

Test Report

FCC ID:2AMPJ-TM141WT

Date of issue: Jul. 17, 2017

| | |
|---------------------|---|
| Report Number: | MTi170628E169 |
| Sample Description: | Laptop |
| Model(s): | TM141WT720C, W1731A, W1641, W1637, W1840A, W1549, W1645A, W1645C, W1639, W1635 |
| Applicant: | TMAX Digital Inc. |
| Address: | 4401 Eucalyptus Ave., Sulte 120 Chino, CA91710 |
| Date of Test: | Jun. 20, 2017 – Jun. 26, 2017 |

Shenzhen Microtest Co., Ltd.
<http://www.mtitest.com>



| TEST RESULT CERTIFICATION | |
|---------------------------------|---|
| Applicant's name | TMAX Digital Inc. |
| Address | 4401 Eucalyptus Ave., Sulte 120 Chino, CA91710 |
| Manufacture's Name | TMAX Digital Inc. |
| Address | 4401 Eucalyptus Ave., Sulte 120 Chino, CA91710 |
| Product description | |
| Product name | Laptop |
| Trademark: | Nuvision, TMAX |
| Model and/or type reference : | TM141WT720C |
| Serial Model | W1731A, W1641, W1637, W1840A, W1549, W1645A, W1645C, W1639, W1635 |
| Standards | FCC Part15.247 |
| Test procedure..... | ANSI C63.4-2014 |

This device described above has been tested by Shenzhen Toby Technology Co., Ltd. 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.

Tested by:



Ace Chai

Jul. 17, 2017

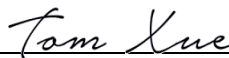
Reviewed by:



Smith Chen

Jul. 17, 2017

Approved by:



Tom Xue

Jul. 17, 2017

Table of Contents

| | Page |
|---|-----------|
| . SUMMARY OF TEST RESULTS | 5 |
| TEST FACILITY | 6 |
| MEASUREMENT UNCERTAINTY | 6 |
| . GENERAL INFORMATION | 7 |
| GENERAL DESCRIPTION OF EUT | 7 |
| DESCRIPTION OF TEST MODES | 9 |
| BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED | 10 |
| DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE) | 11 |
| EQUIPMENTS LIST FOR ALL TEST ITEMS | 12 |
| . EMC EMISSION TEST | 13 |
| CONDUCTED EMISSION MEASUREMENT | 13 |
| POWER LINE CONDUCTED EMISSION LIMITS | 13 |
| TEST PROCEDURE | 14 |
| DEVIATION FROM TEST STANDARD | 14 |
| TEST SETUP | 14 |
| EUT OPERATING CONDITIONS | 14 |
| TEST RESULTS | 15 |
| RADIATED EMISSION MEASUREMENT | 17 |
| RADIATED EMISSION LIMITS | 17 |
| TEST PROCEDURE | 17 |
| DEVIATION FROM TEST STANDARD | 18 |
| TEST SETUP | 19 |
| EUT OPERATING CONDITIONS | 20 |
| TEST RESULTS (BETWEEN 9KHZ – 30 MHZ) | 21 |
| TEST RESULTS (BETWEEN 30MHZ – 1GHZ) | 22 |
| TEST RESULTS (1G-25GHZ) | 23 |
| . 20 DB OCCUPY BANDWIDTH | 28 |
| APPLIED PROCEDURES / LIMIT | 28 |
| TEST PROCEDURE | 28 |
| DEVIATION FROM STANDARD | 28 |
| TEST SETUP | 28 |
| EUT OPERATION CONDITIONS | 28 |
| TEST RESULTS | 29 |
| . CARRIER FREQUENCY SEPARATION TEST | 35 |
| APPLIED PROCEDURES / LIMIT | 35 |
| TEST PROCEDURE | 35 |
| DEVIATION FROM STANDARD | 35 |

Table of Contents

| | Page |
|---|-----------|
| TEST SETUP | 35 |
| EUT OPERATION CONDITIONS | 35 |
| TEST RESULTS | 36 |
| . NUMBER OF HOPPING CHANNEL | 38 |
| APPLIED PROCEDURES / LIMIT | 38 |
| DEVIATION FROM STANDARD | 38 |
| TEST SETUP | 38 |
| EUT OPERATION CONDITIONS | 38 |
| TEST RESULTS | 38 |
| . DWELL TIME | 41 |
| APPLIED PROCEDURES / LIMIT | 41 |
| DEVIATION FROM STANDARD | 41 |
| TEST SETUP | 41 |
| EUT OPERATION CONDITIONS | 41 |
| TEST RESULTS | 41 |
| . PEAK OUTPUT POWER TEST | 49 |
| APPLIED PROCEDURES / LIMIT | 49 |
| TEST PROCEDURE | 49 |
| DEVIATION FROM STANDARD | 49 |
| TEST SETUP | 49 |
| EUT OPERATION CONDITIONS | 49 |
| TEST RESULTS | 50 |
| . 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE | 51 |
| DEVIATION FROM STANDARD | 51 |
| TEST SETUP | 51 |
| EUT OPERATION CONDITIONS | 51 |
| TEST RESULTS | 52 |
| . ANTENNA REQUIREMENT | 60 |
| STANDARD REQUIREMENT | 60 |
| EUT ANTENNA | 60 |

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15 (15.247) , Subpart C | | | |
|---------------------------------|--------------------------------|----------|--------|
| Standard Section | Test Item | Judgment | Remark |
| 15.203/15.247(c) | Antenna Requirement | PASSED | |
| 15.207 | Conducted Emission | PASSED | |
| 15.247(b)(1) | Conducted Peak Output Power | PASSED | |
| 15.247(a)(1) | 20dB Occupied Bandwidth | PASSED | |
| 15.247(a)(1) | Carrier Frequencies Separation | PASSED | |
| 15.247(a)(1) | Hopping Channel Number | PASSED | |
| 15.247(a)(1) | Dwell Time | PASSED | |
| 15.205/15.209 | Spurious Emission | PASSED | |
| 15.247(d) | Band Edge | PASSED | |

NOTE:

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

1.1 TEST FACILITY

Shenzhen Toby Technology Co., Ltd.

Add.: 10/F.,A Block, Jiada R&D Bldg.,No.5 Songpingshan, Road, Science& Technology Park,
Shenzhen, 518057

FCC Registration No.:811562

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 | Conducted Emission Test | $\pm 1.38\text{dB}$ |
| 2 | RF power, conducted | $\pm 0.16\text{dB}$ |
| 3 | Spurious emissions, conducted | $\pm 0.21\text{dB}$ |
| 4 | All emissions, radiated(<1G) | $\pm 4.68\text{dB}$ |
| 5 | All emissions, radiated(>1G) | $\pm 4.89\text{dB}$ |
| 6 | Temperature | $\pm 0.5^{\circ}\text{C}$ |
| 7 | Humidity | $\pm 2\%$ |

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

| | | |
|------------------------|--|------------------------------|
| Equipment | Laptop | |
| Trade Name | Nuvision, TMAX | |
| Model Name | TM141WT720C | |
| Serial Model | W1731A, W1641, W1637, W1840A, W1549, W1645A, W1645C, W1639, W1635 | |
| Model Difference | Only Differ in model name | |
| Product Description | The EUT is a Laptop | |
| | Operation Frequency: | 2402-2480MHz |
| | Modulation Type: | GFSK, $\pi/4$ -DQPSK, 8-DPSK |
| | Bit Rate of Transmitter | 1,2,3Mbps |
| | Number Of Channel | 79CH |
| | Antenna Designation: | Please see Note 3. |
| | Output Power(Conducted): | 3.63 dBm |
| | Antenna Gain (dBi) | 0dbi |
| | Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual. | |
| Channel List | Please refer to the Note 2. | |
| Adapter | Model: PS30D120K2000UD AC Power Input: 100-240V~50/60Hz 0.8A Output: 12.0VDC, 2.0V | |
| Battery | DC 8.7V by rechargeable Li-polymer battery | |
| Connecting I/O Port(s) | Please refer to the User's Manual | |

Note:

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

2. Channel List

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (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 | | |
| Remark: Channel 0, 39 & 78 selected for GFSK, $\pi/4$ -DQPSK and 8DPSK. | | | | | |

3. Table for Filed Antenna

| Ant | Brand | Model Name | Antenna Type | Connector | Gain (dBi) | NOTE |
|-----|-------|------------|--------------------|-----------|------------|------------|
| A | N/A | N/A | Integrated antenna | / | 0 | BT Antenna |

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 | GFSK CH1/CH40/CH79 |
| Mode 2 | $\pi/4$ -DQPSK CH1/CH40/CH79 |
| Mode 3 | 8-DPSK CH1/CH40/CH79 |
| Mode 4 | Link Mode |

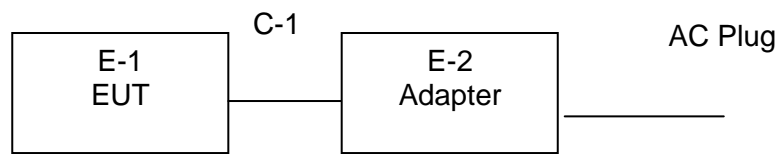
| For Conducted Emission | |
|------------------------|-------------|
| Final Test Mode | Description |
| Mode 4 | Link Mode |

| For Radiated Emission | |
|-----------------------|------------------------------|
| Final Test Mode | Description |
| Mode 1 | GFSK CH1/CH40/CH79 |
| Mode 2 | $\pi/4$ -DQPSK CH1/CH40/CH79 |
| Mode 3 | 8-DPSK CH1/CH40/CH79 |

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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 | Brand | Model/Type No. | Series No. | Note |
|------|-----------|----------------|-----------------|------------|------|
| E-1 | Laptop | Nuvision, TMAX | TM141WT720C | N/A | EUT |
| E-2 | Adapter | N/A | PS30D120K2000UD | N/A | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
| C-1 | NO | NO | 1.0m | |
| C-2 | NO | NO | 0.8m | |
| | | | | |
| | | | | |
| | | | | |

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.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

For RF conducted test:

| Equipment | Manufacturer | Model | Serial No. | Calibration Due |
|--|---------------|-----------|------------|-----------------|
| Signal Analyzer | Agilent | N9010A | MY48030494 | 2017/11/4 |
| 4 Ch. Simultaneous Sampling 14 Bits 2 MS/s | Agilent | U2531A | TW54063513 | 2017/11/4 |
| X-series USB Peak and Average Power Sensor | Agilent | U2021XA | MY54080019 | 2017/11/4 |
| vector Signal Generator | Agilent | E4438C | US44271917 | 2017/11/4 |
| vector Signal Generator | Agilent | E4438C | MY49070163 | 2017/11/4 |
| Dc Power Supply | GW | GPR-6030D | / | 2017/11/4 |
| Temperature & Humidity Chamber | GIANT FORCE | GTH-056P | GF-94454-1 | 2017/11/4 |
| Wideband Radio Communication Tester | ROHDE&SCHWARZ | CMW500 | 120909 | 2017/11/4 |

For Radiated test:

| Equipment | Manufacturer | Model | Serial No. | Calibration Due |
|--------------------------|--------------|-------------|------------|-----------------|
| Broadband TRILOG Antenna | Schwarabeck | VULB9163 | 9163-872 | 2017/11/14 |
| Horn Antenna | Schwarzbeck | BBHA 9120 D | 9120D-1145 | 2017/11/14 |
| Amplifier | HP | 8447D | 3113A06150 | 2017/11/4 |
| Amplifier | Agilent | 8449B | 3008A02400 | 2017/7/4 |
| Test Receiver | Schwarabeck | ESPI7 | 100314 | 2017/11/4 |
| Spectrum analyzer | Agilent | E4407B | MY41441082 | 2017/11/4 |
| Signal Generator | R&S | SMT 06 | 832080/007 | 2017/11/4 |

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | | Standard |
|-----------------|----------------|---------|----------------|-----------|----------|
| | Quasi-peak | Average | Quasi-peak | Average | |
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * | CISPR |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00 | 46.00 | CISPR |
| 5.0 -30.0 | 73.00 | 60.00 | 60.00 | 50.00 | CISPR |

| | | | | | |
|-----------|-------|-------|-----------|-----------|-----|
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * | FCC |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00 | 46.00 | FCC |
| 5.0 -30.0 | 73.00 | 60.00 | 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 |

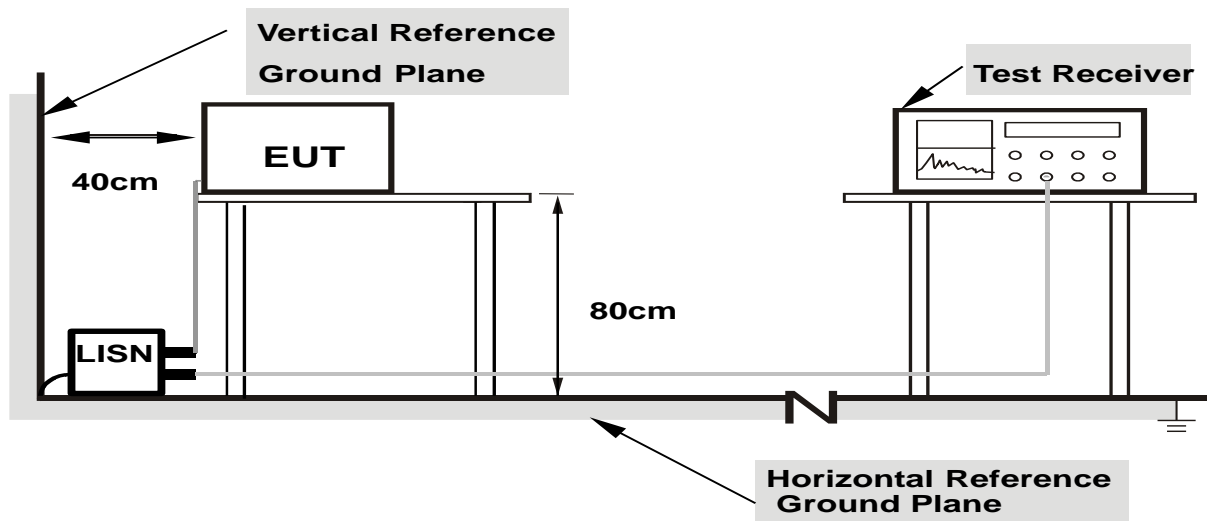
3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 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.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



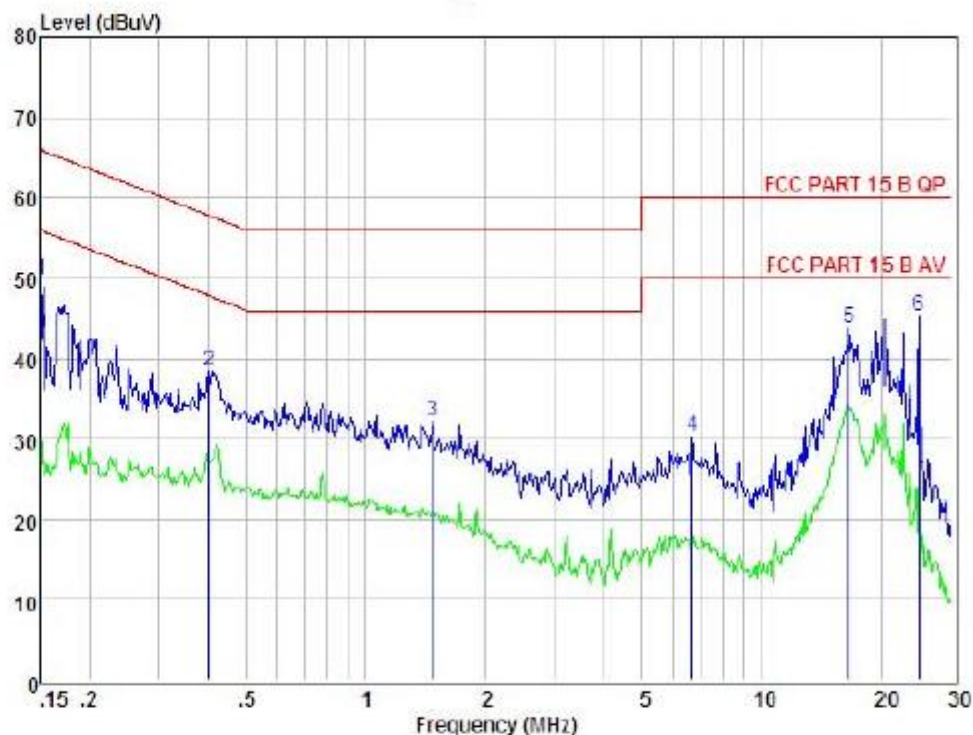
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 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.

3.1.6 TEST RESULTS

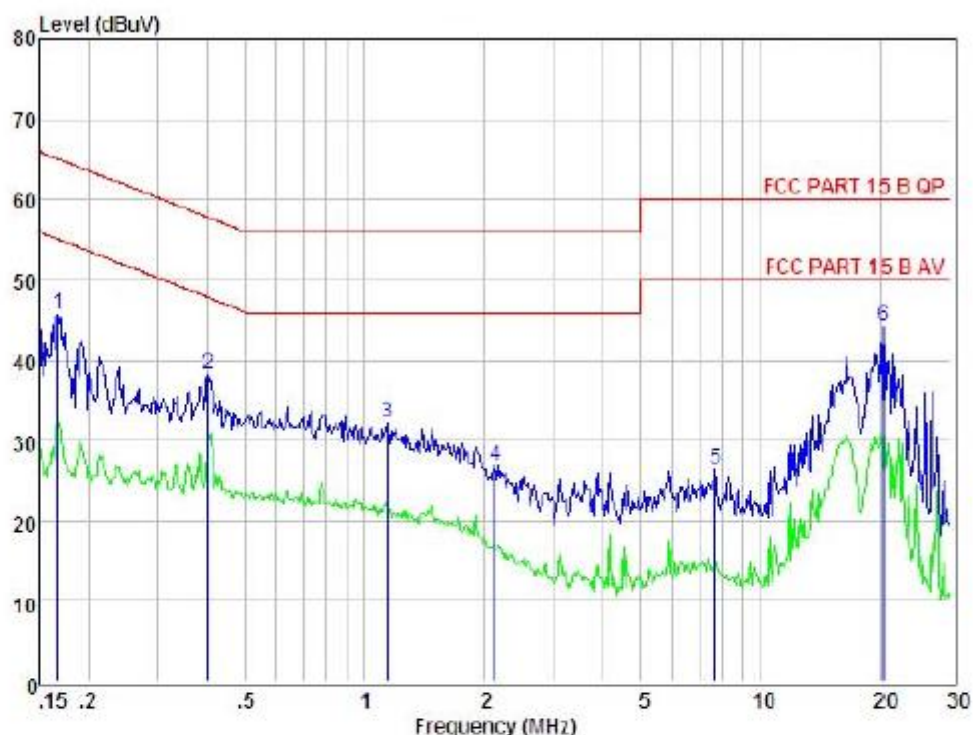
| | | | |
|----------------|---------------------------------|---------------------|-------------|
| EUT : | Laptop | Model Name. : | TM141WT720C |
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 1010hPa | Phase : | L |
| Test Voltage : | DC 12Vfrom adapter AC 120V/60Hz | Test Mode : | Mode 4 |



| Condition : FCC PART 15 B QP | | | | POL: LINE | | Temp: 25°C | | Hum: 51 % | |
|------------------------------|-------------|-----------------------|----------------------|------------------------|---------------------|---------------|---------------|----------------|--------|
| Item | Freq MHz | Read Level dBuV | LISN Factor dB | Preamp Factor dB | Cable Loss dB | Level dBuV | Limit dBuV | Margin dBuV | Remark |
| 1 | 0.150 | 40.21 | 0.03 | -9.49 | 0.10 | 49.83 | 66.00 | -16.17 | Peak |
| 2 | 0.402 | 28.65 | 0.03 | -9.57 | 0.10 | 38.35 | 57.81 | -19.46 | Peak |
| 3 | 1.480 | 22.43 | 0.05 | -9.68 | 0.10 | 32.26 | 56.00 | -23.74 | Peak |
| 4 | 6.698 | 20.10 | 0.12 | -9.97 | 0.15 | 30.34 | 60.00 | -29.66 | Peak |
| 5 | 16.661 | 33.40 | 0.26 | -9.83 | 0.28 | 43.77 | 60.00 | -16.23 | Peak |
| 6 | 24.790 | 34.52 | 0.46 | -9.82 | 0.47 | 45.27 | 60.00 | -14.73 | Peak |

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

| | | | |
|----------------|---------------------------------|---------------------|-------------|
| EUT : | Laptop | Model Name. : | TM141WT720C |
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 1010hPa | Phase : | N |
| Test Voltage : | DC 12Vfrom adapter AC 120V/60Hz | Test Mode : | Mode 4 |



| Condition : FCC PART 15 B QP | | | | | POL: NEUTRAL | Temp: 25°C | Hum: 51 % | | |
|------------------------------|-------------|-----------------------|----------------------|------------------------|---------------------|---------------|---------------|----------------|--------|
| Item | Freq MHz | Read Level dBuV | LISN Factor dB | Preamp Factor dB | Cable Loss dB | Level dBuV | Limit dBuV | Margin dBuV | Remark |
| 1 | 0.168 | 36.00 | 0.03 | -9.52 | 0.10 | 45.65 | 65.08 | -19.43 | Peak |
| 2 | 0.402 | 28.49 | 0.03 | -9.57 | 0.10 | 38.19 | 57.81 | -19.62 | Peak |
| 3 | 1.141 | 22.48 | 0.04 | -9.64 | 0.10 | 32.26 | 56.00 | -23.74 | Peak |
| 4 | 2.133 | 16.86 | 0.06 | -9.73 | 0.10 | 26.75 | 56.00 | -29.25 | Peak |
| 5 | 7.687 | 16.18 | 0.14 | -9.96 | 0.16 | 26.44 | 60.00 | -33.56 | Peak |
| 6 | 20.377 | 33.68 | 0.32 | -9.80 | 0.36 | 44.16 | 60.00 | -15.84 | Peak |

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

3.2 RADIATED EMISSION MEASUREMENT

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

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

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

| 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. 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 the 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; 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 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 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:

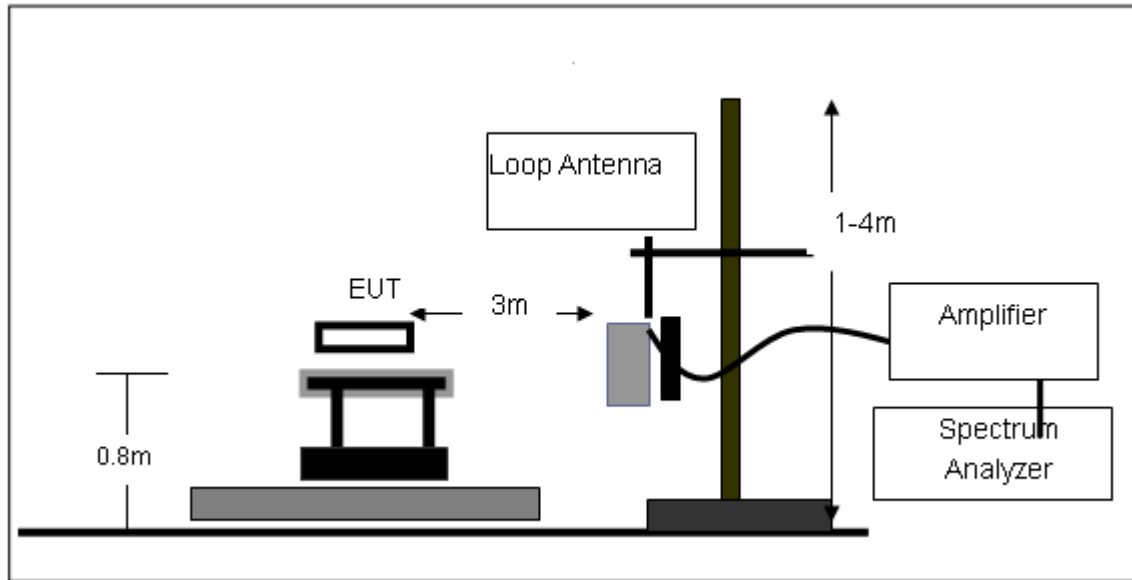
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

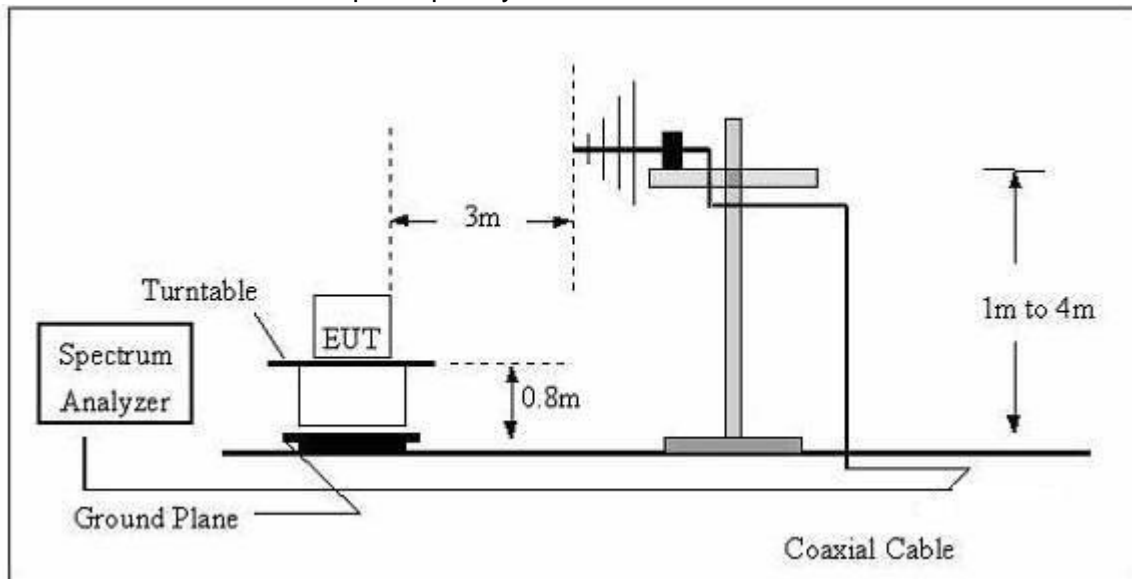
No deviation

3.2.4 TEST SETUP

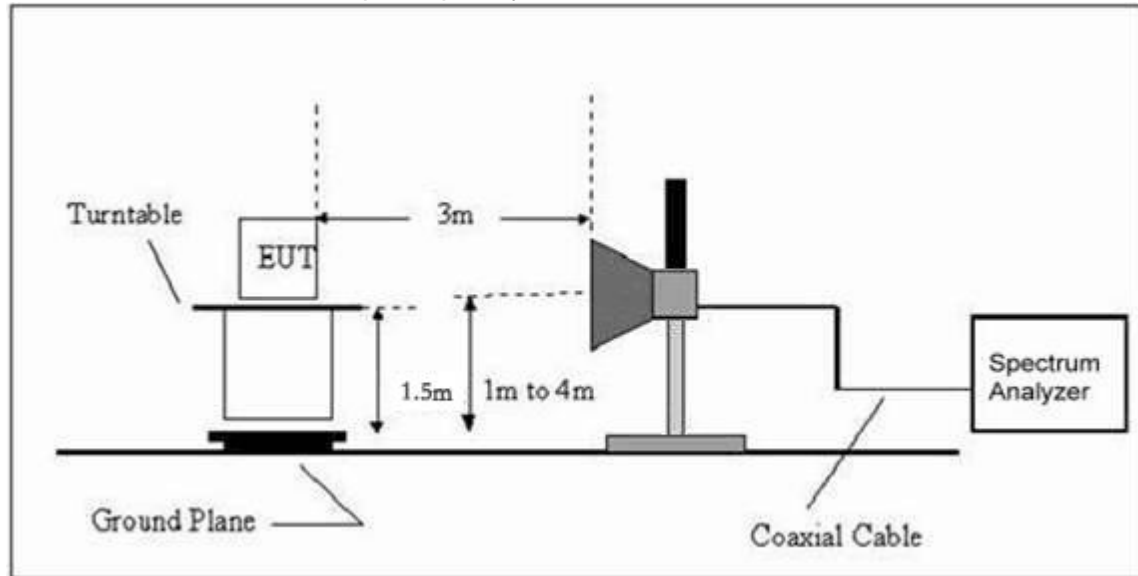
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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 (BETWEEN 9KHZ – 30 MHZ)

| | | | |
|--------------|----------|--------------------|------------------------------------|
| EUT: | Laptop | Model Name. : | TM141WT720C |
| Temperature: | 20 °C | Relative Humidity: | 48% |
| Pressure: | 1010 hPa | Test Voltage : | DC 12Vfrom adapter AC 120V/60Hz |
| Test Mode : | TX | Polarization : | -- |

| 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 = $40 \log (\text{specific distance/test distance})(\text{dB})$;

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

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

| | | | |
|---------------|----------|---------------------|--------------------|
| EUT : | Laptop | Model Name : | TM141WT720C |
| Temperature : | 20 °C | Relative Humidity : | 48% |
| Pressure: | 1010 hPa | Test Voltage : | DC 12Vfrom adapter |
| Test Mode : | TX | | |

| Polar (H/V) | Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|--|-----------|------------------|--------|-------------------|----------|--------|------------------|
| | (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| V | 119.4360 | 15.57 | 12.08 | 27.65 | 43.5 | 15.85 | QP |
| V | 128.1129 | 15.86 | 12.2 | 28.06 | 43.5 | 15.44 | QP |
| V | 170.7926 | 20.41 | 10.35 | 30.76 | 43.5 | 12.74 | QP |
| V | 341.9786 | 12.75 | 16.19 | 28.94 | 46 | 17.06 | QP |
| V | 468.8761 | 17.83 | 19.69 | 37.52 | 46 | 8.48 | QP |
| V | 935.5462 | 9.64 | 29.42 | 39.06 | 46 | 6.94 | QP |
| H | 170.7923 | 27.41 | 10.35 | 37.76 | 43.5 | 5.74 | QP |
| H | 341.9786 | 24.85 | 16.19 | 41.04 | 46 | 4.96 | QP |
| H | 468.8761 | 20.41 | 19.69 | 40.1 | 46 | 5.9 | QP |
| H | 726.8052 | 14.38 | 26 | 40.38 | 46 | 5.62 | QP |
| H | 813.1114 | 16.51 | 26.35 | 42.86 | 46 | 3.14 | QP |
| H | 854.0247 | 12.45 | 27.51 | 39.96 | 46 | 6.04 | QP |
| Remark: Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit Factor = Antenna Factor + Cable Loss – Pre-amplifier. Factor added by measurement software automatically | | | | | | | |

3.2.8 TEST RESULTS (1G-25GHZ)

GFSK,
Normal Voltage

| Polar (H/V) | Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|-------------------------|-----------|------------------|--------|-------------------|----------|--------|------------------|
| | (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| Low Channel (2402 MHz) | | | | | | | |
| Vertical | 2491.777 | 60.32 | -11.65 | 48.67 | 74 | 25.33 | Pk |
| Horizontal | 2498.247 | 57.22 | -12.73 | 44.49 | 74 | 29.51 | Pk |
| Vertical | 4804.156 | 57.32 | -3.6 | 53.72 | 74 | 20.28 | Pk |
| Horizontal | 4804.156 | 57.32 | -9.23 | 48.09 | 74 | 25.91 | Pk |
| Vertical | 1485.838 | 61.02 | -17.1 | 43.92 | 74 | 30.08 | Pk |
| Vertical | 1636.784 | 60.71 | -16.06 | 44.65 | 74 | 29.35 | Pk |
| Vertical | 2095.928 | 59.52 | -11.88 | 47.64 | 74 | 26.36 | Pk |
| Horizontal | 1074.301 | 61.25 | -19.69 | 41.56 | 74 | 32.44 | Pk |
| Horizontal | 1483.178 | 60.24 | -17.09 | 43.15 | 74 | 30.85 | Pk |
| Horizontal | 1895.832 | 57.26 | -14.25 | 43.01 | 74 | 30.99 | Pk |
| Mid Channel (2441 MHz) | | | | | | | |
| Vertical | 2474.777 | 57.01 | -11.65 | 45.36 | 74 | 28.64 | Pk |
| Horizontal | 2474.144 | 57.7 | -9.37 | 48.33 | 74 | 25.67 | Pk |
| Vertical | 4882.539 | 57.08 | -6.15 | 50.93 | 74 | 23.07 | Pk |
| Horizontal | 4882.539 | 57.08 | -6.83 | 50.25 | 74 | 23.75 | Pk |
| Vertical | 1433.535 | 64.07 | -17.12 | 46.95 | 74 | 27.05 | Pk |
| Vertical | 1636.784 | 61.4 | -16.06 | 45.34 | 74 | 28.66 | Pk |
| Vertical | 2284.166 | 55.14 | -12.83 | 42.31 | 74 | 31.69 | Pk |
| Horizontal | 1280.515 | 60.8 | -17.82 | 42.98 | 74 | 31.02 | Pk |
| Horizontal | 1636.784 | 59.63 | -16.06 | 43.57 | 74 | 30.43 | Pk |
| Horizontal | 1892.438 | 59.75 | -14.28 | 45.47 | 74 | 28.53 | Pk |
| High Channel (2480 MHz) | | | | | | | |
| Vertical | 2453.883 | 57.7 | -12.91 | 44.79 | 74 | 29.21 | Pk |
| Horizontal | 2453.839 | 57.7 | -11.59 | 46.11 | 74 | 27.89 | Pk |
| Vertical | 4960.256 | 54.21 | -9.22 | 44.99 | 74 | 29.01 | Pk |
| Horizontal | 4960.478 | 54.21 | -3.64 | 50.57 | 74 | 23.43 | Pk |
| Vertical | 1187.688 | 58.73 | -18.27 | 40.46 | 74 | 33.54 | Pk |
| Vertical | 1636.784 | 57.54 | -16.06 | 41.48 | 74 | 32.52 | Pk |
| Vertical | 2084.693 | 55.13 | -11.99 | 43.14 | 74 | 30.86 | Pk |
| Horizontal | 1534.540 | 57.79 | -16.94 | 40.85 | 74 | 33.15 | Pk |
| Horizontal | 1786.985 | 57.5 | -15.04 | 42.46 | 74 | 31.54 | Pk |
| Horizontal | 1892.438 | 57.38 | -14.28 | 43.1 | 74 | 30.9 | Pk |

π/4-DQPSK

Normal Voltage

| Normal Voltage | | | | | | | |
|---|-----------|------------------|--------|-------------------|----------|--------|------------------|
| Polar (H/V) | Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
| | (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| operation frequency:2402 | | | | | | | |
| V | 4804.428 | 51.4 | -3.53 | 47.87 | 74 | 26.13 | Pk |
| V | 4804.428 | 31.49 | -3.53 | 27.96 | 54 | 26.04 | AV |
| H | 4804.529 | 53.31 | -3.54 | 49.77 | 74 | 24.23 | Pk |
| H | 4804.529 | 31.58 | -3.54 | 28.04 | 54 | 25.96 | AV |
| operation frequency:2441 | | | | | | | |
| V | 4882.548 | 51.59 | -3.64 | 47.95 | 74 | 26.05 | Pk |
| V | 4882.548 | 33.32 | -3.64 | 29.68 | 54 | 24.32 | AV |
| H | 4882.279 | 52.79 | -3.64 | 49.15 | 74 | 24.85 | Pk |
| H | 4882.279 | 32.34 | -3.64 | 28.7 | 54 | 25.3 | AV |
| operation frequency:2480 | | | | | | | |
| V | 4960.358 | 53.81 | -3.75 | 50.06 | 74 | 23.94 | pk |
| V | 4960.358 | 33.48 | -3.75 | 29.73 | 54 | 24.27 | AV |
| H | 4960.591 | 49.99 | -3.74 | 46.25 | 74 | 27.75 | pk |
| H | 4960.591 | 33.63 | -3.74 | 29.89 | 54 | 24.11 | pk |
| Remark: | | | | | | | |
| Absolute Level= Reading Level+ Factor, Margin= Absolute Level - Limit | | | | | | | |

8-DPSK

Normal Voltage

| Normal Voltage | | | | | | | |
|---|-----------|------------------|--------|-------------------|----------|--------|------------------|
| Polar (H/V) | Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
| | (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| operation frequency:2402 | | | | | | | |
| V | 4804.428 | 50.74 | -3.53 | 47.21 | 74 | 26.79 | Pk |
| H | 4804.529 | 53.79 | -3.54 | 50.25 | 74 | 23.75 | Pk |
| operation frequency:2441 | | | | | | | |
| V | 4882.548 | 51.14 | -3.53 | 47.61 | 74 | 26.39 | Pk |
| H | 4882.279 | 53.43 | -3.54 | 49.89 | 74 | 24.11 | Pk |
| operation frequency:2480 | | | | | | | |
| V | 4960.358 | 52.2 | -3.75 | 48.45 | 74 | 25.55 | pk |
| H | 4960.591 | 51.06 | -3.74 | 47.32 | 74 | 26.68 | pk |
| Remark: | | | | | | | |
| Absolute Level= Reading Level+ Factor, Margin= Absolute Level - Limit | | | | | | | |

Note:The PK value is less than the AV value, AV value is not required
Factor added by measurement software automatically.

BAND EDGE(Radiated)

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type | Comment |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------------|------------|
| GFSK | | | | | | | |
| 2390 | 56.02 | -13.06 | 42.96 | 74 | 31.04 | peak | Vertical |
| 2390 | 56.89 | -13.06 | 43.83 | 74 | 30.17 | peak | Horizontal |
| 2483.5 | 57.21 | -12.78 | 44.43 | 74 | 29.57 | peak | Vertical |
| 2483.5 | 54.43 | -12.78 | 41.65 | 74 | 32.35 | peak | Horizontal |
| | | | | | | | |
| π/4-DQPSK | | | | | | | |
| 2390 | 56.63 | -13.06 | 43.57 | 74 | 30.43 | peak | Vertical |
| 2390 | 57.08 | -13.06 | 44.02 | 74 | 29.98 | peak | Horizontal |
| 2483.5 | 57.72 | -12.78 | 44.94 | 74 | 29.06 | peak | Vertical |
| 2483.5 | 57.98 | -12.78 | 45.2 | 74 | 28.8 | peak | Horizontal |
| | | | | | | | |
| 8-DPSK | | | | | | | |
| 2390 | 57.57 | -13.06 | 44.51 | 74 | 29.49 | peak | Vertical |
| 2390 | 57.88 | -13.06 | 44.82 | 74 | 29.18 | peak | Horizontal |
| 2483.5 | 57.6 | -12.78 | 44.82 | 74 | 29.18 | peak | Vertical |
| 2483.5 | 56.03 | -12.78 | 43.25 | 74 | 30.75 | peak | Horizontal |

NOTE: The PK value is less than the AV value, AV value is not required.

BAND EDGE(Radiated)(Hopping Mode)

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector | Comment |
|-----------|---------------|--------|----------------|----------|--------|----------|------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | Type | |
| GFSK | | | | | | | |
| 2390 | 57.89 | -13.06 | 44.83 | 74 | 29.17 | peak | Vertical |
| 2390 | 58.35 | -13.06 | 45.29 | 74 | 28.71 | peak | Horizontal |
| 2483.5 | 57.57 | -12.78 | 44.79 | 74 | 29.21 | peak | Vertical |
| 2483.5 | 55.93 | -12.78 | 43.15 | 74 | 30.85 | peak | Horizontal |
| | | | | | | | |
| π/4-DQPSK | | | | | | | |
| 2390 | 58.03 | -13.06 | 44.97 | 74 | 29.03 | peak | Vertical |
| 2390 | 58.49 | -13.06 | 45.43 | 74 | 28.57 | peak | Horizontal |
| 2483.5 | 57.71 | -12.78 | 44.93 | 74 | 29.07 | peak | Vertical |
| 2483.5 | 56.07 | -12.78 | 43.29 | 74 | 30.71 | peak | Horizontal |
| | | | | | | | |
| 8-DPSK | | | | | | | |
| 2390 | 58.46 | -13.06 | 45.4 | 74 | 28.6 | peak | Vertical |
| 2390 | 58.92 | -13.06 | 45.86 | 74 | 28.14 | peak | Horizontal |
| 2483.5 | 58.14 | -12.78 | 45.36 | 74 | 28.64 | peak | Vertical |
| 2483.5 | 56.5 | -12.78 | 43.72 | 74 | 30.28 | peak | Horizontal |

NOTE:The PK value is less than the AV value, AV value is not required.

4. 20 DB OCCUPY BANDWIDTH

4.1 APPLIED PROCEDURES / LIMIT

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

4.1.1 TEST PROCEDURE

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:
Bandwidth: RBW=30 kHz, VBW=100 kHz, detector= Peak

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



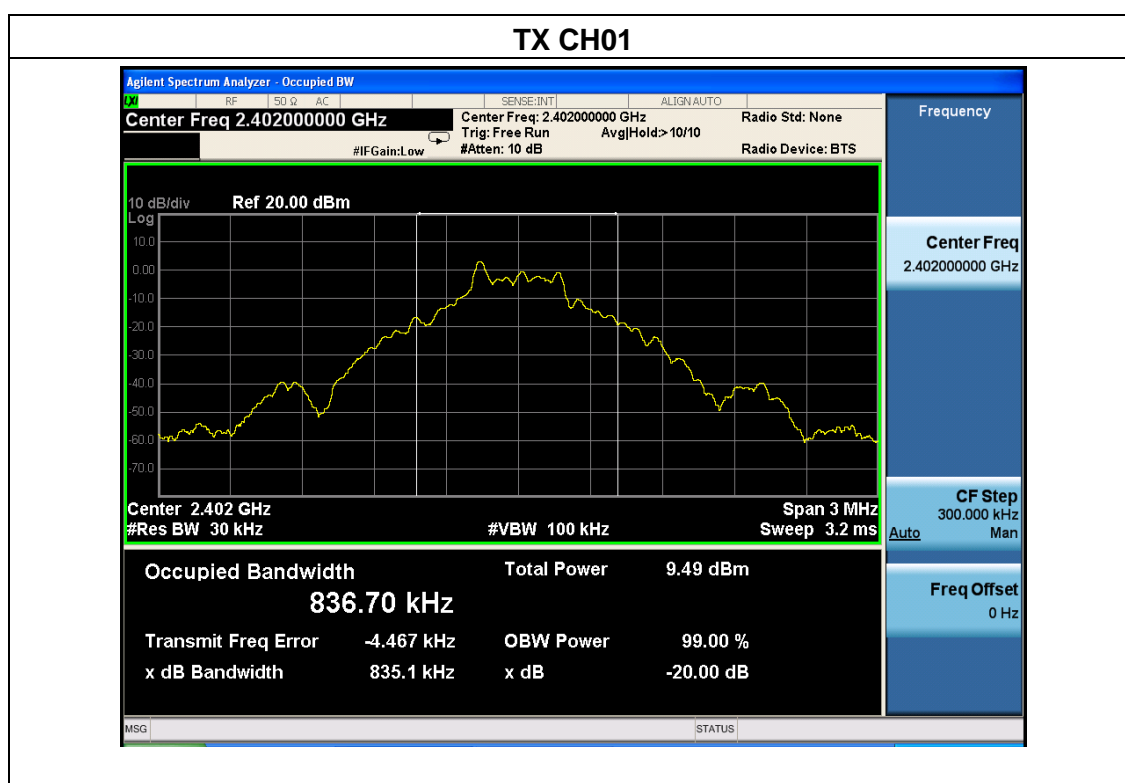
4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

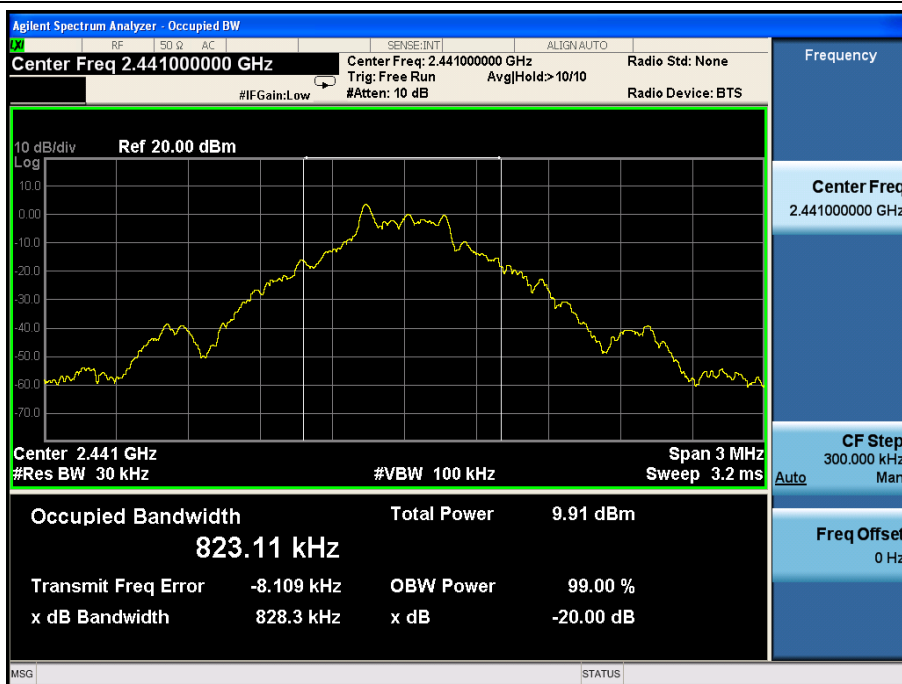
4.1.5 TEST RESULTS

| | | | |
|---------------|-----------------------------|---------------------|--------------------|
| EUT : | Laptop | Model Name : | TM141WT720C |
| Temperature : | 25 °C | Relative Humidity : | 60% |
| Pressure : | 1015 hPa | Test Voltage : | DC 12Vfrom adapter |
| Test Mode : | GFSK Mode /CH01, CH40, CH79 | | |

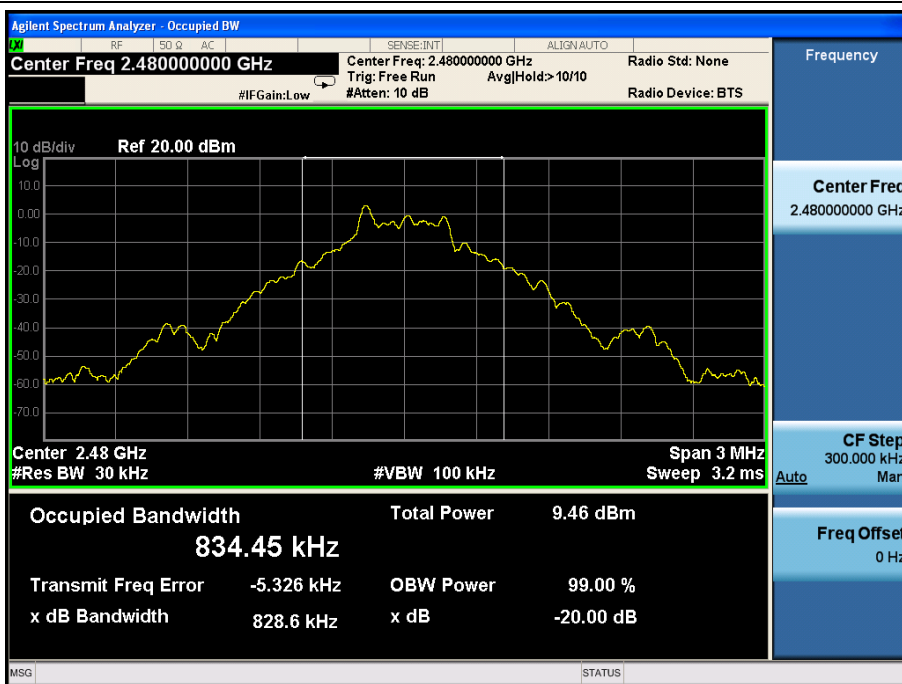
| Frequency | 20dB Bandwidth (MHz) | Limit | Result |
|-----------|----------------------|-------|--------|
| 2402 MHz | 0.8351 | / | PASS |
| 2441 MHz | 0.8283 | / | PASS |
| 2480 MHz | 0.8286 | / | PASS |



TX CH40

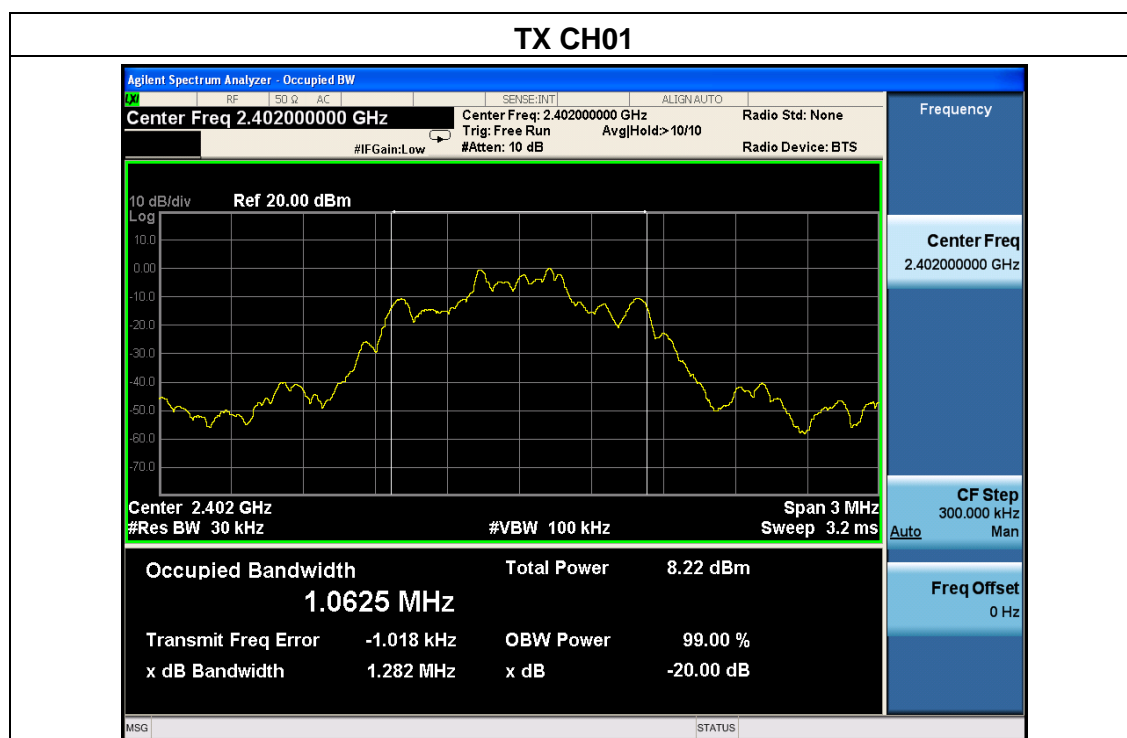


TX CH79



| | | | |
|---------------|--|---------------------|--------------------|
| EUT : | Laptop | Model Name : | TM141WT720C |
| Temperature : | 25 °C | Relative Humidity : | 60% |
| Pressure : | 1015 hPa | Test Voltage : | DC 12Vfrom adapter |
| Test Mode : | $\pi/4$ -DQPSK, Mode /CH01, CH40, CH79 | | |

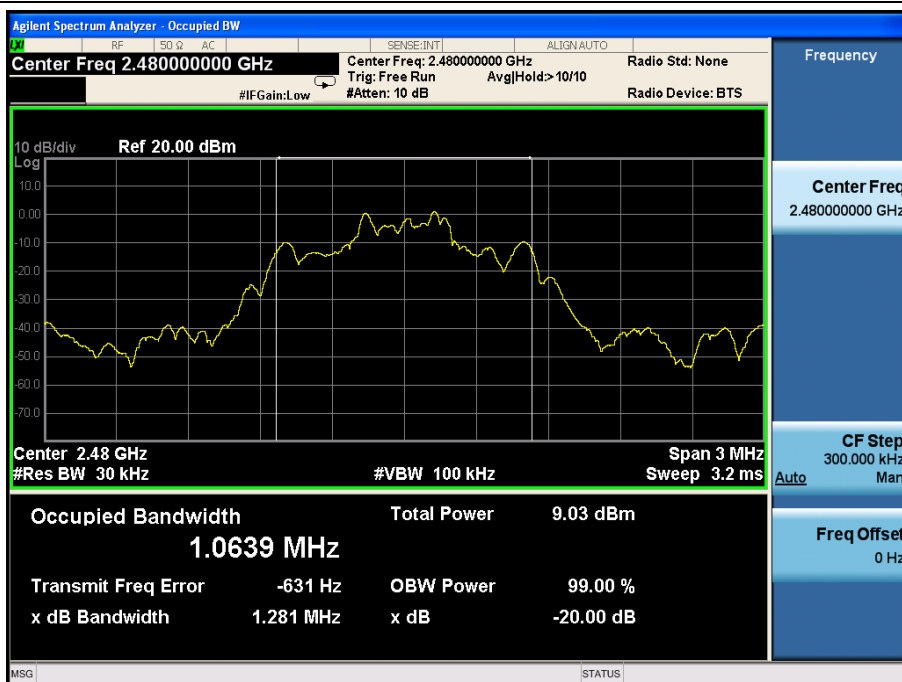
| Frequency | 20dB Bandwidth (KHz) | Limit | Result |
|-----------|----------------------|-------|--------|
| 2402 MHz | 1.282 | / | PASS |
| 2441 MHz | 1.278 | / | PASS |
| 2480 MHz | 1.281 | / | PASS |



TX CH40

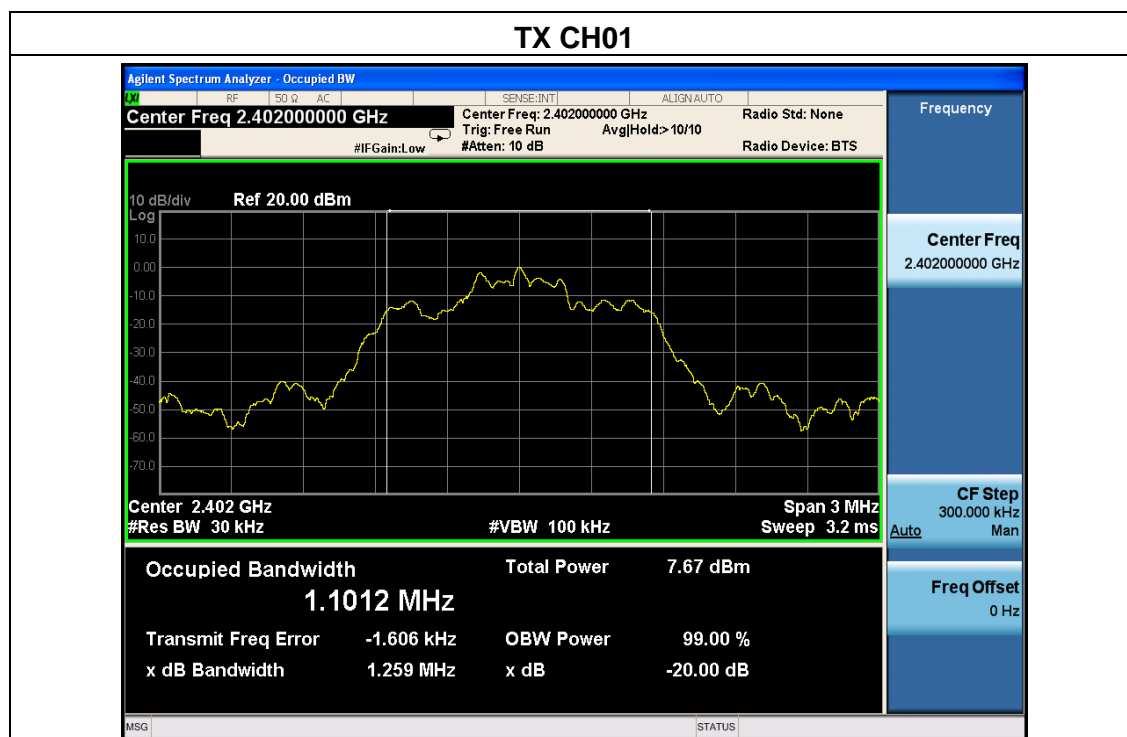


TX CH79

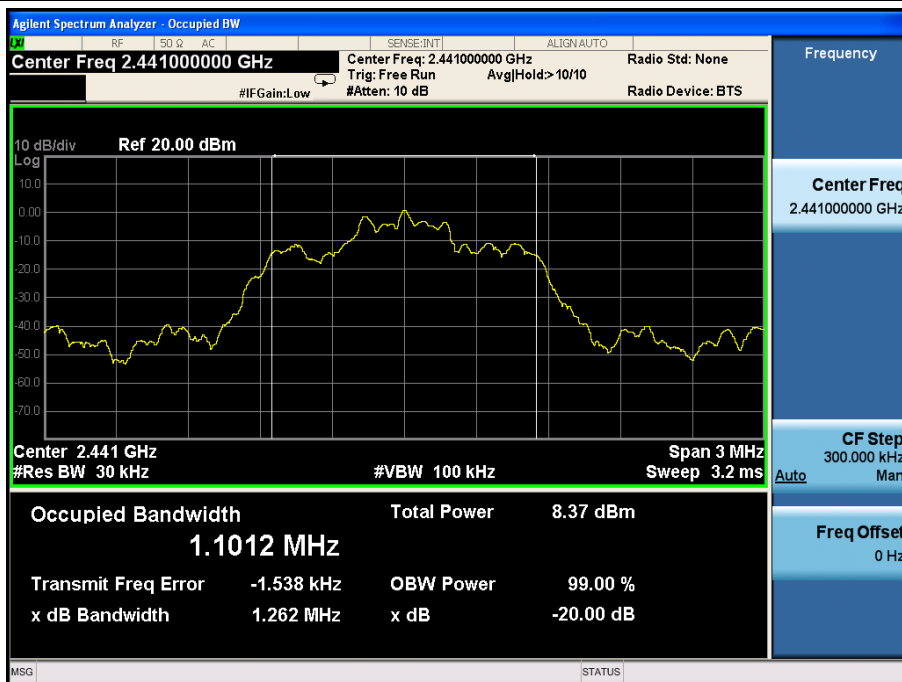


| | | | |
|---------------|-------------------------------|---------------------|--------------------|
| EUT : | Laptop | Model Name : | TM141WT720C |
| Temperature : | 25 °C | Relative Humidity : | 60% |
| Pressure : | 1015 hPa | Test Voltage : | DC 12Vfrom adapter |
| Test Mode : | 8-DPSK Mode /CH01, CH40, CH79 | | |

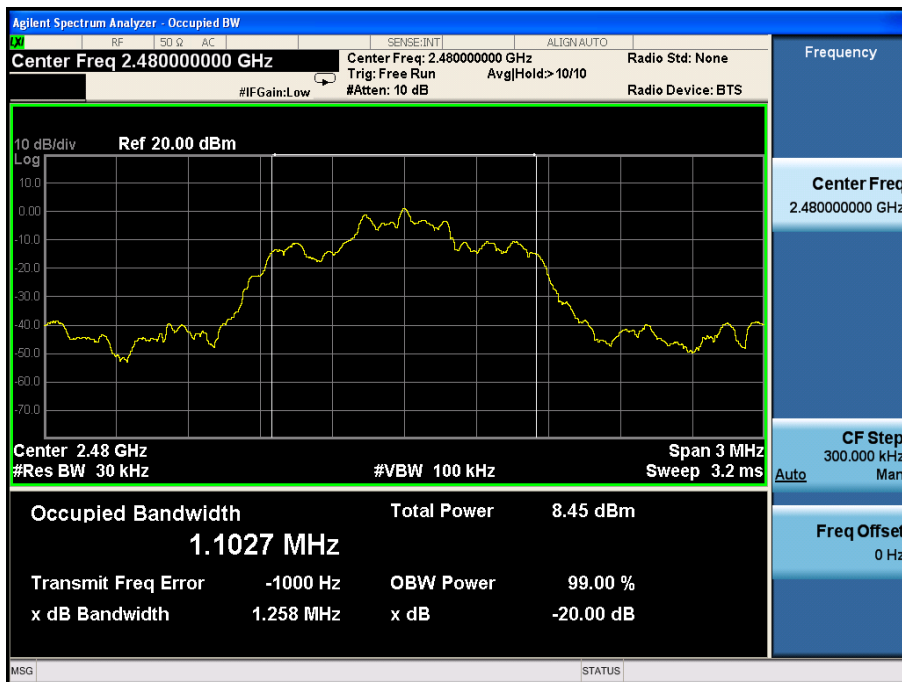
| Frequency | 20dB Bandwidth (KHz) | Limit | Result |
|-----------|----------------------|-------|--------|
| 2402 MHz | 1.259 | / | PASS |
| 2441 MHz | 1.262 | / | PASS |
| 2480 MHz | 1.258 | / | PASS |



TX CH40



TX CH79



5. CARRIER FREQUENCY SEPARATION TEST

5.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C | | | | |
|---------------------------------|--------------------|--|-----------------------|--------|
| Section | Test Item | Limit | Frequency Range (MHz) | Result |
| 15.247(a)(1) | Channel Separation | >25KHz or >two-thirds of the 20 dB bandwidth (Which is greater) | 2400-2483.5 | PASS |

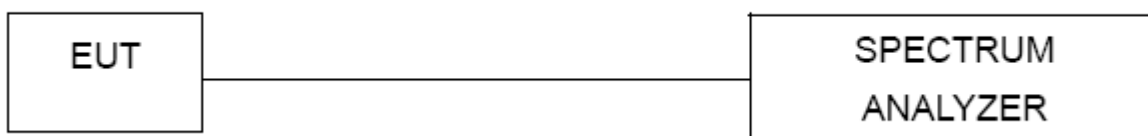
5.1.1 TEST PROCEDURE

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:
RBW=100 kHz, VBW=300 kHz, detector= Peak, Sweep Time =auto.
- (3) The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Test.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



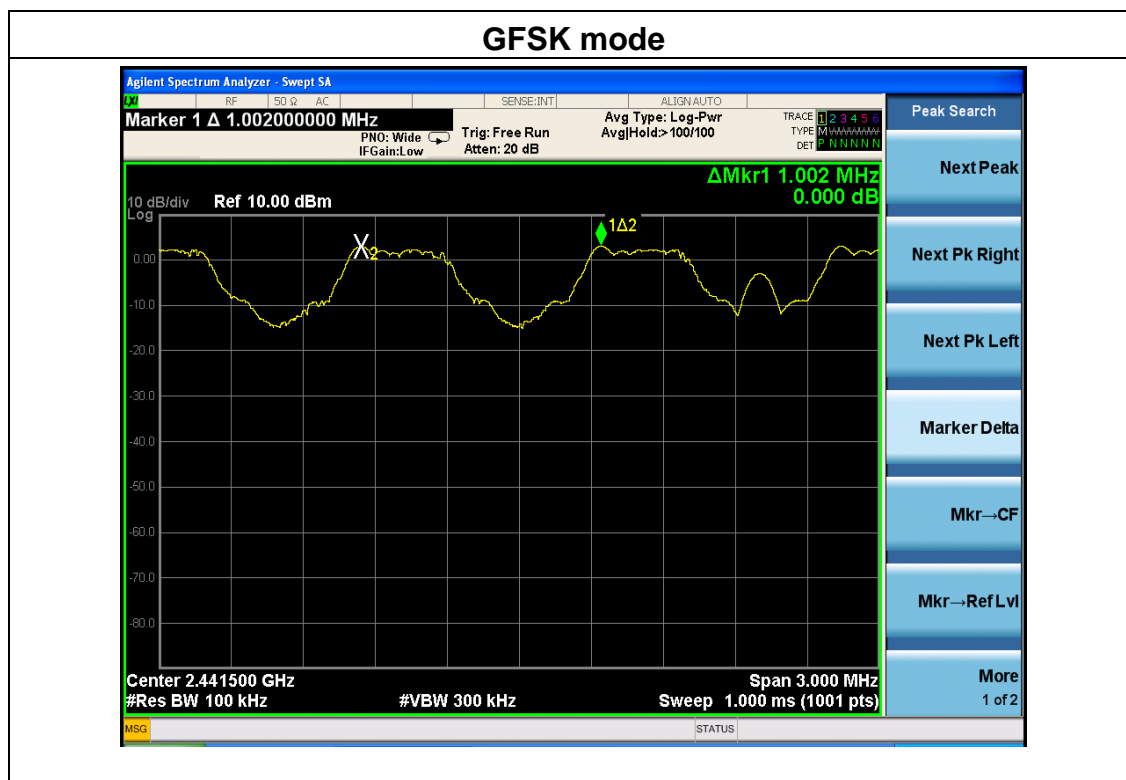
5.1.4 EUT OPERATION CONDITIONS

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.

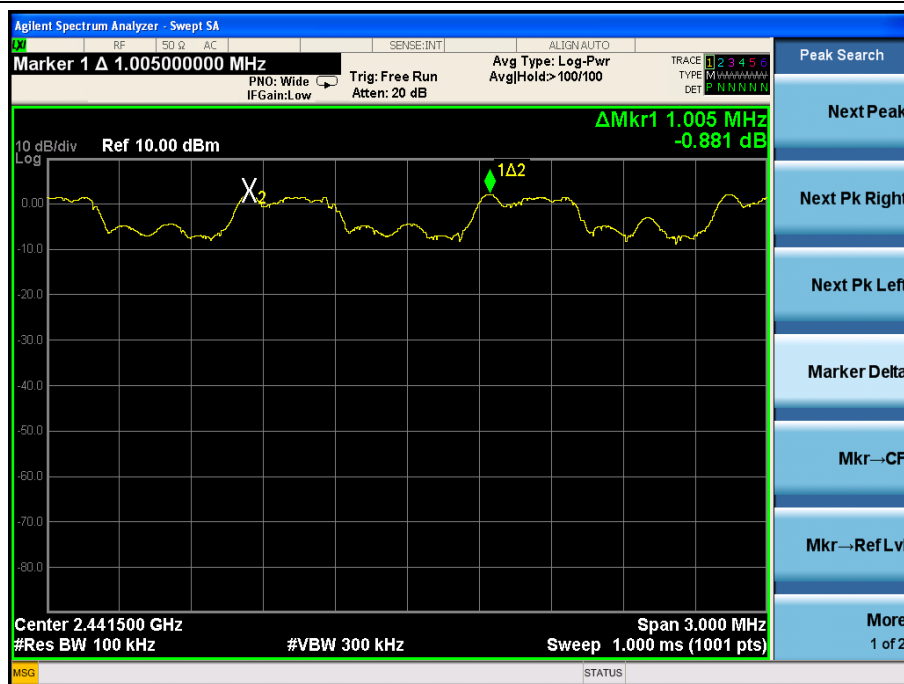
5.1.5 TEST RESULTS

| | | | |
|---------------|-----------------------------|---------------------|--------------------|
| EUT : | Laptop | Model Name : | TM141WT720C |
| Temperature : | 25 °C | Relative Humidity : | 60% |
| Pressure : | 1012 hPa | Test Voltage : | DC 12Vfrom adapter |
| Test Mode : | GFSK Mode /CH01, CH40, CH79 | | |

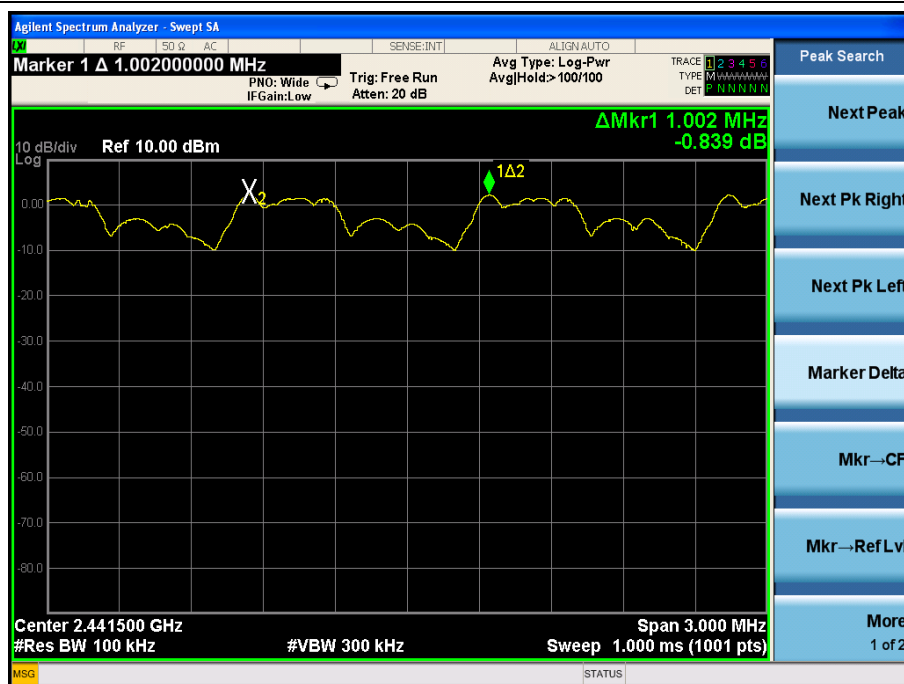
| Mode | Channel | Frequency (MHz) | Test Result (KHz) | Limit (MHz) | Result |
|----------------|---------|-----------------|-------------------|-------------|--------|
| GFSK | Middle | 2441 | 1002 | 0.55 | Pass |
| $\pi/4$ -DQPSK | Middle | 2441 | 1005 | 0.85 | Pass |
| 8DPSK | Middle | 2441 | 1002 | 0.84 | Pass |



$\pi/4$ -DQPSK mode



8DPSK mode



6. NUMBER OF HOPPING CHANNEL

6.1 APPLIED PROCEDURES / LIMIT

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

6.1.1 TEST PROCEDURE

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=100 kHz, VBW=300 kHz, Detector=Peak, Sweep time= Auto.
- (3) The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Test.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 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.

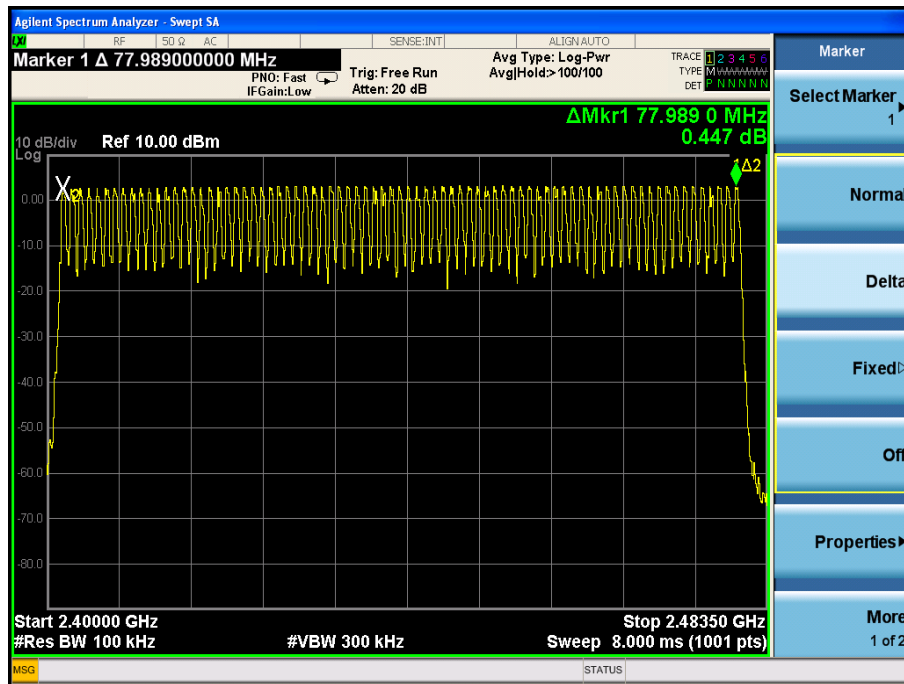
6.1.5 TEST RESULTS

| | | | |
|---------------|---|---------------------|--------------------|
| EUT : | Laptop | Model Name : | TM141WT720C |
| Temperature : | 25 °C | Relative Humidity : | 60% |
| Pressure : | 1012 hPa | Test Voltage : | DC 12Vfrom adapter |
| Test Mode : | GFSK, $\pi/4$ -DQPSK, 8-DPSK Mode /CH01, CH40, CH79 | | |

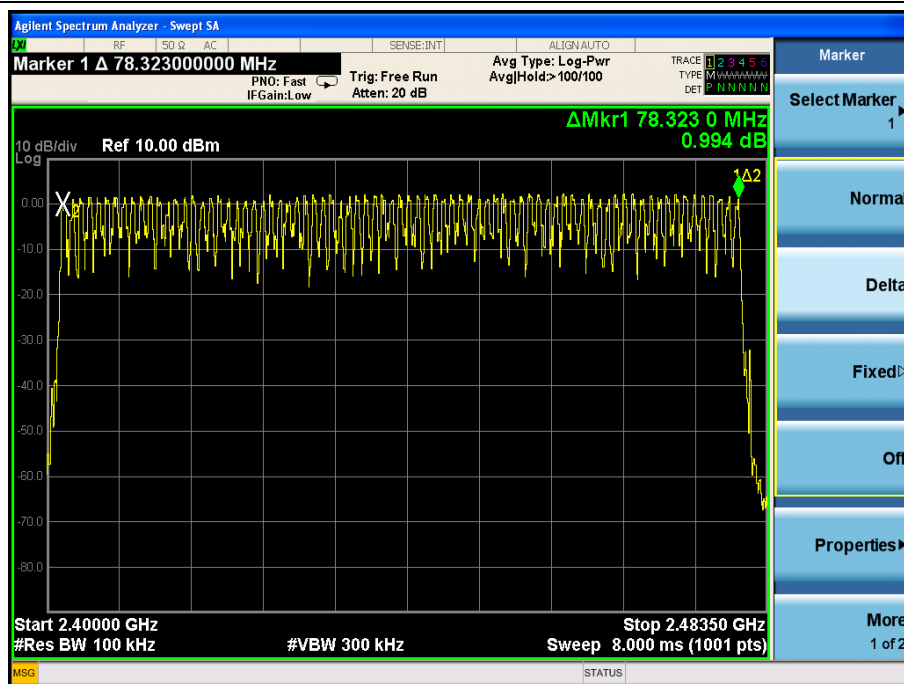
///

| Mode | Quantity of Hopping Channel | Limit | Judgment |
|-----------------------------|-----------------------------|-------|----------|
| GFSK, $\pi/4$ -DQPSK, 8DPSK | 79 | >15 | PASSED |

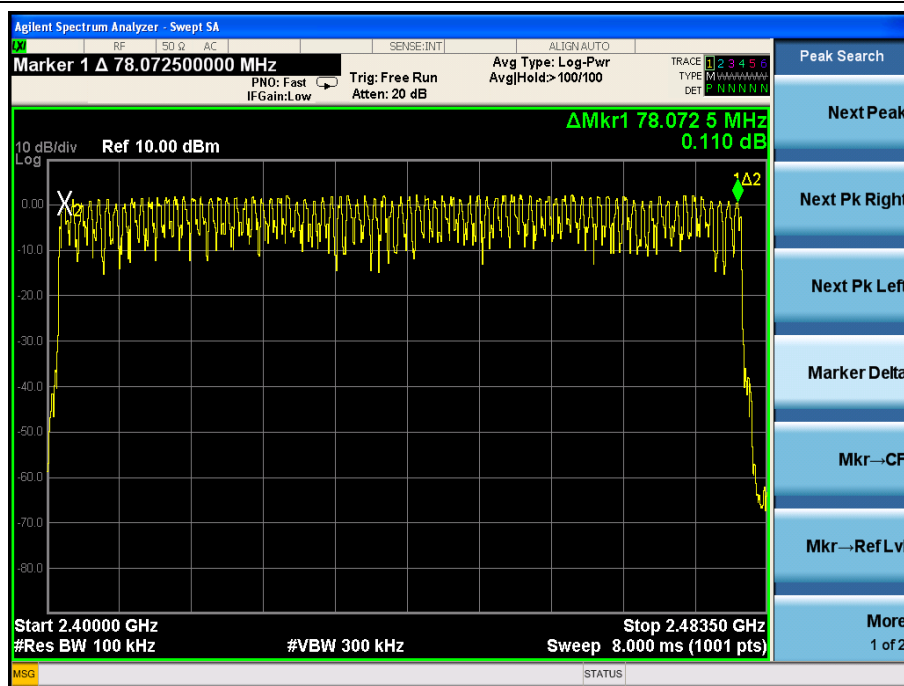
GFSK mode



$\pi/4$ -DQPSK mode



8DPSK mode



7. DWELL TIME

7.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C | | | | |
|---------------------------------|------------|---------|-----------------------|--------|
| Section | Test Item | Limit | Frequency Range (MHz) | Result |
| 15.247(a)(a) | Dwell time | 0.4 sec | 2400-2483.5 | PASS |

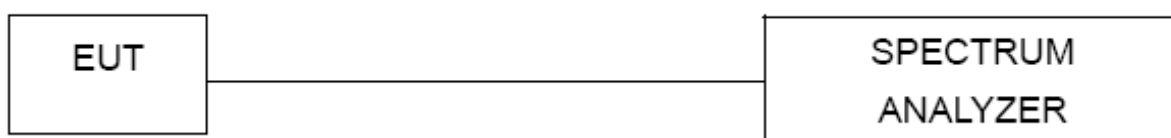
7.1.1 TEST PROCEDURE

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=1MHz, VBW=1MHz, Span=0Hz, Detector=Peak
- (3) Use video trigger with the trigger level set to enable triggering only on full pulses.
- (4) Sweep Time is more than once pulse time.
- (5) Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- (6) Measure the maximum time duration of one single pulse.
- (7) Set the EUT for packet transmitting.
- (8) Measure the maximum time duration of one single pulse.
- (9) The EUT was set to the Hopping Mode for Dwell Time Test

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 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.

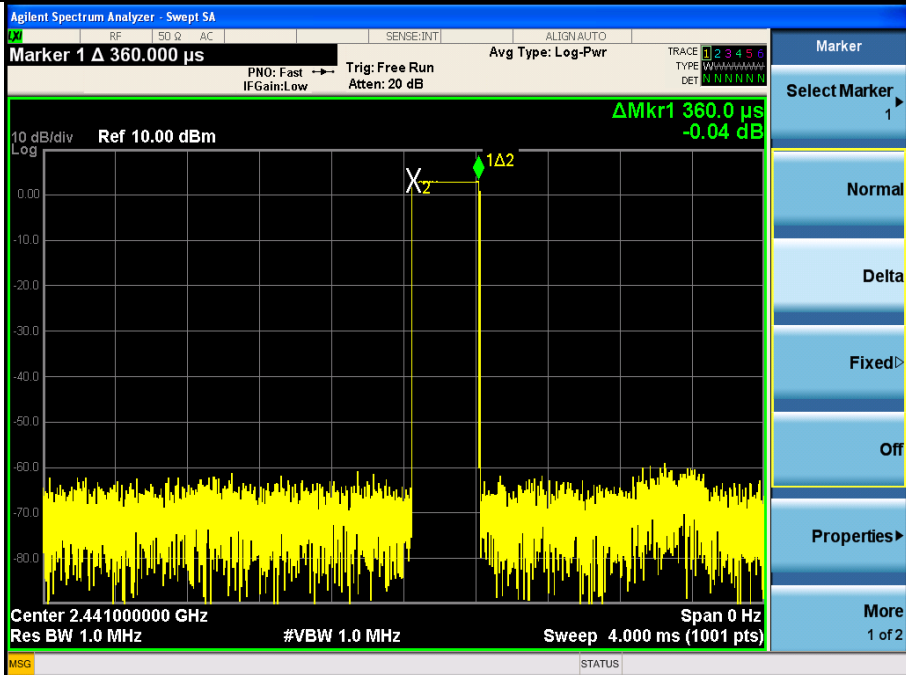
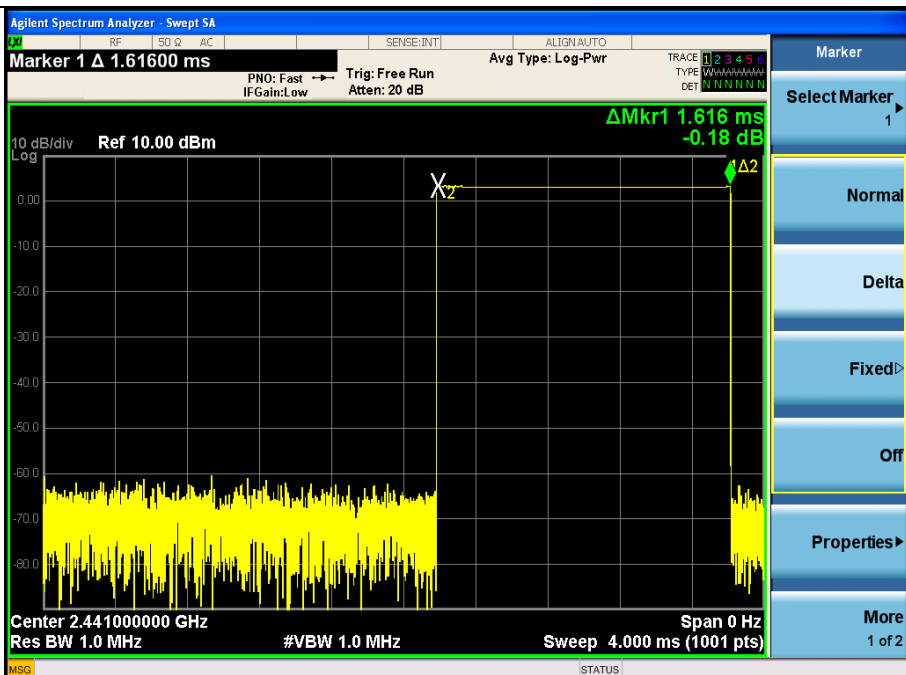
7.1.5 TEST RESULTS

| | | | |
|---------------|--|---------------------|--------------------|
| EUT : | Laptop | Model Name : | TM141WT720C |
| Temperature : | 25 °C | Relative Humidity : | 60% |
| Pressure : | 1012 hPa | Test Voltage : | DC 12Vfrom adapter |
| Test Mode : | GFSK, π/4-DQPSK, 8-DPSK Mode /CH01, CH40, CH79 | | |

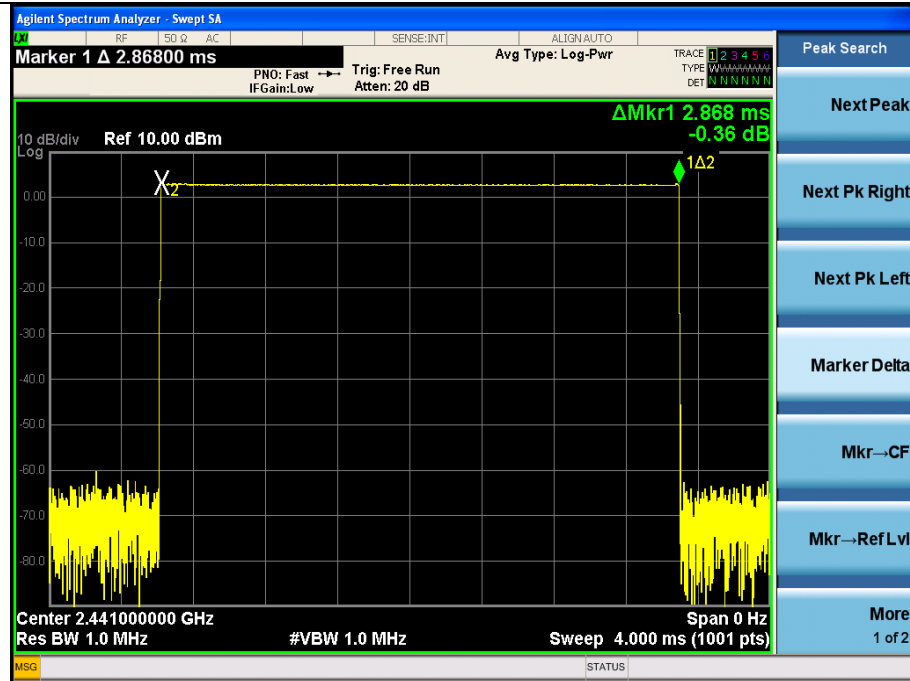
For GFSK, $\pi/4$ -DQPSK and 8DPSK:

The test period: $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

| Mode | Data Packet | Frequency (MHz) | Pulse Duration (ms) | Dwell Time (s) | Limit (s) | Conclusion |
|---|-------------|-----------------|---------------------|----------------|-----------|------------|
| GFSK | DH1 | 2441 | 0.36 | 115.20 | <0.4 | PASS |
| | DH3 | 2441 | 1.616 | 258.56 | <0.4 | PASS |
| | DH5 | 2441 | 2.868 | 305.92 | <0.4 | PASS |
| $\pi/4$ DQPSK | DH1 | 2441 | 0.376 | 120.32 | <0.4 | PASS |
| | DH3 | 2441 | 1.616 | 258.56 | <0.4 | PASS |
| | DH5 | 2441 | 2.88 | 307.20 | <0.4 | PASS |
| 8- DQPSK | DH1 | 2441 | 0.376 | 120.32 | <0.4 | PASS |
| | DH3 | 2441 | 1.624 | 259.84 | <0.4 | PASS |
| | DH5 | 2441 | 2.864 | 305.49 | <0.4 | PASS |
| Note: 1 A period time = $0.4 \text{ (s)} \times 79 = 31.6 \text{ (s)}$ 2 DH1 time slot = $\text{Pulse Duration} \times (1600/(2 \times 79)) \times \text{A period time}$ DH3 time slot = $\text{Pulse Duration} \times (1600/(4 \times 79)) \times \text{A period time}$ DH5 time slot = $\text{Pulse Duration} \times (1600/(6 \times 79)) \times \text{A period time}$ | | | | | | |

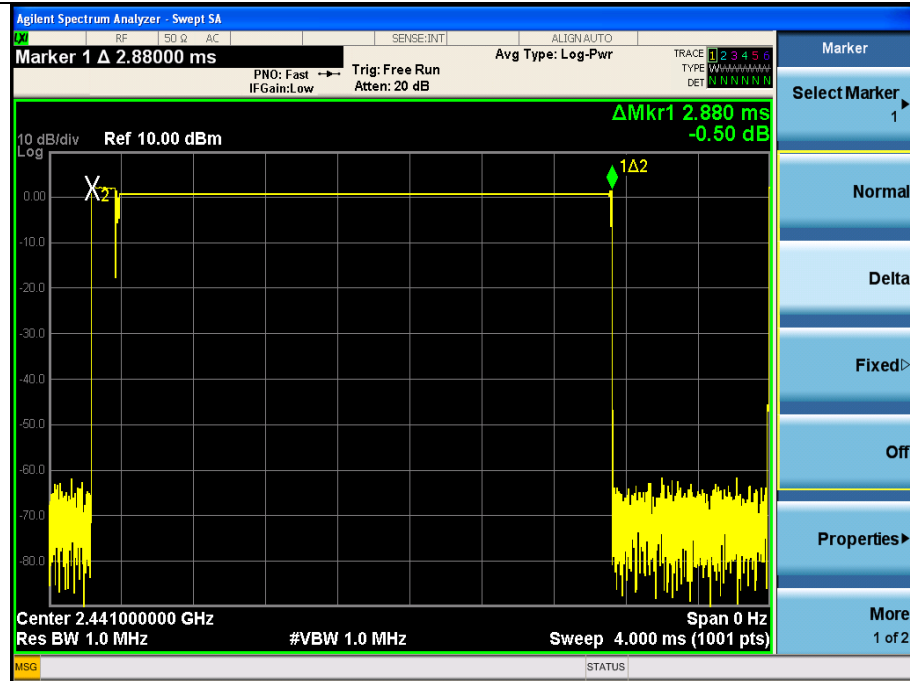
| Modulation mode | | GFSK mode | |
|-----------------|--|--|--|
| DH1 | |  | |
| | | <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 Δ 360.000 μs</p> <p>Ref 10.00 dBm</p> <p>Center 2.441000000 GHz</p> <p>Res BW 1.0 MHz</p> <p>#VBW 1.0 MHz</p> <p>Sweep 4.000 ms (1001 pts)</p> <p>Span 0 Hz</p> <p>Marker 1 Δ 360.0 μs</p> <p>-0.04 dB</p> | |
| DH3 | |  | |
| | | <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 Δ 1.61600 ms</p> <p>Ref 10.00 dBm</p> <p>Center 2.441000000 GHz</p> <p>Res BW 1.0 MHz</p> <p>#VBW 1.0 MHz</p> <p>Sweep 4.000 ms (1001 pts)</p> <p>Span 0 Hz</p> <p>Marker 1 Δ 1.616 ms</p> <p>-0.18 dB</p> | |

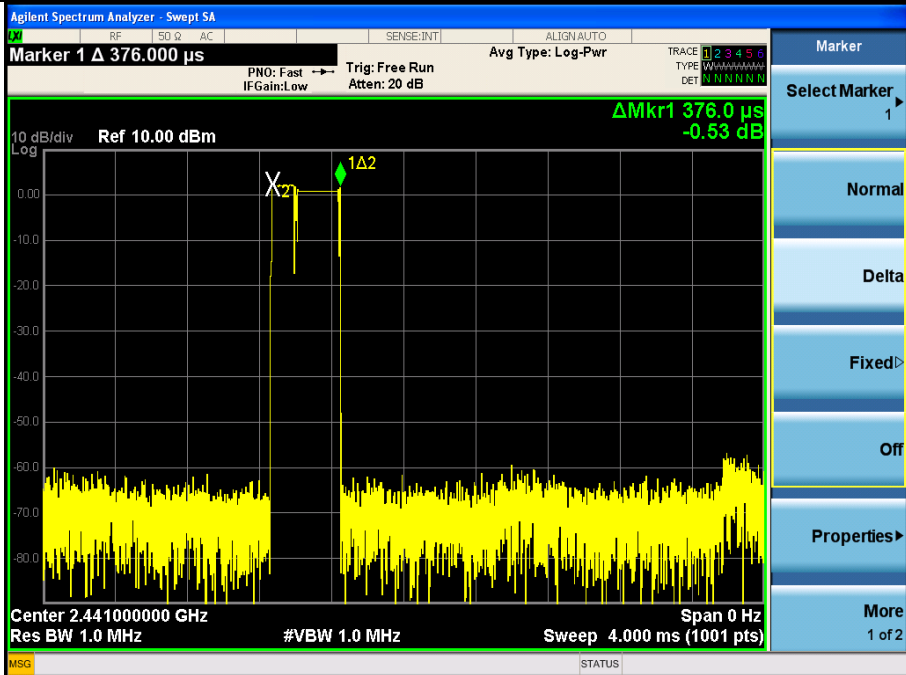
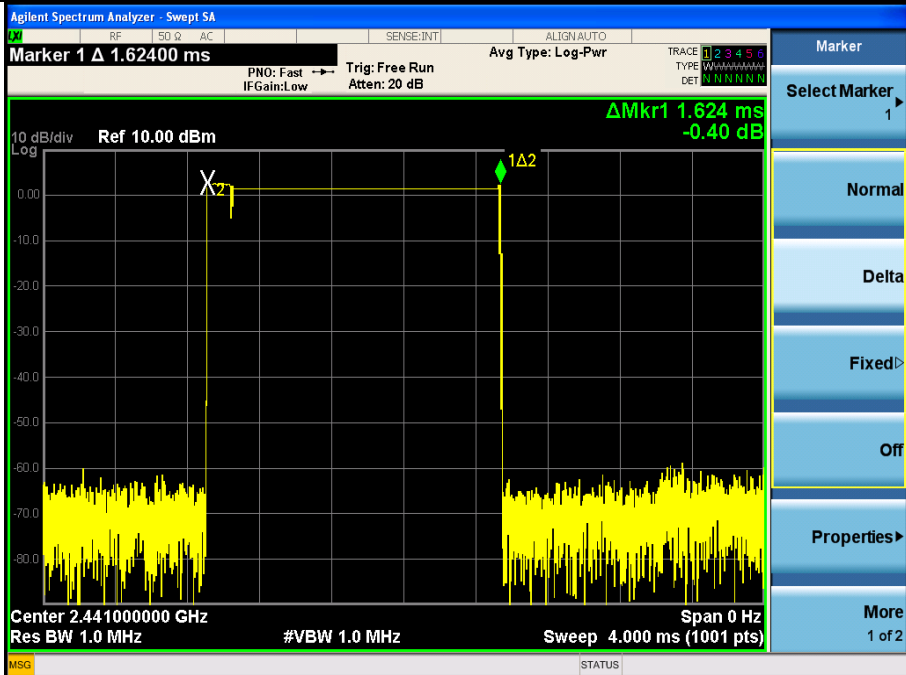
DH5



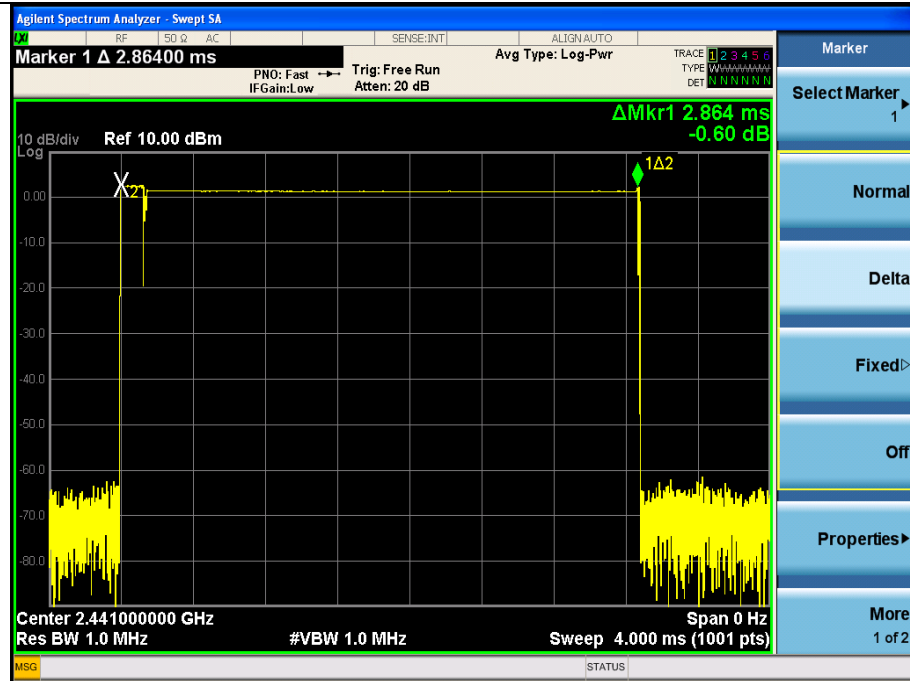
| Modulation mode | | $\pi/4$ -DQPSK | |
|-----------------|--|---|--|
| 2-DH1 | | | |
| | | <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 Δ 376.000 μs</p> <p>PNO: Fast IFGain:Low Trig: Free Run Atten: 20 dB Avg Type: Log-Pwr</p> <p>Ref 10.00 dBm</p> <p>10 dB/div Log</p> <p>Center 2.441000000 GHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 4.000 ms (1001 pts) Span 0 Hz</p> <p>ΔMkr1 376.0 μs -1.42 dB</p> <p>MSG STATUS</p> | |
| 2-DH3 | | | |
| | | <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 Δ 1.61600 ms</p> <p>PNO: Fast IFGain:Low Trig: Free Run Atten: 20 dB Avg Type: Log-Pwr</p> <p>Ref 10.00 dBm</p> <p>10 dB/div Log</p> <p>Center 2.441000000 GHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 4.000 ms (1001 pts) Span 0 Hz</p> <p>ΔMkr1 1.616 ms -1.16 dB</p> <p>MSG STATUS</p> | |

2-DH5



| Modulation mode | | 8DPSK | |
|-----------------|--|---|--|
| 3-DH1 | |  | |
| | |  | |

3-DH5



8. PEAK OUTPUT POWER TEST

8.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C | | | | |
|---------------------------------|-------------------|--|-----------------------|--------|
| Section | Test Item | Limit | Frequency Range (MHz) | Result |
| 15.247(b)(3) | Peak Output Power | Hopping Channels>75 Power<1W(30dBm) Other <125 mW(21dBm) | 2400-2483.5 | PASS |

8.1.1 TEST PROCEDURE

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:
RBW=1MHz, VBW=3MHz, Detector=Peak (If 20dB BW ≤1 MHz)
RBW=3MHz, VBW=10MHz, Detector=Peak (If 20dB BW > 1 MHz)
- (3) The EUT was set to continuously transmitting in the max power during the test.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 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.

8.1.5 TEST RESULTS

| | | | |
|---------------|---|---------------------|--------------------|
| EUT : | Laptop | Model Name : | TM141WT720C |
| Temperature : | 25 °C | Relative Humidity : | 60% |
| Pressure : | 1012 hPa | Test Voltage : | DC 12Vfrom adapter |
| Test Mode : | GFSK, $\pi/4$ -DQPSK, 8-DPSK Mode /CH01, CH40, CH79 | | |

| TX GFSK Mode | | | |
|------------------------|-----------|------------------------------------|-------|
| Test Channe | Frequency | Maximum Conducted Output Power(PK) | LIMIT |
| | (MHz) | (dBm) | dBm |
| CH01 | 2402 | 3.63 | 30 |
| CH40 | 2441 | 3.12 | 30 |
| CH79 | 2480 | 2.87 | 30 |
| TX $\pi/4$ -DQPSK Mode | | | |
| CH01 | 2402 | 2.14 | 30 |
| CH40 | 2441 | 2.56 | 30 |
| CH79 | 2480 | 2.53 | 30 |
| TX 8-DPSK Mode | | | |
| CH01 | 2402 | 1.79 | 30 |
| CH40 | 2441 | 2.12 | 30 |
| CH79 | 2480 | 2.24 | 30 |

||||

9. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

APPLICABLE STANDARD

In any 100 kHz 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 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

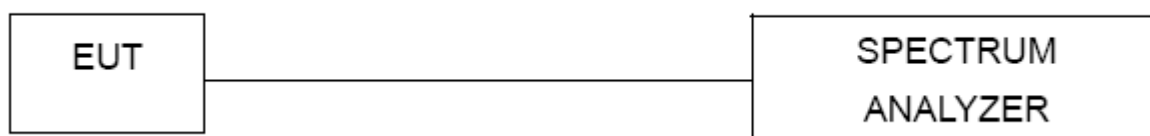
TEST PROCEDURE

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

9.1 DEVIATION FROM STANDARD

No deviation.

9.2 TEST SETUP



9.3 EUT OPERATION CONDITIONS

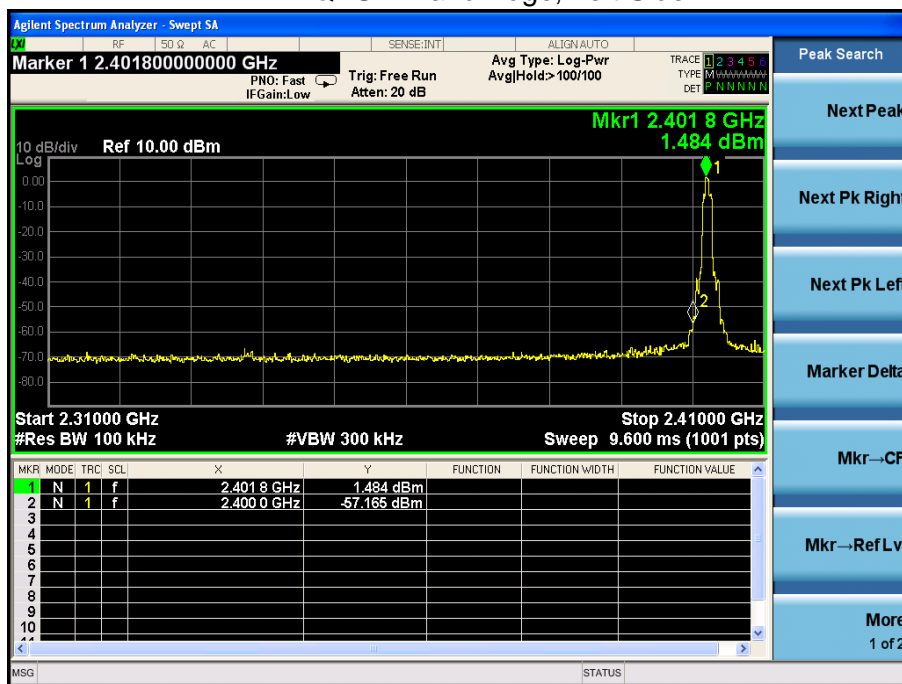
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

9.4 TEST RESULTS

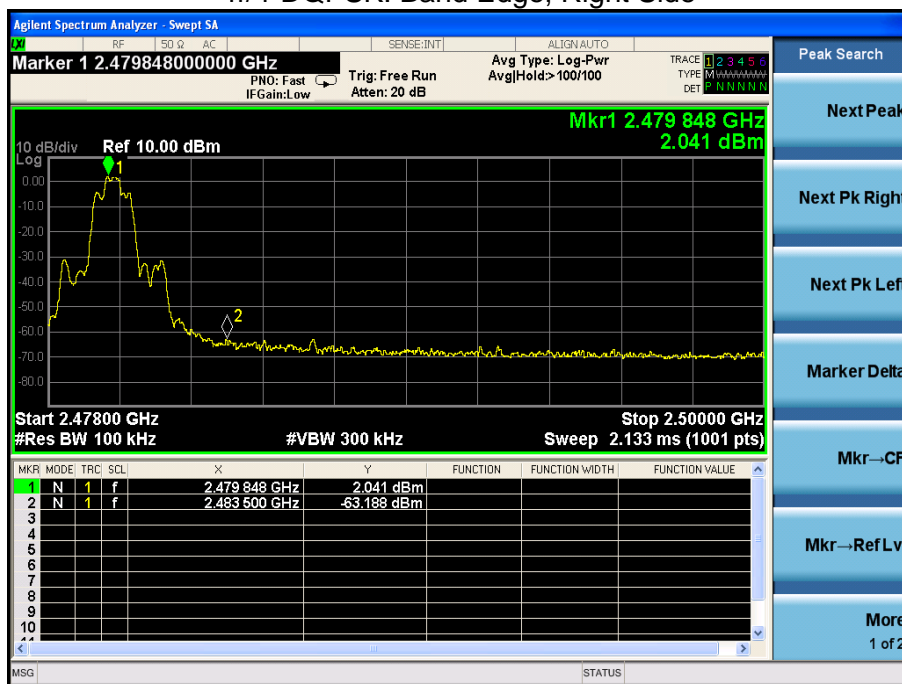
| | | | |
|---------------|----------|---------------------|--------------------|
| EUT : | Laptop | Model Name : | TM141WT720C |
| Temperature : | 25 °C | Relative Humidity : | 60% |
| Pressure : | 1012 hPa | Test Voltage : | DC 12Vfrom adapter |

| Frequency Band | Delta Peak to band emission (dBc) | > Limit (dBc) | Result |
|---------------------|-----------------------------------|---------------|--------|
| GFSK mode | | | |
| Left-band | 57.117 | 20 | Pass |
| Right-band | 68.431 | 20 | Pass |
| $\pi/4$ -DQPSK mode | | | |
| Left-band | 58.649 | 20 | Pass |
| Right-band | 65.229 | 20 | Pass |
| 8-DPSK mode | | | |
| Left-band | 58.132 | 20 | Pass |
| Right-band | 66.847 | 20 | Pass |

$\pi/4$ -DQPSK: Band Edge, Left Side



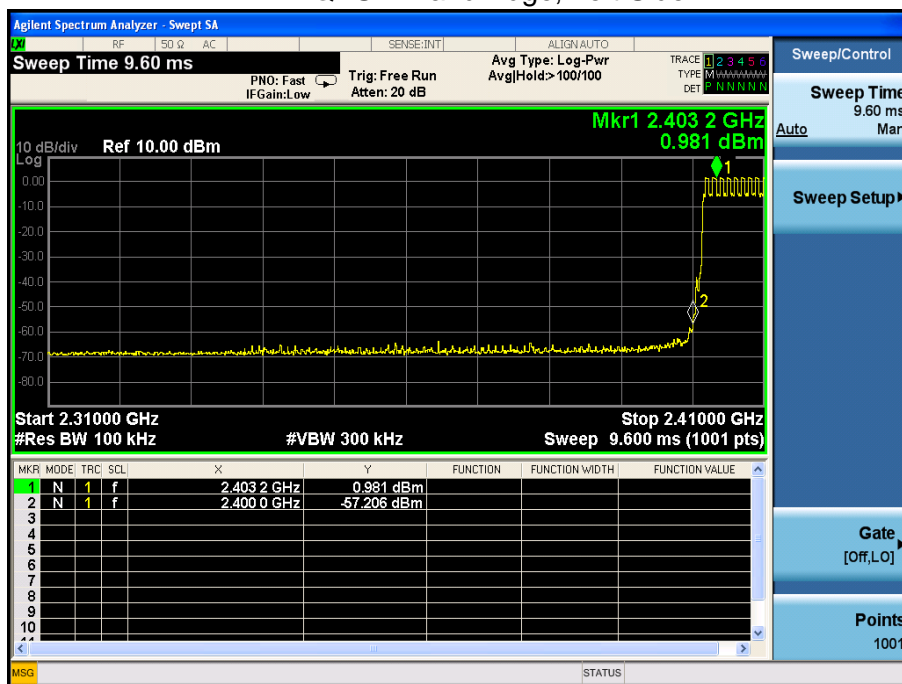
$\pi/4$ -DQPSK: Band Edge, Right Side



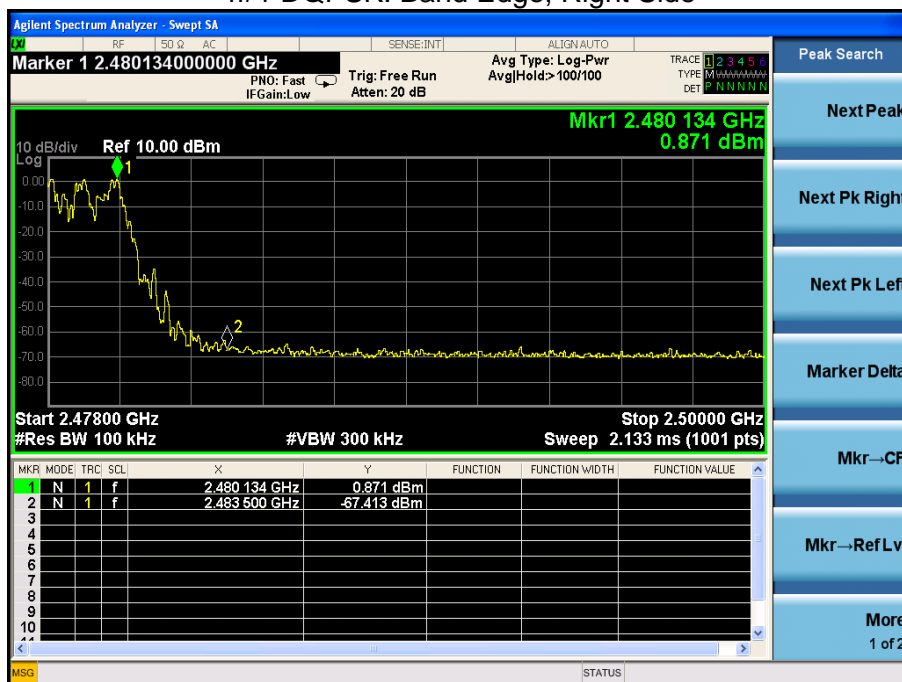
Hopping Mode

| Frequency Band | Delta Peak to band emission (dBc) | > Limit (dBc) | Result |
|---------------------|--------------------------------------|------------------|--------|
| GFSK mode | | | |
| Left-band | 65.137 | 20 | Pass |
| Right-band | 71.773 | 20 | Pass |
| $\pi/4$ -DQPSK mode | | | |
| Left-band | 58.186 | 20 | Pass |
| Right-band | 68.284 | 20 | Pass |
| 8-DPSK mode | | | |
| Left-band | 60.27 | 20 | Pass |
| Right-band | 67.934 | 20 | Pass |

$\pi/4$ -DQPSK: Band Edge, Left Side



$\pi/4$ -DQPSK: Band Edge, Right Side



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 Integrated antenna,0dbi. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

End of Report