HEWLETT PACKARD

2.45 Ghz Detector Demonstration Board

Assembly and Operating Instructions

HSMS-2850

This demonstration board allows you to test and evaluate the performance of the HSMS-2850 zero bias Schottky diode in a 2.45 Ghz detector circuit.

Assembly

In addition to the board and the HSMS-2850 Schottky diode, the following parts will be required to complete the assembly:

Qty	Item	P/N
2	SMA connector	EFJ 142-0701-636
1	100 pF capacitor	ATC 100A101MCA50
1	baseplate	see Figure 1
8	#2-56 pan head screw	---

The mounting plate should be machined of brass or aluminum from the drawing found in Figure 1.

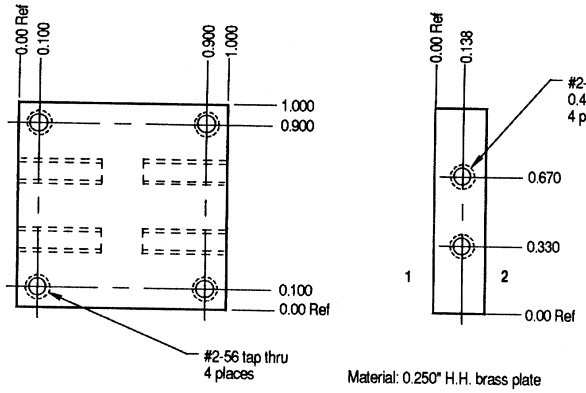

Figure 1

The SOT-23 diode, capacitor and connectors are assembled onto the FR4 printed circuit board as shown in Figure 2. If the recommended connectors are used, the board will be mounted to side 2 of the baseplate. If connectors with center conductors terminating in tabs (such as the Omni Spectra

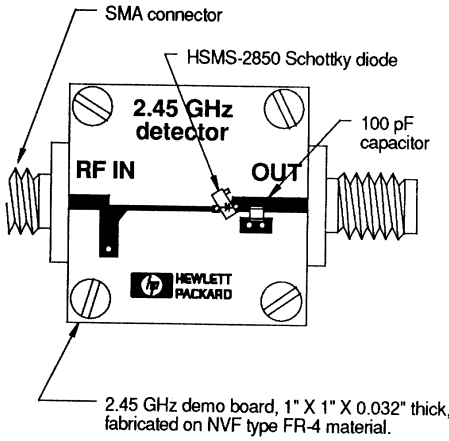

Figure 2

2052-1618-02) are used, mount the demo board on side 1 of the baseplate.

Operation

To test the detector circuit, first perform a swept frequency measurement of input return loss. Take care to insure that the RF power applied to the input to the circuit is less than or equal to -30 dBm, and that the output of the detector circuit is terminated in a 100KΩ load. The measured return loss will look something like that shown in Figure 3, covering the range of 2.3 to 2.7 GHz. In this example, input return loss hits a minimum just above 2.5 Ghz, about 2% high in frequency. It is at this frequency where voltage sensitivity is maximum and subsequent measure-

ments of the circuit's transfer characteristic should be made.

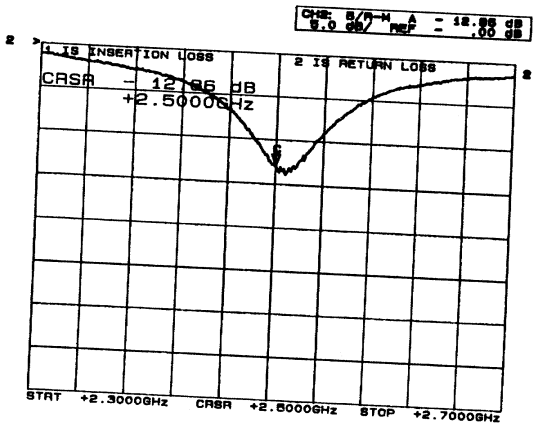

Figure 3

The frequency where peak sensitivity occurs can be adjusted quite easily. While observing swept frequency return loss, remove copper material from the tuning area shown as crosshatched in Figure 4 to lower the peak frequency. To raise it, solder a bit of copper foil to the crosshatched area to make it larger.

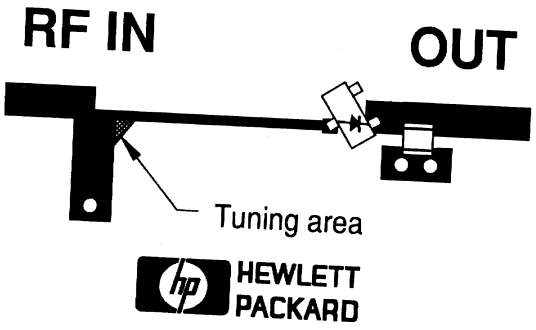

Figure 4

The design of the impedance matching network and the performance which can be expected from this demonstration circuit are detailed in the data sheet for the HSMS-2850 Schottky diode.

Note that other Schottky diodes having a junction capacitance on the order of 0.25pF, such as the DC biased HSMS-8101, can also be tested using this demo board.

References

Performance data for the HSMS-2850 at frequencies other than 2.45 Ghz can be found in the data sheet. Applicable Application Notes are:

AN-923 *Hot Carrier Diode Video Detectors*

AN-963 *Impedance Matching Techniques for Mixers and Detectors*

AN-969 *The Zero Bias Schottky Detector Diode*

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