

APPENDIX F: MAXIMUM PERMISSIBLE EXPOSURE

FCC RULES AND REGULATIONS PART 1.1307, 1.1310, 2.1091, 2.1093: RF EXPOSURE COMPLIANCE

1. GENERAL INFORMATION:

- FCCID: OW5BST800
- Environment: General Population/Uncontrolled Exposure
- Device category: Mobile per Part 2.1093

2. OPERATING CONFIGURATIONS AND TEST CONDITIONS:

2.1 ANTENNA TYPE(S):

Antenna	Type	Gain (dBi)
MOBILE COMMUNICATIONS TECHNOLOGIES, INC.	FLEXIBLE DUAL COIL WIRE	2.6
MOBILE COMMUNICATIONS TECHNOLOGIES, INC	MAGNETIC MOUNT 1/8 WAVE WIRE	1.0
MOBILE COMMUNICATIONS TECHNOLOGIES, INC	GLASS MOUNT 1/8 WAVE WIRE	0.2

3. OPERATING CONDITIONS:

The BST800 Amplifier is a automobile cellular band amplifier for uplink frequencies 824-849 MHz; the peak conducted and peak radiated (ERP) output power does not exceed 3 W.

4. TEST SIGNAL, TIME-AVERAGING, MAX. MEASURED OUTPUT POWER:

Modulation Type/Modes: CDMA1, CDMA2000, WCDMA, and GSM with Edge and GPRS

Frequency Range	Frequency Tolerance (ppm)	Emission Designator
824-849 MHz	N/A	AMP

Output Power (Watt/dBm)	High (Watt)	High (dBm)	Time averaging (___ % Duty Cycle)
Conducted	3.0	34.8	N/A

From FCC 1.1310 Table 1A, the maximum permissible RF exposure for an uncontrolled environment is $f/1500$ $mW/cm^2 = 0.55 - 0.57 mW/cm^2$. The Electric field generated for a $0.57mW/cm^2$ exposure (S) is calculated as follows:

$$S = E^2/Z$$

where:

S = Power density

E = Electric field

Z = Impedance.

$$E = \sqrt{S \cdot Z}$$

$$0.57 mW/cm^2 = 5.7 W/m^2$$

The impedance of free space is 377 ohms, where E and H fields are perpendicular.

Thus:

$$E = \sqrt{5.7 \cdot 377} = 46.4 \text{ V/m which is equivalent to } 0.57mW/cm^2$$

Using the relationship between Electric field E, Power in watts P, and distance in meters d, the corresponding Antenna numeric gain G and the transmitter output power:

$$E(V/m) = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power density: } P_d(mW/cm^2) = \frac{E^2}{2148.9}$$

MPE Calculation:

The maximum distance from the antenna at which MPE is met or exceeded is calculated from the equation relating field strength E in V/m, transmit power P in Watts, transmit antenna numeric gain G, and separation distance in meters above, and solving for d below:

$$d = \frac{\sqrt{30 \times P \times G}}{E} \quad 0.18m = \frac{\sqrt{30 \times 1.288 \times 1.8}}{46.4}$$

The limit for general population/uncontrolled exposure environment from 300 to 1500MHz is $f/1500 mW/cm^2$.

SEPARATION DISTANCE:

Highest Antenna Gain = 1.8	
Power^B (Watt) = 1.288	
Separation Distance	
(in)	(m)
7.1	0.18

Notes:

^B = Measured ERP