| REVISIONS | | | | |
|---|---|---|---|---|
| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
| | -- | Original Release | 21 Jan 2008 | PRELIMINARY |
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| REV STATUS | REV | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SHEETS | SHEET | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| REV STATUS | REV | | | | | | | | | | | | | | | | |
| SHEETS | SHEET | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |

| SCD No.: MIKES 730049 | | | Planar Monolithics Industries, Inc.<br>7311-G Grove Road, Frederick, MD 21704 | | |
|---|---|---|---|---|---|
| | | DATE | | | |
| DRAWN | S Kuhn | 21 Jan 2008 | | | |
| CHECK | | | ACCEPTANCE TEST PROCEDURE<br>MODEL: RFFD-618-730049<br>PART No. T0737SOCN730049-001<br>FILTER DETECTOR | | |
| APPD. | | | | | |
| ENGR. | | | | | |
| QC. | | | | | |
| | | | | | |
| | | | SIZE: A | FSCM: 0ZXZ8 | DRAWING No: 140-R000-000 |
| | | | REV: A | SCALE: N/A | SHEET 1 OF 12 |



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DRAWING No:  140-R000-000

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# ACCEPTANCE

# TEST PROCEDURE
# (ATP)

# FOR

# PMI MODEL NUMBER: RFDD-618-730049

# FILTER DETECTOR



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# TABLE OF CONTENTS

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## 1.0 SCOPE

This procedure defines the tests required for acceptance of a PMI Model RFFD-618-730049 FILTER DETECTOR. This acceptance test procedure to be used together with MIKES RF, FILTER DETECTOR ASSY drawing number 730049.

In the event of a discrepancy ALL SPECIFICATIONS VALUES in that document take priority over those within this document.

## 2.0 TEST EQUIPMENT

| Item Number | ITEM | MANUFACTURER | MODEL NUMBER |
|---|---|---|---|
| 1 | Network Analyzer | Agilent | 8722D |
| 2 | Multi-meter | HP | 34401A |
| 3 | Power Supply | Agilent | 3631A |
| 4 | Log Amplifier with Bias and offset cancelation | AMC custom designed test equipment | Custom test equipment |
| 5 | Oscilloscope | Tektronix | TDS3054/TDS3014B |
| 6 | RF Signal Generator | Gigatronics | 12000A Microwave Synthesizer |

## 3.0 GROUP A INSPECTION ( 100 % ACCEPTANCE TESTS )

3.1 VISUAL AND MECHANICAL INSPECTION Ref -730049 3.2.2

- 3.1.1 Ensure the outline is in accordance with Figure1 of dwg Ref -730049 3.3.1
- 3.1.2 Ensure the weight is in accordance with. Ref -730049 3.3.2
- 3.1.3 Ensure the unit is marked with ESD symbol Ref -730049 3.3.3
- 3.1.4 Ensure the workmanship is in accordance with Ref -730049 3.3.4
- 3.1.5 Ensure the marking is in accordance with Ref -730049 3.4.7
- 3.1.6 Ensure the connectors are in accordance with Ref -730049 3.6.14

3.2 FREQUENCY RANGE Ref -730049 3.2.1



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3.2.1 The Detection frequency range shall be 6 GHz to 18 GHz minimum.

3.2.2 Detector output measurements to be carried out over this frequency range.

3.3 RETURN LOSS or VSWR — Ref -730049 3.2.2

3.3.1 Connect device under test (DUT) as illustrated in Figure 1.

3.3.2 Ensure the network analyzer is calibrated to measure return loss over at least the specified frequency range.

3.3.3 RECORD worst case return loss over specified frequency range.

3.4 FILTER REJECTION — Ref -730049 3.2.4

3.4.1 Connect device under test (DUT) as illustrated in Figure 1.

3.4.2 Ensure that a calibration is used to identify when the log amplifier is indicating a level corresponding to the specified filter rejection. A calibration may be obtained by reducing the RF source power by an amount corresponding to the filter rejection specification and recording the passband detection level. Once the source power is returned to the original level, the filter rejection level can be compared to the recorded level.

3.4.3 VERIFY or RECORD that the detector output as measured on the log amplifier is below the specified rejection level over the specified rejection frequency band.

3.5 VOLTAGE SENSITIVITY — Ref -730049 3.2.5

3.5.1 Connect device under test (DUT) as illustrated in Figure 3 with bias resistor of 10 k ohms.

3.5.2 Ensure a calibrated signal level of -3dBm is available from the signal generator.

3.5.3 Set signal generator internal pulse modulator to give 10 kHz square wave modulation of the RF signal.

3.5.4 RECORD peak to peak detected voltage as measured by the oscilloscope.

3.6 BARRIER POTENTIAL — Ref -730049 3.2.6

3.6.1 Connect device under test (DUT) as illustrated in Figure 2.

3.6.2 Set power supply to appropriate voltage to give 100 microamps bias into detector and balance diodes. If the series resistor is 10 k ohms then power supply voltage should be 1.0 volt more than diode voltage. If the series resistor is 20 k ohms then the power supply should be 2.0 volt more than diode voltage.

3.6.3 RECORD the voltage on the detector and balance diodes while biased at 100 micro amps.

3.7 OPERATING INPUT DYNAMIC RANGE Ref -730049 3.2.7

3.7.1 Connect device under test (DUT) as illustrated in Figure 4.

3.7.2 Set power supply to appropriate voltage to give 100 microamps bias into detector diode. If the series resistor is 10 k ohms then power supply voltage should be 1.0 volt more than diode voltage. If the series resistor is 20 k ohms then the power supply should be 2.0 volt more than diode voltage.

3.7.3 RECORD detector voltage with RF power off.

3.7.4 RECORD detector voltage with RF power set to -23 dBm at 12 GHz.

3.7.5 RECORD detector voltage with RF power set to +7 dBm at 12 GHz.

3.7.6 RECORD detector voltage with RF power set to +8 dBm at 12 GHz.

3.7.7 The detector generates negative output voltage. Progressive increments in the negative direction as the RF power is changed from off, minimum power, maximum power to beyond maximum power indicates the detector is functioning over the specified dynamic range.

3.8 FREQUENCY RESPONSE FLATNESS Ref -730049 3.2.8

3.8.1 Connect device under test (DUT) as illustrated in Figure 1.

3.8.2 Ensure that a calibration is used to identify when the log amplifier is indicating a level corresponding to the specified filter rejection. A calibration may be obtained by changing the RF source power by an amount equal to the peak to peak flatness specification. Recording the log amplifier output at maximum and minimum levels. The RF source power should then be adjusted to centralize the passband response between these levels. If the passband frequency response is between these levels then the unit meets specification. Alternatively the RF power may be adjusted up and down to bring the maximum and minimum points on the frequency response curve to an arbitrary reference level. The difference between these levels is the peak to peak frequency response deviation or flatness.

3.8.3 VERIFY or RECORD that the detector output as measured on the log amplifier and within the passband frequency range is within the specified flatness specification.

3.9 TRACKING Ref -730049 3.2.11

3.9.1 Connect device under test (DUT) as illustrated in Figure 2.

3.9.2 Set power supply to appropriate voltage to give 100 microamps bias into detector and balance diodes. If the series resistor is 10 k ohms then power supply voltage should be 1.0 volt more than diode voltage. If the series resistor is 20 k ohms then the power supply should be 2.0 volt more than diode voltage.

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3.9.3 RECORD the voltage on the detector and balance diodes while biased at 100 micro amps.

3.9.4 CALCULATE the difference between the detector and balance diode voltages. The difference should be less than the specified value. ( 20 mV )

## 4.0 GROUP B INSPECTION ( SAMPLING TESTS)

4.1 LOW TEMPERATURE OPERATION — Ref -730049 3.5.1.1

4.1.1 Perform GROUP A tests at -54 deg C

4.2 HIGH TEMPERATURE OPERATION — Ref -730049 3.5.1.1

4.2.1 Perform GROUP A tests at -95 deg C

4.3 RESISTANCE TO SOLVENTS — Ref -730049 4.6.5.6

4.3.1 Perform GROUP A tests at -95 deg C

4.3.2 Electrical rejects or dummy units may be used for this test.

4.4 WATER VAPOUR CONTENT — Ref -730049 4.6.5.7

4.4.1 Perform GROUP A tests at -95 deg C

4.4.2 Electrical rejects or dummy units may be used for this test.

4.5 MAXIMUM RF INPUT POWER — Ref -730049 3.2.3

4.5.1 Perform this test at -54, 25 and 95 deg C

4.5.2 Apply 20 dBm at any frequency between 6 and 18 GHz to RF input for 30 seconds.

4.5.3 Verify no damage or degradation by repeating Voltage Sensitivity test and ensuring no change. ( Ref -730049 3.2.5 )

4.6 DIODE VOLTAGE PROTECTION — Ref -730049 3.2.9

4.6.1 Perform this test at -54, 25 and 95 deg C

4.7 VIDEO BYPASS CAPACITOR — Ref -730049 3.2.12

4.7.1 Perform this test at 25 deg C

4.7.2 THIS TEST IS OMMITTED.

4.7.3 The schottky detector diode interacts with the capacitance measurements to give incorrect



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readings. The actual capacitors used for video bypass can be verified by design data.

4.8 WARM UP TIME Ref -730049 3.2.9

4.8.1 Perform this test at -54.

4.8.2 There are no active components and no warm up occurs. TEST OMMITTED.



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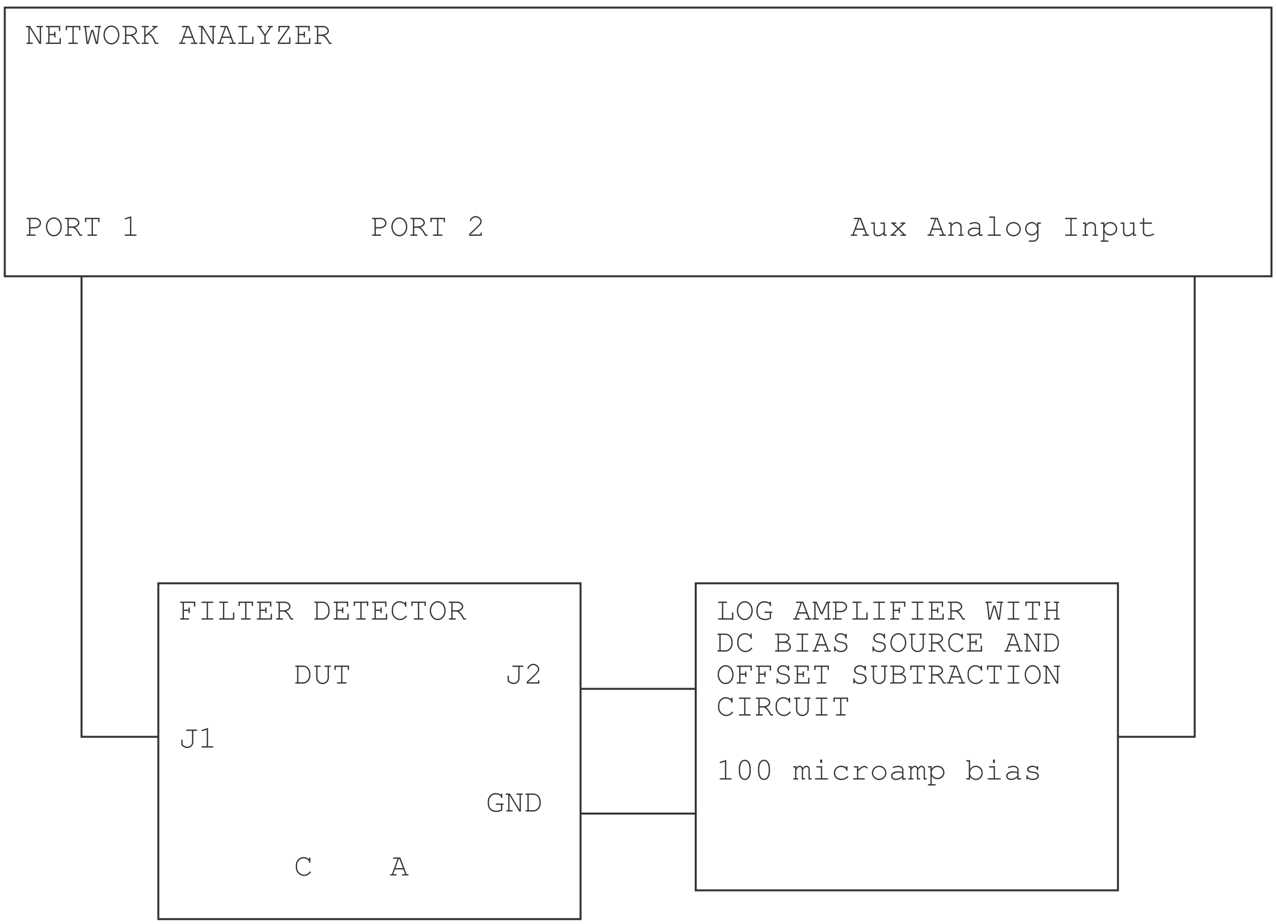
## FIGURE 1



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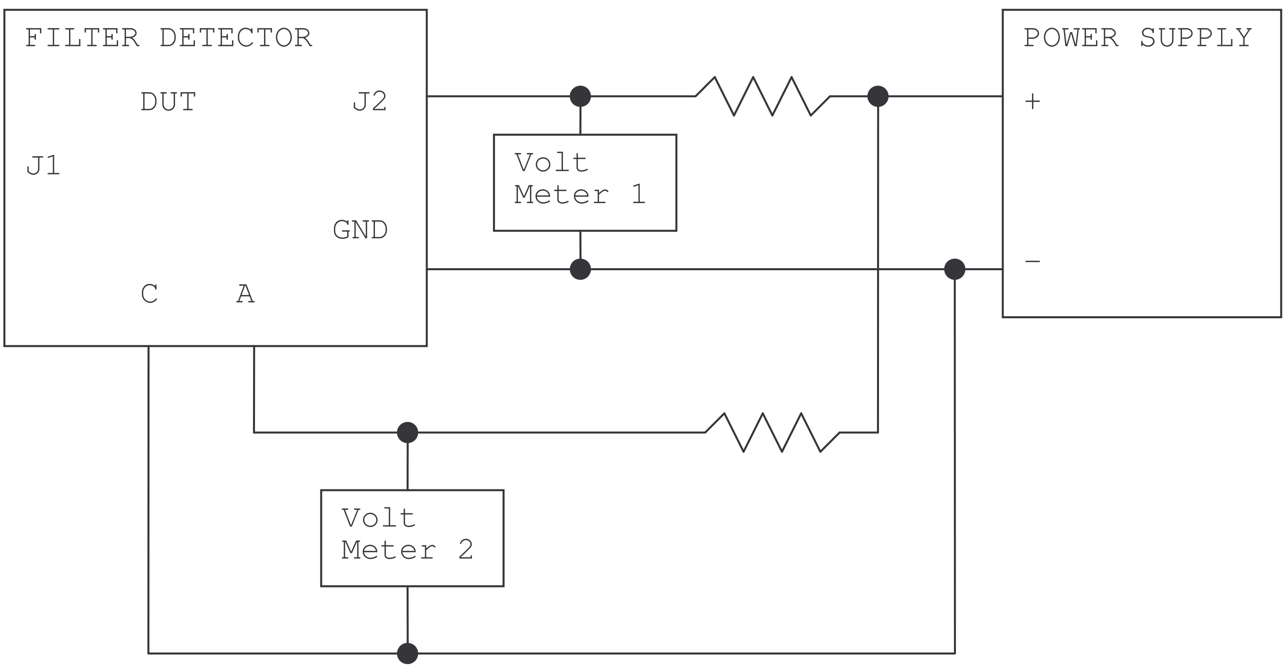
## FIGURE 2




Series Resistors of 10 kohm will give 100 microamp when power supply is 1 volt above the diode voltage. Typically 1.3Volts



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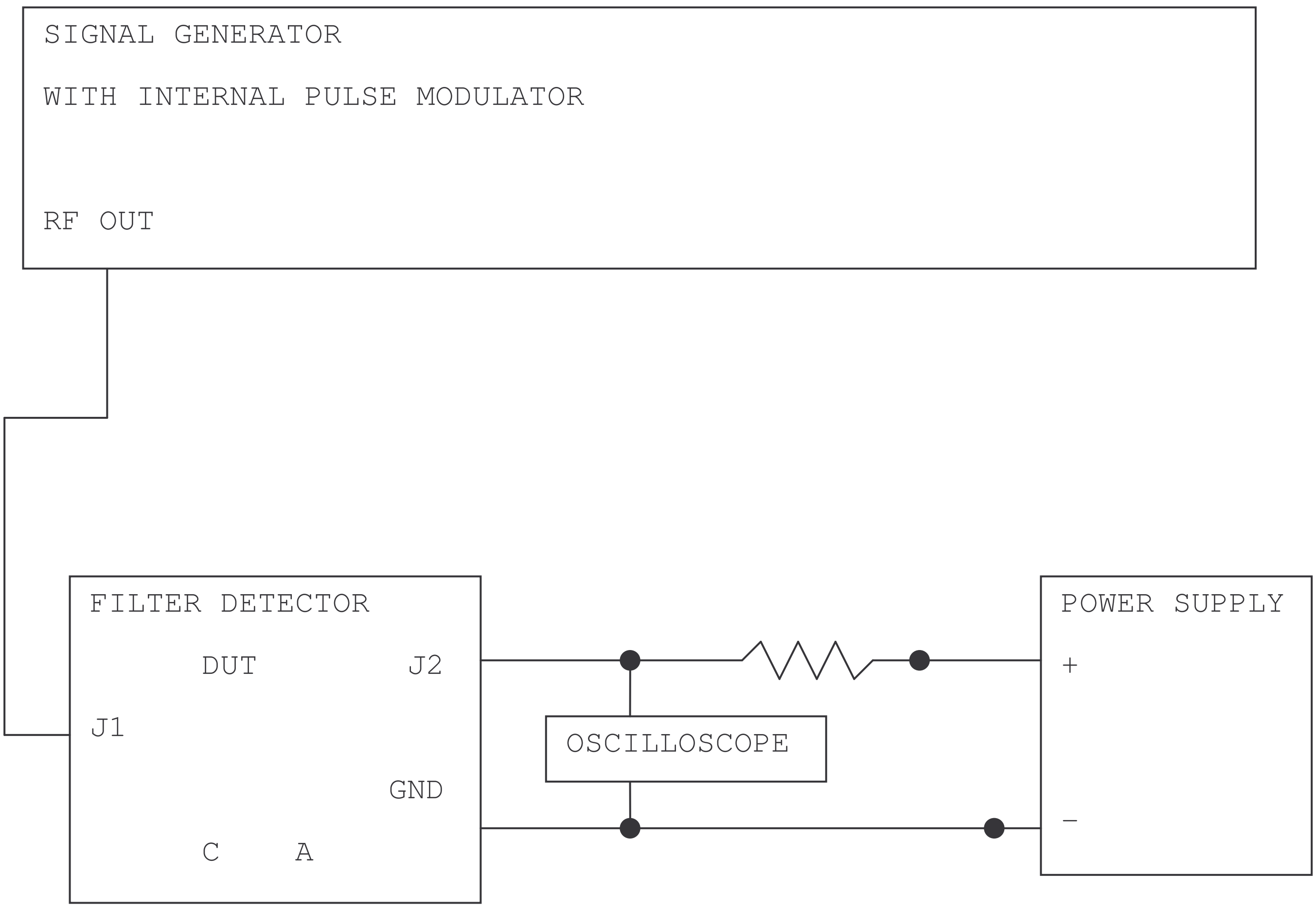
# FIGURE 3

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# FIGURE 4