

FCC Part27M Test Report

Product Name : Wireless Module

Model No. : MC7304

FCC ID : N7NMC7304

IC : 2417C-MC7304

Applicant : SIERRA WIRELESS Inc.

Address : 13811 Wireless Way, Richmond, BC, Canada V6V 3A4

Date of Receipt : Dec. 04, 2014

Test Date : Dec. 04, 2014~ Dec. 13, 2014

Issued Date : Dec. 17, 2014

Report No. : 14C0227R-HP-US-P07V01

Report Version : V 1.1



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Test Report Certification

Issued Date : Dec. 17, 2014

Report No. : 14C0227R-HP-US-P07V01



Product Name : Wireless Module

Applicant : SIERRA WIRELESS TECHNOLOGY (SZ) LTD.

Address : 2/F JIU-ZOU ELECTRONIC BUILDING, SOUTHERN NO.12
ROAD, HI-TECH PARK. NANSHAN, SHENZHEN,
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Manufacturer : Sierra Wireless Inc.

Address : 13811 Wireless Way Richmond, British Columbia, Canada,
V6V 3A4.

Model No. : MC7304

FCC ID : N7NMC7304

IC : 2417C-MC7304

EUT Voltage : DC3.0/3.3/3.6V

Brand Name : AirPrime

Applicable Standard : FCC CFR Title 47 Part 2, TIA/EIA 603-C
FCC Part27 Subpart M
Industry Canada RSS-199, Issue 2

Test Result : Complied

Performed Location : Suzhou EMC Laboratory
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FCC Registration Number: 800392; IC Lab Code: 4075B

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Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC, TAF
Germany	:	TUV Rheinland
Norway	:	Nemko, DNV
USA	:	FCC
Japan	:	VCCI

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site :<http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :

<http://www.quietek.com/>

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1. General Information

1.1. EUT Description

Product Name	Wireless Module
Model No.	MC7304
Brand Name	AirPrime
EUT Voltage	DC3.0/3.3/3.6V
2G	
Support Band	GSM850/PCS1900
GPRS Class	Class 12
Uplink	GSM 850: 824~849MHz PCS 1900: 1850~1910MHz
Downlink	GSM 850: 869~894MHz PCS 1900: 1930~1990MHz
Type of modulation	GMSK for GPRS; 8PSK for EDGE
Antenna Type	Dipole
Antenna Gain	GSM 850: 1.2dBi PCS1900: 1.3dBi
3G	
Support Band	WCDMA Band II/WCDMA Band V
Uplink	WCDMA Band II: 1850~1910MHz WCDMA Band V: 824~849MHz
Downlink	WCDMA Band II: 1930~1990MHz WCDMA Band V: 869~894MHz
Type of modulation	QPSK, 16QAM for Downlink QPSK for Uplink
Antenna Type	Dipole
4G	
Support Band	LTE Band 1/3/7/8/20
Uplink	Band VII: 2502.5~2567.5MHz
Type of modulation	QPSK, 16QAM
Antenna Gain	Band VII: 4.2dBi

1.2. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: LTE Band 7

Note:

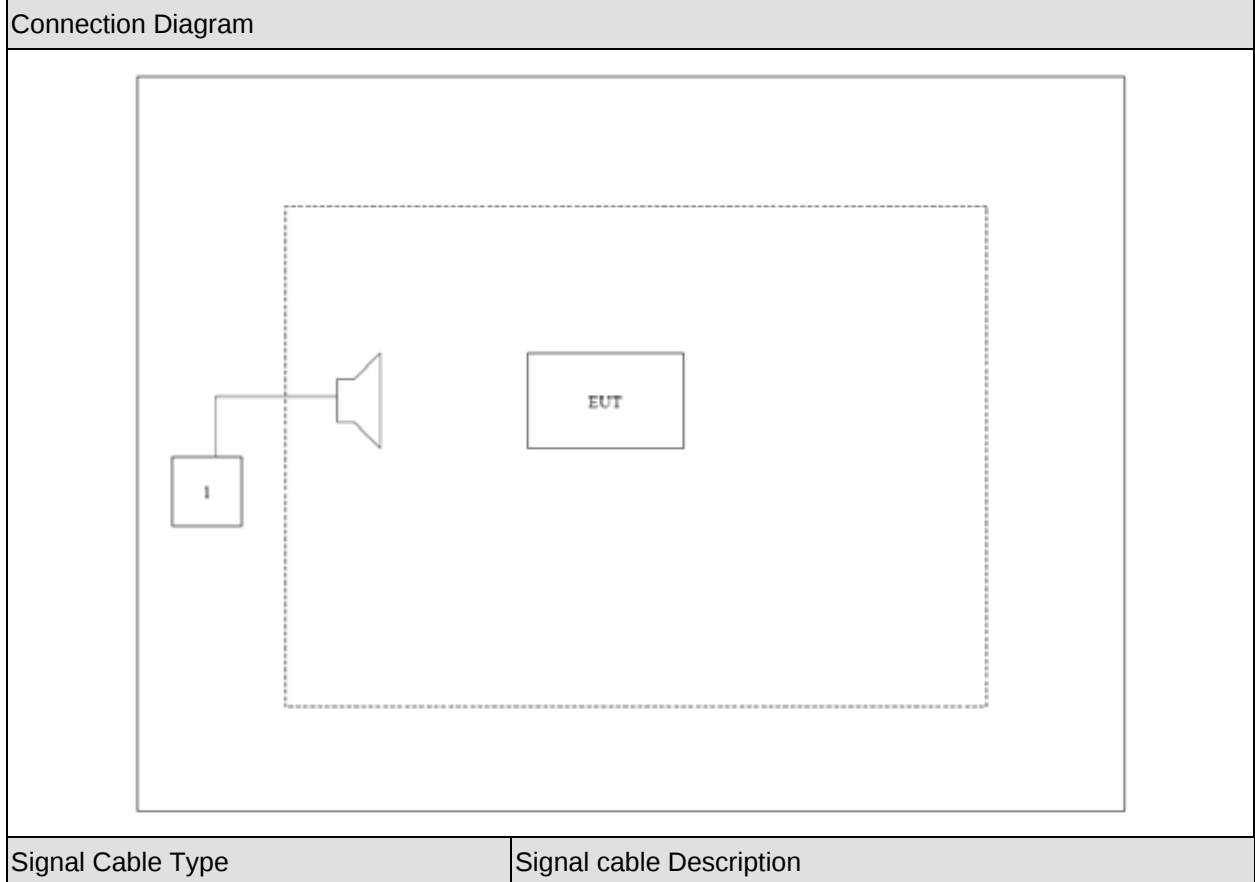
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Radio Communication Tester	Anritsu	MT8820C	6201181503	N/A

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	EUT Communicate with MT8820C, then select channel to test.

2. Technical Test

2.1. Summary of Test Result

For LTE Band VII(FCC Part 27M & Part 2)

Performed Item	FCC Rule	IC Rule	Limit	Result
Maximum Output Power	§2.1033 §2.1046 §27.50	§4.4	Output Power < 2 Watts	Pass
Equivalent Isotropic Radiated Power	§27.50	§4.4	< 33 dBW + 10 log(X/Y)dBW + 10 log(360/beamwidth) dBW	Pass
Modulation characteristics	§2.1047	§4.1	N/A	Pass
Occupied Bandwidth	§2.1049	§4.2	N/A	Pass
Conducted Band Edge Emissions	§27.50	§4.6	< 5MHz: -10 dBm 5MHz-X MHz:-13dBm >X MHz:-25dBm	Pass
Field Strength of Spurious Radiation	§2.1053 §27.53	§4.6	-25 dBm	Pass
Frequency Stability Under Temperature & Voltage Variations	§2.1055 §27.54	§4.3	2.5 ppm	Pass

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	23
Humidity (%RH)	25-75	52
Barometric pressure (mbar)	860-1060	950-1000

3. Maximum Output Power and Effective Isotropic Radiated Power Measurement

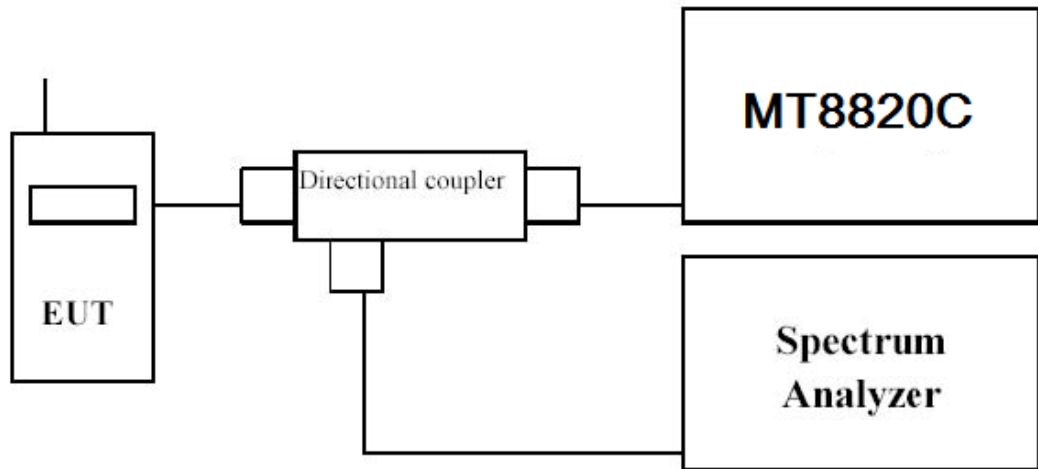
3.1. Test Equipment

Spurious Emission / AC-5

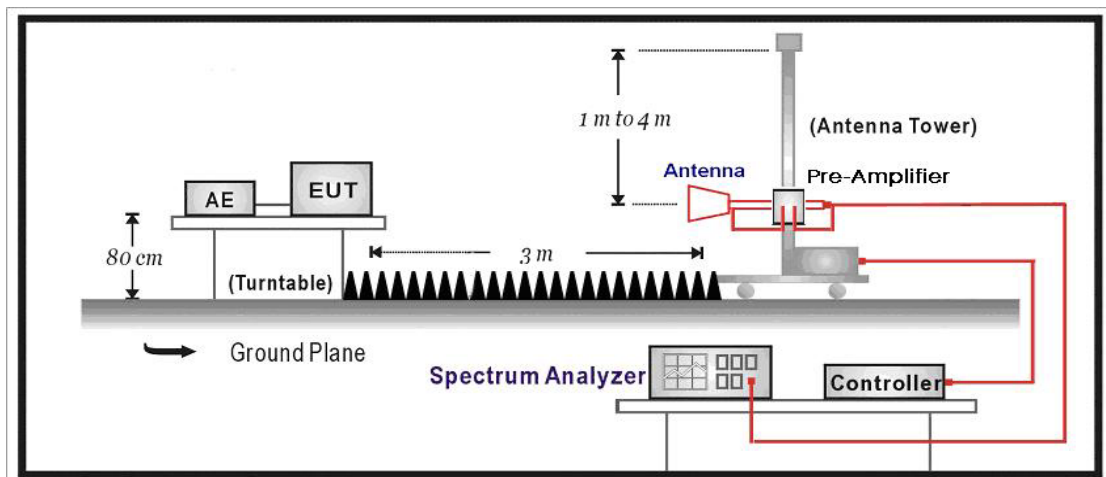
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2015.03.28
Radio Communication Tester	Anritsu	MT8820C	6201181503	2015.03.28
Dual Directional Coupler	Agilent	778D	20160	2015.03.28
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2015.03.28
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2015.03.28
Preamplifier	QuieTek	AP-025C	CHM-0503006	2015.04.11
Preamplifier	Miteq	NSP1800-25	1364185	2015.05.03
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2015.10.15
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40137	2016.02.26
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2016.02.26
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2015.06.08
DRG Horn	ETS-Lindgren	3117	00123988	2015.01.07
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2015.01.08

3.2. Test Setup

Conducted Power Measurement:



Radiated Power Measurement:



3.3. Test Procedure

For Conducted Power Measurement:

- The RF output of the transmitter was connected to base station simulator.
- The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement..
- Set EUT at maximum average power by base station simulator.
- Measure lowest, middle, and highest channels for each bandwidth and different modulation.

For Effective Isotropic Radiated Power Measurement:

- e) The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
- f) The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower
- g) LTE operating modes: Set RBW= 100 KHz, VBW= 300 KHz, RMS detector over frame, and use
- h) channel power option with bandwidth=5MHz, per section 4.0 of KDB 971168 D01.
- i) The table was rotated 360 degrees to determine the position of the highest radiated power.
- j) The height of the receiving antenna is adjusted to look for the maximum EIRP.
- k) Taking the record of maximum EIRP.
- l) A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
- m) The conducted power at the terminal of the dipole antenna is measured.
- n) Repeat step 3 to step 5 to get the maximum EIRP of the substitution antenna.
- o) $EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$.
- p) P_s (dBm) : Input power to substitution antenna
- q) G_s (dBi or dBd) : Substitution antenna Gain.
- r) $E_t = R_t + AF$
- s) $E_s = R_s + AF$
- t) AF (dB/m) : Receive antenna factor
- u) R_t : The highest received signal in spectrum analyzer for EUT.
- v) R_s : The highest received signal in spectrum analyzer for substitution antenna.

3.4. Uncertainty

The measurement uncertainty is defined as for Conducted Power Measurement ± 1.2 dB, for Radiated Power Measurement ± 3.2 dB

3.5. Test Result

Conducted Output Power

BW [MHz]	RB Size	RB Offset	Mod	Maximum Average Power [dBm]		
				Low Ch. / Freq.	Mid Ch. / Freq.	High Ch. / Freq.
Channel				20850	21100	21350
Frequency				2510	2535	2560
20	1	0	QPSK	22.49	22.75	22.85
20	1	49		22.78	22.78	22.83
20	1	99		22.91	22.84	21.02
20	50	0		21.43	21.40	21.65
20	50	24		21.54	21.37	21.69
20	50	49		21.61	21.51	21.68
20	100	0		21.54	21.42	21.80
20	1	0	16-QAM	21.43	21.69	21.78
20	1	49		21.73	21.73	21.76
20	1	99		21.81	21.75	20.03
20	50	0		20.45	20.35	20.63
20	50	24		20.51	20.34	20.67
20	50	49		20.56	20.51	20.66
20	100	0		20.51	20.49	20.78
Channel				20825	21100	21375
Frequency				2507.5	2535	2562.5
15	1	0	QPSK	22.36	22.71	23.01
15	1	37		22.74	22.79	22.97
15	1	74		22.85	23.06	21.09
15	36	0		21.47	21.50	21.89
15	36	18		21.63	21.62	21.85
15	36	37		21.67	21.59	21.68
15	75	0		21.49	21.53	21.81
15	1	0	16-QAM	21.33	21.67	21.95
15	1	37		21.67	21.72	21.89
15	1	74		21.82	22.02	20.14
15	36	0		20.46	20.49	20.86
15	36	18		20.64	20.63	20.84
15	36	37		20.65	20.58	20.66
15	75	0		20.46	20.50	20.76

Channel				20800	21100	21400
Frequency				2505	2535	2565
10	1	0	QPSK	22.52	22.98	23.16
10	1	24		22.76	23.04	23.21
10	1	49		22.81	23.03	22.03
10	25	0		21.53	21.75	22.11
10	25	12		21.52	21.83	22.12
10	25	24		21.58	21.80	21.98
10	50	0		21.39	21.75	22.04
10	1	0	16-QAM	21.48	21.92	22.01
10	1	24		21.67	21.94	22.12
10	1	49		21.78	21.98	21.13
10	25	0		20.55	20.71	21.06
10	25	12		20.59	20.83	21.21
10	25	24		20.54	20.72	20.93
10	50	0		20.32	20.71	20.94
Channel				20775	21100	21425
Frequency				2502.5	2535	2567.5
5	1	0	QPSK	22.58	22.87	23.08
5	1	12		22.62	23.07	22.68
5	1	24		22.79	23.05	22.46
5	12	0		21.54	21.90	22.32
5	12	6		21.58	21.97	22.26
5	12	11		21.58	21.93	22.16
5	25	0		21.44	21.85	21.89
5	1	0	16-QAM	21.53	21.82	22.02
5	1	12		21.52	21.97	21.61
5	1	24		21.75	22.08	21.45
5	12	0		20.53	20.87	21.23
5	12	6		20.56	20.92	21.24
5	12	11		20.59	20.94	21.01
5	25	0		20.45	20.80	20.84

Note: All conducted measurements are based on a RMS detector.

Effective Isotropic Radiated Power

LTE Band 7 Radiated Power EIRP							
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	H/V
			RB Size	RB Offset			
7	5	QPSK	1	24	2505.2	26.43	H
7	5	QPSK	1	12	2535.0	26.54	H
7	5	QPSK	1	0	2567.5	26.89	H
7	5	QPSK	1	24	2505.2	25.88	V
7	5	QPSK	1	12	2535.0	25.96	V
7	5	QPSK	1	0	2567.5	26.07	V
7	5	16QAM	1	24	2505.2	25.68	H
7	5	16QAM	1	24	2535.0	25.79	H
7	5	16QAM	1	0	2567.5	25.93	H
7	5	16QAM	1	24	2505.2	25.13	V
7	5	16QAM	1	24	2535.0	25.35	V
7	5	16QAM	1	0	2567.5	25.69	V
7	10	QPSK	1	49	2505.0	26.58	H
7	10	QPSK	1	49	2535.0	26.69	H
7	10	QPSK	1	24	2565.0	26.73	H
7	10	QPSK	1	49	2505.0	26.11	V
7	10	QPSK	1	49	2535.0	26.21	V
7	10	QPSK	1	24	2565.0	26.34	V
7	10	16QAM	1	49	2505.0	25.73	H
7	10	16QAM	1	49	2535.0	25.89	H
7	10	16QAM	1	24	2565.0	26.01	H
7	10	16QAM	1	49	2505.0	25.26	V
7	10	16QAM	1	49	2535.0	25.37	V
7	10	16QAM	1	24	2565.0	25.41	V

LTE Band 7 Radiated Power EIRP							
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	H/V
			RB Size	RB Offset			
7	15	QPSK	1	74	2507.5	26.55	H
7	15	QPSK	1	74	2535.0	26.78	H
7	15	QPSK	1	0	2562.5	26.89	H
7	15	QPSK	1	74	2507.5	26.15	V
7	15	QPSK	1	74	2535.0	26.37	V
7	15	QPSK	1	0	2562.5	26.42	V
7	15	16QAM	1	74	2507.5	25.98	H
7	15	16QAM	1	74	2535.0	26.08	H
7	15	16QAM	1	0	2562.5	26.18	H
7	15	16QAM	1	74	2507.5	25.83	V
7	15	16QAM	1	74	2535.0	25.93	V
7	15	16QAM	1	0	2562.5	26.15	V
7	20	QPSK	1	99	2507.5	26.52	H
7	20	QPSK	1	99	2535.0	26.77	H
7	20	QPSK	1	0	2560.0	26.83	H
7	20	QPSK	1	99	2507.5	26.21	V
7	20	QPSK	1	99	2535.0	26.35	V
7	20	QPSK	1	0	2560.0	26.42	V
7	20	16QAM	1	0	2507.5	26.01	H
7	20	16QAM	1	99	2535.0	26.17	H
7	20	16QAM	1	99	2560.0	26.23	H
7	20	16QAM	1	0	2507.5	25.98	V
7	20	16QAM	1	99	2535.0	26.13	V
7	20	16QAM	1	99	2560.0	26.23	V

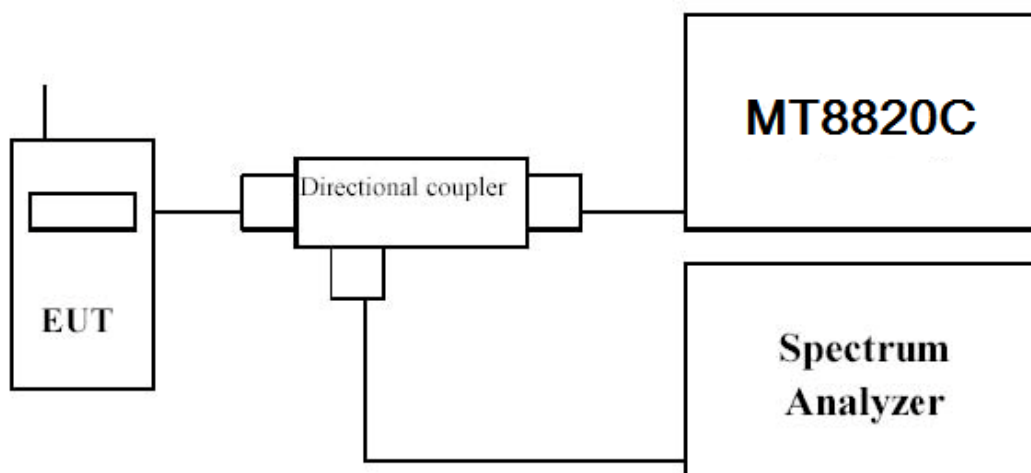
4. Modulation Characteristic

4.1. Test Equipment

Modulation Characteristic / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2015.03.28
Radio Communication Tester	Anritsu	MT8820C	6201181503	2015.03.28
Dual Directional Coupler	Agilent	778D	20160	2015.03.28
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2015.03.28
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2015.01.08

4.2. Test Setup



4.3. Limit

N/A

4.4. Uncertainty

The measurement uncertainty is defined as 0.1%

4.5. Test Result

The modulation of GSM/WCDMA was verified and confirmed compliance with requirement.

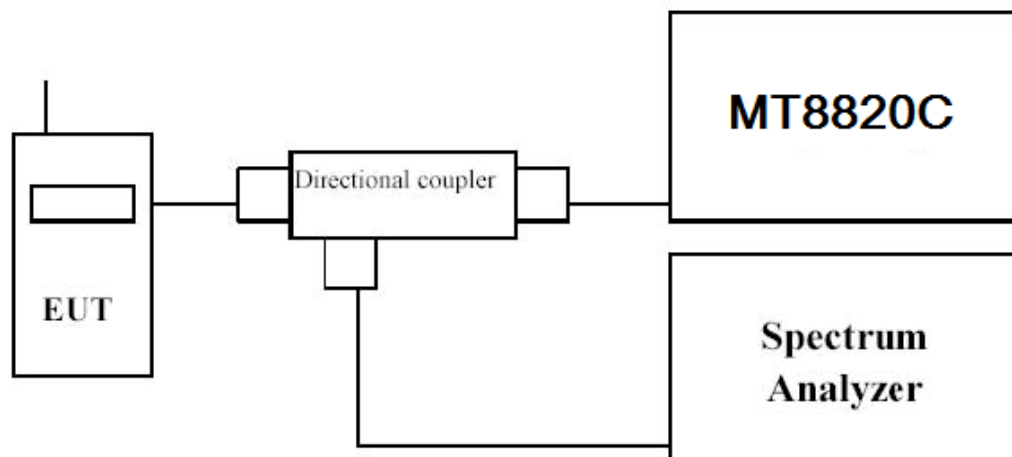
5. Occupied Bandwidth

5.1. Test Equipment

Occupied Bandwidth / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2015.03.28
Radio Communication Tester	Anritsu	MT8820C	6201181503	2015.03.28
Dual Directional Coupler	Agilent	778D	20160	2015.03.28
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2015.03.28
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2015.01.08

5.2. Test Setup



5.3. Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The 99% occupied bandwidth and 26 dB bandwidth of the middle channel for the highest RF powers were measured.

5.4. Uncertainty

The measurement uncertainty is defined as ± 10 Hz

5.5. Test Result

Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: LTE Band VII(5M/QPSK)		
Date of Test	2014/12/06	Test Site	AC6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
20775	2502.50	5089.00	4504.60
21100	2535.00	5060.00	4505.10
21425	2567.50	5041.00	4503.00

Figure Channel 20775 25RB0 (2502.5MHz)

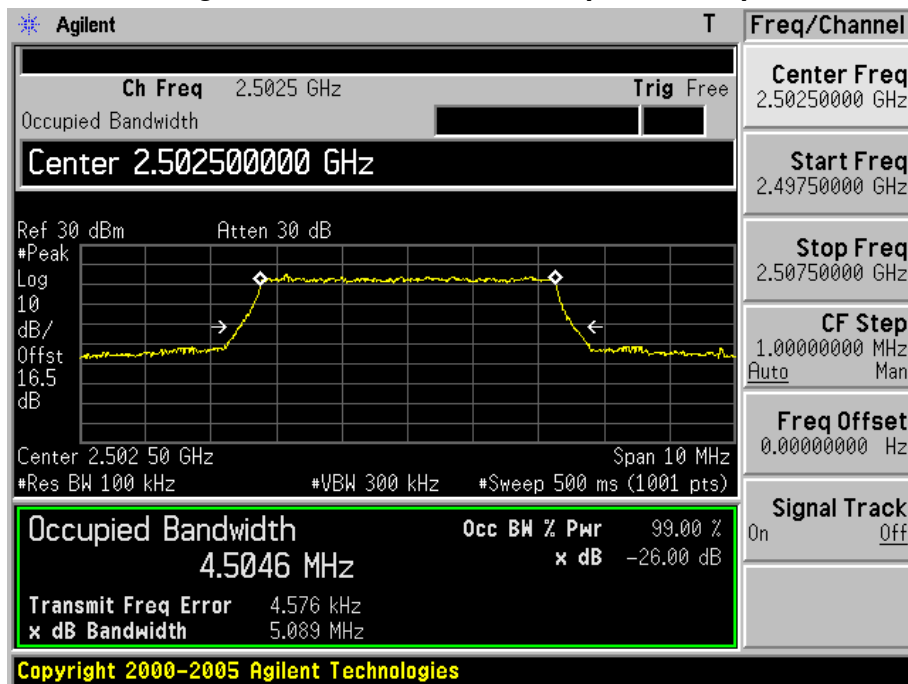


Figure Channel 21100 25RB0 (2535.00MHz)

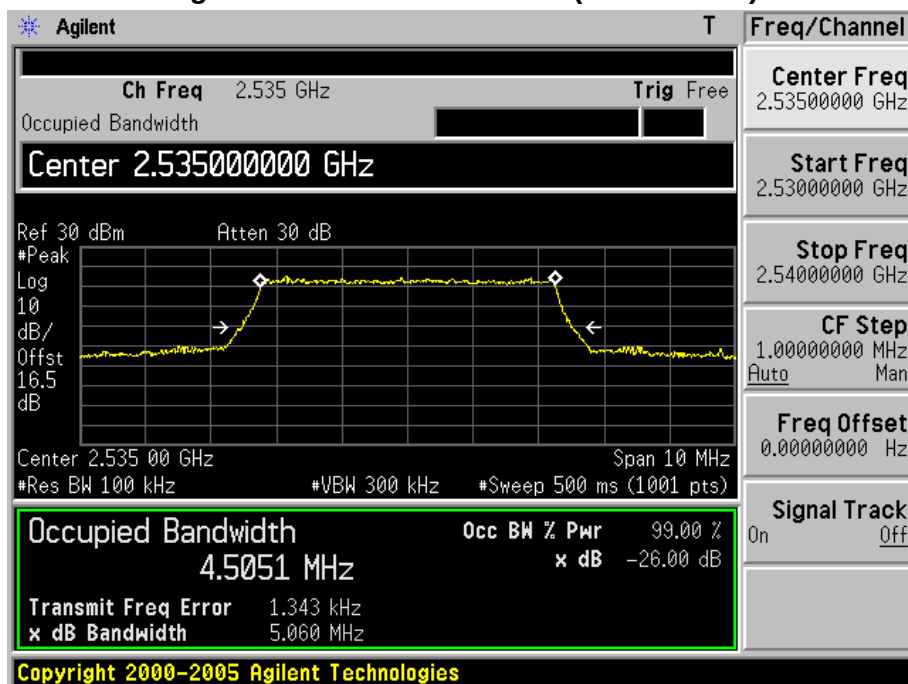
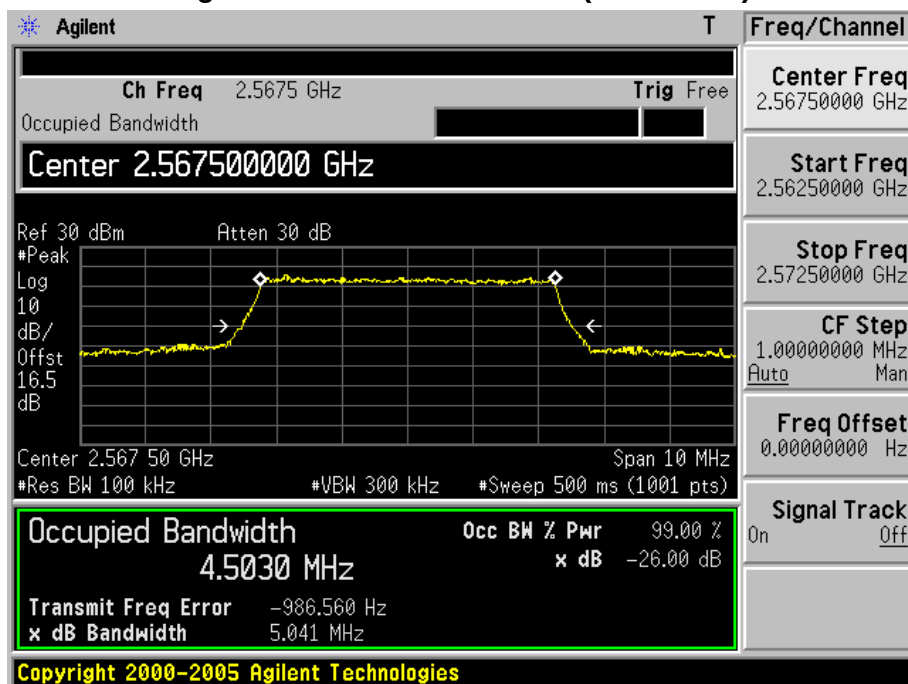


Figure Channel 21425 25RB0 (2567.5MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: LTE Band VII (5M/16QAM)		
Date of Test	2014/12/06	Test Site	AC6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
20775	2502.50	5035.00	4484.80
21100	2535.00	4490.60	5006.00
21425	2567.50	5041.00	4490.50

Figure Channel 20775 25RB0 (2502.5MHz)

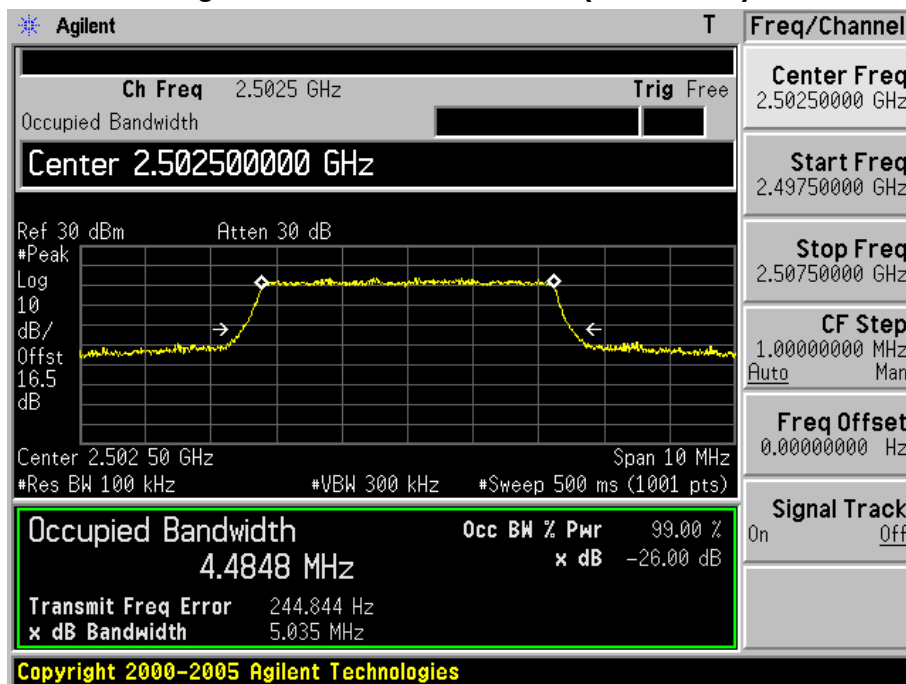


Figure Channel 21100 25RB0 (2535.00MHz)

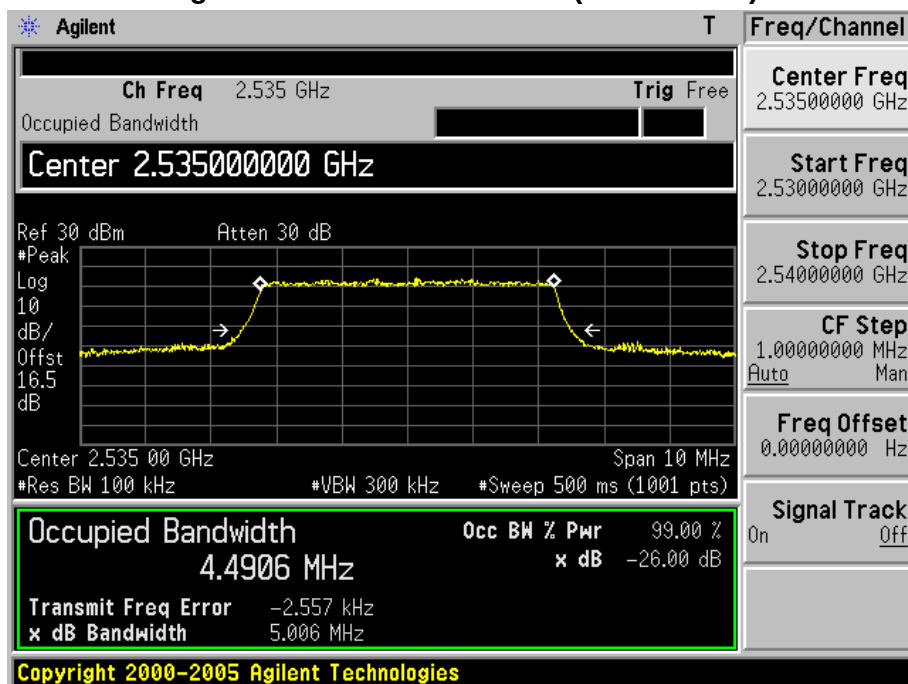
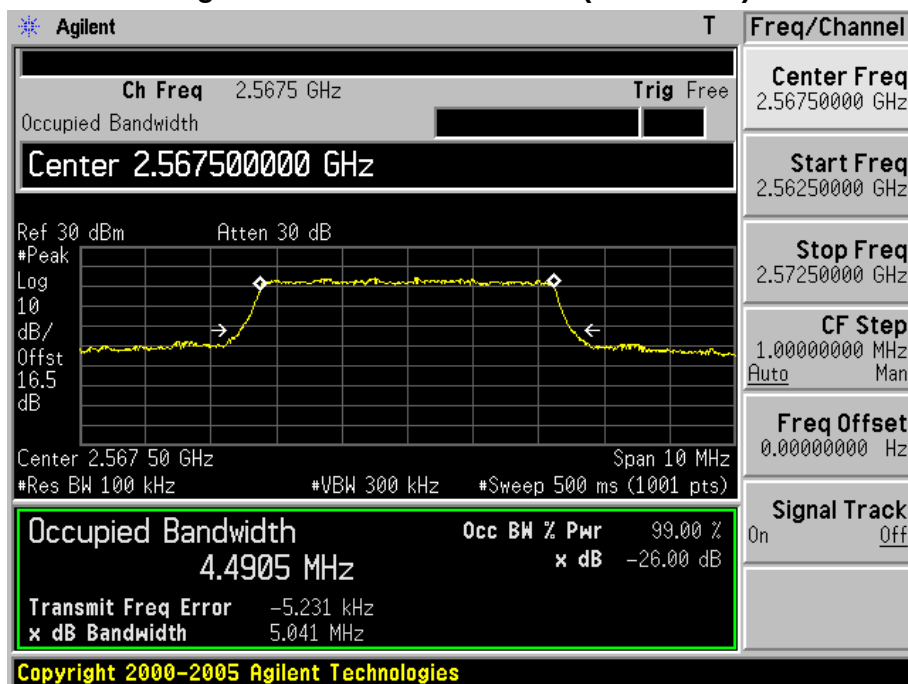


Figure Channel 21425 25RB0 (2567.5MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: LTE Band VII(10M/QPSK)		
Date of Test	2014/12/06	Test Site	AC6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
20800	2505.00	10096.00	9053.70
21100	2535.00	10143.00	9065.10
21400	2565.00	10130.00	9052.30

Figure Channel 20800 50RB0 (2505.00MHz)

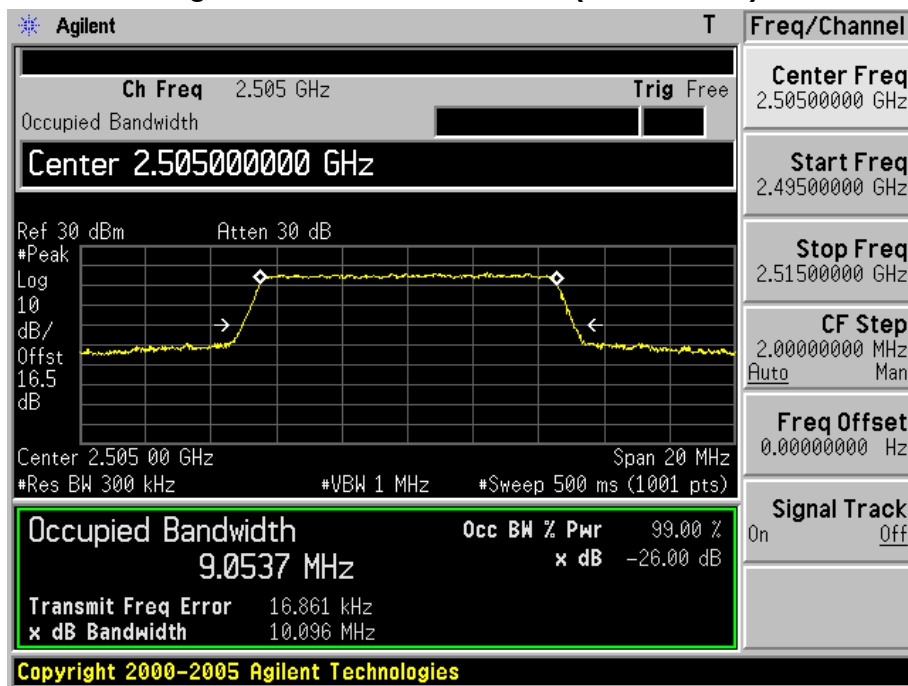


Figure Channel 21100 50RB0 (2535.00MHz)

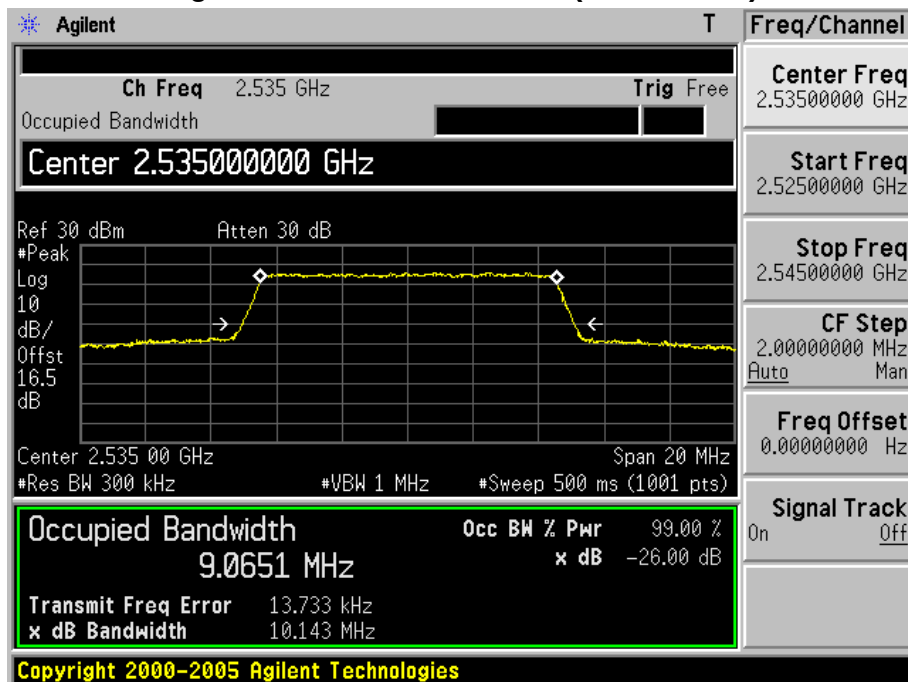
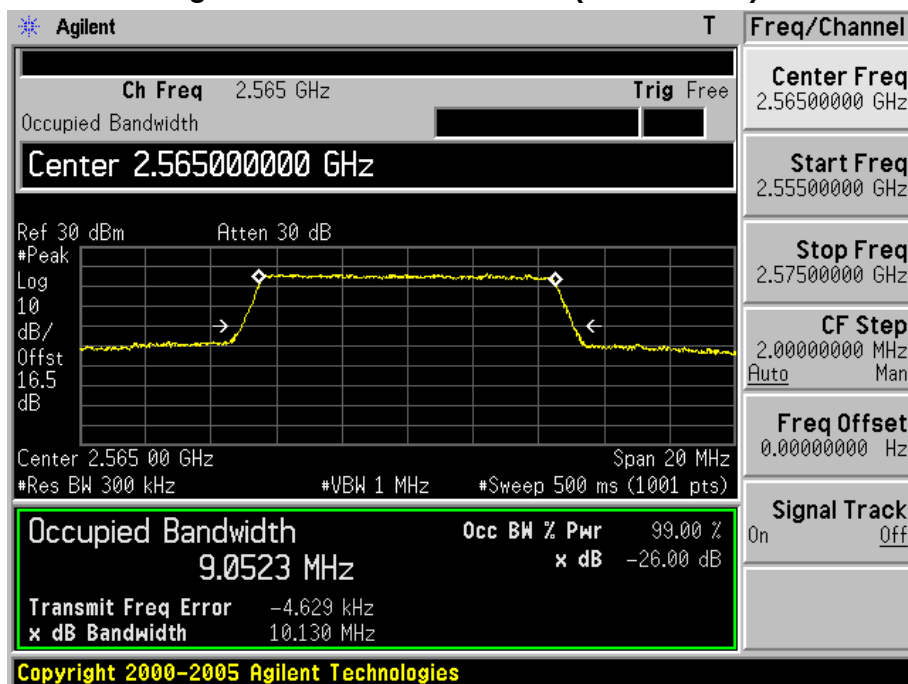


Figure Channel 21400 50RB0 (2565.00MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: LTE Band VII (10M/16QAM)		
Date of Test	2014/12/06	Test Site	AC6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
20800	2505.00	10124.00	9019.60
21100	2535.00	10113.00	9025.70
21400	2565.00	10121.00	9020.00

Figure Channel 20800 50RB0 (2505.00MHz)

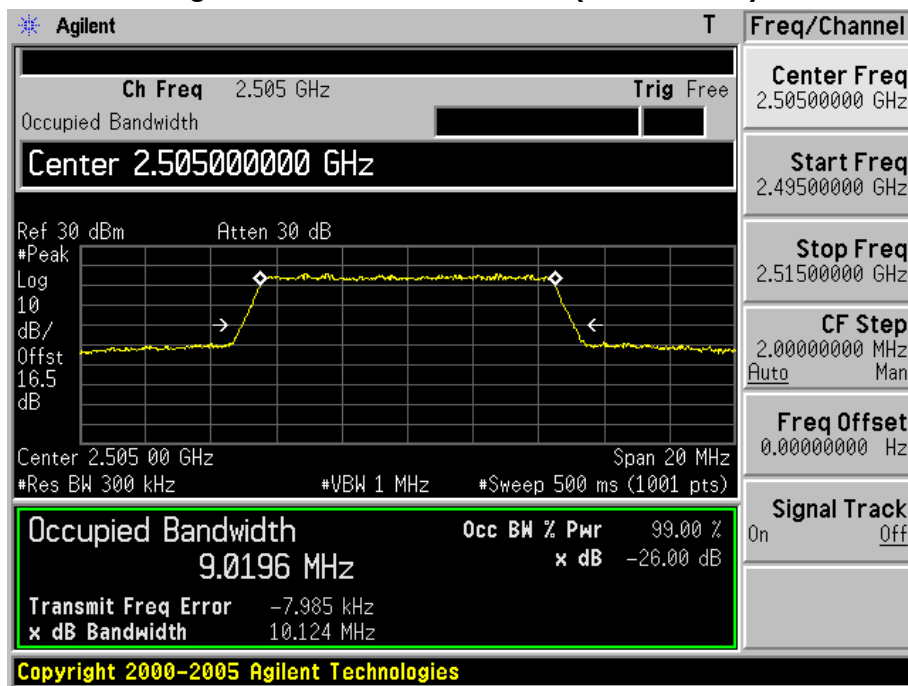


Figure Channel 21100 50RB0 (2535.00MHz)

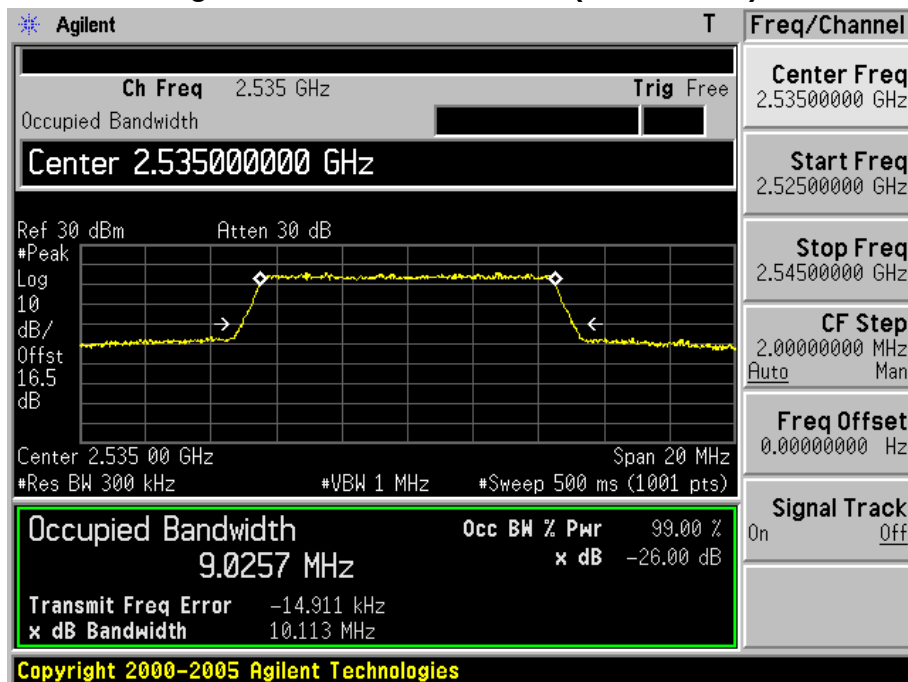
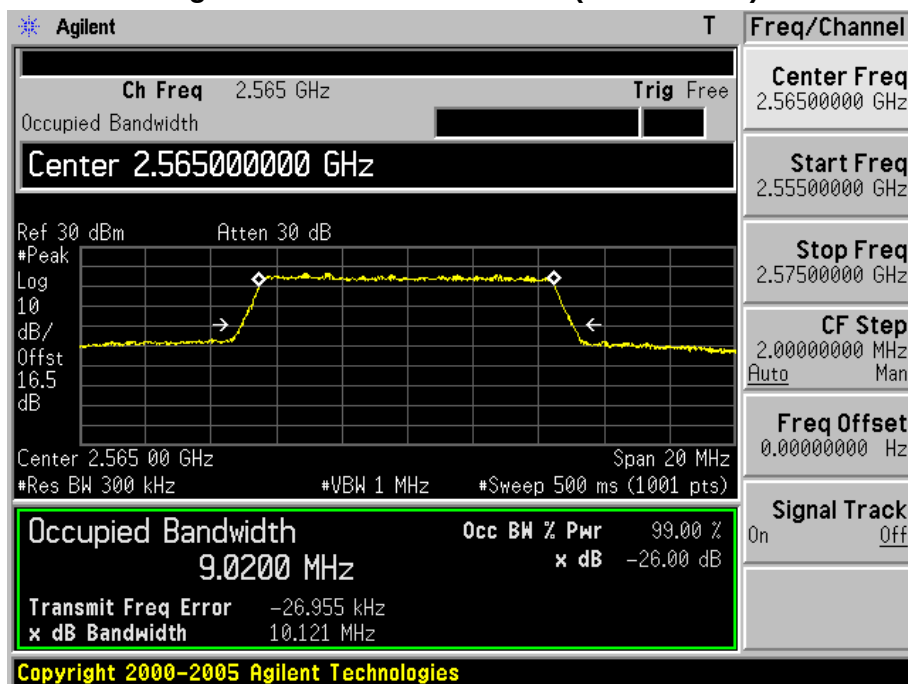


Figure Channel 21400 50RB0 (2565.00MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: LTE Band VII(15M/QPSK)		
Date of Test	2014/12/06	Test Site	AC6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
20825	2507.50	14907.00	13459.40
21100	2535.00	14936.00	13457.50
21375	2562.50	14854.00	13452.70

Figure Channel 20825 75RB0 (2507.50MHz)

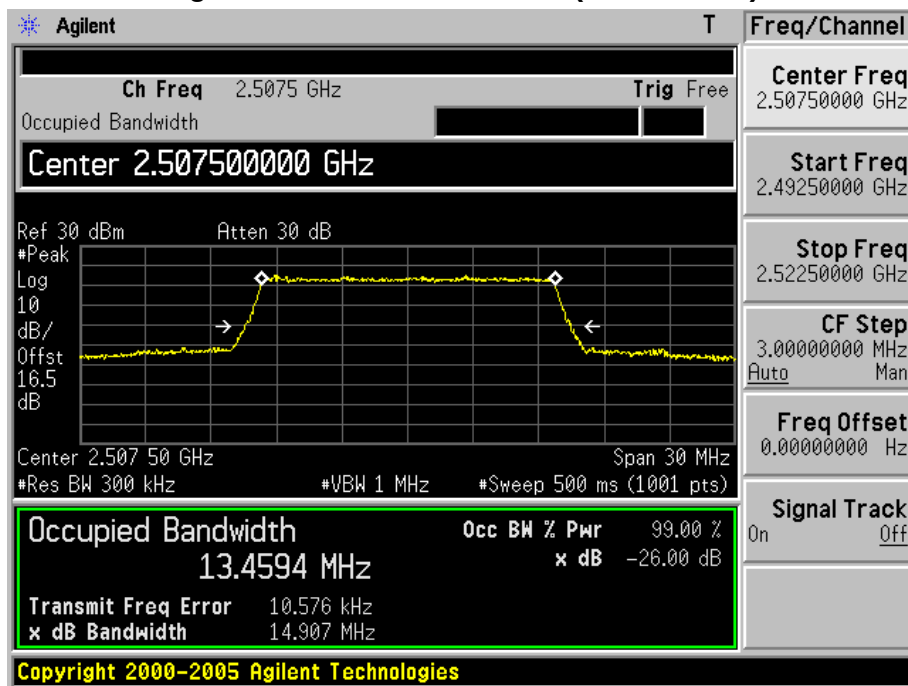


Figure Channel 21100 75RB0 (2535.00MHz)

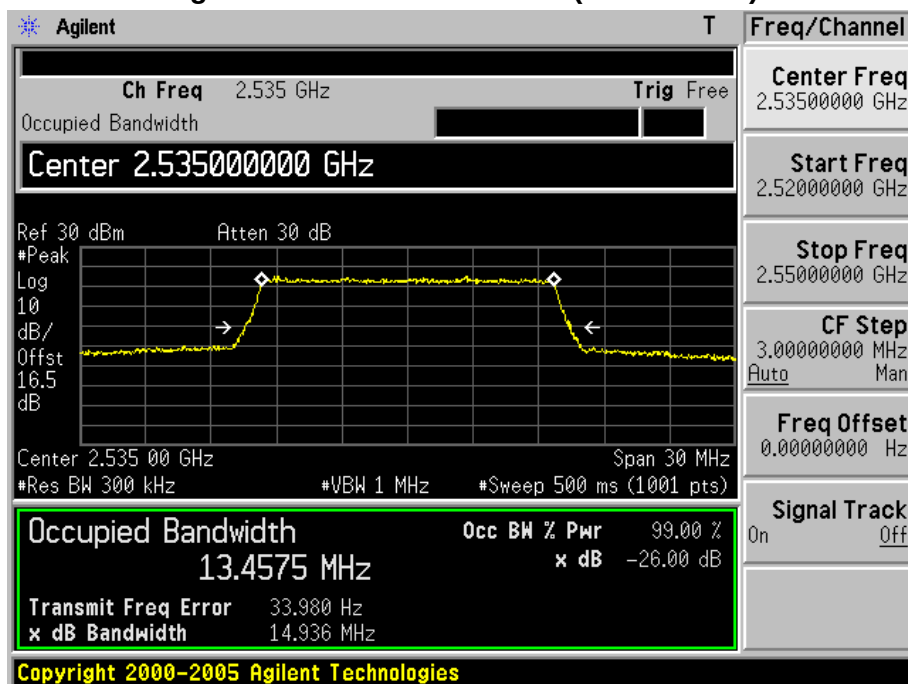
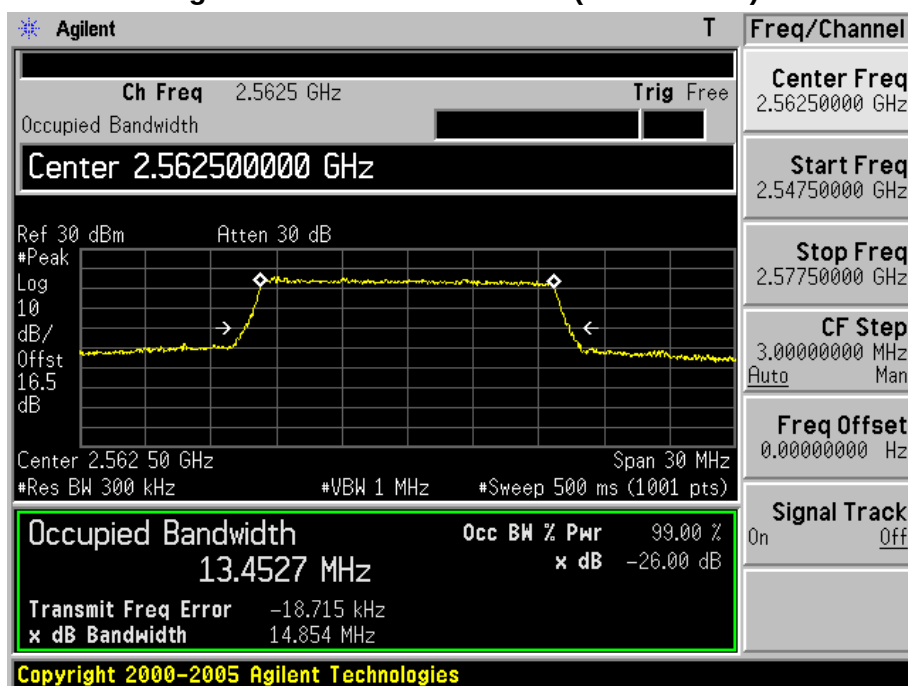


Figure Channel 21375 75RB0 (2562.50MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: LTE Band VII (15M/16QAM)		
Date of Test	2014/12/06	Test Site	AC6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
20825	2507.50	14918.00	13470.30
21100	2535.00	14910.00	13465.70
21375	2562.50	14828.00	13460.50

Figure Channel 20825 75RB0 (2507.50MHz)

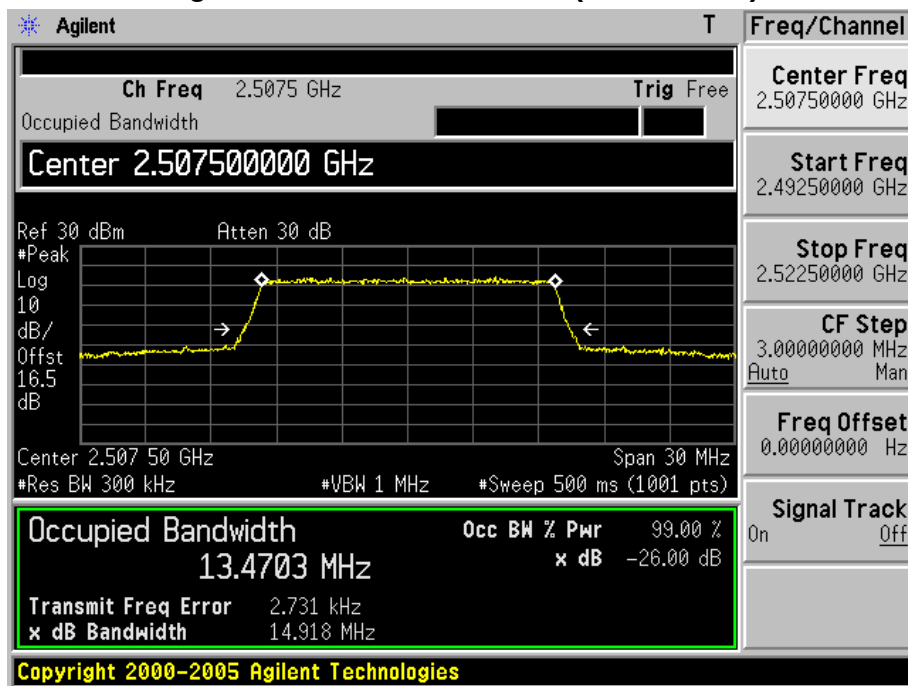


Figure Channel 21100 75RB0 (2535.00MHz)

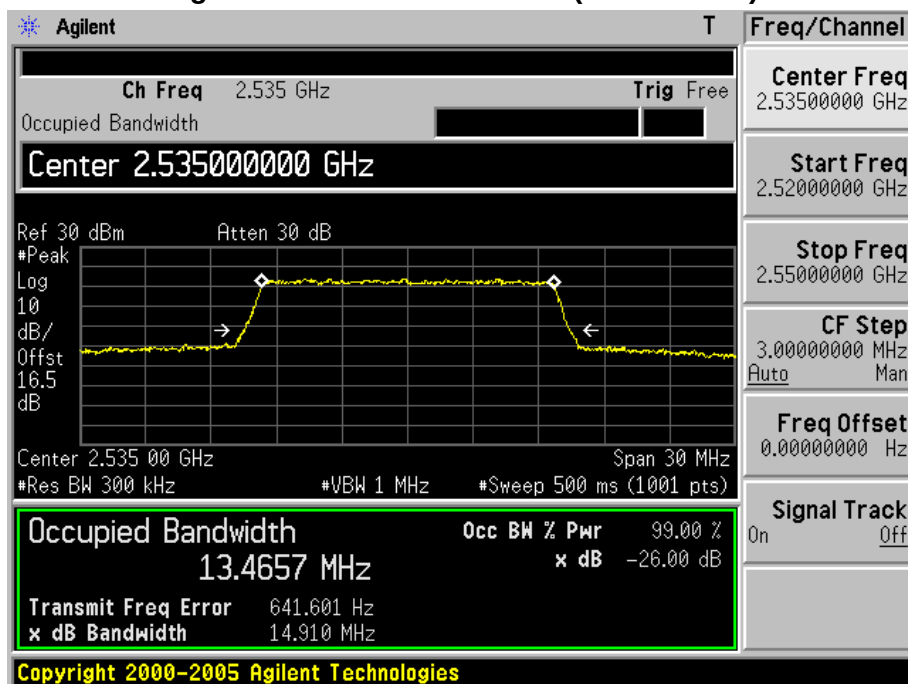
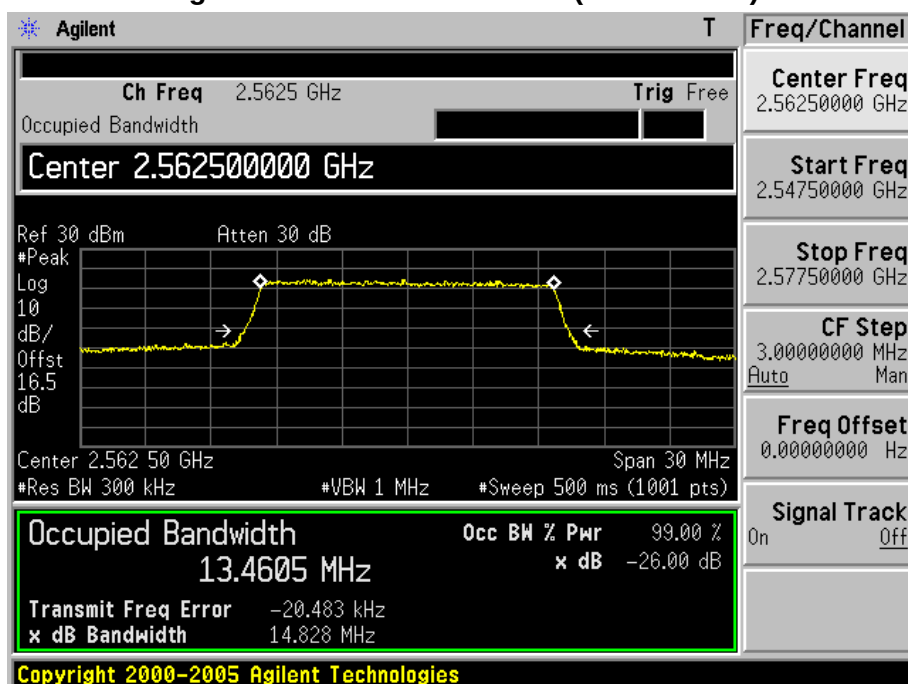


Figure Channel 21375 75RB0 (2562.50MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: LTE Band VII(20M/QPSK)		
Date of Test	2014/12/06	Test Site	AC6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
20850	2510.00	20825.00	18420.40
21100	2535.00	20785.00	18419.90
21350	2560.00	20740.00	18424.50

Figure Channel 20850 100RB0 (2510.00MHz)

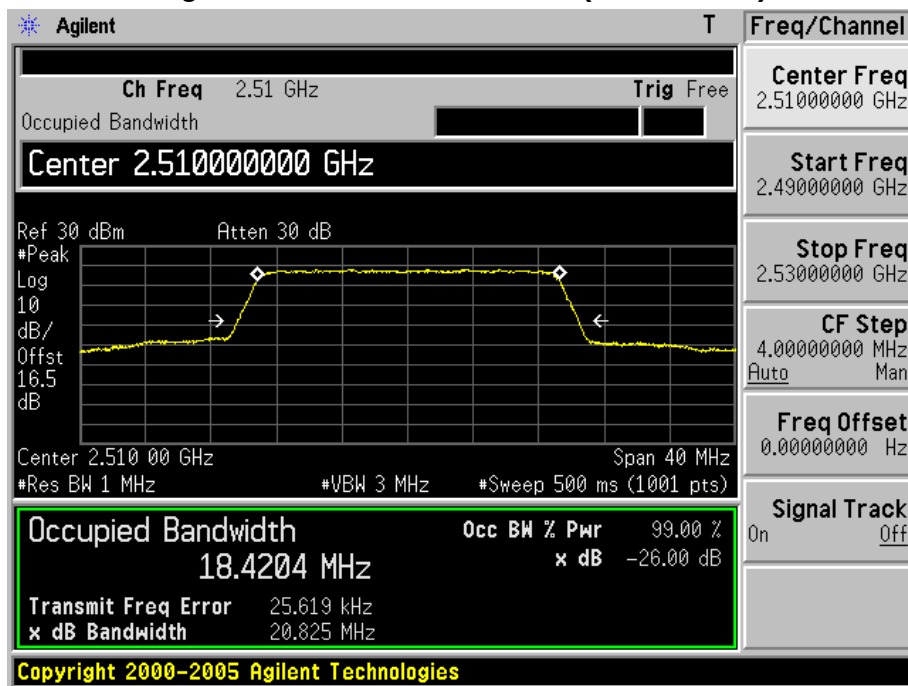


Figure Channel 21100 100RB0 (2535.00MHz)

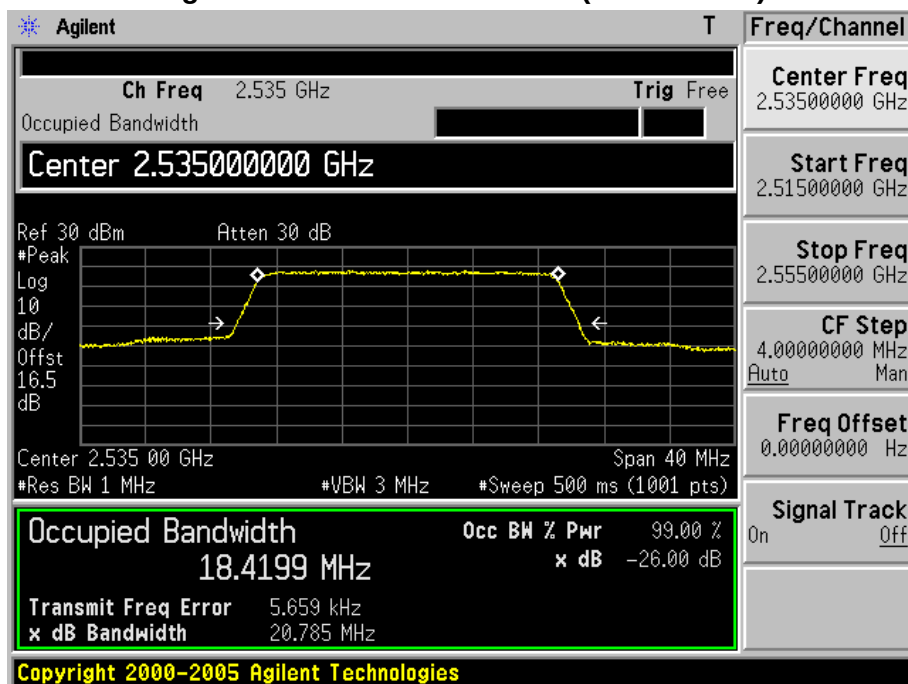
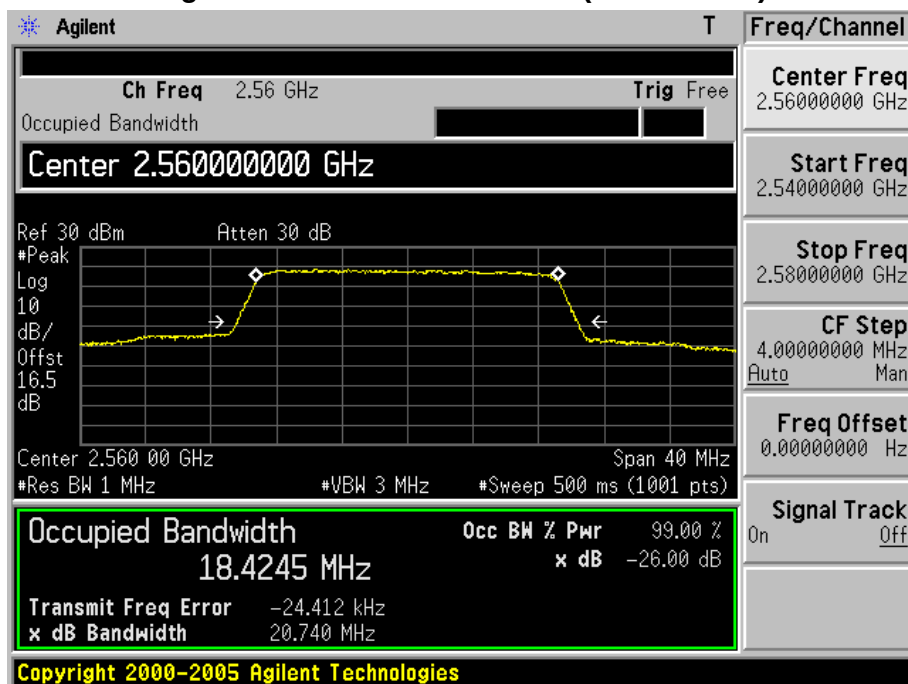


Figure Channel 21350 100RB0 (2560.00MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: LTE Band VII (20M/16QAM)		
Date of Test	2014/12/06	Test Site	AC6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
20850	2510.00	20597.00	18373.40
21100	2535.00	20702.00	18379.70
21350	2560.00	20592.00	18336.20

Figure Channel 20850 100RB0 (2510.00MHz)

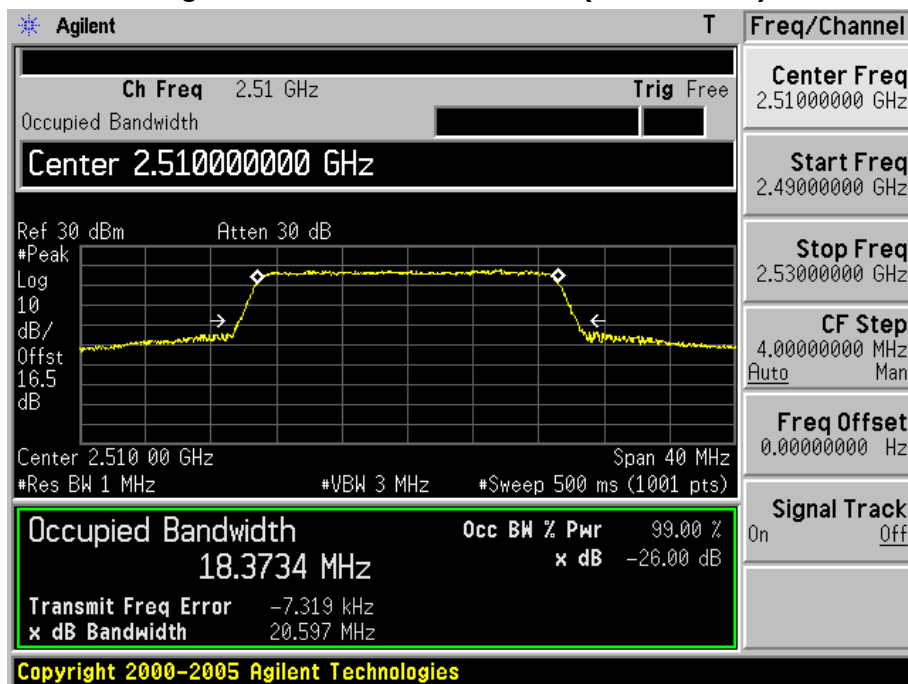


Figure Channel 21100 100RB0 (2535.00MHz)

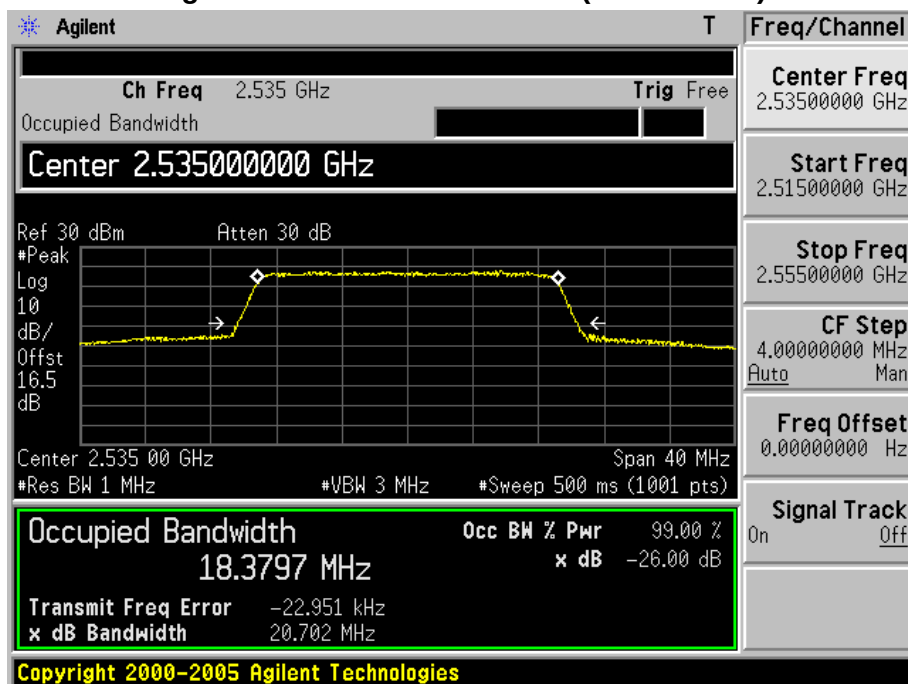
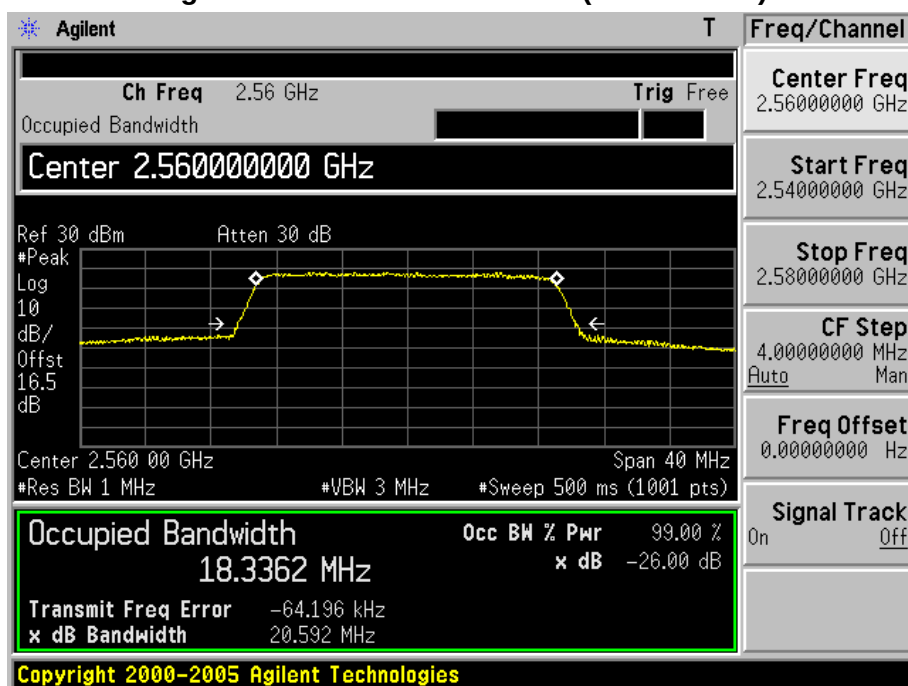


Figure Channel 21350 100RB0 (2560.00MHz)



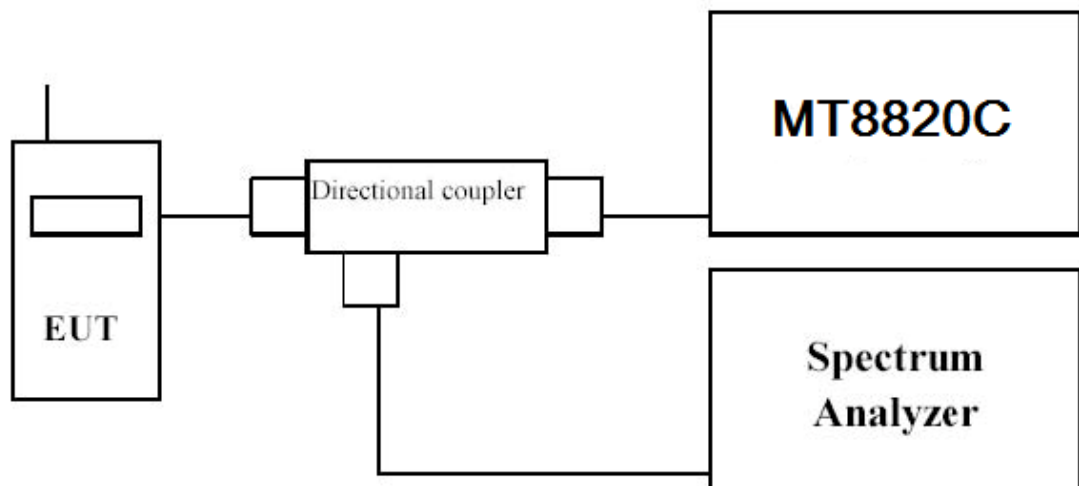
6. Conducted Band Edge

6.1. Test Equipment

Spurious Emission At Antenna Terminals (+/- 1MHz) / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2015.03.28
Radio Communication Tester	Anritsu	MT8820C	6201181503	2015.03.28
Dual Directional Coupler	Agilent	778D	20160	2015.03.28
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2015.03.28
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2015.01.08

6.2. Test Setup



6.3. Test Procedure

1. The EUT was connected to spectrum analyzer and System Simulator via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The conducted spurious emission for the whole frequency range was taken.

6.4. Uncertainty

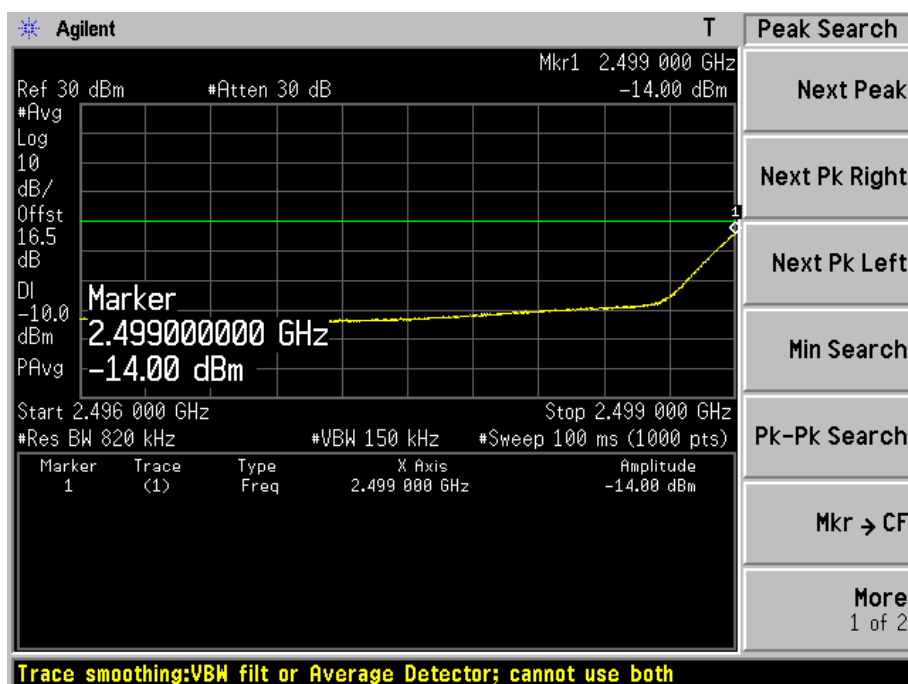
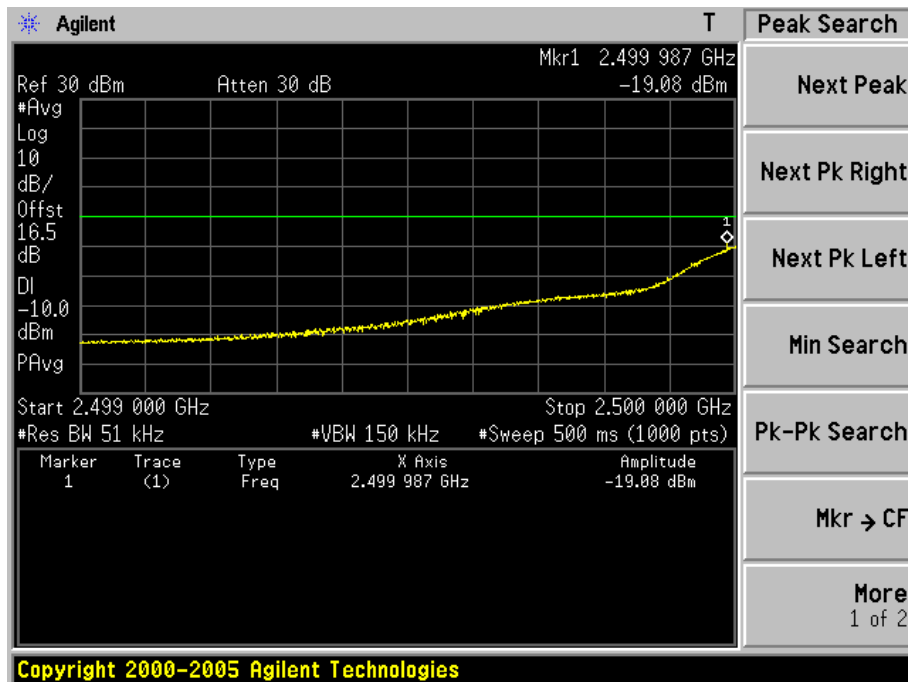
The measurement uncertainty is defined as ± 1.2 dB.

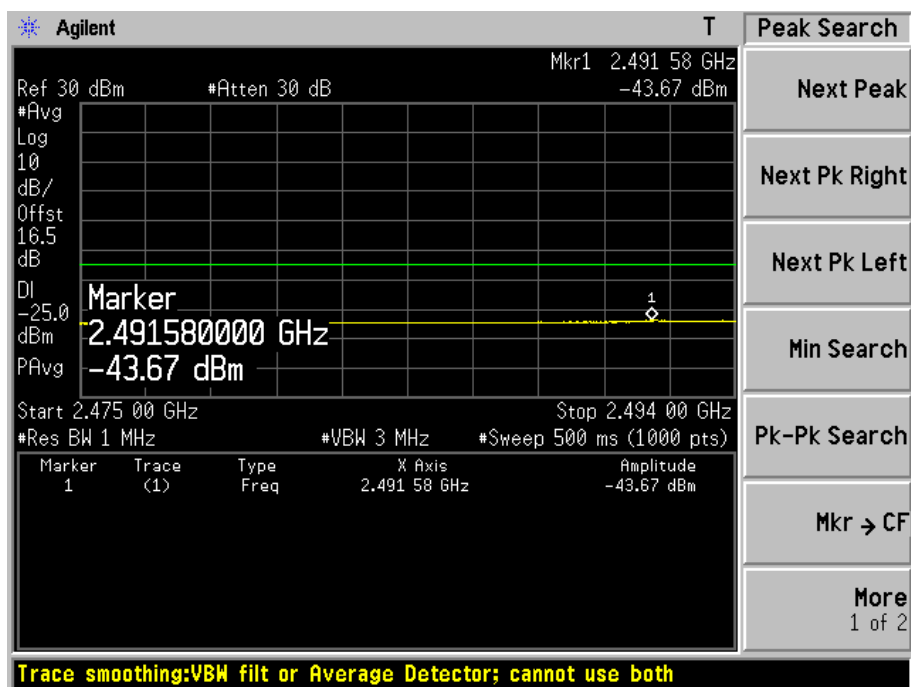
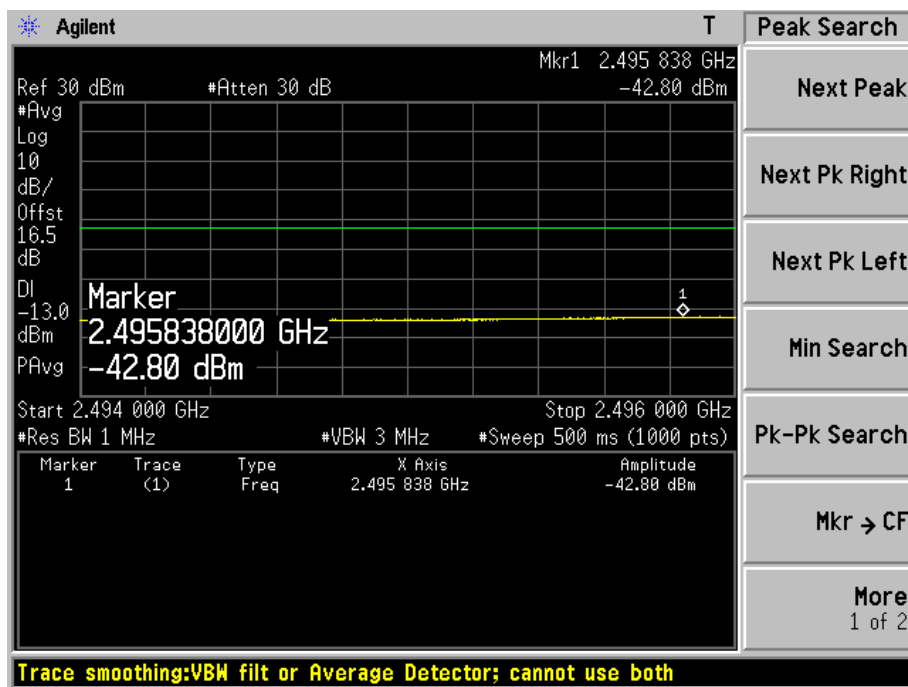
6.5. Test Result

Product	Wireless Module		
Test Item	Conducted Band Edge		
Test Mode	Mode 1: LTE Band VII (5M/QPSK)		
Date of Test	2014/12/07	Test Site	AC6

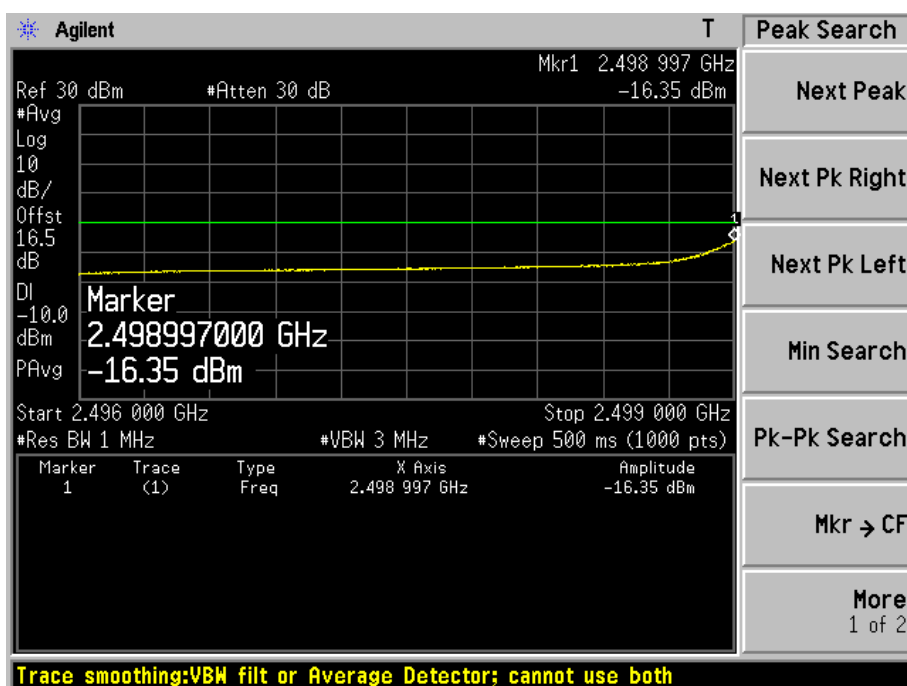
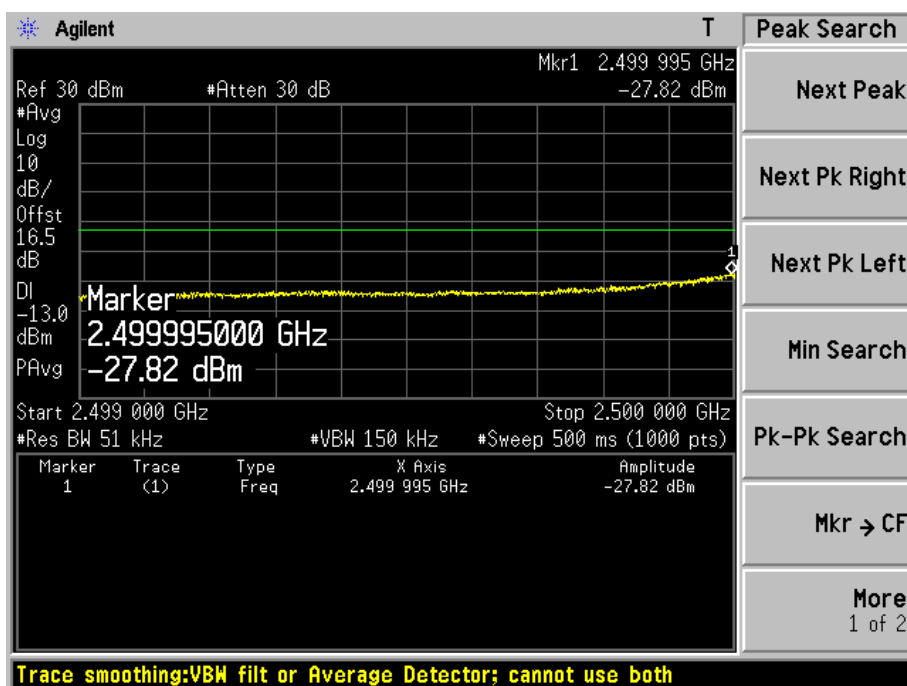
Figure Channel 20775 (2502.5MHz)

1RB0





25RB0



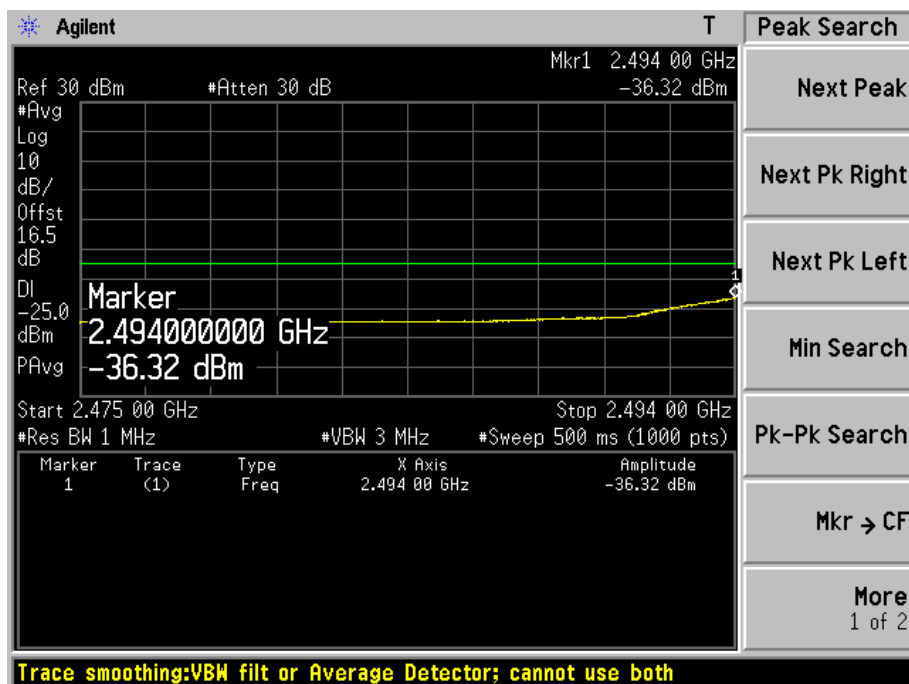
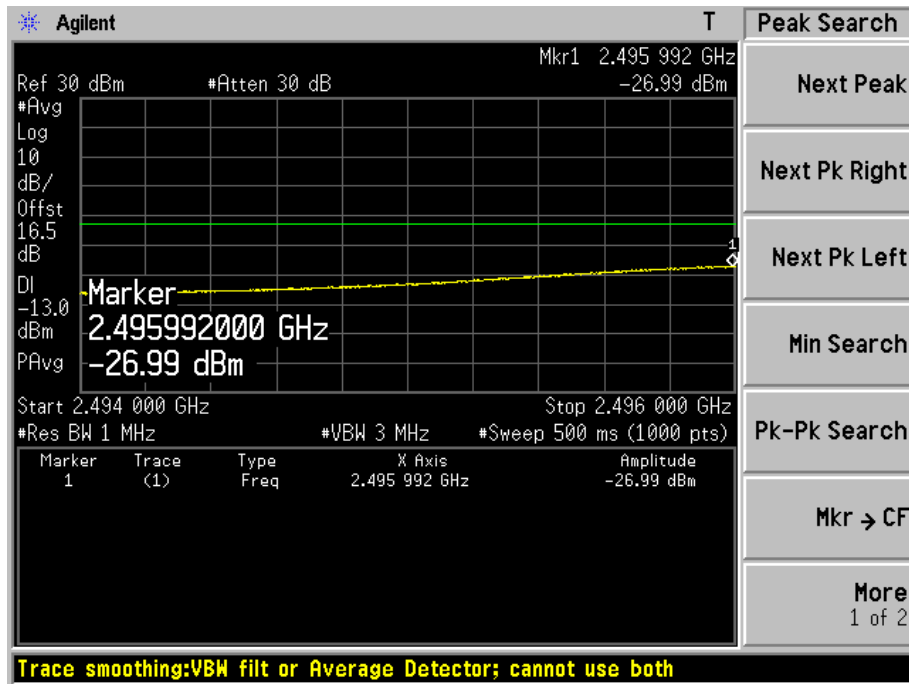
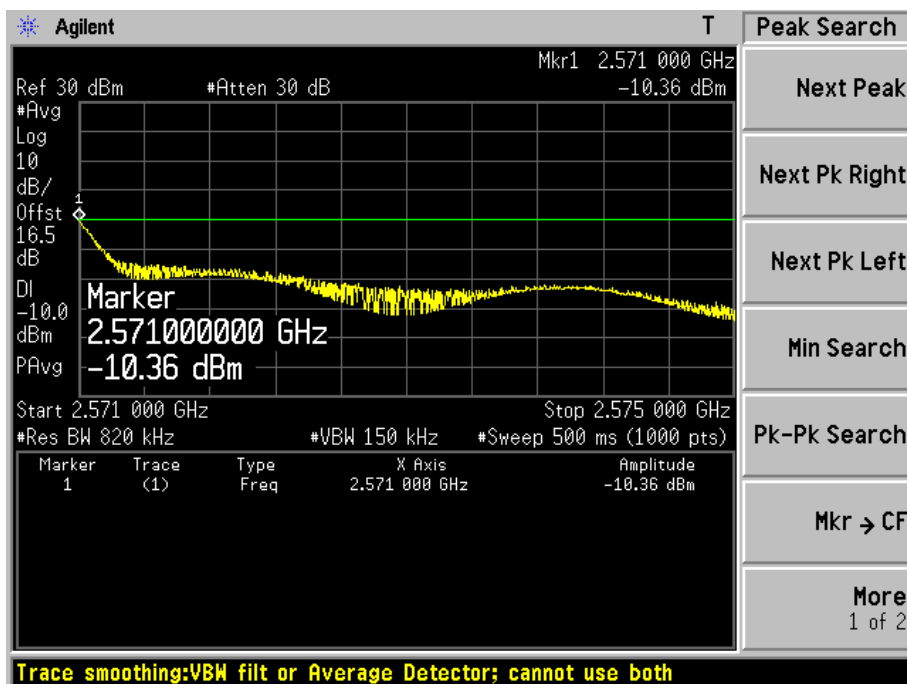
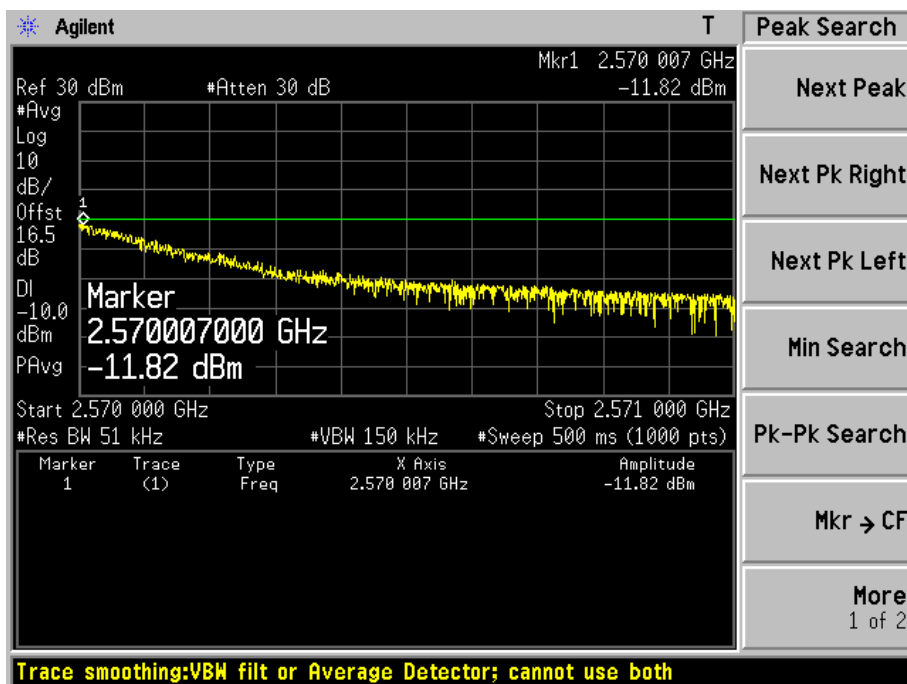
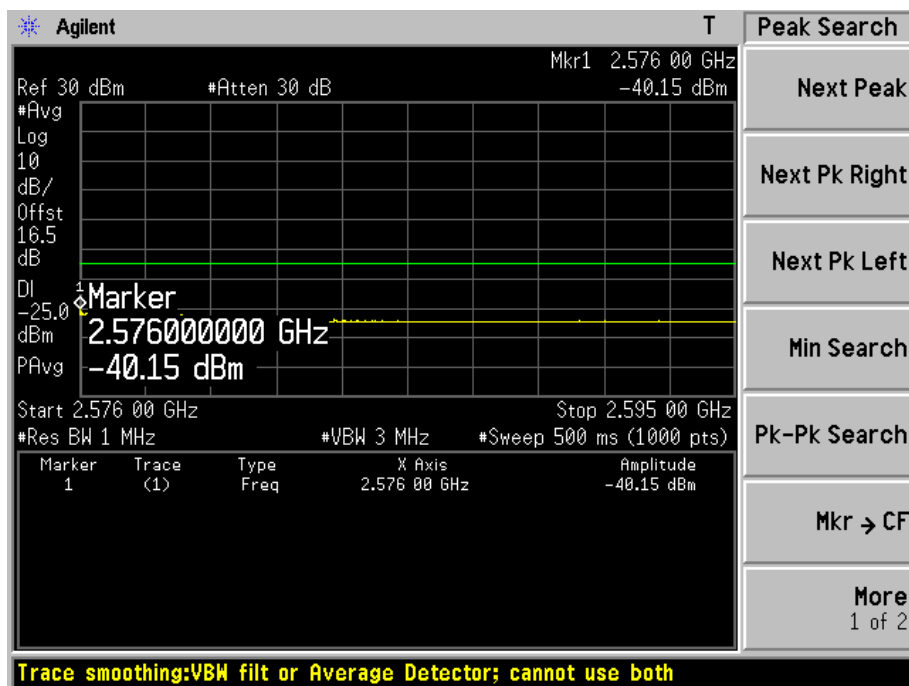
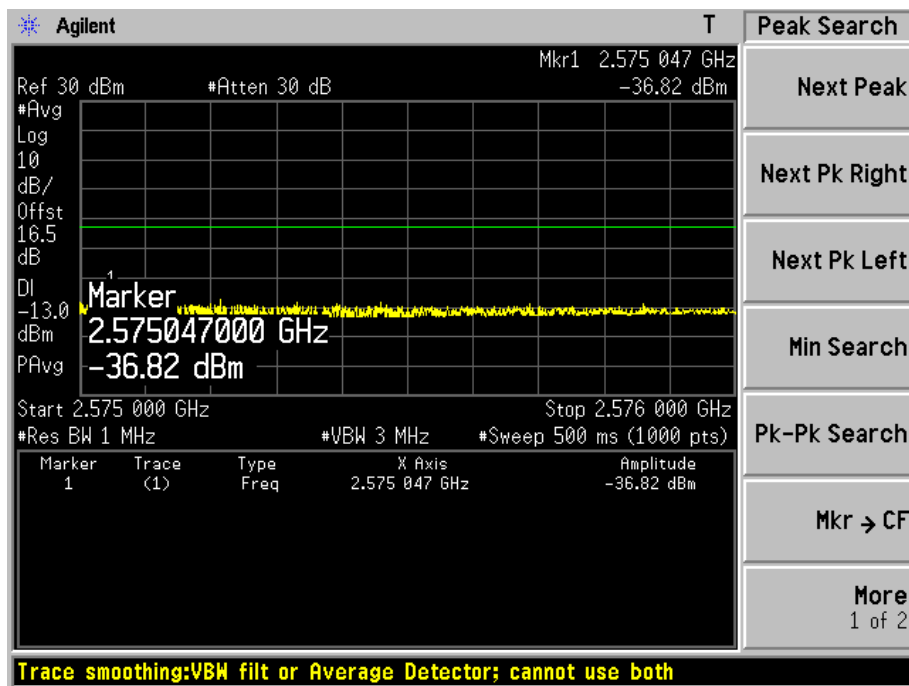


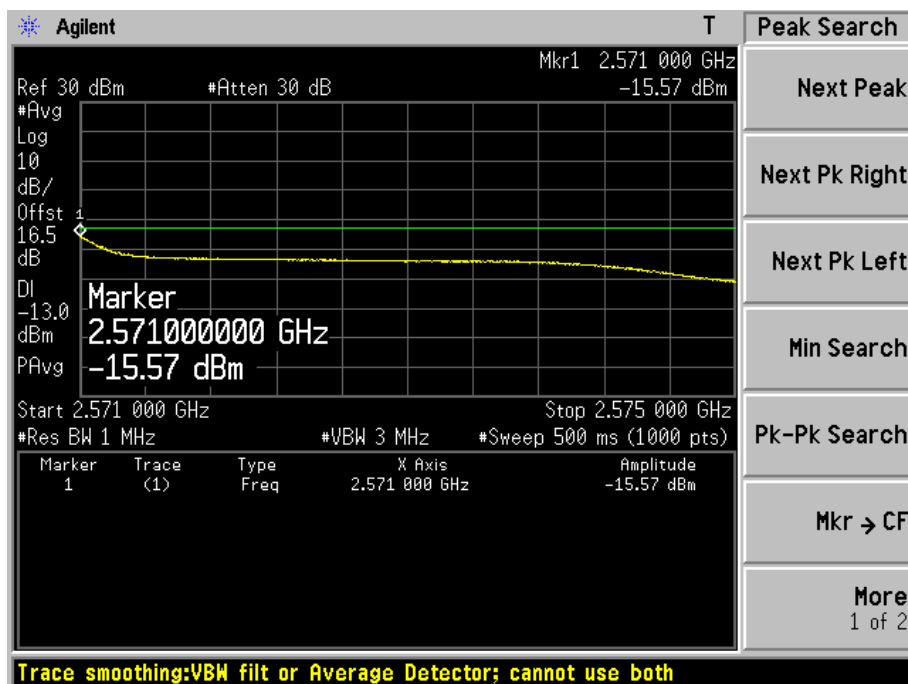
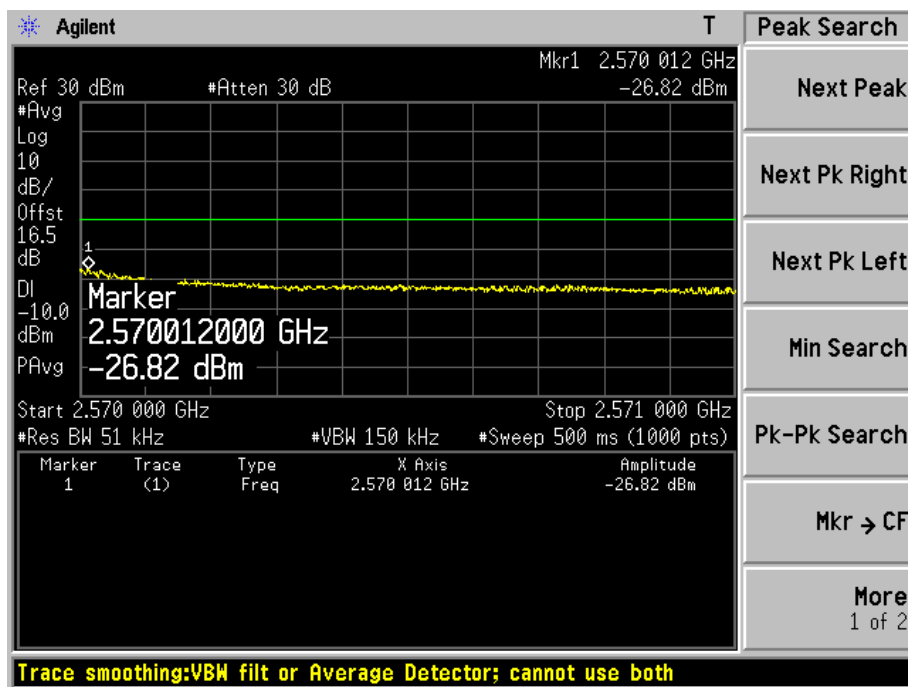
Figure Channel 21425 (2567.5MHz)

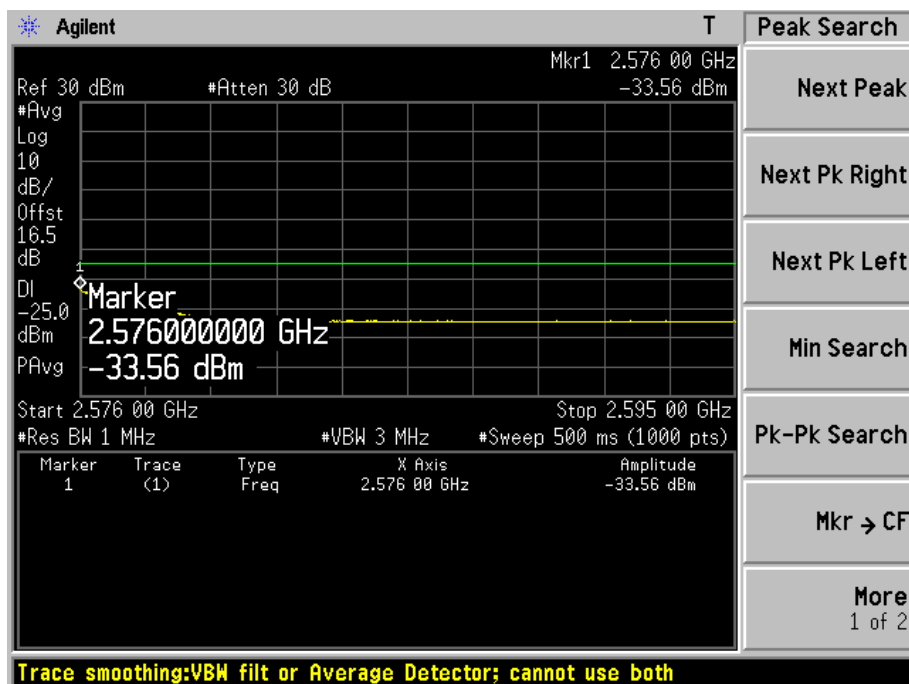
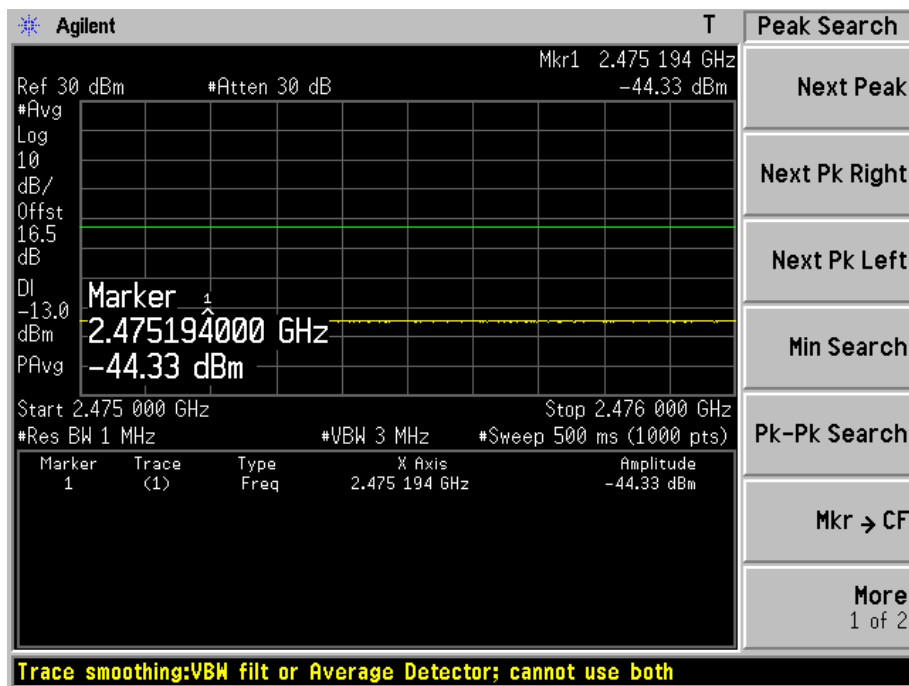
1RB24





25RB0

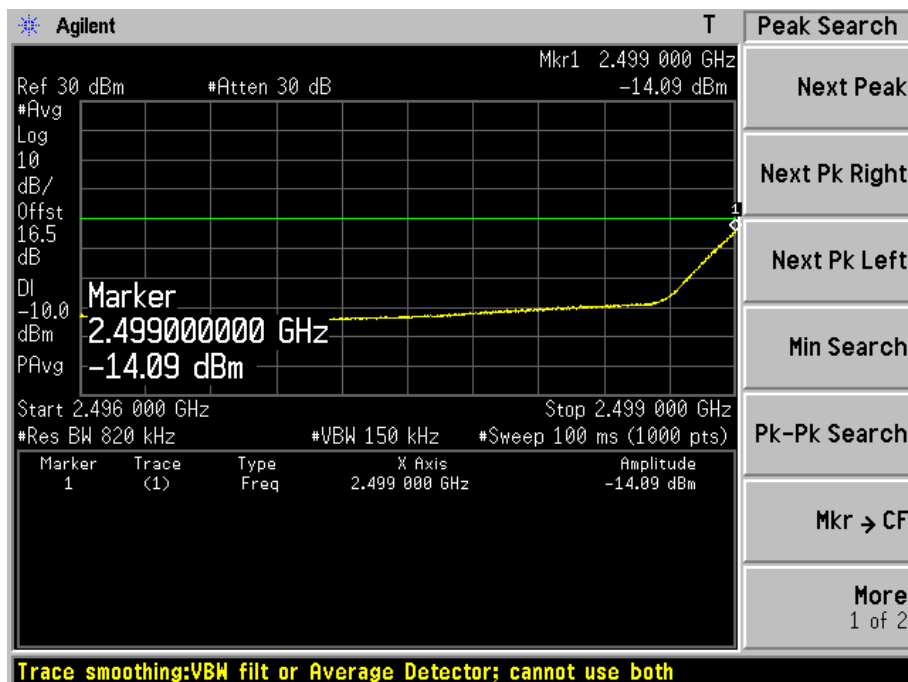
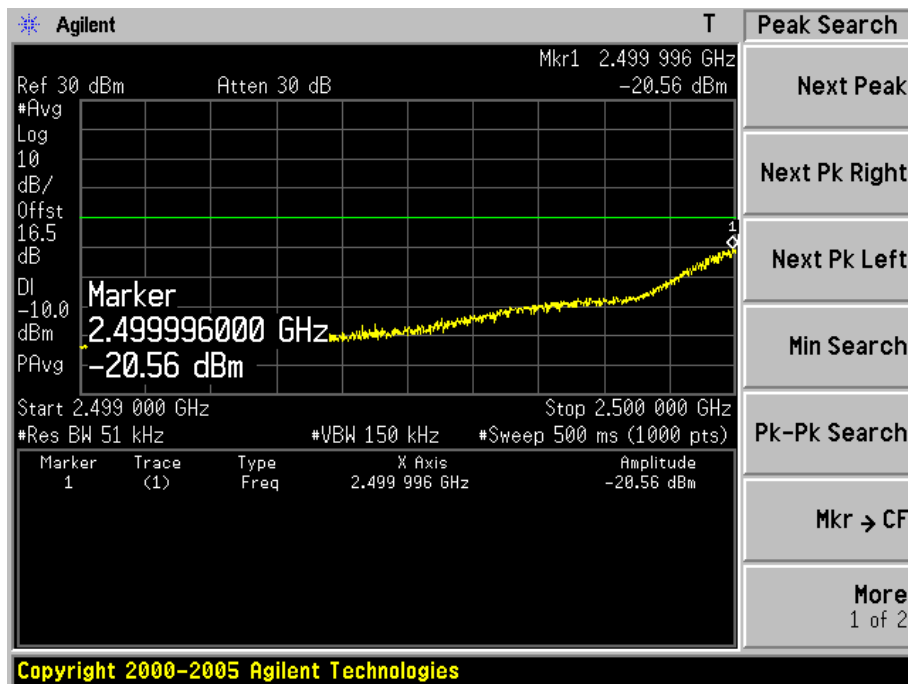


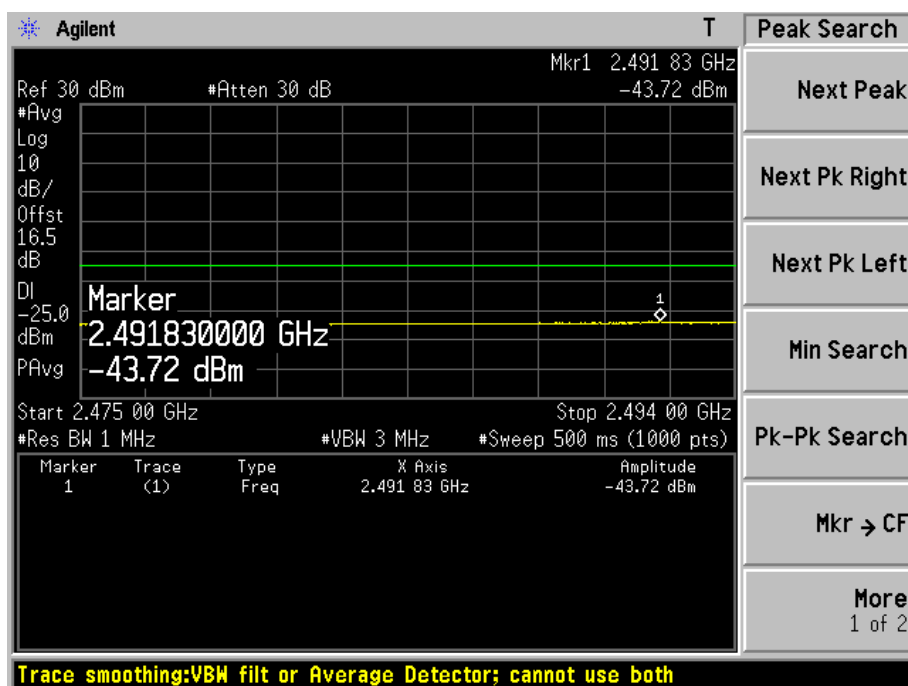
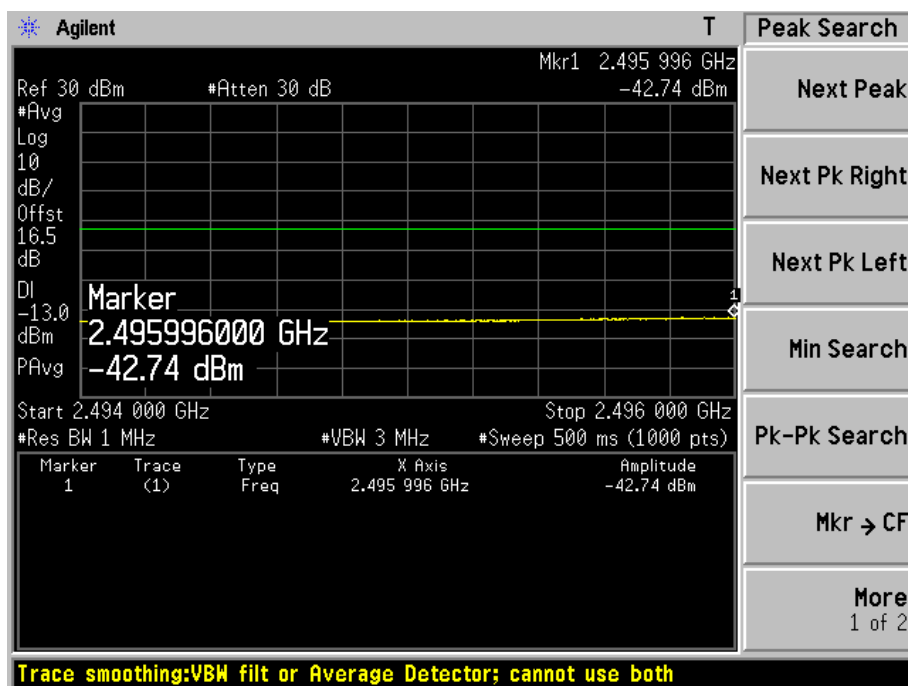


Product	Wireless Module		
Test Item	Conducted Band Edge		
Test Mode	Mode 1: LTE Band VII (5M/16QAM)		
Date of Test	2014/12/07	Test Site	AC6

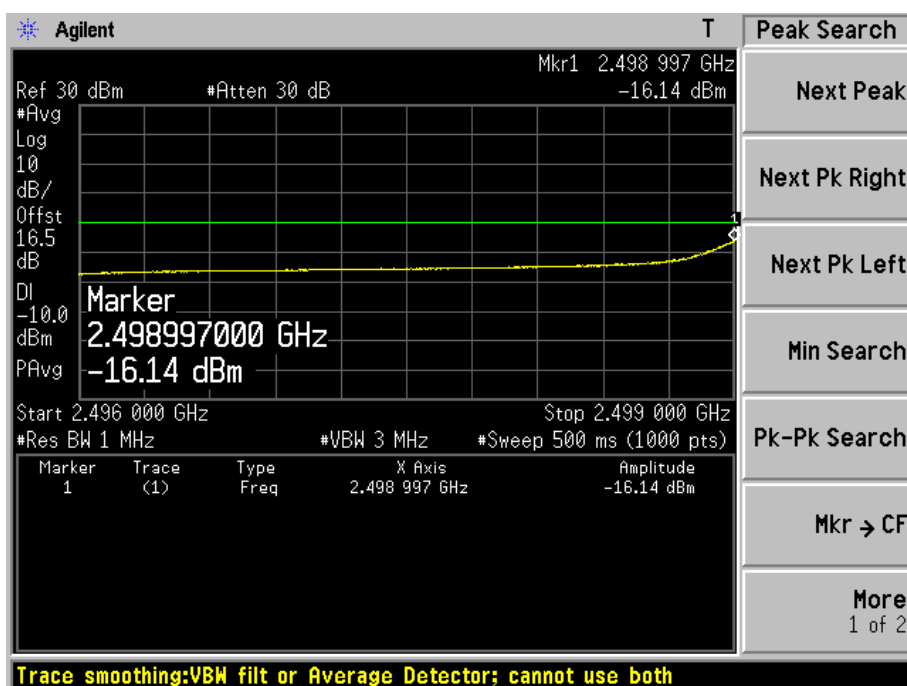
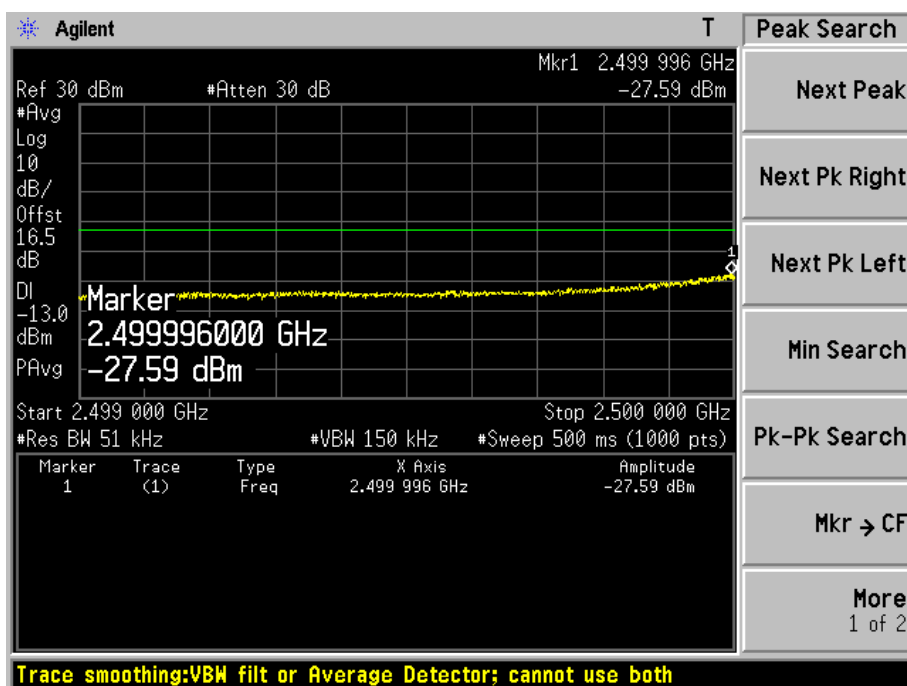
Figure Channel 20775 (2502.5MHz)

1RB0





25RB0



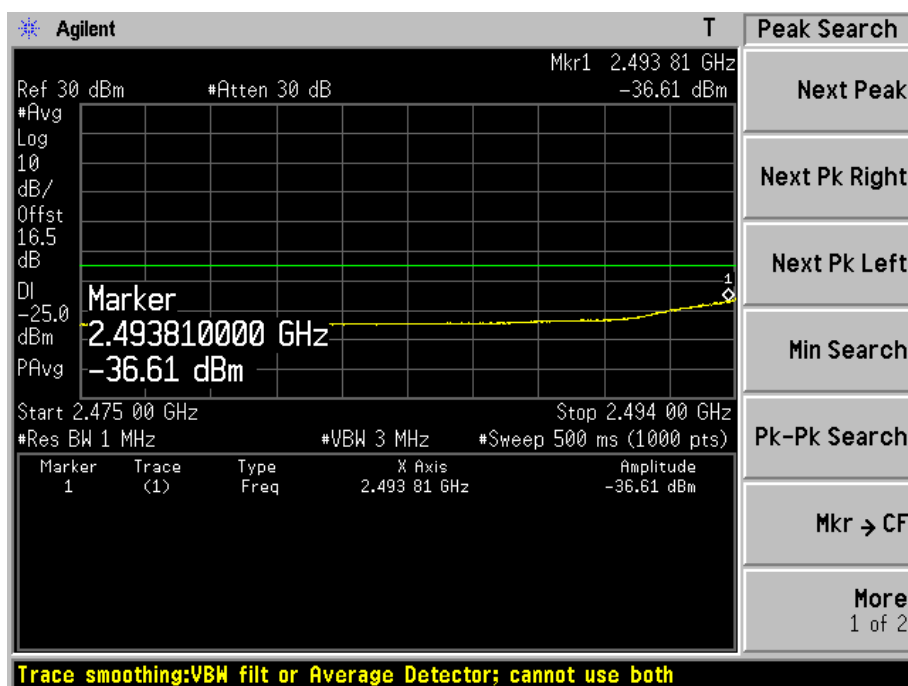
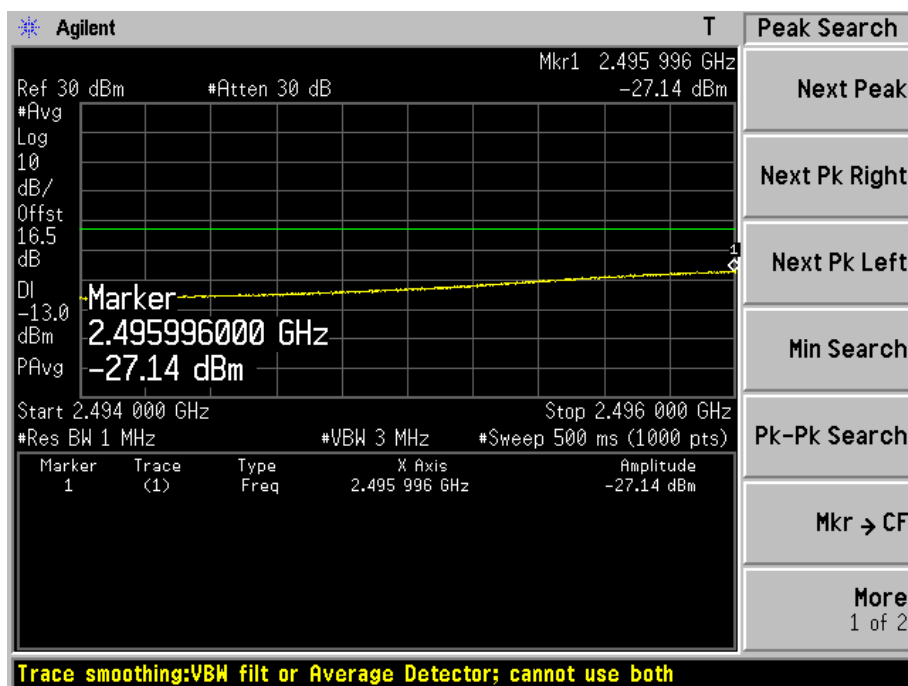
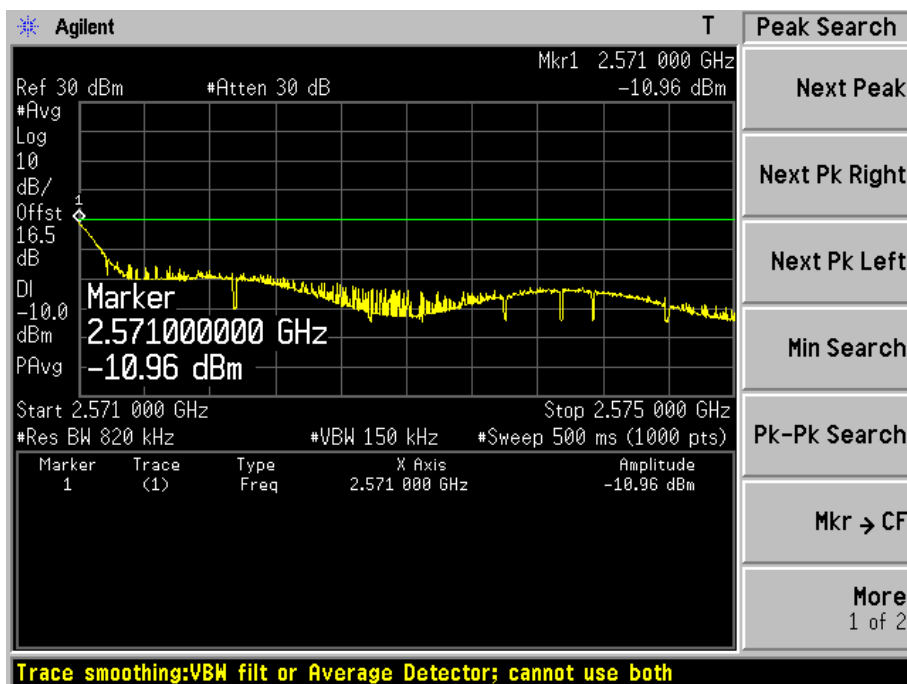
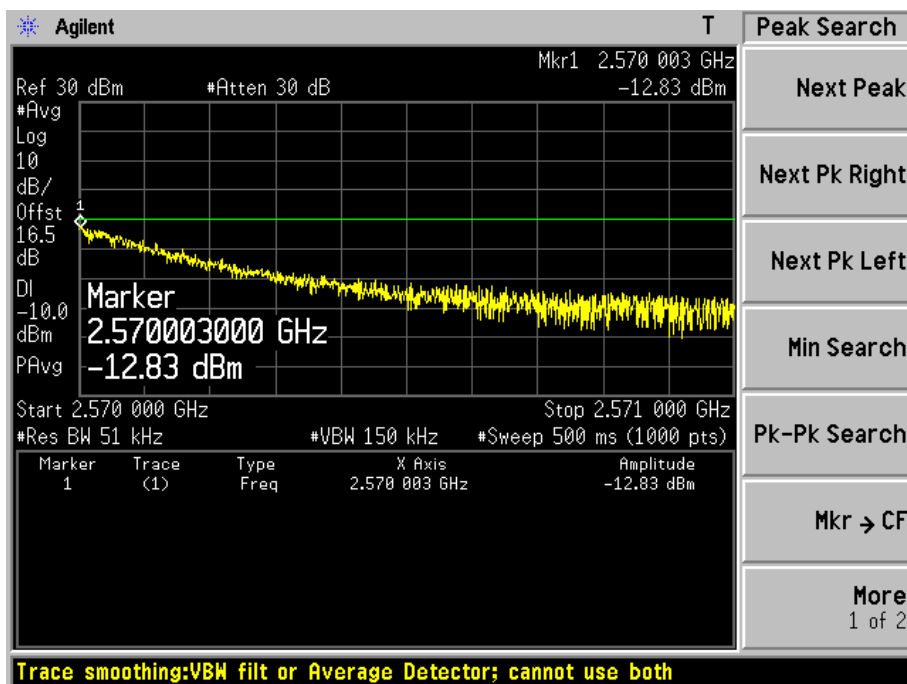
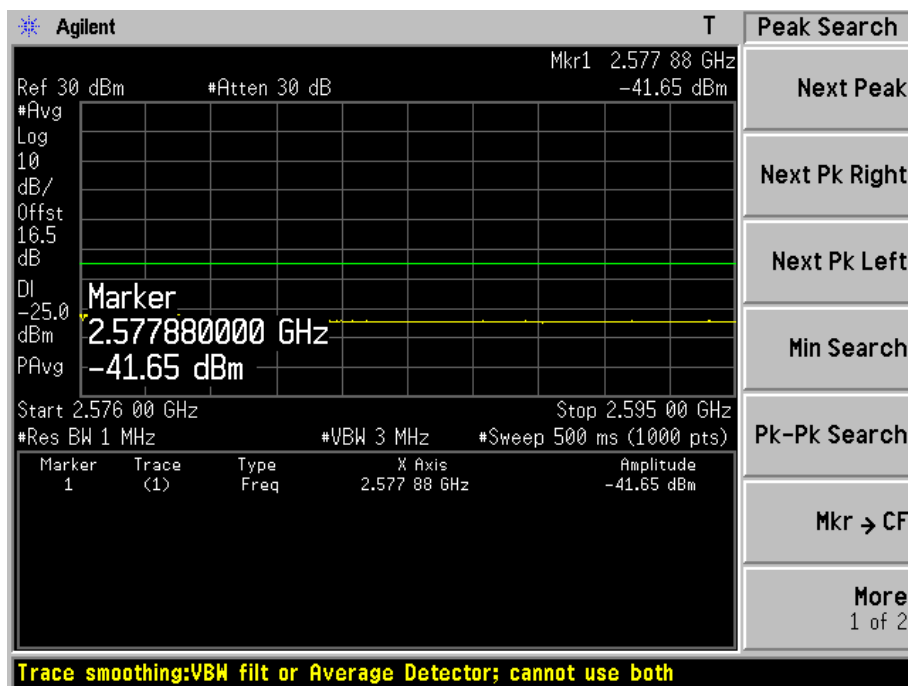
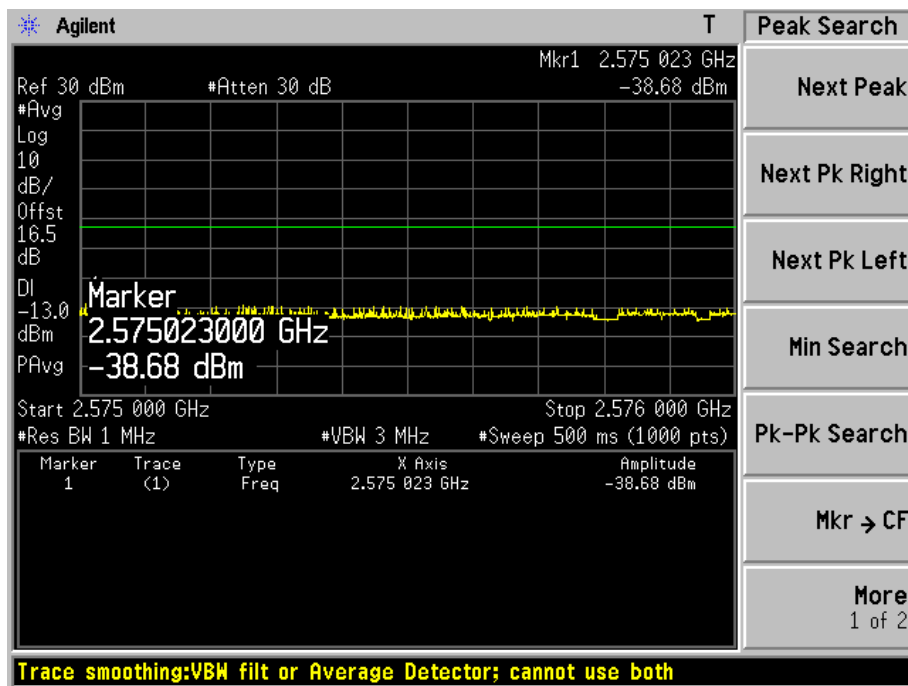


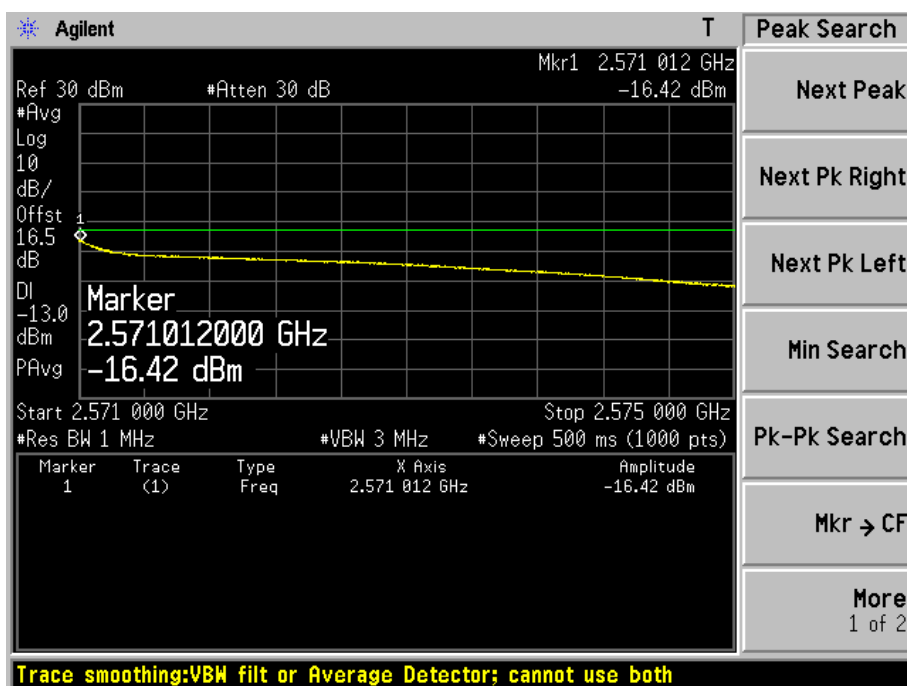
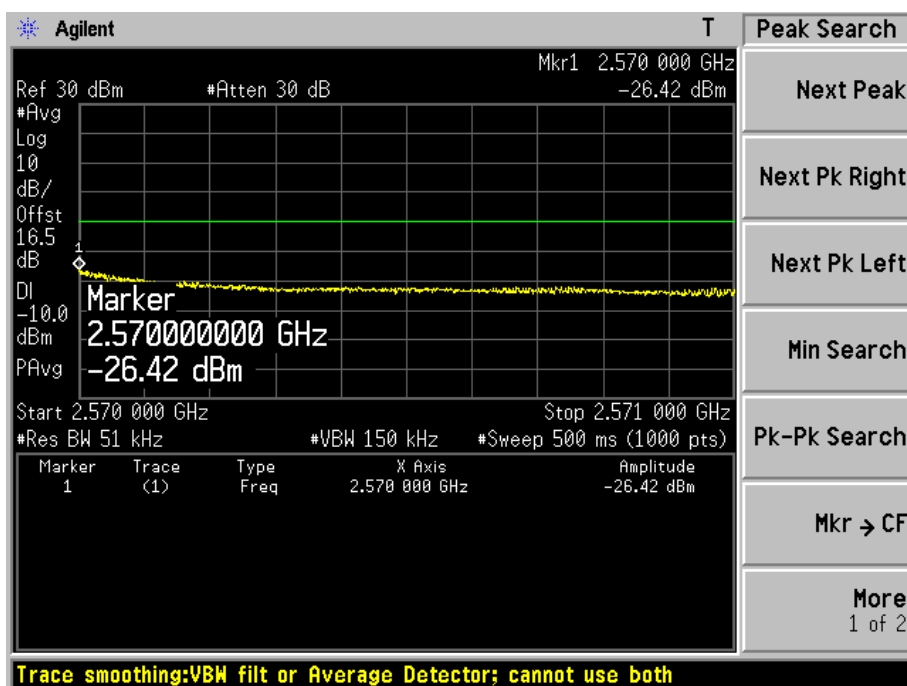
Figure Channel 21425 (2567.5MHz)

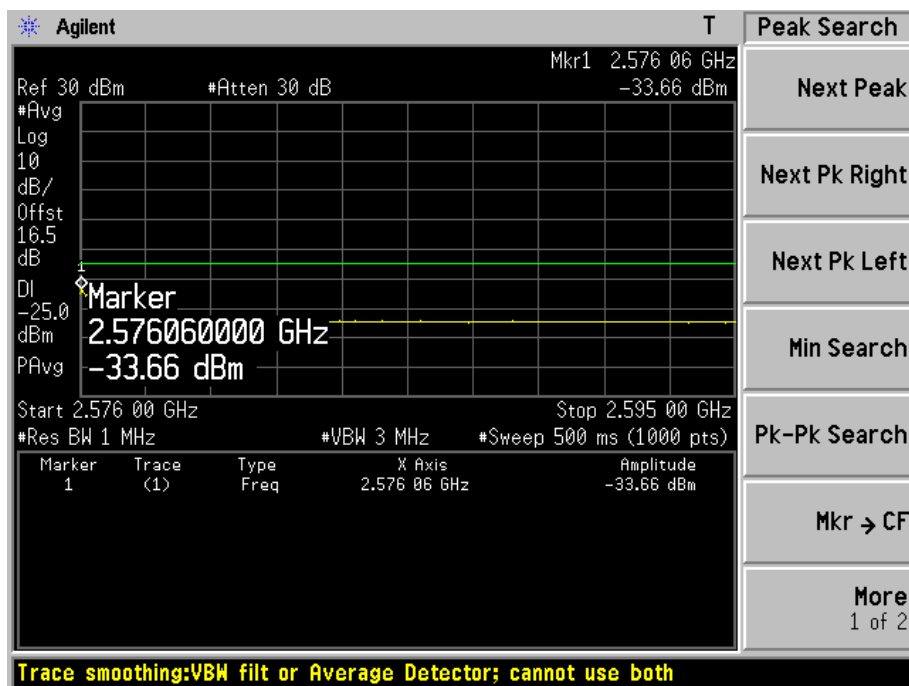
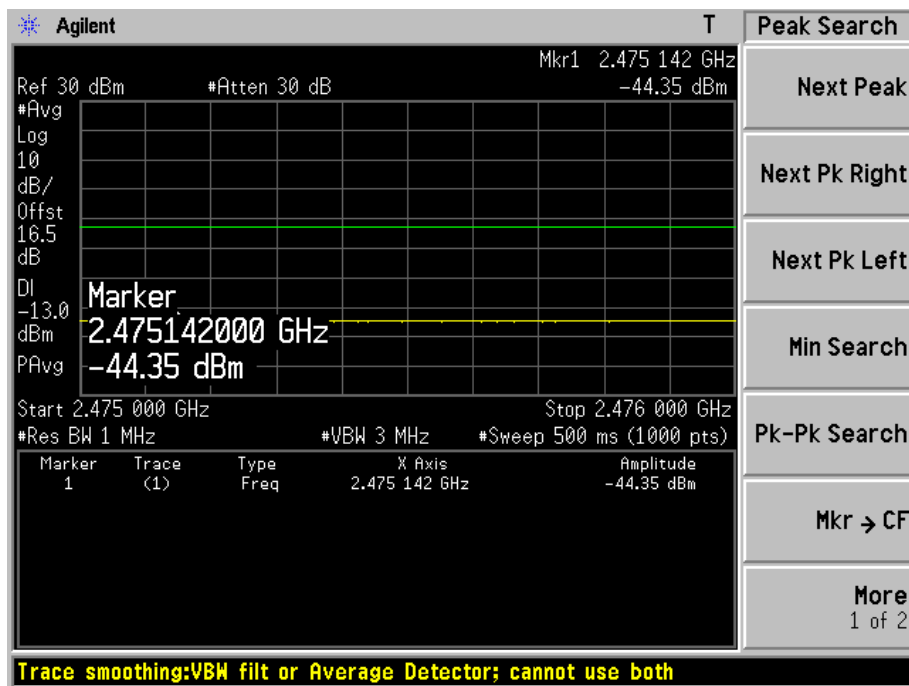
1RB24





25RB0

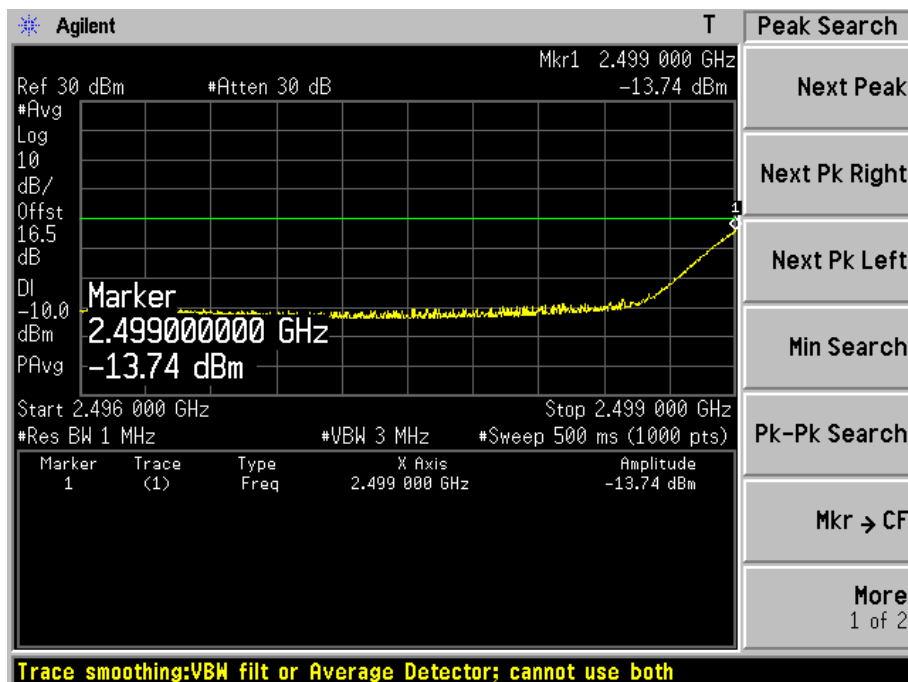
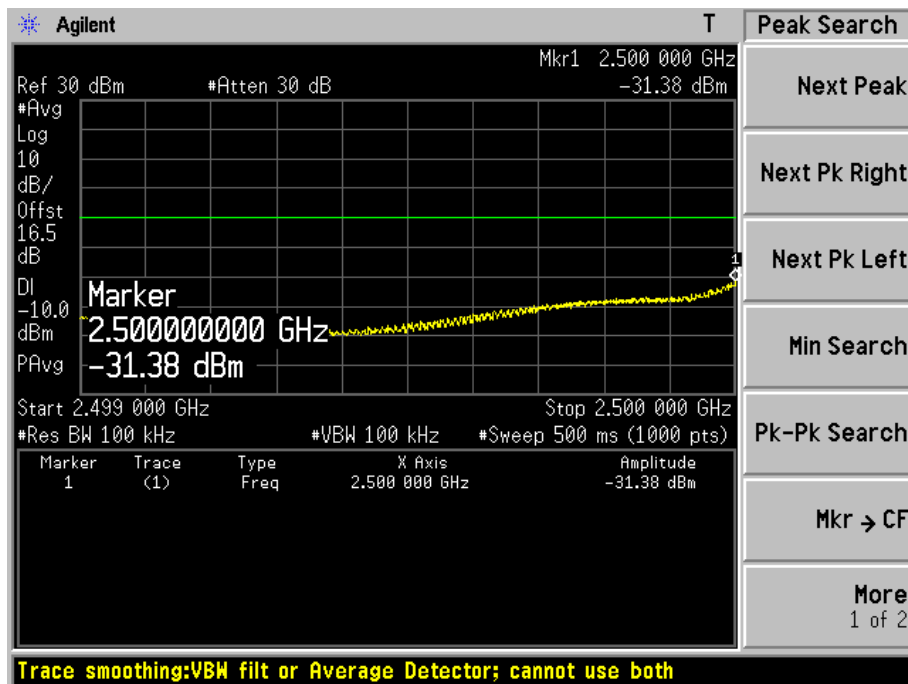


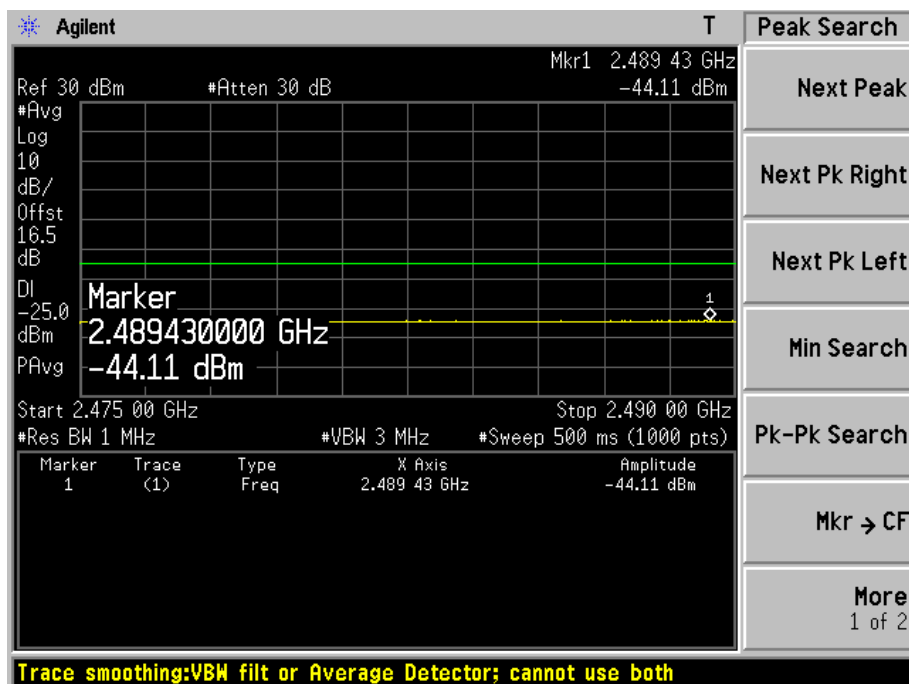
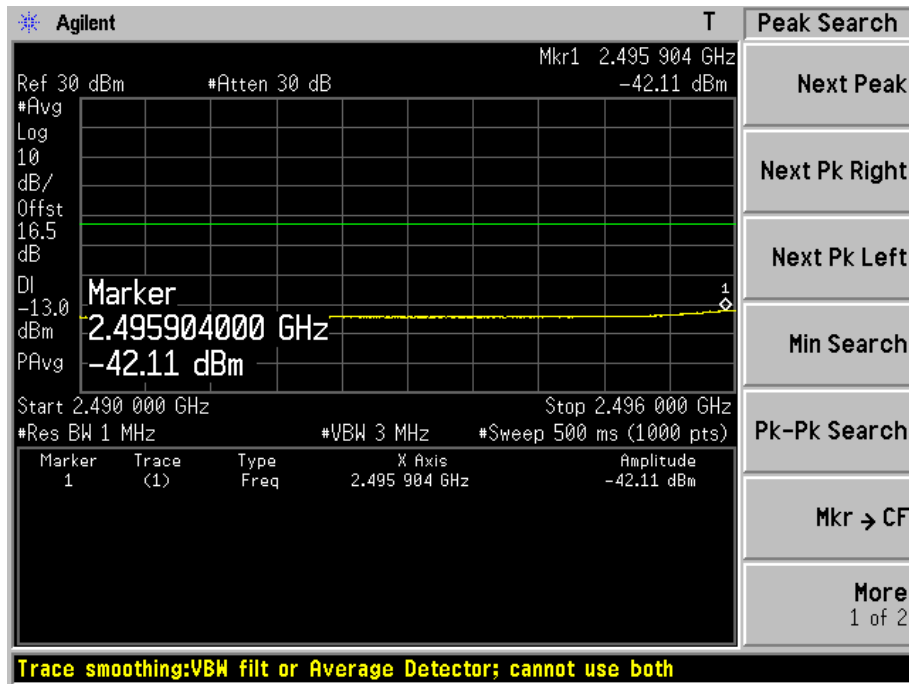


Product	Wireless Module		
Test Item	Conducted Band Edge		
Test Mode	Mode 1: LTE Band VII (10M/QPSK)		
Date of Test	2014/12/07	Test Site	AC6

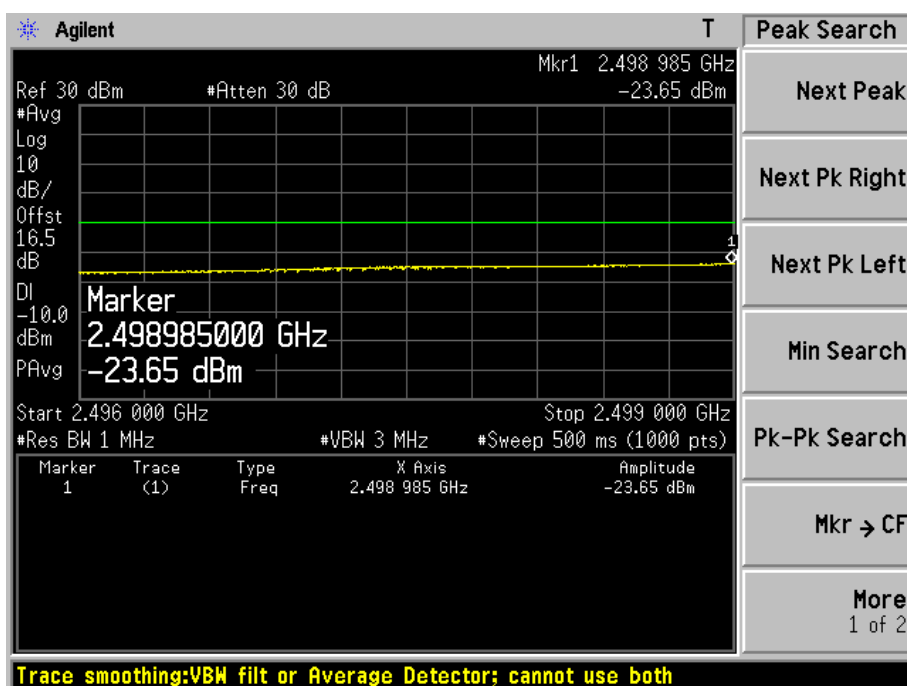
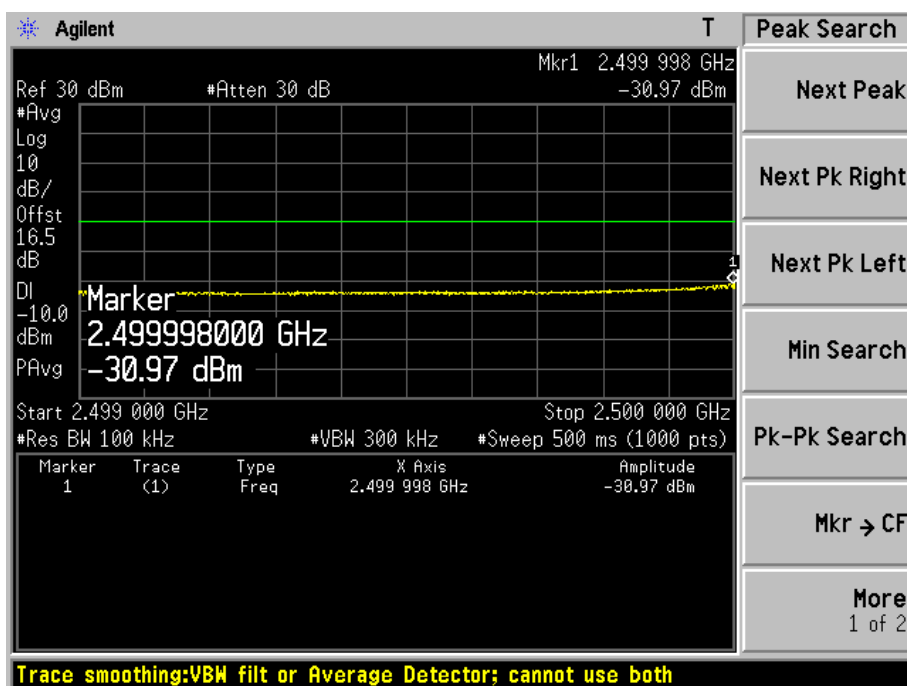
Figure Channel 20800 (2505MHz)

1RB0





50RB0



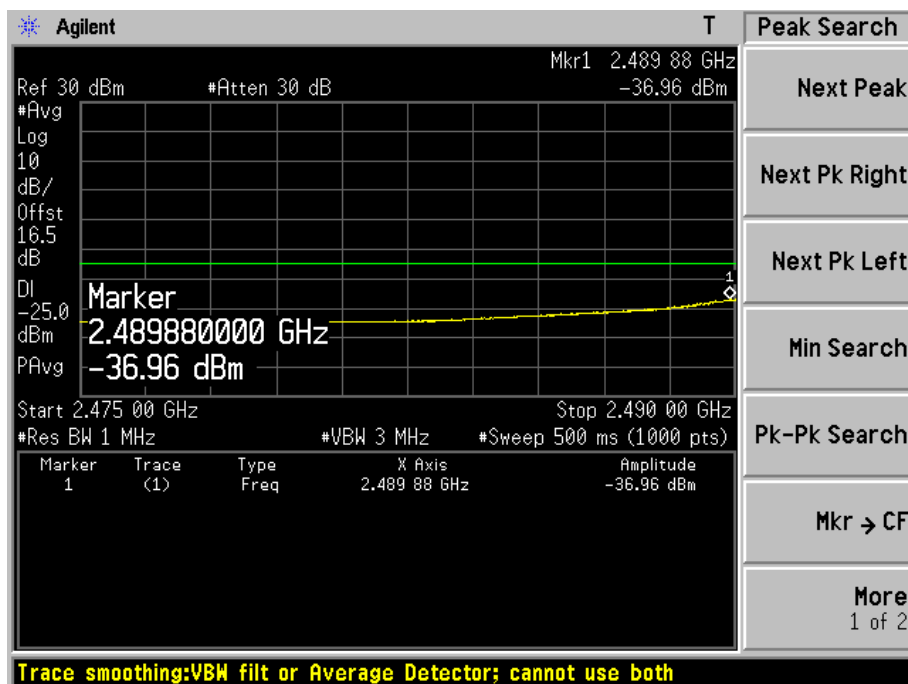
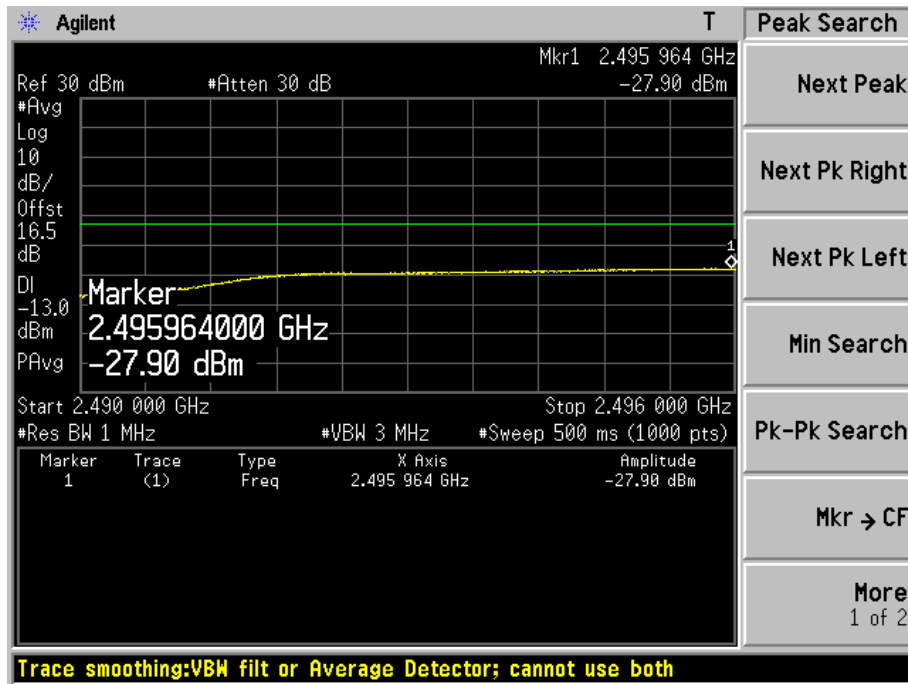
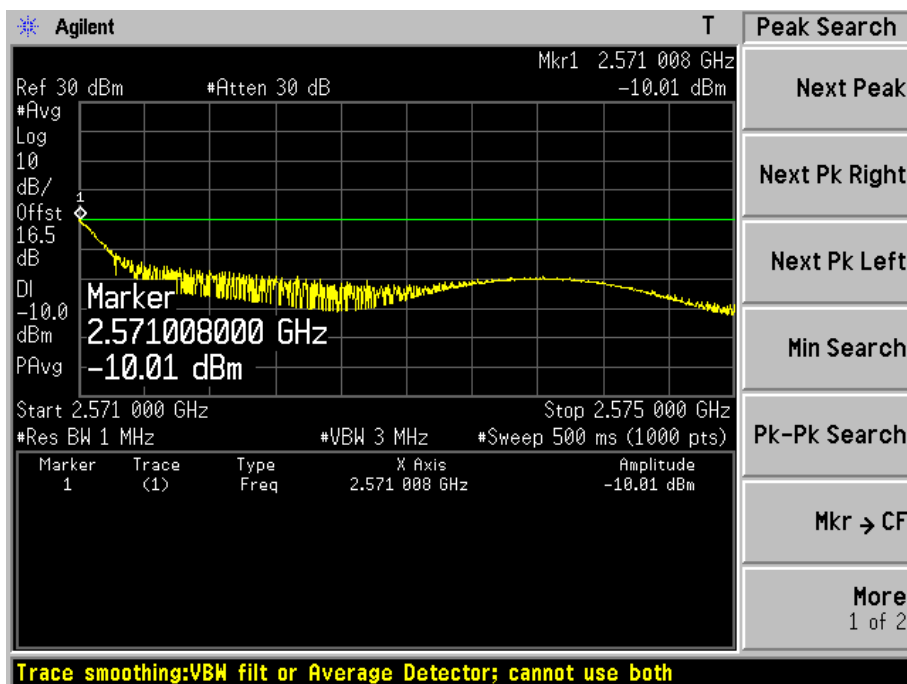
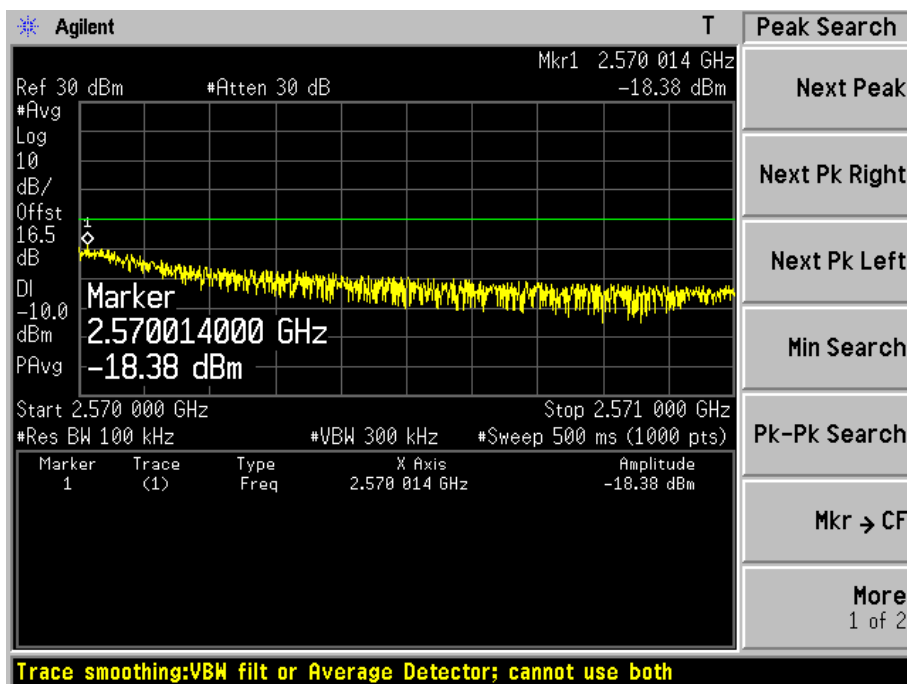
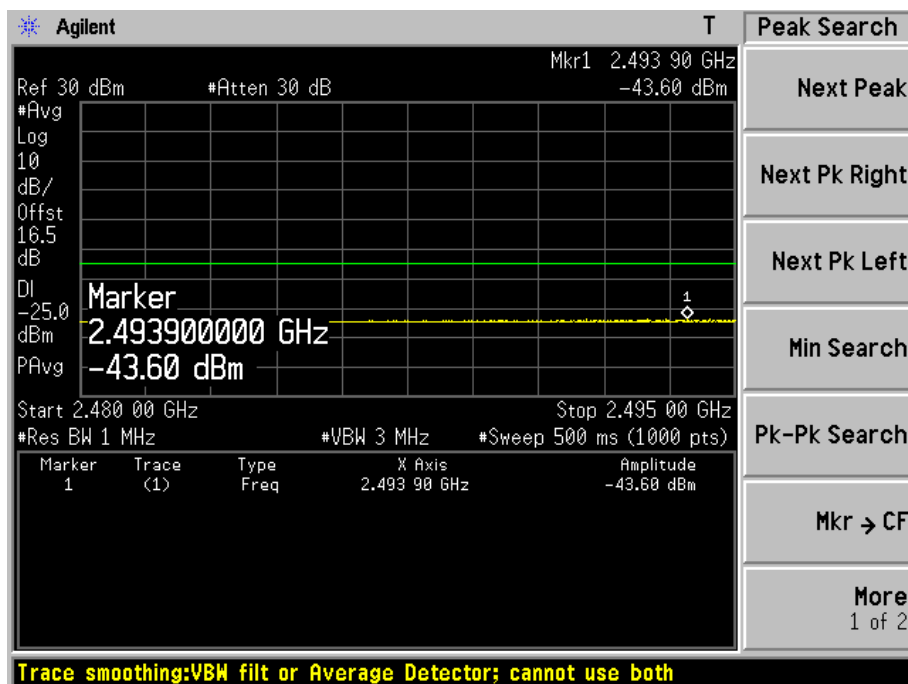
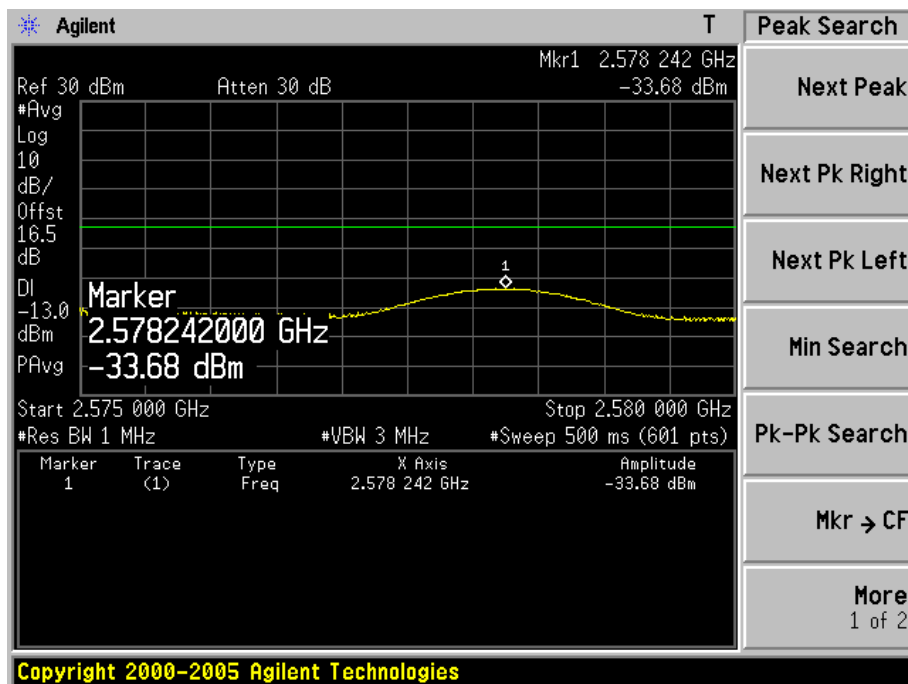


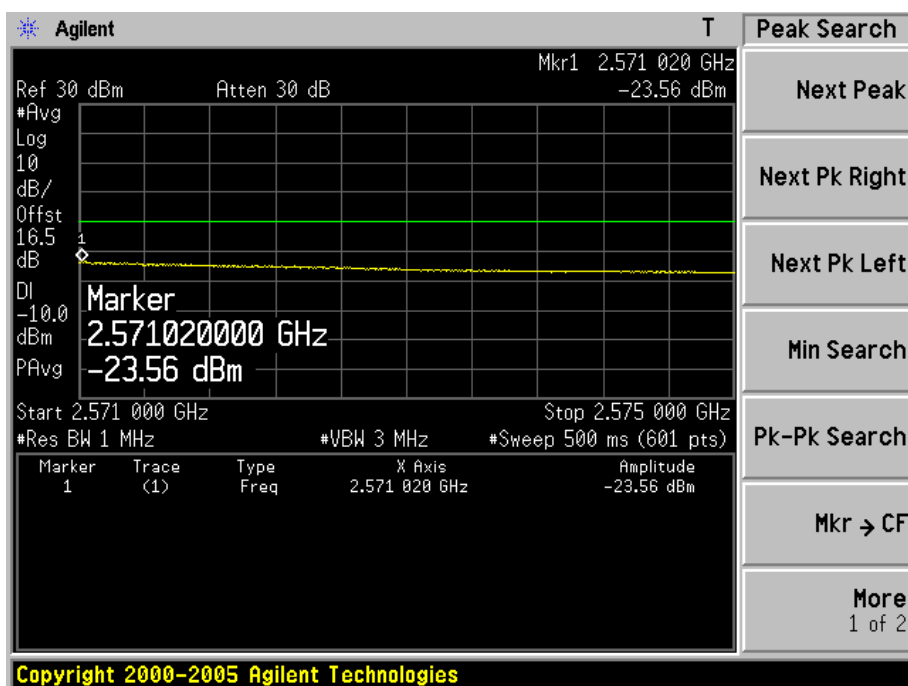
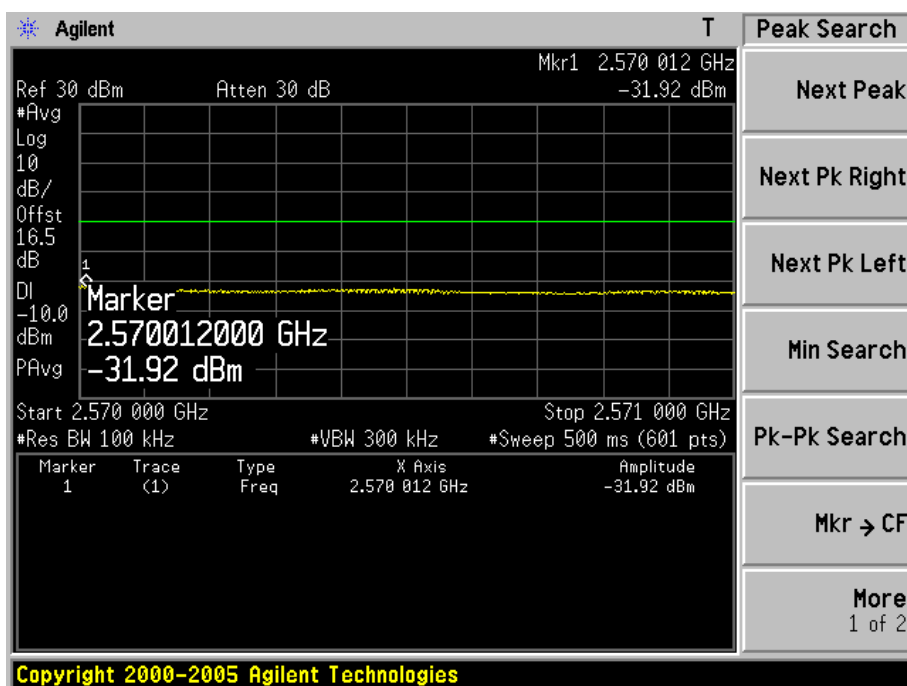
Figure Channel 21400 (2565MHz)

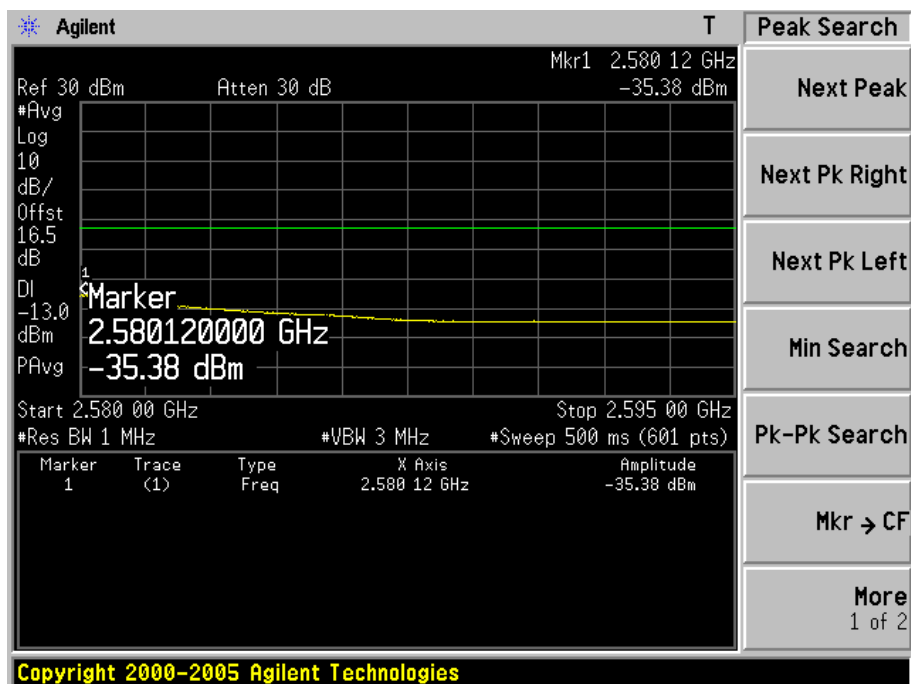
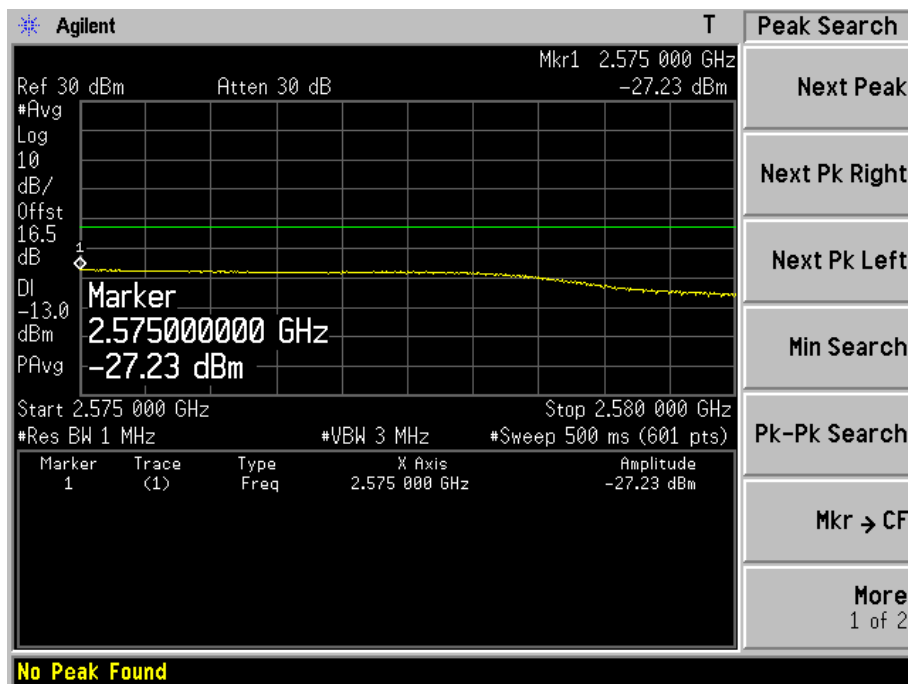
1RB49





50RB0

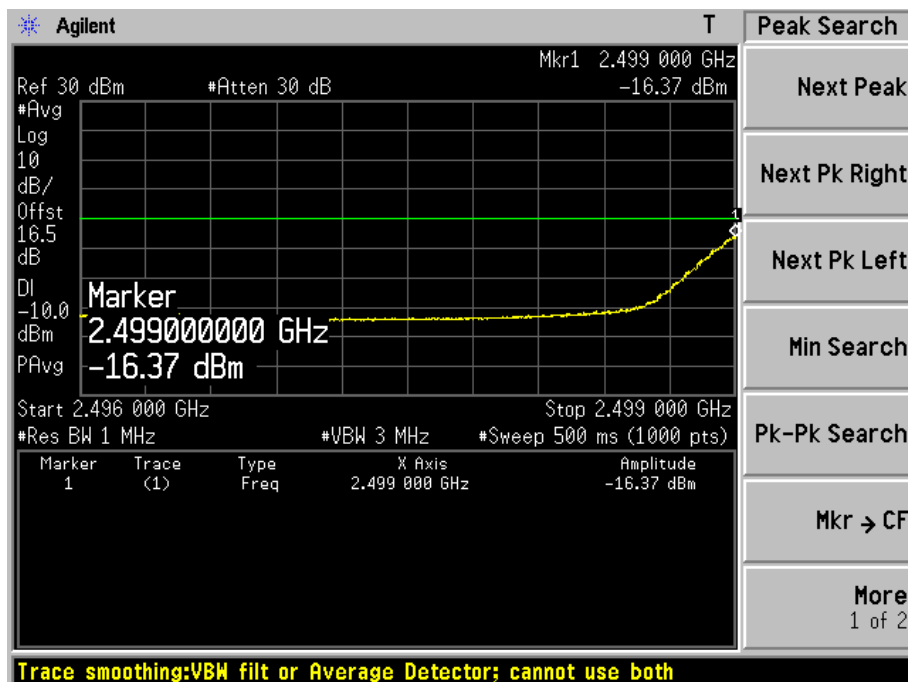
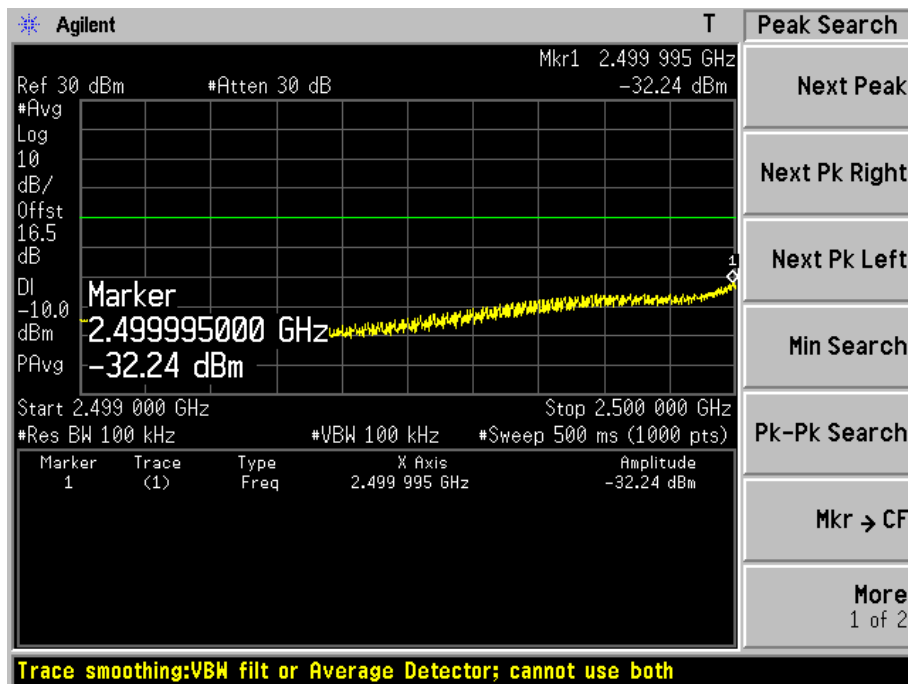


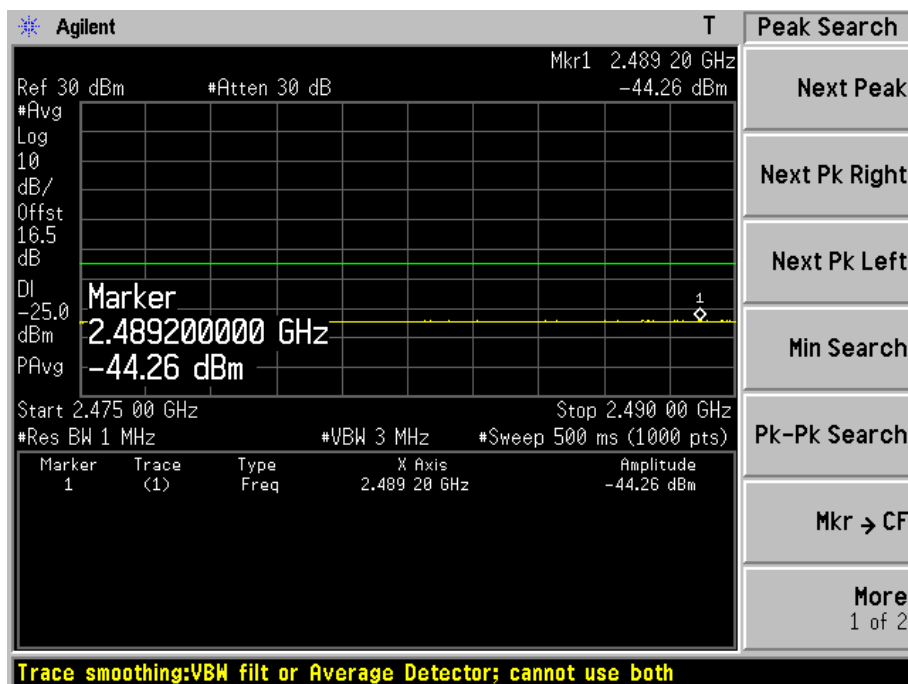
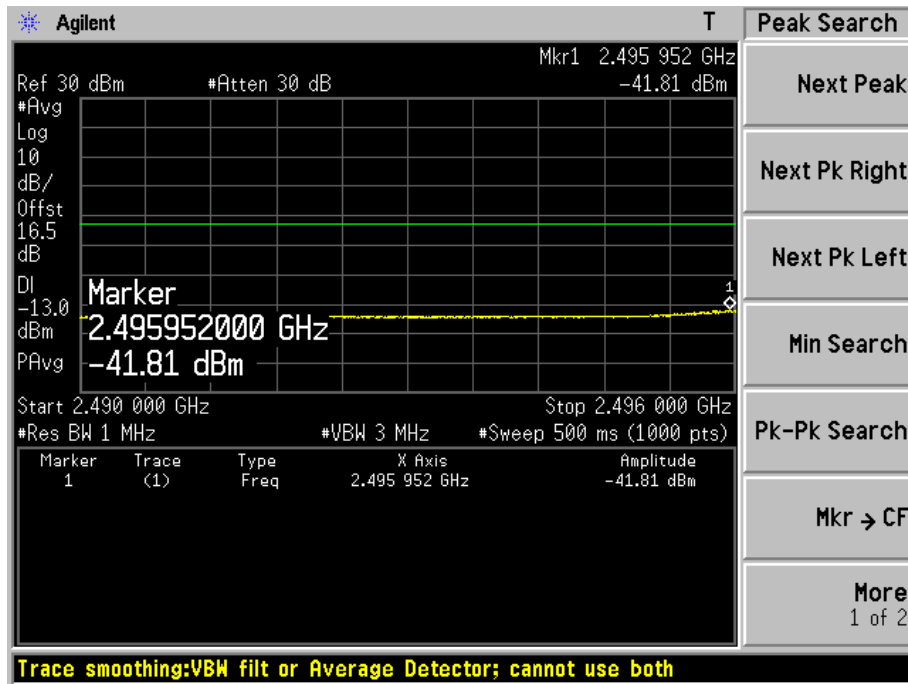


Product	Wireless Module		
Test Item	Conducted Band Edge		
Test Mode	Mode 1: LTE Band VII (10M/16QAM)		
Date of Test	2014/12/07	Test Site	AC6

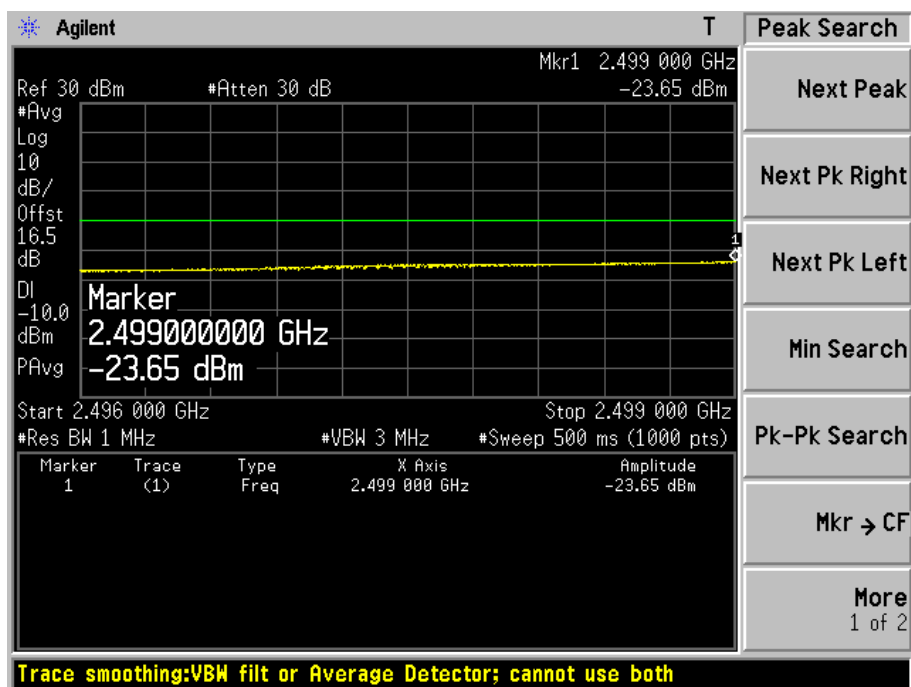
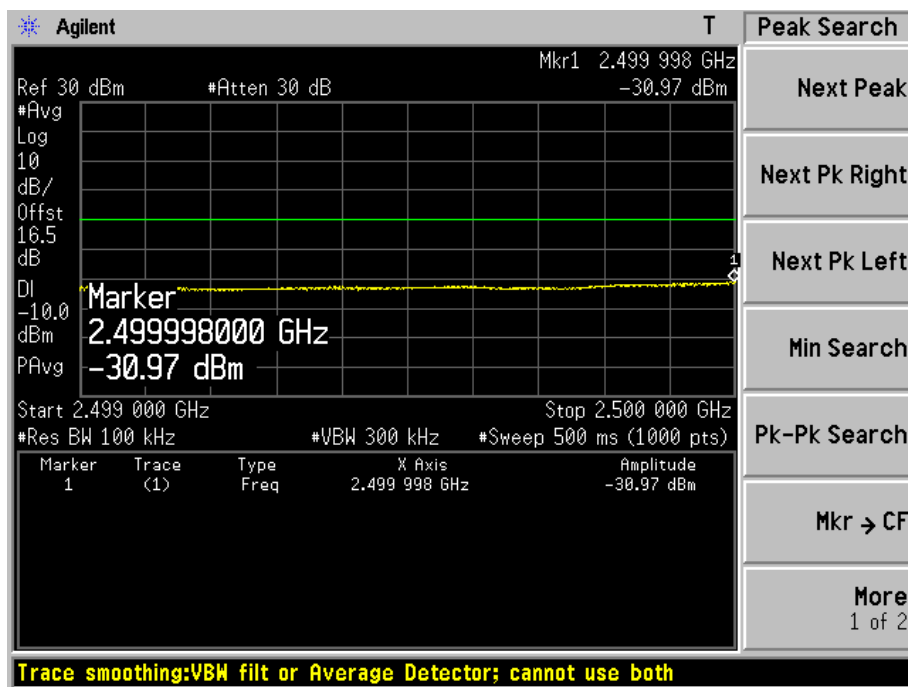
Figure Channel 20800 (2505MHz)

1RB0





50RB0



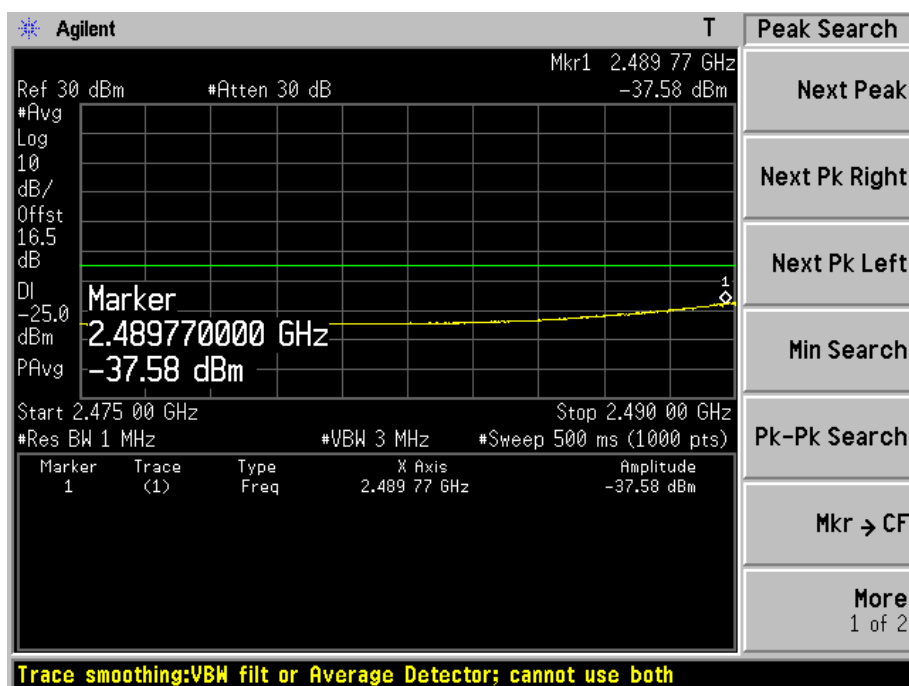
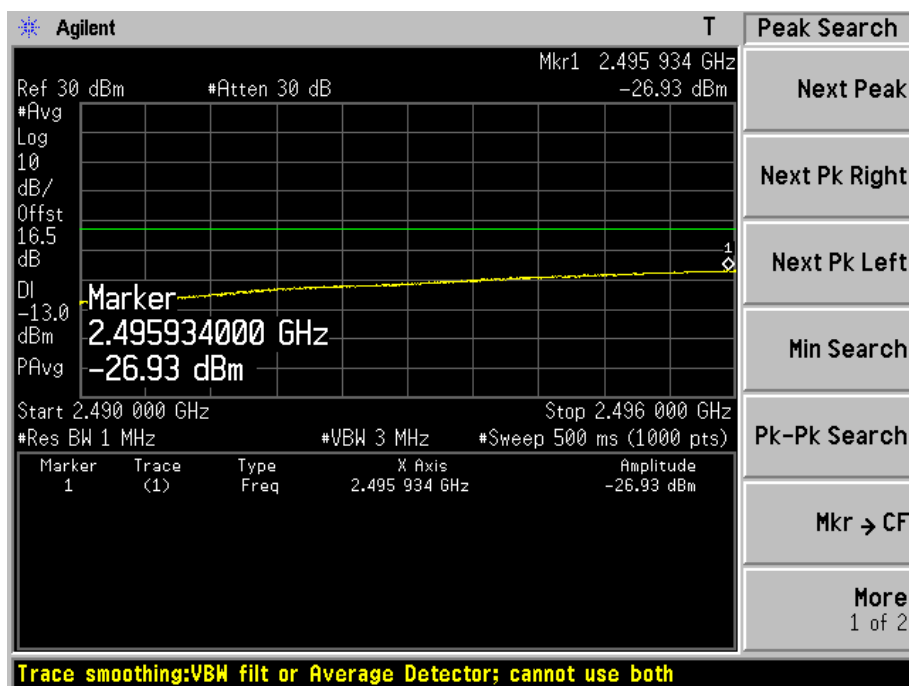
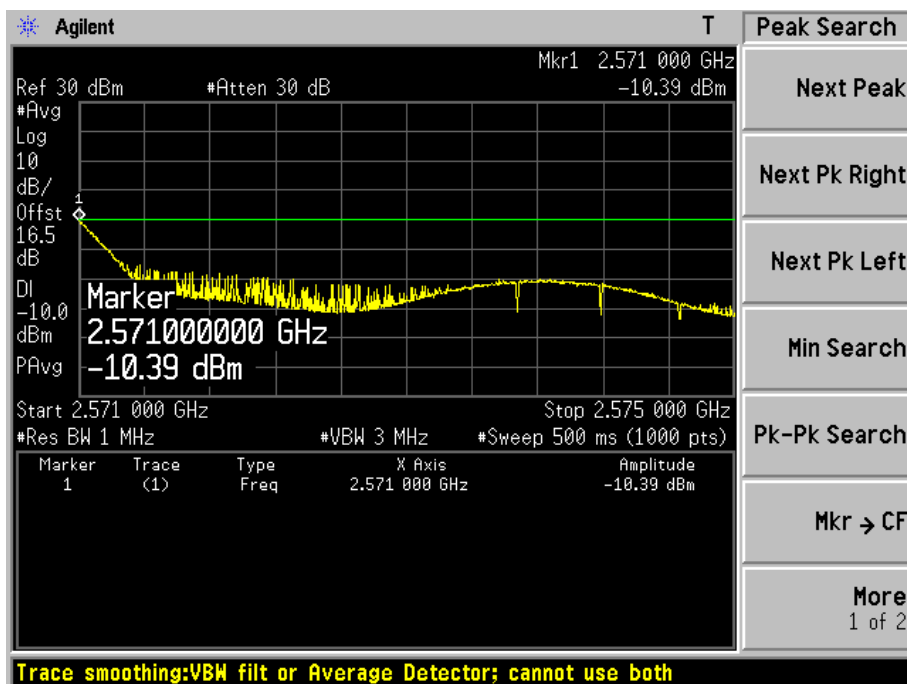
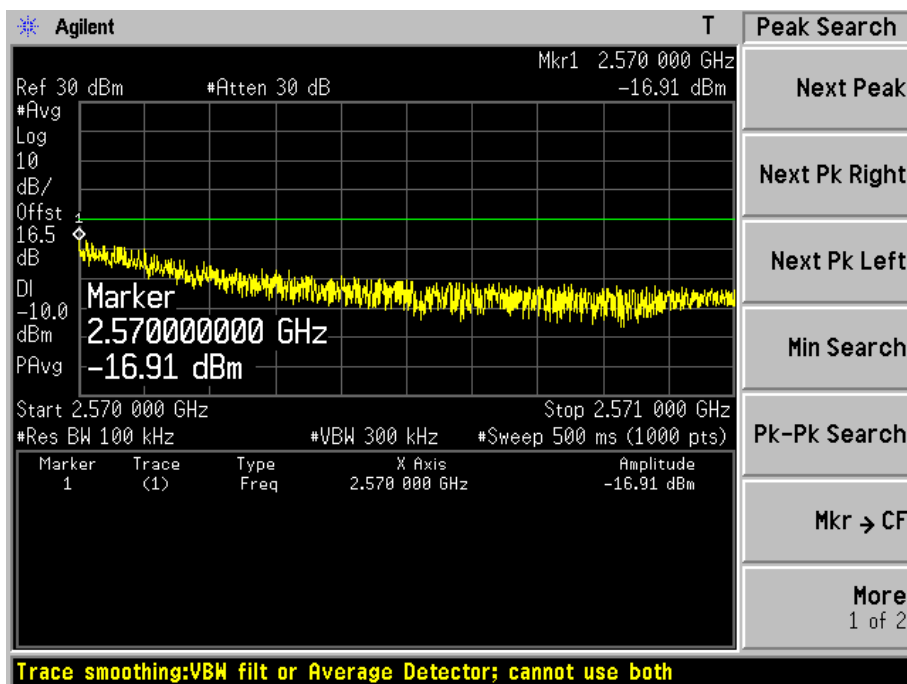
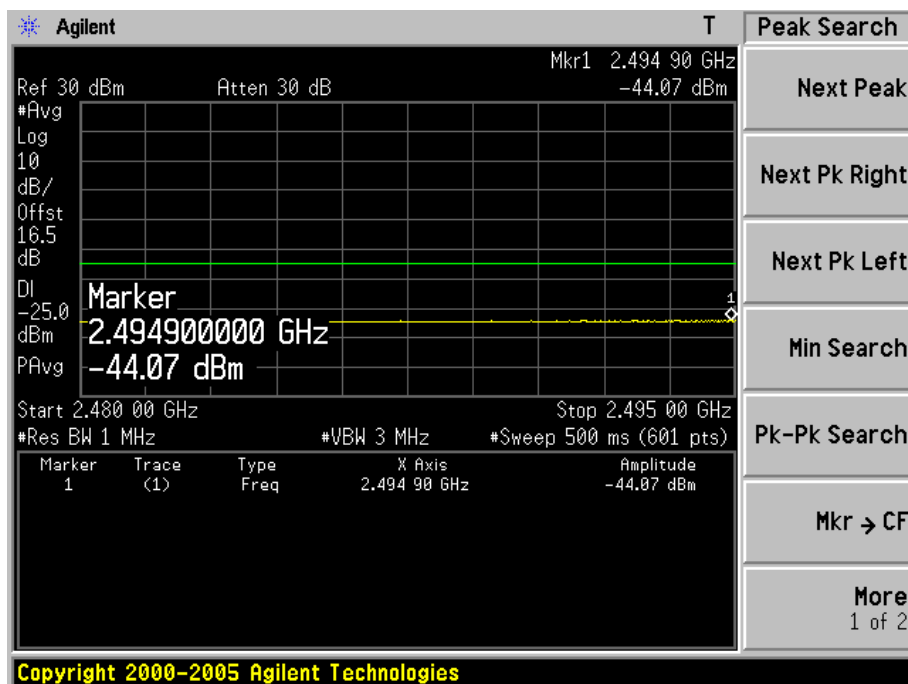
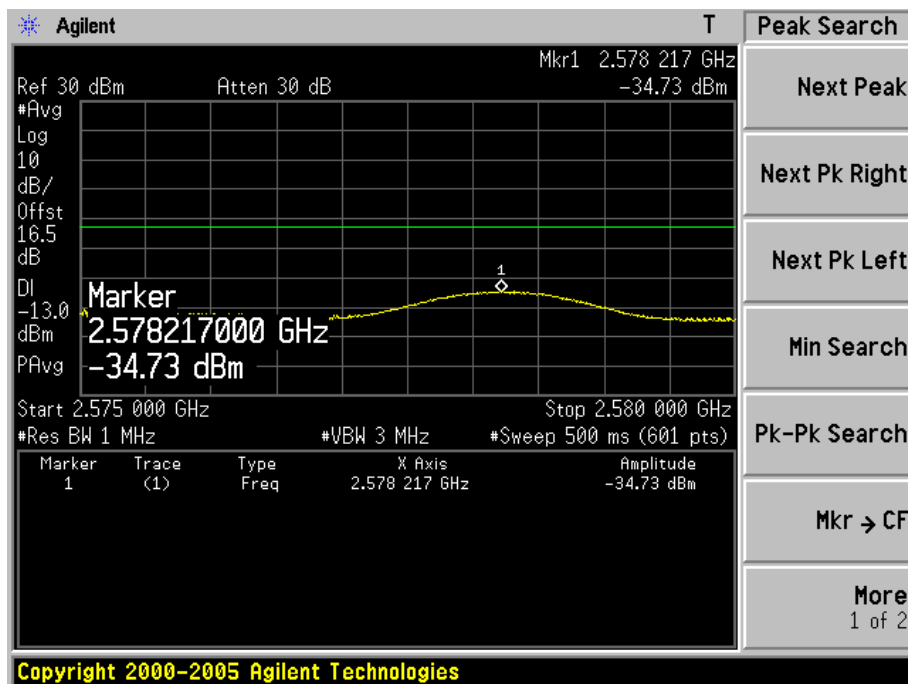


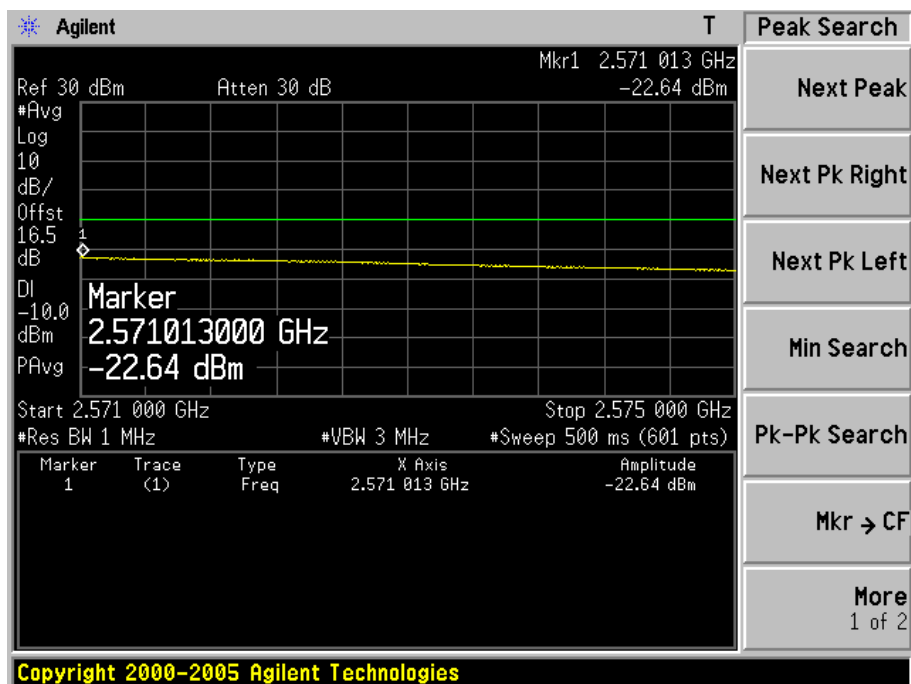
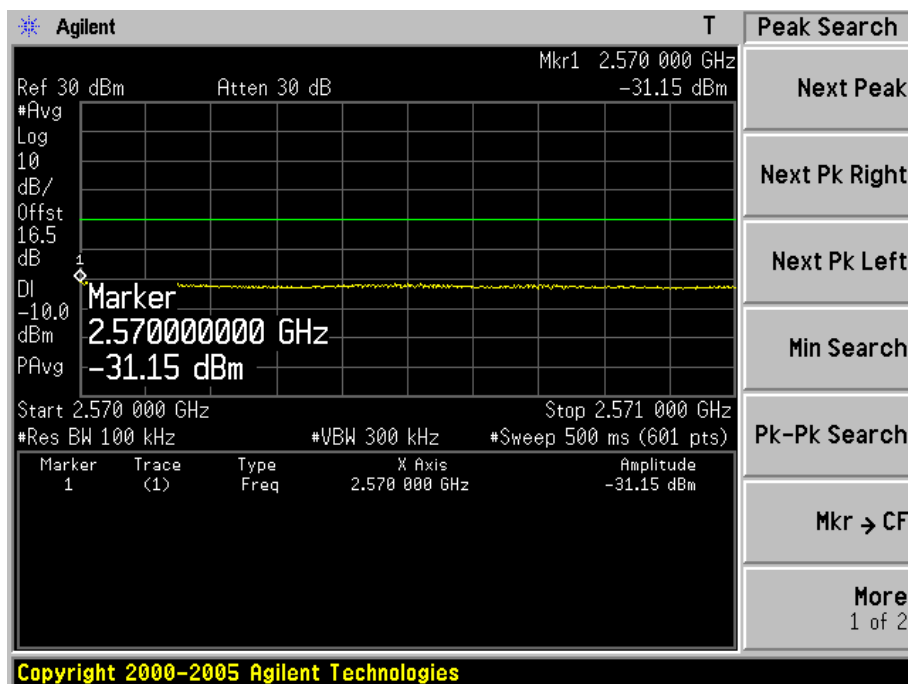
Figure Channel 21400 (2565MHz)

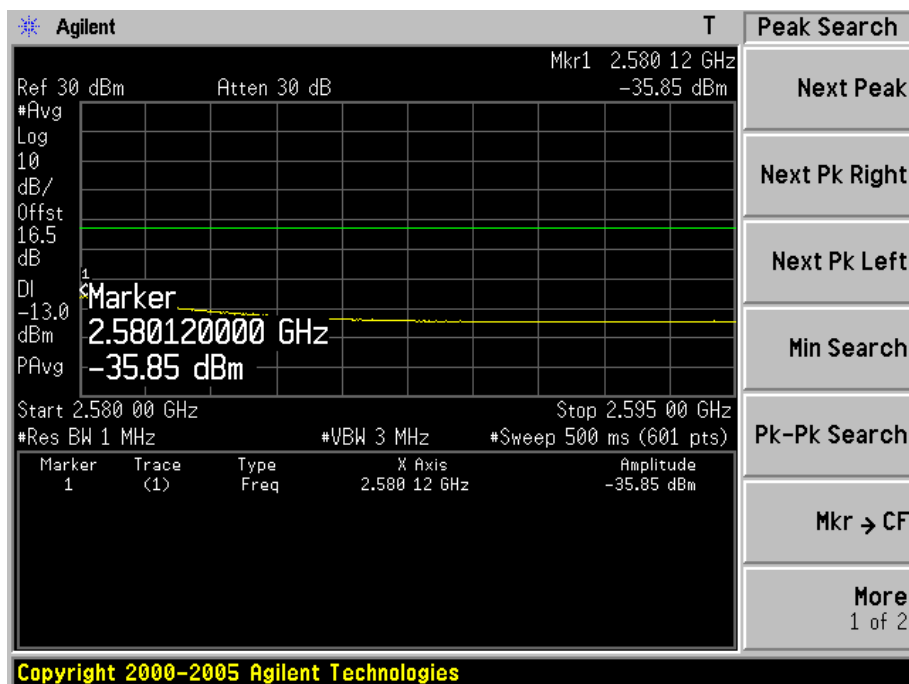
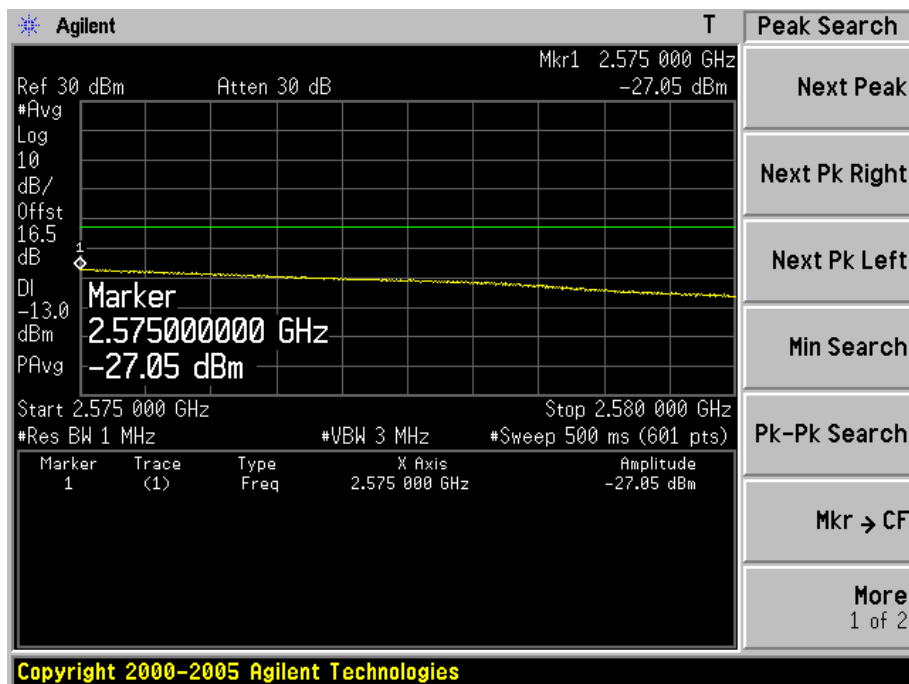
1RB49





50RB0

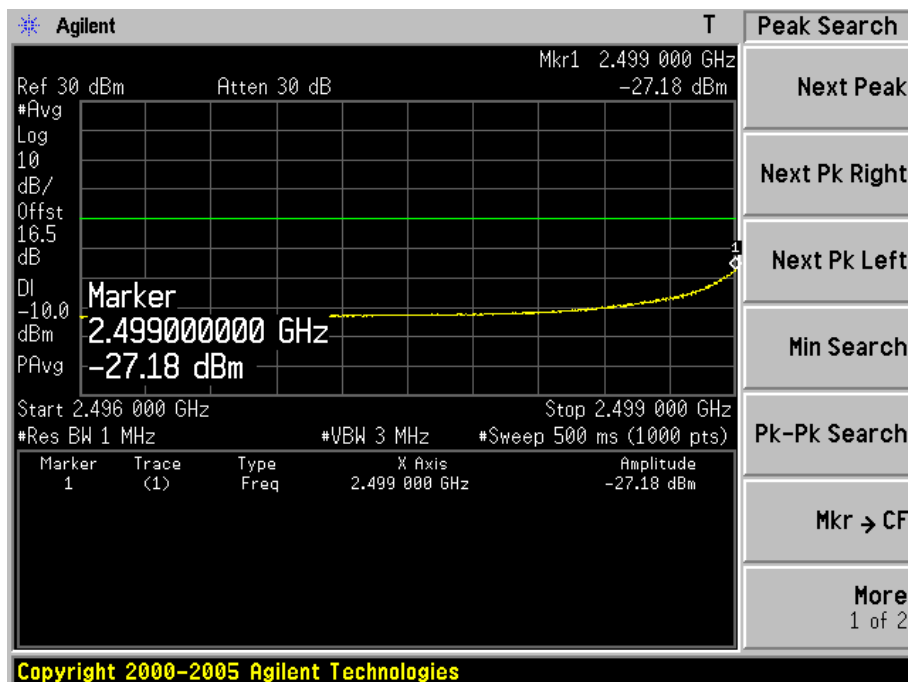
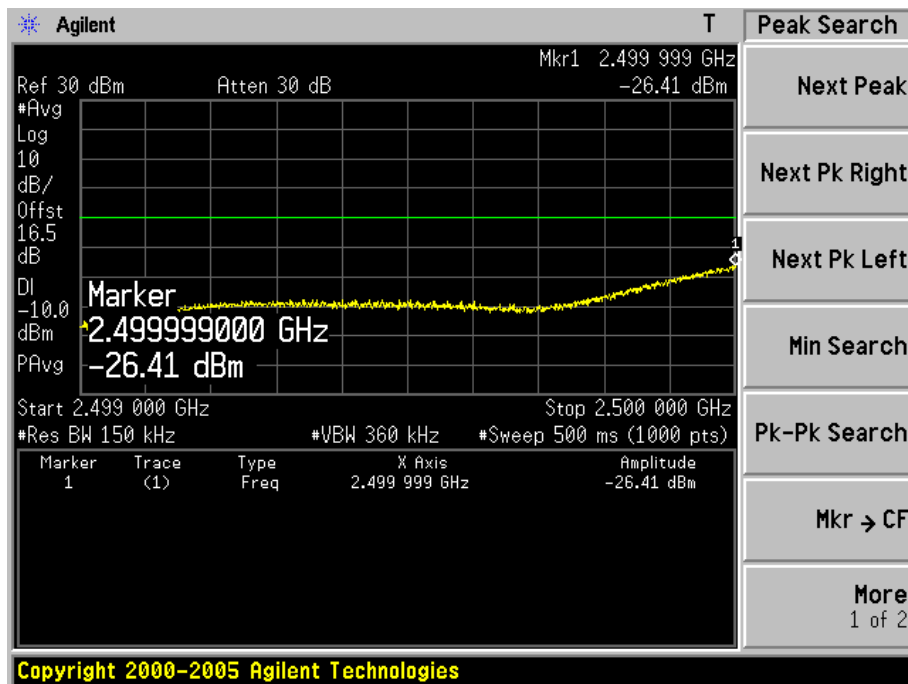


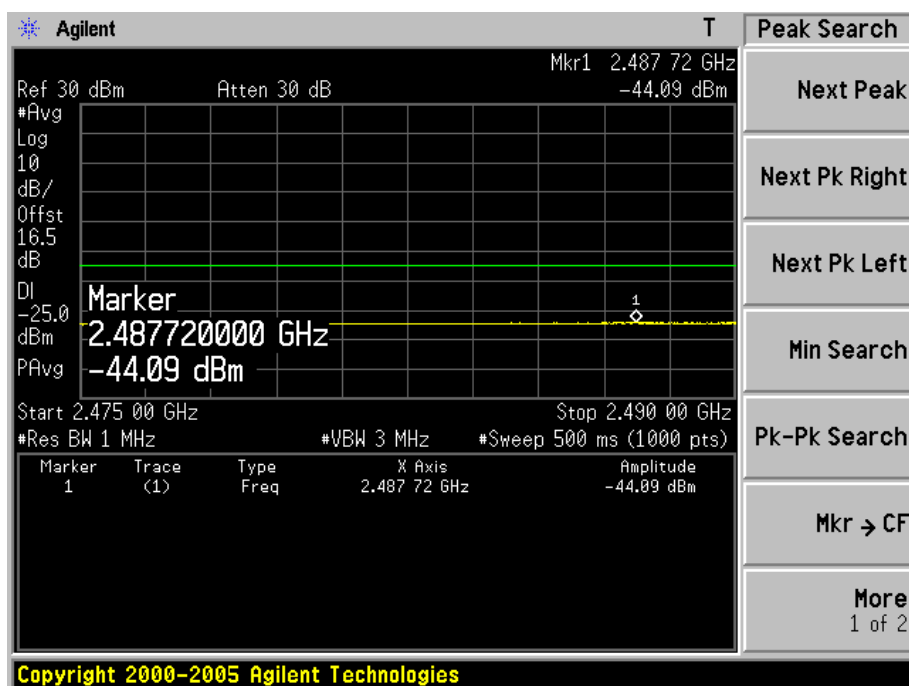
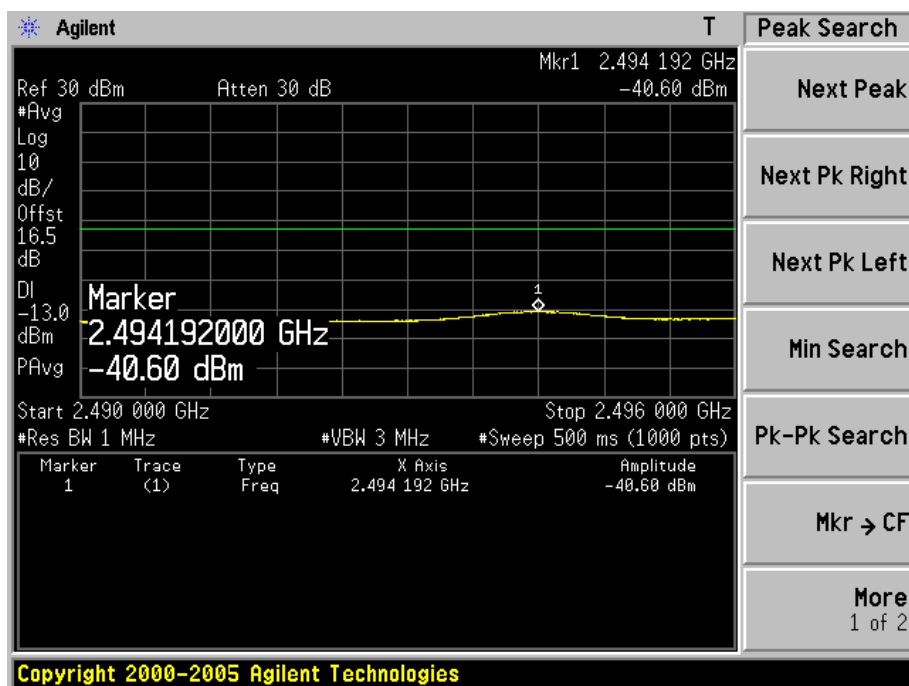


Product	Wireless Module		
Test Item	Conducted Band Edge		
Test Mode	Mode 1: LTE Band VII (15M/QPSK)		
Date of Test	2014/12/07	Test Site	AC6

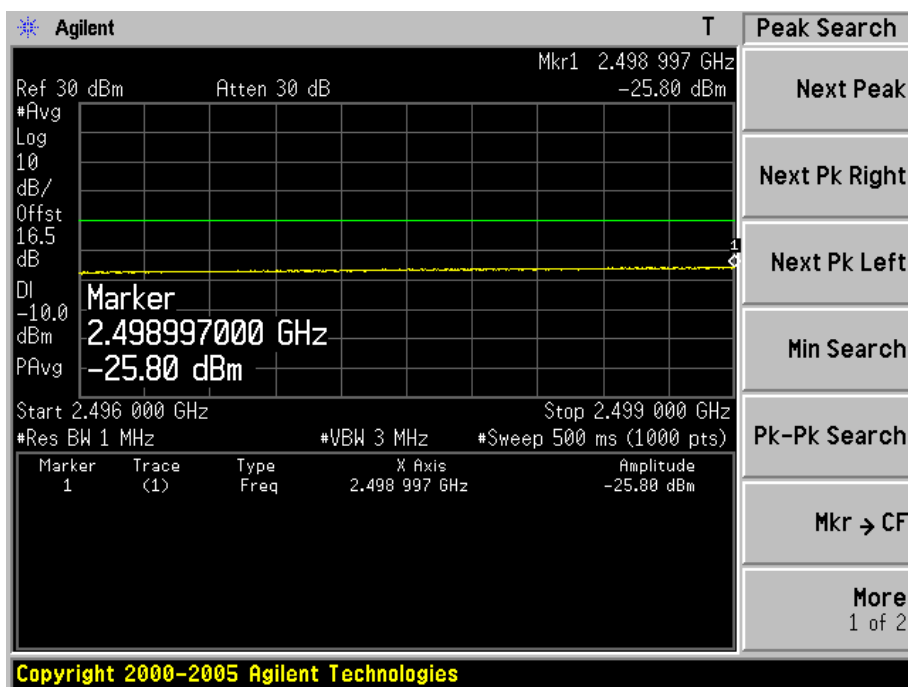
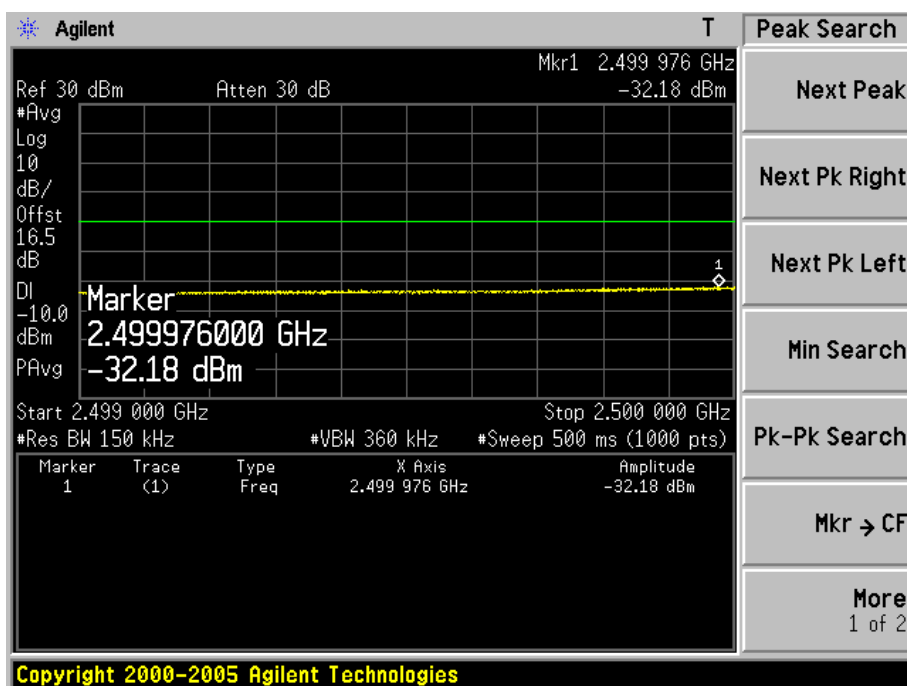
Figure Channel 20825 (2507.5MHz)

1RB0





75RB0



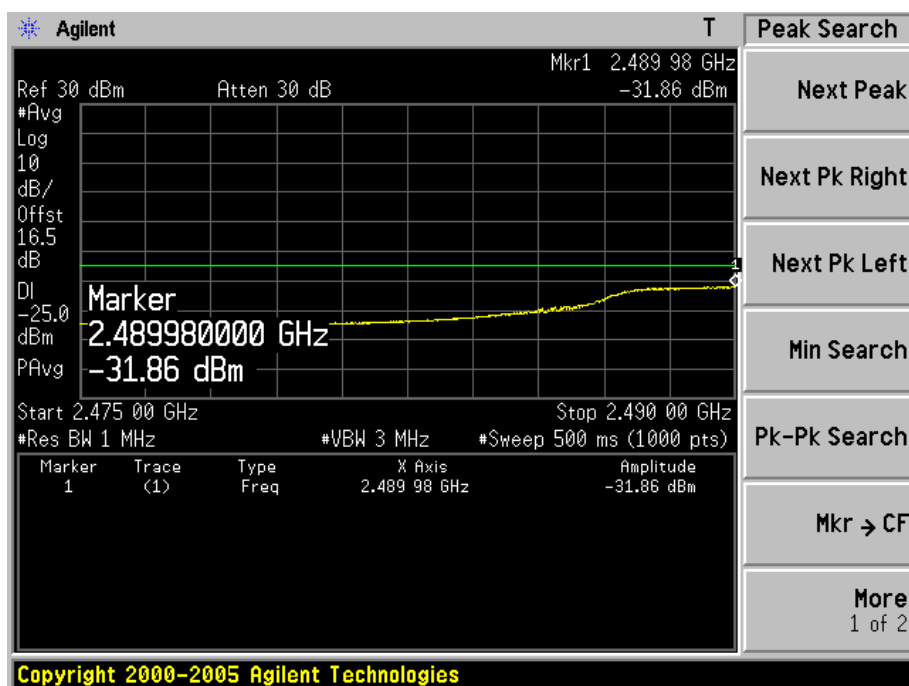
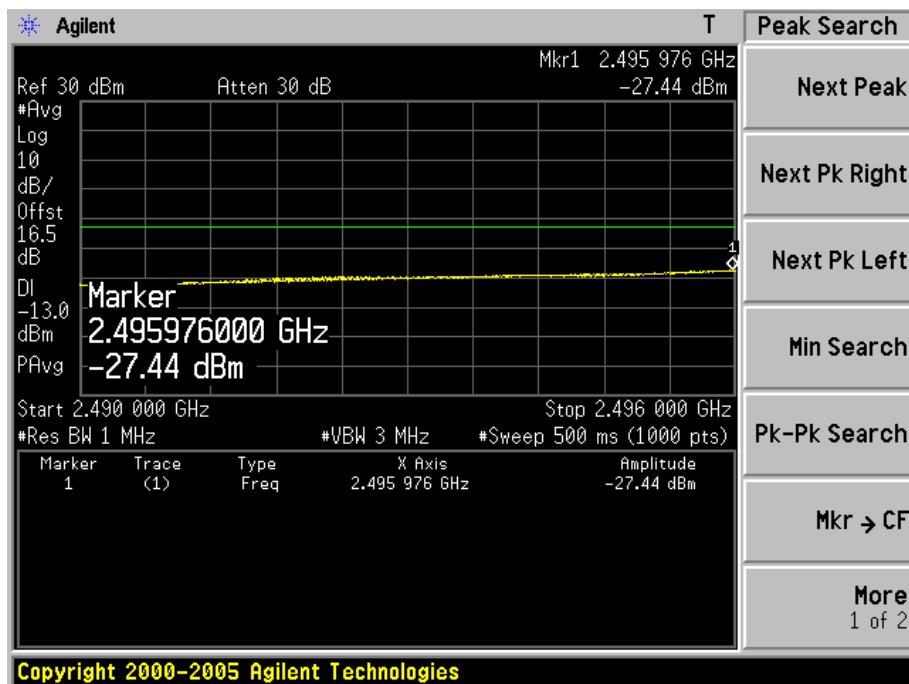
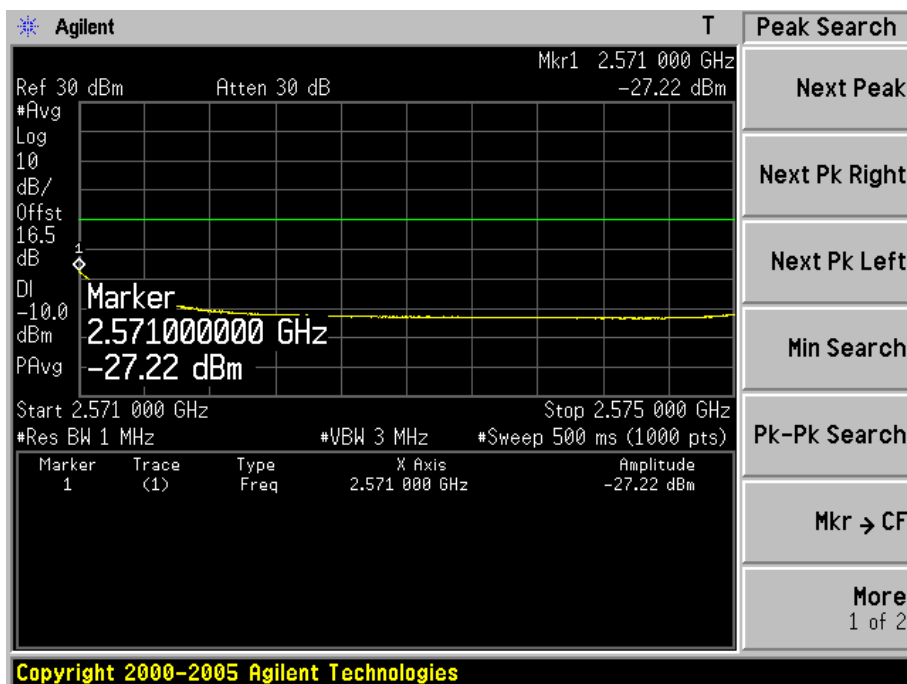
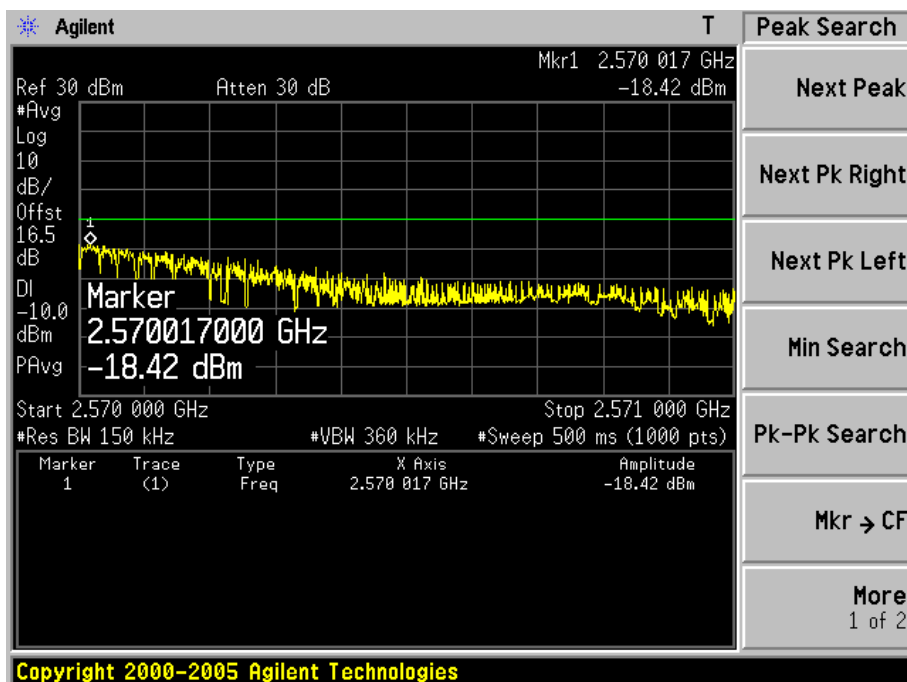
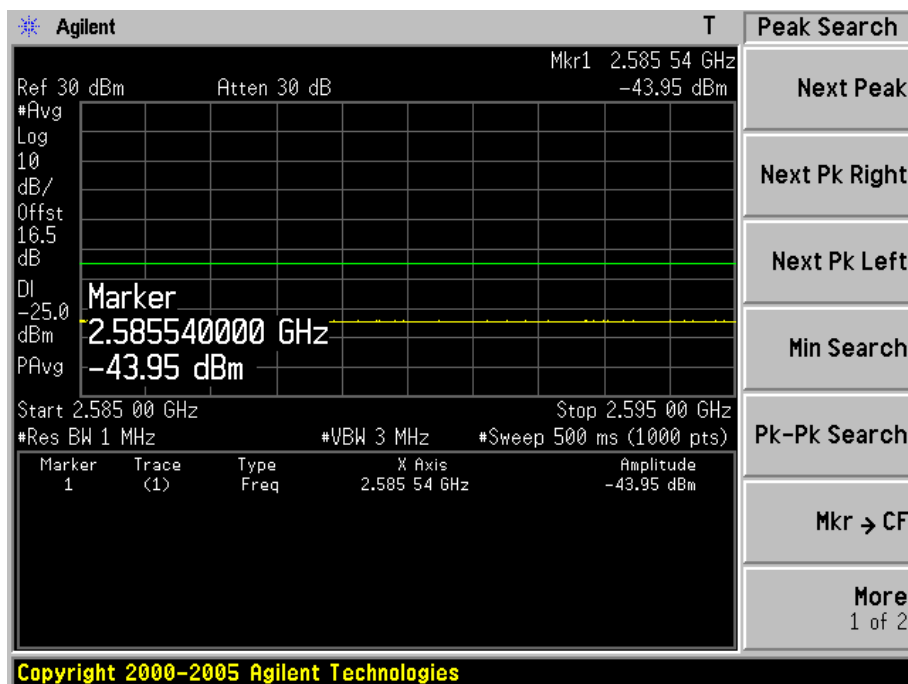
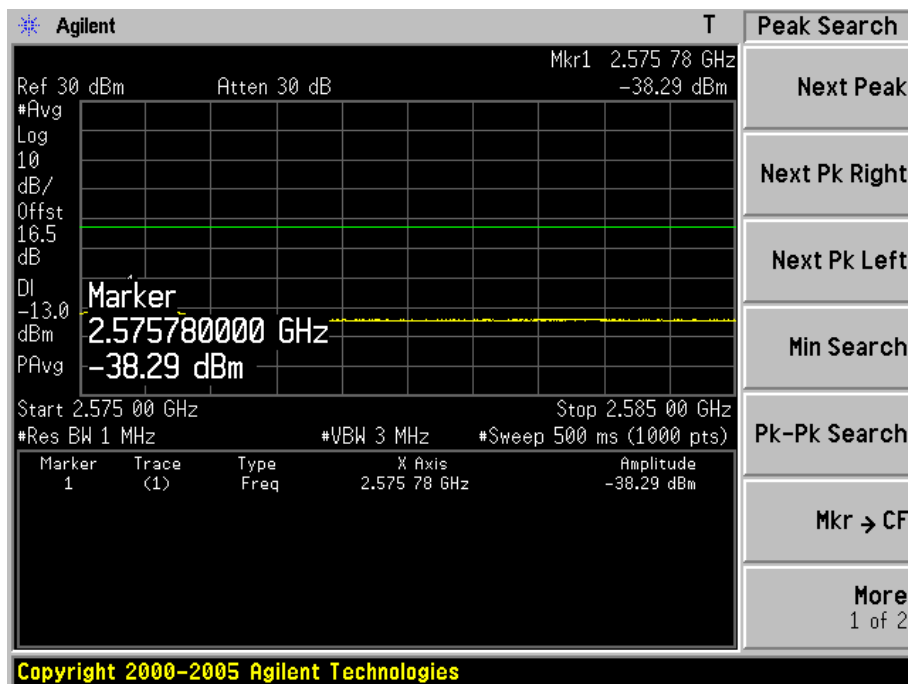


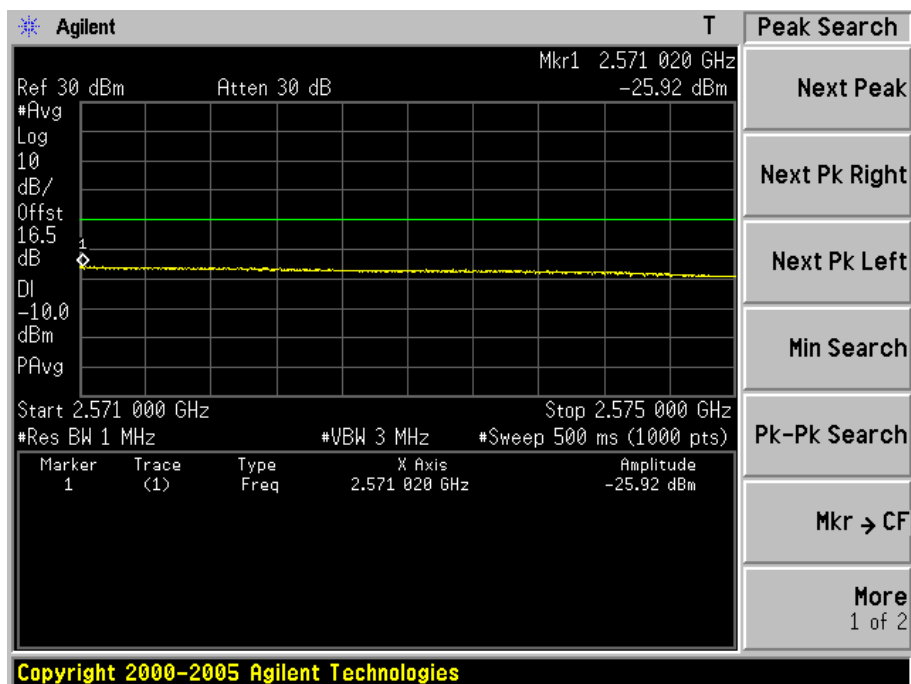
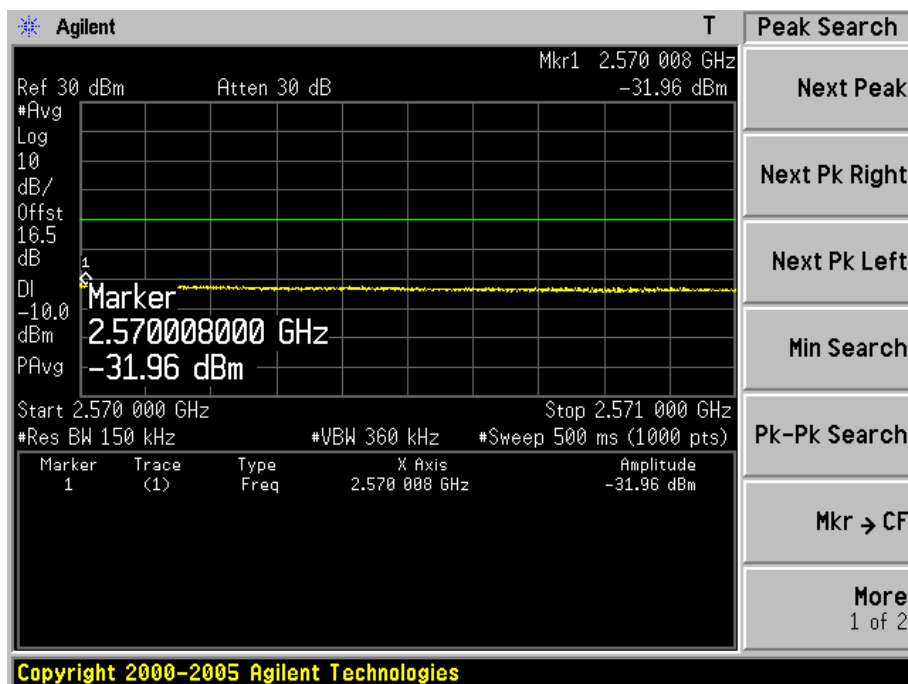
Figure Channel 21375 (2562.5MHz)

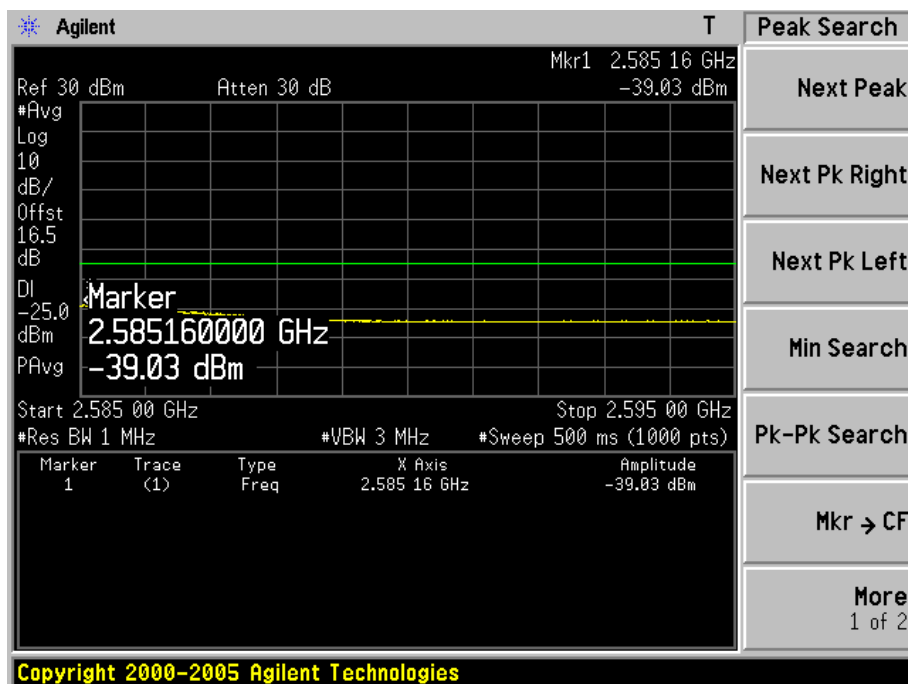
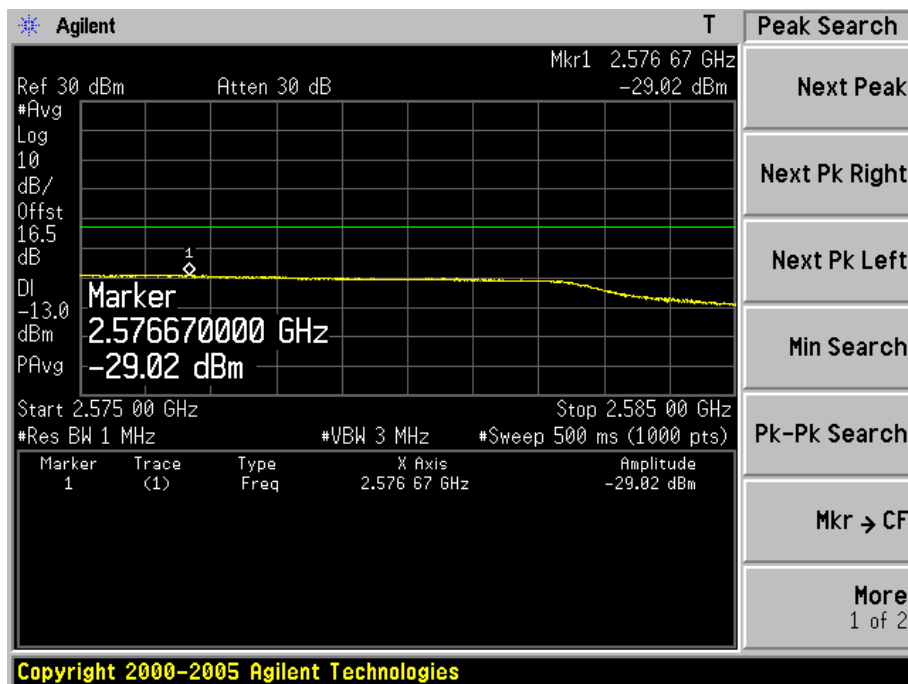
1RB74





75RB0

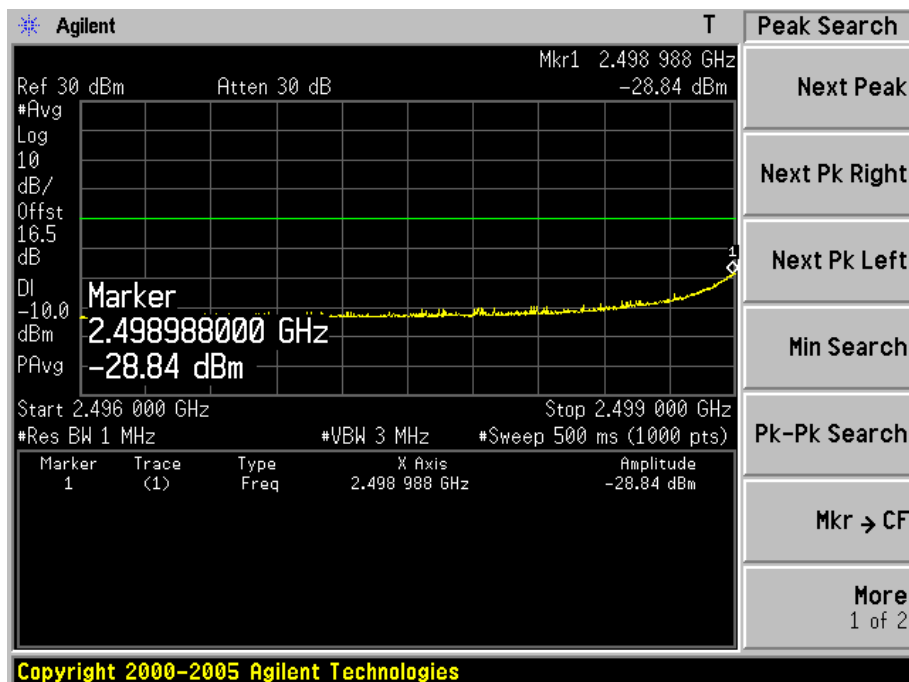
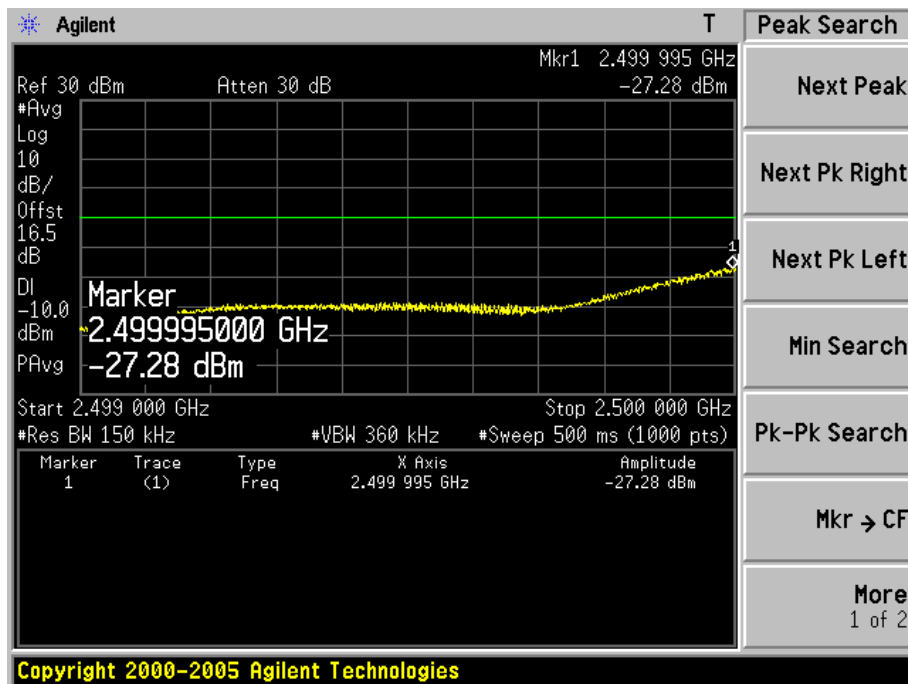


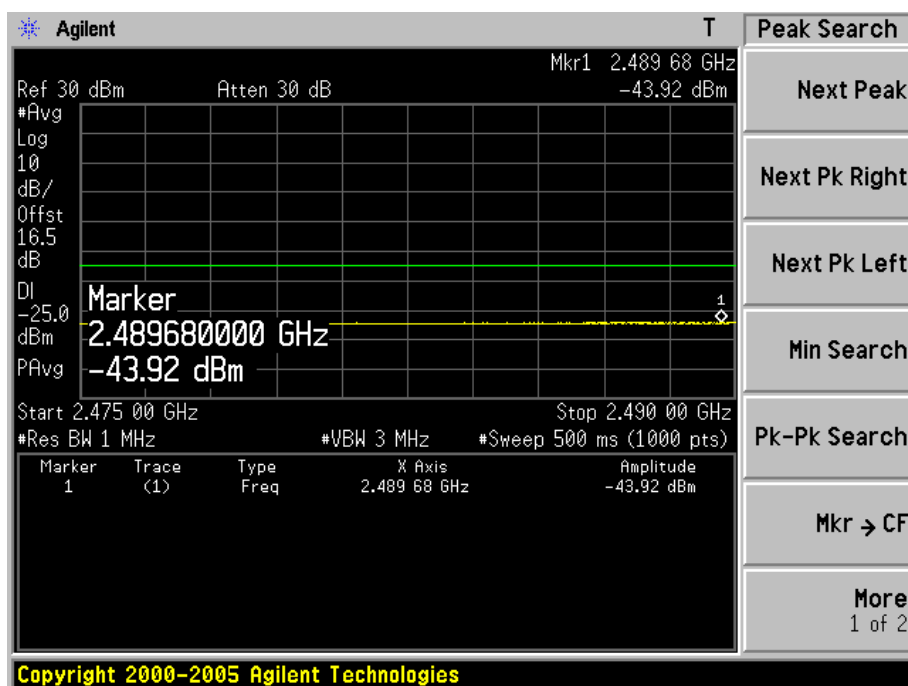
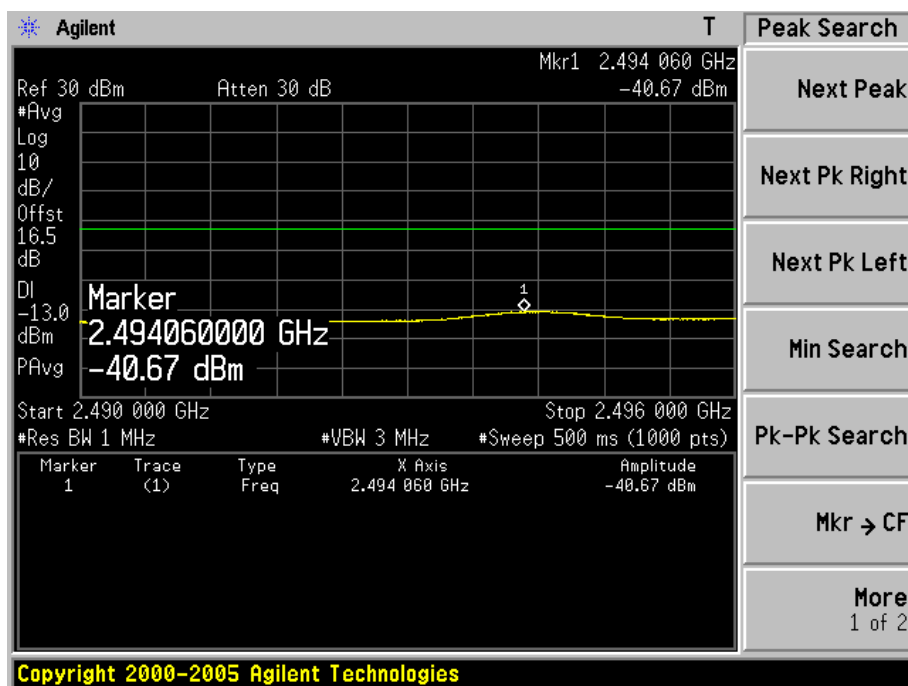


Product	Wireless Module		
Test Item	Conducted Band Edge		
Test Mode	Mode 1: LTE Band VII (15M/16QAM)		
Date of Test	2014/12/07	Test Site	AC6

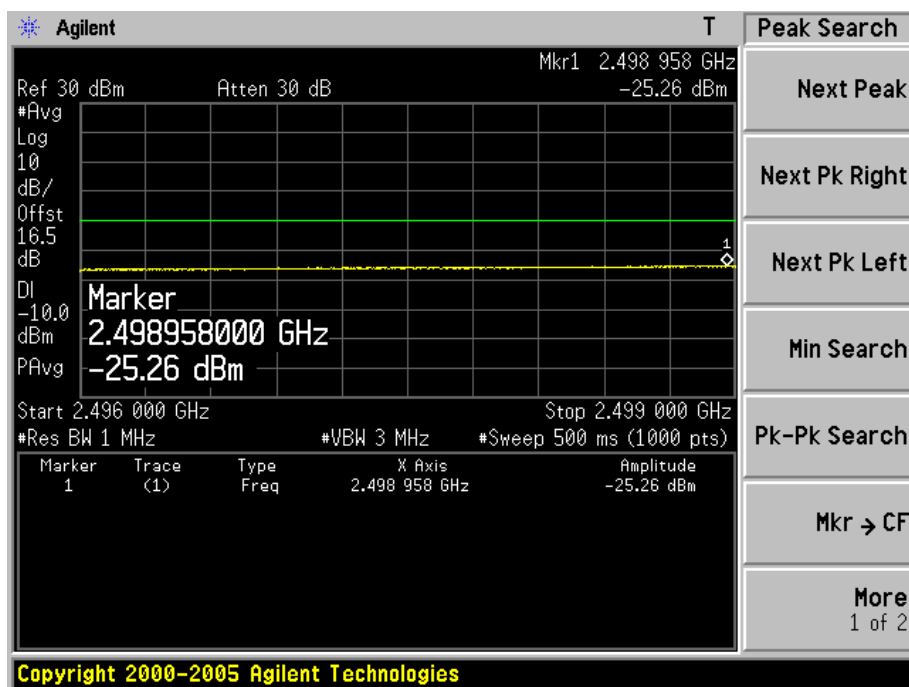
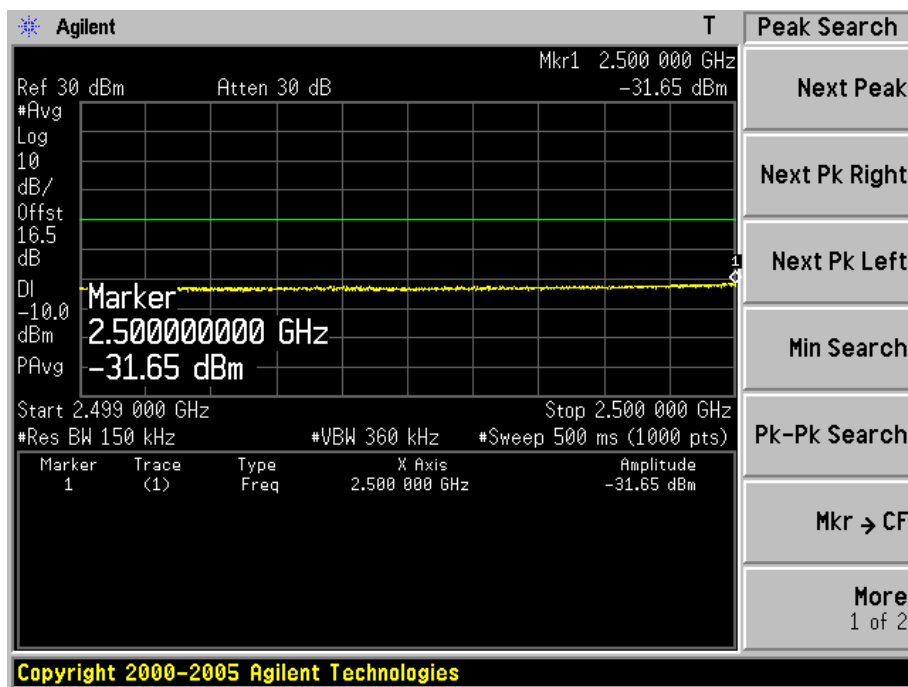
Figure Channel 20825 (2507.5MHz)

1RB0





75RB0



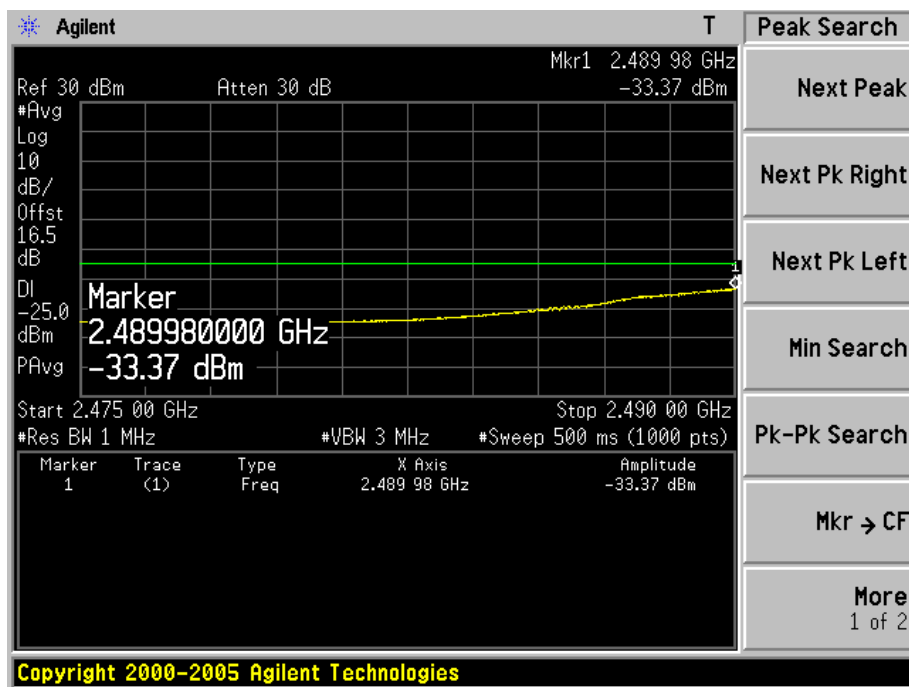
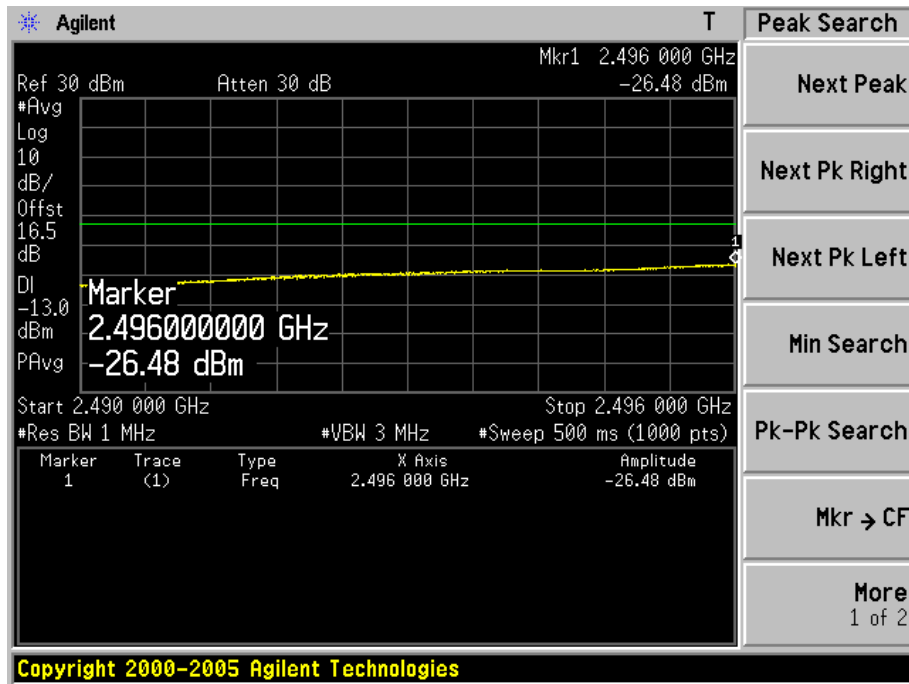
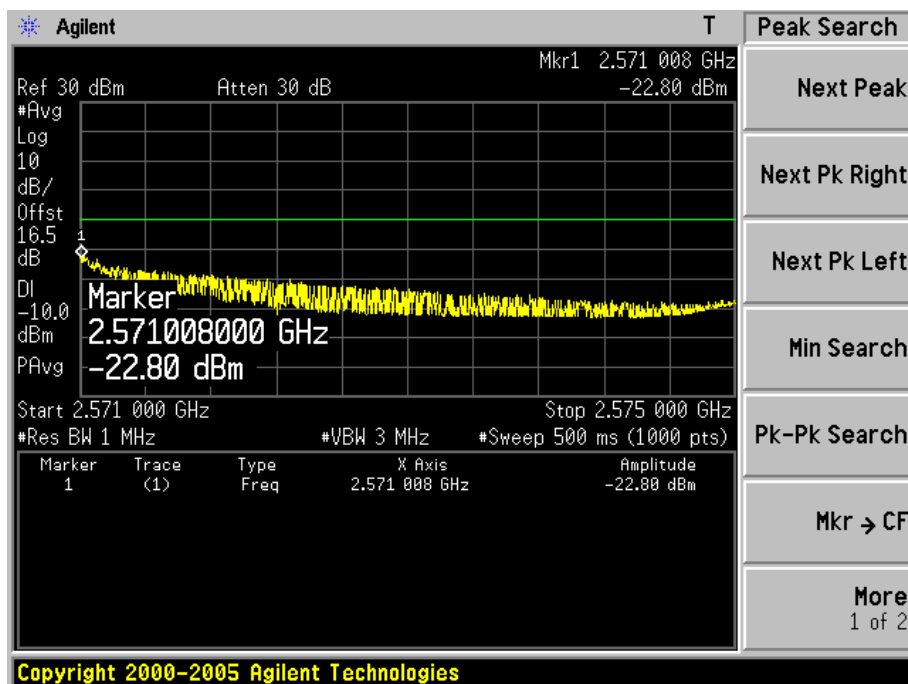
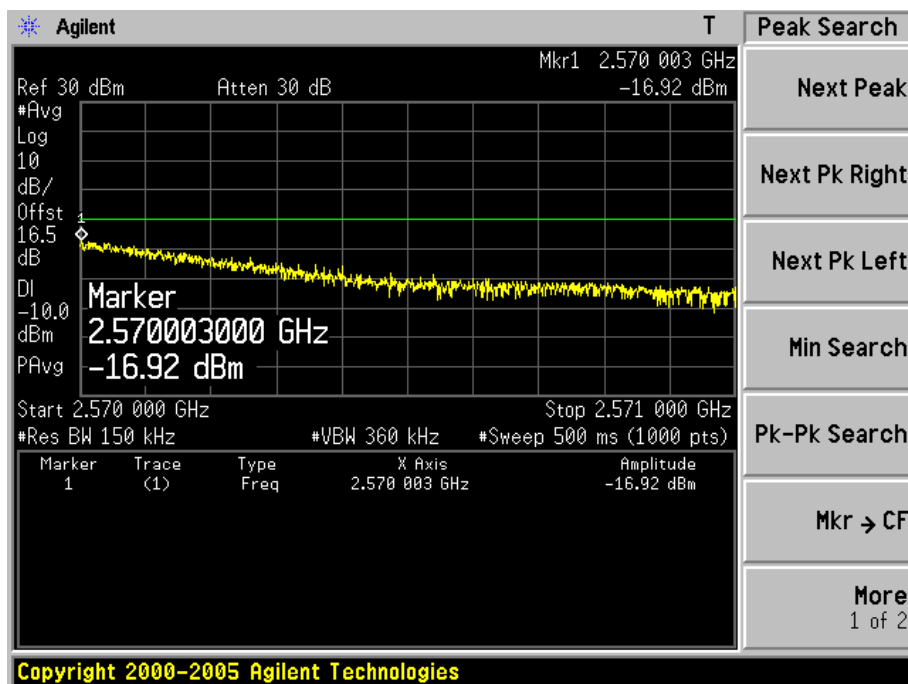
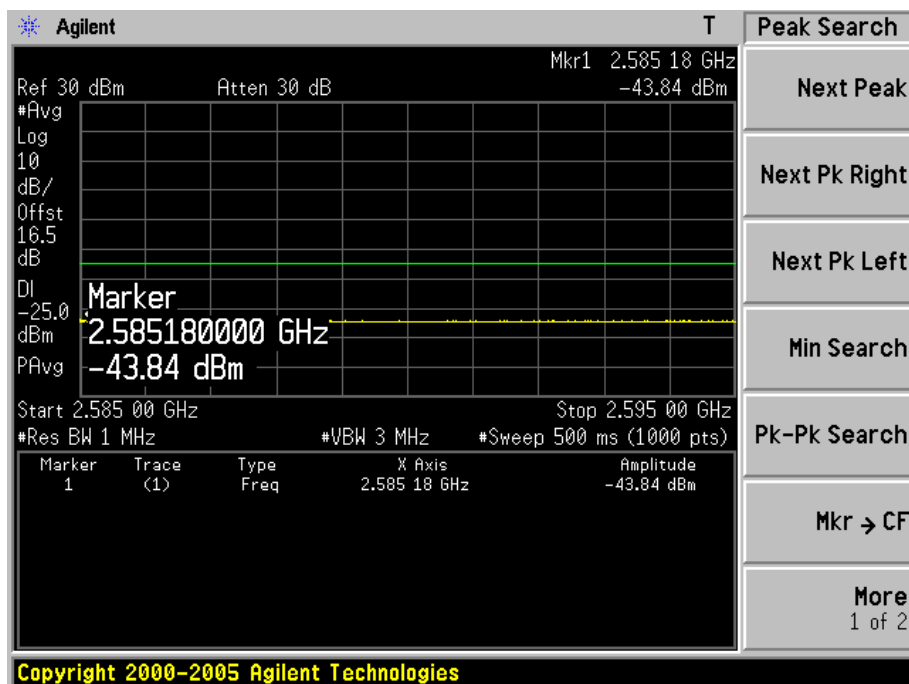
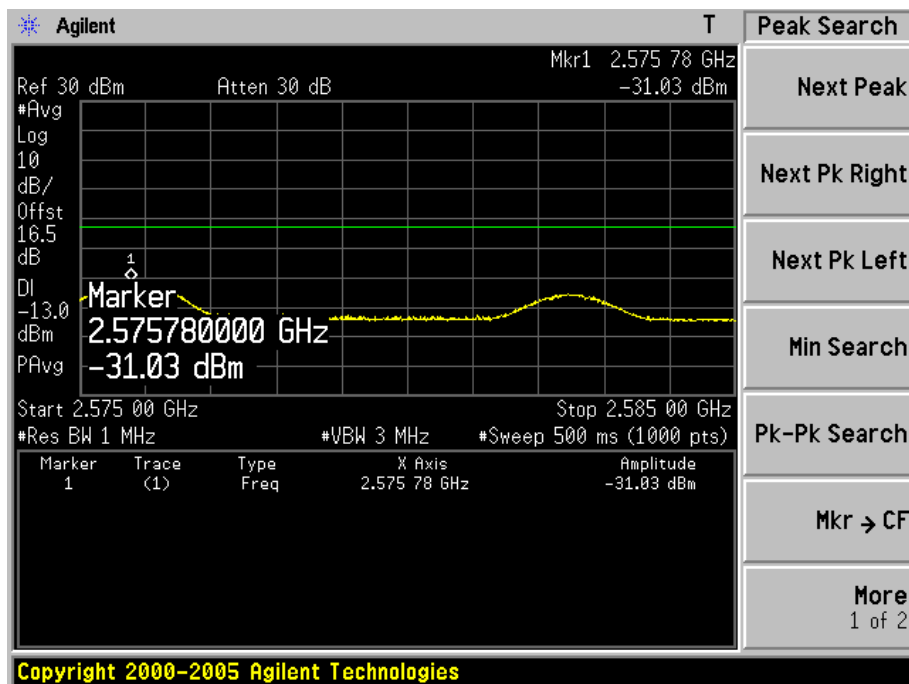


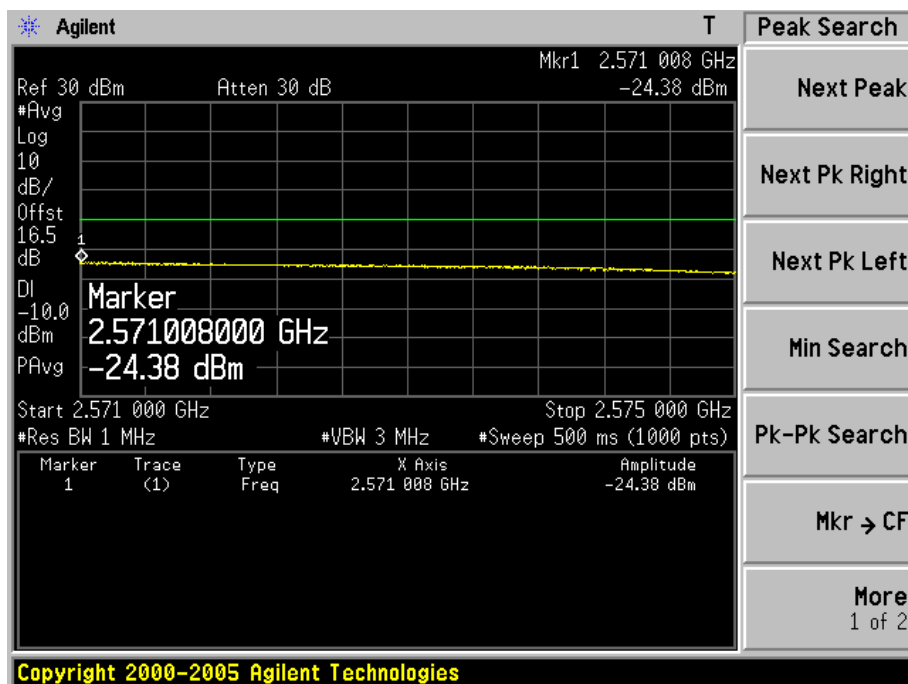
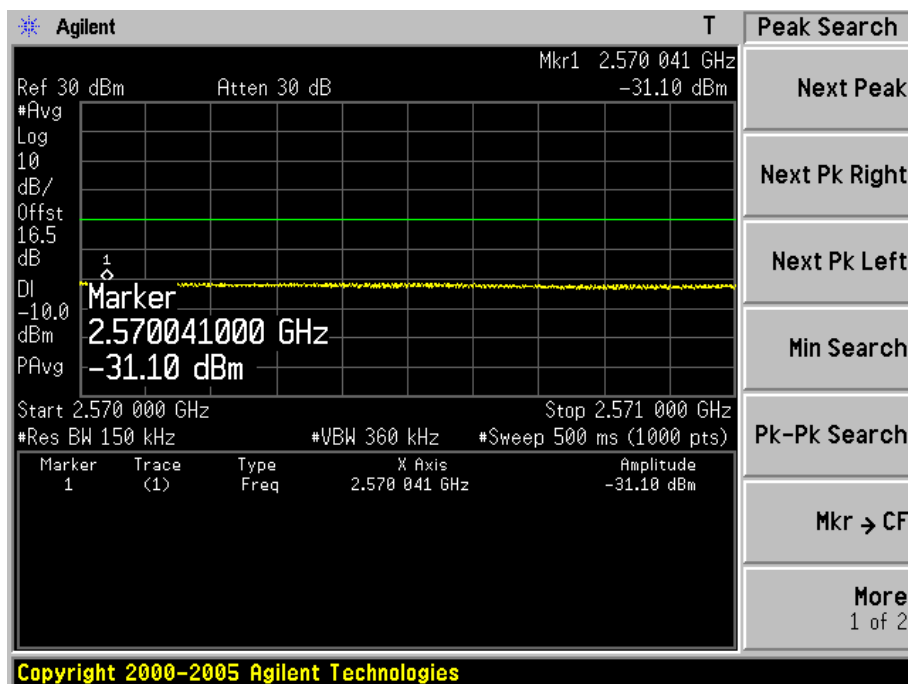
Figure Channel 21375 (2562.5MHz)

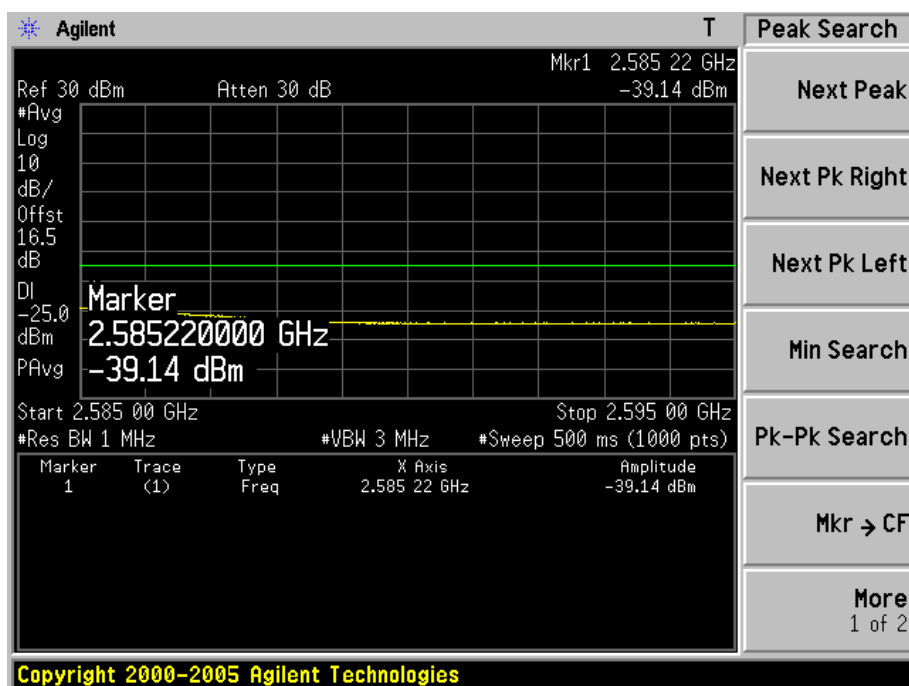
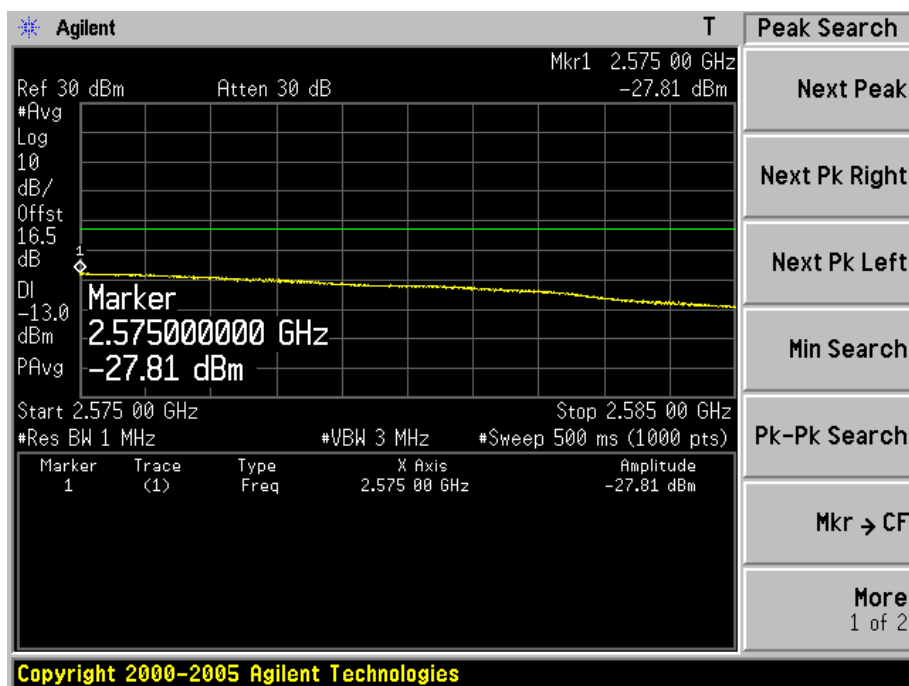
1RB74





75RB0

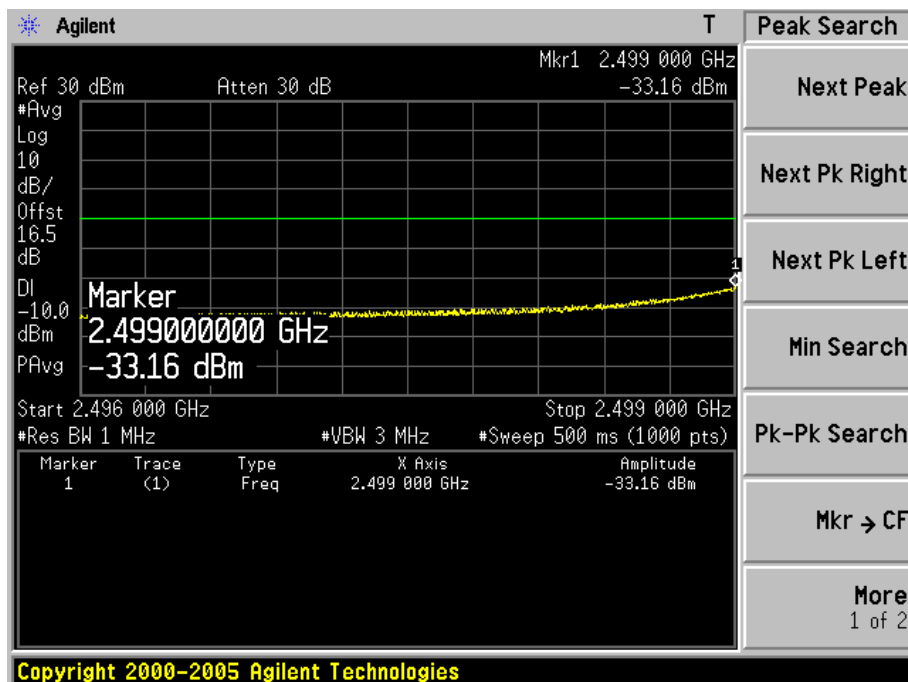
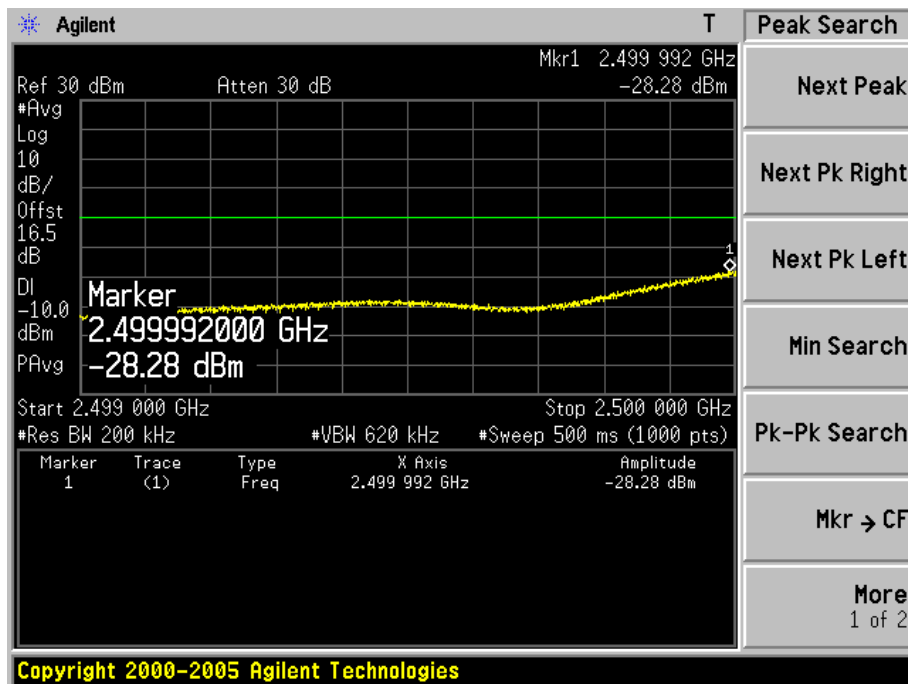


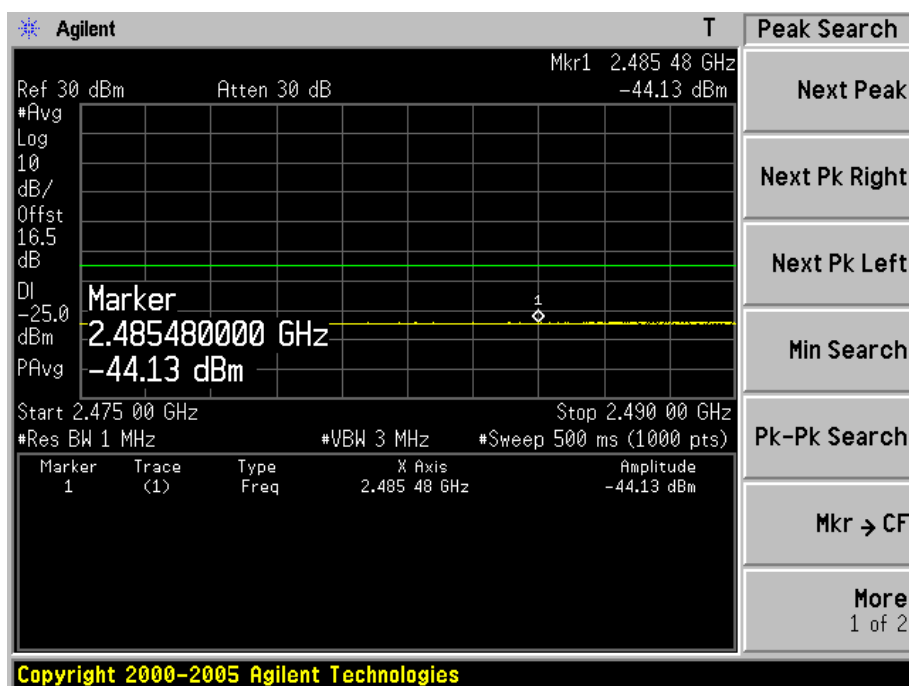
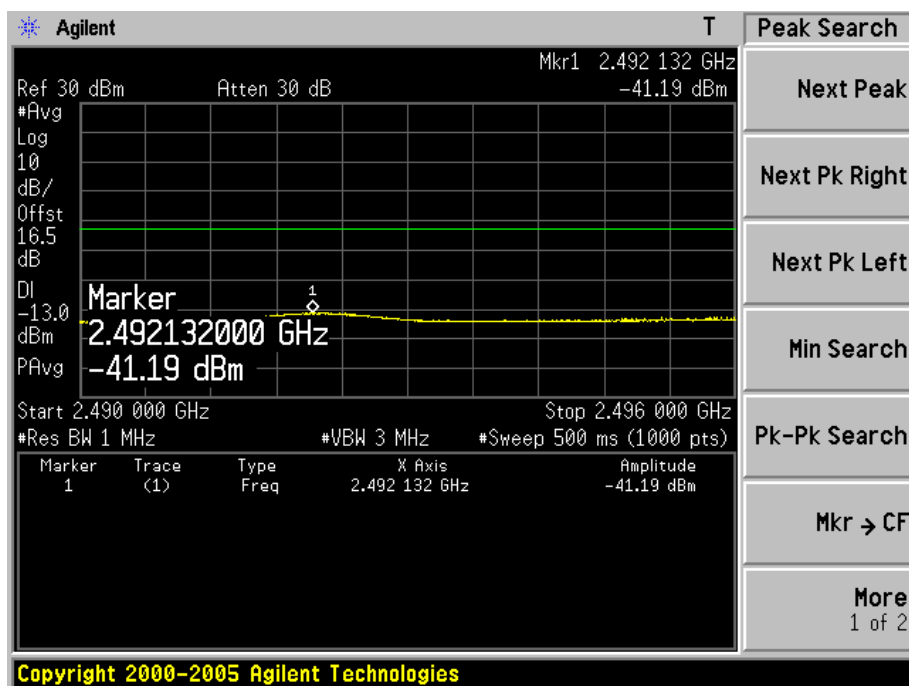


Product	Wireless Module		
Test Item	Conducted Band Edge		
Test Mode	Mode 1: LTE Band VII (20M/QPSK)		
Date of Test	2014/12/07	Test Site	AC6

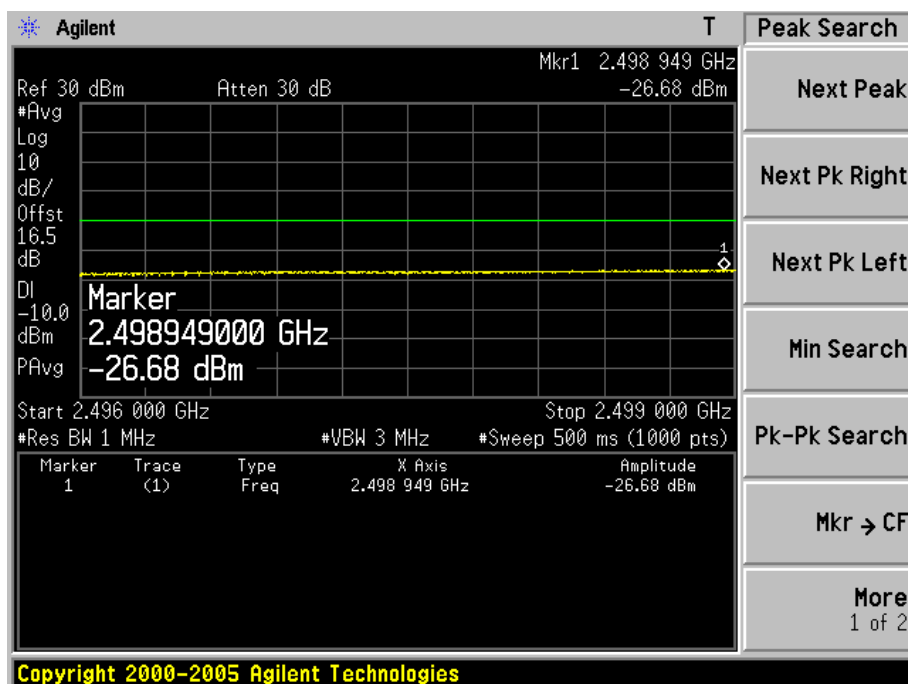
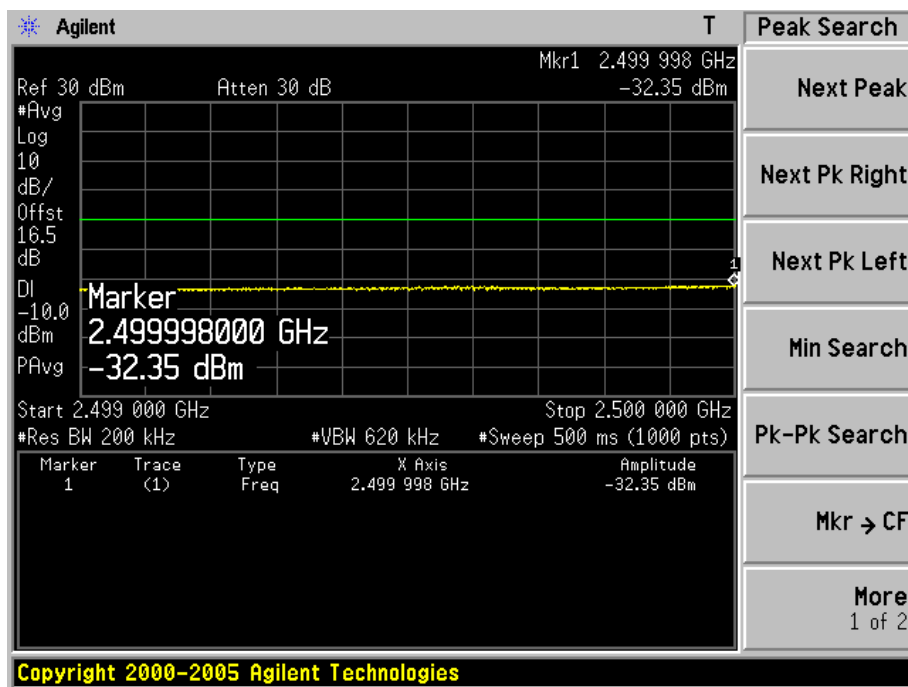
Figure Channel 20850 (2510MHz)

1RB0





100RB0



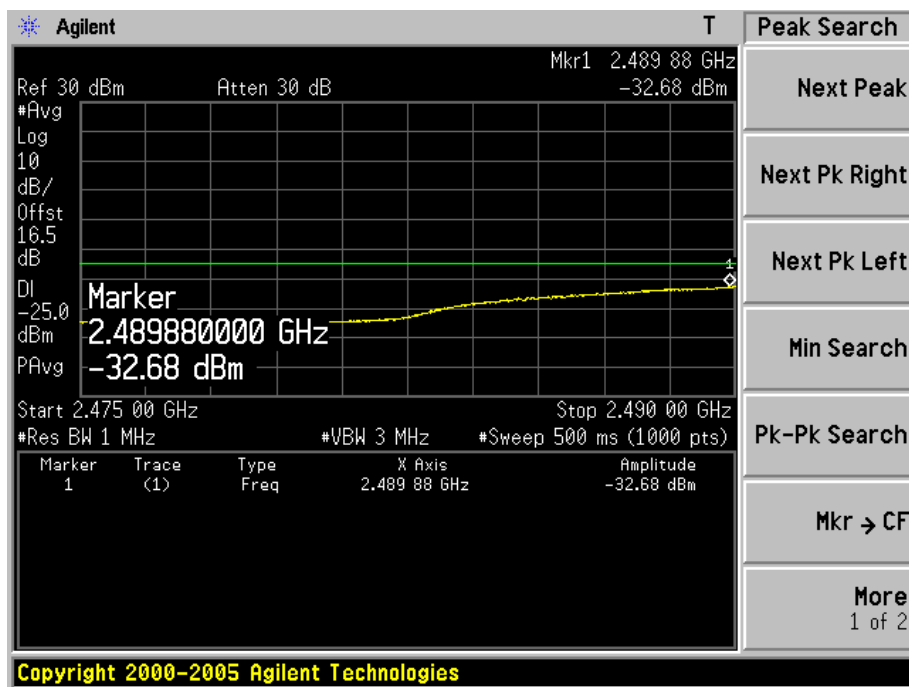
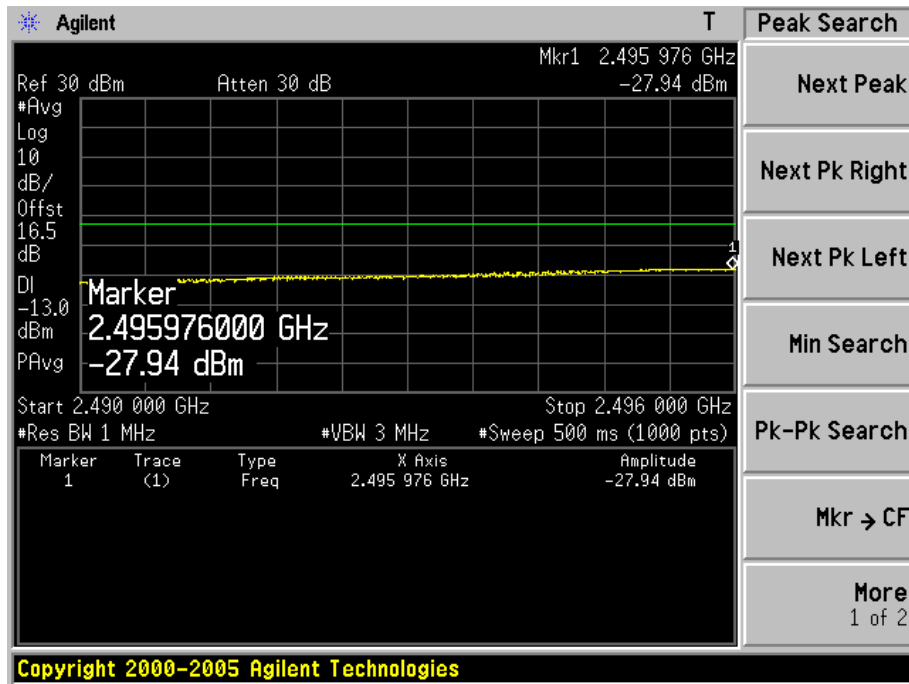
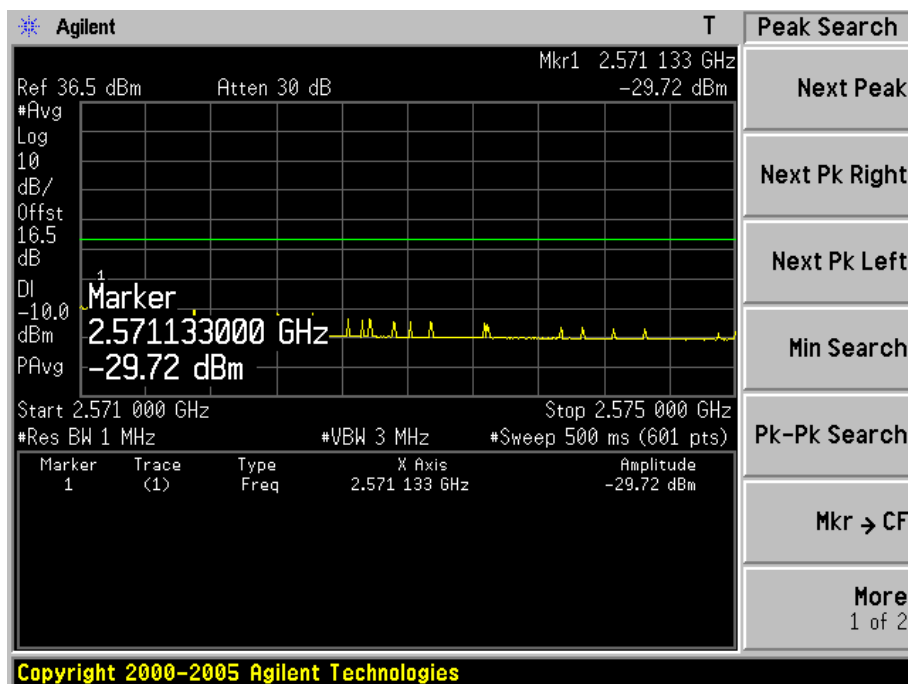
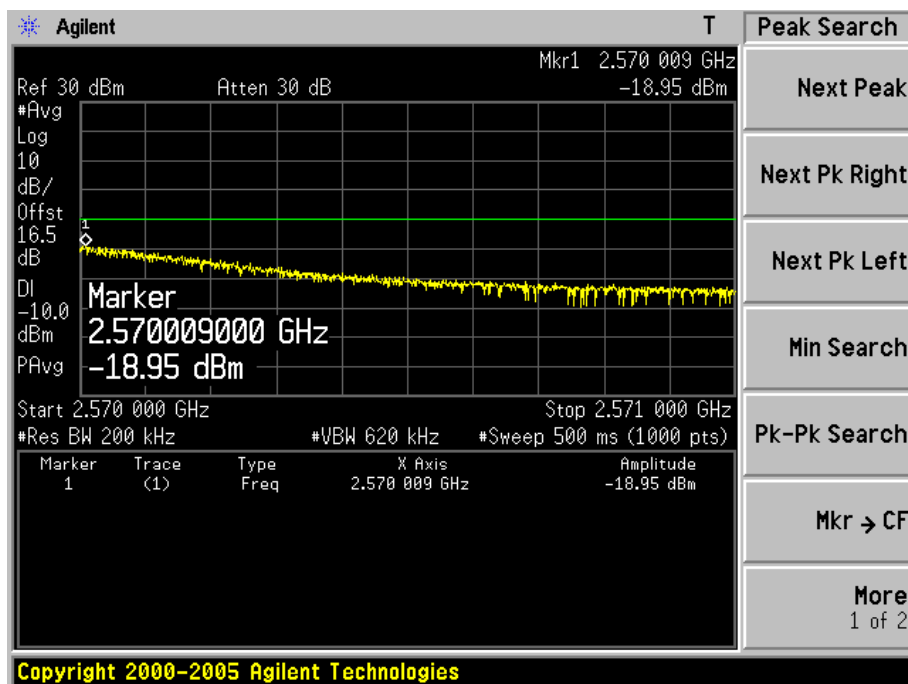
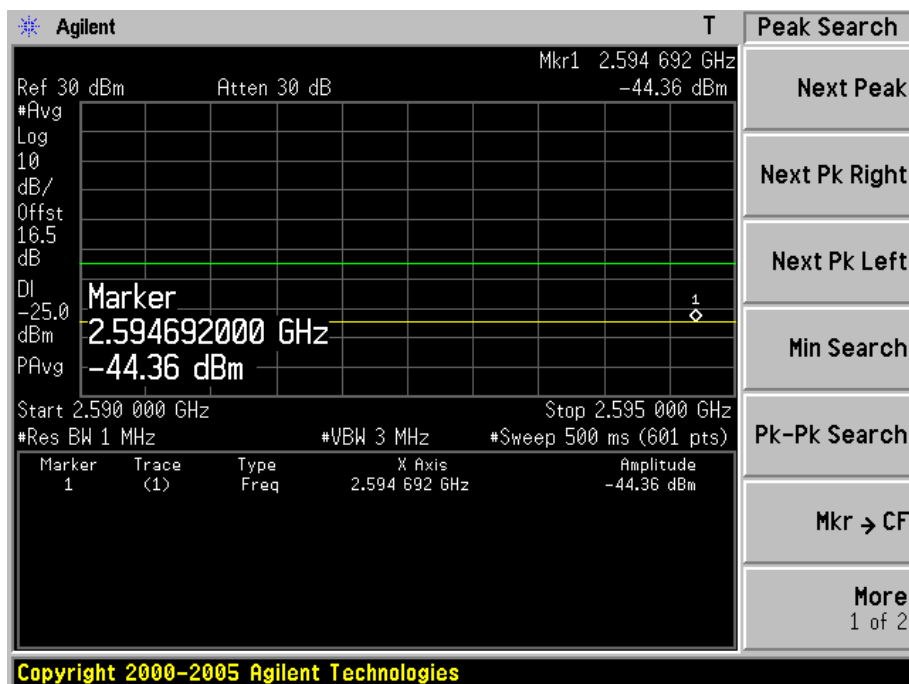
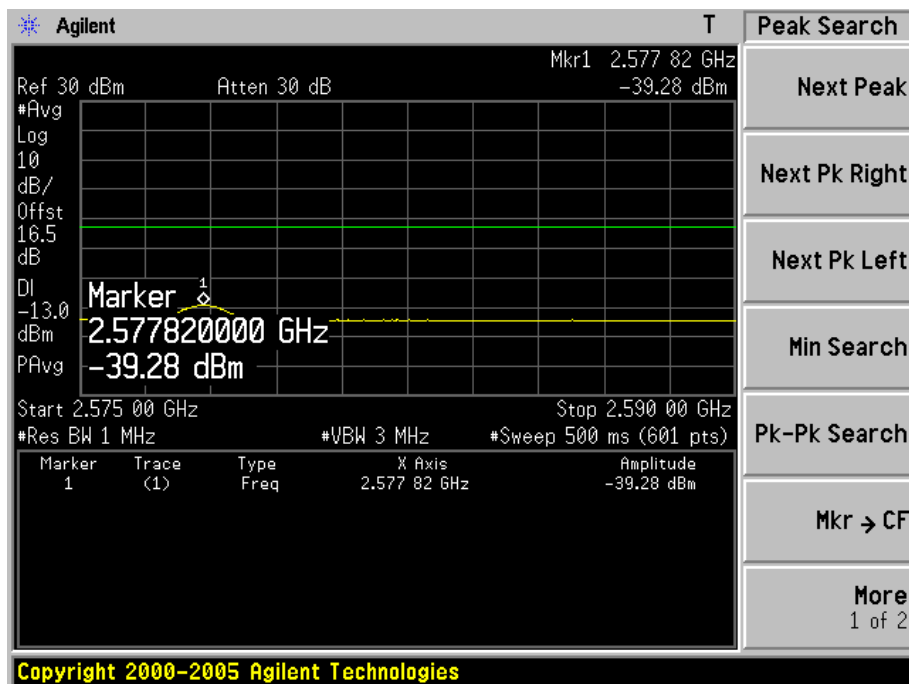


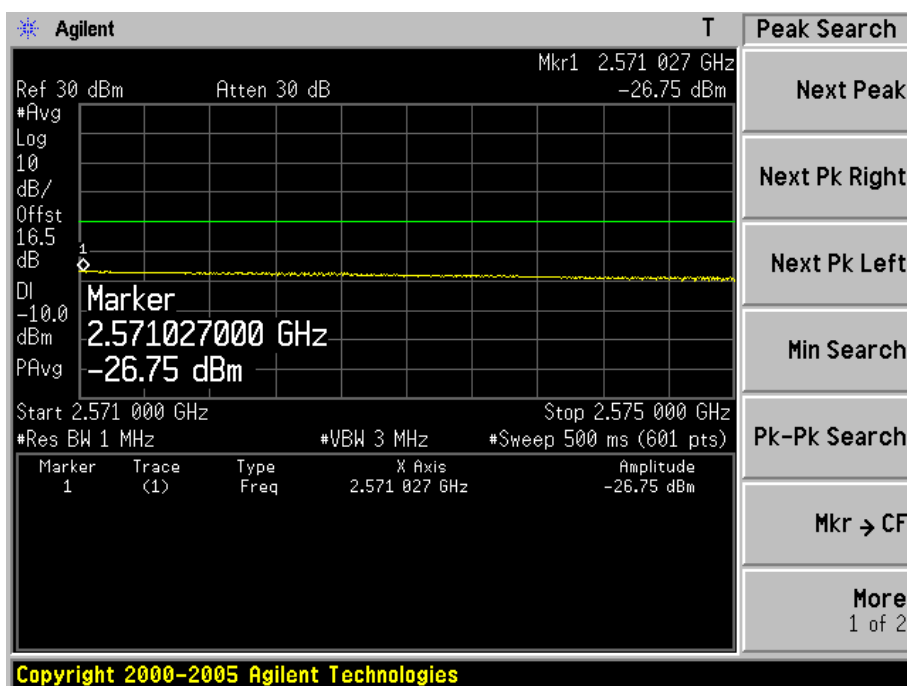
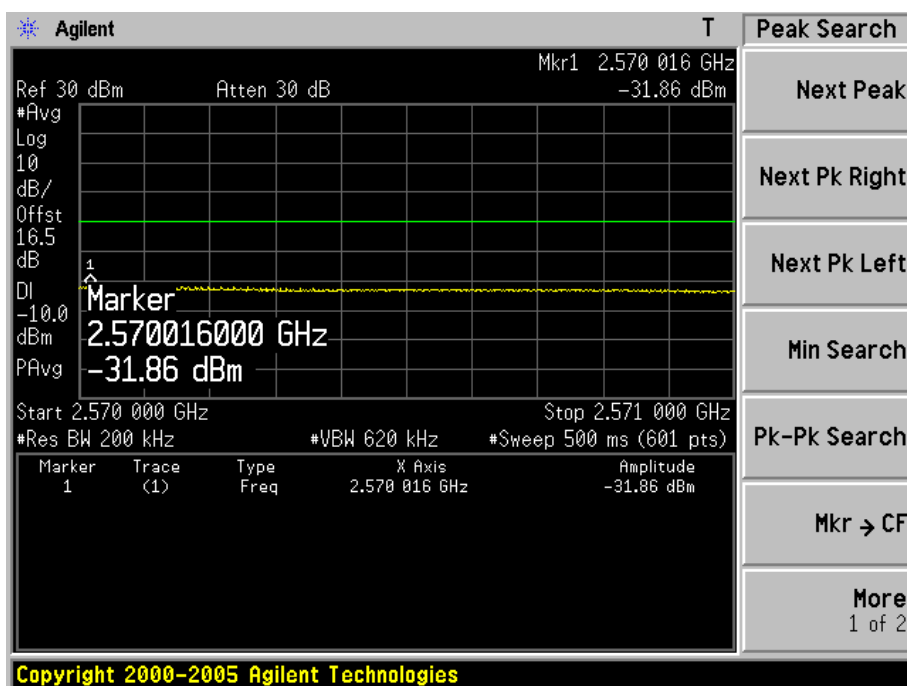
Figure Channel 21350 (2560MHz)

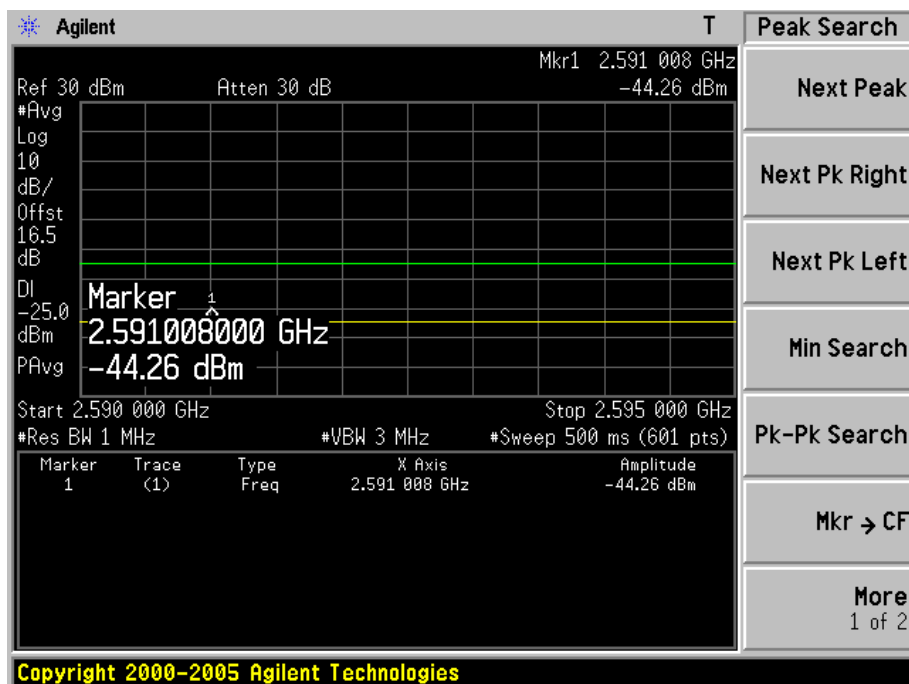
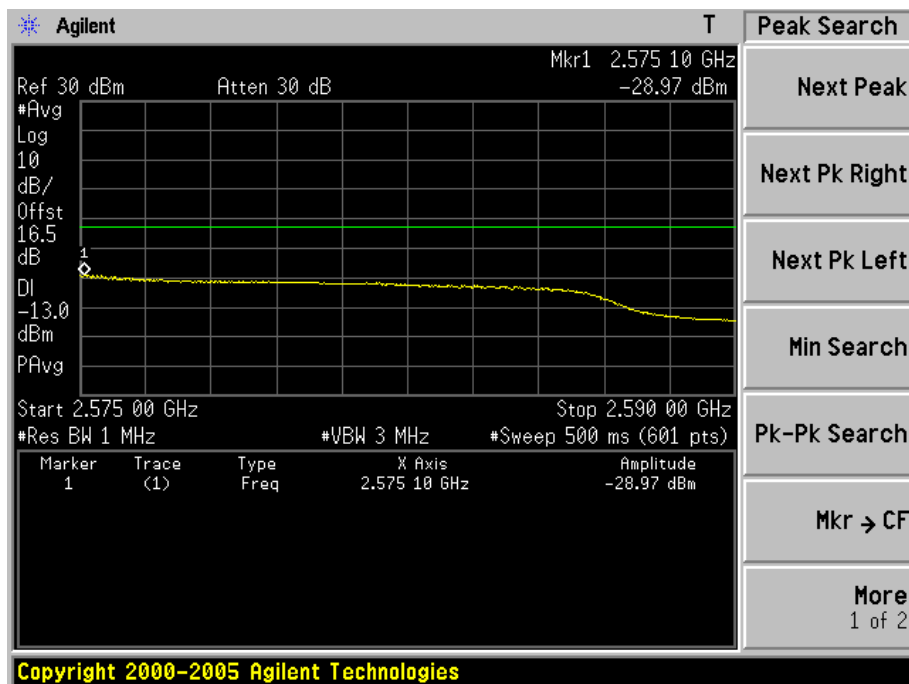
1RB99





100RB0

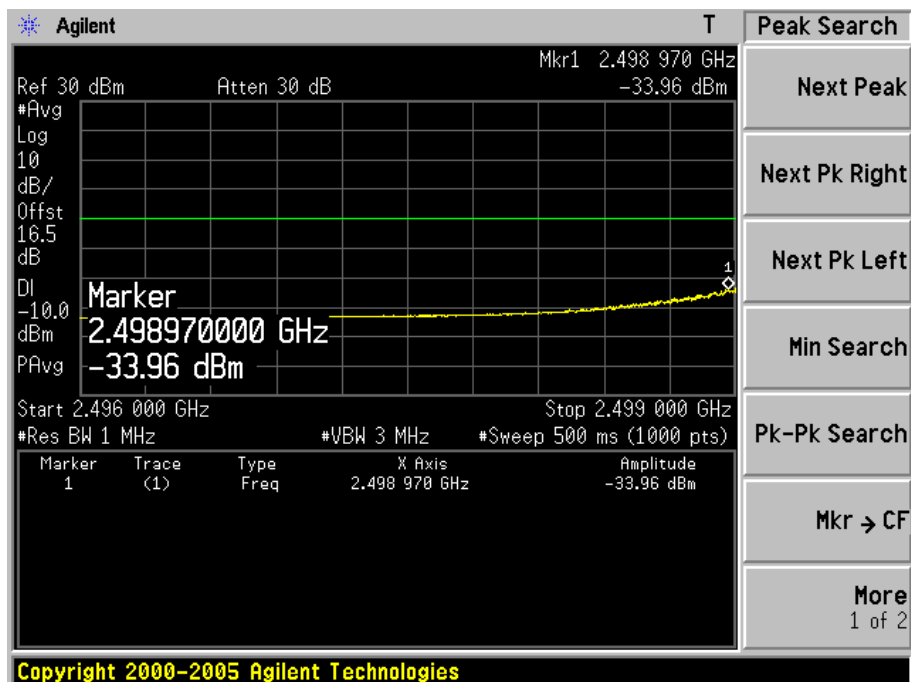
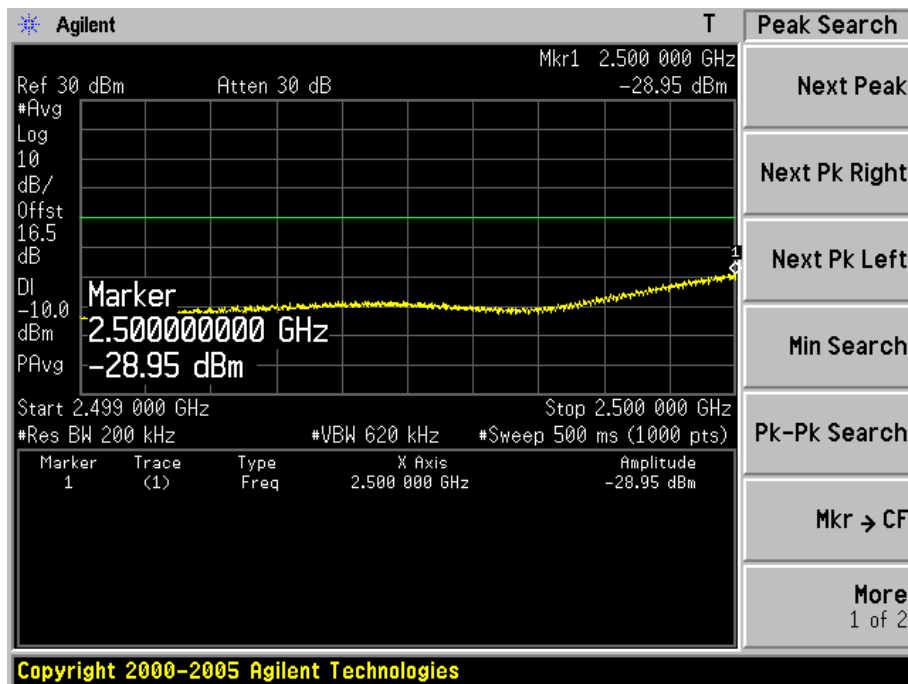


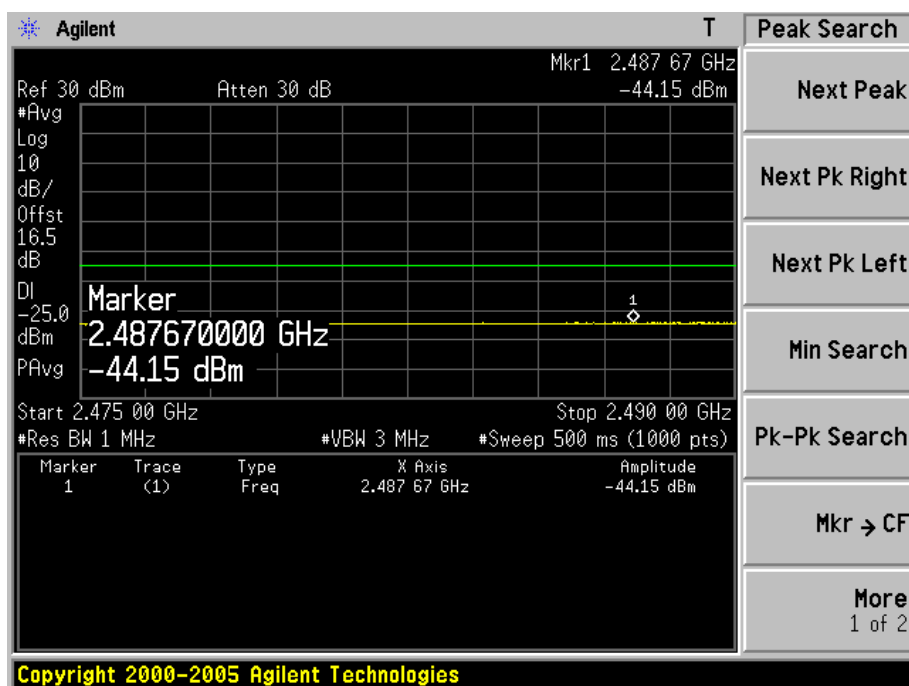
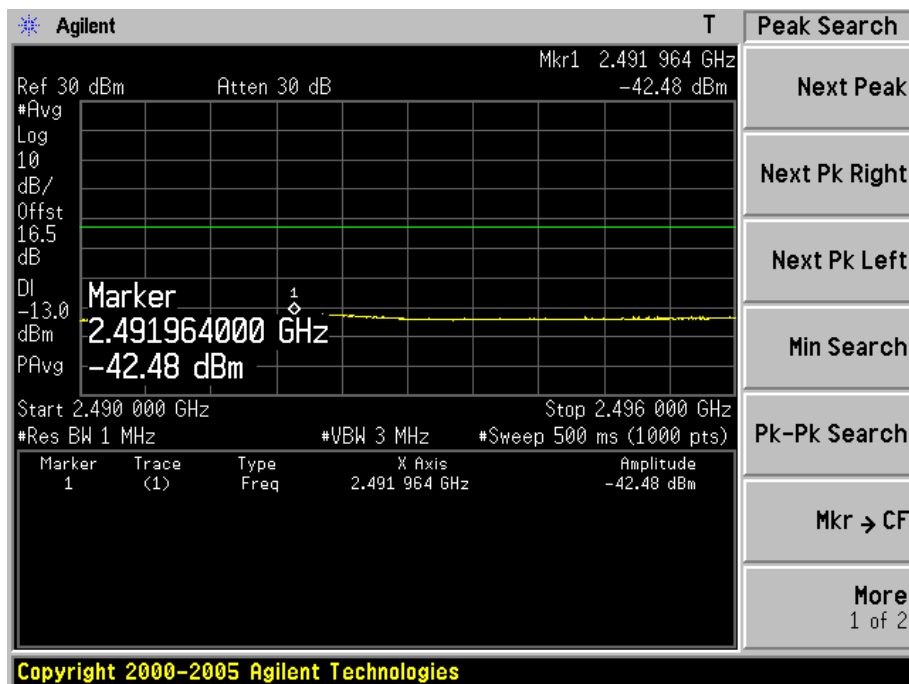


Product	Wireless Module		
Test Item	Conducted Band Edge		
Test Mode	Mode 1: LTE Band VII (20M/16QAM)		
Date of Test	2014/12/07	Test Site	AC6

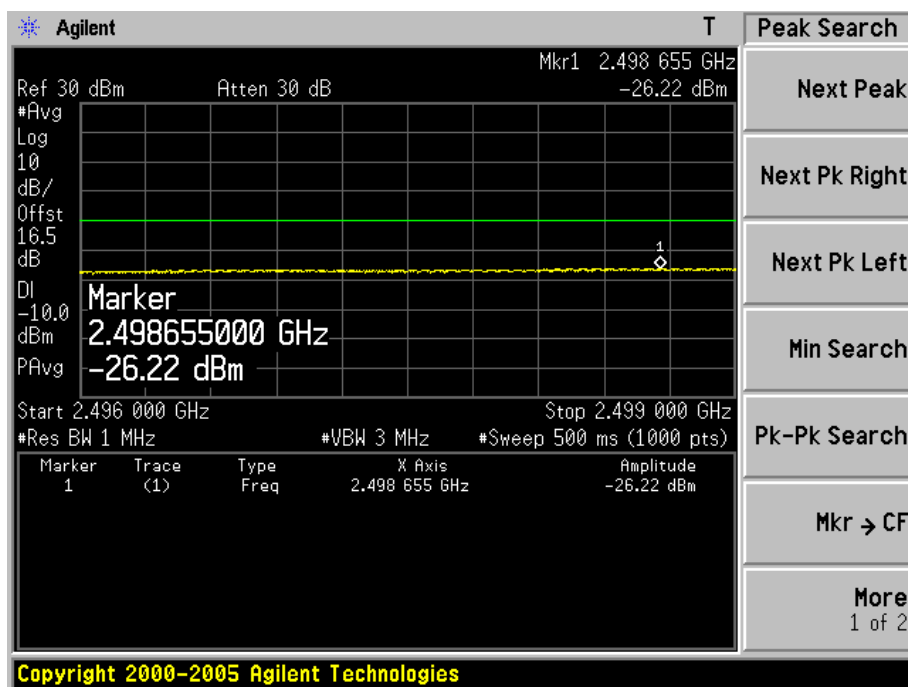
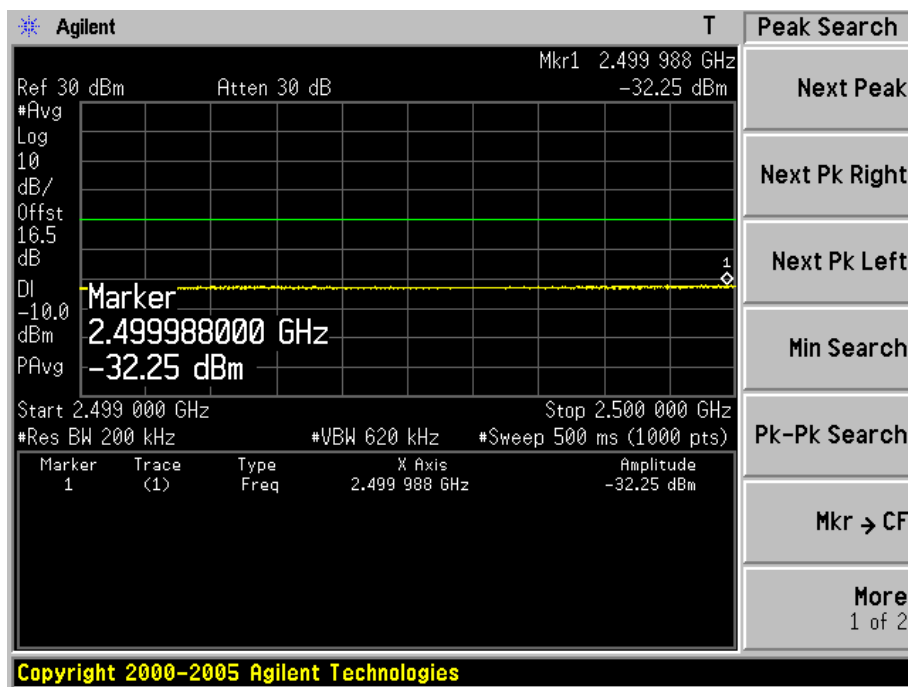
Figure Channel 20850 (2510MHz)

1RB0





100RB0



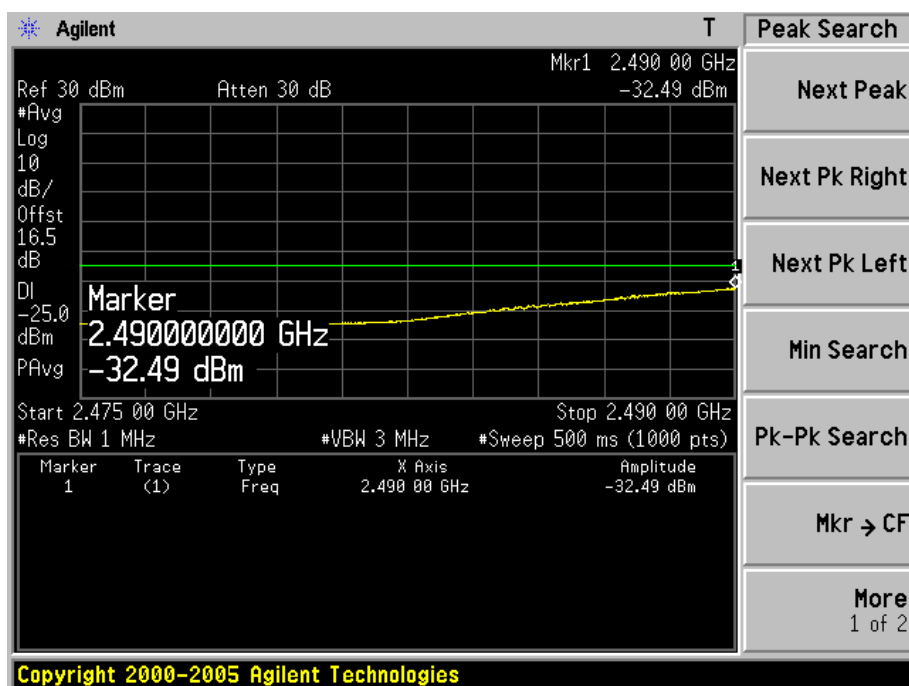
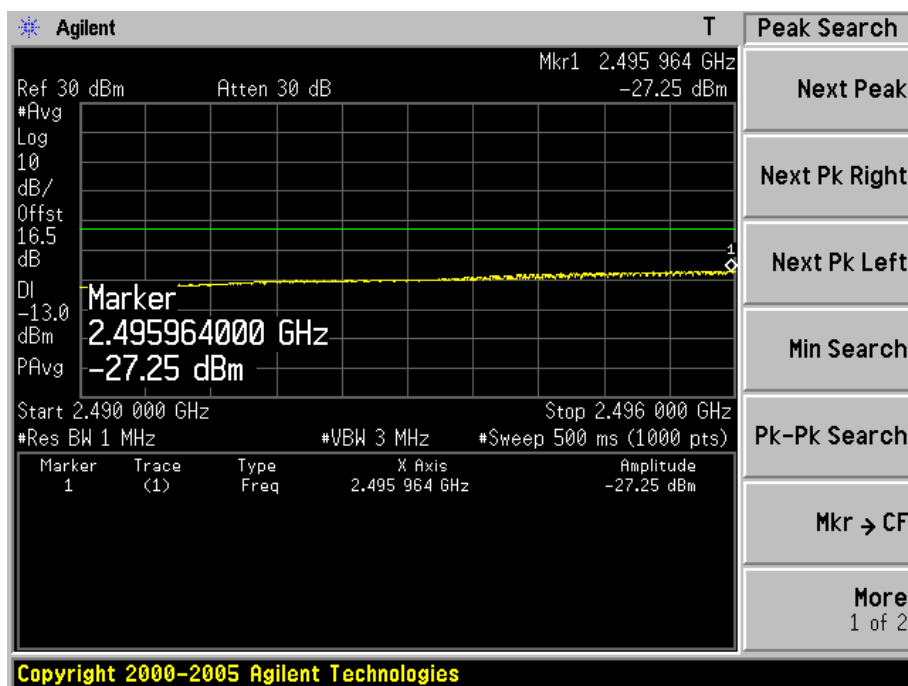
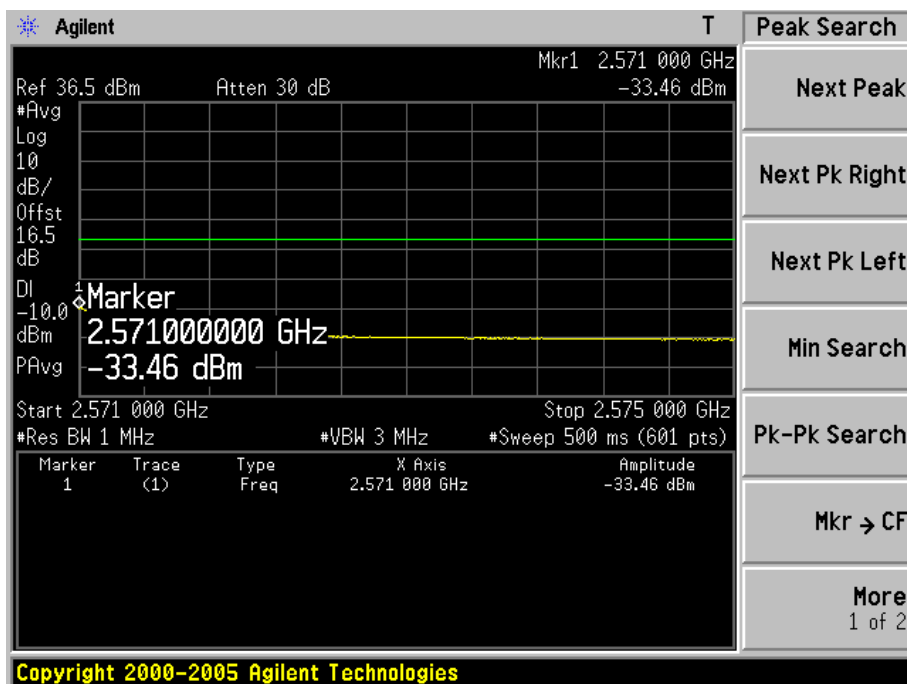
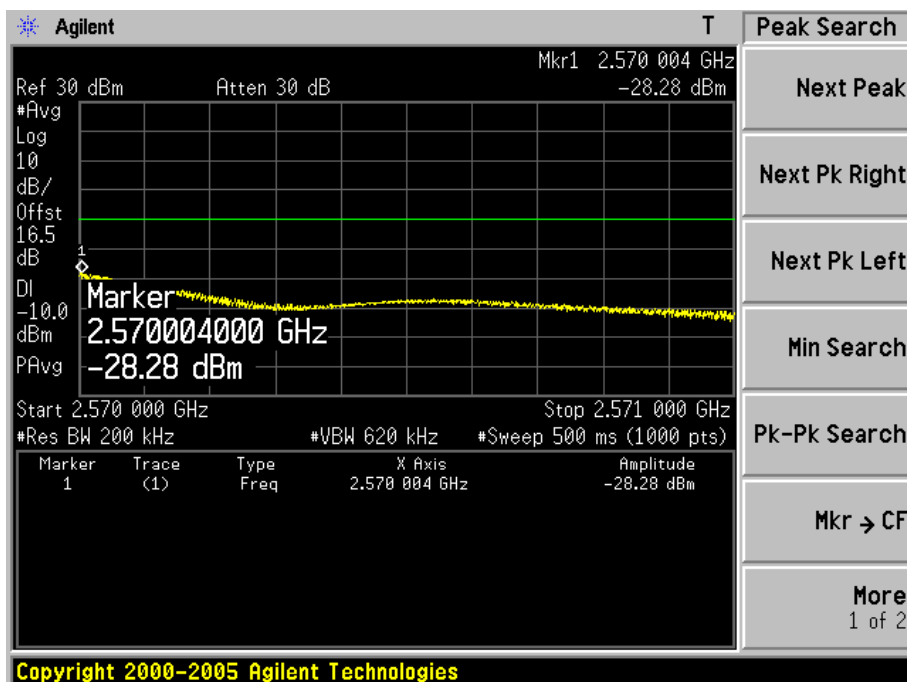
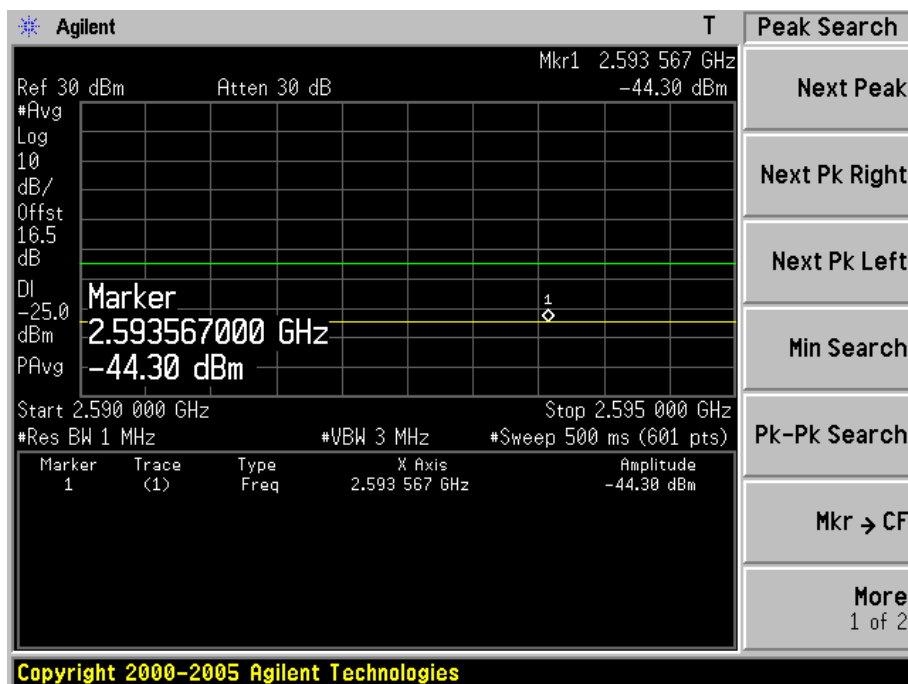
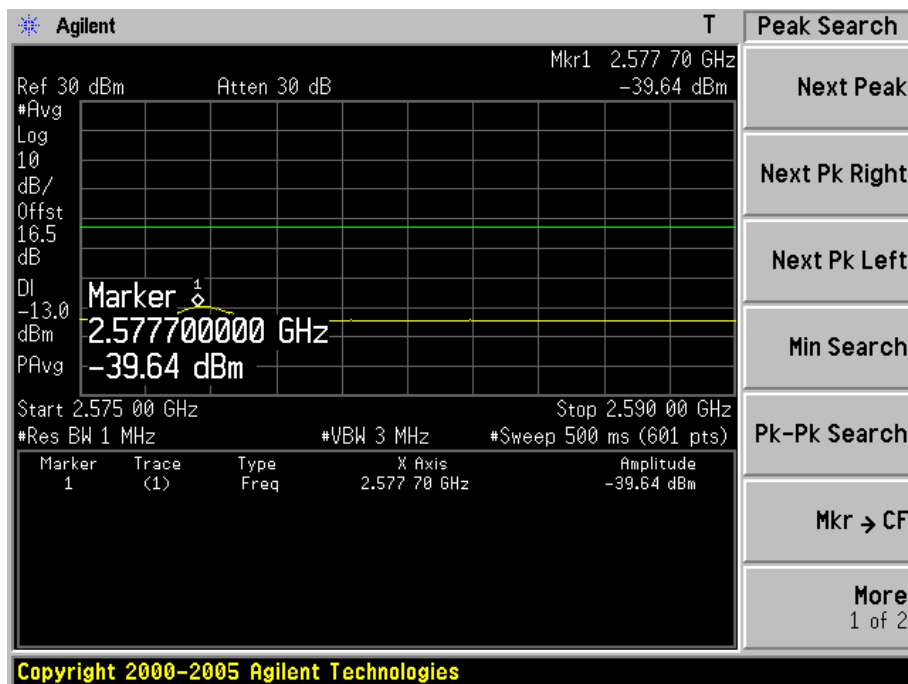


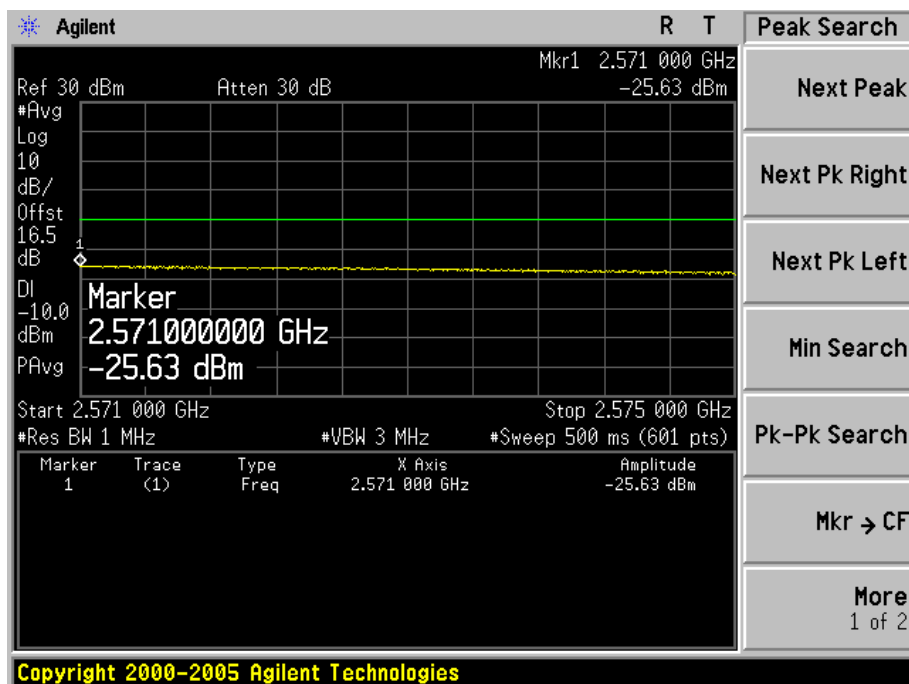
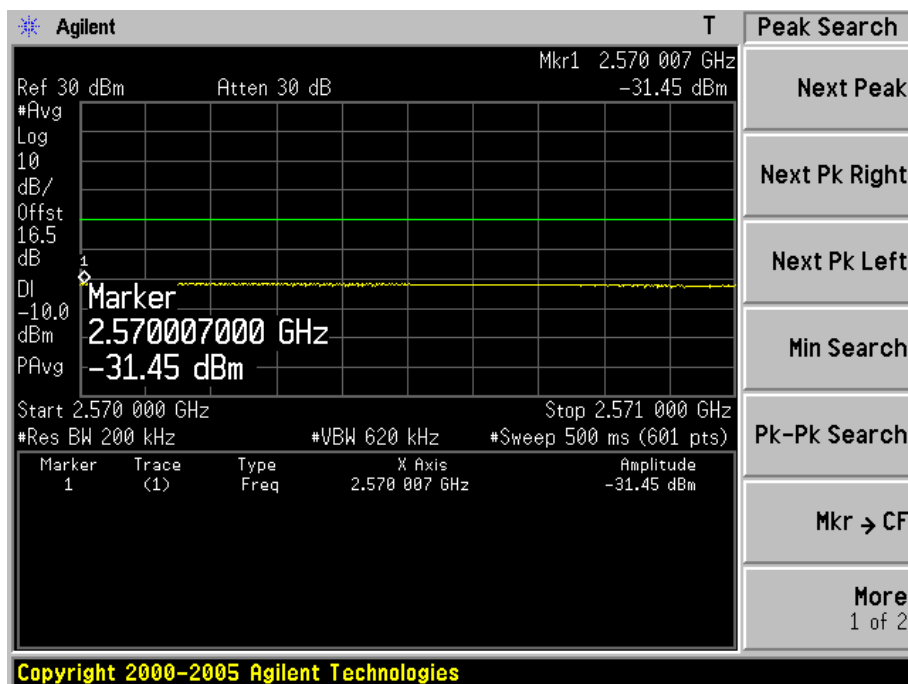
Figure Channel 21350 (2560MHz)

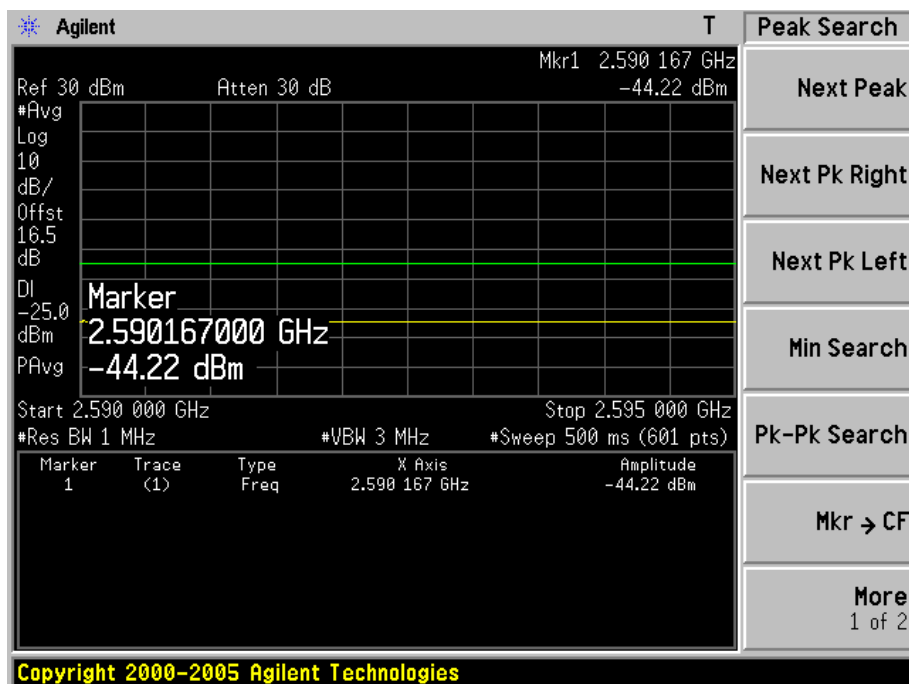
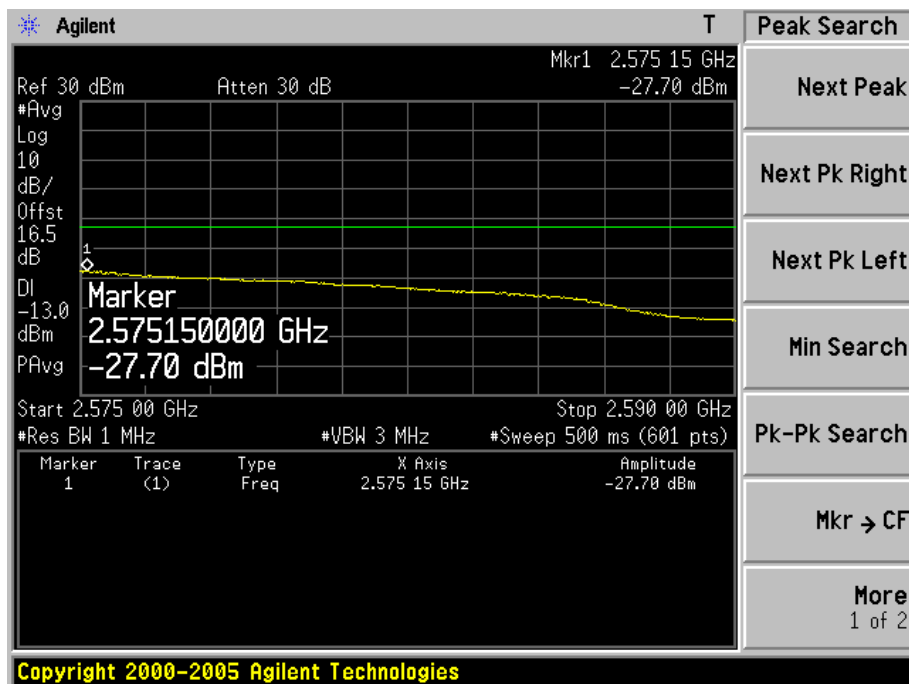
1RB99





100RB0





7. Spurious Emission

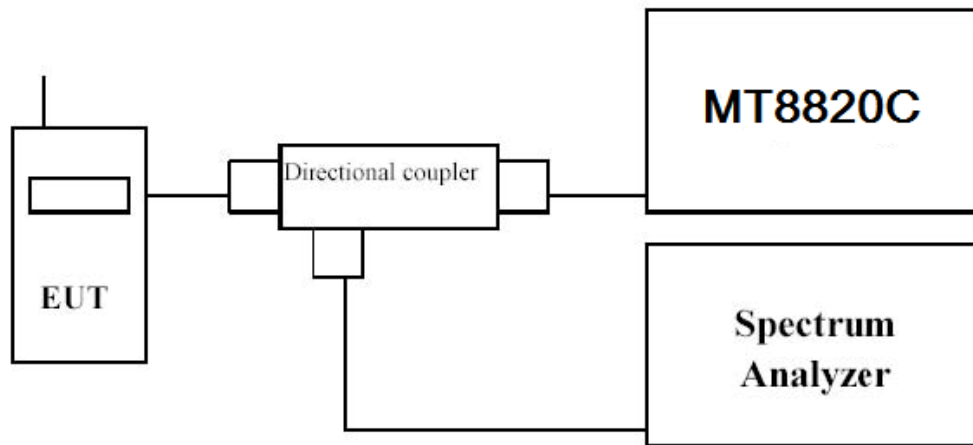
7.1. Test Equipment

Spurious Emission / AC-5

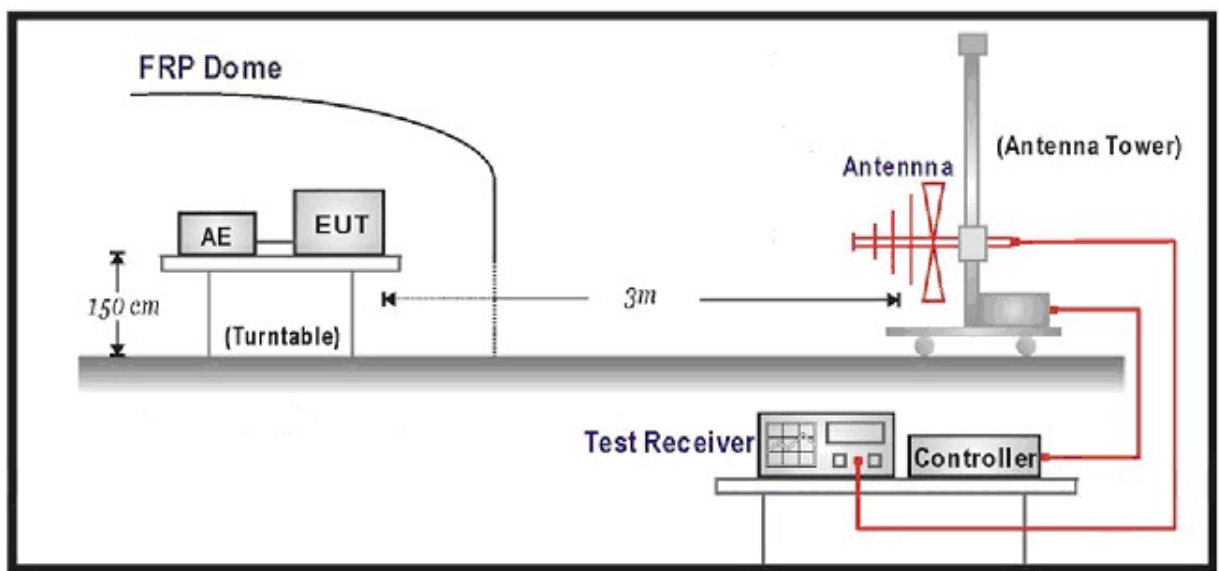
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2015.03.28
Radio Communication Tester	Anritsu	MT8820C	6201181503	2015.03.28
Dual Directional Coupler	Agilent	778D	20160	2015.03.28
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2015.03.28
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2015.03.28
Preamplifier	QuieTek	AP-025C	CHM-0503006	2015.04.11
Preamplifier	Miteq	NSP1800-25	1364185	2015.05.03
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2015.10.15
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40137	2016.02.26
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2016.02.26
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2015.06.08
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2015.01.08

7.2. Test Setup

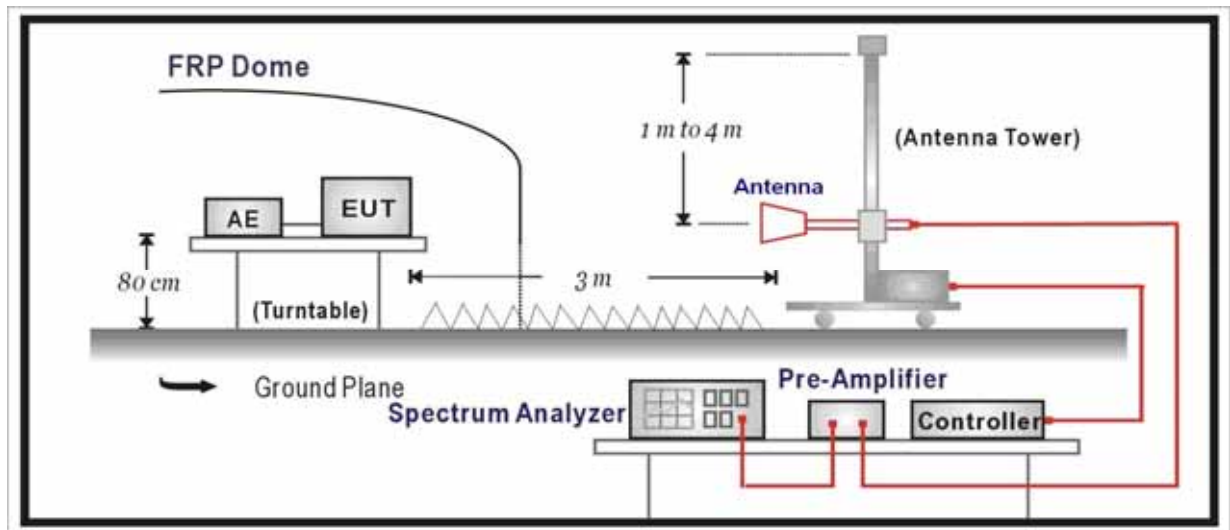
Conducted Spurious Measurement: below 1GHz



Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



7.3. Test Procedure

Conducted Spurious Measurement:

- a) The EUT was connected to spectrum analyzer and System Simulator via power divider.
- b) The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
- c) The conducted spurious emission for the whole frequency range was taken.

Radiated Spurious Measurement:

- d) The EUT was placed on a rotatable wooden table with 1.5 meter above ground.
- e) The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
- f) The table was rotated 360 degrees to determine the position of the highest spurious emission.
- g) The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
- h) Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 1MHz, Sweep 500ms, Taking the record of maximum spurious emission.
- i) A horn antenna was substituted in place of the EUT and was driven by a signal generator.
- j) Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- k) Taking the record of output power at antenna port
- l) Repeat step 7 to step 8 for another polarization.I receiver.
- m) $EIRP = SG - \text{Cable loss} + \text{Antenna Gain}$

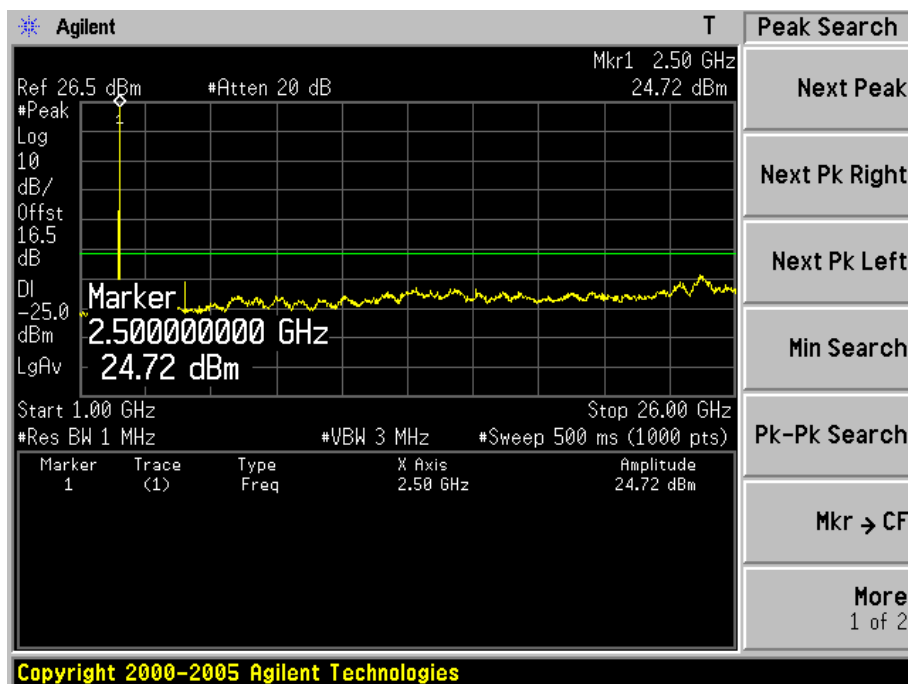
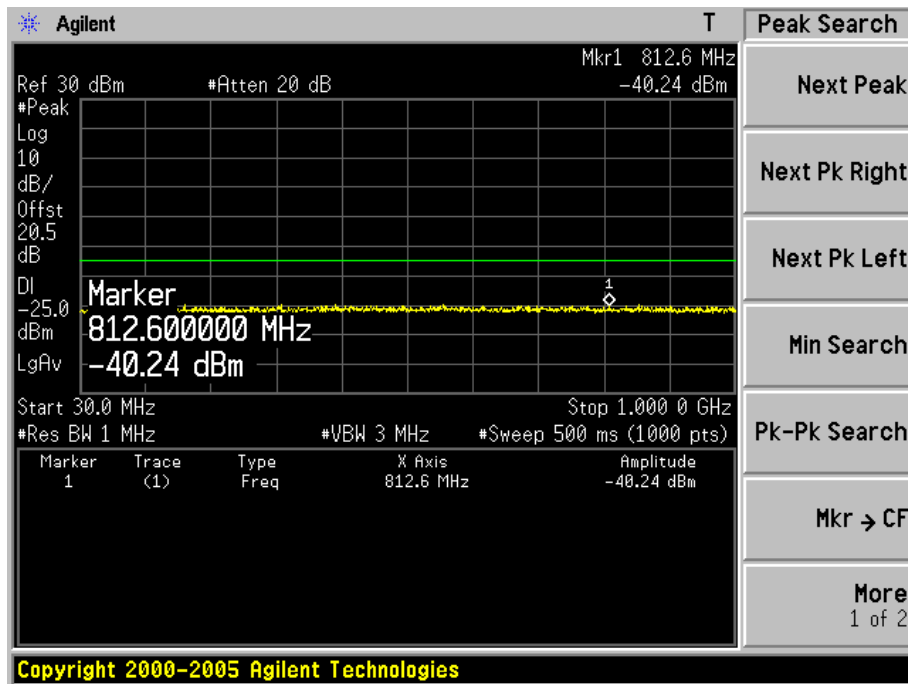
7.4. Uncertainty

The measurement uncertainty is defined as 3.2 dB for Radiated Power Measurement.

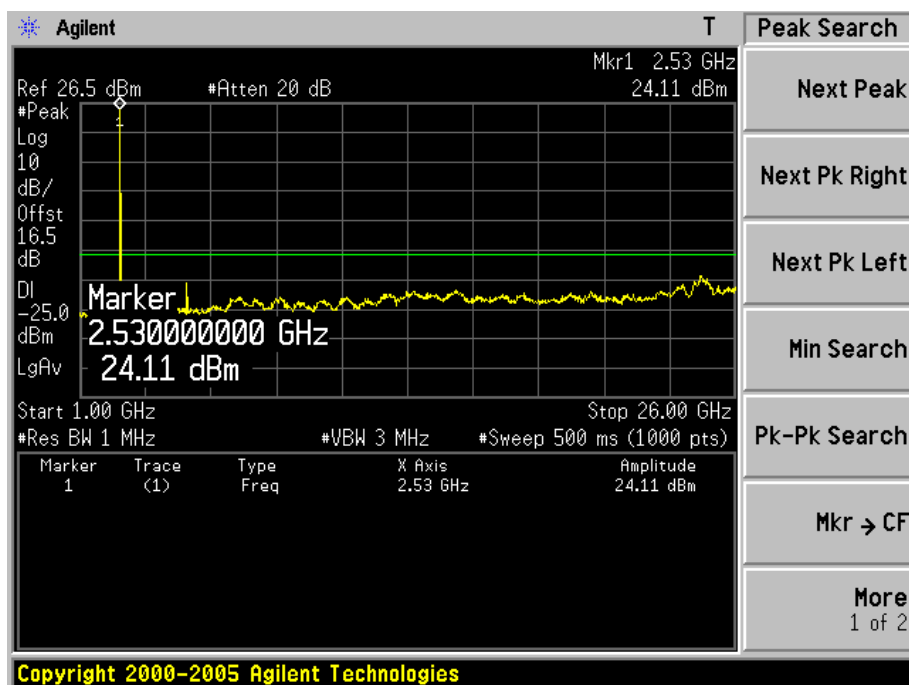
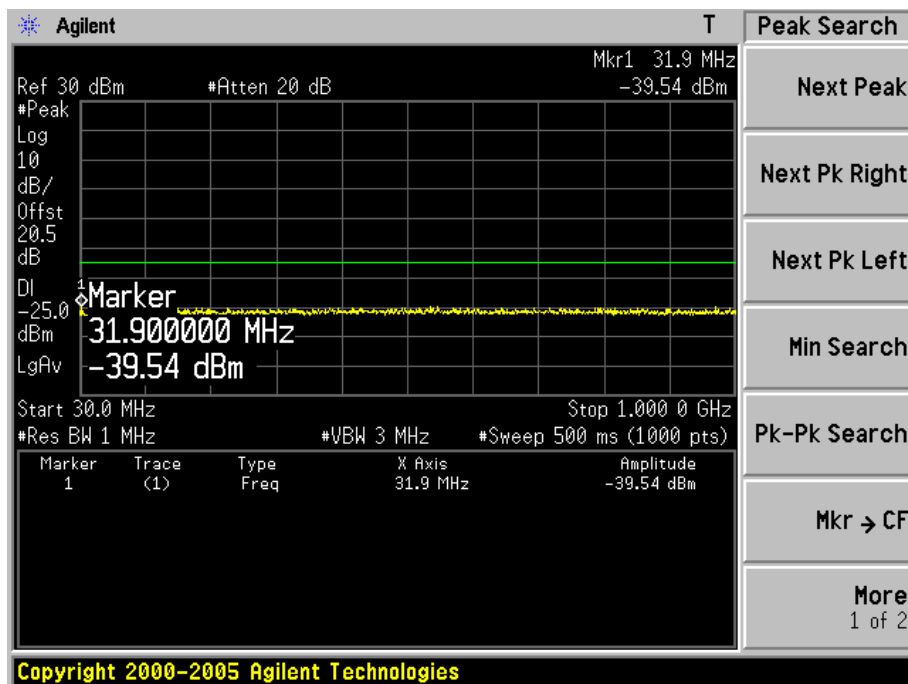
7.5. Test Result

Product	Wireless Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: LTE Band VII (5M/QPSK)		
Date of Test	2014/12/09	Test Site	TR8

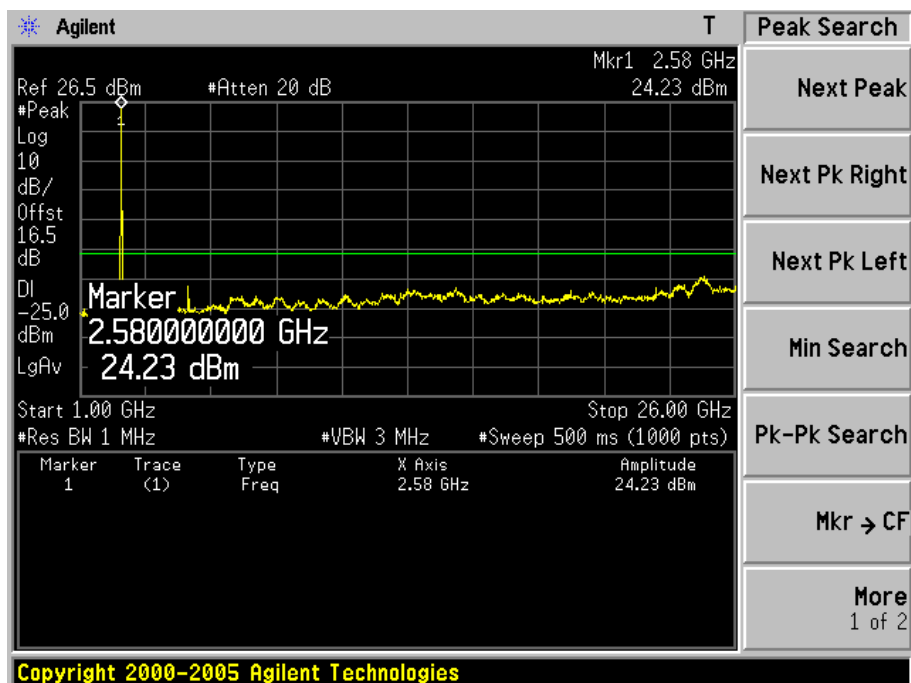
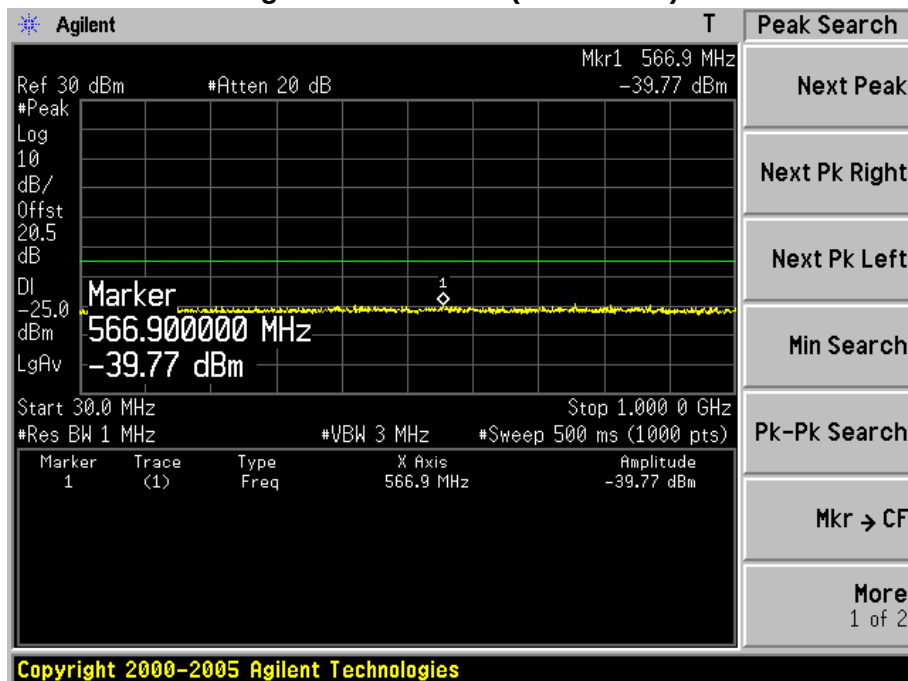
Low Channel 20775(2502.5MHz) 1RB24



Mid Channel 21100(2535MHz) 1RB12

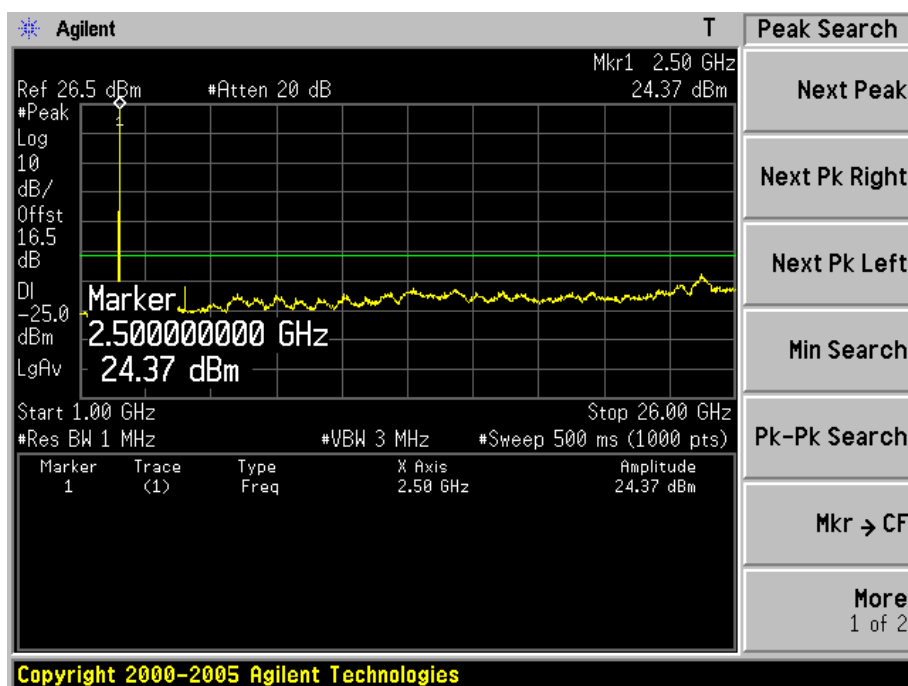
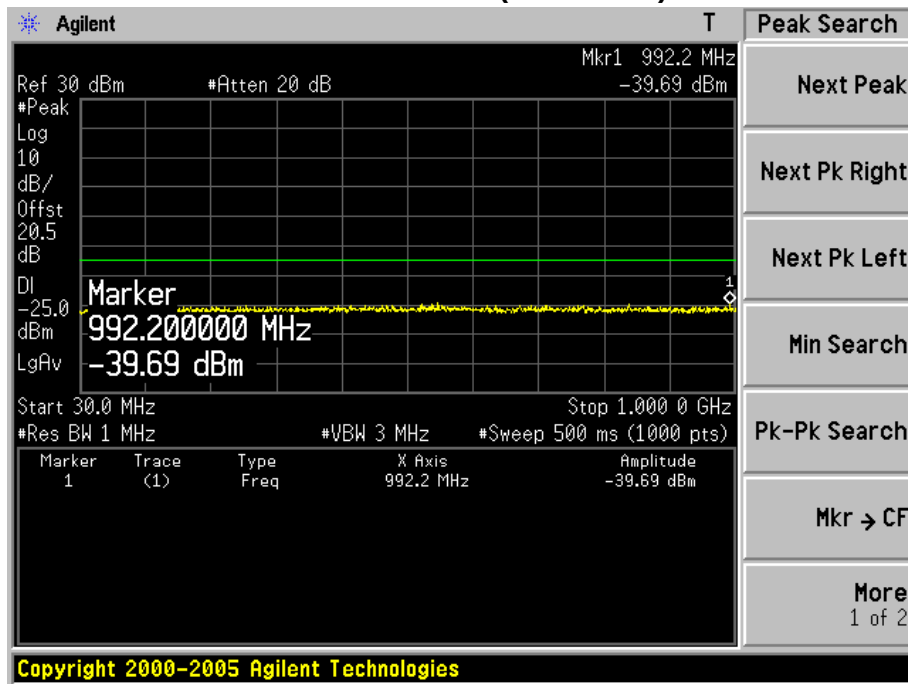


High Channel 21425(2567.5MHz) 1RB0

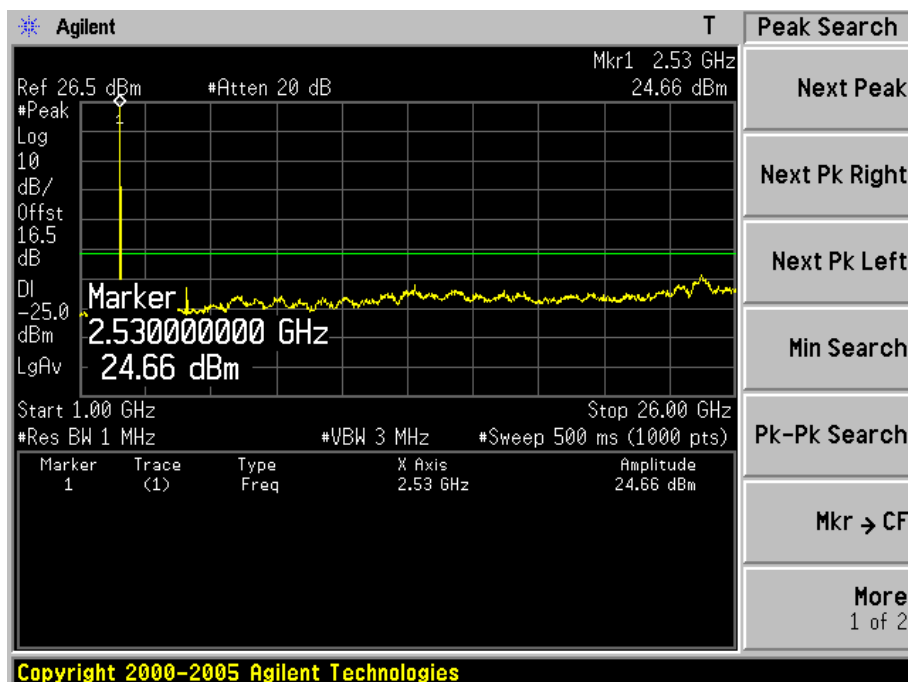
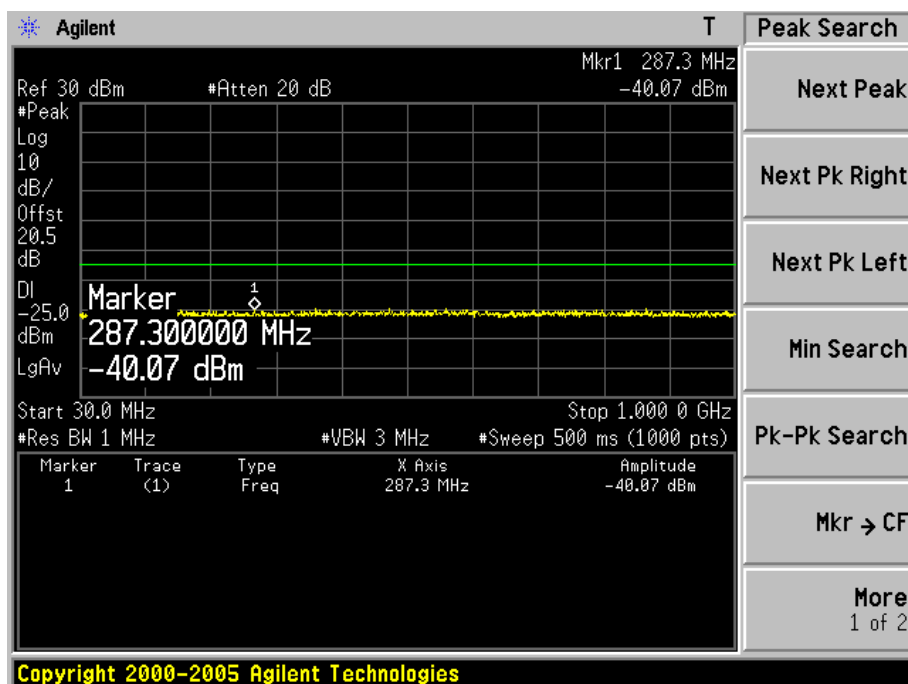


Product	Wireless Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: LTE Band VII (5M/QPSK)		
Date of Test	2014/11/22	Test Site	TR8

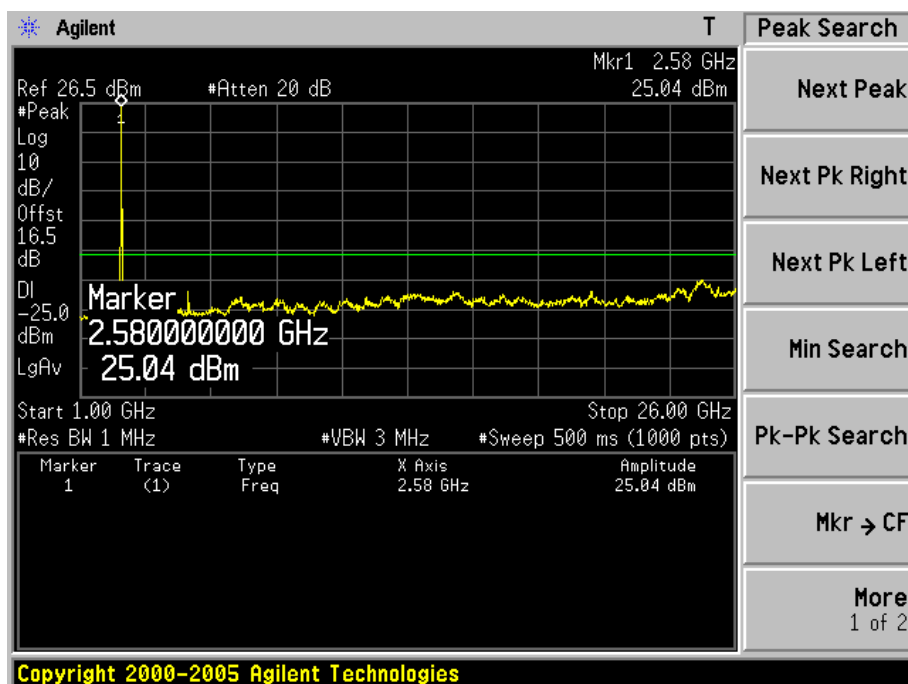
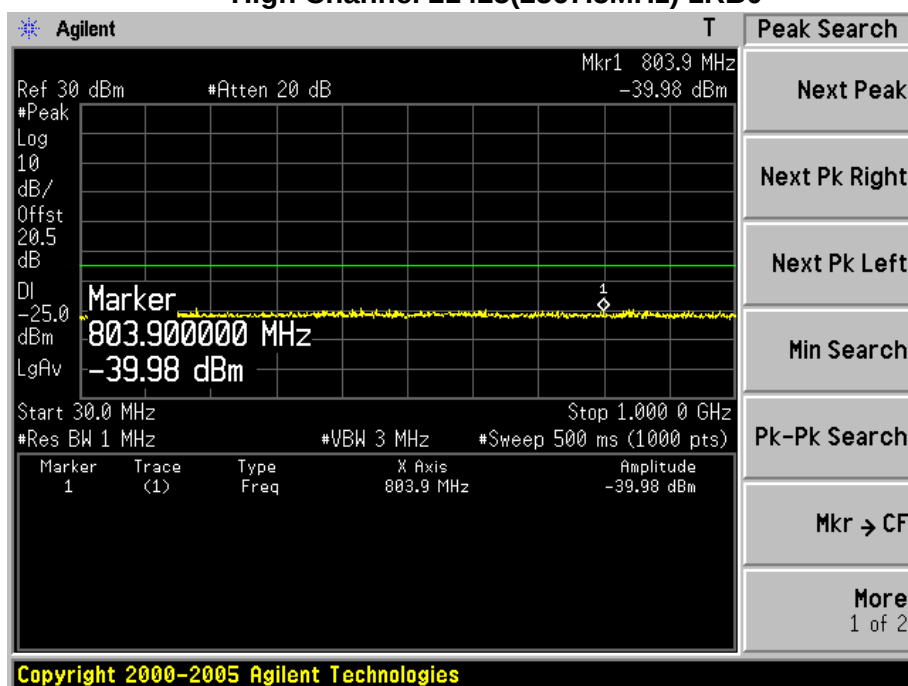
Low Channel 20775(2502.5MHz) 1RB24



Mid Channel 21100(2535MHz) 1RB12

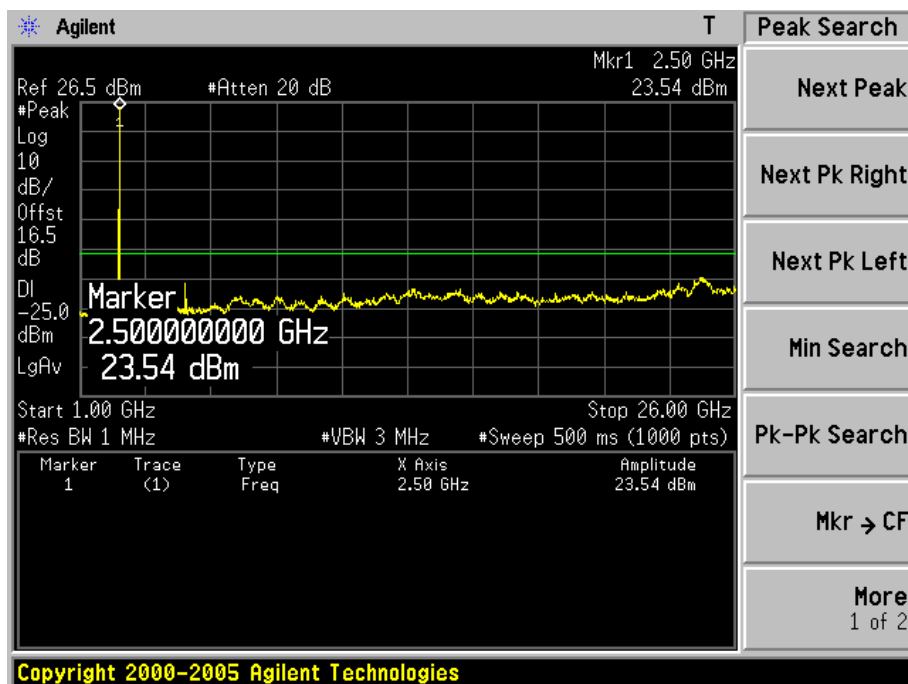
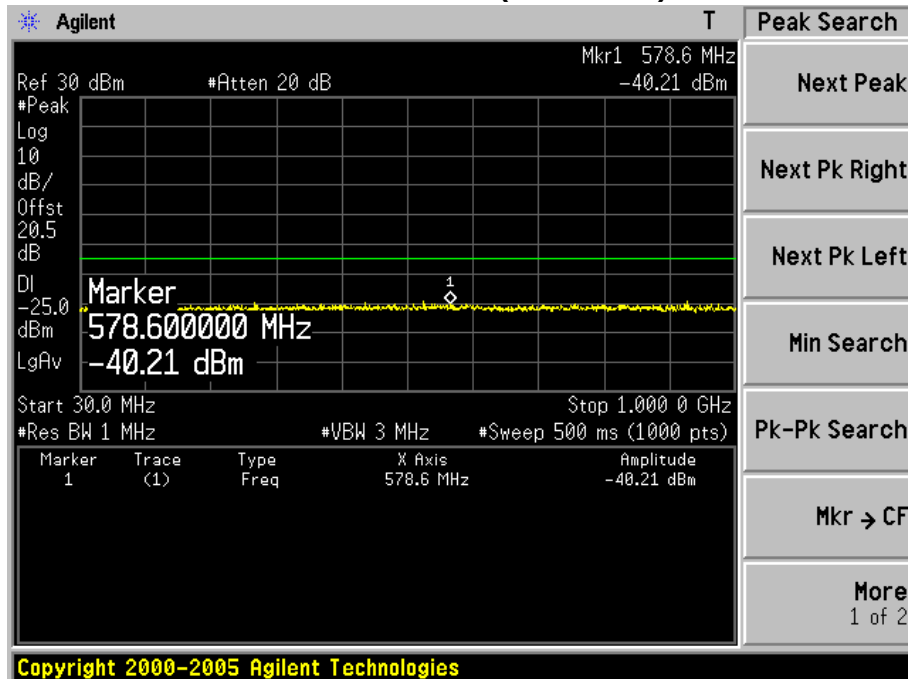


High Channel 21425(2567.5MHz) 1RB0

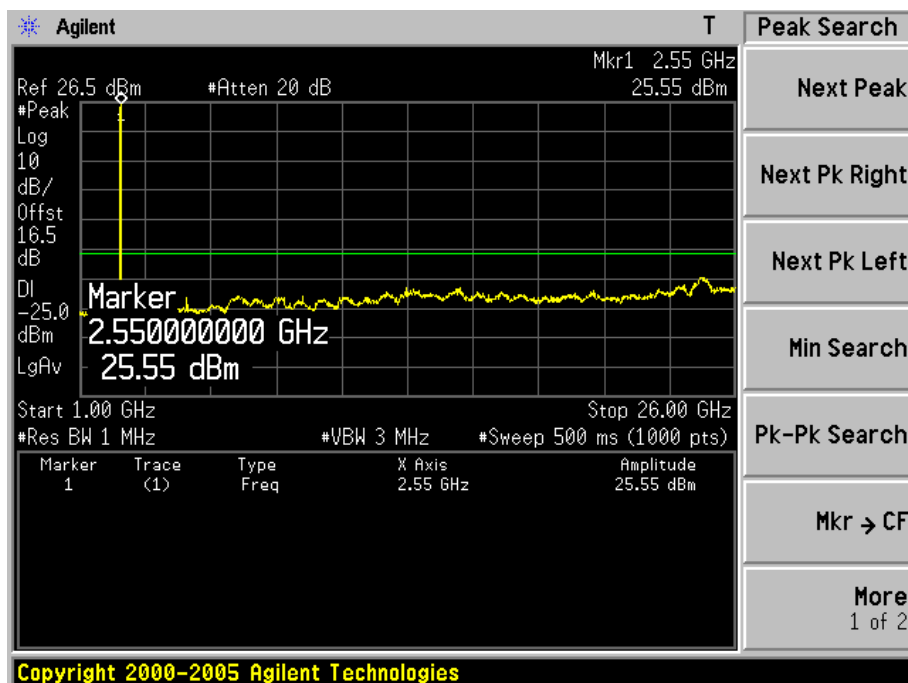
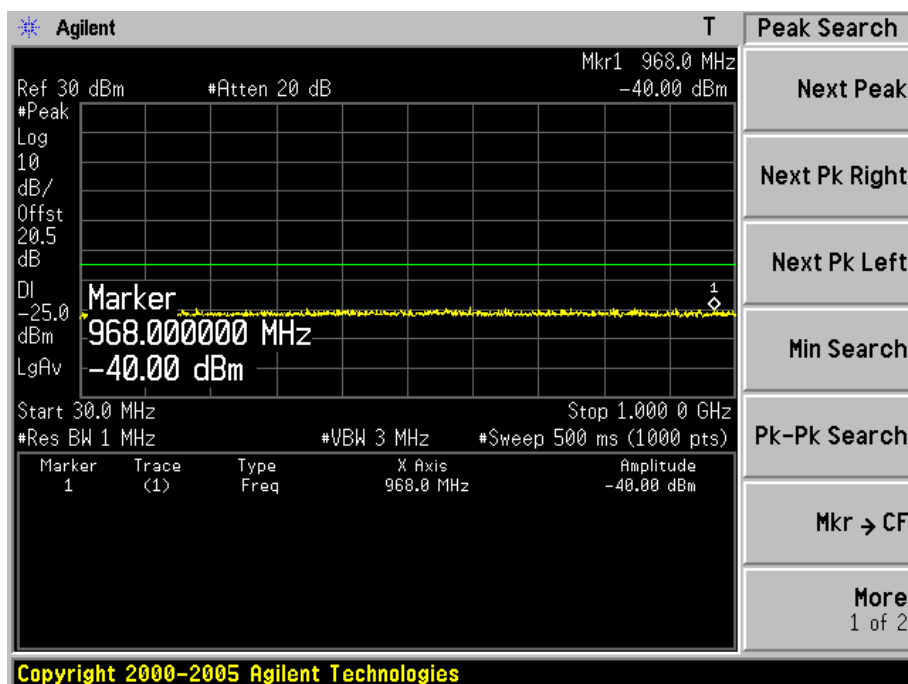


Product	Wireless Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: LTE Band VII (10M/QPSK)		
Date of Test	2014/12/10	Test Site	TR8

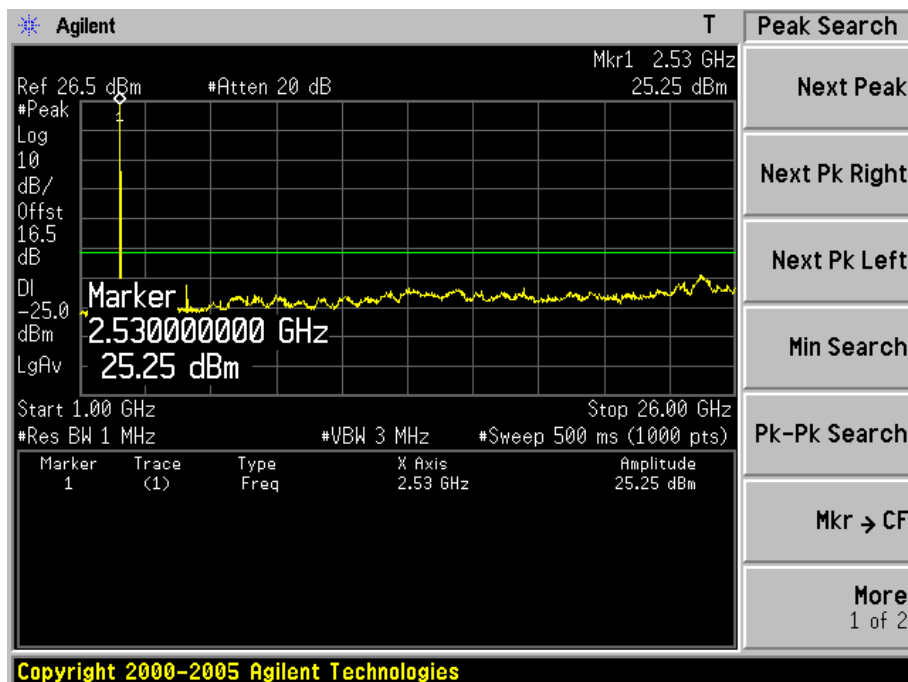
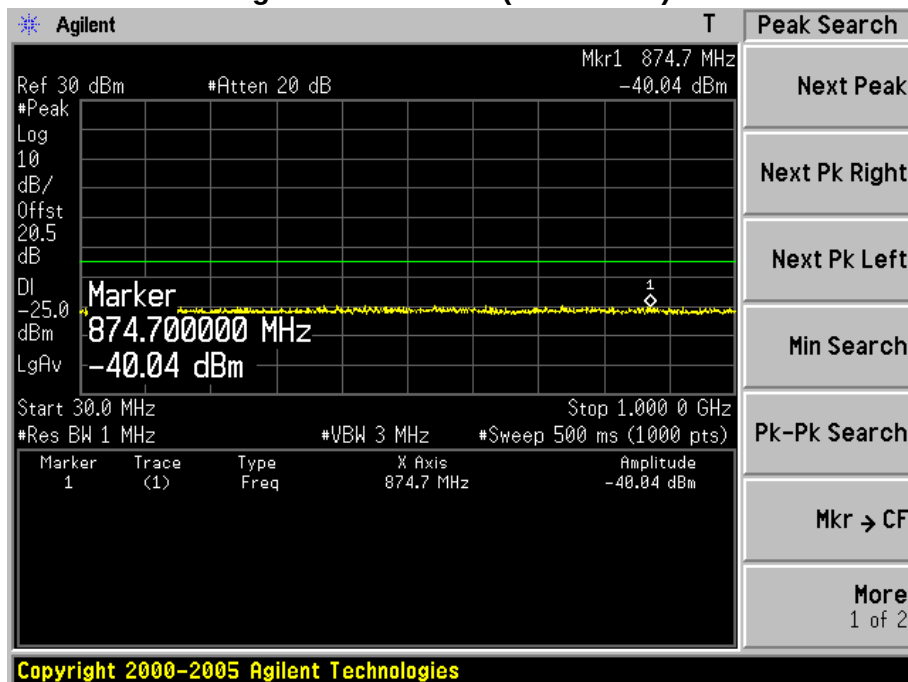
Low Channel 20775(2502.5MHz) 1RB49



Mid Channel 21100(2535MHz) 1RB49

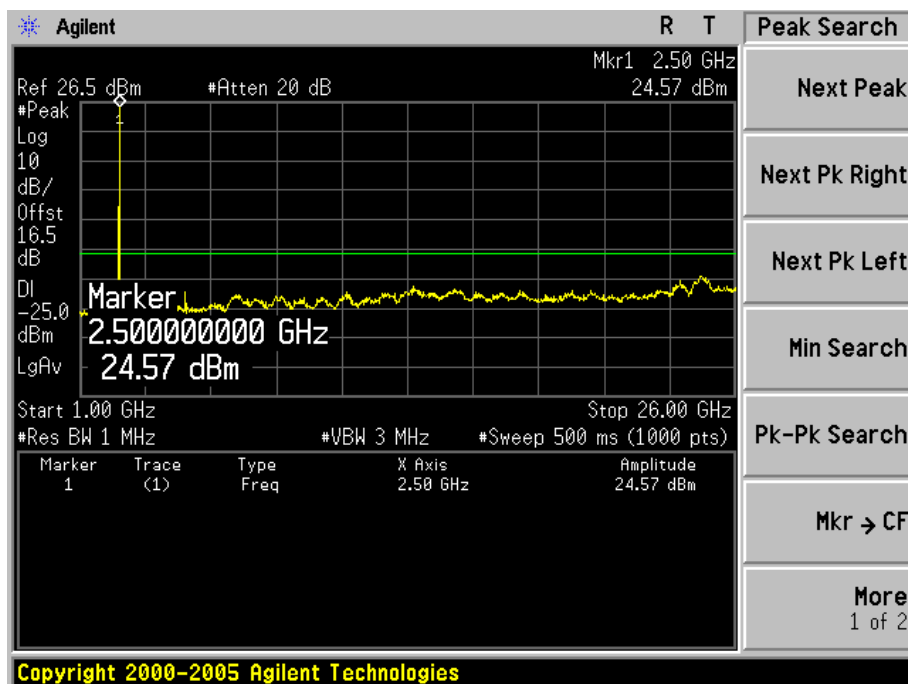
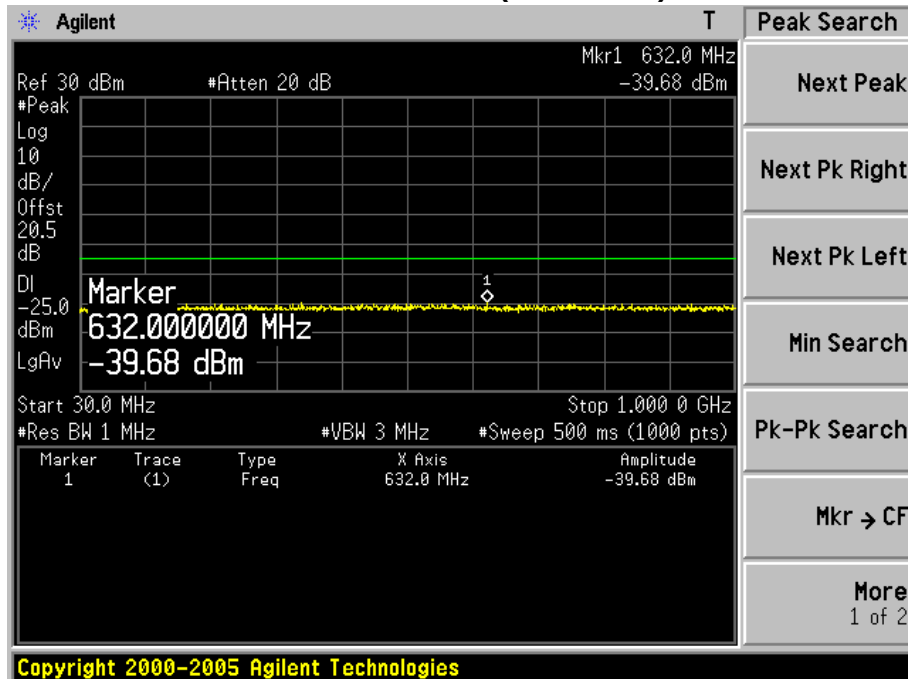


High Channel 21425(2567.5MHz) 1RB24

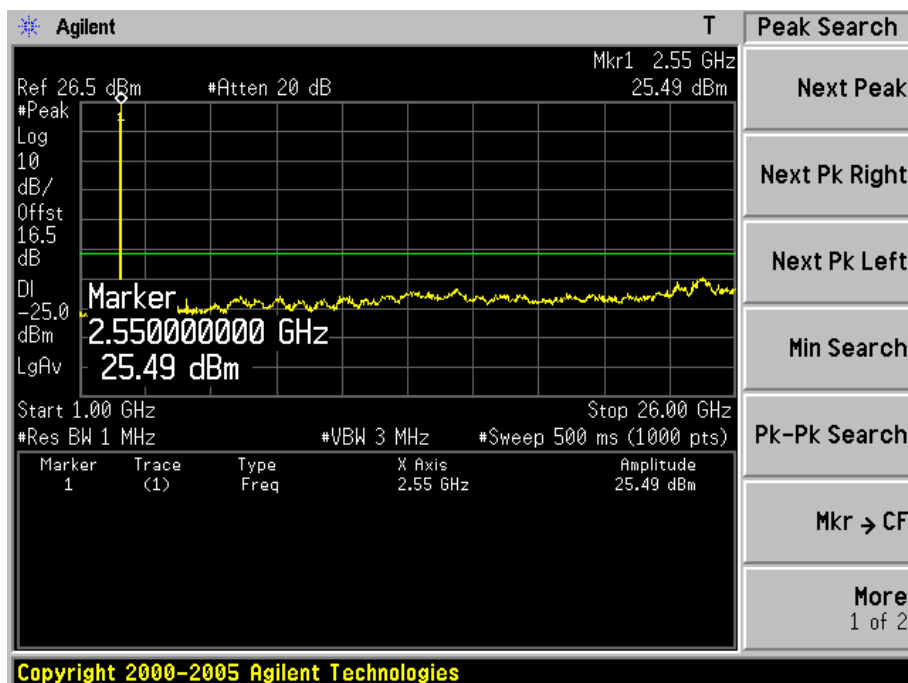
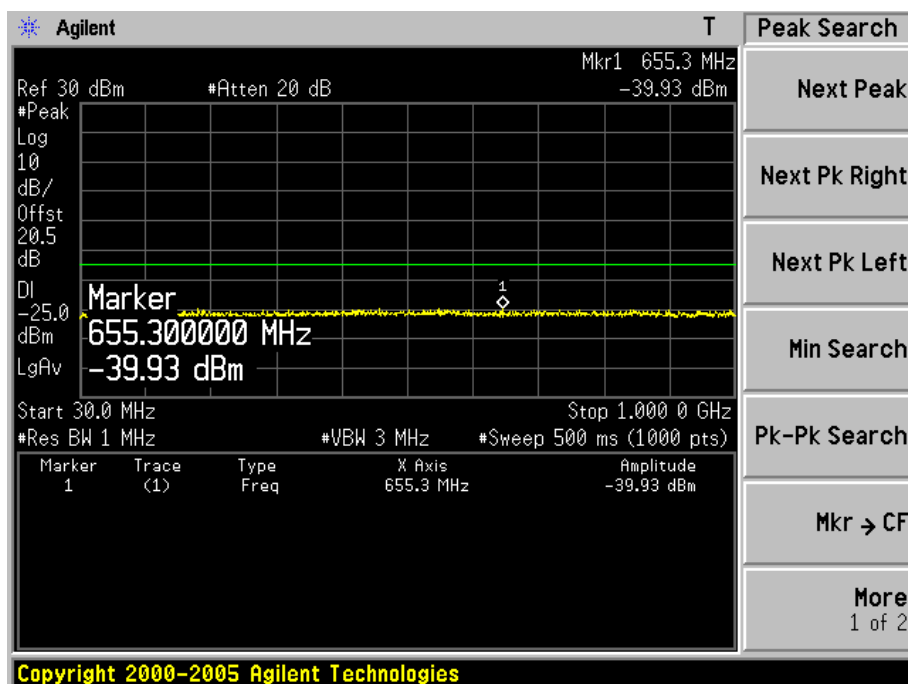


Product	Wireless Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: LTE Band VII (10M/16QAM)		
Date of Test	2014/12/10	Test Site	TR8

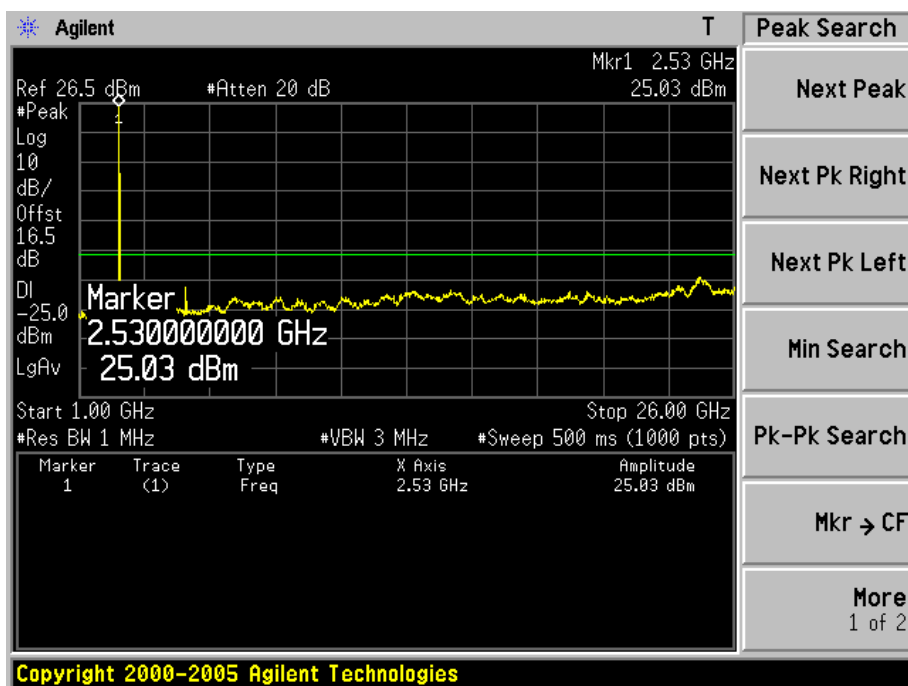
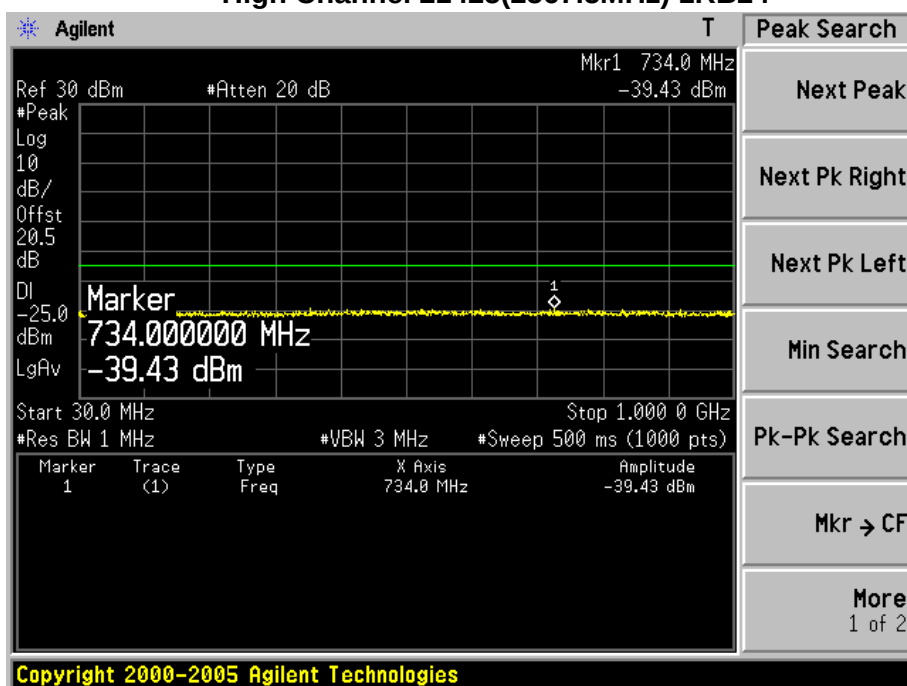
Low Channel 20775(2502.5MHz) 1RB49



Mid Channel 21100(2535MHz) 1RB49

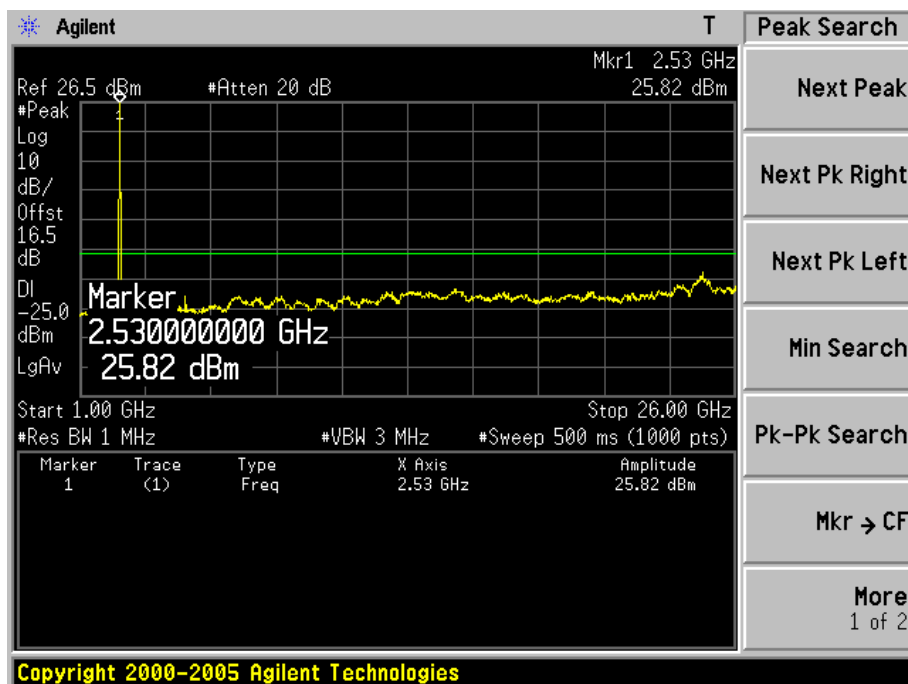
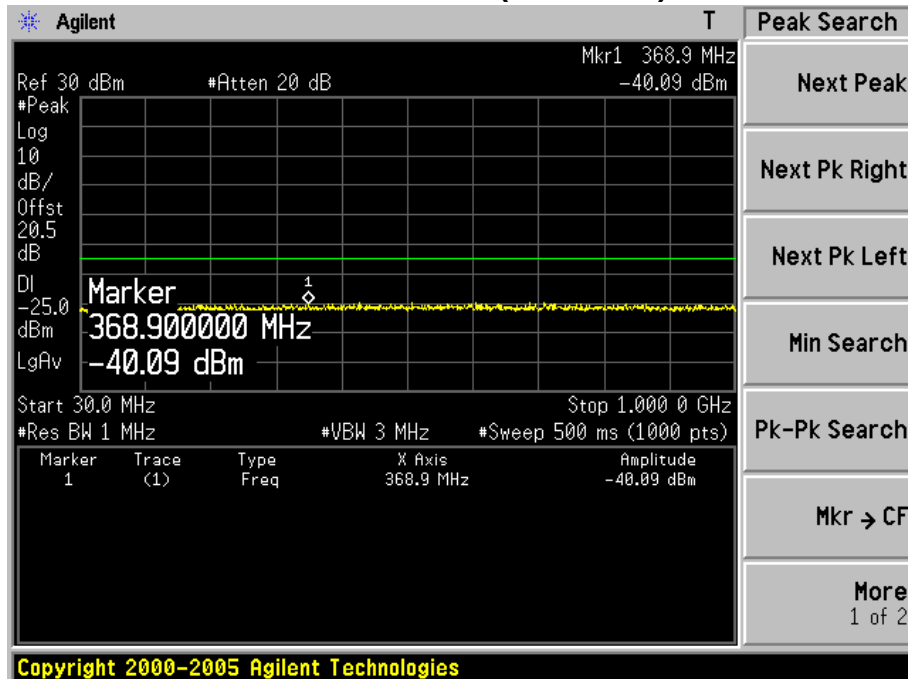


High Channel 21425(2567.5MHz) 1RB24

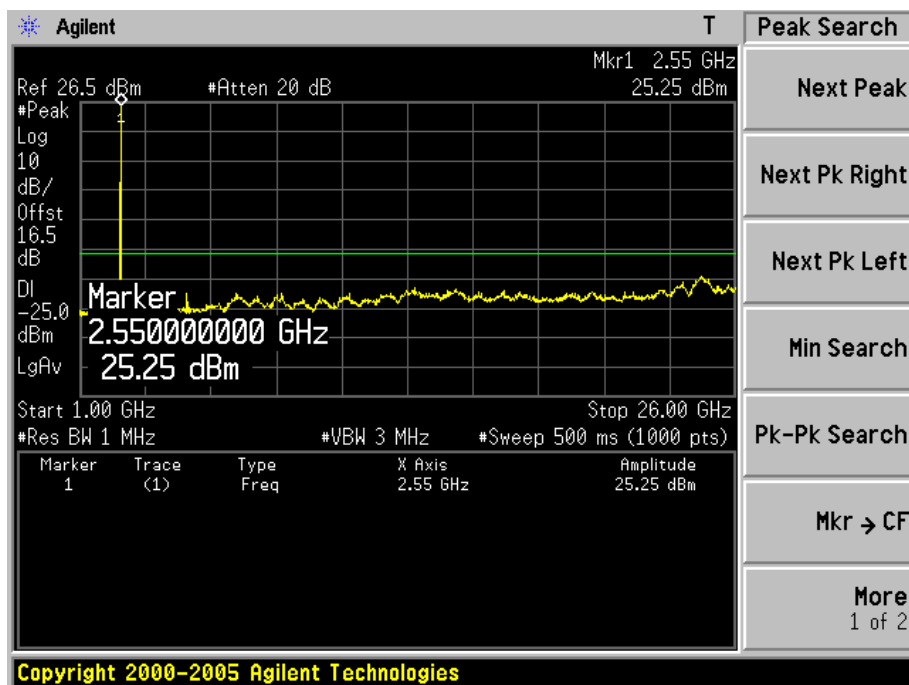
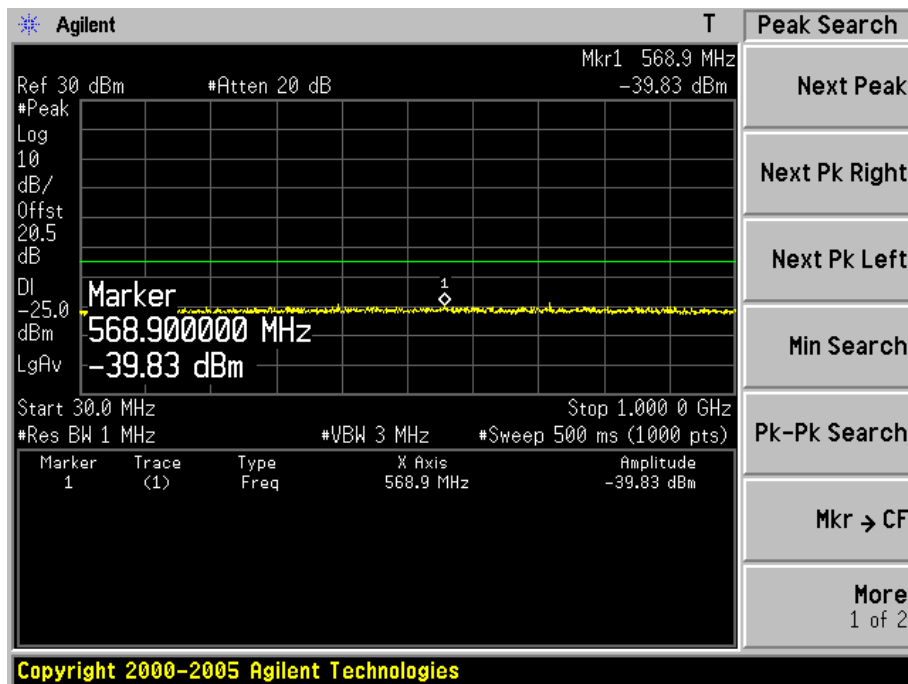


Product	Wireless Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: LTE Band VII (15M/QPSK)		
Date of Test	2014/12/10	Test Site	TR8

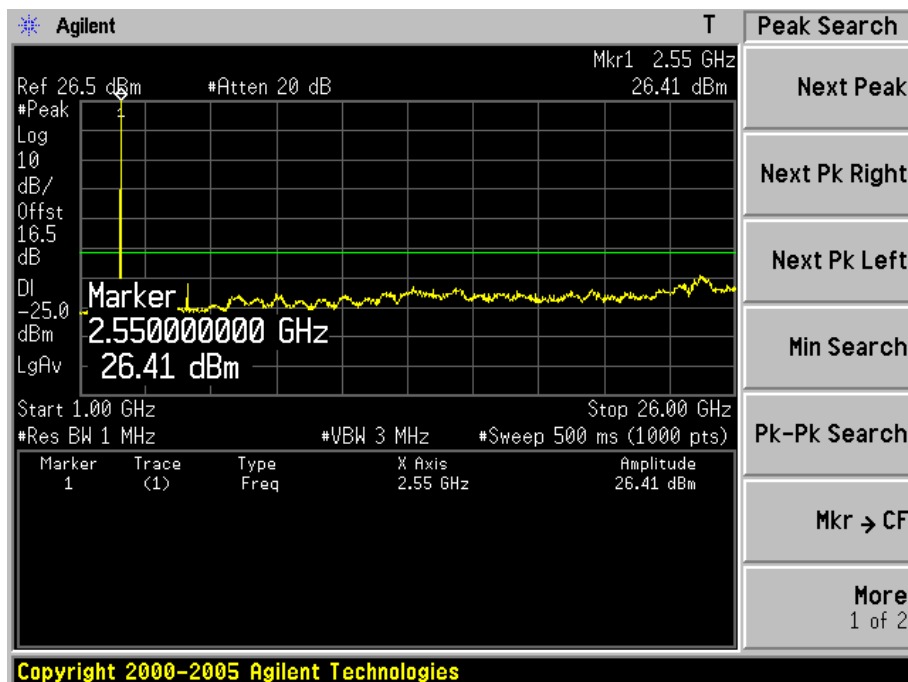
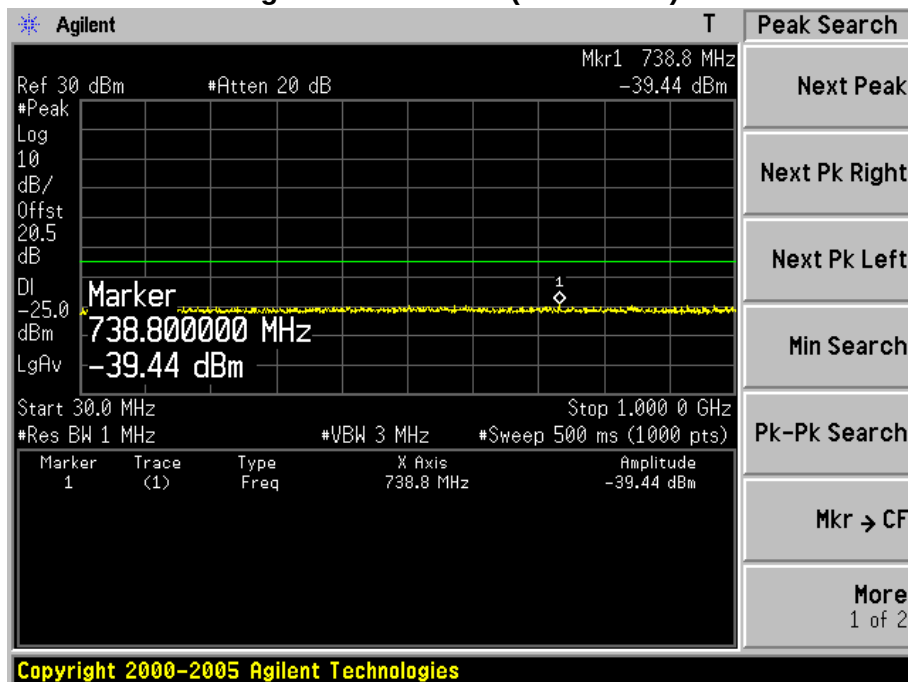
Low Channel 20825(2507.5MHz) 1RB74



Mid Channel 21100(2535MHz) 1RB74

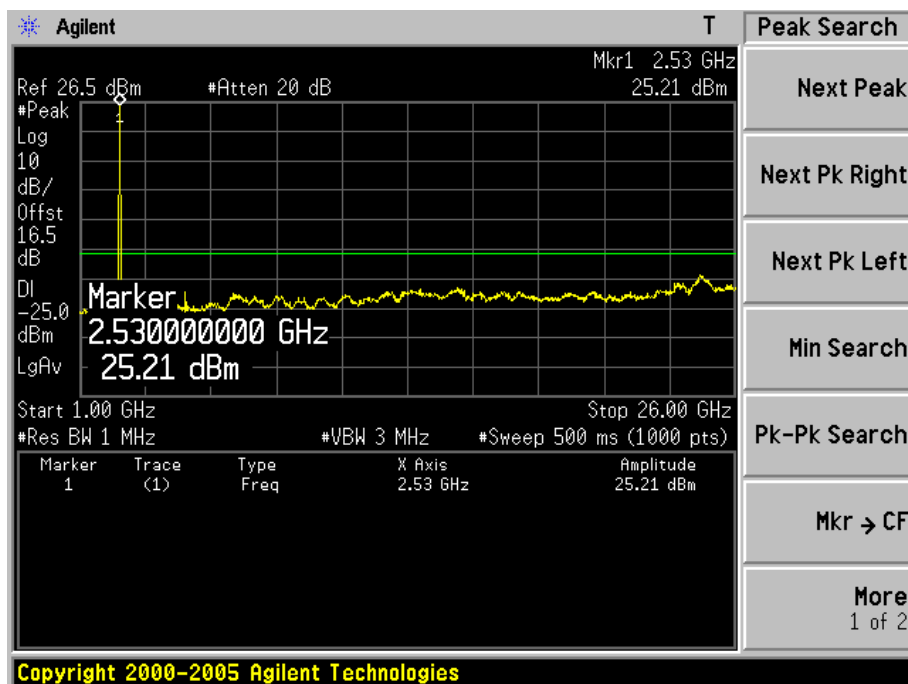
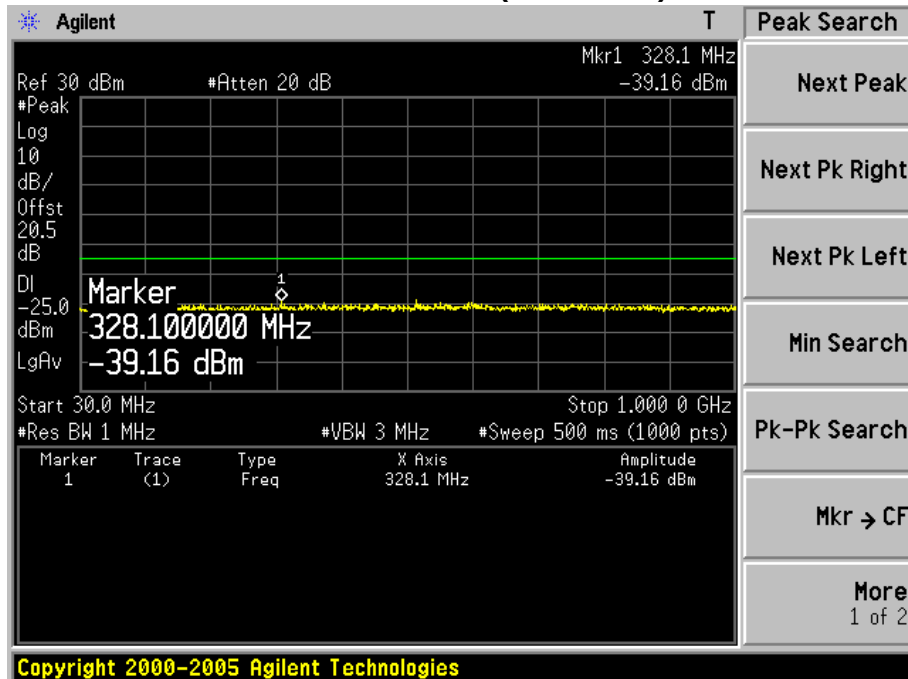


High Channel 21375(2562.5MHz) 1RB0

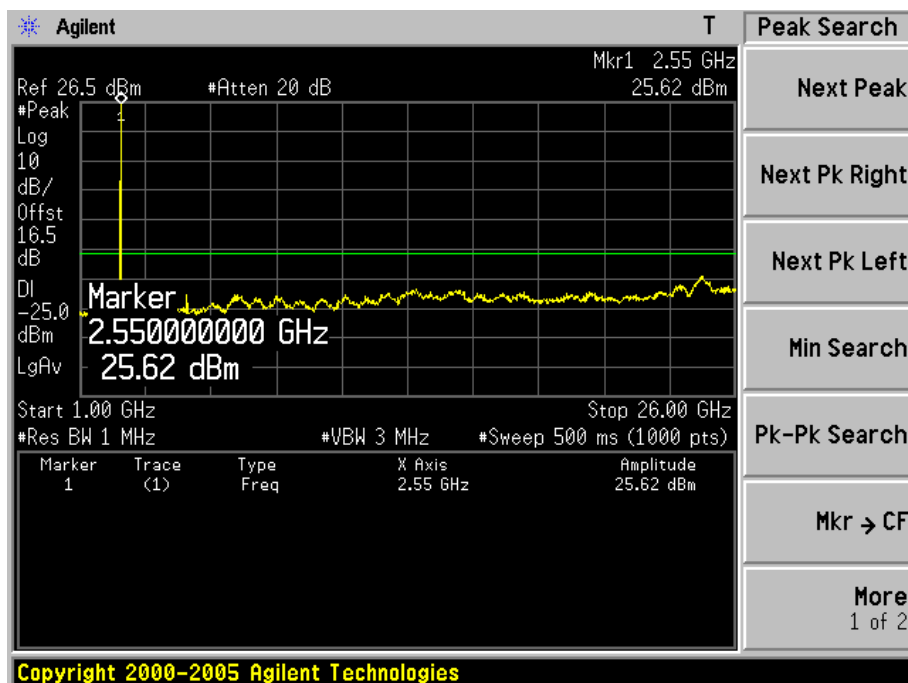
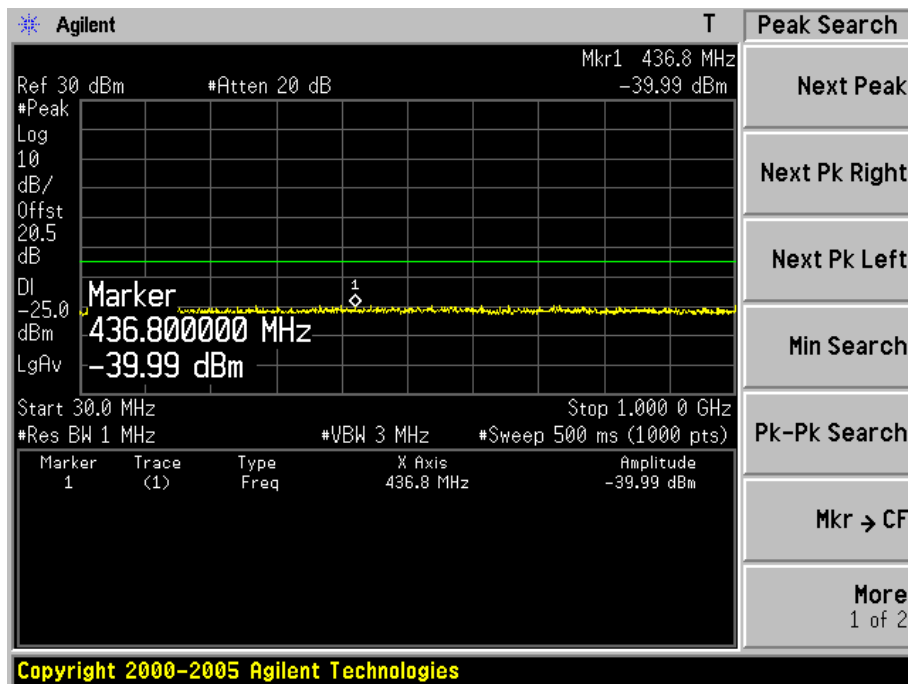


Product	Wireless Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: LTE Band VII (15M/16QAM)		
Date of Test	2014/12/10	Test Site	TR8

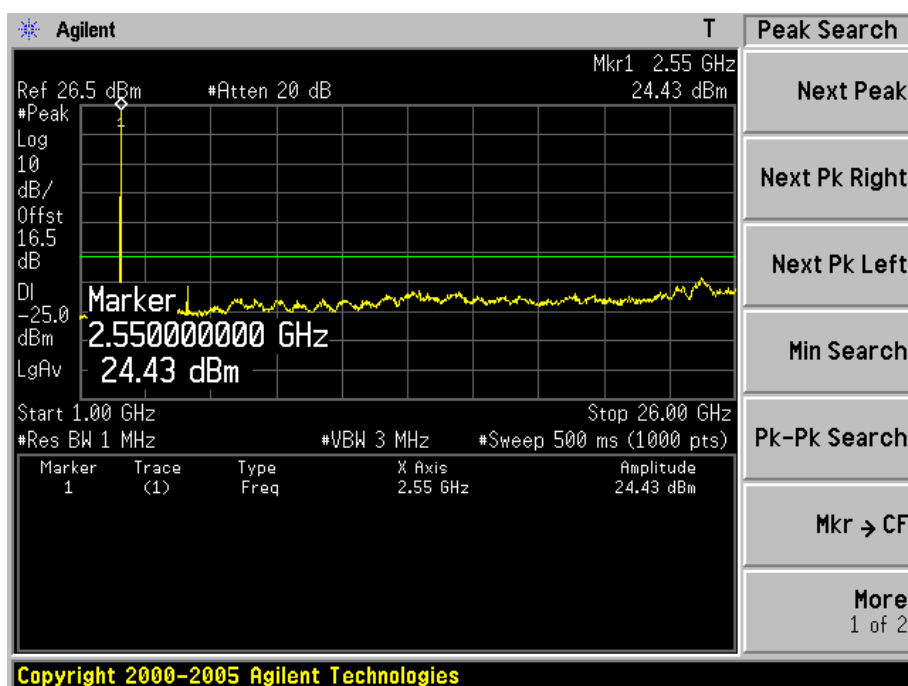
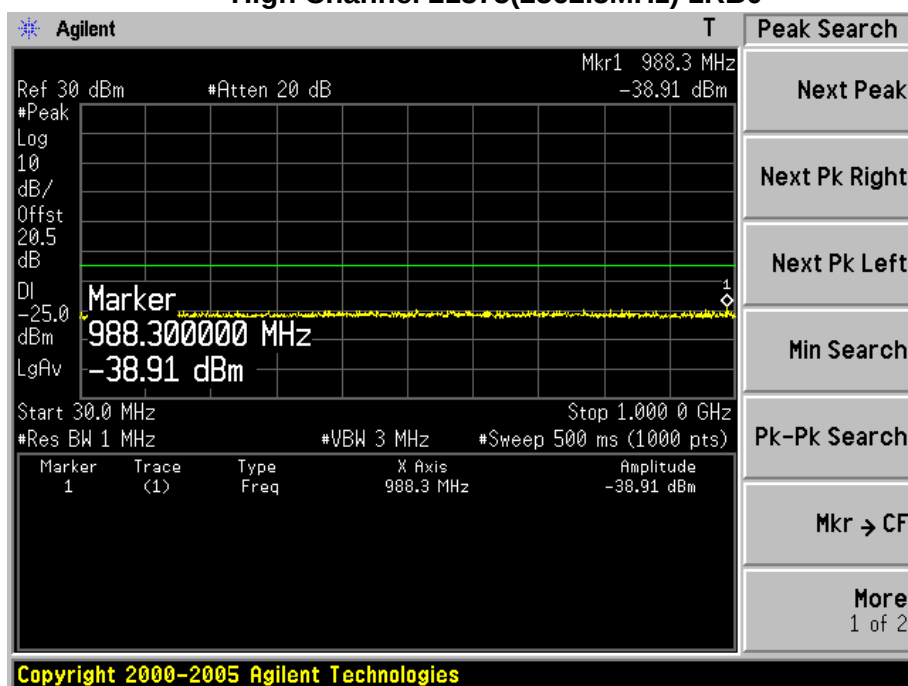
Low Channel 20825(2507.5MHz) 1RB74



Mid Channel 21100(2535MHz) 1RB74

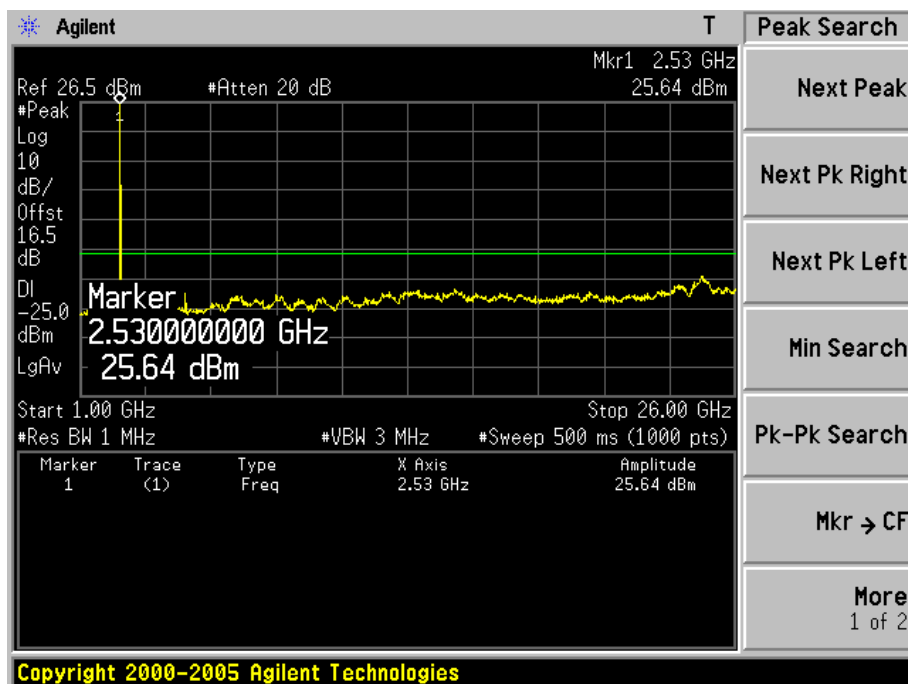
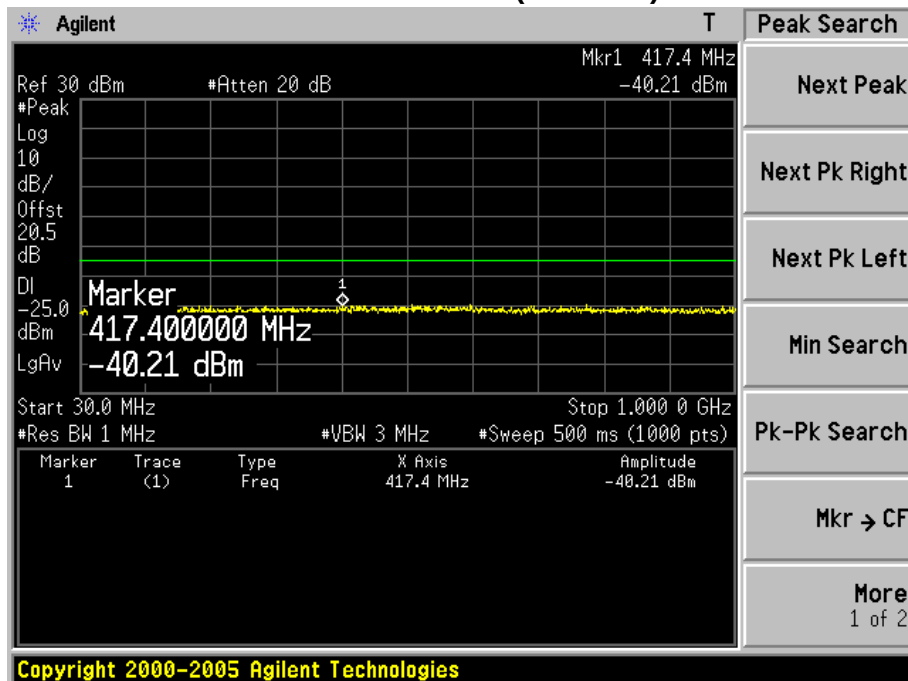


High Channel 21375(2562.5MHz) 1RB0

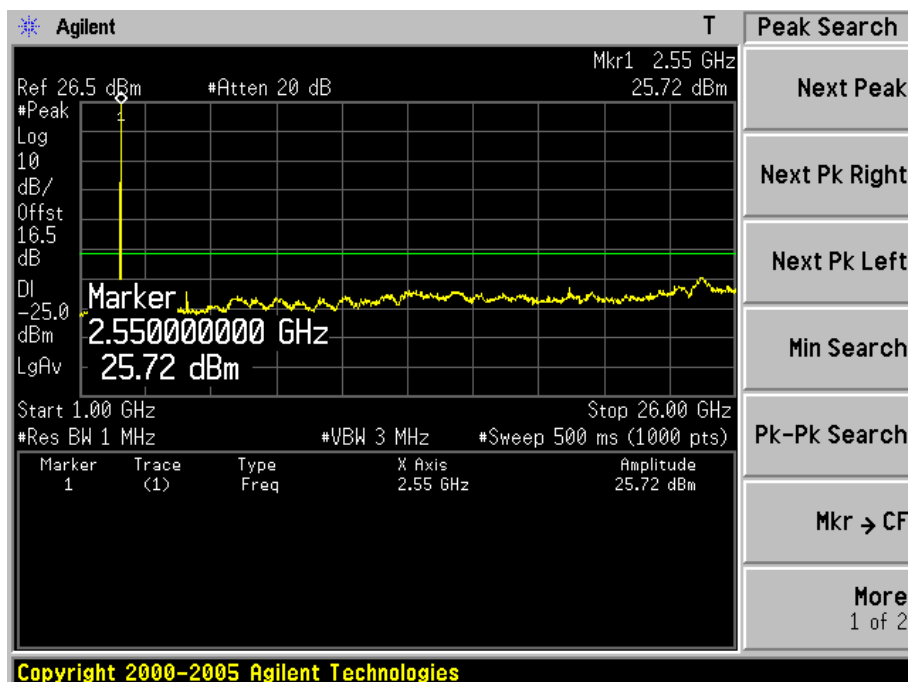
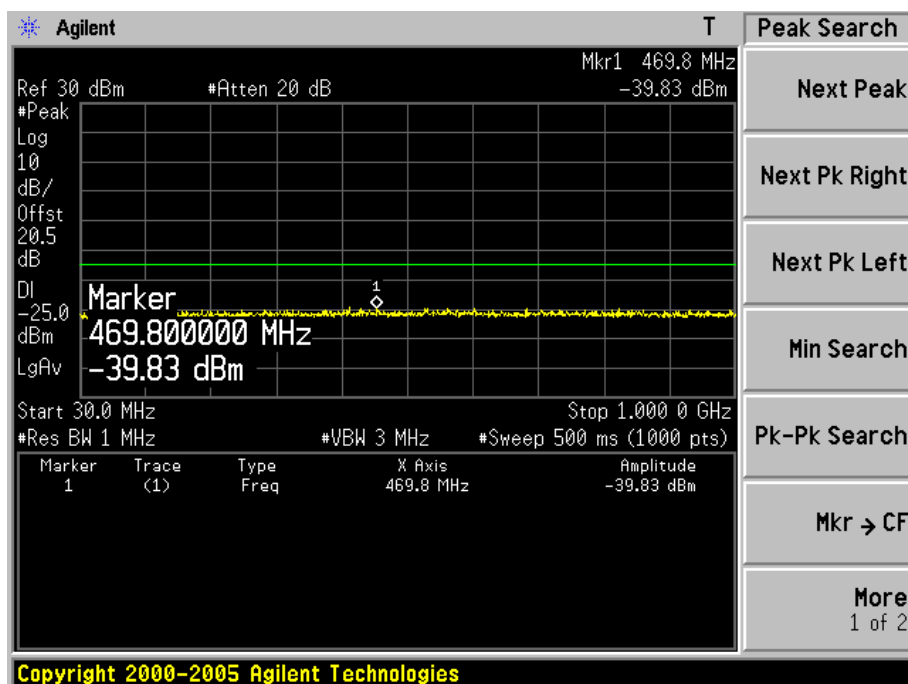


Product	Wireless Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: LTE Band VII (20M/QPSK)		
Date of Test	2014/12/10	Test Site	TR8

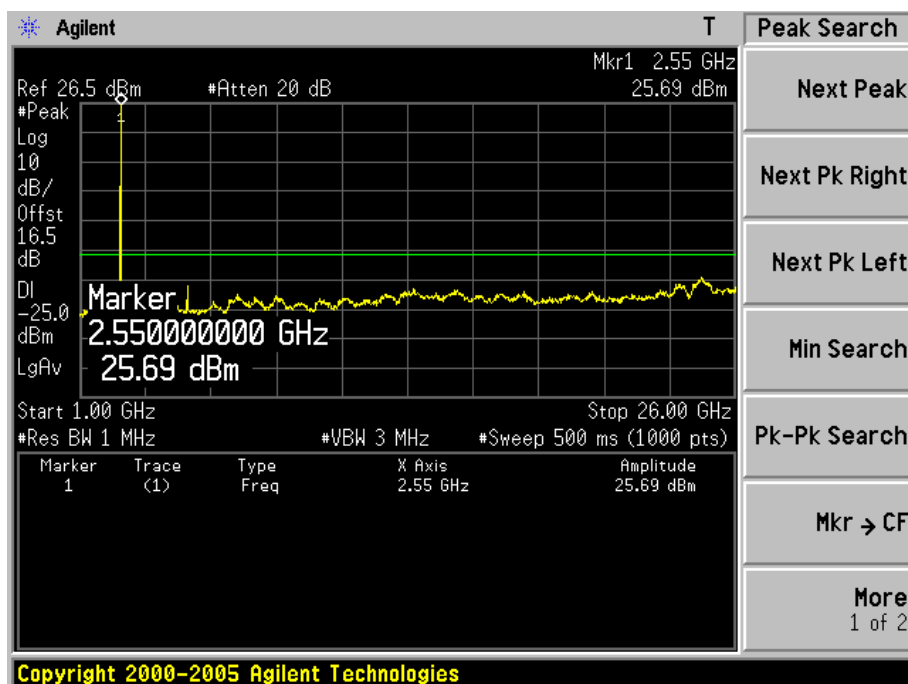
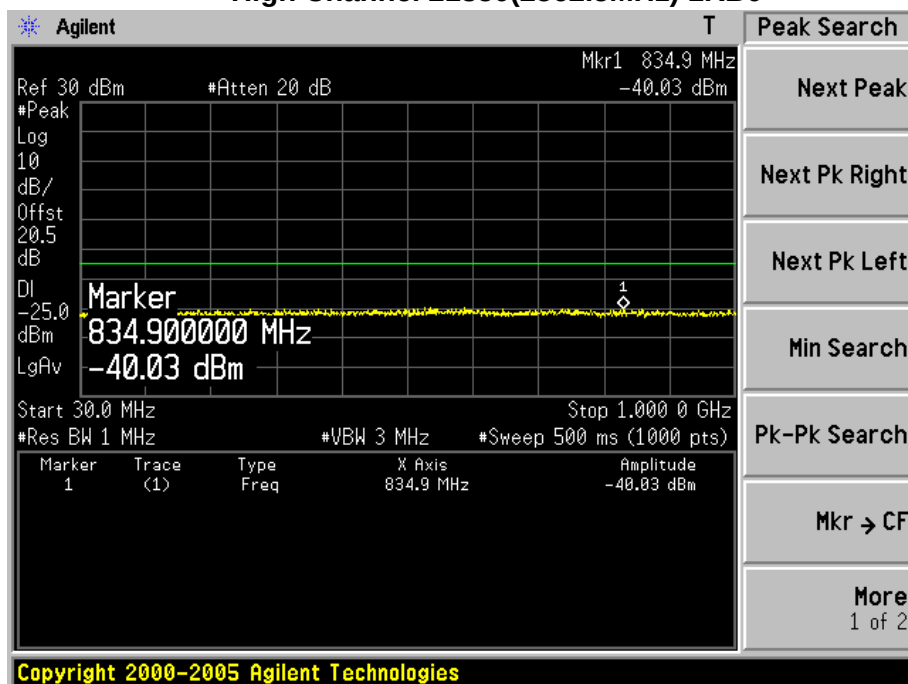
Low Channel 20850(2510MHz)1RB99



Mid Channel 21100(2535MHz) 1RB99

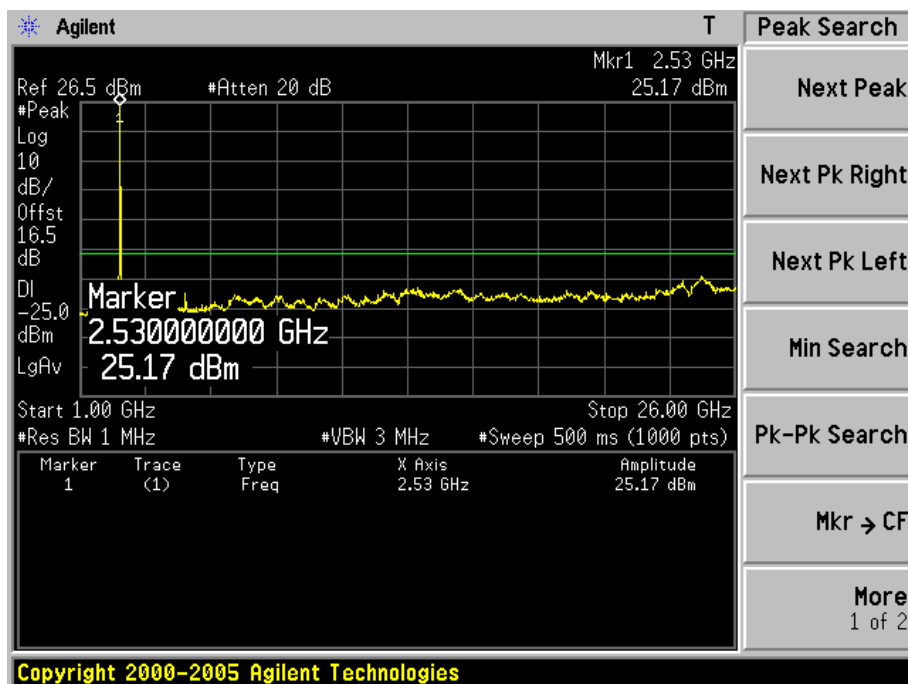
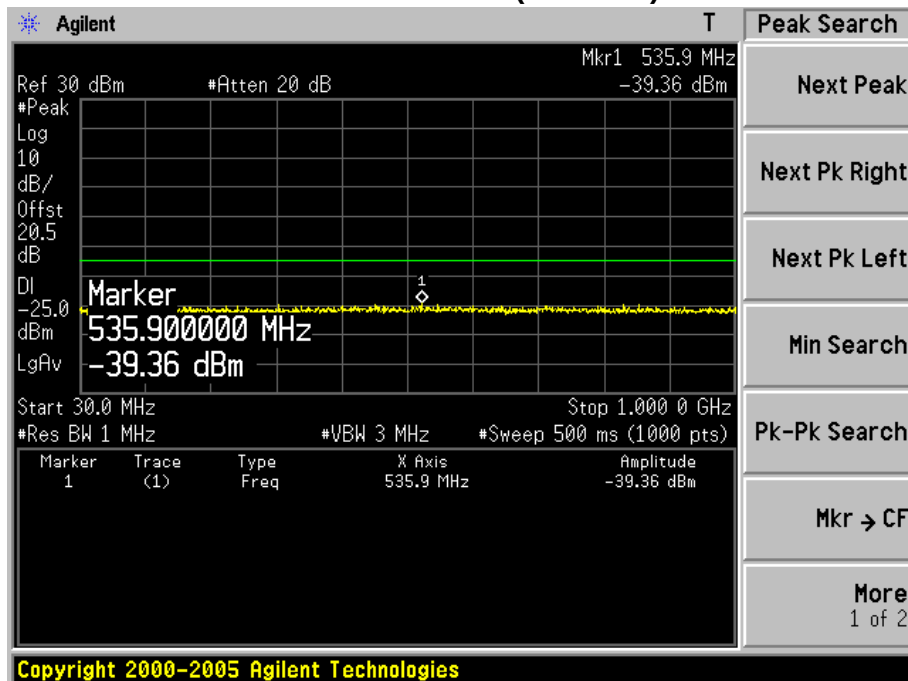


High Channel 21350(2562.5MHz) 1RB0

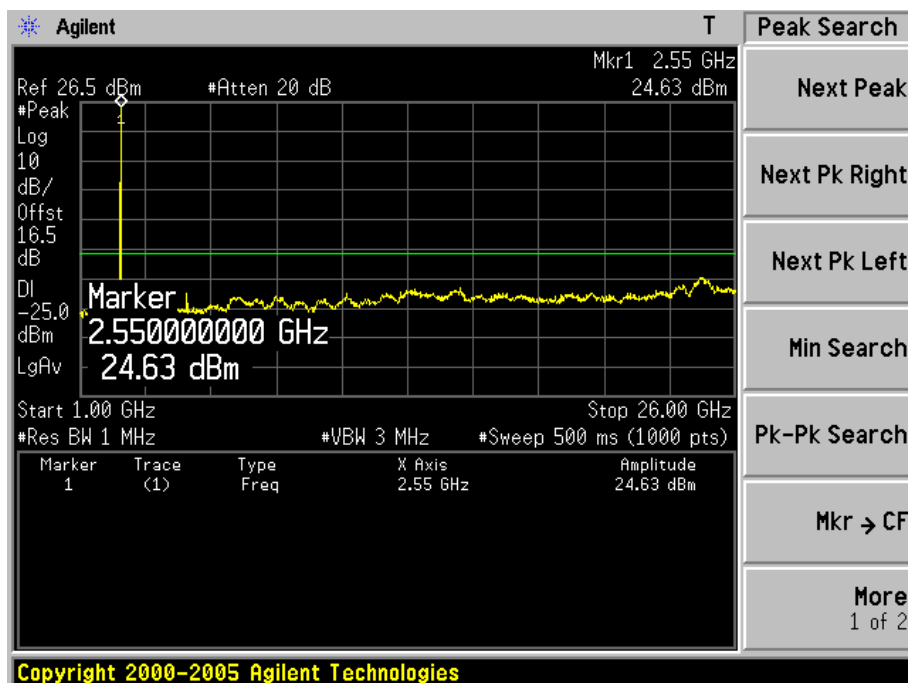
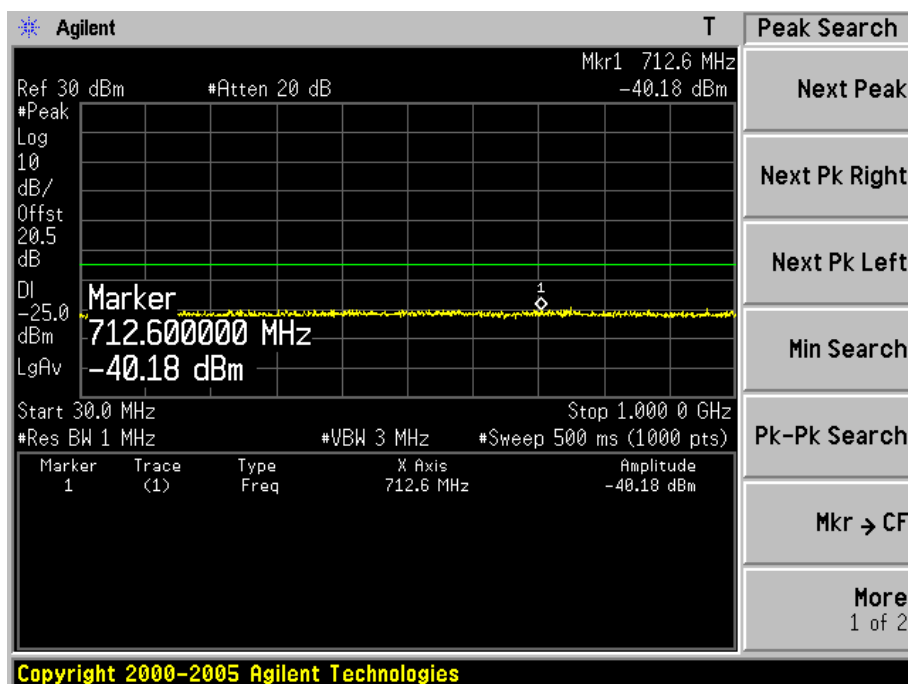


Product	Wireless Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: LTE Band VII (20M/16QAM)		
Date of Test	2014/12/10	Test Site	TR8

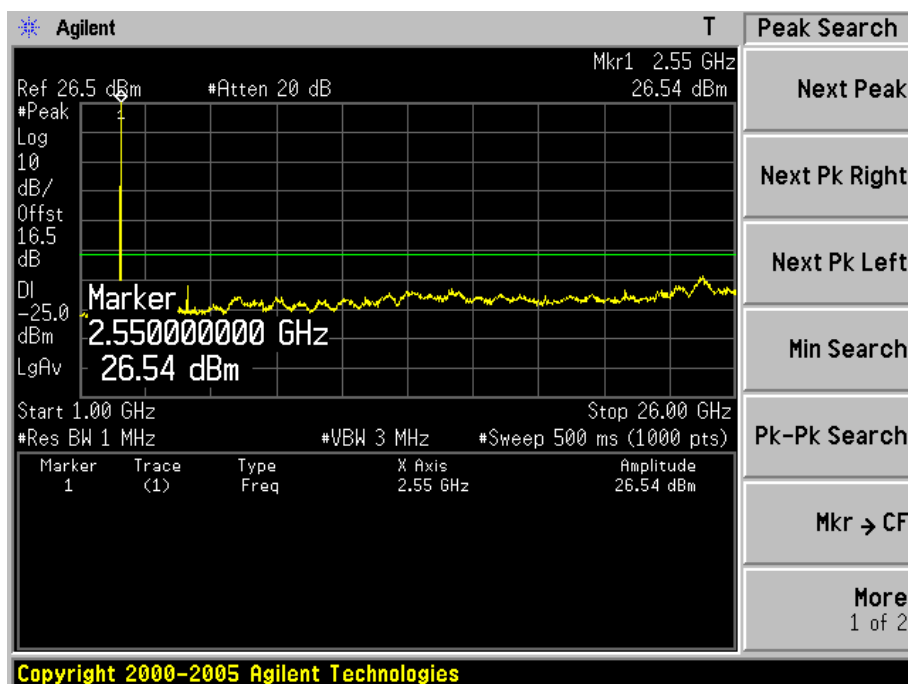
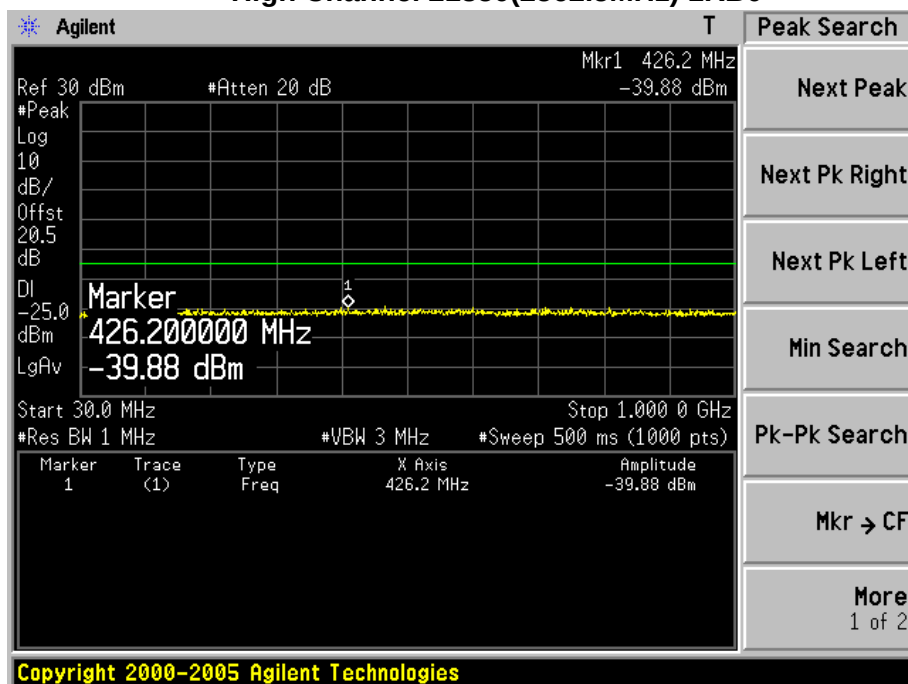
Low Channel 20850(2510MHz)1RB99



Mid Channel 21100(2535MHz) 1RB99



High Channel 21350(2562.5MHz) 1RB0



Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: LTE Band VII (5M/QPSK)		
Date of Test	2014/12/13	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20775 (2502.50MHz) 1RB24								
5005.00	-57.93	V	-53.53	1.24	12.65	-42.12	-25.00	-17.12
7507.50	-63.48	V	-51.16	1.48	11.25	-41.39	-25.00	-16.39
5005.00	-60.28	H	-55.89	1.24	12.65	-44.48	-25.00	-19.48
7507.50	-64.30	H	-52.01	1.48	11.25	-42.24	-25.00	-17.24
Middle Channel 21100 (2535.00MHz) 1RB12								
5070.00	-58.04	V	-53.12	1.22	12.72	-41.62	-25.00	-16.62
7605.00	-64.58	V	-52.21	1.54	11.45	-42.30	-25.00	-17.30
5070.00	-59.80	H	-55.04	1.22	12.72	-43.54	-25.00	-18.54
7605.00	-64.61	H	-52.73	1.54	11.45	-42.82	-25.00	-17.82
High Channel 21425 (2567.50MHz) 1RB0								
5135.00	-57.15	V	-52.39	1.22	12.79	-40.82	-25.00	-15.82
7702.50	-64.52	V	-52.49	1.57	11.45	-42.61	-25.00	-17.61
5135.00	-59.66	H	-54.88	1.22	12.79	-43.31	-25.00	-18.31
7702.50	-65.24	H	-53.10	1.57	11.45	-43.22	-25.00	-18.22

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: LTE Band VII (5M/16QAM)		
Date of Test	2014/12/13	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20775 (2502.50MHz) 1RB24								
5005.00	-57.75	V	-53.48	1.24	12.65	-42.07	-25.00	-17.07
7507.50	-64.67	V	-52.27	1.48	11.25	-42.50	-25.00	-17.50
5005.00	-60.16	H	-55.76	1.24	12.65	-44.35	-25.00	-19.35
7507.50	-64.70	H	-52.40	1.48	11.25	-42.63	-25.00	-17.63
Middle Channel 21100 (2535.00MHz) 1RB24								
5070.00	-59.01	V	-54.09	1.22	12.72	-42.59	-25.00	-17.59
7605.00	-65.01	V	-52.49	1.54	11.45	-42.58	-25.00	-17.58
5070.00	-61.67	H	-56.91	1.22	12.72	-45.41	-25.00	-20.41
7605.00	-64.35	H	-52.21	1.54	11.45	-42.30	-25.00	-17.30
High Channel 21425 (2567.50MHz) 1RB0								
5135.00	-56.78	V	-52.02	1.22	12.79	-40.45	-25.00	-15.45
7702.50	-64.23	V	-52.88	1.57	11.45	-43.00	-25.00	-18.00
5135.00	-58.96	H	-54.17	1.22	12.79	-42.60	-25.00	-17.60
7702.50	-64.66	H	-52.41	1.57	11.45	-42.53	-25.00	-17.53

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: LTE Band VII (10M/QPSK)		
Date of Test	2014/12/13	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20800 (2505.00MHz) 1RB49								
5010.00	-58.60	V	-54.24	1.24	12.66	-42.82	-25.00	-17.82
7515.00	-64.18	V	-51.69	1.49	11.27	-41.91	-25.00	-16.91
5010.00	-59.58	H	-55.20	1.24	12.66	-43.78	-25.00	-18.78
7515.00	-64.48	H	-52.95	1.49	11.27	-43.17	-25.00	-18.17
Middle Channel 21100 (2535.00MHz) 1RB49								
5070.00	-59.40	V	-54.44	1.22	12.72	-42.94	-25.00	-17.94
7605.00	-64.68	V	-52.43	1.54	11.45	-42.52	-25.00	-17.52
5070.00	-61.67	H	-56.82	1.22	12.72	-45.32	-25.00	-20.32
7605.00	-64.84	H	-53.81	1.54	11.45	-43.90	-25.00	-18.90
High Channel 21400 (2565.00MHz) 1RB24								
5130.00	-55.79	V	-51.03	1.22	12.79	-39.46	-25.00	-14.46
7695.00	-64.75	V	-52.32	1.57	11.45	-42.44	-25.00	-17.44
5130.00	-58.47	H	-53.68	1.22	12.79	-42.11	-25.00	-17.11
7695.00	-64.41	H	-52.22	1.57	11.45	-42.34	-25.00	-17.34

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: LTE Band VII (10M/16QAM)		
Date of Test	2014/12/13	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20800 (2505.00MHz) 1RB49								
5010.00	-57.32	V	-52.96	1.24	12.66	-41.54	-25.00	-16.54
7515.00	-65.03	V	-52.44	1.49	11.27	-42.66	-25.00	-17.66
5010.00	-60.90	H	-56.51	1.24	12.66	-45.09	-25.00	-20.09
7515.00	-64.97	H	-52.76	1.49	11.27	-42.98	-25.00	-17.98
Middle Channel 21100 (2535.00MHz) 1RB49								
5070.00	-59.02	V	-54.06	1.22	12.72	-42.56	-25.00	-17.56
7605.00	-64.91	V	-52.40	1.54	11.45	-42.49	-25.00	-17.49
5070.00	-61.36	H	-56.50	1.22	12.72	-45.00	-25.00	-20.00
7605.00	-64.99	H	-52.91	1.54	11.45	-43.00	-25.00	-18.00
High Channel 21400 (2565.00MHz) 1RB24								
5130.00	-57.36	V	-52.60	1.22	12.79	-41.03	-25.00	-16.03
7695.00	-63.49	V	-52.00	1.57	11.45	-42.12	-25.00	-17.12
5130.00	-59.55	H	-54.77	1.22	12.79	-43.20	-25.00	-18.20
7695.00	-63.32	H	-50.35	1.57	11.45	-40.47	-25.00	-15.47

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: LTE Band VII (15M/QPSK)		
Date of Test	2014/12/13	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20825 (2507.50MHz) 1RB74								
5015.00	-58.30	V	-53.83	1.24	12.67	-42.40	-25.00	-17.40
7522.50	-64.52	V	-53.04	1.49	11.27	-43.26	-25.00	-18.26
5015.00	-58.30	H	-53.95	1.24	12.67	-42.52	-25.00	-17.52
7522.50	-64.75	H	-53.26	1.49	11.27	-43.48	-25.00	-18.48
Middle Channel 21100 (2535.00MHz) 1RB74								
5070.00	-58.56	V	-53.56	1.22	12.72	-42.06	-25.00	-17.06
7605.00	-64.22	V	-52.84	1.54	11.45	-42.93	-25.00	-17.93
5070.00	-60.36	H	-55.36	1.22	12.72	-43.86	-25.00	-18.86
7605.00	-64.44	H	-53.13	1.54	11.45	-43.22	-25.00	-18.22
High Channel 21375 (2562.50MHz) 1RB0								
5125.00	-55.41	V	-50.40	1.22	12.78	-38.84	-25.00	-13.84
7687.50	-64.31	V	-51.92	1.57	11.45	-42.04	-25.00	-17.04
5125.00	-59.20	H	-54.08	1.22	12.78	-42.52	-25.00	-17.52
7687.50	-64.60	H	-52.48	1.57	11.45	-42.60	-25.00	-17.60

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: LTE Band VII (15M/16QAM)		
Date of Test	2014/12/13	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20825 (2507.50MHz) 1RB74								
5015.00	-58.29	V	-53.82	1.24	12.67	-42.39	-25.00	-17.39
7522.50	-64.14	V	-52.43	1.49	11.27	-42.65	-25.00	-17.65
5015.00	-60.64	H	-56.29	1.24	12.67	-44.86	-25.00	-19.86
7522.50	-64.42	H	-53.27	1.49	11.27	-43.49	-25.00	-18.49
Middle Channel 21100 (2535.00MHz) 1RB74								
5070.00	-58.01	V	-53.01	1.22	12.72	-41.51	-25.00	-16.51
7605.00	-64.95	V	-52.59	1.54	11.45	-42.68	-25.00	-17.68
5070.00	-60.86	H	-55.91	1.22	12.72	-44.41	-25.00	-19.41
7605.00	-63.95	H	-51.79	1.54	11.45	-41.88	-25.00	-16.88
High Channel 21375 (2562.50MHz) 1RB0								
5125.00	-56.63	V	-51.62	1.22	12.78	-40.06	-25.00	-15.06
7687.50	-64.77	V	-52.21	1.57	11.45	-42.33	-25.00	-17.33
5125.00	-59.12	H	-53.99	1.22	12.78	-42.43	-25.00	-17.43
7687.50	-65.23	H	-52.98	1.57	11.45	-43.10	-25.00	-18.10

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: LTE Band VII (20M/QPSK)		
Date of Test	2014/12/13	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20850 (2510.00MHz) 1RB99								
5020.00	-58.46	V	-53.89	1.24	12.67	-42.46	-25.00	-17.46
7530.00	-65.13	V	-52.63	1.50	11.30	-42.83	-25.00	-17.83
5020.00	-59.98	H	-55.66	1.24	12.67	-44.23	-25.00	-19.23
7530.00	-64.86	H	-52.61	1.50	11.30	-42.81	-25.00	-17.81
Middle Channel 21100 (2535.00MHz) 1RB99								
5070.00	-58.27	V	-53.20	1.22	12.72	-41.70	-25.00	-16.70
7605.00	-64.88	V	-52.59	1.54	11.45	-42.68	-25.00	-17.68
5070.00	-60.02	H	-54.93	1.22	12.72	-43.43	-25.00	-18.43
7605.00	-64.89	H	-52.80	1.54	11.45	-42.89	-25.00	-17.89
High Channel 21350 (2560.00MHz) 1RB0								
5120.00	-56.92	V	-51.89	1.21	12.78	-40.32	-25.00	-15.32
7680.00	-64.52	V	-52.49	1.57	11.45	-42.61	-25.00	-17.61
5120.00	-60.46	H	-55.29	1.21	12.78	-43.72	-25.00	-18.72
7680.00	-64.88	H	-52.82	1.57	11.45	-42.94	-25.00	-17.94

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: LTE Band VII (20M/16QAM)		
Date of Test	2014/12/13	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20850 (2510.00MHz) 1RB99								
5020.00	-58.37	V	-53.80	1.24	12.67	-42.37	-25.00	-17.37
7530.00	-65.09	V	-52.65	1.50	11.30	-42.85	-25.00	-17.85
5020.00	-60.72	H	-56.40	1.24	12.67	-44.97	-25.00	-19.97
7530.00	-63.73	H	-52.61	1.50	11.30	-42.81	-25.00	-17.81
Middle Channel 21100 (2535.00MHz) 1RB99								
5070.00	-57.95	V	-52.89	1.22	12.72	-41.39	-25.00	-16.39
7605.00	-64.79	V	-52.66	1.54	11.45	-42.75	-25.00	-17.75
5070.00	-57.95	H	-52.86	1.22	12.72	-41.36	-25.00	-16.36
7605.00	-64.65	H	-53.74	1.54	11.45	-43.83	-25.00	-18.83
High Channel 21350 (2560.00MHz) 1RB0								
5120.00	-56.04	V	-50.99	1.21	12.78	-39.42	-25.00	-14.42
7680.00	-65.14	V	-50.37	1.57	11.45	-40.49	-25.00	-15.49
5120.00	-59.56	H	-54.39	1.21	12.78	-42.82	-25.00	-17.82
7680.00	-64.72	H	-50.55	1.57	11.45	-40.67	-25.00	-15.67

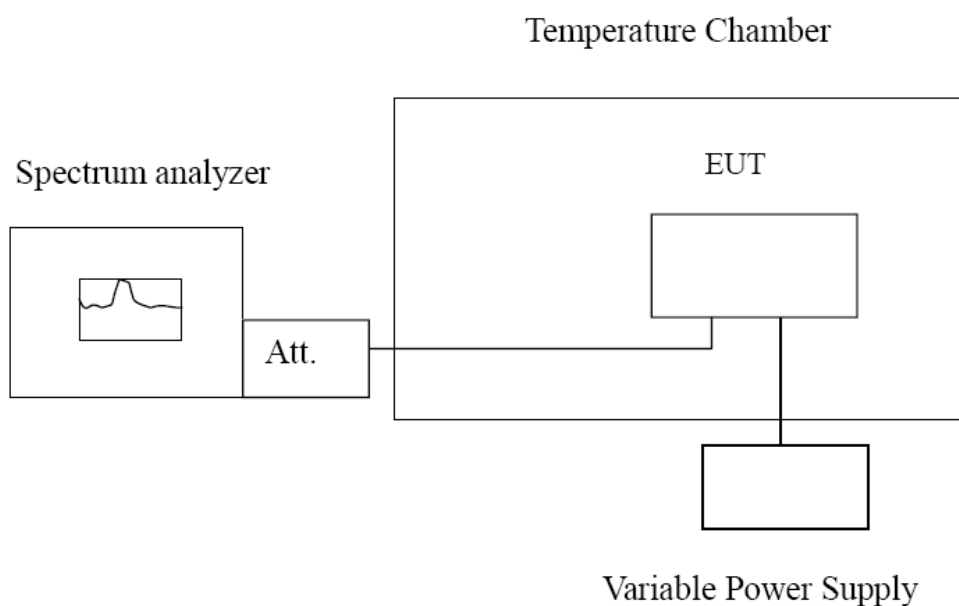
8. Frequency Stability Under Temperature & Voltage Variations

8.1. Test Equipment

Frequency Stability Under Temperature & Voltage Variations / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2015.03.28
Radio Communication Tester	Anritsu	MT8820C	6201181503	2015.03.28
Dual Directional Coupler	Agilent	778D	20160	2015.03.28
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2015.03.28
DC Power Supply	IDRC	CD-035-020PR	977272	2015.03.28
Temperature & Humidity Chamber	Gaoyu	TH-1P-B	WIT-05121302	2015.01.07
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2015.01.08

8.2. Test Setup



8.3. Test Procedure

Frequency Stability Under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

8.4. Uncertainty

The measurement uncertainty is defined as ± 10 Hz.

8.5. Test Result

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: LTE Band VII (5M/QPSK)		
Date of Test	2014/12/13	Test Site	AC6

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	2535.00	-35	± 6337.5
-20	2535.00	49	± 6337.5
-10	2535.00	-36	± 6337.5
0	2535.00	33	± 6337.5
10	2535.00	50	± 6337.5
20	2535.00	-48	± 6337.5
30	2535.00	-53	± 6337.5
40	2535.00	70	± 6337.5
50	2535.00	-67	± 6337.5

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.2	2535.00	-10	± 6337.5
3.3	2535.00	55	± 6337.5
3.6	2535.00	-19	± 6337.5

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: LTE Band VII (5M/16QAM)		
Date of Test	2014/12/13	Test Site	AC6

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	2535.00	60	± 6337.5
-20	2535.00	-54	± 6337.5
-10	2535.00	32	± 6337.5
0	2535.00	36	± 6337.5
10	2535.00	-46	± 6337.5
20	2535.00	-62	± 6337.5
30	2535.00	76	± 6337.5
40	2535.00	58	± 6337.5
50	2535.00	45	± 6337.5

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.2	2535.00	77	± 6337.5
3.3	2535.00	-52	± 6337.5
3.6	2535.00	-49	± 6337.5

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: LTE Band VII (10M/QPSK)		
Date of Test	2014/12/13	Test Site	TR7

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	2535.00	-57	± 6337.5
-20	2535.00	31	± 6337.5
-10	2535.00	-34	± 6337.5
0	2535.00	59	± 6337.5
10	2535.00	-18	± 6337.5
20	2535.00	-42	± 6337.5
30	2535.00	-26	± 6337.5
40	2535.00	50	± 6337.5
50	2535.00	27	± 6337.5

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.2	2535.00	69	± 6337.5
3.3	2535.00	-73	± 6337.5
3.6	2535.00	45	± 6337.5

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: LTE Band VII (10M/16QAM)		
Date of Test	2014/12/13	Test Site	TR7

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	2535.00	32	± 6337.5
-20	2535.00	-12	± 6337.5
-10	2535.00	41	± 6337.5
0	2535.00	-48	± 6337.5
10	2535.00	-30	± 6337.5
20	2535.00	38	± 6337.5
30	2535.00	-89	± 6337.5
40	2535.00	-13	± 6337.5
50	2535.00	-22	± 6337.5

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.2	2535.00	-23	± 6337.5
3.3	2535.00	48	± 6337.5
3.6	2535.00	-73	± 6337.5

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: LTE Band VII (15M/QPSK)		
Date of Test	2014/12/13	Test Site	TR7

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	2535.00	69	± 6337.5
-20	2535.00	31	± 6337.5
-10	2535.00	26	± 6337.5
0	2535.00	35	± 6337.5
10	2535.00	33	± 6337.5
20	2535.00	-58	± 6337.5
30	2535.00	23	± 6337.5
40	2535.00	-48	± 6337.5
50	2535.00	-29	± 6337.5

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.2	2535.00	23	± 6337.5
3.3	2535.00	-17	± 6337.5
3.6	2535.00	-19	± 6337.5

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: LTE Band VII (15M/16QAM)		
Date of Test	2014/12/13	Test Site	TR7

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	2535.00	-75	± 6337.5
-20	2535.00	-43	± 6337.5
-10	2535.00	20	± 6337.5
0	2535.00	-68	± 6337.5
10	2535.00	28	± 6337.5
20	2535.00	-19	± 6337.5
30	2535.00	65	± 6337.5
40	2535.00	-45	± 6337.5
50	2535.00	-77	± 6337.5

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.2	2535.00	-56	± 6337.5
3.3	2535.00	77	± 6337.5
3.6	2535.00	-36	± 6337.5

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: LTE Band VII (20M/QPSK)		
Date of Test	2014/12/13	Test Site	TR7

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	2535.00	73	± 6337.5
-20	2535.00	31	± 6337.5
-10	2535.00	-26	± 6337.5
0	2535.00	35	± 6337.5
10	2535.00	33	± 6337.5
20	2535.00	19	± 6337.5
30	2535.00	-23	± 6337.5
40	2535.00	-48	± 6337.5
50	2535.00	-28	± 6337.5

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.2	2535.00	25	± 6337.5
3.3	2535.00	-29	± 6337.5
3.6	2535.00	-23	± 6337.5

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: LTE Band VII (20M/16QAM)		
Date of Test	2014/12/13	Test Site	TR7

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	2535.00	-75	± 6337.5
-20	2535.00	-43	± 6337.5
-10	2535.00	20	± 6337.5
0	2535.00	-65	± 6337.5
10	2535.00	28	± 6337.5
20	2535.00	18	± 6337.5
30	2535.00	65	± 6337.5
40	2535.00	44	± 6337.5
50	2535.00	-73	± 6337.5

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.2	2535.00	-48	± 6337.5
3.3	2535.00	39	± 6337.5
3.6	2535.00	-25	± 6337.5

_____ The End _____