



SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250500221410

Page: 1 of 17

TEST REPORT

Application No: SZCR2505002214WM
Applicant: Sonim Technologies, Inc.
Address of Applicant: 4445 Eastgate Mall, Suite 200, San Diego, CA 92121, USA
Manufacturer: Sonim Technologies, Inc.
Address of Manufacturer: 4445 Eastgate Mall, Suite 200, San Diego, CA 92121, USA
EUT Description: smartphone
Model No.: X800
Type No.: S6002
Trade Mark: Sonim
FCC ID: WYPS6002
Standard(s) : 47 CFR Part 30
47 CFR Part 2
ANSI C63.26 – 2015
KDB 842590 D01 v01r02 Upper Microwave Flexible Use Service
KDB 971168 D01 v03r01 Power Meas License Digital Systems
Date of Receipt: 2025-05-28
Date of Test: 2025-05-31 to 2025-06-07
Date of Issue: 2025-06-11

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu
EMC Laboratory Manager



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch EMC Laboratory

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SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250500221410

Page: 2 of 17

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2025-06-11		Original

Authorized for issue by:				
		Calvin Weng		
		Calvin Weng/Project Engineer		
		Eric Fu		
		Eric Fu/Reviewer		



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Test Summary

Test specification: 47 CFR Part 30				
Test cases	References & Limits		Test conditions	Result
	Standard	Test Limit		
Spurious Emission	FCC §30.203 FCC §2.1051	-13 dBm/MHz for All out-of-band emissions.	Radiated	Pass

Remark:

Model No.: X800

This test report (Ref. No.: SZCR250500221410) is only valid with the original test report (Ref. No.: SZCR240300076710).

According to the declaration from the applicant, the models in this report and models in original report were identical, only difference with being added an alternative battery and LCD.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for retest.

Therefore in this report Spurious Emission were spot checked on model and shown the data in this report, other tests please refer to original report SZCR240300076710.



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Contents

1	GENERAL INFORMATION	5
1.1	DETAILS OF CLIENT	5
1.2	TEST LOCATION	5
1.3	TEST FACILITY	5
1.4	TECHNICAL DATA OF EQUIPMENT*	6
1.5	PRODUCT DESCRIPTION*	6
1.6	TEST ITEM OPERATING MODES DESCRIPTION*	6
1.7	TEST CONDITIONS	7
1.8	WORST CASE ORIENTATION	7
1.9	BEAM ID	7
1.10	TEST STANDARDS AND REFERENCES	8
1.11	ABNORMALITIES FROM STANDARD CONDITIONS	8
1.12	POSSIBLE VERDICTS OF THE RESULTS	8
1.13	FORMULA FOR DETERMINATION OF CORRECTION VALUES (E_c)	8
1.14	ENVIRONMENTAL CONDITIONS	9
1.15	FAR-FIELD DISTANCE AND MEASUREMENT DISTANCE	9
2	EMISSION TEST RESULTS	10
2.1	RADIATED SPURIOUS EMISSION	10
2.1.1	Limits	10
2.1.2	Test Procedure	11
2.1.3	Test Setup Procedure	11
2.1.4	Test Results	12
3	EQUIPMENT LIST	14
4	MEASUREMENT UNCERTAINTY	16
5	PHOTOGRAPHS	17
5.1	TEST SETUP	17
5.2	EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)	17



1 General Information

1.1 Details of Client

Applicant:	Sonim Technologies, Inc.
Address of Applicant:	4445 Eastgate Mall, Suite 200, San Diego, CA 92121, USA
Manufacturer:	Sonim Technologies, Inc.
Address of Manufacturer:	4445 Eastgate Mall, Suite 200, San Diego, CA 92121, USA

1.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

1.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISCED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.



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1.4 Technical Data of Equipment*

Product Name:	smartphone
Model No.(EUT):	X800
Trade Mark:	Sonim
Hardware Version:	V1.0
Software Version:	X80.0-01-14.0-15.26.00
Transmit Frequency	27500 – 28350 MHz / 37000 – 40000 MHz
5G NR Band	n260, n261
Support bandwidth:	N260:50MHz,100MHz,200MHz(2CC) N261:50MHz,100MHz,200MHz(2CC)
Type of modulation	DFT-s-OFDM: BPSK, QPSK, 16QAM, 64QAM CP-OFDM: QPSK, 16QAM, 64QAM
Antenna Type	PCB Antenna
Power supply	DC3.87V by Li-ion battery(5000mAh) Recharged by AC/DC power adapter Adapter M/N:1-CHUSQ302-097 Adapter Manufacturer: HUIZHOU PUAN ELEOTRONICS CO.,LTD Adapter output: 5V/3A,9V/2A,12V/1.5A Battery M/N:BAT-05000-21S Battery Manufacturer: Tianjin Lishen Juyuan New Energy Technology Co., Ltd.
Temperature	-30° C to +50° C
EUT sample type	Pre-Production
Remark:	*Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

1.5 Product Description*

The EUT is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, GPS, NFC, WPC(Rx). All modes support at least one UICC based SIM. The second SIM is either an UICC based p-SIM (physical SIM). The rechargeable battery is not user accessible.

This test report addresses the 5G NR operational mode on n260 and n261 bands.

Manufactures provided the Beam ID settings that yield the highest EIRP for each antenna by the EIRP Simulation tool. These Beam ID settings were used for all tests. All tests were performed in a non-signalling, stand-alone mode of operation.

1.6 Test Item Operating Modes Description*

EUT operating mode no	Description of operating modes	Additional information
op. 1	Continuously transmitting mode	/

*: declared by the applicant



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1.7 Test Conditions

Temperature, [°C]		Voltage, [V]	
T _{nom}	25	V _{nom}	3.87
T _{min}	-30	V _{min}	3.65
T _{max}	+50	V _{max}	4.45

1.8 Worst Case Orientation

For all 5G NR FR2 Bands, the worst-case scenario for all measurements is based on the EIRP measurement investigation results, comparing to TRP limits to demonstrate compliance. EIRP were measured on BPSK, QPSK, 16QAM and 64QAM modulations.

The fundamental and radiated spurious emission were investigated in three orthogonal orientation X (landscape), Y (portrait), Z (flatbed) and Roll, where is applicable. The final optimum position resulting in the highest EIRP for the frequency or band under investigation is placed on an open air fixture allowing no blockage of the signal as measured by the receiving antenna.

All testing was performed using FTM (Factory Test Mode) software at continuous TX operation. When implemented out in the field, the EUT will operate with a maximum uplink configuration (i.e..a maximum uplink duty cycle of 100).

1.9 Beam ID

In all tests, the following Beam ID settings of each antenna were applied for measurements.

n260 – Peak BID		
Antenna	BID	Paired BID
AG0	0-20	0-20, 128-148
AG1	128-148	0-20, 128-148

n261 – Peak BID		
Antenna	BID	Paired BID
AG0	0-20	0-20, 128-148
AG1	128-148	0-20, 128-148

1.10 Test Standards and references

Test standard	Description
47 CFR Part 30	UPPER MICROWAVE FLEXIBLE USE SERVICE
ANSI C63.26 – 2015	American National Standards for Compliance Testing of Transmitters Used in Licensed Radio Services
KDB 842590 D01 v01r02	Upper Microwave Flexible Use Service
KDB 971168 D01 v03r01	Power Meas License Digital Systems

1.11 Abnormalities from Standard Conditions

None

1.12 Possible verdicts of the results

Test sample meets the requirements	P (PASS) ± the measured value is below the acceptance limit, AL = TL
Test sample does not meet the requirements	F (FAIL) ± the measured value is above the acceptance limit, AL = TL
Test case does not apply to the test sample	N/A (Not applicable)
Test case not performed	N/P (Not performed)

1.13 Formula for determination of correction values (E_c)

$$E_c = E_R + AF + C_L + D_F - G_A \quad (1)$$

$$M = L_T - E_c \quad (2)$$

E_c = Electrical field ± corrected value

E_R = Receiver reading

M = Margin

L_T = Limit

AF = Antenna factor

C_L = Cable loss

D_F = Distance correction factor (if used)

G_A = Gain of pre-amplifier (if used)

All units are dB-units, positive margin means value is below limit.



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1.14 Environmental Conditions

Temperature	20°C ± 5°C
Relative humidity	25-75 % r.H.
Barometric Pressure	860-1060 mbar

1.15 FAR-Field Distance and Measurement Distance

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable. The measurement distance is in the far field per formula $2D^2/\lambda$ where D is the larger dimension of the antenna. For fundamental or band edge emissions, the largest far-field distance of either the EUT antenna or measurement antenna shall be used. For above 18GHz spurious emissions, the far-field distance will be based on the measurement antenna. In this case, the measurement antenna has the largest far-field distance. The EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest EIRP reading on the receive spectrum analyzer.

Frequency Range (GHz)	Antenna Dimension (D) (mm)	Wavelength (λ) (m)	Far Field Distance (m)	Measurement Distance Used (m)
18 – 40	60	0.0167 ~ 0.0075	0.43 ~ 0.96	1
40 – 60	43	0.0075 ~ 0.0050	0.49 ~ 0.74	1
60 – 75	35	0.0050 ~ 0.0040	0.49 ~ 0.61	1
75 - 110	24	0.0040 ~ 0.0027	0.29 ~ 0.42	1
110 – 140	15	0.0027 ~ 0.0021	0.17 ~ 0.21	1
140 – 200	11	0.0021 ~ 0.0015	0.11 ~ 0.16	1

Radiated power levels are investigated while the receive antenna was rotated through all angles to determine the worst case polarization/positioning.

2 Emission Test Results

2.1 Radiated Spurious Emission

2.1.1 Limits

FCC

According to FCC §2.1051 and FCC §30.203 (a): The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be -13 dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be -5 dBm/MHz or lower.

All spurious emissions were measured as EIRP to compare with the FCC §30.203 TRP limits to demonstrate compliance.

RSE was investigated from 30 MHz – 100 GHz on n261 band and 30 MHz – 200 GHz on n260 band.

Plots below 18 GHz are corrected field strength levels, measured at 3-meter test distance. The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26 – 2015 which states:

$EIRP (dBm) = E (dBuV/m) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m. The field strength E is calculated $E (dBuV/m) = \text{Spectrum Analyzer Level (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107$. All appropriate Antenna Factor and Cable Loss have been applied in the spectrum analyzer for each measurement.

RSE above 18 GHz were measured at the appropriate far field distance listed on Section 1.17 on this report (Far-Field Distance and Measurement Distance). Then, the EIRP of RSE was calculated using the equations on ANSI C63.26 – 2015 Annex C.5.2 as described on Sections 8.2 and 8.3.

RSE from 18 – 200 GHz were measured using a spectrum analyzer with an internal preamplifier when applicable. Emissions above 50 GHz were measured using a harmonic mix with spectrum analyzer, while an external LNA was used when applicable.

RSE from 1 – 200 GHz were measured at 1.5 meter height.

All RSE were measured for the configuration with the highest EIRP (configuration with QPSK modulation and a single RB) as representing the worst case.

Preliminary radiated emissions tests on the low, middle and high channels indicated that the worst case radiated spurious emissions were on the channel with the highest power and so only the test data for that channel is included in this report.

As the single RB mode has the highest power, therefore the single RB was used as the worst case for purpose of RSE measurements.

The following worst case EIRP were used at tests at the pre-determined worst case y-axis (portrait) orientation: n260 band;

MIMO_QPSK_50,100,200 MHz, RB Offset 1#15

n261 band;

MIMO_QPSK_50,100,200 MHz, RB Offset 1#15

Where the measurement EIRP values is within 2 dB of the limit, a TRP measurement is made, otherwise the EIRP value is compared with the §30.203 TRP limits to demonstrate compliance.

For simultaneous transmission of multiple channels in the WLAN. BT.. no noticeable new emission was found.



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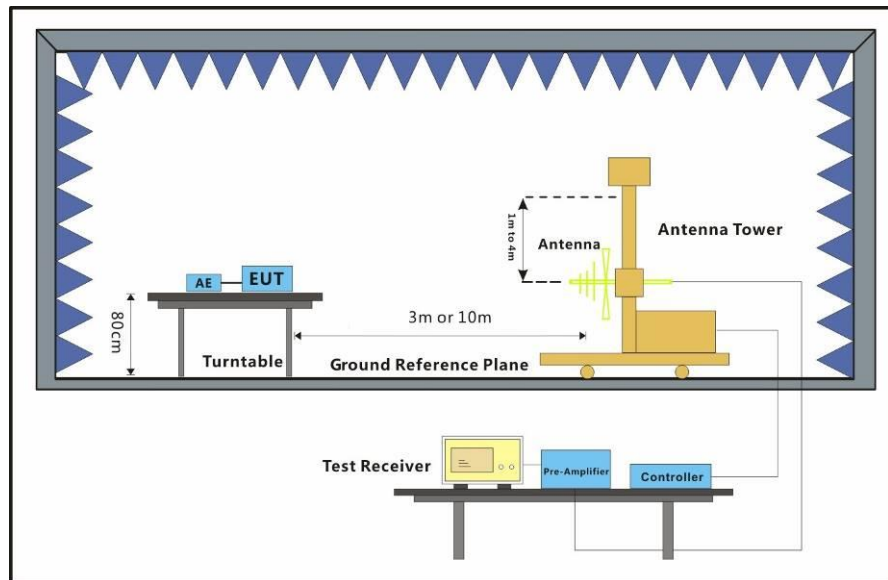
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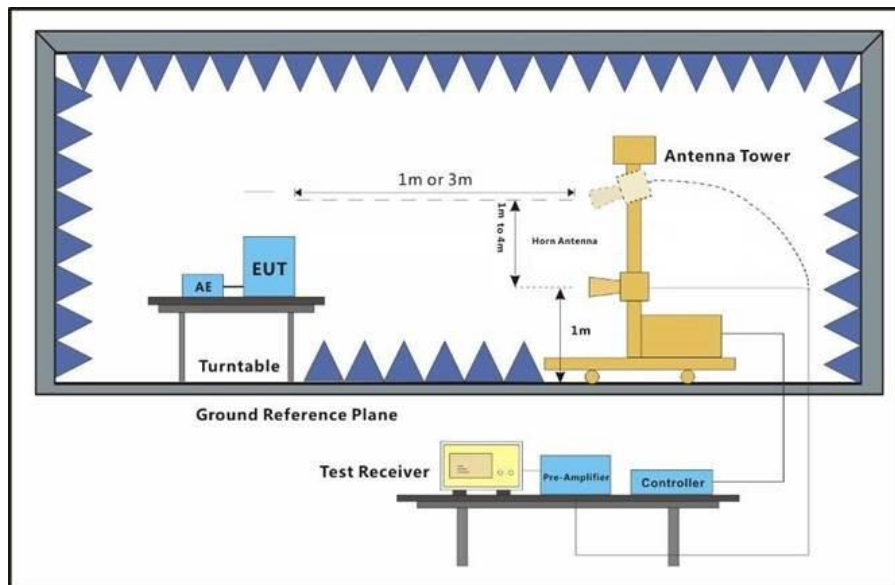
2.1.2 Test Procedure

All measurements were done according to ANSI C63.10-2013.

2.1.3 Test Setup Procedure

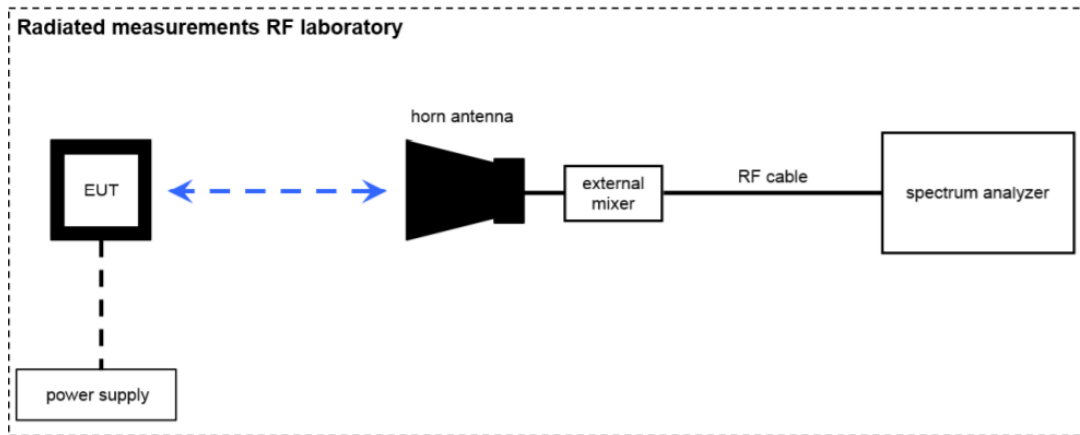


Below 1 GHz



1 – 18 GHz





Above 18 GHz

2.1.4 Test Results

PASS



SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250500221410

Page: 13 of 17

Test Data as below(1GHz-18GHz);

Remark: EIRP=SG level-Cable loss + Antenna gain

N260 Beam ID 146-Middle channel, Modulation: QPSK, Bandwidth:200MHz, 1RB#15								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
2007.66	-63.43	-13	-50.43	-65.7	2.35	4.62	Horizontal	Pass
8808.61	-55.54	-13	-42.54	-64.13	4.51	13.1	Horizontal	Pass
17904.6	-42.96	-13	-29.96	-52.23	4.66	13.93	Horizontal	Pass
2051.8	-62.13	-13	-49.13	-64.47	2.38	4.72	Vertical	Pass
8629.71	-53.5	-13	-40.5	-62.05	4.45	13	Vertical	Pass
17846.79	-43.87	-13	-30.87	-53.18	4.66	13.97	Vertical	Pass



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Shenzhen Branch Testing & Calibration Laboratory

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgs.com.cn
中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

3 Equipment List

RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
3m Fully-Anechoic Chamber	AUDIX	N/A	SEM001-02	2024-05-11	2027-05-10
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2025-03-14	2026-03-13
MXA Signal Analyzer	KEYSIGHT	N9020B	SEM004-24	2025-03-13	2026-03-12
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2023-07-23	2025-07-22
Microwave system amplifier	Agilent	83017A	SEM005-25	2024-09-18	2025-09-17
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2024-07-06	2025-07-05
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	SEM003-15	2024-08-09	2026-08-08
Pre-Amplifier	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2025-03-14	2026-03-13
Signal Generator(9kHz-40GHz)	N5173B	MY53270267	Agilent	2024-09-18	2025-09-17
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	SEM003-32	2024-09-25	2027-09-24
Pre-amplifier	Rohde & Schwarz	CH14-H052	SEM005-17	2025-03-14	2026-03-13
Substitution Antenna	Rohde & Schwarz	HF907	SEM003-06	2024-08-06	2026-08-05
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2025-03-19	2026-03-18
Horn antenna 40-60GHz	REBES	SAZ-2410-19-S1	06299-01	NCR	NCR
Horn antenna 50-75GHz	REBES	SAZ-2410-15-S1	01731-01	NCR	NCR
Horn antenna 75-110GHz	REBES	SAZ-2410-10-S1	01773-09	NCR	NCR
Horn antenna 110-170GHz	REBES	SAZ-2410-06-S1	01776-05	NCR	NCR
Horn antenna 140-220GHz	REBES	SAZ-2410-05-S1	01759-04	NCR	NCR
Waveguide 40-60GHz	REBES	SWG-19025-FB	06303-01	NCR	NCR
Waveguide 50-75GHz	REBES	SWG-15025-FB	01525-09	NCR	NCR



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SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250500221410

Page: 15 of 17

Waveguide 75-110GHz	REBES	SWG-10025-FB	01509-01	NCR	NCR
Waveguide 110-170GHz	REBES	SWG-06025-FB	06302-01	NCR	NCR
Waveguide 140-220GHz	REBES	SWG-05025-FB	06304-01	NCR	NCR
Waveguide Harmonic Mixer40-60GHz	REBES	STH-19SF-S1	06937-01	NCR	NCR
Waveguide Harmonic Mixer(50-75GHz)	KEYSIGHT	M1970V	MY51390966	NCR	NCR
Waveguide Harmonic Mixer(75-110GHz)	KEYSIGHT	M1970W	MY51430883	NCR	NCR
Waveguide Harmonic Mixer110-170GHz	REBES	STH-06SF-S1	06110-01	NCR	NCR
Waveguide Harmonic Mixer140-220GHz	REBES	HM 140-220	200009	NCR	NCR

Remark: NCR=No calibration required.



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Shenzhen Branch (Shenzhen) Laboratory

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中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 5.4 \times 10^{-8}$
2	Occupied Bandwidth	$\pm 3\%$
3	Radiated emission test	$\pm 3.1\text{dB}$ (Below 1GHz)
		$\pm 4.4\text{dB}$ (Above 1GHz)
4	Temperature test	$\pm 1^\circ\text{C}$
5	Humidity test	$\pm 3\%$
6	Supply voltages Time	$\pm 1.5\%$
		$\pm 3\%$



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5 Photographs

5.1 Test Setup

Refer to Test Setup Photos.

5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -

