



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

TEST REPORT

FOR

Intel®60GHz Wireless Module Adapter (Client side)

MODEL NUMBER:

17265NGW

17265NGW LC

FCC ID: PD917265NG

REPORT NUMBER: 14U18424-1

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Intel Mobile Communications
 100 Center Point Circle, Suite 200
 Columbia, SC 29210 USA

EUT DESCRIPTION: Intel@60GHz Wireless Module Adapter (Client side)

MODEL: 17265NGW, 17265NGW LC

SERIAL NUMBER: 001500F7911A (BDM)

DATE TESTED: AUGUST 14-SEPTEMBER 4 ,2014

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC KDB 200443 D02 RF Detection Method V01, FCC KDB 200443 Millimeter Wave Test Procedure.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
<input type="checkbox"/> Chamber A	<input type="checkbox"/> Chamber D
<input type="checkbox"/> Chamber B	<input checked="" type="checkbox"/> Chamber E
<input type="checkbox"/> Chamber C	<input type="checkbox"/> Chamber F
	<input type="checkbox"/> Chamber G
	<input type="checkbox"/> Chamber H

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	±3.52 dB
Radiated Disturbance, 30 to 1000 MHz	±4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a 60GHz 802.11ad module adapter that supports one RFEM antenna array with typical application intended for portable host platforms (e.g., laptops, tablets).

GENERAL INFORMATION

Power Requirements	3.3 VDC (3.135-3.465 VDC)
Frequencies generated or used by the EUT	Clock:1.32 GHz IF: 10.56 GHz VCO: 23.88, 24.96, 26.04 GHz LO2: 47.76, 49.92, 52.08 GHz Fo: 58.32 GHz, 60.48 GHz, 62.64 GHz

5.2. OUTPUT POWER

The antenna is integral thus radiated measurements are made. The EIRP was measured at the worst-case condition, thus the EIRP measurement conditions correspond to the maximum EUT antenna gain. Therefore the maximum antenna gain is used to calculate the Peak Output Power.

The highest peak conducted output power is 10.65 dBm (11.6mW).

5.3. DESCRIPTION OF ANTENNA

The antenna is an integral phased-array antenna with a maximum gain of 15.45 dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

Worst case Modulation was $\pi/2$ BPSK; Rate MCS0.

The following configuration was investigated during testing:

EUT Configuration	Description
Per manufacturer	The EUT tested was connected to a laptop via an Express card adapter and ribbon cable to an Extender board which the EUT is mounted to. The antenna array is connected to the EUT via an I.F coax cable.

Software on Laptop to conduct tests was Intel DRTU (Diagnostic and Regulatory Test Utility) Version 1.7.3-984

5.5. MODE(S) OF OPERATION

Mode	Description
Normal	The EUT in TX mode.

5.6. MODIFICATIONS

No modifications were made during testing.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Dell	E6430	11854304569	DoC
AC/DC Adapter	Dell	LAGSNS2-01	CN-06TM1C-72438	N/A
Express Card Adapt.	--	--	600010823	N/A
PCIe Ext. Board	Intel	PCB00284	ASS00284	N/A
Extender Board	Intel	PCB00469	4694213-090	N/A
AC/DC Adapter	Sinpro	SPU60-12	8086381339	N/A

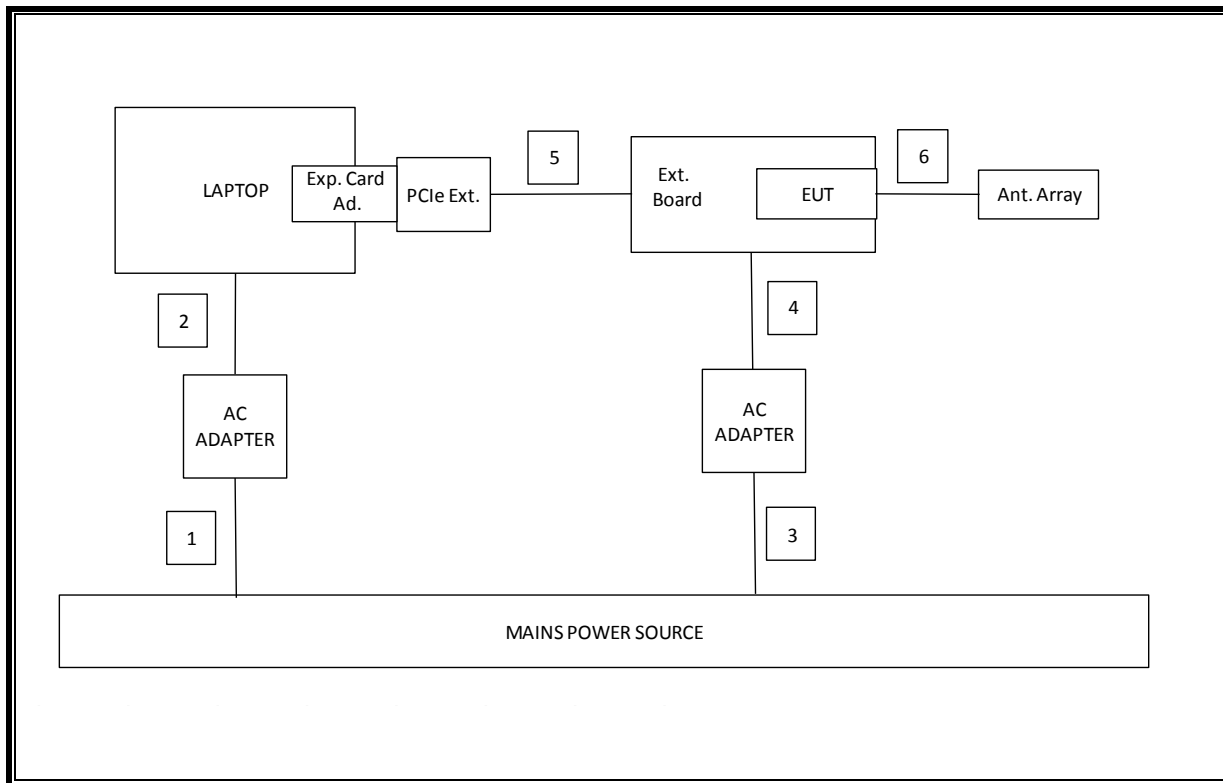
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	No. of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	EURO AC	Unshielded	0.9	N/A
2	DC	1	DC Power	Unshielded	1.7	N/A
3	AC	1	Parallel Blade	Unshielded	1.8	N/A
4	DC	1	DC Power	Unshielded	2.1	N/A
5	Data	1	Ribbon	Shielded	1	N/A
6	IF	1	X.FL	Shielded	0.5	EUT + Ant. Array connection

TEST SETUP

The EUT was set up as shown in the following diagram;

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	Manufacturer	Model	S/N	Cal Due
N9030A PXA Signal Analyzer	Agilent	N9030A	MY52350427	1/22/2015
Analog Signal Generator, 40 GHz	Agilent	E8257D	MY48050681	9/19/2014
Down Converter, 67 GHz	Agilent	MT-463	12020	CNR
mmWave Source 50 - 75 GHz	OML	S15MS-AG	80708-4	CNR
Mixer Diplexer for HP	OML	DPL.313B	N02429	CNR
Harmonic Mixer, 50 GHz	Agilent	11970Q	3003A03363	9/25/2014
Harmonic Mixer, 75 GHz	Agilent	11970V	2521A01183	2/5/2015
Harmonic Mixer, 110 GHz	Agilent	11970W	2521A01314	2/13/2015
Harmonic Mixer, 90 to 140 GHz	OML	M08HWA	F90519-2	6/17/2015
Harmonic Mixer, 140 to 220 GHz	OML	M05HWA	G90519-1	6/17/2015
Single Average Power Meter	Agilent	N1913A	MY53100006	5/1/2015
Waveguide Power Sensor	Agilent	V8486A	MY52300008	5/6/2015
Power Sensor, 50 to 78 GHz	Agilent	V8486A	MY44420424	12/12/2014
Spectrum Analyzer, 40 GHz	Agilent	8564E	3943A01643	8/6/2015
Amplifier, 1 to 26.5GHz	Agilent	8449B	3008A04710	3/25/2015
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	1049	11/26/2014
Amplifier	Miteq	NSP4000-SP2	924343	9/3/2015
Horn Antenna, 40GHz	ARA	MWH-2640/B	1029	7/15/2015
PXA Signal Analyzer	Agilent	N9030A-544	US51350187	5/2/2015
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB3	A022813-1	3/28/2015
Amplifier	Sonoma	310	323561	5/28/2015
Horn Antenna, 1-18GHz	ETS Lindgren	317	143449	2/25/2015
RF PreAmplifier, 1-18GHz	Miteq	AFS42-00101800-25-S-42	T741	2/7/2015
Oscilloscope, 1GHz 4Ch Digital Storage Oscilloscope	Agilent	DSO9104A	MY51420139	7/2/2015
Low Pass Filter, 10MHz	Solar Electronics	6623-10	136101	3/26/2015
Low Noise Amplifier	VIVAtech	VTLN-018-FB	51	CNR
Waveguide switch	mi-Wave	530V/387	1332	CNR
MM-Wave Isolator	Millitech	FBI-15-RSES0	1734	CNR
50-75GHz RF Detector	Millitech	DET-15-RPFWI	41	CNR
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	100935	9/9/2014
LISN, 30 MHz	FCC	50/250-25-2	114	1/17/2015
Spectrum Analyzer, PXA, 3Hz to 50GHz	Agilent	N9030A	MY52350671	6/25/2015
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	MY53310972	5/8/2015
Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	ZP131613	10/11/2014
DC Power supply	Ametek	XT15-4	1319A02780	CNR
Volt Meter	Fluke	87V	23310087	3/21/2015

7. APPLICABLE LIMITS AND TEST RESULTS

7.1. 6 dB BANDWIDTH

APPLICABLE RULE

§15.255 (e) (1) For the purposes of this paragraph (e)(1), emission bandwidth is defined as the instantaneous frequency range occupied by a steady state radiated signal with modulation, outside which the radiated power spectral density never exceeds 6 dB below the maximum radiated power spectral density in the band, as measured with a 100 kHz resolution bandwidth spectrum analyzer. The center frequency must be stationary during the measurement interval, even if not stationary during normal operation (e.g. for frequency hopping devices).

LIMIT

None; for reporting purposes only.

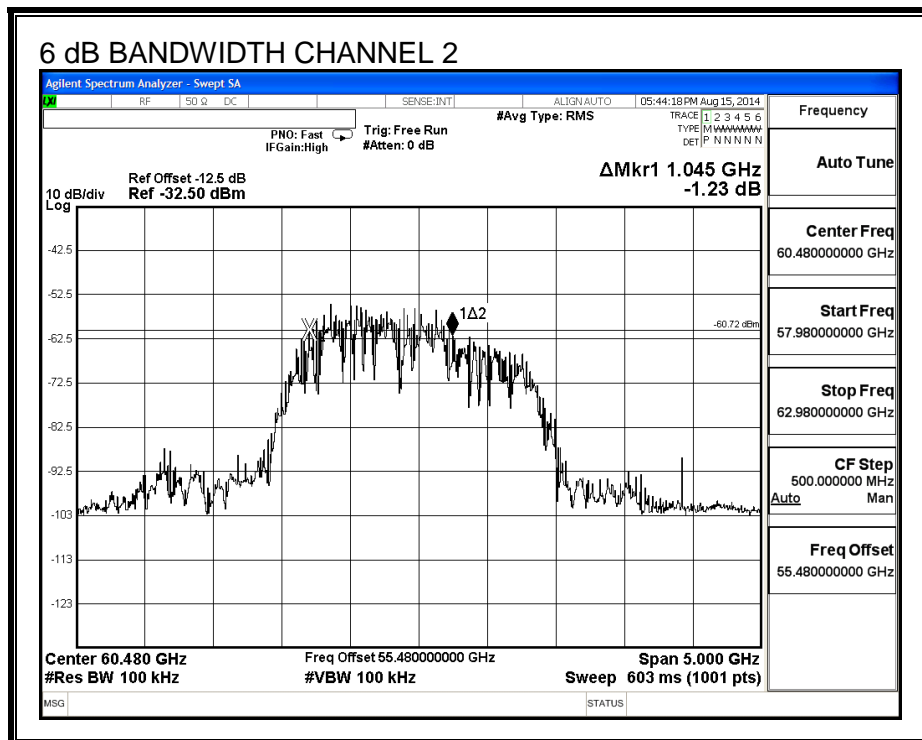
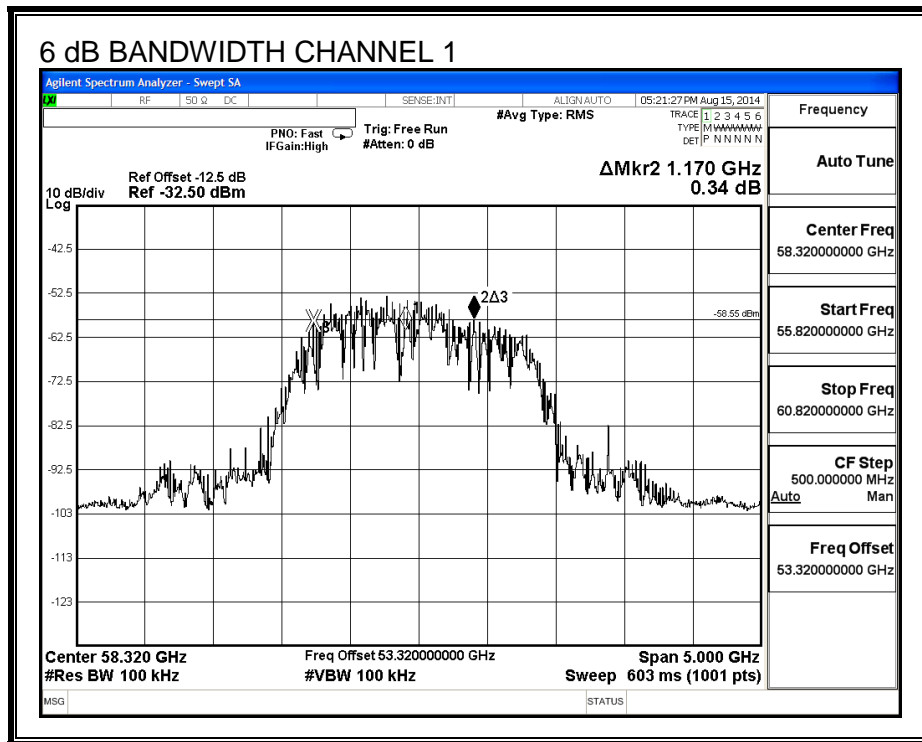
TEST PROCEDURE

The spectrum analyzer and external mixer are set up to measure the radiated output of the transmitter.

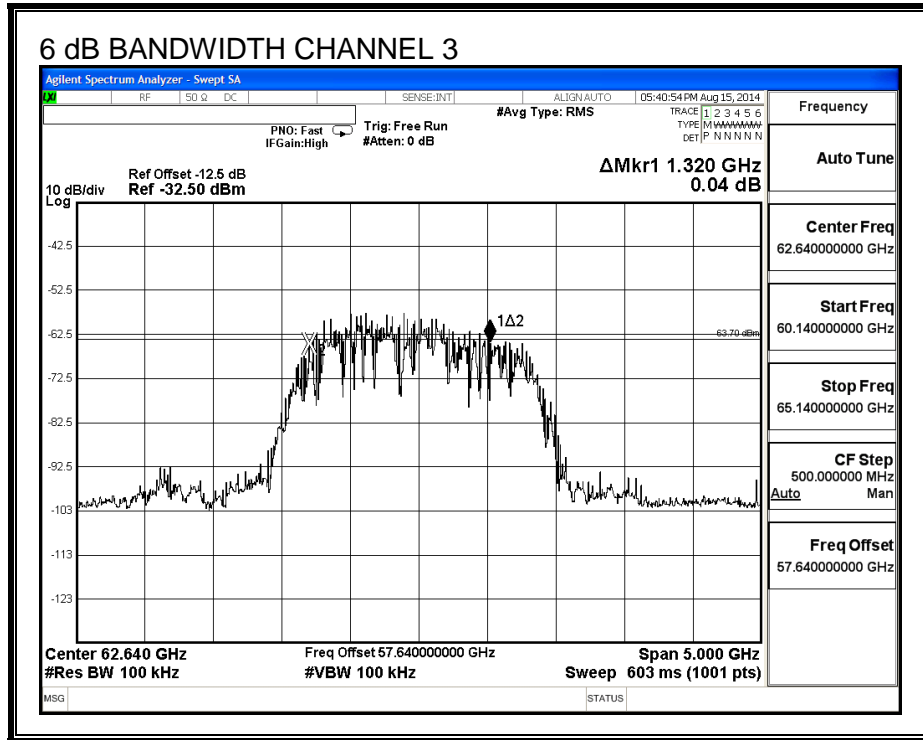
RESULTS

Channel	Frequency (GHz)	6 dB Bandwidth (MHz)
1	58.32	1170
2	60.64	1045
3	62.64	1320

6 dB BANDWIDTH



6 dB BANDWIDTH



7.2. POWER DENSITY

LIMIT

§15.255 (b) (1) Within the 57-64 GHz band, the average power density of any emission, measured during the transmit interval, shall not exceed 9 uW/cm², as measured 3 meters from the radiating structure, and the peak power density of any emission shall not exceed 18 uW/cm², as measured 3 meters from the radiating structure.

TEST PROCEDURE

§15.255 (b) (6) KDB 200443 D02 RF Detection Method V01

Measurements are made at a distance greater than or equal to the far field boundary distance.

The measured power level is converted to EIRP using the Friis equation:

$$EIRP = P_T * G_T = (P_R / G_R) * (4 * \pi * D / \lambda)^2$$

where:

G_R is the gain of the receive measurement antenna

D is the measurement distance

λ is the wavelength

The EIRP is converted to Power Density using the equation:

$$P_D = EIRP / (4 * \pi * D_S^2)$$

where:

D_S is the specification distance

FAR FIELD BOUNDARY CALCULATIONS

The far-field boundary is given in FCC KDB Publication 200443 as:

$$R_{\text{far field}} = (2 * L^2) / \lambda$$

where:

L = Largest Antenna Dimension, including the reflector, in meters

λ = wavelength in meters

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
58.32	0.023	0.0051	0.21
60.48	0.023	0.0050	0.21
62.64	0.023	0.0048	0.22

7.2.1. Peak and Average Power Density, RF Detector Method

CHANNEL 1

PEAK POWER DENSITY

Frequency (GHz)	Measurement Distance (m)	Measured Peak Voltage (mV)	Raw Measured Power (dBm)	Corrd Measured Power (dBm)	Rx Antenna Gain (dBi)
58.32	3.00	6.88	-30.26	-29.96	23.00
EIRP (dBm)	EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (uW/cm ²)	Peak Limit (uW/cm ²)
24.3	0.271	3.0	0.0024	0.24	18

AVERAGE POWER DENSITY

Frequency (GHz)	Measurement Distance (m)	Measured Average (mV)	Measured Power (dBm)	Corrd Measured Power (dBm)	Rx Antenna Gain (dBi)
58.32	3.00	5.12	-31.45	-31.15	23.00
EIRP (dBm)	EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (uW/cm ²)	Average Limit (uW/cm ²)
23.1	0.206	3.0	0.0018	0.18	9

CHANNEL 2**PEAK POWER DENSITY**

Frequency (GHz)	Measurement Distance (m)	Measured Peak Voltage (mV)	Raw Measured Power (dBm)	Corrd Measured Power (dBm)	Rx Antenna Gain (dBi)
60.48	3.00	5.83	-28.80	-28.50	23.00
EIRP (dBm)	EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (uW/cm ²)	Peak Limit (uW/cm ²)
26.1	0.409	3.0	0.0036	0.36	18

AVERAGE POWER DENSITY

Frequency (GHz)	Measurement Distance (m)	Measured Average (mV)	Measured Power (dBm)	Corrd Measured Power (dBm)	Rx Antenna Gain (dBi)
60.48	3.00	4.10	-30.61	-30.31	23.00
EIRP (dBm)	EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (uW/cm ²)	Average Limit (uW/cm ²)
24.3	0.269	3.0	0.0024	0.24	9

CHANNEL 3

PEAK POWER DENSITY

Frequency (GHz)	Measurement Distance (m)	Measured Peak Voltage (mV)	Raw Measured Power (dBm)	Corrd Measured Power (dBm)	Rx Antenna Gain (dBi)
62.64	3.00	3.58	-30.22	-29.92	23.00
EIRP (dBm)	EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (uW/cm ²)	Peak Limit (uW/cm ²)
25.0	0.316	3.0	0.0028	0.28	18

AVERAGE POWER DENSITY

Frequency (GHz)	Measurement Distance (m)	Measured Average Voltage (mV)	Measured Power (dBm)	Corrd Measured Power (dBm)	Rx Antenna Gain (dBi)
62.64	3.00	2.17	-31.78	-31.48	23.00
EIRP (dBm)	EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (uW/cm ²)	Average Limit (uW/cm ²)
23.4	0.221	3.0	0.0020	0.20	9

7.3. PEAK OUTPUT POWER

LIMIT

§15.255 (e) Except as specified paragraph (e)(1) of this section, the peak transmitter conducted output power shall not exceed 500 mW. Depending on the gain of the antenna, it may be necessary to operate the intentional radiator using a lower peak transmitter output power in order to comply with the EIRP limits specified in paragraph (b) of this section.

§15.255 (e) (1) Transmitters with an emission bandwidth of less than 100 MHz must limit their peak transmitter conducted output power to the product of 500 mW times their emission bandwidth divided by 100 MHz. For the purposes of this paragraph, emission bandwidth is defined as the instantaneous frequency range occupied by a steady state radiated signal with modulation, outside which the radiated power spectral density never exceeds 6 dB below the maximum radiated power spectral density in the band, as measured with a 100 kHz resolution bandwidth spectrum analyzer. The center frequency must be stationary during the measurement interval, even if not stationary during normal operation (e.g., for frequency hopping devices).

PROCEDURE

The maximum EUT antenna gain is subtracted from the Peak EIRP.

RESULTS

PEAK OUTPUT POWER-RF Det. Method

Frequency (GHz)	EIRP (dBm)	EUT Antenna Gain (dBi)	Output Power (dBm)	Output Power (mW)	6 dB Bandwidth (MHz)	Output Power Limit (mW)
58.32	24.3	15.45	8.85	7.7	1170	500
60.48	26.1	15.45	10.65	11.6	1045	500
62.64	25.0	15.45	9.55	9.0	1320	500

7.4. PEAK AND AVERAGE RADIATED OUTPUT POWER**LIMIT**

For information purposes.

RESULTS**PEAK RADIATED POWER**

Frequency (GHz)	Channel	Output Power (dBm) EIRP	Output Power (mW) EIRP
58.32	1	24.30	269.15
60.48	2	26.10	407.38
62.64	3	25.00	316.23

AVERAGE RADIATED POWER

Frequency (GHz)	Channel	Output Power (dBm) EIRP	Output Power (mW) EIRP
58.32	1	23.10	204.17
60.48	2	24.30	269.15
62.64	3	23.40	218.78

7.5. FREQUENCY STABILITY

LIMIT

§15.255 (f) Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range - 20 to +50 degrees celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

Manufacturers Specification is 3.3VDC +/- 5% .

TEST PROCEDURE

The radio module is placed in an environmental chamber, with power furnished by an adjustable source. The carrier frequency is counted at each condition and compared with the reference condition.

RESULTS

Reference Conditions: 3.3VDC @ 20°C		CHANNEL 2	
Power Supply (VDC)	Environment Temperature (°C)	Frequency	Delta
		(MHz)	(kHz)
3.30	50	60479.3535680	-391.248
3.30	40	60479.3953900	-349.426
3.30	30	60479.5426460	-202.170
3.30	20	60479.7448160	Reference
3.30	10	60479.8976040	152.788
3.30	0	60480.0837210	338.905
3.30	-10	60480.2492280	504.412
3.30	-20	60480.3175190	572.703
3.135	20	60479.7472850	2.469
3.465	20	60479.7439010	-0.915

7.6. TX SPURIOUS EMISSIONS

LIMITS

§15.255 (c) (1) The power density of any emissions outside the 57–64 GHz band shall consist solely of spurious emissions.

§15.255 (c) (2) Radiated emissions below 40 GHz shall not exceed the general limits in §15.209.

§15.255 (c) (3) Between 40 GHz and 200 GHz, the level of these emissions shall not exceed 90 pW/cm² at a distance of 3 meters.

§15.255 (c) (4) The levels of the spurious emissions shall not exceed the level of the fundamental emission.

§15.255 (d) Only spurious emissions and transmissions related to a publicly accessible coordination channel, whose purpose is to coordinate operation between diverse transmitters with a view towards reducing the probability of interference throughout the 57–64 GHz band, are permitted in the 57–57.05 GHz band.

Note to paragraph (d): The 57–57.05 GHz is reserved exclusively for a publicly-accessible coordination channel. The development of standards for this channel shall be performed pursuant to authorizations issued under part 5 of this chapter.

PROCEDURE FOR 30 MHz TO 40 GHz

ANSI C 63.10-2009

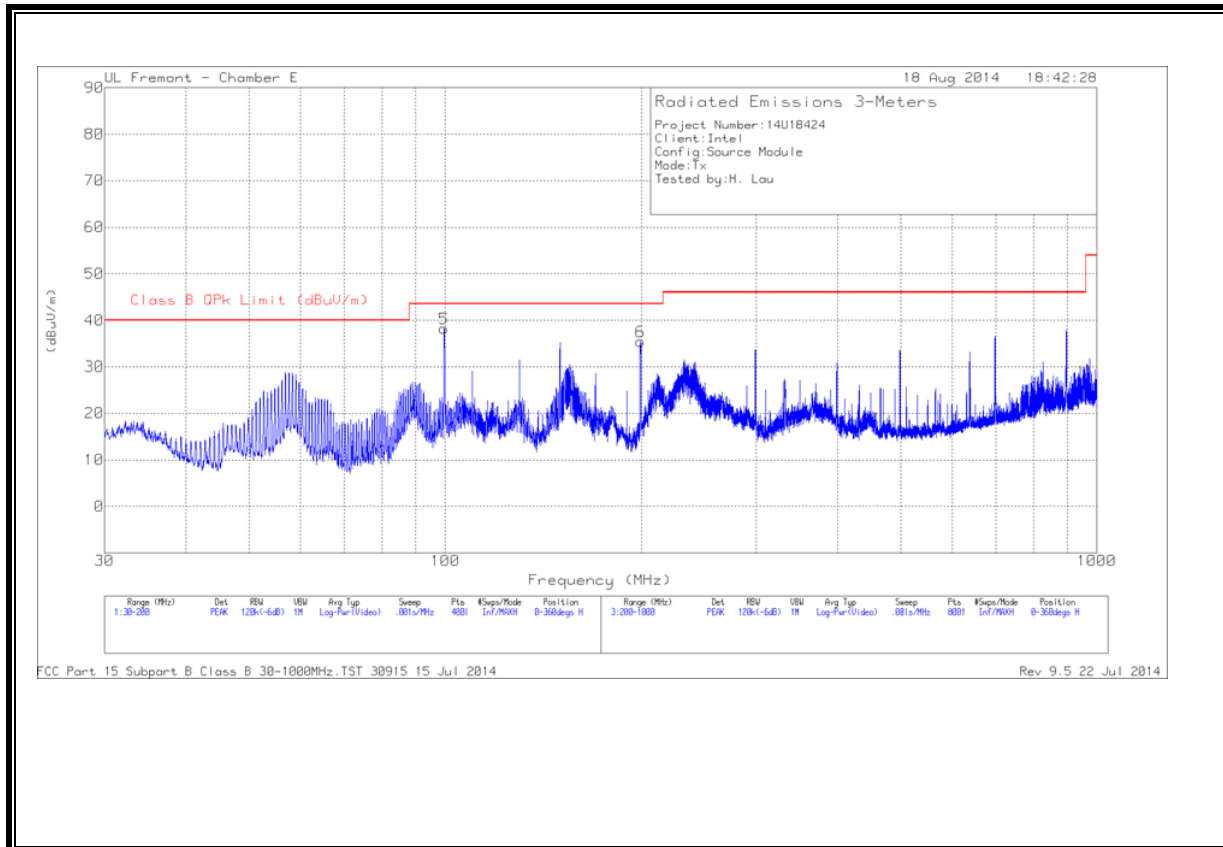
PROCEDURE FOR 40 TO 200 GHz

KDB200443 millimeter wave test procedure.

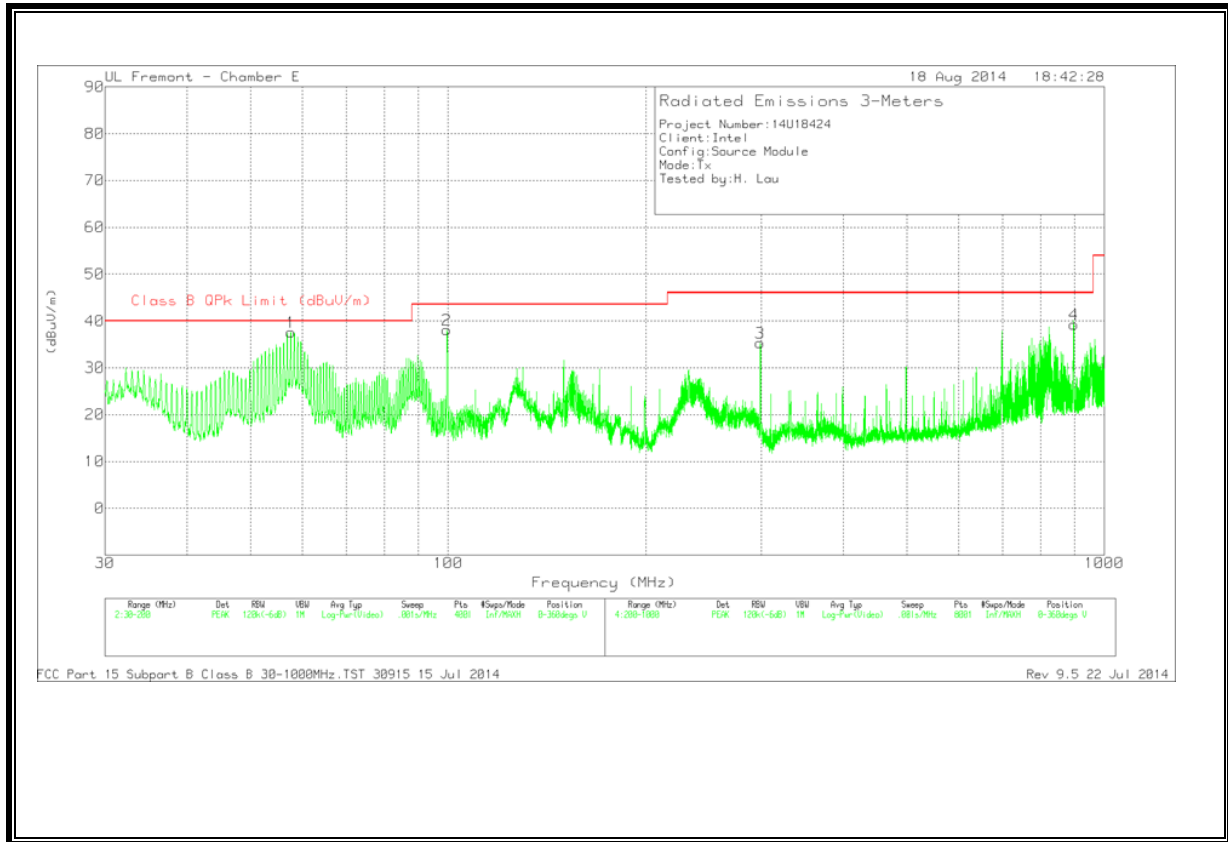
External harmonic mixers are utilized. The EIRP is measured, then the power density at a 3 meter distance is calculated.

7.6.1. Spurious Emissions 30MHz TO 1 GHz

TX SPURIOUS EMISSION 30 TO 1000 MHz (HORIZONTAL PLOT)



TX SPURIOUS EMISSION 30 TO 1000 MHz (VERTICAL PLOT)



TX SPURIOUS EMISSION 30MHz-1GHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Hybrid	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Class B QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	57.5825	61.99	PK	7.3	-31.7	37.59	40	-2.41	0-360	100	V
5	99.5725	59.59	PK	10	-31.3	38.29	43.52	-5.23	0-360	301	H
2	99.615	59.46	PK	10	-31.4	38.06	43.52	-5.46	0-360	100	V
6	199.15	53.96	PK	12.3	-30.8	35.46	43.52	-8.06	0-360	201	H
3	298.8	52.22	PK	13.4	-30.3	35.32	46.02	-10.7	0-360	100	V
4	898	45.51	PK	22	-28.2	39.31	46.02	-6.71	0-360	100	V

PK - Peak detector

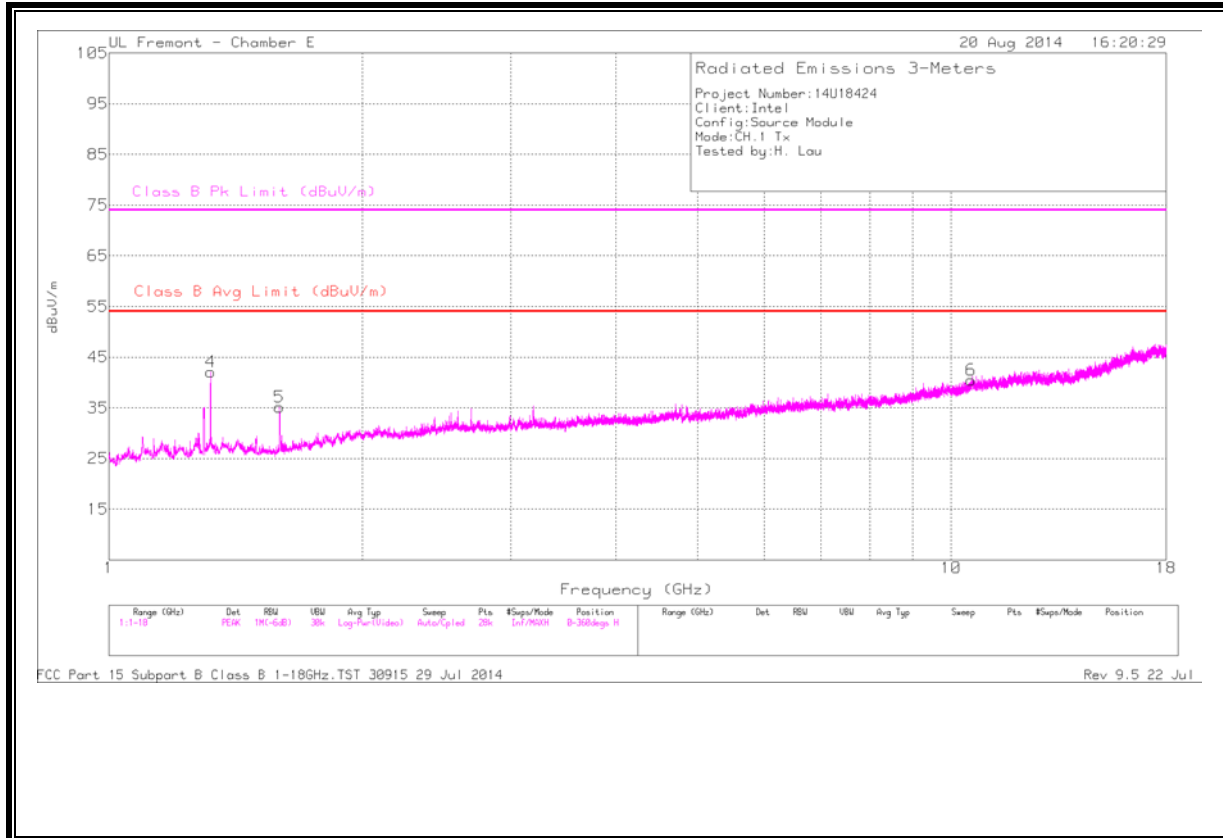
Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Hybrid	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Class B QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	58.2274	60.74	QP	7.3	-31.7	36.34	40	-3.66	346	125	V
2	99.6006	58.41	QP	10	-31.4	37.01	43.52	-6.51	102	100	V
5	99.6206	58.36	QP	10	-31.4	36.96	43.52	-6.56	144	315	H
6	199.5479	52.81	QP	12.4	-30.8	34.41	43.52	-9.11	220	256	H
3	298.7428	51.06	QP	13.4	-30.3	34.16	46.02	-11.86	207	100	V
4	896.2206	44.84	QP	22.1	-28.2	38.74	46.02	-7.28	215	106	V

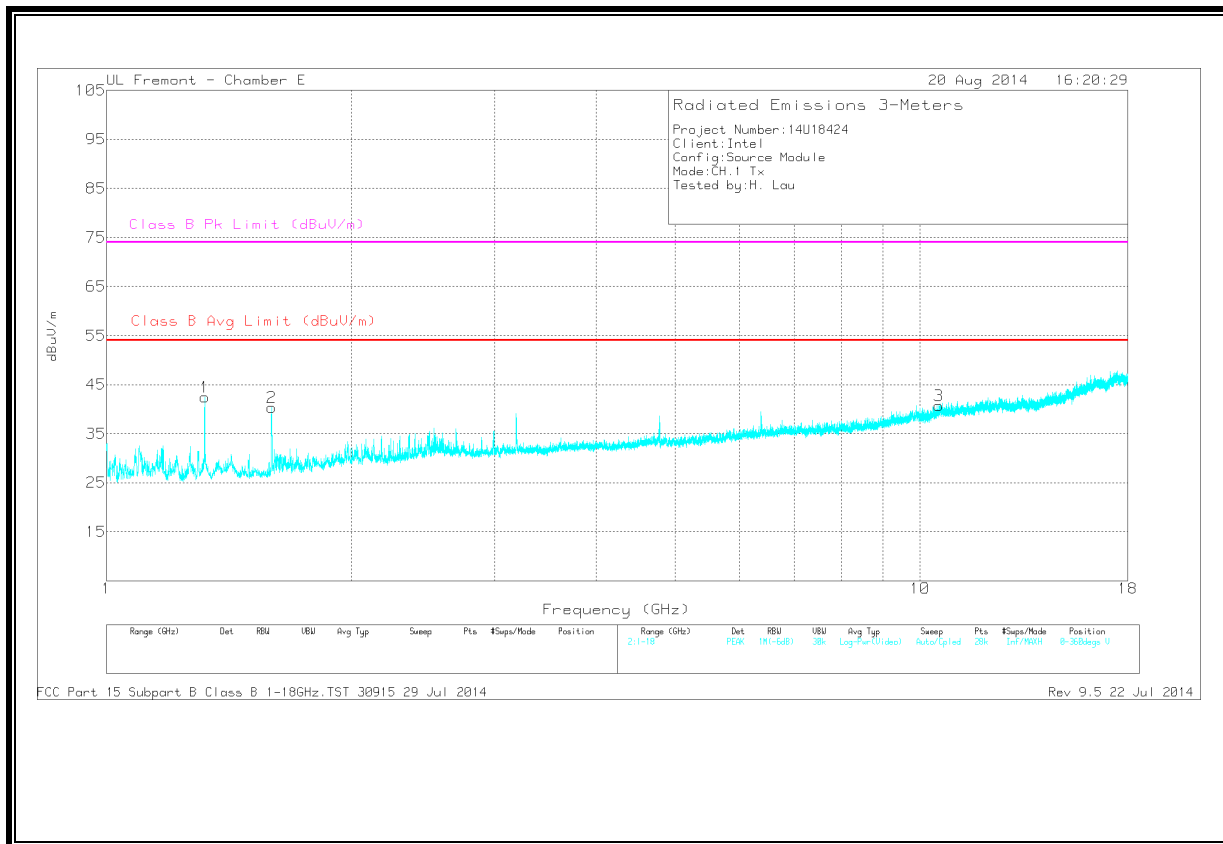
QP - Quasi-Peak detector

7.6.2. Spurious Emissions 1 TO 18 GHz

CHANNEL 1 - TX SPURIOUS EMISSION 1-18 GHz (HORIZONTAL PLOT)



CHANNEL 1 – TX SPURIOUS EMISSION 1-18 GHz (VERTICAL PLOT)



CHANNEL 1 TX SPURIOUS EMISSION 1-18 GHz

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Avg Margin (dB)	Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	1.32	47.72	PK	29	-34.6	42.12	-	-	74	-31.88	0-360	101	H
1	1.32	48.1	PK	29	-34.6	42.5	-	-	74	-31.5	0-360	200	V
5	1.594	40.8	PK	28.4	-34.1	35.1	-	-	74	-38.9	0-360	200	H
2	1.597	46.02	PK	28.4	-34.1	40.32	-	-	74	-33.68	0-360	200	V
3	10.543	27.17	PK	37.6	-24.1	40.67	-	-	74	-33.33	0-360	200	V
6	10.552	26.79	PK	37.6	-23.9	40.49	-	-	74	-33.51	0-360	200	H

PK - Peak detector

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Avg Margin (dB)	Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	1.32	51.95	PK	29	-34.6	46.35	-	-	74	-27.65	188	107	H
	1.32	48.84	Avg	29	-34.6	43.24	54	-10.76	-	-	188	107	H
1	1.32	52.44	PK	29	-34.6	46.84	-	-	74	-27.16	229	198	V
	1.32	48.05	Avg	29	-34.6	42.45	54	-11.55	-	-	229	198	V
5	1.593	55.97	PK	28.4	-34.1	50.27	-	-	74	-23.73	133	180	H
	1.594	36.67	Avg	28.4	-34.1	30.97	54	-23.03	-	-	133	180	H
2	1.594	60.6	PK	28.4	-34.1	54.9	-	-	74	-19.1	176	154	V
	1.595	41.32	Avg	28.4	-34.1	35.62	54	-18.38	-	-	176	154	V
6	10.562	36.56	PK	37.7	-24.2	50.06	-	-	74	-23.94	104	175	H
	10.56	25.57	Avg	37.7	-24.1	39.17	54	-14.83	-	-	104	175	H
3	10.563	37.1	PK	37.7	-24.2	50.6	-	-	74	-23.4	199	218	V
	10.558	28.45	Avg	37.6	-24.1	41.95	54	-12.05	-	-	199	218	V

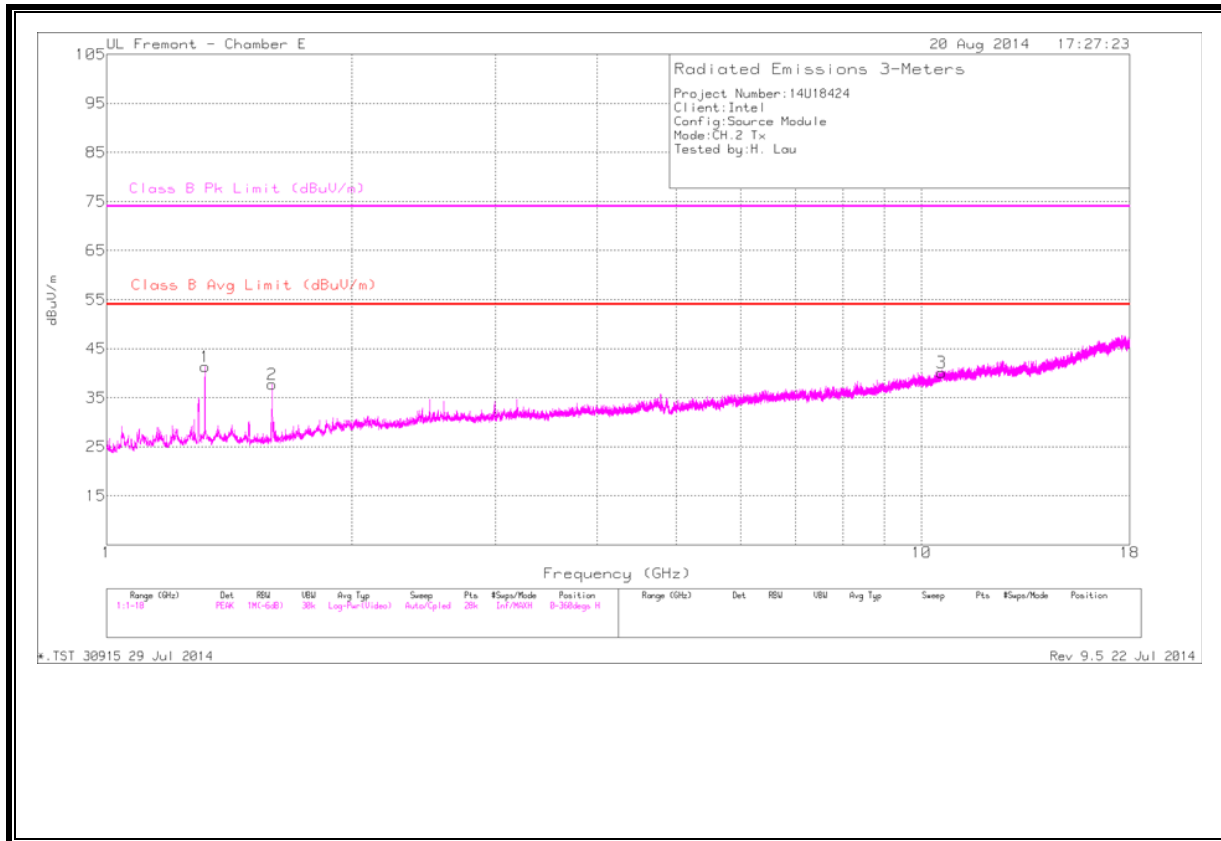
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

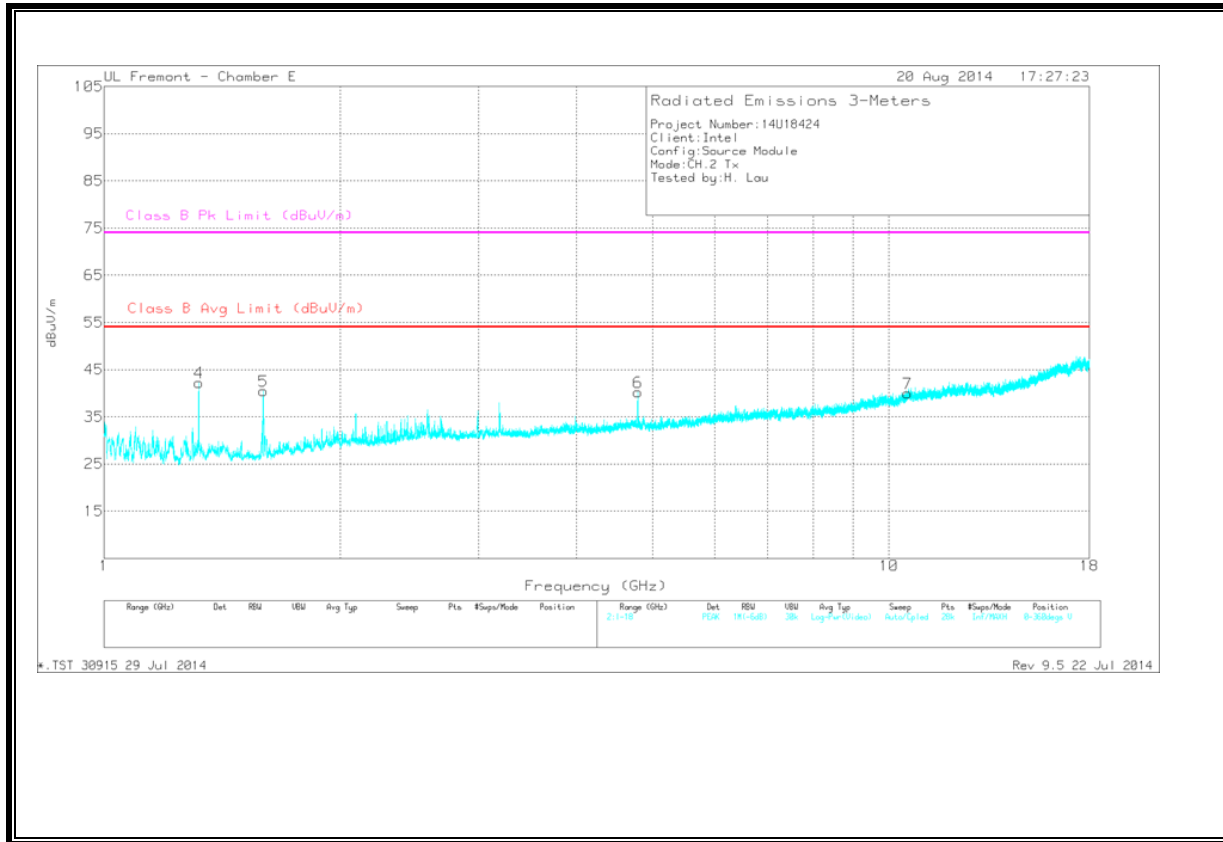
FCC Part 15 Subpart B Class B 1-18GHz.TST 30915 29 Jul 2014

Rev 9.5 22 Jul 2014

CHANNEL 2 - TX SPURIOUS EMISSION 1-18 GHz (HORIZONTAL PLOT)



CHANNEL 2 – TX SPURIOUS EMISSION 1-18 GHz (VERTICAL PLOT)



CHANNEL 2 TX SPURIOUS EMISSION 1-18 GHz

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Avg Margin (dB)	Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.32	46.93	PK	29	-34.6	41.33	-	-	74	-32.67	0-360	100	H
4	1.32	47.87	PK	29	-34.6	42.27	-	-	74	-31.73	0-360	200	V
2	1.596	43.47	PK	28.4	-34.1	37.77	-	-	74	-36.23	0-360	100	H
5	1.597	46.22	PK	28.4	-34.1	40.52	-	-	74	-33.48	0-360	100	V
6	4.789	37.38	PK	34.1	-31.2	40.28	-	-	74	-33.72	0-360	100	V
7	10.559	26.46	PK	37.6	-24.1	39.96	-	-	74	-34.04	0-360	200	V
3	10.58	26.46	PK	37.7	-24	40.16	-	-	74	-33.84	0-360	200	H

PK - Peak detector

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Avg Margin (dB)	Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.32	51.84	PK	29	-34.6	46.24	-	-	74	-27.76	191	111	H
	1.32	46.94	Avg	29	-34.6	41.34	54	-12.66	-	-	191	111	H
4	1.32	53.64	PK	29	-34.6	48.04	-	-	74	-25.96	169	281	V
	1.32	48.11	Avg	29	-34.6	42.51	54	-11.49	-	-	169	281	V
2	1.593	55.61	PK	28.4	-34.1	49.91	-	-	74	-24.09	135	180	H
	1.593	36.43	Avg	28.4	-34.1	30.73	54	-23.27	-	-	135	180	H
5	1.596	62.68	PK	28.4	-34.1	56.98	-	-	74	-17.02	160	179	V
	1.594	44.03	Avg	28.4	-34.1	38.33	54	-15.67	-	-	160	179	V
6	4.78	54.84	PK	34.1	-31.3	57.64	-	-	74	-16.36	355	145	V
	4.78	34.14	Avg	34.1	-31.3	36.94	54	-17.06	-	-	355	145	V
7	10.558	36.4	PK	37.6	-24.1	49.9	-	-	74	-24.1	136	306	V
	10.56	25.36	Avg	37.7	-24.1	38.96	54	-15.04	-	-	136	306	V
3	10.58	37.09	PK	37.7	-24	50.79	-	-	74	-23.21	126	200	H
	10.58	25.25	Avg	37.7	-24	38.95	54	-15.05	-	-	126	200	H

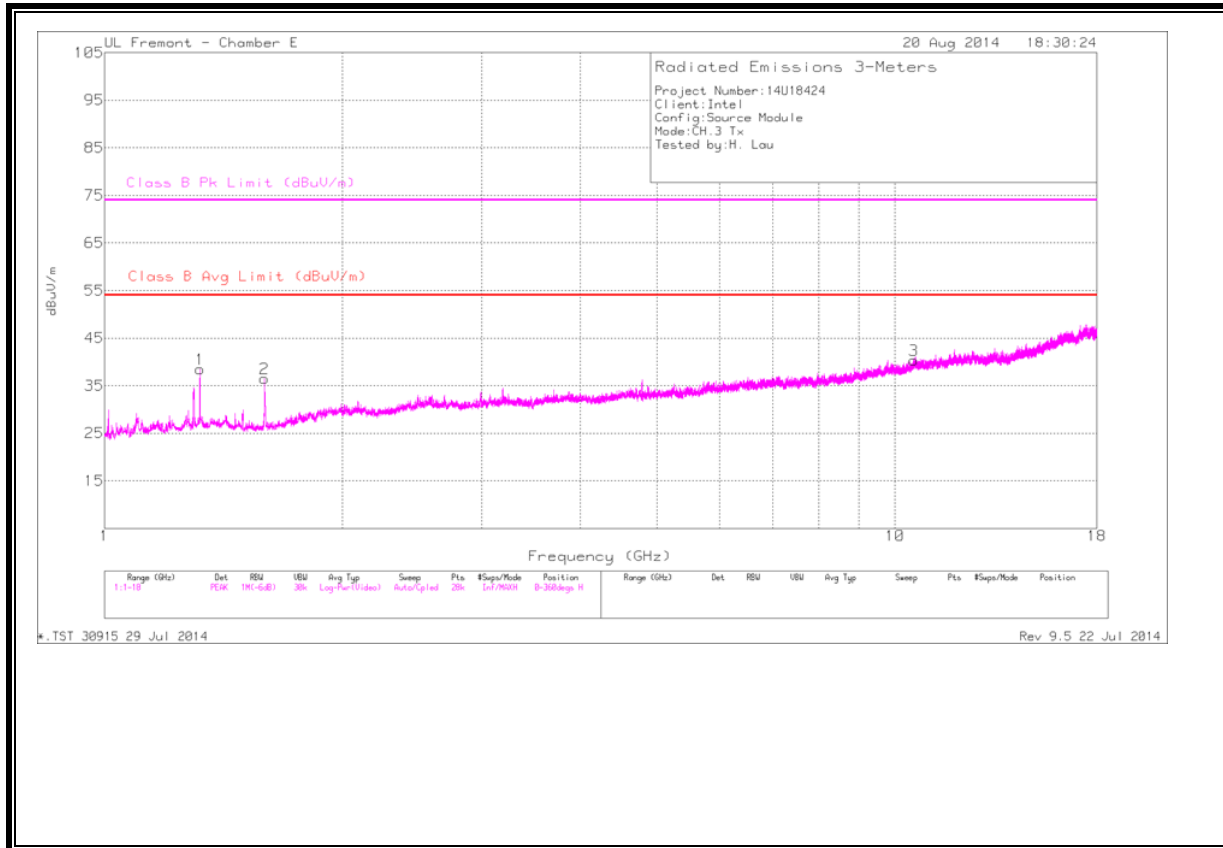
PK - Peak detector

Avg - Video bandwidth < Resolution bandwidth

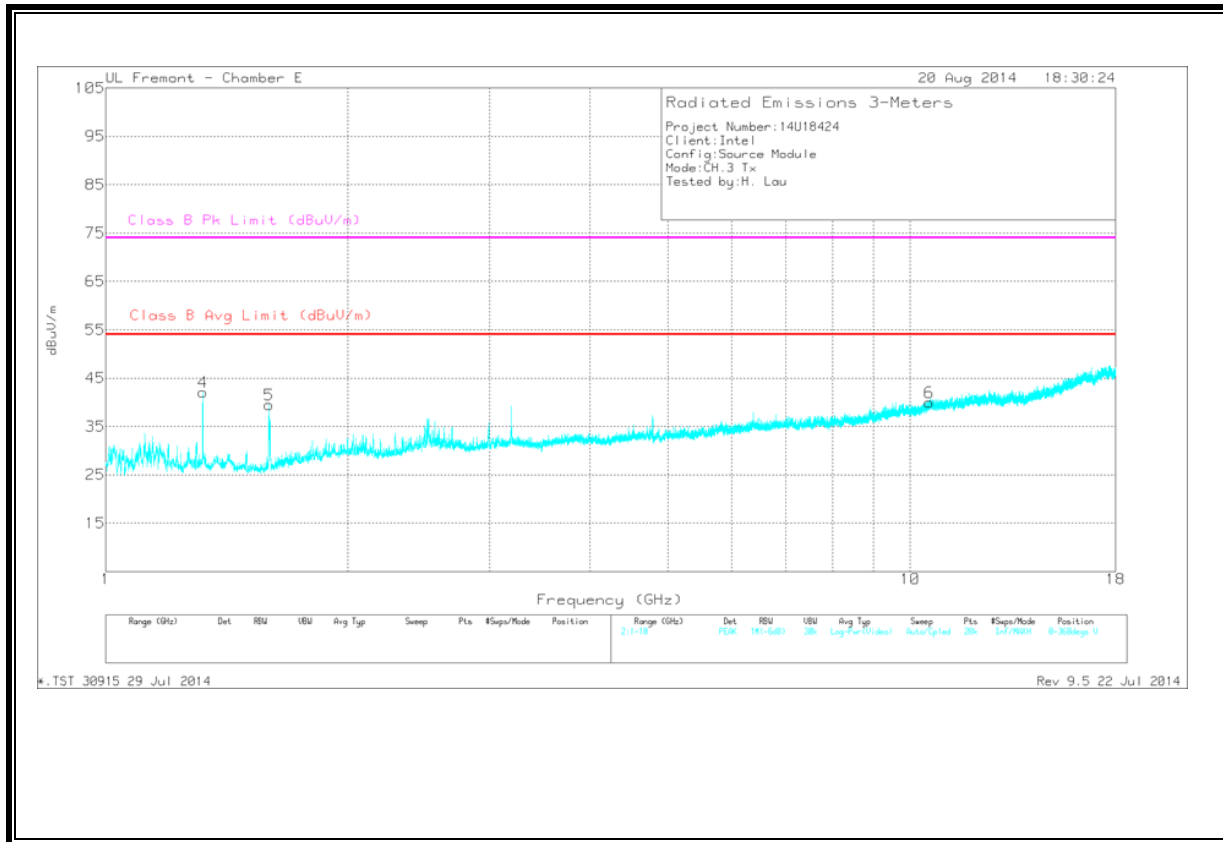
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CHANNEL 3 - TX SPURIOUS EMISSION 1-18 GHz (HORIZONTAL PLOT)



CHANNEL 3 – TX SPURIOUS EMISSION 1-18 GHz (VERTICAL PLOT)



CHANNEL 3TX SPURIOUS EMISSION 1-18 GHz

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT346 (dB/m)	Amp/Cbl (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Avg Margin (dB)	Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.32	44.1	PK	29	-34.6	38.5	-	-	74	-35.5	0-360	205	H
4	1.32	47.68	PK	29	-34.6	42.08	-	-	74	-31.92	0-360	201	V
2	1.593	42.2	PK	28.4	-34.1	36.5	-	-	74	-37.5	0-360	305	H
5	1.596	45.19	PK	28.4	-34.1	39.49	-	-	74	-34.51	0-360	201	V
3	10.558	26.86	PK	37.6	-24.1	40.36	-	-	74	-33.64	0-360	205	H
6	10.561	26.46	PK	37.7	-24.2	39.96	-	-	74	-34.04	0-360	201	V

PK - Peak detector

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Avg Margin (dB)	Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.32	50.33	PK	29	-34.6	44.73	-	-	74	-29.27	348	227	H
	1.32	46.32	Avg	29	-34.6	40.72	54	-13.28	-	-	348	227	H
4	1.32	54.13	PK	29	-34.6	48.53	-	-	74	-25.47	164	277	V
	1.32	48.11	Avg	29	-34.6	42.51	54	-11.49	-	-	164	277	V
2	1.595	55.39	PK	28.4	-34.1	49.69	-	-	74	-24.31	245	314	H
	1.594	36.36	Avg	28.4	-34.1	30.66	54	-23.34	-	-	245	314	H
5	1.596	60.56	PK	28.4	-34.1	54.86	-	-	74	-19.14	152	198	V
	1.594	42.74	Avg	28.4	-34.1	37.04	54	-16.96	-	-	152	198	V
3	10.559	36.43	PK	37.7	-24.1	50.03	-	-	74	-23.97	243	343	H
	10.556	25.39	Avg	37.6	-24	38.99	54	-15.01	-	-	243	343	H
6	10.561	36.19	PK	37.7	-24.1	49.79	-	-	74	-24.21	131	331	V
	10.56	27.37	Avg	37.7	-24.1	40.97	54	-13.03	-	-	131	331	V

PK - Peak detector

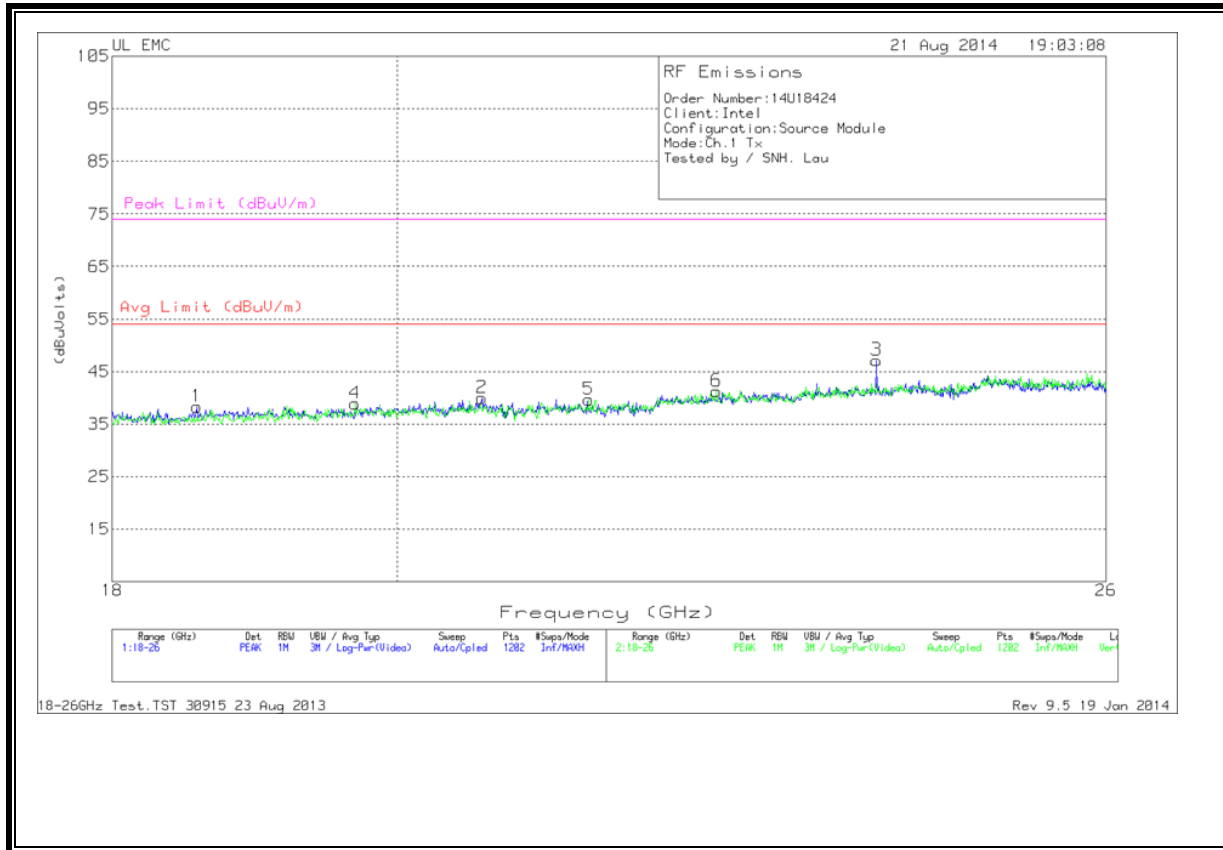
Avg - Video bandwidth < Resolution bandwidth

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Rev 9.5 22 Jul 2014

7.6.3. Spurious Emissions 18 to 26 GHz

CHANNEL 1 - TX SPURIOUS EMISSION 18 TO 26 GHz (HORIZONTAL AND VERTICAL PLOT)



CHANNEL 1 -TX SPURIOUS EMISSION 18 TO 26 GHz

Trace Markers

Horizontal 18000 - 26000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T89 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.573	39.49	PK	32.5	-24.2	-9.5	38.29	54	-15.71	74	-35.71
2	20.638	39.89	PK	32.9	-23.3	-9.5	39.99	54	-14.01	74	-34.01
3	23.882	45.75	PK	33.6	-22.7	-9.5	47.15	54	-6.85	74	-26.85

PK - Peak detector

Vertical 18000 - 26000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T89 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
4	19.692	40.11	PK	32.6	-24.3	-9.5	38.91	54	-15.09	74	-35.09
5	21.47	40.6	PK	32.9	-24.3	-9.5	39.7	54	-14.3	74	-34.3
6	22.51	40.76	PK	33.4	-23.4	-9.5	41.26	54	-12.74	74	-32.74

PK - Peak detector

CHANNEL 2 - TX SPURIOUS EMISSION 18 TO 26 GHz (HORIZONTAL AND VERTICAL PLOT)



Measurement distance is 1 m

CHANNEL 2 -TX SPURIOUS EMISSION 18 TO 26 GHz

Trace Markers

Horizontal 18000 - 26000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T89 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	21.444	40.66	PK	32.9	-24.4	-9.5	39.66	54	-14.34	74	-34.34
2	24.062	42.07	PK	33.6	-22.6	-9.5	43.57	54	-10.43	74	-30.43
3	24.961	45.28	PK	34	-22.8	-9.5	46.98	54	-7.02	74	-27.02

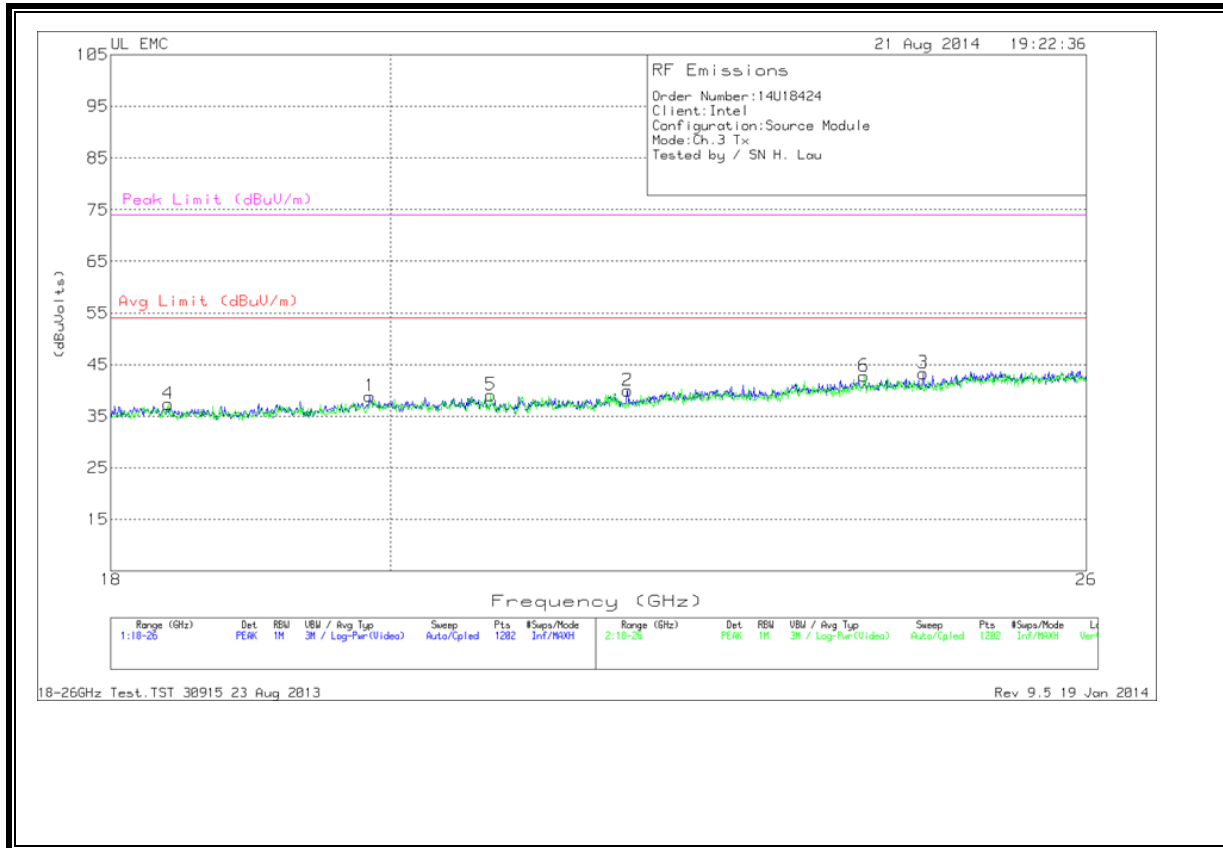
PK - Peak detector

Vertical 18000 - 26000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T89 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
4	19.172	38.72	PK	32.5	-23.7	-9.5	38.02	54	-15.98	74	-35.98
5	20.005	39.93	PK	32.8	-24	-9.5	39.23	54	-14.77	74	-34.77
6	24.535	41.83	PK	33.8	-22.8	-9.5	43.33	54	-10.67	74	-30.67

PK - Peak detector

CHANNEL 3 - TX SPURIOUS EMISSION 18 TO 26 GHz (HORIZONTAL AND VERTICAL PLOT)



Measurement distance is 1 m

CHANNEL 3 -TX SPURIOUS EMISSION 18 TO 26 GHz

Trace Markers

Horizontal 18000 - 26000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T89 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	19.845	39.77	PK	32.7	-24.1	-9.5	38.87	54	-15.13	74	-35.13
2	21.87	39.88	PK	33.3	-23.7	-9.5	39.98	54	-14.02	74	-34.02
3	24.448	42.05	PK	33.8	-23	-9.5	43.35	54	-10.65	74	-30.65

PK - Peak detector

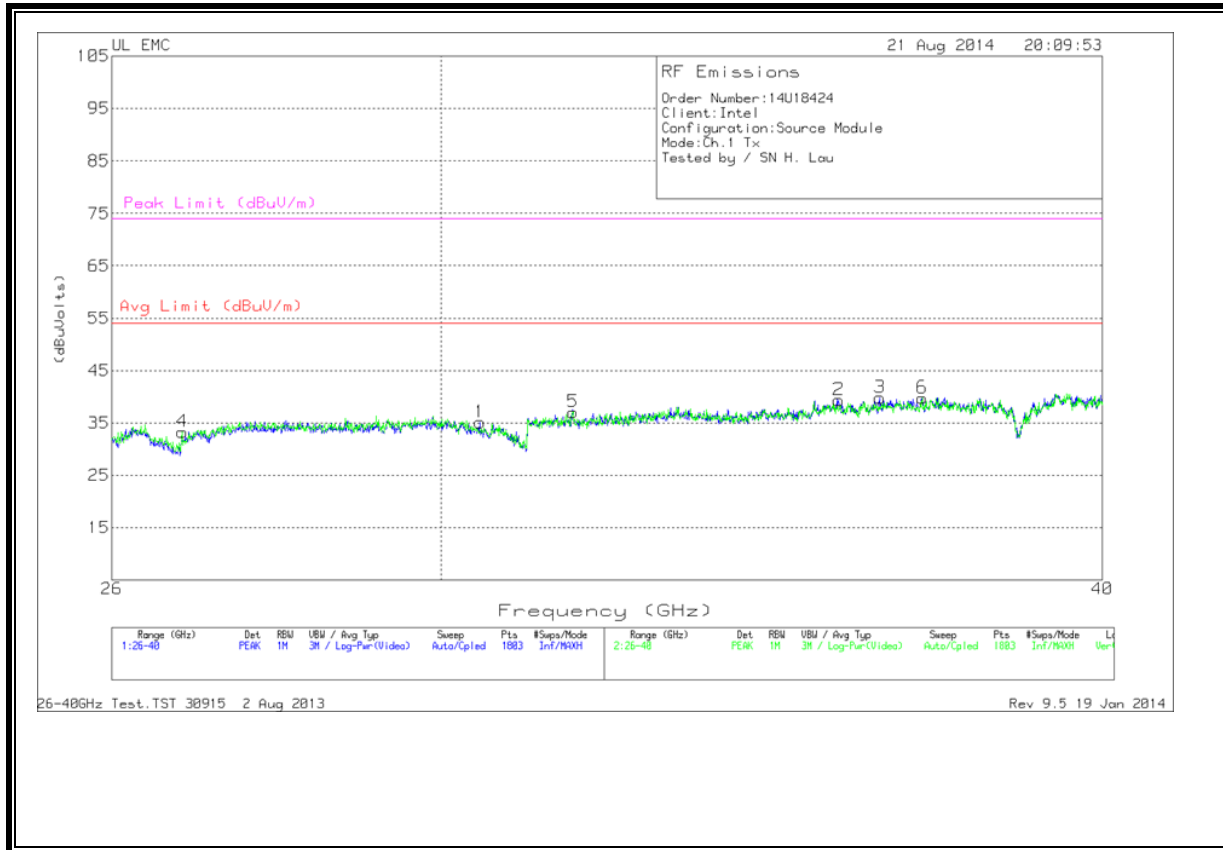
Vertical 18000 - 26000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T89 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
4	18.393	39.28	PK	32.4	-24.8	-9.5	37.38	54	-16.62	74	-36.62
5	20.771	39.61	PK	32.9	-23.9	-9.5	39.11	54	-14.89	74	-34.89
6	23.908	41.37	PK	33.6	-22.7	-9.5	42.77	54	-11.23	74	-31.23

PK - Peak detector

7.6.4. Spurious Emissions 26 TO 40 GHz

CHANNEL 1 - TX SPURIOUS EMISSION 26 TO 40 GHz (HORIZONTAL AND VERTICAL PLOT)



Measurement distance is 1 m

CHANNEL 1 -TX SPURIOUS EMISSION 26 TO 40 GHz

Trace Markers

Horizontal 26000 - 40000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T90 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	30.514	44.63	PK	36	-36	-9.5	35.13	54	-18.87	74	-38.87
2	35.665	48.86	PK	37.4	-37.4	-9.5	39.36	54	-14.64	74	-34.64
3	36.31	50.62	PK	37.1	-38.4	-9.5	39.82	54	-14.18	74	-34.18

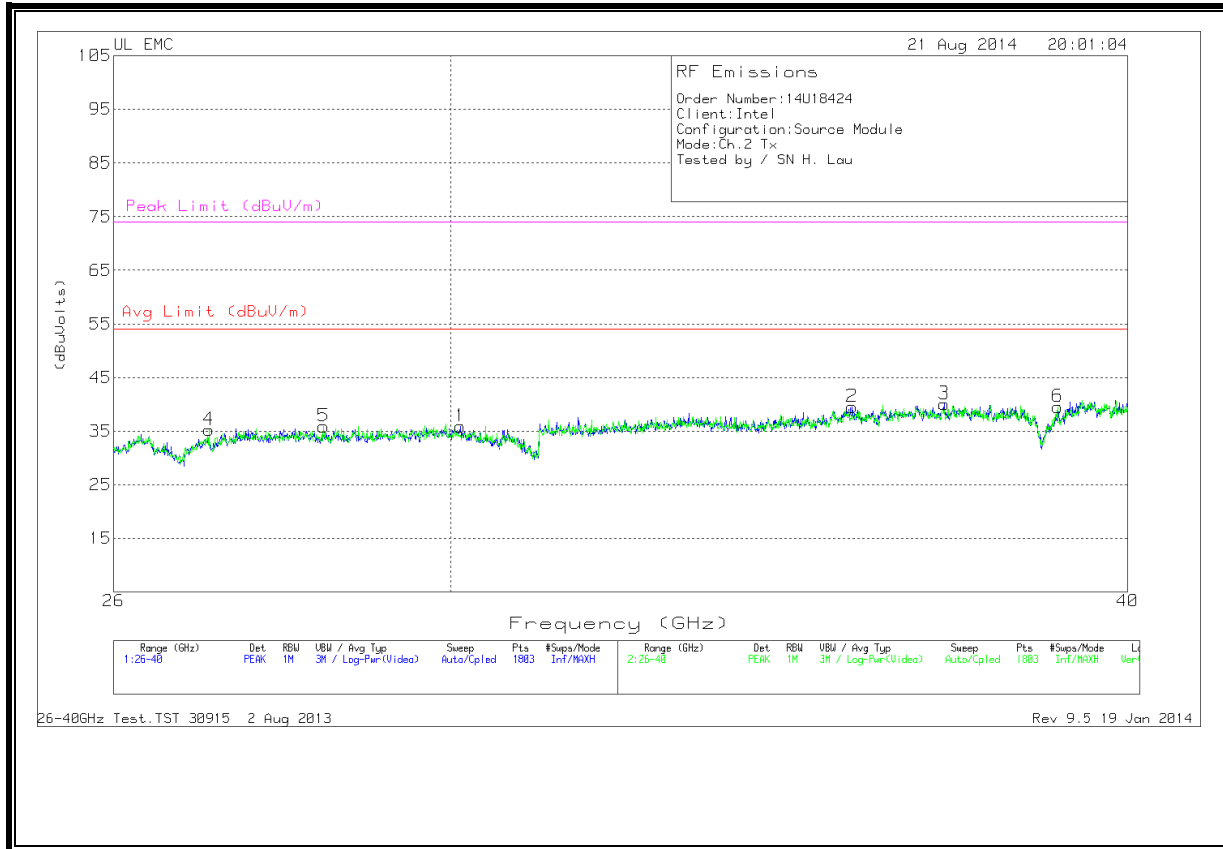
PK - Peak detector

Vertical 26000 - 40000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T90 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
4	26.808	41.48	PK	35.3	-34	-9.5	33.28	54	-20.72	74	-40.72
5	31.772	45.96	PK	36.3	-35.7	-9.5	37.06	54	-16.94	74	-36.94
6	36.986	49.55	PK	37.2	-37.5	-9.5	39.75	54	-14.25	74	-34.25

PK - Peak detector

CHANNEL 2 - TX SPURIOUS EMISSION 26 TO 40 GHz (HORIZONTAL AND VERTICAL PLOT)



Measurement distance is 1 m

CHANNEL 2 -TX SPURIOUS EMISSION 26 TO 40 GHz

Trace Markers

Horizontal 26000 - 40000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T90 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	30.125	45.39	PK	35.9	-35.9	-9.5	35.89	54	-18.11	74	-38.11
2	35.579	49.12	PK	37.7	-37.8	-9.5	39.52	54	-14.48	74	-34.48
3	37.001	50.56	PK	37.2	-38.2	-9.5	40.06	54	-13.94	74	-33.94

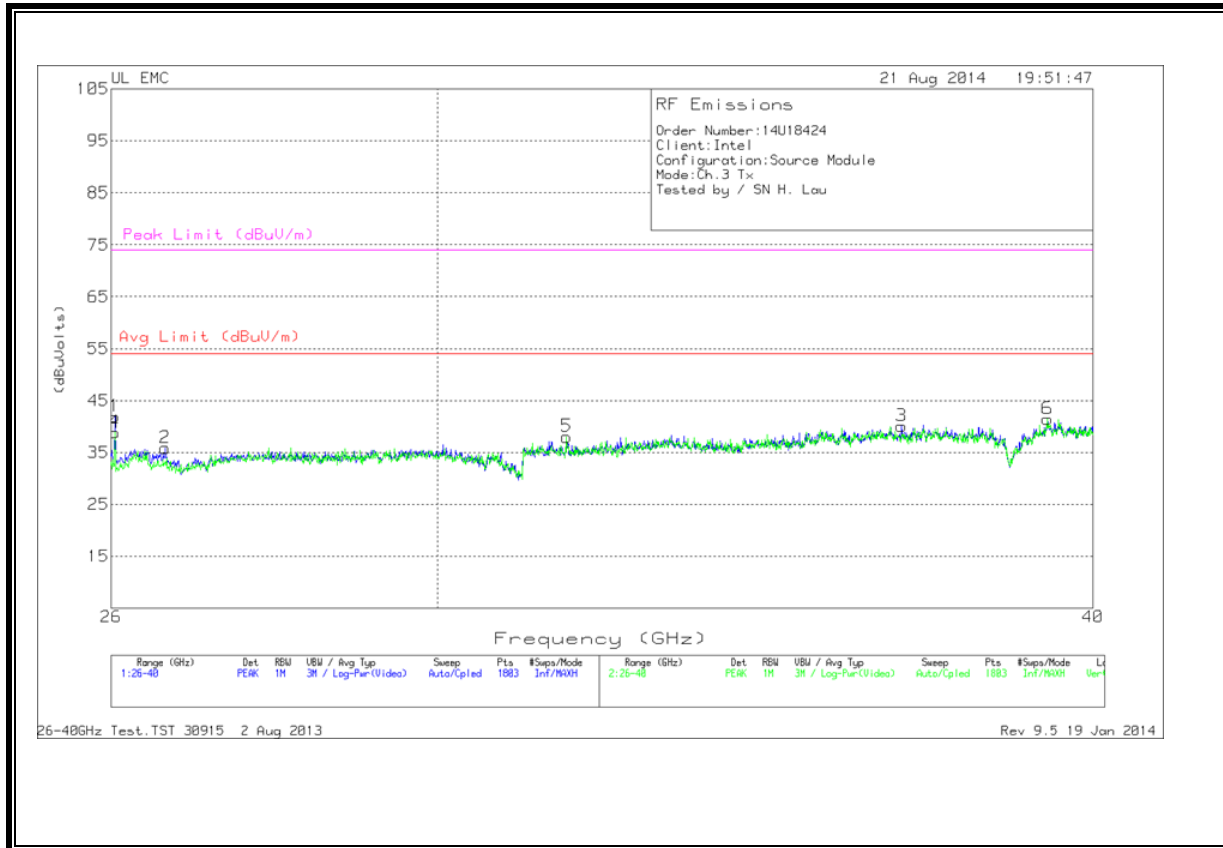
PK - Peak detector

Vertical 26000 - 40000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T90 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
4	27.072	43.33	PK	35.5	-34.1	-9.5	35.23	54	-18.77	74	-38.77
5	28.424	44.27	PK	35.7	-34.6	-9.5	35.87	54	-18.13	74	-38.13
6	38.827	48.55	PK	36.8	-36.3	-9.5	39.55	54	-14.45	74	-34.45

PK - Peak detector

CHANNEL 3 - TX SPURIOUS EMISSION 26 TO 40 GHz (HORIZONTAL AND VERTICAL PLOT)



CHANNEL 3 -TX SPURIOUS EMISSION 26 TO 40 GHz

Trace Markers

Horizontal 26000 - 40000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T90 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	26.039	50	PK	35.6	-34.2	-9.5	41.9	54	-12.1	74	-32.1
2	26.622	43.57	PK	35.4	-33.6	-9.5	35.87	54	-18.13	74	-38.13
3	36.776	50.37	PK	37.1	-37.9	-9.5	40.07	54	-13.93	74	-33.93

PK - Peak detector

Vertical 26000 - 40000MHz

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T90 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
4	26.039	46.94	PK	35.6	-34.2	-9.5	38.84	54	-15.16	74	-35.16
5	31.749	46.94	PK	36.3	-35.7	-9.5	38.04	54	-15.96	74	-35.96
6	39.208	48.34	PK	38.4	-35.8	-9.5	41.44	54	-12.56	74	-32.56

PK - Peak detector

7.6.5. Spurious Emissions 40 TO 200 GHz**Channel 1**

PEAK MEASUREMENT

Note: The peak density is less than the average limit

Frequency (GHz)	Measurement Distance (m)	Peak Power (dBm)	Rx Antenna Gain (dBi)	EIRP (dBm)
50.15	0.010	-24.21	20.00	-17.8
EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (pW/cm ²)	Limit (pW/cm ²)
1.67E-05	3.0	1.48E-07	14.79	90

Frequency (GHz)	Measurement Distance (m)	Peak Power (dBm)	Rx Antenna Gain (dBi)	EIRP (dBm)
54.65	0.010	-21.10	20.00	-13.9
EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (pW/cm ²)	Limit (pW/cm ²)
4.06E-05	3.0	3.59E-07	35.94	90

No other higher emissions up to 200 GHz detected above the noise floor.

Channel 2

PEAK MEASUREMENT

Note: The peak density is less than the average limit

Frequency (GHz)	Measurement Distance (m)	Peak Power (dBm)	Rx Antenna Gain (dBi)	EIRP (dBm)
50.28	0.010	-22.18	20.00	-15.7
EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (pW/cm ²)	Limit (pW/cm ²)
2.68E-05	3.0	2.37E-07	23.73	90

Frequency (GHz)	Measurement Distance (m)	Peak Power (dBm)	Rx Antenna Gain (dBi)	EIRP (dBm)
57.01	0.010	-22.40	20.00	-14.8
EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (pW/cm ²)	Limit (pW/cm ²)
3.28E-05	3.0	2.90E-07	29.00	90

No other higher emissions up to 200 GHz detected above the noise floor.

Channel 3

PEAK MEASUREMENT

Note: The peak density is less than the average limit

Frequency (GHz)	Measurement Distance (m)	Peak Power (dBm)	Rx Antenna Gain (dBi)	EIRP (dBm)
52.1	0.010	-21.97	20.00	-15.2
EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (pW/cm ²)	Limit (pW/cm ²)
3.02E-05	3.0	2.67E-07	26.74	90

Frequency (GHz)	Measurement Distance (m)	Peak Power (dBm)	Rx Antenna Gain (dBi)	EIRP (dBm)
58.765	0.010	-24.21	20.00	-16.4
EIRP (W)	Specification Distance (m)	Power Density (W/m ²)	Power Density (pW/cm ²)	Limit (pW/cm ²)
2.30E-05	3.0	2.03E-07	20.32	90

No other higher emissions up to 200 GHz detected above the noise floor.

7.7. AC MAINS LINE CONDUCTED EMISSIONS**LIMITS**

§15.207

Frequency range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

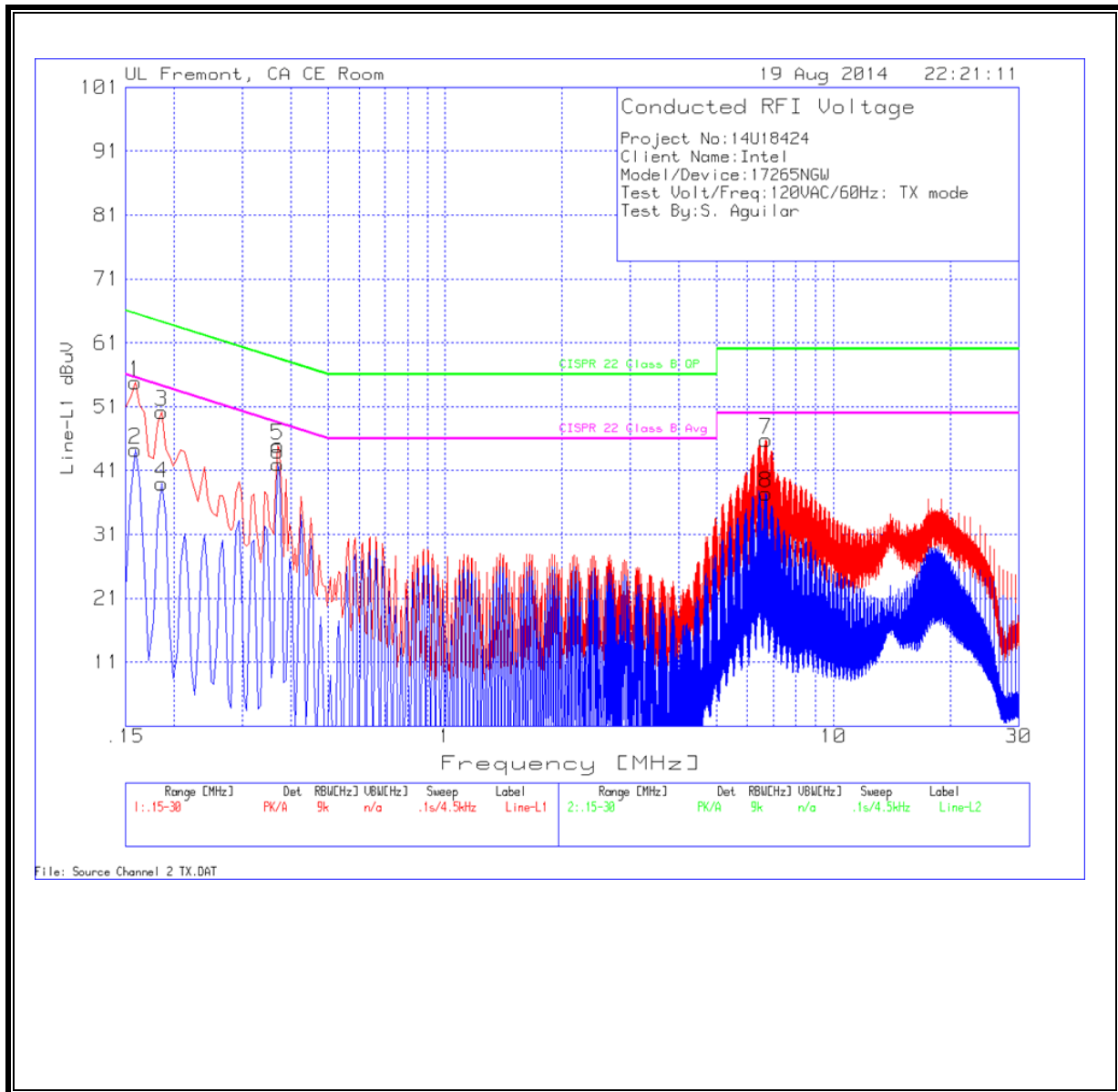
Notes:
1. The lower limit shall apply at the transition frequencies
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

TEST PROCEDURE

ANSI C63.10-2009

6 WORST EMISSIONS

LINE 1 RESULTS

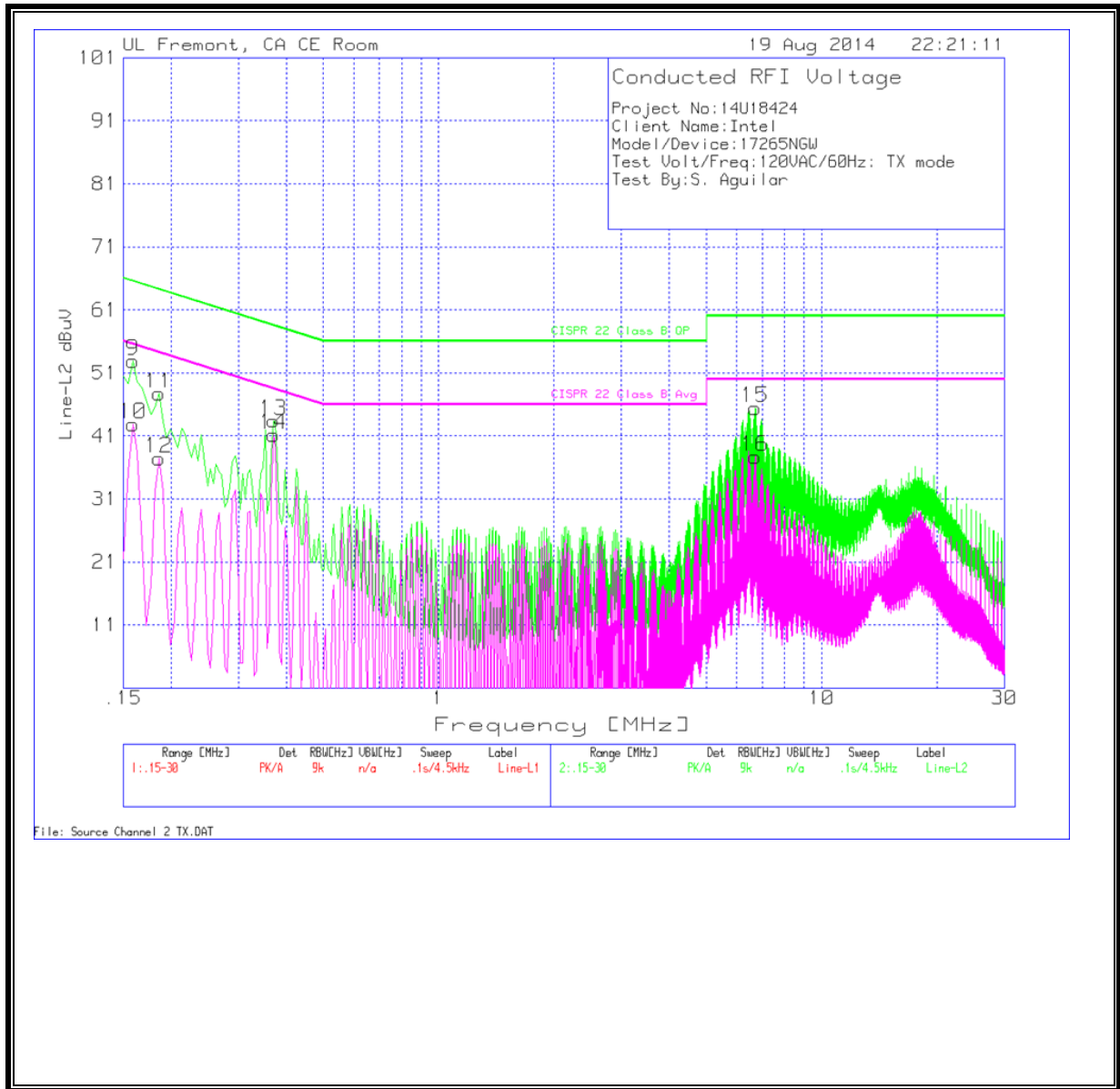


Line-L1 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.159	53.53	PK	1.3	0	54.83	65.5	-10.67	-	-
2	.159	43.02	Av	1.3	0	44.32	-	-	55.5	-11.18
3	.186	49.17	PK	1	0	50.17	64.2	-14.03	-	-
4	.186	38.04	Av	1	0	39.04	-	-	54.2	-15.16
5	.3705	44.47	PK	.4	0	44.87	58.5	-13.63	-	-
6	.3705	41.61	Av	.4	0	42.01	-	-	48.5	-6.49
7	6.693	45.49	PK	.2	.1	45.79	60	-14.21	-	-
8	6.693	37.19	Av	.2	.1	37.49	-	-	50	-12.51

LINE 2 RESULTS



Line-L2 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
9	.159	51.55	PK	1.4	0	52.95	65.5	-12.55	-	-
10	.159	41.44	Av	1.4	0	42.84	-	-	55.5	-12.66
11	.186	46.59	PK	1.1	0	47.69	64.2	-16.51	-	-
12	.186	36.36	Av	1.1	0	37.46	-	-	54.2	-16.74
13	.3705	42.93	PK	.5	0	43.43	58.5	-15.07	-	-
14	.3705	40.66	Av	.5	0	41.16	-	-	48.5	-7.34
15	6.693	45.12	PK	.2	.1	45.42	60	-14.58	-	-
16	6.693	37.4	Av	.2	.1	37.7	-	-	50	-12.3

PK - Peak detector

Av - average detection

8. GROUP INSTALLATION

LIMIT

§15.255 (h) Any transmitter that has received the necessary FCC equipment authorization under the rules of this chapter may be mounted in a group installation for simultaneous operation with one or more other transmitter(s) that have received the necessary FCC equipment authorization, without any additional equipment authorization. However, no transmitter operating under the provisions of this section may be equipped with external phase-locking inputs that permit beam-forming arrays to be realized.

RESULTS

The frequency, amplitude and phase of the transmit signal are set within the EUT. There are no external phase-locking inputs or any other means of combining two or more units together to realize a beam-forming array.

9. RF EXPOSURE

FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
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

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

CALCULATIONS

EIRP is converted to Power Density using the equation:

$$P_D = \text{EIRP} / (4 * \text{Pi} * D_S^2)$$

where:

P_D = power density in W/m^2

EIRP = Equivalent Isotropic Radiated Power in W

D_S = separation distance in m

Power density in units of W/m^2 is converted to units of mW/cm^2 by dividing by 10.

RESULTS

Channel 1

Average EIRP (dBm)	Average EIRP (W)	Separation Distance (cm)	Power Density (mW/cm^2)	FCC Limit (mW/cm^2)
23.1	0.204	20	0.04	1

Channel 2

Average EIRP (dBm)	Average EIRP (W)	Separation Distance (cm)	Power Density (mW/cm^2)	FCC Limit (mW/cm^2)
24.3	0.269	20	0.05	1

Channel 3

Average EIRP (dBm)	Average EIRP (W)	Separation Distance (cm)	Power Density (mW/cm^2)	FCC Limit (mW/cm^2)
23.4	0.219	20	0.04	1