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MPE Report

Test Report No.	：	1601FS13
Applicant	：	Uniform Industrial Corp.
Product Type	：	POS System
Trade Name	：	Uniform
Model Number	：	nPOS15
Date of Received	：	Dec. 25, 2015
Test Period	：	Dec. 23, 2015 ~ Jan. 04, 2016
Date of Issued	：	Jan. 12, 2016
Test Specification	：	ANSI / IEEE Std.C95.1-1992 / IEEE Std. 1528-2013
		47 CFR § 2.1091
		47 CFR § 1.1310
Location of Test Lab.	：	Chang-an Lab.

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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Approved By ： (Bill Hu)　　Tested By ： (Sky Chou)

Contents

1. Description of Equipment under Test (EUT)

Applicant	Uniform Industrial Corp. 47341 Bayside Parkway, Fremont, California 94538, United States
Manufacturer	Uniform Industrial Corp. 47341 Bayside Parkway, Fremont, California 94538, United States
Product Type	POS System
Trade Name	Uniform
Model Number	NBP250
FCC ID	TFJ-NPOS15
Frequency Range	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz : 2412 - 2462 MHz IEEE 802.11n 2.4GHz 40MHz : 2422 - 2452 MHz Bluetooth BR/EDR 2402 - 2480 MHz Bluetooth LE 2402 - 2480 MHz
Transmit Power (conducted power)	IEEE 802.11b: 0.023 W / 13.56 dBm IEEE 802.11g: 0.008 W / 9.15 dBm IEEE 802.11n 2.4GHz 20MHz : 0.010 W / 9.97 dBm IEEE 802.11n 2.4GHz 40MHz : 0.007 W / 8.57 dBm Bluetooth BR/EDR: 0.003 W / 4.48 dBm Bluetooth LE: 0.003 W / 4.49 dBm
Antenna Type	PIFA Antenna
Antenna Peak Gain	IEEE 802.11b, IEEE 802.11g: 3.5 dBi IEEE 802.11n 2.4GHz 20MHz / 40MHz: 3.5 dBi Bluetooth BR/EDR, Bluetooth LE: 3.5 dBi
Temperature Range	0 ~ +40°C (Reference EN300 328 data)
RF Evaluation	0.0011732 mW/cm^2

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1091 / 47 CFR § 1.1310. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties

2. Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR § 1.1310 titled “Radiofrequency radiation exposure limits”, generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as “a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter’s radiating structure(s) and the body of the user or nearby persons. ” This product is intended to be installed into a vehicle such that the unit is physically secured at one location. In the installation guide supplied with the product,

Client has made the following statement: “IMPORTANT: To meet the FCC’s RF Exposure Guidelines, the antenna should be installed so there is at least 20 cm of separation between the body of the user and nearby persons and the antenna”. Based on the installation of the transceiver and the antenna, the transmitters radiating structure is more than 20 cm from the user. Thus, this product is a “mobile device” as defined in section § 2.1091 paragraph (b).

Exposure evaluation
$$S = \frac{PG}{4\pi R^2}$$ Where   S: power density   P: power input to the antenna   G: power gain of the antenna in the direction of interest relative to an isotropic radiator.   R: distance to the center of radiation of the antenna.

3. RF Output Power

Band	Date Rate	CH	Frequency (MHz)	Average Conducted power (dBm)
				ANT-0
IEEE 802.11b	1M	1	2412.0	13.33
		6	2437.0	13.49
		11	2462.0	13.56
	2M	6	2437.0	13.43
	5.5M	6	2437.0	13.40
	11M	6	2437.0	13.26
IEEE 802.11g	6M	1	2412.0	8.91
		6	2437.0	9.08
		11	2462.0	9.15
	9M	6	2437.0	9.06
	12M	6	2437.0	9.01
	18M	6	2437.0	8.97
	24M	6	2437.0	8.90
	36M	6	2437.0	8.93
	48M	6	2437.0	8.79
	54M	6	2437.0	8.84
IEEE 802.11n 2.4GHz 20MHz	6.5M	1	2412.0	9.01
		6	2437.0	9.97
		11	2462.0	9.90
	13M	6	2437.0	9.91
	19.5M	6	2437.0	9.88
	26M	6	2437.0	9.72
	39M	6	2437.0	9.80
	52M	6	2437.0	9.75
	58.5M	6	2437.0	9.67
	65M	6	2437.0	9.71
IEEE 802.11n 2.4GHz 40MHz	13.5M	3	2422.0	8.19
		6	2437.0	8.57
		9	2452.0	8.31
	27M	6	2437.0	8.55
	40.5M	6	2437.0	8.50
	54M	6	2437.0	8.42
	81M	6	2437.0	8.38
	108M	6	2437.0	8.41
	121.5M	6	2437.0	8.48
	135M	6	2437.0	8.32

Band	CH	Frequency (MHz)	Packet Type	Average Conducted power (dBm)
Bluetooth BR GFSK	0	2402	DH1	4.15
			DH3	4.23
			DH5	4.43
	39	2441	DH1	3.81
			DH3	3.89
			DH5	4.12
	78	2480	DH1	3.58
			DH3	3.66
			DH5	3.94
Bluetooth EDR π /4-DQPSK	0	2402	2DH1	4.10
			2DH3	4.12
			2DH5	4.44
	39	2441	2DH1	3.50
			2DH3	3.65
			2DH5	4.08
	78	2480	2DH1	3.23
			2DH3	3.34
			2DH5	3.90
Bluetooth EDR 8DPSK	0	2402	3DH1	4.15
			3DH3	4.21
			3DH5	4.48
	39	2441	3DH1	3.54
			3DH3	3.71
			3DH5	4.13
	78	2480	3DH1	3.26
			3DH3	3.37
			3DH5	3.93
Bluetooth LE	0	2402	---	4.49
	19	2440		4.43
	39	2480		4.05

4. Test Result

Band	Data Rate	Frequency (MHz)	Limit (mw)	Distance [R] (cm)	Max tune-up Power (upper limit) [P] (dBm)	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P] x [G] with Duty cycle [TP] (mW)	Power Density [S] (mw)/cm^2
IEEE 802.11b	1M	2412.0	1.000	20	13.70	3.50	2.24	1	52.51	0.010447
		2437.0	1.000	20	13.70	3.50	2.24	1	52.51	0.010447
		2462.0	1.000	20	13.70	3.50	2.24	1	52.51	0.010447
IEEE 802.11g	6M	2412.0	1.000	20	9.30	3.50	2.24	1	19.07	0.003794
		2437.0	1.000	20	9.30	3.50	2.24	1	19.07	0.003794
		2462.0	1.000	20	9.30	3.50	2.24	1	19.07	0.003794
IEEE 802.11n 2.4GHz 20MHz	6.5M	2412.0	1.000	20	10.10	3.50	2.24	1	22.92	0.004560
		2437.0	1.000	20	10.10	3.50	2.24	1	22.92	0.004560
		2462.0	1.000	20	10.10	3.50	2.24	1	22.92	0.004560
IEEE 802.11n 2.4GHz 20MHz	13.5M	2412.0	1.000	20	8.70	3.50	2.24	1	16.61	0.003304
		2437.0	1.000	20	8.70	3.50	2.24	1	16.61	0.003304
		2462.0	1.000	20	8.70	3.50	2.24	1	16.61	0.003304

Band	Packet Type	Frequency (MHz)	Limit (mw)	Distance [R] (cm)	Max tune-up Power (upper limit) [P] (dBm)	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P] x [G] with Duty cycle [TP] (mW)	Power Density [S] (mw)/cm^2
Bluetooth BR/EDR	---	2402.0	1.000	20	4.60	3.50	2.24	1	6.46	0.001285
		2441.0	1.000	20	4.60	3.50	2.24	1	6.46	0.001285
		2480.0	1.000	20	4.60	3.50	2.24	1	6.46	0.001285
Bluetooth LE	---	2402.0	1.000	20	4.60	3.50	2.24	1	6.46	0.001285
		2440.0	1.000	20	4.60	3.50	2.24	1	6.46	0.001285
		2480.0	1.000	20	4.60	3.50	2.24	1	6.46	0.001285

Simultaneous Transmitting:

1. The Numeric Gain calculated by 10^(ant. Gain(dBi) /10).
2. Each band max power which perform MPE of any configurations.
3. Total MPE = 2.4GHz MPE+BT MPE=0.001285+0.01447=0.011732(mw)/cm^2 < 1(mw)/cm^2