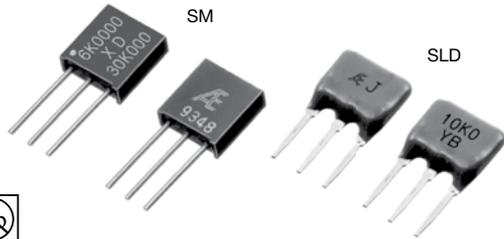


## Ultra Precision Resistor 1-2-3 Network



RoHS COMPLIANT

DSCC Specification 87026

TCR, RESISTANCE RANGE, TOLERANCE, RATED POWER						
Type	TCR (ppm/°C) -55°C to +125°C		Resistance Range/Element (Ω)**	Resistance Tolerance (%)		Rated Power/Package (W) at 125°C
	Absolute*	Tracking		Absolute*	Matching*	
SM	0±5 (X) 0±2.5 (Y)	See Table 1	50 to 30k	±0.02 (Q) ±0.05 (A) ±0.1 (B)	±0.01 (T) ±0.02 (Q) ±0.05 (A) ±0.1 (B)	0.3
SLD	0±5 (X) 0±2.5 (Y)	See Table 1	50 to 100	±0.1 (B) ±0.5 (D)	±0.05 (A) ±0.1 (B)	0.25 at 70°C
			100 to 30k	±0.05 (A) ±0.1 (B)	±0.02 (Q) ±0.05 (A) ±0.1 (B)	

\* Symbols parenthesized are for type number composition.

\*\* -25°C to +125°C for SLD type.

\*\*\* Please contact us for the availability.

**COMPOSITION OF TYPE NUMBER**

Example: R<sub>1</sub>=R<sub>2</sub>  
**SM 1X 10K00 B A**  
 ① ② ③ ④ ⑤ ⑥

Example: R<sub>1</sub>≠R<sub>2</sub>  
**SLD 2X 1K000 / 10K00 B Q**  
 ① ② ③ ④ ⑤ ⑥

① Type  
 ② Number of Values  
 ③ TCR Absolute  
 ④ Nominal Resistance Values  
 ⑤ Resistance Tolerance (Absolute)  
 ⑥ Resistance Tolerance (Matching)

Resistance value, in ohm, is expressed by a series of five characters, four of which represent significant digits. The fifth R or K is a dual-purpose letter that designates both the value range (R for ohmic; K for kilo-ohm) and the location of decimal point.

**TABLE 1. TCR TRACKING IS SUBJECT TO RESISTANCE RATIO**

Resistance Ratio	TCR Tracking (ppm/°C)
Resistance Ratio = 1	±0.5
1 < Resistance Ratio ≤ 10	±1
10 < Resistance Ratio ≤ 100	±2
100 < Resistance Ratio	±3

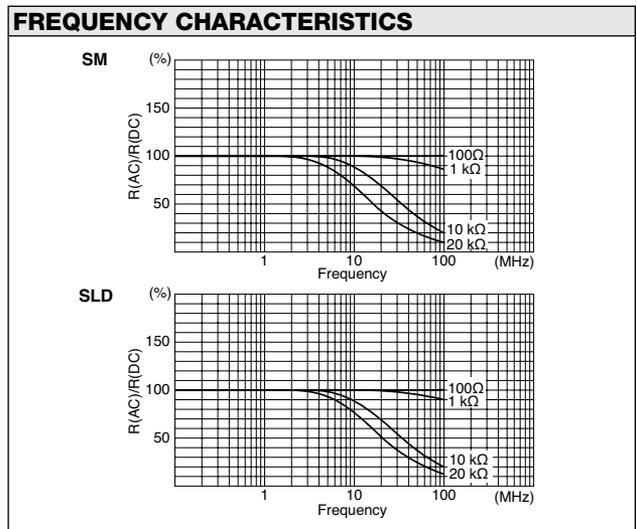
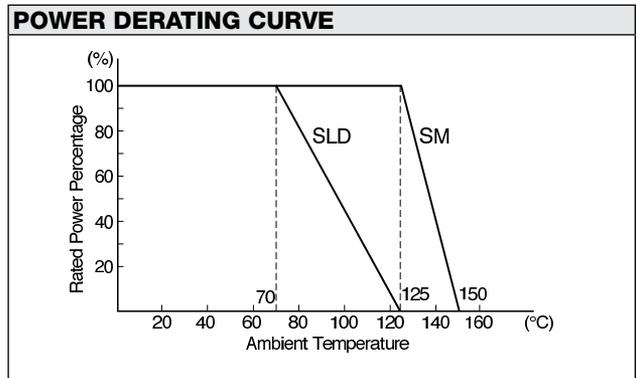
**CONFIGURATION (DIMENSIONS IN mm)**

SM

Type	SM
L	7.7±0.2
L <sub>1</sub>	1.0 max.
W	8.1±0.2
W <sub>1</sub>	7.8±0.2
W <sub>2</sub>	0.3 max.
T	2.6±0.2
F	2.54±0.25
l	10±3
d	φ0.65±0.05

SLD

Type	SLD
L	7.5±0.5
W	7.5±0.5
T	2.2±0.5
F	2.54±0.25
l	5±1
t	0.3±0.05
a	1.0±0.05
b	0.65±0.05
c	0.4±0.05



PERFORMANCE – SM					
Parameters	Test Condition	ALPHA Specification		ALPHA Typical Test Data	
		$\Delta R$	$\Delta$ Ratio	$\Delta R$	$\Delta$ Ratio
Maximum Rated Operating Temperature Working Temperature Range		125°C -65°C to +150°C			
Thermal Shock Overload	-65°C/30 min. ↔ +150°C/30 min., 5 cycles Rated Voltage x 2.5, 5 sec.	±0.02% ±0.02%	±0.01% ±0.01%	±0.005% ±0.0025%	±0.0025% ±0.001%
Solderability	245°C, 5 sec.	over 95% coverage		over 95% coverage	
Resistance to Solvents	① Isopropyl Alcohol + Mineral Spirits ② Water + Butyl Cellosolve + Monoethanolamine	no damage		no damage	
Low Temperature Storage and Operation Terminal Strength	-65°C, No Load, 24 hrs. → Rated Voltage, 45 min. 0.908 kg (2 pounds), 10 sec.	±0.05% ±0.02%	±0.02% ±0.01%	±0.0025% ±0.0025%	±0.001% ±0.001%
Dielectric Withstanding Voltage Insulation Resistance	Atmo. Pres.: AC 300V, 1 min. Baro. Pres. 8 mHg; AC 200V, 1min. DC 500V, 2 min.	±0.02%	±0.01%	±0.0025%	±0.001%
Resistance to Soldering Heat Moisture Resistance	350°C, 3 sec. +65°C to -10°C, 90% RH to 98% RH, Rated Voltage, 10 cycles (240 hrs.)	over 10,000 M $\Omega$		over 10,000 M $\Omega$	
Shock Vibration, High Frequency	100G, 6 ms, Sawtooth Wave, X, Y, Z, each 10 shocks 20G, 10 Hz to 2,000 Hz to 10 Hz, 20 min., X, Y, Z, each 2.5 hrs.	±0.01% ±0.02%	±0.005% ±0.01%	±0.0025% ±0.0025%	±0.001% ±0.001%
Life	125°C, Rated Power, 1.5 hr. – ON, 0.5 hr. – OFF, 2,000 hrs.	±0.05%	±0.02%	±0.015%	±0.005%
Storage Life	15°C to 35°C, 15% RH to 75% RH, No Load, 10,000 hrs.	±0.005%	±0.0025%	±0.0025%	±0.0015%
High Temperature Exposure	150°C, No Load, 2,000 hrs.	±0.05%	±0.02%	±0.015%	±0.005%
Current Noise Voltage Coefficient Thermal EMF		-32 dB 0.0005%/V 1.0 $\mu$ V/°C		-42 dB 0.00003%/V 1.0 $\mu$ V/°C	

PERFORMANCE – SLD					
Parameters	Test Condition	ALPHA Specification		ALPHA Typical Test Data	
		$\Delta R$	$\Delta$ Ratio	$\Delta R$	$\Delta$ Ratio
Maximum Rated Operating Temperature Working Temperature Range		70°C -25°C to +125°C			
Thermal Cycling Overload	-25°C/30 min., Room Temperature/5 min., 125°C/30 min., 5 cycles Rated Voltage x 2.5, 5 sec.	±0.05% ±0.05%	±0.01% ±0.01%	±0.01% ±0.0025%	±0.005% ±0.001%
Solderability Resistance to Solvents	235°C, 2 sec. Isopropyl Alcohol	over 75% coverage no damage		over 75% coverage no damage	
Low Temperature Operation Terminal Strength	-25°C, No Load, 2 hrs. 0.908 kg (2 pounds), 10 sec.	±0.05% ±0.05%	±0.01% ±0.01%	±0.0025% ±0.0025%	±0.001% ±0.001%
Dielectric Withstanding Voltage Insulation Resistance	Atmo. Pres.: AC 300V, 1 min. DC 100V, 1 min.	±0.03%	±0.01%	±0.0025%	±0.001%
Resistance to Soldering Heat Moisture Resistance	350°C, 3 sec. +65°C to -10°C, 90% RH to 98% RH, Rated Voltage, 10 cycles (240 hrs.)	over 10,000 M $\Omega$		over 10,000 M $\Omega$	
Shock Vibration	50G, 11 ms, Half-Sine Wave, X, Y, Z, each 3 shocks 20G, 10 Hz to 55 Hz to 10 Hz, 1 min., X, Y, Z, each 2 hrs.	±0.03% ±0.03%	±0.01% ±0.01%	±0.005% ±0.005%	±0.001% ±0.001%
Life (Rated Load)	70°C, Rated Power, 1.5 hr. – ON, 0.5 hr. – OFF, 1,000 hrs.	±0.1%	±0.05%	±0.01%	±0.005%
Life (Moisture Load)	40°C 90% RH to 95% RH, Rated Power 1.5 hrs – ON, 0.5 hr. – OFF, 1,000 hrs.	±0.05%	±0.01%	±0.01%	±0.005%
Storage Life	15°C to 35°C, 15% RH to 75% RH, No Load, 10,000 hrs	±0.02%	±0.01%	±0.005%	±0.0025%
High Temperature Exposure	125°C, No Load, 1,000 hrs.	±0.05%	±0.01%	±0.01%	±0.005%

**EXAMPLE OF APPLICATION**

An application of type SM/SLD (input/feedback resistors for amplifiers) Because the input and the feedback resistors are incorporated into one single element, amplification is not affected by temperature range.

