

Report No. 372833-2

Test Report

Product	Handheld Wireless Microphone
Name and address of the applicant	Panasonic Corporation of North America Two Riverfront Plaza, 9 th Floor Newark, NJ 07102-5490, USA
Name and address of the manufacturer	Same as above
Model	WX-ST200P
Rating	1.2V _{DC} (1x NiMH Secondary Battery)
Trademark	Panasonic
Serial number	/
Additional information	DECT 6.0
Tested according to	FCC Part 15, subpart D Isochronous UPCS Device, 1920 – 1930 MHz Industry Canada RSS 213, Issue 3 2 GHz License-Exempt Personal Communications Services (LE-PCS) Devices
Order number	372833
Tested in period	2019-04-10 to 2019-05-21
Issue date	2019-05-28
Name and address of the testing laboratory	Institutiveien 6 CAB Number: Kjeller, Norway TEL: +47 22 96 03 30 TEL: +47 22 96 05 50 Compared to the compared tot the compared to the compared tot the compa
	Fract Svorce G. Subathabur. Prepared by [Frode Sveinsen] Approved by [G.Suhanthakumar] accept in full without the written approval of Nemko. Opinions and interpretations expressed within this iditation. This report was originally distributed electronically with digital signatures. For more information

Template version: D



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1 INFORMATION

1.1 Tested Item

Name	Panasonic
Model name	WX-ST200P
FCC ID	ACJ9TAWX-ST200P
ISED ID	216A-WXST200P
Serial number	/
Hardware identity and/or version	ES2
Software identity and/or version	V1.01R99
Tested to IC Radio Standard (RSS)	RSS-213 Issue 3, RSS-GEN Issue 5
Test Site IC Reg. Number	IC 2040D-1
Frequency Range	1921.536 – 1928.448 MHz
Number of Channels	5 RF Channels, 5x12 = 60 TDMA Duplex Channels
Type of Modulation	Digital (Gaussian Frequency Shift Keying)
Conducted Output Power	95 mW (Peak)
Antenna Connector	None (Integral Antennas)
Number of Antennas	2
Antenna Diversity	Yes
Desktop Charger	WX-SZ200P
Power Supply	Secondary Battery (1x AA NiMH cell)
Interfaces	None

1.2 Description of Tested Device

The EUT is a DECT Handset and is an initiating device as described in ANSI C63.17 and is designed to operate together with a DECT Base Station, which is the responding device.



1.3 Test Conditions

Temperature:	20 – 23 °C
Relative humidity:	30 – 50 %
Normal test voltage:	1.2 V_{DC} (Nominal Battery Voltage)

The values are the limit registered during the test period. All tests were performed with a fully charged battery.

1.4 Test Engineer(s)

Frode Sveinsen

1.5 Digital Modulation Techniques

The EUT uses Multi Carrier / Time Division Multiple Access / Time Division Duplex and Digital GFSK modulation. For further details see the operational description provided by the applicant.

Requirement, FCC 15.319(b), RSS-213 Issue 3, clause 5.1:

All transmissions must use only digital modulation techniques.

1.6 Labeling Requirements

See separate documents showing the label design and the placement of the label on the EUT.

Requirements FCC 15.19

The FCC Identifier shall be displayed on the label, and the device(s) shall bear the following statement in a conspicuous location on the device or in the user manual if the device is too small:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label itself shall be of a permanent type, not a paper label, and shall last the lifetime of the equipment.

1.7 Antenna Requirement

Does the EUT have detachable antenna(s)?		⊠ NO	
If detachable, is the antenna connector(s) non-standard?			
The tested EUT have only integral antennas. Conducted tests were performed on a sample with a temporary antenna connector.			

Requirement: FCC 15.203, 15.204, 15.317, RSS-GEN Issue 5, clause 6.8



1.8 Channel Frequencies

UPCS CHANNEL	FREQUENCY (MHz)
Upper Band Edge	1930.000
0 (Highest)	1928.448
1	1926.720
2	1924.992
3	1923.264
4 (Lowest)	1921.536
Lower Band Edge	1920.000

Requirement: FCC 15.303, RSS-213 Issue 3, clause 5.1:

Within 1920 -1930 MHz band for isochronous devices.

1.9 Other Comments

The Monitoring and Time and Spectrum Window Access tests were performed with Test Set-Up 6 (Ref. clause 5). A clock signal from the companion device was used to synchronize the Pulse Pattern Generator and the Spectrum Analyzer to the start of the DECT time window. The EUT was limited by administrative commands to operate on only two frequency carriers. For the tests where the EUT was required to operate on only one frequency carrier, one carrier was blocked by applying a CW interfering signal from RF Generator 3. The Pulse Pattern Generator was used to apply time synchronized interference to time windows where this was required.

Since the EUT was programmed to operate on only two RF carriers, it was only necessary with two RF generators for the monitoring tests, however a third generator was applied for the tests that required specific time slots to be blocked.

This EUT supports Least Interfered Channel procedure (LIC), the Monitoring and Time and Spectrum Window Access tests were conducted as specified for EUTs that support LIC procedure.

All tests except Power-Line Conducted Emissions were performed in conducted mode with a temporary antenna connector.



2 TEST REPORT SUMMARY

2.1 General

All measurements are traceable to national standards.

The tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC CFR47 Part 15D for Isochronous UPCS Devices and ISED Canada RSS-213 Issue 3 / RSS-GEN Issue 5 / RSP-100 Issue 11.

All tests were conducted is accordance with ANSI C63.4-2014 and ANSI C63.17-2013.

☑ New Submission

Production Unit

□ Class II Permissive Change

Pre-production Unit

PUF Equipment Code

□ Family Listing



THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

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2.2 Test Summary

Name of test	FCC CFR 47 Paragraph #	ISED Canada RSS-213 Paragraph #	Verdict
Power Line Conducted Emission	15.107(a) 15.207(a)	5.4 RSS-GEN 7.2 / 8.8	Complies
Digital Modulation Techniques	15.319(b)	5.1	Complies
Labeling requirements	15.19(a)(3)	RSP-100 3.1	Complies
Antenna Requirement	15.317, 15.203	RSS-GEN 6.8	Complies
Channel Frequencies	15.303	5.1	Complies
Automatic discontinuation of transmission	15.319(f)	5.2	Complies
Emission Bandwidth	15.323(a)	5.5	Complies
Occupied Bandwidth	N/A	RSS-GEN 6.7	Complies
In-band emissions	15.323(d)	5.8.2	Complies
Out-of-band emissions	15.323(d)	5.8.1	Complies
Peak Transmit Power and Antenna Gain	15.319(c)(e), 15.31(e)	5.6 RSS-GEN 8.3	Complies
Power Spectral Density	15.319(d)	5.7	Complies
Carrier frequency stability	15.323(f)	5.3	Complies
Frame repetition stability	15.323(e)	5.2 (13)	Complies
Frame period and jitter	15.323(e)	5.2 (13)	Complies
Monitoring threshold, Least interfered channel	15.323(c)(2)(5)(9)	5.2 (2)(5)(9)	Complies
Monitoring of intended transmit window and maximum reaction time	15.323(c)(1)	5.2 (1)	Complies
Threshold monitoring bandwidth	15.323(c)(7)	5.2 (7)	Complies
Reaction time and monitoring interval	15.323(c)(1)(5)(7)	5.2 (1)(5)(7)	Complies
Access criteria test interval	15.323(c)(4)(6)	5.2 (4)(6)	N/A ¹
Access Criteria functional test	15.323(c)(4)(6)	5.2 (4)(6)	N/A ¹
Acknowledgements	15.323(c)(4)	5.2 (4)	Complies
Transmission duration	15.323(c)(3)	5.2 (3)	Complies
Dual access criteria	15.323(c)(10)	5.2 (10)	Complies
Alterative monitoring interval	15.323(c)(11)(12)	5.2 (11)(12)	N/A ²
Spurious Emissions (Radiated)	15.319(g) 15.109(a) 15.209(a)	RSS-GEN 7.3 / 8.9	N/A ³

¹ Only applies for equipment that transmits unacknowledged control and signaling information

² The client declares that the tested equipment does not implement this provision

³ Not required if the Conducted Out-of-Band Emissions test is Passed



3 TEST RESULTS

3.1 Power Line Conducted Emissions

FCC Part 15.207

ISED RSS-213 Issue 3, Clause 6.3; RSS-GEN Issue 5, Clause 7.2 / 8.8

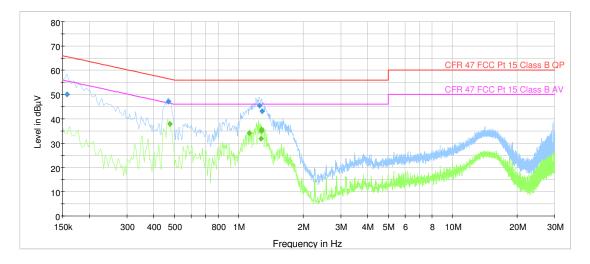
Measurement procedure:	ANSI C63.4-2014 using 50 $\mu\text{H}/\text{50}$ ohms LISN
Test Results:	Complies
Measurement Data:	See attached plots

Highest measured value (L1 and N):

Microphone charging in charger WX-SZ200P, 120V 60Hz:

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter
0.158	50.13		65.57	15.44	1000	9	L1	OFF
0.468	47.20		56.55	9.35	1000	9	L1	OFF
0.476		37.83	46.41	8.58	1000	9	L1	OFF
1.120		34.09	46.00	11.91	1000	9	N	OFF
1.252	45.45		56.00	10.55	1000	9	N	OFF
1.268		31.76	46.00	14.24	1000	9	N	OFF
1.276		35.69	46.00	10.31	1000	9	N	OFF
1.280		34.93	46.00	11.07	1000	9	N	OFF
1.288	43.13	-	56.00	12.87	1000	9	L1	OFF

Microphone charging in charger WX-SZ200P, 120V 60Hz:





3.2 Automatic Discontinuation of Transmission

Does the EUT transmit Contro	⊠ YES		
TYPE OF EUT :			

The following tests simulate the reaction of the EUT in case of either absence of information to transmit or operational failure after a connection with the companion device is established.

Number	Test	EUT Reaction	Verdict
1	Power removed from EUT	С	Pass
2	Switch Off EUT	С	Pass
3	Hook-On by EUT	N/A	Pass
4	Power Removed from Companion Device	Α	Pass
5	Switch Off Companion Device	N/A	Pass
6	Hook-On by Companion Device	N/A	Pass

A - Connection breakdown, Cease of all transmissions

B - Connection breakdown, EUT transmits control and signaling information

C - Connection breakdown, Companion Device transmits control and signaling information

N/A - Not Applicable (Companion Device have no On/Off switch. Hook-On is not supported by either device)

Requirements, FCC 15.319(f), RSS-213 Issue 3, Clause 5.2:

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude transmission of control and signaling information or use of repetitive codes used by certain digital technologies to complete frame or burst intervals.



3.3 Peak Power Output

Test Method:

ANSI C63.17, clause 6.1.2.

Test Results: Complies

Measurement Data:

Maximum Conducted Output Power

Channel No.	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Maximum Antenna Gain (dBi)	Maximum Radiated Output Power (dBm)
4	1921.536	19.64	2.79*	22.43
2	1924.992	19.74	2.79*	22.53
0	1928.448	19.77	2.79*	22.56

*Antenna Gain is value declared by manufacturer

Limit:

Conducted: 100 µW x SQRT(<i>B</i>)	where B is the measured Emission Bandwidth in Hz
FCC 15.319(c)(e):	20.72 dBm (118 mW)
ISED RSS-213, Issue 3:	20.47 dBm (111 mW)

The antenna gain is below 3 dBi, no reduction in transmit power is necessary.

Requirements,

FCC 15.319(c)(e):

Peak transmit power shall not exceed 100 microwatts multiplied by the square root of the emission bandwidth in Hertz.

RSS-213 Issue 3, clause 5.6:

Peak transmit power shall not exceed 100 microwatts multiplied by the square root of the occupied bandwidth in Hertz.

FCC 15.319(c)(e); RSS-213 Issue 3, clause 5.6:

The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.



Conducted Peak Output Power

MultiView 📑 S	pectrum 🗙	Spectrum 2	×					
	m Offset 10.40 dB 🖷							
Att 29 d TRG:RFP(8GHz)	B e SWT 500 µs	VBW 10 MHz						
1 Zero Span								●1Pk Max
							M1[1	r
20 dBm								12.000 µs
20 dBm				-			· · · · · · · · · · · · · · · · · · ·	
10 dBm								
0 dBm								
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allymania							h	mandeloughter
-40 dBm								
-50 dBm								
30 dbm								
-60 dBm								
CF 1.921536 GHz			1001	pts	1			50.0 μs/
~					~	Measuring		10.04.2019 12:58:54

Lower Channel

M1 M1[1] 19.77 dBm 20 dBm 10 dBm -10	MultiView 📑	Spectrum	× sp	ectrum 2	×				•
O 1Pk Max LZero Span M1[1] 19.77 dBm 20 dBm M1 19.77 dBm 8.000 µs 10 dBm M1 10									
OIPk Max M1 M1 M1 M1 M1 19.77 dBm 8.000 µs 20 dBm 0		29 dB 👄 SWT	500 µs 🛛 V	BW 10 MHz					
M1 M1 20 dBm M1 10 dBm M1 0 dBm M1 10 dBm M1 20 dBm M1 20 dBm M1 30 dBm M1 M1 M1 30 dBm M1 M1	1 Zero Span			_				_	o1Pk Max
20 dBm I								M1[1	
20 dBm									8.000 µs
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D dBm Image: Constraint of the second of t									
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-10 dBm									
-20 dBm	0 dBm								
-20 dBm									
-30 dBm	-10 dBm								
-30 dBm									
-30 dBm	-20 dBm								
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www.www.how	-20 d9m								
									nt a contra contra have
40 dBm									and also is been to bett
	-40 dBm								
-50 dBm	-50 dBm				1	<u> </u>			
-60 dBm	-60 dBm						 		
CF 1.928448 GHz 50.0 μs/	CF 1.928448 GH	-			1001	nto			50.0.00/
→ 1.928448 GH2 1001 Pts 50.0 µs/ ✓ Measuring ▲ ● ● 10.04.2019 12:58:20					1001	. pts	Monguring	EXT	10.04.2019

Upper Channel



	Spectru	Spectrum 2 RBW 3 MHz	×				
Att TRG:RFP(8GH	29 dB 🖷 SW Hz)	VBW 10 MHz					
l Zero Span				1	1	1	●1Pk Max
	M1					M1[1] 19.74 dB 8.500 µ
20 dBm							
10 dBm							
D dBm	_						
-10 dBm							
-20 dBm							
-30 dBm		 					
shippontantiput	un					4	warnerman
-40 dBm							
-50 dBm							
-60 dBm							
	TRG						
CF 1.924992	? GHz		100	1 pts			50.0 µs

Middle Channel



3.4 Emission Bandwidth *B*

Test Method:

ANSI C63.17, clause 6.1.3.

Test Results: Complies

Measurement Data:

Channel No.	Frequency (MHz)	Emission Bandwidth <i>B</i> (MHz)
4	1921.536	1.40
0	1928.448	1.39

Channel No.	Frequency (MHz)	Occupied Bandwidth (MHz)
2	1924.992	1.24

Requirements, FCC 15.323(a), RSS-213 Issue 3, clause 5.5:

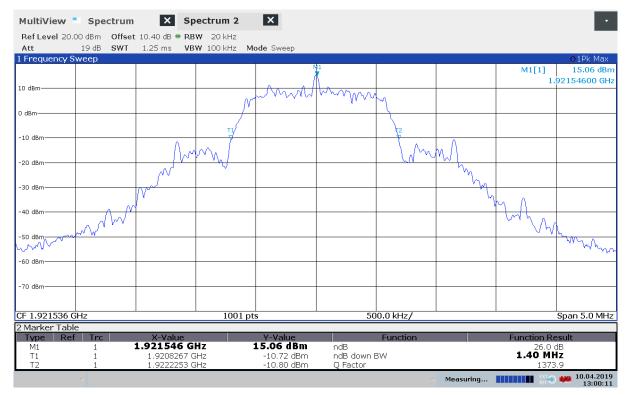
The Emission Bandwidth *B* shall be larger than 50 kHz and less than 2.5 MHz.

No requirements for 6 and 12 dB Bandwidth, these values are only used for testing Monitoring Bandwidth if the Simple Compliance test fails (ANSI C63.17, clause 7.4).

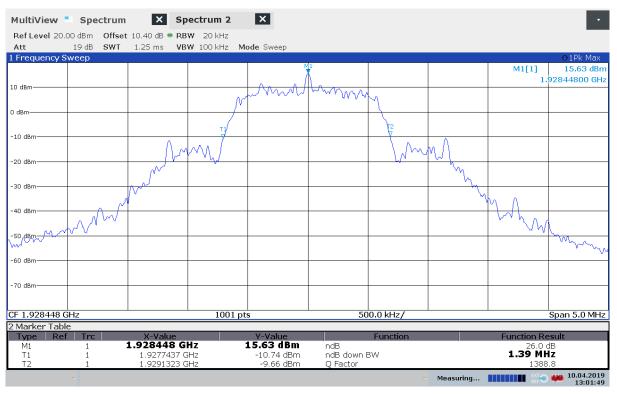
RSS-GEN Issue 5, clause 6.7:

Occupied Bandwidth (99%) is measured according to RSS-GEN Issue 5, clause 6.7. No requirement specified.

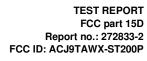




Emission Bandwidth B, Lower Channel



Emission Bandwidth B, Upper Channel





MultiView	v = Spec	ctrum	×	Spec	ctrum 2	×						•
Ref Level 3	20.00 dBm	Offset	10.40 dB 🖷	RBW	30 kHz							
Att	19 dB		1.04 ms	VBW	100 kHz	Mode Swe	еер					
1 Occupied	Bandwidth											●1Pk Max
							7	1			M1[1]	17.64 dBm
10 40-1						Ann.		have			1.	92499200 GHz
10 dBm						~ ~ ~						
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0 dBm					1							
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-10 dBm		\cap	~								\wedge	
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-20 dBm											- Mar	
	5											
-30 dBm	Λ^{\sim}										5	
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-40 dBm												
r*												
-50 dBm												
-60 dBm												
-70 dBm												
-70 uBm-												
CF 1.92499	2 GHz				1001	pts		36	0.0 kHz/			Span 3.6 MHz
2 Marker Ta	able											
	Ref Trc		X-Valu			Y-Va			Function		Function Re	
M1	1		1.92499			17.64		Occ Bw	- 6		1.2413400	
T1 T2	1		1.924370 1.925611				) dBm 3 dBm	Occ Bw Cer Occ Bw Fre			1.9249 -950.4893	9105 GHz 32914 Hz
	1		1.525011			1.00		000 DW 110				10.04.2019
										Measuring		13:05:02

99% Bandwidth, Middle Channel



# 3.5 **Power Spectral Density**

#### **Test Method:**

ANSI C63.17, clause 6.1.5.

#### **Test Results: Complies**

#### Measurement Data:

Channel No.	Frequency (MHz)	Power Spectral Density (dBm)
4	1921.536	-1.7
0	1928.448	-1.4

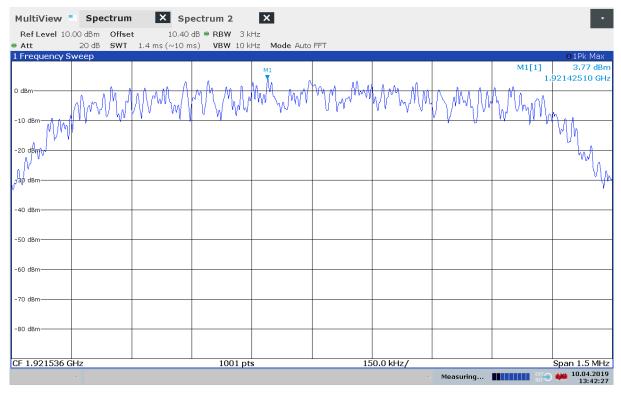
Averaged over 1000 sweeps.

#### Requirements, FCC 15.319(d), RSS-213 Issue 3, clause 5.7

The Power Spectral Density shall be less than 3 mW (4.77 dBm) when averaged over at least 100 sweeps.



#### Lower Channel:



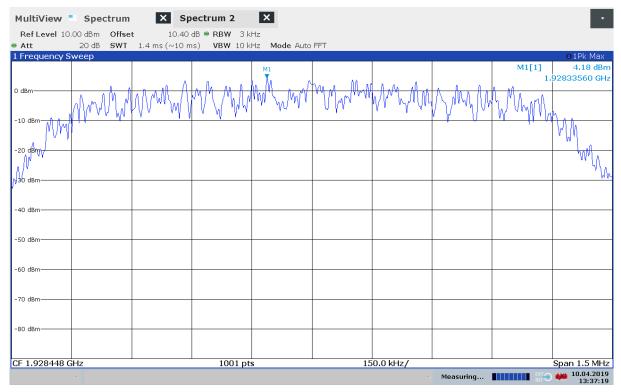
#### **PSD Overview**

RG:VID Time Domain Power								o1Sa Avg
dBm		M1					M1[]	l] 2.64 dB 378.000
0 dBm								
0 dBm	Bm							
0 dBm						$\swarrow$		
0 dBm								
0 dBm								
0 dBm								
0 dBm								
0 dBm					5	2		
- 1.9214251 GHz			100	1 pts				100.0 µ

#### PSD Averaged, 1000 Sweeps



#### **Upper Channel:**



#### **PSD Overview**

3:VID ime Domain Power							●1Sa Avg
	M1					M1[]	
dBm							
dBm							
dBm							
dBm							
dBm							
dBm							
dBm							
dBm				S	2		
		100	l pts				100.0 µs

#### PSD Averaged, 1000 Sweeps



# 3.6 In-Band Unwanted Emissions, Conducted

#### **Test Method:**

ANSI C63.17, clause 6.1.6.1.

**Test Results: Complies** 

#### Measurement Data:

See plots.

#### Requirements, FCC 15.323(d), RSS-213 Issue 3, clause 5.8.2:

$B < f \le 2B$ :	at least 30 dB below max. permitted peak power
2 <i>B &lt; f</i> ≤ 3 <i>B</i> :	at least 50 dB below max. permitted peak power
3 <i>B</i> < <i>f</i> ≤ UPCS I	Band Edge : at least 60 dB below max. permitted peak power

MultiView	Spe	ctrum	×	Sp	ectrum 2		×							
Ref Level 20	).40 dBm	Offset	10.40 dB	s 🖷 RB	W 30 kHz									
Att		SWT	1.12 ms	S VB	<b>W</b> 100 kHz	Mode	Sweep							
1 Frequency														O1Pk Max
Limit Ch						PASS		1					M1[1]	17.66 dBm
Line US	DECT IN-	BAND				PASS		A						.92499200 GHz
10 dBm							have	have	-				M2[1]	-9.52 dBm
							ſ	1 1						.92383300 GHz
0 dBm														
o ubiii						M2			Ma					
-10 dBm			_			M2			T					
10 0011						Imm	1	1 I.A	ι.Λ					
						(mars	4	V	10					
-20 dBm					1		V		-	<u></u>				
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-30 dBm	+ $-$				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				_	٩				
										λ. Λ				
US DECT IN-BAND														
-40 dBm-					0.0					- N. N.				
				<i>ک</i> م	VV					V V	4			
-50 dBm ონდეძBm-ალიარი			~	NAM					-		mr.			
			and we want								- %	man		Marine Marine
-60 dBmp Am	Amm	www											montine	monoman
When drawn 4. 4.	ľ													
-70 dBm									+					
05 1 00 1000					100									
CF 1.924992					100	. pt <b>s</b>			1.0 1	MHz/				Span 10.0 MHz
2 Marker Tab		_												
Type Re	ef Trc		X-Va 92499		17		/-Value 66 dBm		E	unction			Function F	Result
M1 M2	1		.92383				52 dBm							
M3	1		.92614				80 dBm							
	-										_		_CVT	10.04.2010
											Measu	iring	REF	## 10.04.2019 13:06:36

In-Band Emissions, Middle Channel



MultiView	Spe	ctrum	×	Sp	ectrum 2		×					-
Ref Level 20.	40 dBm	Offset	10.40 dE	B 🖷 RB	W 30 kHz							
Att	20 dB	SWT	1.12 m	s VB	<b>W</b> 100 kHz	Mod	de Sweep					
1 Frequency S												●1Pk Max
Limit Che						PAS PAS		1			M1[1]	17.61 dBm
Line US E	JECT IN-I	BAIND				PAS	S Ama	L			1.	92153600 GHz
10 dBm							all	- march			M2[1]	-9.60 dBm
							ſ	1			1.	92037700 GHz
0 dBm												
						M2			M3			
-10 dBm						AL.	Л. Г.	A.				
						Im	*\{{	Υ V	ν)			
-20 dBm						/	v		<u> </u>			
									4			
-30 dBm					ľ				4 0			
US DECT IN-BAND									MA			
				-M	N				, M	h		
-50 dBm			mm	wa						Maria	many	
60. dBmAnn	mm	mm									monto	monna
V- 2001 1												~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
-70 dBm												
-70 uBm												
CF 1.921536 (	ĠHz				100	1 pts		1	.0 MHz/	1	S	pan 10.0 MHz
2 Marker Tab	le											
Type Re	f Trc		X-Va		_		Y-Value		Function		Function Re	sult
M1	1		.9215				7.61 dBm 9.60 dBm					
M2 M3	1	1	.9203	77 GF 84 GF	12		8.91 dBm					
mo	~	-	15220	u t					~	Measuring	EXT REF	10.04.2019
											KEF C	13:07:20

#### In-Band Emissions, Lower Channel

MultiView	= Spe	ctrum	×	Spe	ctrum 2	×						•
Ref Level 20	.40 dBm	Offset	10.40 dB	RBW	30 kHz							
Att	20 dB	SWT	1.12 ms	VBW	100 kHz	Mode Sweep						
1 Frequency												•1Pk Max
Limit Ch						PASS PASS	7				M1[1]	17.80 dBm
Line US I	DECT IN-	BAND					myna				1.	92844800 GHz
10 dBm						al a	the with				M2[1]	-9.66 dBm
											1.	92728900 GHz
0 dBm												
						M2		мз				
-10 dBm						X						
						[mm]		1 m				
-20 dBm						) •						
					- (							
-30 dBm					N			Y				
-30 ubm								20	0			
US DECT IN-BAND					A							
				0	ſ				- MA			
				a north and	v					١.		
-50 dBm			Non a A							m.		mandana
	A A	And	www.v~							mon	Man Maria	
₳₲₯₫₿₥ <mark>∿₀₼₽</mark> ᡘ	moura										no co hombe	marchange
-50 dBm												
-70 dBm												
CF 1.928448	ĠHz				1001	pts	÷	1.0 MHz/				Span 10.0 MHz
2 Marker Tab												
Type Re	ef Trc		X-Val			Y-Value		Functio	n		Function Re	esult
M1	1		92844			17.80 dB						
M2 M3	1	1	.92728	9 GHZ 7 GHz		-9.66 dB -8.94 dB	m					
HU	1			, 3112	,	0.04 00					EVT	10.04.2019
										Measuring		13.08.20

In-Band Emissions, Upper Channel



#### **Test Method:**

ANSI C63.17, clause 6.1.6.2.

**Test Results: Complies** 

#### Measurement Data:

See plots.

#### Requirements, FCC 15.323(d), RSS-213 Issue 3, clause 5.8.1:

$f \le 1.25$ MHz outside UPCS band :	≤ -9.5dBm
$1.25$ MHz $\leq f \leq 2.5$ MHz outside UPCS based on the transformation of the transformation	and :≤ -29.5 dBm
$f \ge 2.5$ MHz outside UPCS band :	≤ -39.5 dBm

# **Out-of-Band Emissions, Conducted**

#### Lower Channel:

MultiView	Spectrum	× Sp	ectrum 2	×					•
Ref Level 10	.00 dBm Offse	et 10.40 dB 🖷 RI	3W 30 kHz						
<ul> <li>Att</li> </ul>	20 dB SWT	7.78 m s VE	3 <b>W</b> 100 kHz 🛛 N	lode Sweep					
1 Frequency S									o1Pk Max
Limit Che	¢k ECT OUT-OF-B			SS SS				M1[1]	-35.87 dBm
Line US L	ECT OUT-OF-B	AND		55				1	.9199650 GHz
0 dBm								M2[1]	61.96 dBm
								1	.9012940 GHz
-10 dBm									
-20 dBm									
-30 dBm									
									M1
10 10 10									
USPERMOUT-OF-	BAND								
-50 dBm									/
-60 dBm									L. MARY
	and a		Same to a ward	m. Will al whole	A MAR LAND MAR A	Mr. J. Meller working	worth alymph	MUMANIAM	A Maria
10124 Martin 1040	and have been a	hubanantumu	A FAAMAAAAA AAAAAAA A	And a Marchine Mar	alond the second of a	tall a start b			
70 dbin									
-80 dBm									
1.85 GHz	1	1	1001 pt	S	7	.0 MHz/	1	1	1.92 GHz
	~					•	Measuring	EXT	10.04.2019
								REF	13:19:54



#### Lower Channel:

MultiView	Spect	trum	×	Spe	ectrum 2	×					•
Ref Level 10	.00 dBm	Offset	10.40 dB	• RB	W 30 kHz						
🖷 Att	20 dB	SWT	94.5 ms	VB	<b>W</b> 100 kHz	Mode Sweep					
1 Frequency S											o1Pk Max
Limit Che						PASS				M1[1]	-63.14 dBm
Line US D	ECT OUT-	OF-BAI	ND			PASS					1.838540 GHz
0 dBm											
-10 dBm											
-20 dBm											
-30 dBm											
40 d0m											
US BEEP OUT-OF-	BAND										
-50 dBm											
-60 dBm											M1 ▼
mundershipping	M. M. A. Marsh	Andrew	and the second second	an tal	a marte to det.	and and marked	webness how white	Maderhow As an e	allos a la la cara da la cara da		la
-70 dBm			and a surface of Aut	6 - 90 - 10 - 10 - 10 - 10 - 10 - 10 - 10	accessibilit access chapter	tonio deres ada das	Almon a consulty which that is a set	a man manufacture	Maria Maria and and	and the second states where the	non-Arbanalan de
10 dbiii											
-80 dBm											
1.0 GHz					1001	pts		5.0 MHz/			1.85 GHz
									Measuring		10.04.2019 13:20:29

MultiView	Spectrum	× Sp	ectrum 2	×					-
Ref Level 10	.00 dBm Offse	t 10.40 dB 🖷 RB	3W 30 kHz						
🗢 Att	20 dB <b>SWT</b>	110 ms <b>VE</b>	3W 100 kHz M	lode Sweep					
1 Frequency S Limit Che		1	PA	<u>SS</u>				M1[1]	<ul> <li>1Pk Max</li> <li>-61,27 dBm</li> </ul>
	ECT OUT-OF-B	ND	PA					M1[1]	441.700 MHz
0 dBm									11110000
-10 dBm									
-10 080									
-20 dBm									
-30 dBm									
USPERMOUT-OF-	BAND								
-50 dBm									
-60 dBm				M1					
	and any Mar March March	manufundadu	mound	mantheman	man and the many	Mulyhuerden en	and the set is	mound	White manusplan
	and and the second second								, i i
vt∑0 dBm									
-80 dBm									
10.0 MHz	I	1	1001 pts	<u> </u>	99	9.0 MHz/		1	1.0 GHz
	~					~	Measuring		
								KEP O	13:21:22



# Upper Channel:

MultiView	Spec	trum	×	Sp	ectrum 2	×					•
Ref Level 10	.00 dBm	Offset	t 10.40 dB	e RB	W 30 kHz						
Att	20 dB	SWT	7.78 ms	VB	<b>W</b> 100 kHz	Mode Sweep					
1 Frequency S								1			●1Pk Max
Limit Che						PASS				M1[1]	-32.99 dBm
Line US D	ECT OUT-	OF-BA	ND		, i	PASS					1.9301750 GHz
0 dBm										M2[1]	-57.11 dBm
											1.9491960 GHz
USIBER OUT-OF-I	AND										
-2D dBm											
M30 dBm											
-SU aBm											
-40 dBm											
I)											
-50 dBm											
1			1	42							
WL.				X I			MB				
-60 dBmmm	Mahna	ال م ه	A water and	1.	11 an - 1		. An				
· ·		- Box Only	- and an analysis	W	Withnesser	mannaman	amananal m	W with my how we	with manny	manumban	mappinghamp
-70 dBm											
-80 dBm											
1.93 GHz					1001	ots	7	.0 MHz/			2.0 GHz
2 Marker Tabl	е										
Type Ref	Trc		X-Valu			Y-Value		Function		Function Re	esult
M1	1		.930175			-32.99 dBm -57.11 dBm					
M2 M3	1		.949196 .969895			-60.59 dBm					
	1				-	colop abili				EVT -	10.04.2019
									Measuring		13:11:03

I Frequency Sweep         01Pk Max           Limit Chesk         PASS         M2[1]         -67.01 dBn           0 dBm         M1[1]         -56.19 dBn         3.85610 GH           -10 dBm         -20 dBm         -10 dBm         -10 dBm         -10 dBm           -20 dBm         -30 dBm         -10 dBm         -10 dBm         -10 dBm         -10 dBm           -20 dBm         -10 dBm	MultiView	Spectr	um	× Spec	trum 2	×						•
1 Frequency Sweep       0.1Pk Max         Limit Check       PASS         Line US DECT OUT-OF-BAND       PASS         0 dBm       M1[1]         -50 dBm       3.85610 GH         -50 dBm       M1         -60 dBm       M1	RefLevel 10	.00 dBm 0	offset 10.40	dB 🗢 RBW	30 kHz							
Limit Check       PASS       M2[1]       -67.01 dBn         0 dBm       0 dBm       -50.19 dBn       -56.19 dBn       3.85610 GH         -10 dBm       -20 dBm       -10 dBm	Att		WT 445	ms VBW	100 kHz	Mode Swe	ер					
Line US DECT OUT-OF-BAND     PASS     5.78620 GH       0 dBm     M1[1]    56.19 dBm       -10 dBm								ľ				
0 dBm											M2[1]	
-10 dBm     -20 dBm	Line US D	ECT UUT-U	F-BAND			PASS						
-10 dBm	0 dBm										M1[1]	
-20 dBm												3.85610 GHz
-20 dBm	= 10 d8m											
-30 dBm	10 0011											
-30 dBm												
S0 dBm     60 dBm     M1     M1 <td>-20 dBm</td> <td></td>	-20 dBm											
S0 dBm     60 dBm     M1     M1 <td></td>												
SO dBm     -60 dBm	-20 d9m											
-50 dBm	-30 UBIII											
-50 dBm												
-60 dBm	US DEEP OUT-OF-I	AND										
-60 dBm												
-60 dBm	50 d0m											
-60 dBm	-50 UBIII						M1					
							T					
	-60 dBm						-					
	h							a set been		1 H		M2
an and an and a second more than the plan and a second with the the the the second which and the second and the	-70 dBm-	manara	multimation	monthly	www.una	manderson	an when	markenter	My have an	unwind	. I stand	and when the second second
	-70 uBm					1				MW-MW/W	Aller March 19 April 19	- Alberton Baura Afreda Ak
-80 dBm	-80 dBm											
2.0 GHz 1001 pts 400.0 MHz/ 6.0 GHz	2.0 GHz				1001	pts		40	0.0 MHz/			6.0 GHz
										Measuring		10.04.2019 13:14:48



# Upper Channel:

MultiView	Spe	ctrum	>	Sp	ectrum 2	×					•
Ref Level 10	.00 dBm	Offse	t 10.40 d	ib 🗕 Re	3W 30 kHz						
Att	20 dB	SWT	667 m	ns VE	3W 100 kHz	Mode Sweep					
1 Frequency S								1		1	o1Pk Max
Limit Che Line US D			NID			PASS PASS				M1[1]	-61.69 dBm
Line US D		-OF-BA	IND			PASS					7.71730 GHz
0 dBm											
-10 dBm											
-20 dBm											
20 0011											
-30 dBm											
US DEEP OUT-OF-	BAND										
-50 dBm											
-60 dBm				M1							
				Ţ							
		al had a				. had the	La contrat de la contra		and the second	and the state	a restriction to such
Herdemanhunt	munim	n alter tate	Andrahard	man	When a will be a wind	have been been been been been been been be	and an and all all all all all all all all all al	Muninin	water with the second second	and the second and the second	Mar
-80 dBm											
6.0 GHz					1001	pts	60	0.0 MHz/		I	12.0 GHz
	~								Moacuring		
	~							~	measuring	REF	13:14:13
Mulhildiare	C				ectrum 2	×					
MultiView	spe	ccrum	~	s sp	ectrum 2	<u>^</u>					
Ref Level 10	.00 dBm	Offse	t 10.40 c	ib 🖷 Re	30 kHz						
Att	20. dB	SWT	000 m	ve VE	W 100 kHz	Mode Sween					

I Frequency Sweep         0 1Pk Max           Limit Chekk         PASS         MI[1]         -61.07 dBm           0 dBm         -10 dBm         -10 dBm         -10 dBm         -10 dBm
Line US DECT OUT-OF-BAND         PASS         16.79920 GHz           0 dBm         -10 dBm         -10 - 0         -10 - 0
Line US DECT OUT-OF-BAND         PASS         16.79920 GHz           0 dBm         -10 dBm         -10 dBm         -10 dBm         -10 dBm
-10 dBm
-10 dBm
-20 dBm-
-20 dBm
-30 dBm
USPERSTON DECEMBENT OF SAND
-50 dBm
M1
-60 dBm
and a second
devenues and mental and and and and a second and a second and and and and and and and and and a
-70 dBm
-80 dBm-
12.0 GHz 1001 pts 800.0 MHz/ 20.0 GHz
✓ Measuring Measuring 10.04.2019



#### Lower Channel:

MultiView	Spectrum	× Sp	ectrum 2	×					•
	0.00 dBm Offse								
<ul> <li>Att</li> </ul>		2.23 ms VE	BW 100 kHz M	lode Sweep					o d Dh. Marri
1 Frequency S			PA	SS				M1[1]	• 1Pk Max -53.03 dBm
	DECT OUT-OF-BA	ND		SS					3.8430800 GHz
0 dBm									
-10 dBm									
-20 dBm									
-30 dBm									
00 00									
UST DEEM OUT-OF	-BAND								
-50 dBm					1				
					N.,				
				m j	h 194.				
-60 dBm					4/ 2				
				mad	1 Umm	monolymon	mound	www.markannew	monum
-70 dBm	www.www.www.w	the second second second	and a contraction of the second	an an and a		Change of the second	AA MAAA	n	and a so show a
-80 dBm									
oo abiii									
CF 3.8431 G⊢	lz		1001 pt	S	2	.0 MHz/		5	pan 20.0 MHz
	~					~	Measuring		<b>##</b> 10.04.2019 13:18:36
MultiView	<ul> <li>Spectrum</li> </ul>	N X Sp	ectrum 2	×					
Ref Level 10	Spectrum 0.00 dBm Offse 20 dB SWT	t 10.40 dB 🖷 RI		_					•
Ref Level 10 Att Frequency 3	0.00 dBm Offse 20 dB SWT Sweep	t 10.40 dB 🖷 RI	BW 30 kHz BW 100 kHz M	lode Sweep					• 1Pk Max
Ref Level 10 Att Frequency S Limit Cho	0.00 dBm Offse 20 dB SWT Sweep epk	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep				M1[1]	-63.04 dBm
Ref Level 10 Att 1 Frequency 9 Limit Chu Line US 1	0.00 dBm Offse 20 dB SWT Sweep	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					
Ref Level 10 Att Frequency S Limit Cho	0.00 dBm Offse 20 dB SWT Sweep epk	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 9 Limit Chu Line US 1	0.00 dBm Offse 20 dB SWT Sweep epk	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 9 Limit Chu Line US 1	0.00 dBm Offse 20 dB SWT Sweep epk	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 3 Limit Ch Line US 1 0 dBm	0.00 dBm Offse 20 dB SWT Sweep epk	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 2 Limit Chu Line US 1 0 dBm	0.00 dBm Offse 20 dB SWT Sweep epk	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 3 Limit Ch Line US 1 0 dBm	0.00 dBm Offse 20 dB SWT Sweep epk	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 2 Limit Che Line US 1 0 dBm -10 dBm -20 dBm	0.00 dBm Offse 20 dB SWT Sweep epk	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 2 Limit Chu Line US 1 0 dBm	0.00 dBm Offse 20 dB SWT Sweep epk	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 2 Limit Che Line US 1 0 dBm -10 dBm -20 dBm	0.00 dBm Offse 20 dB SWT Sweep epk	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 3 Limit Ch Line US 1 0 dBm -10 dBm -20 dBm -30 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 2 Limit Che Line US 1 0 dBm -10 dBm -20 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 3 Limit Ch Line US 1 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 3 Limit Ch Line US 1 0 dBm -10 dBm -20 dBm -30 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 3 Limit Ch Line US 1 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 3 Limit Ch Line US 1 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 3 Limit Ch Line US 1 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10           Att           1 Frequency 1           Limit Ch           Limit Ch           Limit Ch           0 dBm           -10 dBm           -20 dBm           -30 dBm           -30 dBm           -50 dBm           -60 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB • RI 2.23 ms VI	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 Att 1 Frequency 3 Limit Ch Line US 1 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB ● RI 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10           ● Att           1 Frequency 2           Limit Ch           Limit Ch           Limit Ch           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -60 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB • RI 2.23 ms VI	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10           Att           1 Frequency 1           Limit Ch           Limit Ch           Limit Ch           0 dBm           -10 dBm           -20 dBm           -30 dBm           -30 dBm           -50 dBm           -60 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB • RI 2.23 ms VI	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10           ● Att           1 Frequency 2           Limit Ch           Limit Ch           Limit Ch           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -60 dBm	0.00 dBm Offse 20 dB SWT Sweep ek ECT OUT-OF-BA	t 10.40 dB • RI 2.23 ms VI	BW 30 kHz BW 100 kHz M	lode Sweep					-63.04 dBm
Ref Level 10 ● Att 1 Frequency 2 Limit Che Line US 1 0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -30 dBm -50 dBm -60 dBm -80 dBm	DO DE MONTON	t 10.40 dB • RI 2.23 ms VI	BW 30 kHz M BW 100 kHz M PA PA	ode Sweep SS SS				2 	-63.04 dBm 5.7634620 GHz
Ref Level 10           ● Att           1 Frequency 2           Limit Ch           Limit Ch           Limit Ch           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -60 dBm	DO DE MONTON	t 10.40 dB • RI 2.23 ms VI	BW 30 kHz BW 100 kHz M	ode Sweep SS SS	2	.0 MHz/		: 	-63.04 dBm



#### Mid Channel:

MultiView	Spectrum	× Sp	ectrum 2	×					•
Ref Level 1	0.00 dBm Offse	t 10.40 dB 🖷 RB	BW 30 kHz						
Att		2.23 ms VE	3W 100 kHz M	lode Sweep					
1 Frequency Limit Ch			PA	SS				M1517	O 1Pk Max EQ 02 dBm
	DECT OUT-OF-B	AND		SS				M1[1]	-52.32 dBm 3.8499800 GHz
0 dBm									10 199000 0112
-10 dBm									
-20 dBm									
-30 dBm									
SO UDIN									
USPERPOUT-OF	-BAND								
-50 dBm				M	1				
				50					
				0.4	h / N				
-60 dBm				N I	4				
	6	Am		mary V	U M	moundan	Manualana	Mahrhar - was	a sharen al lan
-70 dBm	mather market	the full from the two of the	and how we wanted how a	Max 2 Mar	VMM CA	phile Actions and prime as		the manual	A Theo Orth Andrew A Dis week
-80 dBm									
oo abiii									
CF 3.84998 G	iHz		1001 pt	S	2	.0 MHz/		5	pan 20.0 MHz
	~					~	Measuring		
M. 163 G	Cnochuum		t 0						
	D.00 dBm Offse	et 10.40 dB 🖷 RB		X					٠
	0.00 dBm Offse 20 dB SWT		BW 30 kHz	_					• 1Pk Max
Ref Level 1 Att Frequency Limit Ch	0.00 dBm Offse 20 dB SWT Sweep eck	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep				M1[1]	• 1Pk Max -62.33 dBm
Ref Level 1 Att Frequency Limit Ch	0.00 dBm Offse 20 dB SWT Sweep	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					
Ref Level 1 Att Frequency Limit Ch	0.00 dBm Offse 20 dB SWT Sweep eck	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 1 Att Frequency Limit Ch Line US	0.00 dBm Offse 20 dB SWT Sweep eck	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 1 Att Frequency Limit Ch Line US	0.00 dBm Offse 20 dB SWT Sweep eck	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 11 Att 1 Frequency Limit Ch Line US 0 dBm	0.00 dBm Offse 20 dB SWT Sweep eck	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 10 Att 1 Frequency Limit Ch Line US 0 dBm -10 dBm	0.00 dBm Offse 20 dB SWT Sweep eck	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 11 Att 1 Frequency Limit Ch Line US 0 dBm	0.00 dBm Offse 20 dB SWT Sweep eck	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 10 Att 1 Frequency Line US 0 dBm -10 dBm -20 dBm	0.00 dBm Offse 20 dB SWT Sweep eck	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 10 Att 1 Frequency Limit Ch Line US 0 dBm -10 dBm	0.00 dBm Offse 20 dB SWT Sweep eck	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 10 Att 1 Frequency Limit Ch Line US 0 dBm -10 dBm -20 dBm	0.00 dBm Offse 20 dB SWT Sweep eck	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 10 Att 1 Frequency Limit Ch Line US 0 dBm -10 dBm -20 dBm -30 dBm	D.00 dBm Offse 20 dB SWT Sweep ek DECT OUT-OF-B/	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 10 Att 1 Frequency Limit Ch Line US 0 dBm -10 dBm -20 dBm	D.00 dBm Offse 20 dB SWT Sweep ek DECT OUT-OF-B/	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 10 Att 1 Frequency Limit Ch Line US 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm	D.00 dBm Offse 20 dB SWT Sweep ek DECT OUT-OF-B/	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 10 Att 1 Frequency Limit Ch Line US 0 dBm -10 dBm -20 dBm -30 dBm	D.00 dBm Offse 20 dB SWT Sweep ek DECT OUT-OF-B/	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 10 Att 1 Frequency Limit Ch Line US 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm	D.00 dBm Offse 20 dB SWT Sweep ek DECT OUT-OF-B/	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 10 Att 1 Frequency Limit Ch Line US 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm	D.00 dBm Offse 20 dB SWT Sweep ek DECT OUT-OF-B/	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	lode Sweep					-62.33 dBm
Ref Level 11 Att 1 Frequency Limit Ch Line US 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm	D.00 dBm Offse 20 dB SWT Sweep ek DECT OUT-OF-B/	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	ode Sweep SS SS					-62.33 dBm
Ref Level 10 Att 1 Frequency Limit Ch Line US 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm	D.00 dBm Offse 20 dB SWT Sweep ek DECT OUT-OF-B/	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	ode Sweep SS SS					-62.33 dBm
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Ref Level 11           Att           1 Frequency           Linit Ch           Line US           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -50 dBm           -60 dBm	D.00 dBm Offse 20 dB SWT Sweep ek DECT OUT-OF-B/	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	ode Sweep SS SS		ν.Δ., φ\$.,			-62.33 dBm
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Ref Level 11           Att           1 Frequency           Linit Ch           Line US           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -50 dBm           -60 dBm	D.00 dBm Offse 20 dB SWT Sweep ek DECT OUT-OF-B/	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz BW 100 kHz M	ode Sweep SS SS			4, 100, 100, 100, 100, 100, 100, 100, 10		-62.33 dBm
Ref Level 11           Att           1 Frequency           Line US           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -60 dBm           -80 dBm	DOU dBm Offse 20 dB SWT Sweep ek DECT OUT-OF-B/	et 10.40 dB ● RE 2.23 ms VE	BW 30 kHz M BW 100 kHz M PA PA	ode Sweep SS SS				enter and the second	-62.33 dBm 5.7738060 GHz
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# Upper Channel:

MultiView	Spectri	um 🗙 S	pectrum 2	×					•
Ref Level	10.00 dBm 01	fset 10.40 dB 🖷 F	RBW 30 kHz						
Att		VT 2.23 ms V	/BW 100 kHz N	lode Sweep					
1 Frequency	/ Sweep			66					o1Pk Max
Limit C Line US	песк 5 DECT OUT-OF	-BAND		SS SS				M1[1]	-51.39 dBm 3.8568900 GHz
0 dBm									3.8568900 GHZ
U dBm-									
-10 dBm									
-20 dBm									
20 0011									
-30 dBm									
ਪਤੀ <u>ਊਵਿਊਸਾ ਰਹ⊤- ਰ</u>									
03 8201 001 0	A BAND								
				M	1				
-50 dBm				Δ.					
				I M	h M				
-60 dBm				+ + + + + + + + + + + + + + + + + + +					
				N V	1 V W				
-70 dBm	monorder	mannewar	madurman	mon	1 hour	mmmmm	Mannah	mmyum	genderantines
-70 uBM									
-80 dBm									
CF 3.85689	GHz		1001 pt	s	2	.0 MHz/			Span 20.0 MHz
							Measuring		10.04.2019 13:16:28
Ref Level		fset 10.40 dB 🖷 F		X Iode Sweep					•
Ref Level • Att	10.00 dBm 01 20 dB <b>S</b> V		RBW 30 kHz	_					• 1Pk Max
Ref Level Att <u>1 Frequency</u> Limit C	10.00 dBm Of 20 dB SV / Sweep heck	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep				M1[1]	0 1Pk Max -63.67 dBm
Ref Level Att <u>1 Frequency</u> Limit C	10.00 dBm Of 20 dB SV / Sweep	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					1
Ref Level Att <u>1 Frequency</u> Limit C	10.00 dBm Of 20 dB SV / Sweep heck	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
Ref Level Att 1 Frequency Limit C Line US	10.00 dBm Of 20 dB SV / Sweep heck	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
Ref Level Att <u>1 Frequency</u> Limit C Line US 0 dBm	10.00 dBm Of 20 dB SV / Sweep heck	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
Ref Level Att 1 Frequency Limit C Line US	10.00 dBm Of 20 dB SV / Sweep heck	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
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Ref Level • Att 1 Frequency Limit C Line US 0 dBm -10 dBm	10.00 dBm Of 20 dB SV / Sweep heck	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
Ref Level • Att 1 Frequency Limit C Line US 0 dBm -10 dBm	10.00 dBm Of 20 dB SV / Sweep heck	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
Ref Level Att I Frequency Limit C Line US 0 dBm -10 dBm -20 dBm	10.00 dBm Of 20 dB SV / Sweep heck	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
Ref Level Att I Frequency Limit C Line US 0 dBm -10 dBm -20 dBm -30 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
Ref Level Att I Frequency Limit C Line US 0 dBm -10 dBm -20 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
Ref Level • Att 1 Frequency Limit C Line US 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
Ref Level Att I Frequency Limit C Line US 0 dBm -10 dBm -20 dBm -30 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
Ref Level • Att 1 Frequency Limit C Line US 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
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Ref Level • Att 1 Frequency Limit C Line US 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	Iode Sweep					-63.67 dBm
Ref Level           • Att           1 Frequency           Limit C           Line US           0 dBm           -10 dBm           -20 dBm           -30 dBm           -30 dBm           -50 dBm           -60 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB • F VT 2.23 ms V -BAND	RBW 30 kHz /BW 100 kHz M PA	Iode Sweep					-63.67 dBm
Ref Level Att 1 Frequency Limit C Line US 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB ● F VT 2.23 ms \	RBW 30 kHz /BW 100 kHz M PA	lode Sweep					-63.67 dBm
Ref Level           • Att           1 Frequency           Limit C           Line US           0 dBm           -10 dBm           -20 dBm           -30 dBm           -30 dBm           -50 dBm           -60 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB • F VT 2.23 ms V -BAND	RBW 30 kHz /BW 100 kHz M PA	Iode Sweep					-63.67 dBm
Ref Level           • Att           1 Frequency           Limit C           Line US           0 dBm           -10 dBm           -20 dBm           -30 dBm           -30 dBm           -50 dBm           -60 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB • F VT 2.23 ms V -BAND	RBW 30 kHz /BW 100 kHz M PA	Iode Sweep	want a marked and a marked a Marked a marked a m				-63.67 dBm
Ref Level           Att           1 Frequency           Limit C           Line US           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -50 dBm           -60 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB • F VT 2.23 ms V -BAND	RBW 30 kHz /BW 100 kHz M PA	Iode Sweep					-63.67 dBm
Ref Level           Att           1 Frequency           Limit C           Line US           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -50 dBm           -60 dBm	10.00 dB m O 20 dB SV / Sweep heck s DECT OUT-OF	fset 10.40 dB • F VT 2.23 ms V -BAND	RBW 30 kHz /BW 100 kHz M PA	Iode Sweep					-63.67 dBm
Ref Level           Att           1 Frequency           Limit C           Line US           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -50 dBm           -60 dBm	10.00 dB m Ol 20 dB SV / Sweep heck 5 DECT OUT-OF	fset 10.40 dB • F VT 2.23 ms V -BAND	RBW 30 kHz /BW 100 kHz M PA						-63.67 dBm



# 3.8 Carrier Frequency Stability

#### **Test Method:**

ANSI C63.17, clause 6.2.1.

#### **Test Results: Complies**

#### **Measurement Data:**

Long Term Frequency Stability is measured with the HP53310A Modulation Domain analyzer. The HP53310A is logged by a computer programmed to get new readings as fast as possible over the noted time period or number of readings. The peak-to-peak difference was recorded and the mean value and deviation in ppm was calculated.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

#### Carrier Frequency Stability over Time at Nominal Temperature

Average Mean Carrier	Max. Diff.	Min. Diff.	Max. Dev.	Limit
Frequency (MHz)	(kHz)	(kHz)	(ppm)	
1924.997751	8.34	3.90	1.3	±10 ppm

Deviation ppm = ((Diff. - Mean Diff) / Mean Carrier Freq.) x 10⁶

Deviation (ppm) is calculated from 3000 readings.

#### Frequency Stability over Power Supply Voltage at Nominal Temperature

Voltage	Measured Carrier Frequency (MHz)	Difference (kHz)	Deviation (ppm)	Limit
Vnom	/	0	0	
85% of V _{nom}	/	/	/	±10 ppm
115% of V _{nom}	/	/	/	

Deviation ppm = ((Mean – Measured Frequency) / Mean) x  $10^{6}$ 

This test does not apply for EUT that is powered from batteries.

#### Frequency Stability over Temperature

Temperature	Measured Carrier Frequency (MHz)	Difference (kHz)	Deviation (ppm)	Limit
T = +20 °C	1924.9875	0	0	
T = -20 °C	1924.9831	-4.4	-2.3	±10 ppm
T = +50 °C	1924.9821	-5.4	-2.8	

Deviation ppm = ((Mean – Measured Frequency) / Mean) x 10⁶

Ref. FCC 15.323(e), RSS-213 Issue 3, clause 5.3



# 3.9 Frame Repetition Stability

#### **Test Method:**

ANSI C63.17, clause 6.2.2.

#### **Test Results: Complies**

#### Measurement Data:

The envelope of the RF signal from the EUT is detected with a Crystal Detector and the mean and standard deviation of the frame repetition frequency is then gated over 100 frames and measured with a Frequency Domain Analyzer. The frame repetition stability is 3 times the standard deviation.

Carrier Frequency	Mean Frame Period	Standard Deviation	Frame Repetition
(MHz)	(Hz)	(μHz)	Stability (ppm)
1924.992	100.000	10.726	0.322

Limit:

Frame Repetition Stability	±10 ppm (TDMA)
----------------------------	----------------

Ref. FCC 15.323(e), RSS-213 Issue 3, clause 5.2

# 3.10 Frame Period and Jitter

#### **Test Method:**

ANSI C63.17, clause 6.2.3.

#### **Test Results: Complies**

#### **Measurement Data:**

The envelope of the RF signal from the EUT is detected with a Crystal Detector and the frame period and jitter is measured with a Frequency Domain Analyzer over at least 100.000 frames.

Carrier Frequency	Frame Period	Max Jitter	3xStandard Deviation of
(MHz)	(ms)	(μs)	Jitter (μs)
1924.992	10.000	-0.032	

Max Jitter = (1/ (Frame period + Pk-Pk/2)) - (1/Frame Period), when Pk-Pk and Frame Period are in Hz

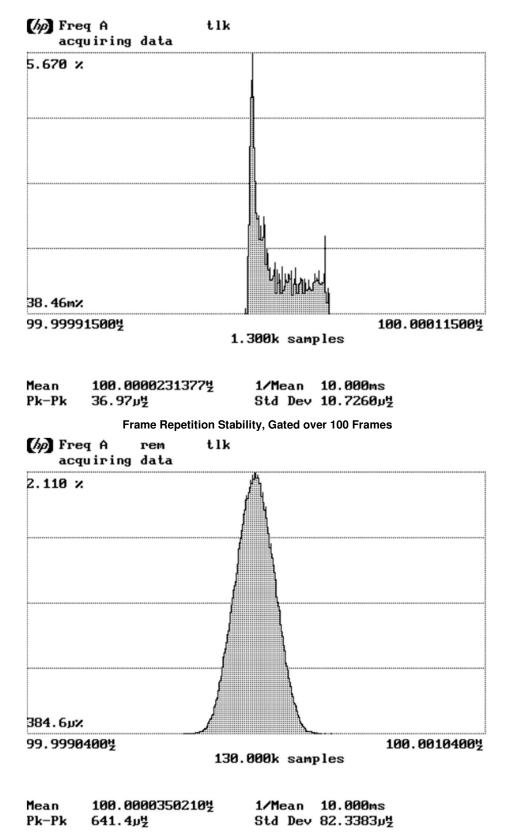
3xSt.Dev.Jitter = 3x (1/(Frame Period + St.Dev) - 1/St.Dev) x 10⁶

#### Limit:

Frame Period	20 or 10 ms
Max Jitter	25 μs
3 times St.Dev of Jitter	12.5 µs

Ref. FCC 15.323(e), RSS-213 Issue 3, clause 5.2





Frame Period and Jitter



#### Monitoring Threshold, Least Interfered Channel 3.11

#### Monitoring Threshold Limits:

Threshold Level:

 $T_L = -174 + 10 \log B + 30 + P_{MAX} - P_{EUT} (dBm)$ 

B is measured Emission Bandwidth (FCC 15.323) or Occupied Bandwidth (RSS-213 Issue 3) in Hz P_{MAX} is the power limit in dBm

P_{EUT} is measured Transmitter Power in dBm

#### **Calculated values:**

	FCC 15.323, RSS-213 Issue 3, clause 5.2
Threshold Level (FCC 15.323)	-81.6 dBm
Threshold Level (RSS-213 Issue 3)	-82.4 dBm

Least Interfered Channel Procedure (LIC) may only be used by systems with more than 20 duplex system access channels. Systems with less than 20 duplex system access channels are not allowed to transmit when interferer level is above Threshold Level.

#### **Measurement Procedure:**

Test only when Least Interfered Channel Procedure is NOT used:			
Lower Threshold	N/A	The EUT uses LIC procedure	

#### Least Interfered Channel (LIC) Procedure Test, FCC 15.323(b), (c)(2) and (c)(5)

ANSI C63.17 clause 7.3.2 ref.	Observation	Verdict
b) $f_1$ at T _L + U _M + 7 dB, $f_2$ at T _L + U _M	Transmission always on f2	Pass
c) $f_1$ at T _L + U _M , $f_2$ at T _L + U _M +7 dB	Transmission always on $f_l$	Pass
d) $f_1$ at T _L + U _M + 1 dB, $f_2$ at T _L + U _M - 6 dB	Transmission always on f2	Pass
e) $f_1$ at T _L + U _M - 6 dB, $f_2$ at T _L + U _M + 1 dB	Transmission always on fi	Pass

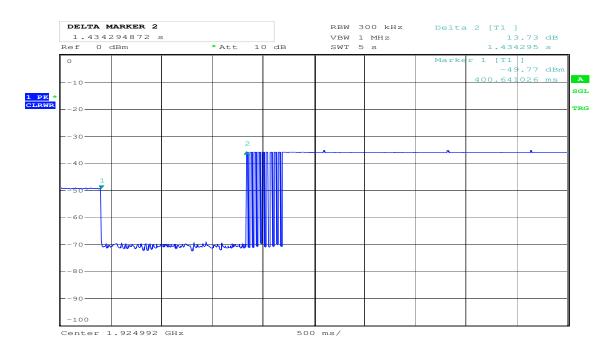
#### Selected Channel Confirmation, FCC 15.323(c)(1) and (5)

ANSI C63.17 clause 7.3.3	Observation	Verdict
b) Shall <b>not</b> transmit on $f_i$	EUT transmits on f2	Pass
d) Shall <b>not</b> transmit on <i>f</i> ₂	EUT transmits on <i>f</i> ₁	Pass

#### Limits:

	FCC 15.323, RSS-213 Issue 3, clause 5.2
Threshold Level + 6 dB margin (FCC 15.323)	-75.6 dBm
Threshold Level + 6 dB margin (RSS-213 Issue 3)	-76.4 dBm





Date: 6.MAY.2019 12:56:01

7.3.4 Selected Channel Confirmation, Connection 1.4s After Interferer Removed



# 3.12 Threshold Monitoring Bandwidth

This test is only required if a dedicated monitoring receiver is used. However, if the test is not carried out the manufacturer shall declare and provide proper evidence that the monitoring is made through the radio receiver used for communication.

#### **Measurement Procedure:**

Simple Compliance Test, ANSI C63.17, clause 7.4.1

More Detailed Test, ANSI C63.17, clause 7.4.2

The test is passed if **either** the Simple Compliance Test or the More Detailed test is passed.

During this test the spectrum analyzer is observed visually to see if the EUT transmits or not.

#### **Test Results:**

Test performed	Observation	Verdict
Simple Compliance test, at $\pm 30\%$ of B	N/A	N/A
More Detailed Test, at -6 dB points	N/A	N/A
More Detailed Test, at -12 dB points	N/A	N/A

The more detailed test must be pass at both the -6 and -12 dB points if the Simple Compliance test fails.

**Comment:** The manufacturer declares that the tested EUT uses the same receiver for monitoring and communication, this test is therefore not required.

#### Limits, FCC 15.323(c)(7), RSS-213 Issue 3, clause 5.2:

The monitoring system bandwidth must be equal to or greater than the emission bandwidth of the intended transmission.



# 3.13 Reaction Time and Monitoring Interval

#### Measurement Procedure

ANSI C63.17, clause 7.5

#### **Test results:**

By administrative commands and out-of-operating region interference, the EUT is restricted to operate on two RF carrier frequencies.

A CW interferer signal at a level  $T_L$  is applied on  $f_1$  and time-synchronized pulsed interference at a level  $T_L + U_M dB$  is applied on  $f_2$ . The level on  $f_2$  was raised 6 dB for part d) with 35 µs pulses.

The pulses are synchronized with the EUT timeslots and applied centered within all timeslots.

For both tests the test is passed if the EUT transmits on  $f_{l}$ .

Pulse Width, ref. to ANSI C63.17 clause 7.5	Observation	Verdict
c) > largest of 50 μs and 50*SQRT(1.25/ <i>B</i> )	EUT transmits on $f_i$	Pass
<ul> <li>d) &gt; largest of 35 µs and 35*SQRT(1.25/B), and with interference level raised 6 dB</li> </ul>	EUT transmits on <i>f</i> ₁	Pass

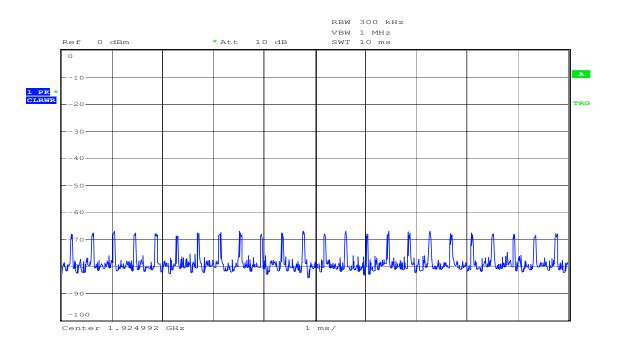
**Comment:** The test was performed with pulse lengths of 50 µs and 35 µs.

#### Limits, FCC 15.323(c)(1), (5) and (7), RSS-213 Issue 3, clause 5.2:

The maximum reaction time must be less than 50xSQRT (1.25/emission bandwidth in MHz) microseconds for signals at the applicable threshold level but shall not be required to be less than 50  $\mu$ s.

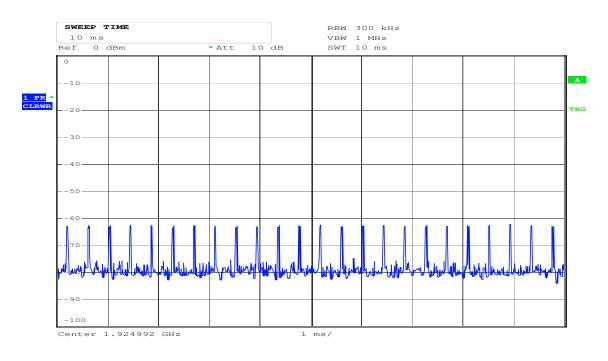
If a signal is detected that is 6 dB or more above the applicable threshold level, the maximum reaction time shall be 35xSQRT (1.25/emission bandwidth in MHz) microseconds but shall not be required to be less than 35  $\mu$ s.





Date: 6.MAY.2019 12:58:48

#### 50 µs Pulses



Date: 6.MAY.2019 13:01:01

35 µs Pulses



# 3.14 Time and Spectrum Window Access Procedure

This requirement is only for EUTs which transmit unacknowledged control and signaling information.

#### **Measurement Procedure:**

Timing for EUTs using control and signaling channel type transmissions: ANSI C63.17, clause 8.1

#### Test results:

Access Criteria, ref. to ANSI C63.17 clause 8.1.1	Observation	Verdict
b) Check that the EUT transmits on the interference free time- slot	N/A	N/A
b) The EUT must terminate or pause in its repetitive transmission of the control and signalling channel on the open channel to repeat the access criteria not less frequently than every 30 s	N/A	N/A

#### If FCC 15.323(c)(6) option, If Random Waiting Interval is NOT implemented

Access Criteria, ref. to ANSI C63.17 clause 8.1.2	Observation	Verdict
b) Check that the EUT changes to an interference-free slot when interference is introduced on the time slot in use	N/A	N/A

#### If FCC 15.323(c)(6) option, Only if Random Waiting Interval is implemented

Access Criteria, ref. to ANSI C63.17 clause 8.1.3	Observation	Verdict
b-d) Check that the EUT uses random waiting interval before continuing transmission on an interfered time slot	N/A	N/A

Comment: The tested EUT does not transmit unacknowledged control and signaling information.

#### Limits:

#### FCC 15.323(c)(4), RSS-213 Issue 3, clause 5.2, RSS-213 Issue 3, clause 5.2:

Once access to specific combined time and spectrum windows is obtained an acknowledgement from a system participant must be received by the initiating transmitter within one second or transmission must cease. Periodic acknowledgements must be received at least every 30 seconds or transmission must cease. Channels used exclusively for control and signaling information may transmit continuously for 30 seconds without receiving an acknowledgement, at which time the access criteria must be repeated.

#### FCC 15.323(c)(6), RSS-213 Issue 3, clause 5.2, RSS-213 Issue 3, clause 5.2:

If the selected combined time and spectrum windows are unavailable, the device may either monitor and select different windows or seek to use the same windows after waiting an amount of time, randomly chosen from a uniform random distribution between 10 and 150 milliseconds, commencing when the channel becomes available



# 3.15 Acknowledgements and Transmission Duration

#### **Measurement Procedure:**

Acknowledgements: ANSI C63.17, clause 8.2.1

Transmission Duration: ANSI C63.17, clause 8.2.2

During the test **Initial transmission without acknowledgements** the signal from the EUT to the companion device is blocked by circulators in addition to the tunable attenuator.

The test **Transmission time after loss of acknowledgements** is performed by cutting-off the signal from the companion device by a RF switch and measuring the time until the EUT stops transmitting.

The **Transmission Duration** test is performed by monitoring the slot in use and measuring the time until the EUT changes to a different slot.

#### **Test Results:**

#### Acknowledgements

Test ref. to ANSI C63.17 clause 8.2.1	Observation	Verdict
a) Initial transmission without acknowledgements	570 ms	Pass
c) Transmission time after loss of acknowledgements	5.1 sec	Pass

#### Transmission Duration

Test ref. to ANSI C63.17 clause 8.2.2	Observation	Verdict
<ul> <li>b) Transmission duration on same time and frequency window</li> </ul>	10 min	Pass

Comment: /

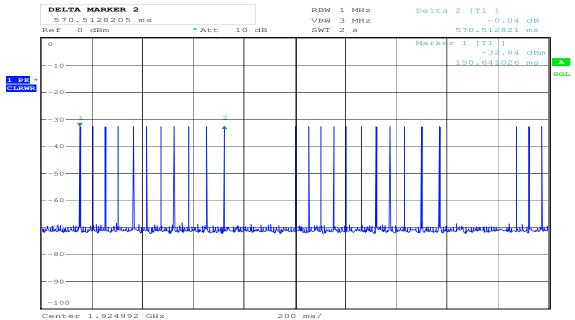
#### Limits, FCC 15.323(c)(3) and (4), RSS-213 Issue 3, clause 5.2:

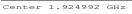
Occupation of the same combined time and spectrum windows by a device or group of cooperating devices continuously over a period of time longer than 8 hours is not permitted without repeating the access criteria.

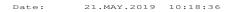
Once access to specific combined time and spectrum windows is obtained an acknowledgement from a system participant must be received by the initiating transmitter within one second or transmission must cease.

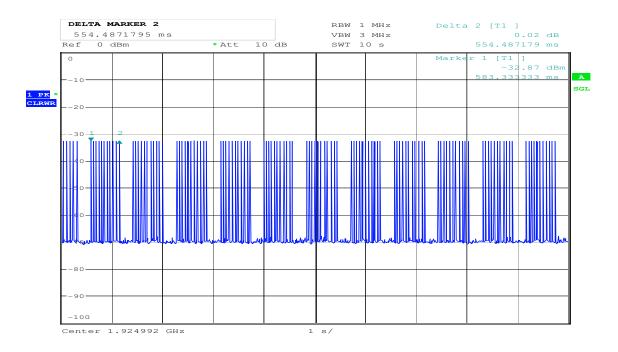
Periodic acknowledgements must be received at least every 30 seconds or transmission must cease. Channels used exclusively for control and signaling information may transmit continuously for 30 seconds without receiving an acknowledgement, at which time the access criteria must be repeated.











21.MAY.2019 10:19:21 Date:

8.2.1a) Initial Transmission Without Acknowledgements



5.	0961	53846	s				VBW	1 MHz		- 0	0.67 de
Ref	-10	dBm		 Att	10	) dB	SWT	10 s		5.09	6154 s
-10									Marke	r 1 [T1 -3	] 5.76 dB
										961.53	
,											
	1							2			
	7			 	~~~~						
40-											-
60-											-
70-											
								hundren	moundaries	human	mardar
90-											
100	) ———						_	_			
-110	, I										

Date: 6.MAY.2019 14:14:21

8.2.1c) Transmission Time After Loss of Acknowledgements



# 3.16 Dual Access Criteria Check

#### **Measurement Procedure:**

EUTs that does not implement the LIC procedure: ANSI C63.17, clause 8.3.1

EUTs that implement the LIC procedure: ANSI C63.17, clause 8.3.2

This test is required for equipment that uses the access criteria in FCC 15.323(c)(10).

#### **Test Results:**

#### EUTs that do NOT implements the LIC procedure:

Test ref. to ANSI C63.17 clause 8.3.1	Observation	Verdict
b) EUT is restricted to a single carrier <i>fi</i> for TDMA systems. The Test is Pass if EUT can transmit	N/A	N/A
c) d) Interference at level $T_L$ + $U_M$ on all timeslots except one $\ensuremath{\textbf{receive}}$ slot where interference is at least 10 dB below $T_L$	N/A	N/A
e) f) Interference at level $T_L + U_M$ on all timeslots except one <b>transmit</b> slot where interference is at least 10 dB below $T_L$	N/A	N/A

#### EUTs that implements the LIC procedure:

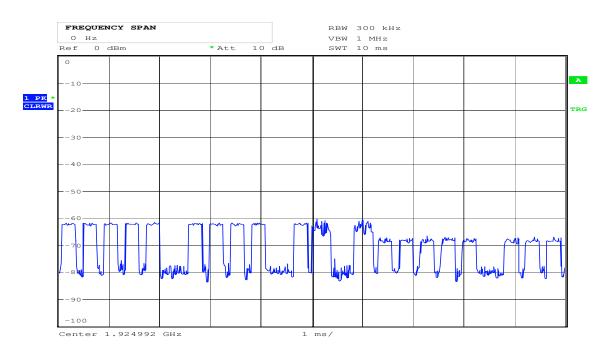
Test ref. to ANSI C63.17 clause 8.3.2	Observation	Verdict
b) EUT is restricted to a single carrier <i>f</i> ₁ for TDMA systems. The Test is Pass if EUT can transmit	EUT can transmit	Pass
c) d) Transmission on interference-free <b>receive</b> time/spectrum window	EUT transmits on interference free <b>receive</b> slot	Pass
e) f) Transmission on interference-free <b>transmit</b> time/spectrum window	EUT transmits on interference free <b>transmit</b> slot	Pass

Comment: See plots.

#### Limits, FCC 15.323(c)(10), RSS-213 Issue 3, clause 5.2:

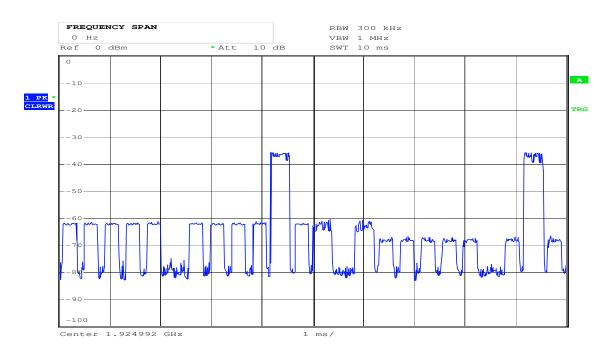
An initiating device may attempt to establish a duplex connection by monitoring both its intended transmit and receive time and spectrum windows. If both the intended transmit and receive time and spectrum windows meet the access criteria, then the initiating device can initiate a transmission in the intended transmit time and spectrum window. If the power detected by the responding device can be decoded as a duplex connection signal from the initiating device, then the responding device may immediately begin transmitting on the receive time and spectrum window monitored by the initiating device.





#### Date: 6.MAY.2019 13:36:03

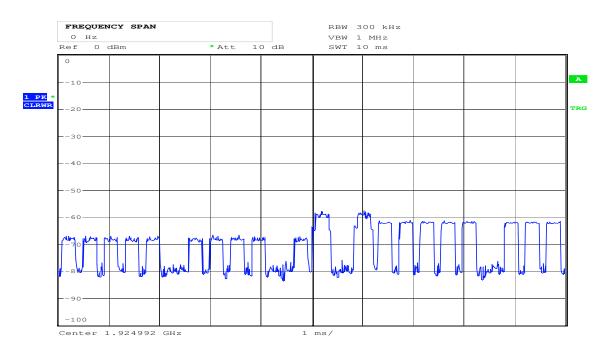




Date: 6.MAY.2019 13:36:15

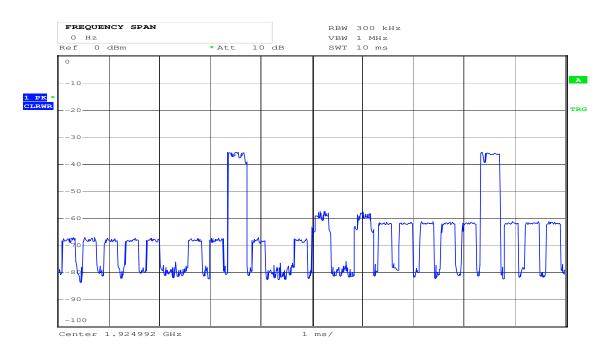
8.3.2c) EUT Transmits on Interference Free RECEIVE Slot, AFTER





Date: 6.MAY.2019 13:36:35

#### 8.3.2e) EUT Transmits on Interference Free TRANSMIT Slot, BEFORE



Date: 6.MAY.2019 13:36:51

8.3.2e) EUT Transmits on Interference Free TRANSMIT Slot, AFTER



# 3.17 Alternative Monitoring Interval

Test procedure described in ANSI C63.17 clause 8.4.

This test is required if the EUT implements the provisions of FCC 15.323(c)(11).

#### Test result:

Not Tested. The tested EUT does not implement this provision. See manufacturers' declaration.



# 4 Measurement Uncertainty

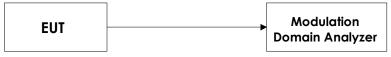
Measurement Uncertainty Values		
Test Item	Uncertainty	
Output Power	±0.5 dB	
Power Spectral Density	±0.5 dB	
Out of Band Emissions, Conducted (RBW < 100 kHz)	< 3.6 GHz	±0.6 dB
	> 3.6 GHz	±0.9 dB
Spurious Emissions, Radiated	< 1 GHz	±2.5 dB
	±2.2 dB	
Emission Bandwidth	±4 %	
Power Line Conducted Emissions	+2.9 / -4.1 dB	
Spectrum Mask Measurements	Frequency	±5 %
	Amplitude	±1.0 dB
Frequency Error		±0.6 ppm
Timing and Jitter Measurements		±2.0 ns
Frame Timing Measurements	±1.4 ppm	
Receiver Blocking Levels	±1.0 dB	
Temperature Uncertainty		±1 °C

All uncertainty values are expanded standard uncertainty to give a confidence level of 95%, based on coverage factor k=2



# 5 Test Setups

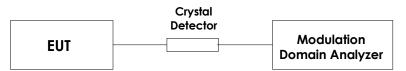
# 5.1 Frequency Measurements



#### Test Set-up 1

This setup is used for measuring Carrier frequency stability at normal and extreme temperatures.

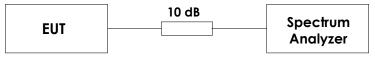
# 5.2 Timing Measurements



#### Test Set-up 2

This setup is used for measuring Frame repetition stability, Frame period and Jitter.

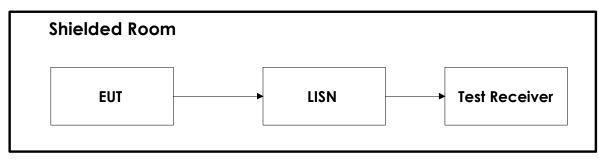
# 5.3 Conducted Emission Test



#### Test Set-up 3

This setup is used for all conducted emission tests.

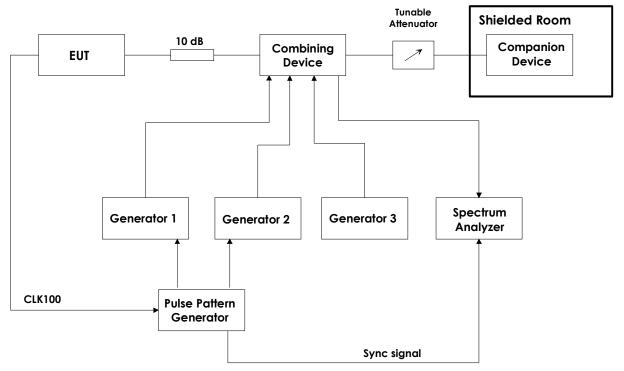
# 5.4 Power Line Conducted Emissions Test



Test Set-Up 5



# 5.5 Monitoring Tests



#### Test Set-Up 6

This test setup is used for all Monitoring and Time and Spectrum Access Procedure tests. The path loss from the signal generators to the EUT is measured with a power meter before the testing is started.

The CLK100 is used to synchronize the Pulse-/ Pattern generator to the start of the DECT frame, this signal always comes from the base station. If the EUT is a DECT Portable Part (i.e. a handset) the CLK100 signal will come from the Companion Device.

The sync signal to the Spectrum Analyzer is the CLK100 signal that is regenerated in the Pulse-/ Pattern Generator, this is used to synchronize the Spectrum Analyzer to the DECT frame when in zero span. The Pulse-/ Pattern Generator is used for tests that require time synchronized pulses or blocking of specific time slots.



# 6 Test Equipment Used

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Testhouse.

No.	Model number	Description	Manufacturer	Manufacturer Ref. no.		Cal. Due
1	FSW43	Spectrum Analyzer	Rohde & Schwarz	LR 1690	2019-01	2020-01
2	SME03	Signal generator	Rohde & Schwarz	& Schwarz LR 1238 CO		
3	SMIQ03B	Signal generator	Rohde & Schwarz	& Schwarz LR 1516 COU		
4	SMHU52	Signal generator	Rohde & Schwarz	warz LR 1240 COU		
5	53310A	Modulation Domain Analyzer	Hewlett Packard	LR 1483	2018-03	2020-03
6	81110A	Pulse-/ Pattern Generator	Agilent	LR 1725	COU	
7	8470B	Crystal Detector	Hewlett Packard	LR 1207	N/A	
8	6810.17B	Attenuator	Suhner	Suhner LR 1669		
9	S212DS	RF Switch	Narda	Narda LR 1244		
10	745-69	Step Attenuator	Narda	a LR 1442 N/		
11	WE 1506A	Power Splitter	Weinchel	LR 244	COU	
12	WE 1506A	Power Splitter	Weinchel LR 245		COU	
13	H-9	Hybrid	Anzac	LR 86	COU	
14	H-9	Hybrid	Anzac	Anzac LR 257		
15	ENV216	Two Line V-Network	Rohde & Schwarz	LR 1665	2017-11	2019-11
16	ESCI3	Measuring Receiver	Rohde & Schwarz	N-4259	2017-10	2019-10
17	6812B	AC Power Source	Agilent	Agilent LR 1515 CC		
18	Model 87 V	Multimeter	Fluke	Fluke LR 1597 201		2020-02
19	87H35-1	Circulator	Racal-MESL	Racal-MESL s.no.: 140 N/A		
20	87H35-1	Circulator	Racal-MESL	Racal-MESL s.no.: 141 N/A		
21	87H35-1	Circulator	Racal-MESL	Racal-MESL s.no.: 142 N/A		
22	U2000A	Average Power Sensor	Agilent	LR 1523	2019-03	2020-03
23	FSU26	Spectrum Analyzer	Rohde & Schwarz	LR 1504	2018-01	2020-01

COU = Calibrate on Use

The software listed below has been used for one or more tests.

No.	Manufacturer	Name	Version	Comment
1	Rohde & Schwarz	EMC32	10.30.10	Power Line Conducted test software
2	Rohde & Schwarz	EMC32	10.30.10	Radiated Emission test software
3	Rohde & Schwarz	GPIBShot	2.7	Screenshots from R&S Spectrum Analyzers
4	Agilent	Intuitlink Data Capture	2.1.0	Screenshots from HP 53310A

# **Revision history**

Version	Date	Comment	Sign
1.0	2019-05-28	First edition	FS