

## Maximum permissible exposure (MPE) measurement according to FCC CFR 47part 2, §2.1091

### EUT with integrated antenna

#### General

This test was performed to determine the minimum safe distance between the transmitter antenna and human to avoid public exposure in excess of limits for general population (uncontrolled exposure). Specification test limits are given in Table 1 below.

**Table 1 RF exposure limits**

Frequency range, MHz	Power density		Electric field strength*, V/m
	mW/cm <sup>2</sup>	W/m <sup>2</sup>	
2400.0 – 10000.0	1.00	10.0	61.4

\* - Electric field strength limit was calculated from power density as follows:  $E = \sqrt{S \times 120 \times \pi}$ , where E is electric field strength in V/m and S is power density in W/m<sup>2</sup>

#### Test procedure for E-field strength measurements

1. The EUT, connected to the antenna providing the maximum directional gain, was set up as shown in Figure 1 below.
2. The E-field probe was pointed to the EUT antenna zero azimuth at a 3 m distance, the maximum field strength reading was recorded in Table 2.
3. The E-field probe was slowly moved toward the EUT until E-field equivalent to the maximum permitted power density was measured.
4. The probe was investigated over a cross-section area equivalent to the antenna size at various test distances to detect the maximum radial from the antenna.
5. The obtained antenna to probe distance was recorded in Table 2 as a minimum separation distance.
6. The test was repeated at the rest of test distances according to Table 2.

Figure 1 Maximum permissible exposure (MPE) measurement set up

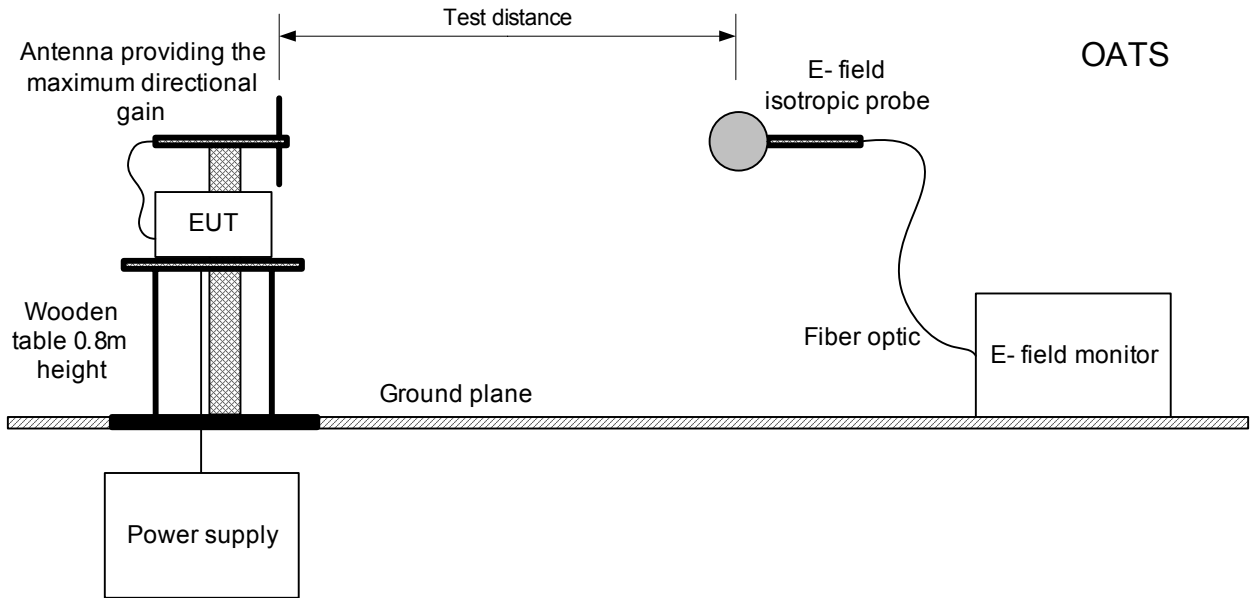


Table 2 Maximum permissible exposure (MPE) measurement with integrated antenna

Test distance, m	Power density, mW/cm <sup>2</sup>	Limit, mW/cm <sup>2</sup>	Margin, mW/cm <sup>2</sup>	Verdict
<b>Low carrier frequency</b>				
3.0	0.0105	1.00	-0.9895	Pass
2.5	0.0135	1.00	-0.9865	Pass
2.0	0.0208	1.00	-0.9792	Pass
1.5	0.0393	1.00	-0.9607	Pass
1.0	0.0302	1.00	-0.9698	Pass
0.5	0.2390	1.00	-0.7610	Pass
0.3	0.4950	1.00	-0.5050	Pass
0.2	0.6070	1.00	-0.3930	Pass
0.1	0.3210	1.00	-0.6790	Pass
0.05	0.4120	1.00	-0.5880	Pass
<b>Mid carrier frequency</b>				
3.0	0.0167	1.00	-0.9833	Pass
2.5	0.0213	1.00	-0.9787	Pass
2.0	0.0320	1.00	-0.9680	Pass
1.5	0.0570	1.00	-0.9430	Pass
1.0	0.1027	1.00	-0.8973	Pass
0.5	0.3540	1.00	-0.6460	Pass
0.3	0.4260	1.00	-0.5740	Pass
0.2	0.4230	1.00	-0.5770	Pass
0.1	0.4400	1.00	-0.5600	Pass
0.05	0.8150	1.00	-0.1850	Pass
<b>High carrier frequency</b>				
3.0	0.0124	1.00	-0.9876	Pass
2.5	0.0143	1.00	-0.9857	Pass
2.0	0.0283	1.00	-0.9717	Pass
1.5	0.0497	1.00	-0.9503	Pass
1.0	0.0982	1.00	-0.9018	Pass
0.5	0.2250	1.00	-0.7750	Pass
0.3	0.4250	1.00	-0.5750	Pass
0.2	0.4750	1.00	-0.5250	Pass
0.1	0.4110	1.00	-0.5890	Pass
0.05	0.8400	1.00	-0.1600	Pass