



## MCS SERIES ~ Current Sensing Chip Resistors



### FEATURES

- Low TCR from  $\pm 100\text{PPM}$  to  $\pm 600\text{PPM}$  / ; 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= $\pm 5\%$
MCS2012	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
MCS2012	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(m Ω)	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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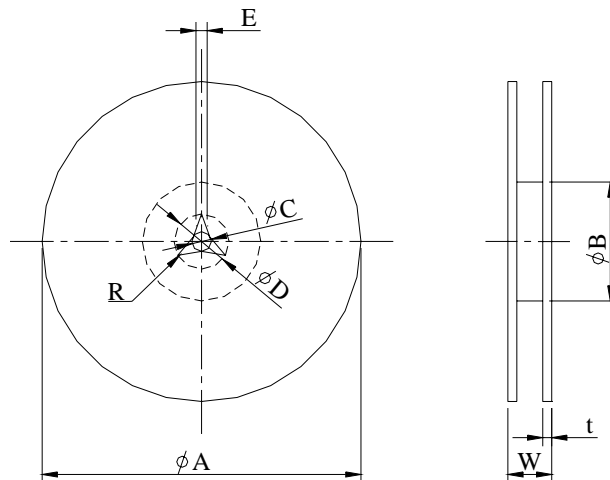
### HIGH POWER RATING ELECTRICAL SPECIFICATION TABLE

TYPE		Power Rating @ 70°C	Operating Temp. Range	Resistance Tolerance	Resistance Range(m )
<b>MCS0805</b>	<b>V</b>	1/4W	-55 to +155°C	±1% ; ±2% ; ±5%	100 to 1000
<b>MCS1206</b>	<b>U</b>	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(m )	TCR (PPM/°C)
<b>MCS1206</b>	<b>E</b>	1/4W	-55 to +155°C	±1% ; ±2% ; ±5%	100 to 1000	±100
<b>MCS2010</b>	<b>E</b>	1/2W	-55 to +155°C	±1% ; ±2% ; ±5%	100 to 1000	±100
<b>MCS2512</b>	<b>E</b>	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)
<b>MCR0402</b>	178±2	60±1	13±0.2	9±0.5	11.4±1.0	10,000	—
<b>MCR0603</b>	178±2	60±1	13±0.2	9±0.5	11.4±1.0	5,000	—
<b>MCR0805</b>	178±2	60±1	13±0.2	9±0.5	11.4±1.0	5,000	—
<b>MCR1206</b>	178±2	60±1	13±0.2	9±0.5	11.4±1.0	5,000	—
<b>MCR2010</b>	178±2	60±1	13±0.2	13.2±1.5	16.0±1.0	—	4,000
<b>MCR2512</b>	178±2	60±1	13±0.2	13.2±1.5	16.0±1.0	—	4,000
<b>MCR1225</b>	178±2	60±1	13±0.2	13.2±1.5	16.0±1.0	—	2000
<b>MCR3720</b>	178±2	60±1	13±0.2	13.2±1.5	16.0±1.0	—	4,000
<b>MCR7520</b>	178±2	60±1	13±0.2	17.0±1.5	19.0±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	±(1%+0.05 )	MIL-STD-202F, Method 107G -55°C to +150, 100 cycles
3	Short Time Overload	±(2%+0.05 )	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 <b>Min</b>	MIL-STD-202F, Method 302 Apply 100 VDC for 1 minute .
7	Load Life	±(1%+0.05 )	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	±(0.5%+0.05 )	MIL-STD-202F, Method 210E 260°C±5°C ,10±1 seconds
9	Humidity ( Steady State )	±(0.5%+0.05 )	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	±(0.5%+0.05 )	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±5°C ,2±0.5 seconds