

DD111: Fast Temperature-Stable Directional Detector for R-26 Waveguide

General Description

DD111 is a miniature directional detector intended for sampling pulse-modulated incident or reflected waves in high-power 2450 MHz industrial applications using R-26 (WR-340) rectangular waveguide. The detector combines three components:

- Directional coupler
- Attenuator
- Tunnel diode detector

The directional detector delivers well-scaled DC voltage proportional to the power of the wave propagating in one direction in the main waveguide. The coupler is attached to the waveguide by six M3 or similar-diameter screws after machining of appropriate holes in the broad waveguide wall. Simple reversing

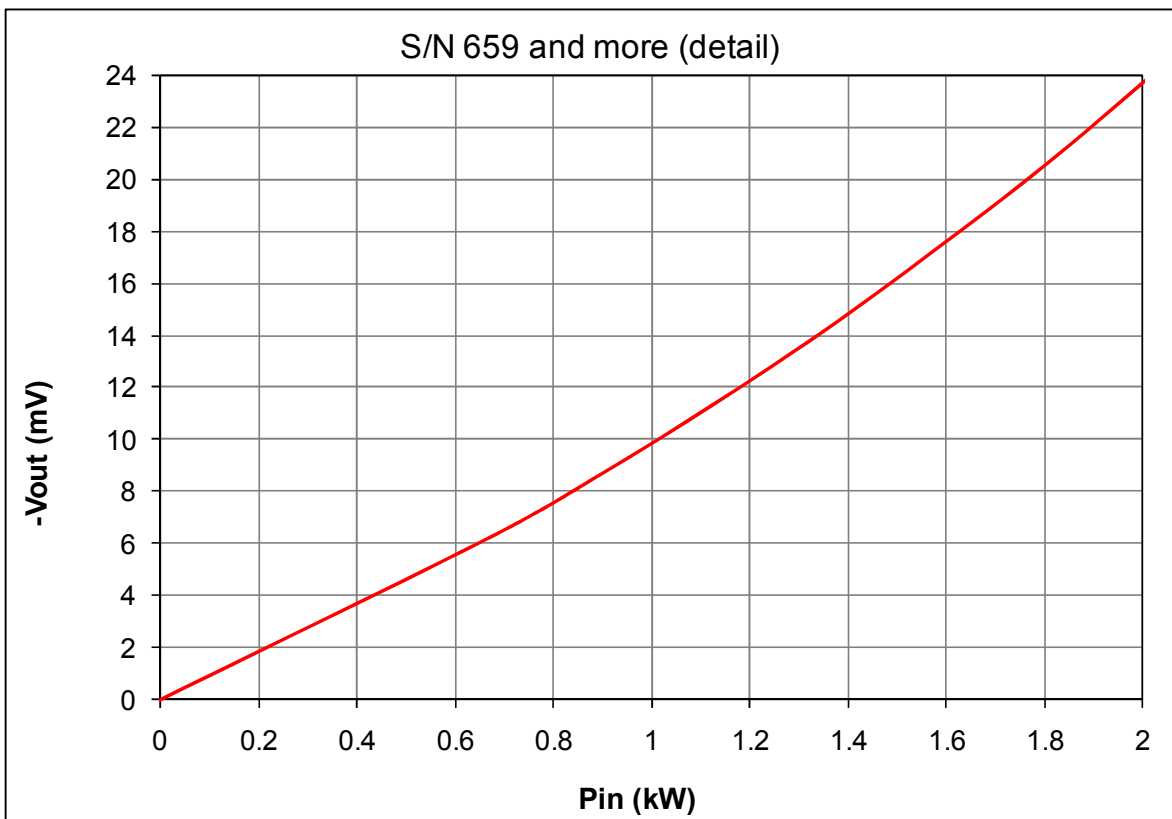
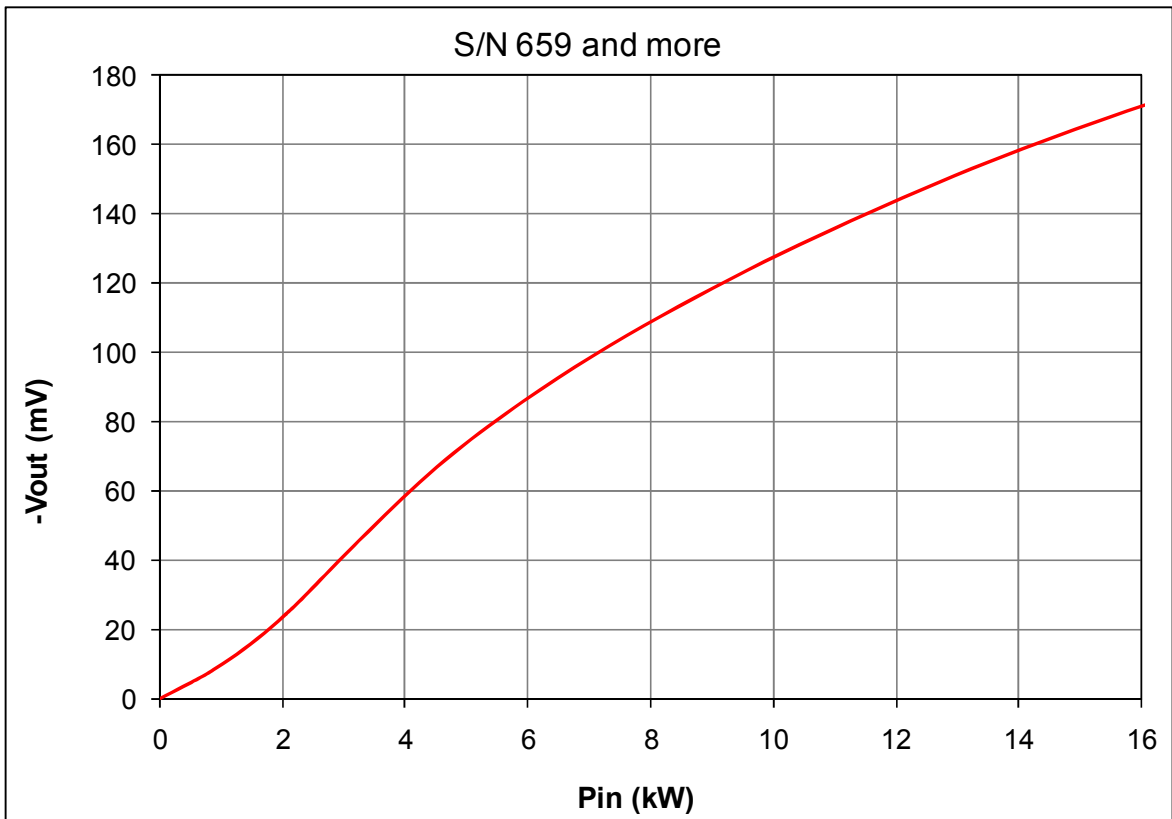
the DD111 causes it to sample the wave propagating in the opposite direction. The tunnel diode detector module assures high temperature stability of the output voltage and low video resistance for fast pulse rise/fall times.



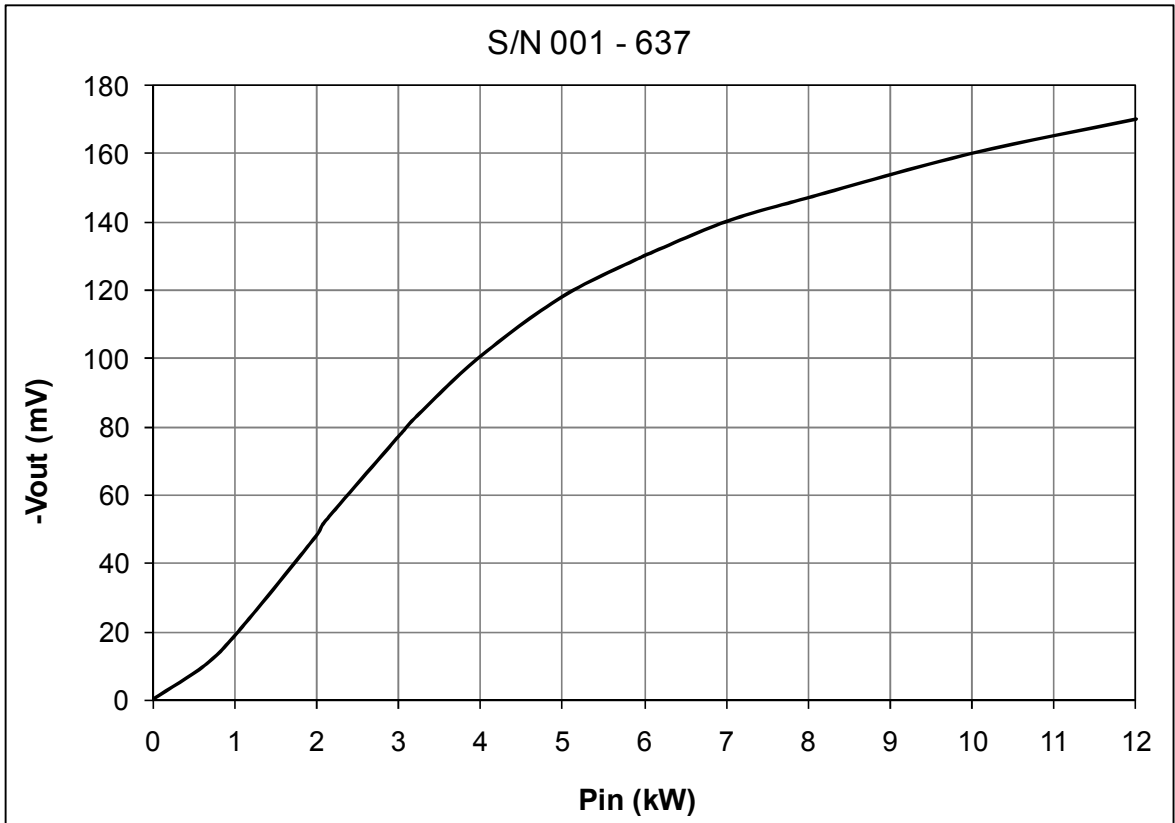
Specifications

Frequency range	2425 - 2475 MHz
Directivity	25 dB min
Statistical spread of output voltage	± 1 dB (3- σ deviation)
Output voltage polarity	Negative
Output voltage temp. variation (5 to 65 ^o C)	< 0.5 dB
Video resistance (typ)	120 Ω
Output DC connector	SMA-F
Waveguide of destination	R-26 (86.36 mm x 43.18 mm)
Waveguide wall thickness	2 mm

Typical Transfer Characteristic, New Model ($f = 2450 \text{ MHz}$, $T_A = 25 \text{ }^\circ\text{C}$)



Typical Transfer Characteristic, Old Model (f = 2450 MHz, T_A = 25 °C)



Dimensional Drawing (all units in millimeters)

