

Coaxial Magnetron Launchers CMLD 1.2 and CML 1.2

Basic Description

The CMLD 1.2 (Fig. 1) and CML 1.2 coaxial magnetron launchers are compact, robust components connecting a class of standard 2.45-GHz Panasonic (and equivalent) magnetron types directly to 7/8'' EIA coaxial line, avoiding thus need for a cumbersome combination of a bulky waveguide launcher with additional waveguide-to-coax adapter.

The employed noncontacting coupling of the magnetron antenna eliminates the problem of sparking and over-heating that can arise in contacting junctions due to imperfect galvanic contact.

The CMLD launcher integrates a bidirectional detector enabling simultaneous measurement of the incident and reflected powers, and thus the net power delivered to load as well as providing signals for magnetron protection circuits.

The CML is an option without bidirectional detector. All relevant parameters are the same, notably all dimensions except the total length (120 mm in CMLD, 69 mm in CML). CML can be used when there is no need to monitor reflected power for magnetron protection: it is not recommended in initial design phases.

The maximum mean power of 2 kW is limited mainly by the 7/8'' EIA line specifications.



Fig. 1. Coaxial magnetron launcher CMLD 1.2.

Specifications

Electrical	
Panasonic magnetron types	2M213 (0.7 kW) 2M107A (0.87 kW) 2M167 (0.94 kW) 2M244 (1 kW) 2M261 (1.1 kW)
Output coaxial line	7/8'' EIA (diameters 8.7 mm/20 mm)
Frequency range	2425 – 2475 MHz
Maximum working power	2 kW
Directivity of the bidirectional detector couplers (min)	25 dB
Detector output voltage; $P_{IN} = 1$ kW (typ)	315 mV
Detector output connector	SMBm
Video resistance (typical)	10.2 k Ω
Internal output capacitance	24 pF
Mechanical	
Mass	0.75 kg (CMLD), 0.45 kg (CML)
Length (axial dimension)	120 mm (CMLD), 69 mm (CML)
Width	125 mm
Height	95 mm
Other	
Operating temperature range	+5 to +125 °C

Detectors Transfer Characteristics

The transfer characteristics (Fig. 2) are defined for frequency $f = 2450$ MHz, ambient temperature $T_a = 25$ °C, and DC output load resistance $R_{LOAD} = 33$ k Ω .

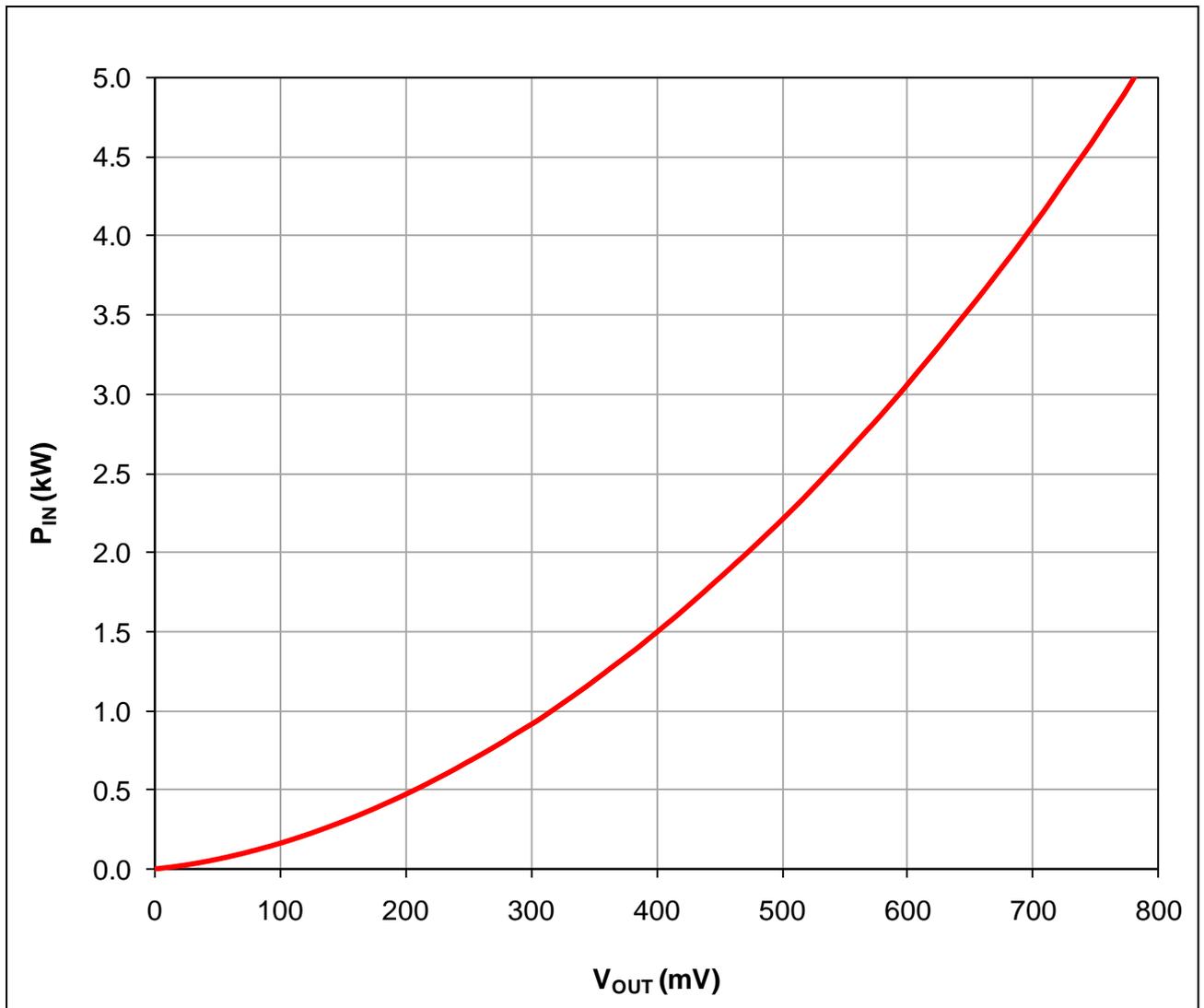


Fig. 2. Typical transfer characteristic of the CMLD detectors.

The transfer characteristic can be approximated by the formula

$$P_{IN} = 0.9381 V_{OUT} + 0.007 V_{OUT}^2$$

where V_{OUT} is in millivolts and P_{IN} is in watts.

Basic Dimensions

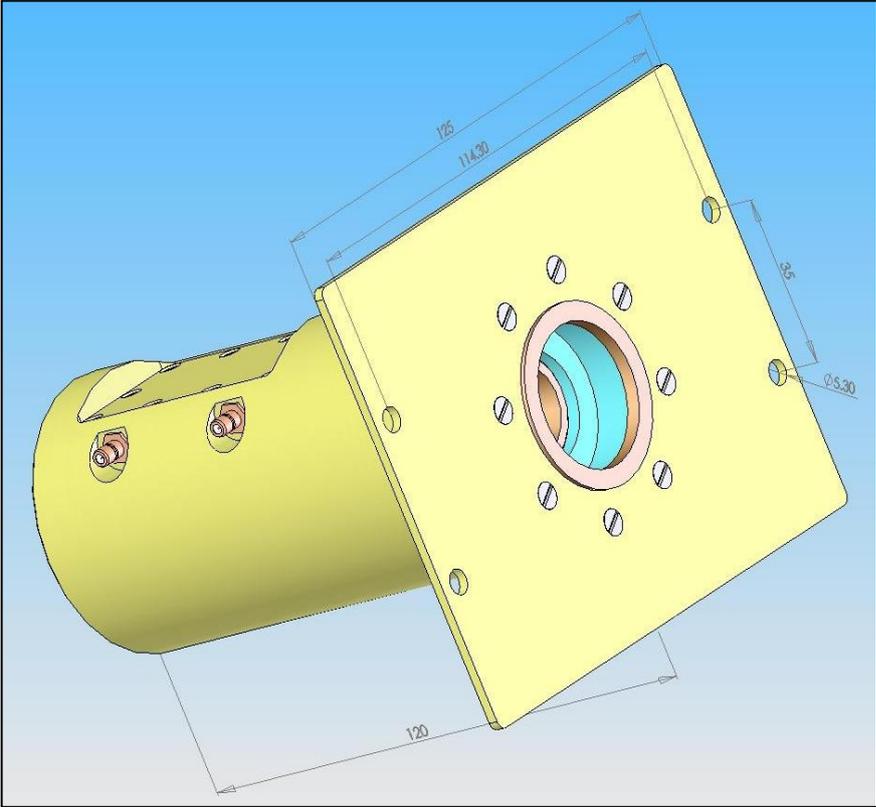


Fig. 3. Basic CMLD dimensions. All dimensions are in millimeters. In CML, the total length is 69 mm instead of 120 mm.

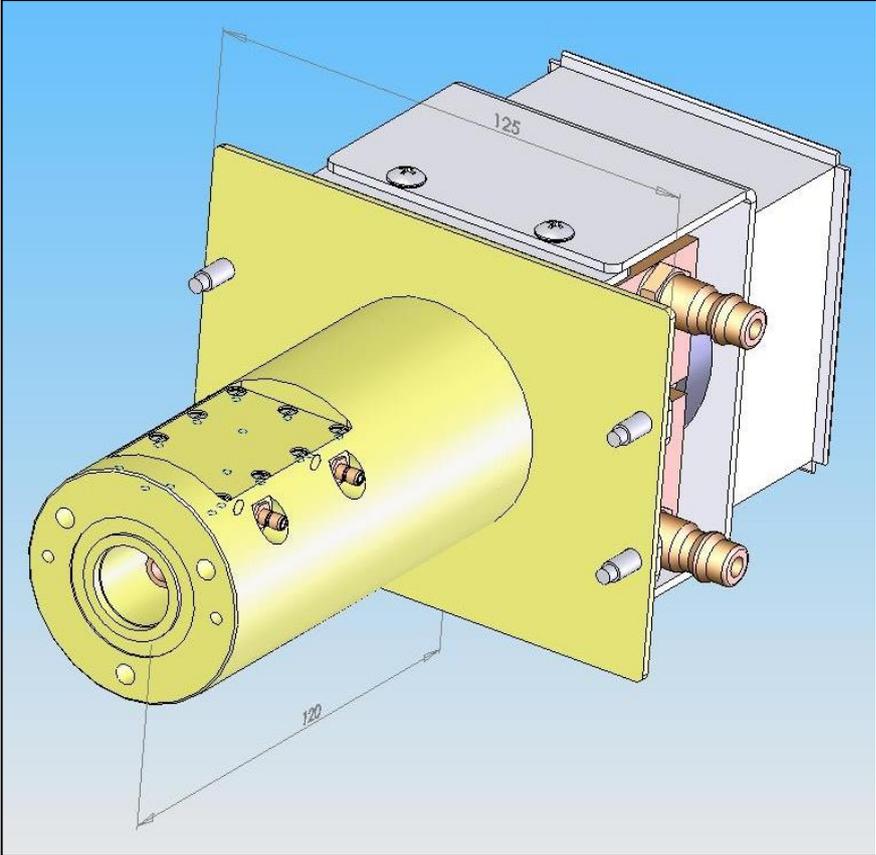


Fig. 4. Magnetron + Launcher assembly.

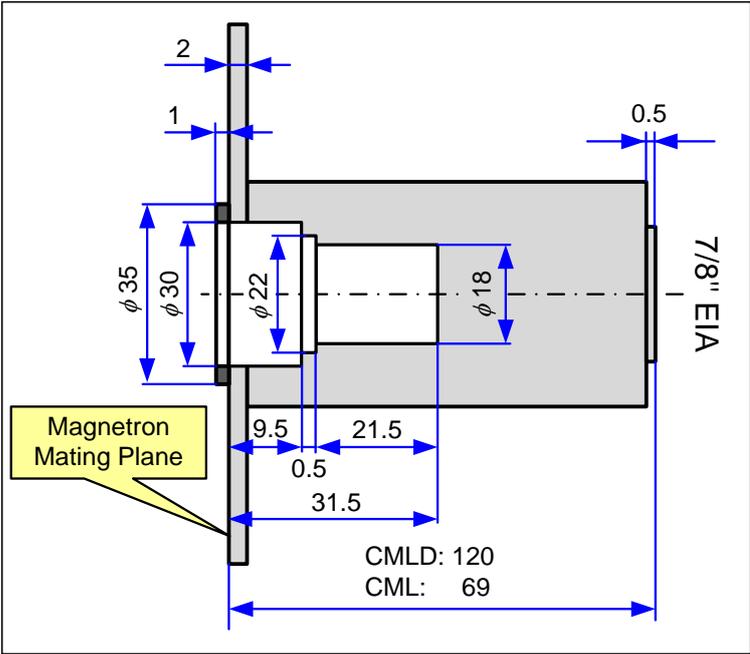


Fig. 5. Dimensions of cavity for magnetron antennas.