

Port 55, Channel Position T, LTE 10M



Port 55, Channel Position B, LTE 20M



Port 55, Channel Position T, LTE 20M



A.4 Conducted Spurious Emission

A.4.1 Reference

FCC CFR 47 Part 2, Clause 2.1051

FCC CFR 47 Part 27, Clause 27.53(m)

A.4.2 Method of measurement

In accordance with FCC rules, 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.

The spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using an attenuator and the frequency spectrum investigated from 3KHz to 27GHz. The resolution bandwidth of 1MHz was employed for frequency band 3KHz to 27GHz. The spectrum analyzer detector was set to RMS.

For MIMO mode configurations, the limit was adjusted with a correction of -18.06dB [10Log(1/64)] by using the Measure and Add 10Log(N) dB technique according to KDB 662911 D01 Multiple Transmitter Output accounting for simultaneous transmission from antenna ports. Then the limit was adjust to -31.06dBm.

A.4.3 Measurement limit

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.

A.4.4 Measurement results

Configuration LTE-MIMO-1C (1LTE QPSK)

Channel Bandwidth	RBW (MHz)	Limit (dBm)
10.0 MHz	1.0	-31.06
20.0 MHz	1.0	-31.06

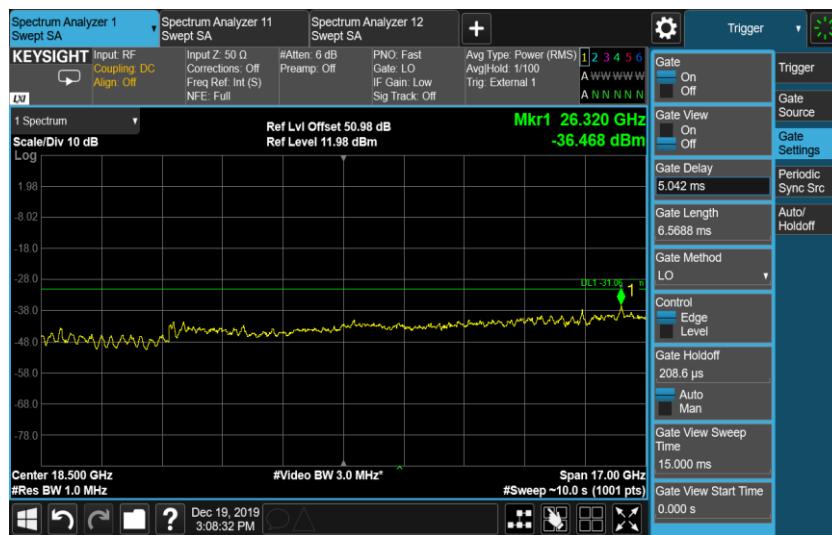
Port 55, Channel Position B 10.0 MHz, LTE





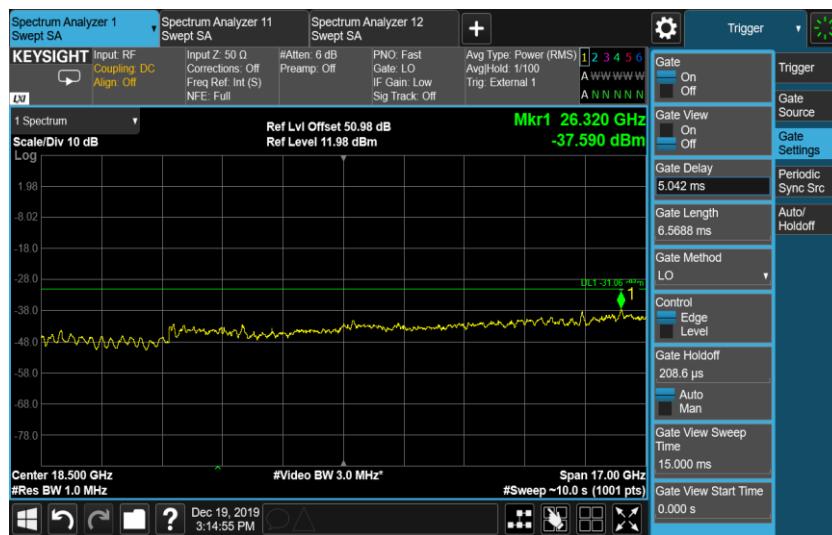
Port 55, Channel Position M 10.0 MHz, LTE





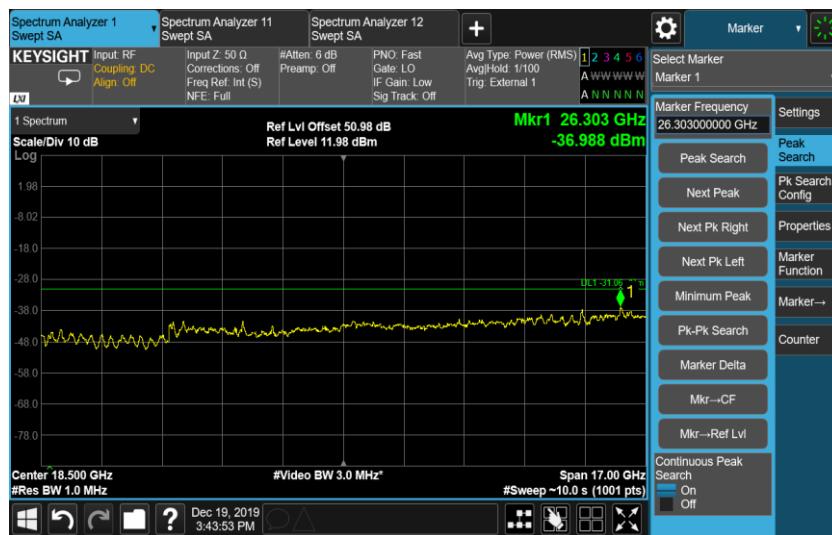
Port 55, Channel Position T 10.0 MHz, LTE





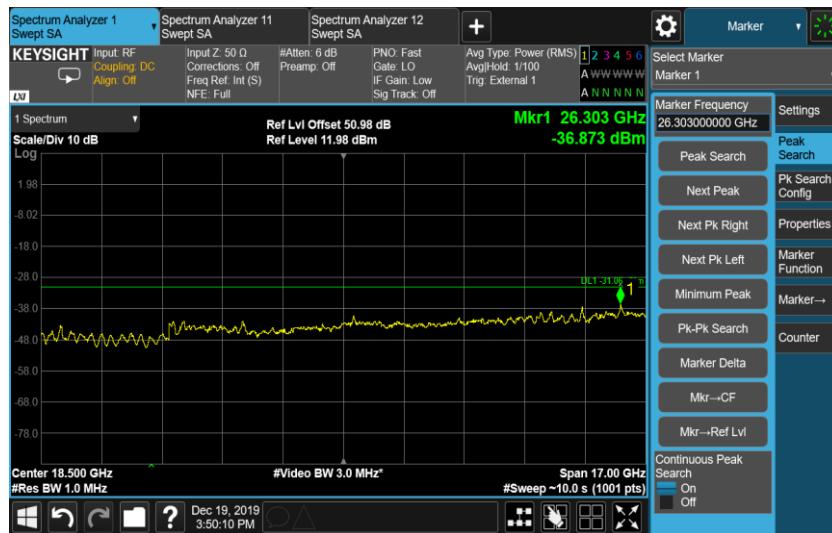
Port 55, Channel Position B 20.0 MHz, LTE





Port 55, Channel Position M 20.0 MHz, LTE





Port 55, Channel Position T 20.0 MHz, LTE





Configuration LTE-MIMO-2C (2LTE QPSK)

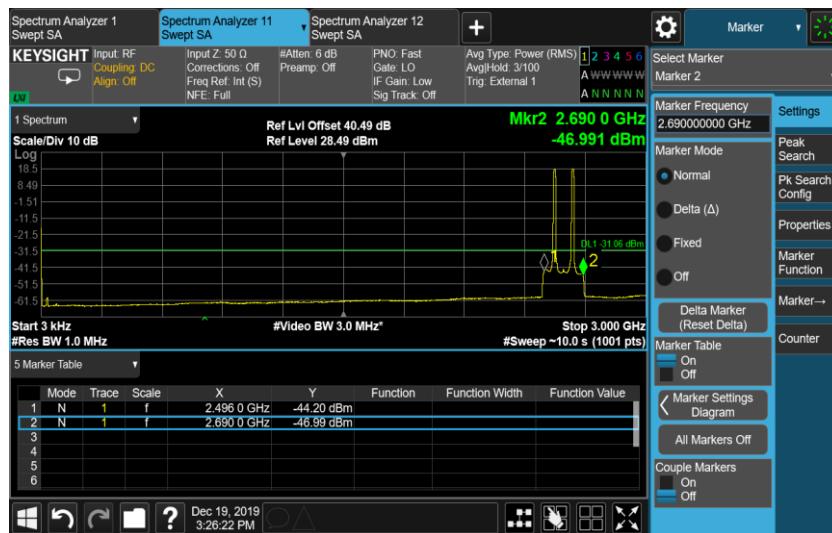
Channel Bandwidth	RBW (MHz)	Limit (dBm)
10.0 MHz	1.0	-31.06
20.0 MHz	1.0	-31.06

Port 55, Channel Position B 10.0 MHz, LTE





Port 55, Channel Position M 10.0 MHz, LTE





Port 55, Channel Position T 10.0 MHz, LTE



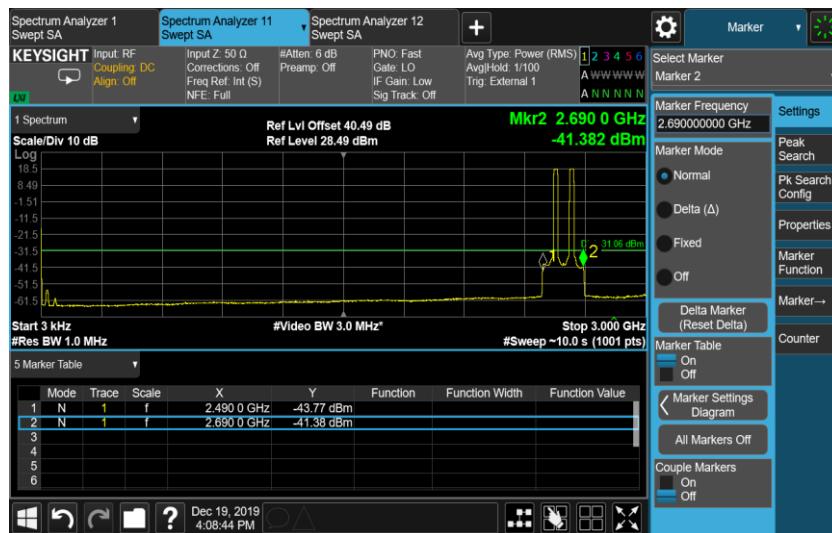


Port 55, Channel Position B 20.0 MHz, LTE





Port 55, Channel Position M 20.0 MHz, LTE





Port 55, Channel Position T 20.0 MHz, LTE





A.5 Radiated Spurious Emission

A.5.1 Reference

FCC CFR 47 Part 2, Clause 2.1053

FCC CFR 47 Part 27, Clause 27.53(m)

A.5.2 Method of measurement

The measurements procedures in TIA-603-E: 2016 are used. This measurement is carried out in semi-anechoic chamber.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within the chamber. Measurements of emissions from the EUT were obtained with the measurement antenna in both horizontal and vertical polarizations.

The measurements in the frequency range 30 to 1000MHz was performed with a RBW of 100kHz.

The measurements in the frequency range 1 to 8GHz was performed with a RBW of 1MHz except in the frequency band 2496 to 2690MHz where a RBW of 10kHz was used.

Emissions identified within the range 30MHz to 8GHz were then formally measured using a peak detector as the worst case.

The limits for outside a licensee's frequency band(s) of operation the power of the spurious emissions have been calculated, as shown below using the following formula:

Field Strength of Carrier - (43 + 10Log (P)) dB

Where:

Field Strength is measured in dB μ V/m

P is measured Transmitter Power in Watts

The EUT was measured with the antenna height varied between 1 and 4 m with the turntable rotated between 0 and 360 degrees. The emission of any outside a licensee's frequencies within 20dB of the limit were measured with the substitution method used according to the standard.

The measurements were performed at a 3m distance unless otherwise stated.

A.5.3 Measurement limit

The field strength of the carrier has been calculated assuming that the power is to be fed to a half-wave tuned dipoles as per 2.1053 (a).

$$E_{(v/m)} = (30 \times G_i \times P_o)^{0.5} / d$$

Where

G_i is the antenna gain of ideal half-wave dipoles,

P_o is the power out of the transceiver in W,

d is the measurement distance in meter.

Therefore at 3m measurement distance the field strength using the lowest transceiver output power would be:

$$E_{(v/m)} = (30 \times 1.64 \times 16.56)^{0.5} / 3 = 9.51V/m = 139.57 \text{ dB}\mu\text{V/m}$$

As per 27.53 (m) For BRS and EBS stations, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(2) For digital base stations, the attenuation shall be not less than $43 + 10 \log (P)$ dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS No. 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Provided that a documented interference complaint cannot be mutually resolved between the parties prior to the applicable deadline, then the following additional attenuation requirements shall apply:

(v) For all fixed digital user stations, the attenuation factor shall be not less than $43 + 10 \log (P)$ dB at the channel edge.

this gives:

$$43 + 10\log(16.56) = 55.19 \text{ dB}$$

Therefore the limit at 3m measurement distance is:

$$139.57 - 55.19 = 84.4 \text{ dB}\mu\text{V/m}$$

These limits have been used to determine Pass or Fail for the harmonics measured and detailed in the following results.

A.5.4 Measurement results

Configuration LTE-MIMO-1C 10M; QPSK;

Channel Position	Channel Frequencies
Channel Position B	2501.0MHz
Channel Position M	2593.0MHz
Channel Position T	2685.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-1C 10M; 16QAM;

Channel Position	Channel Frequencies
Channel Position B	2501.0MHz
Channel Position M	2593.0MHz
Channel Position T	2685.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-1C 10M; 64QAM;

Channel Position	Channel Frequencies
Channel Position B	2501.0MHz
Channel Position M	2593.0MHz
Channel Position T	2685.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-1C 10M; 256QAM;

Channel Position	Channel Frequencies
Channel Position B	2501.0MHz
Channel Position M	2593.0MHz
Channel Position T	2685.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-1C 20M; QPSK;

Channel Position	Channel Frequencies
Channel Position B	2506.0MHz
Channel Position M	2593.0MHz
Channel Position T	2680.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-1C 20M; 16QAM;

Channel Position	Channel Frequencies
Channel Position B	2506.0MHz
Channel Position M	2593.0MHz
Channel Position T	2680.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-1C 20M; 64QAM;

Channel Position	Channel Frequencies
Channel Position B	2506.0MHz
Channel Position M	2593.0MHz
Channel Position T	2680.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-1C 20M; 256QAM;

Channel Position	Channel Frequencies
Channel Position B	2506.0MHz
Channel Position M	2593.0MHz
Channel Position T	2680.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-2C 10M; 256QAM

Channel Position	Channel Frequencies
Channel Position B	2501.0MHz+2591.0MHz
Channel Position M	2548.0MHz+2638.0MHz
Channel Position T	2595.0MHz+2685.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-2C 20M; 256QAM

Channel Position	Channel Frequencies
Channel Position B	2506.0MHz+2586.0MHz
Channel Position M	2553.0MHz+2633.0MHz
Channel Position T	2600.0MHz+2680.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-3C 10M; 256QAM

Channel Position	Channel Frequencies
Channel Position B	2501.0MHz+2511.0MHz+2591.0MHz
Channel Position M	2548.0MHz+2558.0MHz+2638.0MHz
Channel Position T	2595.0MHz+2605.0MHz+2685.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-3C 20M; 256QAM

Channel Position	Channel Frequencies
Channel Position B	2506.0MHz+2526.0MHz+2586.0MHz
Channel Position M	2553.0MHz+2573.0MHz+2633.0MHz
Channel Position T	2600.0MHz+2620.0MHz+2680.0MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-3C 20M; QPSK

Channel Position	Channel Frequencies
Channel Position T	2600.0MHz+2620.0MHz+2680.0MHz

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-3C 20M; 16QAM

Channel Position	Channel Frequencies
Channel Position T	2600.0MHz+2620.0MHz+2680.0MHz

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration LTE-MIMO-3C 20M; 64QAM

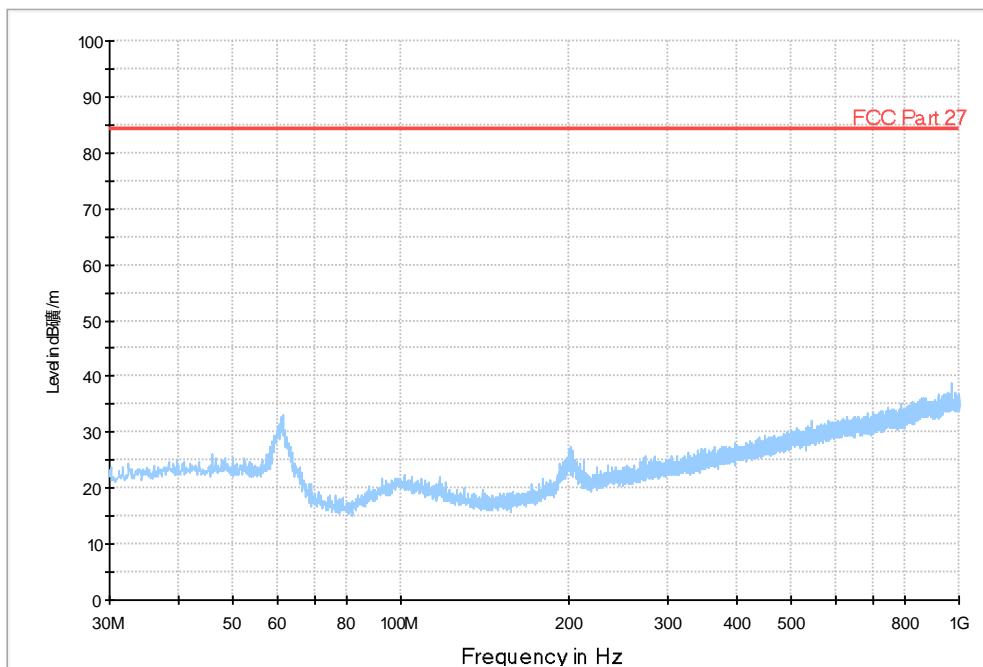
Channel Position	Channel Frequencies
Channel Position T	2600.0MHz+2620.0MHz+2680.0MHz

Channel Position T

No emissions were detected within 20dB of the limit.

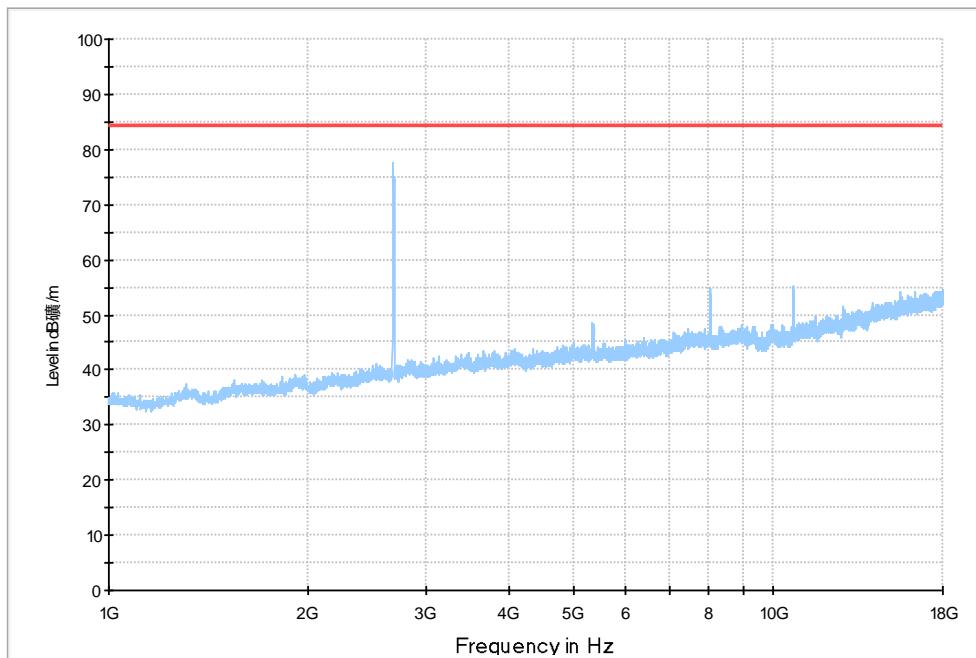
Configuration LTE-MIMO-1C 20M; 256QAM ; T;

RSE_Erisson_30M-1G_FCC

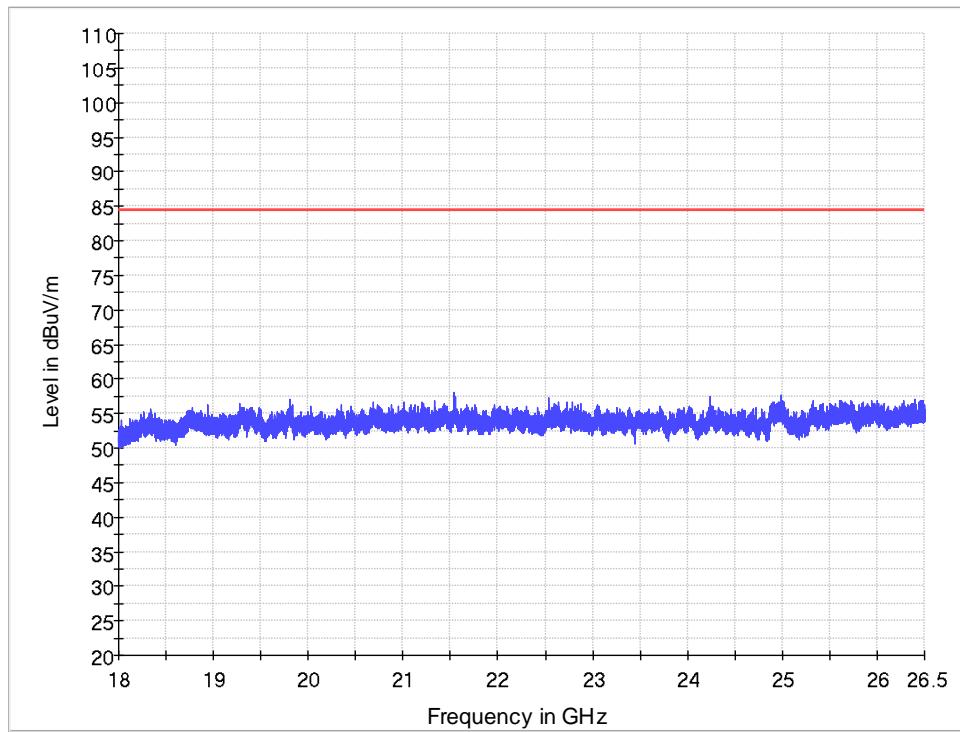


Configuration LTE-MIMO-1C 20M; 256QAM; T;

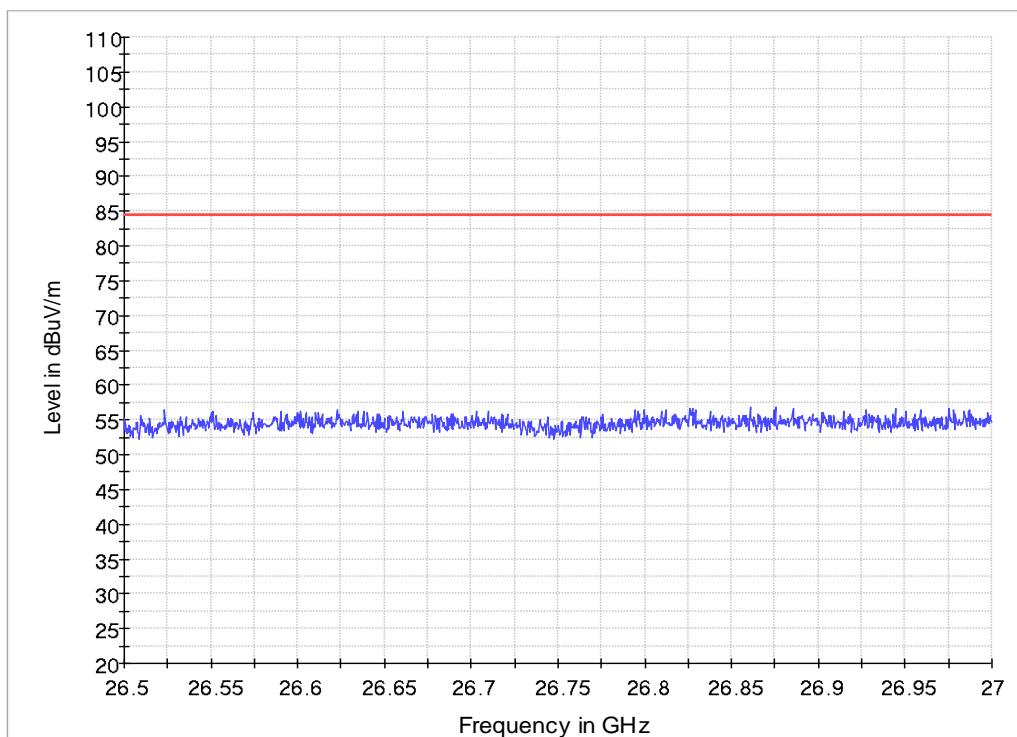
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Configuration LTE-MIMO-1C 20M; 256QAM; T;



Configuration LTE-MIMO-1C 20M; 256QAM; T



A.6 Frequency Stability

A.6.1 Reference

FCC CFR 47 Part 2, Clause 2.1055

FCC CFR 47 Part 27, Clause 27.54

A.6.2 Method of measurement

Temperature Variation

The EUT was tested over the temperature range -30°C to +50°C in 10°C steps with -48 VDC Power Supply. At each temperature step, the Base Station was configured to transmit a [RAT]* at maximum power on the bottom, middle and top channel of the operating band. After achieving thermal balance, the averages of 200 transmission bursts were measured and the result recorded.

Voltage Variation

The EUT was tested at the supplied voltages varied from 85 to 115 percent of the nominal value of -48 VDC. At +20°C, the Base Station was configured to transmit a [RAT]* at maximum power on the bottom, middle and top channel of the operating band. The average of 200 transmission bursts was measured and the result recorded.

[RAT]*:

LTE - QPSK modulation

A.6.3 Measurement limit

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

A.6.4 Measurement results

Frequency Error – Temperature Variation

Configuration LTE-MIMO-1C (1LTE 20MHz QPSK)

Maximum Output Power 30.97dBm per port, Channel Bandwidth 20MHz, LTE

Supply Voltage DC(V)	Temperature	Frequency Stability (Hz)		
		Channel position B	Channel position M	Channel position T
-48	-30	9.30	9.43	7.61
	-20	9.25	9.10	8.41
	-10	6.24	9.83	8.82
	0	8.45	7.79	8.49
	10	9.79	6.87	7.26
	20	9.11	7.76	9.75
	30	8.20	9.41	9.75
	40	7.19	8.97	7.77
	50	10.69	8.82	8.87

Frequency Error – Voltage Variation

Configuration LTE-MIMO-1C (1LTE 20MHz QPSK)

Maximum Output Power 30.97dBm per port, Channel Bandwidth 20MHz, LTE

Supply Voltage DC(V)	Temperature(°C)	Frequency Stability (Hz)		
		Channel position B	Channel position M	Channel position T
-40.8	20	-6.29	-5.12	-9.61
-48	20	-6.30	-6.40	-4.33
-55.2	20	-5.99	-5.92	3.12

ANNEX B: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

**Certificate of Accreditation to ISO/IEC 17025:2005**

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Electromagnetic Compatibility & Telecommunications

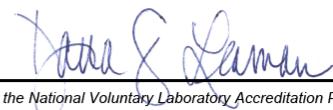
*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).*

2019-09-26 through 2020-09-30

Effective Dates



For the National Voluntary Laboratory Accreditation Program



*****END OF REPORT*****