

## 9. SPURIOUS RADIATED EMISSION TEST

### 9.1 Standard Applicable

According to §15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). And according to §15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

### 9.2 EUT Setup

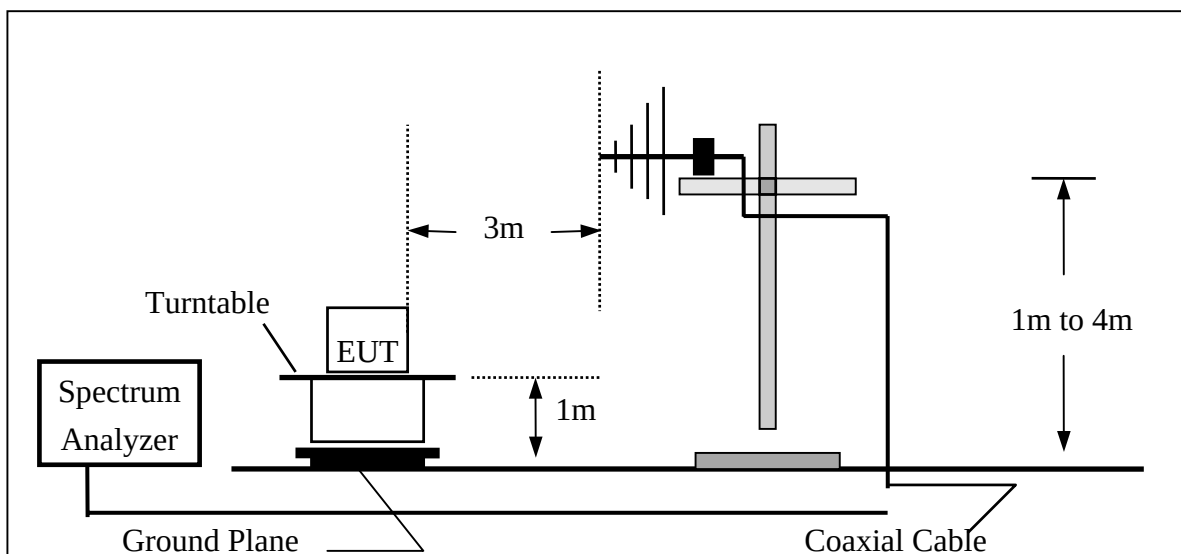
1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4-1992.
2. The EUT was put in the front of the test table. The host PC system was placed on the center of the back edge on the test table. The peripherals like modem, monitor printer, K/B, and mouse were placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The keyboard was placed directly in the front of the monitor, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.
4. The spacing between the peripherals was 10 centimeters.
5. External I/O cables were draped along the edge of the test table and bundle when necessary.
6. The host PC system was connected with 110Vac/60Hz power source.

### 9.3 Measurement Procedure

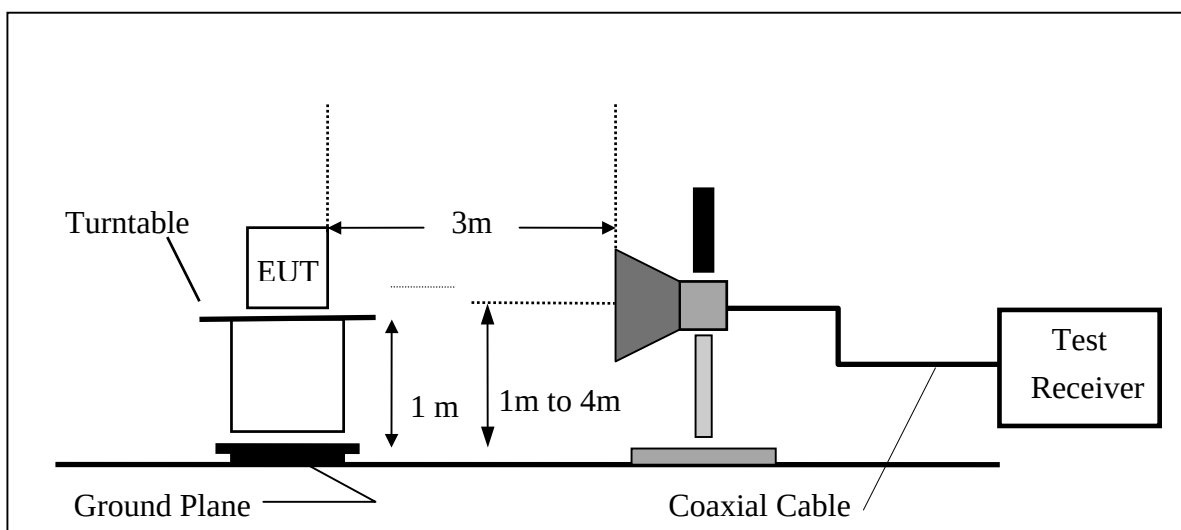
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

## 9.4 Test SET-UP (Block Diagram of Configuration)

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



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



### 9.5 Measurement Equipment Used:

| Open Area Test Site # 3 |             |              |               |            |            |
|-------------------------|-------------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE          | MFR         | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Spectrum Analyzer       | ADVANTEST   | R3261A       | N/A           | 03/19/2002 | 03/18/2003 |
| EMI Test Receiver       | R&S         | ESVS20       | 838804/004    | 01/05/2002 | 01/04/2003 |
| Pre-Amplifier           | HP          | 8447D        | 2944A09173    | 03/04/2002 | 03/03/2003 |
| Bilog Antenna           | SCHWAZBECK  | VULB9163     | 145           | 07/06/2002 | 07/05/2003 |
| Turn Table              | EMCO        | 2081-1.21    | 9709-1885     | N.C.R      | N.C.R      |
| Antenna Tower           | EMCO        | 2075-2       | 9707-2060     | N.C.R      | N.C.R      |
| Controller              | EMCO        | 2090         | 9709-1256     | N.C.R      | N.C.R      |
| RF Switch               | ANRITSU     | MP59B        | M53867        | N.C.R      | N.C.R      |
| Site NSA                | C&C         | N/A          | N/A           | 11/17/2001 | 11/16/2002 |
| Horn antenna            | Schwarzbeck | BBHA 9120    | D210          | 2/24/2002  | 2/23/2003  |
| Pre-Amplifier           | HP          | 8449B        | 3008B00965    | 10/01/2001 | 10/02/2002 |

### 9.6 Field Strength Calculation

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

$$FS = RA + AF + CL - AG$$

|       |                        |                                            |
|-------|------------------------|--------------------------------------------|
| Where | FS = Field Strength    | CL = Cable Attenuation Factor (Cable Loss) |
|       | RA = Reading Amplitude | AG = Amplifier Gain                        |
|       | AF = Antenna Factor    |                                            |

### 9.7 Measurement Result (below 1GHz)

Refer to attach tabular data sheets.

#### NOTE:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.