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# Report On

FCC Testing of the CBRSYS6500 in accordance with FCC CFR 47 Part 2 and FCC CFR 47 Part 24

COMMERCIAL-IN-CONFIDENCE

FCC ID: 2AQSOCBRSYS6500

PREPARED BY

Male Viktorov

Nikolai Viktorov Test Personnel

APPROVED BY

DATED

-y5dale

Scott Drysdale Authorised Signatory

December 18, 2018

October 2018



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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 24: 2016
Start of Test	October 12, 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 24 is shown below.

		Specification Clause		
Section	FCC CFR 47 Part 2	FCC CFR 47 Part 24	Test Description	Result
2.1	2.1046	24.232 (a)	Maximum Peak Output Power, ERP, and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	24.238 (b)	Occupied Bandwidth	Pass
2.3	2.1051	24.238 (b)	Band Edge	Pass
2.4	2.1051	24.238 (a)	Transmitter Spurious Emissions	Pass
2.5	2.1055	24.235	Frequency Stability	Pass
-	-	15.111	Receiver Spurious Emissions	N/A <sup>1</sup>

 $N/A^1$  – 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 CDMA2K in Band 1 (1930 MHz - 1990 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.

## CDMA2K B1 (1930 MHz - 1990 MHz) Channel Configurations

All tests

DAT	No. of	No. of Carrier Carrier Frequency Configuration (MHz)				
Carriers	ers (MHz)	Bottom (BRFBW)	Middle (MRFBW)	Top (TRFBW)		
С	1	1.48	1931.25 + 1932.5	1960	1987.5 + 1988.75	



# 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	B1 1930 – 1990 MHz
RECEIVER OPERATING RANGE	B1 1850 – 1910 MHz
	CBRSYS6000 - India CBRRFE6400 - Canada
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	CDMA2K: G7W
MODULATION TYPES: (i.e. GMSK, QPSK)	CDMA2K: QPSK
HIGHEST INTERNALLY GENERATED FREQUENCY	1.990 GHz
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 24, Clause 24.232 (a)

## 2.1.2 Date of Test and Modification State

November 27, 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 Temperature22°CRelative Humidity35%

#### 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 40 dBm

Antenna		Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
	Modulation		Channel Position B		
				Average Power	
			PAR (dB)	dBm	dBm/MHz
A	QPSK	1.48 MHz	8.22	39.05	38.01





## Maximum Target Output Power 43 dBm

Antenna		Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
	Modulation		Channel Position B2		
				Average Power	
			PAR (dB)	dBm	dBm/MHz
A	QPSK	1.48 MHz	7.54	42.15	41.22





## Maximum Target Output Power 43 dBm

Antenna		Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
	Modulation		Channel Position M		
				Average Power	
			PAR (dB)	dBm	dBm/MHz
A	QPSK	1.48 MHz	7.21	42.78	41.84





## Maximum Target Output Power 43 dBm

Antenna		Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
	Modulation		Channel Position T2		
				Average Power	
			PAR (dB)	dBm	dBm/MHz
A	QPSK	1.48 MHz	7.71	41.65	40.57





## Maximum Target Output Power 40 dBm

Antenna		Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
	Modulation		Channel Position T		
				Average Power	
			PAR (dB)	dBm	dBm/MHz
A	QPSK	1.48 MHz	8.45	38.84	37.86



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 24, Clause 24.238 (b)

## 2.2.2 Date of Test and Modification State

November 27, 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 Temperature22°CRelative Humidity35%

## 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:40 dBm M:43 dBm T:40 dBm

Antenna					Result	: (KHz)		
	Modulation	Carrier	Channel Position B		Channel Position M		Channel Position T	
	Bandw	Bandwidth	Occupied	-26 dB	Occupied	-26 dB	Occupied	-26 dB
			Banuwiuth	Banuwiuth	Banuwiutin	Banuwiuth	Banuwiuth	Banuwiuth
A	QPSK	1.48 MHz	1260.60	1413.06	1290.24	2349.53	1262.17	1414.13



# Antenna A - Bandwidth QPSK - Channel B

Keysight Spectrum Analyzer - Occupied BW	(	CENCE (INT)		05-42-48 AM Nov-27, 200
Center Freq 1.931250000	GHz →	Center Freq: 1.931250000 ( Trig: Free Run #Atten: 24 dB	GHz Avg Hold: 50/50	Radio Std: None Radio Device: BTS
10 dB/div Ref 36.31 dBm	1			
26.3	manun			
6.31	A			\
3.69				
23.7				manner
43.7				
53.7				0
Res BW 13 kHz		#VBW 39 kHz		Span 2.5 MH Sweep 18.27 m
Occupied Bandwidt	h	Total Power	39.1 dBm	
1.	2606 MHZ			
Transmit Freq Error x dB Bandwidth	1.264 kHz 1.413 MHz	% of OBW Power x dB	99.00 % -26.00 dB	
ISG			STATUS	



Keysight Sp	ectrum Analyzer - Occupied	BW								00
Center F	req 1.96000000	00 GHz		Center Freq: 1 Trig: Free Rur	1.960000000	GHz Avg Hold:	50/50		04:29:06 Radio Std: N	3 AM Nov 27, 2016 Ione
		#IFG	ain:Low	#Atten: 24 dB				_	Radio Devic	e: BTS
10 dB/div	Ref 40.62 df	3m								
Log										
20.6		mm	m		man	mon	m			
10.5								1	-	
0.620	a second se							1/2		
-9.38	Annound a second									and the second
-19.4										
-29.4							_	-		
-39.4							_	+		
-49.4		+ + +						+	<u> </u>	
Center 1	1.96 GHz								Sp	an 2.5 MHz
#Res BW	/ 13 kHz			#VBW	39 kHz				Sweep	) 18.27 ms
Occu	pied Bandwig	dth		Total Pov	ver	42.7 d	Bm			
	1	.2902 N	IHz							
Trans	mit Freq Error	84	19 Hz	% of OBV	Power	99.00	%			
x dB E	Bandwidth	2.350	MHz	x dB		-26.00	dB			
MEG						STATUS				
wards.						0101-00				



# Antenna A - Bandwidth QPSK - Channel T

Keysight Spectrum Analyzer - Occupied BW				- # #
enter Freq 1.988750000	GHz #FGain:Low	SENSE:INT] Center Freq: 1.988750000 Trig: Free Run #Atten: 24 dB	GHz Avg Hold: 50/50	01:41:21 AM Dec 07, 20: Radio Std: None Radio Device: BTS
odB/div Ref 36.57 dBm	<b>1</b>			
5.6	Jum	mannener	mm	
43 .4	~			phone the provide a second second
3.4				
3.4				
enter 1.989 GHz Res BW 15 kHz		#VBW 47 kHz		Span 3 MH Sweep 16.4 m
Occupied Bandwidt	<sup>h</sup> 2622 MHz	Total Power	38.9 dBm	
Transmit Freq Error x dB Bandwidth	-21 Hz 1.414 MHz	% of OBW Power x dB	99.00 % -26.00 dB	
iG			STATUS	



## 2.3 BAND EDGE

## 2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051 FCC CFR 47 Part 24, Clause 24.238 (b)

## 2.3.2 Date of Test and Modification State

November 27, 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 Temperature22°CRelative Humidity35%

## 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:40 dBm B:40dBm

Antonio	Ma dulation	O ami an D an duri dith	Band Edge (MHz)			
Antenna	Modulation	Carrier Bandwidth	Channel Position B	Channel Position T		
A	QPSK	1.48 MHz	1931.25	1988.75		



U0:70:7	05:45:47 AM Nov 2
Avg Type: RMS T Run dB	TRACE 1 2 TYPE WWW DET A N
Mkr2 1.930 Band Power -1	(r2 1.930 000 ( ower -18.08 d
	~
2	DL1-13
Span #Sweep 5.000	Span 5.000 ep 5.000 s (1001
TION FUNCTION WIDTH FUNCTION VALUE	UNCTION VALUE
Power 1.000 MHz Power 30.00 kHz	-13.44 -18.08

## Antenna A - Modulation QPSK - Channel B, 1.48 MHz

Antenna A - Modulation QPSK - Channel T, 1.48 MHz

Keysight Sp	ectrum Analyzer - S	iwept SA						- # E
Marker 2	RF 50	DOOOOOO GHz PNO IFGa	E Wide Tris	g: Free Run tten: 18 dB	Avg Type	RMS	01:4:	3:12 AM Dec 07, 2019 TRACE 1 2 3 4 5 TYPE WWWWW DET A NNNN
10 dB/div	Ref Offset 3 Ref 38.50	36.5 dB ) dBm				Band	Mkr2 1.99 Power -	0 000 GH 15.32 dBn
28.5	~		~					
8.50	/							
1.5			here	2				DL1 -13 00 dP
1.5				Junetienter .	Wedness and produced and and and and and and and and and an	1	_	
11.5							when manday a	tommerchankel
enter 1. Res BW	990000 GH 30 kHz	z	#VBW 13	0 kHz*		#5	Spa weep 5.000	an 5.000 Mi 0 s (1001 pt
KRIMODEIT 1 N 2 N	RC SCL f f	× 1.991 000 GHz 1.990 000 GHz	-30.09 dBm -15.17 dBm	EUNCTION Band Power Band Power	FUNCTION WIDTH 1.000 MHz 30.00 kHz		FUNCTION VALU	= -13.28 dB -15.32 dB
3 4 5 6								
7 8 9								
1								,
G					STATUS			



## Maximum Target Output Power T2:43dBm B2:43dBm

Antonio	Ma dudatian	O ami an D an dui dth	Band Edge (MHz)			
Antenna	Modulation	Carrier Bandwidth	Channel Position B2	Channel Position T2		
A	QPSK	1.48 MHz	1932.5	1987.5		

# Antenna A - Modulation QPSK - Channel B2, 1.48 MHz

Rad Span 30.000000 kHz         PNC: Wide Fraint.ow         Trig: FreeRun #Atten: 18 dB         Avg Type: RMS         Trice: Trice Trice: Trice: Tr	Keysight Sp	ectrum Analyzer	- Swept SA	1 cruces	1. T				- 6 Z
Ref Offset 38.5 dB         Mkr2 1.930 000 fB           285         Band Power -20.88 c           285         Context 1.930 000 GHz           315         Context 1.930 000 GHz           415         Span 5.000 GHz           31         f           32         f           33         f           34         Span 5.000 GHz           32.28.28 dBm         Span 5.000 s (1001           20.00 GHz         22.79 dBm           33         f           34         s           35         Span 5.000 GHz           36         Span 5.000 s (1001           20.00 GHz         22.79 dBm         Span 5.000 s (1001           20.00 GHz         22.79 dBm         Span 5.000 s (2.000 s (1001)           39         1         1.930 000 GHz         -22.79 dBm           30         1         1.930 000 GHz         -22.79 dBm           30         1         1.930 000 GHz         -22.28 dBm <th>Band Sp</th> <th>an 30.00</th> <th>0000 kHz</th> <th>NO: Wide Tri Gain:Low #A</th> <th>g: Free Run tten: 18 dB</th> <th>Avg Ty</th> <th>pe: RMS</th> <th>06:12</th> <th>TRACE 1 2 3 4 5 TYPE WWWWW DET A N N N N</th>	Band Sp	an 30.00	0000 kHz	NO: Wide Tri Gain:Low #A	g: Free Run tten: 18 dB	Avg Ty	pe: RMS	06:12	TRACE 1 2 3 4 5 TYPE WWWWW DET A N N N N
Log 285 185 850 155 155 155 155 155 155 155 1	10 dB/div	Ref Offse Ref 38.5	t 36.5 dB 50 dBm				Band	Mkr2 1.93 Power -2	0 000 GHz 0.88 dBm
No.         No. <th>28.5</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>- /</th> <th></th>	28.5							- /	
No.         1         2         2         1         0.1.13           215         1         1         1         1         0.1.13         0.1.13           315         1         1         1         1         1         0.1.13         0.1.13           415         1	8.50								
Start         Start <th< td=""><td>-11.5</td><td></td><td></td><td>1</td><td>2</td><td>weighter the second states of the</td><td>at you want you want</td><td></td><td>DL1 -13.00 dBn</td></th<>	-11.5			1	2	weighter the second states of the	at you want you want		DL1 -13.00 dBn
S15         Span 5.000           Center 1.930000 GHz         #VBW 130 kHz*         Span 5.000           #Res BW 30 kHz         #VBW 130 kHz*         #Sweep 5.000 s (1001           Image: Scale of the state of t	-31.5	wanter and the	- Adres the second and a second second	and the state of t	,				
Center 1.930000 GHZ         Span 5.000           #Res BW 30 kHz         #VBW 130 kHz*         #Sweep 5.000 s (1001           1         N         f         1.929 000 GHz         -28.79 dBm         Band Power         1.000 MHz         FUNCTION         FUNCTION </td <td>-51.5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	-51.5								
MORE INDUCE TREE Sea.         X         Y         FAMALTERM         FAMALTERM WORLH         FAMAT	Center 1. #Res BW	930000 G 30 kHz	Hz	#VBW 13	0 kHz*		#S	Spa weep 5.000	n 5.000 MH s (1001 pts
5         -	1 N 2 N 3 4	RC SCL f f	× 1.929 000 GHz 1.930 000 GHz	- <u>28.79 dBm</u> -22.28 dBm	Band Power Band Power	LONGTON MOTH 1.000 MHz 30.00 kHz		FUNCTION VALUE	-13.37 dB -20.88 dB
10	6 7 8 9								
	10 11				. III				

# Antenna A - Modulation QPSK - Channel T2, 1.48 MHz

K	er 2	1.99	000000	0000 GHz	NO: Wide	. Trig	: Free	Run		Avg Ty	pe: RN	IS		00:44:0 Ti	ACE 1 2 3 4 5 TYPE WWWWW DET A NNNN
в/	div	Ref 0 Ref	Offset 36. 42.50 d	5 dB Bm	Gamicow		xen. 22	ub				N Band	Akr2 Pow	1.990 /er -20	000 GH
F							_		_		_		-		
		A					_		-		-		+		
Ē	10418	- TIA.147	1										+		
			1												
E			1000	weet the way and the server	Mar and a		_		_				-		DL1 -13.00 dBr
L						mage	unne 1	2			-				
L								and shares	hound	ALL AND			-		
-															
┝		_		_					_		- south	HUHHH	MANU	* Preserve	any appropriate
te	er 1.9	99000	0 GHz								r.a.ellin	HULL HANN	191.41.46,12.	Span	ትናትችለት ጥሩ እ 5.000 MH
te	er 1.9 BW	99000 3.0 ki	IO GHz Hz		#VB	W 13	0 kHz	*	F3 181/		- <b>2</b> .000	#104-few #Sv	veep	ւներչչերի Span 5.000 s	ካተነ <sup>ላ</sup> ለም ጥሩ። 5.000 MH 5 (1001 pts
tes	er 1.9 BW	99000 3.0 ki	0 GHz Hz	X 1.991 000 GHz 1 990 000 GHz	#VB	W 13	0 kHz Eux Band Band	* CTION Power Power	FUNCT	1001 WIDTH 000 MHz	- train	#104##wn #SV	veep	Span 5.000 s	-14.39 dB -20.75 dB
te s	er 1.9 BW	99000 3.0 kl	10 GHz Hz	X 1.991 000 GHz 1.990 000 GHz	#VB -39.57 -31.70	dBm dBm	0 kHz Fux Band Band	R Power Power Power	FUNCT 1.( 3(	IONWOTH DOO MHz D.OO KHz		₩₩₩₩₩₩₩ #SV	veep	Span 5.000 s	5.000 MH (1001 pts -14.39 dB -20.75 dB
te s	er 1.9 BW	99000 3.0 kl	IO GHZ HZ	X 1.991 000 GHz 1.990 000 GHz	#VB -39.57 -31.70	W 13 dBm dBm	0 kHz Band Band	* Power Power	EUNCT 1.0 30	ION WIDTH 000 MHz 0.00 kHz		#SV	veep auxen	Span 5.000 s	441 5.000 MH (1001 pts -14.39 dB -20.75 dB
s	er 1.9 BW	99000 3.0 kl	0 GHz Hz	X 1.991 000 GHz 1.990 000 GHz	#VE -39.57 -31.70	W 13	0 kHz Fux Band Band	* CRON Power Power	EUNCT 1.( 3(	000 MHz 0.00 kHz		#104##~/i	veep awen	зер <sub>е</sub> кк <sub>ун</sub> Span 5.000 s	ቁናሰጫዋላዊ መሆን 5.000 MH 5 (1001 pts -14.39 dB -20.75 dB
te s	er 1.9 BW	99000 3.0 kl	IO GHZ HZ	x 1.991 000 GHz 1.990 000 GHz	#VE	W 13 dBm dBm	0 kHz Fux Band Band	CHON Power Power	FUNGT 1.( 3(	ION MIDIFI DOO MHz DOO KHz		#104#\$#~\\ #SV	veep auxen	Span 5.000 s	야가 아유
tes	er 1.9 BW	99000 3.0 kl	IO GHz Hz	X 1.991 000 GHz 1.990 000 GHz	#VB -39.57 -31.70	dBm	0 kHz Band Band	* CRON Power Power	FUNCT 1.( 3(	1007AWIOTH 000 MHz 0.00 kHz		#104##~^	veep	Span 5.000 s	ቁሳሳ ቁጥ እ 5.000 MH 5 (1001 pts -14.39 dB -20.75 dB
tes	er 1.9 BW	99000 3.0 ki	IO GHZ HZ	x 1.991 000 GHz 1.990 000 GHz	#VE	dBm dBm	0 kHz Fux Band Band	* Power Power	1.0 30	DOD MHZ D.OO KHZ		#104#\$~^ #SV	veep	<sup>на</sup> (1997) Span 5.000 s	чт/чн-ссо, 5.000 MH ; (1001 pts -14.39 dB -20.75 dB
s M	er 1.9 BW	99000 3.0 kl	IO GHz Hz	X 1.991 000 GHz 1.990 000 GHz	#VB -39.67 -31.70	dBm dBm	0 kHz Fux Band Band	* Power Power	1.1. 3(	IOTAMIOTE 000 MHz 0.00 kHz		₩Ш₩±₩рк-∧ #SV	veep annen	समिद्धसम् <sub>म</sub> Span 5.000 s DN WALUE	<del>፡፡/ˈˈ</del> ɨ/ɨ‹‹‹›, 5.000 MH (1001 pts -14.39 dB -20.75 dB



## 2.4 TRANSMITTER SPURIOUS EMISSIONS

## 2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051 FCC CFR 47 Part 24, Clause 24.238 (a)

## 2.4.2 Date of Test and Modification State

November 27, 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 Temperature22°CRelative Humidity35%

#### 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.

The EUT has one transmit port, 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:40 dBm, M:43 dBm, T:40 dBm CDMA2K 1.48 MHz Bandwidth setting

# Antenna A - Modulation QPSK - Channel B

Keysight S	PE 50.0	nt SA		SENSE-INT	1 1		05:48:12	AM Nov 27, 2018
Center F	req 2.00000	1500 GHz NFE	PNO: Fast	. Trig: Free Run #Atten: 40 dB	#Avg Type	RMS	TR	ACE 1 2 3 4 5 TYPE WWWWW DET A NNNN
10 dB/div	Ref Offset 36.5 Ref 36.50 d	i dB Bm					Mkr1 1.9 37	31 2 GHz 7.42 dBm
				1				
26.5								
16.5	_							
6.60								
-3.50		_						
-13.5	_							DL1 -13.00 dBr
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-33.5	1				And a start of the second			
-43.5		_						
-53.5								
Start 9 kl #Res BW	Hz / 1.0 MHz		#VB	W 3.0 MHz*		#S\	Stop weep 8.000 s	4.000 GHz

Keysight Sp	ectrum Analy	zer - Swept SA		_						
enter F	req 8.0	0000000	00 GHz	DNO: East	SENSE:INT	Run	#Avg Type:	RMS	05:48:35 TR	AM Nov 27, 201 ACE 1 2 3 4 5 TYPE WWWW
			I	FGain:Low	#Atten: 14	dB				DET A NNNN
) dB/div	Ref Offs Ref 20	set 37.5 dE ).00 dBn	3						Mkr1 4.0	23 0 GH 3.87 dBn
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art 4.00	00 GHz				<u> </u>	·			Stop 1	12.000 G
es BW	1.0 MHz	z		#VB	W 3.0 MHz	æ		#Swee	ep 16.00 s	(16000 p



Keysight Sp	PE FOR OUT	A		CENCE-INT	1			05-10-5	
Center F	req 15.00000	NFE	PNO: Fast	Trig: Free #Atten: 10	Run dB	#Avg Type	RMS	U3.48.3	ACE 1 2 3 4 5 TYPE WWWWW DET A NNNN
10 dB/div	Ref Offset 38,51 Ref 20.00 dB	dB m					'	Mkr1 15.9 -43	50 3 GH: 2.14 dBn
10.0									
0.00		-	_						
-10.0	_	-							DL1 -13.00 dĐ
-20.0									
-30.0									
-40.0					الم أن الم	. X		والألذ وارتب	المرير والأرباط والم
-50.0	in Landelle and all an a fail.								With Diffe
-60.0									
-70.0									
Start 12. #Res BW	000 GHz 1.0 MHz		#VE	W 3.0 MHz	*		#Swe	Stop 12.00 s	18.000 GHz (12000 pts

Keysight Sp	pectrum Analyzer - Swept	SA							
RL	RF 50 Ω	AC OLL		SENSE:INT		HALL THE	DMC	05:49:2	AM Nov 27, 2018
Center F	req 22.25000	NFE	Z PNO: Fast -	Trig: Free	Run	#Avg Type	RIVIS		DET A N N N N
			IFGain:Low	#Atten. It	ub .			Mkr1 25 7	99 0 GHz
10 dB/div	Ref Offset 18.5 Ref 18.50 dE	dB Sim						-5	6.00 dBm
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8.50		-	_	-		-			
-1.50									
-11.5	_		_						0L1 -13.00 dDm
21.5									
-21.5									
-31.5									
41.5									
41.5									
-51.5									<b>♦</b> <sup>1</sup>
-61.5					L,		a da del	and the states	A.4.4
	<b>MALA</b>	L Marila	ألال المسادل	والمناجل الألأليا	-		www.		
-71.5		A. State							
Start 18.0 #Res BW	000 GHz 1.0 MHz		#V	BW 3.0 MHz	*		#Swe	Stop 2 ep 17.00 s	26.500 GHz (17000 pts)
								-	



		NFE	PNO: Fast	<ul> <li>Trig: Free Run #Atten: 36 dB</li> </ul>	and the unio		DET A N N
	Paf Offeat 36	5 dB	IFGain:Low	WALLEN. OU GD		Mkr1	1.959 7 G
B/div	Ref 36.50 c	1Bm					40.91 d
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	and the second second						
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ysight Sp L	ectrum Analyzer - Swi RF 50 Ω	ept SA AC		SENSE:INT		04:	:31:15 AM Nov 27,
ysight Sp L Iter F	RF 50 ຄ req 8.00000	ept SA AC 00000 GH2 NFE	Z PNO: Fast	SENSE:INT	#Avg Type: RMS	04:	31:15 AM Nov 27, TRACE 1 2 3 TYPE WWW
ysight Sp L Iter F	RF 50 Ω Freq 8.00000	AC AC 00000 GH2 NFE	Z PNO: Fast IFGain:Low	SENSE:INT] Trig: Free Run #Atten: 14 dB	#Avg Type: RMS	04: Mkr1	31:15 AM Nov 27, TRACE 1 2 3 TYPE WWW DET A N N
ysight Sp L Iter F B/div	ectrum Analyzer - Sw ۲۳ 50 Ω req 8.00000 Ref Offset 37 Ref 20.00 c	ept SA AC 00000 GH2 NFE .5 dB 1Bm	Z PNO: Fast IFGain:Low	SENSE:DNT → Trig: Free Run #Atten: 14 dB	#Avg Type: RMS	04 Mkr1 4	31:15 AM Nov 27, TRACE [1 2 3 TYPE WWW DET A NN 4.017 0 G -43.14 d
ysight Sp L Iter F B/div	Ref Offset 37. Ref 20.00 c	ept SA AC 00000 GH: NFE .5 dB 1Bm	Z PNO: Fast IFGain:Low	SENSE:INT  Trig: Free Run #Atten: 14 dB	#Avg Type: RMS	04	11:15 AM Nov 27, TRACE 1 2 3 TYPE W DET A NN 4.017 0 G -43.14 d
nysight Sp L nter F B/div	RF 50 Ω RF 50 Ω Freq 8.00000 Ref Offset 37 Ref 20.00 c	AC 00000 GH: NFE 5 dB	Z PNO: Fast IFGain:Low	SENSE:INT	#Avg Type: RMS	04	31:15 AM Nov 27, TRACE [ 1 2 3 TYPE WWW DET A NN 4.017 0 G -43.14 d
nysight Sp L Inter F B/div	RF   50 Q RF   50 Q Freq 8.00000 Ref Offset 37 Ref 20.00 c	ept SA AC D0000 GH: NFE .5 dB IBm	Z PNO: Fast IFGain:Low	SENSE:INT  Trig: Free Run #Atten: 14 dB	#Avg Type: RMS	04: Mkr1 4	31:15 AM Nov 27, TRACE 1 2 3 TYPE WWW DETA NN 4.017 0 G -43.14 dl
B/div	Ref Offset 37	AC AC D0000 GH2 NFE .5 dB IBm	Z PNO: Fast IFGain:Low	SENSE:INT  Trig: Free Run #Atten: 14 dB	#Avg Type: RMS	04: Mkr1 4	31:15 AM Nov27, TRACE [1 2 3 TYPE WWW DETA NN 4.017 0 G -43.14 dl
B/div	Ref Offset 37 Ref 20.00 c	ept SA AC   NFE 5 dB 1Bm	Z PNO: Fast IFGain:Low	SENSE:INT  Trig: Free Run #Atten: 14 dB	#Avg Type: RMS	04 Mkr1 4	31:15 AM Nov27, TRACE [1 2 3 TYPE] DET A NN 4.017 0 G -43.14 dl
B/div	Ref Offset 37. Ref 20.00 c	npt SA AC NFE 5 dB IBm	Z PNO: Fast IFGain:Low	SENSE:INT  Trig: Free Run #Atten: 14 dB	#Avg Type: RMS	04	21:15 AM Nov 27, TRACE [] 2 3 TRACE [] 2 3 DET   A N N 4.017 0 G -43.14 dl 0.11-130
B/div	Ref Offset 37. Ref 20.00 c	AC   AC   NFE 5. dB Bm	Z PNO: Fast IFGain:Low	SENSE:INT  Trig: Free Run #Atten: 14 dB	#Avg Type: RMS	04: Mkr1 4	23:13 AH Nov 27, 1746C [] (3 1746C [] (3
B/div	Ref Offset 37. Ref 20.00 c	ept SA AC   NFE 5. dB Bm	Z PNO: Fast IFGain:Low	SENSE:INT	#Avg Type: RMS	04	23135 AH Nov 27, 1746C [] 13 1746C [] 13 1747C [] 13
B/div	Ref Offset 37. Ref 20.00 c	eert SA AC   NFE 5. dB Bm	Z PNO: Fast IFGain:Low	SENSE:INT	#Avg Type: RMS	04	21:15 AH Nov 27, 1746C [1:3 1746C [1:3 1747C [1:3
B/div	Ref Offset 37. Ref 20.00 c	ept SA AC   NFE 5. dB Bm	Z PNO: Fast IFGain:Low	SENSE:INT	#Avg Type: RMS	04	21:15 AH Nov 27, 1746C [] 13 1746C [] 13 1747C [] 13
systight Sp tter F B/div	Ref Offset 37. Ref 20.00 c	ept SA AC   NFE 5. dB Bm	Z PNO: Fast IFGain:Low	SENSE:INT	#Avg Type: RMS	04	21:15 AH Nov 27, 21:15 AH Nov 27, TYPE [] 13: TYPE [] 13: DET AN 4.017 0 G -43.14 d] DL1-130
B/div	Ref Offset 37 Ref 20.00 c	ept SA AC   NFE 5. dB Bm	Z PNO: Fast - IFGain:Low	SENSE:INT   Trig: Free Run #Atten: 14 dB	#Avg Type: RMS	04	2113 AH NOV 27, 2113 AH NOV 27, TYPE [] 13 TYPE [] 13 TYPE [] 13 TYPE [] 14 DET AN ALOIT 0 0G -43.14 dl
B/div	Ref Offset 37 Ref 20.00 c	ept SA AC   NFE 5. dB Bm	Z PNO: Fast - IFGain:Low	SENSE(INT)	#Avg Type: RMS	04	2113 AN Hov 27, 2113 AN Hov 27, Tree [Li 3 Tree [Waw Der] AN 4.017 0 0 0 -43.14 dl
B/div	Ref Offset 37 Ref 20.00 c	ept SA AC   NFE 5. dB Bm	Z PNO: Fast - IFGain:Low	SENSE(INT)	#Avg Type: RMS	04	2113 AN Hov 27, 2113 AN Hov 27, Trace [1:3 Trace [1:3 Trace [1:3 Trace [1:3] A 1017 0 0 0 -43.14 dl
B/div	Ref Offset 37 Ref 20.00 c	ept SA AC   NFE 5. dB Bm	Z PNO: Fast - IFGain:Low	SENSE:INT   Trig: Free Run #Atten: 14 dB	#Avg Type: RMS	04	2113 AN Hov 27, 2113 AN Hov 27, Trace [1:3 Trace [1:3 Trace [1:3 Trace [1:3] At 10 T 0 T 0 C -43.14 dl
B/div	Ref Offset 37 Ref 20.00 c	ept SA AC   NFE 5. dB Bm	Z PNO: Fast - IFGain:Low	SENSE:INT   Trig: Free Run #Atten: 14 dB	#Avg Type: RMS	04	2113 AN HOV 27 2113 AN HOV 27 TYPEC [1 2] TYPEC [1 2]

# Antenna A - Modulation QPSK - Channel M



Keysight S	ipectrum Analyzer - 5	wept SA							
Center	Freq 15.000	0000000 GHz	:	SENSE:INT	Dura	#Avg Type:	RMS	04:31:35 TR	AM Nov 27, 2018
		NFE	PNO: Fast IFGain:Low	#Atten: 10	dB				DETANNNN
10 dB/div	Ref Offset 3 Ref 20.00	8.51 dB dBm					1	42 Akr1 15.9	99 8 GHz 2.07 dBm
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10.0									
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-50.0	liku u disila adailaa i	مريد المريد	المتحاليسانية بارقا فلل	ally in all and		$\Lambda \Lambda$	Nel Aller		
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start 12. #Res BV	000 GHz V 1.0 MHz		#VE	3W 3.0 MHz	*		#Swe	Stop 1 ep 12.00 s	(12000 GHz

Keysight Sp	ectrum Analyzer - Swep	it SA							
RL	RF 50 Ω	AC		SENSE:INT]		HALL THE	DMC	04:32:0	AM Nov 27, 2018
enter F	req 22.25000	JUUUU GHZ	DNO: East	Trig: Free	Run	#Avg Type	PEN S	1	TYPE WWWW
		NFC	IFGain:Low	#Atten: 10	dB				DET A NNNN
	Def Offert 19 F	dD						Mkr1 25.7	95 0 GHz
10 dB/div	Ref 18.50 di	Bm						-5	6.39 dBm
-og								1	
8.50									
-1.50		-	-					-	
-11.5		_		_					0L1 -13.00 dDm
-21.5		_		-					
-31.5				-					
-41.5									
-51.5		-	-					-	A1
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Start 18	000 GHz				•			Ston	26 500 GHz
#Res BW	1.0 MHz		#V	BW 3.0 MHz	×		#Swe	ep 17.00 s	(17000 pts
									P



Leve	el 50.5	0 dBm				-	#Avg Type:	RMS		TRACE 1 2 3
			NFE	PNO: Fast +	#Atten: 30	dB				DET A N N
	Ref 0	ffset 36,5 d	в						Mkr1 1.	988 8 0
B/div	Ref	50.50 dBr	n						•	37.38 a
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t 9 KH s BW	1.0 M	HZ	A	#VE	SW 3.0 MHz	*		#Sw	veep 8.000	s (8000
t 9 KH s BW ysight Sp L ter F	Iz 1.0 M ectrum An RF req 8.	Hz alyzer - Swept S 50 Ω A 0000000	A C IOO GHz	#VE	SENSE:INT	*	#Avg Type:	#Sw	veep 8.000	31 AM Nov 27, TRACE 1 2 3 TYPE WWW
t 9 KH s BW ysight Sp L iter F	Iz 1.0 M ectrum An RF req 8.	Hz alyzer - Swept S 50 Ω A 0000000	A C DOD GHZ NFE	#VE PNO: Fast IFGain:Low	SENSE:INT) Trig: Free #Atten: 14	* Run dB	#Avg Type:	#Sw	veep 8.000	31 AM Nov 27, TRACE 1 2 3 TYPE WWW DET A N N
T9KH sBW ysight Sp L Iter F	Iz 1.0 MI ectrum An RF req 8. Ref 0 Ref 0	Hz alyzer - Swept S 50 Ω A 00000000 ffset 37,5 d 20.00 dBr	A C OOO GHz NFE	#VE PNO: Fast IFGain:Low	SENSE:INT - Trig: Free #Atten: 14	* Run dB	#Avg Type:	#Sw	06:58 Mkr1 4.	31 AM Nov 27 TRACE 1 2 3 TYPE WWW DET A NN 015 5 C 43.94 d
s BW s BW ysight Sp L I tter F	Iz 1.0 Mi ectrum An RF req 8. Ref 0 Ref 2	Hz 50 Ω A 0000000 ffset 37.5 d 20.00 dBr	A DOO GHz NFE B m	#VE	SENSE:INT] Trig: Free #Atten: 14	* Run dB	#Avg Type:	#Sw	06:58 06:58 Mkr1 4. -4	31 AM Nov 27, TRACE 1 2 3 TYPE WWW DET A NN 015 5 C 43.94 d
ysight Sp ter F	IZ 1.0 MI ectnum An RF req 8. Ref 0 Ref 2	Hz 5 Ω A 0000000 ffset 37.5 d 20.00 dBr	B m	#VE	SENSE:INT Trig: Free #Atten: 14	* Run dB	#Avg Type:	#Sw	06:58 06:58 Mkr1 4.	31 AM Nov 27 TRACE 1 2 3 TYPE DET A N N 015 5 C 43.94 d
ysight Sp L hter F	IZ 1.0 MI ectrum An RF req 8. Ref 0 Ref 2	Hz 50 Ω A 0000000 ffset 37.5 d 20.00 dBr	A C IOO GHz NFE B M	#VE PNO: Fast IFGain:Low	SENSE:INT	* Run dB	#Avg Type:	#Sw	06:59 Mkr1 4.	s (8000 331 AM Nov 27 TRACE 1 2 3 TYPE (WMM DET A NN 015 5 C 43.94 d
s BW	IZ 1.0 M ectnum An RF req 8. Ref 0 Ref 2	Hz 30 0000000 ffset 37.5 d 20.00 dBr	A C DOO GHZ NFE B M	#VE	SENSE:INT Trig: Free #Atten: 14	Run dB	#Avg Type:	#Sw	06:58 Mkr1 4.	9 s (8000 331 AM Nov 27 TRACE 1 2 3 TYPE WWW 015 5 C 43.94 d
ysight Sp L Iter F	tz 1.0 MI ectrum An RF req 8. Ref 0 Ref 1	Hz 50 Ω A 0000000 ffset 37.5 d 20.00 dBr	A C DOD GHZ NFE B M	#VE	SENSE:INT] Trig: Free #Atten: 14	Run dB	#Avg Type:	#Sw	06:58 Mkr1 4.	31 AM Nov 27 TRACE 12 3 TYPE UNA DET A NN 015 5 C 43.94 d
s BW	tz 1.0 MI RF req 8. Ref 0 Ref 1	Hz 50 0 A 00000000 ffset 37.5 d 20.00 dBr	A C OOO GHz NFE B m	#VE	SENSE.INT	Run dB	#Avg Type:	#Sw	06:58 Mkr1 4.	ок (8000 31 АМ № 27 ТЯАСЕ [1 2 3 ТИРСЕ] ФЕТА NN 015 5 С 43.94 d
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ysight Sp ter F	tz 1.0 MI RF req 8. Ref 0 Ref 1	Hz 100000000 1500 A 00000000 ffset 37.5 d 20.00 dBr	A C NFE B N B N C NFE	#VE	SENSEJMT	Run dB	#Avg Type:	#Sw	06:59	s (8000
ysight Sp L Inter F	IZ 1.0 MI	Hz 50 A 00000000 ffset 37.5 d 20.00 dBr	A C NFE B N B N C NFE	#VE	SENSEJMT	Run dB	#Avg Type:	#Sw	06:59	s (8000
ysight Sp L Inter F	tz 1.0 MI estrum Ann PF req 8. Ref 0 Ref 1	Hz 1928 - Swept S 50 A 00000000 ffset 37.5 d 20.00 dBr	A C   NFE B M B C NFE B C NFE B C NFE C N NFE C N	#VE	SENSE JMT	Run dB	#Avg Type:	#Sw	06:59 Mkr1 4. 	s (8000 
ysight Sp L tter F B/div	tz 1.0 MI PF req 8. Ref 0 Ref 1	Hz alyzer - Swept S 50 Ω A 00000000 ffset 37.5 d 20.00 dBr	A C NFE B M C NFE B C NFE B C NFE C N NFE C N	#VE	SENSE JMT	Run dB	#Avg Type:	#Sw	06:59 Mkr1 4. 	S (8000
ysight Sp L L B/div	tz 1.0 MI PF req 8. Ref 0 Ref 1	Hz 1928 - Swept S 50 0 A 00000000 ffset 37.5 d 20.00 dBr	A C NFE B M C NFE	#VE	SENSEINT	Run dB	#Avg Type:	#Sw	06:59 Mkr1 4. 	s (8000
yddit Sp B/div	IZ 1.0 MI	Hz alyzer - Swept S 50 0 A 00000000 ffset 37.5 d 20.00 dBr	A C I NFE B m I I I I I I I I I I I I I	#VE	SENSEINT	Run dB	#Avg Type:	#Sw	06:59 Mkr1 4. 	s (8000 
1	Iz 1.0 MI	Hz	A C I NFE B m I I I I I I I I I I I I I	#VE	SENSEINT	Run dB	#Avg Type:	#Sw	06:59 Mkr1 4. 	s (8000

Antenna A - Modulation QPSK - Channel T



Keysight S	Spectrum Anal	lyzer - Swept SA				,				
Center	Freq 15	.000000	000 GHz	PNO: Fast	. Trig: Free	Run	#Avg Type	RMS	06:58:55 TR	ACE 1 2 3 4 5 6 VPE WWWWWW DET A N N N N
10 dB/div	Ref Of Ref 2	fset 38.51 c 0.00 dBm	iB 1	IPGalli2.0w	million. Io			Ν	Akr1 17.3 -41	07 9 GHz 1.96 dBm
10.0										
0.00	-									
-10.0	_									DL1 -13.00 dBm
-20.0										
-30.0										
-40.0					تحمير والاحتان والال	and the state of the	MA.	و مالد والغار	المانين أطلقتن	
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-70.0	_									
Start 12. #Res BV	.000 GH2 V 1.0 MH	z Iz		#VB	W 3.0 MHz	*		#Swee	Stop 1 20 12.00 s	8.000 GHz (12000 pts)

nter F	req 2	2.25000	0000 GH	Z DNO Fast	Trig: Free F	lun	#Avg Type:	RMS	T	TYPE WWWW
			NFE	IFGain:Low	#Atten: 10 d	B				DETANNN
Ref Offset 18.5 dB Mkr1 25.793 0 GHz 0 dB/div Ref 18.50 dBm -55.75 dBm										
	_		-							
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L.									ليلاقيه فأكتداءه	A.A.
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			T							
t 18. s BW	000 GH	lz Hz		#VB	W 3.0 MHz*			#Swee	Stop 2 p 17.00 s	26.500 G (17000 p

Limit

-13dBm



## 2.5 FREQUENCY STABILITY

#### 2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055 FCC CFR 47 Part 24, Clause 24.235

#### 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

Tamparatura		Frequency Error (Hz)	
remperature	Voltage	Channel Position M	
-30°C	120V AC	EUT non-operational	
-20°C	120V AC	EUT non-operational	
-10°C	120V AC	5	
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	5	
+50°C	120V AC	10	

Limit +/- 1 ppm
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**SECTION 3** 

**TEST EQUIPMENT USED** 



# 3.1 TEST EQUIPMENT USED

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

Instrument	Manufacturer	Type 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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