




TEST REPORT No.: (5211)027-0158

## TEST REPORT

To:	MAC DUE INTERNATIONAL LTD.	To:	-
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Folder No.:	BVCK11JA207MTHS-B		
Factory name:	MAC DUE S.P.A. SOCIETA UNINOMINALE		
Location:	Via Raffaello Sanzio, 19-20058, Villasanta-MB-ITALY		
Product:	1:20 Aston martin B/O Model Number: KD0725A		
		Sample No:	(5211)027-0158
		Test date:	February 8, 2011
		Test Requested:	FCC Part 15 - 2009
		Test Method:	ANSI C63.4 - 2003
		FCC ID:	YB9R-2027MHZ
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: Keith Yeung		Approved by: Steven Tsang	
Date: March 7, 2011		Date: March 7, 2011	



## TEST REPORT No.: (5211)027-0158

### Location of the test laboratory

Radiated and Conducted emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. An Open Area Test Site and Full Anechoic Chamber (FCC Listed Site, Registration No. 642151) 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.	CALIBRATION DUE
EMI TEST RECEIVER	R&S	ESCI	100379	06-SEP-2011
LOOP ANTENNA	ETS-LINDGREN	6502	00102266	17-MAY-2011
BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	02-AUG-2011
OPEN AREA TEST SITE	BVCPS	N/A	N/A	05-JUL-2011
ANECHOIC CHAMBER	ALBATROSS	M-CDC	80374004499B	26-OCT-2011
COAXIAL CABLE	SUHNER	RG214	N/A	19-SEP-2011

#### **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.: (5211)027-0158

### Equipment Under Test [EUT]

#### Description of Sample:

Model Name: 1:20 Aston martin B/O  
Model Number: KD0725A  
Additional Model Name: 1:20 lamborghini B/O / 1:20 corvette B/O  
Additional Model Number: KD0709A / KD0726A  
Additional Model Information: Declare the Circuit, PCB layout and Electrical parts of the products are identical to the basic model. Except the shape and colour of shell.  
Rating: 3Vd.c ("AA" size battery x 2)

The Equipment Under Test (EUT) is a MAC DUE S.P.A. SOCIETA UNINOMINALE of Radio Control toy. It is a 2 sticks and operating at 27.146MHz transmitter. The EUT continues to transmit while sticks are being pushed or pulled, Modulation by IC, and type is pulse modulation.

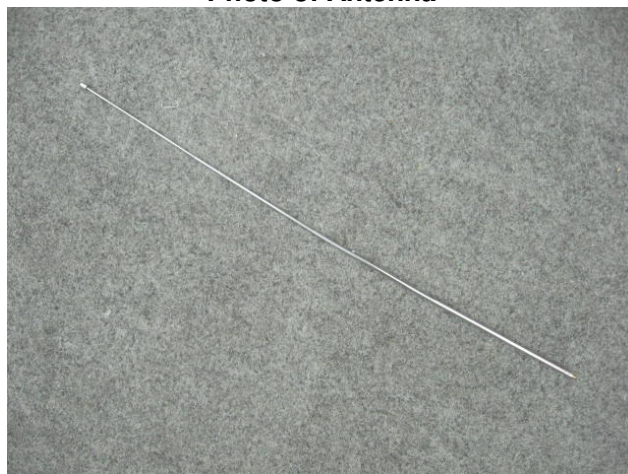
The transmitter has different control:

1. Left stick – control forward and backward
2. Right stick – control left and right

### Antenna Requirement

The EUT is use of a screw-on type antenna. The antenna consists of 43cm long metal antenna. The antenna connector is custom-made and not be able to found in the market. It also cannot be replaced with other antenna other then the one bundled inside the package. The requirements of S15.203 are met. There are no deviations or exceptions to the specifications.

Photo of Antenna



## TEST REPORT No.: (5211)027-0158

### Test Results

#### Radiated Emissions (Fundamental)

Test Requirement: FCC Part 15 Section 15.227  
Test Method: ANSI C63.4  
Test Date(s): 2011-02-08  
Temperature: 17.0 °C  
Humidity: 54.0 %  
Atmospheric Pressure: 102.3 kPa  
Mode of Operation: Transmission mode  
Tested Voltage: 3Vd.c. ("AA" size battery x 2)

#### Test Method:

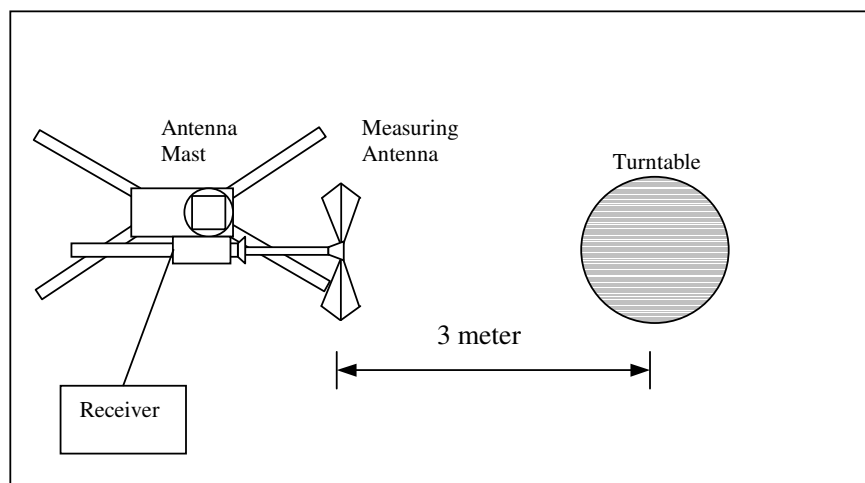
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003.

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. 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 performed 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 placed 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: The Roof, Westin Centre, 26 Hung To Road, Kwun Tong, Kowloon, Hong Kong

#### Test Setup: Open Area Test Site





## TEST REPORT No.: (5211)027-0158

### Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.227]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [μV/m]	Field Strength of Fundamental Emission [Average] [μV/m]
26.96 – 27.28	100,000 (100 dBμV/m)	10,000 (80 dBμV/m)

### Measurement Data

### Test Result of (Transmission mode): PASS

#### Detection mode: Peak

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
27.146	V/0°	9.6	53.4	100	-46.6

#### Detection mode: # Average

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
27.146	V/0°	9.6	**49.4	80	-30.6

# For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

\*\*Duty Cycle Correction =  $20\log(0.63) = -4.0\text{dB}$

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz  
VBW = 300KHz



## TEST REPORT No.: (5211)027-0158

### Radiated Emissions (9kHz – 1GHz)

Test Requirement: FCC Part 15 Section 15.209  
 Test Method: ANSI C63.4  
 Test Date(s): 2011-02-08  
 Temperature: 17.0 °C  
 Humidity: 54.0 %  
 Atmospheric Pressure: 102.3 kPa  
 Mode of Operation: Transmission mode  
 Tested Voltage: 3Vd.c. ("AA" size battery x 2)

#### Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
1.705-30	300
30-88	100
88-216	150
216-960	200
Above 960	500

### Measurement Data

**Test Result of (Transmission mode): PASS**

#### Detection mode: Quasi-Peak

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
54.28	H	6.7	29.0	40.0	-11.0
81.40	H	7.1	28.8	40.0	-11.2
135.76	H	12.2	32.4	43.5	-11.1
162.88	H	10.6	41.9	43.5	-1.6
190.04	H	9.6	37.8	43.5	-5.7
217.16	H	9.9	43.8	46.0	-2.2
244.32	H	13.2	33.6	46.0	-12.4
271.44	H	13.2	34.1	46.0	-11.9
298.60	H	14.4	36.2	46.0	-9.8
434.36	H	17.6	28.8	46.0	-17.2

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz  
 VBW = 120KHz



**TEST REPORT No.: (5211)027-0158**

**Measurement Data**

**Test Result of (Transmission mode): PASS**

**Detection mode: Quasi-Peak**

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
54.28	V	6.7	29.3	40.0	-10.7
81.40	V	7.1	29.6	40.0	-10.4
135.76	V	12.2	32.1	43.5	-11.4
162.88	V	10.6	39.8	43.5	-3.7
190.04	V	9.6	35.4	43.5	-8.1
217.16	V	9.9	39.6	46.0	-6.4
244.32	V	13.2	34.3	46.0	-11.7
271.44	V	13.2	33.7	46.0	-12.3
298.60	V	14.4	32.5	46.0	-13.5
434.36	V	17.6	32.9	46.0	-13.1

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz  
VBW = 120KHz





## TEST REPORT No.: (5211)027-0158

### 26dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.227  
Test Method: ANSI C63.4:2003 (Section 13.1.7)  
Test Date(s): 2011-02-08  
Temperature: 17.0 °C  
Humidity: 54.0 %  
Atmospheric Pressure: 102.3 kPa  
Mode of Operation: Transmission mode  
Tested Voltage: 3Vd.c. ("AA" 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 26dB Bandwidth of Fundamental Emission:

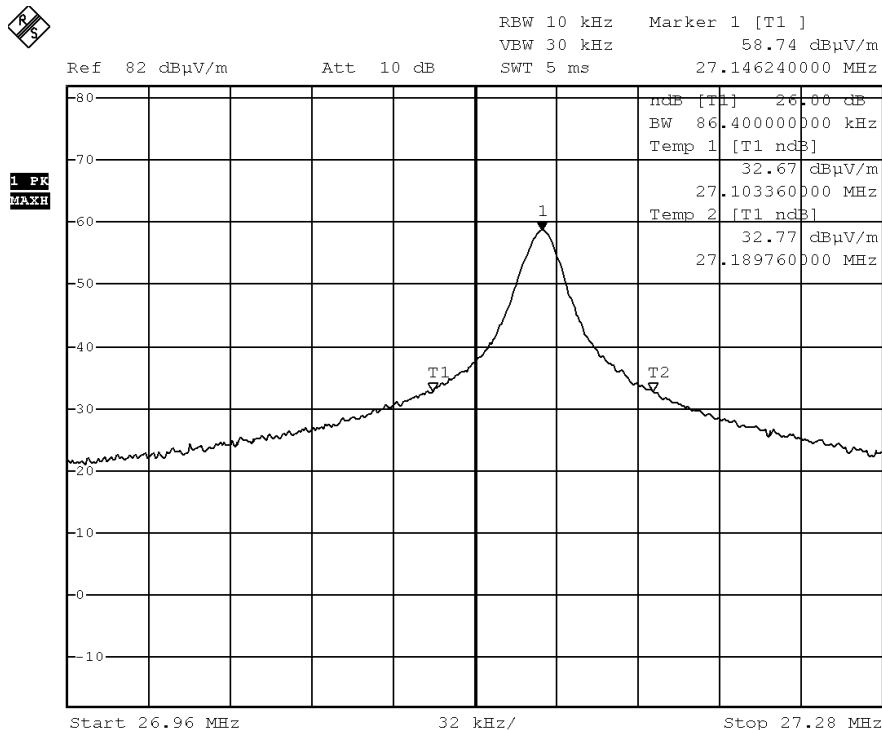
Frequency [MHz]	26dB Bandwidth [KHz]	Limits [MHz]
27.14624	86.4	within 26.96 – 27.28



# TEST REPORT No.: (5211)027-0158

## Measurement Data :

### Test Result of 26dB Bandwidth of Fundamental Emission: PASS



Date: 8.FEB.2011 10:43:00



## TEST REPORT No.: (5211)027-0158

### Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (16.8msec) never exceeds a series of 4 long (1.4msec) and 10 short (0.5msec) pulses. Assuming any combination of short or long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered  $(4 \times 1.4\text{msec}) + (10 \times 0.5\text{msec})$  per 16.8msec = 63.0% duty cycle. Figure A through C show the characteristics of the pulse train for one of these functions.

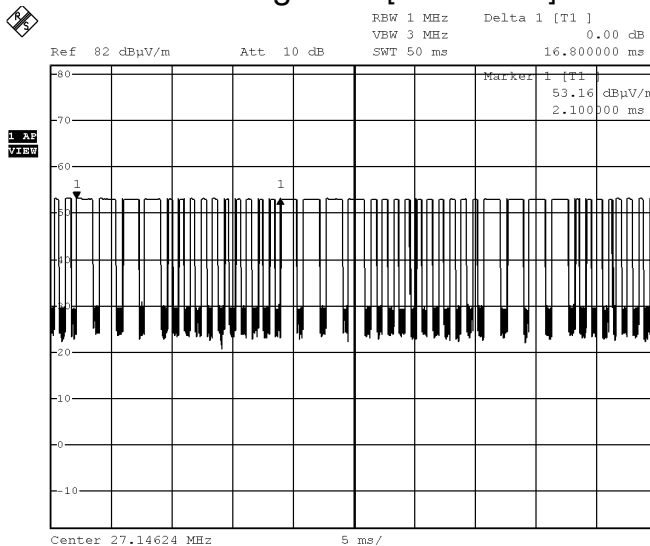
Remarks:

Duty Cycle Correction =  $20\text{Log}(0.63) = -4.0\text{dB}$

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

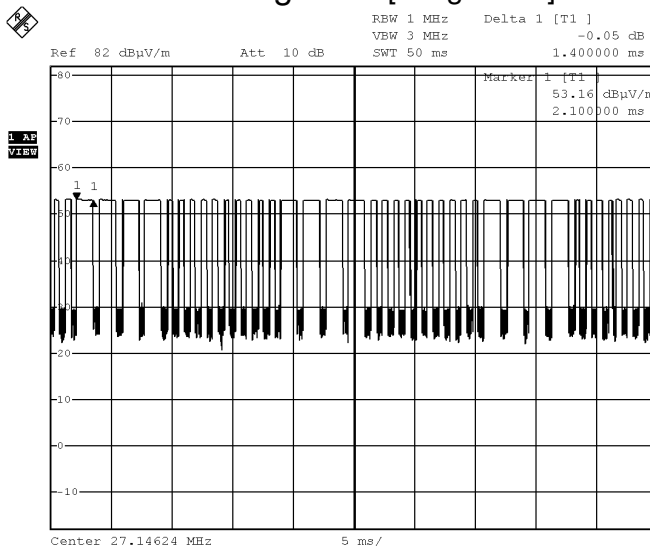
# TEST REPORT No.: (5211)027-0158

## Figure A [Pulse Train]



Date: 8.FEB.2011 10:44:11

## Figure B [Long Pulse]

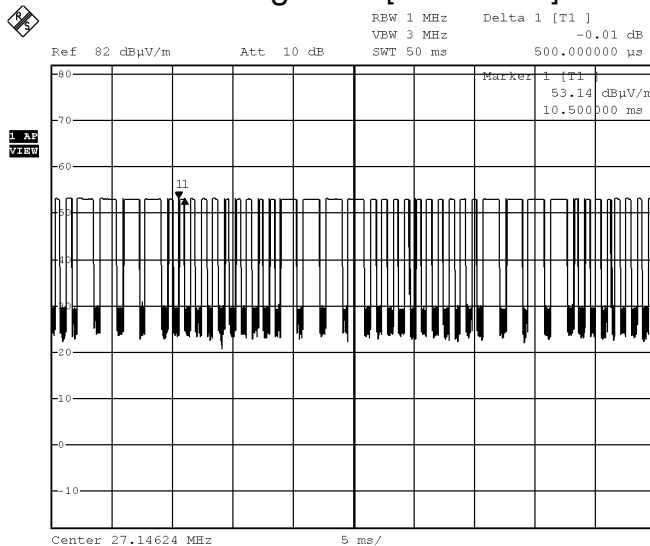


Date: 8.FEB.2011 10:44:28



## TEST REPORT No.: (5211)027-0158

### Figure C [Short Pulse]



Date: 8.FEB.2011 10:44:50

**TEST REPORT No.: (5211)027-0158**

**Photographs of EUT**

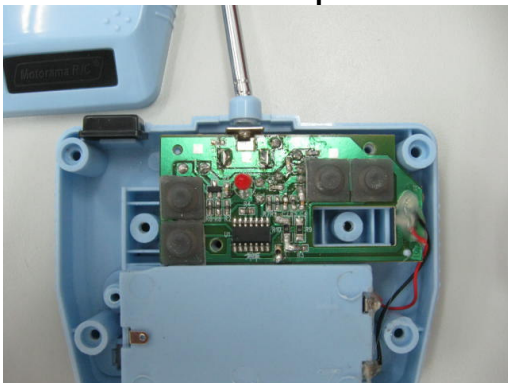
**Front View of the product**



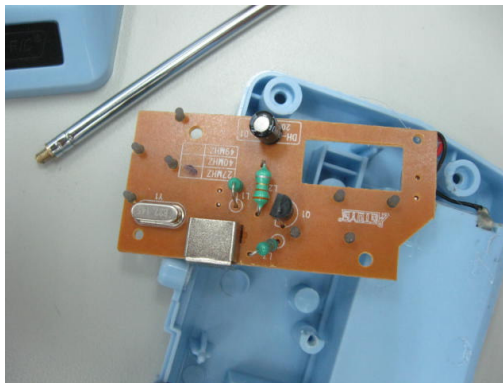
**Rear View of the product**



**Inner Circuit Top View**



**Inner Circuit Bottom View**



**TEST REPORT No.: (5211)027-0158**

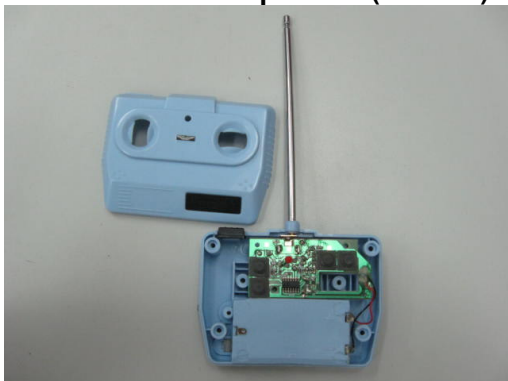
**Battery compartment**



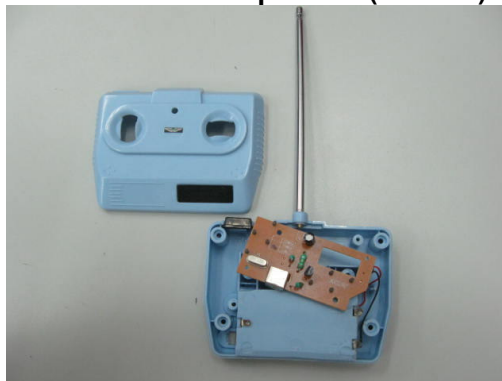
**Battery Cover**



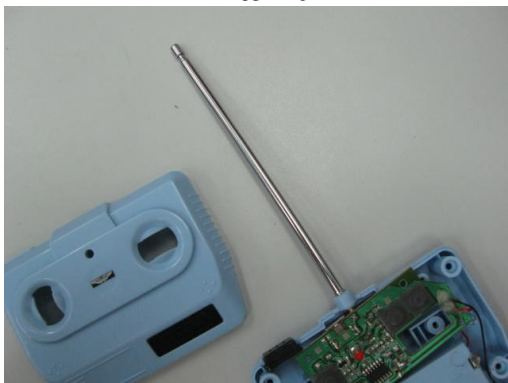
**Front View of the product (Internal)**



**Rear View of the product (Internal)**



**Antenna**



**TEST REPORT No.: (5211)027-0158**

**Measurement of Radiated Emission Test Set Up**



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