

TEST REPORT

Report Number: 100387380MPK-021

Project Number: G100387380

May 31, 2012

**Testing performed on the
DIG UHF-II Radio Module**

FCC ID: LCB-100926

IC: 6050B-100926

Model Number: 05-100926-01LF

Tested with the following configurations:

**Configuration 1: Co-location with FCC ID: RI7P56JE1,
C24 – Cellular/ PCS CDMA Transceiver Module,**

**Configuration 2: Co-location with FCC ID: RI7T56FV2,
G24 – Dual-Band GSM/ EDGE Transceiver Module,**

**Configuration 3: Co-location with FCCID: RI7T56KL1,
H24 - Cellular/ PCS WCDMA/ GSM/ EDGE Transceiver Module,**

to

FCC Part 15 Subpart C (15.247)

FCC Part 22

FCC Part 24

for

Topcon Positioning Systems, Inc.

Test Performed by:
Intertek
1365 Adams Court
Menlo Park, CA 94025

Test Authorized by:
Topcon Positioning Systems, Inc.
7449 Southfront Road
Livermore, CA 94551 USA

Prepared by: Edmund Cruz
Edmund Cruz

Date: May 31, 2012

Reviewed by: Krishna K Vemuri
Krishna K Vemuri

Date: May 31, 2012

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Report No. 100387380MPK-021

Equipment Under Test: DIG UHF-II Radio Module
Trade Name: Topcon Positioning Systems, Inc.
Model No.: 05-100926-01LF tested in the following configurations:

Configuration 1: Co-location with FCC ID: RI7P56JE1,
C24 – Cellular/PCS CDMA Transceiver Module

Configuration 2: Co-location with FCC ID: RI7T56FV2,
G24 – Dual-Band GSM/EDGE Transceiver Module

Configuration3: Co-location with FCCID: RI7T56KL1
H24 - Cellular/ PCS WCDMA/GSM/EDGE Transceiver
Module

Serial No.: EMCPROTO1


Applicant: Topcon Positioning Systems, Inc.
Contact: Mr. Leonid Edelman
Address: 7449 Southfront Road
Livermore, CA 94551
Country USA

Tel. number: (925) 460-1318
Email: Ledelman@topcon.com

Applicable Regulation: FCC Part 15 Subpart C (15.247)
FCC Part 22
FCC Part 24

Date of Test: May 7 to 8, 2012

We attest to the accuracy of this report:



Edmund Cruz
Project Engineer



Krishna K Vemuri
EMC Senior Staff Engineer



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EXECUTIVE SUMMARY

Co-location tests on Bluetooth Transceiver:

TEST	FCC Part 15 Subpart C (15.247)	RESULTS
RF Output Power	15.247(b)	Complies
Transmitter Spurious Radiated Emissions	15.247(d), 15.209, 15.205	Complies

Co-location tests on Cellular/ PCS CDMA Transceiver / Dual-Band GSM/EDGE Transceiver/ Cellular / PCS WCDMA/GSM/EDGE Transceiver:

TEST	FCC Part 22 or 24	RESULTS
RF Output Power	22.913 or 24.232	Complies
Transmitter Spurious Radiated Emissions	22.917 or 24.238	Complies



1.0 Job Description

1.1 Client Information

The EUT has been tested at the request of:

Company: Topcon Positioning Systems, Inc.
7449 Southfront Road.
Livermore, CA 94551 USA

Name of contact: Mr. Leonid Edelman
Telephone: (925) 460-1318
Email: ledelman@topcon.com

1.2 Test Plan Reference:

Tests were performed to the following standards:

- FCC Part 15 Subpart C (15.247)
- FCC Part 22
- FCC Part 24

1.3 Equipment Under Test (EUT)

Equipment Under Test		
Description	Model Number	Serial Number
DIG UHF-II Radio Module	05-100926-01LF tested in the following configurations: Configuration 1: Co-location with FCC ID: RI7P56JE1, C24 – Cellular/PCS CDMA Transceiver Module Configuration 2: Co-location with FCC ID: RI7T56FV2, G24 – Dual-Band GSM/EDGE Transceiver Module Configuration3: Co-location with FCCID: RI7T56KL1 H24 - Cellular/ PCS WCDMA/GSM/EDGE Transceiver Module	EMCPROTO1

EUT receive date: May 7, 2012
EUT receive condition: The EUT was received in good condition with no apparent damage.
Test start date: May 7, 2012
Test completion date: May 8, 2012

The test results in this report pertain only to the item tested.



Topcon Positioning Systems, Inc. supplied the following description of the EUT:

The 05-100926-01LF is a DIG UHF-II Radio Module.

The Equipment Under Test (EUT) is the DIG UHF-II Radio Module, which can be configured in one of the following configurations:

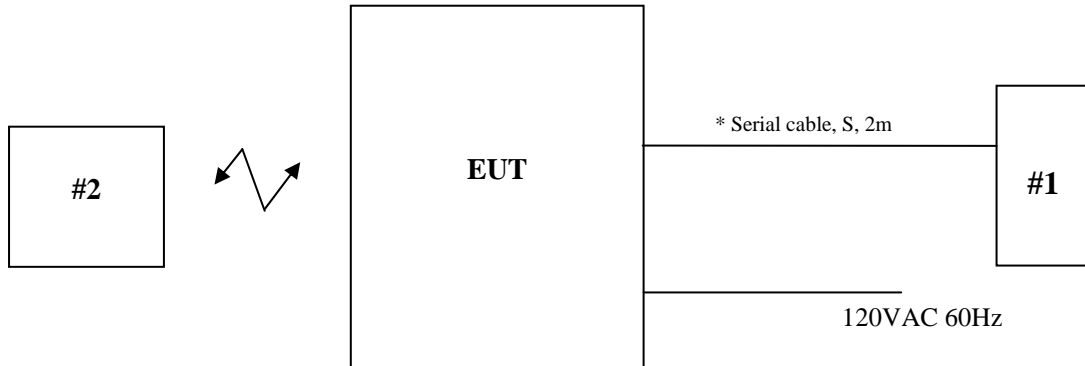
- One UHF radio and one Bluetooth radio (Refer to the original filing for FCC ID: LCB-100926 for test results)
- One Cellular/PCS CDMA Transceiver Module (C24) and one Bluetooth radio
- One Dual-Band GSM/EDGE Transceiver Module (G24) and one Bluetooth radio
- One Cellular/PCS WCDMA/GSM/EDGE Transceiver Module (H24) and one Bluetooth radio

1.4 System Support Equipment

Table 1-1: System Support Equipment

Item #	Description	Model No.	S/N
1	Compaq Laptop	nc6400	CND7062PVK
2	Universal Radio Communication Tester	CMU 200	117548

1.5 System Block Diagram



S = Shielded	T = Terminated
U = Unshielded	m = Length in meters



1.6 Justification

The EUT was configured for testing in a typical configuration, as specified by Topcon Positioning Systems, Inc. The EUT was tested in a table top configuration.

The original filing for the DIG UHF-II Radio Module (FCC ID: LCB-100926, model number 05-100926-01LF) consisted of one UHF radio and one Bluetooth radio.

In the present configuration, the UHF radio in the DIG UHF-II Radio Module was disabled and the Bluetooth radio in the DIG UHF-II Radio Module was co-located with three different Cellular/PCS modules. This report covers the following three configurations:

Configuration 1: Co-location with FCC ID: RI7P56JE1, C24 – Cellular/PCS CDMA Transceiver Module

Configuration 2: Co-location with FCC ID: RI7T56FV2, G24 – Dual-Band GSM/EDGE Transceiver Module

Configuration 3: Co-location with FCCID: RI7T56KL1, H24 - Cellular/ PCS WCDMA/GSM/EDGE Transceiver Module

The tested configuration consists of the DIG UHF-II Radio Module co-located with three different Cellular/PCS modules, while installed inside of a host enclosure: GR-5 GNSS Receiver, Model: 01-090901-21.

1.7 Mode(s) of Operation

For spurious emission measurements, the EUT was setup on middle channel of Cellular/PCS bands with the CMU 200 (Universal Radio Communication Tester) and also setup for simultaneous transmission at middle channel of the Bluetooth band.

1.8 Modifications Required for Compliance

No modifications were made during compliance testing in order to bring the product into compliance.



2.0 Test Environment for Emissions Testing

2.1 Test Facility

The test facility is located at 1365 Adams Court, Menlo Park, California. The test site is a 10-meter semi-anechoic chamber. The site meets the characteristics of CISPR 16-1 and ANSI C63.4. For measurements, a remotely controlled flush-mount metal-top turntable is used to rotate the EUT a full 360 degrees. A remote controlled non-conductive antenna mast is used to scan the antenna height from one to four meters.

The A2LA certificate number for this site is 1755-01.
The Industry Canada (IC) Site Number is 2042L-1.

2.2 Test Equipment

Table 2-1 contains a list of the test equipment used during the testing.

Table 2-1 List of Test Equipment

Equipment	Manufacturer	Model/Type	Serial #	Cal Int	Cal Due
RF Filter Section	Hewlett Packard	85460A	3448A00267	12	03/09/13
EMI Receiver	Hewlett Packard	8546A	3710A00373	12	03/09/13
BI-Log Antenna	ARA	LPB-2513/A	1154	12	07/06/12
Pre-Amplifier	Sonoma Instrument	310	185634	12	12/08/12
Spectrum Analyzer	Rohde and Schwartz	FSP	100030	12	11/07/12
Pre-Amplifier	Miteq	AMF-4D-001180-24-10P	799159	12	09/01/12
Horn Antenna	ETS Lindgren	3115	00126795	12	11/03/12



2.3 Example Field Strength Calculation

For measurements made at 10 meters distance

The field strength is calculated by adding the Antenna Factor and Cable Factor to from the measured reading, followed by subtracting the Amplifier Gain (if any) and Distance Correction Factor (if any). The basic equation with a sample calculation is as follows:

The field strength is calculated by adding the Antenna Factor and Cable Factor and the Distance Correction Factor; and subtracting the Amplifier Gain from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG + DCF$$

Where FS = Field Strength in dB(μ V/m)

RA = Receiver Amplitude (including preamplifier) in dB(μ V)

AF = Antenna Factor in dB(1/m)

CF = Cable Attenuation Factor in dB

AG = Amplifier Gain in dB

DCF = Distance Correction Factor in dB for measurements made at 10 meters distance

Assume a receiver reading of 52.5 dB(μ V) is obtained. The antennas factor of 7.4 dB(1/m) and cable factor of 1.6 dB is added. The amplifier gain of 29 dB and Distance Correction Factor (for measurements made at 10 meters distance) of 10.5 dB is subtracted, giving field strength of 22 dB(μ V/m). This value in dB(μ V/m) was converted to its corresponding level in μ V/m.

$$RA = 52.5 \text{ dB}(\mu\text{V})$$

$$AF = 7.4 \text{ dB}(1/\text{m})$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$DCF = 10.5 \text{ dB}$$

$$FS = 52.5 + 7.4 + 1.6 - 29.0 + 10.5 = 43 \text{ dB}(\mu\text{V}/\text{m}).$$

$$\text{Level in } \mu\text{V}/\text{m} = \text{Common Antilogarithm} [(43 \text{ dB}\mu\text{V}/\text{m})/20] = 141.3 \mu\text{V}/\text{m}.$$

For measurements made at 3 meters distance

The field strength is calculated by following the example above for measurements made at 10 meters distance except the Distance Correction Factor in dB is not applied.



2.4 Measurement Uncertainty

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes.

Radiated Emission:

The uncertainty in the measured field strength is estimated as follows, for a minimum confidence probability of 95 %

Freq. Range	Detection Mode	Uncertainty
30 MHz to 200 MHz	Quasi-peak	± 4.4 dB
200 MHz to 1000 MHz	Quasi-peak	+ 5.0 / - 3.6 dB

Conducted Emission:

The uncertainty in the measured voltage is estimated as follows, for a minimum confidence probability of 95 %

Freq. Range	Detection Mode	Uncertainty
9 kHz to 150 kHz	Average	± 2.1 dB
	Quasi-peak	± 2.5 dB
150 kHz to 30 MHz	Average	± 2.4 dB
	Quasi-peak	± 2.6 dB



3.0 Emissions Test Results

3.1 Transmitter Power

FCC 15.247(b)(3)
22.913 or 24.232

3.1.1 Test Limits

FCC Rule FCC 15.247(b)(3):

For systems operating in the 2400-2483.5 MHz band using digital modulation, the maximum peak output conducted power is 1 watt (30 dBm), the conducted power limit is based on the use of antenna with directional gain that do not exceed 6dBi. If the transmitting antenna of directional gain greater than 6dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated value as in FCC 15.247(b)(4)(i).

FCC Rule 22.913:

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

FCC Rule 24.232:

The EIRP of Mobile and portable stations are limited to 2 watts.

3.1.2 Test Procedure

FCC Rule FCC 15.247(b)(3)

The antenna port of the EUT was connected to the input of a spectrum analyzer. Power was read directly and cable loss correction was added to the reading to obtain the power at the EUT antenna terminal.

FCC Rule 22.913 & 24.232:

The EUT was configured with its' normal antenna. A communication link was established with the Universal Radio Communication Tester. Radiated measurements were performed.

The maximum field strength of the fundamental was measured.

The transmitter's peak power was calculated using the following equation:

Where: E = the measured maximum field strength in V/m.

Set the RBW > 6dB bandwidth of the emission or use a peak power meter.

$P = (E \times d)^2 / (30 \times G)$.

G = the numeric gain of the transmitting antenna over an isotropic radiator.

d = the distance in meters from which the field strength was measured.

P = the power in watts for which you are solving.



3.1.3 Test Results

Bluetooth Transceiver

Frequency (MHz)	Output in dBm	Output in mW
2441	-0.30	0.933

Notes: 1. Hopping function was disabled during the test.
2. The EUT's Bluetooth antenna gain is 4dBi.

Configuration 1: FCC ID: RI7P56JE1, C24 – Cellular/ PCS CDMA Transceiver Module

Frequency	RA	AG	CF	AF	Final Field Strength	EIRP	EIRP
MHz	dB(uV)	dB	dB	dB(1/m)	dB(uV/m)	dBm	W
836.0	122.3	32.0	3.4	20.6	114.3	29.5	0.891

Notes: 1. The antenna gain is 0dBi in 800MHz band.

Frequency	RA	AG	CF	AF	Final Field Strength	EIRP	EIRP
MHz	dB(uV)	dB	dB	dB(1/m)	dB(uV/m)	dBm	W
1880.0	129.2	35.4	3.8	26.3	123.9	28.6	0.724

Notes: 1. The antenna gain is 0dBi in 1800MHz band.

Configuration 2: FCC ID: RI7T56FV2, G24 – Dual-Band GSM/EDGE Transceiver Module

Frequency	RA	AG	CF	AF	Final Field Strength	EIRP	EIRP
MHz	dB(uV)	dB	dB	dB(1/m)	dB(uV/m)	dBm	W
836.6	125.7	32.0	3.4	20.6	117.7	32.9	1.95

Notes: 1. The antenna gain is 0dBi in 800MHz band.

Frequency	RA	AG	CF	AF	Final Field Strength	EIRP	EIRP
MHz	dB(uV)	dB	dB	dB(1/m)	dB(uV/m)	dBm	W
1880.0	131.0	35.4	3.8	26.3	125.7	30.4	1.097

Notes: 1. The antenna gain is 0dBi in 1800MHz band.



Configuration 3: FCCID: RI7T56KL1, H24 - Cellular/ PCS WCDMA/GSM/EDGE Transceiver Module,

Frequency	RA	AG	CF	AF	Final Field Strength	EIRP	EIRP
MHz	dB(uV)	dB	dB	dB(1/m)	dB(uV/m)	dBm	W
836.0	126.0	32.0	3.4	20.6	118.1	33.3	2.138

Notes: 1. The antenna gain is 0dBi in 800MHz band.

Frequency	RA	AG	CF	AF	Final Field Strength	EIRP	EIRP
MHz	dB(uV)	dB	dB	dB(1/m)	dB(uV/m)	dBm	W
1880.0	130.9	35.4	3.8	26.3	125.6	30.3	1.071

Notes: 1. The antenna gain is 0dBi in 1800MHz band.



3.2 Transmitter Radiated Emissions FCC Rule 15.247(d), 15.209, 15.205 22.917, 24.238

3.2.1 Test Limits

FCC Rule 15.247(d), 15.209, 15.205:

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

For out of band radiated emissions (except for frequencies in restricted bands), in any 100 kHz bandwidths outside the EUT pass-band, the RF power shall be at least 20dB (peak) or 30 dB (average) below that of the maximum in-band 100 kHz emissions.

FCC Rule 22.917, 24.238:

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB

Note: That corresponds to the level of -13 dBm for any out-of-band and spurious emissions.

The equivalent field strength limit @3m is 84.4 dB(μ V/m). The equivalent field strength limit @10m is 73.9 dB(μ V/m).

3.2.2 Test Procedure

Radiated emission measurements were performed from 30 MHz to 25,000 MHz. Spectrum Analyzer Resolution Bandwidth is 100 kHz or greater for frequencies 30 MHz to 1000 MHz, 1 MHz for frequencies above 1000 MHz.

The EUT is placed on a non-conductive table. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). During testing, all cables were manipulated to produce worst case emissions. The signal is maximized through rotation of the turntable. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

Data is included for the worst case configuration (the configuration which resulted in the highest emission levels).

3.2.3 Test Results

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance. The radiated emissions in the restricted bands are presented on the following pages.



Configuration 1: FCC ID: RI7P56JE1, C24 – Cellular/ PCS CDMA Transceiver Module

FCC Radiated Disturbance, Bluetooth co-located with C24, 836MHz

Intertek Testing Services
Radiated Emissions below 1 GHz
FCC Part 15 Class B

Operator: EC
May 8, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	DCF dB	AF dB(1/m)
3.566E+07	24.6	40.0	-15.4	28.3	0.7	32.1	10.5	17.2
3.808E+07	24.1	40.0	-15.9	28.1	0.7	32.1	10.5	16.8
6.799E+07	27.4	40.0	-12.6	40.5	0.9	32.1	10.5	7.6
6.961E+07	22.4	40.0	-17.6	35.7	0.9	32.1	10.5	7.3
9.063E+07	24.3	43.5	-19.2	36.3	1.1	32.1	10.5	8.5
1.165E+08	29.8	43.5	-13.7	38.6	1.2	32.0	10.5	11.5
2.022E+08	25.9	43.5	-17.6	35.9	1.7	32.0	10.5	9.8
2.660E+08	28.6	46.0	-17.4	34.8	1.9	32.0	10.5	13.3
2.992E+08	32.4	46.0	-13.6	38.8	2.0	32.0	10.5	13.1
7.850E+08	39.6	46.0	-6.4	37.7	3.3	32.2	10.5	20.2
7.874E+08	38.7	46.0	-7.3	37.0	3.3	32.2	10.5	20.1

Test Mode: C24, 836MHz & Bluetooth at 2441 MHz
Temp: 22C
Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 15 Class B

Operator: EC
May 8, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
1.101E+09	29.1	54.0	-24.9	37.8	2.7	35.4	24.0
1.180E+09	29.3	54.0	-24.7	37.2	2.9	35.4	24.6
1.259E+09	33.0	54.0	-21.0	40.3	3.0	35.4	25.1
1.384E+09	28.7	54.0	-25.3	35.3	3.2	35.4	25.6
4.882E+09	39.8	54.0	-14.2	32.5	9.3	34.9	32.9

Test Mode: C24, 836MHz & Bluetooth at 2441 MHz
Temp: 22C
Humidity: 35%

Note: Investigation was performed with peak detector and no peak emissions were detected at least 10dB below peak limit level. No emissions were detected above the noise floor which was at least 10 dB below the limit up to 25GHz.



FCC Radiated Disturbance, C24, 836MHz co-located with Bluetooth

Intertek Testing Services
Radiated Emissions below 1 GHz
FCC Part 22

Operator: EC
May 8, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Table with 9 columns: Frequency (Hz), Quasi Pk FS (dB(uV/m)), Limit@3m (dB(uV/m)), Margin (dB), RA (dB(uV)), CF (dB), AG (dB), DCF (dB), AF (dB(1/m)). Rows show test results for frequencies from 3.566E+07 to 7.874E+08.

Test Mode: C24, 836MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 22

Operator: EC
May 8, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Table with 8 columns: Frequency (Hz), Quasi Pk FS (dB(uV/m)), Limit@3m (dB(uV/m)), Margin (dB), RA (dB(uV)), CF (dB), AG (dB), AF (dB(1/m)). Rows show test results for frequencies from 1.259E+09 to 7.770E+09.

Test Mode: C24, 836MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Note: No emissions were detected above the noise floor which was at least 10 dB below the limit up to 25GHz.



FCC Radiated Disturbance, Bluetooth co-located with C24, 1880MHz

Intertek Testing Services
Radiated Emissions below 1 GHz
FCC Part 15 Class B

Operator: EC
May 8, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	DCF dB	AF dB(1/m)
3.808E+07	24.1	40.0	-15.9	28.1	0.7	32.1	10.5	16.8
4.940E+07	31.1	40.0	-8.9	37.1	0.8	32.1	10.5	14.7
6.799E+07	27.4	40.0	-12.6	40.5	0.9	32.1	10.5	7.6
1.820E+08	33.7	43.5	-9.8	44.1	1.6	32.0	10.5	9.5
2.022E+08	39.1	43.5	-4.4	49.1	1.7	32.0	10.5	9.8
2.224E+08	34.5	46.0	-11.5	42.8	1.7	32.0	10.5	11.5
2.466E+08	37.8	46.0	-8.2	45.4	1.8	32.0	10.5	12.0
2.620E+08	37.6	46.0	-8.4	44.2	1.9	32.0	10.5	13.0
2.660E+08	28.6	46.0	-17.4	34.8	1.9	32.0	10.5	13.3
2.992E+08	32.4	46.0	-13.6	38.8	2.0	32.0	10.5	13.1
7.850E+08	39.6	46.0	-6.4	37.7	3.3	32.2	10.5	20.2
7.874E+08	38.7	46.0	-7.3	37.0	3.3	32.2	10.5	20.1

Test Mode: C24, 1880MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 15 Class B

Operator: EC
May 8, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
1.021E+09	26.9	54.0	-27.1	36.2	2.6	35.4	23.5
1.101E+09	29.9	54.0	-24.1	38.6	2.7	35.4	24
1.179E+09	29.6	54.0	-24.4	37.5	2.9	35.4	24.6
1.189E+09	31.5	54.0	-22.5	39.3	2.9	35.4	24.7
4.882E+09	40.1	54.0	-13.9	32.8	9.3	34.9	32.9

Test Mode: C24, 1880MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Note: Investigation was performed with peak detector and no peak emissions were detected at least 10dB below peak limit level. No emissions were detected above the noise floor which was at least 10 dB below the limit up to 25GHz.



FCC Radiated Disturbance, C24, 1880MHz co-located with Bluetooth

Intertek Testing Services
Radiated Emissions below 1 GHz
FCC Part 24

Operator: EC
May 8, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	DCF dB	AF dB(1/m)
3.808E+07	24.1	84.4	-60.3	28.1	0.7	32.1	10.5	16.8
4.940E+07	31.1	84.4	-53.3	37.1	0.8	32.1	10.5	14.7
6.799E+07	27.4	84.4	-57.0	40.5	0.9	32.1	10.5	7.6
1.820E+08	33.7	84.4	-50.7	44.1	1.6	32.0	10.5	9.5
2.022E+08	39.1	84.4	-45.3	49.1	1.7	32.0	10.5	9.8
2.224E+08	34.5	84.4	-49.9	42.8	1.7	32.0	10.5	11.5
2.466E+08	37.8	84.4	-46.6	45.4	1.8	32.0	10.5	12.0
2.620E+08	37.6	84.4	-46.8	44.2	1.9	32.0	10.5	13.0
2.660E+08	28.6	84.4	-55.8	34.8	1.9	32.0	10.5	13.3
2.992E+08	32.4	84.4	-52.0	38.8	2.0	32.0	10.5	13.1
7.850E+08	39.6	84.4	-44.8	37.7	3.3	32.2	10.5	20.2
7.874E+08	38.7	84.4	-45.7	37.0	3.3	32.2	10.5	20.1

Test Mode: C24, 1880MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 24

Operator: EC
May 8, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
1.258E+09	35.1	84.4	-49.3	42.4	3.0	35.4	25.1
2.144E+09	39.2	84.4	-45.2	41.8	4.1	35.5	28.8
2.202E+09	35.8	84.4	-48.6	39.1	4.1	35.6	28.2
2.280E+09	36.4	84.4	-48.0	39.8	4.2	35.6	28.0
2.508E+09	67.1	84.4	-17.3	70.0	4.6	35.7	28.2
2.517E+09	39.0	84.4	-45.4	41.8	4.6	35.7	28.3
2.595E+09	48.0	84.4	-36.4	50.3	4.6	35.7	28.8
2.674E+09	39.3	84.4	-45.1	41.4	4.6	35.7	29.0
3.346E+09	45.2	84.4	-39.2	45.0	5.6	35.8	30.4
4.183E+09	40.5	84.4	-43.9	37.2	6.5	35.4	32.2
7.823E+09	41.5	84.4	-42.9	26.4	11.3	33.4	37.2

Test Mode: C24, 1880MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Note: No emissions were detected above the noise floor which was at least 10 dB below the limit up to 25GHz.



Configuration 2: FCC ID: RI7T56FV2, G24 – Dual-Band GSM/ EDGE Transceiver Module

FCC Radiated Disturbance, Bluetooth co-located with G24, 836.6MHz

Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class B

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	DCF dB	AF dB(1/m)
4.536E+07	30.7	40.0	-9.3	35.6	0.8	32.1	10.5	15.9
1.941E+08	37.9	43.5	-5.6	47.9	1.6	32.0	10.5	9.8
2.000E+08	42.0	43.5	-1.5	52.1	1.6	32.0	10.5	9.8
2.329E+08	39.6	46.0	-6.4	47.2	1.8	32.0	10.5	12.1
2.640E+08	45.6	46.0	-0.4	52.0	1.9	32.0	10.5	13.3
3.647E+08	39.3	46.0	-6.7	43.8	2.2	32.0	10.5	14.7
4.592E+08	40.5	46.0	-5.5	43.3	2.5	32.0	10.5	16.2
8.804E+08	36.9	46.0	-9.1	34.4	3.5	31.8	10.5	20.3
8.836E+08	38.0	46.0	-8.0	35.4	3.5	31.8	10.5	20.3

Test Mode: G24, 836.6MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 15 Class B

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
1.000E+09	38.7	54.0	-15.3	48.2	2.5	35.4	23.4
1.146E+09	45.1	54.0	-8.9	53.4	2.8	35.4	24.3
1.298E+09	36.7	54.0	-17.3	43.7	3.1	35.4	25.3
4.882E+09	34.8	54.0	-19.2	27.5	9.3	34.9	32.9

Test Mode: G24, 836.6MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%



FCC Radiated Disturbance, G24, 836.6MHz GSM co-located with Bluetooth

Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 22

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	DCF dB	AF dB(1/m)
4.536E+07	30.7	84.4	-53.7	35.6	0.8	32.1	10.5	15.9
1.941E+08	37.9	84.4	-46.5	47.9	1.6	32.0	10.5	9.8
2.000E+08	42.0	84.4	-42.4	52.1	1.6	32.0	10.5	9.8
2.329E+08	39.6	84.4	-44.8	47.2	1.8	32.0	10.5	12.1
2.640E+08	45.6	84.4	-38.8	52.0	1.9	32.0	10.5	13.3
3.647E+08	39.3	84.4	-45.1	43.8	2.2	32.0	10.5	14.7
4.592E+08	40.5	84.4	-43.9	43.3	2.5	32.0	10.5	16.2
8.804E+08	36.9	84.4	-47.5	34.4	3.5	31.8	10.5	20.3
8.836E+08	38.0	84.4	-46.4	35.4	3.5	31.8	10.5	20.3

Test Mode: G24, 836.6MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 22

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
1.000E+09	38.7	84.4	-45.7	48.2	2.5	35.4	23.4
1.146E+09	45.1	84.4	-39.3	53.4	2.8	35.4	24.3
1.298E+09	36.7	84.4	-47.7	43.7	3.1	35.4	25.3
1.693E+09	42.4	84.4	-42.0	48.8	3.6	35.4	25.4
1.887E+09	38.5	84.4	-45.9	43.8	3.8	35.4	26.3
2.340E+09	36.5	84.4	-47.9	39.9	4.3	35.6	27.9
2.518E+09	40.3	84.4	-44.1	43.1	4.6	35.7	28.3
2.574E+09	43.8	84.4	-40.6	46.3	4.6	35.7	28.6
2.652E+09	41.0	84.4	-43.4	43.2	4.6	35.7	28.9
2.936E+09	36.6	84.4	-47.8	38.4	5.0	35.8	29.0
3.297E+09	28.3	84.4	-56.1	28.4	5.4	35.8	30.3
4.089E+09	29.2	84.4	-55.2	26.2	6.4	35.5	32.1
4.122E+09	29.9	84.4	-54.5	26.9	6.4	35.5	32.1

Test Mode: G24, 836.6MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Note: No emissions were detected above the noise floor which was at least 10 dB below the limit up to 25GHz.



FCC Radiated Disturbance, Bluetooth co-located with G24, 1880MHz

Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class B

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	DCF dB	AF dB(1/m)
1.019E+08	37.4	43.5	-6.1	46.8	1.2	32.1	10.5	11.0
1.682E+08	30.5	43.5	-13.0	41.3	1.5	32.0	10.5	9.1
2.660E+08	39.7	46.0	-6.3	46.0	1.9	32.0	10.5	13.3
3.647E+08	39.3	46.0	-6.7	43.9	2.2	32.0	10.5	14.7
4.592E+08	41.0	46.0	-5.0	43.8	2.5	32.0	10.5	16.2
5.991E+08	35.3	46.0	-10.7	36.1	2.9	32.2	10.5	18.0
7.300E+08	45.6	46.0	-0.4	44.7	3.2	32.3	10.5	20.1
8.343E+08	39.6	46.0	-6.4	36.9	3.4	32.0	10.5	20.8
8.594E+08	34.1	46.0	-11.9	30.1	3.5	31.9	10.5	22.0

Test Mode: G24, 1880MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 15 Class B

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
1.163E+09	31.4	54.0	-22.6	39.5	2.8	35.4	24.5
1.512E+09	33.7	54.0	-20.3	40.3	3.3	35.4	25.5
4.882E+09	34.4	54.0	-19.2	27.1	9.3	34.9	32.9

Test Mode: G24, 1880MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%



FCC Radiated Disturbance, G24, 1880MHz GSM co-located with Bluetooth

Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 24

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	DCF dB	AF dB(1/m)
1.019E+08	37.4	84.4	-47.0	46.8	1.2	32.1	10.5	11.0
1.682E+08	30.5	84.4	-53.9	41.3	1.5	32.0	10.5	9.1
2.660E+08	39.7	84.4	-44.7	46.0	1.9	32.0	10.5	13.3
3.647E+08	39.3	84.4	-45.1	43.9	2.2	32.0	10.5	14.7
4.592E+08	41.0	84.4	-43.4	43.8	2.5	32.0	10.5	16.2
5.991E+08	35.3	84.4	-49.1	36.1	2.9	32.2	10.5	18.0
7.300E+08	45.6	84.4	-38.8	44.7	3.2	32.3	10.5	20.1
8.343E+08	39.6	84.4	-44.8	36.9	3.4	32.0	10.5	20.8
8.594E+08	34.1	84.4	-50.3	30.1	3.5	31.9	10.5	22.0

Test Mode: G24, 1880MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 24

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
1.163E+09	31.4	84.4	-53.0	39.5	2.8	35.4	24.5
1.512E+09	33.7	84.4	-50.7	40.3	3.3	35.4	25.5
1.685E+09	35.5	84.4	-48.9	41.9	3.6	35.4	25.4
2.143E+09	39.2	84.4	-45.2	41.8	4.1	35.5	28.8
2.574E+09	38.8	84.4	-45.6	41.3	4.6	35.7	28.6
2.652E+09	35.9	84.4	-48.5	38.1	4.6	35.7	28.9
2.681E+09	33.1	84.4	-51.3	35.2	4.6	35.7	29.0
3.536E+09	31.6	84.4	-52.8	30.5	5.9	35.7	30.9
3.700E+09	44.0	84.4	-40.4	42.2	6.0	35.6	31.4
3.726E+09	40.8	84.4	-43.6	38.9	6.0	35.6	31.5
4.209E+09	48.3	84.4	-36.1	45.0	6.5	35.4	32.2
4.287E+09	36.3	84.4	-48.1	33.1	6.6	35.4	32.0
5.977E+09	44.3	84.4	-40.1	33.6	9.6	34.3	35.4

Test Mode: G24, 1880MHz & Bluetooth at 2441 MHz Hz
Temp: 22C, Humidity: 35%

Note: No emissions were detected above the noise floor which was at least 10 dB below the limit up to 25GHz.



Configuration 3: FCCID: RI7T56KL1, H24 - Cellular/ PCS WCDMA/ GSM/ EDGE Transceiver Module,

FCC Radiated Disturbance, Bluetooth co-located with H24, 836MHz

Intertek Testing Services
Radiated Emissions below 1 GHz
FCC Part 15 Class B

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	DCF dB	AF dB(1/m)
3.647E+07	26.4	40.0	-13.6	30.2	0.7	32.1	10.5	17.1
1.901E+08	37.1	43.5	-6.4	47.3	1.6	32.0	10.5	9.7
2.329E+08	34.7	46.0	-11.3	42.3	1.8	32.0	10.5	12.1
2.515E+08	39.3	46.0	-6.7	46.9	1.9	32.0	10.5	12.0
2.612E+08	34.4	46.0	-11.6	41.1	1.9	32.0	10.5	12.9
2.660E+08	42.0	46.0	-4.0	48.4	1.9	32.0	10.5	13.3
2.968E+08	37.1	46.0	-8.9	43.7	2.0	32.0	10.5	12.9
3.558E+08	37.4	46.0	-8.6	42.1	2.2	32.0	10.5	14.6
4.002E+08	38.4	46.0	-7.6	42.5	2.4	32.0	10.5	15.0
4.924E+08	39.6	46.0	-6.4	42.0	2.6	32.1	10.5	16.6
6.427E+08	39.5	46.0	-6.5	38.5	3.0	32.3	10.5	19.8

Test Mode: H24, 836MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 15 Class B

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
1.136E+09	32.4	54.0	-21.6	40.7	2.8	35.4	24.3
1.179E+09	32.5	54.0	-21.5	40.4	2.9	35.4	24.6
1.249E+09	32.8	54.0	-21.2	40.2	3.0	35.4	25.0
1.368E+09	36.5	54.0	-17.5	43.2	3.1	35.4	25.6
4.882E+09	41.7	54.0	-12.3	34.4	9.3	34.9	32.9

Test Mode: H24, 836MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Note: Investigation was performed with peak detector and no peak emissions were detected at least 10dB below peak limit level. No emissions were detected above the noise floor which was at least 10 dB below the limit up to 25GHz.



FCC Radiated Disturbance, H24, 836MHz co-located with Bluetooth

Intertek Testing Services
Radiated Emissions below 1 GHz
FCC Part 22

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	DCF dB	AF dB(1/m)
3.647E+07	26.4	84.4	-58.0	30.2	0.7	32.1	10.5	17.1
1.901E+08	37.1	84.4	-47.3	47.3	1.6	32.0	10.5	9.7
2.329E+08	34.7	84.4	-49.7	42.3	1.8	32.0	10.5	12.1
2.515E+08	39.3	84.4	-45.1	46.9	1.9	32.0	10.5	12.0
2.612E+08	34.4	84.4	-50.0	41.1	1.9	32.0	10.5	12.9
2.660E+08	42.0	84.4	-42.4	48.4	1.9	32.0	10.5	13.3
2.968E+08	37.1	84.4	-47.3	43.7	2.0	32.0	10.5	12.9
3.558E+08	37.4	84.4	-47.0	42.1	2.2	32.0	10.5	14.6
4.002E+08	38.4	84.4	-46.0	42.5	2.4	32.0	10.5	15.0
4.924E+08	39.6	84.4	-44.8	42.0	2.6	32.1	10.5	16.6
6.427E+08	39.5	84.4	-44.9	38.5	3.0	32.3	10.5	19.8

Test Mode: H24, 836MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 22

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
1.136E+09	32.4	84.4	-52.0	40.7	2.8	35.4	24.3
1.498E+09	40.5	84.4	-43.9	47.1	3.3	35.4	25.5
1.600E+09	33.5	84.4	-50.9	40.0	3.5	35.4	25.4
1.795E+09	35.8	84.4	-48.6	41.6	3.8	35.4	25.8
1.852E+09	43.4	84.4	-41.0	48.9	3.8	35.4	26.1
1.920E+09	31.6	84.4	-52.8	36.3	3.9	35.4	26.8
1.999E+09	35.0	84.4	-49.4	38.3	3.9	35.5	28.3
2.190E+09	36.7	84.4	-47.7	39.8	4.1	35.5	28.3
3.278E+09	35.7	84.4	-48.7	35.8	5.4	35.8	30.3
5.249E+09	39.5	84.4	-44.9	31.3	9.7	34.7	33.2

Test Mode: H24, 836MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Note: No emissions were detected above the noise floor which was at least 10 dB below the limit up to 25GHz.



FCC Radiated Disturbance, Bluetooth co-located with H24, 1880MHz

Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class B

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	DCF dB	AF dB(1/m)
3.323E+07	34.6	40.0	-5.4	38.0	0.7	32.1	10.5	17.5
9.709E+07	35.0	43.5	-8.5	45.9	1.1	32.1	10.5	9.5
1.666E+08	37.1	43.5	-6.4	48.2	1.5	32.0	10.5	8.9
2.337E+08	35.6	46.0	-10.4	43.2	1.8	32.0	10.5	12.1
2.410E+08	35.4	46.0	-10.6	43.0	1.8	32.0	10.5	12.1
2.515E+08	40.1	46.0	-5.9	47.7	1.9	32.0	10.5	12.0
2.620E+08	36.5	46.0	-9.5	43.1	1.9	32.0	10.5	13.0
2.640E+08	42.4	46.0	-3.6	48.8	1.9	32.0	10.5	13.3
2.668E+08	41.5	46.0	-4.5	47.7	1.9	32.0	10.5	13.3
2.968E+08	35.9	46.0	-10.1	42.4	2.0	32.0	10.5	12.9
4.924E+08	39.6	46.0	-6.4	42.0	2.6	32.1	10.5	16.6

Test Mode: H24, 1880MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 15 Class B

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
1.199E+09	33.6	54.0	-20.4	41.4	2.9	35.4	24.7
1.381E+09	32.9	54.0	-21.1	39.5	3.2	35.4	25.6
1.392E+09	31.6	54.0	-22.4	38.1	3.2	35.4	25.6
4.882E+09	39.8	54.0	-14.2	32.5	9.3	34.9	32.9

Test Mode: H24, 1880MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Note: Investigation was performed with peak detector and no peak emissions were detected at least 10dB below peak limit level. No emissions were detected above the noise floor which was at least 10 dB below the limit up to 25GHz.



FCC Radiated Disturbance, H24, 1880MHz WCDMA co-located with Bluetooth

Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 24

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	DCF dB	AF dB(1/m)
3.323E+07	34.6	84.4	-49.8	38.0	0.7	32.1	10.5	17.5
9.709E+07	35.0	84.4	-49.4	45.9	1.1	32.1	10.5	9.5
1.666E+08	37.1	84.4	-47.3	48.2	1.5	32.0	10.5	8.9
2.337E+08	35.6	84.4	-48.8	43.2	1.8	32.0	10.5	12.1
2.410E+08	35.4	84.4	-49.0	43.0	1.8	32.0	10.5	12.1
2.515E+08	40.1	84.4	-44.3	47.7	1.9	32.0	10.5	12.0
2.620E+08	36.5	84.4	-47.9	43.1	1.9	32.0	10.5	13.0
2.640E+08	42.4	84.4	-42.0	48.8	1.9	32.0	10.5	13.3
2.668E+08	41.5	84.4	-42.9	47.7	1.9	32.0	10.5	13.3
2.968E+08	35.9	84.4	-48.5	42.4	2.0	32.0	10.5	12.9
4.924E+08	39.6	84.4	-44.8	42.0	2.6	32.1	10.5	16.6

Test Mode: H24, 1880MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Intertek Testing Services
Radiated Emissions above 1 GHz
FCC Part 24

Operator: EC
May 7, 2012

Model Number: 05-100926-01LF
Company: Topcon Positioning Systems, Inc.

Frequency Hz	Quasi Pk FS dB(uV/m)	Limit@3m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
1.199E+09	33.6	84.4	-50.8	41.4	2.9	35.4	24.7
1.360E+09	31.1	84.4	-53.3	37.9	3.1	35.4	25.5
1.381E+09	32.9	84.4	-51.5	39.5	3.2	35.4	25.6
1.392E+09	31.5	84.4	-52.9	38.1	3.2	35.4	25.6
1.441E+09	31.6	84.4	-52.8	38.2	3.2	35.4	25.6
1.493E+09	37.1	84.4	-47.3	43.7	3.3	35.4	25.5
1.999E+09	35.7	84.4	-48.7	39.0	3.9	35.5	28.3
2.190E+09	37.3	84.4	-47.1	40.4	4.1	35.5	28.3
3.760E+09	51.2	84.4	-33.2	49.2	6.0	35.6	31.6
4.214E+09	35.5	84.4	-48.9	32.3	6.5	35.4	32.1
4.322E+09	42.6	84.4	-41.8	39.4	6.6	35.3	31.9

Test Mode: H24, 1880MHz & Bluetooth at 2441 MHz
Temp: 22C, Humidity: 35%

Note: No emissions were detected above the noise floor which was at least 10 dB below the limit up to 25GHz.



Results:	Complies by 4.4dB for Configuration 1 Complies by 0.4dB for Configuration 2 Complies by 3.6dB for Configuration 3
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3.2.4 Test Configuration Photographs

The following photographs show the testing configurations used.



Electromagnetic Radiated Disturbance Setup Photograph

3.2.4 Test Configuration Photograph (Continued)



Electromagnetic Radiated Disturbance Setup Photograph

3.2.4 Test Configuration Photograph (Continued)



Electromagnetic Radiated Disturbance Setup Photograph



4.0 RF Exposure Evaluation FCC 2.1091

Bluetooth Radio:

The EUT is a device used in mobile applications and will be located at least 30 cm from any body part of the user or near by persons.

The maximum conducted power is -0.3dBm (0.933mW); the antenna 4dBi gain; therefore, to comply with the requirements for RF Exposure, the MPE is calculated.

The maximum Peak EIRP calculated is 3.7dBm or 2.34mW.
2.34mW was the Bluetooth measured EIRP while simultaneously transmitting with three different Cellular/PCS modules.

The Power Density can be calculated using the formula

$$S = \text{EIRP} / 4\pi D^2$$

Where: S is Power Density in W/m^2
D is the distance from the antenna.

It is considered that 30cm is the minimum distance that a user can go near the EUT which is installed inside a host.

At 0.3 m, $S = 0.00207 \text{ W}/\text{m}^2$, which is below the MPE Limit of $10 \text{ W}/\text{m}^2$

A statement that a minimum separation distance of 30 cm between the antenna and persons is included in the User's Manual.



Configuration 1: FCC ID: RI7P56JE1 , C24 – Cellular/ PCS CDMA Transceiver Module, (800MHz cellular band)

The EUT is a wireless device used in a mobile application and will be located at least 30 cm from any body part of the user or nearby persons.

The maximum calculated EIRP is 29.5 dBm (or 0.891 W).
0.891 W was the C24 measured EIRP while simultaneously transmitting with the Bluetooth radio.

The Power Density can be calculated using the formula

$$S = \text{EIRP} / 4\pi D^2$$

Where: S is Power Density in W/m^2
D is the distance from the antenna.

It is considered that 30cm is the minimum distance that a user can go near the EUT which is installed inside a host.

At 0.3 m, $S = 0.788 \text{ W}/\text{m}^2$, which is below the MPE Limit of $5.57 \text{ W}/\text{m}^2$ at 836MHz

A statement that a minimum separation distance of 30 cm between the antenna and persons is included in the User's Manual.

Configuration 1: FCC ID: RI7P56JE1 , C24 – Cellular/ PCS CDMA Transceiver Module, (1900MHz PCS band)

The EUT is a wireless device used in a mobile application and will be located at least 30 cm from any body part of the user or nearby persons.

The maximum calculated EIRP is 28.6 dBm (or 0.724 W).
0.724 W was the C24 measured EIRP while simultaneously transmitting with the Bluetooth radio.

The Power Density can be calculated using the formula

$$S = \text{EIRP} / 4\pi D^2$$

Where: S is Power Density in W/m^2
D is the distance from the antenna.

It is considered that 30cm is the minimum distance that a user can go near the EUT which is installed inside a host.

At 0.3 m, $S = 0.641 \text{ W}/\text{m}^2$, which is below the MPE Limit of $10 \text{ W}/\text{m}^2$ at 1880MHz

A statement that a minimum separation distance of 30 cm between the antenna and persons is included in the User's Manual.



Configuration 2: FCC ID: RI7T56FV2, G24 – Dual-Band GSM/ EDGE Transceiver Module, (800MHz cellular band)

The EUT is a wireless device used in a mobile application and will be located at least 30 cm from any body part of the user or nearby persons.

The maximum calculated EIRP is 32.9 dBm (or 1.95 W).
1.95 W was the G24 measured EIRP while simultaneously transmitting with the Bluetooth radio.

The Power Density can be calculated using the formula

$$S = \text{EIRP} / 4\pi D^2$$

Where: S is Power Density in W/m^2
D is the distance from the antenna.

It is considered that 30cm is the minimum distance that a user can go near the EUT which is installed inside a host.

At 0.3 m, $S = 1.724 \text{ W}/\text{m}^2$, which is below the MPE Limit of $5.57 \text{ W}/\text{m}^2$ at 836.6MHz

A statement that a minimum separation distance of 30 cm between the antenna and persons is included in the User's Manual.

Configuration 2: FCC ID: RI7T56FV2, G24 – Dual-Band GSM/ EDGE Transceiver Module, (1900MHz PCS band)

The EUT is a wireless device used in a mobile application and will be located at least 30 cm from any body part of the user or nearby persons.

The maximum calculated EIRP is 30.4 dBm (or 1.097 W).
1.097 W was the G24 measured EIRP while simultaneously transmitting with the Bluetooth radio.

The Power Density can be calculated using the formula

$$S = \text{EIRP} / 4\pi D^2$$

Where: S is Power Density in W/m^2
D is the distance from the antenna.

It is considered that 30cm is the minimum distance that a user can go near the EUT which is installed inside a host.

At 0.3 m, $S = 0.970 \text{ W}/\text{m}^2$, which is below the MPE Limit of $10 \text{ W}/\text{m}^2$ at 1880MHz

A statement that a minimum separation distance of 30 cm between the antenna and persons is included in the User's Manual.



Configuration 3: FCCID: RI7T56KL1, H24 - Cellular/ PCS WCDMA/ GSM/ EDGE Transceiver Module, (800MHz cellular band)

The EUT is a wireless device used in a mobile application and will be located at least 30 cm from any body part of the user or nearby persons.

The maximum calculated EIRP is 33.3 dBm (or 2.138 W).
2.138 W was the H24 measured EIRP while simultaneously transmitting with the Bluetooth radio.

The Power Density can be calculated using the formula
$$S = \text{EIRP} / 4\pi D^2$$

Where: S is Power Density in W/m^2
D is the distance from the antenna.

It is considered that 30cm is the minimum distance that a user can go near the EUT which is installed inside a host.

At 0.3 m, $S = 1.890 \text{ W}/\text{m}^2$, which is below the MPE Limit of $5.57 \text{ W}/\text{m}^2$ at 836MHz

A statement that a minimum separation distance of 30 cm between the antenna and persons is included in the User's Manual.

Configuration 3: FCCID: RI7T56KL1, H24 - Cellular/ PCS WCDMA/ GSM/ EDGE Transceiver Module, (1900MHz PCS band)

The EUT is a wireless device used in a mobile application and will be located at least 30 cm from any body part of the user or nearby persons.

The maximum calculated EIRP is 30.3 dBm (or 1.071 W).
1.071 W was the H24 measured EIRP while simultaneously transmitting with the Bluetooth radio.

The Power Density can be calculated using the formula
$$S = \text{EIRP} / 4\pi D^2$$

Where: S is Power Density in W/m^2
D is the distance from the antenna.

It is considered that 30cm is the minimum distance that a user can go near the EUT which is installed inside a host.

At 0.3 m, $S = 0.950 \text{ W}/\text{m}^2$, which is below the MPE Limit of $10 \text{ W}/\text{m}^2$ at 1880MHz

A statement that a minimum separation distance of 30 cm between the antenna and persons is included in the User's Manual.



5.0 Document History

Revision/ Job Number	Writer Initials	Date	Change
1.0 / G100387380	EC	May 31, 2012	Original document