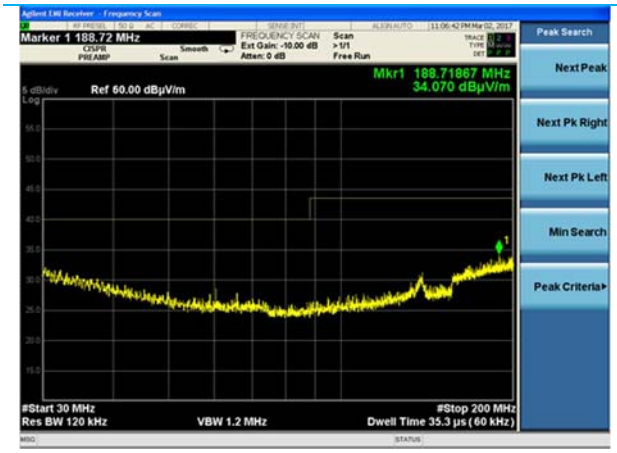
Plots – BLE Spurious Emissions

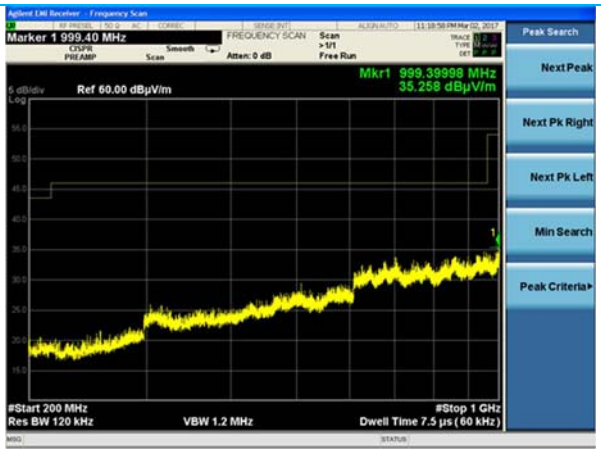
Bluetooth Classic GFSK Measurements



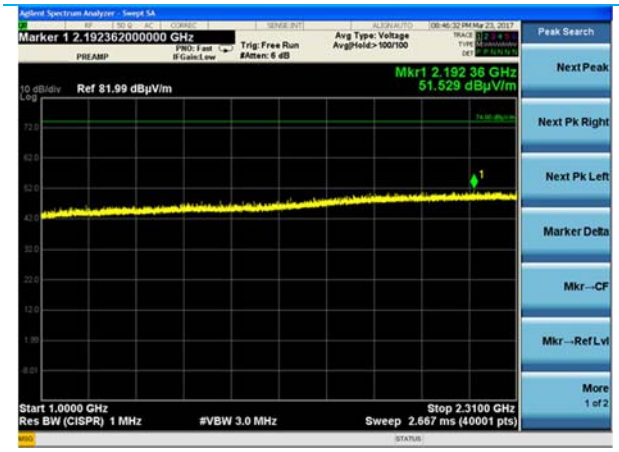
30-200 MHz – Horizontal Antenna

30-200 MHz – Vertical Antenna

200-1000 MHz – Horizontal Antenna



200-1000 MHz – Vertical Antenna

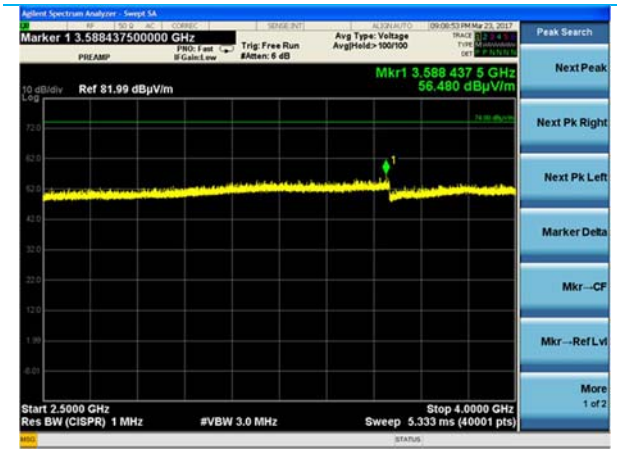


1-2.31 GHz – H+V Antenna

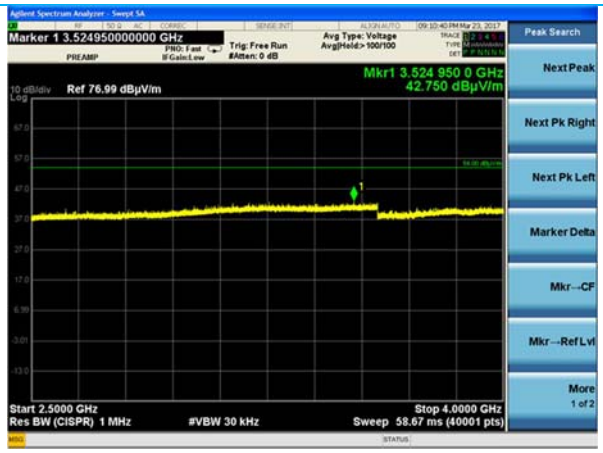
1-2.31 GHz – H+V Antenna – Reduced VBW

Plots – BLE Spurious Emissions, continued

Bluetooth Classic GFSK Measurements



2.5-4 GHz – H+V Antenna

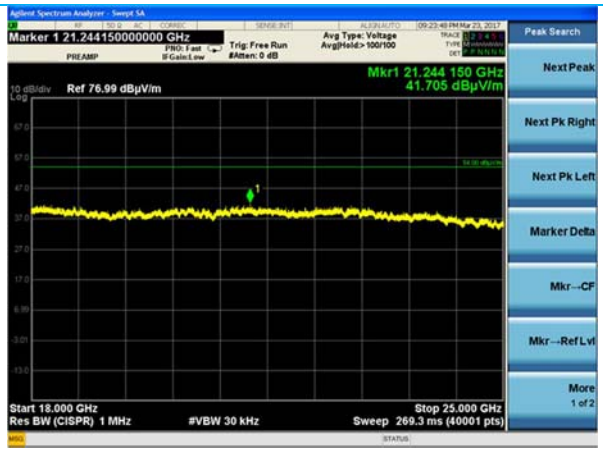


2.5-4 GHz – H+V Antenna – Reduced VBW

Low Channel – 4-18 GHz – Reduced VBW

Mid Channel – 4-18 GHz – Reduced VBW

High Channel – 4-18 GHz – Reduced VBW

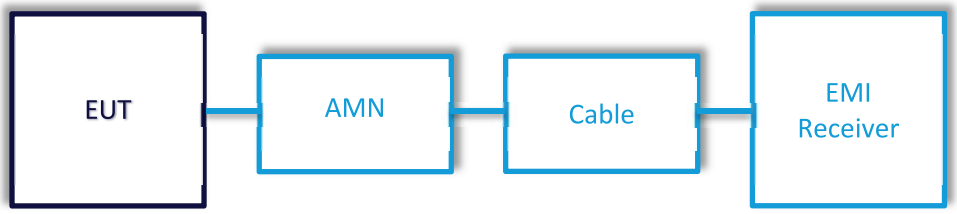


18-25 GHz – Reduced VBW

5.3 AC Mains Conducted Emissions

Description of Measurement	A line impedance stabilization network (LISN) or artificial mains network (AMN) allows the emissions of the power supply conductors to be measured while isolating the EUT from the supply mains. The AMN, cable, and other necessary measurement system correction factors are loaded onto the EMI receiver when the measurements are performed. The data is gathered and reported as the corrected values. Maximum emissions are determined with a peak max hold trace then measurements at a selection of the highest points are made with quasi-peak and average detectors. Results are recorded and compared to limit for each line. (e.g. line and neutral)
Example Calculations	Measurement (dBµV) + Cable factor (dB) + Other (dB) = Corrected Reading (dBµV) Margin (dB) = Limit (dBµV) - Corrected Reading (dBµV)

Block Diagram



5.3.1 AC Mains Conducted Emissions

Operator	Kimberly Bay
QA	Shane Dock
Test Date	April 4, 2017
Location	H+V Ground Plane
Temp. / R.H.	21°C / 43% R.H.
Requirement	FCC 15.207 / RSS-Gen Section 8.8
Method	ANSI C63.10 2013 Section 6.2

Limits

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

* Decreases with the logarithm of the frequency.

Test Parameters

Frequency	0.150-30 MHz
Settings	802.11b, 1 Mbps: 2412 MHz
Settings	Bluetooth, GFSK: 2440 MHz
Notes	No change in emissions between channels or data rates.

Instrumentation

LSR a Laird Business

Date: 4-Apr-2017 Type Test: Bluetooth Cond AC Emissions Job #: C-2602

Prepared By: Kim Customer: LSR Quote #: 316356

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960089	LISN	COM-POWER	LI-215A	191943	3/13/2017	3/13/2018	Active Calibration
2	EE 960088	MXE Spectrum Analyzer	Agilent	N9038A	MY51210138	3/2/2017	3/2/2018	Active Calibration

Table – WLAN Conducted AC Emissions Data

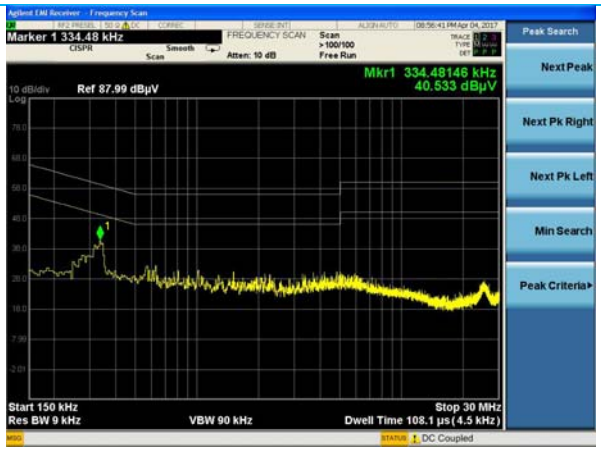
		Quasi-Peak			Average		
Frequency (MHz)	Line	Q-Peak Reading (dBµV)	Q-Peak Limit (dBµV)	Quasi-Peak Margin (dB)	Average Reading (dBµV)	Average Limit (dBµV)	Average Margin (dB)
0.150	1	42.9	66.0	23.1	33.1	56.0	22.9
0.244	1	39.6	61.9	22.4	30.1	51.9	21.8
0.330	1	39.6	59.5	19.9	31.3	49.5	18.2
0.334	2	36.1	59.4	23.3	27.0	49.4	22.3
0.627	2	25.8	56.0	30.2	17.9	46.0	28.1
25.000	2	22.8	60.0	37.3	16.6	50.0	33.4

Table – Bluetooth Conducted AC Emissions Data

		Quasi-Peak			Average		
Frequency (MHz)	Line	Q-Peak Reading (dBµV)	Q-Peak Limit (dBµV)	Quasi-Peak Margin (dB)	Average Reading (dBµV)	Average Limit (dBµV)	Average Margin (dB)
0.159	1	42.5	65.5	23.0	32.6	55.5	23.0
0.186	1	40.8	64.2	23.4	31.2	54.2	23.1
0.222	1	39.6	62.7	23.1	29.9	52.7	22.8
0.348	2	30.0	59.0	29.0	21.9	49.0	27.1
0.276	2	30.1	60.9	30.9	22.9	50.9	28.1
0.483	2	26.5	56.3	29.8	18.6	46.3	27.6

Plots – Conducted AC Emissions

WLAN – Line 1



WLAN – Line 2

Bluetooth – Line 1

Bluetooth – Line 2

6 REVISION HISTORY

Version	Date	Notes	Person
V0	5/3/17	Initial Draft Release	KB
V1	5/9/17	Final	KB

END OF REPORT