



Shenzhen HUAK Testing Technology Co., Ltd.  
Report No.: HK1912053151-E

# TEST REPORT

**FCC ID: 2AQLY-SUMMIT**

**Product: Handheld Translation And Recording Device**

**Model No.: Summit**

**Additional Model No.: G1, Pro, G2, G3, G4, G5**

**Trade Mark: Langogo**

**Report No.: HK1912053151-E**

**Issued Date: Nov. 28, 2019**

**Issued for:**

**Langogo Technology Co., LTD.**

**2 / F, Boxun Building, Keyuan North Road, Nanshan District, Shenzhen  
518000, China**

**Issued By:**

**Shenzhen HUAK Testing Technology Co., Ltd.**

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**Appendix A: Photographs of Test Setup**

**Appendix B: Photographs of EUT**

**Test Data: Refer to Appendix For LTE Band 26**



## 1. Test Certification

<b>Product:</b>	Handheld Translation And Recording Device
<b>Model No.:</b>	Summit
<b>Additional Model:</b>	G1, Pro, G2, G3, G4, G5
<b>Trade Mark:</b>	Langogo
<b>Applicant:</b>	Langogo Technology Co., LTD.
<b>Address:</b>	2 / F, Boxun Building, Keyuan North Road, Nanshan District, Shenzhen 518000, China
<b>Manufacturer:</b>	Jiangxi hongyaoda Communication Co., Ltd.
<b>Address:</b>	No.69, North Huangjin Avenue, Ganzhou economic and Technological Development Zone, Ganzhou City, Jiangxi Province, China
<b>Date of Test:</b>	Oct. 25, 2019 – Nov. 27, 2019
<b>Applicable Standards:</b>	FCC CFR Title 47 Part 2 FCC CFR Title 47 Part90

*The above equipment has been tested by Shenzhen HUAK Testing Technology Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.*

**Tested By:**

(Gary Qian)

**Date:**

Nov. 27, 2019

**Reviewed By:**

(Eden Hu)

**Date:**

Nov. 28, 2019

**Approved By:**

(Jason Zhou)

**Date:**

Nov. 28, 2019



## 2. Test Result Summary

Requirement	CFR 47 Section	Result
Conducted Output Power	§2.1046; §90.635;	PASS
Peak-to-Average Ratio	§2.1046;	PASS
Effective Radiated Power	§2.1046; §90.635;	PASS
Occupied Bandwidth	§2.1049;	PASS
Band Edge	§2.1051; §90.691	PASS
Conducted Spurious Emission	§2.1051; §90.691	PASS
Field Strength of Spurious Radiation	§2.1053; §90.691	PASS
Frequency Stability for Temperature & Voltage	§2.1055; §90.231	PASS

**Note:**

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.



### 3. EUT Description

<b>Product Name:</b>	Handheld Translation And Recording Device
<b>Model :</b>	Summit
<b>Additional Model:</b>	G1, Pro, G2, G3, G4, G5
<b>Trade Mark:</b>	Langogo
<b>Tx Frequency:</b>	LTE Band 26: 814 MHz ~ 824 MHz
<b>Rx Frequency:</b>	LTE Band 26: 859MHz ~ 869 MHz
<b>Bandwidth:</b>	LTE Band 26: 1.4MHz /3MHz /5MHz /10MHz
<b>Maximum Output Power to Antenna:</b>	LTE Band 26: 23.50dBm
<b>99% Occupied Bandwidth:</b>	LTE Band 26: 9M56G7D
<b>Type of Modulation:</b>	QPSK/16QAM
<b>Antenna Type:</b>	Internal Antenna
<b>Antenna Gain:</b>	LTE Band 26: 0.54dBi
<b>Power Supply:</b>	Rechargeable Li-ion Battery DC 3.85V
<b>Remark:</b>	All models above are identical in interior structure, electrical circuits and components, just model names and colors are different for the marketing requirement.

### Emission Designator

LTE Band 26	QPSK		16QAM	
	BW(MHz)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
1.4	1M27G7D	0.251	1M26W7D	0.248
3	2M86G7D	0.248	2M86W7D	0.206
5	4M78G7D	0.252	4M79W7D	0.209
10	9M56G7D	0.254	9M56W7D	0.208



## 4. General Information

### 4.1. Test environment and mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Operation mode:	Keep the EUT in continuous transmitting with modulation
The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

#### Description Operation Frequency

LTE Band 26(1.4MHz)		LTE Band 26(3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
26697	814.7	26705	815.5
26740	819.0	26740	819.0
26783	823.3	26775	822.5
LTE Band 26(5MHz)		LTE Band 26(10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
26715	816.5	26740	819.0
26740	819.0	-	-
26765	821.5	-	-



## 4.2. Test Mode

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

Test Mode		
Band	Radiated TCs	Conducted TCs
LTE Band 26	QPSK Link (1.4MHz / 3MHz / 5MHz / 10MHz)	16QAM Link (1.4MHz / 3MHz / 5MHz / 10MHz)

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas License Digital Systems v03 with maximum output power. Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

## 4.3. Description of Support Units

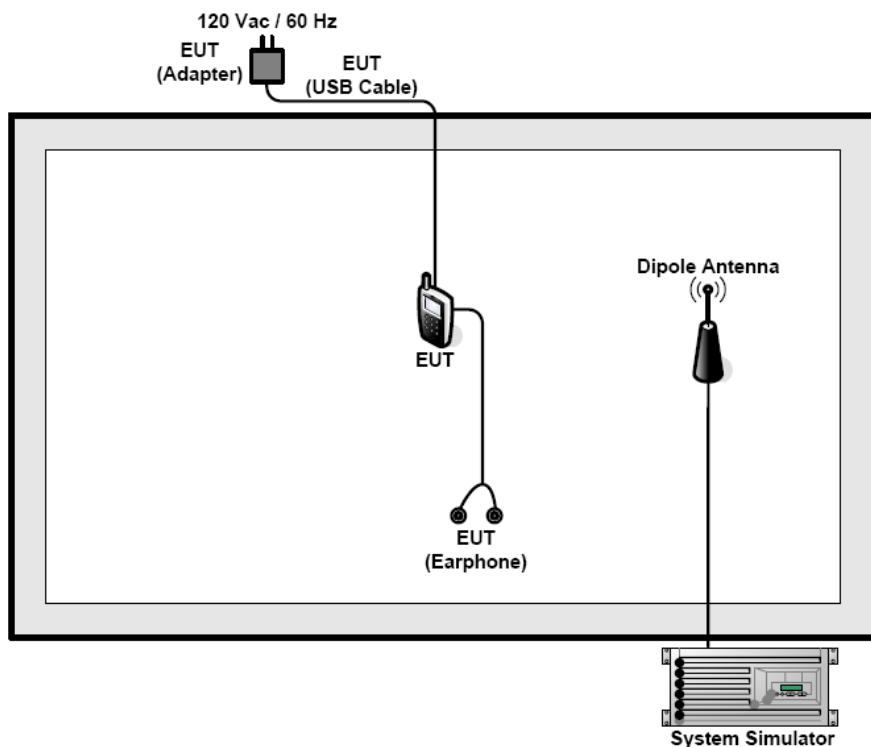
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

**Note:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

#### 4.4. Configuration of Tested System



#### 4.5. Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level. The spectrum analyzer offset is derived from RF cable loss and attenuator factor.  
 $Offset = RF\ cable\ loss + attenuator\ factor$ .



#### 4.6. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	HKE-059	2018/12/27	2019/12/26
LISN	R&S	ENV216	HKE-002	2018/12/27	2019/12/26
Receiver	R&S	ESCI 7	HKE-010	2018/12/27	2019/12/26
Spectrum analyzer	R&S	FSP40	HKE-025	2018/12/27	2019/12/26
Spectrum analyzer	Agilent	N9020A	HKE-048	2018/12/27	2019/12/26
RF automatic control unit	Tonscend	JS0806-1	HKE-060	2018/12/27	2019/12/26
Loop antenna	Schwarzbeck	FMZB 1519 B	HKE-014	2018/12/27	2019/12/26
Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	2018/12/27	2019/12/26
Horn antenna	Schwarzbeck	9120D	HKE-013	2018/12/27	2019/12/26
High gain antenna	Schwarzbeck	LB-180400KF	HKE-054	2018/12/27	2019/12/26
Preamplifier	EMCI	EMC051845SE	HKE-015	2018/12/27	2019/12/26
Preamplifier	Agilent	83051A	HKE-016	2018/12/27	2019/12/26
Preamplifier	Schwarzbeck	BBV 9743	HKE-006	2018/12/27	2019/12/26
Temperature and humidity meter	Boyang	HTC-1	HKE-075	2018/12/27	2019/12/26
High-low temperature chamber	Guangke	HT-80L	HKE-118	2018/12/27	2019/12/26
High pass filter unit	Tonscend	JS0806-F	HKE-055	2018/12/27	2019/12/26
RF Cable(below1GHz)	Times	9kHz-1GHz	HKE-117	2018/12/27	2019/12/26
RF Cable(above 1GHz)	Times	1-40G	HKE-034	2018/12/27	2019/12/26
Power meter	Agilent	E4419B	HKE-085	2018/12/27	2019/12/26
Power Sensor	Agilent	E9300A	HKE-086	2018/12/27	2019/12/26
Conducted test software	Tonscend	TS+ Rev 2.5.0.0	HKE-081	N/A	N/A
Radiated test software	Tonscend	TS+ Rev 2.5.0.0	HKE-082	N/A	N/A
RF test software	Tonscend	JS1120-B Version 2.6	HKE-083	N/A	N/A
RF test software	Tonscend	JS1120-4	HKE-113	N/A	N/A
RF test software	Tonscend	JS1120-3	HKE-114	N/A	N/A
RF test software	Tonscend	JS1120-1	HKE-115	N/A	N/A
Wireless Communication Test Set	R&S	CMW500	HKE-026	2018/12/27	2019/12/26
Wireless Communication Test Set	R&S	CMU200	HKE-029	2018/12/27	2019/12/26



## 5. Facilities and Accreditations

### 5.1. Facilities

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

- FCC - Registration No.: 616276

Shenzhen HUAK Testing Technology Co., Ltd.

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 21210

The 3m Semi-anechoic chamber of Shenzhen HUAK Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

### 5.2. Location

Test Firm: Shenzhen HUAK Testing Technology Co., Ltd.

Address: 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China

### 5.3. Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

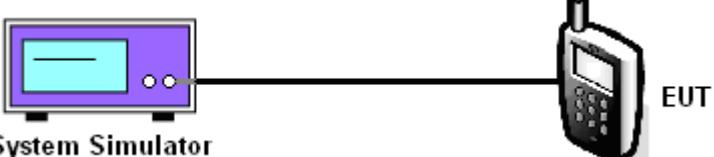
No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^\circ\text{C}$
7	Humidity	$\pm 1.0\%$



## 6. Test Results and Measurement Data

### 6.1. Conducted Output Power Measurement

#### 6.1.1. Test Specification

<b>Test Requirement:</b>	FCC part 90.635
<b>Test Method:</b>	FCC part 2.1046
<b>Limits:</b>	LTE Band 26: 100W
<b>Test Setup:</b>	 <p>System Simulator</p> <p>EUT</p>
<b>Test Procedure:</b>	<ol style="list-style-type: none"><li>1. The transmitter output port was connected to the system simulator.</li><li>2. Set EUT at maximum power through system simulator.</li><li>3. Select lowest, middle, highest channels for each band and different modulation.</li><li>4. Measure and record the power level from the system simulator.</li></ol>
<b>Test Result:</b>	PASS



## 6.2. Peak to Average Ratio

### 6.2.1. Test Specification

<b>Test Method:</b>	FCC KDB 971168 D01v03
<b>Limit:</b>	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
<b>Test Setup:</b>	
<b>Test Procedure:</b>	<ol style="list-style-type: none"><li>1. The testing follows FCC KDB 971168 D01v03 Section 5.7.1.</li><li>2. The EUT was connected to spectrum analyzer and system simulator via a power divider.</li><li>3. Set EUT to transmit at maximum output power.</li><li>4. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.</li></ol>
<b>Test Result:</b>	PASS



### 6.3. 99% Occupied Bandwidth and 26dB Bandwidth Measurement

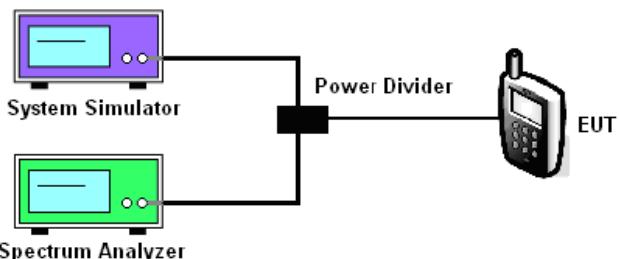
#### 6.3.1. Test Specification

<b>Test Method:</b>	FCC part 2.1049
<b>Limit:</b>	N/A
<b>Test Setup:</b>	<p>The diagram illustrates the test setup. A 'System Simulator' (represented by a purple box with a screen and three dots) is connected to a 'Power Divider' (represented by a black rectangle). The 'Power Divider' is connected to a 'Spectrum Analyzer' (represented by a green box with a screen and three dots) and an 'EUT' (Equipment Under Test, represented by a black mobile phone icon).</p>
<b>Test Procedure:</b>	<ol style="list-style-type: none"><li>1. The testing follows FCC KDB 971168 D01v03 Section 4.2.</li><li>2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.</li><li>3. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li><li>4. The 99% occupied bandwidth were measured, set RBW= 1% of OBW, VBW= 3*RBW, sample detector, trace maximum hold.</li><li>5. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.</li></ol>
<b>Test Result:</b>	PASS



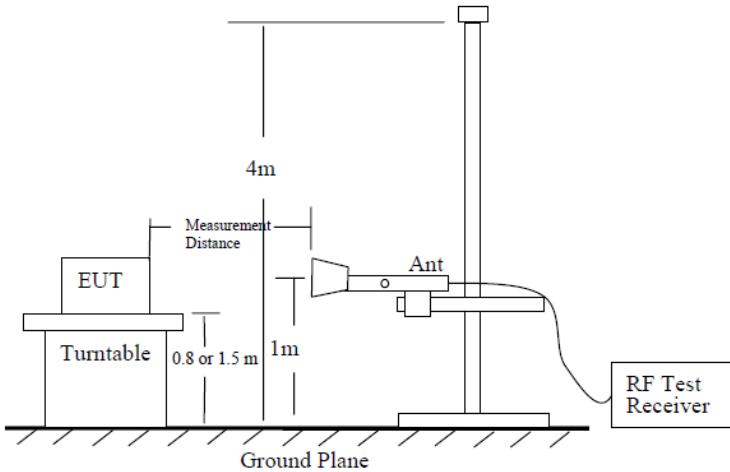
## 6.4. Band Edge and Conducted Spurious Emission Measurement

### 6.4.1. Test Specification

<b>Test Requirement:</b>	FCC part 90.691
<b>Test Method:</b>	FCC part2.1051
<b>Limit:</b>	For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.
<b>Test Setup:</b>	
<b>Test Procedure:</b>	<ol style="list-style-type: none"><li>1. The testing follows FCC KDB 971168 D01v03 Section 6.0.</li><li>2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.</li><li>3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.</li><li>4. The band edges of low and high channels for the highest RF powers were measured.</li><li>5. The conducted spurious emission for the whole frequency range was taken.</li><li>6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.</li></ol>
<b>Test Result:</b>	PASS

## 6.5. Field Strength of Spurious Radiation Measurement

### 6.5.1. Test Specification

<b>Test Requirement:</b>	FCC part 90.691
<b>Test Method:</b>	FCC part 2.1053
<b>Limit:</b>	30MHz~20GHz -13dBm
<b>Test setup:</b>	
<b>Test Procedure:</b>	<ol style="list-style-type: none"><li>1. The testing follows FCC KDB 971168 D01v03 Section 5.8 and ANSI / TIA-603-D-2010Section 2.2.12.</li><li>2. The EUT was placed on a rotatable wooden table 0.8 meters above the ground.</li><li>3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.</li><li>4. The table was rotated 360 degrees to determine the position of the highest spurious emission.</li><li>5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical</li></ol>



	<p>polarizations.</p> <p>6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.</p> <p>7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.</p> <p>8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.</p> <p>9. Taking the record of output power at antenna port.</p> <p>10. Repeat step 7 to step 8 for another polarization.</p> <p>11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain</p> <p>12. ERP (dBm) = EIRP - 2.15</p> <p>13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.</p>
<b>Test results:</b>	PASS
<b>Remark:</b>	All modulations have been tested, but only the worst modulation show in this test item.



### 6.5.2. Test Data

#### Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Limit@3m (dB $\mu$ V/m)
--	--	--
--	--	--
--	--	--
--	--	--

**Note:** 1. Emission Level=Reading+ Cable loss+Antenna factor-Amp factor

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement



Band	Band 26(QPSK, 5MHz)		Test channel:	Lowest
Test mode:			Temperature :	25°C
Note:			Relative Humidity:	56%
Frequency (MHz)	Spurious Emission			
	Polarization	Level (dBm)	Limit (dBm)	Result
1633.00	Vertical	-32.98	-13.00	PASS
2449.50	V	-38.46		
3266.00	V	-52.43		
1633.00	Horizontal	-31.76		
2449.50	H	-37.99		
3266.00	H	-50.84		
Band	Band 26(QPSK, 5MHz)		Test channel:	Middle
Test mode:			Temperature :	25°C
Note:			Relative Humidity:	56%
Frequency (MHz)	Spurious Emission			
	Polarization	Level (dBm)	Limit (dBm)	Result
1638.00	Vertical	-32.79	-13.00	PASS
2457.00	V	-43.80		
3276.00	V	-51.63		
1638.00	Horizontal	-30.71		
2457.00	H	-38.62		
3276.00	H	-51.91		
Band	Band 26(QPSK, 5MHz)		Test channel:	Highest
Test mode:			Temperature :	25°C
Note:			Relative Humidity:	56%
Frequency (MHz)	Spurious Emission			
	Polarization	Level (dBm)	Limit (dBm)	Result
1643.00	Vertical	-34.22	-13.00	PASS
2464.50	V	-43.34		
3286.00	V	-51.91		
1643.00	Horizontal	-30.67		
2464.50	H	-39.80		
3286.00	H	-53.44		

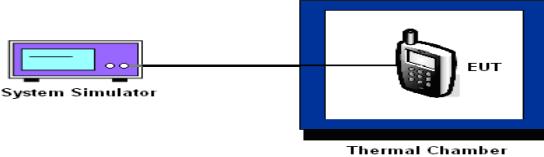


Band	Band 26(16QAM, 5MHz)		Test channel:	Lowest
Test mode:			Temperature :	25°C
Note:			Relative Humidity:	56%
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
1633.00	Vertical	-33.82	-13.00	PASS
2449.50	V	-38.56		
3266.00	V	-52.77		
1633.00	Horizontal	-31.50		
2449.50	H	-37.31		
3266.00	H	-50.09		
Band	Band 26(16QAM, 5MHz)		Test channel:	Middle
Test mode:			Temperature :	25°C
Note:			Relative Humidity:	56%
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
1638.00	Vertical	-32.74	-13.00	PASS
2457.00	V	-43.90		
3276.00	V	-51.61		
1638.00	Horizontal	-30.55		
2457.00	H	-38.16		
3276.00	H	-51.83		
Band	Band 26(16QAM, 5MHz)		Test channel:	Highest
Test mode:			Temperature :	25°C
Note:			Relative Humidity:	56%
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
1643.00	Vertical	-34.79	-13.00	PASS
2464.50	V	-43.46		
3286.00	V	-51.11		
1643.00	Horizontal	-30.80		
2464.50	H	-39.66		
3286.00	H	-53.72		



## 6.6. Frequency Stability Measurement

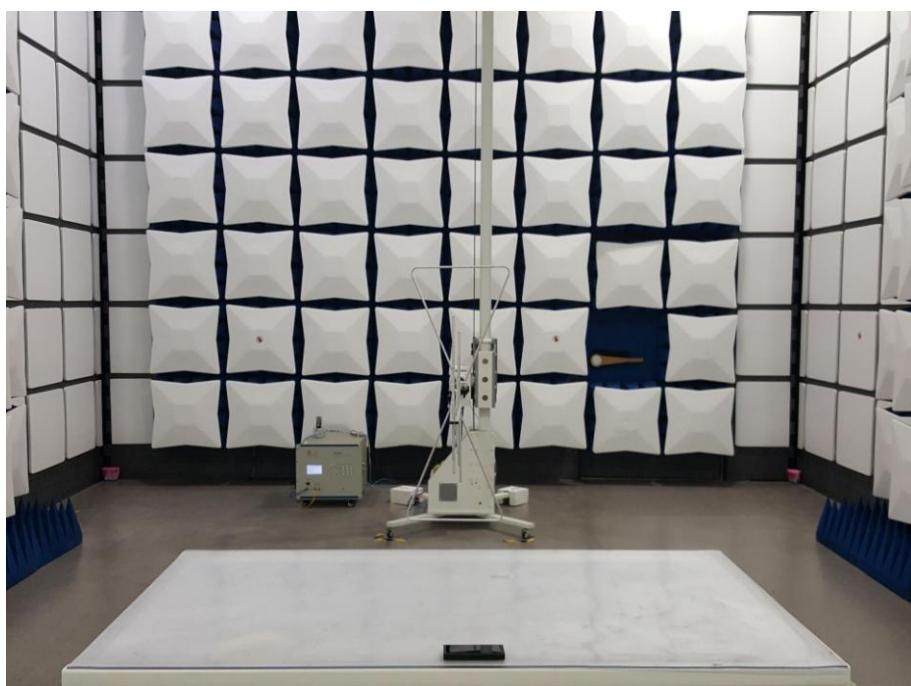
### 6.6.1. Test Specification

<b>Test Requirement:</b>	FCC part 90.213
<b>Test Method:</b>	FCC Part 2.1055
<b>Limit:</b>	$\pm 2.5$ ppm
<b>Test Setup:</b>	
<b>Test Procedure:</b>	<p><b>Test Procedures for Temperature Variation</b></p> <ol style="list-style-type: none"><li>1. The testing follows FCC KDB 971168 D01v03 Section 9.0.</li><li>2. The EUT was set up in the thermal chamber and connected with the system simulator.</li><li>3. With power OFF, the temperature was decreased to <math>-30^{\circ}\text{C}</math> and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.</li><li>4. With power OFF, the temperature was raised in <math>10^{\circ}\text{C}</math> steps up to <math>50^{\circ}\text{C}</math>. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.</li></ol> <p><b>Test Procedures for Voltage Variation</b></p> <ol style="list-style-type: none"><li>1. The testing follows FCC KDB 971168 D01v03 Section 9.0.</li><li>2. The EUT was placed in a temperature chamber at <math>25\pm 5^{\circ}\text{C}</math> and connected with the system simulator.</li><li>3. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.</li><li>4. The variation in frequency was measured for the worst case.</li></ol>
<b>Test Result:</b>	PASS



## Appendix A: Photographs of Test Setup

Product: Handheld Translation And Recording Device  
Model: Summit  
Radiated Emission





## Appendix B: Photographs of EUT

Refer to test report TCT191024E024

### Test Data for Appendix For LTE Band26

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