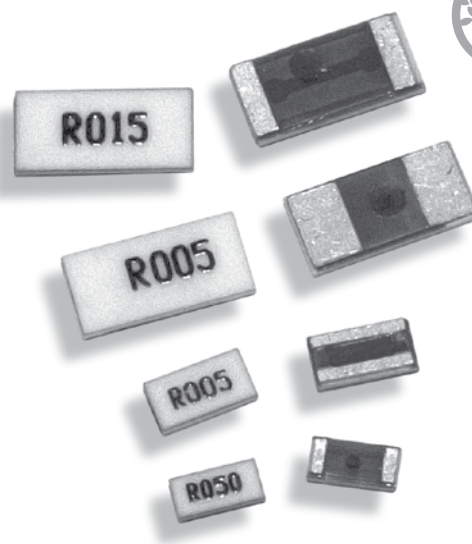


MCS Series

Metal Element Current Sense Resistive Metal Alloy mOhm Technology, SMD



FEATURES

- NiCu or MnCu resistive alloy; material TCR $\pm 10\text{ppm}/^\circ\text{K}$
- Marking epoxy UL-94-V0 conformal
- 96% alumina substrate thermo dissipation protective layer
- Cu Terminal Electrode with Pb Free termination (60% Sn, 40% Ni)
- Flame-retardant epoxy protective coat (UL-94-V0)
- Ultra low resistance value ($0.005\Omega \sim 0.050\Omega$)
- Precision resistance alloy (NiCr20AlSi, or CuMnNi); material selected for low TCR ($<50\text{ppm}/^\circ\text{C}$)
- Superior temperature coefficient characteristics; resistance vs. temp. change from 25°C to 125°C within $10\text{ppm}/^\circ\text{C} \sim 50\text{ppm}/^\circ\text{C}$
- Low inductance, low thermo EMF ($<50\mu\text{V}/^\circ\text{C}$)

APPLICATIONS

- Industrial electronics, power electronics: power supply, DC/DC converter, AC/DC converter, motor controller, automotive electronics
- Battery charger, PC, PDA, 3C products, Telecommunications, instruments, white goods

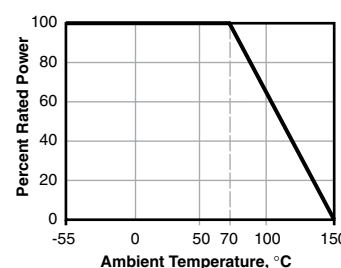
SERIES SPECIFICATIONS

Series	Power Rating (@70°C)	Resistance TCR (ppm/°C)							
		5mΩ	10mΩ	15mΩ	20mΩ	25mΩ	30mΩ	40mΩ	50mΩ
MCS1632	1W	<200	<70	<40	<40	<40	<40	<40	<40
MCS3264	2W	<200	<70	<40	<40	<40	<40	<40	<40

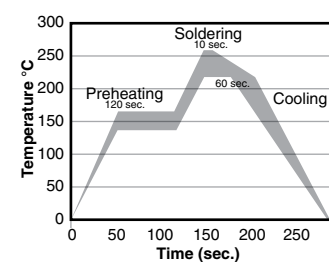
CHARACTERISTICS

Resistance Range	0.005Ω - 0.05Ω
Color	white (top) / green (bottom)
Power	1 and 2 watts at 70°C
Standard resistance values (mΩ)	5, 10, 15, 20, 25, 30, 35, 50
TCR	$\pm 50\text{ppm}/^\circ\text{C}$ (two standard series of temperatures: 25°C , 0°C , -15°C , -55°C and 25°C , 50°C , 75°C , 125°C , 150°C ; temp. tolerance $\pm 3^\circ\text{C}$; $\text{TCR} = (R_2 - R_1)/R_1(T_2 - T_1) \times 10^6$)
Tolerance	1%, 3%, 5%
Rated voltage	$(P \times R)^{1/2}$

Derating



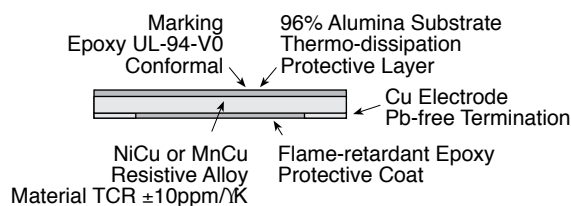
Recommended Solder Profile



Preheating: $145^\circ\text{C} \pm 15^\circ$, max. 120 sec.

Soldering: min. 220°C , max. 60 sec.

Max. Temp.: $260^\circ\text{C} \pm 5^\circ$, 10 sec.



MCS Series

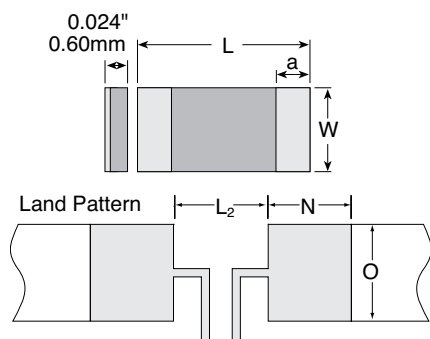
Metal Element Current Sense Resistive Metal Alloy mOhm Technology, SMD

PERFORMANCE CHARACTERISTICS

Test	Condition	Maximum ΔR
Short Time Overload	JIS C 5201 4.13; Overload voltage 2.5x rated voltage for 5 sec.	$\pm(0.5\% + 0.0005\Omega)$
High Temp. Exposure	JIS C 5202 7.11; Test chamber 155 $\pm 3^\circ\text{C}$ for 1000 +48/-0 hours	$\pm(0.5\% + 0.0005\Omega)$
Low Temp. Storage	JIS C 5202 7.1; Test chamber -55 $\pm 3^\circ\text{C}$ for 96 ± 4 hours	$\pm(0.5\% + 0.0005\Omega)$
Endurance under Damp and Load	JIS C 5202 7.9; Temp. 60 $\pm 2^\circ\text{C}$, relative humidity 90-95%, rated DC voltage applied 90 min. on, 30 min. off for 1000 +48/-0 hours	$\pm(0.5\% + 0.0005\Omega)$
Thermal Shock	JIS C 5202 7.4; -55 $\pm 3^\circ\text{C}$ for 30 min. to room temp for 2-3 min. to +150 $\pm 2^\circ\text{C}$ for 30 min. to room temp for 2-3 min., 100 cycles	$\pm(0.5\% + 0.0005\Omega)$
Load Life	JIS C 5202 7.10; Temp. 70 $\pm 2^\circ\text{C}$, rated DC voltage applied 90 min. on, 30 min. off for 1000 +48/-0 hours	$\pm(1\% + 0.0005\Omega)$
Solderability	JIS C 5202 6.5; Solder temp. 235 $\pm 5^\circ\text{C}$, 2 ± 0.5 sec. immersion	New solder min. 90% of terminal
Resistance to Solder Heat	JIS C 5202 6.4; Solder temp. 260 $\pm 5^\circ\text{C}$, 10 ± 1 sec. immersion	$\pm(0.5\% + 0.0005\Omega)$
Mechanical Shock	JIS C 5202 6.2; Load 10N (1.02kgf) for 10 ± 1 sec., middle of specimen pressurized	$\pm(0.5\% + 0.0005\Omega)$
Insulation Resistance	JIS C 5202 5.6; DC 100 $\pm 15\text{V}$ for 1 min.	>102M Ω

DIMENSIONS

(in./mm ± 0.2)



Size	L	W	a	Solder Thickness (μm)
MCS1632	0.126/3.20	0.063/1.60	0.020/0.50	105
MCS3264	0.252/6.40	0.126/3.20	0.040/1.00	105
MCS3264R005FER			0.075/1.9 ± 2	

Size	Resistance	L2	O	N	Solder Thickness	Loading
MCS1632	$\leq 8\text{m}\Omega$	0.60mm	1.84mm	2.80mm	105 μm	1.0w
	$> 8\text{m}\Omega$	1.20mm	1.84mm	2.50mm	105 μm	1.0w
MCS3264	$\leq 8\text{m}\Omega$	1.60mm	3.57mm	3.85mm	105 μm	2.0w
	$> 8\text{m}\Omega$	3.10mm	3.57mm	3.10mm	105 μm	2.0w

Packaging

(in./mm)

Size	Tape width $\pm 0.30\text{mm}$	Reel diam. $\pm 0.50\text{mm}$	Pc/Reel	Weight (g ± 10)
MCS1632	0.315/8.00	7.00/178.0	5000	131
MCS3264	0.472/12.00	7.00/178.0	4000	291

ORDERING INFORMATION

RoHS Compliant				
MCS1632R005FER				
Series	Case Size	Ohms	Tolerance	Taping Code
Metal Alloy	1632 = 1w	R005 = 0.005%	F = 1%	1632 = 5,000 pc/reel
Current Sense	3264 = 2w			3264 = 4,000 pc/reel

Part Number	Power Rating	Ohm Value	Qty./Reel
MCS1632R010FER	1W	0.01 Ω	5000
MCS1632R015FER	1W	0.015 Ω	5000
MCS1632R020FER	1W	0.02 Ω	5000
MCS1632R025FER	1W	0.025 Ω	5000
MCS1632R050FER	1W	0.05 Ω	5000
MCS3264R005FER	2W	0.005 Ω	4000
MCS3264R010FER	2W	0.01 Ω	4000
MCS3264R015FER	2W	0.015 Ω	4000
MCS3264R020FER	2W	0.02 Ω	4000
MCS3264R025FER	2W	0.025 Ω	4000
MCS3264R050FER	2W	0.05 Ω	4000