

## 5.5 SPURIOUS EMISSION

## 5.5.1 CONDUCTED SPURIOUS EMISSION

### 5.5.1.1 MEASUREMENT METHOD

The following steps outline the procedure used to measure the conducted emissions from the EUT. 1. The level of the carrier and the various conducted spurious and harmonic frequency is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the approximate frequencies. All data rates were investigated to determine the worst case configuration.

2. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 9 GHz.

3. Determine EUT transmit frequencies: the following typical channelswere chosen to conducted emissions testing.

Typical Channels for testing of GSM 850						
Channel	Frequency (MHz)					
128	824.2					
190	836.6					
251	848.8					

Typical Channels for testing of PCS 1900						
Channel	Frequency (MHz)					
512	1850.2					
661	1880.0					
810	1909.8					

Typical Channels for testing of UMTS band II							
Channel Frequency (MHz)							
9262	1852.4						
9400	1880						
9538	1907.6						



Typical Channels for testing of UMTS band IV						
Channel	Frequency (MHz)					
1312	1712.4					
1412	1732.4					
1513	1752.6					

Typical Channels for testing of UMTS band V						
Channel	Frequency (MHz)					
4132	846.4					
4182	836.4					
4233	846.6					

## 5.5.1.2 PROVISIONS APPLICABLE

On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

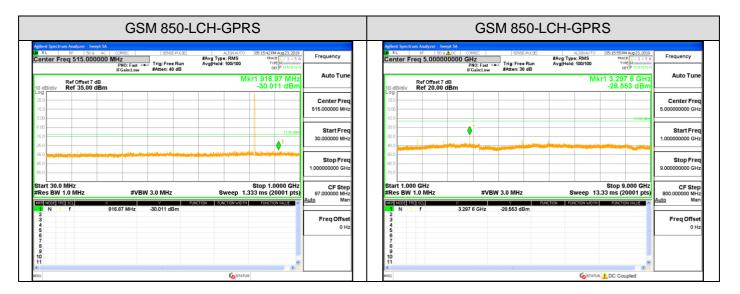


#### 5.5.1.3 MEASUREMENT RESULT

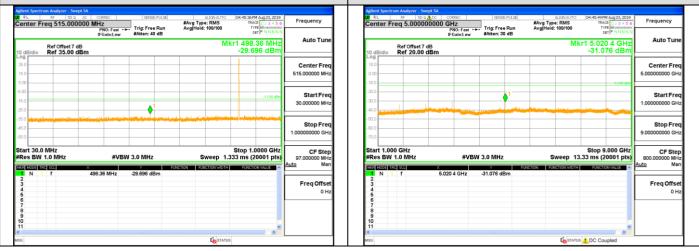
## **Test Results**

## Test Band=GSM850/GSM1900 Test

## Mode=GPRS/EGPRS



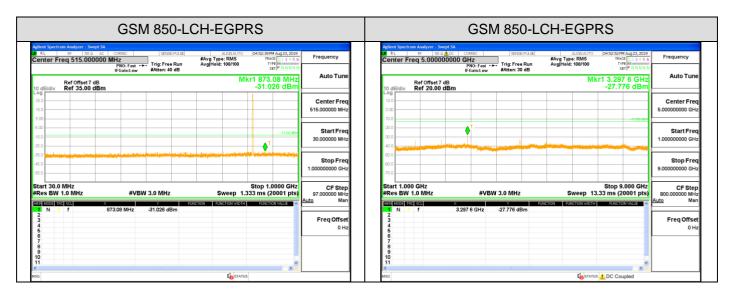
#### GSM 850-MCH-GPRS

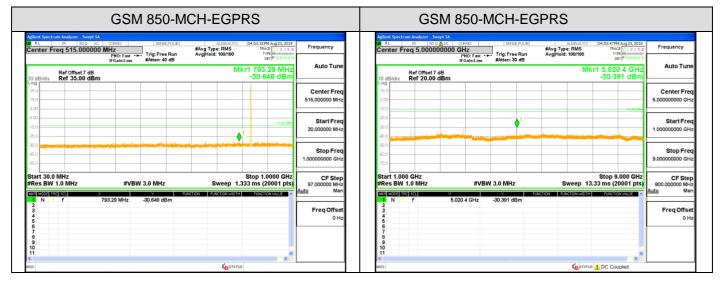


#### **GSM 850-MCH-GPRS**



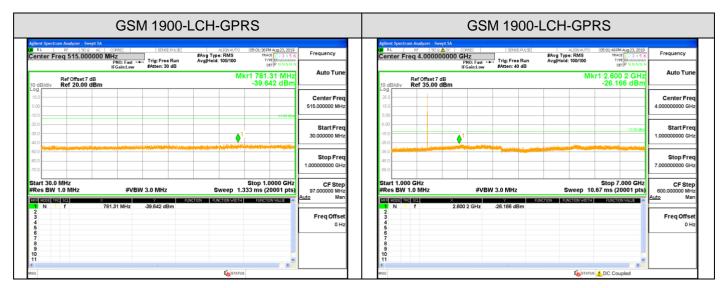
G	SM 850-HCH-	GPRS	GSM 850-HCH-GPRS			
glient Spectrum Analyzer - Swept SA           RL         RF         SD R         CORREC           Center Freq 515.000000 MHz           PR0: Fr         IFGaintL	#Avg Type st Trig: Free Run Avg Hold:	100/100 TYPE MWWWWWW DET P N N N N N	Frequency Auto Tune	Allered Spectrum Adv/spr. Sergit SA         SPECEPALSE         ALSOLATTO         06463319140/22.2000         Frequency           B         L         SPECEPALSE         ALSOLATTO         06463319140/22.2000         Frequency           Center Freq 5.000000000 GHz Figure 1         Trig: Free Run Advgited: 100100         Trig: Free Run Advgited: 100100		
Ref Offset 7 dB 10 dB/div Ref 35.00 dBm		Mkr1 804.06 MHz -30.180 dBm	Auto Tune	Ref Offset 7 dB         Mkr1 2.547 2 GHz         Auto 1 un           10 dB/div         Ref 20.00 dBm		
25.0 15.0 5.00			Center Freq 515.000000 MHz	Center Fre 5.0000000 GH		
5.0		-13.00 dBm	Start Freq 30.000000 MHz	300 300 400		
60 <b>ber und die der der der ber der ber 6.0</b>	gytenisty transport i fei officia a francés je kartenist kierté		Stop Freq 1.000000000 GHz	800 800 700 800 800 800 80000000 GH		
tart 30.0 MHz Res BW 1.0 MHz #	VBW 3.0 MHz S	Stop 1.0000 GHz weep 1.333 ms (20001 pts)	CF Step 97.000000 MHz	Start 1.000 GHz         Stop 9.000 GHz         CF Ste #Res BW 1.0 MHz         #VBW 3.0 MHz         Sweep 13.33 ms (20001 pts)         800.00000 MHz		
19 MODE THE SCL X	Y FUNCTION FUN		ito Man	TASE MODE TREE SCI. X Y RUNCTION FUNCTION FUNCTION VIDTH RUNCTION VIDTH AUXIONVALUE A		
2 3 4 5 6			Freq Offset 0 Hz	2 3 4 6 6		
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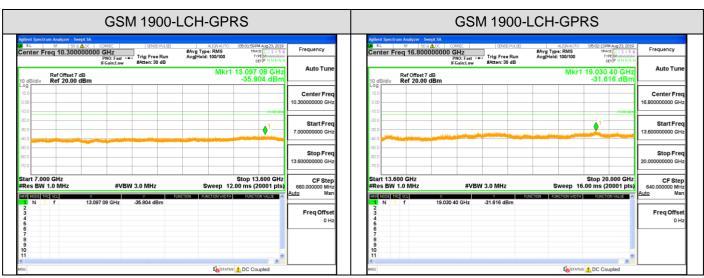






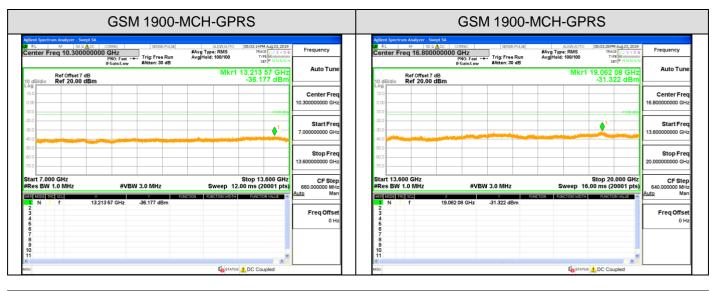
GSM 850-HCH-EGPRS GSM 850-HCH-EG	SPRS	
1 Jorg4 SA. 202 ≈ C 100000 MHZ 2010 ≈ C 10000 C 1000 C	100 TRACE 12 3 4 5 6 TYPE MWWWWWW DET P N N N N N	requency Auto Tune
set7 dB Mkr1 647.94 MHz Auto Tune Ref Offset7 dB	Mkr1 3.396 4 GHz -31.962 dBm	Auto Tune
Center Freq 515.00000 MHz 400		Center Freq 00000000 GHz
300         100.00           1         300.00000 MHz	1.0	Start Free
Main processing         Stop Freq         800	9.0	Stop Free
		CF Step 0.000000 MH2
X         Y         EUTRIDIATION         EUTRIDATION         EUTRIDATION <theutridation< th="">         EUTRIDATION</theutridation<>		Mar Freq Offsel
OHz 4 6 7	aa	0 Ha
8 9 10 10		
	STATUS DC Coupled	

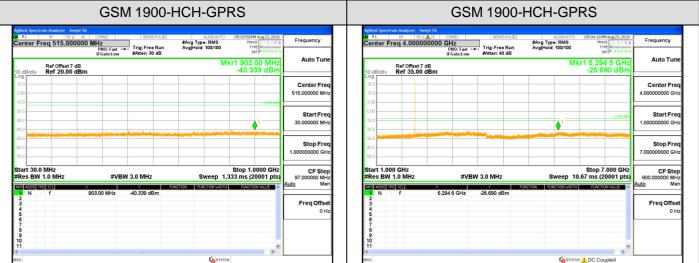




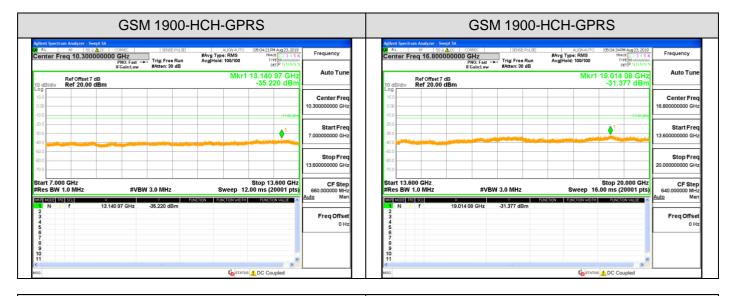


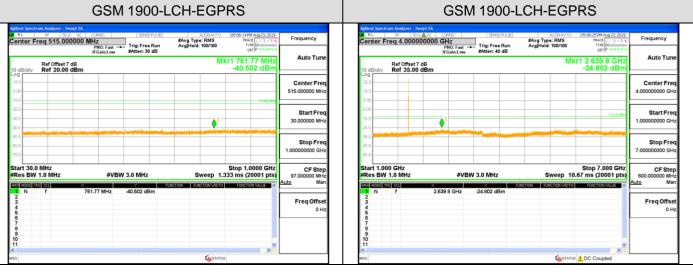
GSM 1900-MCH-GPRS	GSM 1900-MCH-GPRS			
Spectrum Analyzer         Swyll SA.         All SPART         Spectrum Analyzer         All SPART         GIS 02 SEP MAg 23, 2019         Spectrum Analyzer         All SPART         GIS 02 SEP MAg 23, 2019         Spectrum Analyzer         All SPART         Spectrum Analyzer         All SPART         Spectrum Analyzer         Spectrum Analyzer         All SPART         Spectrum Analyzer         Sp	Frequency	Agilenti Spectrum Andyzer - Swigt SA         CORREC         SPISE PLACE         AL30/AUTO         D50/3030PM Aug 23, 2019         Frequency           Center Freq 4.000000000 GHz         Files +++         Trig: Free Run Files ++0 40         Avg Hold: 100/100         Trig: Swigt SA         Trig: Swigt SA         Frequency		
Ref Offset 7 dB Mkr1 788.78 MHz /div Ref 20.00 dBm -40.239 dBm	Auto Tune	Ref Offset 7 dB Mkr1 5.271 1 GHz 10 dB/div Ref 35.00 dBm -26.175 dBm		
	Center Freq 515.000000 MHz	250 250 150 200		
	Start Freq 30.000000 MHz	400		
	Stop Freq 1.000000000 GHz	-350 -450 -650		
30.0 MHz Stop 1.0000 GHz BW 1.0 MHz #VBW 3.0 MHz Sweep 1.333 ms (20001 pts)	CF Step 97.000000 MHz Auto Man	Start 1.000 GHz         Stop 7.000 GHz           #Res BW 1.0 MHz         \$Weep 10.67 ms (20001 PH)           #0.00000000000000000000000000000000000		
CRETIFE[SC] X Y RIBCTION RINCTION/MOTH PUTCTON/NAUE ∧ N 1 f 769.78 MHz -40.239 dBm	Freq Offset 0 Hz	Image         Image <th< td=""></th<>		
		6 7 8 9 10 11		
STATUS STATUS				



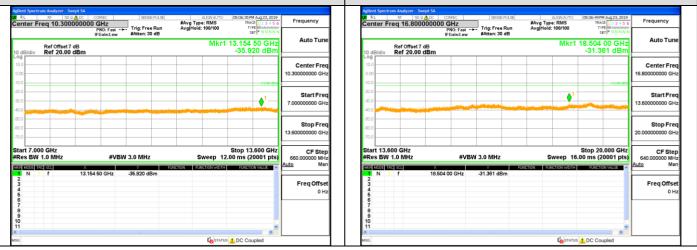








## GSM 1900-LCH-EGPRS

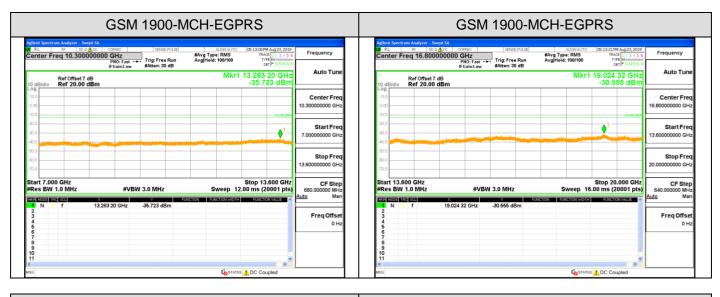


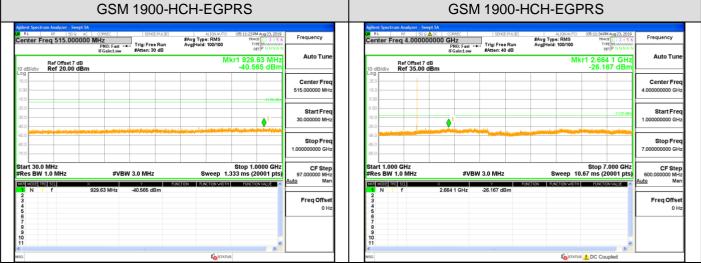
**GSM 1900-LCH-EGPRS** 

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GSM 1900-MCH-EGPRS	GSM 1900-MCH-EGPRS
Bit Spectrum Andryzer         Swigt SA         SUBSERVLEE         AUGMANTO         DS12-46PM Aug23, 2019         Frequ           R L         RF         S0:0         AC         CORREC         SUBSERVLEE         AUGMANTO         DS12-46PM Aug23, 2019           enter Freq 515.0000000 MHz         Frig Free Run         Avg1Held: 100100         Tridt MixAMAN         Frequence	Agtent Spectrum And/yzer, Swigt SA         Bit RL         NF         SO c Apr C         COMPEC         SPICE PLASE         ALISNAUTO         05:12:99/M Aug 23, 2019         Frequency           Uency         Center Freq 4.000000000 GHz         Trig: Free Rin Aug/10:05:12:99/M Aug 23, 2019         Frequency         Frequency           Effect Out         Prof. Fast         Aug/Hold: 100/100         Trig: Free Rin Aug/10:05:12:99/M Aug 23, 2019         Frequency
Ref Offset 7 dB Mkr1 976.91 MHz Au 0 dB/dly Ref 20.00 dBm - 40.997 dBm	uto Tune Ref Offset 7 dB Mkr1 3,289 9 GHz Auto Tur 10 dB/dlv Ref 35.00 dBm -26.250 dBm
	nter Freq 300 150 Center Fre 4.000000 Gi
	tart Freq 150 250 250 250 250 250 250 250 2
500 Si	top Freq 450 00000 GHz 450
	CF Step Start 1.000 GHz Stop 7.000 GHz CF Ste \$\mathcal{Mn}\$ #VBW 3.0 MHz Sweep 10.67 ms (20001 pt) Mn \$\mathcal{Mn}\$ \$\mat
ARE MODE THE ISOU X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE ~	Image         Image         V         PRICTION         PRICTION WORH         PRICTING         PRICTING         PRICTING
	Mis C Coupled







GSM 1900-HCH-EGPRS				GSM 1900-HCH-EGPRS									
Frequency Auto Tune	05:11:58PM Aug 23, 2019 TRACE [1 2:4 5:6 TYPE MINNANN DET P NNNNN 18.988 80 GHz -30,873 dBm	ALIGNAUTO #Avg Type: RMS Avg Hold: 100/100 Mkr1	SENSE:PULSE Trig: Free Run #Atten: 30 dB	PNO: Fast IFGain:Low	trum Analyzer - Swept № 50 x Δt Freq 16.8000000 Ref Offset 7 dB Ref 20.00 dB	()0 RL		05:11:44PM Aug 23, 2019 TRACE 12:3:4:5:6 TYPE MIMMANAN Der P N N N N N 2.651 91 GHz -35.937 dBm	#Avg Type: RMS Avg Hold: 100/100	SENSE-PULSE	DC CORREC 0000 GHz PN0: Fast IFGain:Low	r Freq 10.3000 Ref Offset 7 d	UN RL
Center Freq 16.80000000 GHz	-12.00 40m						Center Freq 10.30000000 GHz	12.00 (Em					10.00 - 10.00 -
Start Freq 13.60000000 GHz						-20.0 - -30.0 - -40.0 2	Start Freq 7.000000000 GHz	↓1					-20.0 -30.0 -40.0
Stop Freq 20.00000000 GHz						-50.0	Stop Freq 13.60000000 GHz						-50.0 -60.0 -70.0
CF Step 640.00000 MHz <u>Auto</u> Man	Stop 20.000 GHz 6.00 ms (20001 pts) 6.00 ms (20001 pts)	Sweep 16	V 3.0 MHz -30.873 dBm	#VB1				Stop 13.600 GHz 0 ms (20001 pts)	Sweep 12.0	W 3.0 MHz	#VE	7.000 GHz BW 1.0 MHz E 166 500	#Res
Freq Offset 0 Hz			-30.873 dBm	988 80 GHZ		2 3 4 5 6	Freq Offset 0 Hz			-36.937 dBm	12.001 91 GHZ		234567
	,*					9 10 11		×					8 9 10 11
	IS 🔔 DC Coupled	🚯 STATU				MSG		DC Coupled	🚯 STATUS 👌				MSG



## Test Band WCDMA850/ WCDMA1700/WCDMA1900

## Test Mode=UMTS



WCDMA8	850-MCH	WCDMA850-MCH
Aglent Spectrum Analyzer - Swept SA ■ RL RP 50 2 AC CORREC SPICEPULSE Center Freq 515.000000 MHz PN0: Fast -→ Trig: Free Run #Gaint un faster: 40 dB	ALIGNAUTO 07/40:19PM Aug 23, 2019 #Avg Type: RMS TRACE 12.2.4.5.6 Avg[Heid: 100/100 TVPE MAMAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Adient Spectrum Analyzer - Swight SA W RL IP S05 ▲ OC COMPEC SHOEPAUSE ALIGNAUTO (07-4033PM Arg23, 2019) Center Freq 5,000000000 GHz Trig: Free Run Avg[Heid: 100/100 CMT/PEISIPM Arg23, 2019) FileGister With States 30 dB Compension of the States
Ref Offset 7 dB 10 dB/div Ref 35.00 dBm	Mkr1 806.78 MHz -29.473 dBm	Ref Offset7 dB Mkr1 3.063 6 GHz 10 dB/d/v Ref 20.00 dBm -36.796 dBm
250	Center Freq 515.00000 MHz	Log 100 000 100 100 100 100 100 10
-500	-13.00 den 30.000000 MHz	300 300 400
-350 -450 -550	Stop Freq 1.00000000 GHz	500 500 500 500000000
Start 30.0 MHz #Res BW 1.0 MHz #VBW 3.0 MHz #Krei Mxxxei Traci SCL × Y FU	Stop 1.0000 GHz         CF Step           Sweep 1.333 ms (20001 pts)         97.000000 MHz           Interference         Man	Start 1.000 GHz         Stop 9.000 GHz         CF st           #Res BW 1.0 MHz         #VBW 3.0 MHz         Sweep 13.33 ms (2000 Hz)         so0.00000 Mz           Use Issee 1745 Social Start
N 1 f 806.78 MHz -29.473 dBm 3 4 5	Freq Offset 0 Hz	1         N         1         f         3.063 6 GHz         36.796 dBm         7           2         3
6 7 8 9 10		6 7 7 9 9 9 9 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0
11 · · · · · · · · · · · · · · · · · ·		11



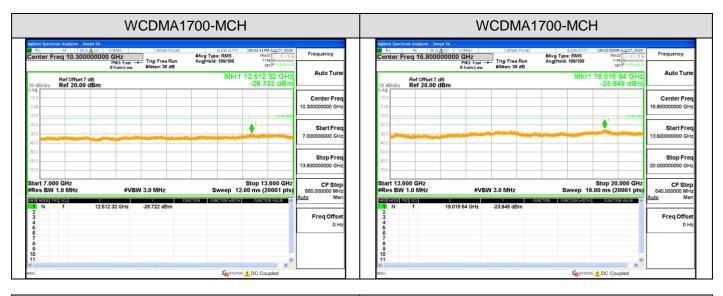


WCDMA1700-LCH	WCDMA1700-LCH
Close Spectrum Analyser         Sample SA         CENEC         ESEE PLACE         AUSIANTO         Open Larget         AUSIANTO         Open Larget         Auget Nation	Addent Sections Advance:         String 5 M         String 5 M         String 5 M         String 5 M         Frequency           requency         B         R.L         Into 100 ACC         String 5 M         String 5 M         String 5 M         Frequency           Center Freq 4.000000000 GH2:         Trig Free Run         AvgiField:         String 5 M         Frequency         Frequency           File Sectors         Frequency         Frequency         Frequency         Frequency         Aug Type: RMS         Trig Free Run         String 5 M         Frequency         Frequency         Frequency         Frequency         Aug Type: RMS         Trig Free Run         AvgiField:         String 5 M         Frequency         Frequency         Frequency         Frequency         Aug Type: RMS         Trig Free Run         AvgiField:         String 5 M         Frequency         Frequency         Frequency         Frequency         Frequency         Frequency         Trig Free Run         AvgiField:         String 5 M         Frequency         Fre
Ref Offset 7 dB Mkr1 930.31 MHz .33.535 dBm	Auto Ture Mkr1 3.178 0 GHz Auto Tu 10 dB/div Ref 35.00 dBm
10.0	Center Freq         30         Center F         Center F <t< td=""></t<>
	Start Freq         600         1         3100 mm         Start F           0.000000 MHz         450         4100 mm         4100 mm         100000000 MHz         1000000000 MHz         100000000 MHz         1000000000 MHz         1000
	Stop Freq         40         Annual         Stop Freq         Stop Fre
tart 30.0 MHz Stop 1.0000 GHz Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.333 ms (20001 pts)	CF Step Start 1.000 GHz Stop 7.000 GHz CF Step 10.07 ms (2000 GHz 000000000 Hz 00000000000 Hz 000000000
CRE MODE (1973) SCL X Y FRANCION FRANCION MODINE FRANCION MADE     STATEMENT (1974) SCL (1974)	Image         Direct Model First Sol,         X         Y         Allocition         Allocition Model         Participation         Partitititititation         Participation
7 8 9 10	7 8 9 10
	MSG Local Lo

	WCDMA1	700-LCH		WCDMA1700-LCH			
Aglent Spectrum Analyzer - Swept SA ■ RL PF 502 _0 CC Center Freq 10.30000000 Ref Offset 7 dB 10 dB/div Ref 20.00 dBm	CORREC   SENSE PULSE  DO CH2 IF Gain:Low #Atten: 30 dB	ALISNAUTO   09:02:21PM Aug2 #Avg Type: RMS Avg Heid: 100/100 Mkr1 12:847 27 0 -28.937 d	Auto Tune	Aglent Spectrum Analyzer - Swigt S 01 RL RF 50 0 Ab 0 Center Freq 16.800000 Ref Offset 7 dB 10 dB/div Ref 20.00 dBr	C CORREC SENSE PULSE PNO:Fast →→ Trig:Free Run IFGein:Low #Atten: 30 dB	ALISHAUTO [09023474 Aug 27, 2015 #Avg Type: RMS [19:3:4:5 Avg]Heid: 100/100 TYPE [Mkr1 19.051 84 GHz -23.953 dBm	Auto Tune
10.0 0.00			Center Freq 10.30000000 GHz	10.0 0.00			Center Freq 16.80000000 GHz
-20.0 -30.0 -40.0			Start Freq 7.000000000 GHz	-20.0 -30.0 -40.0			Start Freq 13.60000000 GHz
-50.0			Stop Freq 13.60000000 GHz	-50.0			Stop Freq 20.000000000 GHz
Start 7.000 GHz #Res BW 1.0 MHz		Stop 13.600 Sweep 12.00 ms (20001 INGTION FUNCTION WIDTH FUNCTION VALU	pts) 660.000000 MHz			Stop 20.000 GHz Sweep 16.00 ms (20001 pts	
1 N 1 f 12.8 3 4 5 6 7 8 9 9	847 27 GHz -28.937 dBm		Freq Offset 0 Hz	N 1 F 1 3 4 5 6 7 8 9 10	9.051 84 GHz -23.953 dBm		Freq Offset 0 Hz
11 <	U.	STATUS 1 DC Coupled	× ×	MSG	Ш	STATUS L DC Coupled	



WCDMA1700-MCH	WCDMA1700-MCH			
Aglent Spectrum Audyzer Swegt SA ■ R. 107 150 0 AC COREC 1596E PL3E ALDRAUTO 000319PM Aug 27,005 Conter Freq 515.0000000 MHz PH0: Faut. → Trig: Free Run IF Grait.tww State: 30 dB Barrie State: 30 dB	Frequency	Agenet Spectrum Analyzer         Swight SA           R RL         RF         50 x B_OC         CORREC         SB DE PL/SE         ALDPLANTO         090331 PM Aug 27, 2019           Center Freq 4.000000000 GHz         Frequency         #Avg Type: RMS         Rwcl [1:3:4:5:0         Frequency           Frequency         Frequency         #Avg Type: RMS         Rwcl [1:3:4:5:0         Frequency           Frequency         Frequency         #Avg Type: RMS         Rwcl [1:3:4:5:0         Frequency		
Ref Offset 7 dB Mkr1 963.04 MHz 10 dB/div Ref 20.00 dBm -33.222 dBm	Auto Tune	Ref Offset 7 dB         Mkr1 3.322 6 GHz         Auto Tune           10 dB/div         Ref 35.00 dBm         -19.002 dBm         -19.002 dBm		
	Center Freq 515.000000 MHz	Log 25.0 15.0 5.0 25		
	Start Freq 30.000000 MHz	5.0		
	Stop Freq 1.000000000 GHz	30 Stop Free 40 Stop Free 20 Stop Free		
tart 30.0 MHz Stop 1.0000 GHz Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.333 ms (20001 pts)	CF Step 97.000000 MHz Auto Man	Start 1.000 GHz Stop 7.000 GHz CF Step #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 10.67 ms (20001 pts) 00000000 MHz MHz MHz		
PR MODE (PS SEC) X Y PANELION PANELION MODIFI PANELION MALUE C 2 9953.04 MHz -33.222 dBm 3 5 6 6	Auto Man Freq Offset 0 Hz	Instruction         N         1         Auto         Mark           1         N         1         7         3.322.6 GHz         -19.002 dBm         #distribution/stable         distribution/stable         #distable		
7 8 9 9 10 11				
sg 🕼 status		MSG Local MSG		



WCDMA1700-HCH					WCDMA1700-HCH			
Agilent Spectrum Analyzer - Swept SA OR RL RF 50 Q AC C Center Freq 515.000000 M		ALIGNAUTO #Avg Type: RMS Avg Hold: 100/100	09:04:58 PM Aug 27, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency	April 12 System Andron Sward M         System Andron Sward M         System Andron Sward M         Figure 12 System Andron Sward M           A EL         Figure Sward M         System Andron Sward M         System Andron Sward M         Figure 12 System Andron Sward M           Center Freq 4.0000000000 CHZ         Figure Ran Andron Sward M         Figure 12 System Andron Sward M         Figure 12 System Andron Sward M			
Ref Offset 7 dB 10 dB/div Ref 20.00 dBm	IFGain:Low #Atten: 30 dB		r1 964.89 MHz -32.970 dBm	Auto Tune	If GaineLow         #Atten: 40 dB         certP HANNAN           Ref Offset 7 dB         Mkr1 2.752 9 GHz         Auto Tune           10 dB/div         Ref 35.00 dBm         -19.140 dBm			
10.0 0.00			1100 000	Center Freq 515.000000 MHz	Log         Center Freq           350         4.00000000 GHz           500         4.00000000 GHz			
-20.0 -30.0 -40.0				Start Freq 30.000000 MHz	500 500 150 150 500 100 100 100			
-50.0				Stop Freq 1.000000000 GHz	350 Stop Freq 450 7,0000000 GHz			
Start 30.0 MHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 1.3	Stop 1.0000 GHz 33 ms (20001 pts)	CF Step 97.000000 MHz Auto Man	Start 1.000 GHz         Stop 7.000 GHz         CF Step 600.0000 MHz           #Res BW 1.0 MHz         #VBW 3.0 MHz         Sweep 10.67 ms (2000 1 pts) 400 MHz         600.0000 MHz			
MARE MODEL THE SOL X 1 N 1 f 964 2 3 4 5	1.89 MHz -32.970 dBm	RETION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz	Liter         Million         Participation         Participation			
6 7 8 9					6 7 8 9 9 9 9 10 8 10 10 10 10 10 10 10 10 10 10 10 10 10			
11 < ISG	3	<b>Ko</b> status	× ×		11 Kasa Coupled			



WCDMA1700-HCH	WCDMA1700-HCH			
Added Spectrum And/wr.2 Swort M.         Swort M.         State St	Addred Spectrum Analyzer, Single M.         Spectrum Analyzer, Single M.         Spectrum Analyzer, Single M.         Prequency           Bit 1         Spectrum Analyzer, Single M.         Spectrum Analyzer, Single M.         Alson Type: RMS         Marg Type: RMS         Tractice Spectrum Analyzer, Spectrum			
Log Center Freq 10.0 0.00 10.0 10.0 10.0000000 GHz 10.0000000 GHz	Log         Center Freq           0.00         10.00000000000000000000000000000000000			
300 300 400 → → → → → → → → → → → → → → → → → →	300 300 400			
50.0 60.0 70.0 13.60000000 GHz	40.0			
Start 7.000 GHz         Stop 13.600 GHz         CF Step 560,00000 MHz           #Res BW 1.0 MHz         #VBW 3.0 MHz         Sweep 12.00 ms (20001 pts)         660,00000 MHz           Loss Excel Intel Col.         X         Patiention         Patiention         Patiention           N         1         13004 69 GHz         29 S44 dBm         Patiention         Patiention         Patiention	Start 13.600 GHz         Stop 20.000 GHz         CF Step           #Res BW 1.0 MHz         #VBW 3.0 MHz         Sweep 16.00 ms (20001 pts)         640.00000 MHz           Mark BWS BWS BWS BWS         X         #WBW 3.0 MHZ         Sweep 16.00 ms (20001 pts)         640.00000 MHz           Mark BWS BWS BWS BWS         X         #WBW 3.0 MHZ         #WBW 3.0 MHZ         Sweep 16.00 ms (20001 pts)           Mark BWS			
2 3 4 4 6 6 7 7 8 9 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 N 1 1 1504 24 012 44.019 0011 3 3 Freq Offset 4 4 5 6 7 8 9 9			
10 11 4 uso C Coupled	10 11 wsg Coupled			

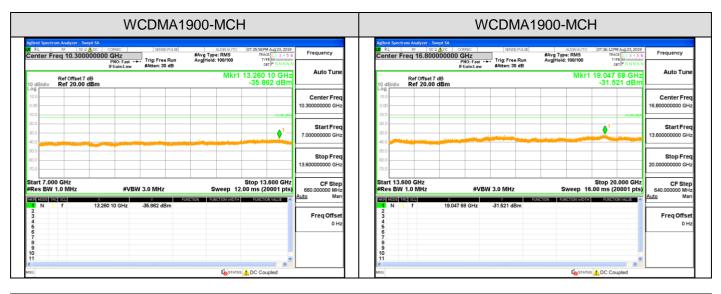




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WCDMA1900-MCH					WCDMA1900-MCH			
glient Spectrum Analyzer - Swept SA RL RF 50 2 AC Center Freq 515.000000 I		ALIGNAUTO #Avg Type: RMS Avg Held: 100/100	07:35:36 PM Aug 23, 2019 TRACE 12:3:4:5:6 TYPE MWWWWWW DET P N N N N N	Frequency	Agient Spectrum Analyzer Uz RL RF Center Freq 4.000	50 g 🛕 DC CORREC SENSE: PULSE	ALIGNAUTO 07:35:48PM Aug23, 22 #Avg Type: RMS TRACE 1.2.3 A Avg[Hold: 100/100 TYPE Mwww Det P N N N	5 6 Frequency
Ref Offset 7 dB 0 dB/div Ref 20.00 dBm		Mkr	l 868.71 MHz -39.762 dBm	Auto Tune	10 dB/div Ref Offse	et7 dB 00 dBm	Mkr1 3.162 7 GF -26.077 dB	
09 10.0 0.00			-12.00 dbn	Center Freq 515.000000 MHz	25.0 15.0			Center Fre 4.000000000 GH
				Start Freq 30.000000 MHz	-5.00 -15.0 -25.0		-13.00 (	Bin Start Fre 1.000000000 GH
1.0 1.0 1.0				Stop Freq 1.00000000 GHz	-35.0 -45.0 -56.0			Stop Fre 7.000000000 GH
art 30.0 MHz Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 1.33	top 1.0000 GHz 3 ms (20001 pts)	CF Step 97.000000 MHz Auto Man	Start 1.000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Stop 7.000 Gł Sweep  10.67 ms (20001 p	
RF MODE TRIC SCL X 1 N 1 f 8/ 2 3 4 5 6	68.71 MHz -39.762 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz	MAR MODE TRE SCL 1 N 1 f 2 3 4 5 6	X Y 3.162 7 GHz -26.077 dBm	FUNCTION FUNCTION WIDTH FUNCTION VALUE	Freq Offse 0 H
7 8 9 0 1			~		6 7 8 9 10 11			•
0		<b>K</b> STATUS	>	ll	MSG		STATUS A DC Coupled	







	1900-HCH	WCDMA	WCDMA1900-HCH				
INN N	ALIGNAUTO 07:38:29PM Aug 23, 2019 #Avg Type: RMS TRACE 12:3 4 5 c Avg Hold: 100/100 Tryte Millionauto Der [P N N N N	Addient Spectrum Analyzer, Singla S. R.L.   197   50 C C (COREC)   SPRESULS Center Freq 16.800000000 GHz PN0: Fast →→ If Galia.tow #Atten: 30 dB	A	ALIGNAUTO 07:38:15FM Aug 23,2019 Avg Type: RMS TRACE 12:3 + 5 6 vg Hold: 100/100 tryE Michael	CORREC SENSE-PULSE GHZ PNO: Fast →→ Trig: Free Run IFGain:Low #Atten: 30 dB	Agilent Spectrum Analyzer - Swept SA RL RF S0 R∆DC Center Freq 10.30000000	
HZ	Mkr1 19.072 96 GHz -30.920 dBm	Ref Offset 7 dB		Mkr1 13.194 43 GHz -35.945 dBm		10 dB/div Ref Offset 7 dB Ref 20.00 dBm	
Center Freq 16.800000000 GHz	-1200 dDm	10.0	Center Freq 10.30000000 GHz	-13.00 @@		10.0	
Start Freq 13.600000000 GHz		-200 -300 -400	Start Freq 7.000000000 GHz	↓ ↓		-20.0	
Stop Freq 20.00000000 GHz		-500 -600 -700	Stop Freq 13.60000000 GHz			-50.0	
pts) 640.000000 MHz	Stop 20.000 GHz Sweep 16.00 ms (20001 pts)	Start 13.600 GHz #Res BW 1.0 MHz #VBW 3.0 MHz	CF Step 660.000000 MHz Auto Man	Stop 13.600 GHz Sweep 12.00 ms (20001 pts)	#VBW 3.0 MHz	Start 7.000 GHz #Res BW 1.0 MHz	
Freq Offset 0 Hz	UNCTION FUNCTION WIDTH FUNCTION VALUE	N 1 f 19.072 96 GHz 30.920 dBm 3 4 5	Freq Offset 0 Hz	FUNCTION WIDTH PUNCTION VALUE	4 43 GHz -35.945 dBm	MRR MODE TRC SCL X 1 N 1 f 13.4 3 4 5 6	
		9 9 10				7 8 9 10 11	
	STATUS 1 DC Coupled	MSG	II	STATUS 1 DC Coupled		MSG	

**Note:**1. Below 30MHZ no Spurious found and Above is the worst mode data.

2. As no emission found in standby or receive mode, no recording in this report.



#### 5.5.2 RADIATED SPURIOUS EMISSION

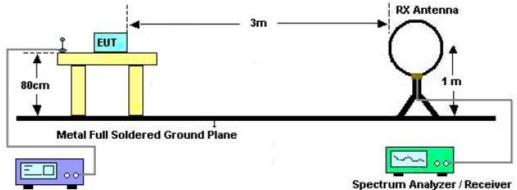
#### 5.5.2.1 MEASUREMENT METHOD

- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8.If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

#### 5.5.2.2 TEST SETUP



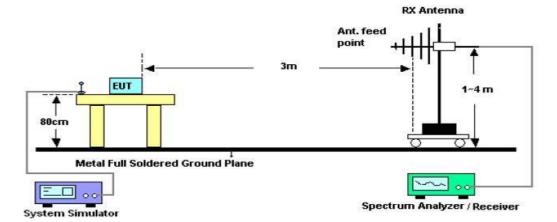
## Radiated Emission Test-Setup Frequency Below 30MHz



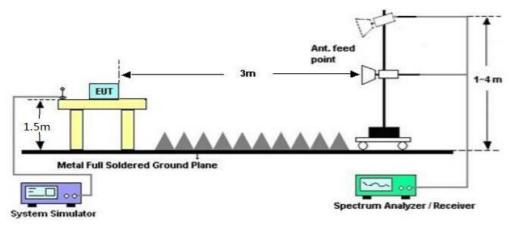
System Simulator

Spectrum Analyzer / Receiver

### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



#### RADIATED EMISSION TEST SETUP ABOVE 1000MHz



#### 5.5.2.3 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the



specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out. **Note:** only result the worst condition of each test mode:



## 5.5.2.4 MEASUREMENT RESULT

## GSM 850:

The Worst Test Results for Channel 128/824.2 MHz								
Frequency	Emission Level	Limits	Margin	Comment				
(MHz)	(dBm)	(dBm)	(dB)	Comment				
1648.17	-60.35	-13	47.35	Horizontal				
3296.51	-42.20	-13	29.20	Horizontal				
4944.86	-53.44	-13	40.44	Horizontal				
1648.16	-41.99	-13	28.99	Vertical				
3296.50	-48.88	-13	35.88	Vertical				
4944.98	-47.02	-13	34.02	Vertical				

## PCS 1900:

The Worst Test Results for Channel 512/1850.2 MHz								
Frequency	Emission Level Limits		Margin	Comment				
(MHz)	(dBm)	(dBm)	(dB)	Comment				
3700.08	-58.28	-13	45.28	Horizontal				
7400.51	-40.14	-13	27.14	Horizontal				
11100.95	-54.30	-13	41.30	Horizontal				
3700.11	-41.65	-13	28.65	Vertical				
7400.54	-50.83	-13	37.83	Vertical				
11100.88	-44.74	-13	31.74	Vertical				

## WCDMA BAND II:

The Worst Test Results for Channel 9400/1880MHz								
Frequency	Emission Level	Limits	Margin	Comment				
(MHz)	(dBm)	(dBm)	(dB)	Comment				
3750.77	-57.68	-13	44.68	Horizontal				
7514.52	-40.67	-13	27.67	Horizontal				
11273.52	-51.05	-13	38.05	Horizontal				
3753.39	-39.40	-13	26.40	Vertical				
7511.57	-50.90	-13	37.90	Vertical				
11272.72	-47.16	-13	34.16	Vertical				



## WCDMA BAND IV:

The Worst Test Results for Channel 1412/1732.4MHz								
Frequency	Emission Level	Limits	Margin	Comment				
(MHz)	(dBm)	(dBm)	(dB)	Comment				
3457.57	-58.87	-13	45.87	Horizontal				
6923.12	-39.29	-13	26.29	Horizontal				
10385.74	-53.13	-13	40.13	Horizontal				
3456.97	-38.53	-13	25.53	Vertical				
6919.77	-52.50	-13	39.50	Vertical				
10385.24	-45.75	-13	32.75	Vertical				

## WCDMA BAND V:

The Worst Test Results for Channel 4233/846.6MHz								
Frequency	Emission Level Limits		Margin	Comment				
(MHz)	(dBm)	(dBm)	(dB)	Comment				
1685.82	-55.48	-13	42.48	Horizontal				
3377.28	-40.22	-13	27.22	Horizontal				
5071.70	-52.15	-13	39.15	Horizontal				
1687.36	-41.30	-13	28.30	Vertical				
3379.90	-50.92	-13	37.92	Vertical				
5072.20	-47.97	-13	34.97	Vertical				

### **RESULT: PASS**

Note:

- 11. Margin = Limit Emission Level
- 12. Below 30MHZ no Spurious found and Above is the worst mode data.



## 5.6 FREQUENCY STABILITY

## 5.6.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

- 1 Measure the carrier frequency at room temperature.
- 2 Subject the EUT to overnight soak at -10℃.

3 With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 band , channel 190 for GSM 850 band, channel 9400 for UMTS band II, channel 1412 for UMTS band IV and channel 4175 for UMTS band V measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

4 Repeat the above measurements at  $10^{\circ}$ C increments from  $-10^{\circ}$ C to  $+50^{\circ}$ C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

5 Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

6 Subject the EUT to overnight soak at  $+50^{\circ}$ C.

7 With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

8 Repeat the above measurements at  $10^{\circ}$ C increments from  $+50^{\circ}$ C to  $-10^{\circ}$ C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

9 At all temperature levels hold the temperature to +/-  $0.5^{\circ}$  during the measurement procedure.

## 5.6.2 PROVISIONS APPLICABLE

### 5.6.2.1 FOR HAND CARRIED BATTERY POWERED EQUIPMENT

According to the ANSI/TIA-603-E-2016, the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.4VDC and 4.2VDC, with a nominal voltage of 3.7VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.



#### 5.6.2.2 FOR EQUIPMENT POWERED BY PRIMARY SUPPLY VOLTAGE

According to the ANSI/TIA-603-E-2016,the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment, the normal environment temperature is 20°C.



## 5.6.3 MEASUREMENT RESULT

## **Test Results**

Frequency Error vs. Voltage:

Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Vardiat
Band	Mode	Channel	Temp.	Volt.(V)	(Hz)	(ppm)	(ppm)	Verdict
			TN	VL	-16.50	-0.02	±2.5	PASS
		LCH	TN	VN	-9.63	-0.01	±2.5	PASS
		TN	VH	-13.38	-0.02	±2.5	PASS	
		GPRS MCH	ΤN	VL	9.32	0.01	±2.5	PASS
GSM850	GPRS		ΤN	VN	-13.36	-0.02	±2.5	PASS
			ΤN	VH	-8.23	-0.01	±2.5	PASS
			ΤN	VL	8.18	0.01	±2.5	PASS
			ΤN	VN	11.11	0.01	±2.5	PASS
			ΤN	VH	-11.22	-0.01	±2.5	PASS

Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Vardiat
Band	Mode	Channel	Temp.	Volt.(V)	(Hz)	(ppm)	(ppm)	Verdict
			TN	VL	12.71	0.02	±2.5	PASS
		LCH	TN	VN	-16.26	-0.02	±2.5	PASS
			TN	VH	15.53	0.02	±2.5	PASS
			TN	VL	-17.74	-0.02	±2.5	PASS
GSM850	EGPRS	MCH	TN	VN	-12.61	-0.02	±2.5	PASS
			TN	VH	10.15	0.01	±2.5	PASS
			TN	VL	-16.09	-0.02	±2.5	PASS
		HCH	TN	VN	10.45	0.01	±2.5	PASS
			TN	VH	19.65	0.02	±2.5	PASS

Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Verdict
Band	Mode	Channel	Temp.	Volt. (V)	(Hz)	(ppm)	(ppm)	
			ΤN	VL	-18.47	-0.01	±2.5	PASS
		LCH	TN	VN	-13.80	-0.01	±2.5	PASS
			TN	VH	12.15	0.01	±2.5	PASS
PCS			TN	VL	-17.38	-0.01	±2.5	PASS
1900	GPRS	MCH	TN	VN	-18.08	-0.01	±2.5	PASS
1900			TN	VH	-9.30	0.00	±2.5	PASS
			ΤN	VL	-28.85	-0.02	±2.5	PASS
		HCH	TN	VN	-27.19	-0.01	±2.5	PASS
			TN	VH	28.21	0.02	±2.5	PASS



Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Verdict
Band	Mode	Channel	Temp.	Volt. (V)	(Hz)	(ppm)	(ppm)	
			TN	VL	12.43	0.01	±2.5	PASS
		LCH	ΤN	VN	15.83	0.01	±2.5	PASS
			TN	VH	18.36	0.01	±2.5	PASS
PCS			ΤN	VL	-15.46	-0.01	±2.5	PASS
1900	EGPRS	MCH	ΤN	VN	-15.78	-0.01	±2.5	PASS
1900			TN	VH	17.53	0.01	±2.5	PASS
			ΤN	VL	22.60	0.01	±2.5	PASS
		HCH	ΤN	VN	-28.35	-0.02	±2.5	PASS
			ΤN	VH	26.27	0.01	±2.5	PASS



## Frequency Error vs. Temperature:

Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Vordiat
Band	Mode	Channel	Volt.	<b>Tem. (</b> ℃)	(Hz)	(ppm)	(ppm)	Verdict
			VN	-10	19.28	0.02	±2.5	PASS
			VN	0	-22.62	-0.03	±2.5	PASS
			VN	10	-20.16	-0.02	±2.5	PASS
GSM850	GPRS	LCH	VN	20	-20.70	-0.02	±2.5	PASS
			VN	30	26.45	0.03	±2.5	PASS
			VN	40	-24.85	-0.03	±2.5	PASS
			VN	50	-18.65	-0.02	±2.5	PASS
			VN	-10	22.55	0.03	±2.5	PASS
			VN	0	24.86	0.03	±2.5	PASS
			VN	10	28.06	0.03	±2.5	PASS
GSM850	GPRS	MCH	VN	20	19.39	0.02	±2.5	PASS
			VN	30	-20.60	-0.02	±2.5	PASS
			VN	40	24.75	0.03	±2.5	PASS
			VN	50	-21.30	-0.03	±2.5	PASS
			VN	-10	20.51	0.02	±2.5	PASS
			VN	0	23.82	0.03	±2.5	PASS
			VN	10	-20.45	-0.02	±2.5	PASS
GSM850	GPRS	HCH	VN	20	-25.25	-0.03	±2.5	PASS
			VN	30	-25.36	-0.03	±2.5	PASS
			VN	40	-24.27	-0.03	±2.5	PASS
			VN	50	-19.58	-0.02	±2.5	PASS



Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Vordict
Band	Mode	Channel	Volt.	Volt. (V)	(Hz)	(ppm)	(ppm)	Verdict
			VN	-10	-22.52	-0.03	±2.5	PASS
			VN	0	22.43	0.03	±2.5	PASS
			VN	10	-21.44	-0.03	±2.5	PASS
GSM850	EGPR	LCH	VN	20	-20.87	-0.02	±2.5	PASS
	S		VN	30	18.42	0.02	±2.5	PASS
			VN	40	26.00	0.03	±2.5	PASS
			VN	50	-21.83	-0.03	±2.5	PASS
			VN	-10	-26.35	-0.03	±2.5	PASS
			VN	0	26.72	0.03	±2.5	PASS
			VN	10	-20.57	-0.02	±2.5	PASS
GSM850	EGPR	MCH	VN	20	25.28	0.03	±2.5	PASS
	S		VN	30	-26.12	-0.03	±2.5	PASS
			VN	40	28.61	0.03	±2.5	PASS
			VN	50	-21.29	-0.03	±2.5	PASS
			VN	-10	23.31	0.03	±2.5	PASS
			VN	0	-20.09	-0.02	±2.5	PASS
			VN	10	27.24	0.03	±2.5	PASS
GSM850	EGPR	HCH	VN	20	25.31	0.03	±2.5	PASS
	S		VN	30	-26.88	-0.03	±2.5	PASS
			VN	40	-21.83	-0.03	±2.5	PASS
			VN	50	21.30	0.03	±2.5	PASS



Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Verdict
Band	Mode	Channel	Volt.	<b>Tem. (</b> ℃)	(Hz)	(ppm)	(ppm)	Verdiot
			VN	-10	24.35	0.01	±2.5	PASS
			VN	0	-27.08	-0.01	±2.5	PASS
PCS			VN	10	20.92	0.01	±2.5	PASS
1900	GPRS	LCH	VN	20	-21.11	-0.01	±2.5	PASS
1900			VN	30	17.43	0.01	±2.5	PASS
			VN	40	-19.46	-0.01	±2.5	PASS
			VN	50	-26.18	-0.01	±2.5	PASS
			VN	-10	20.81	0.01	±2.5	PASS
			VN	0	21.93	0.01	±2.5	PASS
PCS			VN	10	-27.73	-0.01	±2.5	PASS
1900	GPRS	MCH	VN	20	-24.40	-0.01	±2.5	PASS
1900			VN	30	18.87	0.01	±2.5	PASS
			VN	40	26.89	0.01	±2.5	PASS
			VN	50	18.22	0.01	±2.5	PASS
			VN	-10	-21.19	-0.01	±2.5	PASS
			VN	0	23.69	0.01	±2.5	PASS
DOD			VN	10	-22.99	-0.01	±2.5	PASS
PCS	GPRS	HCH	VN	20	-27.00	-0.01	±2.5	PASS
1900			VN	30	-18.75	-0.01	±2.5	PASS
			VN	40	21.84	0.01	±2.5	PASS
			VN	50	22.92	0.01	±2.5	PASS



Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Verdict
Band	Mode	Channel	Volt.	<b>Tem. (</b> ℃)	(Hz)	(ppm)	(ppm)	Voraiot
			VN	-10	23.74	0.01	±2.5	PASS
			VN	0	20.12	0.01	±2.5	PASS
PCS			VN	10	21.08	0.01	±2.5	PASS
1900	EGPR	LCH	VN	20	-28.62	-0.02	±2.5	PASS
1900	S		VN	30	-24.90	-0.01	±2.5	PASS
			VN	40	17.55	0.01	±2.5	PASS
			VN	50	20.10	0.01	±2.5	PASS
			VN	-10	24.59	0.01	±2.5	PASS
			VN	0	19.69	0.01	±2.5	PASS
DCC			VN	10	24.56	0.01	±2.5	PASS
PCS 1900	EGPR	MCH	VN	20	-17.98	-0.01	±2.5	PASS
1900	S		VN	30	-24.17	-0.01	±2.5	PASS
			VN	40	-28.30	-0.02	±2.5	PASS
			VN	50	21.08	0.01	±2.5	PASS
			VN	-10	26.19	0.01	±2.5	PASS
			VN	0	-22.89	-0.01	±2.5	PASS
DOO			VN	10	22.62	0.01	±2.5	PASS
PCS	EGPR	HCH	VN	20	26.08	0.01	±2.5	PASS
1900	S		VN	30	25.00	0.01	±2.5	PASS
			VN	40	-24.39	-0.01	±2.5	PASS
			VN	50	26.26	0.01	±2.5	PASS



# Frequency Error vs. Voltage:

Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Verdiet
Band	Mode	Channel	Temp.	Volt.(V)	(Hz)	(ppm)	(ppm)	Verdict
			ΤN	VL	17.87	0.02	±2.5	PASS
		LCH	ΤN	VN	-11.27	-0.01	±2.5	PASS
			ΤN	VH	-10.80	-0.01	±2.5	PASS
			ΤN	VL	18.66	0.02	±2.5	PASS
WCDMA850	UMTS	MCH	ΤN	VN	14.76	0.02	±2.5	PASS
			ΤN	VH	-9.03	-0.01	±2.5	PASS
			ΤN	VL	-9.70	-0.01	±2.5	PASS
		HCH	ΤN	VN	-13.94	-0.02	±2.5	PASS
			ΤN	VH	-14.51	-0.02	±2.5	PASS

Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Verdict
Band	Mode	Channel	Temp.	Volt.(V)	(Hz)	(ppm)	(ppm)	verdict
			ΤN	VL	-10.09	-0.01	±2.5	PASS
		LCH	ΤN	VN	11.15	0.01	±2.5	PASS
			ΤN	VH	-17.11	-0.01	±2.5	PASS
			ΤN	VL	11.39	0.01	±2.5	PASS
WCDMA1700	UMTS	MCH	ΤN	VN	-15.36	-0.01	±2.5	PASS
			ΤN	VH	-13.03	-0.01	±2.5	PASS
			ΤN	VL	-14.19	-0.01	±2.5	PASS
		HCH	ΤN	VN	17.99	0.01	±2.5	PASS
			ΤN	VH	15.25	0.01	±2.5	PASS

Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Verdict
Band	Mode	Channel	Temp.	Volt.(V)	(Hz)	(ppm)	(ppm)	verdict
			ΤN	VL	11.66	0.01	±2.5	PASS
		LCH	ΤN	VN	-17.93	-0.01	±2.5	PASS
			ΤN	VH	16.35	0.01	±2.5	PASS
			ΤN	VL	14.44	0.01	±2.5	PASS
WCDMA1900	UMTS	MCH	ΤN	VN	13.09	0.01	±2.5	PASS
			ΤN	VH	19.65	0.01	±2.5	PASS
			ΤN	VL	23.51	0.01	±2.5	PASS
		HCH	ΤN	VN	-30.26	-0.02	±2.5	PASS
			ΤN	VH	-33.67	-0.02	±2.5	PASS



# Frequency Error vs. Temperature:

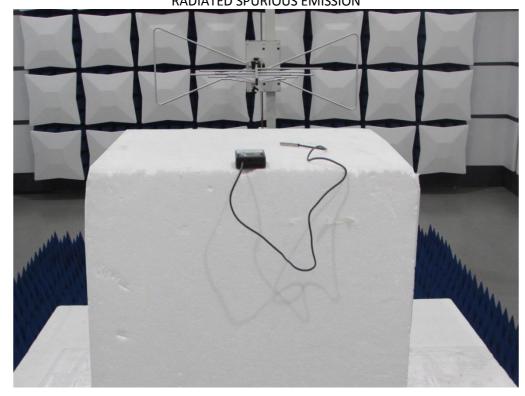
Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Verdict
Band	Mode	Channel	Volt.	<b>Tem. (℃)</b>	(Hz)	(ppm)	(ppm)	verdict
			VN	-10	-24.74	-0.03	±2.5	PASS
			VN	0	18.02	0.02	±2.5	PASS
			VN	10	20.35	0.02	±2.5	PASS
WCDMA850	UMTS	LCH	VN	20	-23.23	-0.03	±2.5	PASS
			VN	30	23.09	0.03	±2.5	PASS
			VN	40	-26.84	-0.03	±2.5	PASS
			VN	50	25.38	0.03	±2.5	PASS
			VN	-10	28.04	0.03	±2.5	PASS
			VN	0	-23.78	-0.03	±2.5	PASS
			VN	10	-24.34	-0.03	±2.5	PASS
WCDMA850	UMTS	MCH	VN	20	18.41	0.02	±2.5	PASS
			VN	30	25.77	0.03	±2.5	PASS
			VN	40	-21.34	-0.03	±2.5	PASS
			VN	50	25.53	0.03	±2.5	PASS
			VN	-10	-27.42	-0.03	±2.5	PASS
			VN	0	26.06	0.03	±2.5	PASS
			VN	10	-20.38	-0.02	±2.5	PASS
WCDMA850	UMTS	HCH	VN	20	-22.71	-0.03	±2.5	PASS
			VN	30	22.74	0.03	±2.5	PASS
			VN	40	-26.42	-0.03	±2.5	PASS
			VN	50	20.91	0.03	±2.5	PASS

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Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Verdict
Band	Mode	Channel	Volt.	<b>Tem. (°</b> ℃)	(Hz)	(ppm)	(ppm)	
WCDMA1700	UMTS	LCH	VN	-10	-22.79	-0.01	±2.5	PASS
			VN	0	-22.52	-0.01	±2.5	PASS
			VN	10	-23.37	-0.01	±2.5	PASS
			VN	20	-28.28	-0.02	±2.5	PASS
			VN	30	-19.37	-0.01	±2.5	PASS
			VN	40	19.72	0.01	±2.5	PASS
			VN	50	22.85	0.01	±2.5	PASS
WCDMA1700	UMTS	MCH	VN	-10	24.96	0.01	±2.5	PASS
			VN	0	-27.82	-0.02	±2.5	PASS
			VN	10	-19.25	-0.01	±2.5	PASS
			VN	20	18.30	0.01	±2.5	PASS
			VN	30	24.83	0.01	±2.5	PASS
			VN	40	28.47	0.02	±2.5	PASS
			VN	50	19.10	0.01	±2.5	PASS
WCDMA1700	UMTS	НСН	VN	-10	-25.43	-0.01	±2.5	PASS
			VN	0	-17.37	-0.01	±2.5	PASS
			VN	10	-21.72	-0.01	±2.5	PASS
			VN	20	27.46	0.02	±2.5	PASS
			VN	30	26.70	0.02	±2.5	PASS
			VN	40	21.54	0.01	±2.5	PASS
			VN	50	-26.04	-0.02	±2.5	PASS



Test	Test	Test	Test	Test	Freq.Error	Freq.vs.rated	Limit	Verdict
Band	Mode	Channel	Volt.	<b>Tem. (℃)</b>	(Hz)	(ppm)	(ppm)	
WCDMA1900	UMTS	LCH	VN	-10	-18.67	-0.01	±2.5	PASS
			VN	0	-25.96	-0.01	±2.5	PASS
			VN	10	-23.34	-0.01	±2.5	PASS
			VN	20	-26.18	-0.01	±2.5	PASS
			VN	30	-24.99	-0.01	±2.5	PASS
			VN	40	-23.08	-0.01	±2.5	PASS
			VN	50	-23.75	-0.01	±2.5	PASS
WCDMA1900	UMTS	MCH	VN	-10	25.47	0.01	±2.5	PASS
			VN	0	-23.70	-0.01	±2.5	PASS
			VN	10	-25.47	-0.01	±2.5	PASS
			VN	20	-25.43	-0.01	±2.5	PASS
			VN	30	22.69	0.01	±2.5	PASS
			VN	40	-19.13	-0.01	±2.5	PASS
			VN	50	17.95	0.01	±2.5	PASS
WCDMA1900	UMTS	НСН	VN	-10	-18.49	-0.01	±2.5	PASS
			VN	0	19.75	0.01	±2.5	PASS
			VN	10	24.32	0.01	±2.5	PASS
			VN	20	27.48	0.01	±2.5	PASS
			VN	30	-21.79	-0.01	±2.5	PASS
			VN	40	-19.17	-0.01	±2.5	PASS
			VN	50	-17.58	-0.01	±2.5	PASS



## 6 APPENDIX A: PHOTOGRAPHS OF TEST SETUP RADIATED SPURIOUS EMISSION

RADIATED SPURIOUS ABOVE 1G EMISSION



----END OF REPORT----