LVK Series

Four Terminal High Precision Current Sense

Current sense resistors enable the measurement of current flow in a circuit by monitoring a voltage drop across a precisely calibrated resistance. The LVK chip features four terminals, also known as a "Kelvin" configuration. This configuration enables current to be applied through two opposite terminals and a sensing voltage to be measured across the other two terminals, eliminating the resistance and temperature coefficient of the terminals for a more accurate current measurement.

Isolating the voltage and current terminals (see schematic) facilitates a very accurate current measurement. Ohmite's proprietary technology offers an excellent Temperature Coefficient of Resistance (TCR) even for very low resistance values. The resistive element consists of a durable, anti-corrosive metal alloy that combines reliable performance with the ability to withstand harsh environments.



FEATURES

- Designed for automatic insertion
- Industry standard sizes
- High-precision Kelvin connect capability in a small package

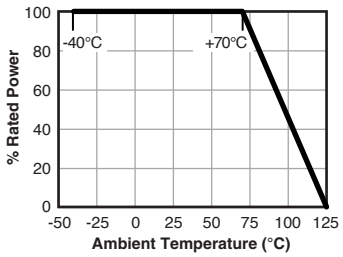
SERIES SPECIFICATIONS

Series	Pkg. Size	Power Rating (W @70°C)	Resistance Range (Ω)	TCR (ppm/°C)	Tolerance	Available Values	Max. Over Current Max. Power	Max. Over Current Max. Current
LVK12	1206	0.5W	0.01-0.100	50ppm	0.25%, 0.5%, 1%	E12	20W	20A
LVK20	2010	0.75W	0.01-0.05	50ppm	0.25%, 0.5%, 1%	E12	29W	23A
LVK24	2412	1.0W	0.01-0.100	50ppm	0.25%, 0.5%, 1%	E12	38W	27A
LVK25	1224	2.0W	0.001 0.002-0.004 0.005-0.01	300ppm 200ppm 100ppm	1% 0.25%	1, 2, 3, 5, 9,10mΩ 5 & 10mΩ	150W	200A

CHARACTERISTICS

Res. Range	0.001Ω - 0.010Ω
Operating Temp. Range	-40°C to +125°C
Rated Ambient Temperature	+70°C
Resistance Tolerance	0.25%, 0.5% and 1% standard
Temperature Coefficient	*LVK12, LVK20, LVK24:* 50ppm standard *LVK25:* 100ppm, 200ppm, or 300ppm based on resistance value
Coating Material	epoxy resin
Terminals	100% matte tin
Max. Over Current	Time applied: 10ms max. Interval: 60sec min. Max. over current = √(Max. power÷ Resistance value) or max. current, whichever is smaller.
Storage conditions	Temperature: 5°C ~ 35°C Humidity: 25% ~ 70%

Derating



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PERFORMANCE CHARACTERISTICS

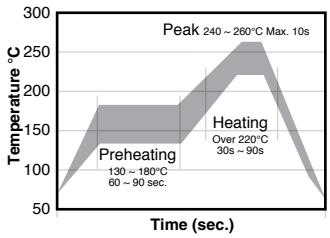
Test Items	Performance Requirements	Test Methods / standard: JIS C 5201.1
Overload	±(0.5%+0.0005Ω)	Rated voltage x 1.5 for 5s
Endurance at 70°C	±(0.5%+0.0005Ω)	70°C±3°C, Rated voltage 1.5h ON, 0.5h OFF, 1000h
Moisture resistance	±(0.5%+0.0005Ω)	60°C±2°C, 90%~95% RH, Rated voltage 1.5h ON, 0.5h OFF, 1000h
Rapid change of temperature	±(0.5%+0.0005Ω)	-40°C (30min.)/+125°C (30min.), 5 cycles
Resistance to soldering heat	±(0.5%+0.0005Ω)	260°C±5°C for 10s±1s
Substrate bending	±(0.5%+0.0005Ω)	Bending width: 2mm for 10s±1s, Glass epoxy substrate with thickness of 1.6mm
Solderability	95% or more of the electrode surface shall be covered with new solder	245°C±5°C for 3s±0.5s

Reflow Temperature Profile

For lead free soldering (Sn-Ag-Cu solder)

Preheating:	130° ~ 180°	60s ~ 90s
Heating:	Over 220°	30s ~ 90s
Peak:	240° ~ 260°	Max. 10s

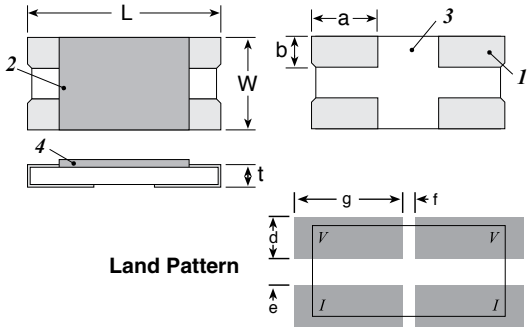
Ramp-up rate:	max 3°C/sec.
Time above liquidous:	60 – 150 sec.
Ramp-down rate:	max 6°C/sec.
Max. number of reflow:	2



DIMENSIONS

(mm)

LVK 12, LVK20, LVK24 (0.5, 0.75 & 1 watt)

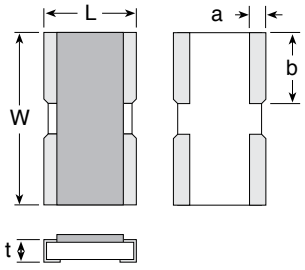


1. Electrode
2. Protection coat
3. Almina substrate
4. Resistor

Land Pattern

Note that LVK25 has a vertical orientation with the current flow along the short edge of the resistor.

LVK25 (2 watt)



Schematic



V = sensing terminal (voltage)
I = current terminal

Layout for illustration only, part can be rotated 180° without effect to the circuit:



Size	L	W	t	a	b	d	e	f	g
LVK12 (1206)	3.2 ±0.2	1.6 ±0.2	0.5 ±0.15	1.0 ±0.2	0.55 ±0.2	1.10	0.30	1.00	1.75
LVK20 (2010)	5.0 ±0.2	2.5 ±0.2	0.5 ±0.15	1.7 ±0.2	0.9 ±0.2	1.55	0.50	1.40	2.55
LVK24 (2412)	6.4 ±0.2	3.2 ±0.2	0.5 ±0.15	2.1 ±0.2	1.2 ±0.2	1.90	0.60	2.00	3.25
LVK25 (1224)	3.2 ±0.2	6.4 ±0.2	0.5 ±0.2	0.4 ±0.2	2.7 ±0.2	1.40	2.20	1.00	3.30

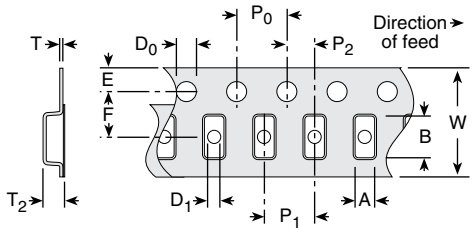
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TAPE AND REEL

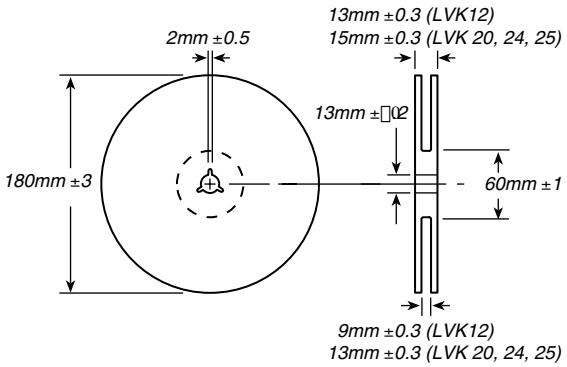
(mm)

Tape



	LVK12	LVK20	LVK24	LVK25
A	1.90 ±0.10	2.90 ±0.1	3.43 ±0.2	3.43 ±0.2
B	3.50 ±0.10	5.35 ±0.1	6.63 ±0.2	6.63 ±0.2
W	8.0 ±0.2	12.0 ±0.2	12.0 ±0.3	12.0 ±0.3
F	3.5 ±0.05	5.5 ±0.05	5.5 ±0.05	5.5 ±0.05
E	1.75 ±0.1	1.75 ±0.1	1.75 ±0.1	1.75 ±0.1
P_0	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1
P_1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1
P_2	2.0 ±0.05	2.0 ±0.05	2.0 ±0.05	2.0 ±0.05
D_0	1.5 +0.1/-0	1.5 +0.1/-0	1.5 +0.1/-0	1.5 +0.1/-0
D_1	1.0 +0.20/-0	1.5 +0.2/-0	1.5 +0.2/-0	1.5 +0.2/-0
T	0.2 ±0.05	0.2 ±0.05	0.2 ±0.05	0.2 ±0.05
T_2	1.0 ±0.2	1.0 ±0.2	1.0 ±0.2	1.0 ±0.2

Reel



Series	Qty/Reel
LVK12	5000
LVK20	1000
LVK24	1000
LVK25	1000

ORDERING INFORMATION

RoHS Compliant

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

Series	Case Size	Ohms	Tolerance	Tape & Reel
	12 = 1206 20 = 2010 24 = 2412 25 = 1224	R005 = 0.005	C = 0.25% D = 0.5% F = 1%	

Standard values

LVK12	LVK20	LVK24	LVK25
0.25% Tolerance			
			0.001
			0.002
			0.003
			0.005
0.01	0.01	0.01	0.01
0.02	0.02	0.02	
0.03	0.03	0.03	
0.05	0.05	0.05	
0.10	0.10	0.10	

LVK12	LVK20	LVK24	LVK25
0.5% Tolerance			
0.01	0.01	0.01	0.001
	0.015	0.015	0.002
0.02	0.02	0.02	0.003
	0.025	0.025	0.005
0.03	0.03	0.03	0.010
0.033		0.033	
0.039			
0.05	0.05	0.05	
0.075			
0.10		0.10	

LVK12	LVK20	LVK24	LVK25
1% Tolerance			
0.01	0.01	0.01	0.001
0.012		0.012	0.002
	0.015	0.015	0.003
			0.005
0.02	0.02	0.02	0.01
0.024	0.027	0.025	
0.03	0.03	0.03	
0.033		0.033	
0.039	0.039	0.039	
0.047		0.047	
0.05	0.05	0.05	
0.075		0.075	
0.10		0.10	

rev 7/20-1

Mouser Electronics

Authorized Distributor

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Ohmite:

LVK25R010FER LVK12R010DER LVK24R015FER LVK20R015FER LVK25R003FER LVK24R012FER LVK12R012FER LVK24R030FER LVK20R030FER LVK24R020DER LVK12R020FER LVK20R020DER LVK24R030DER LVK12R050DER LVK25R001FER LVK20R030DER LVK20R050FER LVK25R005FER LVK20R027FER LVK24R050FER LVK12R030FER LVK24R050DER LVK12R030DER LVK24R039FER LVK20R039FER LVK24R047FER LVK25R002FER LVK20R050DER LVK24R020FER LVK20R020FER LVK12R047FER LVK12R010FER LVK12R050FER LVK20R010DER LVK12R020DER LVK12R024FER LVK24R010DER LVK20R010FER LVK24R010FER LVK25R010DER LVK12R033FER LVK24R025FER LVK12R075DER LVK24R075FER LVK24R033FER LVK24R033DER LVK24R025DER LVK24R015DER LVK20R025DER LVK12R075FER LVK12R039FER LVK12R039DER LVK25R001DER LVK20R015DER LVK25R002DER LVK12R033DER LVK25R003DER LVK25R005DER LVK24R039DER LVK12R010CER LVK12R100CER LVK20R010CER LVK20R020CER LVK20R030CER LVK25R005CER LVK25R010CER LVK12R020CER LVK12R030CER LVK12R050CER LVK20R050CER LVK20R100CER LVK24R010CER LVK24R020CER LVK24R030CER LVK24R050CER