

<b>Prüfbericht - Nr.:</b> Test Report No.:	16030063 001		Seite 1 von 66 Page 1 of 66
Auftraggeber: Client:	Comba Telecom Ltd. 15th Floor, Delta House, No.3 On Yiu Street, Shatin, Hongkong		
Gegenstand der Prüfung: Test item:	Master Unit of Tri-band Distrib	uted Antenna Syste	em
Bezeichnung: Identification:	RA-5700-D	FCC ID: FCC ID	PX8RA-5700-D
Wareneingangs-Nr.: Receipt No.:	173056815	Eingangsdatum: Date of receipt:	20.10.2010
<b>Prüfort:</b> <i>Testing location:</i>	TÜV Rheinland (Guangdong) L Laboratory Guangzhou Auto Market, Yuan Guangshan Road, Guangzhou P. R. China	Gang Section of	Listed test laboratory according to FCC rules section 2.948 for measuring devices
<b>Prüfgrundlage:</b> <i>Test specification:</i>	TIA/EIA-603-C-2004 FCC "Rules and Regulations": Part 22, subpart H, 2009 Part 24, subpart E, 2009 Part 27, 2009 Part 2, 2009		
Prüfergebnis: Test Result:	<b>Der Prüfgegenstand entspric</b> The test item passed the test s		Prüfgrundlage(n).
Prüflaboratorium: Testing Laboratory:	TÜV Rheinland (Guangdong)	Ltd.	
geprüft / tested by:         Apr. 15, 2011       Ken Kuang Project Engin         Datum       Name/Stellu         Date       Name/Position         Sonstiges/ Other Aspects:       Sonstiges/ Other Aspects:	neer .25 Ag ng Unterschrift Datum on Signature Date	liert/reviewed by: Dr. 2011 Liangdong Xia Project Manag Name/Stellur Name/Positio	ger Unterschrift n Signature
F(ail) = entsj N/A = nicht N/T = nicht	pricht nicht Prüfgrundlage anwendbar getestet	F(ail) = N/A = N/T =	= passed = failed = not applicable = not tested paigung dor Prüfetelle pick
uszugsweise vervielfältigt we his test report relates to the a.	ch nur auf das o.g. Prüfmuster u erden. Dieser Bericht berechtigt nic m. test sample. Without permission o eport does not entitle to carry any saf	ht zur Verwendung ei of the test center this te	nes Prüfzeichens. est report is not permitted to b

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 Rev. 3.4.1 2007-09-06 / approved: R.M. Müller





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# TEST SUMMARY

Mode	Test items	Result
	Transmitter Requirements	
	RF power Output	Pass
	Occupied Bandwidth, Input/Output Comparison	Pass
LTE	Spurious Emissions at antenna terminal	Pass
	Field Strength of Spurious Radiation	Pass
	Frequency Stability	Pass
	Error Vector Magnitude (EVM)	No limit
	RF Power Output	Pass
	Occupied Bandwidth, Input/Output Comparison	Pass
	Out-of-Band Emissions at antenna terminal	Pass
CDMA	Intermodulation Test	Pass
CDIMA	Field Strength of Spurious Radiation	Pass
	Out of Band Rejection	Pass
	Frequency Stability	Pass
	Error Vector Magnitude (EVM)	No limit

Note: as the DUT is only RF amplifier without phase modulation function, the Error Vector Magnitude (EVM) is not necessary for FCC application, it is only client's additional request for verification.





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# **1** General Remarks

# **1.1 Complementary Materials**

No attached documents in this report.

# 2 Test Sites

# 2.1 Test Facilities

### TÜV Rheinland (Guangdong) Ltd. EMC Laboratory

Guangzhou Auto Market, Yuan Gang Section of Guangshan Road Guangzhou 510650

P. R. China





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# 2.2 List of Test and Measurement Instruments

 Table 1: List of Test and Measurement Equipment

Equipment	Manufacturer	Туре	Serial No.	Calibrated until		
TÜV Rheinland (Guangdong) Ltd.						
EMI Test Receiver	Rohde & Schwarz	ESCI-3	100216	16.Mar.2011		
Spectrum Analyzer	Rohde & Schwarz	FSP30	100286	16.Mar.2011		
Trilog-Broadband Antenna	SCHWARZBECK MESS- ELEKTRONIK	VULB9168	209	16.Mar.2011		
Trilog-Broadband Antenna	SCHWARZBECK MESS- ELEKTRONIK	VULB9168	210	16.Mar.2011		
Double-Ridged Waveguide Horn Antenna	Rohde & Schwarz	HF906	100385	16.Mar.2011		
Double-Ridged Waveguide Horn Antenna	Rohde & Schwarz	HF906	100407	16.Mar.2011		
Pre-amplifier	MITEQ	AFS42-00101800- 25-S-42	1101599	16.Mar.2011		
Band Reject Filter	Micro-Tronics	BRM50702	023	16.Mar.2011		
Standard Gain Horn Antenna	EMCO	3160-09	21642	16.Mar.2011		
Standard Gain Horn Antenna	ЕМСО	3160-09	21645	16.Mar.2011		
Pre-amplifier	MITEQ	AFS33-18002650- 30-8P-44	1108282	16.Mar.2011		
3m Anechoic Chamber	Albatross Project GmbH	N/A	N/A	16.Mar.2011		
Climatic Chamber	ESPEC	EL-04 KA	6107116	16.Mar.2011		
Audio analyzer	KENWOOD	10087290	VA-2230A	16.Mar.2011		
RF communication test set	HP	8920A	3417A04617	16.Mar.2011		
Signal generator	Rohde & Schwarz	SMU200A	101904	13.Aug.2011		
Spectrum analyzer	Agilent	N9020A	MY49060014	06.May.2011		
Spectrum analyzer	Agilent	N9020A	MY50200776	10.Jun.2011		
Attenuator	SHX manufacturer	30dB/50W	080820	10.Jun.2011		



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# 2.3 Trace ability

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All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations

# 2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

# 2.5 Measurement Uncertainty

Uncertainty for radiated emissions measurements is  $\pm$  4.94dB (30MHz-1GHz),  $\pm$  4.88dB (>1GHz).

The reported expanded uncertainty is based on a standard uncertainty multiply by a coverage factor k=2, providing a level of confidence of approximately 95%.

# 2.6 Location of original data

The original copies of all test data taken during actual testing were attached at Appendix 1 of this report and delivered to the applicant. A copy has been retained in the TUV Rheinland (Guangzhou) file for certification follow-up purposes.

# 2.7 Status of facility used for testing

TÜV Rheinland (Guangdong) Ltd. EMC Laboratory; Guangzhou Auto Market, Yuan Gang Section of Guangshan Road, Guangzhou 510650, P. R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements, the register no. 833845.



MT

RU

#### Prüfbericht - Nr.: Seite 8 von 66 16030063 001 Page 8 of 66 Test Report No.: **3** General Product Information The submitted sample RA-5700-D is Master Unit (RU) of Multi-band In-band Distributed Antenna system RA-5700. The EUT supports three systems, which are LTE 700, CDMA 850 and CDMA 1900. On the UL, the signals transmitted by the mobile are converted into optical signals, and then via the UL optical fiber. The signals are transmitted to MU, which converts the optical signals to RF signals, and then the RF signal is fed to BTS. On the DL, combined signals as 700MHz, 850MHz and 1900MHz from the BTSs converted into optical signals after amplification in the MU. Then the optical signals are transmitted to the RU via optical fiber. The Master Unit can provide four optical I/O ports and can connect four identical Remoter Units via optical fiber. Tx/Rx ANT ΜΤ OP UL\_DL RU WDN 1310nm/1550nm WDM ANT Coupler MT OP UL D RU WDN 0 WDM 1310nm/1550nm ANT Tx/Rx MU

WDN WDN 1310nm/1550nm BTS MT OP UL DL RU 0 WDM WDN 1310nm/1550nm

0

OP UL DL

For details, refer to technical document and the user manual.

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3.1 Product Function and Intended Use

For details, refer to technical document and the user manual.

# 3.2 Ratings and System Details

Model name :	RA-5700-D
Supporting system :	LTE 700, CDMA 850, CDMA 1900
Frequency range :	LTE 700 band 1: Downlink: 728 – 746 MHz Uplink: 698 – 716 MHz
	LTE 700 band 2: Downlink: 746 – 756 MHz Uplink: 777 – 787 MHz
	CDMA 850: Downlink: 869 – 894 MHz Uplink: 824 – 849 MHz
	CDMA 1900: Downlink: 1930 – 1995 MHz Uplink: 1850 – 1915 MHz
Uplink RF output power :	- 20dBm (LTE 700 band 1 and band 2) - 20dBm (CDMA 850) - 20dBm (CDMA 1900)
Type Modulation :	LTE (for LTE 700) CDMA (for 850 and 1900)
Emission Designators :	F9W
Type of antenna :	External antenna
Operating temperature :	-30°C to 50°C
Nominal power input	120VAC / 60Hz
Power supply operating range :	85-264 VAC / 47-63 Hz
Rated power input :	160W
Protection Class :	



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# **3.3 Independent Operation Modes**

The EUT was powered by 120VAC. The EUT was configured for maximum gain, 30dB. Signal generator was used to provide the input signals to the EUT. Tests were performed with CDMA signal input and LTE signal input. The input power was the maximum declared by the manufacturer.

For further information refer to User Manual

# **3.4 Submitted Documents**

Application form Block Diagram Circuit Diagram Components List PCB layout FCC label User Manual Photo document



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# 4 Test Set-up and Operation Mode

## 4.1 Principle of Configuration Selection

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

# 4.2 Test Operation and Test Software

Refer to Test set-up in chapter 5.

## 4.3 Special Accessories and Auxiliary Equipment

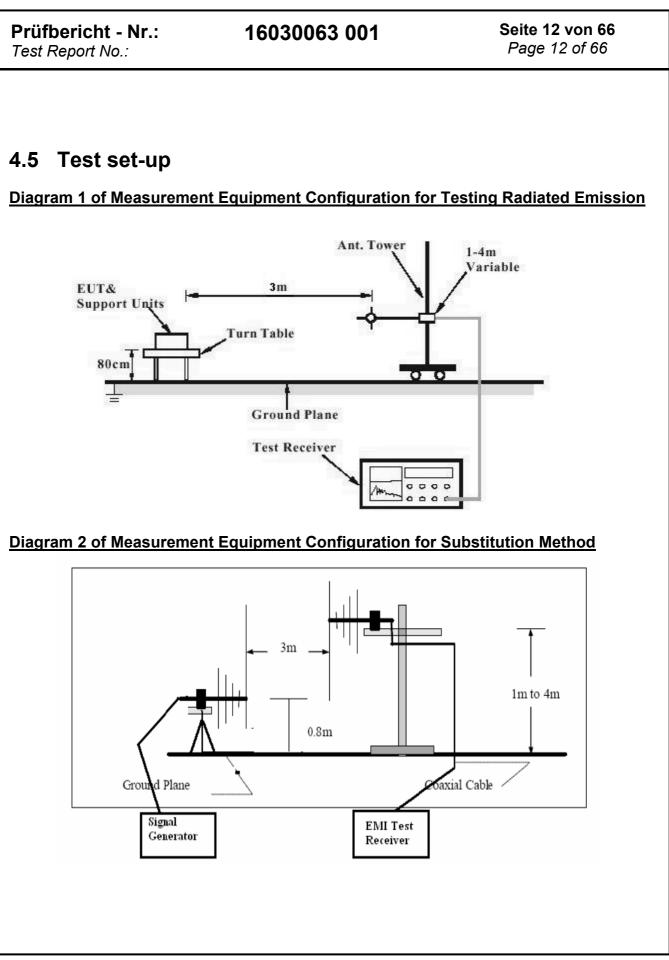
The RA-5700-R is Remote Unit (RU) of Multi-band In-band Distributed Antenna system RA-5700. The R-5700-R is connected with RA-5700-D for test.

## 4.4 Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the technical document. No additional measures were employed to achieve compliance.









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### Diagram 3 of Measurement Equipment Configuration for RF power output, Occupied Bandwidth, Spurious Emissions at antenna terminal, Intermodulation Test, Out-of-Band Rejection



# 4.6 Test frequency selection

Mode	Tested frequency (MHz)
	733.0
LTE 700 Band 1_DL	737.0
	741.0
	703.0
LTE 700 Band 1_UL	707.0
	711.0
LTE 700 Band 2_DL	751.0
LTE 700 Band 2_UL	782.0
	869.62
CDMA 850_DL	881.18
	893.38
	824.62
CDMA 850_UL	836.18
	848.38
	1930.62
CDMA 1900_DL	1960.18
	1989.38
	1850.62
CDMA 1900_UL	1880.18
	1909.38



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# **5** Test Results

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# 5.1 Test result of LTE 700MHz band 1 and Band 2

### 5.1.1 RF power Output

### **RESULT:**

Date of testing	28.Sep.2010
Temperature :	22°C
Humidity :	50%
Basic standard :	FCC Part 2.1046(a)
Test method :	ANSI/TIA-603-C-2004, clause 2.2.1
Operation mode :	Transmitting with maximum RF power output

Limits:

For operating frequency band 698–746 MHz:

FCC Part 27.50 (c) (3)

Fixed and base stations transmitting a signal with an emission bandwidth greater than 1 MHz must not exceed an ERP of 1000 watts/MHz and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts/MHz ERP in accordance with Table 3 of this section.

For operating frequency band 746 -787 MHz:

FCC Part 27.50 (b) (4)

Fixed and base stations transmitting a signal in the 746–757 MHz, 758–763 MHz, 776–787 MHz, and 788–793 MHz bands with an emission bandwidth greater than 1 MHz must not exceed an ERP of 1000 watts/MHz and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts/MHz ERP accordance with Table 3 of this section.

Pass



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#### Measurement procedure:

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- 1. The RF output of EUT was connected to spectrum analyzer.
- 2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
- 3. A spectrum analyzer was setup to measure peak power.
- 4. Measurements were performed at three frequencies (low, middle, and high channels) with modulation.

#### Test Results:

For operating frequency band 698–746 MHz:

Downlink: 728 – 746 MHz, Uplink: 698 – 716 MHz

#### The input signal level is – 50dBm.

#### Table 2: Output power at low, middle and high channel, LTE 700 Band 1\_UL

Channel	Direction	Freq. (MHz)	RF power ouput (dBm)	RF power output (W)	Limit (W)
Low	UL	703.0	-21.32	0.0000074	1000
Middle	UL	707.0	-20.99	0.0000080	1000
High	UL	711.0	-21.32	0.0000074	1000

For operating frequency band 746 -787 MHz:

Downlink: 746 – 756 MHz, Uplink: 777 – 787 MHz

The input signal level is – 50dBm.

#### Table 3: Output power at one channel, LTE 700 Band 2\_UL

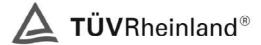
Channel	Direction	Freq. (MHz)	RF power ouput (dBm)	RF power output (W)	Limit (W)
One	UL	782.0	-21.09	0.0000078	1000



#### 16030063 001 Prüfbericht - Nr.: Seite 16 von 66 Page 16 of 66 Test Report No.: 5.1.2 Occupied bandwidth, Input/output Comparison **RESULT:** Pass Date of testing 29.Sep.2010 Temperature : 22°C Humidity 50% Basic standard FCC Part 2.1049 : Test method : ANSI/TIA-603-C-2004 Operation mode : Transmitting with maximum RF power output Limits N/A

### Measurement procedure:

- 1. The EUT RF output port was connected to spectrum analyzer.
- 2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
- 3. The spectrum analyzer was setup to measure the Occupied Bandwidth (defined as the 99% Power Bandwidth).
- 4. The Occupied Bandwidth was measured at the input and output ports of the EUT at low, middle and high channel of each type of modulation.



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### **Test Results:**

### Table 4: 99% Occupied Bandwidth – LTE 700 Band 1\_UL

Channel	Direction	Freq. (MHz)	99% Occupied bandwidth (MHz)
Lowest	UL	703.0	8.91
Middle	UL	707.0	8.93
High	UL	711.0	8.94

### Table 5: 99% Occupied Bandwidth – LTE 700 Band 2\_UL

Channel	Direction	Freq. (MHz)	99% Occupied bandwidth (MHz)
One	UL	782.0	8.93



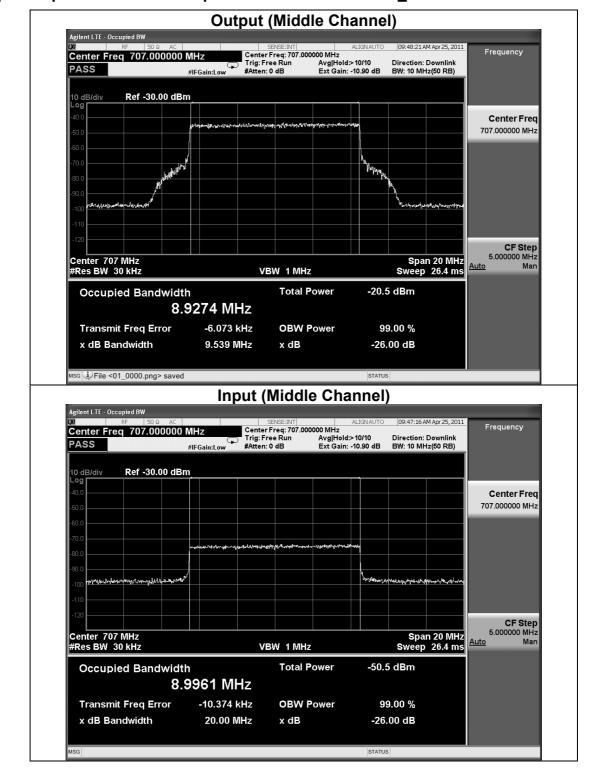


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Note: only middle channel of comparison of input/output is list in the following pages.

Input/output Bandwidth Comparison – LTE 700 Band 1\_UL





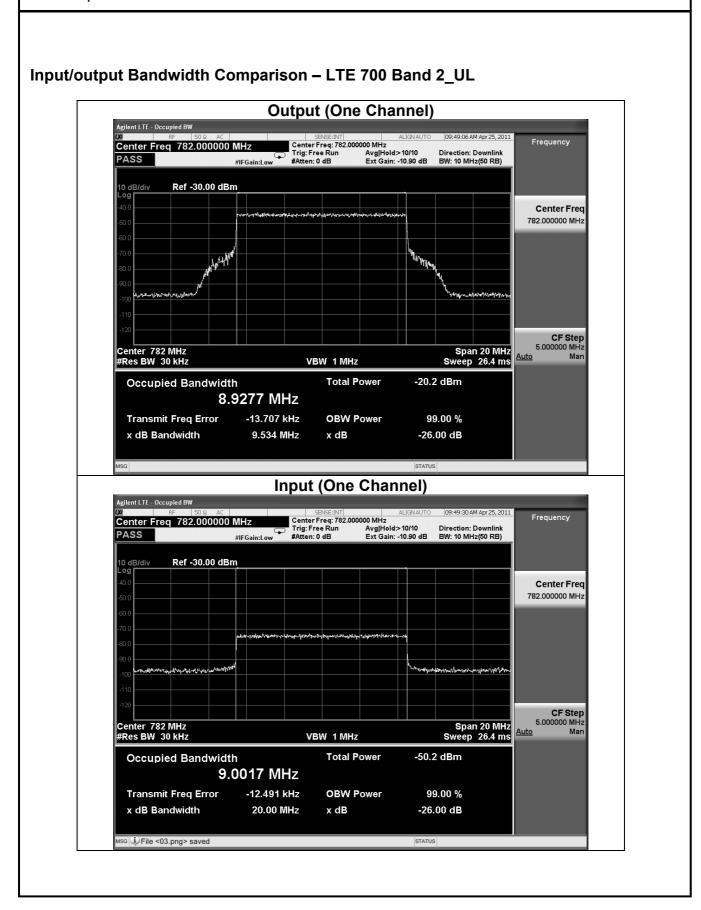


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## Prüfbericht - Nr.: Seite 20 von 66 16030063 001 Page 20 of 66 Test Report No.: 5.1.3 Spurious Radiation at antenna terminal **RESULT:** Pass Date of testing 29.Sep.2010 Temperature 22°C Humiditv 50% Basic standard FCC Part 2.1051 Test method ANSI/TIA-603-C-2004, clause 2.2.13 : Operation mode Transmitting with maximum RF power output Limits: For operating frequency band 698–746 MHz: Refer to FCC Part 27.53 (g). Operations in the 698–746 MHz band. For operations in 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. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed. The following method was used to determine the Limit for Spurious Emissions: Maximum output power in watts: P (W). The emission must be reduced by 43+10Log(P) dB Therefore, the Emission Limit equals: 10Log(P) dBW + 30dB - (43+10Log(P) dB) = -13 dBm



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For operating frequency band 746 -787 MHz:

Refer to FCC Part 27.53 (c) and 27.53(f).

For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the 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, in accordance with the following:

(1) On any frequency outside the 746–758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P) dB$ ;

(2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P) dB$ ;

(3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed.

The emission must be reduced by 76+10Log(P) dB at 6.25 kHz

Therefore, the Emission Limit equals:

10Log(P) dBW + 30dB - (43+10Log(P) dB) = -13 dBm

The emission must be reduced by 76+10Log(P) dB at 6.25 kHz

Therefore, the Emission Limit equals:

10Log(P) dBW + 30dB - (76+10Log(P) dB) + 10Log (10/6.25) = -45 dBm

Refer to FCC Part 27.53(f).

For operations in the 746–763 MHz, 775–793 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to - 70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and – 80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.



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# Measurement procedure:

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- 1. The EUT RF output port was connected to spectrum analyzer.
- 2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
- 3. The spurious emissions at antenna were measured at the RF output port of the EUT at middle channel of each type of modulation.

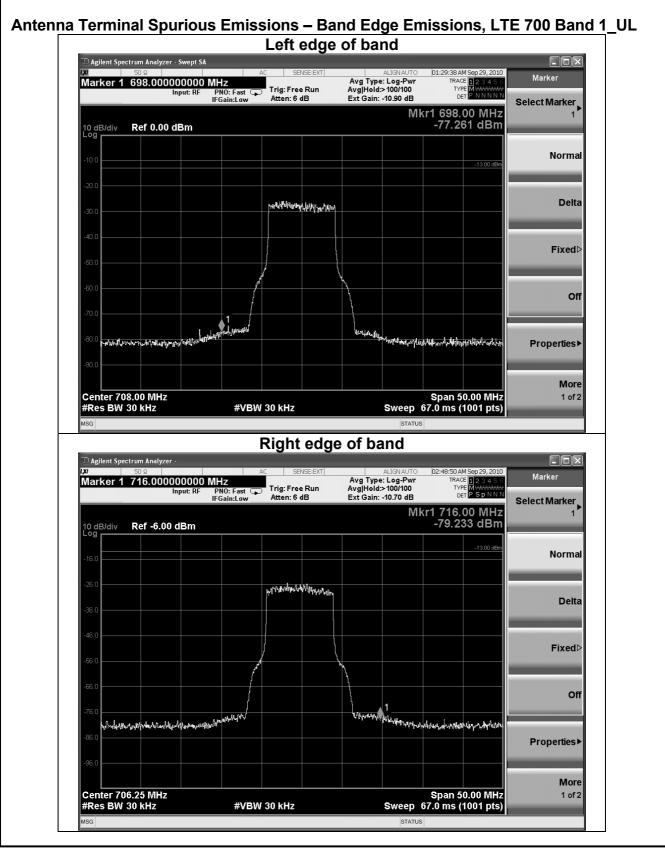




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#### **Test Results:**







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D Agilent Spectrum Ar	nalyzer - Swept SA							- O ×
50 Ω Marker 1 704.	Input: RF P	NO: Fast 😱	SENSE:EXT	Avg Type: Avg Hold:> Ext Gain: -	> 100/100	01:40:39 A TRAC TYP DE	M Sep 29, 2010 E 1 2 3 4 5 6 E MWWWWW T P N N N N N	
	ŀ	Gain:Low	Atten: 6 dB	Ext Gain: -		kr1 704.	15 MHz	Next Deal
10 dB/div Ref	-10.00 dBm					-20.84	10 dBm	
-20.0					,1			Next Right
-30.0								
-40.0								Next Left
-50.0								
-60.0								Marker Delta
-70.0								
17711010-2.2.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	<sub>A</sub> gerly <sup>de, del</sup> le <sup>in</sup> s Northflee Indekjeljij <sub>ere</sub> n	inghi, an the third of the second	when which and the state	population and a second	Linghalangula	handernetstatererse	enerer have the second and the secon	Mkr→CF
-90.0								
-100								Mkr→RefLv
-100								More
Start 30.0 MHz #Res BW 100 k						Stop 1.0	000 GHz	1 of 2
	HZ	#VBW 1	00 kHz		Sweep	117 ms (	1001 pts)	
MSG	HZ	#VBW 1	00 KHZ		Sweep		1001 pts)	
MSG Agilent Spectrum Ar (X) 50 Q Marker 1 5.68	nalyzer - Swept SA 8250000000 G Input: RF P	AC SHZ NO: Fast 😱	SENSE:INT Trig: Free Run Atten: 6 dB	Avg Type: Avg Hold> Ext Gain: -	ALIGNAUTO : Log-Pwr > 100/100	04:28:47PI TRAC	1001 pts) 4 Sep 30, 2010 E 1 2 3 4 5 6 E MWWWWW T P N N N N	Peak Search
Agilent Spectrum An W 50 Q Marker 1 5.68	nalyzer - Swept SA 8250000000 C Input: RF P IF	AC GHz	SENSE:INT	Avg Type: Avg Hold>	STATUS ALIGN AUTO : Log-Pwr >100/100 -10.70 dB	04:28:47 PI TRAC TYP DE Akr1 5.6	M Sep 30, 2010 E 1 2 3 4 5 6 E M WWWWW T P N N N N N 88 GHz	
Agilent Spectrum An (X) 50 Q Marker 1 5.68	nalyzer - Swept SA 8250000000 G Input: RF P	AC SHZ NO: Fast 😱	SENSE:INT	Avg Type: Avg Hold>	STATUS ALIGN AUTO : Log-Pwr >100/100 -10.70 dB	04:28:47 PI TRAC TYP DE Akr1 5.6	4 Sep 30, 2010 E 1 2 3 4 5 6 E MWWWWWWW T P N N N N N	Peak Search Next Peak
D Agilent Spectrum A OV 50 Ω Marker 1 5.68 10 dB/div Ref	nalyzer - Swept SA 8250000000 C Input: RF P IF	AC SHZ NO: Fast 😱	SENSE:INT	Avg Type: Avg Hold>	STATUS ALIGN AUTO : Log-Pwr >100/100 -10.70 dB	04:28:47 PI TRAC TYP DE Akr1 5.6	M Sep 30, 2010 E 1 2 3 4 5 6 E M WWWWW T P N N N N N 88 GHz	Peak Search
In Agilent Spectrum Ar CVI 50 Q Marker 1 5.68 10 dB/div Ref	nalyzer - Swept SA 8250000000 C Input: RF P IF	AC SHZ NO: Fast 😱	SENSE:INT	Avg Type: Avg Hold>	STATUS ALIGN AUTO : Log-Pwr >100/100 -10.70 dB	04:28:47 PI TRAC TYP DE Akr1 5.6	4 Sep 30, 2010 E 1 2 3 4 5 5 E M	Peak Search Next Peak Next Pk Right
Agilent Spectrum Ar     So      Marker 1 5.68     Agilent Spectrum Ar     So      Narker 1 5.68     Agilent Spectrum Ar     So      Agilent Ar     So      So      Agilent Ar     So      Agilent Ar     So      Agilent Ar     So      Agilent	nalyzer - Swept SA 8250000000 C Input: RF P IF	AC SHZ NO: Fast 😱	SENSE:INT	Avg Type: Avg Hold>	STATUS ALIGN AUTO : Log-Pwr >100/100 -10.70 dB	04:28:47 PI TRAC TYP DE Akr1 5.6	4 Sep 30, 2010 E 1 2 3 4 5 5 E M	Peak Search Next Peak
Agilent Spectrum Ai     So Ω     Marker 1 5.68     10 dB/div Ref     -10.0     -20.0	nalyzer - Swept SA 8250000000 C Input: RF P IF	Hz NO: Fast Gain:Low	SENSE:INT	Avg Type: Avg Hold>	STATUS ALIGN AUTO : Log-Pwr >100/100 -10.70 dB	04:28:47 PI TRAC TYP DE Akr1 5.6	4 Sep 30, 2010 E 1 2 3 4 5 5 E M	Peak Search Next Peak Next Pk Right
Agitent Spectrum Ar           (X)         50 ♀           Marker 1         5.68           10 dB/div         Ref           -10.0	nalyzer - Swept SA 8250000000 C Input: RF P IF 0.00 dBm	Gin:Low	SENSE:INT	Avg Type: Avg Hold> Ext Gain: -	STATUS ALIGN AUTO : Log-Pwr - 100/100 -10.70 dB	04:28:47 Try DE 1kr1 5.6 -53.7	4 Sep 30, 2010 E 12 3 4 5 6 F NNNN N 88 GHz 25 dBm -13.00 dFm	Peak Search Next Peak Next Pk Right Next Pk Left
Agitent Spectrum Ar           (X)         50 ♀           Marker 1         5.68           10 dB/div         Ref           -10.0	nalyzer - Swept SA 8250000000 C Input: RF P IF	Gin:Low	SENSE:INT	Avg Type: Avg Hold> Ext Gain: -	STATUS	04:28:47 Try DE 1kr1 5.6 -53.7	4 Sep 30, 2010 E 12 3 4 5 6 F NNNN N 88 GHz 25 dBm -13.00 dFm	Peak Search Next Peak Next Pk Right Next Pk Left
Agitent Spectrum Ar           (X)         50 ♀           Marker 1         5.68           10 dB/div         Ref           -10.0	nalyzer - Swept SA 8250000000 C Input: RF P IF 0.00 dBm	Gin:Low	SENSE:INT	Avg Type: Avg Hold> Ext Gain: -	STATUS	04:28:47 Try DE 1kr1 5.6 -53.7	4 Sep 30, 2010 E 12 3 4 5 6 F NNNN N 88 GHz 25 dBm -13.00 dFm	Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta
Agilent Spectrum An           X//         50 0           Marker 1         5.68           10 dB/div         Ref           10 dB/div         Ref           -20 0	nalyzer - Swept SA 8250000000 C Input: RF P IF 0.00 dBm	Gin:Low	SENSE:INT	Avg Type: Avg Hold> Ext Gain: -	STATUS	04:28:47 Try DE 1kr1 5.6 -53.7	4 Sep 30, 2010 E 12 3 4 5 6 F NNNN N 88 GHz 25 dBm -13.00 dFm	Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta
Image: Sector of the	nalyzer - Swept SA 8250000000 C Input: RF P IF 0.00 dBm	Gin:Low	SENSE:INT	Avg Type: Avg Hold> Ext Gain: -	STATUS	04:28:47 Try DE 1kr1 5.6 -53.7	4 Sep 30, 2010 E 12 3 4 5 6 F NNNN N 88 GHz 25 dBm -13.00 dFm	Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr→CF
Image: system of the syste	nalyzer - Swept SA 8250000000 C Input: RF P IF 0.00 dBm	Gin:Low	SENSE:INT	Avg Type: Avg Hold> Ext Gain: -	STATUS	04:28:47P TRAC TVF 0F 1kr1 5.6 -53.7;	4 Sep 30, 2010 E 12 3 4 5 6 F NNNN N 88 GHz 25 dBm -13.00 dFm	Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta Mkr→CF



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Test Report No.:

Terminal Spuriou			
ISPlay Line -13.00 dBm Input: RF	PNO: Fast Trig: Free Run IFGain:Low Atten: 6 dB	ALIGNAUTO 09:44:39 PM Si Avg Type: Log-Pwr TRACE Avg Hold>100/100 TYPE Ext Gain: -30.70 dB DET	2929,2010 2 3 4 5 6 WWWWW NNNNN
10 dB/div Ref 21.00 dBm		Mkr1 756.00 19.355	MHz Annotation
10 dB/div Ref 21.00 dBm			
11.0			Title
1.00			Graticul
-9.00			-13.00 dBm Of
-19.0			Display Line
-29.0			-13.00 dBn On Of
-39.0			
-49.0			
1.59.0	have the second and the second second and the second s	superindentities and all intermedian personal	System
-69.0			Display Settings
	#VBW 100 kHz	Stop 1.000 Sweep 117 ms (10	
Start 30.0 MHz #Res BW 100 kHz <sup>MSG</sup>	#VBW 100 kHz		
#Res BW 100 kHz		Sweep 117 ms (10	01 pts)
#Res BW 100 kHz MSG D Agilent Spectrum Analyzer - Swept S <i>M</i> (XI 50 Q	AC SENSE:INT	Sweep 117 ms (10 STATUS ALIGNAUTO 04:34:31 PM S: Avg Type: Log-Pwr TRACE	01 pts)
#Res BW 100 kHz MSG D Agilent Spectrum Analyzer - Swept SA	AC SENSE:INT	Sweep         117 ms (10           STATUS         STATUS           Aug Type:         Q4:34:31 PMS           Avg Type:         Log-Pwr           Avg Hold>100/100         TYPE           Ext Gain:         -30.70 dB         Det	01 pts) p 30,2010 2 3 4 5 1 NNNNN
#Res BW 100 kHz MSG → Agilent Spectrum Analyzer - Swept SA (X) 50 Ω Marker 1 5.86450000000 Input: RF 10 dB/div Ref 30.00 dBm	AC SENSE:INT O GHz PN0: Fast Trig: Free Run	Sweep         117 ms (10           STATUS	01 pts) p30,2010 23 4 50 NNNN NNNN SGHZ Next Peal
#Res BW 100 kHz           MSG           Image: Agilent Spectrum Analyzer - Swept SA           SO Q           Marker 1           50 Q           Imarker 1           10 G           Imarker 2           Imarker 3           Imark	AC SENSE:INT O GHz PN0: Fast Trig: Free Run	Sweep         117 ms (10           STATUS         STATUS           Aug Type: Log-Pwr         D4:34:31 PM S           Avg Type: Log-Pwr         TRACE           Avg Hold>100/100         TYPE           Ext Gain: -30.70 dB         DET           Mkr1 5.865         State	01 pts) p30,2010 23 4 50 NNNN NNNN SGHZ Next Peal
#Res BW 100 kHz MSG Agilent Spectrum Analyzer - Swept SA (M 50 Ω 100 Marker 1 5.86450000000 Input: RF 10 dB/div Ref 30.00 dBm 20 0	AC SENSE:INT O GHz PN0: Fast Trig: Free Run	Sweep         117 ms (10           STATUS         STATUS           Aug Type: Log-Pwr         D4:34:31 PM S           Avg Type: Log-Pwr         TRACE           Avg Hold>100/100         TYPE           Ext Gain: -30.70 dB         DET           Mkr1 5.865         State	01 pts) anso:2010 23 4 5 5 NNNNN S GHZ dBm
#Res BW 100 kHz           MSG           MSG           Image: Agilent Spectrum Analyzer - Swept SM           Marker 1         5.86450000000           Input: RF           10 dB/div         Ref 30.00 dBm           20 0         10.0	AC SENSE:INT O GHz PN0: Fast Trig: Free Run	Sweep         117 ms (10           STATUS         STATUS           Aug Type: Log-Pwr         D4:34:31 PM S           Avg Type: Log-Pwr         TRACE           Avg Hold>100/100         TYPE           Ext Gain: -30.70 dB         DET           Mkr1 5.865         State	01 pts) anso:2010 23 4 5 5 NNNNN S GHZ dBm
#Res BW 100 kHz           MSG           Image: Agilent Spectrum Analyzer - Swept SA           SO Q           Marker 1           50 Q           Imarker 1           50 Q           Input: RF           10 dB/div           20.0	AC SENSE:INT O GHz PN0: Fast Trig: Free Run	Sweep         117 ms (10           STATUS         STATUS           Aug Type: Log-Pwr         D4:34:31 PM S           Avg Type: Log-Pwr         TRACE           Avg Hold>100/100         TYPE           Ext Gain: -30.70 dB         DET           Mkr1 5.865         State	01 pts) p30,2010 2 3 4 5 7 3 GHz dBm Next Pk Righ
#Res BW 100 kHz           MSG           MSG           Image: Agilent Spectrum Analyzer - Swept SM           Marker 1         5.86450000000           Image: Agilent Spectrum Analyzer - Swept SM           Marker 1         5.864500000000           Input: RF           10 dB/div         Ref 30.00 dBm           20 0         10.0	AC SENSE:INT O GHz PN0: Fast Trig: Free Run	Sweep         117 ms (10           STATUS         STATUS           Aug Type: Log-Pwr         D4:34:31 PM S           Avg Type: Log-Pwr         TRACE           Avg Hold>100/100         TYPE           Ext Gain: -30.70 dB         DET           Mkr1 5.865         State	01 pts) p30,2010 2 3 4 5 7 3 GHz dBm Next Pk Righ
#Res BW 100 kHz           MSG           MSG           Agilent Spectrum Analyzer - Swept SA           Marker 1           50 Q           Marker 1           5.86450000000           Input: RF           10 dB/div           20 0           10 0           0.00	AC SENSE:INT O GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 10 dB	Sweep         117 ms (10           STATUS         STATUS           Aug Type: Log-Pwr         D4:34:31 PM S           Avg Type: Log-Pwr         TRACE           Avg Hold>100/100         TYPE           Ext Gain: -30.70 dB         DET           Mkr1 5.865         State	01 pts) p30,2010 Peak Search NNNNN SGHZ dBm Next Pk Righ Next Pk Lef
#Res BW 100 kHz           MSG         MSG           Image: Agilent Spectrum Analyzer - Swept SA         SO Q           Marker 1         5.86450000000           Marker 1         5.86450000000           Input: RF         Input: RF           10 dB/div         Ref 30.00 dBm           20 0         Image: Agile A	AC SENSE:INT O CHZ PNO: Fast IFGain:Low Atten: 10 dB	Sweep 117 ms (10           STATUS           ALIGN AUTO           Avg Type: Log-Pwr           Avg[Hold>100/100           Ext Gain: -30.70 dB           Mkr1 5.865           -29.221           Image: Status           Image: Status <td>01 pts) p30,2010 2 3 4 5 0 Peak Search Next Peal Next Pk Righ Next Pk Lef Marker Delta</td>	01 pts) p30,2010 2 3 4 5 0 Peak Search Next Peal Next Pk Righ Next Pk Lef Marker Delta
#Res BW 100 kHz           MSG         MSG           Image: Agilent Spectrum Analyzer - Swept SA         SO Q           Marker 1         5.86450000000           Marker 1         5.86450000000           Input: RF         Input: RF           10 dB/div         Ref 30.00 dBm           20 0         Image: Agile A	AC SENSE:INT O CHZ PNO: Fast IFGain:Low Atten: 10 dB	Sweep         117 ms (10           STATUS         STATUS           Aug Type: Log-Pwr         D4:34:31 PM S           Avg Type: Log-Pwr         TRACE           Avg Hold>100/100         TYPE           Ext Gain: -30.70 dB         DET           Mkr1 5.865         State	01 pts) p30,2010 2 3 4 5 0 Peak Search Next Peal Next Pk Righ Next Pk Lef Marker Delta
#Res BW 100 kHz           MSG         MSG           Image: Agilent Spectrum Analyzer - Swept SA         SO Q           Marker 1         5.86450000000           Marker 1         5.86450000000           Image: Agilent Spectrum Analyzer - Swept SA         Imput: RF           10 dB/div         Ref 30.00 dBm           20 0         Imput: RF           10 0         Imput: RF           -0 0         Imput: RF	AC SENSE:INT O CHZ PNO: Fast IFGain:Low Atten: 10 dB	Sweep 117 ms (10           STATUS           ALIGN AUTO           Avg Type: Log-Pwr           Avg[Hold>100/100           Ext Gain: -30.70 dB           Mkr1 5.865           -29.221           Image: Status           Image: Status <td>01 pts) p30,2010 2 3 4 5 0 Peak Search Next Peal Next Pk Righ Next Pk Lef Marker Delta</td>	01 pts) p30,2010 2 3 4 5 0 Peak Search Next Peal Next Pk Righ Next Pk Lef Marker Delta
#Res BW 100 kHz           MSG         MSG           Image: Sector and	AC SENSE:INT O CHZ PNO: Fast IFGain:Low Atten: 10 dB	Sweep 117 ms (10           STATUS           ALIGN AUTO           Avg Type: Log-Pwr           Avg[Hold>100/100           Ext Gain: -30.70 dB           Mkr1 5.865           -29.221           Image: Status           Image: Status <td>01 pts) 23 4 5 0 23 4 5 0 Comparison</td>	01 pts) 23 4 5 0 23 4 5 0 Comparison
#Res BW 100 kHz           Msg           Majlent Spectrum Analyzer - Swept SA 200           So Q           Marker 1           50 Q           So Q           Input: RF           10 dB/div           Ref 30.00 dBm           000           10.0	AC SENSE:INT O CHZ PNO: Fast IFGain:Low Atten: 10 dB	Sweep 117 ms (10           STATUS           ALIGN AUTO           Avg Type: Log-Pwr           Avg[Hold>100/100           Ext Gain: -30.70 dB           Mkr1 5.865           -29.221           Image: Status           Image: Status <td>01 pts) p30,2010 23 4 5 0 Peak Search Next Peal Next Pk Righ Next Pk Lef Marker Delta Mkr→Ref Ly</td>	01 pts) p30,2010 23 4 5 0 Peak Search Next Peal Next Pk Righ Next Pk Lef Marker Delta Mkr→Ref Ly



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Test Report No.:

Agilent Spectrum Analyzer - Swept S  M 50 Ω			20.00.040140-000.0040	
Start Freq 30.000000 MI Input: RF	AC SENSE:EXT PNO: Fast Trig: Free Run IFGain:Low Atten: 6 dB	ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 98/100 Ext Gain: -10.70 dB	09:08:24 PM Sep 29, 2010 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Frequency
10 dB/div Ref -7.00 dBm	in connector	Mkr	1 780.78 MHz -22.614 dBm	Auto Tune
10 dB/div Ref -7.00 dBm			-13.00 dBm	Center Free
-17.0		1		515.000000 MH:
-27.0				Start Fred
-37.0				30.000000 MHz
-47.0				Stop Fred
-57.0				1.000000000 GHz
-67.0				CF Step
.77 1 Standon Martin Martin Martin	Marian mandata sala dana ang tang tang tang tang tang tang ta	when a showing marine with	and when the second second	97.000000 MHz <u>Auto</u> Mar
-87.0				Freq Offse
				0 Hz
-97.0				
Start 30.0 MHz #Res BW 100 kHz	#VBW 100 kHz	5 5 1/2	Stop 1.0000 GHz I7 ms (1001 pts)	
MSG	#100 HIL	STATUS		
Agilent Spectrum Analyzer - Swept S		ALIGNALITO	14-28-20 PM Sen 30, 2010	
ngilent Spectrum Analyzer - Swept S X 50 Ω Marker 1 5.28875000000 Input: RF	AC SENSE:INT O GHZ PNO: Fast D Trig: Free Run	Avg Type: Log-Pwr Avg Hold:>100/100	04:28:20 PM Sep 30, 2010 TRACE 1 2 3 4 5 0 TYPE MWWWWW	– □ × Peak Search
™ 50 Ω Marker 1 5.28875000000	AC SENSE:INT	Avg Type: Log-Pwr Avg Hold:≻100/100 Ext Gain: -10.70 dB		
™ 50 Ω Marker 1 5.28875000000	AC SENSE:INT O GHZ PNO: Fast D Trig: Free Run	Avg Type: Log-Pwr Avg Hold:≻100/100 Ext Gain: -10.70 dB	TRACE 123456 TYPE MWWWWW DET PNNNNN	Peak Search
00 50 Ω Marker 1 5.28875000000 Input: RF	AC SENSE:INT O GHZ PNO: Fast D Trig: Free Run	Avg Type: Log-Pwr Avg Hold:≻100/100 Ext Gain: -10.70 dB	TRACE 1 2 3 4 5 6 TYPE MUMUMUM DET P NNNNN r1 5.289 GHz -53.817 dBm	Peak Search
XI         50 Ω           Marker 1         5.28875000000           Input: RF         Input: RF           10 dB/div         Ref 0.00 dBm	AC SENSE:INT O GHZ PNO: Fast D Trig: Free Run	Avg Type: Log-Pwr Avg Hold:≻100/100 Ext Gain: -10.70 dB		Peak Search Next Peak
XI         50 Ω           Marker 1         5.28875000000           Input: RF         Input: RF           10 dB/div         Ref 0.00 dBm           -10.0	AC SENSE:INT O GHZ PN0: Fast	Avg Type: Log-Pwr Avg Hold:≻100/100 Ext Gain: -10.70 dB	TRACE 1 2 3 4 5 6 TYPE MUMUMUM DET P NNNNN r1 5.289 GHz -53.817 dBm	Peak Search Next Peak
Xi         50 Q           Marker 1         5.28875000000           Input: RF         Input: RF           10 dB/div         Ref 0.00 dBm           -0 0	AC SENSE:INT O GHZ PN0: Fast	Avg Type: Log-Pwr Avg Hold:≻100/100 Ext Gain: -10.70 dB	TRACE 1 2 3 4 5 6 TYPE MUMUMUM DET P NNNNN r1 5.289 GHz -53.817 dBm	Peak Search Next Peak Next Pk Righ
Xi         50 cl           Marker 1         5.28875000000           Input: RF         Input: RF           10 dB/div         Ref 0.00 dBm           -00 0	AC SENSE:INT OO GHZ PHO: Fast IFGain:Low Atten: 6 dB	Avg Type: Log-Pwr Avg Hold:≻100/100 Ext Gain: -10.70 dB	TRACE 1 2 3 4 5 6 TYPE MUMUMUM DET P NNNNN r1 5.289 GHz -53.817 dBm	Peak Search Next Peak Next Pk Righ
Xi         50 cl           Marker 1         5.288750000000           Input: RF         Input: RF           10 dB/div         Ref 0.00 dBm           -000	AC SENSE:INT DO GHZ PHO: Fast IFGain:Low Atten: 6 dB	Avg Type: Log-Pwr Avg Hold>100/100 Ext Gain: -10.70 dB	178ACE 12.3.45 C TYPE MAXWAWAY DET PINNINN r1 5.289 GHz -53.817 dBm -13.00 dBm	Peak Search Next Peak Next Pk Righ Next Pk Lef
Xi         50 cl           Marker 1         5.28875000000           Input: RF         Input: RF           10 dB/div         Ref 0.00 dBm           -00 0	AC SENSE:INT DO GHZ PHO: Fast IFGain:Low Atten: 6 dB	Avg Type: Log-Pwr Avg Hold:≻100/100 Ext Gain: -10.70 dB	178ACE 12.3.45 C TYPE MAXWAWAY DET PINNINN r1 5.289 GHz -53.817 dBm -13.00 dBm	Peak Search Next Peak Next Pk Righ Next Pk Lef
Xi         50 cl           Marker 1         5.288750000000           Input: RF         Input: RF           10 dB/div         Ref 0.00 dBm           -000	AC SENSE:INT DO GHZ PHO: Fast IFGain:Low Atten: 6 dB	Avg Type: Log-Pwr Avg Hold>100/100 Ext Gain: -10.70 dB	178ACE 12.3.45 C TYPE MAXWAWAY DET PINNINN r1 5.289 GHz -53.817 dBm -13.00 dBm	Peak Search Next Peak Next Pk Righ Next Pk Lef Marker Delta
XI         50 P           Marker 1         5.28875000000           Input: RF         Input: RF           10 dB/div         Ref 0.00 dBm           -00 -         -           -20 0         -           -30 0         -           -40 0         -           -50 0         -           -60 0         -	AC SENSE:INT DO GHZ PHO: Fast IFGain:Low Atten: 6 dB	Avg Type: Log-Pwr Avg Hold>100/100 Ext Gain: -10.70 dB	178ACE 12.3.45 C TYPE MAXWAWAY DET PINNINN r1 5.289 GHz -53.817 dBm -13.00 dBm	Peak Search Next Peak Next Pk Righ Next Pk Lef Marker Delta
XI         50 R           Marker 1         5.28875000000           Input: RF         Input: RF           10 dB/div         Ref 0.00 dBm           -00 0	AC SENSE:INT DO GHZ PHO: Fast IFGain:Low Atten: 6 dB	Avg Type: Log-Pwr Avg Hold>100/100 Ext Gain: -10.70 dB	178ACE 12.3.45 C TYPE MAXWAWAY DET PINNINN r1 5.289 GHz -53.817 dBm -13.00 dBm	Peak Search Next Peak Next Pk Righ Next Pk Lef Marker Delta Mkr→CF
XI         50 Q           Marker 1         5.28875000000 Input: RF           10 dB/div         Ref 0.00 dBm           -00 0	AC SENSE:INT DO GHZ PHO: Fast IFGain:Low Atten: 6 dB	Avg Type: Log.Pwr Avg Hold:>100/100 Ext Gain: -10.70 dB MK	178ACE 12.3.45 C TYPE MAXWAWAY DET PINNINN r1 5.289 GHz -53.817 dBm -13.00 dBm	Peak Search Next Peak Next Pk Righ Next Pk Lef Marker Delta Mkr→CF



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### Antenna Terminal Spurious Emissions within 763 – 775 MHz, LTE 700 Band 2\_UL

	000 MHz								.000 MHz	<b>Mo</b> 1 o
7.0										Mkr→RefL
7.0	RHIHUMPANIA CONTRACT	Au Mashin and Au	hung hat have been have be	<b>4</b> 8-10-10-10-10-10-10-10-10-10-10-10-10-10-	antion of the second second	h <sub>nud</sub> ul <mark>i</mark> tikuututen	(Analogovija), pog	An Hawley and Anthony	1 MANA 1940 M	Mkr→0
										Marker De
									-45.00 dBm	Next L
 										Next Rig
dB/div	Ref -17.00	dBm					Mkı	1 774.7 -82.0	96 MHz 97 dBm	NextPe
arker 1	774.79600 In	put:RF P	<b>iz</b> NO: Far 🖵 Gain:Low	Trig: Free Atten: 6		Avg Type Avg Hold: Ext Gain:		TYP	E 123456 MWWWWW T P N N N N N	Peak Search



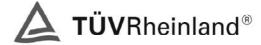


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### Antenna Terminal Spurious Emissions within 793 – 805 MHz, LTE 700 Band 2\_UL

Agilent Spectro	um Analyzer - Swept Si	A							
	50 Ω ( <b>97.884000000</b> Input: RF				Avg Type Avg Hold: Ext Gain:		TRAC	M Sep 29, 2010 E 1 2 3 4 5 6 E M <del>WWWWW</del> T P N N N N N	Peak Search
dB/div	Ref -17.00 dBm					Mkı	1 797.8 -81.7	84 MHz 84 dBm	NextPe
.0									Next Rig
o								-45.00 dBm	Next L
o									Marker De
	haly may affected of the former that	htere erenter ter	•1	L 1 Malard I					Mkr→
	pertry in ploying and in the profile	₩ĸduththutth.echi.r	al ar free free free free	90,FUA 99,744,144,7	a tanyi kasiyo yo yo yo	ayneyrae yyd	an ruh - polytyk	*********	Mkr→Ref
7							Oton 005		M
art 793.00 es BW 10		#VBW	30 kHz			Sweep	Stop 805	.000 MHz 1001 pts)	1 0



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Antenna Terminal Spurious Emissions within 1559 – 1610 MHz, additional

requirement 27.53(f), limit: - 70dBW/MHz, LTE 700 Band 2\_UL

🛙 Agilent Spectrum Analyzer - Swept SA 09:22:33 PM Sep 29, 2010 Peak Search TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N Avg Type: Log-Pwr Avg|Hold:>100/100 Ext Gain: -10.70 dB Marker 1 1.604390000000 GHz PNO: Fast IFGain:Low Atten: 6 dB Input: RF **NextPeak** Mkr1 1.604 390 GHz -63.835 dBm 10 dB/div Log Ref -17.00 dBm Next Right -45.00 dB Next Left **∮**<sup>1</sup> Marker Delta . Alfim www.hand. May make many and an and A State State of the state of t alexistry planeters م.H ութերերերե Mkr→CF Mkr→RefLvl More Start 1.55900 GHz #Res BW 1.0 MHz Stop 1.61000 GHz Sweep 1.00 ms (1001 pts) 1 of 2 #VBW 3.0 MHz STATUS SG



### Prüfbericht - Nr.: Seite 30 von 66 16030063 001 Page 30 of 66 Test Report No.: 5.1.4 Field Strength of Spurious Emissions **RESULT:** Pass Date of testing 13.Jan.2011 Temperature : 22°C Humiditv 50% Basic standard FCC Part 2.1053 Test method ANSI/TIA-603-C-2004, clause 2.2.12 Operation mode Transmitting with maximum RF power output Limits: For operating frequency band 698–746 MHz: Refer to FCC Part 27.53 (g). Operations in the 698–746 MHz band. For operations in 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. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed. For operating frequency band 746–787 MHz: Refer to FCC Part 27.53 (c). For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the 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, in accordance with the following: (1) On any frequency outside the 746–758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB; (2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;



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#### Measurement procedure:

1. The EUT RF output port was connected to 50 ohm RF load.

2. The EUT input port was connected to signal generator and was setup to transmit maximum power.

3. The measurement antenna was placed at a distance of 3 meters from the EUT.

4. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from EUT.

5. The frequency range up to 10-th harmonic of each of the three fundamental frequencies (low, middle and high channels) was investigated. The worst case of emissions was reported.

6. For spurious emissions attenuation, the substitution method was used.

7. The EUT was substituted by a reference antenna (half-wave dipole – below 1 GHz, or Horn antenna – above 1 GHz), connected to a signal generator.

8. The signal generator output level was adjusted to obtain the same reading as from EUT. The EIRP at the spurious emissions frequency was calculated as follows:

EIRP(dBm) = Reading (SG) + Cable loss(dB) + G(dBi)

According the limit specified in 27.53(c) and 27.53(g) :

The following method was used to determine the Limit for Spurious Emissions:

Maximum output power in watts: P (W).

The emission must be reduced by 43+10Log(P) dB

Therefore, the Emission Limit equals:

10Log(P) dBW + 30dB - (43+10Log(P) dB) = - 13 dBm



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Test Report No.:

Prüfbericht - Nr.:

### **Test Results:**

There were no emissions detected above the noise floor, which was at least 20 dB below the specification limit.

Freq. (MHz)	Polariz ation (V/H)	Reading (SG) (dBm)	Cable loss (dB)	Antenna Gain(dBi)	Transmit power (dBm)	Limit (dBm)
1414	Н	-57.15	7.4	5.25	-59.3	-13
2121	Н	-35.55	8.7	6.75	-37.5	-13
2828	Н	-50.25	10.2	6.95	-53.5	-13
3535	Н	-61.75	11.2	8.25	-64.7	-13
4242	Н	-65.95	12.5	8.65	-69.8	-13
4949	Н	-64.85	14.6	8.25	-71.2	-13
1414	V	-57.05	7.4	5.25	-59.2	-13
2121	V	-72.35	8.7	6.75	-74.3	-13
2828	V	-68.85	10.2	6.95	-72.1	-13
3535	V	-34.65	11.2	8.25	-37.6	-13
4242	V	-41.25	12.5	8.65	-45.1	-13
4949	V	-63.85	14.6	8.25	-70.2	-13

Note: All other emissions not reported are more than 20 dB below the limit.

### Table 7: Transmitter Spurious Radiated Emissions - LTE 700 band 2\_UL

Freq. (MHz)	Polariz ation (V/H)	Reading (SG) (dBm)	Cable loss (dB)	Antenna Gain(dBi)	Transmit power (dBm)	Limit (dBm)
1502	Н	-55.15	7.4	5.35	-57.3	-13
2253	Н	-34.85	8.7	6.84	-36.8	-13
3004	Н	-48.25	10.2	7.12	-51.5	-13
3755	Н	-59.35	11.2	8.25	-62.3	-13
4506	Н	-61.55	12.5	8.65	-65.4	-13
5257	Н	-64.25	14.6	8.43	-70.6	-13
1502	V	-56.05	7.4	5.35	-58.2	-13
2253	V	-71.35	8.7	6.84	-73.3	-13
3004	V	-67.85	10.2	7.12	-71.1	-13
3755	V	-33.65	11.2	8.25	-36.6	-13
4506	V	-40.25	12.5	8.65	-44.1	-13
5257	V	-61.85	14.6	8.43	-68.2	-13



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# 5.1.5 Frequency Stability

**Prüfbericht - Nr.:** 

Test Report No.:

### **RESULT**:

Test method Operation mode		29.Sep.2010 -30°C to 50°C 50% FCC Part 2 Per Section 2.1055 ANSI/TIA-603-C-2004, clause 2.2.2 Transmitting with maximum RF power output
Limits:	•	

Refer to FCC Part 27.54

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized of operation.

#### Measurement procedure:

- 1. The EUT was placed inside the temperature chamber.
- 2. The RF output port was connected to a spectrum analyzer.
- 3. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
- 4. After the temperature stabilized for approximately 20 min, the transmitting frequency was measured by the spectrum analyzer and recorded.
- 5. At room temperature, the frequency was measured when EUT was powered with the nominal voltage and with 85% and 115% of the nominal voltage.

Pass



### **Prüfbericht - Nr.:** Test Report No.:

# 16030063 001

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**Test Results:** 

### Table 8: Frequency stability - LTE 700\_UL

Operating frequency	/:_	707.000000	MHz
Channel	:_	Middle	
Reference Voltage	:_	120	VAC

Voltage with nominal Voltage	Power (VAC)	Temp (°C)	Measured Freq (MHz)	Deviation (ppm)	Limit (ppm)
100%		+20(Ref)	737.000000	Ref	
100%		-30	736.999996	- 0.005	
100%		-20	736.999997	- 0.004	
100%		-10	736.999997	- 0.004	
100%	100	0	736.999998	- 0.003	
100%	120	+10	736.999998	- 0.003	4 5
100%		+20	737.000002	+ 0.003	1.5
100%		+30	737.000004	+ 0.004	
100%		+40	737.000006	+ 0.008	
100%		+50	737.000008	+ 0.010	
85%	102	+20	737.000002	+ 0.003	
115%	138	+20	737.000001	+ 0.002	



#### Prüfbericht - Nr.: 16030063 001 Seite 35 von 66 Page 35 of 66 Test Report No.: 5.1.6 Error Vector Magnitude (EVM) **RESULT:** No Limit Date of testing : 04.Mar.2011 Temperature : 22°C Humidity 50% Basic standard ---Test method : ANSI/TIA-603-C-2004 Operation mode : Transmitting with maximum RF power output Limits N/A Measurement procedure: 1. The EUT RF output port was connected to spectrum analyzer. 2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached. 3. The spectrum analyzer was setup to measure the Error Vector Magnitude (EVM) of output signal. The EVM was measured at the output port of the EUT at the middle channel of each type of modulation.



### **Prüfbericht - Nr.:** *Test Report No.:*

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### Test result:

### Table 9: EVM, LTE 700\_UL

Channel	Direction	Freq. (MHz)	EVM Pk (%)	EV	′M RMS (%)
One	UL	782.0	2.55		0.63
Agilent LTE - Modulati	ion Analysis				
LXI RF	50 Ω AC	SENSE:EXT		2:23 AM Mar 04, 2011	Mode Setup
Center Freq	782.000000 MHz	Trig: Free Run		TRACE 1234	wode Setup
		Range: 20.00 dBm		0 MHz(50 RB)	Direction
Ch1 OFDM Meas	0 carrier samplePl	USCH QPSK Ch1 OFD	/I Err Vect Spectrum		ownlink <u>Uplink</u>
300 m/div Ref0		n 706.0905 m 500 m%/div	Ref0%		_
1.2	▲1	Mag			
900m 600m		3.5			Demod►
300m	( )	з —			
0	- E	2.5			
					Dreset To
-300m -600m		2 1.5		ไม้เร็าสาน	Preset To Standard
-300m -600m -900m	$\bigcirc$	2 1.5 1			Preset To Standard
-300m -600m -900m -1.2	$\bigcirc$	2 1.5 1 500m			
-300m -600m -900m		2 1.5 1 500m 2.5825 Start -300 Res BW 1	carrier St	op 299 carrier	
-300m -600m -900m -1.2 -2.583		2.5825 Start -300 Res BW 1	carrier St 5 kHz Tin		
-300m -600m -900m -1.2	dBm	2.5825 Start -300 Res BW 1 Ch1 Error	carrier St 5 kHz Tin Summary	roop 299 carrier neLen 42 Sym	Standard
-300m -600m -900m -1.2 -2.583 Ch1 Spectrum	dBm	2.5825 Start -300 Res BW 1 Ch1 Error EVM EVM Pk	carrier         St           5 kHz         Tin           Summary         = 631.51           = 2.5544         = 2.5544	op 299 carrier neLen 42 Sym	Standard Noise Reduction
-300m -600m -900m -1.2 -2.583 Ch1 Spectrum 10 dB/div Ref 20 -9 -9 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0	dBm	2.5825 Start -300 Res BW 1 Ch1 Error EVM EVM Pk Data EVN	carrier 5 kHz         St Tin           Summary         = 631.51 = 2.5544           1         = 625.87	op 299 carrier neLen 42 Sym	Standard Noise
-300m -600m -900m -1.2 -2.583 Ch1 Spectrum 10 dB/div Ref 20 Log 10 -10	dBm	2.5825 Start -300 Res BW 1 Ch1 Error EVM EVM Pk Data EVM - 3GPP-c - 3GPP-c	carrier         St           5 kHz         Tin           Summary         = 631.51           = 2.5544         = 625.87           lefined QPSK EVM         = 625.87           lefined 16QAM EVM         =	op 299 carrier neLen 42 Sym m%rms at % at m%rms	Standard Noise Reduction [NFE:Off]
-300m -600m -900m -1.2 -2.583 Ch1 Spectrum 10 dB/div Ref 20 log 10 0	dBm	2.5825 Start -300 Res BW 1 Ch1 Error EVM EVM Pk Data EVM - 3GPP-c - 3GPP-c	carrier         St           5 kHz         Tin           Summary         = 631.51           = 2.5544         = 625.87           lefined QPSK EVM         = 625.87	op 299 carrier neLen 42 Sym m%rms at % at m%rms	Standard Noise Reduction [NFE:Off] Restore
-300m -800m -1.2 -2.583 Ch1 Spectrum 10 dB/div Ref 20 -0 -10 -10 -20 -30 -40	dBm	2.5825 Start -300 Res BW 1 Ch1 Error EVM EVM Pk Data EVM - 3GPP-c - 3GPP-c - 3GPP-c	carrier         St           5 kHz         Tin           Summary         = 631.51           = 2.5544         1           1         = 625.87           lefined QPSK EVM         = 625.87           lefined 16QAM EVM	m%rms at m%rms at m%rms at m%rms m%rms	Standard Noise Reduction [NFE:Off] Restore Mode
-300m -600m -1.2 -2.583 Ch1 Spectrum 10 dB/div Ref 20 Log 10 -10 -10 -20 -30 -40 -50	dBm	2.5825 Start -300 Res BW 1 Ch1 Error EVM EVM Pk Data EVM - 3GPP-c - 3GPP-c - 3GPP-c - 3GPP-c RS EVM Freq Err SyncCorr	carrier         St           5 kHz         Tin           Summary         = 631.51           = 2.5544         = 625.87           lefined QPSK EVM         = 625.87           lefined 16QAM EVM =         = 664.33           = 8.4431         = 98.706	m%rms at m%rms at m%rms at m%rms m%rms m%rms m%rms m%rms m%rms	Standard Noise Reduction [NFE:Off] Restore Mode
-300m -600m -1.2 -2.583 Ch1 Spectrum 10 dB/div Ref 20 -0 -10 -10 -20 -30 -40 -50 -60		2.5825 Start -300 Res BW 1 Ch1 Error EVM EVM Pk Data EVM Data EVM - 3GPP-c - 3GPP-c - 3GPP-c - 3GPP-c - 3GPP-c - 3GPP-c - SyncCorr Common	carrier         St           5 kHz         Tin           Summary         = 631.51           = 2.5544         = 625.87           lefined QPSK EVM         = 625.87           lefined 16QAM EVM         =           lefined 64QAM EVM         =           e 664.33         = 8.4431           = 98.706         Tracking Error         = 14.479	m%rms at m%rms at m%rms at m%rms m%rms m%rms m%rms m%rms m%rms	Standard Noise Reduction
-300m -600m -1.2 -2.583 Ch1 Spectrum 10 dB/div Ref 20 -0 -10 -10 -10 -10 -10 -10 -10	dBm	2.5825 Start -300 Res BW 1 Ch1 Error EVM EVM Pk Data EVM - 3GPP-c - 3GPP-c - 3GPP-c - 3GPP-c - 3GPP-c - 3GPP-c - SynCCorr Common SymClk E Time Offs	carrier         St           5 kHz         Tim           Summary         = 631.51           = 2.5544         = 625.87           lefined QPSK EVM         = 625.87           lefined 16QAM EVM =            lefined 64QAM EVM =            lefined 64QAM EVM =            lefined 64QAM EVM =            lefined 64QAM EVM =            lefined 7         = 8.4431           =         98.706           Tracking Error         = 14.479           rr         = 0.00302           et         = 7.4217	m%rms at m%rms at m%rms at m%rms m%rms m%rms m%rms mHz % usi m%rms ppm msec	Standard Noise Reduction [NFE:Off] Restore Mode
-300m -600m -1.2 -2.583 Ch1 Spectrum 10 dB/div Ref 20 -90 -10 -10 -20 -30 -40 -50 -60		2.5825 Start -300 Res BW 1 Ch1 Error EVM EVM Pk Data EVM - 3GPP-0 - 3GPP-0	carrier 5 kHz         St Tin           Summary         = 631.51 = 2.5544           4         = 625.87           lefined QPSK EVM         = 625.87           lefined 16QAM EVM         =           lefined 64QAM EVM         =           is 664.33         = 8.4431           Tracking Error         = 14.479           rr         = 0.00302	m%rms at % at m%rms at m%rms m%rms m%rms m%rms m%rms m%rms	Standard Noise Reduction [NFE:Off] Restore Mode



<b>Prüfbericht - Nr.:</b> Test Report No.:	16030063 001	Seite 37 von 66 Page 37 of 66
5.2 Test result of CDM	A 850 and CDMA 1900	
5.2.1 RF power Output		
RESULT:		Pass
Date of testing Temperature Humidity Basic standard Test method Operation mode Limits:	<ul> <li>28.Sep.2010</li> <li>22°C</li> <li>50%</li> <li>FCC Part 2.1046(a)</li> <li>ANSI/TIA-603-C-2004, clause 2</li> <li>Transmitting with maximum RF</li> </ul>	

For CDMA 850:

FCC Part 22.931 (a)

The effective radiated power (ERP) of transmitters in the Cellular Radiotelephone Service must not exceed the limits in this section.

(a) *Maximum ERP*. In general, the effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 watts.

For CDMA 1900:

FCC Part 24.232 (b) (4)

Base stations are limited to 1640 watts peak equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT. Base station antenna heights may exceed 300 meters with a corresponding reduction in power; see Table 1 of this section.



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### Measurement procedure:

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- 1. The RF output of EUT was connected to spectrum analyzer.
- 2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
- 3. A spectrum analyzer was setup to measure peak power.
- 4. Measurements were performed at three frequencies (low, middle, and high channels) with modulation.

### Test Results:

For CDMA 850:

Downlink: 869 - 894 MHz, Uplink: 824 - 849 MHz

### The input signal level is – 50dBm.

### Table 10: Output power at low, middle and high channel, CDMA 850\_UL

Channel	Direction	Freq. (MHz)	RF power ouput (dBm)	RF power output (W)	Limit (W)
Low	UL	824.62MHz	-20.14	0.00001	500
Middle	UL	836.18MHz	-20.21	0.00001	500
High	UL	848.38MHz	-20.78	0.000008	500

### For CDMA 1900:

Downlink: 1930 – 1995 MHz, Uplink: 1850 – 1915 MHz

### The input signal level is – 50dBm.

Table 11: Output power at low, middle and high channel, CDMA 1900\_UL

Channel	Direction	Freq. (MHz)	RF power ouput (dBm)	RF power output (W)	Limit (W)
Low	UL	1850.62	-21.36	0.000007	500
Middle	UL	1880.18	-20.61	0.000009	500
High	UL	1909.38	-21.01	0.000008	500



### Prüfbericht - Nr.: 16030063 001 Seite 39 von 66 Page 39 of 66 Test Report No.: 5.2.2 Occupied bandwidth, Input/output Comparison **RESULT:** Pass Date of testing 28.Sep.2010 2 Temperature : 22°C Humidity 50% Basic standard FCC Part 2.1049 : Test method : ANSI/TIA-603-C-2004 Operation mode : Transmitting with maximum RF power output Limits N/A

### Measurement procedure:

- 1. The EUT RF output port was connected to spectrum analyzer.
- 2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
- 3. The spectrum analyzer was setup to measure the Occupied Bandwidth (defined as the 99% Power Bandwidth).
- 4. The Occupied Bandwidth was measured at the input and output ports of the EUT at low, middle and high channel of each type of modulation.



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Test Report No.:

# Test Results:

### CDMA 850:

### Table 12: 99% Occupied Bandwidth – CDMA 850\_UL

Channel	Direction	Freq. (MHz)	99% Occupied bandwidth (MHz)
Lowest	UL	824.62	1.2725
Middle	UL	836.18	1.2739
High	UL	848.38	1.2714

### CDMA 1900:

### Table 13: 99% Occupied Bandwidth – CDMA 1900\_UL

Channel	Direction	Freq. (MHz)	99% Occupied bandwidth (MHz)
Lowest	UL	1850.62	1.2646
Middle	UL	1880.18	1.2694
High	UL	1909.38	1.2695





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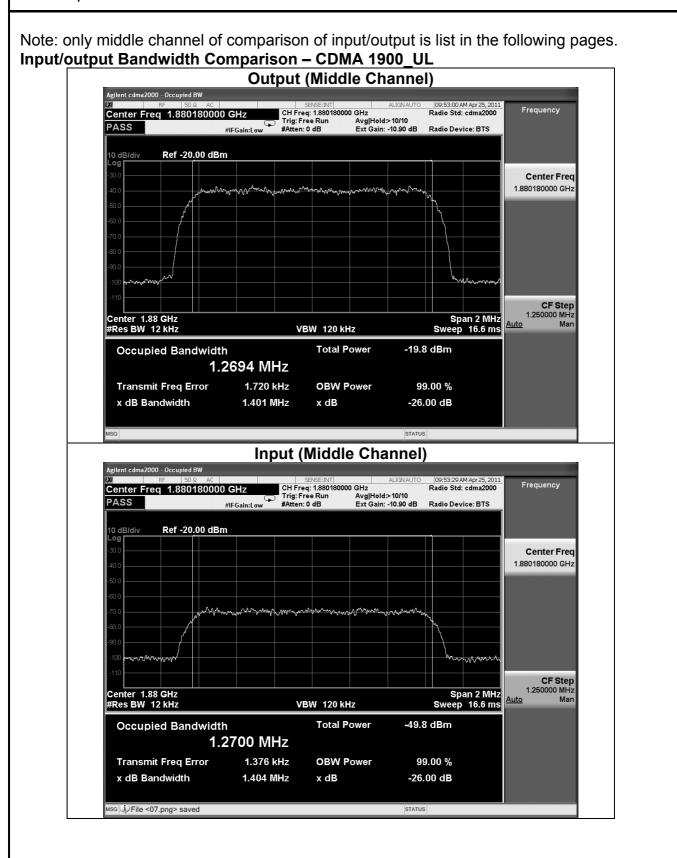
Prüfbericht - Nr.: 16030063 001 Test Report No.: Note: only middle channel of comparison of input/output is list in the following pages. Input/output Bandwidth Comparison – CDMA 850\_UL **Output (Middle Channel)** gilent cdma2000 - Occupied B\ MHZ CH Freq: 836.180000 MHz #IFGain:Low #Atten: 0 dB Ext 09:51:50 AM Apr 25, 201 Radio Std: cdma2000 Recall Center Freq 836.180000 MHz Avg|Hold:>10/10 Ext Gain: -10.90 dB PASS Radio Device: BTS State Ref -20,00 dBm 0 dB/div Data (Import)▶ Capture Buffer Center 836.2 MHz #Res BW 12 kHz Span 2 MHz Sweep 16.6 ms VBW 120 kHz Total Power -20.1 dBm **Occupied Bandwidth** 1.2739 MHz 1.866 kHz **OBW Power** 99.00 % **Transmit Freq Error** x dB Bandwidth 1.403 MHz x dB -26.00 dB sg i)File <05.png> saved STATUS Input (Middle Channel) gilent cdma2000 - Occupied BW 09:51:12 AM Apr 25, 201 Radio Std: cdma2000 Recall CH Freq: 836.180000 MHz Trig: Free Run Avg #Atten: 0 dB Ext Center Freq 836.180000 MHz Avg|Hold:>10/10 Ext Gain: -10.90 dB PASS Radio Device: BTS #IFGain:Low State Ref -20.00 dBm 0 dB/div Data (Import)▶ Capture Buffer www.www. Center 836.2 MHz #Res BW 12 kHz Span 2 MHz Sweep 16.6 ms VBW 120 kHz Occupied Bandwidth Total Power -50.9 dBm 1.2655 MHz 1.620 kHz **Transmit Freq Error OBW Power** 99.00 % x dB Bandwidth 1.396 MHz x dB -26.00 dB STATUS





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# Prüfbericht - Nr.: Seite 43 von 66 16030063 001 Page 43 of 66 Test Report No.: 5.2.3 Out-of-Band Emissions at antenna terminal **RESULT:** Pass Date of testing 29.Sep.2010 Temperature : 22°C Humidity 50% Basic standard FCC Part 2.1051 Test method ANSI/TIA-603-C-2004, clause 2.2.13 Operation mode Transmitting with maximum RF power output Limits : Refer to FCC Part 22.917(a) for CDMA 850. 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. Refer to FCC Part 24.238(a) for CDMA 1900. 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 following method was used to determine the Limit for Spurious Emissions: Maximum output power in watts: P (W). The emission must be reduced by 43+10Log(P) dB Therefore, the Emission Limit equals: 10Log(P) dBW + 30dB - (43+10Log(P) dB) = -13 dBmMeasurement procedure: 1. The EUT RF output port was connected to spectrum analyzer. 2. The EUT was setup to transmit maximum power output. 3. The spurious emissions at antenna were measured at the RF output port of the EUT at low, middle and high channel of each type of modulation. 4. The spectrum analyzer resolution bandwidth (RBW) was set to 1 MHz for above 1 GHz and 100 kHz for the cell band.



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Test Results:

The low channel caused the worst emissions and list in the following page. Antenna Terminal Spurious Emissions, CDMA 850 UL, Low channel

Marker 1	824.62000000 Input: RF	PNO: Fast 😱 Trig	g: Free Run en: 6 dB	Avg Type: Log Avg Hold:>100/		TYPE MWWWWWW DET P N N N N N	Save
10 dB/div	Ref -17.00 dBm	IFGain:Low Atto	en. 0 40		Mkr1 82 -22	4.62 MHz .094 dBm	State►
					∳1		Trace
-27.0							Trace (+ State)
-37.0							
-47.0							
-57.0							Data (Export) ►
-67.0							Trace 1
-77.0		I	. h. d.a	and allocation	1. An and a latter of	han Alan Mahalan Inga	Screen
-87.0	alately von variation dimited fair	the hours of the second s	par port of the second of the	And found and the rest of the second se			Image
-97.0							
-107							
Start 30.0	) MHz				Ston	1.0000 GHz	
	The second se						
_	100 kHz	#VBW 300	KHZ		ep 92.7 m	s (1001 pts)	
MSG		#VBW 300	KHZ			s (1001 pts)	
MSG D Agilent Spe XI	ectrum Analyzer - Swept SA 50 Ω	#VBW 300	KHZ	ALIGN	AUTO 04:19:	06 PM Sep 30, 2010	
MSG I Agilent Spe XI	ectrum Analyzer - Swept SA	AC PNO: Fast			STATUS AUTO 04:19: -Pwr 100		Display
Agilent Spe XI Display L	ctrum Analyzer - Swept SA 50 Ω ine -13.00 dBm Input: RF	AC PNO: Fast 🖵 Trig	SENSE:INT	ALIGN Avg Type: Log Avg Hold>100/	STATUS AUTO 04:19: -Pwr 100 0 dB Mkr1 5	06 PM Sep 30, 2010 IRACE 1 2 3 4 5 6 TYPE M WAAAAAA	Display
MSG Agilent Spe XI Display L 10 dB/div	ectrum Analyzer - Swept SA 50 Ω .ine -13.00 dBm	AC PNO: Fast 🖵 Trig	SENSE:INT	ALIGN Avg Type: Log Avg Hold>100/	STATUS AUTO 04:19: -Pwr 100 0 dB Mkr1 5	06 PM Sep 30, 2010 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P N N N N N 5.735 GHz	Display Annotation►
MSG Agilent Spe XI Display L 10 dB/div	ctrum Analyzer - Swept SA 50 Ω ine -13.00 dBm Input: RF	AC PNO: Fast 🖵 Trig	SENSE:INT	ALIGN Avg Type: Log Avg Hold>100/	STATUS AUTO 04:19: -Pwr 100 0 dB Mkr1 5	06 PM Sep 30, 2010 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P N N N N N 5.735 GHz	Display
Agilent Spe XX Display L 10 dB/div Log	ctrum Analyzer - Swept SA 50 Ω ine -13.00 dBm Input: RF	AC PNO: Fast 🖵 Trig	SENSE:INT	ALIGN Avg Type: Log Avg Hold>100/	STATUS AUTO 04:19: -Pwr 100 0 dB Mkr1 5	06PM Sep 30, 2010 IRACE   23 4 5 6 TYPE   MMNNNN DET PINNNNN 0.735 GHz .048 dBm	Display Annotation► Title►
Agilent Spe X Display L 10 dB/div -10.0	ctrum Analyzer - Swept SA 50 Ω ine -13.00 dBm Input: RF	AC PNO: Fast 🖵 Trig	SENSE:INT	ALIGN Avg Type: Log Avg Hold>100/	STATUS AUTO 04:19: -Pwr 100 0 dB Mkr1 5	06PM Sep 30, 2010 IRACE   23 4 5 6 TYPE   MMNNNN DET PINNNNN 0.735 GHz .048 dBm	Display Annotation►
Agilent Spe Agilent Spe Display L Display L Od B/div -10.0 -20.0 -30.0	ctrum Analyzer - Swept SA 50 Ω ine -13.00 dBm Input: RF	AC PNO: Fast 🖵 Trig	SENSE:INT	ALIGN Avg Type: Log Avg Hold>100/	STATUS AUTO 04:19: -Pwr 100 0 dB Mkr1 5	06PM Sep 30, 2010 IRACE   23 4 5 6 TYPE   MMNNNN DET PINNNNN 0.735 GHz .048 dBm	Display Annotation► Title► Graticule On Off
MSG D Agilent Spe X Display L Display L -10.0 -20.0 -30.0 -40.0	ctrum Analyzer - Swept SA 50 Ω ine -13.00 dBm Input: RF	PNO: Fast IFGain:Low Atte	SENSE:INT	ALIGN Avg Type: Log Avg Hold>100/	STATUS AUTO 04:19: -Pwr 100 0 dB Mkr1 5	06PM Sep 30, 2010 IRACE   23 4 5 6 TYPE   MMNNNN DET PINNNNN 0.735 GHz .048 dBm	Display Annotation≻ Title≻ Graticule On Off Display Line -13.00 dBm
Agilent Spe Display L 0 dB/div -10.0 -20.0 -30.0 -40.0	etrum Analyzer - Swept SA 50 Ω .ine -13.00 dBm Input: RF Ref 0.00 dBm	PNO: Fast IFGain:Low Atte	sense:int g: Free Run en: 6 dB	ALIGN Avg Type: Log Avg[Hold>100/ Ext Gain: -10.70	AUTO 04:19: -Pwr 100 0 dB Mkr1 5 -54	06 PM Sep 30, 2010 TRACE    23 4 5 6 PNNNNN DET PNNNNN 5.735 GHz .048 dBm -13.00 dBm	Display Annotation► Title► Graticule On Off Display Line
Agilent Spe Display L 0 dB/div -10.0 -20.0 -30.0 -40.0	ctrum Analyzer - Swept SA 50 Ω ine -13.00 dBm Input: RF	PNO: Fast IFGain:Low Atte	sense:int g: Free Run en: 6 dB	ALIGN Avg Type: Log Avg[Hold>100/ Ext Gain: -10.70	AUTO 04:19: -Pwr 100 0 dB Mkr1 5 -54	06 PM Sep 30, 2010 TRACE    23 4 5 6 PNNNNN DET PNNNNN 5.735 GHz .048 dBm -13.00 dBm	Display Annotation≻ Title≻ Graticule On Off Display Line -13.00 dBm
Agilent Spe Display L 0 dB/div -10.0 -20.0 -30.0 -40.0	etrum Analyzer - Swept SA 50 Ω .ine -13.00 dBm Input: RF Ref 0.00 dBm	PNO: Fast IFGain:Low Atte	sense:int g: Free Run en: 6 dB	ALIGN Avg Type: Log Avg[Hold>100/ Ext Gain: -10.70	AUTO 04:19: -Pwr 100 0 dB Mkr1 5 -54	06 PM Sep 30, 2010 TRACE    23 4 5 6 PNNNNN DET PNNNNN 5.735 GHz .048 dBm -13.00 dBm	Display Annotation≻ Title≻ Graticule On Off Display Line -13.00 dBm
MSG Agilent Sps Display L Display L -10.0 -20.0 -30.0 -40.0 -50.0	etrum Analyzer - Swept SA 50 Ω .ine -13.00 dBm Input: RF Ref 0.00 dBm	PNO: Fast IFGain:Low Atte	sense:int g: Free Run en: 6 dB	ALIGN Avg Type: Log Avg[Hold>100/ Ext Gain: -10.70	AUTO 04:19: -Pwr 100 0 dB Mkr1 5 -54	06 PM Sep 30, 2010 TRACE    23 4 5 6 PNNNNN DET PNNNNN 5.735 GHz .048 dBm -13.00 dBm	Display Annotation≻ Title≻ Graticule On Off Display Line -13.00 dBm Off System
MSG Agilent Spe 20 Display L 0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 -40.0 -50.0 -60.0 -40.0 -60.0 -70.0 -80.0	etrum Analyzer - Swept SA 50 Ω .ine -13.00 dBm Input: RF Ref 0.00 dBm	PNO: Fast IFGain:Low Atte	sense:int g: Free Run en: 6 dB	ALIGN Avg Type: Log Avg[Hold>100/ Ext Gain: -10.70	AUTO 04:19: -Pwr 100 0 dB Mkr1 5 -54	06 PM Sep 30, 2010 TRACE    23 4 5 6 PNNNNN DET PNNNNN 5.735 GHz .048 dBm -13.00 dBm	Display Annotation≻ Title≻ Graticule On Off Display Line -13.00 dBm Off
MSG Agilent Sps A Display L 0 -10.0 -20.0 -30.0 -30.0 -40.0 -50.0 -50.0 -70.0	etrum Analyzer - Swept SA 50 Ω .ine -13.00 dBm Input: RF Ref 0.00 dBm	PNO: Fast IFGain:Low Atte	sense:int g: Free Run en: 6 dB	ALIGN Avg Type: Log Avg[Hold>100/ Ext Gain: -10.70	AUTO 04:19: -Pwr 100 0 dB Mkr1 5 -54	06 PM Sep 30, 2010 TRACE    23 4 5 6 PNNNNN DET PNNNNN 5.735 GHz .048 dBm -13.00 dBm	Display Annotation≻ Title≻ Graticule On Off Display Line -13.00 dBm On Off System Display≻
MSG Agilent Spe 20 Display L 0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 -40.0 -50.0 -60.0 -40.0 -60.0 -70.0 -80.0	Ref 0.00 dBm	PNO: Fast IFGain:Low Atte	SENSE:INT g: Free Run en: 6 dB	ALIGN Avg Type: Log Avg Hold>100/ Ext Gain: -10.70	AUTO 04:19: 	06 PM Sep 30, 2010 TRACE    23 4 5 6 PNNNNN DET PNNNNN 5.735 GHz .048 dBm -13.00 dBm	Display Annotation≻ Title≻ Graticule On Off Display Line -13.00 dBm On Off System Display≻



# 16030063 001

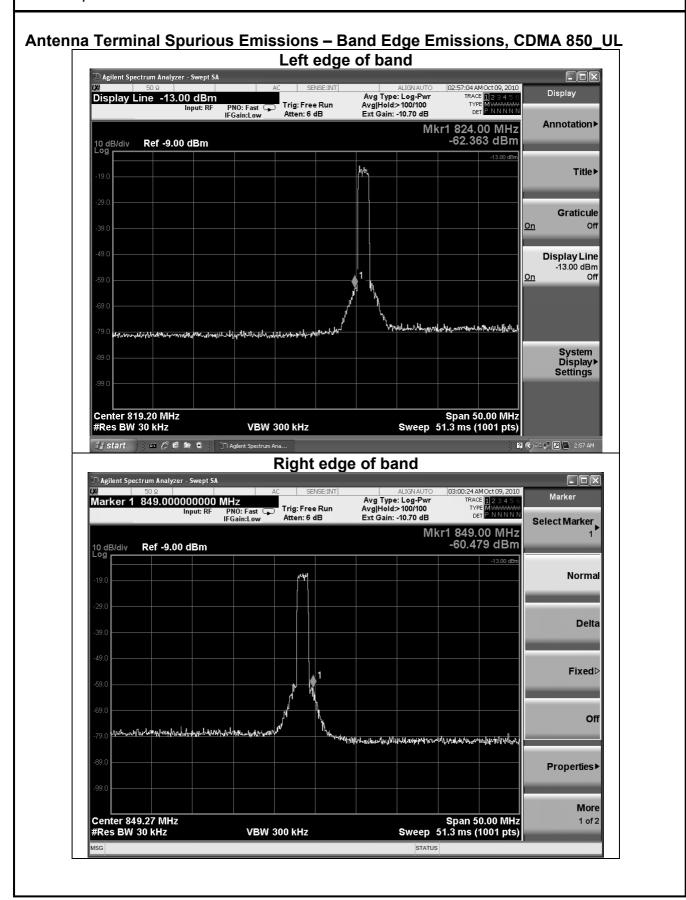
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D Agilent Spectrum Analyzer - Swept SA				
XV 50 Ω Marker 1 788.540000000 Input: RF	AC SENSE:EXT MHZ PN0: Fast IFGain:Low Atten: 6 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold: 99/100	03:37:29 PM Sep 28, 2010 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Peak Search
		Mkr	1 788.54 MHz	Peak Criteri
10 dB/div Ref -6.00 dBm			-77.218 dBm	_
-16.0			-13.00 dBm	PeakTabl
-26.0				Continuo
-36.0				Peak Sear On
-46.0				
-56.0				
-66.0		* 1		Pk-Pk Sear
-76.0	<	A No at le carine de contra des hall Preshar	war hand and an an an and	
-86.0	and harden had been after the standard and the standard and the standard at the standard at the standard at the			Min Sean
-96.0				
				Mo
				IVIC
Start 30.0 MHz #Res BM 100 kHz	#\/B\// 300 kHz	Sween 02	Stop 1.0000 GHz	2 0
Start 30.0 MHz #Res BW 100 kHz MSG D Agilent Spectrum Analyzer - Swept SA	#VBW 300 kHz	Sweep 92 Status	Stop 1.0000 GHz 2.7 ms (1001 pts)	
#Res BW 100 kHz MSG Diaglient Spectrum Analyzer - Swept SA	AC SENSE:INT	Sweep 92 STATUS ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100 Ext Gain: -10.70 dB	04:22:20PM Sep 30, 2010 TRACE 12 2 4 5 FT TYPE M DET P.NINNIN	2 c
#Res BW 100 kHz MSG Agilent Spectrum Analyzer - Swept SA OV 50 Q Marker 1 1.881250000000 Input: RF 10 dB/div Ref 0.00 dBm	AC SENSE:INT O GHz PNO: Fast O	Sweep 92 STATUS ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100 Ext Gain: -10.70 dB	04:22:29 PM Sep 30, 2010 TRACE 12 34 5 6 TYPE M	2 0
#Res BW 100 kHz MSG Agilent Spectrum Analyzer - Swept SA (XI 50 Q Marker 1 1.881250000000 Input: RF	AC SENSE:INT O GHz PNO: Fast O	Sweep 92 STATUS ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100 Ext Gain: -10.70 dB	2.7 ms (1001 pts) 04:22:20PM Sep 30, 2010 TRACE 12 3 4 5 0 TYPE MAXMAN DET P NNNNN cr1 1.881 GHz -4.895 dBm	2 c
#Res BW 100 kHz MSG Pl Agilent Spectrum Analyzer - Swept SA Warker 1 1.881250000000 Input: RF 10 dB/div Ref 0.00 dBm 1 10 0	AC SENSE:INT O GHz PNO: Fast O	Sweep 92 STATUS ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100 Ext Gain: -10.70 dB	04:22:29PM Sep 30, 2010 TRACE 12 2 3 4 5 G TYPE MARK 0 DET PNNNNN (T1 1.881 GHz	2 o Peak Search Next Pea
#Res BW 100 kHz MSG Agilent Spectrum Analyzer - Swept SA Marker 1 1.881250000000 Input: RF 10 dB/div Ref 0.00 dBm 0 g 1	AC SENSE:INT O GHz PNO: Fast O	Sweep 92 STATUS ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100 Ext Gain: -10.70 dB	2.7 ms (1001 pts) 04:22:20PM Sep 30, 2010 TRACE 12 3 4 5 0 TYPE MAXMAN DET P NNNNN cr1 1.881 GHz -4.895 dBm	2 o 
#Res BW 100 kHz MSG Agilent Spectrum Analyzer - Swept SA X1 50 Ω Marker 1 1.881250000000 Input: RF 10 dB/div Ref 0.00 dBm -10.0	AC SENSE:INT O GHz PNO: Fast O	Sweep 92 STATUS ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100 Ext Gain: -10.70 dB	2.7 ms (1001 pts) 04:22:20PM Sep 30, 2010 TRACE 12 3 4 5 0 TYPE MAXMAN DET P NNNNN cr1 1.881 GHz -4.895 dBm	2 o Peak Search Next Pea
#Res BW 100 kHz MSG Agilent Spectrum Analyzer - Swept SA X1 50 Ω Marker 1 1.881250000000 Input: RF 10 dB/div Ref 0.00 dBm -10.0	AC SENSE:INT O GHz PNO: Fast O	Sweep 92 STATUS ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100 Ext Gain: -10.70 dB	2.7 ms (1001 pts) 04:22:20PM Sep 30, 2010 TRACE 12 3 4 5 0 TYPE MAXMAN DET P NNNNN cr1 1.881 GHz -4.895 dBm	2 o 
#Res BW 100 kHz MSG ■ Agilent Spectrum Analyzer - Swept SA Off S0 Ω Marker 1 1.881250000000 Input: RF 10 dB/div Ref 0.00 dBm -0.0 -20.0 -30.0 -40.0 -50.0	AC SENSE:INT PNO: Fast IFGain:Low Trig: Free Run Atten: 6 dB	Sweep 92	2.7 ms (1001 pts) 04:22:29PM Sep 30, 2010 TRACE 12 3 4 5 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 04:12:39 0 0	2 o 
#Res BW 100 kHz MSG ■ Agilent Spectrum Analyzer - Swept SA Off S0 Ω Marker 1 1.881250000000 Input: RF 10 dB/div Ref 0.00 dBm -0.0 -20.0 -30.0 -40.0 -50.0	AC SENSE:INT PNO: Fast IFGain:Low Trig: Free Run Atten: 6 dB	Sweep 92	2.7 ms (1001 pts) 04:22:29PM Sep 30, 2010 TRACE 12 3 4 5 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 04:12:39 0 0	2 o 
#Res BW 100 kHz MSG Agilent Spectrum Analyzer - Swept SA XI 50 2 Marker 1 1.881250000000 Input: RF 10 dB/div Ref 0.00 dBm -0 0 -0	AC SENSE:INT O GHz PNO: Fast O	Sweep 92	2.7 ms (1001 pts) 04:22:29PM Sep 30, 2010 TRACE 12 3 4 5 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 04:12:39 0 0	2 o 
#Res BW 100 kHz MSG ■ Agilent Spectrum Analyzer - Swept SA Off S0 Ω Marker 1 1.881250000000 Input: RF 10 dB/div Ref 0.00 dBm -0.0 -20.0 -30.0 -40.0 -50.0	AC SENSE:INT PNO: Fast IFGain:Low Trig: Free Run Atten: 6 dB	Sweep 92	2.7 ms (1001 pts) 04:22:29PM Sep 30, 2010 TRACE 12 3 4 5 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 04:12:39 0 0	2 o 
#Res BW 100 kHz MSG Agilent Spectrum Analyzer - Swept SA XI 50 2 Marker 1 1.881250000000 Input: RF 10 dB/div Ref 0.00 dBm -0 0 -0	AC SENSE:INT PNO: Fast IFGain:Low Trig: Free Run Atten: 6 dB	Sweep 92	2.7 ms (1001 pts) 04:22:29PM Sep 30, 2010 TRACE 12 3 4 5 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 04:12:39 0 0	2 o 
#Res BW 100 kHz         Msg         Image: Sectrum Analyzer - Swept SA         XX       50 Q         Marker 1       1.881250000000         Image: Sectrum Analyzer - Swept SA         Marker 1       1.881250000000         Image: Sectrum Analyzer - Swept SA         Marker 1       1.881250000000         Image: Sectrum Analyzer - Swept SA	AC SENSE:INT PNO: Fast IFGain:Low Trig: Free Run Atten: 6 dB	Sweep 92	2.7 ms (1001 pts) 04:22:29PM Sep 30, 2010 TRACE 12 3 4 5 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 04:12:39 0 0	2 o 2 o 2 o 2 o 2 o 2 o 2 o 2 o
#Res BW 100 kHz         MSG         Image: Agilent Spectrum Analyzer - Swept SA         XM       S0 2         Marker 1       1.881250000000         Image: Agilent Spectrum Analyzer - Swept SA         XM       S0 2         Marker 1       1.881250000000         Image: Agilent Spectrum Analyzer - Swept SA         XM       S0 2         Marker 1       1.8812500000000         Image: Agilent Spectrum Analyzer - Swept SA         10       S0 2         10       Image: Agilent Spectrum Analyzer - Swept SA         20       Image: Agilent Spectrum Analyzer - Swept SA         -20       Image: Agilent Spectrum Analyzer - Swept SA         -30       Image: Agilent Spectrum Analyzer - Swept SA         -40       Image: Agilent Spectrum Analyzer - Swept SA         -60       Image: Agilent Spectrum Analyzer - Swept SA         -70       Image: Agilent Spectrum Analyzer - Swept SA         -80       Image: Agilent Spectrum Analyzer - Swept SA         -80       Image: Agilent Spectrum Analyzer - Swept SA	AC SENSE:INT PNO: Fast IFGain:Low Trig: Free Run Atten: 6 dB	Sweep 92	2.7 ms (1001 pts) 04:22:29PM Sep 30, 2010 TRACE 12 3 4 5 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 TYPE MANNAN 04:12:39 0 04:12:39 0 0	2 o 2 o 2 o 2 o 2 o 2 o 2 o 2 o



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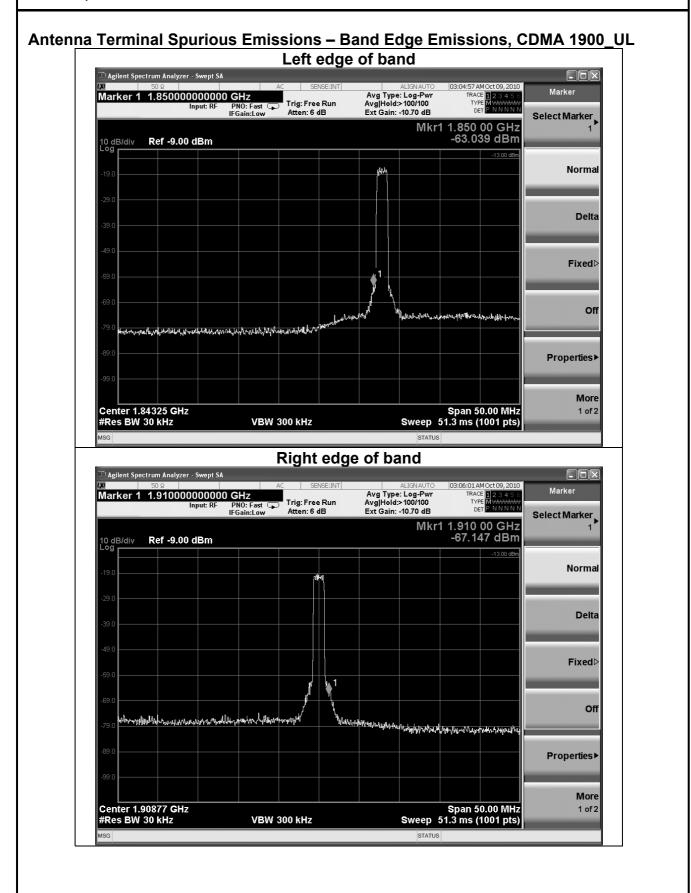
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# Prüfbericht - Nr.: Seite 48 von 66 16030063 001 Page 48 of 66 Test Report No.: 5.2.4 Intermodulation **RESULT:** Pass Date of testing 09.Oct.2010 Temperature 22°C : Humidity 50% Basic standard : FCC Part 2.1051 Test method ANSI/TIA-603-C-2004, clause 2.2.13 : Operation mode Transmitting with maximum RF power output Limits : Refer to FCC Part 22.917(a) for CDMA 850. 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. Refer to FCC Part 24.238(a) for CDMA 1900. 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 must be reduced by 43+10Log(P) dB. Therefore, the Emission Limit equals: 10Log(P) dBW + 30dB - (43+10Log(P) dB) = -13 dBmMeasurement procedure: 1. The EUT RF output port was connected to spectrum analyzer. 2. Two RF signal was input to EUT's input port. 3. The frequencies of both two RF signals shall be within the repeater's operating band. The spacing between two RF signals shall be the minimum possible spacing applied in a network. The level shall be increased till the maximum rated output power per channel, as declared by the manufacturer, is achieved. 4. The spurious emissions at antenna were measured at the RF output port of the EUT.

5. The spectrum analyzer resolution bandwidth (RBW) was set to 100 kHz for the cell band.





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Test Report No.:

### **Test Results:**

# Intermodulation, CDMA 850\_UL

ID Agilent Spectrum Analyzer - Swept 5 IXI 50 Ω	AC SENSE:EXT		03:08:18 PM Sep 28, 2010	Peak Search
Marker 1 827.14500000		Avg Type: Log-Pwr Avg Hold:≻100/100	TRACE 123456 TYPE MWWWWW DET PNNNNN	
		Mkr	1 827.15 MHz -23.891 dBm	NextPe
10 dB/div Ref -7.00 dBm				
-17.0			-13.00 dBm	Next Rig
-27.0				Next
-37.0				Next L
-47.0				
				Marker De
-57.0				
-67.0				Mkr→0
-77.0				IVIKI — V
In montainer provident	unspecific a source and a low off at the logition	ม <sup>ค</sup> างไปหางเกมนาคงในปี หารายในบุโบ	opening in the second of the s	
-87.0				Mkr→RefL
-97.0				_
				Mo
Center 826.50 MHz #Res BW 100 kHz	#VBW 300 kHz	Sween 48	Span 50.00 MHz 30 ms (1001 pts)	1 0
MSG		STATUS		
MSG	High par	STATUS		
	High par	STATUS		
ア Agilent Spectrum Analyzer - Swept S 以 50 Ω	A AC SENSE:EXT	STATUS t of band ALIGNAUTO Avg Type: Log-Pwr	03:06:26 PM Sep 28, 2010 TRACE 123450	_ 🗆
🗇 Agilent Spectrum Analyzer - Swept S	A AC SENSE:EXT	status t of band ALIGNAUTO	03:06:26 PM Sep 28, 2010 TRACE ]] 2 3 4 5 5 TYPE MWWWWW DET P NNNN	Amplitude
D Agilent Spectrum Analyzer - Swept S (X) 50 Q Reference Level -7.00 d Input: RF	A AC SENSE:EXT Bm PN0: Fast C Trig: Free Run	STATUS t of band ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	TRACE 123456 TYPE MWWWWW DET PNNNNN 1 845.89 MHz	Amplitude Ref Lev
⊐ Agilent Spectrum Analyzer - Swept S Ωu 50 Ω Reference Level -7.00 d	A AC SENSE:EXT Bm PN0: Fast C Trig: Free Run	STATUS t of band ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	TRACE 123456 TYPE MWWWW DET PNNNNN	
<sup>™</sup> Agilent Spectrum Analyzer - Swept S <sup>™</sup> 50 Ω <b>Reference Level -7.00 d</b> Input: RF 10 dB/div <b>Ref -7.00 dBm</b>	A AC SENSE:EXT Bm PN0: Fast C Trig: Free Run	STATUS t of band ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	TRACE 123456 TYPE MWWWWW DET PNNNNN 1 845.89 MHz	Amplitude Ref Lev -7.00 dt
<sup>™</sup> Agilent Spectrum Analyzer - Swept S W 50 Ω Reference Level -7.00 d Input: RF 10 dB/div Ref -7.00 dBm	A AC SENSE:EXT Bm PN0: Fast C Trig: Free Run	STATUS t of band ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	TRACE 123456 TYPE MUNUMUN DET PNNNNN 1 845.89 MHz -24.037 dBm	Amplitude Ref Lev -7.00 dt
<sup>™</sup> Agilent Spectrum Analyzer - Swept S <sup>™</sup> 50 Ω <b>Reference Level -7.00 d</b> Input: RF 10 dB/div <b>Ref -7.00 dBm</b>	A AC SENSE:EXT Bm PN0: Fast C Trig: Free Run	STATUS t of band ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	TRACE 123456 TYPE MUNUMUN DET PNNNNN 1 845.89 MHz -24.037 dBm	Amplitude Ref Lev -7.00 dt
P Agilent Spectrum Analyzer - Swept S         XV       50 Ω         Reference Level -7.00 d         Input: RF         10 dB/div       Ref -7.00 dBm         -17.0	A AC SENSE:EXT Bm PN0: Fast C Trig: Free Run	STATUS t of band ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	TRACE 123456 TYPE MUNUMUN DET PNNNNN 1 845.89 MHz -24.037 dBm	Amplitude Ref Lev -7.00 dt Attenuatio [6 de
Agilent Spectrum Analyzer - Swept S XI 50 Q Reference Level -7.00 d Input: RF 10 dB/div Ref -7.00 dBm -17 0	A AC SENSE:EXT Bm PN0: Fast C Trig: Free Run	STATUS t of band ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	TRACE 123456 TYPE MUNUMUN DET PNNNNN 1 845.89 MHz -24.037 dBm	Amplitude Ref Lev -7.00 df Attenuatio [6 dE Scale/I 10
Agilent Spectrum Analyzer - Swept S XI 50 Q Reference Level -7.00 d Input: RF 10 dB/div Ref -7.00 dBm -17 0	A AC SENSE:EXT Bm PN0: Fast C Trig: Free Run	STATUS t of band ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	1744CE 11 2 3 4 5 6 TYPE MAXWAWAY OFT P NINNIN -24.037 dBm -13.00 dBm	Amplitude Ref Let -7.00 df Attenuatio [6 df Scale/I 10 Scale Ty
Agilent Spectrum Analyzer - Swept S XI 50 Q Reference Level -7.00 d Input: RF 10 dB/div Ref -7.00 dBm -17 0	A AC SENSE:EXT Bm PN0: Fast C Trig: Free Run	STATUS t of band ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	1744CE 11 2 3 4 5 6 TYPE MAXWAWAY OFT P NINNIN -24.037 dBm -13.00 dBm	Amplitude Ref Lev -7.00 dt Attenuatio [6 dt Scale/I
Agilent Spectrum Analyzer - Swept S X/ 50 & Reference Level -7.00 d Input: RF 10 dB/div Ref -7.00 dBm -17 0 -27 0 -37 0 -47.0	A AC SENSE:EXT Bm PN0: Fast C Trig: Free Run	STATUS t of band ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	1744CE 11 2 3 4 5 6 TYPE MAXWAWAY OFT P NINNIN -24.037 dBm -13.00 dBm	Amplitude Ref Let -7.00 df Attenuatio [6 df Scale/I 10 Scale Ty
Agilent Spectrum Analyzer - Swept S           Keference Level -7.00 d           Input: RF           10 dB/div         Ref -7.00 dBm           -27.0	A AC SENSE:EXT PHO: Fast IFGain:Low Atten: 6 dB	status	174ACE 11 2 3 4 5 6 TYPE MAXWAWAY DET 2 NINNIN 1 845.89 MHz -24.037 dBm -13.00 dBm	Amplitude Ref Let -7.00 df Attenuatio [6 df Scale/I 10 Scale Ty
Agilent Spectrum Analyzer - Swept S           Keference Level -7.00 d           Input: RF           10 dB/div         Ref -7.00 dBm           -27.0	A AC SENSE:EXT PHO: Fast IFGain:Low Atten: 6 dB	status	174ACE 11 2 3 4 5 6 TYPE MAXWAWAY DET 2 NINNIN 1 845.89 MHz -24.037 dBm -13.00 dBm	Amplitude Ref Let -7.00 df Attenuatio [6 df Scale/I 10 Scale Ty
Agilent Spectrum Analyzer - Swept S           Keference Level -7.00 d           Input: RF           10 dB/div         Ref -7.00 dBm           -27.0	A AC SENSE:EXT Bm PN0: Fast C Trig: Free Run	status	174ACE 11 2 3 4 5 6 TYPE MAXWAWAY DET 2 NINNIN 1 845.89 MHz -24.037 dBm -13.00 dBm	Amplitude Ref Le -7.00 di Attenuatio [6 di Scale/I 10 Scale Ty
Agilent Spectrum Analyzer - Swept S           Ku         50 R           Reference Level -7.00 dBm           Input: RF           10 dB/div         Ref -7.00 dBm           -17 0	A AC SENSE:EXT PHO: Fast IFGain:Low Atten: 6 dB	status	174ACE 11 2 3 4 5 6 TYPE MAXWAWAY DET 2 NINNIN 1 845.89 MHz -24.037 dBm -13.00 dBm	Amplitude Ref Let -7.00 df Attenuatio [6 df Scale/I 10 Scale Ty
Agilent Spectrum Analyzer - Swept S           Xy         50 Q           Reference Level -7.00 d           Input: RF           10 dB/div         Ref -7.00 dBm           -07.0	A AC SENSE:EXT PHO: Fast IFGain:Low Atten: 6 dB	status	174ACE 11 2 3 4 5 6 TYPE MAXWAWAY DET 2 NINNIN 1 845.89 MHz -24.037 dBm -13.00 dBm	Amplitude Ref Ler -7.00 dl Attenuatio [6 de Scale/I 10 Scale Ty _og
Agilent Spectrum Analyzer - Swept S           Ku         50 R           Reference Level -7.00 dBm           Input: RF           10 dB/div         Ref -7.00 dBm           -17 0	A AC SENSE:EXT PHO: Fast IFGain:Low Atten: 6 dB	STATUS	174ACE 11 2 3 4 5 6 TYPE MAXWAWAY DET 2 NINNIN 1 845.89 MHz -24.037 dBm -13.00 dBm	Amplitude Ref Let -7.00 df Attenuatio [6 df Scale/I 10 Scale Ty





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	Low part	of band		
D Agilent Spectrum Analyzer - Swept SA       30 ≤ 50 Ω       Reference Level -10.00 dBm       Input: RF       PN0: Fast       IFGaint_top	AC SENSE:EXT	ALIGNAUTO Avg Type: Log-Pwr Avg Hold:>100/100	03:41:32 PM Sep 28, 2010 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	Trace/Det
10 dB/div Ref -10.00 dBm		Mkr1	1.853 15 GHz -25.203 dBm	Select Trac Trace
-20.0	÷1		-13.00 dBm	Clear Wri
-30.0	 			_
-40.0				Trace Avera
-60.0				Max Ho
-70.0				Mire 11
.80.0	www.www.angler.www.wg.	www.www.		Min Ho
-90.0				View/Blank Trace Or
				Мо
	BW 300 kHz	Sweep 4.8	Span 50.00 MHz 80 ms (1001 pts)	1 o
MSG	High part	of band		
D Agilent Spectrum Analyzer - Swept SA	AC SENSE:EXT	ALIGNAUTO	D3:42:35 PM Sep 28, 2010	Trace/Det
Center Freq 1.907505000 GHz Input: RF PN0: Fast IFGain:Lov	Trig: Free Run Atten: 6 dB	Avg Type: Log-Pwr Avg Hold≫100/100	TRACE 123456 TYPE MWWWW DET PNNNNN	Select Trace
10 dB/div <b>Ref -10.00 dBm</b>		Mkr1 1	1.906 91 GHz -24.280 dBm	Trace 1
-20.0				Clear Writ
-30.0				
-40.0				Trace Averag
-50.0				Max Hol
-70.0				
-0.0 manufacture of a state of the providence of the state of the stat	walter with the	and the super hash and the new fully	e more la hand and	Min Hol
-90.0				<b>View/Blank</b> Trace On
-100				_
				Mor
Center 1.90751 GHz #Res BW 100 kHz #V	/BW 300 kHz	Sween 49	Span 50.00 MHz 0 ms (1001 pts)	1 of



<b>Prüfbericht - Nr.:</b> Test Report No.:	16030063 001	Seite 51 von 66 Page 51 of 66
5.2.5 Field Strength of	Spurious Emissions	
RESULT:		Pass
Date of testing Temperature Humidity Basic standard Test method Operation mode	<ol> <li>13.Jan.2011</li> <li>22°C</li> <li>50%</li> <li>FCC Part 2.1053</li> <li>ANSI/TIA-603-C-2004,</li> <li>Transmitting with maxin</li> </ol>	
Limits:		
	a) for CDMA 850. n outside of the authorized operati ansmitting power (P) by a factor o	
Refer to FCC Part 24.238(	a) for CDMA 1900.	
	n outside of the authorized operati ansmitting power (P) by a factor o	
The emission must be redu	<u>iced by</u> 43+10Log(P) dB.	
Therefore, the Emission Lir	nit equals:	
10Log(P) dBW + 30	dB – (43+10Log(P) dB) = – 13 dE	3m



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### Measurement procedure:

1. The EUT RF output port was connected to 50 ohm RF load.

2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.

3. The measurement antenna was placed at a distance of 3 meters from the EUT.

4. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from EUT.

5. The frequency range up to 10-th harmonic of each of the three fundamental frequencies (low, middle and high channels) was investigated. The worst case of emissions was reported.

5. For spurious emissions attenuation, the substitution method was used.

6. The EUT was substituted by a reference antenna (half-wave dipole – below 1 GHz, or Horn antenna – above 1 GHz), connected to a signal generator.

7. The signal generator output level was adjusted to obtain the same reading as from EUT. The EIRP at the spurious emissions frequency was calculated as follows:

EIRP(dBm) = Reading (SG) + Cable loss(dB) + G(dBi)

According the limit specified in 27.53(c) and 27.53(g) :

The following method was used to determine the Limit for Spurious Emissions:

Maximum output power in watts: P (W).

The emission must be reduced by 43+10Log(P) dB

Therefore, the Emission Limit equals: 10Log(P) dBW + 30dB - (43+10Log(P) dB) = -13 dBm



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**Prüfbericht - Nr.:** *Test Report No.:* 

Test Results:

There were no emissions detected above the noise floor, which was at least 20 dB below the specification limit.

Table 14: Transmitter Spurious Radiated Emissions – CDMA 850\_UL

Freq. (MHz)	Polariz ation (V/H)	Reading (SG) (dBm)	Cable loss (dB)	Antenna Gain(dBi)	Transmit power (dBm)	Limit (dBm)
1648	Н	-52.65	7.4	5.25	-54.8	-13
2472	Н	-62.75	8.7	6.75	-64.7	-13
3296	Н	-35.15	10.2	6.95	-38.4	-13
4120	Н	-53.95	11.2	8.25	-56.9	-13
4944	Н	-62.35	12.5	8.65	-66.2	-13
5768	Н	-57.45	14.6	8.25	-63.8	-13
1648	V	-55.15	7.4	5.25	-57.3	-13
2472	V	-63.35	8.7	6.75	-65.3	-13
3296	V	-65.05	10.2	6.95	-68.3	-13
4120	V	-34.35	11.2	8.25	-37.3	-13
4944	V	-40.25	12.5	8.65	-44.1	-13
5768	V	-58.25	14.6	8.25	-64.6	-13

Note: All other emissions not reported are more than 20 dB below the limit.

### Table 15: Transmitter Spurious Radiated Emissions – CDMA 1900\_UL

Freq. (MHz)	Polariz ation (V/H)	Reading (SG) (dBm)	Cable loss (dB)	Antenna Gain(dBi)	Transmit power (dBm)	Limit (dBm)
3700	Н	-44.85	10.4	6.95	-48.3	-13
5550	Н	-45.95	13.5	8.65	-50.8	-13
7400	Н	-61.72	16.3	10.82	-67.2	-13
9250	Н	-56.32	19.5	12.02	-63.8	-13
11100	Н	-47.51	22.3	13.41	-56.4	-13
12950	Н	-40.43	25.1	14.23	-51.3	-13
3700	V	-37.35	10.4	6.95	-40.8	-13
5550	V	-36.15	13.5	8.65	-41.0	-13
7400	V	-61.72	16.3	10.82	-67.2	-13
9250	V	-58.32	19.5	12.02	-65.8	-13
11100	V	-40.31	22.3	13.41	-49.2	-13
12950	V	-37.43	25.1	14.23	-48.3	-13

Note: All other emissions not reported are more than 20 dB below the limit.



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# 5.2.6 Out-of-Band Rejection

# RESULT:

Date of testing :	28.Sep.2010
Temperature :	22°C
Humidity :	50%
Basic standard :	
Test method :	ANSI/TIA-603-C-2004
Operation mode :	Transmitting with maximum RF power output
Limits :	N/A

### Measurement procedure:

- 1. The EUT RF output port was connected to spectrum analyzer.
- 2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
- 3. A continuous sinusoidal RF signal shall be fed successively at frequency offsets 100 MHz from the edges of the relevant MS or BTS transmit frequency band into the relevant input port of the repeater.
- 4. The RF output curve was recorded by spectrum analyzer.

Pass



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Test Report No.:

### **Test Results:**

# Out-of-Band Rejection, CDMA 850\_UL

∑Agilent Spec Ø Marker 1	50 Ω	0000000 Input: RF			Run A	ALIGNAUTO Avg Type: Log-Pwr vg Hold:>100/100	TRAI TY	M Sep 28, 2010 CE 1 2 3 4 5 6 PE M WWWWW ET P N N N N N	Marker Select Marker
0 dB/div	Ref -7.0	0 dBm				۵		5.0 MHz .924 dB	1
17.0				<u>X</u> 2		1Δ2		-13.00 dBm	Norma
27.0									Delta
47.0									Fixed▷
67.0									Of
77.0 <b>Lond - 104</b> 37.0	Lpageaddh-flhoortawra	ph. wildow on orbi	inn 4 คางไปการใ				hudydaria.towyo	4 <sub>1</sub> ₩}¥₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	Properties
97.0									More
Center 82 Res BW			#VBW	/ 300 kHz		Sweep	9.60 ms (	00.0 MHz (1001 pts)	1 of 2



# Prüfbericht - Nr.:

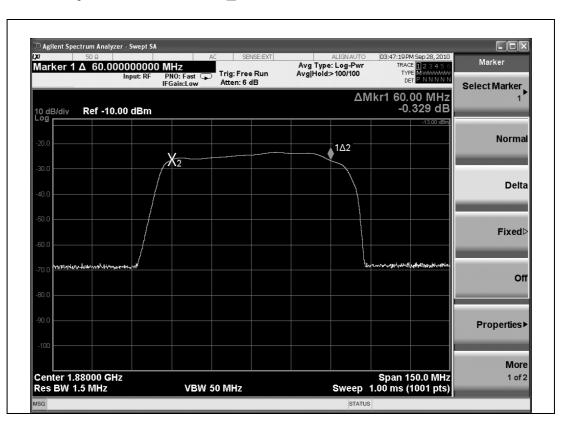
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Test Report No.:

### **Test Results:**

# Out-of-Band Rejection, CDMA 1900\_UL





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# 5.2.7 Frequency Stability

**Prüfbericht - Nr.:** 

Test Report No.:

### **RESULT**:

Refer to FCC part 22.355

For base station, the frequency tolerance shall be within 1.5 ppm.

Refer to FCC part 24.235

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized of operation.

### Measurement procedure:

- 1. The EUT was placed inside the temperature chamber.
- 2. The RF output port was connected to a spectrum analyzer.
- 3. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
- 4. After the temperature stabilized for approximately 20 min, the transmitting frequency was measured by the spectrum analyzer and recorded.
- 5. At room temperature, the frequency was measured when EUT was powered with the nominal voltage and with 85% and 115% of the nominal voltage.

Pass



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# Table 16: Frequency stability – CDMA 850\_UL

Operating frequency	:	836.180000	MHz
Channel	:	Middle	
Reference Voltage	:_	120	_VAC

Voltage with nominal Voltage	Power (VAC)	Temp (ºC)	Measured Freq (MHz)	Deviation (ppm)	Limit (ppm)
100%		+20(Ref)	836.180002	Ref	
100%		-30	836.179979	- 0.025	
100%		-20	836.179984	- 0.019	
100%		-10	836.179983	- 0.020	
100%	100	0	836.179991	- 0.010	
100%	120	+10	836.180090	- 0.012	
100%		+20	836.180002	+ 0.001	1.5
100%		+30	836.180010	+ 0.012	
100%		+40	836.180016	+ 0.019	
100%		+50	836.180018	+ 0.021	
85%	102	+20	836.179979	- 0.038	]
115%	138	+20	836.179984	- 0.027	<u> </u>



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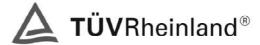
# Table 17: Frequency stability – CDMA 1900\_UL

Operating frequency	:	1880.000000	_MHz
Channel	:	Middle	
Reference Voltage	:	120	VAC

Voltage with nominal Voltage	Power (VAC)	Temp (ºC)	Measured Freq (MHz)	Deviation (ppm)	Limit (ppm)
100%		+20(Ref)	1880.000001	Ref	
100%		-30	1879.999997	- 0.002	
100%		-20	1879.999998	- 0.002	
100%		-10	1880.000001	- 0.001	
100%	100	0	1880.000000	0.000	
100%	120	+10	1880.000001	+ 0.001	
100%		+20	1880.000001	+ 0.001	1.5
100%		+30	1880.000002	+ 0.002	
100%		+40	1880.000002	+ 0.002	
100%		+50	1880.000003	+ 0.002	
85%	102	+20	1880.000003	+ 0.002	
115%	138	+20	1880.000003	+ 0.002	



### Seite 60 von 66 Prüfbericht - Nr.: 16030063 001 Page 60 of 66 Test Report No.: 5.2.8 Error Vector Magnitude (EVM) **RESULT:** No Limit Date of testing : 03.Mar.2011 Temperature : 22°C Humidity 50% Basic standard ---Test method : ANSI/TIA-603-C-2004 Operation mode : Transmitting with maximum RF power output Limits N/A Measurement procedure: 1. The EUT RF output port was connected to spectrum analyzer. 2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached. 3. The spectrum analyzer was setup to measure the Error Vector Magnitude (EVM) of output signal. The EVM was measured at the output port of the EUT at the middle channel of each type of modulation.



# Prüfbericht - Nr.:

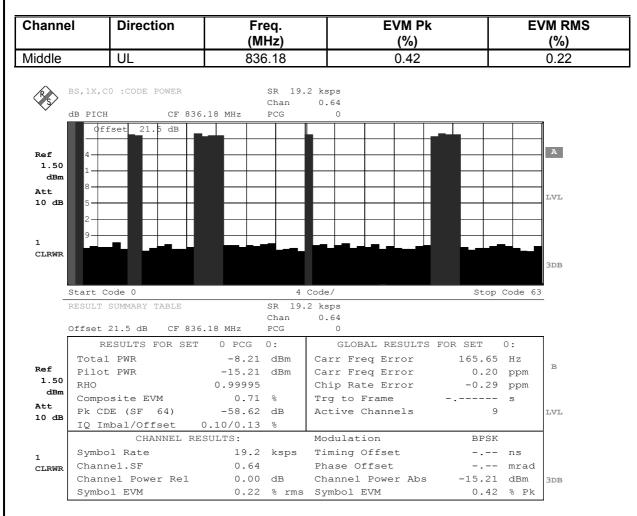
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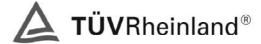
### **Test result:**

### Table 18: EVM, CDMA 850\_UL



Date: 3.MAR.2011 04:59:39





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### Table 19: EVM, CDMA 1900\_UL

Channel	Direction	Freq. (MHz)	EVM Pk (%)	EVM RMS (%)
Middle	UL	1880.18	0.77	0.42



RESULTS FOR SET 0	PCG	0:	GLOBAL RESULTS	FOR SET	0:
Total PWR	-8.75	dBm	Carr Freq Error	377.19	Hz
Pilot PWR -	15.74	dBm	Carr Freq Error	0.20	ppm
RHO 0.	99992		Chip Rate Error	-0.24	ppm
Composite EVM	0.88	용	Trg to Frame		s
Pk CDE (SF 64) -	57.16	dB	Active Channels	9	
IQ Imbal/Offset 0.07	/0.06	용			
CHANNEL RESULT	'S:		Modulation	BPSK	
Symbol Rate	19.2	ksps	Timing Offset		ns
Channel.SF	0.64		Phase Offset		mrad
Channel Power Rel	0.00	dB	Channel Power Abs	-15.74	dBm
Symbol EVM	0.28	% rms	Symbol EVM	0.59	% Pk

Date: 3.MAR.2011 05:25:21

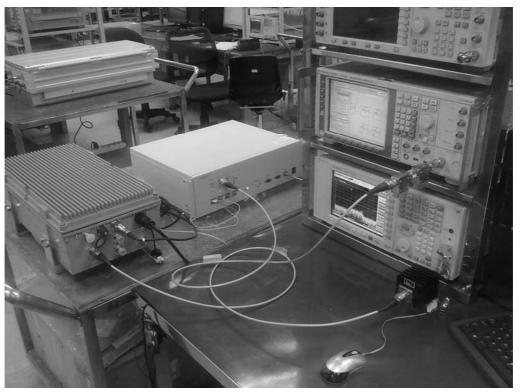


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# 6 Photographs of the Test Set-Up

Photograph 1: Set-up for RF power, Occupied Bandwidth, Out-of-Band emissions, Intermodulation test, Spurious Emissions at antenna terminal, EVM



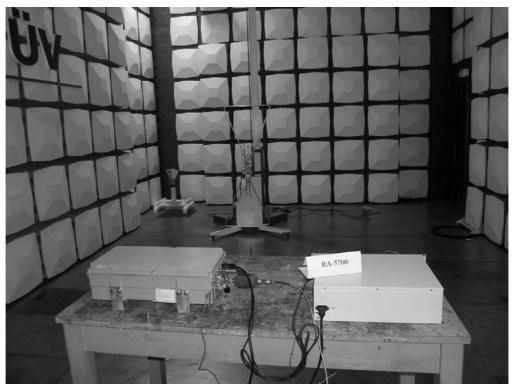




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Photograph 2: Set-up for Radiation Measurement Below 1GHz

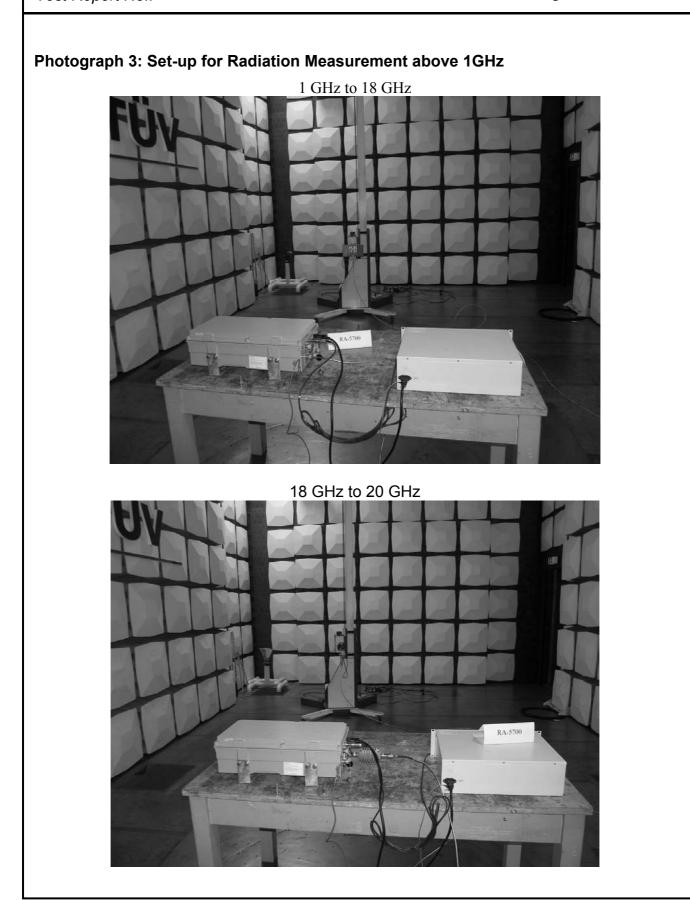


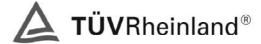




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