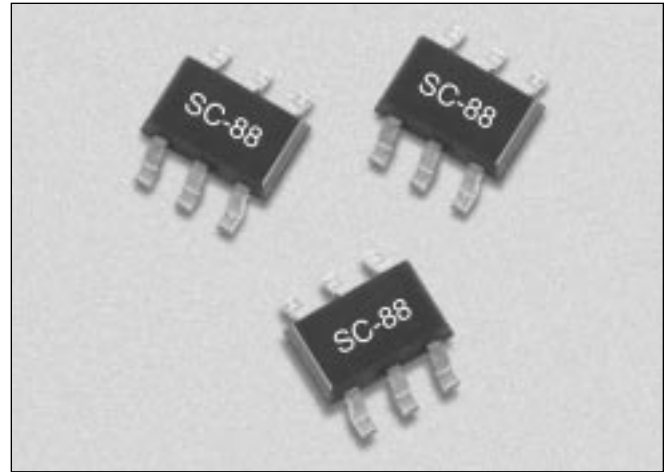


## Features

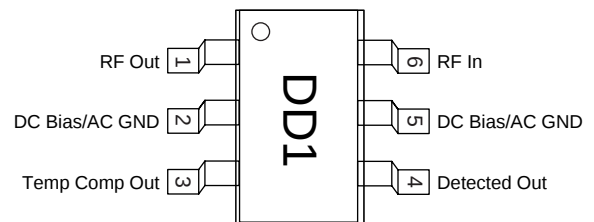
- Frequency Coverage: 650 MHz to 2.5 GHz
- Small Outline SC-88 (6 Lead SC-70) Package
- Built-in Temperature Compensating Diode
- Low Cost for High Volume Handset Applications
- Tape and Reel Availability

## Description

The DD01-92 directional detector is an integrated directional coupler, Schottky diode combination designed for handset power monitor applications specified from 800 MHz to 2 GHz. It is packaged in the small footprint, SC-88 (6 lead SC-70) package. The DD01-92 incorporates a directional coupler and two GaAs Schottky diodes on a monolithic GaAs chip. By applying forward DC bias to both Schottky diodes, the DD01-92 may be conveniently temperature compensated. The DD01-92 is characterized from 650 MHz to 2.5 GHz and generates a detected signal at 1.8 GHz of approximately 200 mV at 10 mW input power. Each Schottky diode is forward biased to approximately 5  $\mu$ A by applying 1 V through 100 k $\Omega$  resistors as shown in the test circuit.



## Pin Out



## Electrical Specifications at 25°C

| Parameter                                | Frequency    | Min. | Typ.  | Max. | Unit     |
|------------------------------------------|--------------|------|-------|------|----------|
| Detected Voltage                         | 0.8–1.2 GHz  | 80   | 120   |      | mV       |
|                                          | 1.8–2.0 GHz  | 150  | 200   |      | mV       |
| Insertion Loss                           | 870–920 MHz  |      | 0.25  | 0.30 | dB       |
|                                          | 1.7–1.8 GHz  |      | 0.50  | 0.55 | dB       |
| Input Return Loss                        | 0.8–1.2 GHz  |      |       | 20   | dB       |
|                                          | 1.2–2.0 GHz  |      |       | 15   | dB       |
| Output Return Loss                       | 0.8–1.2 GHz  |      |       | 20   | dB       |
|                                          | 1.2–2.0 GHz  |      |       | 15   | dB       |
| Directivity                              | 0.8–2.0 GHz  |      | 10    |      | dB       |
| Schottky Noise Voltage (1 MHz Bandwidth) | RF Power Off |      |       | 200  | $\mu$ V  |
| Schottky Diode DC Voltage                | RF Power Off |      | 480   |      | mV       |
| DC Offset Voltage                        | RF Power Off |      | 10    |      | mV       |
| Video Resistance                         | RF Power Off |      | 7,500 |      | $\Omega$ |

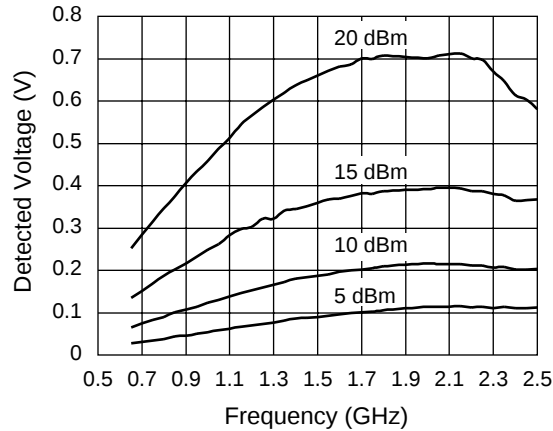
Conditions: 10 dBm input power, 1 V applied to test circuit.

Detected voltage is differential voltage,  $V_4 - V_3$ , on test circuit.

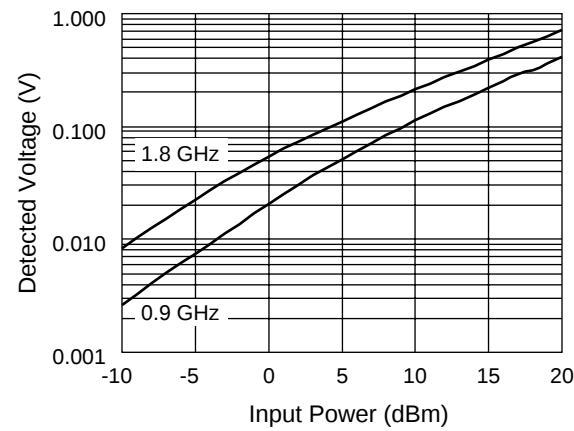
Insertion loss at 870–920 MHz shall be less than 0.4 dB at 85°C.

Insertion loss at 1.7–1.8 GHz shall be less than 0.6 dB at 85°C.

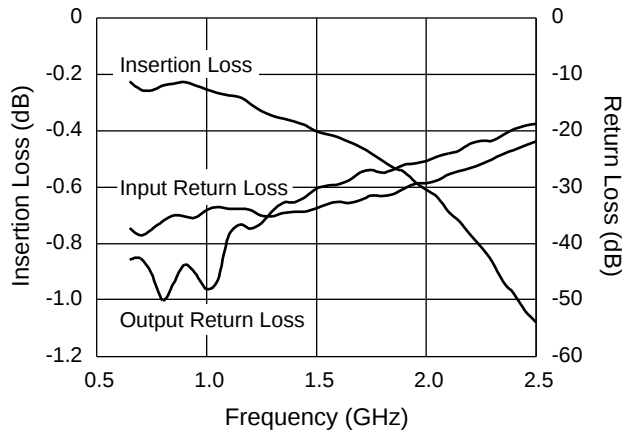
Typical Performance Data



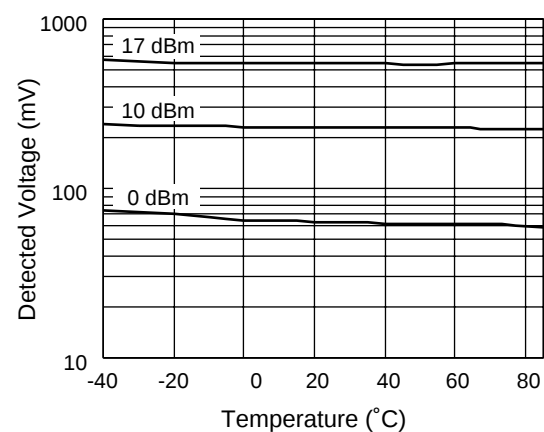
Differential Detected Voltage vs. Frequency



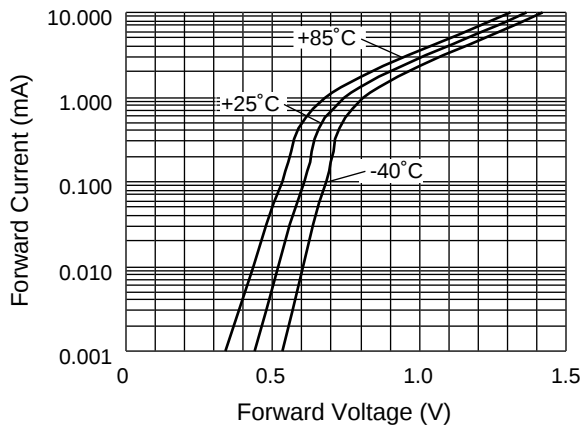
Differential Detected Voltage vs. Input Power



Insertion Loss and Return Loss



Temperature Sensitivity at 1.7 GHz



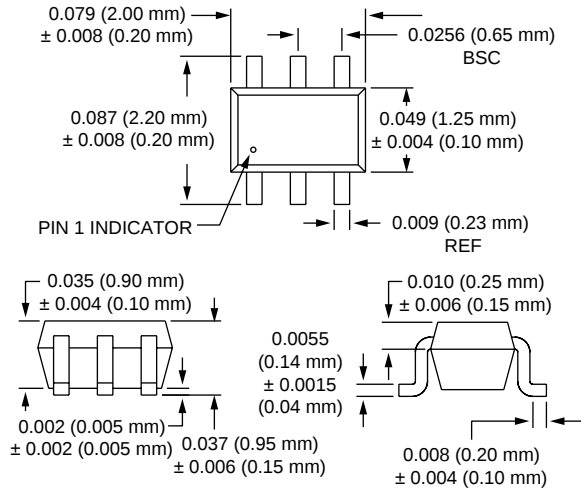
Schottky Diode DC Characteristic

Typical Detected Voltage vs. Temperature

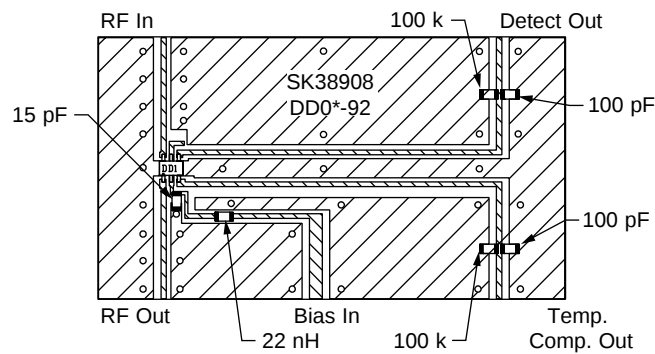
| Input Power (dBm) | V <sub>Out</sub> @ -40°C (mV) | V <sub>Out</sub> @ +25°C (mV) | V <sub>Out</sub> @ +85°C (mV) |
|-------------------|-------------------------------|-------------------------------|-------------------------------|
| 0                 | 74                            | 64                            | 59                            |
| 10                | 241                           | 230                           | 226                           |
| 17                | 570                           | 550                           | 550                           |

Conditions: 1.7 GHz, 10 dBm input power, 1 V applied to test circuit. Detected voltage is differential voltage, V<sub>4</sub>-V<sub>3</sub>, on test circuit.

## SC-88 (6 Lead SC-70)



## Evaluation Board Layout



## Absolute Maximum Ratings

| Characteristic                          | Value           |
|-----------------------------------------|-----------------|
| Incident Power (CW)<br>@ SWR = 2.0 Max. | 4 W @ < 1 GHz   |
|                                         | 2 W @ 1–2.5 GHz |
| DC Bias Current                         | 10 mA           |
| Operating Temperature                   | -40 to +85°C    |
| Storage Temperature                     | -65 to +150°C   |

## Test Circuit

