Advanced
Compliance Laboratory

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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

PRODUCT NAME: MYLINK
MODEL: **1811264**
FCC ID: DWNWRTSI IC: 12049A-WRTSI

November 12, 2014

This report concerns (check one): Original grant __x__ Class II change _____
Equipment type: Low Power Intentional Radiator

Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes _____ no __x__
If yes, defer until: _____ (date)
Company agrees to notify the Commission by _____ (date)
of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? yes _____ no __x__
If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR [10-1-90 Edition] provision.

Report prepared for: SOMFY SYSTEMS Inc.
Report prepared by: Advanced Compliance Lab
Report number: 0048-141014-01

NVLAP®

The test result in this report IS supported and covered by the NVLAP accreditation

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1. GENERAL INFORMATION

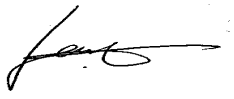
1.1 Verification of Compliance

EUT:	MYLINK
Model:	1811264
Applicant:	SOMFY SYSTEMS INC.
Test Type:	FCC Part 15C (15.231(e)) CERTIFICATION IC RSS-210 (Issue 8) Annex 1 CERTIFICATION
Result:	PASS
Tested by:	ADVANCED COMPLIANCE LABORATORY
Test Completion Date:	November 12, 2014
Report Number:	0048-141014-01

The above equipment was tested by Compliance Laboratory, Advanced Technologies, Inc. for compliance with the requirement set forth in the FCC rules and regulations Part 15 subpart C. This said equipment in the configuration described in the report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty u_c	norm.	±2.36	±2.99	±1.83



Wei Li
Lab Manager
Advanced Compliance Lab

Date: November 12, 2014

1.2 Equipment Modifications

N/A

1.3 Product Information

System Configuration

ITEM	DESCRIPTION	FCC ID	CABLE
Product	MYLINK (1)	DWNWRTSI	
Housing	PLASTICS		
Power Supply	AC 115V		
Operation Freq.	433.56 MHz		
Device Type	Periodic Operation		

(1) EUT submitted for grant.

1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-2009 at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at Hillsborough, New Jersey. This site has been accepted by FCC to perform measurements under Part 15 or 18 in a letter dated May 19, 1997 (Refer to: 31040/PRV 1300F2). The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

1.6 Test Equipment

Manufacture	Model	Serial No.	Description	Cal Due dd/mm/yy
Hewlett-Packard	HP8546A	3448A00290	EMI Receiver	15/10/15
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	15/01/15
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	15/01/15
Fischer Custom	LISN-1	900-4-0008	Line Impedance Stabilization Networks	18/03/15
Fischer Custom	LISN-2	900-4-0009	Line Impedance Stabilization Networks	24/03/15
EMCO	3115	4945	Double Ridge Guide Horn Antenna	22/01/15
Agilent	E4440A	US40420700	PSA Spectrum Analyzer	25/08/15

All Test Equipment Used are Calibrated Traceable to NIST Standards.

1.7 Statement for the Document Use

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2. PRODUCT LABELING

SOMFY mylink Model: 1811264

FCC ID: DWNWRTSI IC: 12049A-WRTSI
Contains FCC:SJ94100 IC: 4979A-4100

This device complies with part 15 of the FCC Rules. Operating is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Figure 2.1 FCC ID Label (statement shown in the manual)

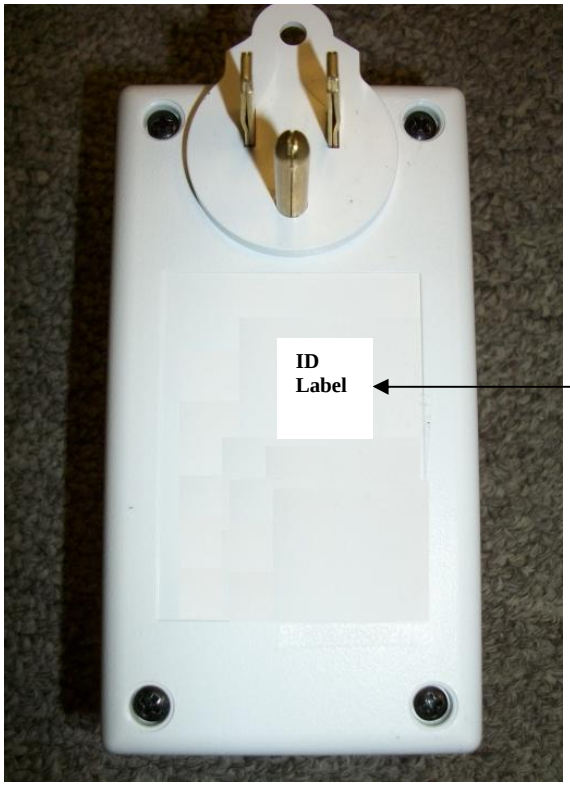


Figure 2.2 FCC ID and IC Label Location

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The product was configured for testing in a typical fashion (as a customer would normally use it). Its antenna is permanently connected to PCB.

For this certification, the RTX module drives an external RF circuit whose carrier frequency is 433.42 Mhz +/- 100 Khz. The power level of the RF circuit has been set to operate at the level described in FCC 15.231(e). It does not send data.

In manual mode, the transmission does stop when the button is released after the completion of the frame. This time is within 5 seconds.

In automatics mode, the transmission duration is less than 0.4s. The minimum interval between transmissions is greater than 10s.

Emission test was performed as 433.42MHz Tx was operated continuously .

This product also contains RTX4140-IN module from the RTX corporation, which transmits 802.11 b/g/n at the power levels shown in its certification. It is FCC/IC certified with the following ID's: FCC:SJ94100 & IC: 4979A-4100.

This WiFi Module and 433.42 MHz Transmitter will not transmit the signals simultaneously.

3.2 Special Accessories

N/A

3.3 Configuration of Tested System

Figure 3.x illustrate this system, which is tested standing along.

Figure 3.1 Radiated Test Setup

Figure 3.2 Conducted Test Setup

4. SYSTEM SCHEMATICS

See Attachment.

Figure 4.1 System Schematics

5. CONDUCTED EMISSION DATA

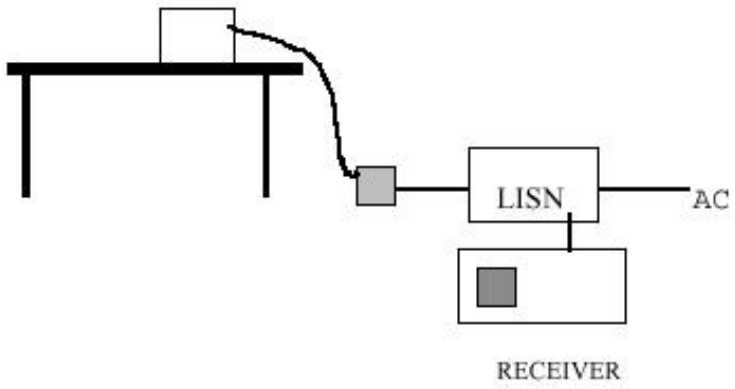
5.1 Test Methods and Conditions

The EUT was under normal operational mode during the conducted emission test. EMI Receiver was scanned from 150KHz to 30MHz with maximum hold mode for maximum emission. Recorded data was sent to the plotter to generate output in linear format. At the input of the spectrum analyzer, a HP transient limiter is inserted for protective purpose. This limiter has a 10 dB attenuation in the range of 150KHZ to 30MHZ. That factor was automatically compensated by the receiver, so the readings are the corrected readings. The reference of the plot is the CISPR 22 Class B limit in Figure 5.1 through Figure 5.2.

Conducted Emission Technical Requirements				
	Class A		Class B	
Frequency Range	Quasi-Peak dBuV	Average dBuV	Quasi-Peak DBuV	Average dBuV
150kHz –0.5MHz	79 (8912uV)	66 (1995uV)	66-56	56-46
0.5MHz-30MHz	73 (4467uV)	60 (1000uV)	---	---
0.5MHz- 5MHz	---	---	56	46 (250uV)
5MHz-30MHz	---	---	60	50

Emissions that have peak values close to the specification limit (if any) are also measured in the quasi-peak mode to determine compliance.

5.2 Measurement Instrument Configuration for Conducted Emission



5.3 Testing Data

The following plots show the neutral and line conducted emissions for the typical operation condition (Transmitting and receiving). The conducted test data shows the worst case emissions still below the FCC Part 15/CISPR22 Class B limits.

Operation Mode: Normal

Highest Data for AC Main Conducted Emissions						
Frequency (KHz)	150	160	170	180	2490	
Peak Reading (dBuV) from Line*	44.55	43.17	41.88	41.52	36.6	
Frequency (KHz)	160	170	180	290	2420	
Peak Reading(dBuV) from Neutral *	43.52	43.13	41.14	36.82	38.30	

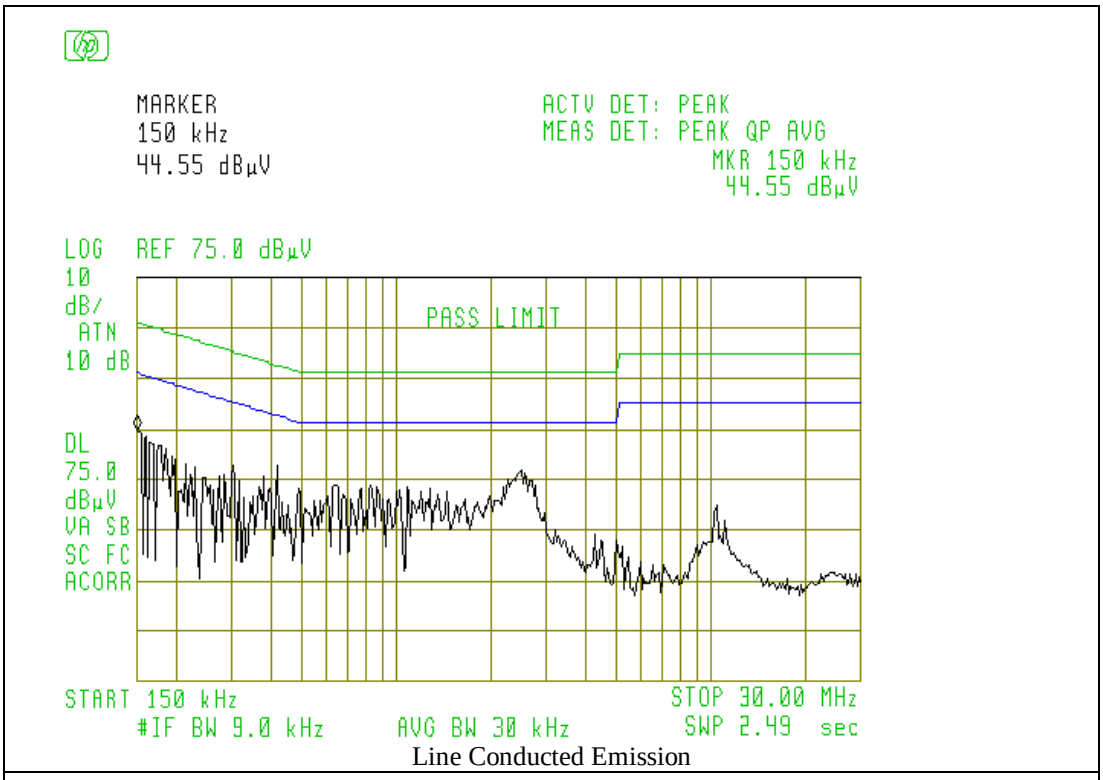
Figure 5.1-5.2 show the neutral and line conducted emissions for the standard operation.

Test Personnel:

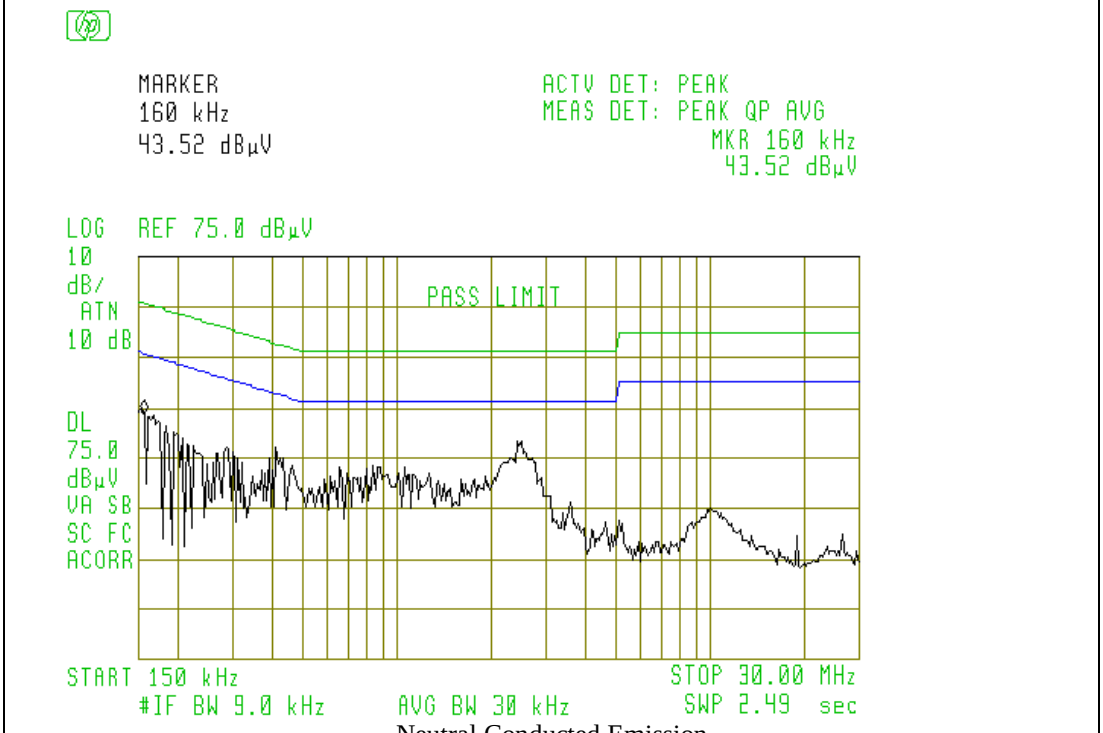
Tester Signature  Date November 12, 2014

Typed/Printed Name: Edward Lee

Operation Mode: Normal



Line Conducted Emission



Neutral Conducted Emission

6. RADIATED EMISSION DATA

6.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

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

where FS: Corrected Field Strength in dBμV/m
RA: Amplitude of EMI Receiver before correction in dBμV
AF: Antenna Factor in dB/m
CF: Cable Attenuation Factor in dB
AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

The pulse train timing plots are showed in Figure 6.2.
The pulse train timing plots as follows:
The total time for each pulse train is 139.62 ms, The short pulse is 0.640ms, The middle pulse is 2.5 ms, The long pulse is 4.8ms.
Coeff. =(55x0.640+1x4.8+5x2.5)/100=0.525
The maximum average field strength should be 0.525 of the peak field strength measured. So we use peak value minus 5.6dB as calculated maximum average field strength.

6.2 Test Methods and Conditions

The initial step in collecting radiated data is a EMI Receiver scan of the measurement range below 30MHz using peak detector and 9KHz IF bandwidth / 30KHz video bandwidth. For the range under 1GHz, 120KHz IF bandwidth / 120KHz video bandwidth are used. Both bandwidths are 1MHz for above 1GHz measurement. Frequency range from 9KHz up to 10th harmonics were investigated.

6.3 Test Data

The following data lists the significant emission frequencies, polarity and position, peak reading of the EMI Receiver, the FCC limit, and the difference between the peak reading and the limit. Explanation of the correction and calculation are given in section 6.1.

Test Personnel: 

Typed/Printed Name: Edward Lee Date: November 12, 2014

Radiated Test Data

Freq. (MHz)	Worst H/V	Height. (m)	Azimuth	Peak@3m (dBuV/m)	QP/Avg @3m (dBuV/m)		QP /Avg. Lim (dBuV/m)		QP /Avg.Mar. (dBuV/m)
433.42	HZ(1)	1.1	190	76.2	70.6		72.1(3)		-1.4
866.84	HZ	1.2	230	40.7	35.1		52.1(4)		-17
1300.3	HZ	1.1	260	48.2	42.6		54.0(2)		-11.4
1733.7	HZ	1.1	250	50.6	45		54.0		-9
2167.1	HZ	1.0	240	44.1	38.5		54.0		-15.5
2600.5	HZ	1.1	270	46.2	40.6		54.0		-13.4
433.42	VZ	1.1	180	73.8	68.2		72.1		-3.9
866.84	VZ	1.0	190	39.2	33.6		52.1		-18.5
1300.3	VZ	1.1	000	50.9	45.3		54.0		-8.7
1733.7	VZ	1.0	020	52.6	47		54.0		-7
2167.1	VZ	1.0	190	46.8	41.2		54.0		-12.8
2600.5	VZ	1.0	180	48.3	42.7		54.0		-11.3

(1) See Figure 3.1. Only vertical orientation, Z, applied to this product.
(2) Restricted band.
(3) Fundamental limit is 1500-5000 microvolts/meter linear interpolations (average reading) for 260-470 MHz fundamental frequency range; 4390uV/m for 433.4MHz Fundamental. Per FCC 15.231(e) & RSS-210 Annx1
(4) Spurious limit is 150-500 microvolts/meter linear interpolations (average reading). Per 15.231(e) & RSS-210 Annx1

6.4 Occupied Bandwidth

The bandwidth of the emission shall be no wider than 0.25% of the center frequency, in this case, 1.0835Hz(433.42x0.25%). Bandwidth is determined at the points 20dB down from the modulated carrier or by containing 99% of the total power of the signal. The occupied bandwidth plots are given as following.

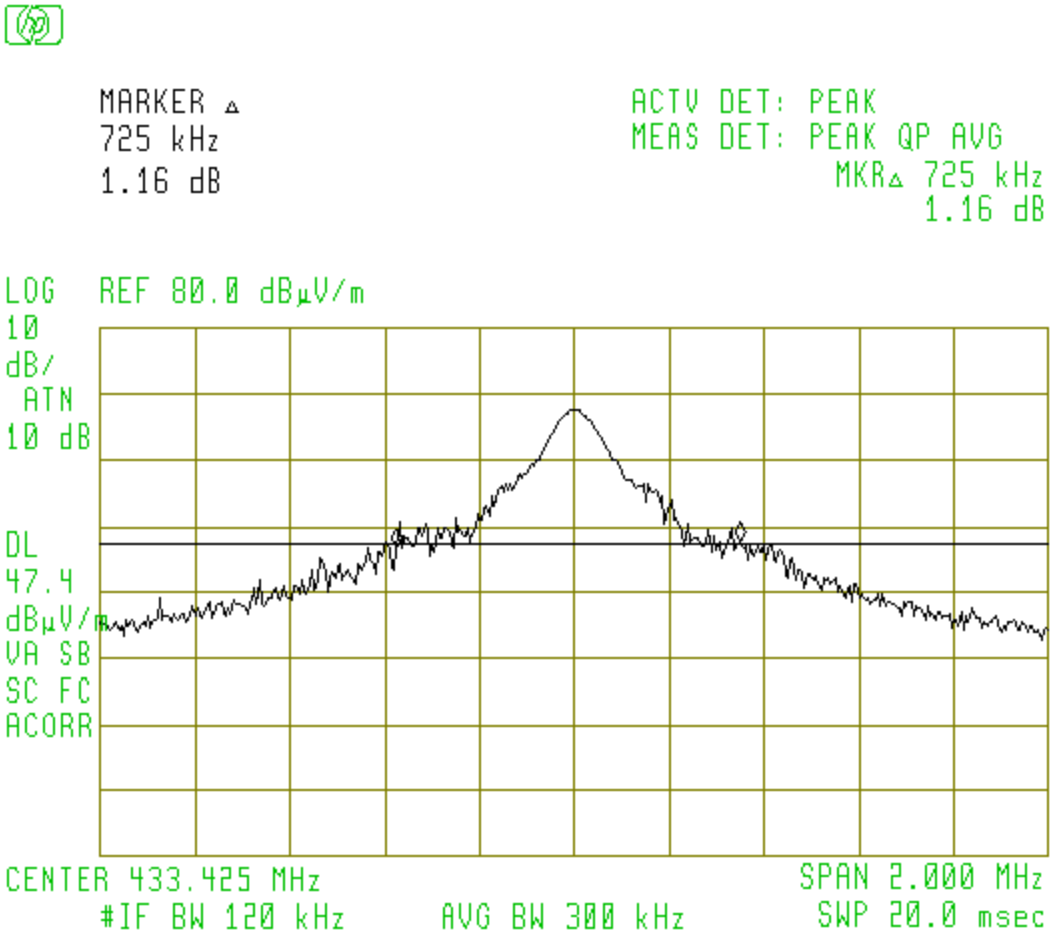


Figure 6.1-1 20 dB Occupied Bandwidth

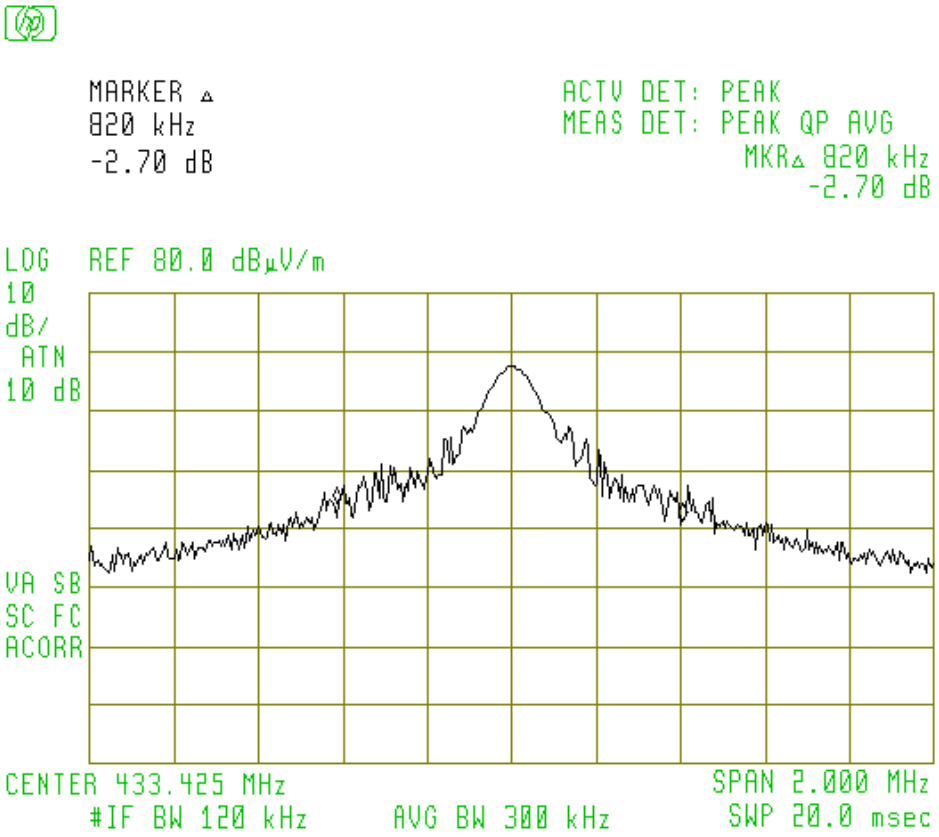
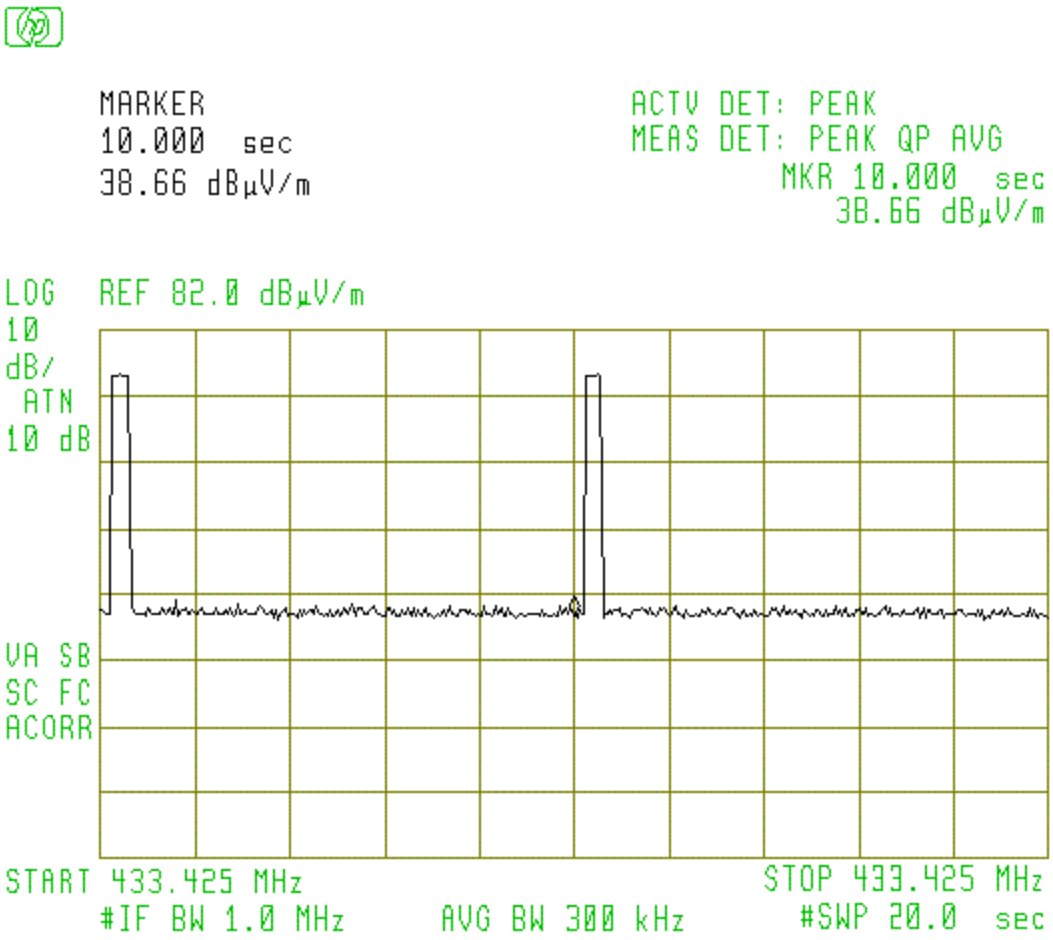
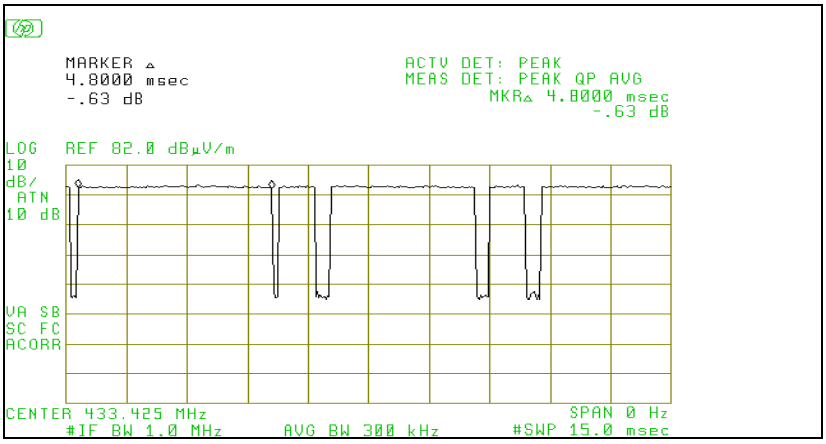


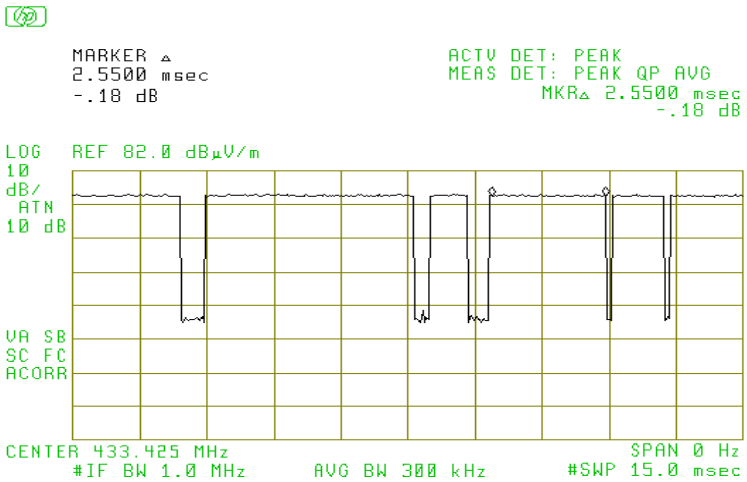
Figure 6.1-2 99% Bandwidth



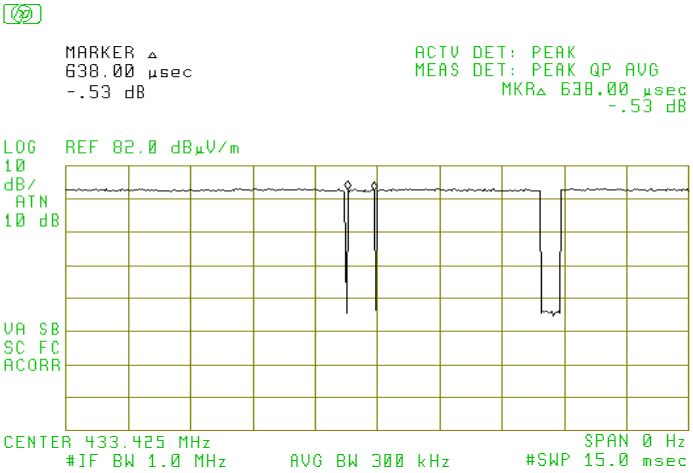
Tx period <0.4s, interval >=10s



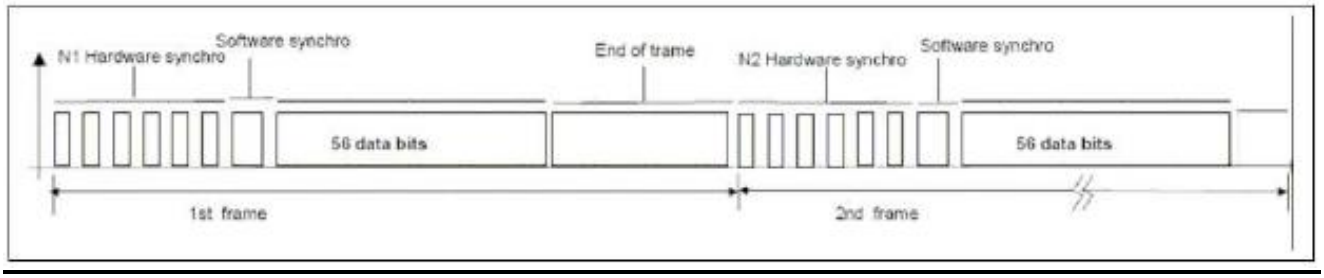
Plot for 4.8ms Pulse



Plot for 2.5ms Pulse



Plot for 0.640ms Pulse



Details and calculations are provided in Operational Description File:

The pulse train timing plots are showed in Figure 6.2 and attached operation description file, which explains how the worst case time in 100ms was determined:
The total time for each pulse train is 139.62 ms, The short pulse is 0.640ms, The middle pulse is 2.5 ms, The long pulse is 4.8ms.
Coeff. =(55x0.640+1x4.8+5x2.5)/100=0.525
The maximum average field strength should be 0.525 of the peak field strength measured. So we use peak value minus 5.6dB as calculated maximum average field strength.

Figure 6.2 Pulse Train Timing