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Report On

FCC Testing of the Ericsson RD 2243 B41 DOT (2496-2690 MHz) LTE Base Station in accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 27

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRY901405-1

PREPARED BY



Maggie Whiting Key Account Manager

APPROVED BY



Scott Drysdale Authorised Signatory DATED

Sept 28 -2017

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Report Issued: 9/28/2017

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SECTION 1

REPORT INFORMATION



1.1 REPORT DETAILS

Manufacturer	Ericsson
Address	349 Terry Fox Drive Ottawa Ontario K2K 2V6
Product Name	RD 2243 B41 DOT
Product Number	KRY 901 405/1
Serial Number(s)	TD3T305060
Software Version	CXP 901 3268/14 Rev R67BE
Hardware Version	R1A
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2016 FCC CFR 47 Part 27: 2016
Start of Test	11 September 2017
Finish of Test	13 September 2017
Name of Test Personnel	Scott Drysdale
Related Document(s)	KDB 971168 D01 v02r02 KDB 662911 D01 v02r01



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 27 is shown below.

b				
	Cla	ause		
Section	FCC CFR 47	FCC CFR 47 Part	Test Description	Result
	Part 2	27		
2.1	2.1046	27.50(h)	Maximum Peak Output Power and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	27.53(m)	Occupied Bandwidth	Pass
2.3	2.1051	27.53 (m)	Band Edge	Pass
2.4	2.1051	27.53 (m)	Transmitter Spurious Emissions	Pass
2.5	2.1055	27.54	Frequency Stability	Pass



1.3 CONFIGURATION DESCRIPTION

Configuration Code	Carrier(s)	Configuration Description
1	1C	LTE Single Carrier
2	2C	LTE Multi Carrier x2

The settings below were deemed representative for all traffic scenarios when settings with different modulations, channel bandwidths, number of carriers and RF configurations has been tested to find the worst case setting. The settings below were used for all measurements if not otherwise noted:

LTE:

MIMO mode single carrier: E-TM1.1, E-TM3.2, E-TM3.1, E-TM3.1a MIMO mode multi carrier (x2): E-TM1.1

The complete testing was performed with the EUT transmiting at maximum RF power unless otherwise stated.

The EUT consists of 2 antenna ports. All measurements were performed on the transmit antenna port A and B. Test result limits for Band Edge and Conducted Spurious were based on a 4 port MIMO system. This is due to the possibility of 2 DOT units being configured to operate as co-located devices. Therefore, a worst case limit accounting for an effective 4 port MIMO configuration was employed and corrected in accordance with FCC KDB 662911, (10log4).

The RDS B41– KRY 901 405/1supports LTE Band 41 – 2496 – 2690 MHz, (downlink and uplink), frequency bands.

Test Models as defined in 3GPP TS 25.141 and TS 36.141 were used to represent the required modulation for test.

The EUT was powered by an external 48 V DC Supply.

Channel Configurations

LTE B41 (2496 MHz - 2690 MHz)

Configuration		No. of Carriers	Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)			
	RAT			Bottom (BRFBW)	Middle (MRFBW)	Top (TRFBW)	
1	LTE	1	5	2498.5	2593	2687.5	
1	LTE	1	10	2501	2593	2685	
1	LTE	1	15	2503.5	2593	2682.5	
1	LTE	1	20	2506	2593	2680	
2	LTE	2	5 + 5	2498.5 + 2503.5	2590.5 + 2595.5	2682.5 + 2687.5	
2	LTE	2	10 + 10	2501 + 2511	2588 + 2598	2675 + 2685	
2	LTE	2	15 + 15	2503.5 + 2518.5	2585.5 + 2600.5	2667.5 + 2682.5	
2	LTE	2	20 + 20	2506 + 2526	2583 + 2603	2660 + 2680	



1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Unit
MANUFACTURER	Ericsson AB
PRODUCT NAME	RD 2243 B41 DOT
PART NUMBER	KRY 901 405/1
IC Model Name	Not Applicable
SERIAL NUMBER	TD3T305060
HARDWARE VERSION	R1A
SOFTWARE VERSION	CXP 901 3268/14 Rev R67BE
TRANSMITTER OPERATING RANGE	2496 – 2690MHz
MODULATIONS	LTE: QPSK, 16QAM, 64QAM, 256QA
INTERMEDIATE FREQUENCIES	DL: 110 – 150MHz, UL: 40 – 80MHz
ITU DESIGNATION OF EMISSION	LTE 5M00 W7D 10M0 W7D 15M0 W7D 20M0 W7D
OUTPUT POWER (RMS) (W or dBm)	2 x 0.126W (21dBm)
OUTPUT POWER TOLERANCE	+/- 2 dB
FCC ID	TA8AKRY901405-1
IC ID	Not Applicable
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The RD 2243 B41 (KRY 901 405/1) is a Remote Radio Unit forming part of the Ericsson Radio Base Station (RBS) equipment. The RD provides radio access for mobile and fixed devices and is intended for the indoor environment. The radio operates over 2 Transmit ports in SRO;Single, Multi-Carrier, and MIMO transmission with a maximum rated RF Output of 0.126W per port over an operational temperature of 5°C to +40°C.

I hereby declare that I am entitled to sign on behalf of the manufacturer and that the information supplied is correct and complete.

Signature :

Name : Denis Lalonde

Position held : Developer Regulatory Approval Verification

Date : August 10th, 201

No responsibility will be accepted by TÜV SÜD as to the accuracy of the information declared in this document by the manufacturer.



1.5 PRODUCT INFORMATION

1.5.1 Technical Description

The Equipment Under Test RD 2243 B41 DOT is an Ericsson AB Radio Unit working in the public mobile service (2496-2690 MHz) band which provides communication connections to (2496-2690 MHz) network. The Radio Unit operates from a -48V DC supply.

The Equipment Under Test RD 2243 B41 DOT is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.



Equipment Under Test



1.6 TEST SETUP





1.7 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure, test laboratories or a chamber as appropriate.

The EUT was powered from a -48V DC supply.

FCC Measurement Facility Accreditation Designation Number: CA6845 TUV SUD Canada (Laval)

1.8 DEVIATION FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.9 MODIFICATION RECORD

No modifications were made to the EUT during testing.

1.10 ALTERNATIVE TEST SITE

Under our Accreditation, TÜV SÜD Canada, Laval conducted the following tests at Ericsson in Ottawa.

Test Name	Name of Test Personnel(s)
Maximum Peak Output Power and Peak to Average Ratio - Conducted	Scott Drysdale
Occupied Bandwidth	Scott Drysdale
Band Edge	Scott Drysdale
Transmitter Spurious Emissions	Scott Drysdale
Frequency Stability	Scott Drysdale

1.11 ADDITIONAL INFORMATION

Testing performed with Gavin Gan and Denis Lalonde of Ericsson - Ottawa.



SECTION 2

TEST DETAILS



2.1 MAXIMUM PEAK OUTPUT POWER AND PEAK TO AVERAGE RATIO - CONDUCTED

2.1.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046 FCC CFR 47 Part 27, Clause 27.50(h)(1)

2.1.2 Date of Test and Modification State

13 September 2017 - Modification State 0

2.1.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.4 Environmental Conditions

Ambient Temperature22-25°CRelative Humidity35-45%

2.1.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, clause 5.2.1 and summed in accordance with FCC KDB 662911 D01.

2.1.6 Test Results

Configuration 1

Maximum Output Power 21dBm

			Peak to Average Ratio (PAR) / Output Power			
A f		LTE Carrier	Channel Position B			
Antenna	LIE Modulation	Bandwidth		Averag	je Power	
			PAR (dB)	dBm	dBm/MHz	
A	QPSK	5.0 MHz	7.32	20.59	15.08	
В	QPSK	5.0 MHz	7.32	20.21	14.69	
	Total		-	23.41	17.90	
A	QPSK	10.0 MHz	7.32	20.59	12.46	
В	QPSK	10.0 MHz	7.36	20.10	11.93	
	Total		-	23.36	15.21	
A	QPSK	15.0 MHz	7.33	20.34	10.52	
В	QPSK	15.0 MHz	7.35	20.20	10.55	
Total			-	23.28	13.55	
A	QPSK	20.0 MHz	7.29	20.53	9.36	
В	QPSK	20.0 MHz	7.36	20.18	9.08	
	Total		-	23.37	12.23	



		LTE Carrier	Peak to Average Ratio (PAR) / Output Power		
Antonio			Channel Position B		
Antenna	LIE Modulation	Bandwidth		Average I	⊃ower (eirp)
			PAR (dB)	dBm	dBm/MHz
A	QPSK	5.0 MHz	7.32	24.39	18.88
В	QPSK	5.0 MHz	7.32	24.01	18.49
	Total			27.21	21.70
A	QPSK	10.0 MHz	7.32	24.39	16.26
В	QPSK	10.0 MHz	7.36	23.90	15.73
	Total		-	27.16	19.01
A	QPSK	15.0 MHz	7.33	24.14	14.32
В	QPSK	15.0 MHz	7.35	24.00	14.35
Total			-	27.08	17.35
A	QPSK	20.0 MHz	7.29	24.33	13.16
В	QPSK	20.0 MHz	7.36	23.98	12.88
Total			-	27.17	16.03

Maximum Output Power 24.8dBm (including 3.8 dBi Antenna Gain)





Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B









Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B









Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B









Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B







Maximum Output Power 21dBm

		LTE Carrier	Peak to Average Ratio (PAR) / Output Power		
A			Channel Position M		
Antenna	LIE Wodulation	Bandwidth		Averag	je Power
			PAR (dB)	dBm	dBm/MHz
A	QPSK	5.0 MHz	7.24	20.40	14.73
В	QPSK	5.0 MHz	7.28	19.82	14.22
	Total			23.13	17.49
A	QPSK	10.0 MHz	7.27	20.24	11.60
В	QPSK	10.0 MHz	7.29	20.08	11.34
	Total		-	23.17	14.48
A	QPSK	15.0 MHz	7.31	20.24	10.05
В	QPSK	15.0 MHz	7.30	20.08	9.85
Total			-	23.17	12.96
A	QPSK	20.0 MHz	7.28	20.31	8.93
В	QPSK	20.0 MHz	7.29	19.97	8.51
Total			-	23.15	11.74

Maximum Output Power 24.8 dBm (including 3.8 dBi Antenna Gain)

		LTE Carrier	Peak to Average Ratio (PAR) / Output Power		
			Channel Position M		
Antenna	LIE Modulation	Bandwidth		Average F	Power (eirp)
			PAR (dB)	dBm	dBm/MHz
A	QPSK	5.0 MHz	7.24	24.20	18.53
В	QPSK	5.0 MHz	7.28	23.62	18.02
	Total			26.93	21.29
A	QPSK	10.0 MHz	7.27	24.04	15.40
В	QPSK	10.0 MHz	7.29	23.88	15.14
	Total		-	26.97	18.28
A	QPSK	15.0 MHz	7.31	24.04	13.85
В	QPSK	15.0 MHz	7.30	23.88	13.65
Total			-	26.97	16.76
A	QPSK	20.0 MHz	7.28	24.11	12.73
В	QPSK	20.0 MHz	7.29	23.77	12.31
	Total		-	26.95	15.54





Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position M





Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position M









Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position M









Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position M









Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M

Configuration 1

Maximum Output Power 21dBm

			Peak to Average Ratio (PAR) / Output Power			
Automa		LTE Carrier	Channel Position T			
Antenna	LIE Wodulation	Bandwidth		Average F	Power (eirp)	
			PAR (QB)	dBm	dBm/MHz	
A	QPSK	5.0 MHz	7.18	20.22	14.60	
В	QPSK	5.0 MHz	7.20	19.88	14.05	
Total			-	23.06	17.34	
A	QPSK	10.0 MHz	7.23	20.11	11.46	
В	QPSK	10.0 MHz	7.21	19.75	11.45	
	Total		-	22.94	14.47	
A	QPSK	15.0 MHz	7.29	20.14	9.87	
В	QPSK	15.0 MHz	7.24	20.03	9.48	
Total			-	23.10	12.69	
A	QPSK	20.0 MHz	7.25	20.11	8.39	
В	QPSK	20.0 MHz	7.21	19.95	8.40	
Total			-	23.04	11.41	



			Peak to Average Ratio (PAR) / Output Power			
Antonno	LTE Modulation	LTE Carrier	Channel Position T			
Antenna		Bandwidth		Average I	Power (eirp)	
			FAR (UD)	dBm	dBm/MHz	
A	QPSK	5.0 MHz	7.18	24.02	18.40	
В	QPSK	5.0 MHz	7.20	23.68	17.85	
Total			-	26.86	21.14	
A	QPSK	10.0 MHz	7.23	23.91	15.26	
В	QPSK	10.0 MHz	7.21	23.55	15.25	
	Total		-	26.74	18.27	
А	QPSK	15.0 MHz	7.29	23.94	13.67	
В	QPSK	15.0 MHz	7.24	23.83	13.28	
	Total		-	26.90	16.49	
A	QPSK	20.0 MHz	7.25	23.91	12.19	
В	QPSK	20.0 MHz	7.21	23.75	12.20	
Total			-	26.84	15.21	

Maximum Output Power 24.8dBm (including 3.8 dBi Antenna Gain)









Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T





Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T









Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T









Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T







Maximum Output Power 21dBm

			Peak to Average Ratio (PAR) / Output Power			
		LTE Carrier	Channel Position B			
Antenna	LIE Modulation	Bandwidth		Averag	ge Power	
			PAR (dB)	dBm	dBm/MHz	
A	QPSK	5.0 MHz	-	20.52	12.31	
В	QPSK	5.0 MHz	-	20.23	12.04	
Total			-	23.39	15.19	
A	QPSK	10.0 MHz	-	20.43	9.17	
В	QPSK	10.0 MHz	-	20.34	9.49	
	Total		-	23.40	12.34	
A	QPSK	15.0 MHz	-	20.31	7.13	
В	QPSK	15.0 MHz	-	20.04	7.43	
Total		-	23.19	10.29		
A	QPSK	20.0 MHz	-	20.35	5.94	
В	QPSK	20.0 MHz	-	20.20	5.78	
	Total		-	23.29	8.87	

Maximum Output Power 24.8 dBm (including 3.8 dBi Antenna Gain)

		LTF Carrier	Peak to Average Ratio (PAR) / Output Power			
			Channel Position B			
Antenna	LIE Modulation	Bandwidth		Average I	⊃ower (eirp)	
			PAR (OB)	dBm	dBm/MHz	
A	QPSK	5.0 MHz	-	24.32	16.11	
В	QPSK	5.0 MHz	-	24.03	15.84	
Total			-	27.18	18.99	
A	QPSK	10.0 MHz	-	24.23	12.97	
В	QPSK	10.0 MHz	-	24.14	13.29	
	Total		-	27.20	16.14	
A	QPSK	15.0 MHz	-	24.11	10.93	
В	QPSK	15.0 MHz	-	23.84	11.23	
Total		-	26.99	14.09		
A	QPSK	20.0 MHz	-	24.15	9.74	
В	QPSK	20.0 MHz	-	24.00	9.58	
Total			-	27.09	12.67	



Maximum Output Power 21dBm

			Peak to Average Ratio (PAR) / Output Power			
		LTE Carrier	Channel Position M			
Antenna	LIE Wodulation	Bandwidth		Averaç	ge Power	
			PAR (dB)	dBm	dBm/MHz	
A	QPSK	5.0 MHz	-	20.26	11.58	
В	QPSK	5.0 MHz	-	20.28	11.57	
	Total		-	23.28	14.59	
A	QPSK	10.0 MHz	-	20.31	8.87	
В	QPSK	10.0 MHz	-	19.91	8.84	
	Total		-	23.12	11.87	
A	QPSK	15.0 MHz	-	20.22	7.13	
В	QPSK	15.0 MHz	-	19.84	7.18	
	Total		-	23.04	10.17	
A	QPSK	20.0 MHz	-	20.31	6.26	
В	QPSK	20.0 MHz	-	19.91	5.79	
	Total			23.12	9.04	

Maximum Output Power 24.8dBm (including 3.8 dBi Antenna Gain)

		LTF Carrier	Peak to Average Ratio (PAR) / Output Power			
			Channel Position M			
Antenna	LIE Modulation	Bandwidth		Average I	⊃ower (eirp)	
			PAR (dB)	dBm	dBm/MHz	
A	QPSK	5.0 MHz	-	24.06	15.38	
В	QPSK	5.0 MHz	-	24.08	15.37	
Total			-	27.08	18.39	
A	QPSK	10.0 MHz	-	24.11	12.67	
В	QPSK	10.0 MHz	-	23.71	12.64	
	Total		-	26.92	15.67	
A	QPSK	15.0 MHz	-	24.02	10.93	
В	QPSK	15.0 MHz	-	23.64	10.98	
	Total		-	26.84	13.97	
A	QPSK	20.0 MHz	-	24.11	10.06	
В	QPSK	20.0 MHz	-	23.71	9.59	
Total			-	26.92	12.84	



Maximum Output Power 21dBm

			Peak to Average Ratio (PAR) / Output Power			
		LTE Carrier	Channel Position T			
Antenna	LIE Modulation	Bandwidth		Averaç	ge Power	
			PAR (QB)	dBm	dBm/MHz	
A	QPSK	5.0 MHz	-	20.22	11.45	
В	QPSK	5.0 MHz	-	20.21	11.43	
Total			-	23.23	14.45	
A	QPSK	10.0 MHz	-	19.91	8.45	
В	QPSK	10.0 MHz	-	19.89	8.34	
	Total		-	22.91	11.41	
A	QPSK	15.0 MHz	-	20.14	7.01	
В	QPSK	15.0 MHz	-	19.95	6.84	
Total		-	23.06	9.94		
A	QPSK	20.0 MHz	-	20.31	5.70	
В	QPSK	20.0 MHz	-	20.09	5.57	
Total			-	23.21	8.65	

Maximum Output Power 24.8dBm (including 3.8 dBi Antenna Gain)

			Peak to Average Ratio (PAR) / Output Power			
Antonno		LTE Carrier	Channel Position T			
Antenna	LIE Modulation	Bandwidth		Average I	Power (eirp)	
			PAR (dB)	dBm	dBm/MHz	
A	QPSK	5.0 MHz	-	24.02	15.25	
В	QPSK	5.0 MHz	-	24.01	15.23	
	Total		-	27.03	18.25	
A	QPSK	10.0 MHz	-	23.71	12.25	
В	QPSK	10.0 MHz	-	23.69	12.14	
	Total		-	26.71	15.21	
A	QPSK	15.0 MHz	-	23.94	10.81	
В	QPSK	15.0 MHz	-	23.75	10.64	
Total		-	26.86	13.74		
A	QPSK	20.0 MHz	-	24.11	9.50	
В	QPSK	20.0 MHz	-	23.89	9.37	
Total		-	27.01	12.45		



Limit	
	≤33 dBW + 10log(X/Y)
	Where:
	X = 5, 10, 15 or 20
Deek Dewer	Y = 5.5
Peak Power	5 MHz: 32.59 dBW / 62.59 dBm
	10 MHz: 35.60 dBW / 65.60 dBm
	15 MHz: 37.36 dBW / 67.36 dBm
	20 MHz: 38.61 dBW / 68.61 dBm
Peak to Average Ratio	≤13 dB



2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049 FCC CFR 47 Part 27, Clause 27.53(m)(6)

2.2.2 Date of Test and Modification State

13 September 2017 - Modification State 0

2.2.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.4 Environmental Conditions

Ambient Temperature25°CRelative Humidity36%

2.2.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01 Clause 4.2.

The Spectrum Analyser RBW was configured to be at least 1% of the channel bandwidth of the carrier to be measured.

For 26dB Bandwidth, in accordance with KDB 971168 D01, a peak detector and a trace setting of Max Hold were used in conjunction with the Occupied Bandwidth/x dB Bandwidth measurement function. The trace was left to stabilise and the result was recorded.

2.2.6 Test Results

Configuration 1

Maximum Output Power 21dBm

			Result (kHz)						
Antenna	LTE	LTE Carrier	Channel I	Position B	Channel Position M		Channel Position T		
Modulation	Bandwidth	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth		
A	QPSK	5.0 MHz	4,463.40	4,840.05	4,466.16	4,834.14	4,464.66	4,826.08	
В	QPSK	5.0 MHz	4,467.04	4,792.43	4,466.83	4,818.85	4,468.99	4,808.10	
A	QPSK	10.0 MHz	8,940.65	9,573.19	8,952.61	9,583.82	8,952.10	9,608.29	
В	QPSK	10.0 MHz	8,932.17	9,587.21	8,937.99	9,595.98	8,936.92	9,612.46	
A	QPSK	15.0 MHz	13,430.48	14,358.13	13,459.72	14,386.11	13,454.80	14,416.14	
В	QPSK	15.0 MHz	13,373.15	14,295.39	13,400.81	14,303.70	13,402.76	14,309.16	
A	QPSK	20.0 MHz	17,851.21	18,977.89	17,895.36	18,990.95	17,890.93	19,011.45	
В	QPSK	20.0 MHz	17,827.08	19,031.86	17,880.09	19,081.59	17,851.42	19,070.20	



RL RF S0 2 DC	011-	SENSE:INT ALL	GN AUTO	11:04:56 AM Sep 12, 20:
enter Freq 2.498500000	GHZ #IFGain:Low	→ Trig: Free Run #Atten: 30 dB	Avg Hold: 3000/3000	Radio Device: BTS
0 dB/div Ref 25.63 dBn	1			10
5.6				
63	Julyunum			
37				
14	man		~ ~	
14 monoral market				Turner
14				·····
.4				
enter 2.499 GHz Res BW 51 kHz		#VBW 160 kHz		Span 10 MI Sweep 5 n
Occupied Bandwidt	h	Total Power	28.3 dBm	
4.4	4634 MHz			
Transmit Freq Error	11.434 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	4.840 MHz	x dB	-26.00 dB	
G			STATUS	

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B

Keysight Spectrum Analyzer - Occupied B	v			
Center Freq 2.498500000	I GHz #FGain:Low	Center Freq: 2.498500000 G Trig: Free Run #Atten: 30 dB	3Hz Avg Hold: 3000/3000	Radio Device: BTS
10 dB/div Ref 25.21 dBr	n			1
5.21	m		m	
4.79				
248 348	r 1		home	www.
44.8				
64.8				On on 40 Mile
#Res BW 51 kHz		#VBW 160 kHz		Sweep 5 ms
Occupied Bandwidt 4.	^h 4670 MHz	Total Power	27.9 dBm	
Transmit Freq Error x dB Bandwidth	6.672 kHz 4.792 MHz	% of OBW Power x dB	99.00 % -26.00 dB	
sa		r	STATUS	



RL RF SO D DC		SENSE:INT ALIG	N AUTO	11:16:13 AM Sep 12.2
nter Freq 2.593000000	GHz	Center Freq: 2.593000000	3Hz	Radio Std: None
	#FGain:Low	#Atten: 30 dB	Avg Hold: 3000/3000	Radio Device: BTS
B/div Ref 25.72 dBm				
2				
3	-/			
3				-
1	nem		P	
	1	<u> </u>		The second
- manual mar				- mm
3				
nter 2.593 GHz				Span 10 N
es BW 51 kHz		#VBW 160 kHz		Sweep 5
Occupied Bandwidth	1	Total Power	28.1 dBm	
A A				
4.4	1002 WITZ			
Fransmit Freg Error	6.265 kHz	% of OBW Power	99.00 %	
dB Bandwidth	4 924 MU-	v dB	26 00 dB	
COB Ballowidul	4.034 MHZ	X UD	-20.00 08	

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position M

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position M

Keysight Spectrum Analyzer - Occupied BW				
Center Freq 2.593000000	GHz	SENSE INT ALIG Center Freq: 2.593000000 (N AUTO	08:41:22 AM Sep 13, 2017 Radio Std: None
	#FGain:Low	"Trig: Free Run #Atten: 30 dB	Avg Hold: 3000/3000	Radio Device: BTS
10 dB/din Dof 25 00 dBm				
Log		T T T	11	
15.0	manna	mannin	moment	
500				
-15.0				
-25.0	1		han	
35.0				pronoun
-45.0				
56.0				
-65.0				
Center 2.593 GHz #Res BW 51 kHz		#VBW 160 kHz		Span 10 MHz Sweep 5 ms
Occupied Bandwidt	h	Total Power	27.7 dBm	
4.	4668 MHz			
Transmit Freq Error	1.949 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	4.819 MHz	x dB	-26.00 dB	
MSG		(STATUS	



Keysight Spectrum Analyzer - Occupied BW	(m) (m)			0.4
enter Freg 2 687500000	GH7	Center Freg: 2.687500000 (GHz	Radio Std: None
2.007.000000		Trig: Free Run	Avg Hold: 3000/3000	
	flFGain:Low	#Atten: 30 dB		Radio Device: BTS
dB/div Ref 25.70 dBm	(
7				
	mann	human	m	
3				
)		+ + +		
3		+ + +		
3	nal			
3 North			1,593	
- management				the property
2				
3				
nter 2.688 GHz		-h	1	Span 10 M
es BW 51 kHz		#VBW 160 kHz		Sweep 5
Occupied Bandwidt	h	Total Power	27.9 dBm	
A	4647 MU-			
4.4	164/ WITZ			
Transmit Freg Error	2.304 kHz	% of OBW Power	99.00 %	
v dB Bandwidth	4 926 MU-	v dB	26 00 dB	
X dB Bandwidth	4.020 WINZ	XUB	-20.00 00	
		C.	STATUS	

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T

Keysight Spectrum Analyzer - Occupied BW	6		and tracks and the second s	
Center Freq 2.687500000	GHz	SENSE:INT ALIG Center Freq: 2.687500000 (Trig: Free Pup	N AUTO SHz AvaiHold: 3000/3000	08:55:47 AM Sep 13, 2017 Radio Std: None
	#FGain:Low	#Atten: 28 dB	Anglinoid. coorsecte	Radio Device: BTS
10 dB/div Ref 24.65 dBm		-10 - 01 - 00	17 ¥1	10 m
Log 14.7				
4.65	monomon	mannen	manning	
-6.35			1	
-15.4				
-25.4			how	
35.4 more marine	1			mannen
-45.4				
-66.4 				
-60.4				
Center 2.688 GHz #Res BW 51 kHz		#VBW 160 kHz		Span 10 MHz Sweep 5 ms
Occupied Bandwidt	h	Total Power	27.5 dBm	
4.4	4690 MHz			
Transmit Freq Error	-209 Hz	% of OBW Power	99.00 %	
x dB Bandwidth	4.808 MHz	x dB	-26.00 dB	
MSG		C.	STATUS	



Ke 11:46:26 AM Sep 12, 2017 Radio Std: None Center Freq: 2.501000000 GHz Trig: Free Run Avg #Atten: 30 dB Center Freq 2.501000000 GHz Avg|Hold: 3000/3000 ----Radio Device: BTS #FGain:Low Ref 27.23 dBm 10 di B/div .00 17 7.2 27 12.8 22.8 m. 321 mon when 42.8 52. 62 Span 20 MHz Sweep 1.933 ms Center 2.501 GHz #Res BW 100 kHz #VBW 300 kHz **Total Power** 29.2 dBm **Occupied Bandwidth** 8.9406 MHz % of OBW Power Transmit Freq Error 22.982 kHz 99.00 % x dB Bandwidth 9.573 MHz x dB -26.00 dB To STATUS

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B

📕 Keysight Spectri	am Analyzer - Occupied BW		Brances ing	and was as	
Center Fre	q 2.501000000	GHz	Center Freq: 2.501000000 C Trig: Free Run	3Hz Avg Hold: 3000/3000	09:05:46 AM Sep 13, 2017 Radio Std: None
		#FGain:Low	#Atten: 30 dB		Radio Device: BTS
10 dB/div	Ref 25.82 dBm	1			
15.8					
5.82	_	h	manner		
-4.18		A		A	
-14.2		-/		1	-
-24.2		-1	· · · · · · · · · · · · · · · · · · ·		
342 mart	monorman	11. 11.			annon march
-44.2					
54.2					
-64.2					
Center 2.50 #Res BW 1	01 GHz 00 kHz		#VBW 300 kHz		Span 20 MHz Sweep 1.933 ms
Occupi	ed Bandwidt	h	Total Power	28.6 dBm	
	8.	9322 MHz			
Transmi	t Freq Error	35.317 kHz	% of OBW Power	99.00 %	
x dB Bar	ndwidth	9.587 MHz	x dB	-26.00 dB	
MSG				STATIS	



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position M

🧫 Keysight Spectrum Analyzer - Occupied Bi	N	MERTANANANA IN SOF	anterio al	
Center Freq 2.593000000) GHz #FGain:Low	SERSE:RM ALIO Center Freq: 2.593000000 0 → Trig: Free Run #Atten: 32 dB	N AUTO 3Hz Avg Hold: 3000/3000	01:17:47 PM Sep 12, 2017 Radio Std: None Radio Device: BTS
10 dB/div Ref 25.85 dBr	n		11	1 1
5.85	parameter	manna mar	m	
-4.15				
-34.2 -44.2	£		n in	mannenner
-54.2				
Center 2.593 GHz #Res BW 100 kHz		#VBW 300 kHz		Span 20 MHz Sweep 1.933 ms
Occupied Bandwidt 8.	th 9526 MHz	Total Power	28.9 dBm	
Transmit Freq Error	11.668 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	9.584 MHz	x dB	-26.00 dB	
MSG		(STATUS	

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position M

Keysight Spectrum Analyzer - Occupied BV	V2			
RL RF 50 0 DC		SENSE:INT ALIE	N AUTO	09:16:59 AM Sep 13, 2017
Center Freq 2.59300000	GHZ ↔	Trig: Free Run #Atten: 30 dB	Avg Hold: 3000/3000	Radio Std: None Radio Device: BTS
10 dB/div Ref 25.53 dBn	n	<u> </u>	ŤŤ	
15.5				
5.53	marinenas	an marine and a second	mannen	
1.47			A	
	/			
-14.5				
-24,5	14			1 70 98
34.5 malanta Marine	471		prov	Manhannan
-44.5				
54.5				
-64.5				
Center 2.593 GHz		# (B) () 000 L()-		Span 20 MHz
#Res BW 100 KHZ		#VBW 300 KHZ		Sweep 1.933 ms
Occupied Bandwidt	h	Total Power	28.5 dBm	
occupica Ballana				
8.	9380 MHZ			
Transmit Freg Error	17.298 kHz	% of OBW Power	99.00 %	
u dB Banduidth	0.506 MU-	u dB	36 00 48	
X dB Bandwidth	9.390 MHZ	XOB	-26.00 dB	
MSG		0	STATUS	



01:28:14 PM Sep 12, 2017 Radio Std: None Center Freq: 2.68500000 GHz Trig: Free Run Avg #Atten: 30 dB Center Freq 2.685000000 GHz Avg|Hold: 3000/3000 -Radio Device: BTS #FGain:Low Ref 26.27 dBm 10 dB/div _00 6.2 3.73 13.7 -23.7 m 33 ~~ 43 53. 63 Span 20 MHz Sweep 1.933 ms Center 2.685 GHz #Res BW 100 kHz #VBW 300 kHz **Total Power** 28.6 dBm **Occupied Bandwidth** 8.9521 MHz % of OBW Power Transmit Freq Error 3.552 kHz 99.00 % x dB Bandwidth 9.608 MHz x dB -26.00 dB TATUS

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T

Keysight Sp	ectrum Analyzer - Occupied BW				
Center F	req 2.685000000	GHz	SENSE:INT ALIG Center Freq: 2.685000000 (Trig: Free Pup	N AUTO 3Hz AvalHold: 3000/3000	09:27:14 AM Sep 13, 2017 Radio Std: None
		#FGain:Low	#Atten: 30 dB	Avginola, socorooce	Radio Device: BTS
10 dB/div	Ref 25.74 dBm	i			
15.7					
5.74		- marine		warman	
-4.26					-
-14.3					
-24,3		. all		1	
-44.3 Arms	warman	Ω ⁶ .			man paramenta
54.3					
-64.3					
Center 2 #Res BW	.685 GHz 100 kHz	Loo hi	#VBW 300 kHz		Span 20 MHz Sweep 1.933 ms
Occu	pied Bandwidt	h	Total Power	28.6 dBm	•
	8.9	9369 MHz			
Transi	mit Freq Error	11.066 kHz	% of OBW Power	99.00 %	
x dB E	landwidth	9.612 MHz	x dB	-26.00 dB	
400				Lering	
15-20				O alling	



Ke 01:39:58 PM Sep 12, 2017 Radio Std: None RSEINT ALTON AUT Center Freq: 2.503500000 GHz Trig: Free Run Avg #Atten: 30 dB Center Freq 2.503500000 GHz Avg|Hold: 3000/3000 -Radio Device: BTS #FGain:Low Ref 26.75 dBm 10 d B/div _00 6.7 3.25 13.3 23 3 -33 in 43.3 march 53. 63 Center 2.504 GHz #Res BW 150 kHz Span 30 MHz Sweep 1.333 ms #VBW 470 kHz **Total Power** 29.5 dBm **Occupied Bandwidth** 13.430 MHz % of OBW Power Transmit Freq Error 42.996 kHz 99.00 % x dB Bandwidth 14.36 MHz x dB -26.00 dB TATUS

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B

Keysight Spectrum Analyzer - Occupied E	W	1000 C	and where the set	
Center Freq 2.50350000	0 GHz	Center Freq: 2.503500000 C	3Hz AvglHold: 3000/3000	09:40:24 AM Sep 13, 2017 Radio Std: None
	#FGain:Low	#Atten: 30 dB		Radio Device: BTS
10 dB/div Ref 27.29 dB	m	<i></i>		
Log 17.3				
7.29		monument	manny	
-2.71	A			
-12.7				
-22.7				-
-32.7	ww			hours
427 ABOANNA MENTONSOF F				and a stand of the state
62.7				
-62.7				
Center 2.504 GHz #Res BW 150 kHz		#VBW 470 kHz		Span 30 MHz Sweep 1.333 ms
Occupied Bandwid	th	Total Power	29.1 dBm	
1	3.373 MHz			
Transmit Freq Error	64.807 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	14.30 MHz	x dB	-26.00 dB	
MSG		C	STATUS	



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position M

Def 25 55 dBa	- Ju dunicon			
dB/div Ref 26.55 dBn	n	<u> </u>		1 1
5.6				
55	human	and the second second	and	_
5				
5	-/11			
5	สปี			
mannon	24		No.	margan monther margar
5				
enter 2.593 GHz les BW 150 kHz		#VBW 470 kHz		Span 30 M Sweep 1.333
Occupied Bandwidt	'n	Total Power	29.3 dBm	
13	8.460 MHz			
Transmit Freq Error	22.702 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	14.39 MHz	x dB	-26.00 dB	

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position M

Keysight Spec	ctrum Analyzer - Occupied BW			and tracks and	
Center Fr	eq 2.593000000	GHz	Center Freq: 2.593000000 C Trig: Free Run	N AUTO 3Hz Avg Hold: 3000/3000	09:50:44 AM Sep 13, 2017 Radio Std: None
		#FGain:Low	#Atten: 30 dB		Radio Device: BTS
10 dB/div	Ref 26.26 dBm	1			
Log					
6.26		mmm	min	mann	
-3.74					
-137					
-23.7				- Da	
-33.7	montenter	wall		101	where have have been and the second
-43.7					
-63.7					
#Res BW	150 kHz		#VBW 470 kHz		Sweep 1.333 ms
Occup	ied Bandwidt	h	Total Power	28.9 dBm	
	13	.401 MHz			
Transm	nit Freq Error	41.649 kHz	% of OBW Power	99.00 %	
x dB Ba	andwidth	14.30 MHz	x dB	-26.00 dB	
MSG			c.	STATUS	



02:02:30 PM Sep 12, 2017 Radio Std: None RSEINT) ALIGN AUT Center Freq: 2.682500000 GHz Trig: Free Run Avg #Atten: 30 dB Center Freq 2.682500000 GHz Avg|Hold: 3000/3000 -Radio Device: BTS #FGain:Low Ref 26.19 dBm 10 dB/div _00 6.1 3.81 13.6 -23.8 33.8 the -43.8 53. 63. Span 30 MHz Sweep 1.333 ms Center 2.683 GHz #Res BW 150 kHz #VBW 470 kHz Total Power 29.2 dBm **Occupied Bandwidth** 13.455 MHz % of OBW Power Transmit Freq Error 6.593 kHz 99.00 % x dB Bandwidth 14.42 MHz x dB -26.00 dB TATUS

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T

📕 Keysight Spe	ctrum Analyzer - Occupied BW			and the second	
Center Fr	req 2.682500000	GHz	Center Freq: 2.682500000 C Trig: Free Run	N AUTO 3Hz Avg Hold: 3000/3000	10:00:20 AM Sep 13, 2017 Radio Std: None
		#FGain:Low	#Atten: 30 dB		Radio Device: BTS
10 dB/div	Ref 26.29 dBm	r .			
Log					
16.3		mon	manon mon	manning	
0.25				l l	
10.71		/			
137					
-23.7		ส		n n	
127	semperson and	71			monorman
53.7					
.63.7					
Center 2. #Res BW	683 GHz 150 kHz		#VBW 470 kHz		Span 30 MHz Sweep 1.333 ms
Occur	oied Bandwidt	h	Total Power	29.1 dBm	
	13	.403 MHz			
Transn	nit Freq Error	28.208 kHz	% of OBW Power	99.00 %	
x dB B	andwidth	14.31 MHz	x dB	-26.00 dB	
MSG			¢.	STATUS	



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B

Keytight Spectrum Analyzer - Occupied BV	V			
Center Freq 2.506000000	GHz #FGain:Low	Center Freq: 2.506000000 G Trig: Free Run #Atten: 30 dB	GHz Avg Hold: 3000/3000	Radio Std: None Radio Device: BTS
10 dB/div Ref 27.30 dBn	n	, , , ,		
7.3	pom	mon	manning	
-2.70				
-22.7				
-427 alianty and a constrainty and a second			1 hori	and the man have been and
-62.7				
Center 2.506 GHz #Res BW 200 kHz		#VBW 620 kHz		Span 40 MHz Sweep 1 ms
Occupied Bandwidt	^h 7.851 MHz	Total Power	29.5 dBm	
Transmit Freq Error	73.150 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	18.98 MHz	x dB	-26.00 dB	
MSG		(STATUS	

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B

Keysight Spect	rum Analyzer - Occupied BW								
RL	RF 50 0 DC		58	ENSE: INT	ALTO	N AUTO		10:10:3	14 AM Sep 13, 2017
Center Fre	ad 5.20000000	GHZ #FGain:Lov		Trig: Free Run #Atten: 30 dB	.506000000	Avg Hold: 300	0/3000	Radio Sta:	e: BTS
		in dam.co							
10 dB/div	Ref 26.88 dBm	1					· · · ·	-	r
16.9			_				-		-
5.88		and	m	man	annon	mound			
3.40							N		
-3.12		f l					1		
-13.1			-				1		
-23,1			-				1		
-33.1		non	-				har	-	
43.1 marsh	mension and and and and and and and and and an	00050	-				1.00441	1 10 10 00	all marker warden and
63.1			-						
-63.1							<u> </u>		
19									
Center 2.5	06 GHz				600 kUn			S	pan 40 MHz
#Res BW	200 KHZ			#VBW	620 KMZ			5	weep 1 ms
Occupi	ied Bandwidt	h		Total Power 2		29.2 dBm	1		
occup	A 7	007 MILL							
	17	.827 WHZ	2						
Transm	it Freg Error	82.900 kH	z	% of OBW	Power	99.00 %	0		
	n duul deb	40.02 MU				26 00 45			
х ав ва	nawiath	19.03 MH	2	XOB		-26.00 de	2		
4SG					0	STATUS			



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M

Keysight Spectrum Analyzer - Occupied BV	¥/	eraine and	al auto	
Center Freq 2.593000000	GHz #FGain:Low	Center Freq: 2.593000000 C Trig: Free Run #Atten: 30 dB	3Hz Avg Hold: 3000/3000	Radio Std: None Radio Device: BTS
10 dB/div Ref 26.32 dBn	n			
16.3 6.32	mmm		monunalpro	
3.68	A			
23.7				
43.7			- nor	and the second color and
-63.7				
Center 2.593 GHz #Res BW 200 kHz		#VBW 620 kHz	1.1	Span 40 MH Sweep 1 m
Occupied Bandwidt 17	^h 7.895 MHz	Total Power	29.2 dBm	
Transmit Freq Error	60.501 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	18.99 MHz	x dB	-26.00 dB	
150		¢.	STATUS	

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position M

Keysight Spec	ctrum Analyzer - Occupied BW	k						
X RL	RF 50 G DC		SENSE: INT	ALTEN AL	JTO		10:20:	58 AM Sep 13, 2017
Center Fr	eq 2.593000000	GHZ #EGain:Low	Trig: Free Run #Atten: 28 dB	Av	g Hold: 3000/	3000	Radio Std:	ce: BTS
		in Gameon						
10 dB/div	Ref 27.10 dBm	<u> </u>						
17.1								
7.10		man	monter	mann	moment			
2.00		1						
-2.50						5		
-12.9						1		
-22.9						1		
-32.9	- hannand	ww/				han	company many	honomin
-42.9								
52.9								
-62.9							-	-
0	500 OU-					_		
#Res BW	200 kHz		#VBW 6	20 kHz			S	weep 1 ms
Occur	ied Bandwidt	h	Total Powe	r 2	29.2 dBm			
	17	.880 MHz						
Transn	nit Freq Error	49.462 kHz	% of OBW F	ower	99.00 %			
x dB B	andwidth	19.08 MHz	x dB	-	26.00 dB			
450				tos:	TATUS			



Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T

0000 GHz		SERSEINT	ALI	GN AUTO		11.21.2.2	
	#FGain:Low	. Trig: Free #Atten: 30	eq: 2.680000000 Run dB	GHz Avg Hold: 3	000/3000	Radio Std: Radio Devi	None ice: BTS
5 dBm						-	
	mann	manna	monorme	marra	~		
	1						
and to see the					hi	marin marine	monter
_					_		
_		#VE	3W 620 kHz	ŝ.		S	pan 40 MHz weep 1 ms
width 17.89	1 MHz	Total P	ower	29.3 dE	lm		
or 35	5.401 kHz	% of O	BW Power	99.00	%		
1	9.01 MHz	x dB		-26.00	B		
				1 mar			
	5 dBm width 17.89 or 3!	5 dBm	5 dBm	5 dBm #VBW 620 kHz #VBW 620 kHz width Total Power 17.891 MHz or 35.401 kHz % of OBW Power 19.01 MHz x dB	5 dBm Image: Solution of the second secon	5 dBm	S dBm Image: Constraint of the second sec

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T

Keysight Spectrum Analyzer - Occup	iied BW			
RL RF 50 G	DC	SENSE:INT ALT	GN AUTO	10:31:15 AM Sep 13, 201
Center Freq 2.680000	#FGain:Low	Trig: Free Run #Atten: 28 dB	Avg Hold: 3000/3000	Radio Sta: None Radio Device: BTS
10 dB/div Ref 26.85	dBm			
og				
16.9				1
ö,85				
3.15				
13.2			1	-
23.2			<u>\</u>	
33.2 marked and the	mucht			- hin
13.2				a summer and and a second
53.2				
63.2				
Center 2.68 GHz				Span 40 MH
Res BW 200 kHz		#VBW 620 kHz		Sweep 1 m
Occupied Bandw	lidth	Total Power	29.0 dBm	
	17.851 MHz			
Transmit Freq Erro	r 27.558 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	19.07 MHz	x dB	-26.00 dB	
sg			STATUS	



2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051 FCC CFR 47 Part 27, Clause 27.53 (m)(2)(6)

2.3.2 Date of Test and Modification State

13 September 2017 - Modification State 0

2.3.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.4 Environmental Conditions

Ambient Temperature25°CRelative Humidity36%

2.3.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01 Clause 6. The EUT was connected to a Spectrum Analyser via an attenuator and switching box. The path loss between the EUT and the Spectrum Analyser was measured using a Network Analyser. The measured path loss was entered as a Reference Level Offset in the Spectrum Analyser. The Spectrum Analyser RBW was adjusted to be at least 1% of the measured 26dB Bandwidth. Using an RMS detector, the frequency spectrum up to 1MHz away from the Band Edge was investigated. The EUT has 2 transmit ports, but can be configured to operate with 2 devices colocated. Therefore, the test limits used were calculated on a worst case basis accounting for an effective 4 port MIMO configuration. Testing was performed on this port with a test limit of 43+10log(P) - 10log(4) = -19 dBm.

2.3.6 Test Results

Configuration 1

Maximum Output Power 21dBm

Antonno	LTE Madulation	LTE Corrier Denduridth	Band Edge (MHz)		
Antenna			Channel Position B	Channel Position T	
A	QPSK	5.0 MHz	2,498.5	2,687.5	
В	QPSK	5.0 MHz	2,498.5	2,687.5	
A	QPSK	10.0 MHz	2,501.0	2,685.0	
В	QPSK	10.0 MHz	2,501.0	2,685.0	
A	QPSK	15.0 MHz	2,503.5	2,682.5	
В	QPSK	15.0 MHz	2,503.5	2,682.5	
A	QPSK	20.0 MHz	2,506.0	2,680.0	
В	QPSK	20.0 MHz	2,506.0	2,680.0	





Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B







11:32:45 AM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWWW DET A NNNN N Avg Type: RMS Center Freq 2.690000000 GHz PNO: Wide ---- Trig: External1 IFGain:Low #Atten: 30 dB Mkr1 2.690 000 GHz -44.74 dBm Ref Offset 9.06 dB Ref 23.06 dBm 10 dB/div 13. 3.06 6.94 -16.5 DE1 -19.023 -26.9 -36.9 ▲1 46.9 -56.9 -66.9 Center 2.690000 GHz #Res BW 51 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts) #VBW 160 kHz* TATUS

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T







11:46:59 AM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A NNNNN Center Freq 2.496000000 GHz Gate: LO Avg Type: RMS PNO: Wide ---- Trig: External1 IFGain:Low #Atten: 28 dB Mkr1 2.496 000 GHz -44.45 dBm Ref Offset 8.94 dB Ref 20.94 dBm 10 dB/div 10.9 0.940 9.05 DL1 -19.02 d8 -19 -29. -39 49. -59 -69 Center 2.496000 GHz #Res BW 100 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts) #VBW 300 kHz* TATUS

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B







Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T









01:40:31 PM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A NNNN N Center Freq 2.496000000 GHz Gate: LO Avg Type: RMS PNO: Wide Trig: External1 IFGain:Low #Atten: 26 dB Mkr1 2.496 000 GHz -45.87 dBm Ref Offset 8.95 dB Ref 18.95 dBm 10 dB/div 8.9 -1.05 -11.1 DL1 -19.02 d8 -21 -31. -41 -51 -61 -71 Center 2.496000 GHz #Res BW 150 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts) #VBW 470 kHz* TATUS

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B







02:03:03 PM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A NNNN N Center Freq 2.690000000 GHz Avg Type: RMS PNO: Wide ---- Trig: External1 IFGain:Low #Atten: 26 dB Mkr1 2.690 000 GHz -46.45 dBm Ref Offset 9.06 dB Ref 19.06 dBm 10 dB/div 9.06 0.94 -10.9 DL1 -19.02 dB -20.5 -30.9 -40.9 -50.9 -60.9 -70 9 Span 2.000 MHz #Sweep 5.000 s (1001 pts) Center 2.690000 GHz #Res BW 150 kHz #VBW 470 kHz* TATUS

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T







02:13:43 PM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A NNNN N Center Freq 2.496000000 GHz Gate: LO Avg Type: RMS PNO: Wide ---- Trig: External1 IFGain:Low #Atten: 26 dB Mkr1 2.496 000 GHz -43.95 dBm Ref Offset 8.95 dB Ref 18.95 dBm 10 dB/div 8.9 -1.05 -11.1 DL1 -19.02 dB -21 -31. -41 -51 -61 -71 Center 2.496000 GHz #Res BW 200 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts) #VBW 620 kHz* TATUS

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B







Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T



Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T





Maximum Output Power 21dBm

Antonno			Band Edge (MHz)		
Antenna	LIE Modulation	LIE Carrier Bandwidth	Channel Position B	Channel Position T	
A	QPSK	5.0 MHz	2498.5 + 2503.5	2682.5 + 2687.5	
В	QPSK	5.0 MHz	2498.5 + 2503.5	2682.5 + 2687.5	
A	QPSK	10.0 MHz	2501 + 2511	2675 + 2685	
В	QPSK	10.0 MHz	2501 + 2511	2675 + 2685	
A	QPSK	15.0 MHz	2503.5 + 2518.5	2667.5 + 2682.5	
В	QPSK	15.0 MHz	2503.5 + 2518.5	2667.5 + 2682.5	
A	QPSK	20.0 MHz	2506 + 2526	2660 + 2680	
В	QPSK	20.0 MHz	2506 + 2526	2660 + 2680	

Antenna A - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B

Keysight S	ectrum Analyzer - Swept SA		1000000000 10	1.00 100 at 20	
Contor F	RF 50 0 DC	247	SENSE:INT	ALIGN AUTO Avg Type: RMS	02:57:54 PM Sep 12, 2017 TRACE 1 2 3 4 5 6
Contor i	Gate: LO	PNO: Wide	Trig: External1 #Atten: 28 dB		TYPE WWWWWW
10 dB/div	Ref Offset 8.94 dB Ref 20.94 dBm				Mkr1 2.496 000 GHz -47.87 dBm
10.9					
.940					
9.06					
19.1					DL1 -19.02 dBm
29.1					
39.1			1/		
49 1 сальна		www.wastlinegite.to-a			
59.1					
69.1					
Center 2 #Res BW	496000 GHz 51 kHz	#VE	W 160 kHz*	0	Span 2.000 MHz #Sweep 5.000 s (1001 pts)
NSG		1007090		STATUS	



06:22:39 PM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWWW DET A N N N N N Center Freq 2.496000000 GHz Gate: LO Avg Type: RMS PNO: Wide ---- Trig: External1 IFGain:Low #Atten: 28 dB Mkr1 2.496 000 GHz -47.65 dBm Ref Offset 8.94 dB Ref 20.94 dBm 10 dB/div 10.9 0.940 9.05 DL1 -19.02 d8 -19 -29. -39 1 49. -59 -69 Center 2.496000 GHz #Res BW 51 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts) #VBW 160 kHz* TATUS

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position B







06:44:53 PM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A NNNN N Center Freq 2.690000000 GHz Avg Type: RMS PNO: Wide ---- Trig: External1 IFGain:Low #Atten: 28 dB Mkr1 2.690 000 GHz -48.26 dBm Ref Offset 9.06 dB Ref 21.06 dBm 10 dB/div 11. 1.06 8.94 DL1 -19.02 d8 -18.5 -28.9 38.9 1 48 9 -58.9 -68 9 Center 2.690000 GHz #Res BW 51 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts) #VBW 160 kHz* TATUS

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 5.0 MHz - Channel Position T







06:57:37 PM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A NNNNN Center Freq 2.496000000 GHz Gate: LO Avg Type: RMS PNO: Wide ---- Trig: External1 IFGain:Low #Atten: 26 dB Mkr1 2.496 000 GHz -42.35 dBm Ref Offset 8.94 dB Ref 18.94 dBm 10 dB/div 8.9 -1.06 -11.1 DL1 -19.02 dB -21 -31. -41. -51 61 -71 Center 2.496000 GHz #Res BW 100 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts) #VBW 300 kHz* TATUS

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position B







07:18:53 PM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A NNNN N Center Freq 2.690000000 GHz Avg Type: RMS PNO: Wide ---- Trig: External1 IFGain:Low #Atten: 28 dB Mkr1 2.690 000 GHz -49.05 dBm Ref Offset 9.03 dB Ref 21.03 dBm 10 dB/div 11.0 1.03 8.97 DL1 -19.02 d8 -19.0 -29.0 -39.0 1 49.0 -59.0 -69.0 Center 2.690000 GHz #Res BW 100 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts) #VBW 300 kHz* TATUS

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 10.0 MHz - Channel Position T







07:30:05 PM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A NNNN N Center Freq 2.496000000 GHz Avg Type: RMS PNO: Wide Trig: External1 IFGain:Low #Atten: 24 dB Mkr1 2.496 000 GHz -48.82 dBm Ref Offset 8.95 dB Ref 16.95 dBm 10 dB/div 6.9 3.05 -13 1 DL1 -19.02 d -23 -33.1 -43 -53. -63 -73 Center 2.496000 GHz #Res BW 150 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts) #VBW 470 kHz* TATUS

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position B







07:51:00 PM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A NNNNN Center Freq 2.690000000 GHz Avg Type: RMS PNO: Wide Trig: External1 IFGain:Low #Atten: 26 dB Mkr1 2.690 000 GHz -46.50 dBm Ref Offset 9.02 dB Ref 19.02 dBm 10 dB/div 9.0 -0.98 -11.0 DL1 -19.02 dB -21.0 -31.0 -41.0 -51.0 -61.0 -71.0 Center 2.690000 GHz #Res BW 150 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts) #VBW 470 kHz* TATUS

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 15.0 MHz - Channel Position T







08:02:32 PM Sep 12, 2017 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A N N N N N Center Freq 2.496000000 GHz Avg Type: RMS PNO: Wide ---- Trig: External1 IFGain:Low #Atten: 26 dB Mkr1 2.496 000 GHz -45.44 dBm Ref Offset 8.95 dB Ref 18.95 dBm 10 dB/div 8.9 -1.05 -11.1 1 -19.02 dE -21 -31. -41. -51 -61 -71 Center 2.496000 GHz #Res BW 200 kHz Span 2.000 MHz #Sweep 5.000 s (1001 pts) #VBW 620 kHz* TATUS

Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position B







Antenna B - LTE Modulation QPSK - LTE Carrier Bandwidth 20.0 MHz - Channel Position T

N RL	RF 50 Q DC		ENSEINT	ALIGN AUTO	08	:30:46 PM Sep 12, 2017
Center I	Freq 2.690000000 G	Hz	Trig: External1	Avg Type: R	MS	TRACE 1 2 3 4 5 TYPE WWWWW
	Gate: LO	IFGain:Low	#Atten: 26 dB			DETANNNN
					Mkr1 2 F	90 000 GH
	Ref Offset 9.02 dB					-42.37 dBm
Log	Kei 15.02 ubm					
9.02						
0.98						
0.00						
11.0						
						DL1 -19.02 dB
21.0						
31.0		28 -	1		9	
			1			
41.0						-
51.0						
61.0						
71.0						
Sec.						
Center 2	.690000 GHz				S	pan 2.000 MH
Res BW	/ 200 kHz	#VBI	N 620 kHz*		#Sweep 5.0	00 s (1001 pts
		New York II-		1 marine	1	

Limit	10 dBm
Liiliit	-19 0011