

. Plot Data for LTE 10MHz , Output Port 0
(QPSK Low Channel)

(30 MHz ~ 1 GHz)

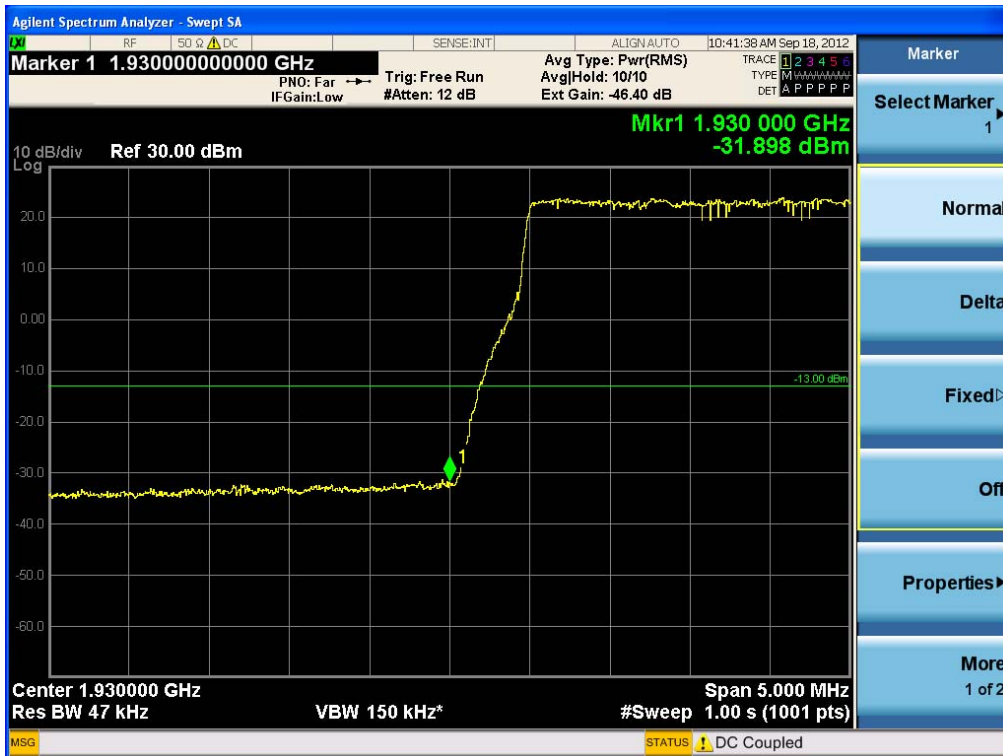


(1 GHz ~ 26.5 GHz)



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(Band Edge)



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(QPSK Middle Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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(QPSK High Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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(16QAM Low Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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(16QAM Middle Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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(16QAM High Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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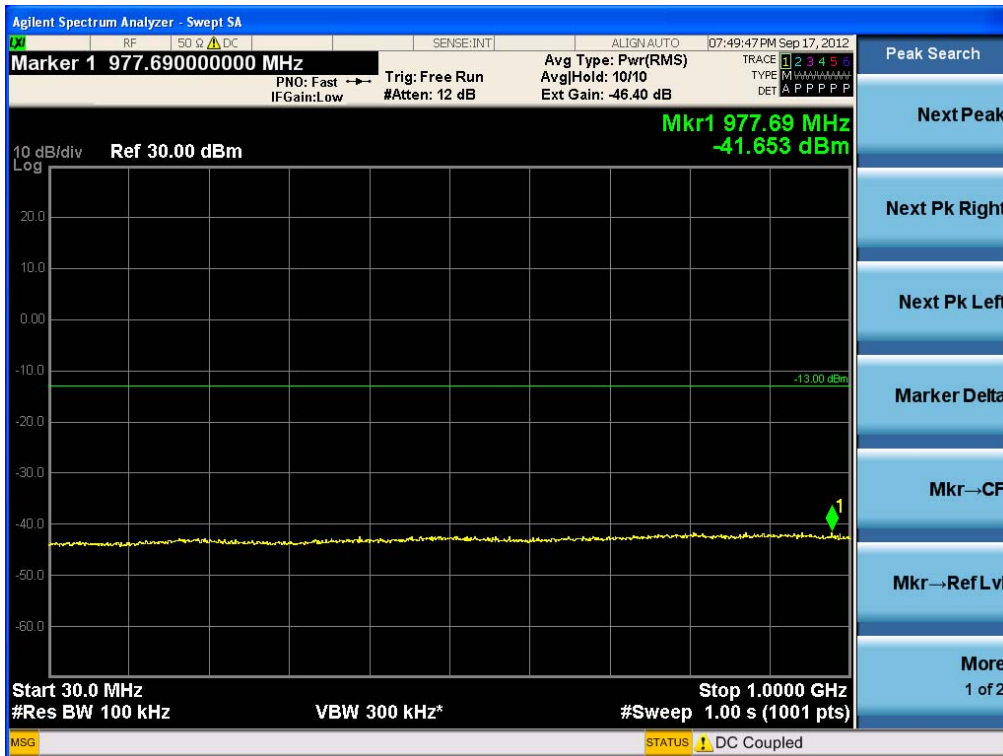
(Band Edge)



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(64QAM Low Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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(64QAM Middle Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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(64QAM High Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



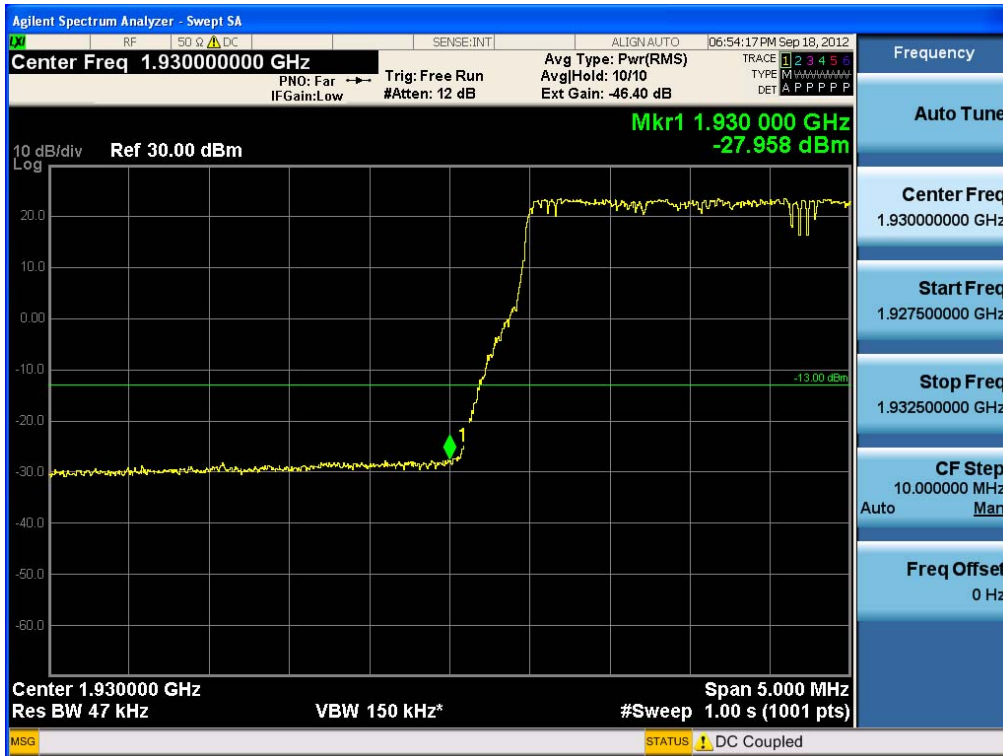
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(Band Edge lower)



(Band Edge higher)



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(16QAM)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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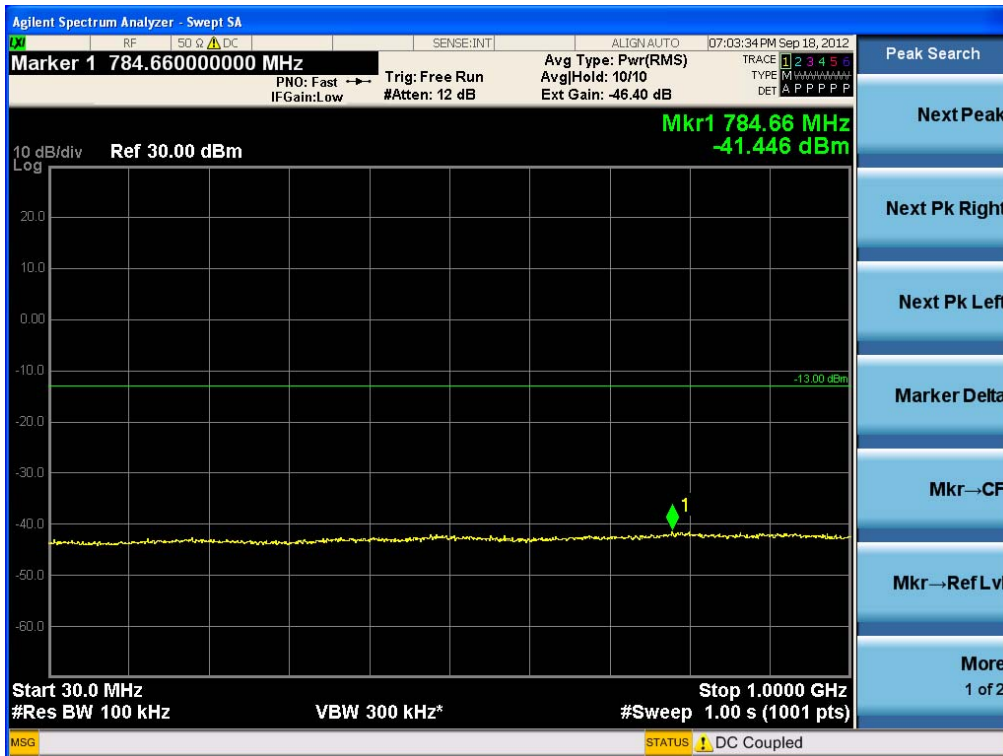
(Band Edge higher)



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(64QAM)

(30 MHz ~ 1 GHz)

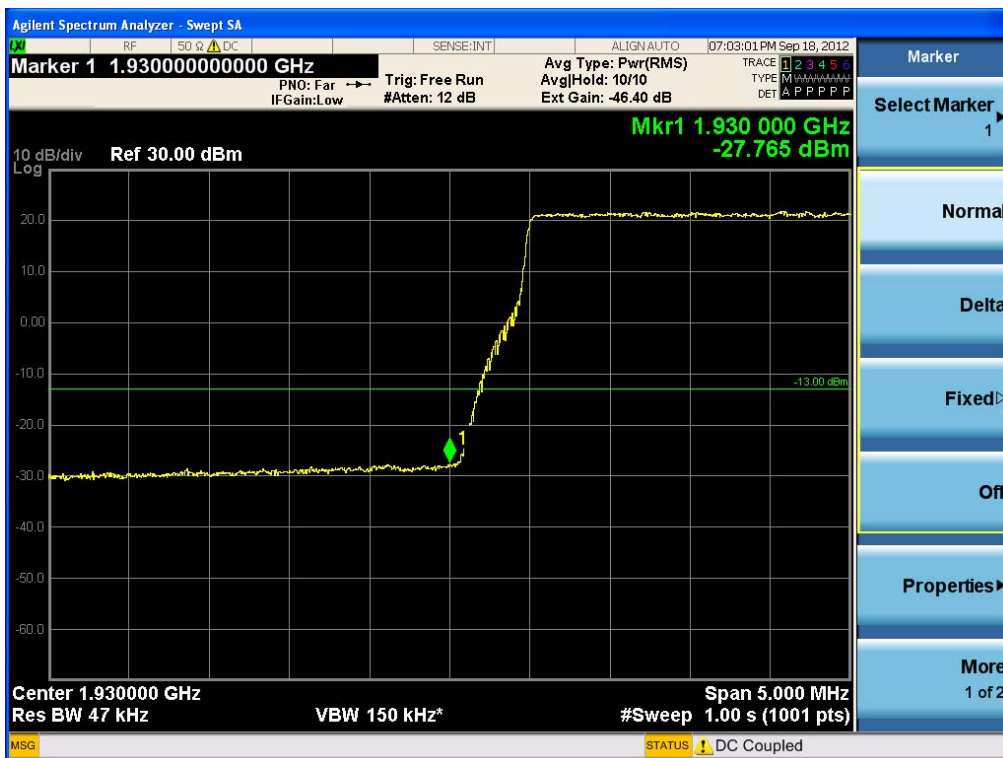


(1 GHz ~ 26.5 GHz)



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(Band Edge lower)



(Band Edge higher)



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8. RADIATED SPURIOUS EMISSION

8.1 Applicable Standard

According to FCC § 24.238

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

8.2 Test Equipment List and Details

Manufacturer	Model / Equipment	Serial No.	Calibration Due
Schwarzbeck	BBHA 9120D / Double Ridged Horn Antenna	937	10/17/2013
Schwarzbeck	BBHA 9120D / Double Ridged Horn Antenna	147	05/15/2014
Schwarzbeck	VULB 9168 / TRILOG Antenna	9168-200	02/19/2013
HD	MA240 / Antenna Position Tower	556	N/A
EMCO	1050 / Turn Table	114	N/A
HD GmbH	HD 100 / Controller	13	N/A
HD GmbH	KMS 560 / SlideBar	12	N/A
MITEQ	AMF-6B-180265-35-10P / POWER AMP	667624	04/16/2013
EMCO	6502/Loop Antenna	9009-2536	01/11/2014
Agilent	N9020A /Signal Analyzer	US46220219	05/02/2013
Agilent	6674A / DC Power Supply	3501A00901	05/02/2013

8.3 Test Procedure

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

The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were terminated to 50ohm load. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360^0 and the receiving antenna scanned from 1-4m in order to capture the maximum emission.

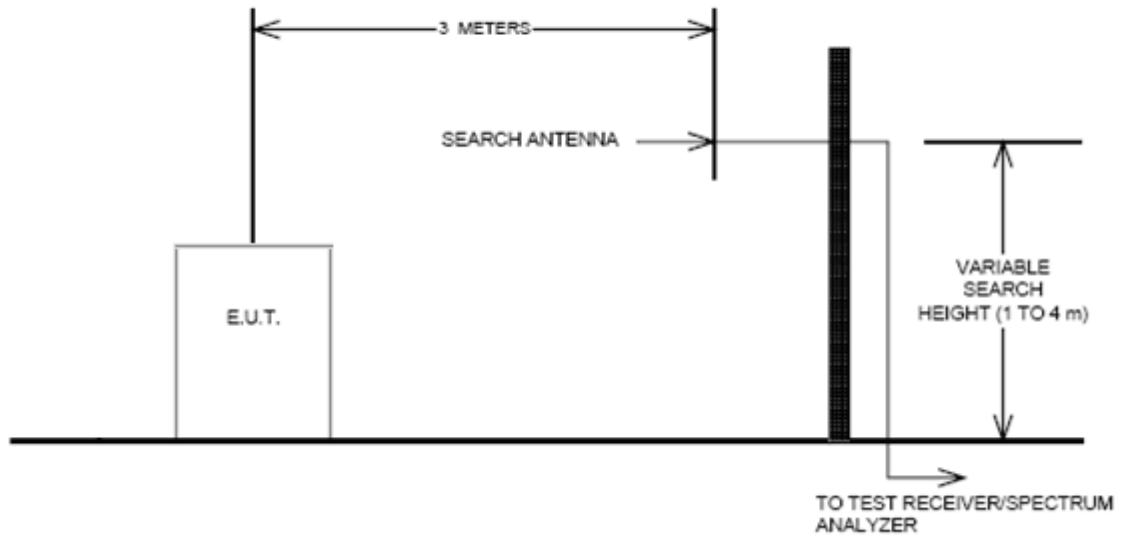
A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was duplicated.

The maximum EIRP of the emission was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and

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horizontal polarization. Harmonic emissions up to the 10th or 40GHz, whichever was the lesser, were investigated.

8.3.1 Radiated Spurious Emissions Test Setup



8.4 Test Result

: PASS

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Mode	Frequency	Freq.(MHz)	Measured	Ant. Gain (dBd)	C.L	SigGen	Pol.	ERP (dBm)	Margin (dB)
			Level [dBm]			Level [dBm]			
CDMA	1963.125	3926.5	-75.40	8.37	8.57	-37.6	V	-37.76	24.76
		5889.3	-73.50	8.79	10.40	-30.6	V	-32.18	19.18
LTE 5 MHz	1962.5	3865.0	-75.60	8.32	8.42	-38.1	V	-38.22	25.22
		5977.5	-73.10	8.81	10.49	-30.0	V	-31.64	18.64
LTE 10 MHz	1962.5	3980.0	-75.10	8.41	8.70	-36.9	V	-37.23	24.23
		5805.0	-74.20	8.78	10.31	-31.5	V	-33.00	20.00

9. FREQUENCY STABILITY

9.1 Applicable Standard

Requirements: FCC § 2.1055 (a), §24.235 following: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

9.2 Test Equipment List and Details

Manufacturer	Model / Equipment	Serial No.	Calibration Due
Agilent	N9020A /Signal Analyzer	US46220219	05/02/2013
Agilent	6674A / DC Power Supply	3501A00901	05/02/2013
WEINSCHTEL	67-30-33 / Attenuator	BU5347	11/07/2012
WEINSCHTEL	67-30-33 / Attenuator	BR0530	11/07/2012
WEINSCHTEL	AF9003-69-31 / Attenuator	11787	11/07/2012
WEINSCHTEL	AF9003-69-31 / Attenuator	5701	11/07/2012

9.3 Test Procedure

Frequency Stability over Temperature variation:

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

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

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

9.4. Test Result

: Pass

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9.4.1. Frequency Stability over Temperature and Voltage variation

(CDMA)

Modulation: BPSK

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1931 249 961	-39.0	0.0	0.0000
	-30	1931 249 964	-35.6	3.5	0.0018
	-20	1931 249 968	-31.7	7.4	0.0038
	-10	1931 249 963	-37.2	1.9	0.0010
	0	1931 249 963	-36.7	2.3	0.0012
	+10	1931 249 959	-41.1	-2.1	-0.0011
	+30	1931 249 966	-34.4	4.7	0.0024
	+40	1931 249 963	-37.0	2.1	0.0011
	+50	1931 249 962	-37.6	1.5	0.0008
115%	+20	1931 249 963	-37.5	1.5	0.0008
85%	+20	1931 249 962	-38.2	0.8	0.0004

Reference: - 48 Vdc at 20°C Freq. = 1931,250,000 MHz

Modulation: QPSK

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1962 499 966	-34.3	0.0	0.0000
	-30	1962 499 960	-40.0	-5.7	-0.0029
	-20	1962 499 960	-39.9	-5.6	-0.0029
	-10	1962 499 962	-37.8	-3.5	-0.0018
	0	1962 499 957	-43.1	-8.8	-0.0045
	+10	1962 499 962	-38.4	-4.1	-0.0021
	+30	1962 499 960	-40.3	-6.0	-0.0031
	+40	1962 499 961	-39.4	-5.1	-0.0026
	+50	1962 499 961	-39.2	-4.9	-0.0025
115%	+20	1962 499 961	-38.8	-4.5	-0.0023
85%	+20	1962 499 961	-39.1	-4.8	-0.0024

Reference: - 48 Vdc at 20°C Freq. = 1962,500,000 MHz

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Modulation: 16QAM

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1993 749 961	-38.9	0.0	0.0000
	-30	1993 749 964	-36.1	2.7	0.0014
	-20	1993 749 964	-36.0	2.8	0.0014
	-10	1993 749 964	-36.0	2.9	0.0014
	0	1993 749 962	-37.9	1.0	0.0005
	+10	1993 749 963	-37.4	1.5	0.0007
	+30	1993 749 960	-40.0	-1.1	-0.0006
	+40	1993 749 962	-37.7	1.2	0.0006
	+50	1993 749 962	-37.5	1.4	0.0007
115%	+20	1993 749 960	-40.3	-1.4	-0.0007
85%	+20	1993 749 963	-37.2	1.7	0.0008

Reference: - 48 Vdc at 20°C Freq. = 1993,750,000 MHz

(LTE)

Modulation: QPSK

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1932 499 959	-41.3	0.0	0.0000
	-30	1932 499 958	-41.5	-0.2	-0.0001
	-20	1932 499 959	-41.5	-0.1	-0.0001
	-10	1932 499 961	-38.6	2.7	0.0014
	0	1932 499 962	-37.5	3.8	0.0020
	+10	1932 499 962	-38.0	3.3	0.0017
	+30	1932 499 962	-37.8	3.5	0.0018
	+40	1932 499 962	-38.0	3.3	0.0017
	+50	1932 499 962	-38.0	3.4	0.0017
115%	+20	1932 499 961	-38.5	2.8	0.0015
85%	+20	1932 499 963	-37.3	4.1	0.0021

Reference: - 48 Vdc at 20°C Freq. = 1932,500,000 MHz

Modulation: 16QAM

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1962 499 958	-41.5	0.0	0.0000
	-30	1962 499 958	-41.6	-0.1	0.0000
	-20	1962 499 959	-41.1	0.4	0.0002
	-10	1962 499 961	-39.3	2.2	0.0011
	0	1962 499 960	-40.0	1.5	0.0008
	+10	1962 499 961	-39.2	2.3	0.0012
	+30	1962 499 961	-38.5	3.0	0.0015
	+40	1962 499 961	-38.9	2.6	0.0013
	+50	1962 499 961	-39.4	2.1	0.0011
115%	+20	1962 499 962	-38.3	3.2	0.0016
85%	+20	1962 499 962	-38.4	3.1	0.0016

Reference: - 48 Vdc at 20°C Freq. = 1962,500,000 MHz

Modulation: 64QAM

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1992 499 959	-41.3	0.0	0.0000
	-30	1992 499 960	-40.5	0.8	0.0004
	-20	1992 499 960	-40.0	1.3	0.0007
	-10	1992 499 960	-40.0	1.3	0.0006
	0	1992 499 959	-40.8	0.5	0.0002
	+10	1992 499 960	-39.9	1.4	0.0007
	+30	1992 499 961	-39.3	2.0	0.0010
	+40	1992 499 960	-40.1	1.2	0.0006
	+50	1992 499 961	-39.3	2.0	0.0010
115%	+20	1992 499 961	-38.6	2.8	0.0014
85%	+20	1992 499 958	-41.7	-0.3	-0.0002

Reference: - 48 Vdc at 20°C Freq. = 1992,500,000 MHz

10. RF EXPOSURE STATEMENT

1. LIMITS

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

(B) Limits for General Population/Uncontrolled Exposures

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

F = frequency in MHz

* = Plane-wave equivalent power density

2. MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

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

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

S = Power density

P = power input to antenna

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

R = distance to the center of radiation of the antenna

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3. RESULTS

(CDMA)

Max Peak output Power at antenna input terminal	45.96000	dBm
Max Peak output Power at antenna input terminal	39.44573	W
Prediction distance	500.00000	cm
Prediction frequency	1963.12500	MHz
Antenna Gain(typical)	18.00000	dBi
Antenna Gain(numeric)	63.09573	-
Power density at prediction frequency (S)	0.79223	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.00000	mW/cm ²

(LTE)

Max Peak output Power at antenna input terminal	46.10000	dBm
Max Peak output Power at antenna input terminal	40.73803	W
Prediction distance	500.00000	cm
Prediction frequency	1962.50000	MHz
Antenna Gain(typical)	18.00000	dBi
Antenna Gain(numeric)	63.09573	-
Power density at prediction frequency (S)	0.81818	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.00000	mW/cm ²

The power density level at 500 cm is 0.81818 mW/cm², which is below the uncontrolled exposure limit of 1.0 mW/cm² at PCS Band.

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