

FCC PART 15.249

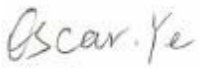
TEST REPORT

For

Playday Manufacturers Group Ltd

Room 245, 2/F, Houston Centre, 63 Mody Road, TST East, Kowloon, Hong Kong

FCC ID: 2AB6924GT

Report Type: Original Report	Product Type: Radio Control Vehicle
Report Number: RSZ170426830-00	
Report Date: 2017-05-11	
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Reviewed By: Engineer	
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Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Playday Manufacturers Group Ltd*'s product, model number: 81624CB (FCC ID: 2AB6924GT) or the "EUT" in this report was a *Radio Control Vehicle*, which was measured approximately: 11.5 mm (L) * 8.0 mm (W) * 5.0 mm (H), rated with input voltage: DC 2*1.5V battery.

Notes: This series products model: 81624CB and 81624 are identical schematics and only are different for model name. Model 81624CB was selected for fully testing, the detailed information can be referred to the attached declaration which was stated and guaranteed by the applicant.

**All measurement and test data in this report was gathered from production sample serial number: 20170426 (Assigned by BACL, Kunshan). The EUT supplied by the applicant was received on 2017-04-26.*

Objective

This report is prepared on behalf of *Playday Manufacturers Group Ltd* in accordance with Part 2-Subpart J, and Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209, 15.215 and 15.249 rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		± 3.26 dB
RF conducted test with spectrum		± 0.9 dB
RF Output Power with Power meter		± 0.5 dB
Radiated emission	30MHz~1GHz	± 5.91 dB
	Above 1G	± 4.92 dB
Occupied Bandwidth		± 0.5 kHz
Temperature		± 1.0 °C
Humidity		$\pm 6\%$

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in engineering mode.

EUT Exercise Software

No software was used.

Equipment Modifications

No modifications were made to the unit tested.

Support Equipment List and Details

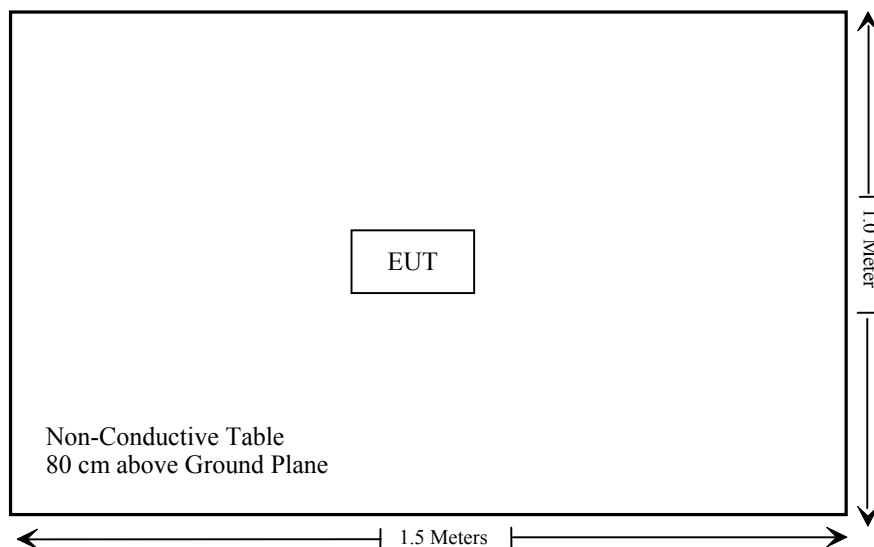
Manufacturer	Description	Model	Serial Number
N/A	N/A	N/A	N/A

External I/O Cable

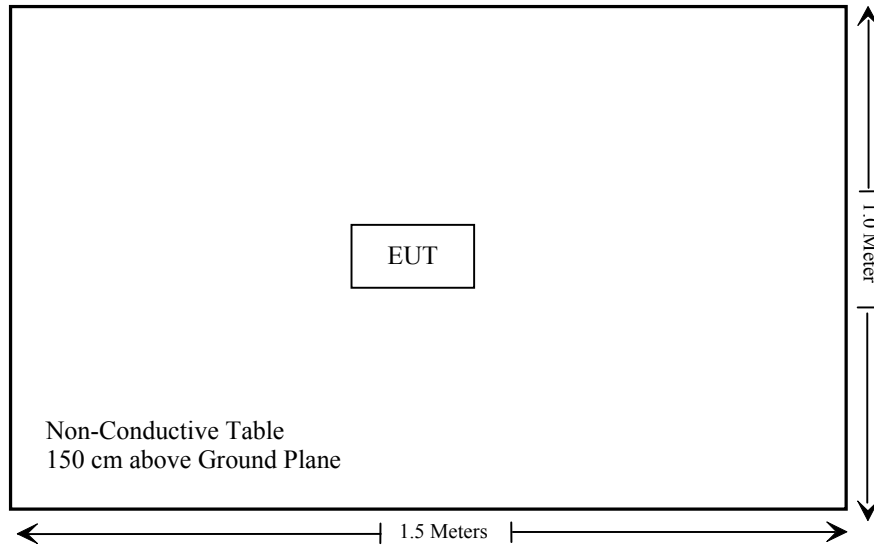
Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup

For radiated emission below 1GHz



For radiated emission Above 1GHz



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 15.203	Antenna Requirement	Compliance
§ 15.207(a)	Conduction Emissions	Not Applicable
15.205, § 15.209, § 15.249	Radiated Emissions	Compliance
§ 15.215 (c)	20 dB Bandwidth	Compliance

Note: EUT power supply by battery

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiation test					
Sonoma Instrument	Amplifier	330	171377	2016-12-12	2017-12-12
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-25
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-09-08	2017-09-08
EMCO	Horn Antenna	3116	00084159	2016-10-18	2019-10-17
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-25
ETS	Horn Antenna	3115	6229	2016-01-11	2019-01-10
R&S	Auto test Software	EMC32	V 09.10.0	NCR	NCR
haojintech	Coaxial Cable	Cable-1	001	2016-12-12	2017-12-12
haojintech	Coaxial Cable	Cable-2	002	2016-12-12	2017-12-12
haojintech	Coaxial Cable	Cable-3	003	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-12-12	2017-12-12
RF Conducted test					
BACL	TS 8997 Cable-01	T-KS-EMC086	T-KS-EMC086	2016-12-09	2017-12-08
BACL	RF cable	KS-LAB-012	KS-LAB-012	2016-12-15	2017-12-15
WEINSCHL	3dB Attenuator	5326	N/A	2016-06-18	2017-06-18
Agilent	Power Meter	N1912A	MY5000492	2016-11-17	2017-11-16
Agilent	Power Sensor	N1921A	MY54210024	2016-11-17	2017-11-16
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2016-09-21	2017-09-21

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has an internal monopole antenna, which the antenna gain is 0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

FCC§15.205, §15.209 & §15.249 - RADIATED EMISSIONS**Applicable Standard**

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

Test Equipment Setup

The spectrum analyzer or receiver is set as:

Below 1000MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

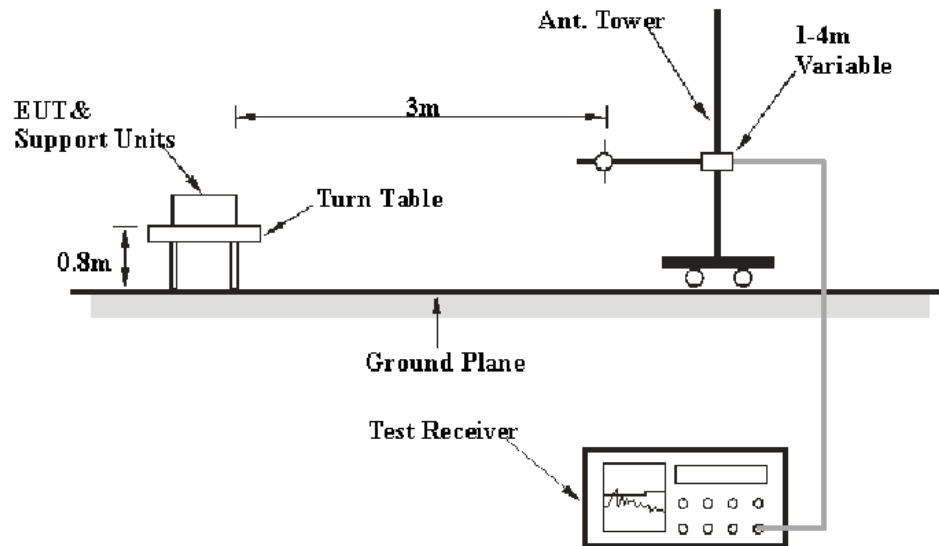
Above 1000MHz:

Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto

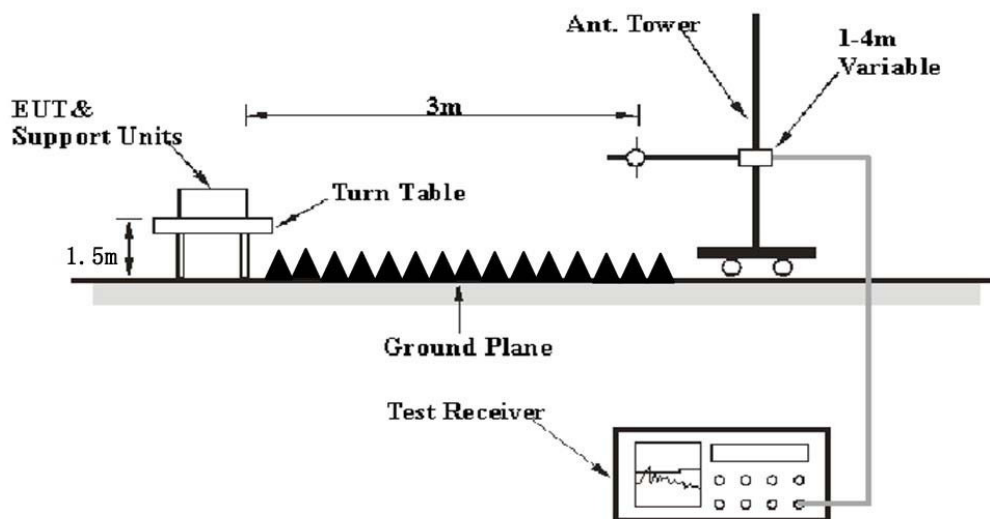
Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

EUT Setup

Below 1G:



Above 1GHz:



The radiated emission and out of band emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC part 15.209, 15.205 and FCC part 15.249 limits.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter above ground plane for below 1GHz and 1.5 meter above ground plane for above 1GHz, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.205, 15.209 & §15.249

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{\text{lim}} + U_{\text{cispr}}$$

In BAEL, $U_{(Lm)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Layne Li on 2017-05-11.

30 MHz to 25 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/15.205/15.209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel									
481.36	33.63	QP	24	2.1	H	-7.21	26.42	46	19.58
2411.00	95.88	PK	172	2.1	H	-6.19	89.69	114	24.31
2411.00	74.3	Ave.	172	2.1	H	-6.19	68.11	94	25.89
2411.00	91.23	PK	356	2.5	V	-6.19	85.04	114	28.96
2411.00	70.13	Ave.	356	2.5	V	-6.19	63.94	94	30.06
2341.58	67.36	PK	329	2.4	H	-6.42	60.94	74	13.06
2341.58	54.3	Ave.	329	2.4	H	-6.42	47.88	54	6.12
2371.24	68.38	PK	247	1.4	H	-6.19	62.19	74	11.81
2371.24	54.18	Ave.	247	1.4	H	-6.19	47.99	54	6.01
4822.00	64.83	PK	101	2.0	V	1.6	66.43	74	7.57
4822.00	41.72	Ave.	101	2.0	V	1.6	43.32	54	10.68
Middle Channel									
481.36	34.98	QP	142	2.2	H	-7.21	27.77	46	18.23
2443.00	95.14	PK	173	1.6	H	-6.19	88.95	114	25.05
2443.00	74.7	Ave.	173	1.6	H	-6.19	68.51	94	25.49
2443.00	89.5	PK	276	1.0	V	-6.19	83.31	114	30.69
2443.00	68.68	Ave.	276	1.0	V	-6.19	62.49	94	31.51
4886.00	63.95	PK	249	1.5	H	1.83	65.78	74	8.22
4886.00	43.17	Ave.	249	1.5	H	1.83	45.00	54	9
High Channel									
481.36	34.17	Ave.	132	1.9	H	-7.21	26.96	46	19.04
2473.00	93.78	PK	160	2.5	H	-5.97	87.81	114	26.19
2473.00	73	Ave.	160	2.5	H	-5.97	67.03	94	26.97
2473.00	86.27	PK	56	1.2	V	-5.97	80.30	114	33.7
2473.00	65.7	Ave.	56	1.2	V	-5.97	59.73	94	34.27
2488.52	68.66	PK	94	1.9	H	-5.97	62.69	74	11.31
2488.52	53.83	Ave.	94	1.9	H	-5.97	47.86	54	6.14
2493.55	67.75	PK	48	2.2	H	-5.97	61.78	74	12.22
2493.55	53.83	Ave.	48	2.2	H	-5.97	47.86	54	6.14
4946.00	63.95	PK	31	2.2	H	1.83	65.78	74	8.22
4946.00	42.3	Ave.	31	2.2	H	1.83	44.13	54	9.87

Note:

Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

Corrected Amplitude = Corrected Factor + Reading

Margin = Limit - Corrected. Amplitude

The other spurious emission which is 20dB to the limit was not recorded.

FCC§15.215(c) - 20dB EMISSION BANDWIDTH**Applicable Standard**

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that indicated 20dB bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Data**Environmental Conditions**

Temperature:	23 °C
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

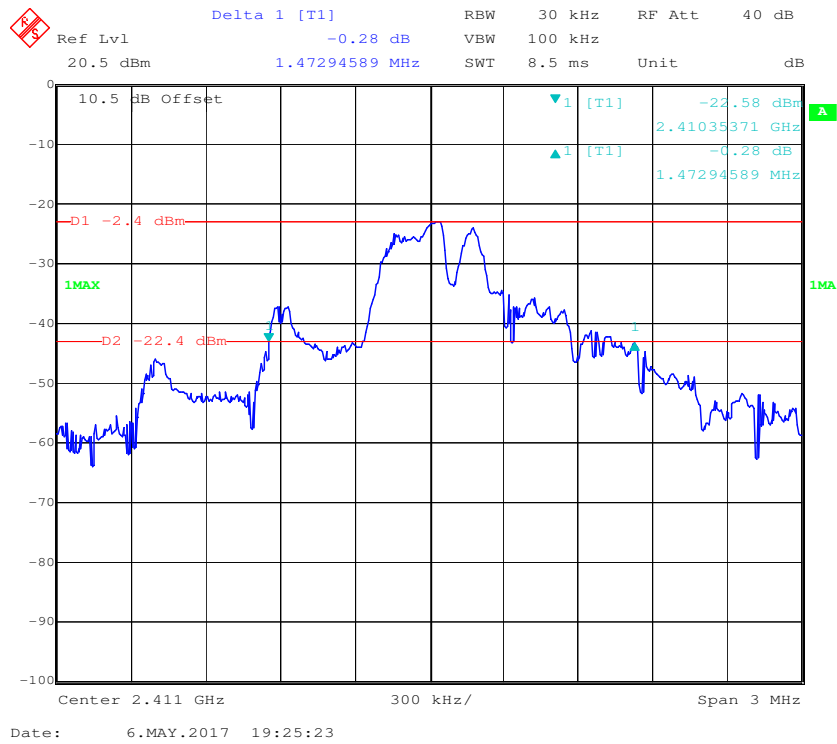
The testing was performed by Phil Zhu on 2017-05-06.

Please refer to the following table and plots.

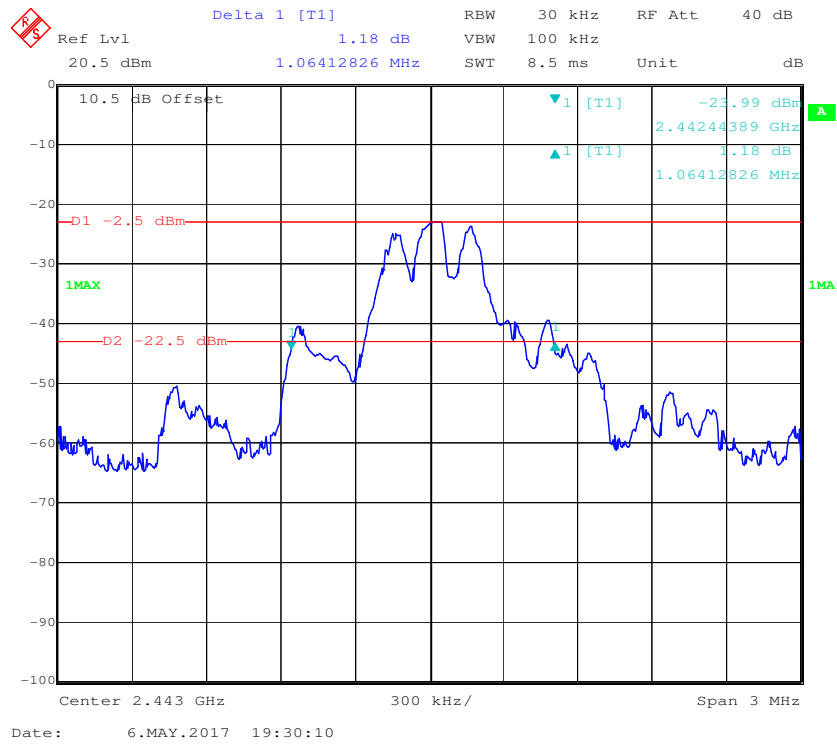
Test Mode: Transmitting

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
Low Channel	2411	1.473
Middle Channel	2443	1.064
High Channel	2473	0.559

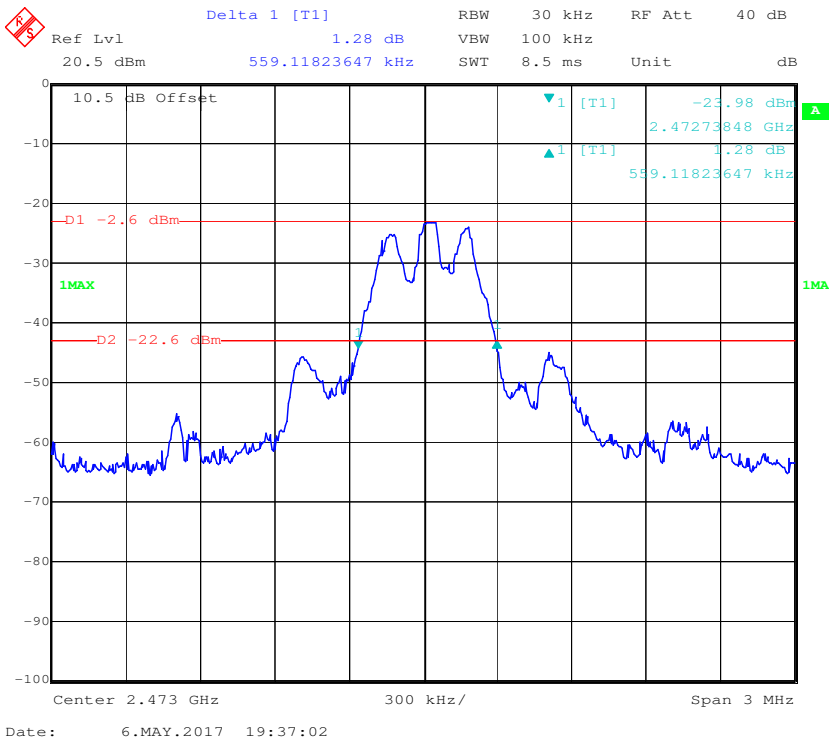
Low Channel



Middle Channel



High Channel



***** END OF REPORT *****