RADIO TEST REPORT

Product	**:**	ELPA
Model Name	**:**	EWS-P36
Test Regulation	**:**	Japan Radio Law Item 8 of Article 2 Paragraph 1
Received Date	**:**	Dec. 8, 2020
Test Date	**:**	Dec. 21, 2020 ~ Mar. 8, 2021
Issued Date	**:**	May. 3, 2021
Applicant	**:**	IQ Group Sdn. Bhd. (Representative Office) 5F.,NO.16, Lane 130, Ming-Chun Rd, Hsin Tien District,New Taipei City, Taiwan(R.O.C.)
Issued By	**:**	Underwriters Laboratories Taiwan Co., Ltd. Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

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REVISION HISTORY

Original Test Report No.: 4789585070-JP-R1-V0

Rev.	Test report No.	Date	Page revised	Contents
Original	4789585070-JP-R1-V0	May. 3, 2021	-	Initial issue

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1. Attestation of Test Results

APPLICANT:	IQ Group Sdn. Bhd. (Representative Office) 5F.,NO.16, Lane 130, Ming-Chun Rd, Hsin Tien District,New Taipei City, Taiwan(R.O.C.)
MANUFACTURER:	IQ Group (Wu Ning) Ltd. Tongtuo Industrial Park, Wuning County, Jiujiang City, Jiangxi Province, China.
EUT DESCRIPTION:	ELPA
MODEL:	EWS-P36
SAMPLE STAGE:	Pilot-run Verification Test sample
DATE of TESTED:	Dec. 21, 2020 ~ Mar. 8, 2021

APPLICABLE STANDARDS	
STANDARD	**Test Results**
Radio Law Item 8 of Article 2 Paragraph 1	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Sally Lu Date : May. 3, 2021
Project Handler

Approved and Authorized By:

Mike Cai Date : May. 3, 2021
Engineer Project Associate

2. Summary of Test Results

Summary of Test Results		
Test Items	**MIC Notice**	**Test Result**
Frequency Range	Japan Radio Law Item 8 of Article 2 Paragraph 1	PASS
Occupied Bandwidth		PASS
Spreading Emission Intensity		PASS
Antenna Power		PASS
Secondary Radiated Emission		PASS
Transmission Time		PASS

3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with Japan Radio Law Item 8 of Article 2 Paragraph 1.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398. The full scope of accreditation can be viewed at http://accreditation.taftw.org.tw/taf/public/basic/viewApplyItems.action?unitNo=3398

5. Measurement Uncertainty

For statement of conformity, accuracy method (Section 8.2.4 and 8.2.5 of ISO Guide 98-4) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Test Item	Measurement Frequency Range	K	U(dB)
Radiated disturbance below 1 GHz	0.15MHz ~ 30MHz	2	5.4
Radiated disturbance above 1GHz	9 kHz - 40GHz	2	4.7

6. General Information

6.1. General Description of EUT

Product	ELPA
Model Name	EWS-P36
Operating Frequency	313.625MHz
Modulation	ASK
Transfer Rate	128kbps
Nominal Voltage	3Vdc
Number of Channel	1
EIRP Power	0.05409mW (82.56dBuV/m @3m)
Antenna Type	Refer to Note 1

Note:

1. The antenna used in this EUT is listed as below table:

Frequency	Type	Gain(dBi)
313.625MHz	Coil	-9.34

2. Test Information:

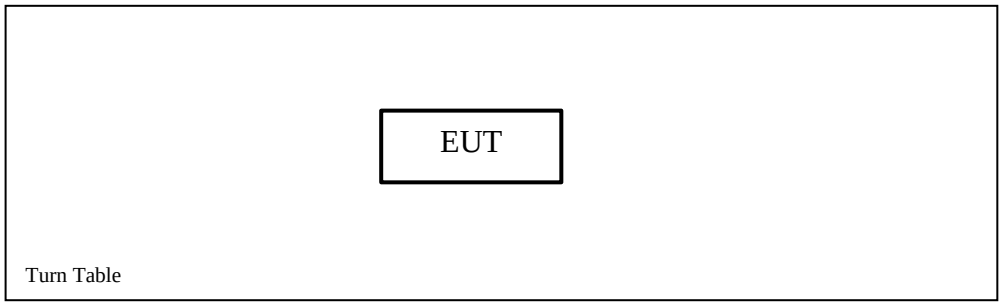
Test Item	Test Site No.	Environmental Condition	Input Power	Test Date	Tested by
Frequency Range	966-2	22~26°C / 63~68%RH	3Vdc	Dec. 21, 2020 ~ Dec. 23, 2020	Wayne Chen
Occupied Bandwidth	966-2	22~26°C / 63~68%RH	3Vdc	Dec. 21, 2020 ~ Dec. 23, 2020	Wayne Chen
Spreading Emission Intensity	966-2	22~26°C / 63~68%RH	3Vdc	Dec. 21, 2020 ~ Mar. 8, 2021	Wayne Chen
Antenna Power	966-2	22~26°C / 63~68%RH	3Vdc	Dec. 21, 2020 ~ Mar. 8, 2021	Wayne Chen
Secondary Radiated Emission	966-2	22~26°C / 63~68%RH	3Vdc	Dec. 21, 2020 ~ Mar. 8, 2021	Wayne Chen

6.2. Test Condition

Test Conditions	Voltage
Vnormal	3Vdc

Note: Since the input voltage to receiver RF circuit varies below ± 1% when the input voltage from the external power supply to the receiver varies ± 10%, therefore only execute normal condition test.

6.3. Configuration Figure



7. Test Instruments

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Calibration Authority	Cal. Interval
Spectrum Analyzer	Keysight	N9010A	MY56070834	Nov. 6, 2020 – Nov. 5, 2021	ITRI	1 year
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	Nov. 17, 2020 – Nov. 16, 2021	ETC	1 year
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	Jan. 3, 2020 – Jan. 2, 2021 Jan. 13, 2021 - Jan. 12, 2022	ETC	1 year
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	Jan. 3, 2020 – Jan. 2, 2021 Dec. 30, 2020 – Dec. 29, 2021	ITRI	1 year
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	Jun. 9, 2020 – Jun. 8, 2021	ETC	1 year
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	Feb. 4, 2020 – Feb. 3, 2021 Feb. 3, 2021 – Feb. 2, 2022	ETC	1 year
Cable	Hanyitek	K1K50-UP0264-K1K50-1000	04	Dec. 10, 2020 – Dec. 9, 2021	ETC	1 year
Signal Generator	Keysight	N5182B	MY56200244	Jan. 6, 2020 – Jan. 5, 2021 Jan. 15, 2021 – Jan. 14, 2022	ETC	1 year

Note:1
Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted bythe NICT or a designated calibration agency under Article 102-18 paragraph (1)
Note: 2
The test equipment was calibrated to ISO17025 by ETC.

8. Measurement Setup Configurations





9. Test Results

9.1. FREQUENCY & OCCUPIED BANDWIDTH

9.1.1 Requirements

The limitation of frequency error : 312MHz < f ≤ 315.25MHz.
Occupied bandwidth is less than 1MHz.

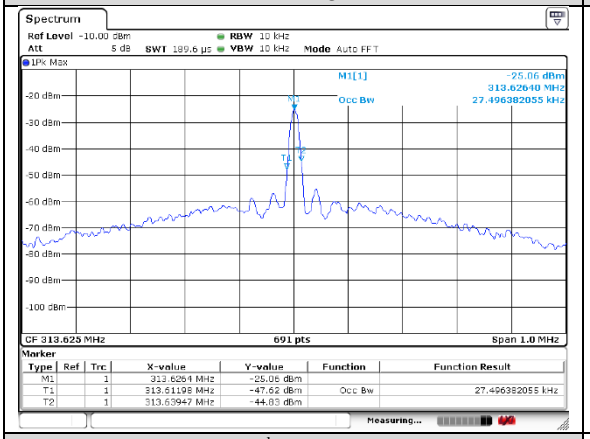
9.1.2 Test Result

Power Voltage	Center Freq. (MHz)	99% OBW (kHz)	Freq. Error (kHz)	Item	Result	Limit	Margin	Pass/Fail
DC 3V 1st Time	313.625	27.496	1.4	Freq. Error(Lower)	313.612MHz	>312MHz	1.612MHz	Pass
				Freq. Error(Upper)	313.639MHz	≤315.25MHz	1.624MHz	Pass
				Measurement Center Freq.	313.626MHz	NA	NA	NA
				99% OBW	27.496kHz	1MHz	972.054kHz	Pass
DC 3V 2nd Time	313.625	27.496	1.4	Freq. Error(Lower)	313.612MHz	>312MHz	1.612MHz	Pass
				Freq. Error(Upper)	313.639MHz	≤315.25MHz	1.624MHz	Pass
				Measurement Center Freq.	313.626MHz	NA	NA	NA
				99% OBW	27.496kHz	1MHz	972.054kHz	Pass
DC 3V 3th Time	313.625	24.602	1.4	Freq. Error(Lower)	313.613kHz	>312MHz	1.613MHz	Pass
				Freq. Error(Upper)	313.638kHz	≤315.25MHz	1.612MHz	Pass
				Measurement Center Freq.	313.626MHz	NA	NA	NA
				99% OBW	24.602kHz	1MHz	975.398kHz	Pass

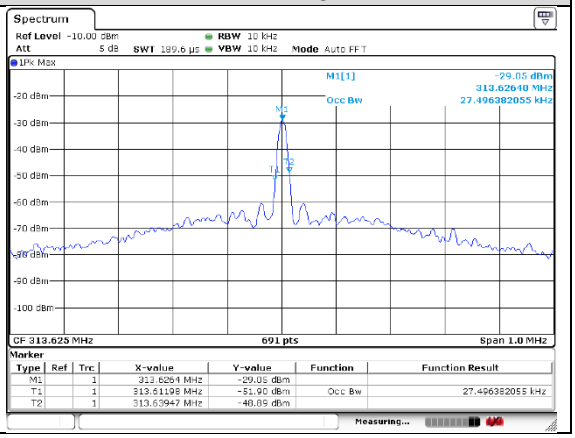
Note:
Measured Center Frequency = Center Frequency + Transmit Frequency Error

Test Data Plot

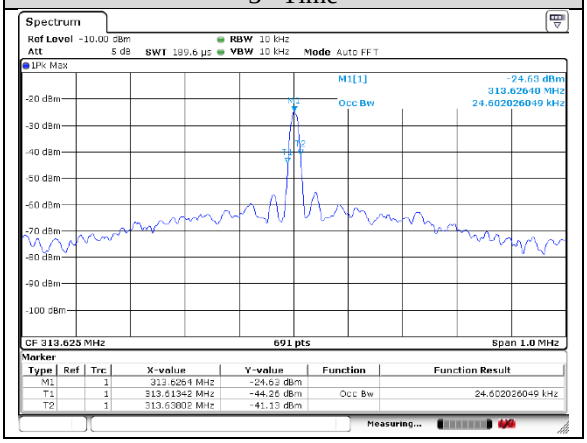
1st Time



2nd Time



3th Time



9.2. SPURIOUS EMISSION INTENSITY

9.2.1 Requirements

Frequency (MHz)	Limitation (dBm)
Below 1GHz	250nW/100kHz or less
Above 1GHz	1 μ W/1MHz or less

9.2.2 Test Results - Spurious Emission

V_{Normal}

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
137.67	23.33	23.85	-80.57	-80.45	0.32	-5.11	-86	-85.88	-36	50	49.88
159.98	24.59	22.89	-79.41	-81.51	0.34	-4.51	-84.26	-86.36	-36	48.26	50.36
191.99	22.28	22.11	-81.01	-81.2	0.39	-0.22	-81.62	-81.81	-36	45.62	45.81
313.625	82.33	82.56	-21.67	-21.34	0.5	0.94	-21.23	-20.9	-6	15.23	14.9
323.91	27.24	28.72	-77.46	-75.38	0.5	0.92	-77.04	-74.96	-36	41.04	38.96
627.52	34.59	31.11	-70.41	-74.69	0.67	0.86	-70.22	-74.5	-36	34.22	38.5
704.15	30.12	36.71	-75.68	-68.29	0.74	0.96	-75.46	-68.07	-36	39.46	32.07
940.83	44.53	39.38	-60.67	-65.62	0.87	0.58	-60.96	-65.91	-36	30.96	35.91
2509.01	51.69	45.02	-51.91	-59.08	1.48	10.7	-42.69	-49.86	-30	12.69	19.86
2638.22	44.98	46.75	-59.02	-57.45	1.66	10.9	-49.78	-48.21	-30	19.78	18.21
3136.25	43.21	44.01	-61.29	-60.79	1.65	11.1	-52.05	-51.55	-30	22.05	21.55

Note 1: Result = SG Reading – Cable Loss + Antenna Gain

$V_{+10\%}$

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
137.68	23.08	23.79	-80.82	-80.51	0.32	-5.11	-86.25	-85.94	-36	50.25	49.94
159.97	24.42	22.8	-79.58	-81.6	0.34	-4.51	-84.43	-86.45	-36	48.43	50.45
191.98	22.24	22.01	-81.1	-81.19	0.39	-0.22	-81.71	-81.8	-36	45.71	45.8
313.625	82.17	82.4	-21.83	-21.5	0.5	0.94	-21.39	-21.06	-6	15.39	15.06
323.9	27.14	28.72	-77.56	-75.38	0.5	0.92	-77.14	-74.96	-36	41.14	38.96
627.51	34.46	30.88	-70.54	-74.92	0.67	0.86	-70.35	-74.73	-36	34.35	38.73
704.14	30.02	36.63	-75.78	-68.37	0.74	0.96	-75.56	-68.15	-36	39.56	32.15
940.84	44.5	39.2	-60.7	-65.8	0.87	0.58	-60.99	-66.09	-36	24.99	30.09
2509.02	51.53	44.87	-52.07	-59.23	1.48	10.7	-42.85	-50.01	-30	12.85	20.01
2638.23	44.86	46.61	-59.14	-57.59	1.66	10.9	-49.9	-48.35	-30	19.9	18.35
3136.26	42.99	43.77	-61.51	-61.03	1.65	11.1	-52.06	-51.58	-30	22.06	21.58

Note 1: Result = SG Reading – Cable Loss + Antenna Gain

$V_{-10\%}$

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
137.69	23.31	23.6	-80.59	-80.7	0.32	-5.11	-86.02	-86.13	-36	50.02	50.13
159.99	24.58	22.89	-79.42	-81.51	0.34	-4.51	-84.27	-86.36	-36	48.27	50.36
191.97	22.18	21.95	-81.11	-81.38	0.39	-0.22	-81.72	-81.99	-36	45.72	45.99
313.625	82.27	82.43	-21.73	-21.47	0.5	0.94	-21.29	-21.03	-6	15.29	15.03
323.93	27.22	28.59	-77.48	-75.51	0.5	0.92	-77.06	-75.09	-36	41.06	39.09
627.53	34.47	30.92	-70.53	-74.88	0.67	0.86	-70.34	-74.69	-36	34.34	38.69
704.15	30	36.66	-75.8	-68.34	0.74	0.96	-75.58	-68.12	-36	39.58	32.12
940.86	44.52	39.24	-60.68	-65.76	0.87	0.58	-60.97	-66.05	-36	24.97	30.05
2509.04	51.51	44.95	-52.09	-59.15	1.48	10.7	-42.87	-49.93	-30	12.87	19.93
2638.24	44.92	46.56	-59.08	-57.64	1.66	10.9	-49.84	-48.4	-30	19.84	18.4
3136.28	43.04	43.82	-61.46	-60.98	1.65	11.1	-52.01	-51.53	-30	22.01	21.53

Note 1: Result = SG Reading – Cable Loss + Antenna Gain

9.2.3 Test Results - Bandedge Emission

V_{Normal}

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
311.972	34.72	28.55	-69.38	-76.45	0.5	0.94	-68.94	-76.01	-36	32.94	40.01
315.967	32.00	28.72	-73	-75.78	0.5	0.94	-72.56	-75.34	-36	36.56	39.34

Note 1: Result = SG Reading – Cable Loss + Antenna Gain

$V_{+10\%}$

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
311.971	34.63	28.5	-69.47	-76.5	0.5	0.94	-69.03	-76.06	-36	33.03	40.06
315.968	31.98	28.63	-73.02	-75.87	0.5	0.94	-72.58	-75.43	-36	36.58	39.43

Note 1: Result = SG Reading – Cable Loss + Antenna Gain

$V_{-10\%}$

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
311.972	34.64	28.48	-69.46	-76.52	0.5	0.94	-69.02	-76.08	-36	33.02	40.08
315.969	31.98	28.58	-73.02	-75.92	0.5	0.94	-72.58	-75.48	-36	36.58	39.48

Note 1: Result = SG Reading – Cable Loss + Antenna Gain

9.3. ANTENNA POWER

9.3.1 Requirements

EIRP less than -6 dBm

9.3.2 Test Result

V_{Normal}

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
313.625	82.33	82.56	-21.67	-21.34	0.5	0.94	-21.23	-20.9	-6	15.23	14.9

Note 1: Result = SG Reading – Cable Loss + Antenna Gain

$V_{+10\%}$

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
313.625	82.17	82.4	-21.83	-21.5	0.5	0.94	-21.39	-21.06	-6	15.39	15.06

Note 1: Result = SG Reading – Cable Loss + Antenna Gain

$V_{-10\%}$

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
313.625	82.27	82.43	-21.73	-21.47	0.5	0.94	-21.29	-21.03	-6	15.29	15.03

Note 1: Result = SG Reading – Cable Loss + Antenna Gain

9.4. SECONDARY RADIATED EMISSION

9.4.1 Requirements

EIRP less than -54 dBm

9.4.2 Test Result

V_{Normal}

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
313.625	20.23	20.2	-83.65	-83.67	0.5	0.94	-83.21	-83.23	-54	29.21	29.23

Note 1: Result = SG Reading – Cable Loss + Antenna Gain
Note 2: The noise level was too low to be measured. The level the noise floor was measured for reference.

$V_{+10\%}$

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
313.625	20.07	20.15	-83.81	-83.72	0.5	0.94	-83.37	-83.28	-54	29.37	29.28

Note 1: Result = SG Reading – Cable Loss + Antenna Gain
Note 2: The noise level was too low to be measured. The level the noise floor was measured for reference.

$V_{-10\%}$

Freq. (MHz)	Rx SA/TR Reading (dBuV/m)		Tx SG Reading (dBm)		Tx Cable Loss (dB)	Tx Ant Gain (dBi)	Result EIRP(dBm)		Limit (dBm)	Margin (dB)	
	H	V	H	V			H	V		H	V
313.625	20.09	20.12	-83.79	-83.75	0.5	0.94	-83.35	-83.31	-54	29.35	29.31

Note 1: Result = SG Reading – Cable Loss + Antenna Gain
Note 2: The noise level was too low to be measured. The level the noise floor was measured for reference.

9.5. TRANSMISSION TIME

9.5.1 Requirements

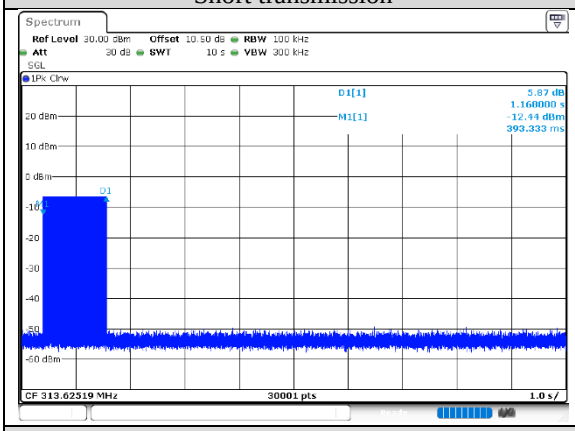
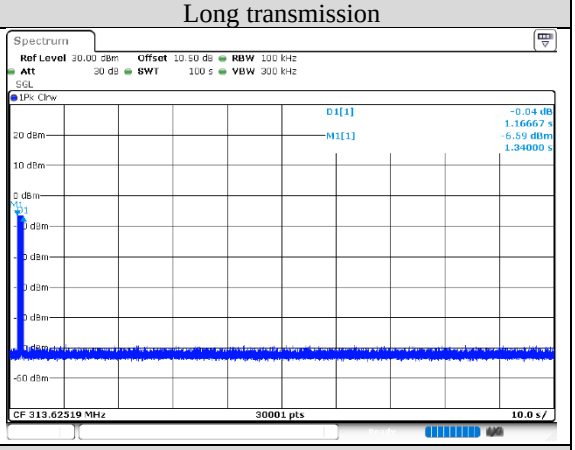
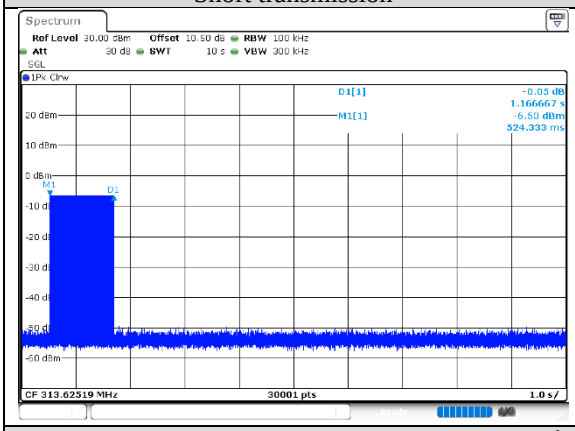
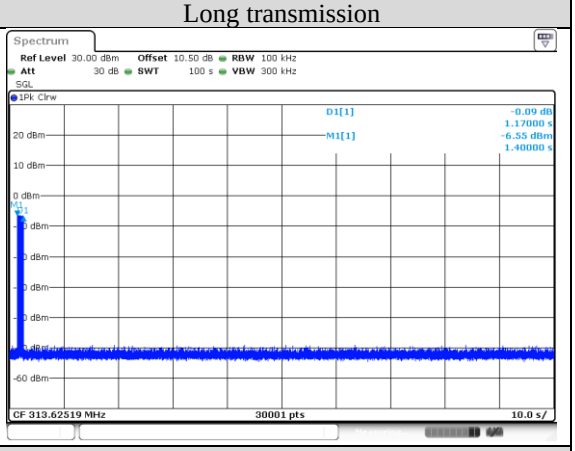
Short transmission less than 5s; Long transmission press less than 90s

9.5.2 Test Result

Power Voltage	Type	Limit	Result(s)	Pass/Fail
DC 3V 1st Time	Short transmission	<5s	1.168	Pass
	Long transmission	<90s	1.16667	Pass
DC 3V 2nd Time	Short transmission	<5s	1.166667	Pass
	Long transmission	<90s	1.17	Pass
DC 3V 3th Time	Short transmission	<5s	1.165333	Pass
	Long transmission	<90s	1.16667	Pass

Note: The EUT has a switch that can switch between short and long transmission.

Test Data Plot

1st Time	
Short transmission	Long transmission
	
2nd Time	
Short transmission	Long transmission
	
3th Time	
Short transmission	Long transmission
