RF Exposure Report

Report No.:	SA170320E01B
FCC ID:	H8NTCG310
Test Model:	TCG310
Series Model:	TCG310, TCG310XXXXXX (X=0~9,A-Z,a-z,” -” ,” .” or blank for marketing)
Received Date:	Aug. 07, 2017
Test Date:	Aug. 29, 2017
Issued Date:	Sep. 14, 2017
Applicant:	ASKEY COMPUTER CORP.
Address:	10F, NO.119, JIANKANG RD., ZHONGHE DIST., NEW TAIPEI CITY 23585, TAIWAN, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
SA170320E01B	Original release.	Sep. 14, 2017

1 Certificate of Conformity

Product:	Cable Modem
Brand:	ASKEY
Test Model:	TCG310
Series Model:	TCG310, TCG310XXXXXX (X=0~9,A-Z,a-z,"-","."or blank for marketing)
Sample Status:	ENGINEERING SAMPLE
Applicant:	ASKEY COMPUTER CORP.
Test Date:	Aug. 29, 2017
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Sep. 14, 2017

Wendy Wu / Specialist

:

Approved by _____ , **Date:** Sep. 14, 2017

May Chen / Manager

2 RF Exposure

2.1 Limits For Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
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
1500-100,000	…	…	1.0	30

f = Frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 32cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Set 1							
Antenna No.	PCB Chain No.	Brand	Ant. Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connecter Type	Cable Length (mm)
1	2.4G-chain 3	Askey	3.57	2.4~2.4835	PCB	none	-
	5G-chain 0		3.48	5.15~5.35			
			3.35	5.47~5.725			
			2.79	5.725~5.85			
2	5G-chain 1	HONGBO	3.89	5.15~5.35	Dipole	i-pex(MHF)	95
			4.16	5.47~5.725			
			4.04	5.725~5.85			
3	2.4G-chain 1		3.99	2.4~2.4835	Dipole	i-pex(MHF)	75
	5G-chain 2		3.89	5.15~5.35			
			3.66	5.47~5.725			
			3.83	5.725~5.85			
4	2.4G-chain 0		3.26	2.4~2.4835	Dipole	i-pex(MHF)	295
	5G-chain 3		3.9	5.15~5.35			
			3.92	5.47~5.725			
			4.49	5.725~5.85			

Set 2							
Antenna No.	PCB Chain No.	Brand	Ant. Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connecter Type	Cable Length (mm)
1	2.4G-chain 3	Askey	3.57	2.4~2.4835	PCB	none	-
	5G-chain 0		3.48	5.15~5.35			
			3.35	5.47~5.725			
			2.79	5.725~5.85			
2	5G-chain 1	TSKY	2.93	5.15~5.35	PIFA	i-pex(MHF)	93
			2.69	5.47~5.725			
			2.76	5.725~5.85			
3	2.4G-chain 1		3.2	2.4~2.4835	PIFA	i-pex(MHF)	71
	5G-chain 2		3.48	5.15~5.35			
			3.23	5.47~5.725			
			3.34	5.725~5.85			
4	2.4G-chain 0		2.12	2.4~2.4835	Dipole	i-pex(MHF)	290
	5G-chain 3		2.61	5.15~5.35			
			2.36	5.47~5.725			
			2.52	5.725~5.85			
Set 3							
Antenna No.	PCB Chain No.	Brand	Ant. Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connecter Type	Cable Length (mm)
1	2.4G-chain 3	Askey	3.57	2.4~2.4835	PCB	none	-
	5G-chain 0		3.48	5.15~5.35			
			3.35	5.47~5.725			
			2.79	5.725~5.85			
2	5G-chain 1	Master Wave	5.96	5.15~5.35	Dipole	i-pex(MHF)	95
			7.51	5.47~5.725			
			7.39	5.725~5.85			
3	2.4G-chain 1		4.52	2.4~2.4835	Dipole	i-pex(MHF)	58
	5G-chain 2		4.9	5.15~5.35			
			3.95	5.47~5.725			
			3.38	5.725~5.85			
4	2.4G-chain 0		3.41	2.4~2.4835	Dipole	i-pex(MHF)	285
	5G-chain 3		4.23	5.15~5.35			
			4.57	5.47~5.725			
			3.76	5.725~5.85			

2.1 Calculation Result of Maximum Conducted Power

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2412-2462	409.643	8.62	32	0.23168	1
5180-5240	431.54	10.71	32	0.39492	1
5745-5825	715.803	10.55	32	0.63137	1

NOTE:
2.4GHz: Directional gain =10 $\log[(10^{G0/20} + 10^{G1/20} + 10^{G3/20})^2 / 3] = 8.62$dBi
5 GHz:
UNII-1: Directional gain = 10 $\log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.71$dBi
UNII-3: Directional gain = 10 $\log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.55$dBi

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz = 0.23168 / 1 + 0.63137 / 1 = 0.86305

Therefore the maximum calculations of above situations are less than the "1" limit.

--- END ---