

4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

For LTE Band 2

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 $43 + 10 \log(P) dB$. The emission limit equal to -13 dBm.

For LTE Band 7

In the FCC 27.53(m)(4),On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least $55 + 10 \log (P) dB$. The emission limit equal to -25 dBm.

For LTE Band 12

According to FCC 27.53(g) for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

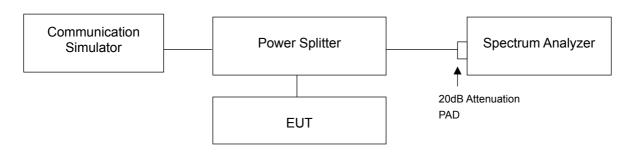
For LTE Band 48

Power of any emissions outside the Fundamental	Limit	
Within 0-10MHz above the Assigned Channel	-13 dBm/MHz	
Within 0-10MHz below the Assigned Channel		
Greater than 0-10MHz above the Assigned Channel	-25 dBm/MHz	
Greater than 0-10MHz below the Assigned Channel		
Power of any emission below 3530MHz	-40 dBm/MHz	
Power of any emission above 3720MHz		

For LTE Band 66

In the FCC 27.53(h), On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P) dB$. The emission limit equal to -13 dBm.

4.7.2 Test Setup

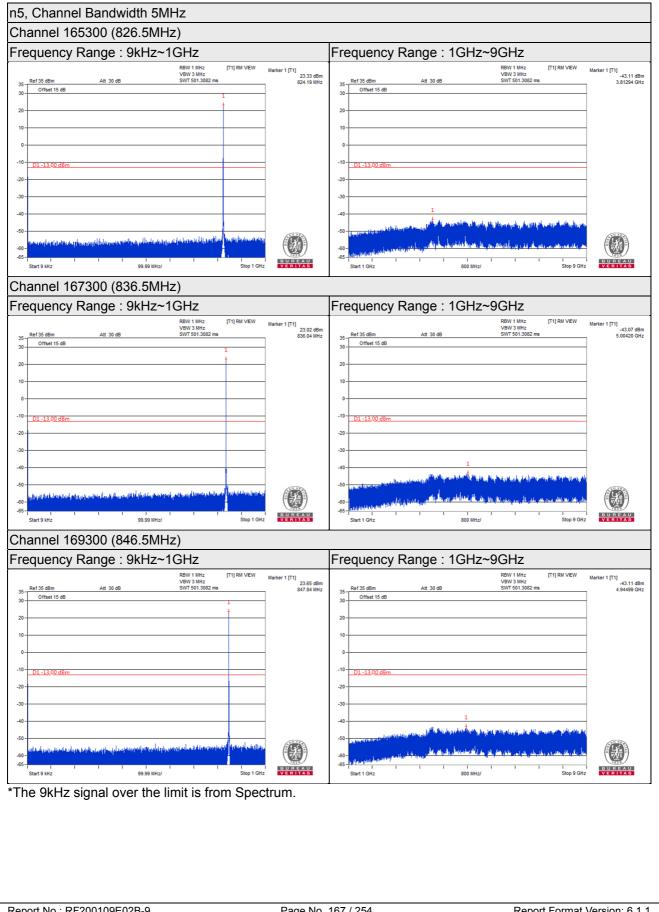


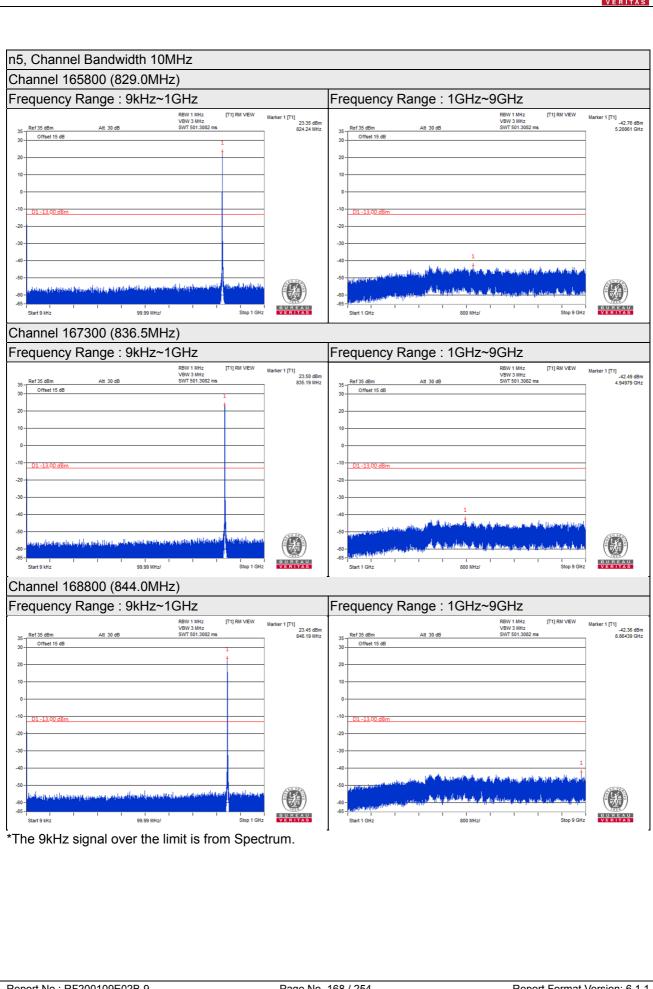
4.7.3 Test Procedure

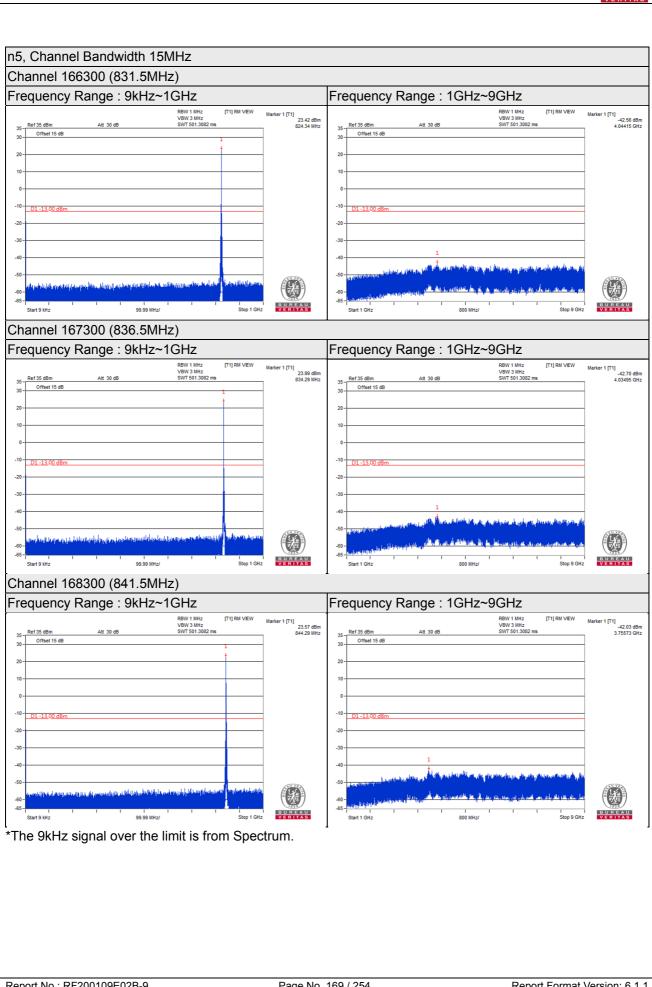
- a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

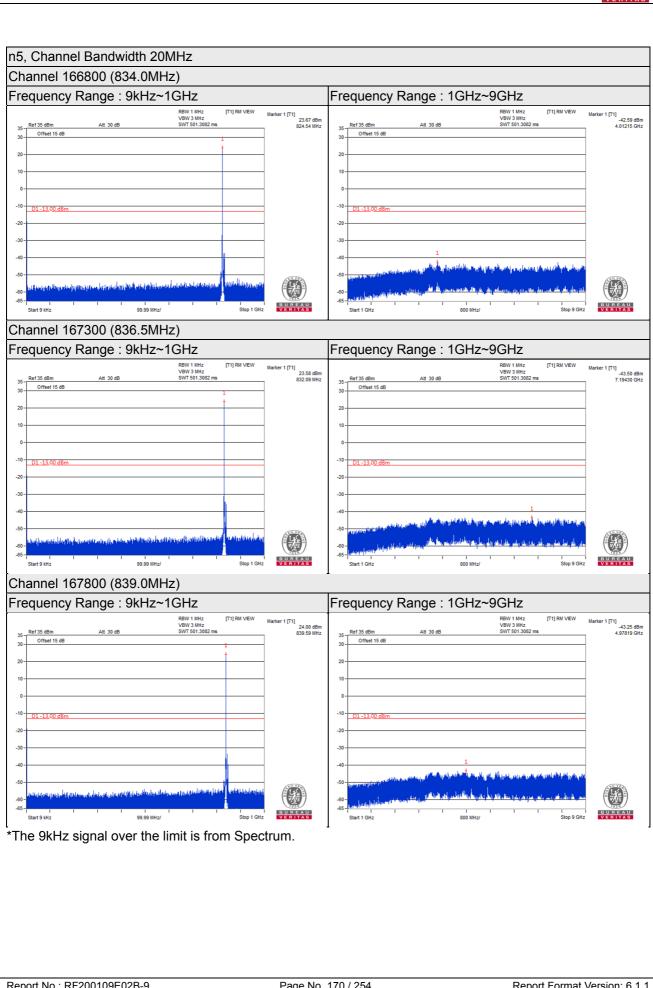


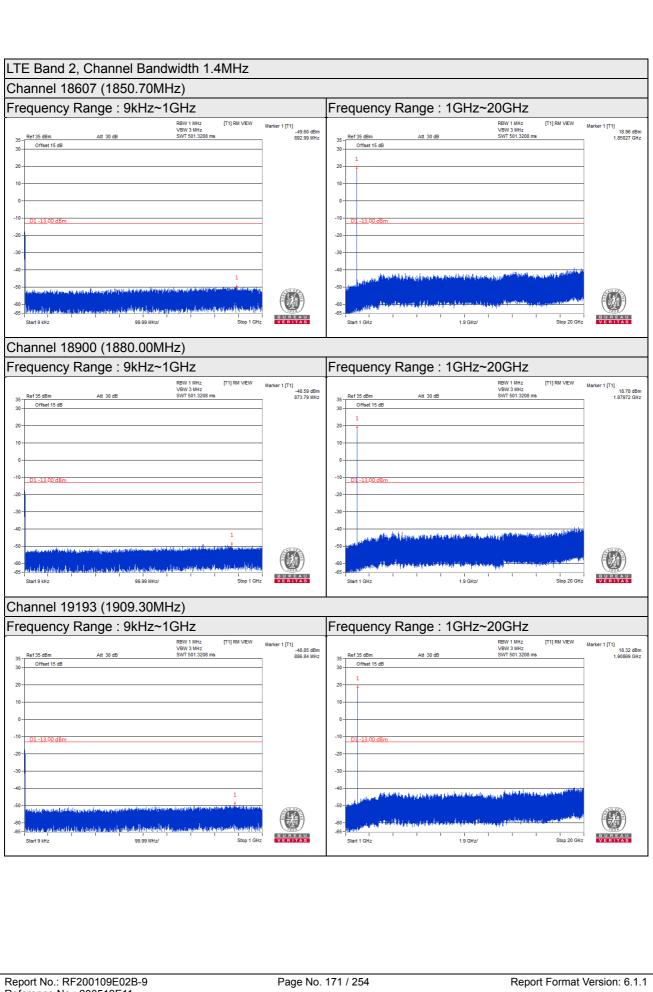
4.7.4 Test Results

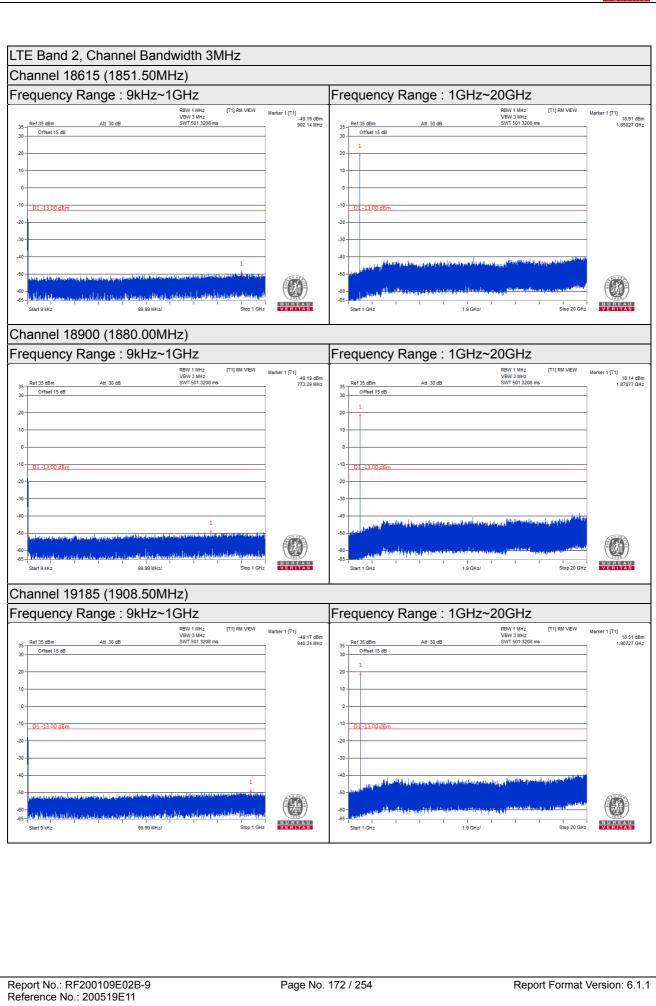


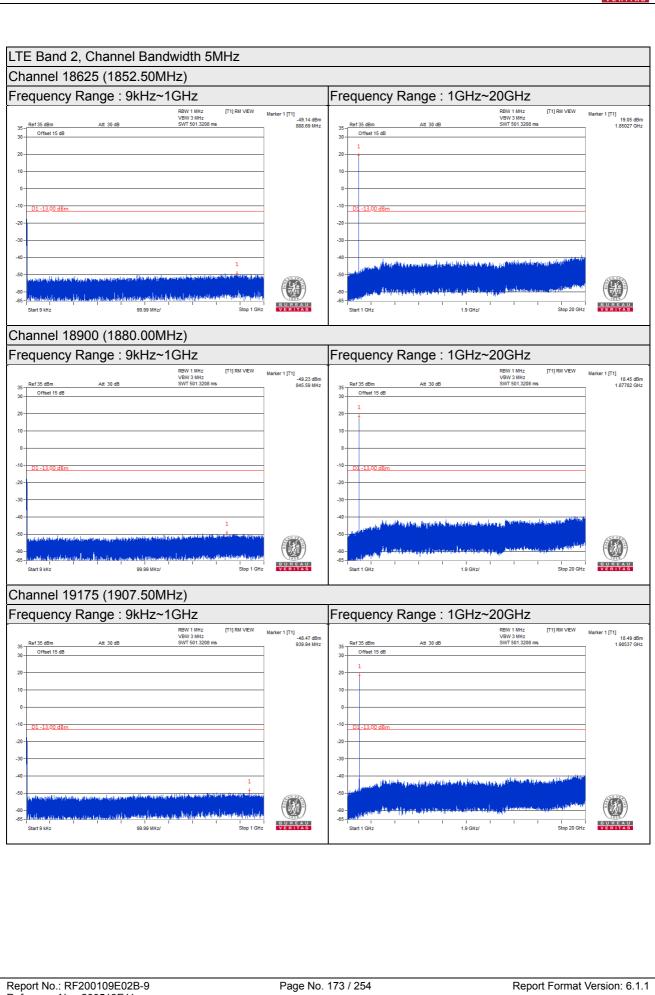


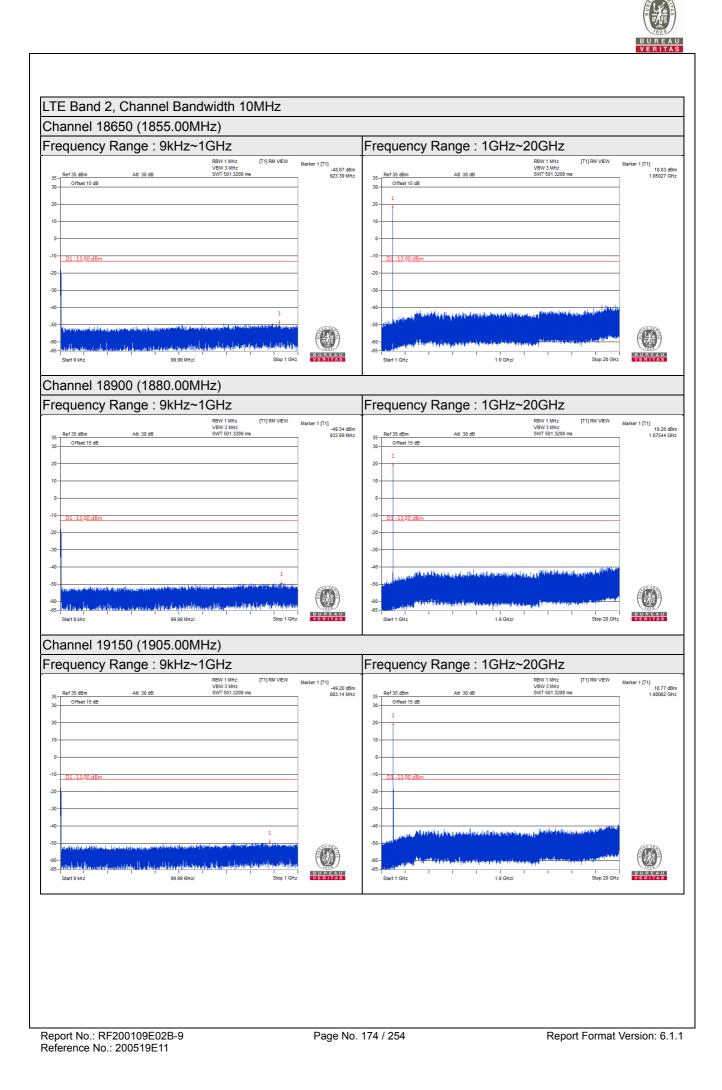


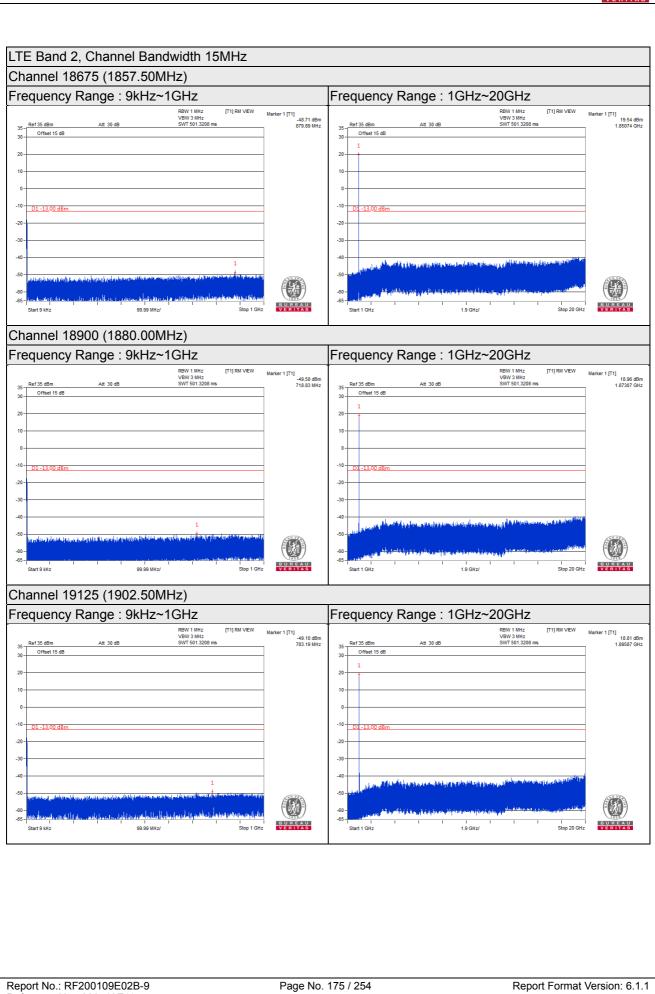


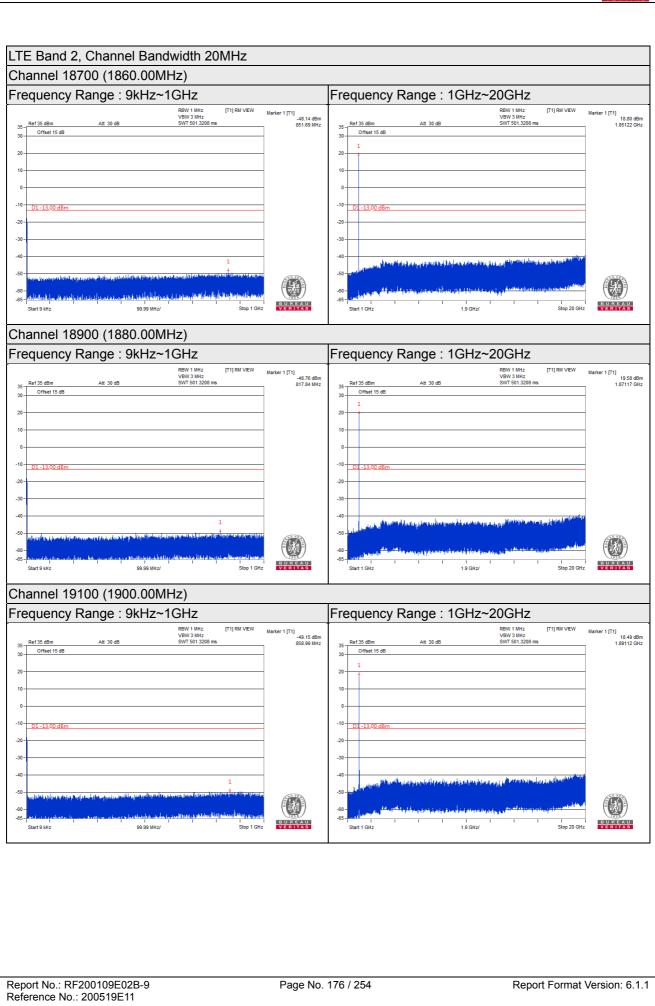














LTE Band 7 Channel Band width: 5MHz Channel 20775(2502.5MHz) Frequency Range : 9kHz~1GHz Frequency Range : 1GHz~3GHz Marker 1 [T1] -49.20 dBm 860.39 MHz Marker 1 [T1] 21.42 dBm 2.50037 GHz RBW 1 MHz VBW 3 MHz SWT 501.308 m RBW 1 MHz VBW 3 MHz SWT 501.308 ms [T1] RM VIEW [T1] RM VIEW Ref 35 dBm Offset 15 dB Ref 35 dBm Offset 15 dB 35 35 30-30 20 20 10 10 0 -10 -1 -20 -20 D1 -25.00 dB D1 -25.00 dB -30 -30 -4 -50 -50 -60 -60 -65 hall and the first at the second second الله العالمة المتنابية بناية بناية المتنابية المعيوم معالم 99.99 MHz/ -65 BUREAU BUREAU I Stop 1 GHz Stop 3 GHz Start 9 kH: Start 1 GHz 200 MHz/ Frequency Range : 3GHz~26GHz RBW 1 MHz VBW 3 MHz SWT 501.3333 ms [T1] RM VIEW Marker 1 [T1] -37.48 dBm 5.00100 GHz Ref -5 dBm Att 0 dB Offset 15 dB D1 -25.00 dB -30 -50 -60 -8 -10 -105-I Stop 26 GHz BUREAU VERITAS 1 2.3 GHz/ Start 3 GHz



Channel Band width: 5MHz	
Channel 21100(2535MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~3GHz
RBW 1 MHz [T1] RM VEW Marker 1 [T1] 36 Ref 35 dBm Att 30 dB SWT 501 308 ms -49 17 dBm 30 Offset 15 dB 983.09 MHz 983.09 MHz 20	RBW1 MHz [T1] RM VEW Marker 1 [T1] 20.31 dBm 35 Ref 35 dBm Att. 30 dB SWT 501.308 ms 2.53287 GHz 30
-10	-10 -20 -20 -20 -20 -20 -20 -20 -20 -20 -2
Complete layer layer layer and the operator of the second se	
RBW 11 MHz [T1] RM VEW VBW 31 MHz Marker 1 [T1] -39.40 dBm -0 Offset 15 dB -30.40 dBm 5.06540 GHz 5.06540 GHz -00 D1 -25.00 dBm -00	
-80- -80- -80- -105 -105 -105 -105 -105 -105 -105 -1	



Channel Band width: 5MHz	
Channel 21425(2567.5MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~3GHz
RBW1 MH:: [T1] RM VEW VBW 3 MH:: Marker 1 [T1] -49.19 (861.69] 36 Ref 35 dBm Att 30 dB SWT 501.308 ms 861.69] 30 Offset 15 dB 861.69] 10 10 10 0 0 10 10	BBm Ref 35 dBm Att 30 dB VBW 1MHz [T1] RM VEW VBW 3HHz Marker 1 [T1] 21.43 dBr 21.43 dBr 35 - Ref 35 dBm Att 30 dB SWY 501.300 ms 2.56607 GH 30
-10- -20- -10- -20- -10- -20- -10- -20- -10- -20- -10- -20- -10- -20- -10- -20- -1025,00 dBm -1025,00 dBm	-10 -20 -20 -20 -20 -20 -20 -20 -20 -20 -2
Start 9 Miz Stort 9 Miz Stort 1 GHZ Stort 26 GHZ	-66- -65-
Ref Att 0 dB Ref Marker 1 [T1] 41.30 -10 Offset 15 dB 5.13037 d 5.13037 d 5.13037 d -20 D1 - 25.00 dBm -30 <t< td=""><td>Bm H/2</td></t<>	Bm H/2
-50	

*The 9kHz signal over the limit is from Spectrum.



Channel Band width: 10MHz	
Channel 20800(2505MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~3GHz
BBIN 1 MHZ [T1] RM VEW Marker 1 [T1] 36 Ref 35 dBm Att 30 dB SWT 501.306 ms 859.69 MHZ 30 Offset 15 dB 00 00 00 00 10 00	RBW1 1MH2 [T1]RM VEW Market 1 [T1] 35 Ref 35 dBm Att 30 dB SWT 501 308 ms 2.50057 GHz 30 0 ffset 15 dB 1 1 1 20 1 1 1 1 10 0 0 0 0 0 -10 0 0 0 0 0
-20 -2125.00 d8m -30 -31 -40 -1 -50 -14.1 cm/d cm/d cm/d cm/d cm/d cm/d cm/d cm/d	-20 -20 -20 -20 -20 -20 -20 -20
Frequency Range : 3GHz~26GHz	
Ref -5 dBm Att 0 dB SWT 501 3333 ms Marker 1 [T1] -0 -0 -33.82 dBm -33.82 dBm -00 -01-25.00 dBm -33.82 dBm -33.82 dBm -00 -01-25.00 dBm -01 -01 -00 -01 -01 -01 -01 -00 -01 -01 -01 -01 -00 -01 -01 -01 -01 -00 -01 -01 -01 -01 -00 -01 -01 -01 -01 -00 -01 -01 -01 -01 -00 -01 -01 -01 -01 -00 -01 -01 -01 -01 -00 -01 -01 -01 -01 -00 -01 -01 -01 -01 -00 -01 -01 -01 -01 -00 -01 -01 -01 -01 -01 -01 -	
-100	



Channel Band width: 10MHz	
Channel 21100(2535MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~3GHz
REV 1 Mrz [T1] RM VEW Marker 1 [T1] 35 Ref 35 dBm Att 30 dB SWT 501.308 ms 865 29 30 Offset 15 dB 0 0 0 0	dBm HBW 1 MH: [T1] RM VEW Marker 1 [T1] 35 Ref 35 dBm Att 30 dB SWT 501.308 ms 2.55007 GHz 30 Offset 15 dB 1 1 1 1 20 1 <td< th=""></td<>
-10	-10 -20 -20 -20 -20 -20 -20 -20 -20 -20 -2
-80- -85- Start 9 kHz -10- 90 99 MHz/ -10- 90 MHz/ -10-	-50 - Through very history of through a transmission of the state of t
RBW 1 MHz [T1] RM VEW Marker 1 [T1] -5 Ref -5 dBm Att 0 dB SWT 501.3333 ma 506080 -10 Offset 15 dB 500000 50 500000 -20 D1 -25.00 dBm -00 -00 -00 -00 -00 -30 1 -00	
-00	

*The 9kHz signal over the limit is from Spectrum.



Channel Band width: 10MHz					
Channel 21400(2565MHz)					
Frequency Range : 9kHz~1GHz		Frequency F	Range : 1GH	Hz∼3GHz	
BBW1 Mh12 [T1] RM VEW 35 Ref 35 dBm Att 30 dB SWT 501.308 ms 30 Offset 15 dB	Marker 1 [T1] -43,84 dBm 900.19 MHz	35 - Ref 35 dBm 30 - Offieit 15 dB 20	Att 30 dB	RBW 1 MHz [71] VBW 2 MHz SWT 501.308 ms	RM VIEW Marker 1 [T1] 21.41 dBn 256067 GHz
-20 D1-25,00 dBm -30 -40 -40 -50 -40 -50 -50 -50 -50 -50 -50 -50 -5		-20 - D1 - 25.00 dBm -30			
requency Range : 3GHz~26GHz					
Ref -5 dBm Att 0 dB VBW 3 Mitz -5 Ref -5 dBm Att 0 dB SVIT 501 3333 ms -10 Offset 15 dB SVIT 501 3333 ms	Marker 1 [T1] -44.94 dBm 5.12175 GHz				
-90	B UT A U VE RITAS				

*The 9kHz signal over the limit is from Spectrum.



Channel Band width: 15MHz		
Channel 20825(2507.5MHz)		
Frequency Range : 9kHz~1GHz		Frequency Range : 1GHz~3GHz
35 Ref 35 dBm Att 30 dB SWT 501.308 ms 30 Offset 15 dB 0 0 10 0 0 0	rker 1 [T1] -48.46 dBm 702.08 MHz	Image: Name Till RM VEW Marker 1 [Till 20 02 dBm 35 Ref 35 dBm Att 30 dB SWT 501.308 ms 2 2 50077 GHz 30 Offset 15 dB 1 2 2 10 0 1 1
-10 -20 - D1 -25.00 dBm 		
Start 9 M/z 99 99 MHz Stop 1 GHz Frequency Range : 3GHz~26GHz	BUREAU VERITAS	Start 1 GHz 200 MHz/ Stop 3 GHz VERITAS
Ref -5 dbm Att 0 dB SWIT 501.3333 ms -5 Ref -5 dbm Att 0 dB SWIT 501.3333 ms -10 Offset 15 dB Offset 15 dB Offset 15 dB -20 D1 -25.00 dBm - - -30 - - - -40 - - - -50 - - - -60 - - - -60 - - - -70 - - - - -80 - - - - -80 - - - - -80 - - - - -80 - - - - -80 - - - - -80 - - - -	rker 1 [T1] -35.14 dBm 5.00157 GHz	
-90 - 41 - 41 - 41 - 41 - 41 - 41 - 41 - 4	B U R E A U VERITAS	



Channel Band width: 15MHz	
Channel 21100(2535MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~3GHz
RBW1 MH: [T1] RM VEW Marker 1 [T1] 4 35 Ref 35 dBm Att 30 dB SWT 501 306 ms 62 30 Offset 15 dB 0 0 0 10 0 0 0 0	Bit Mitz T1 RM VEW VBV3 MHz T1 RM VEW VBV3 MHz Marker 1 [T1] 35 - Ref 35 dBm Att 30 dB SWT 501 306 ms 20.65 dBm 30 - Offset 15 dB 1 1 1 0 1 1 1 0 1 1 1
-10	-10 -20 -20 -20 -20 -20 -20 -20 -20 -20 -2
-00- -05- -05- -06-	-80- -10- <td< td=""></td<>
RBW 1 MH2 VBW 3 MH2 [T1] RM VEW VBW 3 MH2 Marker 1 [T1] -3 -5 Ref -5 dBm Att 0 dB SWT 5013333 ms 5.01 -10 Offset 15 dB 0 5.01 5.01 -20 D1 -25,00 dBm - <td>8.91 dBm 5677 GHz</td>	8.91 dBm 5677 GHz



Channel Band width: 15MHz		
Channel 21375(2562.5MHz)		
Frequency Range : 9kHz~1GHz		Frequency Range : 1GHz~3GHz
Ref 35 dBm Att 30 dB SWT 501 300 ms Market 30 Offset 15 dB 0	er 1 [T1] -48.31 dBm 859.09 MHz	Ref 35 dBm Att 30 dB SWT 501.300 ms 20.67 dBm 30 Offset 15 dB 1 20.67 dBm 2.55667 GHz 20 1 1 1 1 1 10 0 0 0 0 0 0
-10 -20 - D1 -25.00 dBm		-10
100- 100- 105- 106- 116-116-116-116-116-116-116-116-116-1	B U R E A U VER ITAS	-00- 477(1)171(1)111(1)111(1)111(1)111(1)111(1)111(1)11(1)11(1)11(1)11(1)11(1)11(1)11(1)11(1)11(1)11(1)(1)
	er 1 [T1] -40.36 dBm 5.11140 GHz	
	B U R E A U VER ITAS	

*The 9kHz signal over the limit is from Spectrum.



Channel Band width: 20MHz	
Channel 20850(2510MHz)	
requency Range : 9kHz~1GHz	Frequency Range : 1GHz~3GHz
RBW 1 MHz [T1] RM VEW Marker 1 [T1] 35< Ref 35 dBm Att 30 dB SWT 501.398 ms 30 Offset 15 dB 0 0 10 0 0 0 -10 0 0 0 -20 0 0 0	-48.83 dBm 36 37 38 39 48 35 dBm 30 30 30 30 30 30 30 30 30 30
00-22.00 dom 10-22.00 dom 10-20-20-20 dom 10-20-20-20-20-20-20-20-20-20-20-20-20-20	
R8W 1 MHz [T1] RM VIEW Marker 1 [T1] VBW 3 MHz	-35.66 dBm 502:15 GHz



Channel Band width: 20MHz					
Channel 21100(2535MHz)					
requency Range : 9kHz~1GHz		Frequency Ra	ange : 1GHz	z~3GHz	
Ref 35 dBm Att 30 dB SWT 501 300 ms M 30 Offset 15 dB	arker 1 [T1] -48.82 dBm 746.73 MHz	35 - Ref 35 dBm 30 - Offset 15 dB 20	Att 30 dB	RBW1 HMtz [F1] VBW 3 MHz SWT 501.308 ms 1 1	RM VEW Marker 1 [T1] 19.08 dBn 2.52617 OH;
20 - D1 - 25.00 dBm		-20 -20 -20 -30 -40 -40 -50 			
requency Range : 3GHz~26GHz				-	
	larker 1 [T1] -35.98 dBm 5.05217 GHz				
-90- 100- 105- Start 3 GHz 2.3 GHz/ Stop 26 GHz	BU REAU VERITAS				

*The 9kHz signal over the limit is from Spectrum.



Channel Band width: 20MHz					
Channel 21350(2560MHz)					
Frequency Range : 9kHz~1GHz		Frequency I	Range : 1Gł	Hz~3GHz	
RBV 1 MHz VBW 3 MHz [T1] RM VEW VBW 3 MHz 35-Ref 35 dBm Att 30 dB SWT 501.308 ms 30 Offset 15 dB Image: Comparison of the second s	Marker 1 (T1) -48,49 dBm 795,19 MHz	35 Ref 35 dBm 30 Offset 15 dB 20 -	Att 30 dB	RBW 1 MHz [T1] RM VBW 3 MHz SWT 501.308 ms 1	VEW Marker 1 [T1] 20.12 dBn 2.55127 GH;
10		-10 -20 -30 -30 -50 -50 -50 -50 -50 -51 -51 -51 -51 -51 -51 -51 -51 -51 -51	enderung ders sim störa störa första en skala första en skala söre skala söre skala söre skala söre skala söre	, and the second state of	
Start 9 kHz 99 99 MHz/ Stop 1 GHz requency Range : 3GHz~26GHz	BUREAU VERITAS	Start 1 GHz	200	MHz/ St	op 3 GHz VERITAS
RBW 1 MHz [T1] RM VEW -5 Ref-5 dBm Att 0 dB SWT 501.3333 ms -10 Offset 15 dB Offset 15 dB Offset 15 dB -20 D1 -25.00 dBm Offset 15 dB Offset 15 dB -20 D1 -25.00 dBm Offset 15 dB Offset 15 dB -20 D1 -25.00 dBm Offset 15 dB Offset 15 dB -30 - - - - -30 - - - - -30 - - - - -30 - - - - -80 - - - - -80 - - - - -80 - - - - -80 - - - - -80 - - - - -80 - - - -	Marker 1 [T1] -43.11 dBm 5.10220 GHz				
-90	BUREAU VERITAS				



