

MPE CALCULATIONS

1.0 APPLICANT:

DATE: 06/19/2014
NAME OF APPLICANT: HONEYWELL INTERNATIONAL INC.
FCC ID: CFS8DLWLE200N2

2.0 FCC RULES CONCERNING MAXIMUM PERMISSIBLE RF EXPOSURE:

§ CFR 47 1.1310 Radiofrequency radiation exposure limits.

The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of § 2.1093 of this chapter. Further information on evaluating compliance with these limits can be found in the FCC’s OST/OET Bulletin Number 65, “Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation.”

NOTE TO INTRODUCTORY PARAGRAPH:

These limits are generally based on recommended exposure guidelines published by the National Council on Radiation Protection and Measurements (NCRP) in “Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields,” NCRP Report No. 86, Sections 17.4.1, 17.4.1.1, 17.4.2 and 17.4.3. Copyright NCRP, 1986, Bethesda, Maryland 20814. In the frequency range from 100 MHz to 1500 MHz, exposure limits for field strength and power density are also generally based on guidelines recommended by the American National Standards Institute (ANSI) in Section 4.1 of “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,” ANSI/IEEE C95.1–1992, Copyright 1992 by the Institute of Electrical and Electronics Engineers.

3.0 CONDUCTED POWER MEASUREMENTS OF UUT

This table shows the conducted power out of the module as it is used in this host application, where the firmware applies lowered gain settings.

Chain	Channel		Power (dBm) @ data rates		
	No.	Freq (MHz)	11M	24	6.5
0	1	2412	13.75	18.88	18.72
	6	2437	13.63	19.91	20.37
	11	2462	13.72	16.88	16.85
1	1	2412	14.47	19.45	19.32
	6	2437	14.35	20.31	20.27
	11	2462	14.91	17.62	16.92

3.1 MPE CALCULATIONS:

FCC GENERAL POPULATION / UNCONTROLLED EXPOSURE LIMITS:

FOR 300 MHz to 1,500 MHz = F / 1500 mW/cm²;
FOR 1,500 to 100,000 MHz use 1 mW/cm²

EQUATIONS:

P=20 X LOG E -95.2289

THE FRIIS TRANSMISSION EQUATION = EIRP X DUTY CYCLE / (4 X PI X 20 CM²)

CALCULATIONS:

BANDS AND FCC IDs

BAND	FCC ID
SRR	CFS8DLTSSCBASE
WIFI	CFS8DLWLE200N2
Z-WAVE	CFS8DLTSSCBASE
850MHz	QIPPHS8-US
1900MHz	QIPPHS8-US

BAND	CHANNEL:	FREQ:	uV/M @ 3M:	MAXIMUM EIRP (dbm):	ANTENNA GAIN(dBi):	DUTY CYCLE:	MAXIMUM EIRP (mW):	FRISS mW/CM ² :	EXP LIMIT mW/CM ² :	% OF LIMIT:
SRR	N/A	344.94	67608.3	1.37	INTEGRAL	10%	1.371	0.0000273	0.23	0.0119
WIFI (1)	n-HT20 13,14.4 mbps	2437.0		26.9	1.00	100%	616.595	0.1226678	1.000000	12.2668
Z-WAVE	N/A	908.42	42000.0	-2.76	INTEGRAL	100%	0.530	0.0001054	0.6056	0.0174
BAND:	CH No:	FREQ(Mhz)	TRP dbm	MAX COND. PWR (dBm)	ANTENNA GAIN(db):	DUTY FACTOR (dB)	MAX AVG EIRP (mW)	FRISS mW/CM ² :	EXP LIMIT mW/CM ² :	% OF LIMIT:
850MHz	N/A	824.2	N/A	33.50	-1.56	3.01	781.628	0.1555000	0.5577	27.8824
1900MHz	N/A	1880	N/A	30.30	2.67	3.01	990.832	0.1971199	1	19.7120

MAXIMUM MME OF JUST THE 344.94 MHz RADIO AS % OF LIMIT IS:	0.0119
MAXIMUM CO-MPE OF THE 344.94 MHz RADIO & WIFI MODULE AS % OF LIMIT IS:	12.2786
MAXIMUM CO-MPE OF THE 344.94 MHz RADIO & CELLULAR MODULE AS % OF LIMIT IS:	27.8942
MAXIMUM CO-MPE OF THE 344.94 MHz RADIO, WIFI & CELLULAR MODULE AS % OF LIMIT IS:	40.1610
MAXIMUM CO-MPE OF THE 344.94 MHz RADIO, Z-WAVE, WIFI & CELLULAR MODULE AS % OF LIMIT IS:	40.1784

(1) - For conservative purposes, the WIFI MAXIMUM EIRP value is the maximum listed in the original FCC test report (pgs 7, 32). In this host application however, the module is configured with lowered WiFi gain settings in firmware.

4.0 RESULTS:

TEST RESULT: PASS

In the configuration tested the EUT complied with the standards specified above.