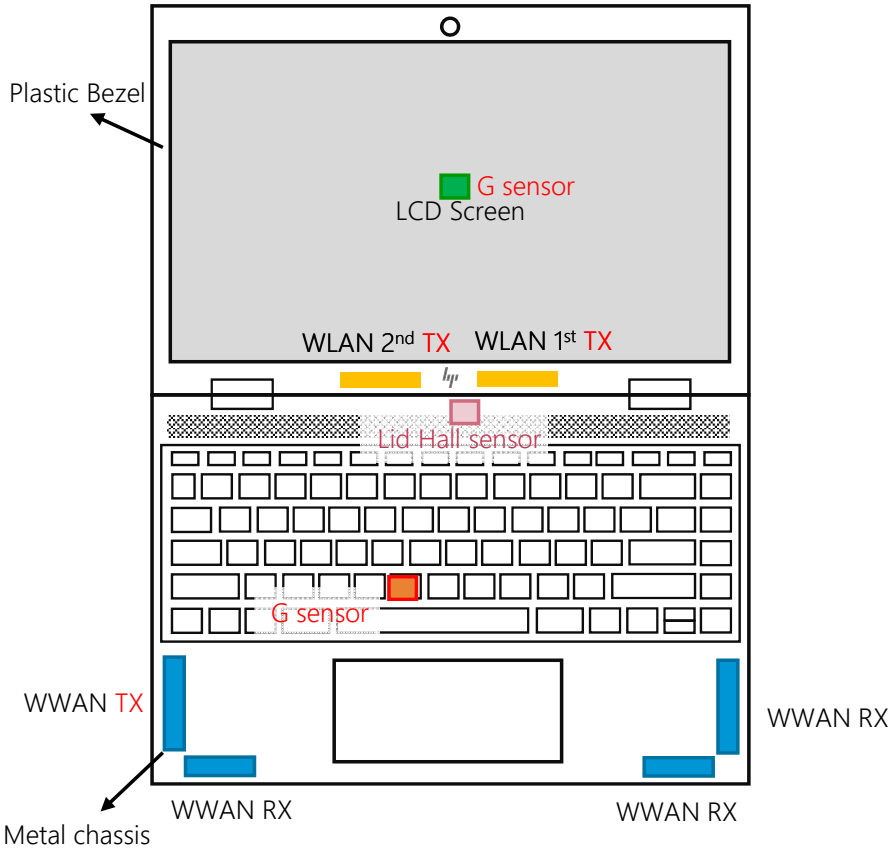
Objective

- To optimize and keep good Wi-Fi performance for different user scenario or operating modes accordingly for this HP x360 Convertible PC.

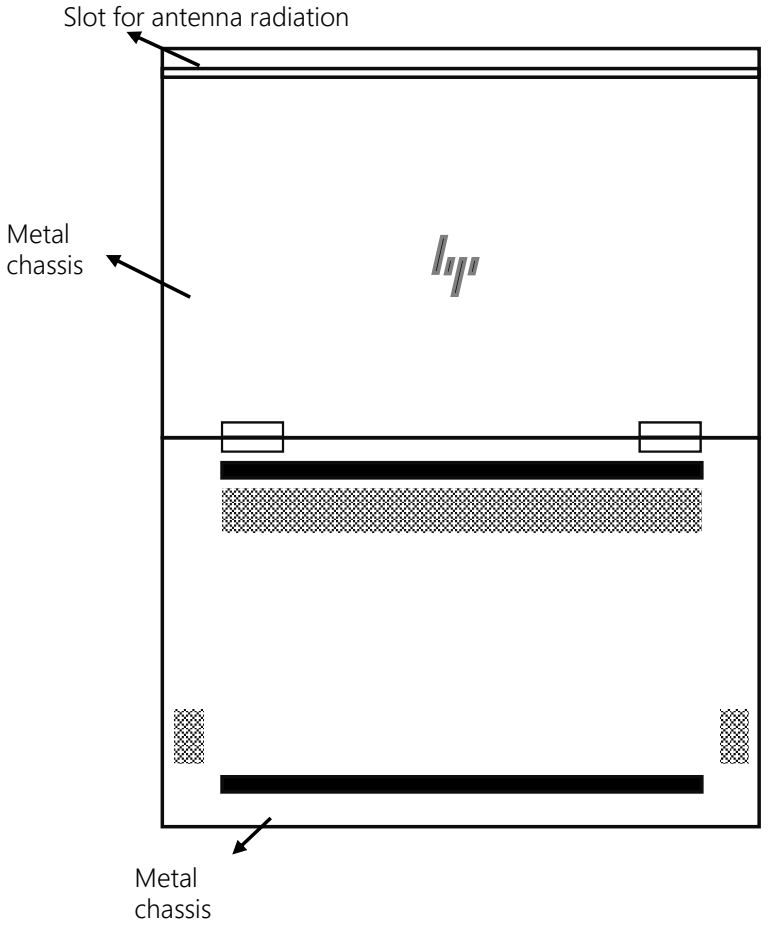
- The 2.4/5GHz TX power of WLAN radio module can be adjusted to different operating modes, for example:
  - Lid Close → No TX transmission
  - Laptop → Power level 1 (full power)
  - Tablet → Power level 2 (reduced)
- Regarding LTE/WWAN bands, LTE/WWAN radio will adjust TX power to different use operating modes, for example:
  - Lid Close → No TX transmission
  - Laptop → Power level 1 (reduced)
  - Tablet → Power level 2 (reduced)

WWAN SKU – WLAN/WWAN Antennas, and Sensor's Location

- Plot 1: Front View of DUT

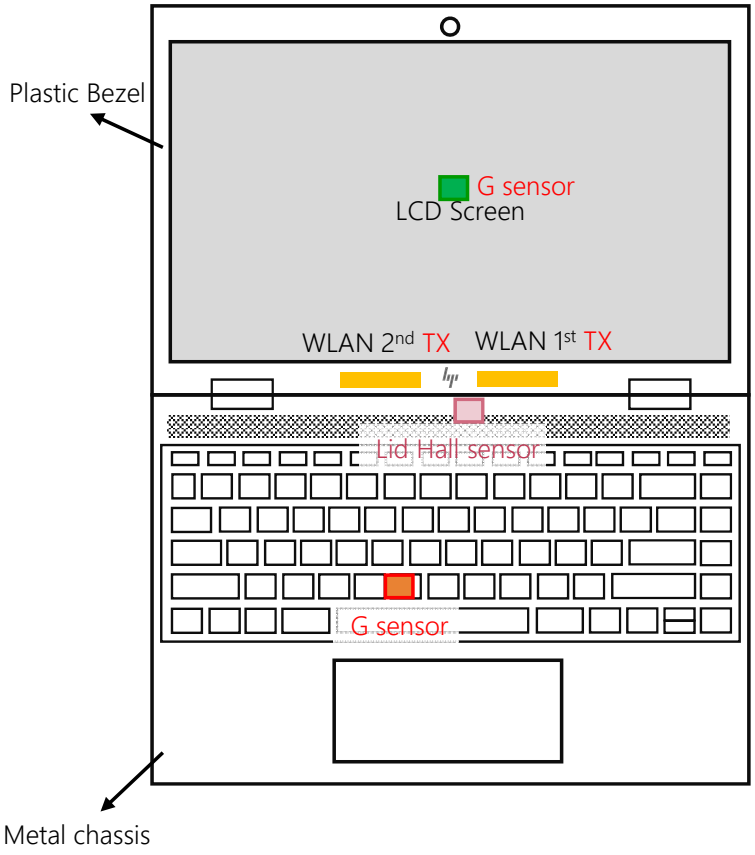


Plot 2: Back View of DUT

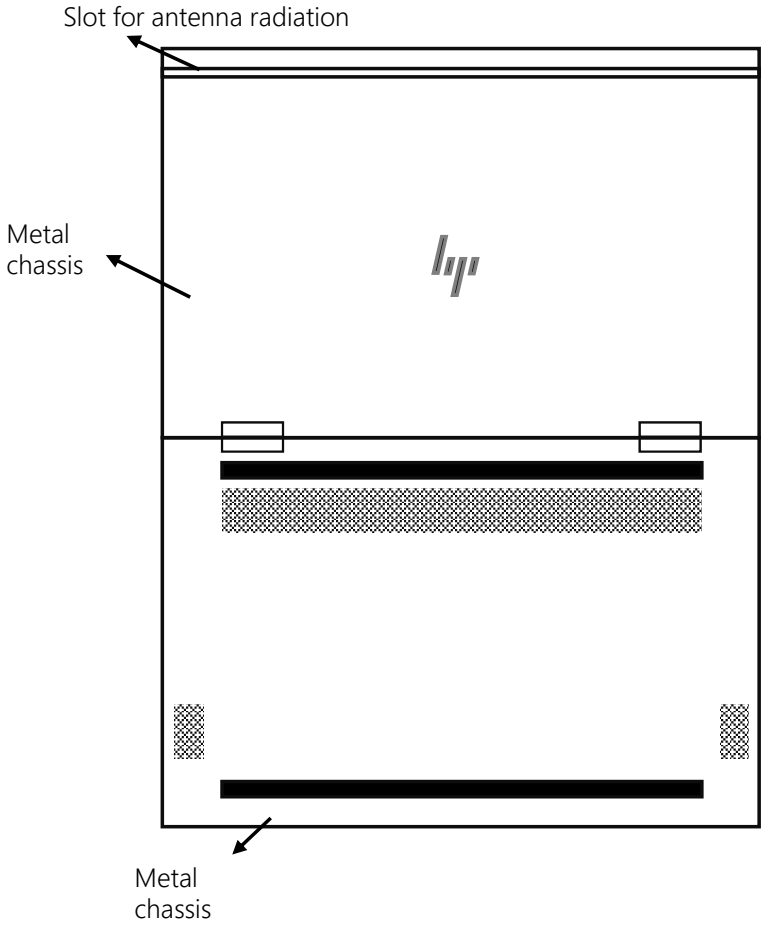


WLAN SKU – WLAN Antennas, and Sensor's Location

- Plot 1: Front View of DUT

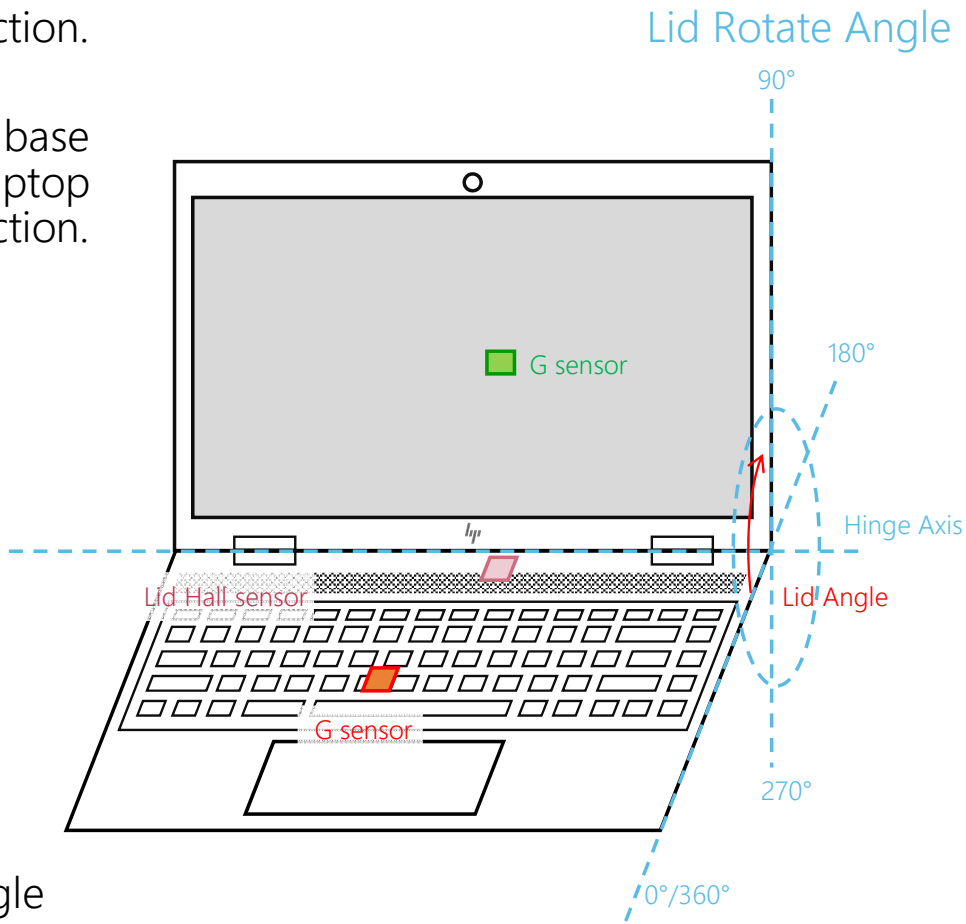


Plot 2: Back View of DUT



The illustration of Lid Angle

- Hall sensor is used for Lid-Close mode detection. (0°≤Lid angle<10 °)
- 2 G-sensors (one is on panel side and one is on base side) which are used for Lid angel calculation for Laptop / Tablet modes detection. (10°<Lid angle≤190°, it is Laptop mode;
  190°<Lid angle≤360°, it is Tablet mode)

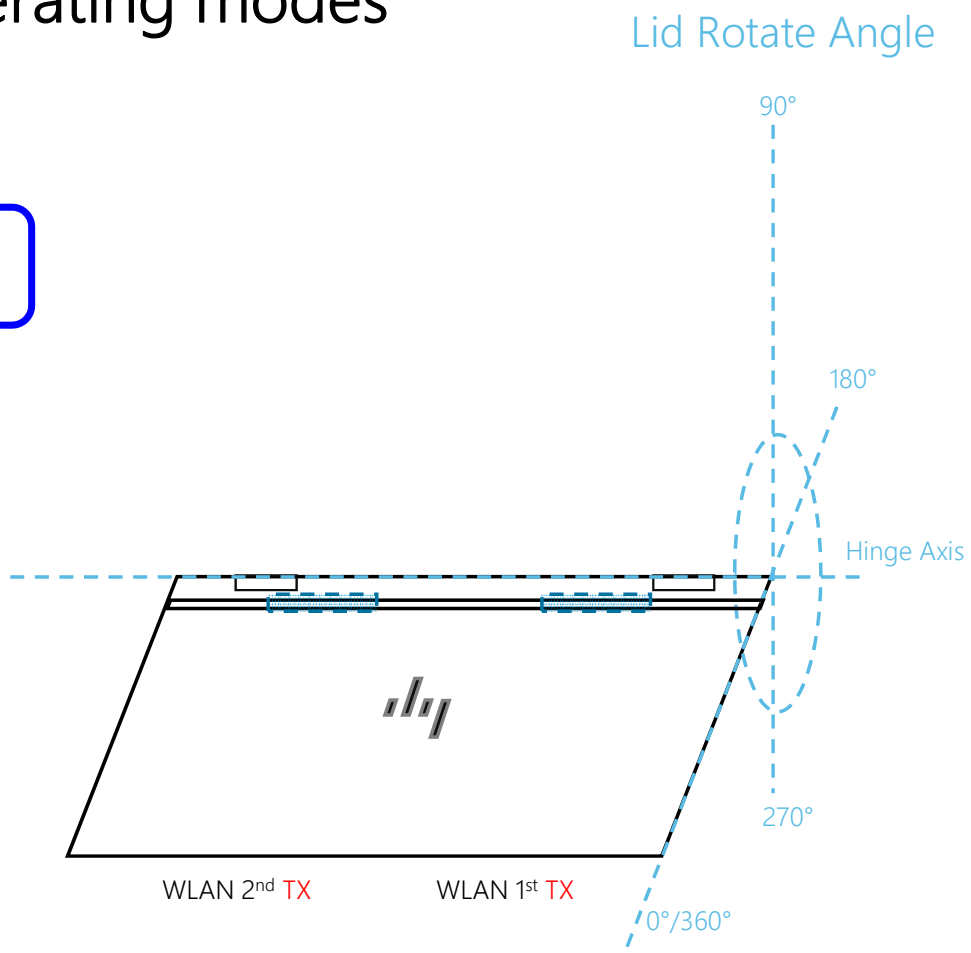


Plot 11: Lid Angle

The Illustration of Lid Angle vs. Operating modes

DUT operating mode	Lid Angle description
Lid Close	0° ≤ Lid angle < 10° (Lid Hall Sensor Trigger)
Laptop	10° < Lid angle ≤ 190°
Tablet	190° < Lid angle ≤ 360°
Book	10° < Lid angle ≤ 360° (Vertical)

Table 3

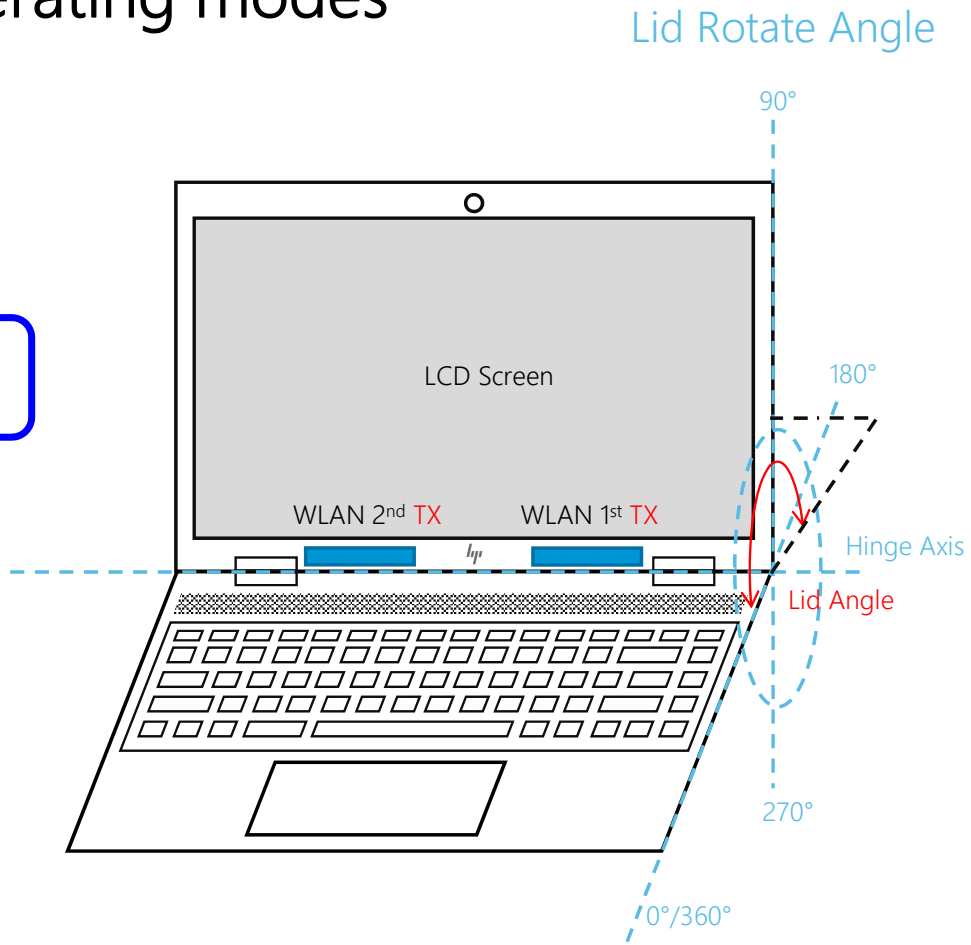


Plot 12: Lid Close

The Illustration of Lid Angle vs. Operating modes

DUT operating mode	Lid Angle description
Lid Close	0° ≤ Lid angle < 10° (Lid Hall Sensor Trigger)
Laptop	10° < Lid angle ≤ 190°
Tablet	190° < Lid angle ≤ 360°
Book	10° < Lid angle ≤ 360° (Vertical)

Table 3



Plot 13: Laptop

The Illustration of Lid Angle vs. Operating modes

DUT operating mode	Lid Angle description
Lid Close	0° ≤ Lid angle < 10° (Lid Hall Sensor Trigger)
Laptop	10° < Lid angle ≤ 190°
Tablet	190° < Lid angle ≤ 360°
Book	10° < Lid angle ≤ 360° (Vertical)

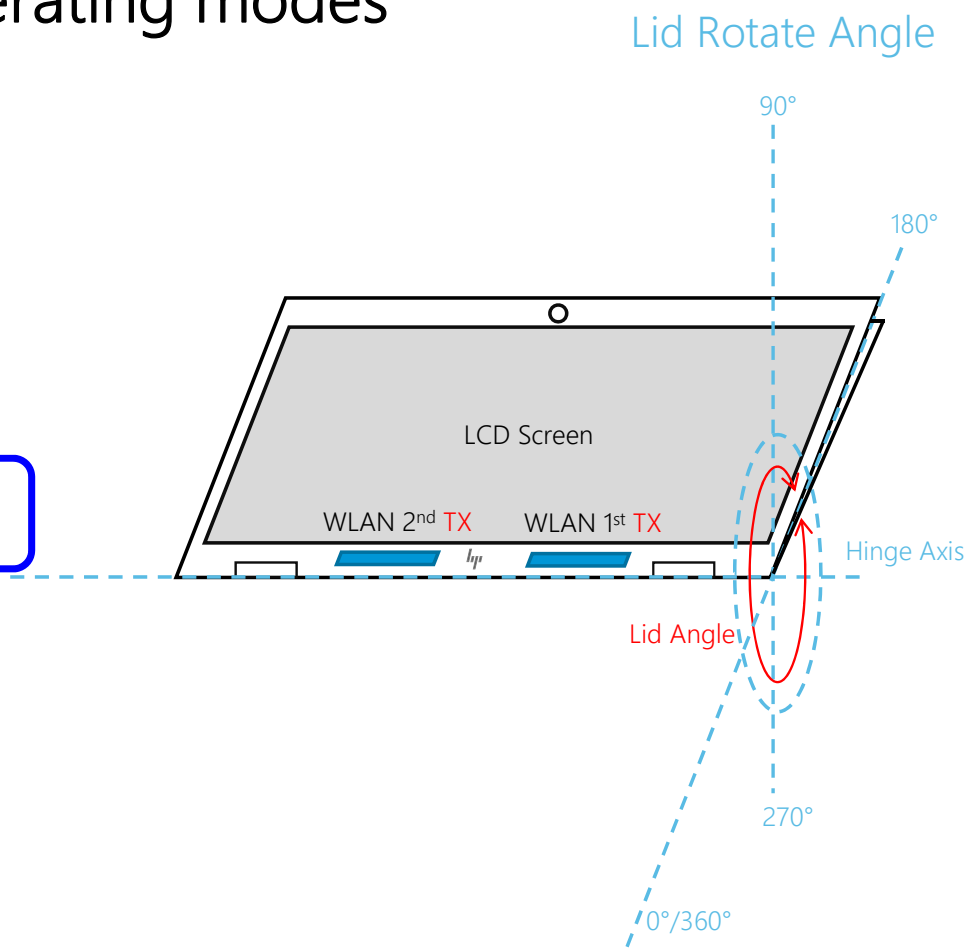


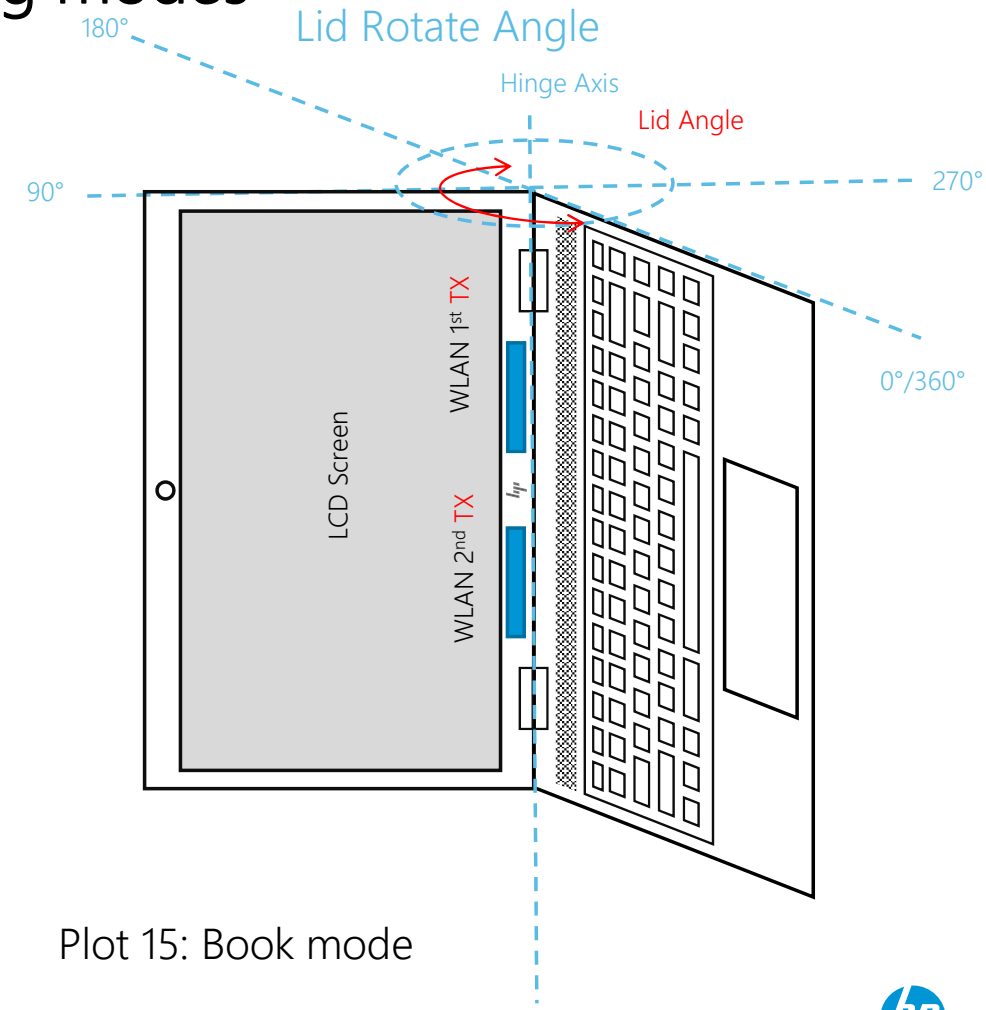
Table 3

Plot 14: Tablet

The Illustration of Lid Angle vs. Operating modes

DUT operating mode	Lid Angle description
Lid Close	0° ≤ Lid angle < 10° (Lid Hall Sensor Trigger)
Laptop	10° < Lid angle ≤ 190°
Tablet	190° < Lid angle ≤ 360°
Book	10° < Lid angle ≤ 360° (Vertical)

Table 3



Plot 15: Book mode

Maximum Specified WLAN Radio TX Power Estimation

- Table 4

DUT operating mode	WLAN 1st	WLAN 2nd	MIMO
Lid Close	No TX transmission	No TX transmission	No TX transmission
Laptop	2.4GHz: 20.5 5GHz: 20.5	2.4GHz: 20.5 5GHz: 20.5	2.4GHz: 18.0 5GHz: 19.0
Tablet	2.4GHz: 16.0 5GHz: 15.5	2.4GHz: 16.0 5GHz: 15.5	2.4GHz: 16.0 5GHz: 15.5
Book	2.4GHz: 16.0 5GHz: 15.5	2.4GHz: 16.0 5GHz: 15.5	2.4GHz: 16.0 5GHz: 15.5

Power level 1 (full power)

Power level 2 (reduced)

- Unit: dBm

Maximum Specified WWAN Radio TX Power Estimation

Mode	Band	Power level 1 (reduced)	Power level 2 (reduced)
WCDMA	Band 2	17.0	14.0
	Band 4	18.5	15.0
	Band 5	22.0	18.5

Mode	Band	Power level 1 (reduced)	Power level 2 (reduced)
LTE FDD	Band 2	17.0	14.0
	Band 4	18.5	15.0
	Band 5	22.0	18.5
	Band 7	17.5	14.0
	Band 12	21.5	19.0
	Band 13	21.5	20.5
	Band 17	21.5	19.0
	Band 25	17.0	14.0
	Band 26	22.0	18.5
	Band 30	17.0	14.5
	Band 66	18.5	15.0
LTE TDD	Band 38	19.5	16.0
	Band 41	19.5	16.0

Proposed SAR Evaluation for WLAN/WWAN

DUT operating mode	WLAN	
	SAR evaluation	Power setting
Laptop	Required	Power level 1
Tablet	Required	Power level 2
Book	Required	Power level 2

DUT operating mode	WWAN	
	SAR evaluation	Power setting
Laptop	Required	Power level 1
Tablet	Required	Power level 2
Book	Required	Power level 2

Note

- 1. For tablet mode, SAR is measured with lid angle 360 degree/fully flipped condition.
- 2. For book mode, it's included in the SAR evaluation of tablet mode, therefore, it's not required to have an extra test.