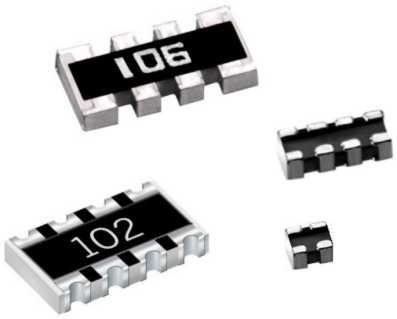
Thick Film Array Chip Resistors

multicomp PRO



RoHS Compliant

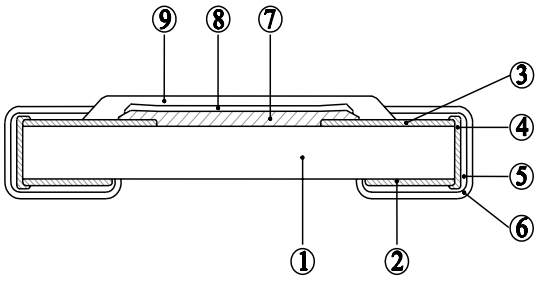
Applications

- Entertainment
- Computer and Related Products
- Communication Equipment
- Power Equipment
- Measuring Instrument

Features

- Small size and light weight
- Reduction of assembly costs and matching with placement machines
- Reliability, high quality
- Suitable for IR reflow soldering

Construction

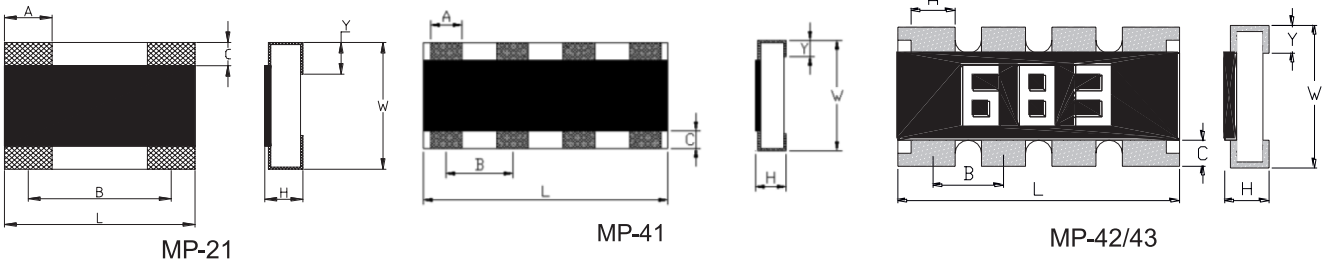


1	Alumina Substrate
2	Bottom Electrode
3	Top Electrode
4	Edge Electrode
5	Barrier Layer

6	External Electrode
7	Resistor Layer
8	Primary Overcoat
9	Secondary Overcoat

Dimensions

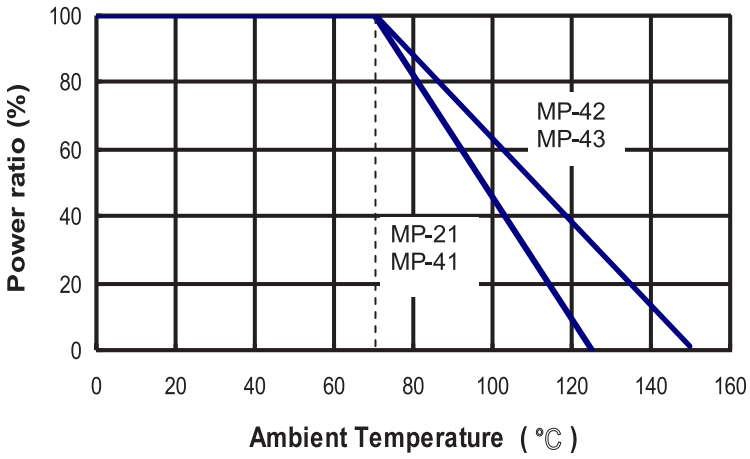
Flat Terminal | **Convex Terminal**



MP-21 MP-41 MP-42/43

Type	Number of Resistors	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	C (mm)	Y (mm)	Weight (g) (1000pcs)
MP-21	2	0.8 ±0.1	0.6 ±0.1	0.35 ±0.1	0.3 ±0.1	0.5 ±0.1	0.15 ±0.1	0.15 ±0.1	0.5
MP-41	4	1.4 ±0.1	0.6 ±0.1	0.35 ±0.1	0.2 ±0.1	0.4 ±0.1	0.1 ±0.07	0.15 ±0.05	0.833
MP-42	4	2 ±0.1	1 ±0.1	0.45 ±0.1	0.3 ±0.1	0.5 ±0.05	0.22 ±0.15	0.22 ±0.15	2.817
MP-43	4	3.2 ±0.15	1.6 ±0.15	0.55 ±0.1	0.5 ±0.15	0.8 ±0.05	0.3±0.15	0.3 ±0.15	8.288

Derating Curve

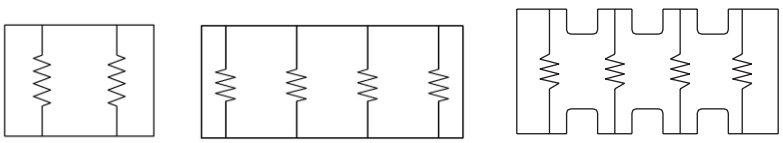


Standard Electrical Specifications

Type	Power Rating at 70°C Jumper Rated Current	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Number of Resistors	Resistance Range		TCR (PPM/°C)
						±1% (E24,E96)	±5% (E24)	
MP-21	1/32W	-55°C to +125°C	12.5V	25V	2	15Ω to 56Ω		±200
MP-41	1/32W	-55°C to +125°C	12.5V	25V	4	15Ω to 56KΩ		±200
MP-42	1/16W	-55°C to +155°C	25V	50V	4	20Ω - 470KΩ	15Ω - 120KΩ	±200
MP-43	1/10W	-55°C to +155°C	50V	100V	4	1KΩ - 100KΩ	10Ω - 470KΩ	±200
	Jumper: 1A					-	0Ω (<50mΩ	-

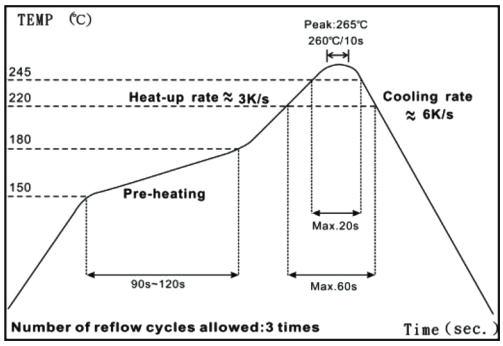
Operating Voltage = √(P×R) or Max. Operating Voltage listed above, whichever is lower.
Overload Voltage = 2.5×√(P×R) or Max. Overload Voltage listed above, whichever is lower.

Equivalent Circuit Diagram

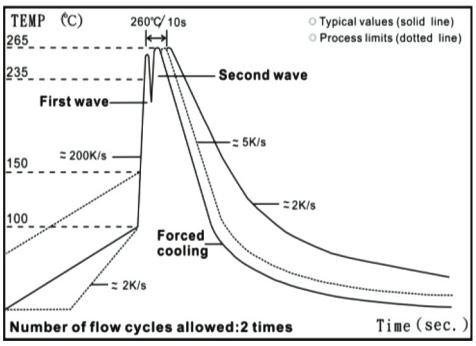


MP-21 MP-41 MP-42/43

Soldering Condition



IR Reflow Soldering



Wave Soldering (Flow Soldering)

1. Time of IR reflow soldering at maximum temperature point 260°C: 10s
2. Time of wave soldering at maximum temperature point 260°C: 10s
3. Time of soldering iron at maximum temperature point 410°C: 5s

Environmental Characteristics

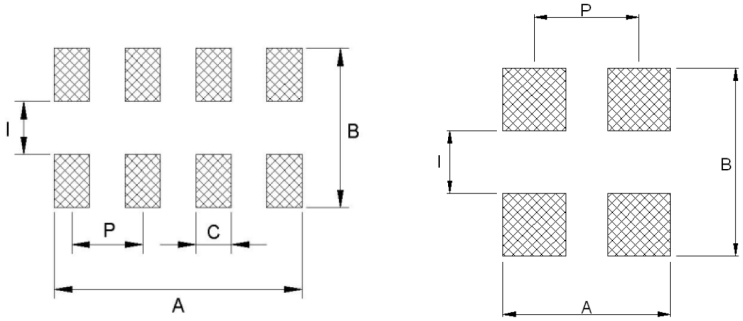
Item	Requirement			Test Method
	±1%	±5%	Jumper	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.			JIS-C-5201-1 4.8 IEC-60115-1 4.8 At 25°C / -55°C and 25°C / +125°C, 25°C is the reference temperature
Short Time Over-load	±(1% +0.05Ω)	±(2%+0.05Ω)	<50mΩ	JIS-C-5201-1 4.13 IEC-60115-1 4.13 RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds
Insulation Resist-ance	≥10G			JIS-C-5201-1 4.6 IEC-60115-1 4.6 Max. Overload Voltage for 1 minute
Endurance	±(2%+0.10Ω)	±(3%+0.10Ω)	<50mΩ MP-21/41: <100mΩ	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1 70±2°C, RCWV for 1000 hrs with 1.5 hrs “ON” and 0.5 hr “OFF”
Damp Heat with Load	±(2%+0.10Ω)	±(3%+0.10Ω)	<50mΩ	JIS-C-5201-1 4.24 IEC-60115-1 4.24 40±2°C, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs “ON” and 0.5 hr “OFF”
Dry Heat	±(1%+0.05Ω)	±(1.5%+0.10Ω) MP-21/41: ±(3%+0.10Ω)	<50mΩ MP-21/41: <100mΩ	JIS-C-5201-1 4.23 IEC-60115-1 4.23.2 at +125/+155°C for 1000 hrs
Bending Strength	±(1% +0.05Ω)	±(1% +0.05Ω)	<50mΩ	JIS-C-5201-1 4.33 IEC-60115-1 4.33 Bending once for 5 seconds with 3mm

Item	Requirement			Test Method
	±1%	±5%	Jumper	
Solderability	95% min. coverage			JIS-C-5201-1 4.17 IEC-60115-1 4.17 245 ±5°C for 3 second
Resistance to Soldering Heat	±(0.5%+0.05Ω)	(1%+0.05Ω)	<50mΩ	JIS-C-5201-1 4.18 IEC-60115-1 4.18 260 ±5°C for 10 second
Voltage Proof	No breakdown or flashover			JIS-C-5201-1 4.7 IEC-60115-1 4.7 1.42 times Max. Operating Voltage for 1 minute
Leaching	Individual leaching area ≦5% Total leaching area ≦10%			JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1 260 ±5°C for 30 second
Rapid Change of Temperature	±(0.5%+0.05Ω)	±(1%+0.05Ω)	<50mΩ	JIS-C-5201-1 4.19 IEC-60115-1 4.19 -55°C to +125/+155°C, 5 cycles

RCWV (Rated Continuous Working Voltage) = √(P×R) or Max. Operating Voltage whichever is lower.

Storage Temperature: 15°C to 28°C; Humidity <80% RH

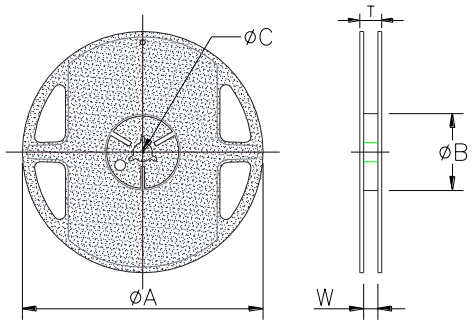
Recommend Land Pattern



Type	A (mm)	B (mm)	C (mm)	I (mm)	P (mm)
MP-21	0.8	0.9	-	0.3	0.5
MP-41	1.4	0.9	0.2	0.3	0.4
MP-42	2.1	1.8	0.3	0.5	0.5
MP-43	3.1	2.85	0.45	0.8	0.8

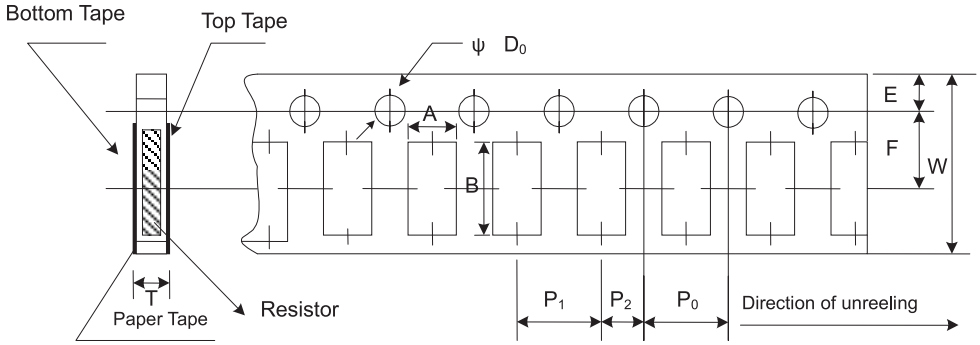
Packaging

Reel Specifications and Packaging Quantity



Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
MP-21 MP-41	Paper	10K	8mm	7 inch	178.5 ±1.5	$60^{+1/-0}$	13 ±0.2	9 ±0.5	12.5 ±0.5
MP-42	Paper	10K	8mm	7 inch	178.5 ±1.5	$60^{+1/-0}$	13 ±0.2	9 ±0.5	12.5 ±0.5
		20K	8mm	10 inch	254 ±1	100 ±0.5	13 ±0.2	9.5 ±0.5	13.5 ±0.5
		40K	8mm	13 inch	330 ±1	100 ±0.5	13 ±0.2	9.5 ±0.5	13.5 ±0.5
MP-43	Paper	5K	8mm	7 inch	178.5 ±1.5	$60^{+1/-0}$	13 ±0.2	9 ±0.5	12.5 ±0.5
		10K	8mm	10 inch	254 ±1	100 ±0.5	13 ±0.2	9.5 ±0.5	13.5 ±0.5
		20K	8mm	13 inch	330 ±1	100 ±0.5	13 ±0.2	9.5 ±0.5	13.5 ±0.5

Paper Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P0 (mm)	P1 (mm)	P2 (mm)	ΦD0 (mm)	T (mm)
MP-21	0.77 ±0.05	0.97 ±0.05	8 ±0.2	1.75 ±0.1	3.5 ±0.05	4 ±0.1	2 ±0.05	2 ±0.05	1.5 +0.1,-0	0.5 ±0.1
MP-41	0.77 ±0.05	1.57 ±0.05	8 ±0.2	1.75 ±0.1	3.5 ±0.05	4 ±0.1	2 ±0.05	2 ±0.05	1.5 +0.1,-0	0.5 ±0.1
MP-42	1.2 ±0.1	2.2 ±0.1	8 ±0.2	1.75 ±0.1	3.5 ±0.05	4 ±0.1	2 ±0.05	2 ±0.05	1.5 +0.1,-0	0.7 ±0.1
MP-43	1.95±0.1	3.5 ±0.1	8 ±0.2	1.75 ±0.1	3.5 ±0.05	4 ±0.1	4 ±0.05	2 ±0.05	1.5 +0.1,-0	0.85 ±0.1

Part Number Table

Description	Type	Part Number
Chip Resistor Array, Thick Film, ± 1%, 22R, Isolated, 2 Elements, ±200ppm/°C, 0302 (0806 Metric)	MP-21	MP000955
Chip Resistor Array, Thick Film, ± 1%, 56R, Isolated, 2 Elements, ±200ppm/°C, 0302 (0806 Metric)	MP-21	MP000956
Chip Resistor Array, Thick Film, ± 5%, 15R, Isolated, 2 Elements, ±200ppm/°C, 0302 (0806 Metric)	MP-21	MP000957
Chip Resistor Array, Thick Film, ± 5%, 39R, Isolated, 2 Elements, ±200ppm/°C, 0302 (0806 Metric)	MP-21	MP000958
Chip Resistor Array, Thick Film, ± 5%, 15R, Isolated, 4 Elements, ±200ppm/°C, 0502 (1406 Metric)	MP-41	MP000959
Chip Resistor Array, Thick Film, ± 5%, 560R, Isolated, 4 Elements, ±200ppm/°C, 0502 (1406 Metric)	MP-41	MP000960
Chip Resistor Array, Thick Film, ± 5%, 10K, Isolated, 4 Elements, ±200ppm/°C, 0502 (1406 Metric)	MP-41	MP000961
Chip Resistor Array, Thick Film, ± 5%, 15K, Isolated, 4 Elements, ±200ppm/°C, 0502 (1406 Metric)	MP-41	MP000962
Chip Resistor Array, Thick Film, ± 5%, 30K, Isolated, 4 Elements, ±200ppm/°C, 0502 (1406 Metric)	MP-41	MP000963
Chip Resistor Array, Thick Film, ± 5%, 47K, Isolated, 4 Elements, ±200ppm/°C, 0502 (1406 Metric)	MP-41	MP000964
Chip Resistor Array, Thick Film, ± 5%, 56K, Isolated, 4 Elements, ±200ppm/°C, 0502 (1406 Metric)	MP-41	MP000965
Chip Resistor Array, Thick Film, ± 1%, 20R, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000966
Chip Resistor Array, Thick Film, ± 1%, 12K, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000967
Chip Resistor Array, Thick Film, ± 1%, 470K, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000968
Chip Resistor Array, Thick Film, ± 5%, 15R, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000969
Chip Resistor Array, Thick Film, ± 5%, 22R, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000970
Chip Resistor Array, Thick Film, ± 5%, 33R, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000971
Chip Resistor Array, Thick Film, ± 5%, 36R, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000972
Chip Resistor Array, Thick Film, ± 5%, 39R, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000973
Chip Resistor Array, Thick Film, ± 5%, 43R, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000974
Chip Resistor Array, Thick Film, ± 5%, 100R, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000975
Chip Resistor Array, Thick Film, ± 5%, 120R, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000976
Chip Resistor Array, Thick Film, ± 5%, 15K, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000977
Chip Resistor Array, Thick Film, ± 5%, 47K, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000978
Chip Resistor Array, Thick Film, ± 5%, 100K, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000979
Chip Resistor Array, Thick Film, ± 5%, 120K, Isolated, 4 Elements, ±200ppm/°C, 0804 (2010 Metric)	MP-42	MP000980
Chip Resistor Array, Thick Film, ± 1%, 1K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000981
Chip Resistor Array, Thick Film, ± 1%, 10K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000982
Chip Resistor Array, Thick Film, ± 1%, 30K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000983
Chip Resistor Array, Thick Film, ± 1%, 47K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000984
Chip Resistor Array, Thick Film, ± 1%, 100K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000985
Chip Resistor Array, Thick Film, ± 5%, Jumper, Isolated, 4 Elements, 1206 (3216 Metric)	MP-43	MP000986
Chip Resistor Array, Thick Film, ± 5%, 10R, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000987
Chip Resistor Array, Thick Film, ± 5%, 33R, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000988
Chip Resistor Array, Thick Film, ± 5%, 47R, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000989
Chip Resistor Array, Thick Film, ± 5%, 75R, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000990
Chip Resistor Array, Thick Film, ± 5%, 150R, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000991
Chip Resistor Array, Thick Film, ± 5%, 560R, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000992

Description	Type	Part Number
Chip Resistor Array, Thick Film, ± 5%, 1K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000993
Chip Resistor Array, Thick Film, ± 5%, 3K9, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000994
Chip Resistor Array, Thick Film, ± 5%, 4K7, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000995
Chip Resistor Array, Thick Film, ± 5%, 6K8, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000996
Chip Resistor Array, Thick Film, ± 5%, 20K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000997
Chip Resistor Array, Thick Film, ± 5%, 33K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000998
Chip Resistor Array, Thick Film, ± 5%, 68K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP000999
Chip Resistor Array, Thick Film, ± 5%, 91K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP001000
Chip Resistor Array, Thick Film, ± 5%, 100K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP001001
Chip Resistor Array, Thick Film, ± 5%, 120K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP001002
Chip Resistor Array, Thick Film, ± 5%, 470K, Isolated, 4 Elements, ±200ppm/°C, 1206 (3216 Metric)	MP-43	MP001003