

RADIO TEST REPORT

Report No: STS1509130F02

Issued for

MOVEON TECHNOLOGY LIMITED

World Trade Plaza-A block#3201-3202 Fuhong Road, Futian Shenzhen, China

| Product Name: | mobile phone |
|----------------|-----------------|
| | |
| Brand Name: | MYM |
| Model No.: | Cooper |
| Series Model: | N/A |
| FCC ID: | 2AFD9COOPER |
| Test Standard: | FCC Part 15.247 |

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L A B

S T



TEST RESULT CERTIFICATION

| Applicant's Name MOVEON TECHNOLOGY LIMITED | | |
|--|--|--|
| Address | World Trade Plaza-A block#3201-3202 Fuhong Road, Futian ¨Shenzhen, China | |
| Manufacture's Name | . MOVEON TECHNOLOGY LIMITED | |
| Address | World Trade Plaza-A block#3201-3202 Fuhong Road, Futian Shenzhen, China | |

Product description

Product name mobile phone

Band name MYM

Model and/or type reference Cooper

Ratings..... DC 5V/500mA

Standards FCC Part 15.247

Test procedure..... ANSI C63.10-2013

This device described above has been tested by STS, and 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.

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Date of Test.....

Date (s) of performance of tests 29 Sep. 2015 ~10 Oct. 2015

Date of Issue 12 Oct. 2015

Test Result Pass

| Testing Engineer | : | Imming | |
|----------------------|-----|-------------|--------------|
| | | (Jin Ming) | STING . CONS |
| Technical Manager | : | Mati | |
| | | (Vita Li) | APPROVAL 8 |
| Authorized Signatory | y : | honey Juney | BASS . WOL |
| | | | |

(Bovey Yang)

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Revision History

| Rev. | Issue Date | Report NO. | Effect Page | Contents |
|------|--------------|---------------|-------------|---------------|
| 00 | 12 Oct. 2015 | STS1509130F02 | ALL | Initial Issue |
| | | | | |



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Report No.: STS1509130F02

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15 (15.247) , Subpart C | | | | |
|---------------------------------|-----------------------------|----------|--------|--|
| Standard Section | Test Item | Judgment | Remark | |
| 15.207 | Conducted Emission | PASS | | |
| 15.247(a)(1) | Hopping Channel Separation | PASS | | |
| 15.247(b)(1) | Peak Output Power | PASS | | |
| 15.247(c) | Radiated Spurious Emission | PASS | | |
| 15.247(d) | Conducted Spurious Emission | PASS | | |
| 15.247(a)(iii) | Number of Hopping Frequency | PASS | | |
| 15.247(a)(iii) | Dwell Time | PASS | | |
| 15.247(a)(1) | Bandwidth | PASS | | |
| 15.205 | Band Edge Emission | PASS | | |
| 15.203 | Antenna Requirement | PASS | | |

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

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1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd. Add. : 1/F., Building B, Zhuoke Science Park, No.190,Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong,China CNAS Registration No.: L7649;

FCC Registration No.: 842334; IC Registration No.: 12108A-1

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 % $^{\circ}$

| No. | Item | Uncertainty |
|-----|--|-------------|
| 1 | Conducted Emission (9KHz-150KHz) | ±2.88dB |
| 2 | Conducted Emission (150KHz-30MHz) | ±2.67dB |
| 3 | RF power,conducted | ±0.70dB |
| 4 | Spurious emissions,conducted ±1.19d | |
| 5 | All emissions,radiated(<1G) 30MHz-200MHz | ±2.83dB |
| 6 | All emissions,radiated(<1G) 200MHz-1000MHz | ±2.94dB |
| 7 | All emissions, radiated (>1G) | ±3.03dB |
| 8 | Temperature | ±0.5°C |
| 9 | Humidity | ±2% |



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

| Equipment | mobile phone | | | |
|----------------------------|---|---|--|--|
| Trade Name | MYM | | | |
| Model Name | Cooper | | | |
| Serial Model | N/A | | | |
| Model Difference | N/A | | | |
| | The EUT is a mobile ph | ione | | |
| | Operation Frequency: | 2402~2480 MHz | | |
| Product Description | Modulation Type: | GFSK(1Mbps), π/4-DQPSK(2Mbps), 8-DPSK(3Mbps) | | |
| | Number Of Channel | 79 | | |
| | Antenna Gain (dBi) | 1 dbi | | |
| Channel List | Please refer to the Note | e 2. | | |
| Adaptor | Input:AC 110-240V,50/60Hz,0.15A | | | |
| Adapter | Output:DC 5V,500mA | | | |
| Battery | Rated Voltage: 3.7V | | | |
| | capacity :1200mAh | | | |
| Hardware version number | RX3121MMB02 | | | |
| Software versioning number | RX3121M_OQ_K12_DA_QQVGA_3232_BFC_M131_R02 | | | |
| Connecting I/O Port(s) | Please refer to the Use | r's Manual | | |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



| | | Channel | List | | - |
|---------|--------------------|---------|--------------------|---------|------------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequer (MHz) |
| 00 | 2402 | 27 | 2429 | 54 | 2456 |
| 01 | 2403 | 28 | 2430 | 55 | 2457 |
| 02 | 2404 | 29 | 2431 | 56 | 2458 |
| 03 | 2405 | 30 | 2432 | 57 | 2459 |
| 04 | 2406 | 31 | 2433 | 58 | 2460 |
| 05 | 2407 | 32 | 2434 | 59 | 2461 |
| 06 | 2408 | 33 | 2435 | 60 | 2462 |
| 07 | 2409 | 34 | 2436 | 61 | 2463 |
| 08 | 2410 | 35 | 2437 | 62 | 2464 |
| 09 | 2411 | 36 | 2438 | 63 | 2465 |
| 10 | 2412 | 37 | 2439 | 64 | 2466 |
| 11 | 2413 | 38 | 2440 | 65 | 2467 |
| 12 | 2414 | 39 | 2441 | 66 | 2468 |
| 13 | 2415 | 40 | 2442 | 67 | 2469 |
| 14 | 2416 | 41 | 2443 | 68 | 2470 |
| 15 | 2417 | 42 | 2444 | 69 | 2471 |
| 16 | 2418 | 43 | 2445 | 70 | 2472 |
| 17 | 2419 | 44 | 2446 | 71 | 2473 |
| 18 | 2420 | 45 | 2447 | 72 | 2474 |
| 19 | 2421 | 46 | 2448 | 73 | 2475 |
| 20 | 2422 | 47 | 2449 | 74 | 2476 |
| 21 | 2423 | 48 | 2450 | 75 | 2477 |
| 22 | 2424 | 49 | 2451 | 76 | 2478 |
| 23 | 2425 | 50 | 2452 | 77 | 2479 |
| 24 | 2426 | 51 | 2453 | 78 | 2480 |
| 25 | 2427 | 52 | 2454 | | |
| 26 | 2428 | 53 | 2455 | | |

3. Table for Filed Antenna

| A | nt | Brand | Model Name | Antenna Type | Connector | Gain (dBi) | NOTE |
|---|----|-------|------------|----------------|-----------|------------|---------------|
| 1 | 1 | MYM | Cooper | Dipole Antenna | N/A | 1 | BT Antenna |

The EUT antenna is Dipole Antenna. no antenna other than that furnished by the responsible party shall be used with the device.





2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description |
|--------------|----------------------------|
| Mode 1 | CH00 |
| Mode 2 | CH39 |
| Mode 3 | CH78 |
| Mode 4 | Charging + Keeping TX mode |

| For Conducted Emission | | | | |
|-----------------------------------|--|--|--|--|
| Final Test Mode Description | | | | |
| Mode 4 Charging + Keeping TX mode | | | | |

| For Radiated Emission | | | | |
|-----------------------|----------------------------|--|--|--|
| Final Test Mode | Description | | | |
| Mode 1 | CH00 | | | |
| Mode 2 | CH39 | | | |
| Mode 3 | CH78 | | | |
| Mode 4 | Charging + Keeping TX mode | | | |

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (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.

2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

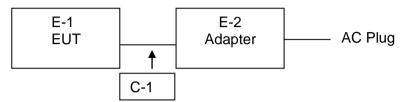
| Test software Version | Test program: N/A | | | | |
|-----------------------|----------------------------|-----|-----|--|--|
| Frequency | 2402 MHz 2441 MHz 2480 MHz | | | | |
| Parameters(1Mbps) | DEF | DEF | DEF | | |



2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Radiated Spurious Emission Test



Conducted Emission Test

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2.5 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.

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. | Note |
|------|--------------|-----------|----------------|------------|------|
| E-1 | mobile phone | MYM | Cooper | N/A | EUT |
| E-2 | Adapter | N/A | N/A | N/A | EUT |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
| C-1 | unshielded | NO | 80cm | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in $\[\]$ Length $\[\]$ column.
- (3) "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".



2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conduction Test equipment

| Kind of Equipment | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until |
|------------------------|--------------|----------|------------|------------------|---------------------|
| EMI Test Receiver | R&S | ESPI | 102086 | 2014.11.20 | 2015.11.19 |
| LISN | R&S | ENV216 | 101242 | 2014.10.25 | 2015.10.24 |
| LISN | EMCO | 3810/2NM | 000-23625 | 2014.10.25 | 2015.10.24 |
| MXA SIGNAL Analyzer | Agilent | Agilent | N9020A | 2014.10.25 | 2015.10.24 |

Radiation Test equipment

| Kind of Equipment | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until |
|-----------------------|--------------|---------------------|------------|------------------|------------------|
| Spectrum Analyzer | Agilent | E4407B | MY50140340 | 2014.10.25 | 2015.10.24 |
| Test Receiver | R&S | ESCI | 101427 | 2014.10.25 | 2015.10.24 |
| Bilog Antenna | TESEQ | CBL6111D | 34678 | 2014.11.25 | 2015.11.24 |
| Horn Antenna | Schwarzbeck | BBHA 9120D(1201) | 9120D-1343 | 2015.03.06 | 2016.03.05 |
| 50Ω Coaxial Switch | Anritsu | MP59B | 6200264416 | 2015.06.06 | 2016.06.05 |
| PreAmplifier | Agilent | 8449B | 60538 | 2014.10.25 | 2015.10.24 |
| Loop Antenna | ARA | PLA-1030/B | 1029 | 2015.06.08 | 2016.06.07 |

RF Connected Test equipment

| Kind of Equipment | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until |
|------------------------|--------------|------------|---------------|------------------|------------------|
| Spectrum Analyzer | Agilent | E4407B | MY50140340 | 2014.10.25 | 2015.10.24 |
| Test Receiver | R&S | ESCI | 101427 | 2014.10.25 | 2015.10.24 |
| MXA SIGNAL Analyzer | Agilent | N9020A | MY49100060 | 2014.10.25 | 2015.10.24 |
| 50Ω Coaxial Switch | Anritsu | MP59B | 6200264416 | 2015.06.06 | 2016.06.05 |
| Loop Antenna | ARA | PLA-1030/B | 1029 | 2015.06.08 | 2016.06.07 |
| USB RF power sensor | DARE | RPR3006W | 15I00041SNO03 | 2014.10.25 | 2015.10.24 |



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.247&207(a) limit in the table below has to be followed.

| | Class B (dBuV) | | Standard | |
|-----------------|----------------|-----------|----------|--|
| FREQUENCY (MHz) | Quasi-peak | Average | | |
| 0.15 -0.5 | 66 - 56 * | 56 - 46 * | CISPR | |
| 0.50 -5.0 | 56.00 | 46.00 | CISPR | |
| 5.0 -30.0 | 60.00 | 50.00 | CISPR | |

| 0.15 -0.5 | 66 - 56 * | 56 - 46 * | FCC |
|-----------|-----------|-----------|-----|
| 0.50 -5.0 | 56.00 | 46.00 | FCC |
| 5.0 -30.0 | 60.00 | 50.00 | FCC |

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 |

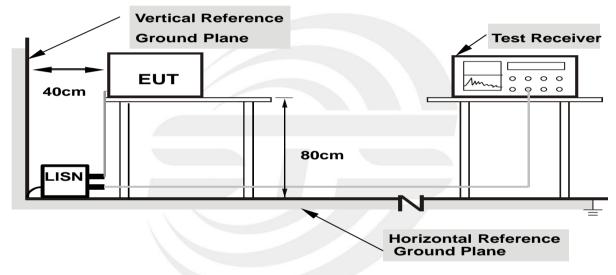
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3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 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 at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.



3.1.3 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 from other units and other metal planes

3.1.4 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.



3.1.5 TEST RESULTS

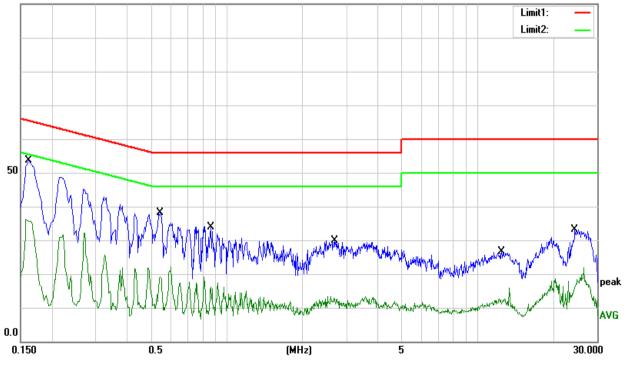
| EUT: | mobile phone | Model Name.: | Cooper |
|---------------|-----------------------------------|--------------------|--------|
| Temperature: | 26 ℃ | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Phase: | L |
| Test Voltage: | DC 5V from Adapter AC120V/60Hz | Test Mode: | Mode 4 |

| Frequency | Reading | Correct | Result | Limit | Margin | Demerik |
|-----------|---------|------------|--------|--------|--------|---------|
| (MHz) | (dBuV) | Factor(dB) | (dBuV) | (dBuV) | (dB) | Remark |
| 0.1620 | 43.66 | 10.00 | 53.66 | 65.36 | -11.70 | QP |
| 0.1620 | 25.72 | 10.00 | 35.72 | 55.36 | -19.64 | AVG |
| 0.5420 | 28.19 | 9.92 | 38.11 | 56.00 | -17.89 | QP |
| 0.5420 | 9.10 | 9.92 | 19.02 | 46.00 | -26.98 | AVG |
| 0.8660 | 23.98 | 9.94 | 33.92 | 56.00 | -22.08 | QP |
| 0.8660 | 6.12 | 9.94 | 16.06 | 46.00 | -29.94 | AVG |
| 2.6860 | 19.95 | 10.00 | 29.95 | 56.00 | -26.05 | QP |
| 2.6860 | 2.70 | 10.00 | 12.70 | 46.00 | -33.30 | AVG |
| 12.4580 | 16.24 | 10.35 | 26.59 | 60.00 | -33.41 | QP |
| 12.4580 | 0.83 | 10.35 | 11.18 | 50.00 | -38.82 | AVG |
| 24.4980 | 22.68 | 10.53 | 33.21 | 60.00 | -26.79 | QP |
| 24.4980 | 5.30 | 10.53 | 15.83 | 50.00 | -34.17 | AVG |

Remark:

1. Factor = Antenna Factor + Cable Loss - Pre-amplifier.

100.0 dBuV



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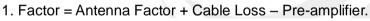
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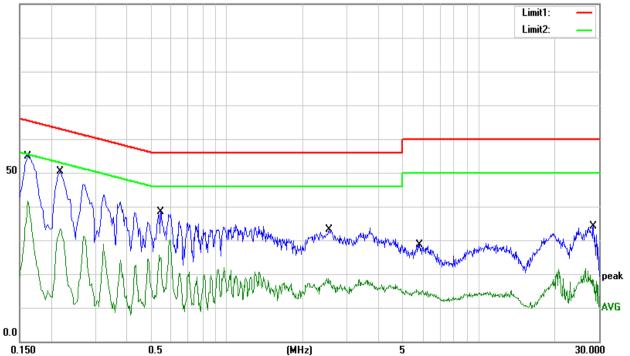
| EUT: | mobile phone | Model Name.: | Cooper |
|---------------|--------------------|--------------------|--------|
| Temperature: | 26 °C | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Phase: | N |
| Test Voltage: | DC 5V from Adapter | Test Mode: | Mode 4 |

| Frequency | Reading | Correct | Result | Limit | Margin | Demerik |
|-----------|---------|------------|--------|--------|--------|---------|
| (MHz) | (dBuV) | Factor(dB) | (dBuV) | (dBuV) | (dB) | Remark |
| 0.1620 | 44.89 | 10.00 | 54.89 | 65.36 | -10.47 | QP |
| 0.1620 | 31.54 | 10.00 | 41.54 | 55.36 | -13.82 | AVG |
| 0.2180 | 40.38 | 9.98 | 50.36 | 62.89 | -12.53 | QP |
| 0.2180 | 23.46 | 9.98 | 33.44 | 52.89 | -19.45 | AVG |
| 0.5460 | 28.50 | 9.92 | 38.42 | 56.00 | -17.58 | QP |
| 0.5460 | 14.93 | 9.92 | 24.85 | 46.00 | -21.15 | AVG |
| 2.5420 | 23.12 | 10.00 | 33.12 | 56.00 | -22.88 | QP |
| 2.5420 | 7.22 | 10.00 | 17.22 | 46.00 | -28.78 | AVG |
| 5.8220 | 18.44 | 10.20 | 28.64 | 60.00 | -31.36 | QP |
| 5.8220 | 3.83 | 10.20 | 14.03 | 50.00 | -35.97 | AVG |
| 28.5500 | 23.32 | 10.68 | 34.00 | 60.00 | -26.00 | QP |
| 28.5500 | 7.43 | 10.68 | 18.11 | 50.00 | -31.89 | AVG |

Remark:



100.0 dBuV



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3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15247&205(a), then the Part 15 247&209(a) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (30MHz - 1000MHz)

| Frequencies | Field Strength | Measurement Distance |
|-------------|--------------------|----------------------|
| (MHz) | (micorvolts/meter) | (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 |

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

| | Class B (dBuV/m) (at 3M) | | | |
|-----------------|--------------------------|---------|--|--|
| FREQUENCY (MHz) | 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).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

| Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz) | Range (MHz) |
|--|---|
| Below 1.705 | 30 |
| 1.705 – 108 | 1000 |
| 108 – 500 | 2000 |
| 500 – 1000 | 5000 |
| Above 1000 | 5 th harmonic of the highest frequency or 40 GHz, whichever is lower |



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| Spectrum Parameter | Setting | |
|---------------------------------|--|--|
| Attenuation | Auto | |
| Detector | Peak | |
| Start Frequency | 1000 MHz(Peak/AV) | |
| Stop Frequency | 10 th carrier harmonic(Peak/AV) | |
| RB / VB (emission in restricted | | |
| band) | 1 MHz / 1 MHz, AV=1 MHz / 10Hz | |

| Receiver Parameter | Setting | |
|------------------------|----------------------------------|--|
| Attenuation | Auto | |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP | |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP | |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP | |

3.2.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz.
- ^{a.} For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters (above 1GHz is 1.5 m) above the b. ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

The height of the equipment or of the substitution antenna shall be 0.8 m (above 1GHz is 1.5

- c. m); the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector d. mode pre-scanning the measurement frequency range. Significant peaks are then marked and
- then Quasi Peak detector mode re-measured. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the
- e. EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item -EUT Test Photos.

Note:

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

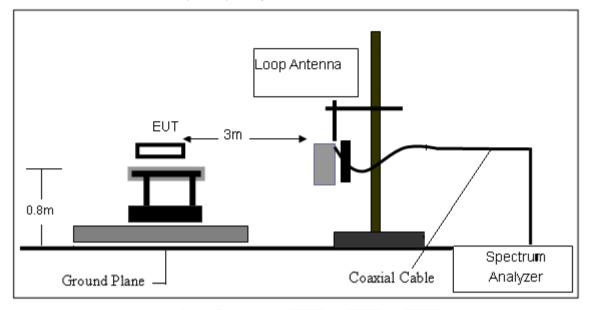
3.2.3 DEVIATION FROM TEST STANDARD

No deviation

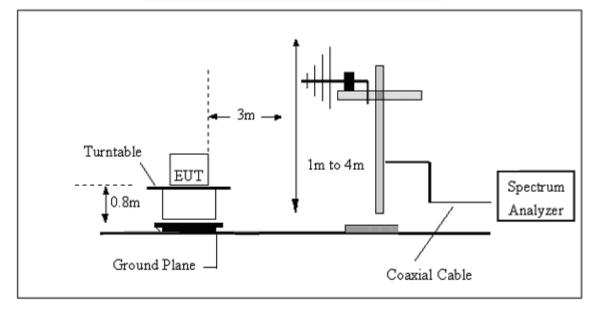


3.2.4 TEST SETUP

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

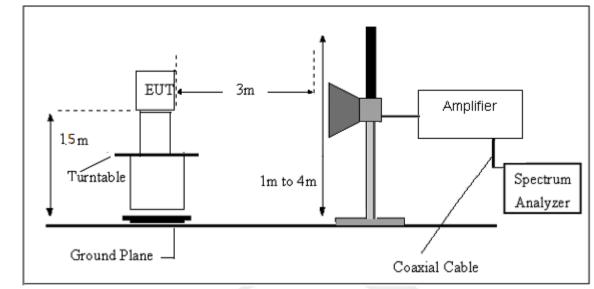


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





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



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



3.2.6 TEST RESULTS

Below 30MHz

| EUT: | mobile phone | Model Name.: | Cooper |
|--------------|--------------|--------------------|------------------------------------|
| Temperature: | 26 ℃ | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Test Voltage: | DC 5V from Adapter AC 120V/60Hz |
| Test Mode: | Mode 4 | | |

| 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.





Between 30-1000MHz

| EUT: | mobile phone | Model Name.: | Cooper |
|---------------|------------------------------------|--------------------|------------|
| Temperature: | 26 °C | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Phase: | Horizontal |
| Test Voltage: | DC 5V from Adapter AC 120V/60Hz | Test Mode: | Mode 4 |

| Frequency | Reading | Correct | Result | Limit | Margin | Remark |
|-----------|---------|--------------|----------|----------|--------|--------|
| (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | |
| 31.2893 | 5.32 | 18.04 | 23.36 | 40.00 | -16.64 | QP |
| 72.5916 | 7.79 | 6.75 | 14.54 | 40.00 | -25.46 | QP |
| 100.9340 | 7.83 | 10.81 | 18.64 | 43.50 | -24.86 | QP |
| 140.8351 | 11.11 | 12.05 | 23.16 | 43.50 | -20.34 | QP |
| 266.6090 | 4.67 | 14.78 | 19.45 | 46.00 | -26.55 | QP |
| 568.6127 | 4.90 | 22.56 | 27.46 | 46.00 | -18.54 | QP |

Remark:

1. Factor = Antenna Factor + Cable Loss - Pre-amplifier.

80.0 dBuV/m



Shenzhen STS Test Services Co., Ltd.

1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong, China Tel: 0755-36886288 Fax: 0755-36886277 Http://www.stsapp.com E-mail: sts@stsapp.com



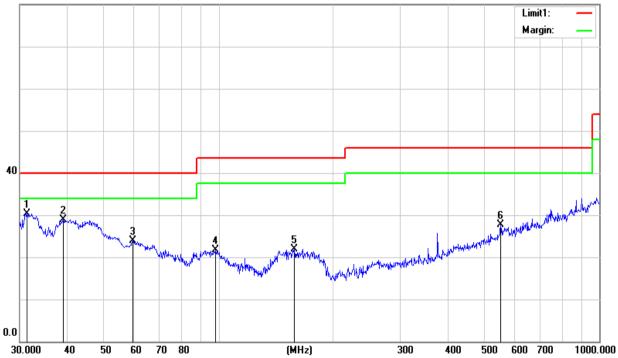
| EUT: | mobile phone | Model Name.: | Cooper |
|---------------|------------------------------------|--------------------|----------|
| Temperature: | 26 ℃ | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Phase: | Vertical |
| Test Voltage: | DC 5V from Adapter AC 120V/60Hz | Test Mode: | Mode 4 |

| Frequency | Reading | Correct | Result | Limit | Margin | Remark |
|-----------|---------|--------------|----------|----------|--------|--------|
| (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | |
| 31.3992 | 12.40 | 17.98 | 30.38 | 40.00 | -9.62 | QP |
| 39.0245 | 15.00 | 13.99 | 28.99 | 40.00 | -11.01 | QP |
| 59.4405 | 18.47 | 5.42 | 23.89 | 40.00 | -16.11 | QP |
| 98.1420 | 11.29 | 10.44 | 21.73 | 43.50 | -21.77 | QP |
| 158.1123 | 10.18 | 11.69 | 21.87 | 43.50 | -21.63 | QP |
| 550.9480 | 5.11 | 22.53 | 27.64 | 46.00 | -18.36 | QP |

Remark:

1. Factor = Antenna Factor + Cable Loss - Pre-amplifier.

80.0 dBuV/m





Above 1000 MHz

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector | 0 | | | | |
|-----------|------------------------|--------|------------------|----------|--------|----------|------------|--|--|--|--|
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | Туре | Comment | | | | |
| | Low Channel (2402 MHz) | | | | | | | | | | |
| 4804.20 | 62.70 | -3.62 | 59.08 | 74 | -14.92 | PK | Vertical | | | | |
| 4804.22 | 43.50 | -3.62 | 39.88 | 54 | -14.12 | AV | Vertical | | | | |
| 7206.13 | 58.66 | -0.9 | 57.76 | 74 | -16.24 | PK | Vertical | | | | |
| 7206.12 | 38.00 | -0.9 | 37.1 | 54 | -16.9 | AV | Vertical | | | | |
| 4804.00 | 58.50 | -3.65 | 54.85 | 74 | -19.15 | PK | Horizontal | | | | |
| 4803.98 | 40.98 | -3.65 | 37.33 | 54 | -16.67 | AV | Horizontal | | | | |
| | Mid Channel (2441 MHz) | | | | | | | | | | |
| 4882.08 | 63.62 | -3.65 | 59.97 | 74 | -14.03 | PK | Vertical | | | | |
| 4882.07 | 48.06 | -3.65 | 44.41 | 54 | -9.59 | AV | Vertical | | | | |
| 7323.21 | 59.87 | -0.84 | 59.03 | 74 | -14.97 | PK | Vertical | | | | |
| 7323.21 | 42.50 | -0.84 | 41.66 | 54 | -12.34 | AV | Vertical | | | | |
| 4882.18 | 60.30 | -3.68 | 56.62 | 74 | -17.38 | PK | Horizontal | | | | |
| 4882.15 | 43.53 | -3.68 | 39.85 | 54 | -14.15 | AV | Horizontal | | | | |
| | | / / | High Channel (24 | 80 MHz) | | | | | | | |
| 4960.26 | 59.96 | -3.59 | 56.37 | 74 | -17.63 | PK | Vertical | | | | |
| 4960.30 | 44.26 | -3.59 | 40.67 | 54 | -13.33 | AV | Vertical | | | | |
| 7440.33 | 59.64 | -0.83 | 58.81 | 74 | -15.19 | PK | Vertical | | | | |
| 7440.30 | 43.69 | -0.83 | 42.86 | 54 | -11.14 | AV | Vertical | | | | |
| 4960.32 | 60.21 | -3.59 | 56.62 | 74 | -17.38 | PK | Horizontal | | | | |
| 4960.30 | 43.68 | -3.59 | 40.09 | 54 | -13.91 | AV | Horizontal | | | | |

Note:

1) 30MHz~25GHz:(Scan with GFSK, π /4-DQPSK,8DPSK, the worst casw is GFSK Mode)

2) Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Emission Level = Meter Reading + Factor

Margin = Limit - Emission Leve



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Band edge

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector | |
|-----------|---------------|--------|----------------|----------|--------|----------|------------|
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | Туре | Comment |
| | | | GFSK | | | | |
| 2399.9 | 66.97 | -12.99 | 53.98 | 74 | -20.02 | PK | Vertical |
| 2399.9 | 52.76 | -12.99 | 39.77 | 54 | -14.23 | AV | Vertical |
| 2399.9 | 68.29 | -12.99 | 55.30 | 74 | -18.70 | PK | Horizontal |
| 2399.9 | 51.76 | -12.99 | 38.77 | 54 | -15.23 | AV | Horizontal |
| 2483.6 | 68.75 | -12.78 | 55.97 | 74 | -18.03 | PK | Vertical |
| 2483.6 | 51.96 | -12.78 | 39.18 | 54 | -14.82 | AV | Vertical |
| 2483.6 | 68.63 | -12.78 | 55.85 | 74 | -18.15 | PK | Horizontal |
| 2483.6 | 52.02 | -12.78 | 39.24 | 54 | -14.76 | AV | Horizontal |
| | | | π/4-DQPSK | | | | |
| 2399.9 | 69.27 | -12.99 | 56.28 | 74 | -17.72 | PK | Vertical |
| 2399.9 | 52.37 | -12.99 | 39.38 | 54 | -14.62 | AV | Vertical |
| 2399.9 | 68.25 | -12.99 | 55.26 | 74 | -18.74 | PK | Horizontal |
| 2399.9 | 53.11 | -12.99 | 40.12 | 54 | -13.88 | AV | Horizontal |
| 2483.6 | 68.80 | -12.78 | 56.02 | 74 | -17.98 | PK | Vertical |
| 2483.6 | 54.14 | -12.78 | 41.36 | 54 | -12.64 | AV | Vertical |
| 2483.6 | 69.09 | -12.78 | 56.31 | 74 | -17.69 | PK | Horizontal |
| 2483.6 | 52.25 | -12.78 | 39.47 | 54 | -14.53 | AV | Horizontal |
| | | | 8DPSK | | | | |
| 2399.9 | 69.18 | -12.99 | 56.19 | 74 | -17.81 | PK | Vertical |
| 2399.9 | 52.85 | -12.99 | 39.86 | 54 | -14.14 | AV | Vertical |
| 2399.9 | 67.90 | -12.99 | 54.91 | 74 | -19.09 | PK | Horizontal |
| 2399.9 | 53.49 | -12.99 | 40.50 | 54 | -13.50 | AV | Horizontal |
| 2483.6 | 69.11 | -12.78 | 56.33 | 74 | -17.67 | PK | Vertical |
| 2483.6 | 52.55 | -12.78 | 39.77 | 54 | -14.23 | AV | Vertical |
| 2483.6 | 69.31 | -12.78 | 56.53 | 74 | -17.47 | PK | Horizontal |
| 2483.6 | 52.56 | -12.78 | 39.78 | 54 | -14.22 | AV | Horizontal |

Low measurement frequencies is range from 2310 to 2400 MHz, high measurement frequencies is range from 2483.5 to 2500 MHz.

Only show the worst point data of the emissions in the frequency 2310-2400 MHz and 2483.5-2500 MHz.



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Hopping

| Fraguenas | Motor Pooding | Factor | Emission Loug | Limits | Margin | Detector | |
|-----------|---------------|--------|----------------|----------|--------|----------|------------|
| Frequency | Meter Reading | Factor | Emission Level | | Ű | Detector | Comment |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | Туре | |
| | | | GFSK | | | | |
| 2390.0 | 66.71 | -12.99 | 53.72 | 74 | -20.28 | PK | Vertical |
| 2390.0 | 54.32 | -12.99 | 41.33 | 54 | -12.67 | AV | Vertical |
| 2390.0 | 65.60 | -12.99 | 52.61 | 74 | -21.39 | PK | Horizontal |
| 2390.0 | 51.52 | -12.99 | 38.53 | 54 | -15.47 | AV | Horizontal |
| 2483.5 | 65.85 | -12.78 | 53.07 | 74 | -20.93 | PK | Vertical |
| 2483.5 | 51.89 | -12.78 | 39.11 | 54 | -14.89 | AV | Vertical |
| 2483.5 | 66.54 | -12.78 | 53.76 | 74 | -20.24 | PK | Horizontal |
| 2483.5 | 53.03 | -12.78 | 40.25 | 54 | -13.75 | AV | Horizontal |
| | | | π/4-DQPSK | | | | |
| 2390.0 | 66.88 | -12.99 | 53.89 | 74 | -20.11 | PK | Vertical |
| 2390.0 | 54.10 | -12.99 | 41.11 | 54 | -12.89 | AV | Vertical |
| 2390.0 | 66.08 | -12.99 | 53.09 | 74 | -20.91 | PK | Horizontal |
| 2390.0 | 51.51 | -12.99 | 38.52 | 54 | -15.48 | AV | Horizontal |
| 2483.5 | 66.04 | -12.78 | 53.26 | 74 | -20.74 | PK | Vertical |
| 2483.5 | 52.04 | -12.78 | 39.26 | 54 | -14.74 | AV | Vertical |
| 2483.5 | 66.62 | -12.78 | 53.84 | 74 | -20.16 | PK | Horizontal |
| 2483.5 | 52.76 | -12.78 | 39.98 | 54 | -14.02 | AV | Horizontal |
| | | | 8DPSK | | | | |
| 2390.0 | 66.36 | -12.99 | 53.37 | 74 | -20.63 | PK | Vertical |
| 2390.0 | 54.13 | -12.99 | 41.14 | 54 | -12.86 | AV | Vertical |
| 2390.0 | 65.58 | -12.99 | 52.59 | 74 | -21.41 | PK | Horizontal |
| 2390.0 | 51.35 | -12.99 | 38.36 | 54 | -15.64 | AV | Horizontal |
| 2483.5 | 65.97 | -12.78 | 53.19 | 74 | -20.81 | PK | Vertical |
| 2483.5 | 51.96 | -12.78 | 39.18 | 54 | -14.82 | AV | Vertical |
| 2483.5 | 67.12 | -12.78 | 54.34 | 74 | -19.66 | PK | Horizontal |
| 2483.5 | 52.75 | -12.78 | 39.97 | 54 | -14.03 | AV | Horizontal |

Low measurement frequencies is range from 2310 to 2400 MHz, high measurement frequencies is range from 2483.5 to 2500 MHz.

Only show the worst point data of the emissions in the frequency 2310-2400 MHz and 2483.5-2500 MHz.



4. CONDUCTED SPURIOUS EMISSIONS

4.1 REQUIREMENT

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

4.2 TEST PROCEDURE

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

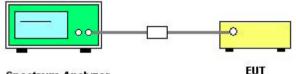
| Spectrum Parameter | Setting |
|---------------------------------------|---------------------------------|
| Detector | Peak |
| Start/Stop Frequency | 30 MHz to 10th carrier harmonic |
| RB / VB (emission in restricted band) | 100 KHz/300 KHz |
| Trace-Mode: | Max hold |

For Band edge

| Spectrum Parameter | Setting | | |
|---------------------------------------|----------------------------------|--|--|
| Detector | Peak | | |
| Stort/Stop Fragueney | Lower Band Edge: 2310 – 2404 MHz | | |
| Start/Stop Frequency | Upper Band Edge: 2478 – 2500 MHz | | |
| RB / VB (emission in restricted band) | 100 KHz/300 KHz | | |
| Trace-Mode: | Max hold | | |

Remark : Hopping on and Hopping off mode all have been tested, only worst case hopping off is reported.

4.3 TEST SETUP



Spectrum Analyzer

The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading. Make the measurement with the spectrum analyzer's resolution bandwidth(RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

4.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



4.5 TEST RESULTS

|--|

00 CH

| External Gain | 06:05:21 PM Oct 08, 2015 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P | ALIGN AUTO | | Trig: Free #Atten: 30 | PNO: Fast | 50Ω AC | RF | | RL |
|--------------------|---|-----------------------|------------------|--------------------------|------------------------|------------------|-----------------------|-----------------------|-------------|
| ExtPrean 0.00 c | lkr1 2.402 GHz 3.027 dBm | М | U 80 | #Atten: 30 | IFGain:Low | | Ref Offse Ref 8.03 | /div | 0 dB |
| N | | | | | | | X1 | | og 1.97 |
| 0.00 c | | | | | | | | | 12.0 |
| | -19.74 dBm | | | | | | _ | | 22.0 |
| | | | | | | | _ | | 32.0 |
| B1 0.00 d | <u> </u> | | | | | | | | 42.0 |
| 0.00 0 | | and the second states | الدرود والسيافين | met one our but tablis | anda Maria | . Luc astelluses | | | 52.0 |
| | | | | | | | | | 52.0 |
| | | | | | | | _ | | 72.0 - |
| | | | | | | | | | 32.0 - |
| | Stop 25.00 GHz 2.39 s (8001 pts) | Sweep | | W 300 kHz | #VBI | | Hz 00 kHz | 30 M BW 1 | |
| | FUNCTION VALUE | N FUNCTION WIDTH | | 3.027 dl -49.741 dl | 2.402 GHz 4.401 GHz | | SCL f f | ide tri N 1 N 1 | 1 2 3 |
| | | | | | | | | | 4 5 |
| | | | | | | | | | 6 7 |
| | | | | | | | | | 6 |

39 CH

| RL RF 50 | DQ AC | SENSE:INT | ALIGN AUTO Avg Type: Log-Pwr | 06:06:28 PM Oct 08, 2015 TRACE 1 2 3 4 5 6 TYPE MWWWWWW | External Gain |
|-------------------------------|--|--|--|---|---------------|
| | PNO: Fast IFGain:Low | | | DETPPPP | ExtPream |
| Ref Offset dB/div Ref 8.07 | | | N | 1kr1 2.440 GHz 3.069 dBm | 0.00 |
| g 1 93 | | | | | 1 |
| 9 | | | | -16.93 dBm | 0.00 |
| 9 | | | | | |
| 9 | | | | | в |
| 9 | | | | <u> </u> | 0.00 |
| | and the second | والباح والمحال الجوالة والمحالي والمحالي والمحالية | and the second diversion of th | | |
| | | | | | |
| 9 | | | | | |
| | | | | | |
| art 30 MHz es BW 100 kHz | #\/ | 300 kHz | Swoon | Stop 25.00 GHz 2.39 s (8001 pts) | |
| NODE TRC SCL | * * | | INCTION FUNCTION WIDTH | FUNCTION VALUE | |
| N 1 f | 2.440 GHz | 3.069 dBm | Tonenon wom | TOREHOR VALUE | |
| N 1 f | 24.401 GHz | -49.171 dBm | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |





| 1000 |
|------|
|------|

| gilent Spectrum Analyzer - Sv | | | | | |
|--|------------------------------|---------------------------------|---------------------------------|---|-------------------------------|
| RL RF 503 Center Freq 12.515 | | Trig: Free Run #Atten: 30 dB | ALIGN AUTO Avg Type: Log-Pwr | 06:45:50 PM Oct 08, 2015 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P | Frequency |
| Ref Offset 0 0 dB/div Ref 8.75 d | | | N | lkr1 2.480 GHz 3.750 dBm | Auto Tun |
| 1.25 11.3 21.3 | | | | -16.25 dBm | Center Fre 12.515000000 GF |
| 41.3 | | | | | Start Fre 30.000000 MH |
| 61.3 | | | | | Stop Fre 25.00000000 GH |
| tart 30 MHz Res BW 100 kHz | | W 300 kHz | - | Stop 25.00 GHz 2.39 s (8001 pts) | CF Ste 2.497000000 GF |
| IXR MODE TRC SCL 1 N 1 f 2 N 1 f 3 4 5 5 | × 2.480 GHz 24.700 GHz | ¥ F 3.750 dBm -49.502 dBm | FUNCTION FUNCTION WIDTH | FUNCTION VALUE | Auto Ma Freq Offs 0 H |
| 6 7 8 9 0 1 2 | | | | | L |
| 5G | | | STATUS | | |



Shenzhen STS Test Services Co., Ltd.

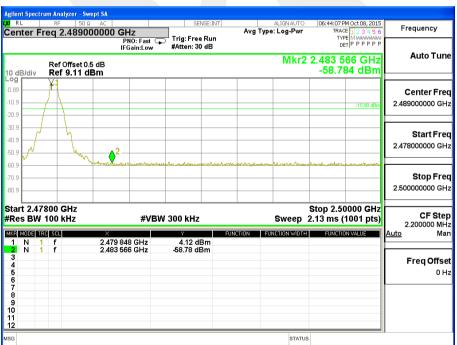
1/F., Building B, Zhuoke Science Park, No.190,Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong,China Tel: 0755-36886288 Fax: 0755-36886277 Http://www.stsapp.com E-mail: sts@stsapp.com



For Band edge

| | rum Analyzer | | | | | | | | |
|----------------------------|-------------------------------|------------------|------------------------|---|-----------------|-----------|------------------------|---|----------------|
| LXIRL | RF | 50 Ω AC | | | SE:INT | Avg Type | ALIGNAUTO : Log-Pwr | 06:04:35 PM Oct 08, 2015 TRACE 1 2 3 4 5 6 | External Gain |
| | | | NO: Fast 🗔 Gain:Low | Trig: Free #Atten: 30 | | | | | ExtPreamp |
| 10 dB/div | Ref Offse Ref 9.19 | | | | | | Mkr | 2 2.401 81 GHz 4.191 dBm | 0.00 dB |
| -0.81 | | | | | | | | 2 | IVIS |
| -10.8 | | | | | | | | -15.81 BBm | 0.00 dE |
| -20.8 | | | | | | | | -15.01 per | 0.00 42 |
| -30.8 | | | | | | | | | |
| 40.8 | | | | | | | | | BT: 0.00 dB |
| -50.8 | | | | | | | | Q' \ | 0.00 01 |
| -60.8 400 March 100 | and and a state of the second | entrene allowing | hennen | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | whythelphaneter | - gennade | مهاری را ار رو ا | tot have my constructed | |
| -70.8 | | | | | | | | | |
| -80.8 | | | | | | | | | |
| Start 2.31 #Res BW | 1000 GHz 100 kHz | | #VBV | V 300 kHz | | | | Stop 2.40400 GHz 9.00 ms (601 pts) | |
| MKR MODE T | | × 2.399 9 | 3 GHz | ĭ -54,199 d⊟ | | NCTION FU | NCTION WIDTH | FUNCTION VALUE | |
| 2 N 1 | f | 2.401 8 | | 4.191 dE | | | | | |
| 3 4 | | | | | | | | | |
| 5 6 | | | | | | | | | |
| 4 5 6 7 8 9 | | | | | | | | | |
| 9 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | 1 | |
| SG | | | | | | | STATUS | | |

78 CH







For Hopping Band edge

00 CH

| | 06:59:59 PM Oct 08, 2015 | ALIGN AUTO | | SENSE:INT | | | - Swept SA 50 Ω AC | um Analyzer - RF 5 | R L |
|---------------|----------------------------------|------------------------|----------|--------------|--------|------------|-----------------------|-----------------------|--------------------|
| Marker | TRACE 1 2 3 4 5 6 TYPE MWWWWW | e:Log-Pwr :>100/100 | | g: Free Run | | PNO: Fast | | | |
| Select Marker | DET PNNNN | | | en: 20 dB | Att | IFGain:Low | | | |
| 1 | 2.408 000 GHz 3.838 dBm | Mkr1 | | | | | 00 dBm | Ref 10.0 | dB/div |
| | 1 | | | | | | | Kei 10.0 | ^g |
| Norma | MAN | | | | | | | | .00 |
| | -16.20 dBm | | | | | | | | 0.0 |
| | | | | | | | | | 10 |
| Del | | | | | | | | | 0.0 |
| | | | | | | | | | 0.0 |
| Fixed | ♀ ∠ | | | | | | | | 0.0 |
| | and a start of the | | ····· | | A | | | |).0 <mark></mark> |
| | | | | | | | | | 0.0 |
| | Stop 2.40800 GHz | | | | | | | 000 GHz | |
| C | 9.40 ms (1001 pts) | Sweep 9 | | kHz | BW 300 | #VB | | 100 kHz | les BW |
| | FUNCTION VALUE | NCTION WIDTH | FUNCTION | 7 838 dBm | | 8 000 GHz | × 2.409 | C SCL | r Mode ti 1 n 1 |
| | | | | 813 dBm | | 9 804 GHz | | f | 2 N 1 |
| Properties | | | | | | | | | 4 |
| • | | | | | | | | | 4 5 5 7 |
| | | | | | | | | | 7 3 9 |
| Мо | | | | | | | | |) |
| 1 of | | | | | | | | | 2 |
| | | STATUS | | | | | | | 3 |





| Test Mode : | π/4-DQPSK(2Mbps) –00/39/78 CH |
|-------------|-------------------------------|
|-------------|-------------------------------|

00 CH

| Agilent Spectrum Analyzer - | | | | | |
|---|-------------------------|-----------------------------------|--|--|-------------------------------------|
| ₩ RL RF 50 Center Freq 12.51 | | SENSE:INT | ALIGN AUTO Avg Type: Log-Pwr | 07:08:26 PM Oct 08, 2015 TRACE 1 2 3 4 5 6 | Frequency |
| Ref Offset | | ➡ Trig: Free Run #Atten: 30 dB | N | TYPE DET P P P P P P Ikr1 2.402 GHz 0.340 dBm | Auto Tune |
| - og 1 -4.66 -14.7 -24.7 | | | | -19.66 dBm | Center Fre 12.515000000 GH |
| 34.7 44.7 54.7 | | | a state and a stat | | Start Fre 30.000000 MH |
| 64.7 74.7 34.7 | | | | | Stop Fre 25.000000000 G⊦ |
| tart 30 MHz Res BW 100 kHz | #VB | W 300 kHz | Sweep | Stop 25.00 GHz 2.39 s (8001 pts) cunction value | CF Ste 2.497000000 GH Auto Ma |
| 1 N 1 f 2 N 1 f 3 - - - 4 - - - 5 - - - 6 - - - 7 - - - 9 - - - 10 - - - 12 - - - | 2.402 GHz 24.426 GHz | 0.340 dBm -50.442 dBm | | | Freq Offse 0 ⊢ |
| 3G | | | STATUS | | |

| | | | | | | - Swept SA | pectrum Analyzer | Agilent S |
|-----------------------------------|--|--------------------------|--------|---|----------|------------|----------------------|--------------------------|
| Frequency | 07:09:27 PM Oct 08, 2015 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P | ALIGN AUTO e: Log-Pwr | Avg Ty | ig: Free Run tig: 30 dB | NO: East | P | RF Pr Freq 12.5 | a _{RL} Cente |
| Auto Tur | kr1 2.440 GHz 2.257 dBm | M | | | | | Ref Offse | 0 dB/d |
| Center Fre | | | | | | | ×1 | 2.74 |
| 12.515000000 GI | -17.74 dBm | | | | | | | 2.7 |
| Start Fro 30.000000 MI | - | | | ر می اندوانده اندواند. رو با از و اندواند و اندواند. | | | | 12.7 12.7 52.7 |
| Stop Fro 25.00000000 GI | | | | | | | | 2.7 🚧 2.7 — 2.7 — |
| CF Ste 2.497000000 GI | Stop 25.00 GHz 2.39 s (8001 pts) | | | | #VBW 30 | | 30 MHz BW 100 kHz | Res |
| <u>Auto</u> M | FUNCTION VALUE | INCTION WIDTH | NCTION | 2.257 dBm 0.217 dBm | | | | 1 N 2 N |
| Freq Offs 01 | | | | | | | | 3 4 5 6 7 |
| | | | | | | | | 8 9 0 1 |
| | | STATUS | | | | | | 2 66 |



78 CH

| | | | | SENSE:INT | | n Analyzer - Swept SA | |
|----------------------------|-------------------------------------|---------------|---------|---------------------------------|-------------------------|--|-------------------|
| Frequency | Avg ippe. Log-Fwi 10002 1 2 3 4 3 0 | | | | | RF 50 Ω AC | XIRL Center Er |
| Auto Tune | DET P P P P P | | | Trig: Free Run #Atten: 30 dB | PNO: Fast IFGain:Low | q 12.51500000 | |
| | kr1 2.480 GHz 2.549 dBm | М | | | | Ref Offset 0.5 dB Ref 7.55 dBm | 10 dB/div |
| Center Fre | | | | | | X1 | -2.45 |
| 12.515000000 GH | -17.45 dBm | | | | | | -12.5 |
| Start Fre | | | | | | | -32.5 |
| 30.000000 MH | <u> </u> | | | | | | -42.5 |
| | | | | | | and the product of the last of | |
| Stop Fre 25.00000000 GH | | | | | | | -72.5 |
| | Stop 25.00 GHz | | | | | lz | Start 30 M |
| CF Ste 2.49700000 GH | 2.39 s (8001 pts) | | | 300 kHz | #VBW : | | Res BW 1 |
| <u>Auto</u> Ma | FUNCTION VALUE | UNCTION WIDTH | JNCTION | 2.549 dBm -50.535 dBm | 2.480 GHz 4.501 GHz | f 2 | 1 N 1 2 N 1 |
| Freq Offs | | | | -00.000 ubin | 1.001 0112 | | 3 |
| 0 H | | | | | | | 5 6 7 |
| | | | | | | | 8 9 |
| | | | | | | | 10 11 12 |
| |] | STATUS | | | | | IZ |



Shenzhen STS Test Services Co., Ltd.

1/F., Building B, Zhuoke Science Park, No.190,Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong,China Tel: 0755-36886288 Fax: 0755-36886277 Http://www.stsapp.com E-mail: sts@stsapp.com

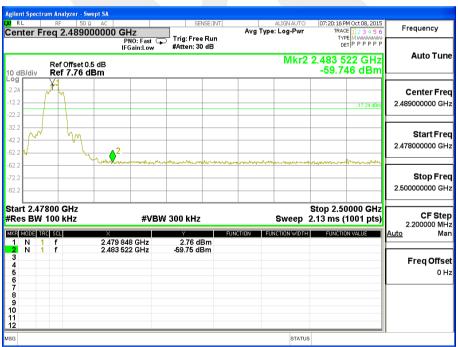


Report No.: STS1509130F02

For Band edge

| | rum Analyzer - S | | | | | | | | | |
|----------------------------|------------------|--|-------------------------------|--|--------------------|------------------------|------------------------|------------------------------|----------------|------------------------------|
| Center F | | DO0000 GH | | | SE:INT | Avg Type | ALIGNAUTO : Log-Pwr | TRAC | M Oct 08, 2015 | Frequency |
| | | PI | NO: Fast 😱 Gain:Low | Trig: Free #Atten: 30 | | | | TYF | TPPPPPP | |
| | Ref Offset | | | | | | Mkr2 | 2.401 8 | 38 GHz | Auto Tune |
| 10 dB/div | Ref 6.73 | | | | | | | 1.72 | 28 dBm | |
| -3.27 | | | | | | | | | 2 | Center Freq |
| -13.3 | | | | | | | | | -18.27 dEm | 2.357000000 GHz |
| -23.3 | | | | | | | | | -10.27 (404) | |
| -33.3 | | | | | | | | | | Otherst Frank |
| -43.3 | | | | | | | | | 1 | Start Freq 2.31000000 GHz |
| -53.3 | | | | | | | | | ` | 2.31000000 GH2 |
| -63.3 | www.penson. | adoptional and a second and a se | 1 to all and a second to logo | and the second | h-toorflact strong | wither with the second | ***** | helefistered and a start was | Landley mind | |
| -73.3 | | | | | | | | | | Stop Freq |
| -83.3 | | | | | | | | | | 2.404000000 GHz |
| Start 2.31 | | | | | | 1 | | Stop 2.40 | | |
| #Res BW | 100 kHz | | #VBW | 300 kHz | | | Sweep | 9.00 ms (| 1001 pts) | CF Step 9.400000 MHz |
| MKB MODE TO | | × 2.399 86 | 4.011- | ¥ -52.75 d⊟ | | NCTION FU | NCTION WIDTH | FUNCTIO | N VALUE | <u>Auto</u> Man |
| 2 N 1 | f f | 2.399 86 | | -52.75 dE 1.73 dE | | | | | | |
| 3 | | | | | | | | | | Freq Offset |
| 5 | | | | | | | | | | 0 Hz |
| 4 5 6 7 8 9 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| MSG | | | | | | | STATU | 5 | | |

78 CH







For Hopping Band edge

| 6 | | | | | | | | | um Analyzer - Sv | |
|---------------|----------------|---------------------------|------------------------|--------------|---------------|---------------------------------|---------------------------|-------------|---------------------------|----------------------------|
| Marker | 23456 | 07:40:33 PM O TRACE 1 | ALIGNAUTO : Log-Pwr | | NSE:INT | | | Ω AC | RF 50 : | XI RL |
| Select Marker | PPPPP | DET | | Avg Hold | | Trig: Free #Atten: 3 | PNO: Fast 🕞 Gain:Low | P IF | | |
| 1 | | 2.408 00 2.817 | Mkr1 | | | | | | Ref Offset 0 Ref 10.00 | 0 dB/div |
| | MW | | | | | | | | | og 0.00 |
| Norm | 17.18 dBm | | | | | | | | | 0.0 |
| | | | | | | | | | | 20.0 |
| Delt | c l | | | | | | | | | 40.0 |
| | 2 | | | | | | | | | 50.0 |
| | | and a second | mana mha an | nanlaskumani | allowedge and | teres and a process of the pro- | لما مثلقه الجومي مع معرمي | ميار محمد م | w | 0.0 <mark>04.1000</mark> |
| Fixed | | | | | | | | | | 80.0 |
| | 00 O U- | No. 0 4004 | | | | | | | 000 OU- | Start 2.31 |
| | | Stop 2.4080 9.40 ms (6 | | | | V 300 kHz | #VBV | | | Res BW |
| | ALUE | FUNCTION V | NCTION WIDTH | CTION FL | | Y 2.817 d | 00 GHz | × | C SCL f | 1 N 1 |
| | | | | | | -54.056 d | B4 GHz | | f | 2 N 3 |
| Properties | | | | | | | | | | 4 |
| | | | | | | | | | | 4 5 6 7 8 9 |
| Мо | | | | | | | | | | 8 9 |
| 1 of | | | | | | | | | | 10 11 |
| | | | STATUS | | | | | | | 1 2 |
| | | | 0.1.1.00 | | | | | | | - |

78 CH





Test Mode : 8-DPSK(3Mbps)

00 CH

| RL | RF 50 | Ω AC | | SENSE:1 | | ALIGN AUTO | | M Oct 08, 2015 | - |
|-----------------------|--|------|-------------------------------|---------------------------------|--------------------|-------------------------|---------|--|--------------------------|
| nter Fr | eq 12.515 | Р | GHZ NO: Fast G Gain:Low | Trig: Free Ru #Atten: 30 dB | Avgī | Гуре: Log-Pwr | TYP | E 1 2 3 4 5 6 E M WWWWWW T P P P P P P | Frequency |
| dB/div | Ref Offset 0 Ref 6.69 (| | | | | N | | 02 GHz 35 dBm | Auto Tun |
| 9 | X1 | | | | | | | | Center Fre |
| 3 | | | | | | | | -18.32 dBm | 12.515000000 GH |
| 3 | | | | | | | | | |
| 3 | | | | | | | | | Start Fre |
| 3 | | | | | | | | <u> </u> | 30.000000 MH |
| 3 3 Japan 1 | and a state of the | | a series and | and the second different of the | فللمواطئة المحادثة | No. of Concession, Name | | | |
| 3 | | | | | | | | | Stop Fre |
| 3 | | | | | | | | | 25.00000000 GH |
| art 30 M | | | | | | | Oton 3 | 5.00 GHz | |
| | 100 kHz | | #VBV | V 300 kHz | | Sweep | | 8001 pts) | CF Ste 2.497000000 GH |
| NODE TR | C SCL | × | | Y | FUNCTION | FUNCTION WIDTH | FUNCTIO | N VALUE | <u>Auto</u> Ma |
| N 1 N 1 | f | | 02 GHz 51 GHz | 1.685 dBm -50.235 dBm | | | | | |
| | | | | | | | | | Freq Offs |
| | | | | | | | | | 0 H |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

39 CH

| | rum Analyzer - | Swept SA | | | | | | | | |
|--|-----------------------|----------|--------------------|------------------------|-----|-----------|--------------------------|----------|--|--|
| Center F | | 50 Ω AC | GHz PNO: Fast G | | Bun | Avg Typ | ALIGN AUTO e: Log-Pwr | TRAC | M Oct 08, 2015 E 1 2 3 4 5 6 E M WWWWWWW | Frequency |
| 10 dB/div | Ref Offse Ref 5.48 | 10.5 dB | FGain:Low | #Atten: 30 | | | N | lkr1 2.4 | 40 GHz 44 dBm | Auto Tune |
| -4.52 | ×1 | | | | | | | | -19.52 dBm | Center Freq 12.515000000 GHz |
| -34.5 -44.5 -54.5 | | | | | | | | where | ð | Start Freq 30.000000 MHz |
| -64.5 -74.5 -84.5 | | | | | | | | | | Stop Fred 25.00000000 GH; |
| Start 30 #Res BW | 100 kHz | | #VB\ | N 300 kHz | | | · · · | | 5.00 GHz 3001 pts) | CF Step 2.49700000 GH: |
| 1 N 2 2 N 3 4 5 6 7 8 9 | HU SUL 1 f 1 f | | 40 GHz 25 GHz | 0.484 df -49.872 df | 3m | NCTION FL | INCTION WIDTH | FUNCTIO | N VALUE | <u>Auto</u> Mar Freq Offset 0 Hz |
| 10 11 12 MSG | | | | | | | STATUS | | | |

1/F., Building B, Zhuoke Science Park, No.190,Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong,China Tel: 0755-36886288 Fax: 0755-36886277 Http://www.stsapp.com E-mail: sts@stsapp.com

Shenzhen STS Test Services Co., Ltd.



78 CH

| | | | | | | | zer - Swept SA | it Spectrum Analyz |
|--|--|--------------------------|---|----------------------|----------|--|-------------------------|---|
| Frequency | 08:09:46 PM Oct 08, 2015 TRACE 1 2 3 4 5 6 TYPE M WARMAN | ALIGN AUTO e: Log-Pwr | Avg Ty | SENSE:INT | TrimE | | 50 Q AC | L RF Iter Freq 12 |
| Auto Tune | Ikr1 2.480 GHz -2.490 dBm | M | | Free Run n: 30 dB | | PNO: Fast G IFGain:Low | fset 0.5 dB 2.51 dBm | |
| Center Freq 12.515000000 GHz | -22.49 dBm | | | | | | | |
| Start Freq 30.000000 MHz | <u> </u> | | Land Land Land Land Land Land Land Land | | | and the second sec | | |
| Stop Freq 25.000000000 GHz | | | | | | | | |
| CF Step 2.497000000 GHz Auto Man | Stop 25.00 GHz 2.39 s (8001 pts) | Sweep | FUNCTION | (Hz | W 300 ki | #VBV | lz × | t 30 MHz s BW 100 kH MODE TRC SCL |
| Freq Offset 0 Hz | PORCHOIN VALUE | | | 90 dBm 51 dBm | -2.490 | 2.480 GHz 1.700 GHz | 2 | N 1 f |
| | | STATUS | | | | | | |



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For Band edge

00 CH

| | rum Analyzer - Swe | pt SA | | | | |
|-------------|----------------------------|---|------------------------------|------------------------------------|---|-----------------|
| LXIRL | RF 50 Ω | | SENSE:INT | ALIGN AUTO Avg Type: Log-Pwr | 07:50:50 PM Oct 08, 2015 TRACE 1 2 3 4 5 6 | Frequency |
| Center F | req 2.35700 | PNO: Fast 🕞 | Trig: Free Run | Avg Type. Log-Fwi | TYPE MWWWWWW DET P P P P P P | |
| | | IFGain:Low | #Atten: 30 dB | | | Auto Tune |
| | Ref Offset 0.5 | dB | | Mkr2 | 2.401 838 GHz | Auto Tune |
| 10 dB/div | Ref 6.73 dE | sm | | | 1.727 dBm | |
| -3.27 | | | | | 2 | |
| -13.3 | | | | | L III | Center Freq |
| | | | | | -18.29 dBm | 2.357000000 GHz |
| -23.3 | | | | | | |
| -33.3 | | | | | N 18 | Start Freq |
| -43.3 | | | | | | 2.310000000 GHz |
| -53.3 | | | | | | 2.0100000000012 |
| -63.3 12mm | Malour Markland and Marken | white any the state of the second second second | have mark by included of the | www.march.l.herval.annormal.sn.ann | m-procession-splatheterit | |
| -73.3 | | | | | | Stop Freq |
| -83.3 | | | | | | 2.404000000 GHz |
| | | | | | | |
| | 1000 GHz | | | | Stop 2.40400 GHz | CF Step |
| #Res BW | 100 KHZ | #VBV | V 300 kHz | Sweep | 9.00 ms (1001 pts) | 9.400000 MHz |
| MKR MODE T | | × | | JNCTION FUNCTION WIDTH | FUNCTION VALUE | <u>Auto</u> Man |
| | 1 f 1 f | 2.399 582 GHz 2.401 838 GHz | -52.06 dBm 1.73 dBm | | | |
| 3 | | 2.401 000 0112 | in o ubiii | | | Freq Offset |
| 4 | | | | | | 0 Hz |
| 5 6 7 | | | | | | |
| 8 | | | | | | |
| 8 9 | | | | | | |
| 10 11 | | | | | | |
| 12 | | | | | | |
| MSG | | | | STATUS | , | |

78 CH



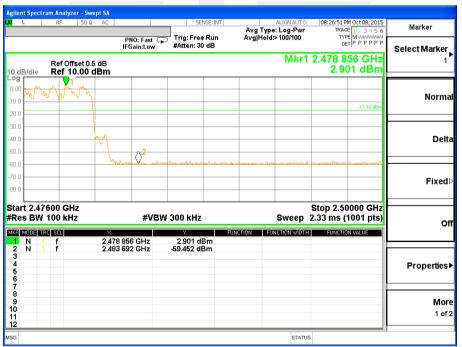


For Hopping Band edge

:03 PM Oct 08, 2015 Marker Avg Type: Log-Pwr Avg|Hold:>100/100 TRACE 1 2 3 4 5 6 TYPE M Trig: Free Run #Atten: 30 dB PNO: Fast 😱 IFGain:Low Select Marker Mkr1 2.405 844 GHz Ref Offset 0.5 dB Ref 10.00 dBm 2.640 dBm 10 dB/div Log 0.0 Norma -10.0 17.36 d 20.0 -30.0 40.0 Delta -50.0 -60.0 -70.0 Fixed 80.0 Start 2.31000 GHz #Res BW 100 kHz Stop 2.40800 GHz Sweep 9.40 ms (1001 pts) #VBW 300 kHz Off MKR MODE TRC SCL FUNCTION FUNCTION WIDTH 2.405 844 GHz 2.399 804 GHz 2.640 dBm -55.835 dBm N N f 2 3 4 5 6 7 8 9 10 11 12 Properties) More 1 of 2 SG STATUS

00 CH

78 CH





5. NUMBER OF HOPPING CHANNEL

5.1 APPLIED PROCEDURES / LIMIT

| | FCC Part15 (15.247), Subpart C | | | | | | |
|-----------------------|--------------------------------|-------|--------------------------|--------|--|--|--|
| Section | Test Item | Limit | Frequency Range (MHz) | Result | | | |
| 15.247 (a)(1)(iii) | Number of Hopping Channel | ≥15 | 2400-2483.5 | PASS | | | |

| Spectrum Parameters | Setting | | | |
|---------------------|-----------------------------|--|--|--|
| Attenuation | Auto | | | |
| Span Frequency | > Operating Frequency Range | | | |
| RB | 100 KHz | | | |
| VB | 100 KHz | | | |
| Detector | Peak | | | |
| Trace | Max Hold | | | |
| Sweep Time | Auto | | | |

5.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100K, VBW=100K, Sweep time = Auto.

5.3 TEST SETUP

| EUT | SPECTRUM |
|-----|----------|
| | ANALYZER |

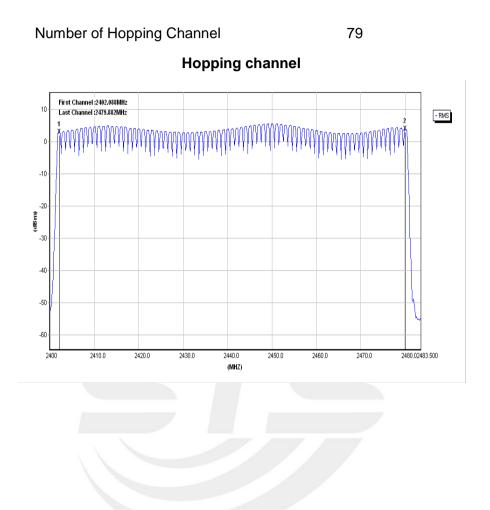
5.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



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5.5 TEST RESULTS



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6. AVERAGE TIME OF OCCUPANCY

6.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247), Subpart C | | | | | | |
|--------------------------------|------------------------------|--------|--------------------------|--------|--|--|
| Section | Test Item | Limit | Frequency Range (MHz) | Result | | |
| 15.247 (a)(1)(iii) | Average Time of Occupancy | 0.4sec | 2400-2483.5 | PASS | | |

6.2 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 3MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- Set the center frequency on any frequency would be measure and set the frequency span to e. zero span.
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.

DH5 Packet permit maximum 1600/79/6 = 3.37 hops per second in each channel (5 time

i. slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 3.37 x 31.6
 = 106.6 within 31.6 seconds.

DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time

j. slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 5.06 x 31.6
 = 160 within 31.6 seconds.

DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time

k. slot RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 10.12 x 31.6
 = 320 within 31.6 seconds.

6.3 TEST SETUP



6.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

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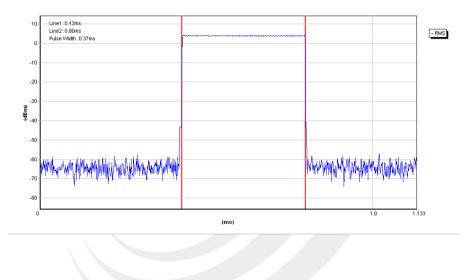


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6.5 TEST RESULTS

| Data Packet | Frequency | Pulse Duration (ms) | Dwell Time (s) | Limits(s) |
|-------------|-----------|------------------------|-------------------|-----------|
| DH1 | 2441 MHz | 0.370 | 0.118 | 0.4 |
| DH3 | 2441 MHz | 1.630 | 0.261 | 0.4 |
| DH5 | 2441 MHz | 2.880 | 0.307 | 0.4 |

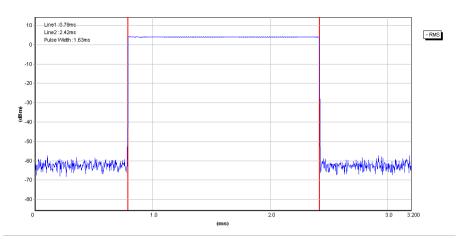
CH39-DH1

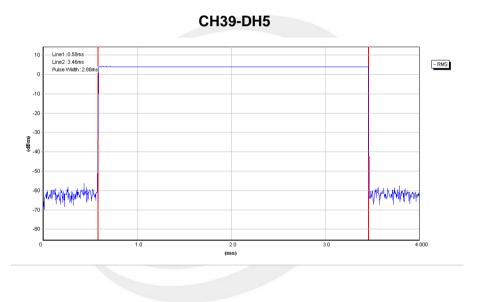


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CH39-DH3





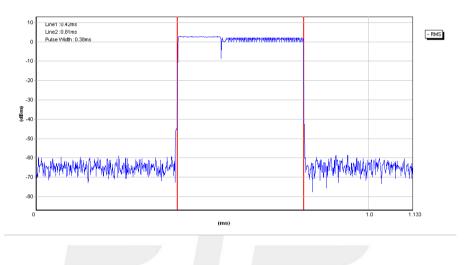
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| Data Packet | Frequency | Pulse Duration (ms) | Dwell Time (s) | Limits(s) |
|-------------|-----------|------------------------|-------------------|-----------|
| 2DH1 | 2441 MHz | 0.380 | 0.122 | 0.4 |
| 2DH3 | 2441 MHz | 1.640 | 0.262 | 0.4 |
| 2DH5 | 2441 MHz | 2.890 | 0.308 | 0.4 |

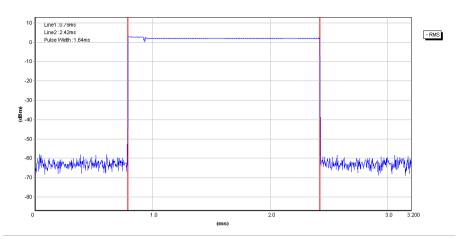
CH39-2DH1

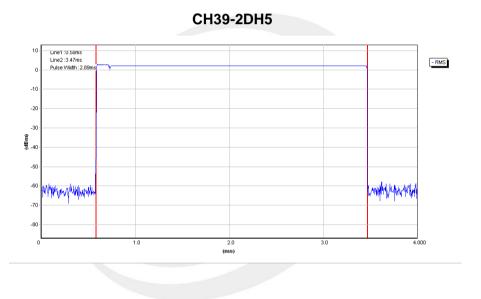


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CH39-2DH3





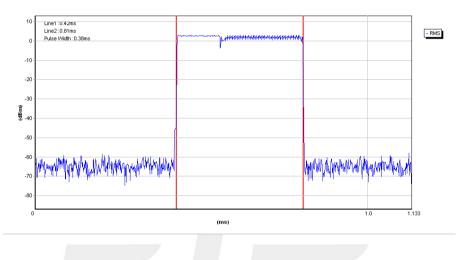
Shenzhen STS Test Services Co., Ltd.



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| Data Packet | Frequency | Pulse Duration (ms) | Dwell Time (s) | Limits(s) |
|-------------|-----------|------------------------|-------------------|-----------|
| 3DH1 | 2441 MHz | 0.380 | 0.122 | 0.4 |
| 3DH3 | 2441 MHz | 1.640 | 0.262 | 0.4 |
| 3DH5 | 2441 MHz | 2.890 | 0.308 | 0.4 |

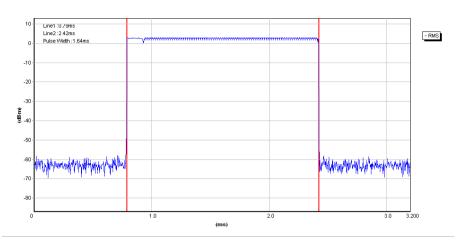
CH39-3DH1

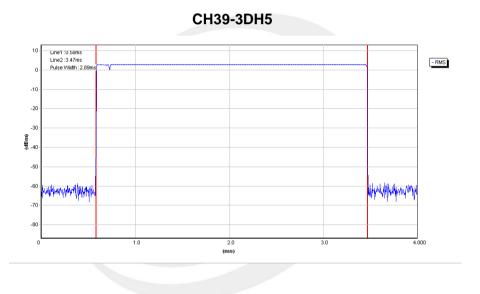


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CH39-3DH3





Shenzhen STS Test Services Co., Ltd.



7. HOPPING CHANNEL SEPARATION MEASUREMEN

7.1 APPLIED PROCEDURES / LIMIT

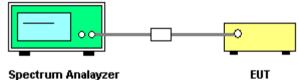
Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 20 dB bandwidth of the hopping channel, whichever is greater.

| Spectrum Parameter | Setting | | | |
|--|---|--|--|--|
| Attenuation | Auto | | | |
| Span Frequency > Measurement Bandwidth or Channel Separation | | | | |
| RB 30 kHz (20dB Bandwidth) / 30 kHz (Channel Separatio | | | | |
| VB | 100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation) | | | |
| Detector | Peak | | | |
| Trace | Max Hold | | | |
| Sweep Time | Auto | | | |

7.2 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- b. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for 20 dB bandwidth measurement.
- c. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for channel separation measurement.

7.3 TEST SETUP



7.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

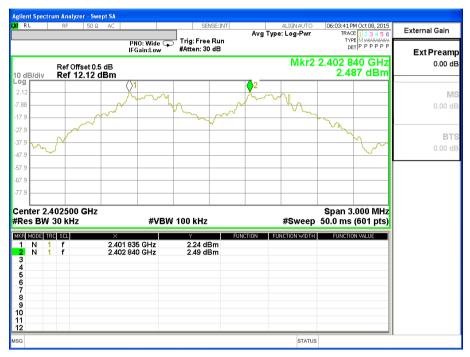


7.5 TEST RESULTS

| Frequency | Ch. Separation (MHz) | Limit | Result |
|-----------|-------------------------|-------|----------|
| 2402 MHz | 1.005 | 0.891 | Complies |
| 2441 MHz | 1.005 | 0.892 | Complies |
| 2480 MHz | 1.000 | 0.849 | Complies |

For GFSK: Ch. Separation Limits: >20dB bandwidth

CH00 -1Mbps

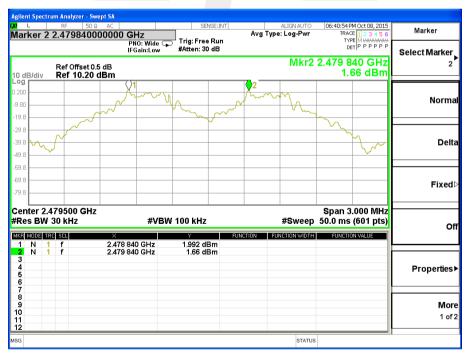




CH39 -1Mbps



CH78 -1Mbps







| Frequency | Ch. Separation (MHz) | Limit | Result |
|-----------|-------------------------|-------|----------|
| 2402 MHz | 1.015 | 0.857 | Complies |
| 2441 MHz | 1.005 | 0.857 | Complies |
| 2480 MHz | 1.025 | 0.856 | Complies |

For π /4-DQPSK(2Mbps): Ch. Separation Limits: > two-thirds 20dB bandwidth

| RF 50 Ω | AC | SENSE:INT | ALIGN AUTO | 07:06:46 PM Oct 08, 2015 | _ |
|------------------------------------|--|---------------------------------|------------------------|--|-------------------------|
| ter Freq 2.40250 | DOOOO GHz PNO: Wide C IFGain:Low | Trig: Free Run #Atten: 30 dB | Avg Type: Log-Pwr | TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P | Frequency |
| Ref Offset 0.4 B/div Ref 4.46 d | | | Mkr2 | 2.402 850 GHz -1.104 dBm | Auto T |
| | X1~~~~ | | A ² | \sim | Center F 2.402500000 |
| ~~ | | | | | Start F 2.401000000 |
| | | | | | Stop F 2.404000000 |
| nter 2.402500 GHz es BW 30 kHz | #VB | W 100 kHz | #Sweep | Span 3.000 MHz 50.0 ms (601 pts) | CF S 300.000 |
| MODE TRC SCL N 1 f N 1 f | × 2.401 835 GHz 2.402 850 GHz | -0.185 dBm -1.104 dBm | JNCTION FUNCTION WIDTH | FUNCTION VALUE | Auto |
| | 2.402 850 GH2 | -1.104 dBm | | | Freq Of |
| | | | | | |
| | | | | | |

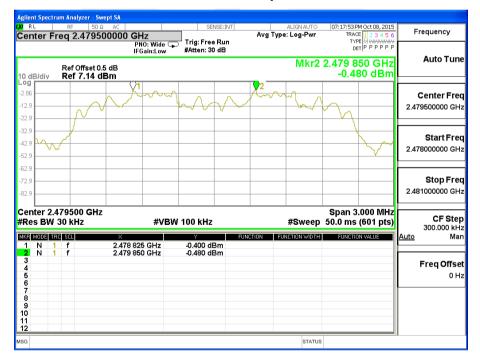
CH00 -2Mbps



CH39 -2Mbps

| L | RF 50 Ω AC | | SENSE: INT | | ALIGN AUTO | 07:13:18 P | M Oct 08, 2015 | - |
|------------------|-----------------------------------|--|------------------------|-------------|------------|------------|--|-------------------------------------|
| nter F | req 2.44150000 | PNO: Wide 😱 | Trig: Free Run | Avg Type | e: Log-Pwr | TYP | E 1 2 3 4 5 6 E M WWWWWW T P P P P P P | Frequency |
| B/div | Ref Offset 0.5 dB Ref 8.07 dBm | IFGain:Low | #Atten: 30 dB | | Mkr2 | 2.441 8 | 40 GHz 56 dBm | Auto Tu |
| 9 | | X-~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | ~~~~ | ×2 | w. | \sim | | Center Fr 2.441500000 G |
| | | | | | | | | Start Fr 2.440000000 G |
| 9 9 9 | | | | | | | | Stop Fr 2.443000000 G |
| es BW Node Tr | | | 100 kHz | FUNCTION FU | #Sweep | 50.0 ms | .000 MHz (601 pts) | CF St 300.000 k <u>Auto</u> M |
| N 1 | | 40 835 GHz 41 840 GHz | 0.823 dBm 1.056 dBm | | | | | Freq Offs 0 |
| | | | | | STATUS | | | |

CH78 -2Mbps





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| Frequency | Ch. Separation (MHz) | Limit | Result |
|-----------|-------------------------|-------|----------|
| 2402 MHz | 1.005 | 0.852 | Complies |
| 2441 MHz | 1.000 | 0.852 | Complies |
| 2480 MHz | 1.000 | 0.851 | Complies |

For 8-DPSK(3Mbps):

3.3

23.4

-43 /

-53.4 -63.4

-83.

SG

Ch. Separation Limits: > two-thirds 20dB bandwidth

CH00 -3Mbps nalyzer ADDEDUE DESERVICE RF 50 Ω AC | I Center Freq 2.402500000 GHz PN0: Wide ↓ IFGain:Low 0 PM Oct 08, 2015 Frequency Avg Type: Log-Pwr Trig: Free Run #Atten: 30 dB DET P P P P P Mkr2 2.402 840 GHz -1.533 dBm Auto Tune Ref Offset 0.5 dB Ref 6.65 dBm 10 dB/div Log Center Freq 2.402500000 GHz Start Freq \mathcal{A} 2.401000000 GHz Stop Freq 2.404000000 GHz Center 2.402500 GHz #Res BW 30 kHz Span 3.000 MHz CF Step 300.000 kHz Man #Sweep 50.0 ms (601 pts) #VBW 100 kHz
 MXR
 MXR</th FUNCTION VALUE FUNCTION WIDTH EUNCTION ۱uto 2.401 835 GHz 2.402 840 GHz -1.755 dBm -1.533 dBm Freq Offset 0 Hz

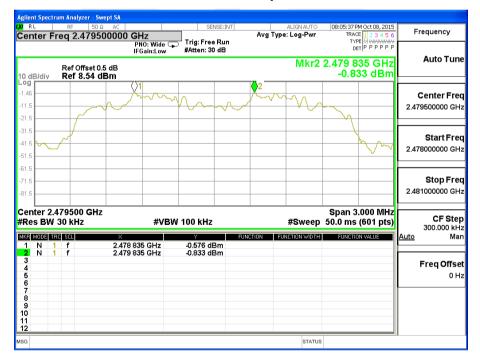
STATUS



CH39 -3Mbps

| | 3 PM Oct 08, 2015 | 08:00:18 F | ALIGN AUTO | | SENSE:INT | | | OΩ AC | 50 | RF | | |
|---------------------------|-------------------|------------|--------------|----------|------------|----------|------------------|--------|------------------|----|-------------|--------|
| Frequency | ACE 1 2 3 4 5 6 | TYP | : Log-Pwr | Avg Typ | : Free Run | Tria: Fr | GHz PNO: Wide | 500000 | 2.441 | eq | Fre | ter |
| Auto Tur | B35 GHZ | | Micro | | en: 30 dB | | IFGain:Low | | | | | |
| | 639 dBm | | | | | | | | Offset f 8.05 | | | 3/di |
| Center Fre | | | ~~~~ | 2 | | A 4. | Xin. | | | _ | | |
| 2.441500000 Gł | | - N | VV | | \sim | YUN | | \sim | ~ | - | | - |
| | V | 1 | | | | | | | / | | | |
| Start Fr 2.440000000 G | hno | | | | | | | | | ~ | had a start | \sim |
| 2.11000000000 | ~ | | | | | | | | | | | |
| Stop Fre | | | | | | | | | | | | |
| 2.443000000 GI | | | | | | | | | | _ | | |
| CF Ste | 3.000 MHz | | | | | | | Ηz | 00 GH | | | |
| 300.000 ki | s (601 pts) | | · · | | | W 100 kH | #VBV | | | | W 3 | |
| Auto M | TION VALUE | FUNCTIO | NCTION WIDTH | NCTION F | 55 dBm | | 0 835 GHz | | | f | TRC 1 | Ν |
| Freq Offs | | | | | 39 dBm | -0.639 | 1 835 GHz | 2.441 | | f | 1 | N |
| 01 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | STATUS | | | | | | | | | |

CH78 -3Mbps





8. BANDWIDTH TEST

8.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247), Subpart C | | | | | | |
|--------------------------------|-----------|------------------|--------------------------|--------|--|--|
| Section | Test Item | Limit | Frequency Range (MHz) | Result | | |
| 15.247 (a)(1) | Bandwidth | (20dB bandwidth) | 2400-2483.5 | PASS | | |

| Spectrum Parameter | Setting | | | | | |
|--------------------|---|--|--|--|--|--|
| Attenuation | Auto | | | | | |
| Span Frequency | > Measurement Bandwidth or Channel Separation | | | | | |
| RB | 30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation) | | | | | |
| VB | 100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation) | | | | | |
| Detector | Peak | | | | | |
| Trace | Max Hold | | | | | |
| Sweep Time | Auto | | | | | |

8.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 30KHz, VBW=100KHz, Sweep time = Auto.

8.3 TEST SETUP

| EUT | SPECTRUM |
|-----|----------|
| | ANALYZER |

8.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



8.5 TEST RESULTS

| Frequency | 20dB Bandwidth (MHz) | Result |
|-----------|-------------------------|--------|
| 2402 MHz | 0.891 | PASS |
| 2441 MHz | 0.892 | PASS |
| 2480 MHz | 0.849 | PASS |

CH00 -1Mbps

| gilent Spectrum Anal RL RF Center Freq 2. | 50 Ω AC 402000000 GH | | SENSE:INT Iter Freq: 2.40200 g: Free Run | | ALIGN AUTO | 02:45:48 AM Oct 08, 201 Radio Std: None | 5 Frequency |
|---|---------------------------|-----------|--|------------|------------|--|--------------------------------|
| Re | #IFG | | en: 30 dB | Avginoid.> | 10/10 | Radio Device: BTS | |
| | ef 10.00 dBm | | | | | | |
| 10.0 | | ~^^ | | M | | | Center Free 2.402000000 GH: |
| 80.0 | | | | <u> </u> | \sim | ~~ | - |
| | ~ | | | | | \sim | 2 |
| 0.0 | | | | | | | _ |
| 0.0 | | | | | | | CF Ste |
| enter 2.402 G Res BW 30 kH | | | #VBW 100 k | :Hz | | Span 2 MH Sweep 2.733 m | Z 200.000 kH |
| Occupied | Bandwidth 840 | .98 kHz | Total P | ower | 10.2 | 2 dBm | Freq Offse 0 H |
| Transmit Fr | eq Error | -168 Hz | OBW F | ower | 99 | 0.00 % | |
| x dB Bandw | idth | 891.0 kHz | x dB | | -20. | 00 dB | |
| G | | | | | STATUS | | |

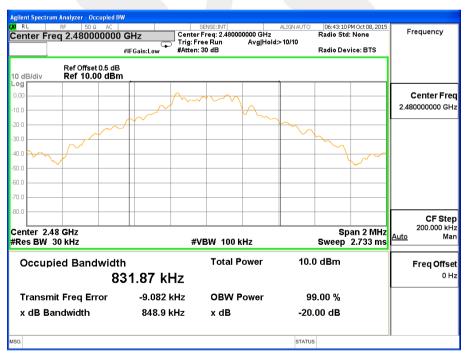
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CH39 -1 Mbps



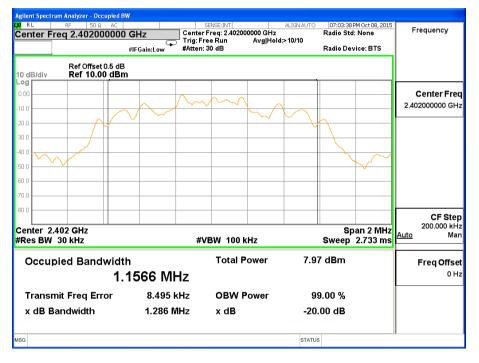
CH78 -1Mbps





| Frequency | 20dB Bandwidth(MHz) | Result |
|-----------|---------------------|--------|
| 2402 MHz | 1.286 | PASS |
| 2441 MHz | 1.286 | PASS |
| 2480 MHz | 1.284 | PASS |

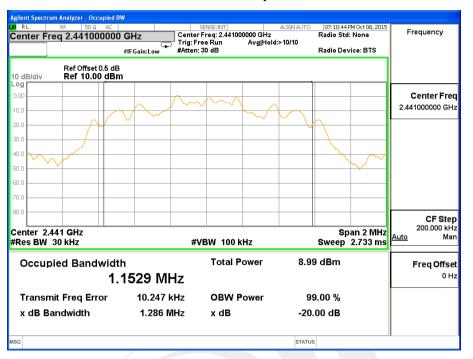
CH00 -2Mbps



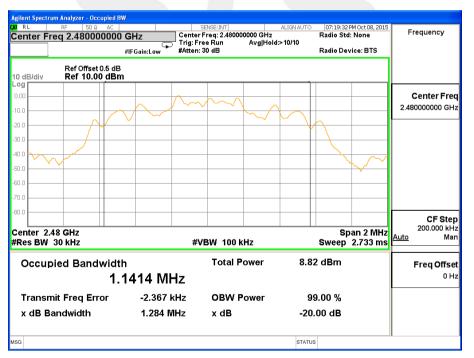
Shenzhen STS Test Services Co., Ltd.



CH39 -2Mbps



CH78 -2Mbps



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| Frequency | 20dB Bandwidth (MHz) | Result |
|-----------|-------------------------|--------|
| 2402 MHz | 1.278 | PASS |
| 2441 MHz | 1.278 | PASS |
| 2480 MHz | 1.277 | PASS |

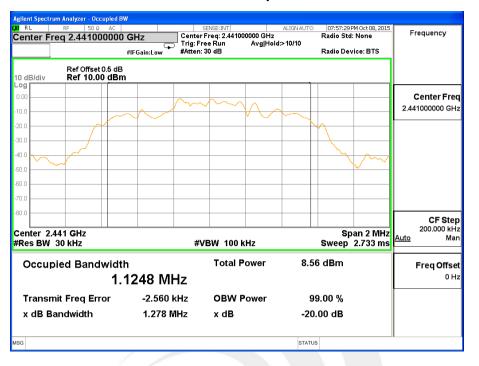
CH00 -3Mbps

| Agilent Spectrun | n Analyzer - Occupier RF 50 Q AC | | CF. | N KOTO IN IT | | | 07:45:40 | DM (0++ 00, 2015 | ſ |
|-------------------------|-------------------------------------|-----------------------------|--|---------------|----------|--------|--|-----------------------|--------------------------------|
| | eq 2.4020000 | | Center Freq: 2.402000000 GHz Radio Std: No | | | | or:45:42 PM Oct 08, 2015 Idio Std: None Frequency | | |
| | | #IFGain:Low | Trig: Fre #Atten: 3 | e Run 0 dB | Avg Hold | >10/10 | Radio De | vice: BTS | |
| 10 dB/div | Ref Offset 0.5 d | | | | | | | | |
| 0.00 | | | \sim | \sim | | | | | Center Freq 2.402000000 GHz |
| -20.0 | | | | | | | $\overline{\mathbf{v}}$ | | |
| -40.0 | | | | | | | | \sim | |
| -60.0 | | | | | | | | | |
| -80.0 | | | | | | | | | CF Step 200.000 kHz |
| Center 2.4 #Res BW 3 | | | #VE | 3W 100 k | Hz | | Sp Sweep | oan 2 MHz 2.733 ms | <u>Auto</u> Man |
| Occupi | ied Bandwid 1 | ^{ժքի} I.1257 Mł | Ηz | Total P | ower | 7.9 | 54 dBm | | Freq Offset 0 Hz |
| Transmi | it Freq Error | -2.464 I | Hz | OBW P | ower | 9 | 99.00 % | | |
| x dB Ba | ndwidth | 1.278 N | IHz | x dB | | -20 | 0.00 dB | | |
| MSG | | | | | | STAT | us | | |

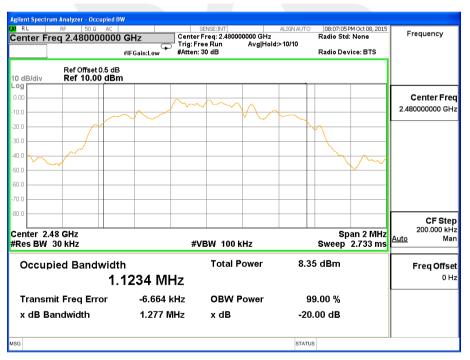
Shenzhen STS Test Services Co., Ltd.



CH39 -3Mbps



CH78 -3Mbps





9. PEAK OUTPUT POWER TEST

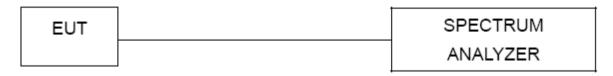
9.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247), Subpart C | | | | | | |
|--------------------------------|-----------------|--|--------------------------|--------|--|--|
| Section | Test Item | Limit | Frequency Range (MHz) | Result | | |
| 15.247 | Peak | 1 W or 0.125W | | | | |
| (b)(i) | Output Power | Or if channel separation > 2/3 bandwidthprovided the systems operatewith an output power no greater than125 mW(20.96dBm) | 2400-2483.5 | PASS | | |

9.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : GFSK(1Mbps):RBW= 1MHz, VBW= 3MHz, Sweep time = Auto.
- ^{c.} Spectrum Setting : $\pi/4$ -DQPSK(2Mbps):RBW= 3MHz, VBW= 3MHz, Sweep time = Auto.
- d. Spectrum Setting : 8-DPSK(3Mbps):RBW= 3MHz, VBW= 3MHz, Sweep time = Auto.

9.3 TEST SETUP



9.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



9.5 TEST RESULTS

| Test Channel | Frequency | Peak Output Power | LIMIT |
|--------------|-----------|-------------------|-------|
| | (MHz) | (dBm) | (dBm) |
| CH00 | 2402 | 4.400 | 30 |
| CH39 | 2441 | 3.924 | 30 |
| CH78 | 2480 | 4.189 | 30 |

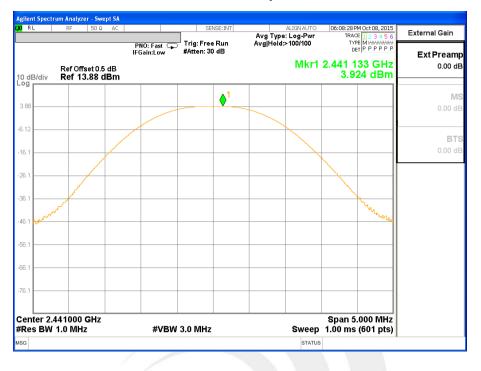
Note : the channel separation > bandwidth

| IFGain:Low Ref Offset 0.5 dB 0 dB/div Ref 14.36 dBm 9 4.36 6.64 5.6 5.6 5.6 | #Atten: 30 dB | Mkr1 | 2.402 142 GHz 4.400 dBm | Auto Tur Center Fro 2.40200000 Gl Start Fro 2.39950000 Gl |
|---|----------------|-------|--|---|
| | ▲ ¹ | | | 2.402000000 GI |
| 5.6 | | | | |
| 5.6 | | | | |
| 5.6 | | | | Stop Fr 2.404500000 G |
| 56 6441111111111111111111111111111111111 | | | Marine Mari | CF Ste 500.000 k <u>Auto</u> M |
| .6 | | | | Freq Offs 0 |
| 5.6 | | | | |
| enter 2.402000 GHz Res BW 1.0 MHz #VE | BW 3.0 MHz | Sweep | Span 5.000 MHz 1.00 ms (601 pts) | |

CH00 -1Mbps



CH39 -1Mbps



CH78 -1Mbps



Shenzhen STS Test Services Co., Ltd.



| Test Channel | Frequency | Peak Output Power | LIMIT |
|--------------|-----------|-------------------|-------|
| | (MHz) | (dBm) | (dBm) |
| CH00 | 2402 | 2.345 | 20.96 |
| CH39 | 2441 | 3.379 | 20.96 |
| CH78 | 2480 | 3.234 | 20.96 |

Note : the channel separation >2/3 bandwidth

| enter Freq 2.402000000 GHz PN0: Fast IFGain:Low Trig: Free Run #Atten: 30 dB Avg Type: Log.PWr AvgHold>100/100 Trace [1:2:3:3:6] PP P P P P Vor PP Vor PP Vor PP P Vor PP Vor PP P Vor PP Vor P | ilent Spectrum Analyzer - Swept SA | | | | | |
|--|------------------------------------|------------------------|-----------------|-------|-------------------------------|----------------------|
| Pho: Fast IFGain:Low Trig: Free Run #Atten: 30 dB Autol AvglHold>100/r00 Trig: Free Run ber P P P P P 2.345 dBm Autol Ref Offset 0.5 dB Mkr1 2.401 84 GHz 2.345 dBm Autol Center 2.40200000 Start 33 67 77 1 1 1 1 1 1 1 2.345 dBm Start 2.39900000 Start 2.40500000 Start 2.40500000 Start 2.40500000 CF 600.00 Auto Start 2.40500000 Start 2.40500000 Start 2.40500000 Start 2.40500000 Start 2.40500000 Start Star < | RL RF 50Ω AC | | | | 07:03:09 PM Oct 08, 2015 | |
| Ref Offset 0.5 dB 101KT 2.40 To 4 GFR 2.345 dBm 2.345 dBm 2.345 dBm 33 1 34 1 37 1 38 1 39 1 31 1 32 1 33 1 34 1 36 1 37 1 38 1 39 1 39 1 39 1 39 1 39 1 30 1 31 1 32 1 33 1 34 1 35 1 36 1 37 1 38 1 39 1 39 1 39 1 39 1 30 1 31 1 32 1 33 1 34 1 35 1 36 1 37 1 38 1 39 1 39 1 | enter Freq 2.40200000 | PNO: Fast 🖵 Trig: Free | eRun Avg Hold:> | | TYPE MWWWWWW DET P P P P P | |
| 33 1 Center 33 1 1 1 67 1 1 1 77 1 1 77 | dB/div Ref 12.33 dBm | | | Mkr | | Auto Tun |
| 67 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7 | | ↓ ¹ | | | | Center Fre |
| 7.7 Start 7.7 Stop | | | | | | 2.402000000 GH |
| 7.7 1 1 1 1 1 1 7.7 1 1 1 1 1 1 7.7 1 1 1 1 1 1 7.7 1 1 1 1 1 1 7.7 1 1 1 1 1 1 7.7 1 1 1 1 1 1 7.7 1 1 1 1 1 1 | 67 | | | | | Start Fre |
| Stop 2.40500000 7.7 CF 600.00 Auto CF 600.00 | /.7 | | | | | 2.399000000 GH |
| | 7.7 | | | | | Stop Fre |
| 500.00 Auto | 7.7 | | | | | 2.405000000 GH |
| | 7.7 | | | | | CF Ste 600.000 kH |
| Freq C | 7.7 | | | | | <u>Auto</u> Ma |
| | 7.7 | | | | | Freq Offs |
| | 77 | | | | | 0 + |
| | | | | | | |
| enter 2.402000 GHz Span 6.000 MHz Res BW 3.0 MHz #VBW 3.0 MHz Sweep 1.00 ms (601 pts) | | #VBW 3.0 MHz | | Sweep | | |
| | | | | | | |

CH00 -2Mbps

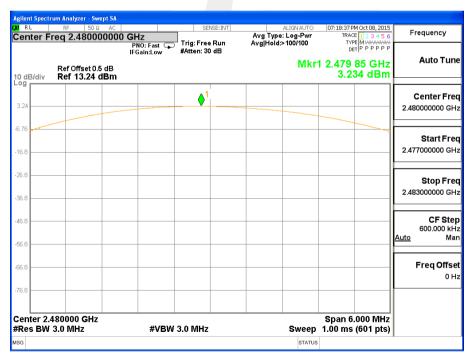




CH39 -2Mbps

| | Analyzer - Swept SA | | | | | |
|--------------------------|------------------------------------|----------------------|-----------------------|--|---|--|
| enter Fre | RF 50 Ω AC q 2.441000000 |) GHz PNO: Fast 😱 | SENSE:INT | ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100 | 07:10:12 PM Oct 08, 2015 TRACE 1 2 3 4 5 6 TYPE M | Frequency |
| | Ref Offset 0.5 dB Ref 12.97 dBm | IFGain:Low | #Atten: 30 dB | Mkr1 | 2.440 80 GHz 3.379 dBm | Auto Tur |
| .97 | | | ● ¹ | | | Center Fre 2.441000000 GH |
| .0 | | | | | | Start Fre 2.438000000 GH |
| .0 | | | | | | Stop Fr 2.444000000 G |
| 0 | | | | | | CF St 600.000 k <u>Auto</u> M |
| | | | | | | Freq Offs 0 |
| .0 | | | | | | |
| enter 2.44 Res BW 3.4 | 1000 GHz 0 MHz | #VBW | 3.0 MHz | Sweep | Span 6.000 MHz 1.00 ms (601 pts) | |
| G | | | | STATUS | , | 0 |

CH78 -2Mbps





| Test Channel | Frequency (MHz) | Peak Output Power (dBm) | LIMIT (dBm) |
|--------------|--------------------|----------------------------|----------------|
| CH00 | 2402 | 2.563 | 20.96 |
| CH39 | 2441 | 3.649 | 20.96 |
| CH78 | 2480 | 3.422 | 20.96 |

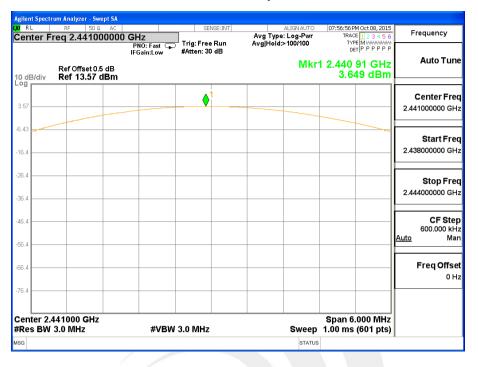
Note : the channel separation >2/3 bandwidth

| | | | | | um Analyzer - Swept SA | |
|--------------------------------|-------------------------------------|--|---------------------------------|----------------------------------|------------------------------------|----------------------|
| Frequency | 07:43:52 PM Oct 08, 2015 | ALIGN AUTO | SENSE:INT | | RF 50.Ω AC | LXI RL |
| | TRACE 1 2 3 4 5 6 TYPE M | Avg Type: Log-Pwr Avg Hold:>100/100 | Trig: Free Run #Atten: 30 dB | GHz PNO: Fast 😱 IFGain:Low | req 2.402000000 | Center F |
| Auto Tune | 2.401 94 GHz 2.563 dBm | Mkr1 | | | Ref Offset 0.5 dB Ref 12.55 dBm | 10 dB/div Log |
| Center Fred 2.402000000 GHz | | | ¹ | | | 2.55 |
| 2.402000000 GH2 | | | | | | -7.45 |
| Start Fred | | | | | | 7.40 |
| 2.399000000 GHz | | | | | | -17.5 |
| Stop Free | | | | | | -27.5 |
| 2.405000000 GH | | | | | | -37.5 |
| CF Step 600.000 kH | | | | | | 47.5 |
| <u>Auto</u> Mai | | | | | | 57.5 |
| Freq Offse | | | | | | .67.5 |
| 0 H: | | | | | | -77.5 |
| | | | | | | |
| | Span 6.000 MHz 1.00 ms (601 pts) | Sweep | 3.0 MHz | #VBW | 102000 GHz 3.0 MHz | Center 2. #Res BW |
| | | STATUS | | | | MSG |

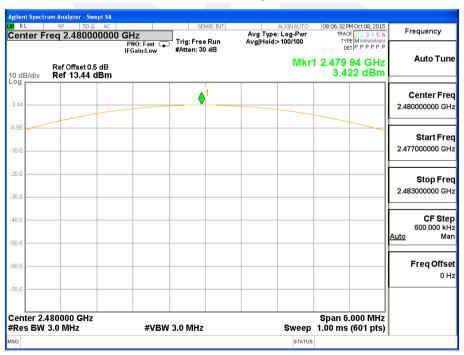
CH00 -3Mbps



CH39 -3Mbps



CH78 -3Mbps





10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: 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.

10.2 EUT ANTENNA

The EUT antenna is Dipole Antenna. It comply with the standard requirement.

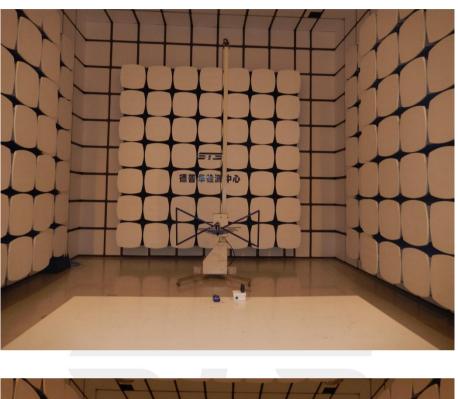


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APPENDIX- PHOTOS OF TEST SETUP



Radiated Measurement Photos



Shenzhen STS Test Services Co., Ltd.



Conducted Measurement Photos



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

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