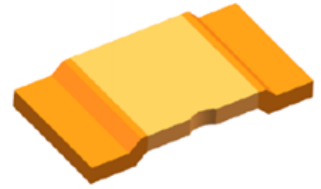


Automotive Grade Chip Shunt Resistor

- Nudity E-beam welded metal strip resistors, pure copper Electrodes are the ideal solution for current sensing applications
- Excellent reliability, stability, Anti-pulse capability
- Special welding process, all-metal construction, Supports low resistance, The surface is pickled and passivated for strong weather resistance
- High temperature silicon molded for sever working Environment
- Very low EMF (<1u V/C)
- Ultra-low parasitic inductance(< 2nH), Fast response, Can be used for high frequency AC current detection
- AEC-Q200 Reliability Testing passed

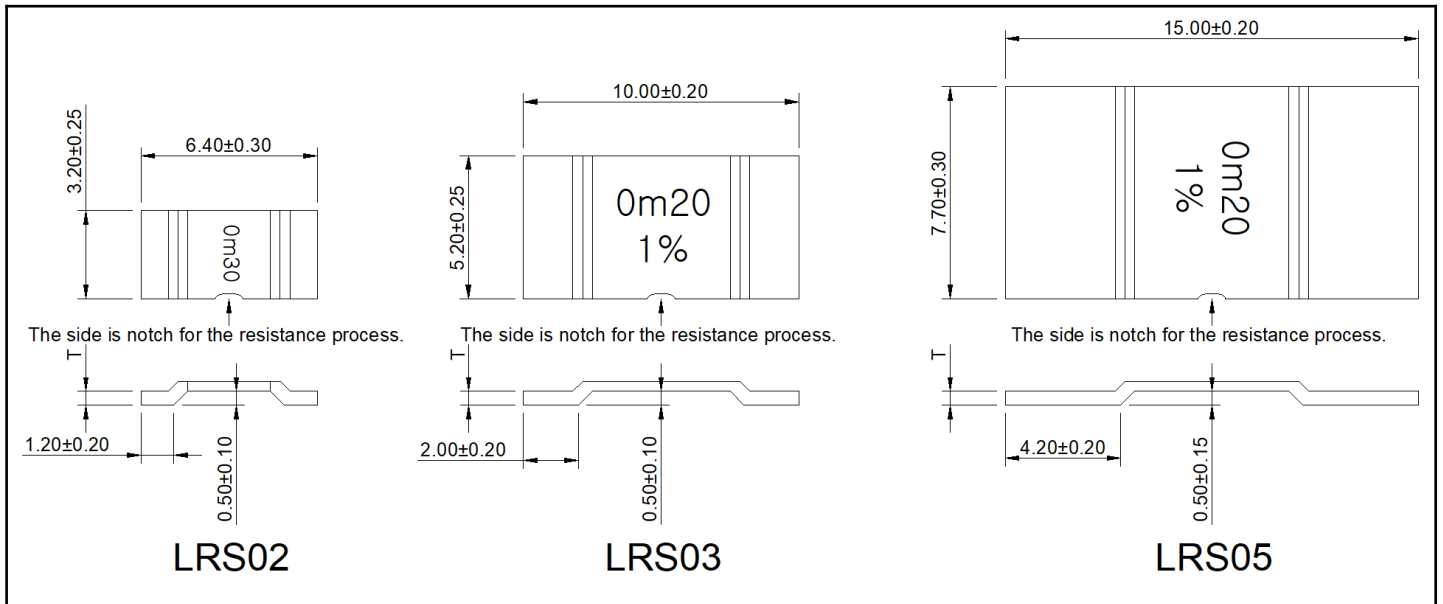


GENERAL SPECIFICATIONS

Model	Power (@70°C)	Material	Resistance Range [mΩ]	Tolerance	T.C.R [ppm/°C]
LRS02	6W	Manganin	0.3, 0.35, 0.4, 0.5 0.7, 0.75, 1	F [±1%] J [±5%]	±150
					±100
	5W	FeCrAl	2		±50
	4W	FeCrAl	3		±50
	3W	FeCrAl	4		±50
	2.5W	FeCrAl	5		±50
	5W	Karma	2		±75
	4W	Karma	2.5, 3		±75
	3W	Karma	4		±75
	2.5W	Karma	5		±75
LRS03	12W	Manganin	0.2		±100
	10W	Manganin	0.3		±100
	9W	Manganin	0.4, 0.5		±100
	8W	Manganin	0.7, 0.8		±100
	7W	Manganin	1		±100
	8W	FeCrAl	1		±50
	7W	FeCrAl	1.5		±50
	6W	FeCrAl	2		±50
	5W	FeCrAl	3		±50
	4W	FeCrAl	4		±50
	3W	FeCrAl	5		±50
	8W	Karma	1		±75
	6W	Karma	2		±75
	5W	Karma	3		±75
	4W	Karma	4		±75
	3W	Karma	5		±75
LRS05	15W	Manganin	0.2		±150
	10W	Manganin	0.3		±150
	9W	Manganin	0.4		±150
	8W	Manganin	0.5		±100
	7W	Manganin	0.7, 0.75, 0.8		±100
	9W	FeCrAl	1		±50
	8W	FeCrAl	1.5		±50
	7W	FeCrAl	2, 3		±50
	9W	Karma	1		±75
	7W	Karma	2, 3		±75

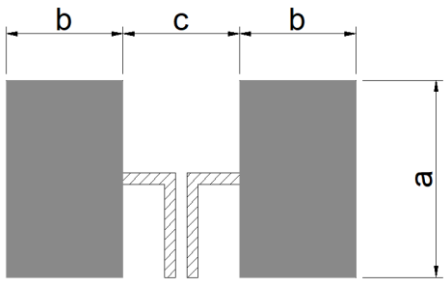
* Note : Iron-chromium aluminium material is magnetic and affects the inverter, so please be careful in product selection.

DIMENSIONS[mm]



LRS02			LRS03			LRS05		
Resistance [mΩ]	Material	T±0.10	Resistance [mΩ]	Material	T±0.10	Resistance [mΩ]	Material	T±0.10
0.3	Manganin	0.95	0.2	Manganin	1.70	0.2	Manganin	1.50
0.35	Manganin	0.80	0.3	Manganin	1.28	0.3	Manganin	0.96
0.4	Manganin	0.88	0.4	Manganin	1.00	0.4	Manganin	0.72
0.5	Manganin	0.85	0.5	Manganin	0.80	0.5	Manganin	0.58
0.7	Manganin	0.60	0.7	Manganin	0.55	0.7	Manganin	0.42
0.75	Manganin	0.56	0.8	Manganin	0.48	0.75	Manganin	0.39
1	Manganin	0.42	1	Manganin	0.40	0.8	Manganin	0.36
2	FeCrAl	0.67	1	FeCrAl	1.25	1	FeCrAl	0.34
3	FeCrAl	0.45	1.5	FeCrAl	0.94	1.5	FeCrAl	0.62
4, 5	FeCrAl	0.32	2	FeCrAl	0.62	2	FeCrAl	0.48
2	Karma	0.65	3	FeCrAl	0.42	3	FeCrAl	0.31
2.5	Karma	0.50	4	FeCrAl	0.35	1	Karma	0.88
3	Karma	0.43	5	FeCrAl	0.28	2	Karma	0.43
4	Karma	0.32	1	Karma	1.16	3	Karma	0.30
5	Karma	0.28	2	Karma	0.65			
			3	Karma	0.43			
			4	Karma	0.32			
			5	Karma	0.28			

RECOMMEND LAND PATTERN[mm]

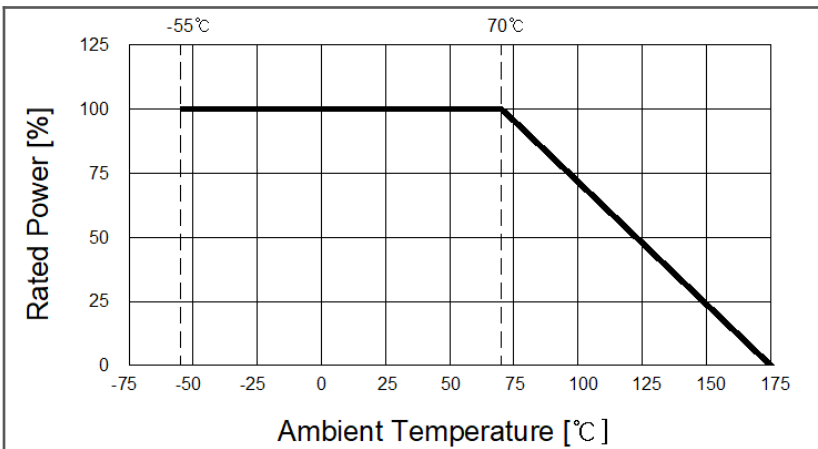
	Model	a	b	c
	LRS02	3.60	1.80	3.80
	LRS03	6.20	2.70	5.60
	LRS05	8.75	5.20	5.60

CHARACTERISTICS

Item	Requirement	Test Method
Thermal shock	Within the specified value	IEC60115-14.8 Measured value -55°C and +125°C, reference value +20°C
Solderability	> 95% coverage	IEC60115-14.17 245°C Tin slot, hold for 3seconds
Short time overload	$\Delta R \pm 0.5\%$	IEC60115-14.13 2.5times rated voltage, 5seconds
Resistance to solder heat	$\Delta R \pm 0.5\%$	IEC20115-14-18 270°C Tin bath, hold for 10seconds
High temperature and humidity	$\Delta R \pm 1.0\%$	AEC-Q200 Test7 MIL-STD-202 Method 103 Temperature 85°C, humidity 85% of the conditions applied 10% of the rated power (current) or component limit current (whichever is less), for 1000hours
High temperature storage	$\Delta R \pm 1.0\%$	IEC60115-14.25.3 1000hours @170°C, without load
Low temperature load	$\Delta R \pm 0.5\%$	IEC60115-14.36 -55°C, No load for 1hour, rated voltage load for 45minutes, no load for 15minutes
Temperature cycling	$\Delta R \pm 0.5\%$	IEC60115-14.19 -55°C @30minutes ~ room temperature @ < 5minutes ~+155°C @ 30minutes, 500cycles
Load life	$\Delta R \pm 1.0\%$	IEC60115-14.25.1 1000hours @70°C \pm 2°C, rated voltage, 90minutes on, 30minutes off

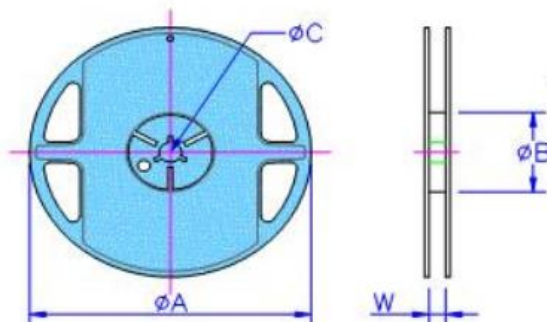
* Operating Temperature range : -55°C~+175°C

DERATING CURVE



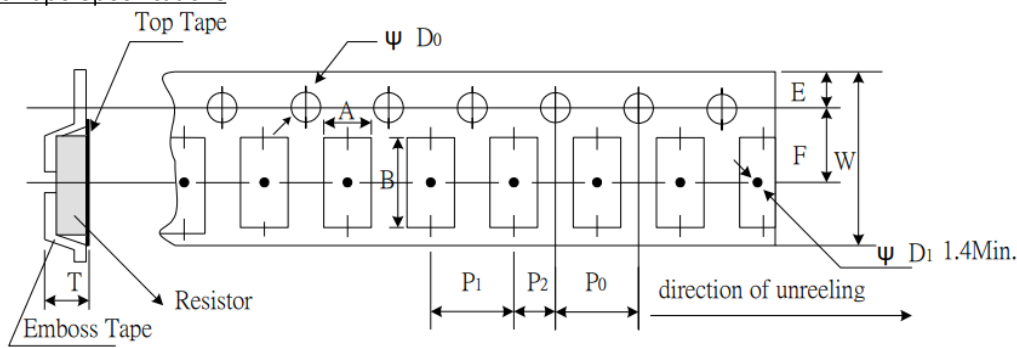
PACKAGING

Reel Specifications & Packaging Quantity



Model	Packaging Quantity	Tape Width	Reel Diameter	ØA [mm]	ØB [mm]	ØC [mm]	W [mm]
LRS02	Embossed 4K	16mm	13inch	330±2	60±1	13.5±0.5	17.5±0.5
LRS03	Embossed 2K	24mm	13inch	330±2	60±1	13.5±0.5	25.0±0.5
LRS05	Embossed 2K	32mm	13inch	330±2	60±1	13.5±0.5	33.0±0.5

Embossed Plastic Tape Specifications



Model	A	B	W	E	F	P0	P1	P2	ØD0	T
LRS02	3.5	6.8	16	1.75	7.5	4	8	2	1.5	1.8
LRS03	5.7	11.2	24	1.75	7.5	4	12	6	1.5	2.5
LRS05	8.2	16.1	32	1.75	11.5	4	12	6	1.5	2.5

ODERING PROCEDURE EXAMPLE

Model#	Rated power	Resistance	Tolerance	Material Code	TCR (ppm/°C)
LRS02 LRS03 LRS05	B : 2.5W R : 3W H : 4W D : 5W I : 6W E : 7W 8 : 8W 9 : 9W J : 10W 12 : 12W 15 : 15W	0M20 : 0.2mΩ 0M30 : 0.3mΩ 0M40 : 0.4mΩ 0M50 : 0.5mΩ 0M70 : 0.7mΩ R001 : 1mΩ R002 : 2mΩ R003 : 3mΩ R004 : 4mΩ R005 : 5mΩ	F : ±1% J : ±5%	M : Manganin F : FeCrAl K : Karma	D : ±50 W : ±75 E : ±100 K : ±150