RF Exposure Report

Report No.:	SA180604C04 R1
FCC ID:	(1) A4R-WT3 (2) A4R-WT4
Test Model:	WT3
Received Date:	Jun. 04, 2018
Date of Evaluation:	Jul. 13, 2018
Issued Date:	Sep. 03, 2018
Applicant:	Google LLC
Address:	1600 Amphitheatre Parkway, Mountain View, California, United States 94043
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
Test Location:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C)
FCC Registration / Designation Number:	788550 / TW0003

Cancels and replaces the report No. SA180604C04 dated Jul. 23, 2018

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Release Control Record

Issue No.	Description	Date Issued
SA180604C04	Original Release	Jul. 23, 2018
SA180604C04 R1	Add FCC ID	Sep. 03, 2018

1 Certificate of Conformity

Product:	Study Hub
Brand:	Verily
Test Model:	WT3
Sample Status:	Production Unit
Applicant:	Google LLC
Date of Evaluation:	Jul. 13, 2018
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 : Rona Chen , **Date:** Sep. 03, 2018

Rona Chen / Specialist

Approved by : , **Date:** Sep. 03, 2018

Dylan Chiou / Project Engineer

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 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

WWAN Antenna											
Antenna Type	Fixed Internal										
Band	**WCDMA**			**LTE**							
	II	**VI**	**V**	**2**	**4**	**5**	**12**	**17**	**30**	**38**	**66**
Gain	3.81	2.51	1.53	3.81	2.51	1.53	2.63	2.35	3.68	1.87	2.51

BT/WLAN Antenna						
Antenna Type	PIFA					
Frequency	**BT**	**WLAN**				
	2.4 GHz	**2.4 GHz**	**5.15~5.25 GHz**	**5.25~5.35 GHz**	**5.47~5.725 GHz**	**5.725~5.825 GHz**
Gain	1.72	2.42	3.61	3.48	3.08	3.35

2.5 Calculation Result of Maximum Conducted Power

Band	Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WCDMA II	1850-1910	23.62	3.81	20	0.110	1.00
WCDMA IV	1710-1755	23.77	2.51	20	0.084	1.00
WCDMA V	824-849	23.76	1.53	20	0.067	0.55
LTE 2	1850-1910	22.75	3.81	20	0.090	1.00
LTE 4	1710-1755	23.27	2.51	20	0.075	1.00
LTE 5	824-849	22.72	1.53	20	0.053	0.55
LTE 12	699-716	22.88	2.63	20	0.071	0.47
LTE 17	704-716	23.00	2.35	20	0.068	0.47
LTE 30	2305-2315	23.03	3.68	20	0.093	1.00
LTE 38	2570-2620	22.96	1.87	20	0.060	1.00
LTE 66	1710-1780	23.25	2.51	20	0.075	1.00
WLAN	2412-2462	19.42	5.43	20	0.061	1.00
	5180-5240	18.10	6.62	20	0.059	1.00
	5260-5320	18.50	6.62	20	0.065	1.00
	5500-5700	18.76	6.62	20	0.069	1.00
	5745-5825	18.45	6.62	20	0.064	1.00
BT	2402-2480	9.55	1.72	20	0.003	1.00

NOTE:
1. Max power used is already max. tune up power for RF exposure evaluation
2. 2.4GHz: Directional gain = 2.42 dBi + 10log(2) = 5.43dBi
3. 5.0GHz: Directional gain = 3.61 dBi + 10log(2) = 6.62dBi

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

WWAN + WLAN + BT = 0.071 / 0.47 + 0.069 / 1.00 + 0.003 / 1.00 = 0.223

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

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