# RF Dummy Load KT-002

**Up to 100 W RF continuous power**
**Frequency range: DC to 54 MHz (6 m band)**
**Active air cooling (80x80 mm fan) ensures high reliability and a compact design**

## Main Features

- **Cost-effective HF + 6 m band 50R RF dummy load**
- **100 W continuous power handling**
- **300 W peak power handling capability**
- **Low VSWR levels up to 54 MHz**
- **UC-1 female (PL-259) RF input connector**
- **Built-in fan for reliable continuous operation**
- **2.1 x 5.5 DC input connector for the fan supply**
- **THT components for easy assembly**

## Mechanical Characteristics

- **Compact design: 80 x 80 x 75 mm (with the fan)**
- **One layer PCB for easy components assembly**
- **Solid aluminum baseplate for the input connector**
- **1-year warranty**

## Application

- **Antenna substitute during transmitter tests**
- **Part of an experimental RF equipment**
- **Dummy load for long-term TX testing**

## General Description

The KT-002 RF Dummy Load is a compact design and cost-effective solution for RF dummy load. Specially selected components and coaxial design ensure a stable 50 R resistive behavior over a wide frequency range with 100 W RF continuous operation as shown in **Table 1**.

**Table 1.** Typical VSWR characteristics

| FREQUENCY RANGE | VSWR | Power Trans. [%] | Power Refl. [%] |
|---|---|---|---|
| DC to 30 MHz | ≤ 1.04 | 100.0 | 0.0 |
| 30 MHz to 60 MHz | ≤ 1.09 | 99.8 | 0.2 |
| 60 MHz to 144 MHz | ≤ 1.42 | 97.0 | 3.0 |

## Absolute Maximum Ratings

| | |
|---|---|
| Maximum input voltage for continuous operation: | 70.7 Vrms (+50.0 dBm) |
| Maximum input voltage for 5 s operation: | 122.5 Vrms (+54.7 dBm) |
| Operating temperature range: | -10°C to +45°C |
| Storage temperature range: | -40°C to +70°C |
| Noise level: | 34.7 dBA |
| Current consumption: | 0.163 A |
| DC input voltage: | 12.0 V |
| Lead temperature (soldering 10 sec): | +300°C |

**FIGURE 1.** Assembled RF Dummy Load (KT-002)


**FIGURE 2.** Coaxial arrangement of resistors

## Important safety instructions

▪ **Risk of electric shock and risk of burns:** high voltage and high temperature may be present on components during use!

▪ This product was **NOT** designed for use in wet/damp locations and should not be used near water or exposed to rain.

## Before you proceed

Before proceeding with assembly, the power resistor should be prepared so that they can be properly mounted in the PCB.

▪ Do not bend leg right next to the resistor body. Keep 1 mm distance from the resistor housing.

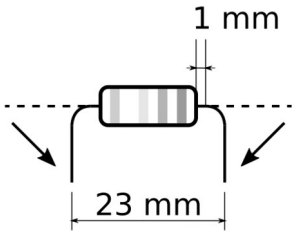


**FIGURE 3.** Requirements for bending the legs of the resistor

Resistors must be mounted in two layers. Details are shown in **Figure 5**. Keep the required clearances to allow proper air cooling.

## Assembly Instructions

**Recommended assembly order**
**a)** solder the bottom layer of the power resistors (15) R1, R3, R5, … ► Keep a distance 3 mm to the PCB (6)
**b)** solder the top layer of the power resistors (15) R2, R4, R6, … ► Keep a distance 2 mm to the bottom layer of resistors
**c)** solder the DC input connector (14) to the PCB (6)
**d)** screw the UC-1 connector (2) to the metal plate with the screws (11) and nuts (10)
**e)** screw the metal pins M4x25 (1) and M4x10 (7) through the PCB
**f)** solder the short metal pin (13) (cut off from the end of the resistors) to the pad on the PCB marked INPUT
**g)** put the metal plate and PCB together and fix with M4x6 screws (9)
**h)** solder pin (13) to UC-1 connector (12)
**i)** mount the fan (4) and the steel guard (3) with the screws (1) and washers (2)
► Note the required fan orientation! Air movement is to be directed towards the resistors. The marking is on the fan.
**j)** solder two fan cables to the PCB; NEG and POS pads are printed on the board ► Pay attention to the polarity!

## Components List

**Table 2.** Components list

| No. | DESIGNATOR | DESCRIPTION | QTY | PART NUMBER | VALUE |
|---|---|---|---|---|---|
| 1 | | Screw M4x25 HEX3 | 4 | – | – |
| 2 | | Washer M4 | 4 | – | – |
| 3 | | Guard, stell 80x80 mm version | 1 | – | – |
| 4 | | Fan 80x80x15 mm,12 V, 163 mA | 1 | EE80151S1-000U-A99 or equivalent | – |
| 5 | | Distance pin M4x25, female-female | 4 | – | – |
| 6 | | Printed circuit board for KT-002 | 1 | – | – |
| 7 | | Distance pin M4x10, female-male | 4 | – | – |
| 8 | | Aluminum plate 80x80 mm with holes | 1 | – | – |
| 9 | | Screw M4x6 HEX3 | 4 | – | – |
| 10 | | Nut M3 | 4 | – | – |
| 11 | | Screw M3x8, PH1 | 4 | – | – |
| 12 | | UC-1 (PL-259) connector, panel version | 1 | – | – |
| 13 | | Metal pin (extracted from resistor's leg) | 1 | – | – |
| 14 | J1 | 2,1x5,5 mm connector, angle version, THT | 1 | – | – |
| 15 | R1...R30 | THT power resistor | 30 | MOF5WS-1K5 | 1k5/5W |

**Required tools for assembly:**
- PH1 screw driver
- HEX3 screw driver
- soldering station
- cutting pliers

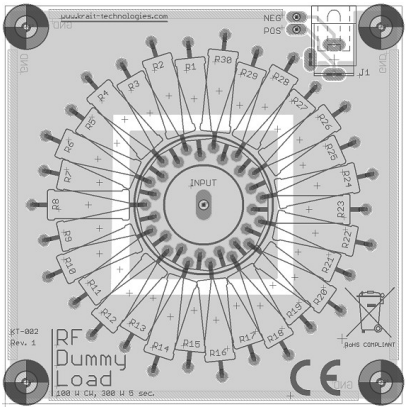


**FIGURE 4.** Printed circuit board layout (top view)

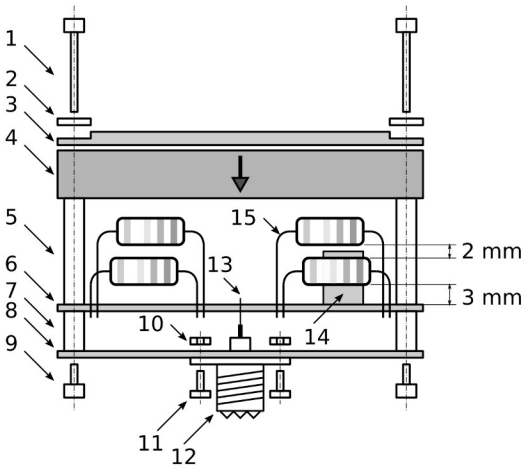


**FIGURE 5.** Mechanical diagram (side view)

## Schematic Diagram

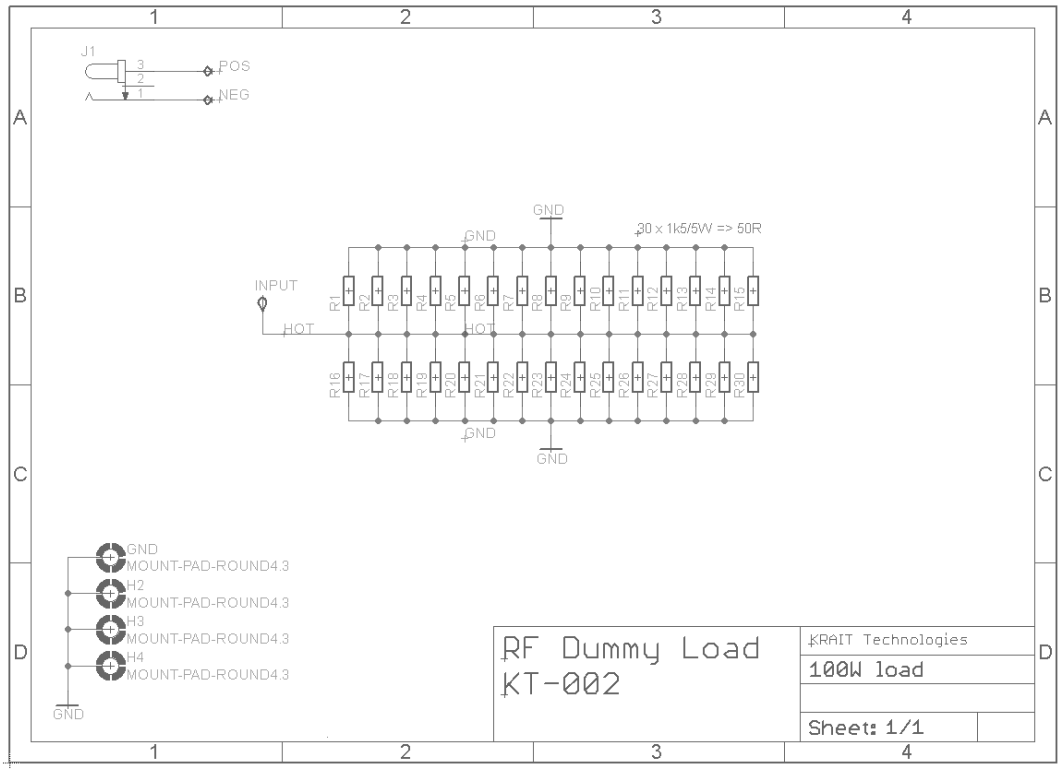


**FIGURE 6.** Schematic diagram

## Mechanical Details

RF Dummy Load dimensions: 80 x 80 x 75 mm (measured with PCB, fan and connectors assembled)
PCB specification: FR 4, one layer, 35 um, HAL, soldermask, 1.6 mm
Protection level: IP20

## Ordering Information

**Table 3.** Ordering information

| Description | Version | Ordering Code | QTY |
|---|---|---|---|
| Printed Circuit Board only | PCB | KT-002B | 1 |
| Kit for self assembly (passive cooling version; without fan) | Kit | KT-002KP | 1 |
| Kit for self assembly (active cooling version; fan included) | Kit | KT-002KA | 1 |
| Assembled module (passive cooling version; without fan) | Assembled | KT-002P | 1 |
| Assembled module (active cooling version; fun included) | Assembled | KT-002A | 1 |

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