



A Test Lab Techno Corp.

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MPE Report

Test Report No.	: 1612FS21
Applicant	: Champtek Incorporated
Product Type	: Price Checker
Trade Name	: SCANTECH ID, CHAMPTEK
Model Number	: SG15 Colour, Shuttle C
Date of Received	: Sep. 10, 2016
Test Period	: Sep. 15 ~ Nov. 17, 2016
Date of Issued	: Dec. 29, 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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(Bill Hu)

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(Mark Duan)



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1. Description of Equipment under Test (EUT)

Applicant	Champtek Incorporated 5/F, No.2, Alley 2, Shih-Wei Lane, Chung Cheng Rd., Hsin Tien City, Taiwan		
Manufacturer	Champtek Incorporated 5F No.2 Alley 2, Shih-Wei Lane, Chung-Cheng Rd. Xindian City, Taipei 231, Taiwan		
Product Type	Price Checker		
Trade Name	SCANTECH ID, CHAMPTEK		
Model Number	SG15 Colour, Shuttle C		
Trade Name and Model Number Different Description	Those trade name and model numbers differ from each other in selling region.		
FCC ID	WOI-SG15COLOUR		
Frequency Range	Operate Band	Frequency (MHz)	
	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz	2412 - 2462	
	IEEE 802.11n 2.4GHz 40MHz	2422 - 2452	
	IEEE 802.11a U-NII Band I	5180 - 5240	
	IEEE 802.11a U-NII Band II-A	5260 - 5320	
	IEEE 802.11n 5GHz 20MHz U-NII Band I	5180 - 5240	
	IEEE 802.11n 5GHz 20MHz U-NII Band II-A	5260 - 5320	
	IEEE 802.11n 5GHz 40MHz U-NII Band I	5190 - 5230	
	IEEE 802.11n 5GHz 40MHz U-NII Band II-A	5270 - 5310	
	IEEE 802.11ac 80 MHz U-NII Band I	5210	
	IEEE 802.11ac 80MHz U-NII Band II-A	5290	
Antenna information	Model	Type	Max. Gain (dBi)
	F39-FL-113-100IPEX	PCB Antenna	2.5
Antenna Delivery	1TX + 1RX		
Temperature Range	0 ~ +40 °C		
RF Evaluation	0.031 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

The conducted power turn-up tolerance reference manufacturer specification.

Band	Date Rate (Mbps)	Frequency (MHz)	Average Conducted power (dBm)
IEEE 802.11b	1	2412	16.01
		2437	16.16
		2462	16.13
	2	2437	16.10
	5.5	2437	16.02
	11	2437	15.97
IEEE 802.11g	6	2412	7.69
		2437	8.08
		2462	8.10
	9	2437	8.02
	12	2437	7.96
	18	2437	7.91
	24	2437	7.94
	36	2437	7.86
	48	2437	7.80
54	2437	7.73	
IEEE 802.11n 2.4GHz 20MHz	6.5	2412	5.78
		2437	6.62
		2462	6.29
	13	2437	6.60
	19.5	2437	6.53
	26	2437	6.49
	39	2437	6.52
	52	2437	6.44
	58.5	2437	6.41
65	2437	6.37	
IEEE 802.11n 2.4GHz 40MHz	13.5	2422	4.20
		2437	4.87
		2452	4.52
	27	2437	4.80
	40.5	2437	4.73
	54	2437	4.69
	81	2437	4.65
	108	2437	4.68
	121.5	2437	4.61
135	2437	4.57	



Band	Date Rate (Mbps)	Frequency (MHz)	Average Conducted power (dBm)
IEEE 802.11a	6	5180	16.26
		5200	16.24
		5220	16.47
		5240	16.41
		5260	14.24
		5280	14.20
		5300	14.22
		5320	14.48
	54	5180	16.21
		5200	16.18
		5220	16.38
		5240	16.33
		5260	14.20
		5280	14.14
IEEE 802.11n 5GHz 20MHz	6.5	5180	15.29
		5200	15.53
		5220	15.62
		5240	15.66
		5260	14.18
		5280	14.16
		5300	14.02
		5320	14.28
	65	5180	15.21
		5200	15.43
		5220	15.51
		5240	15.57
		5260	14.10
		5280	14.14
IEEE 802.11n 5GHz 40MHz	13.5	5190	14.14
		5230	14.06
		5270	13.79
		5310	13.86
	135	5190	14.02
		5230	13.97
		5270	13.73
		5310	13.78



Band	Date Rate (Mbps)	Frequency (MHz)	Average Conducted power (dBm)
IEEE 802.11ac 80MHz	29.3	5210	14.45
		5270	13.24
	390	5210	14.32
		5270	13.17



4. Test Results

Band	Data Rate (Mbps)	Frequency (MHz)	Limit (mw/cm ²)	Distance (cm) [R]	Max Tune-up power (dBm) [P]	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P] x [G] With Duty Cycle (mW) [TP]	Power Density [S] (mw/cm ²)
IEEE 802.11b	1	2412	1	20	16.20	2.50	1.78	1	74.200	0.015
		2437	1	20	16.20	2.50	1.78	1	74.200	0.015
		2462	1	20	16.20	2.50	1.78	1	74.200	0.015
IEEE 802.11g	6	2412	1	20	8.20	2.50	1.78	1	11.760	0.002
		2437	1	20	8.20	2.50	1.78	1	11.760	0.002
		2462	1	20	8.20	2.50	1.78	1	11.760	0.002
IEEE 802.11n 2.4GHz, 20MHz	6.5	2412	1	20	6.70	2.50	1.78	1	8.330	0.002
		2437	1	20	6.70	2.50	1.78	1	8.330	0.002
		2462	1	20	6.70	2.50	1.78	1	8.330	0.002
IEEE 802.11n 2.4GHz, 40MHz	13.5	2422	1	20	5.00	2.50	1.78	1	5.630	0.001
		2437	1	20	5.00	2.50	1.78	1	5.630	0.001
		2452	1	20	5.00	2.50	1.78	1	5.630	0.001

Band	Data Rate (Mbps)	Frequency (MHz)	Limit (mw/cm ²)	Distance (cm) [R]	Max Tune-up power (dBm) [P]	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P] x [G] With Duty Cycle (mW) [TP]	Power Density [S] (mw/cm ²)
IEEE 802.11a	6	5180	1	20	16.50	2.50	1.78	1	79.510	0.016
		5200	1	20	16.50	2.50	1.78	1	79.510	0.016
		5220	1	20	16.50	2.50	1.78	1	79.510	0.016
		5240	1	20	16.50	2.50	1.78	1	79.510	0.016
		5260	1	20	14.50	2.50	1.78	1	50.170	0.010
		5280	1	20	14.50	2.50	1.78	1	50.170	0.010
		5300	1	20	14.50	2.50	1.78	1	50.170	0.010
		5320	1	20	14.50	2.50	1.78	1	50.170	0.010
IEEE 802.11n 5GHz, 20MHz	6.5	5180	1	20	15.70	2.50	1.78	1	66.130	0.013
		5200	1	20	15.70	2.50	1.78	1	66.130	0.013
		5220	1	20	15.70	2.50	1.78	1	66.130	0.013
		5240	1	20	15.70	2.50	1.78	1	66.130	0.013
		5260	1	20	14.30	2.50	1.78	1	47.910	0.010
		5280	1	20	14.30	2.50	1.78	1	47.910	0.010
		5300	1	20	14.30	2.50	1.78	1	47.910	0.010
		5320	1	20	14.30	2.50	1.78	1	47.910	0.010



Band	Data Rate (Mbps)	Frequency (MHz)	Limit (mw/cm ²)	Distance (cm) [R]	Max Tune-up power (dBm) [P]	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P] x [G] With Duty Cycle (mW) [TP]	Power Density [S] (mw/cm ²)
IEEE 802.11n 5GHz, 40MHz	13.5	5190	1	20	14.20	2.50	1.78	1	46.820	0.009
		5230	1	20	14.20	2.50	1.78	1	46.820	0.009
		5270	1	20	14.00	2.50	1.78	1	44.710	0.009
		5310	1	20	14.00	2.50	1.78	1	44.710	0.009
IEEE 802.11ac 80MHz	29.3	5210	1	20	14.40	2.50	1.78	1	49.030	0.010
		5290	1	20	13.30	2.50	1.78	1	38.060	0.008

- Note: 1. The Numeric Gain calculated by $10^{(\text{ant. Gain(dBi)} / 10)}$.
2. Each band max power which perform MPE of any configurations.
3. The device operating IEEE 802.11b/g/n/a/ac mode is only with transmitting signals to 1TX.

Simultaneous Transmitting:

Simultaneous MPE = 2.4GHz MPE+5GHz MPE = 0.15+0.016 = 0.031 mw/cm²