



EMC Test Data

Client:	TopCon Positioning Systems	Job Number:	J89363
Model:	FCC ID: WR4-TPSWT41E	T-Log Number:	-
		Account Manager:	-
Contact:	Ferdinand Riodique		
Standard:	-	Class:	N/A

Maximum Permissible Exposure

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 2/8/2013

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^2), 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):	24.5

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: WR4-TPSWT41E, 2.4GHz, BT radio module can be co-located with either FCC ID: RI7T56KL1 or FCC ID: LCB-100926.

When co-located with LCB-100926, the Bluetooth function of LCB-100926 is disabled.

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



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Total EIRP calculation - BT + HSPA combination

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	-	15.9	2.1	18.0	0.064	79	1	0.064	18.04
400 UHF	-	-	30.4	2.5	32.9	1.949	Varies	0	0.000	-
Totals:								2	1.138	30.56

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*						
400	-	-	-	-	-	1948.99	0.388	0.267
2400	-	-	-	-	-	64.00	0.013	1.000
Total:							0.400	

Freq. MHz	Power Density at 20 cm mW/cm ²	MPE Limit at 20 cm mW/cm ²	Distance where S <= MPE Limit cm
400	0.400	0.267	24.5

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Total EIRP calculation - BT + UHF combination

Band	Mode	Output Power		Antenna gain (Max)	EIRP		Channels Available	Channels Used	Total EIRP	
		Peak	Average		dBm	W			W	dBm
836	HSPA	-	33.3	4.3	37.6	5.714	Varies	0	0.000	-
1850	HSPA	-	30.4	2.5	32.9	1.969	Varies	0	0.000	-
2400-2483	BT	-	15.9	2.1	18.0	0.064	79	1	0.064	18.04
400 UHF	-	-	30.4	2.5	32.9	1.949	Varies	1	1.949	32.90
Totals:								2	2.013	33.04

Freq. MHz	EUT Power		Cable Loss	Ant Gain	Power at Ant	EIRP	Power Density (S) at 20 cm	MPE Limit at 20 cm
	dBm	mW*	dB	dBi	dBm	mW	mW/cm ²	mW/cm ²
824	-	-	-	-	-	1074.06	0.547	0.549
2400	-	-	-	-	-	64.00	0.013	1.000
Total:							0.560	

Freq. MHz	Power Density at 20 cm	MPE Limit at 20 cm	Distance where S <= MPE Limit
	mW/cm ²	mW/cm ²	cm
824	0.560	0.549	20.2

The original HSPA MPE exhibit calculated MPE by:

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

Where: S is power density (W/m²), 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.