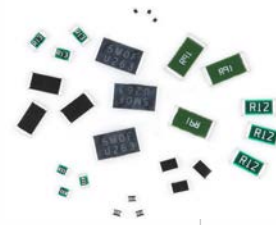


73Lx & 73Ex Series

Current Sensing Resistor – Flat Terminal Chip



Features

- Thick Film Construction
- 0.10 – 1 Watt Power Rating @ +70°C
- Resistance Range 10 – 910 milliohms
- Operating Temperature to +155°C
- EIA Standard Package Sizes
- Terminal Finish – Matte Tin (e3)
- Reflow Capable per JEDEC J-STD-020, +260°C maximum
- Tape and Reel Packaging

RoHS Compliant in Accordance with EU Directive 2011/65/EU

- Lead-Free Termination Finish
- Exemption 7(c)-I, Electrical and electronic components containing lead [Pb] in glass

Applications

- Current Detection
- Current Limiting
- Regulated Battery Circuits
- Motor Control
- Power Supply
- Hard Disk Drives
- Inverter/Converter
- Industrial Equipment
- Infotainment Systems

Description

73Lx & 73Ex Series Current Sensing Resistors are ceramic packaged devices that provides excellent accuracy for current detection. Each resistor has good electrical and thermal characteristics.

Ordering Information

Model		Package Code	Resistor Value	Resistor Tolerance																												
73	L	2	R15	G																												
↓		↓	↓	↓																												
Code	Type		Code		Resistor Value *																											
L	3-Digit Resistor Code		R15		0.150 ohms ²																											
E	4-Digit Resistor Code		R050		0.050 ohms ²																											
		* See Addendum for Standard EIA Values and Codes																														
		↓		↓																												
		<table><tr><th>Code</th><th>Package Size</th><th>Code</th><th>Package Size</th></tr><tr><td>1</td><td>0402 [1005]</td><td>5</td><td>1210 [3225]</td></tr><tr><td>2</td><td>0603 [1608]</td><td>6</td><td>2010 [5025]</td></tr><tr><td>3</td><td>0805 [2012]</td><td>7</td><td>2512 [6432]</td></tr><tr><td>4</td><td>1206 [3216]</td><td></td><td></td></tr></table>	Code	Package Size	Code	Package Size	1	0402 [1005]	5	1210 [3225]	2	0603 [1608]	6	2010 [5025]	3	0805 [2012]	7	2512 [6432]	4	1206 [3216]				<table><tr><th>Code</th><th>Tolerance</th></tr><tr><td>F</td><td>±1%</td></tr><tr><td>G</td><td>±2%</td></tr><tr><td>J</td><td>±5%</td></tr></table>	Code	Tolerance	F	±1%	G	±2%	J	±5%
Code	Package Size	Code	Package Size																													
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Code	Tolerance																															
F	±1%																															
G	±2%																															
J	±5%																															

* See Addendum for Standard EIA Values and Codes

Notes:

1. No dashes or spaces to appear in part number.
2. For Type L use 3-digit resistor code only. For Type E use 4-digit resistor code only. The "R" indicates decimal point.

Not all performance combinations and resistor values may be available.
Contact your local CTS Representative or CTS Customer Service for availability.

This product is specified for use only in standard commercial applications. Supplier disclaims all express and implied warranties and liability in connection with any use of this product in any non-commercial applications or in any application that may expose the product to conditions that are outside of the tolerances provided in its specification.



Ordering Information

Part Number Examples

Tolerance / Value	3-Digit Code			Tolerance / Value	4-Digit Code		
	J [±5%]	G [±2%]	F [±1%]		J [±5%]	G [±2%]	F [±1%]
0.150 Ohms	73L3R15J	73L3R15G	---	0.050 Ohms	73E3R050J	73E3R050G	73E3R050F
0.220 Ohms	73L3R22J	73L3R22G	73L3R22F	0.056 Ohms	73E3R056J	73E3R056G	73E3R056F
0.560 Ohms	73L3R56J	73L3R56G	73L3R56F	0.075 Ohms	73E3R075J	73E3R075G	73E3R075F
0.910 Ohms	73L3R91J	73L3R91G	73L3R91F	0.091 Ohms	73E3R091J	73E3R091G	73E3R091F

Electrical & Environmental Specifications

Operating Conditions

Model Type	Rated Wattage ¹ [Watts]	Resistance Range [milli ohm]	Resistance Tolerance [%]	Temperature Coefficient	Operating Temperature Range	Working Voltage [maximum V]	Overload Voltage [maximum]
73L1	0.100	200 - 910	G = ±2 J = ±5	±300ppm/°C	-55°C to +155°C	V=v(P*R)	100V
73L2	0.100	200 - 910	G = ±2 J = ±5	±300ppm/°C			
73L3	0.125	200 - 910 100 - 910	F = ±1 G = ±2 J = ±5	±200ppm/°C			
73L4	0.250	200 - 910 100 - 910	F = ±1 G = ±2 J = ±5	±100ppm/°C ±200ppm/°C			
73L5	0.500	200 - 910 100 - 910	F = ±1 G = ±2 J = ±5	±100ppm/°C ±200ppm/°C			
73L6	0.750	200 - 910 100 - 910	F = ±1 G = ±2 J = ±5	±100ppm/°C ±200ppm/°C			
73L7	1.000	200 - 910 100 - 910	F = ±1 G = ±2 J = ±5	±200ppm/°C			

1. @ +70°C

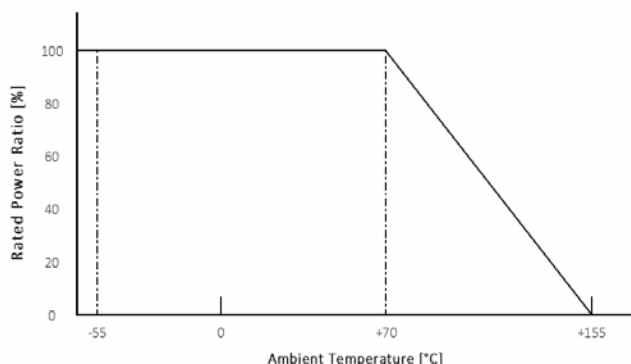
Model Type	Rated Wattage ¹ [Watts]	Resistance Range [milli ohm]	Resistance Tolerance [%]	Temperature Coefficient	Operating Temperature Range	Working Voltage [maximum V]	Overload Voltage [maximum]
73E3	0.250	50 - 91	F = ±1 J = ±5	±100ppm/°C	-55°C to +155°C	---	---
73E4	0.500	50 - 91	F = ±1 J = ±5	±100ppm/°C			
73E6	1.000	50 - 91	F = ±1 J = ±5	±100ppm/°C			

1. @ +70°C

Electrical & Environmental Specifications

Power Derating Curve – Typical

With the rated ambient temperature set to +70°C, the maximum power [maximum current for 0Ω product] at a temperature of no more than rated ambient temperature shall be equal to the rated power [rate current for 0Ω product]. The maximum power at a temperature exceeding the rated ambient temperature shall be a value determined by reducing the rated power according to the power reduction curve in the figure below.



Rated Voltage

The rated voltage shall be the DC or AC [effective power frequency] voltage corresponding to the rated power and shall be determined with the formula shown below. If the determined rated voltage exceeds the maximum operating voltage specified in Operating Conditions table, the maximum operating voltage shall be the rated voltage.

$$E = \sqrt{P \times R}$$

E = Rated Voltage [V]

P = Rated Power [W]

R = Nominal Resistance [Ω]

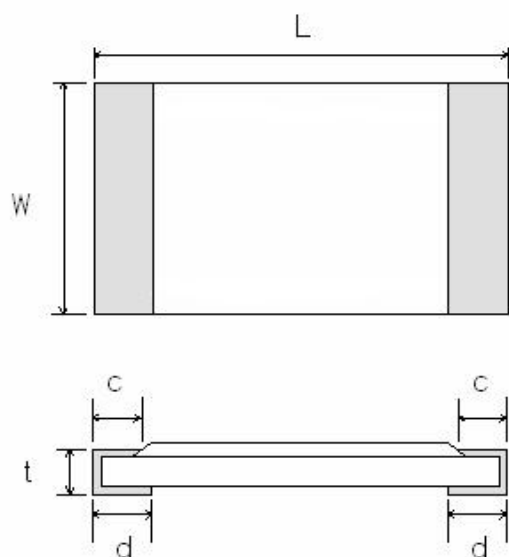
Environmental Parameters

Test	Maximum Delta R [%]	Test Description
Thermal Cycle	5.00	5 cycles -55°C to +125°C
Short Time Overload	2.50	2½ times rated working voltage for 5 seconds
Moisture Resistance	3.00	240 hours; +40°C, 90% RH
High Temperature Exposure	3.00	1,000 hours @ +155°C, no load
Load Life	5.00	1,000 hours @ +70°C, rated load
Resistance to Solder Heat	3.00	10 seconds @ +260°C solder
Resistance to Solvents	---	Isopropyl alcohol, Freon TMC
Solderability	---	RMA Flux, +230°C, 5 seconds dip, 95% coverage

Mechanical Specifications

Package Drawing/Dimensions

Model Type	Package Code Inch [mm]	Dimensions [mm]					
		L	W	t	c	d	
73L1	0402 [1005]	1.00 ±0.05	0.50 ±0.05	0.35 ±0.05	0.20 ±0.10	0.25 ±0.10	
73L2	0603 [1608]	1.60 ±0.15	0.80 ±0.10	0.50 ±0.15	0.25 ±0.20	0.25 ±0.20	
73L3 73E3	0805 [2012]	2.00 ±0.20 -0.10	1.25 ±0.20 -0.10	0.50 ±0.15 -0.05	0.40 ±0.20	0.40 ±0.20	
73L4 73E4	1206 [3216]	3.20 ±0.10 -0.15	1.60 ±0.10 -0.15	0.55 ±0.15 -0.05	0.50 ±0.20 0.40 ±0.20	0.50 ±0.20 0.55 ±0.10	
73L5	1210 [3225]	3.20 ±0.10 -0.15	2.60 ±0.10 -0.15	0.55 ±0.15 -0.05	0.50 ±0.20	0.50 ±0.20	
73L6 73E6	2010 [5025]	5.00 ±0.15	2.50 ±0.15	0.56 ±0.15	0.60 ±0.25 0.25 ±0.25	0.60 ±0.20 0.60 ±0.25	
73L7	2512 [6432]	6.30 ±0.15	3.20 ±0.15	0.56 ±0.15	0.60 ±0.25	0.60 ±0.25	

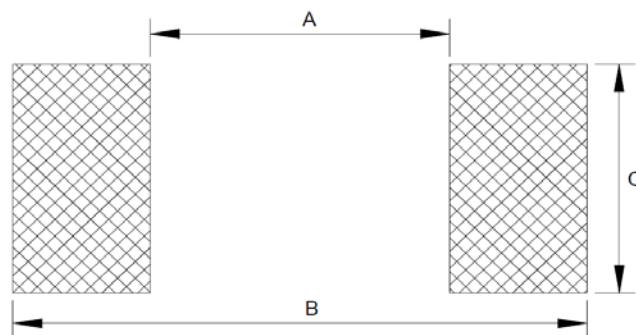


Notes

- Terminal Details
Base Metal - Silver [Ag] or Copper [Cu] plate.
Barrier Plating – Nickel [Ni].
Finish Plating – Matte Tin [Sn].

Recommended Pad Layout

Model Type	Dimensions [mm]		
	A	B	C
73L1	0.60	2.00	0.70
73L2	1.00	3.00	1.20
73L3 73E3	1.20	4.00	1.65
73L4 73E4	2.20	5.00	2.00
73L5	2.20	5.00	2.90
73L6 73E6	3.20	6.60	3.00
73L7	4.20	8.20	3.70



Mechanical Specifications

Marking Information

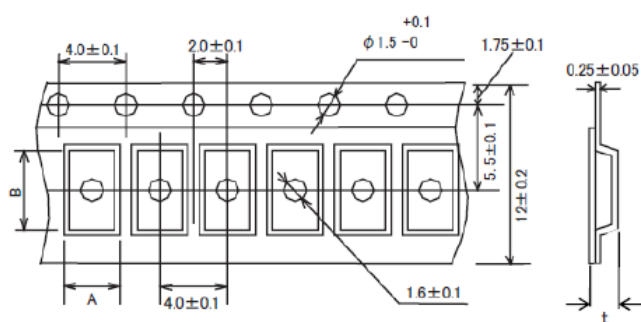
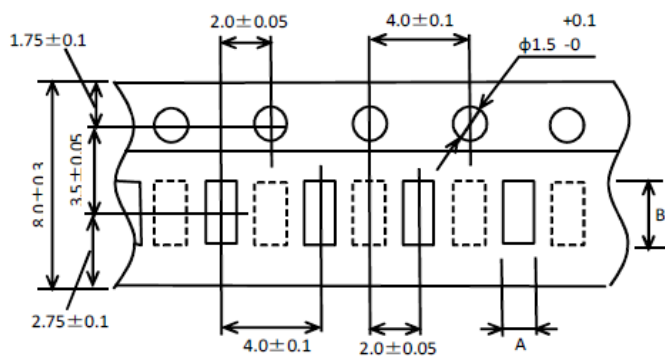
Model	Type
73L1	None
73L2	
73L3	
73L4	Rxx or Rxxx = "R" is the decimal point and 2 or 3 digits are significant values. See resistor table for codes.
73L5	
73L6	
73L7	
73E3	
73E4	None
73L7	

Packaging

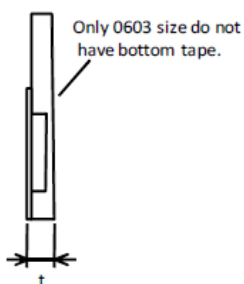
Tape and Reel Information

Paper Tape	[mm]		
Model	A	B	t
Type			
73L1	0.70 ±0.08	1.20 ±0.08	0.50 ±0.10
73L2	1.10 ±0.20	1.90 ±0.20	0.70 ±0.10
73L3	1.65 ±0.20	2.40 ±0.20	0.80 ±0.20
73E3			
73L4	2.00 ^{+0.10} _{-0.15}	3.57 ^{+0.10} _{-0.15}	0.80 ±0.20
73E4			
73L5	2.90 ±0.10	3.60 ±0.10	0.80 ±0.20

Embossed Tape	[mm]		
Model	A	B	t
Type			
73L6	2.905 ±0.10	5.30 ±0.10	1.00 ±0.10
73E6			
73L7	3.40 ±0.10	6.60 ±0.10	1.00 ±0.10



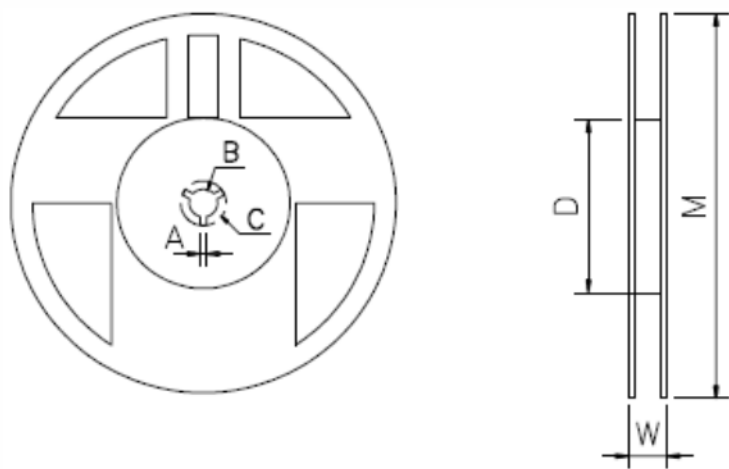
※0603 and 1005 sizes contain parts in sections also and shall be 2 mm pitch.



Packaging

Tape and Reel Information

Reel		[mm]					
Model Type	Quantity Per Reel	W	M	A	B	C	D
73L1	10,000	13.0 ±1.4					
73L2	5,000	13.0 ±1.4					
73L3	5,000	13.0 ±1.4					
73E3							
73L4	5,000	13.0 ±1.4	180	2.5 ±0.6	13.5 ±0.6	21.9 ±0.6	60
73E4							
73L5	5,000	13.0 ±1.4					
73L6	4,000	17.0 ±1.4					
73E6							
73L7	4,000	17.0 ±1.4					





Addendum

Standard EIA Codes and Resistor Values – E-24 [3-Digit Resistor Code for F,G&J Tolerances]

CODE	OHMS	CODE	OHMS	CODE	OHMS	CODE	OHMS
R10	0.100	R27	0.270	R68	0.680		
R11	0.110	R30	0.300	R75	0.750		
R12	0.120	R33	0.330	R82	0.820		
R13	0.130	R36	0.360	R91	0.910		
R15	0.150	R39	0.390				
R16	0.160	R43	0.430				
R18	0.180	R47	0.470				
R20	0.200	R51	0.510				
R22	0.220	R56	0.560				
R24	0.240	R62	0.620				

Standard EIA Codes and Resistor Values – E-24 [4-Digit Resistor Code for F,G&J Tolerances]

CODE	OHMS	CODE	OHMS	CODE	OHMS	CODE	OHMS
R050	0.050						
R051	0.051						
R056	0.056						
R062	0.062						
R068	0.068						
R075	0.075						
R082	0.082						
R091	0.091						

Mouser Electronics

Authorized Distributor

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CTS:

<u>73E6R010J</u>	<u>73E3R051G</u>	<u>73E6R050G</u>	<u>73E4R051G</u>	<u>73E3R068G</u>	<u>73E4R062G</u>	<u>73E4R075G</u>	<u>73E3R056G</u>
<u>73E4R056G</u>	<u>73E3R050G</u>	<u>73E6R082G</u>	<u>73E3R062G</u>	<u>73E6R091G</u>	<u>73E6R051G</u>	<u>73E3R082G</u>	<u>73E6R056G</u>
<u>73E4R050G</u>	<u>73E3R091G</u>	<u>73E6R075G</u>	<u>73E6R062G</u>	<u>73E4R091G</u>	<u>73E3R075G</u>	<u>73E4R068G</u>	<u>73E4R082G</u>
<u>73E6R068G</u>							