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Shaanxi ShengKe Electronic Technology Co., Ltd

RF TEST REPORT

Report Type:
FCC Part 15.256 RF report

Model:
SK-R800E

REPORT NUMBER:
2409B0618SHA-001

ISSUE DATE:
January 15, 2025

DOCUMENT CONTROL NUMBER:
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TEST REPORT

Report no.: 2409B0618SHA-001

Applicant:	Shaanxi ShengKe Electronic Technology Co., Ltd
	Room 1911, Junminronghe Builing, No25 Fazhan Road , Gaoxin zone
Manufacturer:	Shaanxi ShengKe Electronic Technology Co., Ltd
	Room 1911, Junminronghe Builing, No25 Fazhan Road , Gaoxin zone
Manufacturer Site:	Shaanxi ShengKe Electronic Technology Co., Ltd
	Room 1911, Junminronghe Builing, No25 Fazhan Road , Gaoxin zone
Product Name:	80GHz Radar Level Sensor
Type/Model:	SK-R800E
FCC ID:	2BK46SK-R800E

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

47CFR Part 15 (2023): Radio Frequency Devices (Subpart C)

ANSI C63.10 (2020): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

PREPARED BY:	**REVIEWED BY:**
Project Engineer	Reviewer
Dylan Tang	Wakeyou Wang

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TEST REPORT

Content

Revision History

Report No.	Version	Description	Issued Date
2409B0618SHA-001	Rev. 01	Initial issue of report	January 15, 2025

Measurement result summary

TEST ITEM	FCC REFERENCE	RESULT
Fundamental emissions	15.256(g)	Pass
Unwanted Emissions	15.256(h)&15.209	Pass
Antenna beamwidth	15.255(i)	Pass
Fundamental bandwidth	15.256 (f) (1) (2)	Pass
Frequency Stability	15.215 (c)	Pass
Antenna requirement	15.203	Pass

Notes: 1: NA =Not Applicable

TEST REPORT

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	80GHz Radar Level Sensor
Type/Model/PMN/HVIN:	SK-R800E
Description of EUT:	The EUT is a 80GHz Radar Level Sensor, it supports 80G Radar and BLE functions, there is only one model. We test and list the worst results in this report.
Rating:	DC 24V
EUT type:	☒ Table top ☐ Floor standing
Software Version:	v511
Hardware Version:	SK-R-E21-V1.1.0
Sample received date:	September 20, 2024
Date of test:	September 20, 2024 ~ December 10, 2024

1.2 Technical Specification

Frequency Range:	76000MHz ~ 81000MHz
Type of Modulation:	FMCW
Channel Number:	1
Antenna Information:	Lens Horn antenna
Antenna Gain	26.8 dBi

1.3 Description of Test Facility

Name:	Intertek Testing Services (Shanghai FTZ) Co., Ltd.
Address:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L21189
	FCC Accredited Lab Designation Number: CN0175
	IC Registration Lab CAB identifier.: CN0014
	VCCI Registration Lab Registration No.: R-4243, G-845, C-4723, T-2252
	NVLAP Accreditation Lab NVLAP LAB CODE: 200849-0
	A2LA Accreditation Lab Certificate Number: 3309.02

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2023)
ANSI C63.10 (2020)
KDB 890966 DO1 V01r01

2.2 Mode of operation during the test

The channel was tested as representatives.

Frequency Band (MHz)				76000 ~ 81000			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	**79000**	-	-	-	-	-	-

2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.4 Test peripherals list

Item No.	Name	Band and Model	Description
1	DC REGULATED POWER SUPPLY	QJE/QJ3003H	0-30V, 0-3A

2.5 Test environment condition:

Test items	Temperature	Humidity
Fundamental emissions		
Antenna beamwidth		

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Emission outside the frequency band		
Radiated Emissions in restricted frequency bands		
Frequency Stability		
Power line conducted emission	21°C	52% RH

2.6 Instrument list

Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Test Receiver	R&S	ESIB 26	EC 3045	2025-08-18
☑	Test Receiver	R&S	ESR	EC6501	2025-09-10
☑	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2025-03-05
☑	Bilog Antenna	TESEQ	CBL 6112B	EC 6411	2025-09-11
☐	Pre-amplifier	R&S	AFS42-00101800-25-S-42	EC 5262	2025-11-06
☑	Pre-amplifier	Tonscend	tap01018050	EC 6432-1	2025-12-03
☑	Horn antenna	Tonscend	bha9120d	EC 6432-2	2025-03-20
☑	Horn antenna	ETS	3116c	EC 5955	2025-08-14
☑	WW wave antenna (40-60G)	HengDa	M19RH	EC 6529-1	2025-03-09
☑	Mixer (40-60G)	VDi		EC 6529-2	2026-03-05
☑	WW wave antenna (60-90G)	HengDa	M12RH	EC 6382-1	2025-03-14
☑	Mixer (60-90G)	VDi		EC 6382-2	2026-03-05
☑	WW wave antenna (90-140G)	HengDa	M15RH	EC 6383-1	2025-03-12
☑	Mixer (90-140G)	VDi		EC 6383-2	2026-03-05
☑	WW wave antenna (140-220G)	HengDa	M5RH	EC 6384	2025-03-27
☑	Mixer (140-220G)	Keysight		EC 6384-1	2026-03-05
☑	Semi-anechoic chamber	Albatross project	-	EC 3048	2026-07-11
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Therom-Hygrograph	Testo	175h1	EC 6640	2025-08-29
☑	Pressure meter	YM3	Shanghai Mengde	EC 3320	2025-08-16

2.7 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Measurement uncertainty
Maximum peak output power	± 0.74dB
Radiated Emissions in restricted frequency bands below 1GHz	± 4.90dB
Radiated Emissions in restricted frequency bands above 1GHz	± 5.02dB
Emission outside the frequency band	± 2.89dB

3 Fundamental Emissions

Test result: **Pass**

3.1 Limit

The EIRP limits for LPR operations in the bands authorized by this rule section are provided below. The emission limits are based on boresight measurements (i.e., measurements performed within the main beam of an LPR antenna).

Frequencies (GHz)	Average emission limit (EIRP in dBm/1 MHz)	Peak emission limit (EIRP in dBm/50 MHz)
5.925 ~ 7.250	-33	7
24.05 ~ 29.00	-14	26
75 ~ 85	-3	34

3.2 Measurement Procedure

For Radiated emission above 1000MHz:

a) The measurements were performed at 3m test site.
b) The EUT is placed on a non-conductive table is 1.6 meter above test site ground plane.
c) The measurement procedure described in ANSI C63.10-2013 Section 9.9 was followed, to find maximum signal.
d) The average and peak voltages was recorded from the DSO.
e) Replace the EUT with mm-wave source to the RF input port of the instrumentation system.
f) The mm-wave source is unmodulated.
g) Adjust the amplitude of the mm-wave source such that the DSO indicates a voltage equal to the peak voltage recorded in step 4).
h) Without changing any settings, replace the DSO with the mm-wave power meter.
i) Measure and note the power.

Analyzer settings (EIRP in 1 MHz):
a) Resolution Bandwidth (RBW): 1 MHz
b) Video Bandwidth (VBW): 3 MHz
c) Span: 8 GHz
d) Trace: Maxhold
e) Sweeps: allow the trace to stabilize
f) Sweep time: TD = Ts / ΔF (where Ts is the signal sweep frequency time in seconds; ΔF is the signal sweep frequency in MHz)
g) Detector: Peak

Analyzer settings (EIRP in 50 MHz):
a) Resolution Bandwidth (RBW): 50 MHz
b) Video Bandwidth (VBW): 50 MHz
c) Span: 8 GHz

d) Trace: Maxhold
e) Sweeps: allow the trace to stabilize
f) Sweep time: TD = Ts / ΔF (where Ts is the signal sweep frequency time in seconds; ΔF is the signal sweep frequency in MHz)
g) Detector: Peak

Fundamental emission for Pulsed Transmitters

1. For radiated emission measurements, locate the receive test antenna at a far field distance boresighted on the LPR transmit antenna. Adjust the LPR and the test antenna for maximum main beam coupling.

2. For conducted measurements, connect the output of the LPR transmitter through an appropriate attenuator to the downconverter or external harmonic mixer, if necessary, to the spectrum analyzer.

3. Set the spectrum analyzer for power averaging (RMS) detector and 1 MHz RBW.

4. Record the maximum level and frequency of the signal within the fundamental emission bandwidth, which must be contained entirely within the authorized frequency band.

5. Centered on the frequency of the maximum signal recorded in step 4, select peak detector, 50 MHz RBW and at least 50 MHz VBW. a. If 50 MHz RBW is not available on the spectrum analyzer, determine the maximum of the spectrum trace in a narrower RBW which is greater than or less than the PRF by a factor of 3, but not less than 1 MHz, and calculate the maximum signal level in 50 MHz by adding the appropriate correction factor shown below to the maximum measured signal level. For pulsed LPRs

20 Log (50/RBW) dB, if PRF < RBW/3
20 Log (50/PRF) dB, if PRF > 3*RBW

where:
RBW is the resolution bandwidth in MHz
PFR is the pulse repetition frequency in MHz

b. It may be necessary to offset the measurement frequency in order to ensure that the measurement is made within the fundamental emission bandwidth because the 3 dB bandwidth of the RBW is not entirely within the fundamental emission bandwidth. The measurement shall be made at the nearest frequency to the frequency identified in step 4 when the 3 dB point of the RBW closest to the fundamental emission band edge is at the frequency of the band edge.

c. If the measurement must be performed with a RBW greater than 3 MHz because the PRF is between 1 MHz and 3 MHz or for any other reason, the test report must contain a detailed description of the test procedure, calibration of the test setup, and the instrumentation used.

6. Determine the conducted power output of the EUT or the field strength produced by the EUT at a given distance from the measurements in steps 1 to 5 by calculation taking into account all attenuators, amplifier gains, antenna factor, measurement distance extrapolation, conversion loss, cable losses, etc. as applicable or the signal substitution method.

7. The EIRP is then calculated by applying the appropriate equation as follows: a. For conducted measurements EIRP (dBm) = conducted power (dBm) + antenna gain (dBi) where the conducted power is the conducted power output of the EUT and antenna gain is the gain of the EUT antenna.

b. For radiated emission measurements EIRP (dBm) = E (dBμV/m) – 104.8 + 20 Log D where E is the field

strength at the far field distance D.

Fundamental Emissions for FMCW transmitters
When making the following measurements, it is important to recognize that there is a sweep frequency time and sweep frequency span for both the LPR signal and the spectrum analyzer which are independent of each other.

1. For radiated emission measurements, locate the receive test antenna at a far field distance boresighted on the LPR transmit antenna. Adjust the LPR and the test antenna for maximum main beam coupling.

2. For conducted measurements, connect the output of the LPR transmitter through an appropriate attenuator to the downconverter or external harmonic mixer, if necessary, to the spectrum analyzer.

3. Set the spectrum analyzer frequency span to enable viewing the entire sweep frequency span of the LPR signal.

4. Calculate the dwell time, TD, of the sweep frequency signal per MHz of the sweep frequency span

$$TD = TS/\Delta F$$

where:
TS is the signal sweep frequency time in seconds
ΔF is the signal sweep frequency span in MHz

5. Set the detector to peak mode.

6. Set the RBW to 1 MHz.

7. Perform sufficient multiple scans on the spectrum analyzer in maximum hold with a sweep time suitable for displaying the variation in the signal level over the frequency span.

8. Record the maximum signal level. This is the peak value of the LPR signal.

9. Calculate the average factor

Average factor = (TD) / cycle time
where:
cycle time is the total time for a complete cycle of the signal including retrace and any other latency times.

10. Determine the average by multiplying the maximum signal level obtained in Step 8 by the average factor.

11. Determine the conducted power output of the EUT or the field strength produced by the EUT at a given distance from the measurements in steps 1 to 10 by calculation taking into account all attenuators, amplifier gains, antenna factor, measurement distance extrapolation, conversion loss, cable losses, etc. as applicable or the signal substitution method.

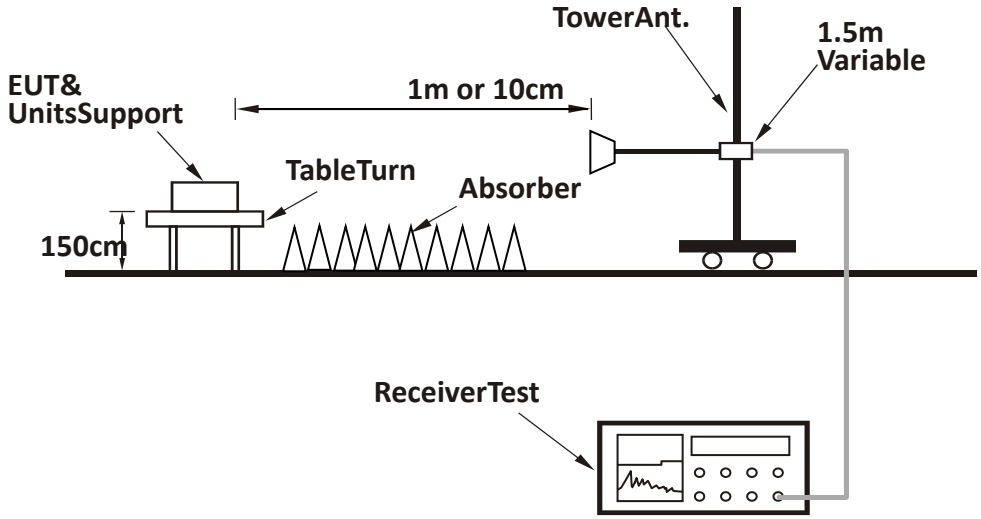
12. The EIRP is then calculated by applying the appropriate equation as follows:
a. For conducted measurements EIRP (dBm) = conducted power (dBm) + antenna gain(dBi) where the conducted power is the conducted power output of the EUT and antenna gain is the gain of the EUT antenna.

b. For radiated emission measurements EIRP (dBm) = E (dBμV/m) – 104.8 + 20 Log D

where E is the field strength at the far field distance D.

3.3 Test Configuration

For Radiated emission above 40GHz:



3.4 Test Results of Radiated Emissions

Peak Power(e.i.r.p)

Frequency (GHz)	P (dBm)	G (dBi)	E (dBμV/m)	d-Meas (m)	Desensitization factor (dB)	EIRP@8M (dBm)	EIRP@50M (dBm)	Limit (dBm)
76.75	-30.83	23.42	120.709	1	0.35	16.36	32.36	34

Note.

1. Sample calculation.

$E = 126.8 – 20\log(\lambda) + P – G$

where

E is the field strength of the emission at the measurement distance, in dBμV/m

P is the power measured at the output of the test antenna, in dBm

λ is the wavelength of the emission under investigation [300/fMHz], in m

G is the gain of the test antenna, in dBi

$EIRP = E_{Meas} + 20\log(d_{Meas}) - 104.7 + \text{Desensitization factor}$

where

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

FMCW desensitization factor =-20 * Log(α) =0.35dB

$$\alpha = \frac{1}{\sqrt[4]{1+\left(\frac{2\ln(2)}{\pi}\right)^2\left(\frac{F_s}{T_s B^2}\right)^2}}$$

F_s = Sweep width = 4065.7MHz

T_s = Sweep time = 4560 μs

B = 3 dB IF bandwidth =8MHz

Average Power(e.i.r.p):

Frequency (GHz)	ERIP (dBm)	Average Factor (dB)	ERIP (dBm)	Limit (dBm)
76.75	14.06	-60.64	-46.58	-3.0

Note.

Frequency Sweep Time Ts = 4560 μs

Signal Sweep Frequency Span ΔF = 4065.7 MHz

Re-trace Time=1.295s

Total-cycle Time =1.3s

Average-Factor = -60.64 dB

Average factor= (sweep freq.time/sweep span in MHz)/cycle time

4 Unwanted emissions

Test result: **Pass**

4.1 Limit

The radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified showed as below:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

4.2 Measurement Procedure

For Radiated emission below 30MHz:

a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c) Both X and Y axes of the antenna are set to make the measurement.
d) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz:

j) The EUT was placed on the top of a rotating table 0.01 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360

degrees to determine the position of the highest radiation.

k) The EUT was set 3 or 1 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

l) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

m) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

n) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

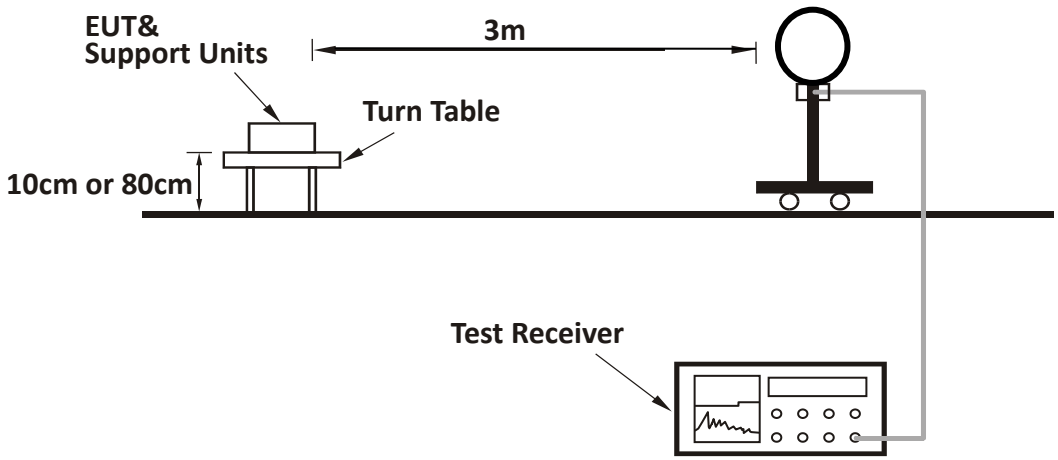
o) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

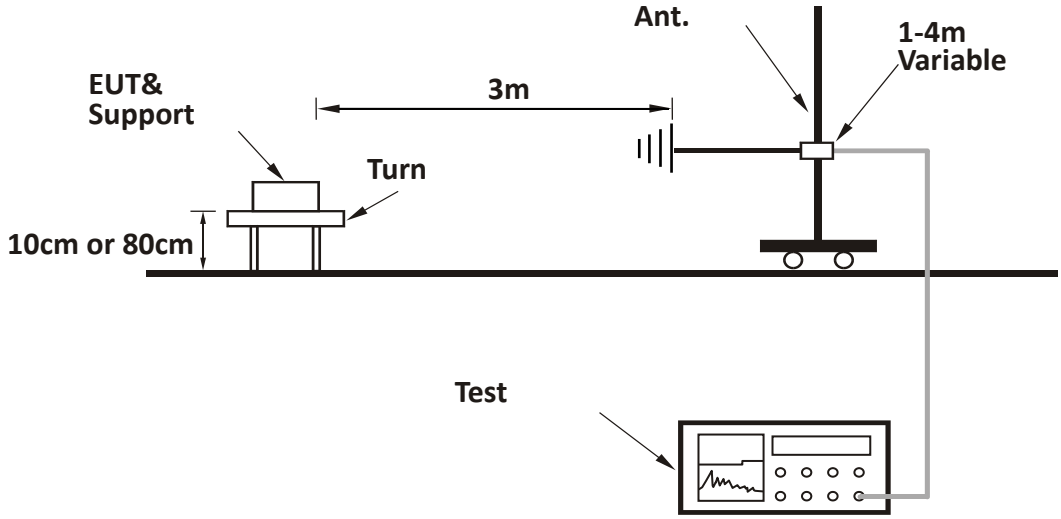
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 3 x RBW (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported

4.3 Test Configuration

For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



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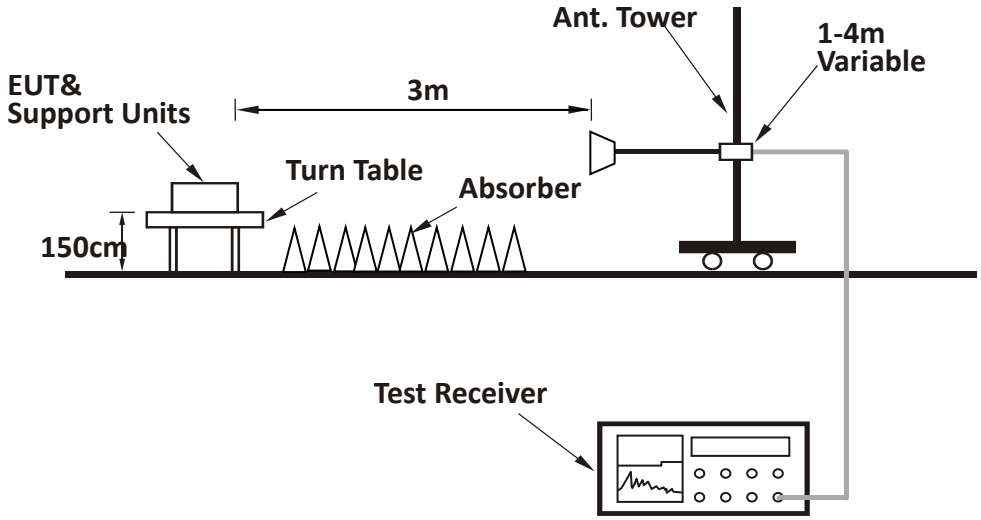
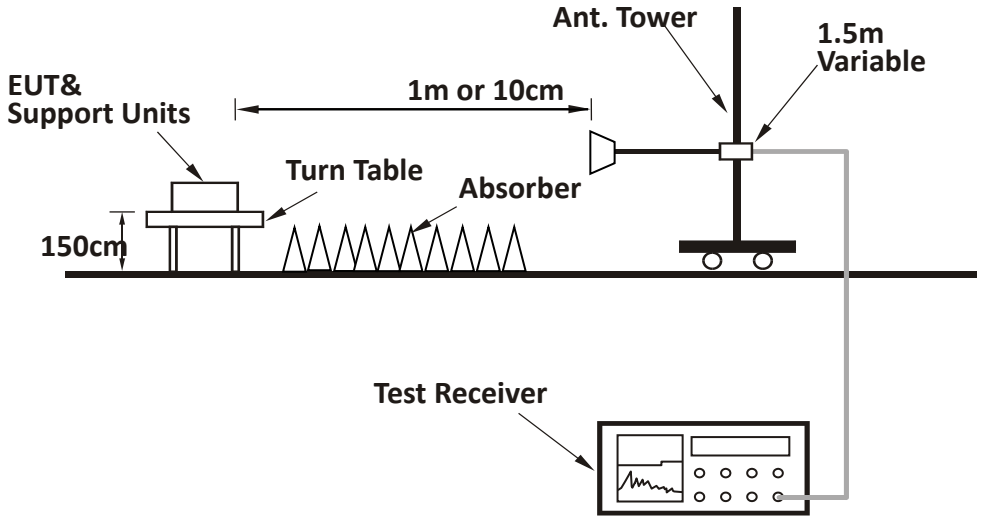
For Radiated emission 1GHz to 40GHz:



For Radiated emission above 40GHz:

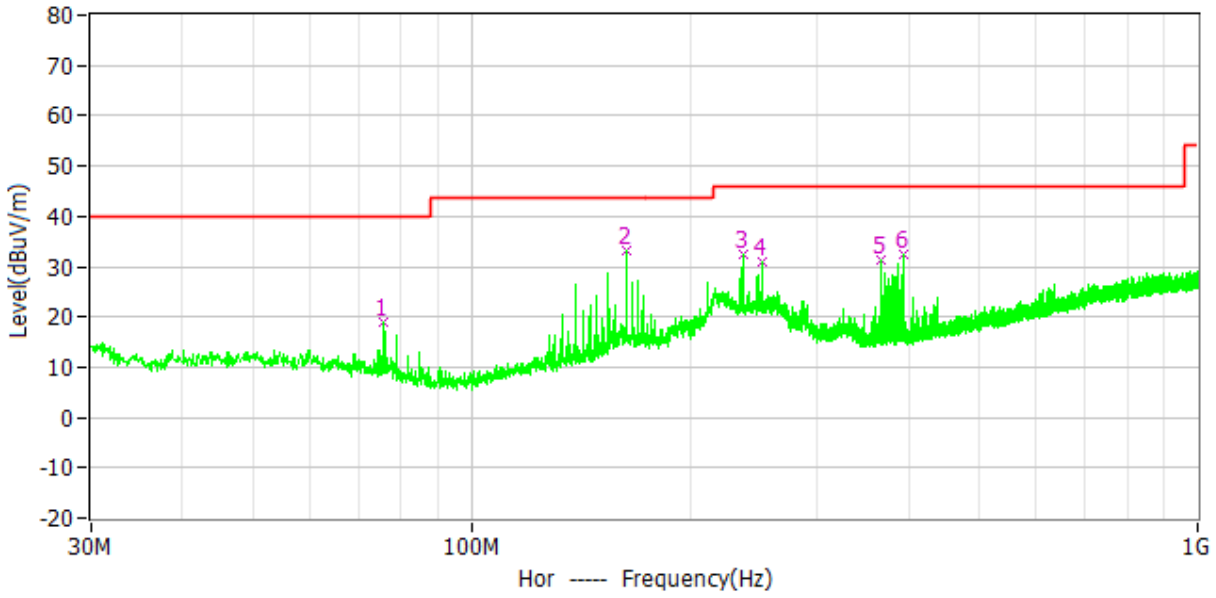


4.4 Test Results of Radiated Emissions

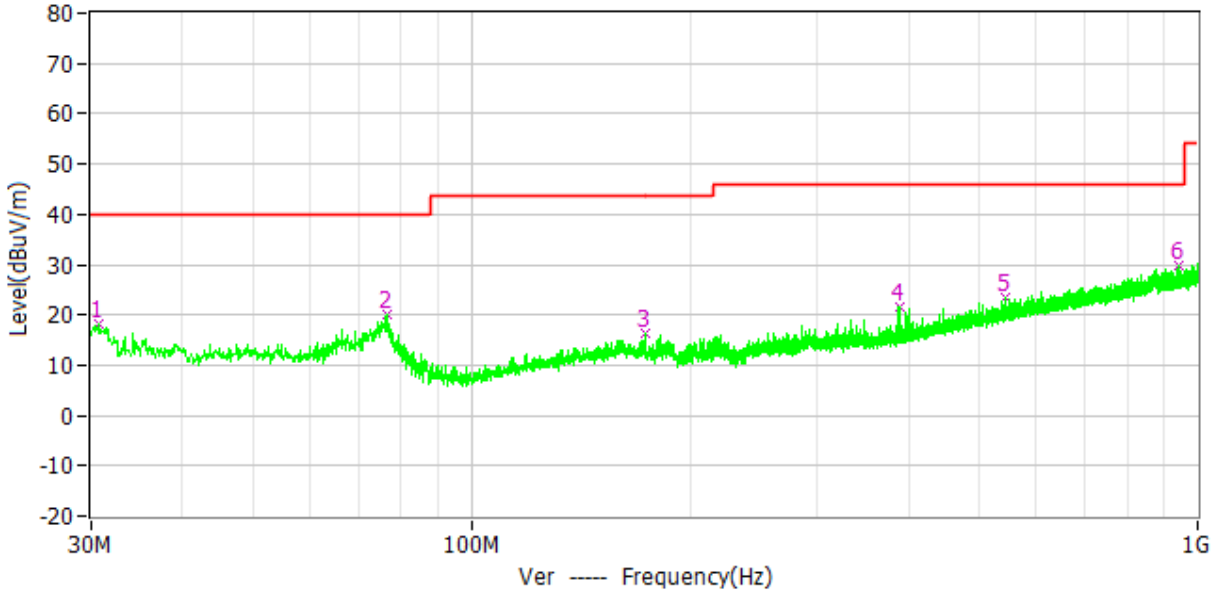
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

The worst waveform from 30MHz to 1000MHz is listed as below:

Horizontal



Vertical



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Test data below 1GHz

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	75.881	19.02	11.16	40.00	20.98	QP
H	163.666	33.34	14.55	43.50	10.16	QP
H	236.319	32.53	13.03	46.00	13.47	QP
H	251.257	30.92	13.65	46.00	15.08	QP
H	367.075	31.20	17.03	46.00	14.80	QP
H	393.653	32.34	17.77	46.00	13.66	QP
V	30.679	18.23	12.30	40.00	21.77	QP
V	76.657	20.16	11.00	40.00	19.84	QP
V	173.269	16.35	13.80	43.50	27.15	QP
V	389.773	21.63	17.66	46.00	24.37	QP
V	543.324	23.45	21.45	46.00	22.55	QP
V	939.957	29.87	27.44	46.00	16.13	QP

The emission was conducted from 1GHz to 40GHz

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	6485	37.17	74.00	36.83	PK
H	6485	23.54	54.00	30.46	AV
H	9279	39.79	74.00	34.21	PK
H	9279	26.95	54.00	27.05	AV
H	12583	35.72	74.00	38.28	PK
H	12583	23.89	54.00	30.11	AV
H	18660	57.68	74.00	16.32	PK
H	18660	46.21	54.00	7.79	AV
H	23324	53.30	74.00	20.70	PK
H	23324	42.09	54.00	11.91	AV
V	7269	41.48	74.00	32.52	PK
V	7269	26.40	54.00	27.60	AV
V	9279	38.22	74.00	35.78	PK
V	9279	24.93	54.00	29.07	AV
V	13162	35.21	74.00	38.79	PK
V	13162	23.77	54.00	30.23	AV
V	18660	58.36	74.00	15.64	PK

V	18660	46.53	54.00	7.47	AV
V	23324	52.57	74.00	21.43	PK
V	23324	38.84	54.00	15.16	AV

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (- Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.
2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = Limit - Corrected Reading
4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV,
Limit = 40.00dBuV/m.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m;
Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m;
Margin = 40.00dBuV/m - 10.20dBuV/m = 29.80dB.

The emission was conducted from 40GHz to 220GHz

Antenna	Frequency (GHz)	E (dBµV/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	58400	64.57	74.00	9.43	PK
H	58400	49.38	54.00	4.62	AV
H	61520	68.05	74.00	5.95	PK
H	61520	51.93	54.00	2.07	AV
H	120270	69.22	74.00	4.78	PK
H	120270	50.06	54.00	3.94	AV
H	201553	72.85	74.00	1.15	PK
H	201553	53.17	54.00	0.83	AV
V	57280	65.43	74.00	8.57	PK
V	57280	50.16	54.00	3.84	AV
V	61055	66.96	74.00	7.04	PK
V	61055	51.02	54.00	2.98	AV
V	120558	68.35	74.00	5.65	PK
V	120558	49.03	54.00	4.97	AV
V	201119	71.12	74.00	2.88	PK
V	201119	52.54	54.00	1.46	AV

Remark: 1. Correct Factor = Antenna Factor + Cable Loss + Mixer Conversion Loss, the value was added to Original Receiver Reading by the software automatically.
2. Sample calculation.
$E = 126.8 – 20\log(\lambda) + P – G$
where
E is the field strength of the emission at the measurement distance, in dBµV/m
P is the power measured at the output of the test antenna, in dBm

λ is the wavelength of the emission under investigation [300/fMHz], in m

G is the gain of the test antenna, in dBi

5 Frequency stability

Test result: **Pass**

5.1 Limit

Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range −20 to + 50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

5.2 Test Result

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	Tested Frequency: 79 GHz	
			Measured low frequency(FL) (GHz)	Measured High frequency(FH) (GHz)
100%	24.0	-20	76.93482	80.99819
100%				
100%		-10	76.93485	80.99856
100%		0	76.93438	80.99816
100%		+10	76.93451	80.99893
100%		+20	76.93475	80.99887
100%		+30	76.93418	80.99855
100%		+40	76.93492	80.99825
100%		+50	76.93385	80.99797
115%	27.6	+20	76.93481	80.99889
85%	20.4	+20	76.93479	80.99885

Note: Fundamental emissions were contained within the frequency bands

6 Antenna Beamwidth and Antenna Side Lobe Gain

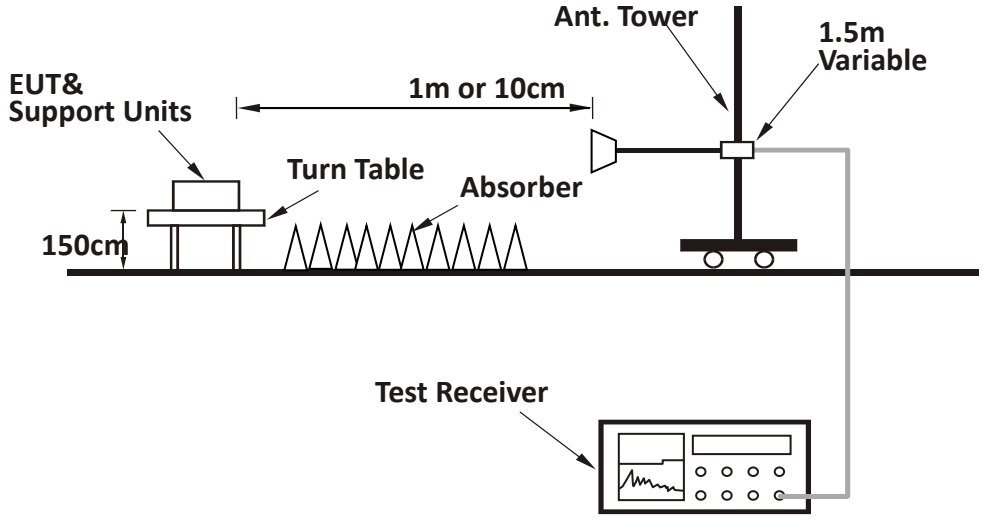
Test result: **Pass**

6.1 Limit

LPR devices operating under the provisions of this section within the 5.925-7.250 GHz and 24.05-29.00 GHz bands must use an antenna with a −3 dB beamwidth no greater than 12 degrees.
LPR devices operating under the provisions of this section within the 75-85 GHz band must use an antenna with a −3 dB beamwidth no greater than 8 degrees.

Frequency range (GHz)	Antenna sidelobe gainlimit relativeto mainbeam gain (dB)
5.925-7.250	-22
24.05-29.00	-27
75-85	-38

6.2 Test Configuration



6.3 Measurement Procedure

1) The EUT was placed on the top of a rotating table 0.01 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

2)The EUT was set 3 or 1 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

3)The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

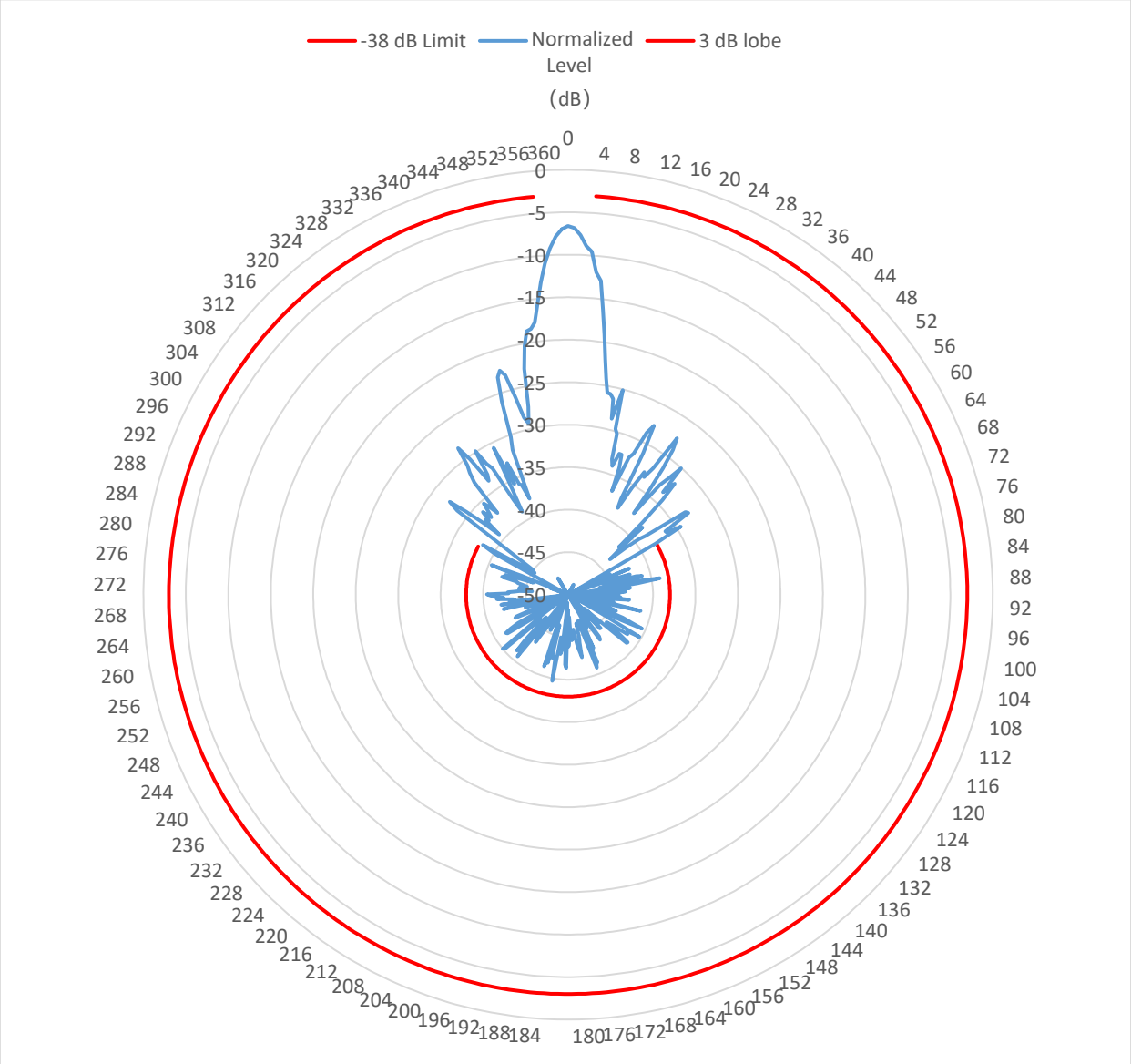
4)For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1.5 meter and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

5)The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

Note:

The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.

6.4 Test Results



7 Fundamental bandwidth

Test result: **Pass**

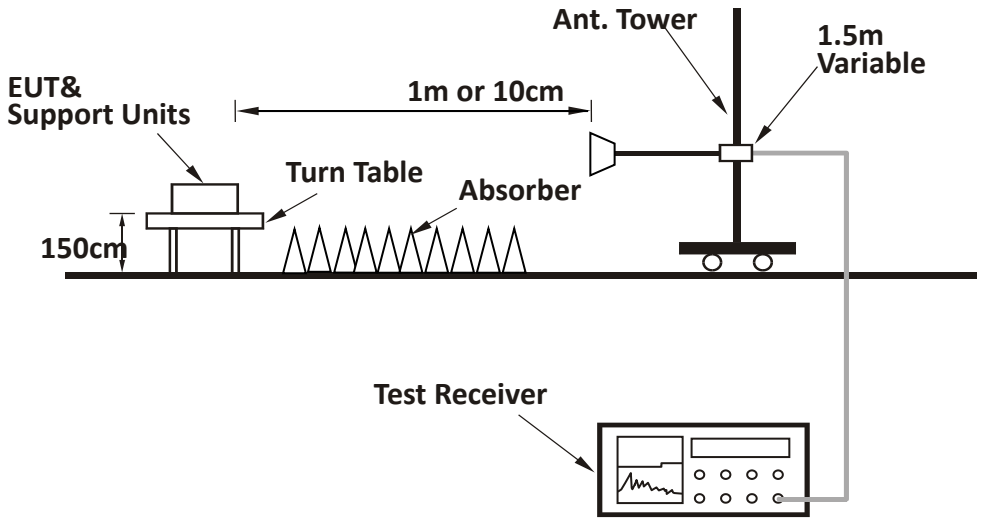
7.1 Limit

Intentional radiators must be designed to ensure that the 10 dB bandwidth of the emission is contained within the allocated frequency band.

7.2 Measurement Procedure

The 10dB Bandwidth is measured using the Spectrum Analyzer.
Set Span = 2 to 3 times the 10 dB bandwidth, RBW = approximately 1% to 5% of the actual occupied, VBW>3xRBW, Sweep = auto, Detector = peak, Trace = max hold.
The test was performed at one channel.

7.3 Test Configuration



7.4 The results

Frequency band (MHz)	10dB Bandwidth (MHz)	99% Bandwidth (MHz)	F_L at 20dB BW (MHz)	F_H at 20dB BW (MHz)
75000 ~ 82000	76921.62	76934.75	>75000	/
	81030.36	80998.87	/	<82000
Limit	N/A	N/A	F_L >75000	F_H <82000
Result	**Complied**			

8 Antenna requirement

Requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Result:
EUT uses permanently attached antenna to the intentional radiator, so it can comply with the provisions of this section.

********** END **********