

MPE REPORT

Report No.: SRTC2019-9004(F)-19070806(I)

Product Name: DALI module without power supply

Product Model: 201-50X.NPS

Applicant: Honeywell International Inc.

Manufacturer: Honeywell International Inc.

Specification: FCC Part §2.1091, §2.1093, §1.1307(b)

FCC ID: GTC-20150XNPS

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30, Shixing Street, Shijingshan District,

Beijing, P.R.China

Tel: 86-10-57996183 Fax: 86-10-57996388

CONTENTS

<u>1 GENERAL INFORMATION</u>	2
1.1 NOTES OF THE TEST REPORT	2
1.2 INFORMATION ABOUT THE TESTING LABORATORY	2
1.3 APPLICANT'S DETAILS	2
1.4 MANUFACTURER'S DETAILS	2
1.5 TEST ENVIRONMENT	3
<u>2 DESCRIPTION OF THE DEVICE UNDER TEST</u>	4
2.1 FINAL EQUIPMENT BUILD STATUS	4
<u>3 REFERENCE SPECIFICATION</u>	6
<u>4 RESULT SUMMARY</u>	7
<u>5 TEST RESULTS</u>	8
5.1 AVERAGE POWER OUTPUT	8
5.2 CALCULATION RESULT	9

1 GENERAL INFORMATION

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).

The test results relate only to individual items of the samples which have been tested.

The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Address:	15th Building, No.30 ShixingStreet, Shijingshan District
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Liu Jia
Tel:	86-10-57996183
Fax:	86-10-57996388
Email:	liujiaf@srtc.org.cn

1.3 Applicant's details

Company:	Honeywell International Inc.
Address:	12 Clintonville Road, Northford, CT 06472, United States
City:	Northford
Country or Region:	United States
Contacted person:	Hardik Upadhyay
Tel:	+1 2034846127
Fax:	---
Email:	mailto:Hardik.Upadhyay@Honeywell.com

1.4 Manufacturer's details

Company:	Honeywell International Inc.
Address:	12 Clintonville Road, Northford, CT 06472, United States
City:	Northford
Country or Region:	United States
Contacted person:	Hardik Upadhyay
Tel:	+1 2034846127
Fax:	---
Email:	mailto:Hardik.Upadhyay@Honeywell.com

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2019-07-08
Testing Start Date:	2019-07-19
Testing End Date:	2019-08-02

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	40

Normal Supply Voltage (V d.c.):	12.0
---------------------------------	------

2 DESCRIPTION OF THE DEVICE UNDER TEST

2.1 Final Equipment Build Status

BLE

Frequency Range	2.402GHz~2.480GHz
Number of Channel	40
Modulation Type	GFSK
Equipment Class	DTS
Channel Spacing	2MHz
Data Rate	1Mbps, 2Mbps
Power Supply	DC Adapter
HW Version	Rev 05
SW Version	Compliance Testing Code V1.0
IMEI	Sample #1
Antenna type	Refer to Note
Antenna connector	Refer to Note

Note:

The antenna provide to the EUT, please refer to the following table:

Brand	Model	Antenna gain	Frequency range(GHz)	Antenna type	Connector Type
N/A	N/A	-1.05dBi	2.402GHz~2.480GHz	Integral Antenna	N/A

Manufacturers ensure that their designs will not be modified by the user or third parties arbitrary antenna parameters and performance.

ZIGBEE

Frequency Range	2.405GHz~2.480GHz
Number of Channel	16
Modulation Type	QPSK
Equipment Class	DTS
Channel Spacing	5MHz
Power Supply	DC Adapter
HW Version	Rev 05
SW Version	Compliance Testing Code V1.0
IMEI	Sample #1
Antenna type	Refer to Note
Antenna connector	Refer to Note

Note:

The antenna provide to the EUT, please refer to the following table:

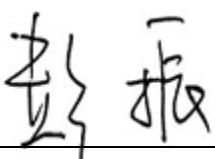
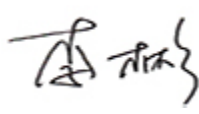
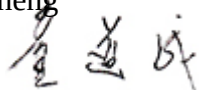
Brand	Model	Antenna gain	Frequency range(GHz)	Antenna type	Connecter Type
N/A	N/A	1.3dBi	2.405GHz~2.480GHz	Integral Antenna	N/A
Manufacturers ensure that their designs will not be modified by the user or third parties arbitrary antenna parameters and performance.					

3 REFERENCE SPECIFICATION

Specification	Version	Title
2.1091	June 23, 2015	Radiofrequency radiation exposure evaluation: mobile devices.
2.1093	June 23, 2015	Radiofrequency radiation exposure evaluation: portable devices.
1.1307(b)	Apr. 22, 1986	Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.
KDB447498	D01	General RF Exposure Guidance

4 RESULT SUMMARY

No.	Test case	FCC reference
1	MPE Calculation	FCC Part §2.1091, FCC Part §2.1093, FCC Part §1.1307(b) KDB447498 D01

This Test Report Is Issued by: Mr. Peng Zhen 	Checked by: Mr. Lin Bin 
Tested by: Mr. Tong Daocheng 	Issued date: 20190808

5 Test Results

5.1 Average Power Output

5.1.1 Ambient condition

Temperature	Relative humidity	Pressure
25°C	40%	101.5kPa

5.1.2 Test Description

A transmitter antenna terminal of EUT is connected to the power meter. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle (>98%), at maximum power, and at the appropriate frequencies.

5.1.3 Test Procedure Used

KDB 558074 D01 DTS Meas Guidance v04 – Section 9.2.3

5.1.4 Test Settings

The maximum average conducted output power may be measured using a broadband average RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

a) As an alternative to spectrum analyzer or EMI receiver measurements, measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.

1) The EUT is configured to transmit continuously, or to transmit with a constant duty factor.

2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.

3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

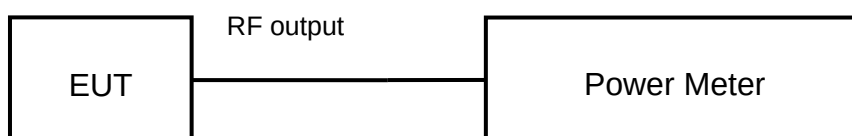
b) If the transmitter does not transmit continuously, measure the duty cycle (x) of the transmitter output signal as described in Section 6.0.

c) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

d) Adjust the measurement in dBm by adding $10\log(1/x)$, where x is the duty cycle to the measurement result.

5.1.5 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



5.1.6 Test Result

BT output power

Modulation type	Average Power Output (dBm)		
	2402MHz (Ch0)	2440MHz (Ch19)	2480MHz (Ch39)
GFSK (LE 1Mbps)	3.55	3.98	4.12
GFSK (LE 2Mbps)	1.33	1.43	1.69

ZIGBEE output power

Modulation type	Average Power Output (dBm)		
	2405MHz (Ch11)	2445MHz (Ch19)	2480MHz (Ch26)
QPSK	19.68	19.34	19.22

5.2 Calculation result

FCC LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

(A) Limits for Occupational/Controlled Exposure ☐

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

(B) Limits for General Population/Uncontrolled Exposure ☒

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

Calculation procedure:

According to §2.1091, §2.1093 and §1.1307(b), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

$$\text{The } S = PG / (4\pi R^2)$$

Where S = power density in mW/cm²

P = transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

The calculations in the table below use the highest gain of antenna for client EUT. These calculations represent worst case in terms of the exposure levels.

Modulation type	Freq (GHz)	Power		Antenna Gain		R (cm)	S (mW/cm ²)	Limits (mW/cm ²)
		(dBm)	(mW)	(dBi)	(Numeric)			
GFSK (LE-1Mbps)	2.480	4.12	2.58	-1.05	0.79	20	0.0004	1.00
GFSK (LE-2Mbps)	2.480	1.69	1.48	-1.05	0.79	20	0.0002	1.00
QPSK (ZIGBEE)	2.405	19.68	92.90	1.30	1.35	20	0.0250	1.00

Worst Simultaneous Transmission Result:

Modulation type	SUM(Ratio)	Limits
LE(1Mbps)+ZIGBEE	0.025/1+0.004/1=0.0254	1.00

Note: 1mW/cm² from 1.1310 Table 1.

---End of Test Report---