

## DD121: Fast Temperature-Stable Directional Detector for R-32 Waveguide

### General description

DD121 is a miniature directional detector intended for sampling pulse-modulated incident or reflected waves in high-power 2450 MHz industrial applications using R-32 rectangular waveguide. The directional detector combines three components:

- directional coupler
- attenuator
- tunnel diode detector

The detector delivers well-scaled DC voltage proportional to the power of the wave propagating in one direction in the main waveguide. The coupler is fixed to the waveguide with six M3 or similar-diameter screws after machining of appropriate holes in the broad waveguide wall. Simple reversing the DD121 causes it to sample the wave propagating in the opposite direction. The

tunnel diode detector module assures high temperature stability of the output voltage and low video resistance for fast pulse rise/fall times.



### Specifications

Frequency range	2425 – 2475 MHz
Directivity	25 dB min
Statistical spread of output voltage	±1 dB (3- $\sigma$ deviation)
Polarity	Negative
Temperature variation of output voltage	< 0.5 dB in 5 to 65 <sup>0</sup> C range
Video resistance (typ)	120 $\Omega$
DC output connector	SMA-F
Waveguide of destination	R-32 (72.14 mm x 34.04 mm, wall thickness 2 mm)

### Typical transfer characteristics

P (W)	Vdc (mV)
850	10
1400	20
2800	50
4300	80
5300	100
8000	130

Dimensional drawing (all units in millimeters)

