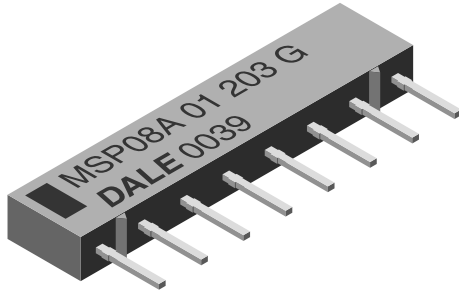


## Thick Film Resistor Networks

### Single-In-Line, Molded SIP; 01, 03, 05 Schematics

### 6, 8, 9 or 10 Pin "A" Profile and 6, 8 or 10 Pin "C" Profile

**FEATURES**

- 0.195" [4.95mm] "A" or 0.350" [8.89mm] "C" maximum seated height
- Highly stable thick film
- Low temperature coefficient (-55°C to +125°C) ± 100ppm/°C
- Rugged, molded case construction
- Reduces total assembly costs
- Compatible with automatic insertion equipment and reduces PC board space
- Wide resistance range
- Available in tube pack or side-by-side pack

**STANDARD ELECTRICAL SPECIFICATIONS**

MODEL/ SCHEMATIC	PROFILE	RESISTOR POWER RATING Max. @ 70°C* W	RESISTANCE RANGE Ω	STANDARD TOLERANCE %	TEMPERATURE COEFFICIENT (-55°C to +125°C) ppm/°C	TCR TRACKING* (-55°C to +125°C) ppm/°C	OPERATING VOLTAGE Max. VDC
MSP01	A C	0.20 0.25	10 - 2.2M	± 2 Standard (1, 5)**	± 100	± 50ppm/°C	100
MSP03	A C	0.30 0.40	10 - 2.2M	± 2 Standard (1, 5)**	± 100	± 50ppm/°C	100
MSP05	A C	0.20 0.25	10 - 2.2M	± 2 Standard (± 5%)**	± 100	± 150ppm/°C	100

\* Tighter tracking available

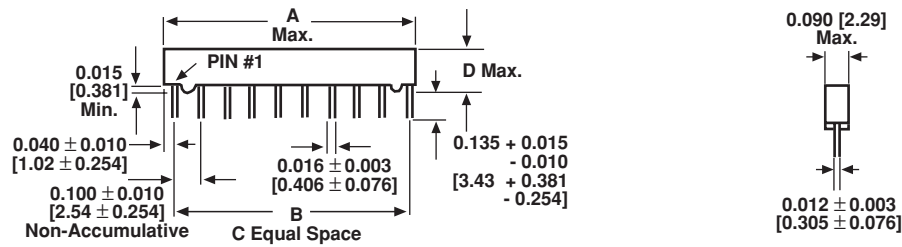
\*\* Tolerances in brackets available on request

**TECHNICAL SPECIFICATIONS**

PARAMETER	UNIT	MSP SERIES
Package Power Rating (Maximum at +25°C and +70°C)		See Derating Curves
Voltage Coefficient of Resistance	V <sub>eff</sub>	< 50ppm typical
Dielectric Strength	VAC	200
Isolation Resistance (03 Schematic)	Ω	> 100M
Operating Temperature Range	°C	-55 to +125
Storage Temperature Range	°C	-55 to +150

**MECHANICAL SPECIFICATIONS**

Marking Resistance to Solvents:	Permanency testing per MIL-STD-202, Method 215.	
Solderability:	Per MIL-STD-202, Method 208E, RMA flux.	
Body:	Molded epoxy.	
Terminals:	Copper alloy, tin-lead plated.	
Weight:	MSP06A = 0.4 gram MSP08A = 0.5 gram MSP09A = .55 gram MSP10A = 0.6 gram	MSP06C = 0.7 gram MSP08C = 0.9 gram MSP10C = 1.1 gram

**DIMENSIONS** in inches [millimeters]


MODEL	A (Max.)	B	C	D (Max.)
MSP06	0.590 [14.99]	0.500 [12.70]	5	MSPxxA = 0.195 [4.95] MSPxxC = 0.350 [8.89]
MSP08	0.790 [20.07]	0.700 [17.78]	7	
MSP10	0.990 [25.15]	0.900 [22.86]	9	
MSP09	0.890 [22.61]	0.800 [20.32]	8	0.195 [4.95] ONLY

**ORDERING INFORMATION**
**01 Schematic**

MSP MODEL	08 NUMBER OF PINS	A PACKAGE CODE	01 SCHEMATIC	101 RESISTANCE VALUE	G TOLERANCE
		A = 0.195" [4.95mm] Height 0.100" [2.54mm] Lead Spacing C = 0.350" [8.89mm] Height 0.100" [2.54mm] Lead Spacing		First 2 digits (3 for "F" tolerance) are significant figures. Last digit specifies number of zeros to follow.	F = ± 1% G = ± 2% J = ± 5%

**03 Schematic**

MSP MODEL	06 NUMBER OF PINS	A PACKAGE CODE	03 SCHEMATIC	102 RESISTANCE VALUE	G TOLERANCE
		A = 0.195" [4.95mm] Height 0.100" [2.54mm] Lead Spacing C = 0.350" [8.89mm] Height 0.100" [2.54mm] Lead Spacing		First 2 digits (3 for "F" tolerance) are significant figures. Last digit specifies number of zeros to follow.	F = ± 1% G = ± 2% J = ± 5%

**05 Schematic**

MSP MODEL	06 NUMBER OF PINS	A PACKAGE CODE	05 SCHEMATIC	221 RESISTANCE VALUE R1	331 RESISTANCE VALUE R2	G TOLERANCE
		A = 0.195" [4.95mm] Height 0.100" [2.54mm] Lead Spacing C = 0.350" [8.89mm] Height 0.100" [2.54mm] Lead Spacing		First two digits are significant figures. Last digit specifies the number of zeros to follow.		G = ± 2% J = ± 5%

**EXAMPLE:**

MSP08A-01-101G = A molded single-in-line thick film resistor network with 8 pins on 0.100" [2.54mm] centers, 0.195" [4.95mm] maximum seated height, 01 Schematic, resistance value of 100 ohm and a tolerance of ± 2%.

**EXAMPLE:**

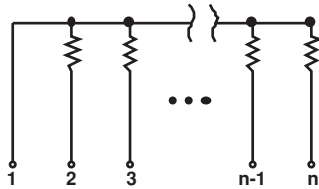
MSP06A-03-102G = A molded single-in-line thick film resistor network with 6 pins on 0.100" [2.54mm] centers, 0.195" [4.95mm] maximum seated height, 03 Schematic, resistance value of 1000 ohm and a tolerance of ± 2%.

**EXAMPLE:**

MSP06A-05-221/331G = A molded single-in-line thick film resistor network with 6 pins on 0.100" [2.54mm] centers, 0.195" [4.95mm] maximum seated height, 05 Schematic with resistances of R1 = 220 ohm and R2 = 330 ohm and a tolerance ± 2%.

**CIRCUIT APPLICATIONS**

**01 Schematic**



5, 7, 8\* or 9 resistors with one pin common

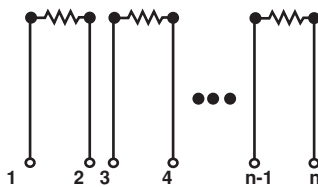
The MSPxxx-01 circuit contains 5, 7, 8\* or 9 nominally equal resistors, each connected between a common pin (Pin No. 1) and a discrete PC board pin. Commonly used in the following applications:

- "Wired OR" Pull-up
- Power Gate Pull-up
- TTL Input Pull-down
- MOS/ROM Pull-up/Pull-down
- Open Collector Pull-up
- TTL Unused Gate Pull-up

\* Available in "A" Profile only

Standard E-24 resistance values stocked. Consult factory.

**03 Schematic**

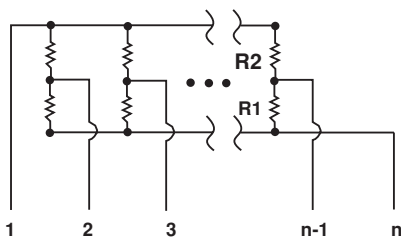


3, 4 or 5 isolated resistors

The MSPxxx-03 circuit contains 3, 4 or 5 resistors of nominally equal value in a compact package. Each resistor is connected to two discrete PC pins.

Standard E-24 resistance values stocked. Consult factory.

**05 Schematic**



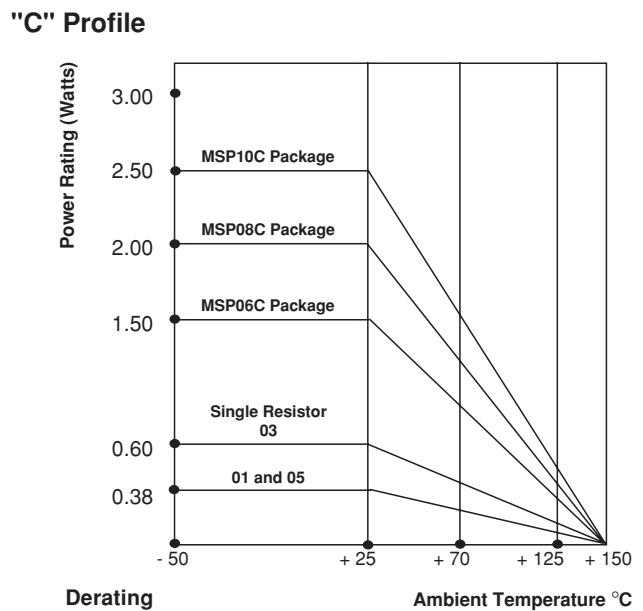
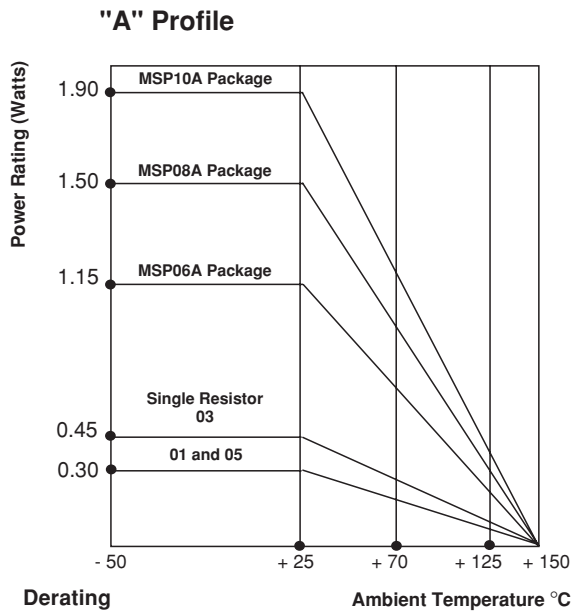
Pulse squaring and TTL dual-line terminators

The MSPxxx-05 circuits contain 4, 6, 7\* or 8 series pair of resistors. Each series pair is connected between two common lines. The junction of these resistor pairs is connected to the input terminals.

The 05 circuits are designed for TTL dual-line termination and pulse squaring.

\* Available in "A" Profile only

Many dual terminator resistance values stocked. Consult factory.



<b>"A" PROFILE + 70°C PACKAGE RATINGS</b>	
MSP10A	1.25 watts
MSP09A	1.12 watts
MSP08A	1.00 watts
MSP06A	0.75 watts

<b>"C" PROFILE + 70°C PACKAGE RATINGS</b>	
MSP10C	1.60 watts
MSP08C	1.30 watts
MSP06C	1.00 watts

Higher power ratings available. Contact factory.

<b>PERFORMANCE</b>		
TEST	CONDITIONS	MAX. ΔR (Typical Test Lots)
Power Conditioning	1.5 x rated power, applied 1.5 hours "ON" and 0.5 hour "OFF" for 100 hours ± 4 hours at + 25°C ambient temperature	± 0.50% ΔR
Thermal Shock	5 cycles between - 65°C and + 125°C	± 0.50% ΔR
Short Time Overload	2.5 x rated working voltage 5 seconds	± 0.25% ΔR
Low Temperature Operation	45 minutes at full rated working voltage at - 65°C	± 0.25% ΔR
Moisture Resistance	240 hours with humidity ranging from 80% RH to 98% RH	± 0.50% ΔR
Resistance to Soldering Heat	Leads immersed in + 260°C solder to within 1/16" of device body for 10 seconds	± 0.25% ΔR
Shock	Total of 18 shocks at 100 G's	± 0.25% ΔR
Vibration	12 hours at maximum of 20 G's between 10 and 2,000 Hz	± 0.25% ΔR
Load Life	1000 hours at + 70°C, rated power applied 1.5 hours "ON", 0.5 hour "OFF" for full 1,000 hour period. Derated according to the curve.	± 1.00% ΔR
Terminal Strength	4.5 pound pull for 30 seconds	± 0.25% ΔR
Insulation Resistance	10,000 Megohm (minimum)	—
Dielectric Withstanding Voltage		—