

1/4 Watt Precision Thin Film Resistors

High precision, thin film resistors. A standard TCR of 2ppm/°C is achieved with a Ni-Cr alloy spattered onto an alumina substrate. Operating temperatures from -55°C to +125°C. These models also exhibit excellent long-term stability, low current noise, a low voltage coefficient and a low thermal EMF. Typical applications are: Discrete voltage dividers, common analog circuits of professional audio, sensor pre-amplifiers, industrial measurement, control, medical electronics, ATE, aerospace, and reliable power electronics.

GENERAL SPECIFICATIONS

Model	Resistance Range[Ω]	1)TCR [±ppm/°C]	1)Tolerance (%)	Standard Resistance	2)Power Rating[W]	Working Voltage[V]
TP48 TP47	100~20K	±1(X)	T [0.01]	E96 and E24(include 2.5 and 5.0) * any resistance value	0.25	$\sqrt{P \cdot R}$
TP46 TP45	100~150K	±2(Y), ±2.5(W) ±5(Z)	Q [0.02] A [0.05]			
TP48, TP47	50~150K	±10(N)	B [0.1]			
TP46, TP45	50~510K					
TP48, TP47	10~150K					
TP46, TP45	10~820K	±25(E)	B [0.1]			



1) Conditions: -55°C to +125°C 2) Conditions: -55°C to +70°C
* 4 or more significant digits and odd resistances, please call factory about printing method

CHARACTERISTICS

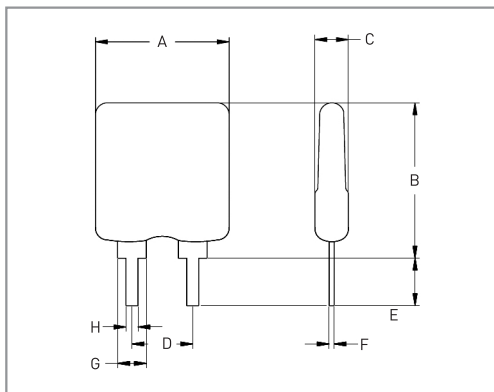
Values in [] mean change in Ω after test

Operating Temperature Range		-55°C to +125°C
Storage Temperature Range		-55°C to +125°C
Dielectric Withstanding Voltage	[±0.03%]	
Short Time Overload	[±0.05%]	2.5 x Power rating, 5 seconds
Moisture Resistance	[±0.05%]	1000 hours
Vibration	[Not Specified]	
Shelf Life Stability	[±0.03%]	One year at 25°C
Voltage Coefficient	[< 0.1ppm/V]	THD at rating power < -120dB
Temperature Cycle	[±0.05%]	-55°C 30minutes, +120°C 30minutes, 20cycles
Thermal EMF	[0.05μV/°C]	
Soldering Heat	[±0.03%]	350°C, 3 seconds
Solvent	[No damage]	IPA test
Solderability	[Covered 95%]	235°C, 2 seconds
Terminal Strength	[±0.05%]	
Noise	[< -43dB]	
Load Life	[±0.05%]	1000 hours

ORDERING PROCEDURE EXAMPLE

Ordering Example	Model	TCR[ppm/°C]	Resistance	Tolerance(%)	Option Code	Note
TP48Y100ohmTZ00	TP48	2(Y)	100Ω	T [0.01]	Z00 [Bulk]	1/4W, 2.54mm
TP46W10kohmQZ00	TP46	2.5(W)	10kΩ	Q [0.02]	Z00 [Bulk]	1/4W, 2.54mm
TP47Z100ohmAZ00	TP47	5(Z)	100Ω	A [0.05]		1/4W, 5.08mm
TP47N10kohmBZ00	TP47	10(N)	10kΩ	B [0.10]		1/4W, 3.81mm
TP45E10kohmD700	TP45	25(E)	10kΩ	D [0.25]		1/4W, 7.62mm

DIMENSIONS [mm]



Model	TP48	TP47	TP46	TP45
A	5,6maximum	6,8maximum	8,0maximum	10,16maximum
B	8,2maximum	8,6maximum	9,0maximum	9,0maximum
C	2,54maximum	2,54maximum	2,54maximum	2,54maximum
D	2,54±0,25	3,81±0,25	5,08±0,25	7,62±0,25
E	3,3±0,5	3,3±0,5	3,3±0,5	3,3±0,5
F	0,25	0,25	0,25	0,25
G	1,2	1,2	1,2	1,2
H	0,5±0,05	0,5±0,05	0,5±0,05	0,5±0,05

RESISTANCES, E24, E96

Standard Resistance E24+							Standard Resistance E96											
1.0	1.5	2.2	3.0	4.3	5.6	8.2	1.00	1.21	1.47	1.78	2.15	2.61	3.16	3.83	4.64	5.62	6.81	8.25
1.1	1.6	2.4	3.3	4.7	6.2	9.1	1.02	1.24	1.50	1.82	2.21	2.67	3.24	3.92	4.75	5.76	6.98	8.45
1.2	1.8	[2.5]	3.6	[5.0]	6.8		1.05	1.27	1.54	1.87	2.26	2.74	3.32	4.02	4.87	5.90	7.15	8.66
1.3	2.0	2.7	3.9	5.1	7.5		1.07	1.30	1.58	1.91	2.32	2.80	3.40	4.12	4.99	6.04	7.32	8.87
							1.10	1.33	1.62	1.96	2.37	2.87	3.48	4.22	5.11	6.19	7.50	9.09
							1.13	1.37	1.65	2.00	2.43	2.94	3.57	4.32	5.23	6.34	7.68	9.31
							1.15	1.40	1.69	2.05	2.49	3.01	3.65	4.42	5.36	6.49	7.87	9.53
							1.18	1.43	1.74	2.10	2.55	3.09	3.74	4.53	5.49	6.65	8.06	9.76

TCR AND TOLERANCE IDENTIFICATION

TCR and Symbols		Tolerance and Symbols	
X	±1ppm/°C	T	±0.01%
Y	±2ppm/°C	Q	±0.02%
W	±2.5ppm/°C	A	±0.05%
Z	±5ppm/°C	B	±0.10%
N	±10ppm/°C	D	±0.50%
E	±25ppm/°C	F	±1.0%
C	±50ppm/°C		