Requirements of Test Sample for RF

2.4 GHz Wireless Data Communication System
(2400~2483.5 MHz)
Requirements

• Anything (ex. software and/or jig) is required with its operating manual to make the EUT get into the following test modes at the lowest, middle and highest frequency channel.
  1. Carrier-only (not modulated) TX
  2. Modulated TX
  3. RX
  4. Frequency hopping (only for FHSS)

• SMA-type RF cable must be attached to the antenna point (the antenna should be disconnected.)
Examples for Test Mode Setup

**Case #1**: Sample has no control interface.

- **PC** (RF control software installed)
  - USB Cable
  - Jig Board
  - SPI Cable
  - **Sample**
    - RF Cable

**Case #2**: Sample has USB, Serial, or Parallel port. (Another port is possible.)

- **PC** (RF control software installed)
  - USB/Serial/Parallel Cable
  - **Sample**
    - RF Cable

**Case #3**: Sample is modified so that...

1. RF function is controllable with its buttons. (one sample)
2. Each sample operates at only one mode. (multiple samples)

- **Sample**
  - RF Cable
- **Sample**
  - RF Cable

※ Another case of test mode setup can be exist.
Example for Test Mode Setup (Case #1)
Test Items

1. Frequency tolerance
2. Power
3. Occupied Bandwidth
4. Spurious TX
5. Spurious RX
6. Dwell Time
1. Frequency Tolerance

• EUT Mode
  – Carrier-only TX

• Limit : $\pm 50 \times 10^{-6}$ (ratio)
  – (ex) 2.4G $\rightarrow$ 120,000 Hz
2. Power

- **EUT Mode**
  - TX

- **Limit**
  - DSSS, CSS, OFDM (ex. WLAN)
    - < 10 mW/MHz (0.5MHz < OBW < 26MHz)
    - < 5 mW/MHz (26MHz < OBW < 40MHz)
    - < 0.1 mW/MHz (40MHz < OBW < 60MHz)
  - FHSS (ex. Bluetooth)
    - < 3 mW (after divided by the hopping bandwidth (MHz))
    - (ex) for Bluetooth, divided by 79
  - Other digital modulation
    - < 10 mW

- **Antenna gain : <6 dBi**
  - If antenna gain exceed 6 dBi, the power should reduced by the amount over 6 dBi.
    - (ex) if antenna gain is 9 dBi, 10 dBm limit becomes (10–(9-6)=7) dBm
3. Occupied Bandwidth

- **EUT Mode**
  - Modulation TX

- **Limit**
  - DSSS, CSS, OFDM : < 26, 40, 60 MHz
  - FHSS : < 5 MHz
  - Other digital modulation : < 26 MHz
4. Spurious TX

- **EUT Mode**
  - Modulation TX

- **Measuring frequency range**
  - 30MHz ~ 12.75GHz
    - RBW : 100kHz, VBW : RBW*3

- **Limit**
  - <-30dBm
5. Spurious RX

- **EUT Mode**
  - RX

- **Measuring frequency range**
  - 30MHz ~ 12.75GHz
    - RBW : 100kHz, VBW : RBW*3

- **Limit**
  - <-54dBm
6. Dwell Time

- **EUT Mode**
  - Frequency hopping
  - Fixed at low, middle, and high frequency

- **Limit**
  - < 400ms