

# **Radio Test Report**

Report No.:STS2412330W05

Issued for

Shiye Technology (Shenzhen) Co., Ltd.

307-5, Qianhai Shengang Youth Innovation Hub, Tinghai Avenue, Nanshan District, Shenzhen, China, 518052

Product Name: HUD Glasses

Brand Name: Cybersight

Model Name: C01

Series Model(s): N/A

FCC ID: 2BPIU-C01

Test Standards: FCC Part15.247

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.



Page 2 of 73 Report No.: STS2412330W05

#### **TEST REPORT**

Applicant's Name...... Shiye Technology (Shenzhen) Co., Ltd.

Address . 307-5, Qianhai Shengang Youth Innovation Hub, Tinghai Avenue,

Nanshan District, Shenzhen, China, 518052

Manufacturer's Name ....... Shiye Technology (Shenzhen) Co., Ltd.

Nanshan District, Shenzhen, China, 518052i Avenue, Nanshan

District, Shenzhen, China, 518052

**Product Description** 

Product Name .....: HUD Glasses

Brand Name .....: Cybersight

Model Name .....: C01

Series Model(s) .....: N/A

Test Standards.....: FCC Part15.247

Test Procedure ...... ANSI C63.10-2020

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

Date of Test .....:

Date of receipt of test item ...... 31 Dec. 2024

Date (s) of performance of tests...... 31 Dec. 2024 ~ 29 Apr. 2025

Date of Issue...... 29 Apr. 2025

Test Result.....: Pass

Testing Engineer : /Jahn 13 u

(Aaron Bu)

Technical Manager :

(Skylar Li)

TESTING APPROVA

Authorized Signatory:

(Bovey Yang)

Tel: +86-755 3688 6288 Fax: +86-755 3688 6277 Http://www.stsapp.com E-mail:sts@stsapp.com



# Page 3 of 73 Report No.: STS2412330W05

# **Table of Contents**

1. SUMMARY OF TEST RESULTS	6
1.1 TEST FACTORY	7
1.2 MEASUREMENT UNCERTAINTY	7
2. GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF THE EUT	8
2.2 DESCRIPTION OF THE TEST MODES	9
2.3 TEST SOFTWARE AND POWER LEVEL	10
2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYST	EM TESTED 10
2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPOR	RT UNITS 11
2.6 EQUIPMENTS LIST	12
3. EMC EMISSION TEST	13
3.1 CONDUCTED EMISSION MEASUREMENT	13
3.2 TEST PROCEDURE	14
3.3 TEST SETUP	14
3.4 EUT OPERATING CONDITIONS	14
3.5 TEST RESULTS	15
4. RADIATED EMISSION MEASUREMENT	17
4.1 RADIATED EMISSION LIMITS	17
4.2 TEST PROCEDURE	19
4.3 TEST SETUP	20
4.4 EUT OPERATING CONDITIONS	20
4.5 FIELD STRENGTH CALCULATION	21
4.6 TEST RESULTS	22
5. CONDUCTED SPURIOUS & BAND EDGE EMISSION	35
5.1 LIMIT	35
5.2 TEST PROCEDURE	35
5.3 TEST SETUP	35
5.4 EUT OPERATION CONDITIONS	35
5.5 TEST RESULTS	35
6. POWER SPECTRAL DENSITY TEST	36
6.1 LIMIT	36
6.2 TEST PROCEDURE	36
6.3 TEST SETUP	36



# Page 4 of 73 Report No.: STS2412330W05

# **Table of Contents**

6.4 EUT OPERATION CONDITIONS	36
6.5 TEST RESULTS	36
7. BANDWIDTH TEST	37
7.1 LIMIT	37
7.2 TEST PROCEDURE	37
7.3 TEST SETUP	37
7.4 EUT OPERATION CONDITIONS	37
7.5 TEST RESULTS	37
8. PEAK OUTPUT POWER TEST	38
8.1 LIMIT	38
8.2 TEST PROCEDURE	38
8.3 TEST SETUP	39
8.4 EUT OPERATION CONDITIONS	39
8.5 TEST RESULTS	39
9. ANTENNA REQUIREMENT	40
9.1 STANDARD REQUIREMENT	40
9.2 EUT ANTENNA	40
APPENDIX 1-TEST DATA	41
1. DUTY CYCLE	41
2. MAXIMUM AVERAGE CONDUCTED OUTPUT POWER	45
3. MAXIMUM PEAK CONDUCTED OUTPUT POWER	49
46DB BANDWIDTH	53
6. MAXIMUM POWER SPECTRAL DENSITY LEVEL	57
7. BAND EDGE	61
8. CONDUCTED RF SPURIOUS EMISSION	66
APPENDIX 2- EUT TEST PHOTO	73



Page 5 of 73

Report No.: STS2412330W05

# **Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	29 Apr. 2025	STS2412330W05	ALL	Initial Issue
		1		



Page 6 of 73 Report No.: STS2412330W05

# 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards: KDB 558074 D01 15.247 Meas Guidance v05r02.

FCC Part 15.247,Subpart C				
Standard Section	Test Item	Judgment	Remark	
15.207	Conducted Emission	PASS		
15.247 (a)(2)	6dB Bandwidth	PASS		
15.247 (b)(3)	Output Power	PASS		
15.209	Radiated Spurious Emission	PASS		
15.247 (d)	Conducted Spurious & Band Edge Emission	PASS		
15.247 (e)	Power Spectral Density	PASS		
15.205	Restricted bands of operation	PASS		
Part 15.247(d)/ Part 15.209(a)	Band Edge Emission	PASS		
15.203	Antenna Requirement	PASS		

# NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report.
- (2) All tests are according to ANSI C63.10-2020.



Page 7 of 73 Report No.: STS2412330W05

#### 1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add.: 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569 IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

#### 1.2 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	Uncertainty
1	RF output power, conducted	±0.755dB
2	Unwanted Emissions, conducted	±2.874dB
3	All emissions, radiated 9K-30MHz	±3.80dB
4	All emissions, radiated 30M-1GHz	±4.18dB
5	All emissions, radiated 1G-6GHz	±4.90dB
6	All emissions, radiated>6G	±5.24dB
7	Conducted Emission (9KHz-150KHz)	±2.19dB
8	Conducted Emission (150KHz-30MHz)	±2.53dB
9	Occupied Channel Bandwidth	±3.5%
10	Power Spectral Density, conducted	±1.245dB
11	Duty Cycle	±3.2%



Page 8 of 73 Report No.: STS2412330W05

#### 2. GENERAL INFORMATION

# 2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	HUD Glasses		
Brand Name	Cybersight		
Model Name	C01		
Series Model(s)	N/A		
Model Difference	N/A		
	The EUT is a HUD Operation Frequency:	2402~2480 MHz	
	Modulation Type:	GFSK	
	Radio Technology:	BLE	
Product Description	Bluetooth Configuration:	LE(Support 1M PHY, 2M PHY)	
	Number Of Channel:	40	
	Antenna Type:	PCB	
	Antenna Gain:	-2dBi	
Channel List	Please refer to the I	Note 3.	
Power Rating	N/A		
Adapter	N/A		
Battery	Rated Voltage: 3.85V Charge Limit Voltage:4.40 V Capacity: 160 mAh		
Hardware version number	V1.0		
Software version number	V1.0.1	//)	
Connecting I/O Port(s)	Please refer to the I	Note 1.	

#### Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
- 2. The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report. Due to the incorrect antenna information, a series of problems such as the accuracy of the test results will be borne by the customer.



Page 9 of 73 Report No.: STS2412330W05

3

	Channel List						
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequenc y (MHz)
00	2402	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	19	2440	29	2460	39	2480

#### 2.2 DESCRIPTION OF THE TEST MODES

For conducted test items and radiated spurious emissions Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively.

Worst Mode	Description	Data/Modulation
Mode 1	TX CH00(2402MHz)	1M PHY /GFSK
Mode 2	TX CH19(2440MHz)	1M PHY /GFSK
Mode 3	TX CH39(2480MHz)	1M PHY /GFSK

Worst Mode	Description	Data/Modulation
Mode 4	TX CH00(2402MHz)	2M PHY /GFSK
Mode 5	TX CH19(2440MHz)	2M PHY /GFSK
Mode 6	TX CH39(2480MHz)	2M PHY /GFSK

#### Note:

- (1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.
- (2) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V/60Hz is shown in the report.
- (3) The battery is fully-charged during the radited and RF conducted test.

# For AC Conducted Emission

	Test Case
AC Conducted Emission	Mode 7 : Keeping BT TX



Page 10 of 73 Report No.: STS2412330W05

# 2.3 TEST SOFTWARE AND POWER LEVEL

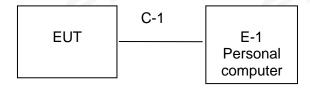
During testing channel & power controlling software provided by the customer was used to control the

operating channel as well as the output power level.

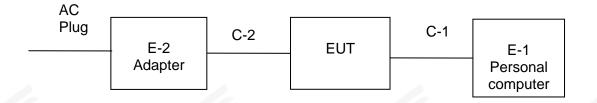
۱,	DE		Mada Or	ANIT	Dawas	
	RF	Type	Mode Or	ANT	Power	Software For Testing
	Function	турс	Modulation type	Gain(dBi)	Class	Software For Testing
	BLE(With	BLE_1M PHY	GFSK	2	6	FCC Test Tools 1/2.2
	2M PHY)	BLE_2M PHY	GFSK	-2	6	FCC_Test_Tools_V2.24

# 2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



# Conducted Emission Test





Page 11 of 73 Report No.: STS2412330W05

# 2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND 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.

Item	Equipment	Mfr/Brand	Model/Type No.	Note
E-1	Personal computer	DELL	Inspiron 3501	N/A
E-2	Adapter	ZTC	NB-A515A	N/A
C-1	Serial port board	XES	WTYZK	N/A
C-2	USB Cable	ZTC	NB-A515A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-2	Shielded	NO	150cm	N/A

#### Note:

- (1) For detachable type I/O cable should be specified the length in cm in Length column.
- (2) "YES" is means "with core"; "NO" is means "without core".



Page 12 of 73 Report No.: STS2412330W05

# 2.6 EQUIPMENTS LIST

4	RF R	Radiation Test Equipme	ent		
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2024.03.15	2025.03.14
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2025.02.22	2026.02.21
Pre-Amplifier(1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2024.09.23	2025.09.22
Pre-Amplifier(18G-40GHz)	SKET	LNPA_1840-50	SK2018101801	2025.02.22	2026.02.21
Active loop Antenna	ZHINAN	ZN30900C	16035	2025.02.25	2026.02.24
Bilog Antenna	TESEQ	CBL6111D	34678	2024.09.30	2025.09.29
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2023.09.24	2025.09.23
Horn Antenna	A-INFOMW	LB-180400-KF	J211020657	2023.10.10	2025.10.09
Positioning Controller	MF	MF-7802	MF-780208587	N/A	N/A
Signal Analyzer	R&S	FSV 40-N	101823	2024.09.23	2025.09.22
Switch Control Box	N/A	N/A	N/A	N/A	N/A
Filter Box	BALUN Technology	SU319E	BL-SZ1530051	N/A	N/A
Antenna Mast	MF	MFA-440H	N/A	N/A	N/A
Turn Table	MF	SC100_1	60531	N/A	N/A
AC Power Source	APC	KDF-11010G	F214050035	N/A	N/A
DC power supply	HONGSHENGFENG	DPS-305AF	17064939	2024.09.23	2025.09.22
Test SW	EZ-EMC		Ver.STSLAB-03A	1 RE	
	Cor	duction Test equipmer	nt		
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2024.09.24	2025.09.23
Limtter	CYBERTEK	EM5010	N/A	2024.09.24	2025.09.23
LISN	R&S	ENV216	101242	2024.09.24	2025.09.23
LISN	EMCO	3810/2NM	23625	2024.09.24	2025.09.23
Temperature & Humidity	SW-108	SuWei	N/A	2024.03.15	2025.03.14
Test SW	EZ-EMC		Ver.STSLAB-03A	1 CE	
		RF Connected Test			
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Signal Analyzer	Agilent	N9020A	MY51510623	2025.02.22	2026.02.21
Power Sensor	Keysight	U2021XA	MY56120038	2024.09.23	2025.09.22
Temperature & Humidity	SW-108	SuWei	N/A	2024.03.15	2025.03.14
Test SW MW MTS 8310_2.0.0.0					

	RF	Radiation Test Equipme	ent			
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until	
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23	
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2025.02.22	2026.02.21	
Pre-Amplifier(18G-40GHz)	SKET	LNPA_1840-50	SK2018101801	2025.02.22	2026.02.21	
Active loop Antenna	ZHINAN	ZN30900C	16035	2025.02.25	2026.02.24	
Positioning Controller	MF	MF-7802	MF-780208587	N/A	N/A	
Test SW	EZ-EMC	MC Ver.STSLAB-03A1 RE				
	Co	onduction Test equipme	nt			
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23	
Test SW	EZ-EMC		Ver.STSLAB-03A	1 CE		
		RF Connected Test				
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	
Signal Analyzer	Agilent	N9020A	MY51510623	2025.02.22	2026.02.21	
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23	
Test SW	MW	MTS 8310 2.0.0.0				

Page 13 of 73 Report No.: STS2412330W05

#### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

#### 3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

EDEOLIENOV (MH-)	Conducted Emission limit (dBuV)		
FREQUENCY (MHz)	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	
0.50 -5.0	56.00	46.00	
5.0 -30.0	60.00	50.00	

#### Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

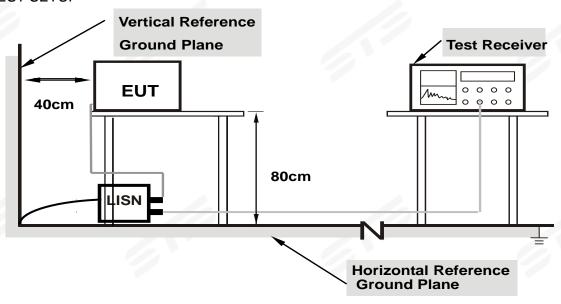
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

Page 14 of 73 Report No.: STS2412330W05

#### 3.2 TEST PROCEDURE

- a. The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN is at least 80 cm from the nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### 3.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

#### 3.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



Page 15 of 73 Report No.: STS2412330W05

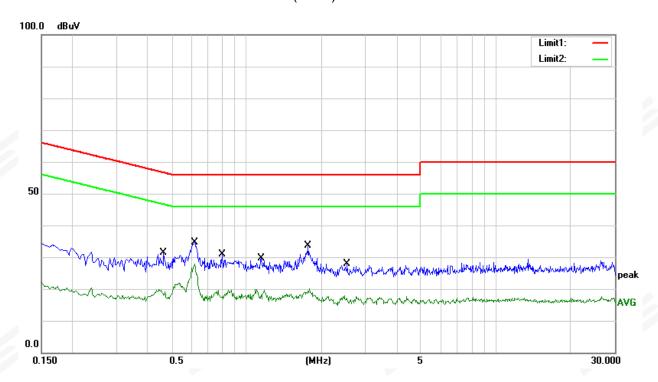
# 3.5 TEST RESULTS

Temperature:	25.1℃	Relative Humidity:	59%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 7		

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(d B)	(dBuV)	(dBuV)	(dB)	
1	0.4660	11.27	20.01	31.28	56.58	-25.30	QP
2	0.4660	-0.22	20.01	19.79	46.58	-26.79	AVG
3	0.6180	14.82	19.90	34.72	56.00	-21.28	QP
4	0.6180	7.89	19.90	27.79	46.00	-18.21	AVG
5	0.7980	10.97	19.80	30.77	56.00	-25.23	QP
6	0.7980	-0.11	19.80	19.69	46.00	-26.31	AVG
7	1.1460	9.76	19.78	29.54	56.00	-26.46	QP
8	1.1460	0.05	19.78	19.83	46.00	-26.17	AVG
9	1.7660	13.92	19.78	33.70	56.00	-22.30	QP
10	1.7660	0.37	19.78	20.15	46.00	-25.85	AVG
11	2.5300	8.03	19.81	27.84	56.00	-28.16	QP
12	2.5300	-2.01	19.81	17.80	46.00	-28.20	AVG

# Remark:

- All readings are Quasi-Peak and Average values
   Margin = Result (Result = Reading + Factor) Limit
   Factor=LISN factor+Cable loss+Limiter (10dB)





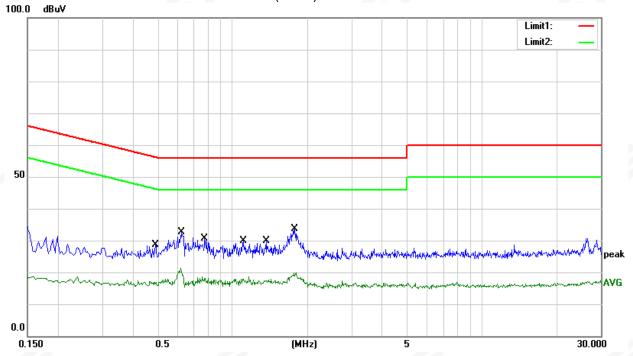
Page 16 of 73 Report No.: STS2412330W05

Temperature:	25.1°C	Relative Humidity:	59%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 7		

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(d B)	(dBuV)	(dBuV)	(dB)	
1	0.4900	8.77	19.97	28.74	56.17	-27.43	QP
2	0.4900	-2.82	19.97	17.15	46.17	-29.02	AVG
3	0.6260	12.72	19.88	32.60	56.00	-23.40	QP
4	0.6260	1.42	19.88	21.30	46.00	-24.70	AVG
5	0.7740	10.78	19.82	30.60	56.00	-25.40	QP
6	0.7740	-1.13	19.82	18.69	46.00	-27.31	AVG
7	1.1020	10.15	19.78	29.93	56.00	-26.07	QP
8	1.1020	-1.14	19.78	18.64	46.00	-27.36	AVG
9	1.3620	10.19	19.81	30.00	56.00	-26.00	QP
10	1.3620	-2.06	19.81	17.75	46.00	-28.25	AVG
11	1.7780	13.85	19.85	33.70	56.00	-22.30	QP
12	1.7780	0.01	19.85	19.86	46.00	-26.14	AVG

#### Remark:

- All readings are Quasi-Peak and Average values
   Margin = Result (Result =Reading + Factor)–Limit
   Factor=LISN factor+Cable loss+Limiter (10dB)





Page 17 of 73 Report No.: STS2412330W05

#### 4. RADIATED EMISSION MEASUREMENT

#### 4.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2020 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (Frequency Range 9kHz-1000MHz)

\	, ,
Field Strength	Measurement Distance
(micorvolts/meter)	(meters)
2400/F(KHz)	300
24000/F(KHz)	30
30	30
100	3
150	3
200	3
500	3
	(micorvolts/meter)  2400/F(KHz)  24000/F(KHz)  30  100  150  200

# LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)		
FREQUENCY (MINZ)	PEAK	AVERAGE	
Above 1000	74	54	

#### Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

#### LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			



Page 18 of 73 Report No.: STS2412330W05

# For Radiated Emission

Spectrum Parameter	Setting		
Attenuation	Auto		
Detector	Peak/QP/AV		
Start Frequency 9 KHz/150KHz(Peak/QP/AV)			
Stop Frequency	150KHz/30MHz(Peak/QP/AV)		
	200Hz (From 9kHz to 0.15MHz)/		
RB / VB (emission in restricted	9KHz (From 0.15MHz to 30MHz);		
band)	200Hz (From 9kHz to 0.15MHz)/		
	9KHz (From 0.15MHz to 30MHz)		

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP
Start Frequency	30 MHz(Peak/QP)
Stop Frequency	1000 MHz (Peak/QP)
RB / VB (emission in restricted	120 KHz / 300 KHz
band)	120 KH2 / 300 KH2

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/AV
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted	1 MHz / 3 MHz(Peak)
band)	1 MHz/1/T MHz(AVG)

# For Restricted band

Spectrum Parameter	Setting		
Detector	Peak/AV		
Stort/Ston Fraguency	Lower Band Edge: 2310 to 2410 MHz		
Start/Stop Frequency	Upper Band Edge: 2475 to 2500 MHz		
DD / VD	1 MHz / 3 MHz(Peak)		
RB / VB	1 MHz/1/T MHz(AVG)		



Page 19 of 73 Report No.: STS2412330W05

Receiver Parameter	Setting
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

#### **4.2 TEST PROCEDURE**

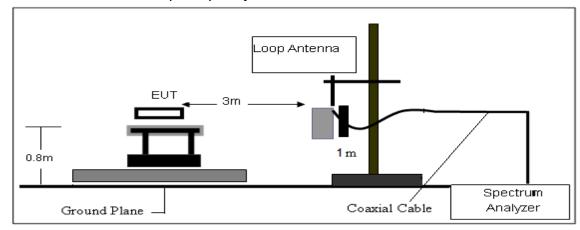
- a. The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- b. The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- c. The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and QuasiPeak detector mode will be re-measured.
- e. If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

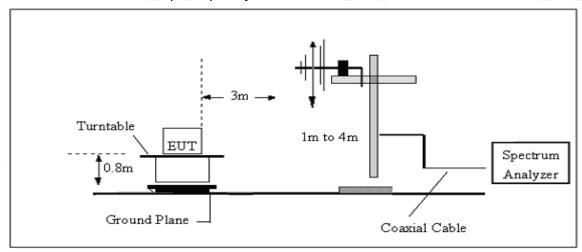
Page 20 of 73 Report No.: STS2412330W05

# 4.3 TEST SETUP

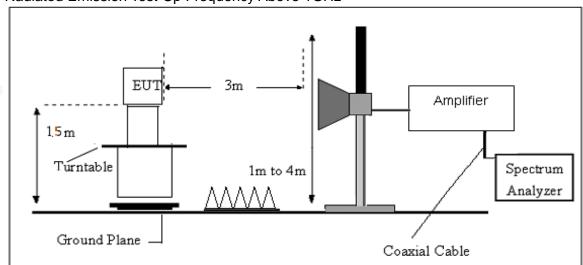
# (A) Radiated Emission Test-Up Frequency Below 30MHz



# (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



# (C) Radiated Emission Test-Up Frequency Above 1GHz



# 4.4 EUT OPERATING CONDITIONS

Please refer to section 3.4 of this report.



Page 21 of 73 Report No.: STS2412330W05

# 4.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

 $F\dot{S} = RA + AF + CL - AG$ 

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBµV/m)	(dBµV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

Factor=AF+CL-AG



Page 22 of 73 Report No.: STS2412330W05

#### 4.6 TEST RESULTS

(Between 9KHz - 30 MHz)

Temperature:	<b>23.4℃</b>	Relative Humidtity:	60%
Test Voltage:	DC 3.85V From Battery	Polarization:	
Test Mode:	TX Mode		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
				PASS
				PASS

#### Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.



Page 23 of 73 Report No.: STS2412330W05

(30MHz -1000MHz)

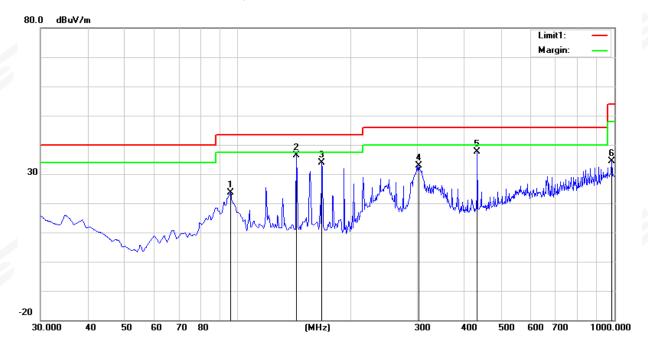
#### 1M PHY

Temperature:	23.4℃	Relative Humidity:	60%		
Test Voltage:	DC 3.85V From Battery	Phase:	Horizontal		
Test Mode:	Mode 1/2/3 (Mode 2 worst mode)				

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/ m)	(dBuV/m)	(dBuV/m)	(dB)	
1	95.9600	44.20	-20.67	23.53	43.50	-19.97	peak
2	143.4900	54.70	-18.23	36.47	43.50	-7.03	peak
3	167.7400	53.39	-19.58	33.81	43.50	-9.69	peak
4	303.5400	47.46	-14.69	32.77	46.00	-13.23	peak
5	433.5200	47.78	-10.13	37.65	46.00	-8.35	peak
6	984.4800	31.88	2.40	34.28	54.00	-19.72	peak

#### Remark:

- Margin = Result (Result = Reading + Factor ) Limit
   Factor = Antenna factor + Cable attenuation factor (cable loss) Amplifier gain
- 3. All modes have been tested, only show the worst case.





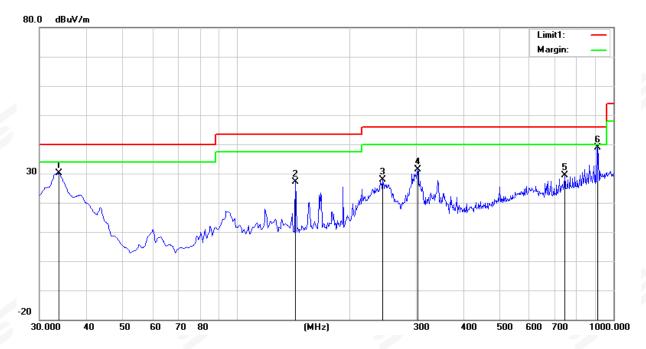
Page 24 of 73 Report No.: STS2412330W05

Temperature:	23.4℃	Relative Humidity:	60%		
Test Voltage:	DC 3.85V From Battery	Phase:	Vertical		
Test Mode:	Mode 1/2/3 (Mode 2 worst mode)				

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/ m)	(dBuV/m)	(dBuV/m)	(dB)	
1	33.8800	44.89	-14.80	30.09	40.00	-9.91	peak
2	143.4900	45.24	-18.23	27.01	43.50	-16.49	peak
3	244.3700	44.88	-17.12	27.76	46.00	-18.24	peak
4	303.5400	45.97	-14.69	31.28	46.00	-14.72	peak
5	743.9200	31.48	-2.13	29.35	46.00	-16.65	peak
6	912.7000	39.04	-0.14	38.90	46.00	-7.10	peak

#### Remark:

- Margin = Result (Result = Reading + Factor ) Limit
   Factor = Antenna factor + Cable attenuation factor (cable loss) Amplifier gain
- 3. All modes have been tested, only show the worst case.





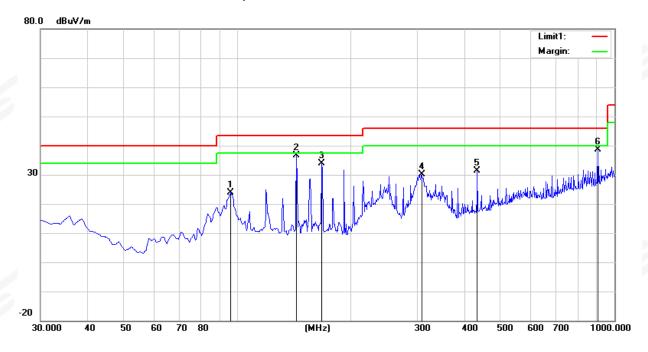
#### Page 25 of 73 Report No.: STS2412330W05

#### 2M PHY

Temperature:	23.4℃	Relative Humidity:	60%		
Test Voltage:	Voltage: DC 3.85V From Battery		Horizontal		
Test Mode:	Mode 4/5/6 (Mode 4 worst mode)				

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/ m)	(dBuV/m)	(dBuV/m)	(dB)	
1	95.9600	44.54	-20.67	23.87	43.50	-19.63	peak
2	143.4900	54.75	-18.23	36.52	43.50	-6.98	peak
3	167.7400	53.47	-19.58	33.89	43.50	-9.61	peak
4	308.3900	44.74	-14.52	30.22	46.00	-15.78	peak
5	433.5200	41.61	-10.13	31.48	46.00	-14.52	peak
6	904.9400	38.92	-0.32	38.60	46.00	-7.40	peak

- Margin = Result (Result = Reading + Factor ) Limit
   Factor = Antenna factor + Cable attenuation factor (cable loss) Amplifier gain
- 3. All modes have been tested, only show the worst case.





Page 26 of 73 Report No.: STS2412330W05

Temperature:	<b>23.4</b> ℃	Relative Humidity:	60%		
Test Voltage:	DC 3.85V From Battery	Phase:	Vertical		
Test Mode:	Mode 4/5/6 (Mode 4 worst mode)				

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/ m)	(dBuV/m)	(dBuV/m)	(dB)	
1	32.9100	44.03	-14.33	29.70	40.00	-10.30	peak
2	143.4900	44.92	-18.23	26.69	43.50	-16.81	peak
3	252.1300	42.51	-15.80	26.71	46.00	-19.29	peak
4	304.5100	43.85	-14.65	29.20	46.00	-16.80	peak
5	660.5000	32.60	-4.80	27.80	46.00	-18.20	peak
6	852.5600	32.99	-0.67	32.32	46.00	-13.68	peak

#### Remark:

- Margin = Result (Result = Reading + Factor ) Limit
   Factor = Antenna factor + Cable attenuation factor (cable loss) Amplifier gain
- 3. All modes have been tested, only show the worst case.

