APPENDIX H: MAXIMUM PERMISSIBLE EXPOSURE

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

1. GENERAL INFORMATION:

- FCC ID: OW5BST801
- 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	5.6
MOBILE COMMUNICATIONS TECHNOLOGIES, INC	MAGNETIC MOUNT 1/8 WAVE WIRE	5.5
MOBILE COMMUNICATIONS TECHNOLOGIES, INC	GLASS MOUNT 1/8 WAVE WIRE	-2

3. OPERATING CONDITIONS:

The BST-800 Amplifier is a automobile cellular band amplifier for uplink frequencies 824-849 MHz, and 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: IDEN

Frequency Range	Freq. Tolerance (ppm)	Emission Designator
806-821 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 =806 MHz to 821 MHz/1500= 0.54 –0.55 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.

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

0.55 mW/cm^2 = 5.5 W/m^2

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

Thus:

$$E = \sqrt{5.5 \cdot 377} \quad = \quad 45.5 \text{ V/m which is equivalent to } 0.55 mW/cm^2$$

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.

$$E(V/m) = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power density: } P_d(mW/cm^2) = \frac{E^2}{2073.5}$$

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:

$$d = \frac{\sqrt{30 \times P \times G}}{E} \qquad 0.44m = \frac{\sqrt{30 \times 3.7 \times 3.6}}{45.5}$$

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

SEPARATION DISTANCE:

Highest Antenna Gain = 3.6 Power[B] (Watt) = 3.7	
Separation Distance [A]	
(in)	(m)
17.3	0.44

Notes:
[A] = Distances are calculated for the largest (worst-case) separation distance as applicable
[B] = Measured radiated output power ERP