LABORATORY TEST REPORT

RADIO PERFORMANCE MEASUREMENTS

for the

TBDB1G BASE STATION Transceiver Fitted with the B1 136-174 MHz Reciter

Tested in accordance with:

FCC 47 CFR Parts 22 and 90

RSS-119 Issue 12 RSS-Gen Issue 5

Report Revision:

1

Issue Date:

22 February 2021

PREPARED BY:

CHECKED & APPROVED BY:

I. D. Russell

M. C. James

Test Techniciar

ulle

Laboratory Technical Manager



FCC Registration: 838288 ISED Registration: 737A

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.

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FCC ID: CASTBDB1G IC : 737A-TBDB1G Page 1 of 129

Report Revision: 1 Issue Date: 22 February 2021

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REVISION HISTORY

Date	Revision	Comments
22 February 2021	1	Initial test report

INTRODUCTION

Type approval testing of the TBDB1G, 50 Watt, BASE STATION transceiver in order to demonstrate compliance with FCC 47 Parts 22 & 90, and RSS-119 Issue 12 & RSS-Gen Issue 5. This radio supports analogue, digital FFSK, Digital Mobile Radio (DMR), APCO P25 phase-1 modulations.

REPORT PREPARED FOR

Tait International Limited 245 Wooldridge Road Harewood Christchurch 8051 New Zealand

DESCRIPTION OF SAMPLE

Manufacturer	Tait International Limited
Equipment:	BASE STATION Transceiver
Type:	TBDB1G
Product Code:	TB7310-B1B0-0000-A000-10
Serial Number(s):	18331488
Frequency range	136 → 174 MHz
Transmit Power	50 Watts

Modulation		Channel Spacing	Speech Channels	Symbol Rate (symbols/sec)	Data Rate (bps)
Analogue FM		12.5 kHz	1	-	-
FFSK	Fast Frequency Shift Keying	12.5 kHz	-	1200	1200
Digital Mobile Radio (DMR)	4 Level FSK (2 slot TDMA) (ETSI TS102 361-1)	12.5 kHz	2	4800	9600
APCO P25 Phase 1	C4FM (TIA 102)	12.5 kHz	1	4800	9600

HARDWARE & SOFTWARE Quantity: 1

Quantity.				
Module	Product Code	Serial Number	Firmware Version	Hardware Version
Reciter	T01-01403-BAAA	18331256	p25-0.01.00-47875- g57afd504cf	2.01
Power Amplifier	T01-01405-BAAA	18337783	-	0.02
Front Panel	T01-01410-AAAA	4793823	1.10.03.9999	0.01

TEST CONDITIONS

All testing was performed between 12 \rightarrow 18 February 2021, and under the following conditions:

Ambient temperature:	15°C → 30°C
Relative Humidity:	20% → 75%
Standard Test Voltage	120 VAC

TEST REQUIREMENTS AND RESULT SUMMARY

ISED Specification	FCC Specification	Test Name	Test Methods	Result
RSS-119 5.4	FCC 47 CFR 2.1046	Transmitter Output Power (Conducted)	RSS-Gen 6.12 ANSI C63.26 5.2.4.2	Р
No specification	FCC 47 CFR 2.1047 (a)	Transmitter Audio Frequency Response – Pre-emphasis	ANSI C63.26 5.3.3.2	Р
No specification	FCC 47 CFR 2.1047 (b)	Transmitter Modulation Limiting	ANSI C63.26 5.3.2	Р
RSS-119 5.5	FCC 47 CFR 2.1049 (c)	Transmitter Occupied (99%) Bandwidth	RSS-Gen 6.7 ANSI C63.26 5.4.4	Р
RSS-119 5.5	FCC 47 CFR 90.210	Transmitter Spectrum Masks	RSS-119 4.2.2 TIA-603-E 2.2.11	Р
RSS-119 5.8.9	FCC 47 CFR 90.543	Adjacent Channel Power Ratio	RSS-119 4.3 ANSI C63.26 6.5.2.4	N/A 1
RSS-119 5.8	FCC 47 CFR 2.1051	Transmitter Spurious Emissions (Conducted)	RSS-Gen 6.13 ANSI C63.26 5.7	Р
RSS-119 5.8	FCC 47 CFR 2.1053	Transmitter Spurious Emissions (Radiated)	RSS-Gen 6.13 ANSI C63.26 5.5	Р
No specification	FCC CFR 90.543	Transmitter Radiated Emissions in the GNSS Band	ANSI C63.26 6.5.2.7.3	N/A 1
RSS-119 5.8.9.2 rad	No specification	Transmitter Conducted Emissions in the GNSS Band	RSS-119 5.8 ANSI C63.26 6.5.2.7.4	N/A 1
RSS-119 5.9	FCC 47 CFR 90.214	Transient Frequency Behaviour	RSS-119 5.9 ANSI C63.26 6.5.2.2	Р
RSS-119 5.3	FCC 47 CFR 90.214	Transmitter Frequency Stability - Temperature	RSS-Gen 6.11 ANSI C63.26 5.6.4	Р
RSS-119 5.3	FCC 47 CFR 2.1055 (d) (1)	Transmitter Frequency Stability - Voltage	RSS-Gen 6.11 ANSI C63.26 5.6.5	Р
RSS-Gen 7.4	FCC 47CFR 15.111	Receiver Spurious Emissions (Conducted)	RSS-Gen 7.4 TIA-603-E 2.1.2	Р

Test Case Result Definitions		
No test Performed	Ν	
Test does not apply to the test object	N/A	
Test object meets requirements	P (Pass)	
Test object does not meet requirements	F (Fail)	
Test object is not conclusive	I (Inconclusive)	

Comments:

N/A 1: Only required where the EUT transmits in the 768-776 or 798-806 MHz band (ISED), or 769-775 or 799-805 MHz band (FCC).

STATEMENT OF COMPLIANCE

We, TELTEST LABORATORIES of 558 Wairakei Road, Christchurch, New Zealand, declare under our sole responsibility that the product:

Equipment: Type:	BASE STATIC TBDB1G	N Transceiver		
Module	Product Code	Serial Number	Firmware Version	Hardware Version
Reciter	T01-01403-BAAA	18331256	p25-0.01.00-47875- g57afd504cf	2.01
Power Amplifier	T01-01405-BAAA	18337783	-	0.02
Front Panel	T01-01410-AAAA	4793823	1.10.03.9999	0.01

to which this declaration relates, is in conformity with the following standards:

FCC 47 CFR Parts 22 and 90

RSS-119 Issue 12 and RSS-Gen Issue 5

Signature:

Mike James **Technical Manager**

Date:

16 March 2021

The results obtained in this test report pertain only to the item(s) tested. Teltest does not make any claims of compliance for samples or variants that were not tested.

CHANNEL TABLE

Channel	Transmit	Receive	Power	Bandwidth
Number	Frequency	Frequency		
CH1	138.1 MHz	138.15 MHz	50W	12.5kHz
CH2	138.1 MHz	138.15 MHz	2W	12.5kHz
CH3	150.85 MHz	150.90 MHz	50W	12.5kHz
CH4	150.85 MHz	150.90 MHz	2W	12.5kHz
CH5	156.1 MHz	156.15 MHz	50W	12.5kHz
CH6	156.1 MHz	156.15 MHz	2W	12.5kHz
CH7	157.2 MHz	157.25 MHz	50W	12.5kHz
CH8	157.2 MHz	157.25 MHz	2W	12.5kHz
CH9	161.9 MHz	161.95 MHz	50W	12.5kHz
CH10	161.9 MHz	161.95 MHz	2W	12.5kHz
CH11	162.1 MHz	162.15 MHz	50W	12.5kHz
CH12	162.1 MHz	162.15 MHz	2W	12.5kHz
CH13	173.3 MHz	173.35 MHz	50W	12.5kHz
CH14	173.3 MHz	173.35 MHz	2W	12.5kHz

MODULATION TYPES, NECESSARY BANDWIDTH & EMISSION DESIGNATORS

MODULATION TYPES: F3E FM Analogue Voice F2D Fast Frequency Shift F1E C4FM FXW Digital Voice / Data	Keying	- 1200 symbols/sec 4800 symbols/sec 4800 symbols/sec	- 1200 bps 9600 bps 9600 bps
CHANNEL SPACING:	12.5 kHz		
EMISSION DESIGNATORS: Analogue Voice FFSK P25 Phase 1 Digital Voice DMR Digital Voice / Data	11K0F3E 7K60F2D 8K10F1E 8K00FXW		
Equation: Bn = 2M + 2Dk (M is highest modulating freq	uency; D is peak al	lowable deviation; k is a consta	ant of 1 for FM)
Analogue Voice 12.5 kHz Cl Necessary bandwidth M = 3.0 kHz D = 2.5 kHz Bn = (2x3.0) + (2x2.5) = 11.0 kHz		Emission Designator 11K0F3E F3E represents an FM voice t	ransmission
Fast Frequency Shift Keying: (FFSK – 1200 b) Necessary bandwidth M = 1.8 kHz D = 2.0 kHz $Bn = (2 \times 1.8) + (2 \times 2.0) \times 1$ = 7.6 kHz		ps) 12.5 kHz Channel Spacing Emission Designator 7K60F2D F2D represents a FM data tran the use of a modulating sub ca	
P25 phase 1: Digital Voice 12.5 kHz Channel Spacing 99% bandwidth Emission Designator = 8.1 kHz 8K10F1E F1E represents a digital FM voice transmining			pice transmission
P25 phase 1 : Digital Data 12 99% bandwidth = 8.1 kHz	.5 kHz Channel Sp	acing Emission Designator 8K10F1D F1D represents an digital FM	data transmission
DMR: Digital Voice 12.5 kHz Channel Spacing 99% bandwidth Emission Designator = 8.0 kHz 8K00FXW FXW represents a FM Time Division Multiple Access (TDMA) combination of data and teleph			ata and telephony
DMR : Digital Data 12.5 kHz 0 99% bandwidth = 8.0 kHz FXD represents FM Time Div		Emission Designator 8K00FXD ss (TDMA) data only	

TEST RESULTS

TRANSMITTER OUTPUT POWER (CONDUCTED)

SPECIFICATION: FCC 47 CFR 2.1046 RSS-119 5.4

GUIDE: ANSI C63.26 5.2.4.2

MEASUREMENT PROCEDURE:

- 1. Refer Annex A for Equipment set up.
- 2. The coaxial attenuator has an impedance of 50 Ohms.
- 3. The unmodulated output power was measured with an RF Power meter.

EXAMPLE CALCULATION:

Example calculation	
Power in dBm =	Measured power (dBm) + attenuator and cable loss (dB)
Chan 1 power (dBm) =	16.98 dBm +30.13 dB
=	47.11dBm
Power in Watts =	(10^(47.11dBm)/10)/1000
=	51.4W

MEASUREMENT RESULTS:

Manufacturer's Rated Output Power:

Switchable: 50 W and 2 W

Nominal 50 W	138.1 MHz	150.85 MHz	156.1 MHz	157.2 MHz	161.9 MHz	162.1 MHz	173.3 MHz
Measured	51.4	51.3	51.9	51.3	54.4	54.4	51.8
Variation (%)	2.9	2.6	3.7	2.6	8.8	8.8	3.5
Variation (dB)	0.1	0.1	0.2	0.1	0.4	0.4	0.2
Nominal 2 W	138.1 MHz	150.85 MHz	156.1 MHz	157.2 MHz	161.9 MHz	162.1 MHz	173.3 MHz
Measured	2.0	2.0	2.1	2.0	2.1	2.1	2.1
Variation (%)	-0.4	0.3	2.8	1.9	3.9	3.9	2.6
Variation (dB)	0.0	0.0	0.1	0.1	0.2	0.2	0.1
Measurement Uncertainty		± 0.6 dB					

LIMIT CLAUSES:

FCC 47 CFR 90.205 (s)

The output power shall not exceed by more than 20%... the manufacturer's rated output power for the particular transmitter specifically listed on the authorization.

RSS-119 5.4 The output power shall be within ±1.0 dB of the manufacturer's rated power. FCC ID: CASTBDB1G Page 9 of 129 IC : 737A-TBDB1G Issue I

Report Revision: 1 Issue Date: 22 February 2021

TRANSMITTER AUDIO FREQUENCY RESPONSE - PRE-EMPHASIS

SPECIFICATION: FCC 47 CFR 2.1047 (a)

GUIDE: ANSI C63.26 5.3.3.2

MEASUREMENT PROCEDURE:

- 1. Refer Annex A for Equipment set up.
- 2. An audio input tone of 1000 Hz was applied with the level set to obtain 20% of maximum deviation. This was used as the 0 dB reference point.
- 3. The AF was varied while the audio level was held constant.
- 4. The response in dB relative to 1000 Hz was measured.

MEASUREMENT RESULTS:

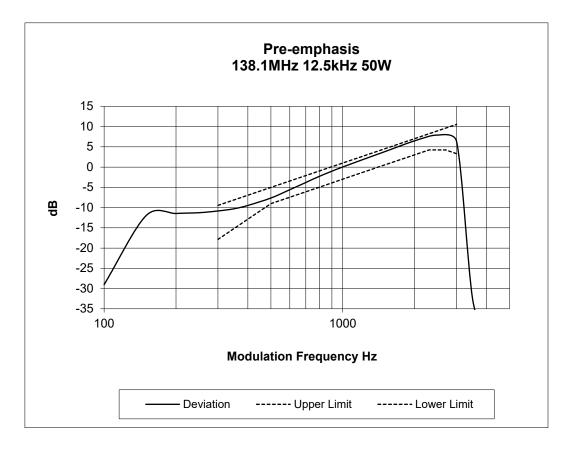
See the plots on the following pages for 12.5 kHz channel spacing tested at 50 W transmit power.

LIMIT CLAUSE: TIA/EIA-603E 3.2.6

MEASUREMENT UNCERTAINTY: ± 1.5 %

SPECIFICATION: FCC CFR 2.1047 (a)

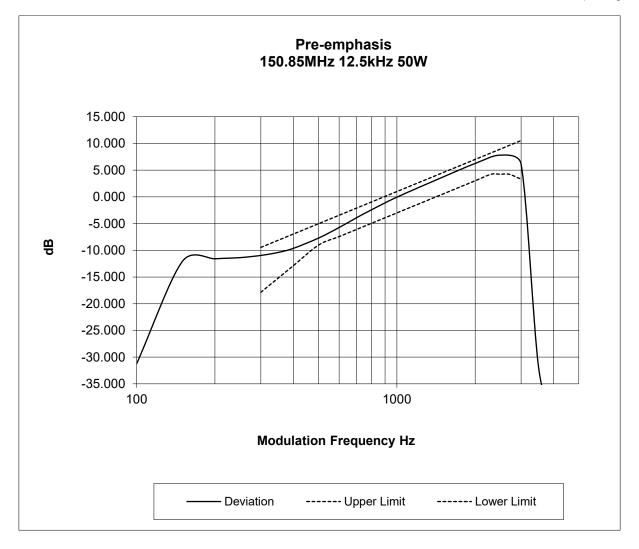
Tx FREQUENCY: 138.1 MHz



Transmitter Audio Frequency Response – Pre-emphasis

SPECIFICATION: FCC CFR 2.1047 (a)

Tx FREQUENCY: 150.85 MHz

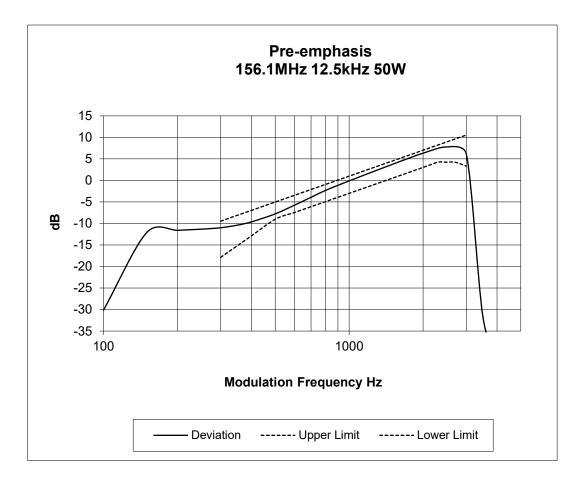


SPECIFICATION:

FCC CFR 2.1047 (a)

156.1 MHz

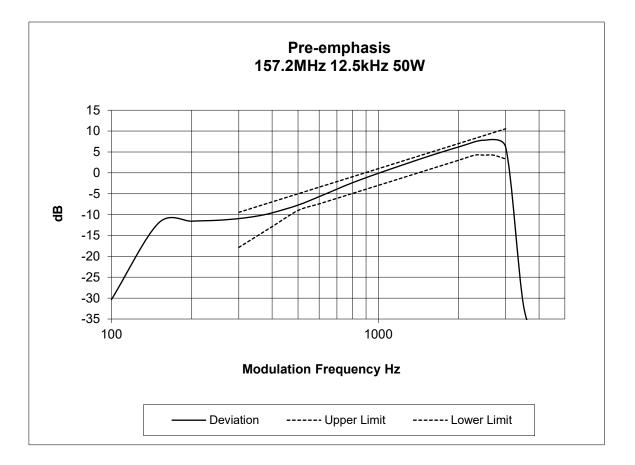
Tx FREQUENCY:



Transmitter Audio Frequency Response – Pre-emphasis

SPECIFICATION: FCC CFR 2.1047 (a)

Tx FREQUENCY: 157.2 MHz

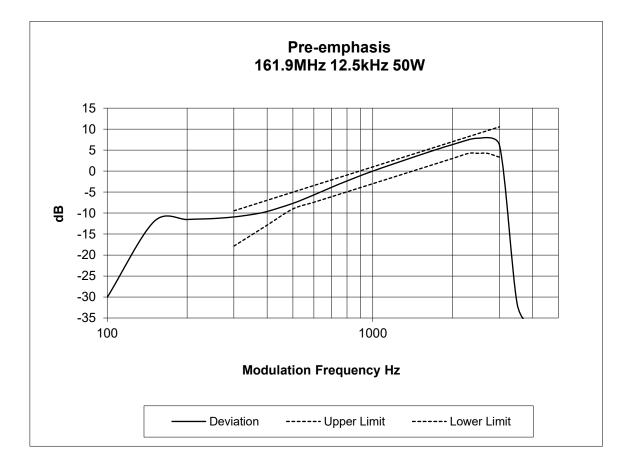


SPECIFICATION:

FCC CFR 2.1047 (a)

161.9 MHz

Tx FREQUENCY:



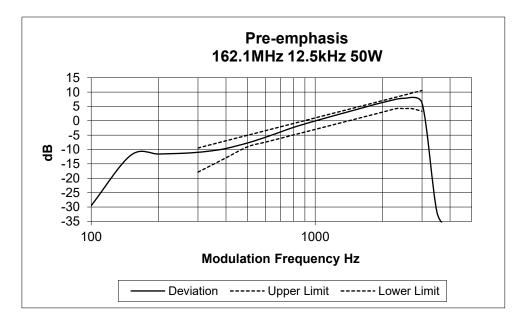
Transmitter Audio Frequency Response – Pre-emphasis

SPECIFICATION: FCC CFR 2.1047 (a)

162.1 MHz

Tx FREQUENCY:

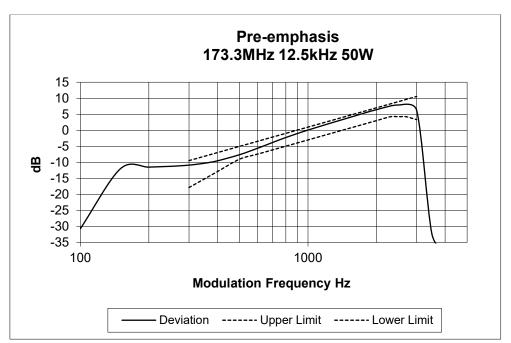
12.5 kHz Channel Spacing



SPECIFICATION: FCC CFR 2.1047 (a)

Tx FREQUENCY:

173.3 MHz



TRANSMITTER MODULATION LIMITING

SPECIFICATION: FCC 47 CFR 2.1047 (b)

GUIDE: ANSI C63.26 5.3.2

MEASUREMENT PROCEDURE:

- 1. Refer Annex A for Equipment set up.
- 2. An audio input tone of 1000 Hz was applied with the level set to obtain 60% of maximum deviation. This was used as the 0 dB reference point.
- 3. The modulation response was measured at four audio frequencies while increasing the input level in 5dB steps.
- 4. Additionally the level used to measure sideband spectrum (occupied bandwidth) was included in the level sweep.
- 5. Measurements were made for both Positive and Negative Deviation.

MEASUREMENT RESULTS:

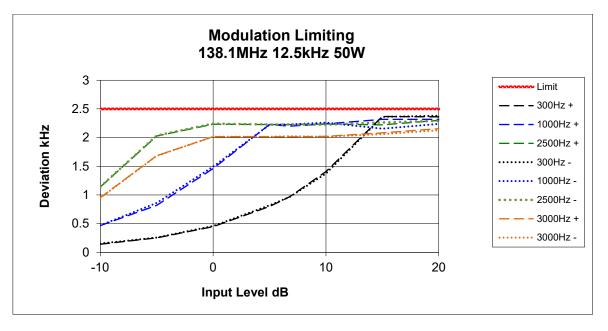
See the plots on the following pages for 12.5 kHz channel spacing.

LIMIT CLAUSE: TIA/EIA-603E 1.3.4.4

MEASUREMENT UNCERTAINTY: ± 1.5 %

SPECIFICATION: FCC CFR 2.1047 (b)

Tx FREQUENCY: 138.1 MHz

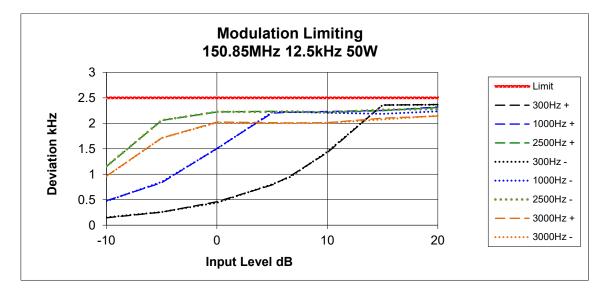


Transmitter Modulation Limiting

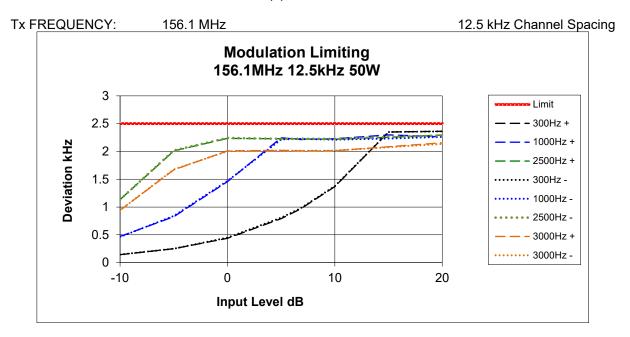
SPECIFICATION: FCC CFR 2.1047 (b)

Tx FREQUENCY: 150.85 MHz

12.5 kHz Channel Spacing



SPECIFICATION: FCC CFR 2.1047 (b)

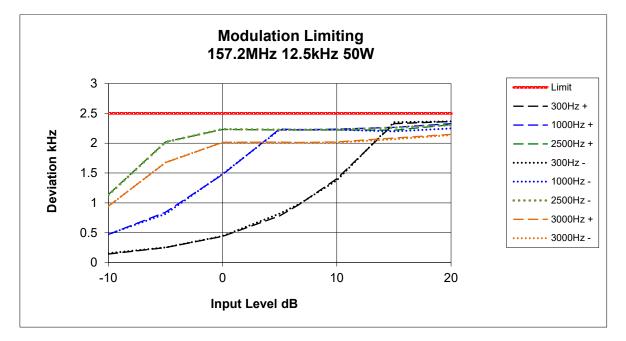


Transmitter Modulation Limiting

SPECIFICATION: FCC CFR 2.1047 (b)

Tx FREQUENCY: 157.2 MHz

12.5 kHz Channel Spacing

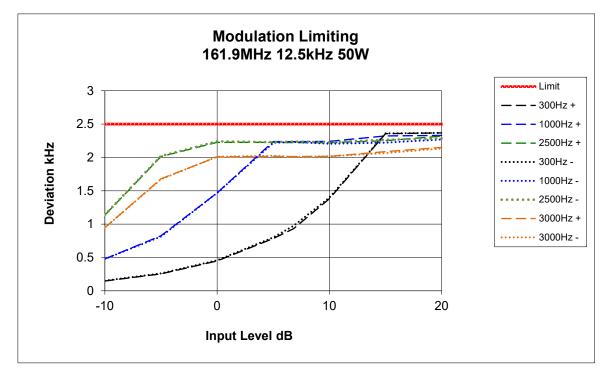


SPECIFICATION: FO

FCC CFR 2.1047 (b)

Tx FREQUENCY:

161.9 MHz



Transmitter Modulation Limiting

SPECIFICATION: FCC CFR 2.1047 (b)

Tx FREQUENCY: 162.1 MHz

12.5 kHz Channel Spacing



SPECIFICATION:

FCC CFR 2.1047 (b)

Tx FREQUENCY:

173.3 MHz



TRANSMITTER OCCUPIED (99%) BANDWIDTH

SPECIFICATION: RSS-119 5.5

GUIDE: RSS-Gen 6.7

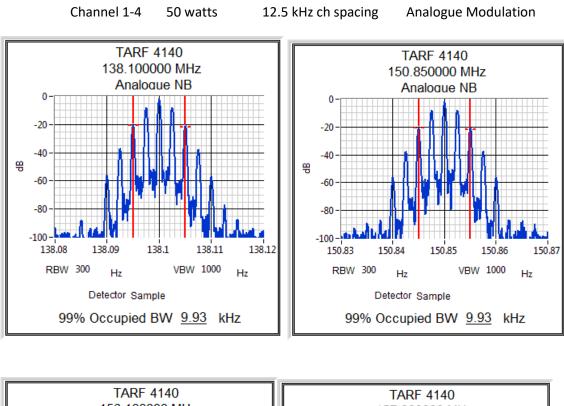
MEASUREMENT PROCEDURE:

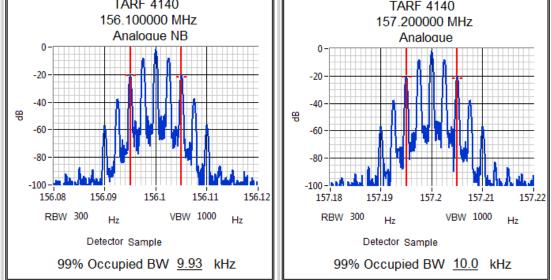
- 1. Refer Annex A for Equipment Set up.
- For analogue measurements: The EUT was modulated by a 2500 Hz tone at an input level 16 dB above a level that produced 50% deviation. The input level was established at the frequency of maximum response of the audio modulating circuit.
 For Data measurements: The EUT was modulated with an internally generated pseudo random bit sequence at the appropriate Baud rates.
- 3. The Occupied Bandwidth was measured on the Spectrum Analyser, with bandwidth settings as follows.

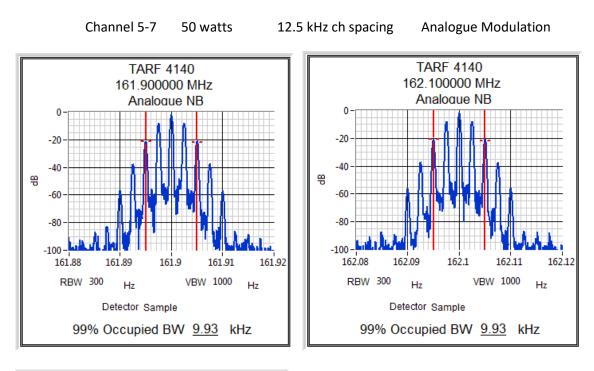
Resolution Bandwidth = 300 Hz, Video Bandwidth = 1000 Hz

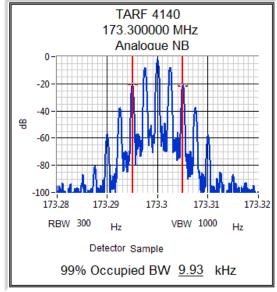
MEASUREMENT RESULTS:

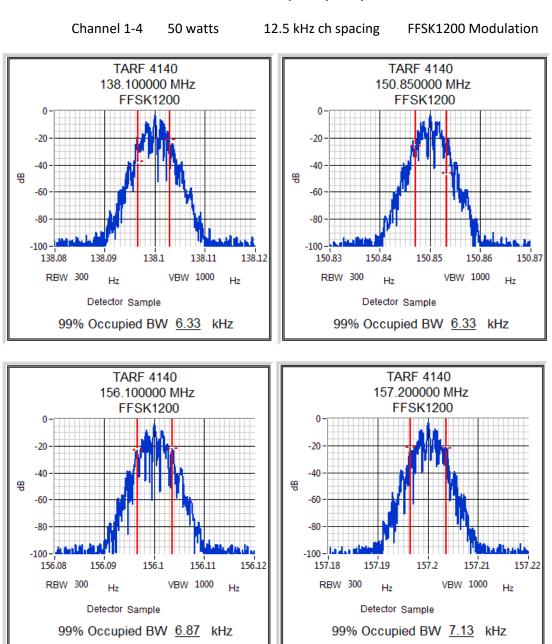
]		Bandwidths (kHz)				
Channel Spacing (MHz)	Channel Spacing (kHz)	Analogue	FFSK 1200 bps	DMR	APCO P25 phase I	
138.1 MHz	12.5	9.93	6.33	7.87	7.73	
150.85 MHz	12.5	9.93	6.33	7.07	7.87	
156.1 MHz	12.5	9.93	6.87	7.87	7.60	
157.2 MHz	12.5	10.00	7.13	7.47	7.67	
161.9 MHz	12.5	9.93	6.87	7.20	7.87	
162.1 MHz	12.5	9.93	6.93	7.67	7.73	
173.3 MHz	12.5	9.93	6.60	7.53	7.93	
Limit Authorized Bandwidth 47 CFR 90.209 RSS 119 5.5		11.25	11.25	11.25	11.25	
Necessary BW used in emission designator		11.0	7.6	8.0	8.1	
Resul	t	Pass	Pass	Pass	Pass	





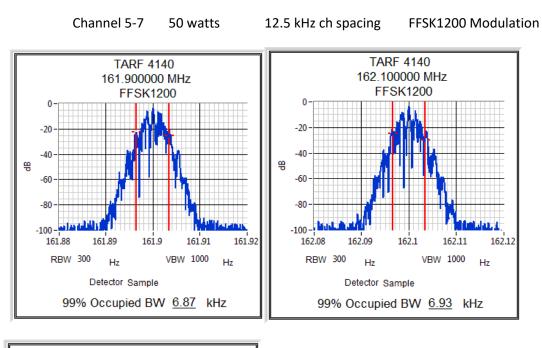


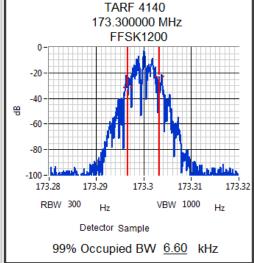


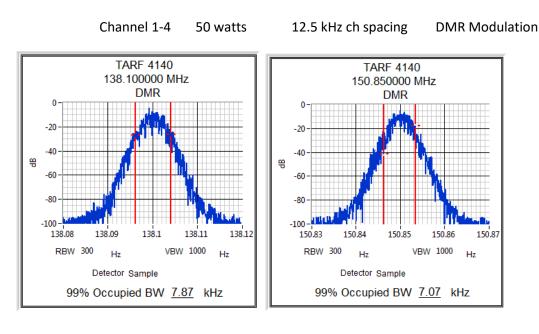


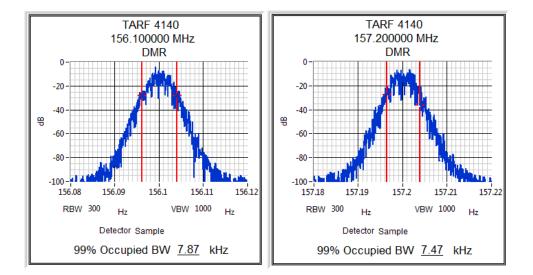
Transmitter Occupied (99%) Bandwidth

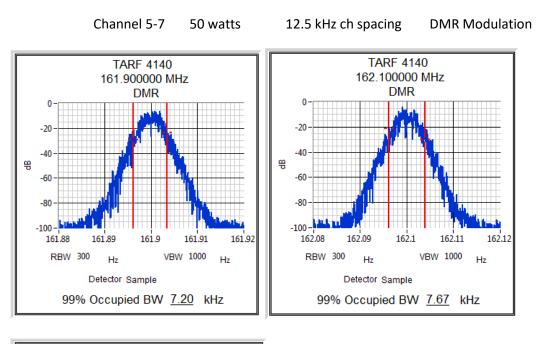
TELTEST Laboratories Tait International Ltd Report Number 4140

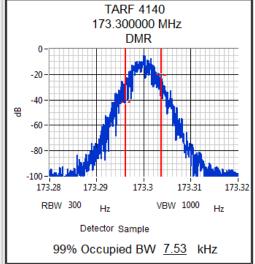


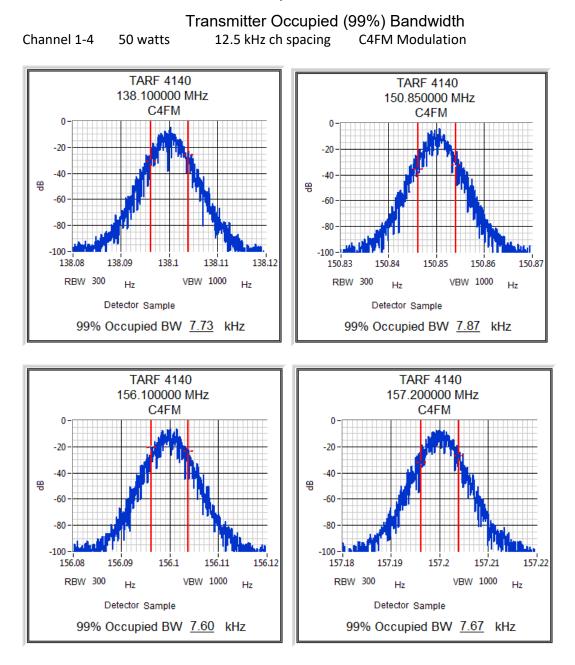


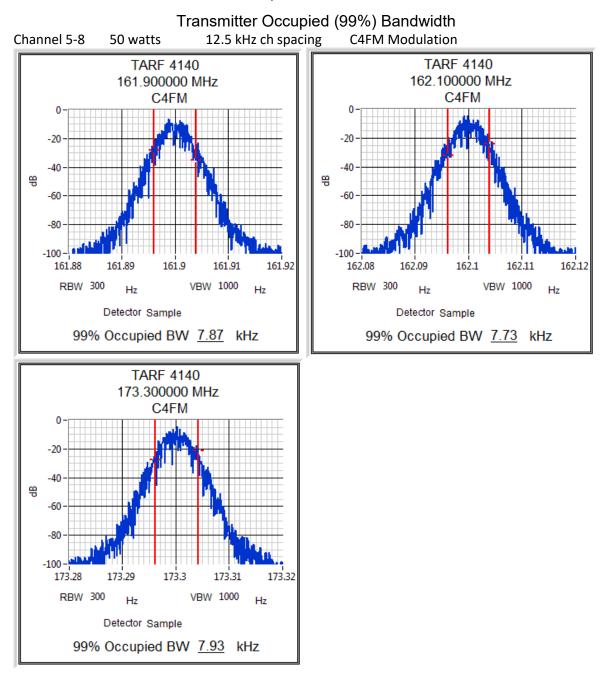












TRANSMITTER SPECTRUM MASKS

SPECIFICATION:	FCC 47 CFR 2.1049 (c)

RSS-119 5.5

GUIDE: TIA/EIA-603E 2.2.11 (Analogue) TIA-102.CAAA-C 2.2.5 (Digital)

MEASUREMENT PROCEDURE:

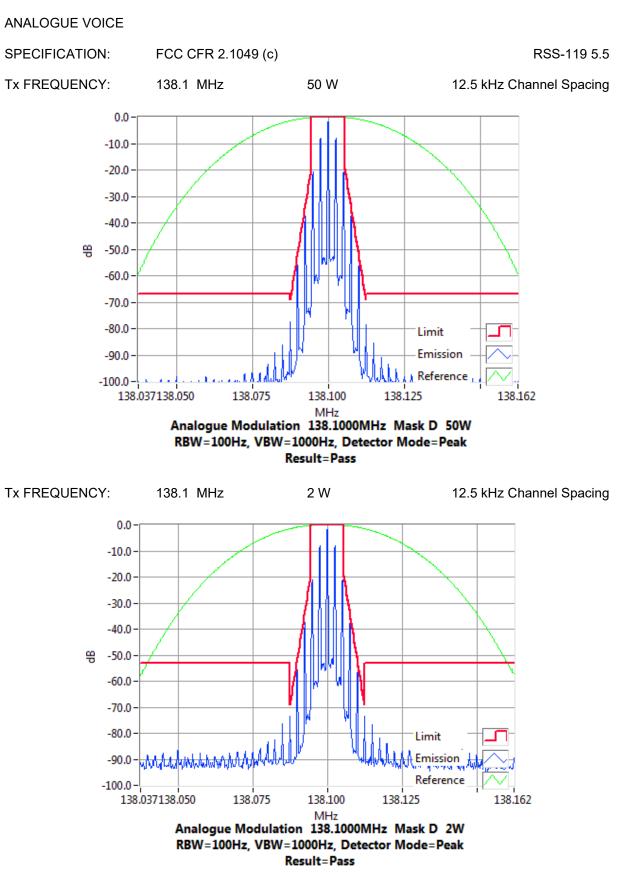
- 1. Refer Annex A for Equipment Set up.
- 2. For Analogue measurements: The EUT was modulated by a 2500 Hz tone at an input level 16 dB above a level that produced 50% deviation. The input level was established at the frequency of maximum response of the audio modulating circuit. For Data measurements: The EUT was modulated with an internally generated pseudo random bit sequence at the appropriate Baud rates.
- 3. The Occupied Bandwidth was measured on the Spectrum Analyser, with bandwidth settings as noted on the recorded plots.

MEASUREMENT RESULTS:

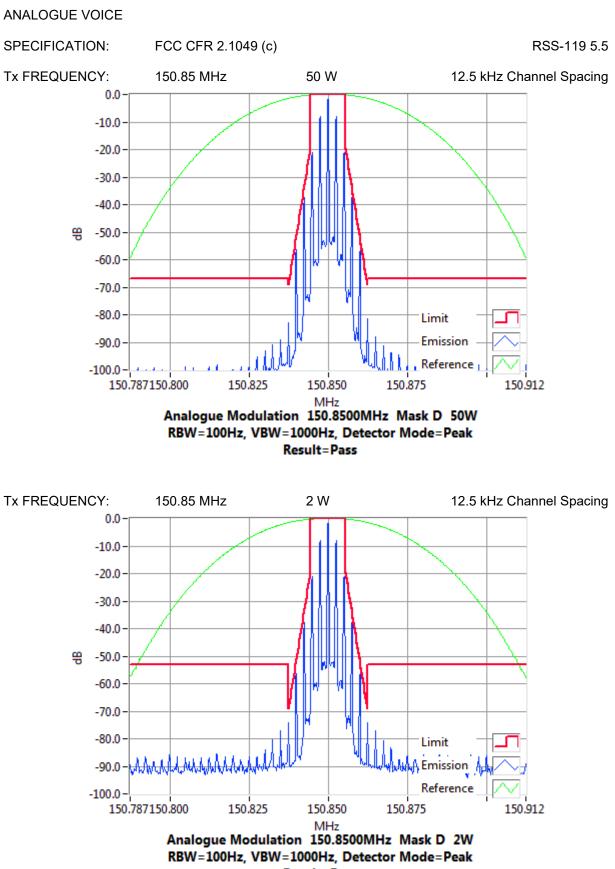
See the plots on the following pages for 12.5 kHz channel spacing.

MEASUREMENT UNCE	RTAINTY 95%	±0.65dB	
LIMIT CLAUSE:	FCC 47 CFR 90.210		RSS-119 5.5
EMISSION MASKS Emission Mask D	12.5 kHz Channel Spac	cing	Analogue, FFSK, Digital Voice/Data
DATA SPEED FFSK Digital Voice/Data	12.5 kHz Channel Spac 12.5 kHz Channel Spac	•	1200 bps 9600 bps (DMR, P25 Phase I)

Transmitter Spectrum Masks

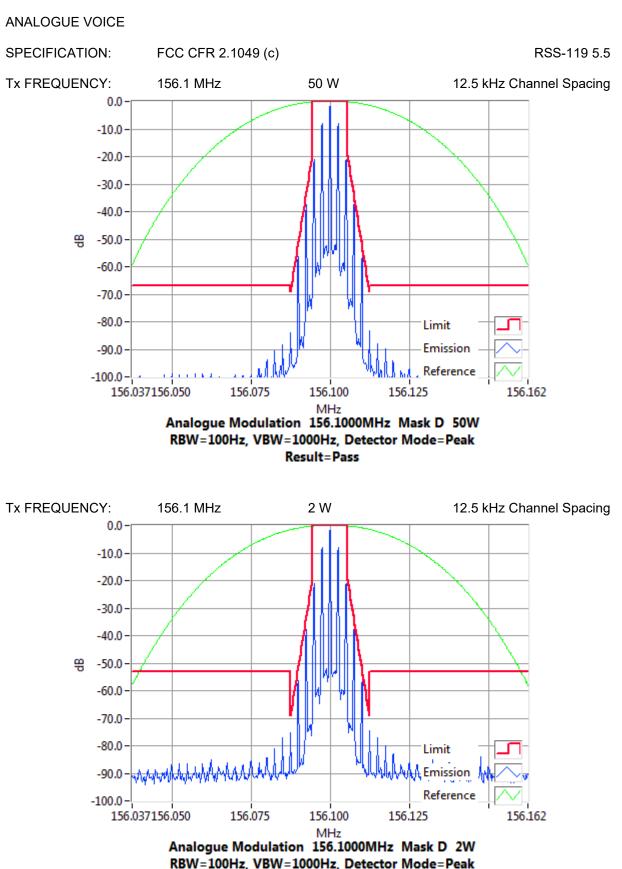


Transmitter Spectrum Masks



Result=Pass

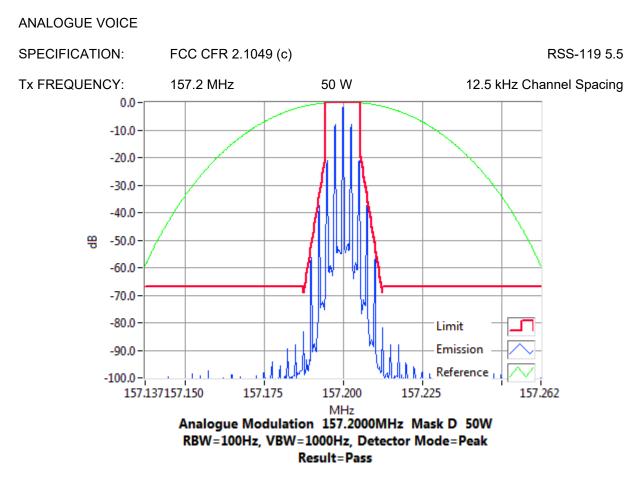
Transmitter Spectrum Masks

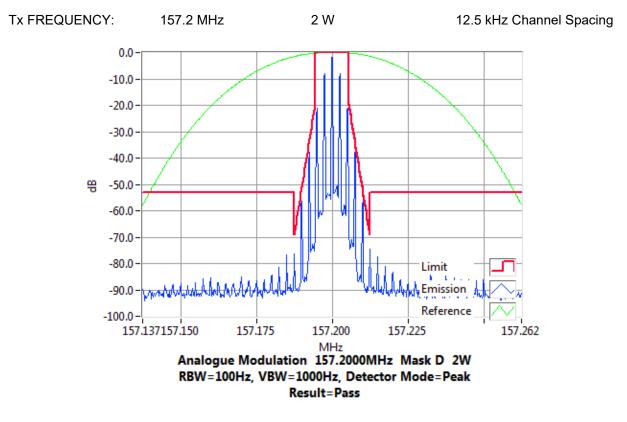


Result=Pass

FCC ID: CASTBDB1G IC : 737A-TBDB1G

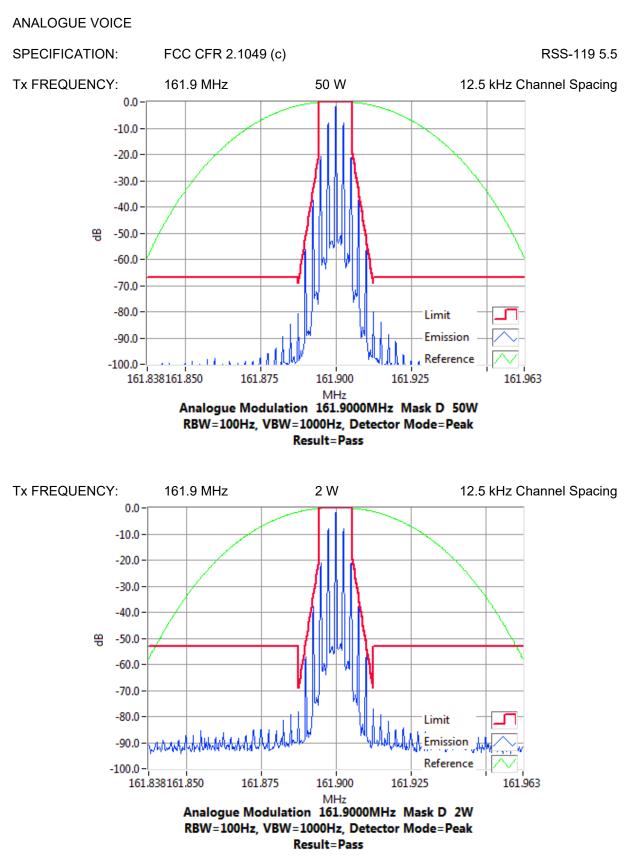
Transmitter Spectrum Masks



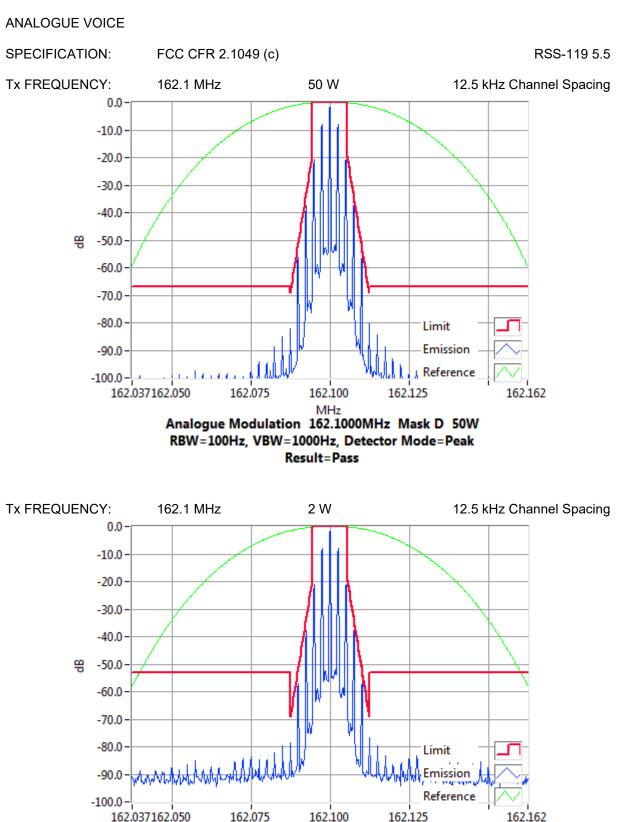


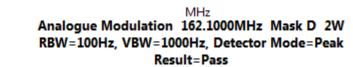
FCC ID: CASTBDB1G IC : 737A-TBDB1G

Transmitter Spectrum Masks



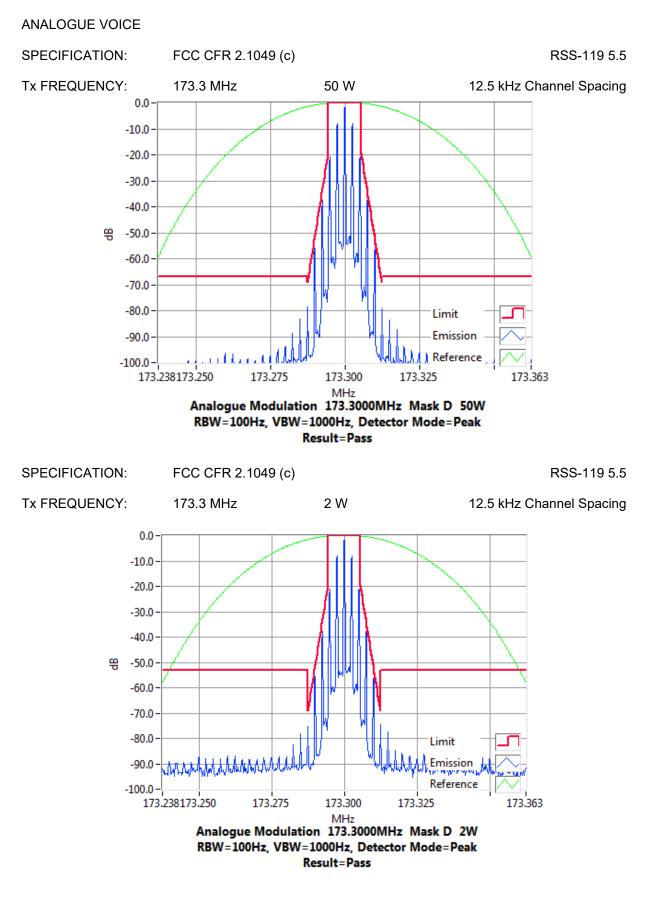
Transmitter Spectrum Masks

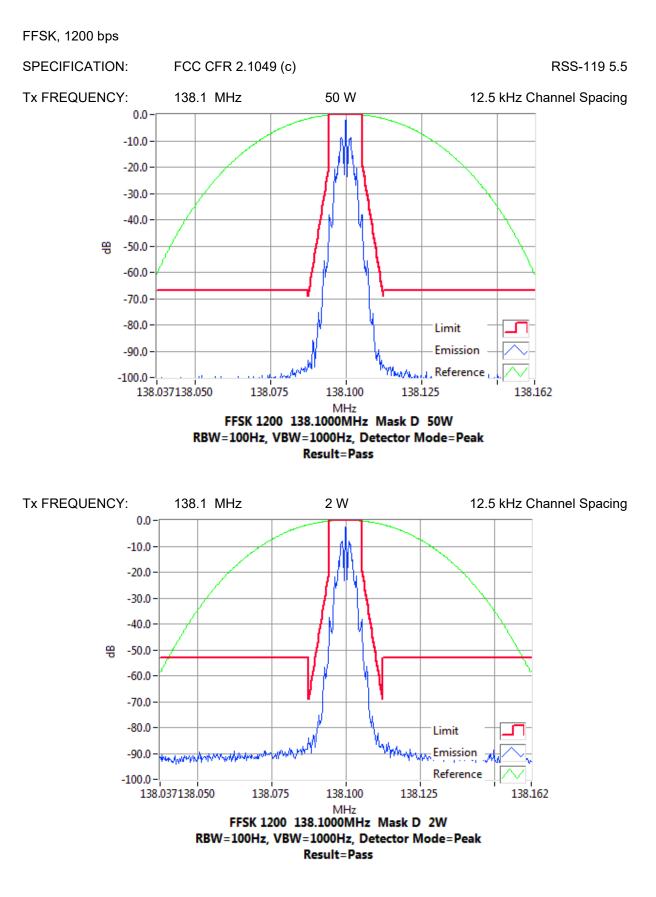




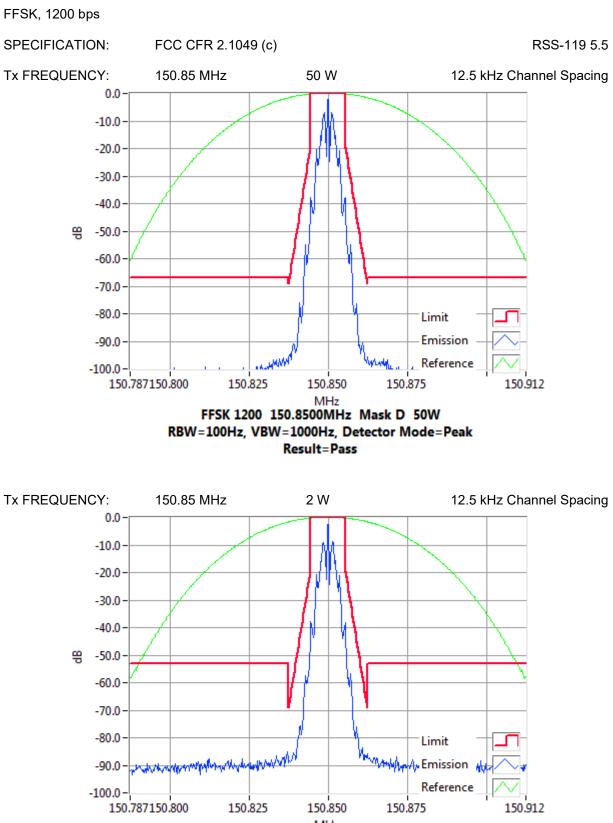
FCC ID: CASTBDB1G IC : 737A-TBDB1G

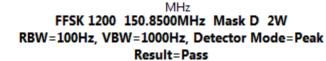
Transmitter Spectrum Masks





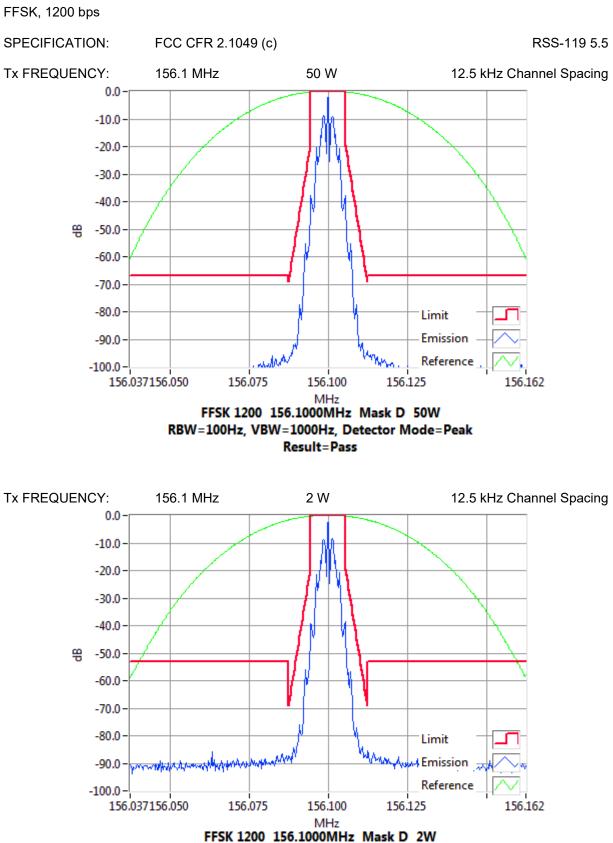
Transmitter Spectrum Masks



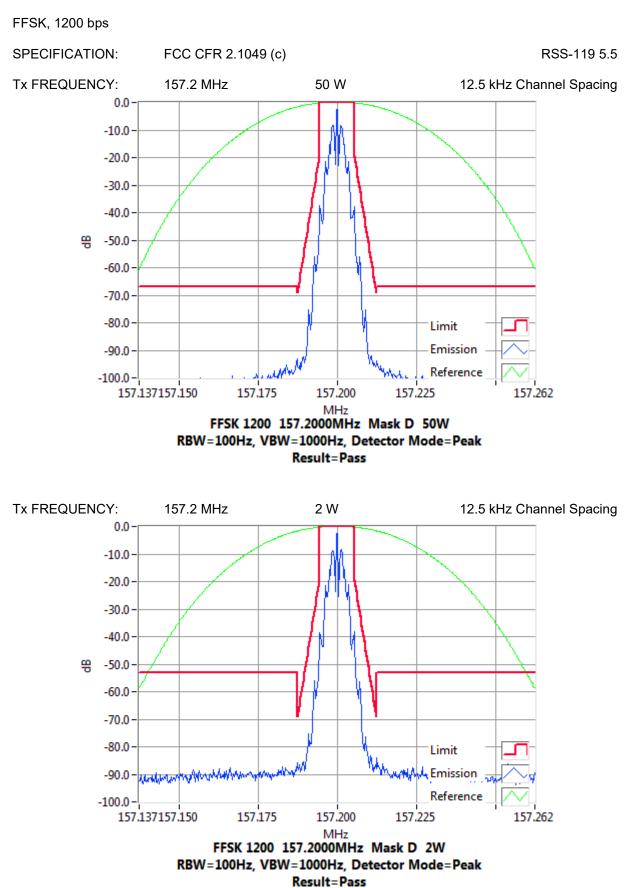


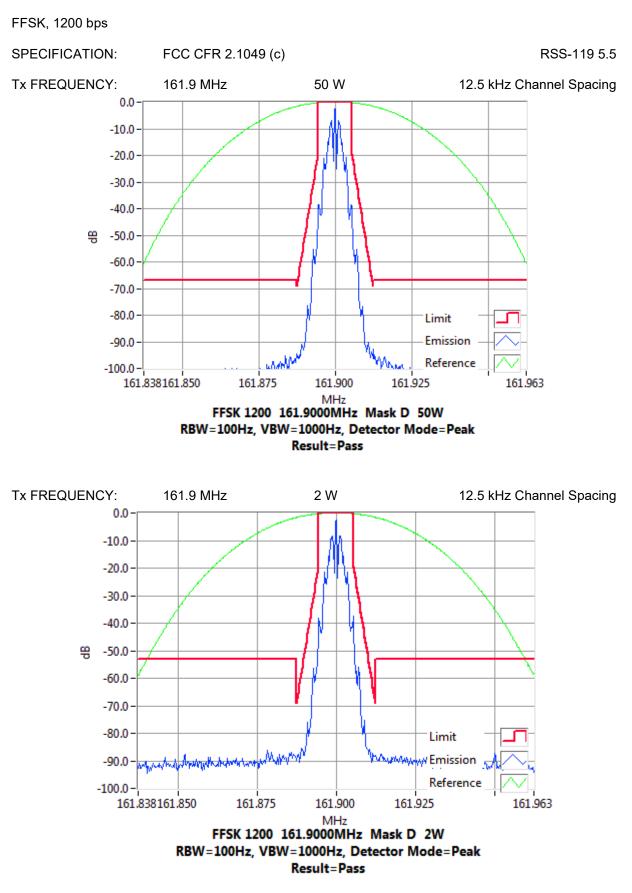
FCC ID: CASTBDB1G IC : 737A-TBDB1G

Transmitter Spectrum Masks

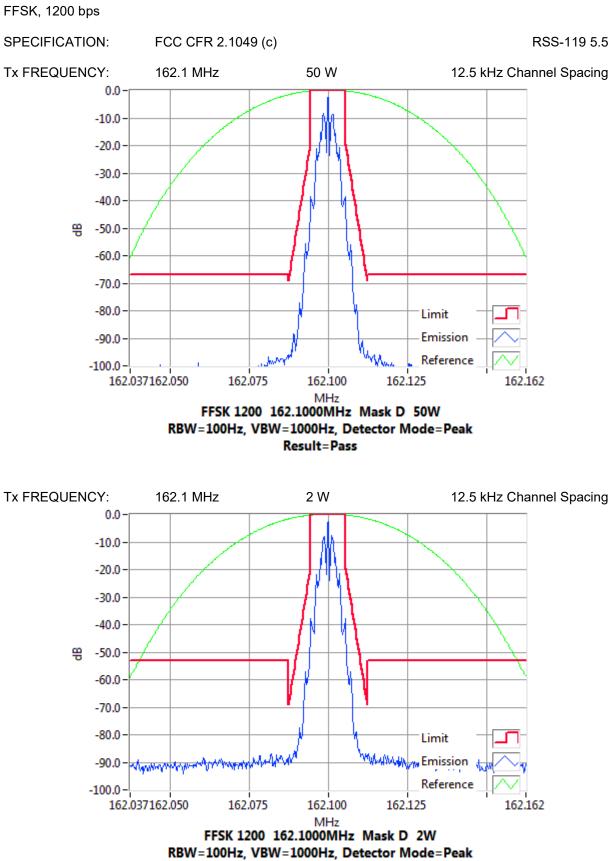


RBW=100Hz, VBW=1000Hz, Detector Mode=Peak Result=Pass

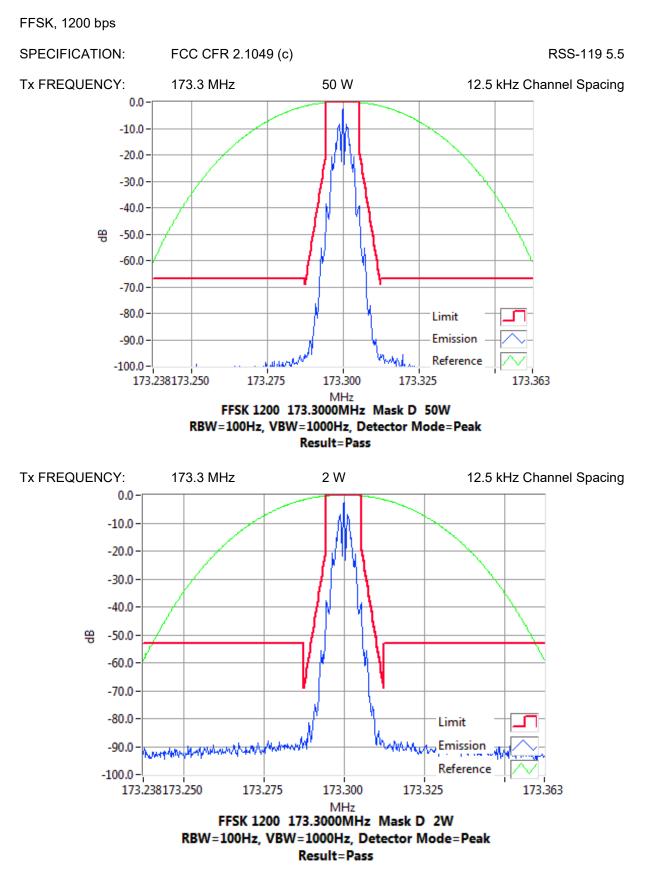


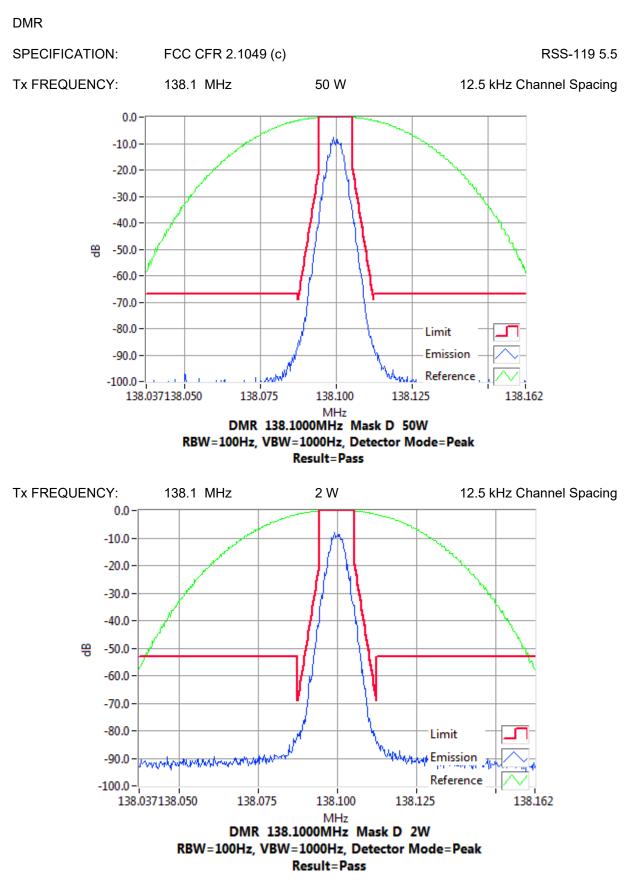


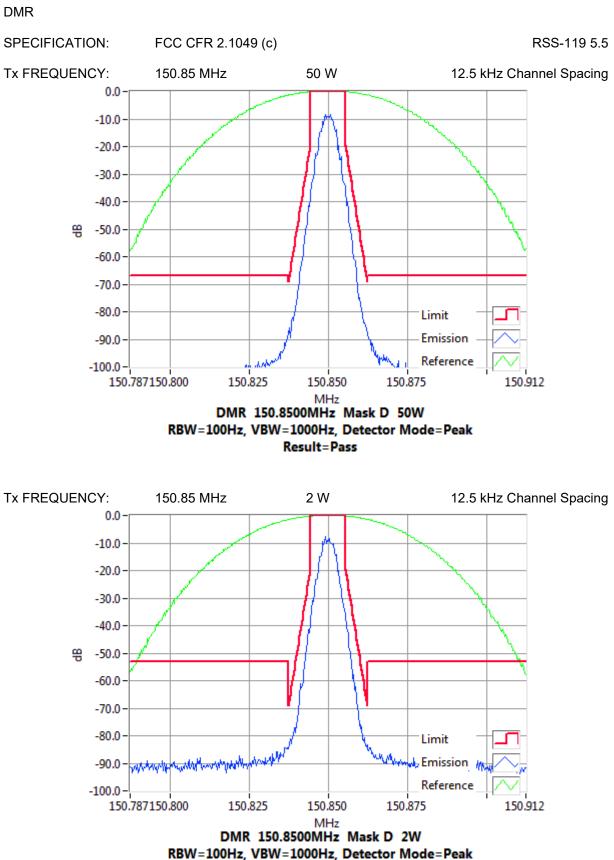
Transmitter Spectrum Masks



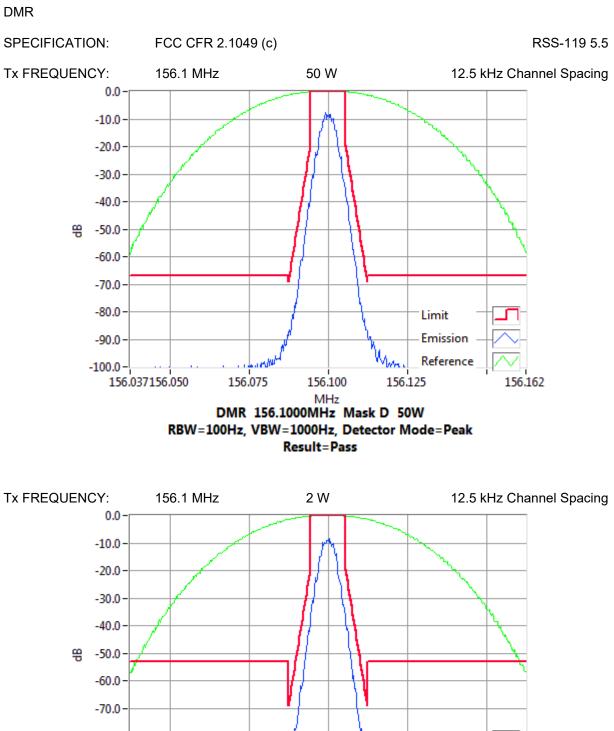
Result=Pass

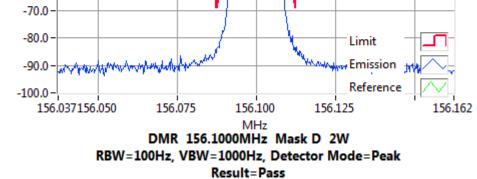






Transmitter Spectrum Masks

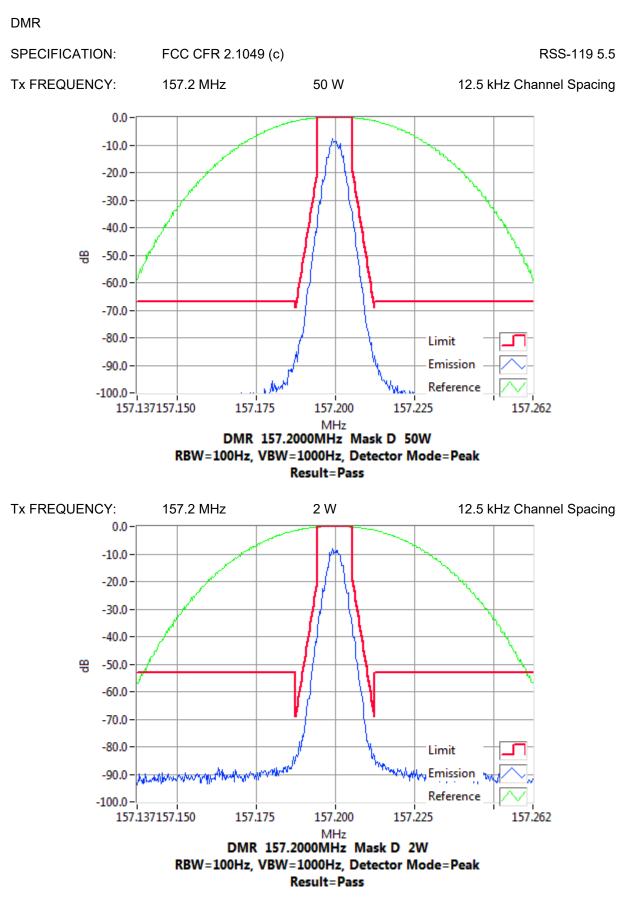




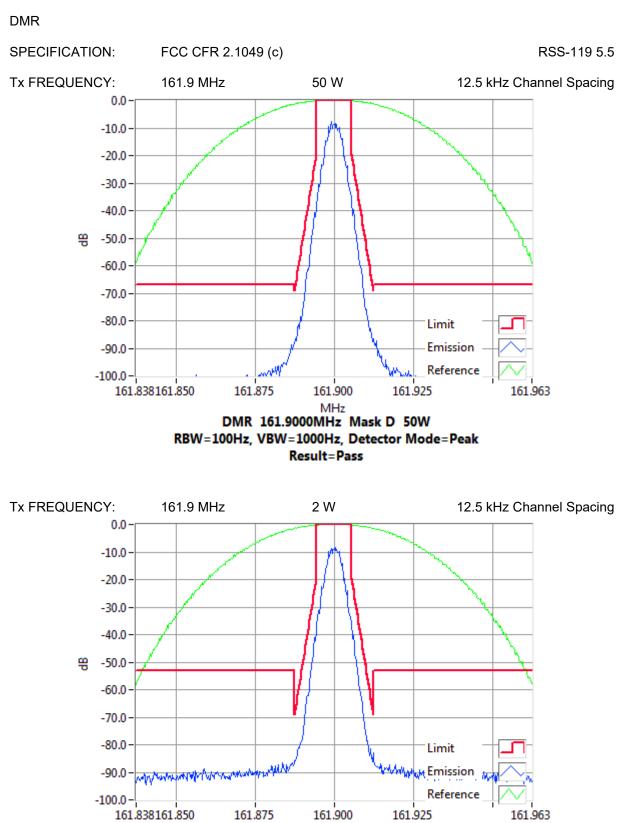
FCC ID: CASTBDB1G IC : 737A-TBDB1G

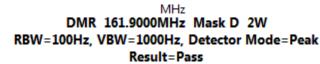
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Report Revision: 1 Issue Date: 22 February 2021



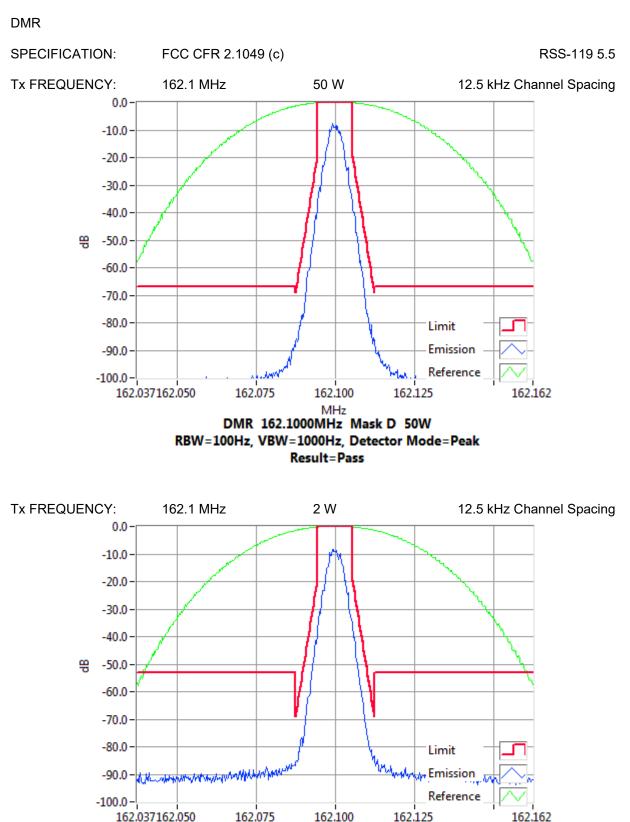
Transmitter Spectrum Masks



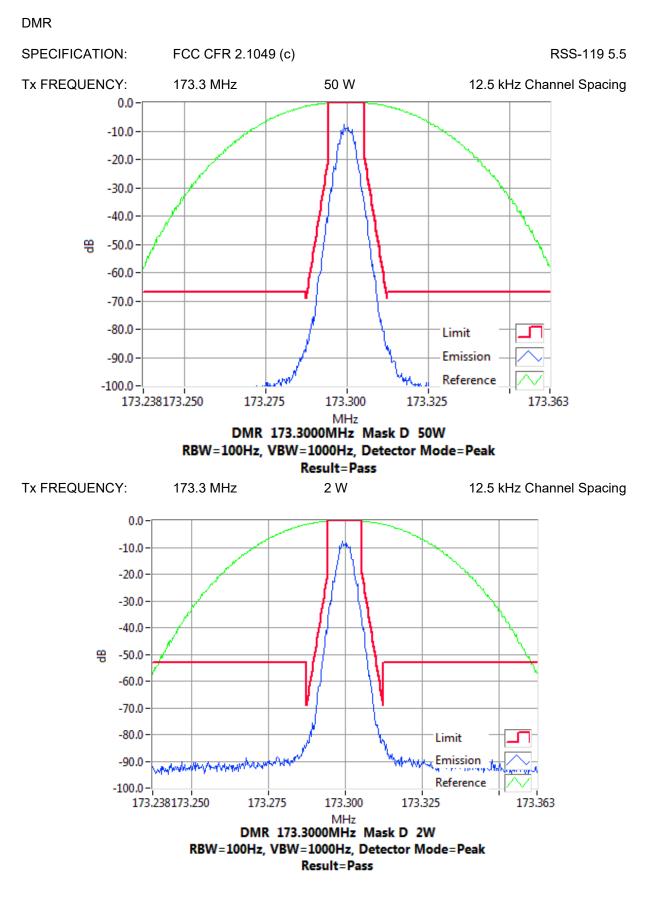


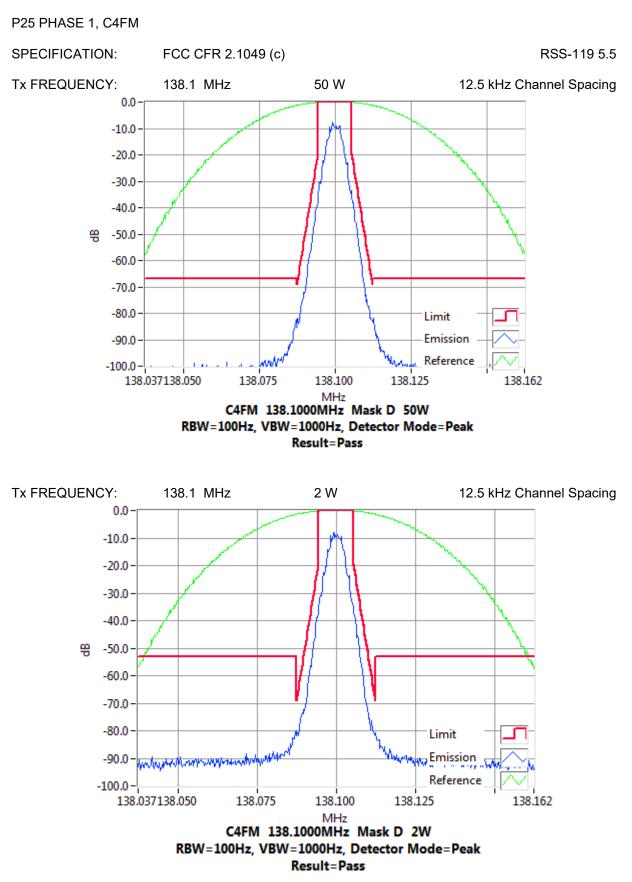
FCC ID: CASTBDB1G IC : 737A-TBDB1G

Transmitter Spectrum Masks

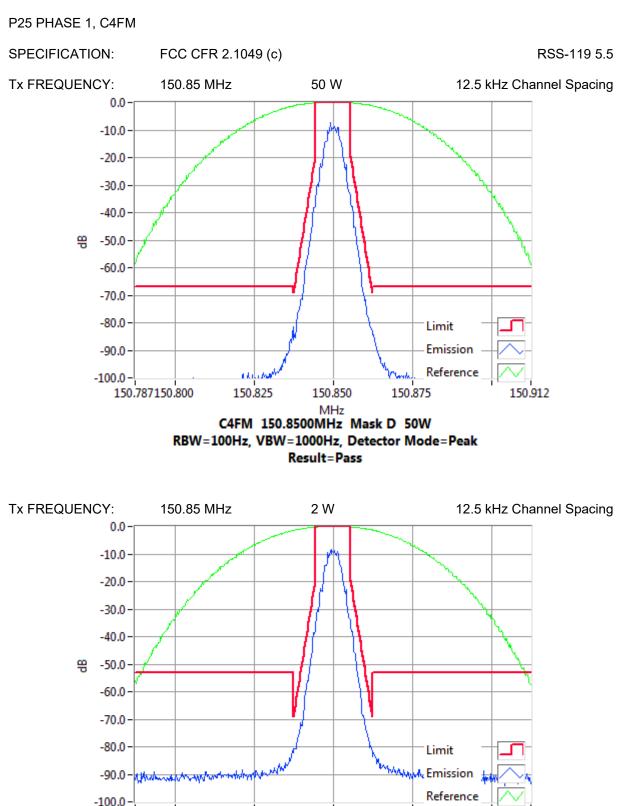


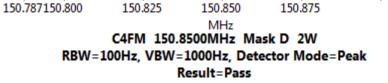
MHz DMR 162.1000MHz Mask D 2W RBW=100Hz, VBW=1000Hz, Detector Mode=Peak Result=Pass





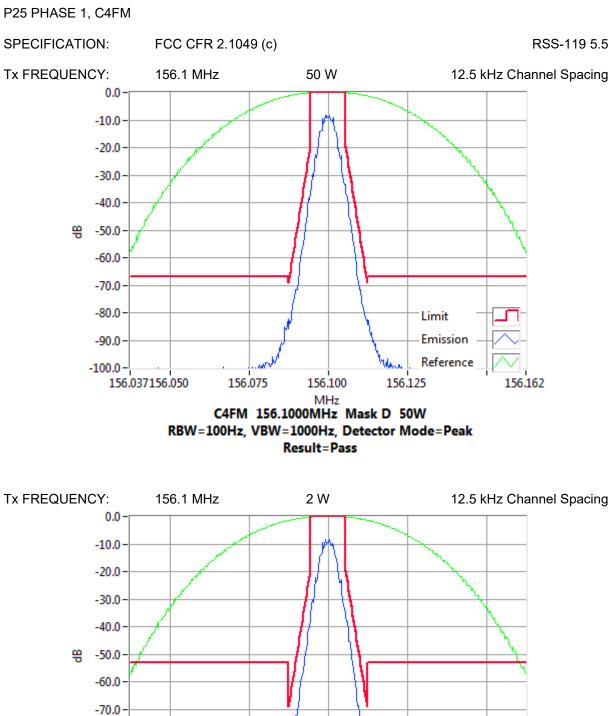
Transmitter Spectrum Masks

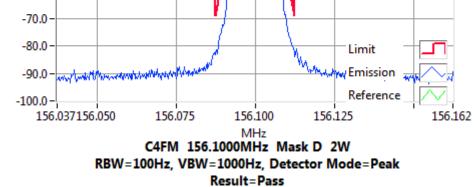




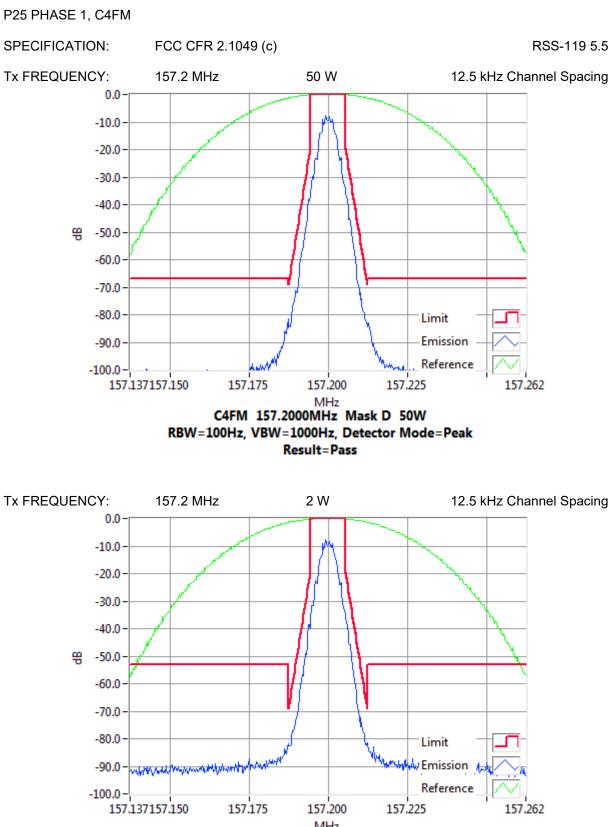
150,912

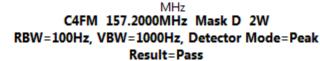
Transmitter Spectrum Masks

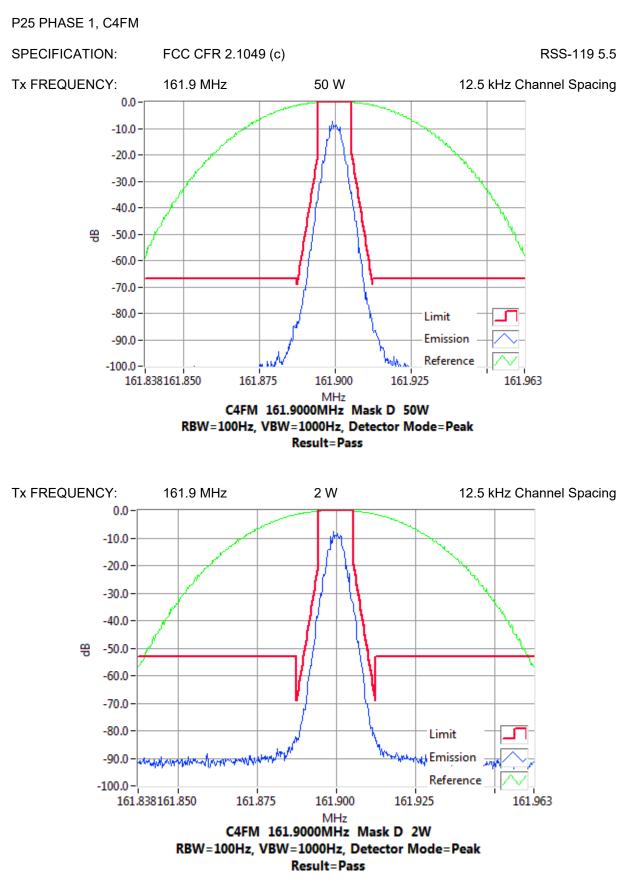




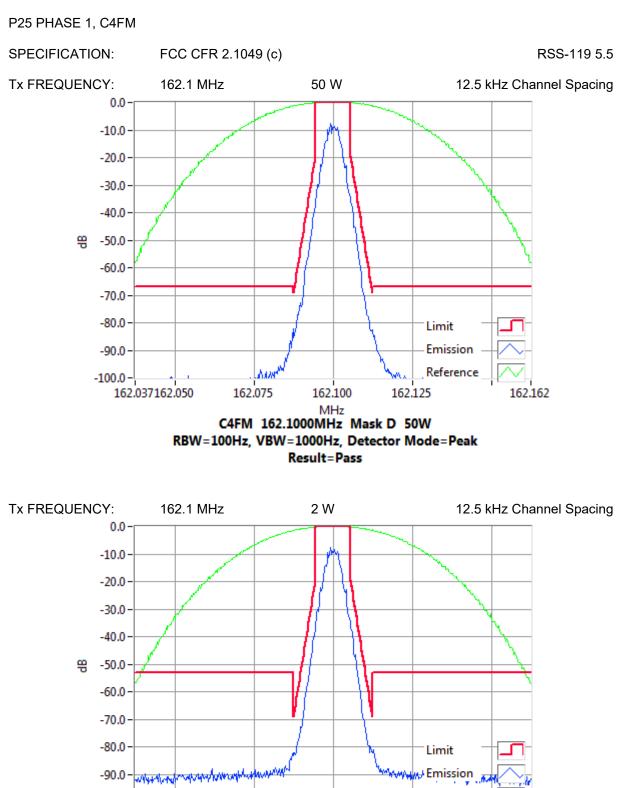
FCC ID: CASTBDB1G IC : 737A-TBDB1G







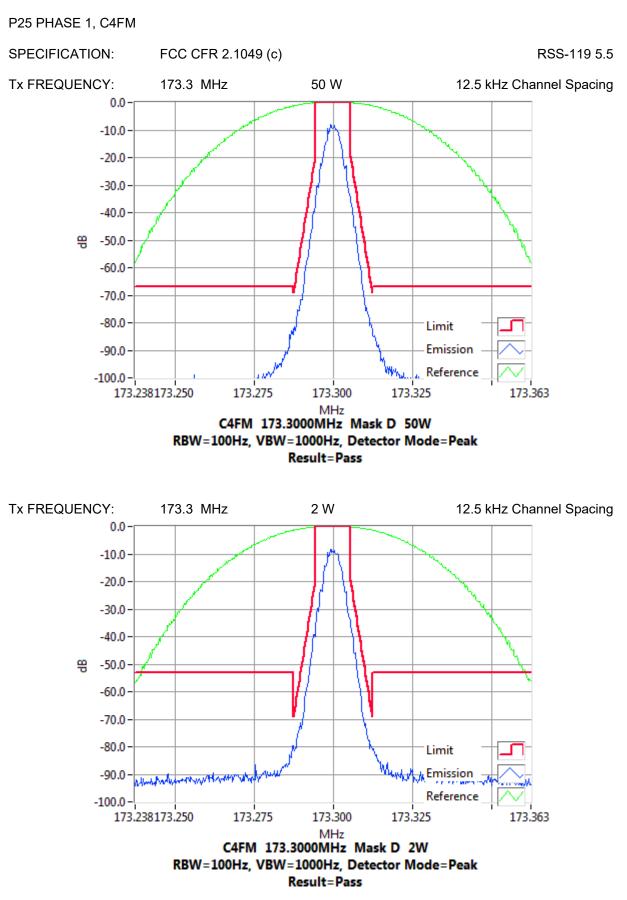
Transmitter Spectrum Masks



-100.0 -

162.162

Reference



TRANSMITTER SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATIONS: FCC 47 CFR 2.1051

RSS-119 5.8

GUIDE: TIA-603-E 2.2.13 (analogue) TIA-102-CAAA-C 2.2.7 (digital)

MEASUREMENT PROCEDURE:

- 1. Refer Annex A for equipment set up.
- The frequency range examined was from the lowest frequency generated within the EUT, to a frequency higher than the 10th Harmonic: 100 kHz to Fc-BW

Fc+ BW to 10Fc (2.0 GHz)

- 3. The EUT was set to transmit high or low power, modulated with DMR. A scan is performed with a resolution bandwidth of 100 kHz and a video bandwidth of 300 kHz for frequencies up to 1 GHz, and a resolution bandwidth of 1 MHz and a video bandwidth of 3 MHz for frequencies above 1 GHz. A filter was used for frequencies just below the second harmonic to 2.0 GHz.
- 4. For each frequency range the spectrum analyser was loaded with the appropriate calibration figures to compensate for the cables, attenuator and filter losses, allowing the emission levels to be read directly with no further calculation.

The calibrations are loaded as an overall reference level offset plus a set of correction factors for the required frequency band.

Spurious emissions which were attenuated by more than 20 dB below the limit were not recorded.

Example of attenuation correction: (dB)

CI			_
	E5023 30dB 350W CK9178	32	
	E5015 3m Blue 503429	0.45	
	E5028 1m5 Blue 501868	0.22	
	E3382 135_175MHz HPBRF	0.53	
ĺ	Total Attenuation @ 276.200	33.2	Sum of component
	MHz		attenuation (a)
	Amplitude offset	33.57	(b)
	Correction @ 276.200 MHz	-0.37	(a-b)

MEASUREMENT RESULTS:

See the tables and plots on the following pages for 12.5 kHz channel spacing.

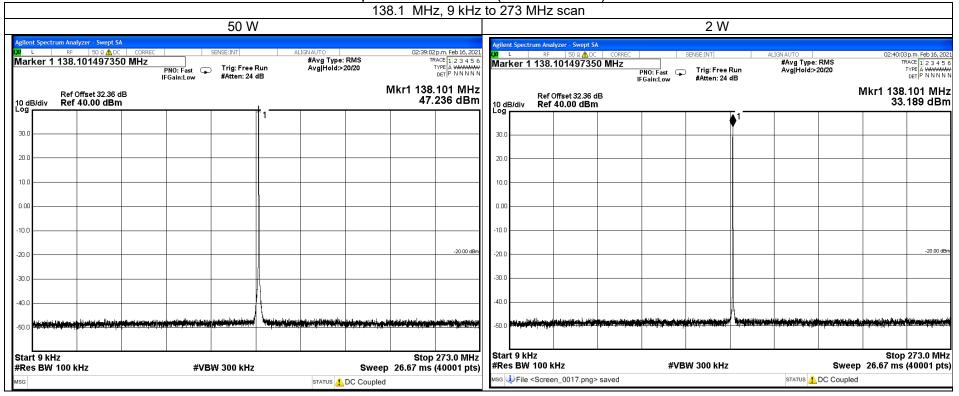
LIMIT CLAUSES: FCC 47 CFR 90.210

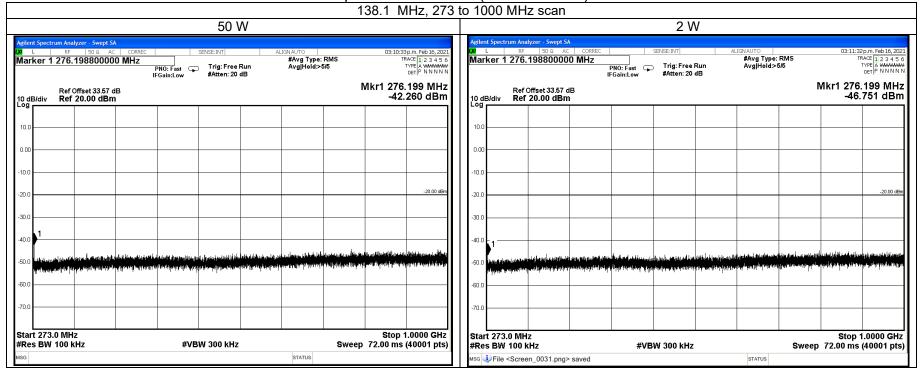
RSS-119 5.8

Photo: Conducted Emissions Test Setup



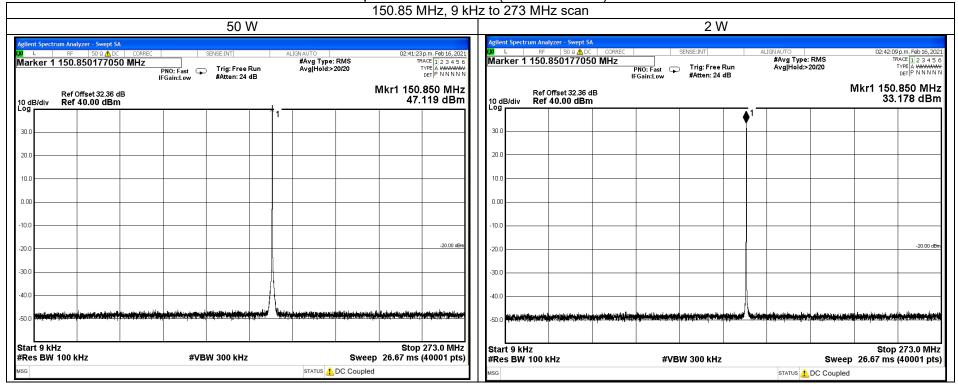
SPECIFICATION: FCC CF	R 2.1051	RSS-119 5.8				
12.5 kHz Channel Spacing	138.1 MHz @ 50 W	Emission Mask D				
Emission Frequency (MHz)	Level (dBm)	Level (dBc)				
~	~	~				
12.5 kHz Channel Spacing	138.1 MHz @ 2 W	Emission Mask D				
Emission Frequency (MHz)	Level (dBm)	Level (dBc)				
~	~	~				
Measurement Uncertainty:	≤12.75 GHz	± 3.0 dB				
No emissions were	detected at a level greater than 20) dB below the limit.				





								138.1	I MHZ,	1 to 2 (Hz scan								
	50 W										2 W								
Agilent Spectrun	n Analyzer - Swept SA									Agilent	pectrum Analyzer - Swe	pt SA							
	RF 50 Ω AC	PN	0: Fast 😱 ain:Low	Trig: Free #Atten: 6 d	Run	IGNAUTO #Avg Type: Avg Hold:>{		03:59:07 Ti	7 p.m. Feb 16, 2021 RACE 1 2 3 4 5 6 TYPE A MWWWW DET P P N N N N	() //	RF 50 Ω		PNO: Fast IFGain:Low	SENSE:INT Trig: Free F #Atten: 6 df	Run	LIGNAUTO #Avg Type: Avg Hold:>	: RMS 5/5	03:59:43 Tř	ID.M. Feb 16, 2021 ACE 1 2 3 4 5 6 FYPE A MWWWW DET P P N N N N
10 dB/div	Ref Offset 34.8 dB Ref 20.00 dBm	•								10 dB/	Ref Offset 34.8 div Ref 20.00 d								
10.0										10.0 -									
-10.0										-10.0 -									
-20.0									-20.00 dBm	-20.0 -30.0 —									-20.00 dBm
-40.0	Jogurouth Company	houldwarder	աշուտերեր	alut logalance	how when	Արաշտոտուն	y-wangelevelier	Var In Maleson and	Jule-markelieve	-40.0		antigra contractions	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ըսհատեւսերութեմ	Log Produced	<mark>բ Իր,ո՞ր ուսիրն</mark>	and and a low to the second	afrefrager allow	_{ขายส} ประสาวฎิเภาร
-60.0										-60.0 —									
-70.0 Start 1.0000 #Res BW 1.			#\/RI	W 3.0 MHz			Swa		2.0000 GHz 1s (601 pts)		1.0000 GHz BW 1.0 MHz		#\/P	W 3.0 MHz			Swo		2.0000 GHz is (601 pts)
MSG	.0 191112		#401	99 J.O 19112		STATUS	300	ср 1.000 II	13 (001 pts)		File <screen_0045.p< th=""><th>ong> saved</th><th>#V6</th><th>WW 3.0 WINZ</th><th></th><th>STATUS</th><th>SWE</th><th>ср 1.000 П</th><th>is (ou i pis)</th></screen_0045.p<>	ong> saved	#V6	WW 3.0 WINZ		STATUS	SWE	ср 1.000 П	is (ou i pis)

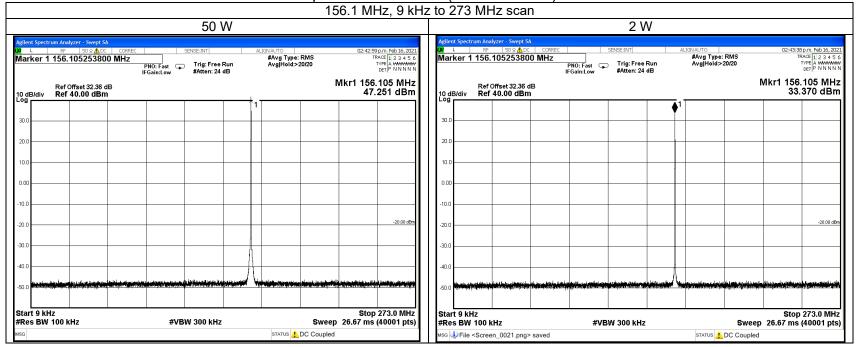
SPECIFICATION: FCC CFF	R 2.1051	RSS-119 5.8								
12.5 kHz Channel Spacing	150.85 MHz @ 50 W	Emission Mask D								
Emission Frequency (MHz)	Level (dBm)	Level (dBc)								
~	~	~								
12.5 kHz Channel Spacing	150.85 MHz @ 2 W	Emission Mask D								
Emission Frequency (MHz)	Level (dBm)	Level (dBc)								
~	~	~								
Measurement Uncertainty:	≤12.75 GHz	± 3.0 dB								
No emissions were detected at a level greater than 20 dB below the limit.										

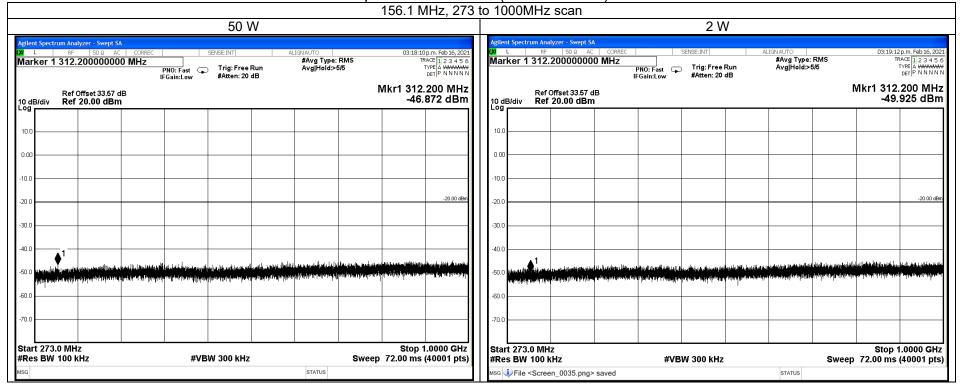


150.85 MHz, 273	to 1000MHz scan						
50 W	2 W						
Aglient Spectrum Analyzer - Swept SA With Line RF S0 2 AC CORREC SENSE:INT ALIGN AUTO 03:13:38 p.m. Feb 10, 202 Marker 1 301.700000000 MHz PN0: Fast Trig: Free Run IFGain:Low #Avg Type: RMS Tract [1:2:3:55 Tract [1:2:3:55 Ref Offset 33.57 dB Mkr1 301.700 MHz Mkr1 301.700 MHz Augure Astronomy Mkr1 301.700 MHz 10 dB/div Ref 20.00 dBm -45.019 dBm -45.019 dBm -45.019 dBm	Mkr1 301.700 MHz						
100	100						
-50.0 -50.0 <td< td=""><td></td></td<>							
Start 273.0 MHz Stop 1.0000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 72.00 ms (40001 pts) MSG Startus Startus Startus	Start 273.0 MHz Stop 1.0000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 72.00 ms (40001 pts) MSG U File <screen_0033.png> saved STATUS Status</screen_0033.png>						

		1:	50.85 MHz, [•]	1 to 2G	Hz scan							
	50 W							2 W				
Ref Offset 34.8 d	IB	ALIGNAUTO #Avg Type: RMS Avg Hold>5/5	04:00:13p.m. Feb 16, 2021 TRACE 1 2 3 4 5 6 TYPE A MWWWW DET P P N N N N	Agilent Sp <mark>(XI</mark> L	ectrum Analyzer - Swep RF 50 Ω Ref Offset 34.8	AC CORREC PN	IO: Fast	ISE:INT Trig: Free Run #Atten: 6 dB	ALIGNAUTO #Avg Typ Avg Hold	⊧e: RMS ⊳5/5	04:00:41 TR 1	p.m. Feb 16, 2021 ACE 1 2 3 4 5 6 YPE A MMMMMM DET P P N N N N
10 dB/div Ref 20.00 dBr 10.0			20.00 dBn	10.0	v Ref 20.00 dl	Bm	Protocol de la color	4. J. M.			Stafradarby	-20.00 dBn
Start 1.0000 GHz #Res BW 1.0 MHz MSG JFile <screen_0046.png< th=""><th>#VBW 3.0 MHz</th><th></th><th>Stop 2.0000 GHz 000 ms (601 pts)</th><th>#Res B</th><th>.0000 GHz W 1.0 MHz ile <screen_0047.p< th=""><th>ng> saved</th><th>#VBW</th><th>3.0 MHz</th><th>STATUS</th><th>Swe</th><th>Stop 2 ep 1.000 m</th><th>.0000 GHz s (601 pts)</th></screen_0047.p<></th></screen_0046.png<>	#VBW 3.0 MHz		Stop 2.0000 GHz 000 ms (601 pts)	#Res B	.0000 GHz W 1.0 MHz ile <screen_0047.p< th=""><th>ng> saved</th><th>#VBW</th><th>3.0 MHz</th><th>STATUS</th><th>Swe</th><th>Stop 2 ep 1.000 m</th><th>.0000 GHz s (601 pts)</th></screen_0047.p<>	ng> saved	#VBW	3.0 MHz	STATUS	Swe	Stop 2 ep 1.000 m	.0000 GHz s (601 pts)

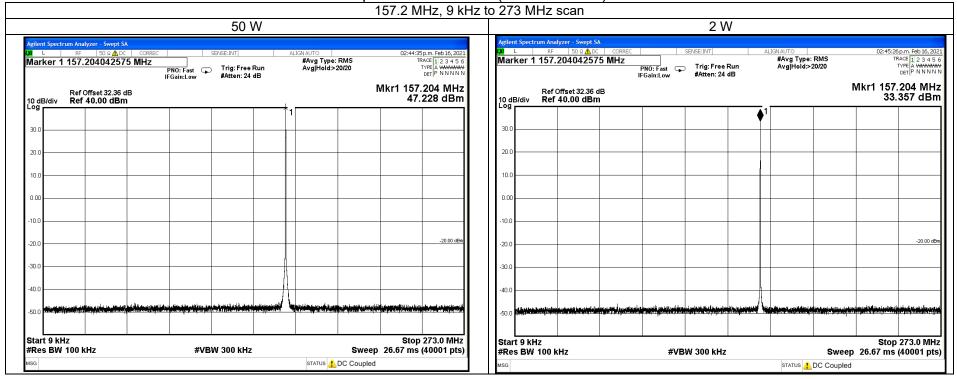
SPECIFICATION: FCC CF	R 2.1051	RSS-119 5.8								
12.5 kHz Channel Spacing	156.1 MHz @ 50 W	Emission Mask D								
Emission Frequency (MHz)	Level (dBm)	Level (dBc)								
~	~	~								
12.5 kHz Channel Spacing	156.1 MHz @ 2 W	Emission Mask D								
Emission Frequency (MHz)	Level (dBm)	Level (dBc)								
~	~	~								
Measurement Uncertainty:	≤12.75 GHz	± 3.0 dB								
No emissions were	No emissions were detected at a level greater than 20 dl									

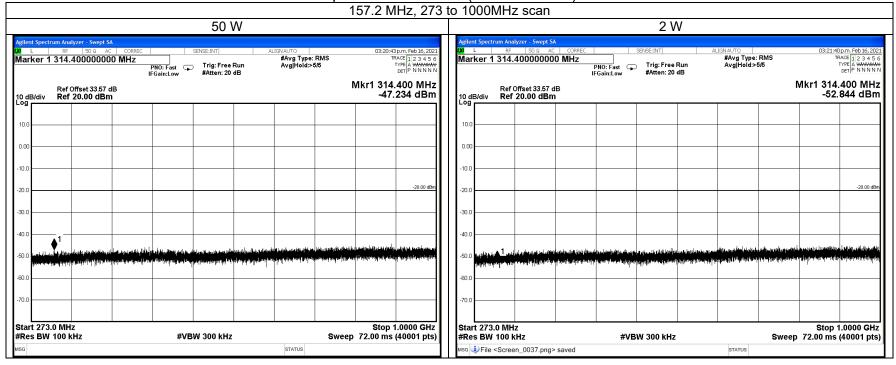




											156.1	1 MHz, 1	to 2	GHz s	can								
	50 W										2 W												
Agile	nt Spectr	rum Analy	/zer - Swept	SA									Agile	ent Spectrum	Analyzer - Swept	SA							
	i	RF Ref O	ffset 34.8	ac correc	PNO: I IFGain:		Trig: Free #Atten: 6	Run	ALIGNAUTO #Avg Type Avg Hold:>	: RMS 5/5	04:01:0 T	7 p.m. Feb 16, 2021 RACE 1 2 3 4 5 6 TYPE A MWWW DET P P N N N N			RF 50 Ω 3		PNO: Fast IFGain:Low	SENSE:INT Trig: Free #Atten: 6 o	Run	LIGN AUTO #Avg Type: Avg Hold:>	: RMS 5/5	04:01:38	p.m. Feb 16, 2021 ACE 1 2 3 4 5 6 YPE A MWWWW DET P P N N N N
10 d Log	B/div	Ref 2	20.00 dB	m						1	1		10 c Log	dB/div R	tef 20.00 dB	m							
10.0)												10.0										
0.00													0.0	0									
-10.0												-20.00 dBm	-10.0										-20.00 dBm
-20.0												20.00 401	-20.0										-20.00 dbm
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	^լ տերերգայի	provent	^{ua} an ya kale	ւնեղեղեսից	u))II)/ ¹⁴ 2014-40	al ^{parad} inger	-Lingenburgh	յի Անուդունելու	al youth parts	արիվերութ ^{ուր} տո	my flahar har	Mr. Monarchart	-50.0	⁰ պետմենաա	epa, herar frakeligense		have a free to a	aagetse of from league	and the second second	https://www.ukalia.	hlugenser	wanger wanter	Lange and a second second
-60.0													-60.0	D									
-70.0													-70.0	D									
		000 GH				#\(B)	W 3.0 MH;	<u> </u>			Stop :	2.0000 GHz		urt 1.0000 es BW 1.0			#\/P	W 3.0 MHz			Swa		.0000 GHz is (601 pts)
			HZ 1_0048.pn	g> saved		#vB	VV 3.0 IVIM2	<u>.</u>	STATUS	SWe	eh 1.000 N	ns (601 pts)			reen_0049.png	g> saved	#VE	999 J.O 1911	-	STATUS	GWE	ср 1.000 П	ia (001 pts)

SPECIFICATION: FCC CFF	R 2.1051	RSS-119 5.8							
12.5 kHz Channel Spacing	157.2 MHz @ 50 W	Emission Mask D							
Emission Frequency (MHz)	Level (dBm)	Level (dBc)							
~	~	~							
12.5 kHz Channel Spacing	157.2 MHz @ 2 W	Emission Mask D							
Emission Frequency (MHz)	Level (dBm)	Level (dBc)							
~	~	~							
Measurement Uncertainty:	≤12.75 GHz	± 3.0 dB							
No emissions were detected at a level greater than 20 dB below the limit.									

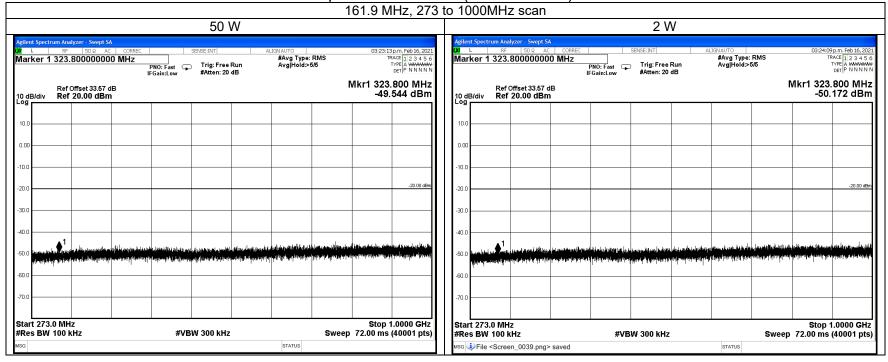




		157.2 MHz,	, 1 to 2GHz scan
	50 W		2 W
Ref Offset 34.8	AC CORREC SENSE:INT ALIGN	AUTO 04:02:09.m. Feb 16, 2021 KAvg Type: RMS TRACE 1 2 3 4 5 6 AvgjHold>5/5 tvre A MAMMAN per P P N N N	Ref Offset 34.8 dB
10 dB/div Ref 20.00 dB	m		10 dB/div Ref 20.00 dBm
-10.0			
-20.0		-20.00 tiên	
-40.0 -50.0 ๆแป้รุงประชาญาณา (10.00)	and later and a second and a	marger and a start and a start and a start and a start	40.0 50.0 marcing marking may may any approprint of the second state of the second sta
-60.0			60.0
Start 1.0000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Stop 2.0000 GHz Sweep 1.000 ms (601 pts)	Start 1.0000 GHz Stop 2.0000 Gi #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.000 ms (601 p Msg J File <screen_0051.png> saved starus</screen_0051.png>

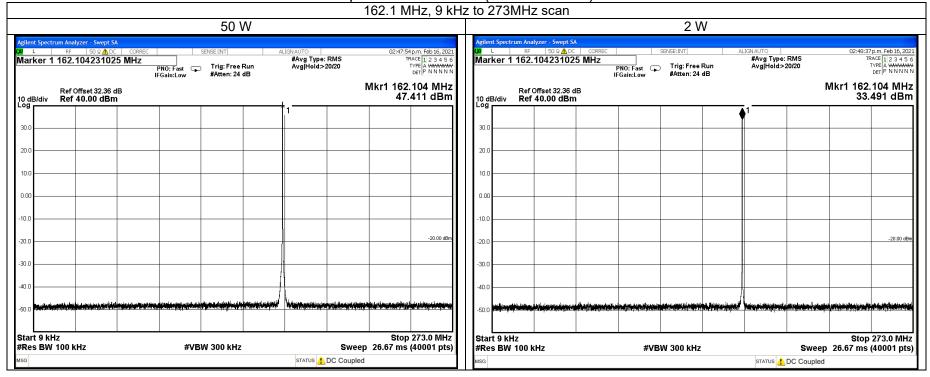
SPECIFICATION: FCC CF	R 2.1051	RSS-119 5.8				
12.5 kHz Channel Spacing	161.9 MHz @ 50 W	Emission Mask D				
Emission Frequency (MHz)	Level (dBm)	Level (dBc)				
~	~	~				
12.5 kHz Channel Spacing	161.9 MHz @ 2 W	Emission Mask D				
Emission Frequency (MHz)	Level (dBm)	Level (dBc)				
~	~	~				
Measurement Uncertainty: ≤12.75 GHz ± 3.0 dB						
No emissions were detected at a level greater than 20 dB below the limit.						

	161.9 MHz, 9 kHz to 273MHz scan																		
					50 \	W									2 V	V			
LXI	L	um Analyzer - Swept SA RF 50 Q A DC 161.906312550	CORREC	PNO: Fast G FGain:Low	SENSE:INT) Trig: Free #Atten: 24	Run	LIGNAUTO #Avg Type: Avg Hold>	20/20	TF	5p.m. Feb 16, 2021 RACE 1 2 3 4 5 6 TYPE A WWWWW DET P N N N N N	LXI L	- RF	Ilyzer - Swept SA 50 Ω ▲ DC CORR 906312550 MHz		SENSE:INT) Trig: Free #Atten: 24	Run	LIGNAUTO #Avg Type: Avg Hold:>	20/20	02:47:19p.m. Feb 16, 202 TRACE 1 2 3 4 5 6 TYPE A WWWWW DET P NNNN
	B/div	Ref Offset 32.36 di Ref 40.00 dBm							47.	.906 MHz 453 dBm	10 dE	Ref Bidiv Ref	Offset 32.36 dB 40.00 dBm					r	4 Mkr1 161.906 MHz 33.515 dBm
30.0 20.0							\$1				20.0						1		
10.0											10.0								
-10.0										-20.00 dBm	-10.0								-20.00 dBm
-30.0											-30.0								
-40.0 -50.0	Nina inte	n finning fan fan skanner staat	i pina di ini ang pina di ini a Ini ang pina di ini ang pina di	a politikan a laki politika a	gint hai let thailet nai Isan ann a thairte churg		and an international part	in a na colora colora con fil	na si		-40.0 -50.0	alden of her adding to the	n filter af stiller skyle forskaller for skyle	National States of Marine And Addie	n dan ji kalan dan sekera sebah Perpenantan dapat dalam terk	andria attación de service	Ministry Samples Antonio	a hydrodd Maran Maran a da Balad A gynar wyn wrai gynar Maran a r	ten men seine den Seiner Attikken auf ansen Attikken der Anten seiner State and Bergel and Artikken seiner Arbeiten seiner Anten seiner State and Artikken seiner auf anten seiner seiner seiner seiner seiner seiner seiner seiner seiner
#Re	t9 kH sBW	z 100 kHz		#VB	W 300 kHz					273.0 MHz (40001 pts)	#Res	t 9 kHz s BW 100 k		#VB	W 300 kHz		STATUS 1	•	Stop 273.0 MHz 26.67 ms (40001 pts)
#Re ^{MSG}	s BW	100 kHz		#VB	W 300 kHz		STATUS 🦺	Sweep DC Coupled	26.67 ms	(40001 pts)			kHz en_0025.png> saved	#VB	W 300 kHz		STATUS 🔔	Sweep DC Coupled	26.67 ms (40001 pt



		161.9 MHz	1 to 2GHz scan
	50 W		2 W
Aglient Spectrum Analyzer - Swept St Dd L RF SD Q AC Image: Colspan="2">Ref Offset 34.3 di 10 dB/div Ref 20.00 dB/n	C CORREC SENSE:INT A PNO: Fast Trig: Free Run IFGain:Low #Atten: 6 dB	LIGNAUTO 04:03:00 p.m. Feb 16, 20 #Avg Type: RMS TRACE 12:3:4:5 AvgjHold>5/5 TYPE A MAANAN DET P N N N	Ref Offset 34.8 dB 10 dB/div Ref 20.00 dBm
Log 10.0 .00 .10.0 .20.0 .30.0 .30.0 .40.0 .60.0 .70.0	Lan within a familie for the second and the second	-2000 dB	Log
Start 1.0000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Stop 2.0000 GH Sweep 1.000 ms (601 pts	Start 1.0000 GHz Stop 2.0000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.000 ms (601 pts)
MSG UFile <screen_0052.png></screen_0052.png>	> saved	STATUS	Msg JFile <screen_0053.png> saved status</screen_0053.png>

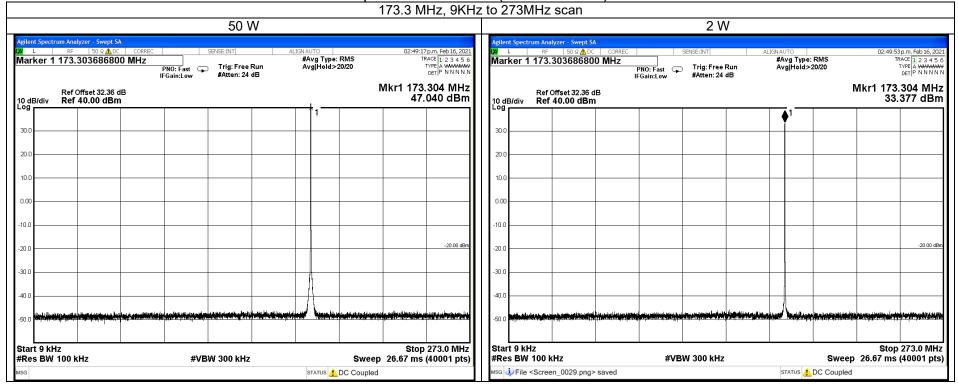
162.1 MHz @ 50 W					
	Emission Mask D				
Level (dBm)	Level (dBc)				
~	~				
162.1 MHz @ 2 W	Emission Mask D				
Level (dBm)	Level (dBc)				
~	~				
Measurement Uncertainty: ≤12.75 GHz ± 3.0 dB					
No emissions were detected at a level greater than 20 dB below the limit.					
	Level (dBm) ~ 162.1 MHz @ 2 W Level (dBm) ~ ≤12.75 GHz				



	162.1 MHz, 273	to 1000MHz scan		
50 W			2 W	
Agilent Spectrum Analyzer - Swept SA Vit RF SD_R CORREC SENSE:INT ALIGN.AUTO Marker 1 324.200000000 MHz #Avg Type: RMS #Avg Type: RMS Avg Hold>5/5 PNO: Fast Free Run #Avg Hold>5/5 Avg Hold>5/5 Ref Offset 33.57 dB 10 dB/div Ref 20.00 dBm Hour Base	03:26:14p.m. Feb 16, 2021 TRACE 12 3 4 5 6 TYPE 6 TYPE 7 NNNN Mkr1 324.200 MHz -51.135 dBm	Agilent Spectrum Analyzer - Swept SA XI RF S0.2 AC CORREC Marker 1 324.200000000 MHz Ref Offset 33.57 dB Ref Offset 33.57 dB Ref 20.00 dBm		AUTO 03:26:57 p.m. Feb 16, 2021 #Avg Type: RMS TRACE 12.2.4.5.6 Avg Hold>5/5 TYPE A WHATWAW DET P NNNN Mkr1 324.200 MHz -49.574 dBm
Log 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.		10.0 .0.00 .10.0 .20.0 .30.0 .40.0 .0.0		-20.00 dBm 20.00 dBm
Start 273.0 MHz #Res BW 100 kHz #VBW 300 kHz Swee	Stop 1.0000 GHz eep 72.00 ms (40001 pts)	Start 273.0 MHz #Res BW 100 kHz Msc JFile <screen_0041.png> saved</screen_0041.png>	#VBW 300 kHz	Stop 1.0000 GHz Sweep 72.00 ms (40001 pts)

162.1 MHz, 1 to 2GHz scan					
50 W	2 W				
	EINT ALIGNAUTO 040435p.m. Feb 16, 2021 #Avg Type: RMS TRACE [12] 3 4 5 6 rig: Free Run Avg[Hold>5/5 TYPE AHWWWW Atten: 6 dB DET P N N N				
101 1					
Start 1.0000 GHz #Res BW 1.0 MHz Stop 2.0000 GHz #VBW 3.0 MHz Stop 2.0000 GHz \$	3.0 MHz Sweep 1.000 ms (601 pts)				

SPECIFICATION: FCC CFF	R 2.1051	RSS-119 5.8			
12.5 kHz Channel Spacing	173.3 MHz @ 50 W	Emission Mask D			
Emission Frequency (MHz)	Level (dBm)	Level (dBc)			
~	~	~			
12.5 kHz Channel Spacing	173.3 MHz @ 2 W	Emission Mask D			
Emission Frequency (MHz)	Level (dBm)	Level (dBc)			
~	~	~			
Measurement Uncertainty: ≤12.75 GHz ± 3.0 dB					
No emissions were detected at a level greater than 20 dB below the limit.					



	<u>173.3 MHz, 273M</u>	<u>Hz to 1000MHz scan</u>		
50 W			2 W	
Aglient Spectrum Analyzer - Swept SA QN L RF 50 Q AC CORREC SENSE:INT ALIGNAUTO Marker 1 346.600000000 MHz #Avg Type: RMS PN0: Fast Trig: Free Run Avg Hold>5/5 Ref Offset 33.57 dB Ref 20.00 dBm	03:28:29 p.m. Feb 16, 2021 TRACE [12 3 4 5 6 TYPE & WWWWW DET P N N N N Mkr1 346.600 MHz -50.511 dBm	Agilent Spectrum Analyzer - Swept SA Id RF 50.0 AC Marker 1 346.600000000 N Ref Offset 33.57 dB 10 dB/div Ref 20.00 dBm	VIHz #Avg 1	03:29:37 р.m. Feb 16, 2021 Туре: RMS ПКАСЕ [1:2:3:4:5:6 old>5/5 ТүРЕ А МАЖА БЕТР N N N N Mkr1 346.600 MHz -51.730 dBm
Log	20.00 dBm	Log 10.0 .000 .10.0 .20.0 .30.0 .40.0		-20.00 dBn
-50.0 Long time servers Tradition and the state of the second server and the second serv	ene tan bertan ta tan internet and an	-50.0	rdenining din disk sing ta may na ing manganakan din ma di kana di kana di kana di kana di kana di kana di kana Na mana mina di kana pangang pangang pangang na pangang pangang na pangang pangang pangang na pangang pangang n Na mana di kana pangang	de cal for all dies sear op aan wat die die al die die die die stat die bestel die sear gehal die wat die die s Naam gehel gehalt wat die
Start 273.0 MHz #VBW 300 kHz Sweet #Res BW 100 kHz #VBW 300 kHz Sweet Msg status Status	Stop 1.0000 GHz eep 72.00 ms (40001 pts)	Start 273.0 MHz #Res BW 100 kHz ^{MSG}	#VBW 300 kHz	Stop 1.0000 GHz Sweep 72.00 ms (40001 pts)

	173.3 MHz, 1GHz to 2GHz scan						
	50 W				2 V	V	
Agilent Spectrum Analyzer - Swept SA V L RF SOQ AC	CORREC SENSE:INT AI PNO: Fast Trig: Free Run IFGain:Low #Atten: 6 dB	IGNAUTO 04:05:03.9.m. Feb 16, 2 #Avg Type: RMS TRACE 12 3 4 Avg Hold>5/6 TYPE A HWHM DET P P N N	21 6 M N		PNO: Fast Trig: Free #Atten: 6 d		04:05:25 p.m. Feb 16, 2021 :RMS TRACE[12:3:4:5 6 5/5 TYREA MANAWAY DET PPNNNN
Ref Offset 34.8 dB 10 dB/div Ref 20.00 dBm			10 dB/div	Ref Offset 34.8 dB Ref 20.00 dBm			
-10.0			- 0.00				
-20.0		-20.00 0					-20.00 dBm
-40.0 -50.0 კითველე უფაბიდერები დე კითვე	anor and march and a second a second a second	and marked and and and and and and and and and an		Margon and a state	yerellow to feellow to get the get the get the get the sector of the sec	and the state of the	ฉ. ส. และ
-70.0			- 60.0				
Start 1.0000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Stop 2.0000 GF Sweep 1.000 ms (601 pt			#VBW 3.0 MHz	· · · ·	Stop 2.0000 GHz Sweep 1.000 ms (601 pts)
мsg 🔱 Alignment Completed		STATUS	™sg 🤑 File <s< td=""><td>creen_0057.png> saved</td><td></td><td>STATUS</td><td></td></s<>	creen_0057.png> saved		STATUS	

Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC CFR 2.1051

RSS-119 5.8

LIMITS: FCC 47 CFR 90.210

RSS-119 5.8

Carrier Output Power	Emission Mask D 12.5 kHz Channel Spacing 50 + 10 Log ₁₀ (P _{watts})				
50 W	-20 dBm	-67 dBc			
2 W	-20 dBm	-53 dBc			

TRANSMITTER SPURIOUS EMISSIONS (RADIATED)

SPECIFICATION: FCC 47 CFR 2.1053

GUIDE: TIA-102.CAAA-C 2.2.6

MEASUREMENT PROCEDURE:

Initial Scan:

- 1. The EUT is placed in the S-Line TEM cell and emissions are measured from 30 MHz to 800 MHz. Any emission within 20 dB of the limit is then re-tested on the OATS.
- 2. The EUT is placed in the reverberation chamber and emissions are measured from 800 MHz to the upper frequency required. Any emission within 20 dB of the limit is then re-tested on the OATS.
- 3. The harmonics emissions up to the 6th harmonic of the fundamental frequency are measured on the OATS

OATS Measurement:

- 1. The EUT is placed on a wooden turntable at a distance of three metres from the test antenna. The output terminal is connected to an RF dummy load.
- 2. The test antenna is raised from 1 m to 4 m to obtain a maximum reading; the turntable is then rotated through 360° to obtain the maximum response of each spurious emission. Valid emissions are determined by switching the EUT on and off.
- 3. The EUT is then replaced by a signal generator and substitution antenna to make measurements by the substitution method.

MEASUREMENT RESULTS: See the tables on the following pages

LIMIT CLAUSE: FCC 47 CFR 90.210

Spurious Emissions (Tx Radiated)

SPECIFICATION: FCC CFR 2	2.1053				
12.5 kHz Channel Spacing	138.1 MHz @ 50 W	Emission Mask D			
Emission Frequency (MHz)	Level (dBm)	Level (dBc)			
~	~	~			
12.5 kHz Channel Spacing	138.1 MHz @ 2 W	Emission Mask D			
Emission Frequency (MHz)	Level (dBm)	Level (dBc)			
~	~	~			
Measurement Uncertainty	± 4.6	6 dB			
No emissions were de	etected at a level greater than 20	dB below the limit.			
12.5 kHz Channel Spacing	150.85 MHz @ 50 W	Emission Mask D			
Emission Frequency (MHz)	Level (dBm)	Level (dBc)			
~	~	~			
12.5 kHz Channel Spacing	150.85 MHz @ 2 W	Emission Mask D			
Emission Frequency (MHz)	Level (dBm)	Level (dBc)			
~	~	~			
Measurement Uncertainty	± 4.6	3 dB			
No emissions were de	etected at a level greater than 20	dB below the limit.			
12.5 kHz Channel Spacing	156.1 MHz @ 50 W	Emission Mask D			
Emission Frequency (MHz)	Level (dBm)	Level (dBc)			
~	~	~			
12.5 kHz Channel Spacing	156.1 MHz @ 2 W	Emission Mask D			
Emission Frequency (MHz)	Level (dBm)	Level (dBc)			
~	~	~			
Measurement Uncertainty	± 4.6	3 dB			
No emissions were detected at a level greater than 20 dB below the limit.					

Spurious Emissions (Tx Radiated)

SPECIFICATION: FCC CFR 2	2.1053		
12.5 kHz Channel Spacing	157.2 MHz @ 50 W	Emission Mask D	
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
]	
12.5 kHz Channel Spacing	157.2 MHz @ 2 W	Emission Mask D	
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
Measurement Uncertainty	± 4.6	3 dB	
No emissions were de	etected at a level greater than 20) dB below the limit.	
12.5 kHz Channel Spacing	161.9 MHz @ 50 W	Emission Mask D	
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
12.5 kHz Channel Spacing	161.9 MHz @ 2 W	Emission Mask D	
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
Measurement Uncertainty	± 4.6 dB		
No emissions were de	etected at a level greater than 20	dB below the limit.	
12.5 kHz Channel Spacing	162.1 MHz @ 50 W	Emission Mask D	
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
12.5 kHz Channel Spacing	162.1 MHz @ 2 W	Emission Mask D	
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
Measurement Uncertainty	± 4.6	à dB	
	etected at a level greater than 20		

12.5 kHz Channel Spacing	173.3 MHz @ 50 W	Emission Mask D	
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
12.5 kHz Channel Spacing	173.3 MHz @ 2 W	Emission Mask D	
Emission Frequency (MHz)	Level (dBm)	Level (dBc)	
~	~	~	
Measurement Uncertainty	± 4.6 dB		
No emissions were detected at a level greater than 20 dB below the limit.			

LIMITS: FCC CFR 2.1053

Carrier Output Power	Emission Mask D 12.5 kHz Channel Spacing 50 + 10 Log ₁₀ (P _{Watts})	
50 W	-20 dBm	-67 dBc
2 W	-20 dBm	-53 dBc

Tx Radiated Emissions - Continued

Open Area Test Site Results:

12.5 kHz Channel Spacing	157.2 MHz @ 50 W	Emission Mask D
Harmonics Emission Frequency (MHz)	Level (dBm)	Level (dBc)
314.400000	-76.35	-123.35
471.600000	-71.01	-118.01
628.800000	-54.43	-101.43
786.000000	-51.45	-98.45
943.200000	-61.54	-108.54
1100.400000	-60.15	-107.15
Measurement Uncertainty	± 4.0	6 dB

Sample Calculation	Measurement						
	Reference	nce Substitution			Res	ult	
Emission Frequency (MHz)	Reference Level (dBm)	Sig-gen Level	Cable and Attenuator Gain	Antenna Gain (dBd)	Path and Boresight corrections	dBm	nW
786.000000	-82.11	-34.13	-16.18	-1.17	0.03	-51.45	7.1547
		Α	В	С	D	E	

Photo: OATS Setup

Result (E) = A+B+C+D



FCC ID: CASTBDB1G IC : 737A-TBDB1G Report Revision: 1 Issue Date: 22 February 2021

TRANSIENT FREQUENCY BEHAVIOR

SPECIFICATION: FCC 47 CFR 90.214

RSS-119 5.9

GUIDE: TIA/EIA-603E 2.2.19

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.

2. Measurements and plots were made following the TIA procedure.

MEASUREMENT RESULTS: See the tables and plots on the following pages for 12.5 kHz channel spacing.

LIMIT CLAUSES: FCC 47 CFR 90.214

RSS-119 5.9

Transient Frequency Behaviour

50 W

SPECIFICATION:	FCC 47 CFR 90.214
SPECIFICATION:	FUU 47 UFR 90.214

RSS-119 5.9

Tx FREQUENCY:

138.1 MHz

12.5 kHz Channel Spacing

TRANSIENT RESPONSE	CARRIER PEAK VARIATION FROM NORMAL		
PERIOD	Key ON (kHz)	Key OFF (kHz)	
t1	-0.1	N/A	
t2	-0.2	N/A	
t3	N/A	0.9	

Confirm that during periods t1 and t3 the frequency difference	YES	NO
does not exceed the value of one channel separation.	1	
Confirm that during the period t2 the frequency difference does	YES	NO
not exceed half a channel separation.	1	
Confirm that during the period t2 to t3 the frequency difference	YES	NO
does not exceed the frequency error limit.	1	

Measurement Uncertainty: Frequency ± 130 Hz;

Time ± 0.2%

LIMIT:

FCC 47 CFR 90.214

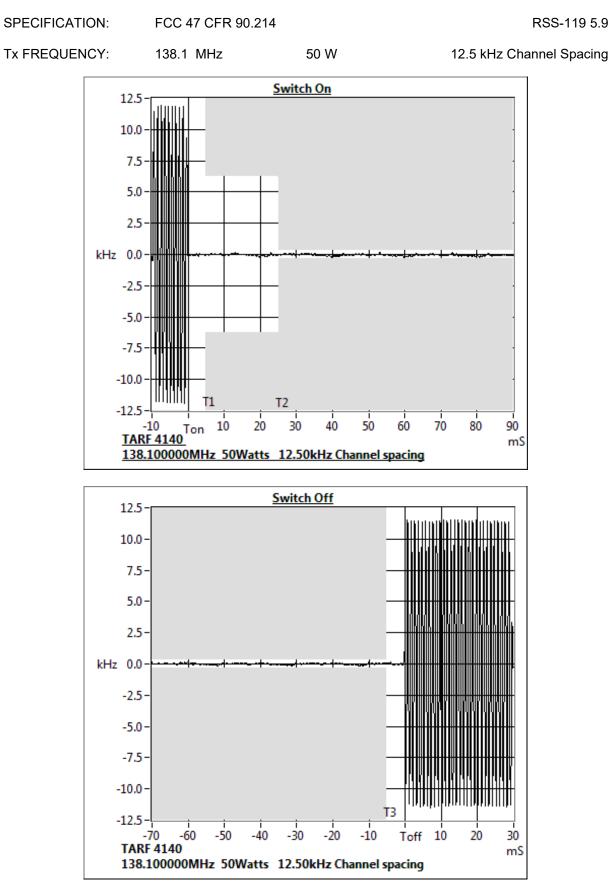
TRANSIENT PERIODS	FREQUENCY RANGE		
TRANSIENT FERIODS	150 MHz – 174 MHz	421 MHz – 512 MHz	
t1 (ms)	5 ms	10 ms	
t2 (ms)	20 ms	25 ms	
t3 (ms)	5 ms	10 ms	

LIMIT: RSS-119 5.9

Transient Frequency Behaviour for Equipment Designed to Operate on 12.5 kHz Channels				
TRANSIENT PERIODS	Maximum Frequency	FREQUENCY RANGE		
	Difference	138 – 174 MHz	406.1 – 470 MHz	
t1 (ms)	± 12.5 kHz	5 ms	10 ms	
t2 (ms)	± 6.25 kHz	20 ms	25 ms	
t3 (ms)	± 12.5 kHz	5 ms	10 ms	

Note: RSS-119 5.9 - If the transmitter carrier output power rating is 6 Watts or less, the frequency difference during the time periods t_1 and t_3 may exceed the maximum frequency difference for these time periods.

Transient Frequency Behaviour



Transient Frequency Behaviour

RSS-119 5.9

Tx FREQUENCY:

150.85 MHz 50 W 12.5 kHz Channel Spacing

TRANSIENT RESPONSE PERIOD	CARRIER PEAK VARIATION FROM NORMAL		
	Key ON (kHz)	Key OFF (kHz)	
t1	-0.2	N/A	
t2	-0.4	N/A	
t3	N/A	0.2	

Confirm that during periods t1 and t3 the frequency difference	YES	NO
does not exceed the value of one channel separation.	\checkmark	
Confirm that during the period t2 the frequency difference does	YES	NO
not exceed half a channel separation.	1	
Confirm that during the period t2 to t3 the frequency difference	YES	NO
does not exceed the frequency error limit.	1	

Measurement Uncertainty: Frequency ± 130 Hz;

Time ± 0.2%

LIMIT: FCC 47 (CFR 90.214	
TRANSIENT PERIODS	FREQUENCY RANGE	
TRANSIENT PERIODS	150 MHz – 174 MHz	421 MHz – 512 MHz
t1 (ms)	5 ms	10 ms
t2 (ms)	20 ms	25 ms
t3 (ms)	5 ms	10 ms

RSS-119 5.9 LIMIT:

Transient Frequency Behaviour for Equipment Designed to Operate on 12.5 kHz Channels			
TRANSIENT PERIODS	Maximum Frequency Difference	FREQUE 138 – 174 MHz	NCY RANGE 406.1 – 470 MHz
t1 (ms)	± 12.5 kHz	5 ms	10 ms
t2 (ms)	± 6.25 kHz	20 ms	25 ms
t3 (ms)	± 12.5 kHz	5 ms	10 ms

Note: RSS-119 5.9 - If the transmitter carrier output power rating is 6 Watts or less, the frequency difference during the time periods t1 and t3 may exceed the maximum frequency difference for these time periods,

Transient Frequency Behaviour

50 W

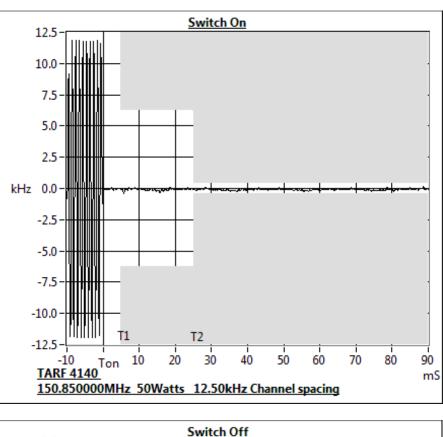


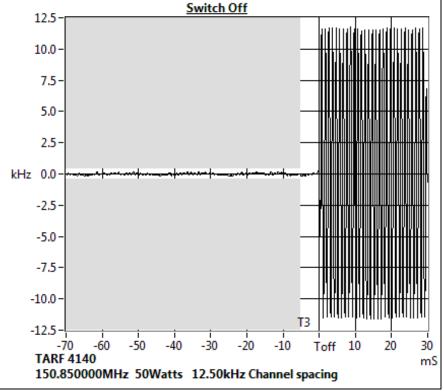
150.85 MHz

Tx FREQUENCY:

RSS-119 5.9

12.5 kHz Channel Spacing





FCC ID: CASTBDB1G IC : 737A-TBDB1G

Transient Frequency Behaviour

156.1 MHz

RSS-119 5.9

Tx FREQUENCY:

50 W

12.5 kHz Channel Spacing

TRANSIENT RESPONSE	CARRIER PEAK VARIATION FROM NORMAL	
PERIOD	Key ON (kHz)	Key OFF (kHz)
t1	-0.3	N/A
t2	-0.3	N/A
t3	N/A	-0.6

Confirm that during periods t1 and t3 the frequency difference	YES	NO
does not exceed the value of one channel separation.	\checkmark	
Confirm that during the period t2 the frequency difference does	YES	NO
not exceed half a channel separation.	1	
Confirm that during the period t2 to t3 the frequency difference	YES	NO
does not exceed the frequency error limit.	1	

Measurement Uncertainty: Frequency ± 130 Hz;

Time ± 0.2%

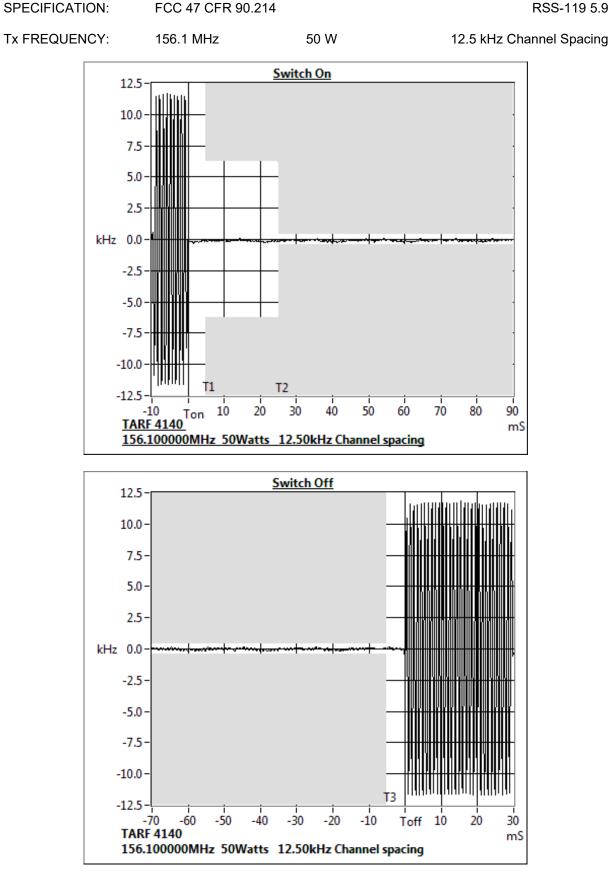
LIMIT: FCC 47 (CFR 90.214	
TRANSIENT PERIODS	FREQUENCY RANGE	
TRANSIENT PERIODS	150 MHz – 174 MHz	421 MHz – 512 MHz
t1 (ms)	5 ms	10 ms
t2 (ms)	20 ms	25 ms
t3 (ms)	5 ms	10 ms

RSS-119 5.9 LIMIT:

Transient Frequency Behaviour for Equipment Designed to Operate on 12.5 kHz Channels			
TRANSIENT PERIODS	Maximum Frequency Difference	FREQUE 138 – 174 MHz	NCY RANGE 406.1 – 470 MHz
t1 (ms)	± 12.5 kHz	5 ms	10 ms
t2 (ms)	± 6.25 kHz	20 ms	25 ms
t3 (ms)	± 12.5 kHz	5 ms	10 ms

Note: RSS-119 5.9 - If the transmitter carrier output power rating is 6 Watts or less, the frequency difference during the time periods t1 and t3 may exceed the maximum frequency difference for these time periods.

Transient Frequency Behaviour



RSS-119 5.9

Transient Frequency Behaviour

SPECIFICATION:	FCC 47 CFR 90.214
SPECIFICATION.	FUU 47 UFR 90.214

157.2 MHz

RSS-119 5.9

Tx FREQUENCY:

50 W

12.5 kHz Channel Spacing

TRANSIENT RESPONSE	CARRIER PEAK VARIATION FROM NORMAL	
PERIOD	Key ON (kHz)	Key OFF (kHz)
t1	-0.2	N/A
t2	-0.3	N/A
t3	N/A	-1.0

Confirm that during periods t1 and t3 the frequency difference	YES	NO
does not exceed the value of one channel separation.	\checkmark	
Confirm that during the period t2 the frequency difference does	YES	NO
not exceed half a channel separation.	\checkmark	
Confirm that during the period t2 to t3 the frequency difference	YES	NO
does not exceed the frequency error limit.	\checkmark	

Measurement Uncertainty: Frequency ± 130 Hz;

Time ± 0.2%

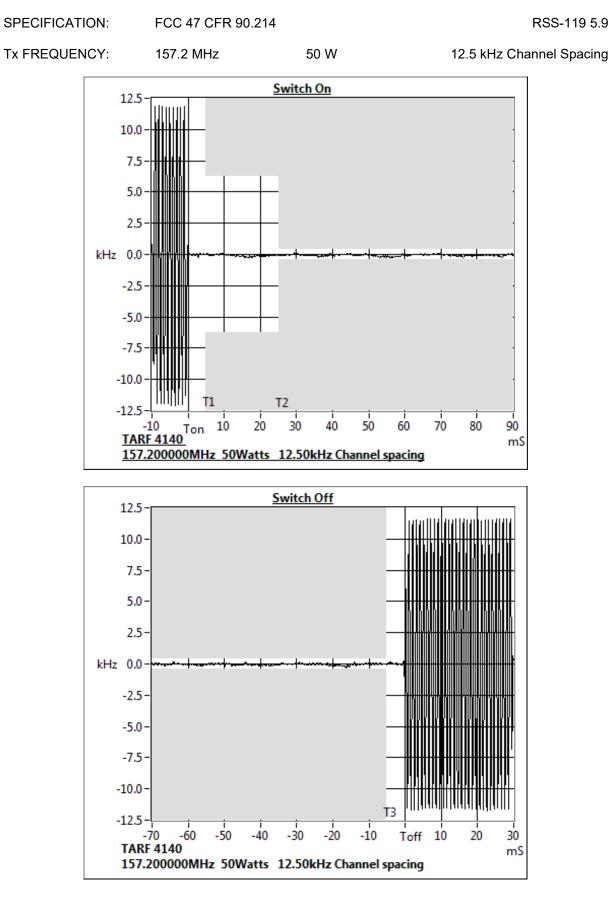
LIMIT: FCC 47	CFR 90.214	
TRANSIENT PERIODS	FREQUENCY RANGE	
TRANSIENT PERIODS	150 MHz – 174 MHz	421 MHz – 512 MHz
t1 (ms)	5 ms	10 ms
t2 (ms)	20 ms	25 ms
t3 (ms)	5 ms	10 ms

RSS-119 5.9 LIMIT:

Transient Frequency Behaviour for Equipment Designed to Operate on 12.5 kHz Channels			
TRANSIENT PERIODS	IENT PERIODS Maximum Frequency	FREQUENCY RANGE	
	Difference	138 – 174 MHz	406.1 – 470 MHz
t1 (ms)	± 12.5 kHz	5 ms	10 ms
t2 (ms)	± 6.25 kHz	20 ms	25 ms
t3 (ms)	± 12.5 kHz	5 ms	10 ms

Note: RSS-119 5.9 - If the transmitter carrier output power rating is 6 Watts or less, the frequency difference during the time periods t1 and t3 may exceed the maximum frequency difference for these time periods,

Transient Frequency Behaviour



FCC ID: CASTBDB1G IC : 737A-TBDB1G

Transient Frequency Behaviour

161.9 MHz

RSS-119 5.9

Tx FREQUENCY:

50 W

12.5 kHz Channel Spacing

TRANSIENT RESPONSE	CARRIER PEAK VARIATION FROM NORMAL		
PERIOD	Key ON (kHz)	Key OFF (kHz)	
t1	0.2	N/A	
t2	0.5	N/A	
t3	N/A	1.0	

Confirm that during periods t1 and t3 the frequency difference	YES	NO
does not exceed the value of one channel separation.	\checkmark	
Confirm that during the period t2 the frequency difference does	YES	NO
not exceed half a channel separation.	1	
Confirm that during the period t2 to t3 the frequency difference	YES	NO
does not exceed the frequency error limit.	1	

Measurement Uncertainty: Frequency ± 130 Hz;

Time ± 0.2%

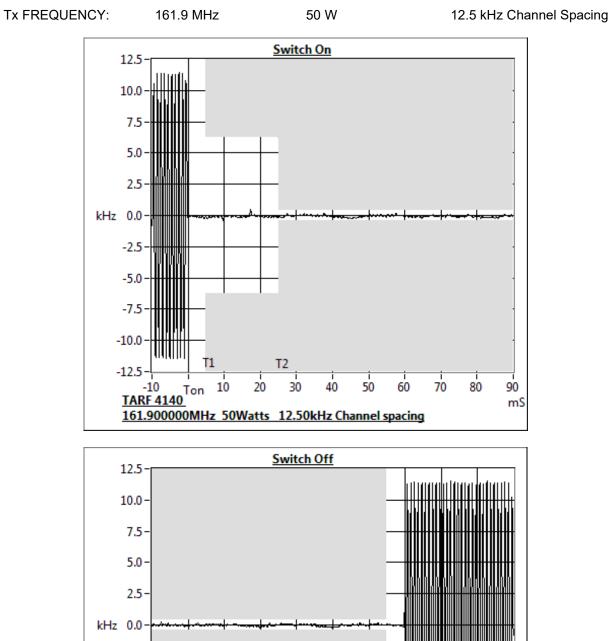
LIMIT: FCC 47 (CFR 90.214		
TRANSIENT PERIODS	FREQUENCY RANGE		
TRANSIENT PERIODS	150 MHz – 174 MHz	421 MHz – 512 MHz	
t1 (ms)	5 ms	10 ms	
t2 (ms)	20 ms	25 ms	
t3 (ms)	5 ms	10 ms	

LIMIT: RSS-119 5.9

Transient Frequency Behaviour for Equipment Designed to Operate on 12.5 kHz Channels				
TRANSIENT PERIODS				NCY RANGE
	Difference	138 – 174 MHz	406.1 – 470 MHz	
t1 (ms)	± 12.5 kHz	5 ms	10 ms	
t2 (ms)	± 6.25 kHz	20 ms	25 ms	
t3 (ms)	± 12.5 kHz	5 ms	10 ms	

Note: RSS-119 5.9 - If the transmitter carrier output power rating is 6 Watts or less, the frequency difference during the time periods t1 and t3 may exceed the maximum frequency difference for these time periods.

Transient Frequency Behaviour



FCC 47 CFR 90.214

-2.5 -5.0 -7.5 -10.0 T3 -12.5 -60 -50 -30 -20 -10 Toff -70 -40 10 20 30 **TARF 4140** mS 161.900000MHz 50Watts 12.50kHz Channel spacing

FCC ID: CASTBDB1G IC: 737A-TBDB1G

SPECIFICATION:

80

90

mS

RSS-119 5.9

Transient Frequency Behaviour

50 W

RSS-119 5.9

Tx FREQUENCY:

162.1 MHz

12.5 kHz Channel Spacing

TRANSIENT RESPONSE	CARRIER PEAK VARIATION FROM NORMAL		
PERIOD	Key ON (kHz)	Key OFF (kHz)	
t1	-0.2	N/A	
t2	-0.2	N/A	
t3	N/A	1.0	

Confirm that during periods t1 and t3 the frequency difference	YES	NO
does not exceed the value of one channel separation.	\checkmark	
Confirm that during the period t2 the frequency difference does	YES	NO
not exceed half a channel separation.	1	
Confirm that during the period t2 to t3 the frequency difference	YES	NO
does not exceed the frequency error limit.	1	

Measurement Uncertainty: Frequency ± 130 Hz;

Time ± 0.2%

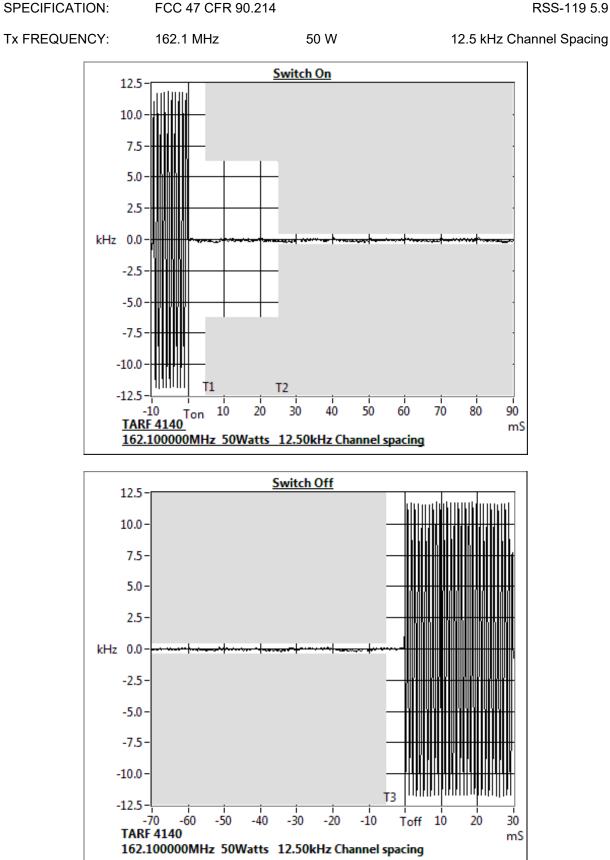
LIMIT: FCC 47 (CFR 90.214		
TRANSIENT PERIODS	FREQUENCY RANGE		
TRANSIENT PERIODS	150 MHz – 174 MHz	421 MHz – 512 MHz	
t1 (ms)	5 ms	10 ms	
t2 (ms)	20 ms	25 ms	
t3 (ms)	5 ms	10 ms	

RSS-119 5.9 LIMIT:

Transient Frequency Behaviour for Equipment Designed to Operate on 12.5 kHz Channels				
TRANSIENT PERIODS			Maximum Frequency Difference	NCY RANGE
	Difference	138 – 174 MHz	406.1 – 470 MHz	
t1 (ms)	± 12.5 kHz	5 ms	10 ms	
t2 (ms)	± 6.25 kHz	20 ms	25 ms	
t3 (ms)	± 12.5 kHz	5 ms	10 ms	

Note: RSS-119 5.9 - If the transmitter carrier output power rating is 6 Watts or less, the frequency difference during the time periods t1 and t3 may exceed the maximum frequency difference for these time periods,

Transient Frequency Behaviour



RSS-119 5.9

Transient Frequency Behaviour

173.3 MHz

RSS-119 5.9

50 W

12.5 kHz Channel Spacing

TRANSIENT RESPONSE PERIOD	CARRIER PEAK VARIATION FROM NORMAL		
	Key ON (kHz)	Key OFF (kHz)	
t1	0.5	N/A	
t2	-0.2	N/A	
t3	N/A	-0.2	

Confirm that during periods t1 and t3 the frequency difference	YES	NO
does not exceed the value of one channel separation.	\checkmark	
Confirm that during the period t2 the frequency difference does	YES	NO
not exceed half a channel separation.	\checkmark	
Confirm that during the period t2 to t3 the frequency difference	YES	NO
does not exceed the frequency error limit.	\checkmark	

Measurement Uncertainty:

Frequency ± 130 Hz;

Time ± 0.2%

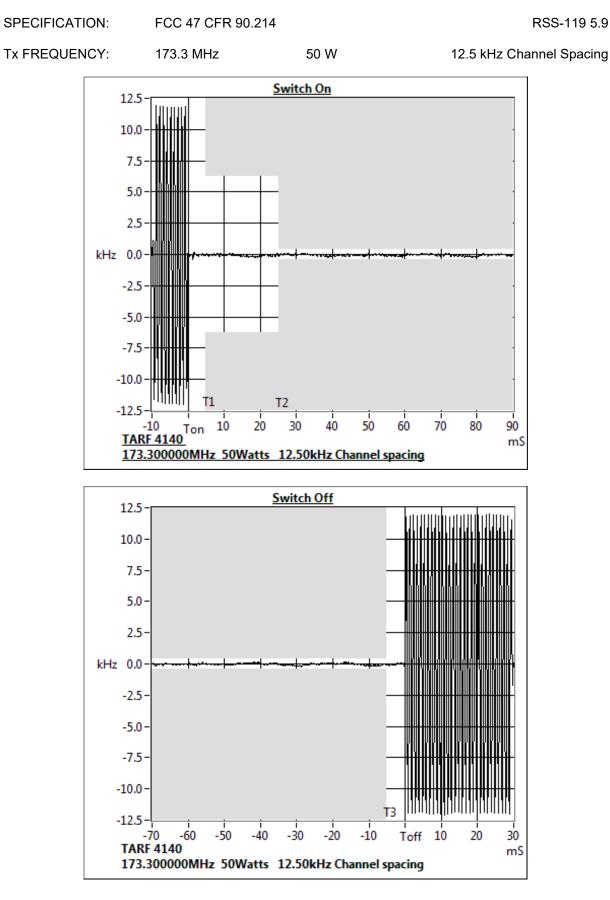
LIMIT: FCC 47	IIT: FCC 47 CFR 90.214			
TRANSIENT PERIODS	FREQUENCY RANGE			
TRANSIENT FERIODS	150 MHz – 174 MHz	421 MHz – 512 MHz		
t1 (ms)	5 ms	10 ms		
t2 (ms)	20 ms	25 ms		
t3 (ms)	5 ms	10 ms		

LIMIT: RSS-119 5.9

Transient Frequency Behaviour for Equipment Designed to Operate on 12.5 kHz Channels				
TRANSIENT PERIODS	Maximum Frequency	FREQUENCY RANGE		
	Difference	138 – 174 MHz	406.1 – 470 MHz	
t1 (ms)	± 12.5 kHz	5 ms	10 ms	
t2 (ms)	± 6.25 kHz	20 ms	25 ms	
t3 (ms)	± 12.5 kHz	5 ms	10 ms	

Note: RSS-119 5.9 - If the transmitter carrier output power rating is 6 Watts or less, the frequency difference during the time periods t1 and t3 may exceed the maximum frequency difference for these time periods,

Transient Frequency Behaviour



FCC ID: CASTBDB1G IC : 737A-TBDB1G

TRANSMITTER FREQUENCY STABILITY - TEMPERATURE

SPECIFICATION: FCC 47 CFR 2.1055 (a) (1)

RSS-119 5.3

GUIDE: ANSI C63.26 5.6.4

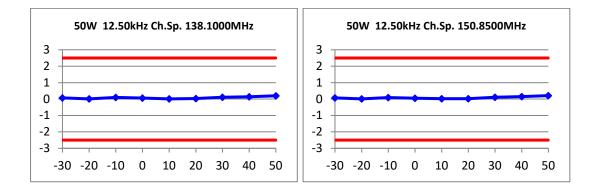
MEASUREMENT PROCEDURE:

- 1. Refer Annex A for equipment set up.
- 2. The EUT was tested for frequency error from -30° C to +50° C in 10° C increments
- 3. The frequency error was recorded in parts per million (ppm).

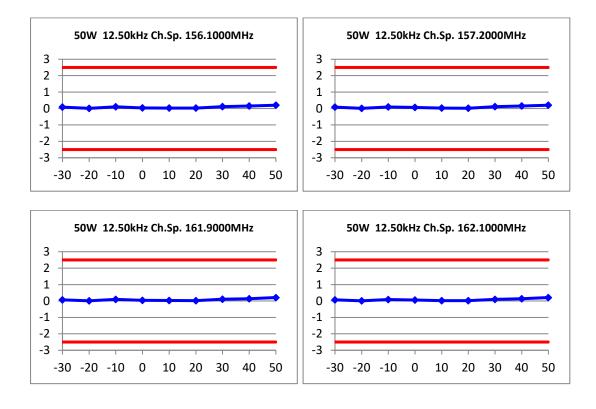
MEASUREMENT RESULTS:

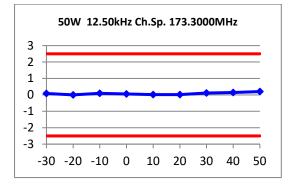
See the plots on the following pages.

	Error (ppm)						
Temperature (°C)	138.1 MHz	150.85 MHz	156.1 MHz	157.2 MHz	161.9 MHz	162.1 MHz	173.3 MHz
-30	0.07	0.07	0.08	0.08	0.07	0.07	0.08
-20	0.01	0.01	0.01	0.01	0.01	0.01	0
-10	0.1	0.09	0.1	0.09	0.1	0.09	0.09
0	0.06	0.05	0.04	0.06	0.04	0.06	0.05
10	0.01	0.02	0.03	0.03	0.03	0.02	0.02
20	0.03	0.02	0.03	0.02	0.02	0.02	0.02
30	0.11	0.11	0.11	0.11	0.11	0.1	0.11
40	0.14	0.15	0.15	0.15	0.14	0.14	0.14
50	0.2	0.21	0.2	0.2	0.21	0.21	0.2
Measurement Uncertainty		± 7 x 10 ⁻⁸					



Transmitter Frequency Stability - Temperature





LIMIT:	FCC 47 CFR 90.213	RSS-119 5.3
Ch	annel Spacing (kHz)	Frequency Error (ppm)
	12.5	2.5

TRANSMITTER FREQUENCY STABILITY - VOLTAGE

SPECIFICATION: FCC 47 CFR 2.1055 (d) (1)

RSS-119 5.3

GUIDE: ANSI C63.26 5.6.5

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.

- 2. The EUT was tested for frequency error at an input voltage to the radio of 85% to 115%.
- 3. The frequency error was recorded in parts per million (ppm).

MEASUREMENT RESULTS:

	FREQUENCY ERROR (ppm) for 12.5 kHz		
	120 V _{AC}	102 VAC	138 V _{AC}
138.1 MHz	0.05	0.07	0.05
150.85 MHz	0.07	0.07	0.07
156.1 MHz	0.06	0.06	0.07
157.2 MHz	0.08	0.06	0.07
161.9 MHz	0.07	0.07	0.08
162.1 MHz	0.07	0.07	0.06
173.3 MHz	0.07	0.07	0.06
Measurement Uncertainty		± 7 x	10 ⁻⁸

LIMIT CLAUSES: FCC 47 CFR 90.213	RSS-119 5.3
Channel Spacing (kHz)	Frequency Error (ppm)
12.5	2.5

RECEIVER SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATION:	RSS-Gen 7.4
GUIDE:	TIA-603-E 2.1.2 (analogue) TIA-102-CAAA-C 2.1.2 (digital)

MEASUREMENT PROCEDURE:

- 1. Refer Annex A for Equipment set up diagram.
- 2. The frequency range examined was from 30 MHz to 3 times highest tunable frequency.
- 3. Spurious emissions which were attenuated more than 20 dB below the limit were not recorded.
- 4. A scan is performed with a resolution bandwidth of 100 kHz and a video bandwidth of 300 kHz for frequencies up to 1 GHz, and a resolution bandwidth of 1 MHz and a video bandwidth of 3 MHz for frequencies above 1 GHz
- 5. For each frequency range the spectrum analyser was loaded with the appropriate calibration figures to compensate for the cables and attenuator losses allowing the emission levels to be read directly with no further calculation .

Spurious emissions which were attenuated by more than 20 dB below the limit were not recorded.

		_
E4364 10dB 50W BC3293	9.65	
E5015 3m Blue 503429	0.33	
E5028 1m5 Blue 501868	0.15	
Total Attenuation @ 138.15 MHz	z 10.13	Sum of component
		attenuation (a)
Amplitude offset	10.53	(b)
Correction @ 138.150 MHz	-0.4	(a-b)

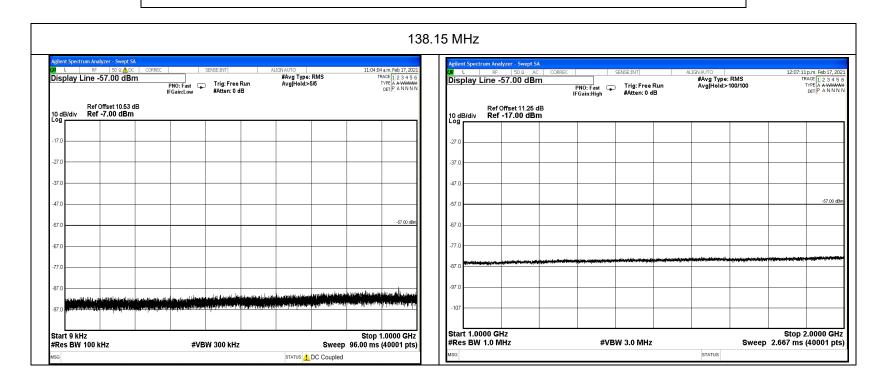
Example of attenuation correction:

LIMIT	CLAUSE:

LIMIT	30 → 1000 MHz	2 nW	- 57 dBm
	> 1000 MHz	5 nW	- 53 dBm

Receiver Spurious Emissions (Conducted) – Continued

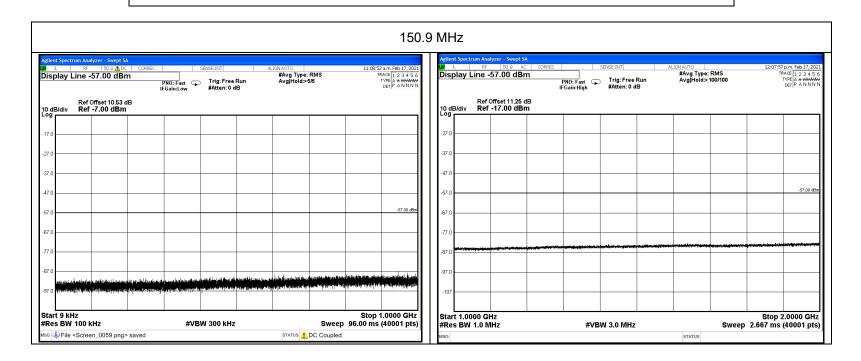
138.15 MHz Receive (Receiver Input Port)			
Emission Frequency (MHz) Level (nW) Level (dBm)			
~	~	~	
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB			
No emissions were detected within 20 dB of Limit.			



FCC ID: CASTBDB1G IC : 737A-TBDB1G Page 112 of 129

Receiver Spurious Emissions (Conducted) – Continued

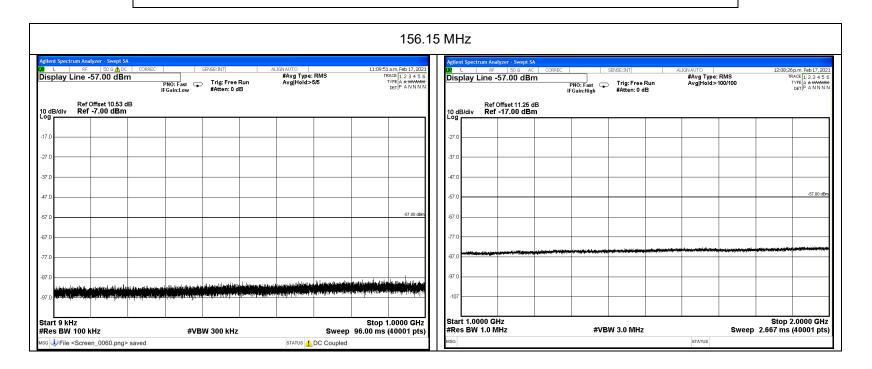
150.9 MHz Receive (Receiver Input Port)				
Emission Frequency (MHz) Level (nW) Level (dBm)				
~	~	~		
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB				
No emissions were detected within 20 dB of Limit.				



FCC ID: CASTBDB1G IC : 737A-TBDB1G Page 113 of 129

Receiver Spurious Emissions (Conducted) – Continued

156.15 MHz Receive (Receiver Input Port)			
Emission Frequency (MHz) Level (nW) Level (dBm)			
~	~	~	
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB			
No emissions were detected within 20 dB of Limit.			



FCC ID: CASTBDB1G IC : 737A-TBDB1G Page 114 of 129

Receiver Spurious Emissions (Conducted) - Continued

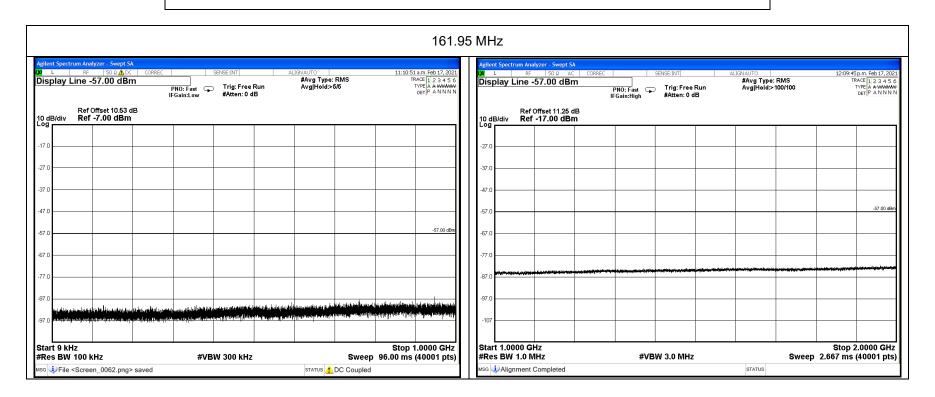
157.25 MHz Receive (Receiver Input Port)			
Emission Frequency (MHz) Level (nW) Level (dBm)			
~	~	~	
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB			
No emissions were detected within 20 dB of Limit.			

	157.25 MHz						
Agitent Spectrum Analyzer - Swept 01 L RF 50 2 db Display Line -57.00 dB Ref Offset 10.53 10 dB/div Ref -7.00 dBr	C CORREC SENSE:INT PNO: Fast IFGain:Low #Atten: 0 dB	ALIGHAUTO 11 #Avg Type: RMS Avg Hold>5/5	:10:27 a.m. Feb 17, 2021 TRACE [] 2 3 4 5 6 TYPE A X WWWW DET P A N N N N	Aglent Spectrum Analyzer - Swept SA VI L RF S0 @ AC C Display Line -57.00 dBm Ref Offset 11.25 dB 10 dB/div Ref Offset 11.25 dB 10 dB/div Ref -17.00 dBm	PNO: Fast Trig: Free Run IFGain:Tligh #Atten: 0 dB	ALIGNAUTO #Avg Type: RMS Avg Hold>100/100	12:09:03p.m. Feb 17, 2021 TRACE 12 3 4 5 6 TYPE A WWWW DET P A N N N N
17.0				-27 0 -37 0 -47 0 -57 0			-57.00 dBm
-67.0 -77.0			-57.00 dBn	-67.0 -77.0 -87.0			
.87.0 .97.0 .97.0 Start 9 kHz Res BW 100 kHz Mas W 100 kHz Mas W 100 kHz	#VIEW 300 kHz	St	op 1.0000 GHz ms (40001 pts)	.87.0	#VBW 3.0 MHz		Stop 2.0000 GHz 67 ms (40001 pts)

FCC ID: CASTBDB1G IC : 737A-TBDB1G Page 115 of 129

Receiver Spurious Emissions (Conducted) – Continued

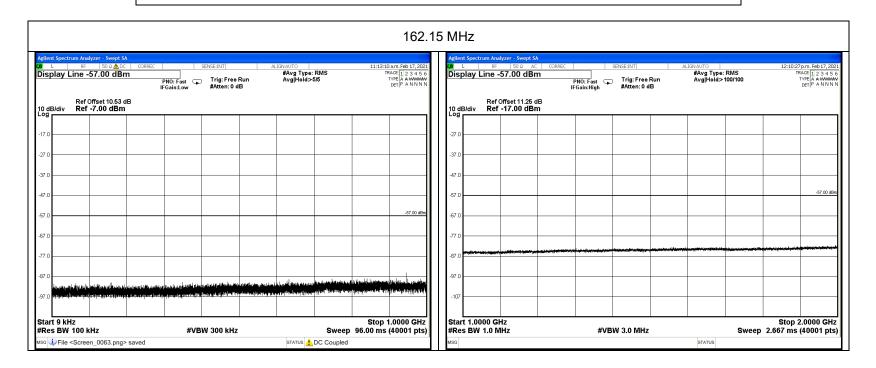
161.95 MHz Receive (Receiver Input Port)						
Emission Frequency (MHz) Level (nW) Level (dBm)						
~	~	~				
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB						
No emissions were detected within 20 dB of Limit.						



FCC ID: CASTBDB1G IC : 737A-TBDB1G Page 116 of 129

Receiver Spurious Emissions (Conducted) – Continued

162.15 MHz Receive (Receiver Input Port)							
Emission Frequency (MHz) Level (nW) Level (dBm)							
~	~	~					
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB							
No emissions were detected within 20 dB of Limit.							



FCC ID: CASTBDB1G IC : 737A-TBDB1G Page 117 of 129

173.35 MHz Receive (Receiver Input Port)						
Emission Frequency (MHz)	Level (dBm)					
~	~	~				
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB						
No emissions were detected within 20 dB of Limit.						

_		173.3	35 MHz
Agilent Spectrum Analyzer - Swept SA BL RF 50 0 ▲ OC CORREC Display Line -57.00 dBm Ref Offset 10.53 dB 10 dB/div Ref -7.00 dBm	SENSEINT ALONAUTO #Avg T PHO: Fast. Trig: Free Run IFGain:Low #Atten: 0 dB	11:1354 а.m. Feb 17.2021 уре: RMS тяас [] [2:3 а.5 б id>6/5 тяас]] [2:3 а.5 б id>6/5 тяс] А. мимон рет[Р А.N.N.N рет]Р А.N.N.N	Agilent Spectrum Analyzer - Swept SA Value Ref 150 & AC CORREC SENSE INT ALISVAUTO 12:10:55.p.m. Feb Display Line -57.00 dBm #Avg Type: RMS TTACE[1] PIRO: Fast Trig: Free Run Avg[Hold>100/100 TYPE A Ref Offset 11.25 dB Trig: Free Run Avg[Hold>100/100 TYPE A Ref Offset 11.25 dB To dB TO dB
-17.0			
-37.0			-47.0 -57.0 -57.0
-67.0		-57.00 dBm	-67.0
-27.0 -87.0 -97.0 2014 J. C. S. B. S. S.	provide particular strategies and the strategies of the strategies	, gail is a faile failed, daoi is in an an ann an Araban an Araban an Araban an Araban an Araban an Araban an Araban an Araban an A	
Start 9 kHz #Res BW 100 kHz MsG JFile <screen_0064.png> saved</screen_0064.png>	#VBW 300 kHz	Stop 1.0000 GHz Sweep 96.00 ms (40001 pts)	Start 1.0000 GHz Stop 2.0000 #Res BW 1.0 MHz #VBW 3.0 MHz Stoep 2.667 ms (4000) wss J File <screen_0087.png> saved startus</screen_0087.png>

TRANSMITTER STANDBY SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATION: RSS-Gen 7.4

GUIDE: TIA-603-E 2.1.2 (analogue) TIA-102-CAAA-C 2.1.2 (digital)

MEASUREMENT PROCEDURE:

- 1. Refer Annex A for Equipment set up diagram.
- 2. The frequency range examined was from 30 MHz to 3 times highest tunable frequency.
- 3. Spurious emissions which were attenuated more than 20 dB below the limit were not recorded.
- 4. A scan is performed with a resolution bandwidth of 100 kHz and a video bandwidth of 300 kHz for frequencies up to 1 GHz, and a resolution bandwidth of 1 MHz and a video bandwidth of 3 MHz for frequencies above 1 GHz
- 5. For each frequency range the spectrum analyser was loaded with the appropriate calibration figures to compensate for the cables and attenuator losses allowing the emission levels to be read directly with no further calculation.

Spurious emissions which were attenuated by more than 20 dB below the limit were not recorded.

		_
E4364 10dB 50W BC3293	9.65	
E5015 3m Blue 503429	0.33	
E5028 1m5 Blue 501868	0.15	
Total Attenuation @ 138.15 MHz	10.13	Sum of component
		attenuation (a)
Amplitude offset	10.53	(b)
Correction @ 138.150 MHz	-0.4	(a-b)

Example of attenuation correction:

UMIT CLAUSE

LIMIT CLAUSE:	RSS-Gen 7.4				
	30 → 1000 MHz	2 nW	- 57 dBm		
LIMIT	> 1000 MHz	5 nW	- 53 dBm		

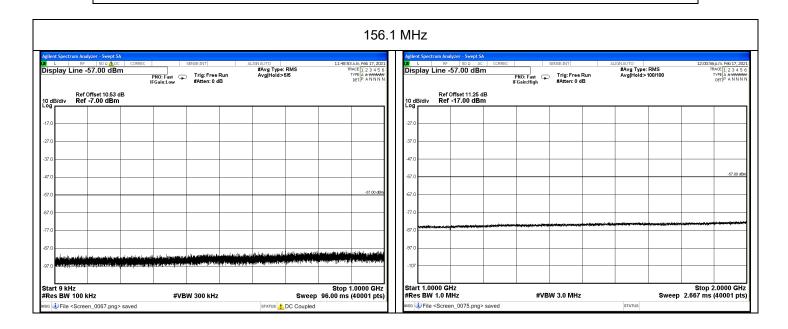
138.1 MHz Transmitter Standby (Transmitter RF Output Port)						
Emission Frequency (MHz) Level (nW) Level (dBm)						
~	~	~				
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB						
No emissions were detected within 20 dB of Limit.						

								138.	1 MF	Ηz									
UXIL Display Line 10 dB/div R	Analyzer - Swept SA ■F 50 @ A DC CORF e -57.00 dBm tef Offset 10.53 dB tef -7.00 dBm	PNO: Fast IFGain:Low	SENSE:INT Trig: Free #Atten: 0 o	Run	IGNAUTO #Avg Type: F Avg Hold>5#	RMS 5	11:47:54 TF	a.m. Feb 17, 2021 IACE 1 2 3 4 5 6 TYPE A 4 3 M N N N DET P A N N N N	Dis 10 d	play Lin	Analyzer - Swept RF 50 2 ie -57.00 dE Ref Offset 11.25 Ref -17.00 dE	AC CORREC 3m IF	PNO: Fast Gain:High	SENSE:INT Trig: Free I #Atten: 0 d	Run	LIGNAUTO #Avg Type Avg Hold>	: RMS 100/100	11:59:4 T	Lam.Feb 17, 2021 RACE 2 3 4 5 6 TYPE A & WWWW DET P A N N N N
-17.0 -27.0									-27.1 -37.1										
-37.0									-47.1) 									-57.00 dBr
-67.0								-57.00 dBm	-67.1										
-77.0	الم من الم	ويتعاربها للارتفاعية	مەر يىنى اسى	Mirandianaka idat	المغضر والفائم الم	n birandastajang	a successive and the second	alê Heranda în esta de	-87.1) 	nara yezheteri da			<u></u>			*****		
.97.0 Start 9 kHz #Res BW 10	here and a second s	ويرجين والمعادية والبوجية	waa namatak W 300 kHz	an ta ka	a kine da ye da na pendara da Anglanda Anglanda da yena pendara da Anglanda da	a da cilia con esco e	Stop 1	.0000 GHz (40001 pts)		rt 1.0000 es BW 1.			#VB)	W 3.0 MHz			Sweep	Stop 2.667 ms	2.0000 GHz (40001 pts)
MSG		# v B			STATUS 🦺 D		55,50 113	(10001 pts)			creen_0073.pn	g> saved				STATUS			

150.85 MHz Transmitter Standby (Transmitter RF Output Port)						
Emission Frequency (MHz) Level (nW) Level (dBm)						
~	~	~				
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB						
No emissions were detected within 20 dB of Limit.						

		150.85	5 MHz		
Display Line -57.00 dBm PNO: Fast IF Gain:Low 10 dB/div Ref -7.00 dBm	४६:अग AUGNAUTO Avg Type: RMS Trig: Free Run Avg Hold>5/5 AAtten: 0 dB	11:48:27 am Feb 17,2021 TRACE [12 3 4 5 6 TYPE A ENVIRONM CET P A NN N N	Aglent Spectrum Analyzer - Swept SA L	c SENCE P(T) AL PNO: Fast Trig: Free Run IFGain:High #Atten: 0 dB	1200390m Feb 17,302 ₿Avg Type: RMS Rocc 1,2 3 4 5 6 Avg Hold>100100 Pol cel P A NNN
-17.0			-27 0		
47.0			-47 0		
570		57.00 dBm	-67.0 -77.0		
 architecture (architecture) (architecture) architecture) (architecture) (architecture) architecture) (architecture) (architecture) (architecture) architecture) (architecture) (arc	il a far a far A far a fa	ning sen for na stala i falla saan i tala talan gagan tala karpan da Vilarda sa tala tala tala ya	-107		
Start 9 kHz #Res BW 100 kHz #VBW : Mo (↓ File <screen_0066.png> saved</screen_0066.png>	300 kHz Sweep	Stop 1.0000 GHz 96.00 ms (40001 pts)	Start 1.0000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Stop 2.0000 GH Sweep 2.667 ms (40001 pt

156.1 MHz Transmitter Standby (Transmitter RF Output Port)							
Emission Frequency (MHz) Level (nW) Level (dBm)							
~	~	~					
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB							
No emissions were detected within 20 dB of Limit.							



157.2 MHz Transmitter Standby (Transmitter RF Output Port)										
Emission Frequency (MHz)	Level (nW)	Level (dBm)								
~ ~ ~										
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB										
No emissions were detected within 20 dB of Limit.										

							157.	2 MI	Ηz								
LXI L	ctrum Analyzer - Swept SA №F 50 Ω Δ DC 1 Line -57.00 dBm Ref Offset 10.53 dB Ref -7.00 dBm	PNO: Fast IFGain:Low	SENSE:INT Trig: Free Rui #Atten: 0 dB	ALIGNAUT #Av n Avg	ro 'g Type: RMS Hold⊘5/5	11:50:05 TF	9 a.m. Feb 17, 2021 84CE 1 2 3 4 5 6 TYPE A A WWWW DET P A N N N N	س Dis	∟ ⊪ play Line	atyzer - Swept SA 50 Ω AC C -57.00 dBm Offset 11.25 dB f -17.00 dBm	PNO: Fast IFGain:High	SENSE:INT Trig: Free Ru #Atten: 0 dB	un A	AUTO Avg Type: RMS Avg Hold>100/10	0	12:01:13 p.m. Feb TRACE [1] 2 TYPE A & DET P A	17,2021 3456 WWWW
-17.0								-27.0									
-27.0								-37.1									
-37.0								-47.0								-5	57.00 dBm
-57.0							-57.00 dBm	-67.1									
-67.0								-77.1								alge, surplus at sold two	,
-87.0	arteet tillans van åtters skullende, hønd forsalse	er rilener in einer siehendener	المرافع الأرمين والمراجع	المعادية والمعادية والمعادية	فعمار وهاتطان ورغ بالمعقري	a belgan ngalataka kekalika kekal	والمترافع والمراجع	-97,1									
-97.0 Arrest	ing the product of the second of the second of the	a hila ka hila sa ka	ana na ana barana	ada yan yan kashiri kash	(and all definition of the second sec		- to A toolants	-10	7								
	kHz N 100 kHz e <screen_0068.png> sa</screen_0068.png>		300 kHz	ST/	Swee	ep 96.00 ms	1.0000 GHz (40001 pts)	#R	urt 1.0000 G es BW 1.0 I File <scre< td=""><td></td><td></td><td>W 3.0 MHz</td><td></td><td>STATUS</td><td>Sweep 2</td><td>Stop 2.0000 .667 ms (4000</td><td></td></scre<>			W 3.0 MHz		STATUS	Sweep 2	Stop 2.0000 .667 ms (4000	

161.9 MHz Transmitter Standby (Transmitter RF Output Port)											
Emission Frequency (MHz) Level (nW) Level (dBm)											
~ ~ ~											
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB											
No emissions were detected within 20 dB of Limit.											

								161	.9 N	1H	lz									
Aglent Spectrum Analyzer JU RF Display Line -57.0 Ref Offse 10 dB/div Ref -7.0	0 9 ADC CORREC 0 dBm	PNO: Fast	SENSE:INT Trig: Free #Atten: 0 d	Run	MAUTO #Avg Type: Avg Hold>4	RMS 5/5	11:50:46 Ti	3 a.m. Feb 17, 2021 840E 1 2 3 4 5 6 TYPE A A WWWW DET P A N N N N	D	L	ay Line	alyzer - Swept 50 Ω / -57.00 dB	dB	PNO: Fast ⊂ IFGain:High	SENSE:INT Trig: Fre #Atten: 0	e Run	ALIGNAUTO #Avg Type Avg Hold>	: RMS •100/100	12:01:3 1	5p.m. Feb 17, 20 RACE 1 2 3 4 5 TYPE A & WWW DET P A N N N
Log										۳										
-17.0									-2	7.0										
27.0									-3	7.0										
37.0									-4	7.0										
47.0									-6	7.0										-57.00 c
57.0								-57.00 dBm	-6	7.0				_		_	_			
57.0									-7	7.0										
7.0									-8	7.0					-					لايب دروه مديدوم
17.0										7.0										
97.0 Hito za sidebatan kata 97.0	alah sa	in som statister Statistick	i si ing kang pangangang	n den sternen formen I den sternen formen	odi wala bita mpirina pina	ar la da fadra dia Alti ponyang dan	an na sail galitika perinten kappan	a de señal como palación la desenación de la como palación de la como palación de la como palación de la como p		107										
Start 9 kHz #Res BW 100 kHz		#VB	W 300 kHz			Sweep		1.0000 GHz (40001 pts)			1.0000 G BW 1.0 I			#V	BW 3.0 MH	z		Sweer	Stop 2.667 ms	2.0000 GH (40001 pt
ısa 🧼File <screen_00< td=""><td>69.png> saved</td><td></td><td></td><td></td><td>STATUS 🚹</td><td>DC Coupled</td><td></td><td></td><td>MS</td><td>G 🌲</td><td>File <scre< td=""><td>en_0077.png</td><td>j> saved</td><td></td><td></td><td></td><td>STATUS</td><td>· · ·</td><td></td><td>•</td></scre<></td></screen_00<>	69.png> saved				STATUS 🚹	DC Coupled			MS	G 🌲	File <scre< td=""><td>en_0077.png</td><td>j> saved</td><td></td><td></td><td></td><td>STATUS</td><td>· · ·</td><td></td><td>•</td></scre<>	en_0077.png	j> saved				STATUS	· · ·		•

Transmitter Standby Spurious Emissions (Conducted) - Continued

162.1 MHz Transmitter Standby (Transmitter RF Output Port)										
Emission Frequency (MHz)	Level (nW)	Level (dBm)								
~ ~ ~										
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB										
No emissions were detected within 20 dB of Limit.										

									162.	1 MI	Ηz								
uxi⊥ Display Li 10 dB/div	m Analyzer - Swept S RF 50 Ω ▲ 00 ine -57.00 dBr Ref Offset 10.53 c Ref -7.00 dBm	: <u>correc</u> n #B	PNO: Fast Gain:Low	SENSE:INT Trig: Free #Atten: 0 d	Run	IGNAUTO #Avg Type: Avg Hold>8	RMS 5/5	<u>11:51:17</u> Ті	7 a.m. Feb 17, 2021 RACE 1 2 3 4 5 6 TYPE A & WWWW DET P A N N N N	Di:	splay Lin	Analyzer - Swept SA RF 50 Ω AC I Ie -57.00 dBm Ref Offset 11.25 dB Ref -17.00 dBm	PNO: IFGain	SENSE:INT ast Trig: High #Atte	Free Run n: 0 dB	ALIGNAUTO #Avg Type Avg Hold>	: RMS 100/100	12:04:0 T	4p.m. Feb 17, 2021 RACE 1 2 3 4 5 6 TYPE A & WWWW DET P A N N N N
-17.0										-27	0								
-27.0										-37 -47	0								-57.00 dBm
-57.0									-57.00 dBm	-57	0								
-67.0										-77	0	****			*****			an an tao an tao an tao an tao	
-87.0 -97.0 944 avrill a	i a sear din nakati ng terkong ki dyang ki ng pada a pang pang ki kang pang pang ng pada a pang pang pang pang pang pang pang p	and an	unan ain bendeles bib All hen fister en felseter	n di den stal di di di di di di di se si se s Se si se	asterioriganishi at sportures (S)	a ana kara arang di Kabuta (PA-2 jang Talang di Birta)	annalise maijia. Marija	in and search statistics processing planter spring	an a fina gan an an an fina an An fina gan an an an fina an	-97									
Start 9 kHz #Res BW 1		> saved	#VB	W 300 kHz	1	STATUS 🦺	Sweep		1.0000 GHz (40001 pts)		art 1.0000 es BW 1.			#VBW 3.0	WHz	STATUS	Sweep	Stop : 2.667 ms	2.0000 GHz (40001 pts)

Transmitter Standby Spurious Emissions (Conducted) - Continued

FCC ID: CASTBDB1G IC : 737A-TBDB1G Page 125 of 129

173.3 MHz Transmitter Standby (Transmitter RF Output Port)											
Emission Frequency (MHz)	Level (nW)	Level (dBm)									
~ ~ ~											
Measurement Uncertainty ≤12.75 GHz ± 3.0 dB											
No emissions were detected within 20 dB of Limit.											

								173.	3 MH	łz									
Display Lin	n Analyzer - Swept SA	PNO: Fast IFGain:Low	SENSE:INT Trig: Free #Atten: 0 d	Run	.IGNAUTO #Avg Type: F Avg Hold≫5#	IMS 5	11:51:40 TF	0 a.m. Feb 17, 2021 RACE 1 2 3 4 5 6 TYPE A A WANNY DET P A N N N N	w Dis	play Line	nalyzer - Swept SA 5 2 2 AC -57.00 dBm f Offset 11.25 dl ef -17.00 dBm	CORREC n PN IFG:	0: Fast 😱 ain:High	vse∷nv⊺ Trig: Free Ri #Atten: 0 dB	un	IGNAUTO #Avg Type: Avg Hold>*	RMS 100/100	12:04:42 TF	Ip.m. Feb 17, 202: AACE 1 2 3 4 5 6 TYPE A ★₩₩₩₩₩ DET P A N N N N
-17.0									-27.0	' <u> </u>									
-27.0									-37.1 -47.1										
-47.0								-57.00 dBm	-57.1										-57.00 dBn
-67.0									-77.)										
-77.0	المراجع والمراجع و		an an an air de la dal an air an an an air an ai	alidaden (Joineden), a	المعرفة والمعرفة المع	there is the state of the second	here and a participant dataset	ine Lan was black to black	-87.1		4994 1994 1994 1994 1994 1994 1994 1994								
-97.0 447-47-6 7	nerigi ki tarten konstanten ja kande Manufi kitar ar di nata dan ja k	and a many set of a set of the party of the	an a	d dag til for and an oppræde	and the second second second	and a state of the second s		1	-10										
Start 9 kHz #Res BW 10	DO kHz creen_0071.png> save		SW 300 kHz		STATUS 🦺 D	•		1.0000 GHz (40001 pts)		es BW 1.0			#VBW	3.0 MHz		STATUS	Sweep		2.0000 GHz (40001 pts)

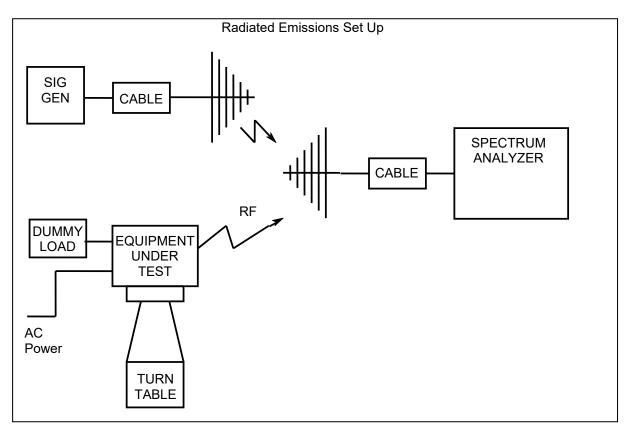
TEST EQUIPMENT LIST

Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
AC Voltmeter		Tait		1		21-May-21
Antenna	Reference Dipoles	Emco	3121C DB1	9510-1164	E3559	14-May-22
Antenna	18GHz DRG	Emco	DRG3115	9512-4638	E3560	3-Sep-20
Antenna	Log Periodic	Schwarzbeck	VUSLP	9111-219	E4617	
Antenna	Reverb - 1- 18GHz DRG	Schwarzbeck	BBHA 9120 D	9120D-885	E4857	
Antenna	Reverb - 1- 18GHz DRG	Schwarzbeck	BBHA 9120 D	9120D-884	E4858	
Audio Analyser	TREVA1	Hewlett Packard	HP8903A	2437A04625	E4986	25-Sep-21
Coax Cable	OATS Turntable Cable 1	Intelcom	RG214	OATS1	E4621	2-Nov-21
Coax Cable	OATS Tower Cable	Intelcom	RG214	OATS2	E4622	2-Nov-21
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack2	E4623	30-Oct-21
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack3	E4624	30-Oct-21
Coax Cable	Reverb - 4.5m Multiflex 141	TeltestBlue6	MF 141	TeltestBlue6	E4843	30-Oct-21
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue5	MF 141	TeltestBlue5	E4844	30-Oct-21
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue4	MF 141	TeltestBlue4	E4845	30-Oct-21
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue3	MF 141	TeltestBlue3	E4846	30-Oct-21
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue2	MF 141	TeltestBlue2	E4847	30-Oct-21
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue1	MF 141	TeltestBlue1	E4848	30-Oct-21
Coax Cable	OATS Turntable Cable 2	Intelcom	RG215	OATS3	E4995	2-Nov-21
Coax Cable	3m Blue	Suhner	Sucoflex 126EA	503429/126EA	E5015	30-Oct-21
Coax Cable	Conducted Disturbance Cable	Tait	RG223/U	EMC1	E5026	3-Nov-21
Coax Cable	1.5m Blue	Suhner	Sucoflex 126EA	502868/126EA	E5028	3-Feb-22
Environ. Chamber	Upright	Contherm	5400 RHSLT.M	1416	E4051	10-Jul-21
Filter High Pass/ Notch	135 to 175MHz	Tait		N/A	E3382	8-Jun-21
Modulation Analyser	TREVA1	Hewlett Packard	HP8901B (Opt 002)	2441A00393	E3073	28-Sep-21
Modulation Analyser	Includes Audio Analyser	Rohde & Schwarz	FMA0852.8500.52	842541/001	E3554	25-Mar-21
Multimeter		Fluke	77	35069359	E3237	28-Sep-21
OATS	Controller	Electrometrics	EM-4700	119	E4445	
OATS	Turntable	Electrometrics	EM-4704A	105	E4446	
OATS	Antenna Tower	Electrometrics	EM-4720-2	112	E4447	+

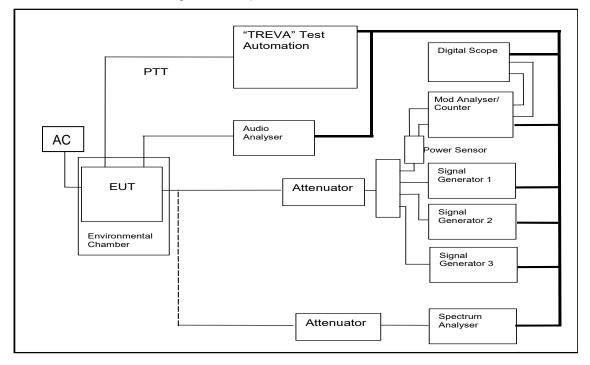
Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
OATS	NSA	Tait				18-Jun-20
Oscilloscope	400MHz	Tektronics	TDS380	B017095	E3782	28-Sep-21
Power Meter	TREVA1 Power Head for HP8901	Hewlett Packard	HP11722A	3111A05573	E7054	28-Sep-21
Power Supply	AC Variac	Yamabishi	S-260-5	TX-533	E1737	
Power Supply		Rohde & Schwarz	NGS M32/10 192.0810.31	Fnr 434	E3556	28-May-21
RF Amplifier	+21.7 dB 1GHz	Tait	ZFL-1000LN	E3660	E3360	31-Jul-21
RF Amplifier	Pre-amplifier	Agilent	87405C	MY47010688	E4941	8-Oct-21
RF Attenuator	30+3dB 350W	Weinschel	67-30-33 & BW- N3W5+	CK9178	E5023	30-Oct-21
RF Attenuator	10dB 50W	Weinschel	24-10-34	BC3293	E4364	30-Oct-21
RF Attenuator	3dB 0.5W	Weinschel	Model 1	CH6863	E5013	2-Nov-21
RF Combiner	TREVA1	Minicircuits	ZFSC-4-1	-	E4083	
RF Load	150W	Bird	8166	524	E3625	30-Oct-21
Signal Generator	Analog 4GHz	Agilent	E4422B	GB40050320	E3788	26-Sep-21
Signal Generator	Digital 3GHz	Agilent	E4438C	MY45093154	E4600	1-Oct-22
Signal Generator	Digital 4GHz	Agilent	E4437B	US39260389	E4764	9-Oct-21
Spectrum Analyser	26.5GHz	Agilent	PXA N9030A	MY49432161	E4907	3-Oct-22
Temp & Humidity datalogger		Hobo	U21-011	10134276	E4981	7-Jul-21
Transient Limiter	9kHz to 200MHz	Agilent	11947A	3107A03657	E4982	2-Oct-21
TREVA 1		Teltest	-	1	-	2-Jun-21
Testware	Conducted Emissions		March 2018	-	-	
Testware	Frequency Vs Temperature		April 2018	-	-	
Testware	Radiated Emissions		April 2018	-	-	
Testware	Reverb Emissions		May 2019	-	-	
Testware	Sideband Spectrum		February 2017	-	-	
Testware	S-Line Radiated Emissions		April 2018	-	-	
Testware	TREVA		29/01/2020	-	-	
Testware	Spec An Correction Loader		June 2019	-	-	

NOTE: Items without calibration dates are calibrated immediately before use, or set using calibrated instruments

ANNEX A – TEST SETUP DETAILS



All other testing is performed using the Teltest Radio EVAluation system (TREVA), which is configured as shown below. The Spectrum Analyser is connected to the EUT via the attenuator network for Conducted Emissions testing, and Occupied Bandwidth.



END OF REPORT