SGS-CSTC Standards Technical Services Co., Ltd.

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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

TEST REPORT

Application No.:	GZEM1104001269RF
Applicant:	GUANGDONG YINRUN INDUSTRY CO., LTD.
FCC ID:	XHT10011-12-T49M
Product Name:	Tornado Tumbler
Product Description:	Radio toys with 49.860 MHz as a carrier.
Model No.:	10011, 10012 ♣
♣	Please refer to section 3 of this report for details
Standards:	FCC PART 15 SUBPART C: 2010 section 15.235 ANSI C63.10:2010
Date of Receipt:	2011-05-04
Date of Test:	2011-05-23 to 2011-05-25
Date of Issue:	2011-05-31
Test Result :	**PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 3 of this report for further details.

Strong Yao
2011 may

Strong Yao

Manager

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00		2011-05-31		Original

Authorized for issue by:				
Tested By		Storm Shu **(Storm Shu) /Project Engineer**		2011-05-23 to 2011-05-25 **Date**
Prepared By		Millie Li **(Millie Li) /Clerk**		2011-05-31 **Date**
Checked By		Strong Yao **(Strong Yao)/Reviewer**		2011-05-31 **Date**

3 Test Summary

Test	Test Requirement	Test method	Result
Radiated Emission (30 MHz to 1 GHz)	FCC PART 15 Section 15.235	ANSI C 63.10 Clasue 6.4, 6.5 and 6.6	PASS **
Occupied Bandwidth	FCC PART 15 Section 15.235	ANSI C 63.10 Clasue 6.9	PASS
Label Requirement	FCC PART 15 Section 15.19	N/A	N/A

Remark:
N/A: not applicable. Refer to the relative section for the details.
Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radio Frequency.
♣ Model No.: 10011, 10012

According to the confirmation from the applicant, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, except for the Model No. for marketing requirement.

Therefore only one model 10012 was tested in this report.

** The EUT passed Radiated Emission test after retest.

4 Contents

5 General Information

5.1 Client Information

Applicant:	GUANGDONG YINRUN INDUSTRY CO., LTD.
Address of Applicant:	YINRUN IND GARDEN, LAIMEI ZONE, CHENGHAI, SHANTOU CITY, GUANGDONG, CHINA

5.2 General Description of E.U.T.

Product Name:	Tornado Tumbler
Model No.:	10011, 10012

5.3 Details of E.U.T.

Modulation and Antenna Type:	The Tx is a ASK modulation by internal signal with a dedicated antenna.
Power Supply:	DC 9 V (1 x 9V size “6F22” battery)
Power cord:	N/A

5.4 Description of Support Units

The EUT has been tested as an independent unit.

5.5 Deviation from Standards

None.

5.6 Abnormalities from Standard Conditions

The EUT passed Radiated Emission test after retest.

5.7 Other Information Requested by the Customer

None.

5.8 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,
198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663
Tel: +86 20 82155555 Fax: +86 20 82075059
No tests were sub-contracted.

5.9 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**

  SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **FCC – Registration No.: 282399**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

6 Equipment Used during Test

RE in Chamber					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date (YYYY-MM-DD)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2011-09-06
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2012-01-17
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	10036	2011-06-02
N/A	EMI Test Software	Audix	E3	N/A	N/A
EMC0514	Coaxial cable	SGS	N/A	N/A	2011-12-08
EMC2025	Trilog Broadband Antenna 30-3000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9163	9163-450	2011-10-28
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2011-12-20
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2011-12-20
EMC0518	Horn Antenna	Rohde & Schwarz	HF906	100096	2011-09-11
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2012-01-17
EMC0049	Amplifier	Agilent	8447D	2944A10862	2012-04-21
EMC0075	310N Amplifier	Sonama	310N	272683	2011-10-25
EMC0523	Active Loop Antenna	EMCO	6502	42963	2011-11-17
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	2012-05-10

General used equipment					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date (YYYY-MM-DD)
EMC0006	DMM	Fluke	73	70681569	2011-12-16
EMC0007	DMM	Fluke	73	70671122	2011-12-16

7 Test Results

7.1 E.U.T. test conditions

Power supply: DC 9.0 V (new battery)

Requirements: **15.31(e)**: For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

Operating Environment:
Temperature: 22-25.0 °C
Humidity: 48-55% RH
Atmospheric Pressure: 1001-1010 mbar

Test frequencies and frequency range: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

According to the 15.33 (a) For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

Remark:Test frequency is 49.860 MHz.

7.2 Radiated Emissions

Test Requirement: FCC Part 15 C section 15.235

Test Method: ANSI C63.10: clause 6.4, 6.5.

Measurement Distance: 3m (Semi-Anechoic Chamber)

Test Status: Test in transmitting mode.

Requirements:

the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

15.235(a) :The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

15.235(b) : The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in Section 15.209, whichever permits the higher emission levels. The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in Section 15.209. All signals exceeding 20 microvolts/meter at 3 meters shall bereported in the application for certification

Out of band emissions shall not exceed:

Frequency range(MHz)	**Quasi-peak limits** dB (μV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960	54
At transitional frequencies the lower limit applies.	

Test Procedure:

1) 9 kHz to 30 MHz emissions:

For testing performed with the loop antenna. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specied distance from the EUT.During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2) 30 MHz to 1 GHz emissions:

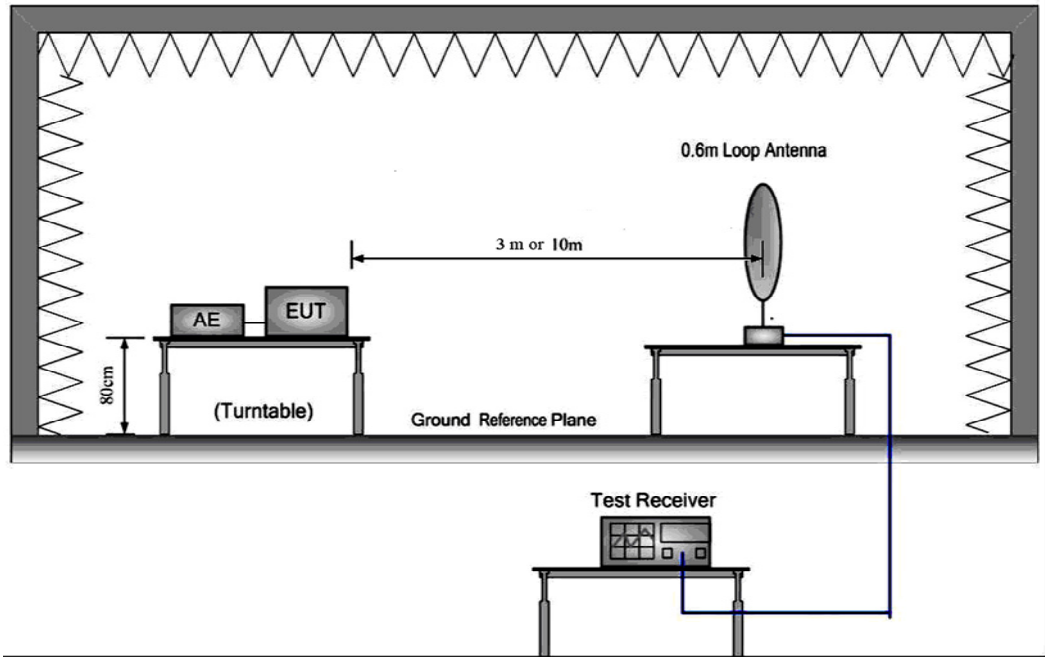
For testing perfomed with the bi-log type antenna. The measurement is performed with the EUT rotated 360º, the antenna height scaned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

Detector:

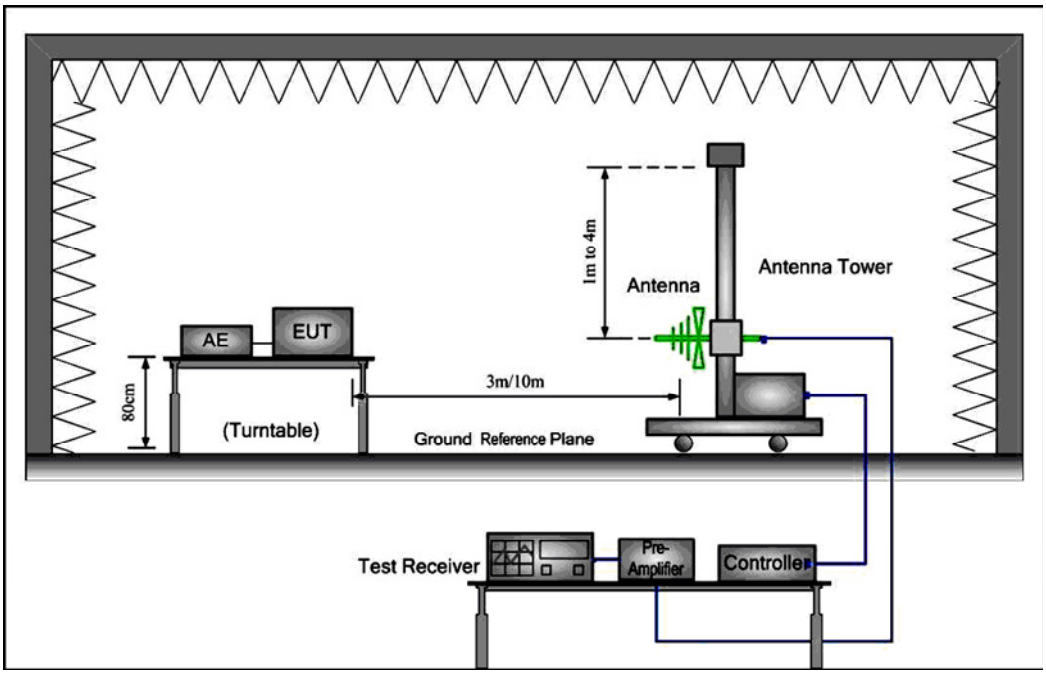
Test Receiver/ Spectrum Analyzer test setup	Detector	
	Peak	Average
RBW	100 kHz for f < 1 GHz	100 kHz for f < 1 GHz
VBW	≥ RBW	10 Hz
Sweep	auto	auto
Detector function	peak	peak
Trace	max hold	max hold

Test Configuration:

1) 9 kHz to 30 MHz emissions:



2) 30 MHz to 1 GHz emissions:



1) Fundamental emission:

Antenna polarization: Horizontal:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
49.860	69.18	6.20	0.60	27.88	48.10	100.0	-51.90	Peak
49.860	66.01	6.20	0.60	27.88	44.93	80.0	-35.07	Average

Antenna polarization: Vertical

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
49.860	81.16	6.20	0.60	27.88	60.08	100.0	-39.92	Peak
49.860	77.69	6.20	0.60	27.88	56.61	80.0	-23.39	Average

Y: rotate EUT by 90° vertically.

X: rotate EUT by 90° clockwise.

Z: EUT as Radiated Emission test setup photograph in section 6 of this report.

Remark: Radiated Emission test setup photograph in section 6 of this report is the worst case and reported.

2) other emissions:

The receive was scanned from 30 MHz to 1 GHz.When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. The worst case emissions were reported.
An initial pre-scan was performed in the 3 m chamber using the spectrum analyzer in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bilog antenna with 2 orthogonal polarities.
The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier. The basic equation with a sample calculation is as follows:

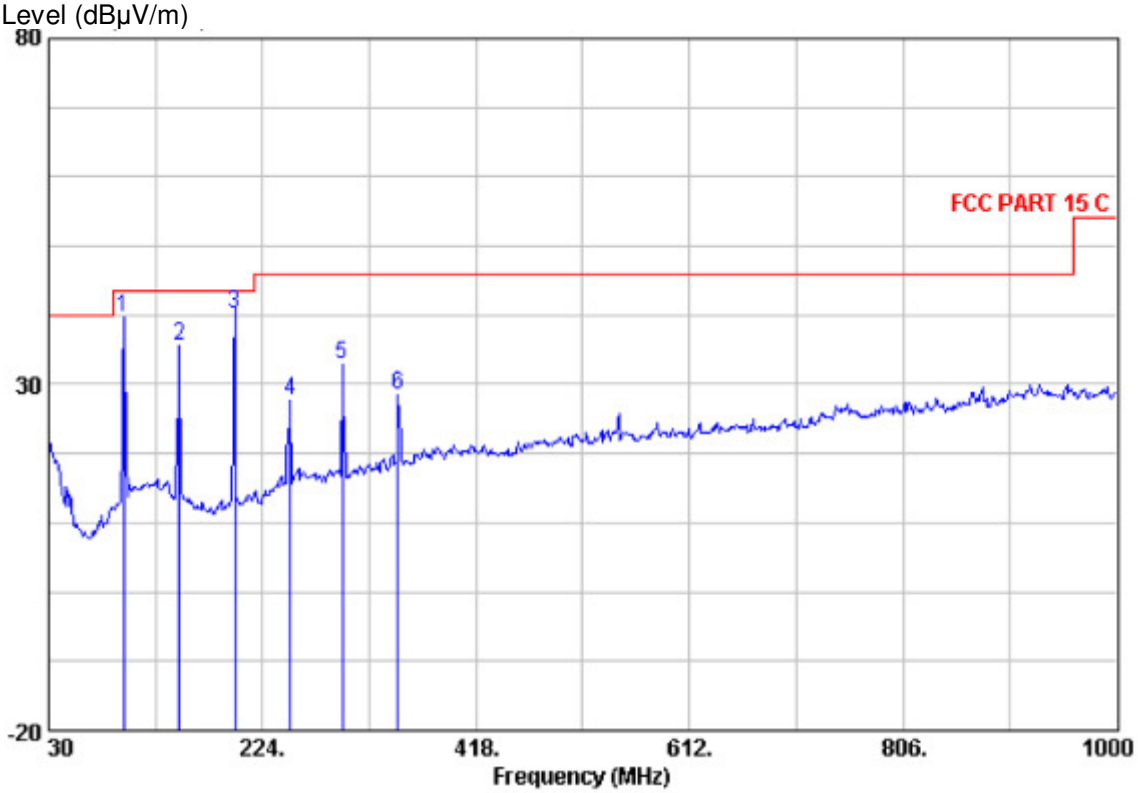
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Peramplifier Factor.
The following test results were performed on the EUT.

Test the EUT in transmitting mode:

Vertical:

Peak scan

Level (dBμV/m)



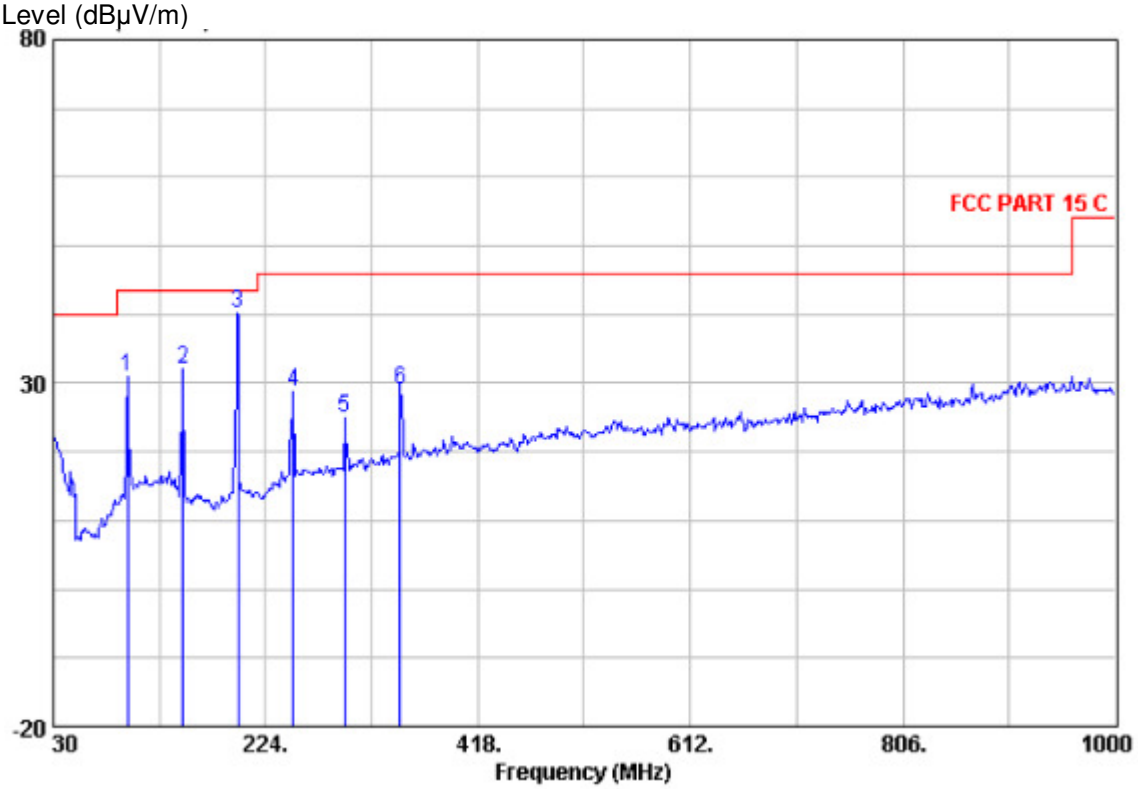
Quasi-peak measurement

Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
97.900	56.27	10.13	0.90	27.69	39.62	43.50	-3.88	QP
148.340	52.24	9.73	1.10	27.43	35.64	43.50	-7.86	QP
198.780	57.45	8.90	1.20	27.24	40.30	43.50	-3.20	QP
249.220	42.00	11.50	1.40	27.15	27.75	46.00	-18.25	QP
296.750	45.85	12.60	1.60	27.07	32.98	46.00	-13.02	QP
347.190	39.87	14.30	1.70	27.43	28.44	46.00	-17.56	QP

Horizontal:

Peak scan

Level (dBµV/m)



Quasi-peak measurement

Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
97.900	47.63	10.13	0.90	27.69	30.97	43.50	-12.53	QP
148.340	48.54	9.73	1.10	27.43	31.95	43.50	-11.55	QP
198.780	57.49	8.90	1.20	27.24	40.34	43.50	-3.16	QP
249.220	43.09	11.50	1.40	27.15	28.85	46.00	-17.15	QP
296.750	37.73	12.60	1.60	27.07	24.85	46.00	-21.15	QP
347.190	40.61	14.30	1.70	27.43	29.18	46.00	-16.82	QP

Remark:
According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

7.3 Occupied Bandwidth

Test Requirement: FCC Part 15 C section 15.235

Test Method: ANSI C63.10 clause 6.9

Test Status: Test in transmitting mode.

Requirements:

15.235(b):The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier.

Test Procedure:

The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector. The vertical Scale is set to 10dB per division. The horizontal scale is set to 10 kHz per division. Read the down 26dB bandwidth of the carrier.

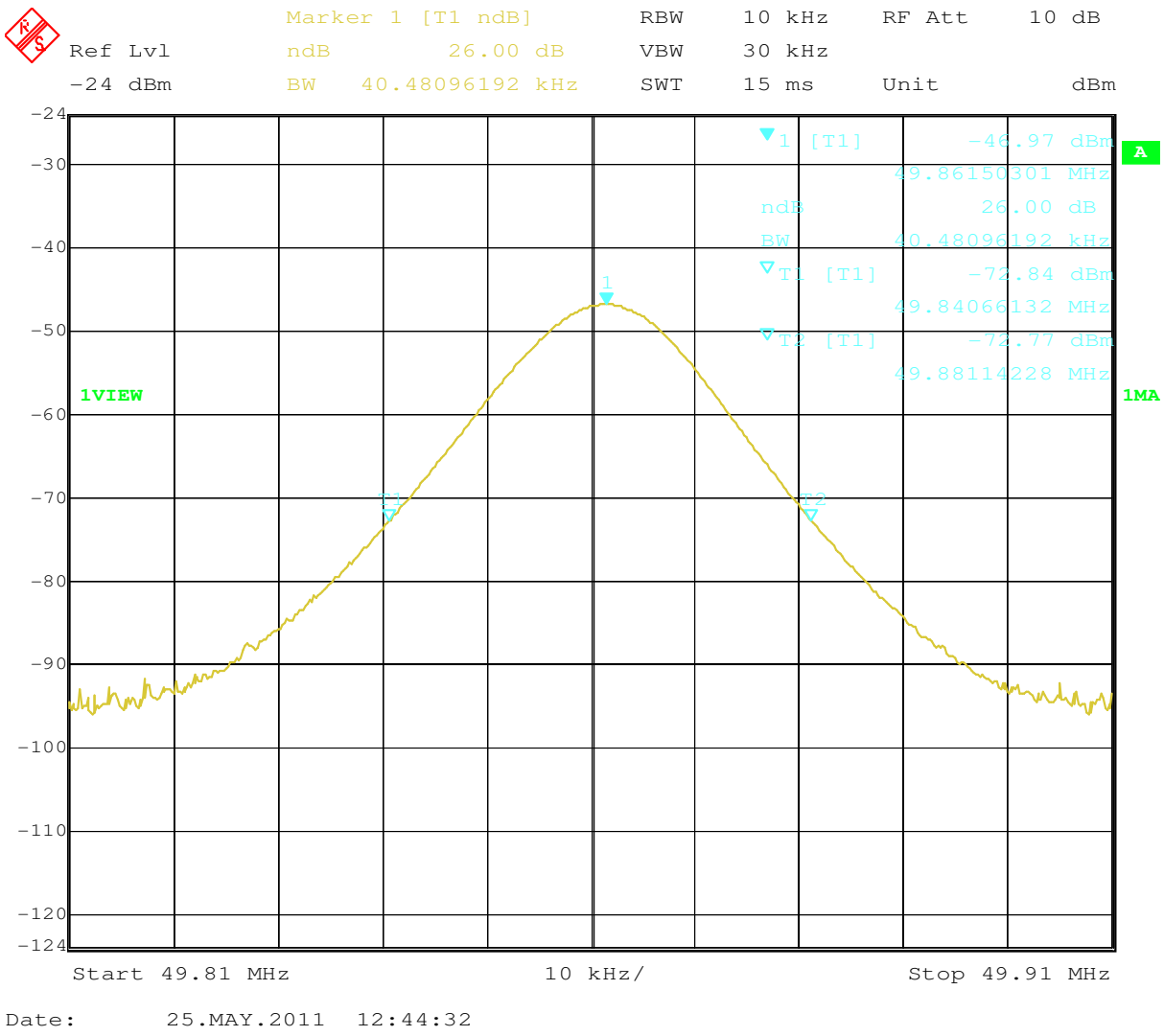
Set the spectrum analyzer: start at 49.81MHz and stop at 49.91MHz.

Set the spectrum analyzer: RBW = 10 kHz, VBW = 30 kHz

Sweep = auto; Detector Function = Peak. Trace = Max Hold.

Mark the peak frequency and -26 dB points bandwidth.

The graph as below:



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26 dB bandwidth lower frequency: 49.84066132MHz

26 dB bandwidth upper frequency: 49.88114228MHz

--The End of Report--