Appendix A

RF Test Data for ZigBee (Conducted Measurement)

Product Name: Register

Trade Mark: Smart Forced Air

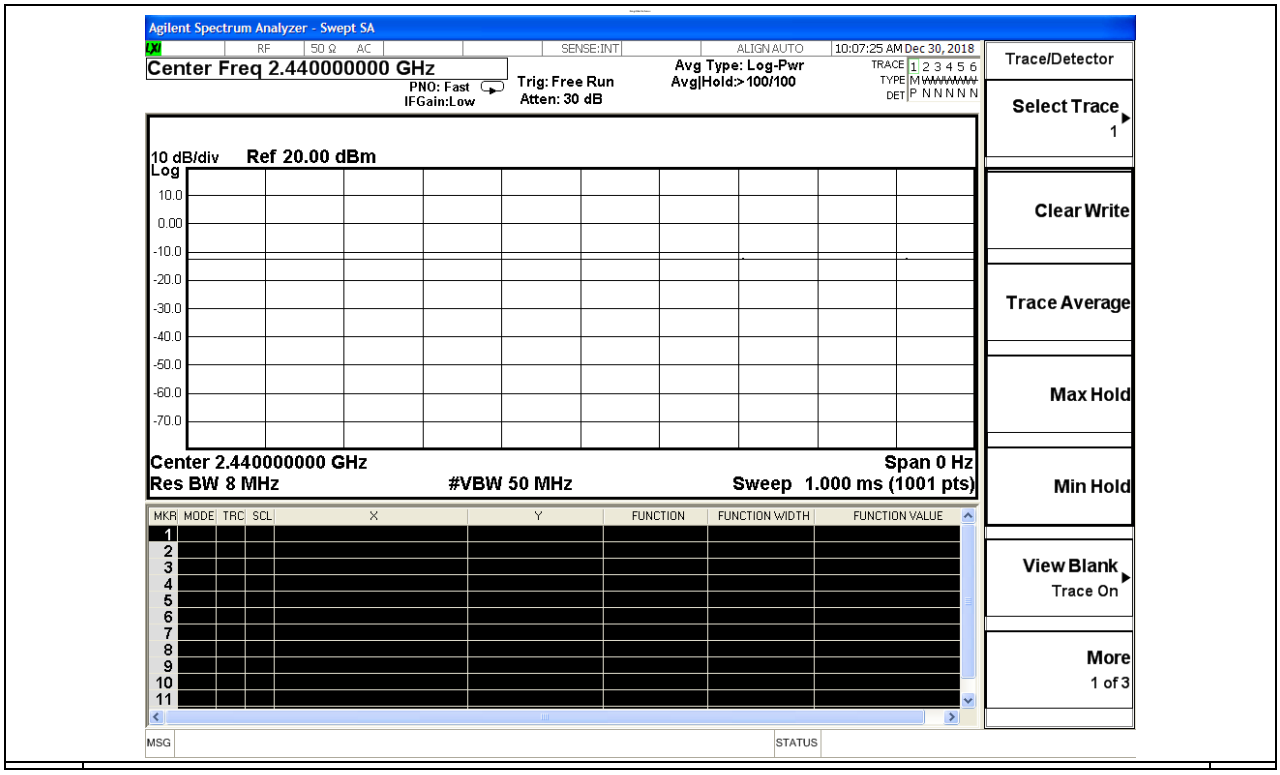
Test Model: Register

Environmental Conditions

Temperature:	23.8 ° C
Relative Humidity:	54.2%
ATM Pressure:	100.0 kPa
Test Engineer:	David Luo
Supervised by:	Jayden.Zhuo

A.1 Duty Cycle

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

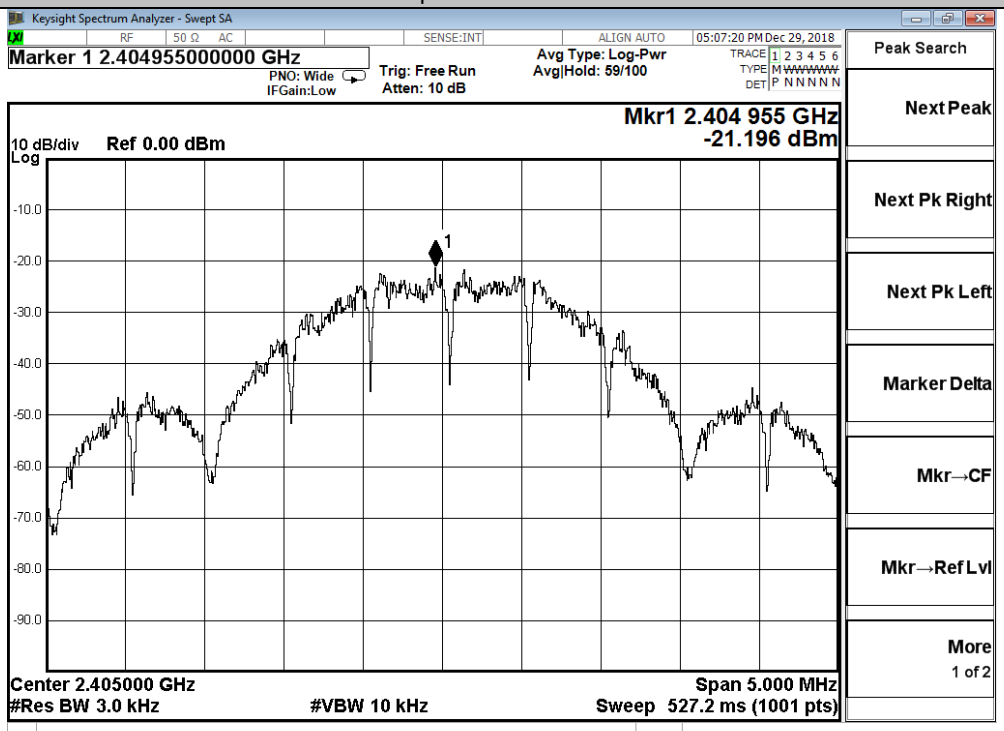
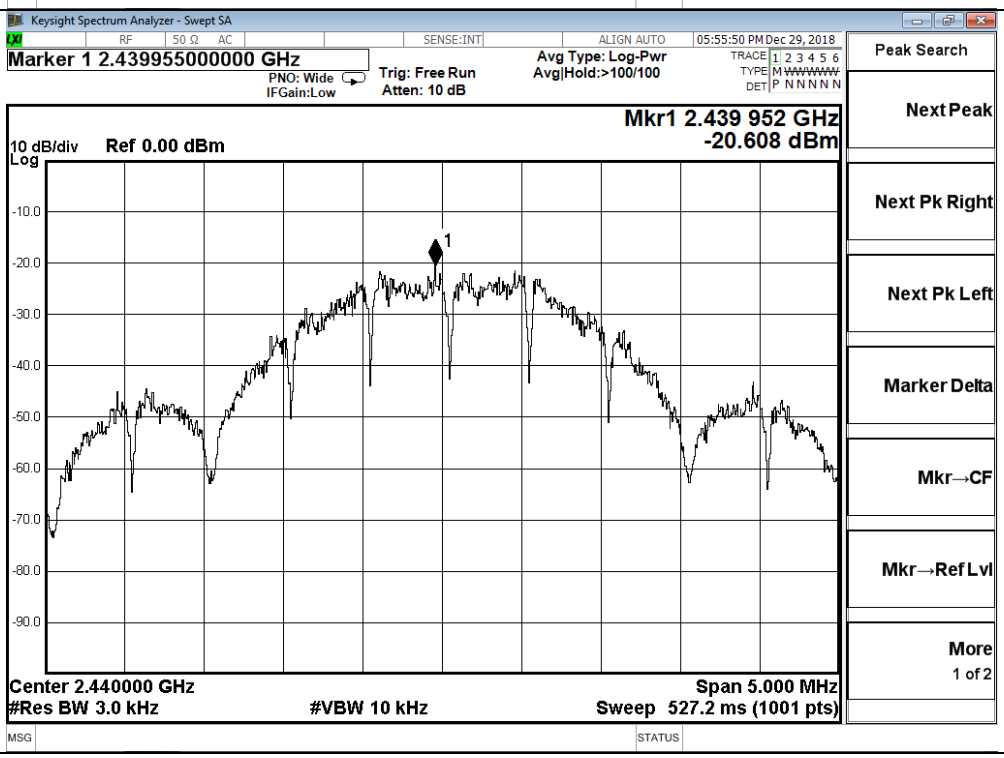


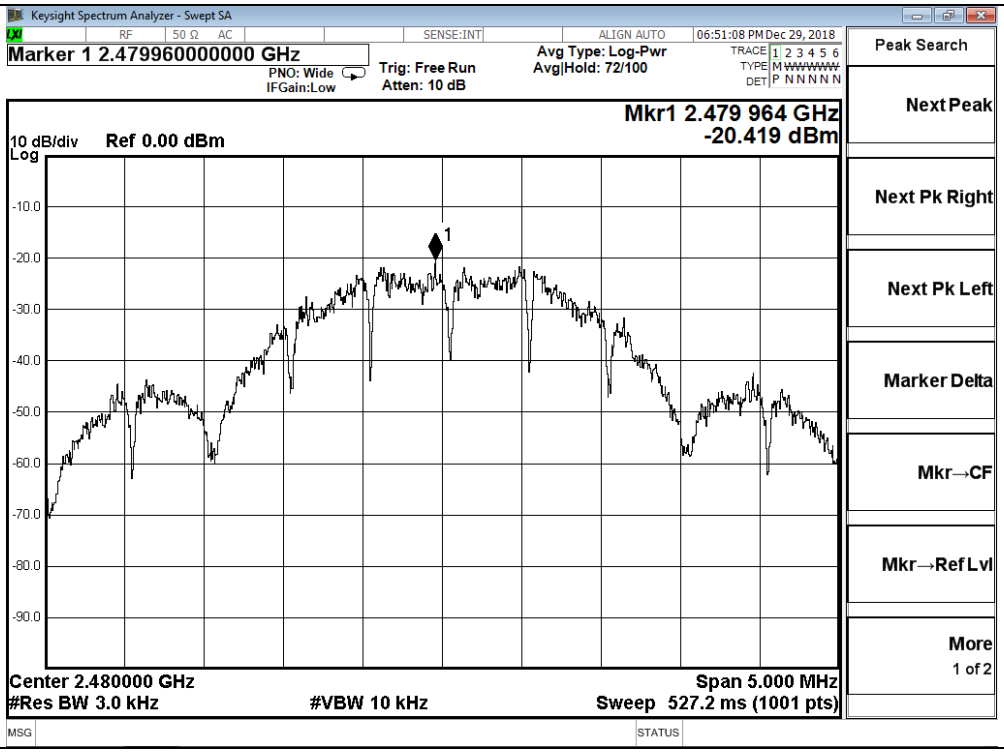
A.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
ZigBee	LCH	-5.253	30	PASS
ZigBee	MCH	-5.038	30	PASS
ZigBee	HCH	-4.804	30	PASS

A.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
ZigBee	LCH	-21.196	8	PASS
ZigBee	MCH	-20.608	8	PASS
ZigBee	HCH	-20.419	8	PASS

Test Graphs	
LCH	
MCH	

HCH	

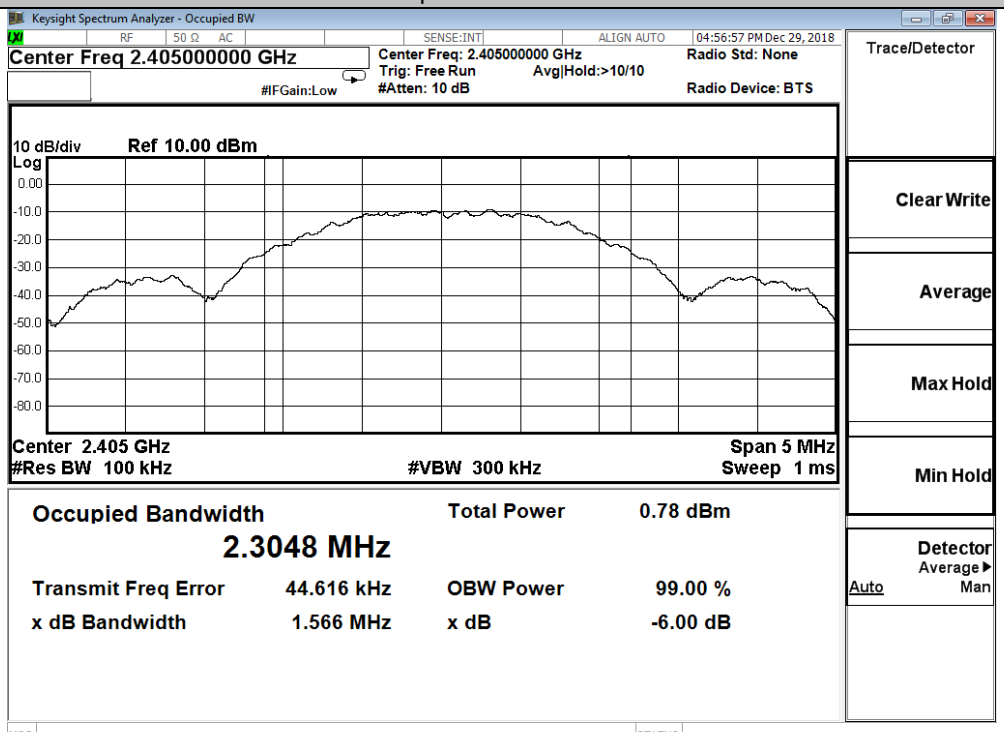
Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
06:51:08 PM Dec 29, 2018
Marker 1 2.479960000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 72/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 2.479 964 GHz
-20.419 dBm
10 dB/div
Log
Ref 0.00 dBm
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
Center 2.480000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 5.000 MHz
Sweep 527.2 ms (1001 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

A.4 6dB Bandwidth

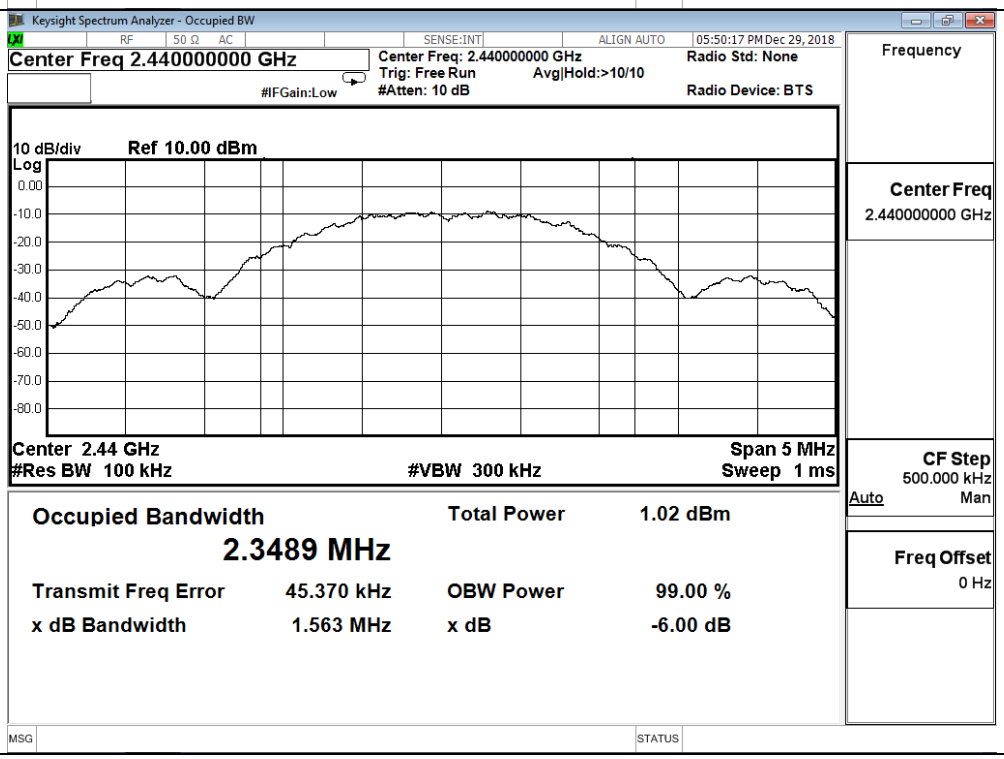
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
ZigBee	LCH	1.566	≥0.5	PASS
ZigBee	MCH	1.563	≥0.5	PASS
ZigBee	HCH	1.596	≥0.5	PASS

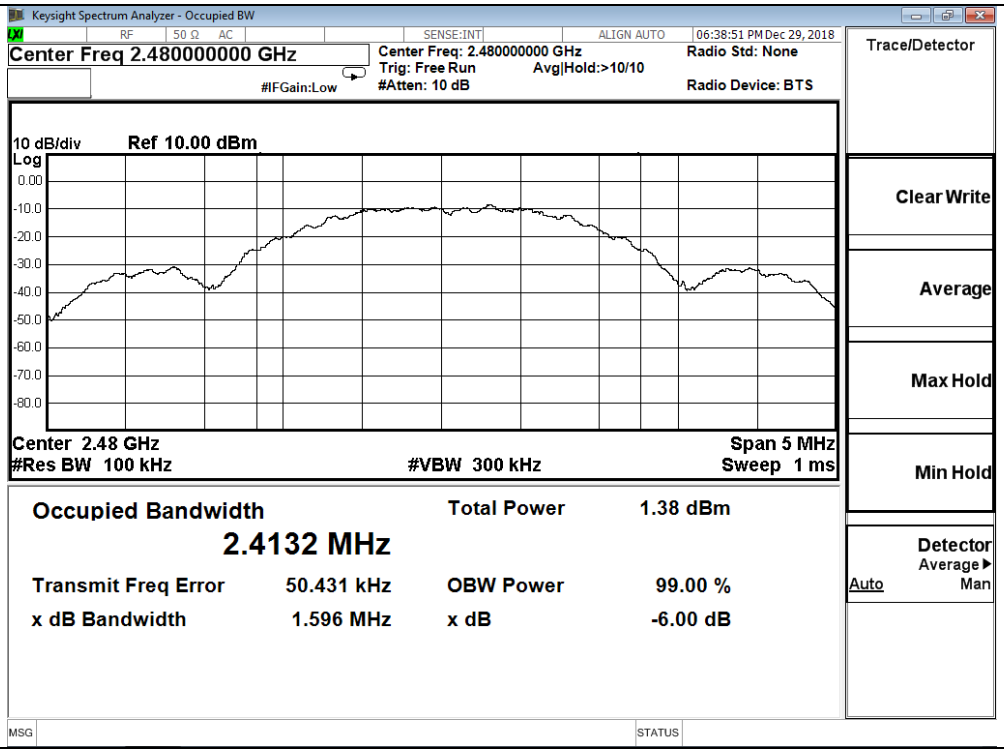
Test Graphs

LCH



MCH

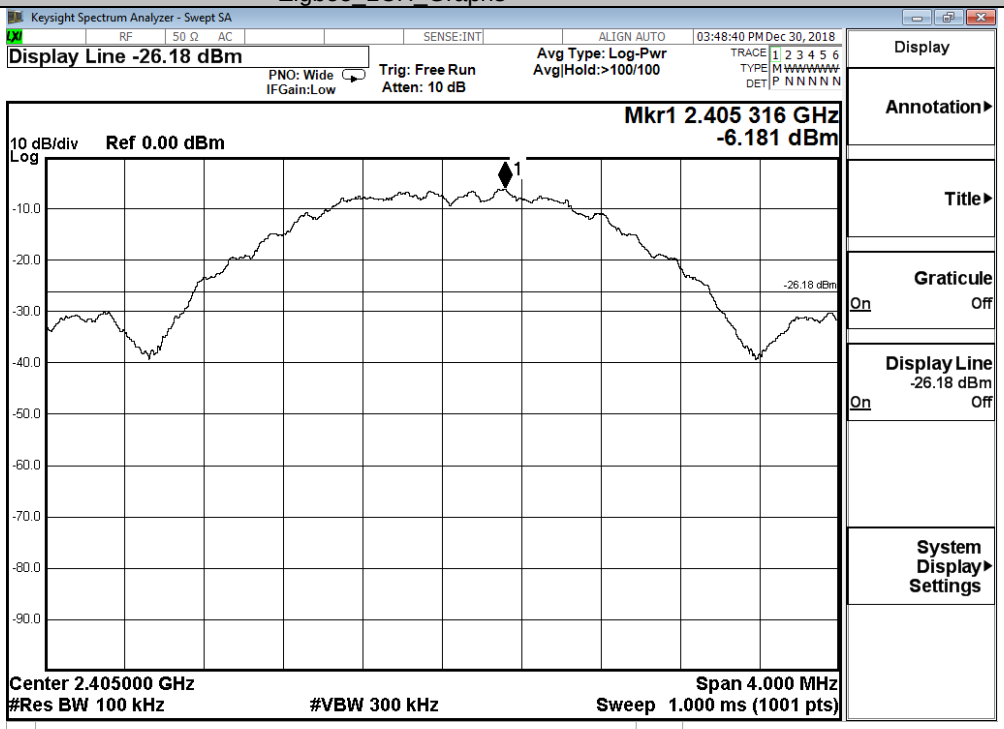
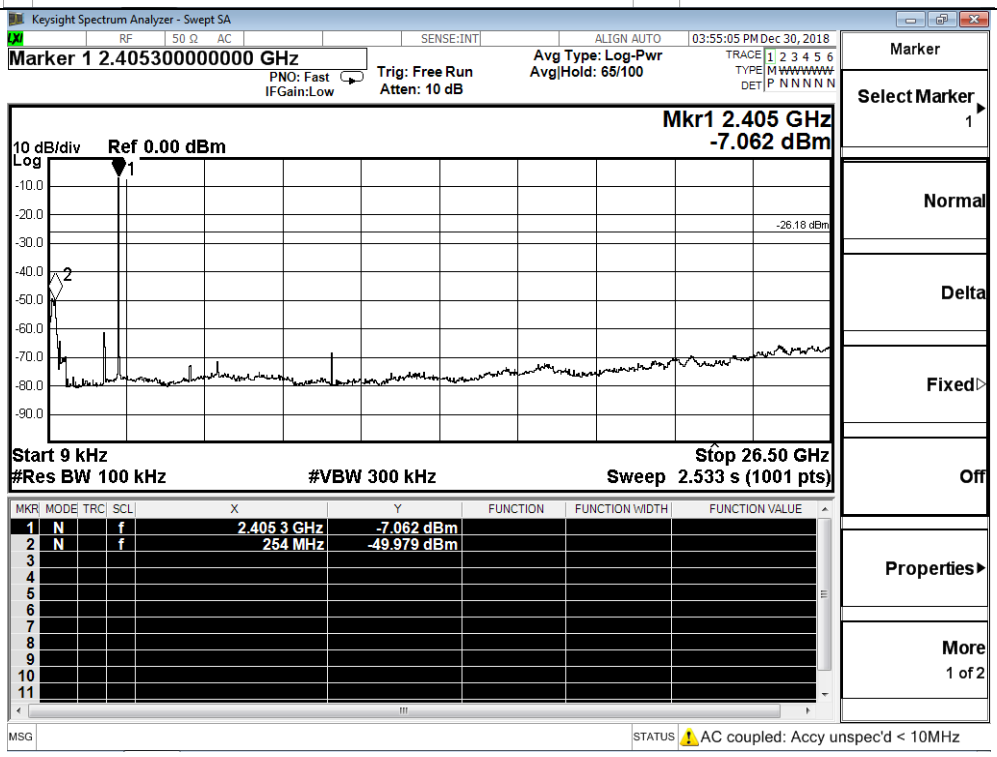


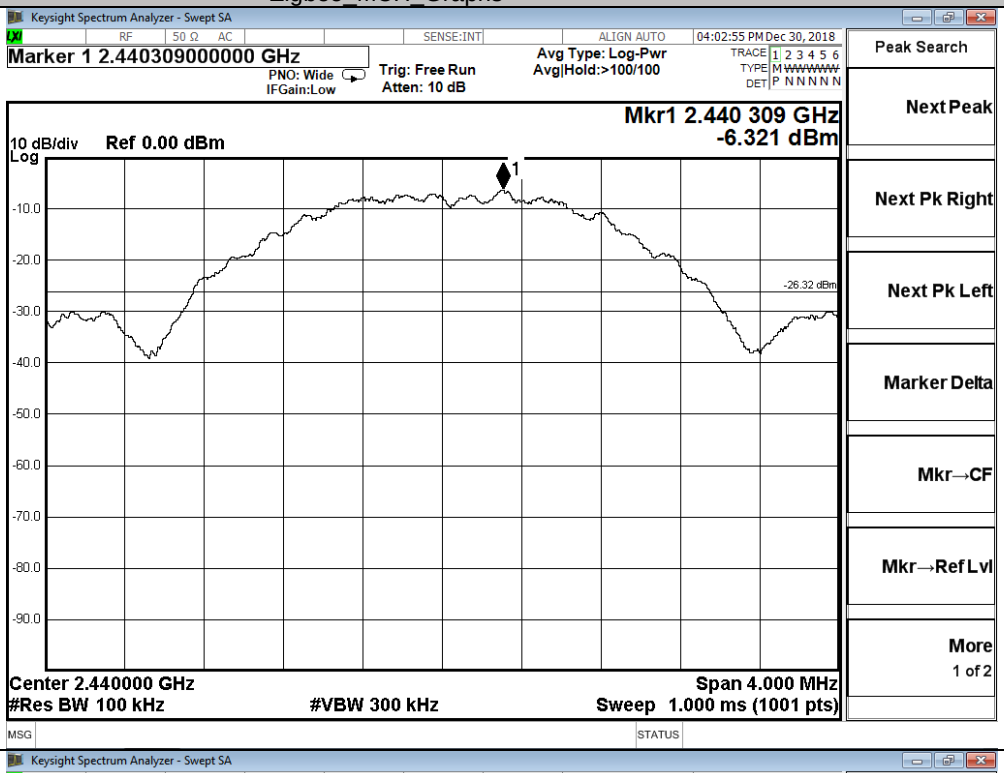
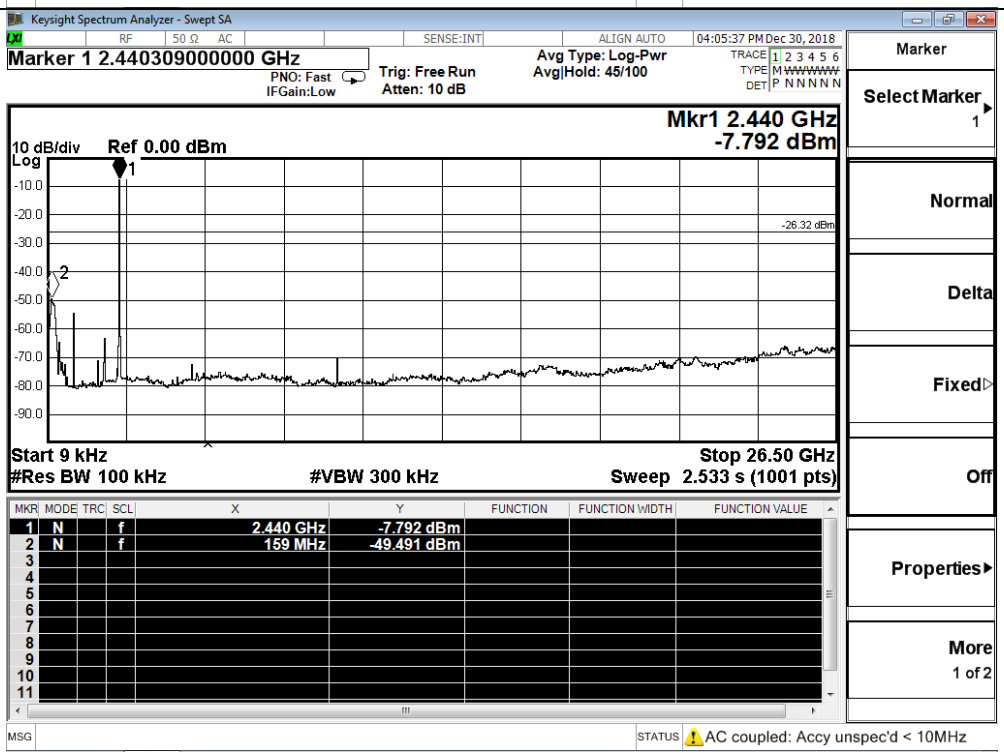
HCH	

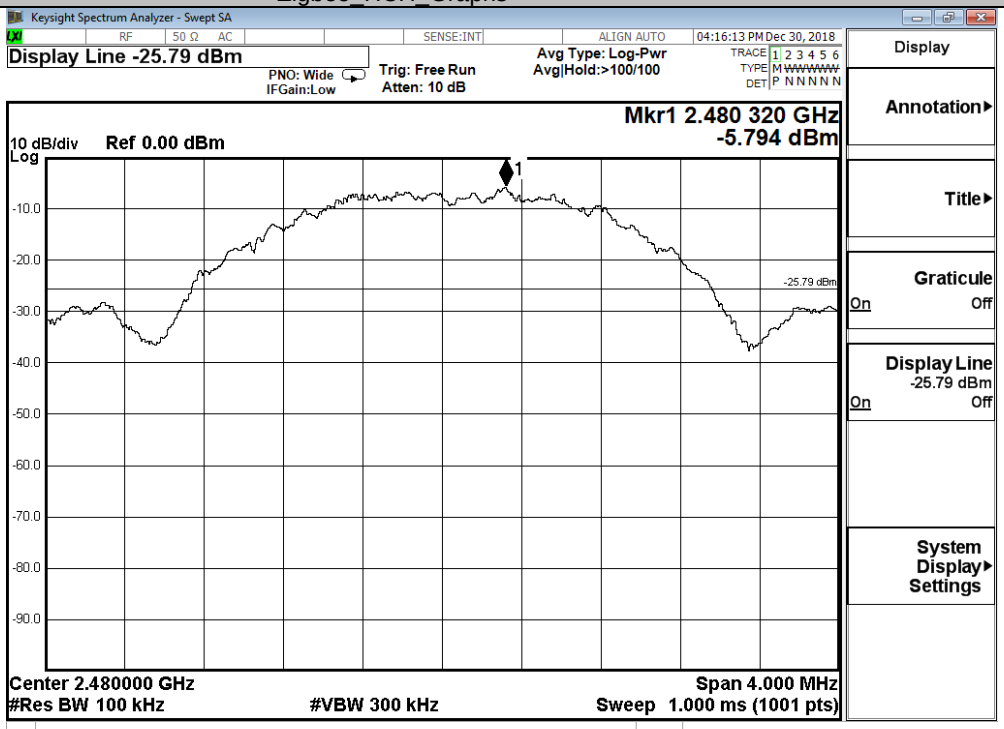
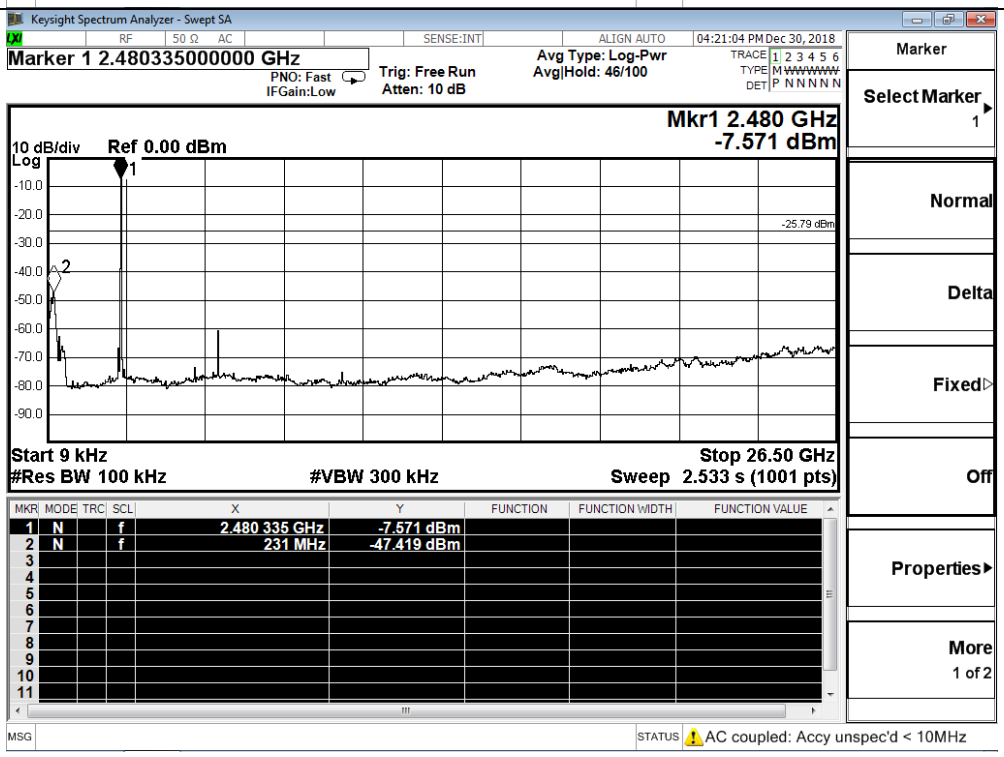
Keysight Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
06:38:51 PM Dec 29, 2018
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 5 MHz
Sweep 1 ms
Occupied Bandwidth
2.4132 MHz
Total Power 1.38 dBm
Transmit Freq Error 50.431 kHz
OBW Power 99.00 %
x dB Bandwidth 1.596 MHz
x dB -6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Average
Auto
Man
MSG
STATUS

A.5 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
ZigBee	LCH	-6.181	-49.979	-26.181	PASS
ZigBee	MCH	-6.321	-49.491	-26.321	PASS
ZigBee	HCH	-5.794	-47.419	-25.794	PASS

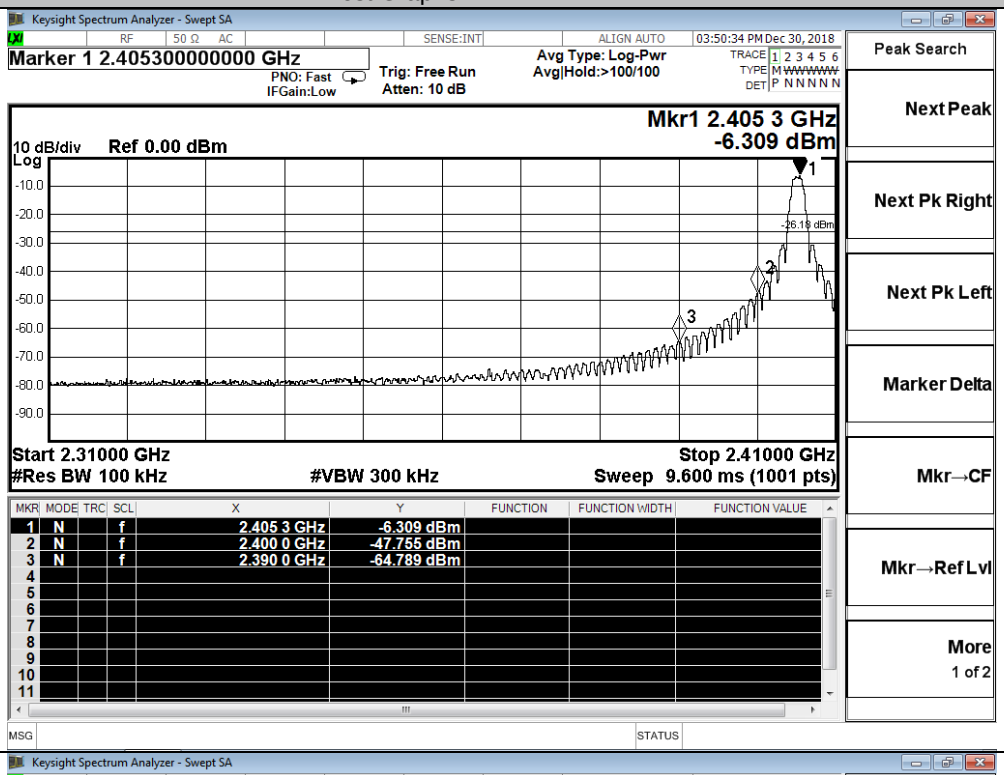
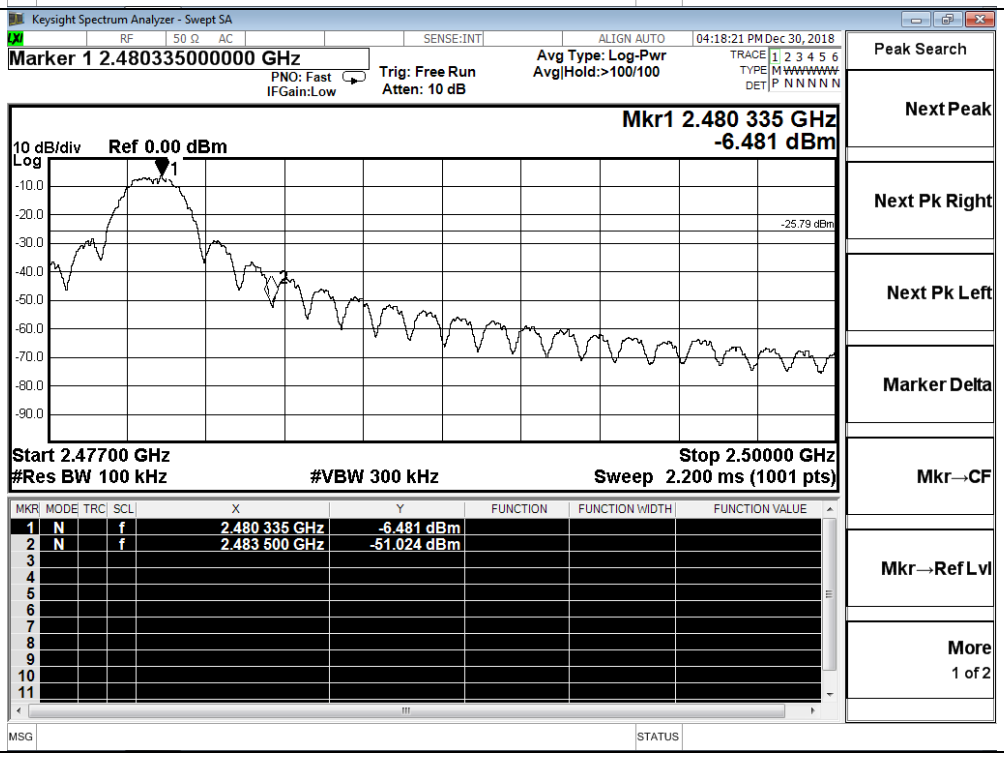
Zigbee_LCH_Graphs	
Pref/ZigBee/LCH	
Puw/ZigBee/LCH	

Zigbee_MCH_Graphs	
Pref/ZigBee/MCH	
Puw/ZigBee/MCH	

Zigbee_HCH_Graphs	
Pref/ZigBee/HCH	
Puw/ZigBee/HCH	

A.6 Band-edge for RF Conducted Emissions

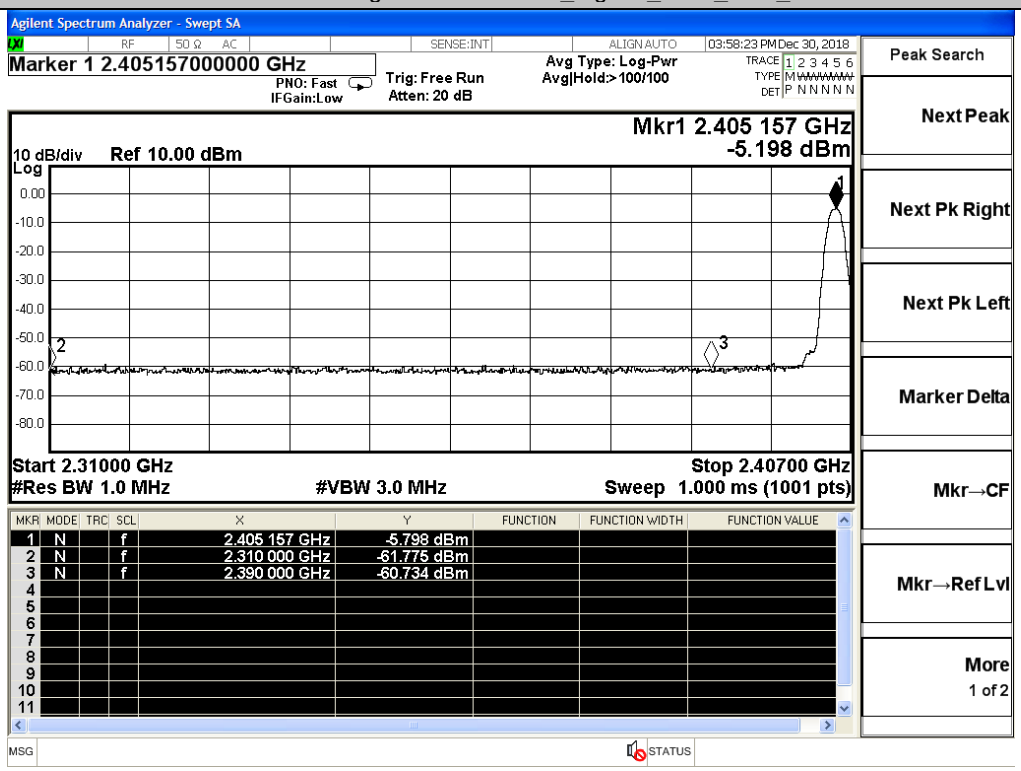
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
ZigBee	LCH	-6.309	-47.755	-26.181	PASS
ZigBee	HCH	-6.481	-51.024	-25.794	PASS

Test Graphs	
LCH	
HCH	

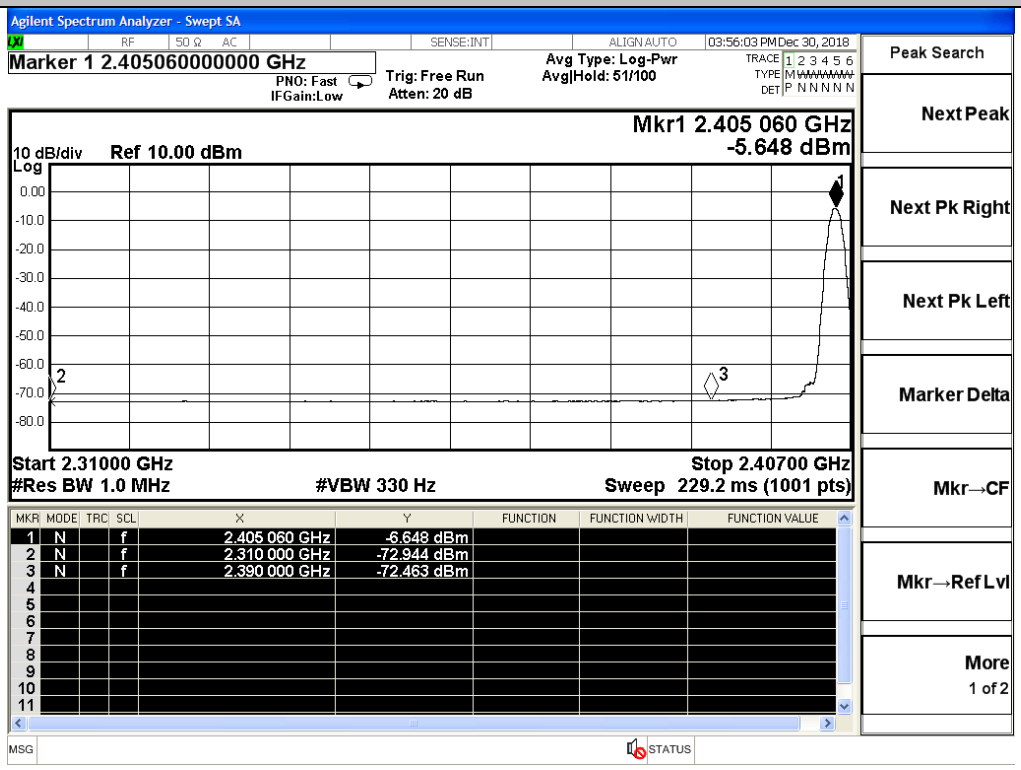
A.7 Restrict-band band-edge measurements

Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
ZigBee	2405	Ant1	2310.0	-61.775	2.0	0	33.455	PEAK	74	PASS
		Ant1	2310.0	-72.944	2.0	0	22.286	AV	54	PASS
		Ant1	2390.0	-60.734	2.0	0	34.496	PEAK	74	PASS
		Ant1	2390.0	-72.463	2.0	0	22.767	AV	54	PASS
	2480	Ant1	2483.5	-58.561	2.0	0	36.669	PEAK	74	PASS
		Ant1	2483.5	-70.231	2.0	0	24.999	AV	54	PASS
		Ant1	2500.0	-60.306	2.0	0	34.924	PEAK	74	PASS
		Ant1	2500.0	-72.374	2.0	0	22.856	AV	54	PASS

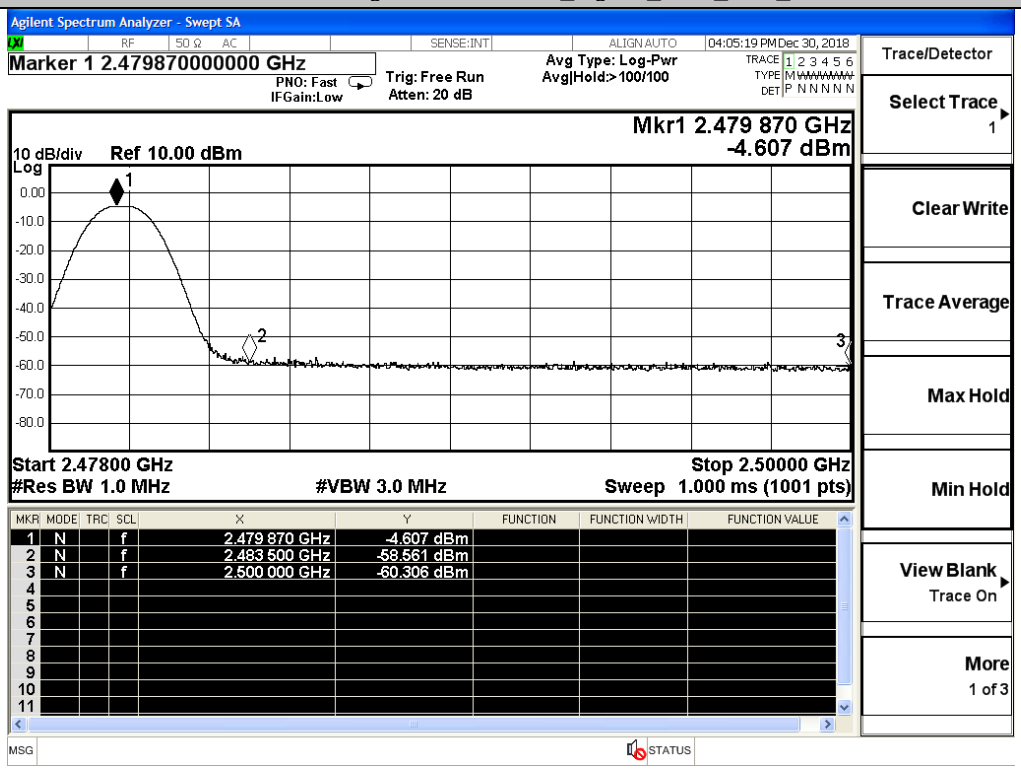
Restrict-band band-edge measurements_Zigbee_2405_Ant1_PEAK



Restrict-band band-edge measurements_Zigbee_2405_Ant1_AV



Restrict-band band-edge measurements_Zigbee_2480_Ant1_PEAK



Restrict-band band-edge measurements_Zigbee_2480_Ant1_AV