

Appendix C: Test results FCC Part 27 / RSS-139, RSS-130



INDEX

TEST CONDITIONS	53
Radiated emissions	



TEST CONDITIONS

POWER SUPPLY (V):

V nonimal:	12 Vdc
Type of Power Supply:	External power supply (Car Battery).

ANTENNA:

Type of Antennas:	Internal.	
Maximum Declared Gain fo	r Bluetooth LE:	+1.7 dBi
Maximum Declared Gain fo	r WLAN 2.4 GHz:	+5.9 dBi
Maximum Declared Gain fo	r WLAN 5 GHz U-NII-1:	+3.6 dBi
Maximum Declared Gain fo	r WLAN 5 GHz U-NII-3:	+5.2 dBi

Maximum Declared Gain for CELLULAR:

MIDDLE Band	GAIN	ANTENNA TYPE
3G Band IV (1700 MHz) WCMDA LTE Band 4 (1700 MHz)	+5.9 dBi	Internal (3D)

HIGH Band	GAIN	ANTENNA TYPE
LTE Band 7 (2600 MHz)	+5.9 dBi	Internal (3D)

LOW Band	GAIN	ANTENNA TYPE
LTE Band 12 (700 MHz)		Internal (3D)
LTE Band 17 (700 MHz)	+5.9 dBi	
LTE Band 13 (700MHz)		

TEST FREQUENCIES:

	CELLULAR 3G (Band IV) (worst case of antenna)		
Band:	3G Band IV		
Frequency Range:	1710 – 1755 MHz		
Transmit Channel:	Channel	Channel Frequency (MHz)	
	Low:	1712.4	



	CELLULAR LTE (Bands 7, 12) (worst case of antenna)		
Band:	LTE 7		
Frequency Range:	2500 – 2570 MHz		
Transmit Channel:	Channel Channel Frequency (MHz)		
	High: 21400	2565	
Band:	LTE 12		
Frequency Range:	699 – 716 MHz		
Transmit Channel:	Channel Channel Frequency (MHz)		
	Middle: 23060	704	

	WLAN (IEEE 802.11 anac) / U-NII (worst case of antenna)		
Mode:	802.11 a20: MCS0		
Frequency Range:	5150 MHz to 5250 MHz (U-NII-1)		
Channel Spacing:	20 MHz		
Transmit Channel:	Channel	Channel Frequency (MHz)	
	Low: 36	5180	
Frequency Range:	5725 MHz to 5850 MHz (U-NII-3)		
Channel Spacing:	20 MHz		
Transmit Channel:	Channel Channel Frequency (MHz)		
	Highest: 165	5825	

	WLAN (IEEE 802.11 bgn2040) / Digital Transmission System (DTS) (worst case of antenna)		
Mode:	802.11 b: 1, 2, 5.5 & 11 Mbps (SISO)		
Channel Spacing:	20 MHz		
Frequency Range:	2412 MHz to 2472 MHz		
Transmit Channel:	Channel	Channel Frequency (MHz)	
	1	2412	
	11 2462		

	Bluetooth LE		
Mode:	GFSK		
Channel Spacing:	1 MHz		
Frequency Range:	2400 MHz to 2483.5 MHz		
Transmit Channel:	Channel Channel Frequency (MHz)		
	39 2480		
	37 2402		



The test set-up was made in accordance to the general provisions of FCC DTS Measurement 558074 D01 DTS Meas Guidance v05r02 dated April 2, 2019 and FCC Unlicensed National Information Infrastructure (U-NII) Devices 789033 D02 General U-NII Test Procedures New Rules v02r01 dated Dec 14, 2017.

The EUT was tested in the following operating mode:

- Continuous transmission with a modulated carrier at maximum power in all required channels selecting the supported data rates/modulations types.

During transmitter test the EUT was being controlled by the SW tool to operate in a continuous transmit mode on the test channel as required and in each of the different modulation modes.

The following configurations were selected based on preliminary testing that identified those corresponding to the worst cases:

Transmission modes selected with each radio:

* <u>CELLULAR</u>: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in 3G band IV and LTE bands 7, 12 configuration as these channels were found to transmit higher EIRP than all the other LTE bands.

* <u>5 GHz WLAN</u>: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in 802.11 a20 / 6Mbps mode configuration as this mode was found to transmit higher EIRP than all the other 5 GHz WLAN modes.

* <u>2.4 GHz WLAN</u>: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in 802.11 b / 1Mbps mode configuration as this mode was found to transmit higher EIRP than all the other 2.4 GHz WLAN modes.

* <u>BLUETOOTH</u>: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in Bluetooth Low Energy (GFSK) mode configuration.



Simultaneous transmission modes selected:

1. CELLULAR 3G, WLAN 2.4 GHz, BLUETOOTH Co-Location, with the EUT configured to simultaneously transmit three signals at maximum output power, CELLULAR 3G Band IV, WLAN 2.4 GHz in 802.11 b / 1 Mbps, Bluetooth Low Energy / GFSK.

2. CELLULAR 3G, WLAN 5 GHz, BLUETOOTH Co-Location, with the EUT configured to simultaneously transmit three signals at maximum output power, CELLULAR 3G Band IV, WLAN 5 GHz (U-NII-1) in 802.11 a20 / 6 Mbps, Bluetooth Low Energy / GFSK.

3. CELLULAR 3G, WLAN 5 GHz, BLUETOOTH Co-Location, with the EUT configured to simultaneously transmit three signals at maximum output power, CELLULAR 3G Band IV, WLAN 5 GHz (U-NII-3) in 802.11 a20 / 6 Mbps, Bluetooth Low Energy / GFSK.

4. CELLULAR LTE, WLAN 2.4 GHz, BLUETOOTH Co-Location, with the EUT configured to simultaneously transmit three signals at maximum output power, CELLULAR LTE Band 7, WLAN 2.4 GHz in 802.11 b / 1 Mbps, Bluetooth Low Energy / GFSK.

5. CELLULAR LTE, WLAN 5 GHz, BLUETOOTH Co-Location, with the EUT configured to simultaneously transmit three signals at maximum output power, CELLULAR LTE Band 7, WLAN 5 GHz (U-NII-1) in 802.11 a20 / 6 Mbps, Bluetooth Low Energy / GFSK.

6. CELLULAR LTE, WLAN 5 GHz, BLUETOOTH Co-Location, with the EUT configured to simultaneously transmit three signals at maximum output power, CELLULAR LTE Band 7, WLAN 5 GHz (U-NII-3) in 802.11 a20 / 6 Mbps, Bluetooth Low Energy / GFSK.

7. CELLULAR LTE, WLAN 2.4 GHz Co-Location, with the EUT configured to simultaneously transmit three signals at maximum output power, CELLULAR LTE Band 12, WLAN 2.4 GHz in 802.11 b / 1 Mbps, Bluetooth Low Energy / GFSK.

8. CELLULAR LTE, WLAN 5 GHz Co-Location, with the EUT configured to simultaneously transmit three signals at maximum output power, CELLULAR LTE Band 12, WLAN 5 GHz (U-NII-1) in 802.11 a20 / 6 Mbps, Bluetooth Low Energy / GFSK.

9. CELLULAR LTE, WLAN 5 GHz Co-Location, with the EUT configured to simultaneously transmit three signals at maximum output power, CELLULAR LTE Band 12, WLAN 5 GHz (U-NII-3) in 802.11 a20 / 6 Mbps, Bluetooth Low Energy / GFSK.



Radiated emissions

SPECIFICATION:

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c) / RSS-Gen):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

<u>RSS-247</u>. Attenuation below the general field strength limits specified in RSS-Gen is not required.

1. 3G Band IV. FCC §2.1053 & §27.53 (h) / RSS-139 Clause 6.6.

FCC §27.53 (h):

(h) Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

RSS-139 Clause 6.6:

i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.

ii. After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 P (watts) dB.

2. LTE Band 7. FCC §2.1053 & §27.53 (m) (4) / RSS-199 Clause 4.5.

FCC §27.53 (m) (4)

(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.



(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

RSS-199 Clause 4.5.

4.5. In the 1 MHz band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment, and 2% for mobile subscriber equipment. Beyond the 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% or 2% of the occupied bandwidth, as applicable.

Equipment shall comply with the following unwanted emission limits:

(b) for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

40 + 10 log10 p from the channel edges to 5 MHz away

43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and

55 + 10 log10 p at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than 43 + 10 log10 p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 log10 p at or below 2490.5 MHz.

In (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

3. LTE Band 12. FCC §2.1053 & §27.53 (g) / RSS-130 Clause 4.6.

FCC §27.53 (g):

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a 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, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130 Issue 1 Clause 4.6.:

The power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 log10 p (watts), dB. However, in the 100 kHz band immediately outside the equipment's operating frequency range, a resolution bandwidth of 30 kHz may be employed.



METHOD:

The measurement was performed with the EUT inside an anechoic chamber.

The spectrum was scanned from 9 kHz to at least the 10th harmonic of the highest frequency of the co-located radios till 40 GHz.

The EUT was placed on a non-conductive stand at a 3 meter distance from the measuring antenna.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

These measurements have been performed in order to check the impact of the Co-Location of all radio interfaces (licensed and unlicensed radios) that can be transmitting simultaneously. The results and plots below show the worst results obtained with the most restrictive limits.

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TEST SETUP:

Radiated measurements below 1 GHz.



Radiated measurements above 1 GHz.







• Mode 3G Band IV, 802.11 b, Bluetooth Low Energy.

WCDMA and HSUPA:

A preliminary scan determined WCDMA modulation as the worst case.

3G Band IV:	
WLAN 802.11 b:	
Bluetooth LE:	

Low Channel (1710 MHz). High Channel (2462 MHz). Low Channel (2402 MHz).

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 17.55 GHz	PK	43 + 10 log (P) dB = -13 dBm -> 82.23 dBµV/m
17.55 to 26 GHz	PK	74 dBµV/m
17.55 to 26 GHz	AVG	54 dBµV/m (*)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a).

(**) Radiated emissions which fall in the non-restricted bands.

Frequency range 30 MHz - 1 GHz

No spurious frequencies detected at less than 20 dB below the limit.

Frequency range 1 - 26 GHz

No spurious frequencies detected at less than 20 dB below the limit.

	<±3.81 for f < 1GHz
Measurement uncertainty (dB)	<±4.72 for f ≥ 1 GHz up to 18 GHz
	<±3.34 for f ≥ 18 GHz up to 26 GHz





FREQUENCY RANGE 1 - 3 GHz

Spectrum
 Ref Level
 97.00 dBµV/m
 ■ RBW
 1 MHz

 Att
 0 dB
 SWT 1 s
 ♥ VBW
 3 MHz
 Mode Auto Sweep
 TDP ●1Pk Viev 90 dBuV/n D1 82.230 dBuV/r 80 dBµV/m 70 dBµV/r 60 dBµV/r 50 dBµV/ 40 dBµV/ 30 dBµV/m 20 dBµV/m 10 dBµV/m 0 dBuV/m Stop 3.0 GHz Start 1.0 GHz 30000 pts

The peak above the limit on the left is the Carrier frequency 3G Band IV (1710 MHz) The peak above the limit in the middle is the Carrier frequency Bluetooth Low Energy (2402 MHz). The peak above the limit on the right is the Carrier frequency 802.11 b (2462 MHz).



FREQUENCY RANGE 3 - 17 GHz



FREQUENCY RANGE 17 - 26 GHz

Spectrum									
Ref Level 95.85 Att TDF	dBµV/m OdB ⊛ SWT 1 s	 RBW 1 MHz VBW 3 MHz 	Mode Sweep						8
●1Pk View●2Av Vi	ew		2	ii.	10			8	
90 dBµV/m		1.		2					
CO-LOCATION 3G B	and IV + WIFI2,4						-		
.70 dBµV/m				C.					
60 dBµV/m				×			-		
50 dBµV/m	-D2 54.000 dBµV/m-								
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20 dBµV/m									
10 dBµV/m									
0 dBµV/m									
Start 17.0 GHz				3000	0 pts				Stop 26.0 GHz



• Mode 3G Band IV, 802.11 a20 U-NII-1, Bluetooth Low Energy.

WCDMA and HSUPA:

A preliminary scan determined WCDMA modulation as the worst case.

3G Band IV:Low Channel (1712.4 MHz).802.11 a U-NII-1:BW=20 MHz, Low Channel (5180 MHz).Bluetooth Low Energy:High Channel (2480 MHz).

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 17.55 GHz	PK	43 + 10 log (P) dB = -13 dBm -> 82.23 dBµV/m
17.55 to 26 GHz	PK	74 dBµV/m
26 to 40 GHz	PK	68.23 (**) OR 74 dBµV/m (*)
17.55 to 40 GHz	AVG	54 dBµV/m (*)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a).

 $(^{\star\star})$ Radiated emissions which fall in the non-restricted bands.

Frequency range 30 MHz - 1 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 40 GHz

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	Detector	E (dBµV/m)	Polarization
20.71955	Peak	42.84	V
39.54383	Peak	49.79	V
39.34783	Peak	49.71	Н

	<±3.81 for f < 1GHz
Measurement uncertainty (dB)	<±4.72 for f ≥ 1 GHz up to 18 GHz
	<±3.34 for f ≥ 18 GHz up to 40 GHz







FREQUENCY RANGE 1 – 6.5 GHz

Spectrum										
Ref Level 97.00	dBµV/m	🖷 RBW 1 MHz								
Att	0 dB 👄 SWT 1	s 🥌 VBW 3 MHz	Mode Auto Sweep							
1Pk View										
		Ê								
	E E									
90 dBµV/m								-		
CO-LOCATION 3G BA	ND IV + WIFI 5GHz									
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		1								
70 dBi0//m-										
ло аврулі										
60 dBi M/m-										1 contraction to a second below
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			7							
30 dBµV/m										
20 dBµV/m		-	· · · · · · · · · · · · · · · · · · ·			-	-			
10 dBµV/m			1							
0 dBµV/m							2			
Start 1.0 GHz				3000	0 pts					Stop 6.5 GHz

The peak above the limit on the left is the Carrier frequency 3G Band IV (1710 MHz) The peak above the limit in the middle is the Carrier frequency Bluetooth Low Energy (2480 MHz). The peak above the limit on the right is the Carrier frequency 802.11 a20 (5180 MHz).

FREQUENCY RANGE 6.5 – 17 GHz

Spectrum								
Ref Level 97.00 Att TDF	dBµV/m 0 dB ● SWT 1 s	 RBW 1 MHz VBW 3 MHz 	Mode Auto Sweep					
●1Pk View		a	25			 ·		
90 dBµV/m								
CO-LOCATION 3G BA	ND IV + WIFI 5GHz_						-	
70. dBuV/m								
60 dBµV/m						-		
50 dBµV/m								
40 dBuV/m				Landara di Chilana ang ang ang ang ang ang ang ang ang	Martin Line Internation	 antibant descent the second at the	lk.	المراجع المراجع والمراجع
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30 dBµV/m								
20 dBµV/m								
10 dBµV/m	a					s		
0 dBµV/m								
Start 6 5 CHz				3000	0 nts			Ston 17.0 GHz



FREQUENCY RANGE 17 - 26 GHz

Spectrum									(m
Ref Level 97.00	dBµV/m O dB ⊕ SWT 1 s	 RBW 1 MHz VBW 3 MHz 	Mode Auto Sweep						
●1Pk View●2Av Vi	ew		8	Q2	10 Q	8	5	9 P	1
90 dBµV/m									
CO-LOCATION 3G BA	ND IV + WIFI 5GHz						2		
70 dBu\//m									
			1						
60 dBµV/m	50 54 000 db V/m								
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40 dBµV/m		ماليا ومرابع	Hand Hanne Haller Ind	an and the first sector of the	an a	and the state of the	وقاليا هي والتلقيقي ، وقار أهمال من	la hana Milan da Balanda ana	ng _{app} ang dan tertering Tertering
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20 dBµV/m				K.					
10 dBµV/m				-			4		
0 dBµV/m									
Start 17.0 GHz				3000	0 pts				Stop 26.0 GHz

FREQUENCY RANGE 26 - 40 GHz

Spectrum									
Ref Level 97.00 Att TDF	dBµV/m O dB ● SWT 1 s	 RBW 1 MHz VBW 3 MHz 	Mode Auto Sweep						
●1Pk View●2Av Vi	ew			-				-	
90 dBµV/m									
80 dBµV/m									
70 dBuV/m									
CO-LOCATION 36 BA	ND IV + WIFI 5GHz								
60 dBµV/m									
	-D1 54.000 dBµV/m-								
20 gBhA/w			under son einer	-		the second comment	and has many different in	and alternation they dealer a little	
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20 dBµV/m									
10 dBµV/m									
0 dBµV/m									
Start 26.0 GHz				3000	0 pts				Stop 40.0 GHz



• Mode 3G Band IV, 802.11 a20 U-NII-3, Bluetooth Low Energy.

WCDMA and HSUPA:

A preliminary scan determined WCDMA modulation as the worst case.

3G Band IV:Low Channel (1710 MHz).802.11 a U-NII-3:BW=20 MHz, High Channel (5825 MHz).Bluetooth Low Energy:Low Channel (2402 MHz).

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 17.55 GHz	PK	43 + 10 log (P) dB = -13 dBm -> 82.23 dBµV/m
17.55 to 26 GHz	PK	74 dBµV/m
26 to 40 GHz	PK	68.23 (**) OR 74 dBµV/m (*)
17.55 to 40 GHz	AVG	54 dBµV/m (*)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a).

 $(\ensuremath{^{\star\star}})$ Radiated emissions which fall in the non-restricted bands.

Frequency range 30 MHz - 1 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 40 GHz

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	Detector	E (dBµV/m)	Polarization
39.6213	Peak	49.80	V

Measurement uncertainty (dB)	<pre><±3.81 for f < 1GHz <±4.72 for f ≥ 1 GHz up to 18 GHz <±3.34 for f ≥ 18 GHz up to 40 GHz</pre>
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Receiver	Spectrum 🗷								
Ref Level 97.0	0 dBµV/m 0 dB SWT 30	RBW 100 kH ms VBW 300 kH	z 7 Mode Sween	Input 1 AC					(42.)
TDF	0.05 0.11.00		- mode oweep	input 180					
●1Pk View	Ĩ							1	
90 dBµV/m									
	D1 82.230 dBµV/m-								
80 dBµV/m									
70 dBu\//m									
, o dop tym									
60 dBµV/m			-			-			
50 dBµV/m				-					
40 dBuil//m-									
40 0500/11									
30 dBµV/m-									
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an an article	MALWWW W	Constanting of the second	2						
TH ODDAYIN									
1	2								
0 dBµV/m									
Start 30.0 MHz				3000) pts				Stop 1.0 GHz



FREQUENCY RANGE 1 – 6.5 GHz

Spectrum									
Ref Level 97.00	dBµV/m	RBW 1 MHz	Mada Auto Cuson						
TDF	0 00 - 3 WT 1 5	S TOW J MINZ	Houe Auto Sweep						
1Pk View		1				(ſ		
90 dBµV/m			-			-			
CO-LOCATION 30 BA	ND IV + WIFI 30H2			9 			2		4
70 dBuV/m									
								1	
60 dBµV/m						1			and the second states of the s
		1 4				1	and the state of the	and the second second second	at water state of the second
				Line Line and a line	delay all parts of the state of the best of a	And the second			
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40 ab)//m							9		
30 dBµV/m		r.				2			*
20 dBuV/m-									
10 dBµV/m		5					5		
0 dBuV/m									
								2	
start 1.0 GHz				3000	u pts				Stop 6.5 GHz

The peak above the limit on the left is the Carrier frequency 3G Band IV (1710 MHz) The peak above the limit in the middle is the Carrier frequency Bluetooth Low Energy (2402 MHz). The peak above the limit on the right is the Carrier frequency 802.11 a20 (5825 MHz).

FREQUENCY RANGE 6.5 – 17 GHz

Spectrum								
Ref Level 97.00 Att	dBµV/m O dB ⊕ SWT 1 s	RBW 1 MHz VBW 3 MHz	Mode Auto Sweep					
●1Pk View								
90 dBµV/m								
CO-LOCATION 3G BA	ND IV + WIFI 5GHz	5				-		
70 dBuV/m-								
60 dBµV/m		2						
50 dBµV/m		e	9			s	2 · · · ·	
40 dBµV/m		المرافعة معمليني المحمد التقط			Phane and a second second		and lag part and by parts of the	and participation of the second development
Line for the second second second		and the second						
30 dBµV/m								
20 dBµV/m								
10 dBµV/m		6	s					
0 40 47 4								
Start 6 5 GHz				3000	fints .			Stop 17 0 GHz



FREQUENCY RANGE 17 - 26 GHz

Spectrum								
Ref Level 97.00 Att TDF	dBµV/m O dB ⊕ SWT 1 s	e RBW 1 MHz WBW 3 MHz	Mode Auto Sweep					
●1Pk View●2Av Vi	BM				10 ×	2		
90 dBµV/m								
CO-LOCATION 3G BA	ND IV + WIFI 5GHz							
70 dBµV/m								
	-D2 54.000 dBµV/m-							
50 dBµV/m								
40 dBµV/m	and the local states in the second	and the second	Andreader stranding his	Comparing output for an internal section of		the state of the s	leads and provide a state of the second state	
30 dBuV/m						and and the second s	اليافعان والمعارفة والمعارفة	
and the second second second			the state of the s	الملتودين محيلهم ورزال كالموريان				
20 dBµV/m		4				9		
10 dBµV/m								
0 dBµV/m								
Start 17.0 GHz				3000	0 pts			Stop 26.0 GHz

FREQUENCY RANGE 26 - 40 GHz

Spectrum									
Ref Level 97.00 Att	dBµV/m 0 dB = SWT 1 s	 RBW 1 MHz VBW 3 MHz 	Mode Auto Sweep						
●1Pk View●2Av Vi	ew								
90 dBµV/m									
80 dBuV/m									
70 dBµV/m									
CO-LOCATION 36 BA	ND IV + WIFI 5GHz								
60 dBµV/m									
50 dBµV/m	D1 54.000 dBµV/m−								
		kn.	. สมสีบน			المرفعة بالمعادين	an ashan as da without its		
40 dBµV/m	al or mail a state path of the build							فالمحمد والمحمد والمحم	
30 dBµV/m						ور المالين المنظمين المراجع الم			
-	-								
20 dBµV/m									
10 dBµV/m			7	r 2		2			
0 dBµV/m									
Start 26.0 GHz				3000	0 pts				Stop 40.0 GHz



• Mode LTE Band 7, 802.11 b, Bluetooth Low Energy.

QPSK & 16QAM:

A preliminary scan determined the QPSK modulation as the worst case.

LTE Band 7: WLAN 802.11 b: Bluetooth Low Energy: High Channel (2565 MHz). RB=1.Offset 0. High Channel (2462 MHz). Low Channel (2402 MHz).

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)		
30 MHz to 1 GHz	PK	55 + 10 log (P) dB = -25 dBm -> 70.23 dBµV/m		
30 MHz to 88 MHz	QP	40 dBµV/m (***)		
88 MHz to 216 MHz	QP	43.5 dBµV/m (***)		
216 MHz to 960 MHz	QP	46 dBµV/m (***)		
960 MHz to 1GHz	QP	54 dBµV/m (***)		
1 GHz to 26 GHz	РК	55 + 10 log (P) dB = -25 dBm -> 70.23 dBµV/m (**) OR -21.23 dBm -> 74 dBµV/m (*) (***)		

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a).

(**) Radiated emissions which fall in the non-restricted bands.

(***) Radiated emission limits to comply with 15.209(a) (see 15.205(c) / RSS-Gen). Frequency range 30 MHz - 1 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 26 GHz

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	Detector	E (dBµV/m)	Polarization
2.522167	Peak	63.27	V
5.12123	Peak	55.83	V
9.8481	Peak	54.93	V
7.2637	Peak	56.72	Н
7.32577	Peak	62.01	Н
7.38643	Peak	63.89	Н

	<±3.81 for f < 1GHz
Measurement uncertainty (dB)	$<\pm4.72$ for $f \ge 1$ GHz up to 18 GHz
	<±3.34 for f ≥ 18 GHz up to 26 GHz





FREQUENCY RANGE 1 – 3 GHz



The peak above the limit on the middle is the Carrier frequency 802.11 b (2462 MHz). The peak above the limit on the left is the Carrier frequency LTE Band 7 (2565 MHz). The peak at 2585 MHz corresponds to the downlink signal LTE Band 7.



FREQUENCY RANGE 3 – 17 GHz

Spectrum									
Ref Level 97.00	dBµV/m □ dB = SWT 1 s	RBW 1 MHz VBW 3 MHz	Mode Sween						
TDF			ibite encop						
OINK AIGM						[
90 dBµV/m									
90 dBu//m									
BU GBDA/III-									
Col ocation TEBand	7+WiFi2.4GHz+BTLE								~
			1						
60 dBµV/m									
50 dBu//m									
50 dbpv/m		31	1						
	100			1 1					
40 dBµV/m				a a la tratta	a ante la a la de de destinte atich start	Alexie allege and the second	I to I delta contato	a plugation of the local line.	
	in III		a statistic and beautions and a	In the Rest of the Rest of the Party of the	and the second second	and the state of t	-	and the set of the set	Addition of the March 1978 In Lot
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	in the data indicate the second second	I have a second and the second	-				(Deserved	Martin Ara Participation Status
30 dBµV/m	transfer and the second second	and the state of the							
- Construction of the second									
20 dBuV/m									
10 dBµV/m									
0 dBµV/m									
Start 3.0 GHz				3000	D pts				Stop 17.0 GHz

FREQUENCY RANGE 17 - 26 GHz

Spectrum)								
Ref Level 97.00 Att TDF	0 dBµV/m 0 dB <mark>● SWT</mark> 1 s	 RBW 1 MHz VBW 3 MHz 	Mode Auto Sweep						
●1Pk View●2Av	View	-						-	
90 dBµV/m	· · · · · · · · · · · · · · · · · · ·								
80 dBuV/m									
Collocation LTERan									
COLOCATION LIEBAN									
60 dBµV/m									
50 dBµV/m									
40 dBµV/m						2	10 M	and the state of the state	ا مراجع و مراجع المراجع المراجع و مراجع
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30 dBµV/m	hand and the local property and the local	Addition and the offer	In Alexandra International States of the	and the second second second second		Participation of the second	and the second s		Test erect
		and the second se	and the second se			-	الأفترندينات المحين والترزيقي	فيتحفظ المستعم المتلك المستعمل المستع	and the second se
20 dBµV/m		and the second secon	and the second	المتعلقا المتلجع والمستحد والمحمد	الشافعة والمطالب والمتعصي والأ				
10 dBµV/m						-			
0 dBµV/m-				3000	0 pts				Stop 26.0 GHz



• Mode LTE Band 7, 802.11 a20 U-NII-1, Bluetooth Low Energy.

QPSK & 16QAM

A preliminary scan determined the QPSK modulation as the worst case.

LTE Band 7: 802.11 a U-NII-1: Bluetooth Low Energy: High Channel (2565 MHz), RB=1.Offset 0. BW=20 MHz, Low Channel (5180 MHz). Low Channel (2402 MHz).

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 1 GHz	PK	55 + 10 log (P) dB = -25 dBm -> 70.23 dBµV/m
30 MHz to 88 MHz	QP	40 dBµV/m (***)
88 MHz to 216 MHz	QP	43.5 dBµV/m (***)
216 MHz to 960 MHz	QP	46 dBµV/m (***)
960 MHz to 1GHz	QP	54 dBµV/m (***)
1 to 26 GHz	PK	55 + 10 log (P) dB = -25 dBm -> 70.23 dBµV/m (**) OR -21.23 dBm -> 74 dBµV/m (*)(***)
26 to 40 GHz	PK	68.23 (**) OR 74 dBµV/m (*)
26 to 40 GHz	AVG	54 dBµV/m (*)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a). (**) Radiated emissions which fall in the non-restricted bands.

(***) Radiated emission limits to comply with §15.209(a) (see §15.205(c) / RSS-Gen).

Frequency range 30 MHz - 1 GHz

No spurious frequencies at less than 20 dB below the limit:

Frequency range 1 - 40 GHz

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	Detector	E (dBµV/m)	Polarization
5.12103	Peak	58.79	V
7.20517	Peak	55.24	V

	<±3.81 for f < 1GHz
Measurement uncertainty (dB)	<±4.72 for f ≥ 1 GHz up to 18 GHz
	<±3.34 for f ≥ 18 GHz up to 40 GHz



Receiver	Spectrum 🗷								
Ref Level 97.00	dBµV/m	曼 RBW 100 kHz							1
🖷 Att	0 dB SWT 30 m	ns 👄 VBW 300 kHz	Mode Sweep	Input 1 AC					
TDF			A	25					
●1Pk View									
00 dBuild									
90 авру/m									
- S- S-									
80 dBµV/m									
70 dBpV/m-	ŧD1 70.230 dBµV/m≕								
60 dBµV/m									
50 dBµV/m				2	1				2
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FCC 15						a recorded	dillor al contrate the dillor	a de la later a bille	night and a share was de-
100_10					La da se sin	Lunar Harth Strand Light and		the state of the sub-state of the state	and the lease of the second
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30 dBµV/m		a saille had delide	and the fill west	sta bin sette a more the part of the					
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	A DESCRIPTION OF A DESCRIPTION OF								
20 dt, 10/m	1.000 St								
10 dBµV/m									
0 dBµV/m									
			/						
Start 30.0 MHz				3000) pts				Stop 1.0 GHz



FREQUENCY RANGE 1 – 7 GHz



The peak above the limit on the left is the Carrier frequency Bluetooth Low Energy (2402 MHz). The peak above the limit in the middle is the Carrier frequency LTE Band 7 (2565 MHz). The peak at 2585 MHz corresponds to the downlink signal LTE Band 7.

The peak above the limit on the right is the Carrier frequency 802.11 a20 (5180 MHz).

FREQUENCY RANGE 7 – 17 GHz

Spectrum									
Ref Level 90.00) dBµV/m	🖷 RBW 1 MHz	5						
TDF	0 dB 🖷 SWT 1 s	: 🖷 VBW 3 MHz	Mode Auto Sweep						
1Pk View									
80 dBµV/m									
	−D1 74.000 dBµV/m−		6						
70 dBµV/m									
60 dBµV/m									
1 Arriente									
50 10 11/1-									
50 08µV/m-			2 1 2						
40 dBuV/m				the second			and a shrinkle a		J. J. M. Markell
1	al as he is a second as he had	La data salisi salisi data (sa data))			مرازع والمتعدين والماريد المراجع			And the state of the set of the set of the	In the second
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30 dBµV/m							-		-
20 dBµV/m	-		5				-		
10 dBµV/m-									
0 dBuV/m						-			2
Start 7.8 CH-				2000	0 nts				Stop 17.0 CHa
atart 7.0 GHZ				3000	u prs				atop 17.0 GHz



FREQUENCY RANGE 17 - 26 GHz

Spectrum									
Ref Level 97.00	dBµV/m	RBW 1 MHz							
TDF		s 🖶 VBW 3 MHZ	Mode Sweep						
●1Pk View	-								
90 dBµV/m									
80 dBµV/m									
	-D1 74.000 dBuV/m-								
70 dBu///m	D1 74.000 08pV/m								
yo aspyrin									
60 dBµV/m									
50 dBµV/m									
40 dBuV/m							a <mark>uti</mark>	وبالطحفين ويتراجع	Well of the bound of a state of the second sta
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	and the second se	Although a second of the second of the	The same	and the providence of the second	the state of the s				
30 dBµV/m				8		<u>.</u>			
20 dBµV/m-									
10 dBµV/m				1/ A					
do do									
0 dBµV/m						a			
Start 17.0 GHz	1		l	3000	Opts	E		1	Stop 26.0 GHz

FREQUENCY RANGE 26 - 40 GHz

Ref Level 97.00 dBµ/* • BBW 1 M+Z Att 0 dB • SWT 1 5 • VBW 3 M+Z TOF • D 0 dB µ/* • D 0 dBµ/* • D • D • D • D • D • D • D • D • D • D • D • D • D • D • D • D • D • D • D	Spectrum									
	Ref Level 97.00 Att	dBµV 0 dB ● SWT 1 s ●	RBW 1 MHz VBW 3 MHz Mo	de Sweep						
9 IPK View 22V View Image: State	TDF									
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	●1Pk View●2Av \	liew			<u> </u>					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$										
	90 dBµV									
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So dB ₄ V	70 dBµV	D1 68.230 dBµV								
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	20 dBµV-				17.0					
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	10 dBµV								1	
D dBµV	0 dBµV									
Start 26.0 GHz 30000 pts Stor 40.0 GHz	Start 26.0 GHz				3000	0 pts			I	Ston 40.0 GHz



• Mode LTE Band 7, 802.11 a20 U-NII-3, Bluetooth Low Energy.

QPSK & 16QAM

A preliminary scan determined the QPSK modulation as the worst case.

LTE Band 7: 802.11 a U-NII-3: Bluetooth Low Energy: High Channel (2565 MHz), RB=1.Offset 0. BW=20 MHz, High Channel (5825 MHz). Low Channel (2402 MHz).

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 1 GHz	PK	55 + 10 log (P) dB = -25 dBm -> 70.23 dBµV/m
30 MHz to 88 MHz	QP	40 dBµV/m (***)
88 MHz to 216 MHz	QP	43.5 dBµV/m (***)
216 MHz to 960 MHz	QP	46 dBµV/m (***)
960 MHz to 1GHz	QP	54 dBµV/m (***)
1 to 26 GHz	PK	74 dBµV/m (***)
26 to 40 GHz	PK	68.23 (**) OR 74 dBµV/m (*)
26 to 40 GHz	AVG	54 dBµV/m (*)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a).

(**) Radiated emissions which fall in the non-restricted bands.

(***) Radiated emission limits to comply with §15.209(a) (see §15.205(c) / RSS-Gen).

Frequency range 30 MHz - 1 GHz

No spurious frequencies at less than 20 dB below the limit:

Frequency range 1 - 40 GHz

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	Detector	E (dBµV/m)	Polarization	Limit (dBµV/m)
5.12094	Peak	59.46	V	74
7.20483	Peak	55.42	V	74

	<±3.81 for f < 1GHz
Measurement uncertainty (dB)	<±4.72 for f ≥ 1 GHz up to 18 GHz
	<±3.34 for f ≥ 18 GHz up to 40 GHz



Receiver	Spectrum 🗷								
Ref Level 97.00 Att	dBµV/m 0 dB SWT 30 r	RBW 100 kHz ms	Mode Sweep	Input 1 AC					
TDF				1					
TEK VIEW	1								
concerciption and the									
90 dBµV/m	-								
80 dBuV/m-						-			
70 dBpV/m	D1 70.230 dBµV/m=								
60 dBµV/m									
50 dBuV/m									
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20 dt . W/m									
10 dBµV/m									
0 dBuV/m-				a				,	
Start 30.0 MHz				3000	0 pts				Stop 1 0 CHz
Cord of the				3000	o pro				010p 1.0 GHz



FREQUENCY RANGE 1 – 7 GHz



The peak above the limit on the left is the Carrier frequency Bluetooth Low Energy (2402 MHz). The peak above the limit in the middle is the Carrier frequency LTE Band 7 (2565 MHz). The peak at 2585 MHz corresponds to the downlink signal LTE Band 7. The peak above the limit on the right is the Carrier frequency 802.11 a20 (5825 MHz).

FREQUENCY RANGE 7 – 17 GHz





FREQUENCY RANGE 17 - 26 GHz

Spectrum									
Ref Level 97.00	dBµV/m	BW 1 MHz							
TDF		WEW 3 MH2	Mode Sweep						
●1Pk View	1				1	l			
90 dBµV/m				7					
80 dBµV/m									
	D1 74.000 dBµV/m-								
70 dBµV/m									
255 - 151									
60 dBµV/m								·	
50 dBµV/m									
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40 dBµV/m	and a second a second	dia a la anderstal	weet lease the large second	and the second second	وروالية المترور والمعرور المرور والم	during the distantinguist is builded	teresting appendix to appendix		
didule with a bank			the second s					2.20	
30 dBuV/m	1								
20 dBµV/m									
10 dBuV/m-									
0 dBµV/m									
Start 17.0 GHz	1		L	3000	0 pts	L			Stop 26.0 GHz

FREQUENCY RANGE 26 - 40 GHz

Ref Level 97.00 dBµV RBW 1 MHz Att 0 dB • SwT 1 s • VBW 3 MHz Mode Sweep TOF
TDF Index streep ●1Pk View●2Av View
● 1Pk View ● 2Av View 90 d8µV
90 dBµV
90 dBµV
80 dBuV-
70 dBuV
D1 68.230 dBµV
D2 54.000 dBµV
50 dBµV
20 dBµV
10 dBµV
D dBu0/
Start 26.0 GHz 30000 nts Stan 40.0 GHz



• Mode LTE Band 12, 802.11 b, Bluetooth Low Energy.

QPSK & 16QAM

A preliminary scan determined the QPSK modulation as the worst case.

LTE Band 12:Low Channel (704 MHz), RB=1. Offset=49.WLAN 802.11 b:High Channel (2462 MHz).Bluetooth Low Energy:Low Channel (2402 MHz).

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 7.16 GHz	PK	43 + 10 log (P) dB = -13 dBm -> 82.23 dBµV/m
7.16 to 26 GHz	PK	74 dBµV/m (**)
7.16 to 26 GHz	AVG	54 dBµV/m (*) (**)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a).

(**) Radiated emission limits to comply with §15.209(a) (see §15.205(c) / RSS-Gen).

Frequency range 30 MHz - 1 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 26 GHz

Spurious frequencies at less than 20 dB below the limits:

Spurious frequency (GHz)	Detector	E (dBµV/m)	Polarization
1.416833	Peak	51.9	Н
4.80343	Peak	51.51	V
4.9243	Peak	49.54	V
7 00000	Peak	57.93	N/
7.20323	Average	50.35	V
7 20577	Peak	62.38	Ц
1.32311	Average	52.32	
7 2055	Peak	65.1	
6000.1	Average	43.98	
9.84763	Peak	55.46	V

	<±3.81 for f < 1GHz
Measurement uncertainty (dB)	<±4.72 for f ≥ 1 GHz up to 18 GHz
	<±3.34 for f ≥ 18 GHz up to 26 GHz





The peak above the limit is the Carrier frequency LTE Band 12 (704 MHz). The peak at 734 MHz corresponds to the downlink signal LTE Band 12.



The peak above the limit on the left is the Carrier frequency Bluetooth Low Energy (2402 MHz). The peak above the limit on the right is the Carrier frequency 802.11 b (2462 MHz).





FREQUENCY RANGE 17 - 26 GHz

Spectrum									
Ref Level 97.00) dBµV/m	🖷 RBW 1 MHz							
Att	0 dB 👄 SWT 1 s	s 🖶 VBW 3 MHz	Mode Sweep						
●1Pk View●2Av V	iew								
90 dBµV/m									
80 dBµV/m									
	D1 74.000 dBuV/m-								
70 dBuV/m									
yo abpyyiii									
60 dBµV/m									
	D2 54.000	dBµV/m						-	
50 dBµV/m									
40 dBµV/m	-								t and the t
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and the state of t		and the second sec	-				1	0.000-0.007	
20 dBµV/m				, in the second s		÷			
10 dBu1//m									
10 08µV/III-									
0 dBuV/m-									
Start 17.0 GHz				3000	U pts				Stop 26.0 GHz





• Mode LTE Band 12, 802.11 a20 U-NII-1, Bluetooth Low Energy.

QPSK & 16QAM

A preliminary scan determined the QPSK modulation as the worst case.

LTE Band 12:Low Channel (704 MHz), RB=1. Offset=49.802.11 a U-NII-1:BW=20 MHz, Low Channel (5180 MHz).Bluetooth Low Energy:Low Channel (2402 MHz).

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 7.16 GHz	PK	43 + 10 log (P) dB = -13 dBm -> 82.23 dBµV/m
7.16 to 26 GHz	PK	74 dBµV/m (***)
26 to 40 GHz	PK	68.23 dBµV/m (**) OR 74 dBµV/m (*)
7.16 to 40 GHz	AVG	54 dBµV/m (*)(***)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a). (**) Radiated emissions which fall in the non-restricted bands.

(***) Radiated emission limits to comply with §15.209(a) (see §15.205(c) / RSS-Gen).

Frequency range 30 MHz - 1 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 40 GHz

Spurious frequencies at less than 20 dB below the limits:

Spurious frequency (GHz)	Detector	E (dBµV/m)	Polarization
1.4169	Peak	50.55	Н
2.1253	Peak	46.33	Н
4.25008	Peak	51.03	V
4.95888	Peak	48.71	V
7.20517	Peak	53.41	V
9.60694	Peak	41.42	V
10.36217	Peak	36.87	V

	<±3.81 for f < 1GHz
Measurement uncertainty (dB)	<±4.72 for f ≥ 1 GHz up to 18 GHz
	<±3.34 for f \ge 18 GHz up to 40 GHz



Receiver	Spectrum 🗷								
Ref Level 97.00 Att	dBµV/m 0 dB SWT 30 m	 RBW 100 kHz ms VBW 300 kHz 	Mode Sweep	Input 1 AC					
TDF 1Pk View				4 					
90 dBµV/m									
an druktim	D1 82.230 dBµV/m-								1
80 dBµV/m-									
70 dBµV/m				ad					
60 dBµV/m							1.000		
50 dBuV/m							<u> </u>		
						<u>.</u> .			with martindiviolation deally to b
40 dBµV/m					1. In southeld				a na mana a da da kata da Bata da ba
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30 dBµV/m		الانتخاصا والمتنا ومانحا	A STATE AND A STAT	ing and exclosion of the little					
A Constantia	and the set of the set	And the second s							
20 dL apm	all ^{an}								
10 d8\0//m									
10 0004/11									
0 dBµV/m									
Start 30.0 MHz				3000	0 pts				Stop 1.0 GHz

The peak above the limit is the Carrier frequency LTE Band 12 (704 MHz). The peak at 734 MHz corresponds to the downlink signal LTE Band 12.



FREQUENCY RANGE 1 – 7 GHz



The peak above the limit on the left is the Carrier frequency Bluetooth Low Energy (2402 MHz).

The peak above the limit on the right is the Carrier frequency 802.11 a20 (5180 MHz).

FREQUENCY RANGE 7 – 17 GHz

Spectrum									
Ref Level 90.0	0 dBµV/m	👄 RBW 1 MHz							
Att	0 dB 👄 SWT 1 :	s 🖷 VBW 3 MHz	Mode Auto Sweep	(D					
TDF	5								
●1Pk View●2Av V	liew					,			
CoLocation LTEBan	d12+WiFI5GHz+BTLE	1.0	1					-	
1									
70 dBµV/m									
1									
60 dBuV/m									-
1000-100-100 March 100									
	D0 E4 000 d0 0//m								
	102 34.000 ubpv/m								
50 dBµV/m		-	-	-					-
			1						
									_
10 10.01/-			- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1					21	1 male of a large la
40 aBµV/m		المراجع المراجع المراجع والمراجع	PP De Line In Charles de La	in the state state is the state	and the second state	had a she of the stand of the	and of the participants and	Martin States and a state of the	and the second second
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Course of the second	for the second			Γ.v.					
30 dBµV/m						1 all an an la c	I a land the state		and the second
	alentin and	الدانيحيا بالجو يطيعوني	www.www.	and the second s	-	a second s	w	The law is law as	AND A DECEMBER OF A DECEMBER O
	and the second								
20 dBµV/m				-					
10 dBu\//m									
10 0001)									-
0 dBµV/m			-	+					
Start 7.0 GHz				3000	10 pts				Stop 17.0 GHz



FREQUENCY RANGE 17 - 26 GHz

Spectrum									E A
Ref Level 97.00	dBµV .	RBW 1 MHz	NAMES MADE AND ADDRESS						
TDF	0 dB 🖷 SWT 1 s 🖷	VBW 3 MHz Mic	de Sweep						
●1Pk View									
00 dp. 42									
A0 98HA-									
90 dB: 4/									
80 UBHV									
	D1 74.000 dBuV								
70 dBuV									
o appr									
60 dBµV	-								
	D2 54.000 dBµV								
50 dBµV									
			2					Carl of Laboration	Ref. 1 demander of and added add
40 dBµV	and privile on the Land of the August	the philippe of produced in	a state of the second stat	. Harris han attended and shake	HANDER THE STOP	Andra barden and an international date	الاصالية أيتلفنه عليا أفاده سيل	and a second	
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Statistics Backwards									الدائدا والمعادين والمعادين والمعالي
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20 dBµV	-							-	
10 dBµV-									
0 40.47									
0 UBHV-									
Start 17.0 GHz				3000	0 pts				Stop 26.0 GHz

FREQUENCY RANGE 26 - 40 GHz

Spectrum									
Ref Level 97.00	dBµV .	RBW 1 MHz							(
🖷 Att	0 dB 🖷 SWT 1 s 🖲	VBW 3 MHz Me	ode Sweep						
TDF	1								
9 IPK VIEW 2AV	new		1	1	1				
90 dBuV									
00 40 44									
80 0BHA									
70 dBµV	D1 68.230 dBuV								
60 dBµV	-			-					
	D2 54.000	dBµV							
50 dBµV									
									ومورداتهما والأرطاناني فألصا ماستعريهم
40 dBuV-							him los	المسلسية بالمسيب المسلحة	and the Children
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20 dB/0/		The state of the s				8			
30 UBDV			a sub-		a second	المقادمة والمعادي والمراجع	and the second designed and th		
	المحر ويقطعه الفضائل من				and the second s				
20 dBµV									
10 dBµV		-				-		-	
0 dBµV		-							
Start 26.0 GHz		1	1	3000	0 nts				Ston 40.0 GHz
515H 2010 GHZ				3000	o pes				otop toto anz



• Mode LTE Band 12, 802.11 a20 U-NII-3, Bluetooth Low Energy.

QPSK & 16QAM

A preliminary scan determined the QPSK modulation as the worst case.

LTE Band 12:Low Channel (704 MHz), RB=1. Offset=49.802.11 a U-NII-3:BW=20 MHz, High Channel (5825 MHz).Bluetooth Low Energy:Low Channel (2402 MHz).

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 7.16 GHz	PK	43 + 10 log (P) dB = -13 dBm -> 82.23 dBµV/m
7.16 to 26 GHz	PK	74 dBµV/m (***)
26 to 40 GHz	PK	68.23 dBµV/m (**) OR 74 dBµV/m (*)
7.16 to 40 GHz	AVG	54 dBµV/m (*) (***)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a). (**) Radiated emissions which fall in the non-restricted bands.

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Frequency range 30 MHz - 1 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 40 GHz

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	Detector	E (dBµV/m)	Polarization
1.4167	Peak	69.21	Н
2.1255	Peak	53.32	Н
2.8339	Peak	51.66	Н
4.25025	Peak	51.37	V
7.20483	Peak	54.26	V
7.7665	Peak	42.71	V
9.6067	Peak	41.41	V
11.64917	Peak	43.4	V

	<±3.81 for f < 1GHz
Measurement uncertainty (dB)	<±4.72 for f ≥ 1 GHz up to 18 GHz
	<±3.34 for f ≥ 18 GHz up to 40 GHz



Receiver	Spectrum 🗵								
Ref Level 97.00	dBµV/m	RBW 100 kHz	Mode Sween	Input 1 AC					
TDF	0.00		mode encop	input 1 iii					
●1Pk View	1								
90 dBµV/m									
	-D1 82.230 dBµV/m-								
80 dBµV/m						· · · · · · · · · · · · · · · · · · ·			
70 dBµV/m									
co do aria						1.			
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50 dBuV/m									
00 00p1/11									
									and some a
40 dBµV/m						I I I I I I I I I I I I I I I I I I I		In the later of the second second second	
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30 dBµV/m		and a state of all the life of the	Profile Contraction of the second second	Hereita hindail Andri					
Mr. Burch	الأطرار والدائد الدراد والراد والمراد	A Department of the state	and the second						
Martin I.	and the second s								
20 dbulym									
10 10 10									
10 gBhA/w									
0 dBuV/m				o				· · · ·	
Shart 00 0 Mit-					0				01
start 30.0 MHZ				3000	u prs				stop 1.0 GHz

The peak above the limit is the Carrier frequency LTE Band 12 (704 MHz). The peak at 734 MHz corresponds to the downlink signal LTE Band 12.



FREQUENCY RANGE 1 – 7 GHz

Receiver	Spectrum 🗷							
Ref Level 92.00 Att	0 dBµV/m 0 dB ⊜ SWT 1 s	 RBW 1 MHz VBW 3 MHz 	Mode Sweep Inp	ut 1 AC				
PS TDF								
TEK VIGW					1	 1	1	
90 dBµV/m	01 82 220 49.0//m							
80 dBµV/m							1	
70 dBµV/m								
60 dBµV/m	1							and the property of the start o
50 dBµV/m		and the second s	I	salar data at a second	and the second second second		- Contraction Backware	A Darmer Collector Connect Linear
40 dBµV/m								
30 dBµV/m	(d)	0					2	
20 dBµV/m								
10 dBµV/m								
0 dBuV/m								
Start 1.0 GHz				3000	0 pts			Stop 7.0 GHz

The peak close to the limit on the left is the Carrier frequency Bluetooth Low Energy (2402 MHz).

The peak above the limit on the right is the Carrier frequency 802.11 a20 (5825 MHz).

FREQUENCY RANGE 7 – 17 GHz





FREQUENCY RANGE 17 - 26 GHz

Spectrum									
Ref Level 97.00	idBµV	RBW 1 MHz	ida Cinasa						
TDF	0 ub 🥌 SWI IS 🕷		ide sweep						
●1Pk View	1	1	1	P.	1	r.			
90 dBµV									
80 dBµV									
	D1 74.000 dBuV-								
70 dBuV									
60 dBµV									
-	D2 54.000 dBuV								
50 db. 47									
50 dBµV									
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10 dBµV	-								
0 dBuV				-					
Start 17.0 Olla				0000	0				Oten Of D Otte
atart 17.0 GHZ				3000	U DLS				atop zo.u GHZ

FREQUENCY RANGE 26 - 40 GHz

Spectrum									
Ref Level 97.00	dBµV .	RBW 1 MHz							
Att	0 dB 👄 SWT 1 s 🖷	VBW 3 MHz Mo	de Sweep						
●1Pk View●2Av \	iew								
90 dBµV									
80 dBµV									
70 dBμV	D1 68 230 dBuy					6			2
	or concordept								
60 dBµV									
-									
	D2 54.000	dBhA							
50 dBµV									
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20 dBµV					-				
10 dBµV									
77									
0 dBµV									
Start 26.0 GHz				3000) pts				Stop 40.0 GHz