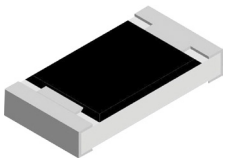
High Precision Thin Film Chip Resistor

RoHS Compliant



Description:

The resistors are constructed in a high grade ceramic body (aluminium oxide). Internal metal electrodes are added at each end and connected by a resistive paste that is applied to the top surface of the substrate. The composition of the paste is adjusted to give the approximate resistance required and the value is trimmed to within tolerance by laser cutting of this resistive layer.

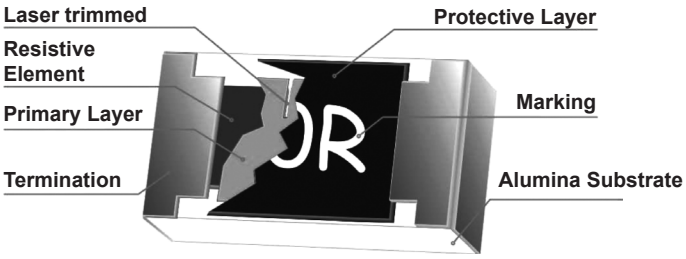
The resistive layer is covered with a protective coat. Finally, the two external end terminations are added. For environmental soldering issue, the outer layer of these end terminations is a Lead-free solder.

Features:

- SMD metal film resistor with high reliability and stability
- High performance of TCR: 25 ppm/K
- Low current noise
- ±0.05% is upon the customer request

Application:

- Medical equipment
- Measuring instrument
- Communication device
- Computer and Printer



Construction of Chip-R

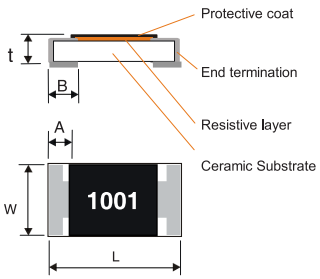
Quick Reference Data

Item	General Specification
Series No.	MCWF08U
Size code	0805 (2012)
Resistance Tolerance	±1%, ±0.5%, ±0.25%, ±0.1%, ±0.05%
Resistance Range	4.7Ω to 1MΩ (E24 +E192)
TCR (ppm/°C)	+25 to -25 ppm/°C
Max. Dissipation @ T amb = 70°C	1/10 W
Max. Operation Voltage (DC or RMS)	100V
Max. Overload Voltage (DC or RMS)	200V
Operation temperature	-55°C to +155°C

Note:

1. This is the maximum voltage that may be continuously supplied to the resistor element, see “IEC publication 60115-8”
2. Max. Operation Voltage : So called RCWV (Rated Continuous Working Voltage) is determined by
   RCWV = $\sqrt{\text{Rated Power} \times \text{Resistance Value}}$ or Max. RCWV listed above, whichever is lower.

Mechanical Data



Part Number	MCWF08U
L	2 ±0.1
W	1.25 ±0.1
A	0.25 ±0.2
B	0.4 ±0.2
t	0.5 ±0.15

Dimensions : Millimetres

Marking

4-digits marking for 0805 size

For E24/E96 series, each resistor is marked with a four digits code on the protective coating to designate the nominal resistance value. For non E24/E96 series, no marking is applied!

Example:

Resistance	10Ω	12Ω	100Ω	6800Ω	47000Ω
4-digits marking	10R0	12R0	1000	6801	4702

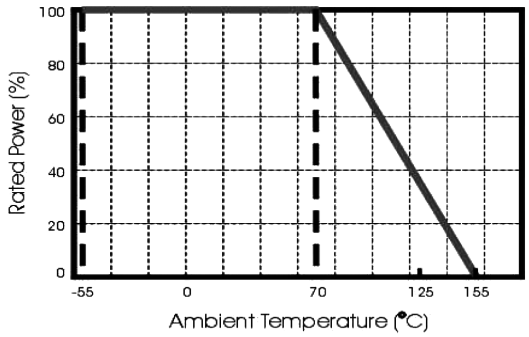
Functional Description:

Product characterization

Standard values of nominal resistance are taken from the E192 & E24 series for resistors with a tolerance of ±1%, ±0.5%, ±0.25%, ±0.1%, ±0.05%. The values of the E24/E192 series are in accordance with “IEC publication 60063”.

Derating

The power that the resistor can dissipate depends on the operating temperature.



Max. Dissipation in percentage of rated power
As a function of the ambient temperature

Mounting

Due to their rectangular shapes and small tolerances, Surface Mountable Resistors are suitable for handling by automatic placement systems.

Chip placement can be on ceramic substrates and printed-circuit boards (PCBs).

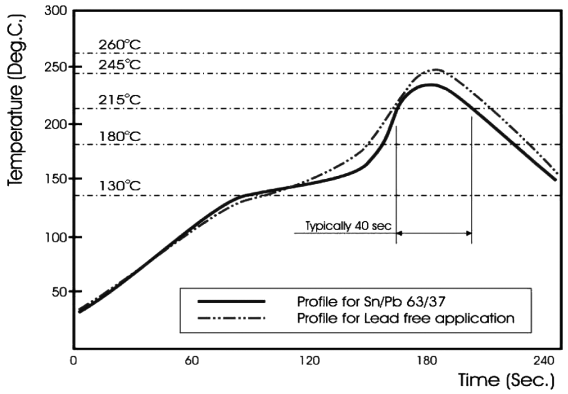
Electrical connection to the circuit is by individual soldering condition.

The end terminations guarantee a reliable contact.

Soldering Condition:

The robust construction of chip resistors allows them to be completely immersed in a solder bath of 260°C for 10 seconds. Therefore, it is possible to mount Surface Mount Resistors on one side of a PCB and other discrete components on the reverse (mixed PCBs).

Surface Mount Resistors are tested for solderability at 235°C during 2 seconds. The test condition for no leaching is 260°C for 30 seconds. Typical examples of soldering processes that provide reliable joints without any damage are given in below figure.



Infrared soldering profile for Chip Resistors

Catalogue Numbers:

The resistors have a catalogue number starting with

MCWF08	U	XXXX	B	T	L
Size code MCWF08 : 0805	**Type code** U : TCR 25ppm	**Resistance code** E192+E24: 3 significant digits followed by No. of zeros e.g.: 102Ω = 1020 37.4kΩ = 3742 220Ω = 2200	**Tolerance** B : ±0.1%	**Packaging code** T : Reeled	**Termination code** L = Sn base (lead free)

Reeled tape packaging : 8mm width paper taping
5,000pcs/reel for MCWF08U Series.

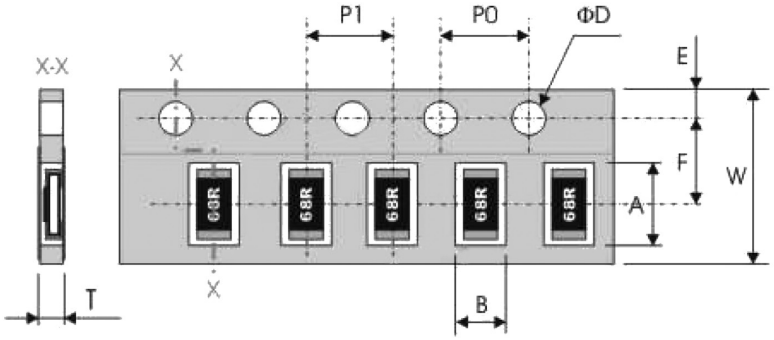
Test And Requirements

Basic specification : JIS C 5201-1 : 1998

Test	Procedure	Requirement
Clause 4.5 DC resistance	DC resistance values measured at the test voltages specified below : <10Ω@0.1V, <100Ω@0.3V, <1kΩ@1.0V, <10kΩ@3V, <100kΩ@10V,<1MΩ@25V, <10MΩ@30V	Within the specified tolerance
Clause 4.8 Temperature Coefficient of Resistance (TCR)	Natural resistance change per change in degree Centigrade. $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6$ (ppm/°C) R_1 : Resistance at reference temperature R_2 : Resistance at test temperature t_1 : 20°C +5°C -1°C. t_2 : 125°C +5°C -1°C.	Refer to quick reference data for T.C.R specification
Clause 4.13 Short time overload	Permanent resistance change after a 5 second application of a voltage 2.5 times RCWV or the maximum overload voltage specified in the above list, whichever is less.	ΔR/R max. ±(0.2% +0.05Ω)
Clause 4.18 Resistance to soldering heat (R.S.H)	Un-mounted chips completely immersed for 10±1second in a SAC solder bath at 260°C ±5°C.	No visible damage ΔR/R max. ±(0.1% +0.05Ω)
Clause 4.17 Solderability	Un-mounted chips completely immersed for 2 ±0.5 second in a SAC solder bath at 235°C ±5°C.	Good tinning (>95% covered) No visible damage
Clause 4.19 Temperature cycling	1. 30 minutes at -55°C ±3°C, 2. 2~3 minutes at 20°C +5°C-1°C, 3. 30 minutes at +155° ±3°C, 4. 2~3 minutes at 20°C +5°C-1°C, Total 5 continuous cycles.	No visible damage ΔR/R max. ±(0.25% +0.05Ω)
Clause 4.25 Load life (endurance)	1000 +48/-0 hours, loaded with RCWV or Vmax in chamber controller 70±2ºC, 1.5 hours on and 0.5 hours off.	ΔR/R max. ±(0.5%+0.05Ω)
Clause 4.24 Load life in Humidity	1000 +48/-0 hours, loaded with RCWV or Vmax in humidity chamber controller at 40°C±2°C and 90~95% relative humidity, 1.5 hours on and 0.5 hours off.	ΔR/R max. ±(0.5%+0.05Ω)
Clause 4.33 Bending strength	Resistors mounted on a 90mm glass epoxy resin PCB(FR4); bending : 3mm, once for 10 seconds.	ΔR/R max. ±(0.1%+0.05Ω)
Clause 4.32 Adhesion	Pressurizing force: 5N, Test time: 10±1sec.	No remarkable damage or removal of the terminations
Clause 4.6 Insulation Resistance	Apply the maximum overload voltage (DC) for 1 minute.	R ≧ 10GΩ
Clause 4.7 Dielectric Withstand Voltage	Apply the maximum overload voltage (AC) for 1 minute.	No breakdown or flashover

Packaging:

Paper Tape specifications

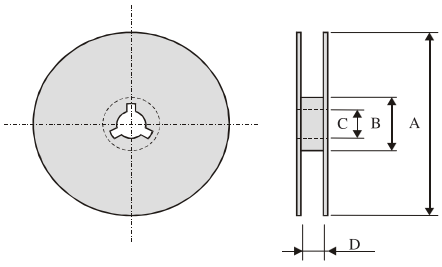


Series No.	A	B	W	F	E
MCWF08	2.4 ±0.2	1.65 ±0.2	8 ±0.3	3.5 ±0.2	1.75 ±0.1

Series No.	P1	P0	D	T
MCWF08	4 ±0.1	4 ±0.1	$1.5^{+0.1}_{-0}$	Max. 1

Dimensions : Millimetres

Reel dimensions:



A	B	C	D
Φ178 ±2	Φ60 ±1	13 ±0.2	9 ±0.5

Dimensions : Millimetres

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