

## **FCC Test Report**

	(Spot Check)				
Report No.:	RF180629E05				
FCC ID:	KA2IR1760A1				
Original FCC ID:	KA2IR867A1				
Test Model:	DIR-1760				
Received Date:	June 29, 2018				
Test Date:	Aug. 04, 2018				
Issued Date: Dec. 12, 2018					
	D-Link Corporation 17595 Mt. Herrmann Street Fountain Valley, CA92708 USA				
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory				
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.				
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.				
FCC Registration / Designation Number:	723255 / TW2022				



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.



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Release Control Record					
Issue No.	Description	Date Issued			
RF180629E05	Original release.	Dec. 12, 2018			



## 1 Certificate of Conformity

Product:	AC1750 Mesh-Enabled Smart Wi-Fi Router
Brand:	D-Link
Test Model:	DIR-1760
Sample Status: ENGINEERING SAMPLE	
Applicant:	D-Link Corporation
Test Date:	Aug. 04, 2018
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247)
	ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :	Wondy Mu	, Date:	Dec. 12, 2018	
	Wendy Wu / Specialist			
Approved by:_	May Chen / Manager	, Date:	Dec. 12, 2018	



## 2 Summary of Test Results

	47 CFR FCC Part 15, Subpart C (Section 15.247)						
FCC Clause	Test Item	Result	Remarks				
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.88dB at 0.36484MHz.				
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -7.2dB at 500.01MHz.				

## 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)	
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.84 dB	
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.53 dB	

#### 2.2 Modification Record

There were no modifications required for compliance.



## 3 General Information

#### 3.1 General Description of EUT

Product	AC1750 Mesh-Enabled Smart Wi-Fi Router
Brand	D-Link
Test Model	DIR-1760
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating Modulation Type	DC 12V from power adapter CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 in 2.4GHz band
Modulation Technology	DSSS,OFDM
Transfer Rate802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps	
Operating Frequency	<b>2.4GHz:</b> 2.412GHz ~ 2.462GHz
Operating Frequency	<b>5GHz:</b> 5.18GHz ~ 5.24GHz, 5.745GHz ~ 5.825GHz
Number of Channel	2.4GHz: 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 5GHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

- 1. Exhibit prepared for FCC Spot Check Verification report, the format, test items and amount of spot-check test data are decided by applicant's engineering judgment, for more details pleae refer to declaration letter exhibit.
- 2. Simultaneously transmission condition.

Condition	Technology				
1	WLAN (2.4GHz)	WLAN (5GHz)			

**Note:** The emission of the simultaneous operation has been evaluated and no non-compliance was found.

3. The EUT must be supplied with a power adapter as following table:

No	Brand	Model No.	Spec.
1	Shenzhen Gongjin Electronics Co., Ltd	S24B72-120A200-0K	AC Input: 100-240V, 0.8A, 50/60Hz DC Output: 12V, 2A DC Output cable: unshielded, 1.2m



4.	The antennas	provided to the	e EUT, please	refer to the	following table:
----	--------------	-----------------	---------------	--------------	------------------

Antenna No.	Brand	Model	Ant. Gain(dBi) Including cable loss	Frequency range (MHz)	Antenna Type	Connecter Type	Cable Length (mm)
1	RF	RF21C02116A	4.75	2400~2483.5	Dipole	inov	130
I		RF21C02116A	4.96	5150~5850	Dipole	i-pex	130
2		DE01000116A	4.75	2400~2483.5	Dinala	inov	120
2	RF link	F link RF21C02116A	4.96	5150~5850	Dipole	i-pex	130
3		RF21C02546A	5	2400~2483.5	Dipole	i-pex	160
4		RF21C02547A	5	5150~5850	Dipole	i-pex	160

## 5. The EUT incorporates a MIMO function.

	2.4	GHz Band	
MODULATION MODE	DATA RATE (MCS)	TX & RX CON	NFIGURATION
802.11b	1 ~ 11Mbps	3TX	3RX
802.11g	6 ~ 54Mbps	3TX	3RX
	MCS 0~7	3TX	3RX
802.11n (HT20)	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
	MCS 0~7	3TX	3RX
802.11n (HT40)	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
	MCS 0~8, Nss=1	3TX	3RX
VHT20	MCS 0~8, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
	MCS 0~9, Nss=1	3TX	3RX
VHT40	MCS 0~9, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
	50	GHz Band	
MODULATION MODE			
802.11a	6 ~ 54Mbps	3TX	3RX
802.11a	6 ~ 54Mbps MCS 0~7	3TX 3TX	3RX 3RX
	6 ~ 54Mbps	3TX	3RX
802.11a	6 ~ 54Mbps MCS 0~7	3TX 3TX	3RX 3RX
802.11a	6 ~ 54Mbps MCS 0~7 MCS 8~15	3TX 3TX 3TX	3RX 3RX 3RX
802.11a	6 ~ 54Mbps MCS 0~7 MCS 8~15 MCS 16~23	3TX 3TX 3TX 3TX 3TX 3TX 3TX	3RX 3RX 3RX 3RX 3RX 3RX 3RX
802.11a 802.11n (HT20)	6 ~ 54Mbps MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~7 MCS 8~15 MCS 16~23	3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX	3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX
802.11a 802.11n (HT20)	6 ~ 54Mbps MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~7 MCS 8~15	3TX 3TX 3TX 3TX 3TX 3TX 3TX	3RX 3RX 3RX 3RX 3RX 3RX 3RX
802.11a 802.11n (HT20)	6 ~ 54Mbps MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~7 MCS 8~15 MCS 16~23	3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX	3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX
802.11a 802.11n (HT20) 802.11n (HT40)	6 ~ 54Mbps MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~7 MCS 8~15 MCS 16~23 MCS 16~23 MCS 0~8, Nss=1	3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX	3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX
802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20)	6 ~ 54Mbps MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~8, Nss=1 MCS 0~8, Nss=2	3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX	3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX
802.11a 802.11n (HT20) 802.11n (HT40)	6 ~ 54Mbps MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~8, Nss=1 MCS 0~8, Nss=2 MCS 0~9, Nss=3 MCS 0~9, Nss=1 MCS 0~9, Nss=2	3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX	3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX
802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20)	6 ~ 54Mbps MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~8, Nss=1 MCS 0~8, Nss=2 MCS 0~9, Nss=3 MCS 0~9, Nss=2 MCS 0~9, Nss=2 MCS 0~9, Nss=2 MCS 0~9, Nss=3	3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX	3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX
802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20)	6 ~ 54Mbps MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~8, Nss=1 MCS 0~8, Nss=2 MCS 0~9, Nss=3 MCS 0~9, Nss=2 MCS 0~9, Nss=2 MCS 0~9, Nss=3 MCS 0~9, Nss=3 MCS 0~9, Nss=3	3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX	3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX
802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20)	6 ~ 54Mbps MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~7 MCS 8~15 MCS 16~23 MCS 0~8, Nss=1 MCS 0~8, Nss=2 MCS 0~9, Nss=3 MCS 0~9, Nss=2 MCS 0~9, Nss=2 MCS 0~9, Nss=2 MCS 0~9, Nss=3	3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX 3TX	3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX 3RX

Note:

All of modulation mode support beamforming function except 2.4GHz & 802.11a modulation mode.
 The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst

case scenario was identified. The worst case data were presented in test report.

 The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and VHT for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

6. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.



## 3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20), VHT20:

Channel	Frequency	Channel	Frequency
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

## 7 channels are provided for 802.11n (HT40), VHT40:

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		



## 3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGI			APPL	ICABLE TO			DESCRIPTION	
MODE	-		RE<1G	<1G PLC				
-			$\checkmark$		$\checkmark$	-		
Where	RE<1G:	Radiate	d Emission below	/ 1GHz	PLC: Power Line Co	onducted Emission		
<ul> <li>NOTE: 1. The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on X-plane.</li> <li><u>Radiated Emission Test (Below 1GHz):</u></li> <li>Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).</li> </ul>								
	owing cł	hanne	., .	,	the final test as			1
	MODE		AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	
	802.11b		1 to 11	6	DSSS	DBPSK	1	
Power	Line Co	onduct	ed Emission	Test:				-

# Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE	TESTED	MODULATION	MODULATION	DATA RATE
	CHANNEL	CHANNEL	TECHNOLOGY	TYPE	(Mbps)
802.11b	1 to 11	6	DSSS	DBPSK	1

## Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY	
RE<1G	22deg. C, 67%RH	120Vac, 60Hz	Frank Chaing	
PLC	24deg. C, 72%RH	120Vac, 60Hz	Andy Ho	



## 3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

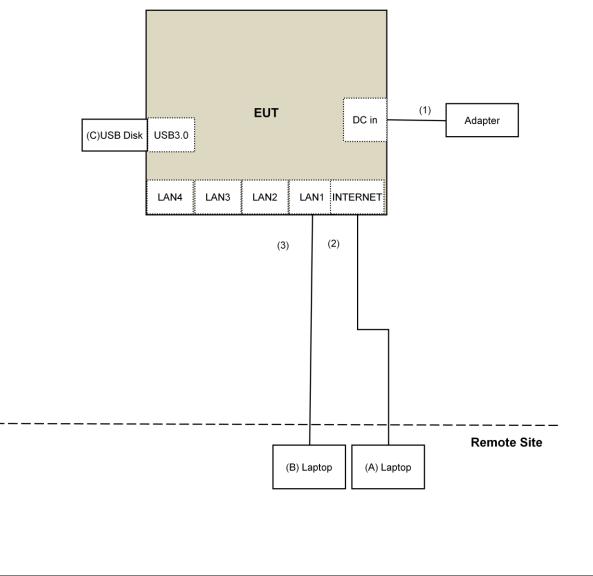
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
Α.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
В.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	USB Disk	Tracscend	NA	NA	NA	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.2	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab

## 3.3.1 Configuration of System under Test





## 3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247) KDB 558074 D01 15.247 Meas Guidance v05 ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.



## 4 Test Types and Results

#### 4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

## NOTE:

1. The lower limit shall apply at the transition frequencies.

- 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



#### 4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2018	July 11, 2019
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna <sup>(*)</sup> Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-05	May 05, 2018	May 04, 2019
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-3-1	Mar. 20, 2018	Mar. 19, 2019
RF Cable	8D	966-3-2	Mar. 20, 2018	Mar. 19, 2019
RF Cable	8D	966-3-3	Mar. 20, 2018	Mar. 19, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 03, 2017	Oct. 02, 2018
Software	ADT_Radiated _V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA

#### Note:

- 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
- 2. \*The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
- 3. The test was performed in 966 Chamber No. 3.
- 4. The CANADA Site Registration No. is 20331-1
- 5. Loop antenna was used for all emissions below 30 MHz.
- 6. Tested Date: Aug. 04, 2018



## 4.1.3 Test Procedures

## For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

#### NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

#### For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

#### Note:

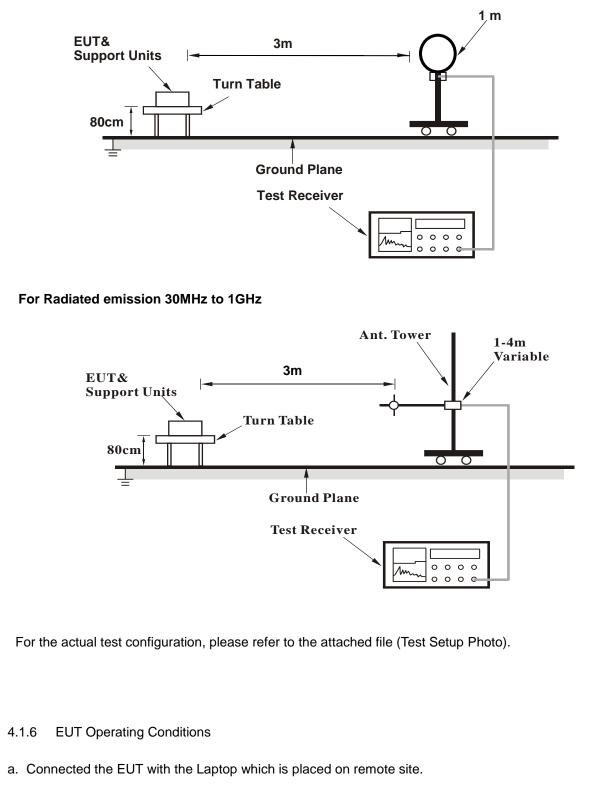
- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. All modes of operation were investigated and the worst-case emissions are reported.
- 4.1.4 Deviation from Test Standard

No deviation.



#### 4.1.5 Test Setup





b. Controlling software (MT7615 QA 0.0.1.73) has been activated to set the EUT on specific status.



#### 4.1.7 Test Results

## Below 1GHz Data:

#### 802.11b

CHANNEL	TX Channel 6	DETECTOR	Queei Deelk (QD)
FREQUENCY RANGE	9kHz ~ 1GHz	FUNCTION	Quasi-Peak (QP)

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	91.13	32.8 QP	43.5	-10.7	2.00 H	102	46.4	-13.6		
2	148.22	34.0 QP	43.5	-9.5	2.00 H	104	41.6	-7.6		
3	250.02	38.2 QP	46.0	-7.8	1.00 H	116	47.1	-8.9		
4	500.01	38.8 QP	46.0	-7.2	1.50 H	144	40.8	-2.0		
5	625.05	31.3 QP	46.0	-14.7	1.50 H	23	30.4	0.9		
6	750.01	35.0 QP	46.0	-11.0	1.00 H	134	31.7	3.3		

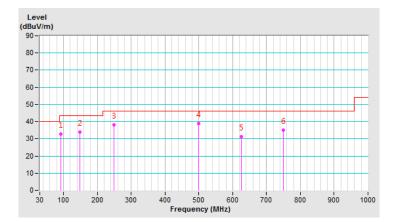
## **REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)

2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) - Pre-Amplifier Factor(dB)

3. Margin value = Emission Level - Limit value

4. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



CHANNEL	TX Channel 6	DETECTOR FUNCTION	
FREQUENCY RANGE	9kHz ~ 1GHz		Quasi-Peak (QP)

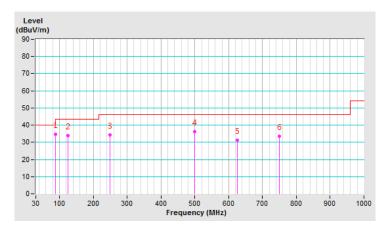
	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)			
1	88.98	34.8 QP	43.5	-8.7	1.50 V	188	48.6	-13.8			
2	125.01	33.9 QP	43.5	-9.6	1.50 V	192	43.2	-9.3			
3	250.02	34.3 QP	46.0	-11.7	1.50 V	199	43.2	-8.9			
4	500.01	36.1 QP	46.0	-9.9	1.00 V	226	38.1	-2.0			
5	625.00	31.4 QP	46.0	-14.6	1.00 V	360	30.5	0.9			
6	750.01	33.6 QP	46.0	-12.4	1.50 V	360	30.3	3.3			

#### **REMARKS**:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)

2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)

- 3. Margin value = Emission Level Limit value
- 4. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.





## 4.2 Conducted Emission Measurement

#### 4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)					
	Quasi-peak	Average				
0.15 - 0.5	66 - 56	56 - 46				
0.50 - 5.0	56	46				
5.0 - 30.0 60		50				

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

#### 4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL	
Test Receiver R&S	ESCS 30	847124/029	Nov. 01, 2017	Oct. 31, 2018	
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 2017	Nov. 14, 2018	
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 04, 2018	June 03, 2019	
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018	
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018	
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019	
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA	

#### Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in Conduction 1.

3 Tested Date: Aug. 04, 2018

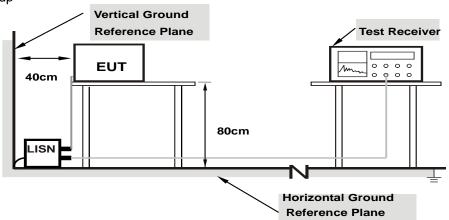


#### 4.2.3 Test Procedures

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit 20dB) was not recorded.
- **NOTE:** The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.
- 4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.2.6 EUT Operating Conditions

Same as 4.1.6.

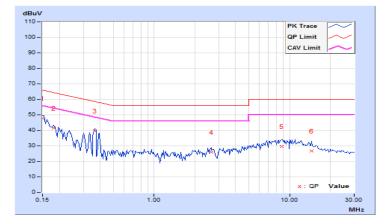


## 4.2.7 Test Results

Phase Line (L)				D	Detector FunctionQuasi-Peak (QP) / Average (AV)					
	Corr.		Reading Value		Emission Level		Limit		Margin	
No	Freq.	Factor	[dB (	(uV)]	[dB	(uV)]	[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.05	37.79	21.30	47.84	31.35	66.00	56.00	-18.16	-24.65
2	0.18125	10.06	31.32	16.08	41.38	26.14	64.43	54.43	-23.05	-28.29
3	0.36484	10.11	29.58	25.63	39.69	35.74	58.62	48.62	-18.93	-12.88
4	2.65234	10.26	15.53	6.46	25.79	16.72	56.00	46.00	-30.21	-29.28
5	8.71094	10.63	18.90	12.00	29.53	22.63	60.00	50.00	-30.47	-27.37
6	14.59375	11.03	15.75	9.82	26.78	20.85	60.00	50.00	-33.22	-29.15

#### **REMARKS**:

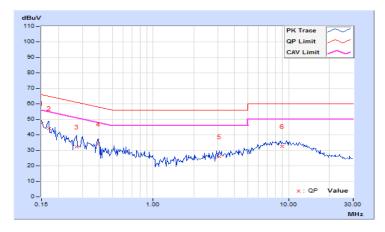
- 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
- 2. The emission levels of other frequencies were very low against the limit.
- 3. Margin value = Emission level Limit value
- 4. Correction factor = Insertion loss + Cable loss
- 5. Emission Level = Correction Factor + Reading Value.



Phase Neutral (N)			C	Detector Fu	Peak (QP) je (AV)	/					
				Emiss	Emission Level Limi			it Margin			
No	No Freq.		r [dB (	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.15000	9.95	37.39	20.43	47.34	30.38	66.00	56.00	-18.66	-25.62	
2	0.16953	9.96	34.26	18.51	44.22	28.47	64.98	54.98	-20.76	-26.51	
3	0.27109	9.99	22.38	14.82	32.37	24.81	61.08	51.08	-28.71	-26.27	
4	0.39219	10.02	23.94	16.97	33.96	26.99	58.02	48.02	-24.06	-21.03	
5	3.08594	10.15	15.63	7.31	25.78	17.46	56.00	46.00	-30.22	-28.54	
6	8.99219	10.48	22.11	14.69	32.59	25.17	60.00	50.00	-27.41	-24.83	

## **REMARKS:**

- 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
- 2. The emission levels of other frequencies were very low against the limit.
  - 3. Margin value = Emission level Limit value
- 4. Correction factor = Insertion loss + Cable loss
- 5. Emission Level = Correction Factor + Reading Value.





## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).



#### Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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