TEST REPORT No: (5219)170-0119

TEST REPORT

To:	**Just Play (H.K.) Ltd**	To:	-
Attn:	Candice Leung, David Yip	Attn:	-
Address:	10th Floor, Mirror Tower, No. 61 Mody Road, Tsim Sha Tsui East, Kowloon, Hong Kong	Address:	-
Fax:	852 2164 3100	Fax:	-
E-mail:	cleung@justplayproducts.com, dyip@justplayproducts.com, testreport@justplayproducts.com	E-mail:	-
Folder No.:	--		

Factory name:	Guangdong Mingyu Plastic Industry Co., Ltd.
Location:	--
Product:	Barbie RC Car Model No.: 63360

Sample No:	(5219)170-0119
Date of Receipt:	June 21, 2019
Test date:	July 09, 2019
Test Requested:	FCC Part 15 - 2017
Test Method:	ANSI C63.10 - 2013
FCC ID:	2AAIB6336000

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: Ivan Yeung	Approved by: Sze Tsz Man
Date: July 26, 2019	Date: July 26, 2019

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

TEST REPORT No: (5219)170-0119
Test Result Summary

EMISSION TEST			
Test requirement: FCC Part 15 - 2017			
Test Condition	Test Method	Test Result	
		Pass	Failed
Radiated Emission Test, 9kHz to 24GHz	ANSI C63.10	☒	☐
Frequency range of Fundamental Emission	ANSI C63.10	☒	☐
26dB Bandwidth of Fundamental Emission	ANSI C63.10	☒	☐
Duty Cycle Correction During 100msec	ANSI C63.10	☒	☐

Report Revision & Sample Re-submit History:
--

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

TEST REPORT No: (5219)170-0119

Location of the test laboratory

Bureau Veritas Hong Kong Limited

Room 03, 6/F, Westin Centre, 26 Hung To Road, Kwun Tong, Kowloon, Hong Kong

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013. Semi-Anechoic Chamber are set up for investigation and located at:

LG1/F., HKPC Building, 78 Tat Chee Avenue, 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	ESU40	100190	12-JUN-2019	12-JUN-2020
SEMI-ANECHOIC CHAMBER	FRANKONIA	--	--	23-APR-2019	23-APR-2020
BICONICAL ANTENNA	R&S	HK116	100241	21-MAR-2018	21-MAR-2020
LOG-PERIODIC ANTENNA	R&S	HL223	841516/017	21-MAR-2018	21-MAR-2020
ACTIVE LOOP ANTENNA	EMCO	6502	9107-2651	30-OCT-2017	30-OCT-2019
STANDARD GAIN HORN (8.2 – 12.4GHZ)	ETS-LINDGREN	3160-07	00205404	04-SEP-2018	04-SEP-2020
STANDARD GAIN HORN (12.4 – 18GHZ)	ETS-LINDGREN	3160-08	002056363	26-SEP-2018	26-SEP-2020
DOUBLE RIDGED HORN (1 – 8.2GHZ)	ETS-LINDGREN	3117	00094998	30-AUG-2018	30-AUG-2020
STANDARD GAIN HORN (26.5 – 40GHZ)	ETS-LINDGREN	3160-10	00205696	03-OCT-2018	03-OCT-2020
DOUBLE RIDGED HORN (18-26.5GHZ)	ETS-LINDGREN	3116	00109210	05-OCT-2018	05-OCT-2020
MICROWAVE PREAMPLIFIER	COM-POWER CORPORATION	PAM-118A	551091	25-JUN-2019	25-JUN-2020
PREAMPLIFIER (18 -40GHZ WITH CABLE)	A.H. Systems, Inc.	Pam-1840VH	168	29-JAN-2019	29-JAN-2020
COAXIAL CABLE	Huber+Suhner	CNM-NMCMILX800-473	A2803 #0001	11-DEC-2017	11-DEC-2019

Measurement Uncertainty

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	30MHz to 200MHz	±5.1dB
	200MHz to 1GHz	±6.2dB
	1GHz to 8.2GHz	±4.9dB
	8.2GHZ to 12.4GHz	±4.4dB
	12.4GHz to 18GHz	±4.6dB

Remarks:-

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

TEST REPORT No: (5219)170-0119

Equipment Under Test [EUT]
Description of Sample:

Model Name:	Barbie RC Car
Model Number:	63360
Additional Model Name:	--
Additional Model Number:	--
Additional Model information:	Declare the Circuit, PCB layout and Electrical parts of the products are identical to the basic model, except the model number for market purpose
Rating:	3Vd.c. (“AAA” size battery x 2)

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

Description of EUT Operation:

The Equipment Under Test (EUT) is a **Just Play (H.K.) Ltd** of Remote Control Transmitter. It is a 2 buttons and 1 wheel transmitter and operating at 2407MHz to 2477MHz. The lowest, middle and highest frequencies were tested and the results are shown in the report. The EUT transmit while buttons is being pressed or sticks are being pushed or pulled, Modulation by IC, and type is GFSK. There are total 71 channels and below is the frequency list :

2407	2408	2409	2410	2411	2412	2413	2414	2415	2416
2417	2418	2419	2420	2421	2422	2423	2424	2425	2426
2427	2428	2429	2430	2431	2432	2433	2434	2435	2436
2437	2438	2439	2440	2441	2442	2443	2444	2445	2446
2447	2448	2449	2450	2451	2452	2453	2454	2455	2456
2457	2458	2459	2460	2461	2462	2463	2464	2465	2466
2467	2468	2469	2470	2471	2472	2473	2474	2475	2476
2477									

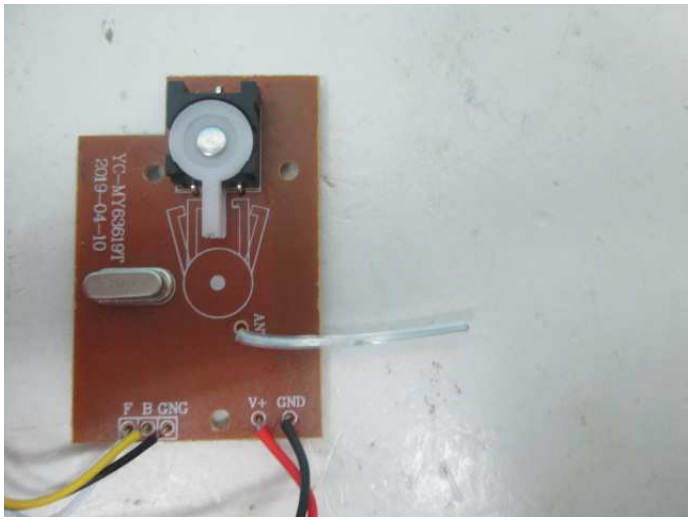
The transceiver has different control:

1. Left button – Forward control
2. Right button – Backward control
3. Wheel – control left and right

Antenna Requirement (Section 15.203)

The EUT is use of a permanently antenna. It is soldered on the PCB. The antenna consists of 3cm long wire 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



BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

Test Results

Radiated Emissions (Fundamental)

Test Requirement:	FCC Part 15 Section 15.249
Test Method:	ANSI C63.10
Test Date(s):	2019-07-09
Temperature:	26.0 °C
Humidity:	55.0 %
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. ("AAA" size battery x 2)

Test Procedure:

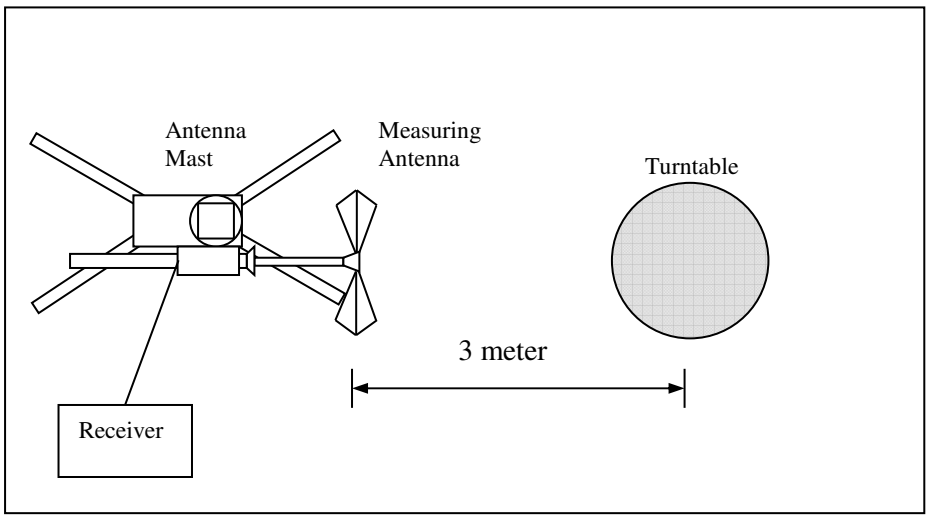
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground for measurement frequency below 1GHz and 1.5m high above the ground for measurement frequency above 1GHz. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using new battery. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.

Location: Hong Kong Productivity Council – Electromagnetic Compatibility Centre

Test Setup: Semi-anechoic chamber



BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

TEST REPORT No: (5219)170-0119

Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission (Average) [mV/m]	Field Strength of Harmonics Emission (Average) [μV/m]
2400-2483.5	50	500

Measurement Data

Test Result of (Transmission mode, Lowest frequency): 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)
2407.00	H	32.0	-11.7	89.3	114.0	-24.7	77.6	94.0	-16.4
2407.00	V	32.0	-11.7	86.7	114.0	-27.3	75.0	94.0	-19.0

Test Result of (Transmission mode, Middle frequency): 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)
2443.00	H	32.0	-11.7	89.1	114.0	-24.9	77.4	94.0	-16.6
2443.00	V	32.0	-11.7	85.7	114.0	-28.3	74.0	94.0	-20.0

Test Result of (Transmission mode, Highest frequency): 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)
2477.00	H	32.3	-11.7	89.9	114.0	-24.1	78.2	94.0	-15.8
2477.00	V	32.3	-11.7	86.3	114.0	-27.7	74.6	94.0	-19.4

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(0.2579) = -11.7dB

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

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

TEST REPORT No: (5219)170-0119

Radiated Emissions (Spurious Emission)

Test Requirement:	FCC Part 15 Section 15.249
Test Method:	ANSI C63.10
Test Date(s):	2019-07-09
Temperature:	26.0 °C
Humidity:	55.0 %
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. ("AAA" size battery x 2)

Measurement Data

Test Result of (Transmission mode, Lowest frequency): 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	32.0	-11.7	59.8	74.0	-14.2	48.1	54.0	-5.9
4814.00	H	-1.3	-11.7	56.1	74.0	-17.9	44.4	54.0	-9.6
7221.00	H	2.4	-11.7	42.9	74.0	-31.1	31.2	54.0	-22.8
9628.00	H	4.8	-11.7	46.3	74.0	-27.7	34.6	54.0	-19.4
12035.00	H	5.4	-11.7	47.1	74.0	-26.9	35.4	54.0	-18.6
14442.00	H	8.9	-11.7	48.2	74.0	-25.8	36.5	54.0	-17.5
16849.00	H	8.4	-11.7	48.5	74.0	-25.5	36.8	54.0	-17.2
19256.00	H	20.5	-11.7	49.0	74.0	-25.0	37.3	54.0	-16.7
21663.00	H	21.7	-11.7	49.6	74.0	-24.4	37.9	54.0	-16.1
24070.00	H	25.7	-11.7	50.3	74.0	-23.7	38.6	54.0	-15.4
26477.00	H	29.5	-11.7	51.2	74.0	-22.8	39.5	54.0	-14.5

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(0.2579) = -11.7dB

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

TEST REPORT No: (5219)170-0119

Measurement Data

Test Result of (Transmission mode, Lowest frequency): 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	32.0	-11.7	57.8	74.0	-16.2	46.1	54.0	-7.9
4814.00	V	-1.3	-11.7	57.1	74.0	-16.9	45.4	54.0	-8.6
7221.00	V	2.4	-11.7	47.2	74.0	-26.8	35.5	54.0	-18.5
9628.00	V	4.8	-11.7	54.2	74.0	-19.8	42.5	54.0	-11.5
12035.00	V	5.4	-11.7	46.2	74.0	-27.8	34.5	54.0	-19.5
14442.00	V	8.9	-11.7	47.5	74.0	-26.5	35.8	54.0	-18.2
16849.00	V	8.4	-11.7	47.8	74.0	-26.2	36.1	54.0	-17.9
19256.00	V	20.5	-11.7	48.3	74.0	-25.7	36.6	54.0	-17.4
21663.00	V	21.7	-11.7	48.9	74.0	-25.1	37.2	54.0	-16.8
24070.00	V	25.7	-11.7	49.1	74.0	-24.9	37.4	54.0	-16.6
26477.00	V	29.5	-11.7	49.6	74.0	-24.4	37.9	54.0	-16.1

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(0.2579) = -11.7dB

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

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

Measurement Data
Test Result of (Transmission mode, Middle frequency): 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)
4886.00	H	-1.3	-11.7	53.6	74.0	-20.4	41.9	54.0	-12.1
7329.00	H	2.4	-11.7	42.5	74.0	-31.5	30.8	54.0	-23.2
9772.00	H	4.8	-11.7	46.6	74.0	-27.4	34.9	54.0	-19.1
12215.00	H	5.4	-11.7	47.0	74.0	-27.0	35.3	54.0	-18.7
14658.00	H	11.1	-11.7	45.6	74.0	-28.4	33.9	54.0	-20.1
17101.00	H	12.5	-11.7	47.3	74.0	-26.7	35.6	54.0	-18.4
19544.00	H	20.7	-11.7	48.0	74.0	-26.0	36.3	54.0	-17.7
21987.00	H	22.1	-11.7	48.5	74.0	-25.5	36.8	54.0	-17.2
24430.00	H	25.7	-11.7	49.9	74.0	-24.1	38.2	54.0	-15.8
26873.00	H	29.7	-11.7	50.2	74.0	-23.8	38.5	54.0	-15.5

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)
4886.00	V	-1.3	-11.7	56.2	74.0	-17.8	44.5	54.0	-9.5
7329.00	V	2.4	-11.7	43.0	74.0	-31.0	31.3	54.0	-22.7
9772.00	V	4.8	-11.7	45.5	74.0	-28.5	33.8	54.0	-20.2
12215.00	V	5.4	-11.7	46.3	74.0	-27.7	34.6	54.0	-19.4
14658.00	V	11.1	-11.7	46.6	74.0	-27.4	34.9	54.0	-19.1
17101.00	V	12.5	-11.7	47.0	74.0	-27.0	35.3	54.0	-18.7
19544.00	V	20.7	-11.7	48.5	74.0	-25.5	36.8	54.0	-17.2
21987.00	V	22.1	-11.7	48.9	74.0	-25.1	37.2	54.0	-16.8
24430.00	V	25.7	-11.7	49.0	74.0	-25.0	37.3	54.0	-16.7
26873.00	V	29.7	-11.7	50.7	74.0	-23.3	39.0	54.0	-15.0

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(0.2579) = -11.7dB

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

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

Measurement Data
Test Result of (Transmission mode, Highest frequency): 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)
2483.50	H	32.3	-11.7	60.1	74.0	-13.9	48.4	54.0	-5.6
4954.00	H	-1.3	-11.7	54.3	74.0	-19.7	42.6	54.0	-11.4
7431.00	H	2.4	-11.7	42.1	74.0	-31.9	30.4	54.0	-23.6
9908.00	H	4.8	-11.7	47.0	74.0	-27.0	35.3	54.0	-18.7
12385.00	H	5.4	-11.7	47.7	74.0	-26.3	36.0	54.0	-18.0
14862.00	H	11.1	-11.7	48.0	74.0	-26.0	36.3	54.0	-17.7
17339.00	H	12.5	-11.7	48.2	74.0	-25.8	36.5	54.0	-17.5
19816.00	H	20.7	-11.7	49.2	74.0	-24.8	37.5	54.0	-16.5
22293.00	H	22.1	-11.7	49.7	74.0	-24.3	38.0	54.0	-16.0
24770.00	H	26.7	-11.7	50.3	74.0	-23.7	38.6	54.0	-15.4
27247.00	H	29.7	-11.7	50.8	74.0	-23.2	39.1	54.0	-14.9

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(0.2579) = -11.7dB

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

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

Measurement Data
Test Result of (Transmission mode, Highest frequency): 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)
2483.50	V	32.3	-11.7	56.2	74.0	-17.8	44.5	54.0	-9.5
4954.00	V	-1.3	-11.7	56.6	74.0	-17.4	44.9	54.0	-9.1
7431.00	V	2.4	-11.7	42.5	74.0	-31.5	30.8	54.0	-23.2
9908.00	V	4.8	-11.7	47.1	74.0	-26.9	35.4	54.0	-18.6
12385.00	V	5.4	-11.7	47.0	74.0	-27.0	35.3	54.0	-18.7
14862.00	V	11.1	-11.7	48.2	74.0	-25.8	36.5	54.0	-17.5
17339.00	V	12.5	-11.7	48.5	74.0	-25.5	36.8	54.0	-17.2
19816.00	V	20.7	-11.7	49.9	74.0	-24.1	38.2	54.0	-15.8
22293.00	V	22.1	-11.7	50.1	74.0	-23.9	38.4	54.0	-15.6
24770.00	V	26.7	-11.7	50.5	74.0	-23.5	38.8	54.0	-15.2
27247.00	V	29.7	-11.7	50.6	74.0	-23.4	38.9	54.0	-15.1

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(0.2579) = -11.7dB

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

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

TEST REPORT No: (5219)170-0119

Radiated Emissions (30MHz – 2.4GHz)

Test Requirement:	FCC Part 15 Section 15.209
Test Method:	ANSI C63.10
Test Date(s):	2019-07-09
Temperature:	26.0 °C
Humidity:	55.0 %
Mode of Operation:	On mode
Tested Voltage:	3Vd.c. (“AAA” size battery x 2)

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

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

TEST REPORT No: (5219)170-0119

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)
33.68	H	27.3	40.0	-12.7
112.26	H	22.4	43.5	-21.1
235.14	H	24.5	46.0	-21.5
322.78	H	26.1	46.0	-19.9
521.62	H	28.9	46.0	-17.1
719.86	H	29.7	46.0	-16.3

Frequency (MHz)	Polarity (H/V)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
33.68	V	27.0	40.0	-13.0
112.26	V	23.0	43.5	-20.5
235.14	V	24.2	46.0	-21.8
322.78	V	26.5	46.0	-19.5
521.62	V	28.1	46.0	-17.9
719.86	V	30.2	46.0	-15.8

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz
VBW = 120KHz

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

TEST REPORT No: (5219)170-0119

Frequency range of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.249
Test Method:	ANSI C63.10 Clause 6.10
Test Date(s):	2019-07-09
Temperature:	26.0 °C
Humidity:	55.0 %
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. (“AAA” size battery x 2)

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. 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 worst-case (i.e. the widest) bandwidth.

Limits for Frequency range of Fundamental Emission:

Frequency [MHz]	FCC Limits [MHz]
2407.00 – 2477.00	2400 – 2483.5

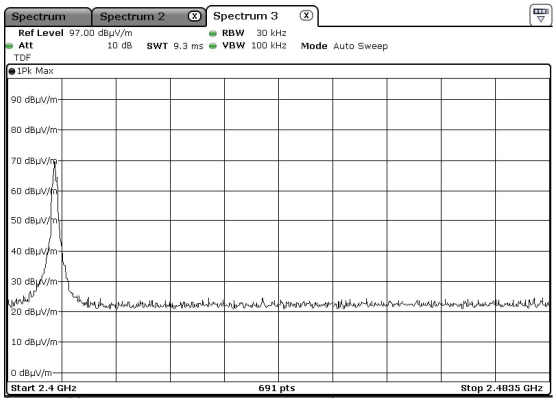
BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

TEST REPORT No: (5219)170-0119

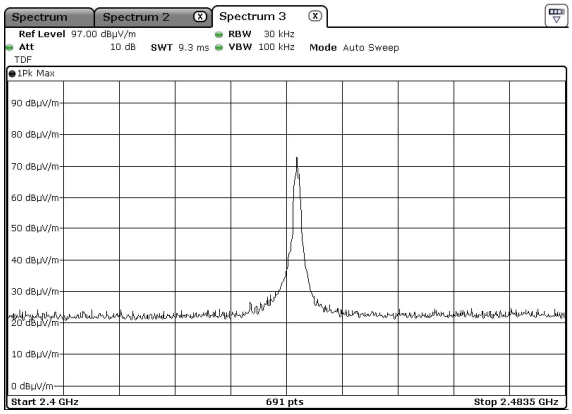
Measurement Data :

Test Result of Frequency Range of Fundamental Emission: PASS

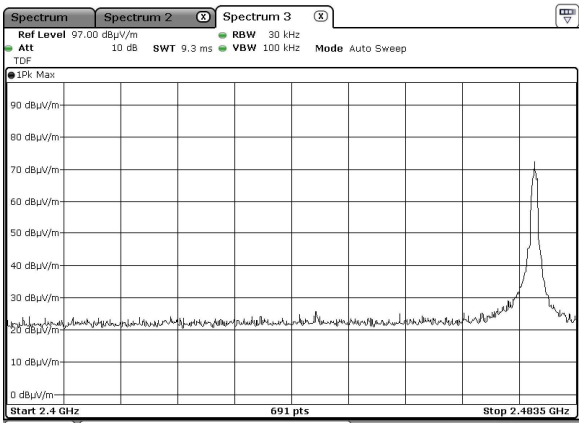
Lowest Frequency – 2407.00MHz



Middle Frequency – 2443.00MHz



Highest Frequency – 2477.00MHz

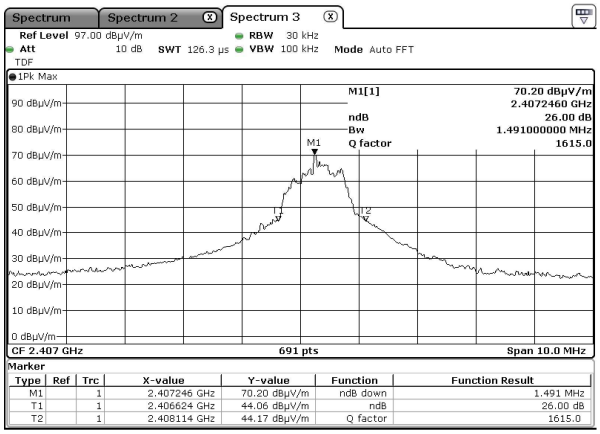


BUREAU VERITAS HONG KONG LIMITED –
Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

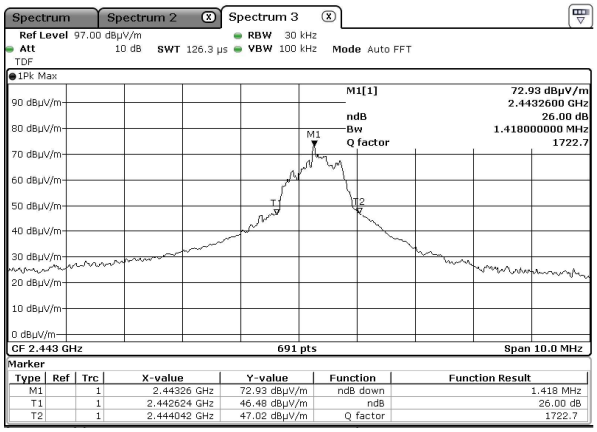
TEST REPORT No: (5219)170-0119
Measurement Data :

Test Result of 26dB Bandwidth of Fundamental Emission: PASS

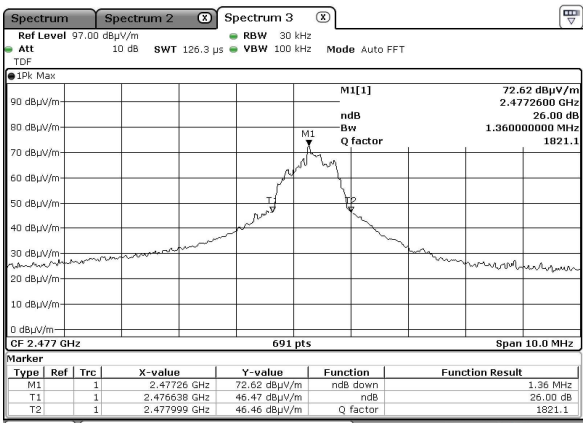
Lowest Frequency – 2407.00MHz



Middle Frequency – 2443.00MHz



Highest Frequency – 2477.00MHz



BUREAU VERITAS HONG KONG LIMITED –
Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (269.86msec) never exceeds a series of 5 long pulses (7.54msec) and 10 short pulses (3.19ms). Assuming any combination of short and long pulses maybe obtained due to encoding the worst case transmit duty cycle would be considered 5*7.54+ 10*3.19 per 269.86msec = 25.79% duty cycle. Figure A to C show the characteristics of the pulse train for one of these functions

Remarks:

Duty Cycle Correction = 20Log(0.2579) = -11.7dB

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

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

TEST REPORT No: (5219)170-0119

Measurement Data :

Figure A [Pulse Train]

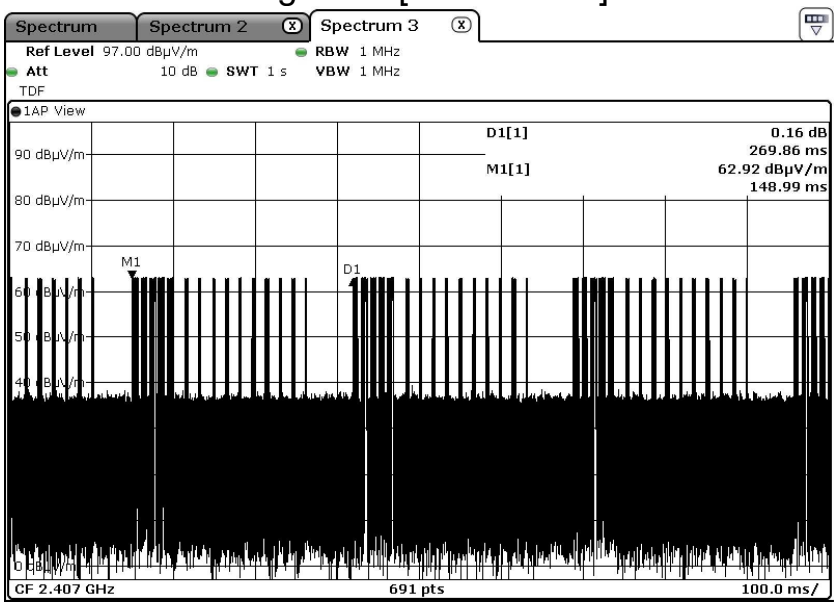
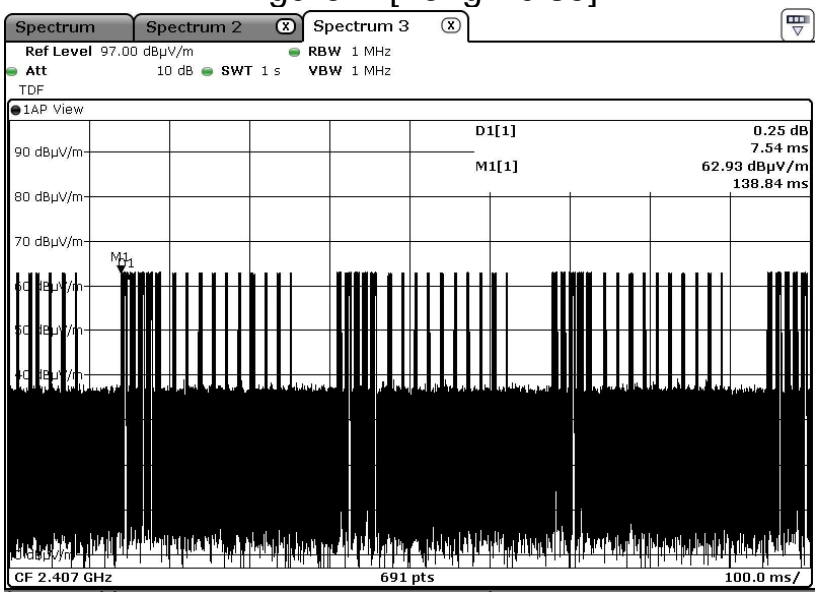
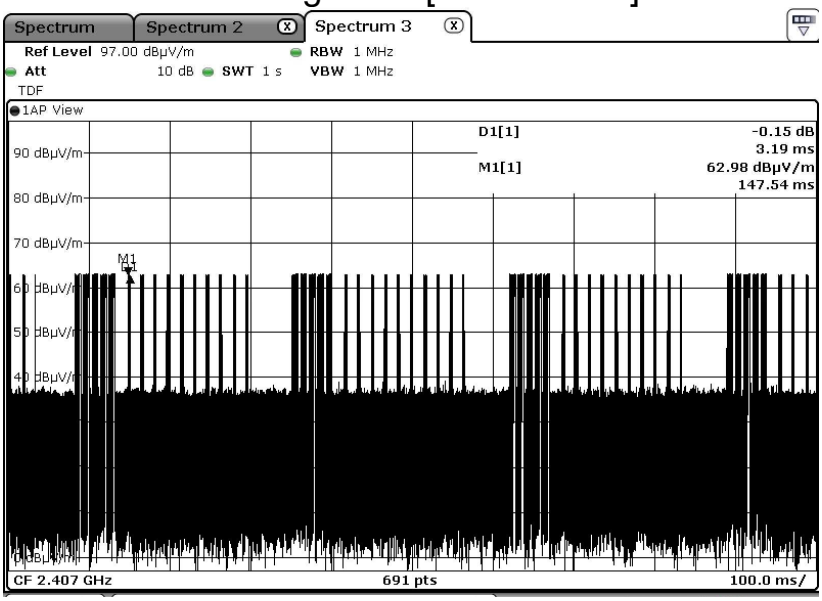


Figure B [Long Pulse]



BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

Figure C [Short Pulse]

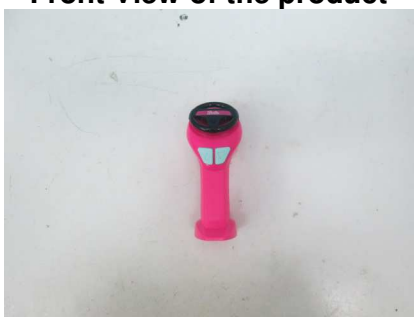


BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

TEST REPORT No: (5219)170-0119

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

Battery compartment

Battery Cover

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

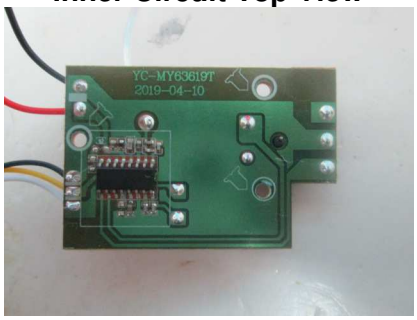
TEST REPORT No: (5219)170-0119

Photographs of EUT

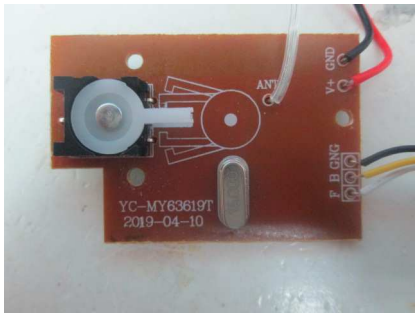
Internal View of the product

Internal View of the product

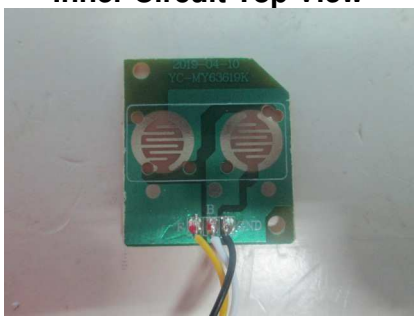
Inner Circuit Top View



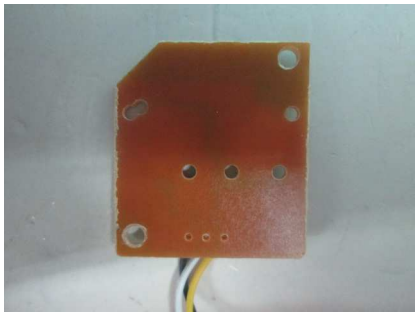
Inner Circuit Bottom View



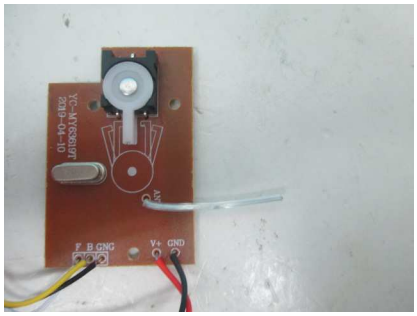
Inner Circuit Top View



Inner Circuit Bottom View



Antenna



BUREAU VERITAS HONG KONG LIMITED –
Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

Measurement of Radiated Emission Test Set Up

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

BUREAU VERITAS HONG KONG LIMITED – Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon,HONG KONG
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com