MCSSA 5216 SERIES

METAL SHUNT RESISTOR

CURRENT METAL SHUNT RESISTOR ▲ Flat type
Ultra-low resistance values up to 0.05mΩ
Sulfur resistant construction
Extremely high overcurrent capability up to 600A
Customize version possible
AEC-Q200 qualified

SPECIFICATION

Item		Characteristics		
Operating Temperature Range		-55°C to +170°C		
Resistive Element Material		MnCuSn		
Resistance Range Note 1	R	0.1mΩ to 0.25mΩ		
Resistance Tolerance	ΔR	±5% ▲ ±10%		
Power Rating at 70°C	P_{70}	12W		
Max. Working Voltage Note 2	V_W	$\sqrt{P \cdot R}$		
Max. Continuous Current	I_{MAX}	$\sqrt{P/R}$		
Temperature Coefficient Component Note 3	TCR_{COMP}	±150ppm		
Temperature Coefficient Element Note 4	TCR_{ELEM}	< ±50ppm		
Case sizes	Size	Length	Width	Height
	5216	52mm	16mm	3mm

Notes:

1: **R** — **Other values may be available, consult MGT.**

2: **V_W** — **Working voltage is the maximum DC or AC (rms) continuous voltage, corresponding to the rated power P at the operating temperature.**
$V_W = \sqrt{P \cdot R}$ **[P = Rated power (W) at operating temperature; R = Resistance value (Ω)]**

3: **TCR_{COMP}** — **Component TCR - Total TCR that includes the TCR effects of the resistor element and the copper terminal**

4: **TCR_{ELEM}** — **Element TCR - Only applies to the alloy used for the resistor element.**

APPLICATIONS

Automotive	Battery Charger	Renewable Energy	Motors & Drives	AC/DC Converter	DC/DC Converter	Welding Inverter

ELECTRICAL CHARACTERISTICS

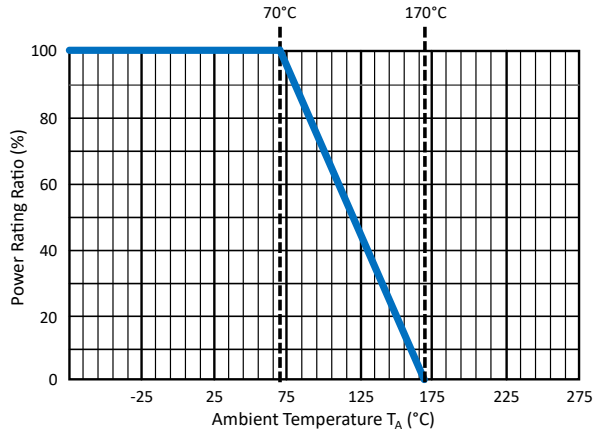
Part number shows blister tape on plastic reel.

Size	R Resistance (mΩ)	P_{70} Power Rating at 70°C (W)	P_{100} Power Rating at 100°C (W)	TCR_{Comp} Temperature Coefficient Component (ppm)	TCR_{Elem} Temperature Coefficient Element (ppm)	Element Material	MGT Part Number
5216	0.10	12	10	±150	< ±50	MnCuSn	MCSSA5216T ⬚ O0L10
	0.15	12	10	±150	< ±50	MnCuSn	MCSSA5216T ⬚ O0L15
	0.20	12	10	±150	< ±50	MnCuSn	MCSSA5216T ⬚ O0L20
	0.25	12	10	±150	< ±50	MnCuSn	MCSSA5216T ⬚ O0L25

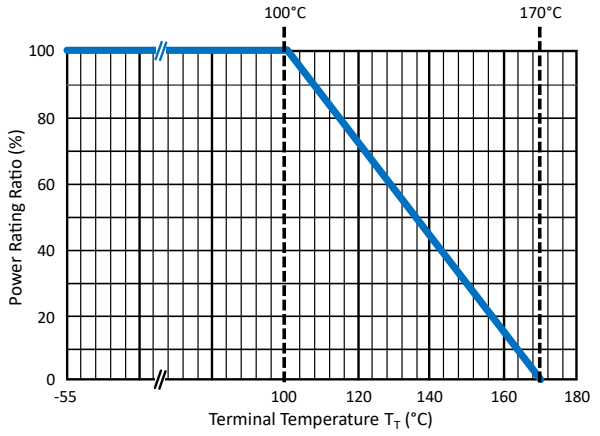
Note: ⬚ **: Enter the appropriate resistance tolerance code. J for ±5% or K for ±10%.**

DERATING CURVE

Power Derating Characteristics at T_A = 70°C

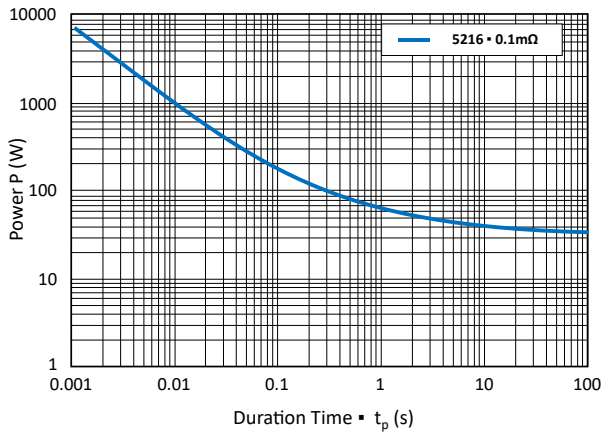


Power Derating Characteristics at T_T = 100°C



PULSE CAPABILITY

Pulsed Power Characteristics ▪ MCSSA 5216 Series

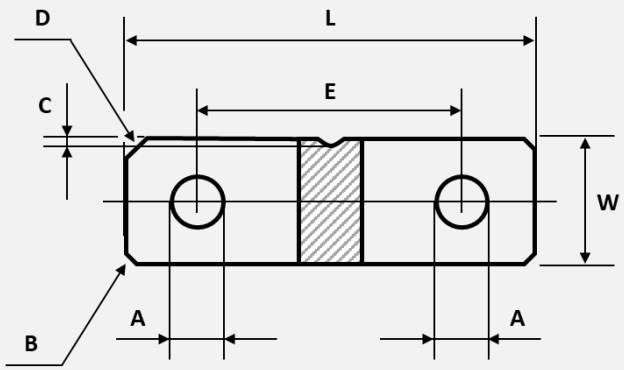


Note:
Other pulsed power characteristics on request

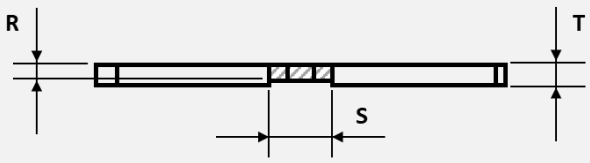
PACKAGE OUTLINE ▲ All dimensions in mm

Size 5216

Top view



Side view



Size	R Resistance (mΩ)	L	W	E	A	B (x 45°)	C	D (x 45°)	R (Ref.)	S (Ref.)	T
5216	0.10	52.0±0.3	16.0±0.15	33.7±0.15	Ø6.6±0.1	1.0±0.15	3 max.	3.0±0.15	2.4	7.5	3.0±0.5
	0.15	52.0±0.3	16.0±0.15	33.7±0.15	Ø6.6±0.1	1.0±0.15	3 max.	3.0±0.15	2.4	7.5	3.0±0.5
	0.20	52.0±0.3	16.0±0.15	33.7±0.15	Ø6.6±0.1	1.0±0.15	3 max.	3.0±0.15	2.4	7.5	3.0±0.5
	0.25	52.0±0.3	16.0±0.15	33.7±0.15	Ø6.6±0.1	1.0±0.15	3 max.	3.0±0.15	2.4	7.5	3.0±0.5

PRODUCT CODE

Example: MCSSA series ▲ AEC-Q200 ▲ Size 5216 ▲ 0.10mΩ ▲ ±5% ▲ 12W ▲ Tray

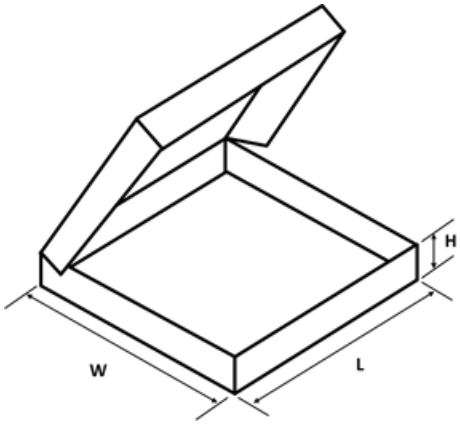
MCSSA		5216		T		J		O		0L10	
Series		Dimensions		Packaging		Tolerance		Power Rating		Resistance	
Code	Desc.	Code	Size	Code	Desc.	Code	%	Code	P_{70} (W)	Code	mΩ
MCSSA	AEC-Q200	5216	5216	T	Tray	J K	±5 ±10	O	12	0L10 0L15 0L20 0L25	0.10 0.15 0.20 0.25

STORAGE AND HANDLING CONDITIONS

Floor life	Temperature	Humidity	MSL
Unlimited	T_A = 22 to 28°C	RH = 40 to 75%	1

PACKAGING

Size	Quantity Box (pcs)	Quantity (pcs) Outer Carton	L x W x H (mm) Outer Carton
5216	100	100	190 x 110 x 50



RELIABILITY TESTS ▪ STANDARD

Standard: JIS C 5202, MIL-STD 202

No.	Test	Test Specification	Test Standard	Test Limits
1	Short Time Overload	Loading 5 times rated power for 5sec	JIS C 5202-5.5	ΔR: ±(1%+0.0005Ω)
2	Temperature Coef-ficient of Re-sistance (T.C.R.)	+25°C to +125°C $TCR(ppm/°C) = \frac{\Delta R}{R \cdot \Delta T} \cdot 10^6$	JIS C 5202-5.2	Refer to electrical specification.
3	Moisture Resistance	The specimens shall be placed in a chamber and subjected to a relative humidity of 90~98% percent and a tempera-ture of 25°C / 65°C with 10 cycles.	MIL-STD-202, Method 106	ΔR: ±(1%+0.0005Ω)
4	High Temperature Exposure	The resistor is exposed in the heat chamber 170°C for 1000 hrs.	JIS C 5202-7.2	ΔR: ±(1%+0.0005Ω)
5	Load Life	Apply rated power for 1000 hours with 1.5 hours ON and 0.5 hour OFF.	JIS C 5202-7.10	ΔR: ±(1%+0.0005Ω)
6	Thermal Shock	-55°C to +155°C, 1000 cycles, 15 min at each extreme.	MIL-STD-202 Method 107	ΔR: ±(1%+0.0005Ω)
7	Vibration	5 g's for 20 min., 12 cycles each of 3 orientations.	MIL-STD-202 Method 201	ΔR: ±(0.5%+0.0005Ω)
8	Biased Humidity	The specimens shall be placed in a chamber and subjected to a relative humidity of 85% percent and a temperature of 85°C for 1000hrs.	MIL-STD-202 Method 103	ΔR: ±(1%+0.0005Ω)

REVISION TABLE

Revision	Date	Status	Notes
001	01/10/2021	Initial release	Initial publication

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It is subject to the user's duty of care to design and validate his products in such a way that appropriate measures are taken, such as protective circuits or redundant systems to ensure the safety standards required in the application.

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