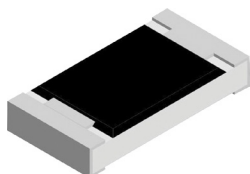


Thick Film General Purpose Chip Resistor

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**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.

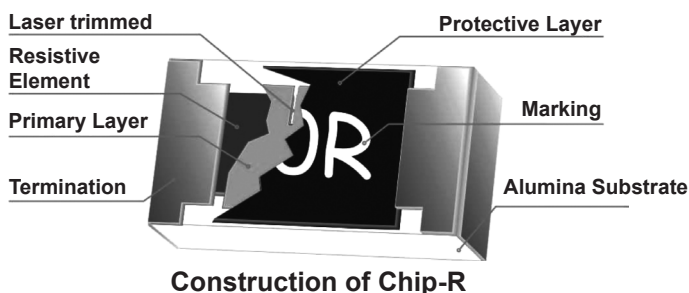
The resistive layer is covered with a protective coat. Finally, the two external end terminations are added. For ease of soldering the outer layer of these end terminations is a Tin (lead free) alloy.

Features:

- High reliability and stability
- Reduced size of final equipment
- Lower assembly costs
- Higher component and equipment reliability

Application:

- Consumer electrical equipment
- EDP, Computer application
- Telecom application



Quick Reference Data

Item	General Specification
Series No.	MCWR08
Size code	0805(2012)
Resistance Range	1Ω ~ 10MΩ (±1% tolerance)
Resistance Tolerance	1%, E96/E24
TCR (ppm/°C) 10MΩ ≥ R > 10 R ≤ 10Ω	≤ ± 100 -200 to +400
Max. Dissipation @ T _{amb} = 70°C	1/8 W
Max. Operation Voltage (DC or RMS)	150V
Max. Overload Voltage (DC or RMS)	300V
Climatic Category	55/155/56

Notes:

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.
3. The resistance of Jumper is defined <0.05Ω.

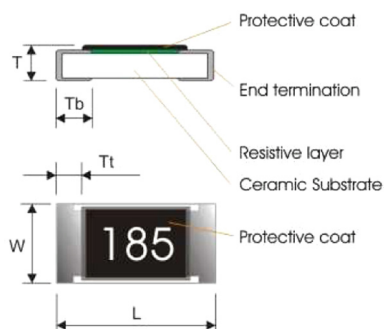
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Dimensions



	MCWR08
L	2mm ±0.1mm
W	1.25mm ±0.1mm
T	0.5mm ±0.15mm
Tb	0.4mm ±0.2mm
Tt	0.4mm ±0.2mm

Marking

Size \ Nr. Of digit of code \ tolerance	±1%
0805 (2012)	4-digits marking

4-digits marking (±1% : 0805)

Each resistor is marked with a four digits code on the protective coating to designate the nominal resistance value.

Example

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

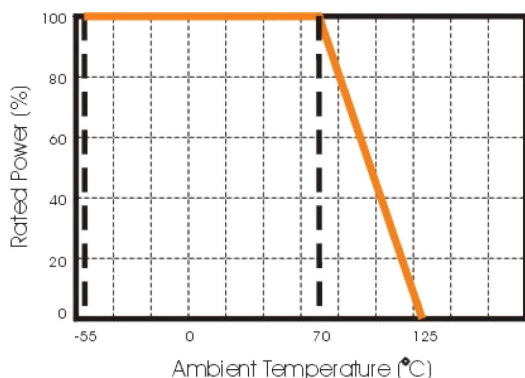
Functional Description:

Product characterization

Standard values of nominal resistance is E96 series for resistors with a tolerance of ±1%. The values of the E24/E96 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 for MCWR08

Thick Film General Purpose Chip Resistor



Mounting

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

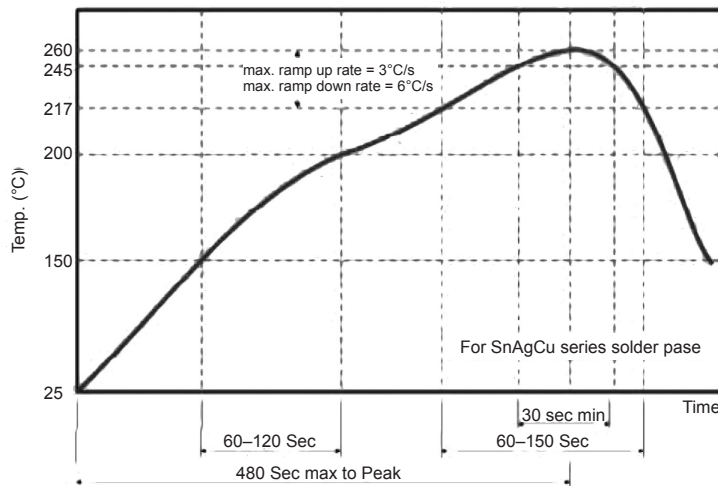
Chip placement can be on ceramic substrates and printed-circuit boards (PCBs).

Electrical connection to the circuit is by individual soldering condition.

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

Part Number Explanation

MCWR08	X	0000	F	T	L
Size code MCWR08 : 0805	Type code X : ±1%, 10Ω to 1MΩ	Resistance code 4.7Ω =4R7_ 10Ω =100_ 220Ω =221_ Jumper =000_ ("_" means a blank) ±1%, E24+E96: 3 significant digits followed by no. of zeros 102Ω =1020 37.4KΩ =3742	Tolerance F : ±1%	Packaging code T : 7" Reeled taping	Termination code L = Sn base (lead free)

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Test and Requirements:

Essentially all tests are carried out according to the schedule of IEC publication 115-8, category LCT/UCT/56 (rated temperature range : Lower Category Temperature, Upper Category Temperature; damp heat, long term, 56 days). The testing also meets the requirements specified by EIA, EIAJ and JIS.

The tests are carried out in accordance with IEC publication 68, "Recommended basic climatic and mechanical robustness testing procedure for electronic components" and under standard atmospheric conditions according to IEC 60068-1, subclause 5.3. Unless otherwise specified, the following value supplied :

Temperature: 15°C to 35°C.

Relative humidity: 45% to 75%.

Air pressure: 86kPa to 106 kPa (860 mbar to 1060 mbar).

All soldering tests are performed with mildly activated flux.

Test	Procedure / Test Method	Requirement	
		Resistor	0Ω
Electrical Characteristics JISC5201-1: 1998	- DC resistance values measurement - Temperature Coefficient of Resistance (T.C.R) Natural resistance change per change in degree centigrade. $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (ppm/}^\circ\text{C)}$ $t_1 : 20^\circ\text{C} + 5^\circ\text{C} / -1^\circ\text{C}; t_2 : -55^\circ\text{C or } +155^\circ\text{C}$ $R_1 : \text{Resistance at reference temperature (20}^\circ\text{C } + 5^\circ\text{C } / -1^\circ\text{C)}$ $R_2 : \text{Resistance at test temperature (-55}^\circ\text{C or } +155^\circ\text{C)}$	Within the specified tolerance Refer to "Quick Reference Data"	<50mΩ
Resistance to soldering heat(R.S.H) JISC5201-1:1998	Un-mounted chips completely immersed for 10 ±1second in a SAC solder bath at 260°C ±5°C	±1%: ΔR/Rmax. ±(0.5%+0.05Ω) no visible damage	<50mΩ
Solderability JISC5201-1: 1998	Un-mounted chips completely immersed for 10 ±1second in a SAC solder bath at 235°C ±5°C	95% coverage min., good finning and no visible damage	
Temperature cycling JISC5201-1: 1998	30 minutes at -55°C ±3°C, 2-3 minutes at 20°C +5°C -1°C, 30 minutes at +155°C ±3°C, 2-3 minutes at 20°C +5°C -1°C, total 5 continuous cycles	±1%: ΔR/Rmax. ±(0.5%+0.05Ω) No visible damage	<50mΩ
High Temperature Exposure MIL-STD-202 method 108	1,000 +48/-0 hours; without load in a temperature chamber controlled 155 ±3° C	±1%:ΔR/ Rmax.±(1%+0.1Ω) No visible damage	<50mΩ
Bending strength JISC5201-1: 1998	Resistors mounted on a 90mm glass epoxy resin PCB(FR4), bending once 3mm for 10sec	±1%:ΔR/ Rmax.±(1%+0.05Ω) No visual damaged	<50mΩ
Adhesion JISC5201-1: 1998	Pressurizing force: 5N, Test time: 10 ±1sec.	No remarkable damage or removal of the terminations	
Short Time Overload (STOL) JISC5201-1: 1998	2.5 times RCWV or max. overload voltage, for 5seconds	±1%: ΔR/R max. ±(1%+0.05Ω) No visible damage	<50mΩ
Load life in Humidity JISC5201-1: 1998	1000 +48/-0 hours, loaded with RCWV or Vmax in humidity chamber controller at 40°C± 2°C and 90 to 95% relative humidity, 1.5hours on and 0.5 hours off	±1%: ΔR/R max. ±(1%+0.1Ω) No visible damage	<50mΩ
Load life (endurance) JISC5201-1: 1998	1000 +48/-0 hours, loaded with RCWV or Vmax in chamber controller 70±2°C, 1.5 hours on and 0.5 hours off	±1%: ΔR/R max. ±(1%+0.1Ω) No visible damage	<50mΩ

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Test	Procedure / Test Method	Requirement	
		Resistor	0Ω
Insulation Resistance JISC5201-1: 1998	Apply the maximum overload voltage (DC) for 1minute	R≥10GΩ	
Dielectric Withstand Voltage JISC5201-1: 1998	Apply the maximum overload voltage (AC) for 1 minute	No breakdown or flashover	

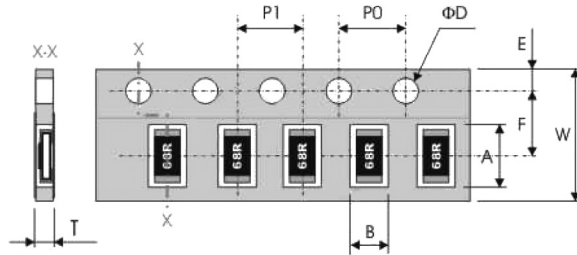
Test Condition For Jumper (0Ω)

Item	MCWR08
Power Rating at 70°C	1/8W
Resistance	Max. 50mΩ
Rated Current	1.5A

Item	MCWR08
Peak Current	3.5A
Operating Temperature	-55°C to +155° C

Packaging

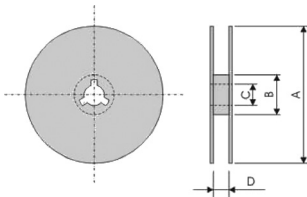
Paper Tape specifications



Series No.	A	B	W	F	E	P1	P0	ΦD	T
MCWR08	2.4 ±0.2	1.65 ±0.2	8 ±0.3	3.5 ±0.1	1.75 ±0.1	4 ±0.1	4 ±0.1	15 ^{+0.1} ₋₀	Max. 1.0

Dimensions : Millimetres

Reel dimensions



A	B	C	D
178 ±2	60 ±1	13 ±0.2	9 ±0.5

Dimensions : Millimetres

Part Number Table

Description	Part Number
Thick Film Chip Resistor, 0R, 1%, 0.125W, 0805	MCWR08X0000FTL

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