Power Resistor Chip Size 1218 5%

2322 735 .....

FEATURES

Reduced size of final equipment

Lower assembly costs

Higher component and equipment reliability

Improved performance at high frequencies

DESCRIPTION

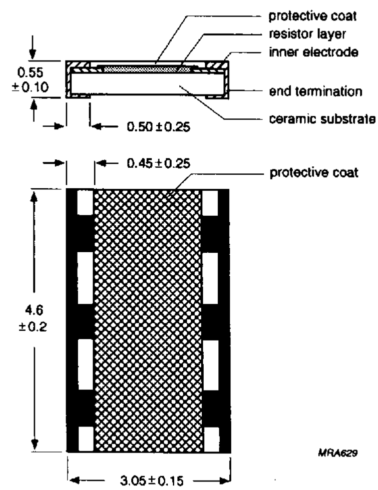
The resistors are constructed on a high grade ceramic body (aluminum oxide). Internal metal electrodes are added at each end and connected by a resistive paste which is applied to the top surface of the substrate. The composition of the paste is adjusted to give the approximate resistance required and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

The resistive layer is covered with a protective coating and printed with the resistance value. The two external end terminations are added along with a nickel barrier coat. For ease of soldering, the outer layer of these end terminations is a tin/lead alloy.

MASS: 3.00 g per 100 units

QUICK REFERENCE DATA

Resistance Range	1Ω to 1 MΩ; E24 Series
Resistance Tolerance	± 5%
Temperature Coefficient 1 Ω to 10 Ω 11 Ω to 1 MΩ	 ≤ ± 200 ppm/°C ≤ ± 100 ppm/°C
Abs. Max. Dissipation at T_{amb} = 70°C	1.00 W
Max. Continuous Operating Voltage	200 V (DC or RMS)
Operating Temperature Range	-55°C to + 155°C
Basic Specification	IEC 115-8
Stability after: Load, 1000 hrs at T_{amb} = 70°C Climatic Tests Resistance to Soldering Heat Short Time Overload, 400 V max.	 ΔR/R Max: 3.0% + 0.10 Ω ΔR/R Max: 3.0% + 0.10 Ω ΔR/R Max: 1.0% + 0.05 Ω ΔR/R Max: 1.0% + 0.05 Ω



Dimensions in mm.

Fig.1 Outlines.

MOUNTING

Due to their rectangular shape and small tolerances on the dimensions, Surface Mounted Resistors are suitable for handling by automatic placement systems. Chip placement is possible on ceramic substrates and printed-circuit boards (PCB's). Electrical connection to the circuit is made by wave, vapor phase, or infrared soldering. The end terminations guarantee a reliable contact and the protective coating enables "face down" mounting.

Ensure that the temperature rise of the resistor body does not affect nearby components or materials by conducted or convected heat.

The hot-spot temperature and the solder joint temperature rise of the resistor body, are dependent on both the PCB material and mounting position. Figure 5 shows the hot-spot temperature and the solder joint temperature rise of the resistor body, horizontally mounted, as a function of dissipated power on different PCB's. Figure 6 shows the same information on a test substrate as described in Figure 7.

The robust construction of the device allows it to be completely immersed in a solder bath of 260°C for up to one minute. Therefore, it is possible to mount Surface Mounted Resistors on one side of a PCB and other discrete components on the reverse side (mixes PCB's).

SOLDERING CONDITIONS

Surface Mounted Resistors are tested for solderability at a temperature of 235°C during 2 seconds. The test condition for no leaching is 260°C for 60 seconds. Typical examples of soldering processes that provide reliable joints without any damage are given in Figs. 2, 3, and 4.

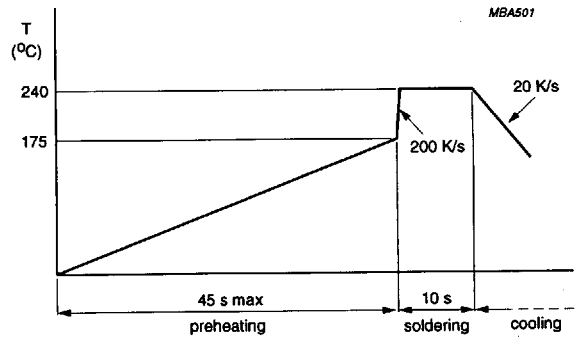


Fig. 2 Infrared soldering.

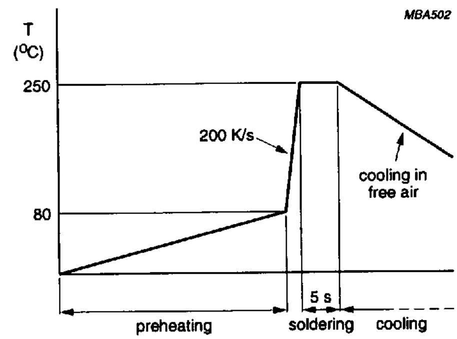


Fig. 3 Wave soldering. The resistors may be soldered twice according to this method if necessary.

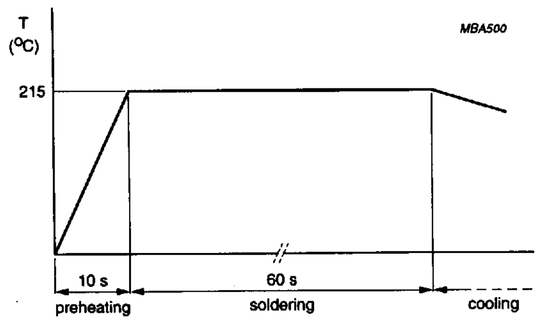


Fig. 4 Vapour phase soldering.

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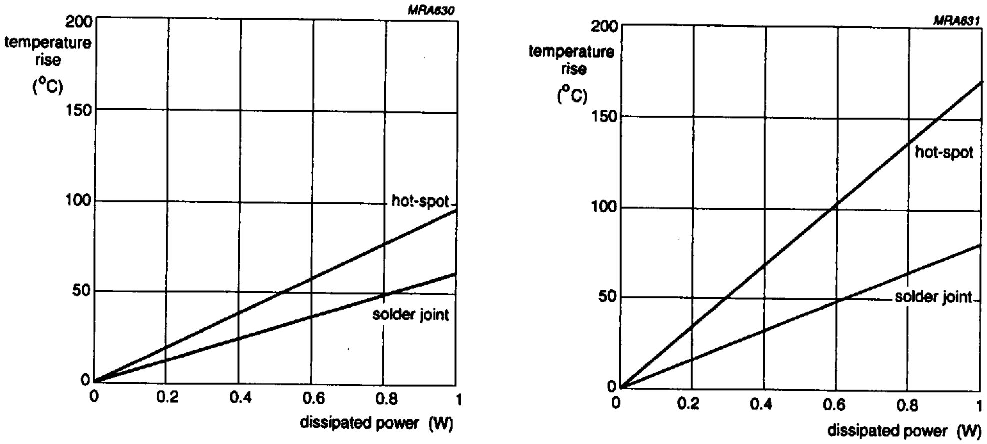

Fig. 5 Temperature rise at hot-spot and solder joint as a function of dissipated power, for a 2322 735 resistor horizontally mounted on different PCB materials.

MARKING

Each resistor is marked with the nominal resistance value on the protective coating.

For values up to 910 Ω, "R" is used as the decimal point.

For values of 1 KΩ and higher, "K" is used as the decimal point for the KΩ indication.

The packing is also marked and includes resistance value, tolerance, TCR, catalogue number, quantity, production period, batch number, and source code.

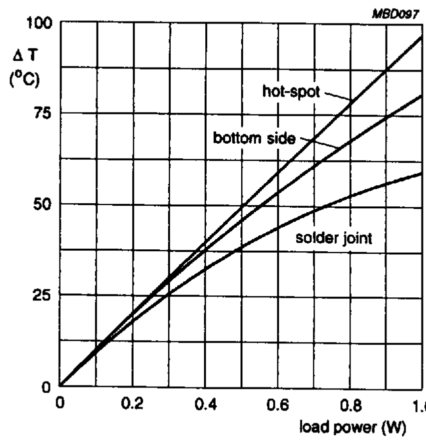

Fig. 6 Temperature rise at hot-spot and solder joint as a function of dissipated power, for a 2322 735 resistor horizontally mounted on test substrate.

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ELECTRICAL DATA

Standard values of nominal resistance are taken from the E24 series for resistors with a tolerance of ± 5%. The values of this series are in accordance with IEC Publication 63.

The maximum continuous working voltage (DC or RMS) is 200 V. This is the maximum voltage that may be continuously applied to the resistor element.

DISSIPATION

The rated power that the resistor can dissipate depends on the operating temperature. See Fig. 8.

PULSE LOAD BEHAVIOR

The Pulse Load Behavior is determined in accordance with the method outlined in the "General Section". The results are shown in Figs. 9 and 10. The "Normstross" Behavior, outlined in the General Section of this catalog is shown in Figure 11.

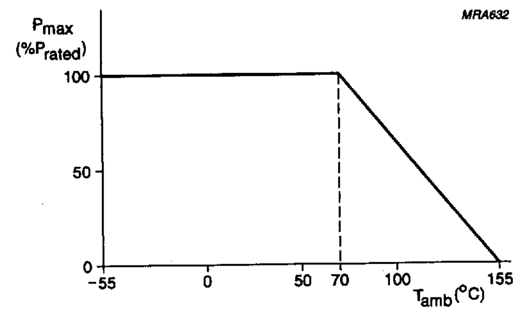
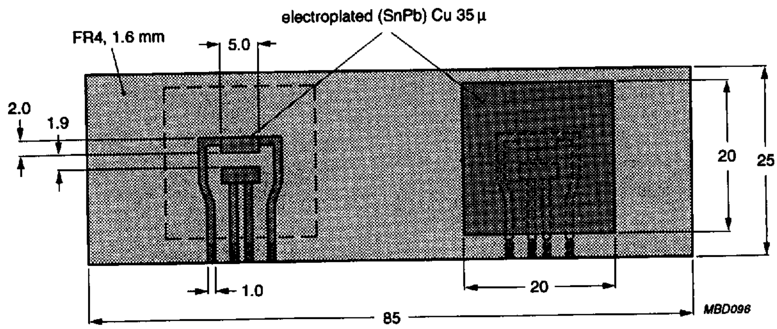


Fig. 8 Maximum dissipation (P_{max}) as a function of the ambient temperature (T_{amb}).



Dimensions in mm.

Fig. 7 Test substrate layout.

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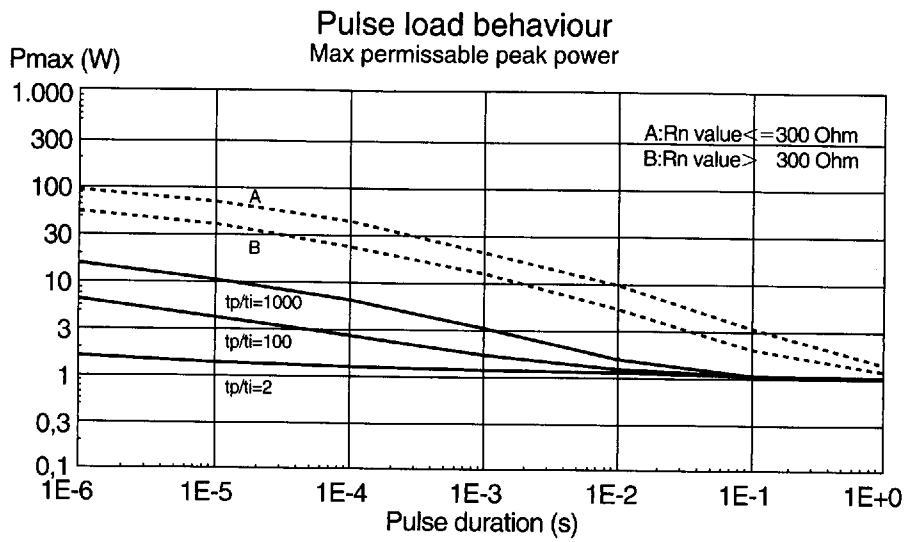

Fig. 9 Maximum permissible peak pulse power (P_{max}) versus pulse duration for R ≤ 10 KΩ.
Single pulse and Repetitive pulse t_p / t_i = 1,000.

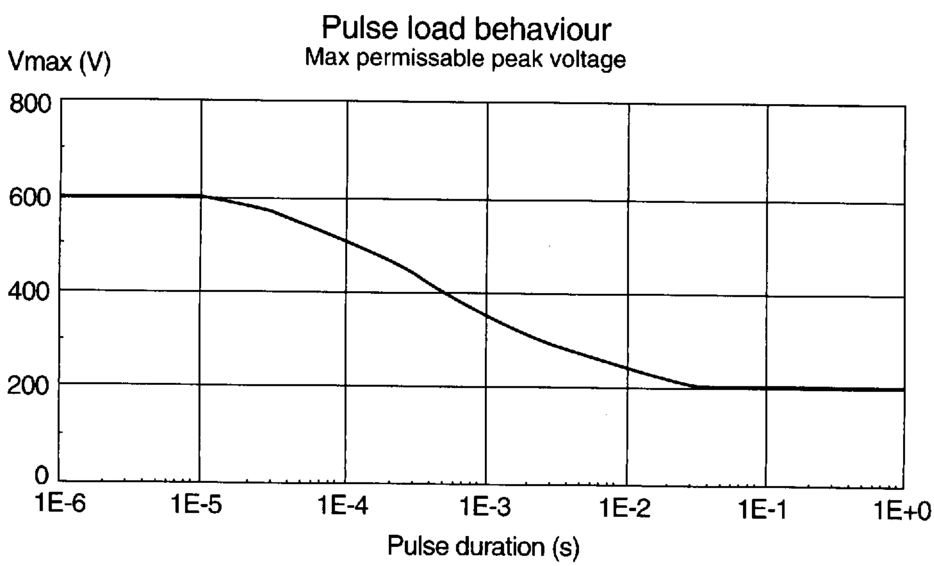

Fig. 10 Maximum permissible peak pulse voltage (V_{max}) versus pulse duration.

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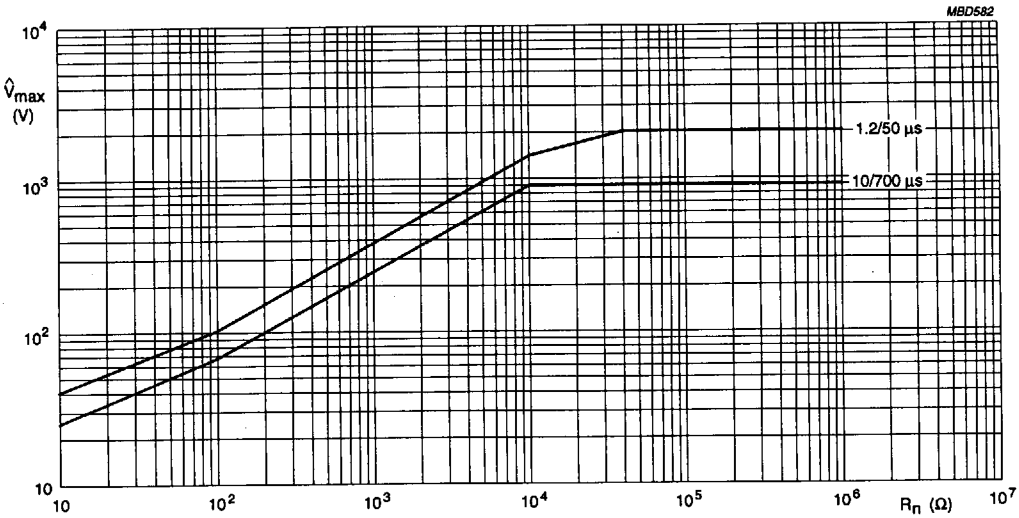

These pulses may not be applied on a regular basis.

Fig. 11 Maximum permissible peak pulse voltage without failing to open circuit

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ORDERING INFORMATION

International Part Number

Table 1 The resistor part numbers start with 2322 735. Subsequent digits indicate packaging and resistance as listed in this table.

Resistance Range	Tol ± %	Series	2322 735	
			Plastic Blister Tape	
			1000 reel	5000 reel
1 Ω to 1 MΩ	5	E24	735 30...	735 60...

Table 2 To complete the part number (see Table 1), replace the first two dots of the remaining code with the first two digits of the resistance value. Replace the third dot with a figure as shown in this table.

Nominal Resistance Range	Last Digit of Part Numbers
1 Ω to 9.1 Ω	8
10 Ω to 91 Ω	9
100 Ω to 910 Ω	1
1 KΩ to 9.1 KΩ	2
10 KΩ to 91 KΩ	3
100 KΩ to 910 KΩ	4
1 MΩ	5