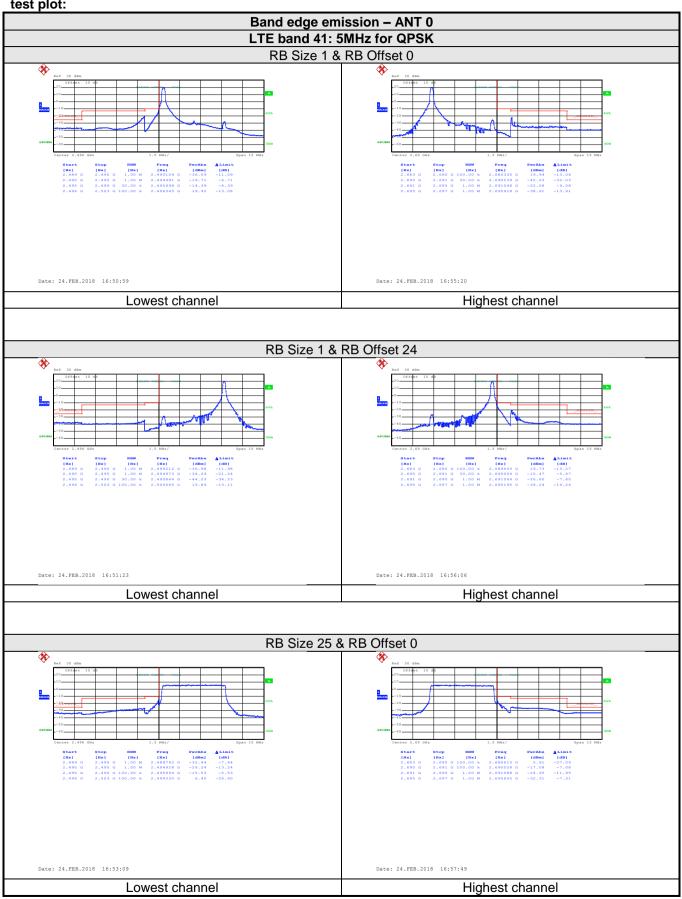


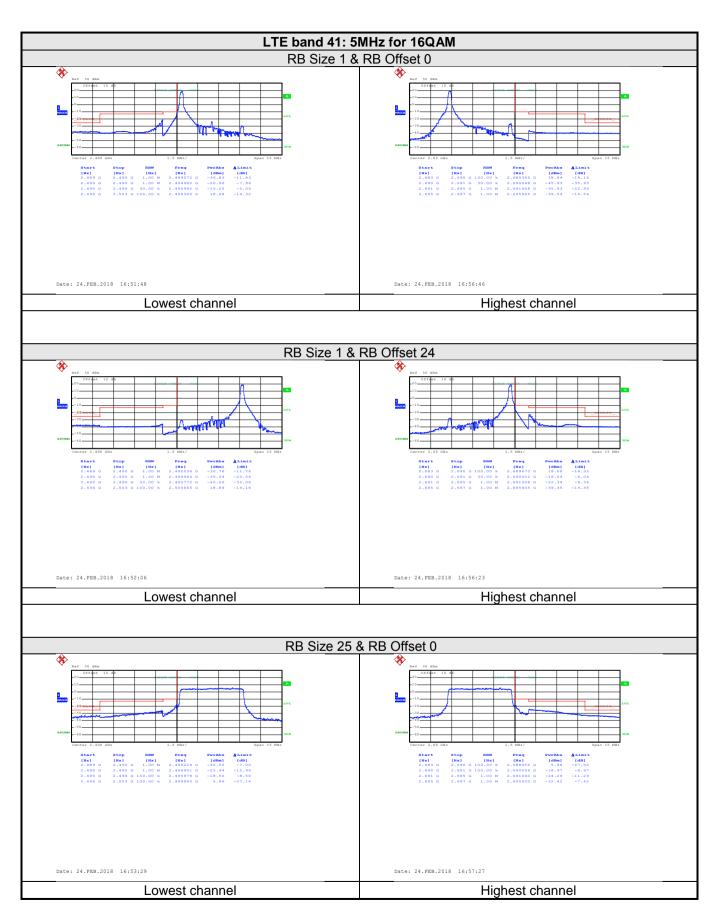




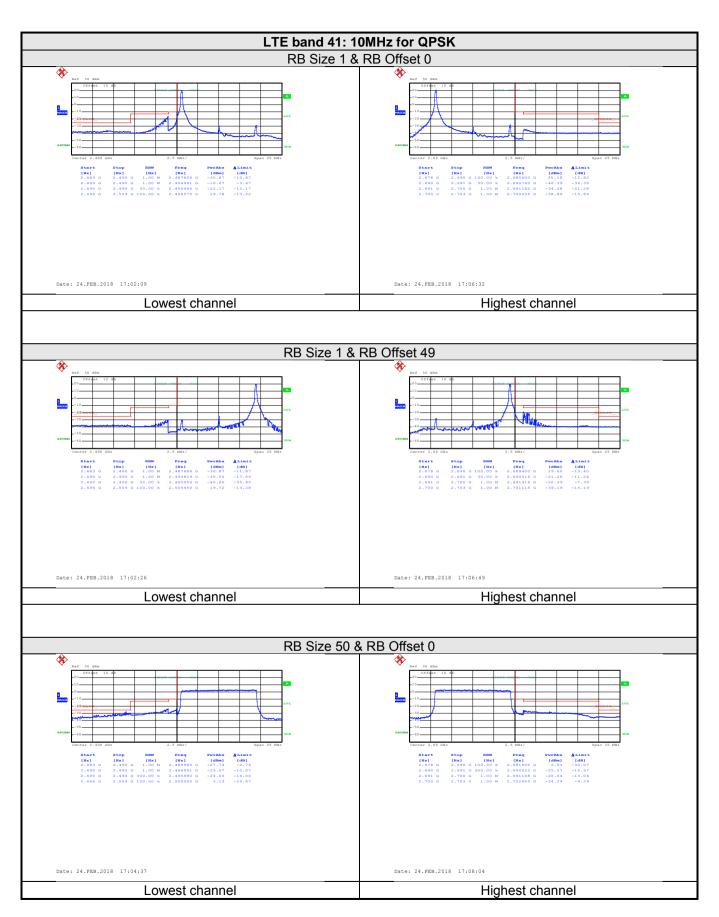
test plot:





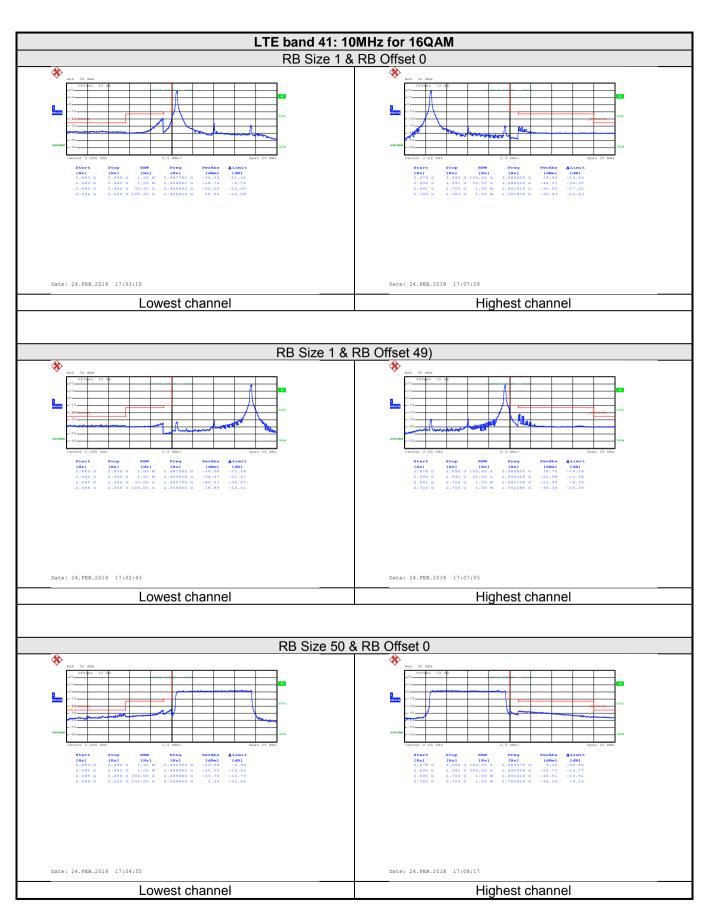




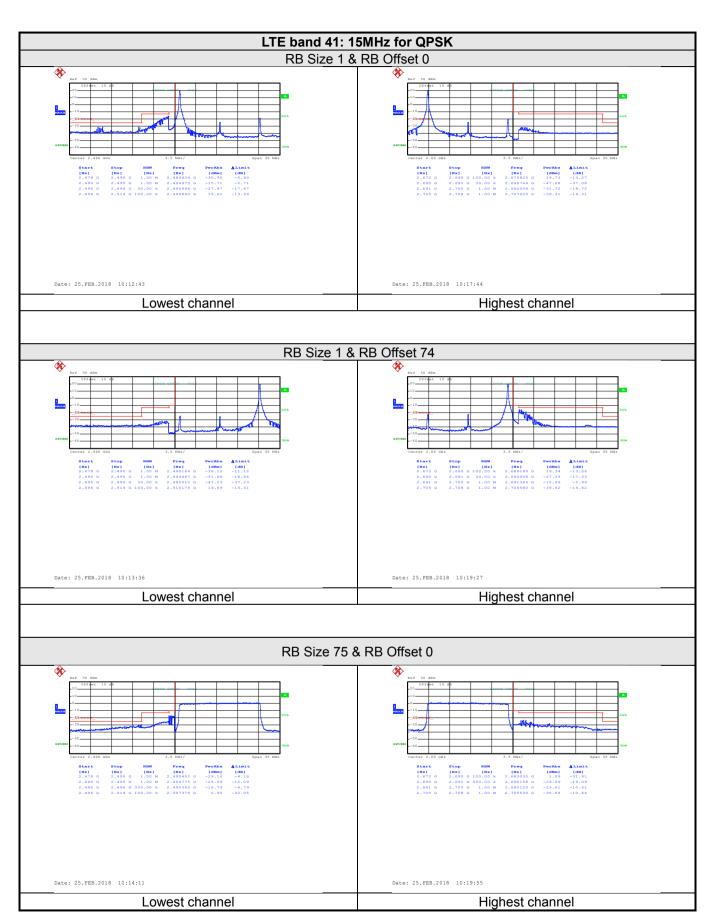






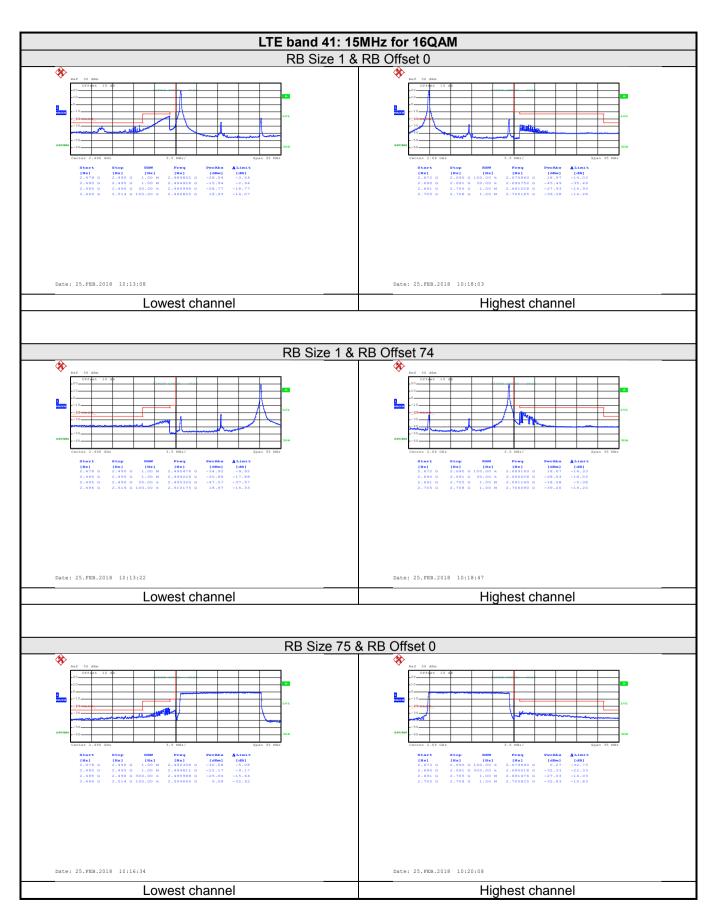






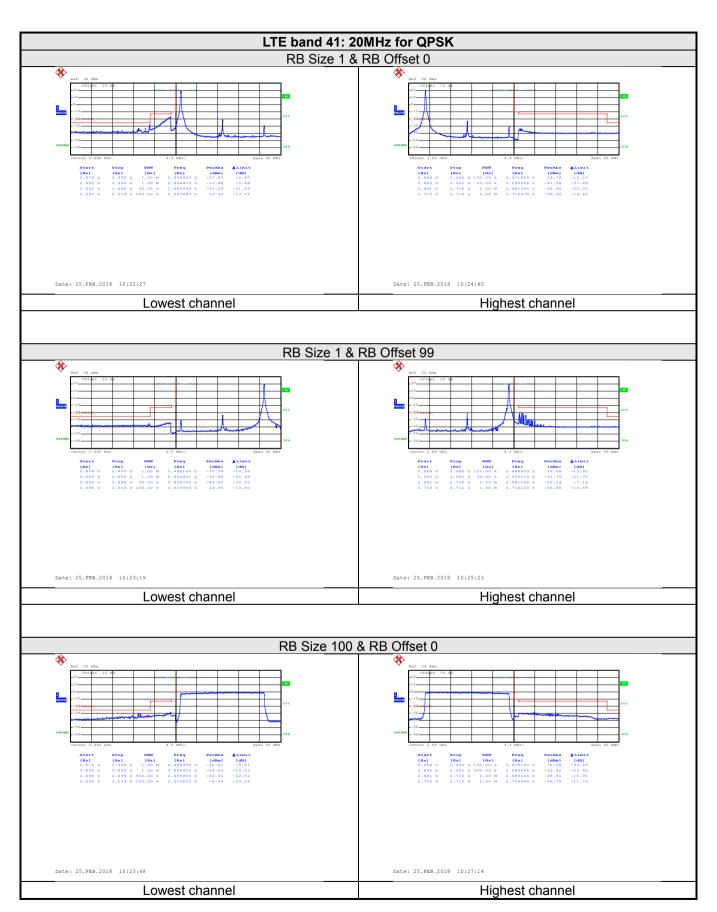






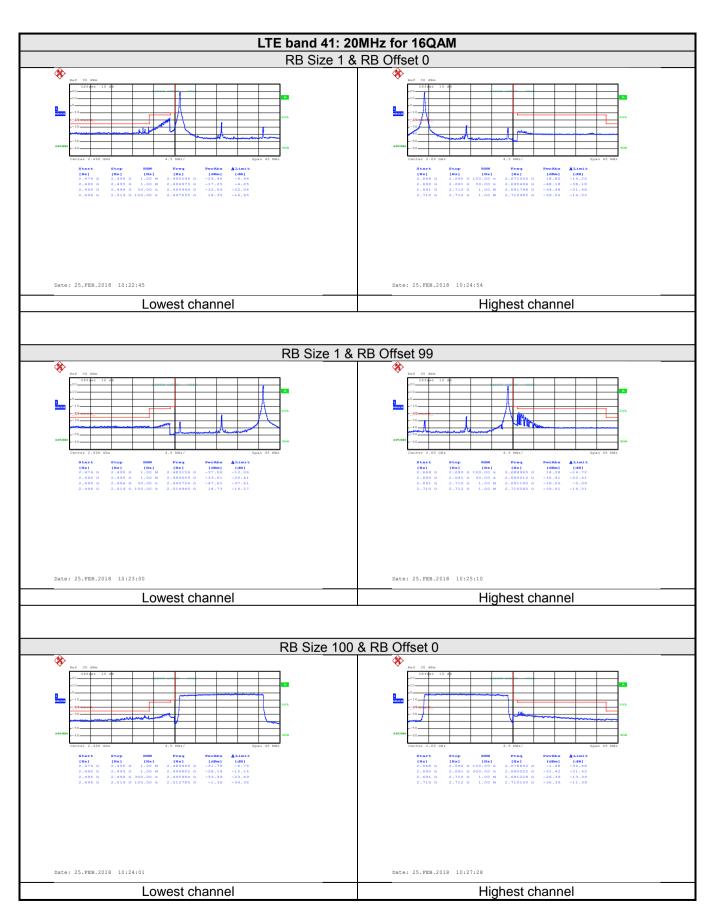




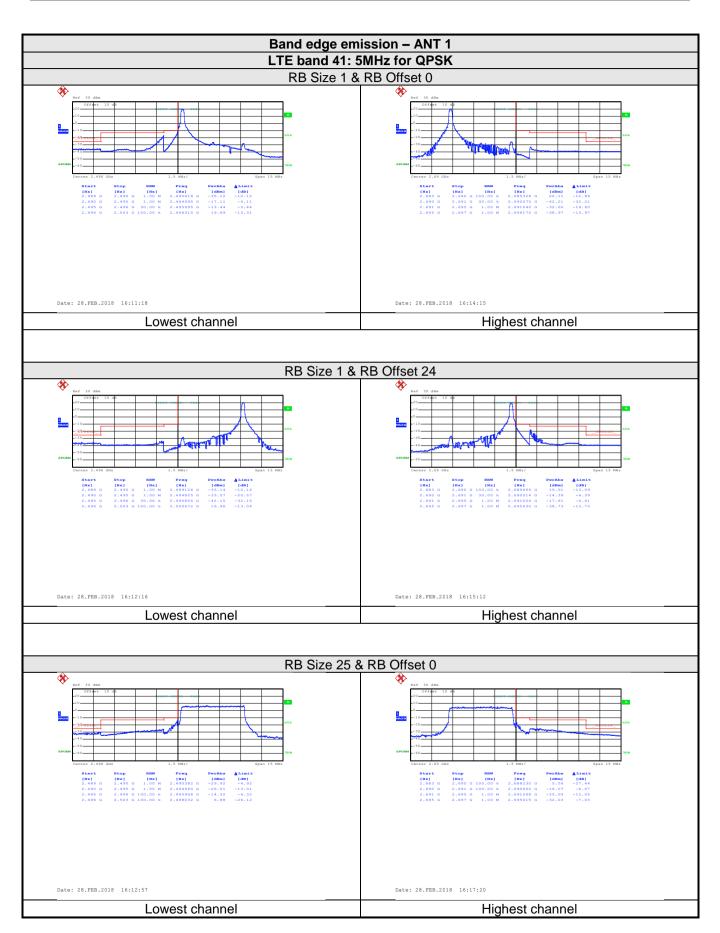






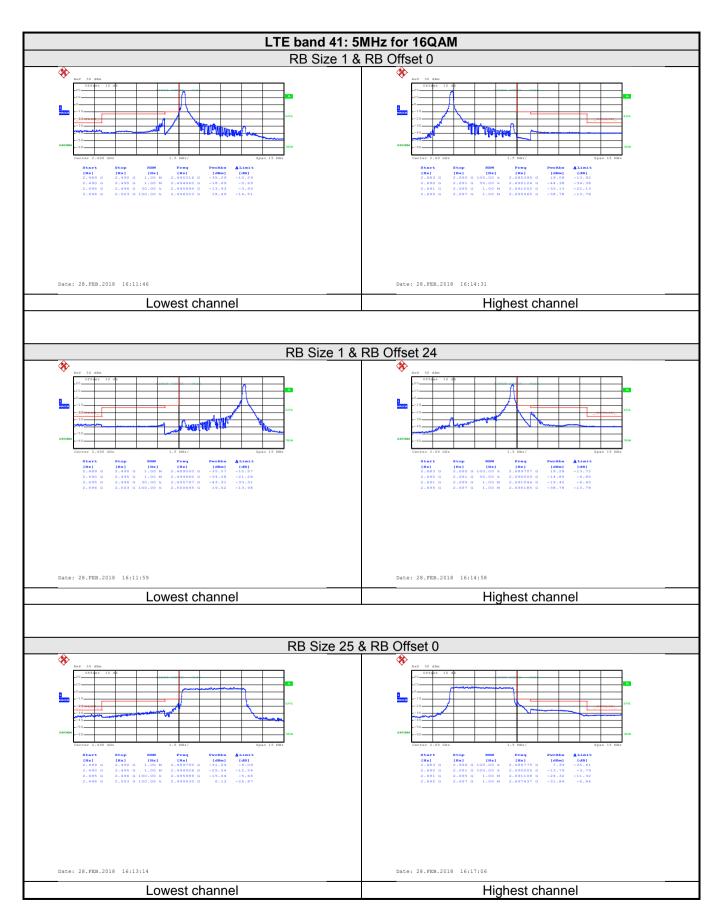






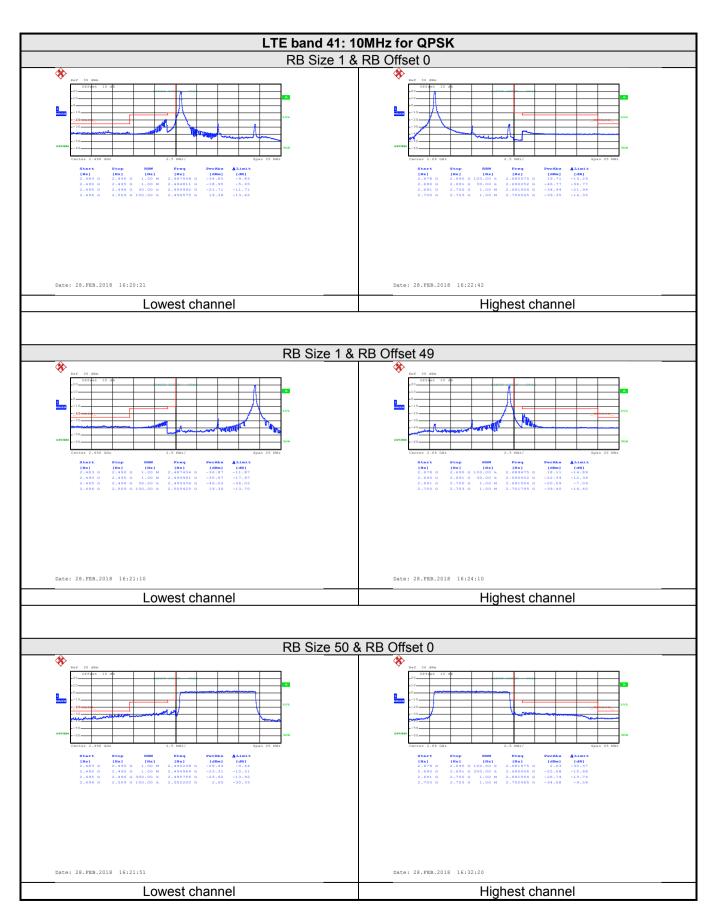






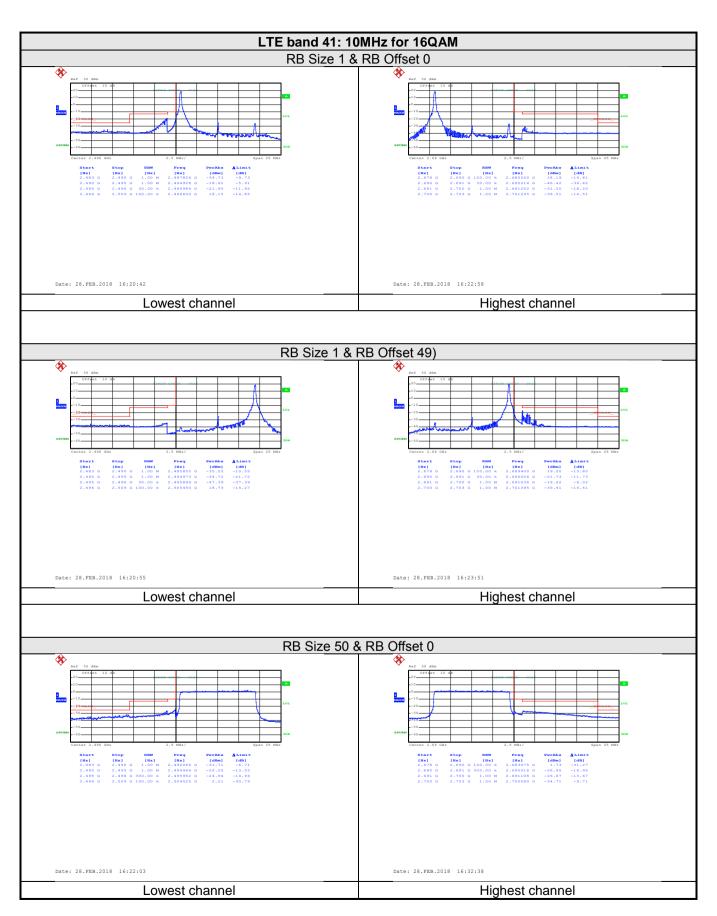




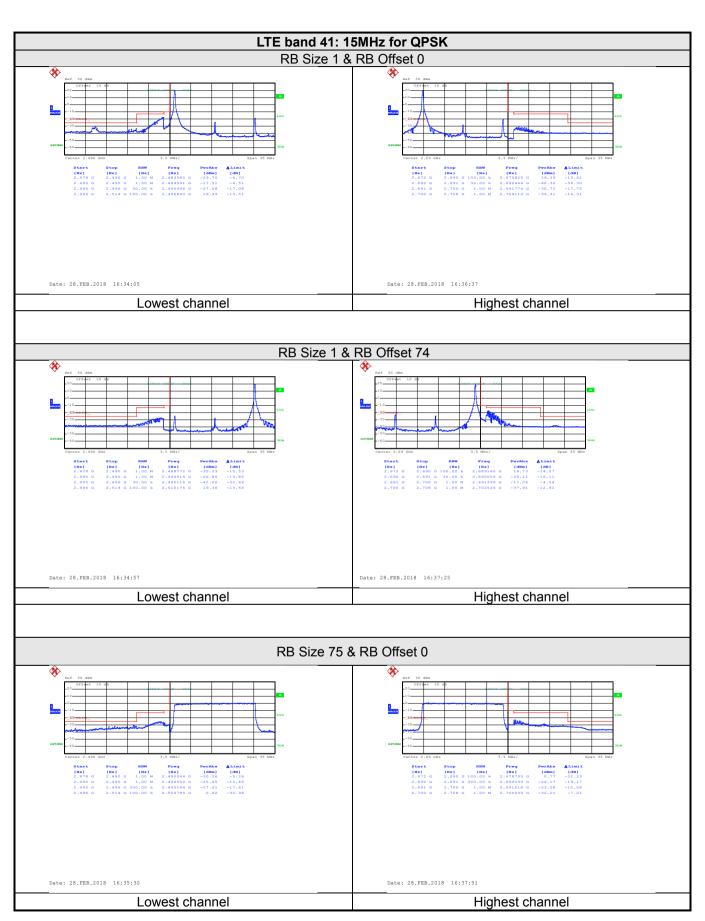






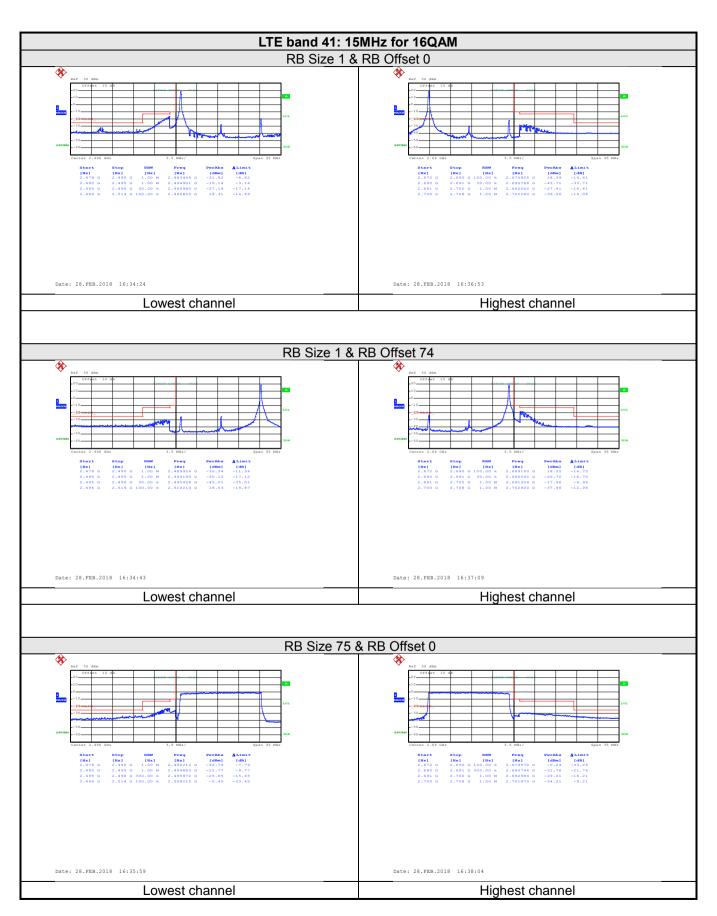






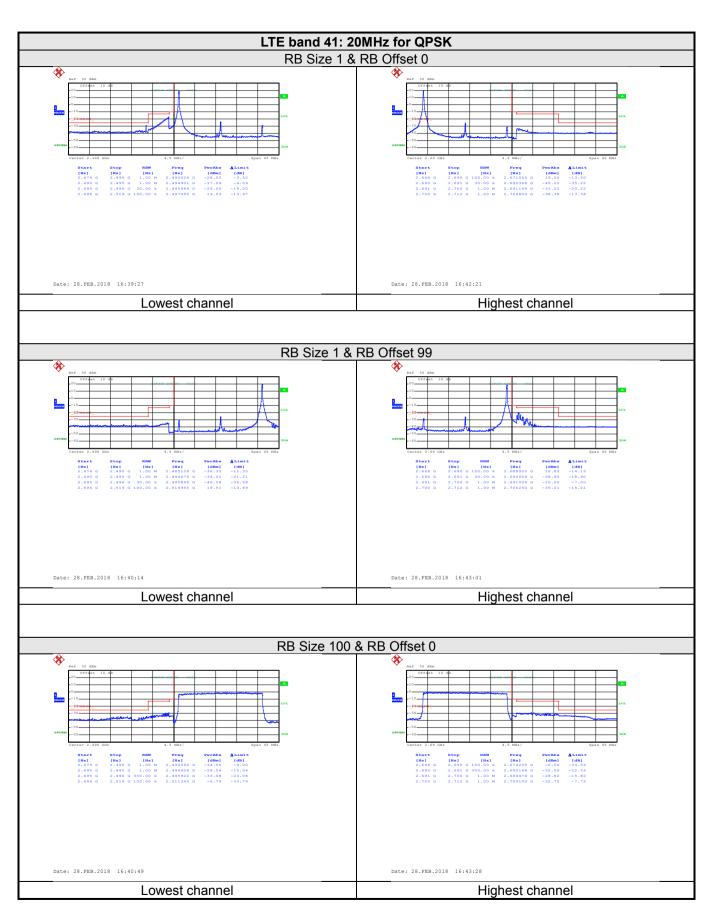






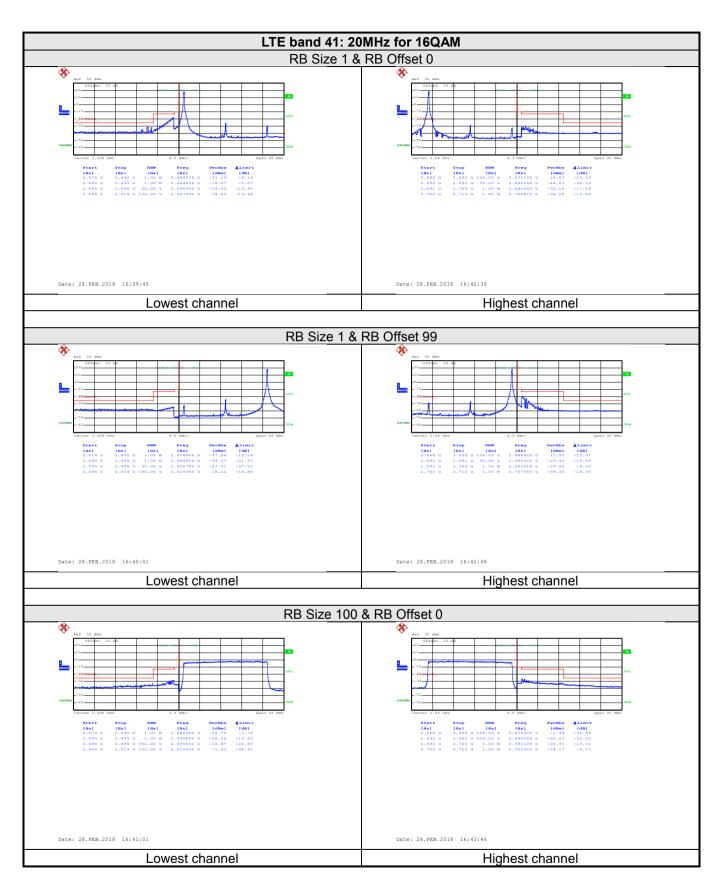














### 6.5 Field strength of spurious radiation measurement

old i lold diloligili di op	urious radiation measurement			
Test Requirement:	Part 27.53(m)(4)			
Test Method:	FCC part 2.1053			
Limit:	For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.			
Test setup:	Below 1GHz			
	Antenna Tower  Antenna Tower  Ground Reference Plane  Test Receiver  Pre- Amplifier  Controller			
	Above 1GHz			
	AE EUT  Horn Anlenna  Antenna Tower  (Turntable)  Ground Reference Plane  Test Receiver  Amplifier  Controller			
	Substituted method:			



	Ground plane  d: distance in meters d:3 meter  I -4 meter  S.G.  Substituted Dipole or Horn Antenna  Bi-Log Antenna or Horn Antenna
Test Procedure:	<ol> <li>The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.</li> <li>During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.</li> <li>The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.</li> <li>The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.  ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) - Cable Loss (dB)</li> </ol>
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details.
Test results:	Passed





# Measurement Data: test data (worst case):

test data (worst case	<i>'</i> )·				
Bandwidth=5MHz for QPSK					
Frequency (MHz)	Spurious Emission		Limit (dBm)	Dooult	
Frequency (MITZ)	Polarization	Level (dBm)	Lilliit (ubili)	Result	
		Lowest channel			
4997.00	Vertical	-37.05			
7495.50	V	-40.23	25	Door	
4997.00	Horizontal	-30.28	-25	Pass	
7495.50	Н	-38.62			
		Middle channel			
5186.00	Vertical	-38.48		Door	
7779.00	V	-40.01	O.F.		
5186.00	Horizontal	-30.56	-25	Pass	
7779.00	Н	-39.65			
		Highest channel			
5375.00	Vertical	-40.99			
8062.50	V	-39.81	-25	Door	
5375.00	Horizontal	-33.54		Pass	
8062.50	Н	-40.15			

Bandwidth=10MHz for QPSK					
Fragues ov (MH=)	Spurious Emission		Limit (dDm)	Desuit	
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
		Lowest channel			
5002.00	Vertical	-37.14			
7503.00	V	-39.08	25	Door	
5002.00	Horizontal	-30.41	-25	Pass	
7503.00	Н	-40.01			
		Middle channel			
5186.00	Vertical	-37.62		Pass	
7779.00	V	-39.87	-25		
5186.00	Horizontal	-31.35	-20		
7779.00	Н	-40.16			
		Highest channel			
5370.00	Vertical	-37.86			
8055.00	V	-39.54	-25	Door	
5370.00	Horizontal	-32.01		Pass	
8055.00	Н	-40.21			

#### Remark:

<sup>1.</sup> The emission levels of below 1 GHz are very lower than the limit and not show in test report.

<sup>2.</sup> Pre-scan QPSK and 16QAM modulation mode, and found the QPSK modulation mode is the worst case. So the worst case shown in report.



Bandwidth=15MHz for QPSK				
Frequency (MHz)	Spurious Emission		Limit (dDm)	Result
Frequency (MITIZ)	Polarization	Level (dBm)	Limit (dBm)	Kesuit
		Lowest channel		
5007.00	Vertical	-37.14		
7510.50	V	-39.95	-25	Door
5007.00	Horizontal	-30.41	-25	Pass
7510.50	Н	-39.57		
		Middle channel		
5186.00	Vertical	-37.74		Pass
7779.00	V	-40.15	-25	
5186.00	Horizontal	-30.71	-20	
7779.00	Н	-40.01		
		Highest channel		
5365.00	Vertical	-40.73		Dave
8047.50	V	-39.45	-25	
5365.00	Horizontal	-33.51		Pass
8047.50	Н	-40.08		

Bandwidth=20MHz for QPSK				
Fraguesia (MIII-)	Spurious	s Emission	Lineit (dDne)	D 11
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)	Result
		Lowest channel		
5012.00	Vertical	-37.00		
7518.00	V	-39.25	25	Door
5012.00	Horizontal	-30.78	-25	Pass
7518.00	Н	-39.57		
		Middle channel		
5186.00	Vertical	-37.12		Pass
7779.00	V	-40.01	25	
5186.00	Horizontal	-31.24	-25	
7779.00	Н	-39.81		
		Highest channel		
5360.00	Vertical	-37.90		Dage
8040.00	V	-39.14	-25	
5360.00	Horizontal	-32.60		Pass
8040.00	Н	-38.56		
Domorla				

#### Remark

<sup>1.</sup> The emission levels of below 1 GHz are very lower than the limit and not show in test report.

<sup>2.</sup> Pre-scan QPSK and 16QAM modulation mode, and found the QPSK modulation mode is the worst case. So the worst case shown in report.



## 6.6 Frequency stability V.S. Temperature measurement

Test Requirement:	Part 27.54				
Test Method:	FCC Part 2.1055(a)(1)(b)				
	Frequency range (MHz)	Fixed and base stations (±ppm)	Mobile sta Over 2 watts output power	tions (±ppm) 2 watts or less output power	
	Below 25 25-50 72-76 150-174 216-220 220-222 421-512	100 20 5 5 1.0 0.1 2.5	100 20 5 1.5 5	200 50 50 50 1.0 1.5 5	
Limit:	806-809 809-824 851-854 854-869 896-901 902-928 902-928 929-930 935-940 1427-1435 Above 2450	1.0 1.5 1.0 1.5 0.1 2.5 2.5 1.5 0.1 300	1.5 2.5 1.5 2.5 1.5 2.5 2.5 2.5 2.5 300	15 2.5 1.5 2.5 1.5 2.5 2.5 2.5 300	
Test setup:			Temperature Chambe	r	
	Note: M	Spectrum analyzer  Att.  Att.	Variable Power	Supply	
Test procedure:	supply and inp 2. RF output wa analyzer via fe 3. The EUT was 4. Set the spectr frequency resorreference frequency 5. Turn EUT off temperature s frequency. 6. Repeat step m	aut rated voltage. as connected to led through attenual placed inside the term analyzer RBW plution and measuruency. and set the chamlatabilized for approximate and set the chamlatability and set	a frequency countors.  emperature chamled low enough to one count to o	obtain the desired ating frequency as o −30°C. After the	
Test Instruments:	Refer to section 5.9				
Test mode:	Refer to section 5.3	3 for details			
Test results:	Passed				
Remark:	All three channels of channel and the wo				





### test data (worst channel):

test data (worst channel):	Antenna port: Al	NT 0	
Poforonco	Frequency: Lowest channel=2		DSK)
Keieleilce	Frequency. Lowest charmer=2	,	ency error
Power supplied (Vac)	Temperature (℃)	Hz	ppm
	-30	185	0.074044
	-20	177	0.070843
	-10	160	0.064038
	0	145	0.058035
120	10	142	0.056834
120	20	138	0.055233
	30	128	0.051231
	40	162	0.064839
	50	140	0.056034
Reference F	requency: Lowest channel=25	LL_	
			ency error
Power supplied (Vac)	Temperature (°C)	Hz	ppm
	-30	184	0.073571
	-20	175	0.069972
	-10	169	0.067573
	0	172	0.068772
120	10	163	0.065174
	20	155	0.061975
	30	152	0.060776
	40	103	0.041184
	50	128	0.051180
Reference F	requency: Lowest channel=25	503.5MHz(15MHz for Q	PSK)
Dower supplied (\/ss)	Temperature (°C)	Frequ	ency error
Power supplied (Vac)	remperature ( C)	Hz	ppm
	-30	165	0.065908
	-20	132	0.052726
	-10	135	0.053925
	0	148	0.059117
120	10	150	0.059916
	20	122	0.048732
	30	104	0.041542
	40	116	0.046335
	50	158	0.063112
Reference F	requency: Lowest channel=25		
Power supplied (Vac)	Temperature (°C)		ency error
	. , ,	Hz	ppm
	-30	171	0.068236
	-20	123	0.049082
	-10	133	0.053073
400	0	136	0.054270
120	10	144	0.057462
	20	150	0.059856
	30	155	0.061852
	40	102	0.040702
	50	117	0.046688





Reference F	requency: Lowest channel=2	498.5MHz(5MHz for 1	6QAM)		
Frequency error					
Power supplied (Vac)	Temperature (℃)	Hz	ppm		
	-30	174	0.069642		
	-20	145	0.058035		
	-10	132	0.052832		
	0	126	0.050430		
120	10	108	0.043226		
0	20	127	0.050830		
	30	136	0.054433		
	40	159	0.063638		
	50	128	0.051231		
Reference F	requency: Lowest channel=2	I I			
			quency error		
Power supplied (Vac)	Temperature (°C)	Hz	ppm		
	-30	163	0.065174		
	-20	120	0.047981		
	-10	114	0.045582		
	0	126	0.050380		
120	10	135	0.053978		
	20	145	0.057977		
	30	140	0.055978		
	40	122	0.048780		
	50	115	0.045982		
Reference F	requency: Lowest channel=2				
			quency error		
Power supplied (Vac)	Temperature (°C)	Hz	ppm		
	-30	105	0.041941		
	-20	114	0.045536		
	-10	136	0.054324		
	0	122	0.048732		
120	10	126	0.050330		
	20	133	0.053126		
	30	101	0.040344		
	40	118	0.047134		
	50	141	0.056321		
Reference F	requency: Lowest channel=2	506.0MHz(20MHz for 1	16QAM)		
Dower supplied (Ves)	Tomporeture (°C)	Fred	quency error		
Power supplied (Vac)	Temperature (°C)	Hz	ppm		
	-30	177	0.070630		
	-20	111	0.044294		
	-10	123	0.049082		
	0	136	0.054270		
120	10	151	0.060255		
.20	20	143	0.057063		
	30	166	0.066241		
	30 40	166 120	0.066241 0.047885		





	Antenna port: A	NT 1	
Reference	Frequency: Lowest channel=		OPSK)
			quency error
Power supplied (Vac)	Temperature (℃)	Hz	ppm
	-30	166	0.066440
	-20	123	0.049230
	-10	133	0.053232
	0	155	0.062037
120	10	121	0.048429
	20	144	0.057635
	30	148	0.059236
	40	102	0.040824
	50	116	0.046428
Reference F	requency: Lowest channel=2	501.0MHz(10MHz for	QPSK)
			quency error
Power supplied (Vac)	Temperature (°C)	Hz	ppm
	-30	133	0.053179
	-20	135	0.053978
	-10	161	0.064374
120	0	121	0.048381
	10	100	0.039984
	20	144	0.057577
	30	150	0.059976
	40	155	0.061975
	50	103	0.041184
Reference F	requency: Lowest channel=2	503.5MHz(15MHz for	QPSK)
Power supplied (Vac)	Temperature (℃)	Fred	quency error
1 ower supplied (vae)		Hz	ppm
	-30	153	0.061114
	-20	136	0.054324
	-10	122	0.048732
	0	144	0.057519
120	10	148	0.059117
	20	123	0.049131
	30	100	0.039944
	40	105	0.041941
	50	118	0.047134
Reference F	requency: Lowest channel=2		
Power supplied (Vac)	Temperature (℃)		quency error
1	` ` ` `	Hz	ppm
	-30	166	0.066241
	-20	163	0.065044
	-10	151	0.060255
400	0	150	0.059856
120	10	132	0.052674
	20	134	0.053472
	30	105	0.041899
	40	115	0.045890
	50	102	0.040702





Reference I	requency: Lowest channel=2	2498.5MHz(5MHz for 1	6QAM)			
	Frequency error					
Power supplied (Vac)	Temperature (°C)	Hz	ppm			
	-30	133	0.053232			
	-20	136	0.054433			
	-10	122	0.034433			
	0	144	0.048829			
120	10	150	0.060036			
120	20	158	0.063238			
	30	100	0.040024			
	40	108	0.040024			
	50					
Deference F	l.	115	0.046028			
Reference F	requency: Lowest channel=2					
Power supplied (Vac)	Temperature (°C)		quency error			
, ,	` ` ` '	Hz	ppm			
	-30	165	0.065974			
	-20	132	0.052779			
	-10	135	0.053978			
	0	144	0.057577			
120	10	140	0.055978			
	20	126	0.050380			
	30	128	0.051180			
	40	115	0.045982			
	50	108	0.043183			
Reference F	requency: Lowest channel=2	503.5MHz(15MHz for	16QAM)			
Power supplied (Vac)	Temperature (°C)	Free	quency error			
rowei supplied (vac)		Hz	ppm			
	-30	160	0.063911			
	-20	132	0.052726			
	-10	135	0.053925			
	0	121	0.048332			
120	10	124	0.049531			
	20	102	0.040743			
	30	106	0.042341			
	40	115	0.045936			
	50	113	0.045137			
Reference F	50 requency: Lowest channel=2	113 506.0MHz(20MHz for	0.045137 16QAM)			
	requency: Lowest channel=2	506.0MHz(20MHz for	16QAM)			
Reference F Power supplied (Vac)		506.0MHz(20MHz for Free	16QAM) quency error			
	requency: Lowest channel=2 Temperature (℃)	506.0MHz(20MHz for Free Hz	16QAM) quency error ppm			
	requency: Lowest channel=2  Temperature (℃)  -30	506.0MHz(20MHz for Free Hz 151	16QAM) quency error ppm 0.060255			
	requency: Lowest channel=2  Temperature (°C)  -30  -20	506.0MHz(20MHz for Free Hz 151 150	16QAM) quency error ppm 0.060255 0.059856			
	requency: Lowest channel=2  Temperature (°C)  -30  -20  -10	506.0MHz(20MHz for Free Hz 151 150 132	16QAM) quency error ppm 0.060255 0.059856 0.052674			
Power supplied (Vac)	requency: Lowest channel=2 Temperature (°C)  -30  -20  -10  0	506.0MHz(20MHz for Free Hz 151 150 132 134	16QAM) quency error ppm 0.060255 0.059856 0.052674 0.053472			
	requency: Lowest channel=2 Temperature (°C)  -30 -20 -10 0 10	506.0MHz(20MHz for Free Hz 151 150 132 134 145	16QAM) quency error ppm 0.060255 0.059856 0.052674 0.053472 0.057861			
Power supplied (Vac)	requency: Lowest channel=2 Temperature (°C)  -30 -20 -10 0 10 20	506.0MHz(20MHz for Free Hz 151 150 132 134 145 149	16QAM) quency error ppm 0.060255 0.059856 0.052674 0.053472 0.057861 0.059457			
Power supplied (Vac)	requency: Lowest channel=2 Temperature (°C)  -30 -20 -10 0 10 20 30	506.0MHz(20MHz for Free Hz 151 150 132 134 145 149 101	16QAM) quency error  ppm 0.060255 0.059856 0.052674 0.053472 0.057861 0.059457 0.040303			
Power supplied (Vac)	requency: Lowest channel=2 Temperature (°C)  -30 -20 -10 0 10 20	506.0MHz(20MHz for Free Hz 151 150 132 134 145 149	16QAM) quency error ppm 0.060255 0.059856 0.052674 0.053472 0.057861 0.059457			



## 6.7 Frequency stability V.S. Voltage measurement

Test Requirement:	Part 27.54			
Test Method:	FCC Part 2.1055(a	a)(1)(b)		
	Frequency range (MHz)	Fixed and base stations (±ppm)	Mobile sta Over 2 watts output power	ations (±ppm) 2 watts or less output power
	Below 25	100	100	200
	25-50	20	20	50
	72-76 150-174	5	5	50 50
	216-220	1.0	,	1.0
	220-222	0.1	1.5	1.5
1.1. %	421–512 806–809	2.5 1.0	5 1.5	5 1.5
Limit:	809-824	1.5	2.5	2.5
	851-854	1.0	1.5	1.5
	854-869	1.5	2.5	2.5
	896-901 902-928	0.1 2.5	1.5 2.5	1.5 2.5
	902-928	2.5	2.5	2.5
	929-930	1.5		
	935-940	0.1	1.5	1.5
	1427–1435 Above 2450	300	300	300
	ABOVE 2450			<del></del>
Test setup:			Temperature Chambe	r
	Spectru	m analyzer	EUT	
		Att.		
			Variable Power	Supply
	Note: Measurement s	etup for testing on Antenna	connector	
Test procedure:		temperature to 25°C EUT and set the vol		•
	·	rum analyzer RBW	-	-
				obtain the desired
	trequency res	olution and recorde	a tne trequency.	
		nput voltage to spe lpoint, record the m		
Test Instruments:	Refer to section 5.	9 for details		
Test mode:	Refer to section 5.	3 for details		
Test results:	Passed			
Remark:		of all modulations horst modulation sho		





### test data (worst channel):

Antenna port: ANT 0					
Reference Frequency: Lowest channel=2498.5MHz(5MHz for QPSK)					
Temperature (°C)	Power supplied (Vac)	Frequency error			
		Hz	ppm		
25	102	99	0.039624		
	120	56	0.022413		
	138	65	0.026016		
Reference Frequency: Lowest channel=2501.0MHz(10MHz for QPSK)					
Tomporature (°C)	Power supplied (Vdc)	Frequency error			
Temperature (℃)		Hz	ppm		
	102	87	0.034786		
25	120	59	0.023591		
	138	69	0.027589		
Reference Frequency: Lowest channel=2503.5MHz(15MHz for QPSK)					
Temperature (℃)	Power supplied (Vac)	Frequency error			
		Hz	ppm		
25	102	90	0.035950		
	120	65	0.025964		
	138	80	0.031955		
Reference Frequency: Lowest channel=2506.0MHz(20MHz for QPSK)					
Temperature (℃)	Power supplied (Vdc)	Frequency error			
		Hz	ppm		
25	102	98	0.039106		
	120	65	0.025938		
	138	80	0.031923		

Reference Frequency: Lowest channel=2498.5MHz(5MHz for 16QAM)				
Temperature (°C)	Power supplied (Vac)	Frequency error		
		Hz	ppm	
25	102	99	0.039624	
	120	80	0.032019	
	138	74	0.029618	
Reference Frequency: Lowest channel=2501.0MHz(10MHz for 16QAM)				
Temperature (°C)	Dower supplied (\/de)	Frequency error		
	Power supplied (Vdc)	Hz	ppm	
	102	68	0.027189	
25	120	90	0.035986	
	138	71	0.028389	
Reference Frequency: Lowest channel=2503.5MHz(15MHz for 16QAM)				
Tomporature (°C)	Power supplied (Vac)	Frequency error		
Temperature (℃)	Power supplied (Vac)	Hz	ppm	
25	102	55	0.021969	
	120	80	0.031955	
	138	90	0.035950	
Reference Frequency: Lowest channel=2506.0MHz(20MHz for 16QAM)				
Temperature (°C)	Power supplied (\/da)	Frequency error		
	Power supplied (Vdc)	Hz	ppm	
25	102	99	0.039505	
	120	94	0.037510	
	138	80	0.031923	





Antenna port: ANT 1					
Reference Frequency: Lowest channel=2498.5MHz(5MHz for QPSK)					
Temperature (°C)	Power supplied (Vac)	Frequency error			
		Hz	ppm		
25	102	98	0.039224		
	120	80	0.032019		
	138	74	0.029618		
Reference F	requency: Lowest channel=29	501.0MHz(10MHz for	QPSK)		
Tomporatura (°C)	Dower supplied ()/de)	Frequency error			
Temperature (℃)	Power supplied (Vdc)	Hz	ppm		
	102	90	0.035986		
25	120	65	0.025990		
	138	81	0.032387		
Reference Frequency: Lowest channel=2503.5MHz(15MHz for QPSK)					
Tomporatura (°C)	Power supplied (Vac)	Frequency error			
Temperature (℃)		Hz	ppm		
	102	95	0.037947		
25	120	80	0.031955		
	138	71	0.028360		
Reference Frequency: Lowest channel=2506.0MHz(20MHz for QPSK)					
Temperature (℃)	Power supplied (Vdc)	Frequency error			
		Hz	ppm		
25	102	96	0.038308		
	120	80	0.031923		
	138	56	0.022346		

Reference Frequency: Lowest channel=2498.5MHz(5MHz for 16QAM)				
Temperature (°C)	Power supplied (Vac)	Frequency error		
		Hz	ppm	
25	102	98	0.039224	
	120	90	0.036022	
	138	56	0.022413	
Reference F	requency: Lowest channel=25	01.0MHz(10MHz for 1	6QAM)	
Temperature (°C)	Device complied ()/d=)	Frequency error		
	Power supplied (Vdc)	Hz	ppm	
	102	80	0.031987	
25	120	74	0.029588	
	138	88	0.035186	
Reference Frequency: Lowest channel=2503.5MHz(15MHz for 16QAM)				
Temperature (℃)	Power supplied (Vac)	Frequency error		
		Hz	ppm	
25	102	90	0.035950	
	120	65	0.025964	
	138	84	0.033553	
Reference Frequency: Lowest channel=2506.0MHz(20MHz for 16QAM)				
Temperature (°C)	Power supplied (Vdc)	Frequency error		
		Hz	ppm	
25	102	97	0.038707	
	120	81	0.032322	
	138	71	0.028332	