Testing data FCC Part 2.1049 and RSS-Gen, 6.6 Occupied bandwidth FCC Part 2, RSS-Gen, Issue 4



Keysight Spectrum Analyzer - Occupied BW				
enter Freg 2.145000000	Clua	SENSE:INT A	LIGN AUTO	11:24:18 AM Jul 10, 2017 Radio Std: None
enter Freq 2.145000000	GHZ	Trig: Free Run	Avg Hold:>100/100	Radio sta: None
	#IFGain:Low	#Atten: 6 dB		Radio Device: BTS
0 dB/div Ref 50.00 dBm				
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- A				
00				
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0.0				
<sup>10</sup>				· · · · · · · · · · · · · · · · · · ·
0.0				
enter 2.145 GHz				Span 15 MH
Res BW 51 kHz		#VBW 150 kH	z	Sweep 7.133 m
Occupied Bandwidth		Total Power	48.7 dBm	
	344 MHz			
0.3	544 MITZ			
Transmit Freq Error	7.092 kHz	% of OBW Power	r 99.00 %	
x dB Bandwidth	9.357 MHz	x dB	-26.00 dB	
	and an end		STATUS	
G 💐 File <obw 10="" a="" mhz="" mid="" q<="" td=""><td>.png&gt; saved</td><td></td><td>100 STATUS</td><td></td></obw>	.png> saved		100 STATUS	

Keysight Spectrum Analyzer - Occupied BW RF 50 Q DC		SENSE:INT ALI	SN AUTO	11:24:42 AM Jul 10, 201
enter Freg 2.175000000	GHz	Center Freq: 2.175000000	GHz	Radio Std: None
	#FGain:Low	Trig: Free Run #Atten: 6 dB	Avg Hold:>100/100	Radio Device: BTS
0 dB/div Ref 50.00 dBm				<u>.</u>
0.0				
30.0				
20.0				<u>ــــــــــــــــــــــــــــــــــــ</u>
0.0				
1.00				
0.0				
0.0				
0.0				
0.0				
enter 2.175 GHz Res BW 51 kHz		#VBW 150 kHz		Span 15 MH Sweep 7.133 m
Occupied Bandwidth	1	Total Power	48.6 dBm	•
8.9	264 MHz			
Transmit Freq Error	2.598 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	9.331 MHz	x dB	-26.00 dB	
			1	
ia.			STATUS	

Figure 8.5-11: Occupied bandwidth, QPSK, 510 MHz, Port B, Mid channel

Keysight Spectrum Analyzer - Occupied BW RF 50 Ω DC			SN AUTO	11:26:09 AM Jul 10, 201
pan 20.000 MHz	#FGain:Low	Center Freq: 2.117500000 Trig: Free Run #Atten: 6 dB	GHz Avg Hold:>100/100	Radio Std: None Radio Device: BTS
0 dB/div Ref 50.00 dBm				
og 0.0				
0.0				
0.0				
0.0				
0.0				
0.0				
0.0				
0.0				
enter 2.118 GHz Res BW 51 kHz		#VBW 150 kHz		Span 20 MH Sweep 9.533 m
Occupied Bandwidth	1	Total Power	48.5 dBm	
	.386 MHz			
Transmit Freq Error	7.521 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	13.92 MHz	x dB	-26.00 dB	
			STATUS	

Figure 8.5-13: Occupied bandwidth, QPSK, 15 MHz, Port A, Low channel

Figure 8.5-12: Occupied bandwidth, QPSK, 10 MHz, Port B, High channel

Keysight Spectrum Analyzer - Occupied BW				
enter Freg 2.145000000	GHz	SENSE:INT ALIO	SN AUTO GHz	11:27:21 AM Jul 10, 2017 Radio Std: None
enter Pred 2. 145000000		Trig: Free Run	Avg[Hold:>100/100	
	#FGain:Low	#Atten: 6 dB		Radio Device: BTS
0 dB/div Ref 50.00 dBm				
0.0				
0.0				
00				
- <i>f</i>				
0.0				
0.0				
0.0				human
0.0				
enter 2.145 GHz				Span 20 MH
Res BW 51 kHz		#VBW 150 kHz		Sweep 9.533 m
Occupied Bandwidth	1	Total Power	48.5 dBm	
13	.389 MHz			
Transmit Freq Error	5.365 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	13.91 MHz	x dB	-26.00 dB	
G 🜙 File <obw 15="" b="" mhz="" mid="" q<="" td=""><td>0004 nng&gt; saved</td><td></td><td>STATUS</td><td></td></obw>	0004 nng> saved		STATUS	

Figure 8.5-14: Occupied bandwidth, QPSK, 15 MHz, Port A, Mid channel

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Keysight Spectrum Analyzer - Occupied BW				
enter Freq 2.172500000 0	21/2	SENSE:INT AL Center Freq: 2.17250000	IGN AUTO	11:27:57 AM Jul 10, 2017 Radio Std: None
enter Freq 2.172500000 (		Trig: Free Run	Avg Hold:>100/100	
	#FGain:Low	#Atten: 6 dB		Radio Device: BTS
I0 dB/div Ref 50.00 dBm				
Log				
40.0				
30.0				n-marked
20.0				
10.0				
100 /				
10.0				
20.0				
0.0				
40.0				
Center 2.173 GHz				Span 20 MH
Res BW 51 kHz		#VBW 150 kH	z	Sweep 9.533 m
Occupied Bandwidth		Total Power	48.3 dBm	
13.	383 MHz			
Transmit Freq Error	1.728 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	13.88 MHz	x dB	-26.00 dB	
5G			<b>STATUS</b>	
14			Convine Convine	

Figure 8.5-15: Occupied bandwidth, QPSK, 15 MHz, Port A, High channel

Keysight Spectrum Analyzer - Occupied BW RF 50 Q DC		SENSE:INT ALI	SN AUTO	11:27:10 AM Jul 10, 201
enter Freq 2.145000000	GHz #FGain:Low	Center Freq: 2.145000000		Radio Std: None Radio Device: BTS
0 dB/div Ref 50.00 dBm				
0.0				
0.0				
0.0				
0.0				
0.0				
0.0				
enter 2.145 GHz Res BW 51 kHz		#VBW 150 kHz		Span 20 MH Sweep 9.533 m
Occupied Bandwidth	1	Total Power	48.8 dBm	
13	.385 MHz			
Transmit Freq Error	2.307 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	13.89 MHz	x dB	-26.00 dB	
-			1	
96		1	STATUS	

Figure 8.5-17: Occupied bandwidth, QPSK, 15 MHz, Port B, Mid channel

Keysight Spectrum Analyzer - Occupied BV	1			
pan 20.000 MHz		SENSE:INT // Center Freq: 2.1175000	ALIGN AUTO	11:26:26 AM Jul 10, 2017 Radio Std: None
	#FGain:Low		Avg Hold:>100/100	Radio Device: BTS
0 dB/div Ref 50.00 dBn	n			
40.0				
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0.0				++
0.0				
enter 2.118 GHz				Span 20 MH
Res BW 51 kHz		#VBW 150 kH	lz	Sweep 9.533 m
Occupied Bandwidt	h	Total Power	48.7 dBm	
13	8.381 MHz			
Transmit Freq Error	6.080 kHz	% of OBW Powe	r 99.00 %	
x dB Bandwidth	13.87 MHz	x dB	-26.00 dB	
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Figure 8.5-16: Occupied bandwidth, QPSK, 15 MHz, Port B, Low channel

Keysight Spectrum Analyzer - Occupied RF 50 Ω DC Center Freq 2.17250000		SENSE:INT ALI Center Freq: 2.172500000	GN AUTO	11:28:13 AM Jul 10, 201 Radio Std: None
center Freq 2.17250000	#FGain:Low		Avg Hold:>100/100	Radio Device: BTS
0 dB/div Ref 50.00 dE	3m			
40.0				
30.0				
20.0				
10.0				
10.0				
20.0				
0.0				
40.0				
Center 2.173 GHz Res BW 51 kHz		#VBW 150 kHz	:	Span 20 MH Sweep 9.533 m
Occupied Bandwid	ith	Total Power	48.6 dBm	
1	3.380 MHz			
Transmit Freq Error	-341 Hz	% of OBW Power	99.00 %	
x dB Bandwidth	13.90 MHz	x dB	-26.00 dB	
sg			STATUS	

Figure 8.5-18: Occupied bandwidth, QPSK, 15 MHz, Port B, High channel

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Keysight Spectrum Analyzer - Occupied BW				
pan 25.000 MHz		SENSE:INT AL Center Freq: 2.12000000	IGN AUTO	11:29:23 AM Jul 10, 201 Radio Std: None
part 25.000 MHZ		Trig: Free Run	Avg Hold:>100/100	
	#FGain:Low	#Atten: 6 dB		Radio Device: BTS
dB/div Ref 50.00 dBm				
<b>og</b>				
0.0				
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00 J				
10				
10				
1.0				
enter 2.12 GHz				Span 25 MH
Res BW 51 kHz		#VBW 150 kH	z	Sweep 11.93 m
Occupied Bandwidth		Total Power	48.4 dBm	
17.	836 MHz			
Transmit Freq Error	8.375 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	18.45 MHz	x dB	-26.00 dB	
	10.10 11112		20100 02	
			AL 1	
G			<b>STATUS</b>	

Keysight Spectrum Analyzer - Occupied BW RF 50 Ω DC		SENSE:INT AL	GN AUTO	11:30:58 AM Jul 10, 2017
enter Freq 2.170000000 G	Hz #FGain:Low	Center Freq: 2.17000000		Radio Std: None Radio Device: BTS
0 dB/div Ref 50.00 dBm				
0.0				
			****	
00				
10 /				- \
0				
1.0				
enter 2.17 GHz Res BW 51 kHz		#VBW 150 kHz	:	Span 25 MH Sweep 11.93 m
Occupied Bandwidth		Total Power	48.3 dBm	
17.8	35 MHz			
Transmit Freq Error	2.140 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	18.49 MHz	x dB	-26.00 dB	
S 🕹 File <obw 20="" b="" high="" mhz="" q<="" td=""><td>0012.png&gt; saved</td><td></td><td>to status</td><td></td></obw>	0012.png> saved		to status	

Figure 8.5-21: Occupied bandwidth, QPSK, 20 MHz, Port A, High channel

Keysight Spectrum Analyzer - Occupied BW RF 50 Ω DC			LIGN AUTO	11:29:58 AM Jul 10, 201
enter Freq 2.145000000 G	Hz	Center Freq: 2.14500000 Trig: Free Run	0 GHz Avg Hold:>100/100	Radio Std: None
	#FGain:Low	#Atten: 6 dB		Radio Device: BTS
0 dB/div Ref 50.00 dBm				
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enter 2.145 GHz				Span 25 MH
Res BW 51 kHz		#VBW 150 kH	Iz	Sweep 11.93 m
Occupied Bandwidth		Total Power	48.5 dBm	
	831 MHz			
17.0				
Transmit Freq Error	4.225 kHz	% of OBW Powe	r 99.00 %	
x dB Bandwidth	18.46 MHz	x dB	-26.00 dB	
a			<b>E</b> STATUS	
			<b>v</b>	

Figure 8.5-20: Occupied bandwidth, QPSK, 20 MHz, Port A, Mid channel

Keysight Spectrum Analyzer - Occupied BW RF 50 Ω DC		SENSE:INT AL	IGN AUTO	11:29:03 AM Jul 10, 201			
pan 25.000 MHz	#FGain:Low	Center Freq: 2.12000000 Trig: Free Run #Atten: 6 dB	Radio Std: None Radio Device: BTS				
0 dB/div Ref 50.00 dBm							
40.0							
30.0							
20.0							
0.0							
0.00							
0.0							
200							
40.0							
enter 2.12 GHz				Span 25 MH			
Res BW 51 kHz		#VBW 150 kHz	z	Span 25 MH Sweep 11.93 m			
Occupied Bandwidth	1	Total Power	48.8 dBm				
17.	.841 MHz						
Transmit Freq Error	8.998 kHz	% of OBW Power	99.00 %				
x dB Bandwidth	18.47 MHz	x dB	-26.00 dB				
9G			<b>K</b> STATUS				

Figure 8.5-22: Occupied bandwidth, QPSK, 20 MHz, Port B, Low channel

Testing data FCC Part 2.1049 and RSS-Gen, 6.6 Occupied bandwidth FCC Part 2, RSS-Gen, Issue 4



50 Q								
	UUU CH	7	SENSE:INT Center Freq:	2.145000000	GN AUTO GHz	R	11:30:13 adio Std: N	AM Jul 10, 201
	000 011		Trig: Free R	un	Avg Hold:>100/			
		#FGain:Low	#Atten: 6 dB			R	adio Devic	e: BTS
Ref 50.00	dBm							
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	+						1	
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1	+							
	+		++				-	
CH7	-						Sr	an 25 MH
KHz			#VBV	V 150 kHz				11.93 n
Bandw	idth		Total Po	wer	48.8 dBm			
		43 MHz						
req Erro	r	6.356 kHz	% of OB	W Power	99.00 %			
x dB Bandwidth 1		18.45 MHz	x dB		-26.00 dB			
/ A 20 MHz I	mid Q 001	10.png> saved			STATUS			
	GHz (Hz I Bandw Freq Error width	H Bandwidth 17.84 Freq Error width	GHz Hz Hz I Bandwidth 17.843 MHz ireq Error 6.356 kHz	GHz #VBV GHz #VBV I Bandwidth Total Po 17.843 MHz Freq Error 6.356 kHz % of OB width 18.45 MHz x dB	GHz (Hz HZ H Bandwidth 17.843 MHz Freq Error 6.356 kHz % of OBW Power 18.45 MHz x dB	GHz         #VEW 150 kHz           GHz         #VEW 150 kHz           I Bandwidth         Total Power         48.8 dBm           17.843 MHz         *of OBW Power         99.00 %           width         18.45 MHz         x dB         -26.00 dB	GHz         #VEW 150 kHz           GHz         #VEW 150 kHz           It Bandwidth         Total Power         48.8 dBm           17.843 MHz         Freq Error         6.356 kHz         % of OBW Power         99.00 %           width         18.45 MHz         x dB         -26.00 dB	GHz         #VBW 150 kHz         Sp           GHz         #VBW 150 kHz         Sp           GHz         #VBW 150 kHz         Sweep           I Bandwidth         Total Power         48.8 dBm           17.843 MHz         Sreq Error         6.356 kHz         % of OBW Power         99.00 %           width         18.45 MHz         x dB         -26.00 dB         -26.00 dB

Figure 8.5-23: Occupied bandwidth, QPSK, 20 MHz, Port B, Mid channel

Keysight Spectrum Analyzer - Occ				
enter Freg 2.17000		SENSE:INT A	D GHz	11:30:41 AM Jul 10, 201 Radio Std: None
enter Freq 2. 17000	#FGain:Low		Avg(Hold:>100/100	Radio Device: BTS
0 dB/div Ref 50.00	) dBm			
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0.0 /				1
0.0				
0.0				
enter 2.17 GHz Res BW 51 kHz		#VBW 150 kH	z	Span 25 MH Sweep 11.93 m
Occupied Band	width	Total Power	48.7 dBm	
	17.844 MHz			
Transmit Freq Erre	or 1.322 kHz	% of OBW Power	r 99.00 %	
x dB Bandwidth	18.49 MHz	x dB	-26.00 dB	
a			<b>STATUS</b>	

Figure 8.5-24: Occupied bandwidth, QPSK, 20 MHz, Port B, High channel



### 8.6 RSS-Gen, 7.1.3 Receiver conducted limits

#### 8.6.1 Definitions and limits

If the receiver has a detachable antenna of known impedance, an antenna-conducted spurious emissions measurement is permitted as an alternative to radiated measurement. However, the radiated method of Section 7.1.2 is preferred.

The antenna-conducted test shall be performed with the antenna disconnected and with the receiver antenna terminals connected to a measuring instrument having equal impedance to that specified for the antenna.

The receiver-spurious emissions measured at the antenna terminals by the antenna-conducted method shall then comply with the following limits:

Receiver-spurious emissions at any discrete frequency shall not exceed 2 nW in the band 30-1000 MHz, nor 5 nW above 1000 MHz.

#### 8.6.2 Test summary

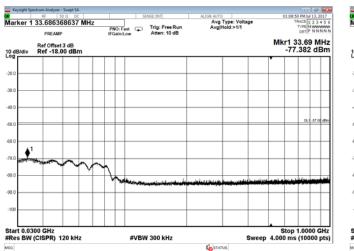
Test date	July 13, 2017	Temperature	22 °C
Test engineer	Andrey Adelberg	Air pressure	1009 mbar
Verdict	Pass	Relative humidity	33 %

### 8.6.3 Observations, settings and special notes

Spectrum analyzer settings:

Detector mode	Peak
Resolution bandwidth	120 kHz (below 1 GHz), 1 MHz (above 1 GHz)
Video bandwidth	RBW × 3
Trace mode	Max Hold

### 8.6.4 Test data



*Figure 8.6-1: Receiver spurious emissions at port A, below 1 GHz* 

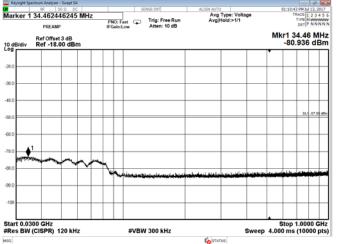


Figure 8.6-2: Receiver spurious emissions at Port B, below 1 GHz

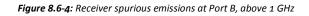
Section 8Testing dataTest nameRSS-Gen, 7.1.3 Receiver conducted limitsSpecificationRSS-Gen, Issue 4



	ectrum Analyzer - Swept SA												6
2	RF 50 Ω DC		SENSE:1	NT		ALIGN A					01	:13:37 PM Ju	13, 2017
Display	Line -53.00 dBm	PNO: Fas	t 😱 Tri	g: Free Ru	n	Á	vg Ty	pe: v d:>1/	onago 1	•		TYPE	23456
	PREAMP	IFGain:Lo	w At	ten: 24 dB									NNNN
10 dB/div	Ref Offset 3 dB Ref -18.00 dBm									N		8.732 63.083	
- <sup>og</sup>													
28.0													_
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	and a set as a												
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98.0													
-108													
Start 1.00	GHZ (CISPR) 1 MHZ		#VBW 3.0	MHz					s	ween	35.33	top 22.0 ms (100	00 GHz
isg	(oron ty Think					ri-	STATUS	_		neep	00.00		oo pro
						-0							

ure 8.6-3: Receiver spurious emissions at port A, above 1 GHz
---

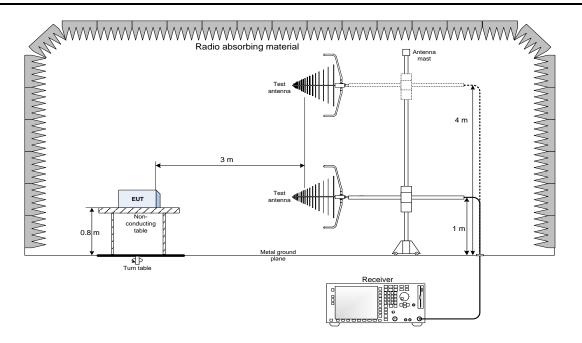
0	rum Analyzer - Swept SA RF 50 Ω DC 10 -53.00 dBm		SENSE:	NT] g: Free Ru		ALIGN A	UTO Vg Ty	pe: V	oltage		01	TRACE 1	13, 2017 2 3 4 5
	PREAMP Ref Offset 3 dB Ref -18.00 dBm	PNO: Fas IFGain:Lo		g: Free Rui ten: 24 dB	n	Ŷ	vğino	ia:>1/	1	N	1kr1 2	0.817 € 62.912	GH:
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tart 1.00 G Res BW (C	GHz CISPR) 1 MHz		#VBW 3.0	MHz					s	weep	35.33	top 22.0 ms (100	0 GH: 00 pts
a a						(h)	STATUS						



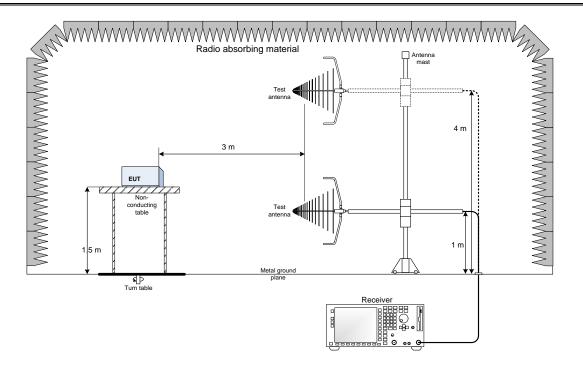


# **Section 9.** Block diagrams of test set-ups

# 9.1 Radiated emissions set-up for frequencies below 1 GHz



## 9.2 Radiated emissions set-up for frequencies above 1 GHz



Report reference ID: 334171-1TRFWL-R1



### 9.3 Conducted emissions set-up

