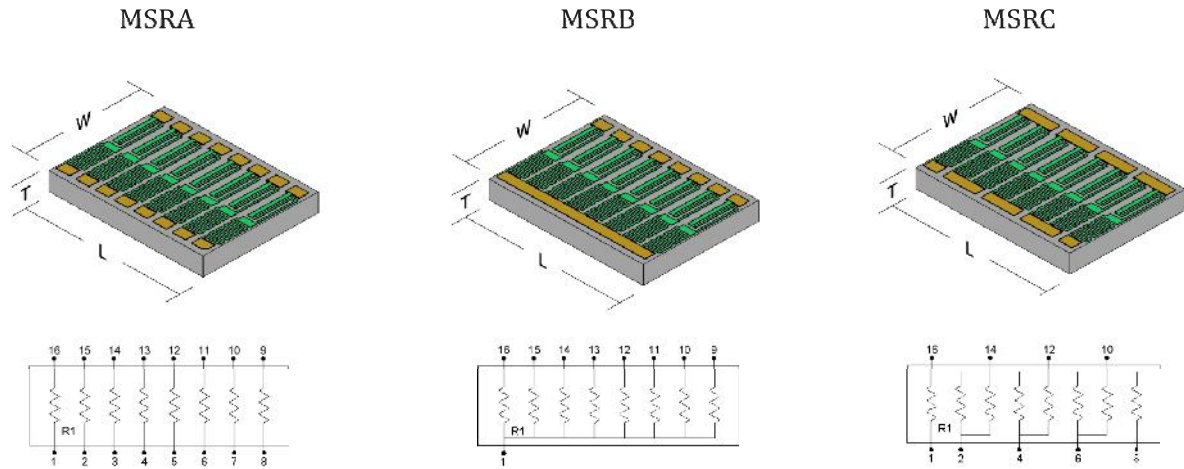


THIN FILM RESISTOR ARRAYS



Mini-Systems, Inc. **Resistor Arrays** are ideal for the hybrid designer seeking a SIP or DIP configuration in chip form. This series has three configurations, MSRA - **isolated**, MSRB - **common bussed**, and MSRC - **series array**. Arrays are offered in 3 to 12 resistor combinations. All resistors are the same value and tolerance. They feature excellent resistance ratio tracking, **low T.C.R.**, and **T.C. tracking**, and are of optimum use when space is a premium. Custom configurations available upon request.

DIMENSIONS

# Resistors	Dimensions									
	3	4	5	6	7	8	9	10	11	12
L ($\pm 0.003"$) ($\pm 0.076\text{mm}$)	0.040" [1.016]	0.050" [1.270]	0.060" [1.524]	0.070" [1.778]	0.080" [2.032]	0.090" [2.286]	0.100" [2.54]	0.110" [2.794]	0.120" [3.048]	0.130" [3.302]
W ($\pm 0.003"$) ($\pm 0.076\text{mm}$)	0.060" [1.524]	0.060" [1.524]	0.060" [1.524]	0.060" [1.524]	0.060" [1.524]	0.060" [1.524]	0.060" [1.524]	0.060" [1.524]	0.060" [1.524]	0.060" [1.524]
T ($\pm 0.002"$) ($\pm 0.051\text{mm}$)	0.010" [0.254]	0.010" [0.254]	0.010" [0.254]	0.010" [0.254]	0.010" [0.254]	0.010" [0.254]	0.010" [0.254]	0.010" [0.254]	0.010" [0.254]	0.010" [0.254]

PART NUMBER DESIGNATION

MSRA	8	S	N	10001	F	RA	AE
STYLE	# Res	SUBSTRATE	RESISTOR FILM	OHMIC VALUE	TOLERANCE	RATIO	OPTION
MSRA	3-12	A = Alumina	T = Tantalum	5-Digit Number: 1st 4 digits are significant with "R" as decimal point when required. 5th digit represents number of zeros.	S = $\pm 0.01\%$	RA = $\pm 0.01\%$	D = $\pm 5\text{ppm}/^\circ\text{C}$
MSRB		S = Silicon	Nitride		Q = $\pm 0.05\%$	RB = $\pm 0.05\%$	C = $\pm 10\text{ppm}/^\circ\text{C}$
MSRC			N = NiChrome		B = $\pm 0.1\%$	RC = $\pm 0.10\%$	B = $\pm 25\text{ppm}/^\circ\text{C}$
					D = $\pm 0.5\%$	RE = $\pm 0.25\%$	A = $\pm 50\text{ppm}/^\circ\text{C}$
					F = $\pm 1\%$	RD = $\pm 0.50\%$	F = $\pm 100\text{ppm}/^\circ\text{C}$
					G = $\pm 2\%$	RF = $\pm 1\%$	E = Aluminum Pads
					J = $\pm 5\%$	RN = No Ratio	G = Gold Bond Pads
					K = $\pm 10\%$		GB = Gold Back

EXAMPLE: MSRA-8-SN-10001F-RA-AE
 MSRA Style - 8 Resistors, Silicon, NiChrome Resistor Element 10k Ω each resistor,
 $\pm 1\%$ Tol., $\pm 0.01\%$ Ratio, Aluminum Bond Pads



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THIN FILM RESISTOR ARRAYS

GENERAL CHARACTERISTICS

Resistance Range	5Ω to 1MΩ
Resistance Tolerance	±0.01% to ±10%
Ratio Tolerance	Available to ±0.01%
Termination Material	Gold (Standard) Aluminum (Optional)
Termination Size	0.0035" Square Min. - Value Dependent
Backing Material	Bare Substrate (Standard) Gold (Optional)
Operating Temperature	-55°C to +150°C
Storage Temperature	-65°C to +150°C
Insulation Resistance	10 ¹² Ω Min.
Dielectric Breakdown	400V Min.
Operating Frequency	DC to 500MHz
Operating Voltage	100 V

SUBSTRATE CHARACTERISTICS

SUBSTRATE MATERIAL	Resistance Range (Per Resistor)	Power ¹ Rating	Dielectric Constant @ 1MHz	Thermal Conductivity W/m•K	Current Noise	
					101Ω to 250kΩ	≤ 100Ω > 250kΩ
99.6% Alumina	5Ω to 100kΩ	50 mW / Res	9.9	28	-35 dB	-30 dB
Silicon (with 12kÅ SiO ₂)	5Ω to 1MΩ	50 mW / Res	N/A (SiO ₂ 3.9)	149 (SiO ₂ 1.38)	-40 dB	-30 dB

¹ Power Rating at 70°C Derated Linearly to 0% at 150°C

RESISTOR CHARACTERISTICS

RESISTOR FILM	Passivation	Standard TCR	TCR Optional To	TCR Tracking
Tantalum Nitride	Ta ₂ O ₅ (Self Passivating)	±150 ppm/°C	±10 ppm/°C	±2ppm/°C
NiChrome	SiO ₂	±25 ppm/°C	±5 ppm/°C	±2ppm/°C

PERFORMANCE SPECIFICATIONS

PROPERTY	TEST CONDITION	REQUIRED LIMITS	MSI TYPICAL LIMITS
SHORT TERM OVERLOAD	2.5xWVDC(6.25xRATED POWER)MIL-PRF-55342, +25°C, 5 SEC	±0.25 MAX ΔR/R	±0.10 MAX ΔR/R
HIGH TEMP EXPOSURE	+150°C, 100HRS	±0.20 MAX ΔR/R	±0.03 MAX ΔR/R
THERMAL SHOCK	MIL-STD 202, METHOD 107	±0.25 MAX ΔR/R	±0.10 MAX ΔR/R
MOISTURE RESISTANCE	MIL-STD 202, METHOD 106	±0.40 MAX ΔR/R	±0.10 MAX ΔR/R
STABILITY	MIL-STD 202 METHOD 108, 2000 HRS, +70°C, RATED POWER	±0.50 MAX ΔR/R	±0.10 MAX ΔR/R

All MSRA, MSRB, MSRC Series parts are produced on the same manufacturing line using the same materials and processes as parts manufactured to MIL-PRF-55342



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