

RF EXPOSURE REPORT

OF

Applicant: Askey Computer Corporation
10F, No 119, JianKang Rd., Zhonghe Dist., New Taipei City,
Taiwan 23585

Product Name: Cat 12 Indoor CPE

Brand Name: Verizon

Model No.: ASK-RTL108

Model Difference: N/A

Report Number: E2/2019/B0015

FCC ID: H8N-ASK-RTL108

FCC Rule Part Part 2.1091

Issue Date: Mar. 05, 2020

We hereby certify that:

The above equipment was verified by SGS Taiwan Ltd. The evaluation in this report is in compliance with the above rule(s).

The results of this report relate only to the sample identified in this report.

Approved By: _____

John Teh

John Yeh / Asst. Manager



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Revision History

Report Number	Revision	Description	Issue Date	Remark
E2/2019/B0015	Rev.00	Original.	Mar. 05, 2020	Revised By: Yuri Tsai

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1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 General:

Product Name:	Cat 12 Indoor CPE	
Brand Name:	Verizon	
Model No.:	ASK-RTL108	
Model Difference:	N/A	
Hardware Version:	REV 3.0	
Software Version:	N/A	
Power Supply:	12Vdc from AC/DC Adapter	
	Adapter:	<ol style="list-style-type: none"> Model No.:PS24L120K2000UD, Supplier: FLYPOWER Model No.:WB-24J12FU, Supplier: Asian Power Devices Inc.

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1.2 Antenna Information:

1.2.1 WLAN 2.4GHz

Antenna Type	Supplier	ANT1 / ANT2	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)	MIMO Antenna Gain (dBi)
PIFA	N/A	ANT1	ASK-RTL108	2.4GHz	1.87	5.14
		ANT2			2.37	

1.2.2 WLAN 5GHz

Antenna Type	Supplier	ANT1 / ANT2	Antenna Part No.	Frequency (MHz)	Peak Antenna Gain (dBi)	MIMO Antenna Gain (dBi)
PIFA	N/A	ANT1	ASK-RTL108	5150~5250	3.26	6.41
				5725~5850	3.04	5.84
		ANT2		5150~5250	3.54	6.41
				5725~5850	2.61	5.84

1.2.3 WWAN

Internal

Vendor	Type	Model Name	Modulation	Frequency (MHz)			Peak Antenna Gain (dBi)
N/A	PIFA	ASK-RTL108	LTE Band 2	1850	~	1910	3.61
			LTE Band 4	1710	~	1755	3.27
			LTE Band 5	824	~	849	1.42
			LTE Band 13	777	~	787	0.01
			LTE Band 48	3550	~	3700	3.59
			LTE Band 66	1710	~	1780	3.27

External

Vendor	Type	Model Name	Modulation	Frequency (MHz)			Peak Antenna Gain (dBi)
Master Wave Technology Co., Ltd.	Monopole	98619ZSAX031	LTE Band 2	1850	~	1910	2.82
			LTE Band 4	1710	~	1755	2.93
			LTE Band 5	824	~	849	2.41
			LTE Band 13	777	~	787	N/A
			LTE Band 66	1710	~	1780	2.93

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1.3 Rated Power

1.3.1 WLAN 2.4GHz

Mode	Freq. Range (MHz)	Channels	Modulation Technology	Max Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Worst Case
802.11b/g/n_HT20	2412-2462	11	DSSS & OFDM	29.30	5.14	34.44	V
802.11 n_HT40				26.90		32.04	
Modulation type:		CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM					

1.3.2 WLAN 5GHz

Wi-Fi	Freq. Range (MHz)	Modulation Technology	Max. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Worst Case
11a	5150~5250	OFDM	22.09	6.41	28.5	V
	5725~5850		20.91	5.84	26.75	
11n HT20	5150~5250		21.83	6.41	28.24	
	5725~5850		20.97	5.84	26.81	
11n HT40	5150~5250		22.01	6.41	28.42	
	5725~5850		21.35	5.84	27.19	
11ac VHT80	5150~5250		16.96	6.41	23.37	
	5725~5850		20.11	5.84	25.95	
Modulation type		64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 802.11ac only				

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1.3.3

LTE:

Operating Frequency (MHz)		Max. Output Power (dBm)	Antenna Gain (dBi)	EIRP / ERP (dBi / dBd)
LTE-Band 2	1850.7 ~ 1909.9	24.69	3.61	28.30
LTE-Band 4	1710.7 ~ 1754.3	24.67	3.27	27.94
LTE-Band 5	824.7 ~ 848.3	24.58	2.41	27.26
LTE-Band 13	779.5 ~ 784.5	24.47	0.01	24.48
LTE-Band 48	3550 ~ 3700	19.36	3.59	22.95
LTE-Band 66	1710.7 ~ 1779.3	24.62	3.27	27.89

ULCA:

Operating Frequency (MHz)			Max. Output Power (dBm)	Antenna Gain (dBi)	EIRP / ERP (dBi / dBd)
LTE-Band 2A+5A	1850.7-1909.9	PCC	20.74	3.61	24.35
	824.7-848.3	SCC	19.06	1.42	20.48
LTE-Band 2A+13A	1850.7-1909.9	PCC	20.79	3.61	24.4
	779.5-784.5	SCC	21.21	0.01	21.22
LTE-Band 4A+5A	1710.7-1754.3	PCC	22.06	3.27	25.33
	824.7-848.3	SCC	21.52	1.42	22.94
LTE-Band 4A+13A	1710.7-1754.3	PCC	23.06	3.27	26.33
	779.5-784.5	SCC	22.49	0.01	22.5
LTE-Band 5A+66A	824.7-848.3	PCC	24.05	1.42	25.47
	1710.7-1779.3	SCC	20.42	3.27	23.69
LTE-Band 5B+5B	824.7-848.3	PCC	22.21	1.42	23.63
		SCC	15.82	1.42	17.24
LTE-Band 13A+66A	779.5-784.5	PCC	24.24	0.01	24.25
	1710.7-1779.3	SCC	20.69	3.27	23.96

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2 FCC MAXIMUM PERMISSIBLE EXPOSURE (MPE)

2.1 FCC Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
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
1500-15000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equipment power density

Prediction of MPE limit at a given distance

$$S = PG / 4\pi R^2$$

Where: S = Power density

P = Power input to 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

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2.2 Power Density Calculation (Worst Case)

FCC Standalone MPE

Operation Mode	Evaluation Frequency (MHz)	Operation Distance (cm)	Max. output Power (dBm)	Antenna Gain (dBi)	Max. output Power EIRP (mW)	Power Density (PD) (mW/cm ²)	Limit (mW/cm ²)	Pass / Fail	Power Density / Limit	Collocated MPE
WLAN 2.4GHz	2437.00	20	29.3	5.41	2958.01	0.589	1.000	Pass	0.589	V
WLAN 5GHz	5150.00	20	22.09	6.41	707.95	0.141	1.000	Pass	0.141	
LTE-Band 2	1850.70	20	25	3.61	726.11	0.145	1.000	Pass	0.145	
LTE-Band 4	1710.70	20	25	3.27	671.43	0.134	1.000	Pass	0.134	
LTE-Band 5	824.70	20	25	1.42	438.53	0.087	0.550	Pass	0.159	V
LTE-Band 13	779.50	20	25	0.01	316.96	0.063	0.520	Pass	0.121	
LTE-Band 48	3552.50	20	25	3.59	722.77	0.144	1.000	Pass	0.144	
LTE-Band 66	1710.70	20	25	3.27	671.43	0.134	1.000	Pass	0.134	

Collocated Power Density Calculation

Max WLAN PD / Limit	Max WWAN PD / Limit ULCA LTE Band 5	Max WWAN PD / Limit ULCA LTE Band 5	Σ (Power Density / Limit) of WLAN + WWAN ULCA
0.589	0.159	0.159	0.907

Note:

- For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band.
- Σ (E- Field Strength / Limit): This is a summation of [(E- Field Strength for each transmitter/antenna included in the simultaneous transmission) / (corresponding MPE limit)].
- Considering the collocated transmitters, the aggregated (E- Field Strength /limit) is smaller than 1, and MPE of collocated transmitters is compliant

~ End of Report ~

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