

8. SPURIOUS EMISSION AT ANTENNA TERMINAL

8.1. Applicable Standard: CFR 47§2.1051, §27.53

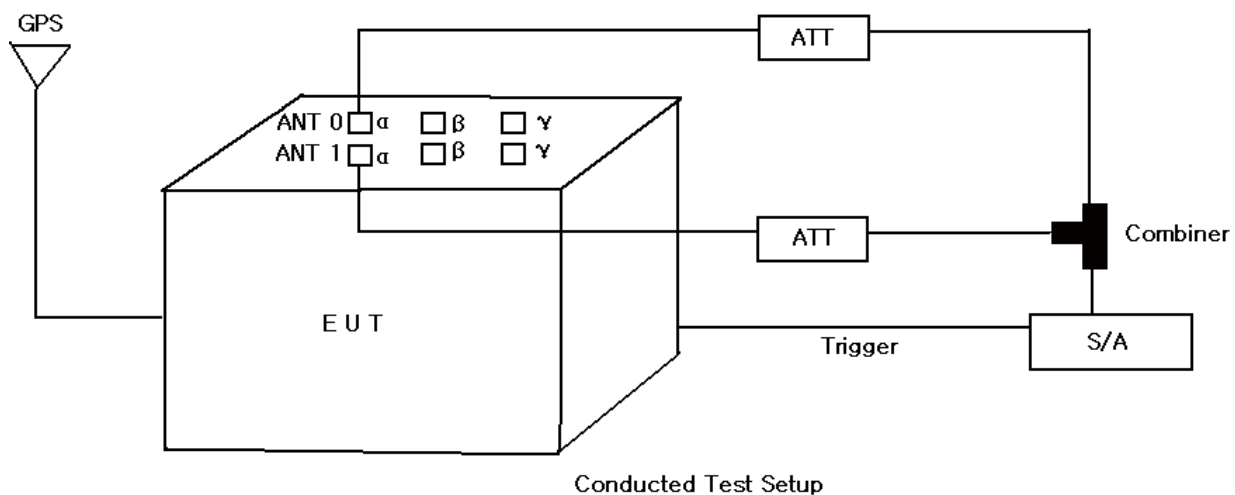
The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in §2.1051

8.2. Test Equipment List and Details

Manufacturer	Model / Equipment	Serial No.	Calibration Due
Agilent	87302C / Power Divider	3239A01051	03/19/2011
Agilent	6674A / DC Power Supply	3501A00901	05/14/2011
WEINSCHEL	67-30-33 / Attenuator	BU5347	12/29/2011
WEINSCHEL	67-30-33 / Attenuator	BR0530	12/29/2011
WEINSCHEL	AF9003-69-31 / STEP ATTENUATOR	11787	11/12/2011
WEINSCHEL	AF9003-69-31 / STEP ATTENUATOR	639	11/12/2011
Agilent	N9020A / MXA Signal Analyzer	US46220219	03/03/2011

8.3. Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.



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The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

The EUT provides the MIMO function which is able to transmit on the same channel with same data simultaneously therefore a combiner is used to sum the individual transmitter output power.

The test data is shown as a combined output in the report.

8.3.1 Environmental Conditions:

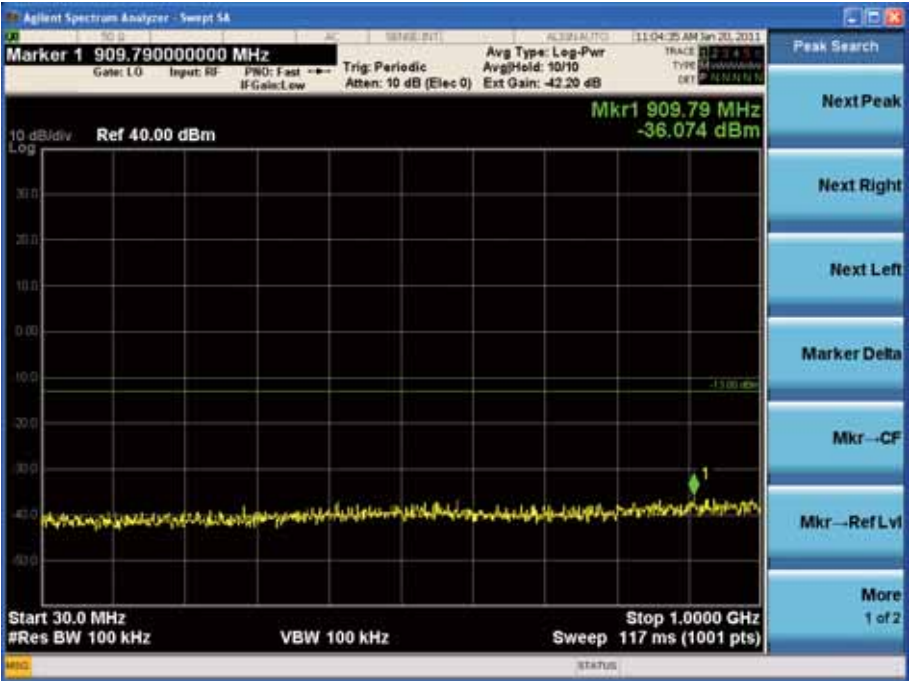
Temperature:	20 °C
Relative Humidity:	22 %

8.4. Test Result

: Pass

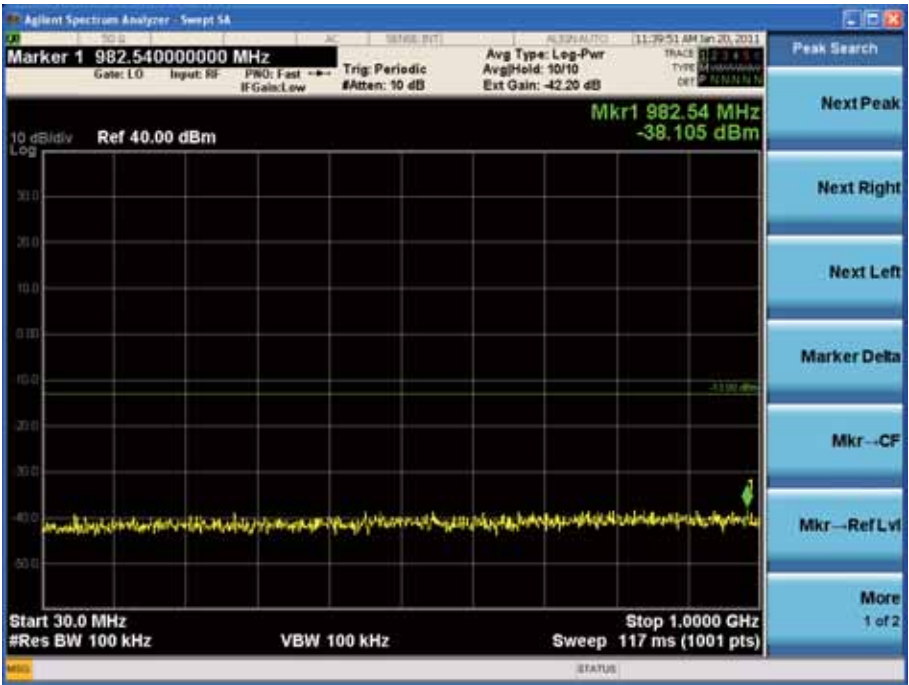
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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8.4.1. Plot Data at Output Port Alpha 1
(QPSK Low Channel)



(30 MHz ~ 1 GHz)

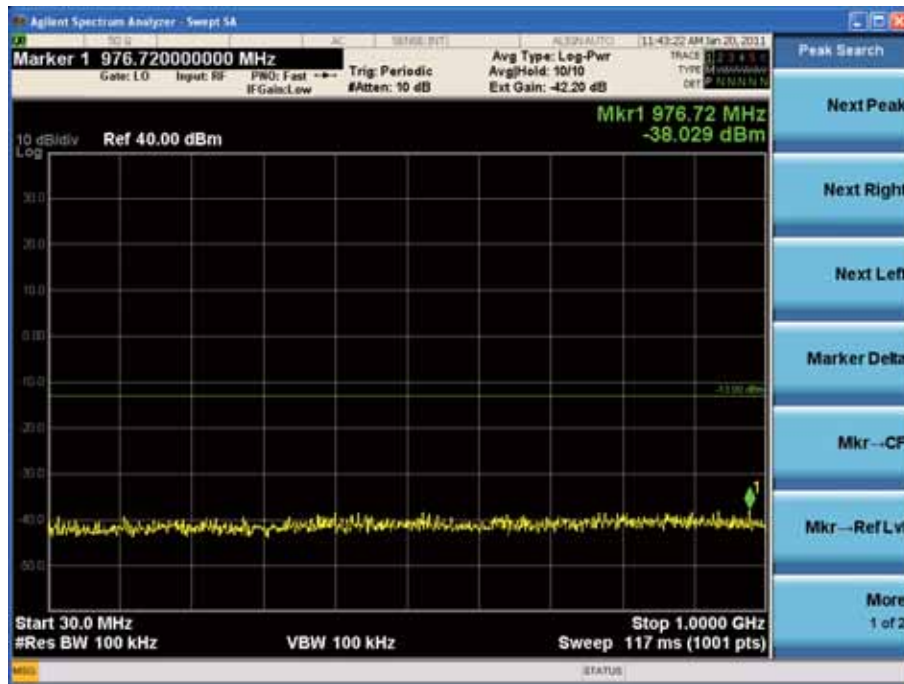
(QPSK Middle Channel)



(30 MHz ~ 1 GHz)

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(QPSK High Channel)



(30 MHz ~ 1 GHz)

(QPSK Low Channel)



(1 GHz ~ 26.5 GHz)

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(QPSK Middle Channel)



(1 GHz ~ 26.5 GHz)

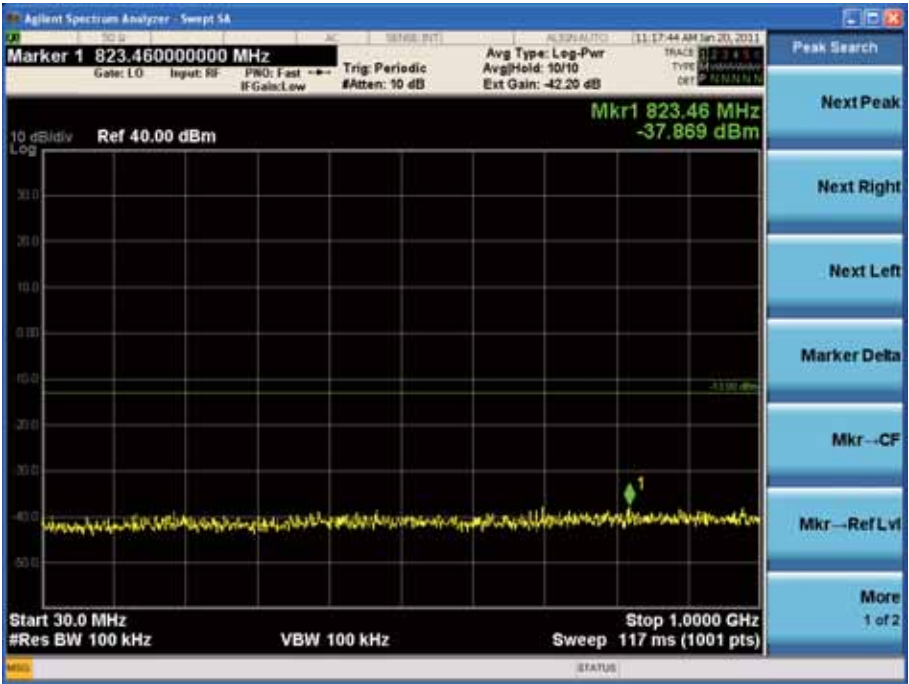
(QPSK High Channel)



(1 GHz ~ 26.5 GHz)

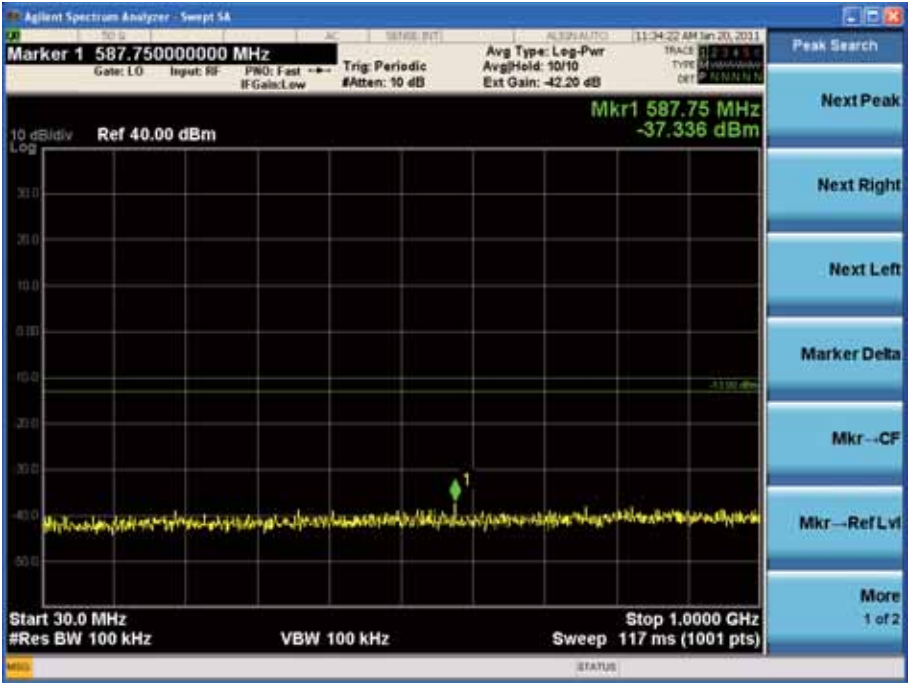
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(16QAM LOW Channel)



(30 MHz ~ 1 GHz)

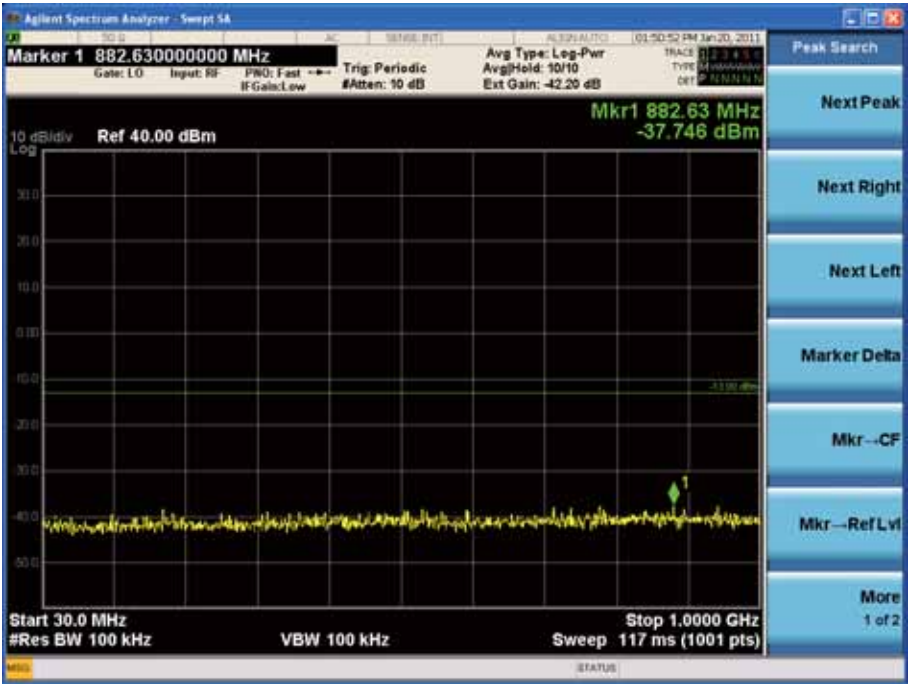
(16QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(16QAM High Channel)



(30 MHz ~ 1 GHz)

(16QAM LOW Channel)



(1 GHz ~ 26.5 GHz)

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(16QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

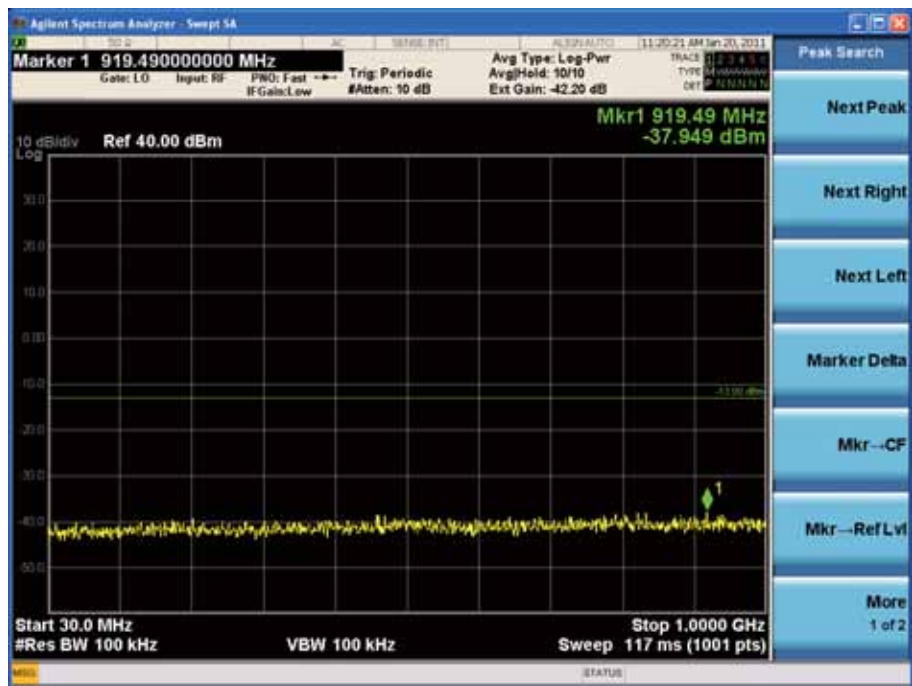
(16QAM High Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(64QAM Low Channel)



(30 MHz ~ 1 GHz)

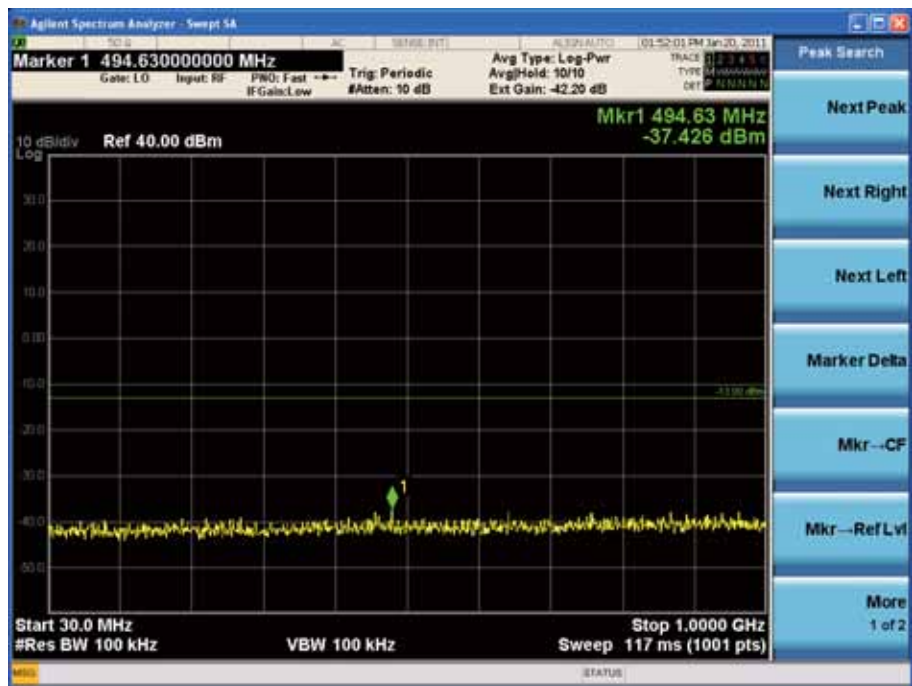
(64QAM Middle Channel)



(30 MHz ~ 1 GHz)

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(64QAM High Channel)



(30 MHz ~ 1 GHz)

(64QAM Low Channel)



(1 GHz ~ 26.5 GHz)

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(64QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

(64QAM High Channel)



(1 GHz ~ 26.5 GHz)

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8.4.2. Plot Data at Output Port Alpha 2
(QPSK Low Channel)



(30 MHz ~ 1 GHz)

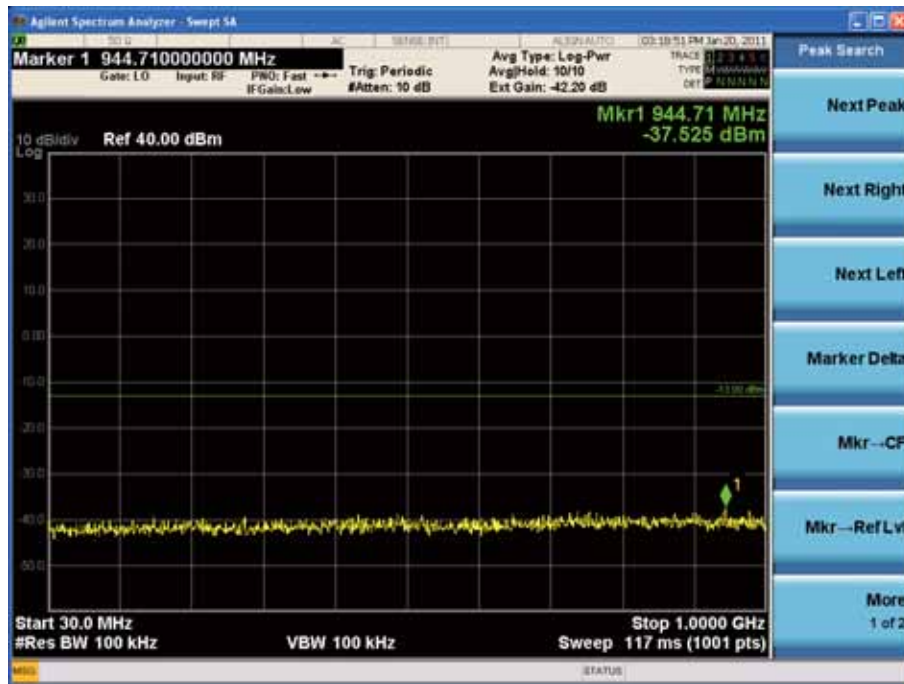
(QPSK Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(QPSK High Channel)



(30 MHz ~ 1 GHz)

(QPSK Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(QPSK Middle Channel)



(1 GHz ~ 26.5 GHz)

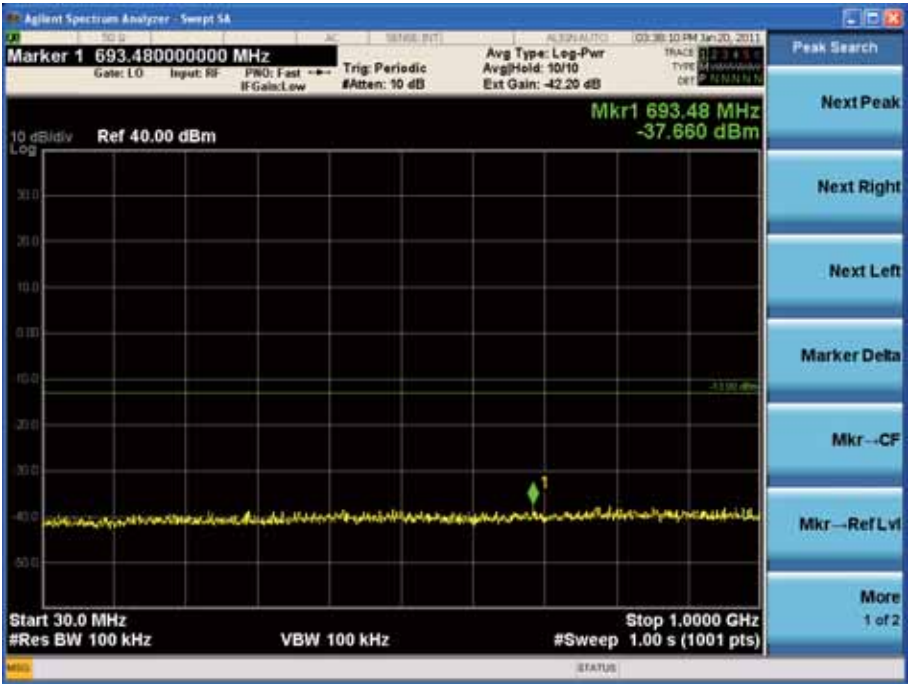
(QPSK High Channel)



(1 GHz ~ 26.5 GHz)

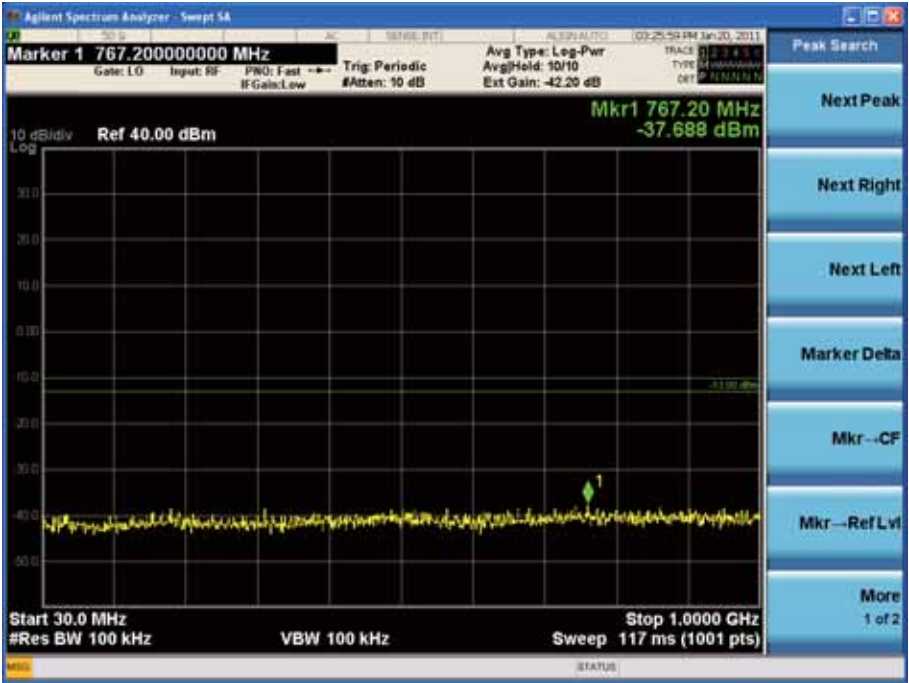
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(16QAM LOW Channel)



(30 MHz ~ 1 GHz)

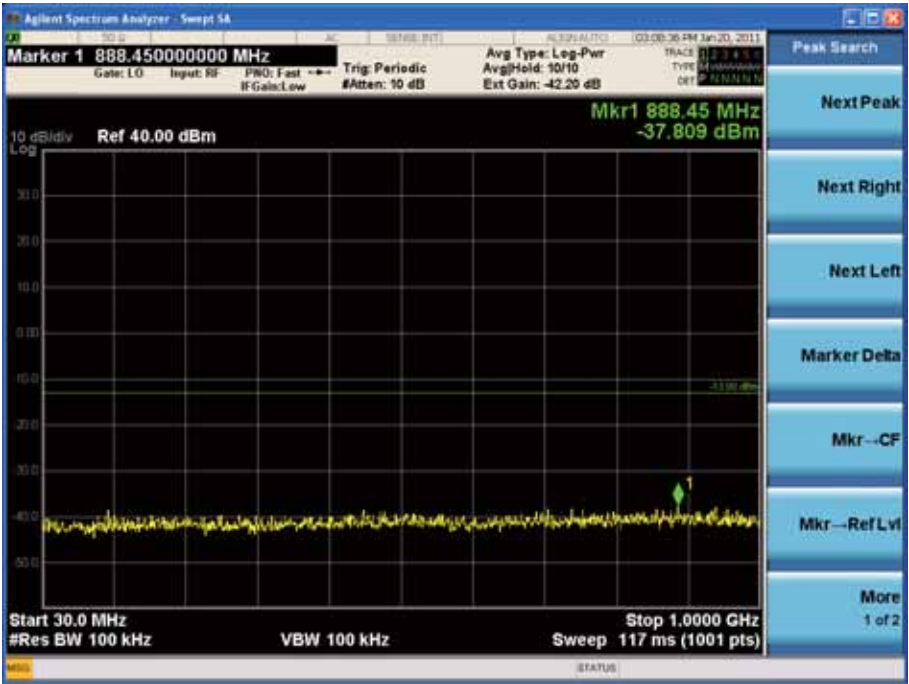
(16QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(16QAM High Channel)



(30 MHz ~ 1 GHz)

(16QAM LOW Channel)



(1 GHz ~ 26.5 GHz)

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(16QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

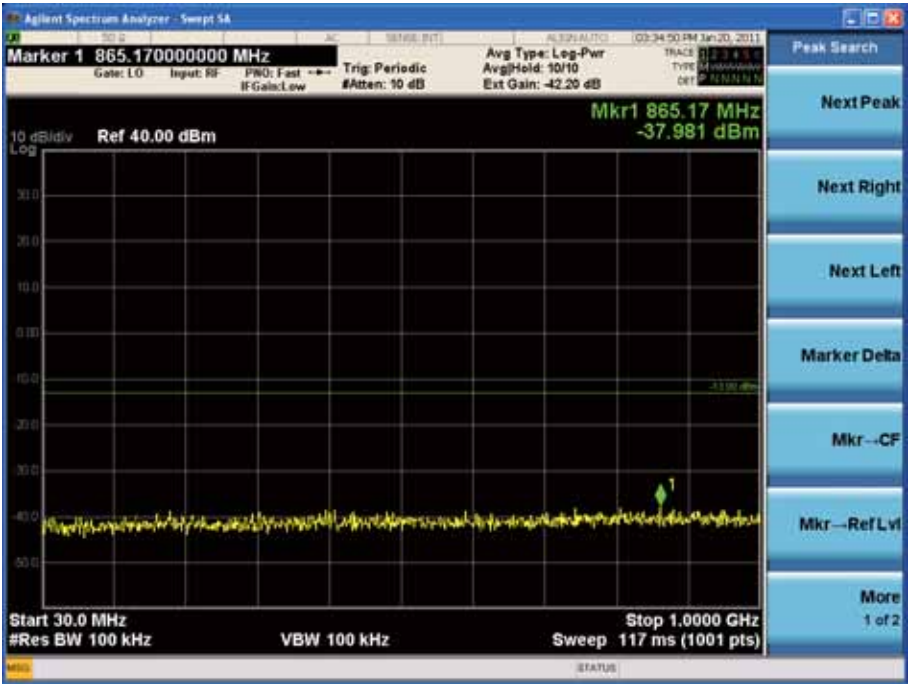
(16QAM High Channel)



(1 GHz ~ 26.5 GHz)

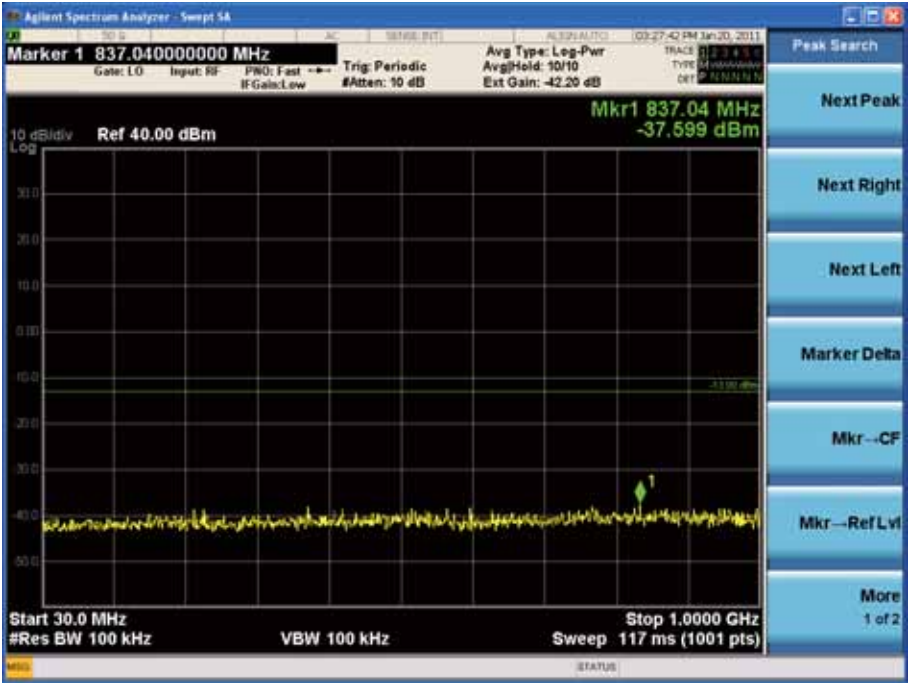
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(64QAM Low Channel)



(30 MHz ~ 1 GHz)

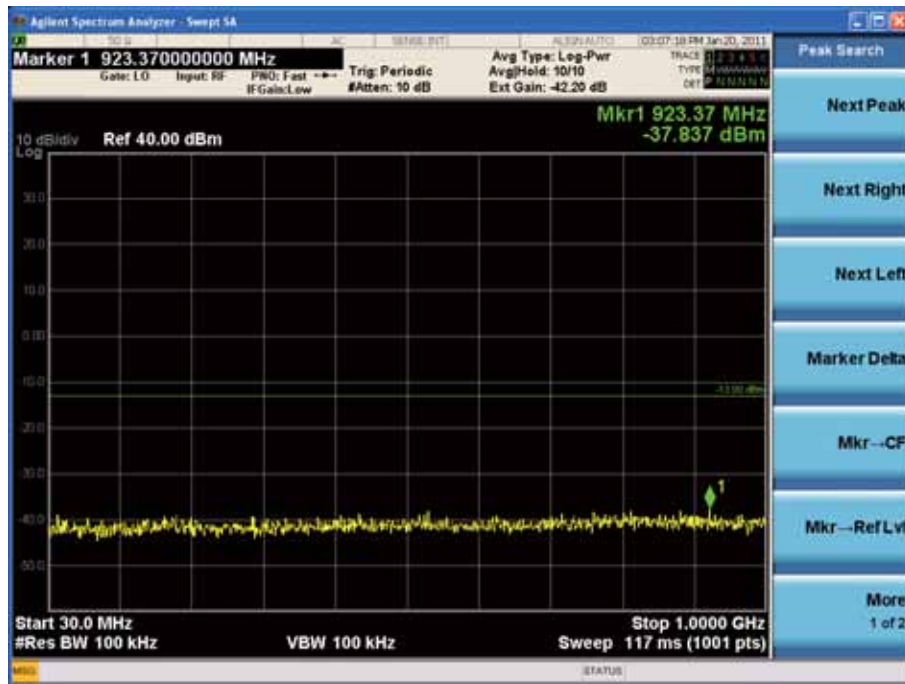
(64QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(64QAM High Channel)



(30 MHz ~ 1 GHz)

(64QAM Low Channel)



(1 GHz ~ 26.5 GHz)

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(64QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

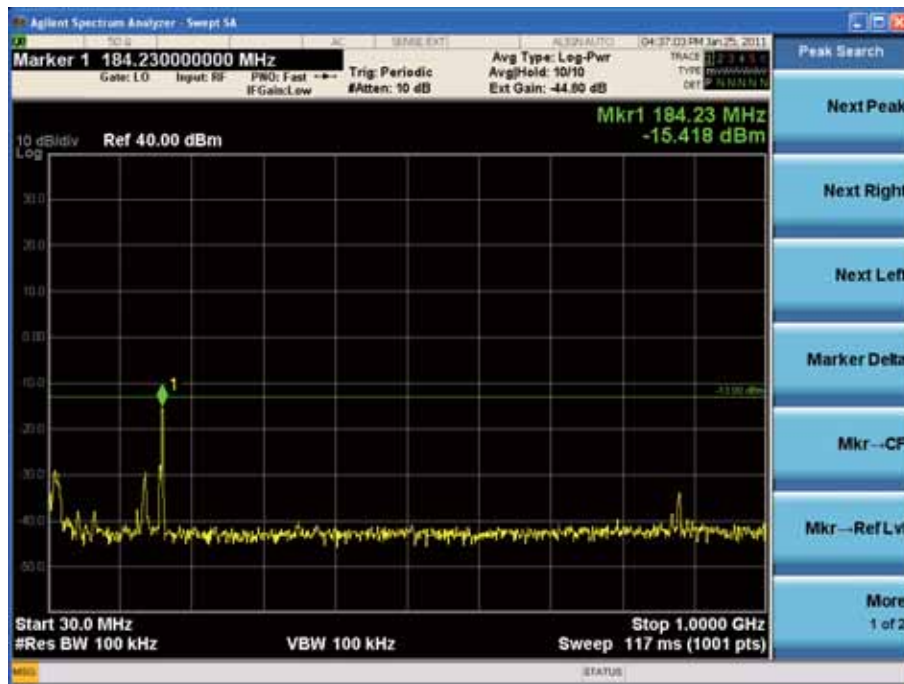
(64QAM High Channel)



(1 GHz ~ 26.5 GHz)

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8.4.3. Combined Plot Data at Output (QPSK Low Channel)



(30 MHz ~ 1 GHz)

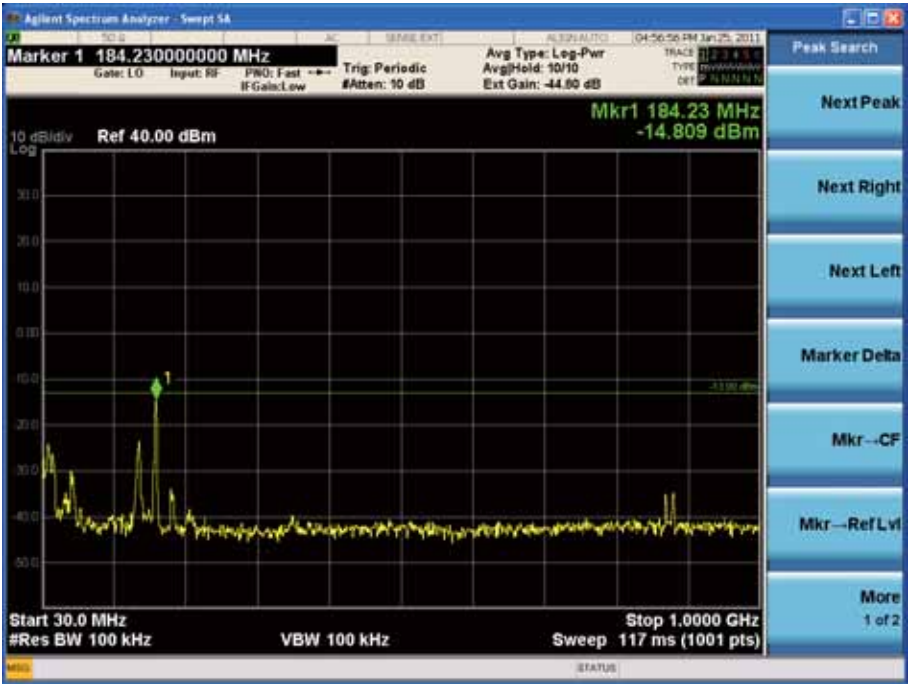
(QPSK Middle Channel)



(30 MHz ~ 1 GHz)

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(QPSK High Channel)



(30 MHz ~ 1 GHz)

(QPSK Low Channel)



(1 GHz ~ 26.5 GHz)

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(QPSK Middle Channel)



(1 GHz ~ 26.5 GHz)

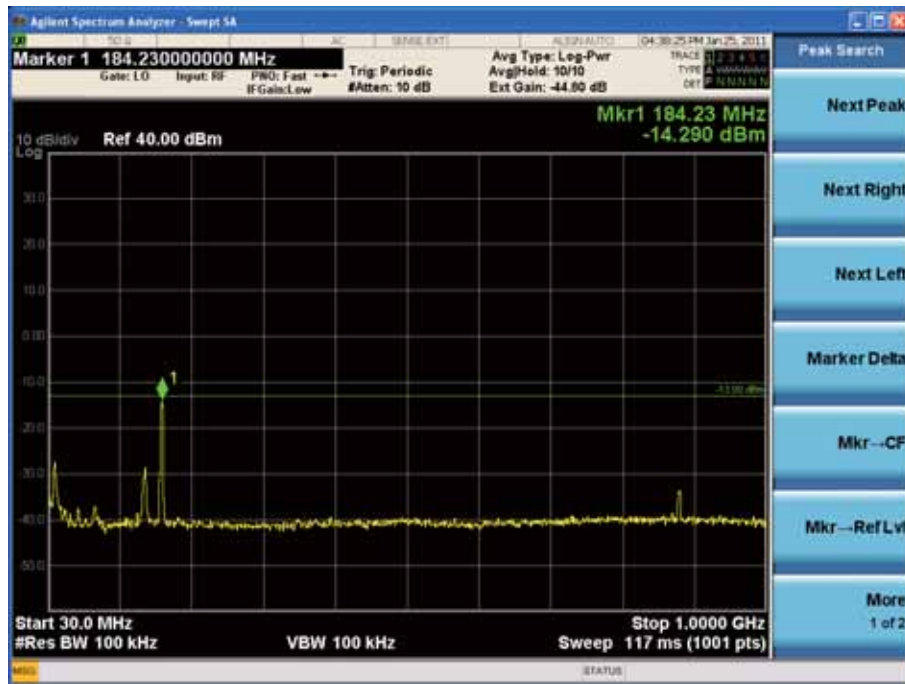
(QPSK High Channel)



(1 GHz ~ 26.5 GHz)

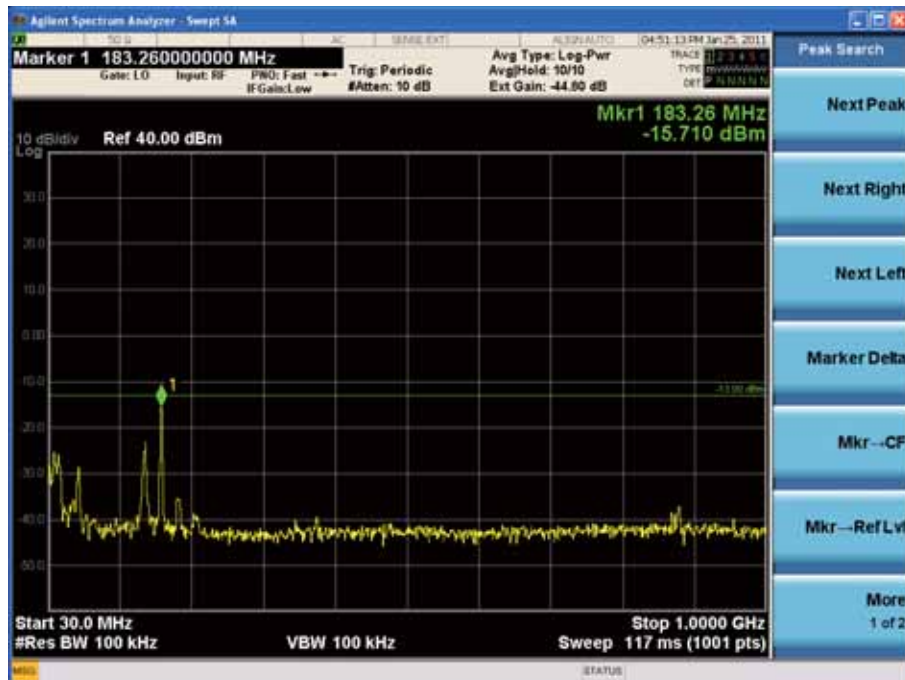
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(16QAM LOW Channel)



(30 MHz ~ 1 GHz)

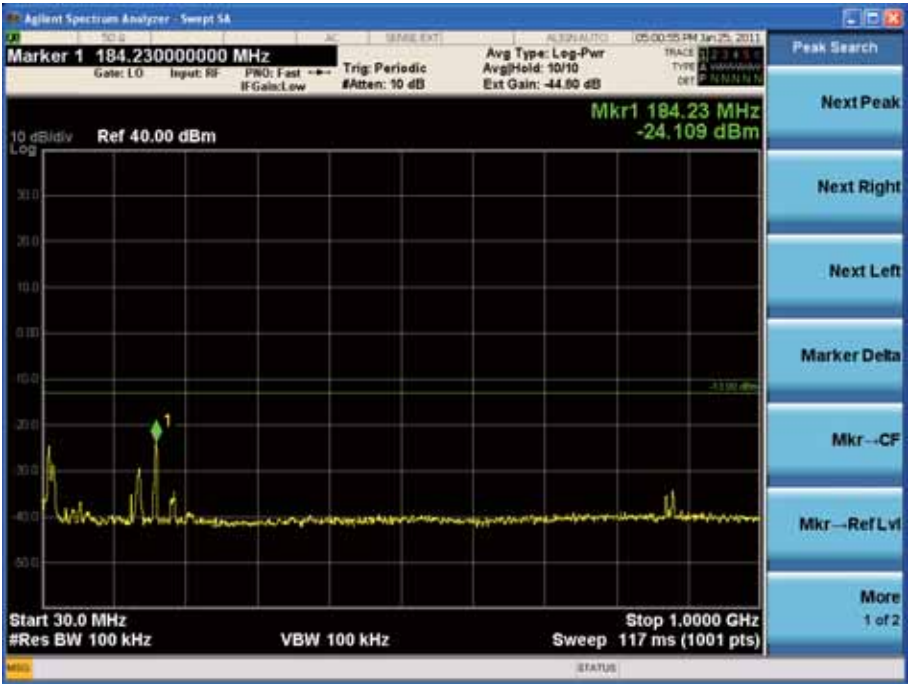
(16QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(16QAM High Channel)



(30 MHz ~ 1 GHz)

(16QAM LOW Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(16QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

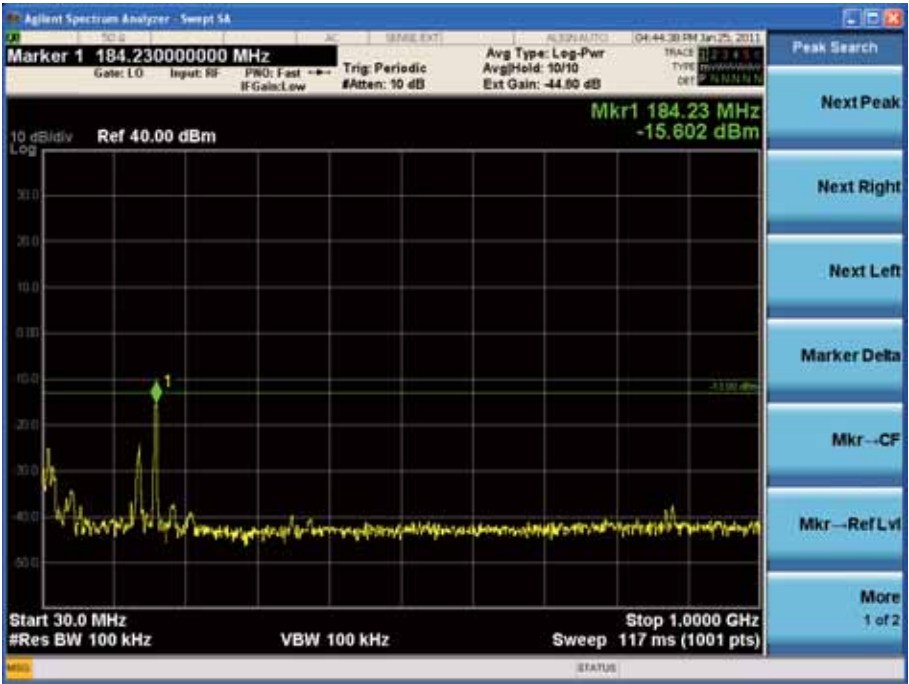
(16QAM High Channel)



(1 GHz ~ 26.5 GHz)

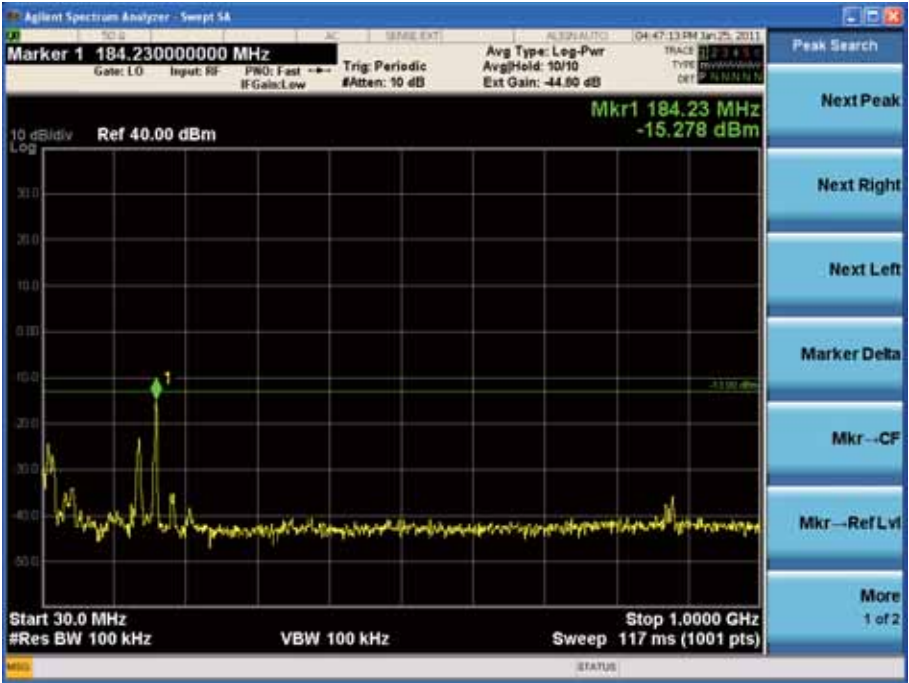
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(64QAM Low Channel)



(30 MHz ~ 1 GHz)

(64QAM Middle Channel)



(30 MHz ~ 1 GHz)

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(64QAM High Channel)



(30 MHz ~ 1 GHz)

(64QAM Low Channel)



(1 GHz ~ 26.5 GHz)

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(64QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

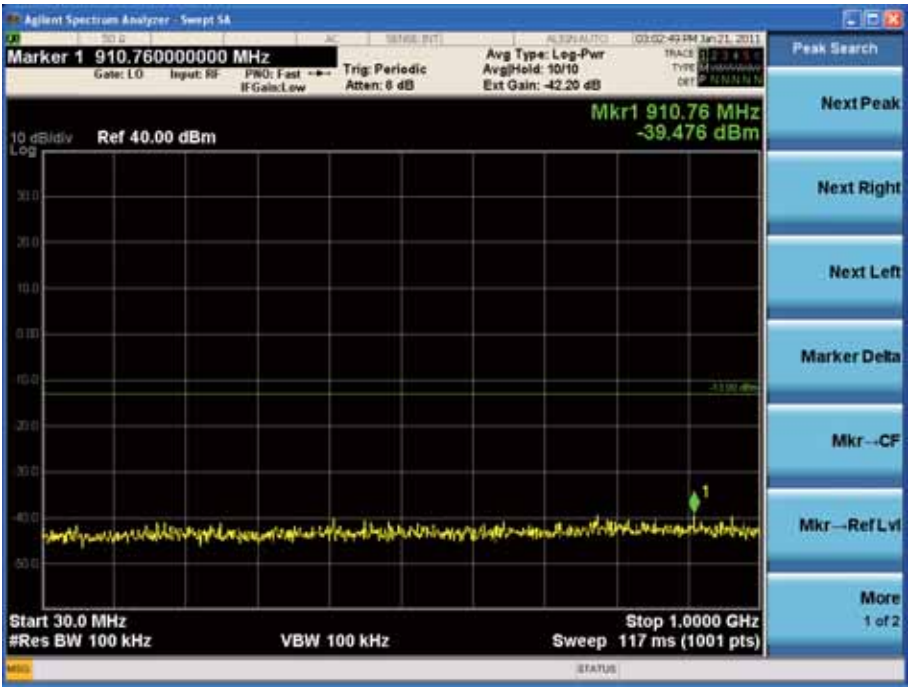
(64QAM High Channel)



(1 GHz ~ 26.5 GHz)

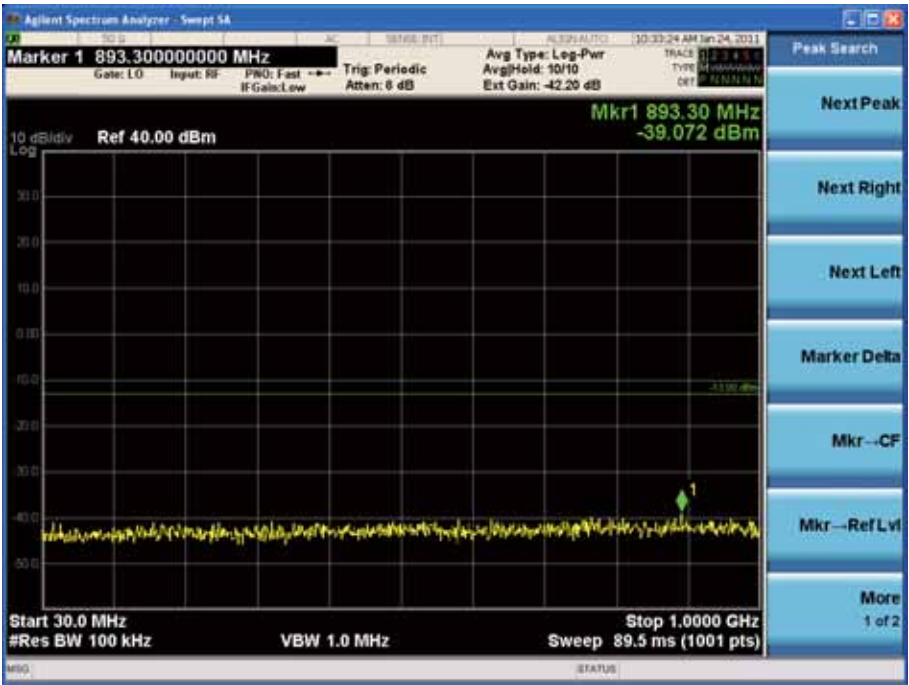
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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8.4.4. Plot Data at Output Port Beta 1
(QPSK Low Channel)



(30 MHz ~ 1 GHz)

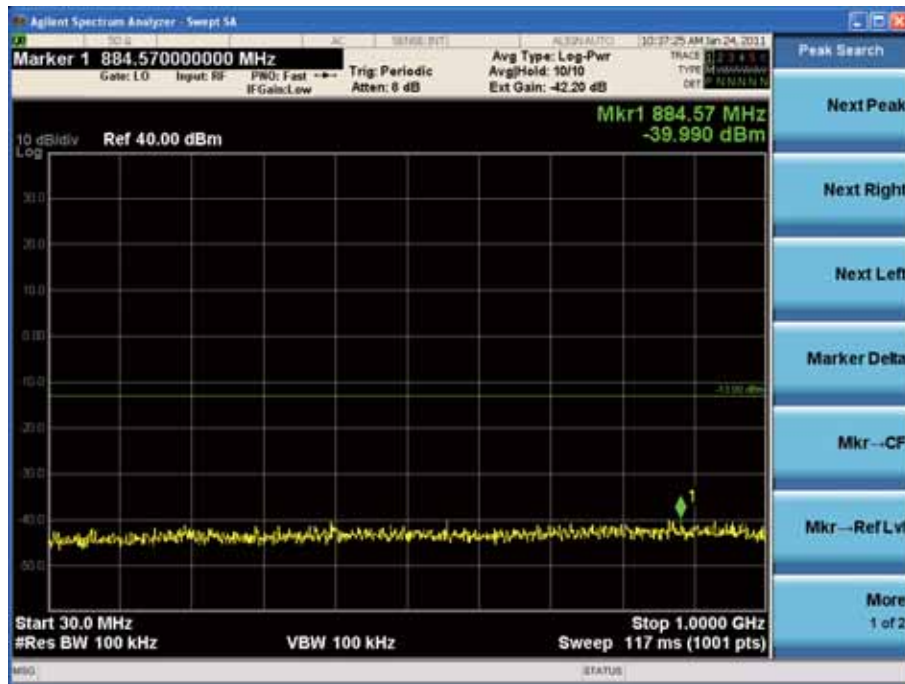
(QPSK Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(QPSK High Channel)



(30 MHz ~ 1 GHz)

(QPSK Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(QPSK Middle Channel)



(1 GHz ~ 26.5 GHz)

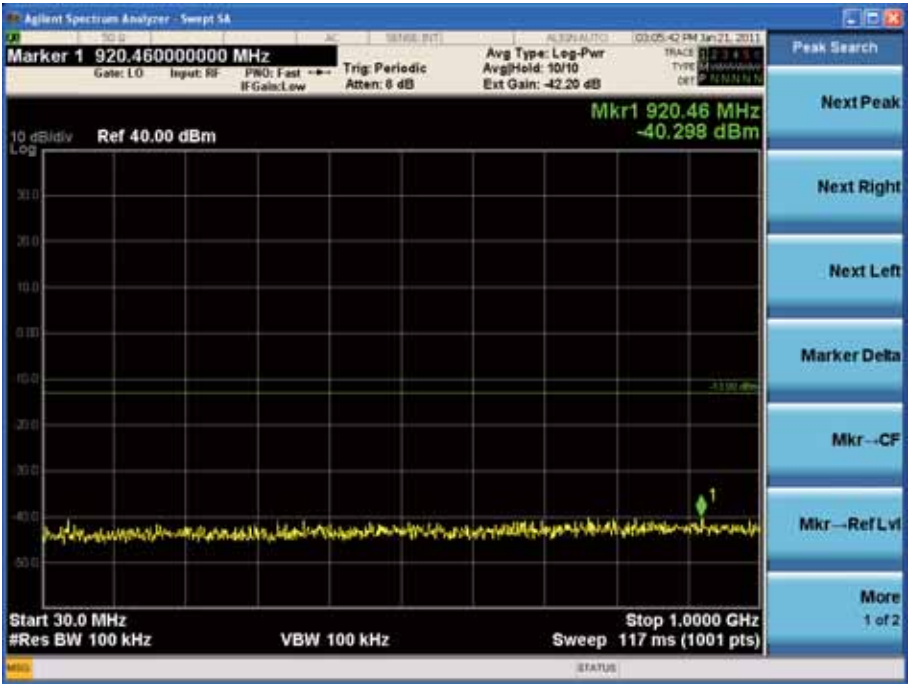
(QPSK High Channel)



(1 GHz ~ 26.5 GHz)

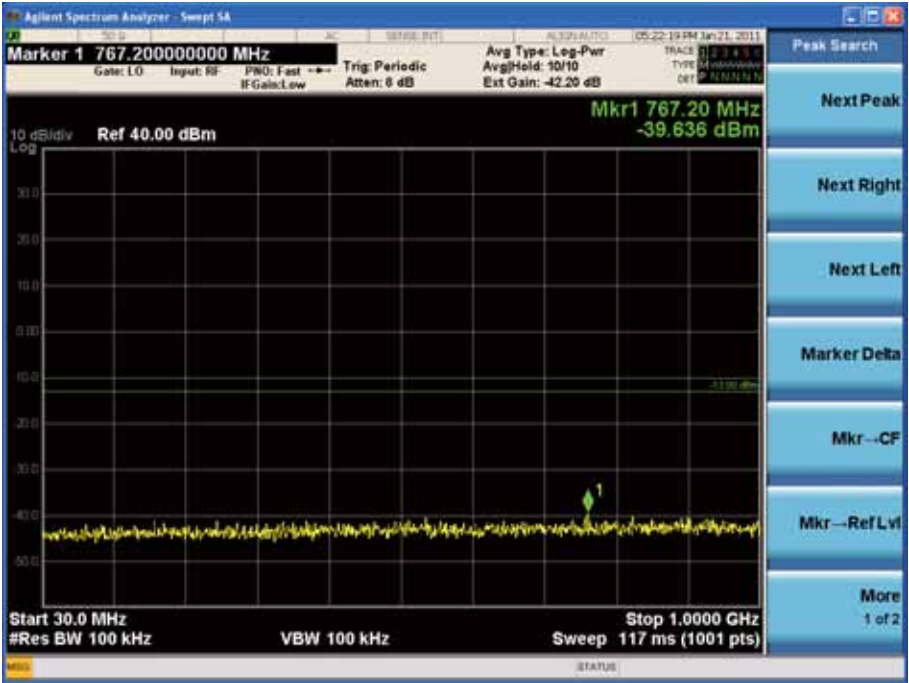
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(16QAM LOW Channel)



(30 MHz ~ 1 GHz)

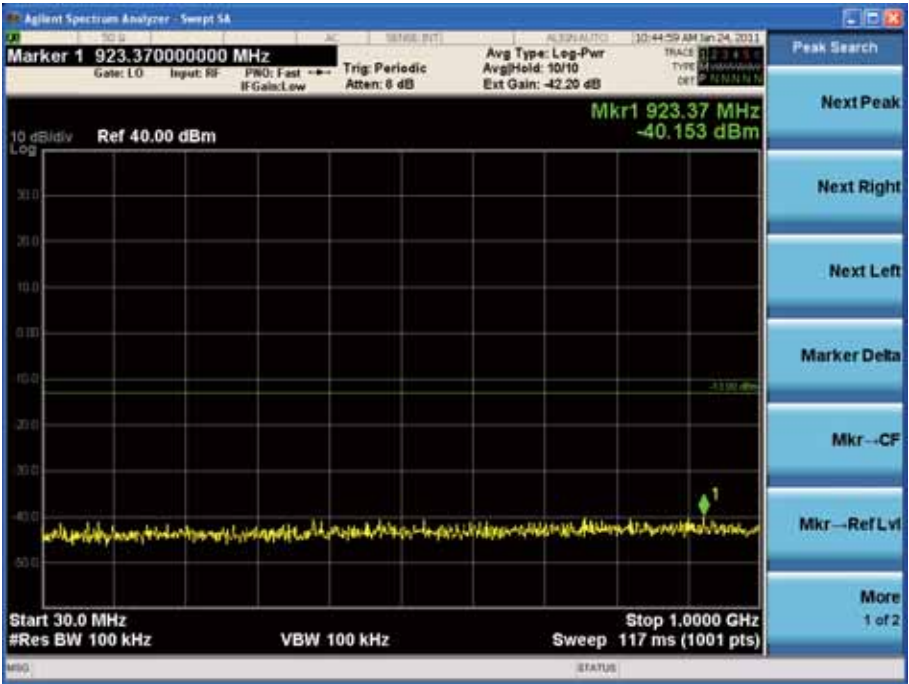
(16QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(16QAM High Channel)



(30 MHz ~ 1 GHz)

(16QAM LOW Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(16QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

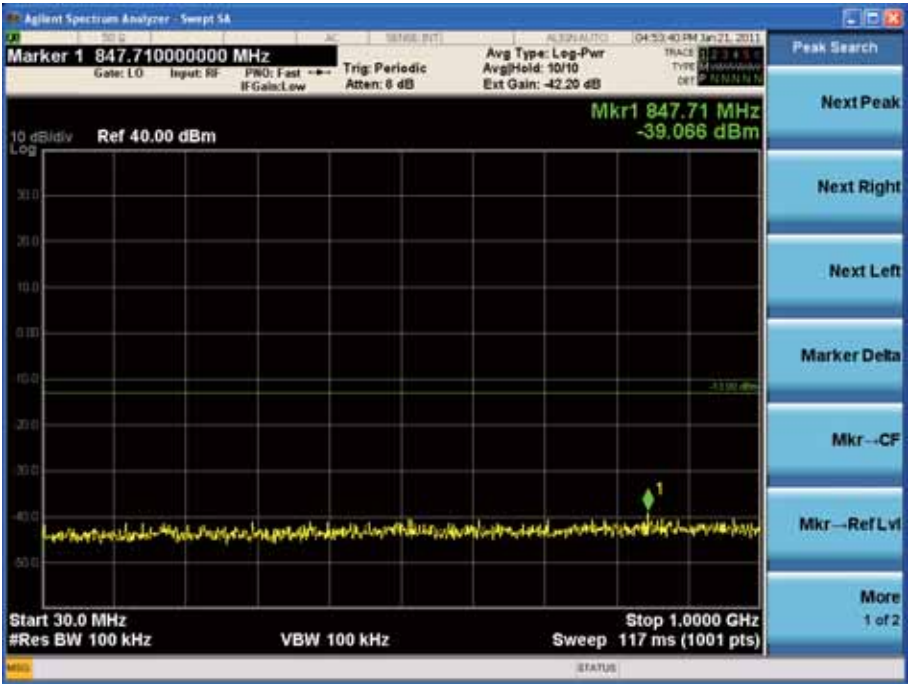
(16QAM High Channel)



(1 GHz ~ 26.5 GHz)

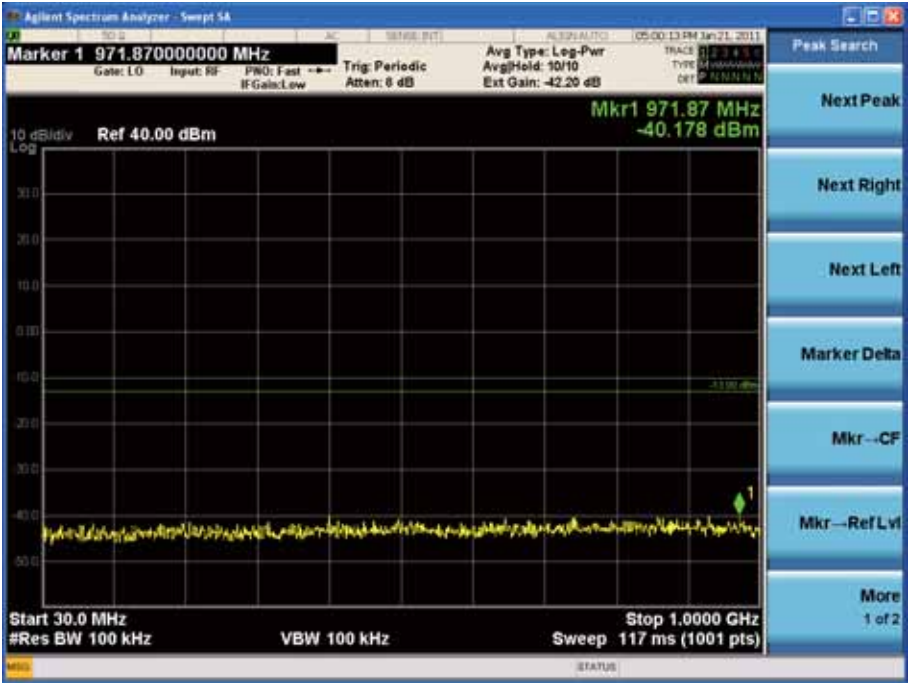
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(64QAM Low Channel)



(30 MHz ~ 1 GHz)

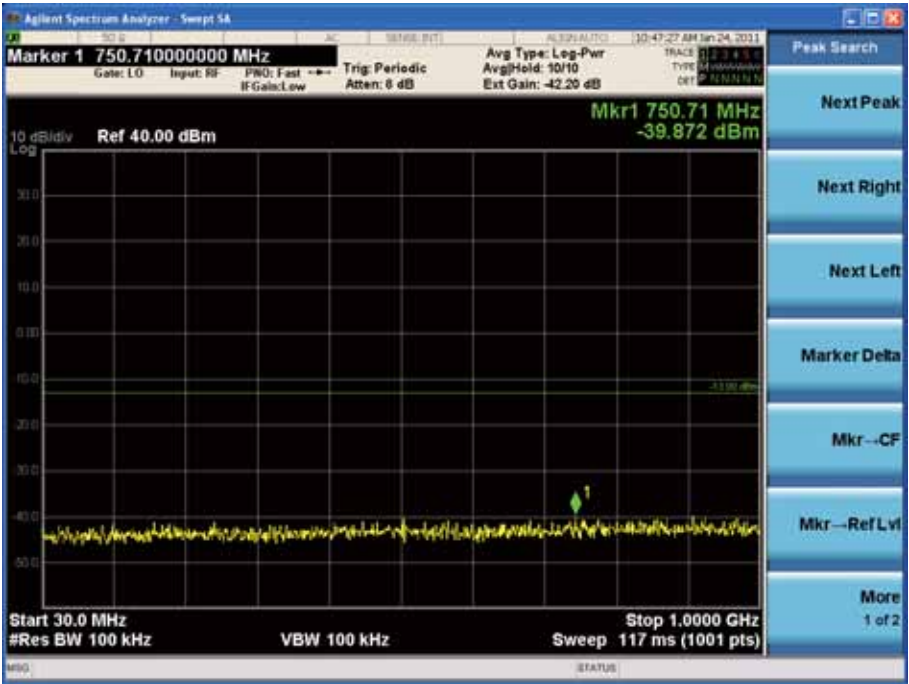
(64QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(64QAM High Channel)



(30 MHz ~ 1 GHz)

(64QAM Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(64QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

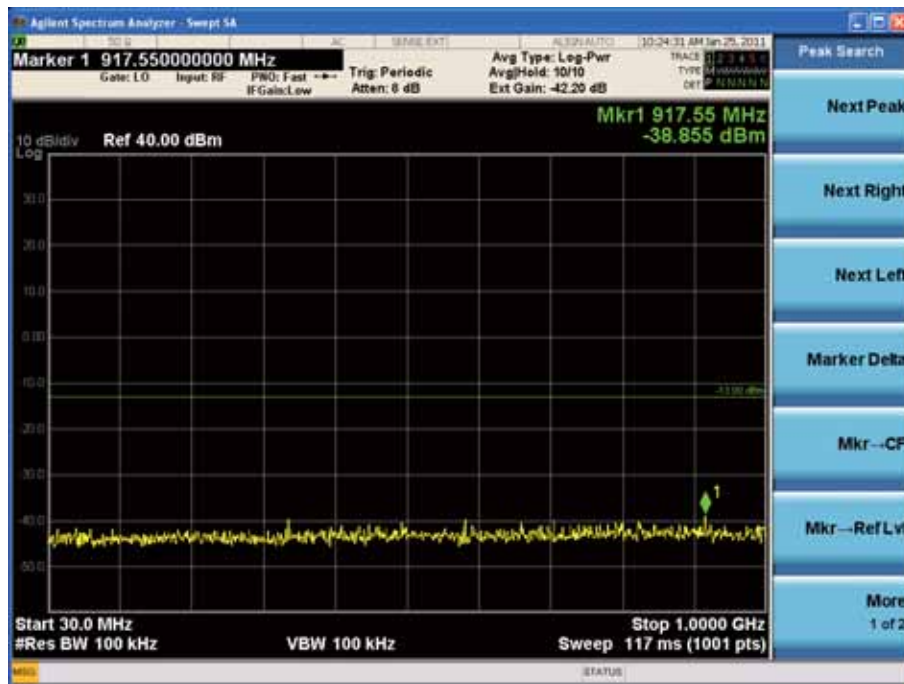
(64QAM High Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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8.4.5. Plot Data at Output Port Beta 2
(QPSK Low Channel)



(30 MHz ~ 1 GHz)

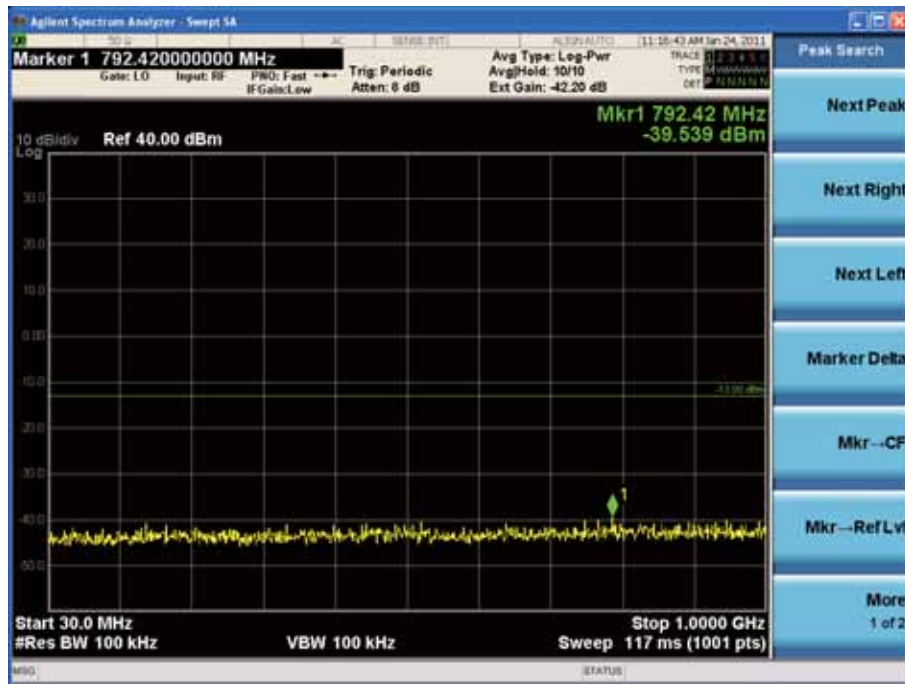
(QPSK Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(QPSK High Channel)



(30 MHz ~ 1 GHz)

(QPSK Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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(QPSK Middle Channel)



(1 GHz ~ 26.5 GHz)

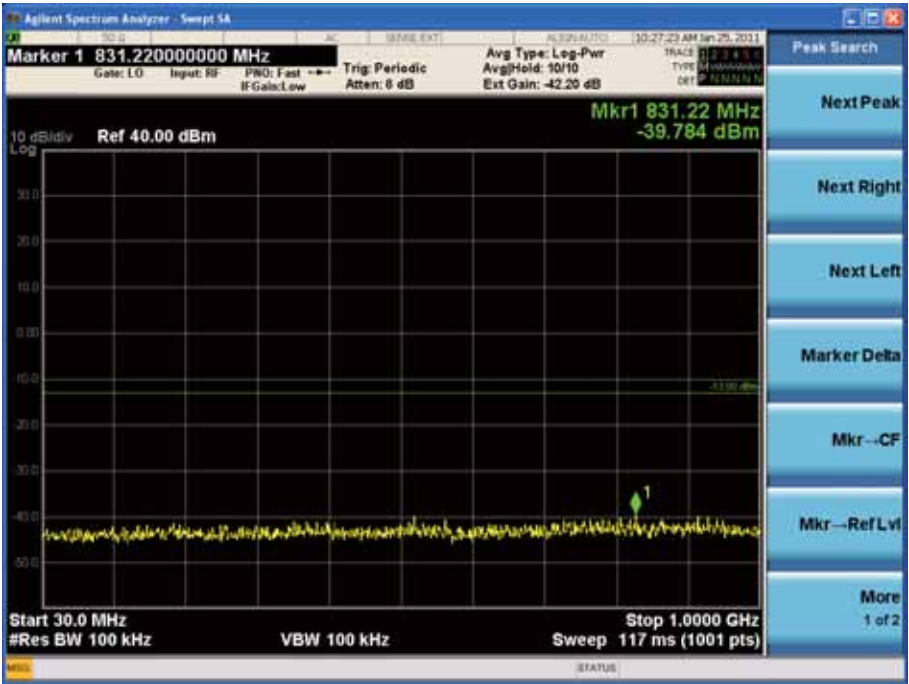
(QPSK High Channel)



(1 GHz ~ 26.5 GHz)

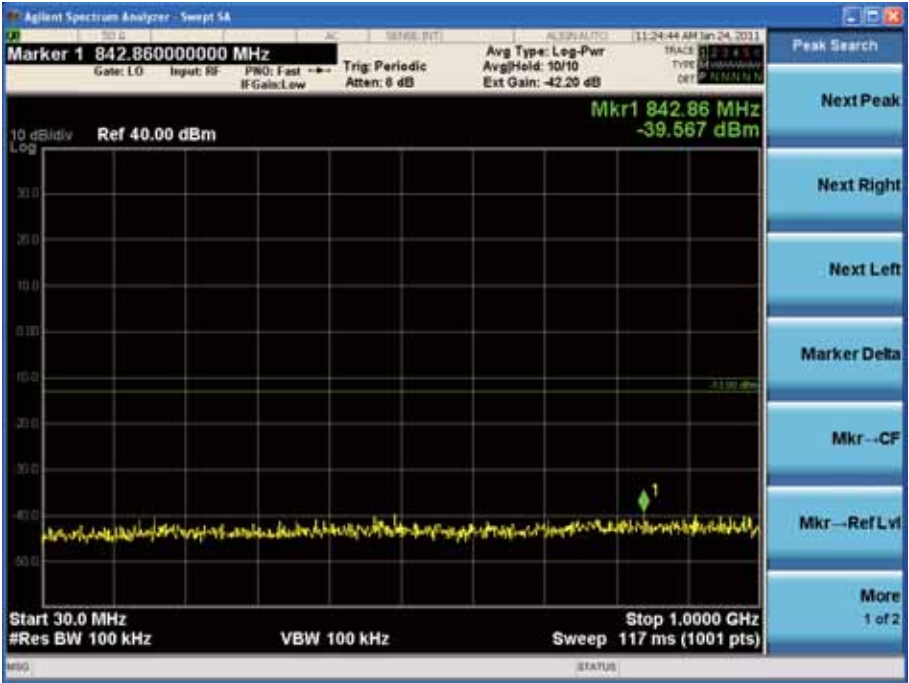
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 188 of 240

(16QAM LOW Channel)



(30 MHz ~ 1 GHz)

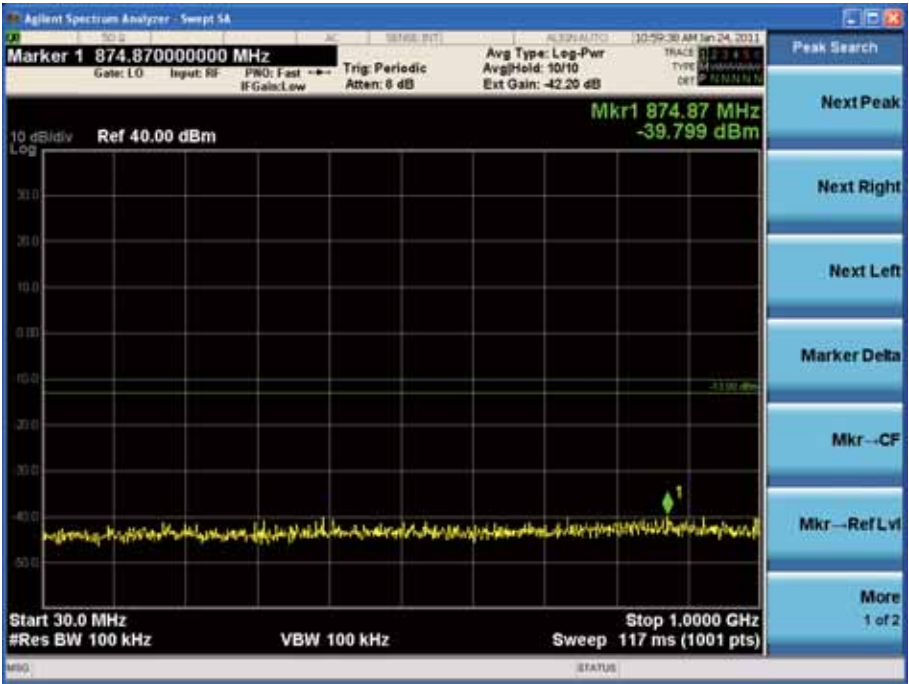
(16QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 189 of 240

(16QAM High Channel)



(30 MHz ~ 1 GHz)

(16QAM LOW Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 190 of 240

(16QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

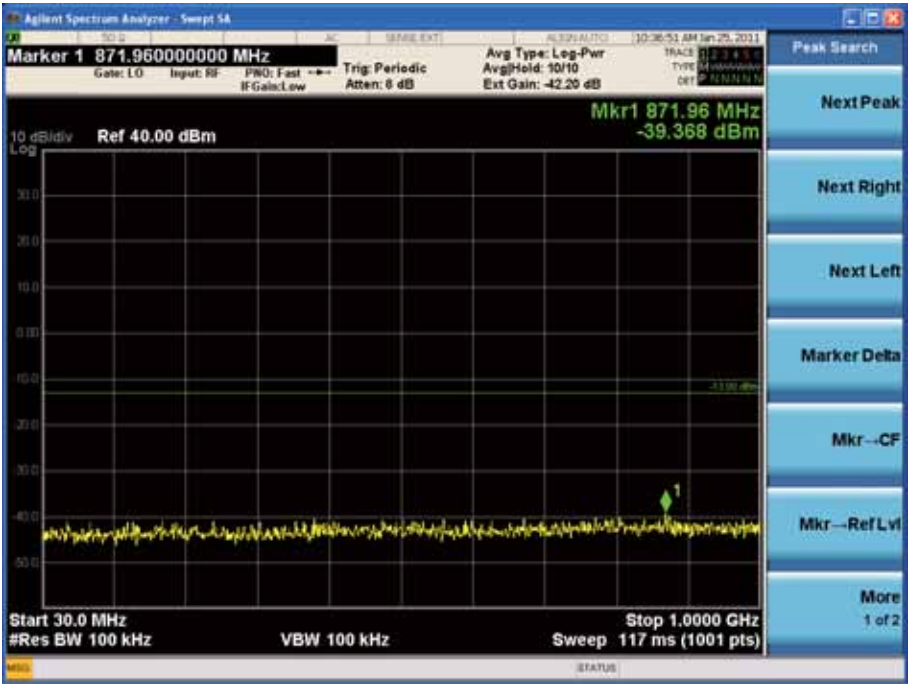
(16QAM High Channel)



(1 GHz ~ 26.5 GHz)

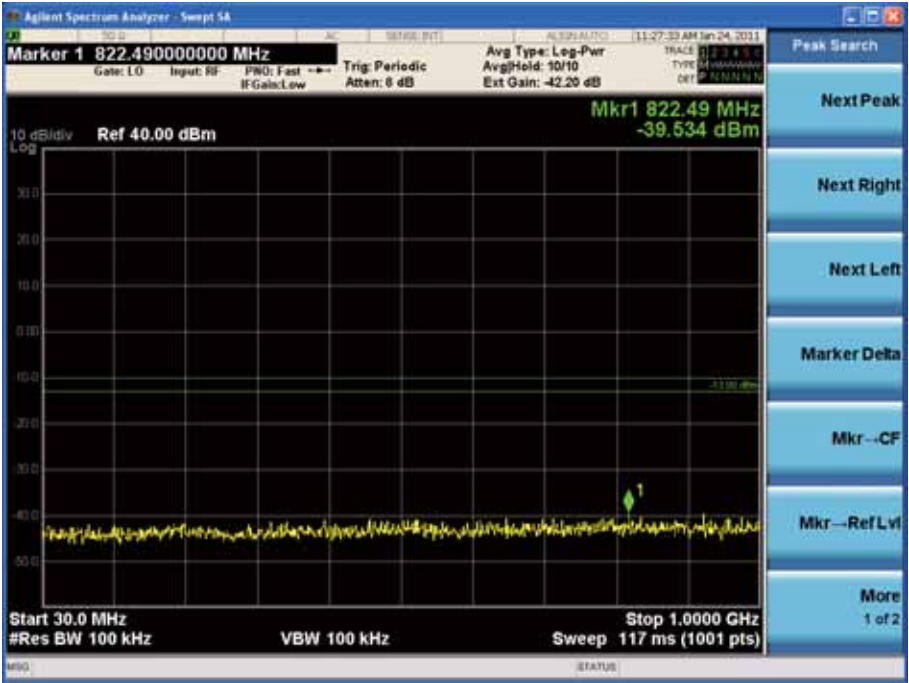
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 191 of 240

(64QAM Low Channel)



(30 MHz ~ 1 GHz)

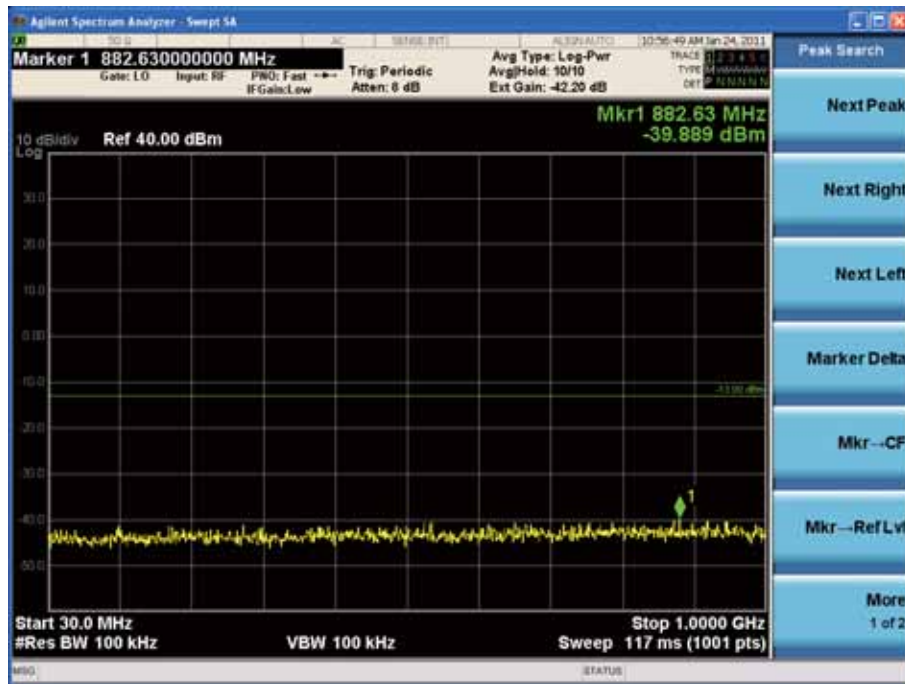
(64QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 192 of 240

(64QAM High Channel)



(30 MHz ~ 1 GHz)

(64QAM Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 193 of 240

(64QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

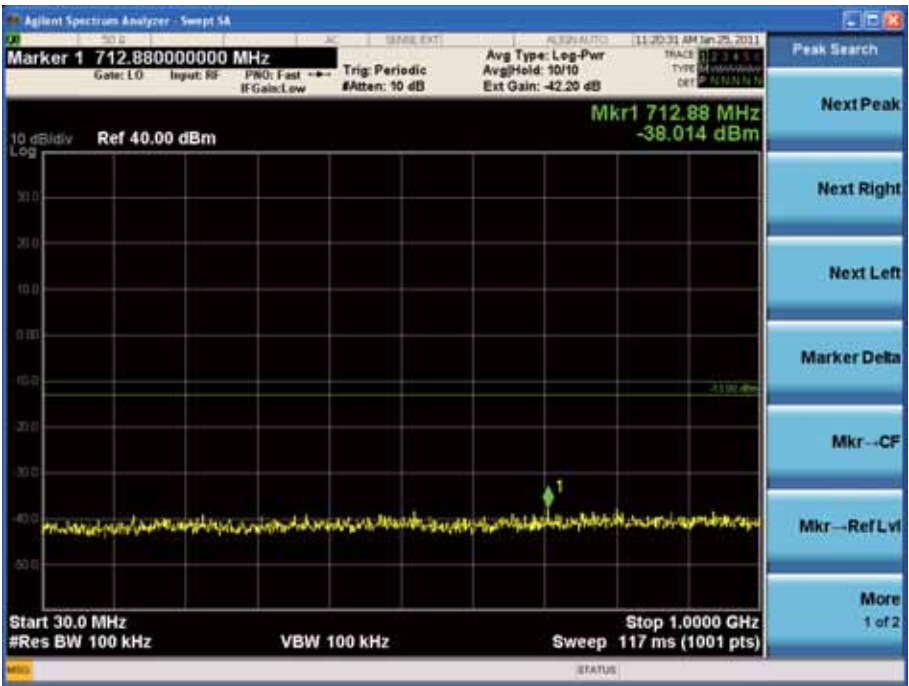
(64QAM High Channel)



(1 GHz ~ 26.5 GHz)

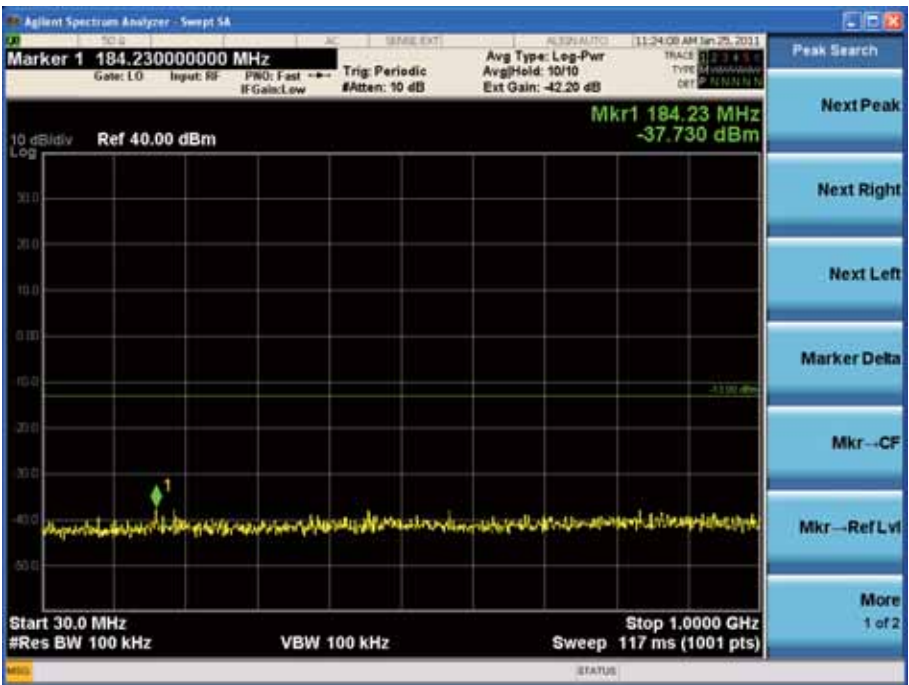
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 194 of 240

8.4.6. Combined Plot Data at Output
(QPSK Low Channel)



(30 MHz ~ 1 GHz)

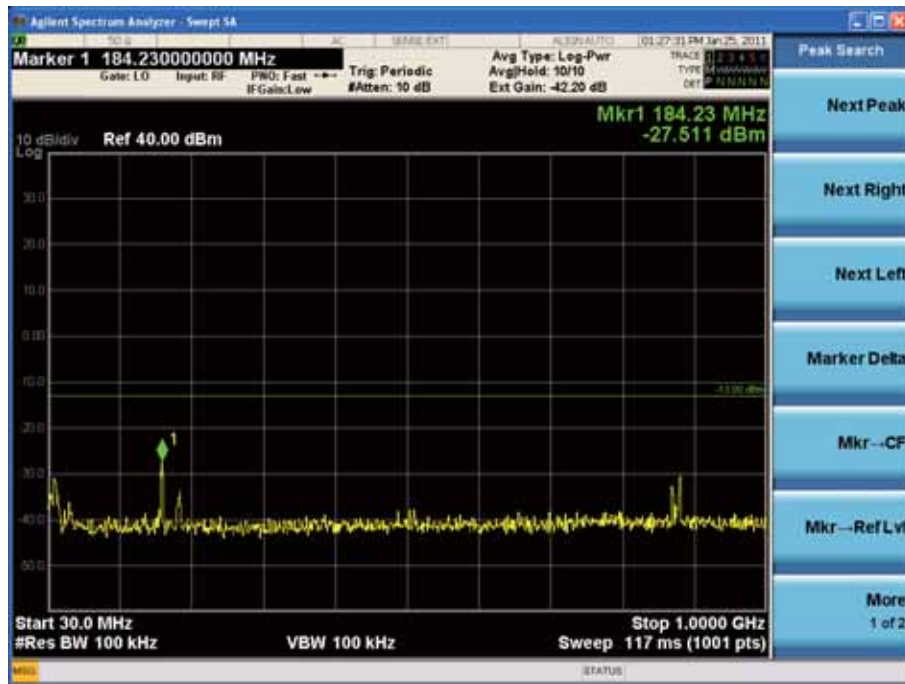
(QPSK Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 195 of 240

(QPSK High Channel)



(30 MHz ~ 1 GHz)

(QPSK Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 196 of 240

(QPSK Middle Channel)



(1 GHz ~ 26.5 GHz)

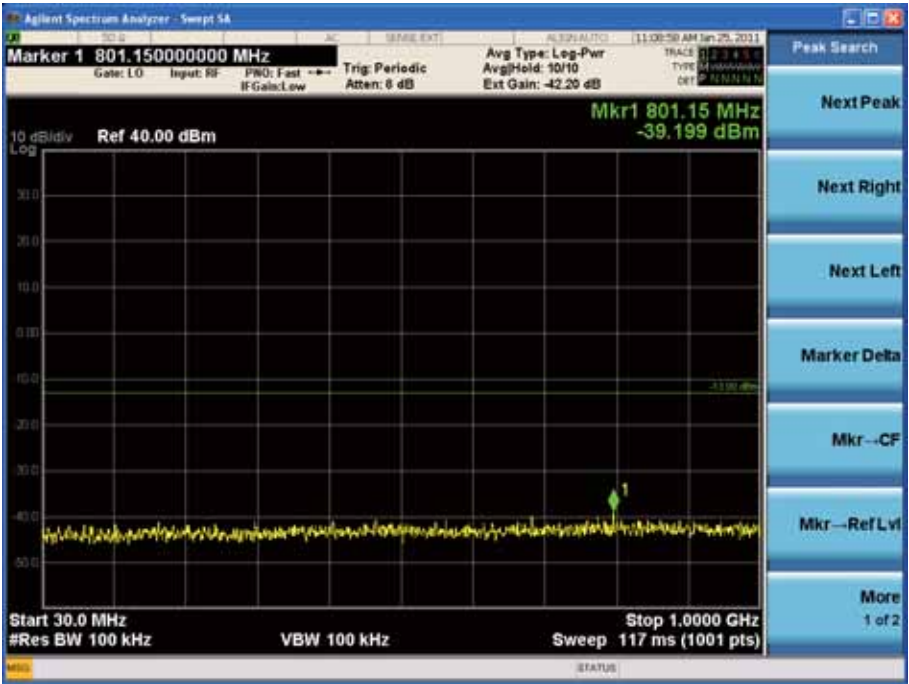
(QPSK High Channel)



(1 GHz ~ 26.5 GHz)

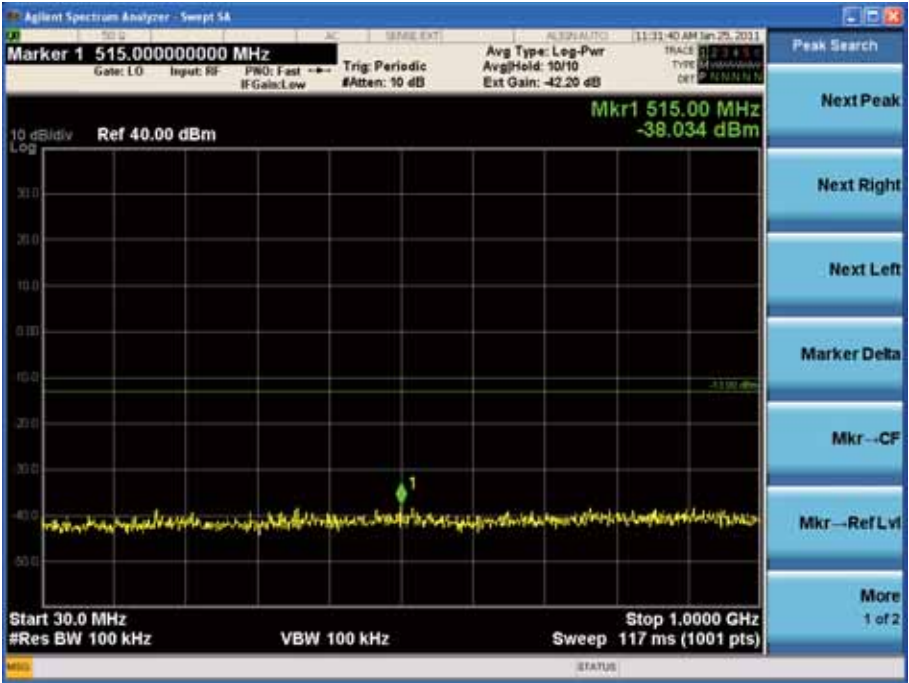
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 197 of 240

(16QAM LOW Channel)



(30 MHz ~ 1 GHz)

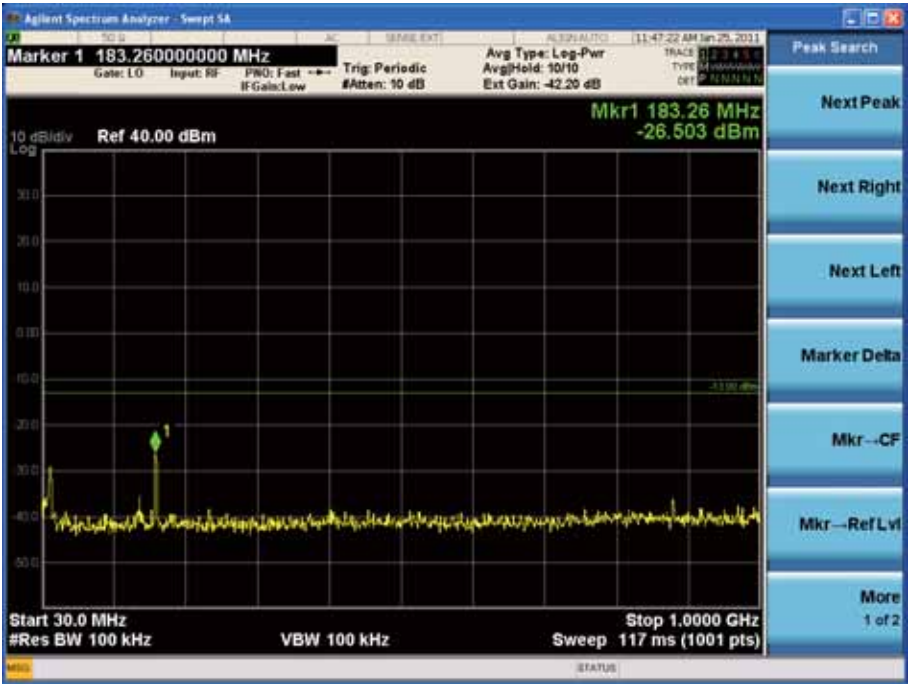
(16QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 198 of 240

(16QAM High Channel)



(30 MHz ~ 1 GHz)

(16QAM LOW Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 199 of 240

(16QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

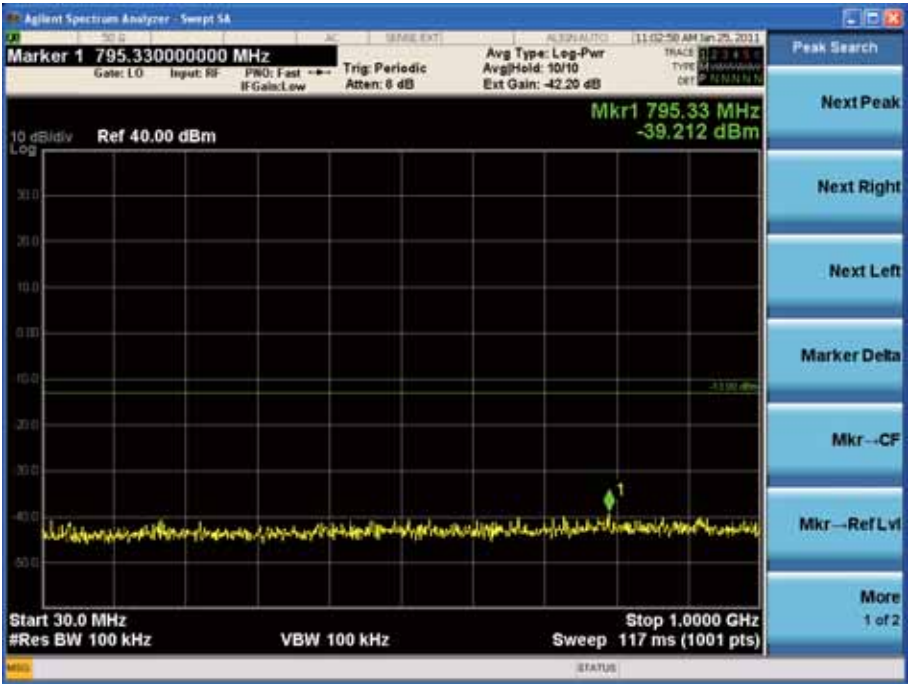
(16QAM High Channel)



(1 GHz ~ 26.5 GHz)

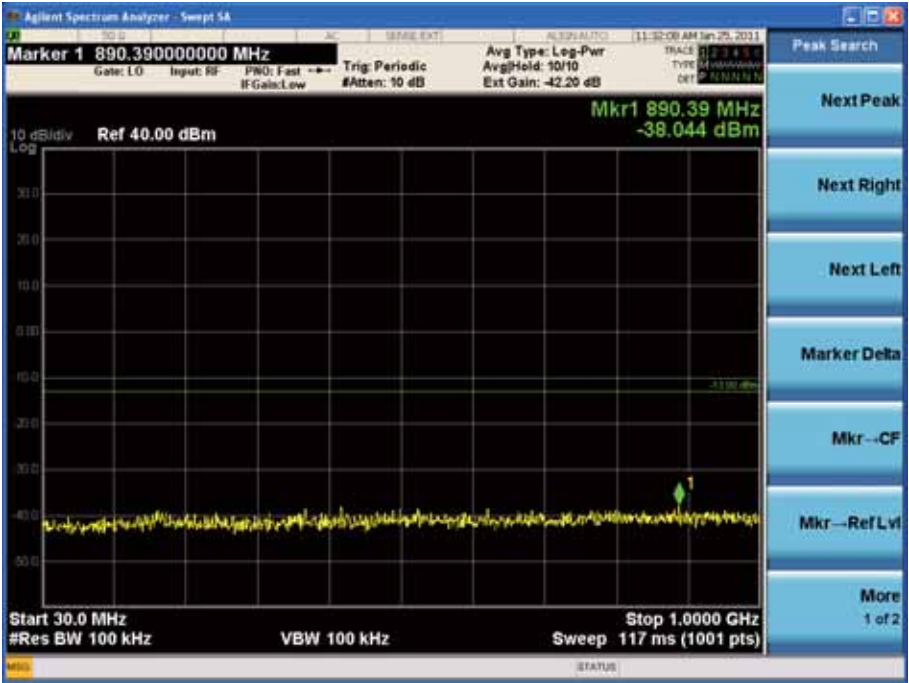
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 200 of 240

(64QAM Low Channel)



(30 MHz ~ 1 GHz)

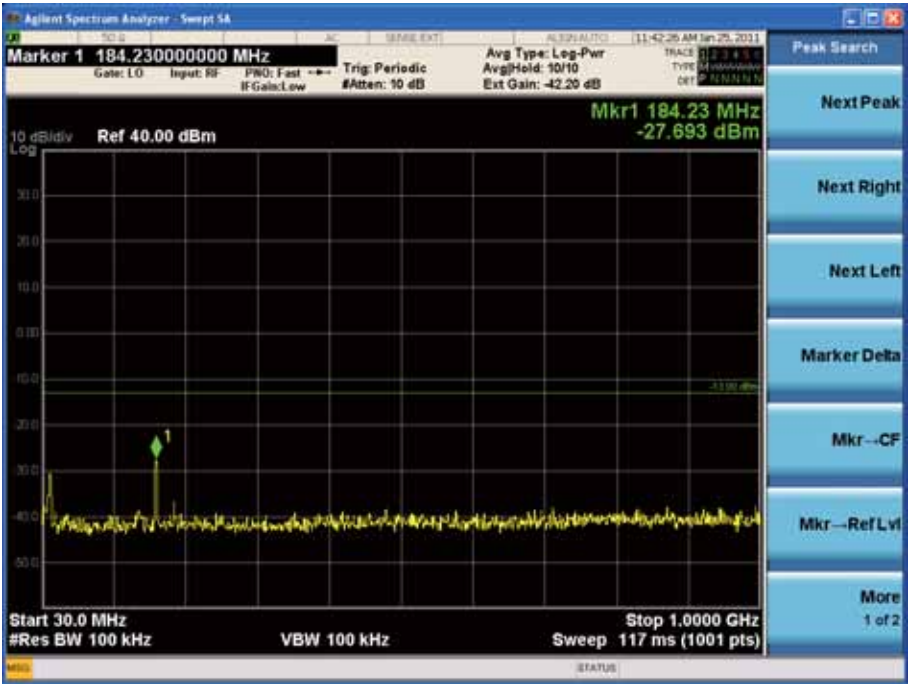
(64QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 201 of 240

(64QAM High Channel)



(30 MHz ~ 1 GHz)

(64QAM Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 202 of 240

(64QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

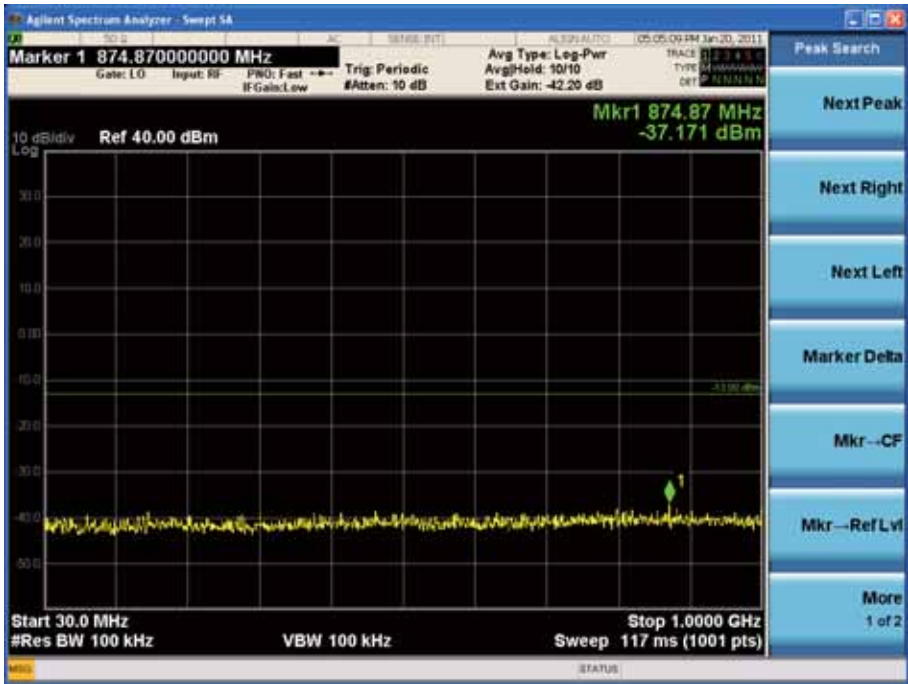
(64QAM High Channel)



(1 GHz ~ 26.5 GHz)

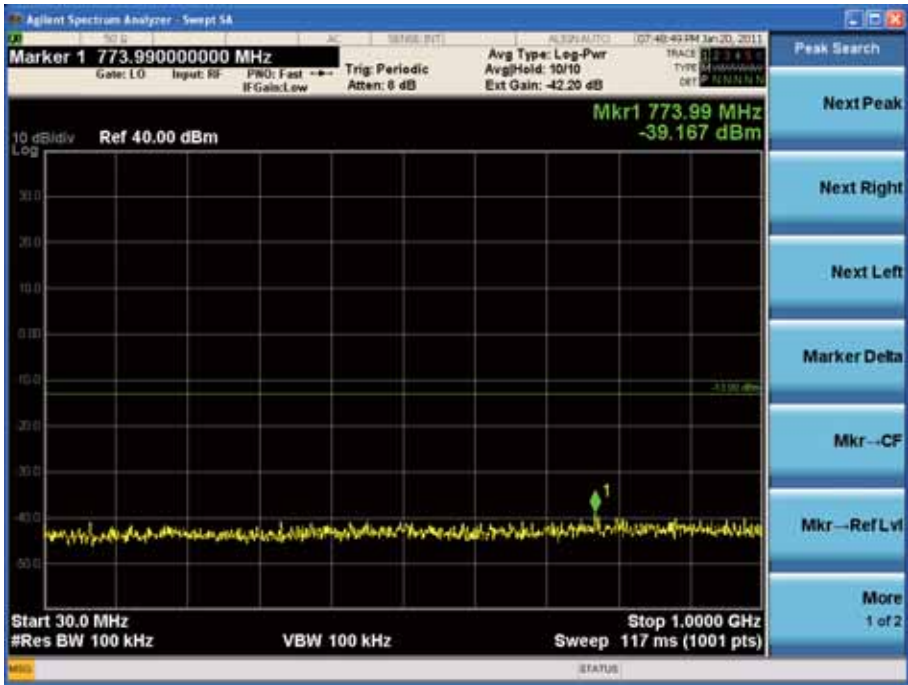
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 203 of 240

8.4.7. Plot Data at Output Port Gamma 1
(QPSK Low Channel)



(30 MHz ~ 1 GHz)

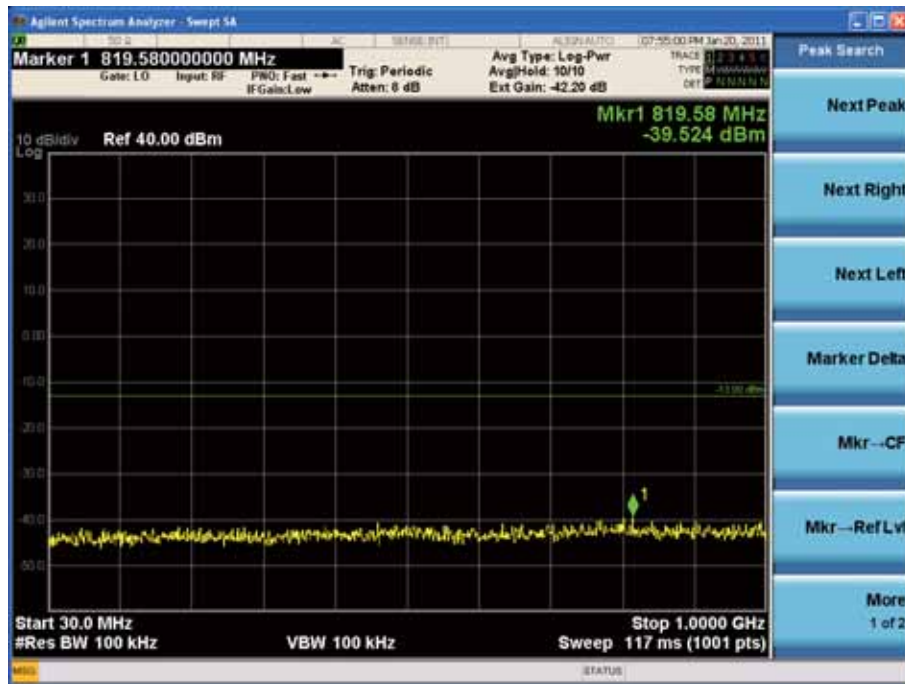
(QPSK Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 204 of 240

(QPSK High Channel)



(30 MHz ~ 1 GHz)

(QPSK Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 205 of 240

(QPSK Middle Channel)



(1 GHz ~ 26.5 GHz)

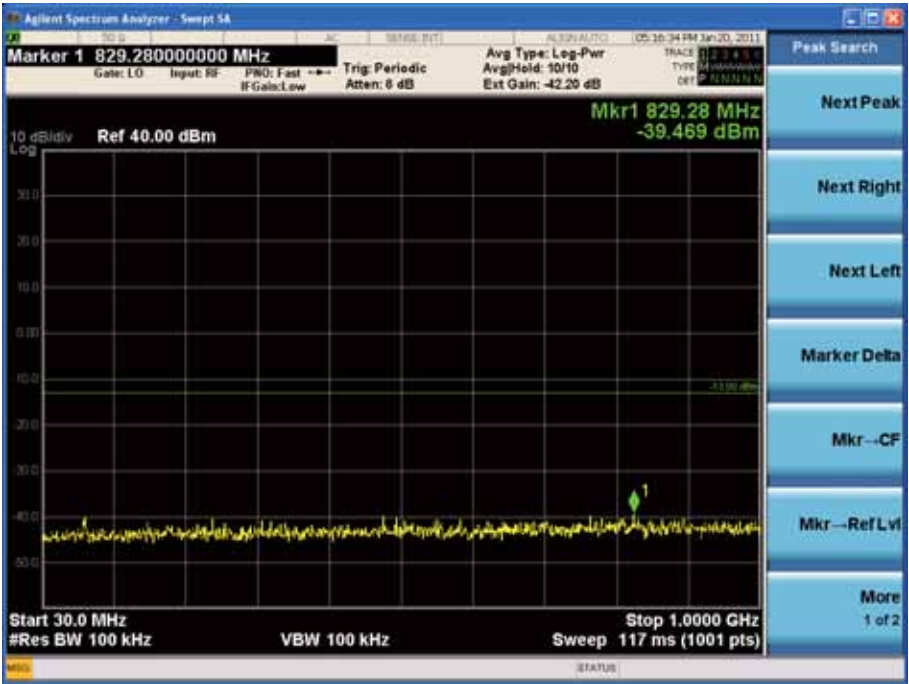
(QPSK High Channel)



(1 GHz ~ 26.5 GHz)

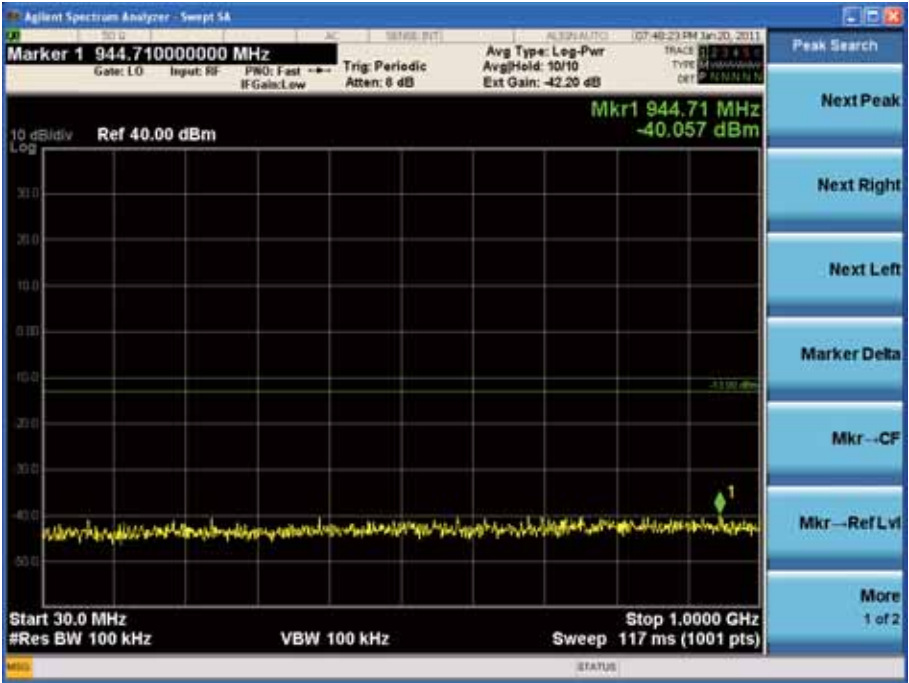
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 206 of 240

(16QAM LOW Channel)



(30 MHz ~ 1 GHz)

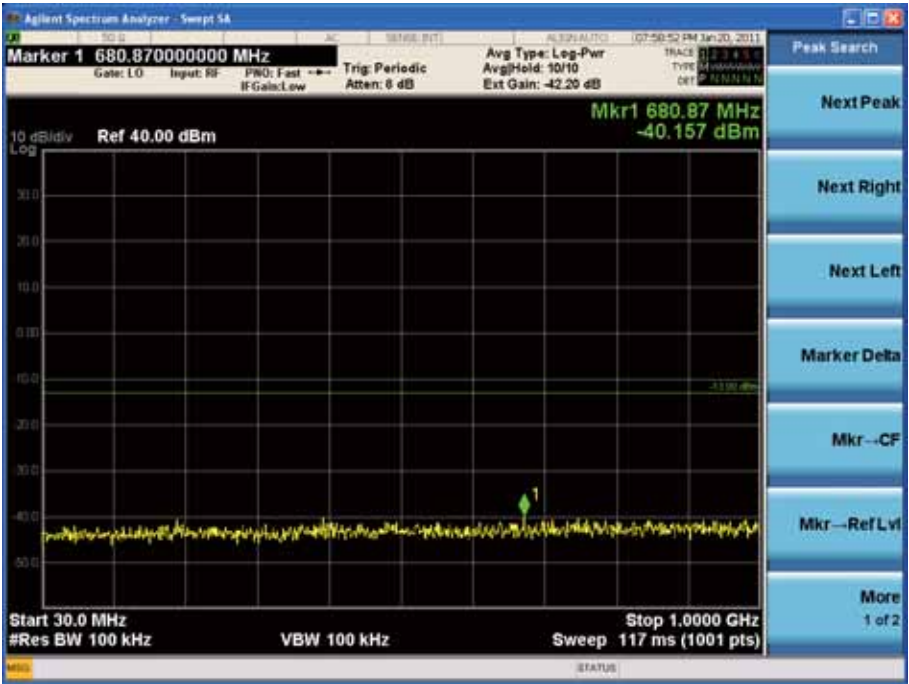
(16QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 207 of 240

(16QAM High Channel)



(30 MHz ~ 1 GHz)

(16QAM LOW Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 208 of 240

(16QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

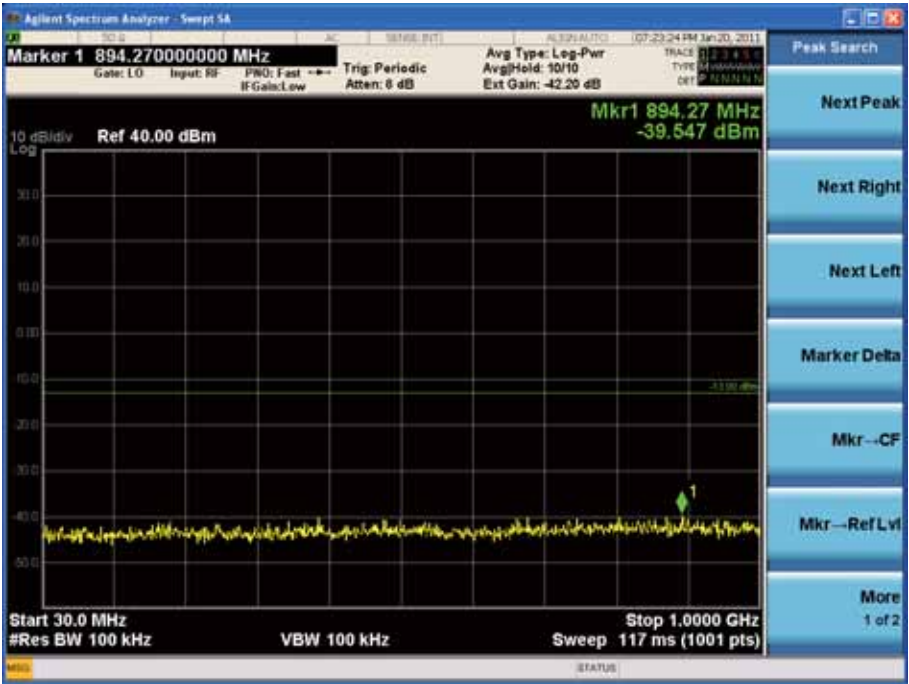
(16QAM High Channel)



(1 GHz ~ 26.5 GHz)

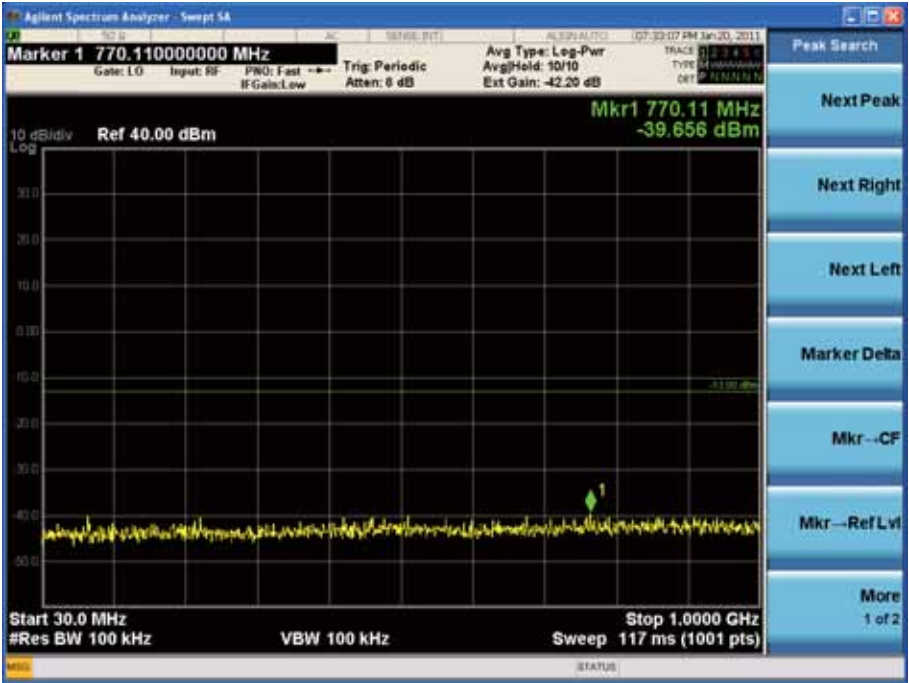
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 209 of 240

(64QAM Low Channel)



(30 MHz ~ 1 GHz)

(64QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 210 of 240

(64QAM High Channel)



(30 MHz ~ 1 GHz)

(64QAM Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 211 of 240

(64QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

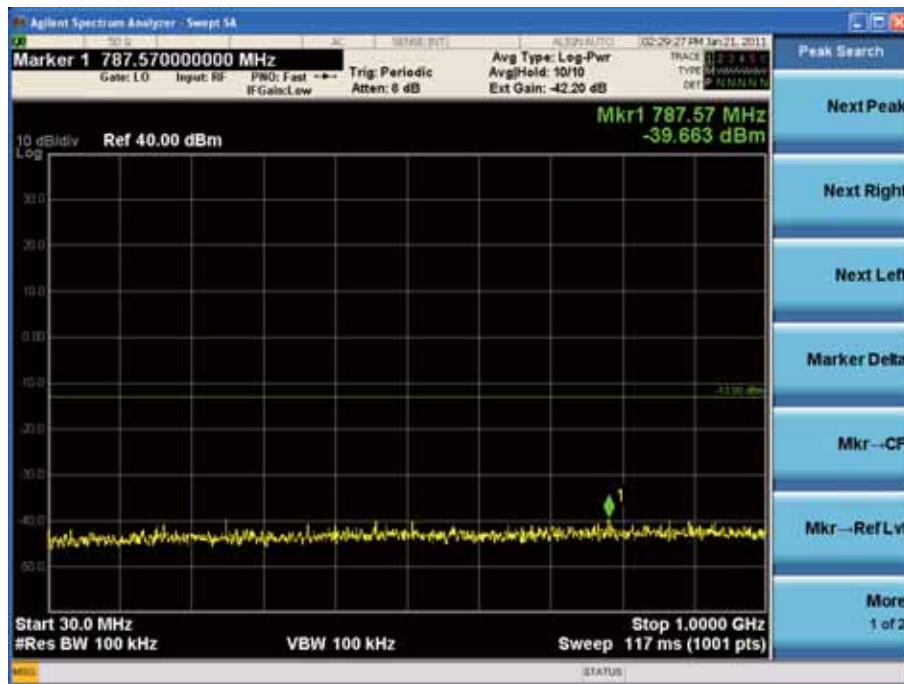
(64QAM High Channel)



(1 GHz ~ 26.5 GHz)

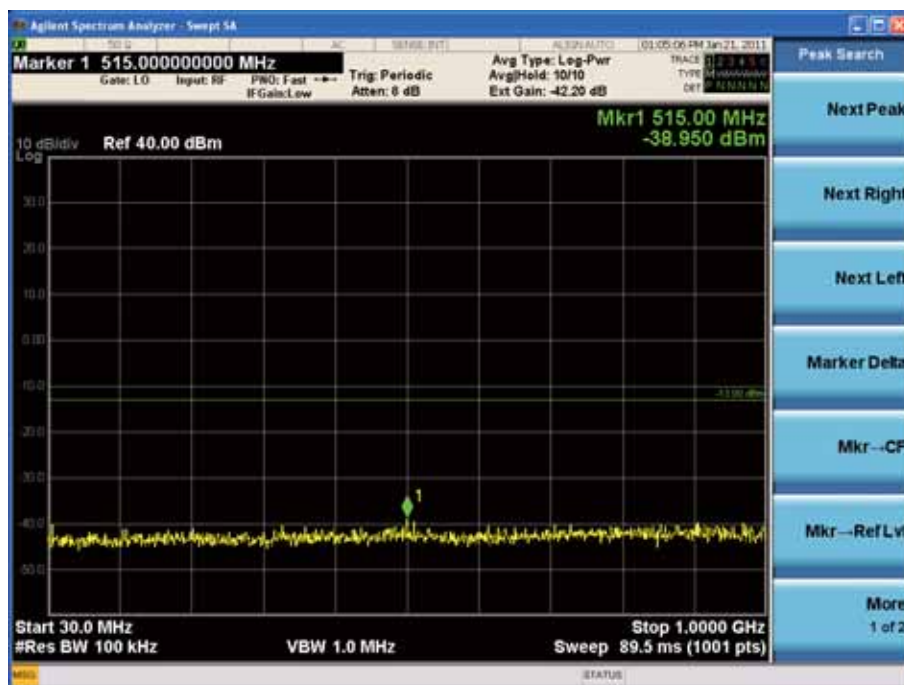
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 212 of 240

8.4.8. Plot Data at Output Port Gamma 2
(QPSK Low Channel)



(30 MHz ~ 1 GHz)

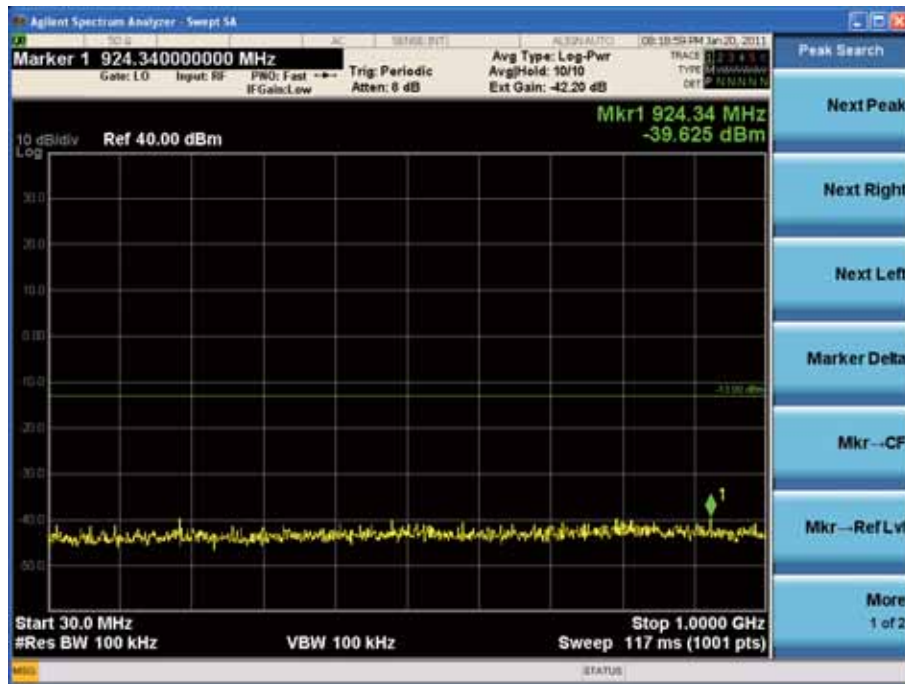
(QPSK Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 213 of 240

(QPSK High Channel)



(30 MHz ~ 1 GHz)

(QPSK Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 214 of 240

(QPSK Middle Channel)



(1 GHz ~ 26.5 GHz)

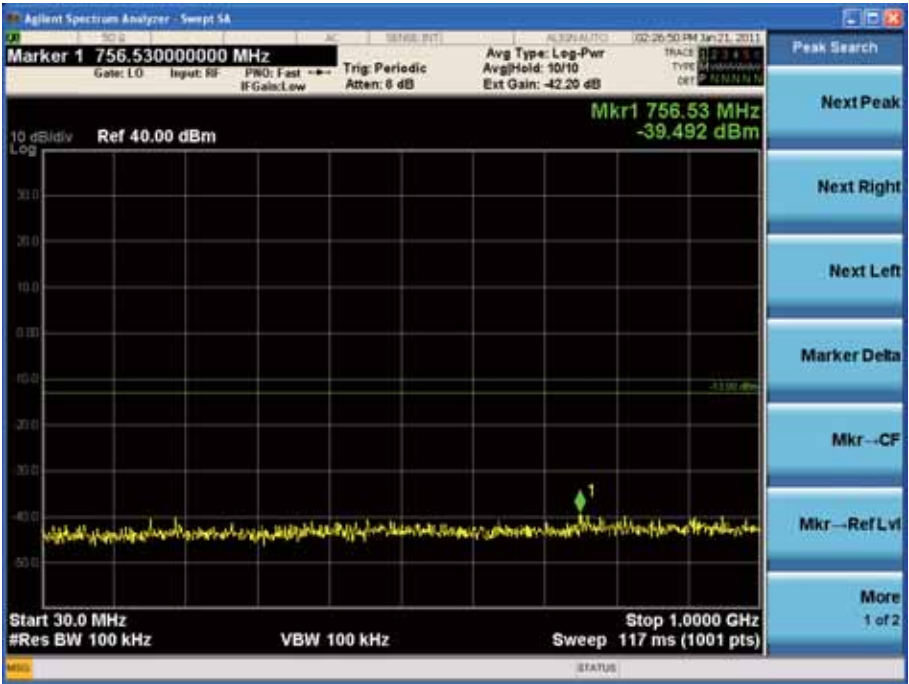
(QPSK High Channel)



(1 GHz ~ 26.5 GHz)

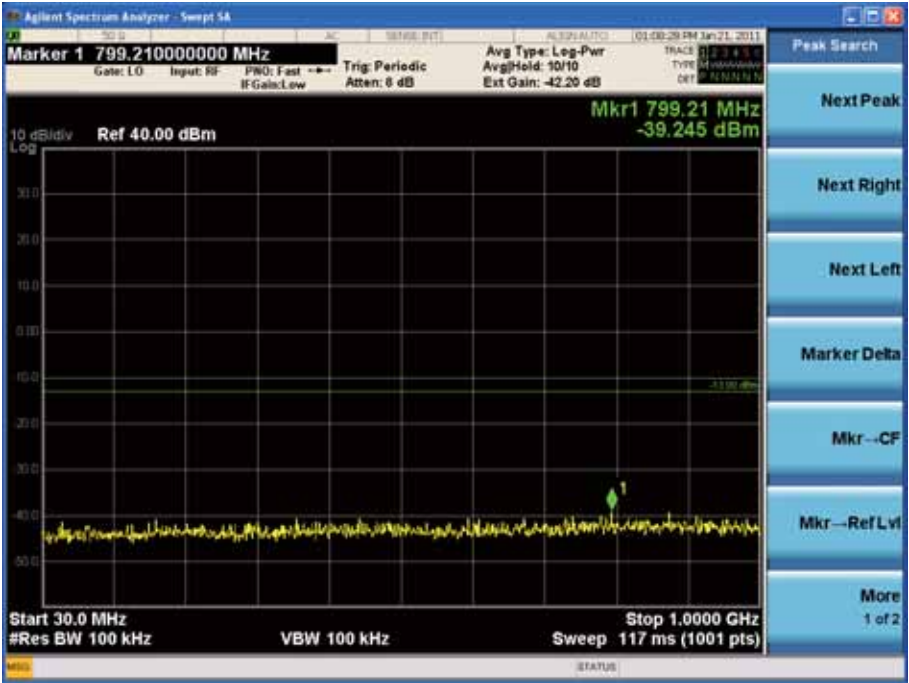
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 215 of 240

(16QAM LOW Channel)



(30 MHz ~ 1 GHz)

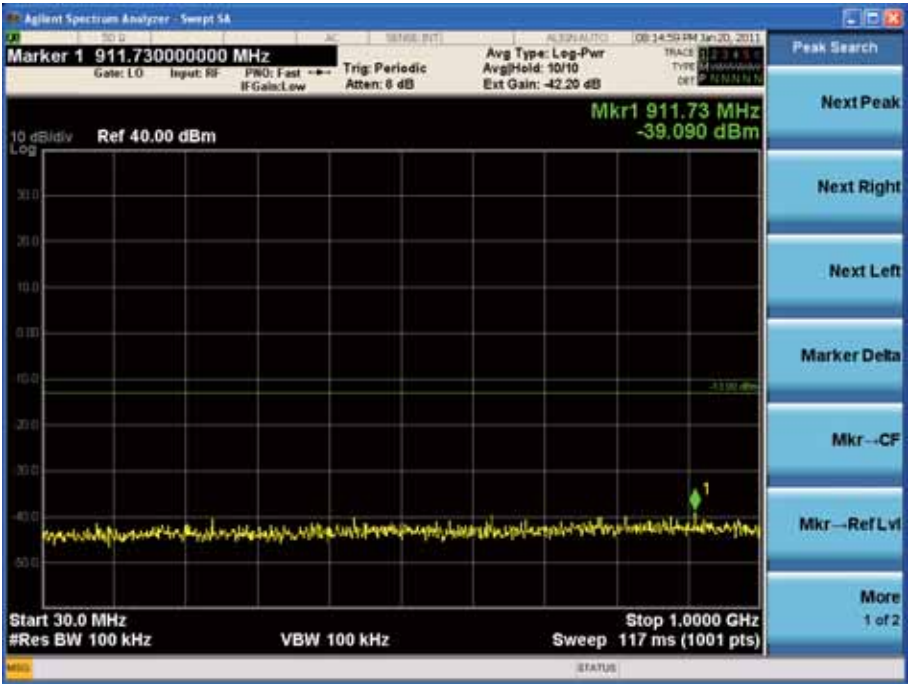
(16QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 216 of 240

(16QAM High Channel)



(30 MHz ~ 1 GHz)

(16QAM LOW Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 217 of 240

(16QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

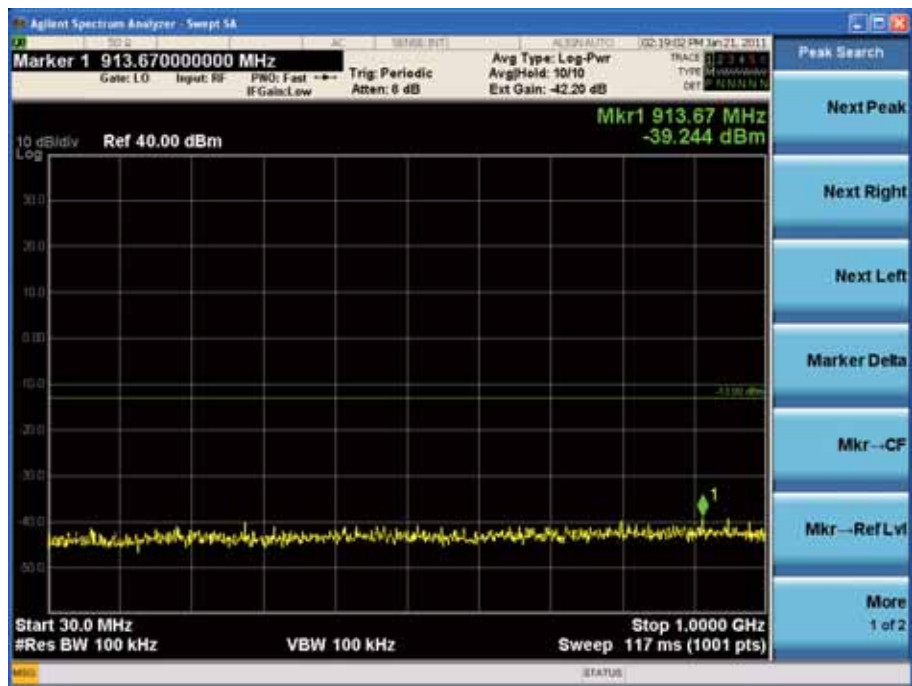
(16QAM High Channel)



(1 GHz ~ 26.5 GHz)

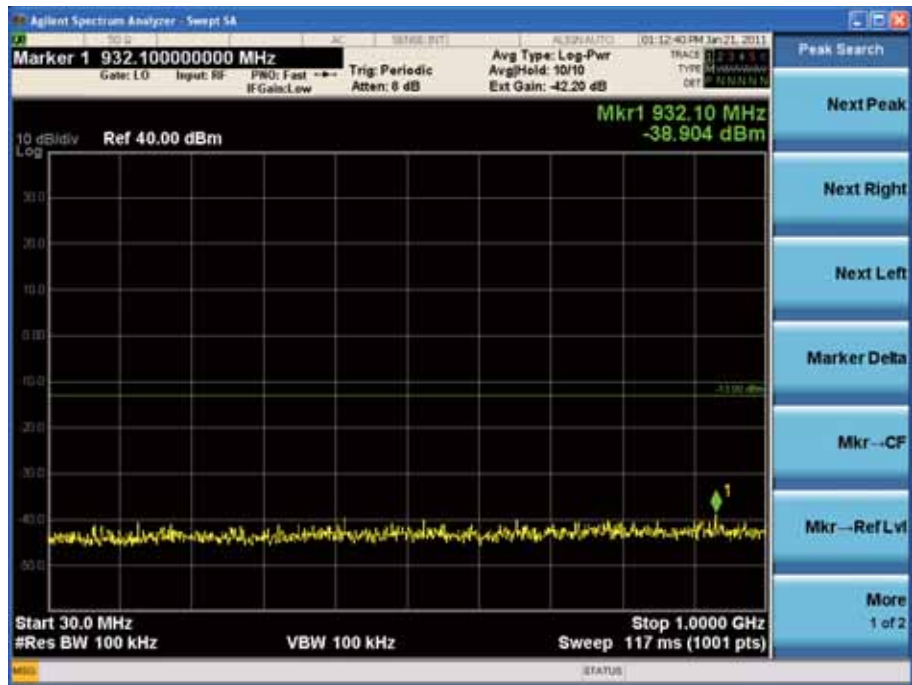
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 218 of 240

(64QAM Low Channel)



(30 MHz ~ 1 GHz)

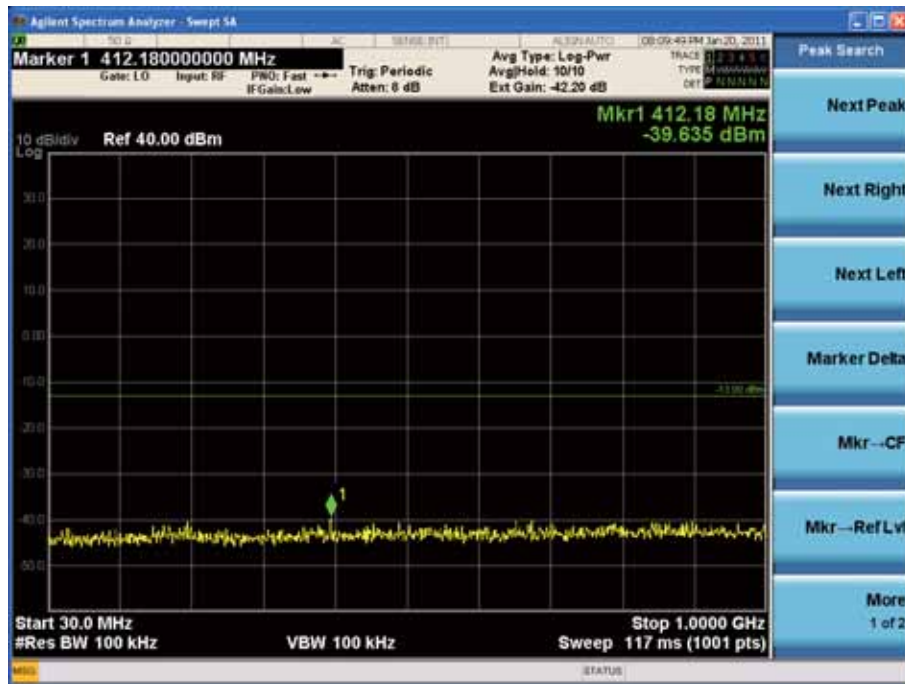
(64QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 219 of 240

(64QAM High Channel)



(30 MHz ~ 1 GHz)

(64QAM Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 220 of 240

(64QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

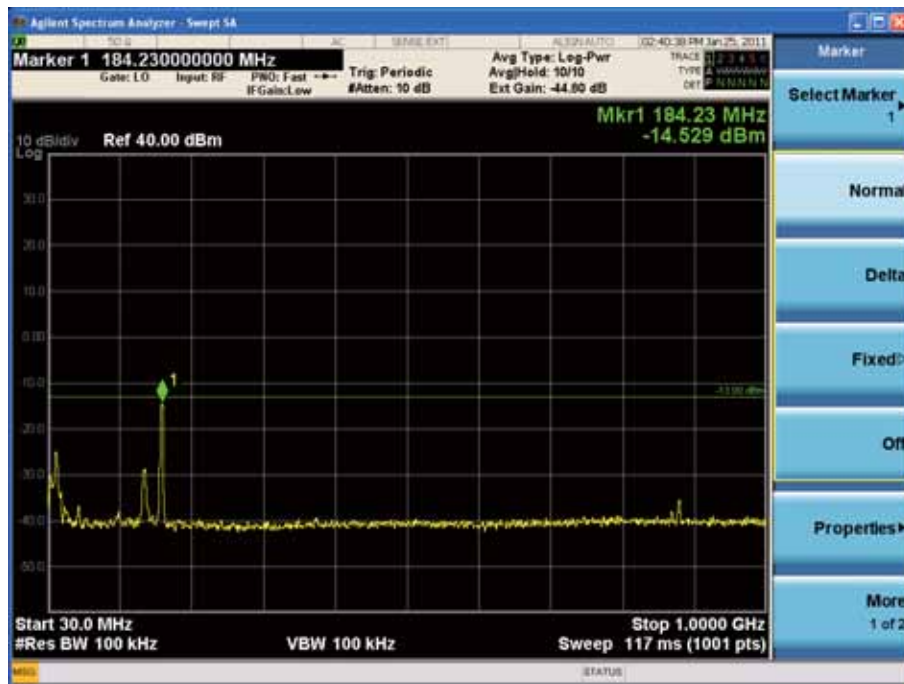
(64QAM High Channel)



(1 GHz ~ 26.5 GHz)

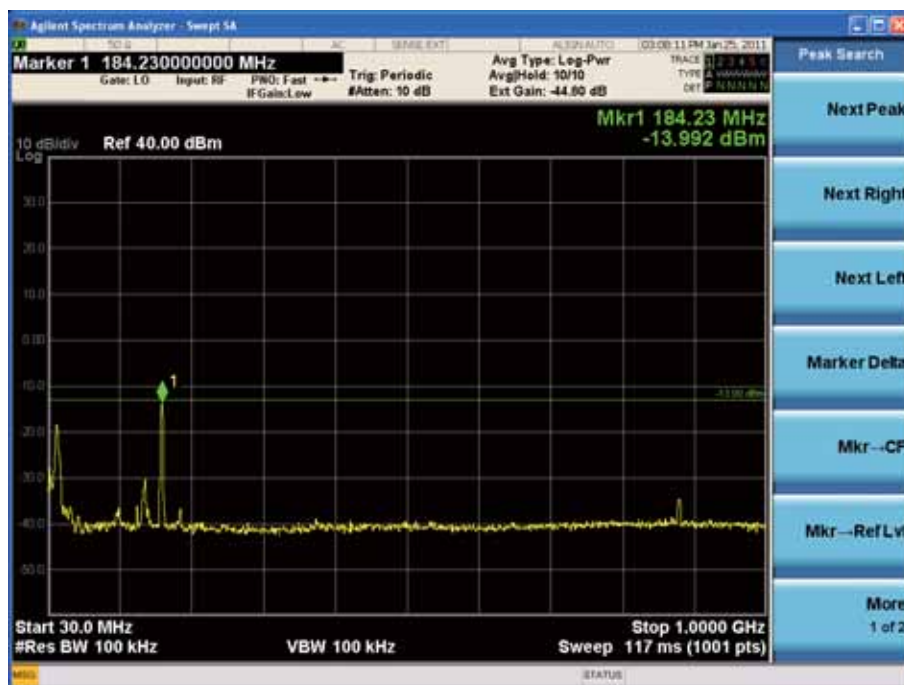
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 221 of 240

8.4.9. Combined Plot Data at Output
(QPSK Low Channel)



(30 MHz ~ 1 GHz)

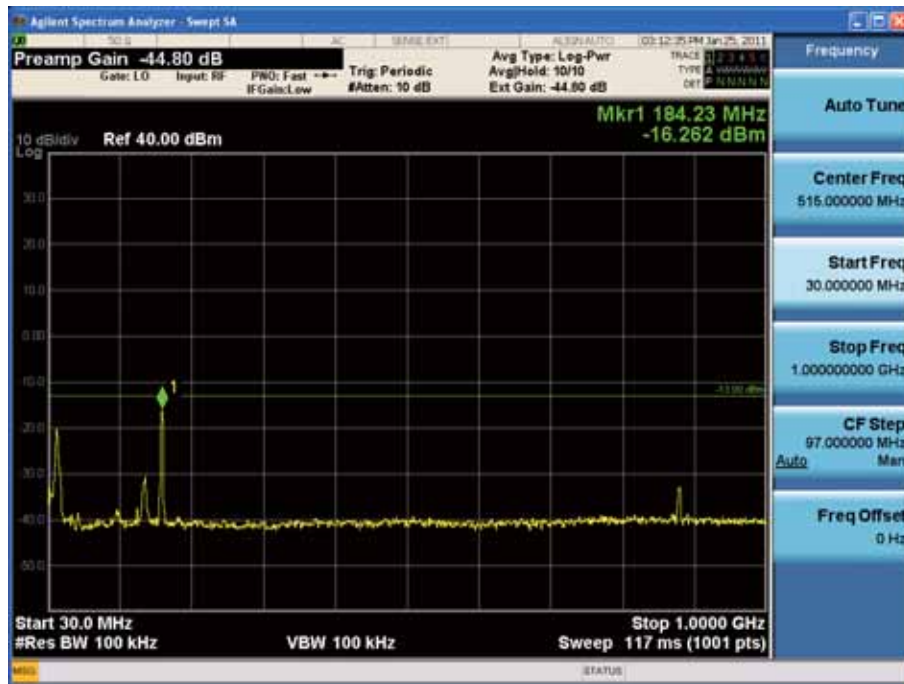
(QPSK Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 222 of 240

(QPSK High Channel)



(30 MHz ~ 1 GHz)

(QPSK Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 223 of 240

(QPSK Middle Channel)



(1 GHz ~ 26.5 GHz)

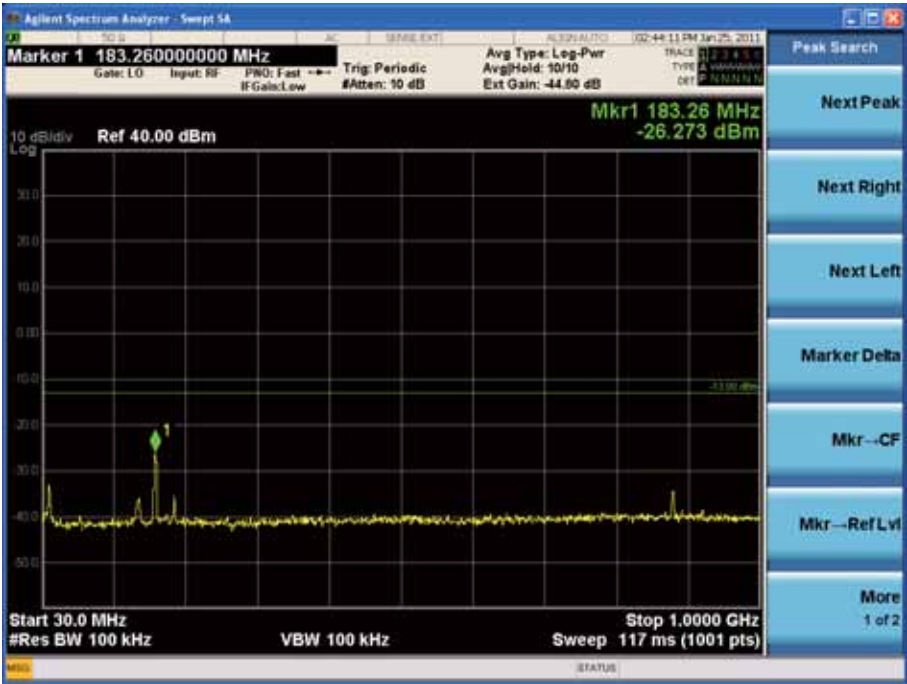
(QPSK High Channel)



(1 GHz ~ 26.5 GHz)

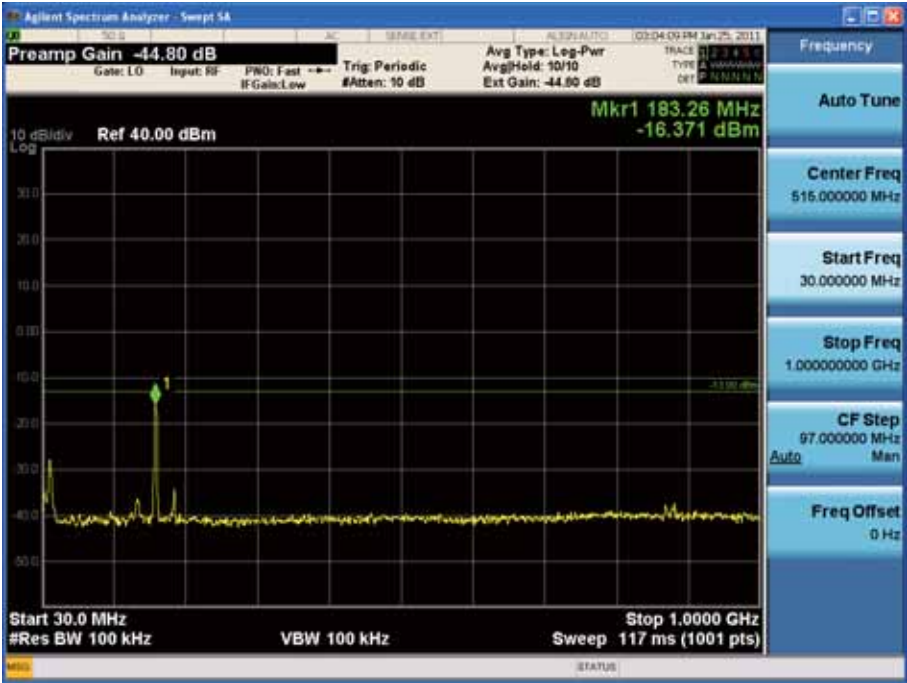
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 224 of 240

(16QAM LOW Channel)



(30 MHz ~ 1 GHz)

(16QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 225 of 240

(16QAM High Channel)



(30 MHz ~ 1 GHz)

(16QAM LOW Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 226 of 240

(16QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

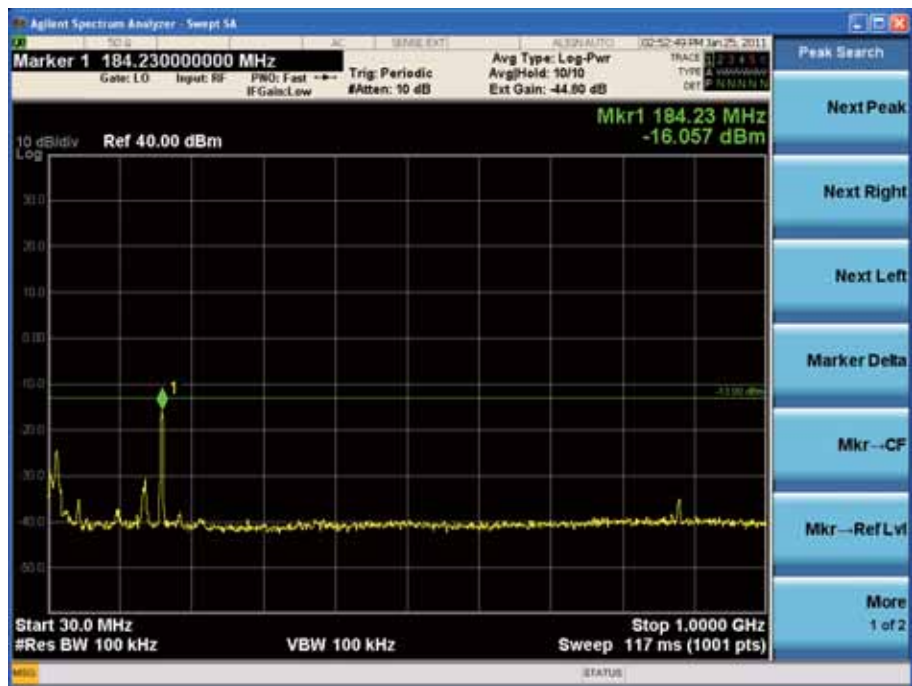
(16QAM High Channel)



(1 GHz ~ 26.5 GHz)

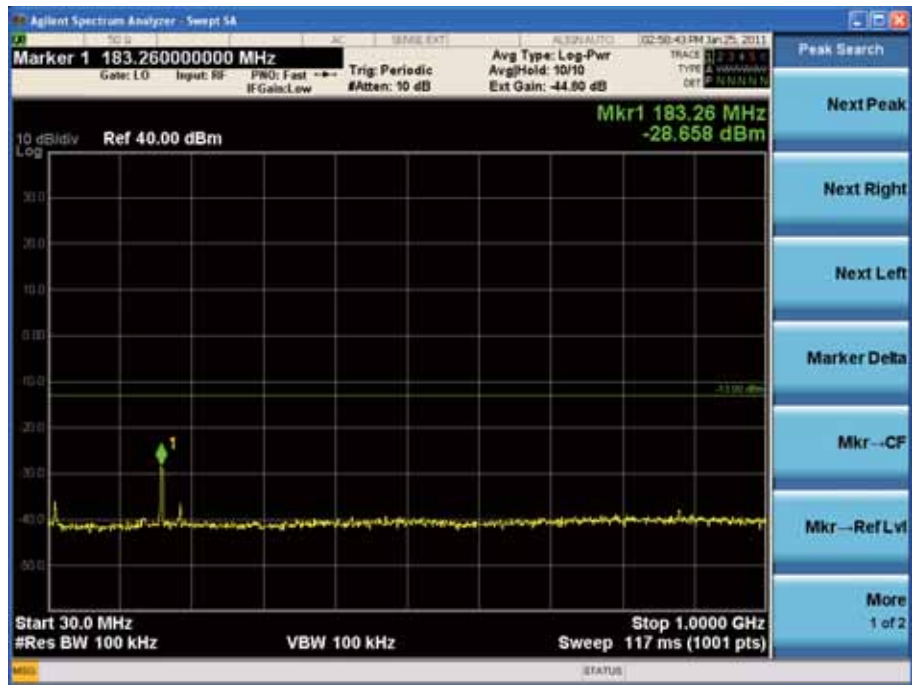
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 227 of 240

(64QAM Low Channel)



(30 MHz ~ 1 GHz)

(64QAM Middle Channel)



(30 MHz ~ 1 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 228 of 240

(64QAM High Channel)



(30 MHz ~ 1 GHz)

(64QAM Low Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1102FR01	Date of Issue: February 11, 2011	EUT Type: Mobile WiMAX Outdoor RAS	FCC ID: A3LSPI-2210022502	Page 229 of 240

(64QAM Middle Channel)



(1 GHz ~ 26.5 GHz)

(64QAM High Channel)



(1 GHz ~ 26.5 GHz)

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
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9. RADIATED SPURIOUS EMISSION

9.1 Applicable Standard

(1) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts. (2) For fixed and temporary fixed digital stations, the attenuation shall be not less than $43 + 10 \log (P)$ dB, unless a documented interference complaint is received from an adjacent channel licensee. Provided that the complaint cannot be mutually resolved between the parties, both licensees of existing and new systems shall reduce their out-of-band emissions by at least $67 + 10 \log (P)$ dB measured at 3 MHz from their channel's edges for distances between stations exceeding 1.5 km.

9.2 Test Equipment List and Details

Manufacturer	Model / Equipment	Serial No.	Calibration Due
Schwarzbeck	BBHA 9120D /Double Ridged Horn Antenna	296	09/23/2011
Schwarzbeck	BBHA 9120D /Double Ridged Horn Antenna	147	04/13/2011
Schwarzbeck	VULB 9168/ TRILOG Antenna	9168-255	05/28/2011
Schwarzbeck	VULB 9160/ TRILOG Antenna	3125	05/06/2011
HD	MA240/ Antenna Position Tower	556	N/A
EMCO	1050/ Turn Table	114	N/A
HD GmbH	HD 100/ Controller	13	N/A
HD GmbH	KMS 560/ SlideBar	12	N/A
MITEQ	AFS44-00102650-42-10P44-PS	1532439	04/05/2011
Schwarzbeck	BBHA9170/ SHF-EHF Horn Antenna	BBHA9170342	03/20/2011
R&S	ESI40 / EMI TEST Receiver	831564/003	10/30/2011

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9.3 Test Procedure

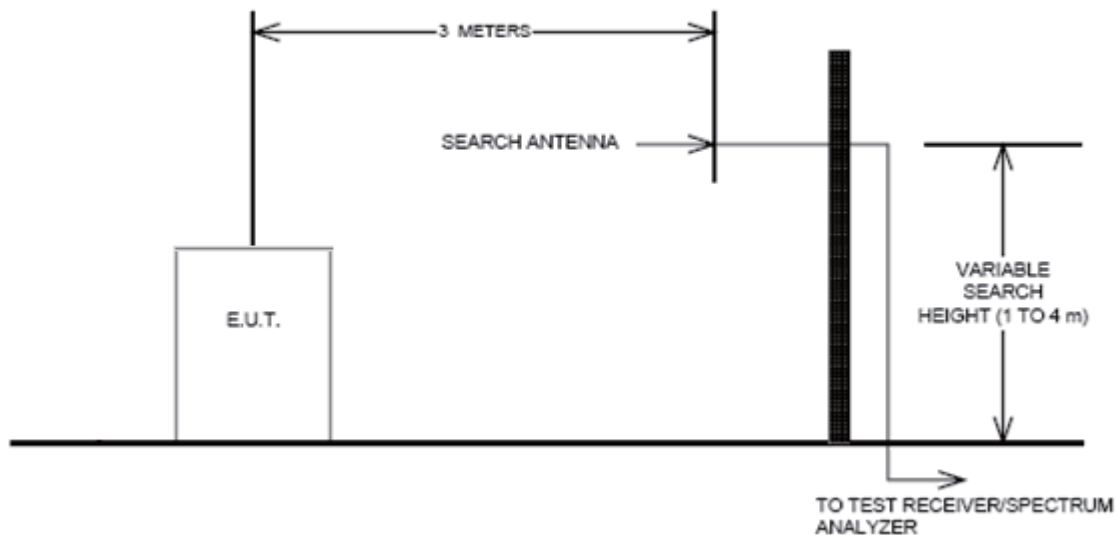
Radiated emission measurements were performed at an semi-anechoic chamber.

The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were terminated to 50ohm load. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360° and the receiving antenna scanned from 1-4m in order to capture the maximum emission.

A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was duplicated.

The maximum EIRP of the emission was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. Harmonic emissions up to the 10th or 40GHz, whichever was the lesser, were investigated.

9.3.1 Radiated Spurious Emissions Test Setup



9.3.2 Environmental Conditions:

Temperature:	23 °C
Relative Humidity:	18 %

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9.4 Test Result

: PASS (There were no emissions detected above the noise floor which was at least 20 dB below the limit.)

Frequency	Freq.(MHz)	<u>Substitute Level</u> [dBm]	Ant. Gain (dBd)	C.L	Pol.	ERP (dBm)	Margin (dB)
2543.25	5086.5	-41.58	10.30	4.22	H	-35.5	22.5
	7629.75	-39.75	9.21	6.29	H	-36.83	23.83
2653.75	5307.5	-39.77	10.42	4.29	H	-33.64	20.64
	7961.25	-35.86	9.30	6.92	H	-33.48	20.48
2686.75	5373.5	-40.11	10.45	4.31	H	-33.97	20.97
	8060.25	-35.59	9.09	6.67	H	-33.17	20.17

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10. FREQUENCY STABILITY

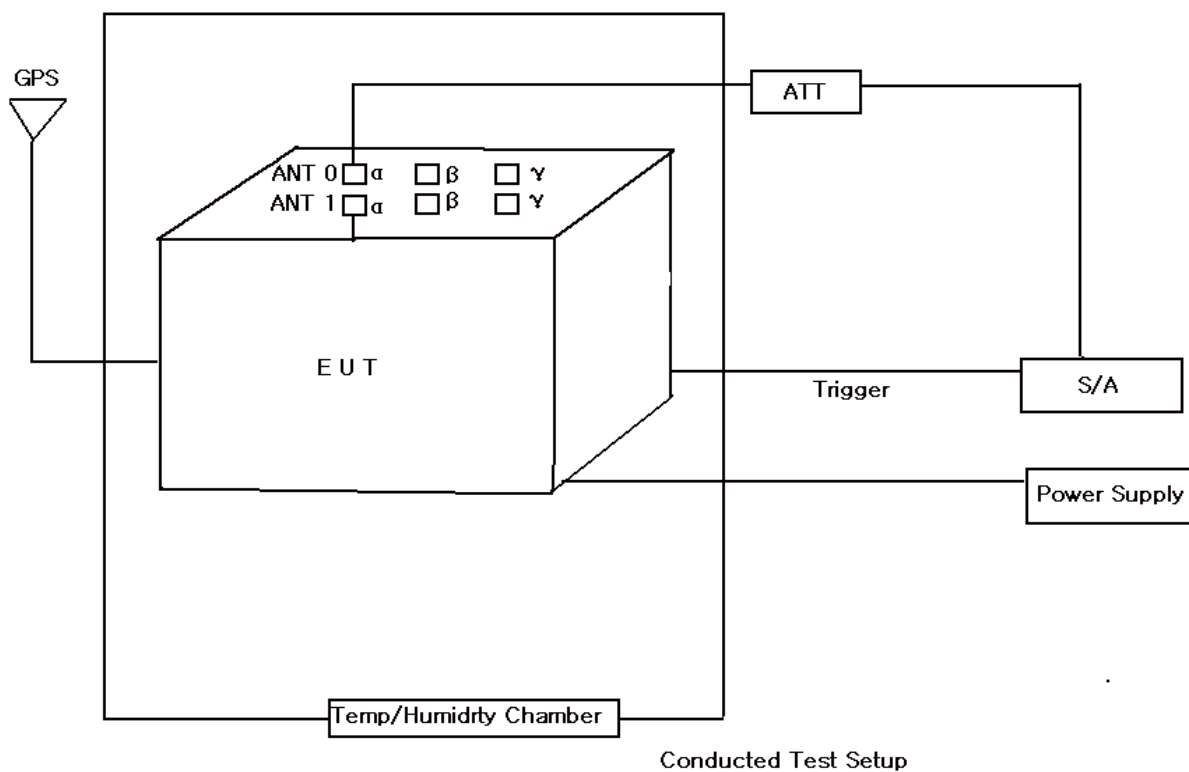
10.1 Applicable Standard

Requirements: FCC § 2.1055 (a), Part 27.54 following: The frequency stability shall be sufficient to ensure that the fundamental emissions stay

10.2 Test Equipment List and Details

Manufacturer	Model / Equipment	Serial No.	Calibration Due
Agilent	6674A / DC Power Supply	3501A00901	05/14/2011
WEINSCHEL	67-30-33 / Attenuator	BR0530	12/29/2011
WEINSCHEL	AF9003-69-31 / STEP ATTENUATOR	11787	11/12/2011
Agilent	N9020A / MXA Signal Analyzer	US46220219	03/03/2011
Nang-Yeul	NY-THR18750 / Temp	NY-200912201A	12/28/2011

10.3 Test Procedure



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Frequency Stability over Temperature variation:

The equipment under test was connected to an external DC power supply and the RF output was connected to a Spectrum Analyzer via feed-through attenuators. The EUT was placed inside the temperature chamber. RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 30 minutes, the frequency output was recorded from the VSA8960 S/W via MXA Signal Analyzer.

Frequency stability over Voltage variation: An external variable DC power supply Source. The voltage was set to 85% and 115% of the nominal value. The output frequency was recorded for each voltage.

10.3.1. Environmental conditions

Temperature:	24 ° C
Relative Humidity:	28 %

10.4. Test Result

: Pass

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10.4.1. Frequency Stability over Temperature and Voltage variation

Modulation: QPSK

Reference: - 48 Vdc at 20°C **Freq.** = 2543.25 MHz

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	2543 249 943	-57	0	0.0000
	-30	2543 249 937	-63	-6	-0.0024
	-20	2543 249 942	-58	-1	-0.0004
	-10	2543 249 937	-63	-6	-0.0024
	0	2543 249 941	-59	-2	-0.0008
	+10	2543 249 947	-53	4	0.0016
	+30	2543 249 937	-63	-6	-0.0024
	+40	2543 249 940	-60	-3	-0.0012
	+50	2543 249 941	-59	-2	-0.0008
115%	+20	2543 249 938	-62	-5	-0.0020
85%	+20	2543 249 937	-63	-6	-0.0024

(LBS Middle CH)

Modulation: 16QAM

Reference: - 48 Vdc at 20°C **Freq.** = 2660.25 MHz

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	2660 249 937	-63	0	0.0000
	-30	2660 249 941	-59	4	0.0015
	-20	2660 249 945	-55	8	0.0030
	-10	2660 249 938	-62	1	0.0004
	0	2660 249 939	-61	2	0.0008
	+10	2660 249 941	-59	4	0.0015
	+30	2660 249 942	-58	5	0.0019
	+40	2660 249 938	-62	1	0.0004
	+50	2660 249 940	-60	3	0.0011
115%	+20	2660 249 937	-63	0	0.0000
85%	+20	2660 249 939	-61	2	0.0008

(FH Middle CH)

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Modulation: 64QAM**Reference: - 48 Vdc at 20°C Freq. = 2653.75 MHz**

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	2653 749 945	-55	0	0.0000
	-30	2653 749 941	-59	-4	-0.0015
	-20	2653 749 941	-59	-4	-0.0015
	-10	2653 749 942	-58	-3	-0.0011
	0	2653 749 938	-62	-7	-0.0026
	+10	2653 749 940	-60	-5	-0.0019
	+30	2653 749 941	-59	-4	-0.0015
	+40	2653 749 937	-63	-8	-0.0030
	+50	2653 749 939	-61	-6	-0.0023
115%	+20	2653 749 940	-60	-5	-0.0019
85%	+20	2653 749 942	-58	-3	-0.0011

(UBS Middle CH)

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11. RF EXPOSURE STATEMENT

1. LIMITS

According to §1.1310 and §2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
0.3 - 1.34.....	614	1.63	*(100)	30
1.34 - 30.....	824/f	2.19/f	*(180/ f ²)	30
30 - 300.....	27.5	0.073	0.2	30
300 - 1500.....			f/1500	30
1500 - 100.000.....			1.0	30

F = frequency in MHz

* = Plane-wave equivalent power density

2. MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

S = Power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

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Max Peak output Power at antenna input terminal	40.21000	dBm
Max Peak output Power at antenna input terminal	10495.42429	mW
Prediction distance	300.00000	cm
Prediction frequency	2499.00000	MHz
Antenna Gain(typical)	17.00000	dBi
Antenna Gain(numeric)	50.11872	–
Power density at prediction frequency (S)	0.46510	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.00000	mW/cm ²

(LBS)

Max Peak output Power at antenna input terminal	40.58000	dBm
Max Peak output Power at antenna input terminal	11428.78335	mW
Prediction distance	300.00000	cm
Prediction frequency	2627.25000	MHz
Antenna Gain(typical)	17.00000	dBi
Antenna Gain(numeric)	50.11872	–
Power density at prediction frequency (S)	0.50646	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.00000	mW/cm ²

(FH)

Max Peak output Power at antenna input terminal	39.92000	dBm
Max Peak output Power at antenna input terminal	9817.47943	mW
Prediction distance	300.00000	cm
Prediction frequency	2648.75000	MHz
Antenna Gain(typical)	17.00000	dBi
Antenna Gain(numeric)	50.11872	–
Power density at prediction frequency (S)	0.43506	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.00000	mW/cm ²

(UBS)

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3. RESULTS

The power density level at 300 cm is 0.50646 mW/cm², which is below the uncontrolled exposure limit of 1.0 mW/cm² at 2627.25 MHz.

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