

Cover letter for Data Referencing

A. Introduction

EUT Type		Model	FCC ID	Support Mode	Equipment Class
Watch	Parent model	SM-L345U	A3LSML345	WCDMA B2/4/5 LTE B2/4/5/7/12/13/14/25/26/66/71 WLAN 11a/b/g/n Bluetooth, Low Energy	PCT NII DTS,DSS CXX,JAB
	Variant model	SM-L340	A3LSML340	WLAN 11a/b/g/n Bluetooth, Low Energy	NII DTS,DSS JAB

Because of same H/W and S/W except for main RF, the **Variant model: SM-L340** need to be reused for the data from the **Parent model: SM-L345U**

SM-L345U compliance test data to be used in the depopulated SM-L340 with the proposed spot-check test plan on the variant in this document per KDB 484596 D01 Referencing Test Data v03.

RF specification for SM-L345U and SM-L340 as below.

EUT Type		Model	Frequency Band	
			Licensed band	Un-licensed band
Watch	Parent model	SM-L345U	Cellular band - WCDMA 850 : 826.4 MHz ~ 846.6 MHz - WCDMA 1700 : 1 712.4 MHz ~ 1 752.6 MHz - WCDMA 1900 : 1 852.4 MHz ~ 1 907.6 MHz - LTE B2 : 1 850.7 MHz ~ 1 909.3 MHz - LTE B4 : 1 710.7 MHz ~ 1 754.3 MHz - LTE B5 : 824.7 MHz ~ 848.3 MHz - LTE B7 : 2 502.5 MHz ~ 2 567.5 MHz - LTE B12 : 699.7 MHz ~ 715.3 MHz - LTE B13 : 779.5 MHz ~ 784.5 MHz - LTE B14 : 790.5 MHz ~ 795.5 MHz - LTE B25 : 1 850.7 MHz ~ 1 914.3 MHz - LTE B26 : 814.7 ~ 848.3 MHz - LTE B66 : 1 710.7 MHz ~ 1 779.3 MHz - LTE B71 : 665.5 MHz ~ 695.5 MHz	WLAN band - ISM Band 2 400 MHz ~ 2 483.5 MHz [11b/g/n] - UNII-1 Band 5 150 MHz ~ 5 250 MHz [11a/n] - UNII-2A Band 5 250 MHz ~ 5 350 MHz [11a/n] - UNII-2C Band 5 470 MHz ~ 5 725 MHz [11a/n] - UNII-3 Band 5 725 MHz ~ 5 850 MHz [11a/n] - UNII-4 Band 5 850 MHz ~ 5 895 MHz [11a/n] Bluetooth band - ISM Band 2 400 MHz ~ 2 483.5 MHz [BDR/EDR] Low Energy band - ISM Band 2 400 MHz ~ 2 483.5 MHz [1M/2M/125k/500k]
	Variant model	SM-L340	Not Used	WLAN band - ISM Band 2 400 MHz ~ 2 483.5 MHz [11b/g/n] - UNII-1 Band 5 150 MHz ~ 5 250 MHz [11a/n] - UNII-2A Band 5 250 MHz ~ 5 350 MHz [11a/n] - UNII-2C Band 5 470 MHz ~ 5 725 MHz [11a/n] - UNII-3 Band 5 725 MHz ~ 5 850 MHz [11a/n] - UNII-4 Band 5 850 MHz ~ 5 895 MHz [11a/n] Bluetooth band - ISM Band 2 400 MHz ~ 2 483.5 MHz [BDR/EDR] Low Energy band - ISM Band 2 400 MHz ~ 2 483.5 MHz [1M/2M/125k/500k]

B. Justification

A brief description of the component and operational differences **Variant model: SM-L340** and **Parent model: SM-L345U**.

SM-L345U support main RF part, SM-L340 delete main RF part from SM-L345U and SM-L340 only support WIFI/BT/LE functions.

EUT Type		Model	The difference between SM-L345U and SM-L340	
			Hardware	Software
Watch	Parent model	SM-L345U	- RF circuits for WCDMA/LTE band are removed from SM-L345U. - NFC chipset is changed (SN300U -> SN300T (Not support ESIM)) - All other parts are same.	- No changes except Main RF between the SM-L345U and SM-L340 - Since WIFI/BT of SM-L345U and SM-L340 use the same tune up power, PCB layout, the same RF IC, and the same antenna, there is no difference in characteristics for WIFI/BT and SM-L340 is qualified to reuse SM-L345U test results.
	Variant model	SM-L340		

C. Spot check Test Plan

Deviation Criteria

For EMC compliance test data (e.g., spurious emissions limits), the deviation between the variant and the parent model, for both field and power quantities, is expressed as:

$$d_{dB} = |V_{dB} - R_{dB}|$$

where V_{dB} is the variant spot-check level in dB, and R_{dB} is the corresponding reference measurement level in dB for the parent model. The spot-check will be deemed acceptable when:

$$d_{dB} \leq d_{dBmax}$$

where d_{dBmax} is the maximum deviation d_{dB} allowed for the EMC data for the spot-check to be considered acceptable. The definition of d_{dBmax} is based on "how far" the reference data R_{dB} is from the compliance threshold C_{dB} (also expressed in dB), for the test under consideration. More specifically, if M_{dB} is the margin in dB from the compliance limit, expressed as

$$M_{dB} = |C_{dB} - R_{dB}|$$

then d_{dBmax} is defined as a function of M_{dB} , which increases linearly from 3 dB to 6 dB (Fig. 2), according to:

$$d_{dBmax}(M_{dB}) = \begin{cases} (3 + M_{dB}/20) \text{ dB}, & \text{for } 0 \leq M_{dB} \leq 60 \text{ dB} \\ 6 \text{ dB}, & \text{for } M_{dB} > 60 \text{ dB} \end{cases}$$

Test plan for spot check measurement

Firstly for Variant model, the output power of each mode will be verified within the tolerance of Parent model. the deviation of the output power between Parent model and Variant model will be compared to the criteria of section 3 in KDB 484596 v03. then if deviation is complied, other spot-check measurement will be performed.

The depopulation of the WWAN transmitter in the Variant model is expected to have minimal impact on the output power, bandwidth or other in-band parameters as measured at the RF output of the remaining transmitters subject to antenna port measurements (15.247 C / 15.407 E).

When performing radiated emissions spot checks for band edge emissions from those transmitters the output power and emission bandwidth are also being verified. Any significant differences in the bandwidth or output power would impact the band edge emissions since the amplitude of those emissions is tied to both the in-band power and the bandwidth.

The below tables show each rule part and test item spot check plan.

Test mode	Equipment Class	Rule Part	Data Referencing
5G WLAN	NII	Part 15 E	Partial ¹⁾
2.4G WLAN	DTS	Part 15 C	All
Bluetooth LE	DTS	Part 15 C	All
Bluetooth	DSS	Part 15 C	All

Notes:

1. The DFS (Dynamic Frequency Selection) test item was additionally investigated.

Test mode of spot check measurement for Variant model.

[NII]

Test mode	Rule Part	Test Item	Data Referencing	Note
5G WLAN (UNII 1/2A/2C/3/4)	15.407(a)	26 dB Bandwidth	Y	We consider these parameters to be verified when making band-edge measurements. Any significant increase or decrease in the emission bandwidth would result in significant deviations in radiated band edge results. Further these would all be measured at the antenna port and the depopulation of the WWAN transmitter will not impact the fundamental signal parameters. If band edge results are significantly different the bandwidth will be verified.
	15.407(e)	6 dB Bandwidth	Y	
	N/A	Occupied Bandwidth	Y	
	15.407(a)	Maximum output power	Y	Spot Check
	15.407(a)	Maximum Power Spectral Density	Y	Spot Check
	15.407(g)	Frequency Stability	Y	This will not be impacted since it is a function of the chipset which is not being changed.
	15.207(a)	AC conducted Emission	Y	Validated as part of the digital device AC conducted emissions testing being performed in full.
	15.407(b), 15.205(a), 15.209(a)	Radiated Spurious Emissions	Y	Spot Check
		Radiated Restricted Band Edge	Y	Spot Check
	15.407(h)	DFS	N	Full test

[DTS]

Test mode	Rule Part	Test Item	Data Referencing	Note
2.4G WLAN Bluetooth LE	15.247(a)(2)	6 dB Bandwidth	Y	We consider these parameters to be verified when making band-edge measurements. Any significant increase or decrease in the emission bandwidth would result in significant deviations in radiated band edge results.
	N/A	Occupied Bandwidth	Y	Further these would all be measured at the antenna port and the depopulation of the WWAN transmitter will not impact the fundamental signal parameters. If band edge results are significantly different the bandwidth will be verified.
	15.247(b)(3)	Maximum Peak Output Power	Y	Spot Check
	15.247(e)	Peak Power Spectral Density	Y	Spot Check
	15.247(d)	Conducted Spurious Emissions	Y	Spot checked via the radiated spurious measurements – any change in output power would result in significant deviations in radiated spurious emissions results.
	15.207(a)	AC Power Line Conducted	Y	Validated as part of the digital device AC conducted emissions testing being performed in full.
	15.247(d),	Radiated Spurious Emissions	Y	Spot Check
	15.205(a), 15.209(a)	Radiated Restricted Band Edge	Y	Spot Check

[DSS]

Test mode	Rule Part	Test Item	Data Referencing	Note
Bluetooth	15.247(a)(1)	20 dB Channel Bandwidth	Y	We consider these parameters to be verified when making band-edge measurements. Any significant increase or decrease in the emission bandwidth would result in significant deviations in radiated band edge results.
	N/A	Occupied Bandwidth	Y	Further these would all be measured at the antenna port and the depopulation of the WWAN transmitter will not impact the fundamental signal parameters. If band edge results are significantly different the bandwidth will be verified.
	15.247(b)(1), (4)	Maximum Peak Output Power	Y	Spot Check
	15.247(a)(1)	Carrier Frequency Separation	Y	This will not be impacted since it is a function of the chipset which is not being changed.
	15.247(a)(1)(iii)	Number of Hopping Frequencies	Y	
	15.247(a)(1)(iii)	Time of Occupancy	Y	
	15.247(d)	Conducted Spurious Emissions	Y	Spot checked via the radiated spurious measurements – any change in output power would result in significant deviations in radiated spurious emissions results.
	15.207(a)	AC Power Line Conducted	Y	Validated as part of the digital device AC conducted emissions testing being performed in full.
	15.205(a), 15.209(a)	Radiated Spurious Emissions	Y	Spot Check
		Band Edge, Restricted band	Y	Spot Check