EN 300 328 RF Test Report

Report No.:	RE150707C20B R1
Test Model:	EYSGJN
Received Date:	Jul. 07, 2015
Test Date:	Jul. 13 ~ Jul. 14, 2015 (For all tests except Receiver Blocking test) Apr. 14, 2020 (For Receiver Blocking test)
Issued Date:	Jul. 30, 2020
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Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
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Release Control Record

Issue No.	Description	Date Issued
RE150707C20B	Original release	Apr. 27, 2020
RE150707C20B R1	Revise the statement on page 1	Jul. 30, 2020

1 Certificate of Conformity

Product:	Wireless Module
Brand:	TAIYO YUDEN
Test Model:	EYSGJN
Sample Status:	Engineering sample
Applicant:	TAIYO YUDEN CO., LTD.
Test Date:	Jul. 13 ~ Jul. 14, 2015 (For all tests except Receiver Blocking test) Apr. 14, 2020 (For Receiver Blocking test)
Standards:	EN 300 328 V2.2.2 (2019-07)

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 RF characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Jul. 30, 2020

Polly Chien / Specialist

Approved by : _____ , **Date:** Jul. 30, 2020

Bruce Chen / Senior Project Engineer

2 Summary of Test Results

The EUT has been tested according to the following specifications:

EN 300 328 V2.2.2		
Clause	Test Parameter	Results
4.3.2.2	RF Output Power	Pass
4.3.2.3	Power Spectral Density	Pass
4.3.2.4	Duty cycle, Tx-sequence, Tx-gap (Non-adaptive equipment)	Not Applicable
4.3.2.5	Medium Utilization (MU) Factor (Non-Adaptive Equipment)	Not Applicable
4.3.2.6	Adaptivity (Adaptive Equipment using modulation other than FHSS)	Not Applicable (Note 2)
4.3.2.7	Occupied Channel Bandwidth	Pass
4.3.2.8	Transmitter Unwanted Emissions in the out-of-band Domain	Pass
4.3.2.9	Transmitter Unwanted Emissions in the Spurious Domain	Pass
4.3.2.10	Receiver Spurious Emissions	Pass
4.3.2.11	Receiver Blocking	Pass
4.3.2.12	Geo-location capability	Not Applicable

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. These requirements do not apply for equipment with a maximum declared RF Output power of less than 10 dBm EIRP or for equipment when operating in a mode where the RF Output power is less than 10 dBm EIRP.

2.1 Test Instruments

Test Date: Jul. 13 ~ Jul. 14, 2015

Description & Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Spectrum Analyzer Agilent	E4440A	MY46185282	Mar. 09, 2015	Mar. 08, 2016
Spectrum Analyzer Rohde & Schwarz	FSV40	100980	Feb. 10, 2015	Feb. 09, 2016
Signal Generator Agilent	E4438C	MY45092849	Dec. 19, 2014	Dec. 18, 2015
Open Switch and Control Unit Rohde & Schwarz	OSP120	B157-100898	Nov. 28, 2014	Nov. 27, 2015
Vector Signal Generator Rohde & Schwarz	SMJ100A	101943	Nov. 21, 2014	Nov. 20, 2015
RF and Microwave Siganl Generator Rohde & Schwarz	SMB100A	177994	Nov. 14, 2014	Nov. 13, 2015
BILOG Antenna SCHWARZBECK	VULB 9168	9168-161	Feb. 04, 2015	Feb. 03, 2016
HORN Antenna ETS	3117	00034130	Feb. 10, 2015	Feb. 09, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Feb. 05, 2015	Feb. 04, 2016
Preamplifier Agilent	8449B	3008A01976	Aug. 22, 2014	Aug. 21, 2015
Preamplifier Agilent	8447D	2944A10634	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNER	SUCOFLEX 104	246272/4	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNER	SUCOFLEX 104	254644+251640	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNER	CA3501-3501-G.90 (3m) & CA3501-3501-F.90(2m)	NF090(3m)*2 & TCF427S(2m)*1	Apr. 07, 2015	Apr. 06, 2016
Software ADT.	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower Max-Full	MFA-440H	1308111	NA	NA
10dB Attenuation JFW	50HF-010-SMA	NA	NA	NA
Turn Table ADT	NA	SN30303	NA	NA
Controller Max-Full	MF7802	MF780208363	NA	NA
Temperature & Humidity chamber TERCHY	MHU-225AU	920842	Jun. 18, 2015	Jun. 17, 2016

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 test was performed in HwaYa RF Chamber 2.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

Test Date: Apr. 14, 2020

Description & Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Spectrum Analyzer Rohde & Schwarz	FSV40	100980	Apr. 23, 2019	Apr. 22, 2020
Vector signal generator Agilent	E4438C	MY47271120	Nov. 11, 2019	Nov. 10, 2020
Radio Communication Analyzer Anritsu	MT8860C	1702001	May 06, 2019	May 05, 2020
Radio Communication Analyzer Anritsu	CBT	100946	Aug. 09, 2018	Aug. 08, 2020
Vector Signal Generator Rohde & Schwarz	SMJ 100A	101943	Dec. 15, 2019	Dec. 14, 2020
MXG Vector signal generator KEYSIGHT	N5182B	MY53052282	Dec. 23, 2019	Dec. 22, 2020

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 Radio Communication Analyzer (model: CBT) is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

2.2 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Parameter	Uncertainty
Occupied Channel Bandwidth	±1.229x10^{-6} %
RF output power, conducted	±1.371 dB
Power Spectral Density, conducted	±2.889 dB
Unwanted Emissions, conducted	±1.34 dB
All emissions, radiated	±3.013 dB
Temperature	±0.23 °C
Supply voltages	±0.3 %
Time	±2.53 %

2.3 Maximum Measurement Uncertainty

For the test methods, according to ETSI EN 300 328 standard, the measurement uncertainty figures shall be calculated in accordance with ETR 100 028-1 [4] and shall correspond to an expansion factor (coverage factor) k = 1,96 or k = 2 (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Maximum measurement uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3 dB
Unwanted Emissions, conducted	±3 dB
All emissions, radiated	±6 dB
Temperature	±3 °C
Supply voltages	±3 %
Time	±5 %

2.4 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless Module
Brand	TAIYO YUDEN
Test Model	EYSGJN
Sample Status	Engineering sample
Nominal Voltage	3Vdc (Host equipment)
Normal Testing Voltage	3Vdc
Temperature Operating Range	-40~85℃
Modulation Type	GFSK
Transfer Rate	1Mbps
Operating Frequency	2402MHz~2480MHz
Number of Channel	40
Adaptive/Non-Adaptive	☐ non-adaptive Equipment ☒ adaptive Equipment without the possibility to switch to a non-adaptive mode ☐ adaptive Equipment which can also operate in a non-adaptive mode
EIRP Power (Measured Max. Average)	2.77dBm
Antenna Type	PCB antenna with -1.5dBi gain
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is issued as a supplementary report of the original report no.: RE150707C20A. The difference compared with the original design is updating standard from EN 300 328 V2.1.1 to V2.2.2. Therefore, only Receiver Blocking test had been re-tested and the other test data was kept in this report.
2. According to above conditions, the limit of frequency range 470 MHz to 694 MHz: -54 dBm/100 kHz, 694 MHz to 1 GHz: -36 dBm/100 kHz for Transmitter Unwanted Emissions in the Spurious Domain (Below 1GHz) updated is no need test, only Receiver Blocking test item needs to be performed. All data for meeting the requirement is verified.

3.2 Description of Test Modes

40 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to										Description
	ROP	PSD	DC/TS/TG	MU	AD	OCB	EOB	SE< 1G	SE≥ 1G	RB	
-	√	√	-	-	-	√	√	√	√	√	-

Where ROP: RF Output Power
PSD: Power Spectral Density
DC/TS/TG: Duty Cycle/ Tx-Sequence / Tx-gap
MU: Medium Utilization
AD: Adaptivity (Channel Access Mechanism)
OCB: Occupied Channel Bandwidth
EOB: Transmitter unwanted emissions in the out-of-band domain
SE<1G: Unwanted Emissions in the Spurious Domain below 1 GHz
SE≥1G: Unwanted Emissions in the Spurious Domain above 1 GHz
RB: Receiver Blocking

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

RF Output Power 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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0, 19, 39	GFSK	1.0

Power Spectral Density 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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0, 19, 39	GFSK	1.0

Occupied Channel Bandwidth 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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0, 39	GFSK	1.0

Transmitter Unwanted Emissions in the Out-of-band Domain 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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0, 39	GFSK	1.0

Unwanted Emissions in the Spurious Domain Test (Below 1 GHz):

☒ 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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0	GFSK	1.0

Unwanted Emissions in the Spurious Domain Test (above 1 GHz):

☒ 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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0, 39	GFSK	1.0

Receiver Blocking 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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate
-	0 to 39	0, 39	GFSK	1.0

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
ROP	25 deg. C, 60% RH	3Vdc	Leo Tsai
PSD	25 deg. C, 60% RH	3Vdc	Leo Tsai
OCB	25 deg. C, 60% RH	3Vdc	Leo Tsai
EOB	25 deg. C, 60% RH	3Vdc	Leo Tsai
SE<1G	25 deg. C, 65% RH	3Vdc	Koven Chuang
SE≥1G	25 deg. C, 65% RH	3Vdc	Koven Chuang
RB	25deg. C, 60%RH	3Vdc	Vincent Huang

3.3 Description of Support Units

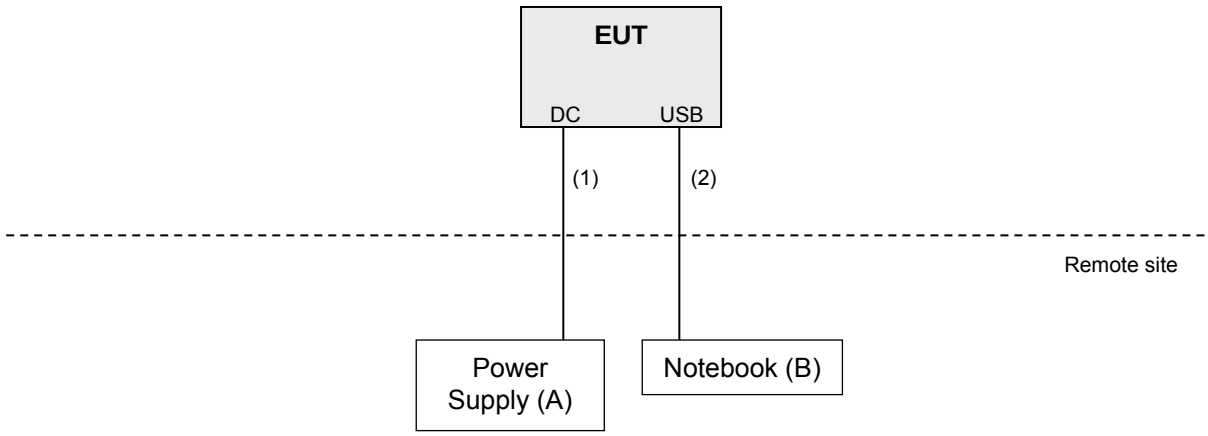
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Power Supply	Topward	6603D	700637	NA	-
B.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-

Note: 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	1	1.2	N	0	-
2.	USB	1	1.7	Y	0	Provided by manufacturer

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:

EN 300 328 V2.2.2 (2019-07)

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

4 Test Procedure and Results

4.1 RF Output Power

4.1.1 Limits of RF Output Power

Condition	Frequency Band	Limit (e.i.r.p)
Under all test conditions	2400 ~ 2483.5 MHz	AV: 20dBm

4.1.2 Test Procedures

Refer to chapter 5.4.2 of EN 300 328 V2.2.2.

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement

4.1.3 Deviation from Test Standard

No deviation.

4.1.4 Test Setup

The measurements for RF output power was performed at both normal environmental conditions and at the extremes of the operating temperature. Controlling software (provided by manufacturer) has been activated to set the EUT on specific channel and power level.

4.1.5 Test Results

Test Condition			EIRP Power (dBm)		
			(CH0) 2402 MHz	(CH19) 2440 MHz	(CH39) 2480 MHz
T_{nom}(℃)	+25	V_{nom}(v)	2.28	2.22	1.78
T_{min}(℃)	-40	V_{nom}(v)	2.71	**2.77**	2.41
T_{max}(℃)	+85	V_{nom}(v)	1.53	1.43	0.87

4.2 Power Spectral Density

4.2.1 Limit of Power Spectral Density

Condition	Frequency Band	Limit (e.i.r.p.)
Under normal conditions	2400 ~ 2483.5 MHz	10dBm / 1MHz

4.2.2 Test Procedures

Refer to chapter 5.4.3 of EN 300 328 V2.2.2.

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement
☒ Option 1: For equipment with continuous and non-continuous transmissions ☐ Option 2: For equipment with continuous transmission capability or for equipment operating (or with the capability to operate) with a constant duty cycle (e.g. Frame Basedequipment)	

4.2.3 Deviation of Test Standard

No deviation.

4.2.4 Test Setup

The test setup has been constructed as the normal test condition. (In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator.) The power spectral density as defined in EN 300 328 clause 4.3.2.3 shall be measured and recorded. Controlling software (provided by manufacturer) has been activated to set the EUT on specific status.

4.2.5 Test Results

Channel	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass/Fail
0	2402	4.07	10	Pass
19	2440	4.13	10	Pass
39	2480	3.92	10	Pass

4.3 Occupied Channel Bandwidth

4.3.1 Limit of Occupied Channel Bandwidth

Condition		Limit
All types of equipment		Shall fall completely within the band 2400 to 2483.5 MHz.
Additional requirement	For non-adaptive using wide band modulations other than FHSS system and e.i.r.p >10dBm.	Less than 20MHz
	For non-adaptive Frequency Hopping system and e.i.r.p >10dBm.	Less than 5MHz

4.3.2 Test Procedure

Refer to chapter 5.4.7 of EN 300 328 V2.2.2.

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement

4.3.3 Deviation from Test Standard

No deviation.

4.3.4 Test Setup

These measurements only were performed at normal test conditions. The measurement shall be performed only on the lowest and the highest frequency within the stated frequency range. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator. Controlling software (provided by manufacturer) has been activated to set the EUT on specific status.

4.3.5 Test Results

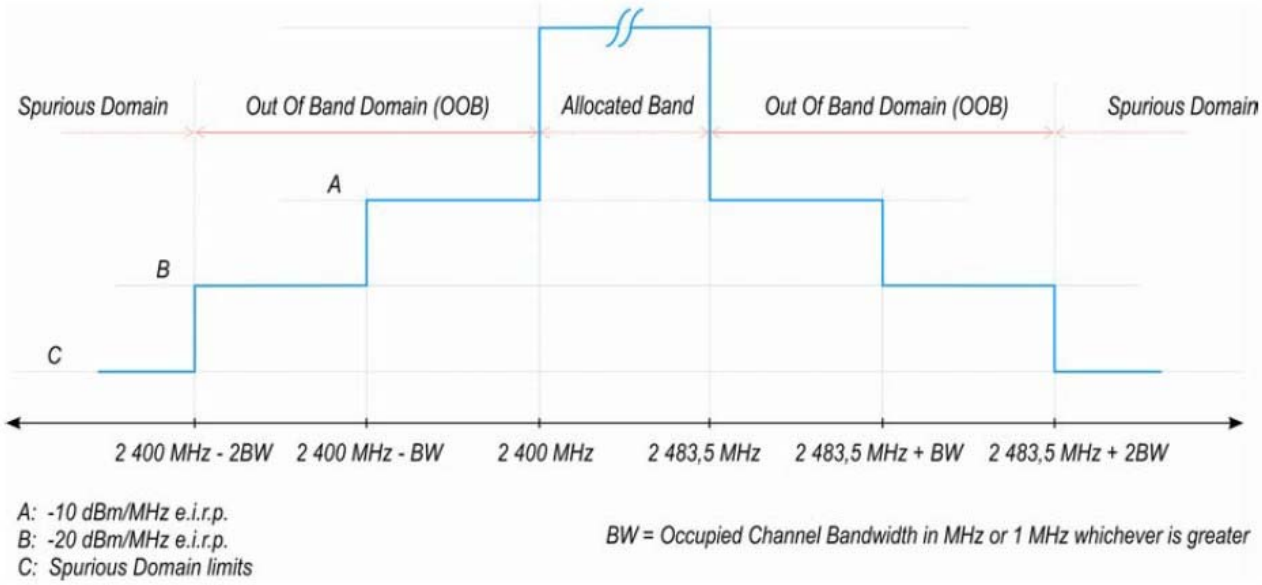
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Measured Frequencies		Limit	Pass/Fail
			F_L (MHz)	F_H (MHz)		
0	2402	2.40	2400.80	2403.20	F_L > 2400 MHz and F_H < 2483.5 MHz	Pass
39	2480	2.40	2478.80	2481.20		Pass

Note: FL is the lowest frequency of the 99% occupied bandwidth of power envelope.
FH is the highest frequency of the 99% occupied bandwidth of power envelope.

4.4 Transmitter Unwanted Emissions in the Out-of-band Domain

4.4.1 Limits of Transmitter Unwanted Emissions in the Out-of-band Domain

Condition	Limit
Under all test conditions	The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask in below figure.



4.4.2 Test Procedure

Refer to chapter 5.4.8 of EN 300 328 V2.2.2.

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement

4.4.3 Deviation from Test Standard

No deviation

4.4.4 Test Setup

The measurements were performed at normal environmental conditions and shall be repeated at the extremes of the operating temperature. The measurement was performed at the lowest and the highest channel on which the equipment can operate. The equipment was configured to operate under its worst case situation with respect to output power. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator. The frequency has to be recorded for the right and left end above threshold of highest and lowest channel respectively.

4.4.5 Test Results

Channel Frequency			2402MHz				2480MHz			
Test Condition			OOB Emission (MHz)				OOB Emission (MHz)			
			2397.6 ~ 2400		2395.2 ~ 2397.6		2483.5 ~ 2485.9		2485.9 ~ 2488.3	
			Freq. (MHz)	Power (dBm/ MHz)	Freq. (MHz)	Power (dBm/ MHz)	Freq. (MHz)	Power (dBm/ MHz)	Freq. (MHz)	Power (dBm/ MHz)
Tnom	25℃	Vnom(v)	2399.50	-36.85	2396.10	-45.89	2485.00	-37.75	2486.40	-50.08
Tmin	-40℃	Vnom(v)	2399.50	-37.01	2396.10	-45.69	2485.00	-37.68	2486.40	-50.27
Tmax	85℃	Vnom(v)	2399.50	-36.82	2396.10	-46.05	2485.00	-37.91	2486.40	-49.96
Limit (dBm/MHz)			-10.00		-20.00		-10.00		-20.00	
Pass/Fail			Pass		Pass		Pass		Pass	

4.5 Transmitter Spurious Emissions in the spurious domain

4.5.1 Limits of Transmitter Spurious Emissions

Frequency Range	Maximum Power Limit	Bandwidth
30 MHz to 47 MHz	-36dBm	100kHz
47 MHz to 74 MHz	-54dBm	100kHz
74 MHz to 87,5 MHz	-36dBm	100kHz
87,5 MHz to 118 MHz	-54dBm	100kHz
118 MHz to 174 MHz	-36dBm	100kHz
174 MHz to 230 MHz	-54dBm	100kHz
230 MHz to 470 MHz	-36dBm	100kHz
470 MHz to 694 MHz	-54dBm	100kHz
694 MHz to 1 GHz	-36dBm	100kHz
1GHz ~ 12.75GHz	-30dBm	1MHz

Note: These limits are e.r.p. for emissions up to 1 GHz and as e.i.r.p. for emissions above 1 GHz.

4.5.2 Test Procedure

Refer to chapter 5.4.9 of EN 300 328 V2.2.2.

Measurement Method	
☐ Conducted measurement	☒ Radiated measurement
For Conducted measurement: The level of unwanted emissions shall be measured as their power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation).	
Conducted measurement (For equipment with multiple transmit chains): ☐ Option 1: The results for each of the transmit chains for the corresponding 1MHz segments shall be added and compared with the limits. ☐ Option 2: The results for each of the transmit chains shall be individually compared with the limits after these limits have been reduced by 10 x log (N) (number of active transmit chains)	

4.5.3 Deviation from Test Standard

No deviation.

4.5.4 Test Setup

1. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration).
2. The equipment was configured to operate under its worst case situation with respect to output power.
3. The test setup has been constructed as the normal use condition. Controlling software (provided by manufacturer) has been activated to set the EUT on specific status.

4.5.5 Test Results

Worst-case Data:

Frequency Range	30MHz ~ 1GHz	Operating Channel	0

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
48.00	V	-68.25	-54.00	-14.25
90.68	V	-63.01	-54.00	-9.01
99.87	H	-62.68	-54.00	-8.68
182.26	V	-62.95	-54.00	-8.95
209.17	H	-70.51	-54.00	-16.51
479.53	H	-62.22	-54.00	-8.22
479.98	V	-62.31	-54.00	-8.31
576.05	H	-62.49	-54.00	-8.49
576.80	V	-63.12	-54.00	-9.12
599.71	V	-61.30	-54.00	-7.30
766.94	H	-62.20	-54.00	-8.20
768.40	V	-63.11	-54.00	-9.11
827.34	H	-62.12	-54.00	-8.12

Frequency Range	1GHz ~ 12.75GHz	Operating Channel	0, 39

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
0	4804.40	V	-56.06	-30.00	-26.06
	4805.89	H	-56.22	-30.00	-26.22
	9606.80	H	-49.70	-30.00	-19.70
	9608.70	V	-49.54	-30.00	-19.54
39	4959.48	H	-56.01	-30.00	-26.01
	4960.06	V	-54.57	-30.00	-24.57
	9919.68	H	-49.23	-30.00	-19.23
	9919.96	V	-49.25	-30.00	-19.25

4.6 Receiver Spurious Emissions

4.6.1 Limit of Receiver Spurious Emissions

Frequency Range	Maximum Power Limit	Bandwidth
30 MHz ~ 1 GHz	-57dBm	100 kHz
1 GHz ~ 12.75 GHz	-47dBm	1 MHz

Note: These limits are e.r.p. for emissions up to 1 GHz and as e.i.r.p. for emissions above 1 GHz.

4.6.2 Test Procedure

Refer to chapter 5.4.10 of EN 300 328 V2.2.2.

Measurement Method	
☐ Conducted measurement	☒ Radiated measurement
For Conducted measurement: The level of unwanted emissions shall be measured as their power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation).	
Conducted measurement (For equipment with multiple transmit chains): ☐ Option 1: The results for each of the transmit chains for the corresponding 1MHz segments shall be added and compared with the limits. ☐ Option 2: The results for each of the transmit chains shall be individually compared with the limits after these limits have been reduced by 10 x log (N) (number of active transmit chains)	

4.6.3 Deviation from Test Standard

No deviation.

4.6.4 Test Setup

1. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration).
2. Testing was performed when the equipment was in a receive-only mode.
3. The test setup has been constructed as the normal use condition. Controlling software (provided by manufacturer) has been activated to set the EUT on specific status.

4.6.5 Test Results

RX worst-case Data:

Frequency Range	30MHz ~ 1GHz	Operating Channel	0

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
89.40	V	-62.28	-57.00	-5.28
99.88	H	-63.06	-57.00	-6.06
157.50	H	-66.41	-57.00	-9.41
180.87	V	-64.40	-57.00	-7.40
265.55	H	-67.03	-57.00	-10.03
408.11	V	-63.65	-57.00	-6.65
478.95	V	-61.20	-57.00	-4.20
479.64	H	-60.86	-57.00	-3.86
577.32	V	-62.82	-57.00	-5.82
599.79	H	-62.08	-57.00	-5.08
599.96	V	-59.20	-57.00	-2.20
767.72	V	-62.92	-57.00	-5.92
825.06	H	-61.75	-57.00	-4.75
936.42	H	-62.47	-57.00	-5.47

Frequency Range	1GHz ~ 12.75GHz	Operating Channel	0, 39

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
0	4803.75	H	-60.55	-47.00	-13.55
	4804.89	V	-59.99	-47.00	-12.99
39	4958.54	V	-59.56	-47.00	-12.56
	4961.24	H	-59.98	-47.00	-12.98

4.7 Receiver Blocking

4.7.1 Limit of Receiver Blocking

This requirement applies to all receiver categories.

Receiver Category		
☐Category 1	☒Category 2	☐Category 3
Minimum performance criterion	☒PER ≦10%	
	☐Alternative performance criteria (See note)	
Note: The manufacturer was declared performance criteria is x %. for the intended use of the equipment.		

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement

Receiver Category 1 Equipment			
Wanted signal mean power from companion device (dBm) (see notes 1 to 4)	Blocking Signal Frequency (MHz)	Blocking Signal Power (dBm) (see note 4)	Type of blocking signal
(-133 dBm + 10 × $\log_{10}$(OCBW)) or -68 dBm whichever is less (see note 2)	2 380 2 504	-34	CW
(-139 dBm + 10 × $\log_{10}$(OCBW)) or -74 dBm whichever is less (see note 3)	2 300 2 330 2 360 2 524 2 584 2 674		

NOTE 1: OCBW is in Hz.
NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 26 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.
NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 20 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.
NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured / positioned as recorded in clause 5.4.3.2.2.

Receiver Category 2 Equipment			
Wanted signal mean power from companion device (dBm) (see notes 1 to 3)	Blocking Signal Frequency (MHz)	Blocking Signal Power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × log10(OCBW) +10) or (-74 dBm + 10) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 26 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured / positioned as recorded in clause 5.4.3.2.2.			

Receiver Category 3 Equipment			
Wanted signal mean power from companion device (dBm) (see notes 1 to 3)	Blocking Signal Frequency (MHz)	Blocking Signal Power (dBm) (See note 3)	Type of blocking signal
(-139 dBm + 10 × log10(OCBW) +20) or (-74 dBm + 20) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 26 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured / positioned as recorded in clause 5.4.3.2.2.			

4.7.2 Test Procedure

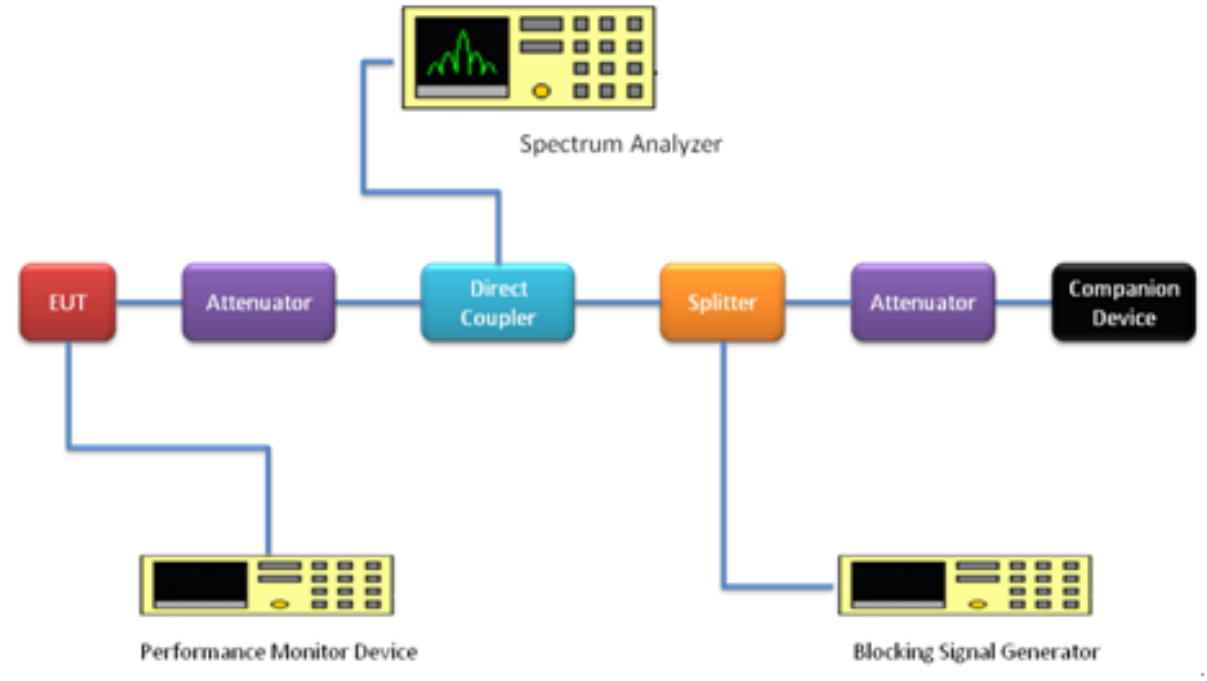
Refer to chapter 5.4.11 of EN 300 328 V2.2.2.

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement

4.7.3 Deviation from Test Standard

No deviation.

4.7.4 Test Setup Configuration



4.7.5 Test Results

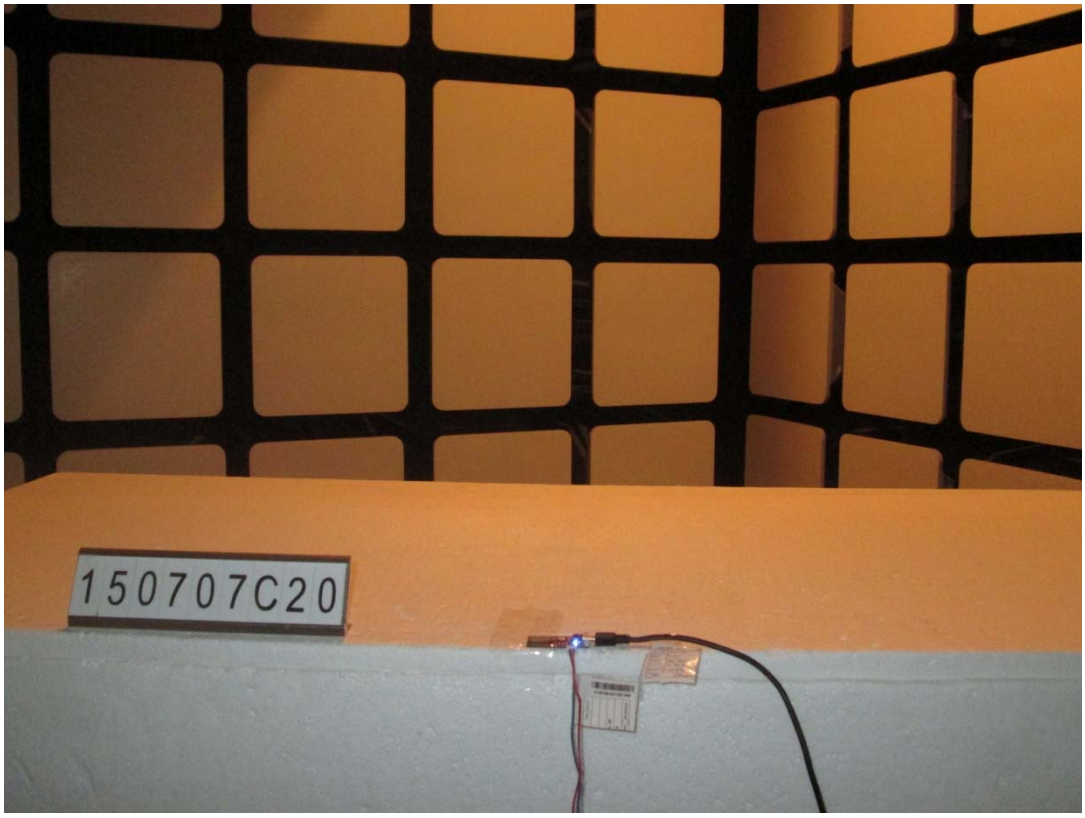
Receiver blocking performance when operating at the lowest and highest channels					
CH 0 OCBW	2.4 MHz	Antenna Gain:	-1.5 dBi	Blocking signal Power	☒ at the antenna connector
CH 39 OCBW	2.4 MHz				☐ in front of the antenna

Operation Mode	Channel Number	Wanted signal mean power from companion device (dBm) (Note 1)	Blocking signal frequency (MHz)	Blocking signal frequency shift (MHz) (Note 2)	Blocking signal power (dBm) (Note 1)	Pass/Fail
BT LE	0	-66.7	2380	-	-35.5	Pass
		-66.7	2300	-	-35.5	Pass
	39	-66.7	2504	-	-35.5	Pass
		-66.7	2584	-	-35.5	Pass

Note 1: In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G).
Note 2: If the performance criteria is not met, those frequencies of the blocking signal has been increased/decreased with a value equal to the Occupied Channel Bandwidth except the blocking frequencies 2380, 2504MHz shall be increased/decreased with a value equal to 10MHz also if the frequency offset is more than 7MHz, the level of the wanted signal shall be increased by 3dB.

5 Photographs of the Test Configuration

TX / RX Spurious Emission Test




150707C20
Applicant
Model
EYSGJN
Purpose
報告 (Report)
Service Type
RE \ RF \ IC \ SA \
Sample ID
EUT
C150706-037-007-006
Date
Accessory

Appendix – Information of 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 and approved according to ISO/IEC 17025.

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

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Tel: 886-2-26052180
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Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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