LVR Series

Low-TCR Current Sense Chips

The resistors are constructed using outstanding TCR level material, which makes LVR resistors excellent for current sensing application in battery charger circuit & DC-DC converter. The composition of the resistive material is adjusted to give the LVR series resistors more resistive stability than the competition in very small package sizes.

APPLICATIONS

- Consumer goods
- Computer
- Telecom / Datacom
- Industrial / Power supply
- Alternative Energy
- Car electronics
- Battery

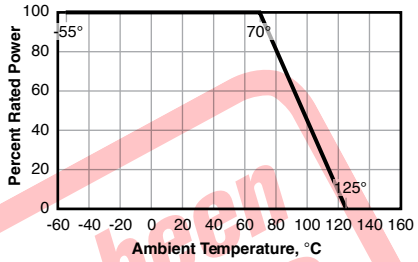
SERIES SPECIFICATIONS

Series	Size	Power Rating	Resistance Range	TCR (ppm/°C)	Tolerance
LVR02	0201	0.1W	3mΩ - 50mΩ	150ppm/°C	1%, 5%
LVR04	0402	0.125W	1mΩ - 2.9mΩ 3mΩ - 50mΩ	±350 ppm/°C ±150 ppm/°C	1%, 5%

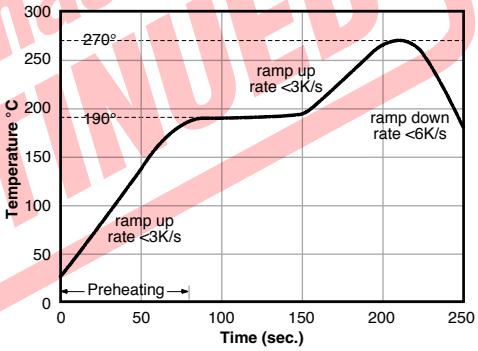
CHARACTERISTICS

Operating Temp. Range	–55°C to +125°C
Power Rating	Standard rated power at 70°C; see chart above
Rated Voltage	The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula: $V = \sqrt{(PxR)}$ or max. working voltage whichever is less, where: V = Cont. rated DC or AC (rms) working voltage (V) P = Rated power (W) R = Resistance value (Ω)
Temperature Coeff. of Resistance	Size / Resistance range / TCR 0201 / 3mΩ - 50mΩ / ±150 ppm/°C 0402 / 1mΩ - 2.9mΩ / ±350 ppm/°C 0402 / 3mΩ - 50mΩ / ±150 ppm/°C
Terminations	Cu, Ni, matte Tin

Derating



Reflow Soldering Conditions



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PERFORMANCE DATA

Test	Method	Procedure	Requirements
Short time overload	IEC60115-1 4.13	2.5 times of rated power for 5 seconds at room temperature	±(1%+0.0005Ω) No visible damage
High Temperature Exposure	MIL-STD-202-Method 108	1,000 hours at maximum operating temperature depending on specification, unpowered. No direct impingement of forced air to the parts Tolerances: 125±5ºC	±(1.0%+0.0005Ω)
Moisture Resistance	MIL-STD-202-Method 106	Each temperature / humidity cycle is defined at 8 hours (method 106F), 3 cycles / 24 hours for 10d with 25ºC / 65ºC 95% R.H, without steps 7a & 7b, unpowered	±(0.5%+0.0005Ω)
Operational Life/ Endurance	MIL-STD-202 Method 108 IEC 60115-1 4.25.1	1,000 hours at 70±2ºC applied RCWV. 1.5 hours on, 0.5 hour off, still air required	±(1.0%+0.0005Ω)
Solderability - Wetting	J-STD-002 test B	Electrical Test not required. Magnification 50X. SMD conditions: 1st step : method B, aging 4 hours at 155°C dry heat; 2nd step: leadfree solder bath at 245±3°C; Dipping time: 3± 0.5 seconds	Well tinned (>95% covered) No visible damage
Moisture Resistance	MIL-STD-202 Method 106	Each temperature / humidity cycle is defined at 8 hours (Method 106G), 3 cycles / 24 hours for 10d. with 25°C / 65°C 95% R.H, without steps 7a & 7b, un-powered Parts mounted on test board, without condensation on parts. Measurement at 24±2 hours after test conclusion.	±(0.5% + 0.0005Ω) No visible damage
Thermal Shock	MIL-STD-202 Method 107	-55/+125°C. Number of cycles required is 300. Parts mounted on test board. Maximum transfer time is 20 seconds. Dwell time is 15 minutes.	±(1.0% + 0.0005Ω)
Board Flex/ Bending	IEC 60115-1 4.33	Device mounted on PCB test board as described, only 1 board bending required. 2 mm bending. Bending time: 60±1 seconds. Ohmic value checked during bending	±(1.0 % + 0.0005Ω)
Resistance to Soldering Heat	MIL-STD-202 Method 210 IEC 60115-1 4.18	Condition B, no pre-heat of samples. Leadfree solder, 260±5°C, 10±1seconds immersion time. Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	±(0.5% + 0.0005Ω) No visible damage

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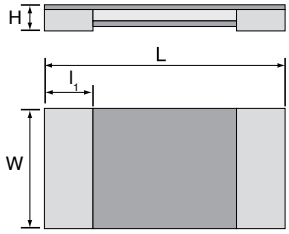
DIMENSIONS

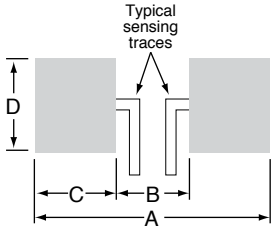
(mm)



Size	Res. Range	L	W	H	I1
0201	3mΩ - 50mΩ	0.60 ±0.03	0.31 ±0.04	0.30 ±0.05	0.15 ±0.06
0402	1mΩ - 2.9mΩ	1.00 ±0.10	0.55 ±0.10	0.30 ±0.10	0.25 ±0.10
	3mΩ - 10mΩ	1.00 ±0.10	0.55 ±0.10	Max. 0.30	0.25 ±0.10
	12mΩ - 50mΩ	1.00 ±0.10	0.55 ±0.10	Max. 0.40	0.25 ±0.10

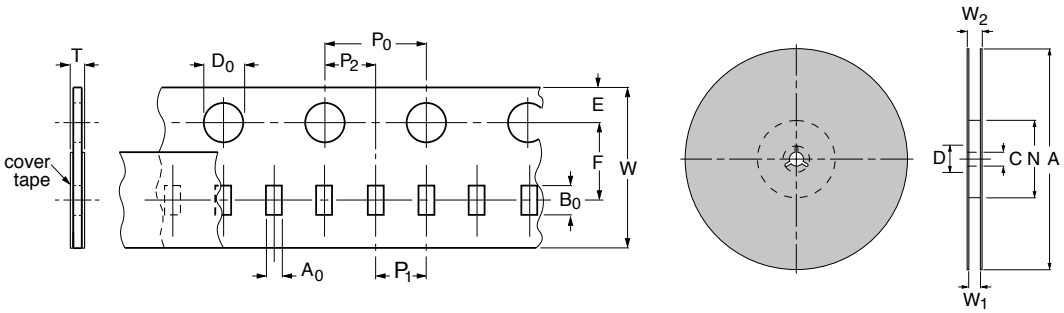
Reflow Soldering footprint

Size	A	B	C	D
0201	1.0	0.3	0.35	0.4
0402	2.0	0.4	0.8	0.6



TAPE AND REEL

(mm)



Paper/PE tape

Size	A0	B0	W	E	F	P0	P1	P2	ØD0	T	Qty. per reel (178mm)
0201	0.35 ±0.10	0.65 ±0.10	8.0 ±0.20	1.75 ±0.10	3.5 ±0.05	4.0 ±0.10	2.0 ±0.05	2.0 ±0.05	1.5 +0.1/-0	0.35 ±0.10*	10,000
0402	0.59 ±0.10	1.10 ±0.10	8.00 ±0.10	1.75 ±0.10	3.50 ±0.10	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	1.55 ±0.05	0.48 ±0.03	10,000

Reel dimensions

Qty./reel	8mm tape	A	N	C	D	W1	W2 max.
10,000	7" (Ø178mm)	178.0 ±1.0	60.0 +1/-0	13.50 ±0.5	21.0 ±0.8	9.0 ±0.5	12.0 ±0.2

ORDERING INFORMATION

RoHS Compliant

L V R 0 2 R 0 0 5 F E R

Series	Size	Ohms	Tolerance	Tape & reel
	02 = 0201 04 = 0402	5% in E24 values, 1% and lower tolerances available in E24 and E96 values	J = 5% F = 1%	T = 5,000 pc R = 10,000 pc

rev 12/21-1