Metal Film Precision Resistor

multicomp PRO

Features

- Thin film technology
- AEC-Q200 Compliance
- Excellent overall stability
- Sn termination on Ni barrier layer
- Tight tolerance down to ±0.1%
- Extremely low TCR down to ±5 PPM/°C
- High power rating up to 1 Watts
- SMD enabled structure

RoHS Compliant

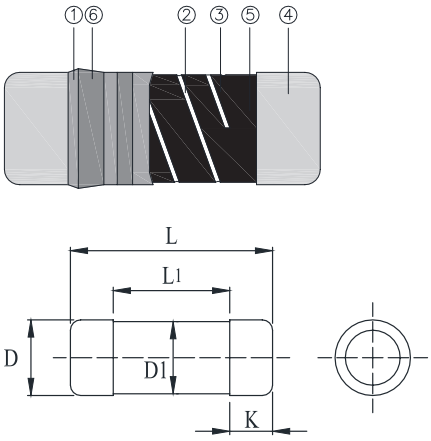
Applications

- Automotive(non-safety parts)
- Industrial
- Telecommunication
- Medical Equipment
- Measurement/Testing Equipment

Technical Specifications

Description	MCCSRV0204		MCCSRV0207	
Resistance range	0.1Ω-10MΩ; 0Ω		0.1Ω-10MΩ; 0Ω	
Resistance tolerance	±5%;±1%;±0.5%;±0.25%;±0.1%			
Temperature coefficient	±100ppm/°C; ±50ppm/°C; ±25ppm/°C; ±15ppm/°C; ±10ppm/°C; ±5ppm/°C			
Operation mode	Standard	High power	Standard	High power
Power rating P_{70}	1/4W	2/5W	1/2W	1W
Operating voltage $U_{max.}$	200V		300V	350V
Operating temperature range	-55°C to 155°C			
Max. resistance change at P70 for resistance range, Δ R/R max., after 1000 h	≤0.5%			

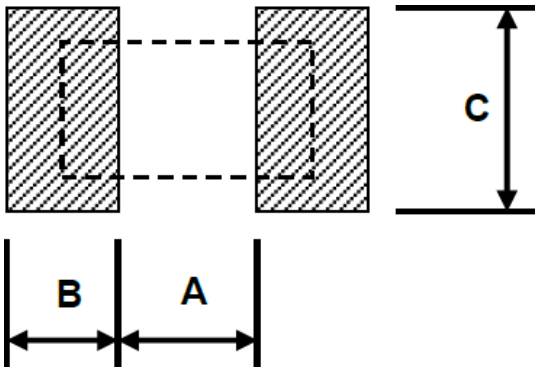
Construction & Dimension



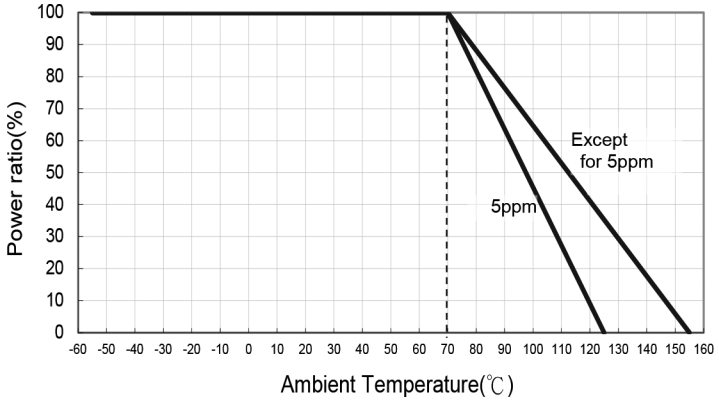
1	Insulation Coating	4	Electrode Cap
2	Trimming Line	5	Resistor Layer
3	Ceramic Rod	6	Marking

Type	L (mm)	$L_{1\ min.}$ (mm)	ΦD (mm)	$ΦD_1$ (mm)	K (mm)	Weight 1,000EA (g)
MCCSRV0204	3.5 ±2	1.7	1.4 ±0.15	D +0/-0.2	0.8 ±0.1	18.7
MCCSRV0207	5.9 ±0.2	2.9	2.2 ±0.2	D +0/-0.2	1.3 ±0.1	80.9

Recommend Land Pattern

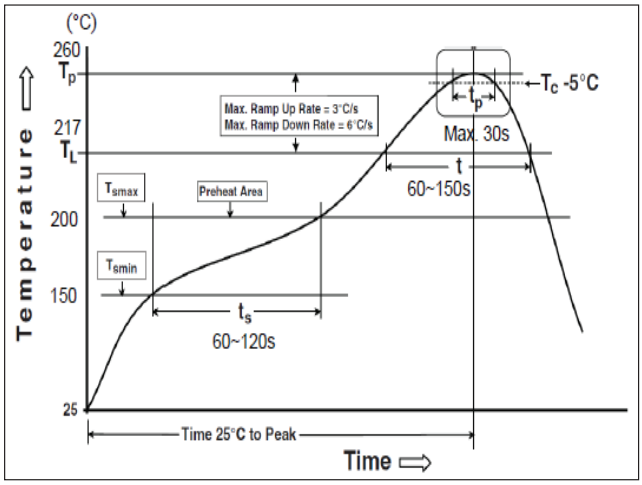


Derating Curve



Type	A (mm)	B (mm)	C (mm)
MCCSRV0204	1.6	1.2	1.6
MCCSRV0207	3	1.7	2.4

Soldering Condition (IPC/JEDEC J-STD-020)



Reflow Profiles	
Profile Feature	**Pb-Free Assembly**
Preheat	
Min. Temperature (Tsmin)	150°C
Max Temperature (Tsmax)	200°C
Preheating time (ts) from (Tsmin to Tsmax)	60-120 seconds
Ramp-up rate (TL to Tp)	3°C/second max.
Liquidous temperature (TL)	217°C
Time (tL) maintained above TL	60-150 seconds
Min. Peak temperature (Tp min)	235°C
Max. Peak temperature (Tp max)	260°C
Time (tp) within 5°C of the specified classification temperature (Tc)	30 seconds max.
Ramp-down rate (Tp to TL)	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

Standard Electrical Specifications

Item / Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range		TCR (PPM/°C)
					±0.1% (E24, E96)	±1% (E24,E96)	
MCCSRV0204	1/4W	-55 ~+125°C	200V	400V	10Ω-332KΩ	--	±5
		-55 ~ +155°C			10Ω-20KΩ		±10
					10Ω-300KΩ		±15
					10Ω -1MΩ	1Ω-3.4MΩ	±25
						0.2Ω-10MΩ	±50
					--	0.1Ω-10MΩ	±100
MCCSRV0207	1/2W	-55 ~ +125°C	300V	600V	10Ω-332KΩ	--	±5
		-55 ~ +155°C			10Ω-20KΩ		±10
					10Ω-300KΩ		±15
					10Ω -1MΩ	1Ω-3.4MΩ	±25
						0.2Ω-10MΩ	±50
					--	0.1Ω-10MΩ	±100

High Power Rating Electrical Specifications

Item / Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range		TCR (PPM/°C)
					±0.1% (E24, E96)	±1% (E24,E96)	
MCCSRV0204	2/5W	-55 ~+125°C	200V	400V	10Ω-332KΩ	--	±5
		-55 ~ +155°C			10Ω-20KΩ		±10
					10Ω-300KΩ		±15
					10Ω -1MΩ	1Ω-3.4MΩ	±25
						0.2Ω-10MΩ	±50
					--	0.1Ω-10MΩ	±100
MCCSRV0207	1W	-55 ~ +125°C	350V	700V	10Ω-332KΩ	--	±5
		-55 ~ +155°C			10Ω-20KΩ		±10
					10Ω-300KΩ		±15
					10Ω -1MΩ	1Ω-3.4MΩ	±25
						0.2Ω-10MΩ	±50
					--	0.1Ω-10MΩ	±100

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

Jumper Specifications

Type \ Item	Power Rating	Operating Temp. Range	Resistance	Rated Current
MCCSRV0204	1/4W	-55 ~ +155°C	0Ω(<15 15mΩ)	3A
	2/5W			
MCCSRV0207	1/2W			5A
	1W4			

Environmental Characteristics

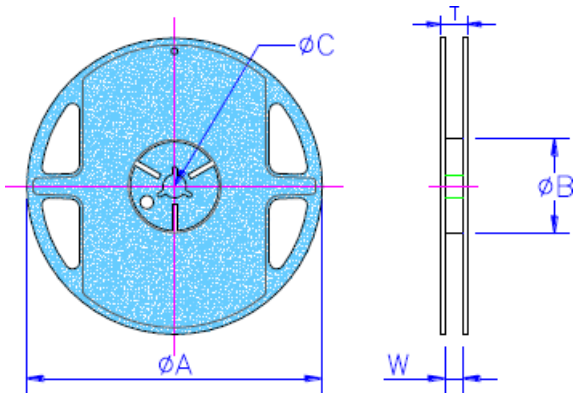
Item	Requirement		Test Method
	5 % and Below	Jumper	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.		JISC 5201-1 4.8 IEC60115-1 4.8 At 25°C/55°C and 25°C/+125°C, 25°C is the reference temperature 5ppm:At 25°C/-10°C and 25°C/+ 85°C, 25°C is the reference temperature
Short Time Overload	10Ω-270KΩ : ±(0.1%+ 0.01Ω <10Ω & >270KΩ: ±(0.15%+0.01Ω) 0102: ±(0.15%+0.01Ω)	<15mΩ	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 Resistance	≥10G		JIS-C-5201-1 4.6 IEC-60115-1 4.6 Max. Overload Voltage for 1 minute
Operational Life	10Ω-270KΩ : ±(0.25%+ 0.01Ω <10Ω & >270KΩ: ±(0.5%+0.01Ω) 0102: ±(0.5%+0.01Ω)	<15mΩ	MIL-STD 202 Method 108 Condition D Steady State TA=125°C at derated power. Measurement at 24±4 hours after test conclusion. 5ppm: 70 ±2°C, RCWV for 1000hrs with 1.5 hrs “ON” and 0.5 hr “OFF”
Biased Humidity	<10Ω: ±(1%+0.01Ω) 10Ω-270KΩ: ±0.5 %+0.01Ω) >270KΩ-3.4MΩ ±(1%+0.01Ω) >3.4MΩ: ±(2%+0.01Ω) 0102: ±2 %+0.01Ω)	<15mΩ	MIL-STD-202 Method 103 1000 hrs 85°C /85%RH 10% of operating power. (≤100V
High Temperature Exposure	10Ω-270KΩ: ±(0.25%+0.01Ω) <10Ω & >270KΩ: ±(1%+0.01Ω) 0102: ±(1%+0.01Ω)	<15mΩ	MIL-STD-202 Method 108 at +125°C/+155°C for 1000 hrs
Board Flex	10Ω-270KΩ: ±(0.1%+0.01Ω) <10Ω & >270KΩ: ±(0.5%+0.01Ω) 0102: ±(0.5%+0.01Ω)	<15mΩ	AEC-Q200-005 Bending once for 60 seconds with 2mm
Solderability	95% min. coverage		JIS-C-5201-1 4.17 IEC-60115-1 4.17 J-STD-002 245 ±5°C for 3 seconds

Resistance to Soldering Heat	10Ω-270KΩ: ±(0.1%+0.01Ω) <10Ω & >270KΩ: ±(0.25%+0.01Ω) 0102: ±(0.25%+0.01Ω) 5ppm: ±(0.05%+0.01Ω)	<15mΩ	MIL-STD-202 Method 210 260 ±5°C for 10 seconds
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 seconds
Temperature Cycling	10Ω-270KΩ: ±(0.25%+0.01Ω) <10Ω & >270KΩ: ±(0.5%+0.01Ω) 0102: ±(1%+0.01Ω)	<15mΩ	JESD22 Method JA-104 -55°C to +125°C, 1000 cycles
Mechanical Shock	±(0.25%+0.01Ω)	<15mΩ	MIL-STD-202 Method 213 Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6.
Vibration	±(0.5%+0.01Ω)	<15mΩ	MIL-STD-202 Method 204 5 g's for 20 min., 12 cycles each of 3 orientations, 10-2000 Hz
ESD	±0.5%+0.01Ω)	<15mΩ	AEC-Q200-002 Human body, 0102/0204:2KV; 0207:4KV
Resistance to Solvents	No visible damage on appearance and marking.		MIL-STD-202 Method 215 Add Aqueous wash chemical-OKEM Clean or equivalent. Do not use banned solvents.
Terminal Strength	No broken		AEC-Q200 006 Force of 1.8kg for 60 seconds.
Flammability	No ignition of the tissue paper or sscorching or the pinewood board		UL94 V-0 or V-1 are acceptable. Electrical test not required.

RCWV(Rated continuous working voltage)= √(P*R) or Max. Operating voltage whichever is lower

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

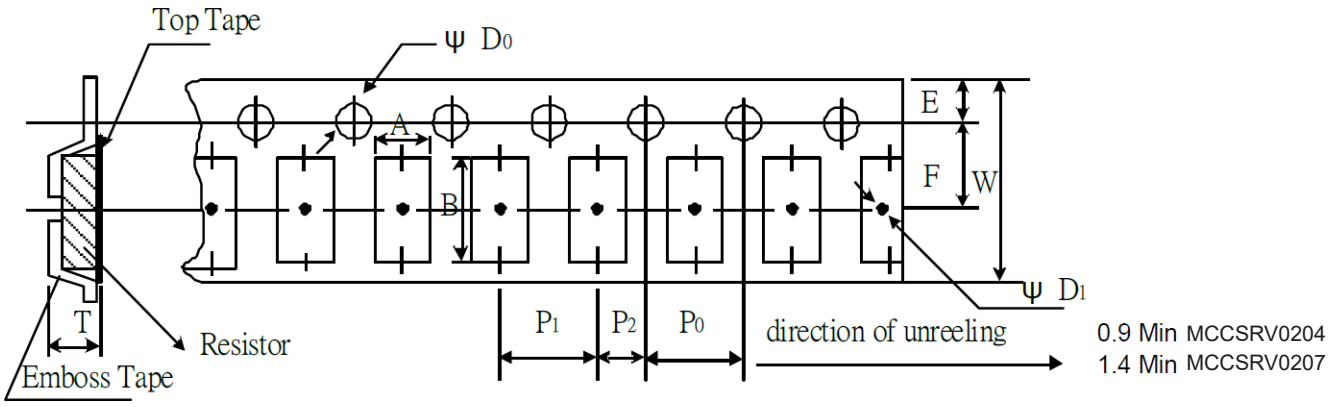
Packaging



Packaging Quantity & Reel Specifications

Type	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)	Emboss Plastic Tape (EA)
MCCSRV0204	7 inch	178.5 ±1.5	60 +1	13 ±0.2	9 ±0.5	12.5 ±0.5	3,000
	13 inch	330 ±1	100 ±0.5	13 ±0.2	9.5 ±0.5	13.5 ±0.5	10,000
MCCSRV0207	7 inch	178.5 ±1.5	60 +1	13 ±0.5	13 ±0.5	15.5 ±0.5	2,000
	13 inch	330 ±1	99 ±0.5	13.5 ±0.5	13.4 ±1	17.8 ±1	6,000

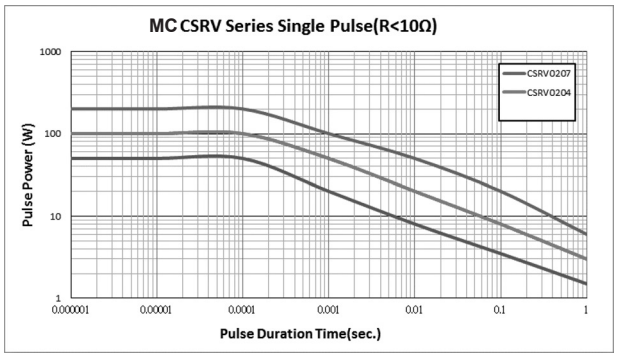
Emboss Plastic Tape Specifications

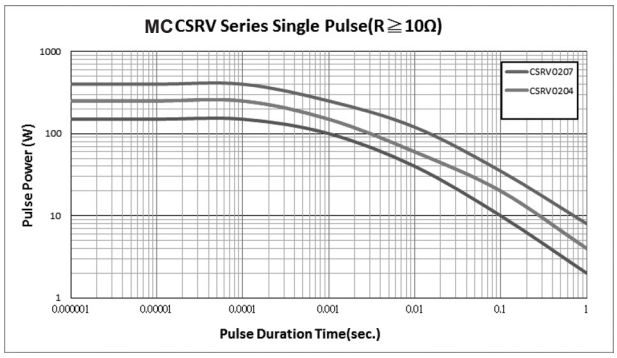


Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P0 (mm)	P1 (mm)	P2 (mm)	ΦD0 (mm)	T (mm)
MCCSRV0204	1.55 ±0.2	3.65 ±0.2	8 ±0.1	1.75 ±0.1	3.5 ±0.05	4 ±0.1	4 ±0.1	2 ±0.05	1.5+0.1	1.8 ±0.1
MCCSRC0207	2.4 ±0.1	6.15 ±0.1	12 ±0.1		5.5 ±0.05					2.7 ±0.1

Pulse withstanding capacity

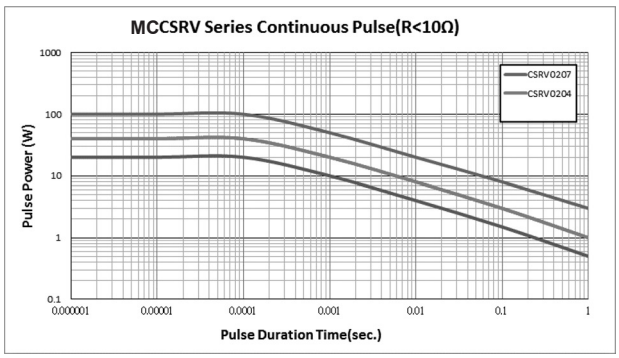
The single impulse graph is the result of the impulse of rectangular shape applied . The limit of acceptance was a shift in resistance of less than 1% from the initial value. The power applied was subject to the restrictions of the maximum permissible impulse voltage graph shown.

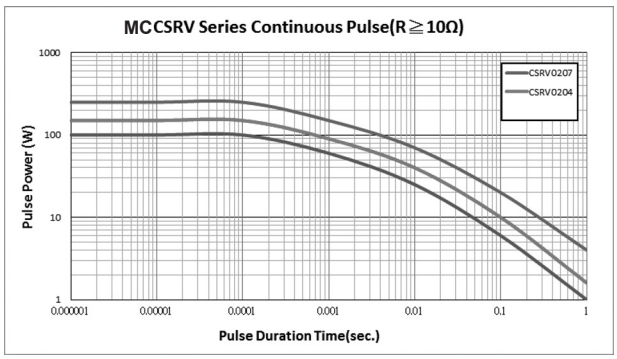




Continuous Pulse

The continuous load graph was obtained by applying repetitive rectangular pulses where the pulse period was adjusted so that the average power dissipated in the resistor was equal to its rated power at 70°C Again the limit of acceptance was a shift in resistance of less than 1% from the initial value.



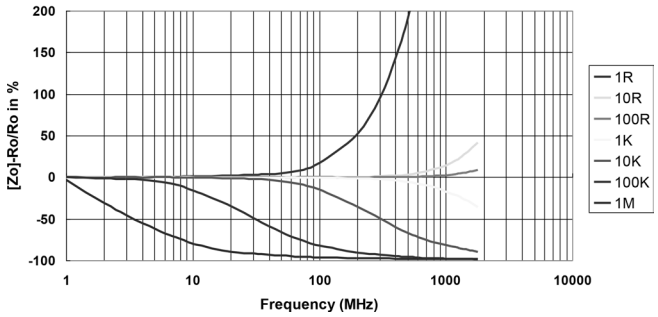


Frequency behavior

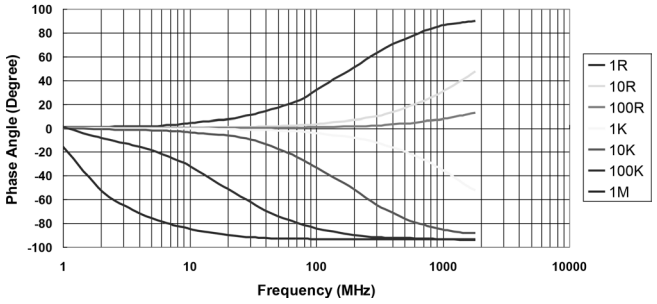
Resistors are designed to function according to ohmic laws. This is basically true of resistors for frequencies up to 100kHz. At higher frequencies, there is an additional contribution to the impedance by an ideal resistor switched in series with a coil and both switched parallel to a capacitor. The values of the capacitance and inductance are mainly determined by the dimensions of the terminations and the conductive path length.

The environment surrounding components has a large influence on the behavior of the component on the printed-circuit board.

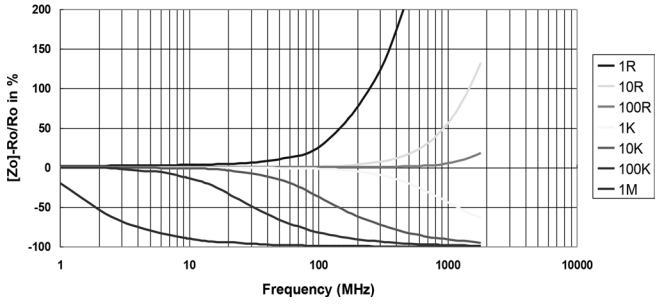
Frequency vs. Impedance
MCCSRV Series (MCCSRV0204)



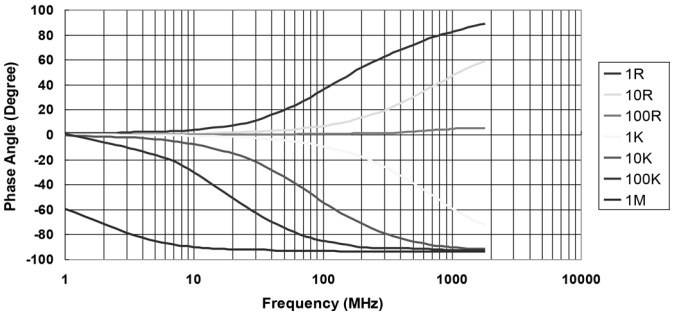
Frequency vs. Phase Angle
MCCSRV Series (MCCSRV0204)



Frequency vs. Impedance
MCCSRV Series (MCCSRV0207)



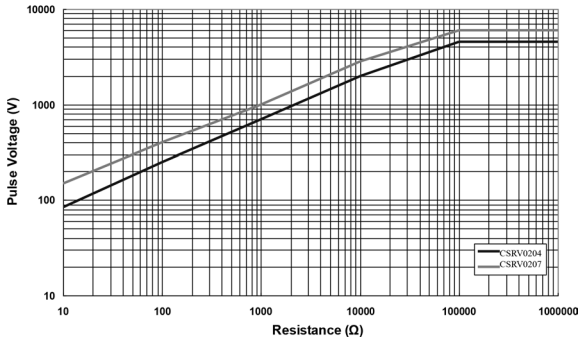
Frequency vs. Phase Angle
MCCSRV Series (MCCSRV0207)



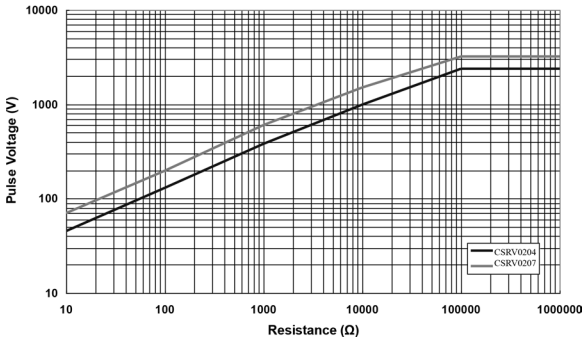
Lightning Surge

Resistors are tested in accordance with IEC 60115-1 using both 1.2/50us and 10/700us pulse shapes. The limit of acceptance is a shift in resistance of less than 0.5% from the initial value.

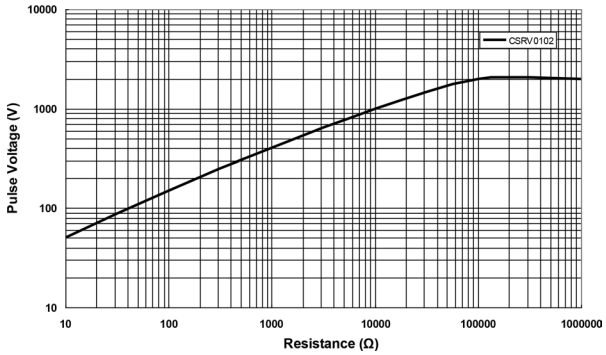
1.2/50μs Lightning Surge



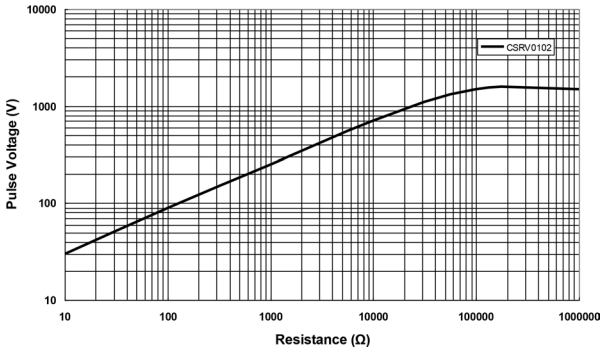
10/700μs Lightning Surge



1.2/50μs Lightning Surge



10/700μs Lightning Surge



Part Number Table

Description	Part Number
MELF Resistor, 0207, 1%, TCR50, 1/2W, 10KΩ	MCCSRV0207FTDU1002
MELF Resistor, 0207, 1%, TCR50, 1/2W, 1.8KΩ	MCCSRV0207FTDU1801
MELF Resistor, 0207, 1%, TCR50, 1/2W, 18Ω	MCCSRV0207FTDU0180
MELF Resistor, 0207, 1%, TCR50, 3/2W, 33Ω	MCCSRV0207FTDU0330
MELF Resistor, 0207, 1%, TCR50, 1/2W, 39Ω	MCCSRV0207FTDU0390
MELF Resistor, 0207, 1%, TCR50, 1/2W, 47KΩ	MCCSRV0207FTDU4702
MELF Resistor, 0207, 1%, TCR50, 1/2W, 470KΩ	MCCSRV0207FTDU4703
MELF Resistor, 0207, 1%, TCR50, 1/2W, 10Ω	MCCSRV0207FTDU0100
MELF Resistor, 0207, 1%, TCR50, 1/2W, 47Ω	MCCSRV0207FTDU0470
MELF Resistor, 0207, 1%, TCR50, 1/2W, 390KΩ	MCCSRV0207FTDU3903
MELF Resistor, 0207, 1%, TCR50, 1/2W, 100Ω	MCCSRV0207FTDU1000
MELF Resistor, 0207, 1%, TCR50, 1/2W, 56Ω	MCCSRV0207FTDU0560
MELF Resistor, 0207, 1%, TCR50, 1/2W, 68KΩ	MCCSRV0207FTDU6802
MELF Resistor, 0207, 1%, TCR50, 1/2W, 820Ω	MCCSRV0207FTDU8200
MELF Resistor, 0204, 0.1%, TCR15, 1/4W, 6.8KΩ	MCCSRV0204BTNV6801
MELF Resistor, 0204, 1%, TCR50, 1/4W, 1.8Ω	MCCSRV0204FTDV1R80
MELF Resistor, 0204, 1%, TCR50, 1/4W, 3.3MΩ	MCCSRV0204FTDV3304
MELF Resistor, 0207, 1%, TCR50, 1/2W, 3.3KΩ	MCCSRV0207FTDU3301
MELF Resistor, 0207, 1%, TCR50, 1/2W, 4.7KΩ	MCCSRV0207FTDU4701
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 430Ω	MCCSRV0204BTNV4300
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 620Ω	MCCSRV0204BTNV6200
MELF Resistor, 0207, 1%, TCR50, 1/2W, 100KΩ	MCCSRV0207FTDU1003
MELF Resistor, 0207, 1%, TCR50, 1/2W, 1MΩ	MCCSRV0207FTDU1004
MELF Resistor, 0207, 1%, TCR50, 1/2W, 390Ω	MCCSRV0207FTDU3900
MELF Resistor, 0207, 1%, TCR50, 1/2W, 150Ω	MCCSRV0207FTDU1500

MELF Resistor, 0207, 1%, TCR50, 1/2W, 0Ω	MCCSRV0207FT-UR0R0
MELF Resistor, 0207, 1%, TCR50, 1/2W, 82Ω	MCCSRV0207FTDU0820
MELF Resistor, 0204, 1%, TCR50, 1/4W, 1MΩ	MCCSRV0204FTDV1004
MELF Resistor, 0204, 1%, TCR50, 1/4W, 100KΩ	MCCSRV0204FTDV1003
MELF Resistor, 0207, 1%, TCR50, 1/2W, 120KΩ	MCCSRV0207FTDU1203
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 330Ω	MCCSRV0204BTNV3300
MELF Resistor, 0204, 0.1%, TCR15, 3/4W, 3.3KΩ	MCCSRV0204BTNV3301
MELF Resistor, 0204, 1%, TCR50, 1/4W, 180Ω	MCCSRV0204FTDV1800
MELF Resistor, 0204, 1%, TCR50, 1/4W, 270KΩ	MCCSRV0204FTDV2703
MELF Resistor, 0204, 1%, TCR50, 1/4W 3, 9KΩ	MCCSRV0204FTDV3901
MELF Resistor, 0204, 0.1%, TCR15, 3/4W, 3.9KΩ	MCCSRV0204BTNV3901
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 82Ω	MCCSRV0204BTNV0820
MELF Resistor, 0207, 1%, TCR50, 1/2W, 1.5Ω	MCCSRV0207FTDU1R50
MELF Resistor, 0207, 1%, TCR50, 1/2W, 3.3Ω	MCCSRV0207FTDU3R30
MELF Resistor, 0207, 1%, TCR50, 1/2W, 8.2Ω	MCCSRV0207FTDU8R20
MELF Resistor, 0204, 1%, TCR50, 1/4W, 6.8Ω	MCCSRV0204FTDV6R80
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 180Ω	MCCSRV0204BTNV1800
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 240Ω	MCCSRV0204BTNV2400
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 470Ω	MCCSRV0204BTNV4701
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 56Ω	MCCSRV0204BTNV0560
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 68KΩ	MCCSRV0204BTNV6802
MELF Resistor, 0207, 1%, TCR50, 1/2W, 4.7Ω	MCCSRV0207FTDU4R70
MELF Resistor, 0204, 1%, TCR50, 1/4W, 2.2MΩ	MCCSRV0204FTDV2204
MELF Resistor, 0204, 0.1%, TCR15, 4/4W, 4.3KΩ	MCCSRV0204BTNV4301
MELF Resistor, 0207, 1%, TCR50, 1/2W, 5.6Ω	MCCSRV0207FTDU5R60
MELF Resistor, 0204, 1%, TCR50, 1/4W, 1Ω	MCCSRV0204FTDV0010
MELF Resistor, 0204, 1%, TCR50, 1/4W, 2.7Ω	MCCSRV0204FTDV2R70
MELF Resistor, 0204, 1%, TCR50, 1/4W, 3.9Ω	MCCSRV0204FTDV3R90
MELF Resistor, 0207, 1%, TCR50, 1/2W, 1KΩ	MCCSRV0207FTDU1001
MELF Resistor, 0204, 1%, TCR50, 1/4W, 10KΩ	MCCSRV0204FTDV1002
MELF Resistor, 0204, 1%, TCR50, 1/4W, 10Ω	MCCSRV0204FTDV0100
MELF Resistor, 0204, 1%, TCR50, 1/4W, 220Ω	MCCSRV0204FTDV2200
MELF Resistor, 0204, 1%, TCR50, 1/4W, 560Ω	MCCSRV0204FTDV5600
MELF Resistor, 0204, 1%, TCR50, 1/4W, 680KΩ	MCCSRV0204FTDV6803
MELF Resistor, 0204, 1%, TCR50, 1/4W, 68Ω	MCCSRV0204FTDV0680
MELF Resistor, 0204, 1%, TCR50, 1/4W, 150KΩ	MCCSRV0204FTDV1503
MELF Resistor, 0204, 1%, TCR50, 1/4W, 560KΩ	MCCSRV0204FTDV5603
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 910Ω	MCCSRV0204BTNV9100
MELF Resistor, 0207, 1%, TCR50, 1/2W, 220KΩ	MCCSRV0207FTDU2203
MELF Resistor, 0207, 1%, TCR50, 1/2W, 270Ω	MCCSRV0207FTDU2700

MELF Resistor, 0207, 1%, TCR50, 1/2W, 330KΩ	MCCSRV0207FTDU3303
MELF Resistor, 0207, 1%, TCR50, 1/2W, 680Ω	MCCSRV0207FTDU6800
MELF Resistor, 0204, 1%, TCR50, 1/4W, 100Ω	MCCSRV0204FTDV1000
MELF Resistor, 0204, 1%, TCR50, 1/4W, 120Ω	MCCSRV0204FTDV1200
MELF Resistor, 0204, 1%, TCR50, 1/4W, 120KΩ	MCCSRV0204FTDV1203
MELF Resistor, 0204, 1%, TCR50, 1/4W, 1.5KΩ	MCCSRV0204FTDV1501
MELF Resistor, 0207, 1%, TCR50, 1/2W, 220Ω	MCCSRV0207FTDU2200
MELF Resistor, 0207, 1%, TCR50, 1/2W, 33KΩ	MCCSRV0207FTDU3302
MELF Resistor, 0207, 1%, TCR50, 1/2W, 2.7KΩ	MCCSRV0207FTDU2701
MELF Resistor, 0204, 1%, TCR50, 1/4W, 2.7KΩ	MCCSRV0204FTDV2701
MELF Resistor, 0204, 1%, TCR50, 1/4W, 27KΩ	MCCSRV0204FTDV2702
MELF Resistor, 0204, 1%, TCR50, 1/4W, 330Ω	MCCSRV0204FTDV3300
MELF Resistor, 0204, 1%, TCR50, 1/4W, 33KΩ	MCCSRV0204FTDV3302
MELF Resistor, 0204, 1%, TCR50, 1/4W, 39Ω	MCCSRV0204FTDV0390
MELF Resistor, 0204, 1%, TCR50, 1/4W, 6.8KΩ	MCCSRV0204FTDV6801
MELF Resistor, 0207, 1%, TCR50, 1/2W, 470Ω	MCCSRV0207FTDU4700
MELF Resistor, 0207, 1%, TCR50, 1/2W, 22Ω	MCCSRV0207FTDU0220
MELF Resistor, 0204, 1%, TCR50, 1/4W, 1.8Ω	MCCSRV0204FTDV1801
MELF Resistor, 0204, 1%, TCR50, 1/4W, 18Ω	MCCSRV0204FTDV0180
MELF Resistor, 0204, 1%, TCR50, 1/4W, 33Ω	MCCSRV0204FTDV0330
MELF Resistor, 0204, 1%, TCR50, 1/4W, 470KΩ	MCCSRV0204FTDV4703
MELF Resistor, 0204, 1%, TCR50, 1/4W, 56KΩ	MCCSRV0204FTDV5602
MELF Resistor, 0204, 1%, TCR50, 1/4W, 8.2KΩ	MCCSRV0204FTDV8201
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 18KΩ	MCCSRV0204BTNV1802
MELF Resistor, 0204, 1%, TCR50, 1/4W, 47Ω	MCCSRV0204FTDV0470
MELF Resistor, 0204, 1%, TCR50, 1/4W, 56Ω	MCCSRV0204FTDV0560
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 110Ω	MCCSRV0204BTNV1100
MELF Resistor, 0207, 1%, TCR50, 1/2W, 27KΩ	MCCSRV0207FTDU2702
MELF Resistor, 0207, 1%, TCR50, 1/2W, 3.9KΩ	MCCSRV0207FTDU3901
MELF Resistor, 0207, 1%, TCR50, 1/2W, 6.8KΩ	MCCSRV0207FTDU6801
MELF Resistor, 0207, 1%, TCR50, 1/2W, 5.6KΩ	MCCSRV0207FTDU5601
MELF Resistor, 0204, 1%, TCR50, 1/4W, 1KΩ	MCCSRV0204FTDV1001
MELF Resistor, 0204, 1%, TCR50, 1/4W, 1.2KΩ	MCCSRV0204FTDV1201
MELF Resistor, 0204, 1%, TCR50, 1/4W, 22KΩ	MCCSRV0204FTDV2202
MELF Resistor, 0204, 1%, TCR50, 1/4W, 220KΩ	MCCSRV0204FTDV2203
MELF Resistor, 0204, 1%, TCR50, 1/4W, 22Ω	MCCSRV0204FTDV0220
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 3KΩ	MCCSRV0204BTNV3001
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 200Ω	MCCSRV0204BTNV2000
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 13KΩ	MCCSRV0204BTNV1302

MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 360Ω	MCCSRV0204BTNV3600
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 43KΩ	MCCSRV0204BTNV4302
MELF Resistor, 0204, 0.1%, TCR15, 5/4W, 5.1KΩ	MCCSRV0204BTNV5101
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 750Ω	MCCSRV0204BTNV7500
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 820Ω	MCCSRV0204BTNV8200
MELF Resistor, 0207, 1%, TCR50, 1/2W, 1Ω	MCCSRV0207FTDU0010
MELF Resistor, 0207, 1%, TCR50, 1/2W, 2.2Ω	MCCSRV0207FTDU2R20
MELF Resistor, 0204, 1%, TCR50, 1/4W, 4.7Ω	MCCSRV0204FTDV4R70
MELF Resistor, 0204, 1%, TCR50, 1/4W, 5.6Ω	MCCSRV0204FTDV5R60
MELF Resistor, 0207, 1%, TCR50, 1/2W, 120Ω	MCCSRV0207FTDU1200
MELF Resistor, 0207, 1%, TCR50, 1/2W, 1.2KΩ	MCCSRV0207FTDU1201
MELF Resistor, 0207, 1%, TCR50, 1/2W, 82KΩ	MCCSRV0207FTDU8202
MELF Resistor, 0207, 1%, TCR50, 1/2W, 27Ω	MCCSRV0207FTDU0270
MELF Resistor, 0204, 1%, TCR50, 1/4W, 150Ω	MCCSRV0204FTDV1500
MELF Resistor, 0204, 1%, TCR50, 1/4W, 15KΩ	MCCSRV0204FTDV1502
MELF Resistor, 0204, 1%, TCR50, 1/4W, 18KΩ	MCCSRV0204FTDV1802
MELF Resistor, 0204, 1%, TCR50, 1/4W, 680Ω	MCCSRV0204FTDV6800
MELF Resistor, 0204, 1%, TCR50, 1/4W, 68KΩ	MCCSRV0204FTDV6802
MELF Resistor, 0204, 1%, TCR50, 1/4W, 12KΩ	MCCSRV0204FTDV1202
MELF Resistor, 0204, 1%, TCR50, 1/4W, 12Ω	MCCSRV0204FTDV0120
MELF Resistor, 0204, 1%, TCR50, 1/4W, 2.2KΩ	MCCSRV0204FTDV2201
MELF Resistor, 0204, 1%, TCR50, 1/4W, 270Ω	MCCSRV0204FTDV2700
MELF Resistor, 0204, 1%, TCR50, 1/4W, 330KΩ	MCCSRV0204FTDV3303
MELF Resistor, 0204, 1%, TCR50, 1/4W, 4.7KΩ	MCCSRV0204FTDV4701
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 20KΩ	MCCSRV0204BTNV2002
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 15KΩ	MCCSRV0204BTNV1502
MELF Resistor, 0204, 0.1%, TCR15, 1/4W, 1.5KΩ	MCCSRV0204BTNV1501
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 130Ω	MCCSRV0204BTNV1300
MELF Resistor, 0207, 1%, TCR50, 1/2W, 1Ω	MCCSRV0207FTDU0010
MELF Resistor, 0204, 1%, TCR50, 1/4W, 39KΩ	MCCSRV0204FTDV3902
MELF Resistor, 0204, 1%, TCR50, 1/4W, 470Ω	MCCSRV0204FTDV4700
MELF Resistor, 0204, 1%, TCR50, 1/4W, 47KΩ	MCCSRV0204FTDV4702
MELF Resistor, 0204, 1%, TCR50, 1/4W, 820Ω	MCCSRV0204FTDV8200
MELF Resistor, 0204, 1%, TCR50, 1/4W, 390Ω	MCCSRV0204FTDV3900
MELF Resistor, 0204, 0.1%, TCR15, 2/4W, 2.4KΩ	MCCSRV0204BTNV2401
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 2KΩ	MCCSRV0204BTNV2001
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 150Ω	MCCSRV0204BTNV1500
MELF Resistor, 0207, 1%, TCR50, 1/2W, 100Ω	MCCSRV0207FTDU1000
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 1KΩ	MCCSRV0204BTNV1001
MELF Resistor, 0207, 1%, TCR50, 1/2W, 22Ω	MCCSRV0207FTDU0220

MELF Resistor, 0207, 1%, TCR50, 1/2W, 47Ω	MCCSRV0207FTDU0470
MELF Resistor, 0207, 1%, TCR50, 1/2W, 6.8KΩ	MCCSRV0207FTDU6801
MELF Resistor, 0207, 1%, TCR50, 1/2W, 220KΩ	MCCSRV0207FTDU2203
MELF Resistor, 0204, 1%, TCR50, 1/4W, 100KΩ	MCCSRV0204FTDV1003
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 120Ω	MCCSRV0204BTNV1200
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 100KΩ	MCCSRV0204BTNV1003
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 10KΩ	MCCSRV0204BTNV1002
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 100Ω	MCCSRV0204BTNV1000
MELF Resistor, 0204, 0.1%, TCR50, 1/4W, 12KΩ	MCCSRV0204BTNV1202
MELF Resistor, 0207, 0.1%, TCR50, 1/2W, 390KΩ	MCCSRV0207BTDU3903
MELF Resistor, 0207, 1%, TCR50, 1/2W, 10Ω	MCCSRV0207FTDU0100
MELF Resistor, 0207, 1%, TCR50, 1/2W, 3.3Ω	MCCSRV0207FTDU3R30
MELF Resistor, 0207, 1%, TCR50, 1/2W, 5.6KΩ	MCCSRV0207FTDU5601