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## Declaration of conformity to FCC Part 80 for Marine Radar

### Unwanted emission of radar systems

FCC ID: CKENKE2062

We: Japan Radio Company Limited

declare under our sole responsibility that the CKENKE2062 scanner unit  
conforms to the CFR part 80 rules for Marine Radars

Signed: H. Hashimoto

Date: 4th November, 2010

Mr. H. Hashimoto  
Manager of radar group  
Engineering Department

# CERTIFICATION

TO: FEDERAL COMMUNICATIONS COMMISSION

SUBJECT: TEST DATA FOR TYPE ACCEPTANCE OF NKE-1125/1129 (JMA-9122/9123)

FCC ID: CKENKE2062

SUPPLIER: JAPAN RADIO CO., LTD/SEATTLE OFFICE

1021 SW Klickitat Way, Bldg D, Suite 101 Seattle, WA98134, U.S.A

PHONE: 206-654-5644

MANUFACTURER: JAPAN RADIO CO., LTD.

1-1 SHIMORENJAKU 5 CHOME,

MITAKA-SHI,

TOKYO, JAPAN

This equipment has been tested in accordance with the requirements contained in the appropriate commission regulation. To the best of my knowledge, these tests were performed using measurement procedures consistent with industry or commission standards and demonstrate that the equipment complies with the appropriate standards. Each unit manufactured, imported or marketed, as defined in the commission's regulations, will conform to the sample(s) tested within the variations that can be expected due to quantity production and testing on a statistical basis. I further certify that the necessary measurements were made by JAPAN RADIO CO., Ltd, 1-1 SHIMORENJAKU, 5 CHOME, MITAKA-SHI, TOKYO, JAPAN. I, the undersigned as the engineer of JAPAN RADIO CO., LTD. TOKYO JAPAN, graduated from the Tokyo University of Agriculture & Technology and have been with this organization for the 13 years specializing the research and development of various type of marine radar equipments as well as assisting in their production.

JAPAN RADIO CO., LTD.

*G. Higuchi*  
.....  
G.HIGUCHI

## 1. SYSTEM DESCRIPTION

### ★NKE-2062

Type of Unit: Scanner unit

The MTR is installed within a 4 feet scanner unit.

The scanner weight is approximately 24kg.

The antenna is rotated 27 rpm by its driving motor.

This has a 2 degrees horizontal beam width and 30 degrees for vertical.

The transmitter operates with 4-pulse length and 4-pulse repetition frequencies.

The magnetron, MSF1422B, rated output is 6kw and is driven by solid-state modulator.

The receiver has a microwave front end, containing the low noise amplifier, mixer, local oscillator, IF amplifier and detector.

### GENERAL SPECIFICATION

|   |   |
|---|---|
| 1. Dimensions:                          | Height: 432mm, Swing circle: 120mm  |
| 2. Mass:                                | Approx. 24kg  |
| 3. Polarization:                        | Horizontal  |
| 4. Beam width                           |   |
| Horizontal (-3dB):                      | 2 degree  |
| Vertical (-3dB):                        | 30 degree   |
| Side lobe level:                        | Less than -23dB within 10 degree of main beam<br>other than -26dB within 10 degree of main beam |
| 5. Rotation speed:                      | Approx. 27rpm   |
| 6. Frequency:                           | 9410 ± 30MHz  |
| 7. Peak Power:                          | 6kW   |
| 8. Pulse length / Repetition frequency: | 0.08us/2250Hz, 025us/1700Hz, 05us/1200Hz, 1.0us/650Hz   |
| 9. Modulator:                           | Solid-state modulator   |
| 10. Duplexer:                           | Circulator / Diode Limiter  |
| 11. Front end module:                   | Built in  |
| 12. IF amplifier:                       | Logarithmic amplifier, Noise figure 6dB maximum.  |
| 13. Tunin:                              | Manual / Auto   |

### 3. TEST RESULTS SUMMARY

#### 3.1 Mechanical Tests

##### Appearance and Structure

Scanner Unit Good

#### 3.2 Electrical Tests

##### 3.2.1 Working of each operation unit

Scanner Unit Good

##### 3.2.2 Scanner

| VSWR | frequency (MHz) | VSWR |
|------|-----------------|------|
|      | 9380            | 1.02 |
|      | 9410            | 1.03 |
|      | 9440            | 1.04 |
|      | 9441            |      |

Scanner Rotation Speed 27 /48 rpm

##### 3.2.3 Transmitter

Magnetron Ser. No. SJ2B/F5769C

##### Operating Frequency

|                              |            |
|------------------------------|------------|
| (at 0.08 $\mu$ s pulse, SP)  | 9428.7 MHz |
| (at 0.25 $\mu$ s pulse, MP1) | 9428.7 MHz |
| (at 0.5 $\mu$ s pulse, MP2)  | 9428.7 MHz |
| (at 1.0 $\mu$ s pulse, LP)   | 9428.0 MHz |

##### RF power output (Mean power)

|                              |        |
|------------------------------|--------|
| (at 0.08 $\mu$ s pulse, SP)  | 0.11 W |
| (at 0.25 $\mu$ s pulse, MP1) | 1.41 W |
| (at 0.5 $\mu$ s pulse, MP2)  | 3.72 W |
| (at 1.0 $\mu$ s pulse, LP)   | 7.94 W |

##### Pulse Length

|                              |               |
|------------------------------|---------------|
| (at 0.08 $\mu$ s pulse, SP)  | 0.088 $\mu$ s |
| (at 0.25 $\mu$ s pulse, MP1) | 0.248 $\mu$ s |
| (at 0.5 $\mu$ s pulse, MP2)  | 0.470 $\mu$ s |
| (at 1.0 $\mu$ s pulse, LP)   | 1.020 $\mu$ s |

##### Repetition Frequency

|                |         |
|----------------|---------|
| (0.08 $\mu$ s) | 2251 Hz |
| (0.25 $\mu$ s) | 1704 Hz |
| (0.5 $\mu$ s)  | 1205 Hz |
| (1.0 $\mu$ s)  | 651 Hz  |

|  |      |
|--|------|
| Spurious Emission at Antenna Terminal    | Good |
| Field strength of spurious radiation     | Good |
| Radiofrequency radiation exposure limits | Good |

3.2.4 Receiver

|                        |            |
|------------------------|------------|
| MIC Front-end Ser. No. | C2862A     |
| Diode limiter Ser. No. | X0847A     |
| IF Center Frequency    | 60 MHz     |
| IF Bandwidth           | 20/6/3 MHz |

3.2.5 Input Voltage and Current(at 24NM-LP1) DC.24V 1.86A(44.64W)

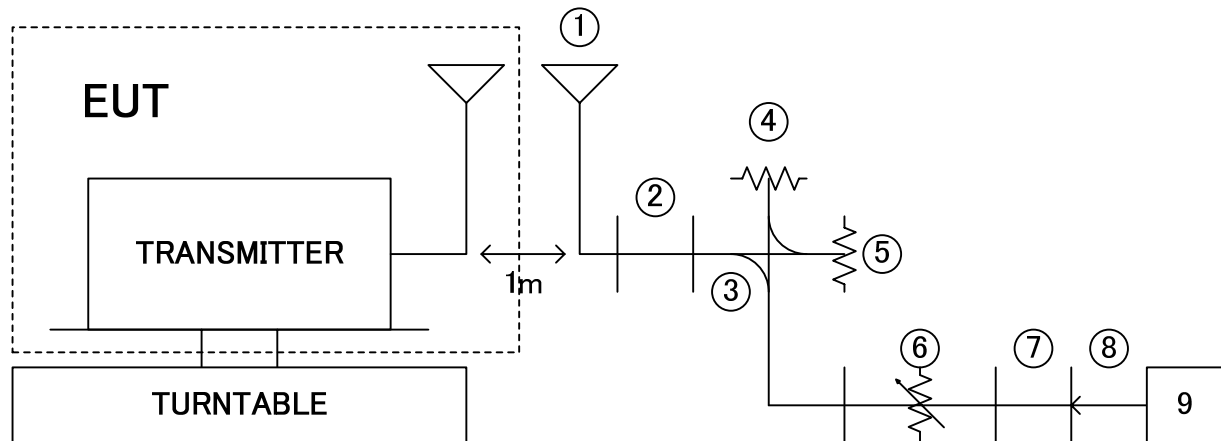
3.3 Overall Tests

|                                   |           |
|-----------------------------------|-----------|
| Working Time of Timer             | 1min30sec |
| Input Variation (21.6Vdc – 42Vdc) | Good      |
| Overall Sensitivity               | Good      |
| Minimum Range                     | Good      |
| Bearing Accuracy                  | Good      |
| Mechanical Noise                  | Good      |

#### 4.1 RF Power Output

47 CFR sec. 2.1046

##### 4.1.1 TEST SETUP



##### 4.1.2 TEST INSTRUMENTS

|   | DESCRIPTION & MANUFACTURER                | MODEL NO.      | SERIAL NO. | CALIBRATION DATE | CALIBRATION DUE DATE |
|---|---|----------------|------------|------------------|----------------------|
| 1 | Double Ridge Horn Antenna<br>ETS LINDGREN | 3117           | 00091928   | NA               | NA                   |
| 2 | Adaptor<br>HP                             | X281A          | NA         | NA               | NA                   |
| 3 | Direction Coupler (30dB)<br>SHIMADARIKA   | 5D363          | R11421     | NA               | NA                   |
| 4 | Dummy Load<br>PASTERNAK                   | PE6815         | NA         | NA               | NA                   |
| 5 | High Power Dummy Load<br>PASTERNAK        | PE6824         | NA         | NA               | NA                   |
| 6 | Variable Attenuator<br>HP                 | X382A          | 1005-00684 | May. 2010        | May. 2011            |
| 7 | Adaptor<br>HP                             | X281A          | NA         | NA               | NA                   |
| 8 | Coaxial Cable<br>HUBER+SUHNER             | SUCOFLEX 104PA | 5784 /4PA  | NA               | NA                   |
| 9 | Spectrum Analyzer<br>Agilent              | E4448A         | MY46180420 | Sep. 24. 2010    | Sep. 2011            |

##### 4.1.3 TEST PROCEDURES

Reference to Section 2.2.17 Radiated Power Output on TIA-603-C.

##### 4.1.4 EUT OPERATING CONDITIONS

- a. Placed the EUT on the testing table.
- b. Prepared other computer systems for controlling EUT and placed them outside of testing area.
- c. EUT can be transmitted four pulses are 0.08usec/2250Hz, 0.25usec/1700Hz, 0.5usec/1200Hz and

1.0usec/650Hz.

#### 4.1.5 TEST RESULTS

The radiated power output is calculated by the following:

$$averageradiated\ power = 10\log\left(\frac{1}{8}\sum_{i=1}^{i=8} 10^{\frac{LVL_i+LOSS}{10}}\right)dBm$$

| Pulse Length [usec]                | 0.08        |                  | 0.25        |                  | 0.5         |                  | 1.0         |                  |
|------------------------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|
| PRF [Hz]                           | 2250        |                  | 1700        |                  | 1200        |                  | 650         |                  |
| <b>averageradiated power [dBm]</b> | <b>20.4</b> |                  | <b>31.5</b> |                  | <b>35.7</b> |                  | <b>39.0</b> |                  |
| i                                  | LVL [dBm]   | LVL + LOSS [dBm] | LVL [dBm]   | LVL + LOSS [dBm] | LVL [dBm]   | LVL + LOSS [dBm] | LVL [dBm]   | LVL + LOSS [dBm] |
| 1                                  | -35.21      | 20.59            | -24.42      | 31.38            | -19.98      | 35.82            | -17.33      | 38.47            |
| 2                                  | -34.95      | 20.85            | -24.34      | 31.46            | -20.21      | 35.59            | -16.56      | 39.24            |
| 3                                  | -35.59      | 20.21            | -24.45      | 31.35            | -19.95      | 35.85            | -17.05      | 38.75            |
| 4                                  | -35.53      | 20.27            | -24.25      | 31.55            | -20.22      | 35.58            | -17.01      | 38.79            |
| 5                                  | -35.58      | 20.22            | -24.19      | 31.61            | -20.17      | 35.63            | -16.87      | 38.93            |
| 6                                  | -35.56      | 20.24            | -24.39      | 31.41            | -20.2       | 35.6             | -16.83      | 38.97            |
| 7                                  | -35.32      | 20.48            | -24.34      | 31.46            | -19.97      | 35.83            | -16.34      | 39.46            |
| 8                                  | -35.33      | 20.47            | -24.19      | 31.61            | -20         | 35.8             | -16.84      | 38.96            |

\*LOSS = 55.80dB

#### 4.1.6 TEST CONDITIONS

Tamb = 20°C to 25°C, RHamb = 40% ~ 60%

EUT input = 24 VDC

#### 4.1.7 STABILIZATION

EUT energized for 10 minutes minimum.

#### 4.1.8 TEST EQUIPMENT

JRC Original – Shielded Room

Other equipment – see test set-ups.

#### 4.1.9 DATE

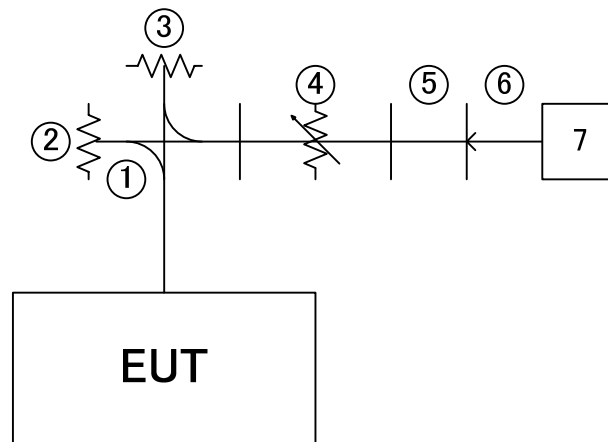
29<sup>th</sup> October, 2010

TESTED BY G. Higuchi

## 4.2 Spurious emission at antenna terminals

47 CFR sec. 2.1051

### 4.2.1.1 TEST SETUP for range 10kHz to 12.5GHz



### 4.2.1.2 TEST INSTRUMENT

|   | DESCRIPTION & MANUFACTURER              | MODEL NO.      | SERIAL NO. | CALIBRATION DATE | CALIBRATION DUE DATE |
|---|---|----------------|------------|------------------|----------------------|
| 1 | Direction Coupler (30dB)<br>SHIMADARIKA | 5D363          | R11421     | NA               | NA                   |
| 2 | Dummy Load<br>PASTERNAK                 | PE6815         | NA         | NA               | NA                   |
| 3 | High Power Dummy Load<br>PASTERNAK      | PE6824         | NA         | NA               | NA                   |
| 4 | Variable Attenuator<br>HP               | X382A          | 1005-00684 | May. 2010        | May. 2011            |
| 5 | Adaptor<br>HP                           | X281A          | NA         | NA               | NA                   |
| 6 | Coaxial Cable<br>HUBER+SUHNER           | SUCOFLEX 104PA | 5784 /4PA  | NA               | NA                   |
| 7 | Spectrum Analyzer<br>Agilent            | E4448A         | MY46180420 | Sep. 24. 2010    | Sep. 2011            |

Measurement Point : Antenna terminal

Spectrum Analyzer setting: RBW = 10kHz less than 1GHz, 1MHz above 1GHz

VBW = 300kHz less than 1GHz, 3MHz above 1GHz

Detector Mode = Positive Peak

### 4.2.1.3 TEST PROCEDURES

- a. Setup EUT as 4.2.1.
- b. Transmitted at most powerful pulse and adjusted attenuator for not exceeding the spectrum analyzer maximum rating.
- c. Transmitted at four pulses are 0.08usec/2250Hz, 0.25usec/1700Hz, 0.5usec/1200Hz and 1.0usec/650Hz, and capture the spectrum at 10kHz to 12.5GHz.



#### 4.2.1.4 EUT OPERATING CONDITIONS

- a. Placed the EUT on the testing table.
- b. Prepared other computer systems for controlling EUT and placed them outside of testing area.

#### 4.2.1.5 TEST RESULTS

No spurious emissions observed above minimum standard.

Test data is described at section 4.2.1.10 to 4.2.1.13

#### 4.2.1.6 TEST CONDITIONS

Tamb = 20°C to 25°C, RHamb = 40% ~ 60%

EUT input = 24 VDC

#### 4.2.1.7 STABILIZATION

EUT energized for 10 minutes minimum.

#### 4.2.1.8 TEST EQUIPMENT

JRC Original – Shielded Room

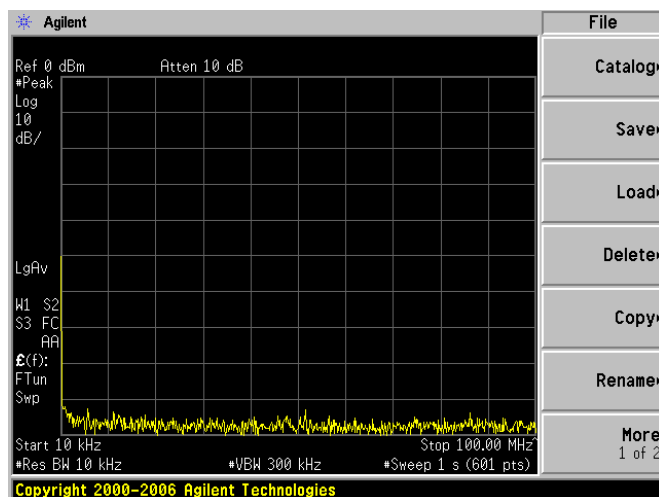
Other equipment – see test set-ups.

#### 4.2.1.9 DATE

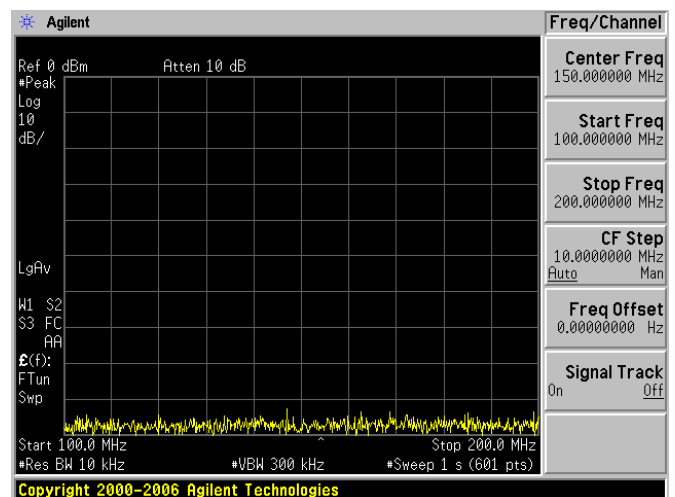
1<sup>st</sup> November, 2010

TESTED BY G.Higuchi

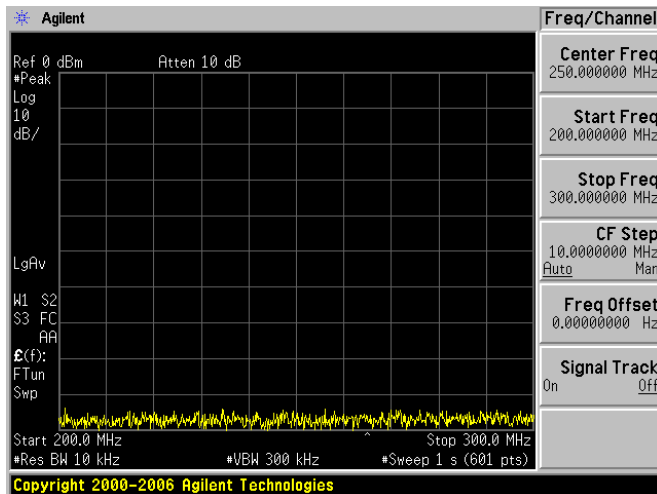
#### 4.2.1.10 TEST RESULTS of 0.08usec/2250Hz pulse



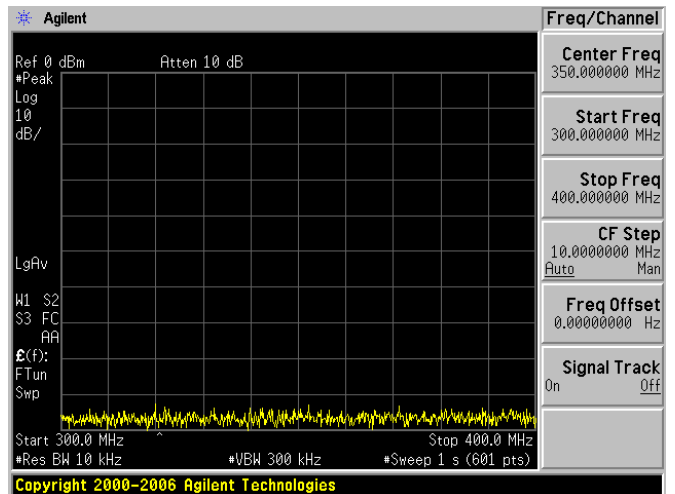
10kHz to 100MHz



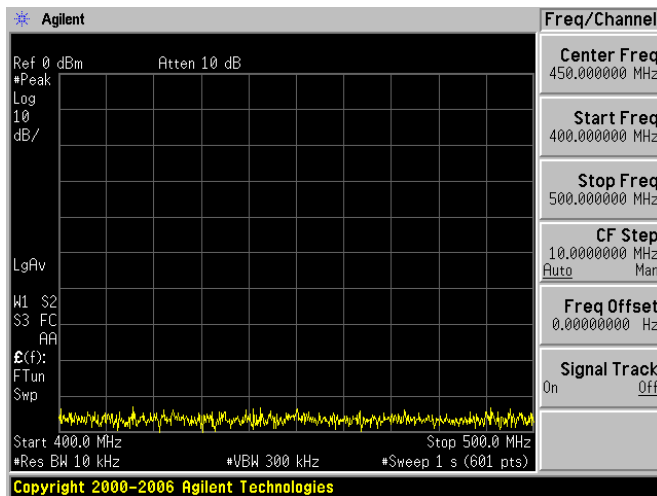
100MHz to 200MHz



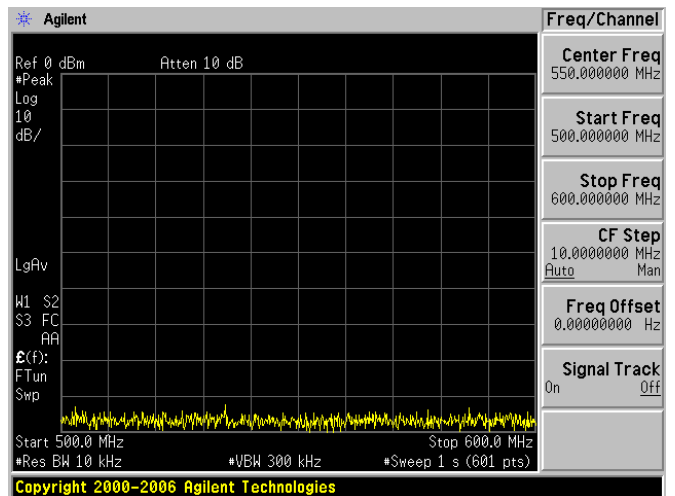
200MHz to 300MHz



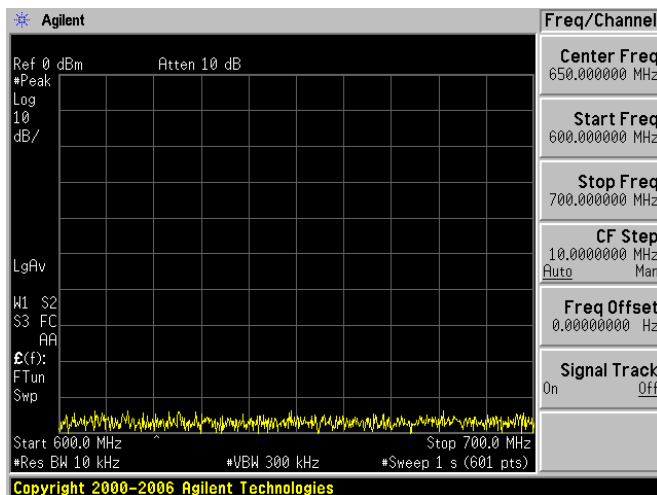
300MHz to 400MHz



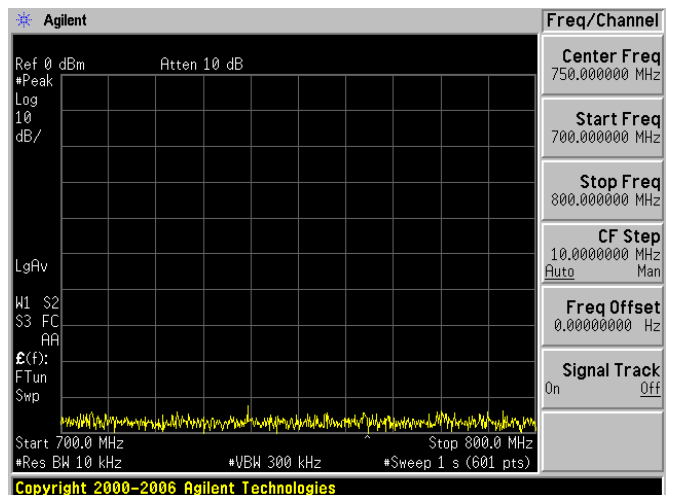
400MHz to 500MHz



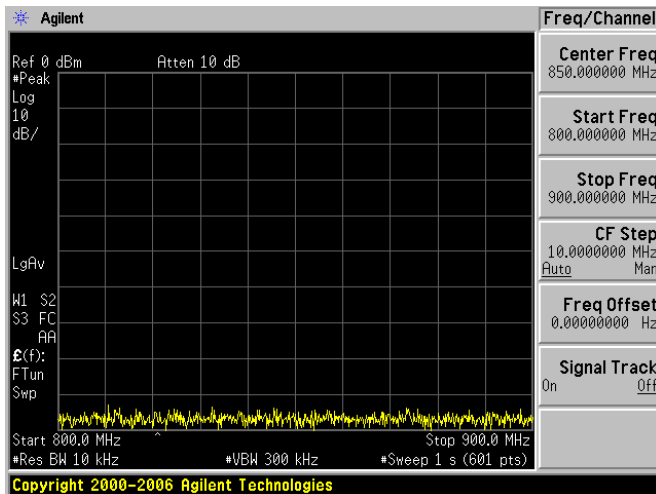
500MHz to 600MHz



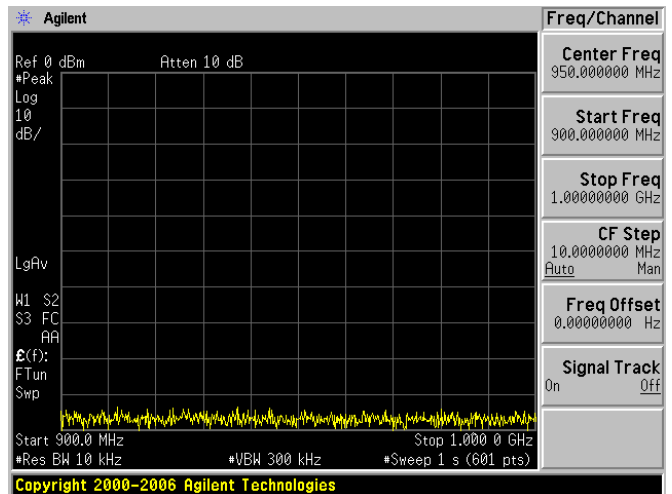
600MHz to 700MHz



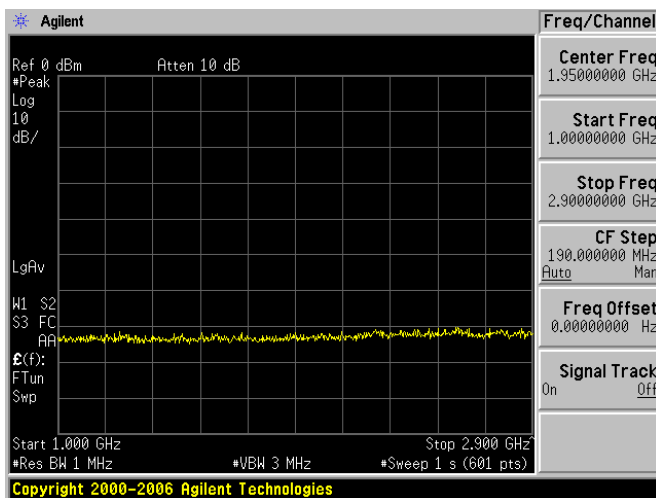
700MHz to 800MHz



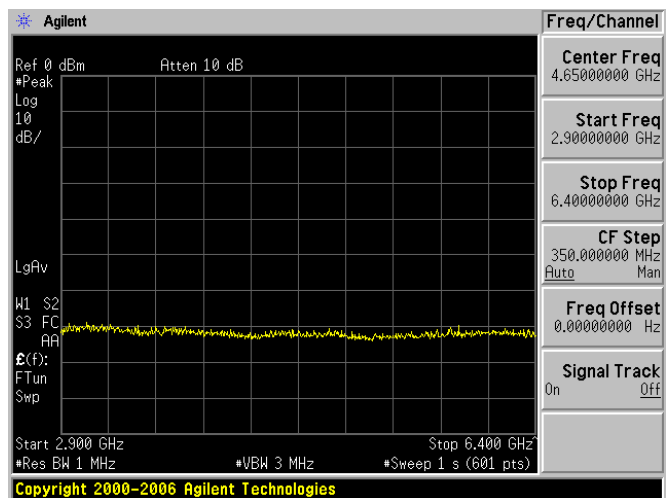
800MHz to 900MHz



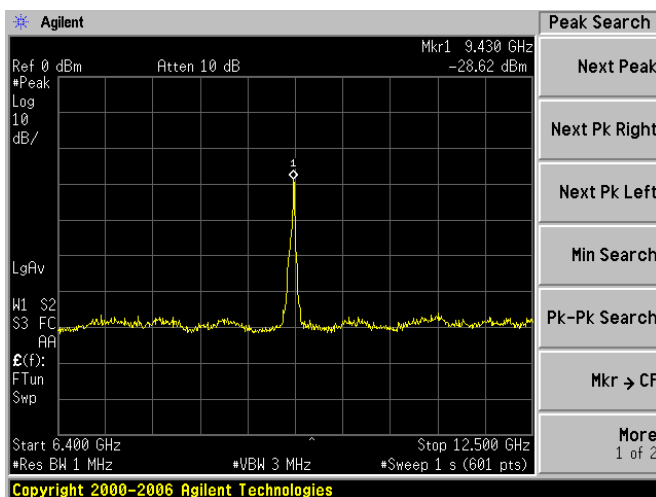
900MHz to 1GHz



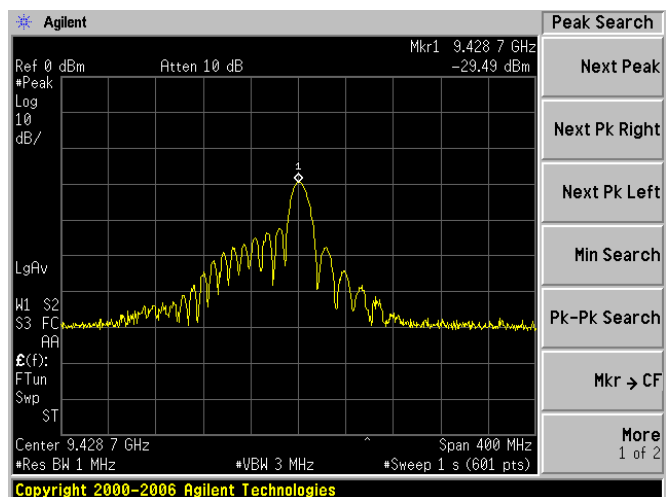
1.0GHz to 2.9GHz



2.9GHz to 6.4GHz

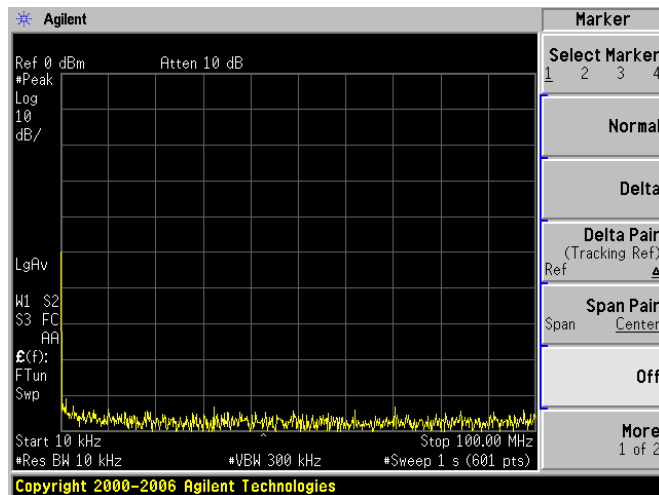


6.4GHz to 12.5GHz

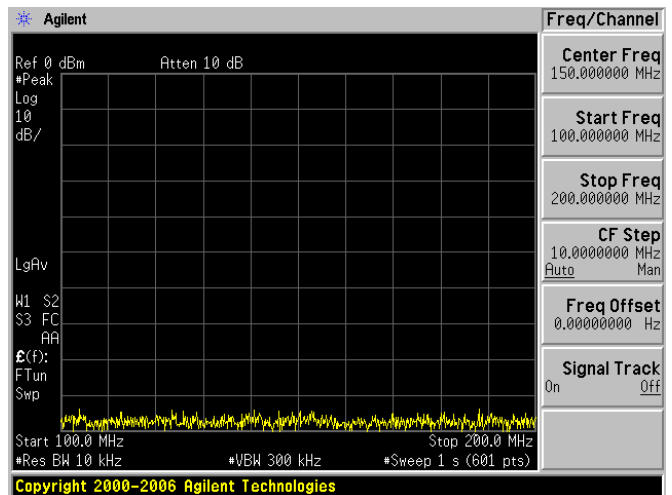


Center 9428.7MHz, Span 400MHz

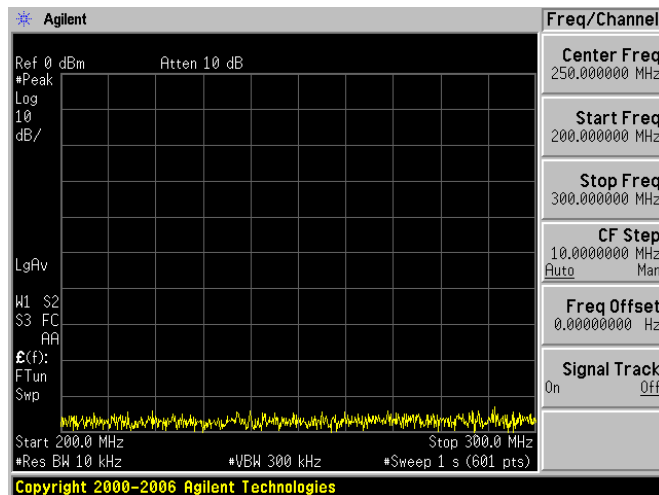
#### 4.2.1.11 TEST RESULTS of 0.25usec/1700Hz pulse



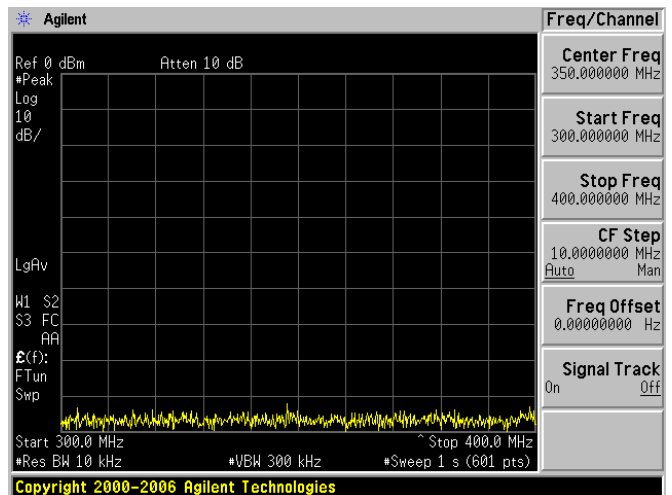
10kHz to 100MHz



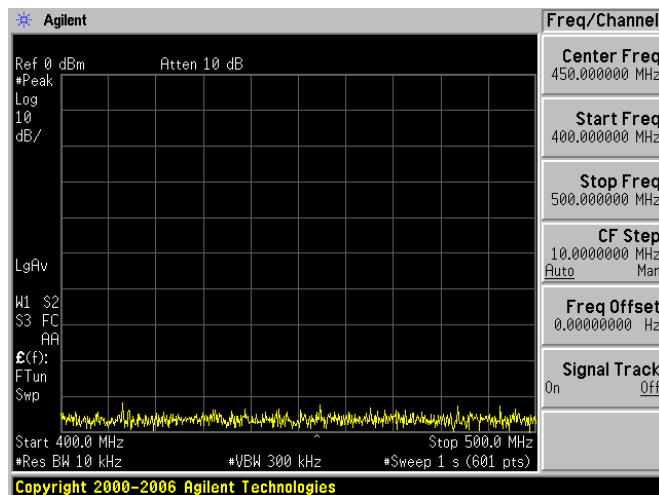
100MHz to 200MHz



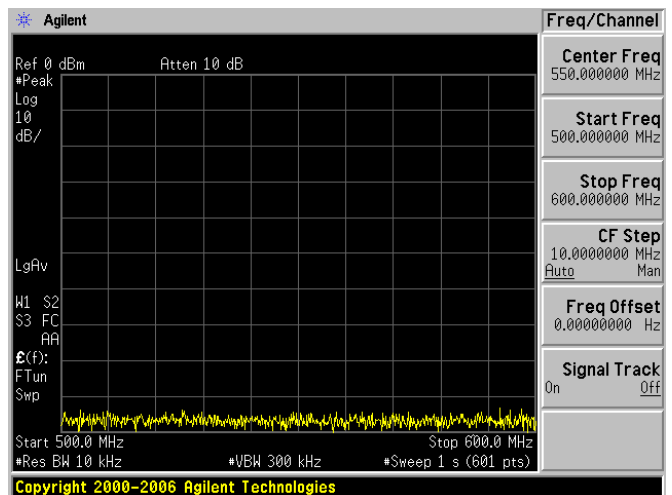
200MHz to 300MHz



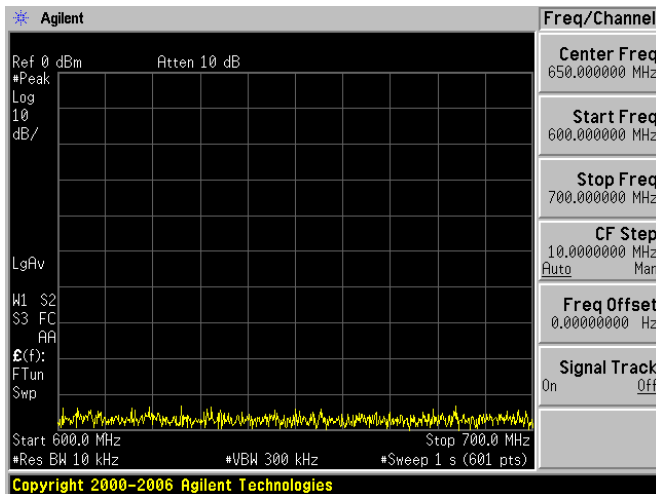
300MHz to 400MHz



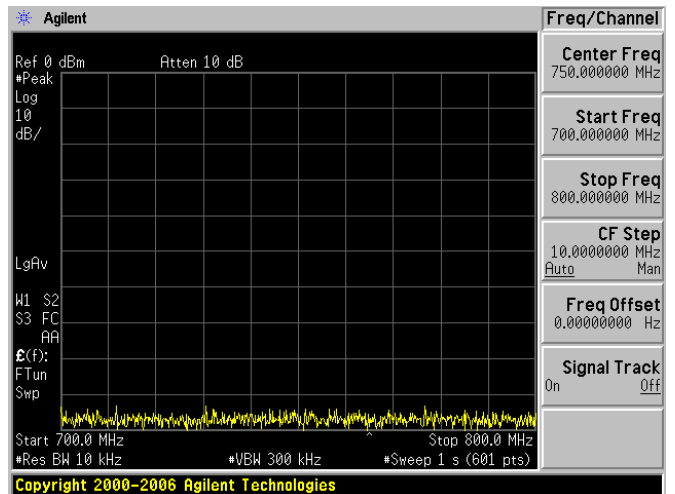
400MHz to 500MHz



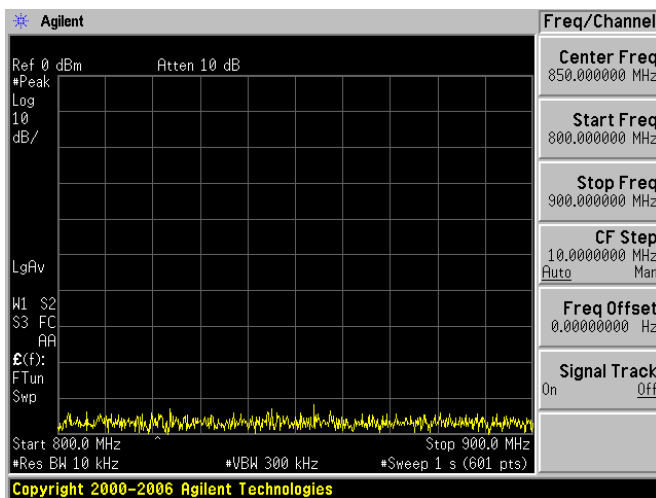
500MHz to 600MHz



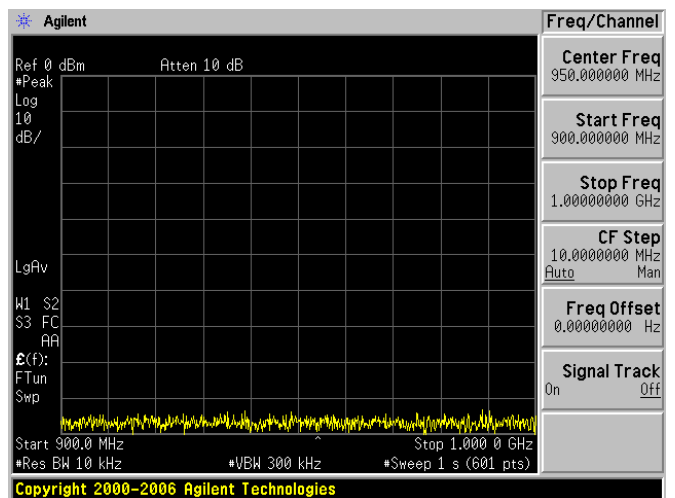
600MHz to 700MHz



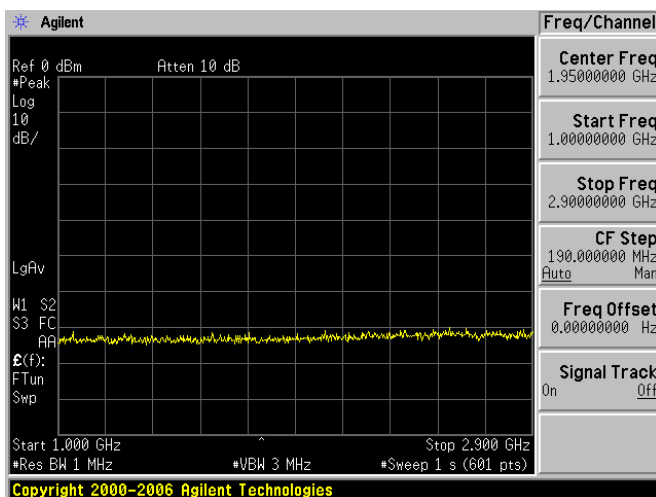
700MHz to 800MHz



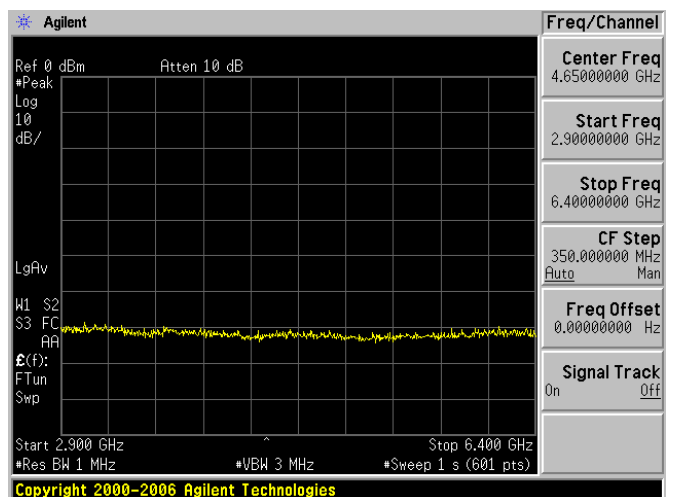
800MHz to 900MHz



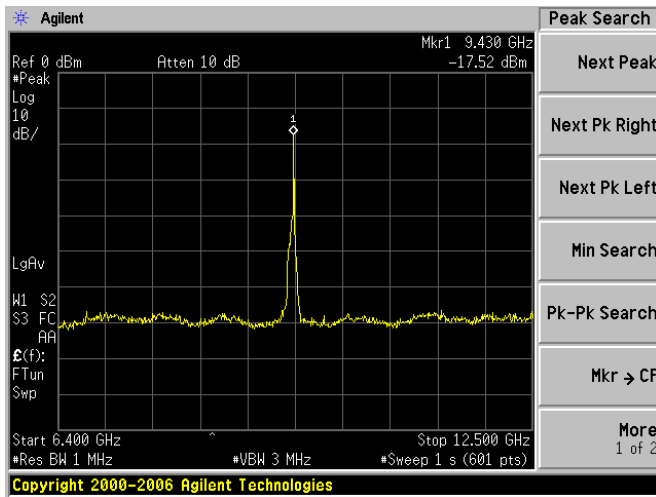
900MHz to 1.0GHz



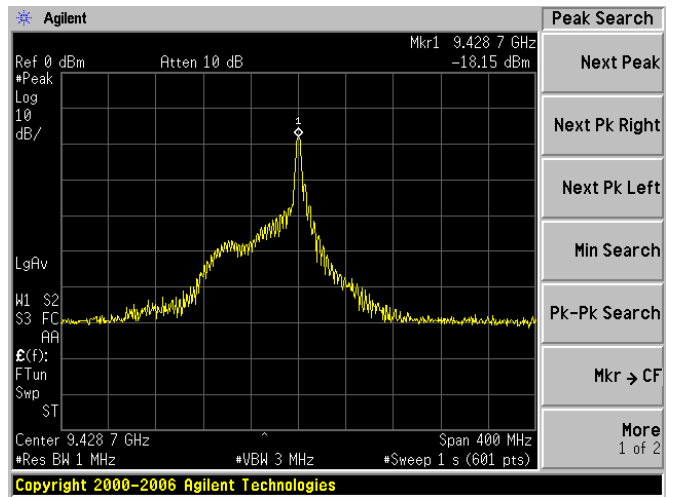
1.0GHz to 2.9GHz



2.9GHz to 6.4GHz

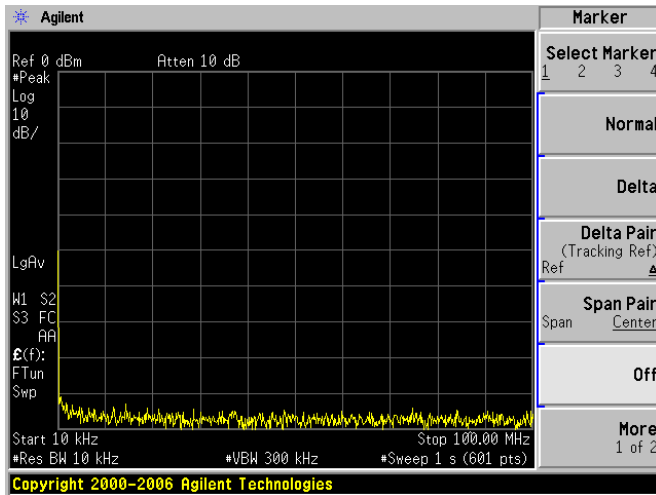


6.4GHz to 12.5GHz

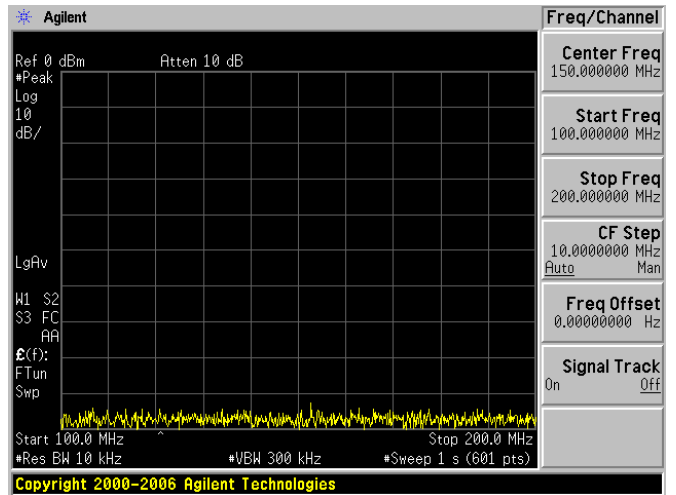


Center 9428MHz, Span 400MHz

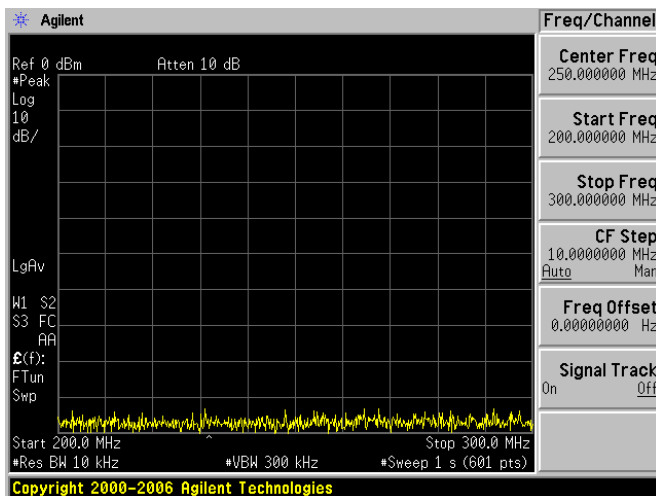
4.2.1.12 TEST RESULTS of 0.5usec/1200Hz pulse



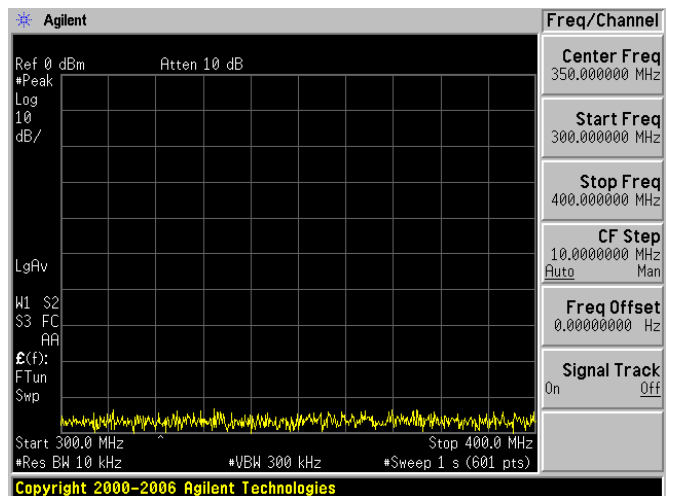
10kHz to 100MHz



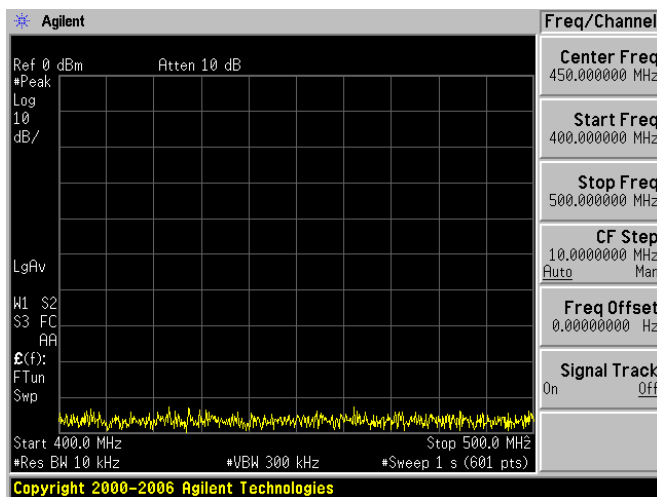
100MHz to 200MHz



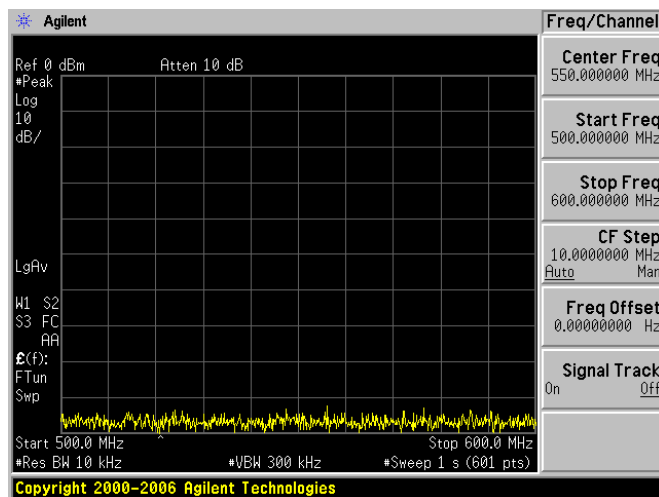
200MHz to 300MHz



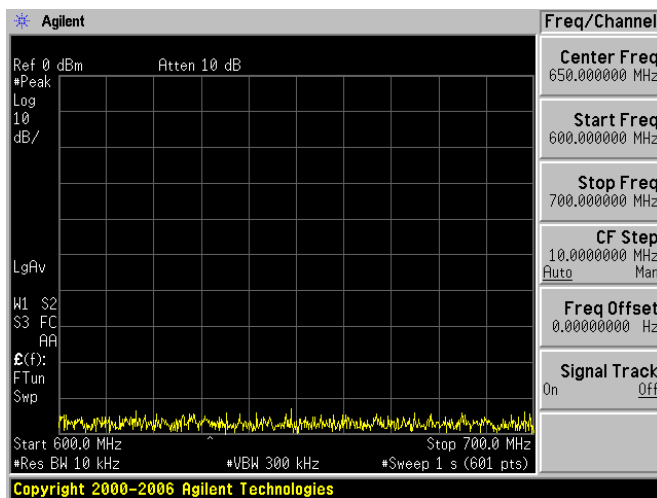
300MHz to 400MHz



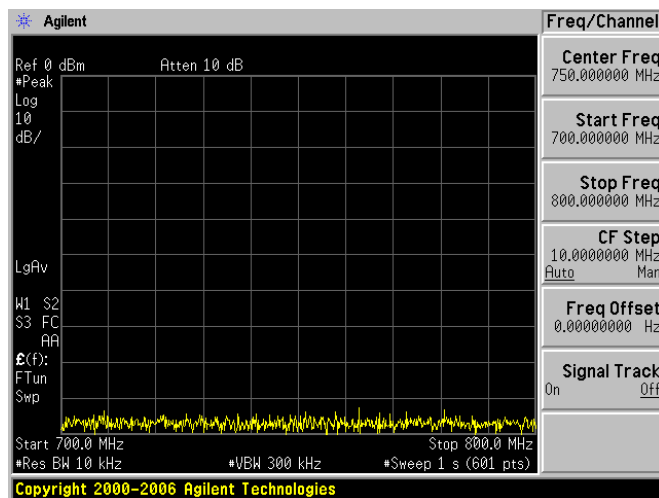
400MHz to 500MHz



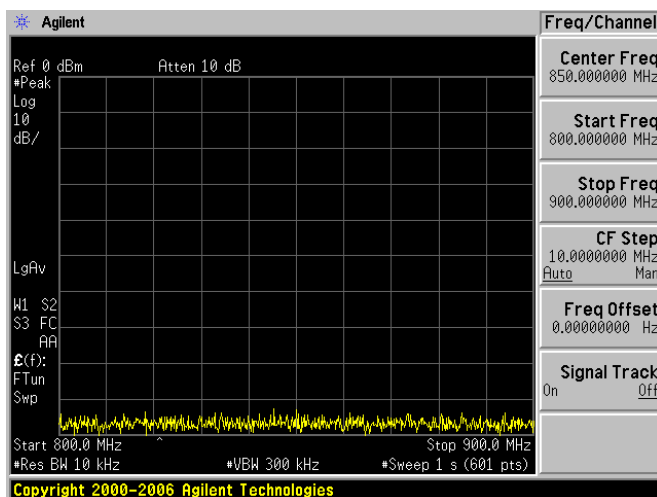
500MHz to 600MHz



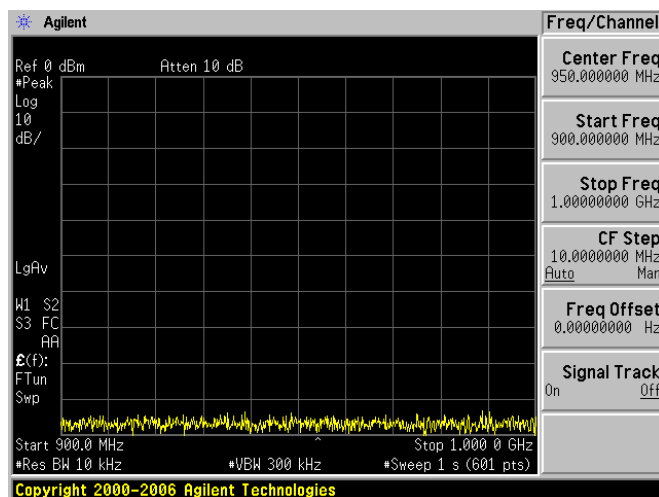
600MHz to 700MHz



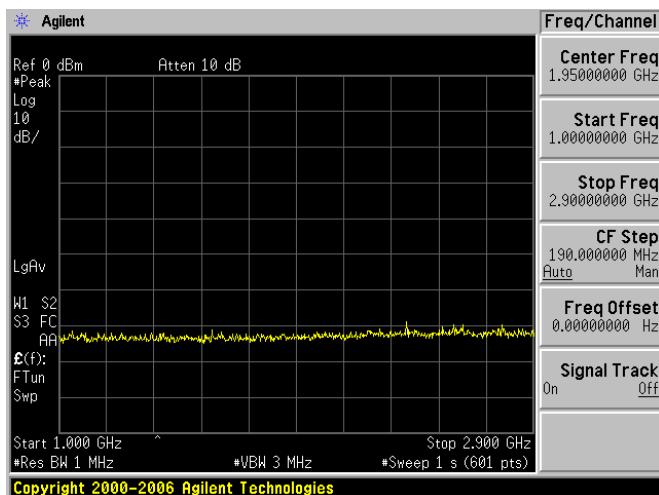
700MHz to 800MHz



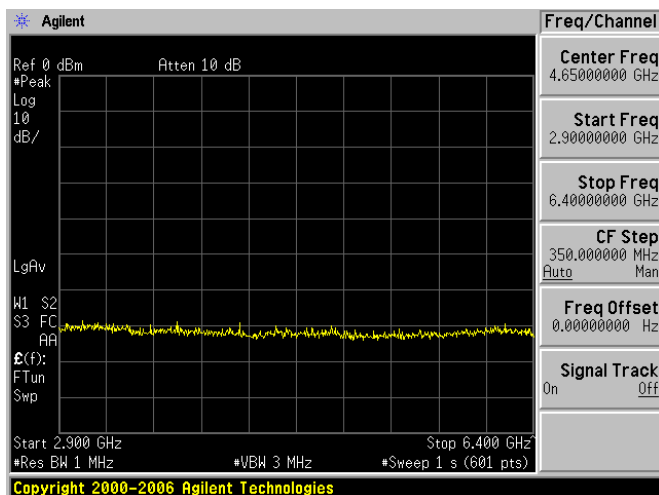
800MHz to 900MHz



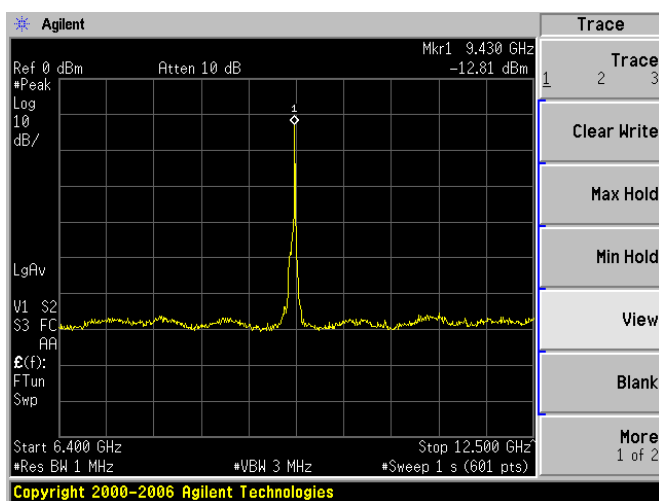
900MHz to 1GHz



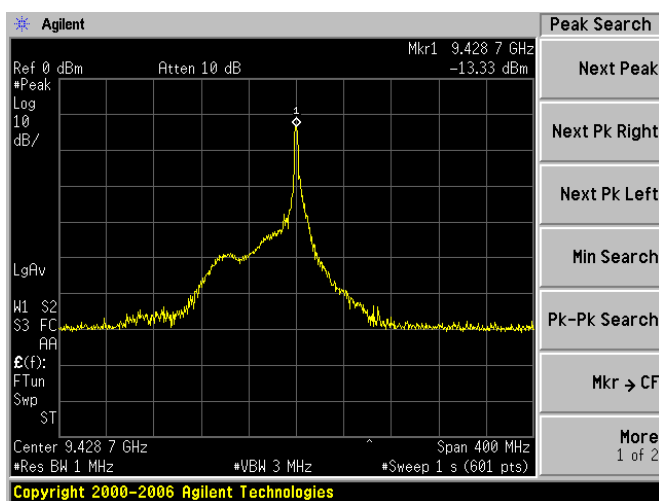
1.0GHz to 2.9GHz



2.9GHz to 6.4GHz



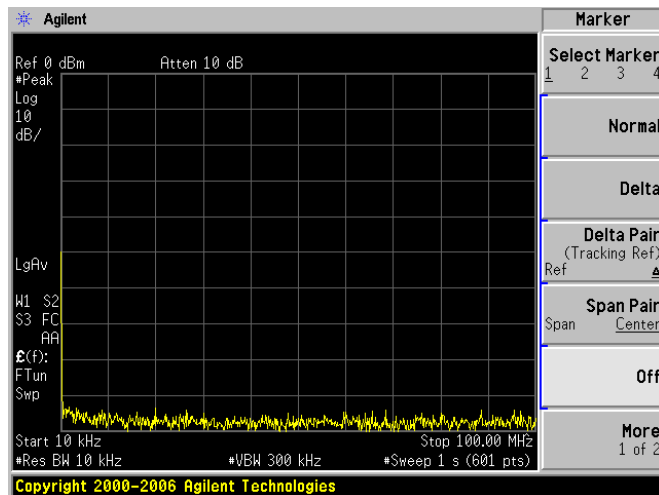
6.4GHz to 12.5GHz



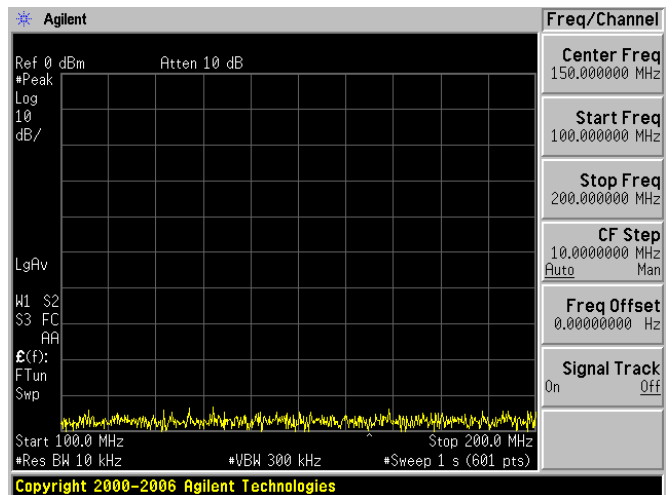
Center 9428.7MHz, Span 400MHz



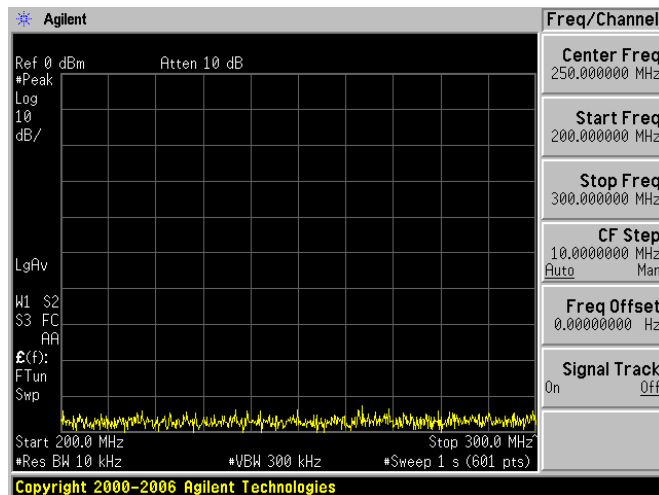
#### 4.2.1.13 TEST RESULTS of 1.0usec/650Hz pulse



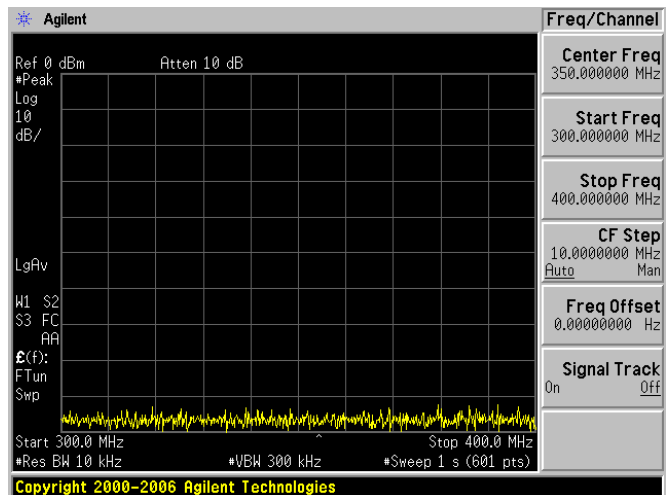
10kHz to 100MHz



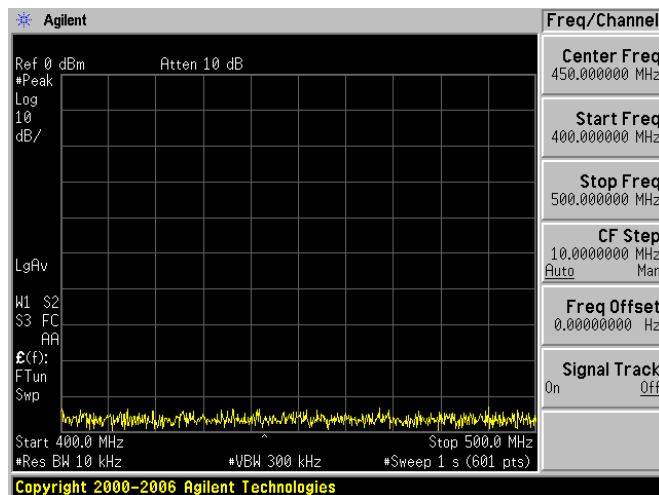
100MHz to 200MHz



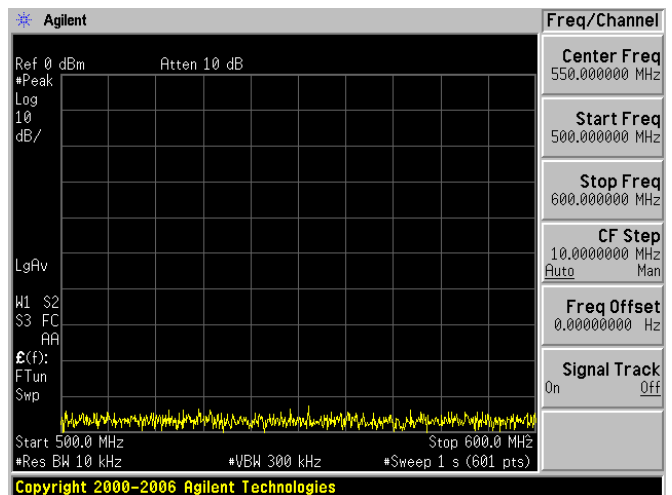
200MHz to 300MHz



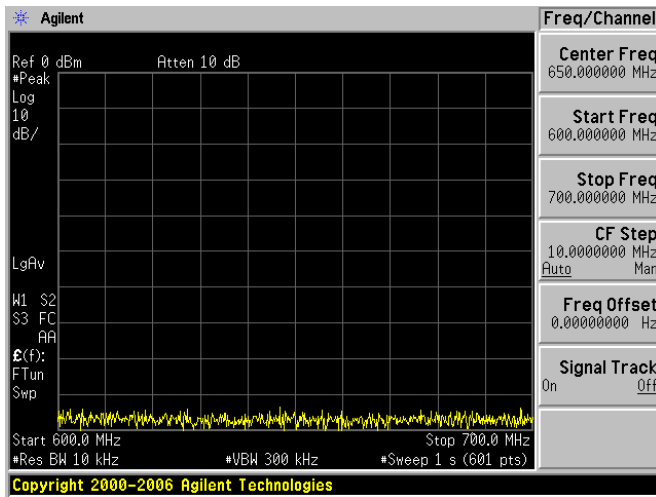
300MHz to 400MHz



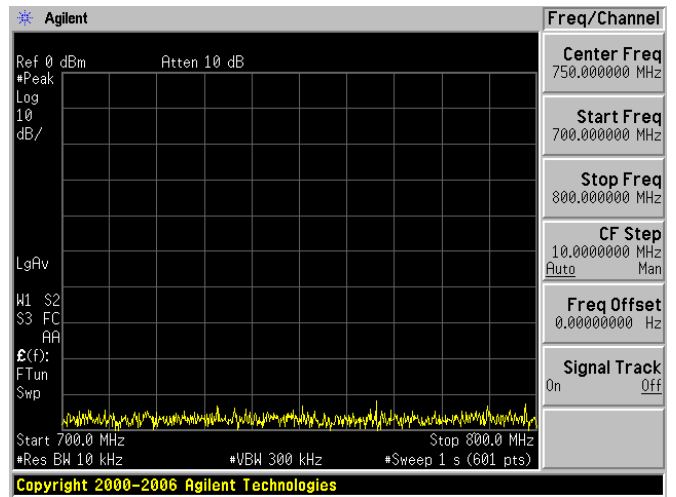
400MHz to 500MHz



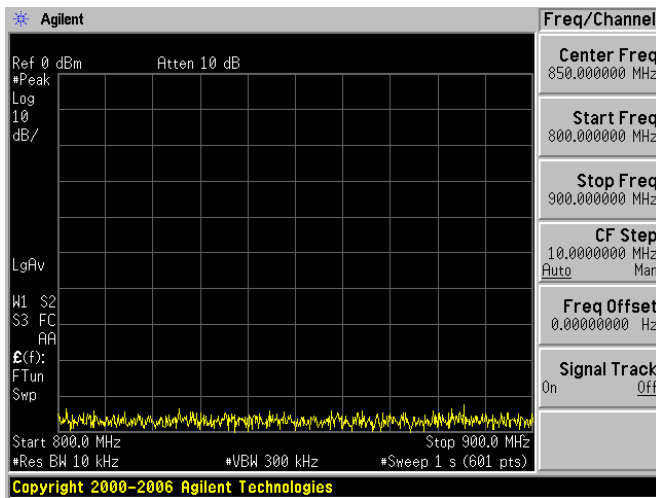
500MHz to 600MHz



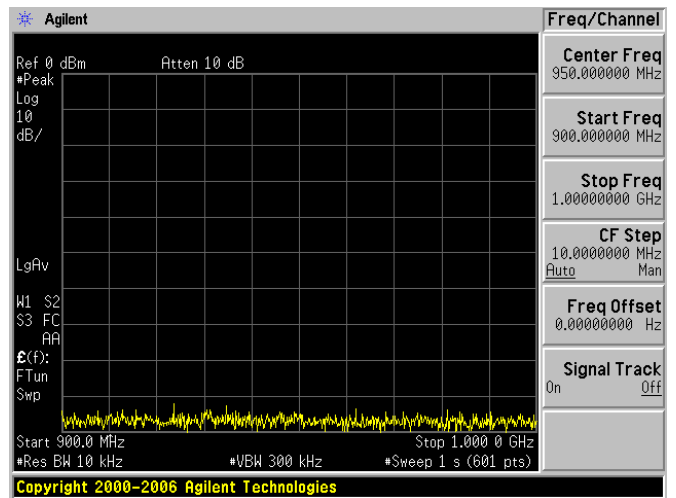
600MHz to 700MHz



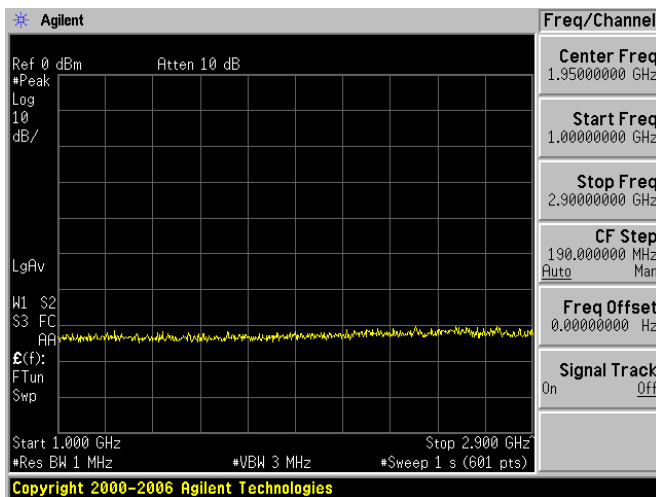
700MHz to 800MHz



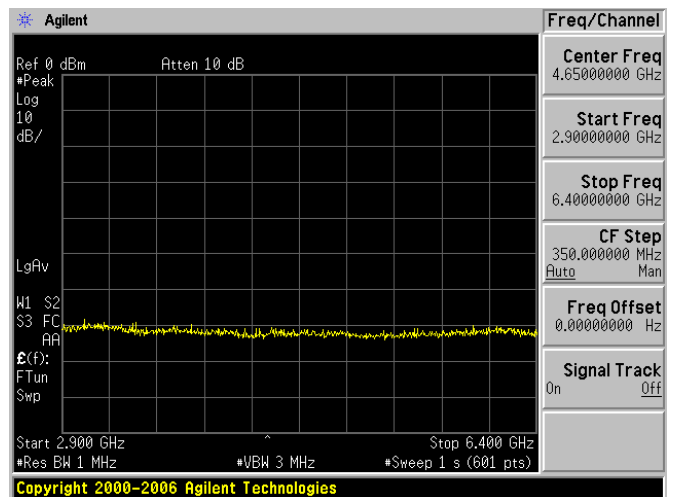
800MHz to 900MHz



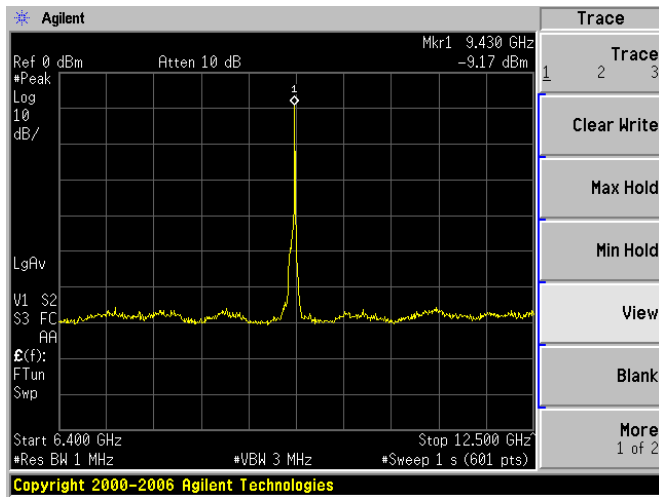
900MHz to 1GHz



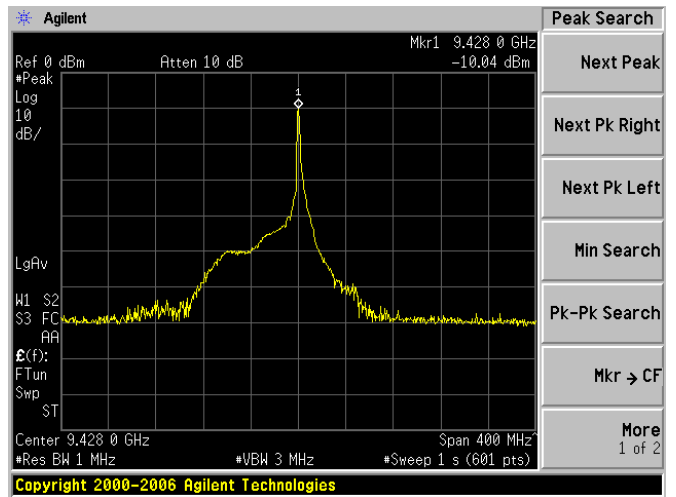
1.0GHz to 2.9GHz



2.9GHz to 6.4GHz

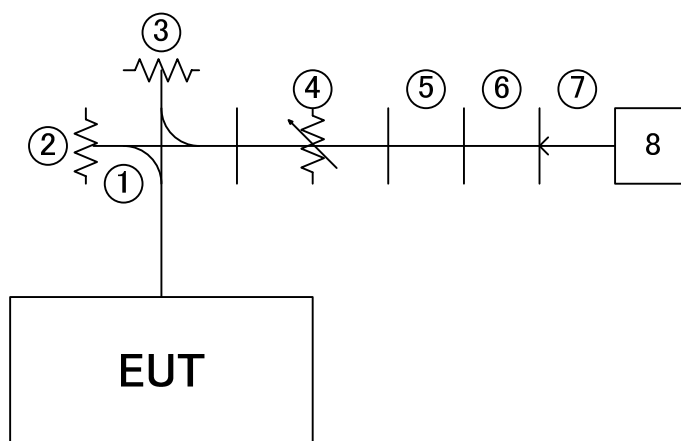


6.4GHz to 12.5GHz



Center 9428.0MHz, Span 400MHz

#### 4.2.2.1 TEST SETUP for range 12.5GHz to 18.0GHz



#### 4.2.2.2 TEST INSTRUMENT

|   | DESCRIPTION & MANUFACTURER              | MODEL NO.      | SERIAL NO. | CALIBRATION DATE | CALIBRATION DUE DATE |
|---|---|----------------|------------|------------------|----------------------|
| 1 | Direction Coupler (30dB)<br>SHIMADARIKA | 5D363          | R11421     | NA               | NA                   |
| 2 | Dummy Load<br>PASTERNAK                 | PE6815         | NA         | NA               | NA                   |
| 3 | High Power Dummy Load<br>PASTERNAK      | PE6824         | NA         | NA               | NA                   |
| 4 | Variable Attenuator<br>HP               | X382A          | 1005-00684 | May. 2010        | May. 2011            |
| 5 | Tapered Waveguide<br>ATM                | 62/90-6-6-6    | G239605-02 | NA               | NA                   |
| 6 | Adaptor<br>MDL                          | 62AC126        | 0622       | NA               | NA                   |
| 7 | Coaxial Cable<br>HUBER+SUHNER           | SUCOFLEX 104PA | 5784 /4PA  | NA               | NA                   |
| 8 | Spectrum Analyzer<br>Agilent            | E4448A         | MY46180420 | Sep. 24. 2010    | Sep. 2011            |

Measurement Point : Antenna terminal

Spectrum Analyzer setting: RBW = 1MHz

VBW = 3MHz

Detector Mode = Positive Peak

#### 4.2.2.3 TEST PROCEDURES

- a. Setup EUT as 4.2.2.1.
- b. Transmitted at most powerful pulse and adjusted attenuator for not exceeding the spectrum analyzer maximum rating.
- c. Transmitted at four pulses are 0.08usec/2250Hz, 0.25usec/1700Hz, 0.5usec/1200Hz and 1.0usec/650Hz, and capture the spectrum at 10kHz to 12.5GHz.

#### 4.2.2.4 EUT OPERATING CONDITIONS

- a. Placed the EUT on the testing table.
- b. Prepared other computer systems for controlling EUT and placed them outside of testing area.

#### 4.2.2.5 TEST RESULTS

No spurious emissions observed above minimum standard.

Test data is described at section 4.2.2.10

#### 4.2.2.6 TEST CONDITIONS

Tamb = 20°C to 25°C, RHamb = 40% ~ 60%

EUT input = 24 VDC

#### 4.2.2.7 STABILIZATION

EUT energized for 10 minutes minimum.

#### 4.2.2.8 TEST EQUIPMENT

JRC Original – Shielded Room

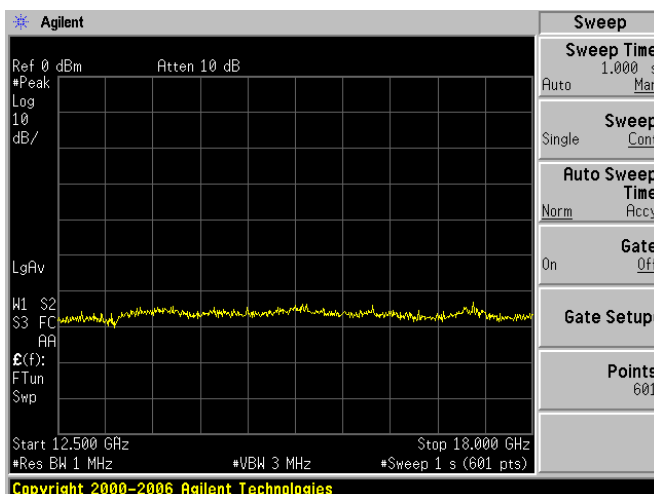
Other equipment – see test set-ups.

#### 4.2.2.9 DATE

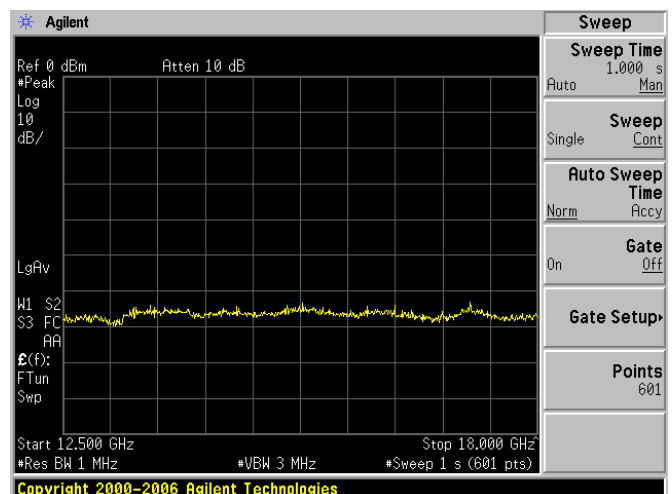
1<sup>st</sup> November, 2010

TESTED BY G.Higuchi

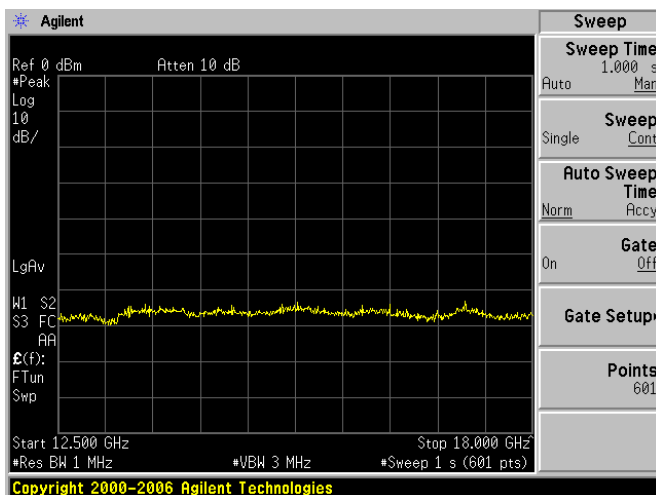
#### 4.2.2.10 TEST RESULTS of 12.5GHz to 18GHz



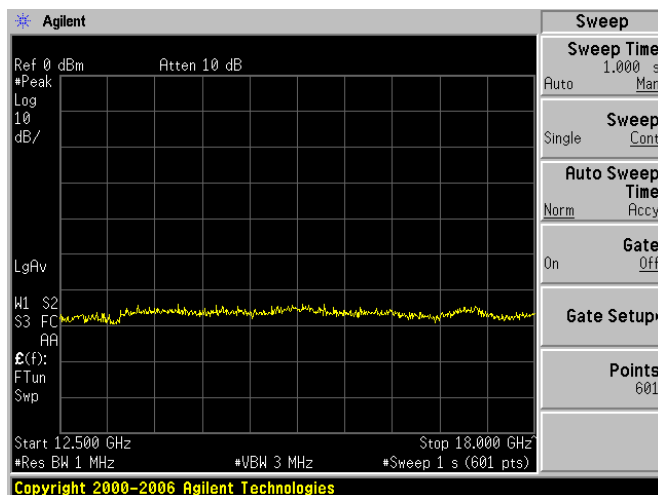
0.08usec/2250Hz



0.25usec/1700Hz

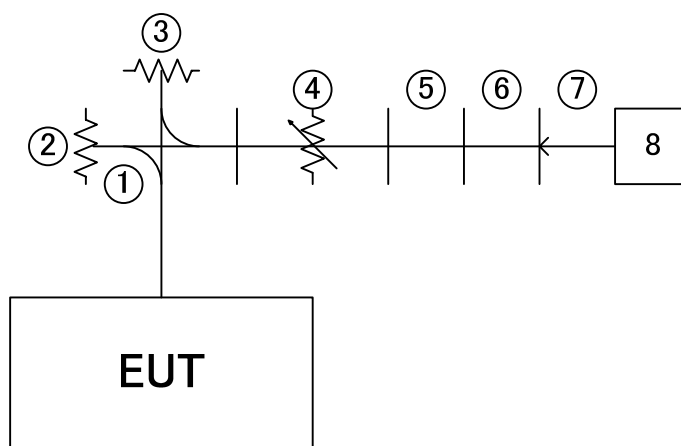


0.5usec/1200Hz



1.0usec/650Hz

#### 4.2.3.1 TEST SETUP for range 17.6GHz to 40.0GHz



#### 4.2.3.2 TEST INSTRUMENT

|   | DESCRIPTION & MANUFACTURER              | MODEL NO.      | SERIAL NO. | CALIBRATION DATE | CALIBRATION DUE DATE |
|---|---|----------------|------------|------------------|----------------------|
| 1 | Direction Coupler (30dB)<br>SHIMADARIKA | 5D363          | R11421     | NA               | NA                   |
| 2 | Dummy Load<br>PASTERNAK                 | PE6815         | NA         | NA               | NA                   |
| 3 | High Power Dummy Load<br>PASTERNAK      | PE6824         | NA         | NA               | NA                   |
| 4 | Variable Attenuator<br>HP               | X382A          | 1005-00684 | May. 2010        | May. 2011            |
| 5 | Tapered Waveguide<br>ATM                | 42/90-8-6-6    | G239705-02 | NA               | NA                   |
| 6 | Adaptor<br>MDL                          | 42AC206        | 0616       | NA               | NA                   |
| 7 | Coaxial Cable<br>HUBER+SUHNER           | SUCOFLEX 104PA | 5784 /4PA  | NA               | NA                   |

|   |                              |        |            |               |           |
|---|------------------------------|--------|------------|---------------|-----------|
| 8 | Spectrum Analyzer<br>Agilent | E4448A | MY46180420 | Sep. 24. 2010 | Sep. 2011 |
|---|------------------------------|--------|------------|---------------|-----------|

Measurement Point : Antenna terminal

Spectrum Analyzer setting: RBW = 1MHz

VBW = 3MHz

Detector Mode = Positive Peak

#### 4.2.3.3 TEST PROCEDURES

- a. Setup EUT as 4.2.2.1.
- b. Transmitted at most powerful pulse and adjusted attenuator for not exceeding the spectrum analyzer maximum rating.
- c. Transmitted at four pulses are 0.08usec/2250Hz, 0.25usec/1700Hz, 0.5usec/1200Hz and 1.0usec/650Hz, and capture the spectrum at 10kHz to 12.5GHz.

#### 4.2.3.4 EUT OPERATING CONDITIONS

- a. Placed the EUT on the testing table.
- b. Prepared other computer systems for controlling EUT and placed them outside of testing area.

#### 4.2.3.5 TEST RESULTS

No spurious emissions observed above minimum standard.

Test data is described at section 4.2.3.10 to 4.2.3.13

#### 4.2.3.6 TEST CONDITIONS

Tamb = 20°C to 25°C, RHamb = 40% ~ 60%

EUT input = 24 VDC

#### 4.2.3.7 STABILIZATION

EUT energized for 10 minutes minimum.

#### 4.2.3.8 TEST EQUIPMENT

JRC Original – Shielded Room

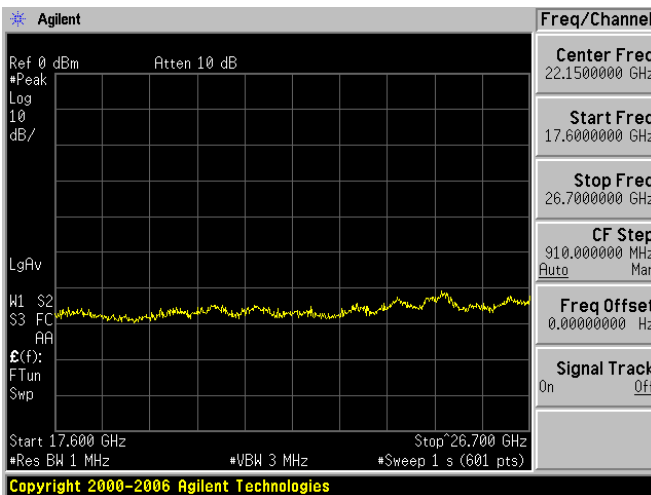
Other equipment – see test set-ups.

#### 4.2.3.9 DATE

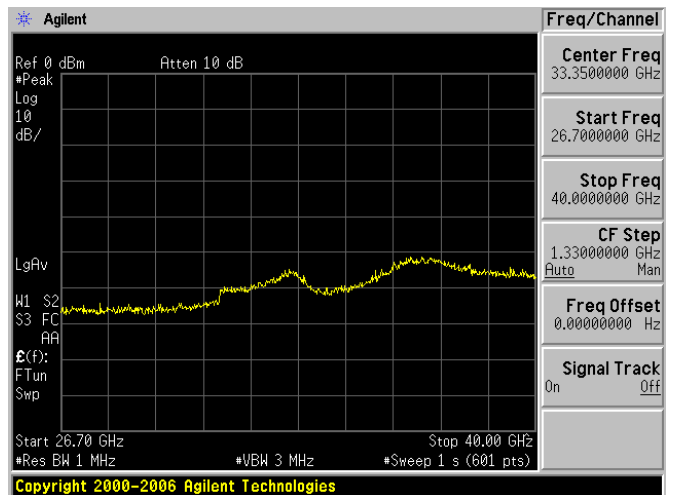
1<sup>st</sup> November, 2010

TESTED BY G.Higuchi

#### 4.2.3.10 TEST RESULTS of 0.08usec/2250Hz

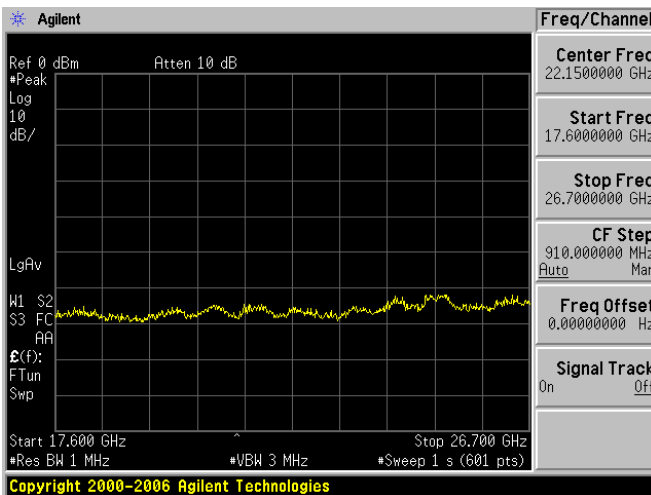


17.6GHz to 26.7GHz

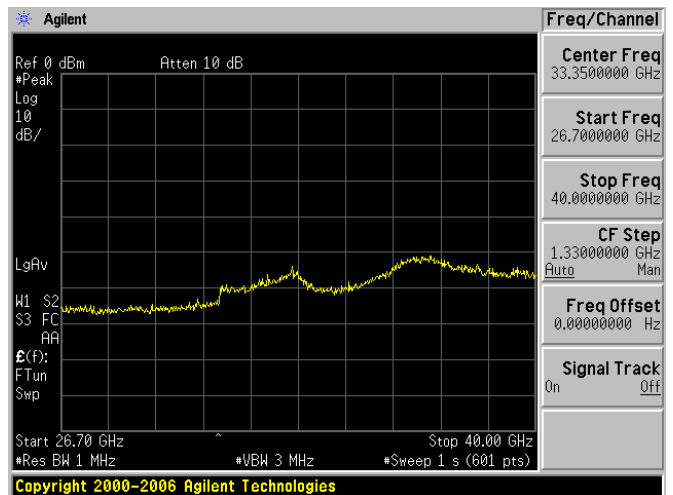


26.7GHz to 40.0GHz

#### 4.2.3.11 TEST RESULTS of 0.25usec/1700Hz

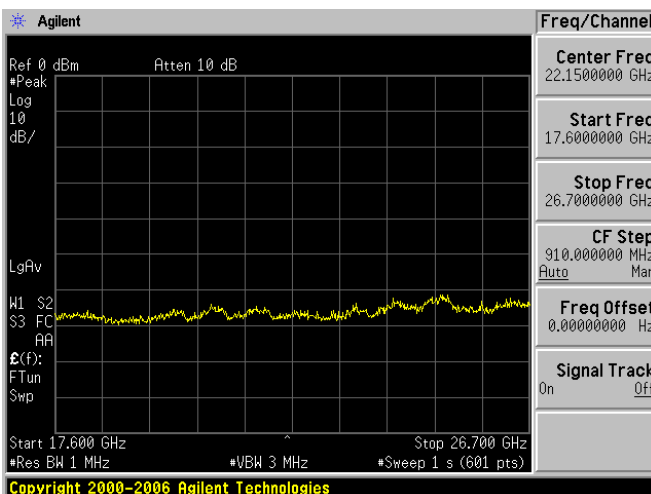


17.6GHz to 26.7GHz

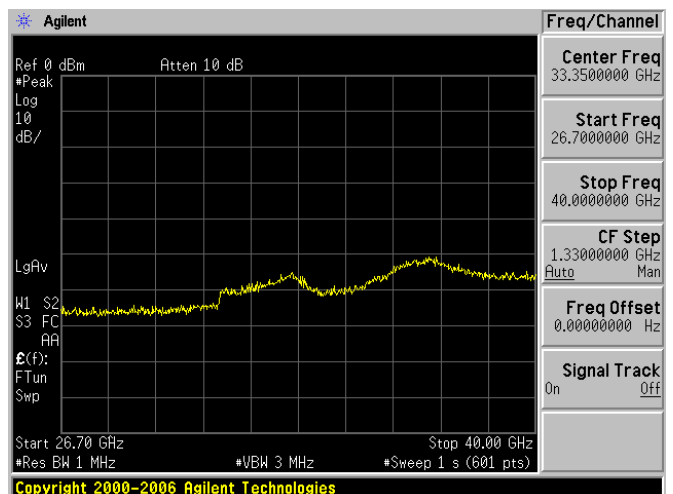


26.7GHz to 40.0GHz

#### 4.2.3.12 TEST RESULTS of 0.5usec/1200Hz



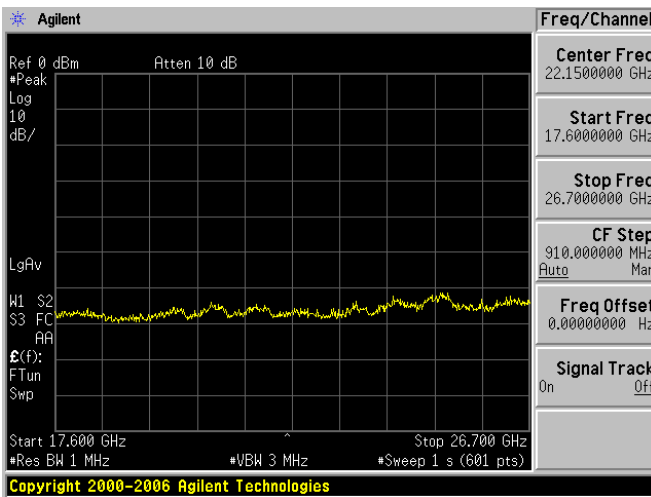
17.6GHz to 26.7GHz



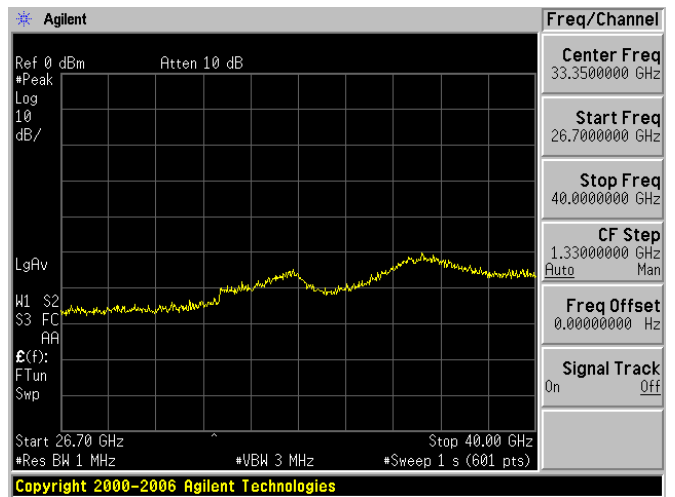
26.7GHz to 40.0GHz



### 4.2.3.13 TEST RESULTS of 1.0usec/650Hz



17.6GHz to 26.7GHz

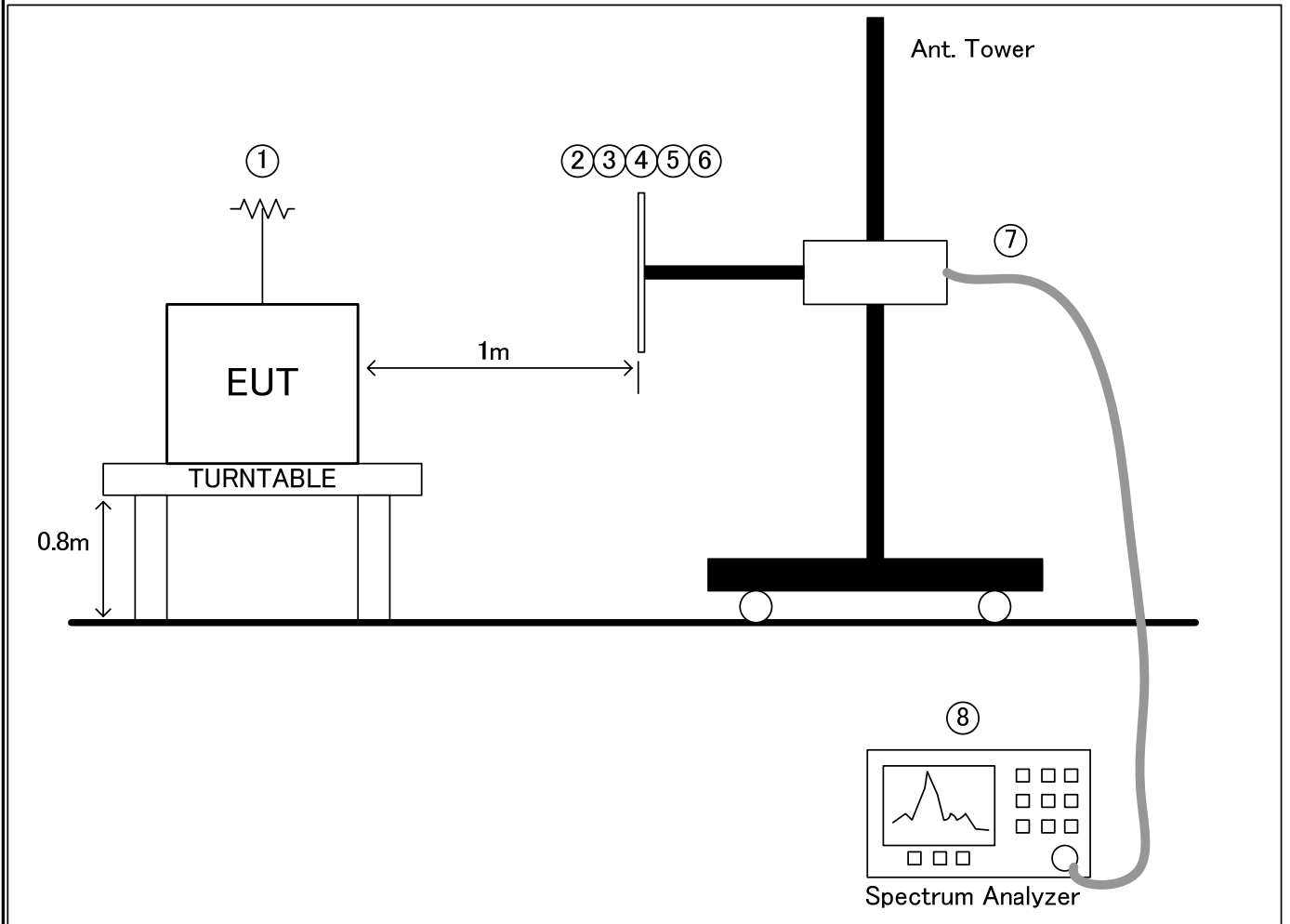


26.7GHz to 40.0GHz

### 4.3 Field strength of spurious radiation

47 CFR sec. 2.1053

4.3.1.1 TEST SETUP for measuring the radiated spurious emissions are from the EUT.

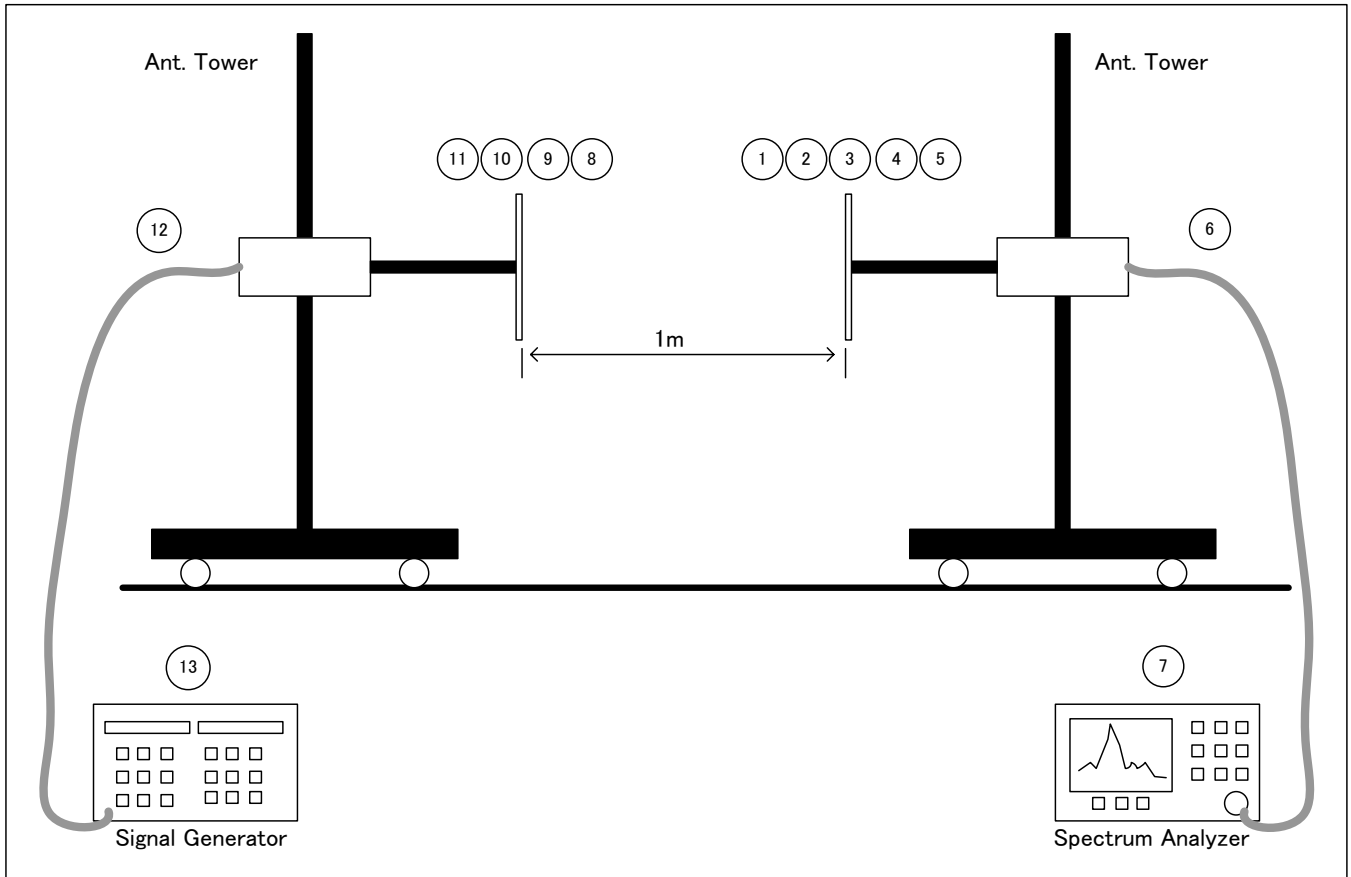


#### 4.3.1.2 TEST INSTRUMENT

|   | DESCRIPTION & MANUFACTURER          | MODEL NO.      | SERIAL NO. | CALIBRATION DATE | CALIBRATION DUE DATE |
|---|-------------------------------------|----------------|------------|------------------|----------------------|
| 1 | High Power Dummy Load<br>PASTERNAK  | PE6824         | 1005-00684 | NA               | NA                   |
| 2 | Biconical<br>Schwarzbeck            | BBA9106        | NA         | NA               | NA                   |
| 3 | Logarithmic Periodic<br>Schwarzbeck | UHALP9107      | 91071314   | NA               | NA                   |
| 4 | Double Ridge Horn<br>ETS LINDGREN   | 3117           | 00091928   | NA               | NA                   |
| 5 | Standard Gain Horn<br>Flann         | 20240          | NA         | NA               | NA                   |
| 6 | Standard Gain Horn<br>Flann         | 22240          | NA         | NA               | NA                   |
| 7 | Coaxial Cable<br>HUBER+SUHNER       | SUCOFLEX 104PA | 5784 /4PA  | NA               | NA                   |

|   |                              |        |            |               |           |
|---|------------------------------|--------|------------|---------------|-----------|
| 8 | Spectrum Analyzer<br>Agilent | E4448A | MY46180420 | Sep. 24. 2010 | Sep. 2011 |
|---|------------------------------|--------|------------|---------------|-----------|

4.3.2.1 TEST SETUP for measuring the level of particular spurious frequency from Signal Generator.



4.3.2.2 TEST INSTRUMENT

|   | DESCRIPTION & MANUFACTURER          | MODEL NO.         | SERIAL NO. | CALIBRATION DATE | CALIBRATION DUE DATE |
|---|-------------------------------------|-------------------|------------|------------------|----------------------|
| 1 | Biconical<br>Schwarzbeck            | BBA9106           | NA         | NA               | NA                   |
| 2 | Logarithmic Periodic<br>Schwarzbeck | UHALP9107         | 91071314   | NA               | NA                   |
| 3 | Double Ridge Horn<br>ETS LINDGREN   | 3117              | 91928      | NA               | NA                   |
| 4 | Standard Gain Horn<br>Flann         | 20240             | NA         | NA               | NA                   |
| 5 | Standard Gain Horn<br>Flann         | 22240             | NA         | NA               | NA                   |
| 6 | Coaxial Cable<br>HUBER+SUHNER       | SUCOFLEX<br>104PA | 5784 /4PA  | NA               | NA                   |
| 7 | Spectrum Analyzer<br>Agilent        | E4448A            | MY46180420 | Sep. 24. 2010    | Sep. 2011            |

|    |                               |                        |            |               |           |
|----|-------------------------------|------------------------|------------|---------------|-----------|
| 8  | Dipole<br>Schwazbeck          | UHA9105                |            | NA            | NA        |
| 9  | Logarithmic Periodic<br>EATON | 94612-1                | 0203       | NA            | NA        |
| 10 | Standard Gain Horn<br>Flann   | 20240                  | NA         | NA            | NA        |
| 11 | Standard Gain Horn<br>Flann   | 22240                  | NA         | NA            | NA        |
| 12 | Coaxial Cable<br>JUNKOSHA     | WMX313-02000<br>NMSNMS | J04137     | NA            | NA        |
| 13 | Signal Generator<br>Agilent   | EE8274C                | MY43321154 | Sep. 22. 2010 | Sep. 2011 |

Measurement Point : Antenna terminal

Spectrum Analyzer setting: RBW = 10kHz less than 1GHz, 1MHz above 1GHz

VBW = 300kHz less than 1GHz, 3MHz above 1GHz

Detector Mode = Positive Peak

#### 4.3.3 TEST PROCEDURES

Reference to Section 2.2.12 Unwanted Emission: Radiated Spurious on TIA-603-C.

#### 4.3.4 MINIMUM STANDARD

Emissions  $\leq$  -13.0 dBm

#### 4.3.5 TEST RESULTS

No spurious emissions observed above minimum standard.

Test data is described at section 4.3.10.

#### 4.3.6 TEST CONDITIONS

Tamb = 20°C to 25°C, RHamb = 40% ~ 60%

EUT input = 24 VDC

#### 4.3.7 STABILIZATION

EUT energized for 10 minutes minimum.

#### 4.3.8 TEST EQUIPMENT

JRC Original – Shielded Room

Other equipment – see test set-ups.

#### 4.3.9 DATE

5<sup>th</sup> October, 2010

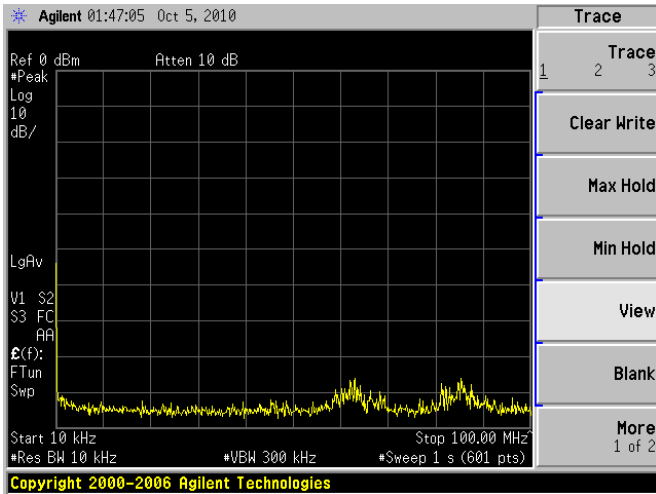
TEST ENGINEER: G. Higuchi

#### 4.4.10.1 TEST RESULTS of Ambient Noise

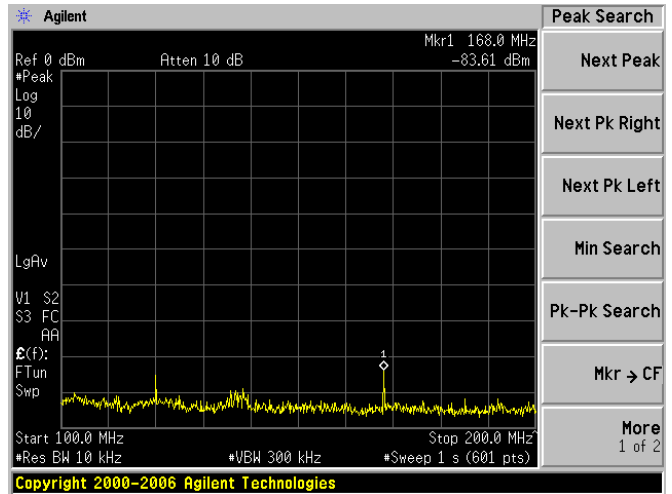
| Horizontally Polarized: Ambient |                 |             |          |                 |                   |           |                                  |
|---------------------------------|-----------------|-------------|----------|-----------------|-------------------|-----------|----------------------------------|
| Range                           | Frequency [MHz] | level [dBm] | Pg [dBm] | Cable Loss [dB] | Antenna Gain [dB] | Pd  [dBm] | Radiated spurious emission [dBm] |
| 10kHz – 100MHz                  | 84.5            | -86.5       | -75.23   | 0.5             | -0.35             | 76.08     | -132.58                          |
| 100MHz – 200MHz                 | 168             | -83.61      | -67.42   | 0.5             | 1.68              | 66.24     | -119.85                          |
| 200MHz – 300MHz                 | 240             | -90.68      | -60.87   | 0.5             | 1.38              | 59.99     | -120.67                          |
| 300MHz – 400MHz                 | 375             | -87.28      | -65.97   | 0.5             | 3.16              | 63.31     | -120.59                          |
| 400MHz – 500MHz                 | 433.2           | -91.69      | -72.47   | 0.5             | 3.16              | 69.81     | -131.50                          |
| 500MHz – 600MHz                 | 572.5           | -92.73      | -67.41   | 0.5             | 2.76              | 65.15     | -127.88                          |
| 600MHz – 700MHz                 | 625             | -89.93      | -67.18   | 0.5             | 2.46              | 65.22     | -125.15                          |
| 700MHz – 800MHz                 | 744.5           | -92.03      | -67.72   | 0.5             | 2.66              | 65.56     | -127.59                          |
| 800MHz – 900MHz                 | 886.3           | -92.78      | -64.4    | 0.5             | 3.06              | 61.84     | -124.62                          |
| 900MHz – 1.0GHz                 | 921.3           | -91.76      | -63.22   | 0.5             | 2.76              | 60.96     | -122.72                          |
| 1.0GHz – 2.9GHz                 | 2618            | -69.3       | -36.8    | 1               | 6.2               | 31.60     | -70.90                           |
| 2.9GHz – 6.4GHz                 | 6149            | -71.2       | -32.26   | 1.7             | 10                | 23.96     | -65.16                           |
| 6.4GHz – 12.5GHz                | 11117           | -65.23      | -21.51   | 2.5             | 12.2              | 11.81     | -47.04                           |
| 12.5G – 28GHz                   | 24870           | -61.96      | -37.38   | 3               | 20                | 20.38     | -52.34                           |
| 17.6G – 26.7GHz                 | 24986           | -59.99      | -28.11   | 3               | 20                | 11.11     | -41.10                           |
| 26.7G – 40.0GHz                 | 37010           | -50.29      | -19.09   | 3               | 20                | 2.09      | -22.38                           |

| Vertically Polarized: Ambient |                 |             |          |                 |                   |           |                                  |
|-------------------------------|-----------------|-------------|----------|-----------------|-------------------|-----------|----------------------------------|
| Range                         | Frequency [MHz] | level [dBm] | Pg [dBm] | Cable Loss [dB] | Antenna Gain [dB] | Pd  [dBm] | Radiated spurious emission [dBm] |
| 10kHz – 100MHz                | 23.34           | -84.25      | -25.65   | 0.5             | -0.35             | 26.50     | -80.75                           |
| 100MHz – 200MHz               | 168             | -88.46      | -69.93   | 0.5             | 1.68              | 68.75     | -127.21                          |
| 200MHz – 300MHz               | 278.7           | -91.71      | -65.89   | 0.5             | 1.38              | 65.01     | -126.72                          |
| 300MHz – 400MHz               | 375             | -86.2       | -65.58   | 0.5             | 3.16              | 62.92     | -119.12                          |
| 400MHz – 500MHz               | 462.5           | -91.39      | -69.94   | 0.5             | 3.16              | 67.28     | -128.67                          |
| 500MHz – 600MHz               | 550.8           | -92.3       | -68.72   | 0.5             | 2.76              | 66.46     | -128.76                          |
| 600MHz – 700MHz               | 673.8           | -91.94      | -67.75   | 0.5             | 2.46              | 65.79     | -127.73                          |
| 700MHz – 800MHz               | 779             | -92.12      | -64.47   | 0.5             | 2.66              | 62.31     | -124.43                          |
| 800MHz – 900MHz               | 888             | -95.79      | -68.87   | 0.5             | 3.06              | 66.31     | -132.10                          |
| 900MHz – 1.0GHz               | 943.5           | -91.54      | -64.45   | 0.5             | 2.76              | 62.19     | -123.73                          |
| 1.0GHz – 2.9GHz               | 2574            | -69.33      | -34.74   | 1               | 6.2               | 29.54     | -68.87                           |
| 2.9GHz – 6.4GHz               | 3198            | -68.43      | -33.72   | 1.7             | 10                | 25.42     | -63.85                           |
| 6.4GHz – 12.5GHz              | 7112            | -65.17      | -24.42   | 2.5             | 12.2              | 14.72     | -49.89                           |
| 12.5G – 18GHz                 | 16213           | -63.22      | -11.81   | 3               | 20                | 5.19      | -38.41                           |
| 17.6G – 26.7GHz               | 25016           | -60.35      | -29.09   | 3               | 20                | 12.09     | -42.44                           |
| 26.7G – 40.0GHz               | 36450           | -49.51      | -16.76   | 3               | 20                | 0.24      | -19.75                           |

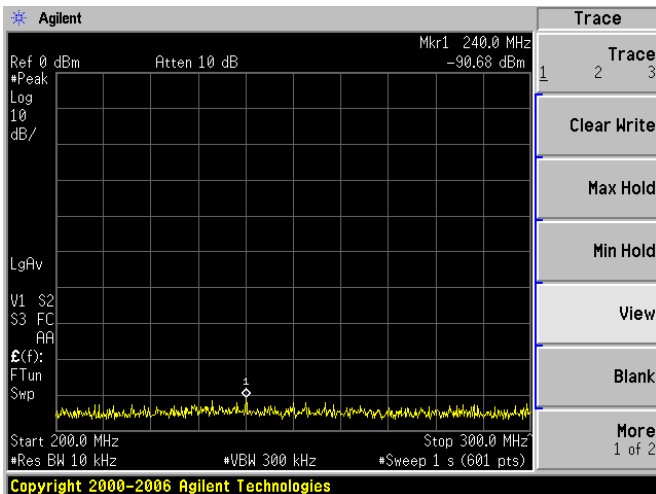
•Horizontally Polarized



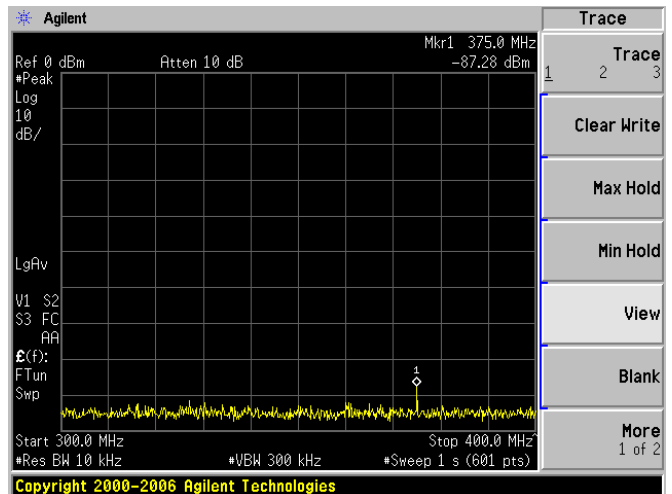
10kHz to 100MHz



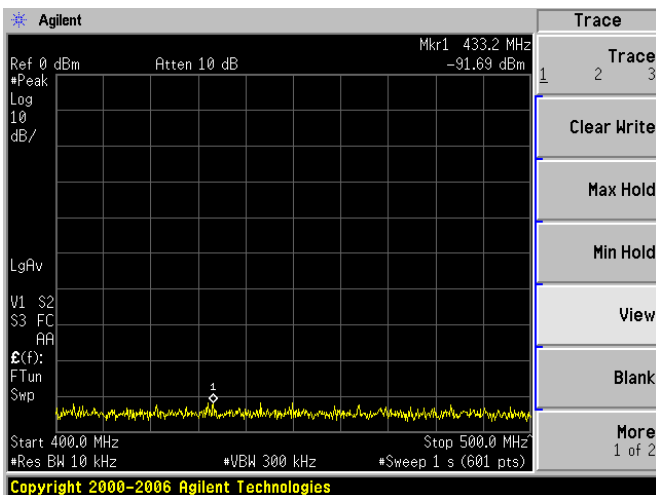
100MHz to 200MHz



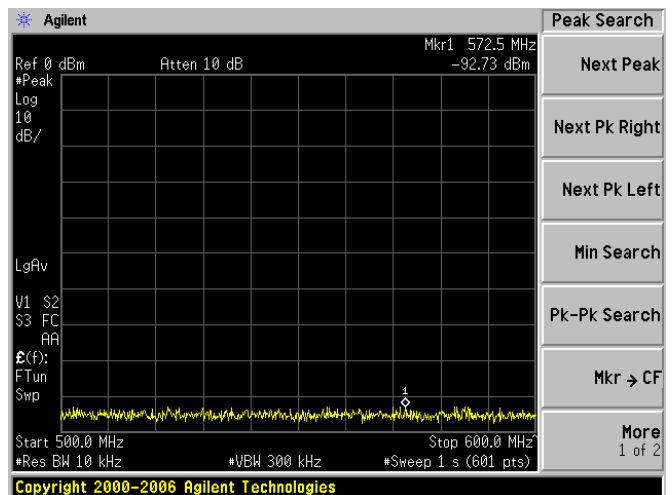
200MHz to 300MHz



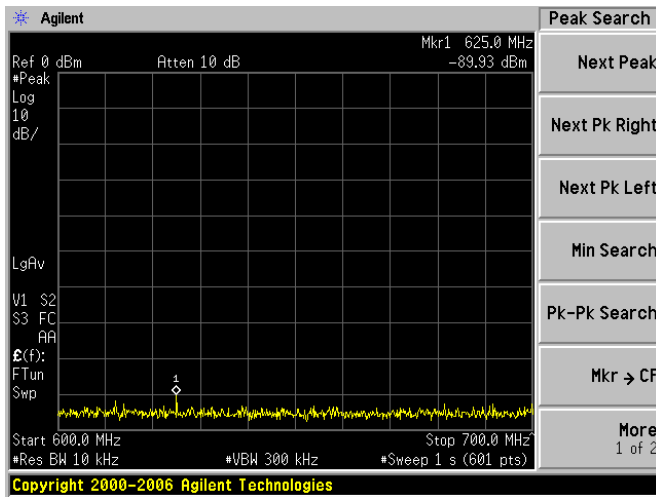
300MHz to 400MHz



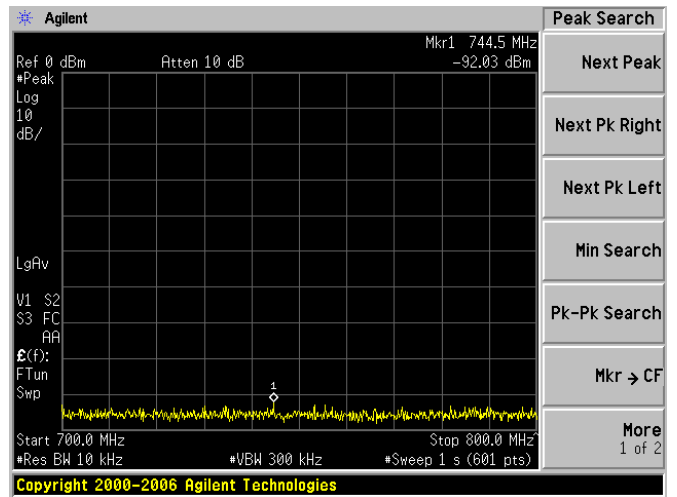
400MHz to 500MHz



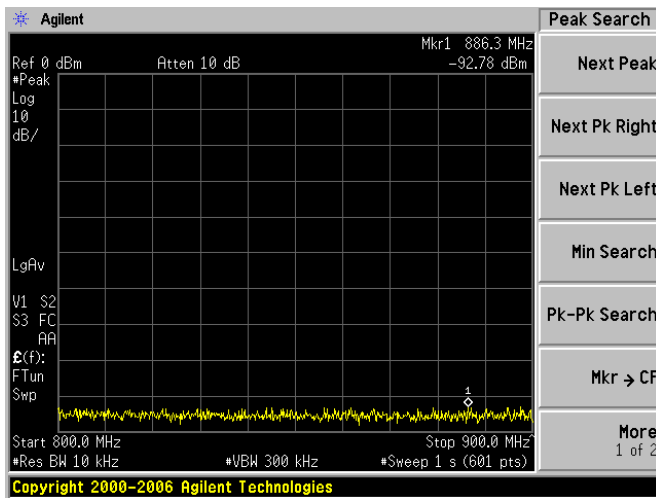
500MHz to 600MHz



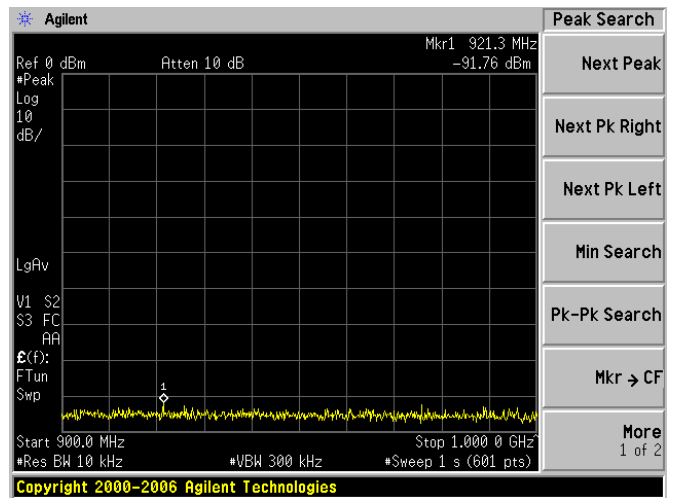
600MHz to 700MHz



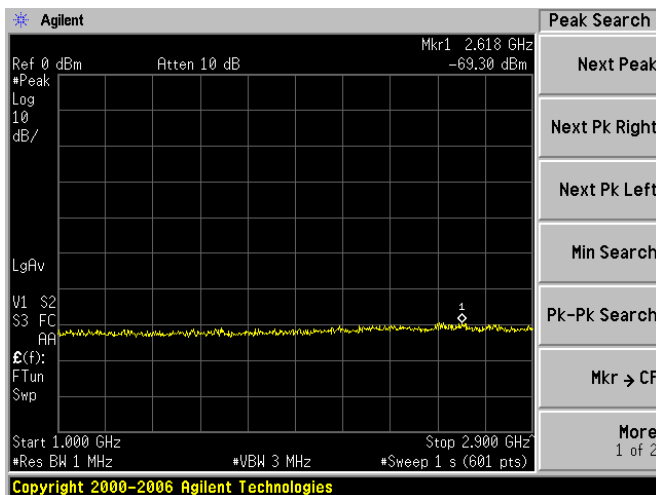
700MHz to 800MHz



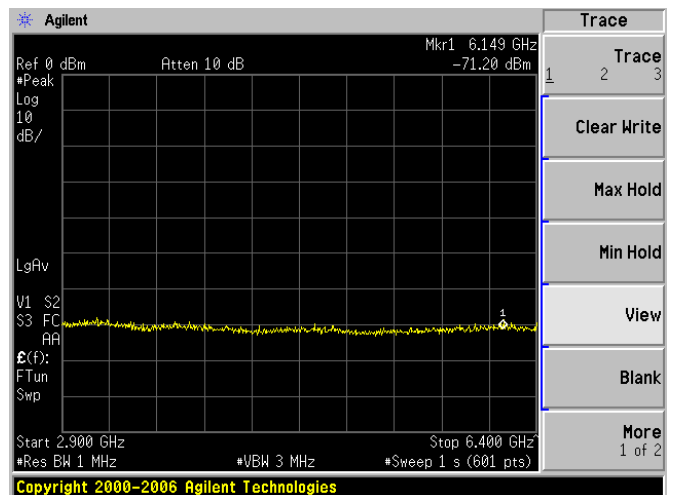
800MHz to 900MHz



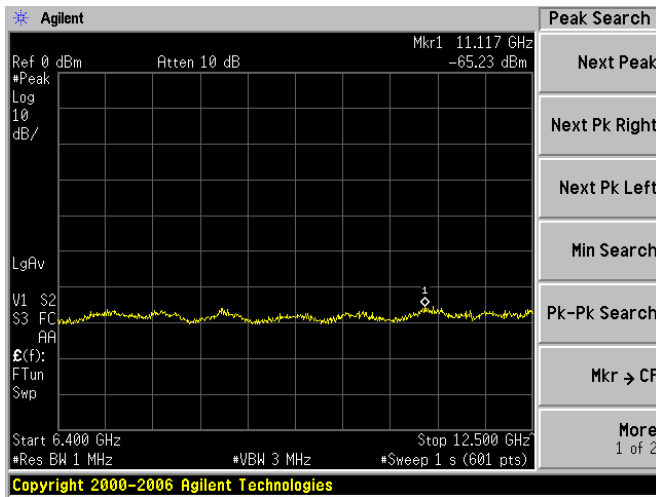
900MHz to 1GHz



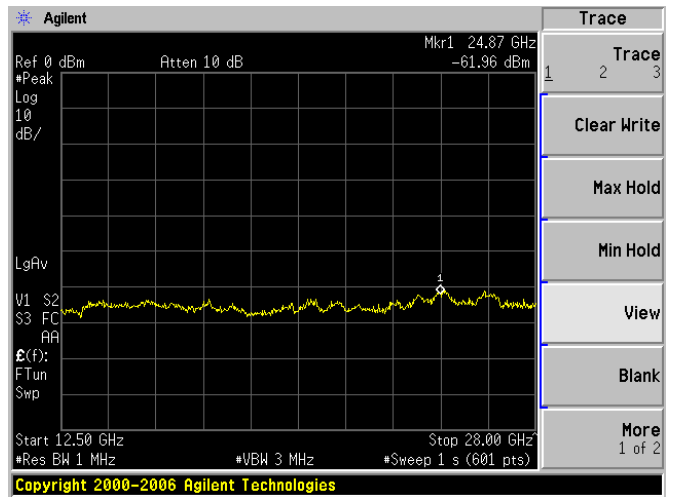
1GHz to 2.9GHz



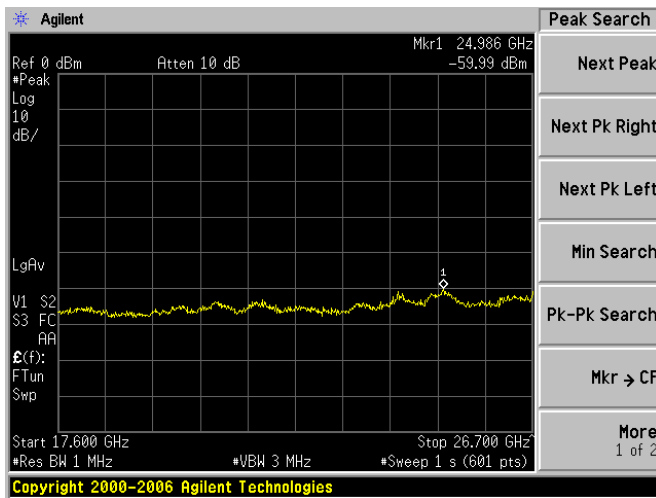
2.9GHz to 6.4GHz



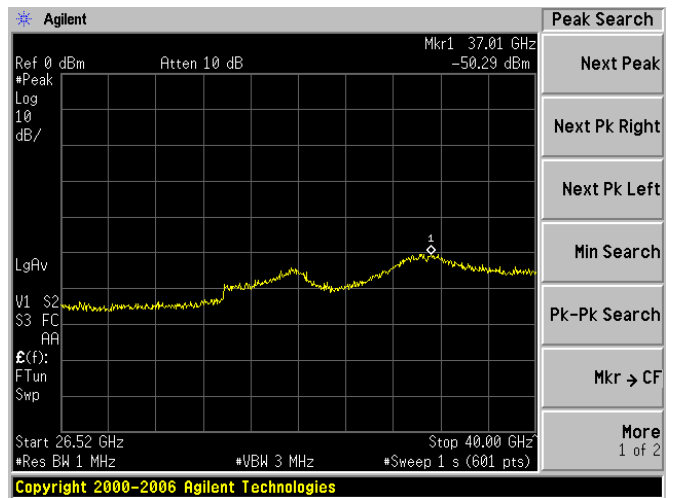
6.4GHz to 12.5GHz



12.5GHz to 28GHz

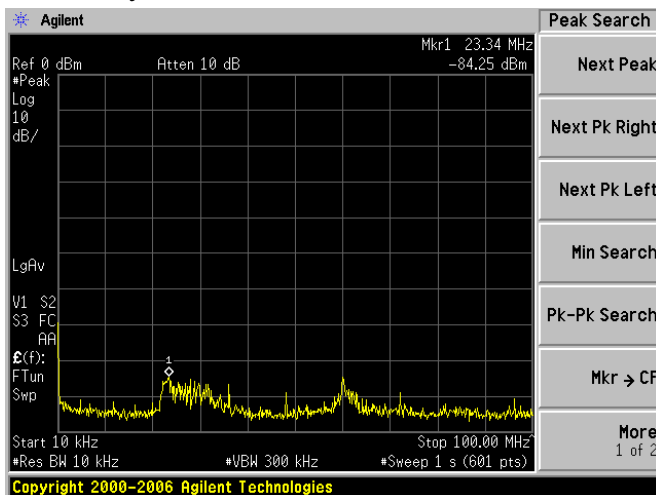


17.6GHz to 26.7GHz

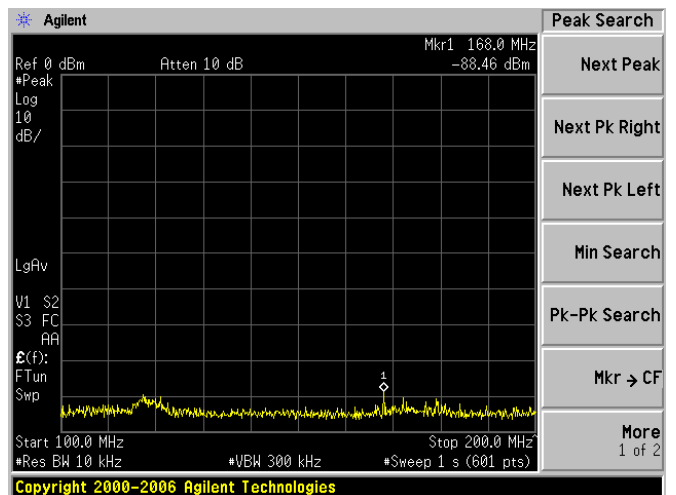


26.5GHz to 40.0GHz

•Vertically Polarized

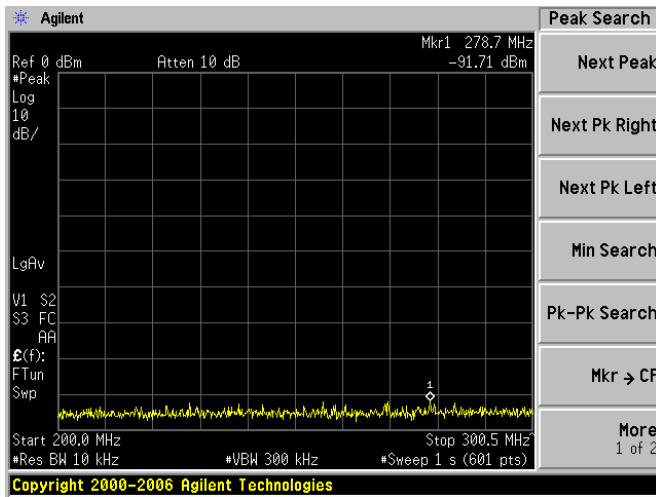


10kHz to 100MHz

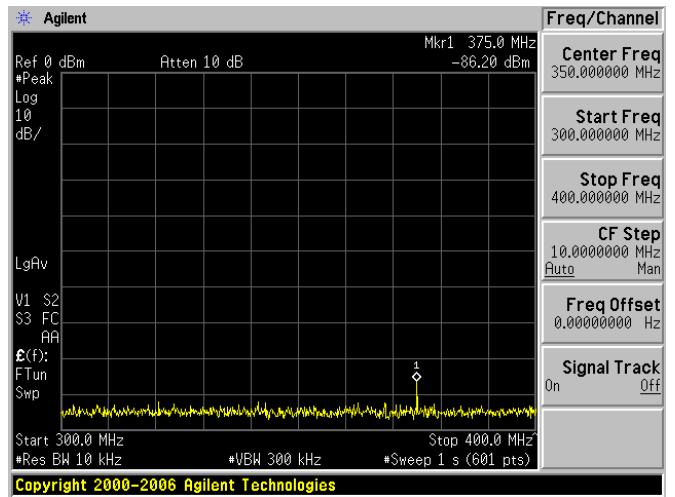


100MHz to 200MHz

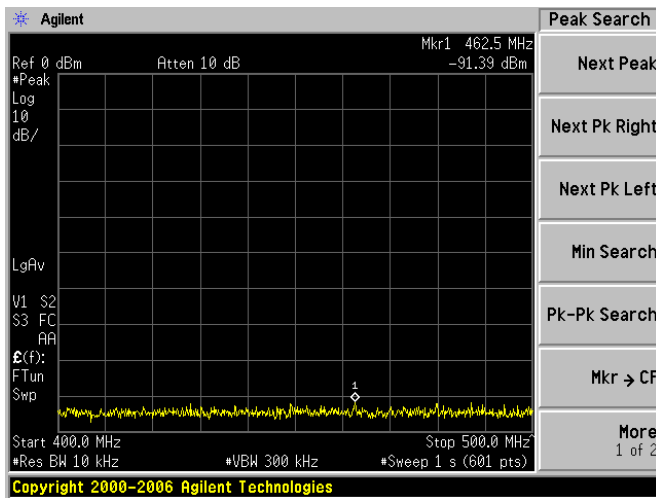




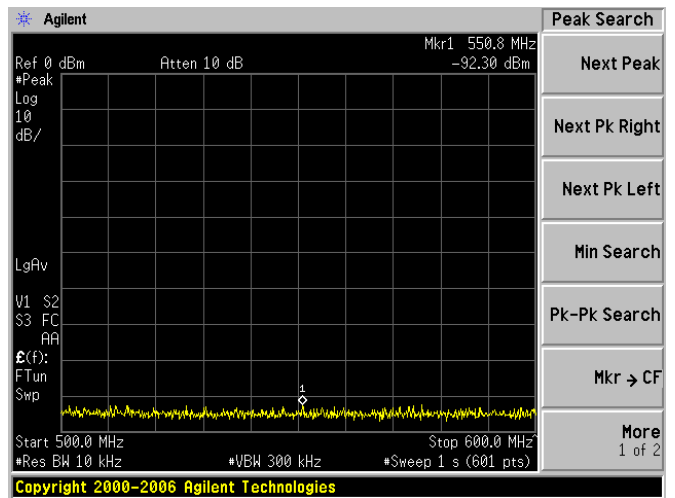
200MHz to 300MHz



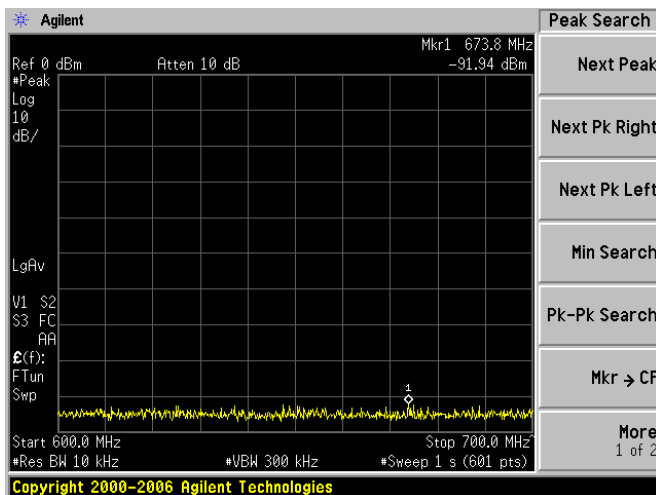
300MHz to 400MHz



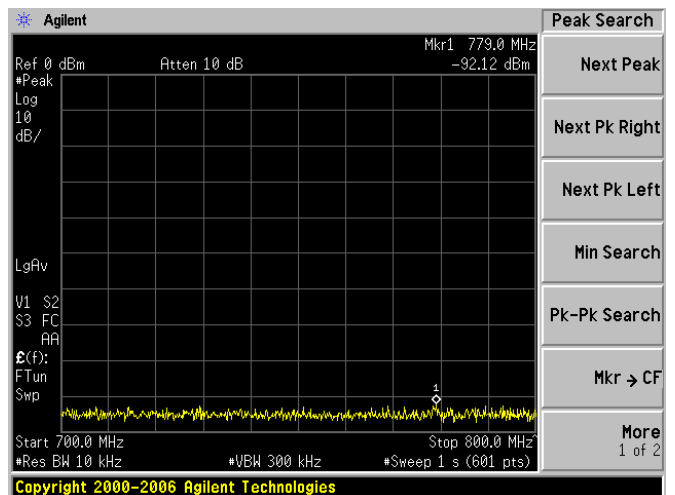
400MHz to 500MHz



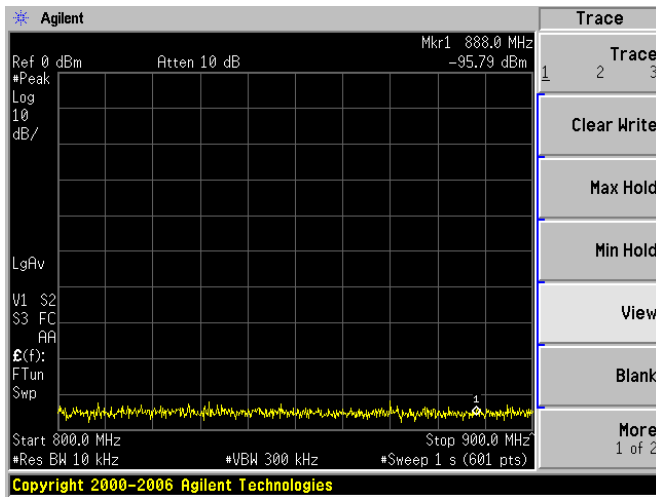
500MHz to 600MHz



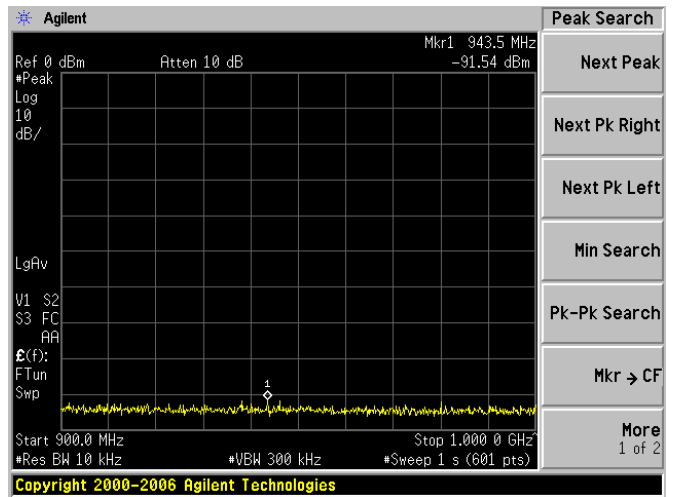
600MHz to 700MHz



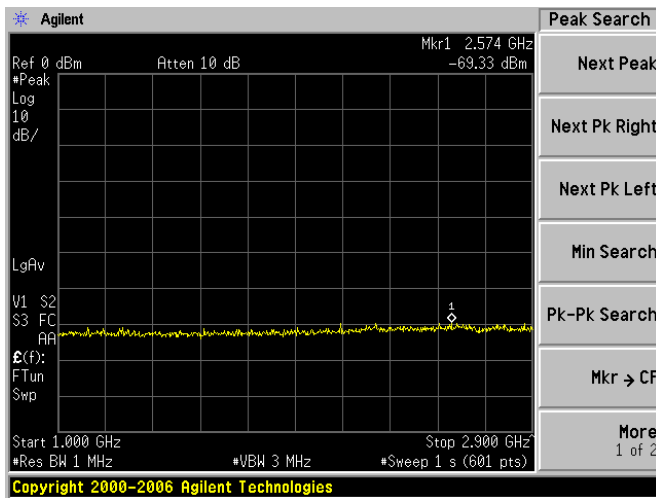
700MHz to 800MHz



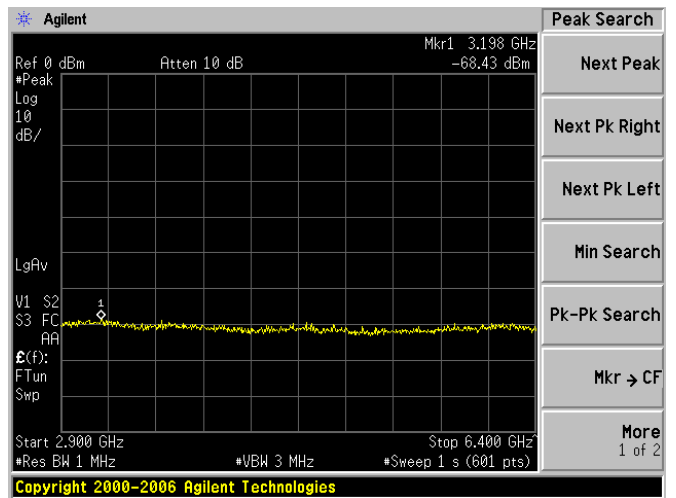
800MHz to 900MHz



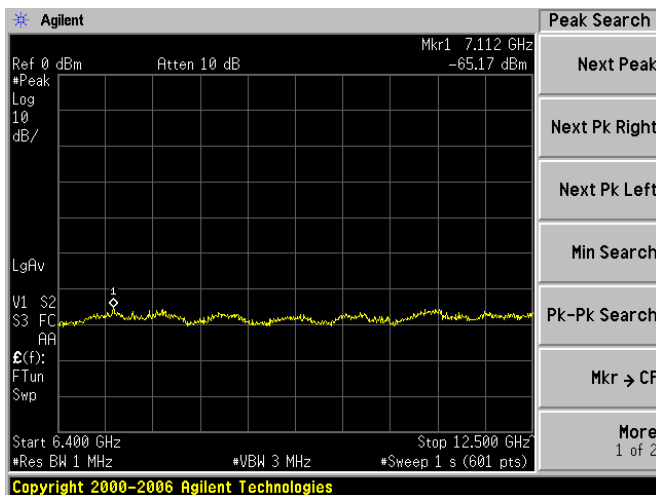
900MHz to 1GHz



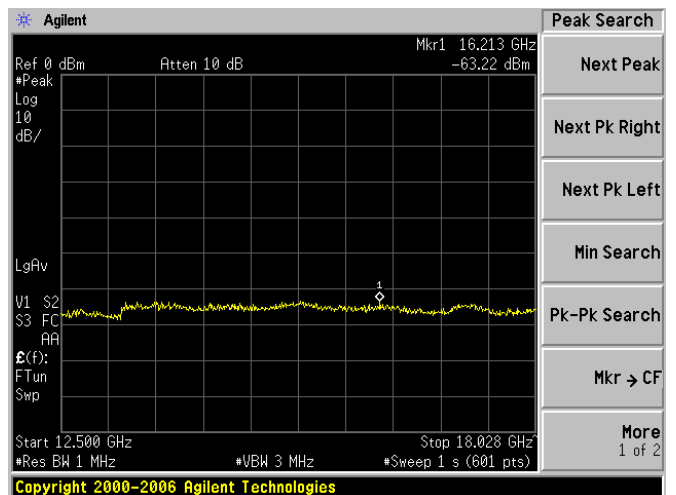
1GHz to 2.9GHz



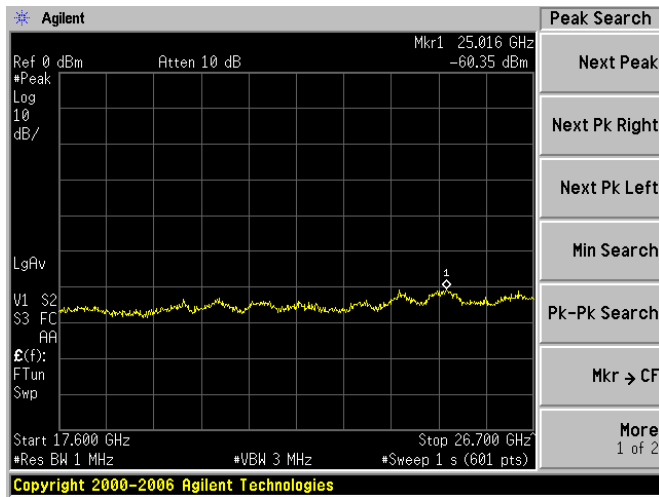
2.9GHz 6.4GHz



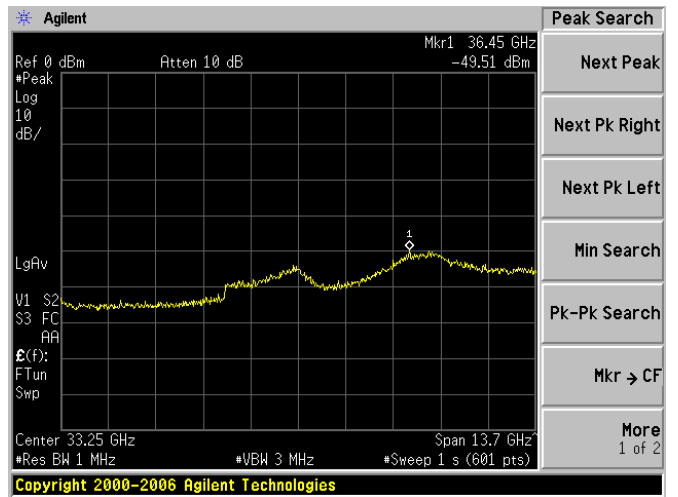
6.4GHz to 12.5GHz



12.5GHz to 18.0GHz



17.6GHz to 26.7GHz



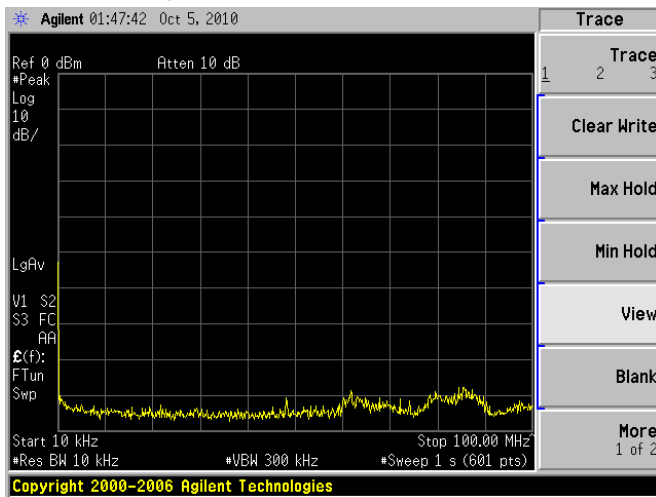
26.4GHz to 40GHz

4.4.10.2 TEST RESULTS of STBY

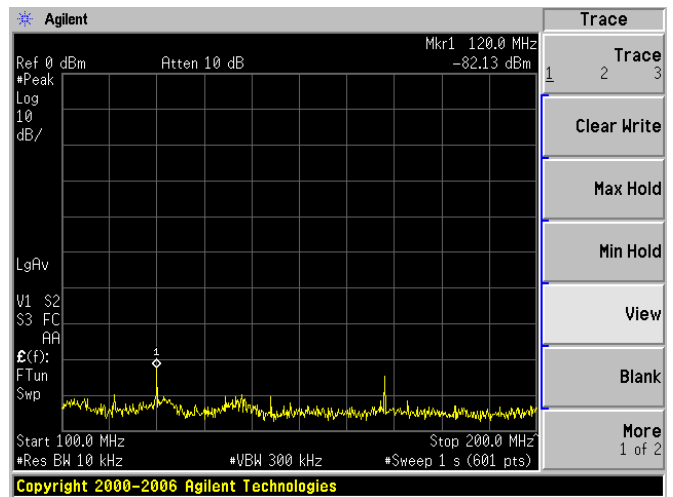
| Horizontally Polarized: STBY |                    |                |             |                    |                      |              |  |
|------------------------------|--------------------|----------------|-------------|--------------------|----------------------|--------------|--|
| Range                        | Frequency<br>[MHz] | level<br>[dBm] | Pg<br>[dBm] | Cable Loss<br>[dB] | Antenna Gain<br>[dB] | Pd <br>[dBm] | Radiated spurious<br>emission<br>[dBm] |
| 10kHz – 100MHz               | 85.17              | -87.8          | -76.41      | 0.5                | -0.35                | 77.26        | -135.06                                |
| 100MHz – 200MHz              | 120                | -82.13         | -59.99      | 0.5                | 1.26                 | 59.23        | -111.36                                |
| 200MHz – 300MHz              | 234.2              | -91.84         | -63.12      | 0.5                | 1.38                 | 62.24        | -124.08                                |
| 300MHz – 400MHz              | 375                | -86.6          | -65.29      | 0.5                | 3.16                 | 62.63        | -119.23                                |
| 400MHz – 500MHz              | 456.7              | -91.08         | -68.99      | 0.5                | 3.16                 | 66.33        | -127.41                                |
| 500MHz – 600MHz              | 547                | -91.52         | -69.05      | 0.5                | 2.86                 | 66.69        | -128.21                                |
| 600MHz – 700MHz              | 625                | -92.08         | -69.33      | 0.5                | 2.46                 | 67.37        | -129.45                                |
| 700MHz – 800MHz              | 750.3              | -92.08         | -67.31      | 0.5                | 2.66                 | 65.15        | -127.23                                |
| 800MHz – 900MHz              | 805.5              | -91.71         | -65.85      | 0.5                | 3.06                 | 63.29        | -125.00                                |
| 900MHz – 1.0GHz              | 944                | -91.38         | -65.5       | 0.5                | 3.06                 | 62.94        | -124.32                                |
| 1.0GHz – 2.9GHz              | 2561               | -69.51         | -38.02      | 1                  | 6.2                  | 32.82        | -72.33                                 |
| 2.9GHz – 6.4GHz              | 3052               | -68.31         | -35.12      | 1.2                | 6.5                  | 29.82        | -68.13                                 |
| 6.4GHz – 12.5GHz             | 11117              | -66.75         | -23.03      | 2.5                | 12.2                 | 13.33        | -50.08                                 |
| 12.5G – 18GHz                | 24820              | -61            | -36.74      | 3                  | 20                   | 19.74        | -50.74                                 |
| 17.6G – 26.7GHz              | 25016              | -59.5          | -27.33      | 3                  | 20                   | 10.33        | -39.83                                 |
| 26.7G – 40.0GHz              | 37100              | -48.79         | -17.94      | 3                  | 20                   | 0.94         | -19.73                                 |

| Vertically Polarized: STBY |                    |                |             |                    |                      |              |  |
|----------------------------|--------------------|----------------|-------------|--------------------|----------------------|--------------|--|
| Range                      | Frequency<br>[MHz] | level<br>[dBm] | Pg<br>[dBm] | Cable Loss<br>[dB] | Antenna Gain<br>[dB] | Pd <br>[dBm] | Radiated spurious<br>emission<br>[dBm] |
| 10kHz – 100MHz             | 60.67              | -78.21         | -65.45      | 0.5                | -0.35                | 66.30        | -114.51                                |
| 100MHz – 200MHz            | 168                | -85.05         | -66.52      | 0.5                | 1.26                 | 65.76        | -120.81                                |
| 200MHz – 300MHz            | 240                | -91.67         | -68.65      | 0.5                | 1.38                 | 67.77        | -129.44                                |
| 300MHz – 400MHz            | 375                | -87.25         | -66.63      | 0.5                | 3.16                 | 63.97        | -121.22                                |
| 400MHz – 500MHz            | 400.3              | -91.39         | -70.28      | 0.5                | 3.16                 | 67.62        | -129.01                                |
| 500MHz – 600MHz            | 532.3              | -93.32         | -69.67      | 0.5                | 2.86                 | 67.31        | -130.63                                |
| 600MHz – 700MHz            | 662.5              | -92.5          | -67.71      | 0.5                | 2.46                 | 65.75        | -128.25                                |
| 700MHz – 800MHz            | 726.2              | -92            | -66.21      | 0.5                | 2.66                 | 64.05        | -126.05                                |
| 800MHz – 900MHz            | 847                | -91.6          | -65.44      | 0.5                | 3.06                 | 62.88        | -124.48                                |
| 900MHz – 1.0GHz            | 900.5              | -92.44         | -65.46      | 0.5                | 3.06                 | 62.90        | -125.34                                |
| 1.0GHz – 2.9GHz            | 2653               | -69.28         | -37.49      | 1                  | 6.2                  | 32.29        | -71.57                                 |
| 2.9GHz – 6.4GHz            | 3145               | -67.72         | -33.78      | 1.2                | 6.5                  | 28.48        | -66.20                                 |
| 6.4GHz – 12.5GHz           | 7701               | -65.31         | -26.2       | 2.5                | 12.2                 | 16.50        | -51.81                                 |
| 12.5G – 18GHz              | 15236              | -63.1          | -15.14      | 3                  | 20                   | 1.86         | -34.96                                 |
| 17.6G – 26.7GHz            | 24986              | -59.38         | -27.55      | 3                  | 20                   | 10.55        | -39.93                                 |
| 26.7G – 40.0GHz            | 37020              | -49.68         | -18.41      | 3                  | 20                   | 1.41         | -21.09                                 |

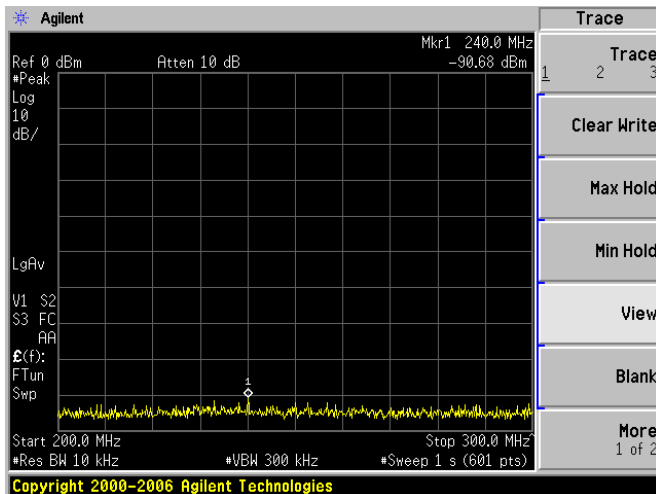
# ·Horizontally Polarized



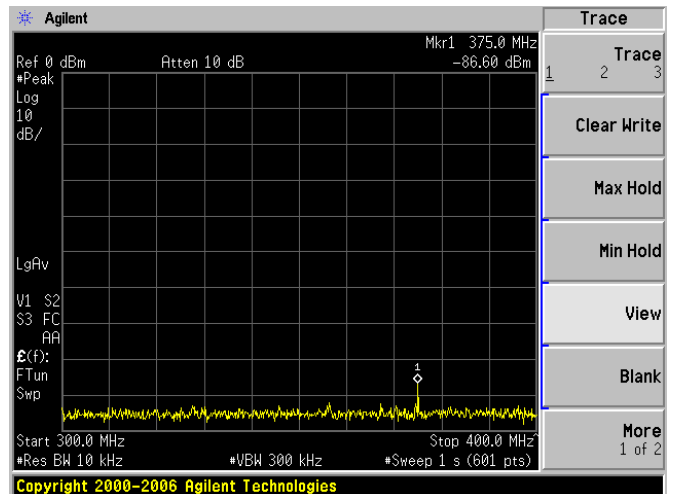
10kHz to 100MHz



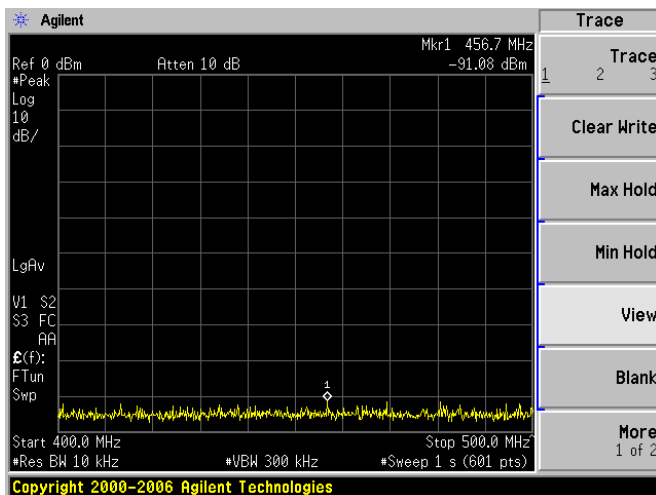
100MHz to 200MHz



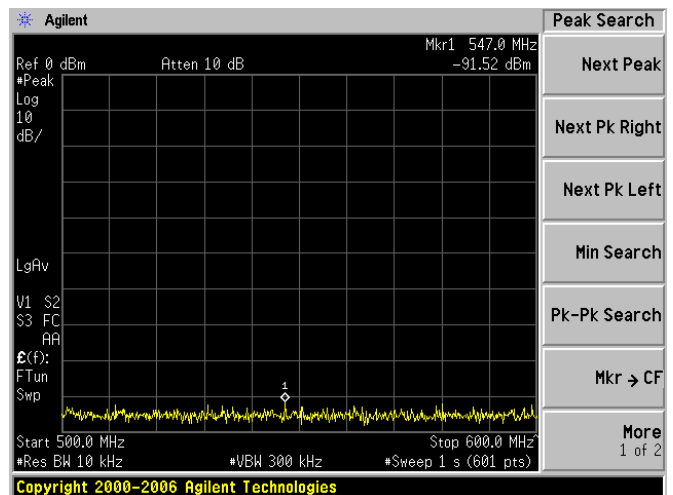
200MHz to 300MHz



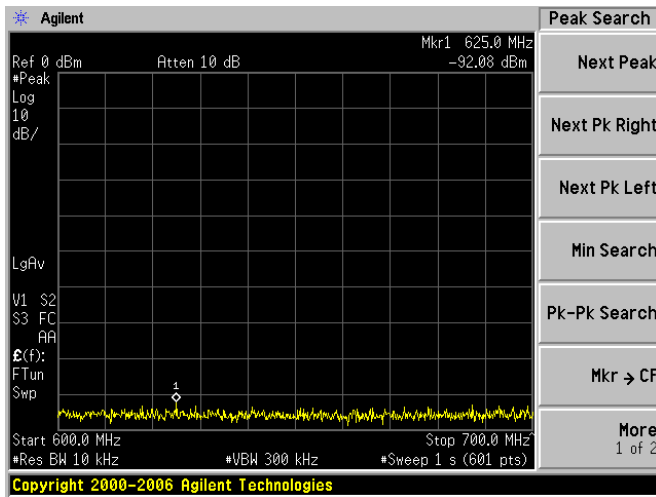
300MHz to 400MHz



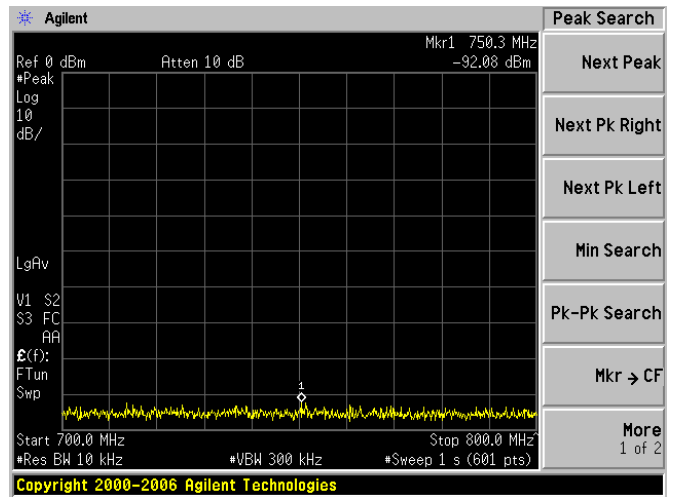
400MHz to 500MHz



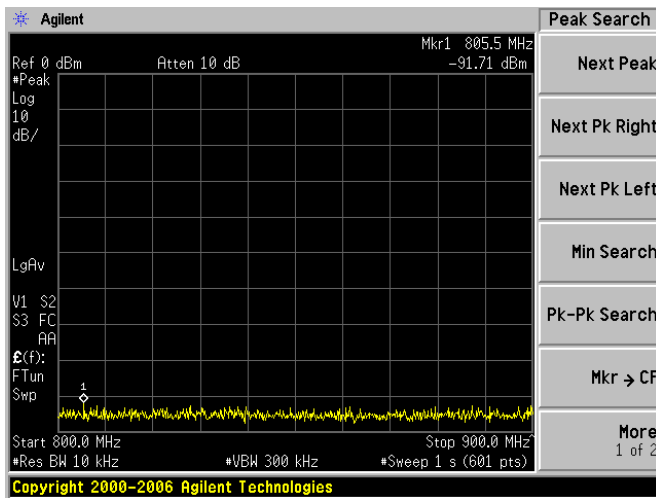
500MHz to 600MHz



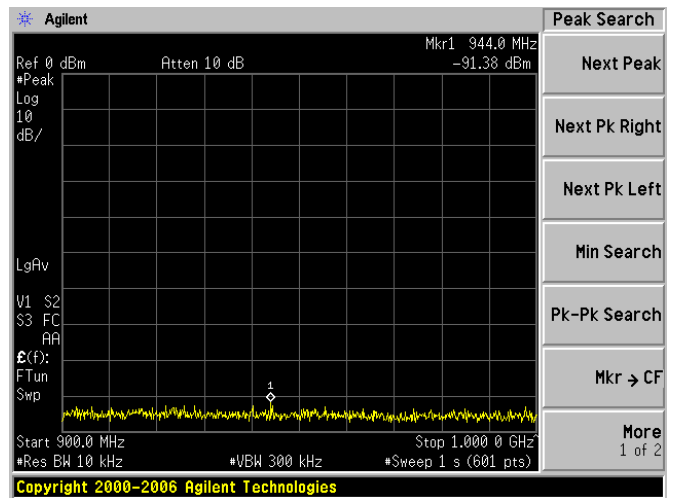
600MHz to 700MHz



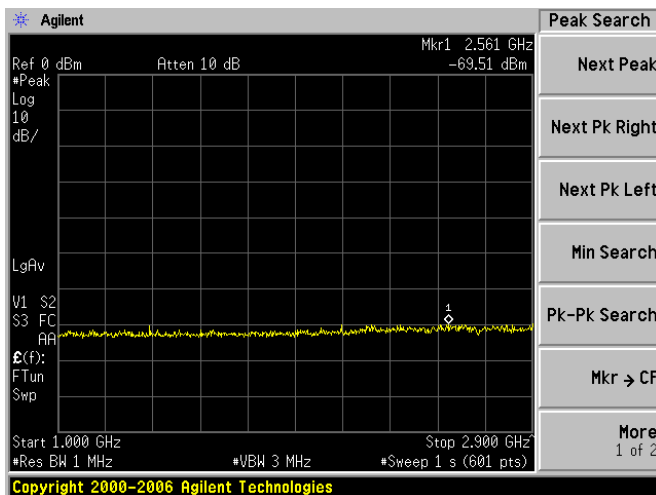
700MHz to 800MHz



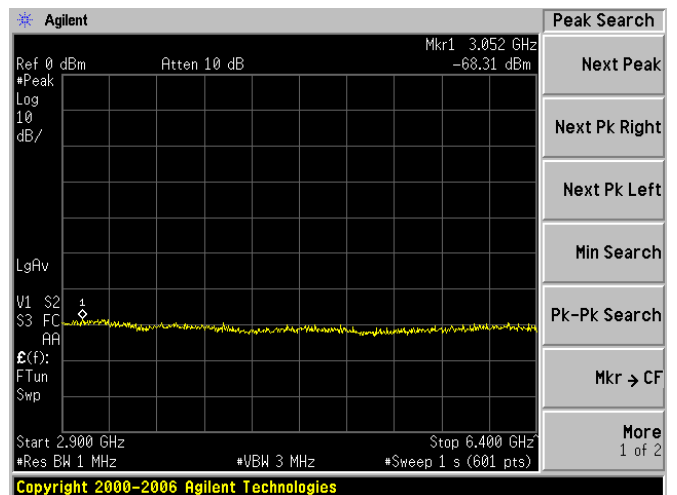
800MHz to 900MHz



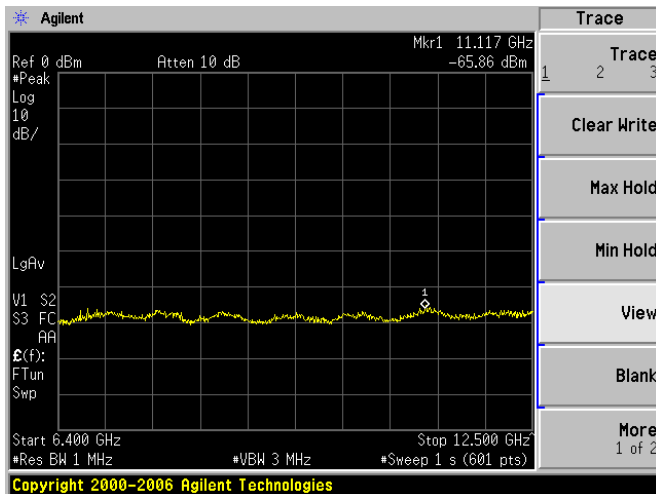
900MHz to 1GHz



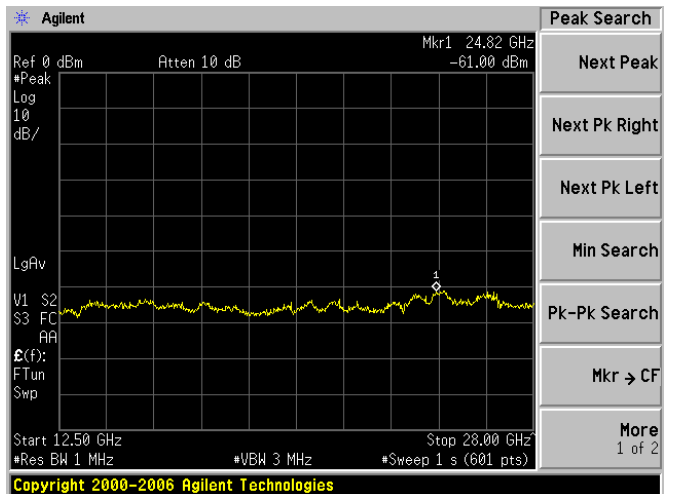
1GHz to 2.9GHz



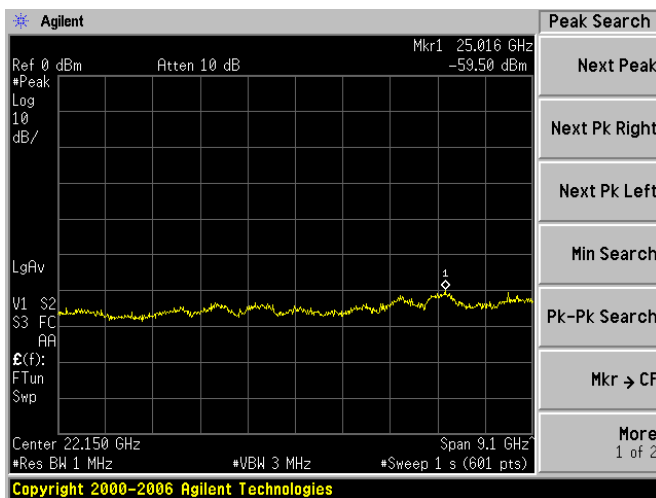
2.9GHz to 6.4GHz



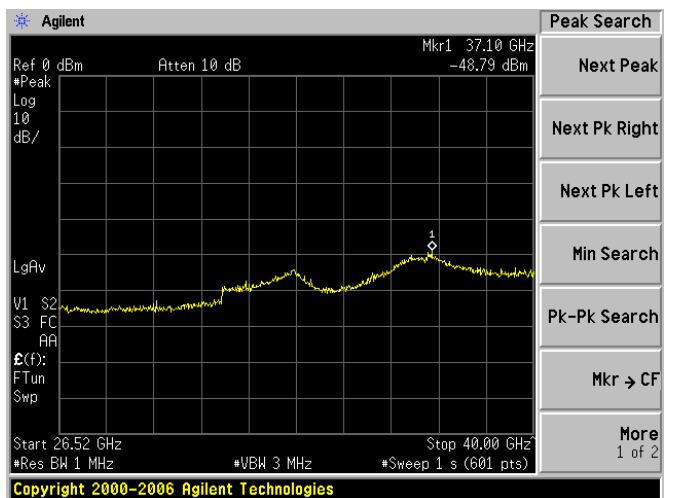
6.4GHz to 12.5GHz



12.5GHz to 28GHz

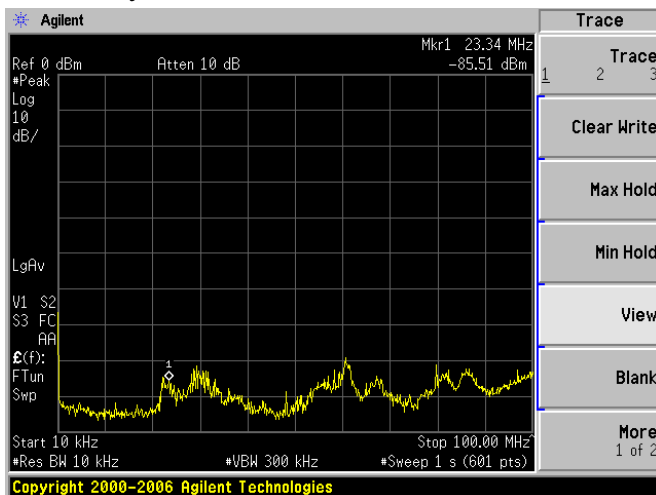


17.6GHz to 26.7GHz

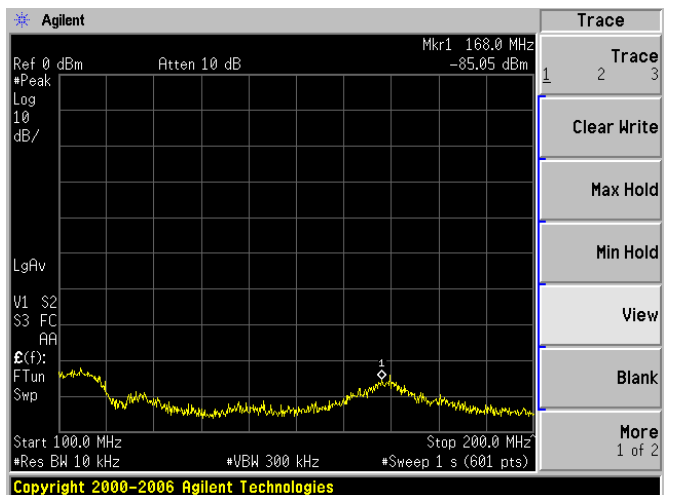


26.5GHz to 40.0GHz

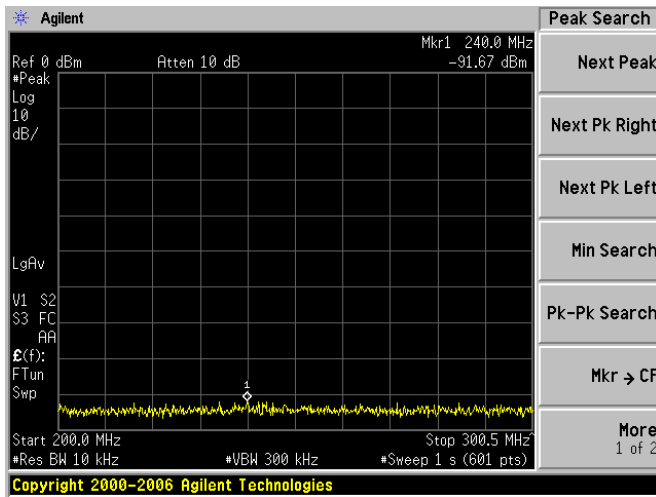
•Vertically Polarized



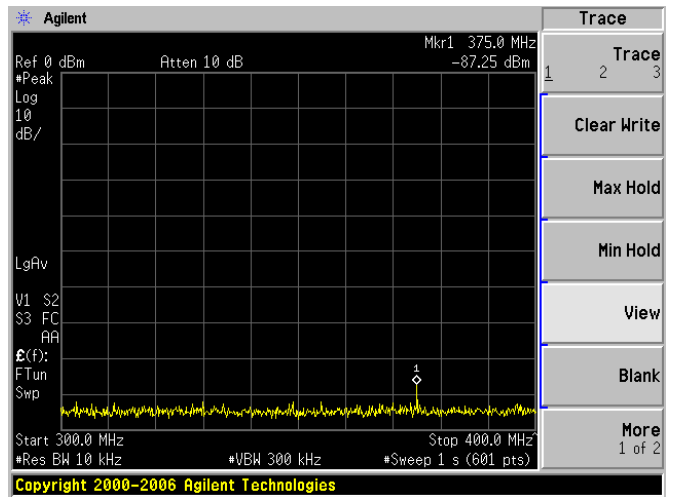
10kHz to 100MHz



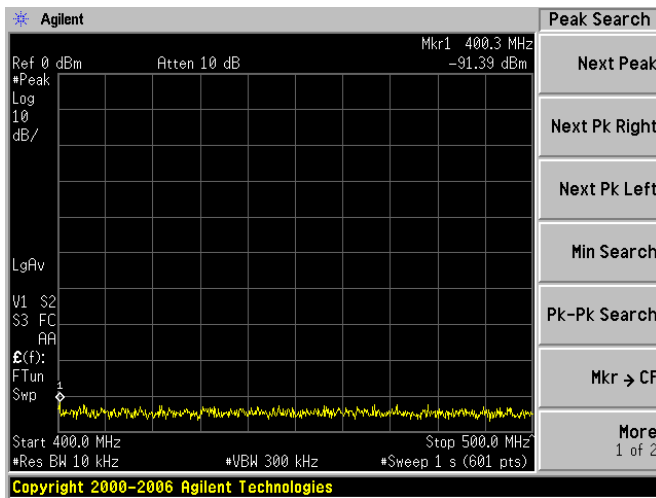
100MHz to 200MHz



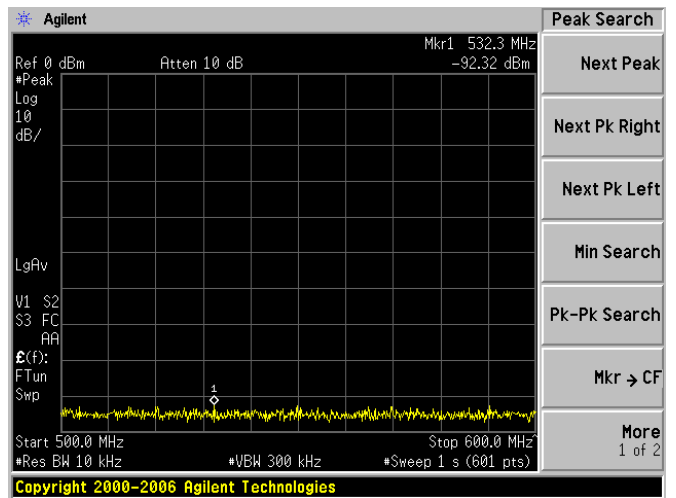
200MHz to 300MHz



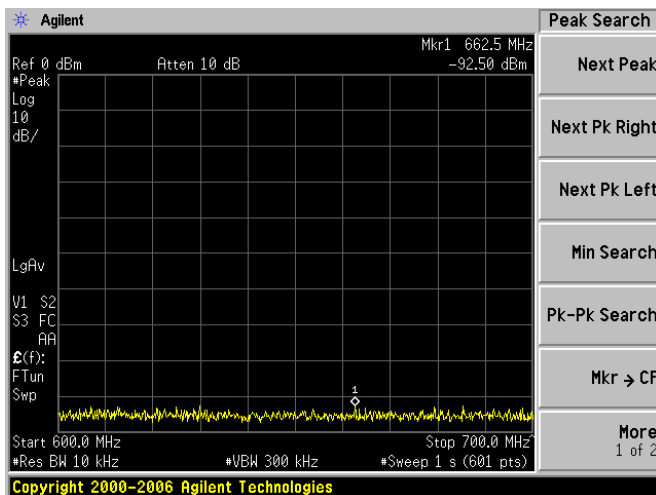
300MHz to 400MHz



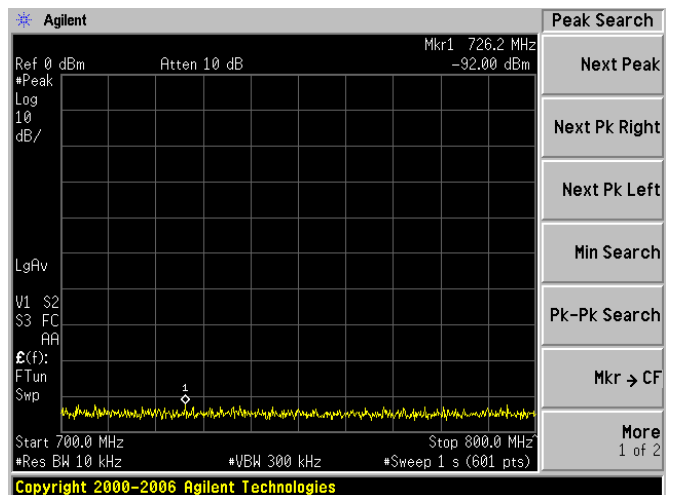
400MHz to 500MHz



500MHz to 600MHz

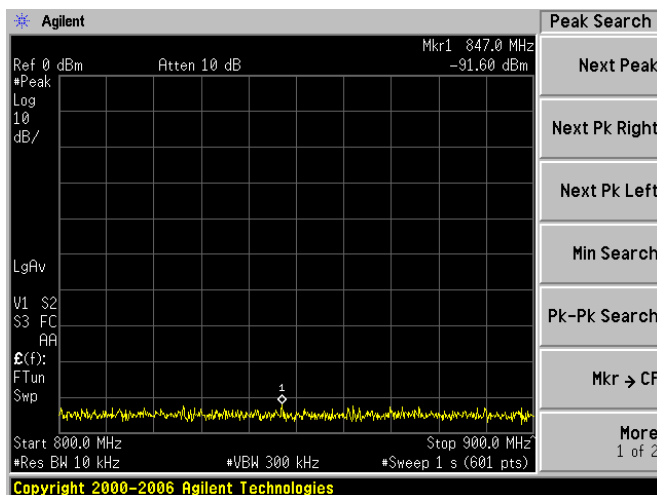


600MHz to 700MHz

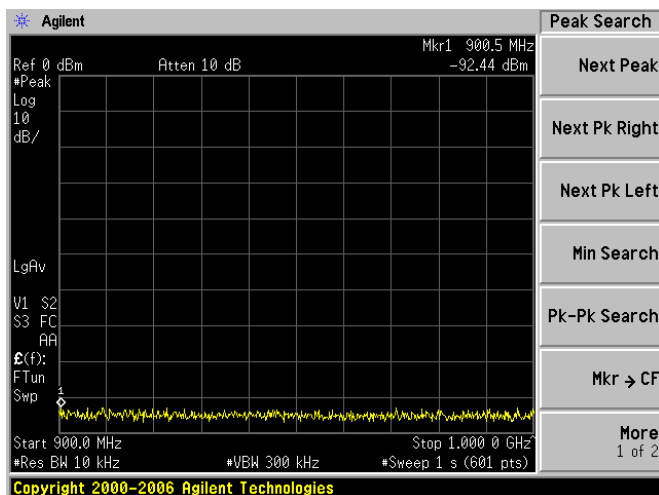


700MHz to 800MHz

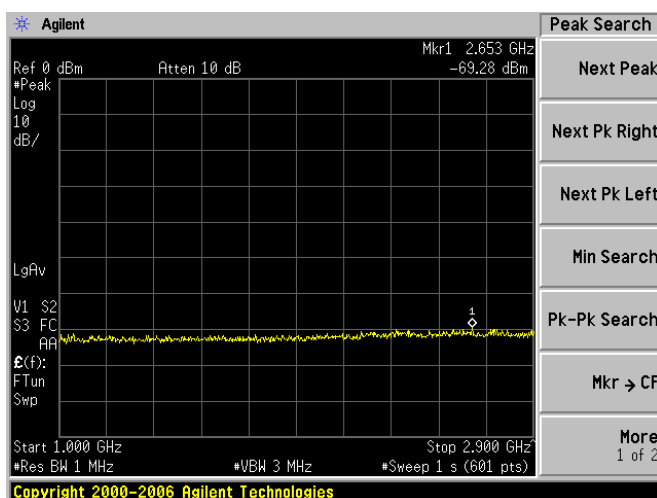




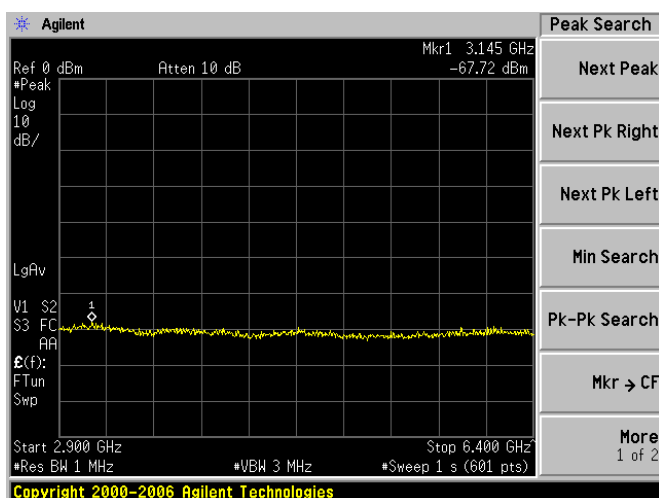
800MHz to 900MHz



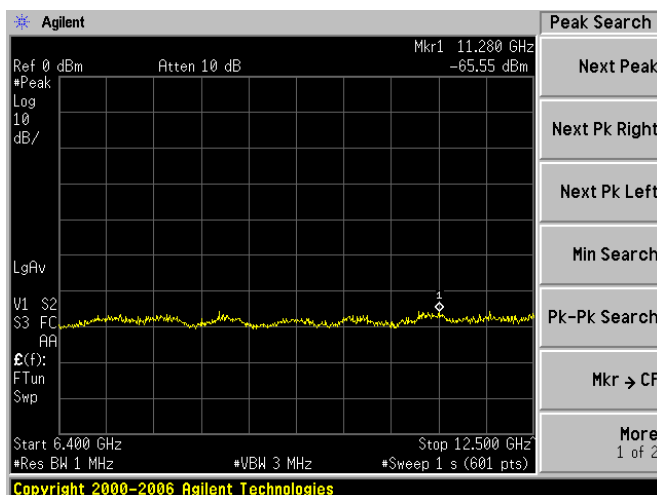
900MHz to 1GHz



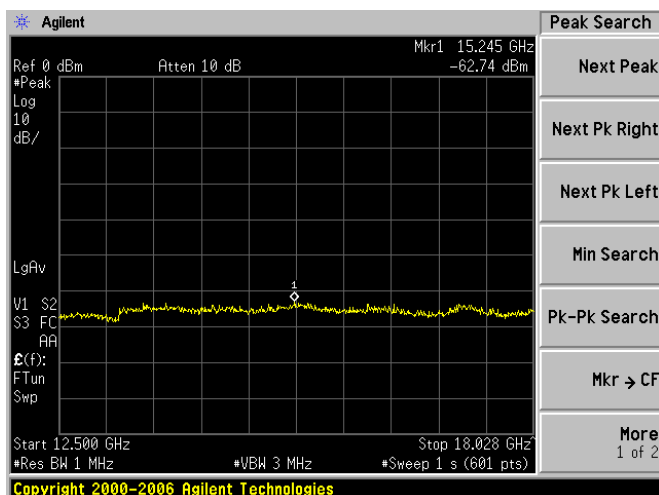
1GHz to 2.9GHz



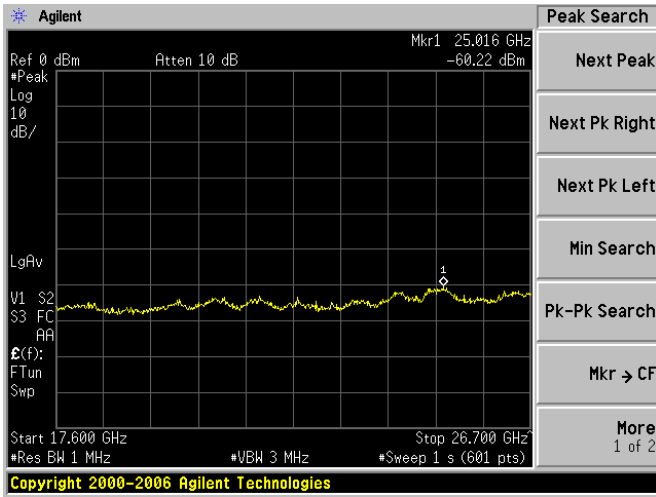
2.9GHz 6.4GHz



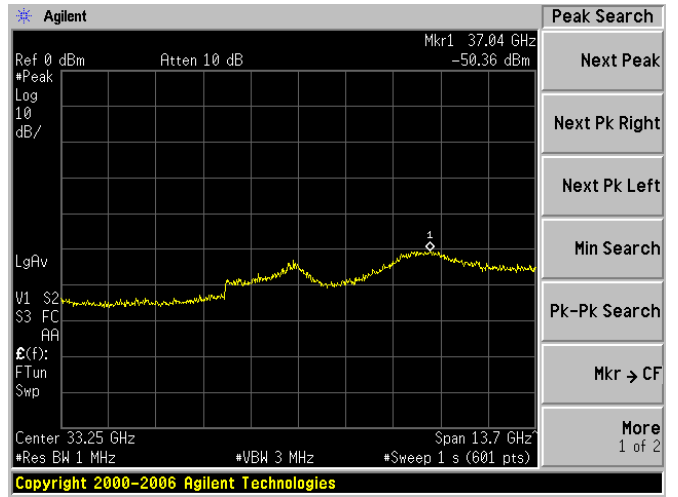
6.4GHz to 12.5GHz



12.5GHz to 18.0GHz



17.6GHz to 26.7GHz



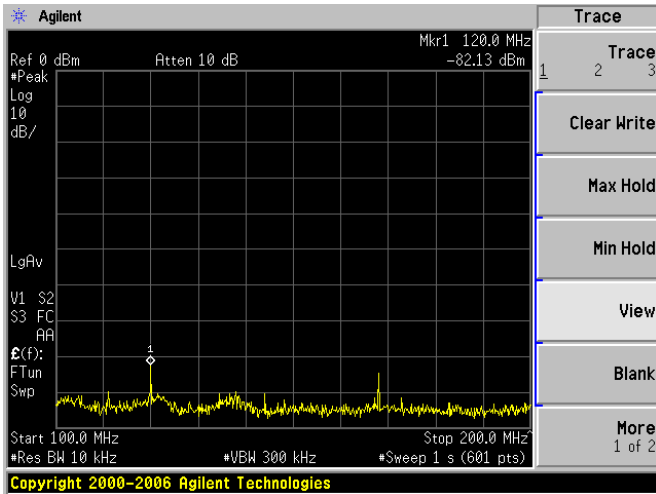
26.4GHz to 40GHz

4.4.10.3 TEST RESULTS of 0.08usec/2250Hz

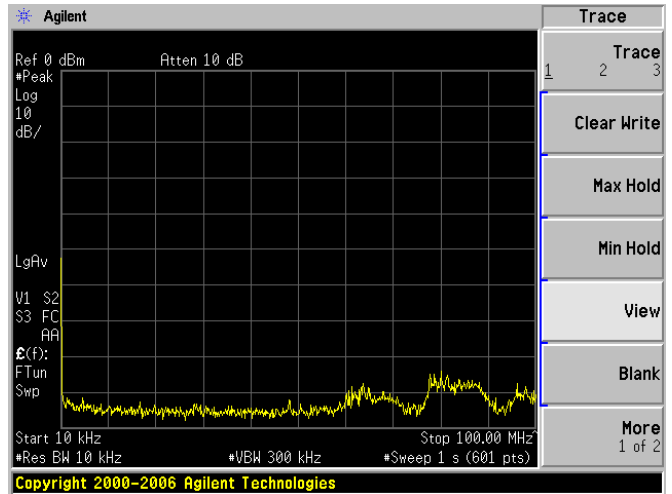
| Horizontally Polarized: 0.08usec/2250Hz |                    |                |             |                    |                      |              |  |
|---|--------------------|----------------|-------------|--------------------|----------------------|--------------|--|
| Range                                   | Frequency<br>[MHz] | level<br>[dBm] | Pg<br>[dBm] | Cable Loss<br>[dB] | Antenna Gain<br>[dB] | Pd <br>[dBm] | Radiated spurious<br>emission<br>[dBm] |
| 10kHz – 100MHz                          | 80.17              | -84.7          | -74.45      | 0.5                | -0.52                | 75.47        | -130.17                                |
| 100MHz – 200MHz                         | 168                | -84.18         | -67.99      | 0.5                | 1.68                 | 66.81        | -120.99                                |
| 200MHz – 300MHz                         | 240                | -86.78         | -56.97      | 0.5                | 1.38                 | 56.09        | -112.87                                |
| 300MHz – 400MHz                         | 375                | -87.86         | -66.55      | 0.5                | 3.16                 | 63.89        | -121.75                                |
| 400MHz – 500MHz                         | 418.8              | -88.41         | -67.91      | 0.5                | 3.26                 | 65.15        | -123.56                                |
| 500MHz – 600MHz                         | 501.5              | -91.86         | -69.7       | 0.5                | 3.16                 | 67.04        | -128.90                                |
| 600MHz – 700MHz                         | 625                | -90.28         | -67.53      | 0.5                | 2.46                 | 65.57        | -125.85                                |
| 700MHz – 800MHz                         | 704.7              | -92.51         | -67.42      | 0.5                | 2.36                 | 65.56        | -128.07                                |
| 800MHz – 900MHz                         | 805.5              | -94.78         | -68.92      | 0.5                | 3.06                 | 66.36        | -131.14                                |
| 900MHz – 1.0GHz                         | 945.5              | -92            | -66.31      | 0.5                | 3.06                 | 63.75        | -125.75                                |
| 1.0GHz – 2.9GHz                         | 2615               | -69.69         | -37.27      | 1                  | 6.2                  | 32.07        | -71.76                                 |
| 2.9GHz – 6.4GHz                         | 3052               | -68.72         | -35.03      | 1.2                | 6.5                  | 29.73        | -68.45                                 |
| 6.4GHz – 12.5GHz                        | 11117              | -65.86         | -22.14      | 2.5                | 12.2                 | 12.44        | -48.30                                 |
| 12.5G – 28GHz                           | 25060              | -60.12         | -35.35      | 3                  | 20                   | 18.35        | -48.47                                 |
| 17.6G – 26.7GHz                         | 25032              | -60.46         | -28.43      | 3                  | 20                   | 11.43        | -41.89                                 |
| 26.7G – 40.0GHz                         | 36560              | -50.14         | -19.59      | 3                  | 20                   | 2.59         | -22.73                                 |

| Vertically Polarized: 0.08usec/2250Hz |                    |                |             |                    |                      |              |  |
|---------------------------------------|--------------------|----------------|-------------|--------------------|----------------------|--------------|--|
| Range                                 | Frequency<br>[MHz] | level<br>[dBm] | Pg<br>[dBm] | Cable Loss<br>[dB] | Antenna Gain<br>[dB] | Pd <br>[dBm] | Radiated spurious<br>emission<br>[dBm] |
| 10kHz – 100MHz                        | 60.67              | -78.21         | -65.45      | 0.5                | -0.52                | 66.47        | -114.68                                |
| 100MHz – 200MHz                       | 105                | -77.3          | -59.12      | 0.5                | 1.68                 | 57.94        | -105.24                                |
| 200MHz – 300MHz                       | 268                | -89.47         | -65.79      | 0.5                | 1.38                 | 64.91        | -124.38                                |
| 300MHz – 400MHz                       | 375                | -86.55         | -65.93      | 0.5                | 3.16                 | 63.27        | -119.82                                |
| 400MHz – 500MHz                       | 435.7              | -86.59         | -65.95      | 0.5                | 3.26                 | 63.19        | -119.78                                |
| 500MHz – 600MHz                       | 540.2              | -91.59         | -67.84      | 0.5                | 3.16                 | 65.18        | -126.77                                |
| 600MHz – 700MHz                       | 603.2              | -91.43         | -67.39      | 0.5                | 2.46                 | 65.43        | -126.86                                |
| 700MHz – 800MHz                       | 722.3              | -91.85         | -66.36      | 0.5                | 2.36                 | 64.50        | -126.35                                |
| 800MHz – 900MHz                       | 895.2              | -91.87         | -64.7       | 0.5                | 3.06                 | 62.14        | -124.01                                |
| 900MHz – 1.0GHz                       | 907.5              | -92.28         | -65.69      | 0.5                | 3.06                 | 63.13        | -125.41                                |
| 1.0GHz – 2.9GHz                       | 2738               | -69.66         | -38.02      | 1                  | 6.2                  | 32.82        | -72.48                                 |
| 2.9GHz – 6.4GHz                       | 3273               | -68.33         | -34.99      | 1.2                | 6.5                  | 29.69        | -68.02                                 |
| 6.4GHz – 12.5GHz                      | 11200              | -65.55         | -20.44      | 2.5                | 12.2                 | 10.74        | -46.29                                 |
| 12.5G – 18GHz                         | 15245              | -62.74         | -14.7       | 3                  | 20                   | 2.30         | -35.04                                 |
| 17.6G – 26.7GHz                       | 25016              | -60.22         | -28.96      | 3                  | 20                   | 11.96        | -42.18                                 |
| 26.7G – 40.0GHz                       | 37040              | -50.36         | -17.2       | 3                  | 20                   | 0.20         | -20.56                                 |

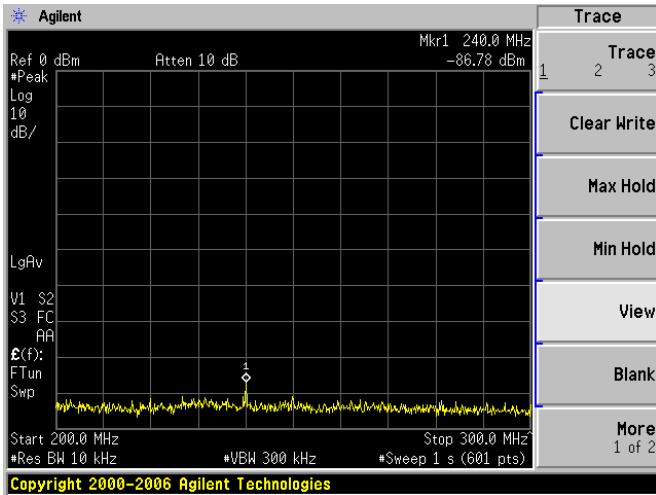
•Horizontally Polarized



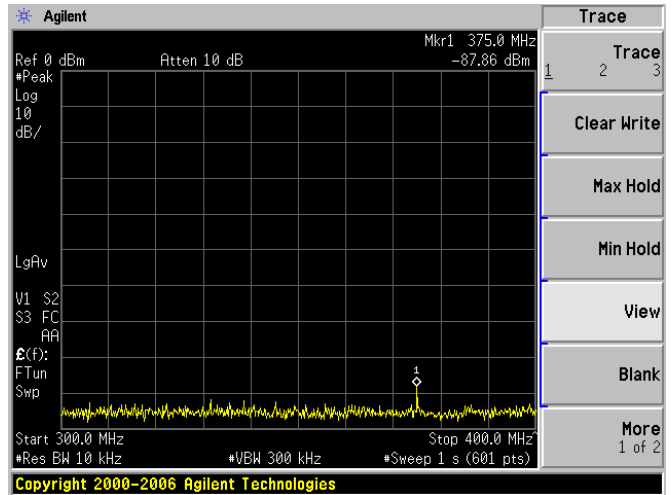
10kHz to 100MHz



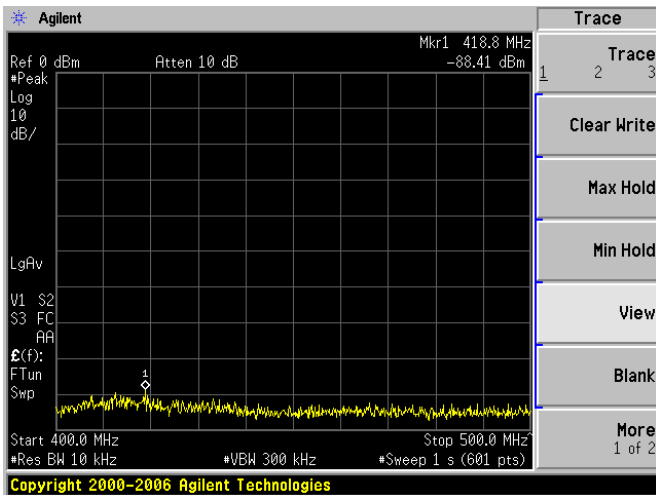
100MHz to 200MHz



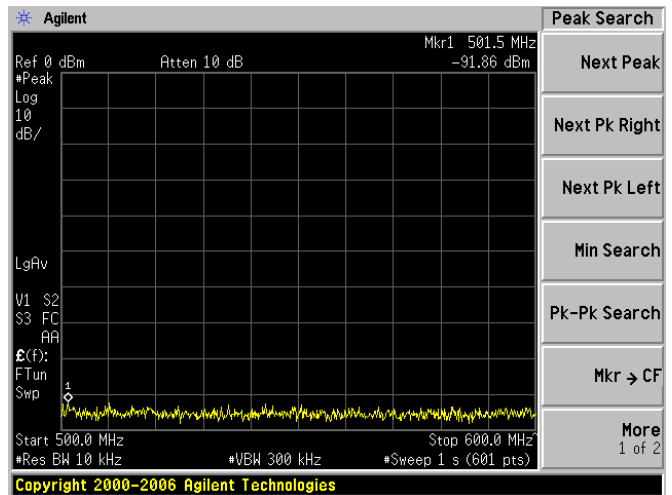
200MHz to 300MHz



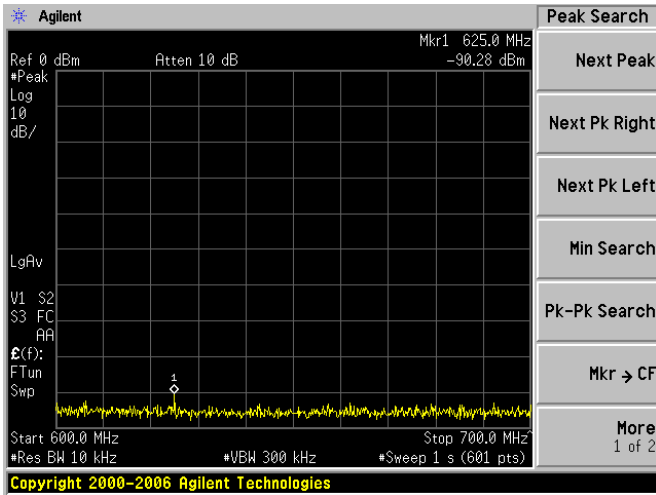
300MHz to 400MHz



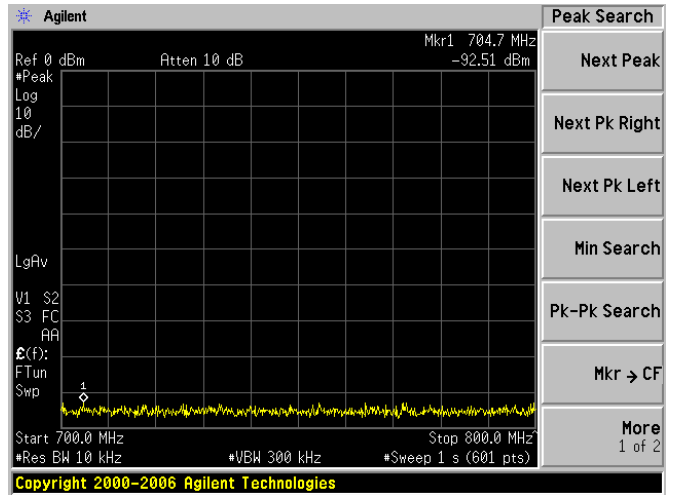
400MHz to 500MHz



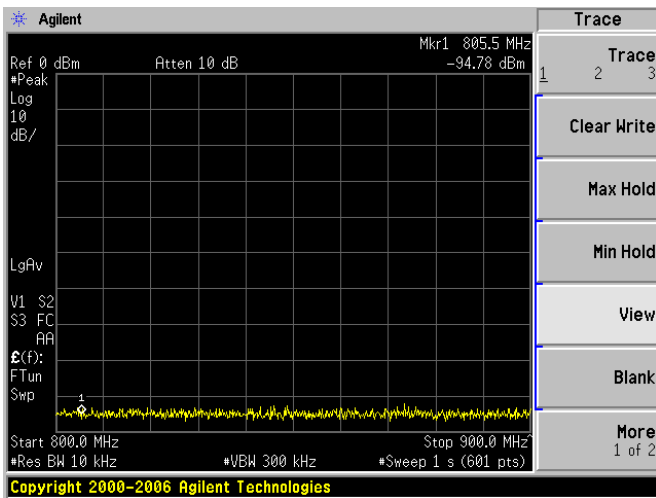
500MHz to 600MHz



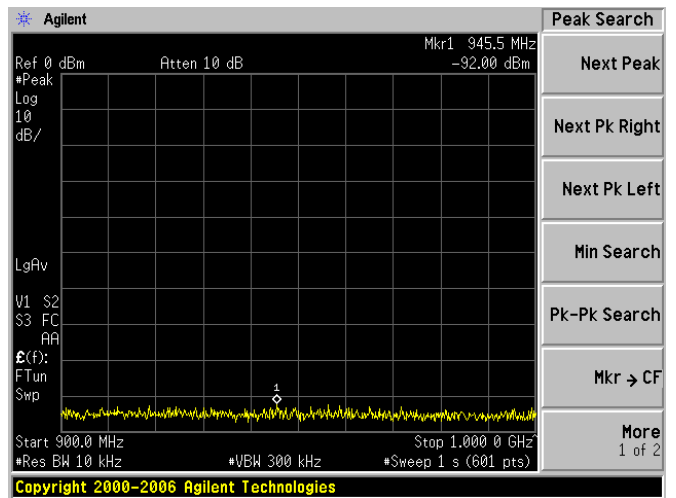
600MHz to 700MHz



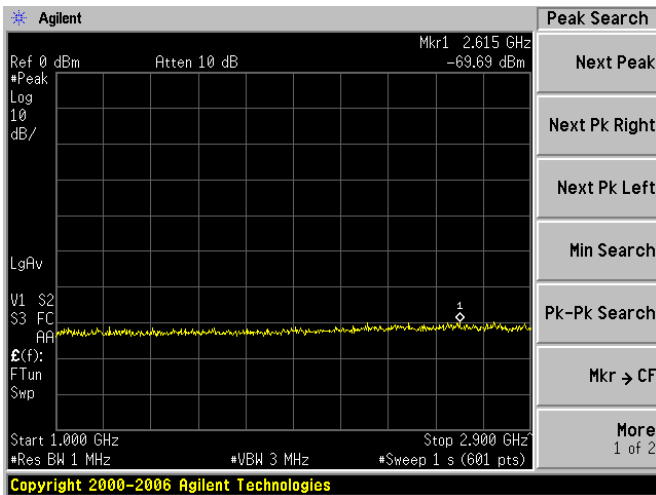
700MHz to 800MHz



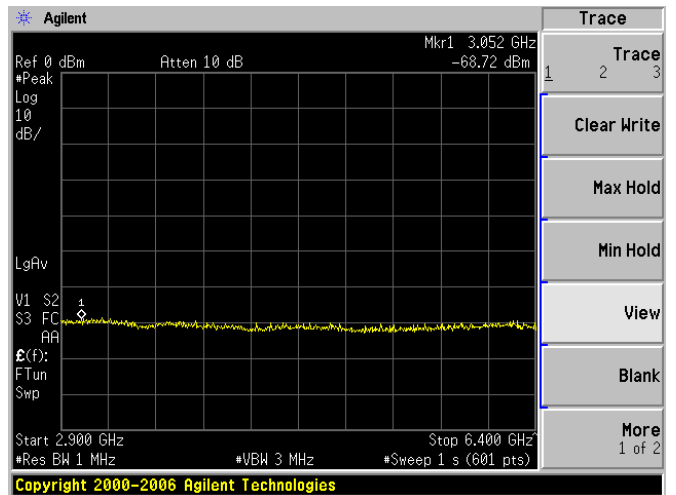
800MHz to 900MHz



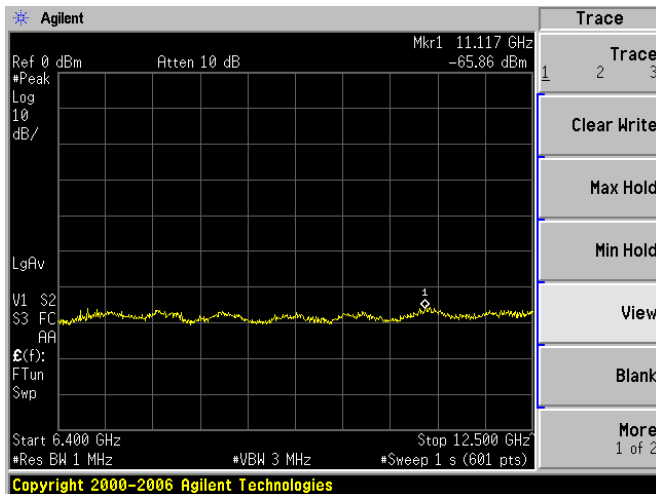
900MHz to 1GHz



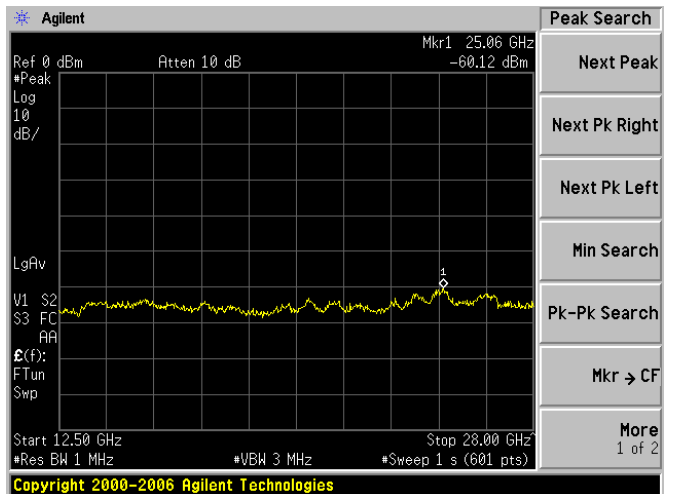
1GHz to 2.9GHz



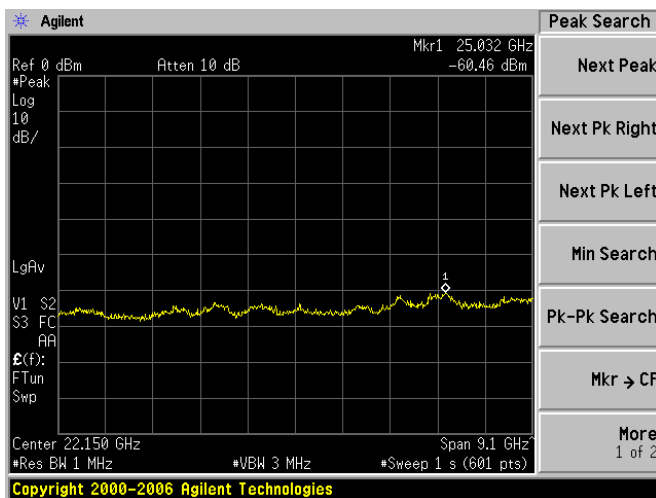
2.9GHz to 6.4GHz



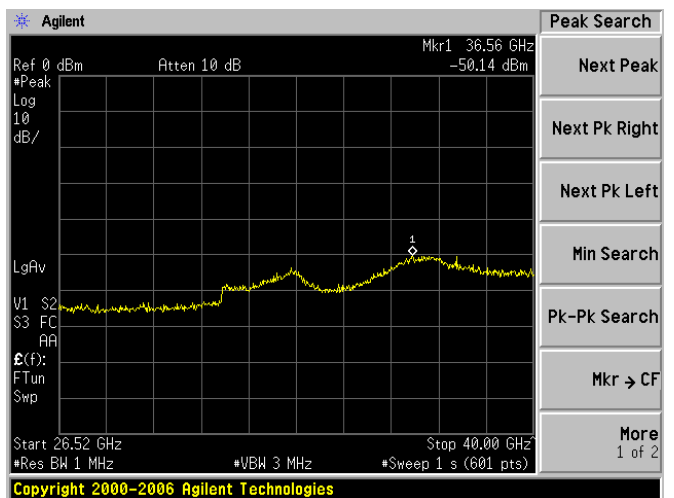
6.4GHz to 12.5GHz



12.5GHz to 28GHz

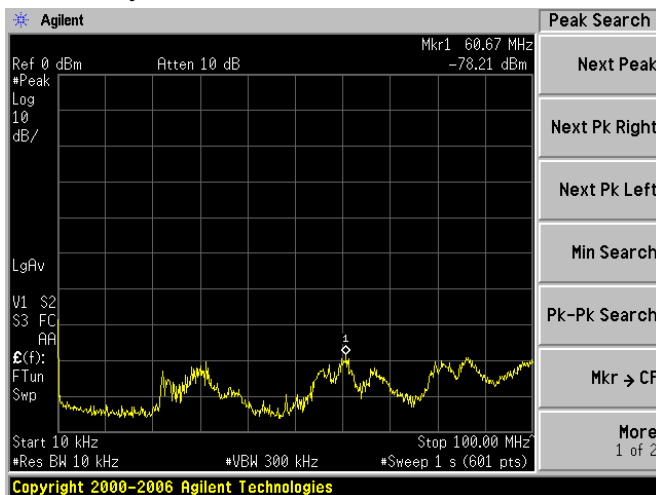


17.6GHz to 26.7GHz

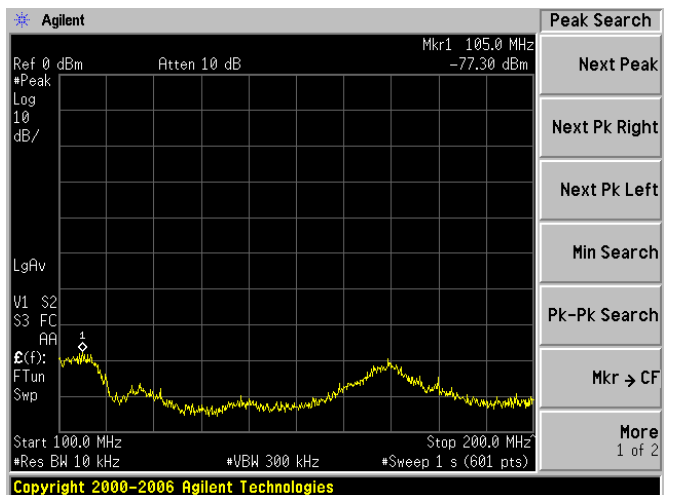


26.5GHz to 40.0GHz

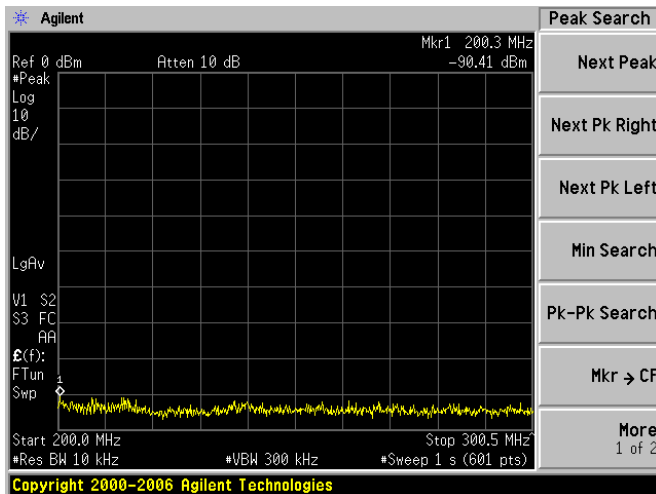
•Vertically Polarized



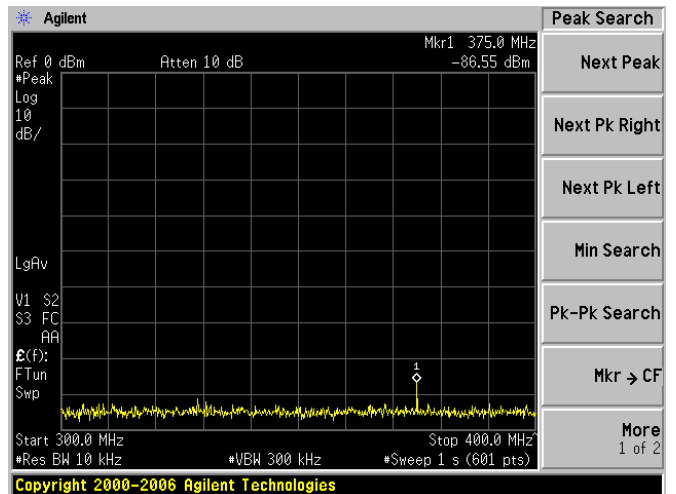
10kHz to 100MHz



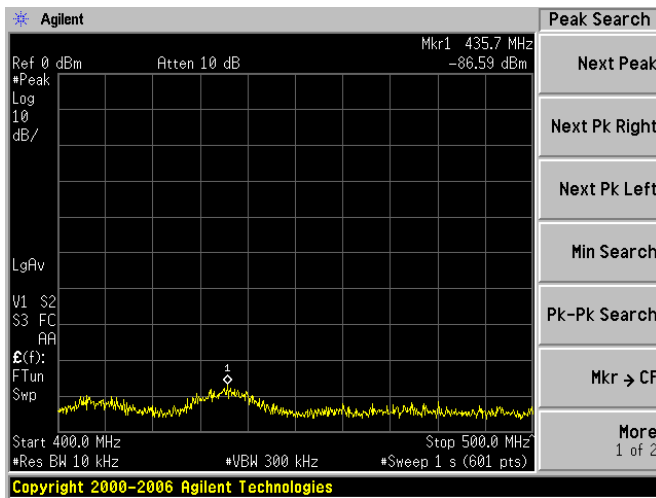
100MHz to 200MHz



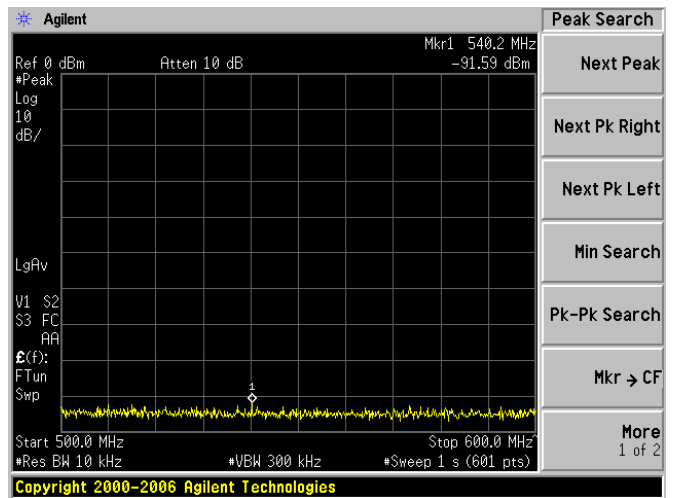
200MHz to 300MHz



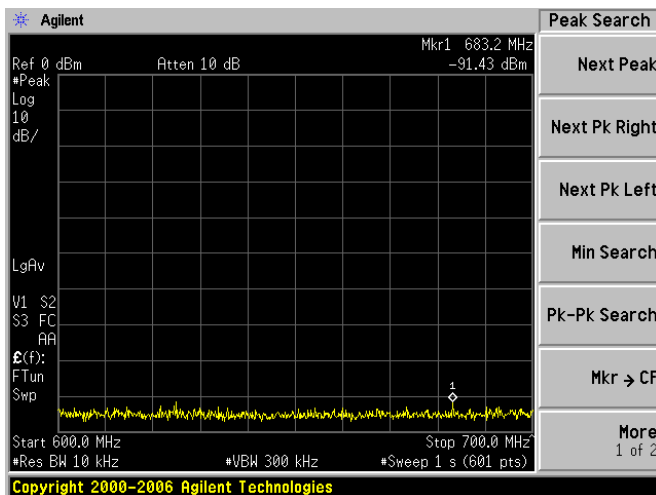
300MHz to 400MHz



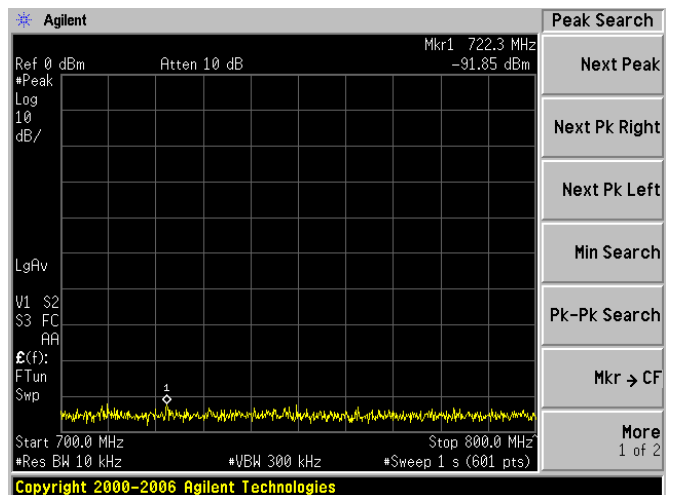
400MHz to 500MHz



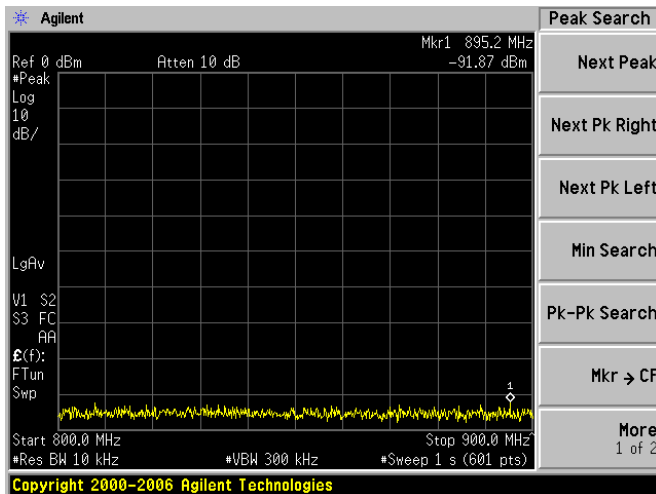
500MHz to 600MHz



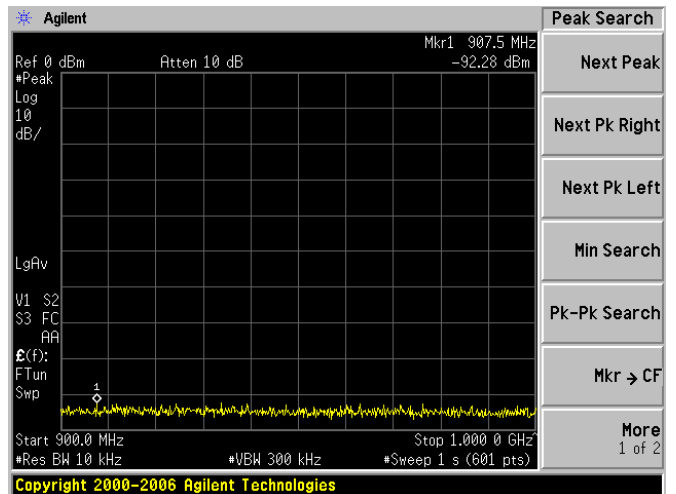
600MHz to 700MHz



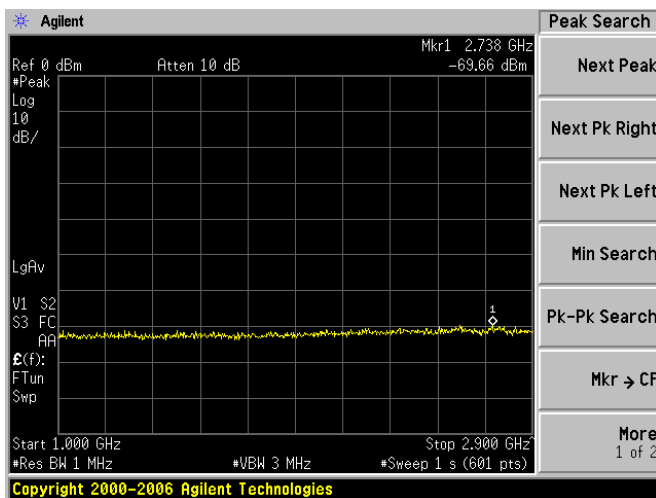
700MHz to 800MHz



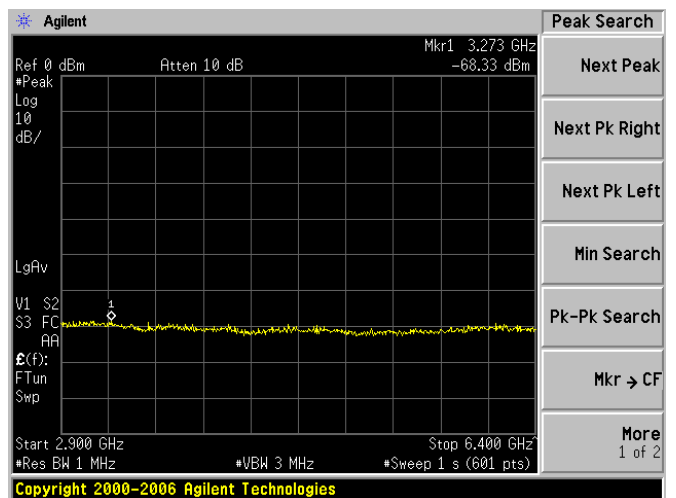
800MHz to 900MHz



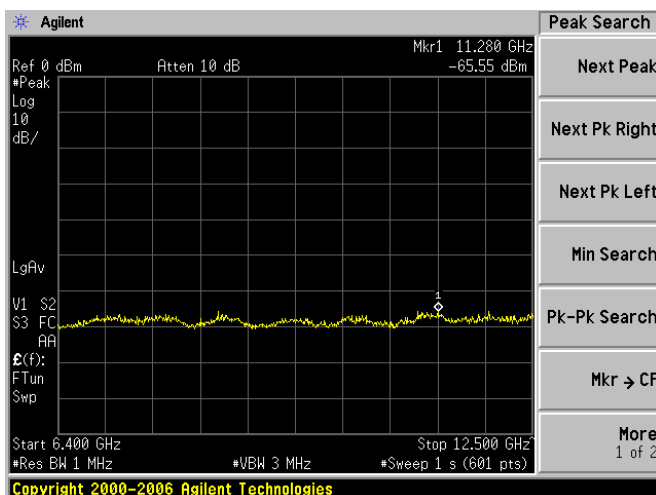
900MHz to 1GHz



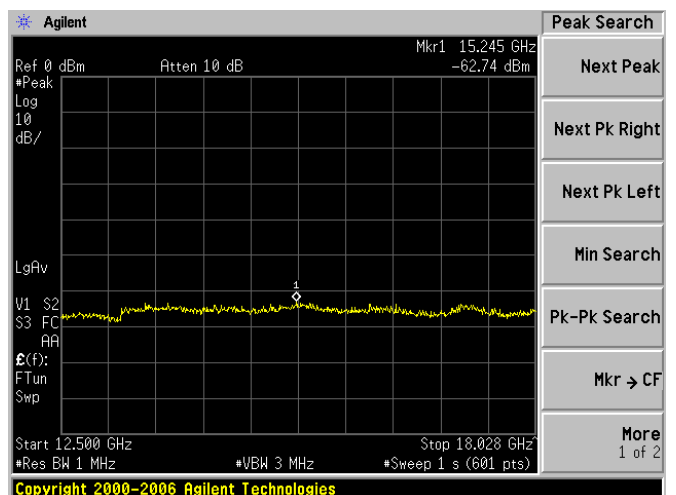
1GHz to 2.9GHz



2.9GHz to 6.4GHz

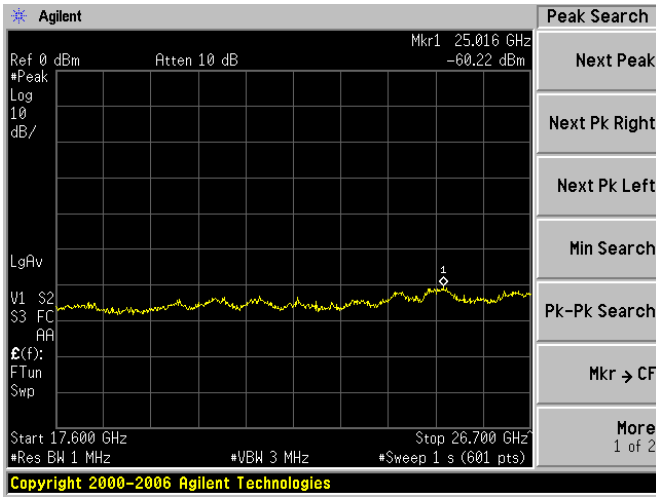


6.4GHz to 12.5GHz

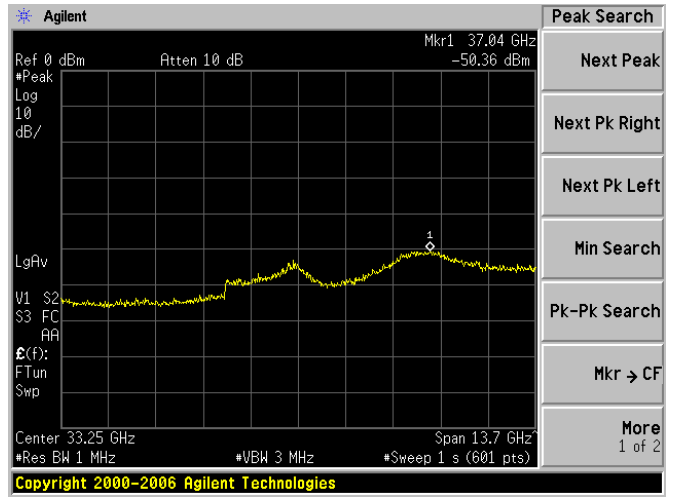


12.5GHz to 18.0GHz





17.6GHz to 26.7GHz



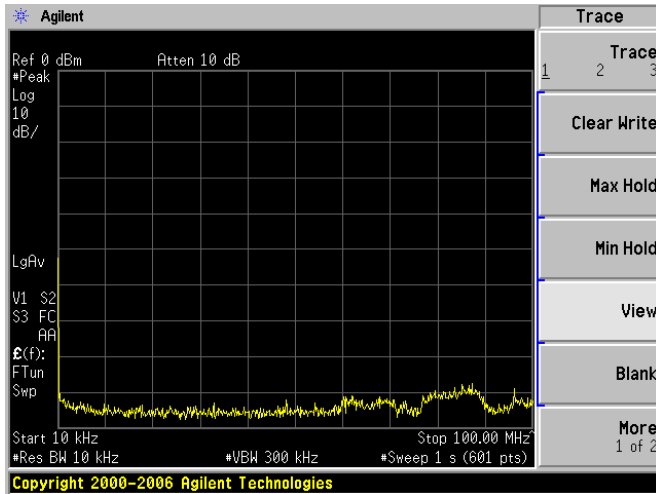
26.4GHz to 40GHz

4.4.10.4 TEST RESULTS of 0.25usec/1700Hz

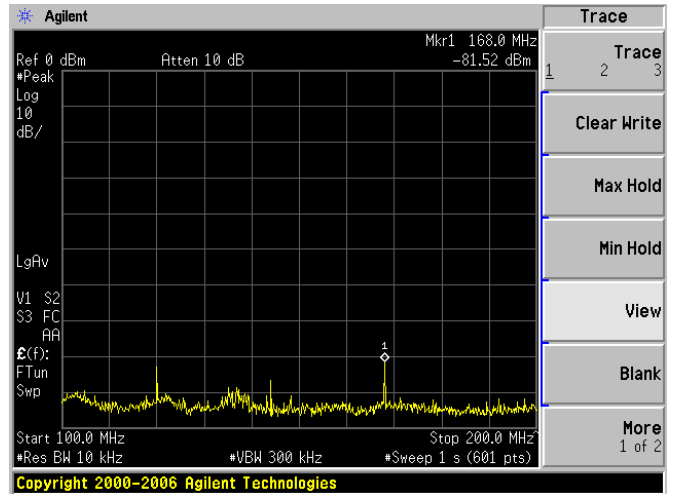
| Horizontally Polarized: 0.25usec/1700Hz |                 |             |          |                 |                   |           |                                  |
|---|-----------------|-------------|----------|-----------------|-------------------|-----------|----------------------------------|
| Range                                   | Frequency [MHz] | level [dBm] | Pg [dBm] | Cable Loss [dB] | Antenna Gain [dB] | Pd  [dBm] | Radiated spurious emission [dBm] |
| 10kHz – 100MHz                          | 87.67           | -87.5       | -75.8    | 0.5             | -0.35             | 76.65     | -134.15                          |
| 100MHz – 200MHz                         | 168             | -81.52      | -65.33   | 0.5             | 1.68              | 64.15     | -115.67                          |
| 200MHz – 300MHz                         | 240             | -89.17      | -59.36   | 0.5             | 1.38              | 58.48     | -117.65                          |
| 300MHz – 400MHz                         | 375             | -87.34      | -66.03   | 0.5             | 3.16              | 63.37     | -120.71                          |
| 400MHz – 500MHz                         | 415.3           | -86.9       | -66.4    | 0.5             | 3.26              | 63.64     | -120.54                          |
| 500MHz – 600MHz                         | 544.2           | -91.9       | -69.54   | 0.5             | 2.86              | 67.18     | -129.08                          |
| 600MHz – 700MHz                         | 625             | -89.92      | -67.17   | 0.5             | 2.46              | 65.21     | -125.13                          |
| 700MHz – 800MHz                         | 773             | -92.29      | -64.63   | 0.5             | 2.86              | 62.27     | -124.56                          |
| 800MHz – 900MHz                         | 815             | -91.13      | -65.81   | 0.5             | 3.16              | 63.15     | -124.28                          |
| 900MHz – 1.0GHz                         | 919.2           | -91.47      | -62.64   | 0.5             | 2.76              | 60.38     | -121.85                          |
| 1.0GHz – 2.9GHz                         | 2621            | -69.6       | -37.16   | 1               | 6.2               | 31.96     | -71.56                           |
| 2.9GHz – 6.4GHz                         | 3052            | -69.88      | -36.19   | 1.2             | 6.5               | 30.89     | -70.77                           |
| 6.4GHz – 12.5GHz                        | 11107           | -65.23      | -21.34   | 2.5             | 12.2              | 11.64     | -46.87                           |
| 12.5G – 18GHz                           | 25060           | -60.45      | -35.68   | 3               | 20                | 18.68     | -49.13                           |
| 17.6G – 26.7GHz                         | 24091           | -60.34      | -30.03   | 3               | 20                | 13.03     | -43.37                           |
| 26.7G – 40.0GHz                         | 37040           | -49.28      | -16.91   | 3               | 20                | 0.09      | -19.37                           |

| Vertically Polarized: 0.25usec/1700Hz |                 |             |         |                 |                   |           |                                 |
|---------------------------------------|-----------------|-------------|---------|-----------------|-------------------|-----------|---------------------------------|
| Range                                 | Frequency [MHz] | level [dBm] | Pg [dB] | Cable Loss [dB] | Antenna Gain [dB] | Pd  [dBm] | Radiated spurious emission [dB] |
| 10kHz – 100MHz                        | 60.67           | -78.95      | -66.19  | 0.5             | -0.35             | 67.04     | -115.99                         |
| 100MHz – 200MHz                       | 105.3           | -78.33      | -60.11  | 0.5             | 1.68              | 58.93     | -107.26                         |
| 200MHz – 300MHz                       | 240             | -89.17      | -59.36  | 0.5             | 1.38              | 58.48     | -117.65                         |
| 300MHz – 400MHz                       | 375             | -87.05      | -66.43  | 0.5             | 3.16              | 63.77     | -120.82                         |
| 400MHz – 500MHz                       | 433.8           | -86.06      | -65.48  | 0.5             | 3.26              | 62.72     | -118.78                         |
| 500MHz – 600MHz                       | 501             | -90.94      | -68.49  | 0.5             | 2.86              | 66.13     | -127.07                         |
| 600MHz – 700MHz                       | 625             | -91.79      | -67.24  | 0.5             | 2.46              | 65.28     | -127.07                         |
| 700MHz – 800MHz                       | 799.7           | -91.85      | -64.07  | 0.5             | 2.86              | 61.71     | -123.56                         |
| 800MHz – 900MHz                       | 836.5           | -91.27      | -65.59  | 0.5             | 3.16              | 62.93     | -124.20                         |
| 900MHz – 1.0GHz                       | 914             | -92.16      | -65.68  | 0.5             | 2.76              | 63.42     | -125.58                         |
| 1.0GHz – 2.9GHz                       | 2624            | -69.4       | -37.17  | 1               | 6.2               | 31.97     | -71.37                          |
| 2.9GHz – 6.4GHz                       | 3098            | -67.92      | -34.62  | 1.2             | 6.5               | 29.32     | -67.24                          |
| 6.4GHz – 12.5GHz                      | 11229           | -65.72      | -20.16  | 2.5             | 12.2              | 10.46     | -46.18                          |
| 12.5G – 18GHz                         | 15365           | -63.15      | -13.9   | 3               | 20                | 3.10      | -36.25                          |
| 17.6G – 26.7GHz                       | 24804           | -60.46      | -29.95  | 3               | 20                | 12.95     | -43.41                          |
| 26.7G – 40.0GHz                       | 36990           | -50.19      | -17.29  | 3               | 20                | 0.29      | -20.48                          |

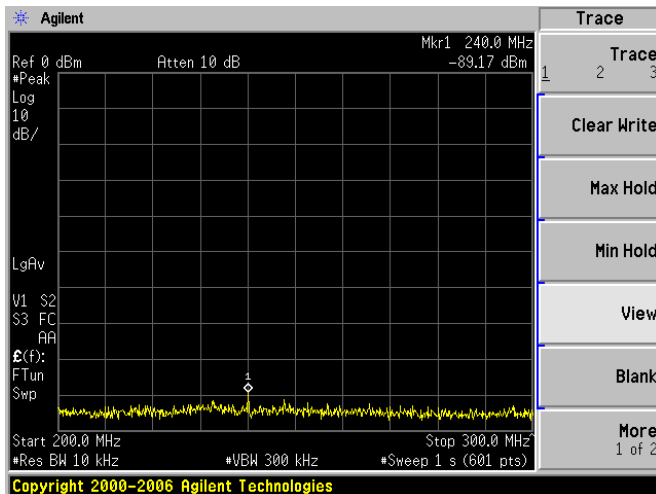
•Horizontally Polarized



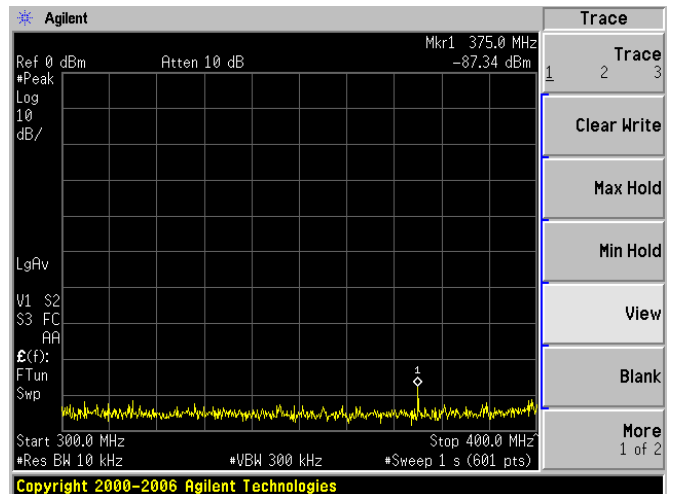
10kHz to 100MHz



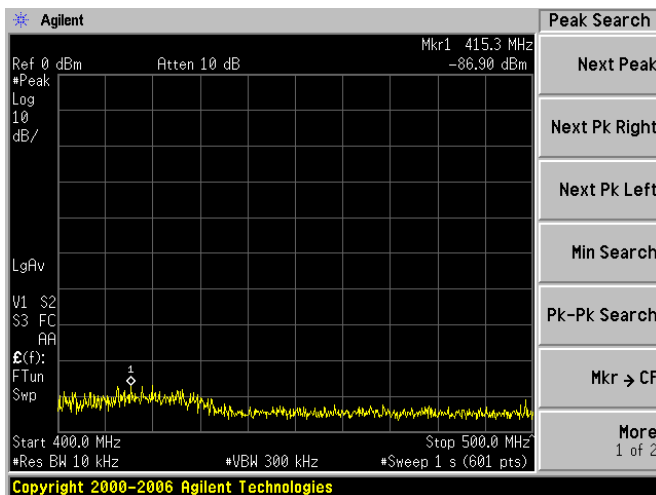
100MHz to 200MHz



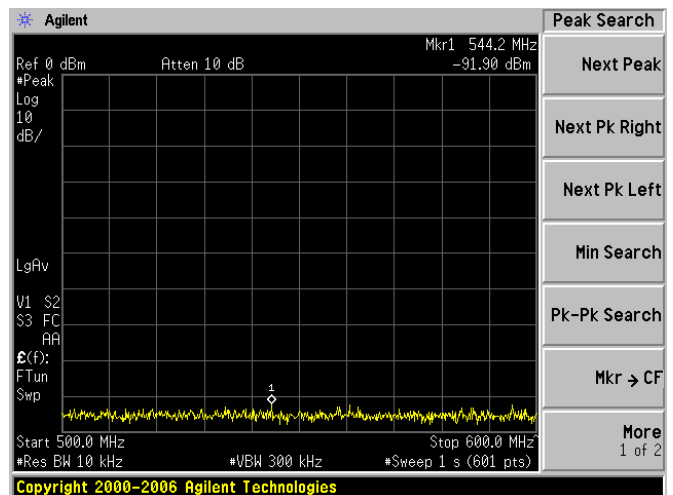
200MHz to 300MHz



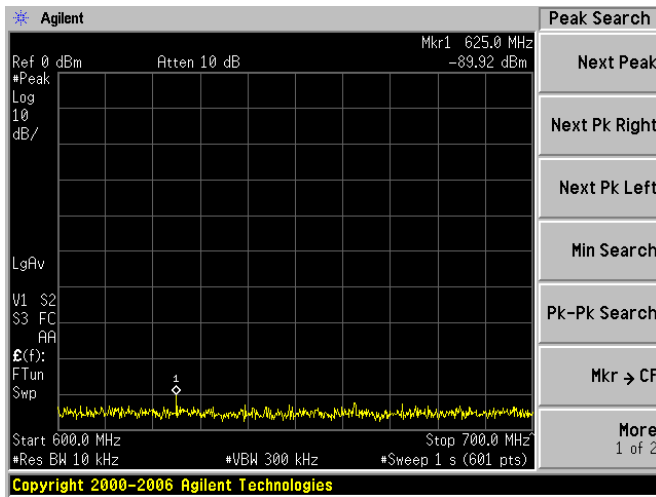
300MHz to 400MHz



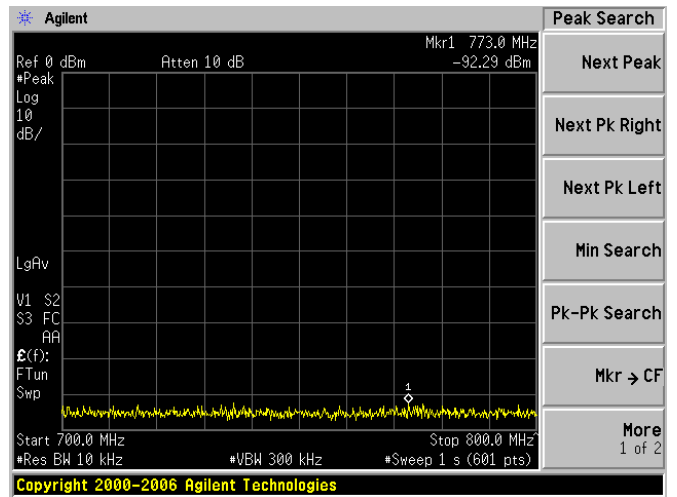
400MHz to 500MHz



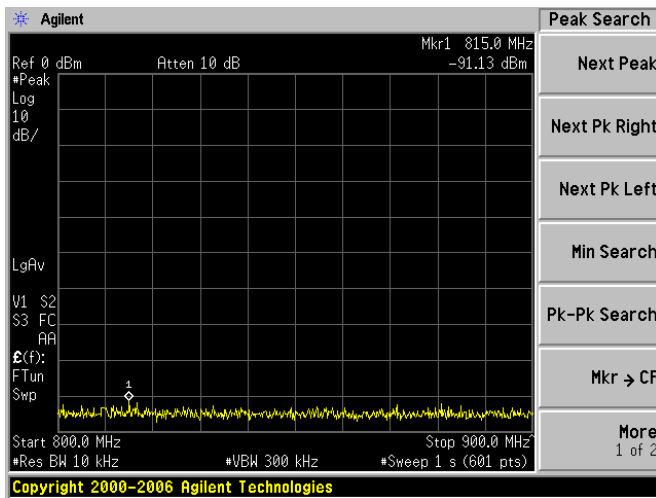
500MHz to 600MHz



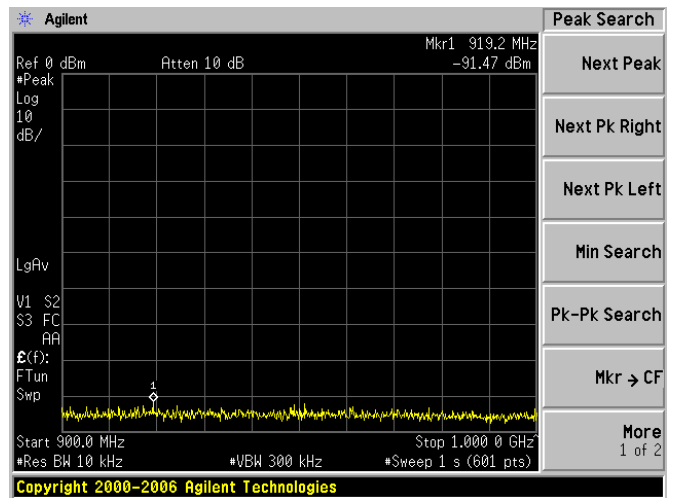
600MHz to 700MHz



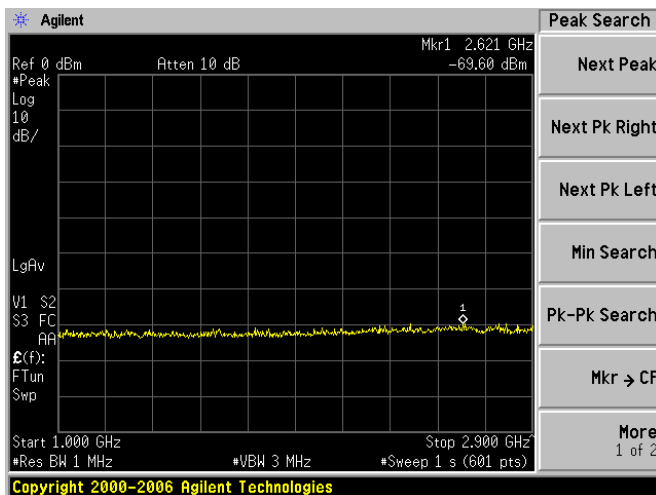
700MHz to 800MHz



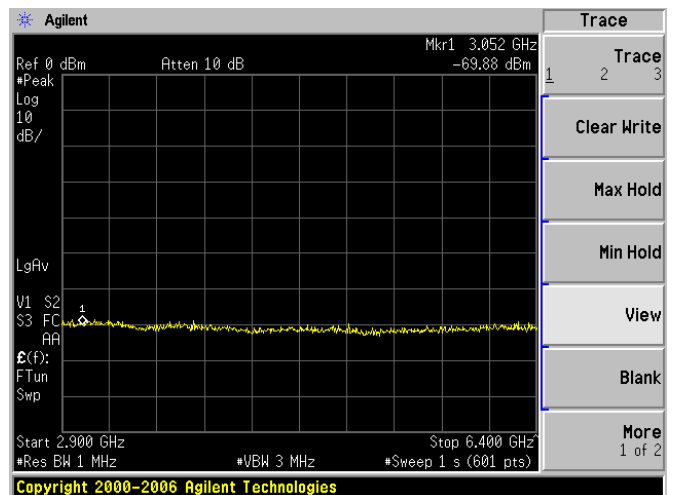
800MHz to 900MHz



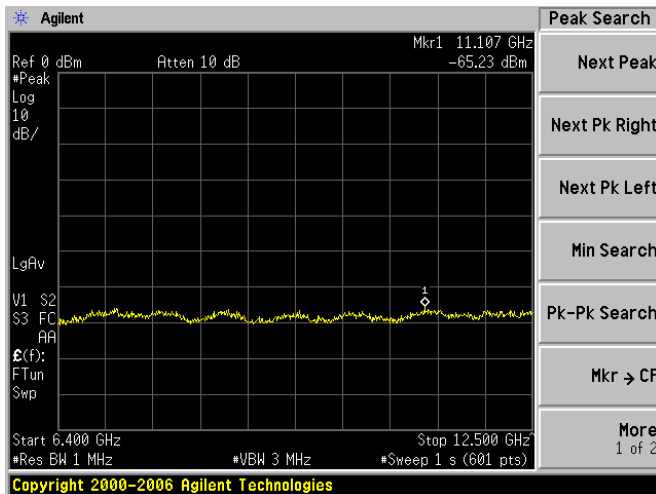
900MHz to 1GHz



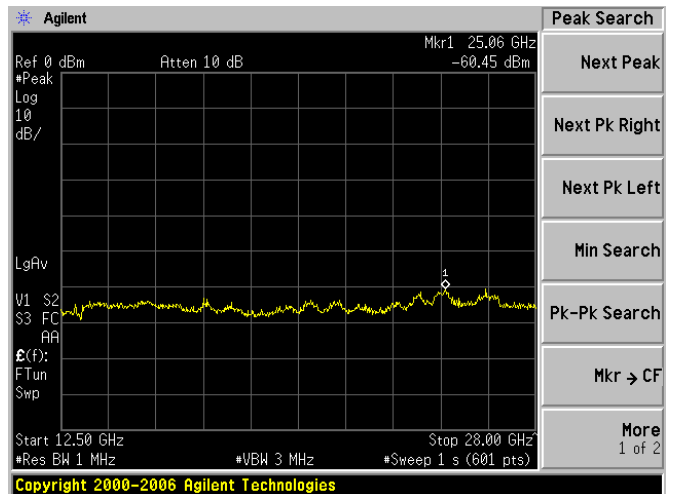
1GHz to 2.9GHz



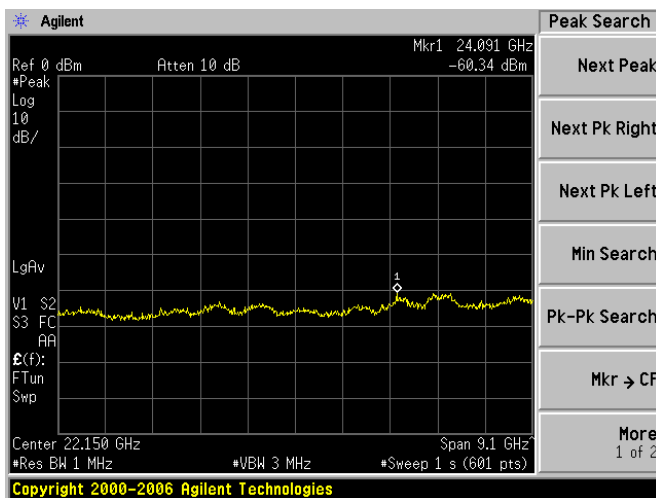
2.9GHz to 6.4GHz



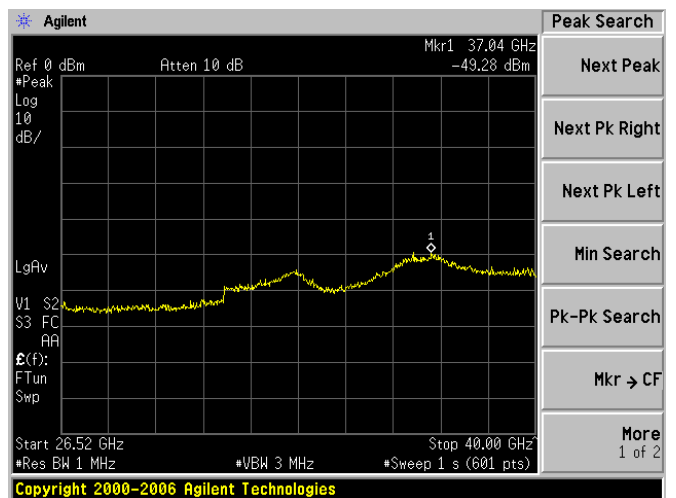
6.4GHz to 12.5GHz



12.5GHz to 28GHz

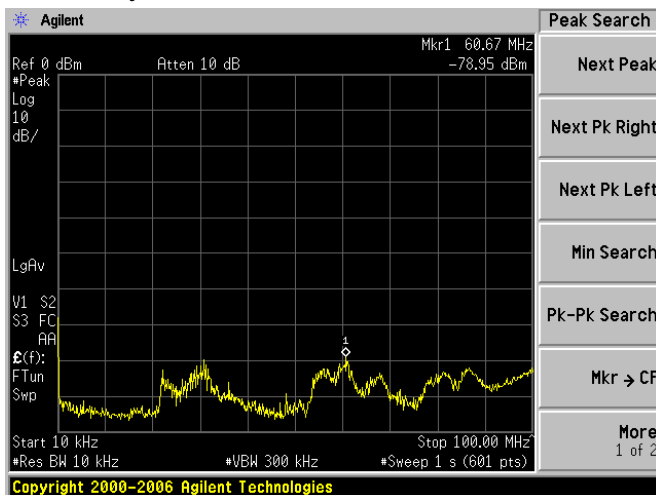


17.6GHz to 26.7GHz

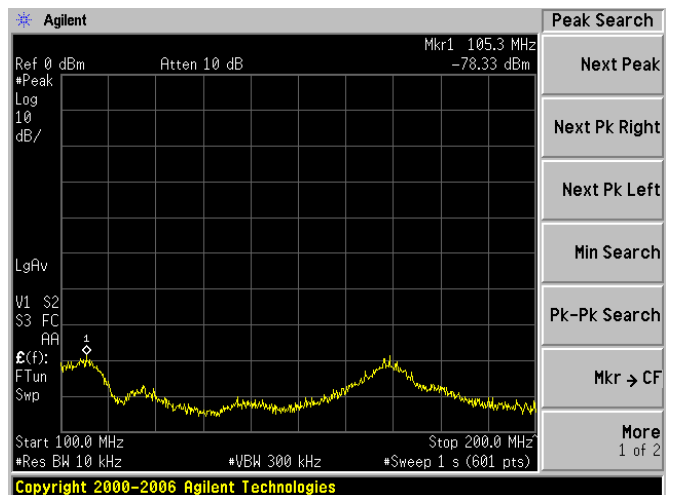


26.5GHz to 40.0GHz

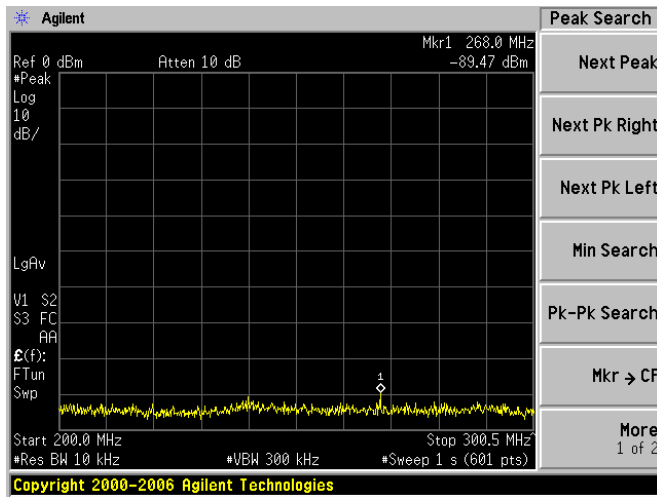
•Vertically Polarized



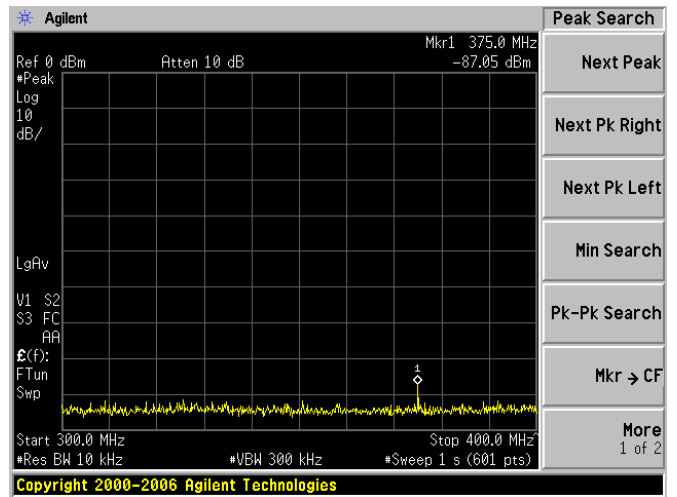
10kHz to 100MHz



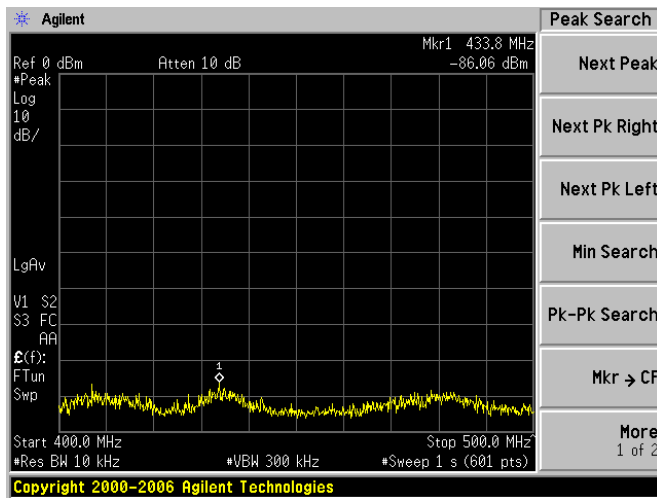
100MHz to 200MHz



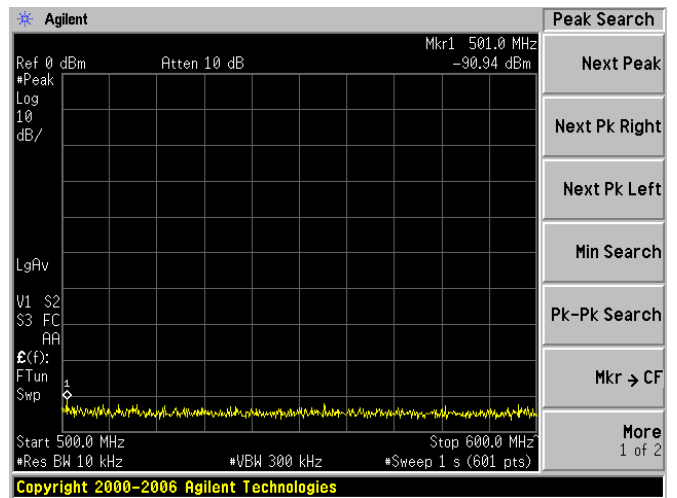
200MHz to 300MHz



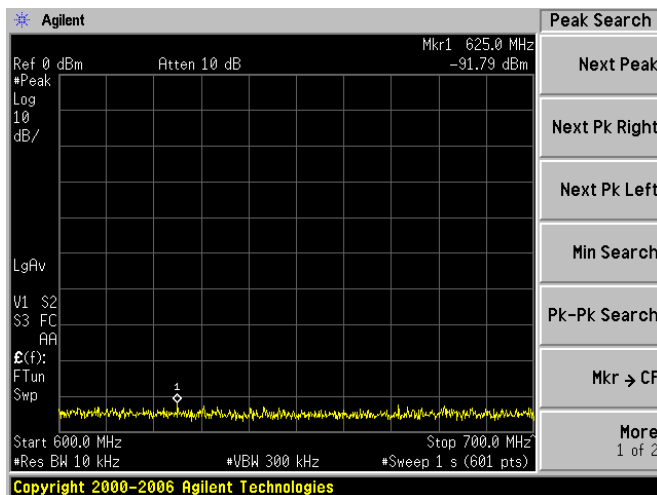
300MHz to 400MHz



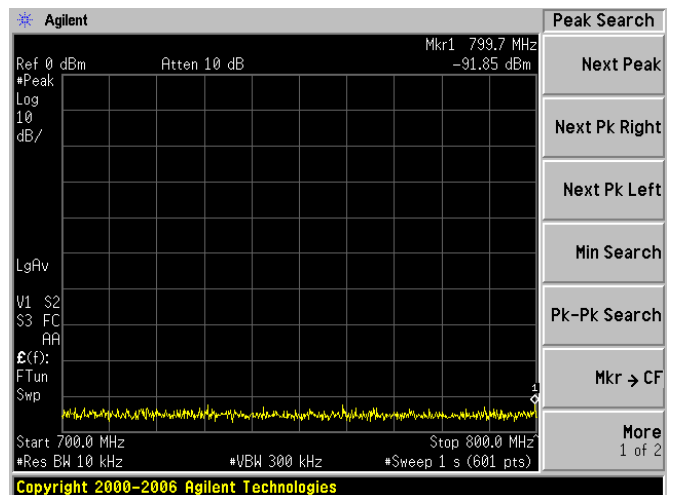
400MHz to 500MHz



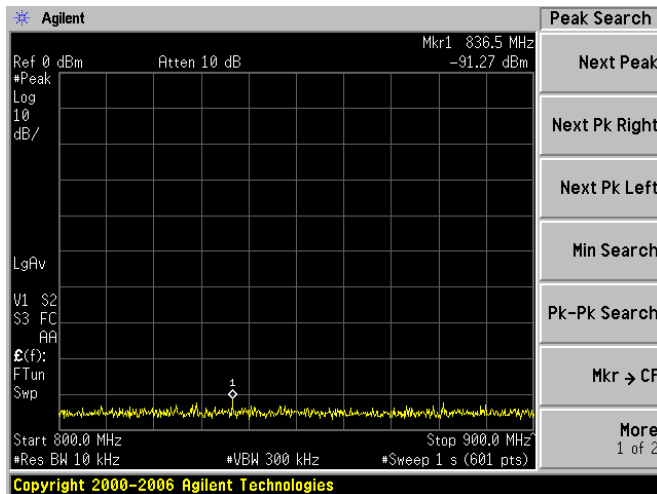
500MHz to 600MHz



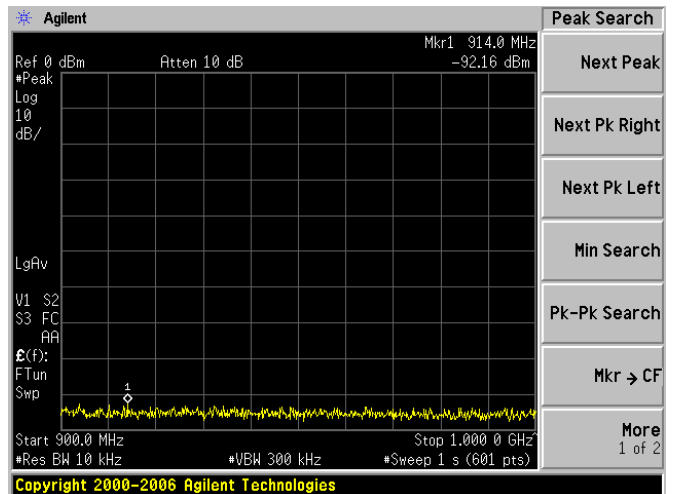
600MHz to 700MHz



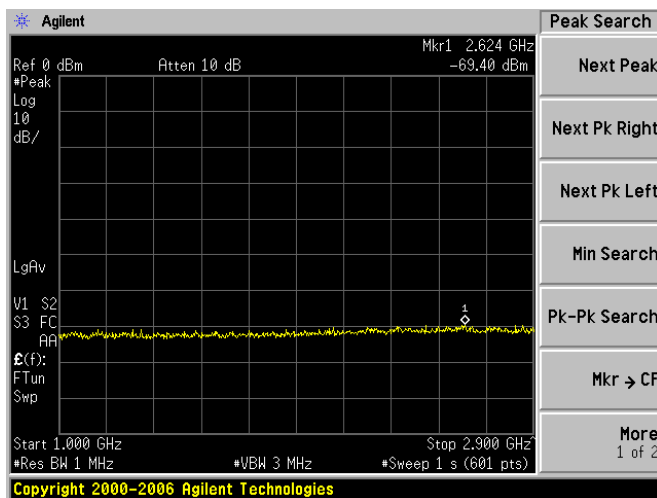
700MHz to 800MHz



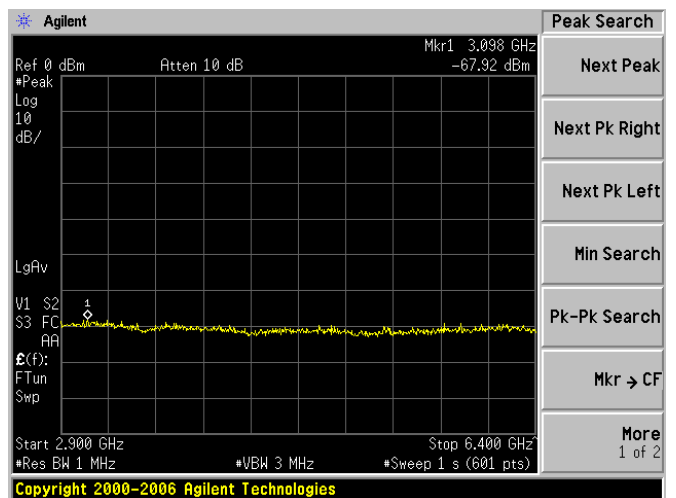
800MHz to 900MHz



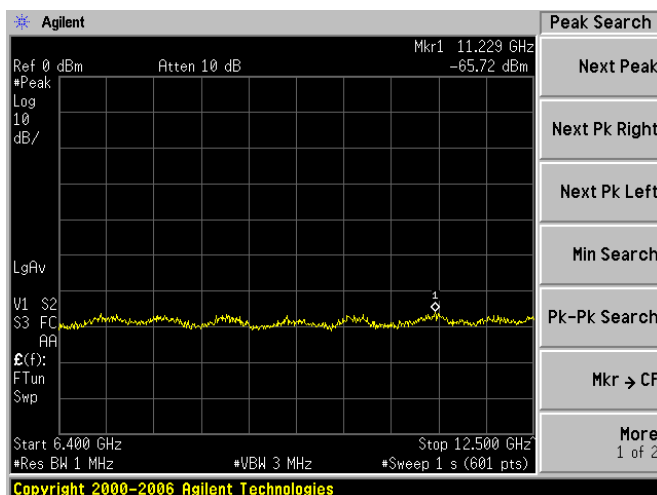
900MHz to 1GHz



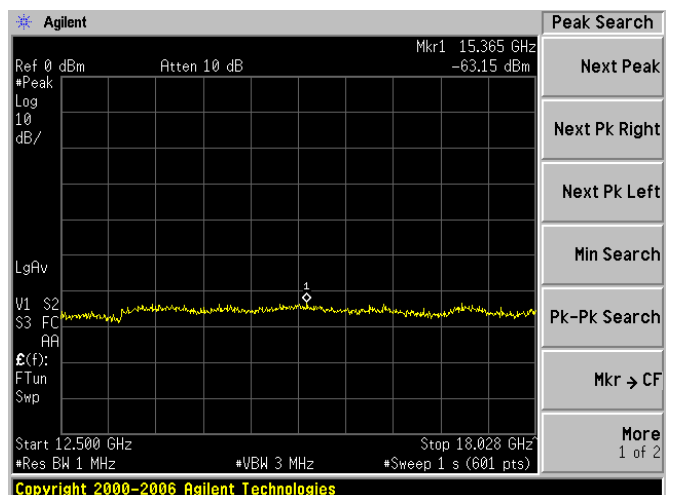
1GHz to 2.9GHz



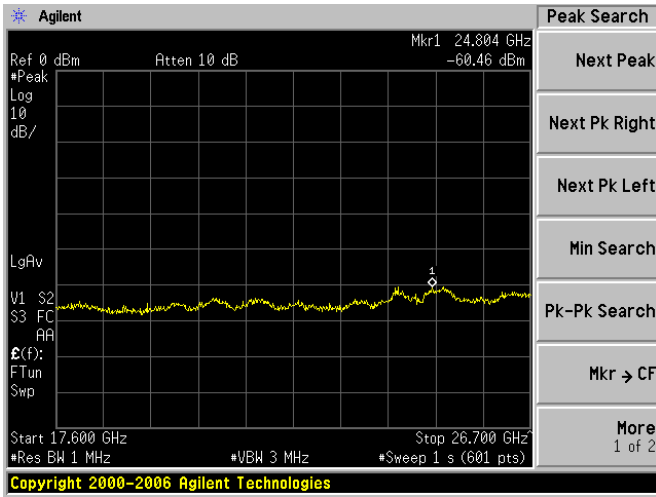
2.9GHz 6.4GHz



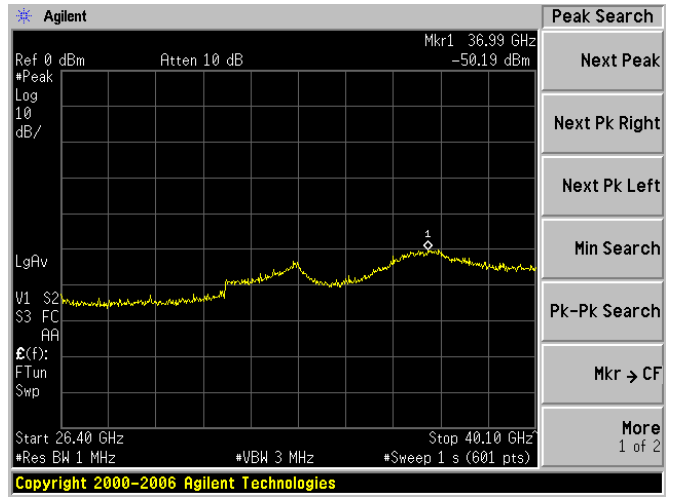
6.4GHz to 12.5GHz



12.5GHz to 18.0GHz



17.6GHz to 26.7GHz



26.4GHz to 40GHz

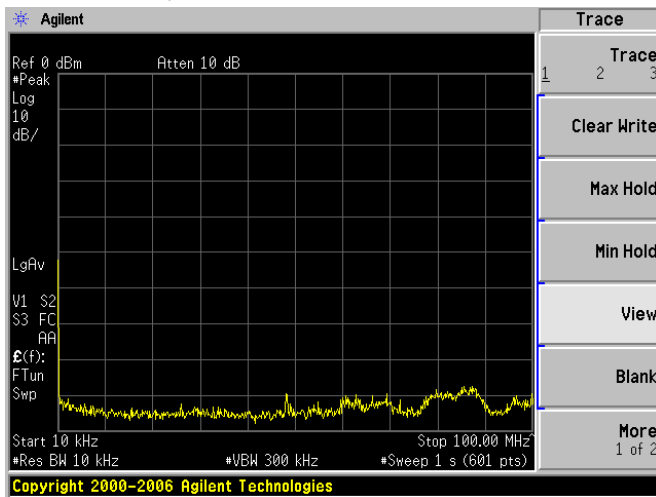


4.4.10.5 TEST RESULTS of 0.5usec/1200Hz

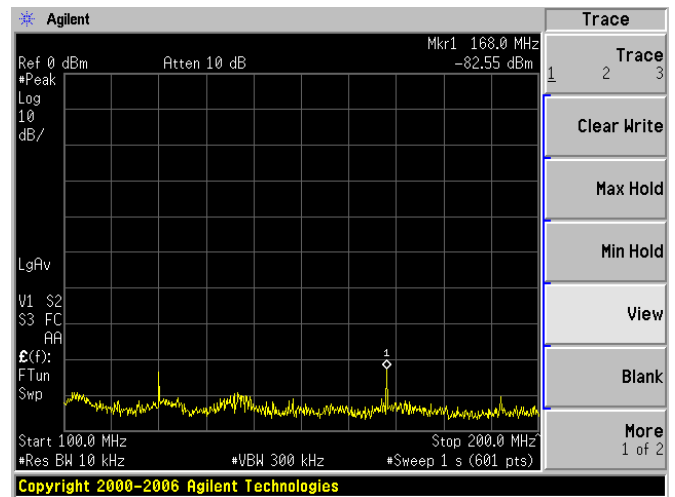
| Horizontally Polarized: 0.5usec/1200Hz |                 |             |          |                 |                   |           |                                  |
|--|-----------------|-------------|----------|-----------------|-------------------|-----------|----------------------------------|
| Range                                  | Frequency [MHz] | level [dBm] | Pg [dBm] | Cable Loss [dB] | Antenna Gain [dB] | Pd  [dBm] | Radiated spurious emission [dBm] |
| 10kHz – 100MHz                         | 85.5            | -87.4       | -75.95   | 0.5             | -0.35             | 76.80     | -134.20                          |
| 100MHz – 200MHz                        | 168             | -82.55      | -66.36   | 0.5             | 1.68              | 65.18     | -117.73                          |
| 200MHz – 300MHz                        | 240             | -89.53      | -59.72   | 0.5             | 1.38              | 58.84     | -118.37                          |
| 300MHz – 400MHz                        | 375             | -89.03      | -67.72   | 0.5             | 3.16              | 65.06     | -124.09                          |
| 400MHz – 500MHz                        | 413.5           | -86.67      | -66.26   | 0.5             | 3.26              | 63.50     | -120.17                          |
| 500MHz – 600MHz                        | 513             | -91.78      | -69.73   | 0.5             | 3.06              | 67.17     | -128.95                          |
| 600MHz – 700MHz                        | 625             | -90.61      | -67.86   | 0.5             | 2.46              | 65.90     | -126.51                          |
| 700MHz – 800MHz                        | 751.2           | -91.05      | -66.15   | 0.5             | 2.66              | 63.99     | -125.04                          |
| 800MHz – 900MHz                        | 894             | -91.29      | -61.91   | 0.5             | 2.86              | 59.55     | -120.84                          |
| 900MHz – 1.0GHz                        | 926             | -91.25      | -63.58   | 0.5             | 2.86              | 61.22     | -122.47                          |
| 1.0GHz – 2.9GHz                        | 2621            | -70.43      | -37.99   | 1               | 6.2               | 32.79     | -73.22                           |
| 2.9GHz – 6.4GHz                        | 3203            | -68.08      | -35      | 1.2             | 6.5               | 29.70     | -67.78                           |
| 6.4GHz – 12.5GHz                       | 7813            | -65.26      | -25.73   | 2               | 12.2              | 15.53     | -50.79                           |
| 12.5G – 18GHz                          | 25000           | -60.73      | -34.82   | 3               | 20                | 17.82     | -48.55                           |
| 17.6G – 26.7GHz                        | 25032           | -60.59      | -28.56   | 3               | 20                | 11.56     | -42.15                           |
| 26.7G – 40.0GHz                        | 37060           | -49.77      | -16.76   | 3               | 20                | 0.24      | -20.01                           |

| Vertically Polarized: 0.5usec/1200Hz |                 |             |         |                 |                   |           |                                 |
|--------------------------------------|-----------------|-------------|---------|-----------------|-------------------|-----------|---------------------------------|
| Range                                | Frequency [MHz] | level [dBm] | Pg [dB] | Cable Loss [dB] | Antenna Gain [dB] | Pd  [dBm] | Radiated spurious emission [dB] |
| 10kHz – 100MHz                       | 60.84           | -78.4       | -65.75  | 0.5             | -0.35             | 66.60     | -115.00                         |
| 100MHz – 200MHz                      | 105.3           | -81.11      | -62.89  | 0.5             | 1.68              | 61.71     | -112.82                         |
| 200MHz – 300MHz                      | 219.3           | -89.51      | -67.77  | 0.5             | 1.38              | 66.89     | -126.40                         |
| 300MHz – 400MHz                      | 375             | -86.07      | -65.45  | 0.5             | 3.16              | 62.79     | -118.86                         |
| 400MHz – 500MHz                      | 476.5           | -87.29      | -65.4   | 0.5             | 3.26              | 62.64     | -119.93                         |
| 500MHz – 600MHz                      | 513.7           | -91.96      | -69.19  | 0.5             | 3.06              | 66.63     | -128.59                         |
| 600MHz – 700MHz                      | 639.2           | -92         | -67.38  | 0.5             | 2.46              | 65.42     | -127.42                         |
| 700MHz – 800MHz                      | 745.2           | -92.5       | -66.04  | 0.5             | 2.66              | 63.88     | -126.38                         |
| 800MHz – 900MHz                      | 814.7           | -91.61      | -65.03  | 0.5             | 2.86              | 62.67     | -124.28                         |
| 900MHz – 1.0GHz                      | 902.5           | -91.63      | -64.88  | 0.5             | 2.86              | 62.52     | -124.15                         |
| 1.0GHz – 2.9GHz                      | 2852            | -69.36      | -36.65  | 1               | 6.2               | 31.45     | -70.81                          |
| 2.9GHz – 6.4GHz                      | 3300            | -67.88      | -34.63  | 1.2             | 6.5               | 29.33     | -67.21                          |
| 6.4GHz – 12.5GHz                     | 12500           | -65.77      | -15.17  | 2               | 12.2              | 4.97      | -40.74                          |
| 12.5G – 18GHz                        | 15485           | -63.3       | -14.42  | 3               | 20                | 2.58      | -35.88                          |
| 17.6G – 26.7GHz                      | 25016           | -59.56      | -28.3   | 3               | 20                | 11.30     | -40.86                          |
| 26.7G – 40.0GHz                      | 37220           | -49.79      | -16.35  | 3               | 20                | 0.65      | -20.44                          |

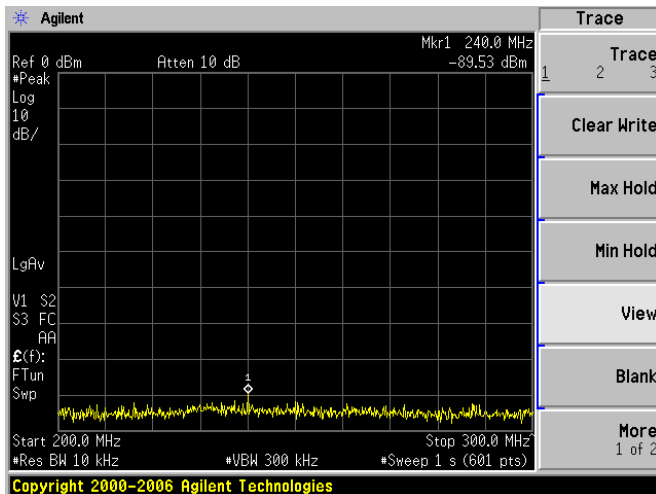
•Horizontally Polarized



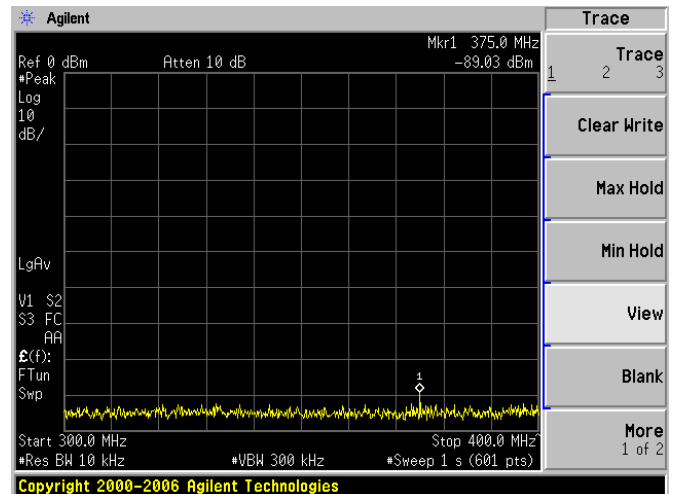
10kHz to 100MHz



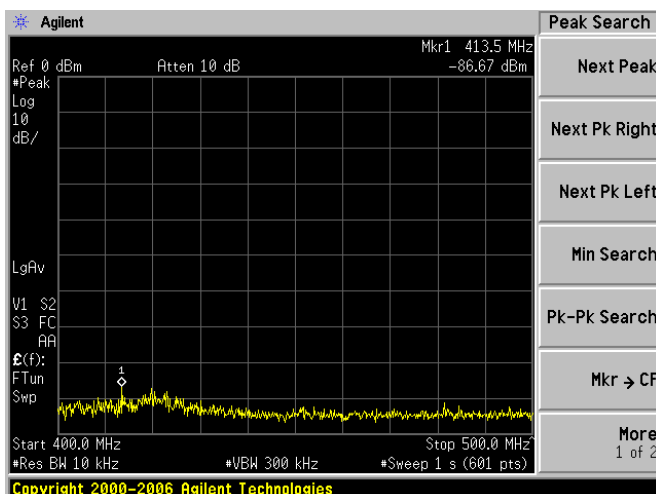
100MHz to 200MHz



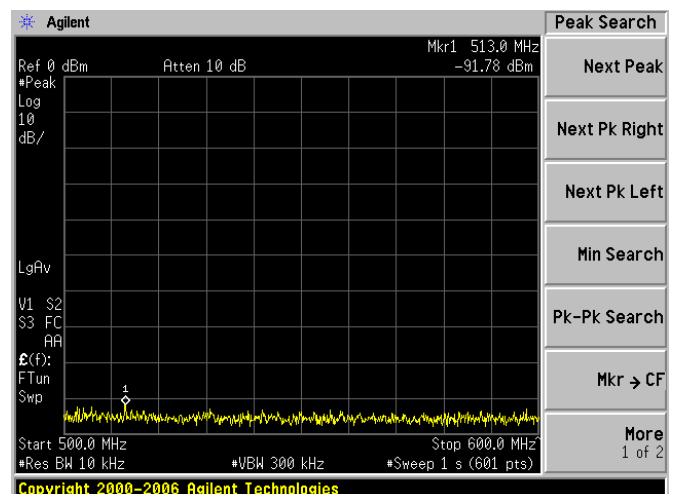
200MHz to 300MHz



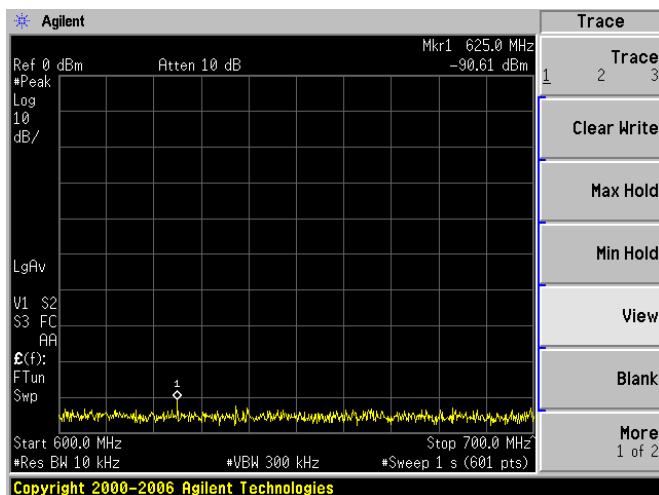
300MHz to 400MHz



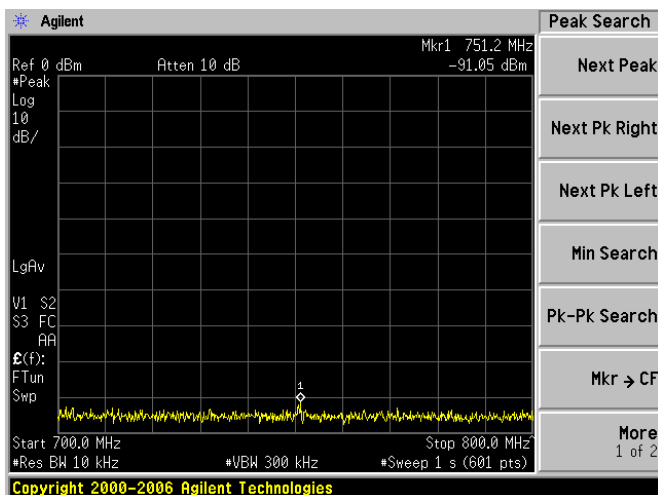
400MHz to 500MHz



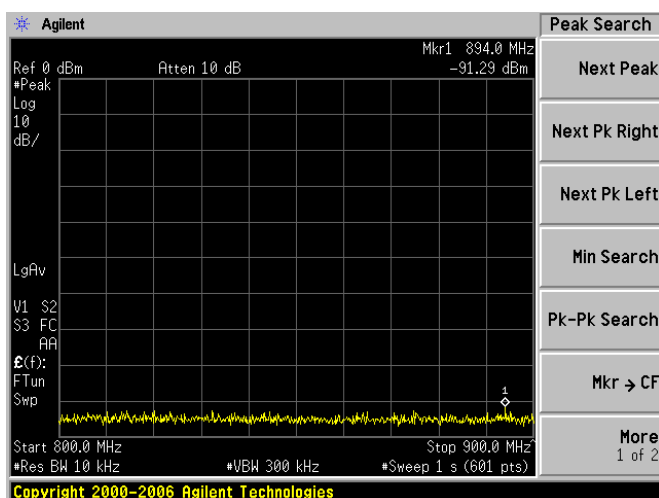
500MHz to 600MHz



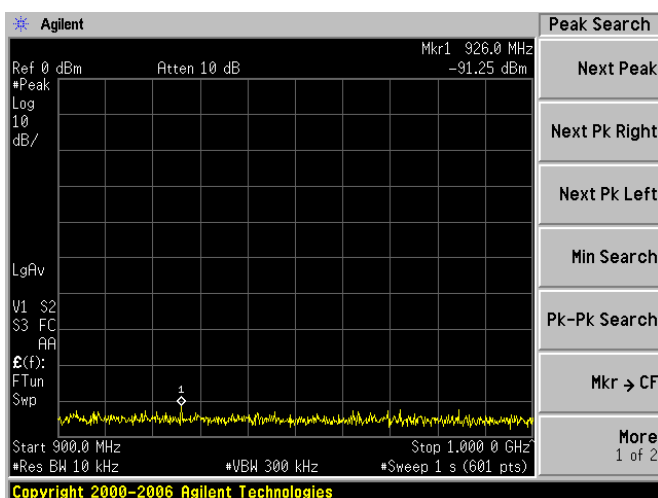
600MHz to 700MHz



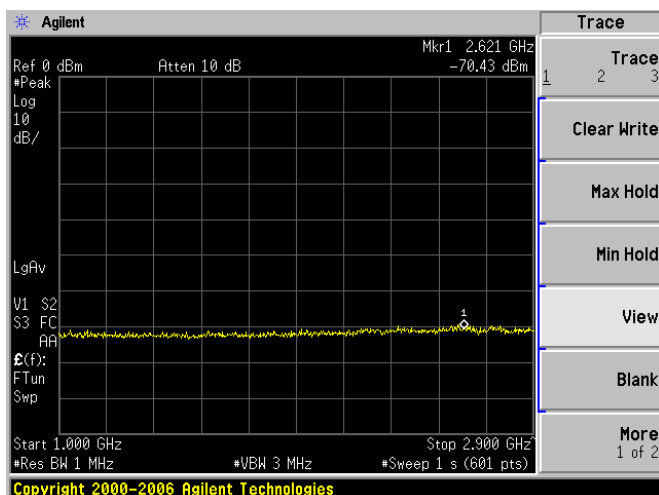
700MHz to 800MHz



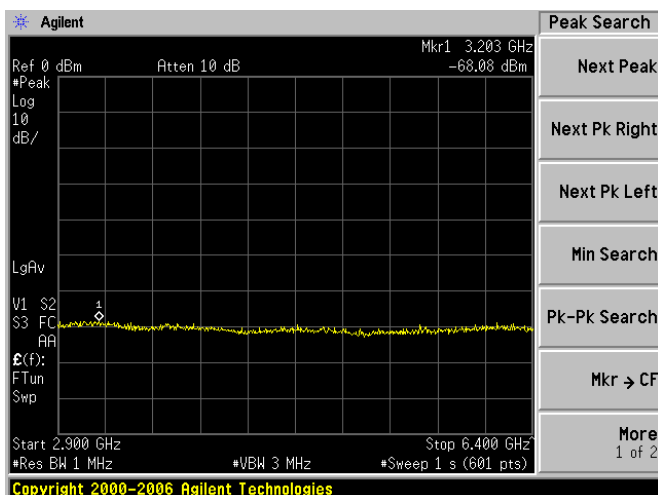
800MHz to 900MHz



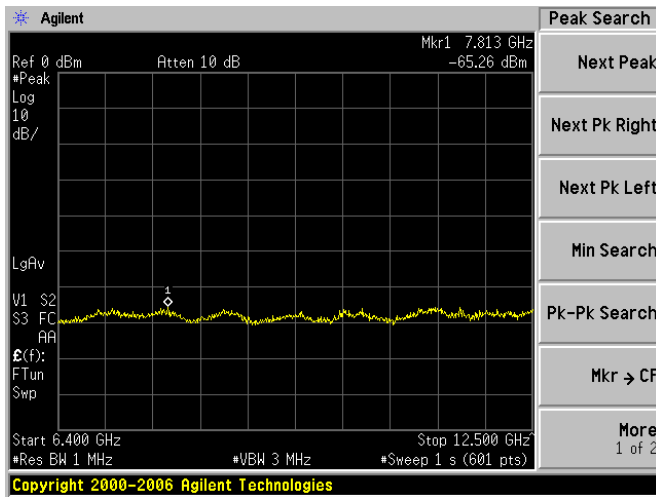
900MHz to 1GHz



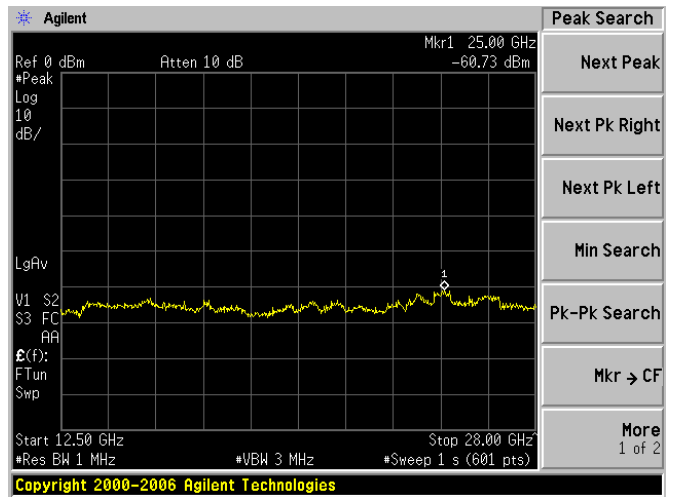
1GHz to 2.9GHz



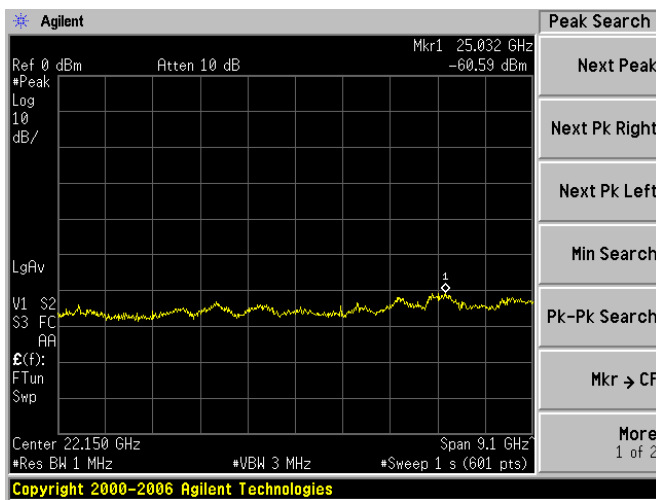
2.9GHz to 6.4GHz



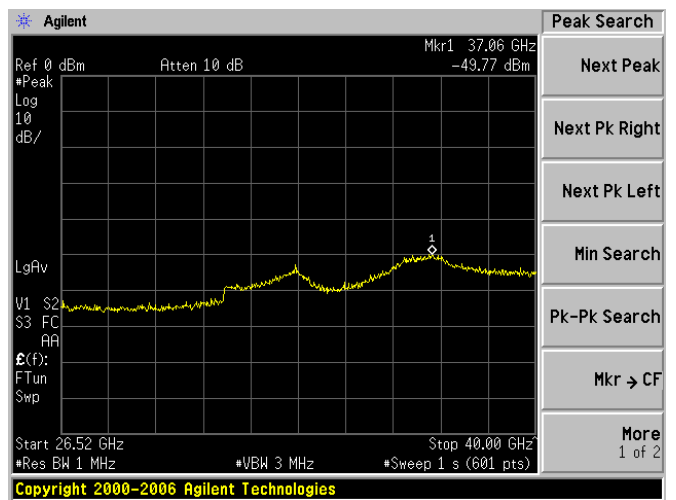
6.4GHz to 12.5GHz



12.5GHz to 28GHz

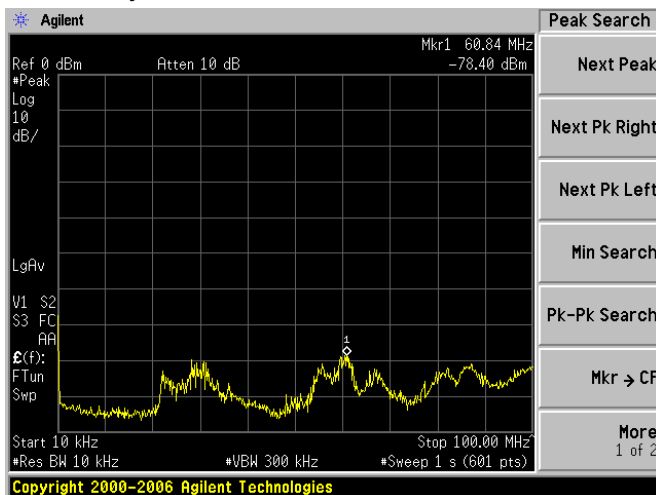


17.6GHz to 26.7GHz

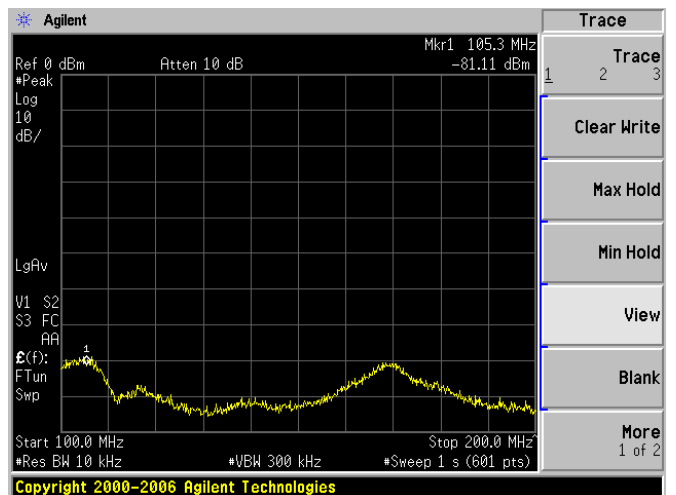


26.5GHz to 40.0GHz

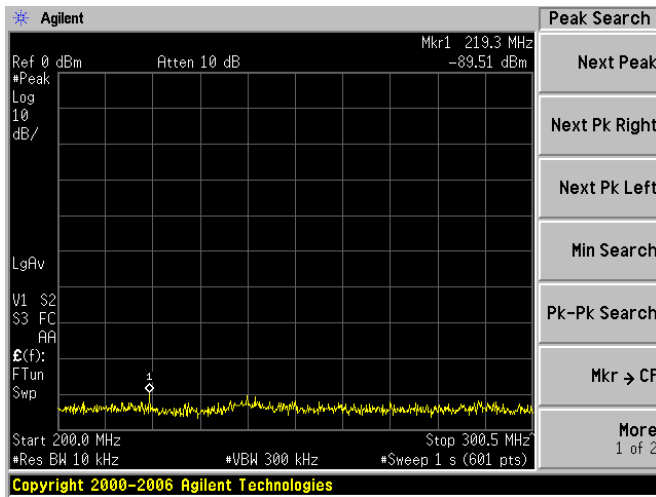
•Vertically Polarized



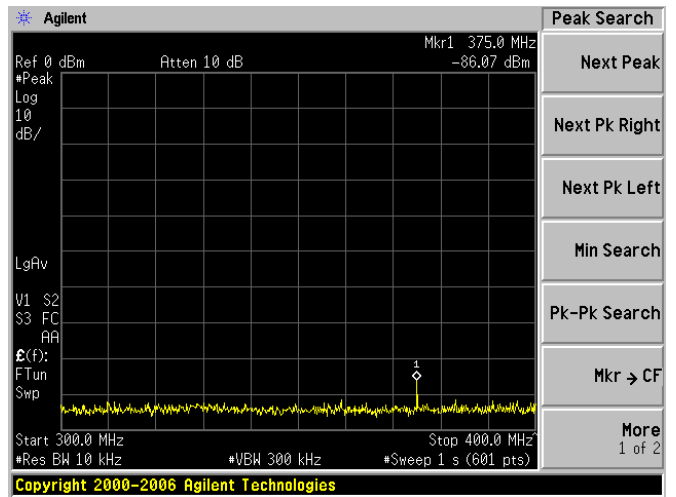
10kHz to 100MHz



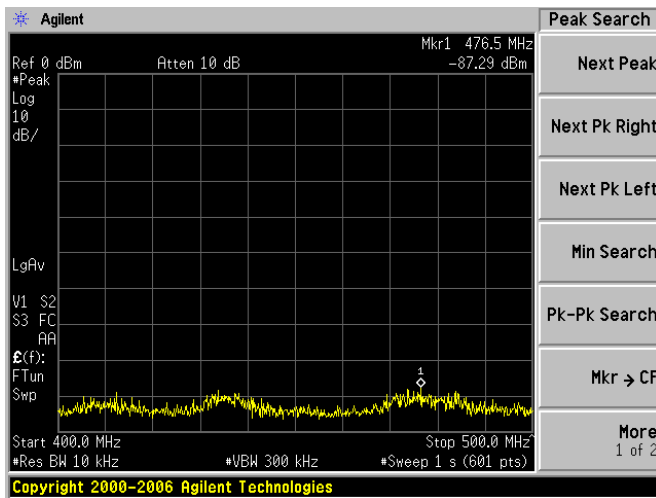
100MHz to 200MHz



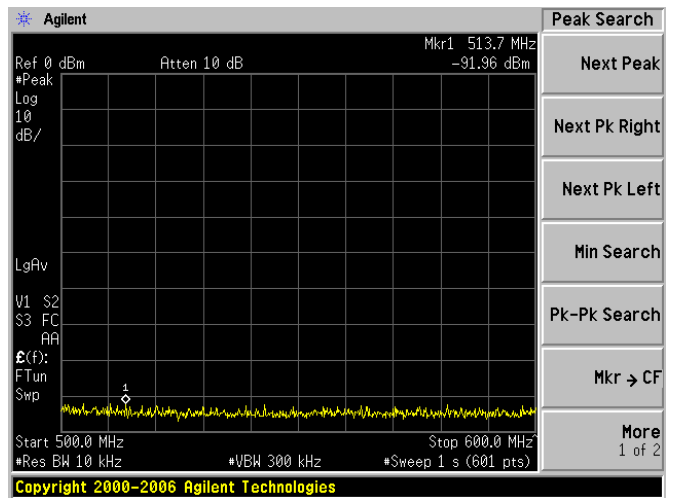
200MHz to 300MHz



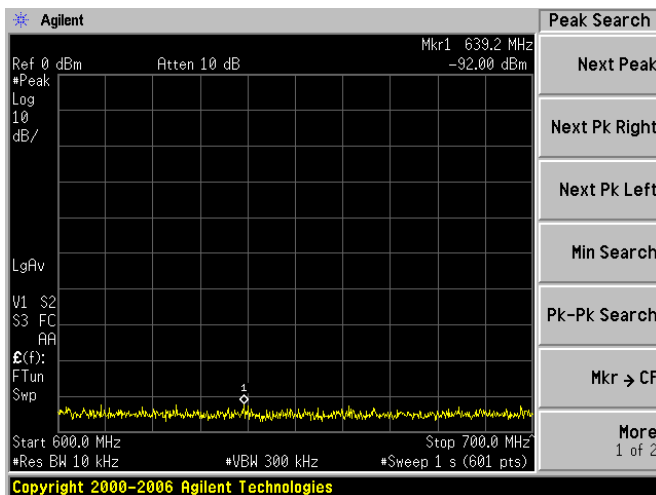
300MHz to 400MHz



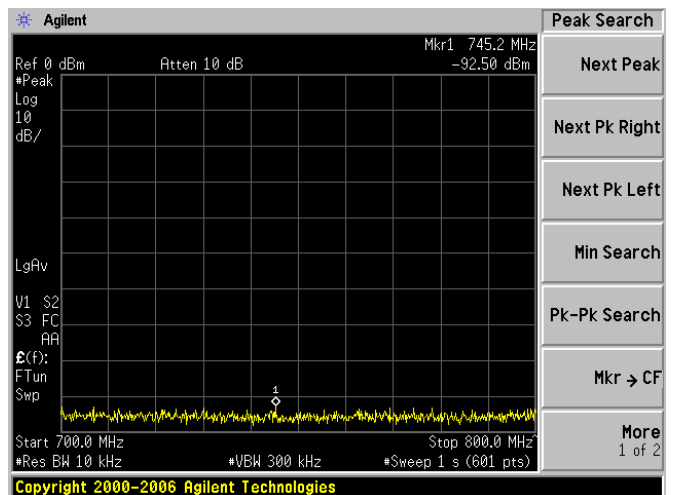
400MHz to 500MHz



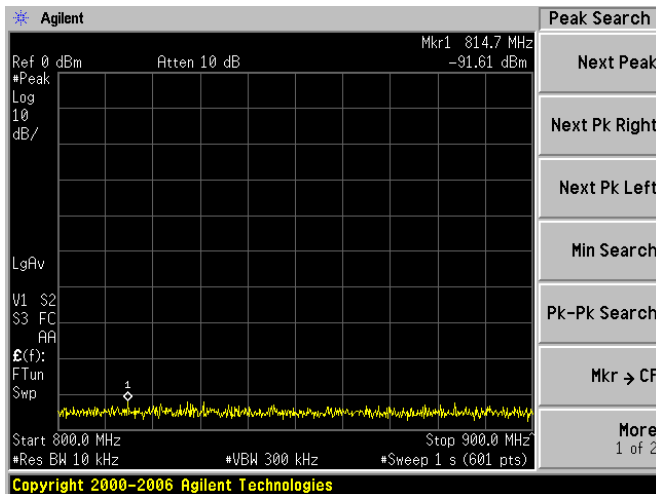
500MHz to 600MHz



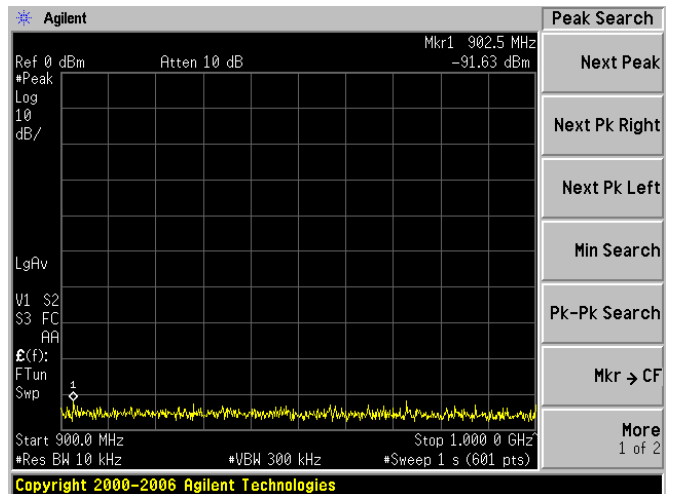
600MHz to 700MHz



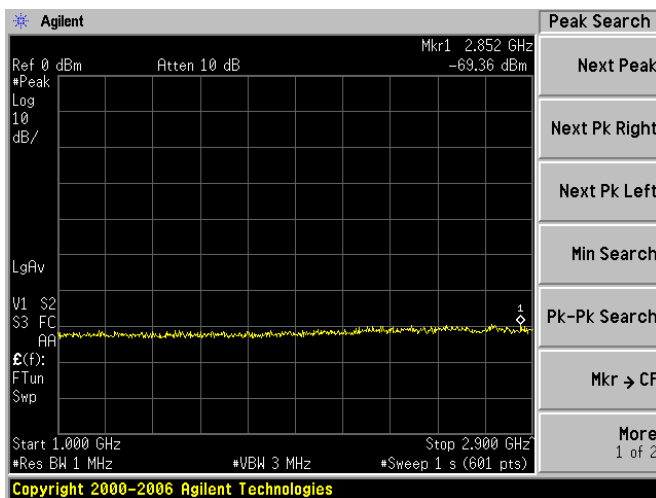
700MHz to 800MHz



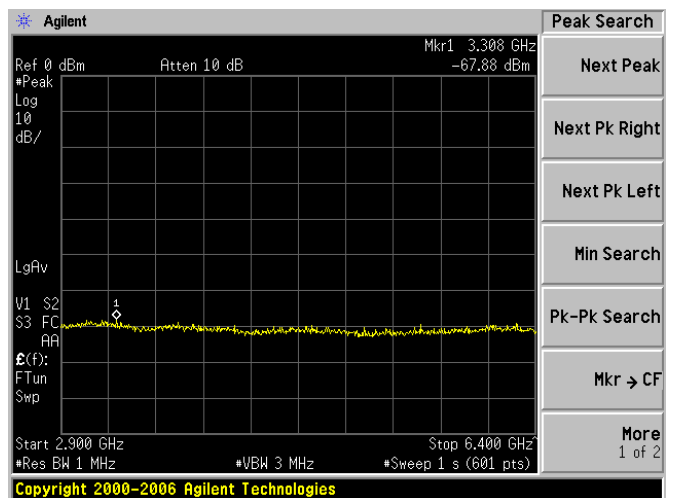
800MHz to 900MHz



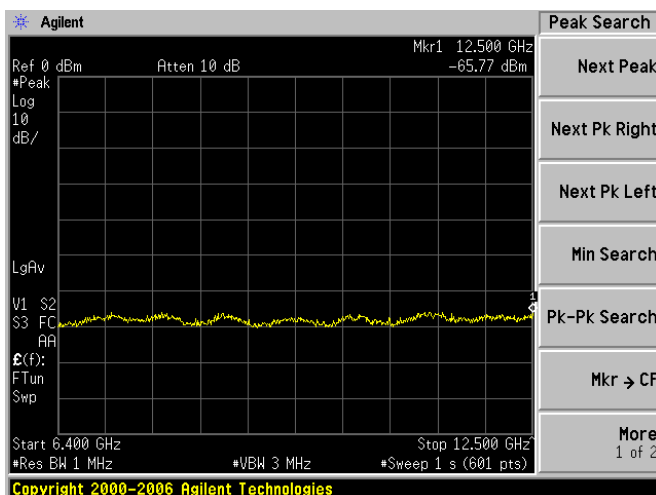
900MHz to 1GHz



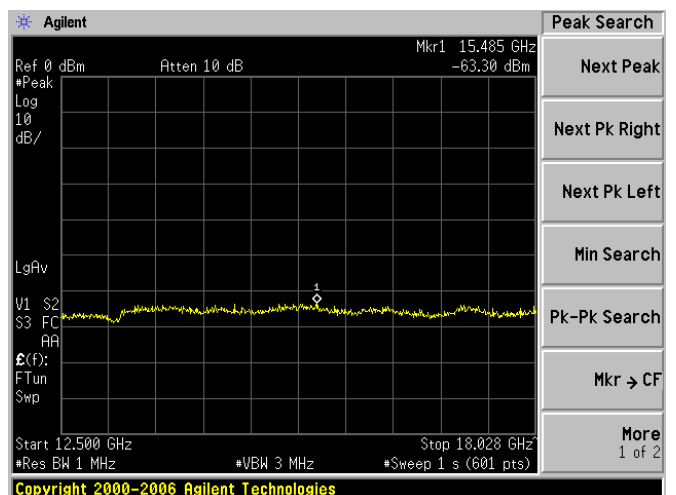
1GHz to 2.9GHz



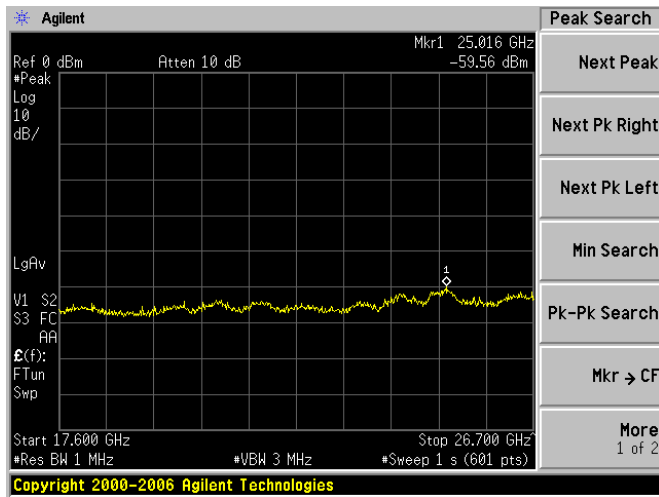
2.9GHz 6.4GHz



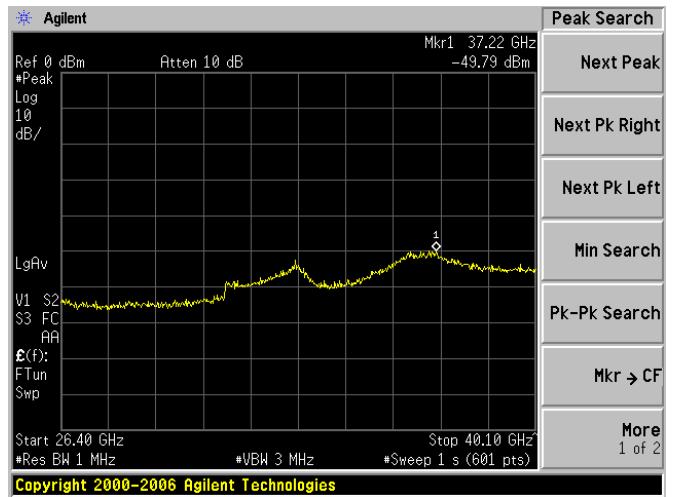
6.4GHz to 12.5GHz



12.5GHz to 18.0GHz



17.6GHz to 26.7GHz



26.4GHz to 40GHz

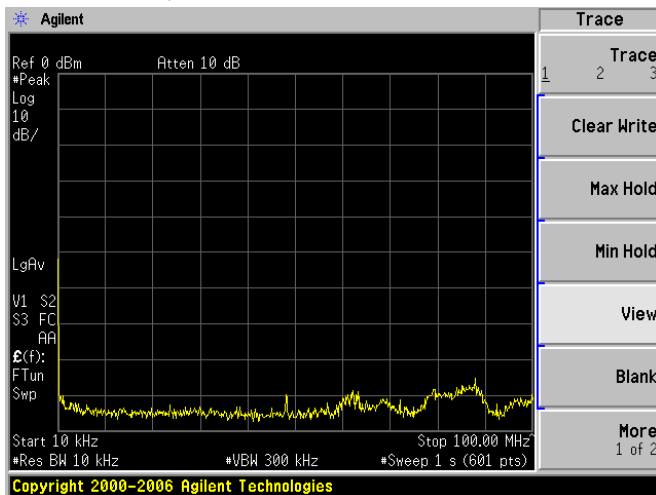
4.4.10.6 TEST RESULTS of 1.0usec/650Hz

| Horizontally Polarized: 1.0usec/650Hz |                 |             |          |                 |                   |           |                                  |
|---------------------------------------|-----------------|-------------|----------|-----------------|-------------------|-----------|----------------------------------|
| Range                                 | Frequency [MHz] | level [dBm] | Pg [dBm] | Cable Loss [dB] | Antenna Gain [dB] | Pd  [dBm] | Radiated spurious emission [dBm] |
| 10kHz – 100MHz                        | 87.67           | -84.9       | -73.2    | 0.5             | -0.35             | 74.05     | -128.95                          |
| 100MHz – 200MHz                       | 168             | -84.81      | -68.62   | 0.5             | 1.68              | 67.44     | -122.25                          |
| 200MHz – 300MHz                       | 240             | -90.02      | -60.21   | 0.5             | 1.38              | 59.33     | -119.35                          |
| 300MHz – 400MHz                       | 375             | -86.35      | -65.04   | 0.5             | 3.16              | 62.38     | -118.73                          |
| 400MHz – 500MHz                       | 426.7           | -89.25      | -70.07   | 0.5             | 3.16              | 67.41     | -126.66                          |
| 500MHz – 600MHz                       | 512             | -91.7       | -69.62   | 0.5             | 3.06              | 67.06     | -128.76                          |
| 600MHz – 700MHz                       | 625             | -90.48      | -67.73   | 0.5             | 2.46              | 65.77     | -126.25                          |
| 700MHz – 800MHz                       | 789.3           | -92.1       | -63.95   | 0.5             | 2.86              | 61.59     | -123.69                          |
| 800MHz – 900MHz                       | 823.8           | -91.98      | -67      | 0.5             | 3.26              | 64.24     | -126.22                          |
| 900MHz – 1.0GHz                       | 952             | -91.73      | -66.46   | 0.5             | 2.96              | 64.00     | -125.73                          |
| 1.0GHz – 2.9GHz                       | 2764            | -69.34      | -38.14   | 1               | 6.2               | 32.94     | -72.28                           |
| 2.9GHz – 6.4GHz                       | 3133            | -68.19      | -35.1    | 1.2             | 6.5               | 29.80     | -67.99                           |
| 6.4GHz – 12.5GHz                      | 11138           | -64.93      | -21.16   | 2.5             | 12.2              | 11.46     | -46.39                           |
| 12.5G – 18GHz                         | 25030           | -60.46      | -35.45   | 3               | 20                | 18.45     | -48.91                           |
| 17.6G – 26.7GHz                       | 25001           | -60.57      | -27.72   | 3               | 20                | 10.72     | -41.29                           |
| 26.7G – 40.0GHz                       | 37350           | -49.14      | -16.43   | 3               | 20                | 0.57      | -19.71                           |

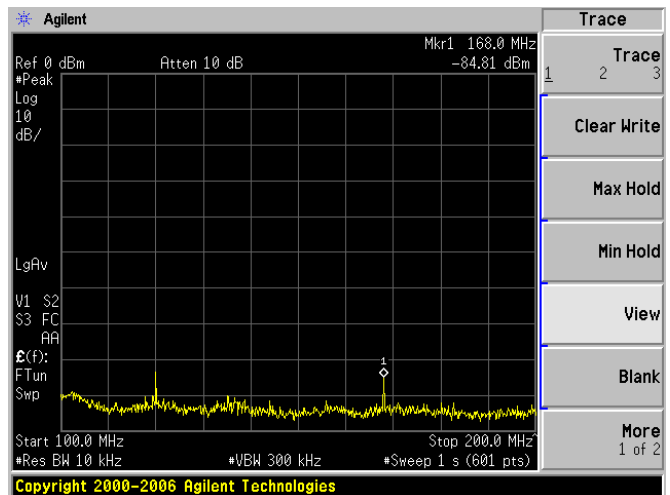
| Vertically Polarized: 1.0usec/650Hz |                 |             |         |                 |                   |           |                                 |
|-------------------------------------|-----------------|-------------|---------|-----------------|-------------------|-----------|---------------------------------|
| Range                               | Frequency [MHz] | level [dBm] | Pg [dB] | Cable Loss [dB] | Antenna Gain [dB] | Pd  [dBm] | Radiated spurious emission [dB] |
| 10kHz – 100MHz                      | 60.67           | -77.97      | -65.21  | 0.5             | -0.35             | 66.06     | -114.03                         |
| 100MHz – 200MHz                     | 104.5           | -77.11      | -59.26  | 0.5             | 1.68              | 58.08     | -105.19                         |
| 200MHz – 300MHz                     | 245.4           | -90.81      | -68.01  | 0.5             | 1.38              | 67.13     | -127.94                         |
| 300MHz – 400MHz                     | 375             | -86.65      | -86.27  | 0.5             | 3.16              | 83.61     | -140.26                         |
| 400MHz – 500MHz                     | 487.5           | -88.11      | -64.96  | 0.5             | 3.16              | 62.30     | -120.41                         |
| 500MHz – 600MHz                     | 513             | -91.87      | -69.11  | 0.5             | 3.06              | 66.55     | -128.42                         |
| 600MHz – 700MHz                     | 625             | -92.05      | -67.5   | 0.5             | 2.46              | 65.54     | -127.59                         |
| 700MHz – 800MHz                     | 700             | -92.26      | -64.29  | 0.5             | 2.86              | 61.93     | -124.19                         |
| 800MHz – 900MHz                     | 817             | -90.7       | -64.24  | 0.5             | 3.26              | 61.48     | -122.18                         |
| 900MHz – 1.0GHz                     | 920.2           | -92.1       | -65.81  | 0.5             | 2.96              | 63.35     | -125.45                         |
| 1.0GHz – 2.9GHz                     | 2571            | -69.78      | -35.2   | 1               | 6.2               | 30.00     | -69.78                          |
| 2.9GHz – 6.4GHz                     | 3302            | -68.18      | -34.93  | 1.2             | 6.5               | 29.63     | -67.81                          |
| 6.4GHz – 12.5GHz                    | 12185           | -65.65      | -17.01  | 2.5             | 12.2              | 7.31      | -42.96                          |
| 12.5G – 18GHz                       | 15328           | -62.92      | -13.83  | 3               | 20                | 3.17      | -36.09                          |
| 17.6G – 26.7GHz                     | 25016           | -59.58      | -28.32  | 3               | 20                | 11.32     | -40.90                          |
| 26.7G – 40.0GHz                     | 37130           | -49.32      | -16.15  | 3               | 20                | 0.85      | -20.17                          |



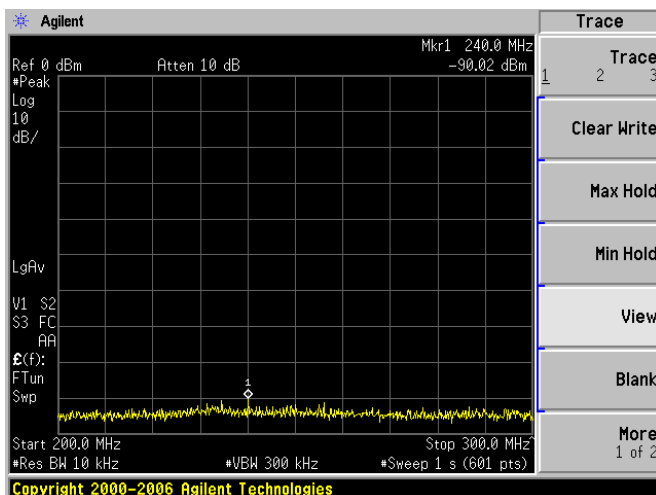
•Horizontally Polarized



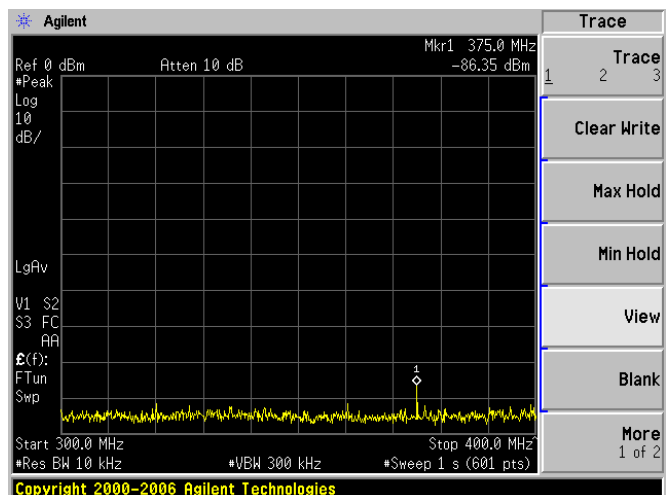
10kHz to 100MHz



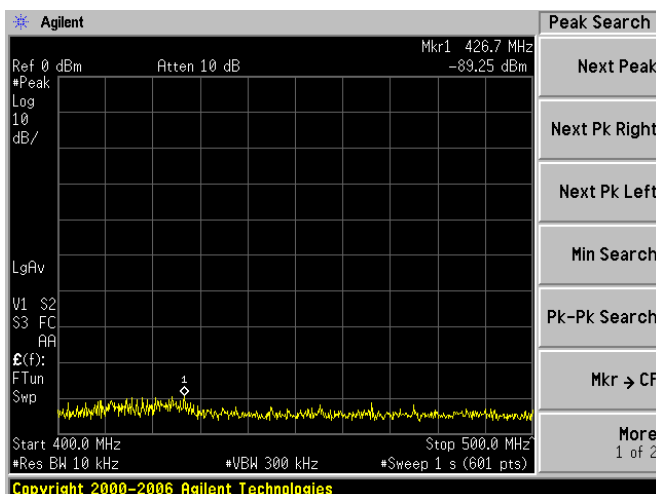
100MHz to 200MHz



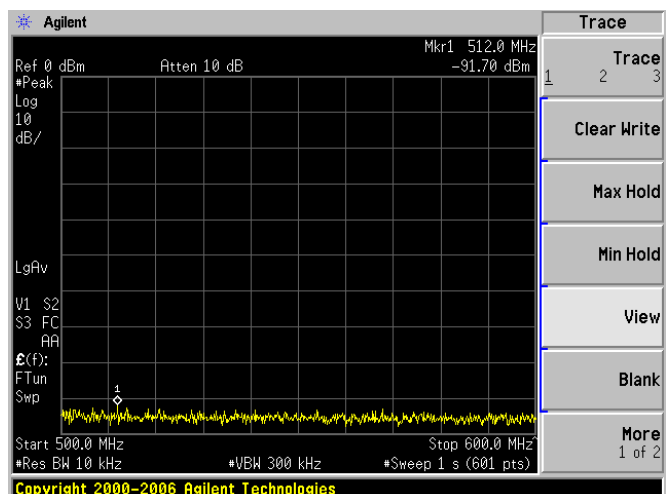
200MHz to 300MHz



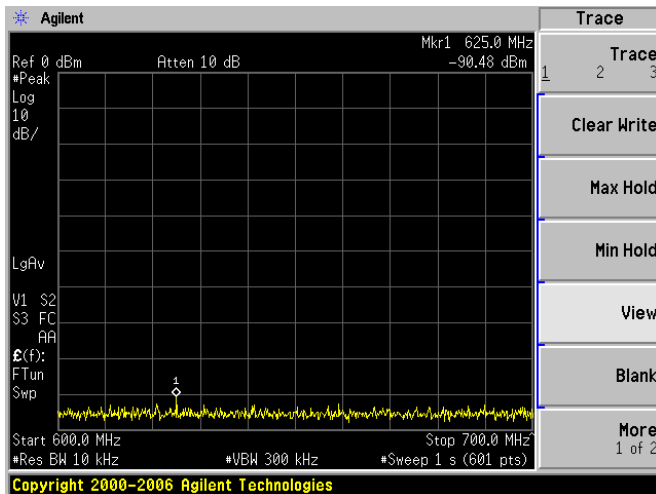
300MHz to 400MHz



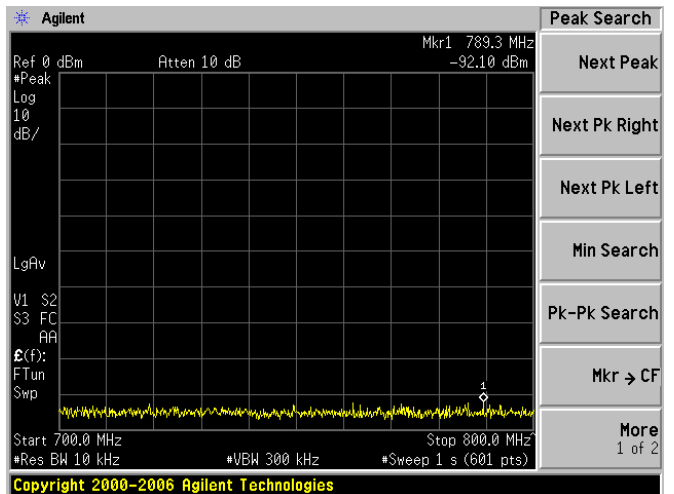
400MHz to 500MHz



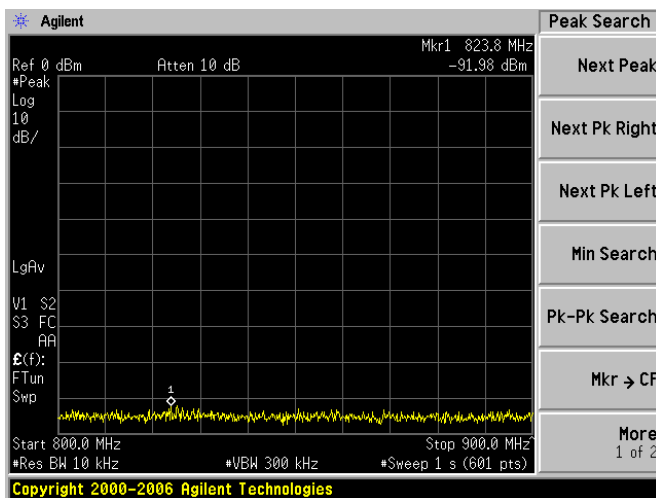
500MHz to 600MHz



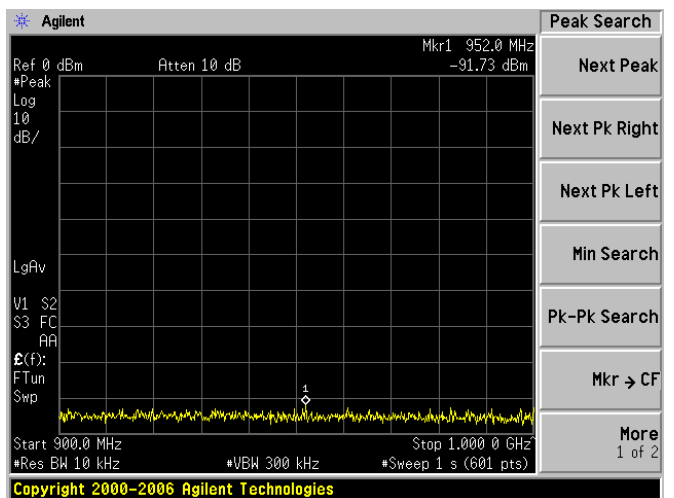
600MHz to 700MHz



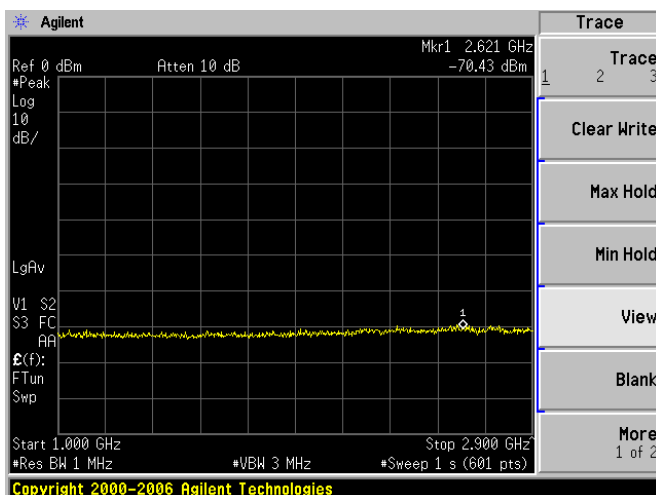
700MHz to 800MHz



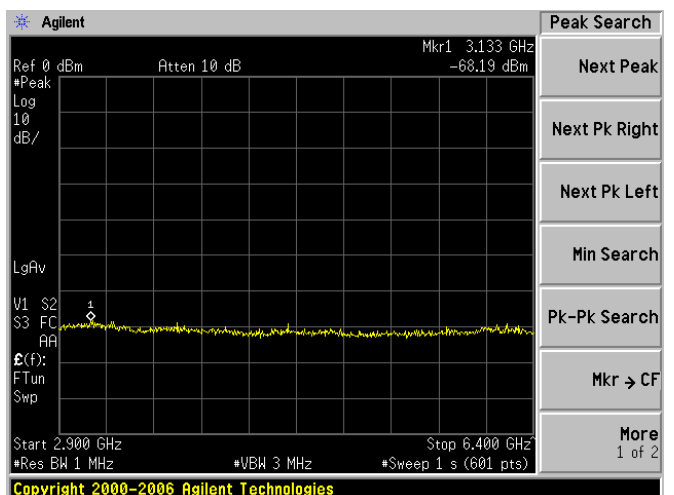
800MHz to 900MHz



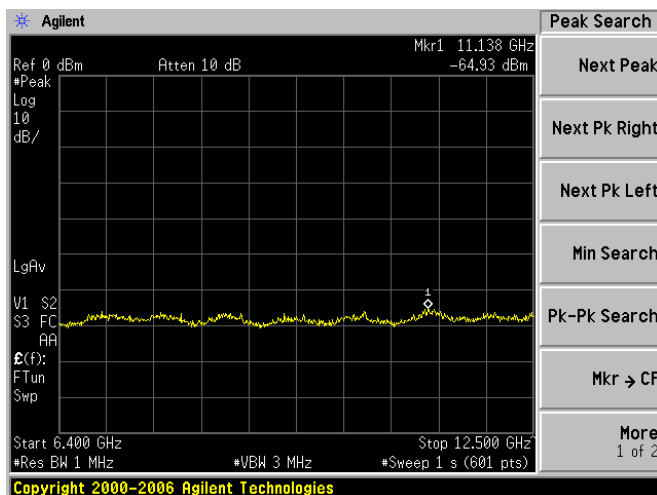
900MHz to 1GHz



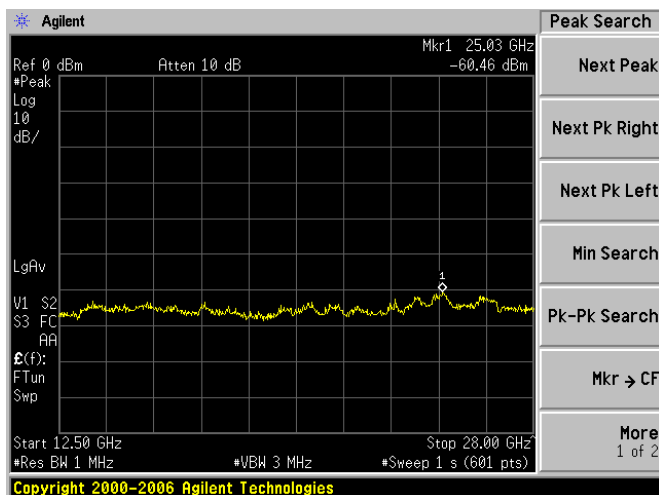
1GHz to 2.9GHz



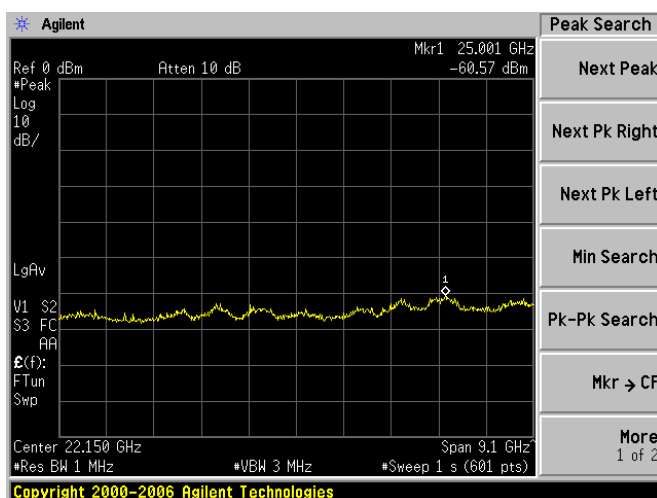
2.9GHz to 6.4GHz



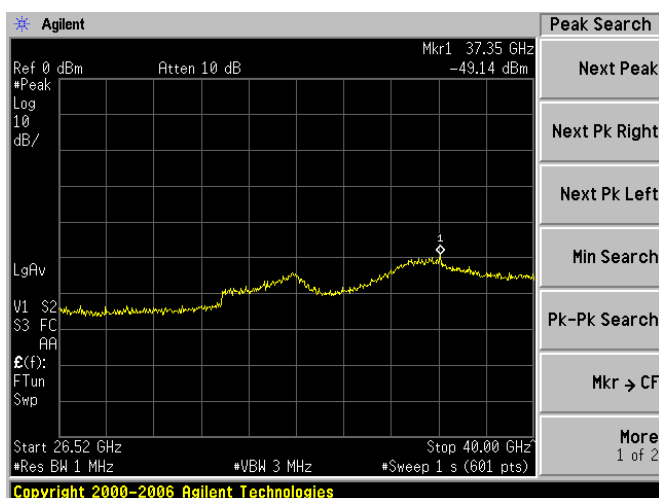
6.4GHz to 12.5GHz



12.5GHz to 28GHz

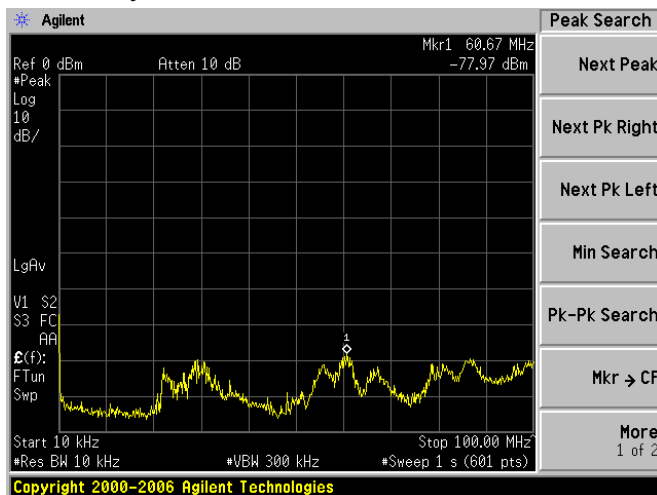


17.6GHz to 26.7GHz

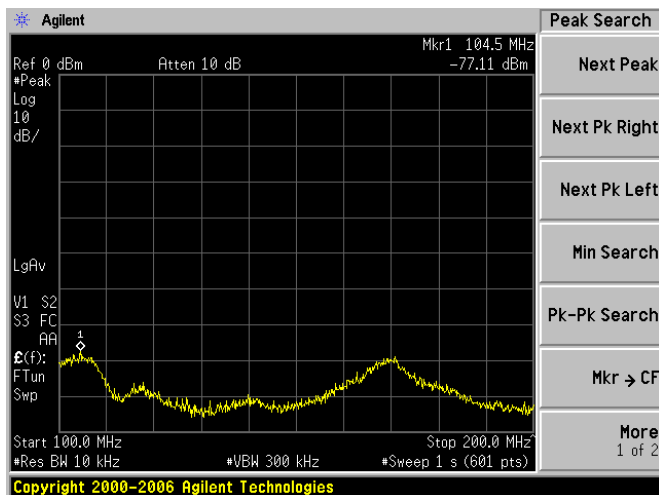


26.5GHz to 40.0GHz

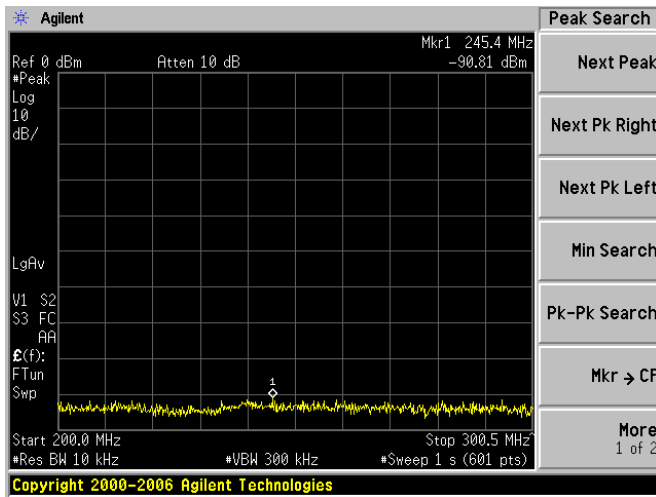
•Vertically Polarized



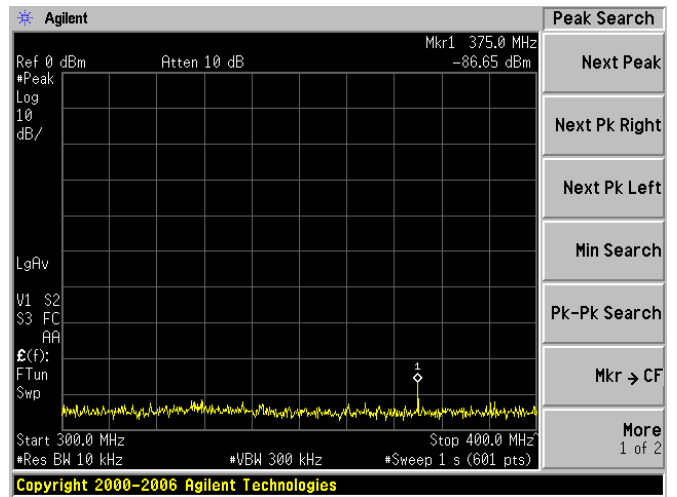
10kHz to 100MHz



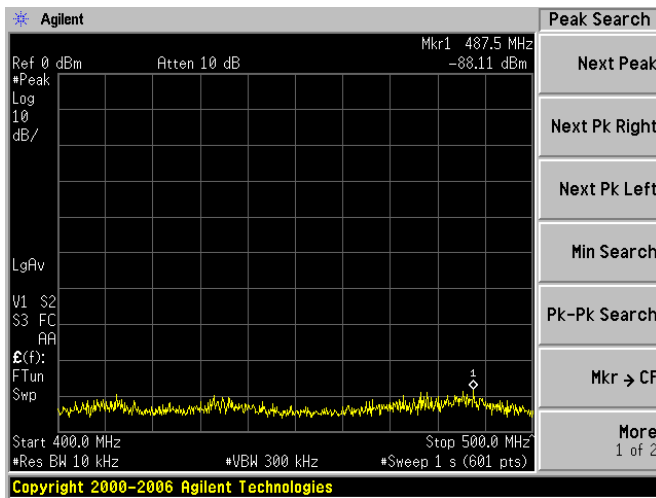
100MHz to 200MHz



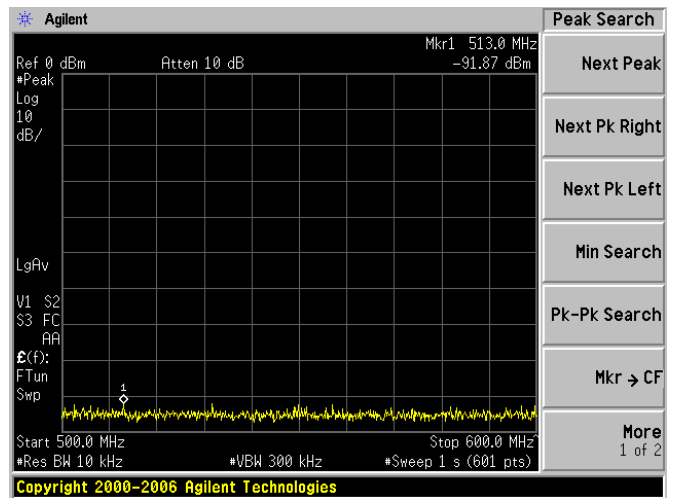
200MHz to 300MHz



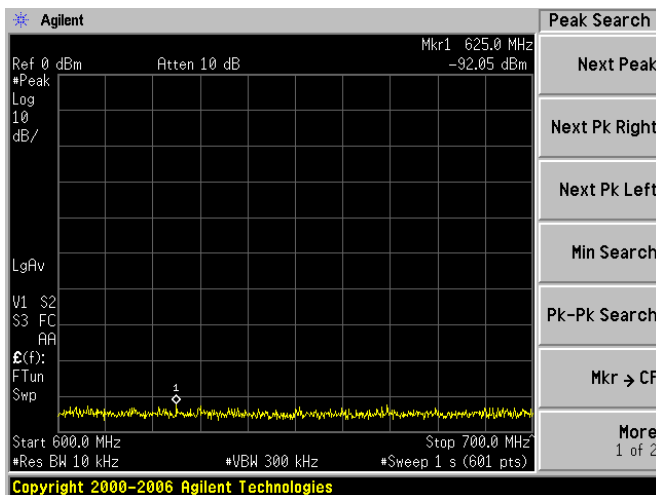
300MHz to 400MHz



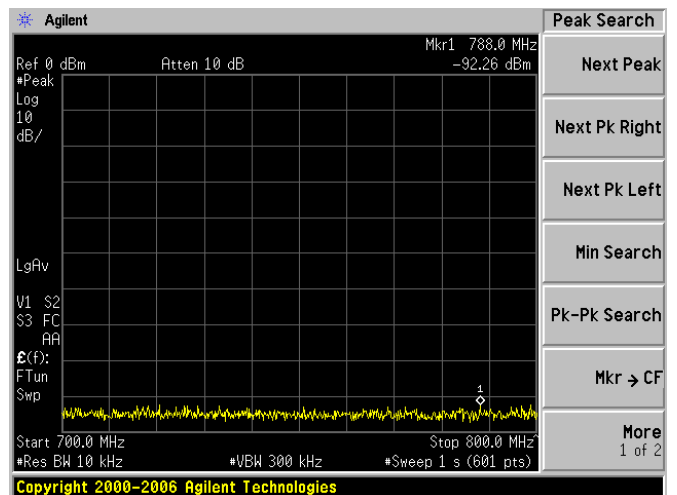
400MHz to 500MHz



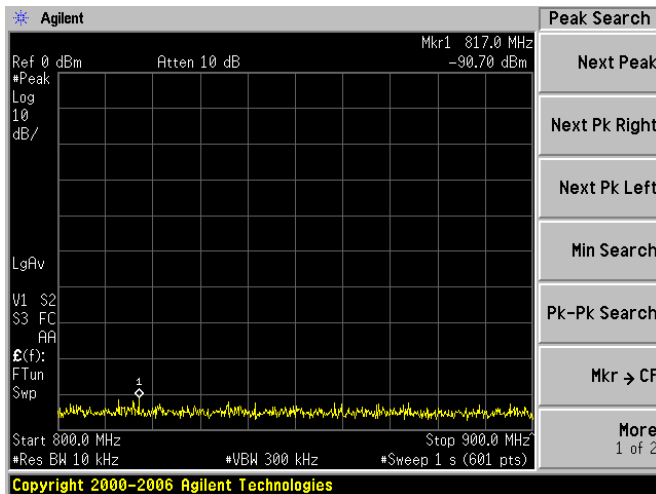
500MHz to 600MHz



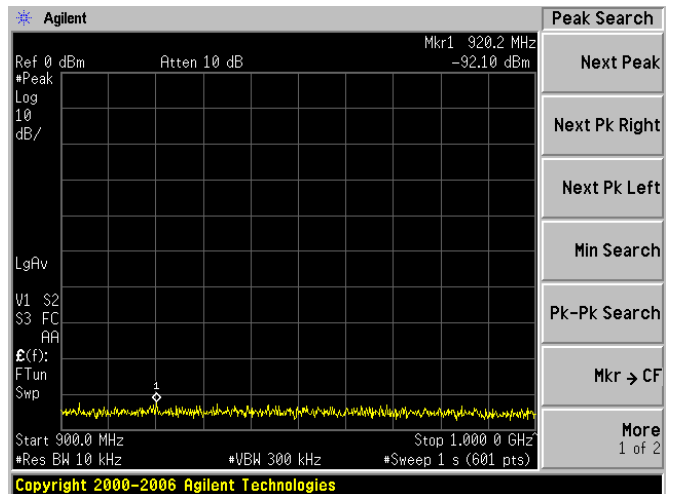
600MHz to 700MHz



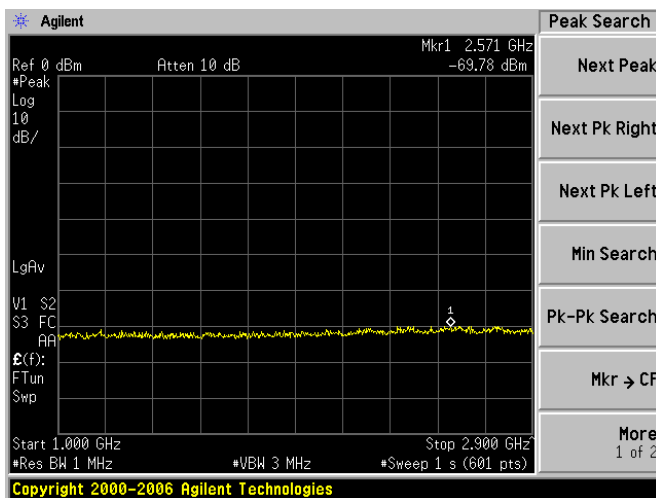
700MHz to 800MHz



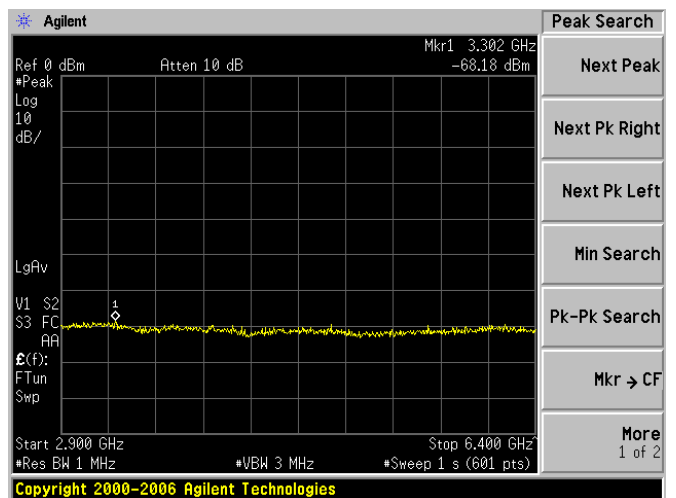
800MHz to 900MHz



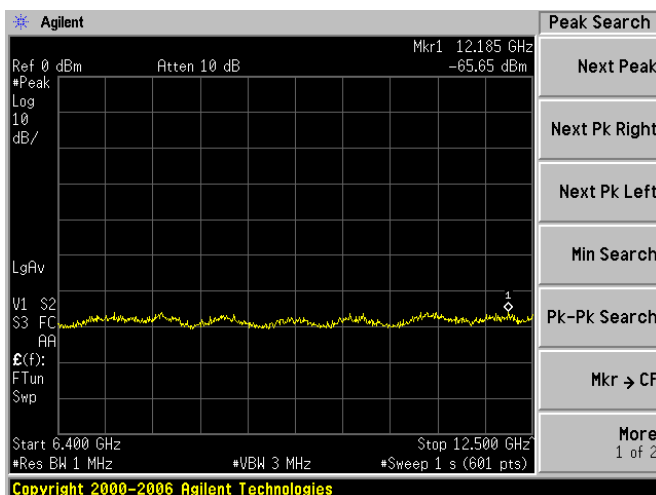
900MHz to 1GHz



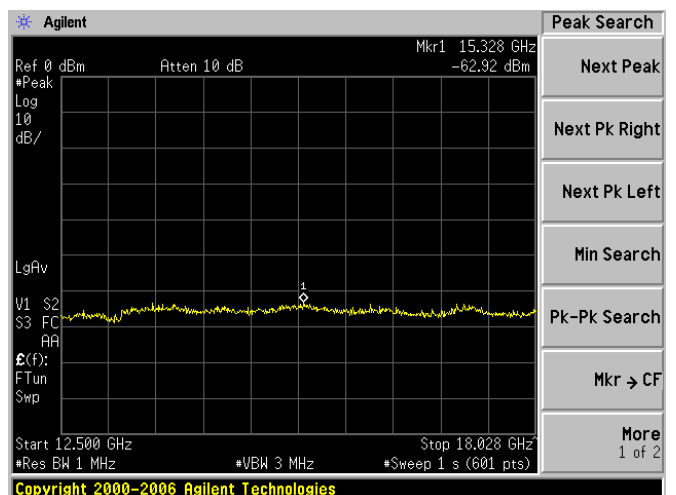
1GHz to 2.9GHz



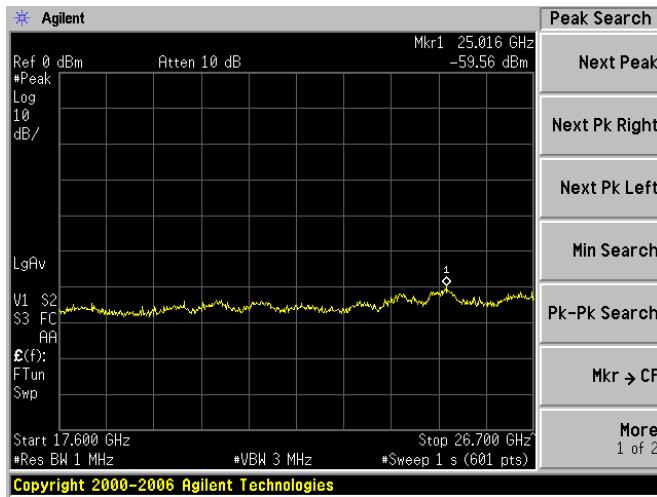
2.9GHz 6.4GHz



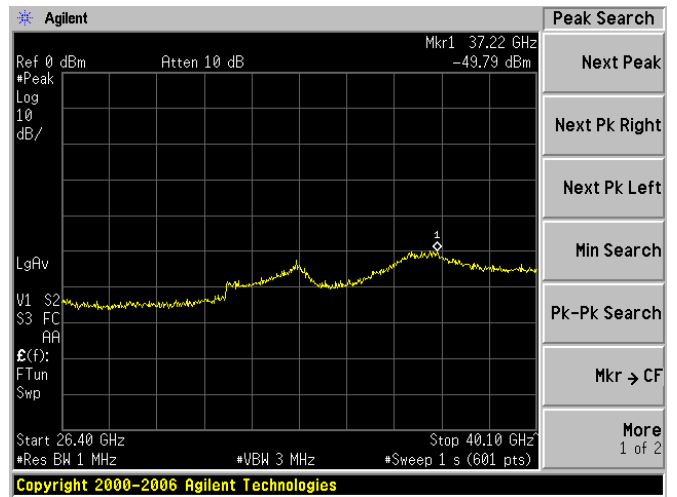
6.4GHz to 12.5GHz



12.5GHz to 18.0GHz



17.6GHz to 26.7GHz



26.4GHz to 40GHz

$$P_d \text{ (dBm)} = P_g \text{ (dBm)} - \text{Cable Loss (dB)} + \text{antenna gain (dB)}$$

where;

$P_g$  is the generator output power into the substitution antenna.

$P_d$  is the dipole equivalent power

and radiated spurious emissions can be calculated by the following:

$$\text{Radiated spurious emissions (dBm)} = 10 \log \left( \frac{\text{TX power in watts}}{0.001} \right) - P_d \text{ (dBm)}$$

#### 4.4 Radiofrequency radiation exposure limits.

47 CFR sec. 1.1310

Power density = 0.186 [mW/cm<sup>2</sup>] is satisfied about 5 [mW/cm<sup>2</sup>].

| Frequency range<br>[MHz] | Electric field<br>strength<br>[V/m] | Magnetic field<br>strength<br>[A/m] | Power density<br>[mW/cm <sup>2</sup> ] | Averaging time<br>[minutes] |
|--------------------------|-------------------------------------|-------------------------------------|--|-----------------------------|
| 1500 – 100,000           | 26.48                               | 0.070                               | 0.186                                  | 6                           |

Calculated by prediction method refer to OET Bulletin 65 as follows:

$$\begin{aligned}
 \text{Power density} \quad S_{\text{limit}} &= \frac{PG}{4\pi R^2} \\
 &= \frac{5000 * 616.59}{4 * \pi * 2803^2} \\
 &= 0.031 \text{ [mW / cm}^2\text{]}
 \end{aligned}$$

where: P = 5000mW (power input to antenna)  
 G = 10<sup>(dB/10)</sup> = 10<sup>(27.9/10)</sup> = 616.59 (power gain of the antenna)  
 R = 2803cm (distance to the center of radiation of antenna)

Distance to the center of radiation of antenna

$$\begin{aligned}
 R &= \frac{0.6D^2}{\lambda} \\
 &= \frac{0.6 * 121.9^2}{3.18} \\
 &= 2803
 \end{aligned}$$

where: D = 121.9cm (antenna diameter)  
 $\lambda$  = 3.18cm (wavelength) f = 9410MHz

Power density level(s) during the appropriate time-averaging interval

$$\begin{aligned}
 \sum S_{\text{exp}} t_{\text{exp}} &= S_{\text{limit}} t_{\text{ave}} \\
 &= 0.031 * 6 \\
 &= 0.186
 \end{aligned}$$

Electric field strength

$$\begin{aligned}
 E &= \sqrt{S * 3770} \\
 &= \sqrt{0.186 * 3770} \\
 &= 26.48 \text{ [V/m]}
 \end{aligned}$$

Magnetic field strength

$$\begin{aligned}
 H &= \sqrt{\frac{S}{37.7}} \\
 &= \sqrt{\frac{0.186}{37.7}} \\
 &= 0.070 \text{ [A/m]}
 \end{aligned}$$