Data Referencing

A. Introduction

This inquiry is seeking approval from FCC if applicant is able to use fully populated **Parent Model: SM-L335U** compliance test data to be used in the depopulated **Variant Model: SM-L330** with the proposed spot-check test plan on the variant in this document per KDB 484596 D01 Referencing Test Data v03.

The applicant takes full responsibility for the fact that the test data as referenced represents valid data for demonstrating compliance for the variant listed in the application.

The grantee (Samsung Electronics) understands that the use of data referencing does not waive their responsibility that the filed certification data properly demonstrates FCC compliance for the variant device(s).

B. Justification and EUT Description

The applicant hereby declares the following for Parent Model: SM-L335U and Variant Model: SM-L330.
Both models are highly similar, with only the differences being listed on the table below.

Model	SM-L335U (Parent Model)	SM-L330 (Variant Model)
FCC ID	A3LSML335	A3LSML330
EUT name	Watch	Watch
Mobile/Portable/Fixed	Portable device	Portable device
HW version	REV1.0	REV1.0
SW version	L335U.001	L330.001 (Main RF licensed "WCDMA/LTE" functionality and eSIM capabilities are removed through software modifications. The rest remains the same.)
Hardware differences between two models	The SM-L335U Main RF licensed related circuits have been physically depopulated, including all cellular functionality components. In the variant model, the part number has been changed which represents the exclusion of eSIM functionality at the chipset block level while maintaining the same physical form factor. This change is not visually identifiable but is documented in the component specifications. The SM-L330 BT/WIFI block diagram and antenna structure remain identical to the SM-L335U. All other aspects including form factors, materials, functions, PCB layouts, and common components are the same between both models.	

Key Differences

According to the KDB 484596 Referencing Test Data v03 procedure, we identify the following differences between the parent model and the variant model:

The circuit board, enclosure and antennas are identical between the parent model and variant device. The variant device maintains the same primary form factor build as the parent model.
The Wi-Fi and Bluetooth circuitry, including antennas, are the same between the two devices.

The hardware, software and firmware are the same except:

- The cellular band functionality has been modified through a combination of firmware changes and component depopulation. The hardware changes consist solely of component depopulation on the main board, with no changes to the circuit board layout. The supported bands in each device are shown in the table below:

Details of the depopulated components between parent and variant devices are shown in the table below, with the locations of these components on the circuit board illustrated in the following pictures in section C. These hardware modifications do not affect the overall PCB layout.

EUT Description

Supported Radios	Frequency Ranges (MHz)	Equipment Class	FCC Rules Parts	SM-L335U (Parent Model)	SM-L330 (Variant Model)
Bluetooth LE	2402-2480	DTS	15C	☑	☑
Bluetooth	2402-2480	DSS	15C	☑	☑
2.4G 11b/g/n20	2412-2472	DTS	15C	☑	☑
5G 11a/n20	5180-5240 5260-5320 5500-5720 5745-5825 5845-5885	NII	15E	☑	☑
WCDMA850	824-849	PCB	22H	☑	☒
WCDMA1700	1710-1755	PCB	27	☑	☒
WCDMA1900	1850-1910	PCB	24E	☑	☒
LTE Band 2	1850-1910	PCB	24E	☑	☒
LTE Band 4	1710-1755	PCB	27	☑	☒
LTE band 5	824-849	PCB	22H	☑	☒
LTE Band 7	2500-2570	PCB	27	☑	☒
LTE Band 12	699-716	PCB	27	☑	☒
LTE Band 13	777-787	PCB	27	☑	☒
LTE Band 14	788-798	PCB	90	☑	☒
LTE Band 25	1850-1915	PCB	24E	☑	☒
LTE Band 26	814-849	PCB	22H & 90	☑	☒
LTE Band 66	1710-1780	PCB	27	☑	☒
LTE Band 71	663-698	PCB	27	☑	☒

☑: Supported

☒ : Not supported (removed from software)

C. Test Plan for data referencing

Test Requirements Summary for Parent and Variant Devices

Test Items	SM-L335U (Parent Model)	SM-L330 (Variant Model)
FCC Part 15C/E (radiated/conducted test)	Full Test	Spot-check the worst-case configuration based on Reference Model for conducted output power, band edge and radiated spurious for each radio technologies.
FCC Part 15E DFS	Full Test	Full test
Part 22, 24, 27, 90 (WCDMA, LTE)	Full Test	N/A
Part 15 B - Receiver	Full Test	N/A
Part 15 B – Digital Device	Full Test	Full Test

Data Referencing Test Plan by Equipment Class

Mode	Equipment Class	Data referencing	Comments
Digital Device	JAB	No	Full Test
Receiver mode	CXX	No	Not supported
WWAN	PCB	No	
	CBE	No	
2.4 GHz Wi-Fi	DTS	**Yes**	Spot-check
Bluetooth LE	DTS	**Yes**	Spot-check
Bluetooth	DSS	**Yes**	Spot-check
5 GHz Wi-Fi	NII	**Yes**	Spot-check

The only data referencing being requested is for the WLAN DTS, NII and Bluetooth DSS equipment codes. For these air interfaces, the circuitry is identical in both the parent and variant models.

We are performing RF exposure measurements in full and therefore there will be no data referencing for RF exposure measurements. Your concerns about RF exposure tests for simultaneous transmissions are noted but we address this by fully testing RF exposure for all air interfaces.

Spot-check test plan(Test Items)

Note. Radiated measurements shall be performed in full on the worst-case operating modes in the band, or bands, where the radiated spot-check tests show deviation from the reference model that does not meet the acceptance criteria. As output power tables and rf circuitry are identical between reference and variant any conducted test data from the reference mode, where applicable, will be used for the variant model.

2.4 GHz Wi-Fi & Bluetooth LE

Rule Part	Test item	Data referencing	Comments
15.247(b)	Tx conducted output power	Y	Worst case Spot-check. Power check with tune-up.
15.205 15.209 15.247	Restricted Bands	Y	Worst case (Lowest margin), variant data within acceptance criteria
	Spurious	Y	

Bluetooth

Rule Part	Test item	Data referencing	Comments
15.247	Tx conducted output power	Y	Worst case Spot-check. Power check with tune-up.
15.205 15.209 15.247	Restricted Bands	Y	Worst case (Lowest margin), variant data within acceptance criteria
	Spurious	Y	

5 GHz Wi-Fi

Rule Part	Test item	Data referencing	Comments
15.407(a)	Tx conducted output power	Y	Worst case Spot-check. Power check with tune-up.
15205 15.209 15.407(b)	Restricted Bands	Y	Worst case (Lowest margin), variant data within acceptance criteria
	Spurious	Y	
15.407(h)	DFS	N	Full test for channel close and move time

Spot-Check Methodology and Acceptance Criteria:

1. RF spot-check justification based on worst-case configuration per KDB 484596 D01 Referencing Test Data v03 Section 3.2

- Spot-check measurements shall be made in correspondence to the worst-case scenario reported in the reference device filing, i.e., for those conditions that are the closest to non-compliance.

- 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, according to:

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

2. The conducted powers of the variant model will be spot checked to be within the tune-up tolerance.