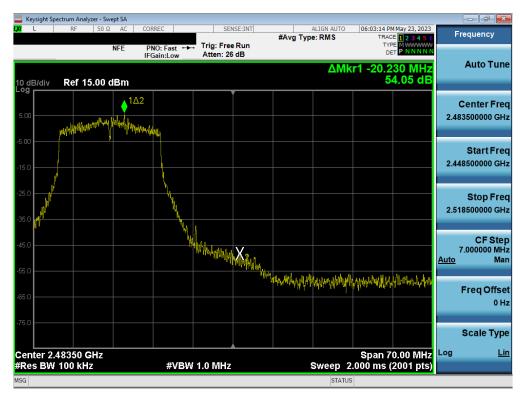




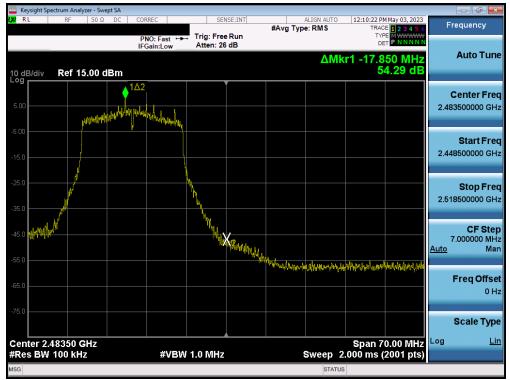
Plot 7-103. Band Edge Plot MIMO ANT2 (802.11ac (2.4GHz) - Ch. 1)



Plot 7-104. Band Edge Plot MIMO ANT2 (802.11ac (2.4GHz) - Ch. 11)

FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	De 10 70 -(440
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 78 of 119
© 2023 ELEMENT	•	·	V9.0 02/01/2019





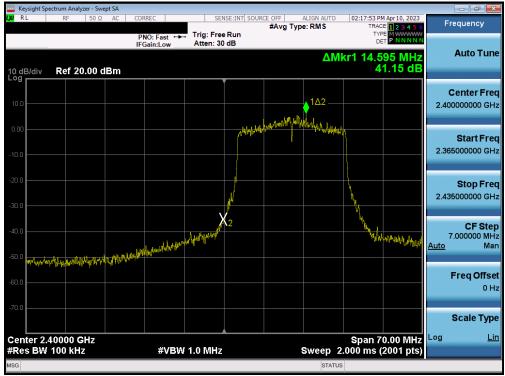
Plot 7-105. Band Edge Plot MIMO ANT2 (802.11ac (2.4GHz) - Ch. 12)



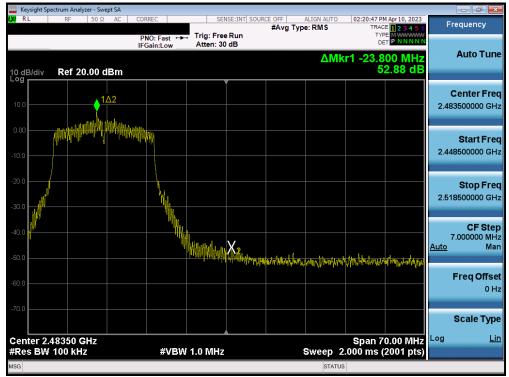
Plot 7-106. Band Edge Plot MIMO ANT2 (802.11ac (2.4GHz) - Ch. 13)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 70 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 79 of 119
© 2023 ELEMENT			V9.0 02/01/2019





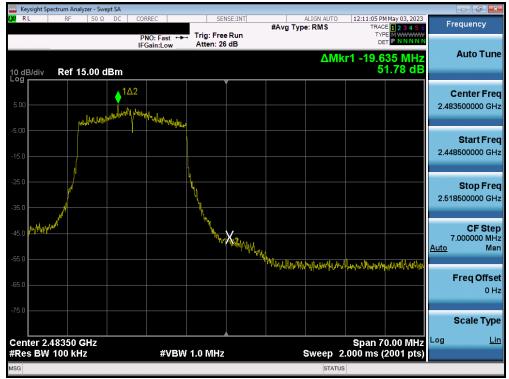




Plot 7-108. Band Edge Plot MIMO ANT2 (802.11ax (2.4GHz) - Ch. 11)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 80 of 119
© 2023 ELEMENT	•		V9.0 02/01/2019





Plot 7-109. Band Edge Plot MIMO ANT2 (802.11ax (2.4GHz) - Ch. 12)



Plot 7-110. Band Edge Plot MIMO ANT2 (802.11ax (2.4GHz) - Ch. 13)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 01 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 81 of 119
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7.6 Conducted Spurious Emissions §15.247(d); RSS-247 [5.5]

Test Overview and Limit

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. For the following out of band conducted spurious emissions plots, the EUT was investigated in all available data rates for "b", "g", "n", "ax" modes. The worst case spurious emissions for the 2.4GHz band were found while transmitting in "b" mode at 1 Mbps and are shown in the plots below.

The limit for out-of-band spurious emissions at the band edge is 30dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the procedure in Section 11.1 of ANSI C63.10-2013 and KDB 558074 D01 v05r02.

Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3 KDB 558074 D01 v05r02 – Section 8.5 ANSI C63.10-2013 – Section 14.3.3 KDB 662911 D01 v02r01 – Section E)3)b)

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 25GHz (separated into two plots per channel)
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-5. Test Instrument & Measurement Setup

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 82 of 119
© 2023 ELEMENT	•		V9.0 02/01/2019



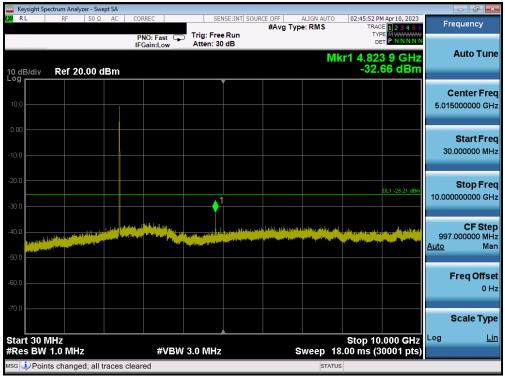
Test Notes

- 1. RBW was set to 1MHz rather than 100kHz in order to increase the measurement speed.
- 2. The display line shown in the following plots denotes the limit at 30dB below the fundamental emission level measured in a 100kHz bandwidth. However, since the traces in the following plots are measured with a 1MHz RBW, the display line may not necessarily appear to be 30dB below the level of the fundamental in a 1MHz bandwidth.
- 3. For plots showing conducted spurious emissions near the limit, the frequencies were investigated with a reduced RBW to ensure that no emissions were present.
- 4. The conducted spurious emissions were measured to relative limits. Therefore, in accordance with ANSI C63.10-2013 and KDB 662911 D01 v02r01 Section E)3)b), it was unnecessary to show compliance through the summation of test results of the individual outputs.

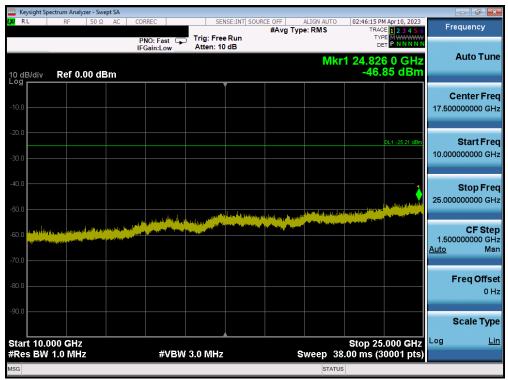
FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 92 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 83 of 119
© 2023 ELEMENT			V9.0 02/01/2019



SISO Antenna-2 Conducted Spurious Emission



Plot 7-111. Conducted Spurious Plot SISO ANT2 (802.11b - Ch. 1)



Plot 7-112. Conducted Spurious Plot SISO ANT2 (802.11b - Ch. 1)

FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dama 04 af 440
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 84 of 119
© 2023 ELEMENT			\/9.0.02/01/2019



Keysight Spectrum Analyzer - Swe					
LX/ RL RF 50 Ω	AC CORREC	SENSE:INT S	OURCE OFF ALIGN AUTO #Avg Type: RMS	02:47:21 PM Apr 10, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 d	PNO: Fas IFGain:Lo IBM	t 🕞 Trig: Free Run w Atten: 30 dB	M	Ikr1 4.873 8 GHz -33.91 dBm	Auto Tune
10.0					Center Freq 5.015000000 GHz
-10.0					Start Freq 30.000000 MHz
-20.0		1		DL1 -24.34 dBm	Stop Freq 10.000000000 GHz
-40.0 In Add In Internet in Addition of the Internet in Ad	a di a di situ di alta a di di ta di fara di situ a di situ di situ di situ a di situ di situ di situ di situ Tanggana di situ			ti e dan nya tanya mana ala ayaa maani kasil Tana da ya ayaa na ayaa ayaa ayaa da ayaa da ahaa ahaa ay	CF Step 997.000000 MHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
-70.0 Start 30 MHz				3100 10.000 3112	Scale Type
#Res BW 1.0 MHz		/BW 3.0 MHz	-	8.00 ms (30001 pts)	
MSG 🗼 Points changed; all t	races cleared		STAT	US	

Plot 7-113. Conducted Spurious Plot SISO ANT2 (802.11b - Ch. 6)



Plot 7-114. Conducted Spurious Plot SISO ANT2 (802.11b - Ch. 6)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 85 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 85 of 119
© 2023 ELEMENT	·		V9.0 02/01/2019



	ctrum Analyzer - Sw										J X
LXI RL	RF 50 Ω	2 AC C	ORREC	SEN	ISE:INT SOUR	CE OFF #Avg Typ	ALIGN AUTO e: RMS		M Apr 10, 2023	Frequence	су
10 dB/div	Ref 20.00		PNO: Fast ⊆ FGain:Low	Trig: Free Atten: 30			MI	cr1 4.92	4 3 GHz 05 dBm	Auto	Tune
10.0										Center 5.01500000	
-10.0										Start 30.00000	t Freq 10 MHz
-20.0					1				DL1 -23.86 dBm	Stop 10.00000000	Freq 00 GHz
-40.0 John Joseph J	a lan la suite anna an taraigh anna an taraigh anna an taraigh an taraigh anna an taraigh anna an taraigh an tar			a magana lagi sa walay sa k	and the second	n a frankriger ^f rankriger frankriger Frankriger frankriger frankriger	destruction destruction and the state of the	n <mark>pa kappati kapi kapa</mark> Indika panakan	, da _{gan} ata antika gan ₁ da _{na a} ntika antika at	CF 997.00000 <u>Auto</u>	Step 0 MHz Man
-60.0										Freq C	Offset 0 Hz
-70.0 Start 30 N								Stop 10	.000 01121	Scale	Type Lin
#Res BW		Ann ann al an		3.0 MHz		S			0001 pts)		
MSG Point	s changed; all	traces clea	ared				STATU	5			

Plot 7-115. Conducted Spurious Plot SISO ANT2 (802.11b - Ch. 11)

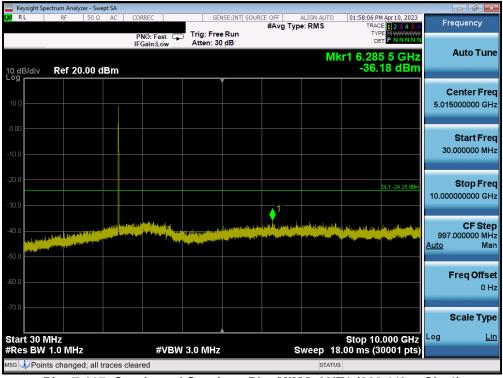


Plot 7-116. Conducted Spurious Plot SISO ANT2 (802.11b - Ch. 11)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 86 of 119
© 2023 ELEMENT	•	•	V9.0 02/01/2019



MIMO Antenna-1 Conducted Spurious Emission



Plot 7-117. Conducted Spurious Plot MIMO ANT1 (802.11b - Ch. 1)



Plot 7-118. Conducted Spurious Plot MIMO ANT1 (802.11b - Ch. 1)

FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dama 07 at 140
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 87 of 119
© 2023 ELEMENT			\/9.0.02/01/2019



🔤 Keysight Spectrum Analyzer - Swept SA 👘				
KL RF 50Ω AC		SE:INT SOURCE OFF ALIGN AUTO #Avg Type: RMS	01:59:56 PM Apr 10, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 dBm	PNO: Fast Trig: Free IFGain:Low Atten: 30	dB	түре Милини Det Римини сг1 3.164 6 GHz -33.84 dBm	Auto Tune
10.0				Center Freq 5.015000000 GHz
-10.0				Start Freq 30.000000 MHz
-20.0			DL1 -25.74 dBm	Stop Freq 10.000000000 GHz
-40.0 -50.0		n an than an an Inne the Anne Internet the active Anti-Anne Property of the Anne Property and Anne Property and Anne Property and Anne Property of the Anne Property of the Anne P	ly posted and an international state of the same of The same of the	CF Step 997.000000 MHz <u>Auto</u> Man
-60.0				Freq Offset 0 Hz
-70.0 Start 30 MHz			3100 10.000 GHZ	Scale Type
#Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 18	3.00 ms (30001 pts)	

Plot 7-119. Conducted Spurious Plot MIMO ANT1 (802.11b - Ch. 6)



Plot 7-120. Conducted Spurious Plot MIMO ANT1 (802.11b - Ch. 6)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 99 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 88 of 119
© 2023 ELEMENT	·		V9.0 02/01/2019



Keysight Spectrum Analyzer - Swept SA					
LX/ RL RF 50Ω AC	C CORREC	SENSE:INT SOUR	CE OFF ALIGN AUTO #Avg Type: RMS	02:02:23 PM Apr 10, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 dBn	PNO: Fast FGain:Low	Trig: Free Run Atten: 30 dB	MI	kr1 3.162 2 GHz -36.01 dBm	Auto Tune
10.0					Center Freq 5.015000000 GHz
-10.0					Start Freq 30.000000 MHz
-20.0	1			DL1 -24.89 dBm	Stop Freq 10.000000000 GHz
-40.0		er (119 - Song (110 - ganz (119 - Ganz (11	na an Anna an Airthe Anna an Anna an Airthe Anna Anna Anna Anna Anna an Anna an Anna an Airthe Anna Anna Anna Anna Anna Anna Anna Ann		CF Step 997.000000 MHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
-70.0 Start 30 MHz				3100 10.000 3112	Scale Type
#Res BW 1.0 MHz		3.0 MHz		8.00 ms (30001 pts)	
MSG Points changed; all trace	es cleared		STATU	S	

Plot 7-121. Conducted Spurious Plot MIMO ANT1 (802.11b - Ch. 11)



Plot 7-122. Conducted Spurious Plot MIMO ANT1 (802.11b - Ch. 11)

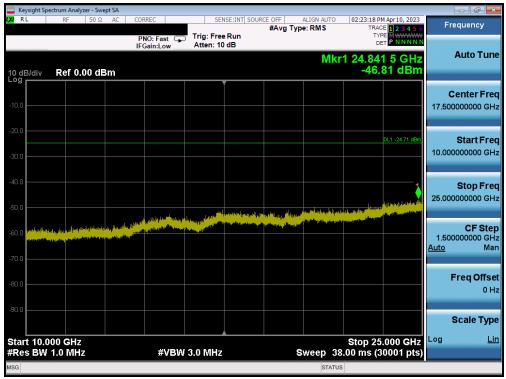
FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Baga 90 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 89 of 119
© 2023 ELEMENT			V9.0 02/01/2019



Keysight Spectrum Analyzer - Swept SA 02:22:57 PM Apr 10, 2023 ALI #Avg Type: RMS Frequency TRACE 1 2 3 4 Trig: Free Run PNO: Fast 🖵 IFGai Atten: 30 dB Auto Tune Mkr1 4.823 9 GHz -33.59 dBm Ref 20.00 dBm 10 dB/div Log Center Frea 5.015000000 GHz Start Freq 30.000000 MHz Stop Freq 10.00000000 GHz CF Step 997.000000 MHz Man <u>Auto</u> **Freq Offset** 0 Hz Scale Type Start 30 MHz #Res BW 1.0 MHz Stop 10.000 GHz Sweep 18.00 ms (30001 pts) Log Lin #VBW 3.0 MHz Points changed; all traces cleared

MIMO Antenna-2 Conducted Spurious Emissions





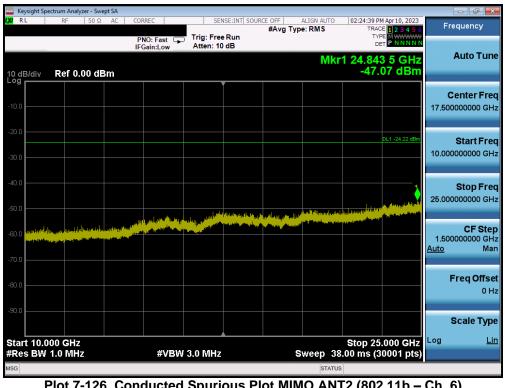
Plot 7-124. Conducted Spurious Plot MIMO ANT2 (802.11b - Ch. 1)

FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	D
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 90 of 119
© 2023 ELEMENT	•		V9.0 02/01/2019



Keysight Spectrum Analyzer - Swe					- 5 🔀
LX RL RF 50 Ω	AC CORREC	SENSE:INT SOU	RCE OFF ALIGN AUTO #Avg Type: RMS	02:24:18 PM Apr 10, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 c	PNO: Fast IFGain:Low	Trig: Free Run Atten: 30 dB	M	kr1 4.874 1 GHz -34.31 dBm	Auto Tune
10.0					Center Freq 5.015000000 GHz
-10.0					Start Freq 30.000000 MHz
-20.0		1		DL1 -24.22 dBm	Stop Freq 10.000000000 GHz
-40.0	an an Ing Tan Bilangan Badalan Jabaran. Manang Kanang		a tel alla di terra de la construcción de parte da parte Construcción de parte de la construcción de parte de parte Construcción de parte de la construcción de parte		CF Step 997.000000 MHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
-70.0 Start 30 MHz				Stop 10.000 GHZ	Scale Type
#Res BW 1.0 MHz		3W 3.0 MHz	Sweep 1	8.00 ms (30001 pts)	
r onto changed, an	uaces ciedieu		SIAIO		

Plot 7-125. Conducted Spurious Plot MIMO ANT2 (802.11b - Ch. 6)



Plot 7-126. Conducted Spurious Plot MIMO ANT2 (802.11b - Ch. 6)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 01 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 91 of 119
© 2023 ELEMENT	•	· · · · · · · · · · · · · · · · · · ·	V9.0 02/01/2019



Keysight Spectrum Analyzer - Swe					- 6 -
LX RL RF 50 Ω	AC CORREC	SENSE:INT SOUR	#Avg Type: RMS	02:25:59 PM Apr 10, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 d	PNO: Fast 🕞 IFGain:Low) Trig: Free Run Atten: 30 dB	Mk	r1 4.923 6 GHz -36.50 dBm	Auto Tune
10.0					Center Freq 5.015000000 GHz
-10.0					Start Freq 30.000000 MHz
-30.0				DL1 -24.16 dBm	Stop Freq 10.00000000 GHz
-40.0			a a bha an an an an an Sandh an tha an Dahanny da far Ngana Ngana Panana Mga ta ta an an angala ta a	y of a part of a fight of part of the part of the offer of the part of the par	CF Step 997.000000 MHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
-70.0 Start 30 MHz				3100 10.000 3112	Scale Type
#Res BW 1.0 MHz		3.0 MHz	-	.00 ms (30001 pts)	
MSG iPoints changed; all t	races cleared		STATUS		

Plot 7-127. Conducted Spurious Plot MIMO ANT2 (802.11b - Ch. 11)



Plot 7-128. Conducted Spurious Plot MIMO ANT2 (802.11b - Ch. 11)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 02 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 92 of 119
© 2023 ELEMENT			V9.0 02/01/2019



7.7 Radiated Spurious Emission Measurements – Above 1 GHz §15.247(d) §15.205 & §15.209; RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-13 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [μV/m]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 7-13. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Section 6.6.4.3 KDB 558074 D01 v05r02 – Sections 8.6, 8.7

Test Settings

Average Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = power average (RMS)
- 5. Number of measurement points = 1001 (Number of points must be $\geq 2 \times \text{span/RBW}$)
- 6. Sweep time = auto
- 7. Trace (RMS) averaging was performed over at least 100 traces

Peak Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dage 02 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 93 of 119
© 2023 ELEMENT			V9.0 02/01/2019



Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

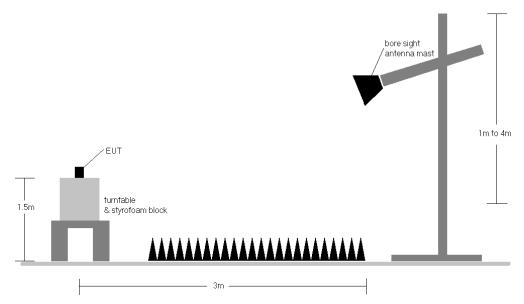


Figure 7-6. Test Instrument & Measurement Setup

Test Notes

- The optional test procedures for antenna port conducted measurements of unwanted emissions per the guidance of KDB 558074 D01 v05r02 were not used to evaluate this device for compliance to radiated limits. All radiated spurious emissions levels were measured in a radiated test setup.
- 2. All emissions lying in restricted bands specified in Section 15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-13.
- 3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- 4. This unit was tested with its standard battery.
- 5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
- 6. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 7. Radiated spurious emissions were investigated while operating in MIMO mode, however, it was determined that single antenna operation produced the worst case emissions. Since the emissions

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 04 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 94 of 119
© 2023 ELEMENT	•		V9.0 02/01/2019

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produced from MIMO operation were found to be more than 20dB below the limit, the MIMO emissions are not reported.

- 8. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section.
- 9. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Sample Calculations

Determining Spurious Emissions Levels

- Field Strength Level [dBµV/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- Margin [dB] = Field Strength Level $[dB\mu V/m]$ Limit $[dB\mu V/m]$

Radiated Band Edge Measurement Offset

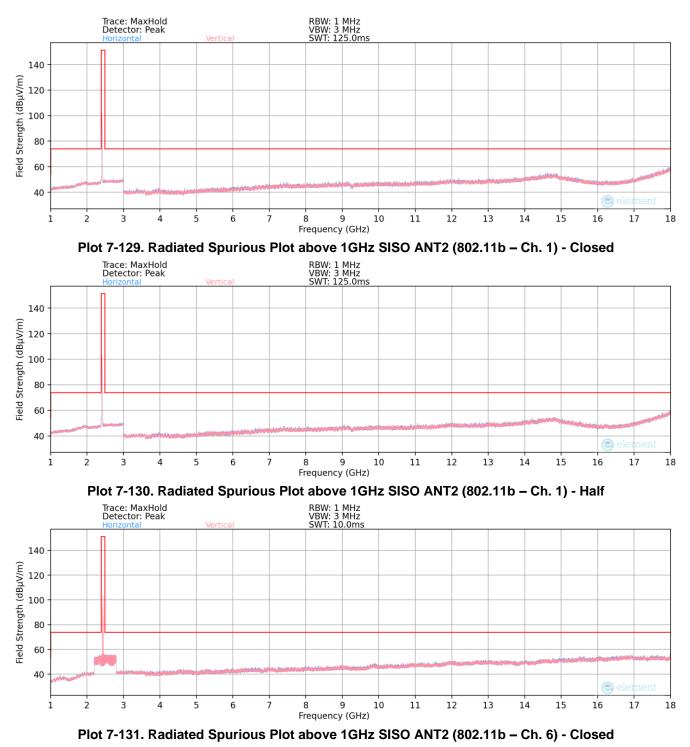
• The amplitude offset shown in the radiated restricted band edge plots in Section 7.7 was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

FCC ID: A3LSMF731JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 05 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 95 of 119
© 2023 ELEMENT		· · · · · · · · · · · · · · · · · · ·	V9.0 02/01/2019

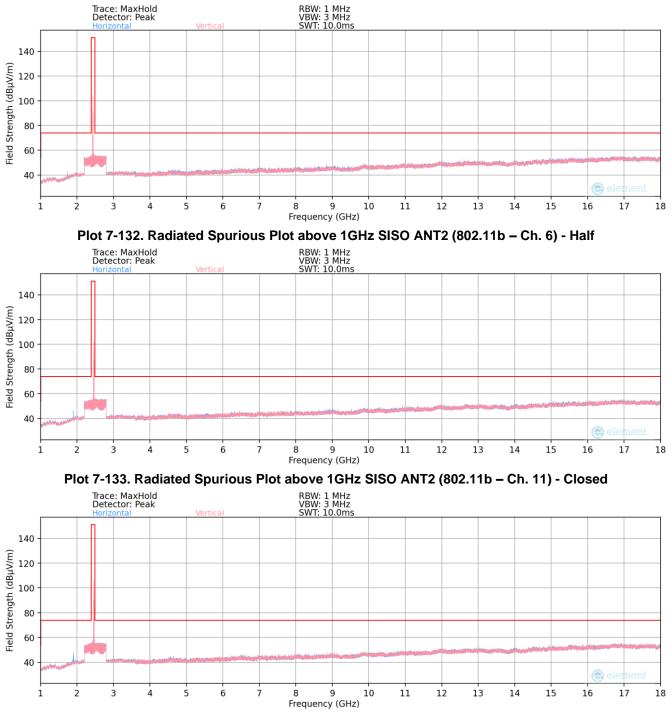


7.7.1 SISO Antenna-2 Radiated Spurious Emission Measurements §15.247(d) §15.205 & §15.209; RSS-Gen [8.9]



FCC ID: A3LSMF731JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 00 of 140	
1M2304260059-10.A3L	3/4-5/30/2023 Portable Handset		Page 96 of 119	
© 2023 ELEMENT		•	V9.0 02/01/2019	



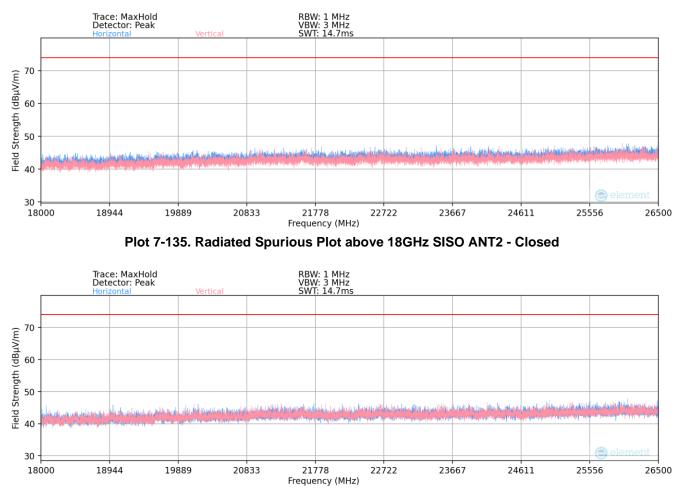


Plot 7-134. Radiated Spurious Plot above 1GHz SISO ANT2 (802.11b – Ch. 11) - Half

FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Page 97 of 119		
1M2304260059-10.A3L	3/4-5/30/2023 Portable Handset		Page 97 of 119		
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SISO Antenna-2 Radiated Spurious Emissions Measurements (Above 18GHz) §15.209; RSS-Gen [8.9]



Plot 7-136. Radiated Spurious Plot above 18GHz SISO ANT2 - Half

FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dama 00 cf 110		
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 98 of 119		
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SISO Antenna-2 Radiated Spurious Emission Measurements §15.247(d) §15.205 & §15.209; RSS-Gen [8.9]

802.11b
1 Mbps
3 Meters
2412MHz
01

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4824.00	Avg	V	-	-	-74.71	-1.53	30.76	53.98	-23.22
4824.00	Peak	V	-	-	-62.34	-1.53	43.13	73.98	-30.85
12060.00	Avg	V	-	-	-78.06	9.65	38.59	53.98	-15.39
12060.00	Peak	V	-	-	-65.14	9.65	51.51	73.98	-22.47

Table 7-14. Radiated Measurements SISO ANT2

Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11b
1 Mbps
3 Meters
2437MHz
06

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4874.00	Avg	V	-	-	-74.77	-1.38	30.85	53.98	-23.13
4874.00	Peak	V	-	-	-62.13	-1.38	43.49	73.98	-30.49
7311.00	Avg	V	-	-	-75.98	4.59	35.61	53.98	-18.37
7311.00	Peak	V	-	-	-64.05	4.59	47.54	73.98	-26.44
12185.00	Avg	V	-	-	-78.01	9.66	38.65	53.98	-15.33
12185.00	Peak	V	-	-	-66.24	9.66	50.42	73.98	-23.56

Table 7-15. Radiated Measurements SISO ANT2

FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dava 00 -(140		
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 99 of 119		
© 2023 ELEMENT			V9.0 02/01/2019		



Worst Case Mode:802.11bWorst Case Transfer Rate:1 MbpsDistance of Measurements:3 MetersOperating Frequency:2462MHzChannel:11

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4924.00	Avg	V	-	-	-75.05	-1.16	30.79	53.98	-23.19
4924.00	Peak	V	-	-	-63.24	-1.16	42.60	73.98	-31.38
7386.00	Avg	V	-	-	-76.01	4.81	35.80	53.98	-18.18
7386.00	Peak	V	-	-	-63.41	4.81	48.40	73.98	-25.58
12310.00	Avg	V	-	-	-78.21	9.69	38.48	53.98	-15.50
12310.00	Peak	V	-	-	-65.69	9.69	51.00	73.98	-22.98

Table 7-16. Radiated Measurements SISO ANT2

Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

80	02.11b
1	Mbps
3	Meters
24	437MHz
6	
6	

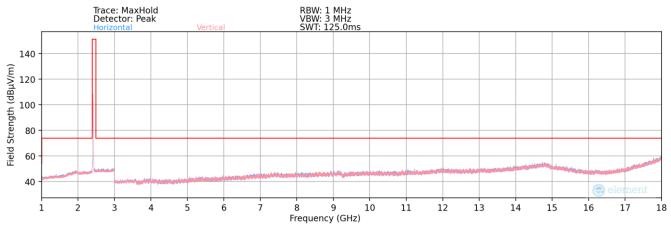
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4874.00	Avg	V	-	-	-79.75	6.61	33.86	53.98	-20.12
4874.00	Peak	V	-	-	-68.51	6.61	45.10	73.98	-28.88
7311.00	Avg	V	-	-	-80.58	12.35	38.77	53.98	-15.21
7311.00	Peak	V	-	-	-69.96	12.35	49.39	73.98	-24.59
12185.00	Avg	V	-	-	-81.80	18.88	44.08	53.98	-9.90
12185.00	Peak	V	-	-	-71.06	18.88	54.82	73.98	-19.16

Table 7-17. Radiated Measurements SISO ANT2 with WCP

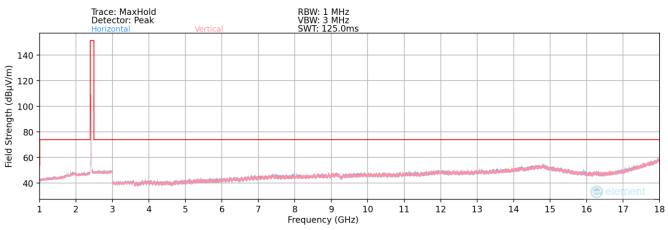
FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	De es 400 sé 440	
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 100 of 119	
© 2023 ELEMENT			V9.0.02/01/2019	



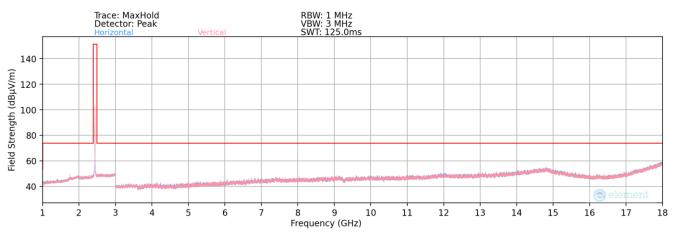
7.7.2 MIMO/CDD Radiated Spurious Emission Measurements §15.247(d) §15.205 & §15.209; RSS-Gen [8.9]







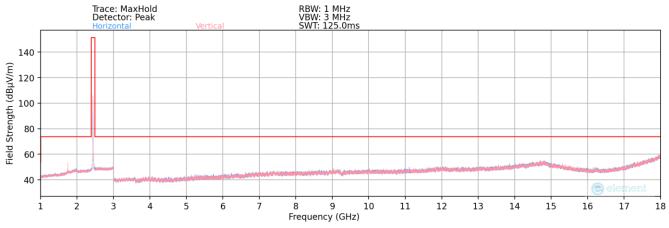
Plot 7-138. Radiated Spurious Plot above 1GHz MIMO/CDD (802.11g - Ch. 1) - Open

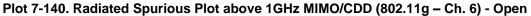


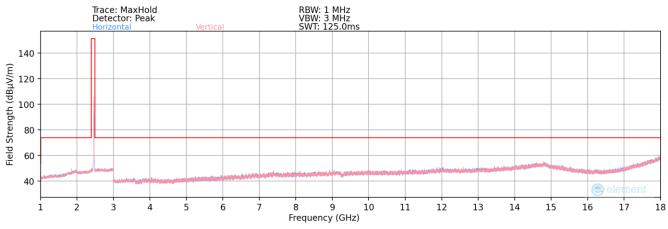
Plot 7-139. Radiated Spurious Plot above 1GHz MIMO/CDD (802.11g - Ch. 6) - Closed

FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 101 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 101 of 119
© 2023 ELEMENT	-		V9.0 02/01/2019

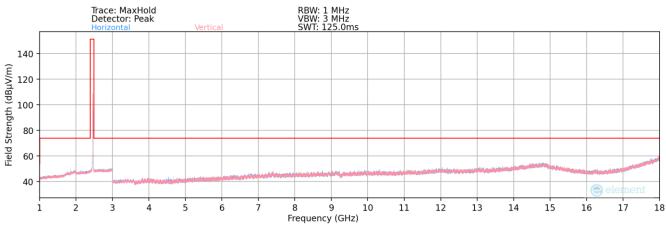










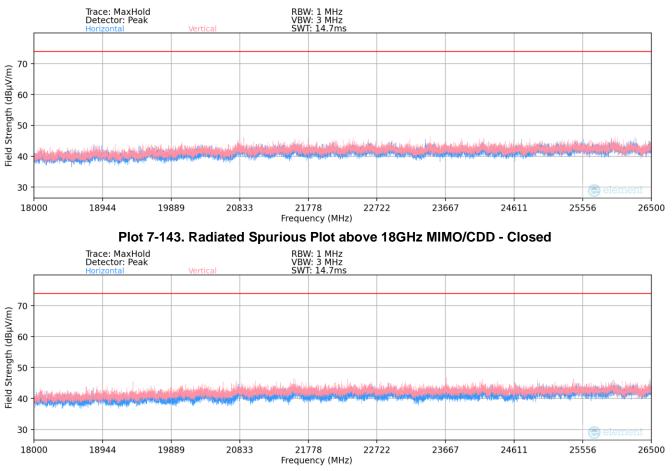




FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dage 102 of 110	
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 102 of 119	
© 2023 ELEMENT	·		V9.0 02/01/2019	



MIMO/CDD Radiated Spurious Emissions Measurements (Above 18GHz) §15.209; RSS-Gen [8.9]



Plot 7-144. Radiated Spurious Plot above 18GHz MIMO/CDD - Open

FCC ID: A3LSMF731JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 102 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 103 of 119
© 2023 ELEMENT			V9.0 02/01/2019



MIMO/CDD Radiated Spurious Emission Measurements §15.247(d) §15.205 & §15.209; RSS-Gen [8.9]

Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2412MHz
Channel:	01

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4824.00	Avg	Н	-	-	-74.67	-1.53	30.80	53.98	-23.18
4824.00	Peak	Н	-	-	-61.71	-1.53	43.76	73.98	-30.22
12060.00	Avg	н	-	-	-74.68	9.65	41.97	53.98	-12.01
12060.00	Peak	Н	-	-	-65.49	9.65	51.16	73.98	-22.82

Table 7-18. Radiated Measurements MIMO/CDD

Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2437MHz
Channel:	06

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4874.00	Avg	Н	-	-	-74.67	-1.38	30.95	53.98	-23.03
4874.00	Peak	н	-	-	-62.66	-1.38	42.96	73.98	-31.02
7311.00	Avg	н	-	-	-76.00	4.59	35.59	53.98	-18.39
7311.00	Peak	н	-	-	-63.57	4.59	48.02	73.98	-25.96
12185.00	Avg	Н	-	-	-78.01	9.66	38.65	53.98	-15.33
12185.00	Peak	Н	-	-	-66.07	9.66	50.59	73.98	-23.39

Table 7-19. Radiated Measurements MIMO/CDD

FCC ID: A3LSMF731JPN		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dama 404 af 440	
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 104 of 119	
© 2023 ELEMENT			V9.0 02/01/2019	



Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2462MHz
Channel:	11

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4924.00	Avg	Н	229	208	-74.28	-1.16	31.56	53.98	-22.42
4924.00	Peak	н	229	208	-62.54	-1.16	43.30	73.98	-30.68
7386.00	Avg	н	-	-	-75.96	4.81	35.85	53.98	-18.13
7386.00	Peak	н	-	-	-64.13	4.81	47.68	73.98	-26.30
12310.00	Avg	н	-	-	-78.15	9.69	38.54	53.98	-15.44
12310.00	Peak	Н	-	-	-66.54	9.69	50.15	73.98	-23.83

Table 7-20. Radiated Measurements MIMO/CDD

Worst Case Mode: Worst Case Transfer Rate: Distance of Measurements: Operating Frequency: Channel:

802.11b
1 Mbps
3 Meters
2437 MHz
6

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4874.00	Avg	Н	132	177	-79.46	6.61	34.15	53.98	-19.83
4874.00	Peak	Н	132	177	-68.18	6.61	45.43	73.98	-28.55
7311.00	Avg	Н	-	-	-80.80	12.35	38.55	53.98	-15.43
7311.00	Peak	Н	-	-	-69.62	12.35	49.73	73.98	-24.25
12185.00	Avg	Н	-	-	-81.86	18.88	44.02	53.98	-9.96
12185.00	Peak	Н	-	-	-70.79	18.88	55.09	73.98	-18.89

Table 7-21. Radiated Measurements MIMO/CDD with WCP

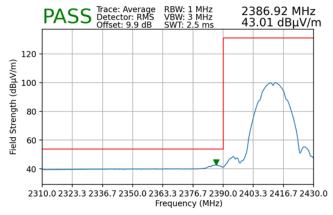
FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 105 of 110
1M2304260059-10.A3L	3/4-5/30/2023 Portable Handset		Page 105 of 119
© 2023 ELEMENT	-		V9.0 02/01/2019



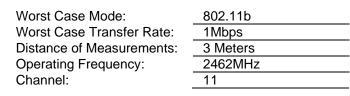
7.7.3 SISO Antenna-2 Radiated Restricted Band Edge Measurements §15.205 §15.209; RSS-Gen [8.9]

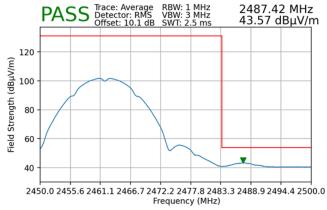
The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting.

Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2412MHz
Channel:	1

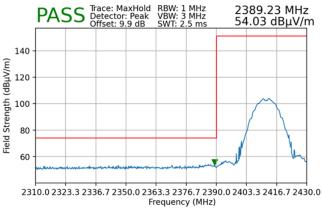


Plot 7-145. Radiated Restricted Lower Band Edge Measurement SISO ANT2 (Average)

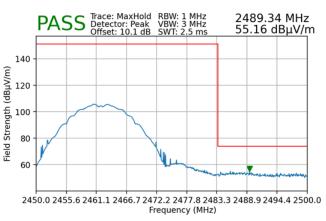








Plot 7-146. Radiated Restricted Lower Band Edge Measurement SISO ANT2 (Peak)



Plot 7-148. Radiated Restricted Upper Band Edge Measurement SISO ANT2 (Peak)

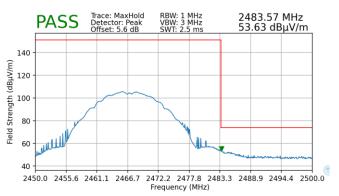
FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dega 100 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 106 of 119
© 2023 ELEMENT			V9.0 02/01/2019



Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2467MHz
Channel:	12

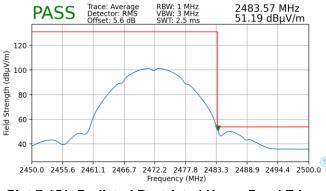


Plot 7-149. Radiated Restricted Upper Band Edge Measurement SISO ANT2 (Average)

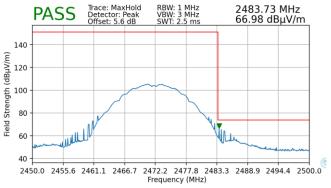


Plot 7-150. Radiated Restricted Upper Band Edge Measurement SISO ANT2 (Peak)

Worst Case Mode:	802.11b
Worst Case Transfer Rate:	1Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2472MHz
Channel:	13







Plot 7-152. Radiated Restricted Upper Band Edge Measurement SISO ANT2 (Peak)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 107 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 107 of 119
© 2023 ELEMENT	·		V9.0 02/01/2019

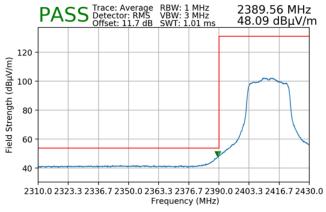


7.7.4 MIMO Radiated Restricted Band Edge Measurements

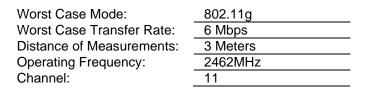
§15.205 §15.209; RSS-Gen [8.9]

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting.

802.11ac
MCS0
3 Meters
2412MHz
1

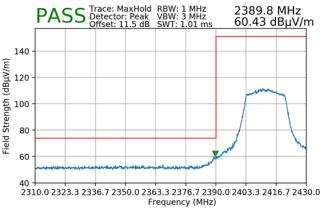


Plot 7-153. Radiated Restricted Lower Band Edge Measurement MIMO (Average)





Plot 7-155. Radiated Restricted Upper Band Edge Measurement MIMO (Average)



Plot 7-154. Radiated Restricted Lower Band Edge Measurement MIMO (Peak)

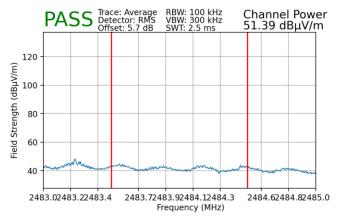


Plot 7-156. Radiated Restricted Upper Band Edge Measurement MIMO (Peak)

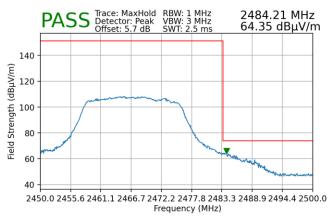
FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 100 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 108 of 119
© 2023 ELEMENT	•		V9.0 02/01/2019



Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	2467MHz
Channel:	12

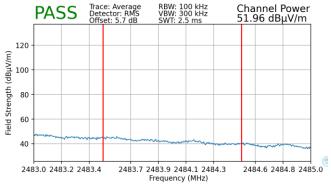


Plot 7-157. Radiated Restricted Upper Band Edge Measurement MIMO (Average)

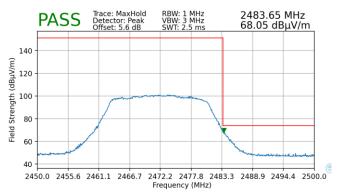


Plot 7-158. Radiated Restricted Upper Band Edge Measurement MIMO (Peak)

Worst Case Mode:	802.11n
Worst Case Transfer Rate:	MCS8
Distance of Measurements:	3 Meters
Operating Frequency:	2472MHz
Channel:	13



Plot 7-159. Radiated Restricted Upper Band Edge Measurement MIMO (Average)

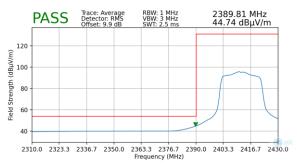


Plot 7-160. Radiated Restricted Upper Band Edge Measurement MIMO (Peak)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 100 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 109 of 119
© 2023 ELEMENT	•		V9.0 02/01/2019



Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	2412MHz
Channel:	1



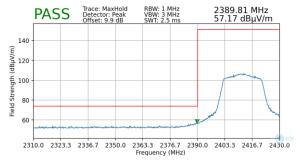
Plot 7-161. Radiated Restricted Band Edge Measurement MIMO with WCP (Average)

Worst Case Mode:	802.11g
Worst Case Transfer Rate:	6 Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	2462MH
Channel:	11

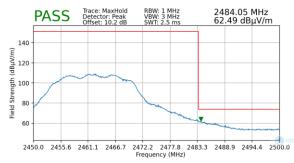
e Transfer Rate:	6 Mbps
Measurements:	3 Meters
requency:	2462MHz
	11



Plot 7-163. Radiated Restricted Band Edge Measurement MIMO with WCP (Average)



Plot 7-162. Radiated Restricted Band Edge Measurement MIMO with WCP (Peak)



Plot 7-164. Radiated Restricted Band Edge Measurement MIMO with WCP (Peak)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	De 22 440 at 440
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 110 of 119
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7.8 Radiated Spurious Emissions Measurements – Below 1GHz §15.209; RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-22 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [µV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-22. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Quasi-Peak Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 120kHz (for emissions from 30MHz 1GHz)
- 3. Detector = quasi-peak
- 4. Sweep time = auto couple
- 5. Trace mode = max hold
- 6. Trace was allowed to stabilize

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 111 of 119
1M2304260059-10.A3L	3/4-5/30/2023	5/30/2023 Portable Handset	
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Test Setup

The EUT and measurement equipment were set up as shown in the diagrams below.

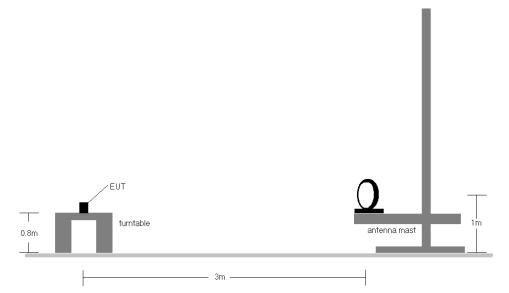
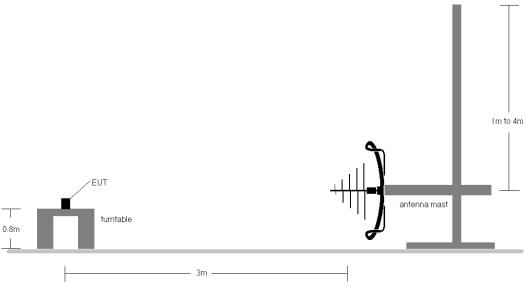
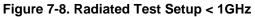


Figure 7-7. Radiated Test Setup < 30Mhz





FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 112 of 110
1M2304260059-10.A3L	3/4-5/30/2023 Portable Handset		Page 112 of 119
© 2023 ELEMENT		·	V9.0 02/01/2019



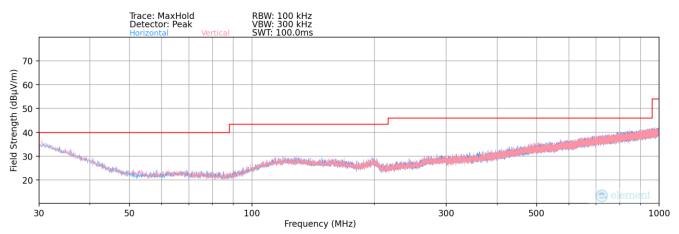
Test Notes

- 1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen(8.10) are below the limit shown in Table 7-22.
- 2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
- 3. This unit was tested with its standard battery.
- 4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
- 5. Emissions were measured at a 3 meter test distance.
- 6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
- 7. No spurious emissions were detected within 20dB of the limit below 30MHz.
- 8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
- The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

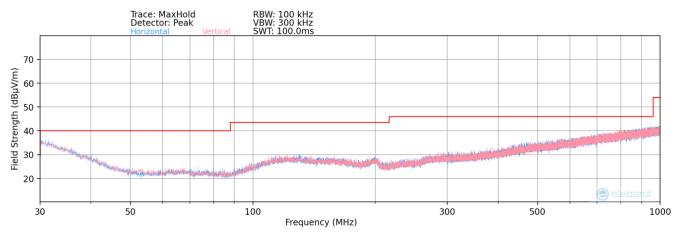
FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 113 of 119
1M2304260059-10.A3L	3/4-5/30/2023	/4-5/30/2023 Portable Handset	
© 2023 ELEMENT			V9.0 02/01/2019



MIMO Radiated Spurious Emissions Measurements (Below 1GHz) §15.209; RSS-Gen [8.9]









Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
32.00	Quasi-Peak	Н	-	-	-97.30	26.22	35.92	40.00	-4.08
850.00	Quasi-Peak	Н	-	-	-96.24	30.82	41.58	46.02	-4.44
961.50	Quasi-Peak	Н	-	-	-96.79	31.62	41.83	53.98	-12.15

Table 7-23. Radiated Spurious Emissions below 1GHz MIMO

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	Dates: EUT Type:	
1M2304260059-10.A3L	3/4-5/30/2023 Portable Handset		Page 114 of 119
© 2023 ELEMENT	-		V9.0 02/01/2019



7.9 Line-Conducted Test Data

<u>§15.207; RSS-Gen [8.8]</u>

Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207 and RSS-Gen (8.8).

Frequency of emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

Table 7-24. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the spurious emission of interest
- 2. RBW = 9kHz (for emissions from 150kHz 30MHz)
- 3. Detector = quasi-peak
- 4. Sweep time = auto couple
- 5. Trace mode = max hold
- 6. Trace was allowed to stabilize

Average Field Strength Measurements

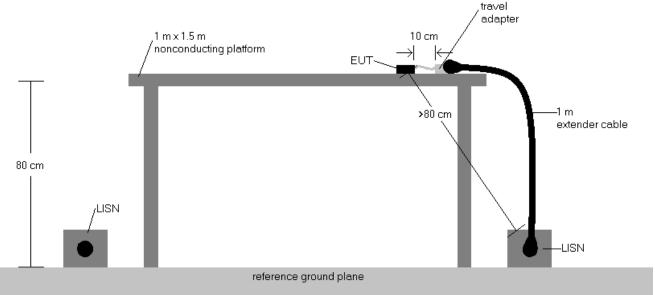
- 1. Analyzer center frequency was set to the frequency of the spurious emission of interest
- 2. RBW = 9kHz (for emissions from 150kHz 30MHz)
- 3. Detector = RMS
- 4. Sweep time = auto couple
- 5. Trace mode = max hold
- 6. Trace was allowed to stabilize

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 115 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 115 of 119
© 2023 ELEMENT	-		V9.0 02/01/2019



Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



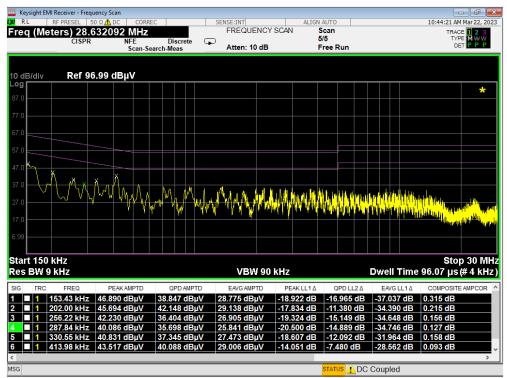


Test Notes

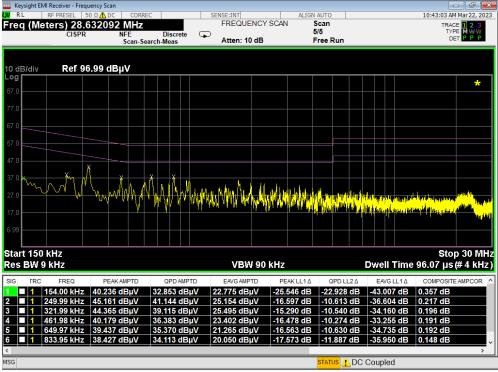
- All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
- 2. The limit for an intentional radiator from 150kHz to 30MHz are specified in Part 15.207 and RSS-Gen(8.8).
- 3. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
- 4. QP/AV Level (dB μ V) = QP/AV Analyzer/Receiver Level (dB μ V) + Corr. (dB)
- 5. Margin (dB) = QP/AV Limit (dB μ V) QP/AV Level (dB μ V)
- 6. Traces shown in plot are made using a peak detector.
- 7. Deviations to the Specifications: None.

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 116 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 116 of 119
© 2023 ELEMENT		·	V9.0 02/01/2019





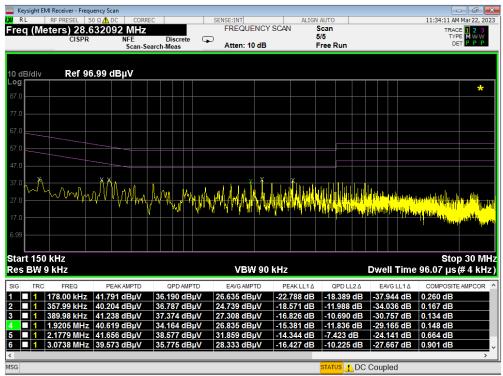
Plot 7-167. Line Conducted Plot with 802.11b (L1)



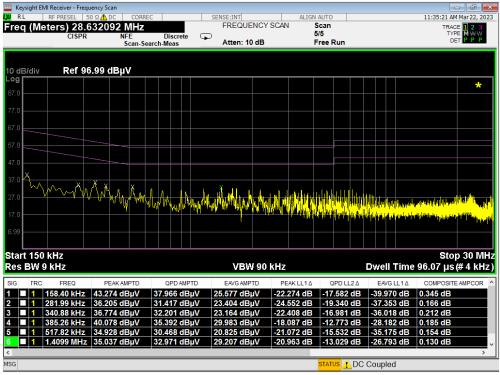
Plot 7-168. Line Conducted Plot with 802.11b (N)

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 117 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 117 of 119
© 2023 ELEMENT	•		V9.0 02/01/2019





Plot 7-169. Line Conducted Plot with 802.11b (L1) with WCP



Plot 7-170. Line Conducted Plot with 802.11b (N) with WCP

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 119 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 118 of 119
© 2023 ELEMENT		· · ·	V9.0 02/01/2019



8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMF731JPN** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules.

FCC ID: A3LSMF731JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 110 of 110
1M2304260059-10.A3L	3/4-5/30/2023	Portable Handset	Page 119 of 119
© 2023 ELEMENT			V9.0 02/01/2019