Appendix B

RF Test Data for BT V5.0 (BDR/EDR) (Conducted Measurement)

Product Name: VIM3

Trade Mark: Khadas

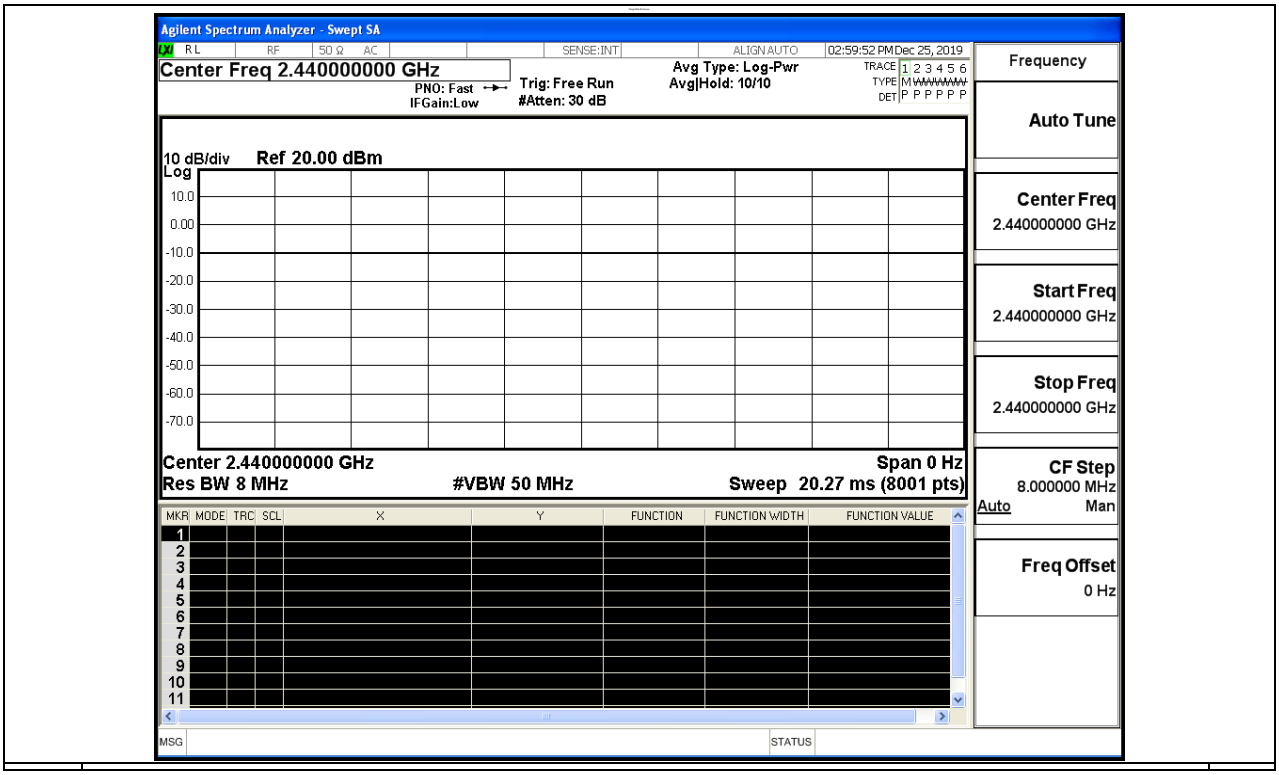
Test Model: VIM3 Pro

Environmental Conditions

Temperature:	23.8 °C
Relative Humidity:	53.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Qu Xin
Supervised by:	Wang Chuang

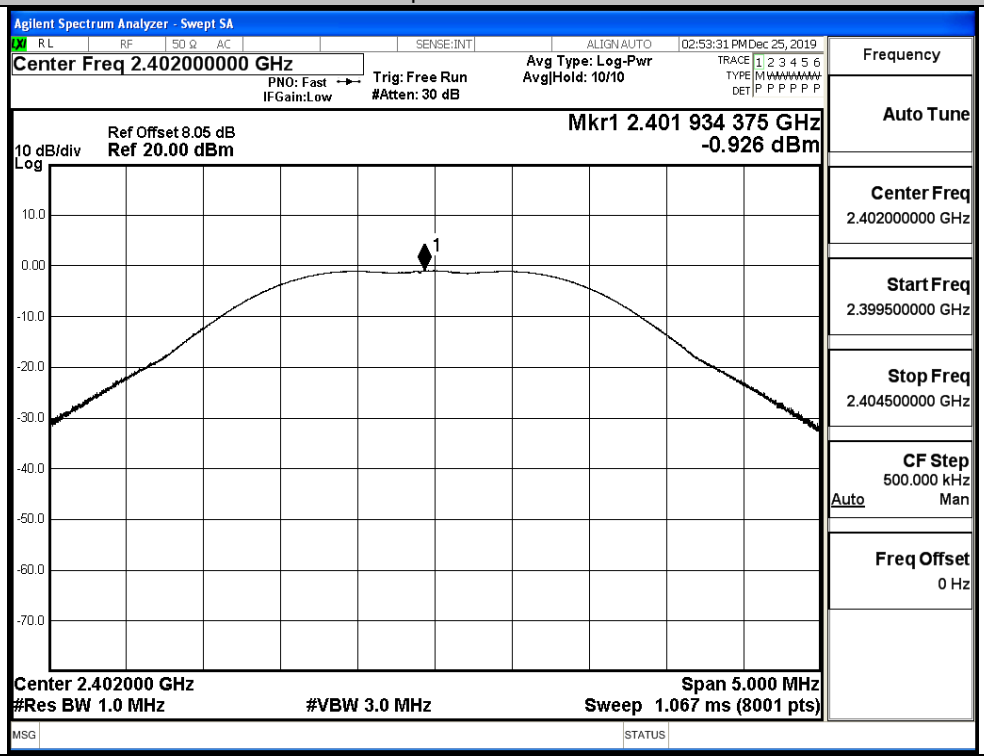
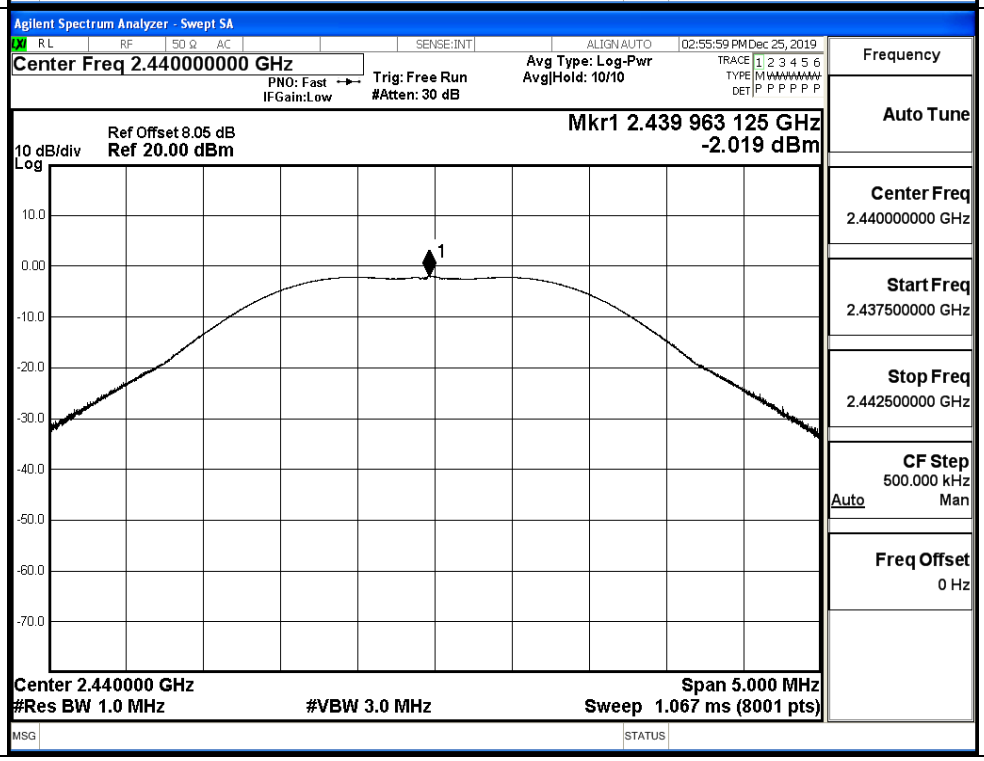
B.1 Duty Cycle

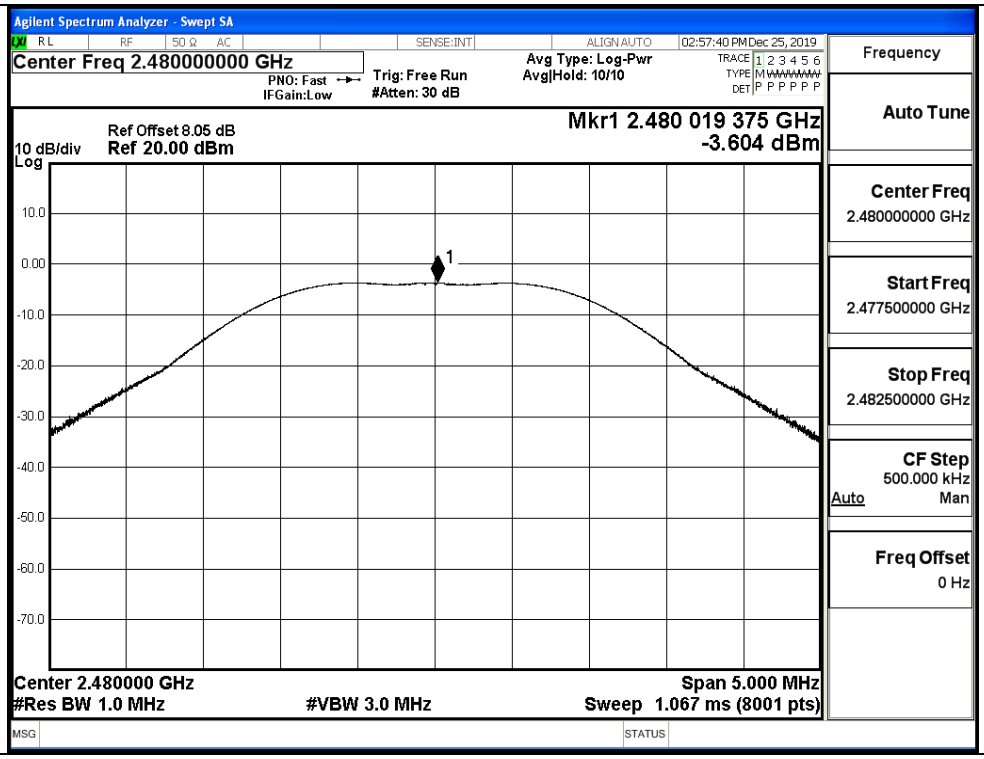
Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100	PASS



B.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
BT LE	LCH	-0.926	30	PASS
BT LE	MCH	-2.019	30	PASS
BT LE	HCH	-3.604	30	PASS

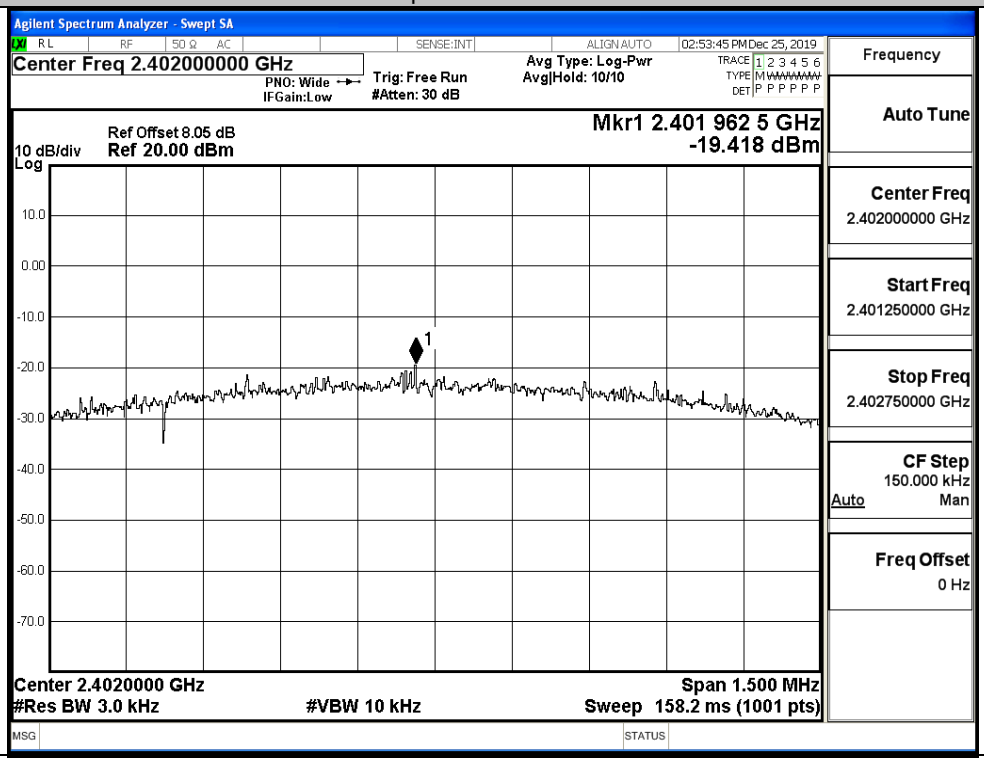
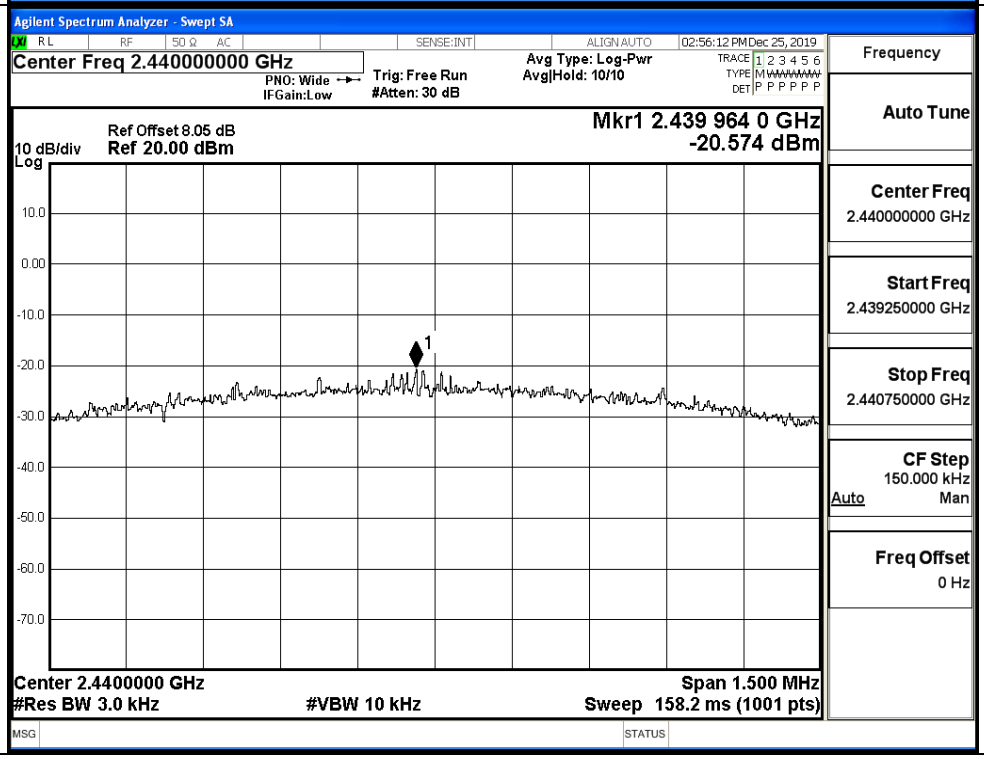
Test Graphs		
LCH		
MCH		

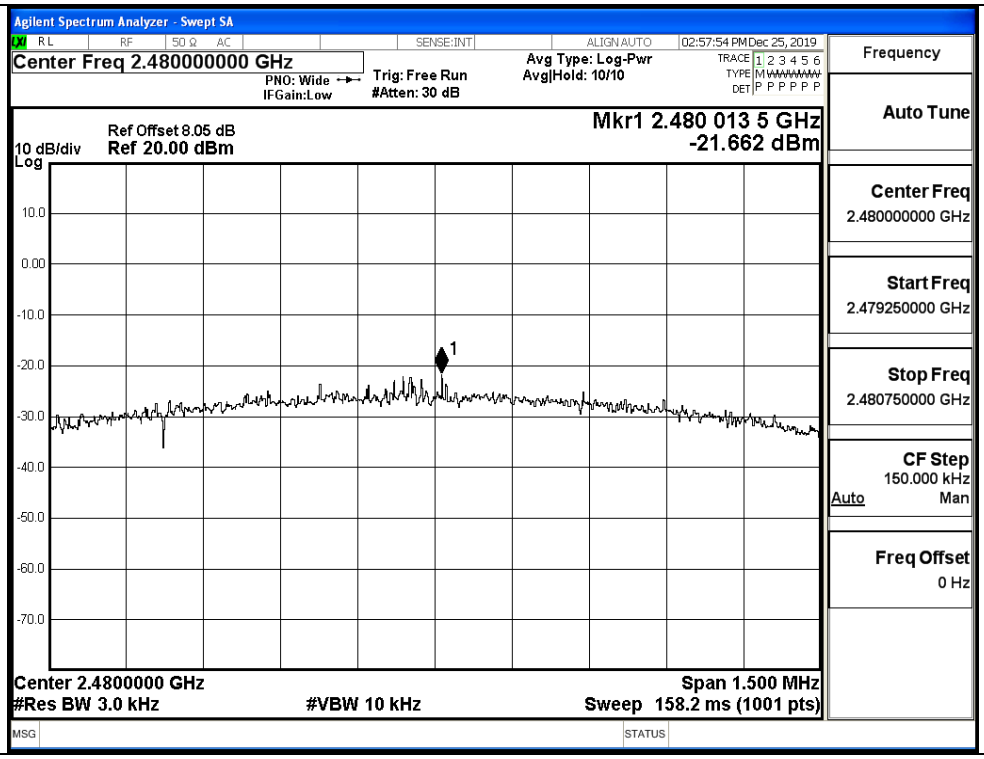
HCH		

Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
02:57:40 PM Dec 25, 2019
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
TRACE 1 2 3 4 5 6
TYPE M
DET P P P P P P
Ref Offset 8.05 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.480 019 375 GHz
-3.604 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 2.480000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 5.000 MHz
Sweep 1.067 ms (8001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.477500000 GHz
Stop Freq
2.482500000 GHz
CF Step
500.000 kHz
Auto
Man
Freq Offset
0 Hz

B.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
BT LE	LCH	-19.418	8	PASS
BT LE	MCH	-20.574	8	PASS
BT LE	HCH	-21.662	8	PASS

Test Graphs		
LCH		
MCH		

HCH		

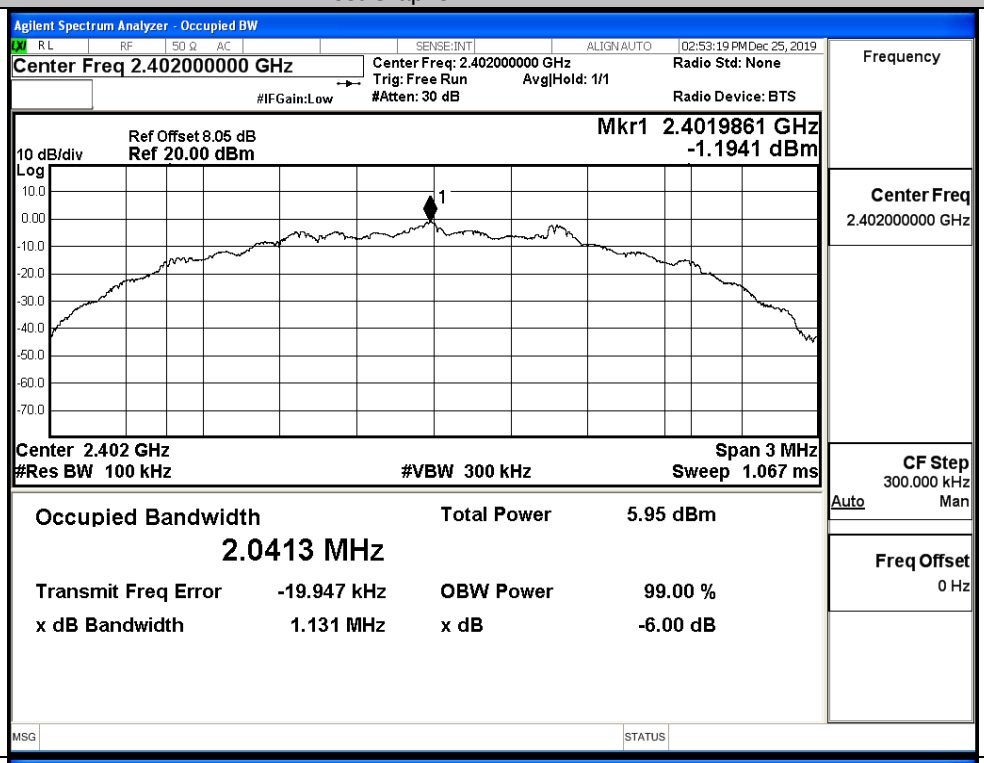
Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
02:57:54 PM Dec 25, 2019
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
TRACE 1 2 3 4 5 6
TYPE M
DET P P P P P
Ref Offset 8.05 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.480 013 5 GHz
-21.662 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 2.4800000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1.500 MHz
Sweep 158.2 ms (1001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479250000 GHz
Stop Freq
2.480750000 GHz
CF Step
150.000 kHz
Auto
Man
Freq Offset
0 Hz

B.4 6dB Bandwidth

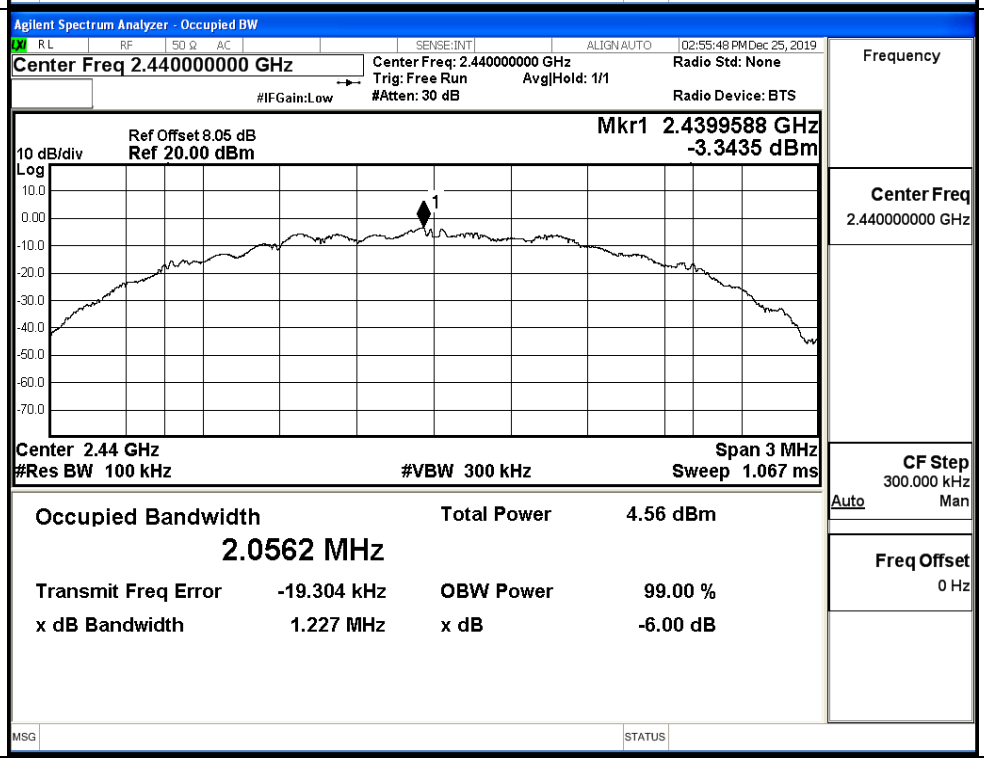
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
BT LE	LCH	1.131	⩾0.5	PASS
BT LE	MCH	1.227	⩾0.5	PASS
BT LE	HCH	1.133	⩾0.5	PASS

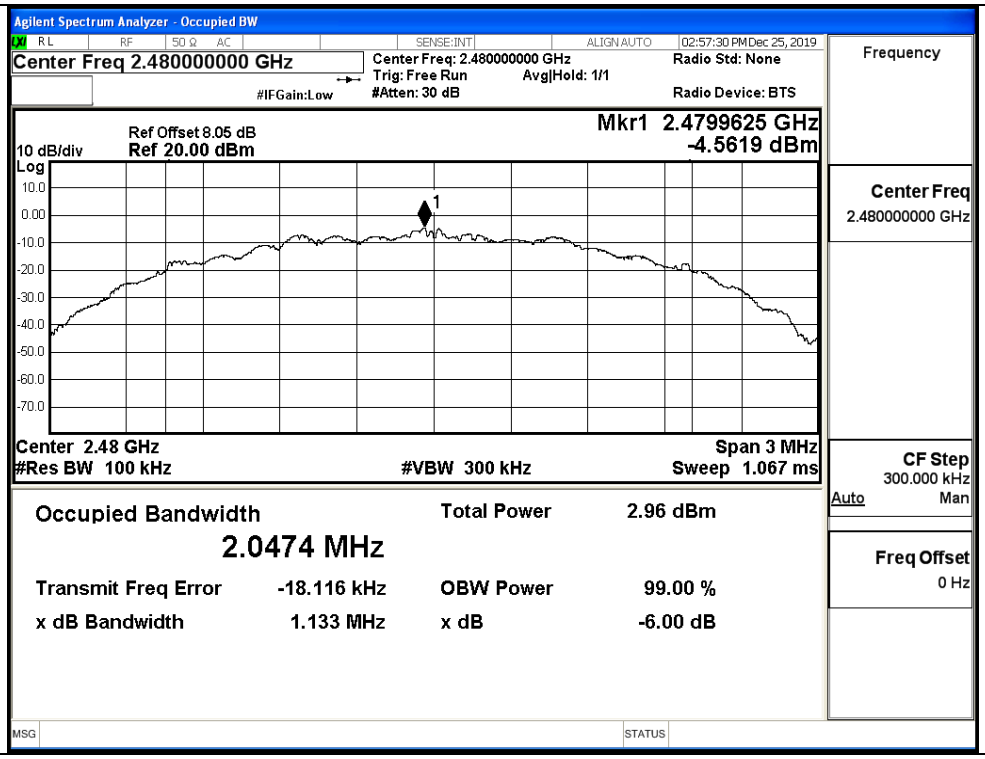
Test Graphs

LCH



MCH

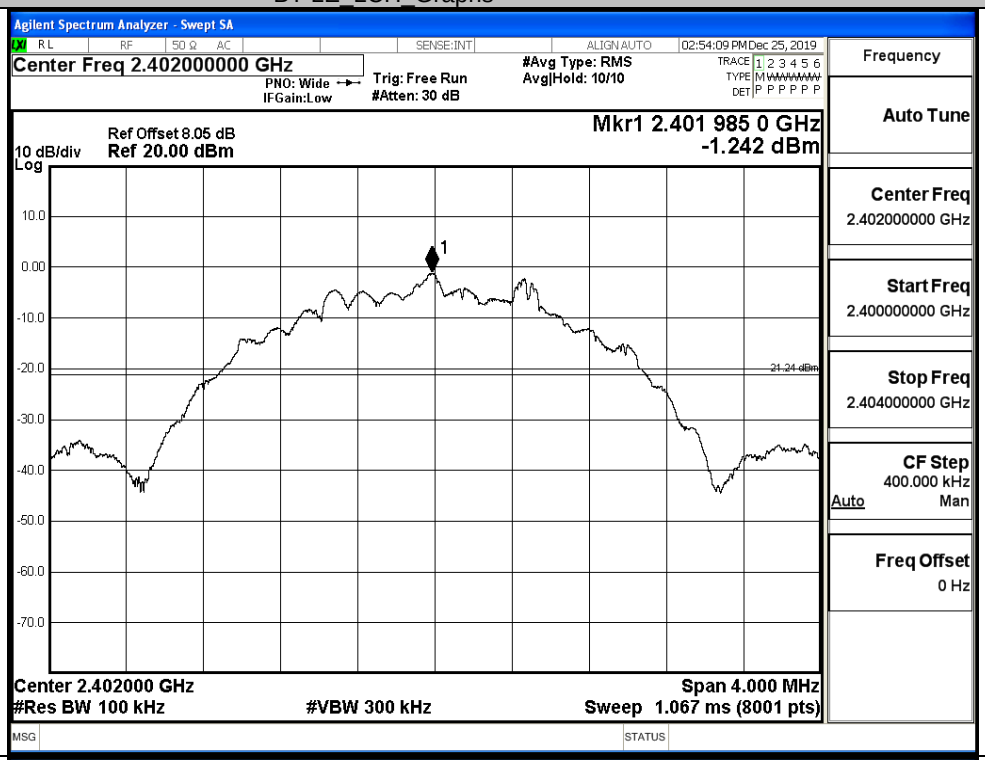
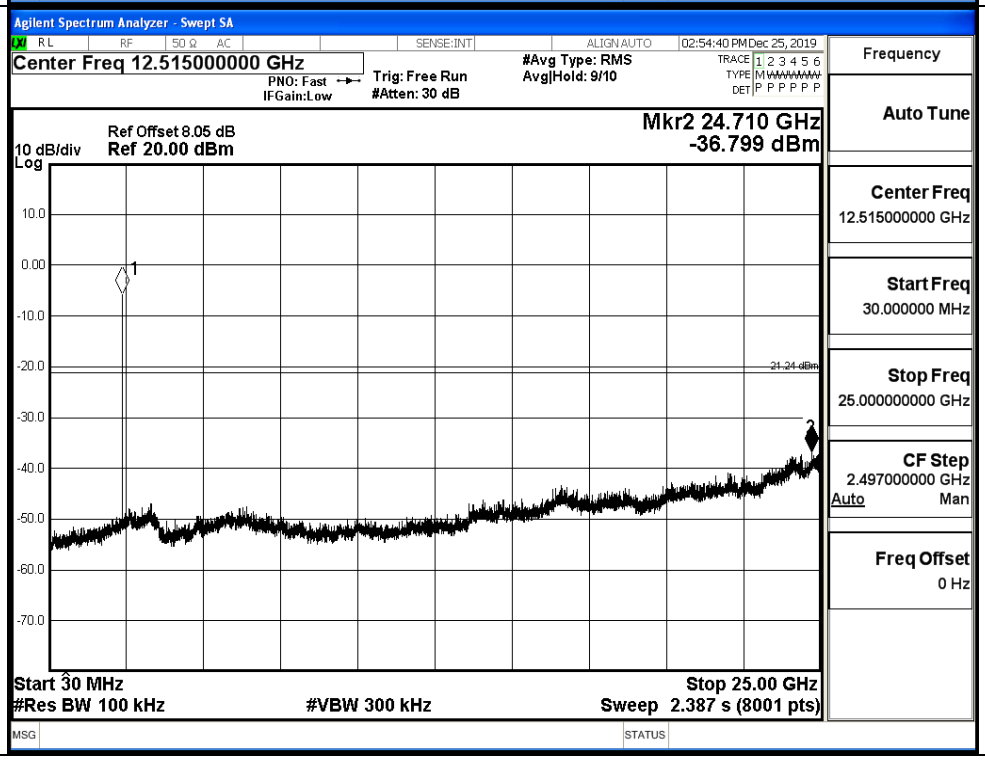


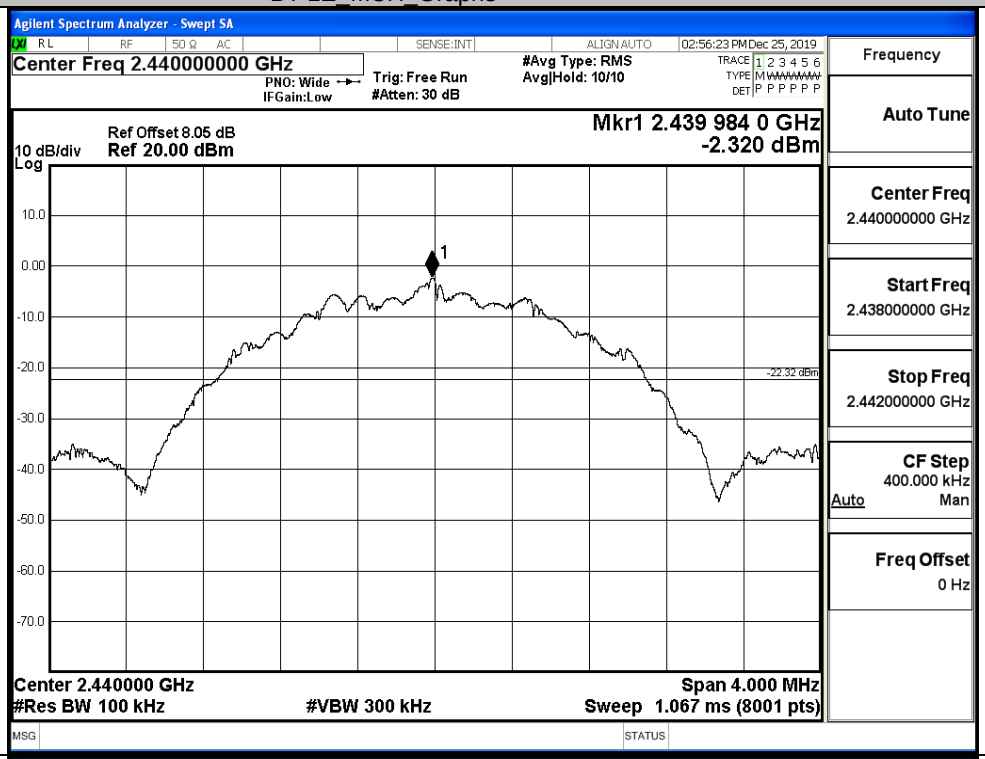
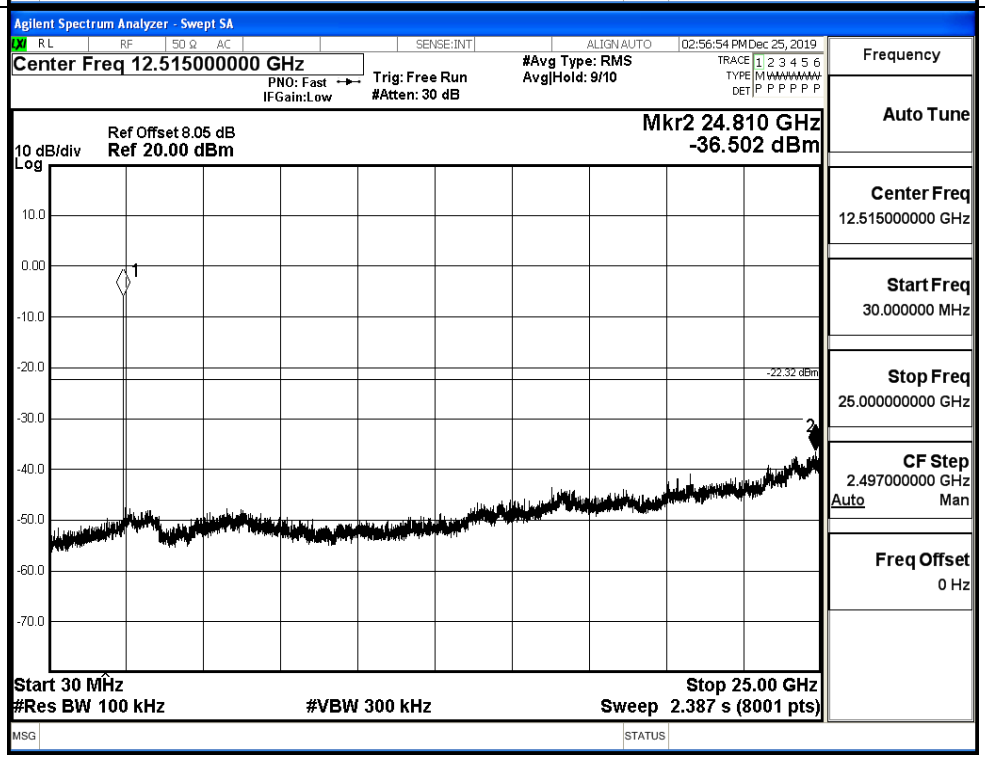
HCH		

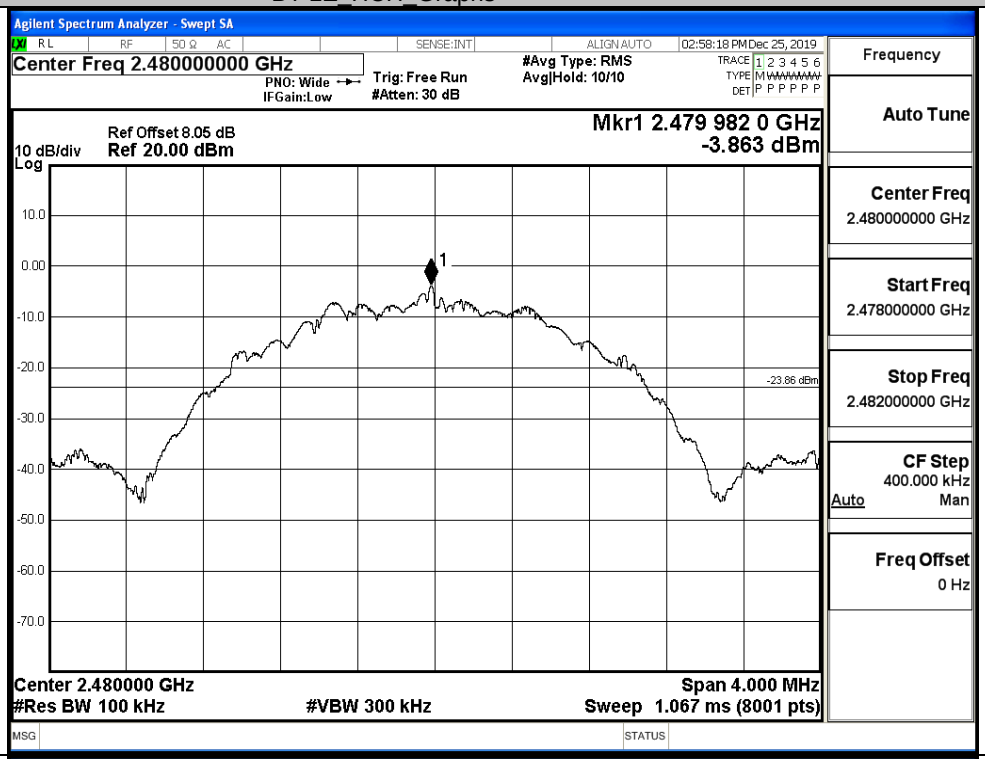
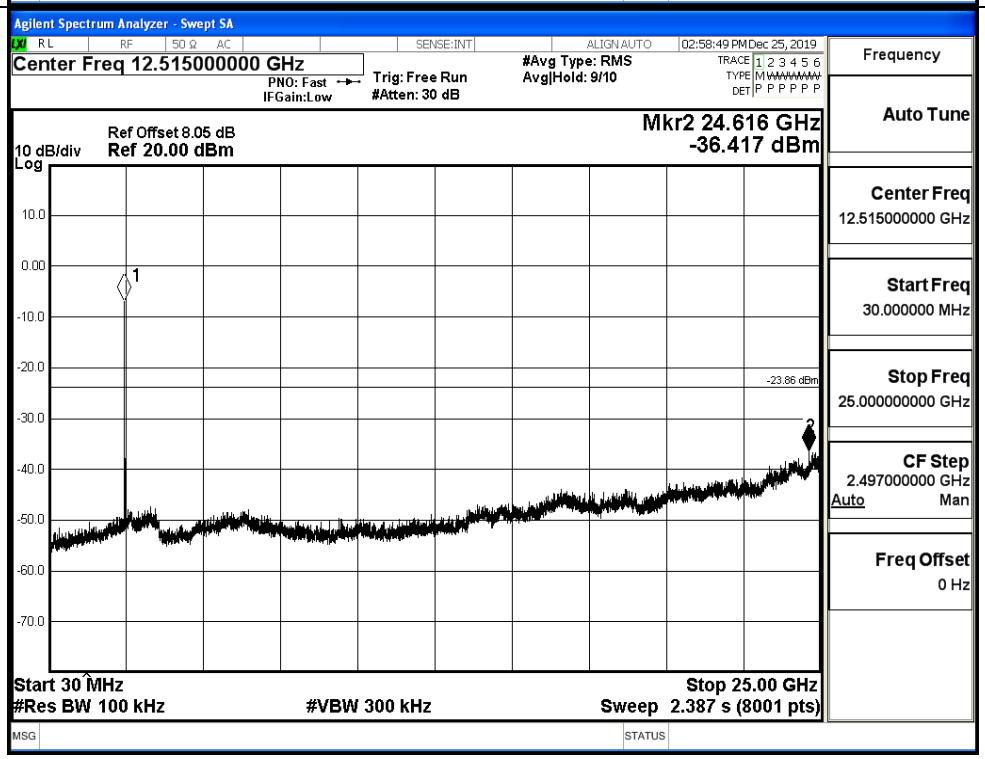
Agilent Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
02:57:30 PM Dec 25, 2019
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 1/1
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.4799625 GHz
-4.5619 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1.067 ms
Occupied Bandwidth
2.0474 MHz
Total Power 2.96 dBm
Transmit Freq Error -18.116 kHz
OBW Power 99.00 %
x dB Bandwidth 1.133 MHz
x dB -6.00 dB
MSG
STATUS
Frequency
Center Freq
2.480000000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz

B.5 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-1.242	-36.799	-21.242	PASS
BT LE	MCH	-2.32	-36.502	-22.320	PASS
BT LE	HCH	-3.863	-36.417	-23.863	PASS

BT LE_LCH_Graphs		
Pref/BT LE/LCH		
Puw/BT LE/LCH		

BT LE_MCH_Graphs	
Pref/BT LE/MCH	
Puw/BT LE/MCH	

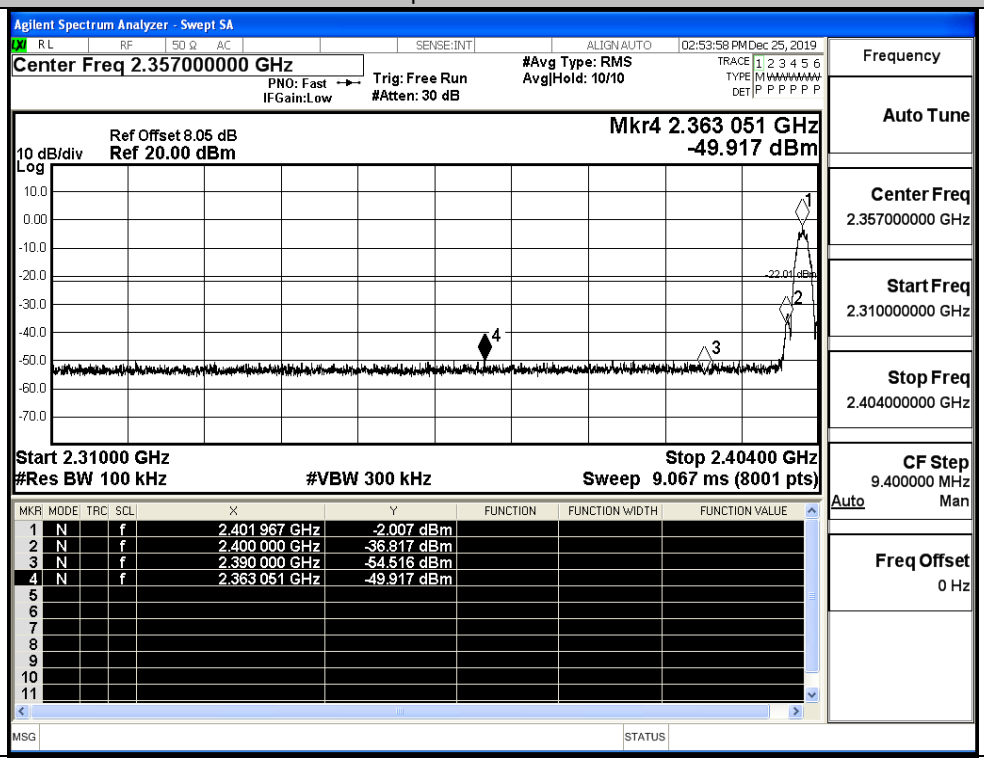
BT LE_HCH_Graphs	
Pref/BT LE/HCH	
Puw/BT LE/HCH	

B.6 Band-edge for RF Conducted Emissions

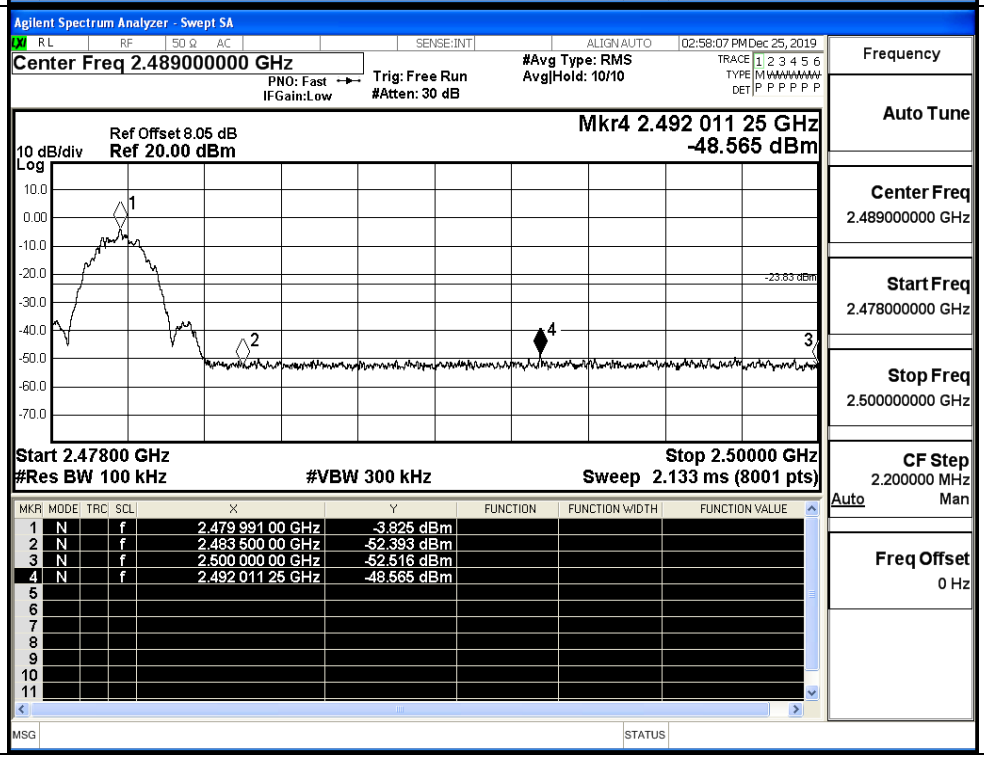
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BT LE	LCH	-2.007	-49.917	-22.01	PASS
BT LE	HCH	-3.825	-48.565	-23.83	PASS

Test Graphs

LCH



HCH



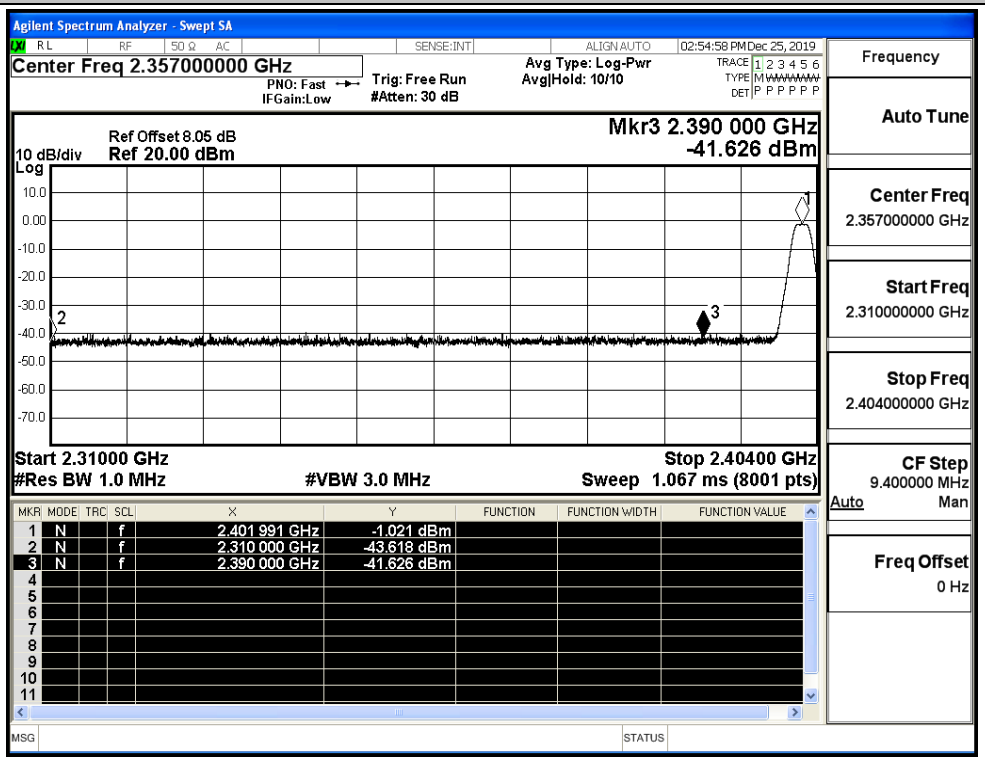
B.7 Restrict-band band-edge measurements

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	-43.62	-3.7	0	53.64	PEAK	74	PASS
		Ant1	2310.0	-53.34	-3.7	0	43.92	AV	54	PASS
		Ant1	2390.0	-41.63	-3.7	0	55.63	PEAK	74	PASS
		Ant1	2390.0	-52.96	-3.7	0	44.30	AV	54	PASS
	2480	Ant1	2483.5	-41.03	-3.7	0	56.23	PEAK	74	PASS
		Ant1	2483.5	-52.14	-3.7	0	45.12	AV	54	PASS
		Ant1	2500.0	-42.89	-3.7	0	54.37	PEAK	74	PASS
		Ant1	2500.0	-52.35	-3.7	0	44.91	AV	54	PASS

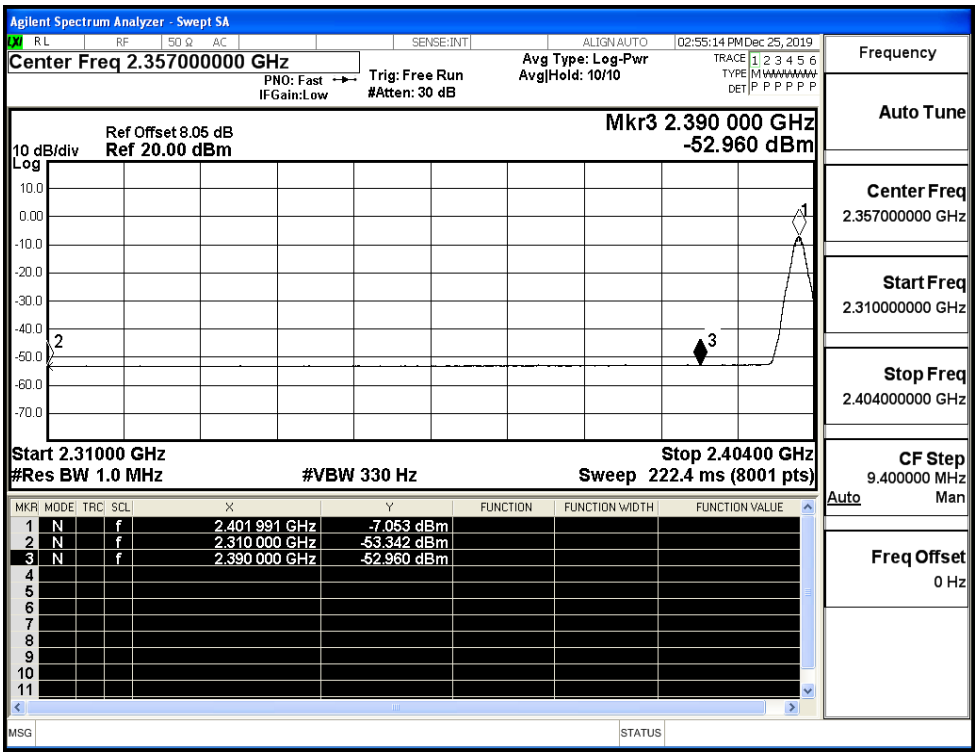
E [dBuV/m]= Power [dBm] + Gain + Ground Factor + 95.26

The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater

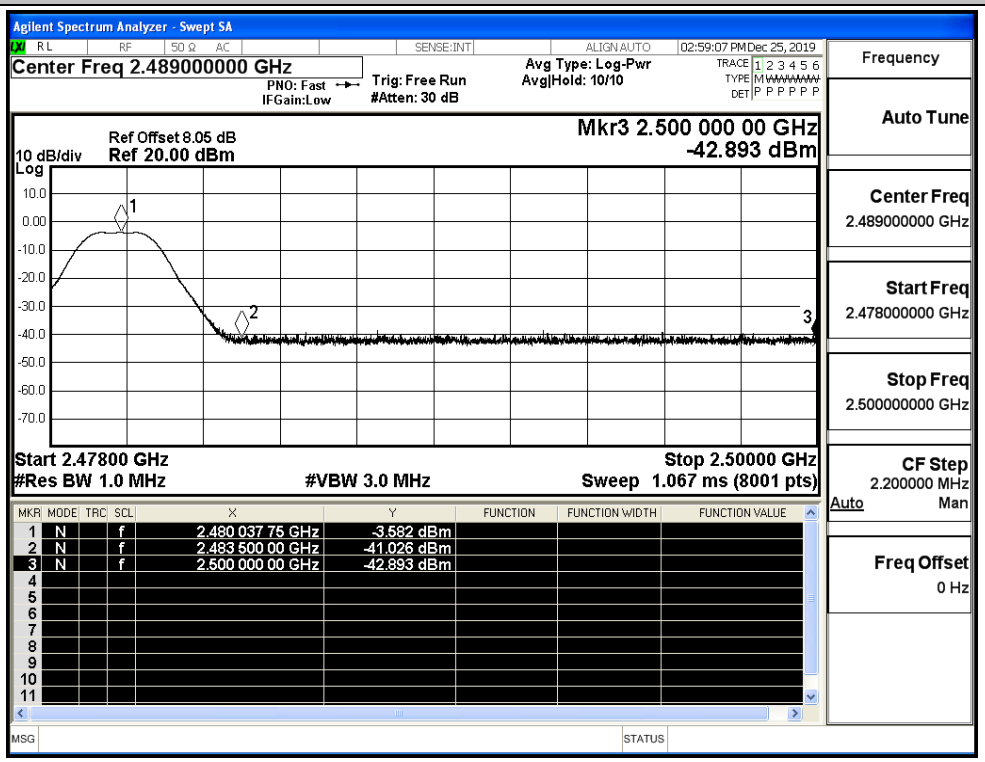
Restrict-band band-edge measurements_BT LE_2402_Ant1_PEAK



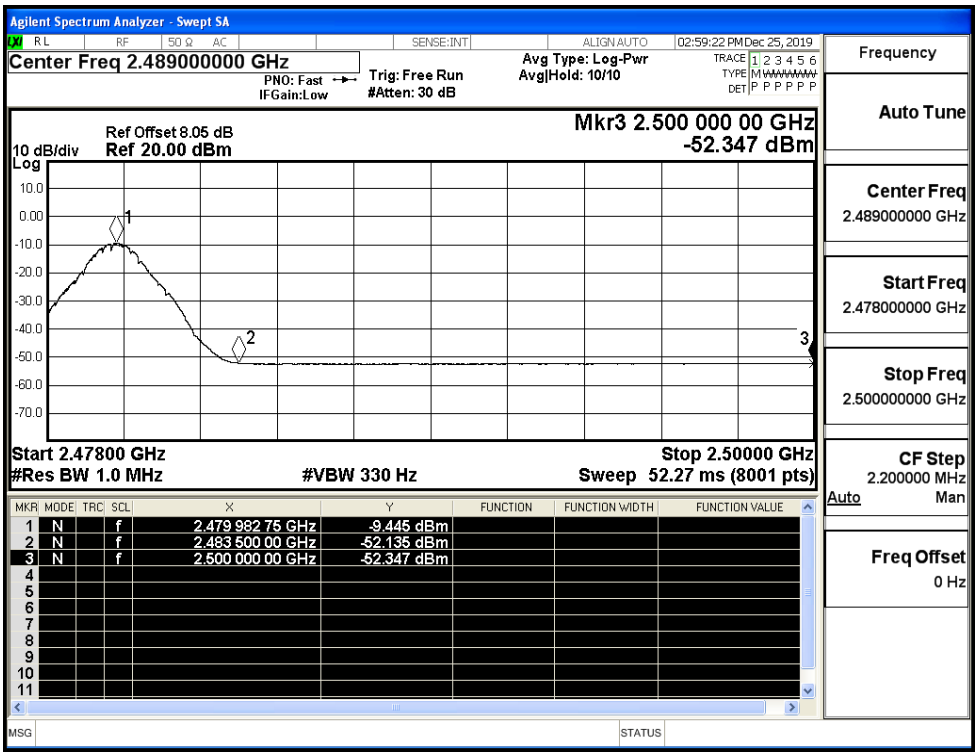
Restrict-band band-edge measurements_BT LE_2402_Ant1_AV



Restrict-band band-edge measurements_BT LE_2480_Ant1_PEAK



Restrict-band band-edge measurements_BT LE_2480_Ant1_AV


Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
02:59:22 PM Dec 25, 2019
Center Freq 2.489000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
TRACE 1 2 3 4 5 6
TYPE M
DET P P P P P
Ref Offset 8.05 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr3 2.500 000 00 GHz
-52.347 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.47800 GHz
#Res BW 1.0 MHz
#VBW 330 Hz
Stop 2.50000 GHz
Sweep 52.27 ms (8001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N f 2.479 982 75 GHz -9.445 dBm
2 N f 2.483 500 00 GHz -52.135 dBm
3 N f 2.500 000 00 GHz -52.347 dBm
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.489000000 GHz
Start Freq
2.478000000 GHz
Stop Freq
2.500000000 GHz
CF Step
2.200000 MHz
Auto
Man
Freq Offset
0 Hz