

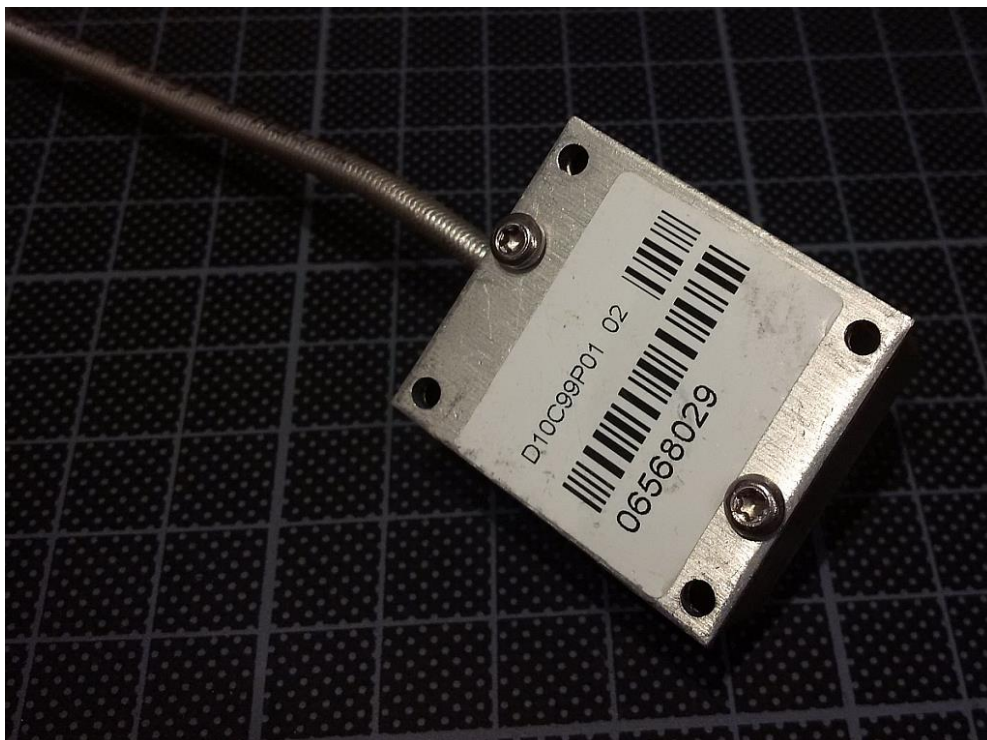
2 GHz 125W Dummy Load based on EMC 5307ALN resistor

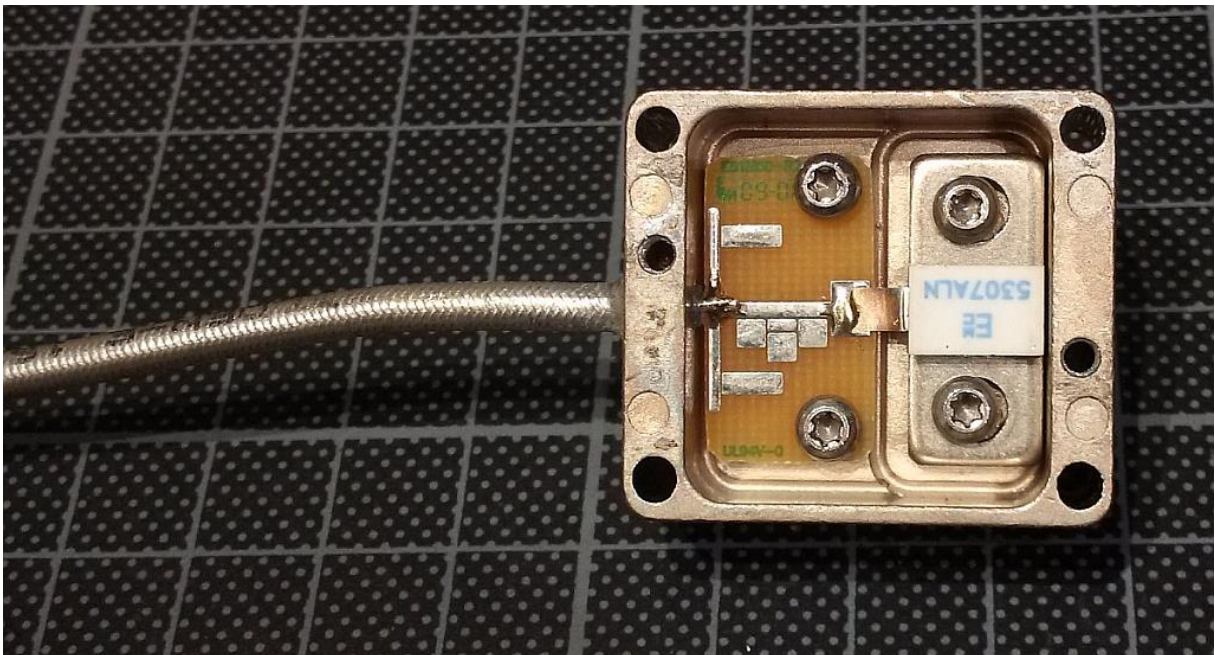
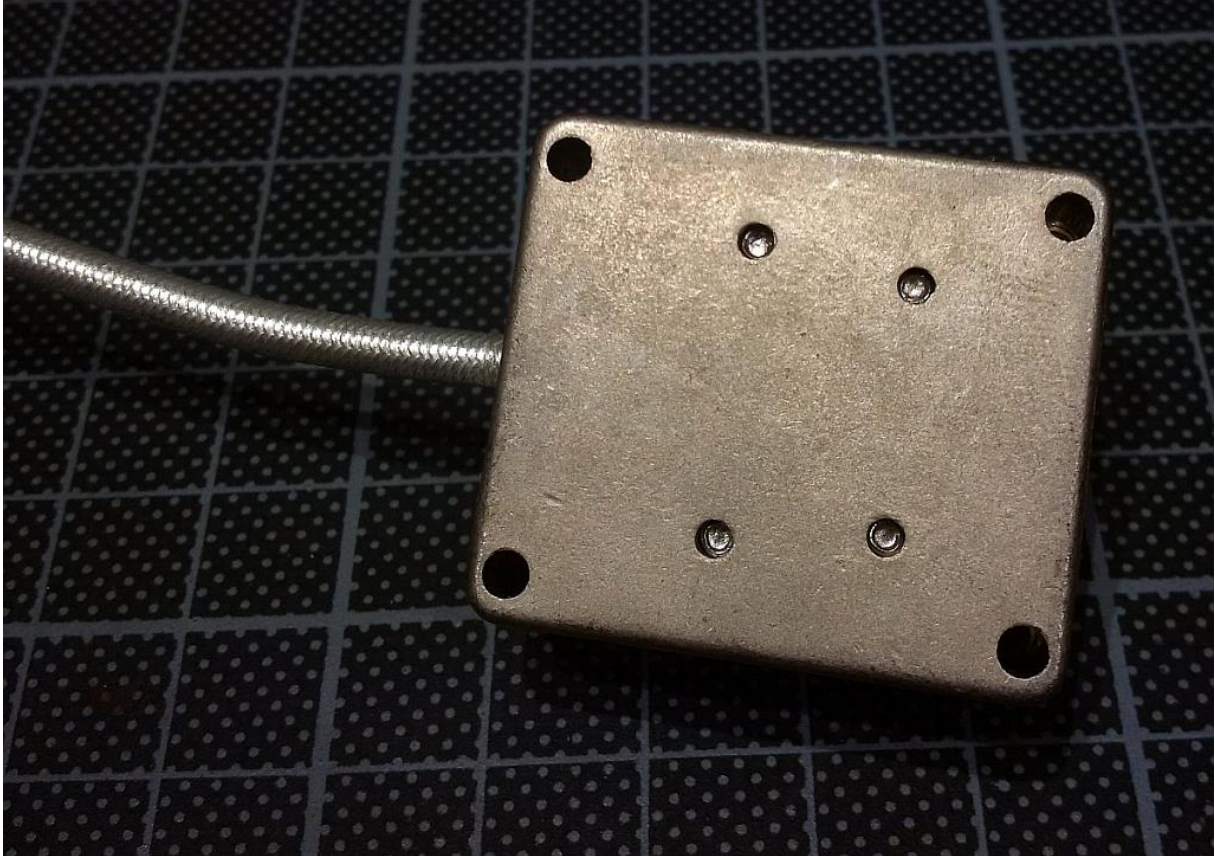
Matthias, DD1US, February 3rd 2020, rev 1.0

Hello,

some time ago I acquired a Dummy Load module on a ham radio flea market. It is based on a 50 Ohm resistor EMC 5307ALN which is already mounted in a small milled aluminum encasing. At the encasing a semirigid cable with a N-connector is mounted. Thus, one needs to simply mount the module on a heatsink and has a nice dummy load. The module has a label marked as D10C99P01 02 and 06568029.

Here are some pictures of the device:





The resistor is housed in a ceramic package with a solid flange. It is screwed in the aluminum encasing to ensure a low thermal resistance. The input pin to the resistor is a rather wide terminal lug, which forms a small loop to reduce mechanical stress during high temperature variations.

Here are the specifications of the resistor:

PART IDENTIFIER: 5307ALN

DESCRIPTION: HIGH POWER LOAD, ALUMINUM NITRIDE, (THICK FILM)

ASSEMBLY DWG: 1700374

1.0 SPECIFICATIONS:

1.1 ELECTRICAL:

- 1.1.1 RESISTANCE VALUE: 50Ω NOMINAL.
- 1.1.2 INPUT POWER: 125 WATTS AT 100°C HEAT SINK, DERATED LINEARLY TO ZERO WATTS AT 150°C.
- 1.1.3 FREQUENCY RANGE: DC - 2.0 GHZ.
- 1.1.4 VSWR: 1.25 MAX.

1.2 MECHANICAL:

- 1.2.1 OUTLINE DWG: SEE SHEET 2.
- 1.2.2 WORKMANSHIP: PER MIL-PRF-55342.

1.3 ENVIRONMENTAL:

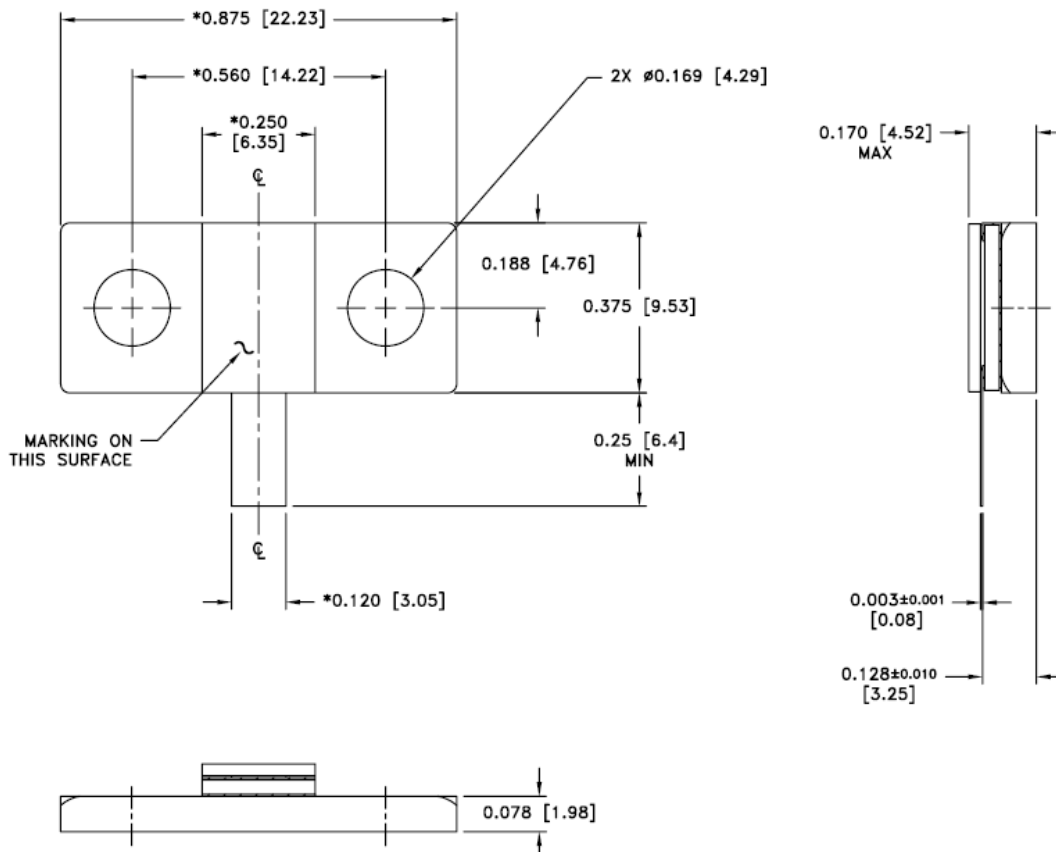
- 1.3.1 TEMPERATURE RANGE:
 - 1.3.1.1 STORAGE: -65°C TO +150°C.
 - 1.3.2.1 OPERATING: -55°C TO +150°C.

2.0 UNIT MARKING: "EMCT" AND PART IDENTIFIER.
LEGIBILITY AND PERMANENCY PER MIL-STD-130.

3.0 QUALITY ASSURANCE:

- 3.1 VISUAL AND MECHANICAL PER 824W155.
- 3.2 100% DC RESISTANCE CHECK (GO/NO GO): 50Ω ± 5%.
- 3.3 DATA REQUIREMENTS:
 - 3.3.1 NO TEST DATA REQUIRED FOR CUSTOMER.
 - 3.3.2 DATA RETENTION – 24 MONTHS.

4.0 PACKAGING: STANDARD PACKING PER 755W002.



MECHANICAL SPECIFICATIONS:

CHIP:

MATERIAL - SUBSTRATE - ALUMINUM NITRIDE, MIL-I-10.
RESISTIVE ELEMENT - THICK FILM.

TOP PLATE:

MATERIAL - ALUMINA, MIL-I-10.

TAB:

MATERIAL - COPPER, ASTM B152.
FINISH - SILVER, QQ-S-365.

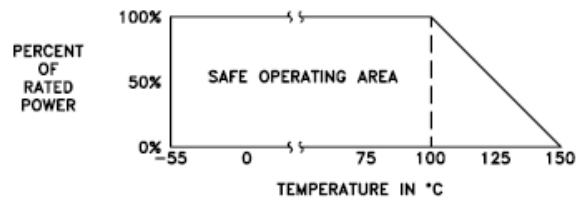
HEAT SINK:

MATERIAL - COPPER, ASTM B187.
FINISH - NICKEL, QQ-N-290.

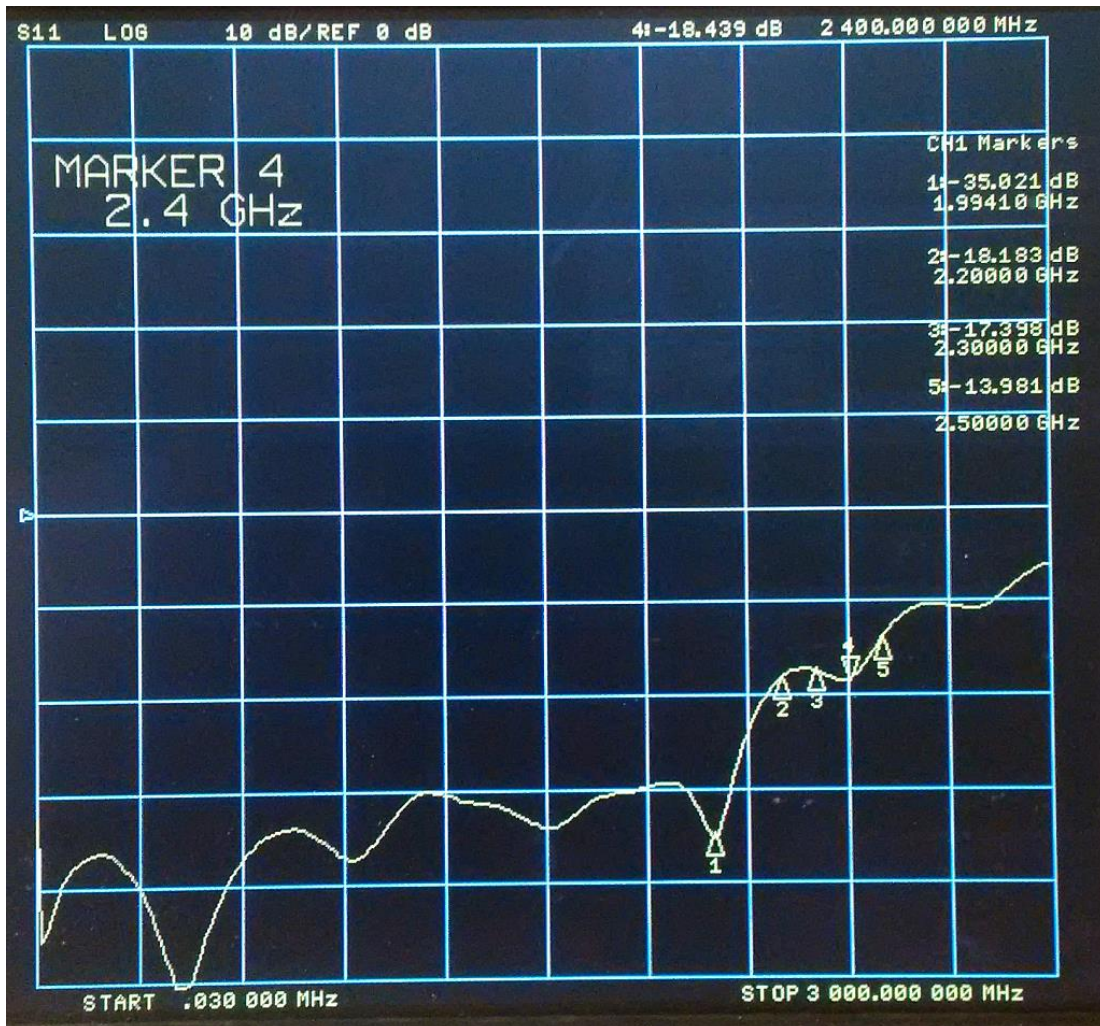
METRIC EQUIVALENTS GIVEN IN [mm]
FOR REFERENCE INFORMATION ONLY

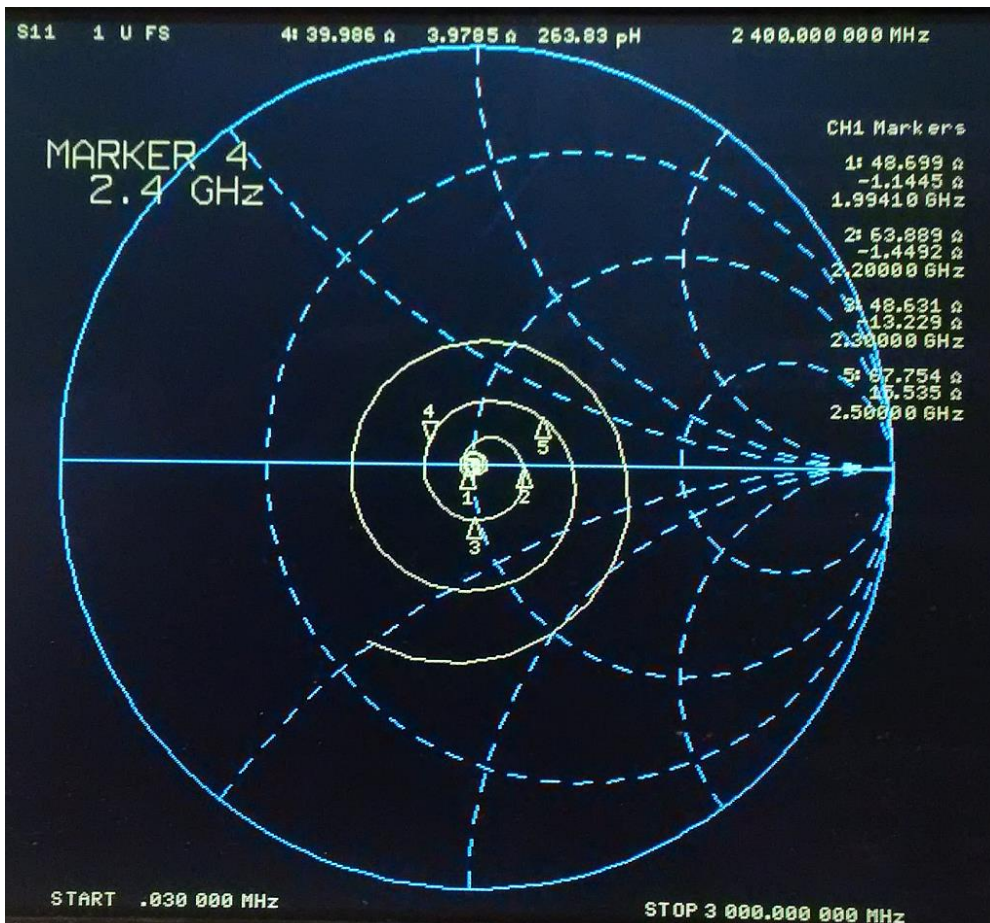
ALLOW ± 0.010 ON TOP PLATE FOR MISALIGNMENT.
*DIMENSIONS TO BE SYMMETRICAL ABOUT C.L. WITHIN ± 0.005 .

POWER RATING AND DERATING



Here are the S11 measurement results of the device. The return loss is better than 29dB up to 2GHz (VSWR <1.1) and thus significantly better than the specification.





At 2.4GHz the return loss is 18dB respectively the VSWR is 1.27, which is in my opinion still good enough to use it as a dummy load. Therefore I am using this dummy load as termination of the output circulator of my 13cm band power amplifier.

I always appreciate feedback. Many thanks in advance.

Best regards

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