

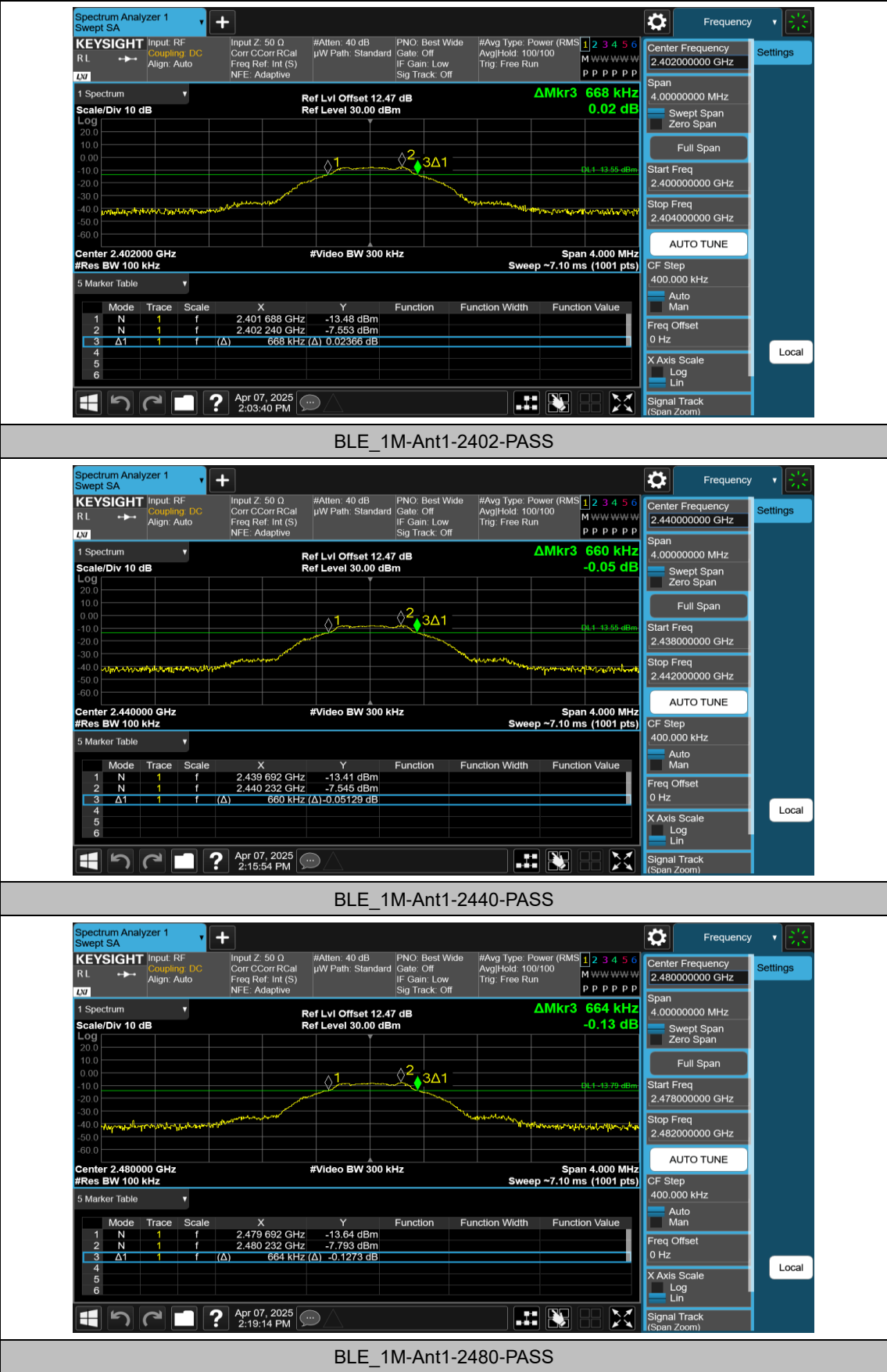
Appendix A of 2504B1823SHA-001

DTS Bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.668	2401.688	2402.356	0.5	PASS
BLE_1M	Ant1	2440	0.660	2439.692	2440.352	0.5	PASS
BLE_1M	Ant1	2480	0.664	2479.692	2480.356	0.5	PASS

Test Graphs



BLE_1M-Ant1-2402-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: CCorr RCal

Freq Ref: Int (S)

NFE: Adaptive

#Atten: 40 dB

μ W Path: Standard

PNO: Best Wide

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 100/100

Trig: Free Run

1 2 3 4 5 6

M W W W W W

P P P P P P

Center Frequency

2.440000000 GHz

Span

4.00000000 MHz

Swept Span

Zero Span

Full Span

Start Freq

2.438000000 GHz

Stop Freq

2.442000000 GHz

AUTO TUNE

CF Step

400.000 kHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Ref Lvl Offset 12.47 dB

Ref Level 30.00 dBm

Δ Mkr3 660 kHz

-0.05 dB

Center 2.440000 GHz

#Res BW 100 kHz

#Video BW 300 kHz

Span 4.000 MHz

Sweep ~7.10 ms (1001 pts)

5 Marker Table

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.439692 GHz	-13.41 dBm			
2	N	1	f	2.440232 GHz	-7.545 dBm			
3	Δ 1	1	f	(Δ)	660 kHz (Δ)	-0.05129 dB		
4								
5								
6								

Apr 07, 2025

2:15:54 PM

BLE_1M-Ant1-2440-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: CCorr RCal

Freq Ref: Int (S)

NFE: Adaptive

#Atten: 40 dB

μ W Path: Standard

PNO: Best Wide

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 100/100

Trig: Free Run

1 2 3 4 5 6

M W W W W W

P P P P P P

Center Frequency

2.480000000 GHz

Span

4.00000000 MHz

Swept Span

Zero Span

Full Span

Start Freq

2.478000000 GHz

Stop Freq

2.482000000 GHz

AUTO TUNE

CF Step

400.000 kHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Ref Lvl Offset 12.47 dB

Ref Level 30.00 dBm

Δ Mkr3 664 kHz

-0.13 dB

Center 2.480000 GHz

#Res BW 100 kHz

#Video BW 300 kHz

Span 4.000 MHz

Sweep ~7.10 ms (1001 pts)

5 Marker Table

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.479692 GHz	-13.64 dBm			
2	N	1	f	2.480232 GHz	-7.793 dBm			
3	Δ 1	1	f	(Δ)	664 kHz (Δ)	-0.1273 dB		
4								
5								
6								

Apr 07, 2025

2:19:14 PM

BLE_1M-Ant1-2480-PASS

FCC ID: 2A64B-WG893

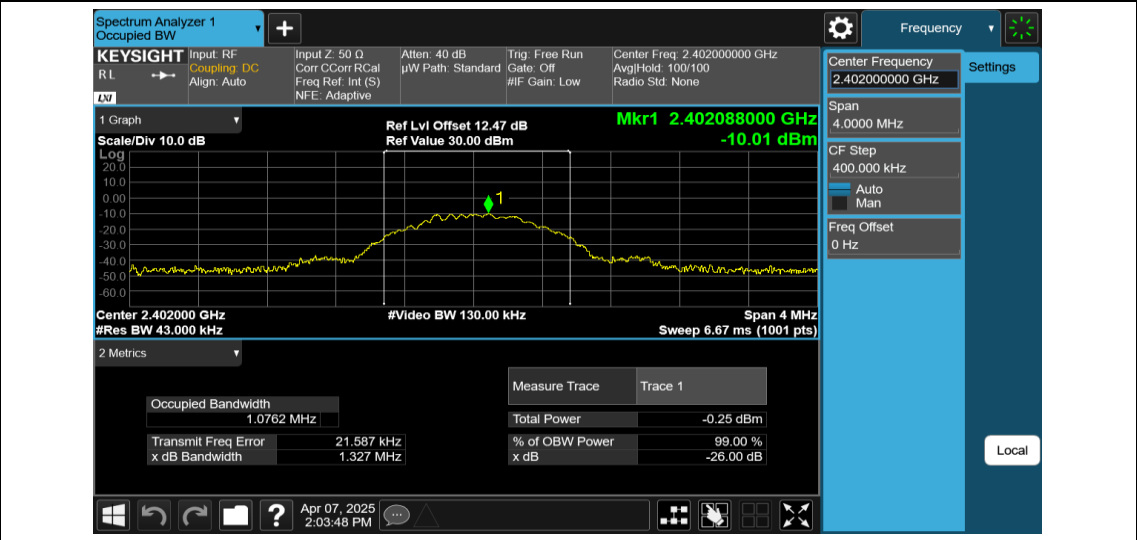
IC: 28593-WG893

Occupied Channel Bandwidth

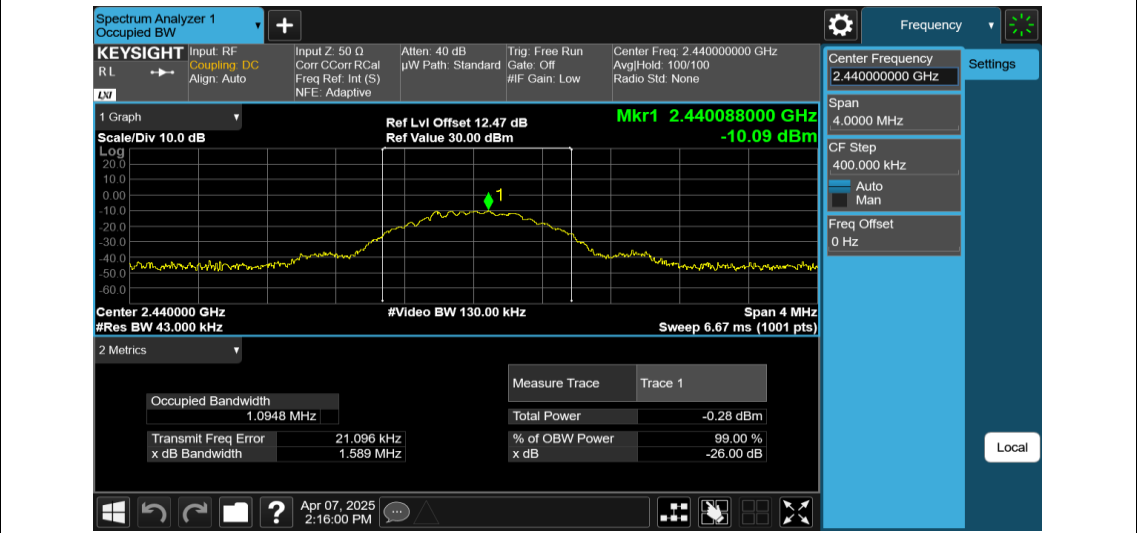
Test Result

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0762	2401.4835	2402.5597	---	---
BLE_1M	Ant1	2440	1.0948	2439.4737	2440.5685	---	---
BLE_1M	Ant1	2480	1.0982	2479.4711	2480.5693	---	---

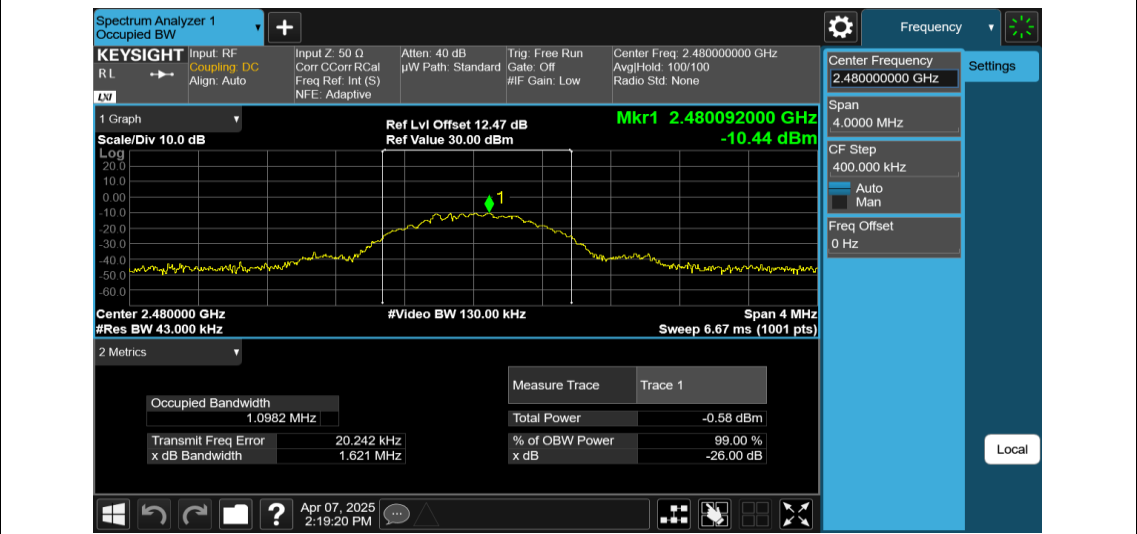
Test Graphs



BLE_1M-Ant1-2402



BLE_1M-Ant1-2440



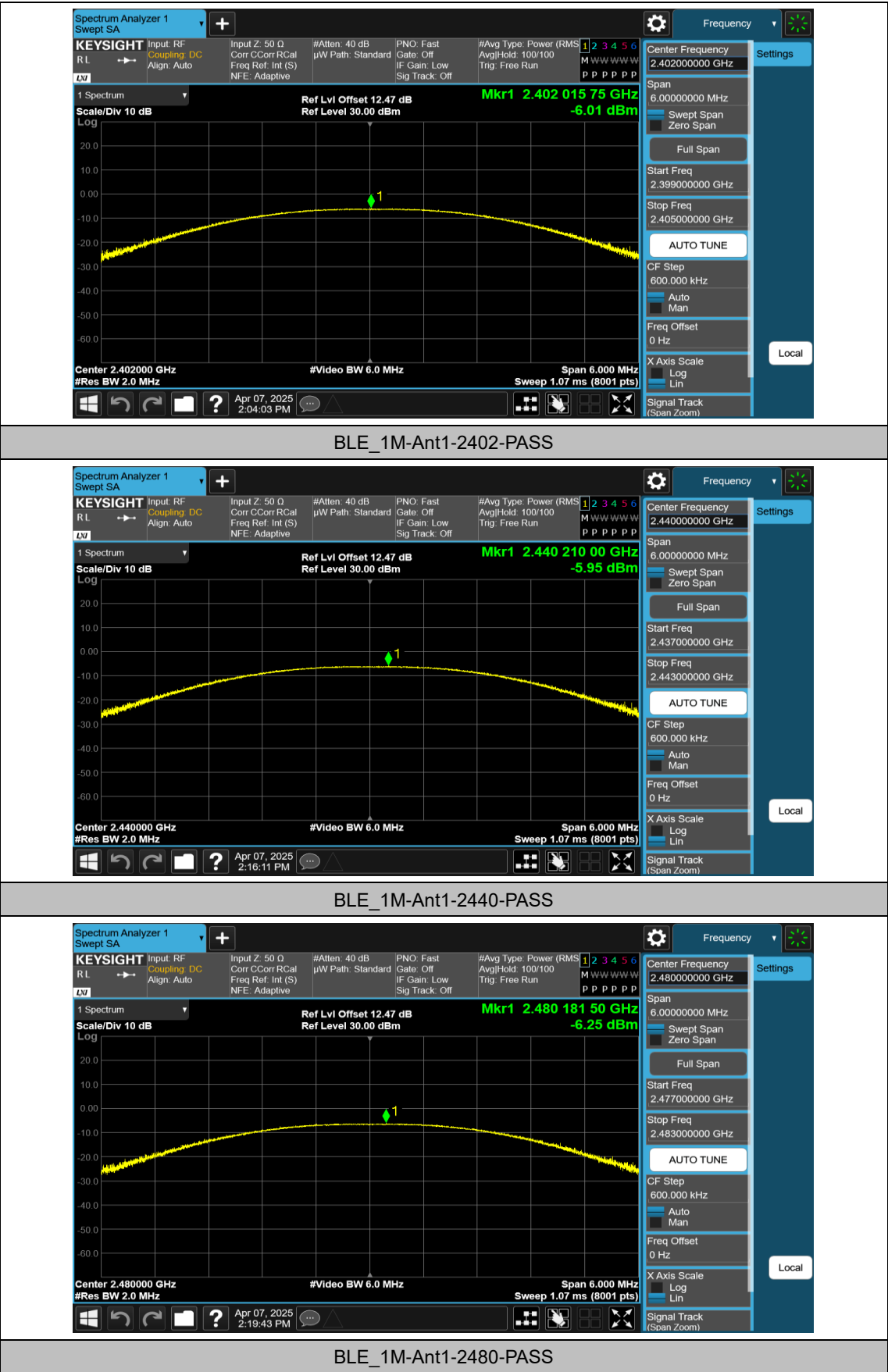
BLE_1M-Ant1-2480

Maximum conducted output power

Test Result Peak

TestMode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	EIRP[dBm]	EIRP Limit[dBm]	Verdict
BLE_1M	Ant1	2402	-6.01	≤30	-1.84	≤36	PASS
BLE_1M	Ant1	2440	-5.95	≤30	-1.78	≤36	PASS
BLE_1M	Ant1	2480	-6.25	≤30	-2.08	≤36	PASS

Test Graphs Peak



BLE_1M-Ant1-2402-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: CCorr RCal

Freq Ref: Int (S)

NFE: Adaptive

#Atten: 40 dB

μ W Path: Standard

PNO: Fast

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 100/100

Trig: Free Run

1 2 3 4 5 6

M W W W W W

P P P P P P

Center Frequency

2.440000000 GHz

Span

6.00000000 MHz

Swept Span

Zero Span

Full Span

Start Freq

2.437000000 GHz

Stop Freq

2.443000000 GHz

AUTO TUNE

CF Step

600.000 kHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Log

Ref Lvl Offset 12.47 dB

Ref Level 30.00 dBm

Mkr1 2.440 210 00 GHz

-5.95 dBm

Center 2.440000 GHz

#Res BW 2.0 MHz

#Video BW 6.0 MHz

Span 6.000 MHz

Sweep 1.07 ms (8001 pts)

Apr 07, 2025 2:16:11 PM

BLE_1M-Ant1-2440-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: CCorr RCal

Freq Ref: Int (S)

NFE: Adaptive

#Atten: 40 dB

μ W Path: Standard

PNO: Fast

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 100/100

Trig: Free Run

1 2 3 4 5 6

M W W W W W

P P P P P P

Center Frequency

2.480000000 GHz

Span

6.00000000 MHz

Swept Span

Zero Span

Full Span

Start Freq

2.477000000 GHz

Stop Freq

2.483000000 GHz

AUTO TUNE

CF Step

600.000 kHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Log

Ref Lvl Offset 12.47 dB

Ref Level 30.00 dBm

Mkr1 2.480 181 50 GHz

-6.25 dBm

Center 2.480000 GHz

#Res BW 2.0 MHz

#Video BW 6.0 MHz

Span 6.000 MHz

Sweep 1.07 ms (8001 pts)

Apr 07, 2025 2:19:43 PM

BLE_1M-Ant1-2480-PASS

FCC ID:2A64B-WG893

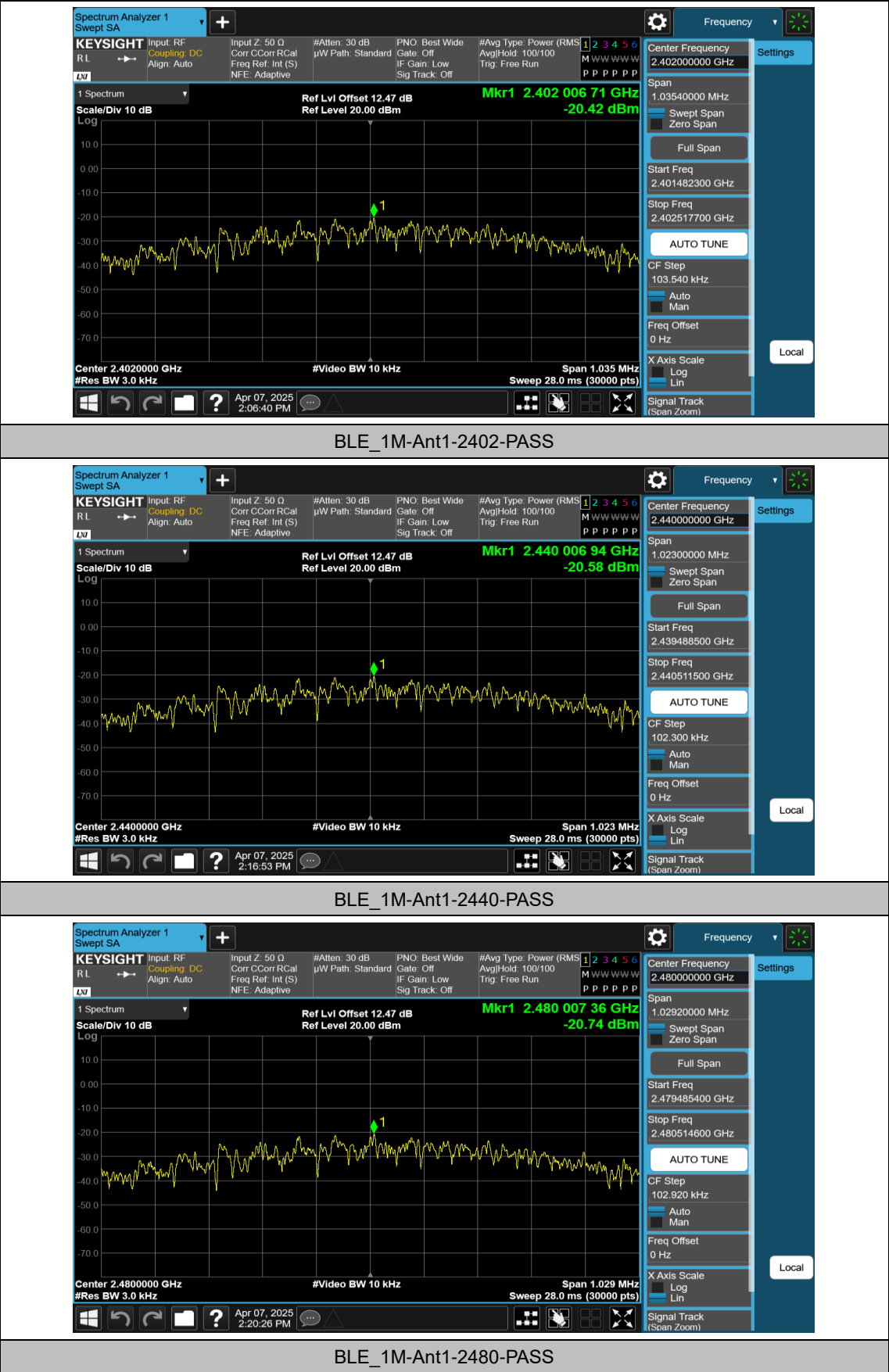
IC:28593-WG893

Maximum power spectral density

Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-20.42	≤8.00	PASS
BLE_1M	Ant1	2440	-20.58	≤8.00	PASS
BLE_1M	Ant1	2480	-20.74	≤8.00	PASS

Test Graphs



BLE_1M-Ant1-2402-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: C Corr R Cal

Freq Ref: Int (S)

NFE: Adaptive

#Atten: 30 dB

μ W Path: Standard

PNO: Best Wide

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 100/100

Trig: Free Run

1 2 3 4 5 6

M W W W W W

P P P P P P

Center Frequency

2.440000000 GHz

Span

1.023000000 MHz

Swept Span

Zero Span

Full Span

Start Freq

2.439488500 GHz

Stop Freq

2.440511500 GHz

AUTO TUNE

CF Step

102.300 kHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Log

Ref Lvl Offset 12.47 dB

Ref Level 20.00 dBm

Mkr1 2.440 006 94 GHz

-20.58 dBm

Center 2.44000000 GHz

#Res BW 3.0 kHz

#Video BW 10 kHz

Span 1.023 MHz

Sweep 28.0 ms (30000 pts)

Apr 07, 2025 2:16:53 PM

BLE_1M-Ant1-2440-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: C Corr R Cal

Freq Ref: Int (S)

NFE: Adaptive

#Atten: 30 dB

μ W Path: Standard

PNO: Best Wide

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 100/100

Trig: Free Run

1 2 3 4 5 6

M W W W W W

P P P P P P

Center Frequency

2.480000000 GHz

Span

1.02920000 MHz

Swept Span

Zero Span

Full Span

Start Freq

2.479485400 GHz

Stop Freq

2.480514600 GHz

AUTO TUNE

CF Step

102.920 kHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Log

Ref Lvl Offset 12.47 dB

Ref Level 20.00 dBm

Mkr1 2.480 007 36 GHz

-20.74 dBm

Center 2.48000000 GHz

#Res BW 3.0 kHz

#Video BW 10 kHz

Span 1.029 MHz

Sweep 28.0 ms (30000 pts)

Apr 07, 2025 2:20:26 PM

BLE_1M-Ant1-2480-PASS

FCC ID:2A64B-WG893

IC:28593-WG893

Band edge measurements

Test Result

TestMode	Antenna	ChName	Frequency [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-7.74	-48.63	≤-27.74	PASS
BLE_1M	Ant1	High	2480	-8.11	-48.62	≤-28.11	PASS

Test Graphs



BLE_1M-Ant1-2402-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: CCorr

RCal: Freq Ref: Int (S)

NFE: Adaptive

#Atten: 30 dB

μ W Path: Standard

PNO: Fast

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 100/100

Trig: Free Run

1 2 3 4 5 6

M W W W W W

P P P P P P

Center Frequency

2.510000000 GHz

Span

80.0000000 MHz

Swept Span

Zero Span

Full Span

Start Freq

2.470000000 GHz

Stop Freq

2.550000000 GHz

AUTO TUNE

CF Step

8.000000 MHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Ref Lvl Offset 12.47 dB

Ref Level 20.00 dBm

Mkr4 2.531 28 GHz

-48.62 dBm

Start 2.47000 GHz

#Res BW 100 kHz

#Video BW 300 kHz

Stop 2.55000 GHz

Sweep 3.00 ms (1001 pts)

5 Marker Table

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.480 00 GHz	-8.110 dBm			
2	N	1	f	2.483 50 GHz	-50.91 dBm			
3	N	1	f	2.500 00 GHz	-53.13 dBm			
4	N	1	f	2.531 28 GHz	-48.62 dBm			
5								
6								

Apr 07, 2025

2:20:32 PM

BLE_1M-Ant1-2480-PASS

FCC ID: 2A64B-WG893

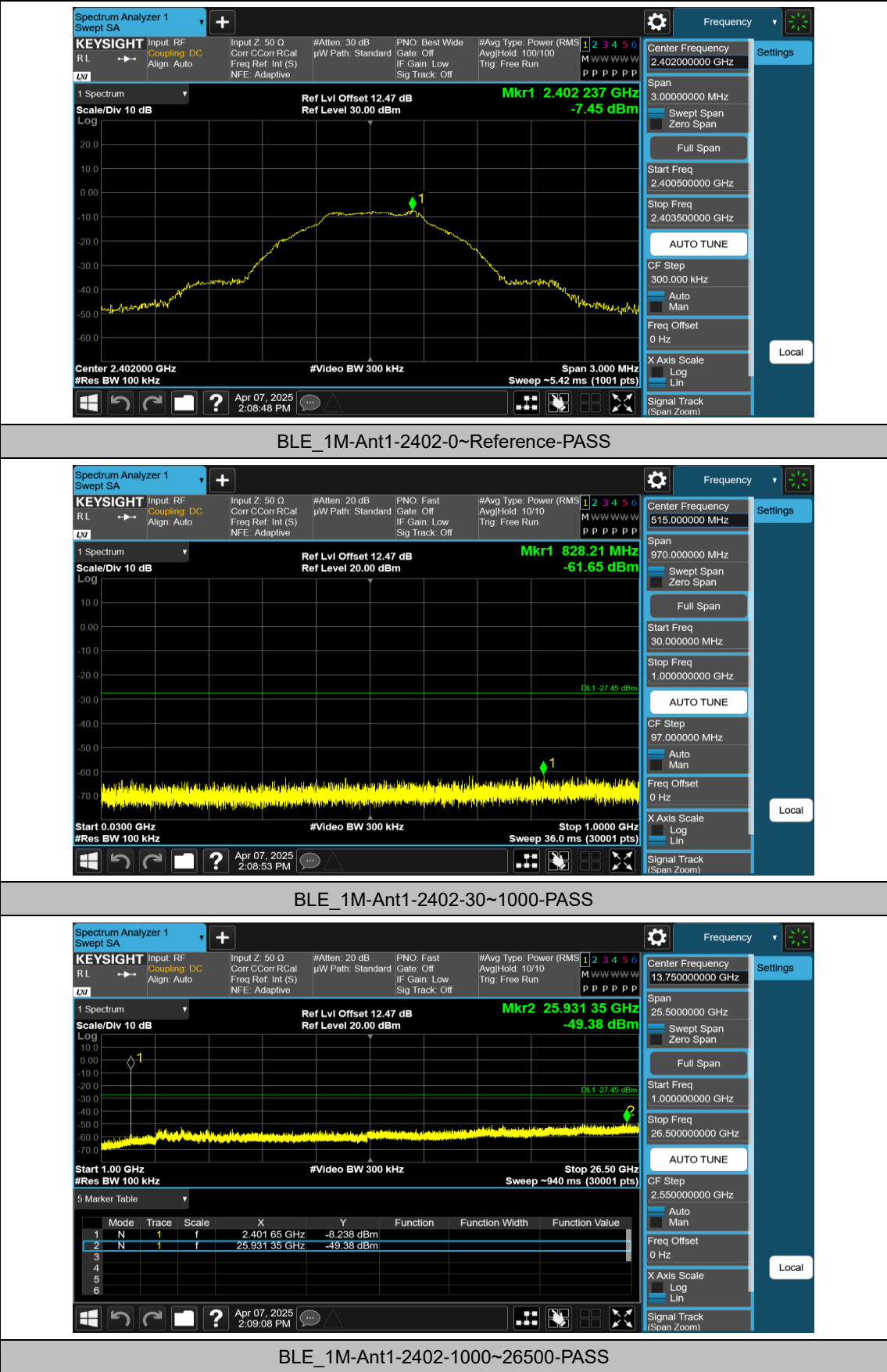
IC: 28593-WG893

Conducted Spurious Emission

Test Result

TestMode	Antenna	Frequency [MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0~Reference	-7.45	-7.45	---	PASS
BLE_1M	Ant1	2402	30~1000	-7.45	-61.65	≤-27.45	PASS
BLE_1M	Ant1	2402	1000~26500	-7.45	-49.38	≤-27.45	PASS
BLE_1M	Ant1	2440	0~Reference	-7.49	-7.49	---	PASS
BLE_1M	Ant1	2440	30~1000	-7.49	-60.19	≤-27.49	PASS
BLE_1M	Ant1	2440	1000~26500	-7.49	-48.66	≤-27.49	PASS
BLE_1M	Ant1	2480	0~Reference	-7.69	-7.69	---	PASS
BLE_1M	Ant1	2480	30~1000	-7.69	-62.32	≤-27.69	PASS
BLE_1M	Ant1	2480	1000~26500	-7.69	-49.33	≤-27.69	PASS

Test Graphs



BLE_1M-Ant1-2402-0~Reference-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: C

Corr: R

Cal: Int (S)

NFE: Adaptive

#Atten: 20 dB

μ W Path: Standard

PNO: Fast

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 10/10

Trig: Free Run

1 2 3 4 5 6

M W W W W W

P P P P P P

Center Frequency

515.0000000 MHz

Span

970.0000000 MHz

Swept Span

Zero Span

Full Span

Start Freq

30.0000000 MHz

Stop Freq

1.000000000 GHz

AUTO TUNE

CF Step

97.0000000 MHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Log

Ref Lvl Offset 12.47 dB

Ref Level 20.00 dBm

Mkr1 828.21 MHz

-61.65 dBm

Start 0.0300 GHz

#Res BW 100 kHz

#Video BW 300 kHz

Stop 1.0000 GHz

Sweep 36.0 ms (30001 pts)

Apr 07, 2025 2:08:53 PM

BLE_1M-Ant1-2402-30~1000-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: C

Corr: R

Cal: Int (S)

NFE: Adaptive

#Atten: 20 dB

μ W Path: Standard

PNO: Fast

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 10/10

Trig: Free Run

1 2 3 4 5 6

M W W W W W

P P P P P P

Center Frequency

13.750000000 GHz

Span

25.50000000 GHz

Swept Span

Zero Span

Full Span

Start Freq

1.000000000 GHz

Stop Freq

26.500000000 GHz

AUTO TUNE

CF Step

2.550000000 GHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Log

Ref Lvl Offset 12.47 dB

Ref Level 20.00 dBm

Mkr2 25.931 35 GHz

-49.38 dBm

Start 1.00 GHz

#Res BW 100 kHz

#Video BW 300 kHz

Stop 26.50 GHz

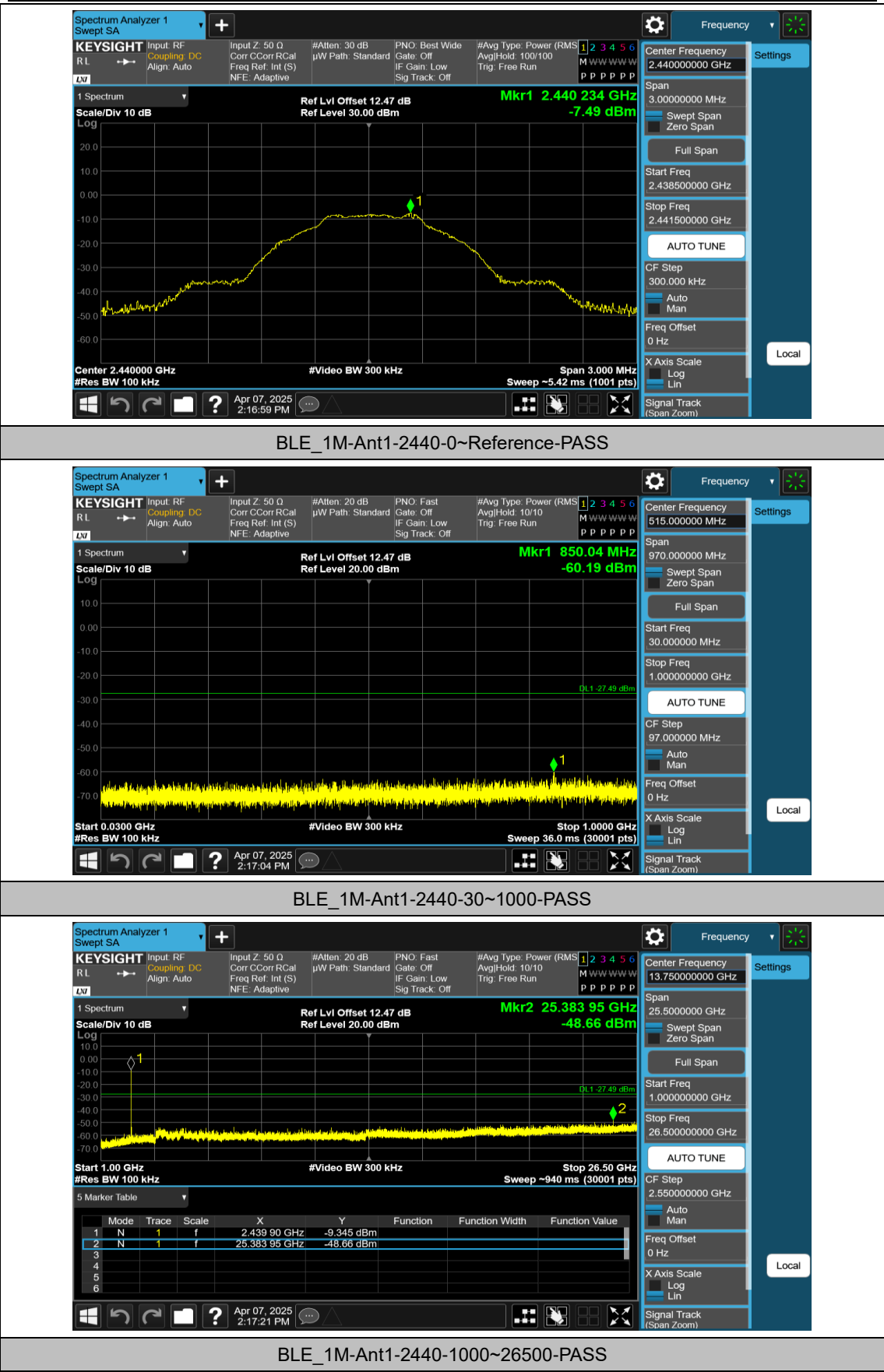
Sweep ~940 ms (30001 pts)

Apr 07, 2025 2:09:08 PM

5 Marker Table

Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	f	2.401 65 GHz	-8.238 dBm			
2	N	f	25.931 35 GHz	-49.38 dBm			
3							
4							
5							
6							

BLE_1M-Ant1-2402-1000~26500-PASS



BLE_1M-Ant1-2440-0~Reference-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: CCorr RCal

Freq Ref: Int (S)

NFE: Adaptive

#Atten: 20 dB

μ W Path: Standard

PNO: Fast

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 10/10

Trig: Free Run

1 2 3 4 5 6

M W W W W W

P P P P P P

Center Frequency

515.000000 MHz

Span

970.000000 MHz

Swept Span

Zero Span

Full Span

Start Freq

30.0000000 MHz

Stop Freq

1.000000000 GHz

AUTO TUNE

CF Step

97.000000 MHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Log

Ref Lvl Offset 12.47 dB

Ref Level 20.00 dBm

Mkr1 850.04 MHz

-60.19 dBm

Start 0.0300 GHz

#Res BW 100 kHz

#Video BW 300 kHz

Stop 1.0000 GHz

Sweep 36.0 ms (30001 pts)

Apr 07, 2025

2:17:04 PM

BLE_1M-Ant1-2440-30~1000-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: CCorr RCal

Freq Ref: Int (S)

NFE: Adaptive

#Atten: 20 dB

μ W Path: Standard

PNO: Fast

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 10/10

Trig: Free Run

1 2 3 4 5 6

M W W W W W

P P P P P P

Center Frequency

13.75000000 GHz

Span

25.50000000 GHz

Swept Span

Zero Span

Full Span

Start Freq

1.000000000 GHz

Stop Freq

26.500000000 GHz

AUTO TUNE

CF Step

2.550000000 GHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Log

Ref Lvl Offset 12.47 dB

Ref Level 20.00 dBm

Mkr2 25.383 95 GHz

-48.66 dBm

Start 1.00 GHz

#Res BW 100 kHz

#Video BW 300 kHz

Stop 26.50 GHz

Sweep ~940 ms (30001 pts)

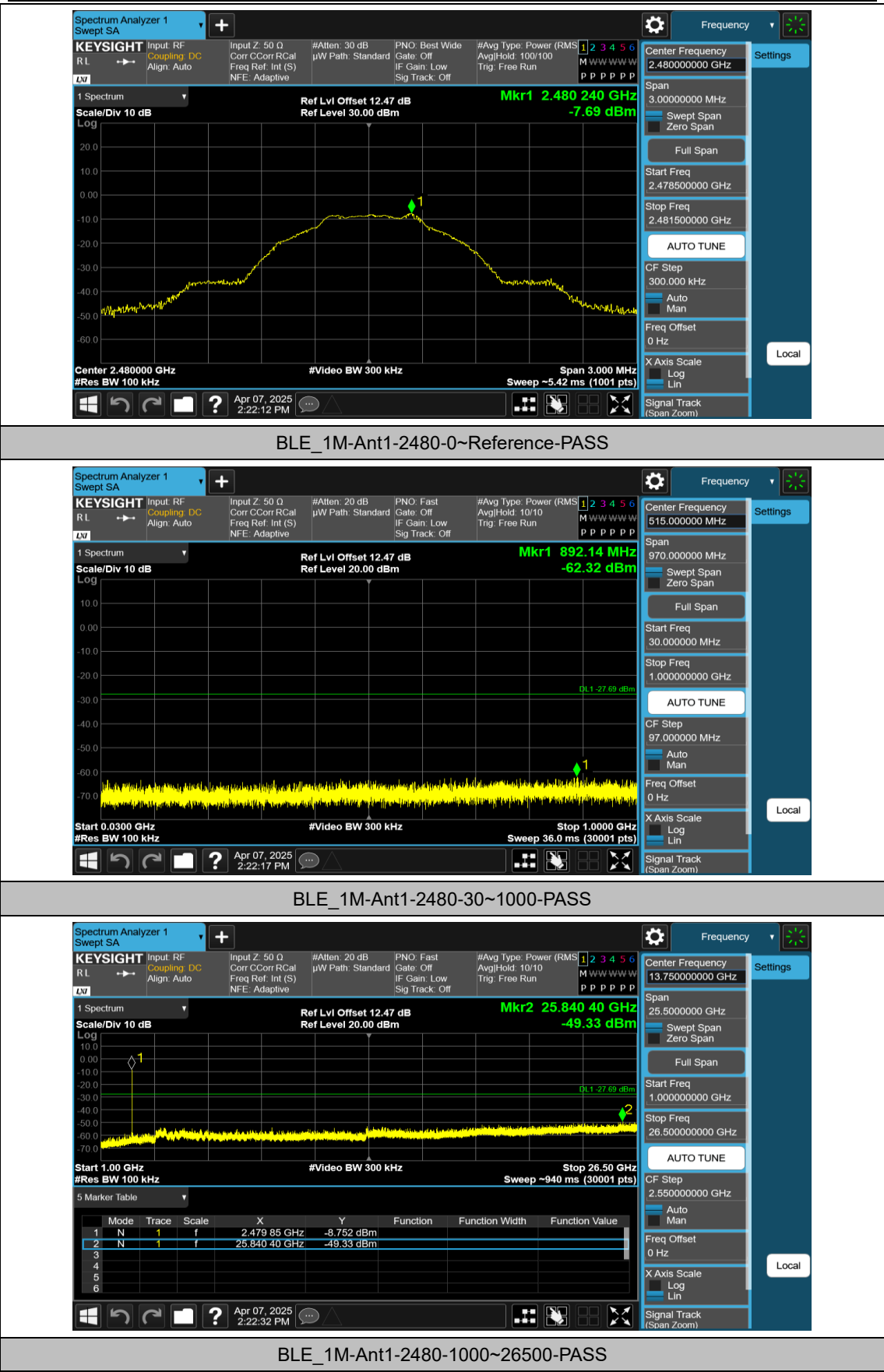
5 Marker Table

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.439 90 GHz	-9.345 dBm			
2	N	1	f	25.383 95 GHz	-48.66 dBm			
3								
4								
5								
6								

Apr 07, 2025

2:17:21 PM

BLE_1M-Ant1-2440-1000~26500-PASS



BLE_1M-Ant1-2480-0~Reference-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: CCorr RCal

Freq Ref: Int (S)

NFE: Adaptive

#Atten: 20 dB

μ W Path: Standard

PNO: Fast

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 10/10

Trig: Free Run

1 2 3 4 5 6

M W W W W W

p p p p p p

Center Frequency

515.000000 MHz

Span

970.000000 MHz

Swept Span

Zero Span

Full Span

Start Freq

30.0000000 MHz

Stop Freq

1.000000000 GHz

AUTO TUNE

CF Step

97.000000 MHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Log

Ref Lvl Offset 12.47 dB

Ref Level 20.00 dBm

Mkr1 892.14 MHz

-62.32 dBm

Start 0.0300 GHz

#Res BW 100 kHz

#Video BW 300 kHz

Stop 1.0000 GHz

Sweep 36.0 ms (30001 pts)

Apr 07, 2025 2:22:17 PM

BLE_1M-Ant1-2480-30~1000-PASS

Spectrum Analyzer 1

Swept SA

KEYSIGHT

Input: RF

Coupling: DC

Align: Auto

Input Z: 50 Ω

Corr: CCorr RCal

Freq Ref: Int (S)

NFE: Adaptive

#Atten: 20 dB

μ W Path: Standard

PNO: Fast

Gate: Off

IF Gain: Low

Sig Track: Off

#Avg Type: Power (RMS)

Avg/Hold: 10/10

Trig: Free Run

1 2 3 4 5 6

M W W W W W

p p p p p p

Center Frequency

13.75000000 GHz

Span

25.5000000 GHz

Swept Span

Zero Span

Full Span

Start Freq

1.000000000 GHz

Stop Freq

26.500000000 GHz

AUTO TUNE

CF Step

2.550000000 GHz

Auto

Man

Freq Offset

0 Hz

X Axis Scale

Log

Lin

Signal Track

(Span Zoom)

Local

1 Spectrum

Scale/Div 10 dB

Log

Ref Lvl Offset 12.47 dB

Ref Level 20.00 dBm

Mkr2 25.840 40 GHz

-49.33 dBm

Start 1.00 GHz

#Res BW 100 kHz

#Video BW 300 kHz

Stop 26.50 GHz

Sweep ~940 ms (30001 pts)

Apr 07, 2025 2:22:32 PM

5 Marker Table

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.479 85 GHz	-8.752 dBm			
2	N	1	f	25.840 40 GHz	-49.33 dBm			
3								
4								
5								
6								

BLE_1M-Ant1-2480-1000~26500-PASS