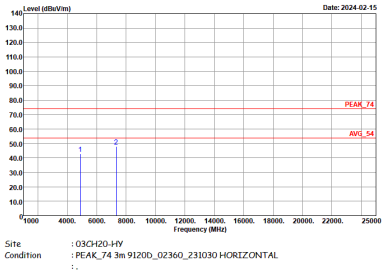
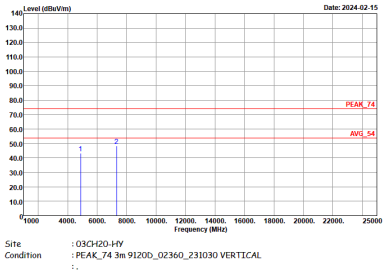
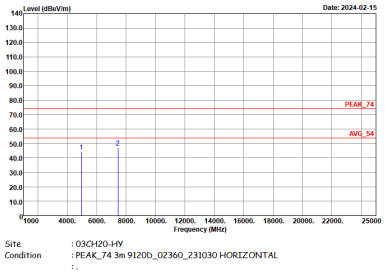
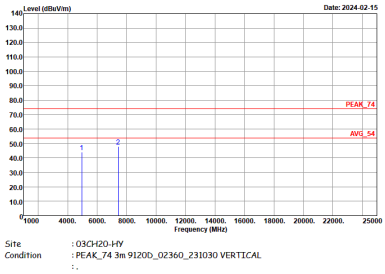
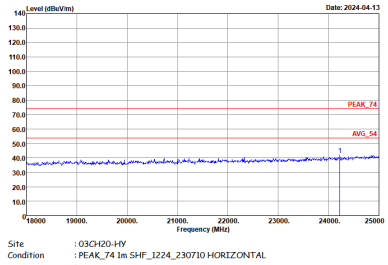
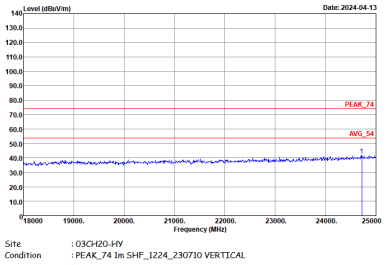
BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH39 2441MHz	
7	Horizontal	Vertical
Peak Avg.		

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH78 2480MHz	
7	Horizontal	Vertical
Peak Avg.		

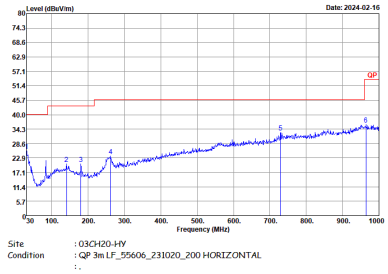
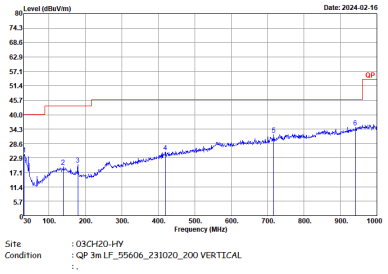
Emission above 18GHz

2.4GHz BT (SHF @ 1m)

BT	2.4GHz 2400~2483.5MHz	
ANT	BT SHF	
7	Horizontal	Vertical
Peak Avg.		

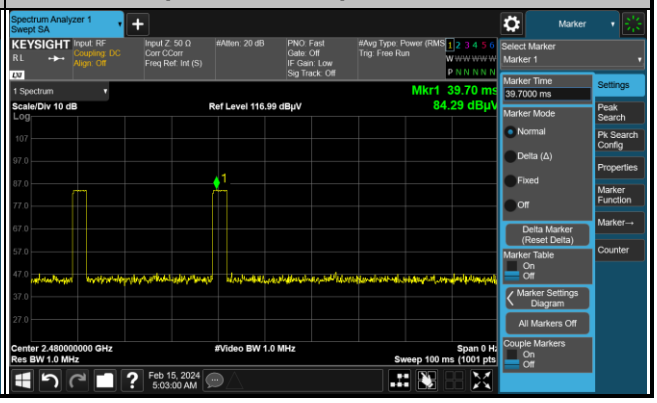
Emission below 1GHz

2.4GHz BT (LF)

BT	2.4GHz 2400~2483.5MHz	
ANT	BT LF	
7	Horizontal	Vertical
QP / Peak		

Appendix E. Duty Cycle Plots

<Ant. 6>

3DH5 on time (One Pulse) Plot on Channel 78	on time (Count Pulses) Plot on Channel 39
	

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. 3DH5 has the highest duty cycle worst case and is reported.

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the on time period to have DH5 packet completing one hopping sequence is

2.88 ms x 20 channels = 57.6 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100 ms / 57.6 ms] = 2 hops

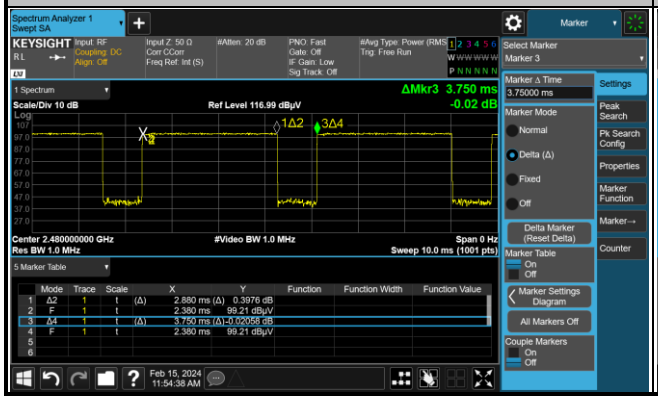
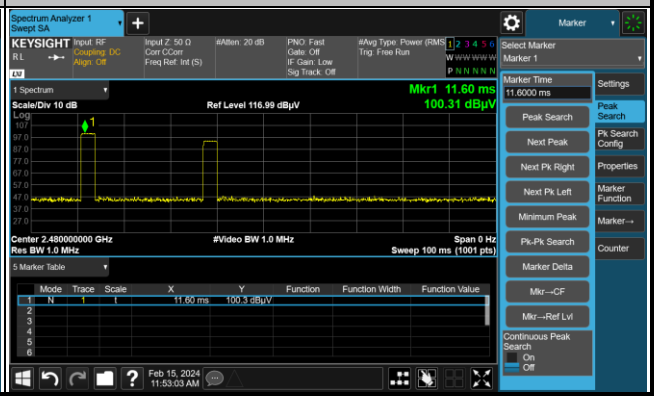
Thus, the maximum possible ON time:

2.88 ms x 2 = 5.76 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.76 ms/100 ms) = -24.79 dB

<Ant. 7>

3DH5 on time (One Pulse) Plot on Channel 78	on time (Count Pulses) Plot on Channel 39
	

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. 3DH5 has the highest duty cycle worst case and is reported.

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the on time period to have DH5 packet completing one hopping sequence is

2.88 ms x 20 channels = 57.6 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100 ms / 57.6 ms] = 2 hops

Thus, the maximum possible ON time:

2.88 ms x 2 = 5.76 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.76 ms/100 ms) = -24.79 dB

Appendix G. Spot Check Evaluation on TC58BE

Conducted power test and radiated spurious emission test configurations were selected from the worst cases identified in the reference model and tested to demonstrate the test data from reference model remains representative for the variant model.

The deviation between the spot check and the referenced values is within 3dB, therefore data referencing is justified according to the guidance in the ECR inquiry

Mode	Test Item	UZ7TC58AE Reference Worst mode Test Result	UZ7TC58BE Variant Check Test Result	Deviation	Limit (dB)
BT	Number of Channels	79	79	0	Within the authorized block
	Hopping Channel Separation	1.007	1.303	0.296	Within the authorized block
	Dwell Time of Each Channel	0.31	0.31	0	Within the authorized block
	20dB Bandwidth	0.872	0.87	0.002	Within the authorized frequency block
	99% Bandwidth	0.803	0.798	0.005	Within the authorized frequency block
	Conducted Band Edges	-43.53	-45.87	2.34	Deviation (ddB) < 3 dB
	Conducted Spurious Emission	-36.86	-38.91	2.05	Deviation (ddB) < 3 dB
	Peak Output Power	7.18	6.7	0.48	Deviation (ddB) < 3 dB
	Radiated Band Edges and Radiated Spurious Emission	48.41	47.65	0.76	Deviation (ddB) < 3 dB
	AC Conducted Emission	17.48	19.72	2.24	Deviation (ddB) < 3 dB
BLE	6dB Bandwidth	1.142	1.155	0.013	Within the authorized frequency block
	99% Bandwidth	1.998	1.996	0.002	Within the authorized frequency block
	Power Spectral Density	5.44	6.07	0.63	Deviation (ddB) < 3 dB
	Conducted Band Edges	-43.68	-46.24	2.56	Deviation (ddB) < 3 dB
	Conducted Spurious Emission	-41.5	-38.88	2.62	Deviation (ddB) < 3 dB
	Peak Output Power	6.3	5.9	0.4	Deviation (ddB) < 3 dB
	Radiated Band Edges and Spurious Emission	50.56	50.49	0.07	Deviation (ddB) < 3 dB
	AC Conducted Emission	17.48	19.72	2.24	Deviation (ddB) < 3 dB
WIFI 2.4G	6dB Bandwidth	9.03	8.54	0.47	Within the authorized frequency block
	99% Bandwidth	13.59	13.52	0.07	Within the authorized frequency block
	Power Spectral Density	1.78	1.06	0.72	Deviation (ddB) < 3 dB
	Conducted Band Edges	-30.53	-30.89	0.36	Deviation (ddB) < 3 dB
	Conducted Spurious Emission	-46.39	-48.89	2.50	Deviation (ddB) < 3 dB
	Peak Output Power	23.41	23.31	0.1	Deviation (ddB) < 3 dB
	Radiated Band Edges and Spurious Emission	59.99	59.85	0.14	Deviation (ddB) < 3 dB
	AC Conducted Emission	17.48	19.72	2.24	Deviation (ddB) < 3 dB

Mode	Test Item	UZ7TC58AE Reference Worst mode Test Result	UZ7TC58BE Variant Check Test Result	Deviation	Limit (dB)
WIFI 5G	26dB Bandwidth	167.75	165.22	2.53	Within the authorized frequency block
	99% Bandwidth	154.89	155.47	0.58	Within the authorized frequency block
	Power Spectral Density	-2.9	-1.17	1.73	Deviation (ddB) < 3 dB
	Conducted Output Power	17.81	17.71	0.1	Deviation (ddB) < 3 dB
	Unwanted Emissions	63.2	64.81	1.61	Deviation (ddB) < 3 dB
	AC Conducted Emission	18.52	19.96	1.44	Deviation (ddB) < 3 dB
WIFI 6G UNII-8 (802.11ax HE20 CH189 6895MHz)	26dB Emission Bandwidth	20.75	21.14	0.39	Within the authorized frequency block
	99% Occupied Bandwidth	18.88	18.92	0.04	Within the authorized frequency block
	Conducted Output Power	7.66	7.56	0.1	Deviation (ddB) < 3 dB
	Fundamental Maximum EIRP	9.8	9.7	0.1	Deviation (ddB) < 3 dB
	Fundamental Power Spectral Density	-1.04	-1.41	0.37	Deviation (ddB) < 3 dB
	In-Band Emissions	-10.04	-12.35	2.31	Deviation (ddB) < 3 dB
WIFI 6G UNII-8 (802.11ax HE80 CH215 7025MHz)	Unwanted Emissions	72.37	72.28	0.09	Deviation (ddB) < 3 dB
WIFI 6G	AC Conducted Emission	18.52	19.96	1.44	Deviation (ddB) < 3 dB

List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 07, 2023	Apr. 22, 2024	Nov. 06, 2024	Conducted (TH05-HY)
Power Meter	Anritsu	ML2495A	1036004	N/A	Jul. 27, 2023	Apr. 22, 2024	Jul. 26, 2024	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV3044	101466	10HZ~44GHZ	Jan. 24, 2024	Apr. 22, 2024	Jan. 23, 2025	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Feb. 08, 2024	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Dec. 06, 2023	Feb. 08, 2024	Dec. 05, 2024	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Oct. 26, 2023	Feb. 08, 2024	Oct. 25, 2024	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 22, 2023	Feb. 08, 2024	Nov. 21, 2024	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32	N/A	N/A	N/A	Feb. 08, 2024	N/A	Conduction (CO05-HY)
ISN Cable	MVE	RG-400	200260	N/A	Dec. 28, 2023	Feb. 08, 2024	Dec. 27, 2024	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	00691	9kHz-200MHz	Jul. 28, 2023	Feb. 08, 2024	Jul. 27, 2024	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 28, 2023	Feb. 08, 2024	Dec. 27, 2024	Conduction (CO05-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	N/A	Oct. 06, 2023	Apr. 26, 2024~ Apr. 27, 2024	Oct. 05, 2024	Radiation (03CH20-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 27, 2023	Apr. 26, 2024~ Apr. 27, 2024	Jun. 26, 2024	Radiation (03CH20-HY)
Controller	ChainTek	3000-1	N/A	Control Turn table & Ant Mast	N/A	Apr. 26, 2024~ Apr. 27, 2024	N/A	Radiation (03CH20-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Apr. 26, 2024~ Apr. 27, 2024	N/A	Radiation (03CH20-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Apr. 26, 2024~ Apr. 27, 2024	N/A	Radiation (03CH20-HY)
Signal Analyzer	Keysight	N9010B	MY60240520	N/A	Dec. 12, 2023	Apr. 26, 2024~ Apr. 27, 2024	Dec. 11, 2024	Radiation (03CH20-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	02360	1GHz-18GHz	Oct. 30, 2023	Apr. 26, 2024~ Apr. 27, 2024	Oct. 29, 2024	Radiation (03CH20-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	1224	18GHz-40GHz	Jul. 10, 2023	Apr. 26, 2024~ Apr. 27, 2024	Jul. 09, 2024	Radiation (03CH20-HY)
Preamplifier	COM-POWER	PAM-103	18020201	1MHz-1000MHz	Jan. 01, 2024	Apr. 26, 2024~ Apr. 27, 2024	Dec. 31, 2024	Radiation (03CH20-HY)
Amplifier	EMCI	EMC118A45SE	980792	N/A	Nov. 13, 2023	Apr. 26, 2024~ Apr. 27, 2024	Nov. 12, 2024	Radiation (03CH20-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	519229/2,804015/2,804027/2	N/A	Jan. 17, 2024	Apr. 26, 2024~ Apr. 27, 2024	Jan. 16, 2025	Radiation (03CH20-HY)
Hygrometer	TECPEL	DTM-303A	TP211382	N/A	Mar. 27, 2024	Apr. 26, 2024~ Apr. 27, 2024	Mar. 26, 2025	Radiation (03CH20-HY)
Software	Audix	N/A	RK-002156	N/A	N/A	Apr. 26, 2024~ Apr. 27, 2024	N/A	Radiation (03CH20-HY)

———THE END———