

inductors  
capacitors  
delay lines  
resistors



*Nytronics Components  
Group, Inc.*



For many years, Nytronics, Inc. supplied the Electronics Industry with a wide variety of high quality passive components through its various Subsidiary Companies and Divisions. These operations were located over a wide geographic area.

In 1970, a plan was developed and implemented to consolidate all component manufacturing operations in one location, Darlington, South Carolina.

By 1973, all of the moves were completed and a new corporation was formed, Nytronics Components Group, Inc.

The companies included in the Group trace their heritage back to such names as: Sage Electronics, Essex Electronics, Mica Mold, Pyramid Electric, Efcon, and General Instruments.

Our present manufacturing facility has 250,000 square feet, is completely air conditioned, and has undergone very extensive renovation.

We have and are still acquiring new state-of-the-art manufacturing, test, and reliability equipment.

We are completely self-contained, with the ability to develop, design, manufacture, test, and qualify new products, in house.

Our reliability laboratory is one of the finest in the industry and is approved for on premises Military Qualification Testing.

In addition to our military test programs, we actively perform reliability test functions, under contract, for several major companies.

We have successfully built a reputation as a high quality supplier in all product areas. Our customer list includes every major company in the industry.

We value the position of technical leadership that we enjoy in many product areas.

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**STRUTHERS-DUNN, INC.**  
**A Subsidiary of Nytronics Inc.**

Struthers-Dunn Commercial/Industrial Relay Sales, Marketing and Manufacturing are located in our Darlington, S.C. facility.

For your Struthers-Dunn military relay requirements, please contact the Struthers-Dunn Sales Department

**STRUTHERS-DUNN, INC.**

Lambs Road

Pitman, NJ 08071-0901

Tel. 609-589-7500 TWX 510-686-7510

FAX 609-589-2619

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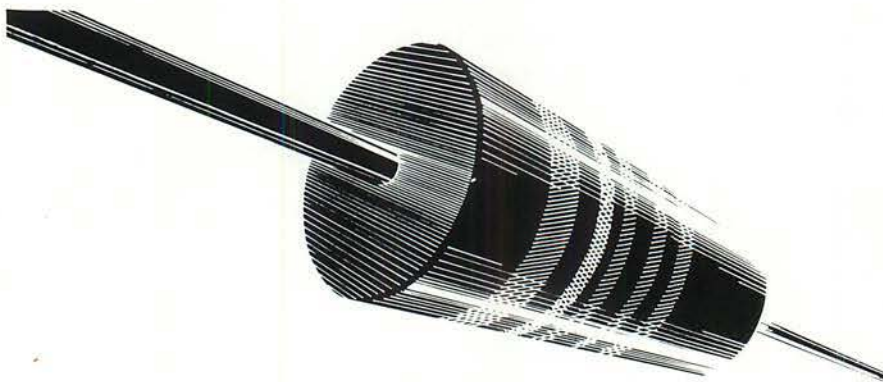
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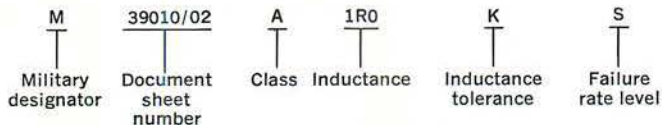
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# Nytronics Inductors



**NCG part number.** The military part number shall consist of the letter "M", the basic document number, and an assigned dash number as shown in the following:



**Class.** The classes of coils denoting the maximum operating temperatures are identified by a single letter in accordance with MIL-C-39010 slash sheets.

Maximum operating temperature

Class	Temperature
A -----	105°C
B -----	125°C

## HI-REL ...

Nytronics Inductors are fully qualified to the established reliability spec MIL-C-39010 in styles /1 through /10. But, Nytronics Inductors also meet the requirements of a **higher authority!** They are widely used in heart pacers to provide RF protection... It's a life or death matter... Literally.

## AVAILABILITY ...

Off-the-shelf from a distributor near you.

**UPDATE**

**UNITS HOURS: 682, 900.090**  
**Date: 6-30-89**

### High Reliability Qualification

MIL-C-39010-1	MIL-C-39010-6
MIL-C-39010-2	MIL-C-39010-7
MIL-C-39010-3	MIL-C-39010-8
MIL-C-39010-4	MIL-C-39010-9
MIL-C-39010-5	MIL-C-39010-10

## BROAD LINE ...

There's a Nytronics Inductor to meet every need from 0.10uH to 180kuH.

With sizes ranging from the world's smallest shielded inductor to the most complex variable inductor... shielded, unshielded and variable, in hundreds of off-the-shelf values... it makes good sense to check first with Nytronics or your local distributor.

### FIXED SHIELDED INDUCTORS

Super Wee Ductor  
MS75087, MS75088, MS75089  
MS90537  
Super Wee Wee Ductor MS21399-21401  
Wee Ductor  
Wee Wee Ductor  
Pee Wee Ductor  
Pee Cee Ductor  
SDD

### FIXED NON-SHIELDED INDUCTORS

Deci Ductor  
Mili Ductor  
MS75083, MS75084, MS75085  
RFC-SS MS18130, MS14046, MS90538  
RFC-S MS21389, MS21390  
MS75008, MS75101, MS90539  
RFC-M MS21388  
RFC-L MS21380  
Pee Dee Ductor  
PL Inductors

### VARIABLE INDUCTORS

Wee V-L (Shielded) MS21381, MS21402  
H Wee V-L (Shielded) MS21381, MS21402  
VIV (Non-Shielded)  
VIH (Non-Shielded)

*Nytronics Components Group, Inc.*

700 ORANGE STREET, DARLINGTON, S.C. 29532  
(803) 393-5421 -- TWX 810-665-2182 -- FAX (803) 393-4123

### ESTABLISHED RELIABILITY

#### MIL-C-39010 (LATEST REVISION)

Magnetically Shielded

MIL-C-39010-1 (Phenolic Core - Iron Sleeve)

MIL-C-39010-2 (Iron Core - Iron Sleeve)

MIL-C-39010-3 (Ferrite Core - Ferrite Sleeve)

#### ELECTRICAL CHARACTERISTICS

Inductance Tolerance: ±10% and ±5% over the entire inductance range. Intermediate values per the MS slash sheet are available.

#### ELECTRICAL CHARACTERISTICS

Dielectric Strength: 1500 volts RMS at sea level.

Self-Resonant Frequency: Measured per MIL-C-39010.

Q: Measured on a Q-Meter.

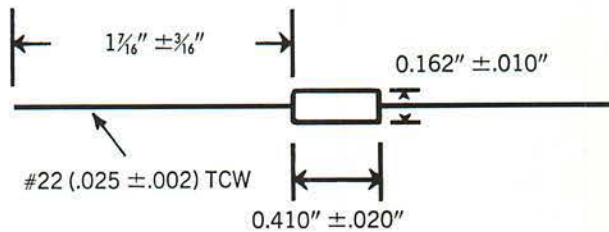
Maximum Current: Based on temperature rise not to exceed 15°C at 90°C ambient.

#### DENSITY CHARACTERISTICS

Volume: 0.0076 cubic inches.

Weight: 1.0 grams maximum.

Shielding: At the coupling test frequency two units assembled side by side exhibit less than 3% coupling.



#### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: -55°C to +105°C.

Terminal Strength: Meets five pound pull test; five 360° rotations in alternate directions.

Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-39010. High frequency 10 cps to 2000 cps @ 20G ±10% maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 100G, 6 MS.

Marking:

EXAMPLE: M39010 /01 A1ROKS 83125 J8711A

- Military part number.

- Manufacturer's source code.

- "JAN" marking, date code, and lot symbol.

M39010	Dash Number	L μH	Q min		Min. SRF MHz	Max. DCR Ω	Max. I mA	Incr.† I mA	
			50	25					
/1	AR10K*	0.10	50	25	250	0.025	1790		
	AR12K*	0.12	50	25	250	0.034	1530		
	AR15K*	0.15	50	25	250	0.037	1470		
	AR18K*	0.18	50	25	250	0.047	1300		
	AR22K*	0.22	49	25	250	0.067	1100		
	AR27K*	0.27	47	25	250	0.11	855		
	AR33K*	0.33	46	25	250	0.13	780		
	AR39K*	0.39	44	25	250	0.18	670		
	AR47K*	0.47	44	25	235	0.25	565		
	AR56K*	0.56	43	25	210	0.33	490		
	AR68K*	0.68	42	25	190	0.45	420		
	AR82K*	0.82	40	25	180	0.59	370		
	/2	A1R0K*	1.0	44	25	140	0.070	1070	
		A1R2K*	1.2	44	7.9	130	0.10	895	
A1R5K*		1.5	44	7.9	115	0.12	815		
A1R8K*		1.8	44	7.9	105	0.14	775		
A2R2K*		2.2	44	7.9	100	0.19	650		
A2R7K*		2.7	44	7.9	92	0.28	535		
A3R3K*		3.3	44	7.9	85	0.35	480		
A3R9K*		3.9	44	7.9	75	0.40	450		
A4R7K*		4.7	44	7.9	70	0.55	380		
A5R6K*		5.6	44	7.9	65	0.72	335		
A6R8K*		6.8	50	7.9	55	1.02	280		
A8R2K*		8.2	50	7.9	50	1.32	245		
A100K*		10	50	7.9	46	1.62	220		
A120K*		12	55	2.5	44	2.00	200		
/3	A150K*	15	45	2.5	49	0.80	315	250	
	A180K*	18	45	2.5	45	0.89	300	235	
	A220K*	22	45	2.5	41	0.96	290	220	
	A270K*	27	45	2.5	38	1.19	260	200	
	A330K*	33	45	2.5	34	1.37	240	190	
	A390K*	39	50	2.5	29	1.93	205	180	
	A470K*	47	50	2.5	27	2.11	195	175	
	A560K*	56	50	2.5	25	2.23	190	160	
	A680K*	68	50	2.5	21	2.70	170	150	
	A820K*	82	50	2.5	10.5	2.44	180	140	
	/3	A101K*	100	50	2.5	10.0	3.12	160	120
		A121K*	120	55	0.79	9.7	3.60	150	95
		A151K*	150	55	0.79	8.5	4.10	140	90
		A181K*	180	55	0.79	8.0	4.40	135	85
A221K*		220	55	0.79	7.5	5.00	125	80	
A271K*		270	55	0.79	7.0	5.80	115	70	
A331K*		330	55	0.79	6.5	6.40	110	65	
A391K*		390	60	0.79	6.2	7.40	105	60	
A471K*		470	60	0.79	5.7	9.50	92	58	
A561K*		560	60	0.79	4.7	10.5	90	55	
A681K*		680	60	0.79	4.5	11.8	80	50	
A821K*		820	60	0.79	4.2	13.0	80	45	
A102K*		1000	60	0.79	3.8	17.5	70	40	
A122K*		1200	45	0.25	1.5	22.1	60	35	
A152K*	1500	45	0.25	1.2	26.5	55	33		
A182K*	1800	45	0.25	1.0	29.9	50	30		
A222K*	2200	45	0.25	0.97	33.8	50	27		
A272K*	2700	45	0.25	0.92	47.3	40	25		
A332K*	3300	45	0.25	0.84	53.0	40	22		
A392K*	3900	45	0.25	0.80	73.8	35	20		
A472K*	4700	45	0.25	0.74	81.6	31	19		
A562K*	5600	44	0.25	0.73	98.9	28	17		
A682K*	6800	40	0.25	0.66	111.0	27	16		
A822K*	8200	40	0.25	0.54	119.0	26	15		
A103K*	10,000	40	0.25	0.47	137.0	24	14		
A123K*	12,000	30	0.079	0.33	143.0	23	13		
A153K*	15,000	30	0.079	0.29	157.0	22	12		
A183K*	18,000	30	0.079	0.28	175.0	21	10		
A223K*	22,000	27	0.079	0.25	274.0	17	9		
A273K*	27,000	27	0.079	0.21	308.0	16	8		
A333K*	33,000	27	0.079	0.19	343.0	15	7.5		
A393K*	39,000	27	0.079	0.17	376.0	15	6.0		
A473K*	47,000	23	0.079	0.16	473.0	13	5.5		
A563K*	56,000	23	0.079	0.14	512.0	13	5.0		
A683K*	68,000	23	0.079	0.13	580.0	12	4.0		
A823K*	82,000	21	0.079	0.12	618.0	11	3.5		
A104K*	100,000	18	0.079	0.11	678.0	11	3.0		

† INCREMENTAL CURRENT: The D.C. current required to cause a 5% reduction in the nominal inductance value.

\* Complete dash number will include an additional letter symbol to indicate failure rate level.

MIL-C-39010/1 - /2 - /3 FAILURE RATE "S" .001%/1000 HRS.

# ESTABLISHED RELIABILITY

## MIL-C-39010 (LATEST REVISION)

- MIL-C-39010-4 (Phenolic Core)
- MIL-C-39010-5 (Iron Core)
- MIL-C-39010-6 (Phenolic Core)
- MIL-C-39010-7 (Iron Core)

### ELECTRICAL CHARACTERISTICS

**Inductance Tolerance:** 0.15 to 0.47 $\mu$ H  $\pm$ 20%; 0.56 $\mu$ H and up  $\pm$ 10%.  $\pm$ 5% and intermediate values per MS slash sheet are available.

**Dielectric Strength:** 1500 Volts RMS at sea level.

**Self-Resonant Frequency:** Measured per MIL-C-39010.

**Rating:** Maximum current based on: 35°C rise in 90° ambient for phenolic, 15°C rise in 90° ambient for iron.

### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

**Operating Temperature:** -55°C to +125°C phenolic core, -55°C to +105°C iron.

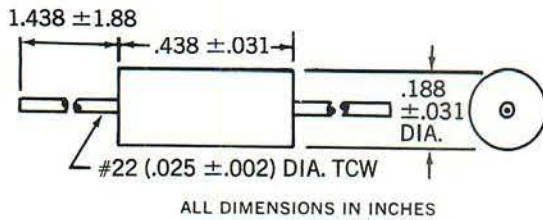
**Terminal Strength:** Meets five pound pull test; five 360° rotations in alternate directions per MIL-C-39010.

**Moisture, Vibration, and Shock Resistance:** Meets requirements of MIL-C-39010 (latest revision), 10 cps to 2000 cps @ 20G  $\pm$ 10% maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 100G, 6 MS.

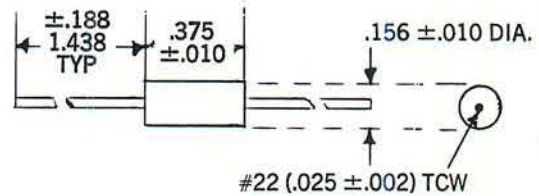
#### Marking:

EXAMPLE: M39010  
          /04  
          A1ROKS  
          83125  
          J8711A

- Military part number.
- Manufacturer's source code.
- "JAN" marking, date code, and lot symbol.



Weight: 0.950 gram maximum.



Weight: 0.90 gram maximum.

M39010	Dash Number	Inductance $\mu$ H	Q min	Test frequency MHz	Self-resonant frequency Min. MHz	DC resistance Max. (25°C) ohms	Rated dc current mA
/4	BR15L*	0.15	55	25.0	510	0.030	2,900
	BR22L*	0.22	50	25.0	415	0.035	2,700
	BR33L*	0.33	50	25.0	350	0.065	2,000
	BR47L*	0.47	50	25.0	300	0.085	1,700
	BR56K*	0.56	50	25.0	270	0.125	1,450
	BR68K*	0.68	45	25.0	250	0.150	1,300
	BR82K*	0.82	40	25.0	210	0.205	1,100
	B1R0K*	1.00	40	25.0	200	0.290	930
	B1R2K*	1.20	30	7.9	180	0.400	785
	B1R5K*	1.50	30	7.9	170	0.485	720
	B1R8K*	1.80	30	7.9	150	0.740	580
	B2R2K*	2.20	30	7.9	140	0.970	505
	B2R7K*	2.70	30	7.9	120	1.20	460
	/5	A3R3K*	3.30	30	7.9	70	0.140
A3R9K*		3.90	30	7.9	65	0.155	370
A4R7K*		4.70	30	7.9	60	0.210	745
A5R6K*		5.60	30	7.9	50	0.280	645
A6R8K*		6.80	30	7.9	50	0.375	560
A8R2K*		8.20	30	7.9	48	0.440	520
A100K*		10.0	30	7.9	42	0.605	440
A120K*		12.0	50	2.5	36	1.05	335
A150K*		15.0	55	2.5	30	1.20	310
A180K*		18.0	60	2.5	30	1.95	245
A220K*		22.0	60	2.5	24	2.20	230
A270K*		27.0	65	2.5	22	2.75	205

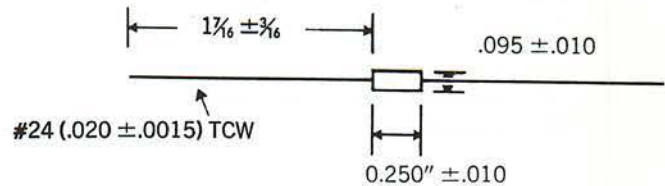
M39010	Dash Number	Inductance $\mu$ H	Q min	Test frequency MHz	Self-resonant frequency Min. MHz	DC resistance Max. (25°C) ohms	Rated dc current mA
/6	BR15L*	0.15	50	25.0	525	0.030	2,450
	BR22L*	0.22	50	25.0	450	0.055	1,810
	BR33L*	0.33	45	25.0	360	0.090	1,400
	BR47L*	0.47	45	25.0	310	0.12	1,225
	BR56K*	0.56	50	25.0	280	0.135	1,150
	BR68K*	0.68	50	25.0	250	0.150	1,100
	BR82K*	0.82	50	25.0	220	0.220	900
	B1R0K*	1.00	50	25.0	200	0.290	785
	B1R2K*	1.20	33	7.9	180	0.420	650
	B1R5K*	1.50	33	7.9	160	0.500	600
/7	B1R8K*	1.80	33	7.9	150	0.650	525
	B2R2K*	2.20	33	7.9	135	0.950	435
	B2R7K*	2.70	33	7.9	120	1.20	385
	B3R3K*	3.30	33	7.9	110	2.00	300
	B3R9K*	3.90	33	7.9	100	2.30	280
	B4R7K*	4.70	33	7.9	90	2.60	260
	A5R6K*	5.6	45	7.9	60	0.32	495
	A6R8K*	6.8	50	7.9	55	0.50	395
	A8R2K*	8.2	50	7.9	50	0.60	360
	A100K*	10	55	7.9	45	0.90	290
A120K*	12	65	2.5	42	1.10	265	
A150K*	15	65	2.5	40	1.40	240	
A180K*	18	75	2.5	34	2.25	185	
A220K*	22	75	2.5	30	2.50	175	
A270K*	27	60	2.5	25	2.60	170	
A330K*	33	65	2.5	19	3.00	165	

\* Complete dash number will include an additional letter symbol to indicate failure rate level.

MIL-C-39010/4 - /5 - /6 - /7 FAILURE RATE "S" .001%/1000 HRS.

# ESTABLISHED RELIABILITY

**MIL-C-39010  
(LATEST REVISION)**



- MIL-C-39010-8** (Phenolic Core)
- MIL-C-39010-9** (Iron Core)
- MIL-C-39010-10** (Ferrite Core)

### ELECTRICAL CHARACTERISTICS

**Inductance Tolerance:** ±10% and ±5% over the entire range. Intermediate values per MS slash sheet are available.

**Dielectric Strength:** 1000 volts RMS at sea level.

**Self-Resonant Frequency:** Measured per MIL-C-39010.

**Rating:** Maximum current based on: 35°C rise in 90° ambient for phenolic, 15°C rise in 90° ambient for iron, and for ferrite core inductors.

### DENSITY CHARACTERISTICS

**Volume:** 0.002 cubic inches; **Weight:** 0.30 grams.

### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

**Operating Temperature:** -55°C to +125°C phenolic core, -55°C to +105°C iron and ferrite core.

**Terminal Strength:** Meets five pound pull test; five 360° rotations in alternate direction.

**Moisture, Vibration, and Shock Resistance:** Meets requirements of MIL-C-39010 (latest revision), 10 cps to 2000 cps @ 20G ±10% maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 100G, 6 MS.

### Marking:

EXAMPLE: M39010 }  
          /08        } - Military part number.  
          A1ROKS }  
          83125    } - Manufacturer's source code.  
          J8711A   } - "JAN" marking, date code, and lot symbol.

M39010	Dash Number	Inductance $\mu$ H	Q min	Test frequency MHz	Self-resonant frequency Min MHz	DC resistance Max. (25°C) ohms	Rated dc current mA
/8	BR10K*	.10	40	25.0	680	.08	1350
	BR12K*	.12	40	25.0	640	.09	1270
	BR15K*	.15	38	25.0	600	.10	1200
	BR18K*	.18	35	25.0	550	.12	1105
	BR22K*	.22	33	25.0	510	.14	1025
	BR27K*	.27	33	25.0	430	.16	960
	BR33K*	.33	30	25.0	410	.22	815
	BR39K*	.39	30	25.0	365	.30	700
	BR47K*	.47	30	25.0	330	.35	650
	BR56K*	.56	30	25.0	300	.50	545
	BR68K*	.68	28	25.0	275	.60	495
	BR82K*	.82	28	25.0	250	.85	415
	B1R0K*	1.00	25	25.0	230	1.00	385
/9	A1R2K*	1.2	25	7.9	150	.18	590
	A1R5K*	1.5	28	7.9	140	.22	535
	A1R8K*	1.8	30	7.9	125	.30	455
	A2R2K*	2.2	30	7.9	115	.40	395
	A2R7K*	2.7	37	7.9	100	.55	335
	A3R3K*	3.3	45	7.9	90	.85	270
	A3R9K*	3.9	45	7.9	80	1.00	250
	A4R7K*	4.7	45	7.9	75	1.20	230
	A5R6K*	5.6	50	7.9	65	1.80	185
	A6R8K*	6.8	50	7.9	60	2.00	175
	A8R2K*	8.2	55	7.9	55	2.70	155
	A100K*	10	55	7.9	50	3.70	130
	A120K*	12	45	2.5	40	2.70	155
	A150K*	15	40	2.5	35	2.80	150
	A180K*	18	50	2.5	30	3.10	145
	A220K*	22	50	2.5	25	3.30	140
	A270K*	27	50	2.5	20	3.50	135

M39010	Dash Number	Inductance $\mu$ H	Q min	Test frequency MHz	Self-resonant frequency Min MHz	DC resistance Max. (25°C) ohms	Rated dc current mA
/10	A330K*	33	45	2.5	24	3.4	130
	A390K*	39	45	2.5	22	3.6	125
	A470K*	47	45	2.5	20	4.5	110
	A560K*	56	45	2.5	18	5.7	100
	A680K*	68	50	2.5	15	6.7	92
	A820K*	82	50	2.5	14	7.3	88
	A101K*	100	50	2.5	13	8	84
	A121K*	120	30	.79	12	13	66
	A151K*	150	30	.79	11	15	61
	A181K*	180	30	.79	10	17	57
	A221K*	220	30	.79	9	21	52
	A271K*	270	30	.79	8	25	47
	A331K*	330	30	.79	7	28	45
	A391K*	390	30	.79	6.5	35	40
	A471K*	470	30	.79	6	42	36
	A561K*	560	30	.79	5	46	35
A681K*	680	30	.79	4	60	30	
A821K*	820	30	.79	3.8	65	29	
A102K*	1000	30	.79	3.4	72	28	

\* Complete dash number will include an additional letter symbol to indicate failure rate level.

**MIL-C-39010/8 - /9 - /10 FAILURE RATE "S" .001%/1000 HRS.**

# Nytronics Components Group, Inc.

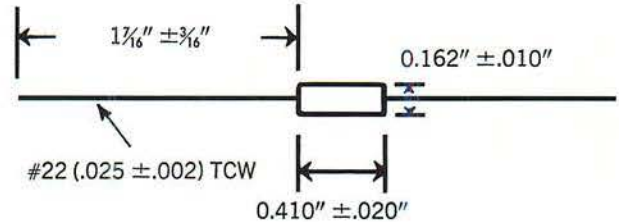
700 ORANGE STREET, DARLINGTON, S. C. 29532  
(803) 393-5421 — TWX 810-665-2182

## TYPE SWD MS75087, 75088 & 75089 INDUCTORS

### MS-INDUCTOR SERIES 75087, 75088, 75089 MOLDED SHIELDED INDUCTOR GRADE 1 CLASS A

Ultra-Reliable Molded Shielded  
Miniature Inductor.  
Inductance Range: 0.1uH to 100,000uH.

The **MS-INDUCTOR SERIES** are R.F. Inductors specifically designed to meet the demanding requirements of MIL-C-15305 (latest revision). The MS-INDUCTOR Series epoxy molded envelope and shielding offers the design engineer reliability, electrical performance, and minimum coupling in high density packaging.



#### ELECTRICAL CHARACTERISTICS

**Inductance Tolerance:** ±10% over the entire inductance range.  
**Dielectric Strength:** 1000 volts RMS at sea level.  
**Self-Resonant Frequency:** Measured per MIL-C-15305 (latest revision).  
**Q:** Measured on a Q-Meter.  
**Maximum Current:** Based on temperature rise not to exceed 15°C at 90°C ambient.

#### DENSITY CHARACTERISTICS

**Volume:** 0.0076 cubic inches  
**Weight:** 0.75 grams maximum  
**Shielding:** At the test frequency, two units assembled side by side exhibit less than 3% coupling.

#### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

**Operating Temperature:** -55°C to +105°C.  
**Terminal Strength:** Meets five pound pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).  
**Moisture, Vibration, and Shock Resistance:** Meets requirements of MIL-C-15305 (latest revision), Grade 1, Class B. High frequency 10 cps to 2000 cps @ 20G ±10% maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 100G, 6 MS.  
**Marking:** Color coded per MIL-C-15305 (latest revision).

Material	MS No.	NCG P/N	L		Q min		Min. SRF MHz	Max. DCR Ω	Max. I mA	Incr.† I mA	Material	MS No.	NCG P/N	L		Q min		Min. SRF MHz	Max. DCR Ω	Max. I mA	Incr.† I mA
			uH	MHz	MHz	MHz								uH	MHz	MHz	MHz				
P H E N O L I C	MS75087-1	SWD	0.10	50	25	250	0.025	1790	>2900		F E R R I T E	MS75089-11	SWD	100	50	2.5	10.0	3.12	160	120	
	MS75087-2	SWD	0.12	51	25	250	0.034	1530	>2800			MS75089-12	SWD	120	55	0.79	9.7	3.60	150	95	
	MS75087-3	SWD	0.15	51	25	250	0.037	1470	>2750			MS75089-13	SWD	150	55	0.79	8.5	4.10	140	90	
	MS75087-4	SWD	0.18	50	25	250	0.047	1300	>2200			MS75089-14	SWD	180	55	0.79	8.0	4.40	135	85	
	MS75087-5	SWD	0.22	49	25	250	0.067	1100	>1700			MS75089-15	SWD	220	55	0.79	7.5	5.00	125	80	
	MS75087-6	SWD	0.27	47	25	250	0.11	855	>1500			MS75089-16	SWD	270	55	0.79	7.0	5.80	115	70	
	MS75087-7	SWD	0.33	46	25	250	0.13	780	>1300			MS75089-17	SWD	330	55	0.79	6.5	6.40	110	65	
	MS75087-8	SWD	0.39	44	25	250	0.18	670	>1100			MS75089-18	SWD	390	60	0.79	6.2	7.40	105	60	
	MS75087-9	SWD	0.47	44	25	235	0.25	565	>1000			MS75089-19	SWD	470	60	0.79	5.7	9.50	92	58	
	MS75087-10	SWD	0.56	43	25	210	0.33	490	> 900			MS75089-20	SWD	560	60	0.79	4.7	10.5	90	55	
	MS75087-11	SWD	0.68	42	25	190	0.45	420	> 750			MS75089-21	SWD	680	60	0.79	4.5	11.8	80	50	
	MS75087-12	SWD	0.82	40	25	180	0.59	370	> 600			MS75089-22	SWD	820	60	0.79	4.2	13.0	80	45	
I R O N	MS75088-1	SWD	1.0	44	25	140	0.070	1070	>1900		MS75089-23	SWD	1000	60	0.79	3.8	17.5	70	40		
	MS75088-2	SWD	1.2	44	7.9	130	0.093	895	>1600		MS75089-24	SWD	1200	45	0.25	1.5	22.1	60	35		
	MS75088-3	SWD	1.5	44	7.9	115	0.12	815	>1300		MS75089-25	SWD	1500	45	0.25	1.2	26.5	55	33		
	MS75088-4	SWD	1.8	44	7.9	105	0.14	775	>1200		MS75089-26	SWD	1800	45	0.25	1.0	29.9	50	30		
	MS75088-5	SWD	2.2	44	7.9	100	0.19	650	>1100		MS75089-27	SWD	2200	45	0.25	0.97	33.8	50	27		
	MS75088-6	SWD	2.7	44	7.9	92	0.28	535	> 950		MS75089-28	SWD	2700	45	0.25	0.92	47.3	40	25		
	MS75088-7	SWD	3.3	44	7.9	85	0.35	480	> 800		MS75089-29	SWD	3300	45	0.25	0.84	53.0	40	22		
	MS75088-8	SWD	3.9	44	7.9	75	0.40	450	> 750		MS75089-30	SWD	3900	45	0.25	0.80	73.8	35	20		
	MS75088-9	SWD	4.7	44	7.9	70	0.55	380	> 650		MS75089-31	SWD	4700	45	0.25	0.74	81.6	31	19		
	MS75088-10	SWD	5.6	44	7.9	65	0.72	335	> 550		MS75089-32	SWD	5600	44	0.25	0.73	98.9	28	17		
	MS75088-11	SWD	6.8	50	7.9	55	1.02	280	> 500		MS75089-33	SWD	6800	40	0.25	0.66	111.0	27	16		
	MS75088-12	SWD	8.2	50	7.9	50	1.32	250	> 475		MS75089-34	SWD	8200	40	0.25	0.54	119.0	26	15		
	MS75088-13	SWD	10	50	7.9	46	1.62	220	> 450		MS75089-35	SWD	10,000	40	0.25	0.47	137.0	24	14		
	MS75088-14	SWD	12	55	2.5	44	2.00	200	> 400		MS75089-36	SWD	12,000	30	0.079	0.33	143.0	23	13		
F E R R I T E	MS75089-1	SWD	15	45	2.5	49	0.80	315	250		MS75089-37	SWD	15,000	30	0.079	0.29	157.0	22	12		
	MS75089-2	SWD	18	45	2.5	45	0.89	300	235		MS75089-38	SWD	18,000	30	0.079	0.28	175.0	21	10		
	MS75089-3	SWD	22	45	2.5	41	0.96	290	220		MS75089-39	SWD	22,000	27	0.079	0.25	274.0	17	9		
	MS75089-4	SWD	27	45	2.5	38	1.19	260	200		MS75089-40	SWD	27,000	27	0.079	0.21	308.0	16	8		
	MS75089-5	SWD	33	50	2.5	34	1.37	240	190		MS75089-41	SWD	33,000	27	0.079	0.19	343.0	15	7.5		
	MS75089-6	SWD	39	50	2.5	29	1.93	205	180		MS75089-42	SWD	39,000	27	0.079	0.17	376.0	15	6.0		
	MS75089-7	SWD	47	50	2.5	27	2.11	195	175		MS75089-43	SWD	47,000	23	0.079	0.16	473.0	13	5.5		
	MS75089-8	SWD	56	50	2.5	25	2.23	190	160		MS75089-44	SWD	56,000	23	0.079	0.14	512.0	13	5.0		
	MS75089-9	SWD	68	50	2.5	21	2.70	170	150		MS75089-45	SWD	68,000	23	0.079	0.13	580.0	12	4.0		
	MS75089-10	SWD	82	50	2.5	10.5	2.44	180	140		MS75089-46	SWD	82,000	21	0.079	0.12	618.0	11	3.5		
											MS75089-47	SWD	100,000	18	0.079	0.11	678.0	11	3.0		

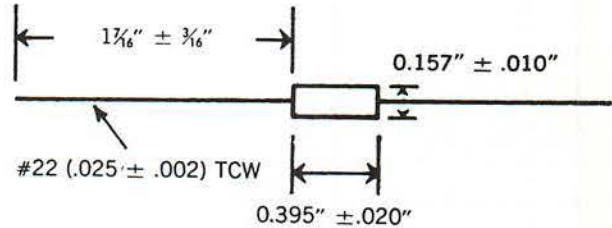
† INCREMENTAL CURRENT: The D.C. current required to cause a 5% reduction in the nominal inductance value.  
MS No. Electricals as shown.



**MS-INDUCTOR SERIES  
90537  
MOLDED SHIELDED INDUCTOR**  
(Manufactured per MS-90537)

Ultra-Reliable Molded Shielded  
Miniature Inductor.  
Inductance Range: 0.1uH to 100,000uH.

The **MS-INDUCTOR SERIES** are R.F. Inductors specifically designed to meet the demanding requirements of MIL-C-15305 (latest revision). The MS-INDUCTOR Series epoxy molded envelope and shielding offers the design engineer reliability, electrical performance, and minimum coupling in high density packaging.



**GRADE 1 CLASS B**

**ELECTRICAL CHARACTERISTICS**

**Inductance Tolerance:** ±10% over the entire inductance range.  
**Dielectric Strength:** 700 volts RMS at sea level.  
**Self-Resonant Frequency:** Measured per MIL-C-15305 (latest revision).  
**Q:** Measured on Q-Meter.  
**Maximum Current:** Based on temperature rise not to exceed 35°C at 90°C ambient.

**DENSITY CHARACTERISTICS**

**Volume:** 0.0076 cubic inches      **Weight:** 0.75 grams maximum  
**Shielding:** At the test frequency, two units assembled side by side exhibit less than 3% coupling.

**PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS**

**Operating Temperature:** —55°C to +125°C.  
**Terminal Strength:** Meets five pound pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).  
**Moisture, Vibration, and Shock Resistance:** Meets requirements of MIL-C-15305D, Grade 1, Class B. High frequency 10 cps to 2000 cps @ 20G ±10% maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes.  
**Shock:** 100G, 6 MS.  
**Marking:** Color coded per MIL-C-15305 (latest revision).

Material	MS Catalog No.	NCG P/N	L		Q Min.	Min. SRF	Max. DCR	Max. I	Incr.** I
			μH	MHz					
PHENOLIC	90537-1	SWD	0.10	50	25	250	0.025	2900	>2900
	90537-2	SWD	0.12	51	25	250	0.034	2800	>2800
	90537-3	SWD	0.15	51	25	250	0.037	2750	>2750
	90537-4	SWD	0.18	50	25	250	0.047	2200	>2200
	90537-5	SWD	0.22	49	25	250	0.067	1700	>1700
	90537-6	SWD	0.27	47	25	250	0.11	1500	>1500
	90537-7	SWD	0.33	46	25	250	0.13	1300	>1300
	90537-8	SWD	0.39	44	25	250	0.18	1100	>1100
	90537-9	SWD	0.47	44	25	235	0.25	1000	>1000
	90537-10	SWD	0.56	43	25	210	0.33	900	>900
	90537-11	SWD	0.68	42	25	190	0.45	750	>750
	90537-12	SWD	0.82	40	25	180	0.59	600	>600
IRON	90537-13	SWD	1.0	47	25	140	0.070	1900	>1900
	90537-14	SWD	1.2	46	7.9	130	0.093	1600	>1600
	90537-15	SWD	1.5	45	7.9	115	0.12	1300	>1300
	90537-16	SWD	1.8	43	7.9	105	0.14	1200	>1200
	90537-17	SWD	2.2	45	7.9	100	0.19	1100	>1100
	90537-18	SWD	2.7	46	7.9	92	0.28	950	>950
	90537-19	SWD	3.3	44	7.9	85	0.35	800	>800
	90537-20	SWD	3.9	44	7.9	75	0.40	750	>750
	90537-21	SWD	4.7	44	7.9	70	0.55	650	>650
	90537-22	SWD	5.6	47	7.9	65	0.72	550	>550
	90537-23	SWD	6.8	50	7.9	55	1.02	500	>500
	90537-24	SWD	8.2	50	7.9	50	1.32	475	>475
	90537-25	SWD	10	49	7.9	46	1.62	450	>450
	90537-26	SWD	12	55	2.5	44	2.00	400	>400
FERRITE	90537-27	SWD	15	44	2.5	49	0.80	620	250
	90537-28	SWD	18	45	2.5	45	0.89	610	235
	90537-29	SWD	22	46	2.5	41	0.96	600	220
	90537-30	SWD	27	49	2.5	38	1.19	500	200
	90537-31	SWD	33	45	2.5	34	1.37	490	190
	90537-32	SWD	39	53	2.5	29	1.93	410	180
	90537-33	SWD	47	52	2.5	27	2.11	400	175
	90537-34	SWD	56	49	2.5	25	2.23	380	160
	90537-35	SWD	68	51	2.5	21	2.70	370	150
	90537-36	SWD	82	45	2.5	10.5	2.44	360	140

Material	MS Catalog No.	NCG P/N	L		Q Min.	Min. SRF	Max. DCR	Max. I	Incr.** I
			μH	MHz					
FERRITE	90537-37	SWD	100	52	2.5	10.0	3.12	325	120
	90537-38	SWD	120	57	.79	9.7	3.60	290	95
	90537-39	SWD	150	56	.79	8.5	4.10	275	90
	90537-40	SWD	180	60	.70	8.0	4.40	260	85
	90537-41	SWD	220	58	.79	7.5	5.00	250	80
	90537-42	SWD	270	60	.79	7.0	5.80	240	70
	90537-43	SWD	330	54	.79	6.5	6.40	225	65
	90537-44	SWD	390	67	.79	6.2	7.40	200	60
	90537-45	SWD	470	60	.79	5.7	9.50	180	58
	90537-46	SWD	560	60	.79	4.7	10.5	174	55
	90537-47	SWD	680	60	.79	4.5	11.8	168	50
	90537-48	SWD	820	57	.79	4.2	13.0	152	45
	90537-49	SWD	1000	65	.79	3.8	17.5	135	40
	90537-50	SWD	1200	45	.25	1.5	22.1	115	35
	90537-51	SWD	1500	49	.25	1.2	26.5	110	33
	90537-52	SWD	1800	47	.25	1.0	29.9	105	30
	90537-53	SWD	2200	50	.25	0.97	33.8	99	27
	90537-54	SWD	2700	47	.25	0.92	47.3	83	25
	90537-55	SWD	3300	43	.25	0.84	53.0	80	22
	90537-56	SWD	3900	43	.25	0.80	73.8	67	20
	90537-57	SWD	4700	44	.25	0.74	81.6	63	19
	90537-58	SWD	5600	45	.25	0.73	98.9	56	17
	90537-59	SWD	6800	43	.25	0.66	111.0	54	16
	90537-60	SWD	8200	42	.25	0.54	119.0	52	15
	90537-61	SWD	10,000	39	.25	0.47	137.0	49	14
	90537-62	SWD	12,000	31	.079	0.33	143.0	46	13
	90537-63	SWD	15,000	31	.079	0.29	157.0	45	12
	90537-64	SWD	18,000	31	.079	0.28	175.0	41	10
	90537-65	SWD	22,000	27	.079	0.25	274.0	33	9
	90537-66	SWD	27,000	27	.079	0.21	308.0	31	8
	90537-67	SWD	33,000	27	.079	0.19	343.0	30	7.5
	90537-68	SWD	39,000	27	.079	0.17	376.0	27	6.0
	90537-69	SWD	47,000	23	.079	0.16	473.0	26	5.5
	90537-70	SWD	56,000	23	.079	0.14	512.0	25	5.0
	90537-71	SWD	68,000	23	.079	0.13	580.0	24	4.0
	90537-72	SWD	82,000	21	.079	0.12	618.0	23	3.5
90537-73	SWD	100,000	18	.079	0.11	678.0	22	3.0	

\*\*INCREMENTAL CURRENT — The D.C. current required to cause a 5% reduction in the nominal inductance value.  
NCG and MS Part No. electricals as shown.

### SUPER WEE-WEE-DUCTOR

The **SUPER WEE-WEE-DUCTOR**, a shielded miniaturized inductor, provides a greater inductance-to-size ratio in a molded epoxy envelope. Use of unique "T" lead construction on all values from 15 uH to 10,000 uH assures exceptional reliability in ranges where fine wire sizes are used. This MS inductor series is designed to meet the stringent requirements of MIL-C-15305 (latest revision). This provides the design engineer with utmost reliability, electrical performance, and minimum coupling in high density packaging.

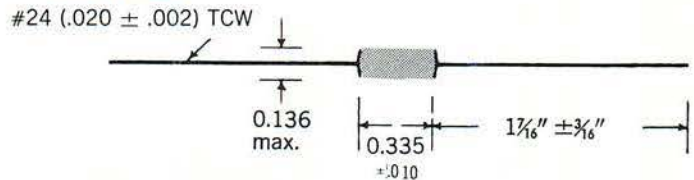
#### ELECTRICAL CHARACTERISTICS

**Inductance Tolerance:** ±10% (Q-Meter) at specified frequency.  
**Dielectric Strength:** 700 volts RMS at sea level.  
**Self-Resonant Frequency:** Measured with full length leads on Q-Meter.  
**Q:** Measured on Q-Meter at specified frequency.  
**Rating:** maximum based on 1/3 watt dissipation.

#### DENSITY CHARACTERISTICS

**Volume:** 0.0041 cubic inches.  
**Weight:** 0.50 grams maximum.  
**Shielding:** Less than 3% coupling with two units mounted side by side at 1000 cycles.

An Ultra-Reliable molded shielded inductor. Subminiature size for high density circuits. Great Inductance-to-size ratio. .10 uH to 10,000 uH. 0.136" diameter x 0.335" length. 61 stock values.



#### GRADE 1 CLASS A

#### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

**Operating Temperature:** -55°C to +105°C.  
**Terminal Strength:** Meets five pounds pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).  
**Moisture, Vibration and Shock Resistance:** Meets requirements of MIL-C-15305 (latest revision). High Frequency: 10 cps to 2000 cps @ 20G ±10% maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes.  
**Shock:** 100G, 6 MS.  
**Marking:** Color coded per MIL-C-15305 (latest revision).

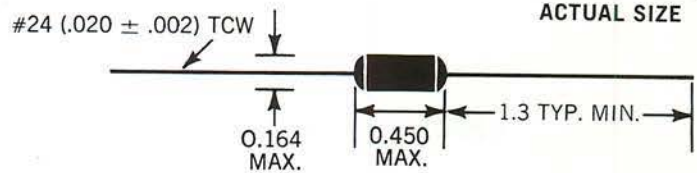
### SUPER WEE-WEE-DUCTOR STANDARD VALUES

Material	MS No.	NCG Part No.	L	Q	Test Freq.	min. SRF	Max. DCR	Max. I	Incr.* I
			μH	Min.	MHz	MHz	Ω	mA	mA
PHENOLIC	MS21399-1	SW-W-D-0.10	0.10	42	25	480	.087	1650	>1650
	MS21399-2	SW-W-D-0.12	0.12	42	25	460	.090	1630	>1630
	MS21399-3	SW-W-D-0.15	0.15	42	25	400	.098	1550	>1550
	MS21399-4	SW-W-D-0.18	0.18	42	25	360	.117	1420	>1420
	MS21399-5	SW-W-D-0.22	0.22	42	25	340	.141	1330	>1330
	MS21399-6	SW-W-D-0.27	0.27	42	25	320	.157	1230	>1230
	MS21399-7	SW-W-D-0.33	0.33	42	25	295	.178	1140	>1140
	MS21399-8	SW-W-D-0.39	0.39	42	25	275	.208	1060	>1060
	MS21399-9	SW-W-D-0.47	0.47	41	25	250	.257	960	>960
	MS21399-10	SW-W-D-0.56	0.56	39	25	238	.283	915	>915
	MS21399-11	SW-W-D-0.68	0.68	36	25	224	.337	840	>840
	MS21399-12	SW-W-D-0.82	0.82	35	25	205	.470	720	>720
IRON	MS21400-1	SW-W-D-1.0	1.0	38	25	135	.170	1180	>1180
	MS21400-2	SW-W-D-1.2	1.2	38	7.9	124	.190	1150	>1150
	MS21400-3	SW-W-D-1.5	1.5	38	7.9	114	.212	1050	>1050
	MS21400-4	SW-W-D-1.8	1.8	38	7.9	105	.242	990	>990
	MS21400-5	SW-W-D-2.2	2.2	38	7.9	95	.263	950	>950
	MS21400-6	SW-W-D-2.7	2.7	38	7.9	85	.320	880	>880
	MS21400-7	SW-W-D-3.3	3.3	38	7.9	78	.345	820	>820
	MS21400-8	SW-W-D-3.9	3.9	42	7.9	74	.411	755	>755
	MS21400-9	SW-W-D-4.7	4.7	42	7.9	68	.562	650	>650
	MS21400-10	SW-W-D-5.6	5.6	42	7.9	62	.742	565	>565
	MS21400-11	SW-W-D-6.8	6.8	45	7.9	55	1.00	485	>485
	MS21400-12	SW-W-D-8.2	8.2	47	7.9	51	1.20	440	>440
	MS21400-13	SW-W-D-10	10	51	7.9	45	1.84	355	>335
	MS21400-14	SW-W-D-12	12	51	2.5	41	2.60	300	>300
FERRITE "T" LEAD	MS21401-1	SW-W-D-15	15	35	2.5	48	.635	610	200
	MS21401-2	SW-W-D-18	18	35	2.5	44	.728	570	175
	MS21401-3	SW-W-D-22	22	35	2.5	37	.825	530	160
	MS21401-4	SW-W-D-27	27	35	2.5	32	.950	500	155
	MS21401-5	SW-W-D-33	33	36	2.5	30	1.26	430	150
	MS21401-6	SW-W-D-39	39	36	2.5	27	1.42	405	145
	MS21401-7	SW-W-D-47	47	36	2.5	23	1.72	370	140
	MS21401-8	SW-W-D-56	56	38	2.5	21	2.03	340	130
	MS21401-9	SW-W-D-68	68	38	2.5	18.5	2.29	320	120
	MS21401-10	SW-W-D-82	82	36	2.5	17.0	2.55	305	115
	MS21401-11	SW-W-D-100	100	36	2.5	15.5	2.92	280	100
	MS21401-12	SW-W-D-120	120	43	0.79	14.5	3.30	235	80
	MS21401-13	SW-W-D-150	150	43	0.79	13.0	4.30	215	68
	MS21401-14	SW-W-D-180	180	43	0.79	11.5	5.40	200	64
	MS21401-15	SW-W-D-220	220	45	0.79	10.0	6.65	150	60
	MS21401-16	SW-W-D-270	270	47	0.79	9.50	7.60	140	58
	MS21401-17	SW-W-D-330	330	47	0.79	8.50	8.50	130	56
	MS21401-18	SW-W-D-390	390	47	0.79	8.00	10.0	120	54
	MS21401-19	SW-W-D-470	470	47	0.79	7.20	13.5	100	52
	MS21401-20	SW-W-D-560	560	51	0.79	6.40	14.5	95	50
	MS21401-21	SW-W-D-680	680	51	0.79	5.80	16.0	90	48
	MS21401-22	SW-W-D-820	820	48	0.79	5.30	19.0	85	47
	MS21401-23	SW-W-D-1000	1000	48	0.79	4.80	21.5	80	45
	MS21401-24	SW-W-D-1200	1200	45	0.25	2.90	23	100	40
	MS21401-25	SW-W-D-1500	1500	45	0.25	2.80	30	90	35
	MS21401-26	SW-W-D-1800	1800	45	0.25	2.60	33	86	32
	MS21401-27	SW-W-D-2200	2200	45	0.25	2.55	40	78	30
	MS21401-28	SW-W-D-2700	2700	45	0.25	2.40	43	74	28
	MS21401-29	SW-W-D-3300	3300	45	0.25	2.00	58	65	26
	MS21401-30	SW-W-D-3900	3900	45	0.25	1.95	76	56	23
	MS21401-31	SW-W-D-4700	4700	45	0.25	1.85	85	53	20
	MS21401-32	SW-W-D-5600	5600	45	0.25	1.75	100	48	18
	MS21401-33	SW-W-D-6800	6800	40	0.25	1.58	127	43	15
	MS21401-34	SW-W-D-8200	8200	40	0.25	1.55	150	40	12
	MS21401-35	SW-W-D-10,000	10,000	40	0.25	1.45	190	37	10

\*INCREMENTAL CURRENT — The D.C. current to cause a 5% reduction in the nominal inductance value.

### WEE-DUCTOR Miniature Shielded Inductor with high inductance-to-size ratio. 0.10uH to 180,000uH in 76 values

The **WEE-DUCTOR** was the first miniature shielded inductor that Nytronics standardized for stock delivery. This encapsulated non-flammable shielded unit in a 0.164" diameter by 0.450" long envelope offers the design engineer extremely high inductance for density packaging.



### GRADE 2 CLASS B

#### ELECTRICAL CHARACTERISTICS

**Inductance Tolerance:** 0.1uH to 22uH ±10% (Q-Meter); 27uH to 1,000uH ±5% (1KC Bridge); 1,200uH to 56,000uH ±10% (1KC Bridge) 68,000uH to 180,000uH ±20% (1KC Bridge) measured at point on leads ¼ inch from body.

**Dielectric Strength:** 700 volts RMS at sea level.

**Self-Resonant Frequency:** Minimum SRF measured with full length leads on Grid DIP Meter.

**Q:** Measured on Q-Meter.

**Maximum Current:** Based on temperature rise not to exceed 40°C at 85°C ambient.

#### DENSITY CHARACTERISTICS

**Volume:** 0.0087 cubic inches **Weight:** 0.75 grams maximum  
**Shielding:** Less than 3% coupling with two units measured side by side at 1000 cycles.

#### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

**Operating Temperature:** -55°C to +125°C.

**Terminal Strength:** Meets five pound pull test; five 360° rotations in alternate directions per MIL-C-15305B.

**Marking:** Printed with pertinent data.

**Note:** L & Q are not always tested at the same frequency.

NCG Part No.	L μH	Q Min.		Min. SRF MHz	Max. DCR Ω	Max. I mA	Incr.* I mA	Material
		MHz	MHz					
WEE- 0.10	0.10	55	25	487	0.020	4000	4000	PHENOLIC
WEE- 0.12	0.12	55	25	442	0.029	3350	3350	
WEE- 0.15	0.15	55	25	402	0.032	3000	3000	
WFF- 0.18	0.18	50	25	366	0.040	2850	2850	
WEE- 0.22	0.22	56	25	331	0.045	2700	2700	
WEE- 0.27	0.27	50	25	298	0.08	2000	2000	
WEE- 0.33	0.33	48	25	270	0.09	1900	1900	
WEE- 0.39	0.39	48	25	248	0.16	1420	1420	
WEE- 0.47	0.47	48	25	226	0.17	1400	1400	
WEE- 0.56	0.56	45	25	206	0.36	960	960	
WEE- 0.68	0.68	45	25	188	0.37	940	940	
WEE- 0.82	0.82	41	25	171	0.46	870	870	
WEE- 1.0	1.0	42	7.9	131	0.062	2300	2300	
WEE- 1.2	1.2	43	7.9	120	0.067	2200	2200	
WEE- 1.5	1.5	41	7.9	108	0.16	1420	1420	
WEE- 1.8	1.8	42	7.9	99	0.17	1370	1370	
WEE- 2.2	2.2	42	7.9	90	0.19	1300	1300	
WEE- 2.7	2.7	41	7.9	86	0.20	1270	1270	
WEE- 3.3	3.3	40	7.9	73	0.31	1030	1030	
WEE- 3.9	3.9	40	7.9	68	0.33	1000	1000	
WEE- 4.7	4.7	40	7.9	61	0.58	750	750	
WEE- 5.6	5.6	40	7.9	56	0.64	710	710	
WEE- 6.8	6.8	40	7.9	51	0.68	680	680	
WEE- 8.2	8.2	45	7.9	46	1.3	500	500	FERRITE
WEE- 10	10	46	2.5	42	1.4	480	480	
WEE- 12	12	47	2.5	38	1.5	460	460	
WEE- 15	15	47	2.5	34	1.7	440	440	
WEE- 18	18	45	2.5	43	0.88	610	235	
WEE- 22	22	47	2.5	38	0.95	590	220	
WEE- 27	27	42	2.5	35	1.15	530	200	
WEE- 33	33	43	2.5	32	1.2	520	193	
WEE- 39	39	45	2.5	30	1.6	450	183	
WEE- 47	47	46	2.5	26	1.8	420	177	
WEE- 56	56	40	2.5	24	2.2	390	170	
WEE- 68	68	40	2.5	22	2.3	375	165	
WEE- 82	82	42	2.5	14	2.4	360	160	
WEE-100	100	63	.79	12	2.6	345	157	
WEE-120	120	62	.79	11	2.9	330	145	

NCG Part No.	L μH	Q Min.		Min. SRF MHz	Max. DCR Ω	Max. I mA	Incr.* I mA	Material
		MHz	MHz					
WEE- 150	150	63	.79	10	3.3	315	126	FERRITE
WEE- 180	180	60	.79	9.2	3.6	300	110	
WEE- 220	220	57	.79	8.8	4.1	280	105	
WEE- 270	270	52	.79	8.0	4.8	260	91	
WEE- 330	330	50	.79	7.2	5.6	240	87	
WEE- 390	390	43	.79	6.8	6.2	230	72	
WEE- 470	470	66	.79	6.4	10.0	180	67	
WEE- 560	560	64	.79	6.0	11.5	170	65	
WEE- 680	680	71	.79	5.2	12.0	160	60	
WEE- 820	820	67	.79	4.8	13.8	150	55	
WEE- 1000	1000	62	.79	4.5	16.0	140	52	
WEE- 1200	1200	52	.250	1.3	18.2	135	50	
WEE- 1500	1500	51	.250	1.2	23.7	118	48	
WEE- 1800	1800	51	.250	1.1	30.2	105	42	
WEE- 2200	2200	50	.250	1.0	33.7	99	37	
WEE- 2700	2700	51	.250	.94	43.1	87	33	
WEE- 3300	3300	52	.250	.84	48.7	82	30	
WEE- 3900	3900	48	.250	.77	62.7	72	29	
WEE- 4700	4700	48	.250	.67	70.5	68	28	
WEE- 5600	5600	48	.250	.65	104	56	24	
WEE- 6800	6800	45	.250	.59	118	53	20	
WEE- 8200	8200	38	.250	.46	146	47	18	
WEE- 10,000	10,000	36	.079	.38	76.6	66	15	
WEE- 12,000	12,000	36	.079	.30	109	55	14	
WEE- 15,000	15,000	38	.079	.26	119	52	13	
WEE- 18,000	18,000	38	.079	.24	138	49	13	
WEE- 22,000	22,000	32	.079	.23	219	39	12	
WEE- 27,000	27,000	32	.079	.22	259	35	12	
WEE- 33,000	33,000	32	.079	.20	296	33	11	
WEE- 39,000	39,000	30	.079	.17	395	29	10	
WEE- 47,000	47,000	25	.079	.16	452	27	9	
WEE- 56,000	56,000	25	.079	.15	499	26	8	
WEE- 68,000	68,000	20	.079	.12	395	29	1.1	
WEE- 82,000	82,000	20	.079	.10	452	27	1.1	
WEE-100,000	100,000	20	.079	.09	499	26	1.1	
WEE-120,000	120,000	20	.070	.08	540	23	1.1	
WEE-150,000	150,000	20	.060	.07	750	20	1.0	
WEE-180,000	180,000	20	.050	.07	880	18	0.8	

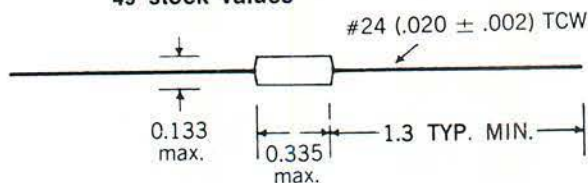
\* INCREMENTAL CURRENT — The D.C. current to cause a 5% reduction in the nominal inductance value.

### WEE-WEE- DUCTOR SERIES

#### GRADE 2 CLASS B

The **WEE-WEE-DUCTOR** offers the Design Engineer a subminiature shielded inductor to solve special problems in density circuit application. This shielded inductor has great inductance-to-size ratio.

**0.10 to 1,000uH**  
**0.133" diameter x 0.335" length**  
**49 stock values**



#### ELECTRICAL CHARACTERISTICS

<b>Inductance Tolerance:</b>	±10% (Q-Meter).
<b>Dielectric Strength:</b>	700 volts RMS at sea level.
<b>Self-Resonant Frequency:</b>	Minimum SRF measured with full length leads on Grid-Dip Meter.
<b>Rating:</b>	1 maximum based on 1/3 watt dissipation.

#### DENSITY CHARACTERISTICS

<b>Volume:</b>	0.0041 cubic inches.
<b>Weight:</b>	0.50 grams maximum.
<b>Shielding:</b>	Less than 3% coupling with two units mounted side by side at 1000 cycles.

#### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

<b>Operating Temperature:</b>	-55°C to +125°C.
<b>Terminal Strength:</b>	Meets five pound pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).
<b>Marking:</b>	Color coded per MIL-C-15305 (latest revision).

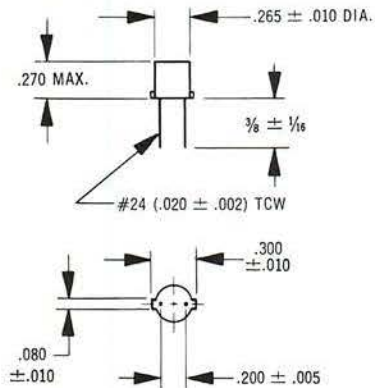
#### WEE-WEE-DUCTOR STANDARD VALUES

NCG Part No.	L	Q Min.		Min. SRF	Max. DCR	Max. I	Incr.* I	Material
	μH		MHz	MHz	Ω	mA	mA	
WEE-WEE- 0.10	0.10	42	25	>400	.112	1720	>1720	PHENOLIC
WEE-WEE- 0.12	0.12	42	25	>400	.126	1630	>1630	
WEE-WEE- 0.15	0.15	42	25	>400	.138	1550	>1550	
WEE-WEE- 0.18	0.18	42	25	366	.165	1420	>1420	
WEE-WEE- 0.22	0.22	42	25	331	.198	1330	>1330	
WEE-WEE- 0.27	0.27	42	25	298	.220	1230	>1230	
WEE-WEE- 0.33	0.33	42	25	288	.258	1140	>1140	
WEE-WEE- 0.39	0.39	42	25	271	.292	1060	>1060	
WEE-WEE- 0.47	0.47	41	25	247	.360	960	> 960	
WEE-WEE- 0.56	0.56	39	25	236	.397	915	> 915	
WEE-WEE- 0.68	0.68	36	25	216	.472	840	> 840	
WEE-WEE- 0.82	0.82	35	25	200	.638	720	> 720	
WEE-WEE- 1.0	1.0	42	25	136	.208	1260	>1260	IRON
WEE-WEE- 1.2	1.2	38	7.9	120	.225	1210	>1210	
WEE-WEE- 1.5	1.5	38	7.9	111	.265	1120	>1120	
WEE-WEE- 1.8	1.8	38	7.9	103	.285	1080	>1080	
WEE-WEE- 2.2	2.2	36	7.9	94	.330	1000	>1000	
WEE-WEE- 2.7	2.7	38	7.9	85	.381	935	> 935	
WEE-WEE- 3.3	3.3	38	7.9	78	.432	875	> 875	
WEE-WEE- 3.9	3.9	40	7.9	73	.576	755	> 755	
WEE-WEE- 4.7	4.7	42	7.9	66	.787	650	> 650	
WEE-WEE- 5.6	5.6	42	7.9	62	1.04	565	> 565	
WEE-WEE- 6.8	6.8	45	7.9	54	1.40	485	> 485	
WEE-WEE- 8.2	8.2	47	7.9	50	1.68	440	> 440	
WEE-WEE- 10	10	51	7.9	44	2.58	355	> 355	
WEE-WEE- 12	12	51	2.5	39	3.65	300	> 300	
WEE-WEE- 15	15	45	2.5	44	.862	620	200	FERRITE
WEE-WEE- 18	18	43	2.5	40	1.02	570	175	
WEE-WEE- 22	22	42	2.5	36	1.12	545	160	
WEE-WEE- 27	27	37	2.5	33	1.28	510	155	
WEE-WEE- 33	33	46	2.5	30	1.70	440	150	
WEE-WEE- 39	39	38	2.5	26	1.99	405	145	
WEE-WEE- 47	47	42	2.5	23	2.41	370	140	
WEE-WEE- 56	56	41	2.5	22	2.85	340	130	
WEE-WEE- 68	68	46	2.5	18	3.21	320	120	
WEE-WEE- 82	82	46	2.5	17	3.57	305	115	
WEE-WEE- 100	100	43	2.5	15	4.10	280	100	
WEE-WEE- 120	120	50	0.79	13	5.97	235	80	
WEE-WEE- 150	150	49	0.79	12	7.05	215	68	
WEE-WEE- 180	180	56	0.79	11	8.12	200	64	
WEE-WEE- 220	220	53	0.79	10	14.8	150	60	
WEE-WEE- 270	270	57	0.79	9	16.8	140	58	
WEE-WEE- 330	330	57	0.79	8.5	18.6	130	56	
WEE-WEE- 390	390	57	0.79	8	21.1	120	54	
WEE-WEE- 470	470	50	0.79	7	32.2	100	52	
WEE-WEE- 560	560	50	0.79	6	36.4	95	50	
WEE-WEE- 680	580	56	0.79	5.5	41.1	90	48	
WEE-WEE- 820	820	49	0.79	5	45.0	85	47	
WEE-WEE-1000	1000	49	0.79	4.5	52.0	80	45	

\* INCREMENTAL CURRENT — The D.C. current to cause a 5% reduction in the nominal inductance value.

The PEE-CEE is designed to meet MIL-C-15305 (latest revision), Grade 1, Class B. Printed board mounting is facilitated by 0.200 grid spacing and unit has shielded construction to allow maximum density packaging. Standardized in 73 stock values.

**Subminiature Shielded Radial Lead Fixed Inductor**  
**High Q Values 0.10 to 100,000uH**  
**Unitized Epoxy-Molded Construction**



All dimensions in inches

### ELECTRICAL CHARACTERISTICS

- Inductance:** ±10% over entire range as measured per MIL-C-15305 (latest revision).
- Q and SRF Values:** Minimum not less than 80% of specified value
- Dielectric Strength:** 840 Volts R.M.S. at sea level.
- Working Voltage:** 300 Volts D.C.
- Maximum Current:** Based on temperature rise not to exceed 35°C at 90°C ambient.
- Incremental Current:** Defined as the DC current required to cause a five percent reduction in the nominal inductance value.

### DENSITY CHARACTERISTICS

- Weight:** 1.5 grams maximum
- Volume:** .015 cubic inches
- Shielding:** 3% coupling maximum when two units are tested side by side.

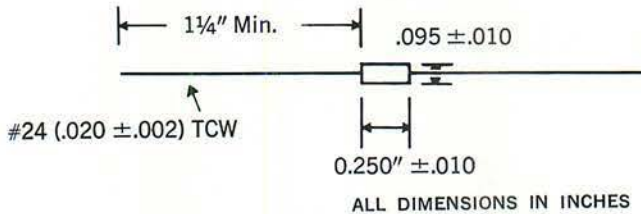
### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

- Operating Temperature:** -55°C to +125°C.
- Moisture, Vibration, and Shock Resistance:** Meet requirements of MIL-C-15305 (latest revision). Low frequency 10 to 55 cps @ .06" maximum total excursion at rate of 1 linear sweep per minute for 2 hours repeated for each of three mutually perpendicular planes. Shock: 100G, 6 MS (body mounted)
- Marking:** Manufacturer data printed.
- Terminal Pull:** Three pounds.

NCG Part No.	L	Test Freq.	Q nom.	SRF nom.	D. C. R. Max.	Max. I	Incr. I
	μh	MHZ		MHZ	ohms	m.a.	m.a.
PC 0.10	.10	25	70	> 250	0.030	2500	2500
PC 0.12	.12	25	70	> 250	0.030	2500	2500
PC 0.15	.15	25	70	> 250	0.030	2500	2500
PC 0.18	.18	25	70	> 250	0.035	2400	2400
PC 0.22	.22	25	70	> 250	0.038	2300	2300
PC 0.27	.27	25	80	> 250	0.040	2200	2200
PC 0.33	.33	25	80	> 250	0.040	2200	2200
PC 0.39	.39	25	80	250	0.045	2100	2100
PC 0.47	.47	25	80	230	0.045	2100	2100
PC 0.56	.56	25	80	220	0.050	2000	2000
PC 0.68	.68	25	80	190	0.055	1900	1900
PC 0.82	.82	25	85	180	0.060	1800	1800
PC 1.00	1.00	25	85	160	0.070	1700	1700
PC 1.2	1.2	7.9	90	170	0.085	1670	1670
PC 1.5	1.5	7.9	100	155	0.100	1540	1540
PC 1.8	1.8	7.9	115	135	0.110	1470	1470
PC 2.2	2.2	7.9	110	120	0.120	1410	1410
PC 2.7	2.7	7.9	110	104	0.125	1380	1380
PC 3.3	3.3	7.9	90	93.0	0.165	1200	1200
PC 3.9	3.9	7.9	90	87.0	0.180	1135	1135
PC 4.7	4.7	7.9	95	79.0	0.245	985	985
PC 5.6	5.6	7.9	95	72.0	0.265	950	950
PC 6.8	6.8	7.9	85	63.0	0.330	853	853
PC 8.2	8.2	7.9	95	60.0	0.460	720	720
PC 10	10	7.9	90	54.0	0.640	620	620
PC 12	12	2.5	120	37.0	0.800	545	545
PC 15	15	2.5	120	28.8	0.865	520	520
PC 18	18	2.5	115	23.8	0.940	504	504
PC 22	22	2.5	125	21.3	1.03	460	460
PC 27	27	2.5	115	20.6	1.18	418	418
PC 33	33	2.5	120	18.6	1.30	398	398
PC 39	39	2.5	120	17.7	1.41	385	385
PC 47	47	2.5	110	14.9	1.61	350	350
PC 56	56	2.5	115	13.9	2.08	330	333
PC 68	68	2.5	105	12.9	2.20	320	330
PC 82	82	2.5	105	11.7	2.42	300	320
PC 100	100	2.5	95	10.5	2.15	333	300
PC 120	120	0.790	95	5.60	2.38	316	190
PC 150	150	0.790	90	5.20	2.52	306	175
PC 180	180	0.790	95	4.90	2.88	288	150
PC 220	220	0.790	95	4.60	3.18	273	125
PC 270	270	0.790	100	4.20	3.50	260	120
PC 330	330	0.790	100	3.55	4.80	222	110
PC 390	390	0.790	100	3.45	5.44	209	105
PC 470	470	0.790	100	3.20	5.90	201	100
PC 560	560	0.790	95	2.90	6.30	194	90
PC 680	680	0.790	100	2.70	7.20	181	80
PC 820	820	0.790	90	2.50	8.00	172	70
PC 1,000	1,000	0.790	100	2.35	12.0	141	65
PC 1,200	1,200	0.250	95	2.20	13.5	132	60
PC 1,500	1,500	0.250	90	1.90	16.5	119	55
PC 1,800	1,800	0.250	100	1.80	18.0	114	47
PC 2,200	2,200	0.250	100	1.70	20.5	107	43
PC 2,700	2,700	0.250	95	1.50	22.5	102	39
PC 3,300	3,300	0.250	90	1.40	42.0	76	36
PC 3,900	3,900	0.250	85	1.27	47.5	71	35
PC 4,700	4,700	0.250	85	1.24	53.0	67	34
PC 5,600	5,600	0.250	85	0.93	62.5	65	31
PC 6,800	6,800	0.250	75	0.79	69.5	58	27
PC 8,200	8,200	0.250	80	0.75	75.0	56	26
PC 10,000	10,000	0.250	70	0.70	100.0	49	24
PC 12,000	12,000	0.079	70	.50	64	60	40
PC 15,000	15,000	0.079	70	.38	84	52	34
PC 18,000	18,000	0.079	70	.36	93	50	30
PC 22,000	22,000	0.079	70	.32	104	45	28
PC 27,000	27,000	0.079	70	.30	173	35	26
PC 33,000	33,000	0.079	70	.27	187	32	24
PC 39,000	39,000	0.079	70	.26	220	30	22
PC 47,000	47,000	0.079	70	.25	253	28	20
PC 56,000	56,000	0.079	70	.24	285	26	19
PC 68,000	68,000	0.079	60	.20	311	24	18
PC 82,000	82,000	0.079	60	.19	385	22	16
PC 100,000	100,000	0.079	60	.17	420	20	15

# SDD MOLDED SHIELDED INDUCTOR

## GRADE 1 CLASS A



The **SDD INDUCTOR SERIES** are R.F. Inductors specifically designed to meet the demanding requirements of MIL-C-15305 (latest revision). The SDD INDUCTOR Series epoxy molded envelope and shielding offers the design engineer reliability, electrical performance, and minimum coupling in high density packaging.

### ELECTRICAL CHARACTERISTICS

**Inductance Tolerance:** ±10% over the entire inductance range.

**Dielectric Strength:** 300 volts RMS at sea level.

**Self-Resonant Frequency:** Measured per MIL-C-15305 (latest revision).

**Q:** Measured on a Q-Meter.

**Maximum Current:** Based on temperature rise not to exceed 15°C at 90°C ambient.

### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

**Operating Temperature:** -55°C to +105°C.

**Terminal Strength:** Meets three pound pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).

**Moisture, Vibration, and Shock Resistance:** Meets requirements of MIL-C-15305 (latest revision), 10 cps to 2000 cps @ 15 G ±10% maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 50G, 11 MS.

**Marking:** Color coded per MIL-C-15305 (latest revision).

### DENSITY CHARACTERISTICS

**Volume:** 0.002 cubic inches

**Weight:** 0.35 grams

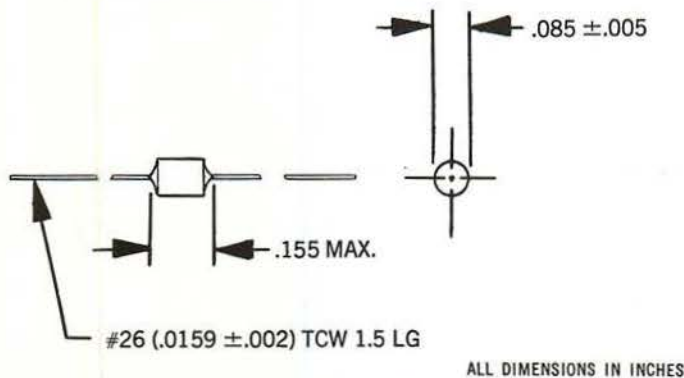
NCG Part. No.	L μH	Q Min.		Min. SRF	Max. DCR	Max I.	Incr. † I
			MHz	MHz	Ohms	mA	mA
SDD- 0.10	0.10	40	25	400	.10	1500	*
SDD- 0.12	0.12	40	25	384	.11	1400	*
SDD- 0.15	0.15	40	25	360	.12	1300	*
SDD- 0.18	0.18	40	25	344	.13	1200	*
SDD- 0.22	0.22	40	25	312	.15	1100	*
SDD- 0.27	0.27	40	25	272	.16	1000	*
SDD- 0.33	0.33	40	25	248	.18	950	*
SDD- 0.39	0.39	40	25	224	.19	900	*
SDD- 0.47	0.47	40	25	200	.21	800	*
SDD- 0.56	0.56	40	25	176	.25	750	*
SDD- 0.68	0.68	35	25	160	.27	700	*
SDD- 0.82	0.82	35	25	144	.36	600	*
SDD- 1.00	1.00	35	25	132	.40	525	*
SDD- 1.20	1.20	35	7.9	120	.73	425	*
SDD- 1.50	1.50	35	7.9	104	.86	400	*
SDD- 1.80	1.80	35	7.9	96	.95	350	*
SDD- 2.20	2.20	35	7.9	88	1.30	320	*
SDD- 2.70	2.70	35	7.9	80	1.80	275	*
SDD- 3.30	3.30	35	7.9	56	1.70	290	*
SDD- 3.90	3.90	35	7.9	52	1.80	275	*
SDD- 4.70	4.70	35	7.9	46	2.60	225	*
SDD- 5.60	5.60	35	7.9	43	2.90	210	*
SDD- 6.80	6.80	35	7.9	40	3.30	200	*
SDD- 8.20	8.20	35	7.9	38	4.50	170	*
SDD- 10.0	10.0	35	7.9	36	4.80	165	*
SDD- 12.0	12.0	45	2.5	40	2.0	250	230
SDD- 15.0	15.0	45	2.5	36	2.5	230	180
SDD- 18.0	18.0	45	2.5	31	3.5	195	150
SDD- 22.0	22.0	46	2.5	28	4.5	170	135
SDD- 27.0	27.0	48	2.5	25	5.0	160	115
SDD- 33.0	33.0	48	2.5	23	5.5	150	105
SDD- 39.0	39.0	48	2.5	22	7.0	140	100
SDD- 47.0	47.0	50	2.5	21	7.5	135	95
SDD- 56.0	56.0	52	2.5	19	8.0	130	90
SDD- 68.0	68.0	55	2.5	18	9.0	120	83
SDD- 82.0	82.0	55	2.5	16	14	95	65
SDD- 100	100	55	2.5	14	16	90	70
SDD- 120	120	34	.79	9.5	10	115	40
SDD- 150	150	34	.79	8.8	12	105	35
SDD- 180	180	34	.79	8.1	15	90	32
SDD- 220	220	36	.79	7.8	20	80	30
SDD- 270	270	36	.79	7.3	23	75	27
SDD- 330	330	36	.79	6.8	26	70	25
SDD- 390	390	36	.79	6.0	35	65	23
SDD- 470	470	38	.79	5.6	37	60	21
SDD- 560	560	40	.79	5.0	40	58	20
SDD- 680	680	40	.79	4.3	48	54	18
SDD- 820	820	40	.79	3.8	54	47	17
SDD-1000	1000	40	.79	3.5	65	43	15

\* GREATER THAN MAX. CURRENT.

† INCREMENTAL CURRENT: The D.C. current required to cause a 5% reduction in the nominal inductance value.

### PEE-WEE SERIES

The amazing **PEE-WEE DUCTOR** represents a 66% size reduction from the smallest magnetically shielded axial leaded inductor series heretofore available anywhere. Furthermore, this size reduction was obtained with negligible loss of electrical performance by employing several unique concepts in RF coil design.



#### ELECTRICAL CHARACTERISTICS:

- Inductance Tolerance:** ± 10% (Std).
- L, Q, F, values:** Measurements per MIL-C-15305. (latest revision).
- Incremental Current:** Incremental current in table is for 5% reduction in inductance value.
- Dielectric Strength:** 300 Volts RMS @ Sea Level.

\*\* SRF minimum not less than 80% of specified values.

#### DENSITY CHARACTERISTICS:

- Volume:** .0007 Cubic Inches
- Weight:** 0.12 Grams
- Shielding:** 5% maximum coupling for two units side by side.
- Marking:** EIA color coded

#### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS:

- Terminal pull:** 3 lbs. minimum.
- Environmental:** Grade 2 Class A

#### PEE-WEE DUCTOR STANDARD VALUES

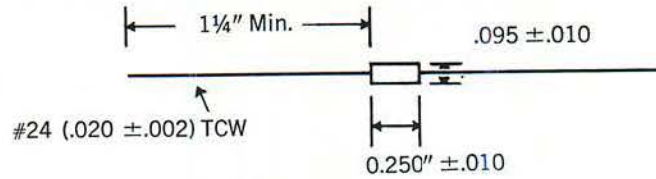
NCG PART NO.	L $\mu$ H	Q min.	MHz	**SRF MHz	Max. DCR $\Omega$	Max. I mA	Incr. I mA
PW- 0.10	.10	40	25	500	.060	1500	*
PW- 0.12	.12	40	25	480	.070	1400	*
PW- 0.15	.15	40	25	450	.080	1300	*
PW- 0.18	.18	40	25	430	.090	1200	*
PW- 0.22	.22	40	25	390	.11	1100	*
PW- 0.27	.27	40	25	340	.12	1000	*
PW- 0.33	.33	40	25	310	.14	950	*
PW- 0.39	.39	40	25	280	.16	900	*
PW- 0.47	.47	40	25	250	.20	800	*
PW- 0.56	.56	40	25	220	.25	750	*
PW- 0.68	.68	35	25	200	.27	700	*
PW- 0.82	.82	35	25	180	.36	600	*
PW- 1.0	1.0	35	25	165	.40	525	*
PW- 1.2	1.2	35	7.9	150	.70	425	*
PW- 1.5	1.5	35	7.9	130	.80	400	*
PW- 1.8	1.8	35	7.9	120	.90	350	*
PW- 2.2	2.2	35	7.9	110	1.3	320	*
PW- 2.7	2.7	35	7.9	100	1.8	275	*
PW- 3.3	3.3	35	7.9	70	1.7	290	*
PW- 3.9	3.9	35	7.9	65	1.8	275	*
PW- 4.7	4.7	35	7.9	58	2.6	225	*
PW- 5.6	5.6	35	7.9	54	2.9	210	*
PW- 6.8	6.8	35	7.9	50	3.3	200	*
PW- 8.2	8.2	35	7.9	48	4.5	170	*
PW- 10	10	35	7.9	45	4.8	165	*
PW- 12	12	35	2.5	40	2.0	250	230
PW- 15	15	35	2.5	36	2.5	230	180
PW- 18	18	35	2.5	31	3.5	195	150
PW- 22	22	35	2.5	28	4.5	170	135
PW- 27	27	35	2.5	25	5.0	160	115
PW- 33	33	35	2.5	23	5.5	150	105
PW- 39	39	35	2.5	22	7.0	140	100
PW- 47	47	35	2.5	21	7.5	135	95
PW- 56	56	35	2.5	19	8.0	130	90
PW- 68	68	35	2.5	18	9.0	120	83
PW- 82	82	35	2.5	16	14	95	65
PW- 100	100	35	2.5	14	16	90	70
PW- 120	120	35	.79	9.5	10	115	40
PW- 150	150	35	.79	8.8	12	105	35
PW- 180	180	35	.79	8.1	15	90	32
PW- 220	220	35	.79	7.8	20	80	30
PW- 270	270	35	.79	7.3	23	75	27
PW- 330	330	35	.79	6.8	26	70	25
PW- 390	390	35	.79	6.0	35	65	23
PW- 470	470	35	.79	5.6	37	60	21
PW- 560	560	35	.79	5.0	40	58	20
PW- 680	680	35	.79	4.3	48	54	18
PW- 820	820	35	.79	3.8	54	47	17
PW-1000	1000	35	.79	3.5	65	43	15

\* GREATER THAN MAX I

**DECI-DUCTOR**

New Subminiature Inductor 0.10uH to 1000uH Range  
0.100" diameter by 0.250" length 49 STANDARD VALUES

The **DECI-DUCTOR** offers the design engineer epoxy-molded reliability and uniformity in a subminiature R.F. Inductor. This Nytronics R.F. Inductor line is designed to meet all the environmental specifications of MIL-C-15305 (latest revision).



**GRADE 1 CLASS B**

**ELECTRICAL CHARACTERISTICS**

Inductance Tolerance: ±10% over entire range.  
Dielectric Strength: 700 volts RMS at sea level.  
Self-Resonant Frequency: Measured per MIL-C-15305 (latest revision).  
Rating: Maximum Current based on 35°C rise in 90°C ambient.

**DENSITY CHARACTERISTICS**

Volume: 0.002 cubic inches      Weight: 0.35 grams

**PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS**

Operating Temperature: -55°C to +125°C  
Terminal Strength: Meets three pound pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).  
Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision), 10 cps to 2000 cps @ 15 G ±10% maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 50G, 11 MS.  
Marking: Color coded per MIL-C-15305 (latest revision).

	NCG Part. No.	L	Q Min.		Min. SRF	Max. DCR	Max I.
		μH		MHz	MHz	Ohms	mA
<b>P H E N O L I C</b>	DD-0.10	0.10	40	25	680	0.07	2000
	DD-0.12	0.12	40	25	640	0.08	1900
	DD-0.15	0.15	38	25	600	0.09	1750
	DD-0.18	0.18	38	25	550	0.10	1600
	DD-0.22	0.22	35	25	520	0.11	1550
	DD-0.27	0.27	35	25	430	0.15	1350
	DD-0.33	0.33	32	25	410	0.21	1150
	DD-0.39	0.39	32	25	365	0.29	970
	DD-0.47	0.47	32	25	330	0.35	820
	DD-0.56	0.56	32	25	300	0.48	700
	DD-0.68	0.68	33	25	275	0.65	600
	DD-0.82	0.82	30	25	250	0.82	500
DD-1.00	1.00	30	25	230	1.10	475	
<b>I R O N</b>	DD-1.20	1.20	30	7.9	150	0.16	1200
	DD-1.50	1.50	32	7.9	140	0.20	1100
	DD-1.80	1.80	35	7.9	125	0.32	900
	DD-2.20	2.20	35	7.9	115	0.37	760
	DD-2.70	2.70	37	7.9	100	0.49	700
	DD-3.30	3.30	45	7.9	90	0.67	575
	DD-3.90	3.90	45	7.9	80	0.95	500
	DD-4.70	4.70	45	7.9	75	1.10	475
	DD-5.60	5.60	52	7.9	65	1.60	380
	DD-6.80	6.80	52	7.9	60	1.80	350
	DD-8.20	8.20	60	7.9	55	2.40	300
	DD-10.0	10.0	60	7.9	50	3.40	265
	DD-12.0	12.0	45	2.5	40	2.40	300
	DD-15.0	15.0	47	2.5	35	2.70	275
	DD-18.0	18.0	50	2.5	30	3.00	260
DD-22.0	22.0	50	2.5	25	3.30	250	
DD-27.0	27.0	50	2.5	20	3.80	240	
<b>F E R R I T E</b>	DD-33.0	33.0	50	2.5	24	3.80	260
	DD-39.0	39.0	50	2.5	22	4.10	240
	DD-47.0	47.0	50	2.5	20	4.40	210
	DD-56.0	56.0	50	2.5	18	5.70	205
	DD-68.0	68.0	52	2.5	15	6.50	180
	DD-82.0	82.0	52	2.5	14	7.30	175
	DD-100	100	50	2.5	13	8.20	165
	DD-120	120	28	0.79	12	14	110
	DD-150	150	28	0.79	11	16	105
	DD-180	180	28	0.79	10	18	100
	DD-220	220	26	0.79	9	25	90
	DD-270	270	26	0.79	8	33	75
	DD-330	330	26	0.79	7	37	70
	DD-390	390	25	0.79	6.5	51	60
	DD-470	470	27	0.79	6	56	58
	DD-560	560	27	0.79	5	61	55
	DD-680	680	28	0.79	4	70	50
DD-820	820	28	0.79	3.8	91	45	
DD-1000	1000	28	0.79	3.4	102	40	

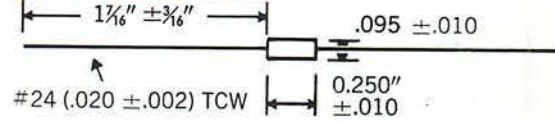


### — MS INDUCTOR SERIES 75083, 75084, 75085 MOLDED INDUCTOR/0.100 uH to 1000 uH

Markings: Color coded per MIL-C-15305 (Latest Rev.)

The MS Inductor Series are RF Inductors specifically designed to meet the demanding requirements of MIL-C-15305 (latest revision). This MS Series is Epoxy Molded enveloped features reliability and uniformity in a Subminiature Inductor.

### Mili-Ductor



**ELECTRICAL CHARACTERISTICS**  
Inductance Tolerance:  $\pm 10\%$  over entire range.  
Dielectric Strength: 1000 volts RMS at sea level.  
Self-Resonant Frequency: Measured per MIL-C-15305 (latest revision).  
Rating: Maximum current based on:  $35^{\circ}\text{C}$  rise in  $90^{\circ}$  ambient for phenolic,  $15^{\circ}\text{C}$  rise in  $90^{\circ}$  ambient for iron and ferrite core inductors.

**DENSITY CHARACTERISTICS**  
Volume: 0.002 cubic inches; Weight: 0.30 grams.

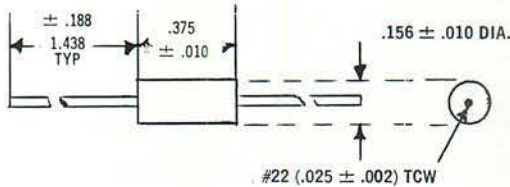
**PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS**  
Operating Temperature:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  phenolic core,  $-55^{\circ}\text{C}$  to  $+105^{\circ}\text{C}$  iron and ferrite core.  
Terminal Strength: Meets five pound pull test; five  $360^{\circ}$  rotations in alternate directions per MIL-C-15305 (latest revision).  
Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision), 10 cps to 2000 cps @ 20G  $\pm 10\%$  maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 100G, 6 MS.

MS No.	NCG Part No.	Inductance		Q Min.	Test Frequency (L & Q)		Self-resonant Frequency, Min.		DC Resistance Max.		Rated DC Current		Material
		uH			MHz		MHz		Ohms		MA		
MS75083-1	MD	.10		40	25.0		680		.08		1350	PHENOLIC	
MS75083-2	MD	.12		40	25.0		640		.09		1270		
MS75083-3	MD	.15		38	25.0		600		.10		1200		
MS75083-4	MD	.18		35	25.0		550		.12		1105		
MS75083-5	MD	.22		33	25.0		510		.14		1025		
MS75083-6	MD	.27		33	25.0		430		.16		960		
MS75083-7	MD	.33		30	25.0		410		.22		815		
MS75083-8	MD	.39		30	25.0		365		.30		700		
MS75083-9	MD	.47		30	25.0		330		.35		650		
MS75083-10	MD	.56		30	25.0		300		.50		545		
MS75083-11	MD	.68		28	25.0		275		.60		495		
MS75083-12	MD	.82		28	25.0		250		.85		415		
MS75083-13	MD	1.00		25	25.0		230		1.00		385		
MS75084-1	MD	1.2		25	7.9		150		.18		590		
MS75084-2	MD	1.5		28	7.9		140		.22		535		
MS75084-3	MD	1.8		30	7.9		125		.30		455		
MS75084-4	MD	2.2		30	7.9		115		.40		395		
MS75084-5	MD	2.7		37	7.9		100		.55		355		
MS75084-6	MD	3.3		45	7.9		90		.85		270		
MS75084-7	MD	3.9		45	7.9		80		1.00		250		
MS75084-8	MD	4.7		45	7.9		75		1.20		230		
MS75084-9	MD	5.6		50	7.9		65		1.80		185		
MS75084-10	MD	6.8		50	7.9		60		2.00		175		
MS75084-11	MD	8.2		55	7.9		55		2.70		155		
MS75084-12	MD	10		55	7.9		50		3.70		130		
MS75084-13	MD	12		45	2.5		40		2.70		155		
MS75084-14	MD	15		40	2.5		35		2.80		150		
MS75084-15	MD	18		50	2.5		30		3.10		145		
MS75084-16	MD	22		50	2.5		25		3.30		140		
MS75084-17	MD	27		50	2.5		20		3.50		135		
MS75085-1	MD	33		45	2.5		24		3.4		130		
MS75085-2	MD	39		45	2.5		22		3.6		125		
MS75085-3	MD	47		45	2.5		20		4.5		110		
MS75085-4	MD	56		45	2.5		18		5.7		100		
MS75085-5	MD	68		50	2.5		15		6.7		92		
MS75085-6	MD	82		50	2.5		14		7.3		88		
MS75085-7	MD	100		50	2.5		13		8		84		
MS75085-8	MD	120		30	.79		12		13		66		
MS75085-9	MD	150		30	.79		11		15		61		
MS75085-10	MD	180		30	.79		10		17		57		
MS75085-11	MD	220		30	.79		9		21		52		
MS75085-12	MD	270		30	.79		8		25		47		
MS75085-13	MD	330		30	.79		7		28		45		
MS75085-14	MD	390		30	.79		6.5		35		40		
MS75085-15	MD	470		30	.79		6		42		36		
MS75085-16	MD	560		30	.79		5		46		35		
MS75085-17	MD	680		30	.79		4		60		30		
MS75085-18	MD	820		30	.79		3.8		65		29		
MS75085-19	MD	1000		30	.79		3.4		72		28		

### RFC-SS SERIES

Molded inductors specifically designed to meet MIL-C-15305 (latest revision). Inductance from 0.15 to 240uH.

#### GRADE 1 CLASS B (0.15-4.7) CLASS A (5.6-240)



#### ELECTRICAL CHARACTERISTICS

**Inductance Tolerance:** 0.15 to 33 uH ±10%  
36 to 240 uH ±5%  
Measured on Q meter per MIL-C-15305 (latest revision).

**Dielectric Strength:** 1000 volts RMS @ sea level

**Rated Current:** Based on max. temp. rise of 35°C (ambient 90°C) for RFC-SS-0.15 to -4.7  
15°C (ambient 90°C) for RFC-SS-5.6 to -240

#### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

**Operating Temperature:** Max. 125°C for RFC-SS-0.15 to -4.7  
Max. 105°C for RFC-SS-5.6 to -240

**Terminal Strength:** Meets five pound pull test per MIL-C-15305 (latest revision).

**Moisture, Vibration, and Shock Resistance:** Meets requirements of MIL-C-15305 (latest revision), high frequency 10 cps

**Marking:** Color banded.

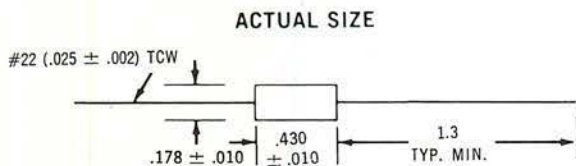
MS NO.	NCG* PART NO.	L		Q Min.	@	Min. SRF	Max. DCR	Rated DC Cur.	Material
		uH			MHz	MHz	Ω	mA	
MS18130-1	RFC-SS-	.15	0.15	50	25	525	0.03	2450	PHENOLIC
MS18130-2	RFC-SS-	.22	0.22	50	25	450	0.05	1900	
MS18130-3	RFC-SS-	.33	0.33	45	25	360	0.09	1400	
MS18130-4	RFC-SS-	.47	0.47	45	25	310	0.12	1225	
MS18130-5	RFC-SS-	.56	0.56	50	25	280	0.13	1220	
MS18130-6	RFC-SS-	.68	0.68	50	25	250	0.15	1100	
MS18130-7	RFC-SS-	.82	0.82	50	25	220	0.22	900	
MS18130-8	RFC-SS-	1.00	1.00	50	25	200	0.29	830	
MS18130-9	RFC-SS-	1.20	1.20	33	7.9	180	0.42	650	
MS18130-10	RFC-SS-	1.50	1.5	33	7.9	160	0.50	600	
MS18130-11	RFC-SS-	1.80	1.8	33	7.9	150	0.65	525	
MS18130-12	RFC-SS-	2.2	2.2	33	7.9	135	0.95	435	
MS18130-13	RFC-SS-	2.7	2.7	33	7.9	120	1.20	385	
MS18130-14	RFC-SS-	3.3	3.3	33	7.9	110	2.00	300	
MS18130-15	RFC-SS-	3.9	3.9	33	7.9	100	2.30	280	
MS18130-16	RFC-SS-	4.7	4.7	33	7.9	90	2.60	260	
MS14046-1	RFC-SS-	5.6	5.6	45	7.9	60	0.32	750	IRON
MS14046-2	RFC-SS-	6.8	6.8	50	7.9	55	0.50	600	
MS14046-3	RFC-SS-	8.2	8.2	50	7.9	50	0.60	545	
MS14046-4	RFC-SS-	10	10.0	55	7.9	45	0.90	445	
MS14046-5	RFC-SS-	12	12	65	2.5	42	1.10	404	
MS14046-6	RFC-SS-	15	15	65	2.5	40	1.40	370	
MS14046-7	RFC-SS-	18	18	75	2.5	34	2.25	280	
MS14046-8	RFC-SS-	22	22	75	2.5	30	2.50	265	
MS14046-9	RFC-SS-	27	27	60	2.5	25	2.60	260	
MS14046-10	RFC-SS-	33	33	65	2.5	19	3.00	250	
MS90538-1	RFC-SS-	36	36	60	2.5	15.5	2.50	180	
MS90538-2	RFC-SS-	39	39	60	2.5	14.5	2.60	176	
MS90538-3	RFC-SS-	43	43	60	2.5	13.7	2.70	172	
MS90538-4	RFC-SS-	47	47	55	2.5	13.0	2.75	170	
MS90538-5	RFC-SS-	51	51	55	2.5	12.7	2.85	167	
MS90538-6	RFC-SS-	56	56	55	2.5	12.0	3.00	164	
MS90538-7	RFC-SS-	62	62	55	2.5	11.5	3.15	160	
MS90538-8	RFC-SS-	68	68	55	2.5	11.0	3.30	156	
MS90538-9	RFC-SS-	75	75	55	2.5	10.5	3.70	147	
MS90538-10	RFC-SS-	82	82	50	2.5	10.3	3.9	143	
MS90538-11	RFC-SS-	91	91	50	2.5	10.0	4.3	136	
MS90538-12	RFC-SS-	100	100	50	2.5	9.5	4.5	133	
MS90538-13	RFC-SS-	110	110	60	0.79	8.9	4.9	128	
MS90538-14	RFC-SS-	120	120	65	0.79	8.7	5.2	124	
MS90538-15	RFC-SS-	130	130	65	0.79	8.5	5.45	121	
MS90538-16	RFC-SS-	150	150	65	0.79	8.0	6.05	114	
MS90538-17	RFC-SS-	160	160	65	0.79	7.5	6.40	111	
MS90538-18	RFC-SS-	180	180	65	0.79	7.0	6.75	108	
MS90538-19	RFC-SS-	200	200	65	0.79	6.5	7.10	106	
MS90538-20	RFC-SS-	220	220	65	0.79	6.2	7.45	103	
MS90538-21	RFC-SS-	240	240	65	0.79	5.9	7.8	101	

\* NCG Part No. electricals and tolerances as shown, MS No. electricals and tolerances per actual MS sheet.

### RFC-S SERIES

Proven reliability molded inductors specifically designed to meet MIL-C-15305 (latest revision). Inductance 0.1 to 1000uH.

#### GRADE 1 CLASS B



#### ELECTRICAL CHARACTERISTICS

- Inductance Tolerance:** 0.1 uH to 22uH ±10% on Q-Meter  
27uH to 100uH ±5%  
1,000 cps bridge  
120uH to 1000uH ±5% on Q-Meter
- Note:** L & Q are not always tested at the same frequency. Inductance values that are tested on Q-Meter, are tested at standard test frequencies.
- Dielectric Strength:** 700 volts RMS at sea level.
- Self-Resonant Frequency:** Minimum SRF measured with full length leads on Grid-Dip Meter.
- Q:** Measured on Q-Meter.
- Rating:** 1/3 watt dissipation for series S

#### DENSITY CHARACTERISTICS

- Volume:** 0.012 cu. in.
- Weight:** 0.90 grams

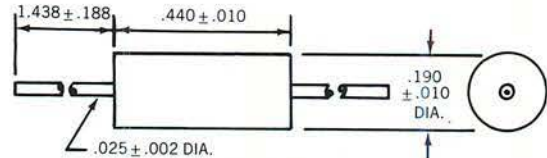
#### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

- Operating Temperature:** -55°C to +125°C.
- Terminal Strength:** Meets five pound pull test per MIL-C-15305 (latest revision).
- Moisture, Vibration, and Shock Resistance:** Meets requirements of MIL-C-15305 Grade 1, Class B. High frequency 10 cps to 2000 cps @ 30G ±10% maximum for 12 logarithmic swings, each of 20 minute duration repeated for each of three mutually perpendicular planes.

MS NO.	NCG PART NO.*	L		Q min		min. SRF	Max. DCR	max. I	MATERIAL
		uH		MHz		MHz	Ω	mA	
MS21389-1	RFC-S- 0.10	0.10	75	50	400	.02	4000	PHENOLIC	
MS21389-2	RFC-S- 0.12	0.12	75	50	400	.025	3500		
MS21389-3	RFC-S- 0.15	0.15	75	50	400	.03	3000		
MS21389-4	RFC-S- 0.18	0.18	75	50	400	.03	3000		
MS21389-5	RFC-S- 0.22	0.22	75	50	400	.03	3000		
MS21389-6	RFC-S- 0.27	0.27	70	45	376	.04	2700		
MS21389-7	RFC-S- 0.33	0.33	70	40	352	.05	2500		
MS21389-8	RFC-S- 0.39	0.39	65	40	320	.08	2000		
MS21389-9	RFC-S- 0.47	0.47	60	25	288	.08	2000		
MS21389-10	RFC-S- 0.56	0.56	55	25	264	.10	1700		
MS21389-11	RFC-S- 0.68	0.68	55	25	240	.12	1500		
MS21389-12	RFC-S- 0.82	0.82	50	25	220	.18	1300		
MS21389-13	RFC-S- 1.0	1.0	50	20	200	.24	1100		
MS21389-14	RFC-S- 1.2	1.2	45	20	176	.35	1000		
MS21389-15	RFC-S- 1.5	1.5	45	15	160	.43	850		
MS21389-16	RFC-S- 1.8	1.8	45	15	144	.65	720		
MS21389-17	RFC-S- 2.2	2.2	45	15	132	.80	610		
MS21390-1	RFC-S- 2.7	2.7	55	10	88	.12	1600	IRON	
MS21390-2	RFC-S- 3.3	3.3	55	10	80	.15	1400		
MS21390-3	RFC-S- 3.9	3.9	60	10	76	.23	1200		
MS21390-4	RFC-S- 4.7	4.7	70	7.9	72	.30	1000		
MS21390-5	RFC-S- 5.6	5.6	65	7.9	64	.45	900		
MS21390-6	RFC-S- 6.8	6.8	65	7.9	56	.55	800		
MS21390-7	RFC-S- 8.2	8.2	60	7.9	52	.65	720		
MS21390-8	RFC-S- 10	10	60	5	48	.73	650		
MS21390-9	RFC-S- 12	12	65	5	42	1.1	590		
MS21390-10	RFC-S- 15	15	80	2.5	38	1.4	500		
MS21390-11	RFC-S- 18	18	75	2.5	34	1.6	460		
MS21390-12	RFC-S- 22	22	75	2.5	32	1.8	430		
MS21390-13	RFC-S- 27	27	75	2.5	29	2.7	360		
MS21390-14	RFC-S- 33	33	85	2.5	26	3.5	300		
MS21390-15	RFC-S- 39	39	80	2.5	21	3.8	290		
MS21390-16	RFC-S- 47	47	80	2.5	18	4.0	275		
MS21390-17	RFC-S- 56	56	75	2.5	15	4.4	265		
MS21390-18	RFC-S- 68	68	75	2.5	13	4.7	250		
MS21390-19	RFC-S- 82	82	75	2.5	10	5.3	235		
MS21390-20	RFC-S- 100	100	75	1.5	8	6.0	220		
MS21390-21	RFC-S- 120	120	65	0.79	5.7	5.0	170		
MS21390-22	RFC-S- 150	150	65	0.79	5.4	5.8	164		
MS21390-23	RFC-S- 180	180	65	0.79	5.0	6.6	158		
MS21390-24	RFC-S- 220	220	65	0.79	4.7	7.4	155		
MS21390-25	RFC-S- 270	270	65	0.79	4.5	8.0	150		
MS21390-26	RFC-S- 300	300	65	0.79	4.2	8.6	145		
MS21390-27	RFC-S- 330	330	65	0.79	4.0	8.9	142		
MS21390-28	RFC-S- 360	360	65	0.79	3.8	9.6	137		
MS21390-29	RFC-S- 390	390	65	0.79	3.6	9.9	135		
MS21390-30	RFC-S- 430	430	65	0.79	3.4	10.4	131		
MS21390-31	RFC-S- 470	470	65	0.79	3.2	10.9	128		
MS21390-32	RFC-S- 510	510	65	0.79	3.0	11.6	124		
MS21390-33	RFC-S- 560	560	65	0.79	2.9	11.8	123		
MS21390-34	RFC-S- 620	620	60	0.79	2.8	12.5	120		
MS21390-35	RFC-S- 680	680	60	0.79	2.7	13.5	115		
MS21390-36	RFC-S- 750	750	60	0.79	2.6	14.0	113		
MS21390-37	RFC-S- 820	820	60	0.79	2.5	15.0	110		
MS21390-38	RFC-S- 910	910	60	0.79	2.4	15.5	107		
MS21390-39	RFC-S-1000	1000	60	0.79	2.2	16.5	104		

\* NCG Part No. electricals and tolerances as shown, MS No. electricals and tolerances per actual MS sheet.

**MS-INDUCTOR SERIES  
75008-75101-90539  
MOLDED INDUCTOR**



ALL DIMENSIONS IN INCHES

Proven reliability molded inductors designed to meet MIL-C-15305 (latest revision). Inductance 0.15 to 1000  $\mu$ H.

**ELECTRICAL CHARACTERISTICS**

Inductance Tolerance: 0.15 to 0.47  $\mu$ H  $\pm 20\%$ ;  
0.56-27  $\mu$ H  $\pm 10\%$ ; 270-1000  $\mu$ H  $\pm 5\%$ .  
Dielectric Strength: 1000 Volts RMS at sea level  
Max. Temp. Rise: 35°C (Class B devices)  
15°C (Class A devices)

**PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS**

Operating Temperature: -55°C to +125°C.  
(.15 thru 2.7  $\mu$ H) -55°C to +105°C (3.3  $\mu$ H thru 1000  $\mu$ H).  
Terminal Strength: Meets five pound pull test per MIL-C-15305 (latest revision).  
Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision). High frequency 10 cps to 2000 cps @ 20G  $\pm 10\%$  maximum for 12 logarithmic swings, each of 20 minute duration repeated for each of three mutually perpendicular planes.  
Volume: S Type — 0.012 cu. in.  
Weight: S Type — 0.90 grams  
Marking: Color banded per MIL-C-15305 (latest revision).

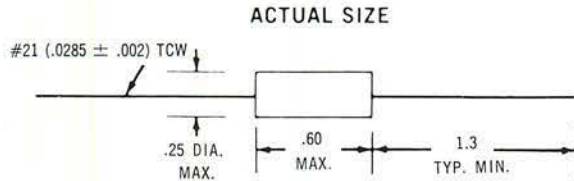
	MS No.	NCG Part No.*	Inductance $\mu$ H	Q Min.	Test Frequency MHz	Self-Resonant Frequency, Min. MHz	DC Resistance Maximum Ohms	Rated DC Current mA	Material
<b>GRADE 1, CLASS B</b>	MS75008-21	RFC-S	0.15 $\pm 20\%$	55	25.0	510	0.030	3,000	<b>PHENOLIC</b>
	MS75008-22	RFC-S	0.22 $\pm 20\%$	50	25.0	415	0.035	2,800	
	MS75008-23	RFC-S	0.33 $\pm 20\%$	50	25.0	350	0.065	2,000	
	MS75008-24	RFC-S	0.47 $\pm 20\%$	50	25.0	300	0.085	1,700	
	MS75008-25	RFC-S	0.56 $\pm 10\%$	50	25.0	270	0.125	1,450	
	MS75008-26	RFC-S	0.68 $\pm 10\%$	45	25.0	250	0.150	1,300	
	MS75008-27	RFC-S	0.82 $\pm 10\%$	40	25.0	210	0.205	1,100	
	MS75008-28	RFC-S	1.00 $\pm 10\%$	40	25.0	200	0.290	930	
	MS75008-29	RFC-S	1.20 $\pm 10\%$	30	7.9	180	0.400	785	
	MS75008-30	RFC-S	1.50 $\pm 10\%$	30	7.9	170	0.485	700	
	MS75008-31	RFC-S	1.80 $\pm 10\%$	30	7.9	150	0.740	580	
	MS75008-32	RFC-S	2.20 $\pm 10\%$	30	7.9	140	0.970	505	
	MS75008-33	RFC-S	2.70 $\pm 10\%$	30	7.9	120	1.20	460	
	<b>GRADE 1, CLASS A</b>	MS75101-1	RFC-S	3.30 $\pm 10\%$	30	7.9	70	0.140	
MS75101-2		RFC-S	3.90 $\pm 10\%$	30	7.9	65	0.155	1,250	
MS75101-3		RFC-S	4.70 $\pm 10\%$	30	7.9	60	0.210	1,100	
MS75101-4		RFC-S	5.60 $\pm 10\%$	30	7.9	50	0.280	935	
MS75101-5		RFC-S	6.80 $\pm 10\%$	30	7.9	50	0.375	810	
MS75101-6		RFC-S	8.20 $\pm 10\%$	30	7.9	48	0.440	750	
MS75101-7		RFC-S	10.00 $\pm 10\%$	30	7.9	42	0.605	640	
MS75101-8		RFC-S	12.00 $\pm 10\%$	50	2.5	36	1.05	490	
MS75101-9		RFC-S	15.00 $\pm 10\%$	55	2.5	30	1.20	460	
MS75101-10		RFC-S	18.00 $\pm 10\%$	60	2.5	30	1.95	360	
MS75101-11		RFC-S	22.00 $\pm 10\%$	60	2.5	24	2.20	335	
MS75101-12		RFC-S	27.00 $\pm 10\%$	65	2.5	22	2.75	300	
<b>GRADE 1, CLASS A</b>	MS90539-01	RFC-S	270 $\pm 5\%$	65	.79	5.6	8.2	110	<b>IRON</b>
	MS90539-02	RFC-S	300 $\pm 5\%$	65	.79	5.3	8.7	107	
	MS90539-03	RFC-S	330 $\pm 5\%$	65	.79	5.0	9.1	105	
	MS90539-04	RFC-S	360 $\pm 5\%$	65	.79	4.7	9.6	102	
	MS90539-05	RFC-S	390 $\pm 5\%$	65	.79	4.5	10.0	100	
	MS90539-06	RFC-S	430 $\pm 5\%$	65	.79	4.3	10.6	97	
	MS90539-07	RFC-S	470 $\pm 5\%$	65	.79	4.0	11.1	95	
	MS90539-08	RFC-S	510 $\pm 5\%$	65	.79	3.8	11.6	93	
	MS90539-09	RFC-S	560 $\pm 5\%$	65	.79	3.6	12.3	91	
	MS90539-10	RFC-S	620 $\pm 5\%$	60	.79	3.5	13.0	88	
	MS90539-11	RFC-S	680 $\pm 5\%$	60	.79	3.4	13.7	85	
	MS90539-12	RFC-S	750 $\pm 5\%$	60	.79	3.3	14.4	83	
	MS90539-13	RFC-S	820 $\pm 5\%$	60	.79	3.1	15.1	81	
	MS90539-14	RFC-S	910 $\pm 5\%$	60	.79	2.9	15.8	79	
	MS90539-15	RFC-S	1000 $\pm 5\%$	60	.79	2.24	16.5	78	

MS No. electricals as shown.  
NCG Part No. is reference only, see page 19 for RFC-S electricals.

**RFC-M SERIES**

Proven reliability molded inductors specifically designed to meet MIL-C-15305 (latest revision). Inductance 1.0 to 2200uH.

**GRADE 1 CLASS B**



**ELECTRICAL CHARACTERISTICS**

- Inductance Tolerance:** 1.0 to 22uH ± 10% on Q-Meter  
27uH to 2200 ± 5%  
1,000 cps bridge
- Note:** L & Q are not always tested at the same frequency. Inductance Values tested on Q-Meter, are tested at standard test frequencies.
- Dielectric Strength:** 700 volts RMS at sea level.
- Self-Resonant Frequency:** Minimum SRF measured with full length leads on Grid-Dip Meter.
- Q:** Measured on Q-Meter.
- Rating:** 1/3 watt dissipation for series M

**DENSITY CHARACTERISTICS**

- Volume:** 0.029 cu. in.
- Weight:** 2.00 grams

**PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS**

- Operating Temperature:** -55°C to +125°C.
- Terminal Strength:** Meets five pound pull test per MIL-C-15305.
- Moisture, Vibration, and Shock Resistance:** Meets requirements of MIL-C-15305 (latest revision). High frequency 10 cps to 2000 cps @ 30G ±10% maximum for 12 logarithmic swings, each of 20 minute duration repeated for each of three mutually perpendicular planes.

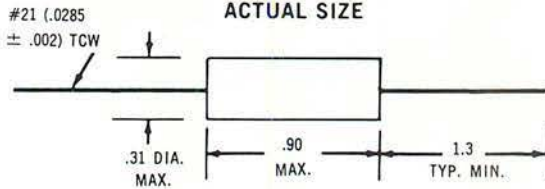
MS NO.	NCG PART NO.*	L		Q Min.		Min. SRF	Max. DCR	Max. I	MATERIAL
		uH		MHz	MHz				
MS21388-1	RFC-M-	1.0	1.0	100	15	136	.04	2700	IRON
MS21388-2	RFC-M-	1.2	1.2	100	15	124	.04	2700	
MS21388-3	RFC-M-	1.5	1.5	100	10	112	.04	2700	
MS21388-4	RFC-M-	1.8	1.8	95	10	100	.05	2500	
MS21388-5	RFC-M-	2.2	2.2	95	10	88	.05	2500	
MS21388-6	RFC-M-	2.7	2.7	68	7.9	76	.05	2500	
MS21388-7	RFC-M-	3.3	3.3	60	7.9	72	.05	2500	
MS21388-8	RFC-M-	3.9	3.9	60	7.9	70	.07	2100	
MS21388-9	RFC-M-	4.7	4.7	60	7.9	60	.09	1800	
MS21388-10	RFC-M-	5.6	5.6	65	7.9	56	.14	1550	
MS21388-11	RFC-M-	6.8	6.8	70	7.9	52	.17	1300	
MS21388-12	RFC-M-	8.2	8.2	65	7.9	46	.25	1150	
MS21388-13	RFC-M-	10	10	65	5	40	.32	1000	
MS21388-14	RFC-M-	12	12	65	5	36	.47	870	
MS21388-15	RFC-M-	15	15	75	4	32	.62	730	
MS21388-16	RFC-M-	18	18	65	4	30	.72	660	
MS21388-17	RFC-M-	22	22	65	2.5	28	.8	600	
MS21388-18	RFC-M-	27	27	65	2.5	25	1.2	520	
MS21388-19	RFC-M-	33	33	80	2.5	22	1.5	450	
MS21388-20	RFC-M-	39	39	80	2.5	20	2.3	380	
MS21388-21	RFC-M-	47	47	100	2.5	19	3.0	300	
MS21388-22	RFC-M-	56	56	100	2.5	18	4.2	270	
MS21388-23	RFC-M-	68	68	100	2.5	16	5.2	250	
MS21388-24	RFC-M-	82	82	100	2.5	14	6.2	220	
MS21388-25	RFC-M-	100	100	100	1.5	13	7	200	
MS21388-26	RFC-M-	120	120	95	1.5	11	7.5	200	
MS21388-27	RFC-M-	150	150	90	1.0	9	8	190	
MS21388-28	RFC-M-	180	180	85	1.0	7	9	185	
MS21388-29	RFC-M-	220	220	85	1.0	5.5	10	180	
MS21388-30	RFC-M-	270	270	80	1.0	4.5	11	172	
MS21388-31	RFC-M-	330	330	80	.8	3.5	12	165	
MS21388-32	RFC-M-	390	390	75	.8	3.0	13	157	
MS21388-33	RFC-M-	470	470	75	.8	2.8	14	150	
MS21388-34	RFC-M-	560	560	65	.8	2.5	16	145	
MS21388-35	RFC-M-	680	680	65	.8	2.2	17	140	
MS21388-36	RFC-M-	820	820	65	.8	2.0	19	132	
MS21388-37	RFC-M-	1000	1000	70	.5	1.8	21	125	
MS21388-38	RFC-M-	1200	1200	60	.25	2.2	22	120	
MS21388-39	RFC-M-	2200	2200	70	.25	1.6	30	100	

\* NCG Part No. electricals and tolerances as shown.  
MS No. electricals and tolerances per actual MS sheet.

**RFC-L SERIES**

Proven reliability molded inductors specifically designed to meet MIL-C-15305 (latest revision). Inductance 1.0 to 10,000uH.

**GRADE 1 CLASS B**



**ELECTRICAL CHARACTERISTICS**

**Inductance Tolerance:** 1.0uH to 22uH ±10% on Q-Meter  
27uH to 10,000uH ±5%  
1,000 cps bridge

**Note:** L & Q are not always tested at the same frequency. Inductance Values tested on Q-Meter are tested at standard test frequencies.

**Dielectric Strength:** 700 volts RMS at sea level.

**Self-Resonant Frequency:** Minimum SRF measured with full length leads on Grid-Dip Meter.

**Q:** Measured on Q-Meter.

**Rating:** ½ watt dissipation for L series.

**DENSITY CHARACTERISTICS**

**Volume:** 0.068 cu. in.

**Weight:** 4.10 grams

**PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS**

**Operating Temperature:** -55°C to +125°C.

**Terminal Strength:** Meets five pound pull test per MIL-C-15305 (latest revision).

**Moisture, Vibration, and Shock Resistance:** Meets requirements of MIL-C-15305 (latest revision). High frequency 10 cps to 2000 cps @ 30G ±10% maximum for 12 logarithmic swings, each of 20 minute duration repeated for each of three mutually perpendicular planes.

MS NO.	NCG PART NO.*	L		Q min		Min. SRF	Max. DCR	max. I	MAT.
		μH		MHz	MHz	MHz	Ω	mA	
MS21380-1	RFC-L- 1.0	1.0	130	15	136	.03	4000	IRON	
MS21380-2	RFC-L- 1.2	1.2	130	15	124	.03	4000		
MS21380-3	RFC-L- 1.5	1.5	130	10	112	.03	4000		
MS21380-4	RFC-L- 1.8	1.8	130	10	100	.03	4000		
MS21380-5	RFC-L- 2.2	2.2	130	10	92	.04	3500		
MS21380-6	RFC-L- 2.7	2.7	100	10	82	.04	3500		
MS21380-7	RFC-L- 3.3	3.3	100	7.9	72	.04	3500		
MS21380-8	RFC-L- 3.9	3.9	80	7.9	68	.05	3100		
MS21380-9	RFC-L- 4.7	4.7	75	7.9	64	.05	3100		
MS21380-10	RFC-L- 5.6	5.6	65	7.9	58	.06	3000		
MS21380-11	RFC-L- 6.6	6.6	65	7.9	52	.06	3000		
MS21380-12	RFC-L- 8.2	8.2	65	7.9	46	.11	2400		
MS21380-13	RFC-L- 10	10	75	5	40	.15	1800		
MS21380-14	RFC-L- 12	12	75	5	36	.23	1600		
MS21380-15	RFC-L- 15	15	75	5	32	.3	1300		
MS21380-16	RFC-L- 18	18	75	5	29	.4	1150		
MS21380-17	RFC-L- 22	22	75	2.5	26	.5	1000		
MS21380-18	RFC-L- 27	27	70	2.5	24	.6	900		
MS21380-19	RFC-L- 33	33	70	2.5	22	.7	850		
MS21380-20	RFC-L- 39	39	70	2.5	21	1.1	720		
MS21380-21	RFC-L- 47	47	75	2.5	20	1.3	620		
MS21380-22	RFC-L- 56	56	80	2.5	18	1.8	540		
MS21380-23	RFC-L- 68	68	100	2.5	16	2.4	450		
MS21380-24	RFC-L- 82	82	100	2.5	14	2.8	425		
MS21380-25	RFC-L- 100	100	100	1.5	13	3.2	400		
MS21380-26	RFC-L- 120	120	100	1.5	12	4.8	360		
MS21380-27	RFC-L- 150	150	100	1.0	11	6.4	280		
MS21380-28	RFC-L- 180	180	95	1.0	10	9.5	240		
MS21380-29	RFC-L- 220	220	95	1.0	9	12	200		
MS21380-30	RFC-L- 270	270	70	1.0	7	13	195		
MS21380-31	RFC-L- 330	330	65	.79	6	14	190		
MS21380-32	RFC-L- 390	390	65	.79	5	15.5	180		
MS21380-33	RFC-L- 470	470	60	.79	4	17	170		
MS21380-34	RFC-L- 560	560	75	.5	3	18.5	165		
MS21380-35	RFC-L- 680	680	75	.5	2.5	20	155		
MS21380-36	RFC-L- 820	820	75	.5	2.0	22	150		
MS21380-37	RFC-L- 1000	1000	75	.5	1.9	24	145		
MS21380-38	RFC-L- 1200	1200	75	.5	1.7	27	137		
MS21380-39	RFC-L- 1500	1500	75	.4	1.5	29	130		
MS21380-40	RFC-L- 1800	1800	65	.4	1.4	32	125		
MS21380-41	RFC-L- 2200	2200	65	.25	1.2	35	120		
MS21380-42	RFC-L- 2700	2700	65	.25	1.0	40	112		
MS21380-43	RFC-L- 3300	3300	65	.25	.95	45	105		
MS21380-44	RFC-L- 3900	3900	65	.25	.80	49	100		
MS21380-45	RFC-L- 4700	4700	65	.25	.75	53	95		
MS21380-46	RFC-L- 5600	5600	65	.25	.70	60	90		
MS21380-47	RFC-L- 6800	6800	65	.25	.60	67	85		
MS21380-48	RFC-L- 8200	8200	65	.25	.50	75	82		
MS21380-49	RFC-L-10000	10000	65	.15	.45	80	80		

MS91189-14 THRU -28, VALUES 1.2 THRU 18uH (ON PHENOLIC CORES) ARE AVAILABLE, AND MS75103-1 THRU -10, VALUES 22 THRU 120uH (ON IRON CORES) ARE ALSO AVAILABLE.

\* NCG Part No. electricals and tolerances as shown.  
MS No. electricals and tolerances per actual MS sheet.

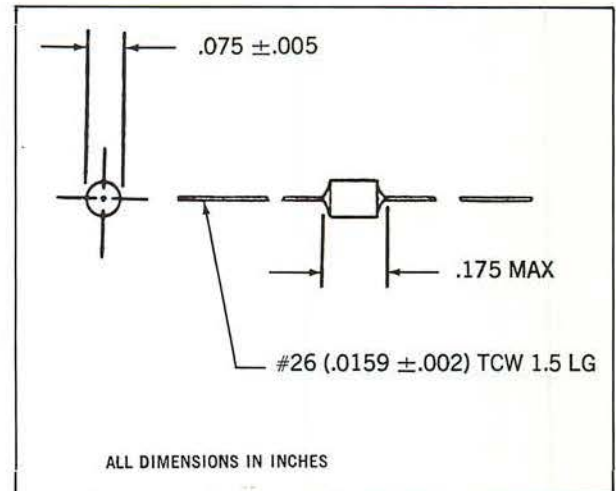
## Pee Dee Ductor Series

Marking: EIA color coded

The Pee Dee Ductor is a microminiature, axial-leaded RF inductor for hybrid circuit applications.

This reliable, high performance inductor has a standard inductance tolerance of  $\pm 10\%$ .

### GRADE 2 CLASS A



### ELECTRICAL DATA

#### ELECTRICAL CHARACTERISTICS:

Inductance Tolerance:  $\pm 10\%$  (Std).

L,Q,F, values: Measurements per MIL-C-15305. (latest revision).

Dielectric Strength: 300 Volts RMS @ Sea Level.

#### DENSITY CHARACTERISTICS:

Volume: .0007 Cubic Inches

Weight: 0.12 Grams

#### PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS:

Terminal pull: 3 lbs. minimum.

NGG Part No.	L uH	Q (Min.)	Test Freq. MHz	SRF Min. MHz	DCR Max. Ohms	Rated Current mA
PD-0.10	0.10	40	25	400	0.2	600
PD-0.12	0.12	40	25	360	0.2	600
PD-0.15	0.15	40	25	320	0.25	575
PD-0.18	0.18	40	25	304	0.25	575
PD-0.22	0.22	40	25	288	0.30	565
PD-0.27	0.27	40	25	240	0.30	565
PD-0.33	0.33	40	25	224	0.35	560
PD-0.39	0.39	40	25	208	0.37	550
PD-0.47	0.47	40	25	200	0.39	535
PD-0.56	0.56	40	25	192	0.40	525
PD-0.68	0.68	35	25	176	0.45	500
PD-0.82	0.82	35	25	144	0.50	480
PD-1.0	1.0	35	25	136	0.60	450
PD-1.2	1.2	35	7.9	120	0.70	425
PD-1.5	1.5	35	7.9	104	0.80	400
PD-1.8	1.8	35	7.9	96	0.90	350
PD-2.2	2.2	35	7.9	88	1.3	320
PD-2.7	2.7	35	7.9	84	1.8	275
PD-3.3	3.3	35	7.9	80	1.1	340
PD-3.9	3.9	35	7.9	72	1.4	310
PD-4.7	4.7	35	7.9	68	1.6	290
PD-5.6	5.6	35	7.9	56	1.8	275
PD-6.8	6.8	35	7.9	52	2.0	250
PD-8.2	8.2	35	7.9	50	2.2	245
PD-10	10	35	7.9	48	3.0	210
PD-12	12	35	2.5	28	2.0	250
PD-15	15	35	2.5	24	2.2	245
PD-18	18	35	2.5	20	2.5	230
PD-22	22	35	2.5	18	2.7	220
PD-27	27	35	2.5	17	3.8	195
PD-33	33	35	2.5	16	4.5	170
PD-39	39	35	2.5	13	6.0	150
PD-47	47	35	2.5	11	6.5	145
PD-56	56	35	2.5	10	7.8	135
PD-68	68	35	2.5	8	8.6	130
PD-82	82	35	2.5	7.2	9.8	120
PD-100	100	35	2.5	6.4	11.5	110
PD-120	120	28	.79	5.6	15.0	90
PD-150	150	28	.79	4.8	16.5	88
PD-180	180	25	.79	4.4	22	75
PD-220	220	24	.79	4.2	31	62
PD-270	270	24	.79	4.0	38	56
PD-330	330	24	.79	3.8	42	53
PD-390	390	24	.79	2.9	58	47
PD-470	470	24	.79	2.7	60	45
PD-560	560	24	.79	2.6	65	43
PD-680	680	22	.79	2.4	90	36
PD-820	820	23	.79	2.0	95	34
PD-1000	1000	21	.79	1.6	130	30

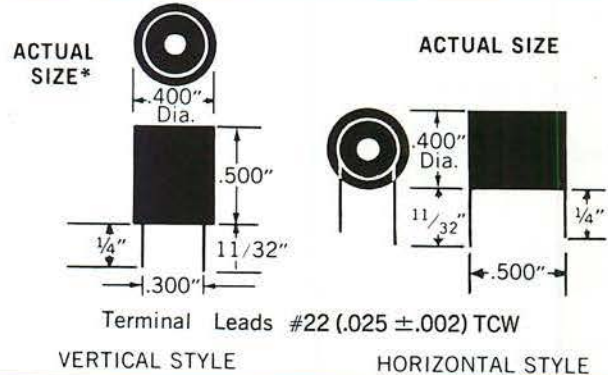




**VIV-VIH**

Miniature with inductance range of 0.10 to 4700uH in 29 values.  
Encapsulated in epoxy resin for reliability.

\*ALL DIMENSIONS ARE  $\pm \frac{1}{2}$  INCH



The **VARIABLE INDUCTOR** offers high reliability and exceptional stability over extreme temperature variations. This small lightweight unit is furnished in vertical and horizontal styles to facilitate mounting on printed circuit boards.

**GRADE 2 CLASS B**

**ELECTRICAL CHARACTERISTICS**

Inductance Range: 0.33 to 4700uH Tunable Range  $\pm 20\%$   
0.15 to 0.22uH Tunable Range  $\pm 15\%$   
0.1 Tunable Range  $\pm 10\%$   
All measurements at 25°C on Q-Meter

Self-Resonant Frequency: Minimum SRF measured with Grid-Dip Meter.

**DENSITY CHARACTERISTICS**

Volume: 0.063 cubic inches  
Weight: 2.6 grams

**PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS**

Torque: 0.75 to 5.0 inch-ounces  
Use Nytronics Tuning Tool No. B-305 or equal.

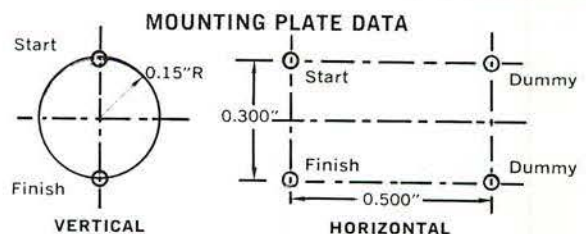
Operating Temperature:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$

Terminal Strength: Meets five pound pull tests.

Core Material: Iron

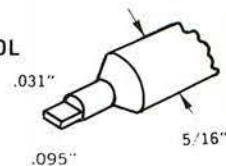
Marking: Manufactured data printed.

NCG PART NOS.		L nom.	Min. Q at L Nom.		Min. SRF, L Nom.	Max. DCR	Max. I
VIV	VIH	$\mu\text{H}$		MHz	MHz	$\Omega$	mA
VIV-0.10	VIH-0.10	0.10	68	25.	300	0.02	3500
VIV-0.15	VIH-0.15	0.15	80	25.	300	0.035	2600
VIV-0.22	VIH-0.22	0.22	80	25.	300	0.04	2500
VIV-0.33	VIH-0.33	0.33	80	25.	267	0.04	2500
VIV-0.47	VIH-0.47	0.47	80	25.	228	0.05	2200
VIV-0.68	VIH-0.68	0.68	80	25.	190	0.07	1850
VIV-1.00	VIH-1.00	1.00	72	25.	164	0.13	1350
VIV-1.50	VIH-1.50	1.50	56	7.9	134	0.24	1000
VIV-2.20	VIH-2.20	2.20	58	7.9	108	0.30	890
VIV-3.30	VIH-3.30	3.30	64	7.9	90	0.45	730
VIV-4.70	VIH-4.70	4.70	60	7.9	80	0.80	550
VIV-6.80	VIH-6.80	6.80	64	7.9	64	1.1	460
VIV-10.0	VIH-10.0	10.0	66	7.9	54	1.9	355
VIV-15.0	VIH-15.0	15.0	52	2.5	43	3.2	270
VIV-22.0	VIH-22.0	22.0	44	2.5	14	3.4	265
VIV-33.0	VIH-33.0	33.0	43	2.5	12	3.6	255
VIV-47.0	VIH-47.0	47.0	41	2.5	10.5	4.5	230
VIV-68.0	VIH-68.0	68.0	44	2.5	9.5	5.5	210
VIV-100	VIH-100	100.0	40	2.5	8.5	6.7	190
VIV-150	VIH-150	150.	40	.79	2.4	11.0	150
VIV-220	VIH-220	220.	40	.79	2.2	13.0	135
VIV-330	VIH-330	330.	38	.79	1.8	16.0	120
VIV-470	VIH-470	470.	36	.79	1.5	18.0	115
VIV-680	VIH-680	680.	34	.79	1.4	21.0	105
VIV-1000	VIH-1000	1000.	32	.79	1.1	38.0	80
VIV-1500	VIH-1500	1500.	32	.25	.9	54.0	65
VIV-2200	VIH-2200	2200.	35	.25	.8	66.0	60
VIV-3300	VIH-3300	3300.	37	.25	.7	85.0	54
VIV-4700	VIH-4700	4700.	38	.25	.6	99.0	49



**TYPICAL ALIGNING TOOL**

B-305



# Application Data Sheet

To ensure correct selection of our product for your application, kindly provide the information indicated below.

Send this information to your area representative or direct to Nytronics Components Group, Inc. Sales Dept. 700 Orange St., Darlington, S.C. 29532 Fax: 803-393-4123.

Company: \_\_\_\_\_ Dept: \_\_\_\_\_  
Address: \_\_\_\_\_ Name: \_\_\_\_\_  
Phone #: \_\_\_\_\_ Title: \_\_\_\_\_  
Fax #: \_\_\_\_\_ Ext: \_\_\_\_\_

Application: \_\_\_\_\_

## Product:

Inductor	Capacitor	Delay line
		Passive
Value: _____	Value: _____	Delay Time: _____
Tolerance: _____	Tolerance: _____	Rise Time: _____
Q Value: _____	DF: _____	Impedance: _____
Self Res. Freq: _____	IR: _____	
DCR: _____	Voltage: _____	Active
IDC: _____	Dielectric	Total Delay: _____
Package: _____	Material: _____	Tap Delay: _____
Molded: _____	Wrap/Fill: _____	Input Pulse _____
End Potted: _____	Hermetically	Width: _____
Shielded: _____	Sealed: _____	
Un-Shielded: _____		
Variable: _____		
Ambient Temp: _____		

Physical Size Limitations: \_\_\_\_\_

Military Specifications: \_\_\_\_\_

Drawing #: \_\_\_\_\_

Other Special Requirements: \_\_\_\_\_

Number of Samples Requested: \_\_\_\_\_

Potential Usage: \_\_\_\_\_

Expected Production Date: \_\_\_\_\_

**HIGH CURRENT  
CHOKES  
PL SERIES**

**Inductance:** Measured on general radio 1657 LRC bridge at 1 kHz.

10 $\mu$ H TO 100mH, 20% TOLERANCE  
RECOMMENDED MOUNTING PITCH: 1.25"

**Current (rated IDC):** Based on 0.5 watt power dissipation for approximately 20°C temperature rise. Depending on the application, these units may be operated at up to twice the rated current.

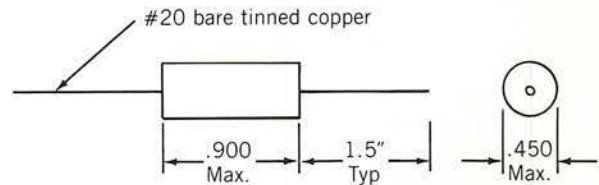
**Incremental Current (INCR I):** The minimum current at which the inductance will be decreased by 5% from its initial (zero DC) value.

**Dielectric Withstanding Voltage:** 1000 VRMS

**Operating Temperature Range:** -55°C to 105°C

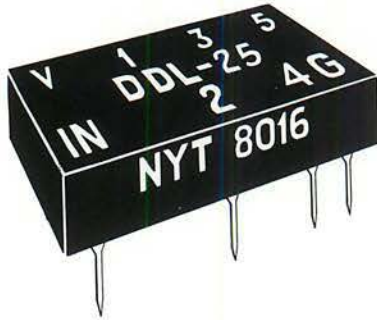
**Materials:** Coil form — ferrite  
Cover — flame retardant heat-shrink tubing  
Magnet wire — per MIL-W-583 Type B

**Marking:** Printed with part number.



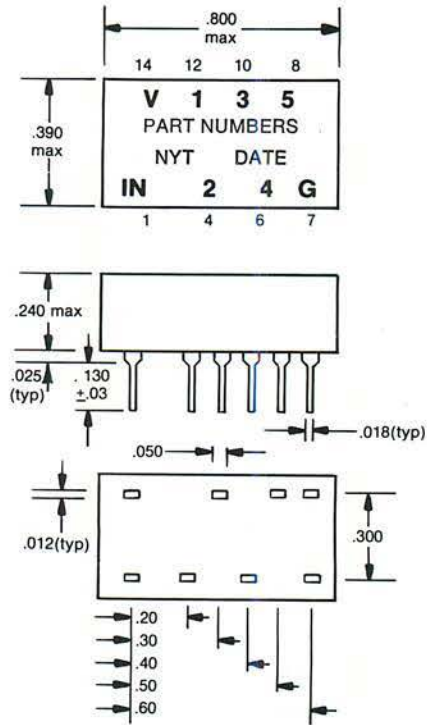
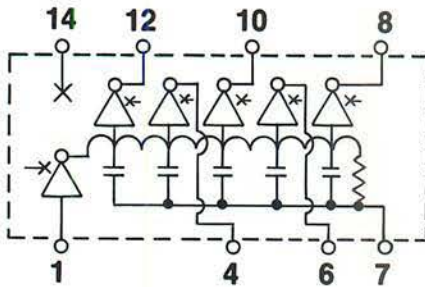
**STANDARD VALUES (OTHER VALUES ARE AVAILABLE ON SPECIAL ORDER)**

PART NUMBER	NOMINAL INDUCTANCE	MAXIMUM DCR ( $\Omega$ )	RATED IDC (mA)	INCR I (mA)
PL 10	10 $\mu$ H	.023	4600	3200
PL 15	15 $\mu$ H	.030	4100	2600
PL 22	22 $\mu$ H	.035	3700	2200
PL 33	33 $\mu$ H	.043	3400	1800
PL 47	47 $\mu$ H	.054	3000	1500
PL 68	68 $\mu$ H	.068	2700	1200
PL 100	100 $\mu$ H	.100	2300	1000
PL 150	150 $\mu$ H	.18	1700	830
PL 220	220 $\mu$ H	.28	1400	680
PL 330	330 $\mu$ H	.35	1200	560
PL 470	470 $\mu$ H	.44	1050	460
PL 680	680 $\mu$ H	.63	890	390
PL 1000	1mH	.96	720	320
PL 1500	1.5mH	1.4	600	260
PL 2200	2.2mH	2.3	470	220
PL 3300	3.3mH	3.5	380	180
PL 4700	4.7mH	4.3	340	150
PL 6800	6.8mH	6.3	280	120
PL 10,000	10mH	9.7	220	100
PL 15,000	15mH	15	180	84
PL 22,000	22mH	24	140	68
PL 33,000	33mH	35	120	56
PL 47,000	47mH	50	100	47
PL 68,000	68mH	76	81	39
PL 100,000	100mH	99	71	32



### FEATURES

- TTL Driven Inputs
- TTL Buffered Outputs
- Internal Terminations
- Low Profile Packages (.240")
- 14-Pin, DIP-IC Compatible
- Output Rise Time 4.0ns max. (0.75V to 2.40V)



### RECOMMENDED OPERATING CONDITIONS

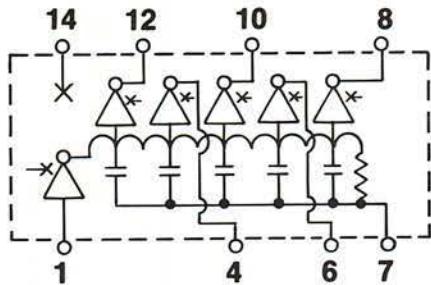
(Vcc) Supply Voltage .....	5.00 ±0.25VDC
(Icc) Supply Current .....	55ma Typ./70ma Max.
(TRin) Input Rise Time .....	3ns.
(TWin) Input Pulse Width .....	40% of Delay
(Ein) Input Pulse Voltage .....	3.20VDC
Operating Temperature .....	0°C to 70°C
Storage Temperature .....	-55°C to +125°C

### ELECTRICAL CHARACTERISTICS

(VIH) High-Level Input Voltage .....	2.0 to 5.0V
(IIH) High-Level Input Current .....	50ua Max.
(VIL) Low-Level Input Voltage .....	0.8V Max.
(IIL) Low-Level Input Current .....	-2ma Max.
(VOH) High-Level Output Voltage .....	2.4V Min.
(VOL) Low-Level Output Voltage .....	0.4V Max.
High-Level Output Drives .....	20 TTL Loads/Unit Max.
Low-Level Output Drives .....	10 TTL Loads/Unit Max. 20 TTL Loads/Unit Max.

PART NUMBER	TOTAL DELAY (NS) (1) (2)	TAP DELAY (NS) (1) (2)	INPUT PULSE WIDTH (NS MINIMUM)
DDL-25	25	5	10
DDL-30	30	6	12
DDL-35	35	7	14
DDL-40	40	8	16
DDL-45	45	9	18
DDL-50	50	10	20
DDL-55	55	11	22
DDL-60	60	12	24
DDL-65	65	13	26
DDL-70	70	14	28
DDL-75	75	15	30
DDL-100	100	20	40
DDL-125	125	25	50
DDL-150	150	30	60
DDL-175	175	35	70
DDL-200	200	40	80
DDL-250	250	50	100
DDL-300	300	60	120
DDL-350	350	70	140
DDL-400	400	80	160
DDL-450	450	90	180
DDL-500	500	100	200

- (1) Measured at 1.5V level leading edge; Vcc = 5.00VDC; No loads; at +25°C.  
(2) Nominal delay, ±2NS or ±5%, whichever is greater; reference to input.



**ADVANCED SCHOTTKY (DDL-XXXF)**

**RECOMMENDED OPERATING CONDITIONS**

(Vcc) Supply Voltage ..... 5.00 ±0.25 VDC  
(Icc) Supply Current ..... 35 ma Typ./40 ma Max.  
(TRin) Input Rise Time ..... 3 ns.  
(TWin) Input Pulse Width ..... 40% of Delay  
(Ein) Input Pulse Voltage ..... 3.20 VDC  
Operating Temperature ..... 0°C to 70°C  
Storage Temperature ..... -55°C to 125°C

**ELECTRICAL CHARACTERISTICS**

(VIH) High-Level Input Voltage ..... 2.0 to 5.0V  
(IIH) High-Level Input Current ..... 20 µa Max.  
(VIL) Low-Level Input Voltage ..... 0.8V Max.  
(IIL) Low-Level Input Current ..... -0.6 ma Max.  
(VOH) High-Level Output Voltage ..... 2.4V Min.  
(VOL) Low-Level Output Voltage ..... 0.4V Max.  
High-Level Output Drives ..... 25 TTL Loads/Unit Max.  
Low-Level Output Drives ..... 12.5 TTL Loads/Tap Max.  
25 TTL Loads/Unit Max.

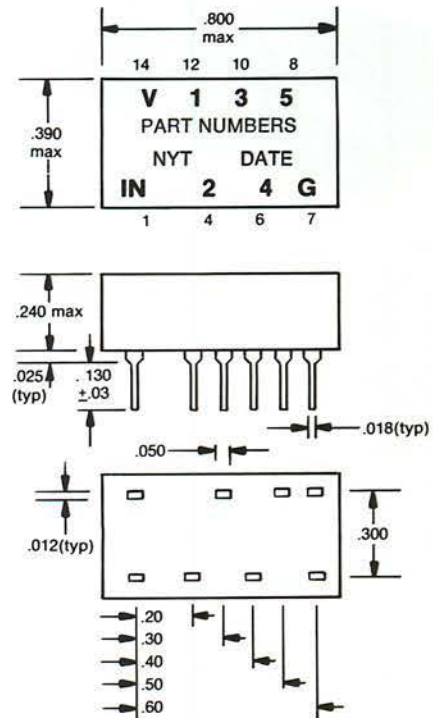
**ADVANCED LOW-POWER SCHOTTKY (LPS-XXX)**

**RECOMMENDED OPERATING CONDITIONS**

(Vcc) Supply Voltage ..... 5.00 ±0.25 VDC  
(Icc) Supply Current ..... 25 ma Typ./30 ma Max.  
(TRin) Input Rise Time ..... 3 ns.  
(TWin) Input Pulse Width ..... 40% of Delay  
(Ein) Input Pulse Voltage ..... 3.20 VDC  
Operating Temperature ..... 0°C to 70°C  
Storage Temperature ..... -55°C to +125°C

**ELECTRICAL CHARACTERISTICS**

(VIH) High-Level Input Voltage ..... 2.0 to 5.0V  
(IIH) High-Level Input Current ..... 20 µa Max.  
(VIL) Low-Level Input Voltage ..... 0.8V Max.  
(IIL) Low-Level Input Current ..... -0.2 ma Max.  
(VOH) High-Level Output Voltage ..... 2.4V Min.  
(VOL) Low-Level Output Voltage ..... 0.4V Max.  
High-Level Output Drives ..... 10 TTL Loads/Unit Max.  
Low-Level Output Drives ..... 5 TTL Loads/Tap Max.  
10 TTL Loads/Unit Max.

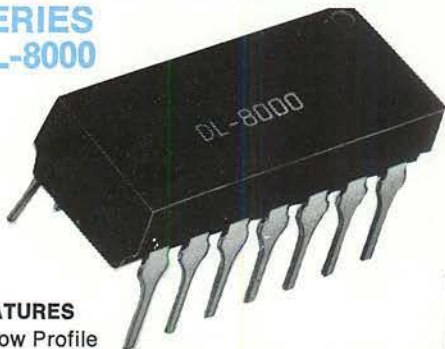


**OUTPUT RISE TIME (0.75v to 2.40v)**  
**DDL-XXXF SERIES = 4.0 ns Max.**  
**LPS-XXX SERIES = 6.0 ns Max.**

PART NUMBER	PART NUMBER	TOTAL DELAY (NS) (1) (2)	TAP DELAY (NS) (1) (2)	INPUT PULSE WIDTH (NS MINIMUM)
DDL-25F	LPS-25	25	5	10
DDL-30F	LPS-30	30	6	12
DDL-35F	LPS-35	35	7	14
DDL-40F	LPS-40	40	8	16
DDL-45F	LPS-45	45	9	18
DDL-50F	LPS-50	50	10	20
DDL-55F	LPS-55	55	11	22
DDL-60F	LPS-60	60	12	24
DDL-65F	LPS-65	65	13	26
DDL-70F	LPS-70	70	14	28
DDL-75F	LPS-75	75	15	30
DDL-100F	LPS-100	100	20	40
DDL-125F	LPS-125	125	25	50
DDL-150F	LPS-150	150	30	60
DDL-175F	LPS-175	175	35	70
DDL-200F	LPS-200	200	40	80
DDL-250F	LPS-250	250	50	100
DDL-300F	LPS-300	300	60	120
DDL-350F	LPS-350	350	70	140
DDL-400F	LPS-400	400	80	160
DDL-450F	LPS-450	450	90	180
DDL-500F	LPS-500	500	100	200

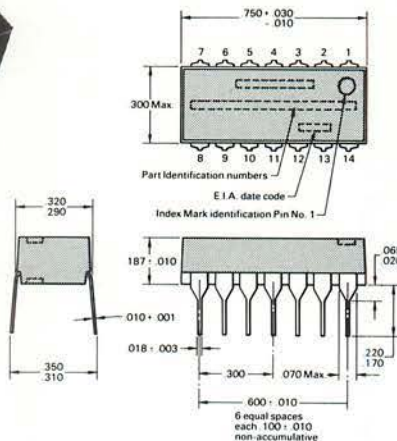
(1) Measured at 1.5v level leading edge; Vcc = 5.00 VDC; No loads; at +25°C.  
(2) Nominal delay ±2 NS or ±5%; whichever is greater; reference to input.

### SERIES DL-8000

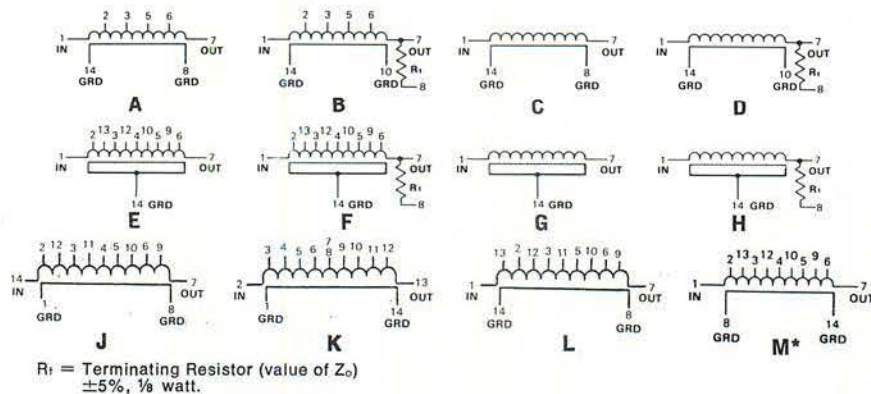


#### FEATURES

- Low Profile
- 14-Lead, DIP-IC Compatible Packages
- Standard Delay Times from 5 nsec to 500 nsec
- Standard Impedances of 50, 100, 200, 360 and 500 ohms
- Standard and Special Attenuations
- Easy to Order Special Models
- Epoxy Transfer Molding



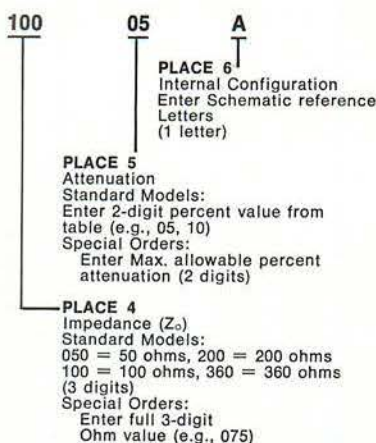
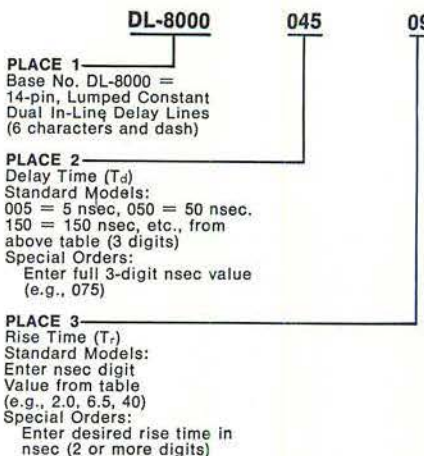
M\* BUILT TO MEET MILITARY SPECIFICATION MIL-D-23859/23C



#### HOW TO ORDER

To allow the greatest possible range of parameters, the following ordering system should be followed on both standard and special orders.

Example: DL-8000-045-09-100-05 A  
14-Pin Lumped Constant Dual In-Line Delay Line, 45 nsec T<sub>d</sub>, 9 nsec T<sub>r</sub>, 100 ohm impedance, 5% (Max.) attenuation, internal configuration "A."



#### STANDARD DL-8000 MODELS

Delay Time (T <sub>d</sub> ), nsec*	Rise Time (T <sub>r</sub> ), Max nsec	% Attenuation Max Per Impedance†				
		50 ohms	100 ohms	200 ohms	360 ohms	500 ohms
5	02	3	5	5	5	7
10	03	3	5	5	5	7
15	04	3	5	5	5	7
20	05	3	5	5	5	7
25	05	3	5	5	5	7
30	6.5	3	5	5	5	7
35	07	3	5	5	5	7
40	08	3	5	5	5	7
45	09	3	5	5	5	7
50	10	3	5	5	5	7
55	11	3	5	5	5	7
60	12	3	5	5	5	7
65	13	3	5	5	5	7
70	14	3	5	5	5	7
75	15	3	5	5	5	7
80	16	3	5	5	5	7
85	17	3	5	5	5	7
90	18	3	5	5	5	7
95	19	3	5	5	5	7
100	20	3	5	5	5	7
110	22	3	5	6	7	8
120	24	3	5	6	7	8
130	26	3	5	6	7	8
140	28	3	5	6	7	8
150	30	3	5	6	7	8
160	32	3	5	6	7	8
170	34	3	5	6	7	8
180	36	3	5	6	7	8
190	38	3	5	6	7	8
200	40	3	5	6	7	8
210	45	5	5	6	7	8
220	45	5	5	6	7	8
230	50	5	5	6	7	8
240	50	5	5	6	7	8
250	50	5	5	6	7	8
260	55	5	5	6	7	8
270	55	5	5	6	7	8
280	60	5	5	6	7	8
290	60	5	5	6	7	8
300	60	5	5	6	7	8
310	65	5	7	8	10	10
320	65	5	7	8	10	10
330	70	5	7	8	10	10
340	70	5	7	8	10	10
350	70	5	7	8	10	10
360	75	5	7	8	10	10
370	75	5	7	8	10	10
380	80	5	7	8	10	10
390	80	5	7	8	10	10
400	80	5	7	8	10	10
410	85	5	8	10	10	10
420	85	5	8	10	10	10
430	90	5	8	10	10	10
440	90	5	8	10	10	10
450	90	5	8	10	10	10
460	95	5	8	10	10	10
470	95	5	8	10	10	10
480	100	5	8	10	10	10
490	100	5	8	10	10	10
500	100	5	8	10	10	10

Taps in equal increments of total delay.

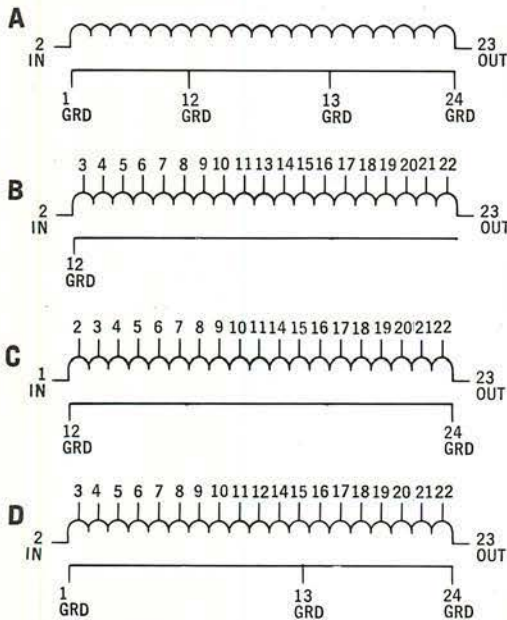
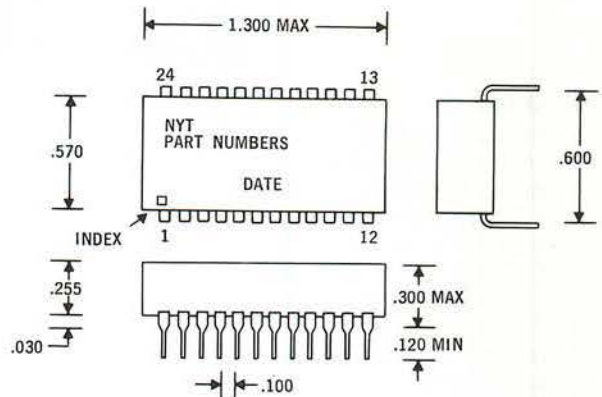
\* ±5% Tolerance for 40 through 500 nsec T<sub>d</sub>.  
2 nsec for 5 through 40 nsec T<sub>d</sub>.

† ±10% Impedance Tolerance.

### DL-2400 SERIES

#### FEATURES

- Standard 24 Pin Dip
- Epoxy Encapsulated
- Operating Temp.  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Hi-Pot = 100VDC
- Up to 20 Outputs
- Temp. Coeff. of Delay  
Up to 1000ns = 100ppm/ $^{\circ}\text{C}$   
Above 1000ns = 200ppm/ $^{\circ}\text{C}$
- Easy to Order Specials
- 1%, 2%, and Other Tolerances Available
- Many Other Delays, Impedances, and Rise Times Available
- Many Other Schematics Available
- Lead Material: Alloy 42



Delay Time (Td), nsec*	Rise Time (Tr), Max nsec	% Attenuation Max. per Impedance†				
		50 ohms	100 ohms	200 ohms	360 ohms	500 ohms
50	5	6	6	8	—	—
100	10	6	8	8	8	8
150	15	8	8	8	8	8
200	20	8	8	8	8	10
250	25	8	8	8	10	10
300	30	8	8	8	10	10
400	40	8	8	10	10	10
500	50	8	8	10	10	10
600	60	8	8	10	10	10
700	70	8	8	10	10	10
800	80	8	10	10	10	15
900	90	8	10	10	10	15
1000	100	8	10	10	10	15
1500	150	—	10	10	15	15
2000	200	—	10	15	15	15
3000	300	—	—	15	15	15
4000	400	—	—	15	15	15
5000	500	—	—	—	15	15
6000	600	—	—	—	15	—
7000	700	—	—	—	15	—

\*  $\pm 5\%$  Tolerance

†  $\pm 10\%$  Impedance Tolerance.

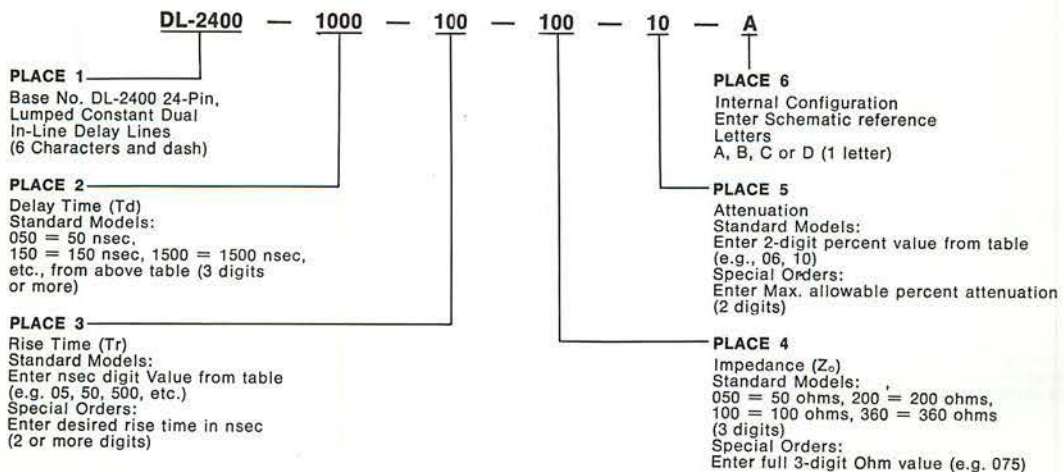
Taps in equal increments of total delay.

EXAMPLE: DL-2400-1000-100-100-10-A

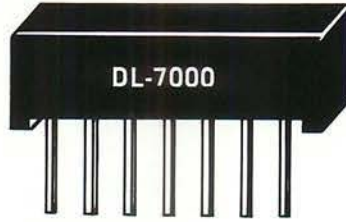
24-Pin Lumped Constant Dual In-Line Delay Line, 1000 nsec Td, 100 nsec Tr, 100 ohm impedance, 10% (Max.) attenuation, internal configuration "A".

#### HOW TO ORDER

To allow the greatest possible range of parameters, the following ordering system should be followed on both standard and special orders.

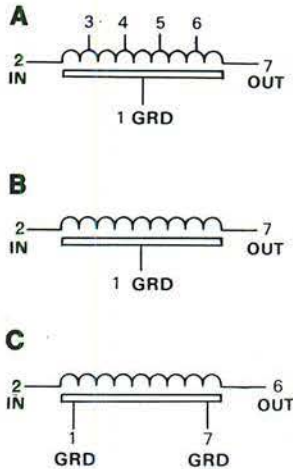
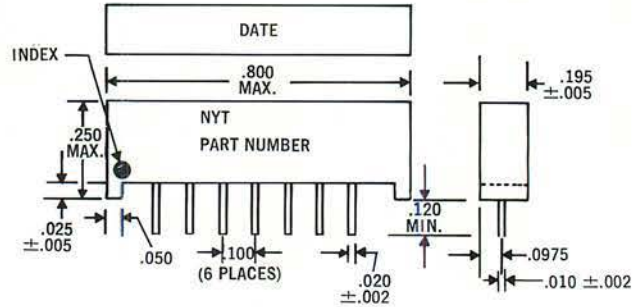


### SERIES DL-7000



#### FEATURES

- Standard 7 Pin SIP
- Epoxy Encapsulated
- Terminal Material — Kovar, Flat
- Tap Delays ("A" Configuration) = 20% Increments ( $\pm 5\%$  or  $\pm 1$  ns, whichever is greater)
- $T_d/T_r$  Ratio  $\geq 5/1$  or  $\geq 3/1$
- Temperature Coefficient of Delay = 100 ppm/ $^{\circ}$ C
- Hi-Pot = 100 VDC
- Operating Temperature =  $-55^{\circ}$ C to  $+125^{\circ}$ C
- Storage Temperature =  $-65^{\circ}$ C to  $+130^{\circ}$ C
- Meets or Exceeds Applicable Requirements of MIL-STD-202
- Easy to Order Specials
- Many Other Delays, and Impedances Available



DELAY TIME ( $T_d$ ), nsec†	RISE TIME ( $T_r$ ), MAX nsec		% ATTENUATION MAX. PER IMPEDANCE*			
	$T_d/T_r \geq 3/1$	$T_d/T_r \geq 5/1$	50 Ohms	100 Ohms	200 Ohms	500 Ohms
20	6.0	4.0	3	5	5	—
30	9.0	6.0	3	5	5	—
40	12.0	8.0	3	5	5	—
50	15.0	10.0	3	5	5	—
60	18.0	12.0	3	5	5	—
70	22.0	14.0	3	5	5	—
80	24.0	16.0	3	5	5	—
90	27.0	18.0	3	5	5	—
100	30.0	20.0	3	5	5	7
200	60.0	40.0	3	5	6	8
300	90.0	60.0	5	5	6	8
400	120.0	80.0	—	7	8	10
500	150.0	100.0	—	8	10	10

†  $\pm 5\%$  Tolerance.  
\*  $\pm 10\%$  Impedance Tolerance.

#### HOW TO ORDER

To allow the greatest possible range of parameters, the following ordering system should be followed on both standard and special orders.

EXAMPLE:

DL-7000 — 100 — 020 — 100 — 05 — A

#### PLACE 1

Base No. DL-7000 7-Pin,  
Lumped Constant  
single in-line package  
(6 characters and dash)

#### PLACE 2

Delay Time ( $T_d$ )  
Standard Models:  
050 = 50 nsec,  
150 = 150 nsec, etc., from  
above table (3 digits or more)

#### PLACE 3

Rise Time ( $T_r$ )  
Standard Models:  
Enter nsec digit Value from table  
(e.g. 6.0, 40, 100, etc.)  
Special Orders:  
Enter desired rise time in nsec  
(2 or more digits)

#### PLACE 6

Internal Configuration  
Enter Schematic reference  
Letters  
A, B, C (1 letter)

#### PLACE 5

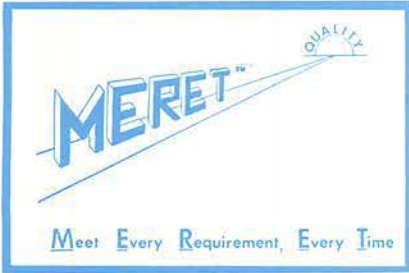
Attenuation  
Standard Models:  
Enter 2-digit percent value from table  
(e.g., 06, 10)  
Special Orders:  
Enter Max. allowable percent attenuation  
(2 digits)

#### PLACE 4

Impedance ( $Z_0$ )  
Standard Models:  
050 = 50 ohms, 200 = 200 ohms,  
100 = 100 ohms, (3 digits)  
Special Orders:  
Enter full 3-digit Ohm value (e.g. 075)

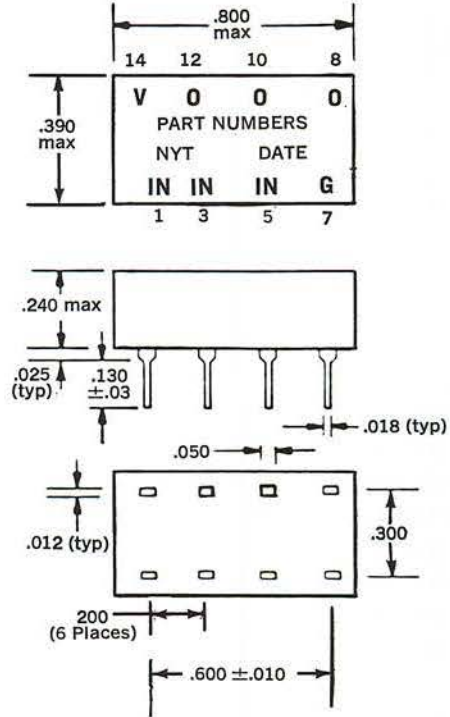
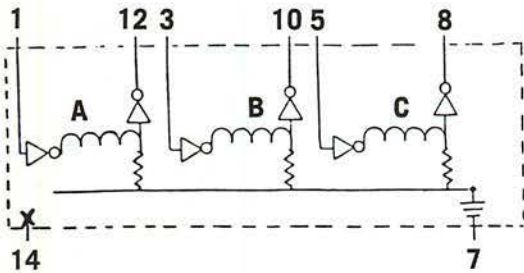


**MDDL SERIES**



**FEATURES**

- 14 Pin, DIP/IC Compatible
- Low Profile Package (.240")
- TTL and DTL Compatible
- Internally Terminated
- THREE INDIVIDUAL DELAY SEGMENTS/UNIT
- Closer Delay Tolerances Available
- Custom Delays Upon Request
- Output Rise Time 4.0ns max. (0.75v to 2.40v)



**ELECTRICAL CHARACTERISTICS**

(VIH) High -Level Input Voltage .....	2.0 to 5.0V
(IIH) High-Level Input Current .....	50µa Max.
(VIL) Low-Level Input Voltage .....	0.8V Max.
(IIL) Low-Level Input Current .....	-2ma Max.
(VOH) High-Level Output Voltage .....	2.4V Min.
(VOL) Low-Level Output Voltage .....	0.4V Max.
High-Level Output Drives .....	10 TTL Loads/Segment Max.
Low-Level Output Drives .....	10 TTL Loads/Segment Max.

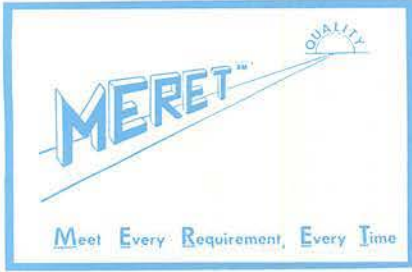
**RECOMMENDED OPERATING CONDITIONS**

(Vcc) Supply Voltage .....	5.00 ±0.25VDC
(Icc) Supply Current .....	60ma (typ.)
(TRin) Input Rise Time .....	3ns.
(TWin) Input Pulse Width .....	100% of Delay
(Ein) Input Pulse Voltage .....	3.20VDC
Operating Temperature .....	0°C to 70°C
Storage Temperature .....	-55°C to +125°C

PART NUMBER	TOTAL DELAY (NS)		INPUT PULSE WIDTH (NS MINIMUM)
	(1)	(2)	
MDDL-25	25	25	
MDDL-30	30	30	
MDDL-35	35	35	
MDDL-40	40	40	
MDDL-45	45	45	
MDDL-50	50	50	
MDDL-55	55	55	
MDDL-60	60	60	
MDDL-65	65	65	
MDDL-70	70	70	
MDDL-75	75	75	
MDDL-100	100	100	
MDDL-125	125	125	
MDDL-150	150	150	
MDDL-175	175	175	
MDDL-200	200	200	
MDDL-250	250	250	

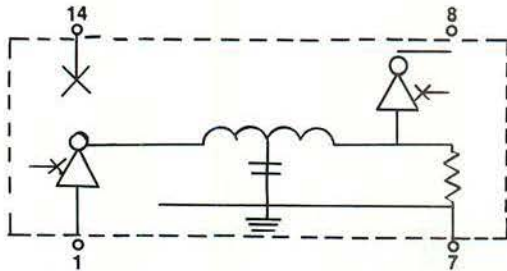
(1) Measured at 1.5V level leading edge; Vcc = 5.00VDC; No loads; at +25°C.  
(2) Nominal delay, ±2NS or ±5%, whichever is greater; reference to input.

**FDDL SERIES**



**FEATURES**

- 14 Pin, DIP/IC Compatible
- Low Profile Package (.240")
- TTL and DTL Compatible
- Internally Terminated
- Single Output
- Closer Delay Tolerances Available
- Custom Delays Upon Request
- Output Rise Time 4.0ns max. (0.75v to 2.40v)

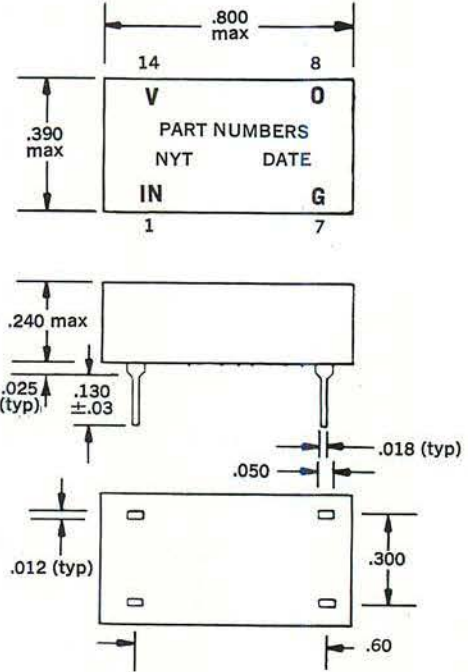


**ELECTRICAL CHARACTERISTICS**

- (VIH) High-Level Input Voltage ..... 2.0 to 5.0V  
 (IIH) High-Level Input Current ..... 50µa Max.  
 (VIL) Low-Level Input Voltage ..... 0.8V Max.  
 (IIL) Low-Level Input Current ..... -2ma Max.  
 (VOH) High-Level Output Voltage ..... 2.4V Min.  
 (VOL) Low-Level Output Voltage ..... 0.4V Max.  
 High-Level Output Drives ..... 20 TTL Loads/Unit Max.  
 Low-Level Output Drives ..... 20 TTL Loads/Unit Max.

**RECOMMENDED OPERATING CONDITIONS**

- (Vcc) Supply Voltage ..... 5.00 ±0.25VDC  
 (Icc) Supply Current ..... 55ma Typ./70ma Max.  
 (TRin) Input Rise Time ..... 3ns  
 (TWin) Input Pulse Width ..... 40% of Delay  
 (Ein) Input Pulse Voltage ..... 3.20VDC  
 Operating Temperature ..... 0°C to 70°C  
 Storage Temperature ..... -55°C to +125°C



PART NUMBER	TOTAL DELAY (NS)		INPUT PULSE WIDTH (NS MINIMUM)
	(1)	(2)	
FDDL-25	25		10
FDDL-30	30		12
FDDL-35	35		14
FDDL-40	40		16
FDDL-45	45		18
FDDL-50	50		20
FDDL-55	55		22
FDDL-60	60		24
FDDL-65	65		26
FDDL-70	70		28
FDDL-75	75		30
FDDL-100	100		40
FDDL-125	125		50
FDDL-150	150		60
FDDL-175	175		70
FDDL-200	200		80
FDDL-250	250		100
FDDL-300	300		120
FDDL-350	350		140
FDDL-400	400		160
FDDL-450	450		180
FDDL-500	500		200

(1) Measured at 1.5V level leading edge; Vcc = 5.00VDC; No loads; at +25°C.  
 (2) Nominal delay, ±2NS or ±5%.

### INDUSTRY'S FINEST RESISTORS

MIL-R-39007  
ESTABLISHED RELIABILITY  
FAILURE RATES M, P, AND R  
.01%/1000 HRS.  
RESISTANCE TOLERANCE  $\pm 1\%$   
TEMPERATURE COEFFICIENT  
 $\pm 20$  PPM/ $^{\circ}$ C MAX.  $10\Omega$   
AND HIGHER  
 $\pm 50$  PPM/ $^{\circ}$ C MAX.  $1\Omega$  TO  $10\Omega$   
 $\pm 90$  PPM/ $^{\circ}$ C MAX.  $1\Omega$  TO  $1\Omega$

SAGE SILICONE COATED fixed wire-wound units are not ordinary power resistors. They provide remarkable miniaturization vs. required wattage performance. Sage has pioneered the area of power handling capacity combined with precision and stability features ordinarily associated with Mil-R-93 resistors.

#### TYPE S: CONSTRUCTION

Showing ceramic core, spaced single layer winding, welded to stainless steel cap, and multiple layer coating.  
Copperweld leads 60/40 Hot Solder Dip. Lead Length  $2'' \pm \frac{1}{16}''$  is supplied on all sizes unless otherwise specified on purchase order.



\* Except 250S and 500S Styles, which are  $1\frac{1}{2}''$  minimum.

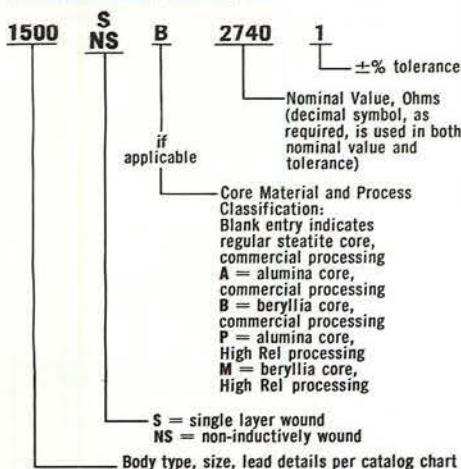
#### TYPE SB & NSB: HIGH WATTAGE COMMERCIAL BERYLLIA CORE RESISTORS

Standard Solderable Leads	Rated Watts		Approx. Grams Weight
	G	V	
250SB	1	1.5	.18
500SB	1.5	2	.28
1000SB	2.25	2.75	.32
1200SB	3.5	4.5	1.0
1240SB	4	5	1.1
1250SB	4.5	6	1.2
1300SB	6	8	1.8
1500SB	7	9	3.6
1600SB	9	12	4.2
1700SB	14	18	7.3

#### TYPE S RESISTOR ITEM DESCRIPTION

Sage Part Number identification consists of a combination of numerals and letters according to the following guide. This is the nomenclature ordinarily marked on resistors and it fully serves the purpose of purchased item description except for limited cases of special testing. Note that grouping of characters is not constant, but varies to fit descriptive need of a given part.

#### STYLE DESIGNATION



#### TYPE DESIGNATIONS

MIL STYLE	DETAIL SPEC. NO.	SAGE STYLE	MIL WATTS @ 25 $^{\circ}$ C	AVAILABLE RESISTANCE RANGE
RWR80S RWR80W	/8E /8E	1009SM 1007SM	2	.10 $\Omega$ to 2.67K
RWR81S RWR81W	/9C /9C	259SM 257SM	1	.10 $\Omega$ to 1.0K
RWR89S RWR89W	/11C /11C	1249SM 1247SM	3	.10 $\Omega$ to 4.12K
RWR71S RWR71W	/5D /5D	1259SP 1257SP	2	.10 $\Omega$ to 16.2K
RWR74S RWR74W	/6C /6C	1509SP 1507SP	5	.10 $\Omega$ to 12.1K
RWR78S RWR78W	/7C /7C	1709SP 1707SP	10	.10 $\Omega$ to 39.2K

#### EXAMPLE PART DESIGNATION:

**RWR-74 S 49R9 F R**

Body Style — Terminals  
S — Solderable  
W — Weldable  
N — Non-inductive

Nominal res.,  $\Omega$ . Three significant digits plus fourth indicating number of zeroes. Below 100 $\Omega$ . R-decimal and following digits are significant.

Tolerance  $\pm 1\%$

Life failure rate

#### MIL-R-26E TYPE DESIGNATIONS

MIL STYLE	SAGE STYLE	MIL WATTS	DEFINED OHMIC RANGE	
			Single layer wound .00175 min. wire dia.	.001 min. wire dia.
RW55V	1900S	7	.1—5100	
RW56V	1950S	14	.1—9100	
RW67V	1550S	6.5	.1—3600	.1—8200
RW68V	1700S	11	.1—8200	.1—20K
RW69V	1200S	3	.1—910	.1—2K

#### EXAMPLE:

**RW69 V 471**

Body Style Characteristic, V only (350 $^{\circ}$ C max.)

Nominal resistance,  $\Omega$ . Two significant digits plus third indicating number of zeros. Below 100 $\Omega$  = decimal and last digit is significant.

TOLERANCE:  $\pm 5\%$  for values  $1\Omega$  and up;  $\pm 10\%$  below  $1\Omega$ .  
TC:  $\pm 260$  ppm/ $^{\circ}$ C  $20\Omega$  and up;  $400$  ppm/ $^{\circ}$ C below  $20\Omega$ .

MIL STYLE	SAGE STYLE	MIL WATTS	VOLTAGE Max.	DEFINED OHMIC RANGE		
				Min.	Max. for .001" wire (Navy)	Max. for .0008" wire (all other)
RW70U	1000S	1	—	.1	1210	3160
RW74U	1500S	5	300	.1	12100	38300
RW78U	1700S	10	720	.1	40200	90900
RW79U	1240S	3	135	.1	3570	10500
RW80U	1000SB	2	—	.1	1240	3160
RW81U	250SB	1	25	.1	649	—

#### EXAMPLE:

**RW70 U 49R9 F**

Body Style Characteristic, U only (275 $^{\circ}$ C max.)

Nominal resistance,  $\Omega$ . Three significant digits plus four indicating number of zeros. Below 100 $\Omega$  R-decimal and following digits are significant.

Tolerance  $\pm\%$   
F = 1.0%  
B = .1%  
D = .5%

TC:  $\pm 30$  ppm/ $^{\circ}$ C  $10\Omega$  and above;  $\pm 50$  ppm/ $^{\circ}$ C  $1\Omega$  to  $10\Omega$ ;  $\pm 90$  ppm/ $^{\circ}$ C below  $1\Omega$ .

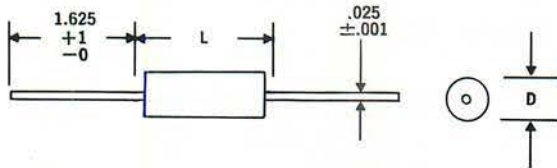
SAGE BODY STYLE NO.	WATTAGE DATA (25 $^{\circ}$ C AMBIENT)			PHYSICAL DATA			BODY DIELECTRIC STRENGTH VOLT rms	STD. RESISTANCE RANGE			
	IND. STD.	SAGE CAPABILITY		LEAD WIRE AWG NO.	BODY LENGTH INCHES	BODY DIAMETER INCHES		REGULAR WINDING		NON-INDUCTIVE	
		CHAR. G OR U	CHAR. V					MIN.	MAX.	MIN.	MAX.
100S	1	1.2	1.7	24-.020	.400 Nom.*	.094 $\pm$ .031	500	0.1	8400	10	3000
200S	2	2.1	3	24-.020	.400 Nom.*	.125 $\pm$ .031	500	0.1	11,000	10	3900
250S	.25	.6	1	24-.020	.250 $\pm$ .031	.078 $\pm$ .016	500	0.1	3800	10	1350
300S	3	3	3.6	24-.020	.400 Nom.*	.187 $\pm$ .031	500	0.1	15,000	10	5300
500S	.5	.9	1.2	24-.020	.312 $\pm$ .031	.078 $\pm$ .016	500	0.1	5000	10	1750
1000S	1	1.2	1.7	24-.020	.406 $\pm$ .031	.094 $\pm$ .031	750	0.1	8400	10	3000
1100S	2	2.3	3.4	20-.032	.500 $\pm$ .062	.125 $\pm$ .031	1000	0.1	15,000	10	5500
1200S	2, 3	3	4	20-.032	.500 $\pm$ .062	.187 $\pm$ .031	1000	0.1	20,000	10	7000
1240S	3	3.2	4.2	20-.032	.562 $\pm$ .062	.187 $\pm$ .031	1000	0.1	24,000	10	8400
1250S	2, 3	3.5	5	20-.032	.812 $\pm$ .062	.187 $\pm$ .031	1000	0.1	40,000	10	14,000
1300S	3	4.2	5.5	18-.040	.625 $\pm$ .062	.250 $\pm$ .031	1000	0.1	30,000	10	10,500
1400S	3, 4	4.3	5.6	18-.040	.750 $\pm$ .062	.250 $\pm$ .031	1000	0.1	42,000	10	15,000
1500S	5	5.3	7.5	18-.040	.875 $\pm$ .062	.312 $\pm$ .031	1000	0.1	71,000	10	25,000
1550S	5	6	8	18-.040	1.000 $\pm$ .062	.312 $\pm$ .031	1000	0.1	88,000	10	31,000
1600S	7	7	9	18-.040	1.219 $\pm$ .062	.312 $\pm$ .031	1000	0.1	114,000	10	40,000
1700S	10	10	12	18-.040	1.781 $\pm$ .062	.375 $\pm$ .031	1000	0.1	230,000	10	80,000
1900S	7	10	12	18-.040	1.375 $\pm$ .062	.431 $\pm$ .031	1000	0.1	210,000	10	73,000
1950S	10	11	15	18-.040	1.937 $\pm$ .062	.431 $\pm$ .031	1000	0.1	314,000	10	110,000

\* Clean lead to clean lead = .450 Max.

**MOLDED MYLAR\* CAPACITORS  
TYPE 111**

**MOLDED IN RUGGED FLAME-  
RETARDANT MOLDING COMPOUND**

**TINNED COPPERWELD LEADS**



Nytronics Type 111 Capacitors were developed for applications requiring excellent capacitance stability, superior humidity, superior humidity resistance and high insulation resistance. The Capacitor element is non-inductively wound with mylar dielectric and extended foil. Molded construction is ideally suited for automatic insertion. Available either reel packaged or ammo packaged.

**CAPACITANCE**

Shall be within the specified limits when measured at a frequency of 1 kHz at +25°C.

**DISSIPATION FACTOR**

Shall not exceed 1% when measured as above.

**INSULATION RESISTANCE**

Shall be a minimum of 50,000 megohms when measured at +25°C and with rated voltage applied for 2 minutes.

**DIELECTRIC STRENGTH**

Shall withstand 2.5X rated voltage for one minute.

**OPERATING TEMPERATURE**

Is -55°C to +85°C at full rated voltage; derated linearly to 50% of rated voltage at 125°C.

**LIFE TEST**

Is 250 hours at +85°C and 150% of rated voltage or, at +125°C with 85°C rated voltage applied. One failure in twelve allowed.

**MOISTURE RESISTANCE**

Capacitors shall meet the humidity requirements of MIL-STD-202E, Method 106D, 5 cycles.

**CAPACITY TOLERANCE SUFFIX**

J = ±5%; K = ±10%; M = ±20%. Other tolerances available on request.

Intermediate Capacitance Values Available.

\* Dupont Trade Name

\*\* Available in alternate A-B size. To order prefix number with AB. Example: AB111B123, 100 VDC only.

**TYPE 111  
MOLDED POLYESTER  
CAPACITORS**

CAPACITANCE μF	CASE SIZE	CATALOG NUMBER
-------------------	--------------	-------------------

**100 VOLTS DC WORKING**

.001	A	111B102K
.0012	A	111B122K
.0015	A	111B152K
.0018	A	111B182K
.0022	A	111B222K
.0027	A	111B272K
.0033	A	111B332K
.0039	A	111B392K
.0047	A	111B472K
.0056	A	111B562K
.0068	A	111B682K
.0082	A	111B822K
.01	A	111B103K
.012**	B or A-B	111B123K
.015**	B or A-B	111B153K
.018**	B or A-B	111B183K
.022**	B or A-B	111B223K
.027**	C or A-B	111B273K
.033**	C or A-B	111B333K
.039	C	111B393K
.047	C	111B473K

**200 VOLTS DC WORKING**

.001	A	111C102K
.0012	A	111C122K
.0015	A	111C152K
.0018	A	111C182K
.0022	A	111C222K
.0027	A	111C272K
.0033	A	111C332K
.0039	A	111C392K
.0047	A	111C472K
.0056	A	111C562K
.0068	A	111C682K
.0082	A	111C822K
.01	B	111C103K
.012	B	111C123K
.015	B	111C153K
.018	B	111C183K
.022	B	111C223K
.027	C	111C273K
.033	C	111C333K

**400 VOLTS DC WORKING**

.001	A-B	111E102K
.0012	A-B	111E122K
.0015	A-B	111E152K
.0018	A-B	111E182K
.0022	A-B	111E222K
.0027	A-B	111E272K
.0033	A-B	111E332K
.0039	A-B	111E393K
.0047	A-B	111E472K
.0056	C	111E562K
.0068	C	111E682K

**600 VOLTS DC WORKING**

.001	A-B	111F102K
.0012	A-B	111F122K
.0015	A-B	111F152K
.0018	A-B	111F182K
.0022	C	111F222K
.0027	C	111F272K
.0033	C	111F332K

CASE SIZE	D MAX	L MAX
A	.188	.440
B	.188	.697
C	.219	.697
A-B	.219	.572

# Nytronics Components Group, Inc.

700 ORANGE STREET, DARLINGTON, S. C. 29532  
(803) 393-5421 — TWX 810-665-2182

## POLYESTER FILM CAPACITORS EXTENDED FOIL/FILM WRAP/EPOXY END FILL STYLE 107 -55°C TO +125°C



### ELECTRICAL AND ENVIRONMENTAL CHARACTERISTICS

#### CAPACITANCE MEASUREMENTS

Capacitors of 1.0  $\mu$ F or less shall be measured at a frequency of 1000 Hz. Capacitors greater than 1.0  $\mu$ F shall be measured at 60 Hz. The standard capacitance tolerance is 20%. Other tolerances are available upon request.

Reference: MIL-STD-202, Method 305.

#### TEMPERATURE CHARACTERISTICS

The maximum change in capacitance from the measured value at +25°C shall be -6% at -55°C, and +15% at +125°C.

#### DISSIPATION FACTOR

When measured as specified in Paragraph 1, the dissipation factor at +25°C shall not exceed 0.6% for values up to 1.0  $\mu$ F and shall not exceed 1.0% for greater capacitance values.

#### INSULATION RESISTANCE

When measured at +25°C, and rated voltage (or 500 VDC, whichever is less), the insulation resistance shall be a minimum of 50,000 megohm-microfarads, but need not exceed 100,000 megohms. The period of electrification shall not exceed two minutes.

Reference: MIL-STD-202, Method 302.

#### VOLTAGE DERATING

The capacitors may be operated at full rated voltage from -55°C to +85°C, or with linear derating to 50% of rated voltage above +85°C with a maximum temperature of +125°C.

#### VOLTAGE TEST

When tested at +25°C, the capacitors shall withstand the indicated DC test voltages for a period of one minute:

Terminal to terminal	200% of DC rating
Terminal to case (less than .235 diameter)	200% of DC rating
Terminal to case (greater than .235 diameter)	400% of DC rating or 2,000 VDC, whichever is less

Reference: MIL-STD-202, Method 301.

#### LIFE TESTING

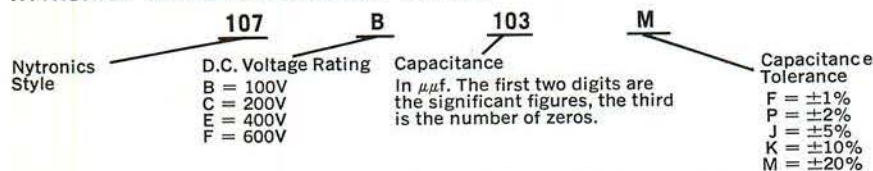
When tested for 1000 hours at 150% of the appropriate rated voltage for the test temperature, the capacitors shall exhibit no more than one failure in twelve pieces tested. Alternatively, an accelerated +125°C test may be performed at the +85°C voltage rating for a period of 250 hours. A failure is defined as:

- A capacitance change of more than 10% of its initial value;
- A dissipation factor greater than that specified in Paragraph 3;
- An insulation resistance less than 1/3 that specified in Paragraph 4; or
- A permanent open or short.

#### VIBRATION

The capacitors will meet or exceed in the vibration requirements of MIL-STD-202, Method 201.

### NYTRONICS CATALOG NUMBERING SYSTEM



Note: Special capacitance values, voltage ratings and sizes available to customer requirements.

#### PHYSICAL SIZE TOLERANCES

DIAMETER	100 Volts DC & 200 Volts DC		400 Volts DC	
	Up to .158	+ .032 - .000	Up to .218	$\pm .032$
DIAMETER	.159 to .200	+ .040 - .000	.219 to .500	$\pm .046$
	Over .200	+ .050 - .000	Over .500	$\pm .062$
LENGTH		$+\frac{1}{16}$ - 0		$+\frac{3}{32}$ - $\frac{1}{16}$

#### TINNED COPPERWELD LEADS

No. 22 AWG. (.025) for cases up to .325 Dia.  
No. 20 AWG. (.032) for cases .326 thru 1.0 Dia.  
No. 18 AWG. (.040) for cases above 1.0 Dia.

Lead Length: 1 1/8" Min.

Also available are the following styles with characteristics similar to Type 107.

## TYPE 107 POLYESTER FILM CAPACITORS

### STANDARD RATINGS

Capacitance $\mu$ f	Dia. x Length	Cat. No.	
<b>100 VOLTS DC WORKING</b>			
.001	.138	3/8	107B102M
.0015	.138	3/8	107B152M
.0022	.138	3/8	107B222M
.0033	.138	3/8	107B332M
.0047	.138	3/8	107B472M
.0068	.138	3/8	107B682M
.0082	.138	3/8	107B822M
.01	.158	3/8	107B103M
.015	.158	2 1/2	107B153M
.022	.158	2 1/2	107B223M
.027	.158	2 1/2	107B273M
.033	.158	2 1/2	107B333M
.047	.190	2 1/2	107B473M
.068	.220	2 1/2	107B683M
.082	.265	2 1/2	107B823M
.1	.265	1 1/4	107B104M
.12	.300	3/4	107B124M
.15	.330	3/4	107B154M
.22	.350	1 3/8	107B224M
.27	.350	1 1/8	107B274M
.33	.385	1 1/8	107B334M
.39	.415	1 1/8	107B394M
.47	.450	1 1/8	107B474M
.56	.490	1 1/8	107B564M
.68	.540	1 1/8	107B684M
.82	.570	1 1/8	107B824M
1.	.590	1 1/8	107B105M
1.5	.670	1 1/8	107B155M
1.8	.730	1 1/8	107B185M
2.0	.700	1 1/2	107B205M

### 200 VOLTS DC WORKING

.001	.138	3/8	107C102M
.0015	.138	3/8	107C152M
.0022	.138	3/8	107C222M
.0033	.138	3/8	107C332M
.0047	.138	3/8	107C472M
.0068	.138	3/8	107C682M
.0082	.138	3/8	107C822M
.01	.158	3/8	107C103M
.015	.158	2 1/2	107C153M
.022	.158	2 1/2	107C223M
.027	.158	2 1/2	107C273M
.033	.158	2 1/2	107C333M
.047	.190	2 1/2	107C473M
.068	.220	2 1/2	107C683M
.082	.265	2 1/2	107C823M
.1	.265	1 1/4	107C104M
.12	.285	1 3/8	107C124M
.15	.315	1 3/8	107C154M
.22	.325	1 1/8	107C224M
.27	.350	1 3/8	107C274M
.33	.390	1 3/8	107C334M
.39	.415	1 3/8	107C394M
.47	.450	1 3/8	107C474M
.56	.490	1 3/8	107C564M
.68	.540	1 3/8	107C684M
.82	.580	1 3/8	107C824M
1.	.590	1 3/8	107C105M
1.5	.680	1 3/8	107C155M
1.8	.740	1 3/8	107C185M
2.0	.750	1 1/2	107C205M

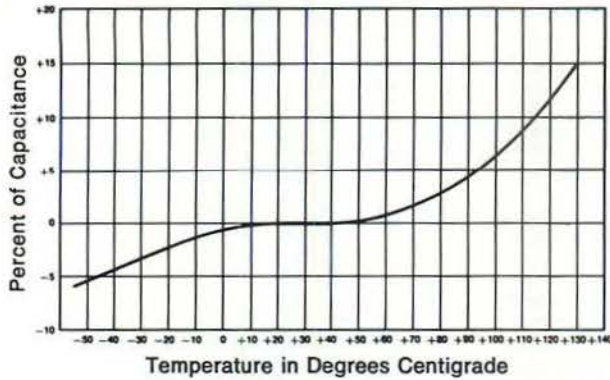
### 400 VOLTS DC WORKING

.001	.156	3/8	107E102M
.0015	.156	3/8	107E152M
.0022	.156	3/8	107E222M
.0033	.156	3/8	107E332M
.0047	.187	3/8	107E472M
.0068	.218	3/8	107E682M
.0082	.234	3/8	107E822M
.01	.250	3/8	107E103M
.015	.296	3/8	107E153M
.022	.312	3/4	107E223M
.027	.281	7/8	107E273M
.033	.312	7/8	107E333M
.047	.343	7/8	107E473M
.068	.375	1	107E683M
.082	.406	1	107E823M
.1	.421	1	107E104M
.12	.468	1	107E124M
.15	.468	1 1/4	107E154M
.22	.546	1 3/8	107E224M
.27	.609	1 3/8	107E274M
.33	.593	1 5/8	107E334M
.39	.625	1 5/8	107E394M
.47	.671	1 5/8	107E474M
.56	.718	1 3/4	107E564M
.68	.796	1 3/4	107E684M
.82	.812	1 7/8	107E824M
1.	.812	2	107E105M
1.5	.921	2 1/4	107E155M
1.8	1.015	2 1/4	107E185M
2.0	1.093	2 1/4	107E205M

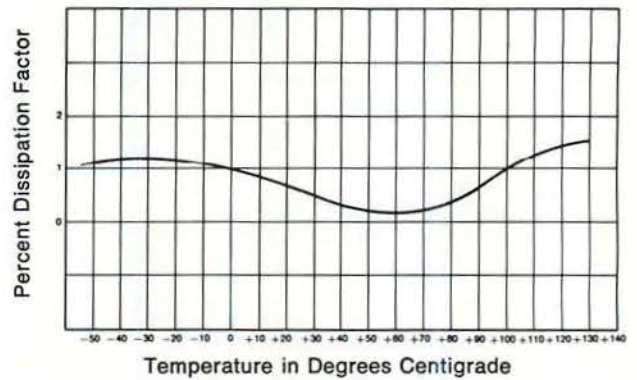
Special capacitance values, tolerances and sizes are available on request.

**TYPICAL CURVES POLYESTER FILM STYLE 107 & 111 -55°C TO +125°C**

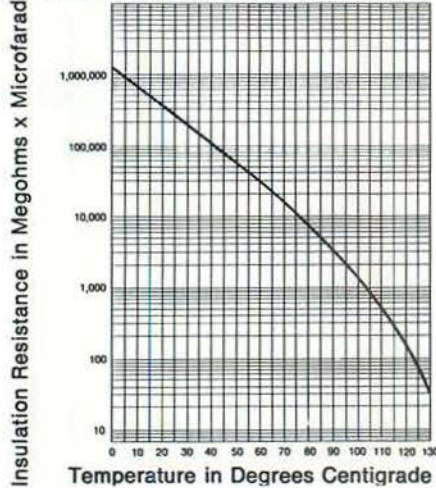
Capacitance Vs Temperature



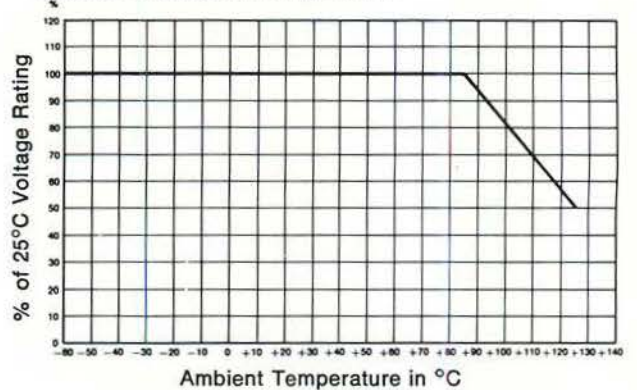
Dissipation Factor Vs Temperature



Insulation Resistance Vs Temperature

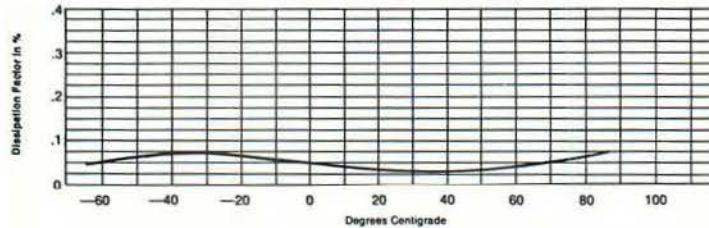


Voltage Derating with Temperature

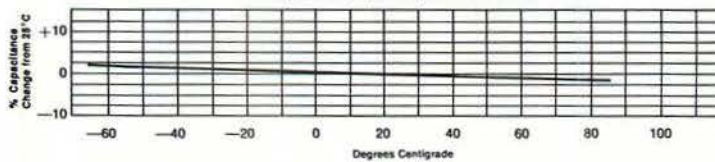


**TYPICAL CURVES POLYSTYRENE FILM STYLE 133 -55°C TO +85°C**

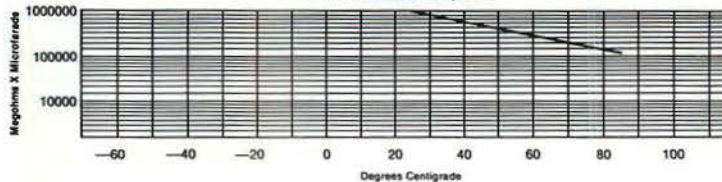
Power Factor vs. Temperature at 1000 Hertz



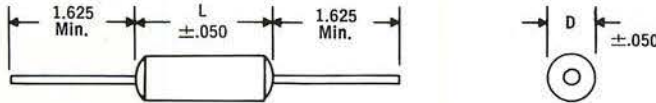
Capacitance Change vs. Temperature at 1000 Hertz



Insulation Resistance vs. Temperature



### SUBMINIATURE CAPACITORS 50, 80, 100 VDC



#### LEAD WIRE SIZE

AWG	Diameter
#24	.280 & Under
#22	.281-.532
#20	Above .533

#### CAPACITANCE TOLERANCE SUFFIX

G	= ±2%
J	= ±5%
K	= ±10%
M	= ±20%

#### OUTSTANDING FEATURES

- Excellent Electrical Characteristics
- Subminiature, Space Saving Sizes
- Excellent Moisture Resistance
- Self Healing
- Excellent Shelf Life
- Wide Operating Temperature Range

#### CAPACITANCE

Shall be measured at +25°C. For capacitance values equal to or less than 1 μF, the test frequency is 1 kHz, above 1 μF use 120 Hz.

#### DISSIPATION FACTOR

Shall not exceed .75% when measured as above.

#### INSULATION RESISTANCE

Shall be a minimum of 10,000 megohm X microfarads, need not exceed 30,000 megohms when measured at +25°C and with rated voltage applied for two minutes.

#### DIELECTRIC STRENGTH

Shall withstand 1.8 times rated voltage for 2 minutes without permanent breakdown.

#### OPERATING TEMPERATURE

-55°C to +85°C at full rated voltage; derated linearly to 50% of rated voltage at +125°C.

#### LIFE TEST

250 hours at +85°C and 150% of rated voltage. One failure in 18 allowed.

#### MOISTURE RESISTANCE

Capacitors shall be subjected to 95% R.H. at +40°C for 500 hours. Capacitors shall be removed from the humidity chamber on completion. Surface of units shall be wiped dry then exposed to circulating air for four hours. No more than one failure in 12 units tested.

CAP. MFD	CATALOG NUMBER	DIA.	LENGTH
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#### 100 VDC

0.01	184B103	.140	.400
0.012	184B123	.140	.400
0.015	184B153	.140	.400
0.018	184B183	.140	.400
0.022	184B223	.140	.400
0.027	184B273	.140	.400
0.033	184B333	.140	.400
0.039	184B393	.140	.400
0.047	184B473	.140	.400
0.056	184B563	.140	.400
0.068	184B683	.140	.400
0.082	184B823	.140	.400
0.10	184B104	.140	.400
0.12	184B124	.150	.400
0.15	184B154	.165	.400
0.18	184B184	.180	.400
0.22	184B224	.195	.400
0.27	184B274	.215	.400
0.33	184B334	.180	.530
0.39	184B394	.205	.530
0.47	184B474	.210	.530
0.56	184B564	.225	.530
0.68	184B684	.250	.530
0.82	184B824	.270	.530
1.00	184B105	.295	.530
1.2	184B125	.265	.680
1.5	184B155	.300	.680
1.8	184B185	.330	.680
2.0	184B205	.345	.680
2.2	184B225	.335	.780
3.0	184B305	.390	.780
3.3	184B335	.410	.780
4.0	184B405	.380	.900
4.7	184B475	.410	.900
5.0	184B505	.425	.900
6.0	184B605	.465	.900
6.8	184B685	.495	.900
8.0	184B805	.535	.900
10.0	184B106	.595	.900

CAP. MFD	CATALOG NUMBER	DIA.	LENGTH
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#### 50 VDC\*

0.047	184A473	.140	.400
0.056	184A563	.140	.400
0.068	184A683	.140	.400
0.082	184A823	.140	.400
0.10	184A104	.140	.400
0.12	184A124	.140	.400
0.15	184A154	.140	.400
0.18	184A184	.140	.400
0.22	184A224	.140	.400
0.27	184A274	.140	.400
0.33	184A334	.150	.400
0.39	184A394	.160	.400
0.47	184A474	.175	.400
0.56	184A564	.185	.400
0.68	184A684	.205	.400
0.82	184A824	.220	.400
1.00	184A105	.240	.400
1.2	184A125	.200	.530
1.5	184A155	.220	.530
1.8	184A185	.240	.530
2.0	184A205	.255	.530
2.2	184A225	.265	.530
3.0	184A305	.260	.680
3.3	184A335	.270	.680
4.0	184A405	.295	.680
4.7	184A475	.320	.680
5.0	184A505	.330	.680
6.0	184A605	.335	.780
6.8	184A685	.355	.780
8.0	184A805	.385	.780
10.0	184A106	.425	.780
12.0	184A126	.395	.900
15.0	184A156	.440	.900
18.0	184A186	.480	.900
20.0	184A206	.505	.900
25.0	184A256	.520	1.08
30.0	184A306	.565	1.08
35.0	184A356	.610	1.08
50.0	184A506	.730	1.08

#### 80 VDC\*

0.047	184Y473	.140	.400
0.056	184Y563	.140	.400
0.068	184Y683	.140	.400
0.082	184Y823	.140	.400
0.10	184Y104	.140	.400
0.12	184Y124	.140	.400
0.15	184Y154	.140	.400
0.18	184Y184	.140	.400
0.22	184Y224	.160	.400
0.27	184Y274	.175	.400
0.33	184Y334	.190	.400
0.39	184Y394	.160	.530
0.47	184Y474	.175	.530
0.56	184Y564	.185	.530
0.68	184Y684	.205	.530
0.82	184Y824	.220	.530
1.00	184Y105	.240	.530
1.2	184Y125	.260	.530
1.5	184Y155	.290	.530
1.8	184Y185	.305	.680
2.0	184Y205	.280	.680
2.2	184Y225	.290	.680
3.0	184Y305	.340	.680
3.3	184Y335	.355	.680
4.0	184Y405	.390	.680
4.7	184Y475	.420	.680
5.0	184Y505	.430	.680
6.0	184Y605	.470	.680
6.8	184Y685	.395	.900
8.0	184Y805	.430	.900
10.0	184Y106	.480	.900
12.0	184Y126	.525	.900
15.0	184Y156	.585	.900
18.0	184Y186	.635	.900

\*For values below .047μF, see 100 VDC rating.

# Nytronics Components Group, Inc.

700 ORANGE STREET, DARLINGTON, S. C. 29532  
(803) 393-5421 — TWX 810-665-2182

## TYPE 185 METALLIZED POLYESTER CAPACITORS

### POLYESTER TAPE WRAP CASE/EPOXY ENDFILL

Type 185 Capacitors feature extremely small size, light weight, and self clearing metallized construction which virtually eliminates catastrophic failures. Well suited for Voltage Multiplier Circuits in TV Power Supplies and Electrostatic copiers. Also ideal for Potting or Encapsulating in Electronic Sub-Assemblies, Power Supplies, etc.

#### CAPACITANCE

Measurements shall be made at 1000 Hz for capacitance values thru 1. MFD and at 60 Hz for values over 1. MFD.

#### CAPACITANCE TOLERANCE

Standard capacitance tolerance is  $\pm 20\%$  (M). Closer tolerances available upon request.

#### DISSIPATION FACTOR

The dissipation factor shall not exceed 1% when measured at 25°C. Measurements shall be made at 1000 Hz for capacitance values thru 1. MFD and at 60 Hz for higher values.

#### TEST VOLTAGE

Capacitors shall withstand 200% of rated DC voltage for one minute at 25°C, with the charging and discharge current limited to a maximum of 1. Ampere.

#### OPERATING TEMPERATURES

-55°C to +125°C.

#### LIFE TEST

Capacitors shall withstand a life test of 250 hours at 125°C, with 140% of the 125°C rated DC voltage applied. A resistance of one ohm per volt of applied voltage shall be inserted in series with the capacitor.

#### VOLTAGE DERATING

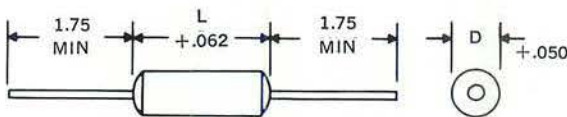
These capacitors will operate as full DC voltage ratings at 85°C. For operation at temperatures above 85°C, see below.

#### VIBRATION

Capacitors shall withstand a vibration test per Method 204, Test Condition B of MIL-STD-202 as modified by MIL-C-27287. After test, the I.R. will be equal to or greater than 1/3 of the initial requirement.

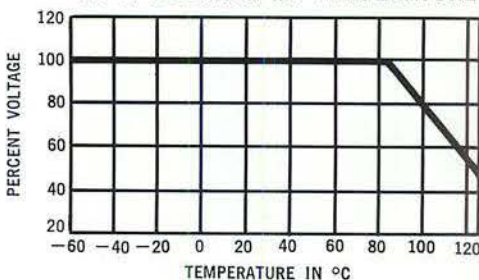
#### HUMIDITY TEST

These capacitors shall meet the humidity test requirements of MIL-STD-202, Method 103, Test Condition B. After testing the I.R. will be equal to or greater than 1/3 of the initial requirement.



LEAD GAUGE	
Body Length	AWG
.530 & Less	24
.650 thru 1.062	22
1.170 thru 2.00	20
Greater than 2.00	18

VOLTAGE RATING  
AS A FUNCTION OF TEMPERATURE



#### LEAD MATERIAL:

Tinned copperweld wire shall withstand mechanical test as specified in Paragraph 3.4 of EIA Standard RS-164A

#### CAPACITY TOLERANCE SUFFIX

- F =  $\pm 1\%$
- P =  $\pm 2\%$
- J =  $\pm 5\%$
- K =  $\pm 10\%$
- M =  $\pm 20\%$

### 200 VOLTS DC WORKING

CAP MFD	CAT. No.	DIA.	LENGTH
.010	185C103	.150	.400
.012	185C123	.150	.400
.015	185C153	.150	.400
.018	185C183	.160	.400
.022	185C223	.170	.400
.027	185C273	.150	.530
.033	185C333	.150	.530
.039	185C393	.155	.530
.047	185C473	.170	.530
.056	185C563	.180	.530
.068	185C683	.190	.530
.082	185C823	.215	.530
.10	185C104	.230	.530
.12	185C124	.250	.530
.15	185C154	.270	.530
.18	185C184	.240	.680
.22	185C224	.265	.680
.27	185C274	.290	.680
.33	185C334	.320	.680
.39	185C394	.300	.780
.47	185C474	.325	.780
.56	185C564	.350	.780
.68	185C684	.385	.780
.82	185C824	.420	.780
1.0	185C105	.410	.950
1.2	185C125	.390	1.170
1.5	185C155	.430	1.170
1.8	185C185	.470	1.170
2.0	185C205	.490	1.170
3.0	185C305	.600	1.170
4.0	185C405	.610	1.450
5.0	185C505	.600	1.700
6.0	185C605	.670	1.700
8.0	185C805	.710	1.940
10.0	185C106	.790	1.940

### 400 VOLTS DC WORKING

CAP MFD	CAT. No.	DIA.	LENGTH
.010	185E103	.150	.530
.012	185E123	.150	.530
.015	185E153	.150	.530
.018	185E183	.170	.530
.022	185E223	.180	.530
.027	185E273	.220	.530
.033	185E333	.220	.530
.039	185E393	.230	.530
.047	185E473	.250	.530
.056	185E563	.270	.530
.068	185E683	.240	.680
.082	185E823	.260	.680
.10	185E104	.280	.680
.12	185E124	.260	.780
.15	185E154	.290	.780
.18	185E184	.320	.780
.22	185E224	.350	.780
.27	185E274	.390	.780
.33	185E334	.380	.950
.39	185E394	.410	.950
.47	185E474	.450	.950
.56	185E564	.420	1.170
.68	185E684	.460	1.170
.82	185E824	.500	1.170
1.0	185E105	.550	1.170
1.2	185E125	.530	1.450
1.5	185E155	.590	1.450
1.8	185E185	.580	1.700
2.0	185E205	.560	1.940
3.0	185E305	.680	1.940
4.0	185E405	.780	1.940
5.0	185E505	.870	1.940

### 600 VOLTS DC WORKING

CAP MFD	CAT. No.	DIA.	LENGTH
.010	185F103	.180	.530
.012	185F123	.200	.530
.015	185F153	.220	.530
.018	185F183	.230	.530
.022	185F223	.250	.530
.027	185F273	.230	.680
.033	185F333	.250	.680
.039	185F393	.265	.680
.047	185F473	.250	.780
.056	185F563	.270	.780
.068	185F683	.290	.780
.082	185F823	.330	.780
.10	185F104	.320	.950
.12	185F124	.350	.950
.15	185F154	.390	.950
.18	185F184	.420	.950
.22	185F224	.390	1.170
.27	185F274	.430	1.170
.33	185F334	.470	1.170
.39	185F394	.510	1.170
.47	185F474	.500	1.450
.56	185F564	.540	1.450
.68	185F684	.590	1.450
.82	185F824	.590	1.700
1.0	185F105	.650	1.700
1.2	185F125	.700	1.700
1.5	185F155	.780	1.700
1.8	185F185	.850	1.700
2.0	185F205	.830	1.940



# Nytronics Components Group, Inc.

700 ORANGE STREET, DARLINGTON, S. C. 29532  
(803) 393-5421 — TWX 810-665-2182

## TYPE 189 POLYESTER CAPACITORS

### METALLIZED POLYESTER CAPACITORS TYPE 189 FILM WRAP EPOXY END FILL -55°C TO +125°C

Type 189 Capacitors features extremely small size, light weight and self clearing metallized construction which virtually eliminates catastrophic failures. Well suited for Voltage Multiplier Circuits in TV power supplies and Electrostatic copiers. Also ideal for Potting or encapsulating in Electronic Sub assemblies, Power supplies, etc.

#### CAPACITANCE

Measurements shall be made at 1000 cycles per second for capacitance values thru 1. MFD and at 60 cycles per second for values over 1. MFD.

#### CAPACITANCE TOLERANCE

Standard capacitance tolerance is  $\pm 20\%$  (M). Closer tolerances available upon request.

#### DISSIPATION FACTOR

The dissipation factor shall not exceed 1% when measured at 25°C. Measurements shall be made at 1000 Hz for capacitance values thru 1. MF and at 60 Hz for higher values.

#### TEST VOLTAGE

Capacitors shall withstand 200% of rated DC voltage for one minute at 25°, with the charging and discharge current limited to a maximum of 1. Ampere.

#### OPERATING TEMPERATURES

-55°C to +125°C.

#### LIFE TEST

Capacitors shall withstand a life test of 250 hours at 125°C, with 140% of the 125°C rated DC voltage applied. A resistance of one ohm per volt of applied voltage shall be inserted in series with the capacitor.

#### VOLTAGE DERATING

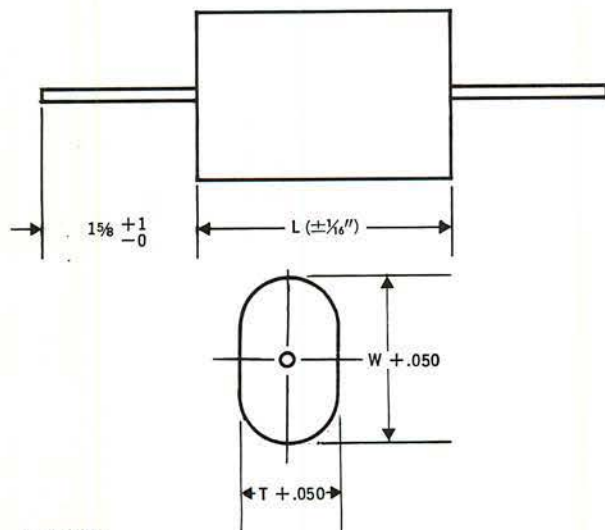
These capacitors will operate as full DC voltage ratings at 85°C. For operation at temperatures above 85°C, see Figure 4.

#### VIBRATION

Capacitors shall withstand a vibration test per Method 204, Test condition B of MIL-STD-202B as modified by MIL-C-27287.

#### HUMIDITY TEST

These capacitors shall meet the humidity test requirements of MIL-STD-202 Method 103B, test condition B. After testing the I.R. will be equal to or greater than  $\frac{1}{3}$  of the initial requirement.



Lead Sizes  
Nom. Body Length  
Thru .530  
.650 thru .970  
Above .970

Lead Dia.  
.020  
.025  
.032

Capacitance	Thickness	Width	Length	Cat. No.
<b>100 VOLTS DC WORKING</b>				
.010	.10	.20	.40	189B103M
.012	.10	.20	.40	189B123M
.015	.10	.20	.40	189B153M
.018	.10	.20	.40	189B183M
.022	.10	.20	.40	189B223M
.027	.10	.20	.40	189B273M
.033	.10	.20	.40	189B333M
.039	.10	.20	.40	189B393M
.047	.10	.22	.40	189B473M
.056	.11	.24	.40	189B563M
.068	.10	.20	.53	189B633M
.082	.10	.20	.53	189B823M
.10	.10	.20	.53	189B104M
.12	.10	.23	.53	189B124M
.15	.12	.25	.53	189B154M
.18	.14	.27	.53	189B184M
.22	.17	.30	.53	189B224M
.27	.19	.32	.53	189B274M
.33	.21	.34	.53	189B334M
.39	.24	.37	.53	189B394M
.47	.21	.34	.65	189B474M
.56	.23	.36	.65	189B564M
.68	.27	.40	.65	189B684M
.82	.24	.37	.78	189B824M
1.0	.26	.42	.78	189B105M
1.2	.29	.45	.78	189B125M
1.5	.33	.49	.78	189B155M
2.0	.32	.48	.97	189B205M
2.5	.36	.52	.97	189B255M
3.0	.35	.51	1.17	189B305M
3.5	.38	.54	1.17	189B355M
4.0	.41	.57	1.17	189B405M
4.5	.44	.60	1.17	189B455M
5.0	.47	.63	1.17	189B505M
6.0	.52	.68	1.17	189B605M
8.0	.46	.62	1.68	189B805M
10.0	.53	.69	1.68	189B106M

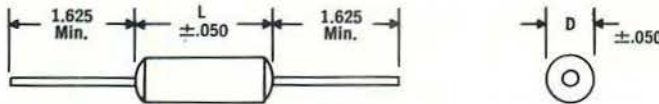
Capacitance	Thickness	Width	Length	Cat. No.
<b>200 VOLTS DC WORKING</b>				
.010	.10	.20	.40	189C103M
.012	.10	.20	.40	189C123M
.015	.10	.20	.40	189C153M
.018	.13	.23	.40	189C183M
.022	.13	.26	.40	189C223M
.027	.10	.20	.53	189C273M
.033	.12	.22	.53	189C333M
.039	.12	.25	.53	189C393M
.047	.13	.26	.53	189C473M
.056	.14	.27	.53	189C563M
.068	.16	.29	.53	189C633M
.082	.18	.31	.53	189C823M
.10	.20	.33	.53	189C104M
.12	.22	.35	.53	189C124M
.15	.26	.39	.53	189C154M
.18	.24	.37	.65	189C184M
.22	.26	.39	.65	189C224M
.27	.24	.37	.78	189C274M
.33	.27	.40	.78	189C334M
.39	.30	.43	.78	189C394M
.47	.33	.46	.78	189C474M
.56	.37	.50	.78	189C564M
.68	.32	.48	.97	189C684M
.82	.35	.51	.97	189C824M
1.0	.35	.51	1.17	189C105M
1.2	.38	.54	1.17	189C125M
1.5	.43	.59	1.17	189C155M
2.0	.52	.68	1.17	189C205M
2.5	.46	.62	1.68	189C255M
3.0	.49	.65	1.68	189C305M
3.5	.54	.70	1.68	189C355M
4.0	.58	.74	1.68	189C405M
4.5	.62	.78	1.68	189C455M
5.0	.64	.84	1.68	189C505M
6.0	.70	.90	1.68	189C605M
8.0	.84	1.04	1.68	189C805M
10.0	.75	.95	2.25	189C106M

Capacitance	Thickness	Width	Length	Cat. No.
<b>600 VOLTS DC WORKING</b>				
.010	.12	.25	.53	189F103M
.012	.13	.26	.53	189F123M
.015	.15	.28	.53	189F153M
.018	.17	.30	.53	189F183M
.022	.19	.32	.53	189F223M
.027	.21	.34	.53	189F273M
.033	.24	.37	.53	189F333M
.039	.21	.34	.65	189F393M
.047	.24	.37	.65	189F473M
.056	.22	.35	.78	189F563M
.068	.25	.38	.78	189F683M
.082	.27	.40	.78	189F823M
.10	.30	.43	.78	189F104M
.12	.32	.48	.78	189F124M
.15	.36	.52	.78	189F154M
.18	.33	.49	.97	189F184M
.22	.37	.53	.97	189F224M
.27	.36	.52	1.17	189F274M
.33	.40	.56	1.17	189F334M
.39	.44	.60	1.17	189F394M
.47	.49	.65	1.17	189F474M
.56	.41	.57	1.68	189F564M
.68	.45	.61	1.68	189F684M
.82	.51	.67	1.68	189F824M
1.0	.58	.74	1.68	189F105M
1.2	.64	.80	1.68	189F125M
1.5	.73	.89	1.68	189F155M
2.0	.69	.89	2.25	189F205M
2.5	.80	1.00	2.25	189F255M
3.0	.87	1.07	2.25	189F305M

INTERMEDIATE VALUES AVAILABLE.

Capacitance	Thickness	Width	Length	Cat. No.
<b>400 VOLTS DC WORKING</b>				
.010	.14	.24	.40	189E103M
.012	.10	.23	.53	189E123M
.015	.11	.21	.53	189E153M
.018	.12	.22	.53	189E183M
.022	.12	.25	.53	189E223M
.027	.13	.26	.53	189E273M
.033	.15	.28	.53	189E333M
.039	.17	.30	.53	189E393M
.047	.19	.32	.53	189E473M
.056	.21	.34	.53	189E563M
.068	.23	.36	.53	189E683M
.082	.26	.39	.53	189E823M
.10	.23	.36	.65	189E104M
.12	.25	.38	.65	189E124M
.15	.24	.37	.78	189E154M
.18	.26	.39	.78	189E184M
.22	.30	.43	.78	189E224M
.27	.33	.46	.78	189E274M
.33	.36	.52	.78	189E334M
.39	.33	.49	.97	189E394M
.47	.37	.53	.97	189E474M
.56	.34	.50	1.17	189E564M
.68	.38	.54	1.17	189E684M
.82	.43	.59	1.17	189E824M
1.0	.48	.64	1.17	189E105M
1.2	.54	.70	1.17	189E125M
1.5	.46	.62	1.68	189E155M
2.0	.54	.70	1.68	189E205M
2.5	.60	.80	1.68	189E255M
3.0	.67	.87	1.68	189E305M
3.5	.73	.93	1.68	189E355M
4.0	.78	.98	1.68	189E405M
4.5	.89	.89	2.25	189E455M
5.0	.75	.95	2.25	189E505M

### SUBMINIATURE CAPACITORS 50, 80, 100 VDC



#### LEAD WIRE SIZE

AWG	Diameter
#24	.280 & Under
#22	.281-.532
#20	Above .533

#### CAPACITANCE TOLERANCE SUFFIX

G	$\pm 2\%$
J	$\pm 5\%$
K	$\pm 10\%$
M	$\pm 20\%$

#### OUTSTANDING FEATURES

- Excellent Electrical Characteristics
- Subminiature, Space Saving Sizes
- Excellent Moisture Resistance
- Self Healing
- Excellent Shelf Life
- Wide Operating Temperature Range

#### CAPACITANCE

Shall be measured at  $+25^{\circ}\text{C}$ . For capacitance values equal to or less than  $1 \mu\text{F}$ , the test frequency is 1 kHz, above  $1 \mu\text{F}$  use 120 Hz.

#### DISSIPATION FACTOR

Shall not exceed .30% when measured as above.

#### INSULATION RESISTANCE

Shall be a minimum of 50,000 megohm X microfarads, need not exceed 200,000 megohms when measured at  $+25^{\circ}\text{C}$  and with rated voltage applied for two minutes.

#### DIELECTRIC STRENGTH

Shall withstand 1.8 times rated voltage for 2 minutes without permanent breakdown.

#### OPERATING TEMPERATURE

$-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  at full rated voltage.

#### LIFE TEST

250 hours at  $+125^{\circ}\text{C}$  and 150% of rated voltage. One failure in 18 allowed.

#### MOISTURE RESISTANCE

Capacitors shall be subjected to 95% R.H. at  $+40^{\circ}\text{C}$  for 500 hours. Capacitors shall be removed from the humidity chamber on completion. Surface of units shall be wiped dry then exposed to circulating air for four hours. No more than one failure in 12 units tested.

CAP. MFD	CATALOG NUMBER	DIA.	LENGTH
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#### 50 VDC

0.047	194A473	.140	.400
0.056	194A563	.140	.400
0.068	194A683	.140	.400
0.082	194A823	.140	.400
0.10	194A104	.140	.400
0.12	194A124	.160	.400
0.15	194A154	.160	.400
0.18	194A184	.160	.400
0.22	194A224	.170	.400
0.27	194A274	.190	.400
0.33	194A334	.200	.400
0.39	194A394	.170	.530
0.47	194A474	.180	.530
0.56	194A564	.200	.530
0.68	194A684	.220	.530
0.82	194A824	.240	.530
1.00	194A105	.260	.530
1.2	194A125	.240	.680
1.5	194A155	.260	.680
1.8	194A185	.290	.680
2.0	194A205	.305	.680
2.2	194A225	.320	.680
3.0	194A305	.345	.780
3.3	194A335	.360	.780
4.0	194A405	.340	.900
4.7	194A475	.365	.900
5.0	194A505	.375	.900
6.0	194A605	.410	.900
6.8	194A685	.435	.900
8.0	194A805	.430	1.08
9.0	194A905	.460	1.08
10.0	194A106	.480	1.08
12.0	194A126	.530	1.08
15.0	194A156	.550	1.205
20.0	194A206	.630	1.205
25.0	194A256	.710	1.205
30.0	194A306	.770	1.205

CAP. MFD	CATALOG NUMBER	DIA.	LENGTH
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#### 100 VDC

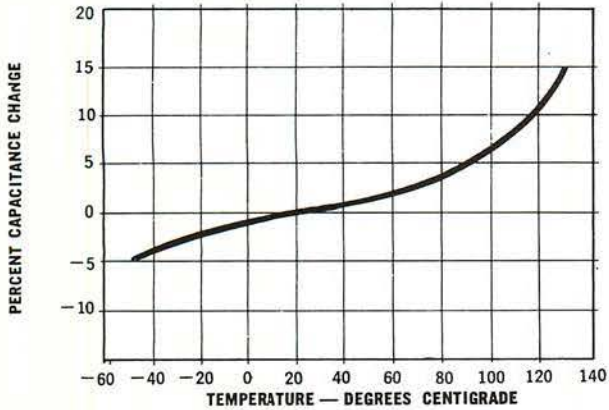
0.047	194B473	.140	.400
0.056	194B563	.140	.400
0.068	194B683	.140	.400
0.082	194B823	.140	.530
0.10	194B104	.140	.530
0.12	194B124	.140	.530
0.15	194B154	.160	.530
0.18	194B184	.175	.530
0.22	194B224	.190	.530
0.27	194B274	.210	.530
0.33	194B334	.230	.530
0.39	194B394	.210	.680
0.47	194B474	.230	.680
0.56	194B564	.250	.680
0.68	194B684	.270	.680
0.82	194B824	.295	.680
1.00	194B105	.325	.680
1.2	194B125	.330	.780
1.5	194B155	.365	.780
1.8	194B185	.340	.900
2.0	194B205	.360	.900
2.2	194B225	.375	.900
3.0	194B305	.435	.900
3.3	194B335	.455	.900
4.0	194B405	.430	1.205
4.7	194B475	.465	1.205
5.0	194B505	.475	1.205
6.0	194B605	.520	1.205
6.8	194B685	.555	1.205
8.0	194B805	.600	1.205
9.0	194B905	.635	1.205
10.0	194B106	.670	1.205

#### 80 VDC

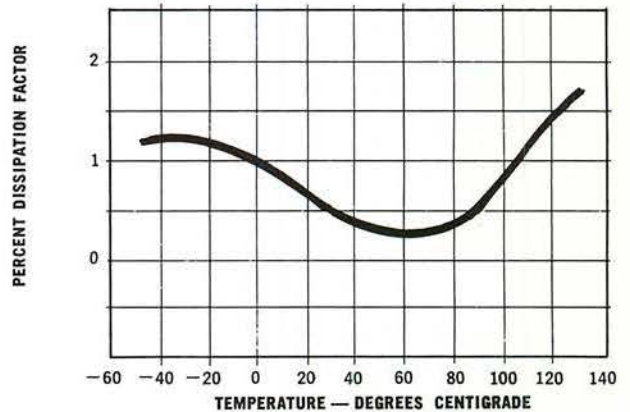
0.047	194Y473	.140	.400
0.056	194Y563	.140	.400
0.068	194Y683	.140	.400
0.082	194Y823	.140	.400
0.10	194Y104	.140	.400
0.12	194Y124	.165	.400
0.15	194Y154	.180	.400
0.18	194Y184	.195	.400
0.22	194Y224	.215	.400
0.27	194Y274	.235	.400
0.33	194Y334	.255	.400
0.39	194Y394	.210	.530
0.47	194Y474	.230	.530
0.56	194Y564	.250	.530
0.68	194Y684	.270	.530
0.82	194Y824	.250	.680
1.00	194Y105	.275	.680
1.2	194Y125	.300	.680
1.5	194Y155	.330	.680
1.8	194Y185	.335	.780
2.0	194Y205	.355	.780
2.2	194Y225	.370	.900
3.0	194Y305	.365	.900
3.3	194Y335	.385	.900
4.0	194Y405	.420	.900
4.7	194Y475	.455	.900
5.0	194Y505	.430	1.08
6.0	194Y605	.470	1.08
6.8	194Y685	.500	1.08
8.0	194Y805	.540	1.08
9.0	194Y905	.570	1.08
10.0	194Y106	.600	1.08
12.0	194Y126	.610	1.205
15.0	194Y156	.685	1.205

**TYPICAL CURVES METALLIZED POLYESTER TYPE 185 & 189 -55°C TO +125°C**

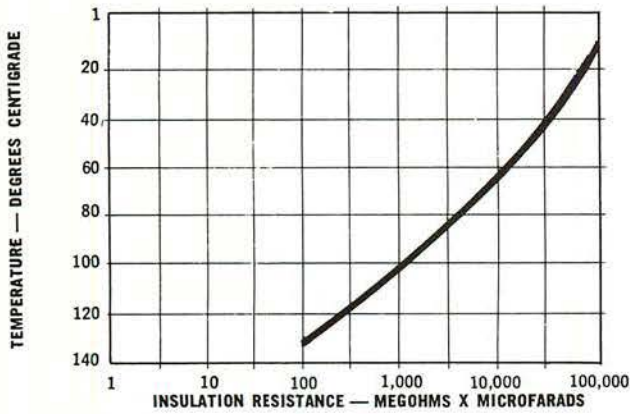
Capacitance Vs Temperature



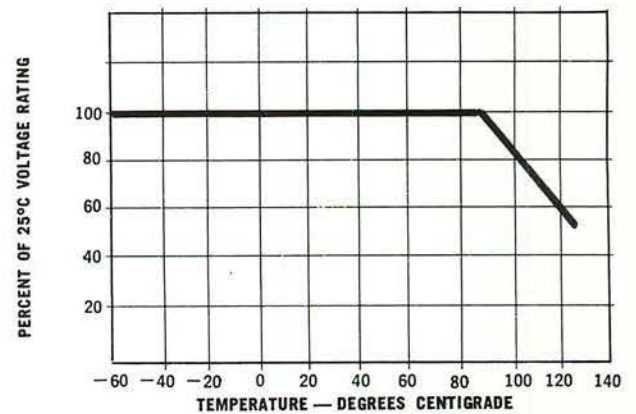
Dissipation Factor Vs Temperature



Insulation Resistance Vs Temperature



Voltage Derating with Temperature

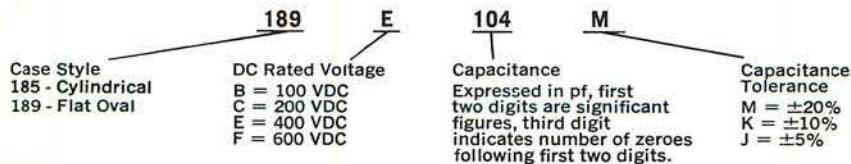


**INSULATION RESISTANCE MINIMUM**

Temperature	Megohms x MF	IR Need Not Exceed Megohms
25°C	20,000	50,000
85°C	1,000	5,000
125°C	10	100

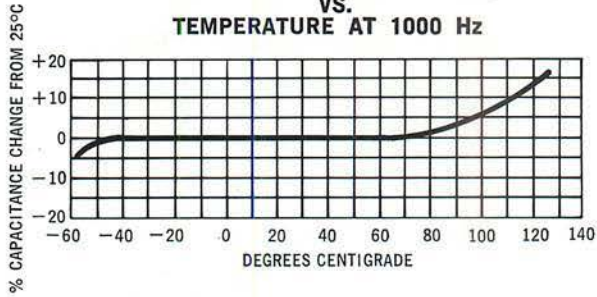
Measurements, shall be made after two minutes charge at rated voltage or 500 VDC, whichever is less.

**NOMENCLATURE**

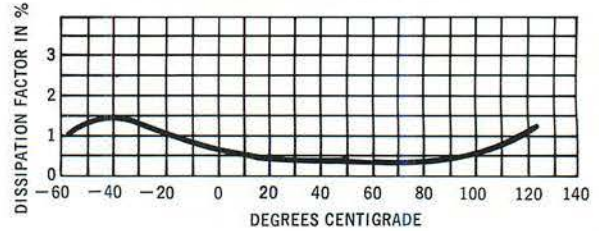


**TYPICAL TEMPERATURE CHARACTERISTICS FOR METALLIZED  
POLYESTER CAPACITORS — TYPE 184**

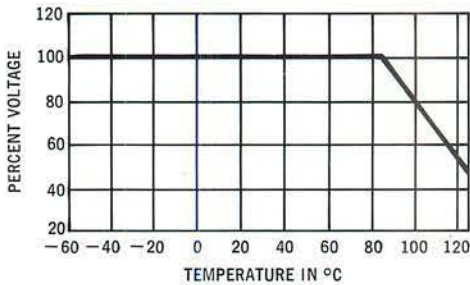
**AVERAGE CAPACITANCE CHANGE  
VS.  
TEMPERATURE AT 1000 Hz**



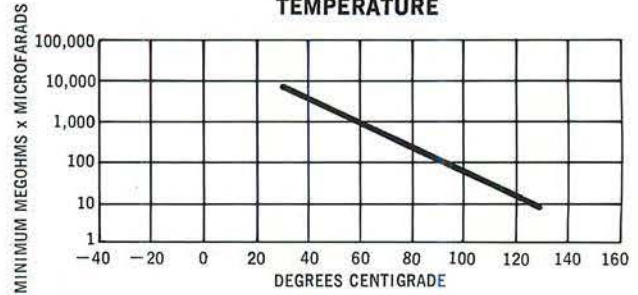
**AVERAGE DISSIPATION FACTOR  
VS.  
TEMPERATURE AT 1000 Hz**



**VOLTAGE RATING  
AS A FUNCTION OF TEMPERATURE**

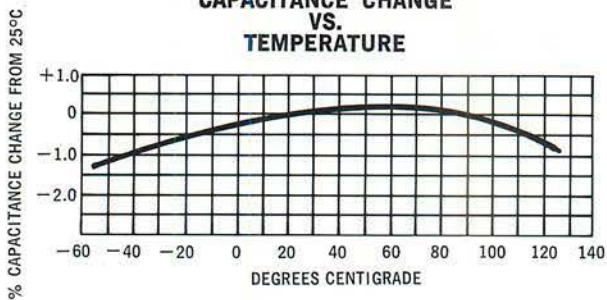


**INSULATION RESISTANCE  
VS.  
TEMPERATURE**

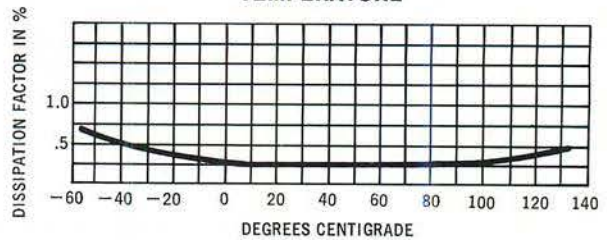


**TYPICAL TEMPERATURE CHARACTERISTICS FOR METALLIZED  
POLYCARBONATE CAPACITORS — TYPE 194**

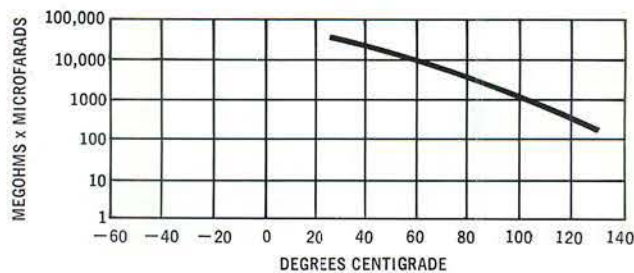
**CAPACITANCE CHANGE  
VS.  
TEMPERATURE**



**DISSIPATION FACTOR  
VS.  
TEMPERATURE**

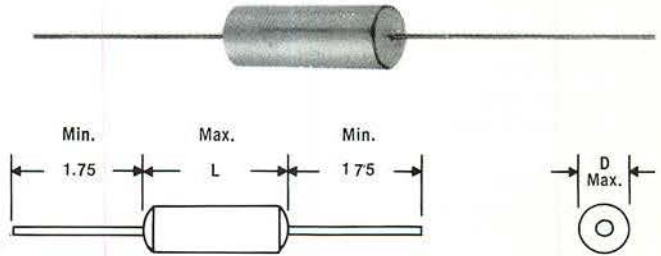


**INSULATION RESISTANCE  
VS.  
TEMPERATURE**



**TYPE 187  
POLYPROPYLENE  
CAPACITORS**

**EXTENDED FOIL/FILM WRAP/  
EPOXY ENDFILL**



**ELECTRICAL SPECIFICATIONS**

**CAPACITANCE**

Shall be within the specified limits when measured at 1 kHz at +25°C.

**DISSIPATION FACTOR**

Shall not exceed .1% when measured as above.

**INSULATION RESISTANCE**

When measured at +25°C and with rated voltage applied for 2 minutes, shall be a minimum 250,000 megohms/mfd; need not exceed 500,000 megohms.

**DIELECTRIC STRENGTH**

Shall withstand 200% of rated voltage for 1 minute.

**OPERATING TEMPERATURE**

-55°C to +105°C at full rated voltage.

**LIFE TEST**

250 hours, at 105°C with 140% of rated voltage applied. One failure in twelve shall be permitted.

**HUMIDITY RESISTANCE**

Meets the requirements of MIL-STD-202, Method 103B, Test Condition B. After test the I.R. will be equal to or greater than 1/3 of the initial requirement.

**LEAD PULL & BEND TEST**

Capacitors will withstand a 5 pound pull test and bend test as described in RS-164.

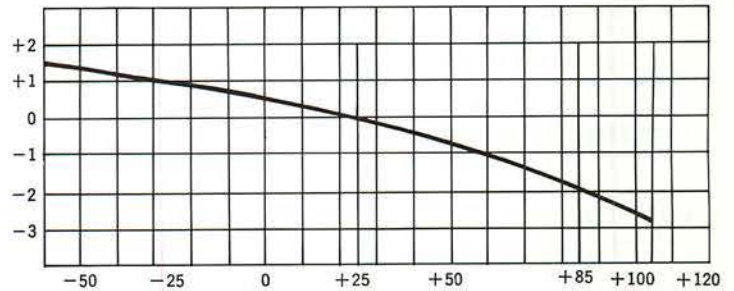
**LEAD WIRE SIZE**

AWG	DIAMETER MAX.
#22	.40 & Under
#20	.401 Thru 1.0
#18	Above 1.0

**CAPACITY TOLERANCE SUFFIX**

F	= ± 1%
P	= ± 2%
J	= ± 5%
K	= ± 10%
M	= ± 20%

**TYPICAL CAPACITANCE CHANGE  
WITH TEMPERATURE IN PERCENT**



TEMPERATURE IN DEGREES CENTIGRADE

Other capacitance values and voltage ratings available upon request.

CAPACITY MFD.	100 VDC CATALOG NO.	D MAX.	L MAX.	200 VDC CATALOG NO.	D MAX.	L MAX.	400 VDC CATALOG NO.	D MAX.	L MAX.
.001	187B102	.218	.625	187C102	.218	.625	187E102	.218	.625
.0012	187B122	.218	.625	187C122	.218	.625	187E122	.218	.625
.0015	187B152	.218	.625	187C152	.218	.625	187E152	.218	.625
.0018	187B182	.218	.625	187C182	.218	.625	187E182	.218	.625
.0022	187B222	.218	.625	187C222	.218	.625	187E222	.218	.625
.0027	187B272	.218	.625	187C272	.218	.625	187E272	.218	.625
.0033	187B332	.218	.625	187C332	.218	.625	187E332	.218	.625
.0039	187B392	.218	.625	187C392	.218	.625	187E392	.218	.625
.0047	187B472	.218	.625	187C472	.218	.625	187E472	.218	.625
.0056	187B562	.218	.625	187C562	.218	.625	187E562	.240	.625
.0068	187B682	.218	.625	187C682	.218	.625	187E682	.255	.625
.0082	187B822	.218	.625	187C822	.218	.625	187E822	.235	.687
.01	187B103	.218	.625	187C103	.232	.625	187E103	.255	.687
.012	187B123	.218	.625	187C123	.245	.625	187E123	.280	.687
.015	187B153	.235	.625	187C153	.242	.687	187E153	.310	.687
.018	187B183	.250	.625	187C183	.255	.687	187E183	.340	.687
.022	187B223	.265	.625	187C223	.265	.687	187E223	.360	.687
.027	187B273	.285	.625	187C273	.316	.687	187E273	.395	.687
.033	187B333	.320	.625	187C333	.320	.687	187E333	.370	.812
.039	187B393	.345	.625	187C393	.358	.687	187E393	.395	.812
.047	187B473	.300	.750	187C473	.330	.812	187E473	.435	.812
.056	187B563	.325	.750	187C563	.354	.812	187E563	.465	.812
.068	187B683	.345	.812	187C683	.385	.812	187E683	.450	.937
.082	187B823	.345	.812	187C823	.415	.812	187E823	.480	.937
.1	187B104	.410	.812	187C104	.415	.937	187E104	.530	.937
.12	187B124	.425	.812	187C124	.450	.937	187E124	.495	1.250
.15	187B154	.425	.937	187C154	.495	.937	187E154	.545	1.250
.18	187B184	.425	.937	187C184	.530	.937	187E184	.605	1.250
.22	187B224	.450	.937	187C224	.520	1.125	187E224	.655	1.250
.27	187B274	.460	1.125	187C274	.575	1.125	187E274	.630	1.500
.33	187B334	.490	1.125	187C334	.635	1.125	187E334	.690	1.500
.39	187B394	.490	1.250	187C394	.635	1.250	187E394	.740	1.500
.47	187B474	.540	1.250	187C474	.690	1.250	187E474	.810	1.500
.56	187B564	.585	1.250	187C564	.660	1.500	187E564	.870	1.500
.68	187B684	.635	1.250	187C684	.720	1.500	187E684	.860	1.750
.82	187B824	.685	1.250	187C824	.720	1.750	187E824	.950	1.750
1.	187B105	.760	1.250	187C105	.770	1.750	187E105	1.040	1.750

# Nytronics Components Group, Inc.

700 ORANGE STREET, DARLINGTON, S. C. 29532  
(803) 393-5421 — TWX 810-665-2182

## TYPE 192 METALLIZED POLYPROPYLENE CAPACITORS

### POLYESTER TAPE WRAP CASE/EPOXY ENDFILL

Type 192 Capacitors feature small size, excellent stability, high insulation resistance, low dissipation factor and good humidity resistance. These properties make them ideal for use in timing and integrating circuitry.

#### CAPACITANCE

Shall be within specified tolerance when measured at 1 KHz for values thru 1 MFD and at 60 Hz for values above 1 MFD.

#### DISSIPATION FACTOR

Less than .1% when measured as above at 25°C.

#### DIELECTRIC STRENGTH

1.5 X rated voltage for one minute through a limiting resistance of 100 ohms/volt.

#### INSULATION RESISTANCE

Minimum values.

Temperature	+25°C	+85°C	+105°C
Megohms			
X Microfarads	100,000	5,000	500
Need Not Exceed (Megohms)	200,000	10,000	1000

Measured After Two Minutes Electrification At Rated Voltage

#### TEMPERATURE RANGE

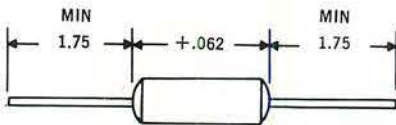
-55°C to +85°C at rated voltage to 105°C with 50% voltage derating.

#### HUMIDITY

Will meet the test requirements of MIL-STD-202, Method 103B, Test Condition B. After testing the I.R. will be equal to or greater than 1/3 of the initial requirements. One failure in 12 permitted.

#### LIFE TEST

250 hours at 85°C with 140% of rated voltage applied. A resistance of one ohm per volt shall be inserted in series with each capacitor. One failure in 12 shall be permitted.



D TOLERANCE	
.249 and Under	+ .032
.250 thru .500	+ .046
.501 thru 1.000	+ .062

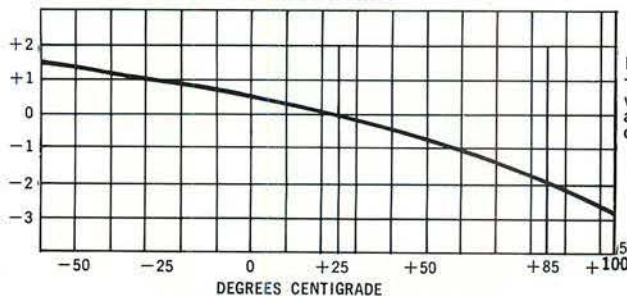
#### LEAD GAUGE

Body Length	AWG
.530 and Less	24
.650 thru 1.062	22
1.187 thru 2.00	20
Greater Than 2.00	18

#### CAPACITY TOLERANCE SUFFIX

F	= ± 1%
P	= ± 2%
J	= ± 5%
K	= ± 10%
M	= ± 20%

#### TYPICAL CAPACITANCE CHANGE WITH TEMPERATURE IN PERCENT



#### LEAD MATERIAL:

Tinned copperweld wire shall withstand mechanical test as specified in Paragraph 3.4 of EIA Standard RS-164A

CAP MFD	CAT No.	DIA.	LENGTH
<b>100 VOLTS DC WORKING</b>			
.010	192B103	.156	.400
.012	192B123	.156	.400
.015	192B153	.156	.400
.018	192B183	.172	.400
.022	192B223	.172	.400
.027	192B273	.188	.400
.033	192B333	.203	.400
.039	192B393	.203	.400
.047	192B473	.219	.400
.056	192B563	.234	.400
.068	192B683	.219	.470
.082	192B823	.234	.470
.10	192B104	.250	.470
.12	192B124	.266	.470
.15	192B154	.250	.530
.18	192B184	.266	.530
.22	192B224	.297	.530
.27	192B274	.328	.530
.33	192B334	.297	.650
.39	192B394	.312	.650
.47	192B474	.344	.650
.56	192B564	.375	.650
.68	192B684	.359	.780
.82	192B824	.391	.780
1.0	192B105	.422	.780
1.2	192B125	.415	.900
1.5	192B155	.453	.900
2.0	192B205	.516	.900
3.0	192B305	.531	1.187
4.0	192B405	.609	1.187
5.0	192B505	.672	1.187
6.0	192B605	.670	1.500
8.0	192B805	.750	1.500
10.0	192B106	.828	1.500
12.0	192B126	.828	1.750
15.0	192B156	.922	1.750

CAP MFD	CAT No.	DIA.	LENGTH
<b>200 VOLTS DC WORKING</b>			
.010	192C103	.160	.400
.012	192C123	.170	.400
.015	192C153	.190	.400
.018	192C183	.165	.470
.022	192C223	.180	.470
.027	192C273	.195	.470
.033	192C333	.210	.470
.039	192C393	.195	.530
.047	192C473	.215	.530
.056	192C563	.230	.530
.068	192C683	.250	.530
.082	192C823	.225	.650
.10	192C104	.245	.650
.12	192C124	.265	.650
.15	192C154	.295	.650
.18	192C184	.285	.780
.22	192C224	.310	.780
.27	192C274	.340	.780
.33	192C334	.370	.780
.39	192C394	.360	.900
.47	192C474	.395	.900
.56	192C564	.425	.900
.68	192C684	.465	.900
.82	192C824	.440	1.187
1.0	192C105	.480	1.187
1.2	192C125	.525	1.187
1.5	192C155	.580	1.187
2.0	192C205	.670	1.187
3.0	192C305	.720	1.500
4.0	192C405	.825	1.500
5.0	192C505	.830	1.750
6.0	192C605	1.000	1.750
8.0	192C805	.960	2.000
10.0	192C106	1.070	2.000

#### 400 VOLTS DC WORKING

CAP MFD	CAT No.	DIA.	LENGTH
.010	192E103	.205	.400
.012	192E123	.220	.400
.015	192E153	.195	.470
.018	192E183	.210	.470
.022	192E223	.230	.470
.027	192E273	.220	.530
.033	192E333	.240	.530
.039	192E393	.255	.530
.047	192E473	.230	.650
.056	192E563	.245	.650
.068	192E683	.270	.650
.082	192E823	.290	.650
.10	192E104	.285	.780
.12	192E124	.305	.780
.15	192E154	.340	.780
.18	192E184	.370	.780
.22	192E224	.365	.900
.27	192E274	.400	.900
.33	192E334	.440	.900
.39	192E394	.475	.900
.47	192E474	.440	1.187
.56	192E564	.475	1.187
.68	192E684	.525	1.187
.82	192E824	.570	1.187
1.0	192E105	.560	1.500
1.2	192E125	.610	1.500
1.5	192E155	.680	1.500
2.0	192E205	.710	1.750
3.0	192E305	.860	1.750
4.0	192E405	.860	2.250
5.0	192E505	.950	2.250

# TYPE 191 METALLIZED POLYPROPYLENE CAPACITORS

## FOR SWITCHED-MODE POWER SUPPLIES

### PERFORMANCE FEATURES:

- Operating temperature range -55°C to +105°C
- Flame retardant wrap/fill
- Rated for usage 20 to 100 kHz
- High current capability
- Very low ESR

### CAPACITANCE

Shall be within specified tolerance when measured at 1 kHz/25°C.

### DISSIPATION FACTOR

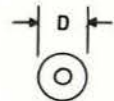
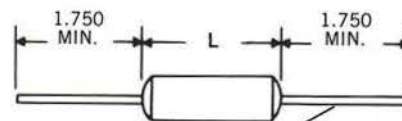
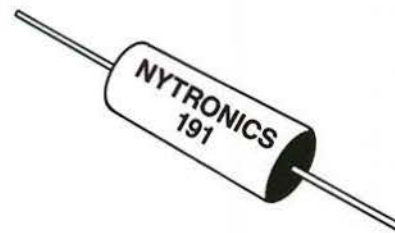
Shall be less than .1% when measured as above.

### INSULATION RESISTANCE

Shall be greater than 200,000 megohm-microfarads but need not exceed 400,000 megohms at 25°C.

### DIELECTRIC STRENGTH

Shall withstand two times rated voltage for two minutes without permanent breakdown.



TINNED SOLID COPPER WIRE

### \*CAPACITANCE TOLERANCE SUFFIX

J = ±5%  
K = ±10%  
M = ±20%

Type 191 capacitors are especially designed for input filter, D.C. blocking and output filter applications in high frequency switched-mode power supplies.

CAPACITANCE MFD	TYPE 191	D +.062	L +.062	LEAD AWG	ESR LIMIT mΩ @ 100 kHz	I MAX 25°C	I MAX 85°C
100VDC						AMPS	RMS
1.0	B105__*	.469	.750	20	15	8.5	4.2
2.0	B205__	.550	.937	20	12	10.0	5.0
3.0	B305__	.660	.937	18	11	11.0	6.0
5.0	B505__	.670	1.250	18	10	12.0	6.5
200VDC							
1.0	C105__	.450	1.250	20	17	9.0	4.6
2.0	C205__	.637	1.250	18	15	11.0	5.5
3.0	C305__	.700	1.500	18	13	12.0	6.5
400VDC							
1.0	E105__	.670	1.500	18	19	9.0	5.5

All dimensions in inches.

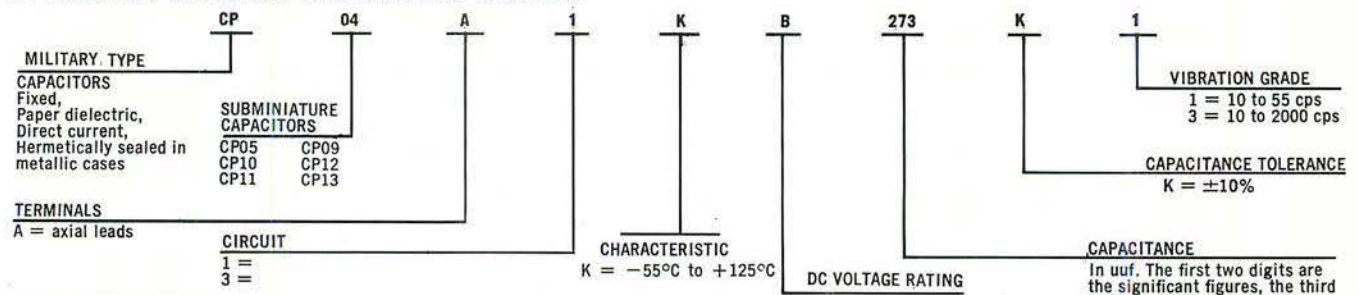
HERMETICALLY SEALED CAPACITORS CP04 THRU CP09 TO MIL-C-25

μF	WVDC	CP04A1 — CP05A1 (Uninsulated) — (Insulated)	
		Char. K -55°C to +125°C	Size* D. x L.
.001	600	CP04A1KF102K3	.235 x 3/4
.0015	600	CP04A1KF152K3	.235 x 3/4
.0022	600	CP04A1KF222K3	.235 x 3/4
.0033	600	CP04A1KF332K3	.235 x 3/4
.0047	600	CP04A1KF472K3	.235 x 3/4
.0068	600	CP04A1KF682K3	.235 x 3/4
.01	400 600	CP04A1KE103K3 CP04A1KF103K3	.235 x 3/4 .312 x 7/8
.015	200 600	CP04A1KC153K3 CP04A1KF153K3	.235 x 3/4 .312 x 7/8
.022	200 600	CP04A1KF223K3 CP04A1KF223K3	.235 x 3/4 .312 x 7/8
.033	100 400 600	CP04A1KB333K3 CP04A1KE333K3 CP04A1KF333K3	.235 x 3/4 .312 x 7/8 .400 x 7/8
.047	200 400 600	CP04A1KC473K3 CP04A1KE473K3 CP04A1KF473K3	.312 x 7/8 .400 x 7/8 .400 x 1 1/8
.068	200 400 600	CP04A1KC683K3 CP04A1KE683K3 CP04A1KF683K3	.312 x 7/8 .400 x 1 1/8 .400 x 1 1/8
.1	100 200 400 600	CP04A1KB104K3 CP04A1KC104K3 CP04A1KE104K3 CP04A1KF104K3	.312 x 7/8 .400 x 7/8 .400 x 1 1/8 .562 x 1 1/8
.15	100 200 400 600	CP04A1KB154K3 CP04A1KC154K3 CP04A1KE154K3 CP04A1KF154K3	.400 x 7/8 .400 x 1 1/8 .562 x 1 1/8 .562 x 1 1/8
.22	100 200 400 600	CP04A1KB224K3 CP04A1KC224K3 CP04A1KE224K3 CP04A1KF224K3	.400 x 1 1/8 .400 x 1 1/8 .562 x 1 1/8 .562 x 1 1/8
.33	100 200 400 600	CP04A1KB334K3 CP04A1KC334K3 CP04A1KE334K3 CP04A1KF334K3	.400 x 1 1/8 .562 x 1 1/8 .562 x 1 1/8 .670 x 1 7/8
.47	100 200 400 600	CP04A1KB474K3 CP04A1KC474K3 CP04A1KE474K3 CP04A1KF474K3	.562 x 1 1/8 .562 x 1 1/8 .670 x 1 7/8 .750 x 2 1/8
.68	100 200 400 600	CP04A1KB684K3 CP04A1KC684K3 CP04A1KE684K3 CP04A1KF684K3	.562 x 1 1/8 .562 x 1 1/8 .750 x 2 1/8 1.0 x 1 7/8
1.0	100 200 400	CP04A1KB105K3 CP04A1KC105K3 CP04A1KE105K3	.562 x 1 1/8 .670 x 1 7/8 1.0 x 1 7/8

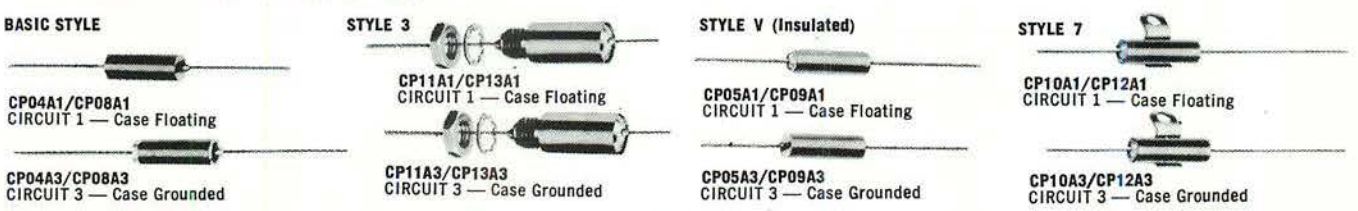
μF	WVDC	CP08A1 — CP09A1 (Uninsulated) — (Insulated)	
		Char. K -55°C to +125°C	Size* D. x L.
.001	600	CP08A1KF102K3	.235 x 3/4
.0015	600	CP08A1KF152K3	.235 x 3/4
.0022	600	CP08A1KF222K3	.235 x 3/4
.0033	400 600	CP08A1KE332K3 CP08A1KF332K3	.235 x 3/4 .312 x 7/8
.0047	200 600	CP08A1KC472K3 CP08A1KF472K3	.235 x 3/4 .312 x 7/8
.0068	200 600	CP08A1KC682K3 CP08A1KF682K3	.235 x 3/4 .312 x 7/8
.01	100 600	CP08A1KB103K3 CP08A1KF103K3	.235 x 3/4 .312 x 7/8
.015	100 400 600	CP08A1KB153K3 CP08A1KE153K3 CP08A1KF153K3	.235 x 3/4 .312 x 7/8 .400 x 7/8
.022	200 600	CP08A1KC223K3 CP08A1KF223K3	.312 x 7/8 .400 x 7/8
.033	200 400 600	CP08A1KC333K3 CP08A1KE333K3 CP08A1KF333K3	.312 x 7/8 .400 x 7/8 .400 x 1 1/8
.047	100 200 400 600	CP08A1KB473K3 CP08A1KC473K3 CP08A1KE473K3 CP08A1KF473K3	.312 x 7/8 .400 x 7/8 .400 x 1 1/8 .400 x 1 1/8
.068	200 400 600	CP08A1KC683K3 CP08A1KE683K3 CP08A1KF683K3	.400 x 7/8 .400 x 1 1/8 .562 x 1 1/8
.1	100 200 400 600	CP08A1KB104K3 CP08A1KC104K3 CP08A1KE104K3 CP08A1KF104K3	.400 x 7/8 .400 x 1 1/8 .562 x 1 1/8 .562 x 1 1/8
.15	100 200 400 600	CP08A1KB154K3 CP08A1KC154K3 CP08A1KE154K3 CP08A1KF154K3	.400 x 1 1/8 .400 x 1 1/8 .562 x 1 1/8 .562 x 1 1/8
.22	100 200 400 600	CP08A1KB224K3 CP08A1KC224K3 CP08A1KE224K3 CP08A1KF224K3	.400 x 1 1/8 .562 x 1 1/8 .562 x 1 1/8 .670 x 1 5/8
.33	100 200 400 600	CP08A1KB334K3 CP08A1KC334K3 CP08A1KE334K3 CP08A1KF334K3	.562 x 1 1/8 .562 x 1 1/8 .670 x 1 5/8 .750 x 2 1/8
.47	100 200 400 600	CP08A1KB474K3 CP08A1KC474K3 CP08A1KE474K3 CP08A1KF474K3	.562 x 1 1/8 .562 x 1 1/8 .670 x 1 5/8 .750 x 2 1/8
.68	100 200 400 600	CP08A1KB684K3 CP08A1KC684K3 CP08A1KE684K3 CP08A1KF684K3	.562 x 1 1/8 .562 x 1 1/8 .670 x 1 5/8 .750 x 2 1/8
1.0	100 200 400	CP08A1KB105K3 CP08A1KC105K3 CP08A1KE105K3	.562 x 1 1/8 .670 x 1 5/8 .750 x 2 1/8

NOTE: The capacitors listed in this table have a capacitance tolerance of ±10%.  
\* For case grounded reduce L dimension by 1/16". Above listing are ratings listed in Mil-C-25C. Other values are available in Nytronics Commercial Equivalents.  
\*\* For CP05 and CP09 add .0625 to Diameter and 1/8" to Length.

NYTRONICS CATALOG NUMBERING SYSTEM



**RATED VOLTAGE DESIGNATIONS**  
(DC working at 40°C, except for characteristic K which is 85°C)  
B = 100 C = 200 E = 400 F = 600 G = 1000



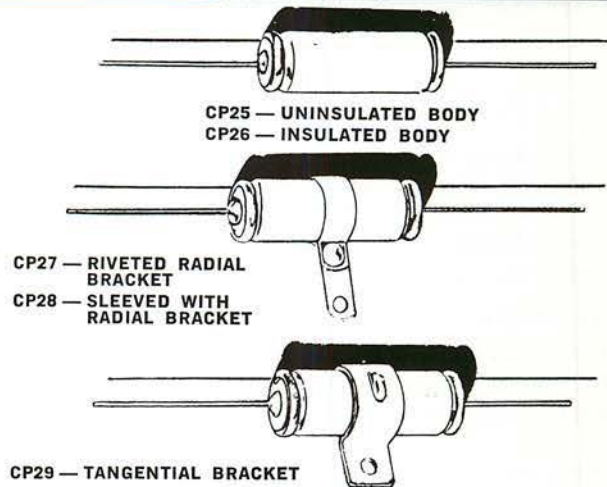


### MIL-C-25 (LATEST REVISION) CP25 TO CP29

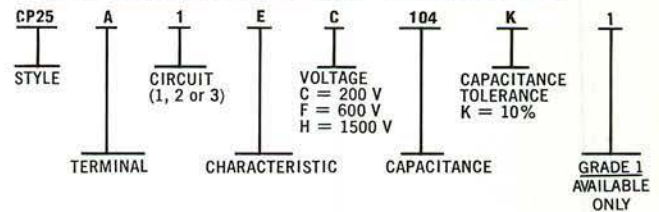
Available in capacitances from .003 thru 0.1 mf and voltages of 1500 VDC.

Type Designation <sup>1</sup>	Rated Voltage	Capacitance $\mu$ f
CP2-A-EC104-	200	.1
CP2-A-EC254-	200	.25
CP2-A-EC504-	200	.5
CP2-A-EF302-	600	.003
CP2-A-EF602-	600	.006
CP2-A-EF103-	600	.01
CP2-A-EF203-	600	.02
CP2-A-EF503-	600	.05
CP2-A-EF104-	600	.1
CP2-A-EF254-	600	.25
CP2-A-EF504-	600	.5
CP2-A-EG302-	1,000	.003
CP2-A-EG602-	1,000	.006
CP2-A-EG103-	1,000	.01
CP2-A-EG203-	1,000	.02
CP2-A-EG503-	1,000	.05
CP2-A-EG104-	1,000	.1
CP2-A-EG254-	1,000	.25
CP2-A-EH302-	1,500	.003
CP2-A-EH602-	1,500	.006
CP2-A-EH103-	1,500	.01
CP2-A-EH203-	1,500	.02
CP2-A-EH503-	1,500	.05
CP2-A-EH104-	1,500	.1

<sup>1</sup> Complete type designation will include additional symbols to complete style designation and to indicate circuit and capacitance tolerance.



#### TYPE - DESIGNATION EXAMPLE (CP25A1EC104K)

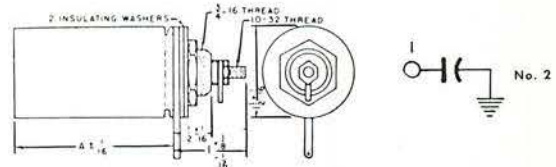
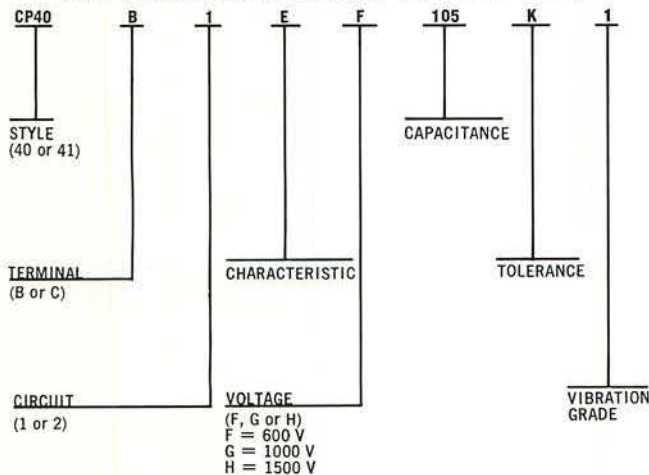


### CP40, CP41 (TYPES PCM, PCIM)

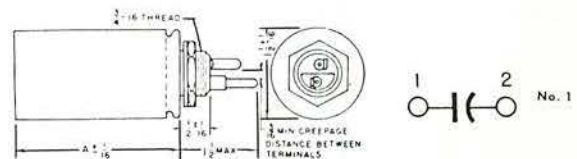
Available in capacitances from .25 mf thru 4.0 mf and voltages of 600 VDC thru 1500 VDC.

Type Designation 1/	DC Voltage Rating (see fig. 2) Volts	Capacitance $\mu$ f
CP4 ---- F105K1	600	1
CP4 ---- F205K1	600	2
CP4 ---- F405K1	600	4
CP4 ---- G105K1	1,000	1
CP4 ---- G205K1	1,000	2
CP4 ---- H254K1	1,500 3/	0.25
CP4 ---- H504K1	1,500	0.5
CP4 ---- H105K1	1,500	1

#### TYPE - DESIGNATION EXAMPLE (CP40B1EF105K)



CIRCUIT DIAGRAM — CP40  
Available with (C) or (B) Terminals



CIRCUIT DIAGRAM — CP41  
Available only with (B) Terminal

**CAPACITORS MIL TYPE CP53, CP54, CP55**

Section assembled in hermetically sealed tin-coated drawn-shell container. Mineral-oil impregnated and filled. Lug-type terminal seals. Meets requirements of MIL-C-25.

**Temperature Rating:** -55°C to +85°C.

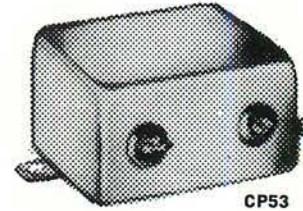
**Standard Tolerance:** -10% to +20%.

**PDM VARIATIONS**

MIL Type CP53, with terminals on side.

PDMT (CP54) With terminals on top.

PDMB (CP55) With terminals on the bottom.



**CP53** — Side Terminals

**CP54** — Top Terminals

**CP55** — Bottom Terminals

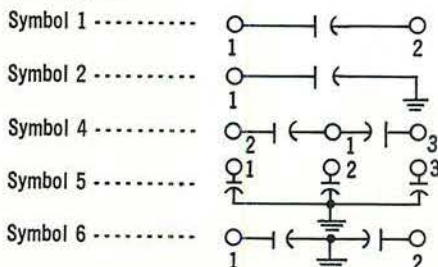
Type Designation	DC Voltage Rating Volts	Capacitance $\mu$ f
CP5-B - B105K1	100	1
CP5-B-EB205K1	100	2
CP5-B - B405K1	100	4
CP5-B-FC504K1	200	0.5
CP5-B-EC105K1	200	1
CP5-B-EC205K1	200	2
CP5-B-EF254K1	600	0.25
CP5-B - F504K1	600	0.5
CP5-B - F105K1	600	1
CP5-B-EF205K1	600	2
CP5-B-EG503K1	1,000	0.05
CP5-B-EG104K1	1,000	0.1
CP5-B - G254K1	1,000	0.25
CP5-B-EG504K1	1,000	0.5
CP5-B-EG105K1	1,000	1
CP5-B-EF503V1	600	0.05-0.05
CP5-B-EF104V1	600	0.1 -0.1
CP5-B - F254V1	600	0.25-0.25
CP5-B - F504V1	600	0.5 -0.5
CP5-B-EF105V1	600	1 -1
CP5-B-EG503V1	1,000	0.05-0.05
CP5-B - G104V1	1,000	0.1 -0.1
CP5-B-EG254V1	1,000	0.25-0.25
CP5-B-EG504V1	1,000	0.5 -0.5
CP5-B5-E504V1	400	0.5 -0.5 -0.5
CP5-B5-F104V1	600	0.1 -0.1 -0.1
CP5-B5EF254V1	600	0.25-0.25-0.25
CP5-B5EF504V1	600	0.5 -0.5 -0.5
CP5-B5EG503V1	1,000	0.05-0.05-0.05
CP5-B5EG104V1	1,000	0.1 -0.1 -0.1
CP5-B5EG254V1	1,000	0.25-0.25-0.25

**Vibration grade:** 1 (10 to 55 Hz, incl.)

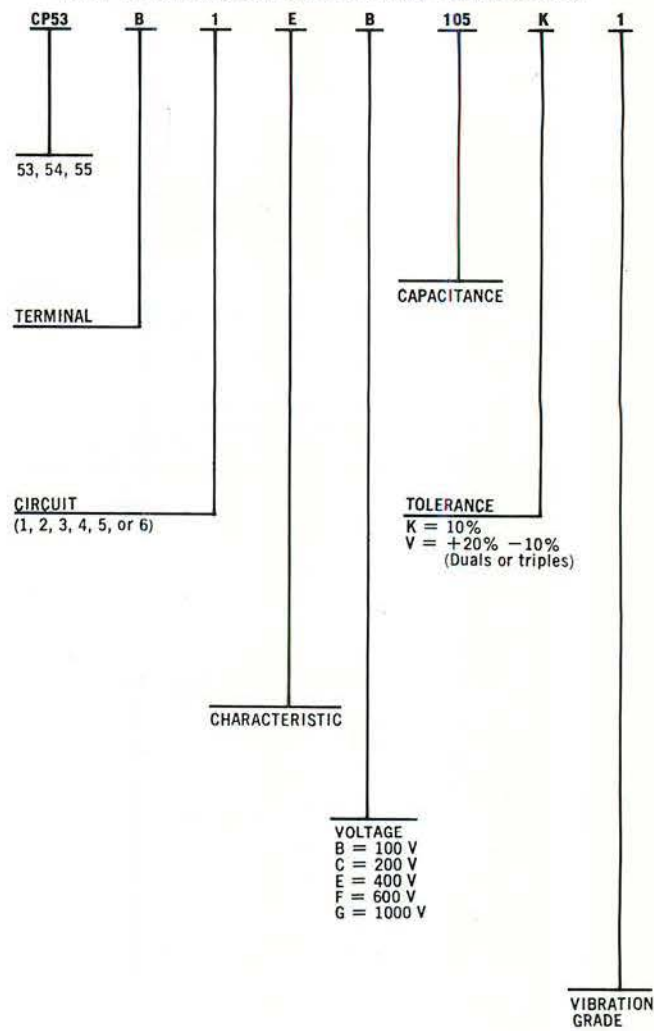
**Terminal:**

Symbol B ----- Solder lug (nonremovable).

**Circuit diagram:**

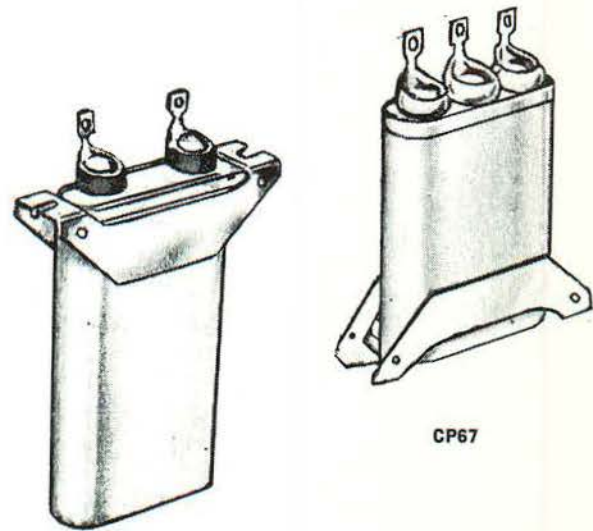


**TYPE - DESIGNATION EXAMPLE (CP53B1EB105K)**



### CAPACITORS MIL TYPE CP67, CP69

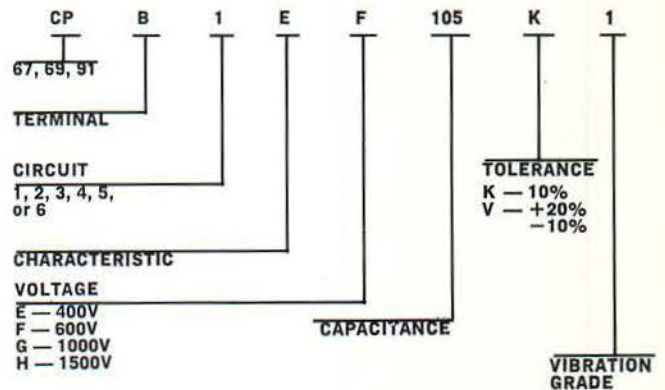
Type Designation	DC Voltage Rating Volts	Capacitance $\mu\text{f}$
CP6-B-EF503K1	600	0.05
CP6-B-EF104K1	600	0.1
CP6-B-EF254K1	600	0.25
CP6-B-EF504K1	600	0.5
CP6-B-F105K1	600	1
CP6-B-EG103K1	1,000	0.01
CP6-B-EG203K1	1,000	0.02
CP6-B-EG503K1	1,000	0.05
CP6-B-G104K1	1,000	0.1
CP6-B-EG254K1	1,000	0.25
CP6-B-G504K1	1,000	0.5
CP6-B-EF503V1	600	0.05-0.05
CP6-B-EF104V1	600	0.1 -0.1
CP6-B-EF254V1	600	0.25-0.25
CP6-B-F504K1	600	0.5 -0.5
CP6-B-EG103V1	1,000	0.01-0.01
CP6-B-EG203V1	1,000	0.02-0.02
CP6-B-G503V1	1,000	0.05-0.05
CP6-B-G104V1	1,000	0.1 -0.1
CP6-B-G254V1	1,000	0.25-0.25
CP6-B-5-F503V1	600	0.05-0.05-0.05
CP6-B5EFP04V1	600	0.1 -0.1 -0.1
CP6-B5-F254V1	600	0.25-0.25-0.25
CP6-B5EG103V1	1,000	0.01-0.01-0.01
CP6-B5EG203V1	1,000	0.02-0.02-0.02
CP6-B5EG503V1	1,000	0.05-0.05-0.05
CP6-B5EG104V1	1,000	0.1 -0.1 -0.1



CP69

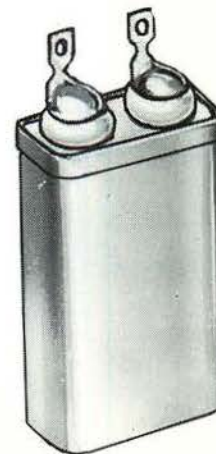
CP67

#### TYPE DESIGNATION EXAMPLE



### CAPACITORS MIL TYPE CP91 SERIES

Type Designation	DC Voltage Rating Volts	Capacitance $\mu\text{f}$	Capacitance Tolerance
CP91B-E105K1	400	1	K
CP91B-EF503K1	600	0.05	K
CP91B-EF254K1	600	0.25	K
CP91B-EF504K1	600	0.5	K
CP91B-F105K1	600	1	K
CP91B-EG103K1	1,000	0.01	K
CP91B-EG203K1	1,000	0.02	K
CP91B-EG503K1	1,000	0.05	K
CP91B-EG104K1	1,000	0.1	K
CP91B-EG254K1	1,000	0.25	K
CP91B-G504K1	1,000	0.5	K
CP91B6EE503V1	400	0.05-0.05	V
CP91B6EE104V1	400	0.1 -0.1	V
CP91B6EE504V1	400	0.5 -0.5	V
CP91B6EF503V1	600	0.05-0.05	V
CP91B6-F104V1	600	0.1 -0.1	V
CP91B6EF254V1	600	0.25-0.25	V
CP91B6-F504V1	600	0.5 -0.5	V
CP91B6EG103V1	1,000	0.01-0.01	V
CP91B6EG203V1	1,000	0.02-0.02	V
CP91B6EG503V1	1,000	0.05-0.05	V
CP91B6-G104V1	1,000	0.1 -0.1	V
CP91B6-G254V1	1,000	0.25-0.25	V
CP91B6EH103V1	1,500	0.01-0.01	V
CP91B6EH503V1	1,500	0.05-0.05	V



CP91

NOTE: AVAILABLE WITH SPADE-LUG  
OR FOOTED BRACKET

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	WESTLAKE	JACO	805-495-9988		DAYTON (MIL.)	C.V. CLARK CO.	513-435-3000
CO	DENVER	BELL IND.	303-424-1985	OR	PORTLAND	BELL IND.	503-635-6500
	ENGLEWOOD	INDELCO	303-694-9444	PA	LANSDALE	PYTRONIC IND.	215-855-0925
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