

FCC Part 24E & 27 Measurement and Test Report

For

Cyrus Technology GmbH

Hergelsbendenstrasse 49, D-52080 Aachen, Germany

FCC ID: 2AI3KCM17SA2

FCC Rules:	FCC Part 24E, FCC Part 27			
Product Description:	Rugged Phone			
Tested Model:	<u>CM17SA</u>			
Report No.:	STR18108156I-2			
Sample Receipt Date:	<u>2018-10-18</u>			
Tested Date:	2018-10-18 to 2018-11-08			
Issued Date:	<u>2018-11-09</u>			
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM Test Technology Co., Ltd.



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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information	
Applicant:	Cyrus Technology GmbH
Address of applicant:	Hergelsbendenstrasse 49, D-52080 Aachen, Germany
Manufacturer:	Cyrus Technology GmbH
Address of manufacturer:	Hergelsbendenstrasse 49, D-52080 Aachen, Germany

General Description of EUT:	
Product Name:	Rugged Phone
Brand Name:	Cyrus
Model No.:	CM17SA
Hardware version:	L819_MB
Software version:	CM17_V1.2
IMEI: /	
Rated Voltage:	DC3.8V
Battery: /	
	Model: JWS664-501000
Adapter Model:	Input:AC100-240V 50/60Hz 0.2A
	Output: DC5V 1000mA
Device Category:	Portable Device

Note: The test data is gathered from a production sample provided by the manufacturer.



Technical Characteristics of EUT: Main board			
4G			
Support Networks:	FDD-LTE		
Support Band:	FDD-LTE Band 2, 4, 7		
	FDD-LTE Band 2: Tx: 1850-1910MHz,		
Uplink Frequency:	FDD-LTE Band 4: Tx: 1710-1755MHz,		
	FDD-LTE Band 7: Tx: 2500-2570MHz,		
	FDD-LTE Band 2: Rx: 1930-1990MHz,		
Downlink Frequency:	FDD-LTE Band 4: Rx: 2110-2155MHz,		
	FDD-LTE Band 7: Rx: 2620-2690MHz,		
	FDD-LTE Band 2: 23.52dBm,		
RF Output Power:	FDD-LTE Band 4: 24.08dBm,		
	FDD-LTE Band 7: 24.38dBm,		
	FDD-LTE Band 2: 17M9G7D, 17M9W7D		
Type of Emission:	FDD-LTE Band 4: 17M9G7D, 17M9W7D		
	FDD-LTE Band 7: 18M0G7D, 17M9W7D		
Type of Modulation:	QPSK, 16QAM		
Antenna Type:	Integral Antenna		
	FDD-LTE Band 2: 1.2dBi		
Antenna Gain:	FDD-LTE Band 4: 0.7dBi,		
	FDD-LTE Band 7: 1.3dBi,		



1.2 Test Standards

The tests were performed according to following standards:

 FCC Rules Part 2: FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS
FCC Rules Part 24: PUBLIC MOBILE SERVICES
FCC Rules Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
TIA/EIA 603 E March 2016: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
ANSI C63.26-2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
KDB 971168 D01 Power Meas License Digital Systems v03r01: MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with TIA/EIA 603 E/ KDB 971168/ ANSI C63.26 The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Test Facility

FCC – Registration No.: 125990

Shenzhen SE M Test Technology Co., Lt d. L aboratory has be en recognized to p erform compliance t esting on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN 5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.



1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the T x frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List			
Test Mode	Description	Remark	
TM1	FDD-LTE Band 2	Low, Middle, High Channels	
TM2	FDD-LTE Band 4	Low, Middle, High Channels	
TM3	FDD-LTE Band 7	Low, Middle, High Channels	

Test Conditions		
Temperature:	22~25 °C	
Relative humidity	50~55 %.	
ATM Pressure:	1019 mbar	

EUT Cable List and Details					
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite		
USB Cable	1.2	Unshielded	Without Ferrite		
Earphone Cable	1.0	Unshielded	Without Ferrite		

Special Cable List and Details					
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite		
//		/	/		

Auxiliary Equipment List and Details					
Description	Manufacturer	Model	Serial Number		
//		/	/		



1.6 Measurement Uncertainty

Measurement uncertainty				
Parameter	Conditions	Uncertainty		
RF Output Power	Conducted	±0.42dB		
Occupied Bandwidth	Conducted	$\pm 1.5\%$		
Frequency Stability	Conducted	2.3%		
Transmitter Spurious Emissions	Conducted	± 0.42 dB		
		30-200MHz ±4.52dB		
Transmitter Spurious Emissions		0.2-1GHz ±5.56dB		
	Kaulateu	1-6GHz ±3.84dB		
		6-18GHz ±3.92dB		

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
SEMT-1075	Communication Tester	Rohde & Schwarz	CMW500	148650	2018-05-22	2019-05-21
SEMT-1063	G SM Tester	Rohde & Schwarz	CMU200	114403	2018-05-22	2019-05-21
SEMT-1072	Sp ectrum Analyzer	Agilent	E4407B	MY41440400	2018-05-22	2019-05-21
SEMT-1079	Sp ectrum Analyzer	Agilent	N9020A	US47140102	2018-05-22	2019-05-21
SEMT-1080	Sig nal Generator	Agilent	83752A	3610A01453	2018-05-22	2019-05-21
SEMT-1081	Vector Signal Generator	Agilent N	5182A	MY47070202	2018-05-22	2019-05-21
SEMT-1028	Po wer Divider	Weinschel	1506A	PM204	2018-05-22	2019-05-21
SEMT-1082	Pow er Divider	RF-Lambda	RFLT4W5M18G	14110400027	2018-05-22	2019-05-21
SEMT-1031	Sp ectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2018-05-22	2019-05-21
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2018-05-22	2019-05-21
SEMT-1008	A mplifier	Agilent	8447F	3113A06717	2018-05-22	2019-05-21
SEMT-1043	A mplifier	C&D	PAP-1G18	2002	2018-05-22	2019-05-21
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2020-06-07
SEMT-1068	Broadband Antenna S	Sch warz beck	VULB9163	9163-333 20	17-06-08	2020-06-07
SEMT-1042	H orn Antenna	ETS	3117	00086197	2017-06-08	2020-06-07
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2 017-06-08	2 020-06-07
SEMT-1168	Pre-am plifier	Direction Systems Inc.	PAP-0126 1	4141-12838	2018-05-22	2019-05-21
SEMT-1169	Pre-am plifier	Direction Systems Inc.	PAP-2640 1	4145-14153	2018-05-22	2019-05-21
SEMT-1163	Sp ectrum Analyzer	Rohde & Schwarz	FSP40	100612	2018-05-22	2019-05-21
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2018-03-19	2021-03-18

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 1.1307, § 2.1093 RF	Exposure	Compliant
§ 24.232 (c), §27.50(d)	RF Output Power	Compliant
§ 24.51, § 27.50	Peak-to-average Ratio (PAR) of Transmitter	Compliant
§ 24.238 (b), § 27.53 E	mission Bandwidth	Compliant
§ 24.238 (a), § 27.53(h) Spurio	us Emissions at Antenna Terminal	Compliant
§ 24.238 (a), § 27.53(h)	Spurious Radiation Emissions	Compliant
§ 24.238 (a), § 27.53(h)	Out of Band Emissions	Compliant
§ 24.235, § 27.54 Freque	ncy Stability	Compliant



3. RF Exposure

3.1 Standard Applicable

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the SAR report.



4. RF Output Power

4.1 Standard Applicable

According to §24.232 (c), Mobile and portable stations are limited to 2 wat ts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to §27.50(d)(4), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MH z band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

According to §27.50(c)(10), Portable stations (hand-held devices) in the 698-746 MHz band are limited to 3 watts ERP.

4.2 Test Procedure

Conducted output power test method:



- Radiated power test method:
- 1. The setup of EUT is according with per ANSI/TIA Standard 603E and ANSI C63.26 measurement procedure.
- 2. The measurement antenna was placed at a distance of 3 m eters from the EUT. During the tests, the antenna height and p olarization as well as EUT azim uth were varie d i n order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
- 3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
- 4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-ra diating cab le. T he absol ute le vels of the sp urious emissions were measured by the substitution.

4.3 Summary of Test Results/Plots



Max. Radiated Power:

FDD-LTE Band 2

	Chanr	nel Bandwidth: 1.4 MHz	
Modulation	Channel	E.i.r.p [dBm]	Verdict
	LCH	21.05	PASS
QPSK	MCH	21.11	PASS
	HCH	21.21	PASS
	LCH	21.18	PASS
16QAM	MCH	21.25	PASS
	HCH	21.14	PASS
	Chan	nel Bandwidth: 3 MHz	-
Modulation	Channel	E.i.r.p [dBm]	Verdict
	LCH	20.98	PASS
QPSK	MCH	20.72	PASS
	НСН	20.76	PASS
	LCH	20.78	PASS
16QAM	MCH	20.78	PASS
	HCH	20.74	PASS
	Chan	nel Bandwidth: 5 MHz	-
Modulation	Channel	E.i.r.p [dBm]	Verdict
	LCH	21.05	PASS
QPSK	MCH	21.02	PASS
	НСН	21.11	PASS
	LCH	21.15	PASS
16QAM	MCH	21.16	PASS
	НСН	21.17	PASS
	Chanr	nel Bandwidth: 10 MHz	
Modulation	Channel	E.i.r.p [dBm]	Verdict
	LCH	21.05	PASS
QPSK	MCH	21.11	PASS
	НСН	21.08	PASS
	LCH	21.36	PASS
16QAM	MCH	21.25	PASS
	НСН	21.18	PASS



	Channel Bandwidth: 15 MHz								
Modulation	Channel	E.i.r.p [dBm]	Verdict						
	LCH	20.74	PASS						
QPSK	MCH	20.76	PASS						
	HCH	20.65	PASS						
	LCH	20.62	PASS						
16QAM	MCH	20.47	PASS						
	НСН	20.69	PASS						
	Cha	nnel Bandwidth: 20 MHz							
Modulation	Channel	E.i.r.p [dBm]	Verdict						
	LCH	20.47	PASS						
QPSK	MCH	20.62	PASS						
	HCH	20.72	PASS						
	LCH	20.95	PASS						
16QAM	MCH	20.56	PASS						
	НСН	20.69	PASS						

FDD-LTE Band 4

Channel Bandwidth: 1.4 MHz								
Modulation	Channel	E.i.r.p [dBm]	Verdict					
	LCH	21.65	PASS					
QPSK	MCH	21.21	PASS					
	НСН	21.08	PASS					
	LCH	21.22	PASS					
16QAM	MCH	21.41	PASS					
	НСН	21.32	PASS					
	Cha	nnel Bandwidth: 3 MHz						
Modulation	Channel	E.i.r.p [dBm]	Verdict					
	LCH	20.78	PASS					
QPSK	MCH	20.62	PASS					
	HCH	20.74	PASS					
	LCH	20.69	PASS					
16QAM	MCH	20.41	PASS					
	HCH	20.58	PASS					



Channel Bandwidth: 5 MHz								
Modulation	Channel	E.i.r.p [dBm]	Verdict					
	LCH	21.01	PASS					
QPSK	MCH	21.53	PASS					
	НСН	21.05	PASS					
	LCH	21.11	PASS					
16QAM	MCH	21.65	PASS					
	НСН	21.28	PASS					
	Char	nnel Bandwidth: 10 MHz						
Modulation	Channel	E.i.r.p [dBm]	Verdict					
	LCH	22.02	PASS					
QPSK	MCH	22.11	PASS					
	НСН	22.25	PASS					
	LCH	22.21	PASS					
16QAM	MCH	22.18	PASS					
	НСН	22.09	PASS					
	Char	nnel Bandwidth: 15 MHz						
Modulation	Channel	E.i.r.p [dBm]	Verdict					
	LCH	20.65	PASS					
QPSK	MCH	20.74	PASS					
	НСН	20.68	PASS					
	LCH	20.74	PASS					
16QAM	MCH	20.36	PASS					
	НСН	20.47	PASS					
	Char	nnel Bandwidth: 20 MHz						
Modulation	Channel	E.i.r.p [dBm]	Verdict					
	LCH	20.65	PASS					
QPSK	МСН	20.48	PASS					
	НСН	20.69	PASS					
	LCH	20.55	PASS					
16QAM	МСН	20.47	PASS					
	НСН	20.69	PASS					



FDD-LTE Band 7

Channel Bandwidth: 5 MHz							
Modulation	Channel	E.i.r.p [dBm]	Verdict				
	LCH	20.74	PASS				
QPSK	MCH	20.36	PASS				
	HCH	20.47	PASS				
	LCH	20.69	PASS				
16QAM	MCH	20.74	PASS				
	HCH	20.48	PASS				
	Chan	nel Bandwidth: 10 MHz					
Modulation	Channel	E.i.r.p [dBm]	Verdict				
	LCH	20.98	PASS				
QPSK	MCH	20.74	PASS				
	HCH	20.66	PASS				
	LCH	20.74	PASS				
16QAM	MCH	20.91	PASS				
	HCH	20.62	PASS				
	Chan	nel Bandwidth: 15 MHz					
Modulation	Channel	E.i.r.p [dBm]	Verdict				
	LCH	20.98	PASS				
QPSK	MCH	20.74	PASS				
	HCH	21.02	PASS				
	LCH	21.26	PASS				
16QAM	MCH	21.02	PASS				
	HCH	21.27	PASS				
	Chan	nel Bandwidth: 20 MHz					
Modulation	Channel	E.i.r.p [dBm]	Verdict				
	LCH	21.02	PASS				
QPSK	MCH	21.22	PASS				
	HCH	21.32	PASS				
	LCH	20.74	PASS				
16QAM	MCH	20.65	PASS				
	HCH	20.72	PASS				



Max. Conducted Output Power

Please refer to Appendix A: Average Power Output Data

Test result: Pass



5. Peak-to-average Ratio (PAR) of Transmitter

5.1 Standard Applicable

According to §24.232(d), Power measurements for transmissions by stations authorized under this section may be made eit her in a ccordance with a C ommission-approved average power t echnique or in com pliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24 .51. In measuring tr ansmissions in th is ba nd usin g an average power techni que, t he peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

According to §27.50(B), the peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be m ade using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other C ommission ap proved pro cedure. The m easurement must be perform ed using a si gnal corresponding to the highest PAPR expected during periods of continuous transmission.

5.2 Test Procedure

According with KDB 971168

- 1. The signal analyzer's CCDF measurement profile is enabled
- 2. Frequency = carrier center frequency
- 3. Measurement BW > Emission bandwidth of signal
- 4. The signal analyzer was set to collect one million samples to generate the CCDF curve

5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal " RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the " on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Configuration for the emission bandwidth testing:



5.3 Summary of Test Results

Please refer to Appendix B: Peak-to-Average Ratio Test result: Pass



6. Emission Bandwidth

6.1 Standard Applicable

According to §24.238(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

According to §27.53, The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one a bove the c arrier center frequency, outside of which a ll emissions are attenuated at least 26 dB below the transmitter power.

6.2 Test Procedure

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Test Configuration for the emission bandwidth testing:



6.3 Summary of Test Results/Plots

Please refer to Appendix C: 26dB Bandwidth and Occupied Bandwidth

Test result: Pass



7. Out of Band Emissions at Antenna Terminal

7.1 Standard Applicable

According to \$24.238(a), 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 $43 + 10 \log(P) dB$.

According to 27.53 (h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log 10$ (P) dB.

According to \$27.53 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

According to \$27.53 (m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P) dB$ on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P) dB$ on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P) dB$ on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that $43 + 10 \log (P) dB$ on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P) dB$ at or below 2490.5 MHz.

7.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10th harmonic.

Test Configuration for the out of band emissions testing:



7.3 Summary of Test Results/Plots



Please refer to Appendix D & E: Band Edge & Conducted Spurious Emission

Test result: Pass



8. Spurious Radiated Emissions

8.1 Standard Applicable

According to 24.238(a), 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 $43 + 10 \log(P) dB$.

According to 27.53 (h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log 10$ (P) dB.

According to \$27.53 (g) 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 $43 + 10 \log (P) dB$.

8.2 Test Procedure

- 1. The set up of EUT is according with per ANSI/ TIA-603-D: 20 10 and A NSI C63.4-2 014 measurement procedure.
- 2. The measurement antenna was placed at a distance of 3 m eters from the EUT. During the tests, the antenna height and p olarization as well as EUT azim uth were varie d i n order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
- 3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
- 4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-ra diating cab le. T he absol ute le vels of the sp urious em issions were measured by the substitution.

Spurious attenuation limit in dB = $43+10 \text{ Log}_{10}$ (power out in Watts)

8.3 Summary of Test Results/Plots

Note: 1. this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

2. All test modes (different bandwidth and different modulation) are performed, but only the worst case is recorded in this report.



Spurious Emissions Below 1GHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	()	(cm)	
15	2.9453	-71.11	-1.08	-72.19	-13.00	-59.19	249	100	peak
2 1	01.6443	-72.28	-2.53	-74.81	-13.00	-61.81	100	100	peak
33	97.6334	-74.08	5.26	-68.82	-13.00	-55.82	56	100	peak
4 9	89.5355	-75.45	15.68	-59.77	-13.00	-46.77	95	100	peak





No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	()	(cm)	
14	5.6948	-70.57	-1.13	-71.70	-13.00	-58.70	279	100	peak
2 1	09.4116	-72.18	-2.13	-74.31	-13.00	-61.31	100	100	peak
34	20.5803	-73.93	5.68	-68.25	-13.00	-55.25	75	100	peak
4 9	79.1804	-75.70	15.49	-60.21	-13.00	-47.21	96	100	peak





No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	()	(cm)	
15	0.2325	-70.93	-1.12	-72.05	-13.00	-59.05	210	100	peak
21	17.3603	-71.94	-3.31	-75.25	-13.00	-62.25	243	100	peak
33	46.8092	-74.03	5.31	-68.72	-13.00	-55.72	97	100	peak
4 9	89.5355	-75.41	15.68	-59.73	-13.00	-46.73	93	100	peak





No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	()	(cm)	
14	3.6585	-71.10	-1.29	-72.39	-13.00	-59.39	190	100	peak
2 9	6.4362	-71.24	-3.19	-74.43	-13.00	-61.43	259	100	peak
33	29.0390	-73.86	4.99	-68.87	-13.00	-55.87	72	100	peak
49	96.4996	-75.25	15.78	-59.47	-13.00	-46.47	203	100	peak





No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	()	(cm)	
14	5.0583	-69.93	-1.17	-71.10	-25.00	-46.10	131	100	peak
21	12.5244	-72.00	-2.55	-74.55	-25.00	-49.55	101	100	peak
33	50.4768	-73.93	5.31	-68.62	-25.00	-43.62	60	100	peak
4 1	000.0000	-75.74	15.84	-59.90	-25.00	-34.90	134	100	peak





No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	()	(cm)	
15	2.0251	-70.99	-1.00	-71.99	-25.00	-46.99	53	100	peak
21	06.0126	-71.71	-2.21	-73.92	-25.00	-48.92	137	100	peak
33	41.9787	-73.94	5.29	-68.65	-25.00	-43.65	78	100	peak
4 9	86.0717	-74.65	15.62	-59.03	-25.00	-34.03	135	100	peak

Note: Margin= (Reading+ Correct)- Limit



Spurious Emissions Above 1GHz

For FDD_LTE Band 2 Mode

Frequency	Reading	Correct	Result	Limit	Margin	Polar		
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V		
Low Channel (1852.5MHz)								
3705.00 -	35.14	10.17	-24.97	-13	-11.97	Н		
5557.50 -	43.04	14.69	-28.35	-13	-15.35	Н		
3705.00 -	35.89	10.17	-25.72	-13	-12.72	V		
5557.50	-41.09	14.69	-26.4 -	13 -	13.4	V		
Middle Channel (1880.0MHz)								
3760.00 -	34.37	10.26	-24.11	-13	-11.11	Н		
5640.00 -	42.63	14.78	-27.85	-13	-14.85	Н		
3760.00 -	34.46	10.26	-24.2	-13	-11.2	V		
5640.00 -	41.1	14.78	-26.32	-13	-13.32	V		
High Channel (1907.5MHz)								
3815.00	-35.79	10.59	-25.2 -	13 -	12.2	Н		
5722.50 -	43.39	15.03	-28.36	-13	-15.36	Н		
3815.00 -	34.14	10.59	-23.55	-13	-10.55	V		
5722.50 -	42.05	15.03	-27.02	-13	-14.02	V		

For FDD_LTE Band 4 Mode

Frequency	Reading	Correct	Result	Limit	Margin	Polar		
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V		
Low Channel (1712.5MHz)								
3425.00	-34.85	8.65	-26.2 -	13 -	13.2	Н		
5137.50	-39.61	12.03	-27.58	-13	-14.58	Н		
3425.00	-34.96 8	.65 -	26.31	-13	-13.31	V		
5137.50	-39.18	12.03	-27.15	-13	-14.15	V		
Middle Channel (1732.5MHz)								
3465.00	-35.34 9	.97 -	25.37	-13	-12.37	Н		
5197.50	-40.28	12.54	-27.74	-13	-14.74	Н		
3465.00	-34.37	9.97	-24.4	-13	-11.4	V		
5197.50	-41.89	12.54	-29.35	-13	-16.35	V		
High Channel (1752.5MHz)								
3505.00 -	33.85	9.11	-24.74	-13	-11.74	Н		
5257.50	-41.93	12.56	-29.37	-13	-16.37	Н		
3505.00	-35.21	9.11	-26.1 -	13 -	13.1	V		
5257.50	-42.53	12.56	-29.97	-13	-16.97	V		



Frequency	Reading	Correct	Result	Limit	Margin	Polar		
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V		
Low Channel (2502.5MHz)								
5005.00 -	41.88	11.66	-30.22	-25	-5.22	Н		
7507.50 -	46.66	15.09	-31.57	-25	-6.57	Н		
5005.00 -	44.44	11.66	-32.78	-25	-7.78	V		
7507.50 -	46.63	15.09	-31.54	-25	-6.54	V		
Middle Channel (2535MHz)								
5070.00 -	42.21	11.78	-30.43	-25	-5.43	Н		
7605.00 -	48.38	15.21	-33.17	-25	-8.17	Н		
5070.00 -	42.42	11.78	-30.64	-25	-5.64	V		
7605.00 -	46.32	15.21	-31.11	-25	-6.11	V		
High Channel (2567.5MHz)								
5135.00 -	42.74	11.89	-30.85	-25	-5.85	Н		
7702.50 -	47.44	15.32	-32.12	-25	-7.12	Н		
5135.00 -	43.24	11.89	-31.35	-25	-6.35	V		
7702.50 -	47.58	15.32	-32.26	-25	-7.26	V		

For FDD_LTE Band 7 Mode

Note: Result=Reading+ Correct, Margin= Result- Limit

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



9. Frequency Stability

9.1 Standard Applicable

According to §24.235, §27.54 the limit is 2.5ppm.

9.2 Test Procedure

According to §2.1055, the following test procedure was performed. The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value. The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode

9.3 Summary of Test Results/Plots

Note: 1.Normal Voltage NV=DC3.8V; Low Voltage LV=DC3.6V; High Voltage HV=DC4.35

Please refer to Appendix F: Frequency Stability

Test result: Pass

***** END OF REPORT *****