TEST REPORT No: (5217)091-0094

TEST REPORT

To:	**NEW BRIGHT INDUSTRIAL CO., LTD.**	To:	-
Attn:	Eric Kwok	Attn:	-
Address:	9/F., New Bright Building, 11 Sheung Yuet Road, Kowloon Bay, Kowloon, Hong Kong	Address:	-
Fax:	2795 3665	Fax:	-
E-mail:	ypeng01@newbright.com / chkwok01@newbright.com	E-mail:	-
Folder No.:	NBT-17MA258ETHS-B		
Factory name:	--		
Location:	--		
Product:	614VR wifi camera Model No.: GF614C		

Sample No:	HK170330/024
Date of Receipt:	March 30, 2017
Test date:	April 26, 2017 to May 05, 2017
Test Requested:	FCC Part 15 - 2015
Test Method:	ANSI C63.10 - 2013
FCC ID:	G6DGF614C

The results given in this report are related to the tested specimen of the described electrical apparatus.

CONCLUSION: The submitted sample was found to COMPLY with requirement of FCC Part 15 Subpart C.

Authorized Signature:

Reviewed by: Kinko Wong	Approved by: Law Man Kit
Date: May 24, 2017	Date: May 24, 2017

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TEST REPORT No: (5217)091-0094
Test Result Summary

EMISSION TEST			
Test requirement: FCC Part 15 - 2015			
Test Condition	Test Method	Test Result	
		Pass	Failed
Maximum Peak Conducted Output Power	ANSI C63.10	☒	☐
Spurious RF Conducted Emission	ANSI C63.10	☒	☐
Radiated Emission Test, 9kHz to 26.5GHz	ANSI C63.10	☒	☐
Band-edge measurement	ANSI C63.10	☒	☐
6dB Bandwidth of Fundamental Emission	ANSI C63.10	☒	☐
Maximum Power Spectral Density	ANSI C63.10	☒	☐
Duty Cycle Correction	ANSI C63.10	☒	☐

Report Revision & Sample Re-submit History:
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Location of the test laboratory

Radiated and Conducted emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013. An Open Area Test Site and Full Anechoic Chamber are set up for investigation and located at :

BUREAU VERITAS HONG KONG LIMITED, EMC CENTRE

No. 2106-2107, 21/F., Westin Centre,
26 Hung To Road,
Kwun Tong, Kowloon,
Hong Kong

List of measuring equipment

Radiated Emission

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	CAL. DUE DATE
EMI TEST RECEIVER	R&S	ESCI	100379	22-FEB-2017	21-FEB-2018
SIGNAL ANALYZER 40GHZ	R&S	FSV 40	100977	16-AUG-2016	15-AUG-2017
BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	27-FEB-2016	26-FEB-2018
OPEN AREA TEST SITE	BVCPS	N/A	N/A	18-JUN-2016	17-JUN-2017
ANECHOIC CHAMBER	ALBATROSS	M-CDC	80374004499B	11-MAY-2016	10-MAY-2017
BICONICAL ANTENNA	R&S	HK116	100179	14-APR-2016	13-APR-2018
LOG-PERIODIC DIPOLE ARRAY ANTENNA	R&S	HL223	832369/001	07-APR-2016	06-APR-2018
LOOP ANTENNA	ETS-LINDGREN	6502	00102266	06-NOV-2015	05-NOV-2017
HORN ANTENNA (1-18GHZ)	SCHWARZBECK	BBHA9120D	9120D-692	05-NOV-2016	04-NOV-2018
HORN ANTENNA (7.5 – 18GHZ)	SCHWARZBECK	HWRD 750	00015	17-JUN-2016	16-JUN-2018
WIDEBAND HORN ANTENNA	STEATITE	QWH-SL-18-40-K-SG	12688	03-SEP-2015	02-SEP-2017
COAXIAL CABLE	SUHNER	N/A	N/A	06-JAN-2017	05-JAN-2018
COAXIAL CABLE	HUBER + SUHNER	RG214	N/A	04-OCT-2016	03-OCT-2017

Measurement Uncertainty

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	9kHz to 30MHz	4.2dB
	30MHz to 200MHz	4.5dB
	200MHZ to 1GHz	5.6dB
	1GHz to 18GHz	4.7dB
	18GHz to 40GHz	5.2dB
Maximum Peak Conducted Output Power	30MHz to 18GHz	2.0dB

Remarks:-

N/A : Not Applicable or Not Available
The measurement instrumentation uncertainty would be taking into consideration on each of the test result

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TEST REPORT No: (5217)091-0094

Equipment Under Test [EUT]
Description of Sample:

Model Name:	614VR wifi camera
Model Number:	GF614C
Additional Model Name:	--
Additional Model Number:	--
Additional Model information:	--
Rating:	5Vd.c.

Description of EUT Operation:

The Equipment Under Test (EUT) is a NEW BRIGHT INDUSTRIAL CO., LTD of Digital Device. It is a transceiver which operating at 2417MHz.The EUT transmit while received the corresponding signal, Modulation by IC, and type is GFSK.

Antenna Requirement (Section 15.203)

The EUT is use of a permanently antenna. The antenna consists of 7cm long wire. It is soldered on the PCB. The antenna is not replaceable or user serviceable. The requirements of S15.203 are met. There are no deviations or exceptions to the specifications.

Photo of Antenna

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Test Results

Maximum Peak Conducted Output Power (Fundamental)

Test Requirement:	FCC Part 15 Section 15.247 (b)(3)
Test Method:	ANSI C63.10 Section 11.9.1.2
Test Date(s):	2017-05-04
Temperature:	25.0 °C
Humidity:	67.0 %
Atmospheric Pressure:	100.2 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	5Vd.c.

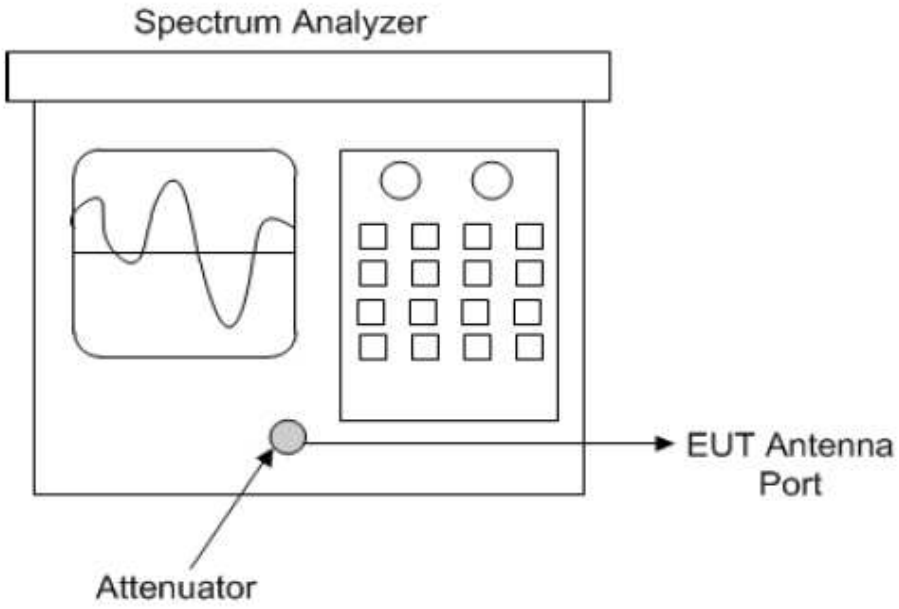
Test Procedure:

Maximum Peak Conducted Output Power measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013.

The RF output of the EUT was connected to spectrum analyser. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in dBm.

Location: Room 2106, 26 Hung To Road, Kwun Tong, Kowloon, Hong Kong

Test Setup:



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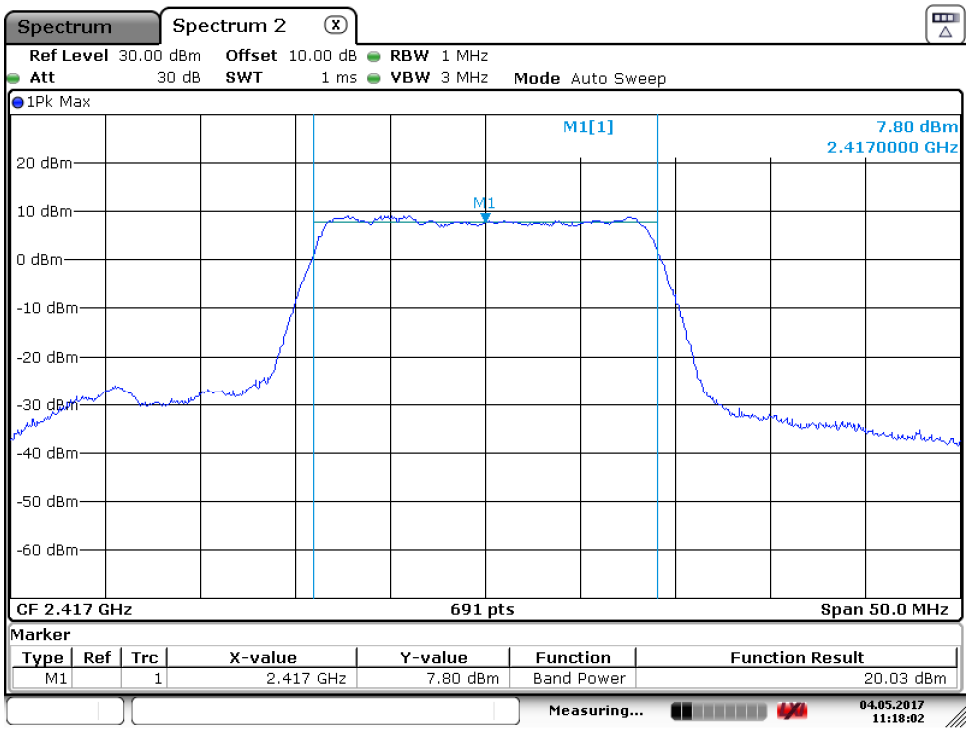
Limits for Maximum Peak Conducted Output Power of Fundamental [FCC 47CFR 15.247]:

Frequency Band of Fundamental [MHz]	Maximum Peak Conducted Output Power of Fundamental (Peak) [dBm]
2400-2483.5	30 (1 Watt)

Test Plot of the Maximum Conducted Output Power



Date: 4.MAY.2017 11:18:02

Measurement Data:

Test Result of (Transmission mode): PASS

Frequency (MHz)	Maximum Conducted Output Power (dBm)	Maximum Conducted Output Power (Watt)	Limits (Watt)
2417	20.03	0.101	1

Note: includes Antenna Factor and Cable Loss.
Receiver setting: RBW = ≥ DTS bandwidth
VBW = 3 x RBW

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TEST REPORT No: (5217)091-0094

Spurious RF Conducted Emissions Test

Test Requirement:	FCC Part 15 Section 15.247(d)
Test Method:	ANSI C63.10 Section 11.11.1
Test Date(s):	2017-05-04
Temperature:	25.0 °C
Humidity:	67.0 %
Atmospheric Pressure:	100.2 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	5Vd.c.

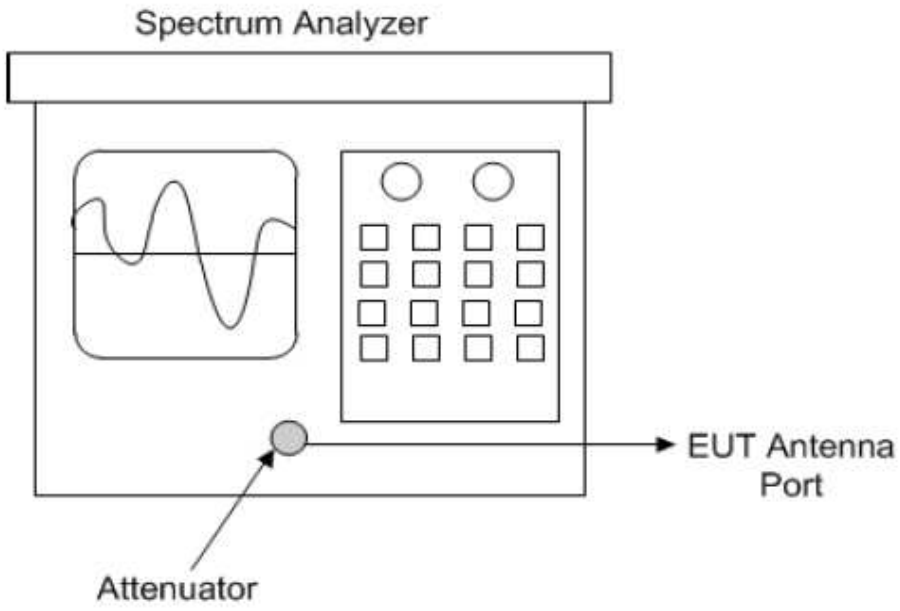
Test Procedure:

Spurious RF Conducted Emissions Test measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013.

The RF output of the EUT was connected to spectrum analyser. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in dBm.

Location: Room 2106, 26 Hung To Road, Kwun Tong, Kowloon, Hong Kong

Test Setup:



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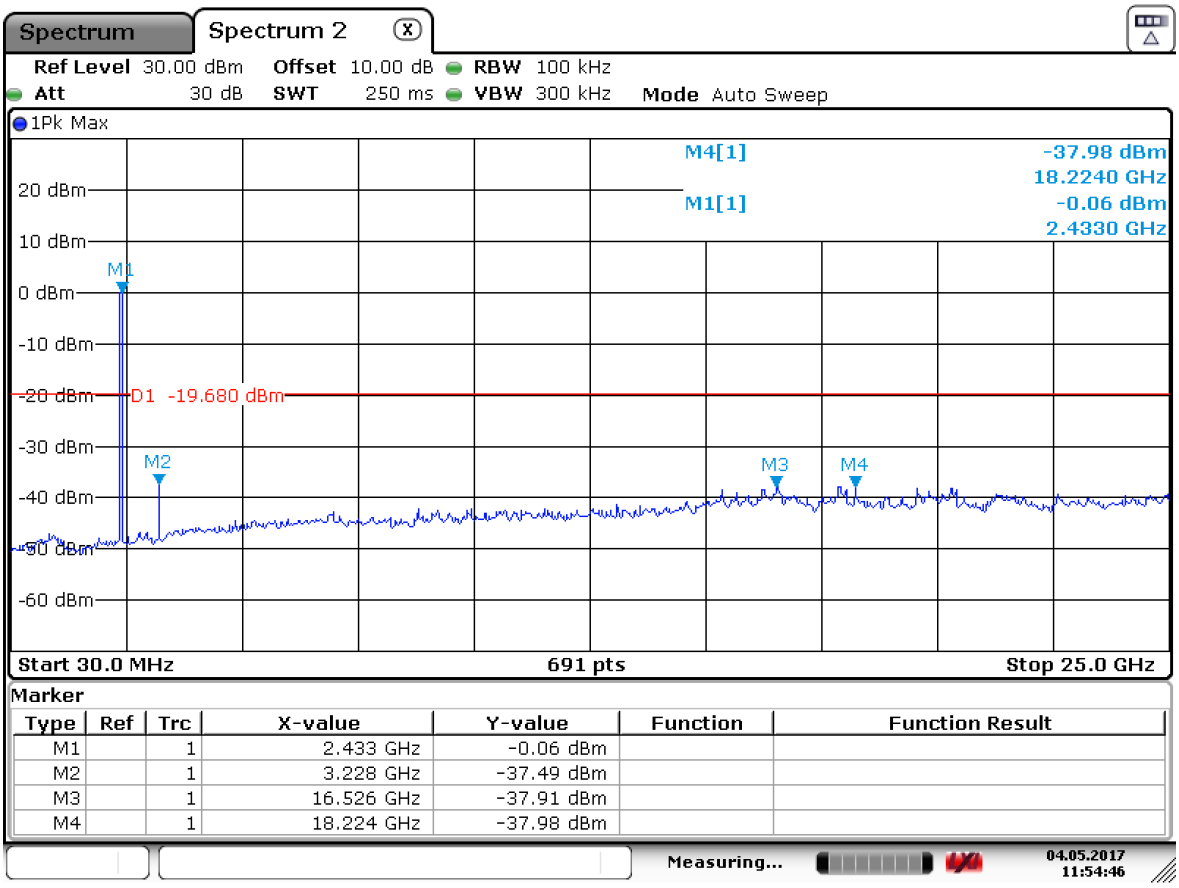
Limits for Spurious RF Conducted Emissions Test [FCC 47CFR 15.247]:

Frequency Range [MHz]	Limit [dBc]
30 - 25000	-20

Measurement Data:

Test Result of (Transmission mode): PASS



Date: 4.MAY.2017 11:54:46

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TEST REPORT No: (5217)091-0094

Radiated Emissions (9kHz – 26.5GHz)

Test Requirement:	FCC Part 15 Section 15.209
Test Method:	ANSI C63.10 Section 11.12.1
Test Date(s):	2017-05-05
Temperature:	25.0 °C
Humidity:	67.0 %
Atmospheric Pressure:	100.2 kPa
Mode of Operation:	On mode
Tested Voltage:	5Vd.c.

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]	Measurement Distance m
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above960	500	3

Measurement Data

Test Result of (On mode): PASS

Detection mode: Quasi-Peak

Frequency	Polarity (H/V)	Field Strength	Limit	Margin (dB)
Emissions detected are more than 20 dB below the limit line(s) in 9kHz to 30MHz				

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 200Hz
VBW = 200Hz

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TEST REPORT No: (5217)091-0094

Measurement Data

Test Result of (On mode): PASS

Detection mode: Quasi-Peak

Frequency (MHz)	Polarity (H/V)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
120.00	H	31.7	43.5	-11.8
156.00	H	29.4	43.5	-14.1
264.00	H	34.5	46.0	-11.5
288.00	H	36.0	46.0	-10.0
336.00	H	32.8	46.0	-13.2
960.00	H	35.1	46.0	-10.9

Frequency (MHz)	Polarity (H/V)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
120.00	V	34.6	43.5	-8.9
156.00	V	32.8	43.5	-10.7
264.00	V	26.6	46.0	-19.4
288.00	V	29.8	46.0	-16.2
336.00	V	31.5	46.0	-14.5
960.00	V	40.1	46.0	-5.9

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz
VBW = 120KHz

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Measurement Data:

Test Result of (Transmission mode): PASS

Frequency (MHz)	Polarity (H/V)	Antenna Factor & Cable Loss (dB/m)	Duty-cycle correction (dB)	Field Strength at 3m – Peak (dBµV/m)	Limit at 3m – Peak (dBµV/m)	Margin - Peak (dB)	Field Strength at 3m – Average (dBµV/m)	Limit at 3m – Average (dBµV/m)	Margin - Average (dB)
2400.00	H	-4.8	-22.1	66.7	74.0	-7.3	**44.6	54.0	-9.4
4834.00	H	4.8	-22.1	51.4	74.0	-22.6	**29.3	54.0	-24.7
7251.00	H	12.4	-22.1	46.1	74.0	-27.9	**24.0	54.0	-30.0
9668.00	H	13.5	-22.1	46.2	74.0	-27.8	**24.1	54.0	-29.9
12085.00	H	19.6	-22.1	51.9	74.0	-22.1	**29.8	54.0	-24.2
14502.00	H	25.8	-22.1	53.8	74.0	-20.2	**31.7	54.0	-22.3
16919.00	H	21.2	-22.1	56.8	74.0	-17.2	**34.7	54.0	-19.3
19336.00	H	46.7	-22.1	56.8	74.0	-17.2	**34.7	54.0	-19.3
21753.00	H	46.9	-22.1	57.7	74.0	-16.3	**35.6	54.0	-18.4
24170.00	H	48.0	-22.1	58.2	74.0	-15.8	**36.1	54.0	-17.9
26587.00	H	48.5	-22.1	58.5	74.0	-15.5	**36.4	54.0	-17.6

For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.
**Duty Cycle Correction = 20Log(0.078) = -22.1dB.

Note: Field Strength includes Antenna Factor and Cable Loss.
Receiver setting: RBW = 1MHz
VBW = 1MHz

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Measurement Data:

Test Result of (Transmission mode): PASS

Frequency (MHz)	Polarity (H/V)	Antenna Factor & Cable Loss (dB/m)	Duty-cycle correction (dB)	Field Strength at 3m – Peak (dBµV/m)	Limit at 3m – Peak (dBµV/m)	Margin - Peak (dB)	Field Strength at 3m – Average (dBµV/m)	Limit at 3m – Average (dBµV/m)	Margin - Average (dB)
2400.00	V	-4.8	-22.1	68.7	74.0	-5.3	**46.6	54.0	-7.4
4834.00	V	4.8	-22.1	48.2	74.0	-25.8	**26.1	54.0	-27.9
7251.00	V	12.4	-22.1	45.2	74.0	-28.8	**23.1	54.0	-30.9
9668.00	V	13.5	-22.1	45.6	74.0	-28.4	**23.5	54.0	-30.5
12085.00	V	19.6	-22.1	52.1	74.0	-21.9	**30.0	54.0	-24.0
14502.00	V	25.8	-22.1	53.9	74.0	-20.1	**31.8	54.0	-22.2
16919.00	V	21.2	-22.1	56.4	74.0	-17.6	**34.3	54.0	-19.7
19336.00	V	46.7	-22.1	56.7	74.0	-17.3	**34.6	54.0	-19.4
21753.00	V	46.9	-22.1	58.2	74.0	-15.8	**36.1	54.0	-17.9
24170.00	V	48.0	-22.1	57.4	74.0	-16.6	**35.3	54.0	-18.7
26587.00	V	48.5	-22.1	58.7	74.0	-15.3	**36.6	54.0	-17.4

For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.
**Duty Cycle Correction = 20Log(0.078) = -22.1dB.

Note: Field Strength includes Antenna Factor and Cable Loss.
Receiver setting: RBW = 1MHz
VBW = 1MHz

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TEST REPORT No: (5217)091-0094

Band-edge Measurement

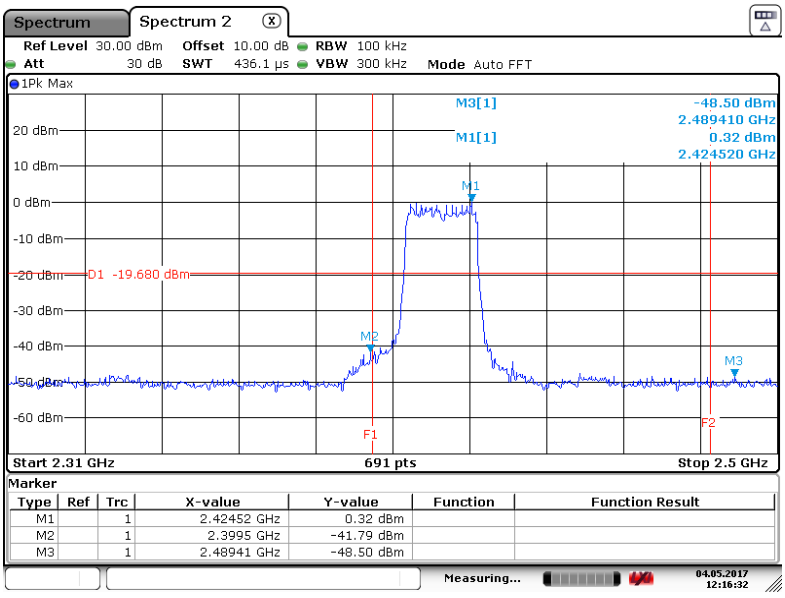
Test Requirement:	FCC 47 CFR 15.247(d)
Test Method:	ANSI C63.10 Section 11.13.2
Test Date(s):	2017-05-04
Temperature:	25.0 °C
Humidity:	67.0 %
Atmospheric Pressure:	100.2 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	5Vd.c.

Test Limits:

In any 100kHz bandwidth outside the frequency band in which the spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

Measurement Data :

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2399.50	-41.79
2489.41	-48.50



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TEST REPORT No: (5217)091-0094

6dB Bandwidth measurement

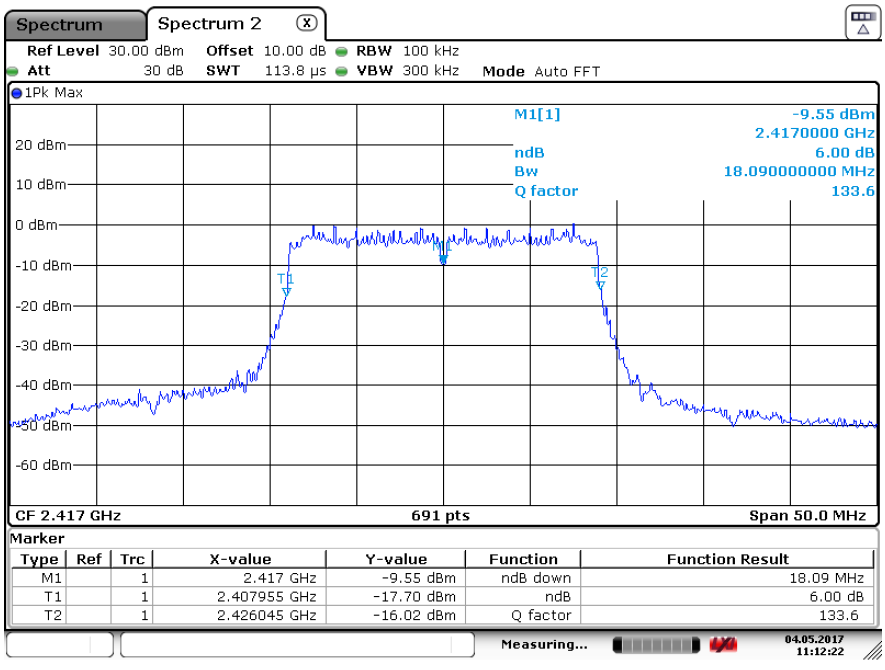
Test Requirement:	FCC 47 CFR 15.247(a)(2)
Test Method:	ANSI C63.10 Section 11.8.1
Test Date(s):	2017-05-04
Temperature:	25.0 °C
Humidity:	67.0 %
Atmospheric Pressure:	100.2 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	5Vd.c.

Test Method:
The bandwidth is measured at an amplitude level reduced from the reference level by a specified radio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the wrost-case (i.e. the widest) bandwidth.

Test Setup:
Refer to Maximum Peak Conducted Power Measurement

Measurement Data:

Fundamental Frequency [MHz]	6 dB Bandwidth [MHz]	FCC Limits
2417	18.09	≥500kHz



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TEST REPORT No: (5217)091-0094

Maximum Power Spectral Density Test

Test Requirement:	FCC 47 CFR 15.247(e)
Test Method:	ANSI C63.10 Section 11.10.2
Test Date(s):	2017-05-04
Temperature:	25.0 °C
Humidity:	67.0 %
Atmospheric Pressure:	100.2 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	5Vd.c.

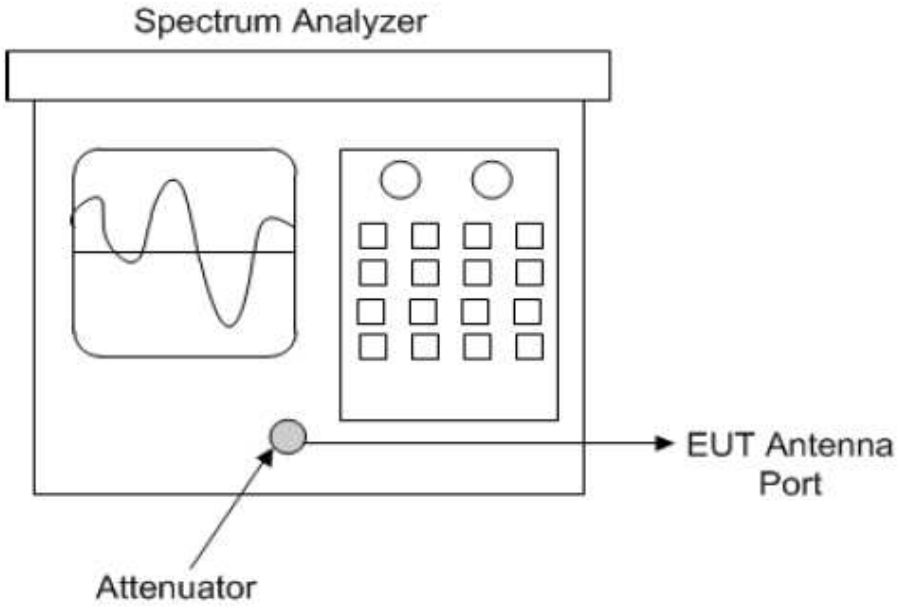
Test Procedure:

Maximum Power Spectral Destiny Test measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013.

The RF output of the EUT was connected to spectrum analyser. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in dBm.

Location: Room 2106, 26 Hung To Road, Kwun Tong, Kowloon, Hong Kong

Test Setup:



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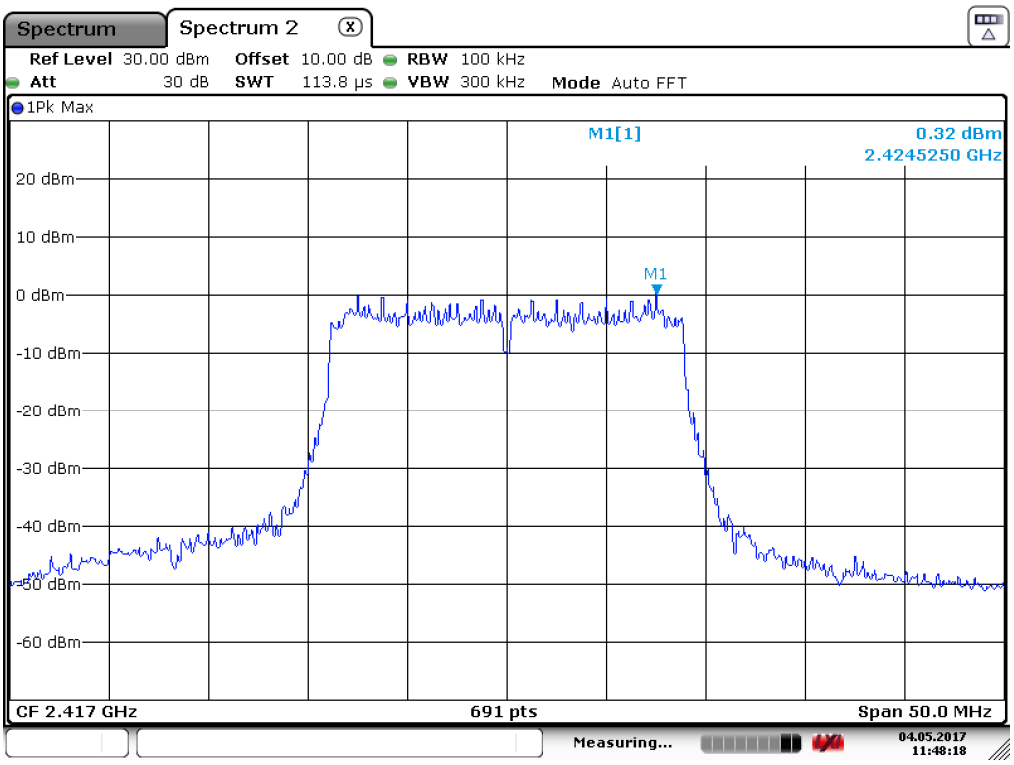
Test Plot of the Maximum Power Spectral Density



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Measurement Data:

Test Result of (Transmission mode): PASS

Frequency (MHz)	Maximum Power Spectral Density (dBm)	Limits (dBm)
2417	0.32	8

Note: includes Antenna Factor and Cable Loss.
Receiver setting: RBW = 100kHz
VBW = 3 x RBW

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Duty Cycle Correction During 100msec:

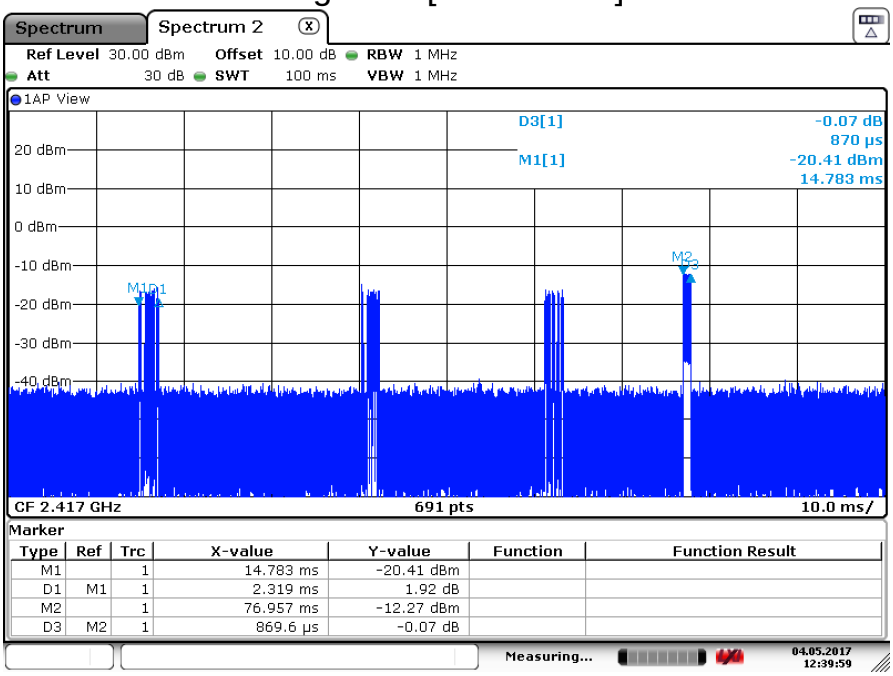
Each function key sends a different series of characters, but each packet period (100msec) never exceeds a series of 3 long pulses (2.319msec) and 1 short pulse (0.8696msec). Assuming any combination of short or long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered 3 x (2.319msec) + 1 x (0.8696msec) per 100msec = 7.8% duty cycle. Figure A show the characteristics of the pulse train for one of these functions

Remarks:

Duty Cycle Correction = 20Log(0.078) = -22.1dB

The following figures [Figure A] show the characteristics of the pulse train for one of these functions.

Figure A [Pulse Train]



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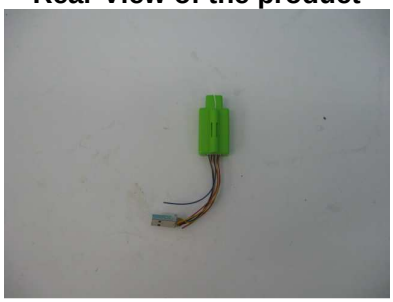
TEST REPORT No: (5217)091-0094

Photographs of EUT

Front View of the product

Rear View of the product



Top View of the product

Bottom View of the product

Side View of the product

Side View of the product

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Photographs of EUT

Internal View of the product

Internal View of the product

Inner Circuit Top View

Inner Circuit Bottom View

Inner Circuit Bottom View

Inner Circuit Top View

Inner Circuit Bottom View

Antenna

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Measurement of Radiated Emission Test Set Up

******* End of Report *******

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