

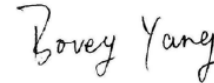
## FCC RADIO TEST REPORT

**Report Reference No.** ..... : NTEK-2011DG11012654F

Compiled by (+ signature) ..... : Jim He



Approved by (+ signature) ..... : Bovey Yang



**Applicant's name** ..... : ZF Friedrichshafen AG, Electronic Systems

Address ..... : Cherryst., 91275 Auerbach/Opf., Germany

**Manufacture's Name** ..... : Dongguan Togran Electronic Technology Co, Ltd.

Address ..... : 262 Shidan Rd., 3<sup>rd</sup> Industrial Area, Juzhou, Shijie, Dongguan, Guangdong,.

**Test specification:**

Standard ..... : FCC Part15.249

Test procedure ..... : ANSI C63.4-2003

**Test item description**

Product name ..... : Cherry MW 3000

FCC ID ..... : GDDJF-T01

Model and/or type reference : JF-T01

Rating(s) ..... : DC 3V from battery

**Testing Laboratory information:**

Testing Laboratory Name ..... : NTEK Testing Technology Co., Ltd

Address ..... : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao ' an District, Shenzhen P.R. China.

This device described above has been tested by NTEK Testing 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.

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**Testing** ..... :

Date of receipt of test item ..... : 20 Oct. 2011

Date (s) of performance of tests ..... : 20 Oct. 2011 ~02 Nov. 2011

Date of Issue ..... : 02 Nov. 2011

Test Result ..... : **Pass**

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## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| <b>FCC Part15, Subpart C (15.249) &amp; RSS-Gen Issue 3 &amp; RSS-210 Issue 8</b> |                            |          |         |
|---|----------------------------|----------|---------|
| Standard Section  | Test Item                  | Judgment | Remark  |
| 15.207  | Conducted Emission         | N/A      | Note(1) |
| 15.203  | Antenna Requirement        | Pass     |         |
| 15.249  | Radiated Spurious Emission | Pass     |         |
| 15.249  | Occupied Bandwidth         | Pass     |         |

**NOTE:**

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


**1.1 MEASUREMENT UNCERTAINTY**

The reported uncertainty of measurement  $y \pm U$ , where expanded 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      | $\pm 3.2\text{dB}$  |
| 2   | Radiated Emission Test       | $\pm 4.7\text{dB}$  |
| 3   | RF power,conducted           | $\pm 0.16\text{dB}$ |
| 4   | Spurious emissions,conducted | $\pm 0.21\text{dB}$ |
| 5   | All emissions,radiated(<1G)  | $\pm 4.68\text{dB}$ |
| 6   | All emissions,radiated(>1G)  | $\pm 4.89\text{dB}$ |

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                        |   |               |
|------------------------|---|---------------|
| Equipment              | Cherry MW 3000  |               |
| Trade Name             |  |               |
| Model Name             | JF-T01  |               |
| OEM Brand/Model Name   | N/A   |               |
| Model Difference       | N/A   |               |
| Product Description    | The EUT is a Cherry MW 3000   |               |
|                        | Operation Frequency:  | 2403~2478 MHz |
|                        | Channel Number  | 20            |
|                        | Modulation Type:  | GFSK          |
|                        | Antenna Designation:  | PCB antenna   |
|                        | Antenna Gain(Peak)  | 0 dBi         |
| Channel List           | Please refer to the Note 2.   |               |
| Power Source           | DC Voltage supplied from 2*AA battery   |               |
| Power Rating           | DC 3V from battery  |               |
| Connecting I/O Port(s) | Please refer to the User's Manual   |               |
| Products Covered       | N/A   |               |
| EUT Modification(s)    | N/A   |               |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2.

| Channel List |                 |                 |                 |                 |                 |
|--------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Group        | Frequency (MHz) | Frequency (MHz) | Frequency (MHz) | Frequency (MHz) | Frequency (MHz) |
| 01           | 2403            | 2478            | 2453            | 2413            | 2466            |
| 02           | 2404            | 2474            | 2444            | 2424            | 2464            |
| 03           | 2405            | 2475            | 2445            | 2415            | 2465            |
| 04           | 2406            | 2476            | 2436            | 2456            | 2416            |

3.

Table for Filed Antenna

| Ant | Brand | Model Name | Antenna Type | Connector | Gain (dBi) | NOTE    |
|-----|-------|------------|--------------|-----------|------------|---------|
| 1   | N/A   | N/A        | PCB Antenna  | NA        | 0          | 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       | 2403MHz     |
| Mode 2       | 2453MHz     |
| Mode 3       | 2478MHz     |

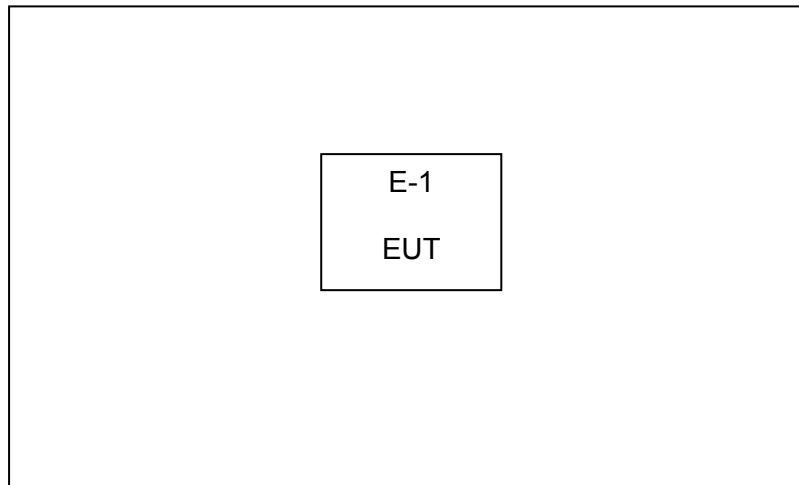
| For Conducted Emission |  |
|------------------------|--|
| Final Test Mode        | Description  |
| -                      | "N/A" denotes test is not applicable in this Test Report |

| For Radiated Emission |             |
|-----------------------|-------------|
| Final Test Mode       | Description |
| Mode 1                | 2403MHz     |
| Mode 2                | 2453MHz     |
| Mode 3                | 2478MHz     |

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The EUT use new battery.


### 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      | Mfr/Brand   | Model/Type No. | FCC ID      | Series No. | Note |
|------|----------------|---|----------------|-------------|------------|------|
| E-1  | Cherry MW 3000 | <b>CHERRY</b>  | JF-T01         | CDDJF-T01TX | N/A        | EUT  |
|      |                |   |                |             |            |      |
|      |                |   |                |             |            |      |
|      |                |   |                |             |            |      |
|      |                |   |                |             |            |      |
|      |                |   |                |             |            |      |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |

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**

Radiation Test equipment

| Item | Kind of Equipment  | Manufacturer | Type No.    | Serial No. | Calibrated until |
|------|--------------------|--------------|-------------|------------|------------------|
| 1    | Spectrum Analyzer  | Agilent      | E4407B      | 160400005  | Jul. 06. 2012    |
| 2    | Test Receiver      | R&S          | ESPI        | 101318     | Jul. 06. 2012    |
| 3    | Bilog Antenna      | TESEQ        | CBL6111D    | 31216      | Jul. 06. 2012    |
| 4    | 50Ω Coaxial Switch | Anritsu      | MP59B       | 6200264416 | Jul. 06. 2012    |
| 5    | Spectrum Analyzer  | ADVANTEST    | R3132       | 150900201  | Jul. 06. 2012    |
| 6    | Horn Antenna       | EM           | EM-AH-10180 | 2011071402 | Jul. 06. 2012    |
| 7    | Horn Ant           | Schwarzbeck  | BBHA 9170   | 9170-181   | Jul. 06. 2012    |
| 8    | Amplifier          | EM           | EM-30180    | 060538     | Jul. 06. 2012    |
| 9    | Loop Antenna       | ARA          | PLA-1030/B  | 1029       | Jul. 06. 2012    |
| 10   | Power Meter        | R&S          | NRVS        | 100696     | Jul. 06. 2012    |

Conduction Test equipment

| Item | Kind of Equipment     | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|-----------------------|--------------|----------|------------|------------------|
| 1    | Test Receiver         | R&S          | ESCI     | 101160     | Jul. 06. 2012    |
| 2    | LISN                  | R&S          | ENV216   | 101313     | Jul. 06. 2012    |
| 3    | LISN                  | EMCO         | 3816/2   | 00042990   | Jul. 06. 2012    |
| 4    | 50Ω Coaxial Switch    | Anritsu      | MP59B    | 6200264417 | Jul. 06. 2012    |
| 5    | Passive Voltage Probe | R&S          | ESH2-Z3  | 100196     | Jul. 06. 2012    |
| 6    | Absorbing clamp       | R&S          | MOS-21   | 100423     | Jul. 06. 2012    |

### **3. TEST RESULT**

#### **3.1 ANTENNA REQUIREMENT**

##### **3.1.1 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.

##### **3.1.2 EUT ANTENNA**

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

**3.2 CONDUCTED EMISSION MEASUREMENT**

**3.2.1 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       |                |         | 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 * | LP002. |
| 0.50 -5.0 |  |  | 56.00     | 46.00     | LP002. |
| 5.0 -30.0 |  |  | 60.00     | 50.00     | LP002. |

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    |

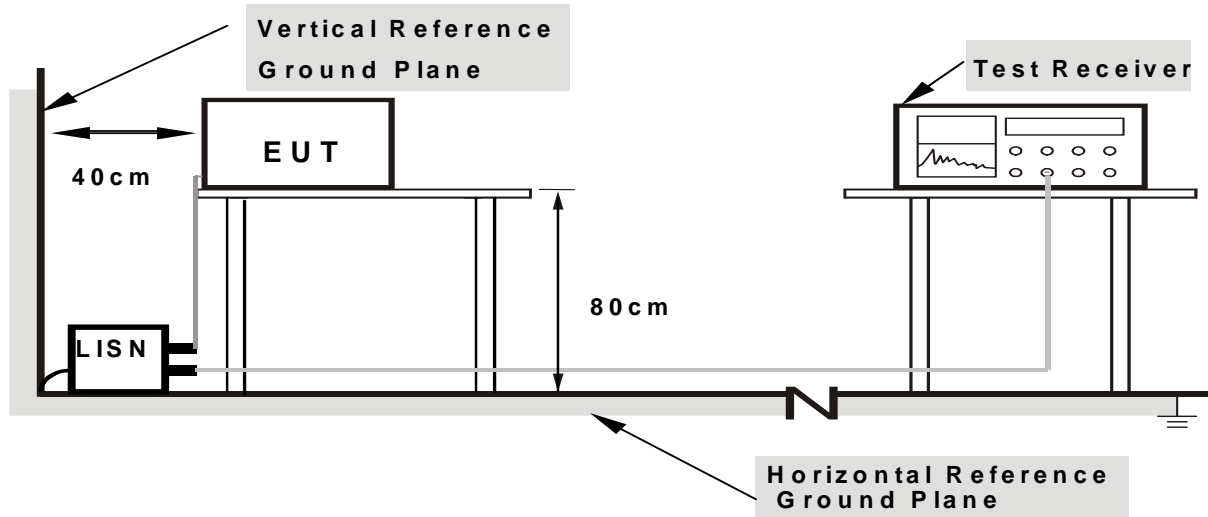
**3.2.2 TEST PROCEDURE**

- 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.

**3.2.3 DEVIATION FROM TEST STANDARD**

No deviation

**3.2.4 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

**3.2.5 TEST RESULT**

Cause the EUT only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Measurements to demonstrate compliance with the conducted limits are not required for devices

### 3.3 RADIATED EMISSION MEASUREMENT

#### 3.3.1 Radiated Emission Limits ( FCC 15.209 )

| Frequencies (MHz) | Field Strength (micorvolts/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                             |

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

#### LIMITS OF RADIATED EMISSION MEASUREMENT ( FCC 15.249)

| Frequency of Emission (MHz) | Field Strength of fundamental ((millivolts /meter) | Field Strength of Harmonics (microvolts/meter) |
|-----------------------------|--|--|
| 2400 - 2483.5               | 50   | 500  |

Notes:

- (1) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

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

| 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 |

**3.3.2 TEST PROCEDURE**

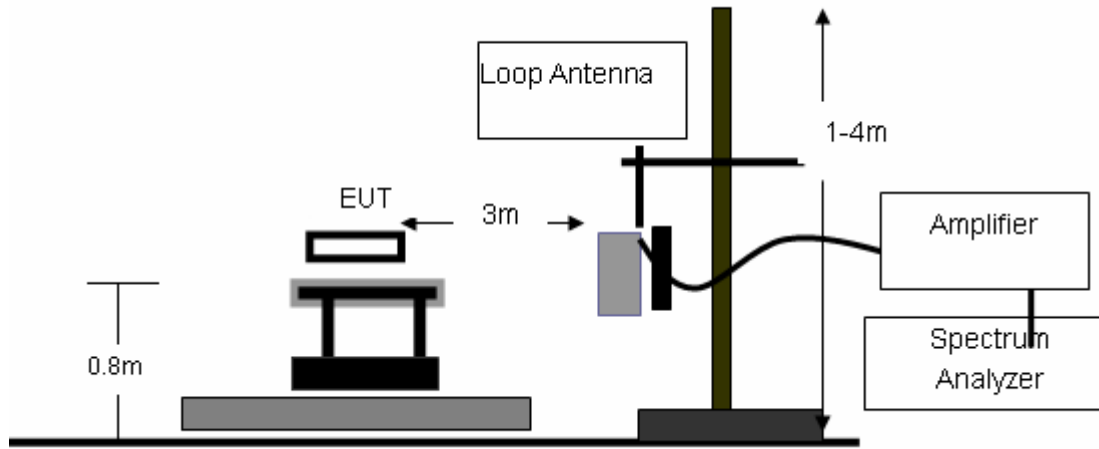
- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. 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. performed pretest to three orthogonal axis.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. 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.

**3.3.3 DEVIATION FROM TEST STANDARD**

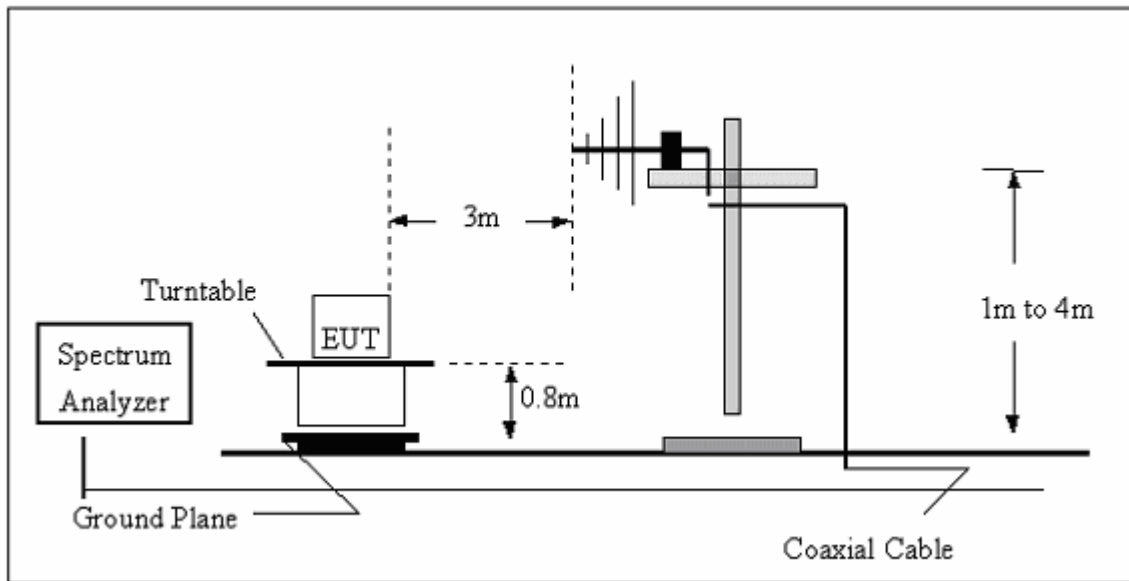
No deviation

### 3.3.4 TEST SETUP

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

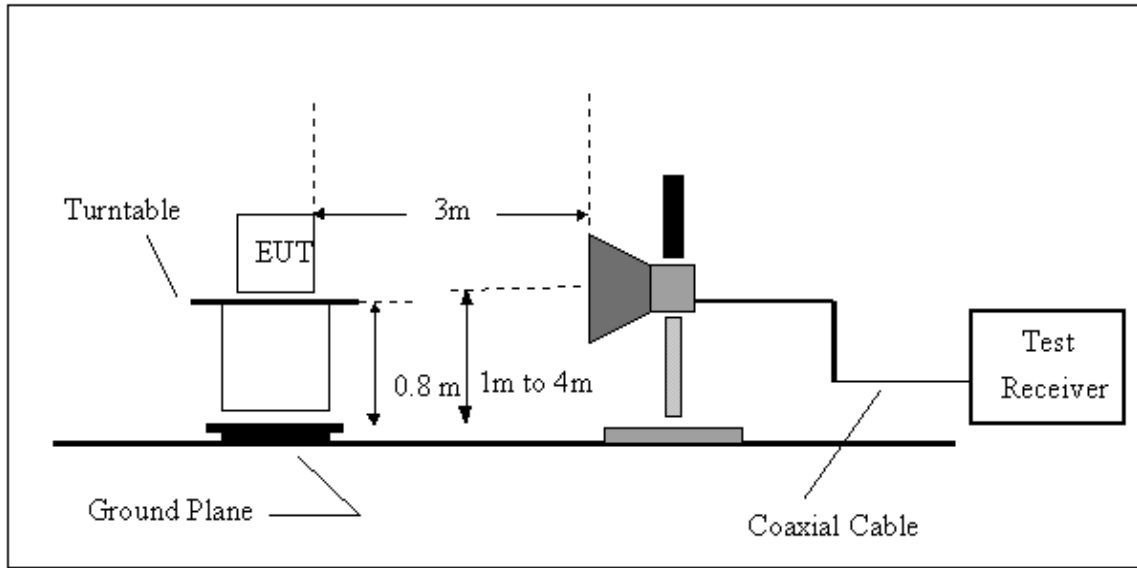


(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz





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



**3.3.5 TEST RESULTS (BLOW 30MHz)**

|               |                |                     |        |
|---------------|----------------|---------------------|--------|
| EUT :         | Cherry MW 3000 | Model Name. :       | JF-T01 |
| Temperature : | 20 °C          | Relative Humidity : | 48%    |
| Pressure :    | 1010 hPa       | Test Voltage :      | DC 3V  |
| 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 =  $20 \log (\text{specific distance}/\text{test distance})(\text{dB})$ ;

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

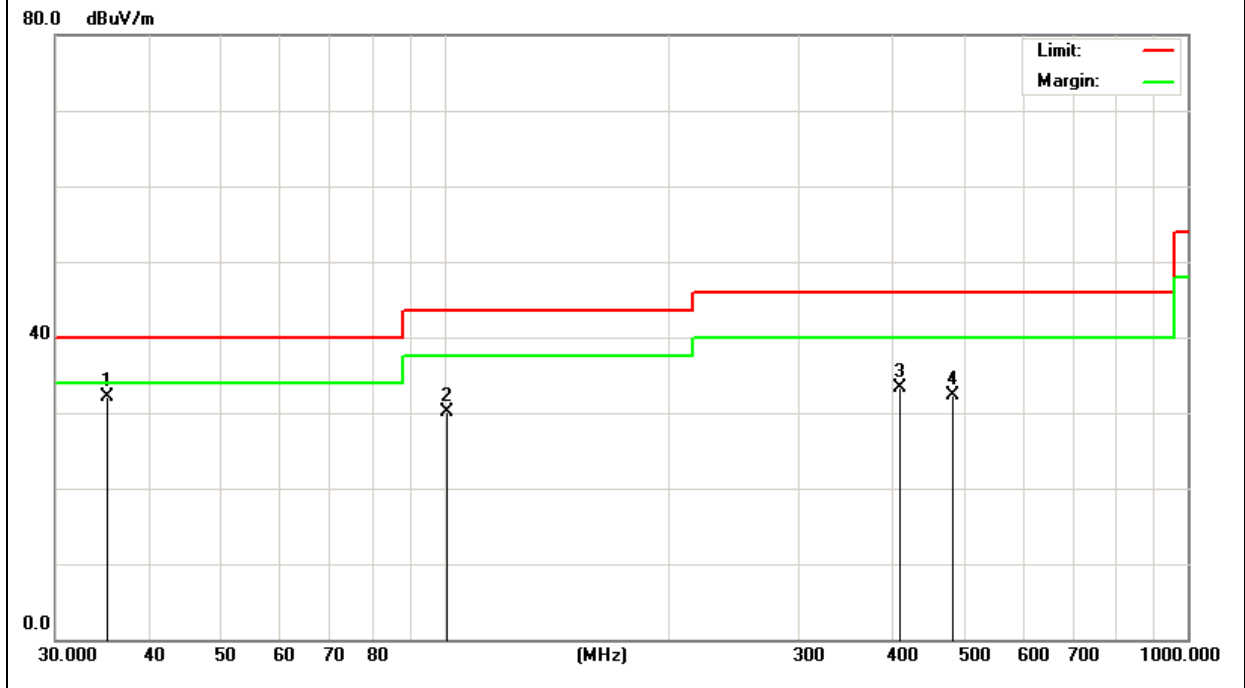
### 3.3.6 TEST RESULTS (BETWEEN 30 – 1000 MHZ)

|               |                |                     |            |
|---------------|----------------|---------------------|------------|
| EUT :         | Cherry MW 3000 | Model Name :        | JF-T01     |
| Temperature : | 24 °C          | Relative Humidity : | 54%        |
| Pressure :    | 1010 hPa       | Polarization :      | Horizontal |
| Test Mode :   | TX             |                     |            |
| Test Power :  | DC 3V          |                     |            |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|---------------|
| 35.18           | 16.61                | 15.58       | 32.19                   | 40              | -7.81       | QP            |
| 100.65          | 19.5                 | 10.69       | 30.19                   | 43.5            | -13.31      | QP            |
| 410.26          | 15.58                | 17.68       | 33.26                   | 46              | -12.74      | QP            |
| 481.19          | 13.57                | 18.75       | 32.32                   | 46              | -13.68      | QP            |
|                 |                      |             |                         |                 |             |               |
|                 |                      |             |                         |                 |             |               |

Remark:

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

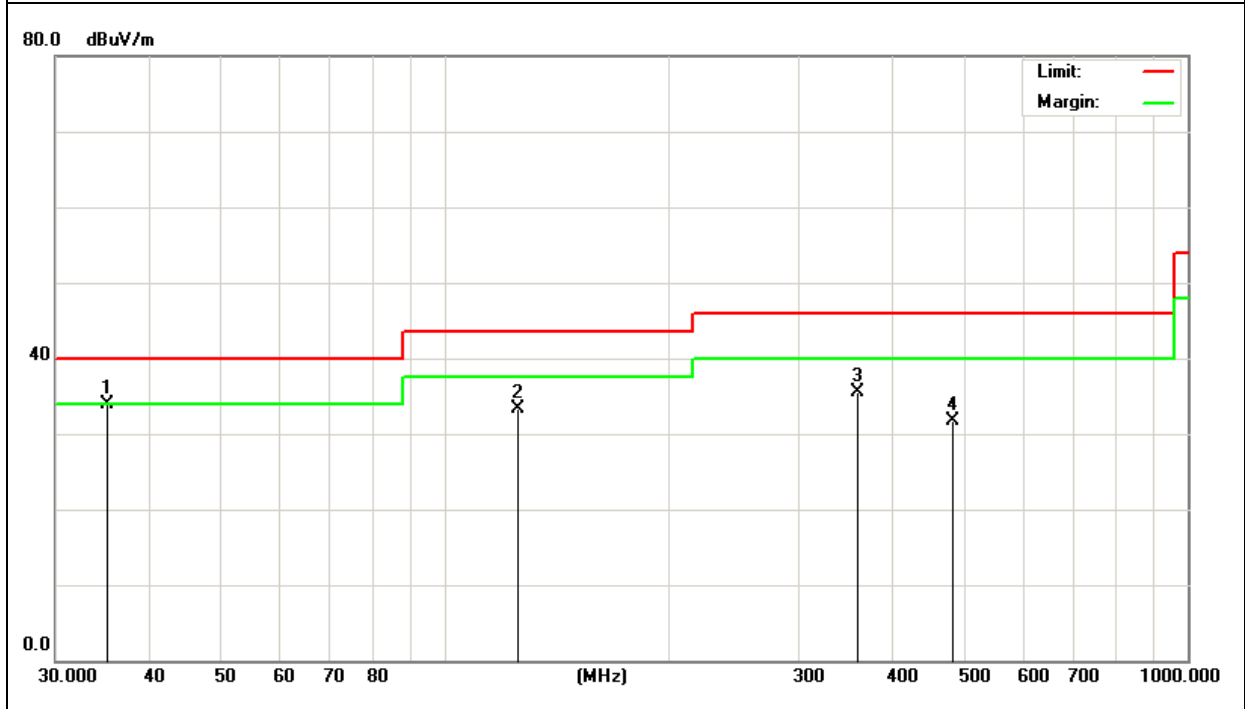


|               |                |                     |          |
|---------------|----------------|---------------------|----------|
| EUT :         | Cherry MW 3000 | Model Name :        | JF-T01   |
| Temperature : | 24 °C          | Relative Humidity : | 54%      |
| Pressure :    | 1010 hPa       | Polarization :      | Vertical |
| Test Mode :   | TX             |                     |          |
| Test Power :  | DC 3V          |                     |          |

| Frequency (MHz) | Meter Reading (dBµV) | Factor (dB) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Detector Type |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|---------------|
| 35.18           | 18.39                | 15.58       | 33.97                   | 40              | -6.03       | QP            |
| 125.54          | 21.48                | 11.91       | 33.39                   | 43.5            | -10.11      | QP            |
| 360.18          | 19.93                | 15.55       | 35.48                   | 46              | -10.52      | QP            |
| 480.97          | 13.05                | 18.74       | 31.79                   | 46              | -14.21      | QP            |
|                 |                      |             |                         |                 |             |               |
|                 |                      |             |                         |                 |             |               |

Remark:

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



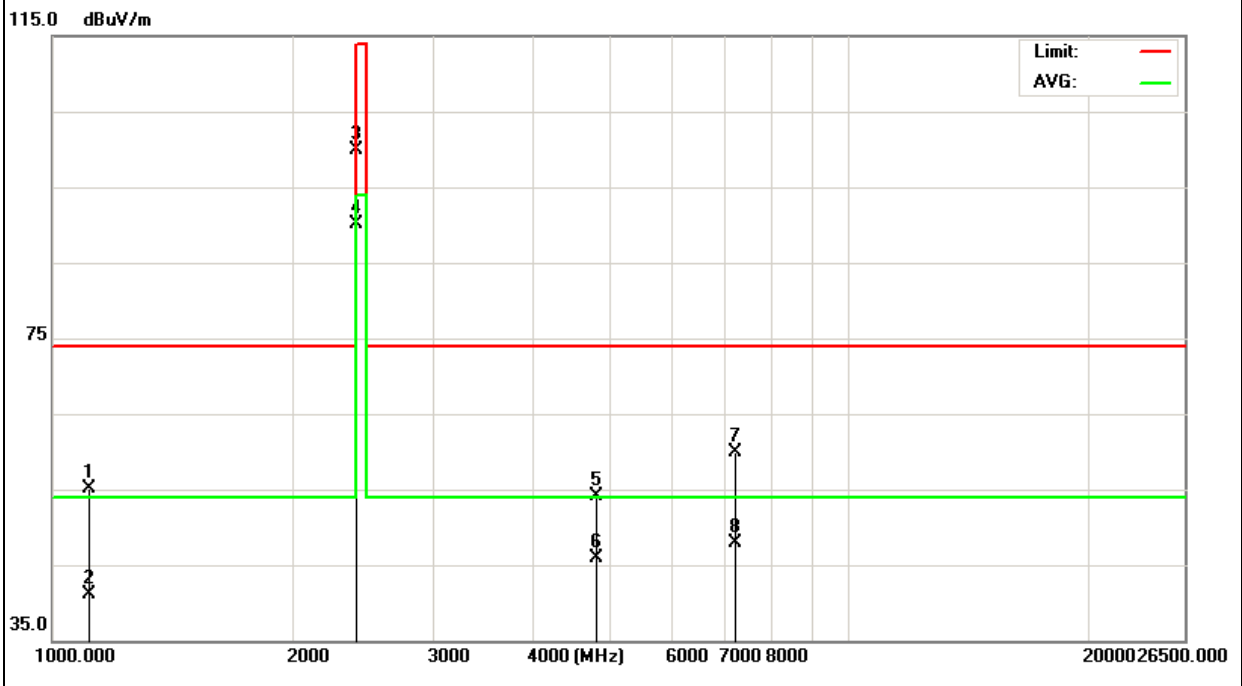
### 3.3.7 TEST RESULTS (ABOVE 1000 MHZ)

|               |                |                     |            |
|---------------|----------------|---------------------|------------|
| EUT :         | Cherry MW 3000 | Model Name :        | JF-T01     |
| Temperature : | 24 °C          | Relative Humidity : | 54%        |
| Pressure :    | 1010 hPa       | Polarization :      | Horizontal |
| Test Mode :   | TX 2403MHz     |                     |            |
| Test Power :  | DC 3V          |                     |            |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|---------------|
| 1111            | 60.2                 | -5.02       | 55.18                   | 74              | -18.82      | peak          |
| 1111            | 46.21                | -5.02       | 41.19                   | 54              | -12.81      | AVG           |
| 2403.26         | 100.56               | -0.69       | 99.87                   | 114.00          | -14.13      | peak          |
| 2403.26         | 90.83                | -0.69       | 90.14                   | 94              | -3.86       | AVG           |
| 4806.52         | 43.78                | 10.4        | 54.18                   | 74              | -19.82      | peak          |
| 4806.52         | 35.58                | 10.4        | 45.98                   | 54              | -8.02       | AVG           |
| 7209.52         | 47.48                | 12.39       | 59.87                   | 74              | -14.13      | peak          |
| 7209.52         | 35.56                | 12.39       | 47.95                   | 54              | -6.05       | AVG           |

Remark:

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

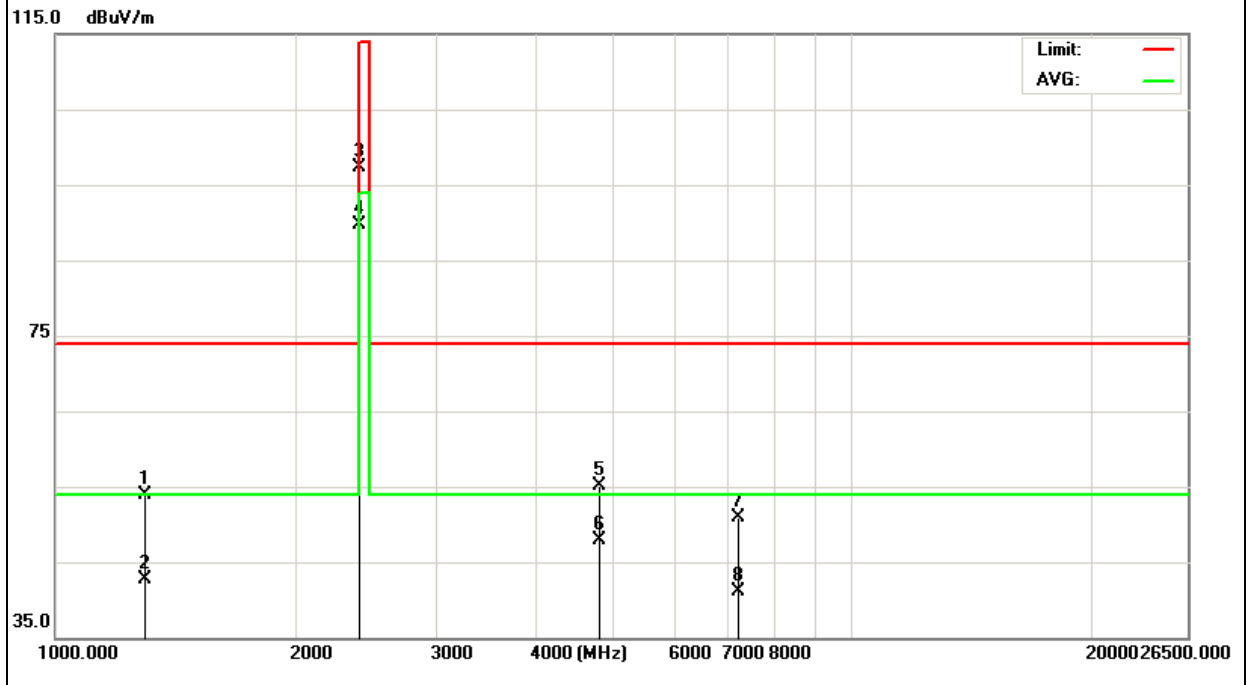


|               |                |                     |          |
|---------------|----------------|---------------------|----------|
| EUT :         | Cherry MW 3000 | Model Name :        | JF-T01   |
| Temperature : | 24 °C          | Relative Humidity : | 54%      |
| Pressure :    | 1010 hPa       | Polarization :      | Vertical |
| Test Mode :   | TX 2403MHz     |                     |          |
| Test Power :  | DC 3V          |                     |          |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|---------------|
| 1293.28         | 58.02                | -4.05       | 53.97                   | 74              | -20.03      | peak          |
| 1293.28         | 46.69                | -4.05       | 42.64                   | 54              | -11.36      | AVG           |
| 2403.26         | 98.05                | -0.69       | 97.36                   | 114.0 0         | -16.64      | peak          |
| 2403.26         | 90.33                | -0.69       | 89.64                   | 94              | -4.36       | AVG           |
| 4806.52         | 44.78                | 10.4        | 55.18                   | 74              | -18.82      | peak          |
| 4806.52         | 37.58                | 10.4        | 47.98                   | 54              | -6.02       | AVG           |
| 7209.52         | 38.55                | 12.39       | 50.94                   | 74              | -23.06      | peak          |
| 7209.52         | 28.8                 | 12.39       | 41.19                   | 54              | -12.81      | AVG           |

Remark:

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

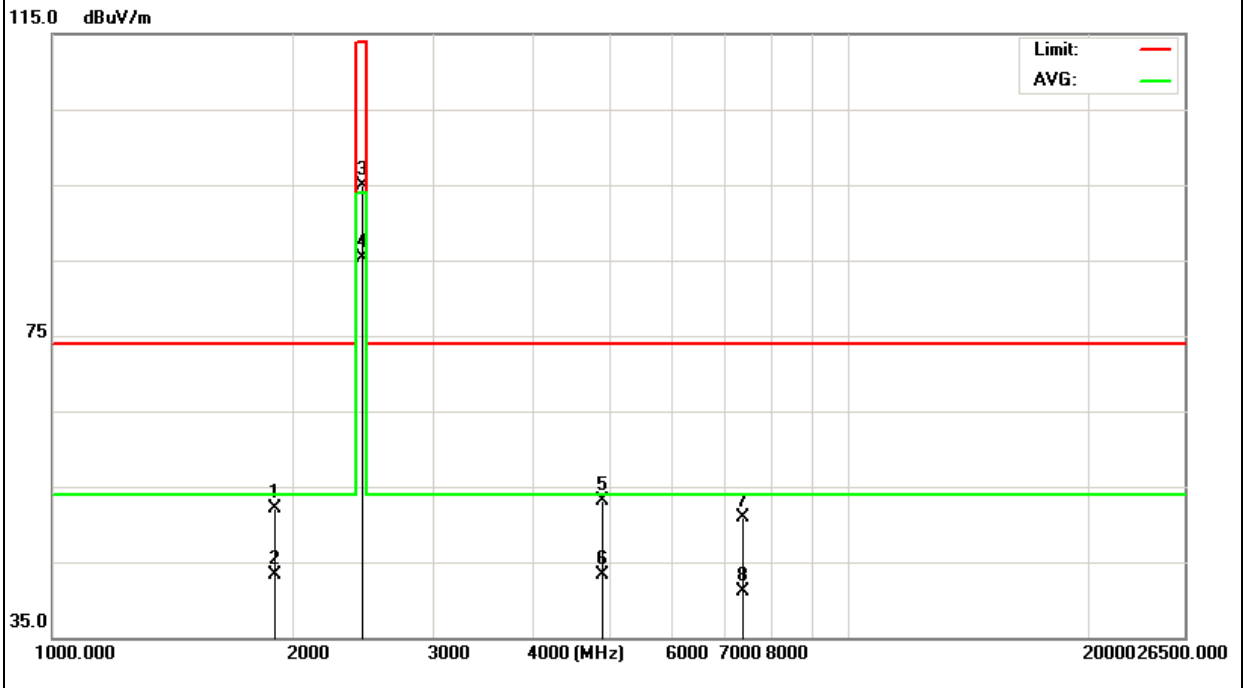


|               |                |                     |            |
|---------------|----------------|---------------------|------------|
| EUT :         | Cherry MW 3000 | Model Name :        | JF-T01     |
| Temperature : | 24 °C          | Relative Humidity : | 54%        |
| Pressure :    | 1010 hPa       | Polarization :      | Horizontal |
| Test Mode :   | TX 2453MHz     |                     |            |
| Test Power :  | DC 3V          |                     |            |

| Frequency (MHz) | Meter Reading (dBµV) | Factor (dB) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Detector Type |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|---------------|
| 1896.29         | 53.99                | -1.8        | 52.19                   | 74              | -21.81      | peak          |
| 1896.29         | 45.11                | -1.8        | 43.31                   | 54              | -10.69      | AVG           |
| 2453.19         | 95.58                | -0.6        | 94.98                   | 114.0 0         | -19.02      | peak          |
| 2453.19         | 85.93                | -0.6        | 85.33                   | 94              | -8.67       | AVG           |
| 4906.38         | 42.89                | 10.3        | 53.19                   | 74              | -20.81      | peak          |
| 4906.38         | 33.02                | 10.3        | 43.32                   | 54              | -10.68      | AVG           |
| 7359.68         | 38.16                | 12.78       | 50.94                   | 74              | -23.06      | peak          |
| 7359.68         | 28.41                | 12.78       | 41.19                   | 54              | -12.81      | AVG           |

Remark:

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

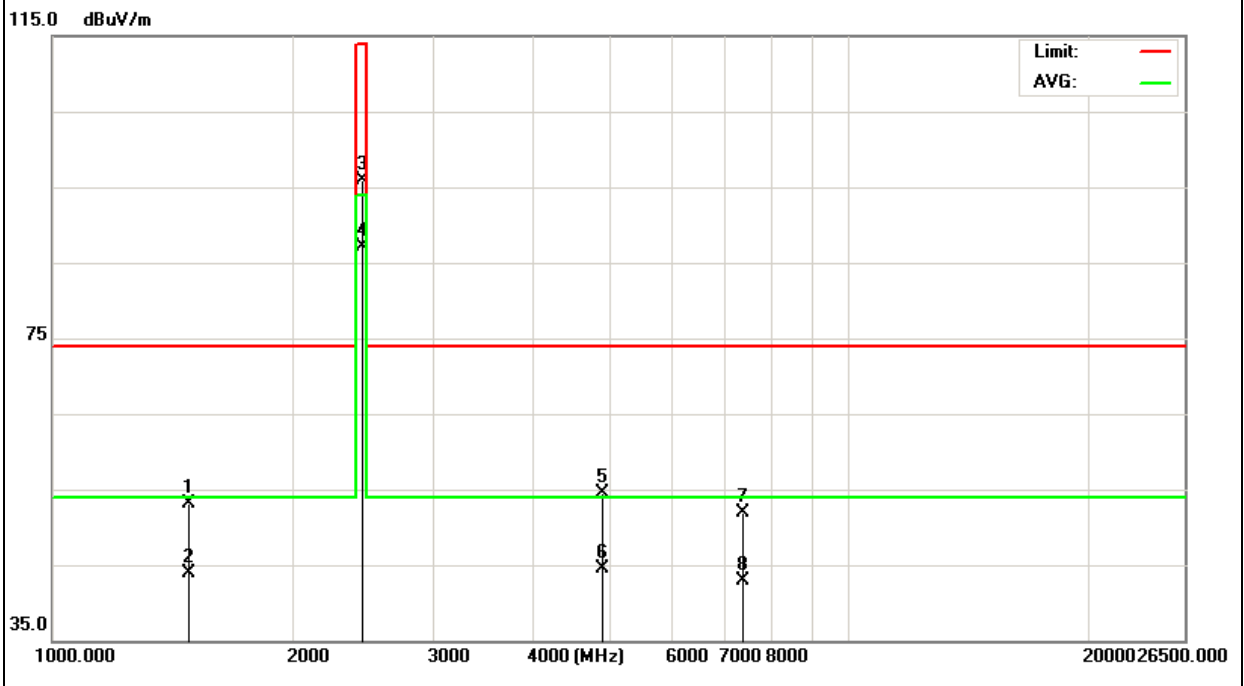


|               |                |                     |          |
|---------------|----------------|---------------------|----------|
| EUT :         | Cherry MW 3000 | Model Name :        | JF-T01   |
| Temperature : | 24 °C          | Relative Humidity : | 54%      |
| Pressure :    | 1010 hPa       | Polarization :      | Vertical |
| Test Mode :   | TX 2453MHz     |                     |          |
| Test Power :  | DC 3V          |                     |          |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|---------------|
| 1478.36         | 56.9                 | -3.79       | 53.11                   | 74              | -20.89      | peak          |
| 1478.36         | 47.76                | -3.79       | 43.97                   | 54              | -10.03      | AVG           |
| 2453.19         | 96.55                | -0.6        | 95.95                   | 114.0 0         | -18.05      | peak          |
| 2453.19         | 87.76                | -0.6        | 87.16                   | 94              | -6.84       | AVG           |
| 4906.38         | 44.26                | 10.3        | 54.56                   | 74              | -19.44      | peak          |
| 4906.38         | 34.24                | 10.3        | 44.54                   | 54              | -9.46       | AVG           |
| 7359.68         | 39.19                | 12.78       | 51.97                   | 74              | -22.03      | peak          |
| 7359.68         | 30.19                | 12.78       | 42.97                   | 54              | -11.03      | AVG           |

Remark:

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



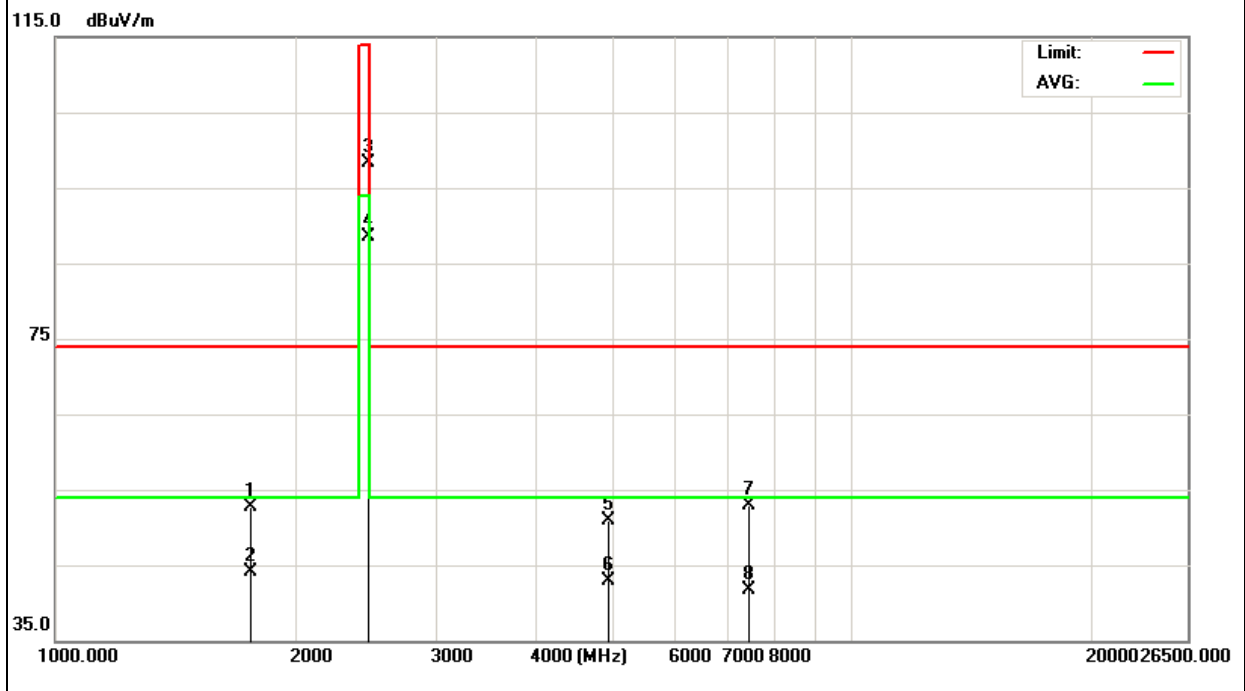


|               |                |                     |            |
|---------------|----------------|---------------------|------------|
| EUT :         | Cherry MW 3000 | Model Name :        | JF-T01     |
| Temperature : | 24 °C          | Relative Humidity : | 54%        |
| Pressure :    | 1010 hPa       | Polarization :      | Horizontal |
| Test Mode :   | TX 2478MHz     |                     |            |
| Test Power :  | DC 3V          |                     |            |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|---------------|
| 1754.16         | 55.23                | -2.54       | 52.69                   | 74              | -21.31      | peak          |
| 1754.16         | 46.73                | -2.54       | 44.19                   | 54              | -9.81       | AVG           |
| 2478.32         | 98.85                | -0.5        | 98.35                   | 114.0 0         | -15.65      | peak          |
| 2478.32         | 88.97                | -0.5        | 88.47                   | 94              | -5.53       | AVG           |
| 4956.64         | 40.5                 | 10.47       | 50.97                   | 74              | -23.03      | peak          |
| 4956.64         | 32.5                 | 10.47       | 42.97                   | 54              | -11.03      | AVG           |
| 7434.96         | 39.83                | 13.08       | 52.91                   | 74              | -21.09      | peak          |
| 7434.96         | 28.56                | 13.08       | 41.64                   | 54              | -12.36      | AVG           |

Remark:

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

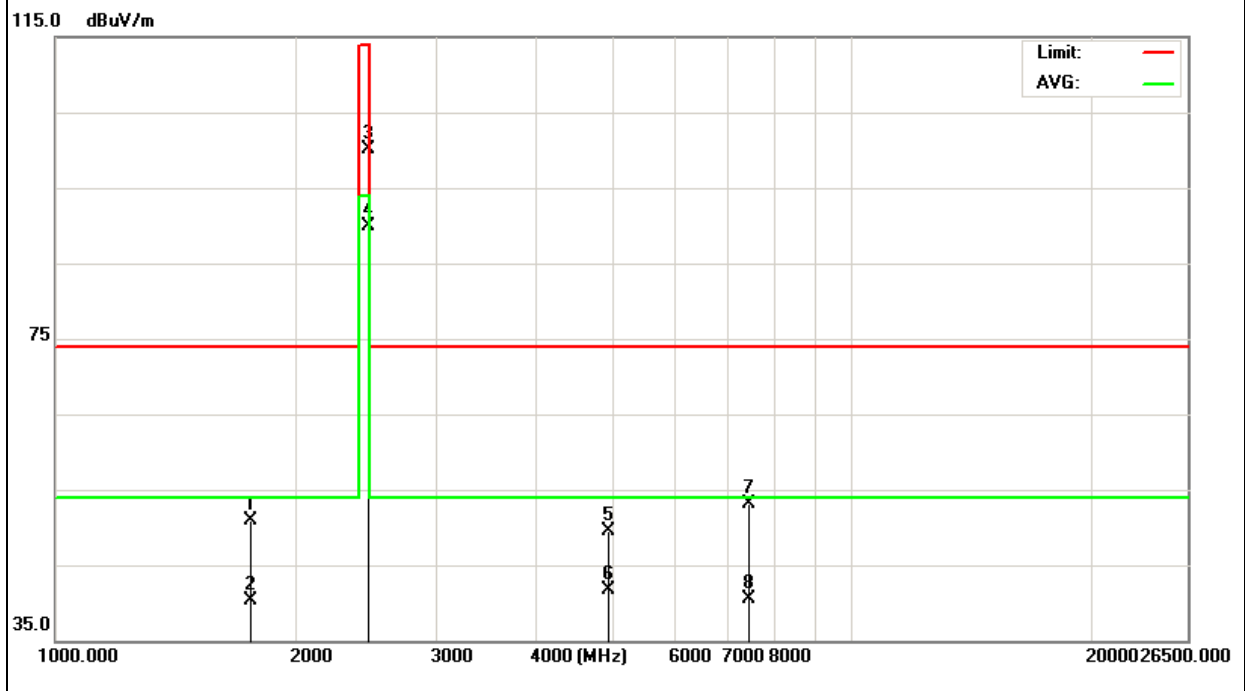


|               |                |                     |          |
|---------------|----------------|---------------------|----------|
| EUT :         | Cherry MW 3000 | Model Name :        | JF-T01   |
| Temperature : | 24 °C          | Relative Humidity : | 54%      |
| Pressure :    | 1010 hPa       | Polarization :      | Vertical |
| Test Mode :   | TX 2478MHz     |                     |          |
| Test Power :  | DC 3V          |                     |          |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|---------------|
| 1754.16         | 53.48                | -2.54       | 50.94                   | 74              | -23.06      | peak          |
| 1754.16         | 42.89                | -2.54       | 40.35                   | 54              | -13.65      | AVG           |
| 2478.32         | 100.68               | -0.5        | 100.18                  | 114.0 0         | -13.82      | peak          |
| 2478.32         | 90.47                | -0.5        | 89.97                   | 94              | -4.03       | AVG           |
| 4956.64         | 39.01                | 10.47       | 49.48                   | 74              | -24.52      | peak          |
| 4956.64         | 31.3                 | 10.47       | 41.77                   | 54              | -12.23      | AVG           |
| 7434.96         | 40.03                | 13.08       | 53.11                   | 74              | -20.89      | peak          |
| 7434.96         | 27.5                 | 13.08       | 40.58                   | 54              | -13.42      | AVG           |

Remark:

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



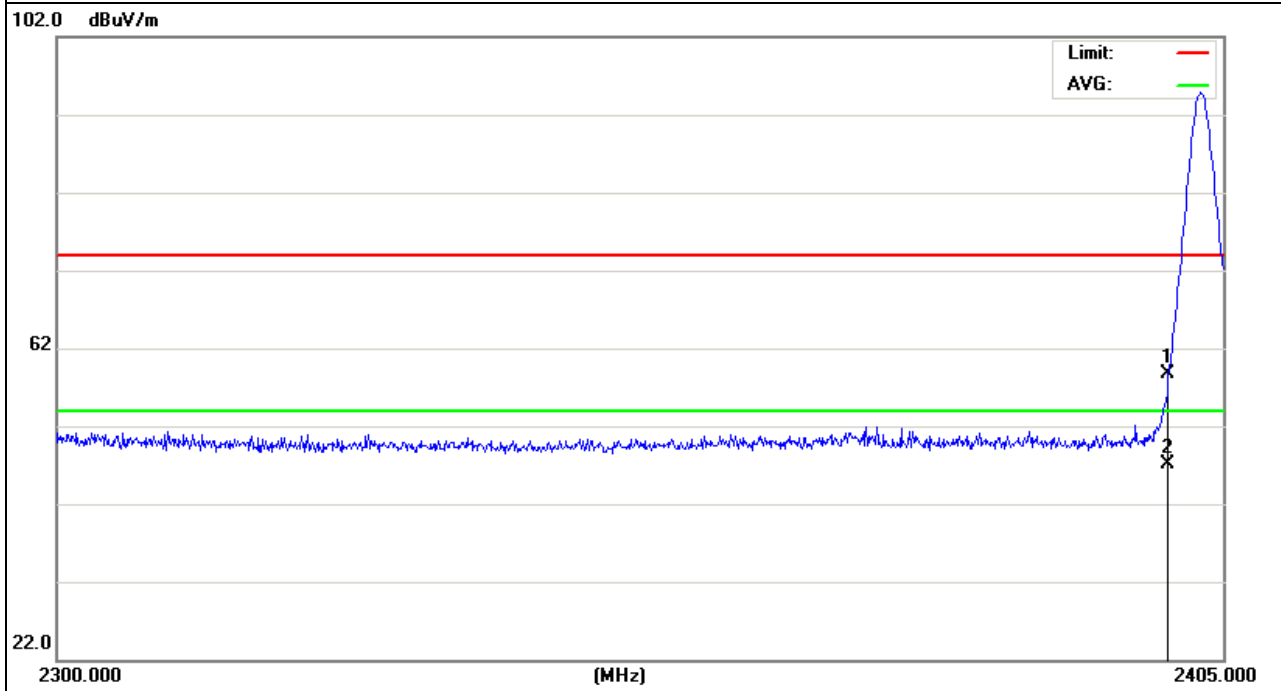
### 3.3.8 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

|                |   |                     |            |
|----------------|---|---------------------|------------|
| EUT :          | Cherry MW 3000  | Model Name :        | JF-T01     |
| Temperature :  | 25 °C   | Relative Humidity : | 60%        |
| Pressure :     | 1012 hPa  | Polarization :      | Horizontal |
| Test Voltage : | DC 3V   |                     |            |
| Test Mode :    | CH1   |                     |            |
| Note :         | 1. The transmitter was setup to transmit at the lowest channel. Then the field strength was measured at 2310-2390 MHz.<br>2. The transmitter was setup to transmit at the highest channel. Then the field strength was measured at 2483.5-2500 MHz. |                     |            |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Detector Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|---------------|
| 2400               | 23.76                   | 35             | 58.76                      | 74                 | -15.24         | peak          |
| 2400               | 12.19                   | 35             | 47.19                      | 54                 | -6.81          | AVG           |

**Remark:**

- Factor = Antenna Factor + Cable Loss – Pre-amplifier.
- Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode
- During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

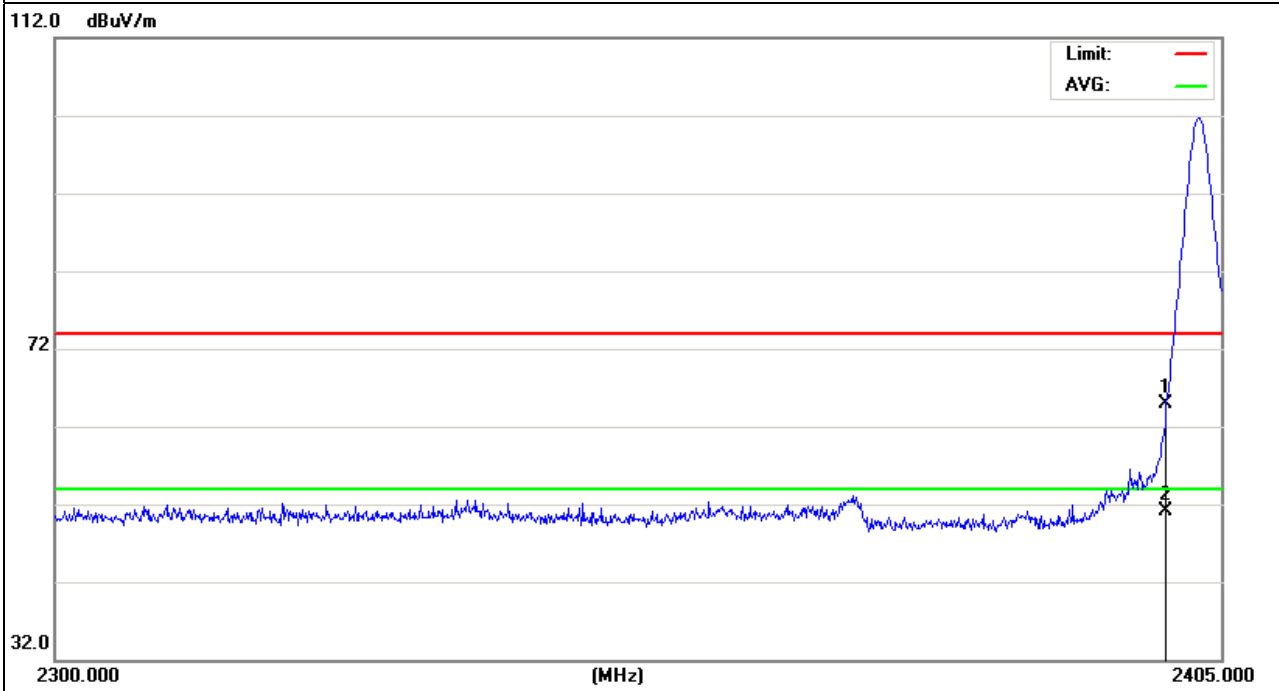


|               |   |                     |          |
|---------------|---|---------------------|----------|
| EUT :         | Cherry MW 3000  | Model Name :        | JF-T01   |
| Temperature : | 25 °C   | Relative Humidity : | 60%      |
| Pressure :    | 1012 hPa  | Polarization :      | Vertical |
|               | DC 3V   |                     |          |
| Test Mode :   | CH1   |                     |          |
| Note :        | 1. The transmitter was setup to transmit at the lowest channel. Then the field strength was measured at 2310-2390 MHz.<br>2. The transmitter was setup to transmit at the highest channel. Then the field strength was measured at 2483.5-2500 MHz. |                     |          |

| Frequency (MHz) | Meter Reading (dBµV) | Factor (dB) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Detector Type |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|---------------|
| 2400            | 29.81                | 35          | 64.81                   | 74              | -9.19       | peak          |
| 2400            | 16.19                | 35          | 51.19                   | 54              | -2.81       | AVG           |

Remark:

- Factor = Antenna Factor + Cable Loss – Pre-amplifier.
- Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode
- During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

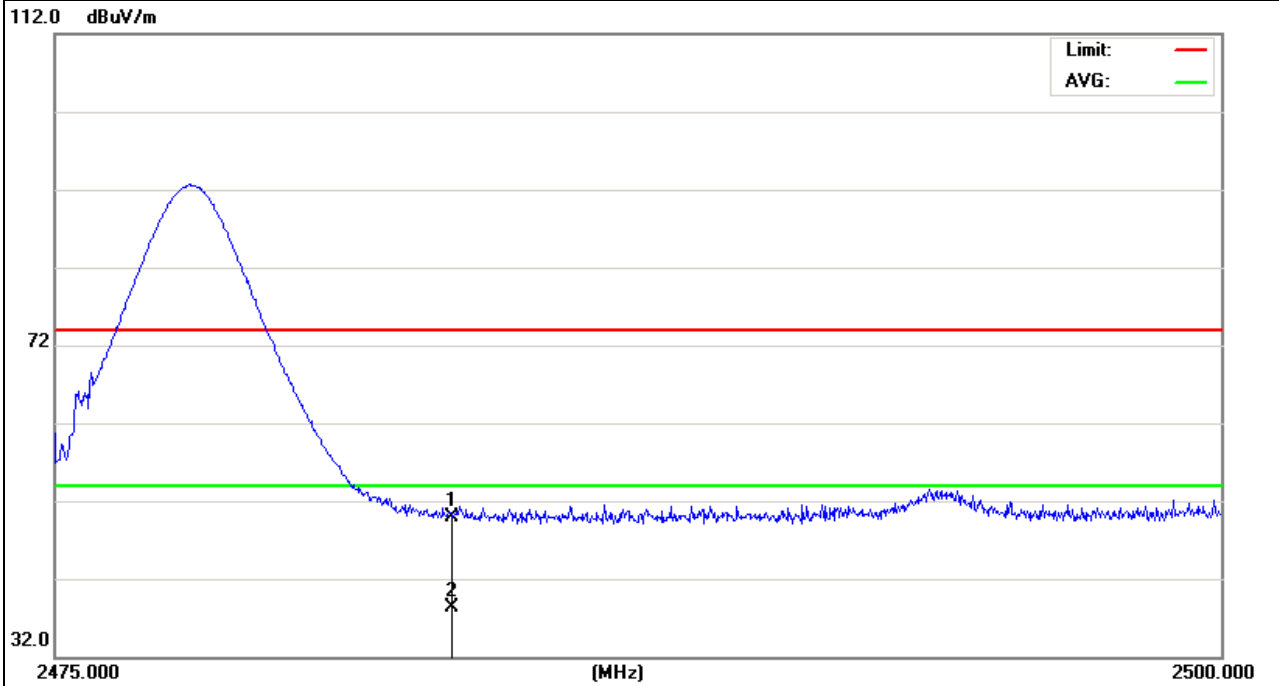


|                |   |                     |            |
|----------------|---|---------------------|------------|
| EUT :          | Cherry MW 3000  | Model Name :        | JF-T01     |
| Temperature :  | 25 °C   | Relative Humidity : | 60%        |
| Pressure :     | 1012 hPa  | Polarization :      | Horizontal |
| Test Voltage : | DC 3V   |                     |            |
| Test Mode :    | CH20  |                     |            |
| Note :         | 1. The transmitter was setup to transmit at the lowest channel. Then the field strength was measured at 2310-2390 MHz.<br>2. The transmitter was setup to transmit at the highest channel. Then the field strength was measured at 2483.5-2500 MHz. |                     |            |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|---------------|
| 2483.5          | 14.61                | 35.25       | 49.86                   | 74              | -24.14      | peak          |
| 2483.5          | 3.05                 | 35.25       | 38.3                    | 54              | -15.7       | AVG           |

**Remark:**

4. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
5. Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode
6. During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

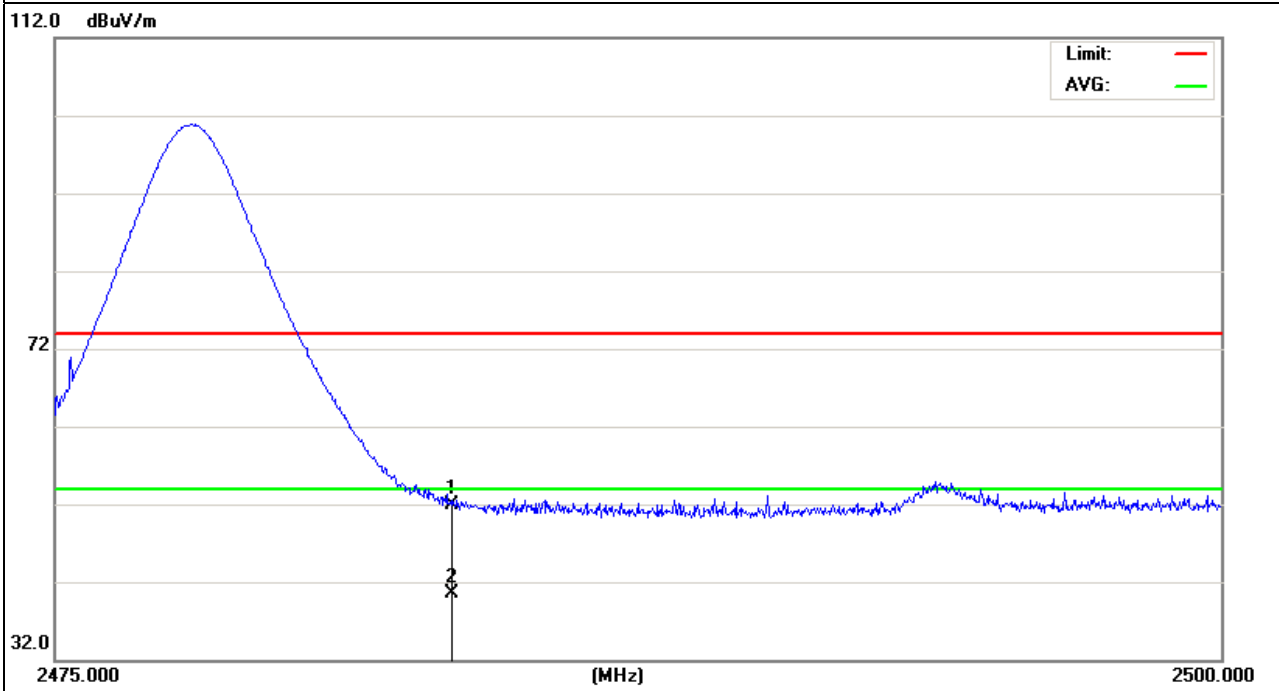


|               |   |                     |          |
|---------------|---|---------------------|----------|
| EUT :         | Cherry MW 3000  | Model Name :        | JF-T01   |
| Temperature : | 25 °C   | Relative Humidity : | 60%      |
| Pressure :    | 1012 hPa  | Polarization :      | Vertical |
|               | DC 3V   |                     |          |
| Test Mode :   | CH20  |                     |          |
| Note :        | 1. The transmitter was setup to transmit at the lowest channel. Then the field strength was measured at 2310-2390 MHz.<br>2. The transmitter was setup to transmit at the highest channel. Then the field strength was measured at 2483.5-2500 MHz. |                     |          |

| Frequency (MHz) | Meter Reading (dBµV) | Factor (dB) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Detector Type |
|-----------------|----------------------|-------------|-------------------------|-----------------|-------------|---------------|
| 2483.5          | 16.61                | 35.25       | 51.86                   | 74              | -22.14      | peak          |
| 2483.5          | 5.25                 | 35.25       | 40.5                    | 54              | -13.5       | AVG           |

Remark:

4. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
5. Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode
6. During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



## 4. BANDWIDTH TEST

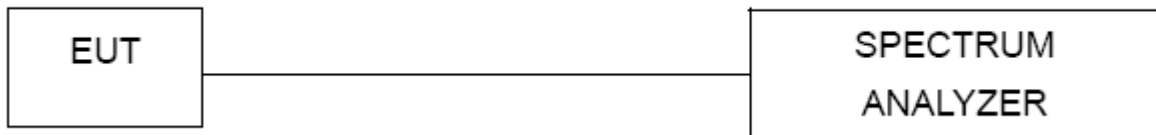
### 4.1 TEST PROCEDURE

- 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= 100KHz, VBW $\geq$ RBW, Sweep time = Auto.

### 4.2 DEVIATION FROM STANDARD

No deviation.

### 4.3 TEST SETUP

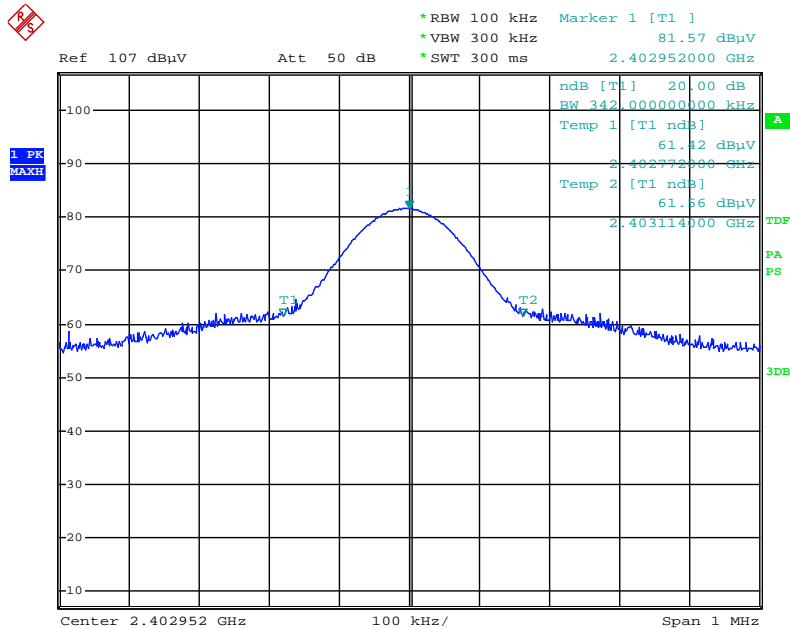


### 4.4 TEST RESULTS

|               |                |                     |        |
|---------------|----------------|---------------------|--------|
| EUT :         | Cherry MW 3000 | Model Name :        | JF-T01 |
| Temperature : | 26 °C          | Relative Humidity : | 53%    |
| Pressure :    | 1020 hPa       | Test Power :        | DC 3V  |
| Test Mode :   | TX (L/M/H)     |                     |        |

| Test Channel | Frequency (MHz) | 20 dBc Bandwidth (MHz) |
|--------------|-----------------|------------------------|
| Low          | 2403            | 0.342                  |
| Middle       | 2453            | 0.337                  |
| High         | 2478            | 0.324                  |

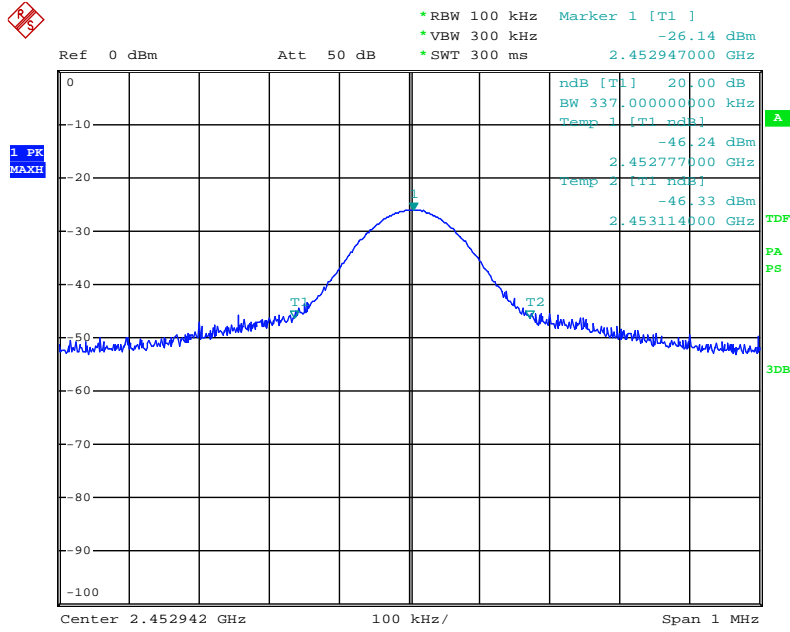
The Lowest Channel:2403MHz



Date: 31.OCT.2011 12:58:22

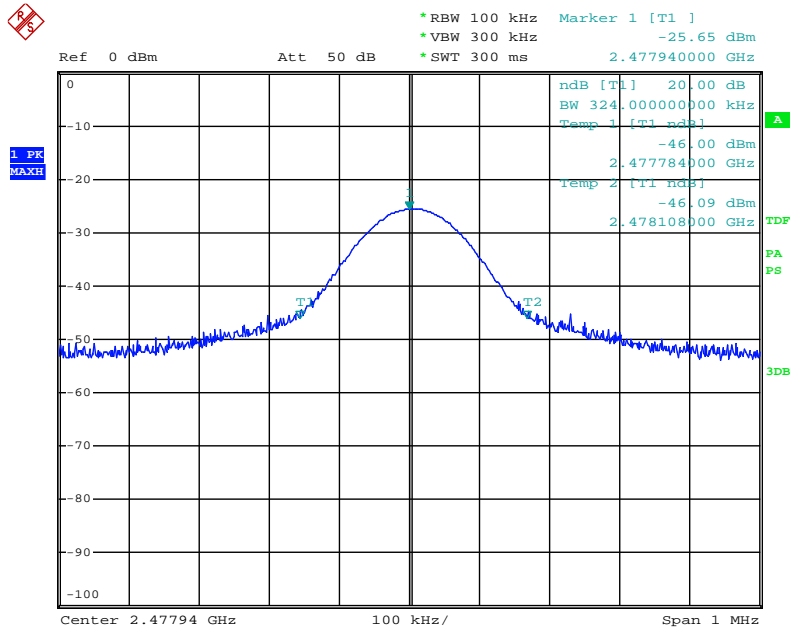


### The Middle Channel:2453MHz



Date: 31.OCT.2011 13:01:14

### The Middle Channel:2478MHz



Date: 31.OCT.2011 13:02:28

**5. EUT TEST PHOTO**

**Radiated Measurement Photos**

