Advanced
Compliance Laboratory

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Hillsborough, NJ 08844
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Electromagnetic Emission Compliance Test Report

Equipment Under Test (EUT)	**Skymaster TX HD/SD COFDM Transmitter 65SKTX**
Applicant	Integrated Microwave Technologies, LLC.
In Accordance With	FCC Part 101 (/Part 2)
Test by	Advanced Compliance Laboratory, Inc. 6 Randolph Way Hillsborough, New Jersey 08844
Authorized by	Wei Li Lab Manager Signature
Date	January 8, 2013
AC Lab Report Number	0048-130108-01

Lab Code:200101-0

The test result in this report is supported and covered by the NVLAP accreditation.

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Section 1. Summary of Test Results

Manufacturer:	Integrated Microwave Technologies, LLC.
Model No.:	Skymaster TX HD/SD COFDM Transmitter
	65SKTX
Sample No.:	ENGUNIT002

General: **All measurements are traceable to national standards**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 2& Part 101 Subparts C&H for mobile operation.

☒New Submission ☐Production Unit

☐Class II Permissive Change ☒Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

"See Summary of Test Data"

NVLAP LAB CODE: 200101-0

Summary of Test Data

FCC Part 101, Subparts C&H Testing Items	FCC Requirements	Limit	Result
RF Power Output	101.113/2.1046	35dBW (65dBm) (6425-6525MHz Band) EIRP	Complies
Occupied Bandwidth	101.109/2.1049	25MHz (6G Band)	Complies
Spurious Emissions at Antenna Terminals	101.111(a)(2)/2.1051	-13 dBm	Complies
Field Strength of Spurious Emissions	101.111(a)(2)/2.1051	-13 dBm E.I.R.P.	Complies
Emission Limitation Mask	101.111(a)(2)	Mask	Complies
Frequency Stability vs. Voltage &Temperature	101.108/2.1055	50ppm	Complies

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty u_c	norm.	±2.36	±2.99	±1.83

Wei Li
Lab Manager
Advanced Compliance Lab

Date: January 8, 2013

Section 2. General Equipment Specification

Supply Voltage	Nominal +28Vdc Extended +24-32Vdc					
EUT Type	**Mobile Operation**					
Frequency Range	6G Band	**6425.0 - 6525.0 MHz**				
Modulations	All Modes	Digital QPSK (D7W) ☒	Digital 16QAM (D7W) ☒	Digital 64QAM (D7W) ☒		
Emission Designators / Max. Rated Power	**8M0D7W/25M0D7W** **Max. Rate Power: 4W (36dBm)** See Page 7 for details					
Max. Antenna Gain	<29dBi					
Output Impedance	50ohm					
Frequency Translation	All Bands	F1-F1 ☒	F1-F2 ☐	N/A ☐		
		Software ☐	Duplexer Change ☐	Full Band Coverage ☒		

DC voltages and DC currents per 2.1033(c)(8)

The input supply to the RF Circuitry was set as followings:
6GHz Band: 12Vdc/9Amax for & 28Vdc /5.3Amax for SKTX unit
The RF power output was measured with the indicated voltage and current applied into the final RF amplifying device(s).
Measured Maximum RF output : 35.95dBm (3.95W)
Measured Minimum RF output: 0 dBm

Tune-up procedure per 2.1033(c) (9)

There are no user accessible adjustments or tuning in this portable Transmitter. All necessary adjustments and tuning are performed during manufacture of the product. Any adjustments or tuning after service or repair are done as part of that process as special equipment is required to perform such adjustments.

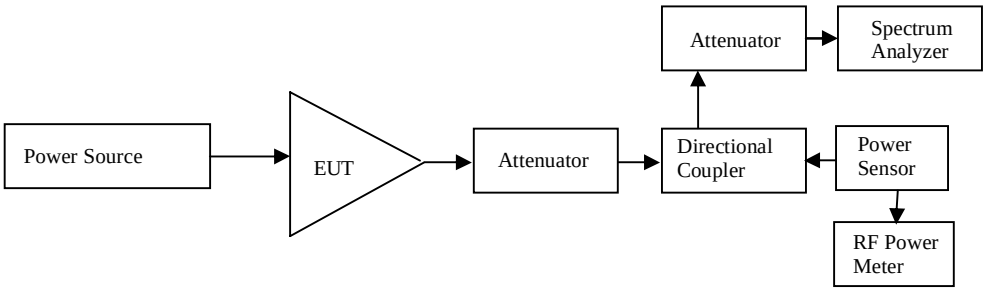
Description of Operation

The new SkymasterTX (SKTX) is a lightweight, full-featured digital COFDM video downlink transmitter built to address the unique requirements of aircraft downlink operation. The chassis design features either horizontal or vertical ARINC mounting. All of the connections and controls have been located on one side of the unit. This allows the SkymasterTX to be removed from one aircraft and installed in another with ease.

System Diagram

See Attachment.

General EUT Setup



Internal color-bar signal was used for testing.

Channel Plan:

Requirements --refer to 101.147 (j) for OFS systems in 6GHz Operating Band: two pairs of 1MHz bandwidth channels, 6 pairs of 8MHz channels and 2 pairs of 25MHz channels.

Example of EUT 8 MHz Channels:
6430, 6438, 6446, 6455, 6463, 6471, 6480, 6488, 6496, 6505, 6513, 6521 (MHz)
Example of EUT 25 MHz channels:
6437.5 6462.5 6487.5 6512.5 (MHz)

Testing Frequency/Modulation BW/Mask BW/Modulation/Power Selection:

CH	Frequency MHz	Mod BW MHz	Mask BW MHz	Modulation	PWR SET (High/Low) dBm	Emission Designator
L	6429	6	8	QPSK 16QAM 64QAM	**32/31 (1.58W/1.26W)**	8M0D7W
M	6475					
H	6521					
L	6437.5	8	25	QPSK 16QAM 64QAM	**36/31 (3.98W/1.26W)**	25M0D7W
M	6475					
H	6512.5					

Section 3. RF Output Power

Name of Test:	*RF Output Power*	Test Standard:	*101.113/2.1046*
Tested By:	WEI LI	Test Date:	04/12/2012-06/20/2012

Minimum Standard: Refer to FCC Part 101.113(a)/2.1046:
Power Limit

Frequency Band (MHz)	Maximum Allowable Transmitter Power for Mobile: EIRP (dBW) /(dBm)
6,425 to 6,525	35 dBW / 65dBm

Method of Measurement: *Detachable Antenna:*
The average/peak power at antenna terminals is measured using power meter.

Integral Antenna:
If the antenna is not detachable from the circuit then the Peak Power Output is derived from the peak radiated field strength of the fundamental emission by using the plane wave relation

$$\frac{GP}{4\pi R^2} = \frac{E^2}{120\pi}$$

and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,
P = the equivalent isotropic radiated power in watts
E = the maximum measured field strength in V/m
R = the measurement range (3 meters)
G = the numeric gain of the transmit antenna in relation to an isotropic radiator

Test Result: **Complies**

Test Data:

Summary: Max. output power is 35.62 dBm at antenna port. Therefore, the maximum antenna gain for use with this device shall be no more than (65-36=) 29dBi in order to comply with the 35dBW (65dBm) limit.

Channel BW / Signal BW (MHz)	Freq Channel	Transmitter Power (dBm): *High Setting*				FCC Limit (dBm)	UNDER LIMIT
		QPSK	16QAM	64QAM			
8 /6	L	31.88	31.91	31.87		65	Y
	M	31.74	31.72	31.76		65	Y
	H	31.50	31.54	31.53		65	Y
25 /8	L	35.62	35.60	35.61		65	Y
	M	35.54	35.56	35.50		65	Y
	H	35.48	35.44	35.51		65	Y

Channel BW / Signal BW (MHz)	Freq Channel	Transmitter Power (dBm): *Low Setting*				FCC Limit (dBm)	UNDER LIMIT
		QPSK	16QAM	64QAM			
8 /6	L	30.41	30.23	30.33		65	Y
	M	30.40	30.29	30.37		65	Y
	H	30.58	30.60	30.61		65	Y
25 /8	L	30.64	30.68	30.67		65	Y
	M	30.74	30.73	30.71		65	Y
	H	30.65	30.62	30.64		65	Y

Section 4. Occupied Bandwidth

Name of Test:	*Occupied Bandwidth*	Test Standard:	*101.109/2.1049*
Tested By:	WEI LI	Test Date:	04/12/2012-06/20/2012

Minimum Standard: Part 101.109(c)

(c) The maximum bandwidth which will be authorized per frequency assigned is set out in the table that follows. Regardless of the maximum authorized bandwidth specified for each frequency band, the Commission reserves the right to issue a license for less than the maximum bandwidth if it appears that a lesser bandwidth would be sufficient to support an applicant's intended communications.

Frequency Band (MHz)	Maximum Authorized Bandwidth (MHz)
6,425 to 6,525	25

Method of Measurement: Spectrum Analyzer Settings:
RBW: 1~3% of Signal Channel BW
VBW: ≥RBW
Span: As required
Sweep: Auto
Input Signal Characteristics:
RF level: Maximum Gain recommended by manufacturer

Test Result: **Complies**

Test Data: Attached Plots

Channel BW / Signal BW (MHz)	Freq Channel	OC BW (MHz): High power Setting				FCC Limit (MHz)	UNDER LIMIT
		QPSK	16QAM	64QAM			
8 /6	L	5.6517	5.6627	5.6713		25	Y
	M	5.6711	5.6450	5.6538		25	Y
	H	5.6798	5.6819	5.6824		25	Y
25 /8	L	7.5436	7.5564	7.4949		25	Y
	M	7.5414	7.5291	7.5425		25	Y
	H	7.5178	7.5220	7.5301		25	Y

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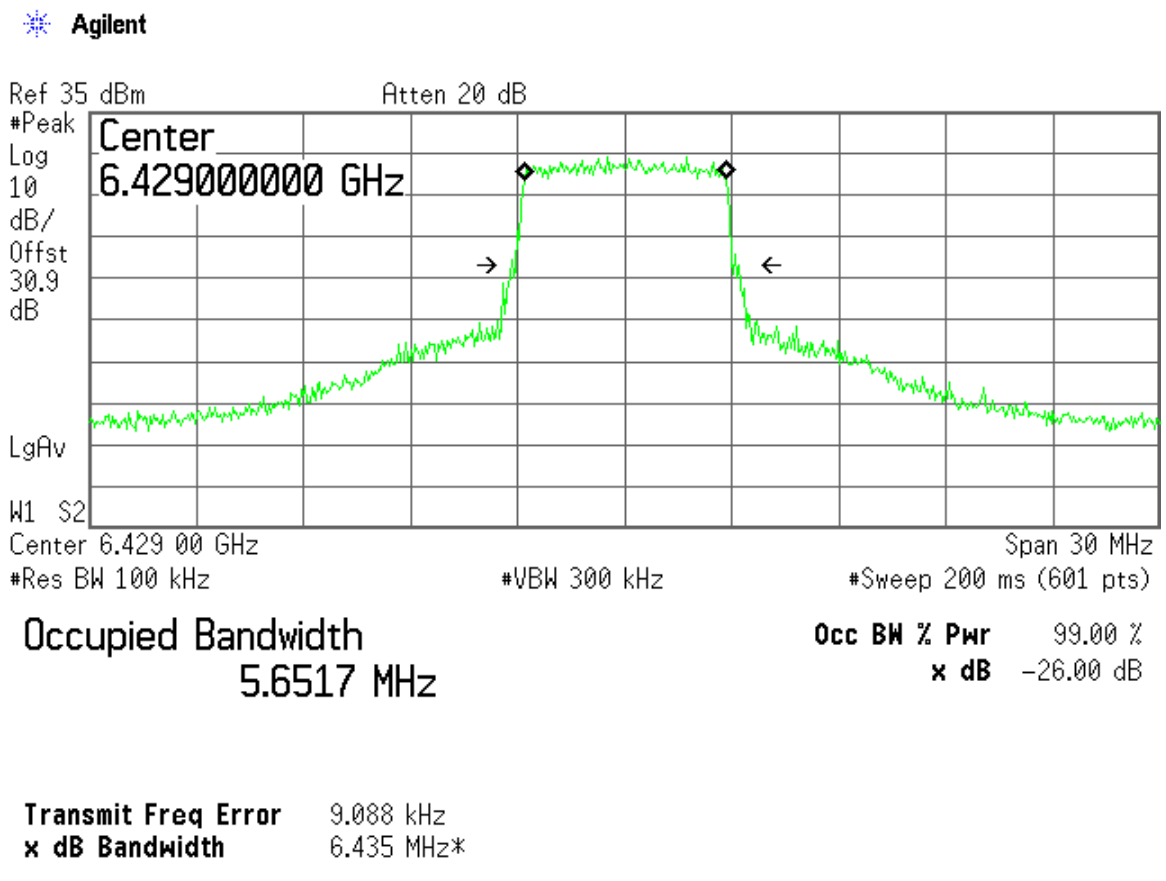
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Occupied Bandwidth: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	OC BW: Hi Power, QPSK Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT



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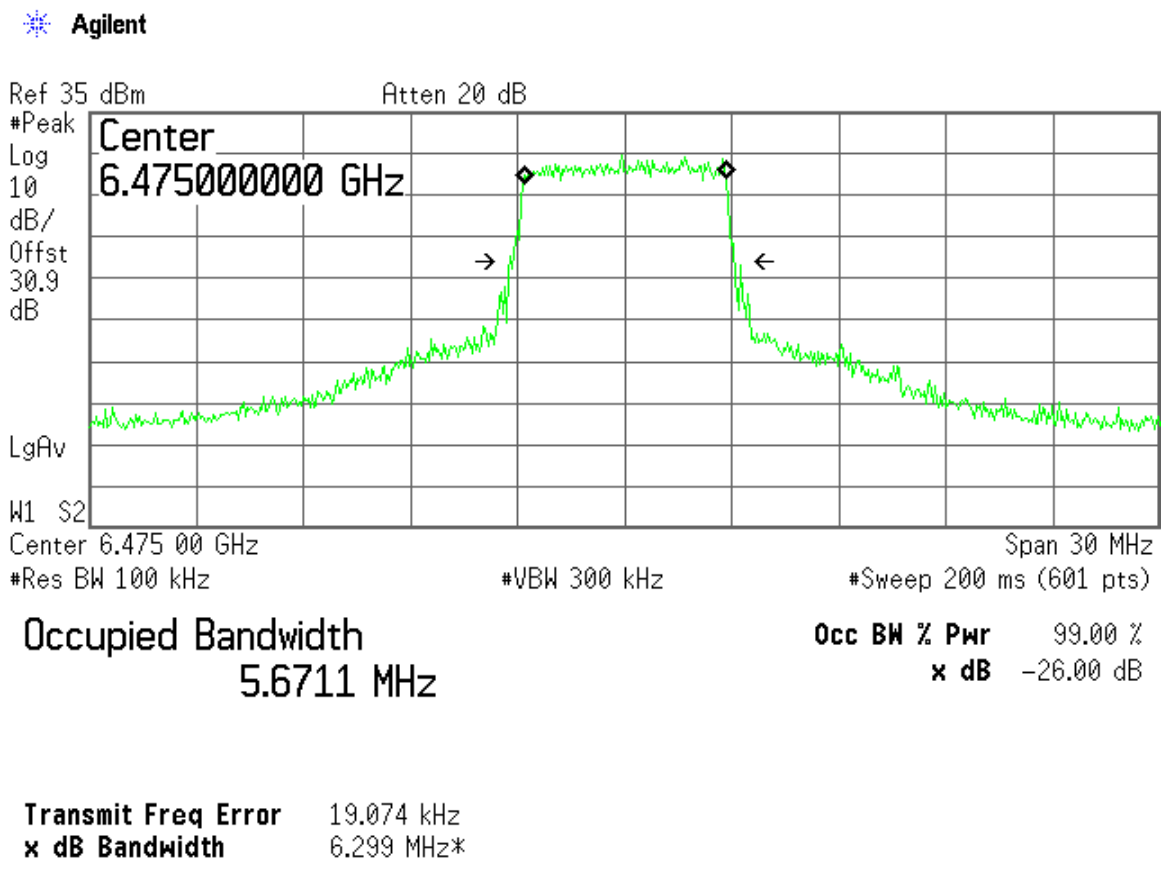

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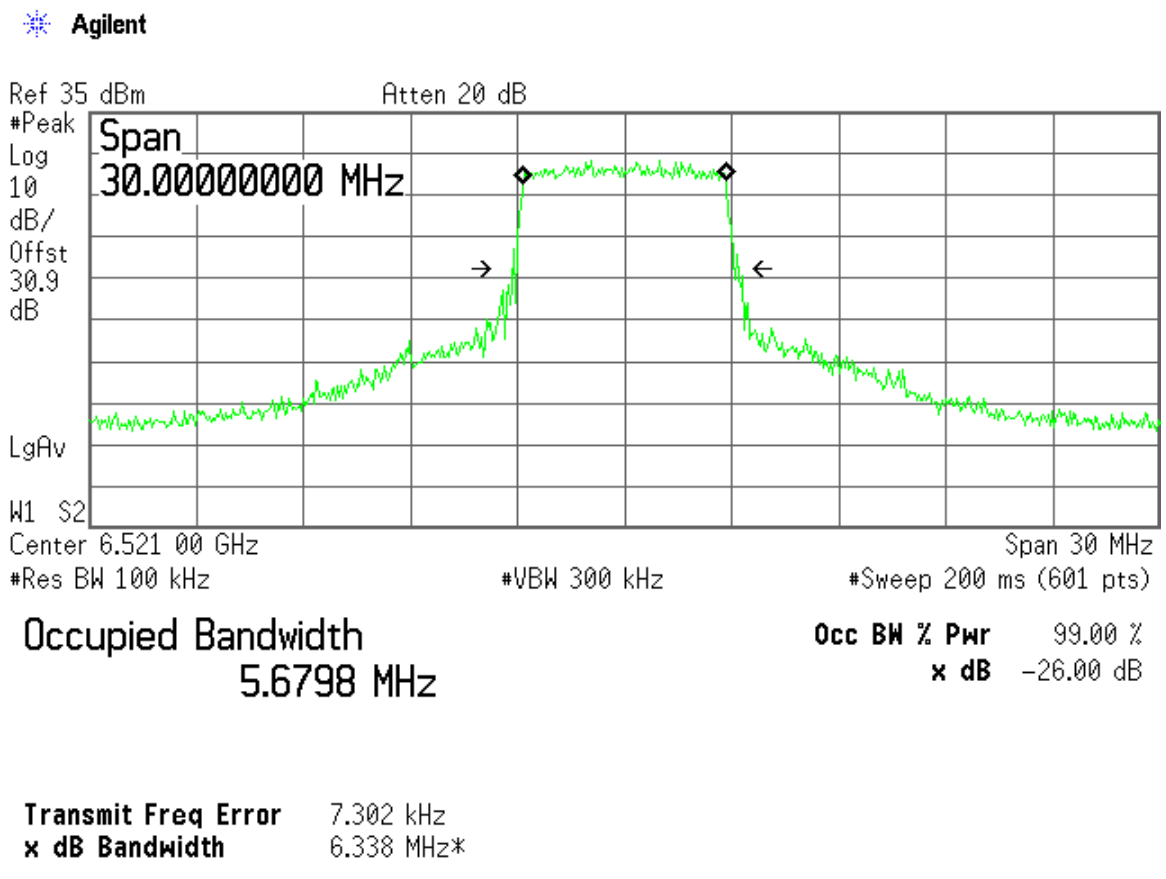

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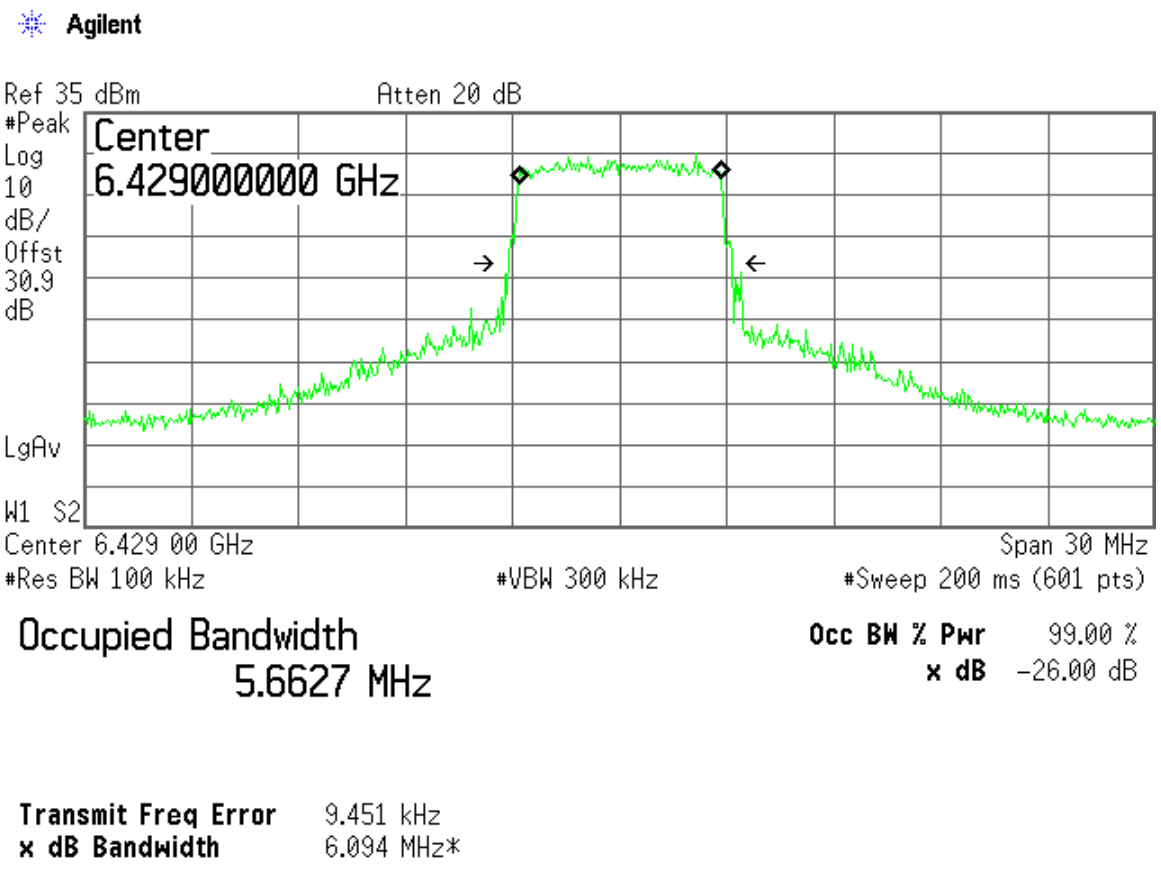
Configuration:	SG Input: Color Bar. Output Port: EUT



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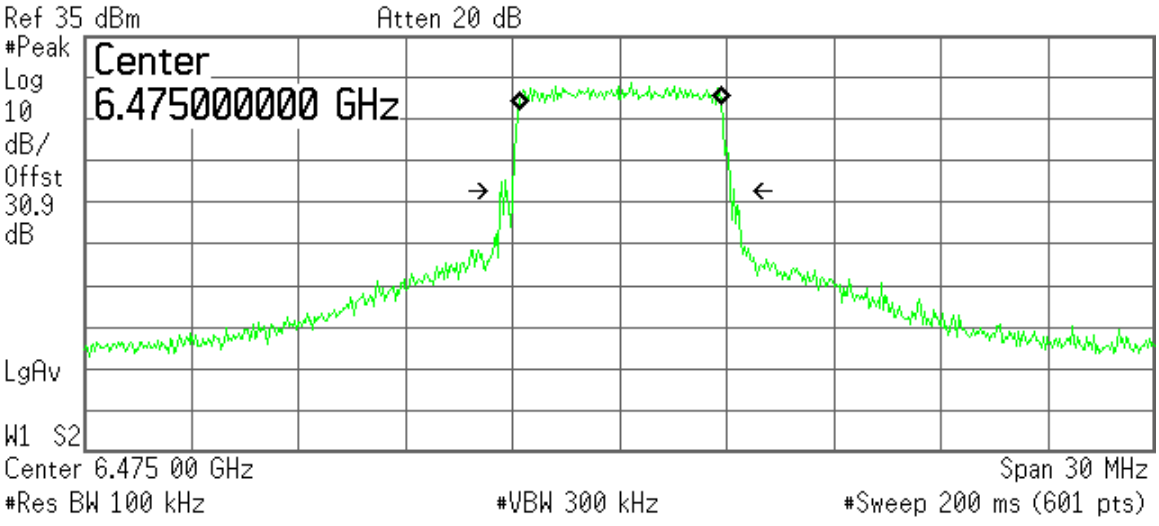

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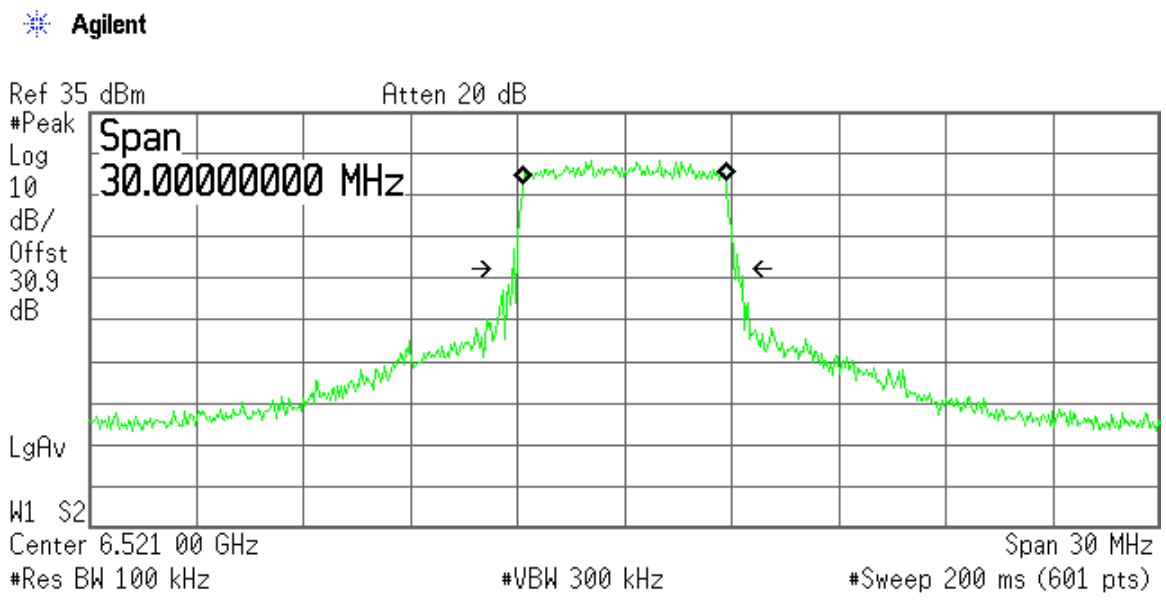

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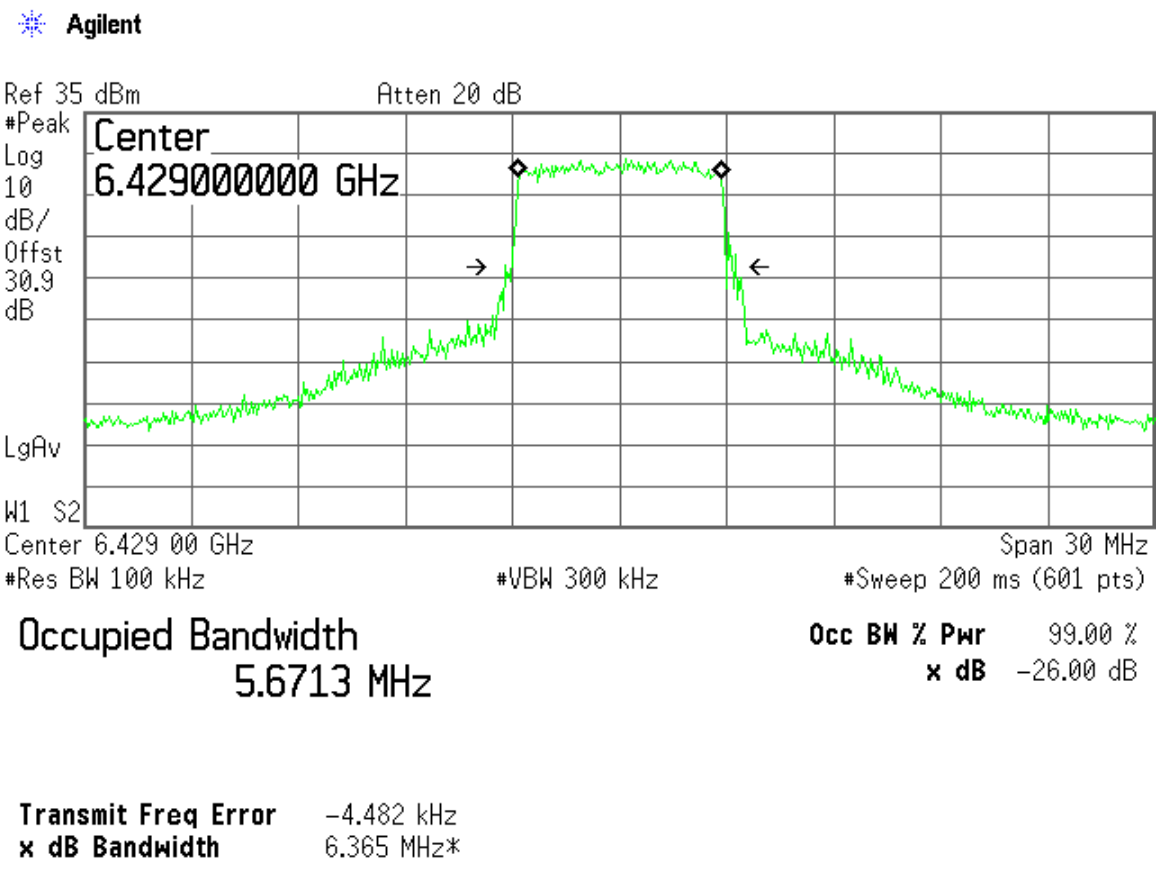

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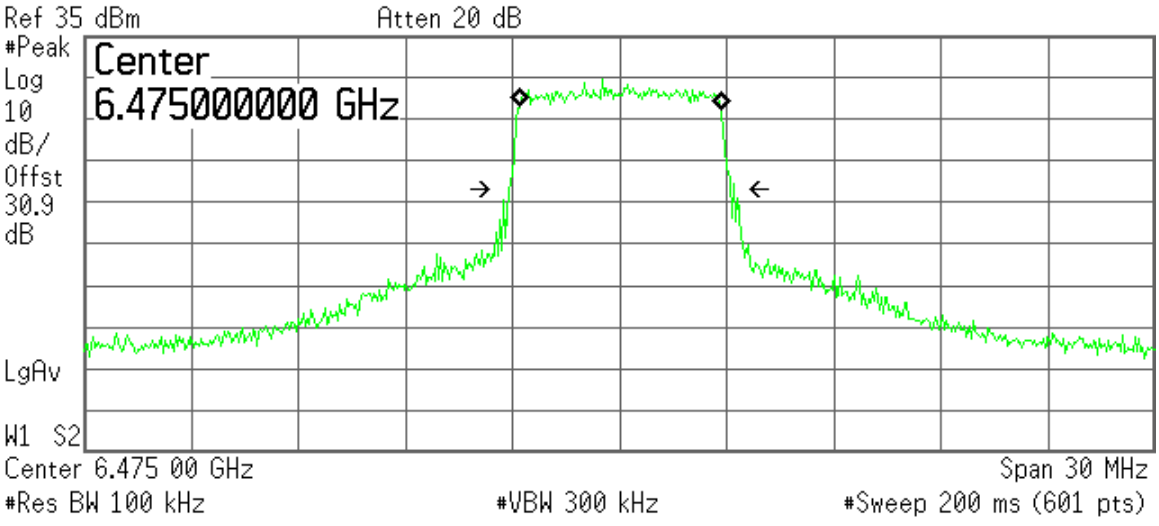

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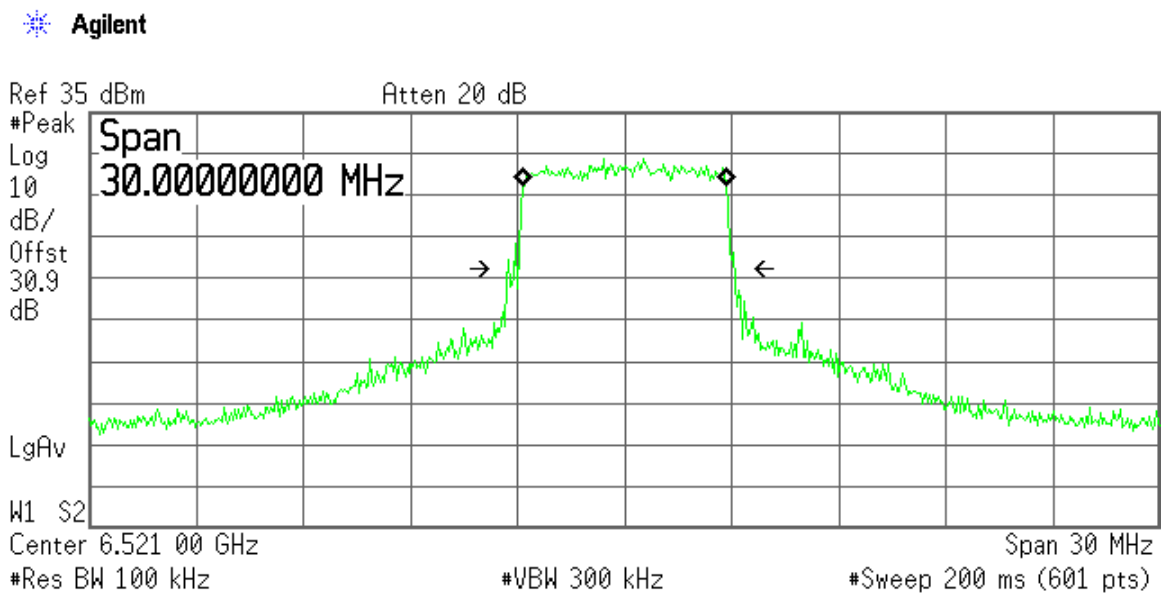

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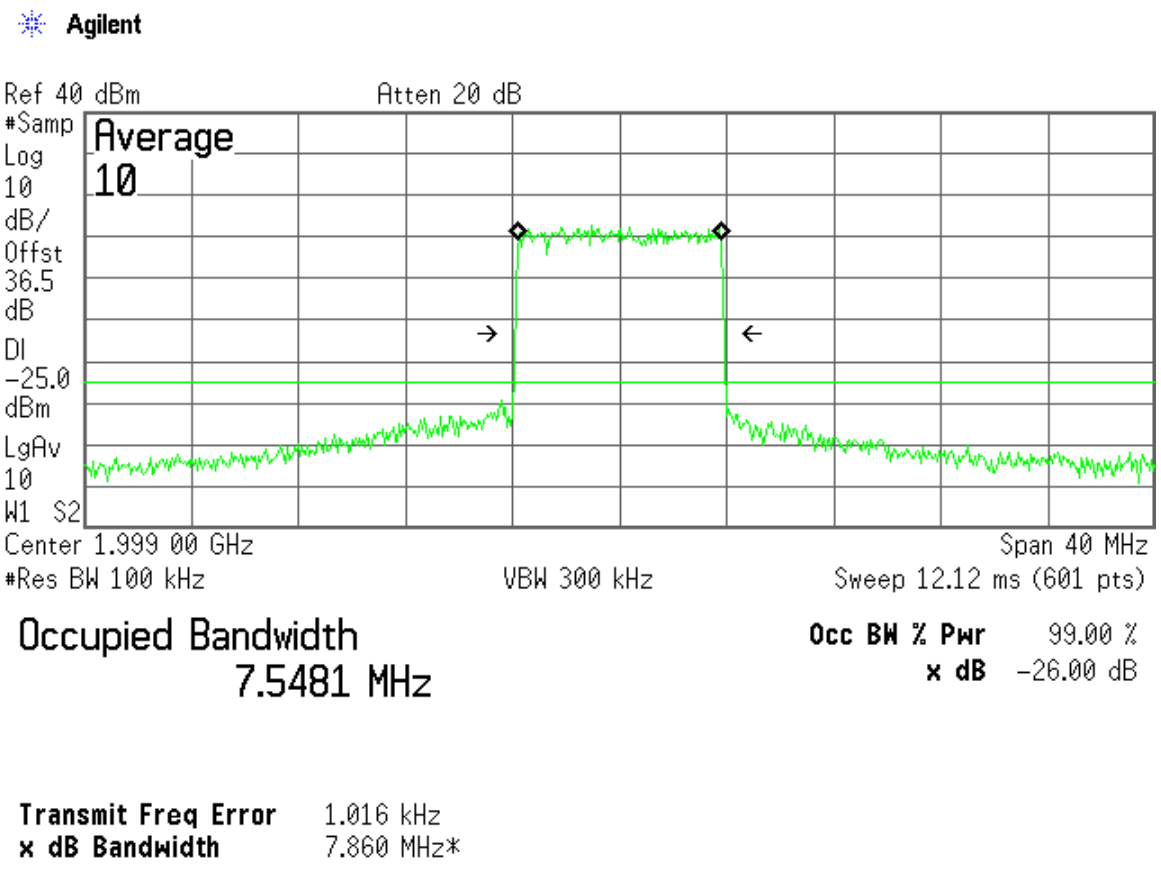
Plot Name:	OC BW: Hi Power, QPSK Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT



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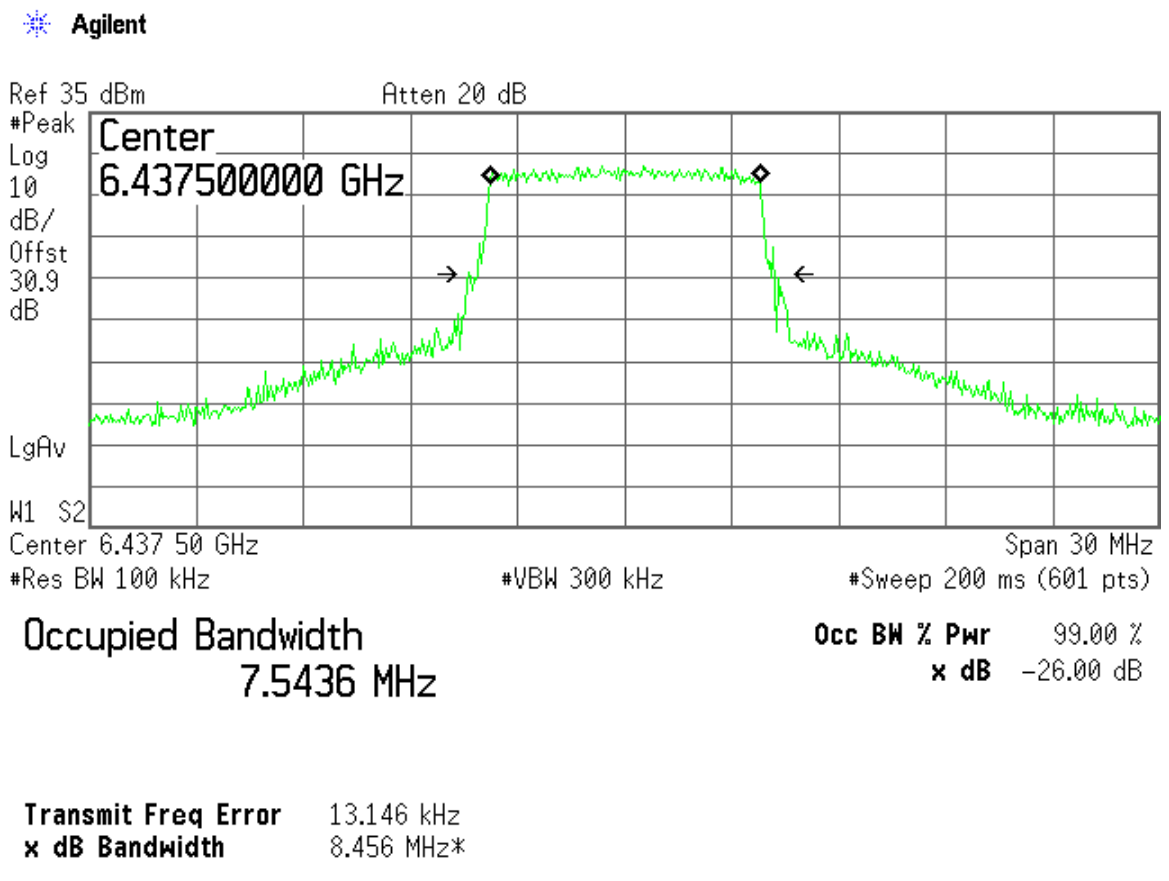

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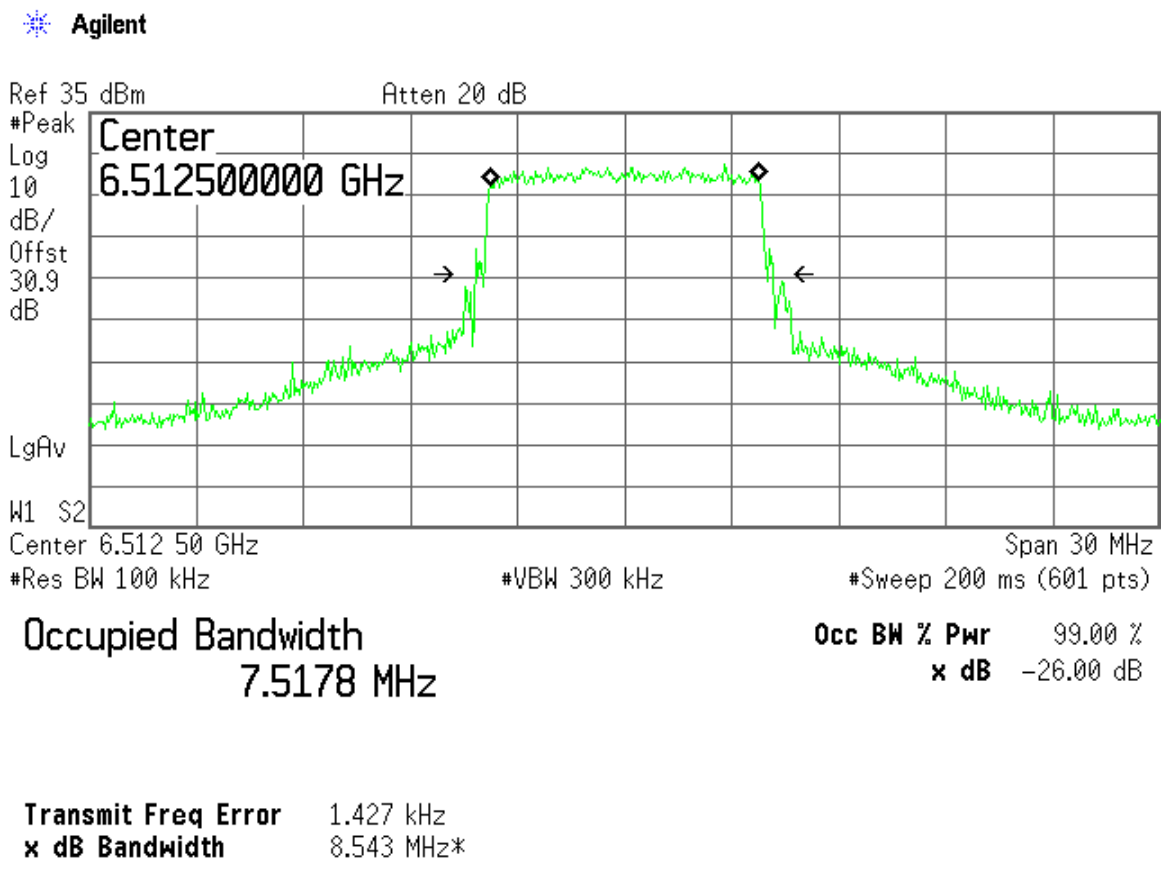

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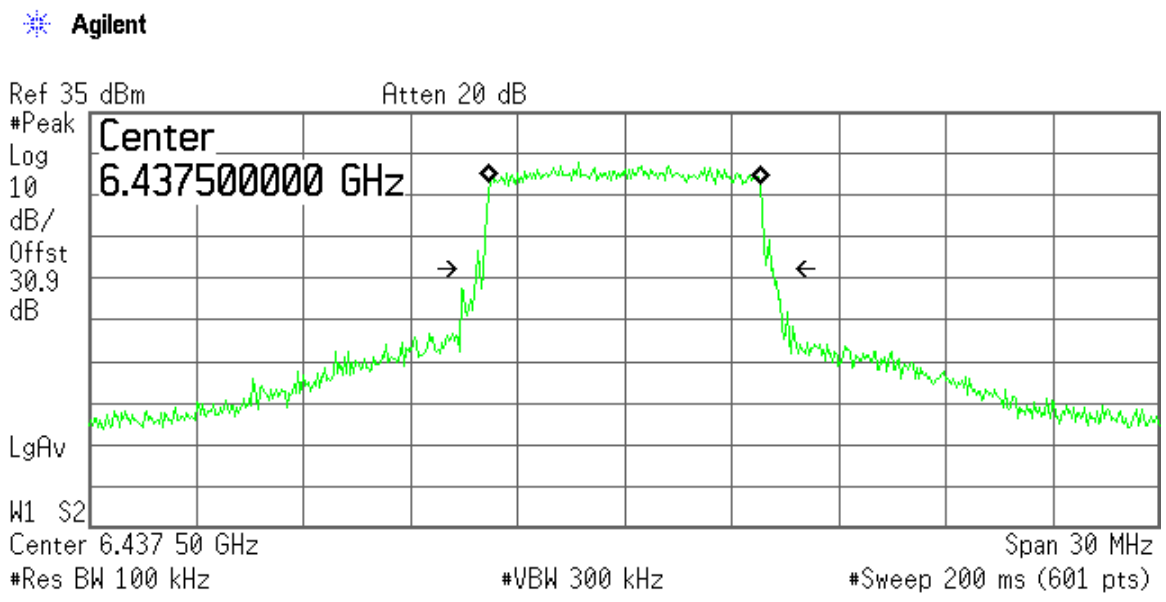

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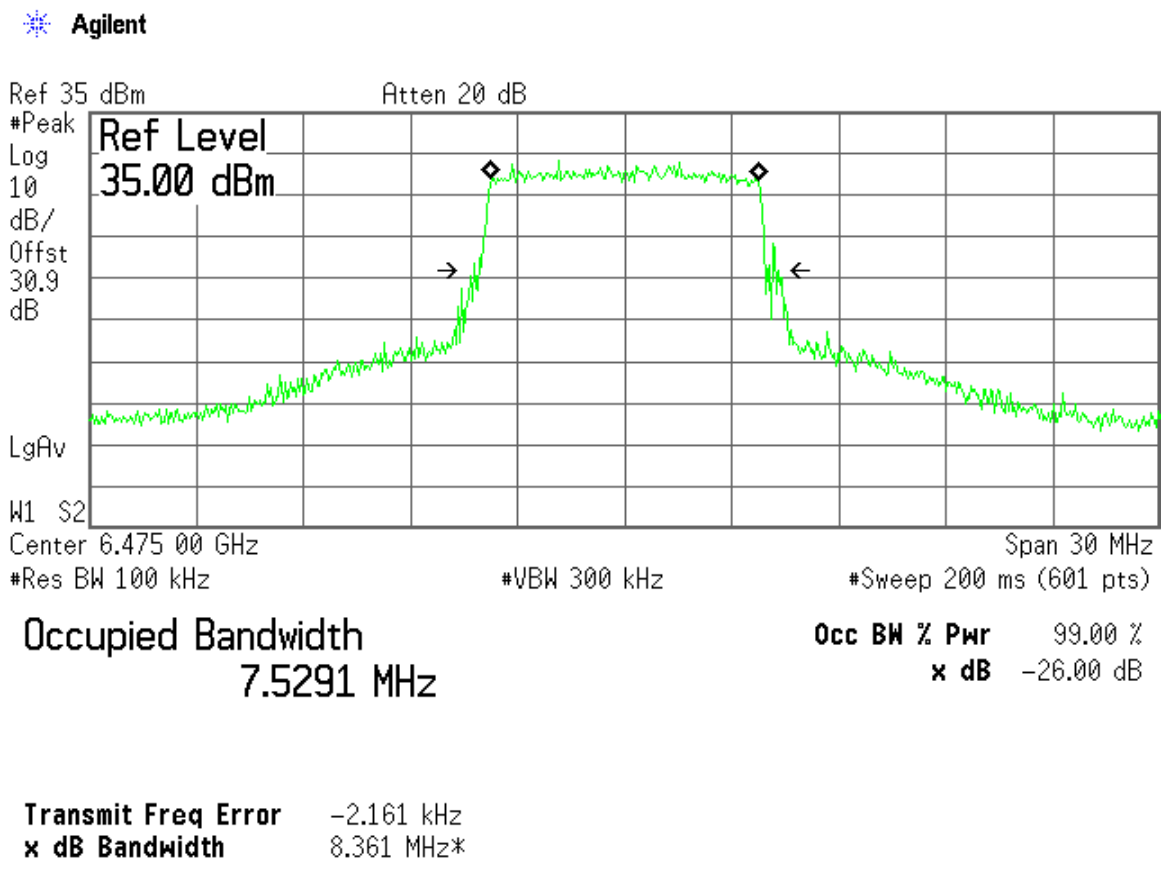

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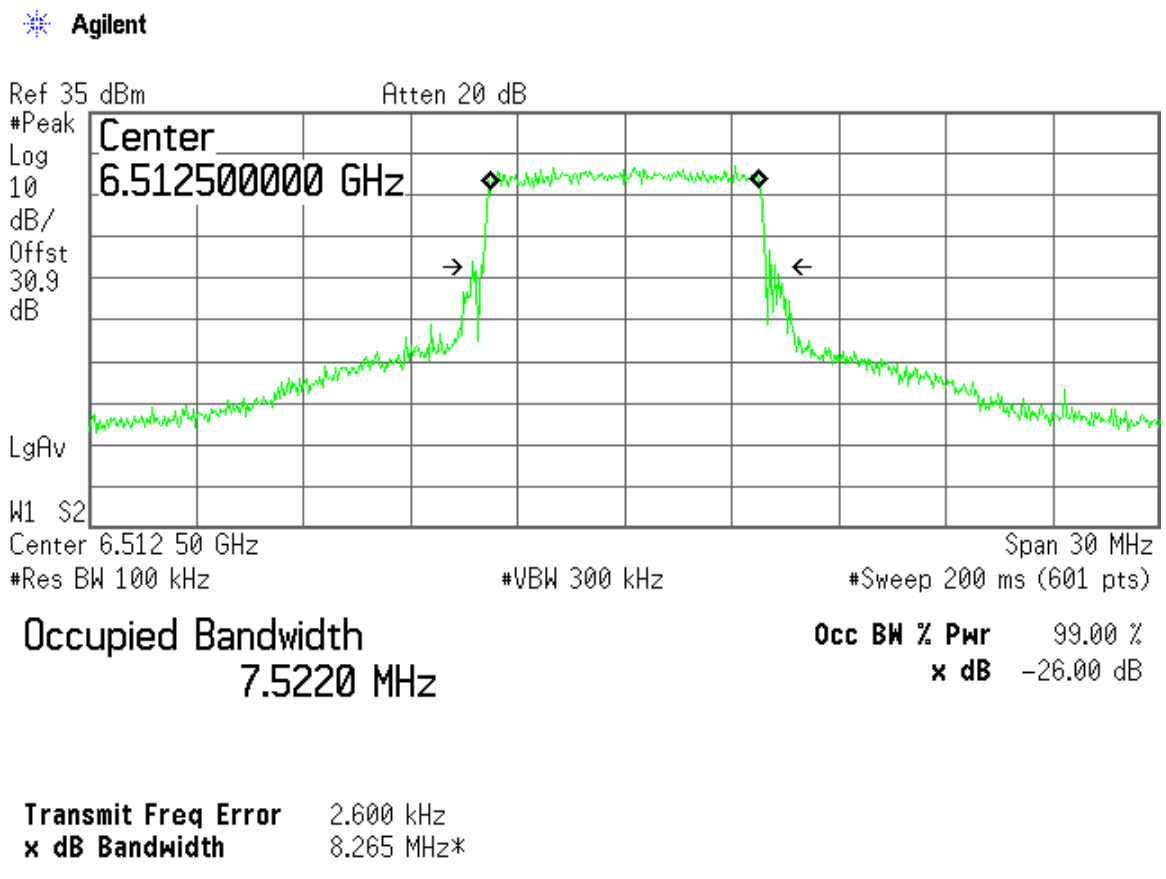

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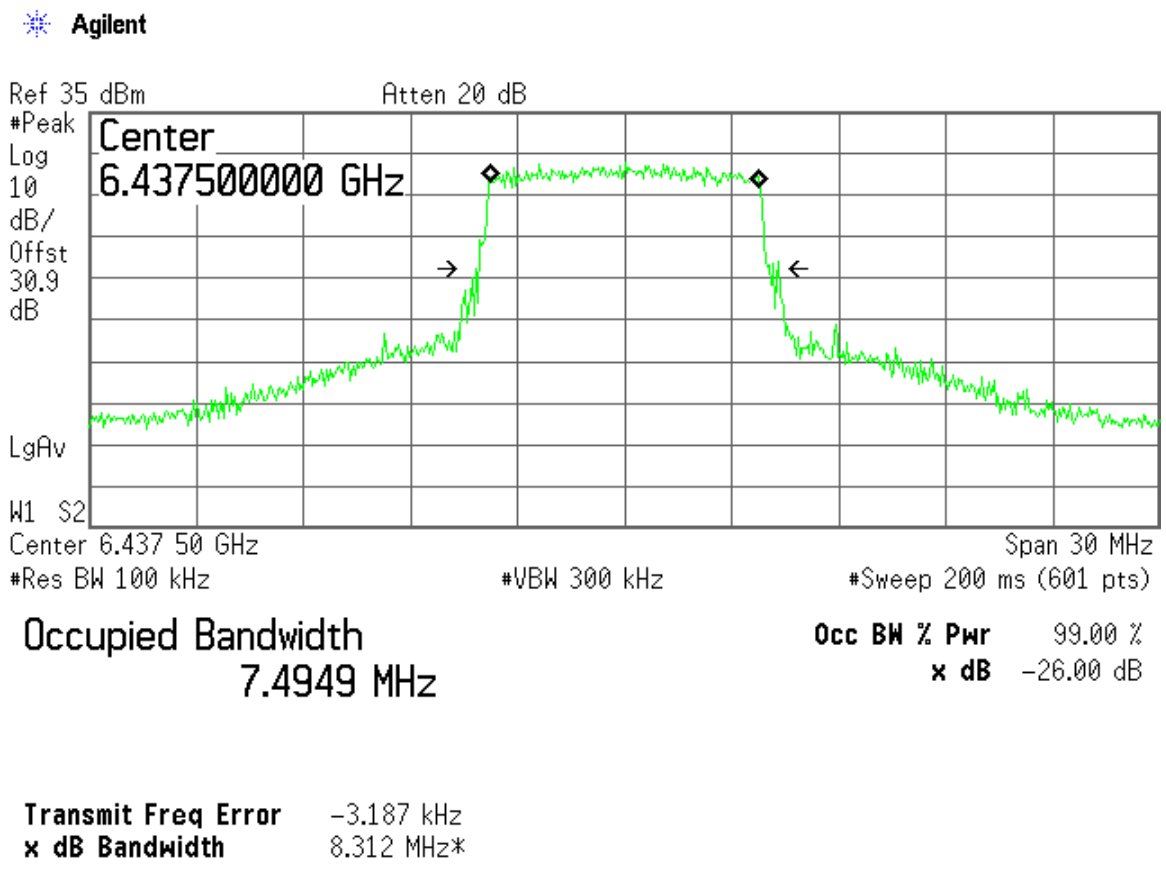

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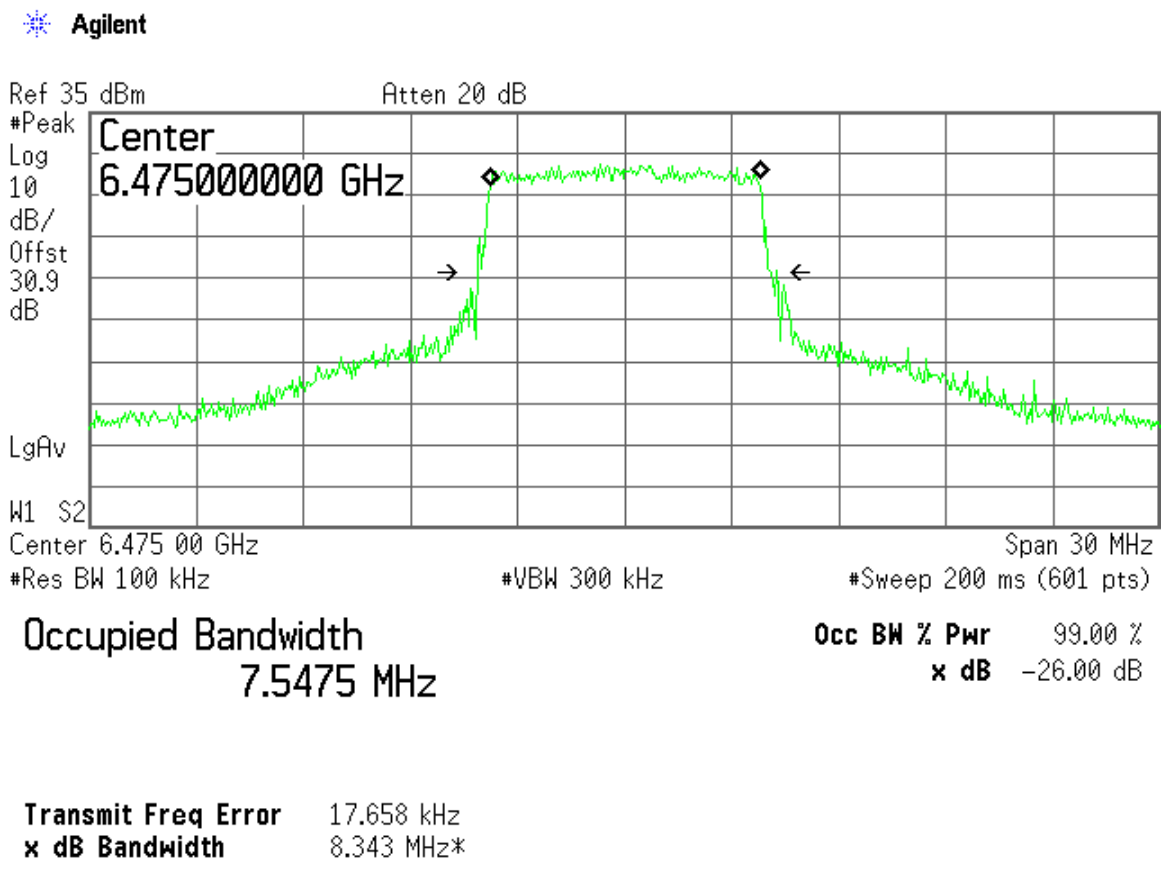

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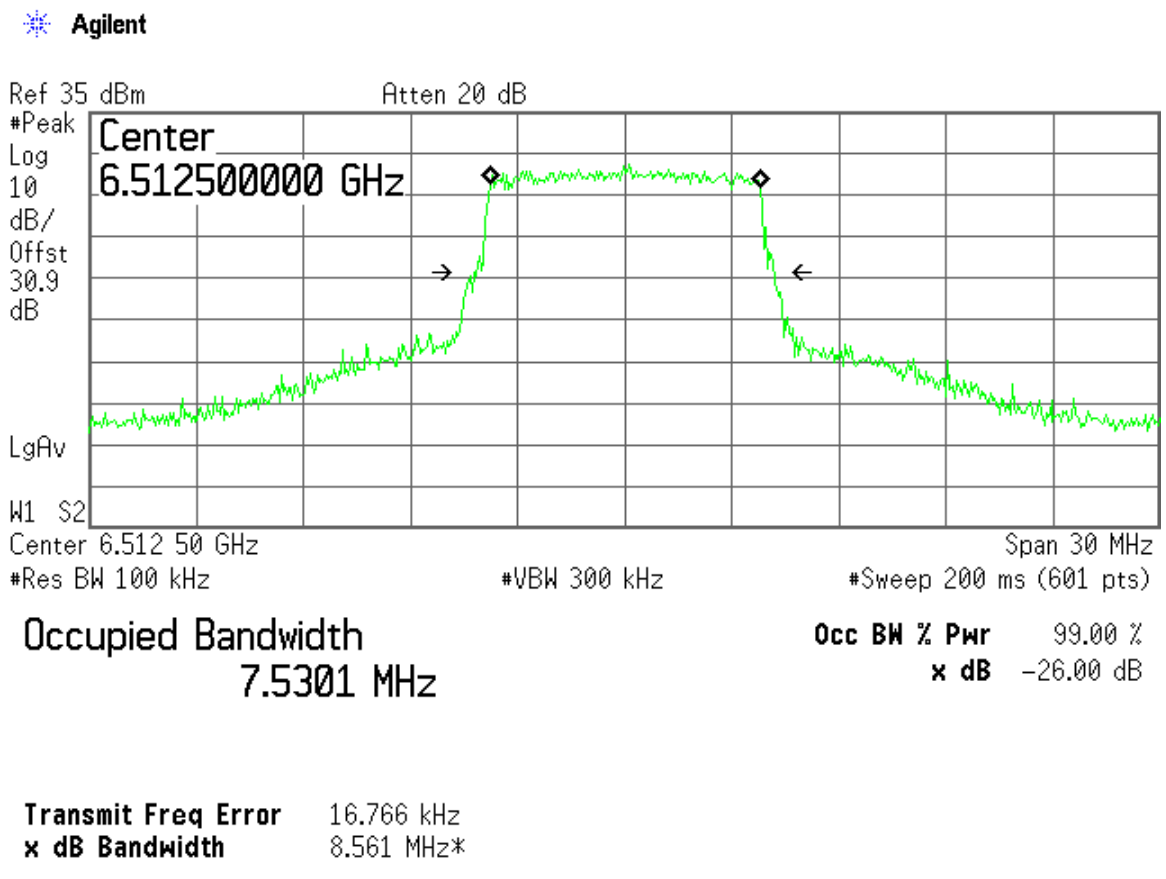

Section 5. Spurious Emissions at Antenna Terminals

Name of Test:	*Spurious Emissions at Antenna Terminals*	Test Standard:	*101.111(a)(2)/2.1051*
Tested By:	WEI LI DAVID TU	Test Date:	04/12/2012-06/20/2012

Minimum Standard: Refer to Part 101.111(a):

(iii) In any 1 MHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 Log_{10} (the mean output power in watts) decibels, or 80 decibels, whichever is the lesser attenuation. The authorized bandwidth includes the nominal radio frequency bandwidth of an individual transmitter/modulator in block-assigned bands.

Method of Measurement: Spectrum Analyzer Settings:
RBW: 1MHz. As required for digital modulations.
VBW:>=RBW
Start Frequency: 9kHz or lowest EUT clock frequency.
Stop Frequency: up to 10th Harmonics or 40GHz highest.
Sweep: Auto

Test Result: **Complies**

Test Data: Attached Plots

***No significant signals were found above 26GHz frequency range.**

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Tested By:	Wei Li
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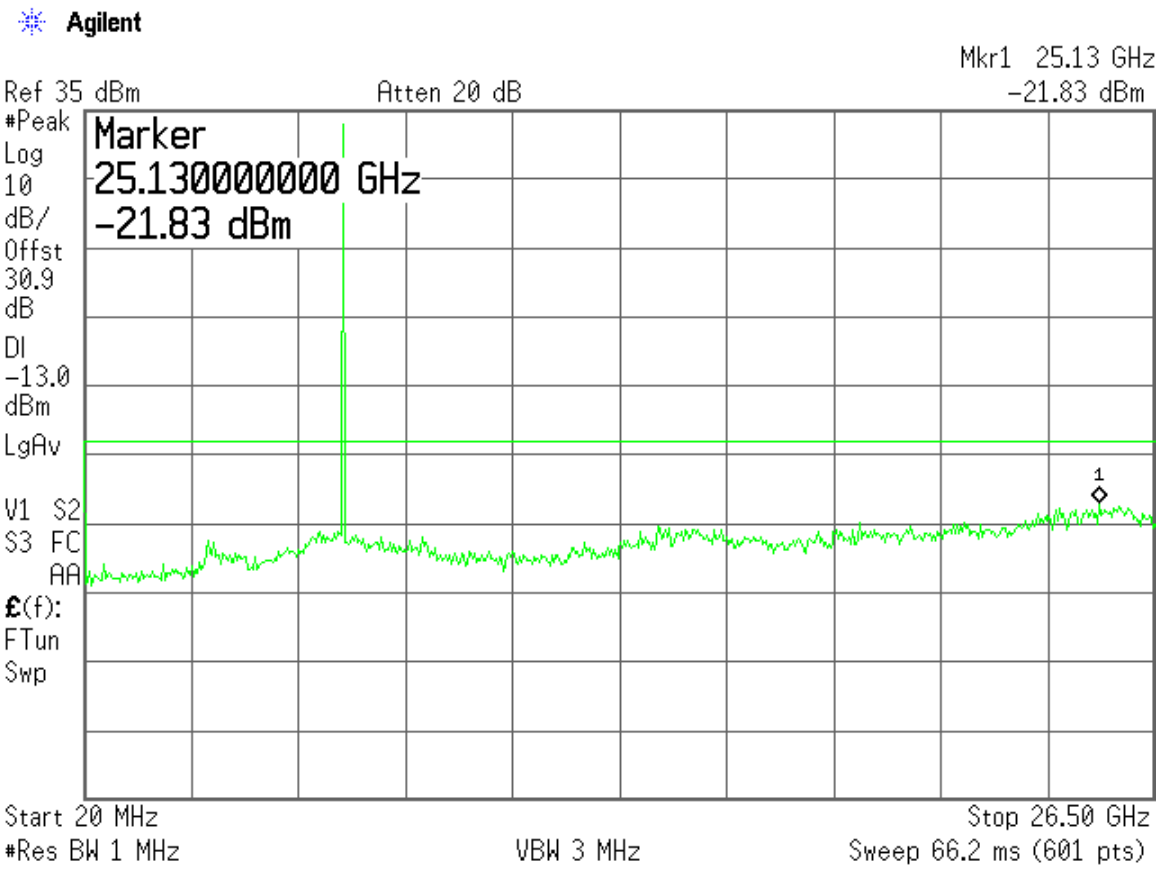
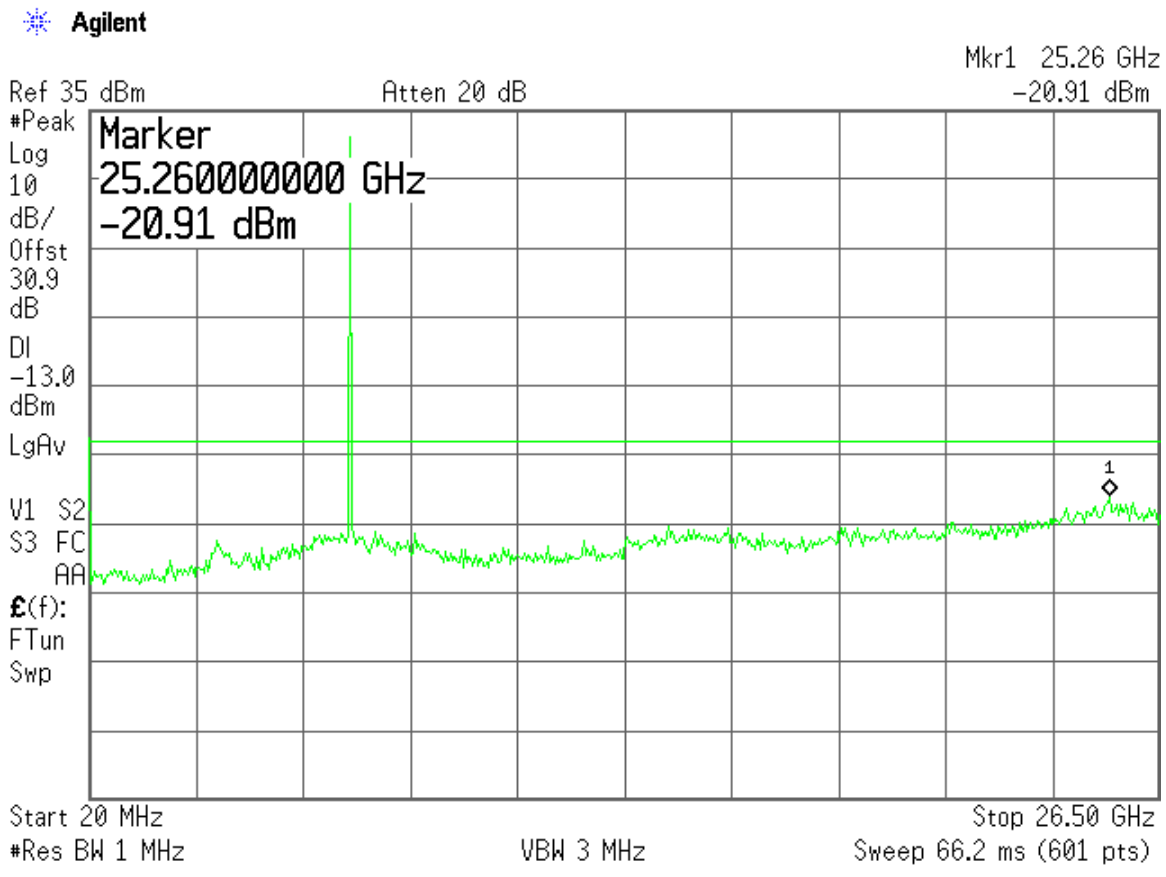
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	SPURIOUS: Hi Power, QPSK Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT



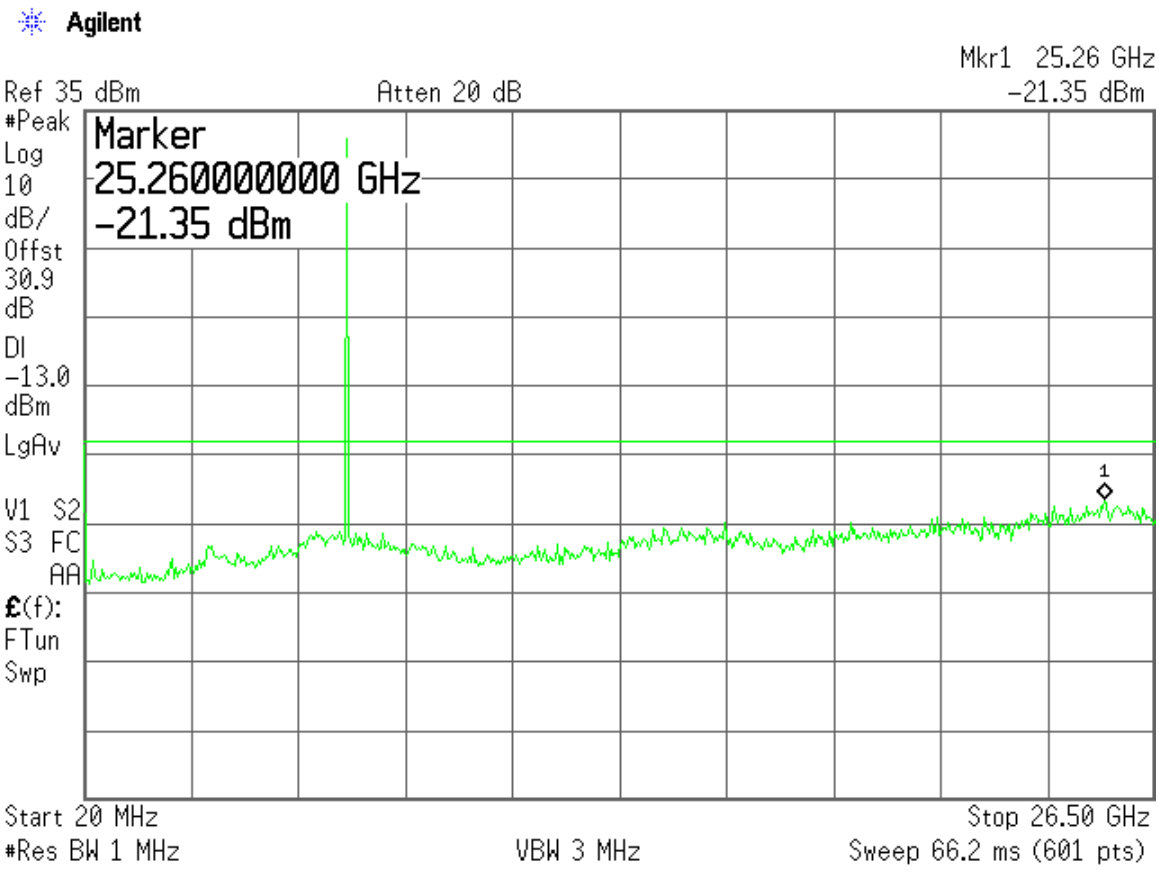
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	SPURIOUS: Hi Power, QPSK Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT



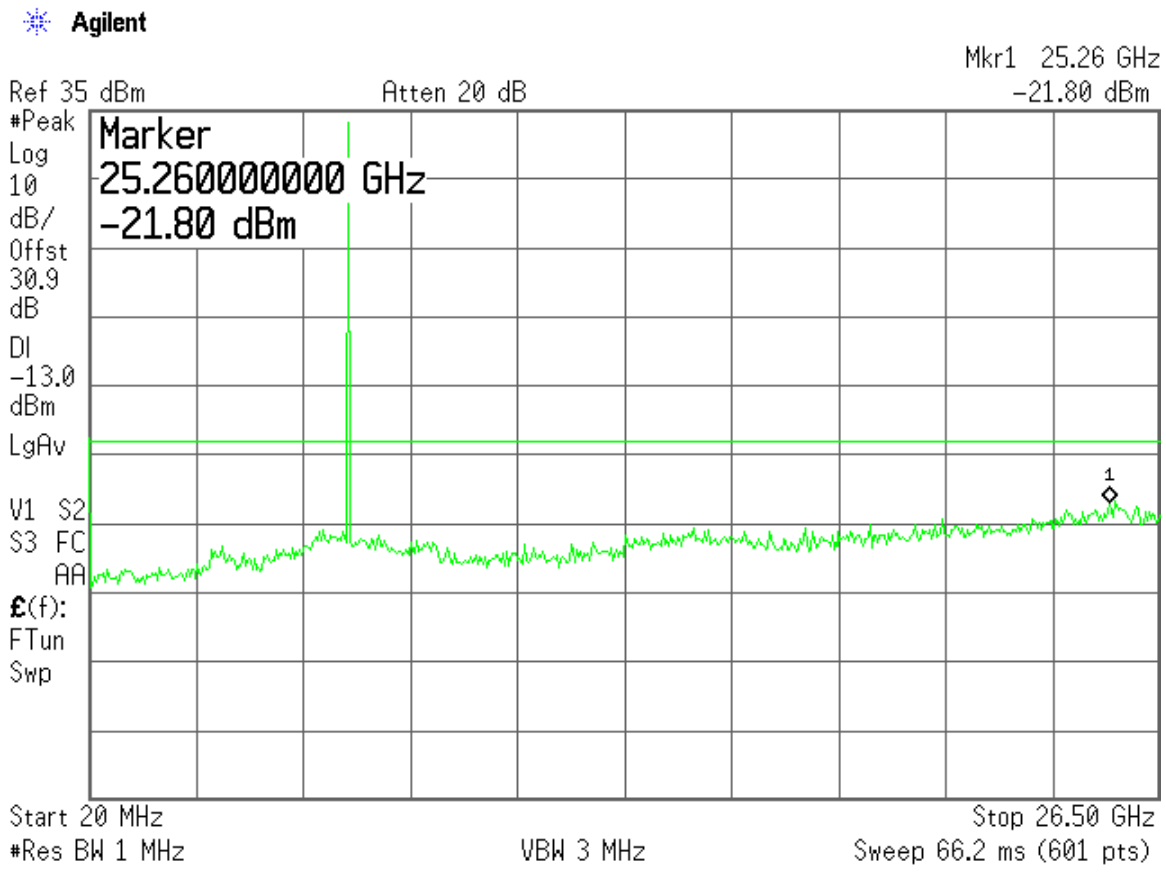
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	SPURIOUS: Hi Power, QPSK Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT



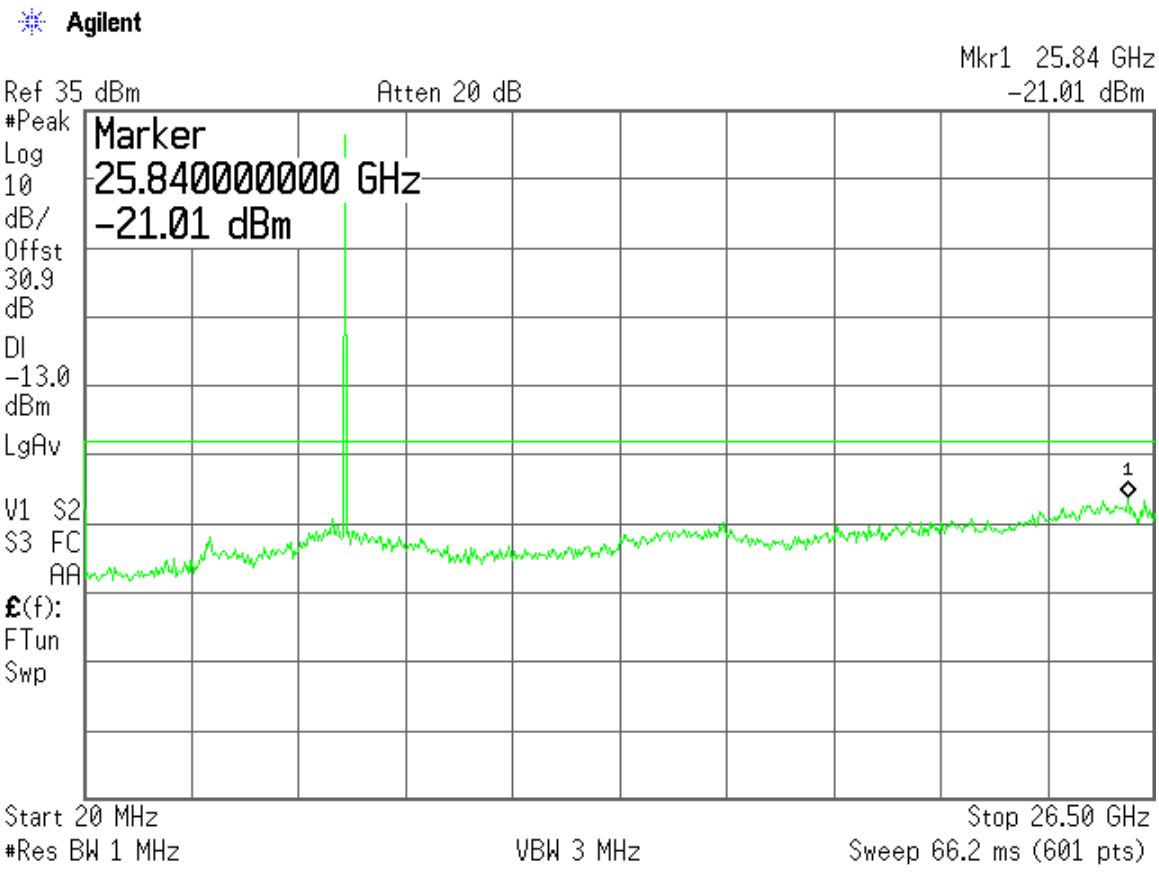
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	SPURIOUS: Hi Power, 16QAM Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT



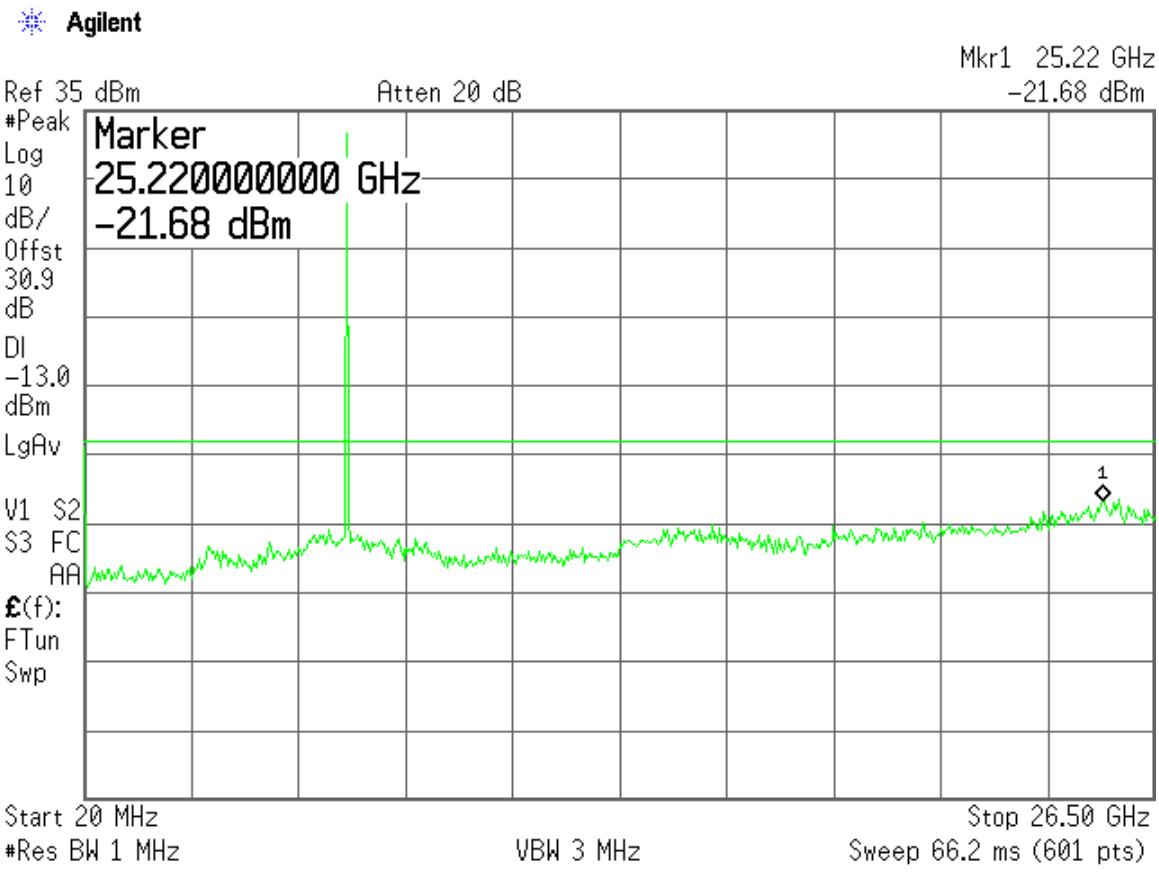
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	SPURIOUS: Hi Power, 16QAM Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT



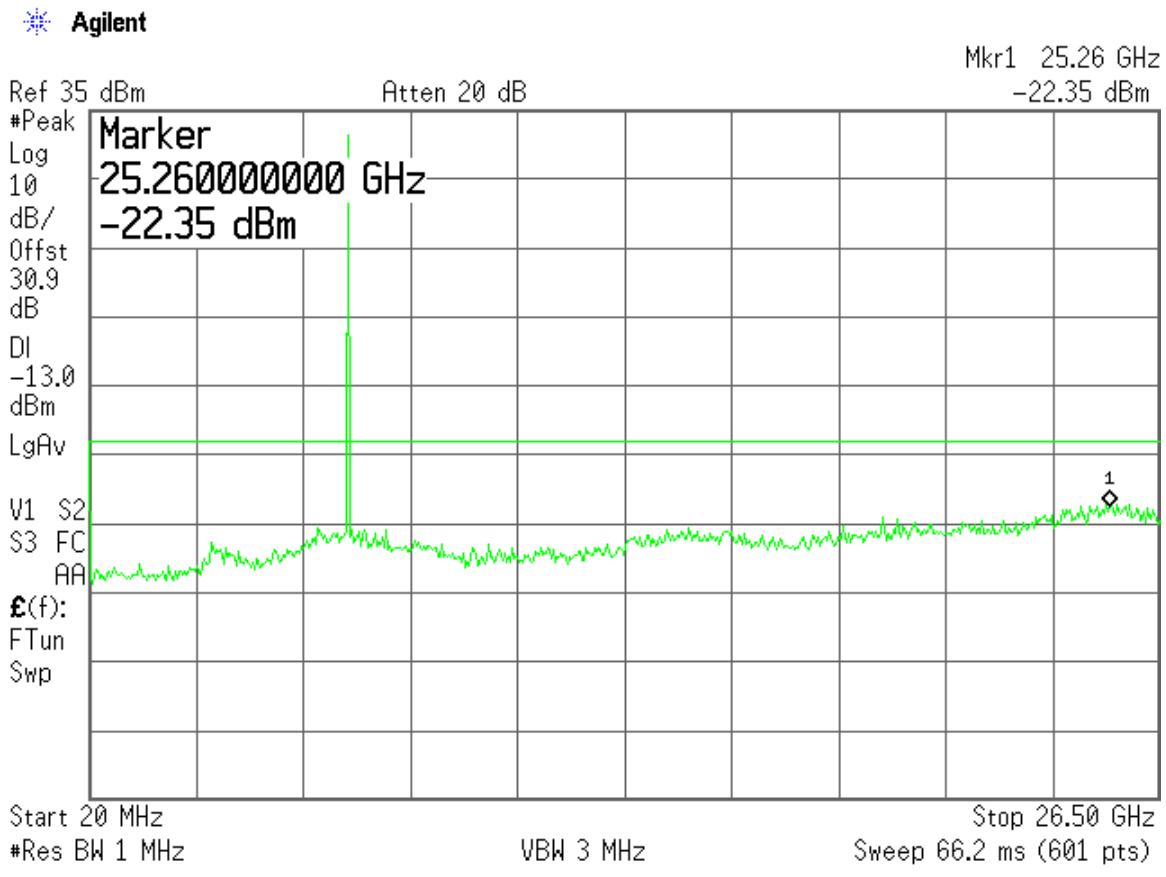
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	SPURIOUS: Hi Power, 16QAM Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT



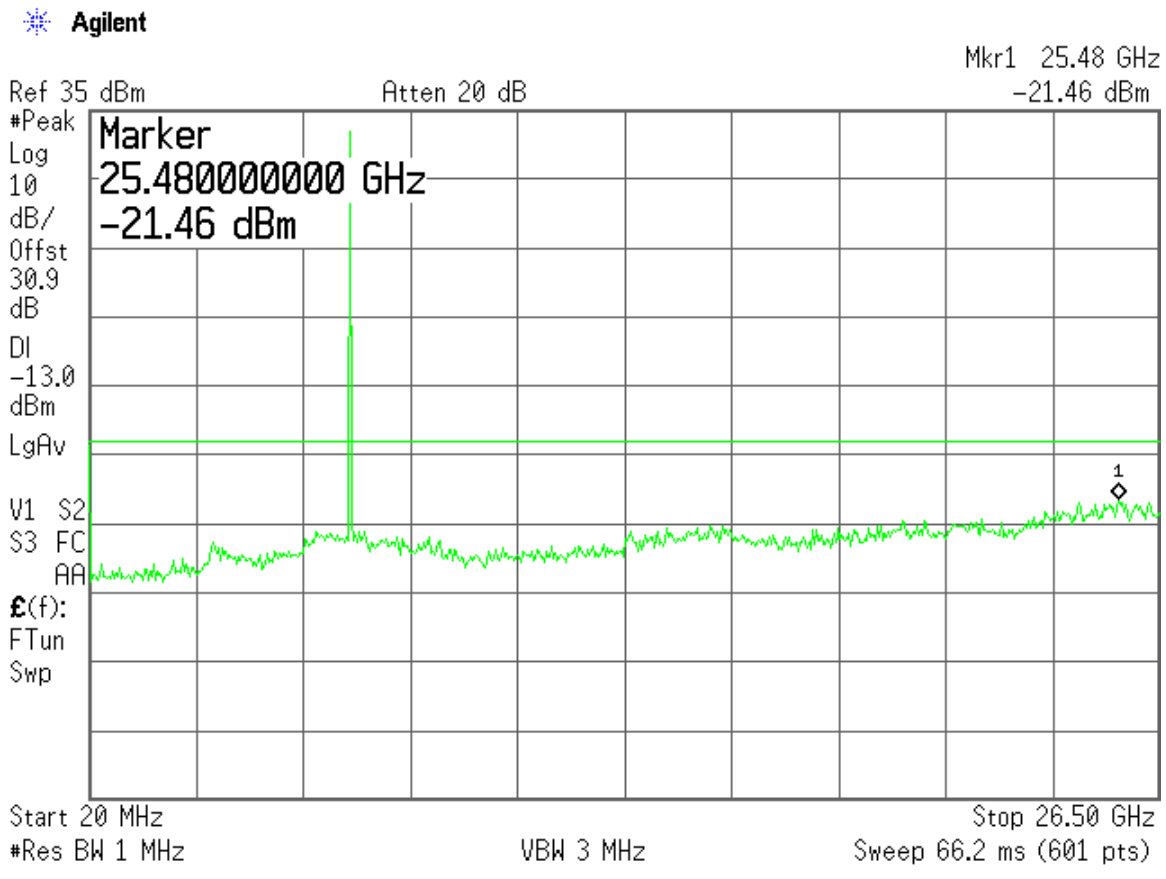
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	SPURIOUS: Hi Power, 64QAM Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT



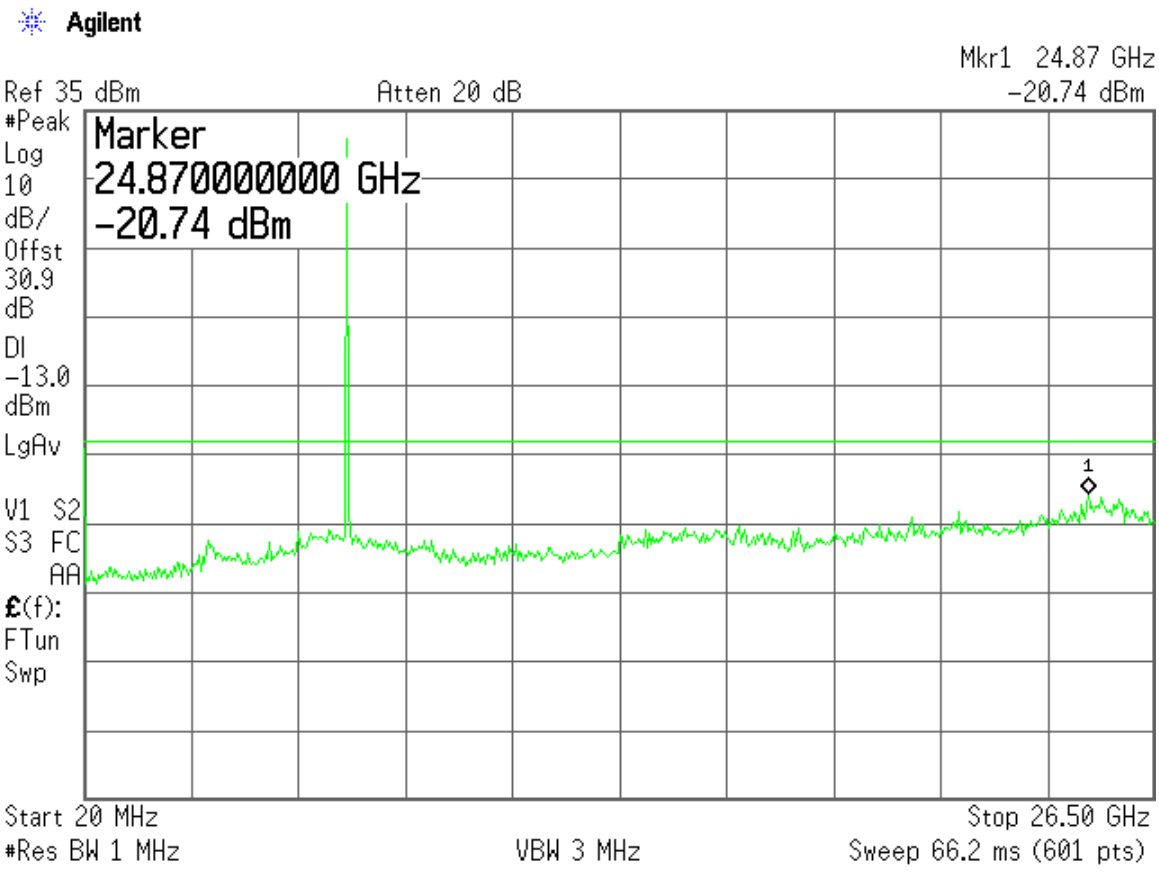
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	SPURIOUS: Hi Power, 64QAM Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT



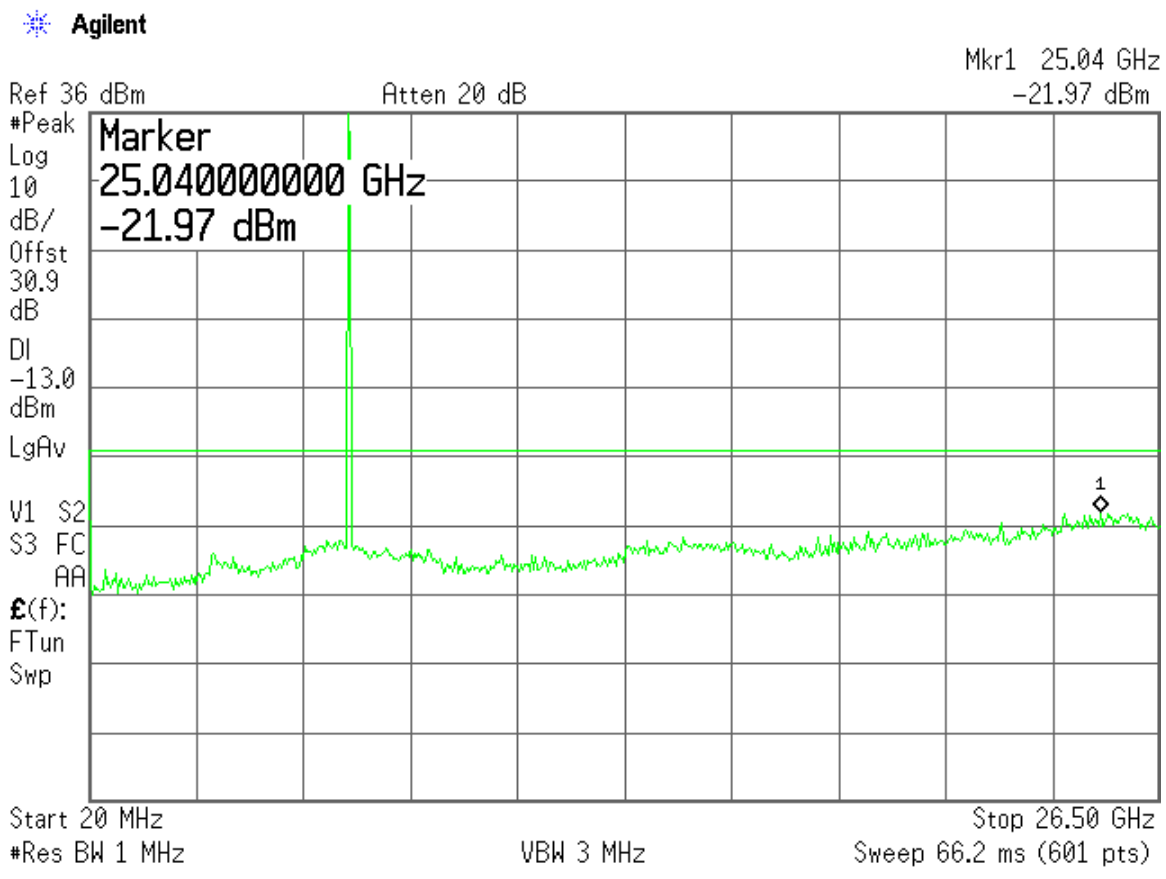
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	SPURIOUS: Hi Power, 64QAM Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT



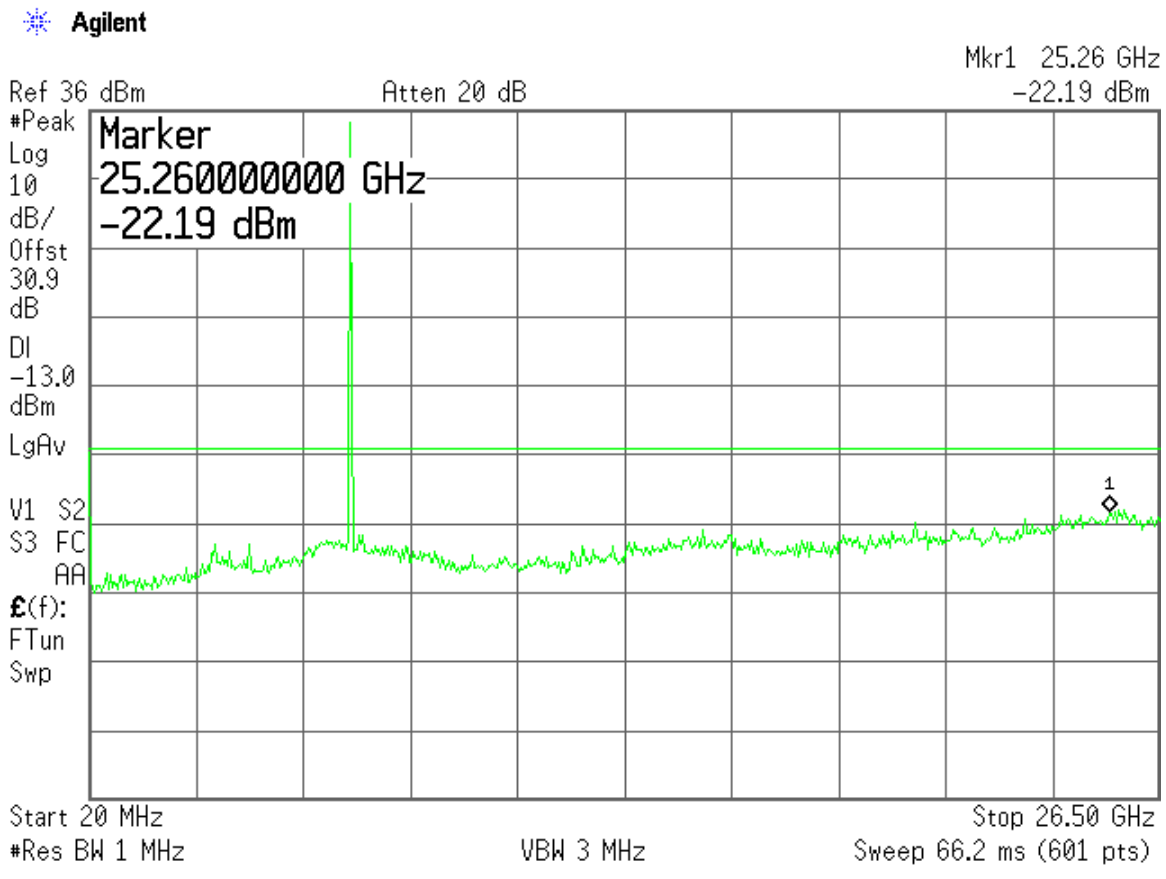
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	SPURIOUS: Hi Power, QPSK Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT



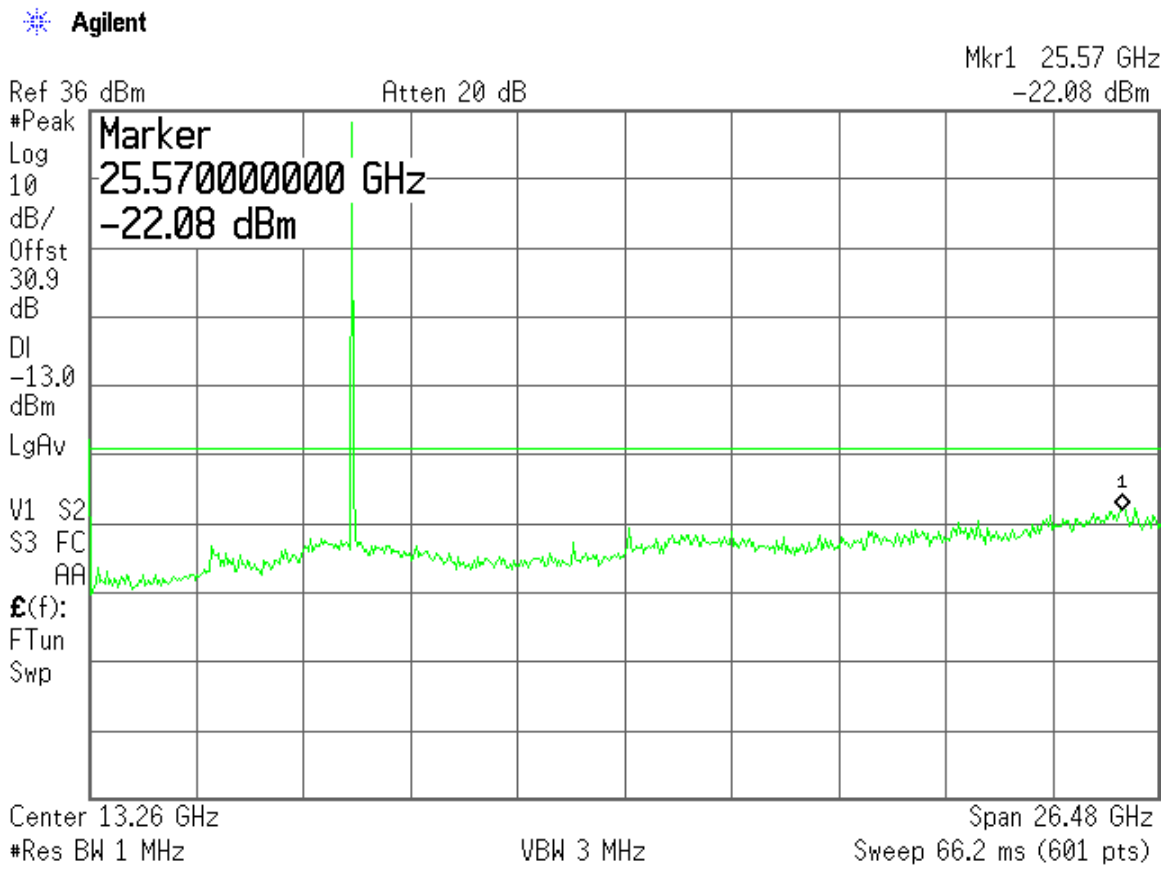
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	SPURIOUS: Hi Power, QPSK Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT



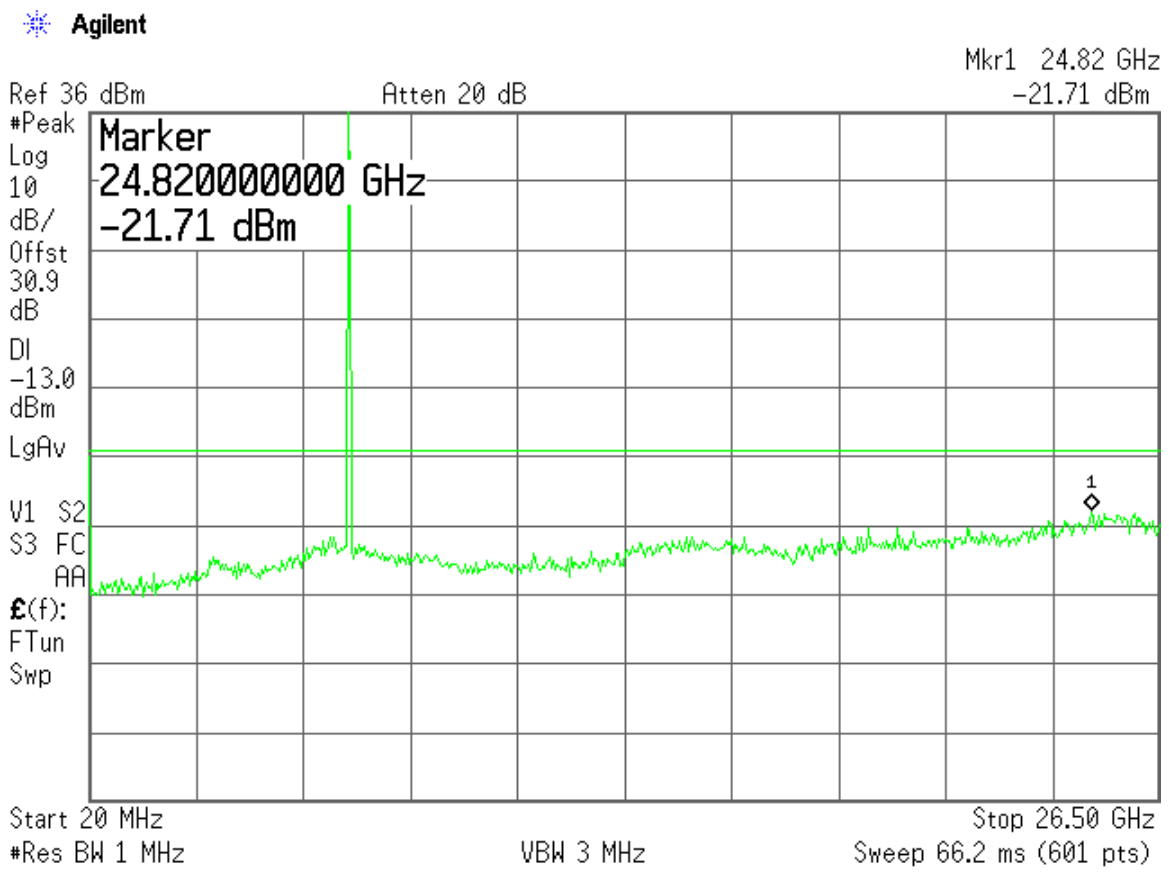
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	SPURIOUS: Hi Power, QPSK Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT



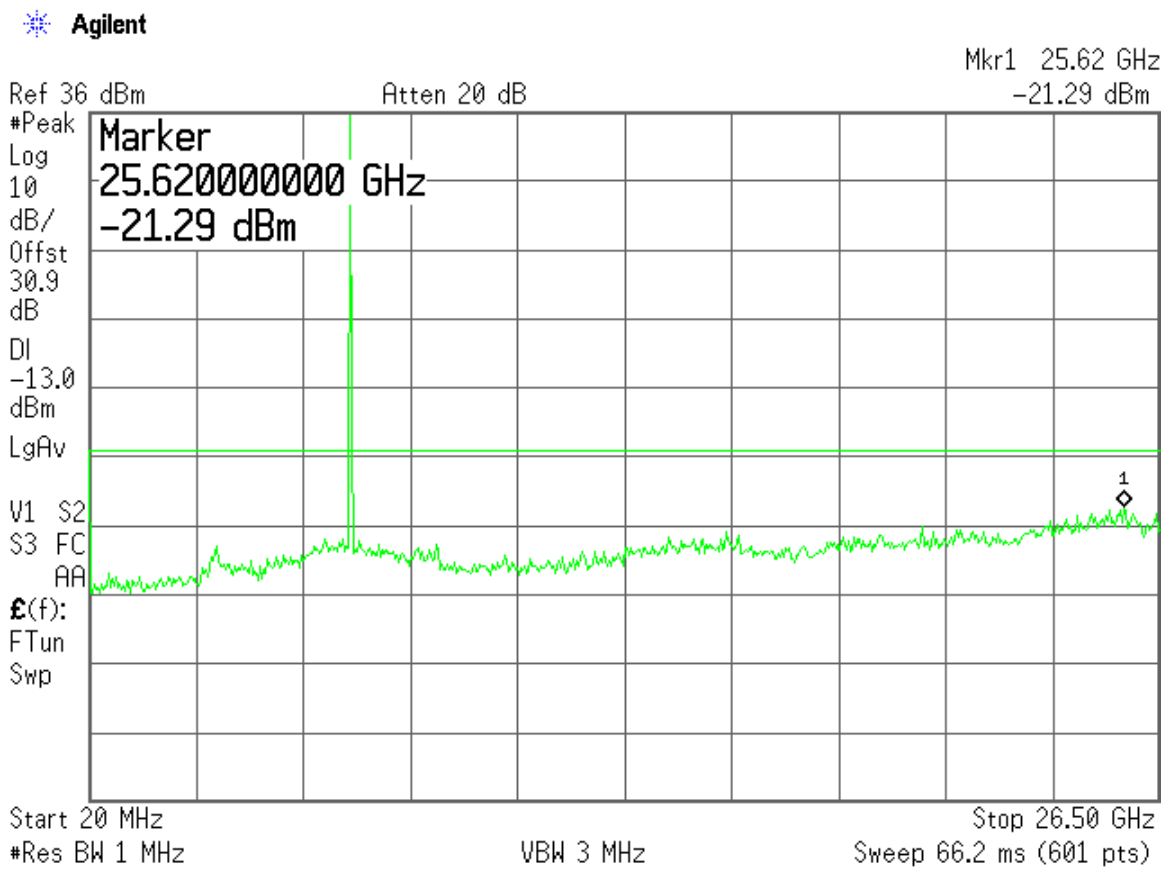
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	SPURIOUS: Hi Power, 16QAM Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT



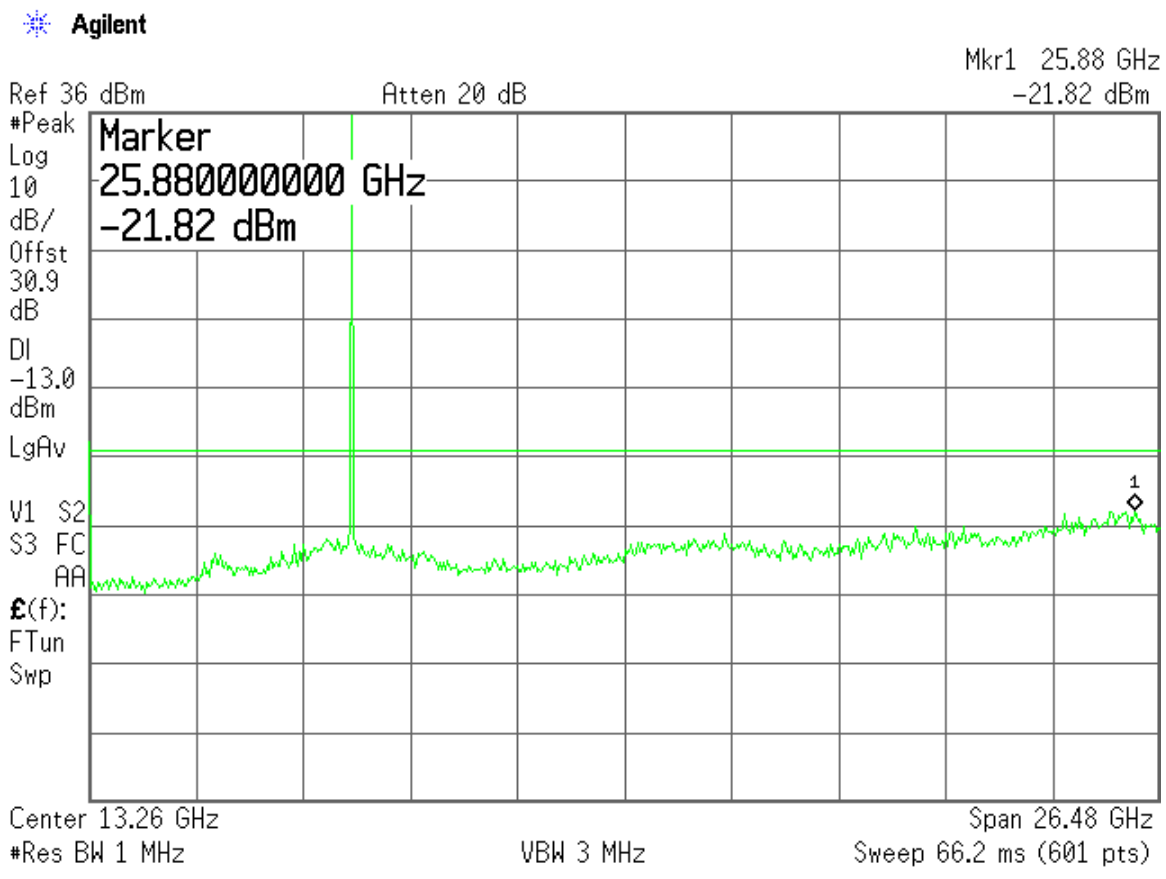
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	SPURIOUS: Hi Power, 16QAM Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT



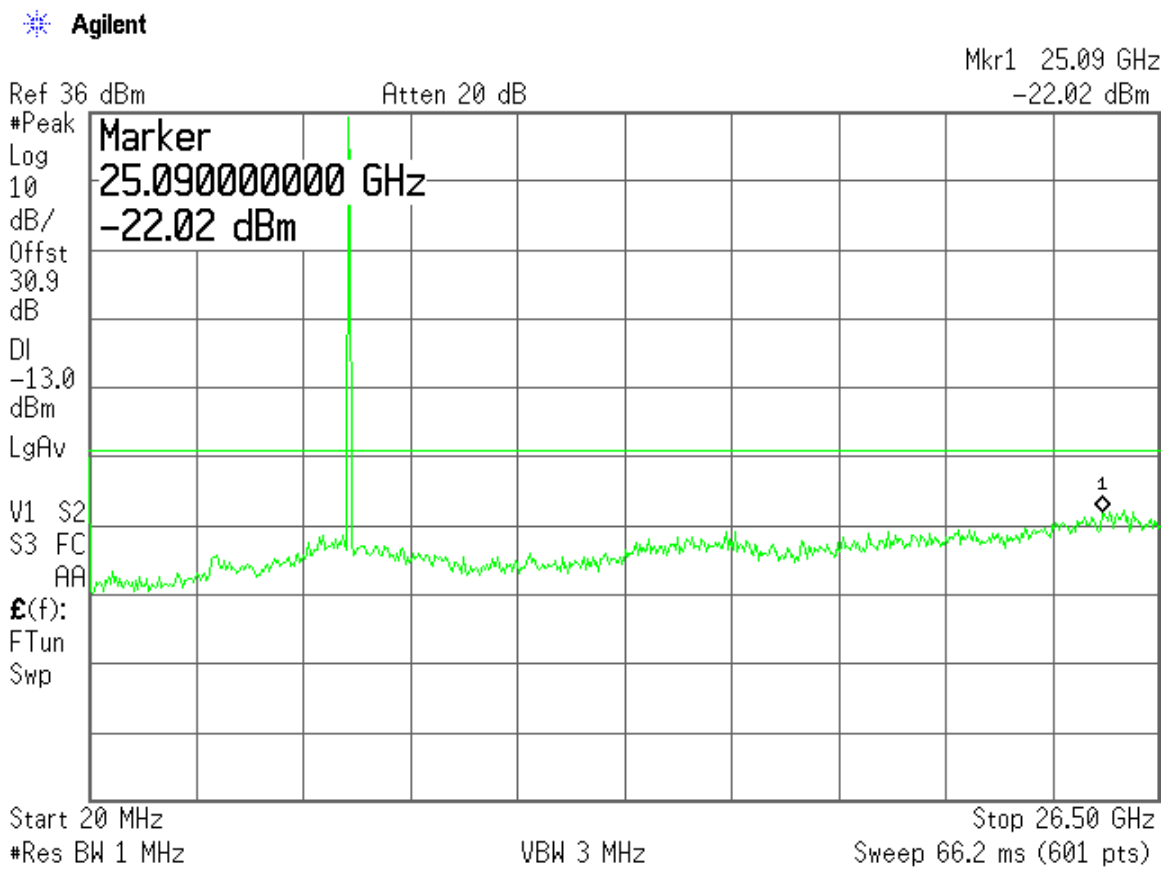
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	SPURIOUS: Hi Power, 16QAM Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT



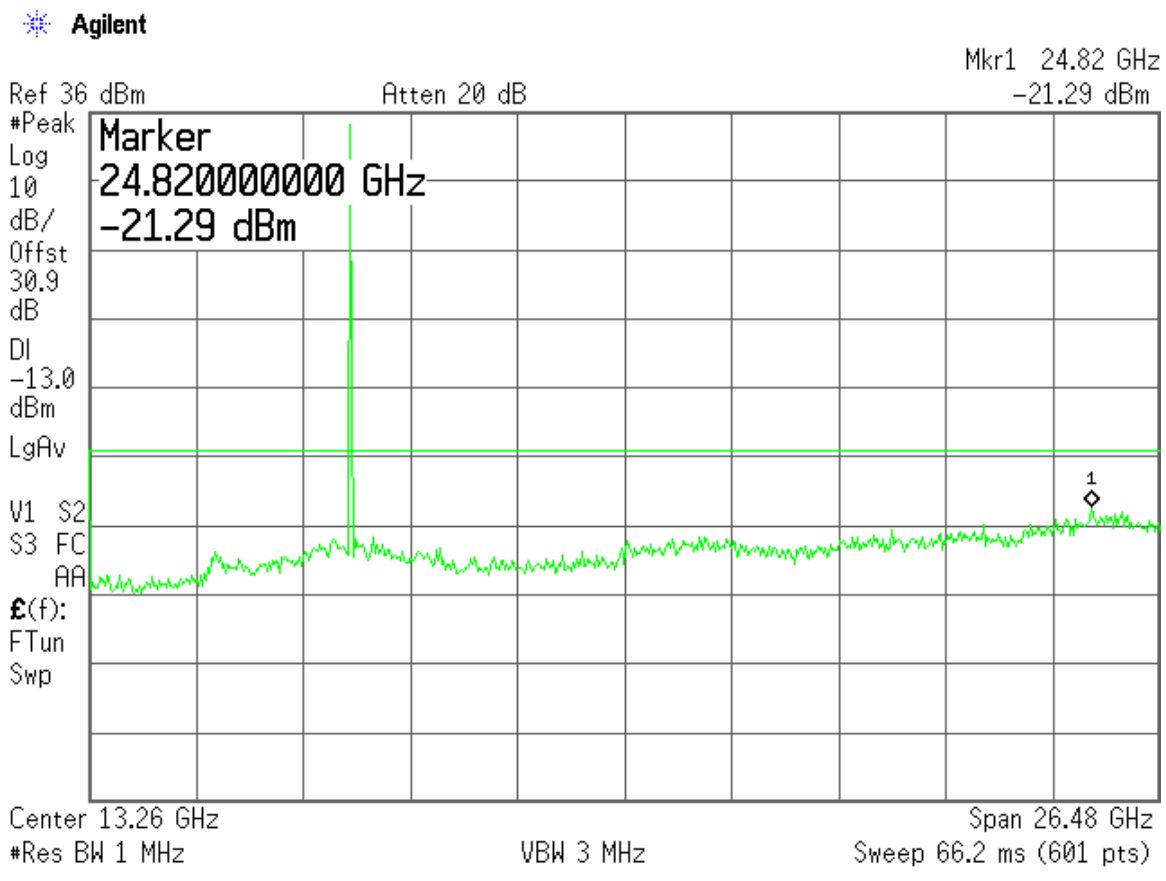
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	SPURIOUS: Hi Power, 64QAM Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT



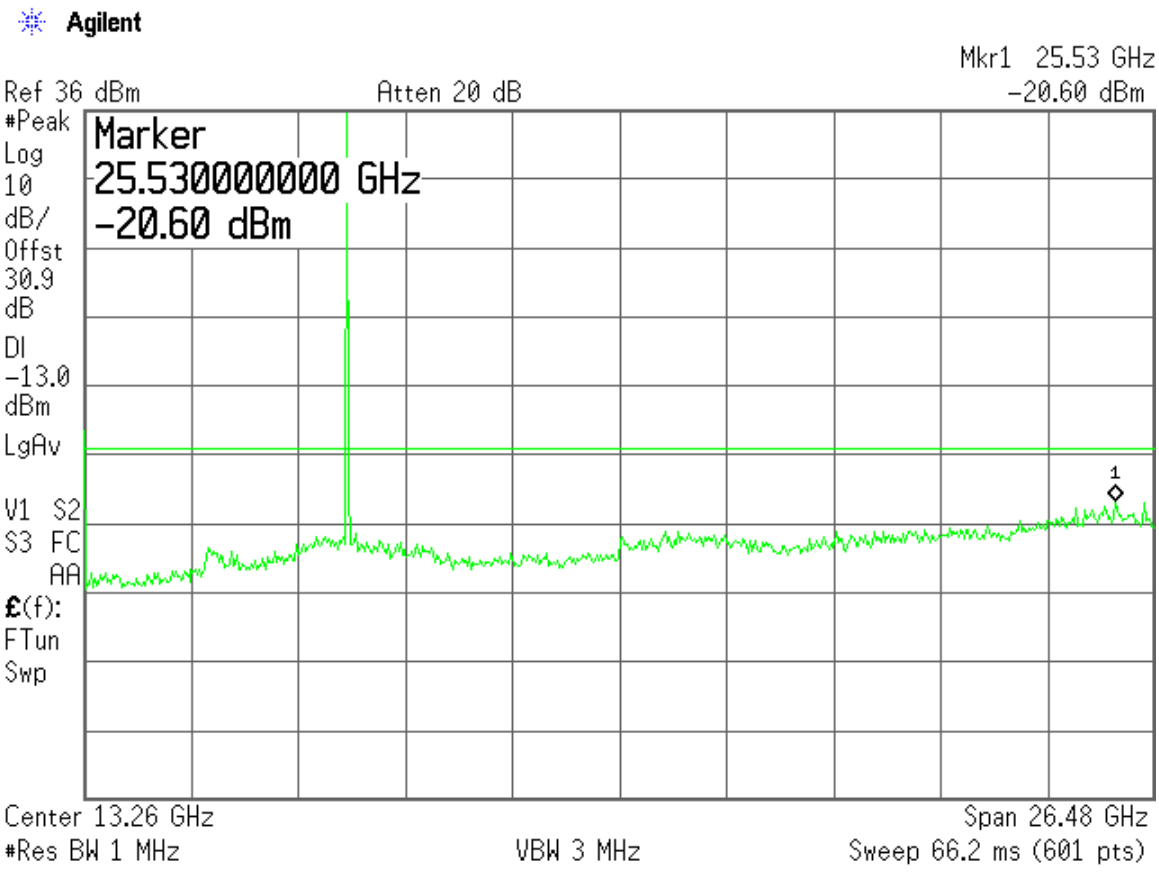
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	SPURIOUS: Hi Power, 64QAM Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT



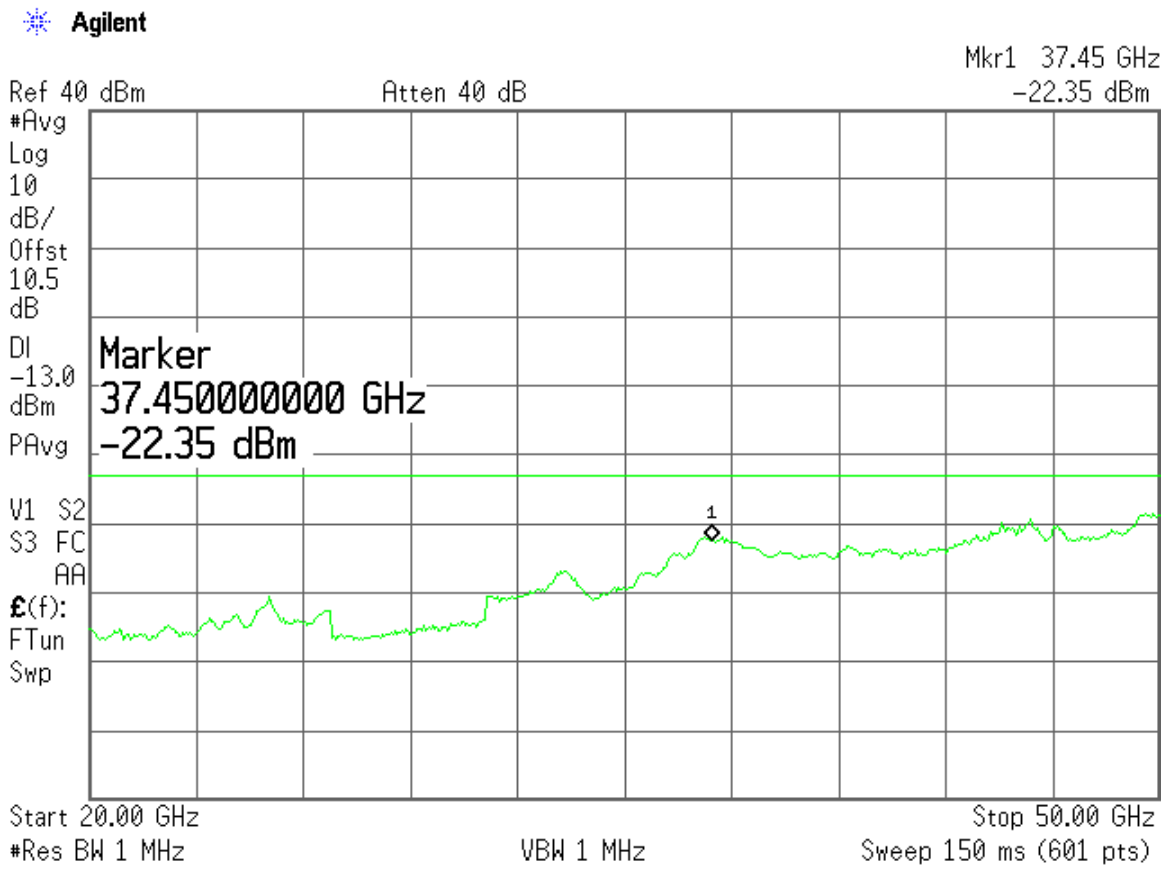
Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Conducted Spurious: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	SPURIOUS: Hi Power, 64QAM Modulation,High CH
Configuration:	SG Input: Color Bar. Output Port: EUT



Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Spurious Emissions Channel BW / Signal Modulation BW=7.0/2.5 MHz
Plot Name:	SPURIOUS: Hi Power,QPSK Modulation, Low CH (Worst Case for above 20GHz Range)
Configuration:	SG Input: Color Bar, Output Port: Antenna Port



Section 6. Field Strength of Spurious

Name of Test:	*Field Strength of Spurious*	Test Standard:	*101.111(a)(2)/2.1053*
Tested By:	DAVID TU	Test Date:	04/12/2012-06/20/2012

Minimum Standard: Refer to Part 101.111(a):

(iii) In any 1 MHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 Log_{10} (the mean output power in watts) decibels, or 80 decibels, whichever is the lesser attenuation. The authorized bandwidth includes the nominal radio frequency bandwidth of an individual transmitter/modulator in block-assigned bands.

Method of Measurement: TIA/EIA-603-C-2004, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting ERP is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

Test Result: **Complies**

Test Data: See Attached Table(s)

*** The pre-scan investigation shows that different digital modulation mode has no evident effect on spurious measurements and the worst case is the high power setting, QPSK modulation mode, which is chosen for final data collection.**

Configuration	Spurious: High Power Setting, QPSK Modulation
Band	6G Band
Channel	Low

Freq. (MHz)	H,V	SA Reading (dBuV)	SG Reading (dBm)	CL (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)
12862.50	H	42.7	-64	4.5	12.6	-58.05	-13	-45.05
12862.50	V	43.8	-63	4.5	12.6	-57.05	-13	-44.05

NO significant spurious which are under FCC limit by less than 20dB margin were founded.

NOTE:
*** Measured noise floor**
SA: Spectrum Analyzer
SG: Signal Generator
CL: SMA cable loss (6ft)

Worse case selected
H=horizontal and V=vertical
ERP = SG reading - CL + Gain (dBi)-2.15
Margin = ERP - Limit

Configuration	Spurious: High Power Setting, QPSK Modulation
Band	6G Band
Channel	Middle

Freq. (MHz)	H,V	SA Reading (dBuV)	SG Reading (dBm)	CL (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)
12962.50	H	42.4	-64	4.5	12.5	-58.15	-13	-45.15
12962.50	V	44.2	-63	4.5	12.5	-57.15	-13	-44.15

NO other significant spurious which are under FCC limit by less than 20dB margin were founded.

NOTE:
*** Measured noise floor**
SA: Spectrum Analyzer
SG: Signal Generator
CL: SMA cable loss (6ft)

Worse case selected
H=horizontal and V=vertical
ERP = SG reading - CL + Gain (dBi)-2.15
Margin = ERP - Limit

Configuration	Spurious: High Power Setting, QPSK Modulation
Band	6G Band
Channel	High

Freq. (MHz)	H,V	SA Reading (dBuV)	SG Reading (dBm)	CL (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)
13037.50	H	43.0	-64	4.6	12.5	-58.25	-13	-45.25
13037.50	V	43.2	-64	4.6	12.5	-58.25	-13	-45.25

NO Significant spurious which are under FCC limit by less than 20dB margin were founded.

NOTE:
*** Measured noise floor**
SA: Spectrum Analyzer
SG: Signal Generator
CL: SMA cable loss (6ft)

Worse case selected
H=horizontal and V=vertical
ERP = SG reading - CL + Gain (dBi)-2.15
Margin = ERP - Limit

Section 7. Emission Limitation Mask

Name of Test:	*Emission Mask*	Test Standard:	*101.111(a)(2)*
Tested By:	David Tu	Test Date:	04/12/2012-06/20/2012

Minimum Standard: *Refer to Part 101.111(a)(2)*
(i) For operating frequencies below 15 GHz, in any 4 KHz band, the center frequency of which is removed from the assigned frequency by more than 50 percent up to and including 250 percent of the authorized bandwidth: As specified by the following equation but in no event less than 50 decibels:
A = 35 + 0.8(P −50) + 10 Log10 B. (Attenuation greater than 80 decibels or to an absolute power of less than −13 dBm/1MHz is not required.) where:
A = Attenuation (in decibels) below the mean output power level.
P = Percent removed from the center frequency of the transmitter bandwidth.
B = Authorized bandwidth in MHz.

Method of Measurement: Different Emission Masks were applied for
Channel BW / Signal Modulation BW=
8.0/6.0, 25.0/8.0 at different power settings stated on Page 7.

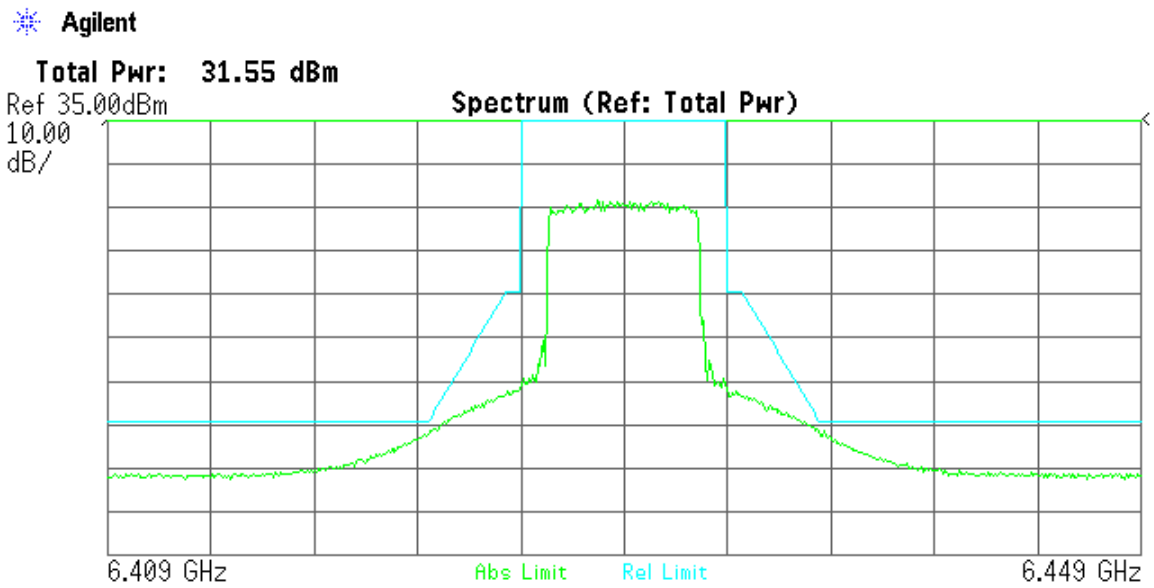
Test Result: **Complies**

Test Data: See Attached Table(s)

Emission Mask Measurement for High Power Setting

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Hi Power, QPSK Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT

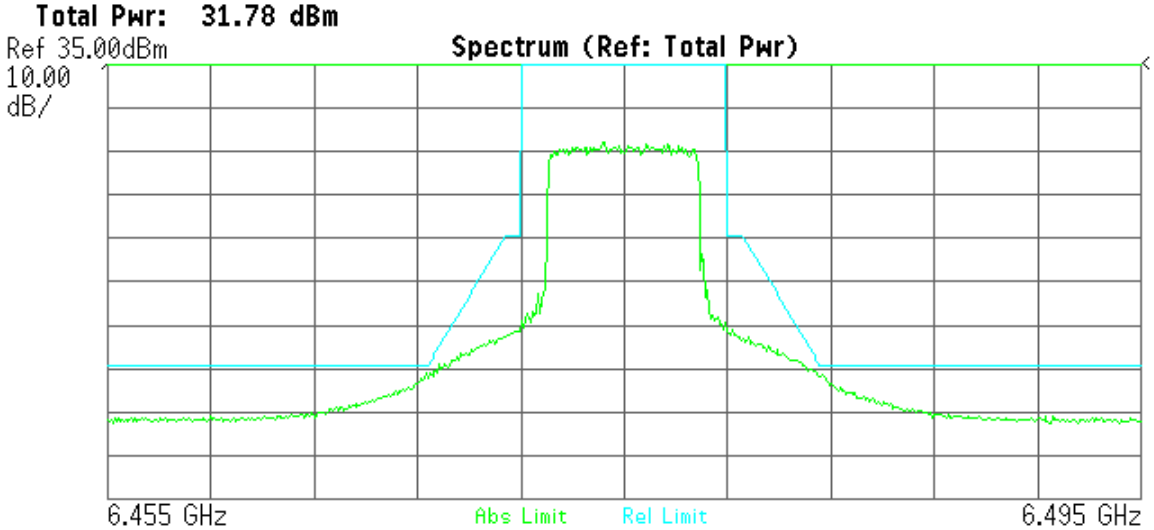


Total Pwr Ref: 31.55 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-26.55	6.4250 G	-27.35	6.4333 G
4.6000 M	7.6000 M	100.00 k	-28.02	6.4244 G	-28.58	6.4336 G
7.6000 M	20.000 M	100.00 k	-37.25	6.4214 G	-36.34	6.4368 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Hi Power, QPSK Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT

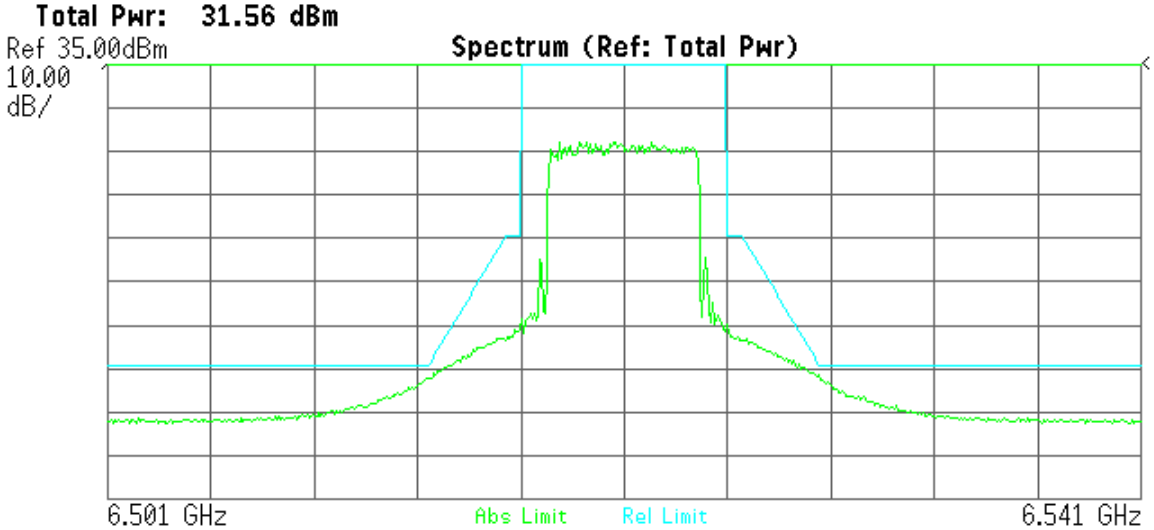


Total Pwr Ref: 31.78 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-26.47	6.4709 G	-26.13	6.4792 G
4.6000 M	7.6000 M	100.00 k	-27.60	6.4703 G	-27.75	6.4798 G
7.6000 M	20.000 M	100.00 k	-36.09	6.4673 G	-36.55	6.4827 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Hi Power, QPSK Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT

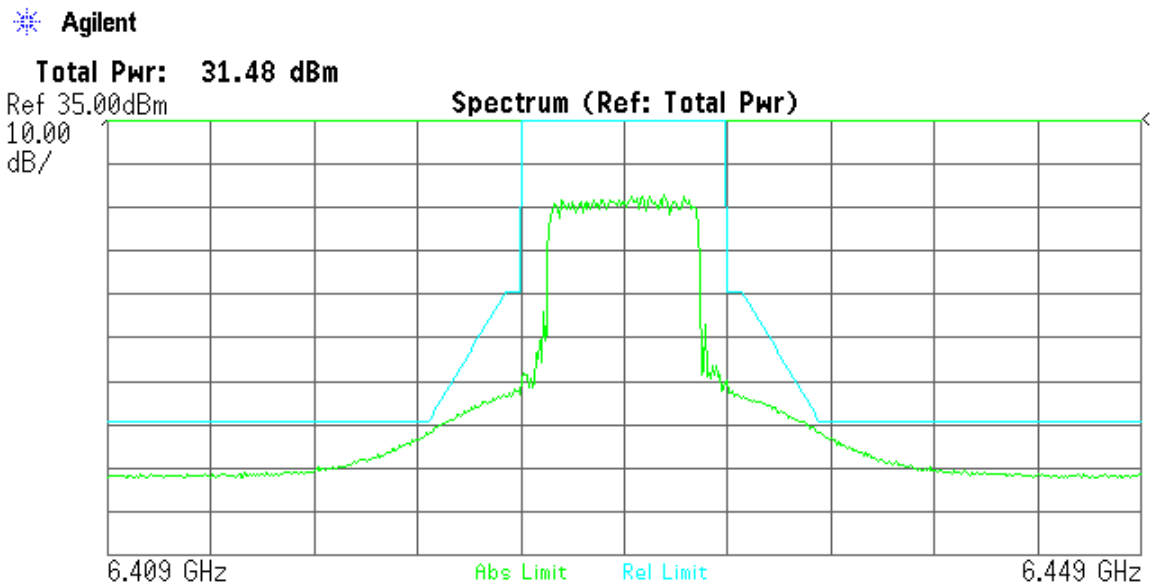


Total Pwr Ref: 31.56 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-26.04	6.5168 G	-27.01	6.5250 G
4.6000 M	7.6000 M	100.00 k	-28.01	6.5163 G	-28.17	6.5258 G
7.6000 M	20.000 M	100.00 k	-37.36	6.5133 G	-37.57	6.5287 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Hi Power, 16QAM Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT

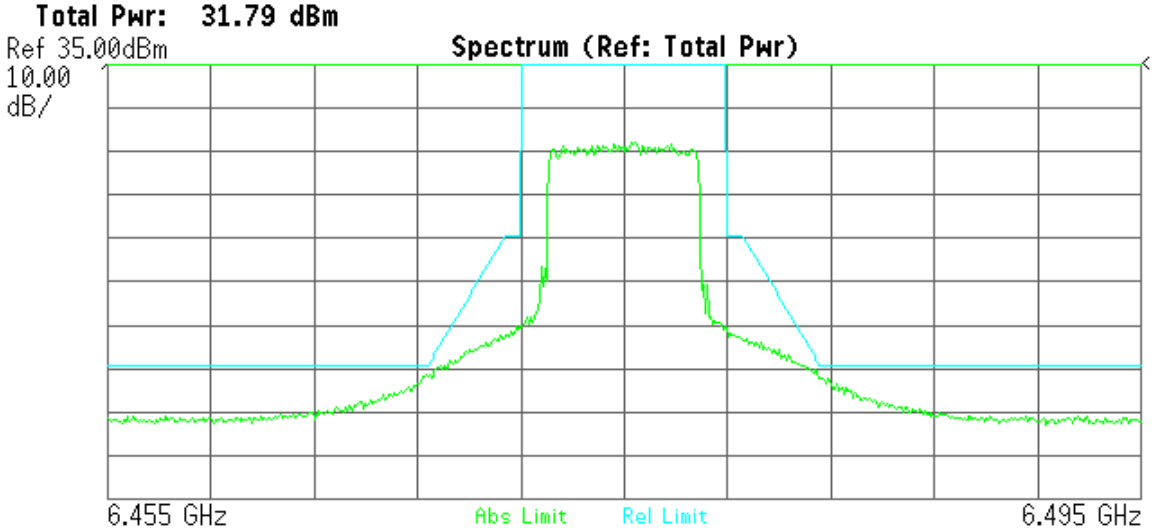


Total Pwr Ref: 31.48 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-26.76	6.4248 G	-27.35	6.4332 G
4.6000 M	7.6000 M	100.00 k	-28.00	6.4243 G	-28.40	6.4336 G
7.6000 M	20.000 M	100.00 k	-36.80	6.4213 G	-36.79	6.4366 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Hi Power, 16QAM Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT

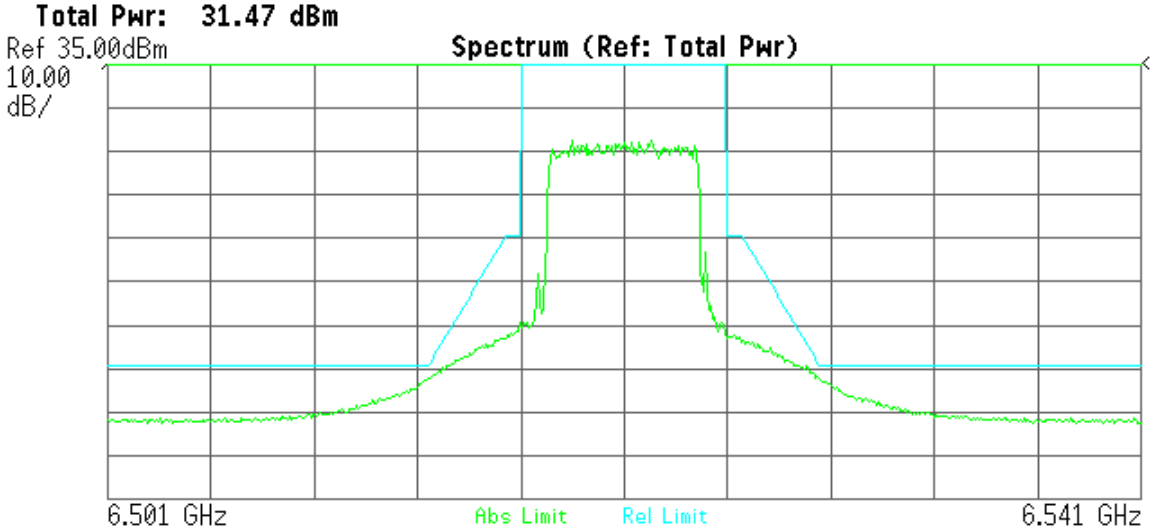


Total Pwr Ref: 31.79 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-25.33	6.4708 G	-26.67	6.4791 G
4.6000 M	7.6000 M	100.00 k	-27.03	6.4702 G	-28.03	6.4798 G
7.6000 M	20.000 M	100.00 k	-36.46	6.4673 G	-37.00	6.4827 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Hi Power, 16QAM Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT

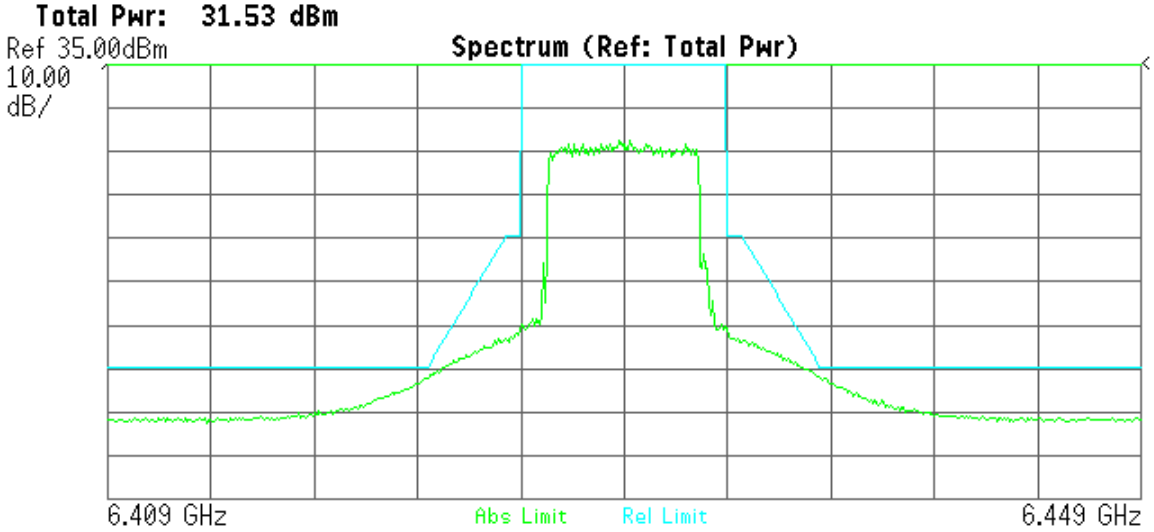


Total Pwr Ref: 31.47 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-26.49	6.5168 G	-27.32	6.5252 G
4.6000 M	7.6000 M	100.00 k	-27.87	6.5164 G	-28.36	6.5256 G
7.6000 M	20.000 M	100.00 k	-37.12	6.5134 G	-37.41	6.5286 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Hi Power, 64QAM Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT

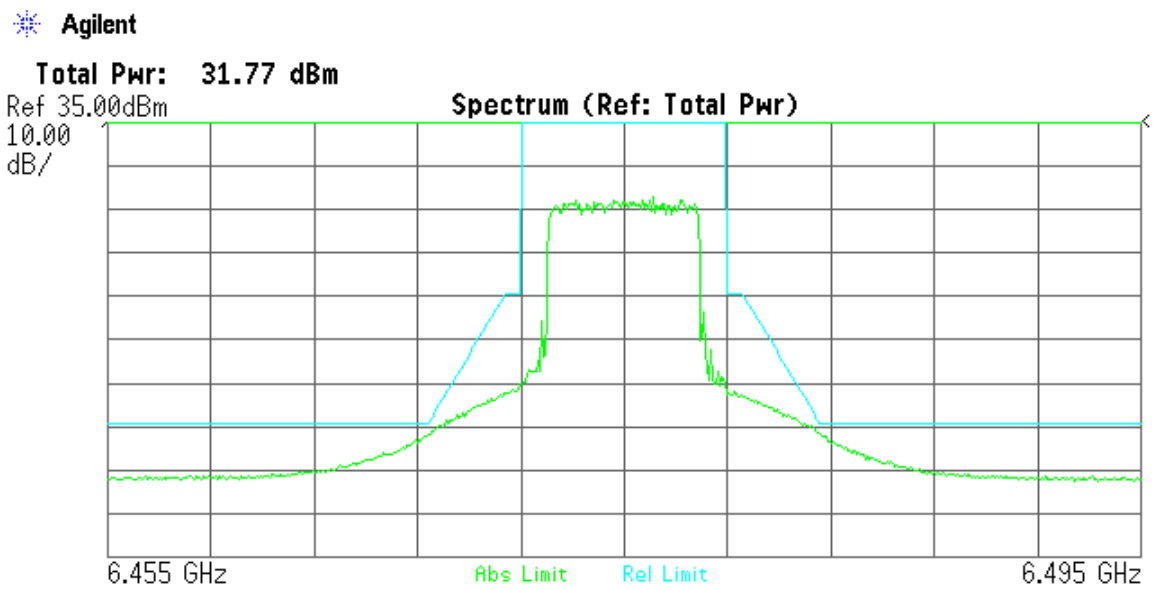


Total Pwr Ref: 31.53 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-26.69	6.4250 G	-27.65	6.4330 G
4.6000 M	7.6000 M	100.00 k	-27.96	6.4244 G	-28.40	6.4336 G
7.6000 M	20.000 M	100.00 k	-37.06	6.4213 G	-37.04	6.4366 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Hi Power, 64QAM Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT

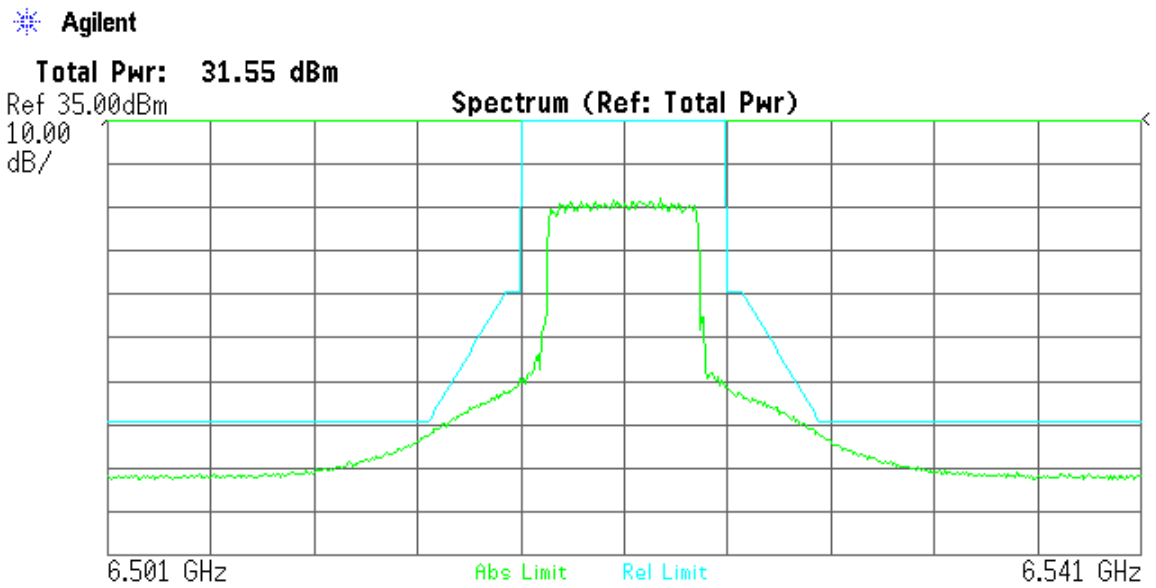


Total Pwr Ref: 31.77 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-25.93	6.4709 G	-26.95	6.4792 G
4.6000 M	7.6000 M	100.00 k	-27.10	6.4704 G	-28.18	6.4796 G
7.6000 M	20.000 M	100.00 k	-36.77	6.4674 G	-36.63	6.4826 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Hi Power, 64QAM Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT

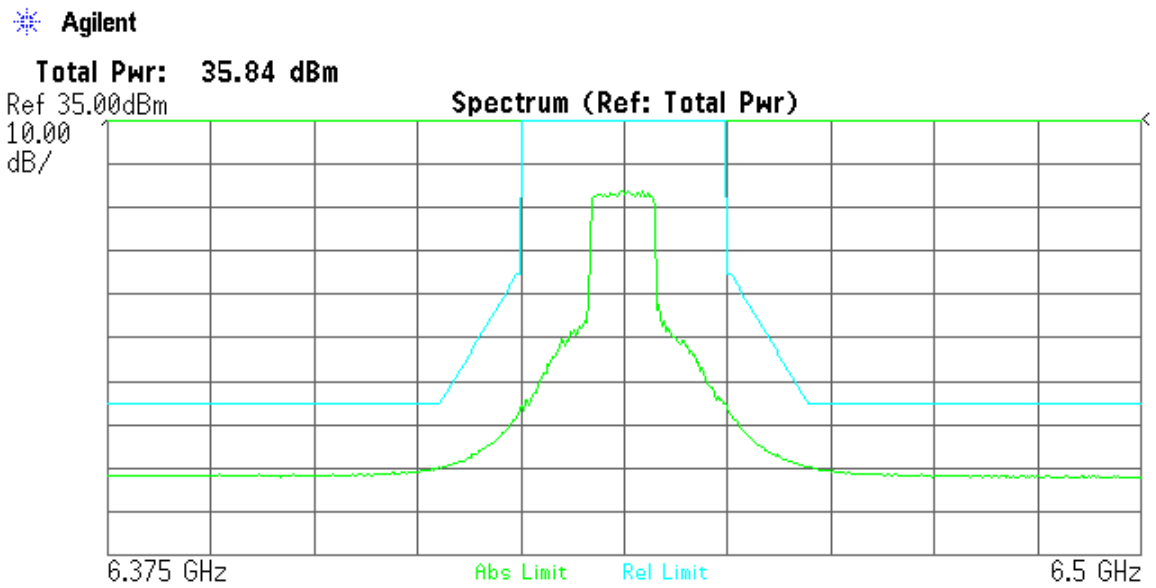


Total Pwr Ref: 31.55 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-26.14	6.5169 G	-26.91	6.5250 G
4.6000 M	7.6000 M	100.00 k	-27.36	6.5163 G	-28.76	6.5256 G
7.6000 M	20.000 M	100.00 k	-37.58	6.5132 G	-37.56	6.5286 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Hi Power, QPSK Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT

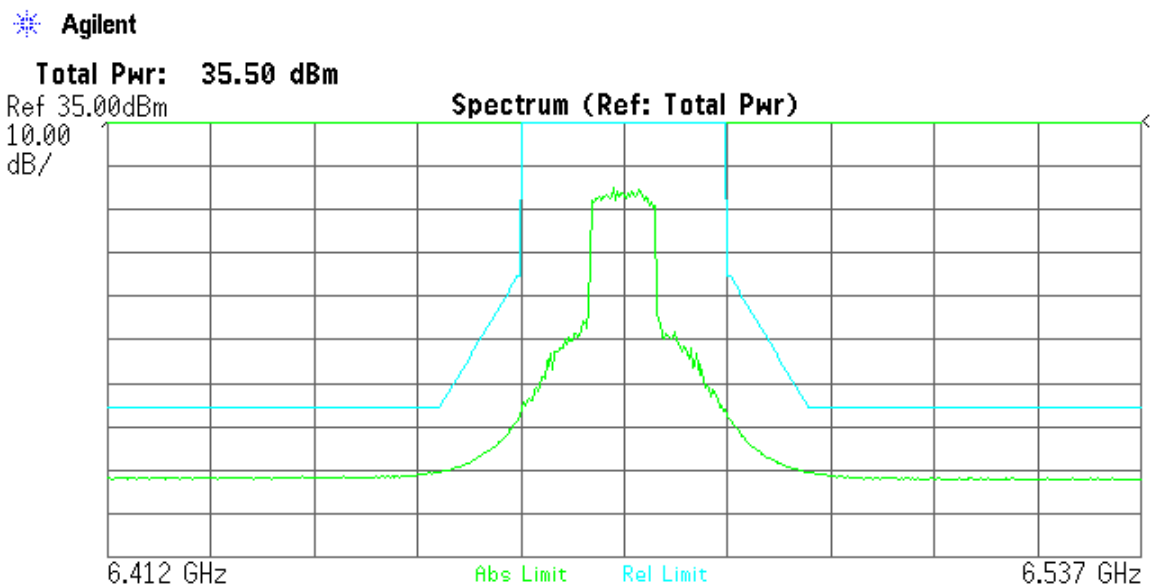


Total Pwr Ref: 35.84 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-32.49	6.4249 G	-32.30	6.4501 G
12.820 M	22.200 M	100.00 k	-32.74	6.4247 G	-32.51	6.4503 G
22.200 M	62.500 M	100.00 k	-44.74	6.4151 G	-44.51	6.4599 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Hi Power, QPSK Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT

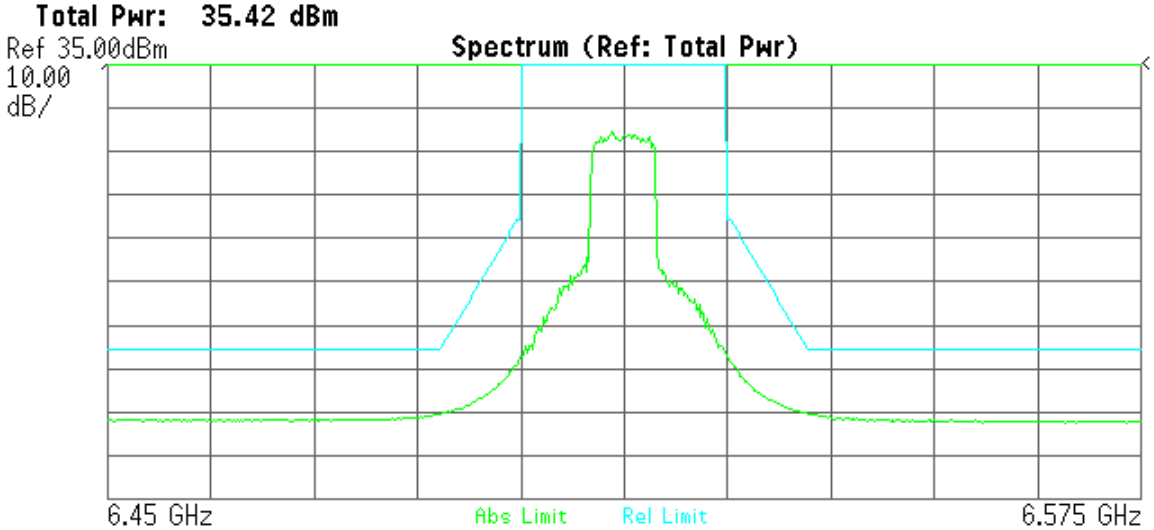


Total Pwr Ref: 35.50 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-32.96	6.4624 G	-32.95	6.4876 G
12.820 M	22.200 M	100.00 k	-33.21	6.4622 G	-33.49	6.4878 G
22.200 M	62.500 M	100.00 k	-45.37	6.4528 G	-45.38	6.4972 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Hi Power, QPSK Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT

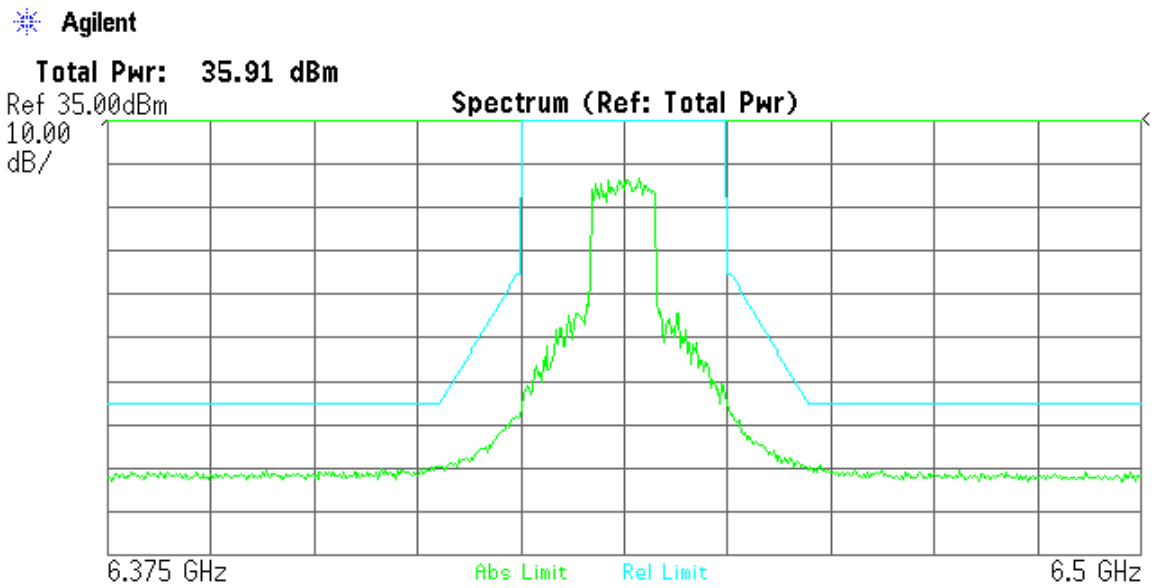


Total Pwr Ref: 35.42 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-33.04	6.4999 G	-33.02	6.5251 G
12.820 M	22.200 M	100.00 k	-33.63	6.4997 G	-33.47	6.5253 G
22.200 M	62.500 M	100.00 k	-45.30	6.4901 G	-45.42	6.5347 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Hi Power, 16QAM Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT

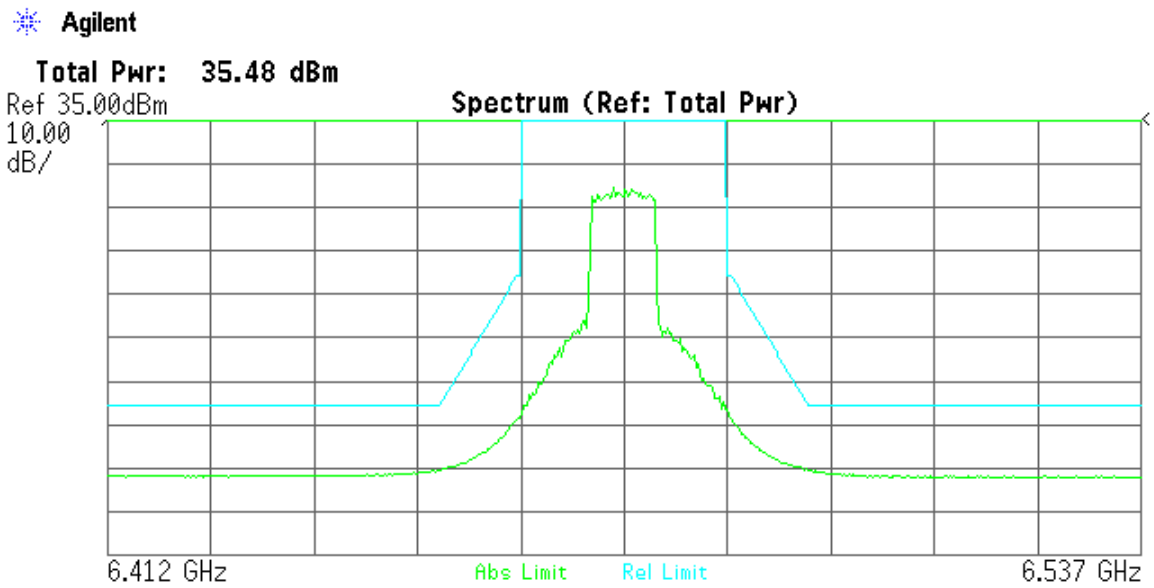


Total Pwr Ref: 35.91 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-33.18	6.4249 G	-31.85	6.4501 G
12.820 M	22.200 M	100.00 k	-33.17	6.4245 G	-32.65	6.4505 G
22.200 M	62.500 M	100.00 k	-44.53	6.4149 G	-44.31	6.4613 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Hi Power, 16QAM Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT

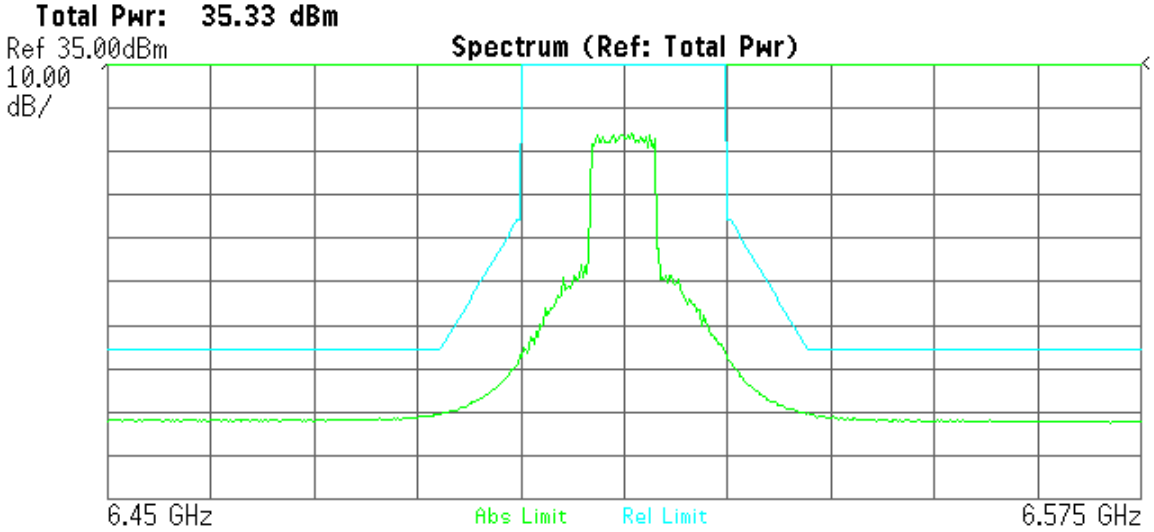


Total Pwr Ref: 35.48 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-32.97	6.4624 G	-33.19	6.4876 G
12.820 M	22.200 M	100.00 k	-33.37	6.4622 G	-33.61	6.4878 G
22.200 M	62.500 M	100.00 k	-45.44	6.4528 G	-45.33	6.4972 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Hi Power, 16QAM Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT

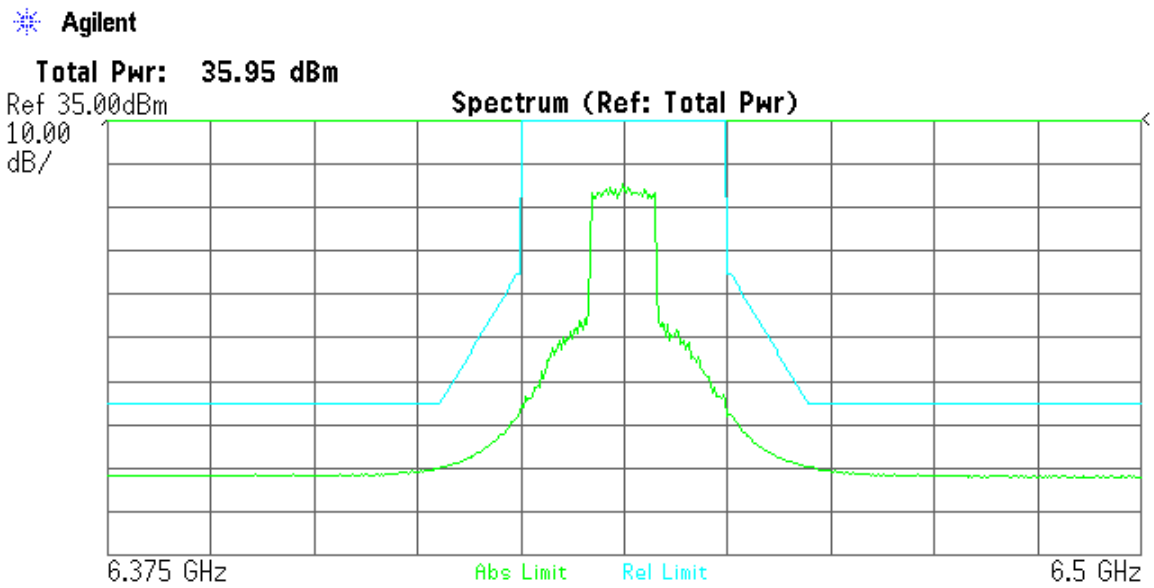


Total Pwr Ref: 35.33 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-33.08	6.4999 G	-33.06	6.5251 G
12.820 M	22.200 M	100.00 k	-33.75	6.4997 G	-33.48	6.5253 G
22.200 M	62.500 M	100.00 k	-45.46	6.4901 G	-45.26	6.5347 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Hi Power, 64QAM Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT

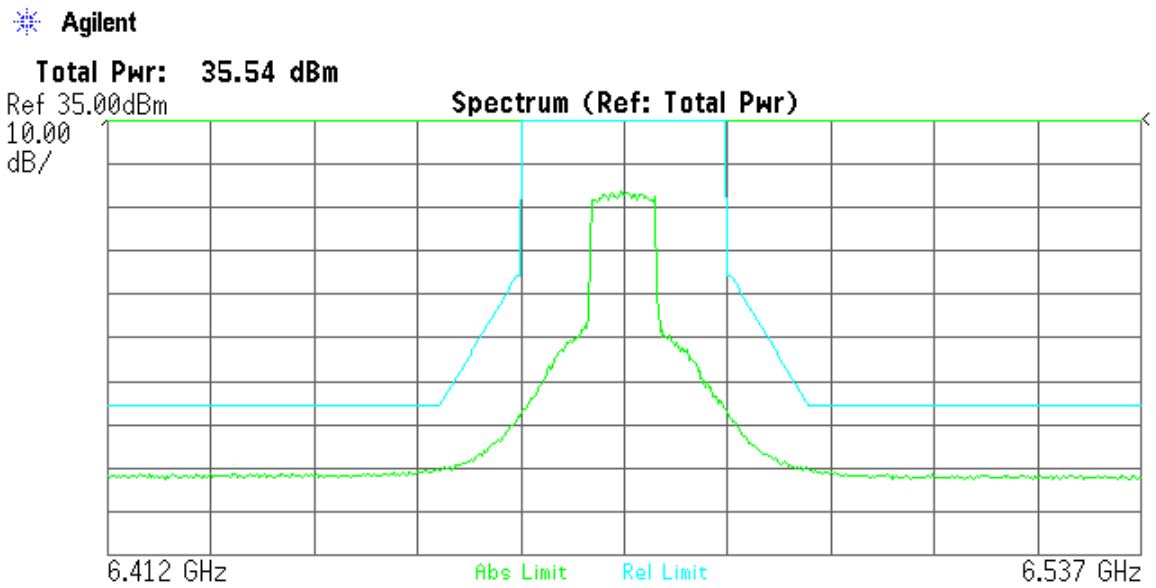


Total Pwr Ref: 35.95 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-32.65	6.4249 G	-32.61	6.4503 G
12.820 M	22.200 M	100.00 k	-33.09	6.4247 G	-32.61	6.4503 G
22.200 M	62.500 M	100.00 k	-44.76	6.4153 G	-44.74	6.4597 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Hi Power, 64QAM Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT

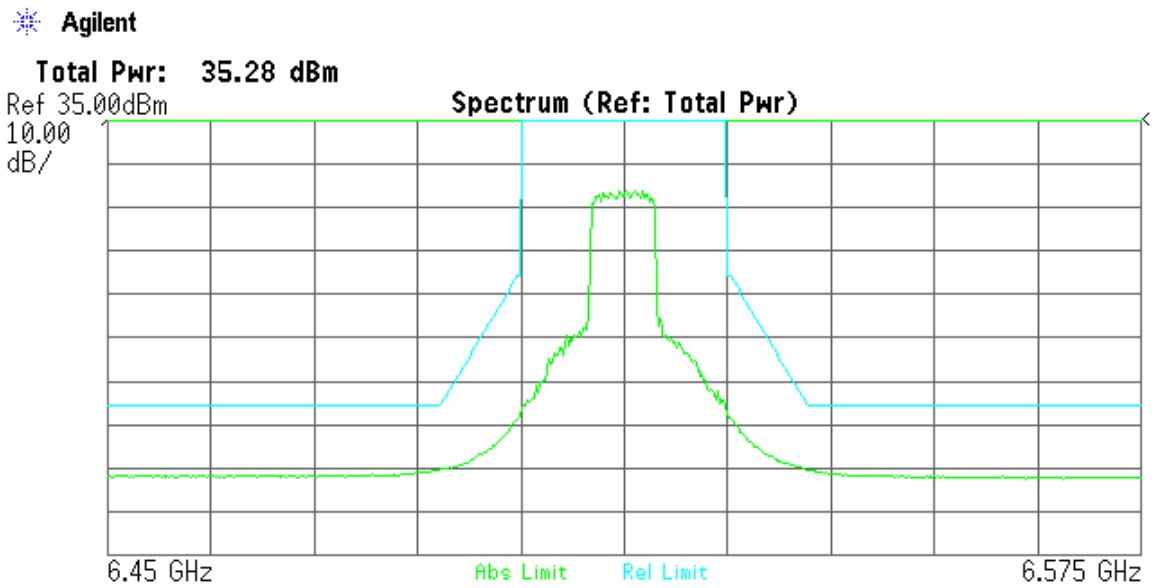


Total Pwr Ref: 35.54 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-32.92	6.4624 G	-33.13	6.4876 G
12.820 M	22.200 M	100.00 k	-33.25	6.4622 G	-33.58	6.4878 G
22.200 M	62.500 M	100.00 k	-44.98	6.4524 G	-45.26	6.4972 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Hi Power, 64QAM Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT



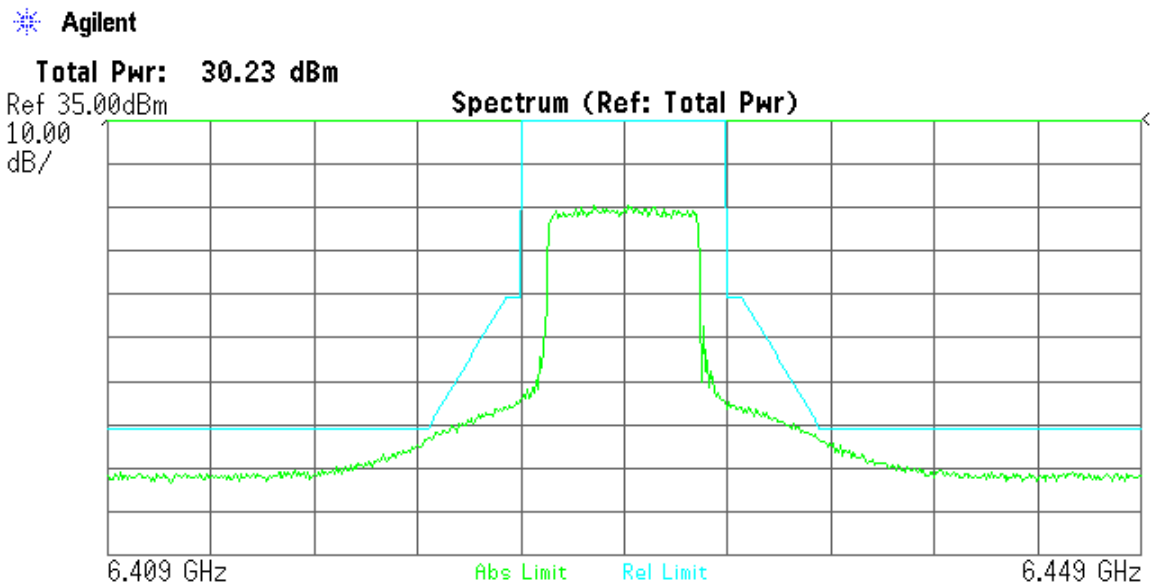
Total Pwr Ref: 35.28 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-33.18	6.4999 G	-33.32	6.5251 G
12.820 M	22.200 M	100.00 k	-33.43	6.4997 G	-33.34	6.5253 G
22.200 M	62.500 M	100.00 k	-45.26	6.4903 G	-45.30	6.5347 G

Selected Emission Mask Measurement for Low Power Setting:

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Low Power, 64QAM Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT

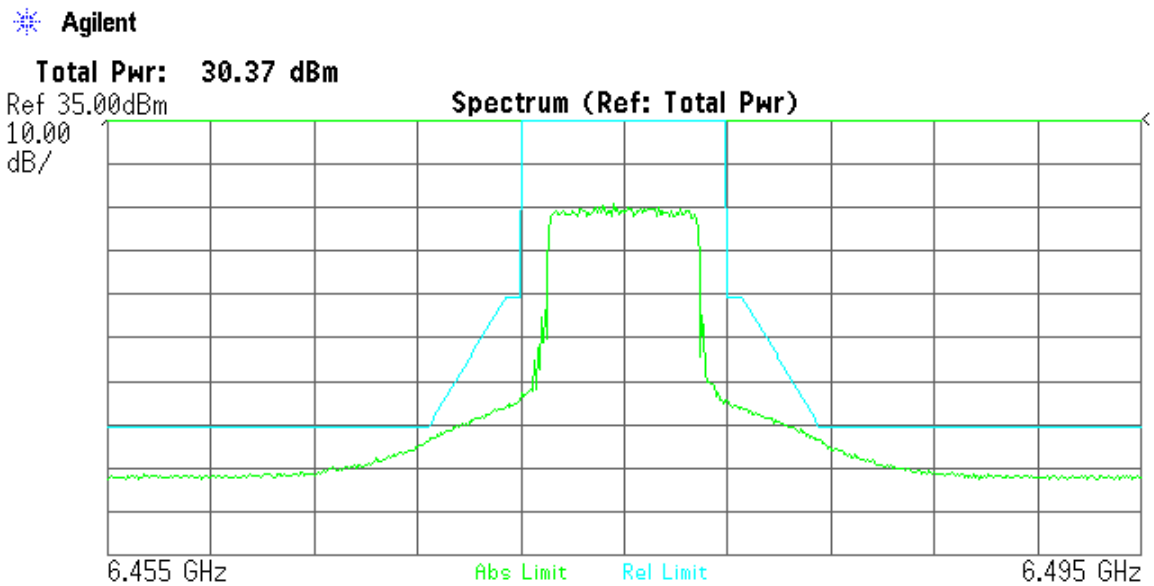


Total Pwr Ref: 30.23 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-29.44	6.4250 G	-29.53	6.4330 G
4.6000 M	7.6000 M	100.00 k	-30.92	6.4243 G	-31.09	6.4338 G
7.6000 M	20.000 M	100.00 k	-38.23	6.4214 G	-39.00	6.4367 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Low Power, 16QAM Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT

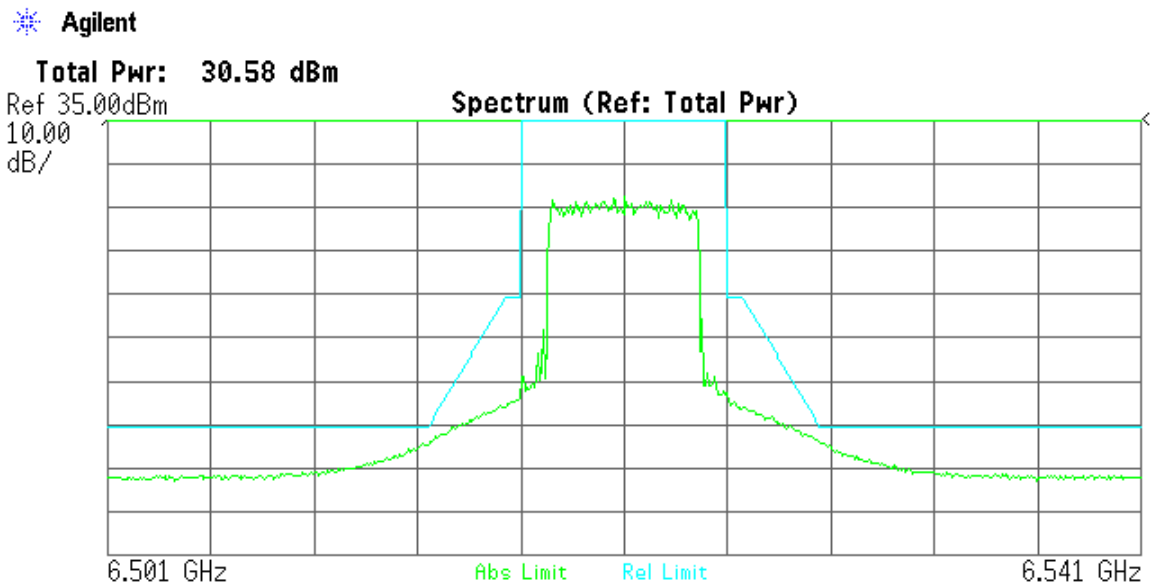


Total Pwr Ref: 30.37 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-29.48	6.4710 G	-30.11	6.4790 G
4.6000 M	7.6000 M	100.00 k	-31.18	6.4704 G	-31.23	6.4796 G
7.6000 M	20.000 M	100.00 k	-38.68	6.4674 G	-38.54	6.4826 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=8.0/6.0 MHz
Plot Name:	EM-MASK: Low Power, QPSK Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT

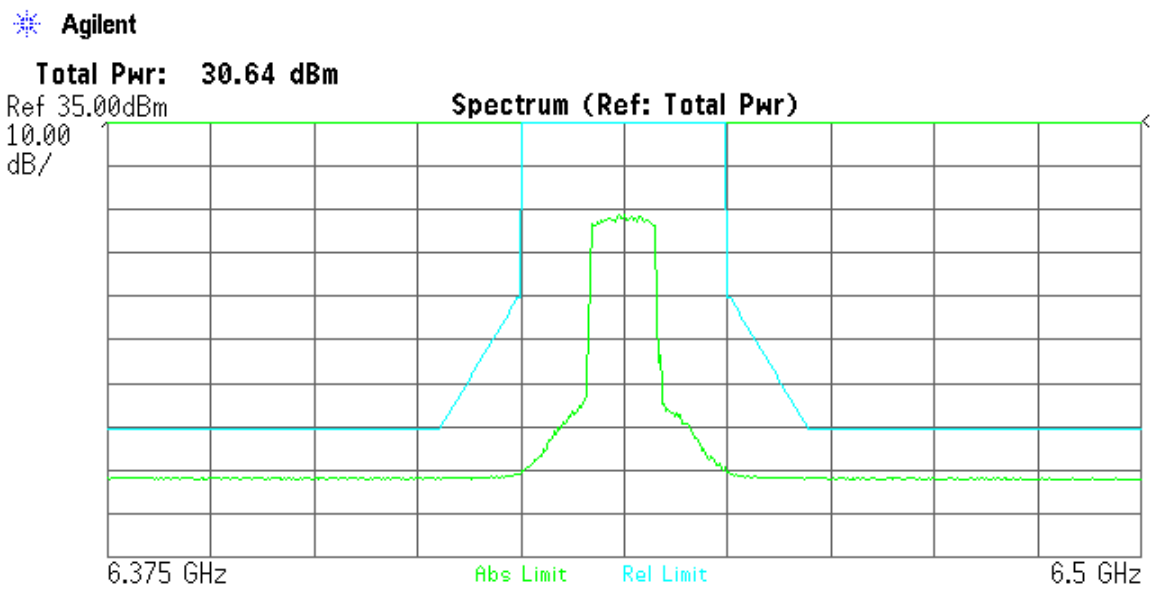


Total Pwr Ref: 30.58 dBm / 8.00000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
4.0000 M	4.6000 M	100.00 k	-29.24	6.5170 G	-29.77	6.5250 G
4.6000 M	7.6000 M	100.00 k	-30.54	6.5162 G	-30.91	6.5256 G
7.6000 M	20.000 M	100.00 k	-39.41	6.5132 G	-39.16	6.5288 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Low Power, QPSK Modulation, Low CH
Configuration:	SG Input: Color Bar. Output Port: EUT

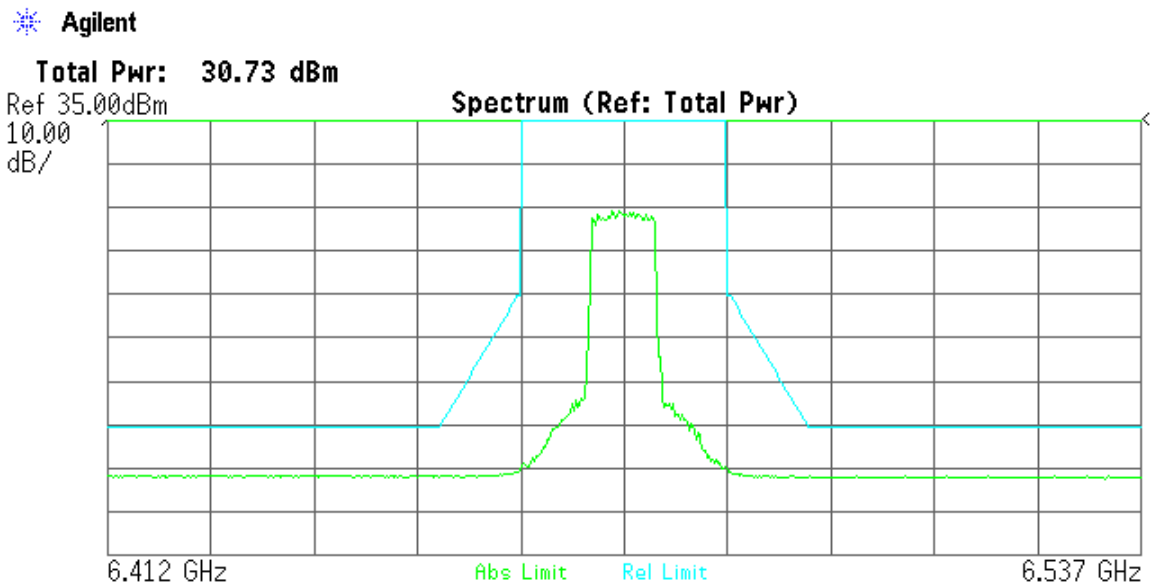


Total Pwr Ref: 30.64 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-45.84	6.4247 G	-45.70	6.4501 G
12.820 M	22.200 M	100.00 k	-45.84	6.4247 G	-45.96	6.4505 G
22.200 M	62.500 M	100.00 k	-46.63	6.3975 G	-46.66	6.4611 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Low Power, 16QAM Modulation, Mid CH
Configuration:	SG Input: Color Bar. Output Port: EUT

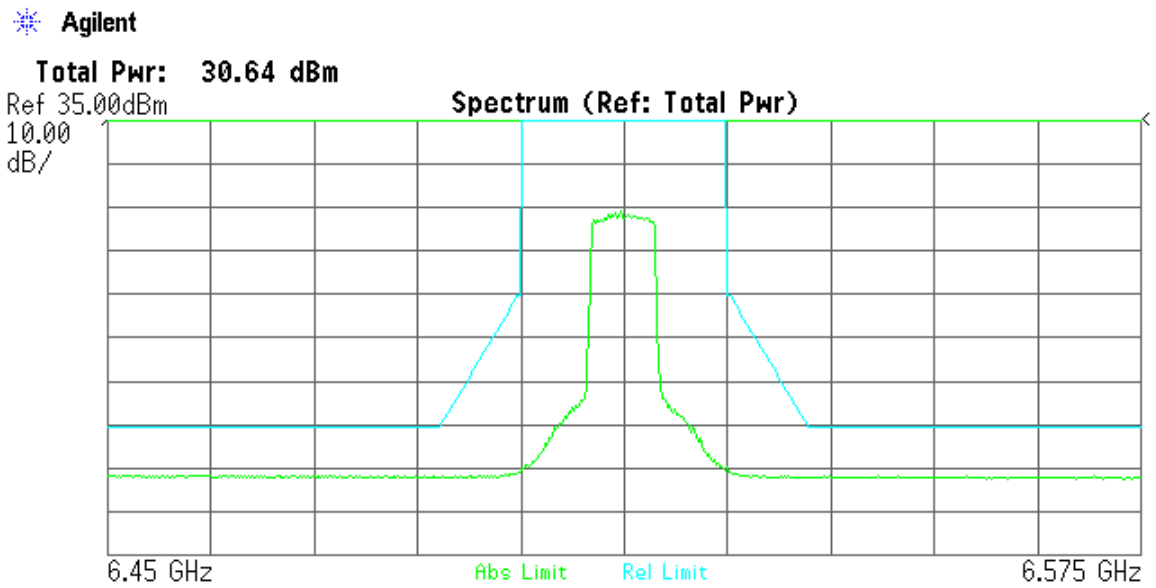


Total Pwr Ref: 30.73 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-45.66	6.4624 G	-46.00	6.4876 G
12.820 M	22.200 M	100.00 k	-45.73	6.4622 G	-46.07	6.4878 G
22.200 M	62.500 M	100.00 k	-46.65	6.4327 G	-46.85	6.5090 G

Project Number:	0048-130108-01
EUT:	IMT Skymaster TX HD/SD COFDM Transmitter 65SKTX
SN:	ENGUNIT002
Tested By:	Wei Li
Temperature:	70°F
Humidity:	30%

Section:	Emission Mask: Channel BW / Signal Modulation BW=25.0/8.0 MHz
Plot Name:	EM-MASK: Low Power, 64QAM Modulation, High CH
Configuration:	SG Input: Color Bar. Output Port: EUT



Total Pwr Ref: 30.64 dBm / 25.0000 MHz

Start(Hz)	Stop(Hz)	Meas BW(Hz)	Lower dBm	Lower Freq(Hz)	<-Peak-> dBm	Upper Freq(Hz)
12.500 M	12.820 M	100.00 k	-45.91	6.4999 G	-46.04	6.5253 G
12.820 M	22.200 M	100.00 k	-45.99	6.4997 G	-46.04	6.5253 G
22.200 M	62.500 M	100.00 k	-46.68	6.4508 G	-46.85	6.5457 G

Section 8. Frequency Stability

Name of Test:	*Frequency Stability*	Test Standard:	*101.108/2.1055*
Tested By:	WEI LI	Test Date:	04/12/2012-06/20/2012

Minimum Standard: Refer to Part 2.1055
Frequency Stability vs Temperature Variation and Power Supply Voltage Variation.

Frequency Band (MHz)	Maximum Frequency Tolerance(%)
1,990 to 2,110	0.005 (50ppm)
2,450 to 2,483.5	0.001 (10ppm)
6,425 to 6,525	0.005 (50ppm)
6,875 to 7,125	0.005 (50ppm)
12,700 to 13,250	0.005 (50ppm)

Method of Measurement: Frequency Stability With Voltage Variation:
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. Set SA resolution bandwidth low enough (30Hz) to obtain the desired frequency resolution. (Using frequency counter method: The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10MHz ref, in of the signal generator). With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation:
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C (+60 degree per manufacturer's spec.). The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

Test Result: **Complies**

Test Data: See Attached Table(s)

*** The modulation modes have no evident effect on frequency stability measurements. EUT was set in CW mode for final data collection.**

8.1. Frequency Stability vs . Voltage

Nominal voltage =28Vdc, extended voltage range= 24 – 32Vdc, T=25C

Voltage (Vdc)	Channel	Nominal Channel Frequency	Measured Frequency (MHz)	Frequency Error (KHz)	Error in ppm	Limit in ppm
28	M	6475.00	6475.002625	2.625	0.405405	50
24	M	6475.00	6475.002639	2.629	0.406023	50
32	M	6475.00	6475.002633	2.633	0.406641	50
28	L	6429.00	6429.003430	3.430	0.533520	50
24	L	6429.00	6429.003421	3.421	0.532120	50
32	L	6429.00	6429.003438	3.438	0.534764	50
28	H	6521.00	6521.003178	3.178	0.487349	50
24	H	6521.00	6521.003185	3.185	0.488422	50
32	H	6521.00	6521.003180	3.180	0.487655	50

8.2. Frequency Stability vs. Temperature

Nominal voltage =28Vdc, Nominal Middle channel frequency = 6475.00MHz

Temperature ©	Measured Frequency (MHz)	Frequency Error (KHz)	Error in ppm	Limit
+60	6475.006309	6.309	0.974363	50
+50	6475.005710	5.710	0.881853	50
+40	6475.004938	4.938	0.762625	50
+30	6475.004730	4.730	0.730502	50
+20	6475.003016	3.016	0.465792	**50**
+10	6475.004078	4.078	0.629807	50
0	6475.005719	5.719	0.883243	50
-10	6475.006425	6.425	0.992278	50
-20	6475.006836	6.826	1.054208	50
-30	6475.007223	7.223	1.115521	50

Section 9. Maximum Permissible Exposure

MPE estimate is given per 2.1091 of FCC Rules:

Given

$E = \sqrt{(30 * P * G) / d}$

and

$S = E^2 / 3770$

where

E = Field Strength in Volts/meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$d = \sqrt{((30 * P * G) / (3770 * S))}$

Changing to units of Power to mW and Distance to cm, using:

P (mW) = P (W) / 1000 and
d (cm) =100 * d (m)

yields

$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$
$d = 0.282 * \sqrt{(P * G / S)}$

where

d = distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and
G (numeric) = 10 ^ (G (dBi) / 10)

yields

$d = 0.282 * 10^{((P + G) / 20)} / \sqrt{S}$ Equation (1)

$S = 0.796 * 10^{((P + G)/10)} / d^2$ Equation (2)

where

d = MPE distance in cm
P = Power in dBm
G = Antenna Gain in dBi
S = Power Density Limit in mW/cm^2

Equation (1) and the measured peak power is used to calculate the MPE distance.
Equation (2) and the measured peak power is used to calculate the Power density.

Limit:

$S=1.0$ mW/cm^2

*1mW/ cm^2 is the reference level for general public exposure according to the OET Bulletin 65, Edition 97-01 Table 1.

Results:

NOT APPLICABLE TO THIS EUT SINCE ALL THE CONDUCTED MEASUREMENTS WERE TAKEN AT THE ANTANNA PORT. THIS APPLICATION IS FOR TRANSMITTER ONLY. ANTENNA IS NOT INCLUDED.

Section 10. Test Equipment List

Manufacture	Model	Serial No.	Description	Last Cal dd/mm/yy	Cal Due dd/mm/yy
Agilent	E4440A	US40420700	3Hz-26.5GHz Spec. Analyzer	4/08/11	4/08/12
R &S	ESPI7	6001	9KHz-7GHz EMI Receiver	17/06/11	17/06/12
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	5/01/11	5/01/13
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	15/01/11	15/01/13
EMCO	6502	2665	10KHz-30MHz Active Loop Antenna	27/02/12	27/02/13
EMCO	3115	4945	Double Ridge Guide Horn Antenna	12/03/12	12/03/13
HP	E8254A	US42110367	Signal Generator	23/03/12	23/03/13
Scientific-Atlanta	12A-18	441	Wave Guide Horn Antenna	04/08/11	04/08/12
Agilent	E4448A	MY45300108	3Hz-50GHz Spectrum Analyzer	05/09/11	05/09/12
Agilent	83650B	3844A01114	50G Swept Signal Generator	27/01/11	27/01/13
HP	5361B	3023A01322	20G Pulse/CW Microwave Counter	10/06/11	10/06/12
HP	4419A	US37292112	RF Power Meter w/ Sensor Probe	29/06/11	29/06/12
EMCO	3116	4943	Double Ridge Guide Horn Antenna	11/01/11	11/01/13
Tenney	T10C	26871-06	Temperature Test Chamber	30/06/11	30/06/12
Lorch Microwave	5NF-800/1000-S	AC3	Notch Filter		
Lorch Microwave	5NF-1800/2200-S	AE10	Notch Filter		
RES-NET	RFA500NFF30	0108	30dB in-line Power Attenuator		
Narda	3022	80986	Directional Coupler		

All Test Equipment Used are Calibrated Traceable to NIST Standards.