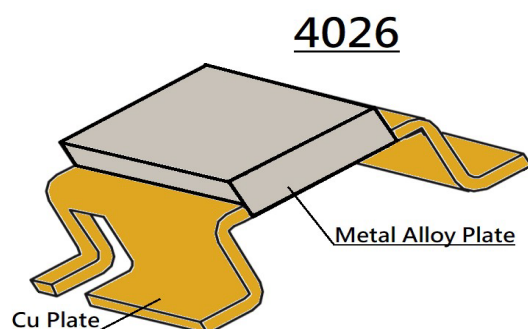
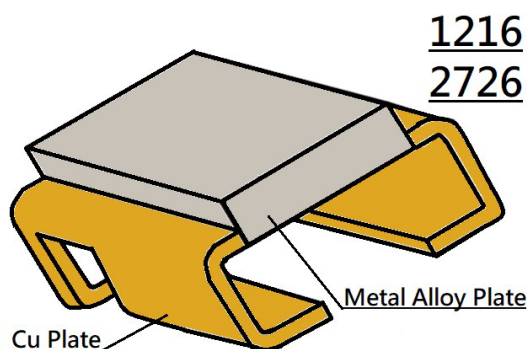




■ FEATURES

- Low Resistance / TCR
- Excellent long term stability
- RoHS and REACH Compliant
- Lead Free
- High precision current sensing and voltage division
- Excellent anti-surge ability
- Four terminal construction (Down to size 1216)
- AEC-Q200 compliant

■ APPLICATIONS

- High current power modules
- High current power supply
- Motor driver
- Industrial control
- Battery management system

■ PRODUCT IDENTIFICATION

Example:

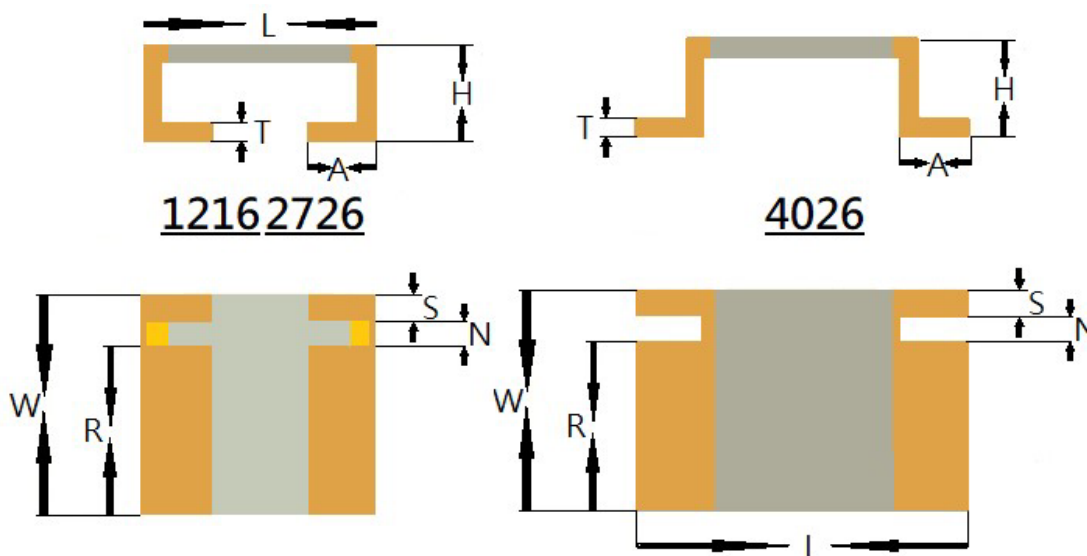
LRSRF	2726	30	F	R004	F	Z
Product Type	Size (Inch)	Rated Power	Tolerance	Resistance	Material	Optional
	1216	30=3.00W	F : ±1%	0m50=0.5mR	S : MnCuSn	
	2726	45=4.50W	G : ±2%	R001=1.0mR	M : MnCu	
	4026	50=5.00W	J : ±5%	R005=5mR	F : FeCrAl	
		60=6.00W			R : NiCrAl	
		70=7.00W			I : MnCuNi	
		80=8.00W				

■ STANDARD ELECTRICAL SPECIFICATIONS

Type	Power Rating at 70°C (See de-rating curve, except where noted)	T.C.R. (ppm/°C)	Max. Rating Current(A)	Max. Overload Current(A)	Resistance Range (mΩ)	Material	Operating Temperature Range (°C)
					1.0% (F) 2.0% (G) 5.0% (J)		
LRSRF1216	8W ^(at 100°C derates to 5W)	≤ ±75	163.2	365.1	0.3	MnCuSn	- 65 ~ + 170
	7W ^(at 100°C derates to 5W)	≤ ±50	100.00	223.60	0.5	MnCuSn	
	4.5W ^(at 100°C derates to 3W)	≤ ±50	54.77	122.47	1	MnCu	
	3W ^(at 100°C derates to 2W)	≤ ±50	31.62	70.71	2	MnCuNi	
	3W ^(at 100°C derates to 2W)	≤ ±50	25.82	57.73	3	MnCuNi	
LRSRF2726	7W	≤ ±50	187.08	418.33	0.2	MnCuSn	
	7W	≤ ±50	118.31	264.58	0.5	MnCuSn	
	6W	≤ ±50	77.46	173.21	1	MnCu	
	6W	≤ ±50	54.77	122.47	2	FeCrAl	
	6W	≤ ±50	54.77	122.47	2	MnCuNi	
	4.5W	≤ ±50	36.51	81.64	3	NiCrAl	
	4.5W	≤ ±50	36.51	81.64	3	FeCrAl	
	4W	≤ ±50	31.62	70.71	4	FeCrAl	
	4W	≤ ±50	31.62	70.71	4	NiCrAl	
	3W	≤ ±50	24.49	54.77	5	FeCrAl	
	3W	≤ ±50	24.49	54.77	5	NiCrAl	
LRSRF4026	7W	≤ ±50	187.08	418.33	0.2	MnCuSn	
	7W	≤ ±50	118.32	264.58	0.5	MnCuSn	
	6W	≤ ±50	77.46	173.21	1	MnCu	
	6W	≤ ±50	54.77	122.47	2	FeCrAl	
	6W	≤ ±50	54.77	122.47	2	MnCuNi	
	4.5W	≤ ±50	36.51	81.64	3	NiCrAl	
	4.5W	≤ ±50	36.51	81.64	3	FeCrAl	
	4W	≤ ±50	31.62	70.71	4	FeCrAl	
	4W	≤ ±50	31.62	70.71	4	NiCrAl	
	4W	≤ ±50	28.28	63.24	5	FeCrAl	
	4W	≤ ±50	28.28	63.24	5	NiCrAl	

- For non-standard parts, please contact our sales dept.
- Power rating is guaranteed when terminal temperature of resistor is below 70°C

■ TYPE DIMENSION



■ DIMENSION

Unit : mm

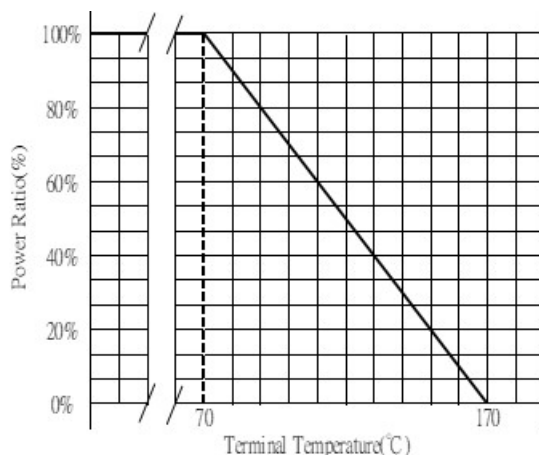
Type	Resistance	L	W	H	T	A	S	N	R
LRSRF1216	0.3mR	3.0±0.30	3.81±0.30	1.80(Ref.)	0.30±0.20	1.1±0.30	0.50(Ref.)	0.60(Ref.)	2.7(Ref.)
	0.5mR	3.0±0.30	3.81±0.30	1.80(Ref.)	0.30±0.20	1.1±0.30	0.50(Ref.)	0.60(Ref.)	2.7(Ref.)
	1mR	3.0±0.30	3.81±0.30	1.80(Ref.)	0.30±0.20	1.1±0.30	0.50(Ref.)	0.60(Ref.)	2.7(Ref.)
	2mR	3.0±0.30	3.81±0.30	1.80(Ref.)	0.30±0.20	1.1±0.30	0.50(Ref.)	0.60(Ref.)	2.7(Ref.)
	3mR	3.0±0.30	3.81±0.30	1.80(Ref.)	0.30±0.20	1.1±0.30	0.50(Ref.)	0.60(Ref.)	2.7(Ref.)
LRSRF2726	0.2mR	6.9±0.30	6.6±0.30	3.40(Ref.)	0.45±0.20	1.9±0.30	0.70(Ref.)	1.0(Ref.)	5.0(Ref.)
	0.5mR			2.85(Ref.)	0.45±0.20				5.0(Ref.)
	1mR			2.85(Ref.)	0.35±0.20				5.0(Ref.)
	2mR(FeCrAl)			2.85(Ref.)	0.55±0.20				5.0(Ref.)
	2mR(MnCuNi)			2.85(Ref.)	0.40±0.20				5.0(Ref.)
	3mR			2.85(Ref.)	0.35±0.20				5.0(Ref.)
	4mR			2.85(Ref.)	0.35±0.20				5.0(Ref.)
	5mR			2.85(Ref.)	0.35±0.20				5.0(Ref.)
LRSRF4026	0.2mR	10.1±0.30	6.6±0.30	3.40(Ref.)	0.45±0.20	1.9±0.30	0.70(Ref.)	1.0(Ref.)	5.0(Ref.)
	0.5mR			2.85(Ref.)	0.45±0.20				5.0(Ref.)
	1mR			2.85(Ref.)	0.37±0.20				5.0(Ref.)
	2mR(FeCrAl)			2.85(Ref.)	0.55±0.20				5.0(Ref.)
	2mR(MnCuNi)			2.85(Ref.)	0.40±0.20				5.0(Ref.)
	3mR			2.85(Ref.)	0.35±0.20				5.0(Ref.)
	4mR			2.85(Ref.)	0.35±0.20				5.0(Ref.)
	5mR			2.85(Ref.)	0.35±0.20				5.0(Ref.)

■ PERFORMANCE CHARACTERISTICS

■ POWER DERATING CURVE

The Operating Temperature Range: -65°C ~+170°C.

Terminal temperatures above 70°C, power rating must be derated in accordance with the curve as below :



■ RATING CURRENT

The following equation may be used to determine the DC (Direct Current) or AC (Alternating Current) (RMS, root mean square value) of normal rated power. However, if the result value exceeds the highest current of regulated standards, the highest normal rated power is to be used

$$I = \sqrt{P/R}$$

I = Rating current (A)
 P= Rating Power (W)
 R= Resistance(Ω)

■ MARKING FORMAT

- All the products marking are 3 digits. SRF1216 no marking.
- “L” designates the decimal location in milliohm
 e.g. 3mΩ the product marking is 3L0.
 0.3mΩ the product marking is L30.
- The criteria to distinguishing the mark on the surface of products are that characters can be identified.

■ RELIABILITY TEST AND REQUIREMENT

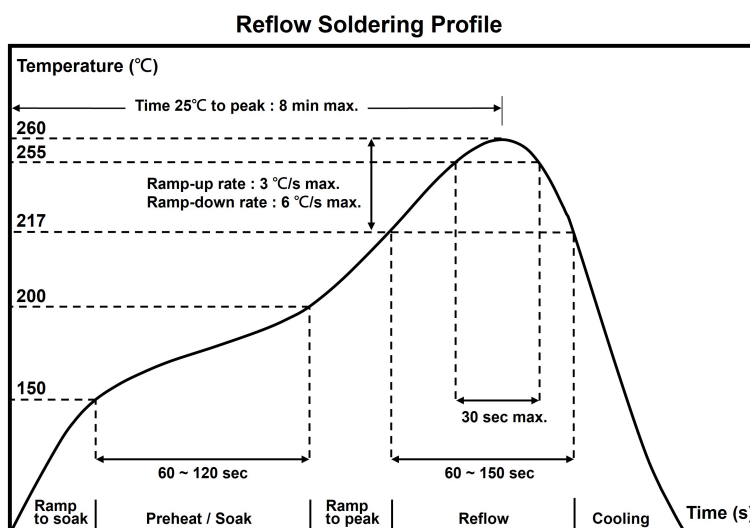
Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	At 25°C /+125°C, 25°C is the reference temperature	As Spec
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	The number of rated power are as follows: - SRF1216: 5 times of rated power - SRF2726: 5 times of rated power - SRF4026: 5 times of rated power for 5 seconds.	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
High Temperature Exposure (Storage)	MIL-STD-202 Method 108	1000 hrs. @ T=170°C. Unpowered. Measurement at 24±4 hours after test conclusion.	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Biased Humidity	MIL-STD-202 Method 103	1,000 hours; 85°C / 85% RH, 10% of operating power. Measurement at 24±4 hours after test conclusion.	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Operation Life	MIL-STD-202 Method 108	Condition D Steady State TA=125°C at derated power. Measurement at 24±4 hours after test conclusion.	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Moisture Resistance	MIL-STD-202, Method 106	Humidity of 90~98% and a temperature of 25°C / 65°C ,10 cycles	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Temperature Cycling	JESD22 Method JA-104	1000 Cycles (-55°C to +155°C) Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme.	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Mechanical Shock	MIL-STD-202 Method 213	Test ½ Sine Pulse, Peak value: 100g, normal duration: 6ms, Velocity change:12.3ft/sec.	$\Delta R/R1 \leq \pm(0.5\%+0.0005\Omega)$
Vibration	MIL-STD-202 Method 204	5 g's for 20 min., 12 cycles each of 3 orientations. Note: Test from 10-2000Hz	$\Delta R/R1 \leq \pm(0.5\%+0.0005\Omega)$
Board Flex	AEC Q200-005	Beading once for 60 seconds ,2mm	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Solderability	J-STD-002	(1) 4 hrs 155°C dry heat (2) 245±5°C 3 sec.	>95% coverage(electrode area)

• Note: All Reliability test should follow De-rating curve , terminal temperature of component should be below 70°C.

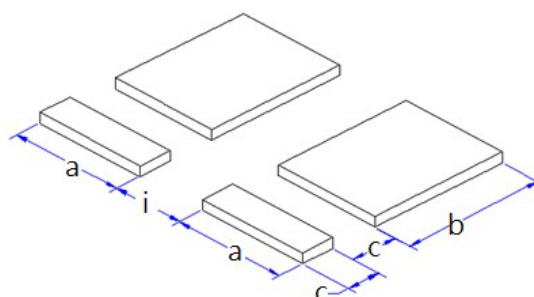
• Note : Footprint size, solder insufficient, excessive solder, solder void and component shifted will affect the resistance accuracy after IR reflow. Circuit calibration is a must to be done by functional test.

■ RECOMMENDED SOLDERING PARAMETERS

■ SOLDER REFLOW TEMPERATURE CONDITION



■ RECOMMENDED LAND PATTERN DESIGN



■ DIMENSIONS

Unit : mm

Type	Resistance Range	a	b	c	i
LRSRF1216	0.3mR-3mR	1.5	2.95	0.6	0.6
LRSRF2726	0.2mR-5mR	2.9	5.6	1	2
LRSRF4026	0.2mR-5mR	2.44	5.6	0.9	5.8

■ PACKING QUANTITY

Type	PCS / Reel
LRSRF1216	3,000
LRSRF2726	1,400
LRSRF4026	1,400

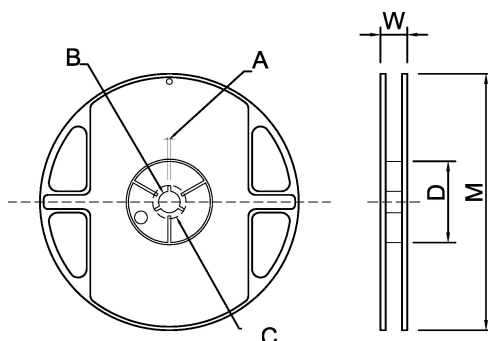
■ STORAGE TEMPERATURE

Temperature : $25 \pm 5^{\circ}\text{C}$, Humidity : $60 \pm 20\%$

■ APPENDIX FOR SMD CHIP RESISTOR

■ PACKAGING INFORMATION

■ REEL DIMENSIONS

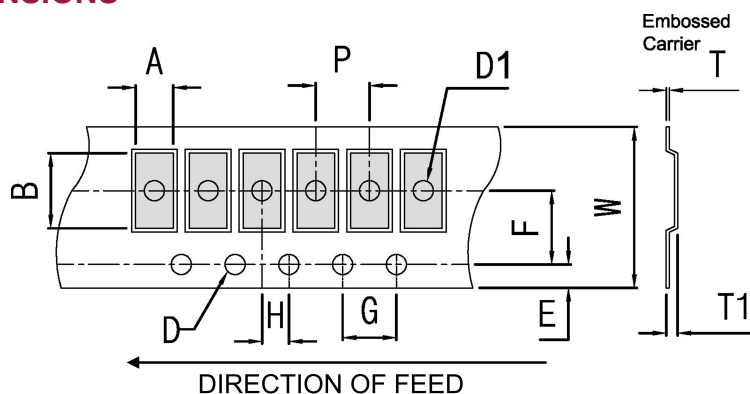


■ DIMENSIONS

Unit : mm

Reel Type / Tape	A	B	C	D	W	M
13" reel for 12 mm embossed	2.3 ± 0.5	13.5 ± 0.5	17.7 ± 0.5	99.0 ± 0.5	16.7 ± 0.5	330 ± 1.0
13" reel for 16 mm embossed	2.3 ± 0.5	13.5 ± 0.5	17.7 ± 0.5	99.0 ± 0.5	20.7 ± 0.5	330 ± 1.0
13" reel for 24 mm embossed	2.5 ± 0.5	13.5 ± 0.5	17.7 ± 0.5	99.0 ± 0.5	29.4 ± 0.5	330 ± 1.0

■ EMBOSSED DIMENSIONS



Item	Resistance(Ω)	W	P	E	F	D	G	H	A	B	T1
LRSRF1216	0.3m~3m	12.0 ± 0.30	8.0 ± 0.10	1.75 ± 0.10	5.5 ± 0.10	$1.50^{+0.1}_{-0}$	4.0 ± 0.10	2.0 ± 0.10	3.3 ± 0.10	4.3 ± 0.10	2.3 ± 0.10
LRSRF2726	0.2m	16.0 ± 0.30	12.0 ± 0.10	1.75 ± 0.10	7.5 ± 0.10	$1.50^{+0.1}_{-0}$	4.0 ± 0.10	2.0 ± 0.10	7.0 ± 0.10	7.0 ± 0.10	4.2 ± 0.20
LRSRF2726	0.5m~5m	16.0 ± 0.30	12.0 ± 0.10	1.75 ± 0.10	7.5 ± 0.10	$1.50^{+0.1}_{-0}$	4.0 ± 0.10	2.0 ± 0.10	7.0 ± 0.10	7.0 ± 0.10	3.2 ± 0.20
LRSRF4026	0.2m	24.0 ± 0.30	12.0 ± 0.10	1.75 ± 0.10	11.5 ± 0.10	$1.50^{+0.1}_{-0}$	4.0 ± 0.10	2.0 ± 0.10	6.9 ± 0.10	10.6 ± 0.20	4.2 ± 0.20
LRSRF4026	0.5m~5m	24.0 ± 0.30	12.0 ± 0.10	1.75 ± 0.10	11.5 ± 0.10	$1.50^{+0.1}_{-0}$	4.0 ± 0.10	2.0 ± 0.10	6.9 ± 0.10	10.6 ± 0.20	3.2 ± 0.20