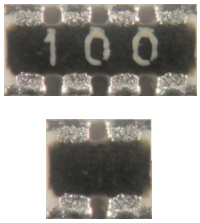
Thin Film Technology Corp.

Product Family: Automotive Application Thick Film Chip Array

Part Number Series: TRA Series

RoHS COMPLIANT 2011/65/EU — HF HALOGEN-FREE



Construction:

- High Purity Alumina Substrate
- Highly reliable and stable thick film resistive element
- Wrap around electrodes
- RoHS 2011/65/EU compliant and Pb Free (100% tin terminations)

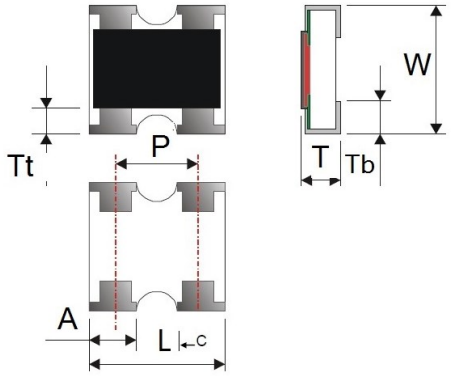
Features:

- 0404, 0606, 0804, and 1206 sizes
- Resistances from 1Ω to 1MΩ
- Tolerances of ±1% and ±5%
- TCR's down to ±200 ppm/°C
- AEC-Q200 Automotive Compliant

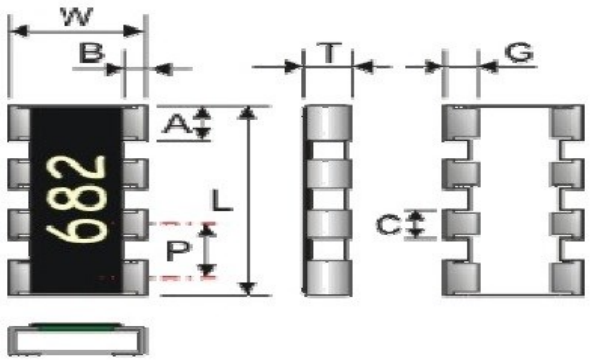
Description:

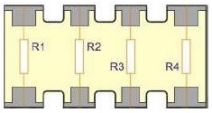
These precision chip resistors offer excellent performance and tolerance in TCR, current noise, and linearity for high frequency circuit applications and other applications requiring precision and stability. High volume manufacturing allows for lower costs for the customer.

Product Dimensions:



R1=R2





R1=R2=R3=R4

Size	L	W	T	P/C	A	Tt	Tb
0404	0.039 ±0.004	0.039 ±0.004	0.014 ±0.004	0.026 ±0.004	0.013 ±0.004	0.008 ±0.006	0.010 ±0.007
0606	0.063 ±0.004	0.059 ±0.004	0.020 ±0.004	0.016 ±0.004	0.024 ±0.004	0.012 ±0.006	0.012 ±0.006

Size	L	W	T	P	A	B	C	G
0804	0.079 ±0.004	0.039 ±0.004	0.018 ±0.004	0.020 ±0.002	0.016 ±0.004	0.008 ±0.004	0.012 ±0.002	0.010 ±0.004
1206	0.126 ±0.004	0.063 ±0.004	0.020 ±0.004	0.031 ±0.004	0.024 ±0.004	0.012 ±0.004	0.016 ±0.004	0.012 ±0.004

Part Numbering: Ex: TRAV0606S1002J-T5

Product Designator	Termination Style	Overall Size English	Temp. Coefficient of Resistance (TCR)	Resistance Value	Resistance Tolerance	T&R Packaging Quantity
TRA	V = Convex	0404 0606 0804 1206	S = ±200ppm/°C W = See Table (TCR is dictated by resistance value. Refer to electrical table)	4 digits with the first 3 being significant. The last digit specifies the number of zeros. "R" denotes decimal position as necessary. All resistors are of equal value in this resistor array.	F = ±1.0% J = ±5.0%	-T5 = 5,000/reel -T10 = 10,000/reel (refer to electrical table)

Electrical Specifications:

Type	TRA0404	TRA0606	TRA0804	TRA1206
English Size	0404	0606	0804	1206
Metric Size	1010	1615	2010	3216
Resistance Range	3Ω to 1MΩ + Jumper	1Ω to 1MΩ + Jumper	10Ω to 1MΩ + Jumper	10Ω to 1MΩ + Jumper
Resistance Tolerance	±5.0%	±1.0% for E-24 values ±5.0% for all values	±1.0%, ±5.0%	±1.0%, ±5.0%
TCR (ppm/°C)	Less than 10Ω=±400 (W) 10Ω or greater=±300 (W)	Less than 10Ω=-300/+500 (W) 10Ω or greater=±200 (S)	10Ω = -300/+500 (W) 10.2Ω to 976kΩ = ±200 (S) 1MΩ=-300/+500 (W)	
Max Power at 70°C	1/16 W	1/10 W	1/16 W	1/10 W
Max Operation Voltage (DC or RMS)	25 V	50 V	25 V	50 V
Max Overload Voltage	50 V	100 V	50 V	100V
Operating Temp Range	-55°C to +155°C (derates from 100% power at 70°C to 0% power at 155°C			
Packaging	10,000 pcs/reel (T10) 7 inch diameter reel	5,000 pcs/reel (T5) 7 inch diameter reel	10,000 pcs/reel (T10) 7 inch diameter reel	5,000 pcs/reel (T5) 7 inch diameter reel

Reliability Specifications:

Test	Test Method	Specification
Short Time Overload	Applied voltage: 2.5X rated voltage or 2X maximum operating voltage, whichever is less. Test duration: 5 seconds	±2.0% +0.10Ω
Resistance to Soldering Heat	MIL-STD-202, Method 210 Dip into 270°C solder bath until fully immersed 10 ±1 seconds	±1.0% +0.05Ω
Load Life	MIL-STD-202, Method 108 Test Temperature: 125°C Applied power: 35% of operational power rated voltage Test period: 1000 hours	±2.0% +0.10Ω
Moisture Load Life	MIL-STD-202, Method 103 Test Condition: 85°C/85 RH Applied power: 10% or rated power Test period: 1000 hours with power cycling as follows:	±2.0% +0.10Ω
Thermal Shock	MIL-STD-202, Method 107G -55°C ~155°C, 15 minute dwell, 300 cycles	±1.0% +0.05Ω
High Temperature Exposure	MIL-STD-202, Method 108 Test Temperature: 155°C No load Test period: 1000 hours	±1.0% +0.05Ω
Board Flex	AEC-Q200-005 Resistor mounted on 90mm FR4 PCB 2mm bend for 10 seconds	±1.0% +0.05Ω
Terminal Strength	AEC-Q200-006 Force of 1Kg Test time: 60 ±1 second	No damage or removal of the termination
ESD	AEC-Q200-005 Test contact 1.0KV (0402 size tested with 0.5KV)	±1.0% +0.05Ω
Solderability	Dip into 235°C solder bath until fully immersed (SAC solder) 2 ±0.5 seconds	Minimum 95% coverage of new solder