

Conducted Spurious Emissions (1 GHz – 26.5 GHz)

[Downlink Low]



[Downlink Low]





[Downlink Low]-3





[Downlink Middle]-1

XIRL RF 50Ω A	C CORREC	SENSE;INT		ALIGNAUTO	02:42:41 PM May 11, 201	7
Start Freq 1.00000000	O GHz PNO: Fast ↔ IFGain:Low	Trig: External1 #Atten: 20 dB	#Avg Type Avg Hold: Ext Gain:	e: Pwr(RMS) 20/20 -10.00 dB	TRACE 1 2 3 4 5 TYPE A MANANA DET A A A A A	Frequency
10 dB/div Ref -10.00 dB	m			Mkr	1.922 7 GH: -28.020 dBm	Auto Tune
-20.0					-13.08 dBr	Center Freq 1.462500000 GHz
-30.0 <mark>สถาปฏะหมุญสมเป็ญที่สำคัญใหญ่ให้เหตุที่หน้า</mark> -40.0	~~************************************	nalpertensionen en sen ander and and and and	saasalaadaan	ylydd yn	hinalaanay magaalaa kaala walaana	Start Freq 1.000000000 GHz
-60.0						Stop Freq 1.925000000 GHz
-70.0						CF Step 92.500000 MHz Auto Mar
-100						Freq Offset 0 Hz
Start 1.0000 GHz #Res BW 1.0 MHz	#VBW	3.0 MHz*		Sweep 1.	Stop 1.9250 GHz 20 ms (2001 pts	
use Deints changed; all trac	es cleared			STATUS		

[Downlink Middle]-2





[Downlink Middle]-3





[Downlink High]-1









Single channel Enhancer Plots of Spurious Emission for 1900 PCS BAND WCDMA Conducted Spurious Emissions (9 kHz – 150 kHz)



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[Downlink Middle]









Conducted Spurious Emissions (150 kHz – 30 MHz)



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Center Freq 15.075000 MHz PR0: Fast ++- Trig: Free Run #Avg Type: Pvr(RMS) Trace Dig #d Preduency 10 dB/div Ref -10.00 dBm Mkr1 319 kHz KHz Auto Tune 200 1 1000 dBm	MSG Depints changed; all traces	cleared		STATUS	1 DC Coupled	
Center Freq 15.075000 MHz PN0: Fast ++	Start 150 kHz #Res BW 10 kHz	#VBW	30 kHz*	Sweep	Stop 30.00 MHz 368 ms (6001 pts)	
Center Freq 15.075000 MHz Trig: Free Run #Avg Type: Pwr(RMS) True: Type: Type: Pwr(RMS) True: Type: Type: Pwr(RMS)						
Center Freq 15.075000 MHz PN0: Fast +	-100					0 Hz
Center Freq 15.075000 MHz PN0: Fast +	-90,0					Freq Offset
Center Freq 15.075000 MHz Trig: Free Run #Avg Type: Pwr(RMS) Avg Hold: 10/10 TRACE 12.8.4 EXAAAA PN0: Fast +	-80,0					<u>Auto</u> Ivian
Center Freq 15.075000 MHz PN0: Fast + Il Gain: Low Trig: Free Run #Atten: 10 dB #Avg Type: Pwr(RMS) Avg Hold: 10/10 Ext Gain: -10.00 dB TRACE [2:3:4] EXAMPLE 10 dB/div Ref -10.00 dBm	-70.0					2.985000 MHz
Center Freq 15.075000 MHz Trig: Free Run #Avg Type: Pwr(RMS) Avg Hold: 10/10 TRACE 12.8.4 EXAMAA Auto Tune In dB/div Ref -10.00 dBm Image: Center Frequency Mkr1 319 kHz -28.137 dBm Auto Tune 10 dB/div Ref -10.00 dBm Image: Center Frequency Image: Center Frequency Image: Center Frequency 200 Image: Center Frequency Image: Center Frequency Image: Center Frequency Image: Center Frequency 200 Image: Center Frequency Image: Center Frequency Image: Center Frequency Image: Center Frequency 200 Image: Center Frequency Image: Center Frequency Image: Center Frequency Image: Center Frequency 200 Image: Center Frequency Image: Center Frequency Image: Center Frequency Image: Center Frequency 200 Image: Center Frequency Image: Center Frequency Image: Center Frequency Image: Center Frequency 200 Image: Center Frequency Image: Center Frequency Image: Center Frequency Image: Center Frequency 200 Image: Center Frequency Image: Center Frequency Image: Center Frequency Image: Center Frequency 200 Image: Center Frequency Image: Center Frequency		A DESCRIPTION OF THE OWNER.				05.044
Center Freq 15.075000 MHz #Avg Type: Pwr(RMS) TRACE 12.3.4 E PN0: Fast + Trig: Free Run #Avg Type: Pwr(RMS) TRACE 12.3.4 E PN0: Fast + Trig: Free Run AvgHold: 10/10 TYPE & WWWW Image: Stop Free 0 dB/div Ref -10.00 dBm Center Frequency	-60.0	and but week street of		bion on attack of the station	RMS	30.000000 MHz
Center Freq 15.075000 MHz PN0: Fast +	-50,0					Stop Fred
Center Freq 15.075000 MHz PN0: Fast ↔ Trig: Free Run #Avg Type: Pwr(RMS) TRACE 12 3 4 5 Trig: Free Run Trig: Free Run #Avg Hold: 10/10 Trig: Free Run Mkr1 319 kHz Auto Tune 10 dB/div Ref -10.00 dBm -1300 d6m -1300 d6m Center Freq 15.075000 MHz 20.0 1 -1300 d6m -1300 d6m Start Freq	-40.0					150.000 kHz
Center Freq 15.075000 MHz Trig: Free Run #Avg Type: Pwr(RMS) TRACE 12 3 4 5 5 Prequency PN0: Fast + Trig: Free Run Avg Hold: 10/10 Trig: Stree Run Avg Hold: 10/10 Ext Gain: -10.00 dB Der A A A A A 10 dB/div Ref -10.00 dBm -26.137 dBm -1300 dBm Center Freq 15.075000 MHz 200 1 -1	-30.0					Start Freq
Center Freq 15.075000 MHz PN0: Fast						15.075000 WH2
Center Freq 15.075000 MHz PN0: Fast	-20.0					Center Freq
Center Freq 15.075000 MHz PN0: Fast	10 dB/div Ref -10.00 dBm				-26.137 dBm	
Center Freq 15.075000 MHz PN0: Fast + IFGain: Low #Atten: 10 dB Ext Gain: -10.00 dB DET A A A A A A					Mkr1 319 kHz	Auto Tune
Contor From 45.075000 MHz #Ava Type: Pwr(RMS) TRACE 12.24 F	Center Freq 15.075000	PNO: Fast	Trig: Free Run #Atten: 10 dB	Avg Hold: 10/10 Ext Gain: -10.00 dB		
🚺 R L RF 50 Q 🕰 DC CORREC SENSE:INT ALIGN AUTO 09:53:01 AM May 15, 2017	Contor From 45 075000	CORREC	SENSE;INT	ALIGNAUTO	09:53:01 AM May 15, 2017 TRACE 1 2 3 4 5 5	Frequency



Conducted Spurious Emissions (30 MHz – 1 GHz)

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Center Freq 515.00000 MHz Trig: Free Run #Avg Type: Pwr(RMS) Avg Hold: 2020 Trig: Center Freq 515.00000 MHz Frequency PN0: Fast +	MSG JAlignment Completed			STATUS		
Center Freq 515.000000 MHz Frequency Frequency PN0: Fast + Trig: Free Run Avg Hold: 2020 Trig: Free Run It Gain: Low #Atten: 10 dB Mkr1 852.22 MHz Auto Tune 10 dB/dlv Ref -10.00 dBm -48.478 dBm Center Freq 200 100 100 100 100 100 200 100 100 100 100 100 100 200 100 100 100 100 100 100 100 200 100<	Start 30.0 MHz #Res BW 100 kHz	#VBW	300 kHz*	Sweep 1	Stop 1.0000 GHz 20 ms (20001 pts)	
Center Freq 515.000000 MHz PN0: Fast ++ Trig: Free Run #Avg Type: Pwr(RMS) AvgHold: 20/20 Ext Gain: 40:00 dB Trace 12.3.4.5 Frequency 10 dB/div Ref -10.00 dBm Mkr1 852.22 MHz -48.478 dBm Auto Tune 20.0 1300000 1300000 Start Freq 30.00000 MHz Start Freq 30.00000 MHz 20.0 1300000 Start Freq 30.00000 MHz 1300000 Start Freq 30.00000 MHz 20.0 10000000000000000000 1000000000000000000000000000000000000						
Center Freq 515.000000 MHz Trig: Free Run #Avg Type: Pwr(RMS) Trace I2: 45 Frequency Note Freq 515.000000 MHz PNO: Fast	100					0 Hz
Center Freq 515.000000 MHz PN0: Fast - Ifig: Free Run #Avg Type: Pwr(RMS) ITRACE I 2: 45 / 1000 / 100	-90,0					Freq Offset
Center Freq 515.000000 MHz PN0: Fast	-80,0					<u>Auto</u> Man
Center Freq 515.000000 MHz PN0: Fast	-70.0					CF Step 97.000000 MHz
Center Freq 515.000000 MHz PNO: Fast IFGainLow PNO: Fast IFGai	-80.0	and the failed and the production of the	, and the first of the second se	en sed bi van en lije in gester de		1.000000000 GHz
Center Freq 515.000000 MHz PNO: Fast	-50.0	e da se a constanti de la constante de la const	u a antikati matikati a su da	l de suur a recentration à la constant de la constant de la constant	RMS	01-11-E-11-
Center Freq 515.000000 MHz PN0: Fast +	-40,0					Start Freq 30.000000 MHz
Center Freq 515.000000 MHz PN0: Fast	-30.0					
Center Freq 515.000000 MHz #Avg Type: Pwr(RMs) TRACE 12:45:5 Frequency PN0: Fast →→ IFGain:Low Trig: Free Run #Atten: 10 dB #Avg Type: Pwr(RMs) TRACE 12:45:5 Mkr1 852.22 MHz -48.478 dBm Auto Tune	-20,0					Center Freq 515.000000 MHz
Center Freq 515.000000 MHz PN0: Fast ↔ IFGain:Low #Atten: 10 dB Ext Gain: -10.00 dB Det AAAAAA Mkr1 852.22 MHz Mkr1 852.22 MHz	10 dB/div Ref -10.00 dBm	1			-46.4/8 QBM -13.00 dBm	
Center Freq 515.000000 MHz PN0: Fast				MI	(r1 852.22 MHz	Auto Tune
Frequency	Center Freq 515.00000	O MHZ PNO: Fast ↔ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: Pwr(RMS Avg Hold: 20/20 Ext Gain: -10.00 dB	TRACE 1 2 3 4 5 6 TYPE A WANAWAA DET A A A A A A	Trequency
IN BL RE 50.0 AC CORRECT SENSE INT ALIGNALITO D0:52:10 AM May 15 2017	LXI RL RF 50 Q AC	CORREC	SENSE:INT	ALIGNAUTO	09:53:10 AM May 15, 2017	Frequency



Conducted Spurious Emissions (1 GHz – 26.5 GHz)

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[Downlink Low]-3





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[Downlink High]-1

Agilent Spectrum Analyzer - Swept SA					
LXI RE SOΩ AC	CORREC	SENSE:INT	ALIGNAUTO	09:53:20 AM May 15, 2017	Frequency
Center Freq 1.462500000	PNO: Fast	Trig: Free Run #Atten: 20 dB	#Avg Type: Pwr(RMS) Avg Hold: 20/20 Ext Gain: -10.00 dB	TRACE 1 2 3 4 5 5 TYPE A WARAWAY DET A A A A A A	rrequency
10 dB/div Ref -10.00 dBm			Mkr	1 1.823 7 GHz -28.455 dBm	Auto Tune
-20.0				-13.00 dBm	Center Freq 1.462500000 GHz
-30.0 140.0 -40.0	1944 1 4497 4497 4494 4444 4444	namententekokologia farintaisenen ponte	gelerdytelletanserveren gebieten en omredelet	lan di kalendara kale	Start Freq 1.000000000 GHz
-60.0					Stop Freq 1.925000000 GHz
-70.0 -80.0					CF Step 92.500000 MHz <u>Auto</u> Man
-90.0					Freq Offset 0 Hz
Start 1.0000 GHz #Res BW 1.0 MHz	#VBW	3.0 MHz*	Sweep 1	Stop 1.9250 GHz .20 ms (2001 pts)	
MSG JPoints changed; all traces c	leared		STATUS		







Single channel Enhancer Plots of Spurious Emission for 1900 PCS BAND CDMA Conducted Spurious Emissions (9 kHz – 150 kHz)



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Conducted Spurious Emissions (150 kHz – 30 MHz)



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MSG 🧼 Poin	s changed; all trac	ces cleared		STATUS	1 DC Coupled	
Start 150 #Res BW	kHz 10 kHz	#VBW	30 kHz*	Sweep	Stop 30.00 MHz 368 ms (6001 pts)	
-100						
100						0 Hz
-90.0						Freq Offset
-80.0						<u>Auto</u> Man
-70,0						CF Step 2.985000 MHz
-60.0						
-50.0	Urija Nu					Stop Freq 30.000000 MHz
-40.0						Start Freq 150.000 kHz
-30.0						
-20,0						Center Freq 15.075000 MHz
10 dB/div	Ref -10.00 dB	sm			-34.244 dBm	
	_	IFGain:Low	#Atten: 10 dB	Ext Gain: -10.00 dB	Mkr1 344 kHz	Auto Tune
Center F	req 15.07500	O MHz PNO: Fast ↔	Trig: Free Run	#Avg Type: Pwr(RMS) Avg Hold: 10/10		Frequency
LXI RL	RF 50 Ω 🧥 D	CORREC	SENSE;INT	ALIGNAUTO	10:50:16 AM May 15, 2017	Francisco de la



Conducted Spurious Emissions (30 MHz – 1 GHz)

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-100					
					0 H:
.90.D					Freg Offse
-80.0					Auto
-70,0					97.000000 MH
70.0					CE Ster
-60.0					1.00000000 GH
-50.0					Stop Free
				1 RMS	
-40.0					30.000000 MH
-30.0					Start Free
					515.000000 MITZ
-20.0					Center Free
				-13.00 dBm	
10 dB(div Ref -10 00 dBr	n		IVIK	-48.269 dBm	Auto Turk
	IFGain:Low	#Atten: 10 dB	Ext Gain: -10.00 dB	DET A A A A A A	Auto Tupe
Center Freq 515.00000	0 MHz	Tria: Free Run	#Avg Type: Pwr(RMS) Avg Hold: 20/20	TRACE 1 2 3 4 5 5 TYPE A WANNAM	Frequency
Center Freq 515.00000	0 MHz	Tales For a Data	#Avg Type: Pwr(RMS)	TRACE 1 2 3 4 5 5	Frequenc



Conducted Spurious Emissions (1 GHz – 26.5 GHz)

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LKIRL RF 50Ω	AC CORREC	SENSE;INT	ALIGNAUTO	10:45:49 AM May 15, 2017	- and the second
Start Freq 1.0000000	00 GHz PNO: Fast ↔	- Trig: Free Run #Atten: 20 dB	#Avg Type: Pwr(RMS) Avg Hold: 20/20 Ext Gain: -10.00 dB	TRACE 1 2 3 4 5 5 TYPE A WARANAN DET A A A A A A A	Frequency
10 dB/div Ref -10.00 dE	Sm		Mkr	1 1.645 7 GHz -28.613 dBm	Auto Tune
-20.0			1	-13,00 dBm	Center Freq 1.462500000 GHz
-30.0 	arteinetharthyddyr yfylur ffadirada	tratelland, Milanan (Alyanan anai	erselwaanseragsardhetmanaadaaaanaadaaaaa	4~4 ₁ 4974/10474/10474/10474/10474/10474/10474/10474/10474/10474/10474/10474/10474/10474/10474/10474/10474/1047	Start Freq 1.000000000 GHz
-60.0					Stop Fred 1.925000000 GHz
-70.0					CF Step 92.500000 MH: Auto Mar
-100					Freq Offse 0 Ha
Start 1.0000 GHz #Res BW 1.0 MHz	#VBM	/ 3.0 MHz*	Sweep 1.	Stop 1.9250 GHz 20 ms (2001 <u>pts)</u>	
MSG JPoints changed: all trad	ces cleared		STATUS		

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Single channel Enhancer Plots of Spurious Emission for 1900 PCS BAND GSM Conducted Spurious Emissions (9 kHz – 150 kHz)



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Conducted Spurious Emissions (150 kHz – 30 MHz)

Agilent Spectrum Analyzer - Swept SA					
🗶 RL RF 50 Ω 🧥 DC	CORREC	SENSE:INT	ALIGNAUTO	11:08:50 AM May 15, 2017	Attenuation
nput Mech Atten 10 dB	PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: Pwr(RMS) Avg Hold: 10/10 Ext Gain: -10.00 dB	TRACE 1 2 3 4 5 5 TYPE A WANNAM DET A A A A A A	Mech Atten
10 dB/div Ref -10.00 dBm				Mkr1 344 kHz -38.942 dBm	10 dB Auto <u>Man</u>
Log				-13.00 dBm	
1					E CONTRACTOR OF CONTRACTOR
20.0					
30.0					in the second
					The second second
40.0					
-50.0					
li A Wall					
-60.0		لحاصد والازر يسارين بالألب أريانا فلي	والمحرر أربقا الأرباط والأمر والأمر وألأم والطار الذارة	RMS	
and the second se	Approximation and provide the party	na na jampa para na	An appropriate the state of the state	and determine the fact of the sector	
70.0					
80,0					
90,0					Mech Atten Step
					2dB 10dB
-100					
					Max Milyon Lui
				Ot	Max Mixer LV
Res BW 10 kHz	#VBW	30 kHz*	Sweep	368 ms (6001 pts)	-10.00 dBm
Asg iPoints changed; all traces	cleared		STATUS	L DC Coupled	

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MSG Depints changed: all trace	es cleared		STATUS	1 DC Coupled	
Start 150 kHz #Res BW 10 kHz	#VBW	30 kHz*	Sweep :	Stop 30.00 MHz 368 ms (6001 pts)	
-100					
100					0 Hz
-90,0					Freq Offset
-80,0					<u>Auto</u> Man
-70.0					CF Step 2.985000 MHz
				al ad indexes a set of reacting to define	
-50.0				RMS	Stop Freq 30.000000 MHz
-40.0					150.000 KH2
-30,0					Start Freq
					15.075000 MH2
-20,0				510,05 0Dm	Center Freq
10 dB/div Ref -10.00 dBr	n			-33.875 dBm	Hato Falle
	PNO: Fast	#Atten: 10 dB	Ext Gain: -10.00 dB	DET A A A A A A	Auto Tune
Center Freq 15.075000	MHz	Tria: Free Pup	#Avg Type: Pwr(RMS)	TRACE 1 2 3 4 5 5	Frequency
LXI RL RE 50 Q ADO	CORREC	SENSE:INT	ALIGNAUTO	11:24:44 AM May 15, 2017	



Conducted Spurious Emissions (30 MHz – 1 GHz)

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	ts changed: all trace	s cleared		STATUS		
Start 30.0 #Res BW	MHz 100 kHz	#VBW	300 kHz*	Sweep 12	Stop 1.0000 GHz 20 ms (20001 pts)	
100						
-100						0 Hz
-90,0						Freq Offset
-80,0						<u>Auto</u> Man
-70.0						CF Step 97.000000 MHz
-60.0		and a state of the second s	<mark>Manufalan ya kangkatakan kana kana k</mark>	n fan en ste ante en	an a tha an Mary Mary Mary and a second	Stop Freq 1.000000000 GHz
-50.0		The second second second		. ut mi nit sking, yt de ferefestivetenskelde	RMS RMS	
-40.0						Start Freq 30.000000 MHz
-30.0						
-20.0						Center Freq
10 dB/div Log	Ref -10.00 dBn	n		IVIKI	-48.241 dBm	, and the second
		PNO: Fast +++ IFGain:Low	Trig: Free Run #Atten: 10 dB	Avg Hold: 20/20 Ext Gain: -10.00 dB		Auto Tune
Center F	reg 515.00000	0 MHz	SENSE(INT)	#Avg Type: Pwr(RMS)	11:23:20 AM May 15, 2017 TRACE 1 2 3 4 5	Frequency
Agriefit Spect	rum Analyzer - Swept SA	CORDEC	CENCETAIT	ALICH ALITO	11/00/00 MMM-1E 0017	



Conducted Spurious Emissions (1 GHz – 26.5 GHz)

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XI RL RF 50Ω /	C CORREC	SENSE;INT	ALIGNAUTO	11:17:37 AM May 15, 2017	Francisco
Start Freq 1.0000000	00 GHz PNO: Fast ↔	- Trig: Free Run	#Avg Type: Pwr(RMS Avg Hold: 20/20 Ext Gain: -10.00 dB) TRACE 1 2 3 4 5 5 TYPE A WARANA DET A A A A A A	Frequency
10 dB/div Ref -10.00 dE	m	Pricent 20 40	M	r1 1.894 9 GHz -28.477 dBm	Auto Tune
-20.0					Center Freq 1.462500000 GHz
-30.0 Initroporternetictation -40.0	del y de contra de la deste	angen (nillingen konstruction angen konst	radionangeneral allochappenerganistik	ems gladiditionilianen valandiditete	Start Freq 1.000000000 GHz
-60.0					Stop Freq 1.925000000 GHz
-70.0					CF Step 92.500000 MHz <u>Auto</u> Mar
-100					Freq Offset 0 Hz
Start 1.0000 GHz #Res BW 1.0 MHz	#VBM	/ 3.0 MHz*	Sweep	Stop 1.9250 GHz 1.20 ms (2001 pts)	
use iPoints changed; all trad	es cleared		STATU	5	

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Intermodulation Spurious Emissions for FCC_1900 PCSBAND LTE 5 MHz

nt Spectrum Analyzer - Swept SA 54 PM May 15, 2017 IRACE 1 2 3 4 5 5 TYPE A WAAAAAA DET A A A A A A Avg Type: Pwr(RMS) Avg|Hold: 100/100 Ext Gain: -10.00 dB Frequency PNO: Fast +++ Trig: Free Run IFGain:Low #Atten: 30 dB Auto Tune Mkr1 1.930 00 GHz -19.888 dBm 10 dB/div Ref 30.00 dBm **Center Freq** 1.930000000 GHz Start Freq 1.920000000 GHz Stop Freq 1 1.94000000 GHz **CF** Step 2.000000 MHz Man Auto Freq Offset 0 Hz Center 1.93000 GHz #Res BW 100 kHz Span 20.00 MHz Sweep 2.53 ms (1001 pts) #VBW 300 kHz* STATUS

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Intermodulation Spurious Emissions for FCC_1900 PCSBAND LTE 10 MHz

			Ava Type	· Pwr(RMS)	TRACE	122485	Frequency
PNO: Fast	Trig: Free F #Atten: 30 c	Run IB	Avg Hold: Ext Gain:	100/100 -10.00 dB	TYP	A WAATATATAT	
				Mkr1	1.995 -19.68	00 GHz 38 dBm	Auto Tun
murmen	usensing						Center Fre 1.995000000 GH
							Start Fre 1.975000000 GH
		ı.—				+13.00 dBm	Stop Fre 2.015000000 GH
	u,	www.www	and the second sec	www.www.www.	mmm	RMS	CF Ste 4.000000 MH <u>Auto</u> Ma
							Freq Offse 0 H
					Span 40	0.00 MHz	
	PNO: Fast	PNO: Fast Trig: Free F #Atten: 30 c	PNO: Fast Trig: Free Run #Atten: 30 dB	PNO: Fast	PNO: Fast Trig: Free Run #Atten: 30 dB AvgHold: 100/100 Ext Gain: -10.00 dB Mkr1	PNO: Fast Trig: Free Run #Atten: 30 dB Arg Hold: 100/100 Ext Gain: 10.00 dB Trig: DE Mkr1 1.995 0 -19.68	PNO: Fast +- IFGain:Low Trig: Free Run #Atten: 30 dB Avg Hold: 100/100 Ext Gain: -10.00 dB Pyref Def AAAAAA Mkr1 1.995 00 GHz -19.688 dBm

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Intermodulation Spurious Emissions for FCC_1900 PCSBAND LTE 20 MHz

Agilent Spectrum Analyzer - Swept S	SA	OF LOT A F			
ideo BW 1.2 MHz	C CORREC	SENSEUNT	Avg Type: Pwr(RMS)	U4:28:14 PM May 15, 2017 TRACE 1 2 3 4 5 5	BW
	PNO: Fast	#Atten: 30 dB	Avg Hold: 100/100 Ext Gain: -10.00 dB	DET A A A A A A	Res BV
0 dB/div Ref 30.00 dBr	n		Mkr1	1.930 00 GHz -23.191 dBm	390 kH Auto <u>Ma</u>
					Video BV 1.2 MH
		haven	mound have	marrier and warrand	Auto <u>Ma</u>
0.0 i.00					VBW:3dB RBW 100 r Auto Ma
J.Ó					Epop:2dB DBI
0.0		1	M	-13.00 dBm	Auto Ma
.0.0	energe of the second	nun han han han han han han han han han ha			RBW Control [Gaussian,-3 dB]
0,0					
0.0					
Ó,Ó					
enter 1.93000 GHz Res BW 390 kHz	#VBW	1.2 MHz*	Sweep 1	Span 80.00 MHz .00 ms (1001 <u>pts</u>)	
SG			STATUS		

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Intermodulation Spurious Emissions for FCC_1900 PCS WCDMA



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Intermodulation Spurious Emissions for FCC_1900 PCS BAND CDMA



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HCT CO., LTD.

Intermodulation Spurious Emissions for FCC_1900 PCS BAND GSM



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Single channel Enhancer Band Edge_1900 PCS BAND LTE 5 MHz



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Single channel Enhancer Band Edge_1900 PCS BAND LTE 10 MHz



[Downlink Low]





Single channel Enhancer Band Edge_1900 PCS BAND LTE 20 MHz



[Downlink Low]





Single channel Enhancer Band Edge_1900 PCS BAND WCDMA



[Downlink Low]





Single channel Enhancer Band Edge_1900 PCS BAND CDMA



[Downlink Low]





Single channel Enhancer Band Edge_1900 PCS BAND GSM



[Downlink Low]



11. RADIATED SPURIOUS EMISSIONS

Test Requirements:

§ 2.1053 Measurements required: Field strength of spurious radiation.

(a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.

(b) The measurements specified in paragraph (a) of this section shall be made for the following equipment:

(1) Those in which the spurious emissions are required to be 60 dB or more below the mean power of the transmitter.

(2) All equipment operating on frequencies higher than 25 MHz.

(3) All equipment where the antenna is an integral part of, and attached directly to the transmitter.

(4) Other types of equipment as required, when deemed necessary by the Commission.

IC Rules

Test Requirements:

RSS-Gen

7. Receiver Limits

7.1 Receiver Emission Limits

7.1.2 Receiver Radiated Limits

Radiated emission measurements shall be performed with the receiver antenna connected to the receiver antenna terminals. The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is higher, to at least 5x the highest tunable or local

oscillator frequency, whichever is higher, without exceeding 40 GHz.

Table 2 – Receiver Radiated Limits						
Frequency (MHz)	Field Strength (µv/m at 3 metres) [*]					
30-88	100					
88-216	150					
216-960	200					
Above 960	500					

Spurious emissions from receivers shall not exceed the radiated limits shown in Table 2 below:

Footnote *

Measurements for compliance with limits in the above table may be performed at distances other than 3 metres, in accordance with Section 6.5.

Test Procedures:

As required by 47 CFR 2.1053, *field strength of radiated spurious measurements* were made in accordance with the procedures of ANSI/TIA-603-C-2004 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards".

Radiated emission measurements were performed inside a 3 meter semi-anechoic chamber.

The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were terminated to 50ohm load. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360and the receiving antenna scanned from 1-3m in order to capture the maximum emission. A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was duplicated. The maximum EIRP of the emission was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried. out with the receiving antenna in both vertical and horizontal polarization. Harmonic emissions up to the 10th or 40GHz, whichever was the lesser, were investigated.





Radiated Spurious Emissions Test Setup

Note :

- 1. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).
- 2. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)



Receiver Spurious Emissions Test Result:

Test Requirements:	Blow the table
Operating conditions:	Under normal test conditions
Method of testing:	Radiated
S/A Sottings	F < 1 GHz: RBW: 120 kHz, VBW: 300 kHz (Quasi Peak)
S/A. Settings.	F > 1 GHz: RBW: 1 MHz, VBW: 1 MHz (Peak)
Mode of operation:	Receive
S/A. Settings:	F > 1 GHz: RBW: 1 MHz, VBW: 1 MHz (Peak)

Frequency	Field Strength				
(MHz)	(microvolts/m at 3 meters)				
30 – 88	100				
88 - 216	150				
216 – 960	200				
Above 960	500				

Operation Mode: Receive:

30 MHz ~ 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin	
MHz	$dB\mu N$	dB /m	dB	(H/V)	dBµN/m	dBµN/m	dB	
No critical peaks found								

Above 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin	
MHz	dBμN	dB /m	dB	(H/V)	dBµN/m	dBµN/m	dB	
No critical peaks found								



Radiated Spurious Emissions Test Result:

Harmonics were not found.

1900 PCS Band

[Downlink]

Ch.	Freq.(MHz)	Measured Level	Measured Power	Ant. Factor	C.L	A.G.	H.P.F	D.F.	Pol.	Result
		[dBuV/m]	[dBm]	[dB/m]	[dB]	[dB]	[dB]	[dB]		[dBm]
			No Cr	itical Peaks Fo	ound					

* C.L.: Cable Loss / A.G.: Ant. Gain / H.P.F.: High Pass Filter / D.F.: Distance Factor (3.75 m)

[Uplink]

Ch. Freq.(Freq.(MHz)	Measured Level	Measured Power	Ant. Factor	C.L	A.G.	H.P.F	D.F.	Pol.	Result
		[dBuV/m]	[dBm]	[dB/m]	[dB]	[dB]	[dB]	[dB]		[dBm]
			No Cr	itical Peaks Fo	ound					

* C.L.: Cable Loss / A.G.: Ant. Gain / H.P.F.: High Pass Filter / D.F.: Distance Factor (3.75 m)

Notes:

We have done horizontal and vertical polarization in detecting antenna.



12. FREQUENCY STABILITY OVER TEMPERATURE AND VOLTAGE VARIATIONS

FCC Rules

Test Requirements:

§ 2.1055 Measurements required: Frequency stability.

(a) The frequency stability shall be measured with variation of ambient temperature as follows:

(1) From -30° to + 50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.

§ 24.235 Frequency stability.

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

IC Rules

Test Requirements:

RSS-131

5. Equipment standard specifications for zone enhancers working with equipment certified in RSSs listed in section 1 except RSS-119

5.2 Industrial Zone Enhancers

5.2.4 Frequency stability

Industrial Zone Enhancers shall comply with the frequency stability given in the RSS that applies to the equipment with which the zone enhancer is to be used. In cases where the frequency stability limit is not given in the applicable RSS, the equipment shall comply with a frequency stability of \pm 1.5 ppm.

For zone enhancers with no input signal processing capability, the frequency stability measurement in this section is not required.

RSS-139

6. Transmitter and Receiver Standard Specifications

6.3 Frequency Stability

The carrier frequency shall not depart from the reference frequency, in excess of ± 2.5 ppm for mobile stations and ± 1.0 ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

Test Procedures:



As required by 47 CFR 2.1055, *Frequency Stability measurements* were made at the RF output terminals using a Spectrum Analyzer.

The EUT was placed in the Environmental Chamber.

A CW signal was injected into the EUT at the appropriate RF level. The frequency counter option on the Spectrum Analyzer was used to measure frequency deviations.

The frequency drift was investigated for every 10 °C increment until the unit is

stabilized then recorded the reading in tabular format with the temperature range of -30 to 50 °C.

Voltage supplied to EUT is 110 Vac reference temperature was done at 20°C.

The voltage was varied by ± 15 % of nominal

RSS-Gen

6. Technical Requirements

6.11 Transmitter Frequency Stability

In circumstances when the transmitter frequency stability is not stated in the applicable RSS or reference measurement method, the following applies:

- Frequency stability is a measure of frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at an appropriate reference temperature and the rated supply voltage. Unless specified otherwise in an RSS applicable to the device, the reference temperature for radio transmitters is +20°C (+68°F);
- A hand-held device that is only capable of operating using internal batteries shall be tested at the battery's nominal voltage, and again at the battery's operating end-point voltage, which must be specified by the equipment manufacturer. For this test, either a battery or an external power supply can be used; and
- The operating carrier frequency shall be set up in accordance with the manufacturer's published operation and instruction manual prior to the commencement of these tests. No adjustment of any frequency-determiningcircuit element shall be made subsequent to this initial set-up.

With the transmitter installed in an environmental test chamber, the unmodulated carrier frequency shall be measured under the conditions specified below. A sufficient stabilization period at each temperature shall be used prior to each frequency measurement. The following temperatures and supply voltage ranges apply, unless specified otherwise in the applicable RSS:

(a) at the temperatures of -30° C (-22° F), $+20^{\circ}$ C ($+68^{\circ}$ F) and $+50^{\circ}$ C ($+122^{\circ}$ F), and at the manufacturer's rated supply voltage; and

(b) at the temperature of +20°C (+68°F) and at \pm 15% of the manufacturer's rated supply voltage.

If the frequency stability limits are only met within a temperature range that is smaller than the -30° C to $+50^{\circ}$ C range specified in (a), the frequency stability requirement will be deemed to be

met if the transmitter is automatically prevented from operating outside this smaller temperature range and if the published operating characteristics for the equipment are revised to reflect this restricted temperature range.

In addition, if an unmodulated carrier is not available, the measurement method shall be described in the test report.

Test Setup:



* Note: This EUT is supported power supply both of AC and DC. Test results are only attached worst cases.

Test Results:

Frequency Stability and Voltage Test Results

[Downlink]

Reference: 120 Vac at 20°CFreq. = 1962.5 MHz									
Voltage	Temp.	Frequency	Frequency	Deviation	552				
(%)	(°°)	(Hz)	Error (Hz)	(Hz)	ррш				
	+20(Ref)	1962 500 000	0.067	0.000	0.00000				
	-30	1962 499 999	-1.123	-1.190	-0.00046				
	-20	1962 500 001	0.521	0.454	0.00018				
	-10	1962 500 001	0.899	0.832	0.00032				
100%	0	1962 500 001	0.958	0.891	0.00034				
	+10	1962 499 997	-2.917	-2.984	-0.00115				
	+30	1962 499 998	-1.639	-1.706	-0.00066				
	+40	1962 500 002	1.675	1.608	0.00062				
	+50	1962 500 002	2.150	2.083	0.00080				
High	+20	1962 500 000	-0.138	-0.205	-0.00008				
Low	+20	1962 500 000	0.241	0.174	0.00007				