

73WLx & 73WEx Series

Current Sensing Resistor – Wide Terminal Chip



Features

- Thick Film Construction – Wide Terminal Configuration
- 0.75 – 21 Watts Power Rating @ +70°C
- Resistance Range 5 – 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

73WEx – Lead Free Design

73WLX – RoHS Compliant in Accordance with EU Directive 2011/65/EU and 2015/863

- 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

73WLx & 73WEx 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	WL	6	R024	G
Code Type			Code Resistor Value	
WL	4-Digit Resistor Code		R024 0.024 ohms ²	
WE	4-Digit Resistor Code		R100 0.100 ohms ²	
		Code Package Size		Code Tolerance
		4 1206 [3216]		F ±1%
		6 2010 [5025]		J ±5%
		7 2512 [6432]		

Notes:

1. No dashes or spaces to appear in part number.
2. The "R" indicates decimal point. See Addendum for Standard EIA Values and Codes.

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	Package Size	4-Digit Code	
		J [±5%]	F [±1%]
0.024 Ohms	2010 [5025]	73WL6R024J	-
0.100 Ohms	1206 [3216]	73WL4R100J	73WL4R100F
0.750 Ohms	2512 [6432]	73WL7R750J	73WL7R750F
0.007 Ohms	2010 [5025]	73WE6R007J	-
0.016 Ohms	1206 [3216]	73WE4R016J	73WE4R016F
0.091 Ohms	2512 [6432]	73WE7R091J	73WE7R091F

Electrical & Environmental Specifications

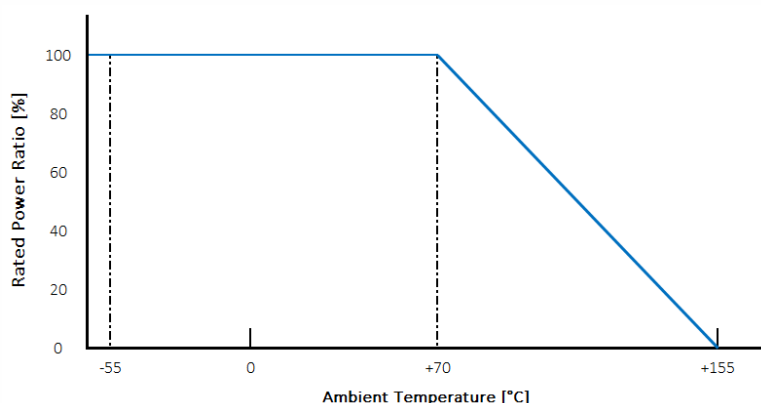
Operating Conditions

Model Type	Package Code Inch [mm]	Rated Power [Watts]	Resistance Range [mΩ]	Resistor Tolerance [%]	Temperature Coefficient	Rated Ambient Temperature	Operating Temperature Range	Working Voltage [max V]	Overload Voltage [max V]
73WL4	1206 [3216]	0.75	100 - 910	±1	±200ppm/°C	+70°C	-55°C to +155°C	200	400
			10 - 33		±500ppm/°C				
			36 - 91	±5	±350ppm/°C				
			100 - 910		±200ppm/°C				
73WL6	2010 [5025]	1.0	100 - 910	±1	±200ppm/°C	+70°C	-55°C to +155°C	200	400
			10 - 33		±500ppm/°C				
			36 - 91	±5	±350ppm/°C				
			100 - 910		±200ppm/°C				
73WL7	2512 [6432]	2.0	100 - 910	±1	±200ppm/°C	+70°C	-55°C to +155°C	200	400
			10 - 33		±500ppm/°C				
			36 - 91	±5	±350ppm/°C				
			100 - 910		±200ppm/°C				
73WE4	1206 [3216]	0.75	10 - 91 5 - 91	±1 ±5	±100ppm/°C	+70°C	-55°C to +155°C	200	400
73WE6	2010 [5025]	1.0	10 - 91 5 - 91	±1 ±5	±100ppm/°C	+70°C	-55°C to +155°C	200	400
73WE7	2512 [6432]	2.0	10 - 91 5 - 91	±1 ±5	±100ppm/°C	+70°C	-55°C to +155°C	200	400

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

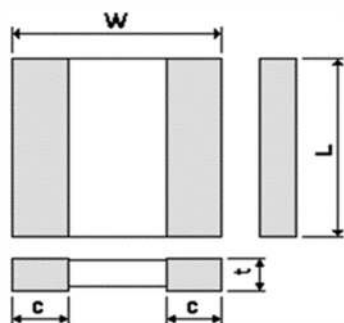
Test	Maximum Delta R [%]	Test Description
	73WLx & 73WEx	
Temperature Coefficient	±200ppm/°C ¹	Measured temperature at -55°C to 155°C
Short-Time Overload	±2.0	Apply 2.5 times the rated voltage, 5 seconds, maximum 100V
Insulation Resistance	Over 10 ⁹ ohm	Measured at terminals and center of resistor by D.C. 100V ±15V in 1 minute [JIS C 5202]
Dielectric Withstanding Voltage	No Breakdown	Applied at terminals and center of resistor on A.C. 400V, 1 minute [JIS C 5201-1 4.7]
Resistance to Solder Heat	±1.0 No Damage	Immerse in solder, +260°C ±5°C, 10 ±1 seconds
Solderability	Over 95% Coverage	Immerse terminal in solder [Sn3Ag0.5Cu], +245°C ±0.5°C, 3 ±0.5 seconds [JIS C 5201-1 4.17]
High Temperature Exposure	±3.0	1,000 hours @ +155°C ±2°C, bias load 0% power [JIS C 5201-1 4.23.2]
Change of Temperature	±1.0 No Damage	30 minutes @ -55°C, 10 minutes @ +25°C, 30 minutes @ +155°C, 10 minutes @ +25°C; 1,000 cycles
Moisture Resistance	±1.0	MIL-STD-202, Method 106, 0% power 7a and 7b not required, 1 cycle = 24 hours, 10 cycles
Bias Humidity	±3.0	1,000 hours @ +85°C ±2°C, 90% - 95% relative humidity, bias load 10%, on time 90 minutes/off time 30 minutes
Endurance [Rated Load]	±3.0	1,000 hours @ +70°C ±3°C, bias load, on time 90 minutes/off time 30 minutes
Resistance to Solvent	No Damage	Immerse in Isopropyl alcohol, +20°C to +25°C, 60 ±5 seconds
Terminal Strength [Bending]	±0.1 No Damage	3mm bending, 1mm/second, hold 5 seconds

1. Temperature Coefficient value varies by resistance range. Refer to data sheet for specific value.

Mechanical Specifications

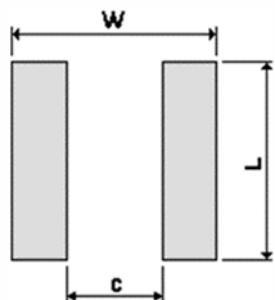
Package Drawing/Dimensions

Model Type	Package Code Inch [mm]	Dimensions [mm]				
		L	W	t	c	d
73WL4 73WE4	1206 [3216]	3.2 ±0.15	1.6 ±0.15	0.55 ^{+0.15} -0.05	0.3 ±0.2	0.5 ±0.2 0.3 ±0.2
73WL6 73WE6	2010 [5025]	5.0 ±0.2	2.5 ±0.2	0.56 ±0.015	0.5 ±0.2	0.6 ±0.2 0.5 ±0.2
73WL7 73WE7	2512 [6432]	6.3 ±0.2	3.2 ±0.2	0.56 ±0.15	0.5 ±0.2 0.6 ±0.2	0.9 ±0.2 0.6 ±0.2



Recommended Pad Layout

Model Type	Dimensions [mm]		
	C	L	W
73WL4 73WE4	0.65	3.2	2.65
73WL6 73WE6	1.3	5.0	4.0
73WL7 73WE7	1.45	6.4	4.85



Notes

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

Mechanical Specifications

Marking Information

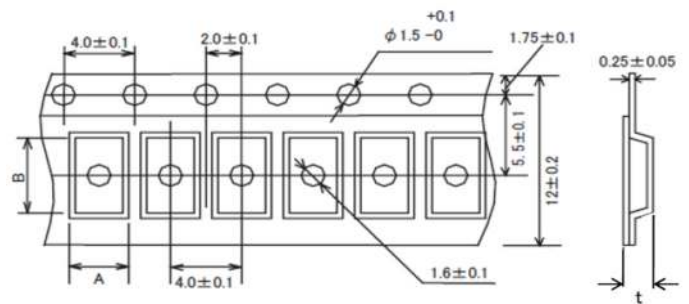
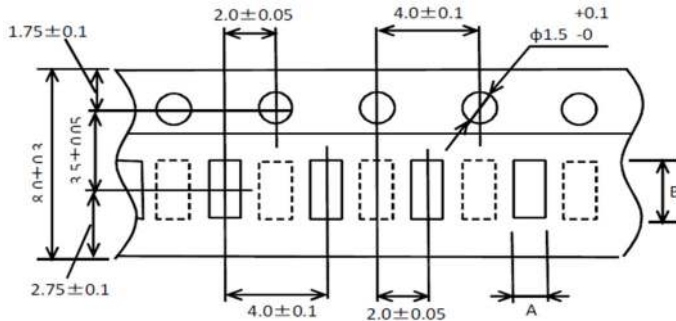
Model Type	Part Marking
73WL4	
73WL6	Rxxx = "R" is the decimal point and 3 digits [E24] are significant values. See resistor tables for codes.
73WL7	
73WE4	
73WE6	No Marking
73WE7	

Packaging

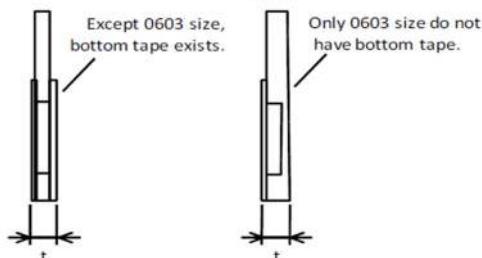
Tape and Reel Information

Model Type	[mm]			
	A	B	t	
73WL4	2.00	3.57	0.80 ±0.20	
73WE4				

Model Type	[mm]		
	A	B	t
73WL6	2.9 ±0.1	5.3 ±0.1	1.0 ±0.1
73WE6			
73WL7	3.4 ±0.1	6.6 ±0.1	1.0 ±0.1
73WE7			



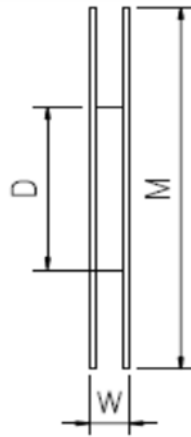
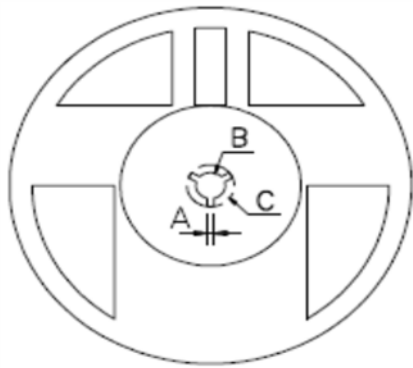
※0603 and 1005 sizes contain parts in sections also and shall be 2 mm pitch.



Packaging

Tape and Reel Information

Reel		[mm]					
Model Type	Quantity Per Reel	W	M	A	B	C	D
73WL4 73WE4	5,000	13.0 ±1.4	180	2.5 ±0.6	13.5 ±0.6	21.9 ±0.6	60
73WL6 73WE6	4,000	17.0 ±1.4	180	2.5 ±0.6	13.5 ±0.6	21.9 ±0.6	60
73WL7 73WE7	4,000	17.0 ±1.4	180	2.5 ±0.6	13.5 ±0.6	21.9 ±0.6	60





Addendum

73WLx

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

CODE	OHMS	CODE	OHMS	CODE	OHMS	CODE	OHMS
R010	0.0100	R033	0.0330	R100	0.1000	R330	0.3300
R011	0.0110	R036	0.0360	R110	0.1100	R360	0.3600
R012	0.0120	R039	0.0390	R120	0.1200	R390	0.3900
R013	0.0130	R043	0.0430	R130	0.1300	R430	0.4300
R015	0.0150	R047	0.0470	R150	0.1500	R470	0.4700
R016	0.0160	R051	0.0510	R160	0.1600	R510	0.5100
R018	0.0180	R056	0.0560	R180	0.1800	R560	0.5600
R020	0.0200	R062	0.0620	R200	0.2000	R620	0.6200
R022	0.0220	R068	0.0680	R220	0.2200	R680	0.6800
R024	0.0240	R075	0.0750	R240	0.2400	R750	0.7500
R027	0.0270	R082	0.0820	R270	0.2700	R820	0.8200
R030	0.0300	R091	0.0910	R300	0.3000	R910	0.9100

73WEx

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

CODE	OHMS	CODE	OHMS	CODE	OHMS	CODE	OHMS
R005	0.0050	R012	0.0120	R024	0.0240	R056	0.0560
R006	0.0060	R013	0.0130	R027	0.0270	R062	0.0620
R007	0.0070	R015	0.0150	R030	0.0300	R068	0.0680
R008	0.0080	R016	0.0160	R033	0.0330	R075	0.0750
R009	0.0090	R018	0.0180	R036	0.0360	R082	0.0820
R010	0.0100	R020	0.0200	R039	0.0390	R091	0.0910
R011	0.0110	R022	0.0220	R043	0.0430		