Product Name :	Transmitter Heart Rate MC2.0 Wireless
Model Number :	TFO7704
Applicant:	Cycle Parts GmbH Le Quartier Hornbach 13 D-67433 Neustadt/Weinstrasse
Date of Receipt :	Dec. 16, 2011
Finished date of Test :	Dec. 30, 2011
Applicable	47 CFR Part 15, Subpart C ANSI C63.4: 2003

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By : Jeff Lo , Date: 12/30/2011
(Jeff Lo)

Approved By : , Date: 12/30/2011
(Johnson Ho, Director)

Table of Contents

1. DOCUMENT POLICY AND TEST STATEMENT

1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.

1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC power source from battery: DC power source 3 Vdc, was used during the test.

1.3 EUT MODIFICATION

- No modification in SRT Lab.

2. DESCRIPTION OF EUT AND TEST MODE

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Transmitter Heart Rate MC2.0 Wireless
MODEL NO.	TFO7704
CABLE	N/A
POWER SUPPLY	TX：DC 3V, 30mA RX：DC 3V, 30mA
FREQUENCY BAND	110.5KHz ~ 113.5KHz
CARRIER FREQUENCY	113.0 KHz ± 1KHz
NUMBER OF CHANNEL	1
RF OUTPUT POWER	TX：74.31 dBuV
MODULATION TYPE	Pulse
MODE OF OPERATION	Simplex
BIT RATE OF TRANSMISSION	1K bit/sec
ANTENNA TYPE	Coil with ferrite bar
OPERATING TEMPERATURE RANGE	-10~55°C

NOTE： For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

2.2 DESCRIPTION OF EUT INTERNAL DEVICE

DEVICE	BRAND / MAKER	MODEL #	FCC ID/DOC	REMARK
N/A				

2.3 DESCRIPTION OF TEST MODE

1. TX
2. Standby
3. Link

TX :

X axis: Y axis: Z axis:



2.4 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL #	FCC ID / DOC	CABLE
	N/A				

NOTE : 1. For the actual test configuration, please refer to the photos of testing.
2. For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a Transmitter Heart Rate MC2.0 Wireless and according to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C
ANSI C63.4: 2003
All tests have been performed and recorded as per the above standards.

4. RADIATED EMISSION TEST

4.1 RADIATED EMISSION LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dBmV/m)
0.009 - 0.490	300	2400/F(KHz)
0.490 - 1.705	30	24000/F(KHz)
1.705 - 30	30	30
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

Note : 1. 30 dBuV (in 30m) = 70 dBuV (in 3m).

2. Transmitters that require Crystal Controlled Oscillators with values below 30 MHz requires the Test Report to show “Spurious Radiated Emissions” results below 30 MHz per FCC Part 15.33(a).

According to the FCC Part 15, Subpart A Section 15.31(f)(2), the extrapolation factor of 40 dB/decade is used for measurement distances different then specified in with limits for frequencies below 30 MHz.

According to the Part 15.201(a): Intentional radiators operated as carrier current systems, devices operated under the provisions of §§ 15.211, 15.213 and 15.221, and devices operating below 490 kHz in which all emissions are at least 40 dB below the limits in Section 15.209.

4.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

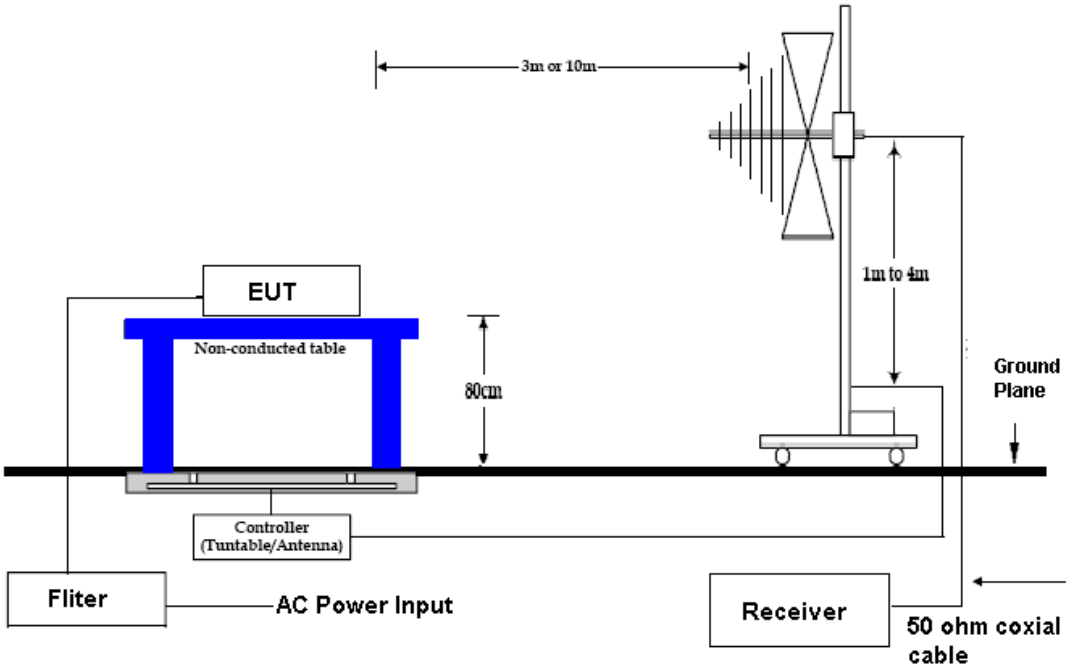
EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	20 MHz TO 1000 MHz	ROHDE & SCHWARZ	ESVS30 / 841977/003	DEC. 2011 ETC
BI-LOG ANTENNA	30 MHz TO 2 GHz	SCHAFFNER	CBL6141A / 4181	MAY. 2012 ETC
OATS	3 – 10 M MEASUREMENT	SRT	A02/SRT002	JUN. 2012 SRT
COAXIAL CABLE	30M	TIMES	LMR-400 / #30M	MAY. 2012 ETC
FILTER	2 LINE, 30A	FIL.COIL	FC-943 / 869	NCR
SPECTRUM ANALYZER	9K- 40GHz	R&S	FSP40/ 100093	DEC. 2011 ETC
PRE-AMPLIFIER	1GHz TO 26.5GHz	HP	8449B/ 3008A01995	JAN. 2012 ETC
HORN ANTENNA	1GHz TO 18GHz	EMCO	3115/ 6881	NOV. 2012 ETC
HORN ANTENNA	18GHz TO 40GHz	EMCO	3116/ 00032255	FEB. 2012 ETC
K-TYPE CABLE	1M	HUBER SUHNER	SF 102-40/2*11 /23934/2	NOV. 2012 ETC
Loop Antenna	10KHz TO 30MHz	ETS.LINDGREN	00063889	JUN. 2012 ETC

NOTE :

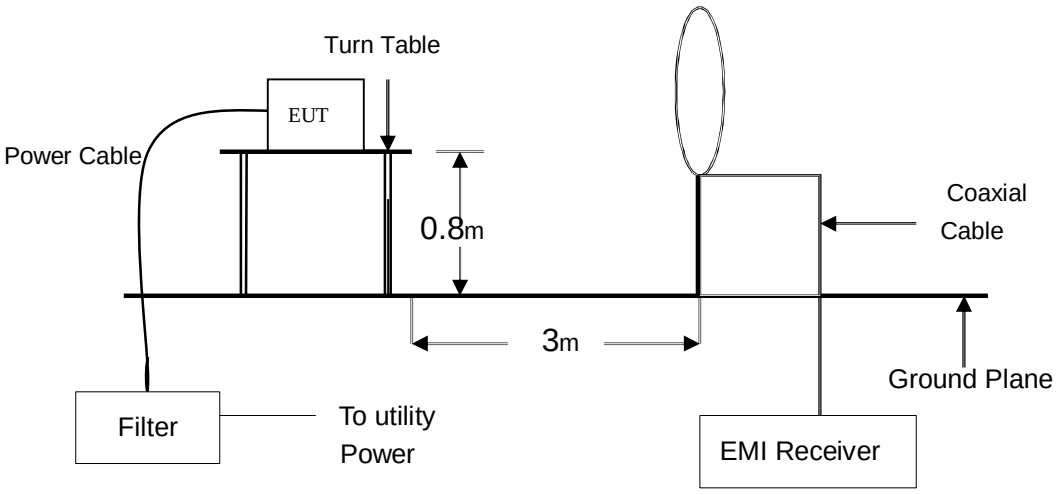
1. The calibration interval of the above test equipment is one year and the calibrations are traceable to
   NML/ROC and NIST/USA.

4.3 TEST SET-UP

30MHz ~ 1GHz



9KHz ~ 30MHz



NOTE :

1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
2. For the actual test configuration, please refer to the photos of testing.

4.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4. The measurements were made at an open area test site with 3 meter measurement distance. The frequency spectrum measured started from 9 kHz. All readings were quasi-peak value with 200Hz resolution bandwidth at frequency below 150kHz, and with 9kHz resolution bandwidth between 150 kHz and 30MHz . Under 30MHz to 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver.

4.5 RADIATED EMISSION TEST RESULT

Temperature:	23 °C	Humidity:	58%RH
Ferquency Range:	9kHz – 30MHz	Measured Distance:	3m
Spectrum Detector:	Q.P.	Test Mode:	TX
Tested Date:	Dec. 26, 2011	Tested by	Jeff Lo

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
0.1132 (F)	0.06	-5.29	74.31	69.08	106.73	-37.65
1.5222	0.17	-7.00	50.63	43.80	83.95	-40.15
1.8686	0.20	-6.98	46.09	39.31	82.17	-42.86
2.4200	0.24	-6.96	36.05	29.33	70.00	-40.67
9.5320	0.50	-6.49	35.28	29.29	70.00	-40.71
27.0320	0.85	-5.44	33.43	28.84	70.00	-41.16

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	23 °C	Humidity:	58%RH
Ferquency Range:	30 – 1000 MHz	Measured Distance:	3m
Spectrum Detector:	Q.P.	Test Mode:	TX
Tested Date:	Dec. 26, 2011	Tested by	Jeff Lo

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
54.6100	1.14	12.14	7.5	20.8	40.0	-19.2	329	3.92
221.0180	2.01	13.15	9.1	24.3	46.0	-21.7	347	3.41
734.3140	3.87	21.52	2.7	28.1	46.0	-17.9	187	1.82
854.1410	4.32	22.92	2.5	29.7	46.0	-16.3	107	1.45
867.6270	4.37	22.97	2.8	30.1	46.0	-15.9	109	1.41
929.1150	4.56	23.74	3.1	31.4	46.0	-14.6	114	1.22

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
54.6400	1.14	12.14	11.7	25.0	40.0	-15.0	43	1.08
68.1700	1.20	8.30	9.7	19.2	40.0	-20.8	47	1.12
220.3400	2.00	13.20	10.4	25.6	46.0	-20.4	58	1.59
734.3250	3.87	21.52	2.2	27.6	46.0	-18.4	287	3.18
781.6500	4.02	22.02	2.3	28.4	46.0	-17.6	291	3.32
948.5600	4.60	24.16	2.9	31.7	46.0	-14.3	40	3.84

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	23 °C	Humidity:	58%RH
Ferquency Range:	9kHz – 30MHz	Measured Distance:	3m
Spectrum Detector:	Q.P.	Test Mode:	Standby
Tested Date:	Dec. 26, 2011	Tested by	Jeff Lo

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
0.7288	0.09	-7.08	56.39	49.40	90.35	-40.95
1.5385	0.17	-7.00	48.85	42.02	83.86	-41.84
9.5461	0.50	-6.49	34.57	28.58	70.00	-41.42
11.6155	0.55	-6.37	31.34	25.52	70.00	-44.48
24.0318	0.80	-5.80	27.52	22.52	70.00	-47.48
27.0310	0.85	-5.44	32.99	28.40	70.00	-41.60

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	23 °C	Humidity:	58%RH
Ferquency Range:	30 – 1000 MHz	Measured Distance:	3m
Spectrum Detector:	Q.P.	Test Mode:	Standby
Tested Date:	Dec. 26, 2011	Tested by	Jeff Lo

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
64.3600	1.20	8.90	12.5	22.6	40.0	-17.4	124	3.89
220.4700	2.00	13.20	8.3	23.5	46.0	-22.5	338	3.44
693.8400	3.79	20.64	3.3	27.7	46.0	-18.3	131	1.95
760.2400	3.94	21.94	2.5	28.4	46.0	-17.6	209	1.74
870.4500	4.38	22.98	2.6	30.0	46.0	-16.0	111	1.40
945.9500	4.59	24.09	2.4	31.1	46.0	-14.9	24	1.17

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
34.6700	0.94	22.00	2.9	25.8	40.0	-14.2	311	1.01
54.6100	1.14	12.14	11.1	24.4	40.0	-15.6	145	1.08
76.7400	1.26	8.12	7.5	16.9	40.0	-23.1	256	1.14
220.4500	2.00	13.20	9.0	24.2	46.0	-21.8	188	1.59
788.5400	4.05	22.05	2.4	28.5	46.0	-17.5	191	3.35
970.1800	4.64	24.36	12.2	41.2	54.0	-12.8	331	3.91

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	23 °C	Humidity:	58%RH
Ferquency Range:	30 – 1000 MHz	Measured Distance:	3m
Spectrum Detector:	Q.P.	Test Mode:	Link
Tested Date:	Dec. 26, 2011	Tested by	Jeff Lo

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
54.3800	1.14	12.14	9.1	22.4	40.0	-17.6	131	3.92
152.3100	1.72	12.48	6.7	20.9	43.5	-22.6	20	3.62
180.6200	1.80	10.50	8.2	20.5	43.5	-23.0	114	3.53
206.5900	1.96	12.04	14.5	28.5	43.5	-15.0	223	3.45
354.6100	2.62	15.20	10.0	27.8	46.0	-18.2	147	3.00
373.9200	2.69	15.65	15.8	34.1	46.0	-11.9	272	2.94

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
54.3300	1.14	12.14	10.9	24.2	40.0	-15.8	143	1.08
205.8400	1.95	12.00	8.1	22.1	43.5	-21.5	256	1.54
219.0080	2.00	13.10	13.3	28.4	46.0	-17.6	260	1.58
745.7700	3.89	21.78	2.4	28.1	46.0	-17.9	263	3.21
919.4700	4.54	23.52	2.3	30.4	46.0	-15.6	144	3.75
954.2300	4.61	24.23	2.5	31.4	46.0	-14.6	40	3.86

NOTE :

1. Measurement uncertainty is +/- 4.73dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

5. CONDUCTED EMISSION TEST FOR POWER PORT

The test item was not performed, because the EUT uses 3Vdc battery as power source.

6. TIME DOMAIN AND DUTY CYCLE TEST

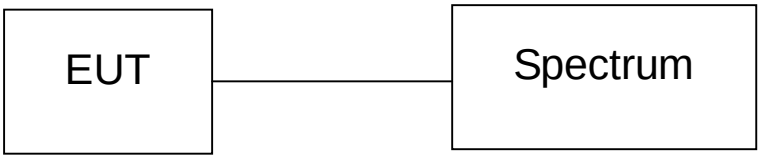
6.1 TEST EQUIPMENT

The following test equipment was used during the radiated emission test：

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM ANALYZER	9kHz-40GHz	ROHDE & SCHWARZ	FSP40/ 100093	Dec. 2011 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

6.2 TEST SET-UP



6.3 TEST PROCEDURE

The EUT was transmitting continuously.The spectrum recorded signal values.The simulator’s signal was imitated for normal use mode.The number of hearbeat is 130 times at one minute during the test.

6.4 EUT OPERATING CONDITION

Set the EUT under transmission condition continuously at specific channel frequency.

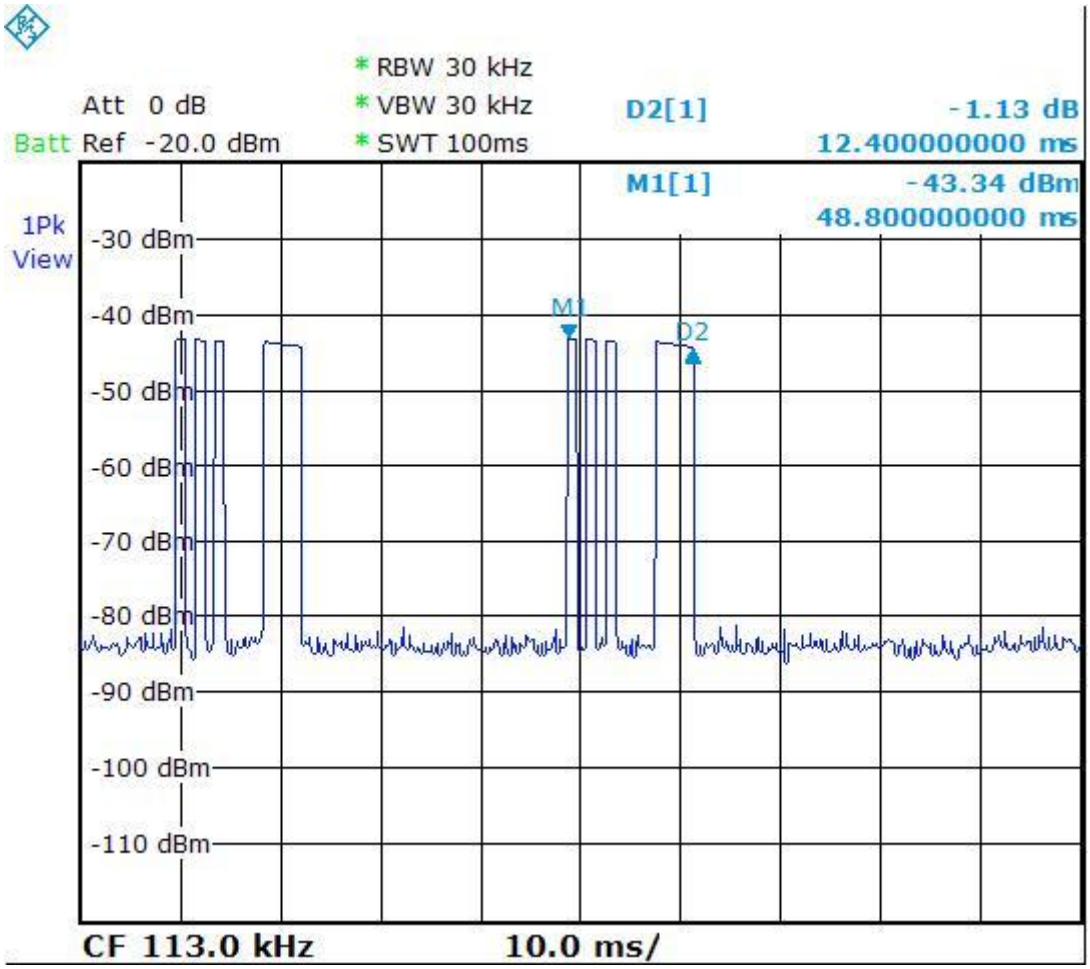
6.5 TIME DOMAIN AND DUTY CYCLE TEST RESULT

Temperature:	22 °C	Humidity:	54%RH
Tested by	Jeff Lo	Tested Date:	Dec. 26, 2011

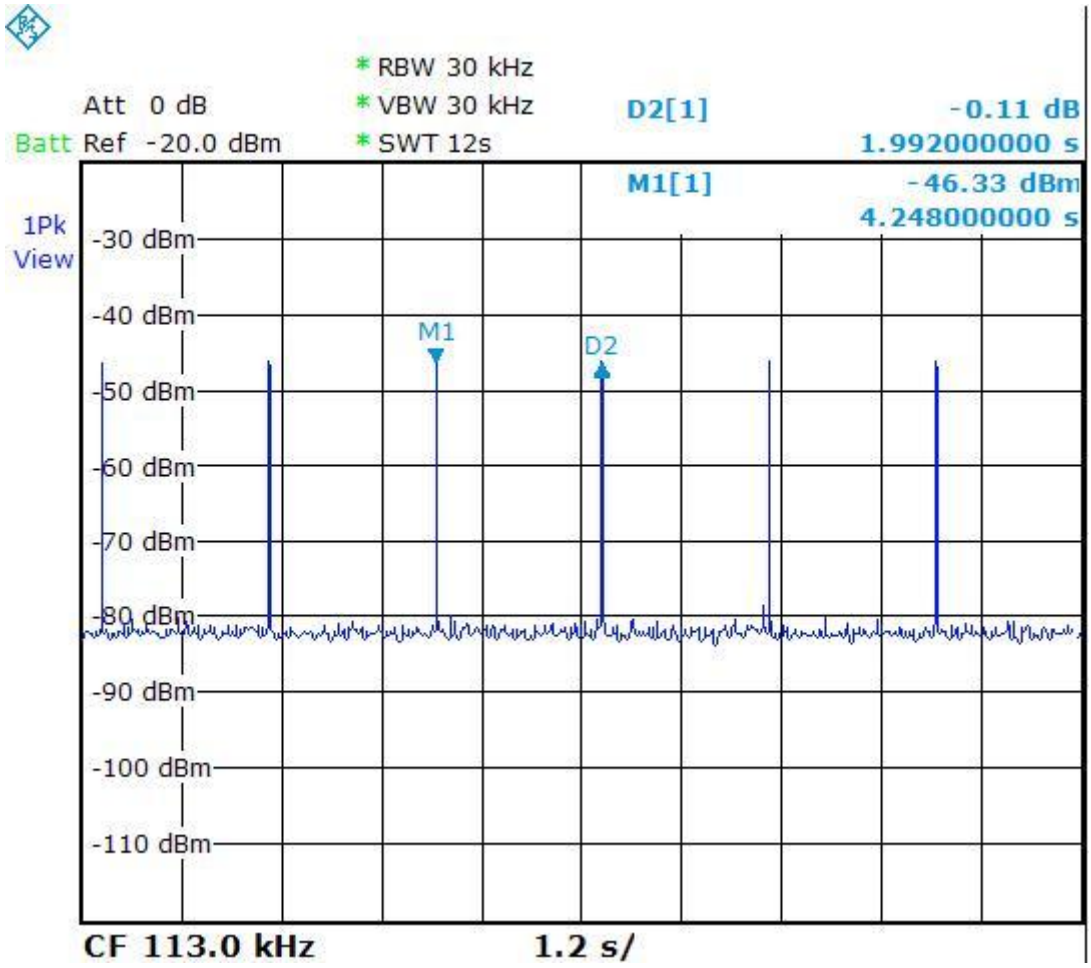
TIME DOMAIN:

Time on (ms)	Period (ms)	Duty cycle (%)	PASS/FAIL
12.4	1992	0.6224	PASS

Time on:



Total time: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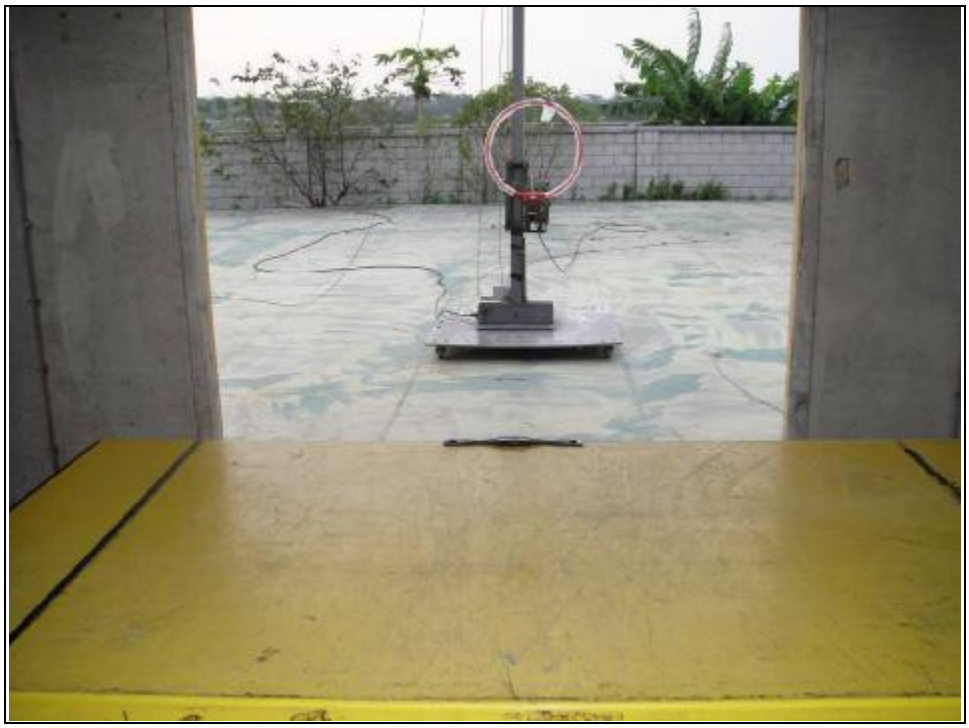
Att 0 dB
* VBW 30 kHz
D2[1]
-0.11 dB
Batt Ref -20.0 dBm
* SWT 12s
1.992000000 s
M1[1]
-46.33 dBm
4.248000000 s
1Pk
View
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
-100 dBm
-110 dBm
M1
D2
CF 113.0 kHz
1.2 s/

7. PHOTOS OF TESTING

- Raditated test -Below 30MHz (TX , Standby)



-Raditated test-30~1000MHz (TX , Standby)

-Raditated test-30~1000MHz (Link)

8. TERMS OF ABRIVATION

AZ(°)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction