

Test Data Referencing

Justification of Test Data Referencing, for EMC/RF

- Parent model: FCC ID: YZZGWN7672
- Variant model: FCC ID: YZZGWN7672L

- 1. Product Overview**
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1. Product Overview

Radio	FCC Rule Part	YZZGWN7672	FCC ID: YZZGWN7672L
Wi-Fi, 2.4, 5,6GHz	Part 15	Supported	Supported
BLE	Part 15	Supported	No Supported

2. Comparison – Summary

2.1 Identical

FCC ID : YZZGWN7672, FCC ID : YZZGWN7672L are identical in the followings:

- The device form factor, the size of display area and the housing material is identical
- Enclosure and material
- PCB Layout

2.2 Difference:

FCC ID : YZZGWN7672L (Variant model) is different from FCC ID : YZZGWN7672 (Parent model), in the followings:

- the difference on changed the Network port and removed BT Components.

2.3. Comparison Chart

FCC ID: YZZGWN7672 (Parent Model)	FCC ID: YZZGWN7672L (Variant Model)
	

4. Test Strategy

- FCC ID YZZGWN7672: parent model, full test for EMC/RF
- FCC ID YZZGWN7672L: variant model, data referencing from the reference model for RF

■ Full test for different parts: EMC

■ Identical design parts: Spot check the worst cases in FCC ID YZZGWN7672

➤ EMC/RF spot check justification:
Reference KDB484596 D01 Referencing Test Data v03

a) EMC Test Data Spot-Checks

These exhibits for the variant certification shall meet the following criteria:

- Spot-check measurements must correspond to the worst-case scenario reported in the parent device filing, i.e., for conditions closest to non-compliance.
- Spot-check measurements must always show compliance with the rule part(s) applicable to the test under consideration.
- Spot-check measurements may show deviations from the reference data, as specified in sub-sections 3.2.1 and 3.2.2. These specifications differ between EMC data and RF exposure test data.

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:

$$d_{dB} = |V_{dB} - R_{dB}| \quad (1) ,$$

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:

$$d_{dB} \leq d_{dBmax} \quad (2) ,$$

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

$$M_{dB} = |C_{dB} - R_{dB}| \quad (3) ,$$

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

$$d_{dBmax}(M_{dB}) = \begin{cases} (3 + M_{dB} / 20) \text{ dB} & , \text{ for } 0 \leq M_{dB} \leq 60 \text{ dB} \\ 6 \text{ dB} & , \text{ for } M_{dB} > 60 \text{ dB} \end{cases} \quad (4) .$$

b) The Spot-Check Plan for RF Exposure Test Data

By expressing all the quantities in linear units, an RF exposure spot-check must be accepted based on the maximum relative difference between the variant and the parent model test results.

The spot-check acceptance criterion is formulated in terms of the total exposure ratio (TER) to easily include RF exposure evaluations based on MPE and evaluations for simultaneous transmissions, (that may include a mix of MPE and SAR evaluations but not for incident power density related to frequencies above 6 GHz).

Accordingly, proceeding in a similar way to the previous section but operating in linear units, the relative difference (expressed as a percentage) between the TER of the variant (TER_V) and that of the parent model used as a reference (TER_R) is defined as

$$d_{TER} = | TER_V - TER_R | / TER_R \quad (5) ,$$

and the acceptance criterion for the spot-check on the variant will be:

$$d_{TER} \leq d_{TERmax} \quad (6) ,$$

where d_{TERmax} , to be defined further below, is the maximum acceptable d_{TER} , and all the quantities are expressed in linear units.

It is also important to note that if the MPE is considered to refer to a field quantity and not power, the corresponding TER is to be computed as the square of the field ratio, consistent with the other terms that refer to power levels.

The value of d_{TERmax} , the maximum d_{TER} allowed for the spot-check to be deemed acceptable, is established based on the compliance margin M corresponding to the worst-case test scenario (i.e., the most challenging from the compliance perspective) for the parent model.

The margin M is defined as

$$M = TER_T - TER_R = 1 - TER_R \quad (7) ,$$

where TER_T is the TER corresponding to the compliance threshold, which is always $TER_T = 1$.

For instance, for a general population evaluation, $SAR \leq 1.6$ W/kg, as required for any compliant measurement. Thus, since $TER = SAR/1.6$, and $0 \leq TER \leq 1$, then M in eq. (7) will always be a positive number because TER_R cannot be larger than 1 for the parent model to be compliant.

The threshold d_{TERmax} is defined as function of the margin M to provide values between 25% and 50%, linearly increasing between $M = 0.5$ (50% of the compliance limit) and $M = 0.75$ (75% of the compliance limit), in accordance with the following expression:

$$d_{TERmax}(M) = \begin{cases} 0.25 & , \text{ for } 0 \leq M < 0.5 \\ M - 0.25 & , \text{ for } 0.5 \leq M < 0.75 \\ 0.5 & , \text{ for } 0.75 \leq M \end{cases} \quad (8) .$$

- Compliance is determined by both the spot check data and the referenced test data.
- Test strategy is tabulated in next page

Band	Rule Part	Test item	Parent model FCC ID YZZGWN7672		Variant model FCC ID YZZGWN7672L	
			Data	Reference Report No.	Data Referencing	Remark
2.4G WIFI	15.207	AC Power Line Conducted Emission	Full Test	SZCR250200054403	Y	reuse patrent data
	15.247 (b)(3)	Conducted Output Power	Full Test		Y	Check Worse
	15.247 (a)(2)	DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	Full Test		Y	Check Worse
	15.247 (e)	Power Spectral Density	Full Test		Y	Check Worse
	15.247(d)	Band-edge for RF Conducted Emissions	Full Test		Y	Check Worse
	15.247(d)	RF Conducted Spurious Emissions	Full Test		Y	Check Worse
	15.205/15.209	Radiated Spurious Emissions	Full Test		Y	Check Worse
	15.205/15.209	Restricted bands around fundamental frequency (Radiated Emission)	Full Test		Y	Check Worse
5G WIFI	Band I: 15.407(a)(1) Band II-A: 15.407(a)(2) Band II-C: 15.407(a)(2) Band III: 15.407(e)	26dB Emission Bandwidth 26dB Emission Bandwidth 26dB Emission Bandwidth 6dB Emission Bandwidth	Full Test	SZCR250200054404	Y	Check Worse
	Band I&Band II-A&Band II-C &Band III: KDB 789033 D02§ D	99% Occupied Bandwidth	Full Test		Y	Check Worse
	Band I: 15.407(a)(iv) Band II-A: 15.407(a)(2) Band II-C: 15.407(a)(2) Band III: 15.407(a)(3)	Maximum Conducted Output Power	Full Test		Y	Check Worse
	Band I: 15.407(a)(iv) Band II-A: 15.407(a)(2) Band II-C: 15.407(a)(2) Band III: 15.407(a)(3)	Maximum Power Spectral Density	Full Test		Y	Check Worse
	Band I&Band II-A&Band II-C &Band III: 15.407(b) 15.205/15.209	Radiated Spurious Emissions	Full Test		Y	Check Worse
	Band I&Band II-A&Band II-C &Band III: 15.407(b) 15.205/15.209	Restricted bands around fundamental frequency	Full Test		Y	Check Worse
	Band I&Band II-A&Band II-C &Band III: 15.207	AC Power Line Conducted Emissions	Full Test		Y	reuse patrent data
	Band II-A &Band II-C: 15.407	Dynamic Frequency Selection	Full Test	SZCR250200054405	Y	reuse patrent data
	Band I&Band II-A&Band II-C &Band III: 15.407(g)	Frequency Stability	Full Test		Y	Check Worse
EMI	Part 15B (SDOC)	AC Conducted Emission	Full Test		N	Full Test
		Radiated Emission	Full Test		N	Full Test
MPE	2.1091	RF Exposure Evaluation	Full Test		Y	reuse patrent data

6G WIFI	Band 5: 15.207 Band 6: 15.207 Band 7: 15.207 Band 8: 15.207	Conducted Emissions at AC Power Line	Full Test	SZCR250200054406	Y	reuse patrent data
	Band 5: 15.407(a) Band 6: 15.407(a) Band 7: 15.407(a) Band 8: 15.407(a)	Maximum Conducted Output Power	Full Test		Y	Check Worse
	Band 5&Band 6&Band 7&Band 8 15.407(b) 15.205/15.209	Radiated Spurious Emissions	Full Test		Y	Check Worse
	Band 5&Band 6&Band 7&Band 8: 15.407(b) 15.205/15.209	Radiated Emissions which fall in the restricted bands	Full Test		Y	Check Worse
	Band 5&Band 6&Band 7&Band 8: 15.407(b)	In-Band Emissions	Full Test		Y	Check Worse
	Band 5&Band 6&Band 7&Band 8: 15.407(d) (6)	Contention-based Protocol	Full Test		Y	reuse patrent data
	Band 5&Band 6&Band 7&Band 8: 15.407(d) (6)	99% Occupied Bandwidth	Full Test		Y	Check Worse
	Band5&Band6&Band7&Band 8: 15.407(a)	26dB Emission bandwidth	Full Test		Y	Check Worse
	Band5&Band6&Band7 &Band 8: 15.407(a)	Peak Power spectrum density	Full Test		Y	Check Worse
	Band5&Band6&Band7&B and 8: 15.407(a)	Frequency Stability	Full Test		Y	Check Worse