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Report On

FCC and IC Testing of the CBRSYS6500 in accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 22

COMMERCIAL-IN-CONFIDENCE

FCC ID: 2AQSOCBRSYS6500

PREPARED BY

Mel Viktorov

Nikolai Viktorov Test Personnel

October 2018

APPROVED BY

DATED

rysdale

Scott Drysdale Authorised Signatory

December 18, 2018

Page 1 of 34

Report Issued: 12/18/2018

Report File #: 7169004718 Report 01 Issue 1



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SECTION 1

REPORT INFORMATION



1.1 REPORT DETAILS

Manufacturer	Octasic inc.
Address	300-401 Molson St, Montreal, QC, H1Y 3L1
Product Name	CBRSYS6500 (CBRRFE6400+CBRSYS6000)
Product Number	CBRSYS6000 - CBRSYS6008-RE-3E CBRRFE6400 - CBRRFE6407-NC100-EE1
Serial Number(s)	CBRSYS6000 – F-00190 CBRRFE6400 – K-15468
Hardware Version	CBRSYS6000 - 3.0 CBRRFE6400 - 3.1
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2016 FCC CFR 47 Part 22: 2016
Start of Test	October 5, 2018
Finish of Test	December 17, 2018
Name of Test Personnel(s)	Scott Drysdale and Nikolai Viktorov
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 22 is shown below.

		Specification Clause		
Section	FCC CFR 47 Part 2	FCC CFR 47 Part 22	Test Description	Result
2.1	2.1046	22.913(a)	Maximum Peak Output Power, ERP, and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	22.917(b)	Occupied Bandwidth	Pass
2.3	2.1051	22.917(b	Band Edge	Pass
2.4	2.1051	22.917(a) (b)	Transmitter Spurious Emissions	Pass
2.5	2.1055	22.355	Frequency Stability	Pass
-	-	15.111	Receiver Spurious Emissions	N/A ¹

 N/A^1 – Not Applicable, as this is a transceiver.



1.3 CONFIGURATION DESCRIPTION

The CBRSYS6500 supports Single Mode operation from a single port configuration.

The CBRSYS6500 supports GSM 850(869 MHz – 894 MHz).

TX test cases: Maximum Conducted Output Power, Spurious Emissions at Antenna Terminals (\pm 1MHz) and Conducted Spurious Emissions, measurements were performed on the RF Port. The test limits shown are representative of the worst case. All testing was performed with the EUT transmitting at maximum RF power unless as designated setting by client, otherwise stated.

The EUT was powered via a 120V 60Hz power supply.

<u>GSM 850(869 MHz – 894 MHz) Channel Configurations</u>

All tests

RAT	No. of	Carrier Bandwidth	Carrier Fre	equency Configuration	(MHz)
NAT .	Carriers	(MHz)	Bottom (BRFBW)	Middle (MRFBW)	Top (TRFBW)
G	1	0.2	869.2	881.6	893.8



1.4 DECLARATION OF BUILD STATUS

	MAIN EUT
MANUFACTURING DESCRIPTION	CBRSYS6500
MANUFACTURER	Octasic inc.
ТҮРЕ	Portable Base Station Unit with Transportable Amplification Unit
PART NUMBER	CBRSYS6000 - CBRSYS6008-RE-3E CBRRFE6400 - CBRRFE6407-NC100-EE1
SERIAL NUMBER	CBRSYS6000 – F-00190 CBRRFE6400 – K-15468
HARDWARE VERSION	CBRSYS6000 - 3.0 CBRRFE6400 - 3.1
TRANSMITTER OPERATING RANGE	GSM 850 869 – 894 MHz
RECEIVER OPERATING RANGE	GSM 850 824 – 849 MHz
COUNTRY OF ORIGIN	CBRSYS6000 - India CBRRFE6400 - Canada
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	GSM: 250KGXW, 250KG7W
MODULATION TYPES: (i.e. GMSK, QPSK)	GSM: GMSK
HIGHEST INTERNALLY GENERATED FREQUENCY	894 MHz
OUTPUT POWER (W or dBm)	20W
FCC ID	2AQSOCBRSYS65000
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The Transportable Amplification Unit (TAU) is a powerful multiband RF front-end (RFE) designed for use as a Transportable Amplification Unit (TAU) in conjunction with a Portable Base station Unit (PBU). The EUT fits in a standard 19" 6U rack.



1.5 PRODUCT INFORMATION

1.5.1 Technical Description

The Equipment Under Test (EUT) operates from a 120V 60Hz supply.

The CBRRFE6400 Transportable Amplification Unit (TAU) is a powerful multiband RF front-end (RFE) designed for use as a Transportable Amplification Unit (TAU) in conjunction with a Portable Base station Unit (PBU) such as the CBRSYS6000. The TAU ships in a ruggedized case and fits in a standard 19" 6U rack.

Depending on band configuration it can support up to 8 bands. It has a high sensitivity multiband receiver and an interference mitigation and suppression mechanism to maintain sensitivity in the presence of interference. The transmitter can transmit up to 100W peak per band.

The TAU has automatic RF power control per band for coverage optimization and a standby mode to optimize power consumption.

The CBRSYS6000 Portable Base station Unit (PBU) is multi-channel, software-defined radio (SDR) based base station system for wireless applications like Network in a Box (NIB). It is designed to fit in a standard 19" 3U rack-two PBUs can be fit in a standard 3U rack and ships in a ruggedized 3U rackmount case.

The PBU has a basic RF front end that internally combines the TX signals and splits the RX signals of each SDR. It can be coupled with a high-power RF front end Transportable Amplification Unit (TAU) such as the CBRRFE6400 for a complete system. The PBU is controlled over wired Ethernet and has a USB service port for maintenance access to the serial ports of each SDR. The PBU has built-in fans for thermal management.

The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.

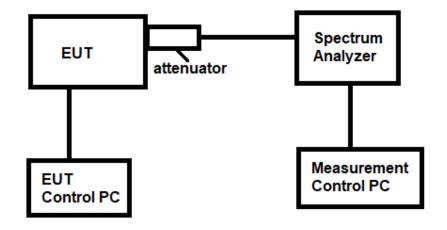


Equipment Under Test





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 120V 60Hz 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 the TÜV SÜD Canada, Ottawa location.

1.11 ADDITIONAL INFORMATION

The CBRSYS6000 Portable Base station Unit (PBU) is multi-channel, software-defined radio (SDR) based base station system for wireless applications like Network in a Box (NIB). It is designed to fit in a standard 19" 3U rack-two PBUs can be fit in a standard 3U rack and ships in a ruggedized 3U rackmount case.

Depending on band configuration it can support up to 8 bands. It has a high sensitivity multiband receiver and an interference mitigation and suppression mechanism to maintain sensitivity in the presence of interference. The transmitter can transmit up to 100W peak per band.



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 22, Clause 22.913(a)

2.1.2 Date of Test and Modification State

October 5, 2018 - 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 Temperature24°CRelative Humidity34%

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.

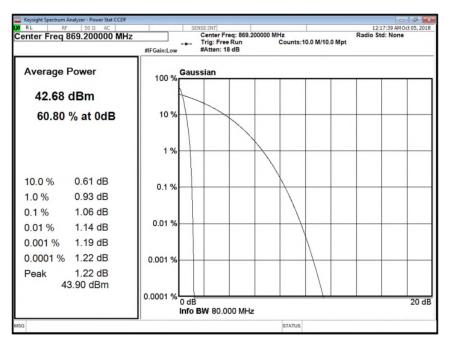
2.1.6 Test Results



Maximum Target Output Power 43 dBm

			Peak to Average Ratio (PAR) / Output Power			
Antenna	enna Modulation	Carrier Bandwidth	Channel Position B			
				Average Power		
			PAR (dB)	dBm	dBm/MHz	
A	GMSK	0.2 MHz	1.06	42.86	42.96	

GSM Modulation GMSK - GSM Carrier Bandwidth 0.2 MHz - Antenna A

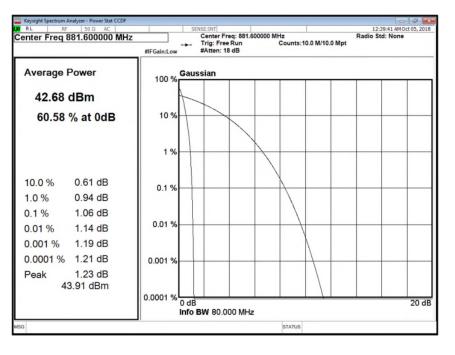




Maximum Target Output Power 43 dBm

	Antenna Modulati			Peak to Ave	erage Ratio (PAR) /	Output Power
		Marshala Gara	Carrier Bandwidth	Channel Position M		
		Modulation			Average Power	
				PAR (dB)	dBm	dBm/MHz
	А	GMSK	0.2 MHz	1.06	42.63	42.93

GSM Modulation GMSK - GSM Carrier Bandwidth 0.2 MHz - Antenna A

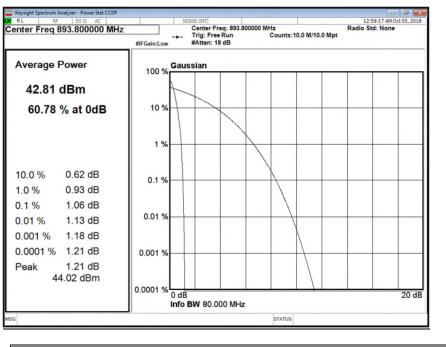




Maximum Target Output Power 43 dBm

			Peak to Average Ratio (PAR) / Output Power			
Antenna	Madulatian	Carrier Bandwidth	Channel Position T			
	a Modulation			Average Power		
			PAR (dB)	dBm	dBm/MHz	
A	GMSK	0.2 MHz	1.06	42.88	43.09	

GSM Modulation GMSK - GSM Carrier Bandwidth 0.2 MHz - Antenna A



Limit

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 22, Clause 22.917(b)

2.2.2 Date of Test and Modification State

October 5, 2018 - 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 Temperature24°CRelative Humidity34%

2.2.5 Test Method

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

2.2.6 Test Results

Maximum Target Output Power B:43dBm M:43dBm T:43dBm

			Result (KHz)					
Antenna	Modulation	Carrier	Channel F	Position B	Channel F	Position M	Channel	Position T
	Bandwidth	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth	
A	GMSK	0.2 MHz	234.26	277.22	234.34	275.86	233.02	276.26



Antenna A - Bandwidth GMSK - Channel B

Keysight Spectrum Analyzer - Occupied BW				
RL RF 50 Q AC		SENSE:INT		12:18:18 AM Oct 05, 201 Radio Std: None
enter Freq 869.200000 N	Hz	Center Freq: 869.200000 N Trig: Free Run	Avg Hold: 50/50	Radio Std: None
	#IFGain:Low	#Atten: 18 dB	A Maintena . Seres	Radio Device: BTS
dB/div Ref 48.05 dBm				
og 8.1				
3.1		man - m		
3.1	- A			
05				
95				
.0				
.0				
0	mont		m	mannan
2.0				
enter 869.2 MHz				Span 1 M
Res BW 10 kHz		#VBW 30 kHz		Sweep 12.4 r
Occupied Bandwidth	1	Total Power	42.8 dBm	
	34.26 kHz			
23	04.20 KHZ			
Transmit Freq Error	-376 Hz	% of OBW Power	99.00 %	
x dB Bandwidth	277.2 kHz	x dB	-26.00 dB	

Antenna A - Bandwidth GMSK - Channel M

Keysight Spectrum Analyzer - Occupied BW RL RF 50 Ω AC		SENSE:INT		12:40:26 AM Oct 05, 201
Center Freq 881.600000 MH	lz #IFGain:Low	Center Freq: 881.600000 N	IHz Avg Hold: 50/50	Radio Device: BTS
0 dB/div Ref 48.93 dBm			1	
28.9		mon		
93				
1.1				
1.1			m	mm
enter 881.6 MHz Res BW 10 kHz		#VBW 30 kHz		Span 1 Mi Sweep 12.4 n
Occupied Bandwidth		Total Power	42.7 dBm	
234	4.34 kHz			
Transmit Freq Error	-611 Hz	% of OBW Power	99.00 %	
x dB Bandwidth	275.9 kHz	x dB	-26.00 dB	
			PTATIP	
45G			STATUS	



Antenna A - Bandwidth GMSK - Channel T

Keysight Spectrum Analyzer - Occupied BW RL RF 50 Ω AC		could that		
enter Freq 893.800000 M	Hz	Center Freq: 893.800000 M Trig: Free Run	Hz Avg Hold: 50/50	12:59:58 AM Oct 05, 20 Radio Std: None
	#IFGain:Low	#Atten: 18 dB		Radio Device: BTS
dB/div Ref 48,38 dBm 9 14 14 14 14 15 16 16 16 16				
enter 893.8 MHz Res BW 10 kHz		#VBW 30 kHz		Span 1 M Sweep 12.4 r
Occupied Bandwidth	1	Total Power	42.8 dBm	
23	3.02 kHz			
Transmit Freq Error	-497 Hz	% of OBW Power	99.00 %	
x dB Bandwidth	276.3 kHz	x dB	-26.00 dB	
			STATUS	



2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051 FCC CFR 47 Part 22, Clause 22.917(b)

2.3.2 Date of Test and Modification State

October 5, 2018- 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 Temperature24°CRelative Humidity34%

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 one transmit port, testing was performed on this port with a test limit of $43+10\log(P) = -13 \text{ dBm}$.

2.3.6 Test Results

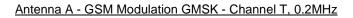
Maximum Target Output Power T:43dBm B:43dBm

Antonno	Madulation	Corrier Denduidth	Band Edge (MHz)			
Antenna	Modulation	Carrier Bandwidth	Channel Position B	Channel Position T		
A	GMSK	0.2 MHz	869.2	893.8		



RL		er – Swept SA							0 0
	RF	50 Ω AC		SENSE:	INT	Avg Typ	e: RMS	TR	AM Oct 05, 201
Juli 0.	0000000		PNO: IFGair		ig: Free Run Itten: 18 dB				DET A N N N N
dB/div		et 36.5 dB .50 dBm						Mkr1 868 Power -3	
^g									
8.5						m			
8.5		_			1	<u></u>			
50						1			
50						1			10
									DL1-13.00 d
.5									011-13.00.0
.5					2				
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he he	Anthonia antique								
					1 kHz*		#Ouu	Span ep 5.000 s	3.000 MH
	869.000 M N 3.0 kHz	Hz		#VBW 30	7 KHZ		#SWe	ср 0.000 с	s (1001 pt
Res BA	N/3.0 kHz	x		Y	FUNCTION	FUNCTION WIDTH		UNCTION VALUE	<u> </u>
Res BA	N 3.0 kHz	× 868.0	00 0 MHz	-51,52 dBm	Band Power	FUNCTION WIDTH 100,0 kHz		-	-35.35 dB
Res BA	W 3.0 kHz	× 868.0	00 0 MHz .000 MHz	Y	Band Power			-	<u> </u>
tes BA	W 3.0 kHz	× 868.0		-51,52 dBm	Band Power			-	<u> </u>
Res BA	W 3.0 kHz	× 868.0		-51,52 dBm	Band Power			-	<u> </u>
Res BA	W 3.0 kHz	× 868.0		-51,52 dBm	Band Power			-	<u> </u>
Res BA	W 3.0 kHz	× 868.0		-51,52 dBm	Band Power				<u> </u>
Res BA	W 3.0 kHz	× 868.0		-51,52 dBm	Band Power				<u> </u>
Res BA	W 3.0 kHz	× 868.0		-51,52 dBm	Band Power				<u> </u>

Antenna A - GSM Modulation GMSK - Channel B, 0.2MHz



RL	ht Spectrum A	nalyzer – Swept SA 50 Ω AC		1	cende a	ial							
		00000000	0 MHz	NO: Wide		g: Free I ten: 18			Avg Type	E: RMS	U	TRAC	PE WWWW ET A NNN
0 dB/d		Offset 36.5 dB 38.50 dBm									Mkr2 89		00 MH 66 dBr
og 28.5					,the second	_							
8.5				production of the second secon	No way	2					_		
.50				1		1				_	-		
50	_					-							
1.5						+		-			_		0L1 -13.00 d
1.5							2	-+					
1.5			- later all a later a later have	Later way		Ψ.	Mar						
1.5	Astron and a special s	And And The Contraction of the C				_		74454545	her have a first	en and the states of the state	whenterlyn	wint	1 Weterman
	r 894.000 3W 3.0 k			#VB	W 30	kHz*						Span 2	.500 MI
KFIMOD	DE TRC SCL		× 95.000 0 MHz	-49.65	dBm	FUN			ONWIDTH 0.0 kHz		FUNCTION V		-36.10 dB
2 N	1 f		94.000 0 MHz	-28,66	dBm	Carlo	- onei		o.o mit				00.10 00
4													
5 6													
5 6 7 8													
5 6 7 8 9													
5 6 7 8 9 0 1						m							,

Limit	-13 dBm
-------	---------



2.4 TRANSMITTER SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051 FCC CFR 47 Part 22, Clause 22.917(a)(b)

2.4.2 Date of Test and Modification State

October 5, 2018- Modification State 0

2.4.3 Test Equipment Used

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

2.4.4 Environmental Conditions

Ambient Temperature24°CRelative Humidity34%

2.4.5 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. Prior to testing, a Network Analyser was used to calibrate the path loss between the EUT and the Spectrum Analyser. The worst-case path loss in the measured ranges was entered as a reference level offset. Over the measured ranges, the RBW was set to 1MHz with a VBW of 3MHz. All measurement results are specified as average with an RMS detector being used in conjunction with a trace setting of Max Hold. Measurements were performed in configurations of the EUT as reported below.

Testing was performed on this port with a test limit of $43+10\log(P) = -13$ dBm.

2.4.6 Test Results

Maximum Target Output Power B:43dBm, M:43dBm, T:43dBm GSM 0.2 MHz Bandwidth setting



Antenna A - GSM Modulation GMSK - Channel B

RL RL	RF 50 Ω			SE	NSE:INT	-			12:24	21 AM Oct 05, 20
	req 2.000004		Z PNO: F	ast	Trig: Free #Atten: 22		#Avg Type	RMS		TYPE WWWW DET A NNN
0 dB/div	Ref Offset 36.5 Ref 48.13 dE								Mkr1 8	69.22 MH 40.76 dB
og		●1				1				
38.1		Ť	-				-			
28.1							-		-	-
18.1			_							
8.13		+	-							
1.87			-							
11.9		+	_							DL1 -13.00 d
21.9			_							
31.9			_		1					
41.9									damedas	and the second second
Start 9 kl	Hz 100 kHz	يريبها أعامي	ens. Undertinensis		/ 300 kHz		ويعقفنا إغراف فاشعنه		Sto	p 4.000 GH
SG SG	TUU KHZ			#VBW	7 300 KH2		STATUS 1	DC Couple	eep 80.00	s (80000 pi

enter Freq 8.000000	AC	SENSE:INT		12:27:10 AM Oct 05, 20
enter Freq 8.000000	NFE PNO: Fast → IFGain:Low	Trig: Free Run #Atten: 20 dB	#Avg Type: RMS	TRACE 1 2 3 4 TYPE WWWW DET A NNN
Ref Offset 37.5 c D dB/div Ref 20.00 dB		•		Mkr1 6.898 16 GH -45.34 dB
0.0				
.00				
D.0				DL1 -13.00
0.0				
0.0				
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	ر. مەرماللەردىدەر ئەردىدە رەھەر مەردىدە بەرمىدىدەر.	يند بينه بنه ب	and and and an other states of the states	ىرى يىلى
			His off and the second second	
tart 4.000 GHz				Stop 12.000 GI
Res BW 100 kHz	#VI	BW 300 kHz*	#Swe	eep 160.0 s (100001 p



RL	RF 50 Ω	AC		SENSE:INT					3 AM Oct 05, 201
Center F	req 15.000	000000 GH	Z PNO: Fast IFGain:Low	Trig: Free R #Atten: 20 d	un IB	#Avg Type	RMS	T	TYPE WWWW
0 dB/div	Ref Offset 38 Ref 20.00						M	r1 17.67 -3	0 66 GH 8.13 dB
10.0		_							
0.00		_							
10.0									DL1 -13.00 s
20.0									
0.0									●1
0.0	والمراجع والمراجع	Liberty, Links	human an a birk with	ateri, izinitir	ily, and the lite	States States	the star in the star is a star in the star	والمتحديد والمتحديد	in the state
50.0 1000	and the second secon	u və dələtərə yazı tərik bilərət	instal (tary backstelling)	Taul Brack and particular	an-daily of highly	and and the second s	and the second second	and the second s	and the second
0.0									
	000 GHz 100 kHz		#VE	3W 300 kHz*			#Sweep	Stop 120.0 s (18.000 GI 100001 p

Keysight Spectrum Analyzer - Swept SA	cence and		
Center Freq 22.250000000 NFE	GHz PNO: Fast IFGaln:Low #Atten: 10 dB	#Avg Type: RMS	12:33:07 AM Oct 05, 2018 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A N N N N
Ref Offset 18,5 dB 10 dB/div Ref 18.50 dBm		Mk	r1 26.080 100 GHz -62.81 dBm
8.50			
1.50			
11.5			DL1 -19:00 dD
21.5			
31.5			
41.5			
51.5			
61.5	اللوارية والمراجع المراجع	b) and and grader we allowed in	Adapter and a strength of the
	innetitier and the second states of the second sta	an an a state and a state of the	and the second second second
Start 18.000 GHz #Res BW 100 kHz	#VBW 300 kHz*	#Swee	Stop 26.500 GHz 170.0 s (100001 pts
SG		STATUS	



Antenna A - GSM Modulation GMSK - Channel M

Keysight Sp	ectrum Analyzer - Swept RF 50 Ω 🔥			ENSE:INT	_			12:42:01	AM Oct 05, 201
	el 44.75 dBm	NFE	PNO: Fast	Trig: Free Ru #Atten: 22 dl	un B	#Avg Type:	RMS	TF	ACE 1 2 3 4 5 TYPE WWWW DET A NNNN
10 dB/div	Ref Offset 36,5 Ref 44.75 dE							Mkr1 88 40	1.62 MH 0.78 dBr
.09		•1							
34.8									
24.8									
4.8									
.75									
.25									
5.3									DL1 -13.00 (
5.3			-						
95.3				_					
5.3		- <u> </u> A			abiliana at ila	init, shandhid ad	IL Jan and an and a start of the	ntakan di sahabila	
	فوالمرابعة أساوره	بوسادها انتلقيه	والمرد وملاوتين والمردامين	lendelis (Aligeria)		1.1			ull.
tart 9 kl Res BW	lz 100 kHz		#VB	№ 300 kHz*			#Swee	Stop 80.00 s	4.000 GH (80000 pt
SG						STATUS 🙏	DC Coupled		

Keysight Sp	RF 50 Ω	AC AC		SENSE:INT		_		1245-0	AM Oct 05, 201
	req 8.00000	NFE	PNO: Fast	Trig: Free R #Atten: 20 d		#Avg Type:	RMS	TF	ACE 1 2 3 4 5 TYPE WWWWW DET A NNNN
0 dB/div	Ref Offset 37.5 Ref 20.00 dE						M	kr1 6.92 -4	1 60 GH 1.74 dBi
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tart 4.00 Res BW	00 GHz 100 kHz		#VB	W 300 kHz*			#Sweep	Stop 1 160.0 s (1	12.000 GH 100001 pt
SG						STATUS			



Keysight Sj	RF 50 Ω			answer to or				12.10.2	3 AM Oct 05, 2018
	Freq 15.0000			Trig: Free Ru #Atten: 20 dB		#Avg Type:	RMS	Т	RACE 1 2 3 4 5 1 TYPE WWWWWW
10 dB/div	Ref Offset 38. Ref 20.00 d						М	kr1 17.86 -3	61 82 GHz 7.41 dBm
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0.00		_	-						
+10.0									DL1 -13.00 dBr
-20.0									
-30.0									∮ ¹
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-70.0									
Start 12. #Res BW	000 GHz 100 kHz		#VB	W 300 kHz*			#Swee	Stop 120.0 s (18.000 GHz 100001 pts
MSG						STATUS			

Keysight Spectrum Analyzer - Swept 5			
Center Freq 22.250000	NFE PNO: Fast Trig: Free Run IFGain:Low #Atten: 10 dB	#Avg Type: RMS	12:51:46 AM Oct 05, 2018 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET A N N N N
Ref Offset 18.5 d 0 dB/div Ref 18.50 dB		Mkr	1 25.770 020 GHz -63.04 dBm
8.50			
1.50			
11.5			DL1 -19.00 dDr
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71.5 Spill the Single station of the	and a country the second second	and the second	and and a photosta
Start 18.000 GHz #Res BW 100 kHz	#VBW 300 kHz*	#Sweep	Stop 26.500 GHz 170.0 s (100001 pts
ISG		STATUS	



Antenna A - GSM Modulation GMSK - Channel 1

RL	RF 50 Q 🔥 D	C		SENSE:INT				01:0	5:30 AM Oct 05, 201
et Leve	el 44.50 dBm	NFE	PNO: Fast IFGain:Low	Trig: Fr #Atten:		#Avg Type: F	(MS		TYPE WWWW DET A N N N
	Ref Offset 36.5 d		il ounitor					Mkr1	893.82 MH 40.63 dB
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art 9 kl	Hz 100 kHz	ماريا حد ينا		#VBW 300 ki				St	
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art 9 kl Res BW	100 kHz	الارتية المراب					#Sw	St eep 80.00	s (80000 pt
Keysight Sp RL	100 kHz ectrum Analyzer - Swept S RF 50 Ω A	C				status 🔔 D	#Swe	St eep 80.00	s (80000 pt s (80000 pt 88:18 AM Oct 05, 20
art 9 kk Res BW	100 kHz	C	Z PNO: Fast	#VBW 300 ki	Hz*		#Swe	St eep 80.00	8:18 AM Oct 05, 20 TRACE 1 2 3 4
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Keysight Sp RL dB/div 00	100 kHz ectrum Analyzer - Sweet S RF 50 Ω A req 8.0000000 Ref Offset 37.5 d	IDO GH:	Z PNO: Fast	#VBW 300 ki	Hz*	status 🔔 D	#Swe	St eep 80.00 d 01:0 Mkr1 6.1	9 \$ (80000 pt 6518 AM OC 05, 20 TRACE [12 3 TRACE] [2 4 TYPE] WWWW 0ETA NNNN 888 24 GH -44.77 dB
G Keysight Sp RL 0 dB/div 0 dB/div 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	100 kHz ectrum Analyzer - Sweet S RF 50 Ω A req 8.0000000 Ref Offset 37.5 d	IDO GH:	Z PNO: Fast	#VBW 300 ki	Hz*	status 🔔 D	#Swe	St eep 80.00 d 01:0 Mkr1 6.1	9 \$ (80000 pt 6518 AM OCT 05, 20 TRACE [1 2, 34 TYPE [WWWW 0ET A NNNN 888 24 GH -44.77 dB
Keysight Sp RL enter F 0.0 0.0	100 kHz ectrum Analyzer - Sweet S RF 50 Ω A req 8.0000000 Ref Offset 37.5 d	IDO GH:	Z PNO: Fast	#VBW 300 ki	Hz*	status 🔔 D	#Swe	St eep 80.00 d 01:0 Mkr1 6.1	9 \$ (80000 pt 6518 AM OCT 05, 20 TRACE [1 2, 34 TYPE [WWWW 0ET A NNNN 888 24 GH -44.77 dB
Keysight Sp RL enter F	100 kHz	IDO GH:	Z PNO: Fast	#VBW 300 ki	Hz*	status 🔔 D	#Swe	St eep 80.00 d 01:0 Mkr1 6.1	9 \$ (80000 pt 6518 AM OC 05, 20 TRACE [12 3 TRACE] [2 4 TYPE] WWWW 0ETA NNNN 888 24 GH -44.77 dB

#VBW 300 kHz*

70.0

Start 4.000 GHz #Res BW 100 kHz Stop 12.000 GHz #Sweep 160.0 s (100001 pts)

STATUS



Keysight Spi	ectrum Analyzer – Swe RF 50 Ω	pt SA AC		SENSE:INT	1				AM Oct 05, 2018
	req 15.0000		PNO: Fast		1	#Avg Type: I	RMS	TR	ACE 1 2 3 4 5 DET A NNNN
10 dB/div	Ref Offset 38. Ref 20.00 d						MI	r1 17.94 -38	5 10 GHz 3.26 dBm
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-10.0									DL1 -13.00 dBr
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-70.0									
Start 12.0								Stop 1	8.000 GHz
#Res BW	100 kHz		#VB	W 300 kHz*		STATUS	#Sweep	120.0 s (1	00001 pts

enter F	req 22.2500	NFE	PNO: Fast ++	Trig: Free Ru #Atten: 10 dl		#Avg Type:	RMS	TF	DET A NNN
) dB/div	Ref Offset 18 Ref 18.50 c						Mkr	1 25.779 -63	540 GH 3.02 dBr
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	000 GHz 100 kHz		#VB	W 300 kHz*	i		#Sweep	Stop 2 170.0 s (*	26.500 GH 100001 pt
G						STATUS			

Limit	-13dBm



2.5 FREQUENCY STABILITY

2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055 FCC CFR 47 Part 22, Clause 22.355

2.5.2 Date of Test and Modification State

October 12 and 15th, 2018 - Modification State 0

2.5.3 Test Equipment Used

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

2.5.4 Environmental Conditions

Ambient Temperature23°CRelative Humidity36%

2.5.5 Test Method

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

2.5.6 Test Results

Maximum Target Output Power 43 dBm

Tomporatura	Veltere	Frequency Error (Hz)		
Temperature	Voltage	Channel Position M		
-30°C	120V AC	EUT non-operational		
-20°C	120V AC	EUT non-operational		
-10°C	120V AC	0		
0°C	120V AC	0		
+10°C	120V AC	0		
+20°C	99V AC	0		
+20°C	120V AC	0		
+20°C	135V AC	0		
+30°C	120V AC	0		
+40°C	120V AC	0		
+50°C	120V AC	0		

Limit +/- 1 ppm



SECTION 3

TEST EQUIPMENT USED



3.1 **TEST EQUIPMENT USED**

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Туре No.	Serial No	Calibration Period (months)	Calibration Due
PXA Signal Analyzer	Keysight	N9030A	MY53310519	12	2019-07-17

N/A – Not Applicable O/P Mon – Output Monitored with Calibrated Equipment



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Conducted Maximum Peak Output Power	30 MHz to 20 GHz Amplitude	± 0.1 dB
Conducted Emissions	30 MHz to 20 GHz Amplitude	± 2.3 dB
Frequency Stability	30 MHz to 2 GHz	± 5.0 Hz
Occupied Bandwidth	Up to 20 MHz Bandwidth	± 1.1 Hz
Band Edge	30 MHz to 20 GHz Amplitude	± 2.3 dB



SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

This report does not imply product endorsement by any government, accreditation agency, or TÜV SÜD Canada Inc.

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