

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Block - DC	Fairview Microwave	SD3379	AMT	2021-09-14	2022-09-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in the available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

All limits were adjusted by a factor of [-10*log(4)] dB to account for the device operation as a 4 port MIMO transmitter, as per FCC KDB 622911.

Per FCC 24.238(a) and RSS 133 6.5.1 (i). the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

Per FCC 24.238(b) and RSS 133 6.5.1 (i). emissions seen up to 1 MHz outside of authorized operating frequency range band edges shall be measured with a RBW of 1% of the measured emission bandwidth. Any emission seen to be > 1 MHz further outside the band edges shall be measured with a RBW of 1 MHz. However, a narrower RBW of at least 1% of the emission bandwidth is still allowed provided that the measured power is integrated over the full reference bandwidth of 1 MHz.

Per section FCC 27.53(h)(1), RSS-139 6.6 and RSS-170 5.4 & 5.4.1.2, the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm for a 1 MHz measurement bandwidth. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter. The RBW to be used for these measurements are per 27.53(h)(3), RSS-139 6.6 and RSS-170 5.4. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified).

RF conducted emissions testing was performed only on one port. All four AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraph 5.7.2i.



					TbtTx 2021.12.14.1	XMit 2022.02.07.0
EUT: AHF	II Remote Radio Head			Work Order:	NOKI0037	
Serial Number: YK2	14000036			Date:	28-Feb-22	
Customer: Noki	ia Solutions and Networks			Temperature:	22.6 °C	
Attendees: Davi	d Le, John Rattanavong			Humidity:	23.7% RH	
Project: Non	e			Barometric Pres.:	1026 mbar	
Tested by: Mark	k Baytan		Power: 54 VDC	Job Site:	1 X 09	
TEST SPECIFICATIONS			Test Method			
FCC 24E:2022			ANSI C63.26:2015			
RSS-133 Issue 6:2013+A	1:2018		RSS-133 ISSUE 6:2013+A1:2018			
COMMENTS			Warmenten Classes and DO blastes David OF and an	h h - h - i - 00 i - 1 - 00		
All measurement path ic	ses accounted for in the ref	erence level offest including any a	attenuators, filters, and DC blocks. Band 25 carriers ena	ibled at maximum power is 80 watts/ca	arrier. Some mark	ter values were
offset by RBW/2 from the	e band edge frequency as al	llowed by ANSI C63.26 Clause 5.7	2 for some test cases.			
DEVIATIONS FROM TES						
None						
Configuration #	2	~	TK BI			
		Signature				
			Frequency	Max Value	Limit	
			Range	(dBm)	(dBm)	Results
Band 25, 1930 MHz - 199	5 MHz, LTE Narrow Band IoT	Guard Band				
Port	1					
	10 MHz Bandwdith					
	E-1M1.7	1 with N-TM	4	04.4	10	Deres
		Low Channel, 1935 MHz	1	-24.1	-19	Pass
		Low Channel, 1935 MHz	2	-19.5	-19	Pass
		Low Channel, 1955 MHZ	3	-20.1	-19	Pass
		High Channel, 1990 MHz	1	-24.5	-19	Pass
		High Channel 1990 MHz	2	-20.1	-19	Pass
	15 MHz Bandwdith	right channel, 1930 Milz	3	-20.7	13	1 000
	E-TM1.	1 with N-TM				
		Low Channel, 1937.5 MHz	1	-24.2	-19	Pass
		Low Channel, 1937.5 MHz	2	-20.3	-19	Pass
		Low Channel, 1937.5 MHz	3	-20.1	-19	Pass
		High Channel, 1987.5 MHz	1	-24.4	-19	Pass
		High Channel, 1987.5 MHz	2	-20.1	-19	Pass
		High Channel, 1987.5 MHz	3	-20.4	-19	Pass
	20 MHz Bandwdith					
	E-TM1.1	1 with N-TM				
		Low Channel, 1940 MHz	1	-23.9	-19	Pass
		Low Channel, 1940 MHz	2	-21.1	-19	Pass
		Low Channel, 1940 MHz	3	-21.1	-19	Pass
		High Channel, 1985 MHz	1	-23.2	-19	Pass
		High Channel, 1985 MHz	2	-19.7	-19	Pass
		High Channel, 1985 MHz	3	-20.0	-19	Pass









	Frequency	1			Max Value	Limit	Poculto
	range 2	- T			20.1	(UBIII) 10	Page
	3				-20.1	-19	Pass
West he Country	A						
Keysight Spectru	RF 50 Ω DC COF	REC	SENSE:INT		ALIGN OFF		06:46:33 AM Mar 02, 2022
		PNO: Fast IFGain:Low	++- Trig: Fre #Atten: 2	e Run 10 dB	Avg Type: Avg Hold:	RMS 1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN
10 dB/div R	tef Offset 42 dB Ref 48.00 dBm					Mkr1 1	1.927 800 0 GHz -20.100 dBm
				Y III			
38.0							
28.0							
18.0							
0.00							
8.00							
-2.00							
-12.0							
							DL1 -19.00 dt
-22.0							
22.0							
-32.0							
-42.0							
Start 1 9080	0 GH7			.			Stop 1 92800 GHz
#Res BW 1.0) MHz	#	≠VBW 3.0 MH	Z*		Sweep 7	1.067 ms (8001 pts)
MSG					STATUS		
and 25, 1930 MHz ·	- 1995 MHz, LTE Narr	ow Band IoT (Guard Band, Po	ort 1, 10 MH	lz Bandwdith,	E-TM1.1 with N	-TM, High Channel, 19
	Frequency	1			Max Value	Limit	
	Range				(dBm) -24.5	(dBm)	Results
					-24.0	-19	F'855

Keysight Sp	ectrum Ana	lyzer - Element	Materials Technology	ology	CENCE INT	AUTONOCE		
	RF	1 20 32 DI	L LURREL	PNO: Wide ↔ IFGain:Low	. Trig: Free Ru #Atten: 20 dE	Avg Type: In Avg Hold:	RMS 1000/1000	TRACE 1 2 3 4 5 TYPE A WWWW DET A NNNN
I0 dB/div	Ref Of Ref 5	fset 42 dB 2.00 dBn	n				Mkr1 1	1.995 000 00 GHz -24.548 dBm
42.0								
32.0								
22.0								
12.0								
2.00								
8.00								
18.0								DL1 -19.00 dBm
28.0								
38.0								
start 1.99 ≇Res BW	94000 C 100 kH	SHz Iz		VBI	N 300 kHz*		Sweep	Stop 1.996000 GHz 1.067 ms (8001 pts
ISG						STATUS		





Band 25, 1930 MHz - 1995 MHz, LTE Narrow Band IoT Guard Band, Port 1, 10 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 1990 MHz										
		Frequency			Max Value	Limit				
			(dBm)	(dBm)	Results					
		3			-20.7	-19	Pass			

Keysight Sp	ectrum Analyzer - Element N	laterials Technology						
(XV) RL	RF 50 Ω DC	CORREC PNO: F IFGain:	ast Tri -ow #At	g: Free Run tten: 20 dB	ALIGN OFF Avg Type: Avg Hold:	RMS 1000/1000	07:21:12 TF	AM Mar 02, 2022 ACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N
10 dB/div	Ref Offset 42 dB Ref 48.00 dBm					Mkr	1 1.997 2 -20.	32 5 GHz 740 dBm
38.0								
28.0								
18.0								
8.00								
-12.0								
-22.0								DL1 -19.00 dBm
-32.0								
-42.0								
Start 1.99 #Res BW	700 GHz 1.0 MHz		#VBW 3.0) MHz*		Sweep	Stop 2. 0 1.067 ms	01700 GHz (8001 pts)
MSG					STATUS			





	↔ #IFGain:Low	Trig: Free Run Av #Atten: 20 dB	Radio Device: BTS		
Ref Offset 42 dB 10 dB/div Ref 22.00 dBm					
12.0					
2.00					
-8.00					
-18.0					
-28.0					
-38.0					
-48.0					
-58.0					
-68.0					
Center 1.9285000 GHz Res BW 9.1 kHz		VBW 91 kHz	Span 1.000 MHz Sweep 14.4 ms		
Channel Power		Power Spectral De	nsity		
-20.27 dBm / 1	MHz	-80.27 dB			





Frequency		wax value	Limit	
Range		(dBm)	(dBm)	Results
1		-24.4	-19	Pass







 Band 25, 1930 MHz - 1995 MHz, LTE Narrow Band IoT Guard Band, Port 1, 15 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 1987.5 MHz

 Frequency
 Max Value
 Limit

 Range
 (dBm)
 (dBm)
 Results

 3
 -20.4
 -19
 Pass

🛄 Keysight S	pectrum Analy	zer - Element Ma	terials Technol	ogy						
L <mark>XI</mark> RL	RF	50 Ω DC	CORREC	S	ENSE:INT	ALI	GN AUTO		08:26:23	AM Mar 02, 2022
				PNO: Fast +++ FGain:Low	Trig: Free Ri #Atten: 20 d	un B	Avg Type: Avg Hold: 1	000/1000	T T	ACE 1 2 3 4 5 6 YPE A WWWWW DET A NNNNN
10 dB/div	Ref Off: Ref 48	set 42 dB 8.00 dBm						Mkr1	1.997 1 -20.	65 0 GHz 396 dBm
LUg										
38.0										
28.0										
18.0										
8.00										
0.00										
-2.00										
-12.0										DL1 -19.00 dBm
-22.0										
-32.0									1	
-42.0										
Start 1.9 #Res <u>BM</u>	9700 GH / 1.0 MH;	z		#VBV	N 3.0 MH <u>z*</u>			Sweep	Stop 2. 1.067 ms	01700 GHz (8001 p <u>ts)</u>
MSG							STATUS			





	+→→ #IFGain:Low	#Atten: 20 dB	Avg Hold: 1000/1000	Radio Device: BTS
Ref Offset 42 dB 10 dB/div Ref 22.00 dBm				
12 0				
2.00				
-8.00				
-18.0				
-28.0				
-48.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
-58.0				
-68.0				
Center 1.9285000 GHz Res BW 9.1 kHz		VBW 91 ki	Hz	Span 1.000 MHz Sweep 14.4 ms
Channel Power		Power Spec		
-21.08 dBm /	1 MHz	-81.0		
MSG			STATUS	





Frequency		Max Value	Limit	
 Range		(dBm)	(dBm)	Results
1		-23.2	-19	Pass







 Band 25, 1930 MHz - 1995 MHz, LTE Narrow Band IoT Guard Band, Port 1, 20 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 1985 MHz

 Frequency
 Max Value
 Limit

 Range
 (dBm)
 Results

 3
 -20.0
 -19
 Pass

Keysight Spectrum Analyzer - Element Materia	ls Technology					
LX/ RL RF 50Ω DC 0	CORREC	ENSE:INT	ALIGN AUTO	MC	09:14:21 /	M Mar 02, 2022
	PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold: 10	00/1000	TY E	PE A WWWWW ET A NNNNN
Ref Offset 42 dB 10 dB/div Ref 48.00 dBm				Mkr1	1.997 13 -19.9	7 5 GHz 81 dBm
		Ť				
38.0						
28.0						
18.0						
10.0						
8.00						
-2.00						
-12.0						
<u>▶</u> 1						DL1 -19.00 dBm
-22.0						
.32.0		****				
52.0						
-42.0						
Start 1.99700 GHz #Res BW 1.0 MHz	#VB1	W 3.0 MHz*		Sweep	Stop 2.0	1700 GHz (8001 pts)
MSG	<i>"</i>		STATUS			



XMit 2022.02.07.0 EUT: AHFII Remote Radio Head Serial Number: YK214000036 Customer: Nokia Solutions and Networks Attendees: David Le, John Rattanavong Broist None Work Order: NOKI0037 Date: 28-Feb-22 Temperature: 22.6 °C Humidity: 23.7% RH Barometric Pres.: 1026 mbar Project: None Tested by: Mark Baytan TEST SPECIFICATIONS Power: 54 VDC Test Method Job Site: TX09 FCC 27:2022 ANSI C63.26:201 RSS-139 Issue 3:2015 RSS-139 Issue 3:2015 RSS-170 Issue 3:2015 COMMENTS RSS-170 Issue 3:2015 All measurement path loses accounted for in the reference level offest including any attenuators, filters, and DC blocks. Band 66 carriers enabled at maximum power is 80 watts/carrier. Some marker values were offset by RBW/2 from the band edge frequency as allowed by ANSI C63.26 Clause 5.7.2 for some test cases. DEVIATIONS FROM TEST STANDARD None 4+4 Configuration # 2 7+ Signature Frequency Max Value Limit Range (dBm) (dBm) Results Band 66, 2110 MHz - 2200 MHz, LTE Narrow Band IoT Guard Band Port 1 10 MHz Bandwidth E-TM1.1 with N-TM Low Channel, 2115 MHz -24.9 -19 Pass 1 -21.2 -21.4 Low Channel, 2115 MHz 2 -19 Pass Low Channel, 2115 MHz 3 -19 Pass High Channel, 2195 MHz High Channel, 2195 MHz 1 -24.5 -19 Pass 2 -21.7 -19 Pass High Channel, 2195 MHz 3 -21.2 -19 Pass 15 MHz Bandwidth E-TM1.1 with N-TM Low Channel, 2117.5 MHz Pass -24.4 -19 1 Low Channel, 2117.5 MHz -21.8 -19 Pass 2 Low Channel, 2117.5 MHz -21.6 -19 3 1 Pass High Channel, 2192.5 MHz High Channel, 2192.5 MHz -24.5 -21.0 -19 Pass 2 3 -19 Pass High Channel, 2192.5 MH: -20.2 -19 Pass 20 MHz Bandwidth E-TM1.1 with N-TM Low Channel, 2120 MHz 1 -25.0 -19 Pass -22.6 -22.1 -19 -19 Low Channel, 2120 MHz 2 3 Pass Low Channel, 2120 MHz Pass High Channel, 2190 MHz 1 -24.1 -19 Pass High Channel, 2190 MHz 2 3 -20.4 -19 Pass High Channel, 2190 MHz -19.6 -19 Pass



	Frequ Ran	ency ae			N	<pre>nax Value (dBm)</pre>	Limit (dBm)	Result	ts
	1	- 3 -				-24.9	-19	Pass	;
Keysight Spectrum	Analyzer - Element Ma	terials Technolo	'gy	SENSEIINT	Δ			07·21·47 AM	- 07 07 022
	3032 00	CONNEC		Trim Ener I		Avg Type: F	RMS	TRACE	123456
		F	PNO: Wide ++++ FGain:Low	#Atten: 20	dB	Avginoia: 1	1000/1000	DET	ANNNN
Ref	Offset 42 dB						Mkr1 2	2.110 000 (00 GHz
10 dB/div Rei	f 52.00 dBm							-24.91	2 dBm
42.0									
22.0									
32.0									
22.0									
12.0					/				
2.00									
-8.00									
40.0									1.1.10.00.40
-16.0					1				
-28.0									
-38.0									
-38.0									
-38.0 Start 2.109000 #Res BW 100	0 GHz kHz		#VB	W 300 kHz			Sween	Stop 2.111	000 GHz
Start 2.109000 #Res BW 100	0 GHz kHz		#VB	W 300 kHz		STATUS	Sweep	Stop 2.1110 1.067 ms (8	000 GHz 001 pts)
-38.0 Start 2.109000 #Res BW 100	0 GHz kHz		#VB	W 300 kHz*	-	STATUS	Sweep	Stop 2.1110 1.067 ms (8	000 GHz 001 pts)
-38.0 Start 2.109000 #Res BW 100 MSG 66, 2110 MHz - 2	0 GHz kHz 2200 MHz, LTE	Narrow B	#VB	W 300 kHz* rd Band, Por	t 1, 10 MHz	status z Bandwidth, F	Sweep E-TM1.1 with	Stop 2.1110 1.067 ms (8 N-TM, Low Cł	000 GHz 001 pts) hannel, 2'
Start 2.109000 #Res BW 100 Msg 56, 2110 MHz - 2	0 GHz kHz 2200 MHz, LTE Frequ Ran	Narrow B ency	#VB and loT Guar	W 300 kHz* rd Band, Por	t 1, 10 MHz N	status 2 Bandwidth, F Max Value (dBm)	Sweep E-TM1.1 with Limit (dBm)	Stop 2.111(1.067 ms (8 N-TM, Low Cf Result	000 GHz 001 pts) nannel, 2' ts
Start 2.109000 #Res BW 100 Msg 36, 2110 MHz - 2	0 GHz kHz 2200 MHz, LTE Frequ Ran 2	Narrow B ency ge	#VB	W 300 kHz [*]	t 1, 10 MHz N	STATUS Bandwidth, E Iax Value (dBm) -21.2	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1110 1.067 ms (8 N-TM, Low Ch Resul	000 GHz 001 pts) nannel, 2' ts
Start 2.109000 #Res BW 100 MSG 56, 2110 MHz - 2	0 GHz kHz 22000 MHz, LTE Frequ Ran 2	Narrow B ency ige	#VB	W 300 kHz* rd Band, Por	t 1, 10 MHz N	status 2 Bandwidth, E fax Value (dBm) -21.2	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1111 1.067 ms (8 N-TM, Low Cł Resul Pass	000 GHz 001 pts) nannel, 2' ts
38.0 Start 2.109000 #Res BW 100 Msg 36, 2110 MHz - 2	0 GHz kHz 2200 MHz, LTE Frequ Ran 2 Analyzer - Element Ma	Narrow B ency ge	#VB and IoT Guar	W 300 kHz*	t 1, 10 MHz N	STATUS 2 Bandwidth, E fax Value (dBm) -21.2	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1111 1.067 ms (8 N-TM, Low Cł Resul Pass 07.22:49 AM	000 GHz 001 pts) nannel, 2' ts s Mar05, 2022
Start 2.109000 #Res BW 100 Msg 66, 2110 MHz - 2	0 GHz KHz 2200 MHz, LTE Frequ Ran 2 Analyzer - Element Ma 5 50 Ω DC	Narrow B ency ige terials Technoloc CORREC	#VB and IoT Guar	W 300 kHz*	t 1, 10 MHz W RMS) g: 2.10850000	STATUS : Bandwidth, E fax Value (dBm) -21.2 Auton Auto D0 GHz Avrilhold: 1	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1111 1.067 ms (8 N-TM, Low Cr Result Pass 07:22:49 AM Radio Std: None	000 GHz 001 pts) nannel, 21 ts 3 Mar05, 2022
Start 2,109000 #Res BW 100 Msg 66, 2110 MHz - 2 Keysight Spectrum. W RL	0 GHz KHz 2200 MHz, LTE Frequ Ran 2 Analyzer - Element Ma 5 50 Ω DC	Narrow B ency ige terials Technolo CORREC	#VB and IoT Guar	W 300 kHz*	t 1, 10 MHz W RMS) q: 2.10850000 Run dB	STATUS Bandwidth, E fax Value (dBm) -21.2 UIGN AUTO D0 GHz Avg Hold: 1	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1111 1.067 ms (8 N-TM, Low Ch Result Pass 07:22:49 AM Radio Std: None Radio Device: B	000 GHz 001 pts) nannel, 21 ts 5 Maros, 2022 e TS
Start 2.109000 #Res BW 100 MSG 66, 2110 MHz - 2	0 GHz kHz 2200 MHz, LTE Frequ Ran 2 Analyzer - Element Ma = 50 DC	Narrow Bi ency ige terials Technolo CORREC	#VB and IoT Guar gy - Points: 1001, D	W 300 kHz* rd Band, Por sextent Average (f SENSE:INT Center Fre Trig: Fre #Atten: 20	t 1, 10 MHz W (MS) q: 2.10850000 Run dB	STATUS Bandwidth, E lax Value (dBm) -21.2 UIGN AUTO DO GHz Avg Hold: 1	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1111 1.067 ms (8 N-TM, Low Cr Result Pass 07:22:49 AM Radio Std: None Radio Device: B	000 GHz 001 pts) nannel, 21 ts 3 Maros, 2022 e TTS
Start 2.109000 #Res BW 100 MSG 66, 2110 MHz - 2 66, 210 MHz - 2 66, 20 MHz - 2 66,	0 GHz kHz 2200 MHz, LTE Frequ Ran 2 Analyzer - Element Ma = 50 Ω DC	Narrow Bi ency ige terials Technoloc CORREC / #I	#VB and IoT Guar	W 300 kHz* rd Band, Por etector Average (f SENSE:INT Center Free Trig: Free #Atten: 20	t 1, 10 MHz N 1445) q: 2.10850000 Run dB	STATUS Bandwidth, E lax Value (dBm) -21.2 JIGN AUTO DO GHz Avg Hold: 1	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1111 1.067 ms (8 N-TM, Low Cr Result Pass 07:22:49 AM Radio Std: None Radio Device: B	000 GHz 001 pts) nannel, 21 ts Maros, 2022 Maros, 2022
Start 2.109000 #Res BW 100 MSG 66, 2110 MHz - 2 Keysight Spectrum (X) RL RF 10 dB/div	0 GHz kHz 2200 MHz, LTE Frequ Ran 2 Analyzer - Element Ma 5 50 Ω DC Ref Offset 42 dB Ref 22.00 dBr	Narrow B ency ge terials Technolo CORREC #I	#VB and IoT Guar gy - Points: 1001, D FGain:Low	W 300 kHz rd Band, Por etector Average (F SENSE:INT Center Free #Atten: 20	t 1, 10 MHz N 	STATUS Bandwidth, E lax Value (dBm) -21.2 -21.2 LIGN AUTO DO GHZ AVg Hold: 1	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1111 1.067 ms (8 N-TM, Low Cł Result Pass 07:22:49 AM Radio Std: None Radio Device: B	000 GHz 001 pts) nannel, 21 ts 3 Mar05, 2022
Start 2.109000 #Res BW 100 MSG 66, 2110 MHz - 2 66, 2110 MHz - 2 Control Control Contr	0 GHz kHz 2200 MHz, LTE Frequ Ran 2 Analyzer - Element Ma = 50 \Omega DC Ref Offset 42 dB Ref 22.00 dBr	Narrow B ency ge terials Technolo CORREC #I	#VB and IoT Guar gy - Points: 1001, D FGain:Low	W 300 kHz d Band, Por etector Average (F SENSE:INT Center Free #Atten: 20	t 1, 10 MHz N (MS) 4 2.10850000 Run dB	STATUS Bandwidth, E Iax Value (dBm) -21.2 -21.2 UGN AUTO DO GHZ AVg Hold: 1	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1111 1.067 ms (8 N-TM, Low Cł Result Pass 07:22:49 AM Radio Std: None Radio Device: B	000 GHz 001 pts) nannel, 21 ts s Mar05, 2022
Start 2.109000 #Res BW 100 MSG 66, 2110 MHz - 2 Keysight Spectrum V RL RF 10 dB/div	0 GHz kHz 2200 MHz, LTE Frequ Ran 2 Analyzer - Element Ma = 50 \Overline DC Ref Offset 42 dB Ref 22.00 dBr	Narrow Ba ency ge terials Technolo CORREC #I	#VB	W 300 kHz d Band, Por etector Average (F SENSE:INT Center Free #Atten: 20	t 1, 10 MHz N 	STATUS Bandwidth, E Iax Value (dBm) -21.2 -21.2 UGN AUTO DO GHZ AVg Hold: 1	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1111 1.067 ms (8 N-TM, Low Cł Result Pass 07:22:49 AM Radio Std: None Radio Device: B	000 GHz 001 pts) nannel, 21 ts s Mar05, 2022
Start 2.109000 #Res BW 100 MSG 66, 2110 MHz - 2 66, 2110 MHz - 2 Keysight Spectrum RL RF 10 dB/div Log 12.0 -8.0 -8.0	0 GHz kHz 2200 MHz, LTE Frequ Ran 2 Analyzer - Element Ma = 50 Ω DC Ref Offset 42 dB Ref 22.00 dBr	Narrow B ency ge terials Technolo CORREC #I	#VB	W 300 kHz d Band, Por etector Average (F SENSE:INT Center Free #Atten: 20	t 1, 10 MHz N (M5) q: 2.10850000 Run dB	STATUS Bandwidth, E Iax Value (dBm) -21.2 -21.2 UGN AUTO DO GHZ AVg Hold: 1	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1111 1.067 ms (8 N-TM, Low Cł Resul Pass 07:22:49 AM Radio Std: None Radio Device: B	000 GHz 1001 pts) nannel, 21 ts Mar05, 2022 TS
Start 2.109000 #Res BW 100 MSG 66, 2110 MHz - 2 66, 2110 MHz - 2 Control Control Contr	0 GHz kHz 2200 MHz, LTE Frequ Ran 2 Analyzer - Element Mar = 50 Ω DC Ref Offset 42 dB Ref 22.00 dBr	Narrow B ency ge terials Technolog correc 1 #1	#VB	W 300 kHz*	t 1, 10 MHz N 	STATUS : Bandwidth, E lax Value (dBm) -21.2 LIGN AUTO DO GHz Avg Hold: 1	Sweep E-TM1.1 with Limit (dBm) -19 000/1000	Stop 2.1111 1.067 ms (8 N-TM, Low Cr Result Pass 07:22:49 At Radio Std: None Radio Device: B	000 GHz 1001 pts) 1001 pts) 10
38.0 Start 2.109000 #Res BW 100 Msg 36, 2110 MHz - 2 Start Spectrum M RL RL RL RL RL Start Spectrum Start Spectrum M RL RL RL Start Spectrum	0 GHz kHz 2200 MHz, LTE Frequ Ran 2 Analyzer - Element Me = 50 Ω DC Ref Offfset 42 dB Ref 22.00 dBr	Narrow B ency ge terials Technolog correc 1 #1	#VB	W 300 kHz*	t 1, 10 MHz W 	STATUS : Bandwidth, E lax Value (dBm) -21.2 LIGN AUTO D0 GHz Avg Hold: 1	Sweep E-TM1.1 with Limit (dBm) -19	Stop 2.1111 1.067 ms (8 N-TM, Low Cr Result Pass 07:22:49 AM Radio Std: None Radio Device: B	000 GHz 001 pts) nannel, 21 ts 3 Maros, 2022 TS
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Center 2.1085000 GHz Res BW 9.1 kHz Span 1.000 MHz Sweep 14.4 ms Channel Power Power Spectral Density -21.19 dBm / 1 MHz -81.19 dBm /Hz

STATUS

MSG



Range (dBm) Results 3 -21.4 -19 Pass Knappe (dBm) (dBm) Results Range (dBm) (dBm) Results Results 92.0 0.000000 92.0 Results 92.0 0.000000 92.0 Results 92.0 0.00000 92.0 Results 0.000000 92.0 0.00000 Results 0.000000 92.0 0.000000 Results 0.0000000 92.0 0.000000 Results 0.00000000 92.0 0.0000000000 12.0 0.00000000000000000000000000000000000		Freque	new	Ji Guaru Banu, r		HZ Bandwidth, E	l imit	- I IVI, LOV	v Channel, 21
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Rt. W 0 0 0 c CONNECC SEMECHT ALION WTO 0722374 Munrits 2222 No. PRO- First	Keyright Spectru	um Analuzer - Element Mate	rials Technology						
PRO: Fast Trig: Free Run #Atten: 22 dB Arg Type: RMS Arg/Inde: 1000/1000 Trig: Free Run #Arg/Inde: 1000/1000 0 Ref 0 free 4/2 dB (0 dB dIV) Mkr1 2.107 780 0 GHz -21.357 dBm Mkr1 2.107 780 0 GHz -21.357 dBm 20 Image: State 2 dB (0 dB dIV) Image: State 2 dB (0 dB dIV) Mkr1 2.107 780 0 GHz -21.357 dBm 20 Image: State 2 dB (0 dB dIV) Image: State 2 dB (0 dB dIV) Image: State 2 dB (0 dB dIV) 30 Image: State 2 dB dIV) Image: State 2 dB (0 dB dIV) Image: State 2 dB (0 dB dIV) 31 Image: State 2 dB dIV) Image: State 2 dB dIV) Image: State 2 dB dIV) 32 Image: State 2 dB dIV) Image: State 2 dB dIV) Image: State 2 dB dIV) 32 Image: State 2 dB dIV) Image: State 2 dB dIV) Image: State 2 dB dIV) 33 Image: State 2 dB dIV) 34 Image: State 2 dB dIV) 35 Image: State 2 dB dIV)	IXI RL	RF 50 Ω DC	CORREC	SENSE:INT		ALIGN AUTO		07:23:3	4 AM Mar 05, 2022
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Keyzight Spectrum Analyzer - Element Materials Technology COUNT August Augu	Start 2.0880 #Res BW 1.0 ^{MSG} 56, 2110 MHz -	0 MHz - 2200 MHz, LTE N Freque	Varrow Band Io	T Guard Band, F	Port 1, 10 M	status Hz Bandwidth, E- Max Value	•TM1.1 with N	·TM, Hig	h Channel, 21
Keysight Spectrum Analyzer - Element Materials Technology Correction ALIGN AUTO 07:52:03 AM Mar:05, 2022 X RL RF 50 Ω CORREC SENSE:INT ALIGN AUTO 07:52:03 AM Mar:05, 2022 PNO: Wide IFGain:Low → Trig: Free Run #Atten: 20 dB Avg Type: RMS Avg[Hold: 1000/1000 TRACE [2:34:36 Trig: Free Run Bert ANNINN 10 dB/div Ref Offset 42 dB Ref 52.00 dBm Mkr1 2.200 000 00 GHz -24.492 dBm 20 420 Image: Ref Addition	Start 2.0880 #Res BW 1.0 ^{MSG} 66, 2110 MHz -	0 MHZ - 2200 MHz, LTE N Freque Rang	Varrow Band Io ncy	T Guard Band, F	Port 1, 10 M	STATUS Hz Bandwidth, E- Max Value (dBm)	TM1.1 with N- Limit (dBm)	TM, Hig	h Channel, 21
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RL RF 50 Ω DC CORREC SENSE:INT ALIGN AUTO 07:52:03 AM Mar05, 2022 Avg Type: RMS Trace II 2:34:56 Avg Type: RMS Trace II 2:34:56 Trace II 2:34:56 PNO: Wide IFGain:Low → Trig: Free Run #Atten: 20 dB Avg Type: RMS Trace II 2:34:56 No B/div Ref Offset 42 dB Ref 52.00 dBm Mkr1 2:200 000 00 GHz -24.492 dBm 20 420	Start 2.0880 #Res BW 1.0 MSG 56, 2110 MHz -	o MHz - 2200 MHz, LTE N Freque Rang 1	Varrow Band Ic ncy Je	T Guard Band, F	Port 1, 10 M	STATUS Hz Bandwidth, E- Max Value (dBm) -24.5	TM1.1 with N- Limit (dBm) -19	TM, Hig Re	h Channel, 21 sults Pass
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42.0	Start 2.0880 #Res BW 1.0 MSG 66, 2110 MHz -	0 MHz - 2200 MHz, LTE N Freque Rang 1 m Analyzer - Element Mater RF 50 Ω DC 05 OEfoct 12 4D	Narrow Band Ic ncy je ials Technology correc PNO: W IFGain:L	T Guard Band, F SENSE:INT ide → Trig: Fr ow #Atten:	Port 1, 10 M	status Hz Bandwidth, E- Max Value (dBm) -24.5 ALIGN AUTO Avg Type: R Avg Hold: 10	MS 00/1000 MKr1 2.	TM, Hig Re 07:52:0 T	h Channel, 21 suits Pass 3 AM Maros, 2022 3 AM Maros, 2022 TYPE CANNANN 0 COO GH2
42.0	Start 2.0880 #Res BW 1.0 MSG 66, 2110 MHz - Keysight Spectru W RL	0 MHz - 2200 MHz, LTE N Freque Rang 1 m Analyzer - Element Mater RF 50 Ω DC tef Offset 42 dB kef 52.00 dBm	Narrow Band Ic ncy je ials Technology CORREC PNO: W IFGain:L	T Guard Band, F SENSE:INT ide →→ Trig: Fr ow #Atten:	Port 1, 10 M	STATUS Hz Bandwidth, E- Max Value (dBm) -24.5 ALIGN AUTO Avg Type: R Avg Hold: 10	MS 00/1000 MKr1 2.	TM, Hig Re 07:52:0 T 2200 00 -24	h Channel, 21 sults Pass AM Mar 05, 2022 AM Mar 05, 2022 TYPE TANNANN 0 000 GHz 492 dBm
42.0	Start 2.0880 #Res BW 1.0 MSG 66, 2110 MHz - Keysight Spectru W RL	0 MHz - 2200 MHz, LTE N Freque Rang 1 m Analyzer - Element Mater RF 50 Ω DC tef Offset 42 dB Ref 52.00 dBm	Narrow Band Ic ncy [e ials Technology CORREC PNO: Wi IFGain:L	T Guard Band, F SENSE:INT ide ↔ Trig: Fr ow #Atten:	Port 1, 10 M	STATUS Hz Bandwidth, E- Max Value (dBm) -24.5 ALIGN AUTO Avg Type: R Avg Hold: 10	TM1.1 with N- Limit (dBm) -19 MS 00/1000 Mkr1 2.	TM, Hig Re 07:52:0 T 2000 00 -24	h Channel, 21 sults Pass 3 AM Mar 05, 2022 3 AM Mar 05, 2022 TYPE TYPE ANNINN DET ANNINN DET ANNINN A Sults Control of the A Sults Control of the Control of the A Sults Control of the Control of
	Start 2.0880 #Res BW 1.0 Msg 66, 2110 MHz - 	0 MHz - 2200 MHz, LTE N Freque Rang 1 m Analyzer - Element Mater RF 50 Ω DC sef Offset 42 dB Ref 52.00 dBm	Narrow Band Ic ncy Je nals Technology CORREC PNO: W IFGain:L	iT Guard Band, F SENSE:INT ide → Trig: Fr ow #Atten:	Port 1, 10 M	STATUS Hz Bandwidth, E- Max Value (dBm) -24.5 ALIGN AUTO Avg Type: R Avg]Hold: 10	.TM1.1 with N- Limit (dBm) -19 MS 00/1000 Mkr1 2.	TM, Hig Re 07:52:0 T 2000 00 -24	h Channel, 21 suits 'ass 3 AM Mar 05, 2022 3 AM Mar 05, 2022 TYPE TYPE ANNINN Det ANNINN 00 00 GHz 492 dBm

Start 2.199000 GHz #Res BW 100 kHz	#VBW 300 kHz*	Stop 2.201000 GHz Sweep 1.067 ms (8001 pts)
38.0		
28.0		
18.0		DL1 -19.00 dBm
2.00		
12.0		
22.0		
32.0		





Band	Band 66, 2110 MHz - 2200 MHz, LTE Narrow Band IoT Guard Band, Port 1, 10 MHz Bandwidth, E-TM1.1 with N-TM, High Channel, 219 Frequency Max Value Limit Range (dBm) (dBm) Results							2195 M
		Frequency			Max Value	Limit		
		Range			(dBm)	(dBm)	Results	
		3			-21.2	-19	Pass	

Keysight Spe	ectrum Analyz	ter - Element Ma	aterials Techno	logy						
LXI RL	RF	50 Ω DC	CORREC		SENSE:INT		ALIGN AUTO		07:53:40	AM Mar 05, 2022
				PNO: Fast ↔ IFGain:Low	Trig: Free #Atten: 22	Run dB	Avg Type: Avg Hold: 1	RMS 000/1000	TF	ACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN
10 dB/div	Ref Offs Ref 48	et 42 dB .00 dBm						Mkr	1 2.202 0 -21.	00 0 GHz 210 dBm
Log										
38.0										
28.0										
18.0										
8.00										
-2.00										
-12.0										
-22.0										DL1 -19.00 dBm
-32.0										
-42.0										
Start 2.20 #Res B <u>W</u>	200 GH: 1.0 M <u>Hz</u>	z		#VI	BW 3.0 MHz	*		Sw <u>ee</u>	Stop 2. p 1.067 ms	22200 GHz s (8001 p <u>ts)</u>
MSG							STATUS			





	NT 30.32 DC C	#IFGain:Low	Center Freq: 2.108500 Trig: Free Run #Atten: 20 dB	000 GHz Avg Hold: 1000/1000	Radio Std: None D Radio Device: BTS		
10 dB/div Log	Ref Offset 42 dB Ref 22.00 dBm						
12.0 2.00							
-18.0 -28.0							
-38.0 -48.0							
-68.0	085000 GHz				Spap 1 000 MHz		
Res BW 9	.1 kHz		VBW 91 kHz	2	Sweep 14.4 ms		
Chann	el Power		Power Spectr	al Density			
-2	1.75 dBm /	l MHz	-81.75	dBm /Hz			



	Frequency Range	,		Max Val (dBm)	ue Limit) (dBm)	Results
	3			-21.6	-19	Pass
Keysight Spectrum A	nalyzer - Element Materials T	echnology	CENCEJINT	ALICN AUT	0	
	50 32 DC COR	REC	SENSE.INT	ALIGN AUT	Type: RMS	TRACE 1 2 3
		PNO: Fast IFGain:Low	++- Trig: Free F #Atten: 22 c	tun Avg iB	Hold: 1000/1000	DET A WW
Ref	Offset 42 dB				Mkr1	2.107 855 0 G
10 dB/div Ref	52.00 dBm					-21.560 di
209			Ĭ			
42.0						
32.0						
22.0						
12.0						
12.0						
2.00						
-8.00						
-18.0						DL1 -19.0
20.0						
-20.0						
-38.0						
Start 2 08800 (2Hz					Stop 2 10800 0
#Res BW 1.0 N	1Hz	#	VBW 3.0 MHz*		Sweep	1.067 ms (8001
MSG				STA	TUS	
6, 2110 MHz - 22	00 MHz, LTE Narro	w Band IoT G	uard Band, Port	1, 15 MHz Bandwi	dth, E-TM1.1 with N	N-TM, High Channel
	Frequency			Max Val	ue Limit	Poculto
	Range	-		(dBM)	, (uBM)	Results







Band 6	6, 2110 MHz - 2200 N	/Hz, LTE Narrow	Band IoT Guard B	and, Port 1, 15 N	/IHz Bandwidth, E	-TM1.1 with N-T	M, High Channel,	2192.5 MHz
		Frequency			Max Value	Limit		
		Range			(dBm)	(dBm)	Results	
		3			-20.2	-19	Pass	

Key:	sight Spec	trum Ana	lyzer - Element N	laterials Technol	ogy						
LXI RL	18.48	RF	50 Ω DC	CORREC	9	SENSE:INT		ALIGN AUTO		08:38:59	AM Mar 05, 2022
					PNO: Fast ↔→ IFGain:Low	Trig: Free #Atten: 22	Run dB	Avg Type: I Avg Hold: 1	RMS 000/1000	TF	ACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN
10 dB Log r	/div	Ref Of Ref 4	fset 42 dB 8.00 dBm						Mkr	1 2.202 2 -20.	62 5 GHz 188 dBm
38.0 -											
28.0 -											
18.0 -											
8.00 -											
-2.00 -											
-12.0 -	↓ ¹										DL1 -19.00 dBm
-22.0 -	<u>.</u>		1007-100-100-100-100-100-100-								
-32.0 -											
-42.0 -											
Start #Res	2.202 BW	200 GH	lz Iz		#VB\	N 3.0 MHz	*		Swee	Stop 2. p 1.067 ms	22200 GHz s (8001 pts)
MSG								STATUS			







STATUS



Freque	ency		Max Value	Limit	
Rang	je		(dBm)	(dBm)	Results
3			-22.1	-19	Pass
Keysight Spectrum Analyzer - Element Mate	copper	SENCE-INT			00:00:51 AM Mar 05, 2022
N 50.32 DC	CONNEC	JENJELINI	Avg Type: F	RMS	TRACE 1 2 3 4 5 6
	PNO: Fast ↔ IFGain:Low	Trig: Free Run #Atten: 22 dB	Avg Hold: 10	000/1000	
Ref Offeet 42 dB				Mkr1 2	.107 690 0 GHz
10 dB/div Ref 52.00 dBm					-22.121 dBm
		1 Y			
42.0					
32.0					
22.0					
12.0					
2.00					
-8.00					
-18.0					DL1 -19.00 8
-28.0					
		فتتناقف أنسكنه وانتظارت			
-38.0					
Start 2.08800 GHz					Stop 2.10800 GHz
#Res BW 1.0 MHz	#V	BW 3.0 MHz*		Sweep 1	.067 ms (8001 pts)
MSG			STATUS		
166 2110 MHz - 2200 MHz I TE I	Narrow Band IoT Gu	ard Band Port 1 20	MHz Bandwidth F	-TM1 1 with N-	TM High Channel 2
Freque	ency		Max Value	Limit	,
Rang	je		(dBm)	(dBm)	Results
1			-24.1	-19	Pass
Keysight Spectrum Analyzer - Element Mate	copper	CENCE-INT			00:41:22 AM Mar(05, 2022
N 100 1 10 12 DC	CONCE	SENSERINT	Avg Type: F	RMS	TRACE 1 2 3 4 5 6
	PNO: Wide	🛏 Trig: Free Run	Avg Hold: 10	000/1000	







Band 66, 2 ⁻	110 MHz - 2200 M	MHz, LTE Narrow	Band IoT Guard E	Band, Port 1, 20	MHz Bandwidth,	E-TM1.1 with N-T	M, High Channel	, 2190 MHz
		Frequency			Max Value	Limit		
		Range			(dBm)	(dBm)	Results	
		3			-19.6	-19	Pass	

Keysight Spec	ctrum Analyzer - Element N	Aaterials Technologi	ogy						
LXI RL	RF 50 Ω DC	CORREC		SENSE:INT		ALIGN AUTO		09:43:21	AM Mar 05, 2022
			PNO: Fast ↔ FGain:Low	Trig: Free #Atten: 22	Run dB	Avg Type: Avg Hold: 1	RMS 1000/1000	TF	ACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN
10 dB/div	Ref Offset 42 dB Ref 48.00 dBm						Mkr	1 2.202 7 -19.	15 0 GHz 559 dBm
					Y			1	
38.0									
28.0									
18.0									
8.00									
-2.00									
-12.0									
									DL1 -19.00 dBm
-22.0		and the second	<u></u>						
			and a second sec				·		
-32.0									
-42 በ									
Start 2.202 #Res BW	200 GHz 1.0 MHz		#VI	BW 3.0 MHz	*		Swee	Stop 2. p 1.067 ms	22200 GHz (8001 pts)
MSG						STATUS			



Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
Block - DC	Fairview Microwave	SD3379	AMT	2021-09-14	2022-09-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in the available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

All limits were adjusted by a factor of [-10*log(4)] dB to account for the device operation as a 4 port MIMO transmitter, as per FCC KDB 622911.

Per FCC 24.238(a) and RSS 133 6.5.1 (i). the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

Per FCC 24.238(b) and RSS 133 6.5.1 (i). emissions seen up to 1 MHz outside of authorized operating frequency range band edges shall be measured with a RBW of 1% of the measured emission bandwidth. Any emission seen to be > 1 MHz further outside the band edges shall be measured with a RBW of 1 MHz. However, a narrower RBW of at least 1% of the emission bandwidth is still allowed provided that the measured power is integrated over the full reference bandwidth of 1 MHz.

Per section FCC 27.53(h)(1), RSS-139 6.6 and RSS-170 5.4 & 5.4.1.2, the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm for a 1 MHz measurement bandwidth. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter. The RBW to be used for these measurements are per 27.53(h)(3), RSS-139 6.6 and RSS-170 5.4. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified).

RF conducted emissions testing was performed only on one port. All four AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraph 5.7.2i.



12.14 XM# 2022 02 07 0 EUT: AHFII Remote Radio Head Serial Number: YK214000036 Customer: Nokia Solutions and Networks Work Order: NOKI0037 Date: 28-Feb-22 Temperature: 22.6 °C Humidity: 23.7% RH Barometric Pres.: 1026 mba Attendees: David Le, John Rattanavong Project: None Tested by: Mark Baytan TEST SPECIFICATIONS Power: 54 VDC Test Method Job Site: TX09 CC 24E:2022 ANSI C63.26:2015 RSS-133 Issue 6:2013+A1:2018 COMMENTS ue 6:2013+A1:2018 All measurement path loses accounted for in the reference level offest including any attenuators, filters, and DC blocks. Band 25 carriers enabled at maximum power is 80 watts/carrier. Some marker values were offset by RBW/2 from the band edge frequency as allowed by ANSI C63.26 Clause 5.7.2 for some test cases. DEVIATIONS FROM TEST STANDARD None NALE Configuration # 2 >++ Signature Frequency Max Value Limi Results (dBm) Range (dBm) Band 25, 1930 MHz - 1995 MHz, LTE Narrow Band IoT In-Band Port 1 5 MHz Bandwdith E-TM1.1 with N-TM Low Channel, 1932.5 MHz -22.3 -19 Pass 1 -21.3 -21.5 Low Channel, 1932.5 MHz 2 -19 Pass 3 -19 Low Channel, 1932.5 MHz Pass High Channel, 1992.5 MHz 1 -24.3 -19 Pass High Channel, 1992.5 MHz -21.2 -19 2 Pass High Channel, 1992.5 MHz 3 -20.7 -19 Pass 10 MHz Bandwdith E-TM1.1 with N-TM Low Channel, 1935 MHz -21.9 -19 Pass 1 Low Channel, 1935 MHz 2 -20.3 -19 Pass Low Channel, 1935 MHz 3 -21.1 -19 Pass High Channel, 1990 MHz -21.8 -19 Pass High Channel, 1990 MHz -19 2 -20.3 Pass High Channel, 1990 MHz 3 -20.2 -19 Pass 15 MHz Bandwdith E-TM1.1 with N-TM Low Channel, 1937.5 MHz Pass -20.8 -19 1 Low Channel, 1937.5 MHz Low Channel, 1937.5 MHz -21.3 -20.6 -19 -19 2 3 Pass Pass High Channel, 1987.5 MHz 1 -20 1 -19 Pass High Channel, 1987.5 MHz 2 -20.0 -19 Pass High Channel, 1987.5 MHz 3 -20.4 -19 Pass 20 MHz Bandwdith E-TM1.1 with N-TM Low Channel, 1940 MHz -21.7 -19 Pass 1 Low Channel, 1940 MHz Low Channel, 1940 MHz -21.1 -20.7 -19 -19 2 Pass 3 Pass High Channel, 1985 MHz High Channel, 1985 MHz 1 -21.7 -19 -19 Pass 2 -19.4 Pass High Channel, 1985 MHz 3 -196 -19 Pass



	Frequency				Max Value	Limit	Beaulte
	Kange	<u> </u>			-22.3	(uBm) -19	Pass
Keysight Spectrum	Analyzer - Element Materials Tec	chnology	CENCEANT				
	50 32 DC CONN		Tria: Free	Bun	Avg Type:	RMS	TRACE 1 2 3 4 5 6
		PNO: Wide ← IFGain:Low	#Atten: 20	dB	Avginoid:	1000/1000	DET
Ref	f Offset 42 dB					Mkr1 1.	930 000 00 GHz
10 dB/div Rel	f 52.00 dBm					1	-22.251 dBm
42.0							
32.0							
22.0							
12.0							
2.00							
0.00							
-0.00							
-18.0	<u>کا کمی ا</u>			1			DL1 -19.00 dBm
20.0							
-26.0							
-38.0							
Start 1.929000	0 GHz						Stop 1.931000 GHz
#Res BW 51 k	(112	#V	/BW 160 kHz		STATIS	Sweep	1.067 ms (8001 pts)
mou					STATUS		
nd 25, 1930 MHz	- 1995 MHz, LTE Nar	row Band IoT I	In-Band, Port 1	, 5 MHz B	andwdith, E-T	M1.1 with N-TM	I, Low Channel, 1932.
	Frequency				Max Value (dBm)	Limit (dBm)	Results
	2				-21.3	-19	Pass
	Analyzer - Element Materials Ter	hnology - Points: 100	1, Detector: Average (RMS)			
Keysight Spectrum	- 50 Ω DC CORRE		JEIJEILI		ALIGN AUTO		09:44:03 AM Mar 02, 2022
Keysight Spectrum	F 50 Ω DC CORR		Center Free	q: 1.9285000 Run	ALIGN AUTO 00 GHz AvalHold: 1	R 1000/1000	09:44:03 AM Mar 02, 2022 adio Std: None
Keysight Spectrum	F 50 Ω DC CORR	#IFGain:Low	Center Fre Trig: Free #Atten: 20	q: 1.9285000 Run dB	ALIGN AUTO 00 GHz Avg Hold: 1	R 1000/1000 R	09:44:03 AM Mar02, 2022 adio Std: None adio Device: BTS
Keysight Spectrum	F 50 Ω DC CORR Ref Offset 42 dB	#IFGain:Low	Center Free Trig: Free #Atten: 20	q: 1.9285000 Run dB	ALIGN AUTO 00 GHz Avg Hold: 1	R 1000/1000 R	09:44:03 AM Mar02, 2022 adio Std: None adio Device: BTS
Keysight Spectrum R R R R R	F 50 Ω DC COR Ref Offset 42 dB Ref 22.00 dBm	#IFGain:Low	Center Fre Trig: Free #Atten: 20	q: 1.9285000 Run dB	ALIGN AUTO 00 GHz Avg Hold: 1	1000/1000 R	09:44:03 AM Mar02, 2022 adio Std: None adio Device: BTS
Keysight Spectrum RL RF	F 50Ω DC COR Ref Offset 42 dB Ref 22.00 dBm	#IFGain:Low	Center Free Trig: Free #Atten: 20	q: 1.9285000 Run dB	ALIGN AUTO	R 1000/1000 R	09:44:03 AM Mar02, 2022 adio Std: None adio Device: BTS
Keysight Spectrum RL RF	F 50Ω DC COR Ref Offset 42 dB Ref 22.00 dBm	#IFGain:Low	Center Free Trig: Free #Atten: 20	q: 1.9285000 Run dB	ALIGN AUTO	1000/1000 R R	09:44:03 AM Mar02, 2022 adio Std: None adio Device: BTS
Keysight Spectrum 0d R L RF 10 dB/div 10 Log	F 50Ω DC COR Ref Offset 42 dB Ref 22.00 dBm	#IFGain:Low	Center Fre Trig: Free #Atten: 20	q: 1.9285000 Run dB	ALION AUTO 00 GHz Avg Hold: 1	R 1000/1000 R	09:44:03 AM Mar02, 2022 adio Std: None adio Device: BTS
Keysight Spectrum 0d RL RF 10 dB/div dd/div Log	F 50 Ω DC COR Ref Offset 42 dB Ref 22.00 dBm	#IFGain:Low	Center Fre Trig: Free #Atten: 20	q: 1.9285000 Run dB	00 GHz Avg Hold: 1	1000/1000 R	09:44:03 AM Mar02, 2022 adio Std: None adio Device: BTS
Keysight Spectrum 00 RL RF 10 dB/div dB/div dB/div 12.0	F 50 Ω DC COR Ref Offset 42 dB Ref 22.00 dBm	#IFGain:Low	Center Fre Trig: Free #Atten: 20	q: 1.9285000 Run dB	00 GHz Avg Hold: *	R 1000/1000 R	09:44:03 AM Mar02, 2022 adio Std: None adio Device: BTS
Keysight Spectrum 00 RL RF 10 dB/div dB/div Log	F 50 Ω DC COR Ref Offset 42 dB Ref 22.00 dBm	#IFGain:Low	Center Fre Trig: Free #Atten: 20	g: 1.9285000 Run dB	00 GHz Avg Hold: 1	R 1000/1000 R	09:44:03 AM Mar02, 2022 adio Std: None adio Device: BTS
Keysight Spectrum 00 RL RF 10 dB/div dB/div Log	F 50 Ω DC COR Ref Offset 42 dB Ref 22.00 dBm	#IFGain:Low	Center Fre Trig: Free #Atten: 20	q: 1.9285000 Run dB	ALIGN AUTO 00 GHz Avg Hold: '	R 1000/1000 R	09:44:03 AM Mar02, 2022 adio Std: None adio Device: BTS
Keysight Spectrum Dd RL RF 10 dB/div 10 Log 10 10 12.0 10 10 2.00 10 10 38.0 10 10 -38.0 10 10 -38.0 10 10 -38.0 10 10 -66.0 10 10	F 50 Ω DC COR	#IFGain:Low	Center Fre Trig: Free #Atten: 20	g: 1.9285000 Run dB	ALIGN AUTO 00 GHz Avg Hold: '	R 1000/1000	09:44:03 AM Mar02, 2022 adio Std: None adio Device: BTS

Channel Power Power Spectral Density -21.32 dBm / 1 MHz -81.32 dBm /Hz

STATUS

MSG



	Frequency Range			Max Value (dBm)	(dBm)	Results
	3			-21.5	-19	Pass
Keysight Spectrum Analyz	er - Element Materials Techno	ology				- @ - X
LXI KL RF	50 Ω DC CORREC		SENSE:INT	ALIGN AUTO Avg Type: F	MS	09:45:26 AM Mar 02, 2022 TRACE 1 2 3 4 5 6
		PNO: Fast 🔸	Trig: Free Run	Avg Hold: 10	000/1000	TYPE A WWWWW
		IFGain:Low	#Atten: 20 dB		Miles 4	
Ref Offs	et 42 dB				IVIKET	-21 475 dBm
	.00 0811		v			
38.0						
28.0						
18.0						
8.00						
-2.00						
-12.0						
						DL1 -19.00 d
-22.0						and the second se
-32.0						
-42.0						
Start 1.90800 GHz	2					Stop 1.92800 GHz
#Res BW 1.0 MHz		#VB	W 3.0 MHz*		Sweep 1	.067 ms (8001 pts)
MSG				STATUS		
Band 25, 1930 MHz - 199	95 MHz, LTE Narrow	w Band IoT In-	Band, Port 1, 5 MH	z Bandwdith, E-TM	11.1 with N-TM	High Channel, 1992.5 MHz
	Frequency			Max Value	Limit	
	Range			(dBm)	(dBm)	Results
	1			-24.3	-19	Pass

LXI RL	RF 50 Ω DC	CORREC		SENSE:INT	ALI	GN AUTO		10:55:54	AM Mar02, 2022
			PNO: Wide ↔→ FGain:Low	. Trig: Free #Atten: 20	Run dB	Avg Type: Avg Hold: 1	RMS 000/1000	TR. T	ACE 1 2 3 4 5 6 YPE A WWWW DET A NNNN
10 dB/div	Ref Offset 42 dB Ref 52.00 dBm						Mkr1 1	.995 02 -24.	5 00 GHz 322 dBm
42.0									
32.0									
22.0									
12.0				\					
2.00									
-8.00									
-18.0					1				DL1 -19.00 dBm
-28.0									
-38.0									
Start 1.9	94000 GHz							Stop 1.9	96000 GHz
#Res BW	51 KHZ		#VB	W 160 kHz	*	STATUS	Sweep	1.067 ms	(8001 pts)
Contraction of the second second									





Band 25, 1930 MHz - 1995	5 MHz, LTE Narrov	w Band IoT In-Bar	nd, Port 1, 5 MH	z Bandwdith, E-TI	M1.1 with N-TM,	High Channel, 19	92.5 MH
	Frequency			Max Value	Limit		
	Range			(dBm)	(dBm)	Results	
	3			-20.7	-19	Pass	

🔤 Keysight Sp	ectrum Analyze	r - Element Mat	erials Technol	ogy						
LXI RL	RF	50 Ω DC	CORREC	5	SENSE:INT		ALIGN AUTO		10:58:50	AM Mar 02, 2022
				PNO: Fast ↔→ IFGain:Low	Trig: Free #Atten: 22	Run dB	Avg Type: I Avg Hold: 1	RMS 000/1000	TF	ACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN
10 dB/div	Ref Offse Ref 48.	et 42 dB 00 dBm						Mkr	1 1.997 0 -20.	15 0 GHz 732 dBm
						Í				
38.0										
28.0										
18.0										
8.00										
-2.00										
-12.0										
1										DL1 -19.00 dBm
-22.0								ويحودون منجوع مندستين المنافقة مروحيتهما		
-32.0										
-42.0										
Start 1.99	9700 GHz								Stop 2.	01700 GHz
#Res BW	T.U WIHZ			#VB	N 3.0 WHZ		STATUS	Swee	p 1.067 ms	(8001 p(S)





VBW 91 kHz

Power Spectral Density

-80.30 dBm /Hz

STATUS

Center 1.9285000 GHz Res BW 9.1 kHz

Channel Power

-20.30 dBm / 1 MHz

Span 1.000 MHz Sweep 14.4 ms



	-requency Range			Max Value (dBm)	Limit (dBm)	Results
	3			-21.1	-19	Pass
Keysight Spectrum Analyzer - Eler CRL RF 50 Ω	nent Materials Tecl DC CORRE	hnology C	SENSE:INT	ALIGN AUTO	RMS	11:23:24 AM Mar02, 202 TRACE 2 3 4 5
		PNO: Fast + IFGain:Low	Trig: Free Rur #Atten: 20 dB	n Avg Hold: 1	000/1000	
Ref Offset 42 10 dB/div Ref 48.00 d	dB Bm				Mkr1 1	1.927 785 0 GH -21.055 dBn
_0g			The second secon			
38.0						
28.0						
. 18.0						
8.00						
.2 00						
2.00						
-12.0						
-22.0						DL1 -19.00 d.
22.0						~~~~~
-32.0						
-42.0						
Start 1.90800 GHz #Res BW 1.0 MHz		#V	BW 3.0 MHz*		Sweep	Stop 1.92800 GH 1.067 ms (8001 pts
MSG				STATUS		
3 25, 1930 MHz - 1995 MI	Hz, LTE Narr	row Band IoT I	n-Band, Port 1, 1	0 MHz Bandwdith, E-1	FM1.1 with N-T	M, High Channel, 19
1	requency			Max Value	Limit	Baculto
	Range			-21.8	<u>(авт)</u> -19	Pass

Keysight Sp	ectrum Ana	lyzer - Elem	ent Mate	rials Techno	logy							
LXI RL	RF	50 Ω	DC	CORREC			SENSE:INT		ALIGN AUTO		12:00:3	5 PM Mar 02, 2022
					PNO: Wide IFGain:Low		Trig: Free #Atten: 20	Run dB	Avg Type: I Avg Hold: 1	RMS 000/1000	TI	ACE 123456 TYPE A WWWW DET A NNNN
	Ref Of	feet //2 c	18							Mkr1	1.995 00	0 00 GHz
10 dB/div	Ref 5	2.00 di	Bm								-21.	756 dBm
								Ĭ				
42.0												
42.0												
32.0												
22.0				\rightarrow								
				```								
12.0												
					m							
2.00					$\rightarrow$	Yy						
-8.00						~	~					
0.00												
-18.0								1				DL1 -19.00 dBm
							~					
-28.0										~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
-38.0												
Start 1.99	94000 <b>G</b>	Hz									Stop 1.9	96000 GHz
#Res BW	100 kH	IZ				#VΒ	W 300 kHz	*		Swee	p 1.067 m	s (8001 pts)
MSG									STATUS			





Ba	nd 25, 1930 MHz - 199	5 MHz, LTE Narro	ow Band IoT In-Ba	and, Port 1, 10 M	Hz Bandwdith, E-	TM1.1 with N-TM	1, High Channel, 1	1990 MHz
		Frequency			Max Value	Limit		
		Range			(dBm)	(dBm)	Results	
		3			-20.2	-19	Pass	

🛄 Keysight Sp	ectrum Analyzer - Element Materials T	echnology					
(X) RL	RF 50 Ω DC COR	PNO: Fast	Trig: Free Run	ALIGN AUTO Avg Type: Avg Hold: 1	RMS 000/1000	12:02:11 TR T	PM Mar 02, 2022 ACE 1 2 3 4 5 6 YPE A DET A N N N N N
10 dB/div	Ref Offset 42 dB Ref 48.00 dBm	IFGailLow	#Atten: 11 db		Mkr1	1.997 0 -20.	20 0 GHz 169 dBm
			ľ				
38.0							
28.0							
18.0							
8.00							
-2 00							
-12.0							DL1 -19.00 dBm
-22.0							
-32.0							
-42.0							
Start 1.99 #Res BW	1.0 MHz	#VB	W 3.0 MHz*		Sweep	Stop 2.0 1.067 ms	01700 GHz (8001 pts)
MSG	NATION AND AND AND ADDRESS			STATUS			





		#IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold: 1000/1000	Radio Device: BTS
10 dB/div	Ref Offset 42 dB Ref 22.00 dBm				
Log 12.0					
2.00					
-8.00					
-18.0					
-28.0					
-38.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		·	
-48.U					
-50.0					
Center 1.92 Res BW 9.	285000 GHz .1 kHz		VBW 91 kł	łz	Span 1.000 M Sweep 14.4 r
Chann	el Power		Power Spec	tral Density	
-2	1.27 dBm / 1	MHz	-81.2	7 dBm /нz	
NEG				OTATIO	



	Range			Max Value (dBm)	(dBm)	Results
	3			-20.6	-19	Pass
Keysight Spectrum	Analyzer - Element Materials Ter F 50 Ω DC CORR	EC	SENSE:INT	ALIGN AUTO Avg Type: F	RMS	12:12:13 PM Mar 02, 2022 TRACE 1 2 3 4 5 6
		IFGain:Low	#Atten: 20 dB	Arginola. 1		DETANNNN
Ref 10 dB/div Re	f Offset 42 dB f 48.00 dBm				Mkr1 1	.927 910 0 GHz -20.636 dBm
38.0						
28.0						
18.0						
8.00						
-2.00						
-12.0						1
-22.0						DL1 -19.00 d.
-32.0						
-42.0						
Start 1.90 <u>800</u>	GHz					Stop 1.92800 GHz
#Res BW 1.0	MHz	#VI	BW 3.0 MHz*	STATUS	Sweep 1	l.067 ms (8001 pts)

	Frequency		Max Value	Limit	
-	Range		(dBm)	(dBm)	Results
	1		-20.1	-19	Pass







Band 2	5, 1930 MHz - 1995	MHz, LTE Narrow	w Band IoT In-Bar	Iz Bandwdith, E-T	M1.1 with N-TM,	High Channel, 19	987.5 MHz	
		Frequency			Max Value	Limit		
	Range				(dBm)	(dBm)	Results	
		3			-20.4	-19	Pass	

Key	/sight Spe	ctrum Analyzer	- Element N	laterials Techno	ology						
L <mark>XI</mark> RI	<b>1</b> 88.3815	RF	50 Ω DC	CORREC		SENSE:INT		ALIGN AUTO	DMS	12:46:20	PM Mar 02, 2022
					PNO: Fast • IFGain:Low	Trig: Fre #Atten: 2	e Run 22 dB	Avg Hold:	1000/1000		
		Ref Offse	t 42 dB						Mki	1 1.997 1	17 5 GHz
10 dE Loa	3/div	Ref 48.0	0 dBm							-20.	418 GBM
							Ť				
38.0											
28.0											
18.0											
8.00											
-2.00											
-12.0											
	<u> </u>										DL1 -19.00 dBm
-22.0		and the second s									
					ومردور والمتود والمحكون والم						
-32.0											
-42.0											
							1				
Star	t 1.99	700 GHz								Stop 2.	01700 GHz
#Res	s BW	1.0 MHz			#\	/BW 3.0 MH	z*		Swee	ep 1.067 ms	s (8001 pts)
MSG								STATUS			









	Frequency			Max Value	Limit (dBm)	Results
	3			-20.7	-19	Pass
Keysight Spectrum Analyzer - E	lement Materials T	echnology				
CX RL RF 50	Ω DC COR	REC	SENSE:INT	ALIGN AUTO	RMS	12:56:41 PM Mar 02, 2022 TRACE 1 2 3 4 5
		PNO: Fast +++ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold: 1	000/1000	TYPE A WWWW DET A NNNN
Ref Offset 4	2 dB dBm				Mkr1 1	1.927 987 5 GH2 -20.721 dBn
Log			Ť			
20.0						
30.0						
28.0						
18.0						
8.00						
-2.00						
-12.0						
						DL1 -19.00 d.
-22.0						
						Married Contraction
-32.0						
-42.0						
Start 1.90800 GHz #Res BW 1.0 MHz		#VB	W 3.0 MHz*		Sweep 1	Stop 1.92800 GH2 1.067 ms (8001 pts
MSG				STATUS		
d 25, 1930 MHz - 1995 N	ИНz, LTE Na	arrow Band IoT In-	Band, Port 1, 20 MI	Hz Bandwdith, E-1	M1.1 with N-TI	M, High Channel, 198
	Frequency			Max Value	Limit	Beaulta
	Range			(asm)	(aBm)	Results







Band 25, 1930 MHz - 1995 MHz, LTE Nam	ow Band IoT In-Band	d, Port 1, 20 MHz Bandwdith,	E-TM1.1 with N-TM	V, High Channel, 1	1985 MHz
Frequency		Max Value	Limit		
Range		(dBm)	(dBm)	Results	
3		-19.6	-19	Pass	

🧱 Keysight Sp	pectrum Analyzer - Element Materials T	echnology					
CXI RL	RF   50 Ω DC   COF	PNO: Fast	Trig: Free Run #Atten: 22 dB	ALIGN AUTO Avg Type: R Avg Hold: 10	MS 00/1000	01:44:57 TRJ T	PM Mar 02, 2022 ACE 1 2 3 4 5 6 YPE A WWWW DET A N N N N N
10 dB/div	Ref Offset 42 dB Ref 48.00 dBm				Mkr1	1.997 00 -19.0	60 0 GHz 634 dBm
38.0							
28.0							
18.0							
8.00							
-2.00							
1							DL1 -19.00 dBm
-22.0							
-32.0							
-42.0							
Start 1.99 #Res BW	9700 GHz 1.0 MHz	#VB	N 3.0 MHz*		Sweep	Stop 2.0 1.067 ms	01700 GHz (8001 pts)
MSG				STATUS			



XMit 2022.02.07.0 EUT: AHFII Remote Radio Head Serial Number: YK214000036 Customer: Nokia Solutions and Networks Attendees: David Le, John Rattanavong Broist None Work Order: NOKI0037 Date: 28-Feb-22 Temperature: 22.6 °C Humidity: 23.7% RH Barometric Pres.: 1026 mbar Project: None Tested by: Mark Baytan TEST SPECIFICATIONS Power: 54 VDC Test Method Job Site: TX09 FCC 27:2022 ANSI C63.26:201 RSS-139 Issue 3:2015 RSS-139 Issue 3:2015 RSS-170 Issue 3:2015 S-170 Issue 3:2015 COMMENTS All measurement path loses accounted for in the reference level offest including any attenuators, filters, and DC blocks. Band 66 carriers enabled at maximum power is 80 watts/carrier. Some marker values were offset by RBW/2 from the band edge frequency as allowed by ANSI C63.26 Clause 5.7.2 for some test cases. DEVIATIONS FROM TEST STANDARD None ULLE Configuration # 2 3++ Signature Max Value Limit Frequency Results Range (dBm) (dBm Band 66, 2110 MHz - 2200 MHz, LTE Narrow Band IoT In Band Port 1 5 MHz Bandwdith E-TM1.1 with N-TM Low Channel, 2112.5 MHz -22.4 -19 Pass 1 Low Channel 2112 5 MHz 2 -23.3 -19 Pass Low Channel, 2112.5 MHz 3 -22.1 -19 Pass High Channel, 2197.5 MH: High Channel, 2197.5 MH: 1 -24.1 -19 Pass 2 -22.5 -19 Pass High Channel, 2197.5 MHz 3 -21.7 -19 Pass 10 MHz Bandwdith E-TM1.1 with N-TM Low Channel, 2115 MHz Low Channel, 2115 MHz. -23.2 -23.2 -19 -19 Pass 1 2 Pass Low Channel, 2115 MHz.. 3 -22.5 -19 Pass High Channel, 2195 MHz 1 -22 4 -19 Pass High Channel, 2195 MHz. -22.6 -19 Pass 2 High Channel, 2195 MHz 3 -22.1 -19 Pass 15 MHz Bandwdith E-TM1.1 with N-TM Low Channel, 2117.5 MHz -20.6 -22.8 -19 -19 Pass 1 Low Channel, 2117.5 MHz 2 Pass Low Channel, 2117.5 MHz 3 -22.3 -19 Pass High Channel, 2192.5 MH; 1 -20.0 -19 Pass High Channel, 2192.5 MH: -22.2 -19 Pass 2 High Channel 2192 5 MH: 3 -20.9 -19 Pass 20 MHz Bandwdith E-TM1.1 with N-TM Low Channel, 2120 MHz -22.9 -19 Pass 1 Low Channel, 2120 MHz. -22.8 2 -19 Pass Low Channel, 2120 MHz.. 3 -22.3 -19 -19 Pass High Channel, 2190 MHz 1 -21.6 Pass High Channel, 2190 MHz. 2 3 -20.5 -19 Pass High Channel, 2190 MHz. -19.8 -19 Pass



	Frequency				Max Value	Limit	Desults
	Range				(aBm)	(aBm) -19	Pass
		1	1		22.4	15	1 433
Keysight Spectr	um Analyzer - Flement Materials Tec	bology					
LXI RL	RF 50 Ω DC CORRE	EC	SENSE:INT		ALIGN AUTO		11:20:55 AM Mar 05, 2022
			Trig: Free	Run	Avg Type: R Avg/Hold: 1	MS	TRACE 1 2 3 4 5 6
		IFGain:Low	#Atten: 20	dB	Anglitola. It		DETANNNN
	Ref Offset 42 dB					Mkr1 2.	110 000 00 GHz
10 dB/div	Ref 52.00 dBm						-22.370 dBm
42.0							
32.0							
22.0							
12.0							
2.00				/			
0.00							
-0.00							
-18.0				1			DL119.00 dBm
-28.0							
-38.0							
Start 2,1090	000 GHz			<b>A</b>			Stop 2.111000 GHz
#Res BW 5	1 kHz	#VI	BW 160 kHz	*		Sweep	1.067 ms (8001 pts)
MSG					STATUS		
					And and a second second		
d 66, 2110 MH	Iz - 2200 MHz, LTE Narr	row Band IoT In	Band, Port 1	, 5 MHz∣	Bandwdith, E-TM	1.1 with N-TM	, Low Channel, 2112.
	Frequency				wax value	Limit (dBm)	Poculte
	2				-23.3	-19	Pass
	2			1	20.0	10	1 400
	2			l	-23.3	-19	Pass
Wagisht Speet	um Analiger Flement Materials Tes	mology - Fomus: 1001,	Delector: Average (	(WD)	ALIGN AUTO		11:21:58 AM Mar 05, 2022
Keysight Spectr	um Analyzer - Element Materials Tec RF 50 Ω DC CORRE	EC	SENSE:INT		TIGEOTITIOTO		and the second
Keysight Spectr	um Analyzer - Element Materials Tec RF 50 Ω DC CORRE		Center Fre	q: 2.10850	0000 GHz	R	adio Std: None
Keysight Spectr	um Analyzer - Element Materials Tec RF 50 Ω DC CORRE	€C	SENSE:INT Center Fre ↓ Trig: Free #Atten: 20	q: 2.10850 Run dB	0000 GHz Avg Hold: 10	000/1000 R	adio Std: None adio Device: BTS
Keysight Spectr	um Analyzer - Element Materials Tec RF 50 Ω DC CORRE	ec	Center Fre Trig: Free #Atten: 20	q: 2.10850 Run dB	00000 GHz Avg Hold: 10	R 000/1000 R	adio Std: None adio Device: BTS
Keysight Spectr	um Analyzer - Element Materials Tec RF 50 Ω DC CORRE Ref Offset 42 dB Ref 22.00 dBm	ec ∔ #IFGain:Low	Center Fre Trig: Free #Atten: 20	q: 2.10850 Run dB	0000 GHz Avg Hold: 10	R 000/1000 R	adio Std: None adio Device: BTS
Keysight Spectr     Keysight Spectr     RL	um Analyzer - Element Materials Tec RF 50 Ω DC CORRE Ref Offset 42 dB Ref 22.00 dBm	EC	SENSE:INT Center Fre Trig: Free #Atten: 20	q: 2.10850 Run dB	00000 GHz Avg Hold: 10	R 000/1000 R	adio Std: None adio Device: BTS
10 dB/div	um Analyzer - Element Materials Tec RF 50 Ω DC CORRE Ref Offfset 42 dB Ref 22.00 dBm	€C	SENSE:INT Center Fre Trig: Free #Atten: 20	q: 2.10850 Run dB	00000 GHz Avg Hold: 10	R 000/1000 R	adio Sta: None adio Device: BTS
Keysight Spectr     RL     dB/div     Log     2.00	um Analyzer - Element Materials Tec RF 50 Ω DC CORRE Ref Offfset 42 dB Ref 22.00 dBm	#IFGain:Low	SENSE:INT Center Free Trig: Free #Atten: 20	q: 2.10850 Run dB	0000 GHz Avg Hold: 10	R 000/1000 R	adio Device: BTS
Keysight Spectr.           X         R L           10         dB/div           Log	um Analyzer - Element Materials Tec RF 50 Ω DC CORRE Ref Offset 42 dB Ref 22.00 dBm	#IFGain:Low	SENSE:INT Center Free Trig: Free #Atten: 20	q: 2.10850 Run dB	0000 GHz Avg Hold: 10	R 000/1000 R	adio Device: BTS



	Frequency	,			Max Value	Limit	Desults
	Range				(dBm)	(dBm) 10	Results
	3				-22.1	-19	Pass
Keysight Spectrum A	Analyzer - Element Materials T	echnology REC	SENSEIINT		ALIGN AUTO		11:23:17 AM Mar 05, 20
14	0012 000		Genoentit		Avg Type: I	RMS	TRACE 1 2 3 4
		PNO: Fast IFGain:Low	, Trig: , #Atte	Free Run n: 22 dB	Avg Hold: 1	000/1000	DET A N N N
Def						Mkr1 2	2.107 315 0 GI
10 dB/div Ref	52.00 dBm						-22.079 dB
Log				Y			
42.0							
22.0							
32.0							
22.0							
22.0							
12.0							
12.0							
2.00							
2.00							
8.00							
0.00							
-18.0							DL1 -19.00
							Y
-28.0							
-38.0							
Start 2.08800 ( #Res BW 1.0 M	GHZ AH7		#VBW 3.01	/H7*		Sween	Stop 2.10800 GI 1 067 ms (8001 m
MSG					STATUS		
d 66, 2110 MHz -	2200 MHz, LTE Na	rrow Band Io	T In Band, P	ort 1, 5 MHz	Bandwdith, E-TM	M1.1 with N-TM	, High Channel, 219
	Frequency				Max Value	Limit	
	Range	- I		r	(dBm)	(dBm)	Results
	1				-24.1	-19	Pass







 Band 66, 2110 MHz - 2200 MHz, LTE Narrow Band IoT In Band, Port 1, 5 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 2197.5 MHz..

 Frequency
 Max Value
 Limit

 Range
 (dBm)
 (dBm)
 Results

 3
 -21.7
 -19
 Pass

Keysight Spectrum Analyzer - I	lement Materials Tech	nology					
<b>X</b> RL   RF   50	Ω DC CORRE(	PNO: Fast ↔→	Trig: Free Run #Atten: 22 dB	ALIGN AUTO Avg Type: I Avg Hold: 1	RMS 000/1000	11:55:12 TR/ T	AM Mar 05, 2022 ACE 1 2 3 4 5 6 YPE A WWWW DET A N N N N
Ref Offset 4 10 dB/div Ref 48.00	12 dB dBm				Mkr1	2.202 02 -21.0	27 5 GHz 662 dBm
38.0							
28.0							
18.0							
8.00							
2.00							
12.0							
22.0							DL1 -19.00 dBm
32.0							
42.0							
Start 2.20200 GHz #Res BW 1.0 M <u>Hz</u>		#VB	W 3.0 MHz*		Swe <u>ep</u>	Stop 2.2	22200 GHz (8001 pts)
ISG				STATUS			





LXI RL	RF 50 Ω DC	CORREC	SENSE:INT Center Freg: 2.108	ALIGN AUTO	12:09:55 PM Mar 05, 2022 Radio Std: None
		#IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold: 1000/1000	Radio Device: BTS
	Ref Offset 42 dB				
10 dB/div Logi	Ref 22.00 dBm				
12.0					
2.00					
-8.00					
-18.0					
-28.0					
-38.U					
-40.0					
-68.0					
Conter 2.40					Snon 4 000 Mile
Res BW 9.	1 kHz		VBW 91	kHz	Span 1.000 MH2 Sweep 14.4 ms
Channe	el Power		Power Spe	ctral Density	
Channe	ci rowci		rower ope	cual Density	
-2:	3.16 dBm /	1 MHz	-83.1	16 dBm /нz	
HEC				CTATIIC	



	Range			(dBm)	(dBm)	Results	
	3			-22.5	-19	Pass	
Keysight Spectrum Analyzer	Element Materials Te	chnology	- mure and				×
	US2 DC CORP	EC	SENSE:INT	ALIGN AUTO Avg Type:	RMS	TRACE 1 2 3 4	5 6
		PNO: Fast ↔ IFGain:Low		Avg Hold: 1	000/1000		AV I N
Ref Offset 10 dB/div Ref 52.0	42 dB 0 dBm				Mkr1 2	2.104 625 0 GH -22.508 dBi	Z
Log			Y Y				
42.0							
22.0							
32.8							
22.0							
22.0							
12.0							
12.0							
2.00							
-8.00							
-18.0						DL1 -19.00 df	Bm
						<b></b>	
-28.0							
-38.0							
Start 2 09900 CHz						Stop 2 10900 CL	
#Res BW 1.0 MHz		#VI	3W 3.0 MHz*		Sweep	1.067 ms (8001 pt	ś
MSG				STATUS			
and 66, 2110 MHz - 2200		rrow Band IoT Ir	Band Port 1 10 M	Hz Bandwdith E-	M1 1 with N-T	M High Channel 21	195 M
and 00, 2110 Minz - 2200	Frequency		Duna, Forti, TOIV	Max Value	Limit	in, i igri Onarinei, 21	55 N
	Range			(dBm)	(dBm)	Results	
	1			-22.4	-19	Pass	
Keysight Spectrum Analyzer	Element Materials Te	chnology					×
LXI RL RF 5	0Ω DC CORF	REC	SENSE:INT	ALIGN AUTO		12:42:51 PM Mar 05, 202	22

		PNO: Wide ↔→ IFGain:Low	Trig: Free F #Atten: 20	lun JB	Avg Hold: 10	00/1000	1	
10 dB/div	Ref Offset 42 dB Ref 52.00 dBm					Mkr1	2.200 00 -22.	0 00 GHz 409 dBm
209								
42.0								
32.0		<u> </u>						
22.0		$\rightarrow$						
12.0								
2.00								
2.00		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						
-8.00								
-18.0				1				DL1
-28.0				have been a second and a second a secon			~~~~~	
-38.0								
Start 2.1 #Res BW	99000 GHz / 100 kHz	#VBV	V 300 kHz*			Sweep	Stop 2.2 1.067 ms	01000 GHz (8001 pts)
MSG					STATUS			





 Band 66, 2110 MHz - 2200 MHz, LTE Narrow Band IoT In Band, Port 1, 10 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 2195 MHz..

 Frequency
 Max Value
 Limit

 Range
 (dBm)
 (dBm)
 Results

 3
 -22.1
 -19
 Pass

🔤 Keysight Spectrum Analyzer -	Element Materials Technol	ogy					
IXI RL RF 5	0 Ω DC CORREC	S	ENSE:INT	ALIGN AUTO		12:44:35	PM Mar 05, 2022
	1	PNO: Fast +++	Trig: Free Run #Atten: 22 dB	Avg Type: Avg Hold: 1	RMS 1000/1000	IR T	ACE 1 2 3 4 5 6 YPE A WWWWW DET A NNNNN
Ref Offset 10 dB/div Ref 48.0	42 dB 0 dBm				Mkr	1 2.202 1 -22.	07 5 GHz 099 dBm
			Ť				
38.0							
28.0							
49.0							
10.0							
8.00							
-2.00							
12.0							
1							DL1 -19.00 dBm
-22.0	and the second sec						
-32.0							
-42,0							
Start 2.20200 GHz		#\/B)	M 3 0 MHz*		Sweer	Stop 2.	22200 GHz
MSG		#969	vroavimili ²	STATUS	Gweel	, 1.007 ms	(ooon pis)









Image: Notice of the second state of the se		Frequency			Max Value (dBm)	Limit (dBm)	Results
AvgType:RtS Rt Ref 92:00 GHz Ref 9		3			-22.3	-19	Pass
Projekt Spectrum Makeyer- Brener Makeyber 2009         ALLON AUTO         Dec 2019         Dec 201							
A.C.       BP       58 B       DC       DREE       Start 2.000       DREE       August 2.000         International and the start 2.000       BB       Start 2.000       DE       DE       Start 2.000       DE	Keysight Spectru	um Analyzer - Element Materials Tr	echnology		1		
PNO:Tail the free Run Ref 000:1000       Mkr1 2:107:810.0 GHz 2:22:66 dBm         10 dBidly Ref 32:00 dBm       2:22:66 dBm         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         2:0       2:0         3:0       2:0         3:0       2:0         3:0       2:0         3:0       2:0         3:0       2:0         3:0       2:0         3:0       2:0         3:0       3:0         3:0       3:0         3:0       3:0         3:0       3:0         3:0       3:0         3:0       3:0         3:0       3:0         3:0       3:0         3:0       3:0	CXI RL	RF 50 Ω DC CORF	REC	SENSE:INT	ALIGN AUTO Avg Type: F	RMS	01:02:57 PM Mar 05, 2022 TRACE 1 2 3 4 5 6
Ref Offset 42 dB         Mkr1 2.107 810 0 GHz           20         -22.266 dBm           20         -22.200 dBm           30         -22.200 dBm           5tart 2.08800 GHz         #VBW 3.0 MHz*           Start 2.08800 GHz         #VBW 3.0 MHz*			PNO: Fast +	Trig: Free Rur #Atten: 22 dB	n Avg Hold: 10	000/1000	DET A WWWWW DET A N N N N
OdBidiv       Ref 32.00 dBm       -22.266 dBm         20       -22.266 dBm       -22.266 dBm         20       -20       -20         20       -20       -20         20       -20       -20         20       -20       -20         20       -20       -20         20       -20       -20         20       -20       -20         20       -20       -20         20       -20       -20         30       -20       -20         30       -20       -20         30       -20       -20         30       -20       -20.0         30       -20.0       -19         30       -20.0       -19         30       -20.0       -19         30       -20.0       -19         30       -20.0       -19         30       -20.0       -19         30       -20.0       -19         30       -20.0       -19         30       -20.0       -19         30       -20.0       -19         30       -20.0       -19         30	_					Mkr1 2	.107 810 0 GHz
20       20       20       20         20       20       20       20         20       20       20       20         20       20       20       20         20       20       20       20         20       20       20       20         20       20       20       20         20       20       20       20         20       20       20       20         20       20       20       20         20       20       20       20         300       GH2       20       20         Start 2.08800 GH2       #VBW 3.0 MH2*       Stop 2.10800 GH2         #Res BW 1.0 MHz       #VBW 3.0 MH2*       Stop 2.10800 GH2         #Res BW 1.0 MHz       #VBW 3.0 MH2*       Stop 2.10800 GH2         Frequency       Max Value       Limit         (dBm)       Results       20         1       -20.0       -19       Pass         1       -20.0       -19       Pass         1       -20.0       -19       Pass         1       -20.0       -19       Pass         10       20	10 dB/div	Ref 52.00 dBm					-22.266 dBm
20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20 <t< td=""><td>LUg</td><td></td><td></td><td>The second se</td><td></td><td></td><td></td></t<>	LUg			The second se			
20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20 <t< td=""><td>42.0</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	42.0						
320       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       <							
220       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20       20 <t< td=""><td>32.0</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	32.0						
200       200         200       200         300       200         300       200         Start 2.08800 GHz       Stop 2.10800 GHz         #Res BW 1.0 MHz       #VBW 3.0 MHz*         Sweep 1.067 ms (8001 pts)         MG       100         MG       100         Frequency       Max Value         Limit       (dBm)         Range       (dBm)         (dBm)       (dBm)         Verylight Spectrum Analyzer- Biement Materials Technology       200         PNO: Wide       Trig: Free Run         Avg Type: RMS       1000/1000         Trig: Free Run       Avg Type: RMS         Avg Type: RMS       1000/1000         Trig: Free Run       Avg Type: RMS         Avg Type: RMS       1000/1000         Trig: Free Run       Avg Type: RMS         Avg Type: RMS       1000/1000         Trig: Free Run       Avg Type: RMS         Avg Type: RMS       1000/1000         Trig: Free Run       Avg Type: RMS         Avg Type: RMS       1000/1000         Trig: Free Run       Avg Type: RMS         Trig: Free Run       Avg Type: RMS         Trigo Bindition <td< td=""><td>22.0</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	22.0						
120       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200 <td< td=""><td>22.0</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	22.0						
2.00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00       00	12.0						
200       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0							
8.00       Resplay to the second of the secon	2.00						
300       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       1000       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>							
180	-8.00						
233 0	-18.0						DL1-19.00 d
230       330       Stop 2.10800 GHz         Start 2.08800 GHz       #VEW 3.0 MHz*       Stop 2.10800 GHz         #Res BW 1.0 MHz       #VEW 3.0 MHz*       Stop 2.10800 GHz         #start 2.08800 GHz       #VEW 3.0 MHz*       Stop 2.10800 GHz         #start 2.08800 GHz       #VEW 3.0 MHz*       Stop 2.10800 GHz         #start 2.08800 GHz       #VEW 3.0 MHz*       Stop 2.10800 GHz         #start 2.08800 GHz       #VEW 3.0 MHz*       Stop 2.10800 GHz         #start 2.08800 GHz       #VEW 3.0 MHz*       Stop 2.10800 GHz         #start 2.08800 GHz       #VEW 3.0 MHz*       Stop 2.10800 GHz         #start 2.000 MHz, LTE Narrow Band IoT In Band, Port 1, 15 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 2192.5 M       Frequency         Max Value       Limit       (dBm)       (dBm)         Range       (dBm)       (dBm)       Results         1       -20.0       -19       Pass         *       R       So Ω Dc       CORRec       Sense:Intr         PNO: Wide       *       Trig: Free Run       Avg Type: RMS       Trace         Avg Type: RMS       Avg Type: RMS       Trace       Trace       Trace         PNO: Wide       *       Trig: Free Run       Avg Type: RMS       Avg Type: RMS <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>							
330       Stop 2.10800 GHz         Start 2.08800 GHz       #VEW 3.0 MHz*         Start 2.08800 GHz       #VEW 3.0 MHz*         Stop 2.10800 GHz       #VEW 3.0 MHz*         Start 2.08800 GHz       #VEW 3.0 MHz*         Start 2.08800 GHz       #VEW 3.0 MHz*         Stop 2.10800 GHz       #VEW 3.0 MHz*         Start 2.08800 GHz       #VEW 3.0 MHz*         Start 2.08800 GHz       #VEW 3.0 MHz*         Start 2.020 MHz, LTE Narrow Band IoT In Band, Port 1, 15 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 2192.5 M         Frequency       Max Value         Limit       (dBm)         Range       (dBm)         (dBm)       (dBm)         Results       -20.0         1       -20.0         2.00       0128:05 PMar 05, 2022         RL       RF         Start 2.00       CORREC         Sense:INT       ALIGN AUTO         VILGE       Trig: Free Run         Avg Type: RMS       Trace         PNO: Wide       Trig: Free Run         PNO: Wide       Trig: Free Run         Avg Type: RMS       Avg Type: RMS         Avg Hydid: 1000/1000       Trig: PNO: Wide         PNO: Wide       Trig: Free Run      <	-28.0			****			
Start 2.08800 GHz       Stop 2.10800 GHz         #Res BW 1.0 MHz       #VBW 3.0 MHz*         Start 2.08800 GHz       #VBW 3.0 MHz*         Start 2.00 MHz, LTE Narrow Band IoT In Band, Port 1, 15 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 2192.5 M         Frequency       Max Value         Limit       (dBm)         Range       (dBm)         (dBm)       (dBm)         Results       1         -20.0       -19         Pass       PRC: CORREC         Sexight Spectrum Analyzer - Element Materials Technology       Avg Type: RMS         PNO: Wide       Trig: Free Run         Avg Type: RMS       TRACE P2 # 50 mar 05, 2022         PNO: Wide       Trig: Free Run         Avg Type: RMS       TRACE P2 # 50 mar 05, 2022         PNO: Wide       Trig: Free Run         Avg Type: RMS       TRACE P2 # 50 mar 05, 2022         PNO: Wide       Trig: Free Run         Avg Type: RMS       TRACE P2 # 50 mar 05, 2022         Mar 1							
Start 2.08800 GHz #Res BW 1.0 MHz       Stop 2.10800 GHz Sweep 1.067 ms (8001 pts)         Stop 2.10800 GHz Sweep 1.067 ms (8001 pts)         Stop 2.10800 GHz Sweep 1.067 ms (8001 pts)         Start 2.0800 GHz Sweep 1.067 ms (8001 pts)         Start 2.000 MHz, LTE Narrow Band IoT In Band, Port 1, 15 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 2192.5 M Frequency       Max Value       Limit	-38.0						
Start 2,08800 GHz #Res BW 1.0 MHz Storp 2,10800 GHz #WBW 3.0 MHz* Sweep 1.067 ms (8001 pts) MSG Startus 3and 66, 2110 MHz - 2200 MHz, LTE Narrow Band IoT In Band, Port 1, 15 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 2192.5 M Frequency Max Value Limit Range (dBm) (dBm) Results 1 -20.0 -19 Pass Keysight Spectrum Analyzer - Element Materials Technology RL RF 50 Q DC CORREC SENSE:INT ALIGN AUTO 01:28:05 PM Mar 05, 2022 PNO: Wide ++ Trig: Free Run Avg Type: RMS TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++ Trig: Free Run Avg Hold: 1000/1000 TRACE 02:34 4 M PNO: Wide ++							
Keysight Spectrum Analyzer - Element Materials Technology     Max Out of the Materials Technology     Aug Type: RMS     Trace       RL     RF     50 0 DC     CORREC     SENSE:INT     Aug Type: RMS     TRACE     TRACE     23.4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Start 2.0880 #Res BM 1	0 GHZ 0 MHZ	#V	B)A( 3.0 MH7*		Sween 1	Stop 2.10800 GHz
Band 66, 2110 MHz - 2200 MHz, LTE Narrow Band IoT In Band, Port 1, 15 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 2192.5 M Frequency Max Value Limit Range (dBm) (dBm) Results 1 -20.0 -19 Pass Keysight Spectrum Analyzer - Element Materials Technology RL RF 50 Ω DC CORREC SENSE:INT ALIGN AUTO 01:28:05 PM Mar 05, 2022 PNO: Wide → Trig: Free Run Avg1Ype: RMS TRACE 234 559 PNO: Wide → Trig: Free Run Avg1Ype: RMS Avg1Hold: 1000/1000 TRACE 234 559 PNO: Wide → Trig: Free Run Avg1Hold: 1000/1000 TRACE 234 559 PNO: Wide → Trig: Free Run Avg1Hold: 1000/1000 TRACE 234 559 PNO: Wide → Trig: Free Run Avg1Hold: 1000/1000 TRACE 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 TRACE 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 TRACE 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 559 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 550 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 550 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 550 PNO: Wide → Trig: Pree Run Avg1Hold: 1000/1000 Trace 234 550 PNO: Wide → Trig: PNO: Wi	MSG	°			STATUS	Sincep 1	
Band 66, 2110 MHz - 2200 MHz, LTE Narrow Band IoT In Band, Port 1, 15 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 2192.5 M Frequency Max Value Limit (dBm) (dBm) Results 1 -20.0 -19 Pass Keysight Spectrum Analyzer - Element Materials Technology RL RF 50 Ω DC CORREC SENSE:INT ALIGN AUTO 01:28:05 PM Mar 05, 2022 PNO: Wide → Trig: Free Run HEGain:Low #Atten: 20 dB Nkr1 2:200 000 00 GHz -19.994 dBm 420							
Frequency     Max Value     Limit       Range     (dBm)     (dBm)     Results       1     -20.0     -19     Pass         Keysight Spectrum Analyzer - Element Materials Technology     Image: Complexity of the second seco	3and 66, 2110 MH	z - 2200 MHz, LTE Nar	row Band IoT In	Band, Port 1, 15	MHz Bandwdith, E-TM	M1.1 with N-TM	, High Channel, 2192.5 M
Keysight Spectrum Analyzer - Element Materials Technology     Constant     ALIGN AUTO     O1:28:05 PM Mar 05, 2022       R L     RF     50 Ω     DC     CORREC     SENSE:INT     ALIGN AUTO     01:28:05 PM Mar 05, 2022       PNO: Wide		Frequency			Max Value	Limit (dBm)	Posulte
Keysight Spectrum Analyzer - Element Materials Technology       Image: Constant of the system of the					(dBill)		Page
Keysight Spectrum Analyzer - Element Materials Technology       Image: Constant of the system of the					-20.0	-19	1 0 0 0
M2     RL     RF     50 Ω     DC     CORREC     SENSE:INT     ALIGN AUTO     01:28:05 PM Mar 05, 2022       PNO: Wide →→ IFGain:Low     Trig: Free Run #Atten: 20 dB     Avg Type: RMS Avg Hold: 1000/1000     Trace I2 3 4 5 6 Trype I 2 3 4 5 6 Avg Hold: 1000/1000       Ref Offset 42 dB 10 dB/div     Ref 52.00 dBm     Mkr1 2.200 000 00 GHz -19.994 dBm		'			-20.0	-19	1 835
PNO: Wide         →→         Trig: Free Run #Atten: 20 dB         Avg Hoid: 1000/1000         Trie A DET ANNINN           Ref Offset 42 dB         Mkr1 2.200 000 00 GHz         -19.994 dBm           10 dB/div         Ref 52.00 dBm         -19.994 dBm	🚥 Keysight Spectru	um Analyzer - Element Materials Te	echnology		-20.0	-19	
Ref Offset 42 dB         Mkr1 2.200 000 00 GHz           10 dB/div         Ref 52.00 dBm           42.0         Image: Comparison of the second s	Keysight Spectru (X) RL	um Analyzer - Element Materials Te RF 50 Ω DC CORF	echnology REC	SENSE:INT	ALIGN AUTO Avg Type: F	-19 RMS	01:28:05 PM Mar 05, 2022 TRACE 12 3 4 5 6
10 dB/div Ref 52.00 dBm -19.994 dBm	Keysight Spectru () RL	um Analyzer - Element Materials Ti RF 50 Ω DC CORF	echnology REC PNO: Wide -	SENSE:INT	ALIGN AUTO Avg Type: R Avg Hold: 10	-19 RMS 000/1000	01:28:05 PM Mar 05, 2022 TRACE 1 2 3 4 5 5 TYPE A NUMNIN
42.0		um Analyzer - Element Materials Τι RF 50 Ω DC CORI	echnology REC   PNO: Wide ← IFGain:Low	SENSE:INT Trig: Free Rur #Atten: 20 dB	ALIGN AUTO Avg Type: F Avg Hold: 10	-19 RMS 000/1000 Mikr1.2.2	01:28:05 PMMar 05, 2022 TRACE 12 24 5 6 TYPE 4 MINININ DET ANNININ 2000 0000 00 GH2
42.0	Keysight Spectri M RL	um Analyzer - Element Materials Tr RF 50 Ω DC COR Ref Offset 42 dB Ref 52.00 dBm	echnology REC │ │ │ PNO: Wide ← IFGain:Low	SENSE:INT Trig: Free Rur #Atten: 20 dB	ALIGN AUTO Avg Type: F Avg Hold: 10	-19 RMS 000/1000 Mkr1 2.1	01:28:05 PMMar 05, 2022 TRACE 0.2 3 4 5 6 TYPE 4 WWW OF DET NNNNN 2000 000 00 GHz -19.994 dBm
	Keysight Spectri M RL 10 dB/div F	um Analyzer - Element Materials To RF   50 Ω DC   COR Ref Offset 42 dB Ref 52.00 dBm	echnology NEC PNO: Wide IFGain:Low	SENSE:INT Trig: Free Run #Atten: 20 dB	ALIGN AUTO Avg Type: F Avg Hold: 10	-19 RMS 000/1000 Mkr1 2.:	01:28:05 PMMar 05, 2022 TRACE 12 24 5 6 TYPE A WWW OFT ANNIN N 2000 0000 00 GHz -19.994 dBm







 Band 66, 2110 MHz - 2200 MHz, LTE Narrow Band IoT In Band, Port 1, 15 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 2192.5 MHz..

 Frequency
 Max Value
 Limit

 Range
 (dBm)
 (dBm)
 Results

 3
 -20.9
 -19
 Pass

Keysight Sp	ectrum Analyzer - Element Materia	s Technology					
CA RL	RF   50 Ω DC   C	PNO: Fast	Trig: Free Run #Atten: 22 dB	ALIGN AUTO Avg Type: Avg Hold: '	RMS 1000/1000	01:30:57 TR T	PM Mar 05, 2022 ACE 1 2 3 4 5 6 YPE A WWWW DET A N N N N N
10 dB/div	Ref Offset 42 dB Ref 48.00 dBm				Mkr	1 2.202 1 -20.	80 0 GHz 910 dBm
38.0							
28.0							
18.0							
8.00							
-2.00							
-12.0							DL1 -19.00 dBm
-22.0	an a						lanet forefleren er der meren av
-32.0							
42.0							
Start 2.20 #Res BW	200 GHz 1.0 MHz	#VB	W 3.0 MHz*		Sweep	Stop 2.: p 1.067 ms	22200 GHz (8001 pts)
MSG				STATUS			





VBW 91 kHz

**Power Spectral Density** 

-82.78 dBm /Hz

STATUS

**Channel Power** 

-22.78 dBm / 1 MHz



	Frequency Range			Max Value (dBm)	Limit (dBm)	Results
	3			-22.3	-19	Pass
Keysight Spectrum Analyze	r - Element Materials Teo	hnology				
LCC RF	50 Ω DC CORRE	±C	SENSE:INT	ALIGN AUTO Avg Type: F	RMS	02:08:17 PM Mar 05, 2022 TRACE 1 2 3 4 5
		PNO: Fast 🔸 IFGain:Low	. Trig: Free Run #Atten: 22 dB	Avg Hold: 1	000/1000	
Ref Offse	et 42 dB 00 dBm				Mkr1 2	2.107 860 0 GHz -22.260 dBm
			¥			
42.0						
32.0						
22.0						
12.0						
2.00						
0.00						
-0.00						
-18.0						DI 1-19.00 d
10.0						
-28.0						
-38.0						
#Res BW 1.0 MHz		#VB	3.0 MHz*		Sweep 1	<del>Stop 2.1</del> 0800 GHz 1.067 ms (8001 pts
MSG				STATUS		
					-	
00, 2110 MHz - 220	Frequency	TOW Band Io1 In	Band, Port 1, 201	Max Value	l imit	vi, High Channel, 219
	Range			(dBm)	(dBm)	Results
	1			-21.6	-19	Pass
Keysight Spectrum Analyze	r - Element Materials Teo	hnology				







Band 66, 2110 MHz - 2200 MHz, LTE Narrow Band IoT In Band, Port 1, 20 MHz Bandwdith, E-TM1.1 with N-TM, High Channel, 2190 MHz										
	Frequency Max Value Limit									
		Range			(dBm)	(dBm)	Results			
		3			-19.8	-19	Pass			

Keysight S	pectrum A	nalyzer - Elen	nent Mater	ials Techno	logy							
K RL	RF	50 Ω	DC	CORREC		SE	NSE:INT		ALIGN AUTO		06:48:5	AM Mar 08, 2022
					PNO: Fast • IFGain:Low	•••	Trig: Free #Atten: 22	Run dB	Avg Type: Avg Hold: 1	RMS 000/1000	IT	RACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN
10 dB/div Log	Ref ( <b>Ref</b>	Offset 42 48.00 d	dB Bm						I	Mkr	1 2.202 8 -19	15 0 GHz 768 dBm
38.0												
28.0												
18.0												
8.00												
-2.00												
-12.0	<u>1</u>											
-22.0	·	·***										DL1 -19.00 dBm
-32.0										1		
-42.0												
Start 2.2	0200 0	247									Stop 2	22200 CH7
#Res BV	V 1.0 IV	1Hz			#\	VBW	3.0 MHz*	;		Swee	p 1.067 m	s (8001 pts)
MSG									STATUS			