



# MCS SERIES – Current Sensing Chip Resistors



RoHS Compliant

## FEATURES

- Low TCR from  $\pm 100\text{PPM}$  to  $\pm 600\text{PPM} / ^\circ\text{C}$  ; 3W Rating in 1W size , 1225 Package .
- Resistance values from 1m ohm to 1000m ohms .
- High Purity Alumina Substrate for High Power Dissipation .
- Products with Lead Free terminations meet RoHS Compliant .

## PART NUMBERING SYSTEM

<b>MCS</b>	<b>0402G</b>	—	<b>R10F</b>	—	<b>LF</b>
TYPE	DIMENSIONS		IMPEDANCE		LEAD FREE

## SHAPES AND DIMENSIONS

UNIT : mm

TYPE	DIMENSIONS	EIA	RESISTANCE	TOLERANCE
MCS0402	1.00x0.50	0402	F= $\pm 1\%$ ; G= $\pm 2\%$ ; H= $\pm 3\%$ ; J= $\pm 5\%$	
MCS0603	1.60x0.80	0603	F= $\pm 1\%$ ; G= $\pm 2\%$ ; H= $\pm 3\%$ ; J= $\pm 5\%$	
MCS0805	2.00x1.25	0805	F= $\pm 1\%$ ; G= $\pm 2\%$ ; H= $\pm 3\%$ ; J= $\pm 5\%$	
MCS1206	3.10x1.55	1206	F= $\pm 1\%$ ; G= $\pm 2\%$ ; H= $\pm 3\%$ ; J= $\pm 5\%$	
MCS2010	5.00x2.50	2010	F= $\pm 1\%$ ; G= $\pm 2\%$ ; H= $\pm 3\%$ ; J= $\pm 5\%$	
MCS1225	3.10x6.30	1225	F= $\pm 1\%$ ; G= $\pm 2\%$ ; H= $\pm 3\%$ ; J= $\pm 5\%$	
MCS2512	6.30x3.20	2512	F= $\pm 1\%$ ; G= $\pm 2\%$ ; H= $\pm 3\%$ ; J= $\pm 5\%$	
MCS3720	3.75x2.00	3720	F= $\pm 1\%$ ; G= $\pm 2\%$ ; H= $\pm 3\%$ ; J= $\pm 5\%$	
MCS7520	7.50x2.00	7520	F= $\pm 1\%$ ; G= $\pm 2\%$ ; H= $\pm 3\%$ ; J= $\pm 5\%$	

## DIMENSIONS

TYPE	L	W	T	D1	D2
MCS0402	1.00 $\pm$ 0.05	0.50 $\pm$ 0.05	0.32 $\pm$ 0.10	0.25 $\pm$ 0.10	0.20 $\pm$ 0.10
MCS0603	1.60 $\pm$ 0.10	0.80 $\pm$ 0.10	0.45 $\pm$ 0.10	0.30 $\pm$ 0.20	0.30 $\pm$ 0.20
MCS0805	2.00 $\pm$ 0.15	1.25 $\pm$ 0.15	0.55 $\pm$ 0.10	0.30 $\pm$ 0.20	0.40 $\pm$ 0.25
MCS1206	3.05 $\pm$ 0.15	1.55 $\pm$ 0.15	0.55 $\pm$ 0.10	0.50 $\pm$ 0.30	0.40 $\pm$ 0.25
MCS2010	5.00 $\pm$ 0.20	2.45 $\pm$ 0.15	0.60 $\pm$ 0.15	0.60 $\pm$ 0.30	0.50 $\pm$ 0.25
MCS1225	3.10 $\pm$ 0.15	6.30 $\pm$ 0.15	0.90 $\pm$ 0.15	0.60 $\pm$ 0.20	0.55 $\pm$ 0.20
MCS2512	6.35 $\pm$ 0.20	3.15 $\pm$ 0.15	0.60 $\pm$ 0.10	0.60 $\pm$ 0.20	0.55 $\pm$ 0.20
MCS3720	2.00 $\pm$ 0.20	3.75 $\pm$ 0.20	0.60 $\pm$ 0.10	0.40 $\pm$ 0.20	0.40 $\pm$ 0.20
MCS7520	2.00 $\pm$ 0.20	7.50 $\pm$ 0.30	0.60 $\pm$ 0.10	0.40 $\pm$ 0.20	0.40 $\pm$ 0.20



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### STANDARD ELECTRICAL SPECIFICATION TABLE

TYPE	Power Rating @ 70°C	Operating Temp. Range	Resistance Tolerance	Resistance Range(mΩ)	TCR °C)	PPM/
MCS0402H	1/16W	-55 to +155°C	±1% ; ±2% ; ±5%	50 to 100	±400	
MCS0402G	1/16W	-55 to +155°C	±1% ; ±2% ; ±5%	101 to 500	±300	
MCS0402F	1/16W	-55 to +155°C	±1% ; ±2% ; ±5%	501 to 1000	±200	
MCS0603J	1/10W	-55 to +155°C	±1% ; ±2% ; ±5%	20 to 50	±600	
MCS0603H	1/10W	-55 to +155°C	±1% ; ±2% ; ±5%	51 to 100	±400	
MCS0603G	1/10W	-55 to +155°C	±1% ; ±2% ; ±5%	101 to 500	±300	
MCS0603F	1/10W	-55 to +155°C	±1% ; ±2% ; ±5%	501 to 1000	±200	
MCS0805J	1/10W	-55 to +155°C	±1% ; ±2% ; ±5%	20 to 50	±600	
MCS0805H	1/10W	-55 to +155°C	±1% ; ±2% ; ±5%	51 to 100	±400	
MCS0805G	1/10W	-55 to +155°C	±1% ; ±2% ; ±5%	101 to 500	±300	
MCS0805F	1/10W	-55 to +155°C	±1% ; ±2% ; ±5%	501 to 1000	±200	
MCS1206J	1/4W	-55 to +155°C	±1% ; ±2% ; ±5%	10 to 20	±600	
MCS1206H	1/4W	-55 to +155°C	±1% ; ±2% ; ±5%	21 to 50	±400	
MCS1206G	1/4W	-55 to +155°C	±1% ; ±2% ; ±5%	51 to 500	±300	
MCS1206F	1/4W	-55 to +155°C	±1% ; ±2% ; ±5%	501 to 1000	±200	
MCS1225J	3W	-55 to +155°C	±1% ; ±2% ; ±5%	5 to 49	±600	
MCS1225F	3W	-55 to +155°C	±1% ; ±2% ; ±5%	50 to 200	±200	
MCS2010J	1/2W	-55 to +155°C	±1% ; ±2% ; ±5%	10 to 20	±600	
MCS2010H	1/2W	-55 to +155°C	±1% ; ±2% ; ±5%	21 to 50	±400	
MCS2010G	1/2W	-55 to +155°C	±1% ; ±2% ; ±5%	51 to 500	±300	
MCS2010F	1/2W	-55 to +155°C	±1% ; ±2% ; ±5%	501 to 1000	±200	
MCS2512J	1W	-55 to +155°C	±1% ; ±2% ; ±5%	10 to 20	±600	
MCS2512H	1W	-55 to +155°C	±1% ; ±2% ; ±5%	21 to 50	±400	
MCS2512G	1W	-55 to +155°C	±1% ; ±2% ; ±5%	51 to 500	±300	
MCS2512F	1W	-55 to +155°C	±1% ; ±2% ; ±5%	501 to 1000	±200	
MCS3720G	1W	-55 to +155°C	±1% ; ±2% ; ±5%	10 to 500	±300	
MCS7520G	2W	-55 to +155°C	±1% ; ±2% ; ±5%	1 to 500	±300	



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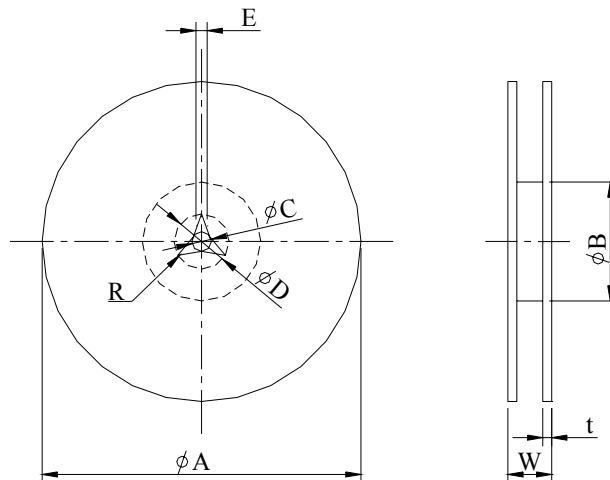
## HIGH POWER RATING ELECTRICAL SPECIFICATION TABLE

TYPE	Power Rating @ 70°C	Operating Temp. Range	Resistance Tolerance	Resistance Range(mΩ)
MCS0805□□□□ V □□□□	1/4W	-55 to +155°C	±1% ; ±2% ; ±5%	100 to 1000
MCS1206□□□□ U □□□□	1/2W	-55 to +155°C	±1% ; ±2% ; ±5%	100 to 1000

## LOW TCR ELECTRICAL SPECIFICATION TABLE

TYPE	Power Rating @ 70°C	Operating Temp. Range	Resistance Tolerance	Resistance Range(mΩ)	TCR (PPM/°C)
MCS1206□□□□ E □□□□	1/4W	-55 to +155°C	±1% ; ±2% ; ±5%	100 to 1000	±100
MCS2010□□□□ E □□□□	1/2W	-55 to +155°C	±1% ; ±2% ; ±5%	100 to 1000	±100
MCS2512□□□□ E □□□□	1W	-55 to +155°C	±1% ; ±2% ; ±5%	100 to 1000	±100

## PACKAGING SPECIFICATION



TYPE	A	B	C	W	T	Paper Tape (EA)	Embossed Tape(EA)
MCS0402	$\phi 178 \pm 2$	$\phi 60 \pm 1$	$\phi 13 \pm 0.2$	$9 \pm 0.5$	$11.4 \pm 1.0$	10,000	—
MCS0603	$\phi 178 \pm 2$	$\phi 60 \pm 1$	$\phi 13 \pm 0.2$	$9 \pm 0.5$	$11.4 \pm 1.0$	5,000	—
MCS0805	$\phi 178 \pm 2$	$\phi 60 \pm 1$	$\phi 13 \pm 0.2$	$9 \pm 0.5$	$11.4 \pm 1.0$	5,000	—
MCS1206	$\phi 178 \pm 2$	$\phi 60 \pm 1$	$\phi 13 \pm 0.2$	$9 \pm 0.5$	$11.4 \pm 1.0$	5,000	—
MCS2010	$\phi 178 \pm 2$	$\phi 60 \pm 1$	$\phi 13 \pm 0.2$	$13.2 \pm 1.5$	$16.0 \pm 1.0$	—	4,000
MCS2512	$\phi 178 \pm 2$	$\phi 60 \pm 1$	$\phi 13 \pm 0.2$	$13.2 \pm 1.5$	$16.0 \pm 1.0$	—	4,000
MCS1225	$\phi 178 \pm 2$	$\phi 60 \pm 1$	$\phi 13 \pm 0.2$	$13.2 \pm 1.5$	$16.0 \pm 1.0$	—	2000
MCS3720	$\phi 178 \pm 2$	$\phi 60 \pm 1$	$\phi 13 \pm 0.2$	$13.2 \pm 1.5$	$16.0 \pm 1.0$	—	4,000
MCS7520	$\phi 178 \pm 2$	$\phi 60 \pm 1$	$\phi 13 \pm 0.2$	$17.0 \pm 1.5$	$19.0 \pm 1.0$	—	4,000



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### ENVIRONMENTAL CHARACTERISTICS

NO	ITEM	SPECIFICATION	TEST METHOD
1	Temperature coefficient of Resistance	As spec.	MIL-STD-202F, Method 304 +25/-55/+25/+125/+25°C
2	Thermal Shock	$\pm(1\%+0.05\Omega)$	MIL-STD-202F, Method 107G -55°C to +150, 100 cycles
3	Short Time Overload	$\pm(2\%+0.05\Omega)$	JIS-C-5202-5.5 RCWV*2.5 or Max overloading Voltage , 5 seconds
4	Dielectric Withstand Voltage	By Type	MIL-STD-202F, Method 301 Apply Max Overload Voltage for 1 minute .
6	Insulation Resistance	1000M $\Omega$ <b>Min</b>	MIL-STD-202F, Method 302 Apply 100 VDC for 1 minute .
7	Load Life	$\pm(1\%+0.05\Omega)$	MIL-STD-202F, Method 108A; RCWV, 70°C ,1.5 hours, 0.5 hours off , total 1000 to 1048 hours
8	Resistance of Soldering Heat	$\pm(0.5\%+0.05\Omega)$	MIL-STD-202F, Method 210E 260°C $\pm$ 5°C ,10 $\pm$ 1 seconds
9	Humidity ( Steady State )	$\pm(0.5\%+0.05\Omega)$	MIL-STD-202F, Method 103B 40°C ,90~95%RH, RCWV 1.5hours ON, 0.5 hours Off , total 1000 to 1048 hours
10	Low Temperature Operation	$\pm(0.5\%+0.05\Omega)$	JIS-C-5202-7.1 1hour ,-65°C ,followed by 45 minutes of RCWV
11	Bending Strength	As spec.	JIS-C-5202 6.1.4 Bending Amplitude 3mm for 10 seconds
12	Solderability	95% min coverage	MIL-STD-202F, Method 208H 260°C $\pm$ 5°C ,2 $\pm$ 0.5 seconds