

DM213: Microwave Detector

General Description

DM213 (Fig. 1) is a general-purpose zero-bias Schottky diode microwave coaxial detector intended primarily for 915 MHz and 2450 MHz industrial applications.

The detector delivers well-scaled DC voltage as a function of incident microwave power.



Fig. 1. Microwave detector DM213.

Specifications

Frequency range	880 – 930 MHz	2350 – 2550 MHz
Frequency response variation (max)	± 0.25 dB	± 0.5 dB
Typical output voltage; $P_{IN} = 1$ mW, $R_{LOAD} = 33$ k Ω	180 mV	220 mV
Nominal input impedance	50 Ω	
VSWR max	2	
VSWR typ	1.3	
Statistical spread of output voltage	± 1 dB (3- σ deviation)	
Output voltage polarity	Negative	
Output voltage temperature variation (5 to 65 $^{\circ}$ C)	< 3 dB	
Video resistance (typ)	9 k Ω	
Max input working power	10 mW	
Max input power (destruction limit)	100 mW	
Input RF connector	SMA-M	
Output DC connector	SMA-F	
Dimensions (L x W x H)	38.7 mm x 18 mm x 11 mm	

Typical Transfer Characteristic

Typical detector transfer curves for the frequencies $f = 915$ MHz and 2450 MHz are shown in Fig. 2. The curves are valid for the detector DC output load resistance $R_{LOAD} = 33$ k Ω and ambient temperature $T_A = 25$ °C.

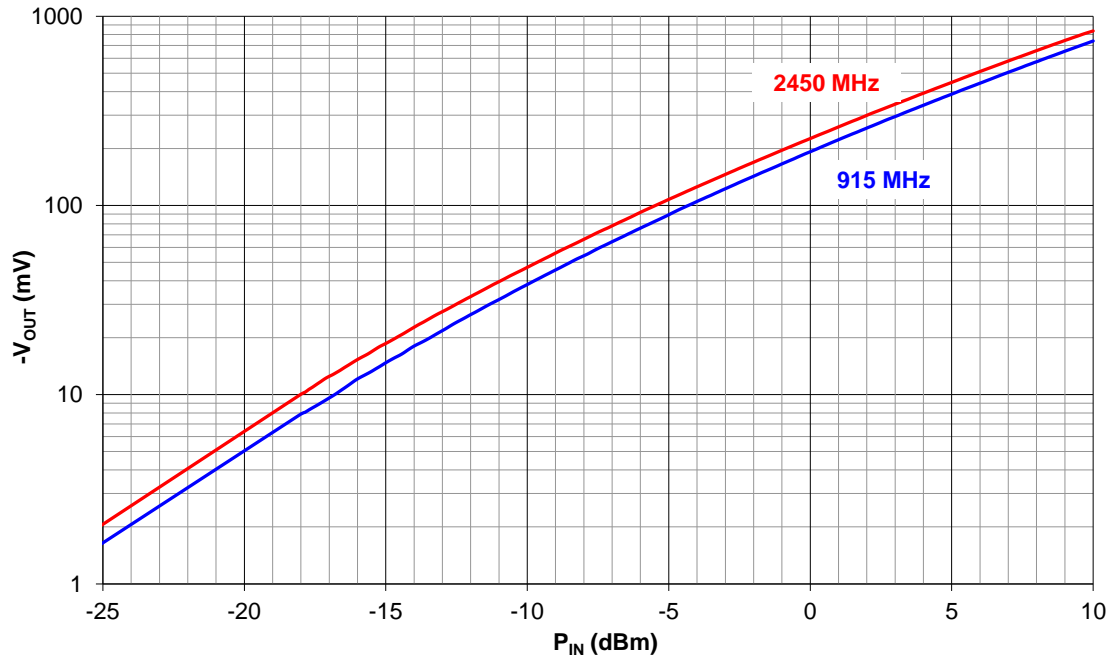


Fig. 2. Typical DM213 transfer curves. Please note that $P_{dBm} = 10 \cdot \log(P_{mW})$.

The detector correction curve (the inverse of Fig. 2) can be approximated by a polynomial

$$P = d_1 V + d_2 V^2 + d_3 V^3 + d_4 V^4$$

where $P = P_{IN}$ in milliwatts and $V = V_{OUT}$ in millivolts. The coefficients d_i depend on ambient temperature T_A and DC load resistance R_{LOAD} . For $T_A = 25$ °C and $R_{LOAD} = 33$ k Ω , the coefficients are listed in the table below.

	915 MHz	2450 MHz
d_1	2.033800E-03	1.470139E-03
d_2	1.725105E-05	1.411382E-05
d_3	-5.223944E-09	-5.478810E-09
d_4	3.908716E-12	4.219974E-12

Please be aware that the function is a statistical average based on evaluation of a number of detectors. Behavior of individual detectors may differ.

The user can employ a correction for detector sensitivities differing from the “typical” case by multiplying P by an additional factor.

Dimensional Drawing

(All dimensions in millimeters)

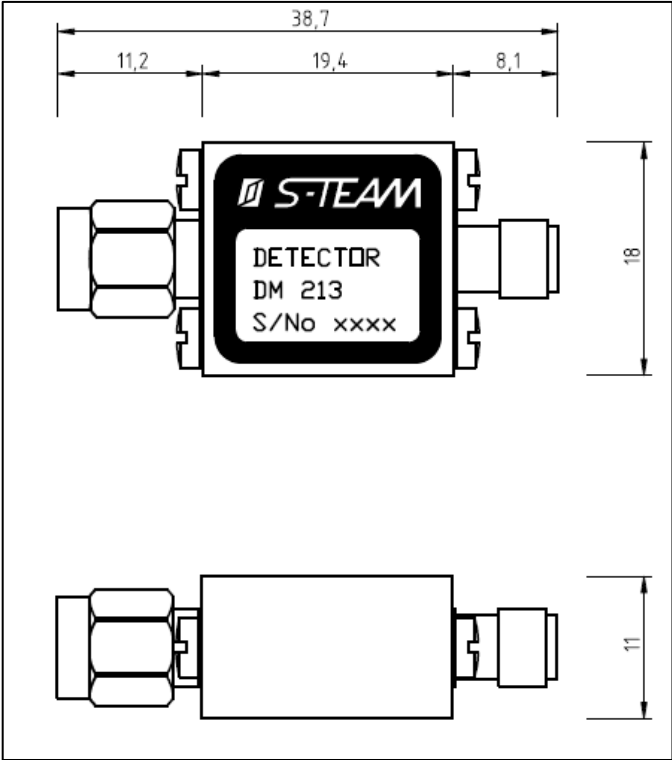


Fig. 3. Basic DM213 dimensions.

Actual Size

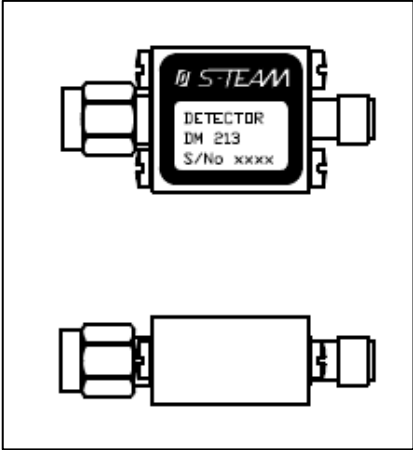


Fig. 4. Actual DM213 size.