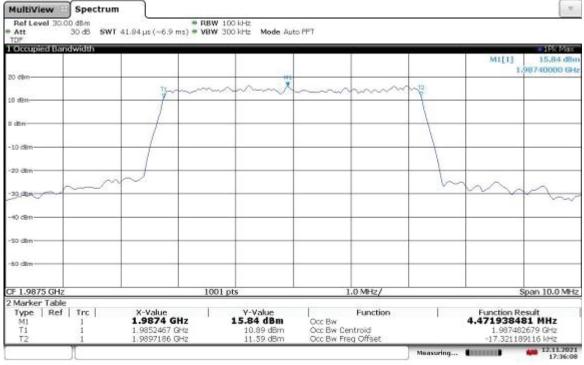
Issued: 12/03/2021 Revised: 02/07/2022

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, -10 °C



17:36:08 12.11.2021

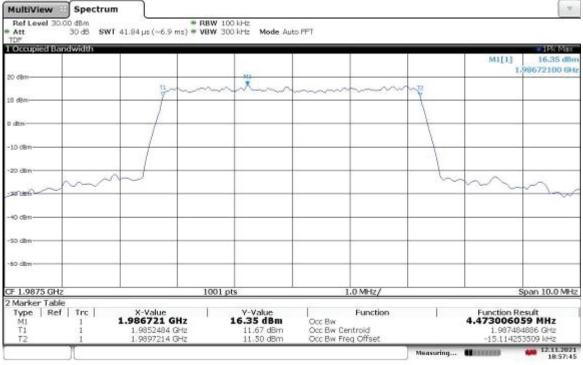
MultiView Spectrum 7 0 dBm 30 dB SWT 41.84 µs (~6.9 ms) ♥ VBW 300 kHz Ref Level 30.00 dBm Mode Auto PFT Att 1 Occupied Bandwid MILLI 16,42 dBr 8947800 GH 20 dł ŤĽ, n de -10 dB 40 dE 60 (Br Span 10.0 MHz CF 1.9875 GHz 1001 pts 1.0 MHz/ 2 Marker Table Type | Ref | Trc | X-Value 1.989478 GHz T Function Result **V-Value** Function Occ Bw Occ Bw Centroid Occ Bw Freq Offset 16.42 dBm 4.469268709 MHz 1.9852493 GHz 1.9897186 GHz 11.93 dBm 11.86 dBm 1.987483976 GHz -16.024451038 kHz T1 12.11.2021 17:50:07 Measuring.... **CO** CONTRACTOR

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, -20 °C

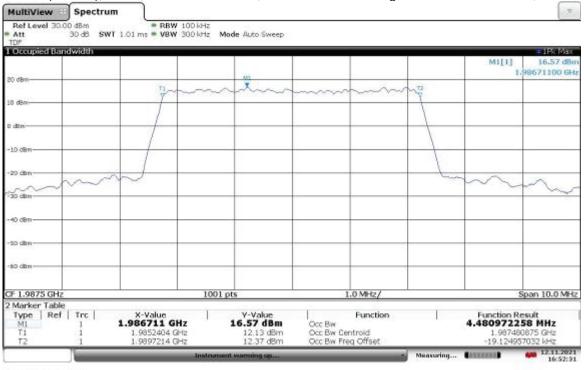
17:50:07 12.11.2021

Issued: 12/03/2021 Revised: 02/07/2022

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, -30 °C

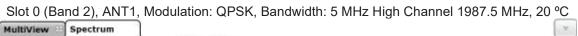


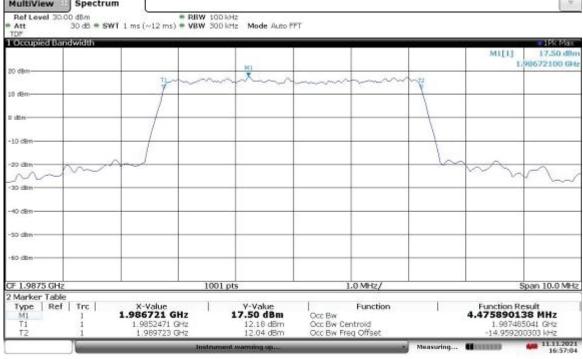
18:57:46 12.11.2021



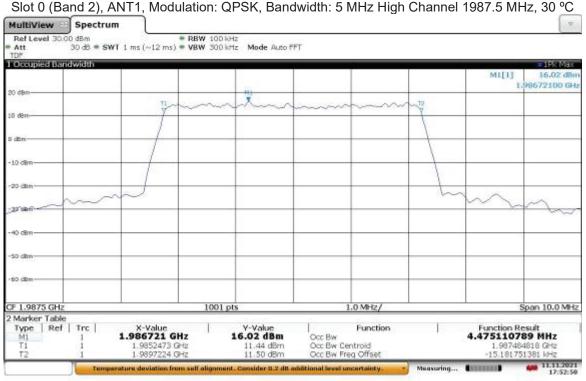
Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, 10 °C

16:52:31 12.11.2021

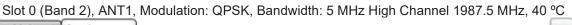


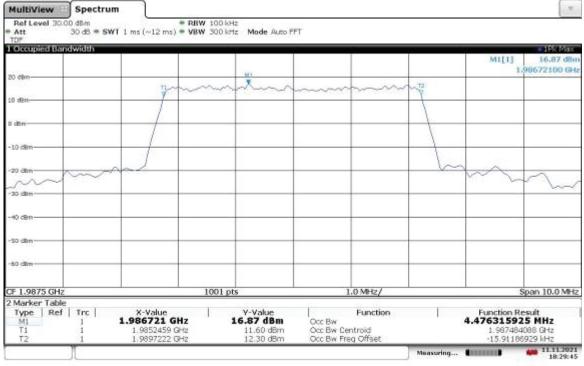


16:57:05 11.11.2021

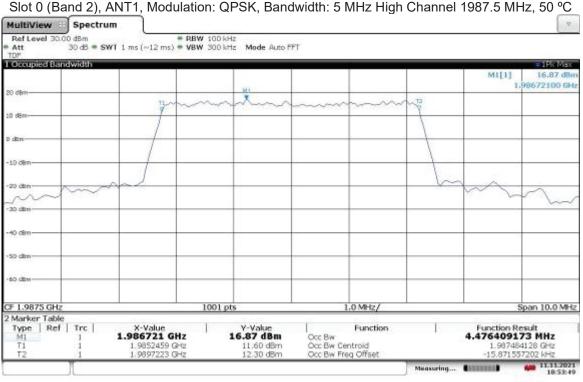


17:52:58 11.11.2021





18:29:45 11.11.2021



18:53:50 11.11.2021

Intertek									
Report Number: 104844468BOX-001	Issued: 12/03/2021								
	Revised: 02/07/2022								

MultiView	Spectrum	1								
Ref Level 30.0 Att	00 dBm 30 dB = SWT 50		 PBW 200 k VBW 1 M 		FFT					
Occupied Bar	idwidth				00				= 1Pk Max	
5-8 (* - 17.)								MI[1]	14.38 dB	
0 dBm-		n		- A . A	man	- Am	ALT?			
0 dBm-		ponto	mon	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	washing a	- and a street -	1			
dbrs										
10 dBm										
20 dbn										
30 dBm		1					La	vouse.		
m	~~~							A	m	
o'dam-		-								
in dan										
60 dBm										
F 1.94 GHz			1001 pt	5	4	4.0 MHz/			Span 40.0 MH	
Marker Table		1000			10	- <u>a</u> - <u>A</u>	100	2 34 52		
Type Ref M1 T1	1 1.9	X-Value 1.945554 GHz 1.9305673 GHz		V-Value 4.38 dBm 10.62 dBm	Occ Bw Occ Bw Ce		Function Result 18.875193796 MHz 1.940004872 GHz			
12	1	.9494425 GHz		11.30 dBm	Occ Bw Fre	eq Offset		4.87213	4252 kHz	

20:05:11 12.11.2021

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, -10 °C MultiView 🗄 Spectrum 7
 Ref Level 30.00 dBm
 RBW 200 kHz

 Att
 30 dB = SWT 500 µs (~24 ms) = VBW
 1 MHz
 Mode Auto FFT Att 1 Occupied Bandwidt TPS Max MI[1] 14,17 dBr 9485110 GHz 20 dB M1 X TI 11 D dbr -10 dB 20 di 30 (Br × 10. 40 381 50 60 (Br Span 40.0 MHz CF 1.94 GHz 1001 pts 4.0 MHz/ 2 Marker Table Type | Ref | Trc | X-Value 1.948511 GHz Function Function Result 18.870517779 MHz V-Value 14.17 dBm T Occ Bw Occ Bw Centroid Occ Bw Freq Offset T1 1.9305726 GHz 1.9494431 GHz 10.20 dBm 11.09 dBm 1.940007684 GHz 7.68426801 kHz 12.11.2021 19:47:25 Measuring....

19:47:26 12.11.2021

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, -20 °C

MultiView	Spectrur	n î								
Ref Level 30.0			= RBW 2		a series					
Att TDF	30 d8 = SW	Τ 500 μs (~24	ms) 🖝 VBW	1 MHz Mode Auto	FFT				1.	
1 Occupied Ban	dwidth				()	-			= 1Pk Max	
								M1[1]	14.47 dBn 1.9485110 GH	
20 dBm			-				N2		1,9485110 GH	
-0300-0		T1		mm		A. Mari				
10 d8m-		- Frit	when when a	and a series		a subset of Allow and			-	
D dbm		1							-	
-10 dBm										
-10 GBM		1					1			
-20 dBn		1	_				1			
		1								
-30 dBm	and						100	man	mm	
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	20.00							0.00	mon	
-90 dan							+		-	
-50 dBm										
-60 dBm										
CF 1.94 GHz			100	1 pts		4.0 MHz/			Span 40.0 MHz	
2 Marker Table	50.00 m	12.3102.50		22	545		225	80 - 380-CC	e ^{l C} or	
Type Ref MI	Trc	X-Value 1.948511 GHz		Y-Value 14.47 dBm	Occ Bw	Function		Function R		
T1	i	1.9305748	3 GHz	10.38 dBm	Occ Bw C		18.869274828 MHz 1.940009435 GHz			
T2	1	1.9494441	GHz	11.42 dBm	Occ Bw Fr	req Offset		9.4347.	27187 kHz	
	A						Measuring		12.11.2021 19:42:00	

19:42:01 12.11.2021

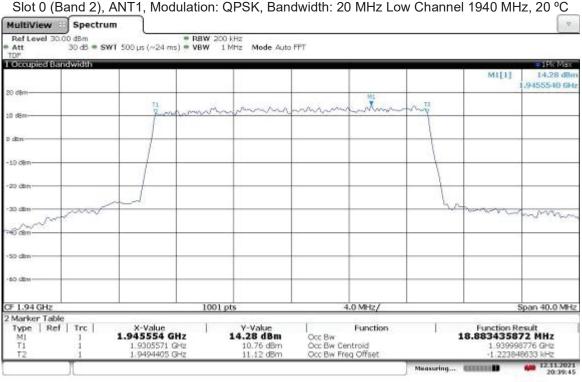
Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, -30 °C MultiView Spectrum 7 0 dBm ● RBW 200 kHz 30 dB ● SWT 500 µs (~24 ms) ● VBW 1 MHz Ref Level 30.00 dBm Mode Auto FFT Att 1 Occupied Bandwid MI[1] 14.43 dBr 9455540 GH 20 dł X 17 11 n dei -10 dB 20 d 30 GB 48 60 (Br Span 40.0 MHz CF 1.94 GHz 1001 pts 4.0 MHz/ 2 Marker Table Function Result 18.878100624 MHz Type | Ref | Trc | X-Value 1.945554 GHz V-Value 14.43 dBm Function Occ Bw Occ Bw Centroid Occ Bw Freq Offset 1.9305645 GHz 1.9494426 GHz 10.71 dBm 11.37 dBm 1.940003559 GHz 3.559454257 kHz T1 Measuring... 12.11.2021 19:04:20 110 contit.

19:04:20 12.11.2021

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, 10 °C

Ref Level 30.00 Att TDF Cocupits Hand	30 d8 = SW1	1 500 µs (~24 m	= RBW 2 s) = VBW		FFT				
TOM		1 500 ps (~24 m	s) = ¥B₩	T MILE Mode Auto	TET .				
Occupied Band	lwidth								
						-			= 1Pk Max
*******								M1[1]	13.85 dBn 1.9455540 GH
20 dBm						ML		-	-
		11		mmm	and a second		T2		
10 dBm		1 1.00	Course -				1		+
							1		
D dbrs									
		1					1		
-10 dBm								-	
		1					1		
-20 dBn		1					1		
- 30 dBm		d							
20 000	NW	1.026.0					5	moun	mm
-46 den									
No com									
-50 dbn									
100000000000000000000000000000000000000									
60 dBm									
CF 1.94 GHz			1001	l pts		4.0 MHz/		- 8	Span 40.0 MHz
2 Marker Table	11.11. Yes	20.2022-0	112	1000 and 1000	515	- m - 16	225	106 - 340-927	1990 - S
	f   Trc   X-Value 1 1.945554 GHz			V-Value 13.85 dBm		Function		Function R 8.8790610	
M1 T1	1	1.9305623.0		10.27 dBm	Occ Bw Occ Bw Ce	entroid			1863 GHz
T2	1	1.9494414 (		10.76 dBm	Occ Bw Fr				51236 kHz
	1						Measuring	COLUMN TWO IS NOT	20:18:59

20:18:59 12.11.2021



20:39:46 12.11.2021

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, 30 °C

MultiView	Spectru	n ]							
Ref Level 30.0 Att		rf 500 µs (~24 m	= RBW 2	200 kHz 1 MHz Mode Auto	FFT				
TDF		(1 500 ps ( 124 (	(s) = 1011	1 Pirts Pierce Pierce	939.				
1 Occupied Ban	idwidth								= 1Pk Max
1.1 × 1.1 × 1.1 × 1.1 × 1.1 × 1.1								MI[1]	13.68 dBm 1.9455540 GHz
20 dBm						ME			
		11		man	- ah a - an	¥	T. A.		
10 d8m-		1 100	atrener .				1	-	
							A		
D dbrs							1		-
-10 dBm-								-	
		1					1		
-20 dBn		1							
- 30 dBm		- A							
-30 GH1	$\sim\sim\sim$						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mm	mon
-40 (Bill) ~~ (Bill)									
10 0011									
-50 dbn									_
- 19/2 (01/2)									
-60 dBm									
2.585° 8.4.									
CF 1.94 GHz			100	1 pts		4.0 MHz/		-	Span 40.0 MHz
2 Marker Table		20.00000-00		- 0.00 8000	845	- a 8		206 - 344	a 1996 - 19
Type Ref	Trc	Trc X-Value		Y-Value 13.68 dBm		Function	1	Function R	
M1 T1	1	1.945554 ( 1.9305533		10.32 dBm	Occ Bw Occ Bw Ce	entroid		18.8858810	9629 GHz
T2	1	1.9494392		10.47 dBm	Occ Bw Fr				32868 kHz
	Tumps	eature deviation fr	um self align	ment. Consider 0.2 dB /	udditional level u	ncertainty.	Measuring		12.11.2021 21:00:55

21:00:55 12.11.2021

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, 40 °C MultiView Spectrum .9 
 Ref Level 30.00 dBm
 ■ RBW 200 kHz

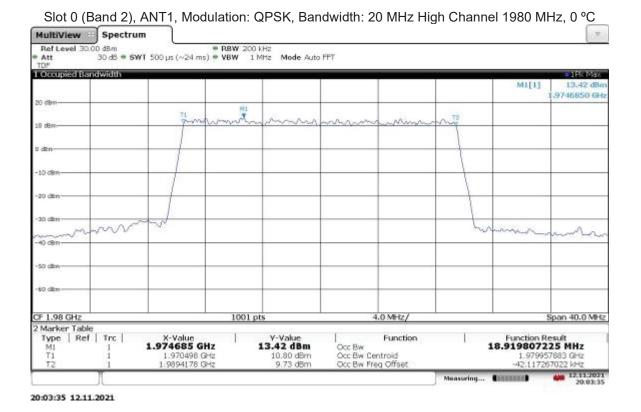
 Att
 30 dB = SWT 500 µs (~24 ms) = VBW
 1 MHz
 Mode Auto FFT 1 Occupied Bandwid MILLI 14.20 dBr 9455540 GH 20 dł 30 T1 Т n de -10 dB 20 d 30 GB my 40 08 so di 60 (Br Span 40.0 MHz CF 1.94 GHz 1001 pts 4.0 MHz/ 2 Marker Table Type | Ref | Trc | 1 Function Result 18.88904222 MHz X-Value 1.945554 GHz Y-Value 14.20 dBm Function Occ Bw Occ Bw Centroid Occ Bw Freq Offset 1.9305496 GHz 1.9494387 GHz 10.84 dBm 10.96 dBm 1.939994154 GHz -5.846177055 kHz T1 21:15:13 Measuring. turn deviation from self alig ment. Consider 0.2 dB additional level uncertainty 1001

21:15:13 12.11.2021

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, 50 °C

80 dbm     11     11     11     11     11       10 dbm     1     1     1     1     1       10 dbm     1     1     1     1     1       -10 dbm     1     1     1     1     1       -20 dbm     1     1     1     1     1       -30 dbm     1     1     1     1     1       -50 dbm     1     1     1     1     1       -50 dbm     1     1     1     1     1       -60 dbm     1     1     1     1     1       2 Marker Table     1001 pts     4.0 MHz/     Spi									Spectrum	MultiView
1 Occupied Bandwidth     MI[1]       20 dBm     II       10 dBm     II       10 dBm     III       -10 dBm     IIII       -20 dBm     IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII					FFT					Att 3
20 dbm M1[1] 10 dbm M1[1] 10 dbm M1 10 db	= 1Pk Max					STONE TO CONSIDER	6 1 AD 11 - 22		uidth	
20 dBm 10 dBm 11 11 11 11 11 11 11 11 11 11 11 11 11	13.63 dBn 0455540 GH	M1[1]							Widen	r occupied band
10 den 11 den 12	455540 GH			-		-				20 dBm
D dbn -10 dBn -20 dbn -20 dbn -20 dbn -20 dbn -30 dbn -50 d			. T2	T	348 149	CO				-2020/01
-10 dBm -20 dBm -20 dBm -20 dBm -30 dBm -30 dBm -50 dBm -50 dBm -50 dBm -50 dBm -50 dBm -50 dBm -50 dBm -20			cont .	mm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	man	mantho	Fundan		10 dBm-
-10 dBm -20 dBm -20 dBm -20 dBm -30 dBm -50								1		
-20 dbn -30 dbn -30 dbn -50			-	-						D dbrs
-20 dbn -30 dbn -30 dbn -50			1							
-20 dbm -20 dbm -50 dbm -50 dbm -50 dbm -60 dbm -60 dbm -60 dbm -1001 pts 4.0 MHz/ Spi										-10 dBm
-20 dbm -20 dbm -50 dbm -50 dbm -50 dbm -60 dbm -60 dbm -60 dbm -1001 pts 4.0 MHz/ Spi			1					1		- 00 - 00 -
-50 dbs -50 dbs -5			1					1		20 5241
-50 dbm -50 dbm -60 dbm -60 dbm -60 dbm -80		N 242 A						1		-30 dBm
-50 dbm -50 db	m	out the							~~~~	mit
•50 dbm						-				-40 cBm
•50 dbm										
CF 1.94 GHz 1001 pts 4.0 MHz/ Spi 2 Marker Table										-SD dBm
CF 1.94 GHz 1001 pts 4.0 MHz/ Spi 2 Marker Table										10.00
2 Marker Table										-bo dan
	an 40.0 MHz	5		.0 MHz/	4	ots	1001 c			CF 1.94 GHz
	26	200 - New - On 10		- 12 C		200.007		03600.00	171 Mu - 1	2 Marker Table
			· · ·	Function		Y-Value				
MI 1 1.945554 GHz 13.63 dBm Occ Bw 18.891954827 T1 1 1.9305481 GHz 9.84 dBm Occ Bw Centroid 1.93999413			1	ntroid						
T2 1 1.9494401 GHz 10.43 dBm Occ Bw Freq Offset -5.8731555										
Measuring	21:32:10	Concession of the local division of the loca	Measuring							

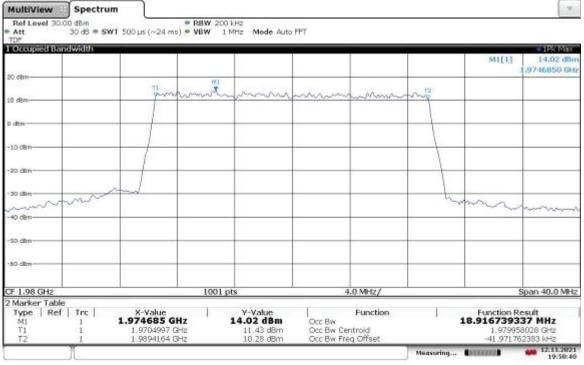
21:32:11 12.11.2021



Non-Specific Radio Report Shell Rev. December 2017Page 279 of 313Client: CommScope Technologies LLC / Model: Legacy RPM-A5A11-B02 W/ 5G NR waveform With OneCell® RP5100

Issued: 12/03/2021 Revised: 02/07/2022

# Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz High Channel 1980 MHz, -10 °C



19:50:41 12.11.2021

MultiView Spectrum 0 dBm 30 dB = SWT 500 µs (~24 ms) = VBW 1 MHz Ref Level 30.00 dBm Mode Auto FFT Att 1 Occupied Bandwid MILLI 14.27 dBr 9746850 GH 20 dł n de -10 dB 20 d 30 (B) 40 cB 60 (Br CF 1.98 GHz 1001 pts 4.0 MHz/ Span 40.0 MHz 2 Marker Table Type | Ref | Trc | Function Result X-Value 1.974685 GHz T Y-Value 14.27 dBm Function Occ Bw Occ Bw Centroid Occ Bw Freq Offset 18.919482819 MHz 1.9704953 GHz 1.9894148 GHz 11.68 dBm 10.49 dBm 1.979955037 GHz -44.963038648 kHz T1 **12 11 2021** 19:40:20 Measuring... **Externation** 

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz High Channel 1980 MHz, -20 °C

19:40:20 12.11.2021

# Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz High Channel 1980 MHz, -30 °C

MultiView	Spectrun	n								
Ref Level 30.0				BW 200		anamar.				<u></u>
Att TDP	30 d8 = SW	1 200 hs (~;	24 ms) 🖤 VB	SW 1	MHz Mode Auto	FFT				
1 Occupied Ban	dwidth			_		0				= 1Pk Max
									M1[1]	13.76 dBn 1.9746850 GH
20 dBm		-	_	181				+	-	and the boot at
		11	mour	*	mon	- 1	0.00.00	T2		
10 d8m-		1	1.00		du s way	~~~~~~		- and		
		1								
D dbm		1								
10.00		L L								
-10 dBm									1	
-20 dbn		1						1		
								1		
-30 dBm		how						+ +		
mart	m							- ×	winnin	harrow
-40 dBm		-					-	+	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
-SD dBm							-	-		
10.20										
-60 dBm										
CF 1.98 GHz				1001 p	ter :		4.0 MHz/			Span 40.0 MHz
2 Marker Table				10010			1.0 (ME 12/			open 40.0 Minz
Type   Ref	Trc	X-Value		1	V-Value	18 10	Function	1	Function R	
M1 T1	1	1.97468			13.76 dBm 11.17 dBm	Occ Bw Occ Bw Cr	introid.		18.9193220	63 MHz 57042 GHz
T2	1	1.98941			10.04 dBm	Occ Bw Fr				45144 kHz
	1							Measuring		12.11.2021
	, <u> </u>							A CONTRACTOR OF THE OWNER OF THE	Second Second Second	19:12:20

19:12:20 12.11.2021

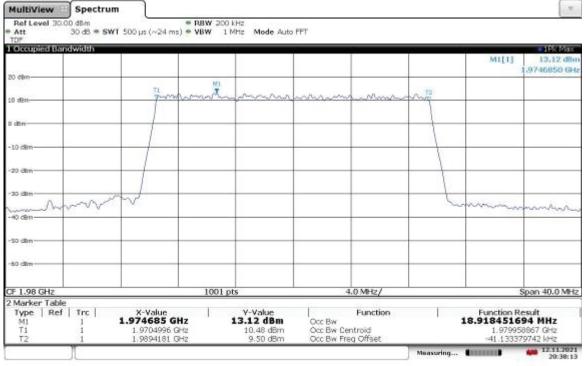


Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz High Channel 1980 MHz, 10 °C

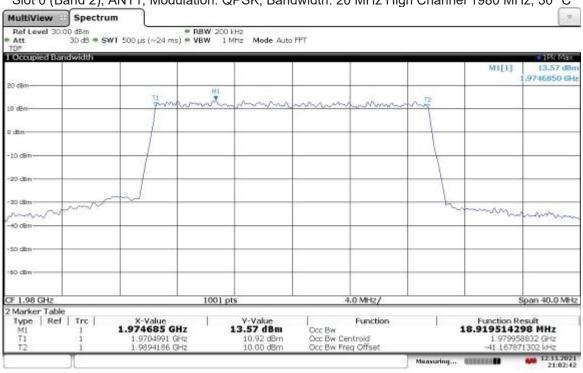
20:20:52 12.11.2021

Issued: 12/03/2021 Revised: 02/07/2022

## Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz High Channel 1980 MHz, 20 °C



20:38:13 12.11.2021



Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz High Channel 1980 MHz, 30 °C

21:02:43 12.11.2021

lssued: 12/03/2021 Revised: 02/07/2022

## Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz High Channel 1980 MHz, 40 °C

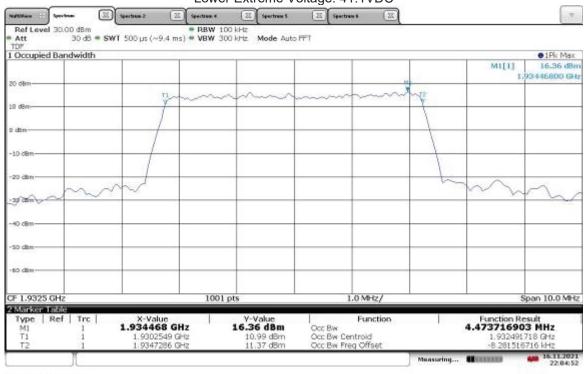
Ref Level 30.0	Spectrun	" [	= PBW 2	00 kHz					4
* Att		Ť 500 μs (~24 m		1 MHz Mode Auto	FFT				
1 Occupied Ban	dwidth				0				= 1Pk Max
								M1[1]	12.97 dBm 1.9746850 GHz
20 dBm-		-	143	1		-	-		
10 d8m-		TI They M	hann	mon	man	mm	martie .		
20 0011						-			
D dbn		1				-	1		
-10 dBm									
		1							
-20 dBn									
-30 dBm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\sim$							
-40 dBm	mo							mm	inm
10 0001									
-50 dbn							1		
-60 dBm									
CF 1.98 GHz			100	1 pts		.0 MHz/			Span 40.0 MHz
2 Marker Table	5322 W.	10.3000-0			85	- 26 - 26		105 - 3412-673	
Type   Ref M1 T1 T2	Trc   1 1	X-Value 1.974685 G 1.970501 1.9894183	GHz	Y-Value 12.97 dBm 10.33 dBm 9.41 dBm	Occ Bw Occ Bw Ce Occ Bw Fre				
	Tumps	ratura deviation fr	um self aligon	nent . Consider 0.2 dB a	dditional level ur	certainty.	Measuring	Circuit)	12.11.2021 21:13:28

21:13:28 12.11.2021

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz High Channel 1980 MHz, 50 °C MultiView Spectrum .9 0 dBm ● RBW 200 kHz 30 dB ● SWT 500 µs (~24 ms) ● VBW 1 MHz Ref Level 30.00 dBm Mode Auto FFT Att 1 Occupied Bandwid MI[1] 13.52 dBr 9746850 GH 20 dB 1.484 -10 dB 20 d 30 GB mon m 40 dB so di 60 (Br Span 40.0 MHz CF 1.98 GHz 1001 pts 4.0 MHz/ 2 Marker Table Function Result 18.912407167 MHz Type | Ref | Trc | X-Value 1.974685 GHz Function V-Value Occ Bw Occ Bw Centroid Occ Bw Freq Offset 13.52 dBm 1.9705047 GHz 1.9894171 GHz 10.86 dBm 9.96 dBm 1.979960861 GHz 39.138902311 kHz T1 12.11.2021 21:33:56 Measuring... .

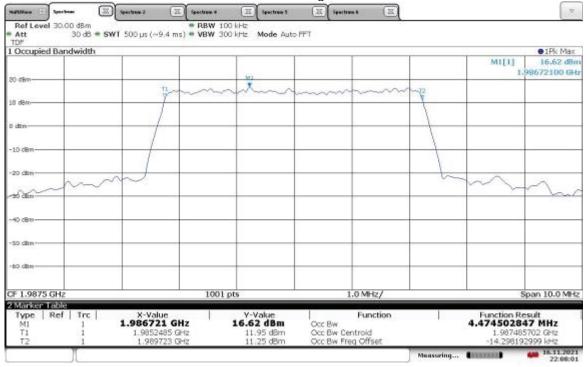
21:33:56 12.11.2021

### Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz, Low Channel, Lower Extreme Voltage: 41.1VDC



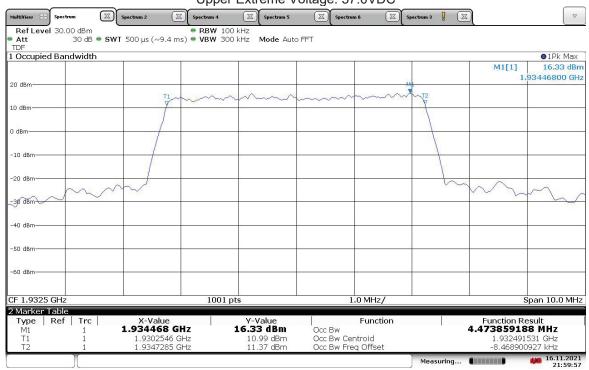
22:04:53 16.11.2021

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz, High Channel, Lower Extreme Voltage: 41.1VDC



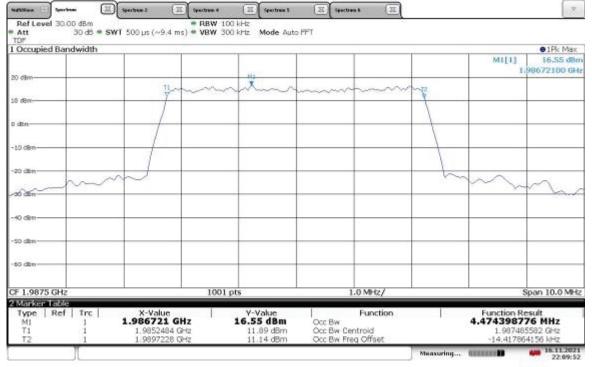
22:08:01 16.11.2021

### Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz, Low Channel, Upper Extreme Voltage: 57.0VDC



21:59:58 16.11.2021





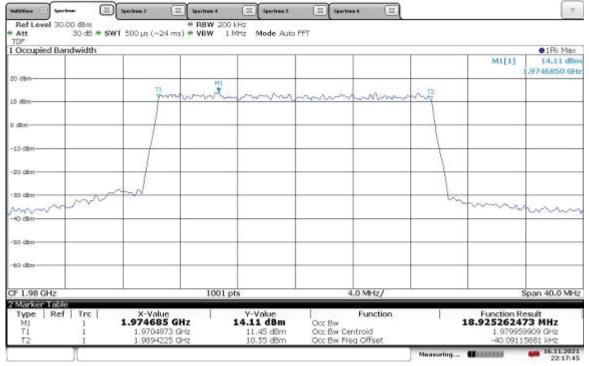
22:09:53 16.11.2021

### Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz, Low Channel, Lower Extreme Voltage: 41.1VDC

Ref Level 30. Att		1 500 µs (~24 m	● RBW 2 (a) ● VBW	00 kHz 1 MHz Mode Auto	FFT				625
TD# Occupied Bar	dwidth		Stear Charles	200 BOV - 10 GOV 200200					• 1Pk Max
or copied en	in the second seco							M1[1]	14.46 dBr
20 dBm		тл	8			n. Min	No TE		
10 d8m	-	From	wmw	monom	man	and a succession of	a rup		
dans		+ +				-			
10 dBm									
20 dBn									-
ao dan	~~~~	~						m	mm
40-clan		-						0106 548	
SD dBm									
60 dBm									
∓ 1,94 GHz			100	l pts	4	1.0 MHz/			Span 40.0 MH
Manker Table Type   Ref		X-Value		Y-Value		Function	Function Result		
M1 T1 T2	T1 1 1.9305551 GH		3-12	14.46 dBm 10.99 dBm 11.25 dBm	Occ Bw Occ Bw Ce Occ Bw Fre		-		97974 GHz 70811 kHz

22:16:41 16.11.2021

Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz, High Channel, Lower Extreme Voltage: 41.1VDC



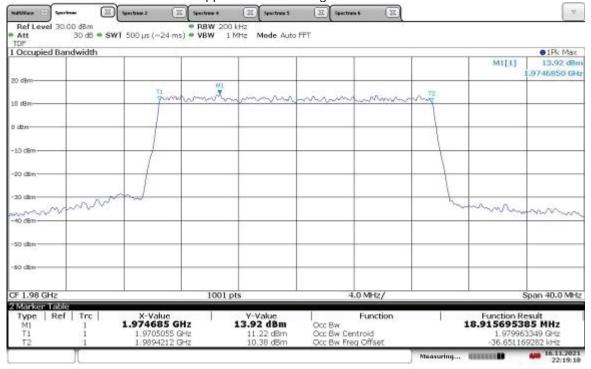
22:17:46 16.11.2021

### Slot 0 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz, Low Channel, Upper Extreme Voltage: 57.0VDC

	Spectrum	Spectrum 2	Y	Spectrum 5					
MultiView 88		Spectrum 2	Spectrum 4		Spectru	n6 🔬			Ľ
Ref Level Att	30.00 dBm	T 500 µs (~24 ms)	RBW 200 k		CCT				
TDF	30 GD 📼 344	i 500 µs (~24 ms,		m2 Mode Auto	UFF1				
1 Occupied	Bandwidth								●1Pk Max
				2				M1[1]	14.71 dBm
									1.9455540 GHz
20 dBm						M1			
		T1	mm	mana	man	minum	T2		
10 dBm		hum	man hu	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
0 dBm							+ + +		
-10 dBm									
-20 dBm									
-20 ubiii-							1		
	~	m				-	50	s z tat	
-30 dBm	m							mon	mmy
m	$\sim$								2221 221 12
-40 dBm				-		-			
-50 dBm				1	Δ	0	a		
-60 dBm									
				8	4				
CF 1.94 GH			1001 pt	5	4	.0 MHz/			Span 40.0 MHz
2 Marker T									
	Ref   Trc	X-Value 1.945554 GH		Y-Value .4.71 dBm		Function		Function R 8.8886489	
M1 T1	1	1.945554 GF		11.12 dBm	Occ Bw Occ Bw Cer	atroid	1		7726 GHz
T2	i	1.9494421 G		11.52 dBm	Occ Bw Fre				9576 kHz
	Y						Measuring	- Series	16.11.2021
L	JL						measuring		22:20:26

22:20:27 16.11.2021





22:19:19 16.11.2021

		Intertek		
Report Number: 104	4844468BOX-001			Issued: 12/03/2021 Revised: 02/07/2022
Test Personnel:	Vathana Ven	_	Test Date:	11/11/2021, 11/12,2021, 11/16/2021
Supervising/Reviewing Engineer: (Where Applicable)	Kouma Sinn 495			
	FCC Part 24 48VDC (POE)	_	Limit Applied:	See report section 10.3
Pretest Verification w/ Ambient Signals or		Am	bient Temperature:	22, 22, 23 °C
BB Source:	N/A		Relative Humidity:	41, 44,34 %
		Atm	ospheric Pressure:	1011, 1002, 1005 mbars

Deviations, Additions, or Exclusions: None

## **11** Transmitter spurious emissions

## 11.1 Method

Tests are performed in accordance with ANSI C63.26 and CFR47 FCC Parts 2.1051, 2.1053, 2.1057, and 24

### TEST SITE: EMC Lab & 10m ALSE

**The EMC Lab** has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

### Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions  $U_{lab}$  is less than the corresponding  $U_{CISPR}$  reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Report Number: 104844468BOX-001

### Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

 $\begin{array}{ll} FS = RA + AF + CF - AG \\ Where & FS = Field \ Strength \ in \ dB_{\mu}V/m \\ RA = Receiver \ Amplitude \ (including \ preamplifier) \ in \ dB_{\mu}V \\ CF = Cable \ Attenuation \ Factor \ in \ dB \\ AF = Antenna \ Factor \ in \ dB \\ AG = Amplifier \ Gain \ in \ dB \end{array}$ 

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

 $RA = 52.0 \text{ dB}\mu\text{V} \\ AF = 7.4 \text{ dB}/\text{m} \\ CF = 1.6 \text{ dB} \\ AG = 29.0 \text{ dB} \\ FS = 32 \text{ dB}\mu\text{V/m} \\ \end{cases}$ 

To convert from  $dB\mu V$  to  $\mu V$  or mV the following was used:

UF =  $10^{(NF/20)}$  where UF = Net Reading in  $\mu$ V NF = Net Reading in dB $\mu$ V

### Example:

$$\label{eq:FS} \begin{split} &\mathsf{FS} = \mathsf{RA} + \mathsf{AF} + \mathsf{CF} - \mathsf{AG} = 52.0 + 7.4 + 1.6 - 29.0 = 32.0 \\ &\mathsf{UF} = 10^{(32\ dB\mu V\,/\,20)} = 39.8\ \mu V/m \end{split}$$

Alternately, when BAT-EMC Emission Software is used, the "Level" includes all losses and gains and is compared directly in the "Margin" column to the "Limit". The "Correction" includes Antenna Factor, Preamp, and Cable Loss. These are already accounted for in the "Level" column.

## **11.2 Test Equipment Used:**

### Test equipment used for antenna port conducted test

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
CEN001'	DC-40GHz attenuator 20dB	Centric RF	C411-20	CEN001	01/22/2021	01/22/2022
CBLSHF204'	Cable, SMA - SMA, 9kHz -40GHz, (Cable Kit 5)	Huber + Suhner	Sucoflex 102EA	234714001	02/03/2021	02/03/2022
ROS005-1'	Signal and Spectrum Analyzer	Rohde and Shwartz	FSW43	100646	11/02/2021	11/02/2022
DAV005'	Weather Station	Davis	6250	MS191218083	02/07/2021	02/07/2022

### Software Utilized:

Name	Manufacturer	Version
None		

### Test equipment used for Radiated emissions

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
IW001'	2 meter cable	Insulated Wire	2801-NPS	001	09/23/2021	09/23/2022
HS003'	10m under floor cable	Huber-Schuner	10m-1	HS003	02/17/2021	02/17/2022
HS002	DC-18GHz cable 1.5M long	Huber & Suhner	SucoFlex 106A	HS002	11/25/2020	11/25/2021
PRE11`	50dB gain preamp	Pasternack	PRE11	PRE11	09/02/2021	09/02/2022
IW006`	DC-18GHz cable 8.4m long	Insulated Wire	2800-NPS	IW006	11/25/2020	11/25/2021
PRE12'	Pre-amplifier	Com Power	PAM-118A	18040117	12/07/2020	12/07/2021
145145'	Broadband Hybrid Antenna 30 MHz - 3 GHz	Sunol Sciences Corp.	JB3	A122313	06/09/2021	09/09/2022
EMC04'	ANTENNA, RIDGED GUIDE, 18-40 GHZ	EMCO	3116	2090	01/28/2021	01/28/2022
	Cable, SMA - SMA, 9kHz -40GHz, (Cable Kit					
CBLSHF204'	5)	Huber + Suhner	Sucoflex 102EA	234714001	02/03/2021	02/03/2022
145108`	EMI Test Receiver (20Hz – 40GHz)	Rohde & Schwarz	ESIB40	100209	06/22/2021	06/22/2022
PRE9'	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	09/23/2021	09/23/2022
				MS19121200		
DAV007`	Weather Station Vantage Vue	Davis	6250	3	03/22/2021	03/22/2022
ETS002'	1-18GHz DRG Horn Antenna	ETS Lindgren	3117	00143260	08/24/2021	08/24/2022
PRE10'	30-1000MHz pre-amp	ITS	PRE10	PRE10	02/17/2021	02/17/2022
ETS003'	9kHz-30MHz Active Loop Antenna	ETS Lindgren	6502	00143396	08/26/2021	08/26/2022

### Software Utilized:

Name	Manufacturer	Version
BAT-EMC	Nexio	3.18.0.16

### 11.3 Results:

The sample tested was found to Comply. Where a resolution bandwidth of less than 1 MHz was used (in some cases, 120 kHz or 100 kHz), more than 10 dB margin to the limit is shown. Since the two antenna ports transmit uncorrelated data streams and use cross polarized antennas, no adjustments to the test results were applied due to MIMO operation, per KDB 662911.

§24.238(a): The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

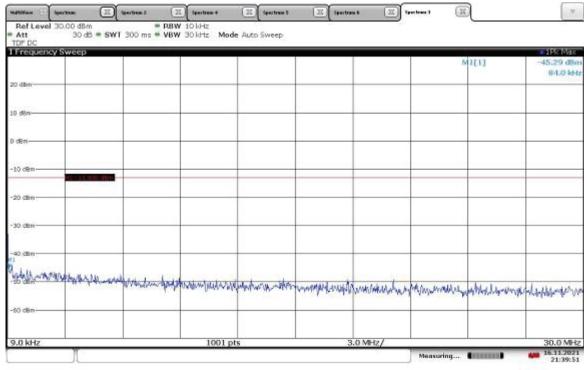
Note: All spurious emissions were tested with narrowest bandwidth and QPSK modulation settings. Since there were no emissions within 30dB of limit, and settings had ~1dB effect on peak readings, other settings were not tested and EUT was considered compliant.

# **11.4 Setup Photographs:**

Confidential – Test setup photo not included in this report

## 11.5 Plots/Data:

### Slot 0 (Band 2), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Low Channel 1932.5 MHz 9kHz-30MHz



^{21:39:52 16.11.2021} 

# Slot 0 (Band 2), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Low Channel 1932.5 MHz 30MHz-1GHz

Frequency S	weep				10				= 1Pk Max
								M1[1]	-37,68 dBr 547,950 MF
dām									
	-						· · · · · · · · · · · · · · · · · · ·		-
d8m									-
0 dBm	11 13 ID: die								
0 dBm									
i0 dBm									
0 cBm	Monafragel, the	and the section of th	Marphister	, where the second	and the approximation	the second and the	-	and constructions	***
i0 dbm									
i0 dBm			-						-

21:39:08 16.11.2021

### Slot 0 (Band 2), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Low Channel 1932.5 MHz 1-22 GHz

edtilian 🗄	Spectrum 🗵	ipertrem 2	E Spectron #	I Spectrum	s 🖂 🕯	ipectres 6 📃	Spectrum 3	22	
Ref Level Att	30.00 dBm 30 d8 = SV		VBW 1 MHz VBW 3 MHz Mo	de Auto Sweep			•	<u> </u>	
	cy Sweep								= 1Pk Max
D dBm								м1[1]	21.92 dB 1,9340 G
) d8m									
den-				-			_		
10 dBm	15 15 100 dbm	-							
20 (8)	unger warde	Justimore	about and	unglim	u Minter	ner annannanna	the second	alon for a south of the	white
30 (8m	There								
40 dBm		-		-					
50 dBm				-					
60 dBm									
.0 GHz			1001	pts		2.1 GHz/			22.0 GF
	) (						Measuring	Commit D	4 16.11.202 21:38:3

21:38:32 16.11.2021

### Slot 0 (Band 2), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Mid Channel 1960 MHz 9kHz-30MHz

	30.00 dBm		BW 10 kHz	100 Carl					
Att TDF DC	30 d8 = SV	VI 300 ms = VI	3W 30 kHz Mod	e Auto Sweep					
Frequenc	y Sweep								= 1Pk Max
								1111	-44.07 dB
20 dBm	_								1000000000
) d8m			-			-			
10 dBm	HI -13,000 dBm								
20 dBm									
30 (Bm						-			
90 dBm									
hansan	manufant	Warman	and the second	A. March . A. I	and the second			_	
					C. ALBINES, SUMMER	ane-expressions	and the second	el Marine and Andrew	indulari (ternaria)
60 dBm									
9.0 kHz			1001 p		3	.0 MHz/			30.0 MH

21:40:54 16.11.2021

# Slot 0 (Band 2), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Mid Channel 1960 MHz 30MHz-1GHz

Natilian 🗄	Spectrum	(II) Spectrum 2	E (pectres #	Spectrum 5	E Spec	ben 6 🗵	Janetran 1 (	N	
Ref Leve Att	al 30.00 dBm 30 dB	• SWT 300 ms •	RBW 100 kHz VBW 300 kHz Mo	de Auto Sweep	20		-14-C	275	54
TOP	cy Sweep					_			= 1Pk Max
i i i sospesari	ny amag							W1[1]	-36.40 dB
20 dBm							_		
						-			
) d8m									
-10 dBm		04 (Ber)							
-20 dBm									
-30 (Bm					M1	-		-	
alenter.	wheel and the second	working of the second second	provation providente mail	gunnagar-hua	- when the stranger	whenersters	and the states of the states	my dank many	harddan
50 dBm									
-60 dBm									
30.0 MHz			1001 p	ts		97.0 MHz/			1.0 GH
	1						Measuring		16.11.202 21:44:3

21:44:38 16.11.2021

# Slot 0 (Band 2), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Mid Channel 1960 MHz 1-22GHz

edtiller 🕀	Spectrum 🖂	tpectrem 2	ipectres #	E Spectrum 5	X 4	ectres 6 🕎	Spectrum 3	Ð	
Ref Leve Att	30.00 dBm 30 dB = SW	● RBY T 300 ms ● VBV	WIMHZ WISMHZ Mode	Auto Sweep					
	cy Sweep								= 1Pk Max
M15								41[1]	22,10 dBr 1,9550 GH
0 d8m-									
i den		-					-		
10 dBm		-				_			
20 cBm	umananto	henderster	down which he	- en anno 1994	when the the state	and any algebra	My and Martine May	adapped and	Harde Barder
30 dbm									
40 dBm									
50 dBm						_			
60 dBm									-
.0 GHz			1001 p	5		2.1 GHz/			22.0 GH
	J						Measuring		16.11.202 21:45:04

21:45:09 16.11.2021

### Slot 0 (Band 2), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, High Channel 1987.5 MHz 9kHz-30MHz

natifian 🗄	işerban [	() ipertree 2	(I Spectress #	Spectrum 5	I Spectra	. Z	Spectrum 3	22	
Att TDF DC	ALCONTRACTOR ON	5WT 300 ms	NBW 10 kHz VBW 30 kHz Mode	e Auto Sweep					
Frequence	cy Sweep								≠ 1Pk Max
							-	MIE13	-43,39 dBr 84.0 kH
20 dBm									84.42 89
10 d8m			8		9	-		_	
0 d8m		-							-
10 dBm							-		
		m							
-20 dBm		_				-			
30 dBm									
140 dBm							_		
hundrum	remphasister	manderine	utalaya u salasi usadas	6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					
20.001				March The na cost	washing and the	and approximately and	and the production of the prod	Aspendurmicht	rivelessmal
-60 dBm					-				
9.0 kHz			1001 pt	5	3	.0 MHz/			30.0 MH
	T.					0	Measuring	Concession in the local division of the loca	16.11.2021 21:50:47

21:50:48 16.11.2021

Slot 0 (Band 2), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, High Channel 1987.5 MHz 30MHz-1GHz

20 dbm 20	TDF	-								
10 d8m 0 d8m -10 d8m -10 d8m -20 d8m -20 d8m -30 d8m -30 d8m -30 d8m -30 d8m -30 d8m -30 d8m -40 d8	I rrequency	Sweep						h	0[1]	- 1Fx Max -37,48 dBn 535,350 MH
0 dBm 10 dBm 10 dBm 20 dBm 30 dBm 30 dBm 50 dBm 11 - 13, B021 dBm 12 - 13, B021 dBm 14 - 13, B021 dBm 15 - 14 - 14 - 14 - 14 - 14 - 14 - 14 -	20 dBm									
10 dBm 11 - 13.000 dBm 20 dBm 30 dBm 50 dBm 50 dBm										
20 dBm	) d8m	-					-			
30 clem	-10 dBm									
50 CBM	-20 dBm	-								
50 dbm	-30 dBm					н				
	White among her	egot but state	and providents	for a construction of the	highliterstrethe	on Total Warmington	anatalisati tat	antoritization	children wanter	Andrewski
60 d8n	-50 dBm			-						
	-60 dBm			-						

21:48:24 16.11.2021

### Slot 0 (Band 2), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, High Channel 1987.5 MHz 1-22GHz

eattWave 🗄	Spectrum (	ipertraw 2	Ξ	Spectrem #	Ξ	Spectrum S	X	Spectrum	. I	Spectrum 1		Ľ.	
Ref Level Att D#	30.00 dBm 30 dB =	<b>SWT</b> 300 ms	<ul> <li>RBW 1</li> <li>VBW 3</li> </ul>		e Auto S	weep		0				3-0	
Frequenc	y Sweep			_									= 1Pk Max
N1											M	1[1]	23.20 dB 1.9760 G
) d8m					-						_		
dBrs.					-			_		-	-		
10 dBm		21						_			_		
20 cBri Maryle Paralar	we work	inthermore	united to	Manutak	Kichilo	rentlynner	numb	laway A	to complexity	- And Anna	علمك	canotech	algorige and the
40 dBm					-			_			_		
so dan	-							_			-		
60 dBm					-			_					
.0 GHz				1001 p	ts			2	1 GHz/				22.0 GH
OT L	),			1001 p					a shing	Measuring	1	annua a	16.11.202 21:47:4

21:47:45 16.11.2021

### Slot 0 (Band 2), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Low Channel 1932.5 MHz 9kHz-30MHz

natifian 🕀	iperitam (	ipectrem 2	(I Spectron #	🖂 Spectrum 5	I Spectrum 6	Spectrum 1	22	
Att TDF DC		<b>SWT</b> 1.96 ms (	= RBW 1 ∼39 ms) = VBW 3		PET .	_		
Frequen	cy Sweep						المحمد معدينا المح	= 1Pk Max
							M1[1]	-43,10 dBr 84.0 kH
20 dBm								
					· ·			
0 d8m					-			
-10 dBm								
-20 dBm								
-30 dBm								
AD dBn		_		-				
-50 dBm	in the point in the same	antermont	Andrabethere and enque	water southing and	maluer and part		tudodanowani	Angrad Maranta again
-60 dBm				_				
9.0 kHz			1001	pts	3.0 N	Hz/		30.0 MH
	T					Measurin	g <b>W</b> ARANA	16.11.2021 21:34:28

### 21:34:28 16.11.2021

# Slot 0 (Band 2), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Low Channel 1932.5 MHz 30MHz-1GHz

TDF									
Frequency Sv	veep							M1[1]	= 1Pk Max -43,54 dBr 982,070 MH
0 dBm									
-m5b 0									
) d8m								-	
-10 dBm	1-11.00 dbm								
20 dBm									
30 dbn									
40 dBm									
boldernillendriste	and in the second	dan de ser an	han have	ad white baland	anonimuch	whentheman	wheenworkin	helinan likeli	manufacture
-60 dBm								-	
						07.0 MHz/			

21:36:31 16.11.2021

### Slot 0 (Band 2), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Low Channel 1932.5 MHz 1-22GHz

1411Viau	iperitam 🖂	Spectres 2	(I Spectram #	Spectrum 5	(III) 544	ectron 6 🔤	Spectrue 1	3)	
Ref Leve Att DF	1 30.00 dBm 30 dB = SW	● Pd 1 300 ms ● VI	BW 1 MHz BW 3 MHz Mod	e Auto Sweep				<u>.</u>	
	cy Sweep								= 1Pk Max
M1								M1[1]	23.67 dB/ 1.9340 GF
nsb (		_		-	2				
d8m-			_						
10 dBm						_	-		
20 cer	and and the	Unenementer	and	away we do no	hormould	American	an part Marine	montheather	and all and a start of the star
90 dBm									
40 dBm									
50 dBm									
60 dBm						-			
.0 GHz			1001 g	ts		2.1 GHz/		1	22.0 GH
	Л						Measuring	(Street)	16.11.202 21:37:5

21:37:57 16.11.2021

### Slot 0 (Band 2), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Mid Channel 1960 MHz 9kHz-30MHz

TDF DC	30 d8 = \$1	WT 300 ms 🖷 VB	W 30 kHz Mod	e Auto Sweep					
TEP DC	v Sween					-			= 1Pk Max
								w1[1]	-54.71 dBr 30.0000 MH
20 dBm	_	-							
10 d8m		-	a					-	-
) d8m									
-10 dBm	41-15.005 dbr								
20 dBm							-		
30 (Bm									
40 dBm	_								
WWW.hyth	hundustainen	Profilestation	Anital Anithmation	a	Tube on a dout a				
-60 dBm			a dompar		ole i Al al Roberto	an multiple of	hday ( Alasan Alada an	section and a section of the section	nmeselen n
Sec Upon									
9.0 kHz			1001 pt	<b>e</b>		3.0 MHz/			30.0 MH

21:43:28 16.11.2021

# Slot 0 (Band 2), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Mid Channel 1960 MHz 30MHz-1GHz

Natifican 🖽	Spectrum	E spectree 2	(II) Spectron #	E Spectrum 5	I Spect	nat 🖾	Spectrum 3	8	
Ref Leve Att	il 30.00 dBm 30 dB	• SWT 300 ms •	NBW 100 kHz NBW 300 kHz Mo	de Auto Sweep	120			273	
Frequen	cy Sweep				(A)				<ul> <li>IPk Max</li> </ul>
								M1[1]	-36.42 dB
0 dBm						-			
						-			
) d8m						-	-		-
-10 dBm							_	-	
-20 dBm	-								
-30 (Bm									
RATI	mana		and an and the same rate	gerettineralain	Mary and and		-	an and the second	and the second
-50 dBm									
-60 dBm									
30.0 MHz			1001 p	ts		97.0 MHz/			1.0 GH
	T		100				Measuring	and in case of the local division of the loc	16.11.202 21:44:1

21:44:13 16.11.2021

# Slot 0 (Band 2), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Mid Channel 1960 MHz 1-22GHz

ultifiere	iperitam 🖂	Spectrum 2		ectasa #	Spectrum !		Spectrum 6	2	Spectrum 3	M)	
Ref Level Att	30.00 dBm 30 dB = SW		PBW 1 M VBW 3 M		Auto Sweep						
Frequenc	y Sweep			_							# 1Pk Mar
D dBm										M1[1]	23.52 dB 1,9550 G
dem		_		2			-				-
18 mi	-	-									-
0 dB n	all as the direct	-	_			_	-		-		
o dan	manner	Canadad	general state	hand	when which a share a sh	and such made	does the	hopener	mandanak	and the second and	
o dBm							_				
D dBm						-	+				
0 dBm							-				
.0 GHz				1001 pts	8		2.1 G	Hz/			22.0 GF
	),								Measuring	. Cimmil	16.11.202 21:45:3

21:45:40 16.11.2021

### Slot 0 (Band 2), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, High Channel 1987.5 MHz 9kHz-30MHz

HallWave 🕀	iperteam 🗵	jestus 2	E Spectres #	Spectrum 5	E Spects	mt 🗵	Spectrum 3		
Ref Leve Att TDF DC	1 30.00 dBm 30 dB = \$1	● Ra WT 300 ms ● VE	BW 10kHz BW 30kHz Mod	e Auto Sweep					
Frequen	cy Sweep				0.0				= 1Pk Max
								A1[1]	-45.72 dBn 354.0 kH
20 dBm						-			and the second second
10 d8m									
0 d8m			-				-		
-10 dBm									
-20 cBm							-		
-30 dBm	-					-			
-40 dBm		_	-				_		
Jan Martin	HUNDU - Arapaton	Mintakay	here have the de week of	achtereser	and the same	an was ha	moderation		
-60 dBm				A THE WEIT COM	and be added	uhun Abasel Yulke	understreet and the second	an survey and the	edan paparan pa
9.0 kHz			1001 p	ts	2	3.0 MHz/			30.0 MHz
	1						Measuring	Colona and	16.11.2021 21:49:53

21:49:53 16.11.2021

Slot 0 (Band 2), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, High Channel 1987.5 MHz 30MHz-1GHz

TDF	Powerow					_		-	
Frequency	sweep							41[1]	= 1Fx Max -36,82 dBr 998,550 MH
20 dBm						-			
			.e						
d815		-	-				-		-
-10 dBm	41-15.000 dbm								
-20 dBm									
-30 dBm			4 <u>.</u>		-				-
Contractory of the	petrolan Arriva	a habiddan	utersouthy and served	444 Marine	www.washrow	monuture	manut	magut mar phone	Murphine propher
50 dBm									
-60 dBm							-		-
30.0 MHz			1001 p			7.0 MHz/			1.0 GF

21:49:07 16.11.2021

### Slot 0 (Band 2), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, High Channel 1987.5 MHz 1-22GHz

adtilian 🖂	iperitam 🗵	Spectrum 2	(I) Spectress #	🖾 Spectrum S	X 4	rectrem 6 🗵	Spectrum 3	(X)	
Ref Leve Att	30.00 dBm 30 dB = SW	₩ 1 300 ms ₩ V	BW 1 MHz BW 3 MHz Mod	e Auto Sweep			•	<u>.</u>	
	cy Sweep								= 1Pk Max
H1								м1[1]	20,83 dB 1,9760 GF
d8m		-	_	-					
10 dBm		_				_			-
20 dBei		and the second	man h		1. A. Bernard and	an Marian	meren	usanel book	and many
50 (BH	with a familie	approx	about the	Wayd Ingeland Web					-
40 dBm									
50 dBm									
60 dBm						_			
.0 GHz			1001 g	ots		2.1 GHz/			22.0 GH
	Л						Measuring.		4 16.11.202 21:46:5

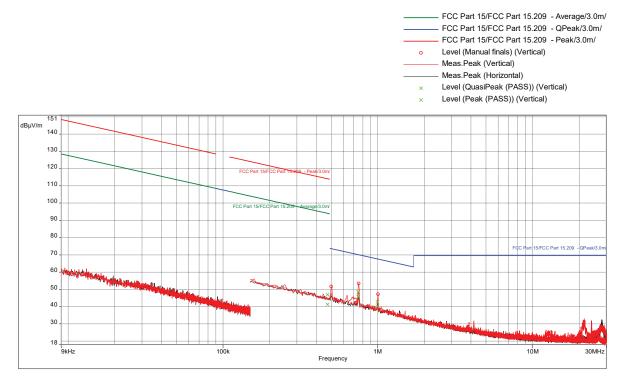
21:46:53 16.11.2021

### Radiated Emissions, 9 k-30 MHz Slot 0 (Band 2), Modulation: TM1.1-QPSK, Bandwidth 5 MHz, Transmit @ Low Channel

### Test Information:

Date and Time	11/28/2021 12:50:13 PM
Client and Project Number	Commscope_G104844468
Engineer	Vathana Ven
Temperature	23 C
Humidity	15 %
Atmospheric Pressure	1002 mbar
Comments	RE 9kHz-30MHz Loop antenna, Electric Field, 3M Location_Band 2 5MHz
	BW_TM1.1 (worst-case output power)_RP5100 host

### Graph:



### Results:

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
0.4725789474	46.99	67.64	-20.65	236.00	1.00	Vertical	9000.00	11.06
0.7482631579	48.47	70.12	-21.65	206.00	1.00	Vertical	9000.00	11.16
0.9978947368	42.83	67.64	-24.81	1.00	1.00	Vertical	9000.00	11.50

#### QuasiPeak (PASS) (3)

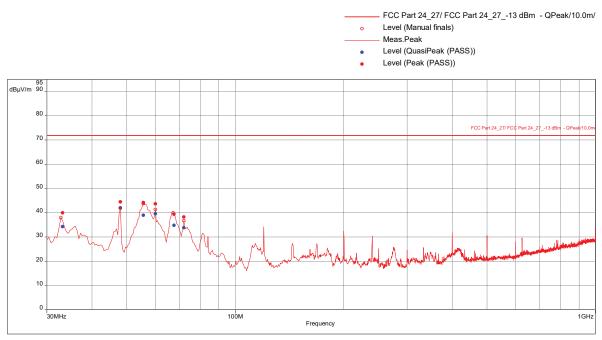
Frequency	Level	Limit	Margin	Azimuth (°)	Height (m)	Pol.	RBW	Correction		
(MHz)	(dBµV/m)	(dBµV/m)	(dB)				(Hz)	(dB)		
0.4725789474	41.28	67.64	-26.36	236.00	1.00	Vertical	9000.00	11.06		
0.7482631579	45.75	70.12	-24.37	206.00	1.00	Vertical	9000.00	11.16		
0.9978947368	40.10	67.64	-27.54	1.00	1.00	Vertical	9000.00	11.50		

### Radiated Emissions, 30-1000 MHz Slot 0 (Band 2 with 5G NR), Modulation: TM1.1-QPSK (worst-case output power), Bandwidth 5 MHz, Transmit @ Low Channel

### Test Information:

Date and Time	11/19/2021 9:53:14 AM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	24 C
Humidity	31 %
Atmospheric Pressure	1008 mbar
Comments	Scan 1: Low Ch, Band 2 with 5G NR, 5MHz BW, QPSK (worst-case output power),
	RP5100 host, RE 30-1000MHz SA mode

#### Graph:



### Results:

Peak and E.I.R Peak (PASS) (6)

Frequency	Peak	E.I.R.P	Limit	Margin	Azimuth	Height	Pol.	RBW (Hz)	Correction		
(MHz)	Level	Level	(dBm)	(dB)	(°)	(m)			(dB)		
	(dBµV/m)	(dBm)	. ,								
33.11578947	39.92	-44.88	-13	-31.88	125.00	1.00	Vertical	120000.00	-14.68		
48	44.42	-40.38	-13	-27.38	53.00	1.00	Vertical	120000.00	-24.46		
55.66315789	44.15	-40.65	-13	-27.65	235.00	2.13	Vertical	120000.00	-25.77		
60	43.63	-41.17	-13	-28.17	285.00	1.62	Vertical	120000.00	-25.54		
67.42105263	39.35	-45.45	-13	-32.45	307.00	1.69	Vertical	120000.00	-24.94		
72.03157895	38.18	-46.62	-13	-33.62	148.00	3.42	Vertical	120000.00	-24.77		

### Notes:

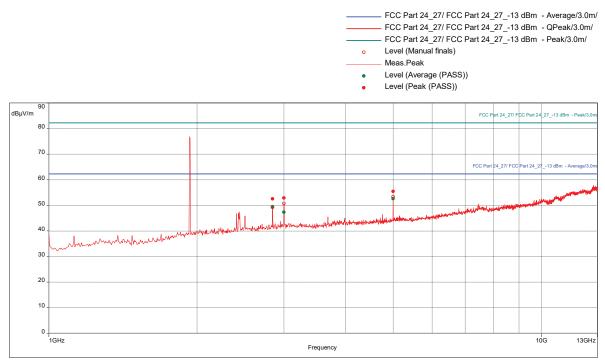
The level in E.I.R.P (dBm) is calculated from the peak readings as E.I.R.P (dBm) = E Peak (dB $\mu$ V/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter.

### Radiated Emissions, 1-22 GHz Slot 0 (Band 2 with 5G NR), Modulation: TM1.1-QPSK (worst-case output power), Bandwidth 5 MHz, Transmit @ Low Channel

### Test Information:

Date and Time	11/19/2021 2:02:15 PM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	24 C
Humidity	31 %
Atmospheric Pressure	1008 mbar
Comments	Scan 6: Low Ch, Band 2 with 5G NR, 5MHz BW, QPSK (worst-case output power),
	RP5100 host, RE 1-13 GHz SA mode

#### Graph:



#### Results:

Peak and E.I.R Peak (PASS) (3)

Frequency (MHz)	Peak Level (dBµV/m)	E.I.R.P Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
2844.473684	52.51	-42.79	-13	-29.79	265.00	1.25	Vertical	1000000.00	-1.17
3000	52.86	-42.44	-13	-29.44	75.00	1.05	Vertical	1000000.00	-0.55
5000	55.41	-39.89	-13	-26.89	9.00	3.89	Vertical	1000000.00	3.64

### Notes:

The level in E.I.R.P (dBm) is calculated from the peak readings as E.I.R.P (dBm) = E Peak (dB $\mu$ V/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter.

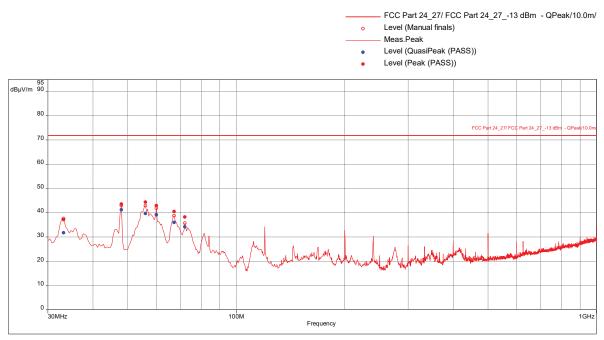
The highest peak on the plot is the fundamental signal. Manual scan was performed from 13 to 22 GHz. No emissions were detected above the measuring equipment noise floor.

### Radiated Emissions, 30-1000 MHz Slot 0 (Band 2 with 5G NR), Modulation: TM1.1-QPSK (worst-case output power), Bandwidth 5 MHz, Transmit @ Mid Channel

### Test Information:

Date and Time	11/19/2021 10:53:53 AM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	24 C
Humidity	31 %
Atmospheric Pressure	1008 mbar
Comments	Scan 2: Mid Ch, Band 2 with 5G NR, 5MHz BW, QPSK (worst-case output power),
	RP5100 host, RE 30-1000MHz SA mode

#### Graph:



### Results:

Peak and E.I.R Peak (PASS) (6)

Frequency	Peak	E.I.R.P	Limit	Margin	Azimuth	Height	Pol.	RBW (Hz)	Correction		
(MHz)	Level	Level	(dBm)	(dB)	(°)	(m)			(dB)		
, ,	(dBµV/m)	(dBm)	. ,								
33.38947368	37.15	-47.65	-13	-34.65	83.00	1.97	Vertical	120000.00	-14.92		
48.03157895	43.51	-41.29	-13	-28.29	54.00	1.00	Vertical	120000.00	-24.47		
55.90526316	44.34	-40.46	-13	-27.46	293.00	1.63	Vertical	120000.00	-25.76		
60.03157895	42.90	-41.9	-13	-28.9	307.00	1.98	Vertical	120000.00	-25.53		
67.16842105	40.43	-44.37	-13	-31.37	249.00	2.52	Vertical	120000.00	-24.94		
72	38.20	-46.6	-13	-33.6	257.00	1.43	Vertical	120000.00	-24.77		

### Notes:

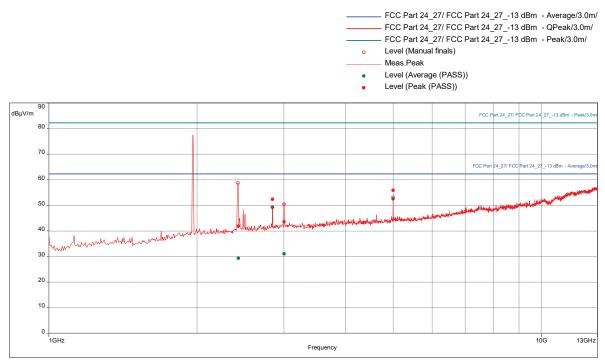
The level in E.I.R.P (dBm) is calculated from the peak readings as E.I.R.P (dBm) = E Peak (dB $\mu$ V/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter.

### Radiated Emissions, 1-22 GHz Slot 0 (Band 2 with 5G NR), Modulation: TM1.1-QPSK (worst-case output power), Bandwidth 5 MHz, Transmit @ Mid Channel

### Test Information:

Date and Time	11/19/2021 1:35:11 PM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	24 C
Humidity	31 %
Atmospheric Pressure	1008 mbar
Comments	Scan 5: Mid Ch, Band 2 with 5G NR, 5MHz BW, QPSK (worst-case output power),
	RP5100 host, RE 1-13 GHz SA mode

#### Graph:



### Results:

Peak and E.I.R Peak (PASS) (4)

Frequency (MHz)	Peak Level (dBuV/m)	E.I.R.P Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
2422.631579	41.82	-53.48	-13	-40.48	302.00	1.90	Vertical	1000000.00	-1.97
2844.473684	52.37	-42.93	-13	-29.93	264.00	1.55	Vertical	1000000.00	-1.17
3005.789474	43.58	-51.72	-13	-38.72	10.00	1.00	Vertical	1000000.00	-0.47
5000	55.86	-39.44	-13	-26.44	10.00	1.01	Vertical	1000000.00	3.64

### Notes:

The level in E.I.R.P (dBm) is calculated from the peak readings as E.I.R.P (dBm) = E Peak (dB $\mu$ V/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter.

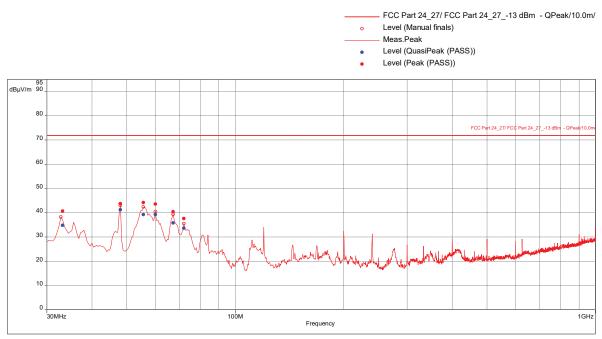
The highest peak on the plot is the fundamental signal. Manual scan was performed from 13 to 22 GHz. No emissions were detected above the measuring equipment noise floor.

### Radiated Emissions, 30-1000 MHz Slot 0 (Band 2 with 5G NR), Modulation: TM1.1-QPSK (worst-case output power), Bandwidth 5 MHz, Transmit @ High Channel

### Test Information:

Date and Time	11/19/2021 11:50:40 AM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	24 C
Humidity	31 %
Atmospheric Pressure	1008 mbar
Comments	Scan 3: High Ch, Band 2 with 5G NR, 5MHz BW, QPSK (worst-case output power), RP5100 host, RE 30-1000MHz SA mode
	KP3 TUU TUSI, KE SU-TUUUIVITZ SA TITUUE

#### Graph:



### Results:

Peak and E.I.R Peak (PASS) (6)

Tour and E.I.I		-/(-/							
Frequency	Peak	E.I.R.P	Limit	Margin	Azimuth	Height	Pol.	RBW (Hz)	Correction
(MHz)	Level	Level	(dBm)	(dB)	(°)	(m)			(dB)
	(dBµV/m)	(dBm)	. ,						
33.11578947	40.66	-44.14	-13	-31.14	96.00	1.69	Vertical	120000.00	-14.68
48	43.71	-41.09	-13	-28.09	0.00	1.40	Vertical	120000.00	-24.46
55.69473684	44.21	-40.59	-13	-27.59	279.00	1.52	Vertical	120000.00	-25.77
60	43.53	-41.27	-13	-28.27	317.00	1.69	Vertical	120000.00	-25.54
67.26315789	40.33	-44.47	-13	-31.47	244.00	1.74	Vertical	120000.00	-24.94
72.03157895	37.60	-47.2	-13	-34.2	162.00	1.82	Vertical	120000.00	-24.77

### Notes:

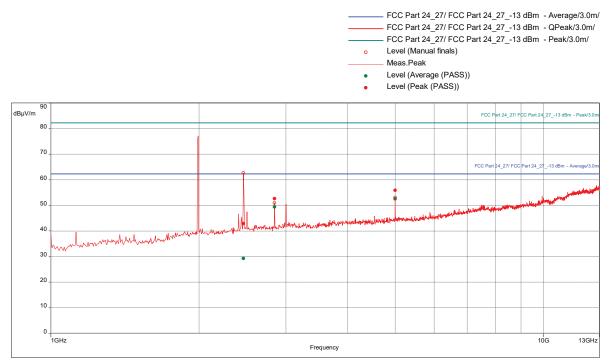
The level in E.I.R.P (dBm) is calculated from the peak readings as E.I.R.P (dBm) = E Peak (dB $\mu$ V/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter.

### Radiated Emissions, 1-22 GHz Slot 0 (Band 2 with 5G NR), Modulation: TM1.1-QPSK (worst-case output power), Bandwidth 5 MHz, Transmit @ High Channel

### Test Information:

Date and Time	11/19/2021 1:29:04 PM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	24 C
Humidity	31 %
Atmospheric Pressure	1008 mbar
Comments	Scan 4: High Ch, Band 2 with 5G NR, 5MHz BW, QPSK (worst-case output power), RP5100 host, RE 1-13 GHz SA mode

#### Graph:



#### Results:

Peak and E.I.R Peak (PASS) (3)

Frequency (MHz)	Peak Level (dBµV/m)	E.I.R.P Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
2461.578947	42.84	-52.46	-13	-39.46	292.00	1.11	Vertical	1000000.00	-1.65
2844.473684	52.65	-42.65	-13	-29.65	264.00	1.25	Vertical	1000000.00	-1.17
5000	55.86	-39.44	-13	-26.44	10.00	1.01	Vertical	1000000.00	3.64

### Notes:

The level in E.I.R.P (dBm) is calculated from the peak readings as E.I.R.P (dBm) = E Peak (dB $\mu$ V/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter.

The highest peak on the plot is the fundamental signal. Manual scan was performed from 13 to 22 GHz. No emissions were detected above the measuring equipment noise floor.

Intertek							
Report Number: 104	4844468BOX-001		Issued: 12/03/2021				
			Revised: 02/07/2022				
Test Personnel:	Vathana Ven ^V FV	. Test Date:					
Supervising/Reviewing Engineer: (Where Applicable)	N						
Product Standard:	FCC Part 24	Limit Applied:	See report section 11.3				
Input Voltage:	48 VDC (POE)						
Pretest Verification w/ Ambient Signals or		Ambient Temperature:	26, 24, 23, 26 °C				
BB Source:	N/A	Relative Humidity:	42, 31, 15, 38 %				
		Atmospheric Pressure:	1002, 1008, 1002, 1017 mbars				

Deviations, Additions, or Exclusions: None

## 12 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	12/03/2021	104844468BOX-001	VEVUSU	KPS 45	Original Issue
1	01/06/2022	104844468BOX-001	VFV ^{V5V}	KPS 43	Removed test setup photos and added frequency stability vs. voltage test results tables
2	02/07/2022	104844468BOX-001	VFV ^V 5V	KPS ¹²⁸³	Added justification for worst case for spurious emissions on page 291