1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 General:

Product Name:	Convertible PC
Brand Name:	HP
Model No.:	TPN-C137
Hardware Version:	N/A
Software Version:	N/A
WWAN Module:	Model No.: L860-GL, Supplier: Fibocom, FCC ID: ZMOL860GL

1.2 Antenna Information:

Vendor	**Advanced Wireless & Antenna Inc.**						
Antenna	**Main (PIFA)**						
Part Number	AML6Y-10057(DC330024W00)						
Frequency(MHz)	699~716	777~798	814~849	1710~1780	1850~1915	2305~2315	2496~2690
Gain (dBi)	-1.87	-1.31	-3.02	2.39	2.48	2.33	-0.81

1.3 Rated Power

Operating Frequency (MHz)				Max. Output Power (dBm)	Antenna Gain (dBi)	EIRP / ERP (dBi / dBd)
WCDMA/HSDPA Band 2	1852.4	~	1907.6	24.50	2.48	26.98
WCDMA/HSDPA Band 4	1712.4	~	1752.6	24.50	2.39	26.89
WCDMA/HSDPA Band 5	826.4	~	846.6	24.50	-3.02	21.48
LTE-Band 2	1850.7	~	1909.9	24.00	2.48	26.48
LTE-Band 4	1710.7	~	1754.3	24.00	2.39	26.39
LTE-Band 5	824.7	~	848.3	25.00	-3.02	21.98
LTE-Band 7	2502.5	~	2567.5	24.00	-0.81	23.19
LTE-Band 12	699.7	~	715.3	24.00	-1.87	22.13
LTE-Band 13	779.5	~	784.5	24.00	-1.31	22.69
LTE-Band 14	788	~	798	24.00	-1.31	22.69
LTE-Band 17	706.5	~	713.5	24.00	-1.87	23.19
LTE-Band 25	1850.7	~	1914.3	24.00	2.48	26.48
LTE-Band 26	824.7	~	848.3	25.00	-3.02	21.98
LTE-Band 30	2307.5	~	2312.5	23.00	2.33	25.33
LTE-Band 38	2572.5	~	2617.5	24.00	-0.81	23.19
LTE-Band 41	2498.5	~	2687.5	25.00	-0.81	24.19
LTE-Band 66	1710.7	~	1779.3	24.00	2.39	26.39

Operating Frequency (MHz)		Operation Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm2)	Margin	Worst Case
WCDMA/HSPA Band 2	1852.4 ~ 1907.6	20	0.10	1.00	-0.90	
WCDMA/HSPA Band 4	1712.4 ~ 1752.6	20	0.10	1.00	-0.90	
WCDMA/HSPA Band 5	826.4 ~ 846.6	20	0.03	0.55	-0.52	
LTE-Band 2	1850.7 ~ 1909.3	20	0.09	1.00	-0.91	
LTE-Band 4	1710.7 ~ 1754.3	20	0.09	1.00	-0.91	
LTE-Band 5	824.7 ~ 848.3	20	0.03	0.55	-0.52	
LTE-Band 7	2502.5 ~ 2567.5	20	0.04	1.00	-0.96	
LTE-Band 12	699.7 ~ 715.3	20	0.03	0.47	-0.43	V
LTE-Band 13	779.5 ~ 784.5	20	0.04	0.52	-0.48	
LTE-Band 14	788 ~ 798	20	0.04	0.53	-0.49	
LTE-Band 17	706.5 ~ 713.5	20	0.03	0.47	-0.44	
LTE-Band 25	1850.7 ~ 1914.3	20	0.09	1.00	-0.91	
LTE-Band 26	824.7 ~ 848.3	20	0.03	0.55	-0.52	
LTE-Band 30	2307.5 ~ 2312.5	20	0.07	1.00	-0.93	
LTE-Band 38	2572.5 ~ 2617.5	20	0.04	1.00	-0.96	
LTE-Band 41	2498.5 ~ 2687.5	20	0.05	1.00	-0.95	
LTE-Band 66	1710.7 ~ 1779.3	20	0.09	1.00	-0.91	

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

2.2 Power Density Calculation (Worst Case)

Operation Mode	Evaluation Frequency (MHz)	Operation Distance (cm)	Max. output Power (dBm)	Antenna Gain (dBi)	Max. output Power EIRP (mW)	Power Density (PD) (mW/cm2)	Limit (mW/cm2)	Pass / Fail
WWAN	699.70	20	24	-1.87	163.31	0.033	0.466	Pass

2.3 Evaluating the mixed mobile and portable host platform exposure condition

When the device is operated in notebook mode, WWAN is belong to mobile condition because the separation distance between WWAN antenna and user is larger than 20cm, so MPE evaluation is required, besides, WLAN is belong to portable condition because the separation distance between WLAN antenna and user is less than 20cm, so SAR evaluation is required. Thus, this would be the mixed mobile and portable conditions when operating in notebook mode.
Based on KDB447498 D01v06 7.2, when one of the following test exclusion conditions is satisfied, the simultaneous transmission would be compliant.
a) The [Σ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg] + [Σ of MPE ratios] is ≤ 1.0.

b) The SAR to peak location separation ratios of all simultaneously transmitting antenna pairs operating in portable device exposure conditions are all ≤ 0.04, and the [Σ of MPE ratios] is ≤ 1.0.
According to the following evaluation, above a) can be satisfied, so the simultaneous transmission is compliant.

Scenario 1	***WWAN + WLAN 2.4GHz TX1 + BT***		
Worst case	***WWAN***	***WLAN 2.4GHz TX1***	***BT***
Reported SAR or MPE	***0.033***	***0.928***	***0.123***
Limit	***0.466***	***1.6***	***1.6***
Exposure ratio	***0.071***	***0.58***	***0.08***
Total exposure ratio	***0.731***		

Scenario 2	***WWAN + WLAN 5GHz TX1 + BT***		
Worst case	***WWAN***	***WLAN 5GHz TX1***	***BT***
Reported SAR or MPE	***0.033***	***1.055***	***0.123***
Limit	***0.466***	***1.6***	***1.6***
Exposure ratio	***0.071***	***0.66***	***0.08***
Total exposure ratio	***0.811***		

Scenario 1	WWAN + WLAN 2.4GHz TX2	
Worst case	WWAN	WLAN 2.4GHz TX2
Reported SAR or MPE	0.033	0.854
Limit	0.466	1.6
Exposure ratio	0.071	0.53
Total exposure ratio	0.601	

Scenario 1	WWAN + WLAN 5GHz TX2	
Worst case	WWAN	WLAN 2.4GHz TX1
Reported SAR or MPE	0.033	0.936
Limit	0.466	1.6
Exposure ratio	0.071	0.59
Total exposure ratio	0.661	

Scenario 1	WWAN + WLAN 2.4GHz TX1 + WLAN 2.4GHz TX2 (MIMO)		
Worst case	WWAN	WLAN 2.4GHz TX1	WLAN 2.4GHz TX1
Reported SAR or MPE	0.033	0.250	0.314
Limit	0.466	1.6	1.6
Exposure ratio	0.071	0.16	0.20
Total exposure ratio	0.431		

Scenario 1	WWAN + WLAN 5GHz TX1 + WLAN 5GHz TX2 (MIMO)		
Worst case	WWAN	WLAN 5GHz TX1	WLAN 5GHz TX2
Reported SAR or MPE	0.033	0.381	0.482
Limit	0.466	1.6	1.6
Exposure ratio	0.071	0.24	0.30
Total exposure ratio	0.611		

~ End of Report ~