

Client:	Topcon Positioning Systems	Job Number:	J90335
Model:	WT11	T-Log Number:	T90831
Contact:	Ferdinand Riodique	Account Manager:	Deepa Shetty
Standard:	FCC 15.247	Class:	N/A

## Maximum Permissible Exposure

### Test Specific Details

Objective: Evaluate the RF Exposure requirements per FCC 1.1310, 2.1091 and RSS-102.

Date of Test: 3/20/2013

Test Engineer: Mark Hill

### General Test Configuration

Calculation uses the free space transmission formula:

$$S = (PG)/(4 \pi d^2)$$

Where: S is power density (W/m<sup>2</sup>), P is output power (W), G is antenna gain relative to isotropic, d is separation distance from the transmitting antenna (m).

### Summary of Results

Device complies with Power Density requirements at 20cm separation:	No
If not, required separation distance (in cm):	20.04

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

### Notes:

FCC ID: S6MWT11, BT radio module can be co-located with one of the following: RI7T56KL1, RI7P56JE1, RI7T56FV2

Time average power values used for the HSPA module, not peak power.

## EMC Test Data

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Total EIRP calculation - BT + RI7T56KL1

Band	Mode	Output Power		Antenna gain (Max)	EIRP		Channels Available	Channels Used	Total EIRP	
		Peak	Average		dBm	W			W	dBm
850	HSPA	-	26.0	4.3	30.3	1.074	Varies	1	1.074	30.31
1900	HSPA	-	23.9	2.5	26.4	0.440	Varies	0	0.000	-
2400-2483	BT	11.4	-	2.1	13.6	0.023	79	1	0.023	13.55
Totals:								2	1.097	30.40

Freq. MHz	EUT Power		Cable Loss dB	Ant Gain dBi	Power at Ant dBm	EIRP mW	Power Density (S) at 20 cm mW/cm^2	MPE Limit at 20 cm mW/cm^2
	dBm	mW*						
824	-	-	-	-	-	1074.06	0.547	0.549
2400	-	-	-	-	-	22.654	0.005	1.000
Total:						0.552		

Freq. MHz	Power Density at 20 cm mW/cm^2	MPE Limit at 20 cm mW/cm^2	Distance where S <= MPE Limit cm
824	0.552	0.549	20.04

The original HSPA MPE exhibit calculated MPE by:

$$S = 2.56 \cdot (PG) / (4 \pi d^2)$$

Where: S is power density (W/m<sup>2</sup>), P is output power (W), G is antenna gain relative to isotropic, d is separation distance from the transmitting antenna (m). The 2.56 factor was used to account for ground reflections.

This approach was used in these calculations for the HSPA operation. The 2.56 factor was not applied to the BT operation.

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Total EIRP calculation - BT + RI7P56JE1

Band	Mode	Output Power		Antenna gain (Max)	EIRP		Channels Available	Channels Used	Total EIRP	
		Peak	Average		dBm	W			W	dBm
850	HSPA	-	25.0	4.3	29.3	0.851	Varies	1	0.851	29.30
1900	HSPA	-	25.0	2.5	27.5	0.562	Varies	0	0.000	-
2400-2483	BT	11.4	-	2.1	13.6	0.023	79	1	0.023	13.55
Totals:								2	0.873	29.41

Freq. MHz	EUT Power		Cable Loss dB	Ant Gain dBi	Power at Ant dBm	EIRP mW	Power Density (S) at 20 cm mW/cm <sup>2</sup>	MPE Limit at 20 cm mW/cm <sup>2</sup>
824	-	-	-	-	-	850.52	0.433	0.549
2400	-	-	-	-	-	22.654	0.005	1.000
Total:							0.438	

Freq. MHz	Power Density at 20 cm mW/cm <sup>2</sup>	MPE Limit at 20 cm mW/cm <sup>2</sup>	Distance where S <= MPE Limit cm
824	0.438	0.549	17.85

The original HSPA MPE exhibit calculated MPE by:

$$S = 2.56 \cdot (PG) / (4 \pi d^2)$$

Where: S is power density (W/m<sup>2</sup>), P is output power (W), G is antenna gain relative to isotropic, d is separation distance from the transmitting antenna (m). The 2.56 factor was used to account for ground reflections.

This approach was used in these calculations for the HSPA operation. The 2.56 factor was not applied to the BT operation.

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Total EIRP calculation - BT + RI7P56JE1

Band	Mode	Output Power		Antenna gain (Max)	EIRP		Channels Available	Channels Used	Total EIRP	
		Peak	Average		dBm	W			W	dBm
850	HSPA	-	24.0	4.3	28.3	0.676	Varies	1	0.676	28.30
1900	HSPA	-	21.4	2.5	23.9	0.247	Varies	0	0.000	-
2400-2483	BT	11.4	-	2.1	13.6	0.023	79	1	0.023	13.55
Totals:								2	0.698	28.44

Freq. MHz	EUT Power		Cable Loss dB	Ant Gain dBi	Power at Ant dBm	EIRP mW	Power Density (S) at 20 cm mW/cm^2	MPE Limit at 20 cm mW/cm^2
824	-	-	-	-	-	675.58	0.344	0.549
2400	-	-	-	-	-	22.654	0.005	1.000
Total:							0.349	

Freq. MHz	Power Density at 20 cm mW/cm^2	MPE Limit at 20 cm mW/cm^2	Distance where S <= MPE Limit cm
824	0.349	0.549	15.93

The original HSPA MPE exhibit calculated MPE by:

$$S = 2.56 \cdot (PG) / (4 \pi d^2)$$

Where: S is power density (W/m<sup>2</sup>), P is output power (W), G is antenna gain relative to isotropic, d is separation distance from the transmitting antenna (m). The 2.56 factor was used to account for ground reflections.

This approach was used in these calculations for the HSPA operation. The 2.56 factor was not applied to the BT operation.