

XMit 2019.09.05

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	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20

#### **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. For Multiband operation, measurements were taken at the lower band edge of the lower band and the upper band edge of the upper band.

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((N)] to account for the device operation as a N port MIMO transmitter, as per FCC KDB 622911.

For Bands 12 and 14, the adjustment factor is  $-10^{10}(4) = -6 \text{ dB}$ . The Bands 12 and 14 adjusted limit is -19 dBm. For Band 29, the adjustment factor is  $-10^{10}(2) = -3 \text{ dB}$ . The Band 29 adjusted limit is -16 dBm.

For Band 14 band edge measurements from 769MHz-775MHz and 799MHz-807MHz, reference level offset corrections were applied to the spectrum analyzer, according to the following table:

Frequency									
(MHz)	769	769.05	769.1	769.15	769.2	769.25	769.3	769.35	769.4
Correction									
Factor (dB)	50.1	49.2	48.4	47.8	47.3	46.9	46.5	46.2	45.9
		r			r	r		r	
Frequency									
(MHz)	769.45	769.5	769.55	769.6	769.65	769.7	769.75	769.8	769.85
Correction									
Factor (dB)	45.7	45.4	45.2	45.1	44.9	44.7	44.6	44.5	44.4
		r			r	r		r	
Frequency									
(MHz)	769.9	769.95	770	770.5	771	775	776	798	805
Correction									
Factor (dB)	44.3	4.2	44.1	43.3	42.9	41.9	41.8	41.1	41.1

Per section 90.543(e)(3), 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 RRH may operate as a 4 port MIMO transmitter for Band 14.

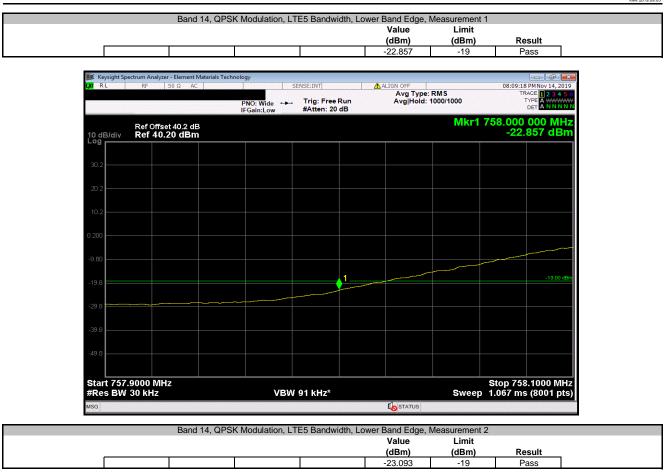
FCC 90.543(e)(5) requires a >100 kHz measurement bandwidth for emissions 100 kHz outside of the RRH operating frequency range. FCC 90.543(e)(5) requires a >30 kHz measurement bandwidth for emissions between 100 kHz outside of the RRH operating frequency range and band edge of the operating frequency range.

FCC 90.543(e)(1) requires an emission limit of -46dBm for any 6.25 kHz bandwidth between frequency bands 769-775 MHz and 799-805 MHz. The limit is adjusted to -52 dBm per 6.25kHz bandwidth [-46 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.



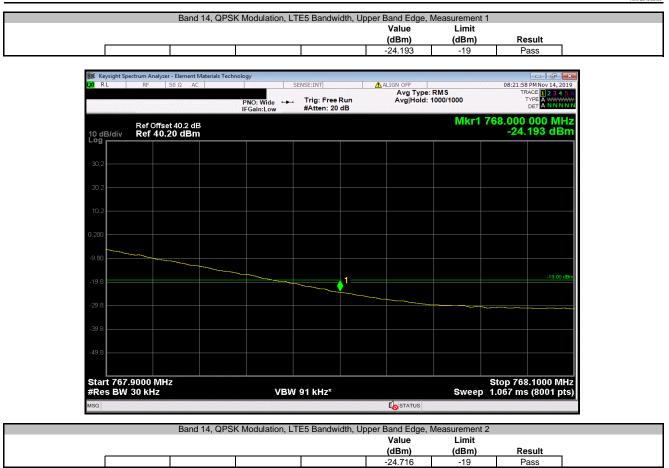
						XMit
	r: K9193514835			Work Order:		
Serial Number Customer	r: Nokia Solutions and N	etworks			18-Nov-19 22.7 °C	
	s: John Rattanavong			Humidity:		
	t: None y: Jonathan Kiefer		Power: 54VDC	Barometric Pres.: Job Site:		
ST SPECIFICA			Test Method		17.00	
C 901:2019			ANSI C63.26:2015			
MMENTS						
nd 14 band edg	ge measurements. Teste	d on highest power antenna port (Port 2). EUT is	is operated at 100% duty cycle.			
VIATIONS FRO	OM TEST STANDARD					
ne						
nfiguration #	2	Signature	nothan Kiefer			
				Value (dBm)	Limit (dBm)	Resul
nd 14	QPSK Modulation			(upin)	(4211)	
	LTE5 Bar					
		Lower Band Edge Measurement 1		-22.857	-19	Pass
		Measurement 2		-23.093	-19	Pass
		Upper Band Edge Measurement 1		-24.193	-19	Pass
		Measurement 2		-24.716	-19	Pass
		Measurement 3		-59.31	-52	Pass
	LTE10 Ba	Measurement 4 ndwidth		-69.848	-52	Pass
	2.2.500	Lower Band Edge				
		Measurement 1 Measurement 2		-25.257 -23.316	-19 -19	Pass
		Upper Band Edge			-19	
		Measurement 1		-28.282	-19	Pass
		Measurement 2 Measurement 3		-26.778 -59.777	-19 -52	Pass Pass
		Measurement 4		-59.777 -70.023	-52 -52	Pass
	16QAM Modulation LTE5 Bar	dwidth				
	LIES BAR	Lower Band Edge				
		Measurement 1		-22.951	-19	Pass
		Measurement 2 Upper Band Edge		-23.269	-19	Pass
		Measurement 1		-24.444	-19	Pass
		Measurement 2		-25.062	-19	Pass
		Measurement 3 Measurement 4		-59.423 -69.768	-52 -52	Pass
	LTE10 Ba			00.700	52	1 43.
		Lower Band Edge		20.014	10	Deer
		Measurement 1 Measurement 2		-26.011 -23.472	-19 -19	Pass Pass
		Upper Band Edge				
		Measurement 1 Measurement 2		-28.055 -27.143	-19 -19	Pass Pass
		Measurement 3		-59.71	-19	Pass
		Measurement 4		-69.804	-52	Pass
	64QAM Modulation LTE5 Bar	dwidth				
	LILU Dai	Lower Band Edge				
		Measurement 1		-23.335	-19	Pas
		Measurement 2 Upper Band Edge		-23.243	-19	Pas
		Measurement 1		-24.175	-19	Pass
		Measurement 2		-24.806	-19	Pass
		Measurement 3 Measurement 4		-59.222 -69.962	-52 -52	Pass
	LTE10 Ba	ndwidth				
		Lower Band Edge Measurement 1		-25.432	-19	Pass
		Measurement 2		-23.432 -23.83	-19	Pass
		Upper Band Edge				
		Measurement 1 Measurement 2		-27.75 -26.474	-19 -19	Pass
		Measurement 3		-59.469	-52	Pass
	256QAM Modulation	Measurement 4		-69.905	-52	Pass
	256QAM Modulation LTE5 Bar	dwidth				
		Lower Band Edge			10	_
		Measurement 1 Measurement 2		-22.633 -23.393	-19 -19	Pas: Pas:
		Upper Band Edge				
		Measurement 1		-24.656	-19	Pass
		Measurement 2 Measurement 3		-24.953 -58.885	-19 -52	Pass Pass
		Measurement 4		-69.877	-52	Pase
	LTE10 Ba					
		Lower Band Edge Measurement 1		-24.563	-19	Pass
		Measurement 2		-23.552	-19	Pase
		Upper Band Edge		07.400	10	Der
		Measurement 1 Measurement 2		-27.469 -26.709	-19 -19	Pass Pass
		Measurement 3 Measurement 4		-59.615	-52 -52	Pass





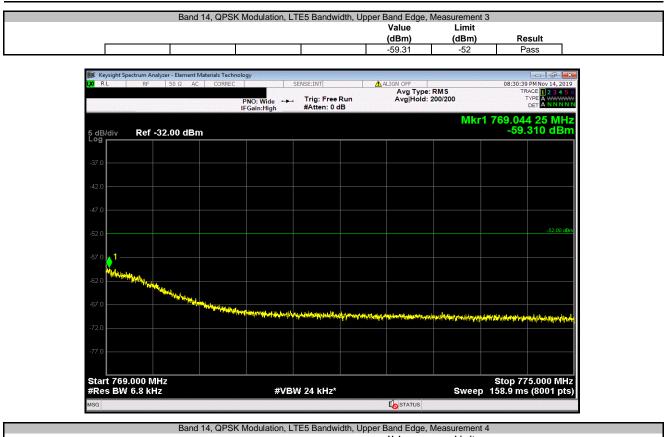
RL         RF         50 Ω         AC	SENSE:INT	ALIGN OFF	08:10:03 PM Nov 14, 20
	PNO: Fast Trig: Free Run IFGain:Low #Atten: 20 dB	Avg Type: RMS Avg Hold: 1000/1	TRACE 1 2 3 4 5 TYPE A WWWW DET A N N N
Ref Offset 40.2 dB dB/div Ref 40.20 dBm			Mkr1 757.900 00 MH -23.093 dBi
2			
.2			
.2			
00			
30			
.8			11
.8			
.8			
.8			
art 726.00 MHz			Stop 768.00 Mi
les BW 100 kHz	VBW 300 kHz*		Stop 768.00 Mi Sweep 5.333 ms (8001 pt





RL RF 50 Ω AC	terials Technology	SENSE:INT	ALIGN OFF	08:22:35 PM Nov 14, 20
	PNO: Fast IFGain:Low		Avg Type: RMS Avg Hold: 1000/1000	TRACE 1 2 3 4 5 TYPE A WWW DET A NNNN
Ref Offset 40.2 dB			N	lkr1 768.100 00 MH -24.716 dBi
.2				
.2				
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)0				
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8	1			-19.00 (
~				
8				
.8				
art 758.00 MHz				Stop 808.00 Mł eep 6.400 ms (8001 pł
tes BW 100 kHz		/BW 300 kHz*	Sw Costatus	eep 6.400 ms (8001 pt





		Value	Limit	
		(dBm)	(dBm)	Result
		-69.848	-52	Pass

RL	RF 50 Ω A0	CORREC		SENSE:INT		ALIGN OFF		08:31:43	PM Nov 14, 201
		PI	NO: Wide 🔸	Trig: Free #Atten: 0 d	Run	Avg Type: Avg Hold: 2		TR T	ACE 1 2 3 4 5 YPE A DET A NNN
dB/div	Ref -32.00 dBi	m					N	lkr1 802. -69.	937 MH 848 dBi
°g									
7.0									
2.0									
7.0									
									-52.00 d
2.0									-52.00 di
7.0									
2.0									
7.0					1				
والمساور والم	els News and I saw what is share to the second s	يحمل احالى فرو فلانته والجلو المراد مع	وأروا ومناحضا المقالات فالد	المعر بالمائنة ومعادمة المناهسة		الألامية الميلادية والداري	والمحاجز المراجع والمحاجز أوار وتحاذلو	in ei bis bekene ein eithe	والمحادثة المفاقله والمسا
2.0			فنفتر إيلا أستنتم يتبي		and the second s	and the second secon			
7.0									
	.000 MHz							Stop 80	7.000 MH
Res BW	6.8 kHz		#VB	W 24 kHz*			Sweep	211.7 ms	(8001 pt



			Value (dBm)	Limit (dBm)	Result
			-25.257	-19	Pass
📁 Keysight Spectrum Analyzer - Element Ma					
LX/RL RF 50Ω AC		SENSE:INT	ALIGN OFF	RMS	07:38:46 PM Nov 14, 2019
	PNO: Wide ← IFGain:Low	<ul> <li>Trig: Free Run #Atten: 20 dB</li> </ul>		1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNN
Ref Offset 40.2 dB 10 dB/div Ref 40.20 dBm				Mkr1	758.000 000 MHz -25.257 dBm
Log					
30.2					
20.2					
10.2					
0.200					
-9,80					
0.00					
-19.8		1			19. <del>00 dDm</del>
-29.8					
-39.8					
-49.8					
40.0					
Start 757.9000 MHz #Res BW 30 kHz	VE	W 91 kHz*		Swoon	Stop 758.1000 MHz 1.067 ms (8001 pts)
MSG	915		STATUS	Sweep	1.007 ms (8001 pts)
MSG			LO STATUS		
Band 1	4, QPSK Modulation,	LTE10 Bandwidth. L	ower Band Edge	. Measurement	2
	,	,	Value	Limit	
			(dBm)	(dBm)	Result
			-23.316	-19	Pass

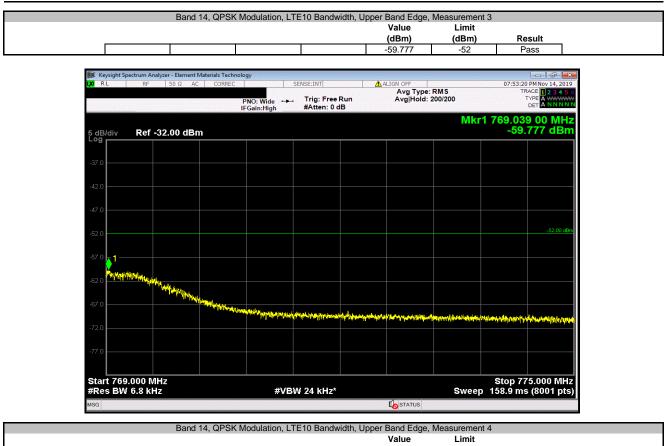
RL	RF 50 Ω AC	SENSE:INT	ALIGN OFF	07:40:13 PM Nov 14, 201
		PNO: Fast ↔ Trig: Free Run IFGain:Low #Atten: 20 dB	Avg Type: RMS Avg Hold: 1000/1000	TRACE 1 2 3 4 5 TYPE A WWW DET A NNNN
) dB/div	Ref Offset 40.2 dB Ref 40.20 dBm		Mk	r1 757.900 00 MH -23.316 dBi
0.2				
).2				
).2				
00				
30				
.8			1 -	-19.00 c
.8				
.8				
.8				
	.00 MHz 100 kHz	VBW 300 kHz*	Swee	Stop 768.00 MH p 5.333 ms (8001 pt
G			STATUS	



				Value	Limit	Deset
		-		(dBm) -28.282	(dBm) -19	Result Pass
				-20.202	-19	F d 55
						· · · · ·
Keysight Spectrum Analy	yzer - Element Materials Te 50 Ω AC	chnology	SENSE:INT	ALIGN OFF		07:40:42 PM Nov 14, 2019
	JU SZ AC			Avg Type:	RMS	TRACE 1 2 3 4 5 6
		PNO: Wide ↔ IFGain:Low	_, Trig: Free Run #Atten: 20 dB	Avg Hold:	1000/1000	TRACE 2 3 4 5 6 TYPE A WWWWW DET A N N N N
		IFGain:Low	#Atten: 20 db		Milered	768.000 000 MHz
Ref Off 10 dB/div Ref 40	<sup>:</sup> set 40.2 dB 0 <b>.20 dBm</b>				WIKET	-28.282 dBm
Log	1					
30.2						
20.2						
10.2						
0.200						
-9.80						
-19.8						-19.00 dBm
-13.0			1			
-29.8						
20.0						
-39.8						
-49.8						
04						04 700 4000 Mill-
Start 767.9000 M #Res BW 30 kHz		VB	W 91 kHz*		Sween	Stop 768.1000 MHz 1.067 ms (8001 pts)
MSG		UD.	W 31 KHZ	STATUS	omeep	1.001 m3 (0001 pt3)
Dem				STATUS		
	Band 14 OP	SK Modulation	TE10 Bandwidth, U	pper Band Edge	Measurement	2
				Value	Limit	<b>_</b>
				(dBm)	(dBm)	Result
				-26.778	-19	Pass

RL	RF	50 Ω AC		5	SENSE:INT	ALIGN OFF		07:41:07 PM Nov	14,20
			PNO: F IFGain:L	ast ⊶⊷ ₋ow	Trig: Free Run #Atten: 20 dB	Avg Type: Avg Hold:	1000/1000	TRACE 1 TYPE A DET A	N N N I
dB/div	Ref Offse Ref 40.2	t 40.2 dB 20 dBm				1	Mkr1	768.100 00 -26.778	M⊦ dB
.2									
.2									
.2									
10									
8		<b>X</b>							
8		1							
8									
.8									
	3.00 MHz / 100 kHz			VBW	300 kHz*		Sween	Stop 808.00 6.400 ms (800	0 MI
	TOOMITE				OUD MIL	STATUS	encop	01100 1110 (000	

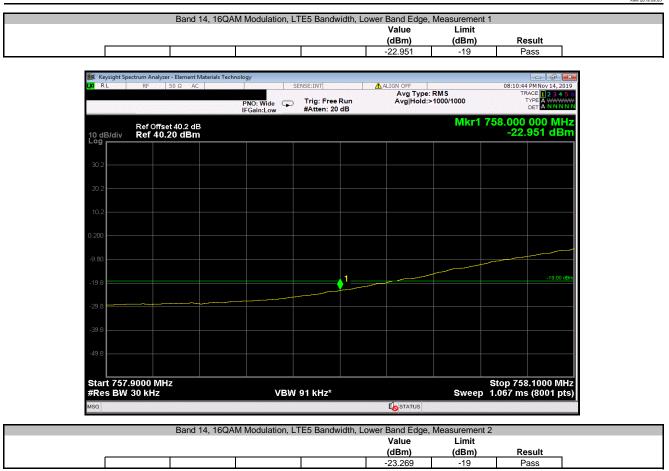




	Danu 14, QPSN	wooulation, LIE	TO Bandwidth, O	pper banu cuge,	Measurement 4	
				Value	Limit	
				(dBm)	(dBm)	Result
				-70.023	-52	Pass

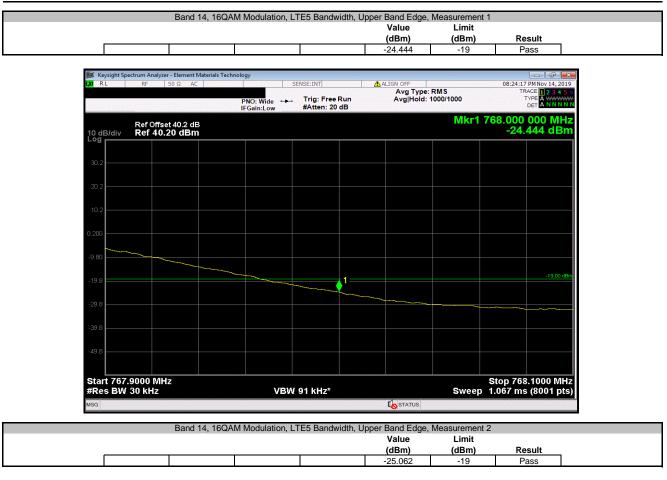
RL	RF 50 Ω AC	CORREC	SENSE:INT	ALIGN OFF	07:54:24 PM Nov 14, 201
		PNO: Wide IFGain:High		Avg Type: RMS Avg Hold: 200/20	TRACE 1 2 3 4 5
dB/div	Ref -32.00 dBm				Mkr1 805.217 MH -70.023 dBr
7.0					
/.0					
2.0					
7.0					
2.0					-52.00 di
2.0					
7.0					
2.0					
7.0					
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2.0		line to be a state of the state		an the second	tele and the distant of a start of the articles and start and sample same distant
7.0					
7.0					
	.000 MHz ' 6.8 kHz	#	VBW 24 kHz*		Stop 807.000 MH Sweep 211.7 ms (8001 pt
G				STATUS	





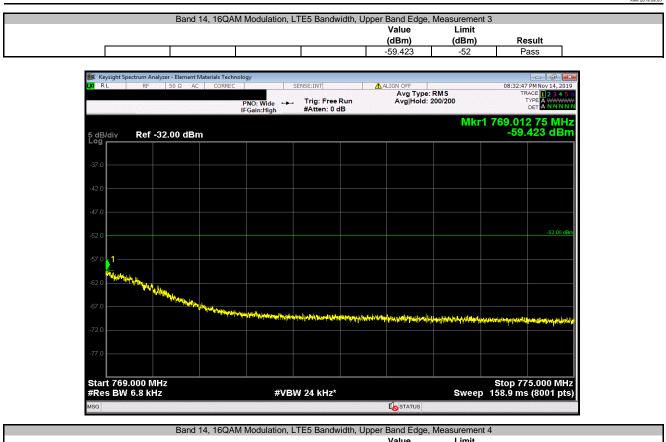
RL RF 50 Ω AC		SENSE:INT	ALIGN OFF		8:11:10 PM Nov 14, 20
	PNO: Fast ++- IFGain:Low	. Trig: Free Run #Atten: 20 dB	Avg Type: RM Avg Hold: 100	AS 10/1000	TRACE 1 2 3 4 5 TYPE A WWW DET A NNN
Ref Offset 40.2 dB dB/div Ref 40.20 dBm				Mkr1 75	7.900 00 MH -23.269 dBi
0.2				mm	4
.2					
0.2					
00					
80					
.8				1	-19.00
.0				mana and a second s	
.8					
.8					
art 726.00 MHz Res BW 100 kHz	VBM	√ 300 kHz*		Sween 533	top 768.00 Mi 3 ms (8001 pi
G G		1 000 KH2	STATUS	eweep 3.30	o mo tooo r pi





RL R	F 50 Ω AC		SENSE:INT	ALIGN OFF		08:24:41 PM Nov 14, 201
	1 1 20 32 AC		nst 🛶 Trig: Free Ru	Avg Type: R		TRACE 1 2 3 4 5
		IFGain:L		3		DETANNN
Re	f Offset 40.2 dB				Mkr1 7	68.100 00 MH -25.062 dBr
0 dB/div Re	ef 40.20 dBm					-25.062 dBr
°g						
0.2	man					
0.2						
0.2						
0.2						
0.2						
0.2						
200						
.80						
9.8		1				-19.00 d
	- <b>-</b>					
9.8						
~~~						
9.8						
9.8						
tart 758.00 I						Stop 202 00 MH
Res BW 100			VBW 300 kHz*		Sweep 6.4	Stop 808.00 MH 400 ms (8001 pt
G				STATUS		





		 Value	Limit	
		(dBm)	(dBm)	Result
		-69.768	-52	Pass

RL	RF 50 Ω A	CORREC		SENSE:INT	🚹 Al	IGN OFF	and the second second		PM Nov 14, 201
			PNO: Wide ↔→ FGain:High	. Trig: Free Ru #Atten: 0 dB		Avg Type: Avg Hold:		Т	ACE 1 2 3 4 5 TYPE A DET A NNN
	Ref -32.00 dB	m					N	lkr1 805. -69.	857 MF 768 dBi
<sup>,g</sup>									
7.0									
2.0									
2.0									
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2.0									-52.00 d
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2.0	an an in the first of the second s	فالجوار معوالها أوارتها وغواد	an farighter and		the state of the s	-		line the second second	ah tan kating saya tan kating sa
7.0									
art 799.00 Res BW 6.			#VB	W 24 kHz*			Sween	Stop 80 211.7 ms	7.000 MH



				Value	Limit	
				(dBm)	(dBm)	Result
				-26.011	-19	Pass
	m Analyzer - Element Materials RF 50 Ω AC	Technology	SENSE:INT	ALIGN OFF		07:41:51 PM Nov 14, 2019
	Nº JU X AC			Avg Type	RMS	TRACE 1 2 3 4 5 (
		PNO: Wide ← IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold:	: 1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNN
_		II Guilleow			Mkr1	758.000 000 MHz
R 10 dB/div	ef Offset 40.2 dB ef <b>40.20 dBm</b>					-26.011 dBm
10 dB/div R	01 40.20 dBm					
30.2						
20.2						
10.2						
).200						
-9.80						
-9.00						
-19.8						-19.00 dBm
-13.0			↓ 1			
-29.8						
-39.8						
-49.8						
Start 757.90	00 MH-2					Stop 758.1000 MHz
#Res BW 30		VE	SW 91 kHz*		Sweep	1.067 ms (8001 pts)
MSG				STATUS		
				<b>.</b>		
	Band 14, 16	QAM Modulation,	, LTE10 Bandwidth, L	ower Band Edge	e, Measurement	t 2
				Value	Limit	
				(dBm)	(dBm)	Result
				-23.472	-19	Pass

RL RF 50 Ω AC		SENSE:INT	ALIGN OFF	07:42:26 PM Nov 14, 2019
	PNO: Fast ↔ IFGain:Low	. Trig: Free Run #Atten: 20 dB	Avg Type: RMS Avg Hold: 1000/100	0 TRACE 1 2 3 4 5 TYPE A WWWWA DET A N N N N
Ref Offset 40.2 dB 0 dB/div Ref 40.20 dBm				Mkr1 757.900 00 MH: -23.472 dBn
0.2				month
0.2				
200				
.80				1
9.8				
9.8				
9.8 tart 726.00 MHz				Stop 768.00 MH
Res BW 100 kHz	VBV	V 300 kHz*	4	weep 5.333 ms (8001 pts



				Value	Limit	
			-	(dBm)	(dBm)	Result
				-28.055	-19	Pass
-						
Keysight Spectrum Ar	alyzer - Element Materials T 50 Ω AC		SENSE:INT	ALIGN OFF		07:42:47 PM Nov 14, 2019
KL RF	50 52 AL		SENSE:INT	Avg Type:	RMS	TRACE 1 2 3 4 5 6
		PNO: Wide ++-	. Trig: Free Run #Atten: 20 dB	Avg Hold:	1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNN
		IFGain.Low	"Atten. 20 ab		Mkr1 7	68.000 000 MHz
Ref C 10 dB/div Ref	)ffset 40.2 dB <b>40.20 dBm</b>					-28.055 dBm
10 dB/div Ref						
30.2						
20.2						
10.2						
10.2						
0.200						
0.200						
-9.80						
-19.8						-19.00 dBm
			↓ <sup>1</sup>			
-29.8						
-39.8						
-49.8						
-49.8						
Start 767.9000						Stop 768.1000 MHz
#Res BW 30 kH	Z	VBV	V 91 kHz*		Sweep	1.067 ms (8001 pts)
MSG				STATUS		
	Band 14_160	AM Modulation	.TE10 Bandwidth, U	Inner Band Edge	Measurement	2
	Danu 14, 100	er ini mouulation, L		Value	Limit	<u>_</u>
				(dBm)	(dBm)	Result
				-27.143	-19	Pass

RL	RF 50 Ω AC			SENSE:INT	ALIGN OFF		07:43:19 PM Nov 14, 201
	-		PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: R Avg Hold: 10	00/1000	TRACE 1 2 3 4 5 TYPE A WWW DET A N N N
dB/div	Ref Offset 40.2 df Ref 40.20 dBm	3 1				Mkr1	768.100 00 MH -27.143 dBr
D.2	m						
0.2							
).2							
30							
.8							-19.00 d
.8		1					
.8		L					
.8							
art 758.							Stop 808.00 MH
tes BW	100 kHz		VBW	/ 300 kHz*	<b>I</b> STATUS	Sweep (	6.400 ms (8001 pt





		Value	Limit	
		(dBm)	(dBm)	Result
		-69.804	-52	Pass

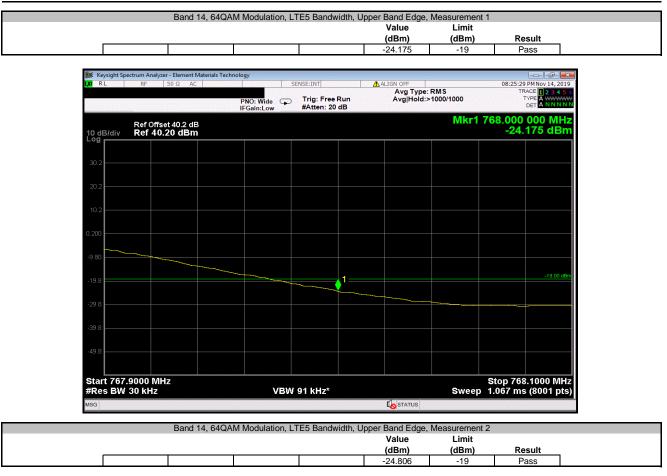
RL	RF 50 Ω A	CCORREC		SENSE:INT	1	ALIGN OFF		07:56:46	PM Nov 14, 201
			PNO: Wide ↔ IFGain:High		un	Avg Type: F Avg Hold: 20		TR. T	ACE 1 2 3 4 5 YPE A DET A NNN
dB/div	Ref -32.00 dB	m					Μ	kr1 800. -69.	741 MH 804 dBr
<sup>og</sup>									
7.0									
2.0									
7.0									
2.0									-52.00 d
7.0									
2.0									
7.0		1 1							
2.0 <b>4.44444</b>	kyrtiniydiyylydoratinyfyddiaetorafiiyda	and the second second	Hick and an all the st	a the second	and the second secon	y ny desire in the party of the state	ininingin katala	ishma didini da	an a
7.0									
	.000 MHz								7.000 MH
Res BW	6.8 kHz		#VE	3W 24 kHz*			Sweep	211.7 ms	(8001 pt





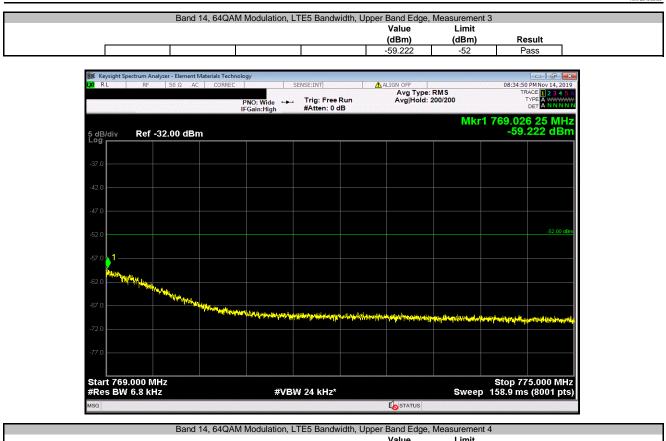
Keysight Spectrum Analyzer - Element Materials To           RL         RF         50 Ω         AC		erree starl	•	-	8:12:30 PM Nov 14, 201
KL N- 3032 AC	PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB	ALIGN OFF Avg Type: RMS Avg Hold: 1000/		TRACE 1 2 3 4 5 TYPE A WWW DET A NNNN
Ref Offset 40.2 dB dB/div Ref 40.20 dBm				Mkr1 757	.900 00 MH -23.243 dBr
0.2					
0.2					
.2					
00					
30					
.8				l_	-19.00 c
.8				~	
.8					
.8					
art 726.00 MHz				S	top 768.00 MI
Res BW 100 kHz	VBW	300 kHz*	<b>I</b> STATUS	Sweep 5.33	3 ms (8001 pt





	ectrum Analyzer - Element M	laterials Technology						
RL	RF 50 Ω AC		S	ENSE:INT	ALIGN OFF			3 PM Nov 14, 201
	-	PN IFG	O: Fast ↔→→ ain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: Avg Hold: /	1000/1000		TYPE A WWW DET A NNNN
) dB/div	Ref Offset 40.2 dB Ref 40.20 dBm					Mkr	1 768.10 -24.	0 00 MH 806 dBr
0.2								
).2								
).2								
00								
80								
.8		1						-19.00 c
~		L						
.8								
9.8								
art 758. Res BW	00 MHz 100 kHz		VBW	300 kHz*		Sweep	Stop 8 6.400 ms	808.00 MF s (8001 pt
G					STATUS			





		Value	Limit	
		(dBm)	(dBm)	Result
		-69.962	-52	Pass

RL	RF 50 Ω	AC CORREC		SENSE:INT		ALIGN OFF		08:35:51	PM Nov 14, 201
			PNO: Wide ↔ IFGain:High	. Trig: Free F #Atten: 0 dl		Avg Type:   Avg Hold: 2		٦	ACE 1 2 3 4 5 TYPE A WWWWA DET A NNNN
dB/div	Ref -32.00 dE	3m					N	lkr1 806. -69.	.401 MH 962 dBr
<sup>og</sup>									
7.0									
2.0									
7.0									
2.0									-52.00 d
7.0									
2.0									
7.0									1
2.0	united and the second states of the second states o	and which we are	united for the state of the sta	niki wana pana mana ka	a y filment an	en e	uda yaya kata ya kata y	here (special division)	state the sector
7.0									
tart 799	.000 MHz								7.000 MH
Res BW	6.8 kHz		#VB	W 24 kHz*			Sweep	211.7 ms	; (8001 pt



			Value	Limit	Dessil
[]			(dBm) -25.432	(dBm) -19	Result Pass
			-20.432	-19	FdSS
📜 Keysight Spectrum Analyzer - Element Mate	rials Technology				
V RL RF 50Ω AC		SENSE:INT	ALIGN OFF		07:44:10 PM Nov 14, 2019
	PNO: Wide ↔ IFGain:Low	⊶ Trig: Free Run #Atten: 20 dB	Avg Type Avg Hold:	: RMS 1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N
Ref Offset 40.2 dB 10 dB/div Ref 40.20 dBm				Mkr1 7	58.000 000 MHz -25.432 dBm
Log					
20.3					
30.2					
20.2					
10.2					
0.200					
-9.80					
-9.80					
-19.8					
		· · · ·			
-29.8					
-39.8					
-49.8					
Start 757.9000 MHz #Res BW 30 kHz	VB	W 91 kHz*		Sweep 1	top 758.1000 MHz .067 ms (8001 pts)
MSG		W 31 KHZ	STATUS	oweeb i	.001 113 (0001 pt3)
			<b>N</b>		
Band 14,	64QAM Modulation,	LTE10 Bandwidth, I	0		
			Value	Limit	
			(dBm)	(dBm)	Result
	I	<u> </u>	-23.83	-19	Pass
10 Keysight Spectrum Analyzer - Element Mate					

ISG			
Start 726.00 MHz #Res BW 100 kHz	VBW 300 kHz*		Stop 768.00 MHz Sweep 5.333 ms (8001 pts
49.8			
39.8	There is a second and the second and		
29.8			
19.8			-19:00 dB
9.80			-19.00 dB
.200			
10.2			
20.2			
30.2			
0 dB/div Ref 40.20 dBm			-23.850 dBi
Ref Offset 40.2 dB			Mkr1 757.900 00 MH -23.830 dBn
	PNO: Fast ++- Trig: Free IFGain:Low #Atten: 20	Avg Type: RM Run Avg Hold: 100 dB	
RL RF 50Ω AC	SENSE:INT	ALIGN OFF	07:44:37 PM Nov 14, 2019



				Value (dBm)	Limit (dBm)	Result
				-27.75	-19	Pass
				21.15	15	1 433
	m Analyzer - Element Materials RF 50 Ω AC		ENSE:INT	ALIGN OFF		07:46:23 PM Nov 14, 2019
				Avg Type	RMS	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNN
		PNO: Wide	Trig: Free Run #Atten: 20 dB	Avg Hold:	: 1000/1000	DET A NNNN
		in Guineon anno			Mkr1 7	58.000 000 MHz
10 dB/div R	ef Offset 40.2 dB ef <b>40.20 dBm</b>					-27.750 dBm
Log						
30.2						
20.2						
10.2						
0.200						
-9.80						
						-19.00 dBm
-19.8			1			
-29.8						
20.0						
-39.8						
-49.8						
<u>م الم ا</u>						
Start 767.90 #Res BW 30		VDW	91 kHz*		Success	top 768.1000 MHz .067 ms (8001 pts)
	NHZ	VBW	91 KHZ"	A	Sweep 1	.007 ms (8001 pts)
MSG				<b>I</b> STATUS		
	Dond 14 CA	QAM Modulation, L		Inner Dand Eda	Maggurament	
	Band 14, 64	QAIN NOQUIATION, L	i E i o Bandwidth, C	Value	e, Measurement 2 Limit	
				(dBm)	(dBm)	Result

RL RF 50 Ω AC		SENSE:INT	ALIGN OFF		07:46:59 PM Nov 14, 201
	PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: RN Avg Hold: 100		TRACE 1 2 3 4 5 TYPE A WWW DET A NNNN
Ref Offset 40.2 dB B/div Ref 40.20 dBm				Mkr1 7	68.100 00 MH -26.474 dBi
2					
2					
2					
3					-19.00
<b>\</b>					
3					
3					
3					
urt 758.00 MHz es BW 100 kHz	VBIA	/ 300 kHz*		Swoon_6	Stop 808.00 Mi 400 ms (8001 pt





		Value	Limit	
		(dBm)	(dBm)	Result
		-69.905	-52	Pass

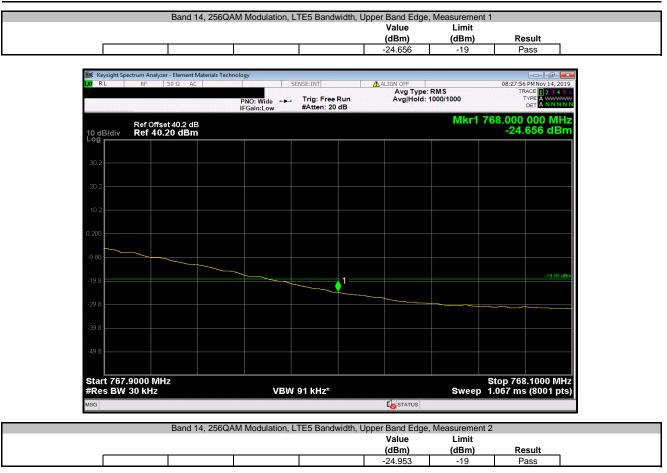
RL	RF 50 Ω A0	CORREC		SENSE:INT		ALIG	N OFF		07:58:4	6 PM Nov 14, 201
			PNO:Wide ↔ FGain:High				Avg Type: Avg Hold: 2		TI	RACE 12345 TYPE A WWW DET A NNNN
dB/div	Ref -32.00 dBi	m						Ν		.612 MH .905 dBr
<sup>og</sup>										
7.0										
2.0										
7.0										
2.0										-52.00 d
7.0										
2.0										
7.0		<b>↓</b> 1								
2.0 <b>Ministry 1</b>	ti filmini bi se here de altera de se tita	i na shekara na shekar Na shekara na	n an	ne se	e internet i Internet internet inter	n di pilipation	ndetworkely M	a de la desta de la desta La desta de la d	<mark>elistensiene</mark> tist	adjoint form and
7.0										
	.000 MHz 6.8 kHz		#\/F	- 3W 24 kHz*				Sween		07.000 MH s (8001 pt
G			<i>"</i> ••E			~	STATUS	Sweep		, our pu





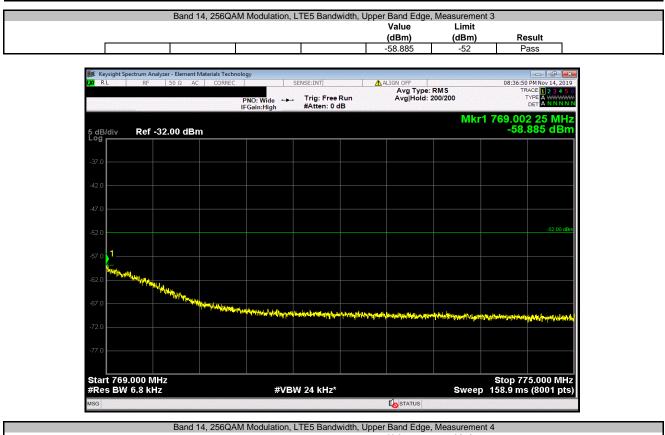
Avg Type: RMS Avg Hold: 1000/1000 Type: Avg  Mkr1 757.900 00 MH -23.393 dB
Mkr1 757.900 00 Ml -23.393 dB
-19.00
Stop 768.00 MI Sweep   5.333 ms (8001 p





		ALIGN OFF		08:28:47 PM Nov 14, 20
PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: I Avg Hold: 1	000/1000	TRACE 1 2 3 4 5 TYPE A WWW DET A N N N
			Mkr1	768.100 00 MH -24.953 dBi
				-19.00 (
******				**************************************
				Stop 808.00 Mi
VBW	300 kHz*		Sweep 6	Stop 808.00 Mi 5.400 ms (8001 pt
	IFGain:Low		#Atten: 20 dB	IFGain:Low       #Atten: 20 dB         Image: Comparison of the second of th





	Band 14, 256QA	AM Modulation, L	IE5 Bandwidth, U	Ipper Band Edge,	, Measurement 4	
				Value	Limit	
				(dBm)	(dBm)	Result
				-69.877	-52	Pass

RL	RF	Analyzer - Eler 50 Ω	AC	CORREC		5	ENSE:INT		ALIGN OFF		08:37:	5 PM Nov 14, 201
NC.		100 11			PNO: Wide IFGain:High		Trig: Free F #Atten: 0 dl	Run	Avg Type Avg Hold	e: RMS : 200/200		RACE 12345 TYPE A WWW DET A NNNN
dB/div	Rei	f -32.00 (	dBm								Mkr1 804 -69	.633 MH .877 dBr
<sup>og</sup>												
7.0												
2.0												
<sup>7.0</sup>												
2.0												-52.00 d
7.0												
2.0												
7.0										1		
2.0	-	in the second	n de la compañía de l	n inder Antolia	wante particularite de la construcción de la construcción de la construcción de la construcción de la construcc	Aberry A	hand the state of the second	ana in the state	and the for the state of the st	THE PARAMETER	den an	+hand hand the
7.0												
	99.000 W 6.8 I				#	VBV	V 24 kHz*			Swee	Stop 8 p 211.7 m	07.000 MH
		ani-							STATUS	owcc	р—2-тат III	o tooor pr



			Value (dBm)	Limit (dBm)	Result
			-24.563	-19	Pass
Keysight Spectrum Analyzer - Element Materials	Technology	course turi			
LXI RL RF 50Ω AC		SENSE:INT	ALIGN OFF Avg Type	RMS	07:49:37 PM Nov 14, 2019 TRACE 1 2 3 4 5 6
	PNO: Wide ↔ IFGain:Low	Atten: 20 dB	Avg Hold:		DET A WWWWWW DET A N N N N N
Ref Offset 40.2 dB 10 dB/div Ref 40.20 dBm				Mkr1 75	8.000 000 MHz -24.563 dBm
30.2					
20.2					
10.2					
10.2					
0.200					
0.200					
-9.80					
-19.8		1			
-29.8					
-39.8					
-49.8					
Start 757.9000 MHz				S	top 758.1000 MHz
#Res BW 30 kHz	VB	W 91 kHz*		Sweep 1	.067 ms (8001 pts)
MSG			To STATUS		
Des L14.050				- M	
Band 14, 256	QAIVI IVIODUIATION,	LTE10 Bandwidth,	Lower Band Edg	e, Measurement 2	
			(dBm)	(dBm)	Result
			-23.552	-19	Pass
	•	•	•	•	· · · ·

RL	RF 50 Ω AC	SE	NSE:INT	ALIGN OFF		07:50:02 PM Nov 14, 20
		PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: F Avg Hold: 10		TRACE 1234 TYPE A WWW DET A NNNI
) dB/div	Ref Offset 40.2 dB Ref 40.20 dBm				Mkr1 7	57.900 00 MH -23.552 dBi
-						
).2						
).2						
).2						
30						
.8					1	-19.00 (
.8					and and and	
			man and a second se			
9.8						
	00 MHz 100 kHz	VBW	300 kHz*		Sweep 5.3	Stop 768.00 MH 333 ms (8001 pt
G				STATUS		



				Value	Limit	
				(dBm)	(dBm)	Result
				-27.469	-19	Pass
	Analyzer - Element Materials	Technology				
LXVIRL RI	F 50 Ω AC		SENSE:INT		DME	07:50:24 PM Nov 14, 2019
		PNO:Wide ←	📕 Trig: Free Run			TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNN
		IFGain:Low	#Atten: 20 dB			
Ret	f Offset 40.2 dB				Mkr1 7	68.000 000 MHz
10 dB/div Re	f 40.20 dBm					-27.469 dBm
Log						
30.2						
20.2						
20.2						
10.2						
10.2						
0.000						
0.200						
-9.80						
10.0						-19.00 dBm
-19.8			1			
-29.8						
-29.0						
-39.8						
-50.0						
-49.8						
10.0						
Start 767.900						Stop 768.1000 MHz
#Res BW 30 k	Hz	VE	SW 91 kHz*		Sweep 7	1.067 ms (8001 pts)
MSG				to status		
	Band 14, 256	6QAM Modulation	n, LTE10 Bandwid	th, Upper Band Edge		2
				Value	Limit	Beerk
				(dBm) -26.709	(dBm) -19	Result Pass

RL RF 50Ω A	t Materials Technology	S	ENSE:INT	ALIGN OFF			PM Nov 14, 2019
	PN0 IFGa	D: Fast ↔→ ain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: I Avg Hold: 1	000/1000		ACE 12345 TYPE A WWWM DET A NNNN
Ref Offset 40.2 c 0 dB/div Ref 40.20 dB	IB n				Mkr	1 768.10 -26.	0 00 MH: 709 dBn
30.2							
20.2							
10.2 -							
200							
9.80							
9.8							-19.00 dE
9.8	•. 						
9.8			·····			**************************************	
19.8							
tart 758.00 MHz Res BW 100 kHz		VBW	300 kHz*		Sweep	Stop 8 6.400 ms	08.00 MH s (8001 pt
SG				STATUS			





		Value	Limit	
		(dBm)	(dBm)	Result
		-69.961	-52	Pass

RL RF 50 Ω AC C	ORREC	SENSE:INT	ALIGN OFF		9 PM Nov 14, 201
	PNO: Wide ↔ IFGain:High	. Trig: Free Run #Atten: 0 dB	Avg Type: RMS Avg Hold: 200/200		TYPE A WWW DET A NNNN
dB/div Ref -32.00 dBm				Mkr1 805 -69.	.598 MF 961 dBi
7.0					
2.0					
7.0					
2.0					-52.00 d
2.0					
7.0					
2.0					
7.0				1	
2.0 <b>a desina farenya de a na seria de a de</b>	dan diki ang dan distan kanapanti ya si	nyy hada ay ini dalah si siya hagang	aliterative the state of the internet state of the state of the	en fridader innan Undahander auge	en an the states of the states
7.0					
tart 799.000 MHz				Stop %	)7.000 MH
Res BW 6.8 kHz	#VB	W 24 kHz*		Sweep 211.7 ms	s (8001 pt



XMit 2019.09.05

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	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20

#### **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. For Multiband operation, measurements were taken at the lower band edge of the lower band and the upper band edge of the upper band.

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((N)] to account for the device operation as a N port MIMO transmitter, as per FCC KDB 622911.

For Bands 12 and 14, the adjustment factor is  $-10^{*}\log(4) = -6$  dB. The Bands 12 and 14 adjusted limit is -19 dBm. For Band 29, the adjustment factor is  $-10^{*}\log(2) = -3$  dB. The Band 29 adjusted limit is -16 dBm.

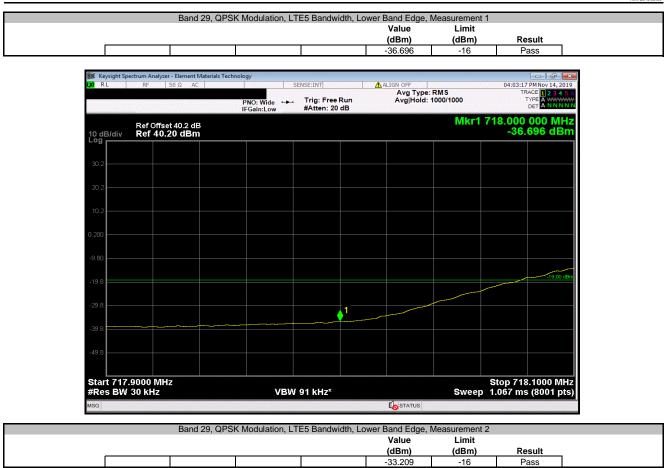
Per FCC section 27.53(g), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -16 dBm [-13 dBm -10 log (2)] per FCC KDB 662911D01 v02r01 because the RRH may operate as a 2 port MIMO transmitter for Band 29.

FCC 27.53(g) requires a >100 kHz measurement bandwidth for emissions 100 kHz outside of the RRH operating frequency range. FCC 27.53(g) requires a >30 kHz measurement bandwidth for emissions between 100 kHz outside of the RRH operating frequency range and band edge of the operating frequency range.



					XMit 2011
EUT: AHLBBA			Work Order:		Juni 201
Serial Number: K9193514				18-Nov-19	
Customer: Nokia So			Temperature:		
Attendees: John Rat Project: None	anavong		Humidity: Barometric Pres.:	29.9% RH	
Tested by: Jonathan	Kiefer	Power: 54VDC	Job Site:		-
ST SPECIFICATIONS		Test Method	000 0110.	17.05	
C 27:2019		ANSI C63.26:2015			
OMMENTS					
and 29 band edge measure		Port 1). EUT is operated at 100% duty cycle. Note: altho	ugh screen capture display line is at -19 dBn	n, compliance limit	: is -16 dBm.
ne					
onfiguration #	2	Jonathan Kiefen			
, and the second	Signature	Summer and the Ber			
			Value (dBm)	Limit (dBm)	Result
ind 29			(dBiii)	(ubili)	Result
QPSK Mo	LTE5 Bandwidth				
	Lower Band Edge Measurement 1		-36.696	-16	Pass
	Measurement 2		-33.209	-16	Pass
	Upper Band Edge			10	
	Measurement 1		-35.764	-16	Pass
	Measurement 2		-32.316	-16	Pass
	LTE10 Bandwidth				
	Lower Band Edge Measurement 1		-32.338	-16	Pass
	Measurement 2		-32.336 -30.581	-16	Pass Pass
	Upper Band Edge		00.001	10	1 435
	Measurement 1		-38.315	-16	Pass
	Measurement 2		-34.305	-16	Pass
16QAM N					
	LTE5 Bandwidth				
	Lower Band Edge Measurement 1		-36.684	-16	Pass
	Measurement 2		-33.493	-16	Pass
	Upper Band Edge		00.100	10	1 400
	Measurement 1		-35.547	-16	Pass
	Measurement 2		-32.809	-16	Pass
	LTE10 Bandwidth				
	Lower Band Edge		-40.605	46	Deee
	Measurement 1 Measurement 2		-40.605 -35.32	-16 -16	Pass Pass
	Upper Band Edge		-30.32	-10	F d55
	Measurement 1		-38.221	-16	Pass
	Measurement 2		-34.389	-16	Pass
64QAM N					
	LTE5 Bandwidth				
	Lower Band Edge		00.700	40	Beer
	Measurement 1 Measurement 2		-36.733 -33.067	-16 -16	Pass Pass
	Upper Band Edge		00.001	10	1 435
	Measurement 1		-35.731	-16	Pass
	Measurement 2		-32.166	-16	Pass
	LTE10 Bandwidth				
	Lower Band Edge				_
	Measurement 1		-40.204	-16	Pass
	Measurement 2 Upper Band Edge		-34.956	-16	Pass
	Measurement 1		-38.618	-16	Pass
	Measurement 2		-34.495	-16	Pass
256QAM	LTE5 Bandwidth				
	Lower Band Edge			10	D
	Measurement 1 Measurement 2		-36.377 -33.144	-16 -16	Pass Pass
	Upper Band Edge		-33.144	- 10	Pass
	Measurement 1		-35.659	-16	Pass
	Measurement 2		-32.343	-16	Pass
	LTE10 Bandwidth				
	Lauran Danal Edua				_
	Lower Band Edge				Pass
	Measurement 1		-40.303	-16	
	Measurement 1 Measurement 2		-40.303 -35.307	-16 -16	Pass
	Measurement 1 Measurement 2 Upper Band Edge		-35.307	-16	Pass
	Measurement 1 Measurement 2				





Keysight Spectrum Analyzer - Element Materi           RL         RF         50 Ω         AC		SENSE:INT	ALIGN OFF		04:03:54 PM Nov 14, 20
	PNO: Fast + IFGain:Low	►. Trig: Free Run #Atten: 20 dB	Avg Type: RI Avg Hold: 10	00/1000	TRACE 1 2 3 4 TYPE A WWW DET A NNN
Ref Offset 40.2 dB				Mkr1 71	17.900 00 MH -33.209 dB
~9					
.2					
).2					
).2					
00					
80					
					-19.00 (
.8					
9.8				<mark>\</mark> 1	
.8				- war and a start of the start	
9.8					
art 697.00 MHz Res BW 100 kHz	V	300 kHz*		Sweep 3.7	Stop 723.00 MI ′33 ms (8001 pi
3			STATUS		





RL	ectrum Analyzer - Element M RF 50 Ω AC			SENSE:INT	ALIGN OFF		05:36:55 PM Nov 14, 20
			PNO: Fast ↔→ Gain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: Avg Hold:	RMS 1000/1000	TRACE 1 2 3 4 TYPE A WWW DET A NNN
) dB/div	Ref Offset 40.2 dE Ref 40.20 dBm	5				Mkr1	728.100 00 MH -32.316 dB
-9							
0.2							
).2							
).2							
.00							
80							
9.8							-19.00 (
9.8		1					
3.8		Sur and	*				
9.8							
tart 718. Res BW	00 MHz 100 kHz		VBW	/ 300 kHz*		Sweep	Stop 760.00 Mł 5.333 ms (8001 pl
G					STATUS		(out i pi



				Value	Limit	<b>-</b>
		-		(dBm)	(dBm) -16	Result
				-32.338	-16	Pass
📜 Keysight Sp IXI R L	pectrum Analyzer - Element Materials T RF 50 Ω AC		SENSE:INT	ALIGN OFF		04:52:24 PM Nov 14, 2019
W KL	NF JU SZ AC		SENSE-TIMI	Avg Type	RMS	TRACE 1 2 3 4 5 6
		PNO: Wide ↔→ IFGain:Low	. Trig: Free Run #Atten: 20 dB	Avg Hold:	1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A N N N N N
		IFGain:Low	#Atten: 20 db		Mired	718.000 000 MHz
10 dB/div	Ref Offset 40.2 dB Ref 40.20 dBm				IVIKI I	-32.338 dBm
20.2						
30.2						
20.2						
20.2						
10.2						
10.1						
0.200						
-9.80						
-19.8						-19.00 dBm
			1			
-29.8			••••••••••••••••••••••••••••••••••••••			
-39.8						
-49.8						
-49.0						
	.9000 MHz				-	Stop 718.1000 MHz
#Res BW	30 kHz	VBV	√ 91 kHz*		Sweep	1.067 ms (8001 pts)
MSG						
	Band 29. QF	SK Modulation. L	TE10 Bandwidth, Lo	wer Band Edge	, Measurement	2
				Value	Limit	
				(dBm)	(dBm)	Result
				-30.581	-16	Pass

α RL RF 50 Ω AC		SENSE:INT	ALIGN OFF		04:53:59 PM Nov 14, 201
	PNO: Fast ↔ IFGain:Low		Avg Type: RI Avg Hold: 100	00/1000	TRACE 1 2 3 4 5 TYPE A WWWW DET A NNNN
Ref Offset 40.2 dB				Mkr1 7	17.900 00 MH -30.581 dBn
30.2					
20.2					
10.2					
200					
3.80					
9.8					-19.00 d
9.8				1	
39.8 <b></b>	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		-		
19.8					
49.6					
Start 697.00 MHz Res BW 100 kHz	VB	W 300 kHz*		Sweep 3.	Stop 723.00 MH 733 ms (8001 pt
SG			STATUS		



				Value	Limit	
				(dBm)	(dBm)	Result
				-38.315	-16	Pass
	ectrum Analyzer - Element Materials T					
LXI RL	RF 50 Ω AC		SENSE:INT	ALIGN OFF	RMS	05:05:34 PM Nov 14, 2019 TRACE 2 3 4 5 6
		PNO: Wide 🔸	Trig: Free Run	Avg Hold:	1000/1000	TRACE 123456 TYPE A WWWW DET A NNNNN
		IFGain:Low	#Atten: 20 dB			
10 dB/div	Ref Offset 40.2 dB <b>Ref 40.20 dBm</b>				Mkr1	728.000 000 MHz -38.315 dBm
10 dB/div						
30.2						
20.2						
10.2						
0.200						
-9.80						
						-19.00 dBm
-19.8						
-29.8			1			
-39.8						
-39.6						
-49.8						
	.9000 MHz					Stop 728.1000 MHz
#Res BW	30 KHZ	VBV	V 91 kHz*		Sweep	1.067 ms (8001 pts)
MSG						
	Band 29. OF	SK Modulation. L	TE10 Bandwidth, Up	per Band Edge	. Measurement	2
	,,,,			Value	Limit	
				(dBm)	(dBm)	Result
				-34.305	-16	Pass

RL	RF 50 Ω	ent Materials Tec		SENSE:INT		GN OFF		05:08:4	4 PM Nov 14, 201
	10 30 32		PNO: Fast • IFGain:Low		un	Avg Type:   Avg Hold: 1	RMS 000/1000		RACE 1 2 3 4 5 TYPE A WWW DET A NNNN
0 dB/div	Ref Offset 40.2 Ref 40.20 dE	dB 3m					Mkr1	728.100 -34	000 MH .305 dBi
30.2									
0.2									
0.2									
80									
9.8									-19.00
9.8		1							
9.8									
9.8									
art 718.0								Stop p 5.333 m	760.00 MI
Res BW 1	UU KHZ		V	3W 300 kHz*		STATUS	Swee	p 5.333 m	s (8001 pi



		QAM Modulation, L			Value	Limit	
					(dBm)	(dBm)	Result
				-	36.684	-16	Pass
🚺 Keysight Spe	ctrum Analyzer - Element Materials T	echnology					
LXI RL	RF 50 Ω AC	S	ENSE:INT	<u>∧</u> A	LIGN OFF		04:04:44 PM Nov 14, 2019
		PNO: Wide ↔ ↔ IFGain:Low	Trig: Free Run #Atten: 20 dB		Avg Type Avg Hold	e: RMS : 1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N
		II Guilleow				Mkr1	718.000 000 MHz
10 dB/div Log	Ref Offset 40.2 dB Ref 40.20 dBm						-36.684 dBm
30.2							
20.2							
10.2							
10.2							
0.200							
-9.80							
10.0							-19.00 dBm
-19.8							
-29.8							
			↓ <sup>1</sup>				
-39.8							
-49.8							
Start 717. #Res BW	9000 MHz 30 kHz	VBW	91 kHz*			Sweep	Stop 718.1000 MHz 1.067 ms (8001 pts)
MSG					STATUS		
	Band 20, 160	QAM Modulation, L	TE5 Bandwidth	Lower	Band Edge	Massurement	2
	Danu 29, 160	Anim Modulation, L	TES Danuwidth,		Band Edge Value	Limit	2
					(dBm)	(dBm)	Result
		1			33.493	-16	Pass

RL RF 50 Ω AC	5	ENSE:INT	ALIGN OFF		04:05:21 PM Nov 14, 201
	PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: RM Avg Hold: 100	0/1000	TRACE 1 2 3 4 5 TYPE A WWWW DET A NNNN
Ref Offset 40.2 dB 0 dB/div Ref 40.20 dBm				Mkr1 71	17.900 00 MH -33.493 dBr
30.2				~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
20.2					
10.2					
200					
.80					
9.8					-19.00 c
9.8				1_	
9.8				Martin Contraction of the Contra	
9.8					
tart 697.00 MHz Res BW 100 kHz	VBW	300 kHz*		Sweep 3.7	Stop 723.00 MH 733 ms (8001 pt





RL         RF         50 Ω         AC		SENSE:INT	ALIGN OFF	05:38:45 PM Nov 14, 20
	PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: RMS Avg Hold: 1000/100	TRACE 2 3 4 5 TYPE A WWWW DET A N N N
Ref Offset 40.2 dB dB/div Ref 40.20 dBm				Mkr1 728.100 00 MH -32.809 dBi
5				
2 mmm				
.2				
.2				
30				
.8				-19.00 (
.8	1			
	·····			
.8				
.8				
art 718.00 MHz				Stop 760 00 M
es BW 100 kHz	VBW	300 kHz*		Stop 760.00 MI Sweep 5.333 ms (8001 p



				Value	Limit	Desult
		- r		(dBm)	(dBm)	Result
				-40.605	-16	Pass
-						
	rum Analyzer - Element Materials		-			
LXI RL	RF 50 Ω AC		SENSE:INT	ALIGN OFF Avg Type	RMS	04:55:00 PM Nov 14, 2019 TRACE 1 2 3 4 5 6
		PNO: Wide ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold:	1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N
10 dB/div	Ref Offset 40.2 dB Ref 40.20 dBm				Mkr1 7	18.000 000 MHz -40.605 dBm
Log						
30.2						
20.2						
10.2						
0.200						
-9.80						
-19.8						-19.00 dBm
-29.8						
			1			
-39.8						
-49.8						
Start 717.9						Stop 718.1000 MHz
#Res BW 3	0 kHz	VBW	91 kHz*		Sweep 7	1.067 ms (8001 pts)
MSG						
	Dend 00-40			error Dend C I		
	Band 29, 16	QAM Modulation, L	TE TO Bandwidth, L	ower Band Edge Value	e, Measurement 2 Limit	<u>-</u>
				value	Limit	
				(dBm)	(dBm)	Result

Keysight Spectrum Analyzer - Element Materia RL RF 50 Ω AC		ENSE:INT	ALIGN OFF	04:55:24 PM Nov 14, 201
	PNO: Fast +++ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: RMS Avg Hold: 1000/1000	TRACE 1 2 3 4 5 TYPE A WWW DET A N N N N
Ref Offset 40.2 dB 0 dB/div Ref 40.20 dBm			Mk	r1 717.900 00 MH -35.320 dBr
30.2				
20.2				
0.2				
200				
9.80				
9.8				-19.00 d
9.8				
9.8				1
9.8				
9.8				
tart 697.00 MHz Res BW 100 kHz	VBW	300 kHz*	Swee	Stop 723.00 MF p   3.733 ms (8001 pt
G G			STATUS	



	, , , , , , , , , , , , , , , , ,			h, Upper Band Edg Value	Limit	
				(dBm)	(dBm)	Result
				-38.221	-16	Pass
📜 Keysight Spectru	m Analyzer - Element Materials T	echnology				
	RF 50 Ω AC		SENSE:INT	ALIGN OFF		05:16:59 PM Nov 14, 2019
			. Trig: Free Run		e:RMS :1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNN N
		PNO: Wide ++ IFGain:Low	#Atten: 20 dB	Avginoid	. 1000/1000	DET ANNNN
					Mkr1 7	28.000 000 MHz
10 dB/div R	ef Offset 40.2 dB ef <b>40.20 dBm</b>					-38.221 dBm
Log						1
30.2						
20.2						
10.2						
0.200						
-9.80						
-19.8						-19.00 dBm
-29.8						
			_1			
-39.8						
-49.8						
Start 727.90					ę	Stop 728.1000 MHz
#Res BW 30	kHz	VBV	V 91 kHz*		Sweep 1	.067 ms (8001 pts)
MSG				to status		
	Band 29, 160	AM Modulation, L	TE10 Bandwidt	h, Upper Band Edg	e, Measurement 2	2
				Value	Limit	
				(dBm)	(dBm)	Result
				-34.389	-16	Pass

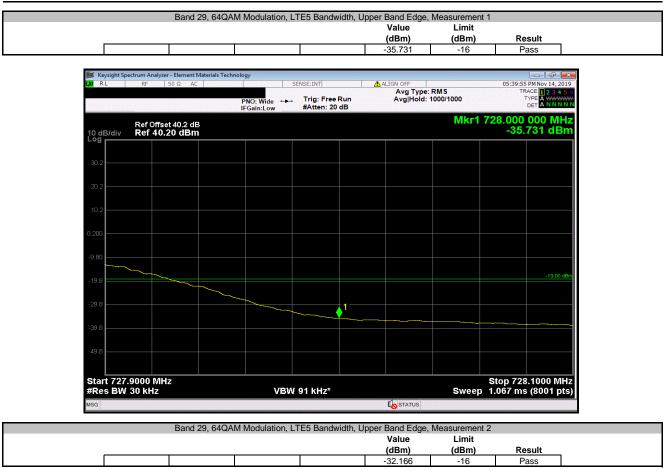
PNO: Fast ↔ Trig: FGain:Low #Atte	Free Run n: 20 dB	Avg Type: R Avg Hold: 10		TRACE 1 2 3 4 5 TYPE A WWW
			Mkr1 7	728.100 00 MH -34.389 dBi
				-19.00 (
		·····		·····
				<b>B</b> (1) = <b>B</b> (0) <b>O</b> (1)
VBW 300 k	Hz*		Sweep 5	Stop 760.00 Mi .333 ms (8001 pt
	VBW 300 k	VBW 300 kHz*	VEW 300 kHz*	



			LTE5 Bandwidth, L	Value	Limit	
				(dBm)	(dBm)	Result
				-36.733	-16	Pass
Keysight Spe	ectrum Analyzer - Element Materials T	echnology				- 6 <b>-</b> ×
LXI RL	RF 50 Ω AC		SENSE:INT	ALIGN OFF		04:06:03 PMNov 14, 2019
			T	Avg Type		TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNN
		PNO: Wide	<ul> <li>Trig: Free Run #Atten: 20 dB</li> </ul>	Avginoid	1000/1000	DETANNNN
					Mkr1 7	18.000 000 MHz
40 1011	Ref Offset 40.2 dB					-36.733 dBm
10 dB/div Log	Ref 40.20 dBm		1			-00.100 abiii
30.2						
20.2						
20.2						
10.0						
10.2						
0.200						
-9.80						
						-19.00 dBm
-19.8						
-29.8			1			
			↓ <b>↓</b>			
-39.8						
-49.8						
	9000 MHz				S	top 718.1000 MHz
#Res BW	30 kHz	VBV	V 91 kHz*		Sweep 1	.067 ms (8001 pts)
MSG				To STATUS		T.
_	Band 29, 640	QAM Modulation,	LTE5 Bandwidth, L	ower Band Edge	, Measurement 2	
				Value	Limit	
				(dBm)	(dBm)	Result
-				-33.067	-16	Pass

			ALIGN OFF		
	PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: RM: Avg Hold: 1000	/1000	TRACE 1 2 3 4 5 TYPE A WWW DET A NNN
Ref Offset 40.2 dB dB/div Ref 40.20 dBm				Mkr1 71	7.900 00 MH -33.067 dB
-					
.2					
.2					
.2					
00					
30					
.8					-19.00
.8				1	
.8	·				
.8					
art 697.00 MHz tes BW 100 kHz	VBW	300 kHz*		Sweep 3.7	Stop 723.00 Mi 33 ms (8001 pi





RL	RF 50 Ω AC	s Technology	SENSE:INT	ALIGN OFF	05:40:21 PM Nov 14, 201
	_	PNO: Fast IFGain:Low	T	Avg Type: RMS Avg Hold: 1000/1000	TRACE 1 2 3 4 5 TYPE A WWWW DET A N N N N
) dB/div	Ref Offset 40.2 dB Ref 40.20 dBm			Mkr1	728.100 00 MH -32.166 dBi
0.2					
).2					
).2					
30					
.8					-19.00
.8		1			
			~~~~~~~		
.8					
9.8					
	.00 MHz 100 kHz	V	300 kHz*	Sweep	Stop 760.00 Mi 5.333 ms (8001 pi
3				STATUS	



				Value (dBm)	Limit (dBm)	Result
				-40.204	-16	Pass
			<u> </u>	-40.204	-10	Pass
Keysight Spe	RF 50 Ω AC		ENSE:INT	ALIGN OFF		04:57:05 PM Nov 14, 2019
	10 30 3C AC			Avg Type		TRACE 1 2 3 4 5 6
		PNO: Wide ↔ → IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold:	: 1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN
					Mkr1 7	18.000 000 MHz
10 dB/div	Ref Offset 40.2 dB <b>Ref 40.20 dBm</b>					-40.204 dBm
Log						
30.2						
20.2						
10.2						
0.200						
-9.80						
40.0						-19.00 dBm
-19.8						
-29.8						
			1			
-39.8			<b>↓</b> '			
-49.8						
Dtort 747						Stop 718.1000 MHz
#Res BW	9000 MHz 30 kHz	VBW	91 kHz*		Sween	stop 718.1000 MHz 1.067 ms (8001 pts)
MSG				STATUS		local proj
ined in				<b>10</b> 010103		
	Band 29 64	QAM Modulation, LT	E10 Bandwidth	ower Band Edge	e. Measurement :	2
	20,01			Value	Limit	
				(dBm)	(dBm)	Result
				-34.956	-16	Pass

Keysight Spectrum Analyzer - Element Mater RL RF 50 Ω AC		SENSE:INT	ALIGN OFF	04:57:29 PM Nov 14, 201
	PNO: Fast ↔→→ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: RMS Avg Hold: 1000/1000	TRACE 1 2 3 4 5 TYPE A WWWM DET A NNNN
Ref Offset 40.2 dB dB/div Ref 40.20 dBm			Mk	r1 717.900 00 MH -34.956 dBr
0.2				
0.2				
.2				
00				
80				
				-19.00
).8				
3.8				1
9.8	~_~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
9.8				
tart 697.00 MHz Res BW 100 kHz	VBM	/ 300 kHz*	Swaa	Stop 723.00 Mł p   3.733 ms (8001 pl
G G		- 500 KHZ	SWEE	p - 54 55 ma (660 i pi



				Value	Limit	Desult
				(dBm)	(dBm)	Result
				-38.618	-16	Pass
Keysight Spectrum Anal		Technology				
(XI RL RF	50 Ω AC		SENSE:INT	ALIGN OFF Avg Type	DMC	05:18:33 PM Nov 14, 2019
		PNO: Wide ↔ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold:	: 1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N
Ref Of	fset 40.2 dB				Mkr1 7	28.000 000 MHz
10 dB/div Ref 4	0.20 dBm					-38.618 dBm
30.2						
20.2						
10.2						
10.2						
0.200						
0.200						
-9.80						
-9.00						
-19.8						-19.00 dBm
10.0						
-29.8						
20.0			1			
-39.8						
-49.8						
Start 727.9000 N	/IHz					Stop 728.1000 MHz
#Res BW 30 kHz		VB	W 91 kHz*		Sweep	1.067 ms (8001 pts)
MSG				<b>K</b> STATUS		
	Band 29 64	CAM Modulation	LTE10 Bandwidth, U	pper Band Edge	e. Measurement :	2
	20.10 20, 01		2.2.0 24144444, 6	Value	Limit	
				(dBm)	(dBm)	Result
		-		-34.495	-16	Pass

RL RF 50 Ω AC	SENSE:INT	ALIGN OFF	05:18:59 PM Nov 14, 20
	PNO: Fast ↔→ Trig: Free Run IFGain:Low #Atten: 20 dB	Avg Type: RMS Avg Hold: 1000/1000	TRACE 1 2 3 4 5 TYPE A WWW DET A NNN
Ref Offset 40.2 dB dB/div Ref 40.20 dBm		Mkr	1 728.100 00 MH -34.495 dBi
-			
.2			
.2			
.2			
00			
30			
			-19.00
.8			
.8			
.8			
.8			
art 718.00 MHz es BW 100 kHz	VBW 300 kHz*	Swee	Stop 760.00 Mi p 5.333 ms (8001 pt



		QAM Modulation, L		Value	Limit	
				(dBm)	(dBm)	Result
				-36.377	-16	Pass
Keysight Spec	trum Analyzer - Element Materials	Technology				
IXI RL	RF 50 Ω AC		ENSE:INT	ALIGN OFF		04:07:30 PM Nov 14, 2019
				Avg Type	RMS	TRACE 1 2 3 4 5 6
		PNO: Wide ++- IFGain:Low	Trig: Free Run #Atten: 20 dB	Avginoia	1000/1000	TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A N N N N
		in Guineon			Mkr1 7	18.000 000 MHz
	Ref Offset 40.2 dB Ref 40.20 dBm					-36.377 dBm
10 dB/div						
30.2						
20.2						
10.2						
0.200						
0.200						
-9.80						
0.00						
-19.8						-19.00 dBm
-10.0						
-29.8						
2010			1			
-39.8						
-49.8						
-43.6						
Start 717.9	000 MHz					Stop 718.1000 MHz
#Res BW 3		VBW	91 kHz*		Sweep	1.067 ms (8001 pts)
MSG				STATUS		
	Band 29, 256	QAM Modulation, L	TE5 Bandwidth, L	ower Band Edge	e, Measurement	2
		,	,	Value	Limit	
				(dBm)	(dBm)	Result
				-33.144	-16	Pass

PNO: Fast Trig: Free Run Avg Type: RMS TRAC PNO: Fast Trig: Free Run Avg/Hold: 1000/1000 TVP IFGain:Low #Atten: 20 dB Deformed to the transmission of transmis	2 PM Nov 14, 20			ALIGN OFF	SENSE:INT		RF 50 Ω AC	X/ RL
Ref 40.20 dBm     -33.14       30 2	TYPE A WWW DET A NNN	TF	RM S 000/1000	Avg Type: R Avg Hold: 10			_	
	0 00 MH 144 dBi	1 717.90 -33.	Mkr1				Ref Offset 40.2 dB Ref 40.20 dBm	0 dB/div
								-
	~~~~~							30.2
								20.2
								10.2
								200
9.8								.80
	-19.00 c							
		• '						9.8
			and a second	~~~ <u>~</u> ^~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				9.8
								9.8
tart 697.00 MHz Stop 72:	723.00 MF	Ston 7					00 MHz	tart 697
Res BW 100 kHz VBW 300 kHz* Sweep 3.733 ms (	s (8001 pt	5 3.733 ms	Sweep		/ 300 kHz*	VBV		





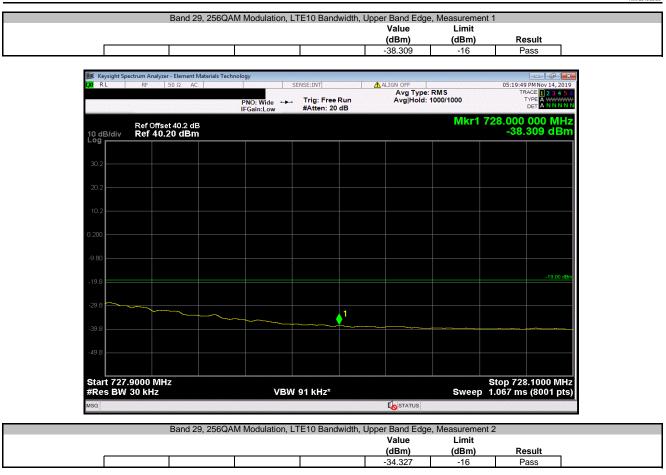
RL	ctrum Analyzer - Element Mate RF 50 Ω AC			SENSE:INT	ALIGN OFF		05:41:28 PM Nov 14, 201
	-		IO: Fast ↔ ain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: Avg Hold: 1	000/1000	TRACE 12345 TYPE A WWW DET A NNNN
0 dB/div	Ref Offset 40.2 dB Ref 40.20 dBm					Mkr1	728.100 00 MH -32.343 dBr
0.2		٦					
0.2							
0.2							
200							
.80							
3.8							-19.00 d
		1					
3.8			-				
9.8							
tart 718.0 Res BW			VBW	300 kHz*		Sweep	Stop 760.00 M⊦ 5.333 ms (8001 pt
G					STATUS		



	, 256QAM Modulation,		Value	Limit	
r			(dBm)	(dBm)	Result
			-40.303	-16	Pass
Keysight Spectrum Analyzer - Element Ma					
LXIRL RF 50Ω AC		SENSE:INT	ALIGN OFF Avg Type	RMS	04:59:06 PM Nov 14, 2019 TRACE 1 2 3 4 5
	PNO: Wide 🔸	, Trig: Free Run	Avg Hold:	1000/1000	TYPE A WWWW DET A N N N N
	IFGain:Low	#Atten: 20 dB			
Ref Offset 40.2 dB				Mkr1 7	718.000 000 MHz
10 dB/div Ref 40.20 dBm					-40.303 dBm
Log					
30.2					
20.2					
20.2					
49.2					
10.2					
0.000					
0.200					
0.00					
-9.80					
(0.0					-19.00 dBm
-19.8					
-29.8					
-29.6					
-39.8		↓ <b>1</b>			
-49.8					
10.0					
Start 717.9000 MHz					Stop 718.1000 MHz
#Res BW 30 kHz	VBI	N 91 kHz*		Sweep	1.067 ms (8001 pts
MSG			<b>I</b> STATUS		
Band 29	, 256QAM Modulation,	LTE10 Bandwidth, I			t 2
			Value	Limit	
			(dBm)	(dBm)	Result

Keysight Spectrum Analyzer - Element Mater R RL RF 50 Ω AC		SENSE:INT	ALIGN OFF		ا ھے او ہے۔ 4:59:33 PM Nov 14, 201
	PNO: Fast ↔ IFGain:Low		Avg Type: RM Avg Hold: 100	IS 10/1000	TRACE 1 2 3 4 5 TYPE A WWW DET A NNNN
Ref Offset 40.2 dB				Mkr1 717	7.900 00 MH -35.307 dBr
30.2					
20.2					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
10.2					
200					
9.80					
19.8					-19.00 d
29.8				1	
8.8					
49.8					
tart 697.00 MHz Res BW 100 kHz	VBV	√ 300 kHz*		Sweep <u>3.73</u>	top 723.00 MH 33 ms (8001 pt
SG			STATUS		





	ctrum Analyzer - Element Materia	ls Technology			6- <b>-</b>
RL	RF 50 Ω AC		SENSE:INT	ALIGN OFF	05:20:17 PM Nov 14, 201
	-	PNO: Fast IFGain:Low	++- Trig: Free Run #Atten: 20 dB	Avg Type: RMS Avg Hold: 1000/1000	TRACE 1 2 3 4 5 TYPE A WWWW DET A NNNN
0 dB/div	Ref Offset 40.2 dB Ref 40.20 dBm			MI	r1 728.100 00 MH -34.327 dBr
_					
30.2					
0.2					
0.2					
00					
80					
					-19.00 (
9.8					-13.001
9.8		1			
9.8				***	
9.8					
tart 718.0 Res BW		V	'BW 300 kHz*	Swe	Stop 760.00 MH ep 5.333 ms (8001 pt
G				STATUS	