

Appendix A

RF Test Data for BT V5.0(BLE) (Conducted Measurement)

Product Name: Barcode Scanner

Trade Mark: Newland

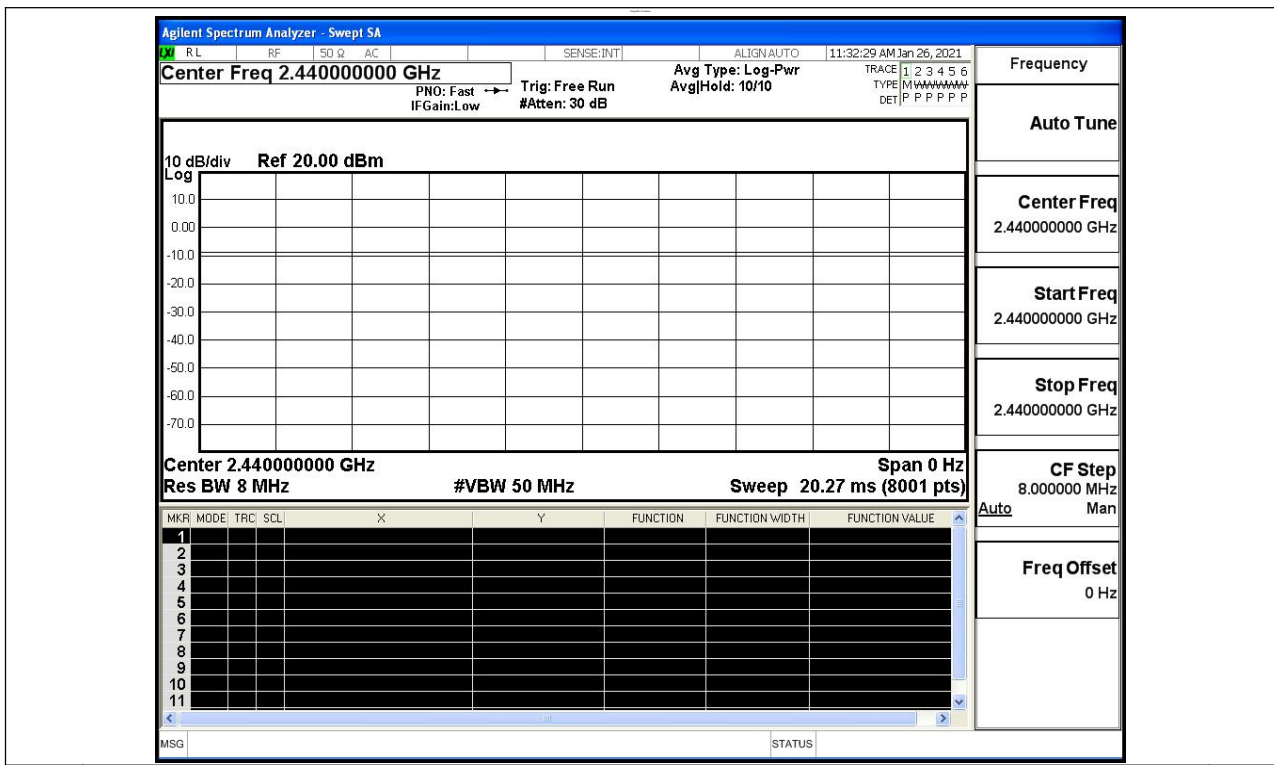
Test Model: NLS-BS30

Environmental Conditions

Temperature:	24.6 °C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan

A.1 Duty Cycle

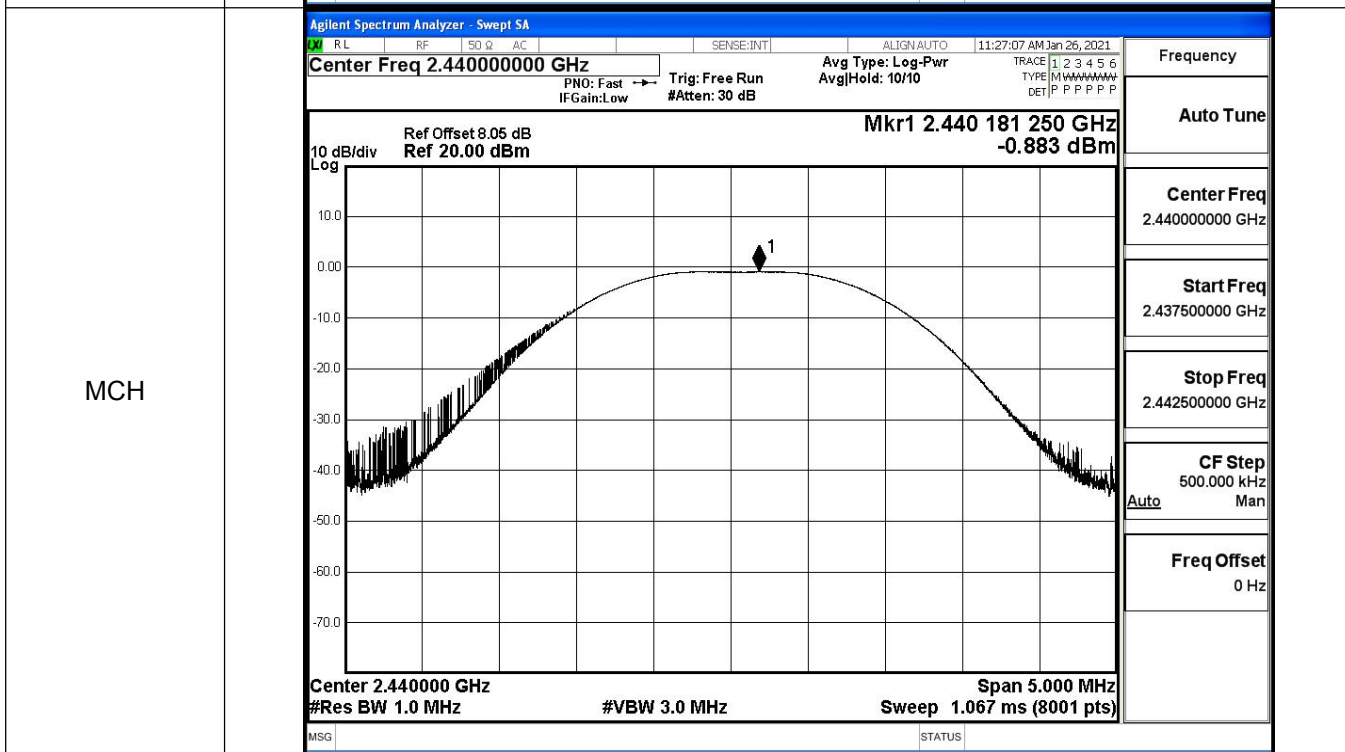
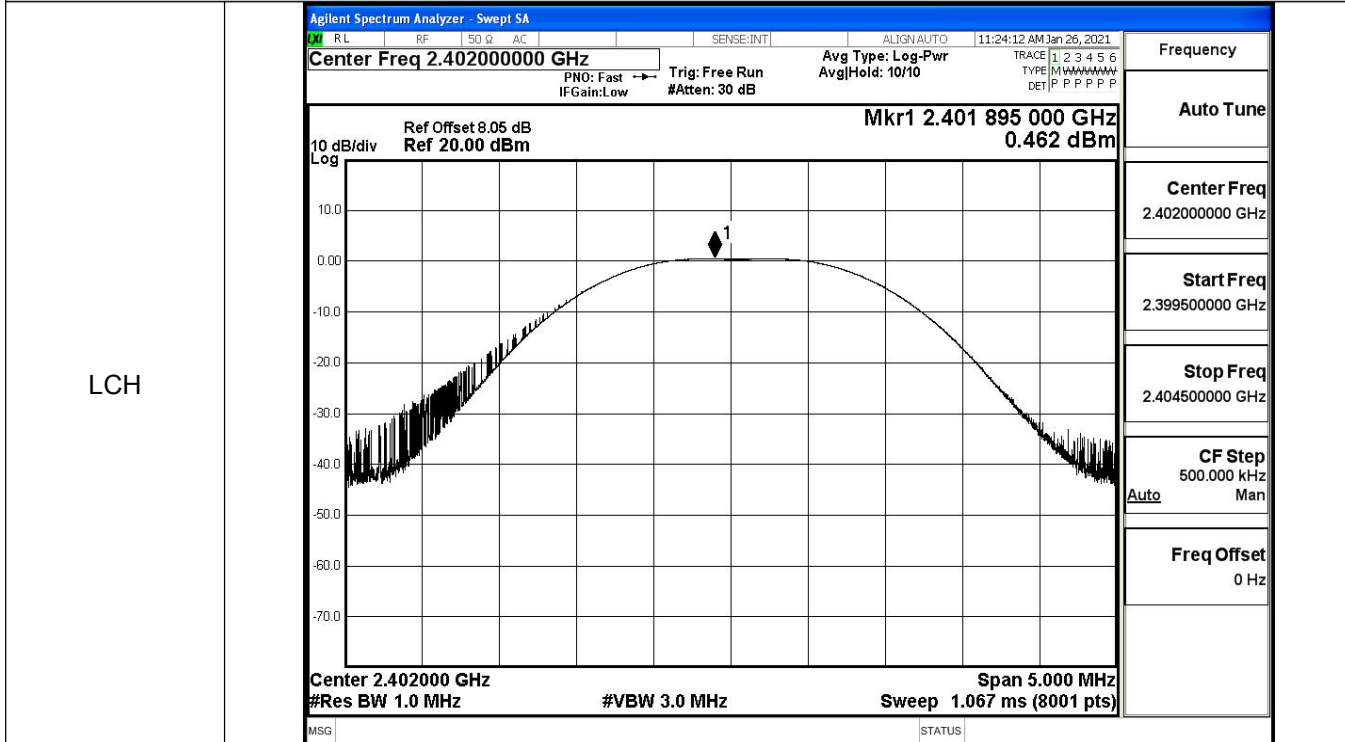
Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100	PASS



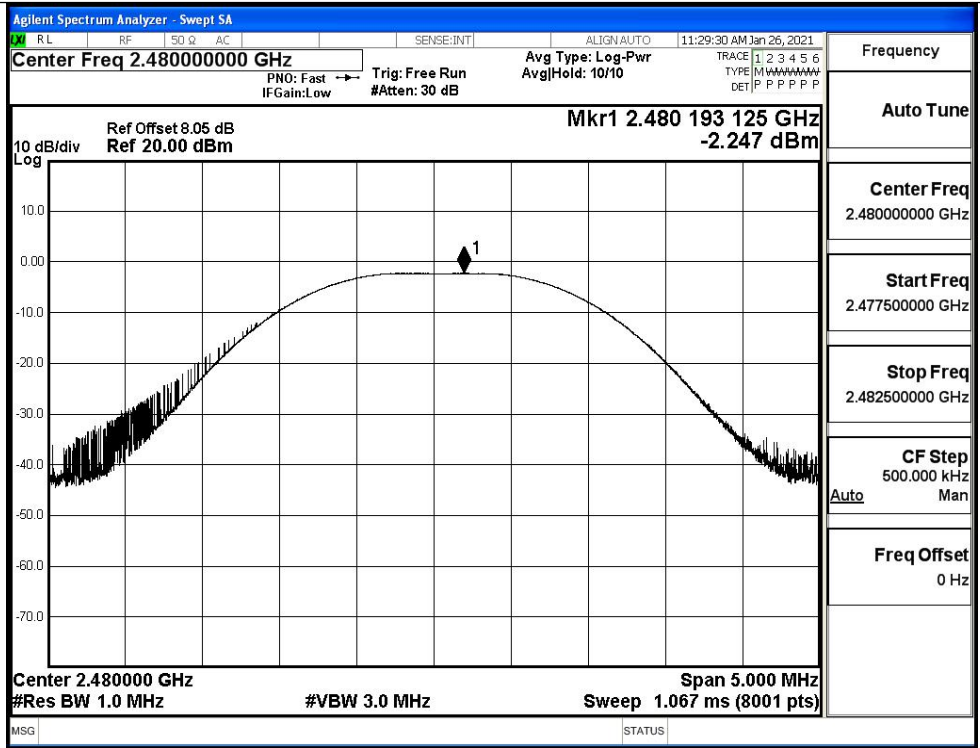
A.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.462	30	PASS
BT LE	MCH	-0.883	30	PASS
BT LE	HCH	-2.247	30	PASS

Test Graphs



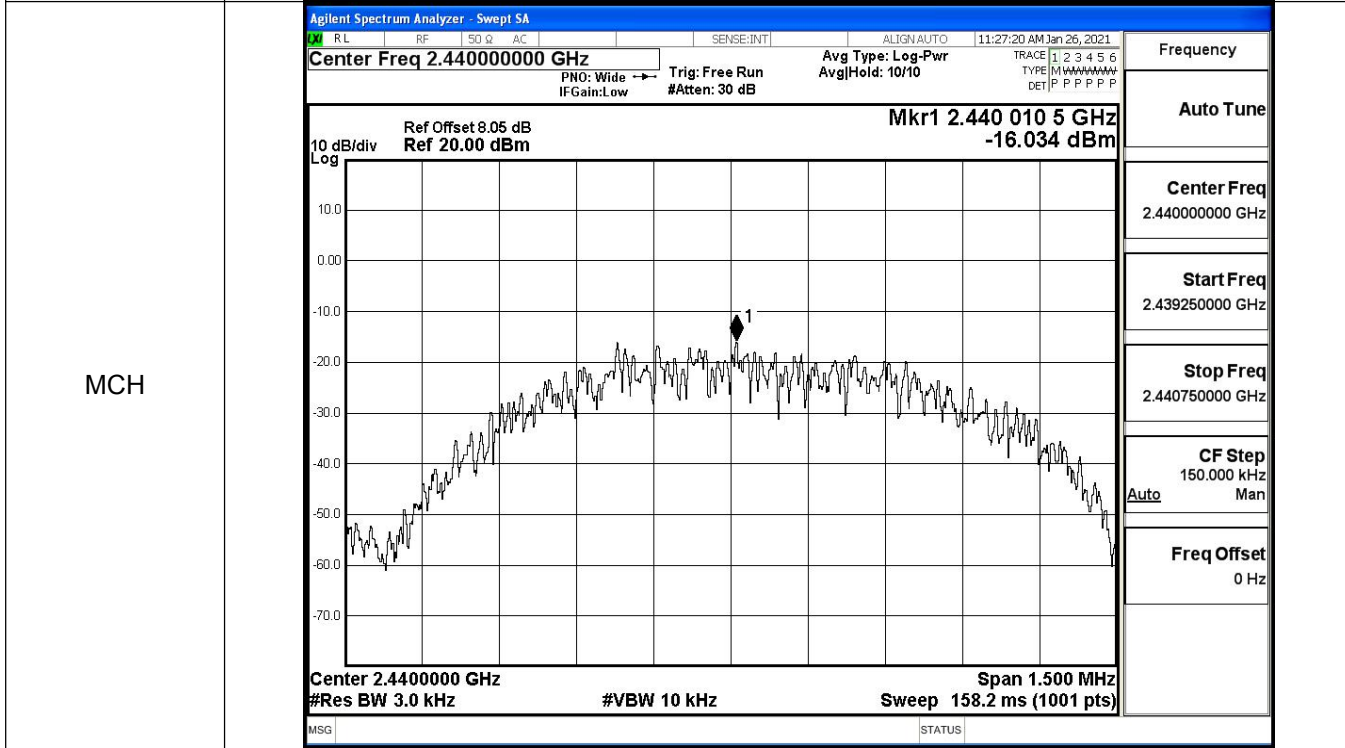
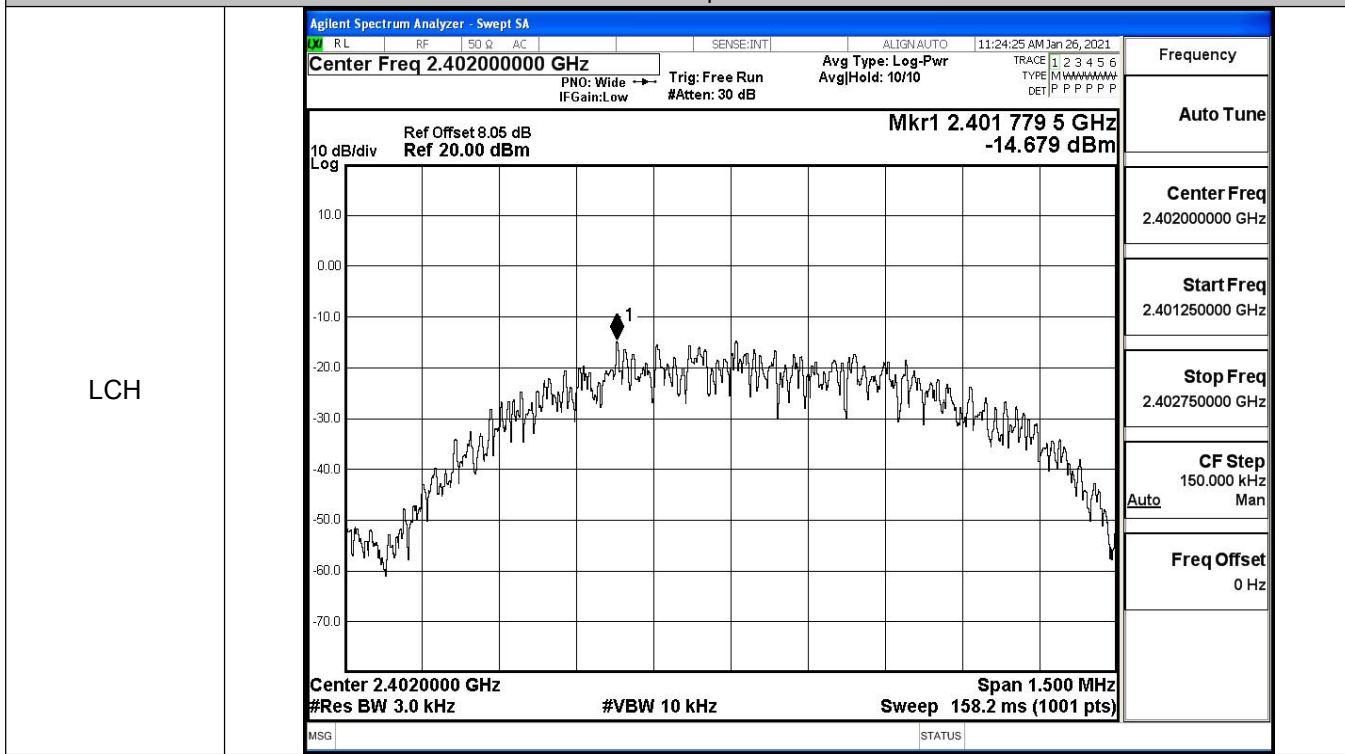
HCH



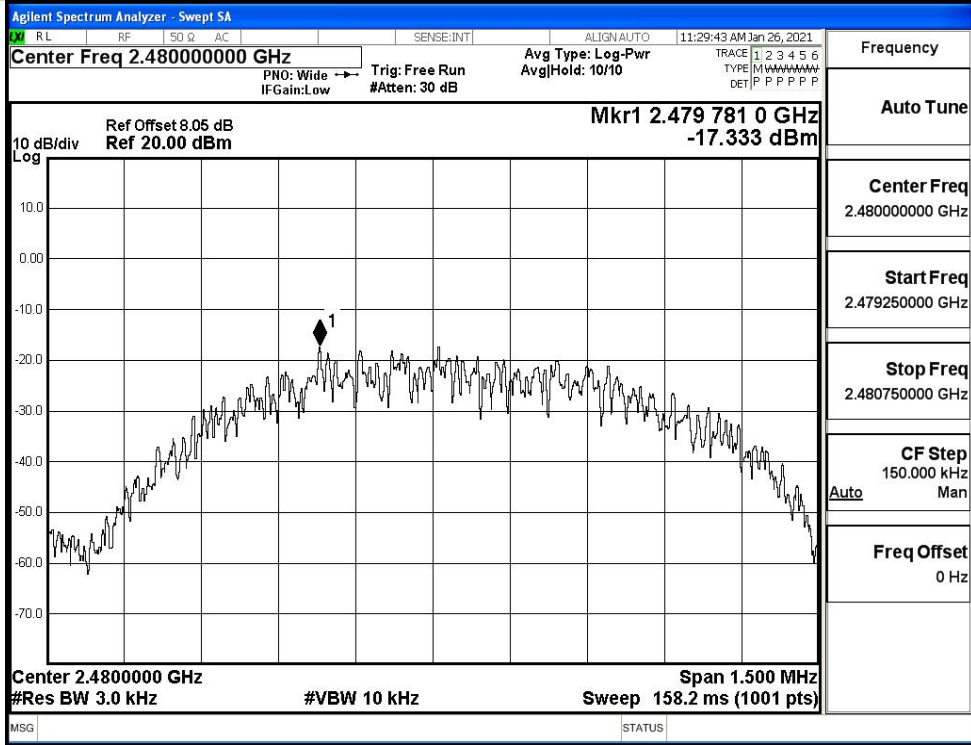
A.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-14.679	8	PASS
BT LE	MCH	-16.034	8	PASS
BT LE	HCH	-17.333	8	PASS

Test Graphs



HCH



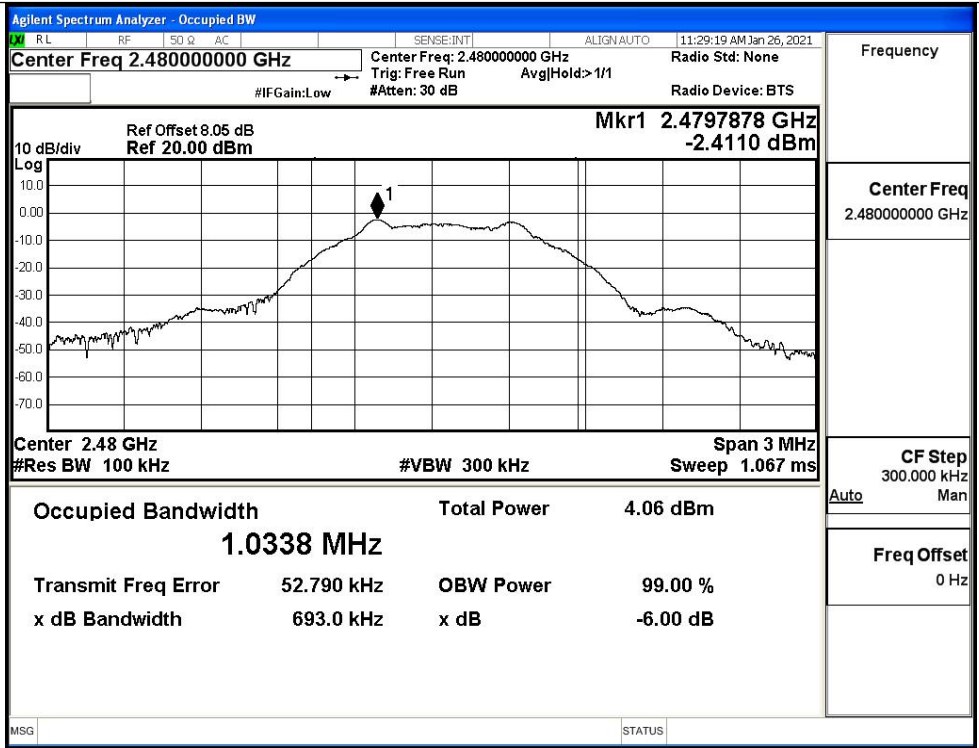
A.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	0.6868	≥0.5	PASS
BT LE	MCH	0.6949	≥0.5	PASS
BT LE	HCH	0.6930	≥0.5	PASS

Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.40200000 GHz</p> <p>Center Freq: 2.40200000 GHz</p> <p>Mkr1 2.4017863 GHz</p> <p>10 dB/div</p> <p>Ref Offset 8.05 dB</p> <p>Ref 20.00 dBm</p> <p>Occupied Bandwidth 1.0307 MHz</p> <p>Total Power 7.18 dBm</p> <p>Transmit Freq Error 51.926 kHz</p> <p>x dB Bandwidth 686.8 kHz</p>	<p>Frequency</p> <p>Center Freq 2.40200000 GHz</p> <p>CF Step 300.000 kHz</p> <p>Freq Offset 0 Hz</p>
	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.44000000 GHz</p> <p>Center Freq: 2.44000000 GHz</p> <p>Mkr1 2.4397859 GHz</p> <p>10 dB/div</p> <p>Ref Offset 8.05 dB</p> <p>Ref 20.00 dBm</p> <p>Occupied Bandwidth 1.0353 MHz</p> <p>Total Power 5.41 dBm</p> <p>Transmit Freq Error 51.667 kHz</p> <p>x dB Bandwidth 694.9 kHz</p>	<p>Frequency</p> <p>Center Freq 2.44000000 GHz</p> <p>CF Step 300.000 kHz</p> <p>Freq Offset 0 Hz</p>

HCH



A.5 RF Conducted Spurious Emissions

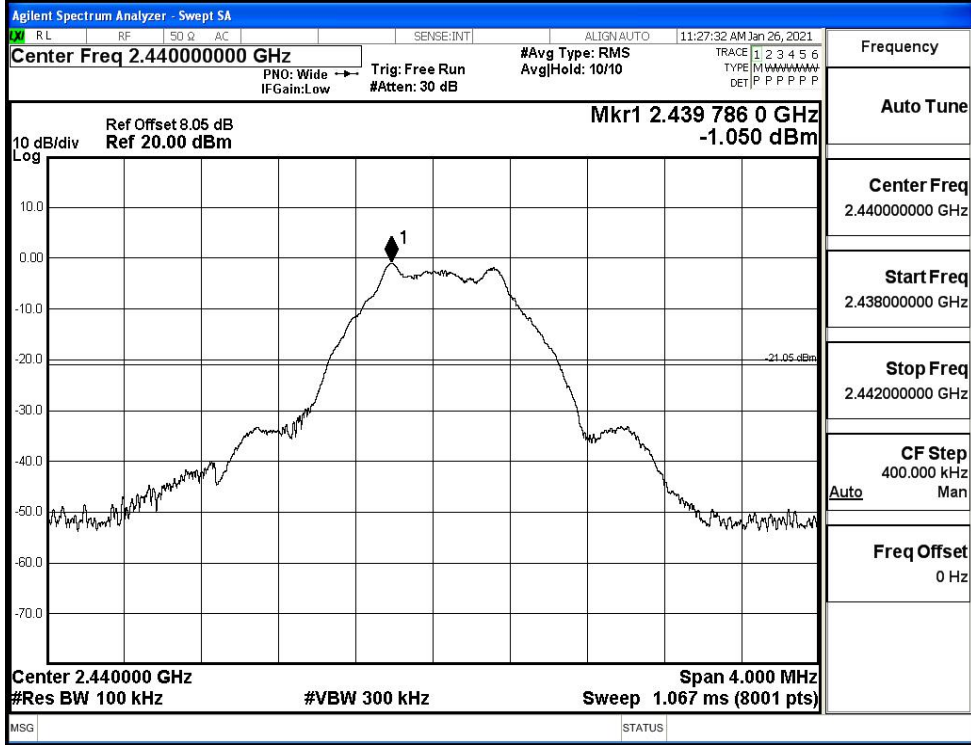
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.317	-37.235	-19.683	PASS
BT LE	MCH	-1.05	-37.505	-21.050	PASS
BT LE	HCH	-2.404	-36.967	-22.404	PASS

BT LE_LCH_Graphs

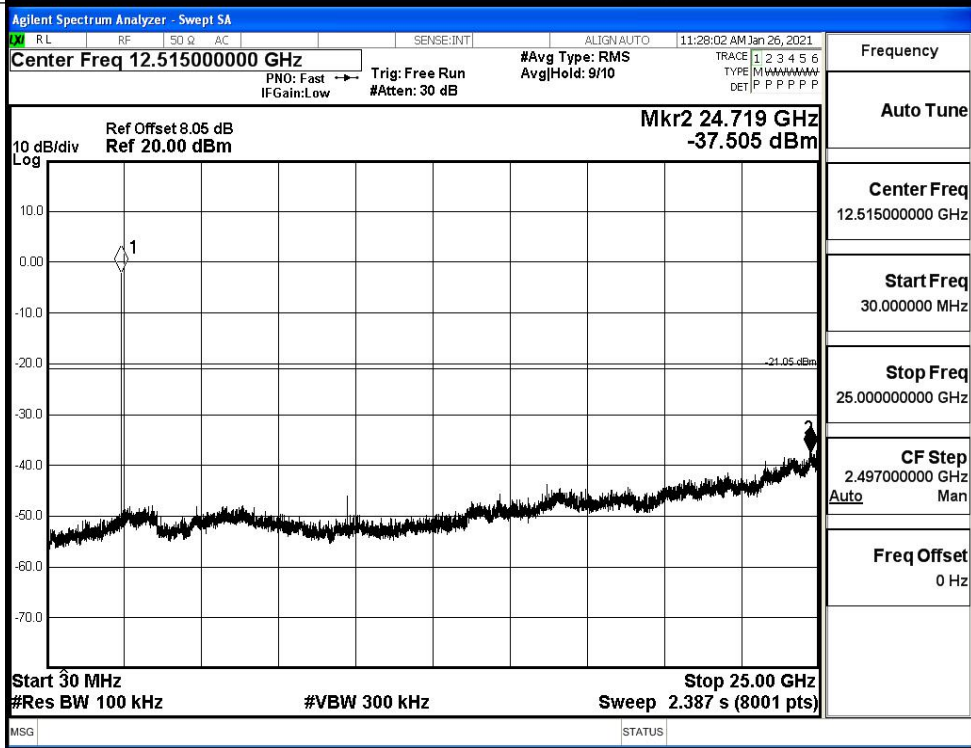
Pref/BT LE/LCH		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Frequency</td></tr> <tr><td>Auto Tune</td></tr> <tr><td>Center Freq 2.402000000 GHz</td></tr> <tr><td>Start Freq 2.400000000 GHz</td></tr> <tr><td>Stop Freq 2.404000000 GHz</td></tr> <tr><td>CF Step 400.000 kHz Auto Man</td></tr> <tr><td>Freq Offset 0 Hz</td></tr> </table>	Frequency	Auto Tune	Center Freq 2.402000000 GHz	Start Freq 2.400000000 GHz	Stop Freq 2.404000000 GHz	CF Step 400.000 kHz Auto Man	Freq Offset 0 Hz
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Freq Offset 0 Hz									

BT LE MCH Graphs

Pref/BT LE/MCH

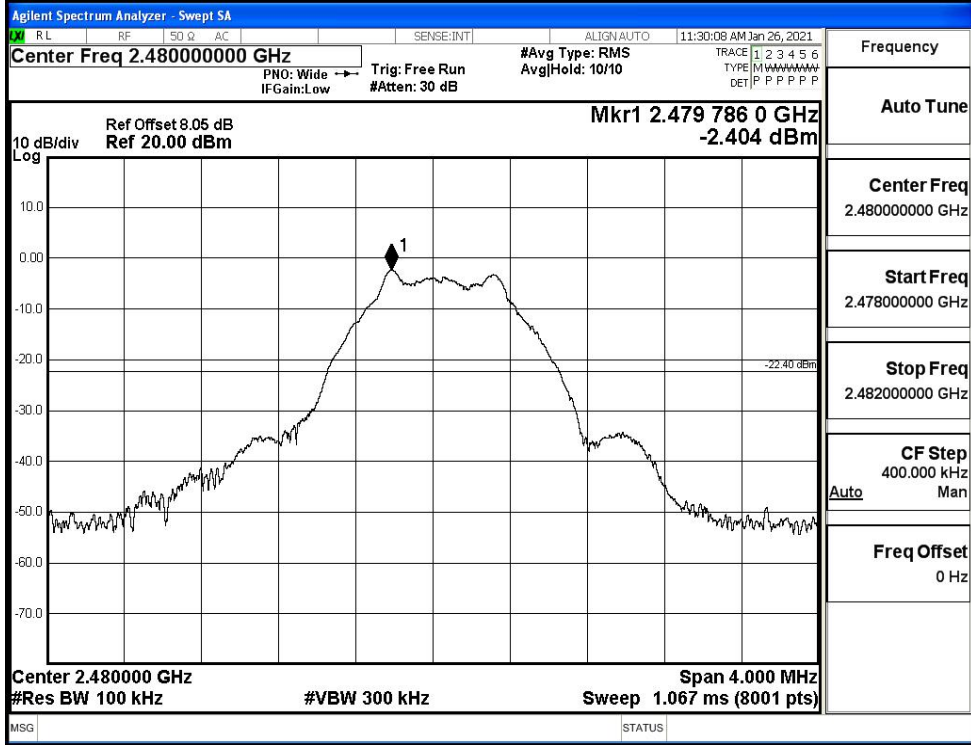


Puw/BT LE/MCH

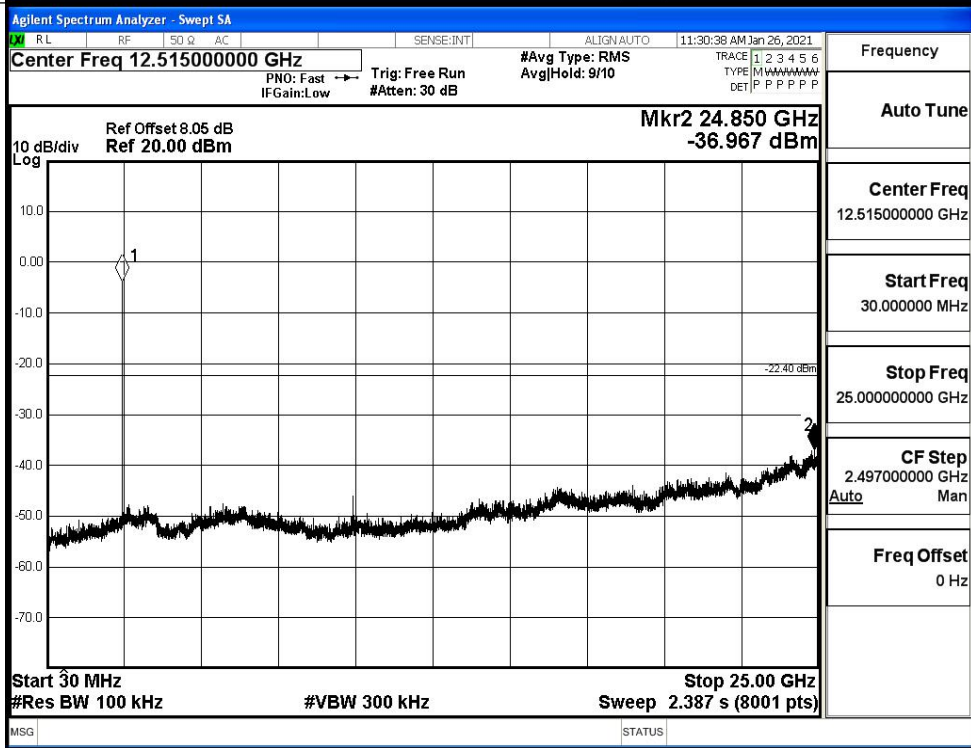


BT LE HCH Graphs

Pref/BT LE/HCH



Puw/BT LE/HCH



A.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	0.327	-49.301	-19.67	PASS
BT LE	HCH	-2.392	-49.546	-22.39	PASS

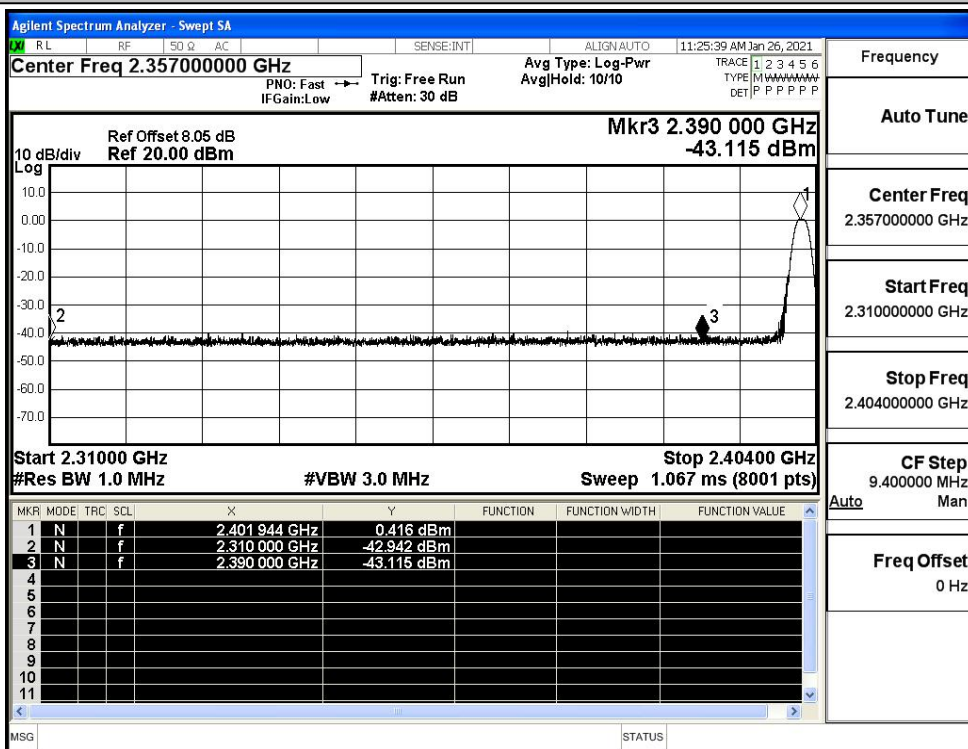
Test Graphs

LCH		<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.35700000 GHz</p> <p>Mkr4 2.375 812 GHz -49.301 dBm</p> <p>Start 2.31000 GHz Stop 2.40400 GHz</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr><td>1</td><td>N</td><td>f</td><td></td><td>2.401 791 GHz</td><td>0.327 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>f</td><td></td><td>2.400 000 GHz</td><td>-51.650 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>f</td><td></td><td>2.390 000 GHz</td><td>-52.796 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.375 812 GHz</td><td>-49.301 dBm</td><td></td><td></td><td></td></tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f		2.401 791 GHz	0.327 dBm				2	N	f		2.400 000 GHz	-51.650 dBm				3	N	f		2.390 000 GHz	-52.796 dBm				4	N	f		2.375 812 GHz	-49.301 dBm			
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HCH		<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.48900000 GHz</p> <p>Mkr4 2.492 121 25 GHz -49.546 dBm</p> <p>Start 2.47800 GHz Stop 2.50000 GHz</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr><td>1</td><td>N</td><td>f</td><td></td><td>2.479 790 25 GHz</td><td>-2.392 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>f</td><td></td><td>2.483 500 00 GHz</td><td>-52.506 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>f</td><td></td><td>2.500 000 00 GHz</td><td>-53.222 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.492 121 25 GHz</td><td>-49.546 dBm</td><td></td><td></td><td></td></tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f		2.479 790 25 GHz	-2.392 dBm				2	N	f		2.483 500 00 GHz	-52.506 dBm				3	N	f		2.500 000 00 GHz	-53.222 dBm				4	N	f		2.492 121 25 GHz	-49.546 dBm			
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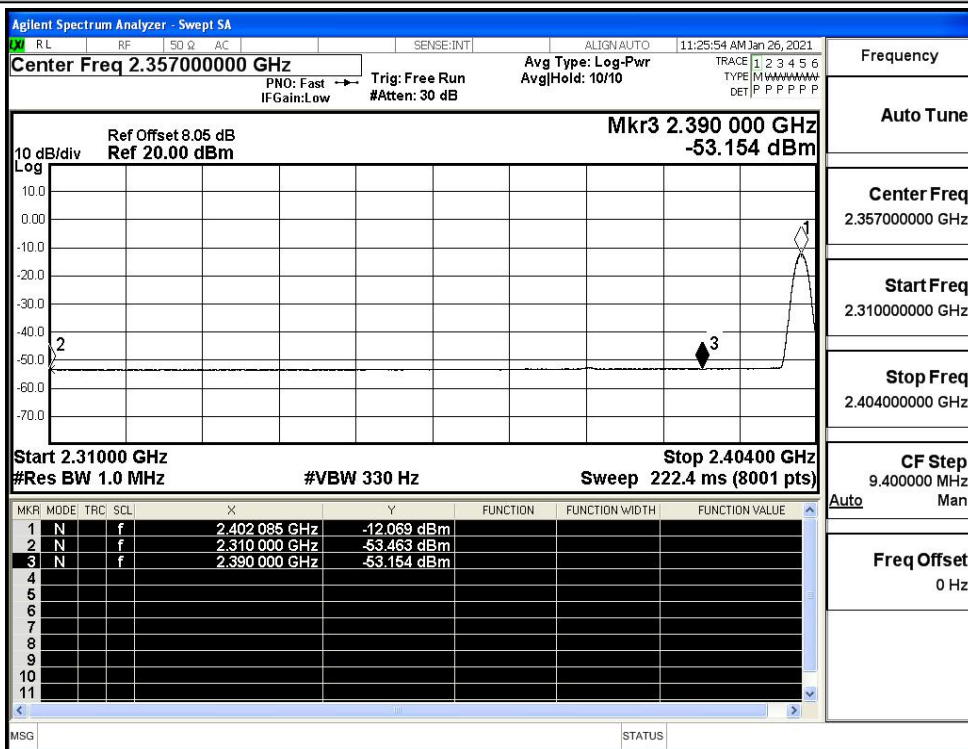
A.7 Restrict-band band-edge measurements

Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdi
BT LE	2402	Ant1	2310.0	-42.94	2.0	0	54.29	PEAK	74	PASS
		Ant1	2310.0	-53.46	2.0	0	43.77	AV	54	PASS
		Ant1	2390.0	-43.12	2.0	0	54.11	PEAK	74	PASS
		Ant1	2390.0	-53.15	2.0	0	44.08	AV	54	PASS
	2480	Ant1	2483.5	-40.90	2.0	0	56.33	PEAK	74	PASS
		Ant1	2483.5	-52.62	2.0	0	44.61	AV	54	PASS
		Ant1	2500.0	-42.52	2.0	0	54.71	PEAK	74	PASS
		Ant1	2500.0	-52.49	2.0	0	44.74	AV	54	PASS

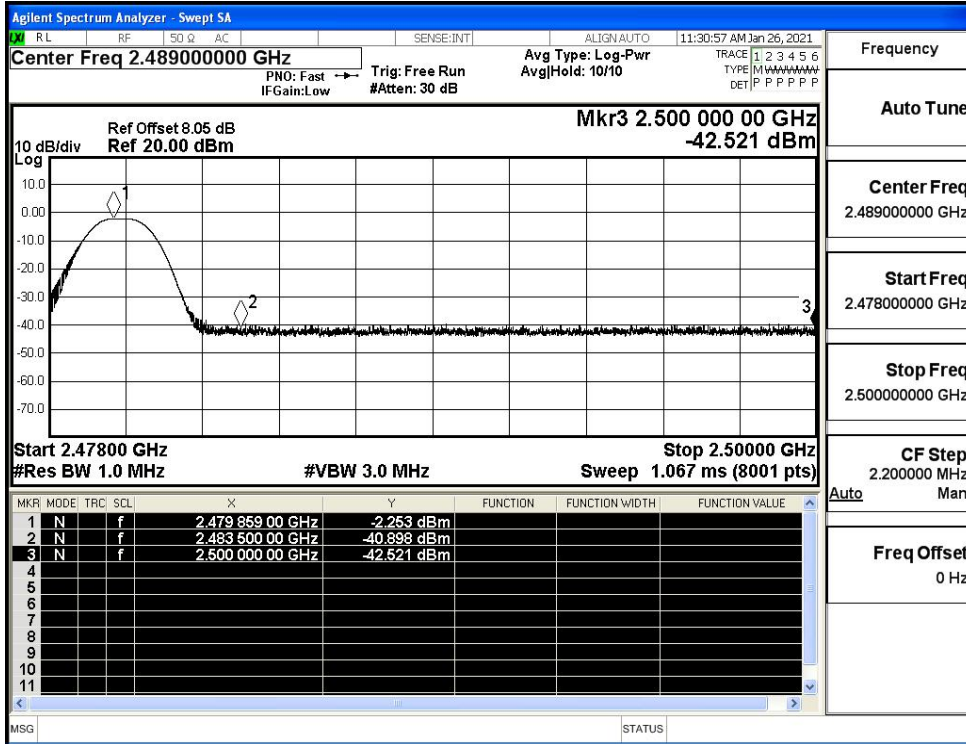
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



Restrict-band band-edge measurements_BT LE_2402_Ant1_AV



Restrict-band band-edge measurements_BT LE_2480_Ant1_PEAK



Restrict-band band-edge measurements_BT LE_2480_Ant1_AV

