

FCC Test Report

FCC ID	:	PRDMU58
Equipment	:	Acer Wireless Optical Mouse
Model No.	:	AMR800
Brand Name	:	acer
Applicant	:	ACROX Technologies Co., Ltd.
Address	:	4F., No.89, Minshan St., Neihu Dist., Taipei City 114, Taiwan, R.O.C.
Standard	:	47 CFR FCC Part 15.249
Received Date	:	Dec. 22, 2017
Tested Date	:	Jan. 02 ~ Jan. 03, 2018

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

Approved by:

ong Cher





Along Cherly/ Assistant Manager Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FR7D2202	Rev. 01	Initial issue	Jan. 30, 2018



Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emissions	Note	N/A
15.249(a)	Field Strength of Fundamental	Meet the requirement of limit	Pass
15.249(a)(d)	Field Strength of Harmonics and Emissions Radiated outside of the Specified Frequency Bands	Meet the requirement of limit	Pass
15.215(c)	20dB bandwidth	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass
Note: The EUT c	onsumes DC power from battery, therefore this t	est is not required.	



1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information							
Frequency Range (MHz)	Modulation	Ch. Freq. (MHz)	Channel Number	Channel Bandwidth (MHz)			
2400-2483.5	FSK	2408-2474	1-34 [34]	2			

1.1.2 Antenna Details

Ant. No.	Туре	Gain (dBi)	Connector
1	Printed	-1.55	N/A

1.1.3 EUT Operational Condition

Power Supply TypeDC 3V (1.5Vdc AAA battery x2)

Note: The equipment tests are performed using a new battery.

1.1.4 Accessories

N/A



1.1.5 Channel List

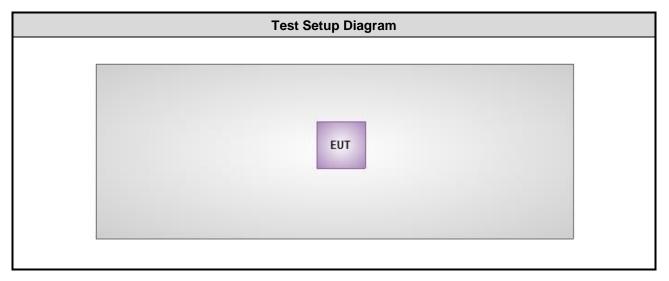
	Frequency	band (MHz)			2400~2	2483.5	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2408	10	2426	19	2444	28	2462
2	2410	11	2428	20	2446	29	2464
3	2412	12	2430	21	2448	30	2466
4	2414	13	2432	22	2450	31	2468
5	2416	14	2434	23	2452	32	2470
6	2418	15	2436	24	2454	33	2472
7	2420	16	2438	25	2456	34	2474
8	2422	17	2440	26	2458		
9	2424	18	2442	27	2460		



1.2 Local Support Equipment List

	Support Equipment List							
No.	Equipment	Brand	Model	S/N	FCC ID	Signal cable / Length (m)		
1								

1.3 Test Setup Chart





The Equipment List 1.4

6 chamber 3 / (03Cl n. 02, 2018 Manufacturer R&S R&S SCHWARZBECK	Model No. FSV40 ESR3	Serial No. 101498	Calibration Date Dec. 04, 2017	Calibration Until
Manufacturer R&S R&S	FSV40 ESR3	101498		Calibration Until
R& S R& S	FSV40 ESR3	101498		Calibration Until
R& S	ESR3		Dec. 04 2017	
			200.01,2011	Dec. 03, 2018
CHWARZBECK		101658	Nov. 20, 2017	Nov. 19, 2018
	VULB9168	VULB9168-685	Apr. 28, 2017	Apr. 27, 2018
CHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Feb. 09, 2017	Feb. 08, 2018
CHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 23, 2017	Nov. 22, 2018
R&S	HFH2-Z2	100330	Nov. 13, 2017	Nov. 12, 2018
KOAX KABEL	101354-BW	101354-BW	Dec. 07, 2017	Dec. 06, 2018
EMC	EMC02325	980187	Sep. 04, 2017	Sep. 03, 2018
Agilent	83017A	MY53270014	Aug. 21, 2017	Aug. 20, 2018
EMC	EMC184045B	980192	Aug. 22, 2017	Aug. 21, 2018
UBER+SUHNER	SUCOFLEX104	MY22620/4	Nov. 27, 2017	Nov. 26, 2018
UBER+SUHNER	SUCOFLEX104	MY32487/4	Nov. 27, 2017	Nov. 26, 2018
UBER+SUHNER	SUCOFLEX104	MY22624/4	Nov. 27, 2017	Nov. 26, 2018
EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800 -001	Nov. 27, 2017	Nov. 26, 2018
EMC	EMC8D-NM-NM-300 0	131103	Nov. 27, 2017	Nov. 26, 2018
EMC	EMC8D-NM-NM-130 00	131104	Nov. 27, 2017	Nov. 26, 2018
AUDIX	e3	6.120210g	NA	NA
	R&S KOAX KABEL EMC Agilent EMC JBER+SUHNER JBER+SUHNER JBER+SUHNER EMC EMC EMC AUDIX	R&SHFH2-Z2KOAX KABEL101354-BWEMCEMC02325Agilent83017AEMCEMC184045BJBER+SUHNERSUCOFLEX104JBER+SUHNERSUCOFLEX104JBER+SUHNERSUCOFLEX104BER+SUHNERSUCOFLEX104BER+SUHNEREMC68D-NM-NM-800EMCEMC8D-NM-NM-300 0EMCEMC8D-NM-NM-130 00	R&S HFH2-Z2 100330 KOAX KABEL 101354-BW 101354-BW EMC EMC02325 980187 Agilent 83017A MY53270014 EMC EMC184045B 980192 JBER+SUHNER SUCOFLEX104 MY22620/4 JBER+SUHNER SUCOFLEX104 MY22624/4 JBER+SUHNER SUCOFLEX104 MY22624/4 EMC EMC8D-NM-NM-800 EMC8D-NM-NM-800 EMC EMC8D-NM-NM-800 131103 EMC EMC8D-NM-NM-1300 131104 AUDIX e3 6.120210g	R&S HFH2-Z2 100330 Nov. 13, 2017 KOAX KABEL 101354-BW 101354-BW Dec. 07, 2017 EMC EMC02325 980187 Sep. 04, 2017 Agilent 83017A MY53270014 Aug. 21, 2017 EMC EMC184045B 980192 Aug. 22, 2017 JBER+SUHNER SUCOFLEX104 MY22620/4 Nov. 27, 2017 JBER+SUHNER SUCOFLEX104 MY22620/4 Nov. 27, 2017 JBER+SUHNER SUCOFLEX104 MY22624/4 Nov. 27, 2017 JBER+SUHNER SUCOFLEX104 MY22624/4 Nov. 27, 2017 JBER+SUHNER SUCOFLEX104 MY22624/4 Nov. 27, 2017 EMC EMC8D-NM-NM-800 EMC8D-NM-NM-800 Nov. 27, 2017 EMC EMC8D-NM-NM-300 131103 Nov. 27, 2017 EMC EMC8D-NM-NM-130 131104 Nov. 27, 2017 AUDIX e3 6.120210g NA

Test Item	RF Conducted							
Test Site	(TH01-WS)							
Tested Date	Jan. 03, 2018							
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until			
Spectrum Analyzer	R&S	FSV40	101063	Mar. 15, 2017	Mar. 14, 2018			
Power Meter	Anritsu	ML2495A	1241002	Oct. 16, 2017	Oct. 15, 2018			
Power Sensor	Anritsu	MA2411B	1207366	Oct. 16, 2017	Oct. 15, 2018			
DC POWER SOURCE	GW INSTEK	GPC-6030D	EM892433	Oct. 26, 2017	Oct. 25, 2018			
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA			
Note: Calibration Inte	rval of instruments liste	d above is one year.		-				



1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.249 ANSI C63.10-2013

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty				
Parameters	Uncertainty			
Bandwidth	±34.134 Hz			
Radiated emission ≤ 1GHz	±3.66 dB			
Radiated emission > 1GHz	±5.72 dB			



2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By		
Radiated Emissions	03CH03-WS	22°C / 64%	Vincent Yeh Roger Lu		
RF Conducted	TH01-WS	20°C / 60%	Akun Chung		

➢ FCC Designation No.: TW0009

➢ FCC site registration No.: 207696

➢ IC site registration No.: 1807C-1

2.2 The Worst Test Modes and Channel Details

Test item	Mode	Test Frequency (MHz)	Test Configuration		
Field Strength of Fundamental	FSK	2408, 2440, 2474			
Radiated Emissions (below 1GHz)	FSK	2440			
Radiated Emissions (Above 1GHz)	FSK	2408, 2440, 2474			
20dB bandwidth	FSK	2408, 2440, 2474			



3 Transmitter Test Results

3.1 Radiated Emission

This section includes field strength of fundamental, field strength of harmonics and emissions radiated outside of the operating frequency bands.

3.1.1 Limit of field strength of fundamental and field strength of harmonics

Fundamental Frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)			
2400–2483.5 MHz	50	500			

3.1.2 Limit of Unwanted Emissions

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in below table, whichever is the lesser attenuation.

Radiated emission limits								
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)					
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300					
0.490~1.705	24000/F(kHz)	33.8 - 23	30					
1.705~30.0	30	29	30					
30~88	100	40	3					
88~216	150	43.5	3					
216~960	200	46	3					
Above 960	500	54	3					

Note 1:

Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit **Note 2:**

Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.



3.1.3 Test Procedures

- Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
- 2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
- 3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

- Radiated emission below 1GHz
- 1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission
- 2. Radiated emission above 1GHz / Peak value except fundamental
- 2. RBW=1MHz, VBW=3MHz and Peak detector

Radiated emission above 1GHz / Average value The average value is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:

= -34.8dB

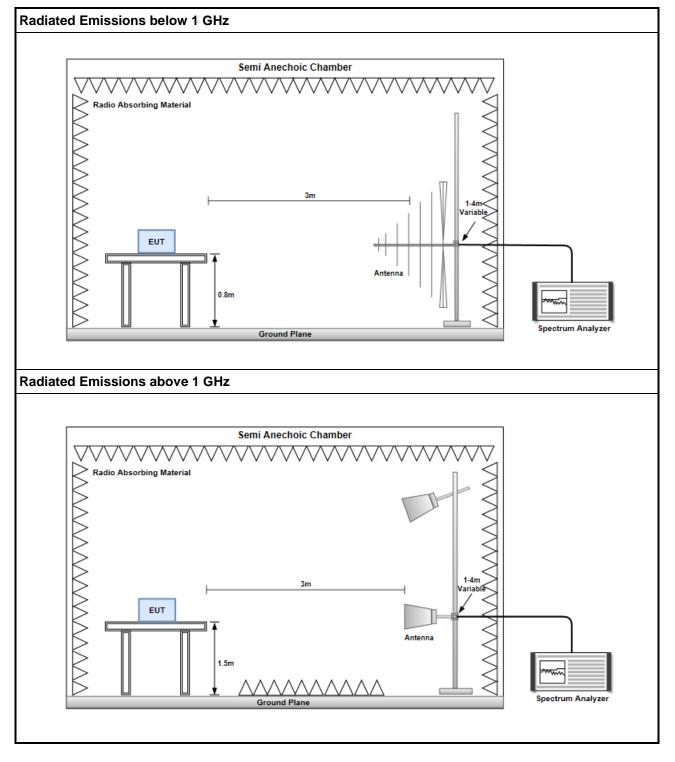
3. $20\log (\text{Duty cycle}) = 20\log \frac{7 * 0.259855 \text{ ms}}{100 \text{ ms}}$

Please see page 22 for plotted duty

- 4. Radiated emission above 1GHz / Average value for other emissions RBW=1MHz, VBW=10Hz and Peak detector
- 5. Radiated emission Peak value for fundamental RBW=10MHz, VBW=10MHz and Peak detector



3.1.4 Test Setup

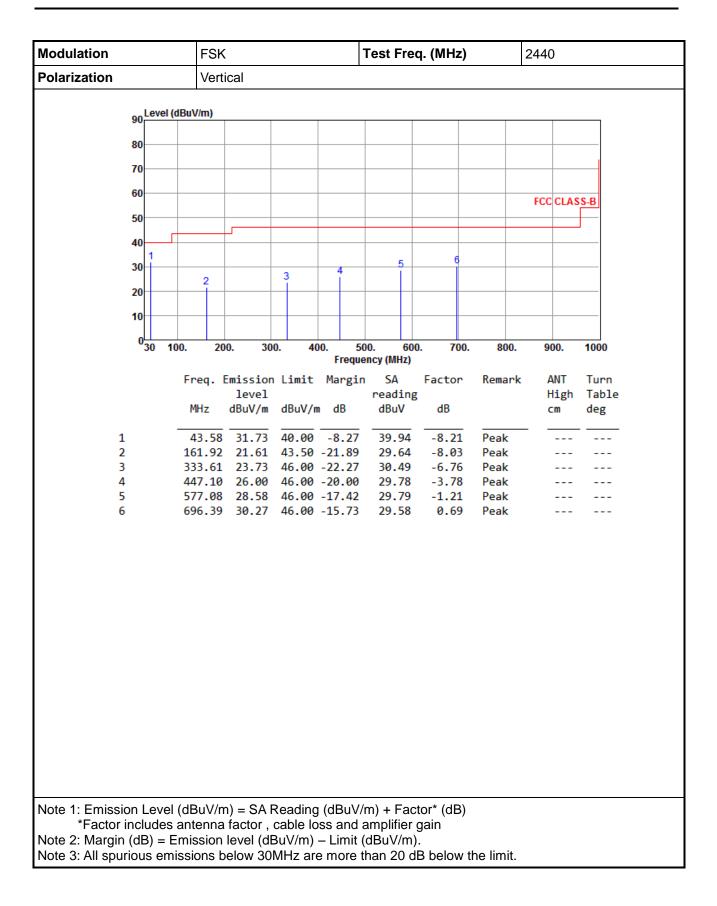




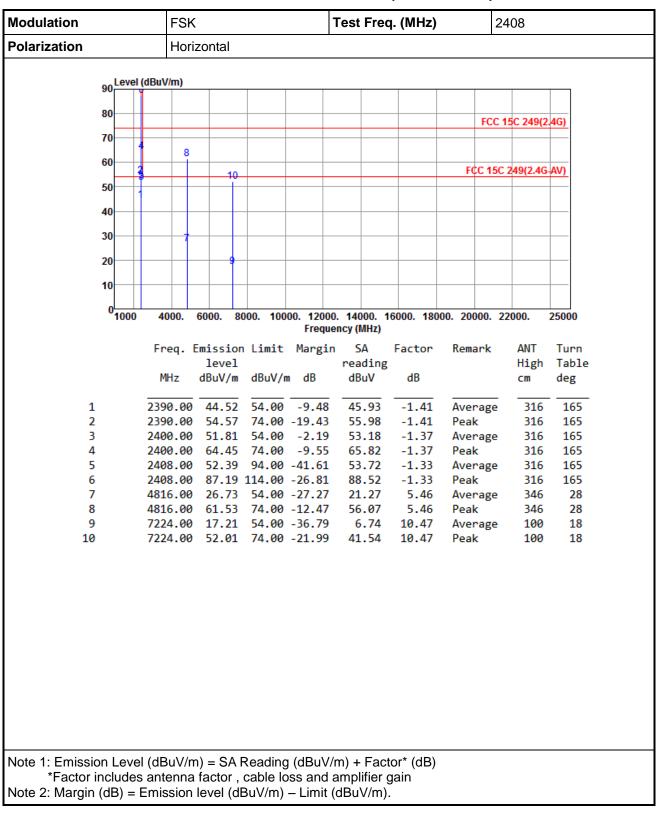
Modulation		FSK Test Freq. (MHz) 2440										
Polarization			Horizontal									
	Leve	el (dBu\	//m)									
	80											
	70											
	60											
	50										FCC CLA	SS-B
	40							+				
	30 1				4	5	6					
	20		2									
	10											
	0 <mark></mark> 30	100.	20	0. 30	0. 4			600.	700.	800.	900.	1000
		_					ency (MHz		_			_
		Fr	eq. I	Emissior level	n Limit	Margi	n SA readi		actor	Remark	ANT High	Turn Table
		M	Hz	dBuV/m	dBuV/r	n dB	dBuV		dB		cm	deg
			0.00		40.00	42.02	77.0		10.14	Deale		
1				27.07 21.57					-10.14 -8.34	Peak Peak		
3				22.79					-7.60	Peak		
4				25.40					-5.15	Peak		
5				28.28 28.96					-3.37 -1.37	Peak Peak		
Ŭ			1.20	20.90	40.00	17.04	50.5		1.57	1 Curk		
Note 1: Emissio												
Factor ir* Note 2: Margin (es ant	enna	tactor,	cable lo	oss and	amplifie	er ga	ain			
note ∠. Margin (elow 30				11).				

3.1.5 Transmitter Radiated Unwanted Emissions (Below 1GHz)



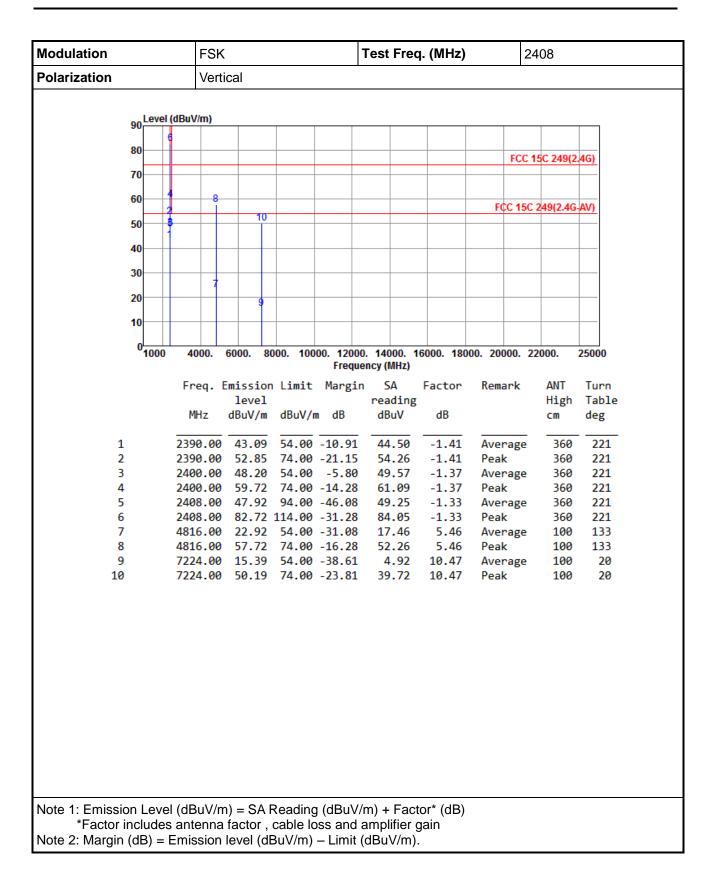




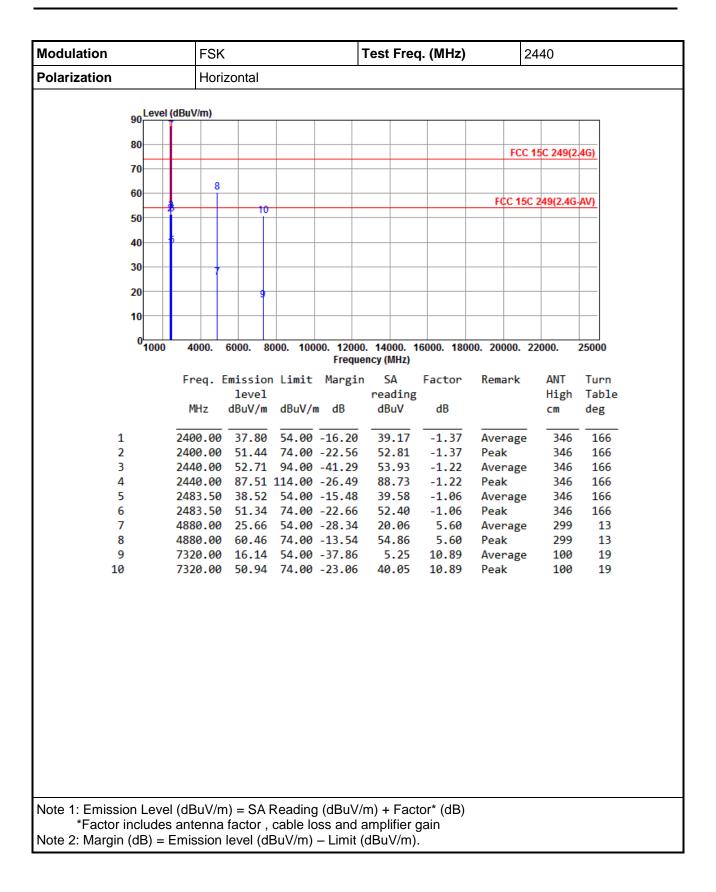


3.1.6 Transmitter Radiated Unwanted Emissions (Above 1GHz)

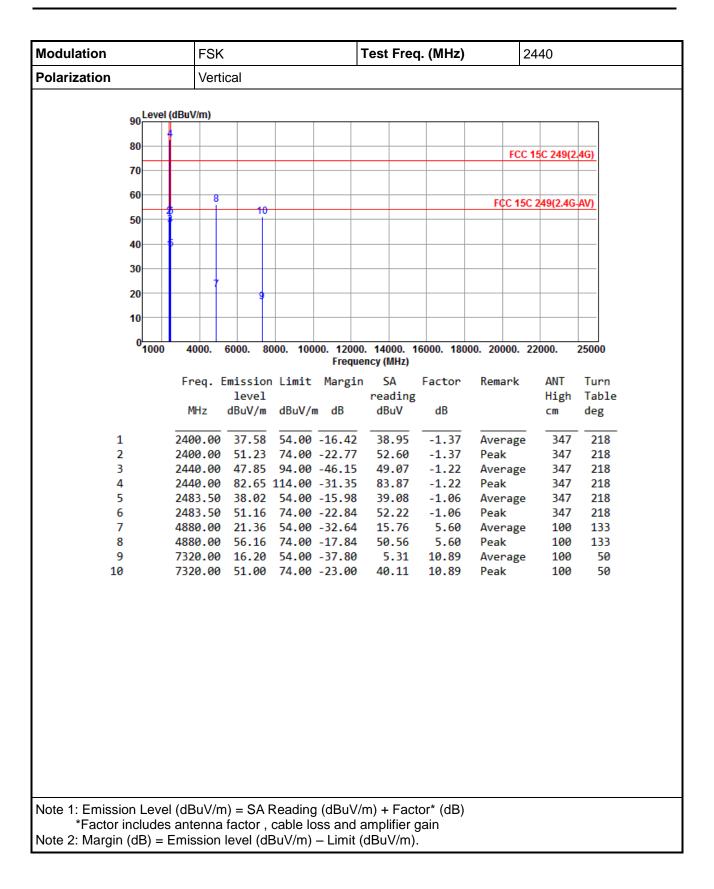




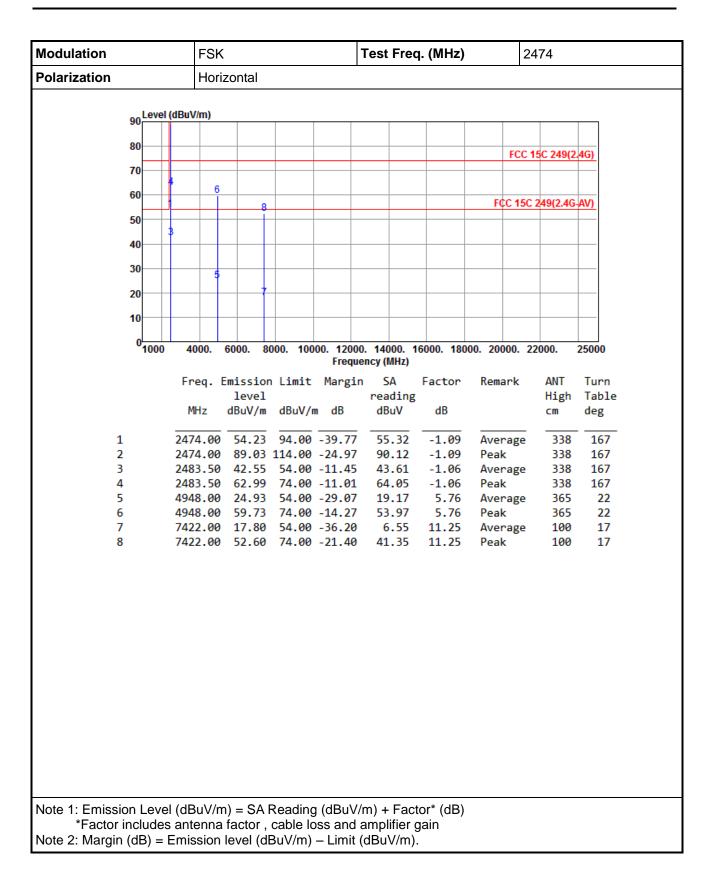




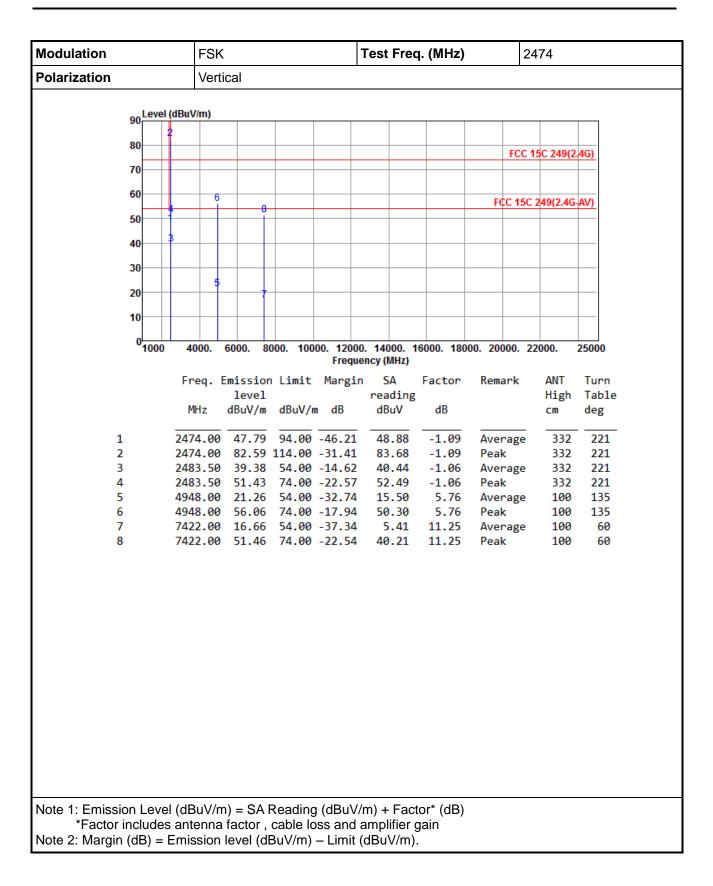




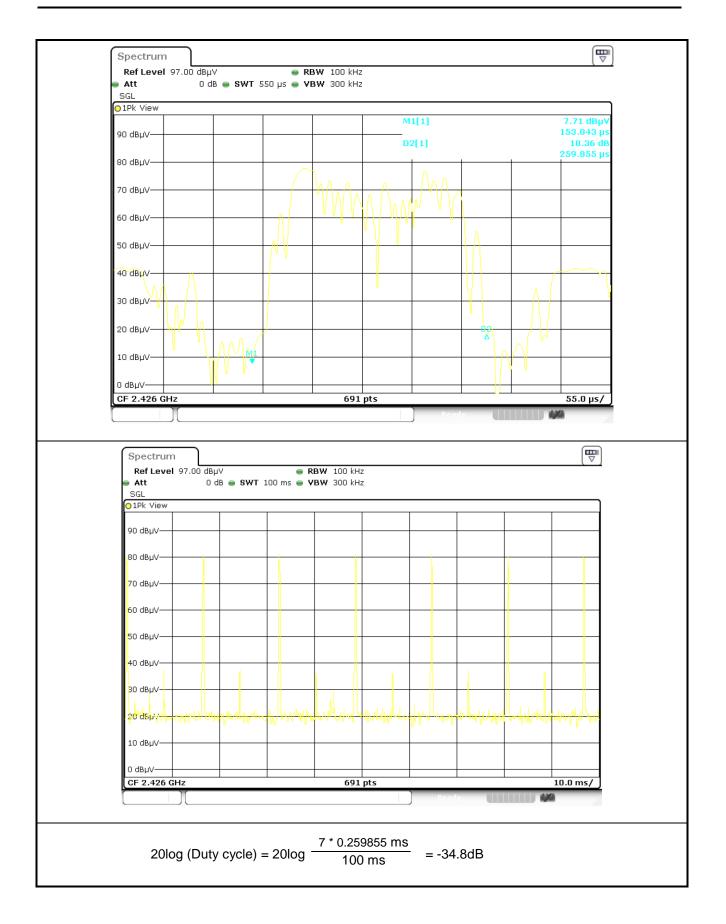












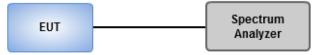


3.2 20dB and Occupied Bandwidth

3.2.1 Test Procedures

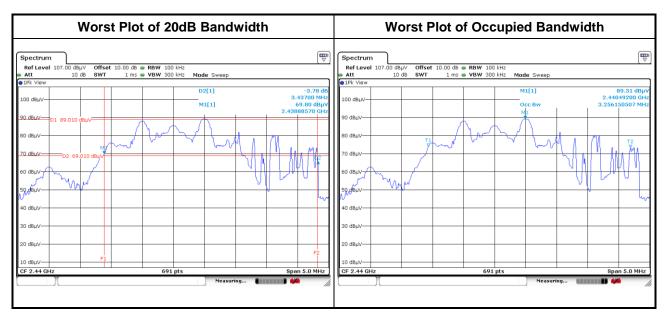
- 1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
- 2. Detector = Peak(20 dB bandwidth) / Sample(Occupied bandwidth), Trace mode = max hold.
- 3. Sweep = auto couple, Allow the trace to stabilize.
- 4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 20dB relative to the maximum level measured in the fundamental emission.
- 5. Use the occupied measurement function of specturm analyzer to measure 99% occupied bandwidth

3.2.2 Test Setup



3.2.3 20dB and Occupied Bandwidth

Freq. (MHz)	20dB Bandwidth (MHz)	Occupied Bandwidth (MHz)
2408	3.44	3.04
2440	3.44	3.26
2474	2.66	2.66





4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <u>http://www.icertifi.com.tw</u>.

Linkou Tel: 886-2-2601-1640 No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C. Kwei Shan Tel: 886-3-271-8666 No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C. Kwei Shan Site II Tel: 886-3-271-8640 No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666 Fax: 886-3-318-0155 Email: ICC_Service@icertifi.com.tw

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