Testing of MDHC
High Frequency Coaxial Connectors
Return Loss and Crosstalk

STR #570
Revision N/C

Revision Letter	Page Number	Paragraph / Appendix	Description of Revision	Approval Date
N/C	-	-	Original Release	05/18/09

Table of Contents

Scope
The purpose of this test report is to document the electrical performance of the MDHC High Frequency Coaxial Connectors.

1   Order of Precedence

In case of a conflict between the text of this document and the applicable referenced documents, the text of this document took precedence.

2   Description of Test Articles

Sabritec internal part number, customer part number, quantity tested, and a general description of articles tested to the requirements of this document are as in Table 1.

Table 1: Connector Part Numbers and Descriptions.

Sabritec Part Number	Customer Part Number	Quantity	General Description
013109-2004 & 013209-2004	N/A	8	MDHC High Frequency Coaxial Connectors

3   Standard Ambient Test Conditions

All tests and examinations were tested within the ranges stated in this paragraph, unless specified otherwise.

Temperature:	21°C to 27°C
Relative Humidity:	20% to 80%
Barometric Pressure:	725 +50/–70 mm Hg

4   References

None.

5   Test Equipment and Facilities

5.1   Test Equipment

The following test equipment was used when testing was accomplished to the criteria of this specification.

Table 2: Test Equipment

Manufacturer	Description and Model	Sabritec S/N
Anritsu	37369A Vector Network Analyzer	909

5.2   Facilities

Sabritec Test Lab.

6   Calibration and Source Inspection

6.1   Calibration

All test equipment used in the performance of the tests required was calibrated in accordance with ANSI/NCSL Z540-1-1994. Records of all equipment were maintained in accordance with ANSI/NCSL

HYPERTAC   IDi INTERCONNECT DEVICES   SABRITEC

Z540-1-1994 and made available for review. Unless otherwise specified, Sabritec Quality Assurance verified that all test data and collection methods were accurate and reliable.

7   Test Sequence

The VNA was first calibrated with a full 2 Port, 12 term error correction.

VSWR was then measured for all 8 connector pairs in an eight position housing, fully mated.

An intentional .035" gap was introduced between the two housings and two contact pairs were tested again to see how the performance degraded with this gap.

The noise floor of the VNA was then measured in preparation for Crosstalk testing.

One line was driven, while Crosstalk testing was performed on the 2 adjacent contacts, with all ports terminated in 50 Ohms.

An intentional .035" gap was again introduced between the two housings and Crosstalk testing was repeated with this intentional gap.

8   Test Results

8.1   **VSWR:** VSWR typically measured better than 1.3:1 through 30 GHz, and about 1.5:1 from 30 to 40 GHz. See attached data.

8.2   **CROSSTALK:** Crosstalk was below the VNA noise floor and was better than -90 dB for all test conditions. See attached data.
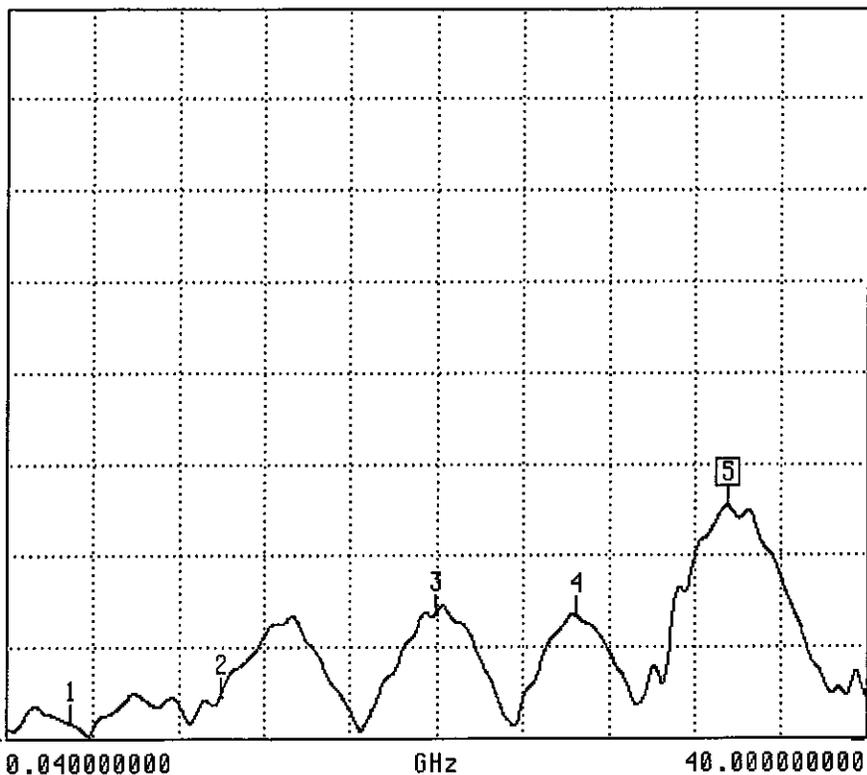
* * * * *

HYPERTAC   IDI INTERCONNECT DEVICES   SABRITEC

Wiltron

MOHC #1

37369A

MODEL:	DATE:	05/15/09 14:50	Page 1
DEVICE ID:	OPERATOR:		

START: 0.040000000 GHz	GATE START: 746.0000 ps	ERROR CORR: 12-TERM
STOP: 40.000000000 GHz	GATE STOP: 1.9605 ns	AVERAGING: 1 PT
STEP: 0.024975000 GHz	GATE: NOMINAL	IF BNDWDTH: 1 KHz
	WINDOW: NOMINAL	

------------CH1------------
PARAMETER:	-S11-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S11 FORWARD REFLECTION   FGT

SWR   ►REF=1.000 U   200.000 mU/DIV

0.040000000   GHz   40.000000000

CH 1 - S11
REFERENCE PLANE
0.0000 mm

MARKER 5
33.531475000 GHz
1.507 U

►MARKER TO MAX
MARKER TO MIN

1   3.012025000 GHz
1.031 U

2   10.005025000 GHz
1.089 U

3   19.995025000 GHz
1.272 U

4   26.488525000 GHz
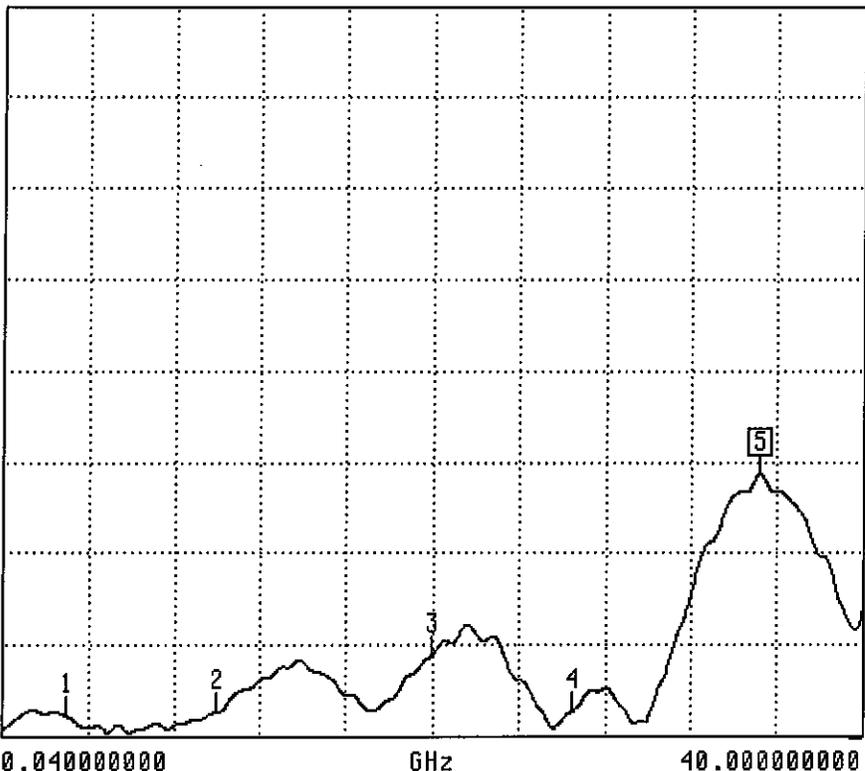1.268 U

MARKER READOUT
FUNCTIONS

Wiltron

MOHC #2

37369A

START:	0.040000000 GHz	GATE START:	746.0000 ps	ERROR CORR:	12-TERM
STOP:	40.000000000 GHz	GATE STOP:	1.9605 ns	AVERAGING:	1 PT
STEP:	0.024975000 GHz	GATE:	NOMINAL	IF BNDWDTH:	1 KHz
		WINDOW:	NOMINAL		

--------------------CH1--------------------

PARAMETER:	-S11-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S11 FORWARD REFLECTION   FGT

SWR   ▶REF=1.000 U   200.000 mU/DIV

0.040000000   GHz   40.000000000

CH 1 - S11
REFERENCE PLANE
  0.0000 mm

MARKER 5
  35.229775000 GHz
      1.574 U

▶MARKER TO MAX
 MARKER TO MIN

1   3.012025000 GHz
        1.044 U

2   10.005025000 GHz
        1.051 U

3   19.995025000 GHz
        1.176 U

4   26.488525000 GHz
        1.054 U

MARKER READOUT
FUNCTIONS

Wiltron

MOHC #3

37369A

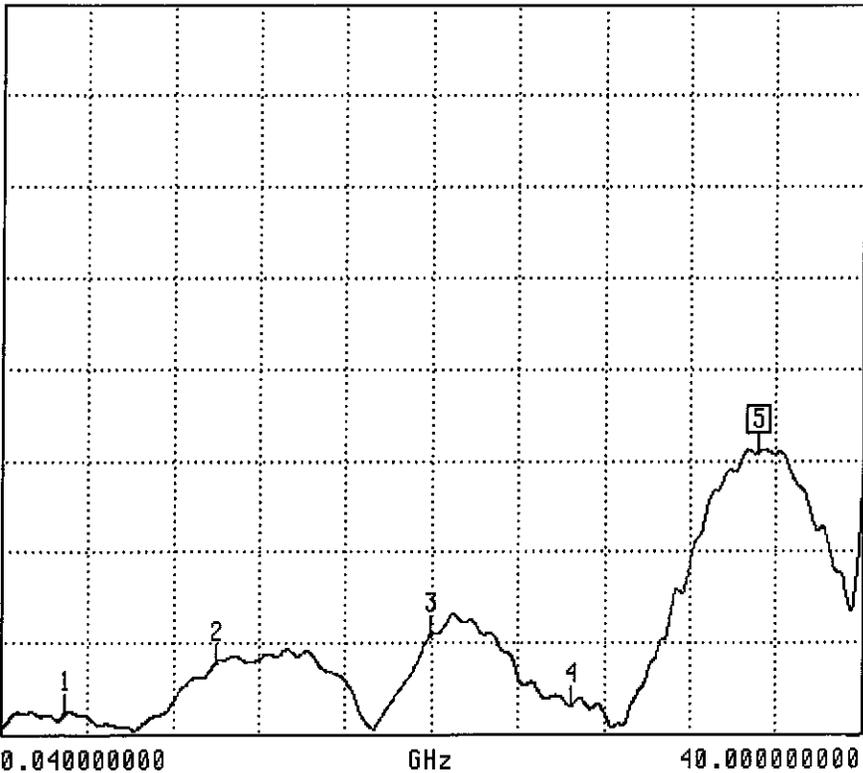|					
MODEL:		DATE:	05/15/09	15:26	Page 1
DEVICE ID:		OPERATOR:			

START:	0.040000000 GHz	GATE START:	746.0000 ps	ERROR CORR: 12-TERM
STOP:	40.000000000 GHz	GATE STOP:	1.9605 ns	AVERAGING: 1 PT
STEP:	0.024975000 GHz	GATE:	NOMINAL	IF BNDWDTH: 1 KHz
		WINDOW:	NOMINAL	

------------CH1------------

PARAMETER: -S11-
NORMALIZATION: OFF
REFERENCE PLANE: 0.0000   mm
SMOOTHING: 0.0 PERCENT
DELAY APERTURE: -
PROCESSING: FREQ W/GATE
GATING: ON

S11 FORWARD REFLECTION   FGT

SWR   ▸REF=1.000 U   200.000 mU/DIV

0.040000000   GHz   40.000000000

CH 1 - S11
REFERENCE PLANE
   0.0000 mm

MARKER 5
 35.229775000 GHz
    1.616 U

▸MARKER TO MAX
 MARKER TO MIN

1   3.012025000 GHz
       1.042 U

2 10.005025000 GHz
       1.155 U

3 19.995025000 GHz
       1.215 U

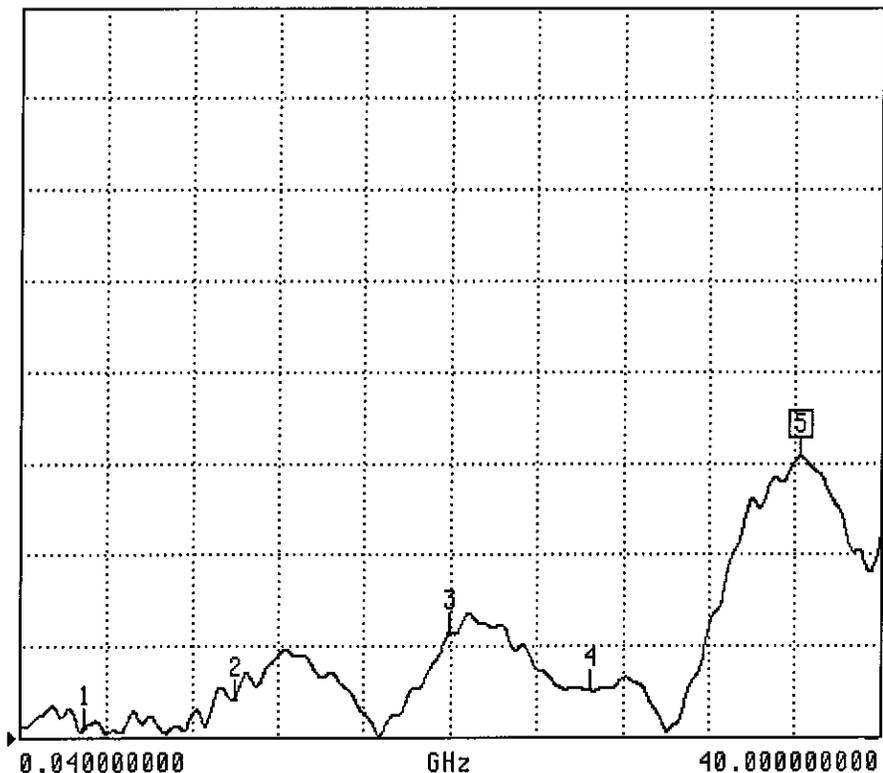4 26.488525000 GHz
       1.062 U

MARKER READOUT
FUNCTIONS

Wiltron

MOHC #4

37369A

MODEL:		DATE:	05/15/09	15:27	Page	1
DEVICE ID:		OPERATOR:				

START:	0.040000000 GHz	GATE START:	746.0000 ps	ERROR CORR:	12-TERM
STOP:	40.000000000 GHz	GATE STOP:	1.9605 ns	AVERAGING:	1 PT
STEP:	0.024975000 GHz	GATE:	NOMINAL	IF BNDWDTH:	1 KHz
		WINDOW:	NOMINAL		

-----------CH1-----------

PARAMETER:	-S11-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S11 FORWARD REFLECTION   FGT

SWR   ▶REF=1.000 U   200.000 mU/DIV

0.040000000   GHz   40.000000000

CH 1 - S11
REFERENCE PLANE
0.0000 mm

MARKER 5
36.303700000 GHz
1.612 U

▶MARKER TO MAX
MARKER TO MIN

1   3.012025000 GHz
1.020 U

2   10.005025000 GHz
1.081 U

3   19.995025000 GHz
1.227 U

4   26.488525000 GHz
1.101 U

MARKER READOUT
FUNCTIONS

Wiltron

MOHC #5

37369A

MODEL:	DATE:	05/15/09 15:28	Page 1
DEVICE ID:	OPERATOR:		

START:	0.040000000 GHz	GATE START:	746.0000 ps	ERROR CORR:	12-TERM
STOP:	40.000000000 GHz	GATE STOP:	1.9605 ns	AVERAGING:	1 PT
STEP:	0.024975000 GHz	GATE:	NOMINAL	IF BNDWDTH:	1 KHz
		WINDOW:	NOMINAL		

-----------CH1-----------

PARAMETER:	-S11-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S11 FORWARD REFLECTION   FGT

SWR   ▶REF=1.000 U   200.000 mU/DIV

0.040000000   GHz   40.000000000

CH 1 - S11
REFERENCE PLANE
0.0000 mm

MARKER 5
33.881125000 GHz
1.537 U

▶MARKER TO MAX
MARKER TO MIN

1   3.012025000 GHz
1.034 U

2 10.005025000 GHz
1.134 U

3 19.995025000 GHz
1.224 U
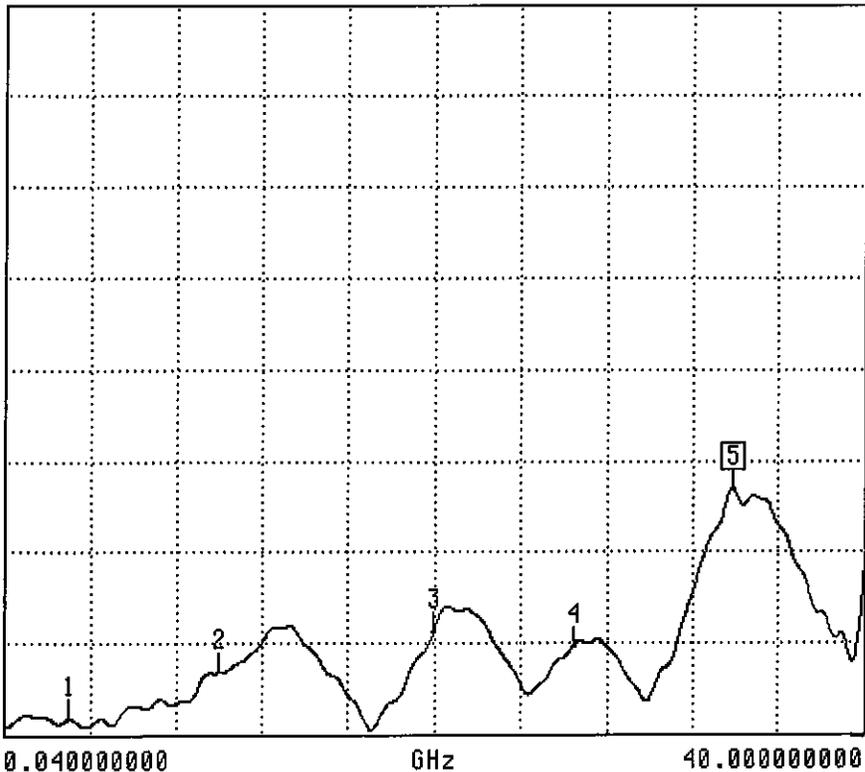
4 26.488525000 GHz
1.193 U

MARKER READOUT
FUNCTIONS
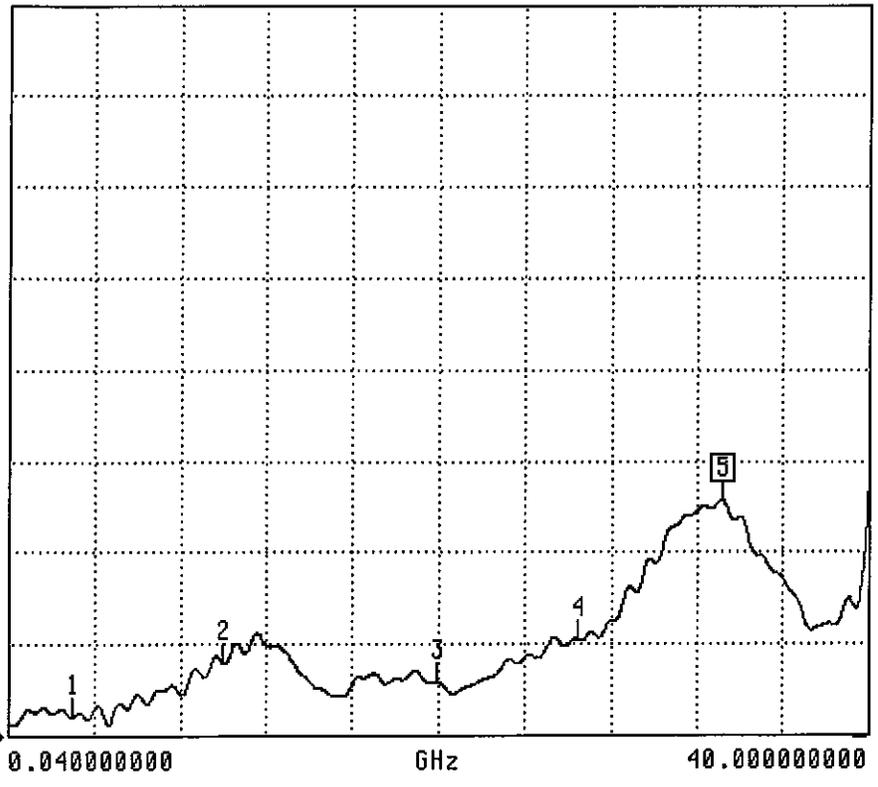
Wiltron

37369A

MODEL:		DATE: 05/15/09 15:52 Page 1	
DEVICE ID:		OPERATOR:	

START:	0.040000000 GHz	GATE START: 746.0000 ps	ERROR CORR: 12-TERM
STOP:	40.000000000 GHz	GATE STOP: 1.9605 ns	AVERAGING: 1 PT
STEP:	0.024975000 GHz	GATE: NOMINAL	IF BNDWDTH: 1 KHz
		WINDOW: NOMINAL	

-----------CH1-----------

PARAMETER:	-S11-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S11 FORWARD REFLECTION   FGT

SWR   ▶REF=1.000 U   200.000 mU/DIV

0.040000000   GHz   40.000000000

CH 1 - S11
REFERENCE PLANE
0.0000 mm

MARKER 5
33.206800000 GHz
1.512 U

▶MARKER TO MAX
MARKER TO MIN

1   3.012025000 GHz
1.039 U

2   10.005025000 GHz
1.159 U

3   19.995025000 GHz
1.116 U

4   26.488525000 GHz
1.209 U

MARKER READOUT
FUNCTIONS

Wiltron

37369A

MODEL:		DATE: 05/15/09 15:56	Page 1	
DEVICE ID:		OPERATOR:		

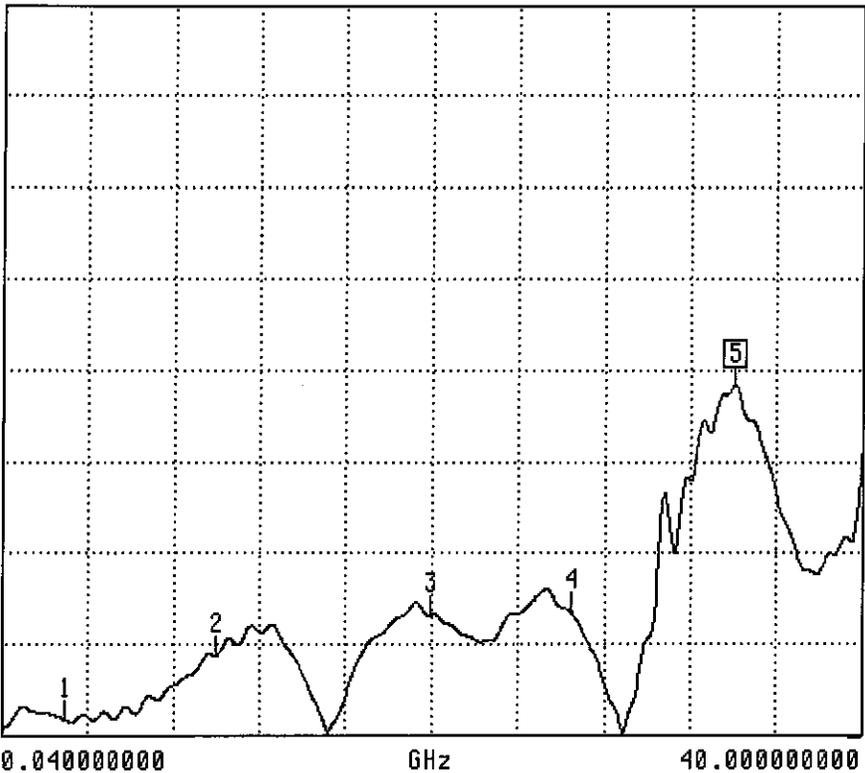|				
START:	0.040000000 GHz	GATE START:	746.0000 ps	ERROR CORR: 12-TERM
STOP:	40.000000000 GHz	GATE STOP:	1.9605 ns	AVERAGING: 1 PT
STEP:	0.024975000 GHz	GATE:	NOMINAL	IF BNDWDTH: 1 KHz
		WINDOW:	NOMINAL	

---------------CH1---------------

PARAMETER: -S11-
NORMALIZATION: OFF
REFERENCE PLANE: 0.0000   mm
SMOOTHING: 0.0 PERCENT
DELAY APERTURE: -
PROCESSING: FREQ W/GATE
GATING: ON

S11 FORWARD REFLECTION   FGT

.SWR   ▶REF=1.000 U   200.000 mU/DIV

0.040000000   GHz   40.000000000

CH 1 - S11
REFERENCE PLANE
0.0000 mm

MARKER 5
34.105900000 GHz
1.765 U

▶MARKER TO MAX
MARKER TO MIN

1   3.012025000 GHz
1.034 U

2   10.005025000 GHz
1.174 U

3   19.995025000 GHz
1.264 U

4   26.488525000 GHz
1.269 U

MARKER READOUT
FUNCTIONS

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MOHC #7

37369A

MODEL:		DATE: 05/15/09 16:00	Page	1
DEVICE ID:		OPERATOR:		

START:	0.040000000 GHz	GATE START:	746.0000 ps	ERROR CORR:	12-TERM
STOP:	40.000000000 GHz	GATE STOP:	1.9605 ns	AVERAGING:	1 PT
STEP:	0.024975000 GHz	GATE:	NOMINAL	IF BNDWDTH:	1 KHz
		WINDOW:	NOMINAL		

------------CH1------------

PARAMETER:	-S11-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S11 FORWARD REFLECTION   FGT

SWR   ▶REF=1.000 U   200.000 mU/DIV

0.040000000   GHz   40.000000000

CH 1 - S11
REFERENCE PLANE
0.0000 mm

MARKER 5
34.355650000 GHz
1.569 U

▶MARKER TO MAX
MARKER TO MIN

1   3.012025000 GHz
1.033 U

2   10.005025000 GHz
1.142 U

3   19.995025000 GHz
1.335 U
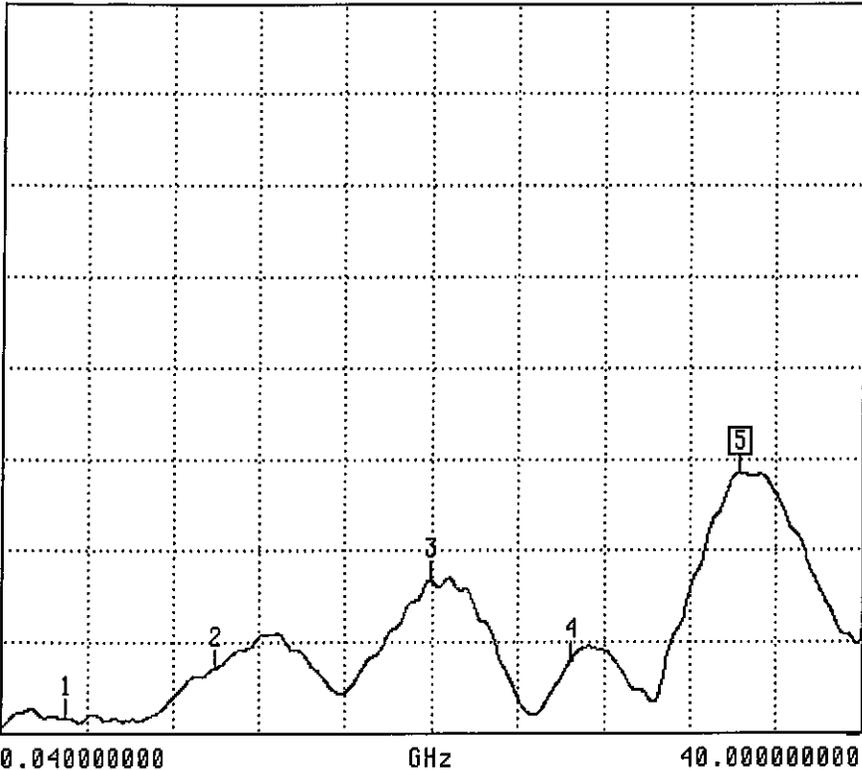
4   26.488525000 GHz
1.159 U

MARKER READOUT
FUNCTIONS

Wiltron

MDHC #8

37369A

MODEL:		DATE: 05/15/09 15:59	Page 1
DEVICE ID:		OPERATOR:	

START:	0.040000000 GHz	GATE START: 746.0000 ps	ERROR CORR: 12-TERM
STOP:	40.000000000 GHz	GATE STOP: 1.9605 ns	AVERAGING: 1 PT
STEP:	0.024975000 GHz	GATE: NOMINAL	IF BNDWDTH: 1 KHz
		WINDOW: NOMINAL	

------------CH1------------

PARAMETER:	-S11-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S11 FORWARD REFLECTION   FGT

SWR   ▸REF=1.000 U   200.000 mU/DIV

0.040000000   GHz   40.000000000

CH 1 - S11
REFERENCE PLANE
0.0000 mm

MARKER 5
34.355650000 GHz
1.453 U

▸MARKER TO MAX
MARKER TO MIN

1 3.012025000 GHz
   1.063 U

2 10.005025000 GHz
   1.084 U

3 19.995025000 GHz
   1.132 U

4 26.488525000 GHz
   1.085 U

MARKER READOUT
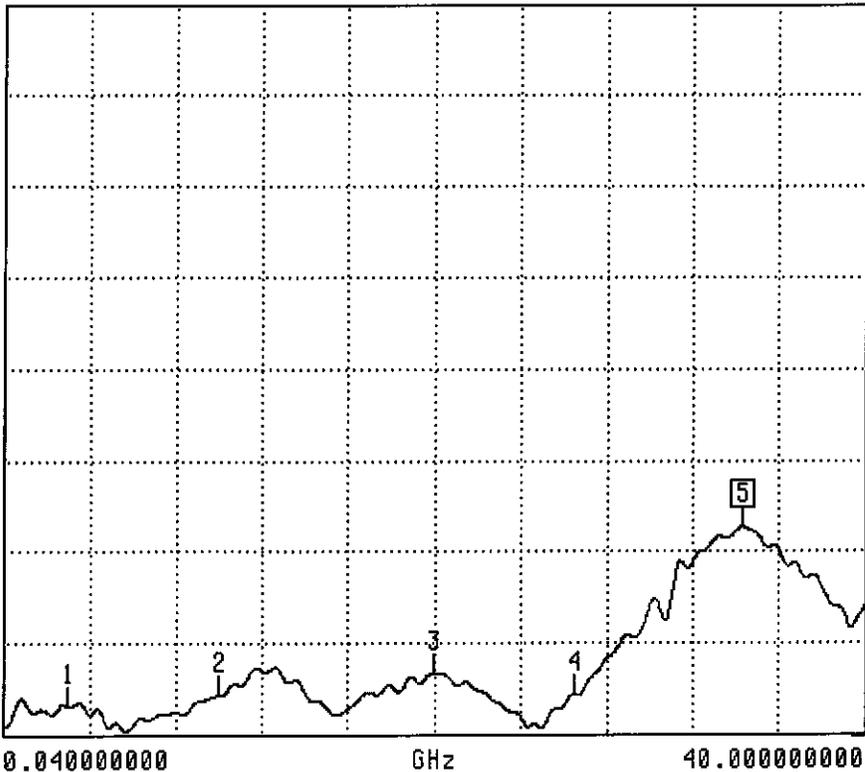FUNCTIONS

Wiltron

37369A

MODEL:	DATE:	05/15/09 15:47	Page 1
DEVICE ID:	OPERATOR:		

START:	0.040000000 GHz	GATE START:	746.0000 ps	ERROR CORR: 12-TERM
STOP:	40.000000000 GHz	GATE STOP:	1.9605 ns	AVERAGING: 1 PT
STEP:	0.024975000 GHz	GATE:	NOMINAL	IF BNDWDTH: 1 KHz
		WINDOW:	NOMINAL	

----------CH1----------

PARAMETER: -S11-
NORMALIZATION: OFF
REFERENCE PLANE: 0.0000   mm
SMOOTHING: 0.0 PERCENT
DELAY APERTURE: -
PROCESSING: FREQ W/GATE
GATING: ON

S11 FORWARD REFLECTION   FGT

SWR   ▶REF=1.000 U   200.000 mU/DIV

0.040000000   GHz   40.000000000

CH 1 - S11
REFERENCE PLANE
   0.0000 mm

MARKER 5
 33.206800000 GHz
    1.854 U

▶MARKER TO MAX
 MARKER TO MIN

1   3.012025000 GHz
       1.073 U

2 10.005025000 GHz
       1.253 U

3 19.995025000 GHz
       1.294 U

4 26.488525000 GHz
       1.498 U

MARKER READOUT
FUNCTIONS

Wiltron

37369A

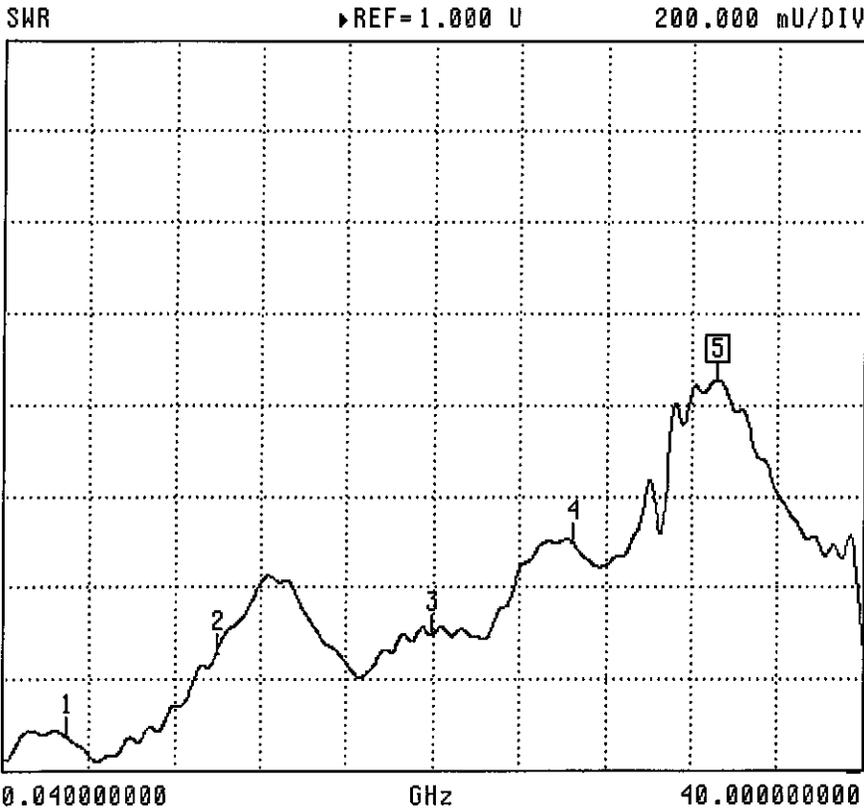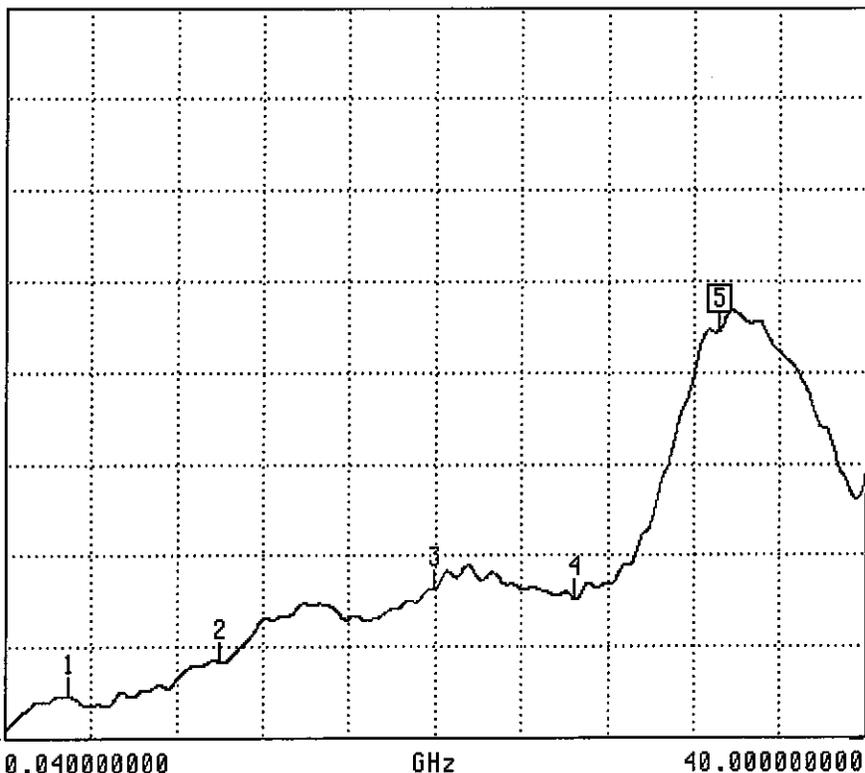MODEL: DATE: 05/15/09   15:49   Page   1
DEVICE ID: OPERATOR:

START: 0.040000000 GHz   GATE START: 746.0000 ps   ERROR CORR: 12-TERM
STOP: 40.000000000 GHz   GATE STOP: 1.9605 ns   AVERAGING: 1 PT
STEP: 0.024975000 GHz   GATE: NOMINAL   IF BNDWDTH: 1 KHz
                                          WINDOW: NOMINAL

-----------CH1-----------
PARAMETER: -S11-
NORMALIZATION: OFF
REFERENCE PLANE: 0.0000   mm
SMOOTHING: 0.0 PERCENT
DELAY APERTURE: -
PROCESSING: FREQ W/GATE
GATING: ON

S11 FORWARD REFLECTION   FGT

SWR   ▶REF=1.000 U   200.000 mU/DIV

0.040000000   GHz   40.000000000

CH 1 - S11
REFERENCE PLANE
 0.0000 mm

MARKER 5
 33.206800000 GHz
    1.890 U

▶MARKER TO MAX
 MARKER TO MIN

1   3.012025000 GHz
        1.090 U

2   10.005025000 GHz
        1.167 U

3   19.995025000 GHz
        1.324 U

4   26.488525000 GHz
        1.306 U
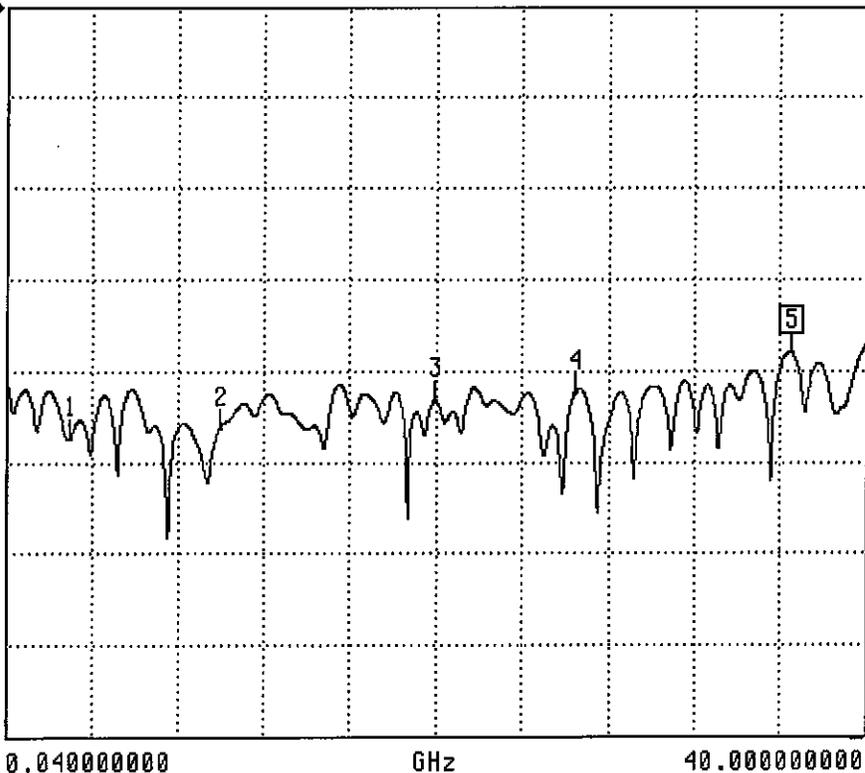
MARKER READOUT
FUNCTIONS

Wiltron

ANALYZER NOISE FLOOR

37369A

MODEL:		DATE: 05/15/09 15:39	Page	1
DEVICE ID:		OPERATOR:		

START:	0.040000000 GHz	GATE START: 746.0000 ps	ERROR CORR:	12-TERM
STOP:	40.000000000 GHz	GATE STOP: 1.9605 ns	AVERAGING:	1 PT
STEP:	0.024975000 GHz	GATE: NOMINAL	IF BNDWDTH:	1 KHz
		WINDOW: NOMINAL		

-----------CH1-----------

PARAMETER:	-S21-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S21 FORWARD TRANSMISSION   FGT

LOG MAGNITUDE   ▶REF=0.000 dB   20.000 dB/DIV

0.040000000   GHz   40.000000000

CH 1 - S21
REFERENCE PLANE
   0.0000 mm

MARKER 5
 36.553450000 GHz
   -76.086 dB

▶MARKER TO MAX
 MARKER TO MIN

1   3.012025000 GHz
     -94.829 dB

2 10.005025000 GHz
     -92.791 dB

3 19.995025000 GHz
     -86.659 dB

4 26.488525000 GHz
     -84.937 dB

MARKER READOUT
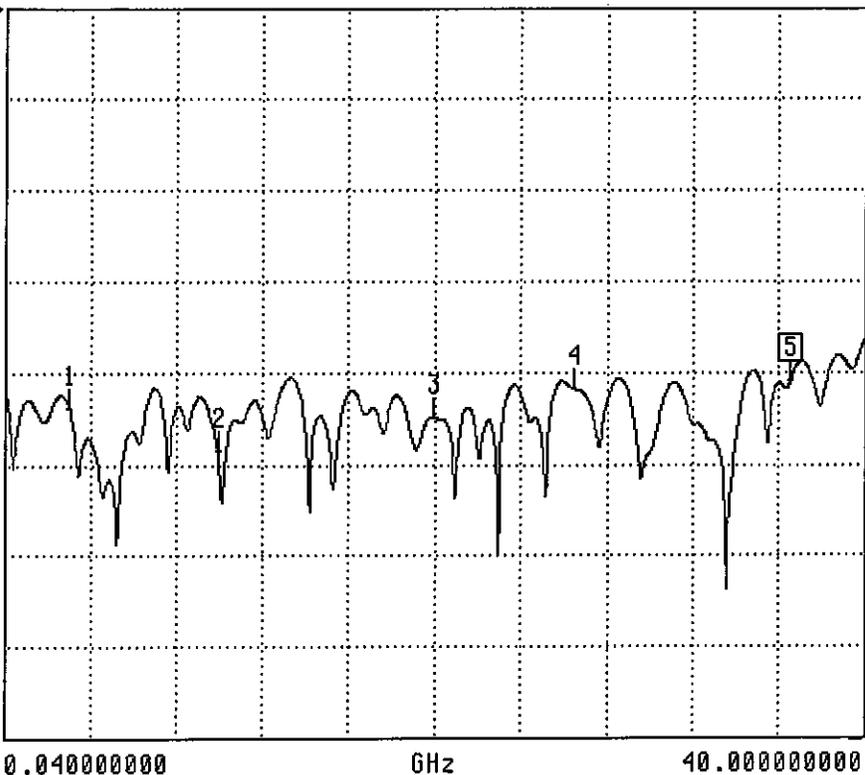FUNCTIONS

Wiltron

37369A

MODEL:		DATE: 05/15/09 15:37	Page 1
DEVICE ID:		OPERATOR:	

START:	0.040000000 GHz	GATE START:	746.0000 ps	ERROR CORR:	12-TERM
STOP:	40.000000000 GHz	GATE STOP:	1.9605 ns	AVERAGING:	1 PT
STEP:	0.024975000 GHz	GATE:	NOMINAL	IF BNDWDTH:	1 KHz
		WINDOW:	NOMINAL		

```
-----------CH1-----------
```

PARAMETER:	-S21-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S21 FORWARD TRANSMISSION   FGT

LOG MAGNITUDE   ▶REF=0.000 dB   20.000 dB/DIV

0.040000000   GHz   40.000000000

CH 1 - S21
REFERENCE PLANE
   0.0000 mm

MARKER 5
 36.553450000 GHz
   -81.955 dB

▶MARKER TO MAX
 MARKER TO MIN

1   3.012025000 GHz
      -87.718 dB

2   10.005025000 GHz
      -96.989 dB

3   19.995025000 GHz
      -89.879 dB

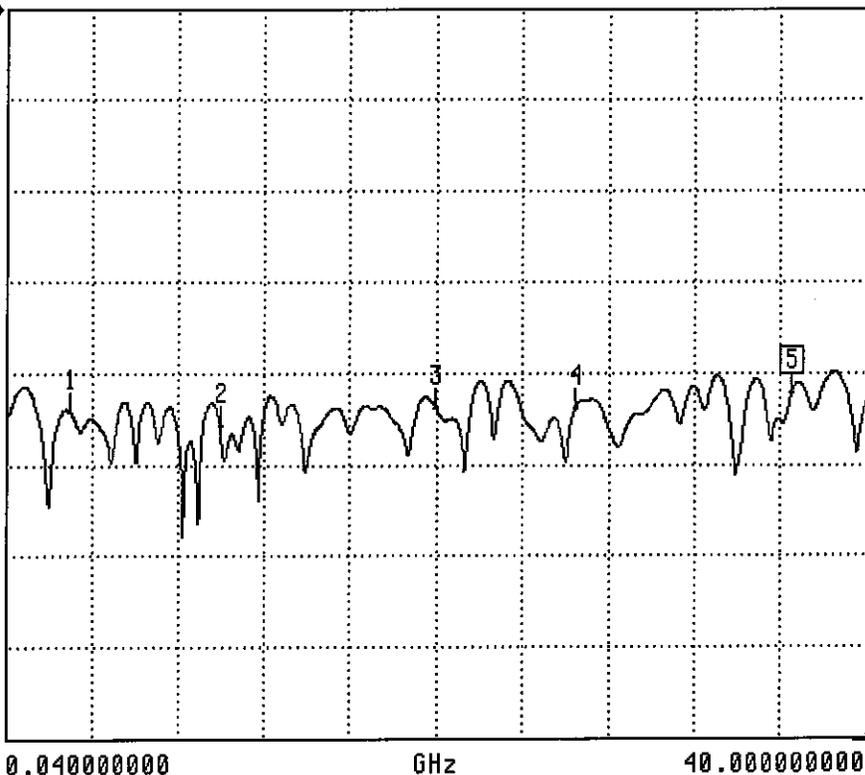4   26.488525000 GHz
      -83.661 dB

MARKER READOUT
FUNCTIONS

Wiltron

MDHC CROSSTALK #2

FULLY SEATED

37369A

| MODEL: | | DATE: | 05/15/09 | 15:41 | Page | 1 |
| DEVICE ID: | | OPERATOR: | | | | |

START:	0.040000000 GHz	GATE START:	746.0000 ps	ERROR CORR:	12-TERM
STOP:	40.000000000 GHz	GATE STOP:	1.9605 ns	AVERAGING:	1 PT
STEP:	0.024975000 GHz	GATE:	NOMINAL	IF BNDWDTH:	1 KHz
		WINDOW:	NOMINAL		

---------------CH1---------------

PARAMETER:	-S21-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S21 FORWARD TRANSMISSION   FGT

LOG MAGNITUDE   ▶REF=0.000 dB   20.000 dB/DIV

0.040000000   GHz   40.000000000

CH 1 - S21
REFERENCE PLANE
0.0000 mm

MARKER 5
36.553450000 GHz
-84.419 dB

▶MARKER TO MAX
MARKER TO MIN

1   3.012025000 GHz
    -88.424 dB

2   10.005025000 GHz
    -91.490 dB

3   19.995025000 GHz
    -87.702 dB

4   26.488525000 GHz
    -87.899 dB

MARKER READOUT
FUNCTIONS

Wiltron

MDHC CROSSTALK #1

.035" GAP

37369A

MODEL:		DATE:	05/15/09 15:44	Page 1
DEVICE ID:		OPERATOR:		

START:	0.040000000 GHz	GATE START:	746.0000 ps	ERROR CORR:	12-TERM
STOP:	40.000000000 GHz	GATE STOP:	1.9605 ns	AVERAGING:	1 PT
STEP:	0.024975000 GHz	GATE:	NOMINAL	IF BNDWDTH:	1 KHz
		WINDOW:	NOMINAL		

-------------------CH1-------------------

PARAMETER:	-S21-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S21 FORWARD TRANSMISSION   FGT

LOG MAGNITUDE   ▸REF=0.000 dB   20.000 dB/DIV

0.040000000   GHz   40.000000000
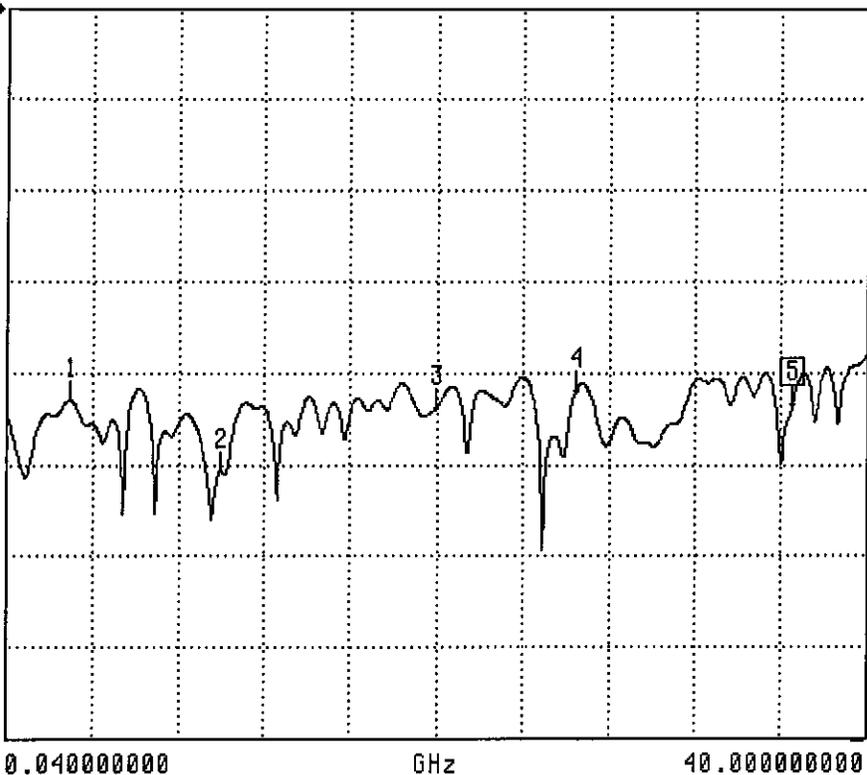
CH 1 - S21
REFERENCE PLANE
0.0000 mm

MARKER 5
36.553450000 GHz
-87.063 dB

▸MARKER TO MAX
MARKER TO MIN

1   3.012025000 GHz
-86.152 dB

2   10.005025000 GHz
-101.791 dB

3   19.995025000 GHz
-87.738 dB

4   26.488525000 GHz
-83.971 dB

MARKER READOUT
FUNCTIONS

Wiltron

37369A

|				
MODEL:		DATE:	05/15/09 15:43	Page 1
DEVICE ID:		OPERATOR:		

START:	0.040000000 GHz	GATE START:	746.0000 ps	ERROR CORR: 12-TERM
STOP:	40.000000000 GHz	GATE STOP:	1.9605 ns	AVERAGING: 1 PT
STEP:	0.024975000 GHz	GATE:	NOMINAL	IF BNDWDTH: 1 KHz
		WINDOW:	NOMINAL	

-----------CH1-----------

PARAMETER:	-S21-
NORMALIZATION:	OFF
REFERENCE PLANE:	0.0000 mm
SMOOTHING:	0.0 PERCENT
DELAY APERTURE:	-
PROCESSING:	FREQ W/GATE
GATING:	ON

S21 FORWARD TRANSMISSION   FGT

LOG MAGNITUDE   ▶REF=0.000 dB   20.000 dB/DIV

0.040000000   GHz   40.000000000
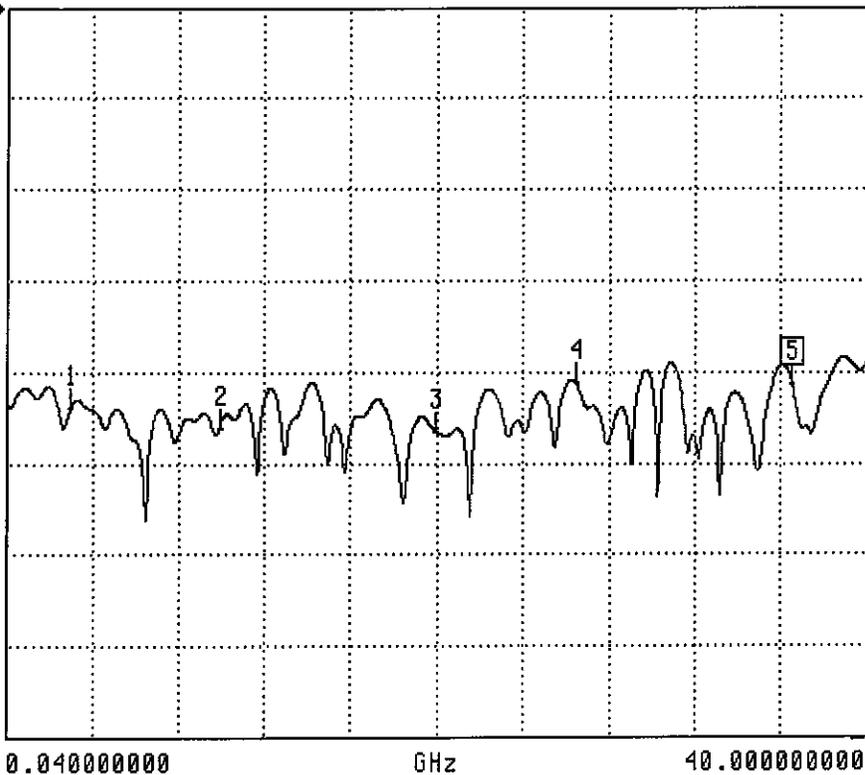
CH 1 - S21
REFERENCE PLANE
   0.0000 mm

MARKER 5
 36.553450000 GHz
   -82.629 dB

▶MARKER TO MAX
 MARKER TO MIN

1   3.012025000 GHz
       -87.745 dB

2   10.005025000 GHz
       -92.162 dB

3   19.995025000 GHz
       -93.052 dB

4   26.488525000 GHz
       -82.503 dB

MARKER READOUT
FUNCTIONS