EMC
TEST REPORT

Report No.: **EME-061308**
Model No.: **MTP-104, MTP-105, MTCP-106, MTP-124, MTP-125, MTCP-126, MTP-3104, MTP-3105, MTCP-3106, MTP-3124, MTP-3125, MTCP-3126, CHORUS, FREEDOM PLUS**
Issued Date: **Jan. 11, 2007**

Applicant: **MYTECH TECHNOLOGY CO., LTD.**
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Test By: **Intertek Testing Services Taiwan Ltd.**
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Project Engineer

Rico Deng

Reviewed By

Jerry Liu

Table of Contents

Summary of Tests

Special Needs Phone -Model: MTCP-126
FCC ID: KWW-MT126-R

Test	Reference	Results
Conducted Emission of AC Power	15.207	Pass
Radiated Emission test	15.231(b), 15.209	Pass
Measured bandwidth	15.231(c)	Pass

1. General information

1.1 Identification of the EUT

Manufacturer:	MYTECH TECHNOLOGY CO., LTD.
Product:	Special Needs Phone
Model No.:	MTCP-126
FCC ID.:	KWW-MT126-R
Frequency Range:	433.92 MHz
Channel Number:	1 channel
Frequency of each channel:	Single
Type of Modulation:	ASK
Power Supply:	12Vdc from Battery for transmitter
Power Cord:	N/A
Sample Received:	Nov. 16, 2006
Test Date(s):	Nov. 16, 2006 ~ Nov. 27, 2006

A DoC report has been generated for the client.

1.2 Additional information about the EUT

The EUT is a Special Needs Phone, and was defined as information technology equipment.

According to the hardware aspect, Intertek verified the models listed as below are series model to MTCP-126 (EUT), the difference please refer to the following table:

Trade Name	Model Number	Difference
MYTECH	MTP-104	9 Keys one touch memory key
MYTECH	MTP-105	10 Keys one touch memory key
MYTECH	MTCP-106	Have Caller ID Function
MYTECH	MTP-124	9 Keys one touch memory key with Rec. key
MYTECH	MTP-125	10 Keys one touch memory key with Rec. key
MYTECH	MTCP-126	Have Caller ID Function with Rec. key
MYTECH	MTP-3104	9 keys one touch memory key
MYTECH	MTP-3105	10 keys one touch memory key
MYTECH	MTCP-3106	Have Caller ID Function
MYTECH	MTP-3124	9 Keys one touch memory key with Rec. key
MYTECH	MTP-3125	10 Keys one touch memory key with Rec. key
MYTECH	MTCP-3126	Have Caller ID Function with Rec. key
DIGNITY	CHORUS	9 Keys one touch memory key
DIGNITY	FREEDOM PLUS	Have Caller ID Function with Rec. key

For more detail features, please refer to User's manual as file name “Installation guide.pdf”

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain : 0dBi max
Antenna Type : Rolling antenna
Connector Type : N/A

1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.
EAR PHONE	Logitech	N/A	N/A
Exchange Board	Teltone	250-00193-07	94948
Telephone	TENTEL	K-903S	0514000477

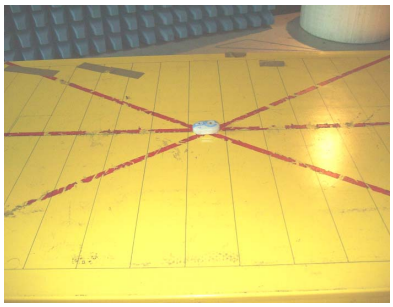
2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section 15.231.

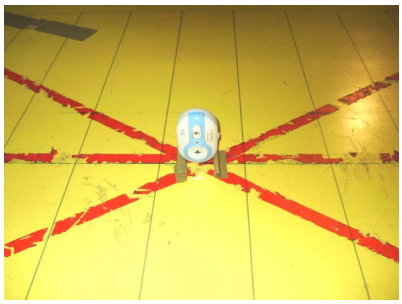
2.2 Operation mode

After verifying three setups of transmitter, we found out the worst case was occurred at setup 1, so the final test was executed under this condition and recorded in this report.



Setup 1

Setup 2



Setup 3

During all of the tests, the EUT was operated in transmitting continuously.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Intertek ID No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	EC303	04/13/2007
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	EC317	07/14/2007
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	EC353	07/13/2007
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30	EC365	10/18/2007
Horn Antenna	EMCO	1GHz~18GHz	3115	EC338	08/16/2007
Horn Antenna	SCHWARZBECK	14GHz~40GHz	BBHA 9170	EC351	07/08/2007
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160	EC368	05/20/2007
Pre-Amplifier	MITEQ	100MHz~26.5GHz	919981	EC373	4/13/2007
Pre-Amplifier	MITEQ	26GHz~40GHz	828825	EC374	1/28/2007
Wideband Peak Power Meter/ Sensor	Anritsu	100MHz~18GHz	ML2497A/ MA2491A	EC396	10/18/2007
Controller	HDGmbH	N/A	HD 100	EP317-1	N/A
Antenna Tower	HDGmbH	N/A	MA 240	EP317-2	N/A
Turn Table	HDGmbH	N/A	DS 420S	EP317-3	N/A
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	01/14/2007

Note: The above equipments are within the valid calibration period.

3. Radiated emission test FCC 15.231 (b)

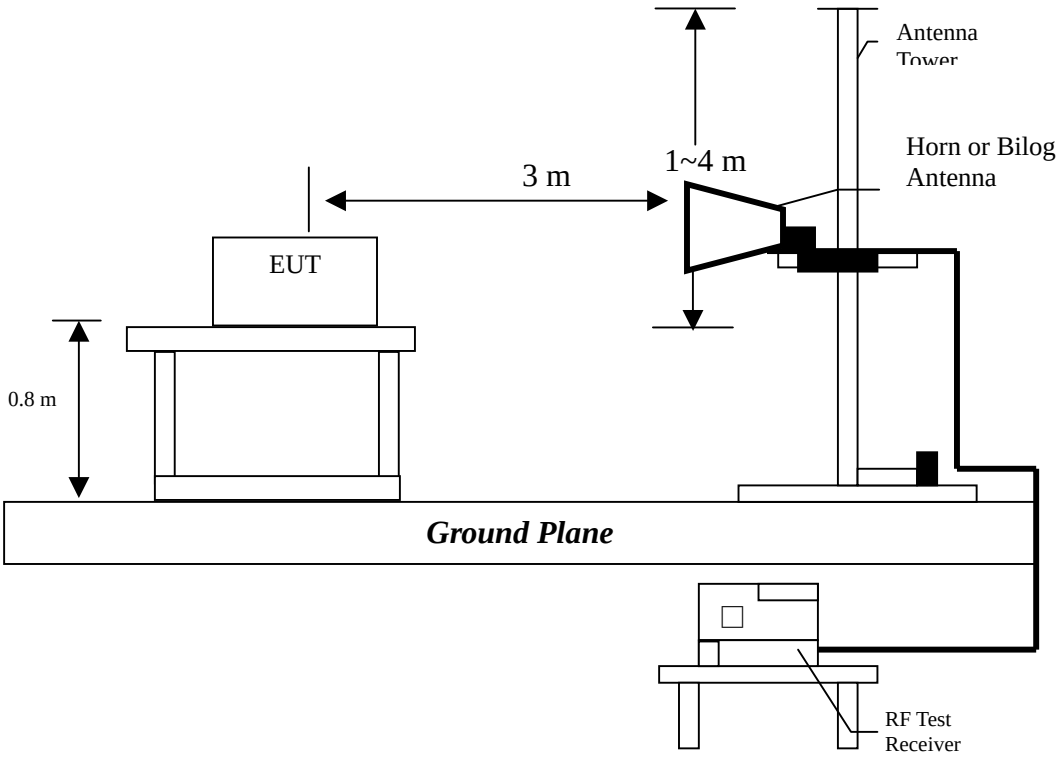
3.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1023	hPa

3.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.

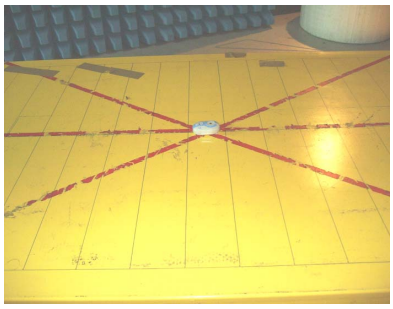
The frequency spectrum from 30MHz to 5000MHz was investigated.



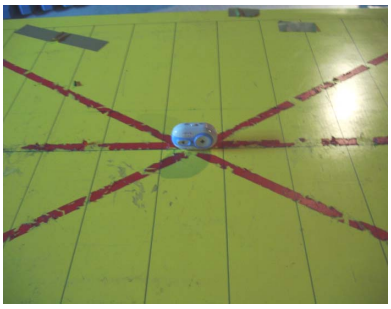
Radiated emission measurements were performed from 30MHz to 5GHz. Spectrum Analyzer Resolution Bandwidth is 100kHz or greater for frequencies 30MHz to 1GHz, 1MHz – for frequencies above 1GHz.
The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

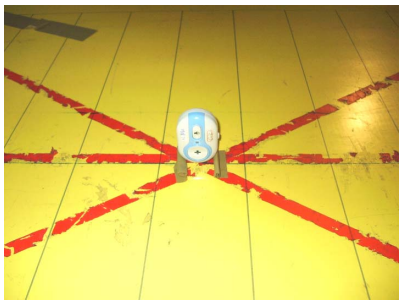
The signal is maximized through rotation and placement in the three orthogonal axes.



Setup 1



Setup 2



Setup 3

After verifying three axes, we found the maximum electromagnetic field was ccurred at setup 1 configuration. The final tset data was executed under this configuration.

The EUT configuration please refer to the “Spurious set-up photo.pdf”.

3.3 Radiated emission limit

3.3.1 Fundamental and harmonics emission limits

Frequency (MHz)	Field Strength of Fundamental		Field Strength of Harmonics	
	(uV/m@3m)	(dBuV/m@3m)	(uV/m@3m)	(dBuV/m@3m)
433.92	10958	80.8	1096.5	60.8

3.3.2 General radiated emission limit

The spurious Emission shall test through the 10th harmonic. In addition, 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).

Frequency MHz	15.209 Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:
1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

   Uncertainty was calculated in accordance with NAMAS NIS 81. Expanded uncertainty (k=2) of radiated emission measurement is ±4.98 dB.

3.4 Calculation of Average Factor

The specification for output field strengths in accordance with the FCC rules specify measurements with an average detector. During testing, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The time period over which the duty cycle is measured in 100 ms or the repetition cycle, whichever is a shorter time frame. The duty cycle is measured by placing the spectrum analyzer in zero span mode at 100 resolution bandwidth.

Averaging factor in dB = 20log (duty cycle)

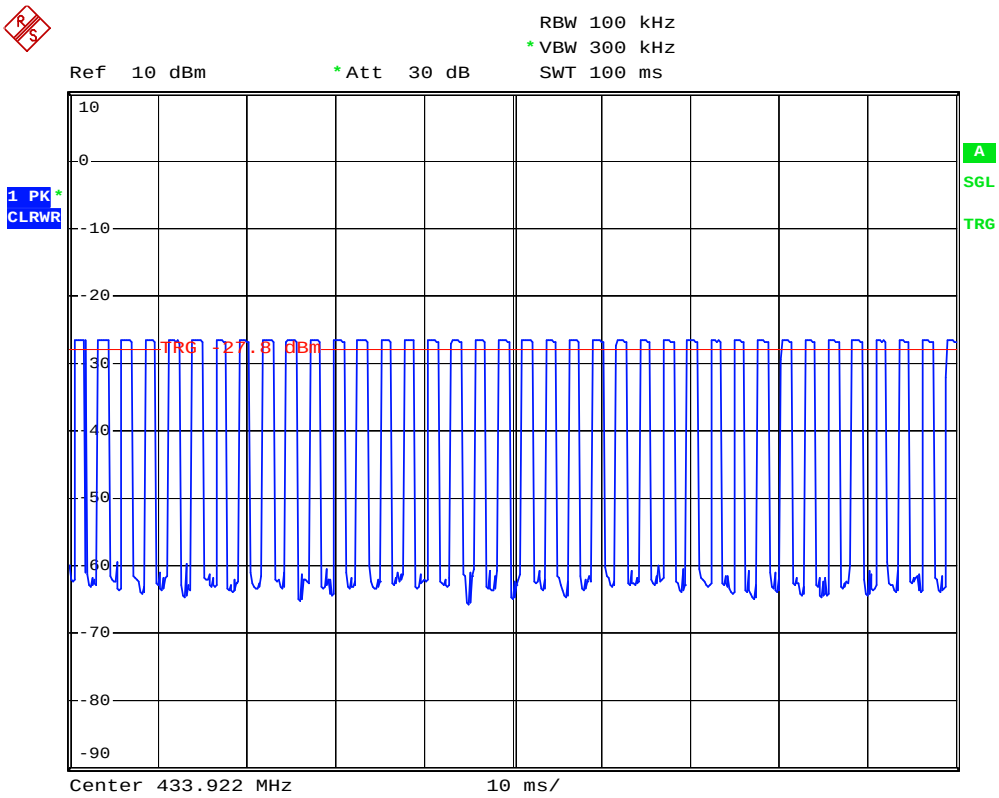
The duty cycle is simply the on-time divided by the period:

The duration of one cycle = 100 ms

Duty Cycle =
(1.3ms×38) / 100ms = 0.494

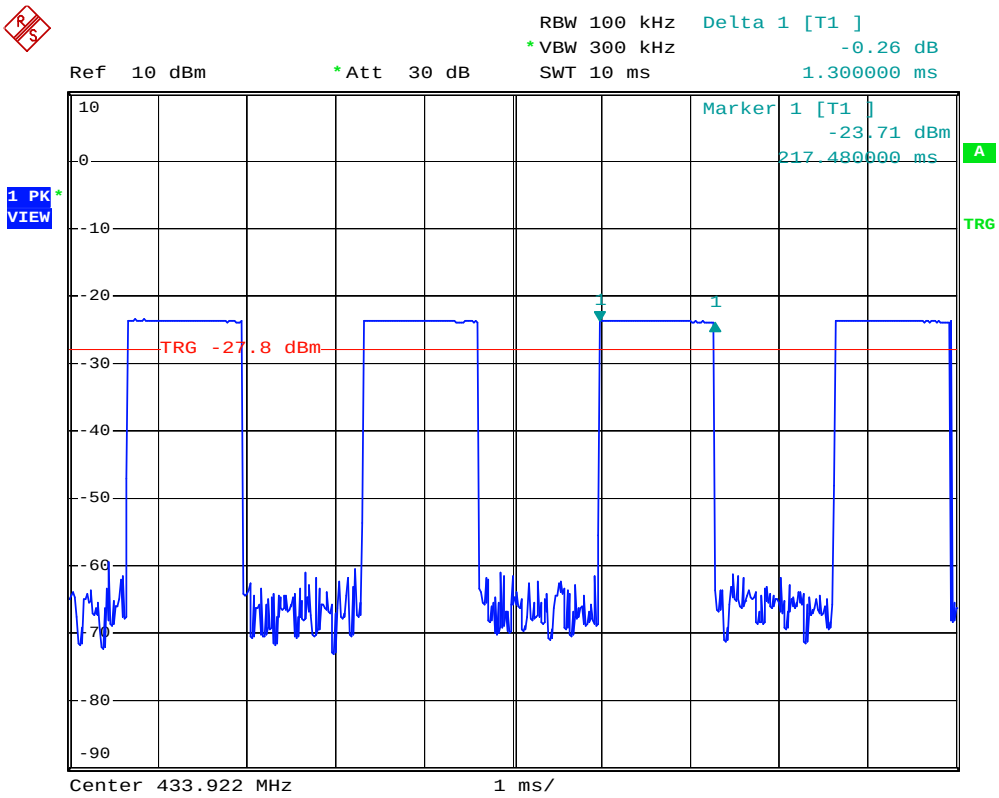
Therefore, the averaging factor is fond by $20 \log_{10} 0.494 = -6.125$ dB

Please see the plot below.



duty cycle

Date: 15.NOV.2006 13:15:01



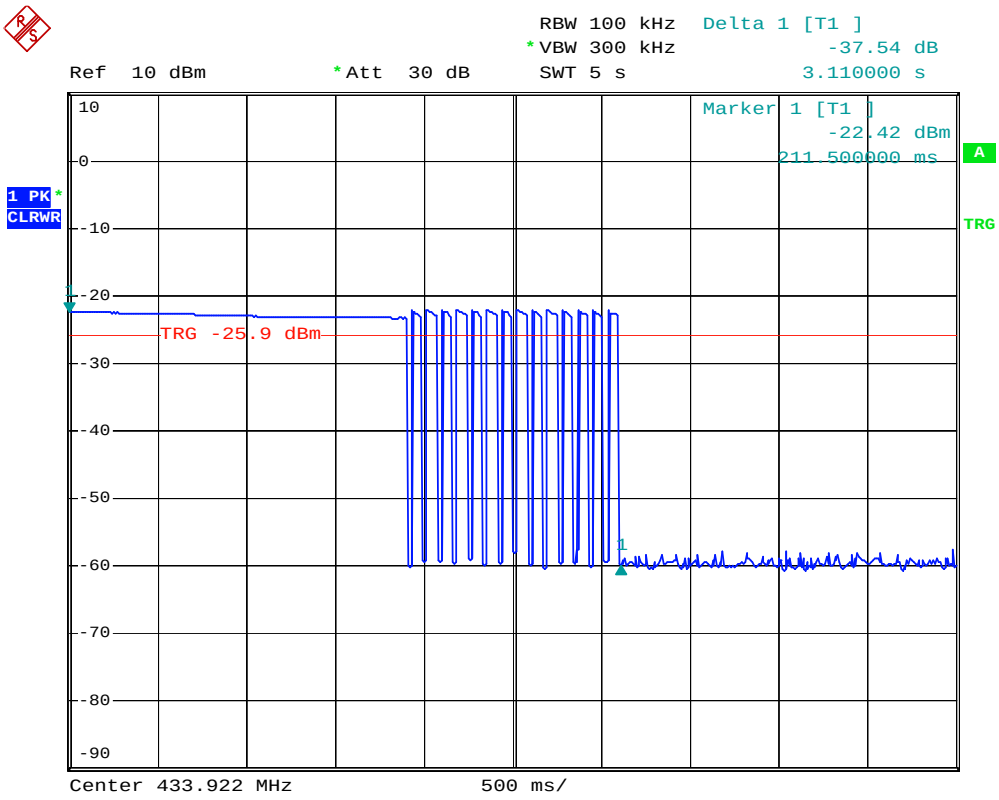
on

Date: 15.NOV.2006 13:17:17

3.5 Requirement of FCC 15.231 (a)(1)

The EUT was complied with the requirement of FCC 15.231 (a)(1) which employed a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Please see the plot below.



<5s stop

Date: 15.NOV.2006 13:12:07

3.6 Radiated emission test data FCC 15.231

The radiated emissions at

Frequency(MHz)	Margin
1730.00	-2.61
1300.00	-3.07
1730.00	-1.51

are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

3.6.1 Measurement results: frequencies equal to or less than 1 GHz

EUT : MTCP-126
Worst case : Tx at setup 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
433.92	PK	V	17.28	57.13	-	74.41	100.8	-26.39
433.92	AV	V	17.28	57.13	-6.1	68.31	80.80	-12.49
867.84	PK	V	23.9	25.18	-	49.08	80.80	-31.72
867.84	AV	V	23.9	25.18	-6.1	42.98	60.80	-17.82
433.92	PK	H	17.72	63.76	-	81.48	100.80	-19.32
433.92	AV	H	17.72	63.76	-6.1	75.38	80.80	-5.42
867.84	PK	H	24.27	36.39	-	60.66	80.80	-20.14
867.84	AV	H	24.27	36.39	-6.1	54.56	60.80	-6.24

Remark:
1.Corrected Level = Reading + Correction Factor
2.Correction Factor = Antenna Factor + Cable Loss

3.6.2 Measurement results: frequencies above 1GHz

EUT : MTCP-126
Worse case : Tx at with setup 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
1730.00	PK	V	28.76	28.73	-	57.49	74	-16.51
1730.00	AV	V	28.76	28.73	-6.1	51.39	54	-2.61
1300.00	PK	H	27.33	29.70	-	57.03	74	-16.97
1300.00	AV	H	27.33	29.70	-6.1	50.93	54	-3.07
1730.00	PK	H	28.76	29.83	-	58.59	74	-15.41
1730.00	AV	H	28.76	29.83	-6.1	52.49	54	-1.51

Remark:
1. Corrected Level = Reading + Correction Factor＋Average Factor
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

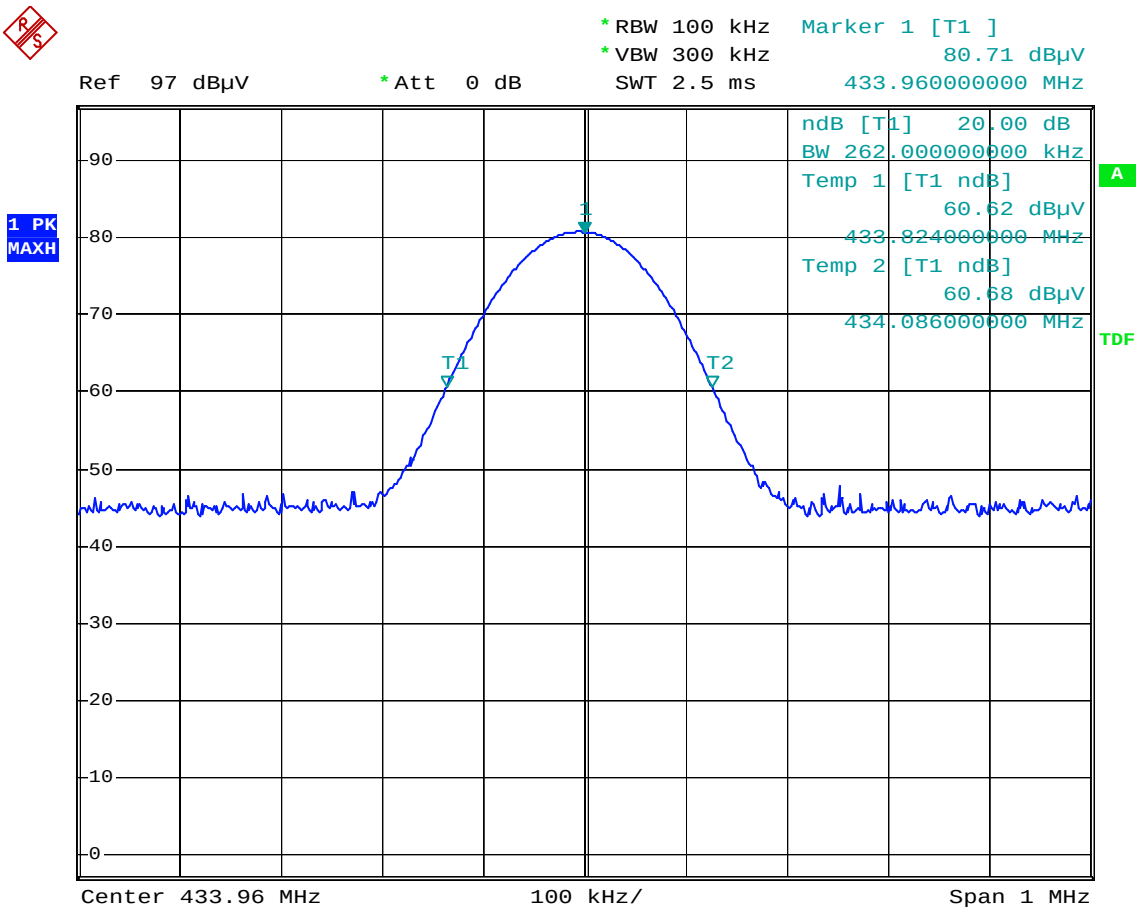
3.7 Measured bandwidth FCC 15.231(C)

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. Bandwidth is determined at the points 20dB down from the modulated carrier.

B.W(20dBc) Limit = 0.25% × f(MHz) = 0.25% × 433.92MHz = 1.0848MHz

From the plot, the bandwidth is observed to be 433.92MHz, at 20dBc where the bandwidth limit is 1.0848MHz.

Please see the plot below.



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