

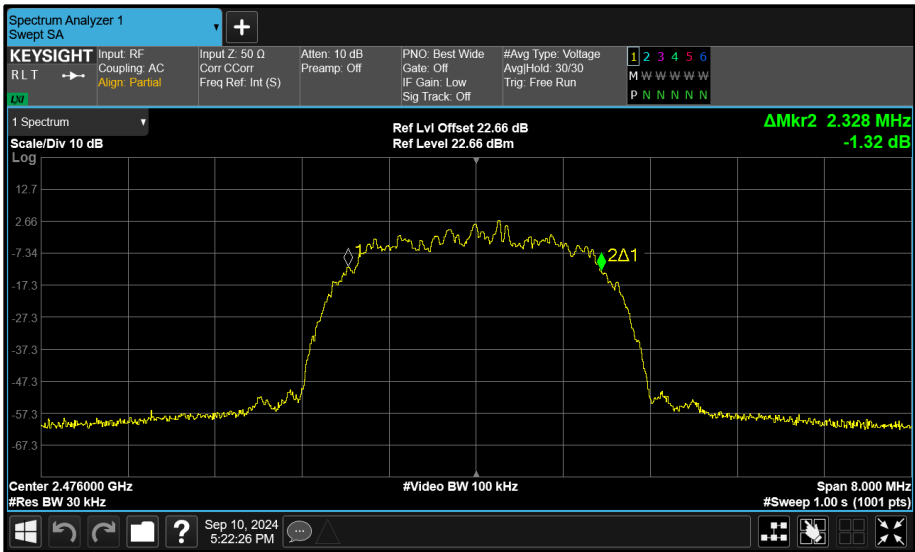


Figure 68 - Core 1 (B) 2476 MHz (CH74) 99% Bandwidth

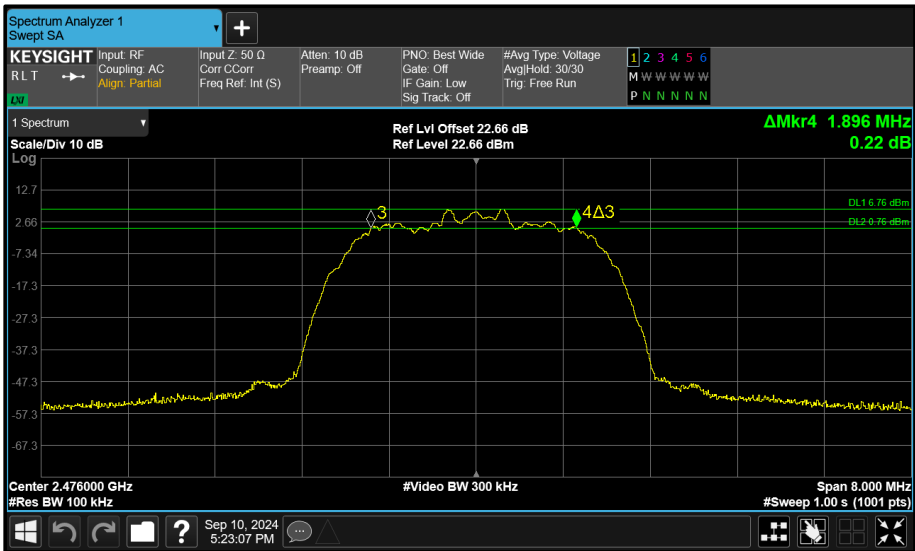


Figure 69 - Core 1 (B) 2476 MHz (CH74) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	iPA $\pi/4$ DQPSK (8-DH5)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	B (Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	-	0.660	-	-	≥ 500.0
2441	-	1.020	-	-	≥ 500.0
2476	-	1.020	-	-	≥ 500.0

Table 18 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	-	4.620	-	-	-
2441	-	4.620	-	-	-
2476	-	4.635	-	-	-

Table 19 - 99% Bandwidth Results

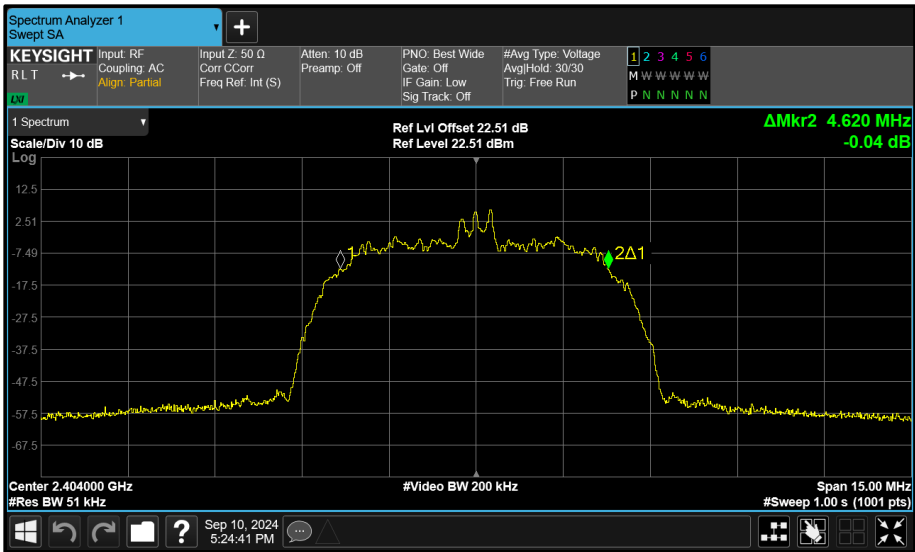


Figure 70 - Core 1 (B) 2404 MHz (CH2) 99% Bandwidth

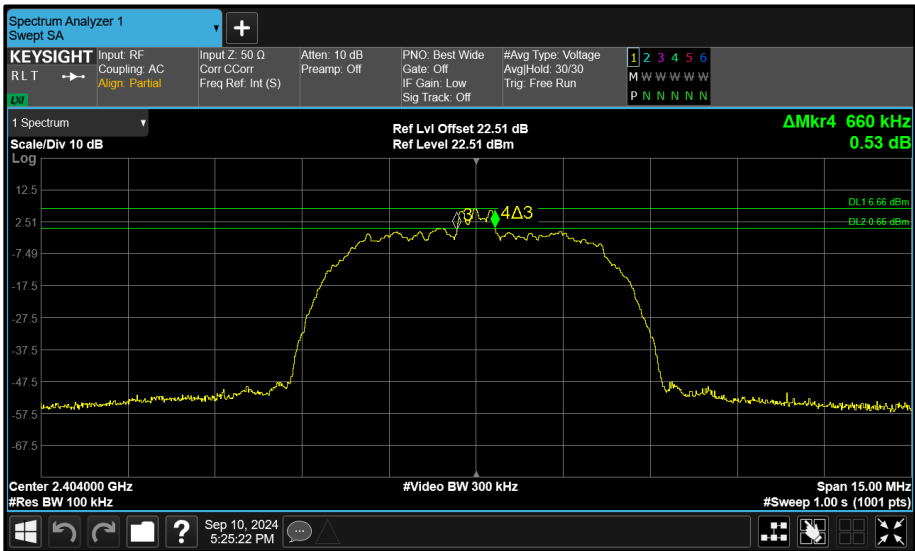


Figure 71 - Core 1 (B) 2404 MHz (CH2) 6 dB Bandwidth

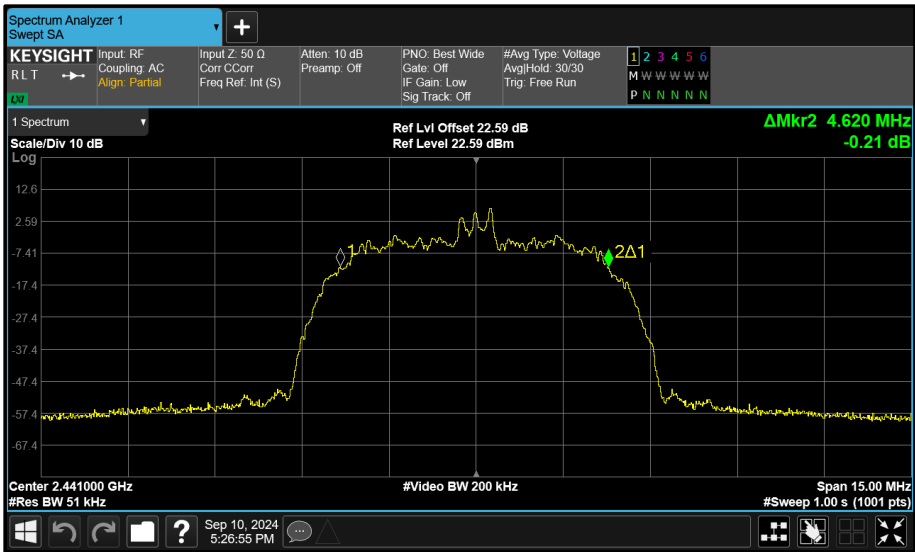


Figure 72 - Core 1 (B) 2441 MHz (CH39) 99% Bandwidth

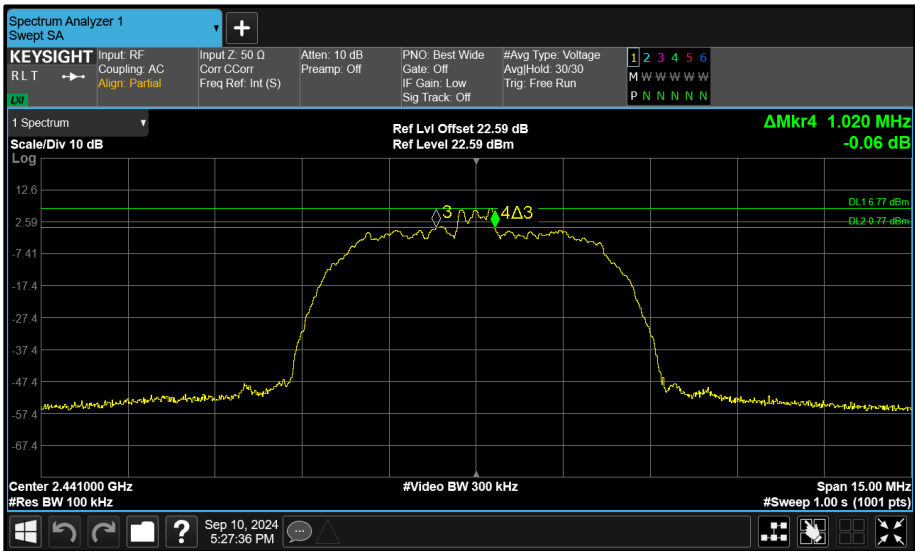


Figure 73 - Core 1 (B) 2441 MHz (CH39) 6 dB Bandwidth

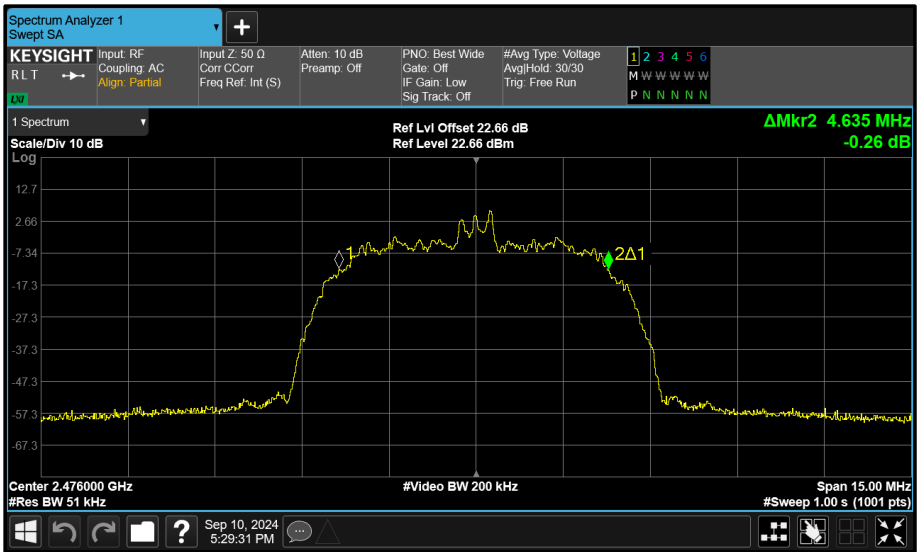


Figure 74 - Core 1 (B) 2476 MHz (CH74) 99% Bandwidth

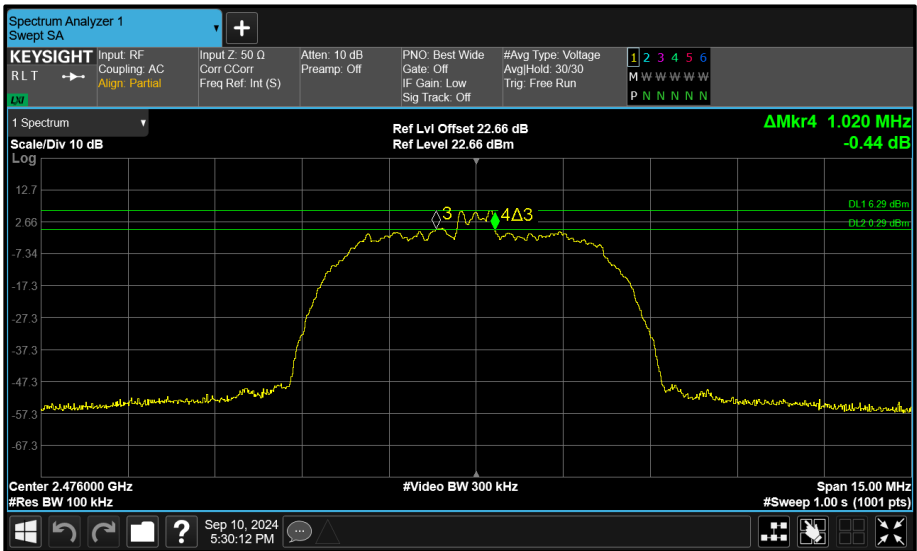


Figure 75 - Core 1 (B) 2476 MHz (CH74) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	iPA GFSK (LE 1M)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	B (Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	-	0.704	-	-	≥500.0
2440	-	0.668	-	-	≥500.0
2480	-	0.724	-	-	≥500.0

Table 20 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	-	1.036	-	-	-
2440	-	1.036	-	-	-
2480	-	1.032	-	-	-

Table 21 - 99% Bandwidth Results

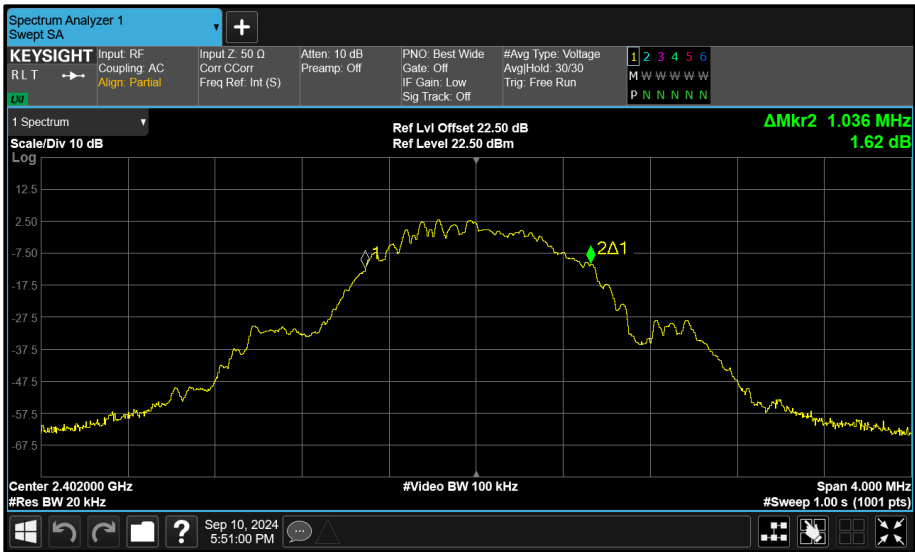


Figure 76 - Core 1 (B) 2402 MHz (CH37) 99% Bandwidth

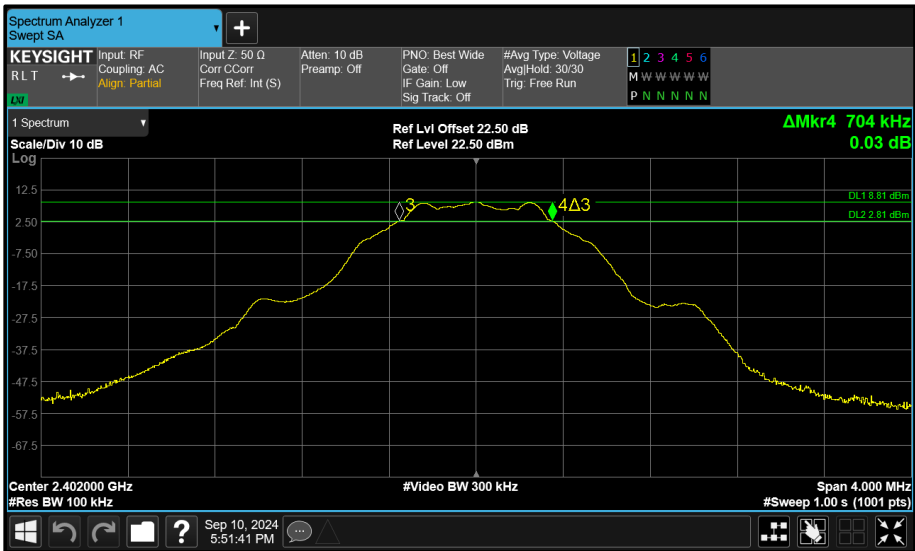


Figure 77 - Core 1 (B) 2402 MHz (CH37) 6 dB Bandwidth

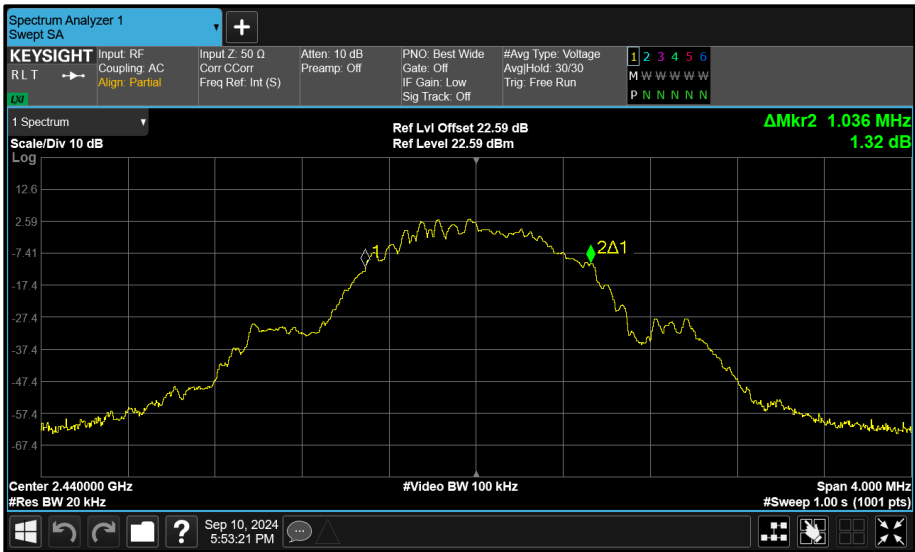


Figure 78 - Core 1 (B) 2440 MHz (CH17) 99% Bandwidth

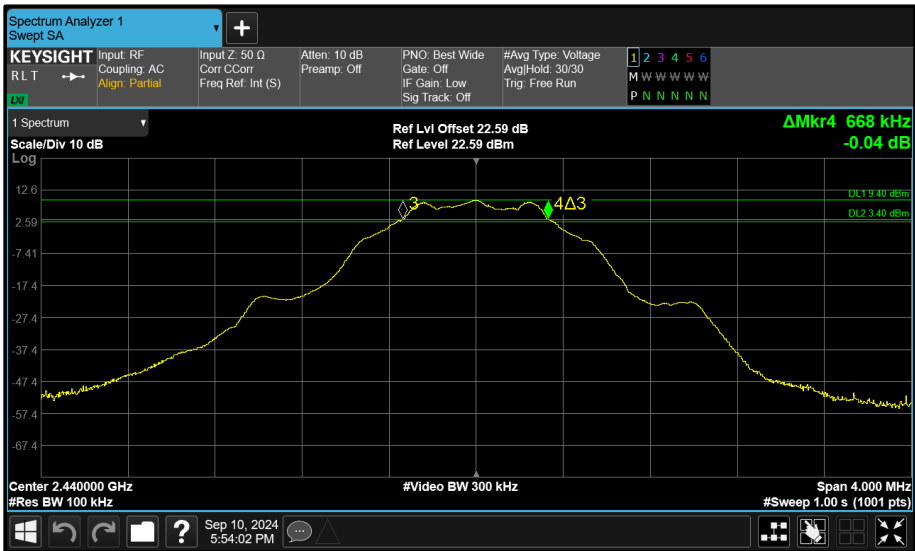


Figure 79 - Core 1 (B) 2440 MHz (CH17) 6 dB Bandwidth

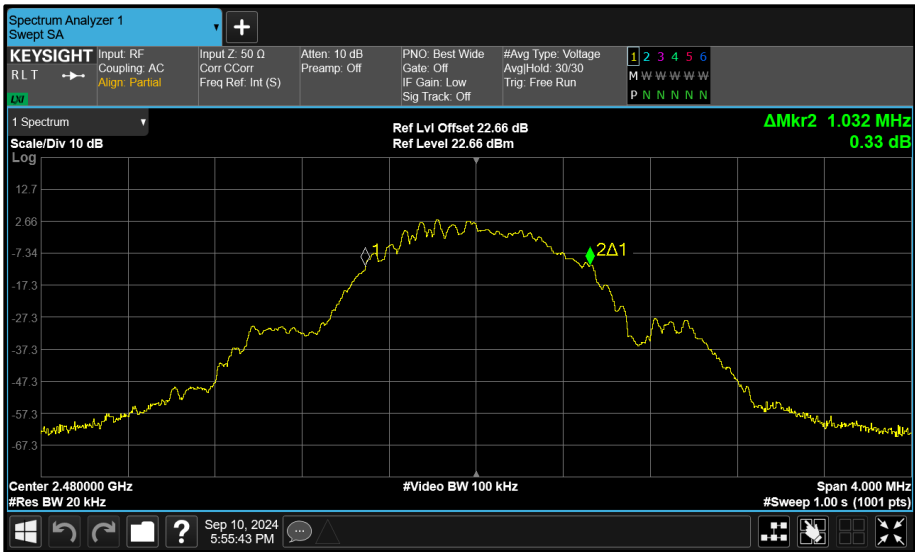


Figure 80 - Core 1 (B) 2480 MHz (CH39) 99% Bandwidth

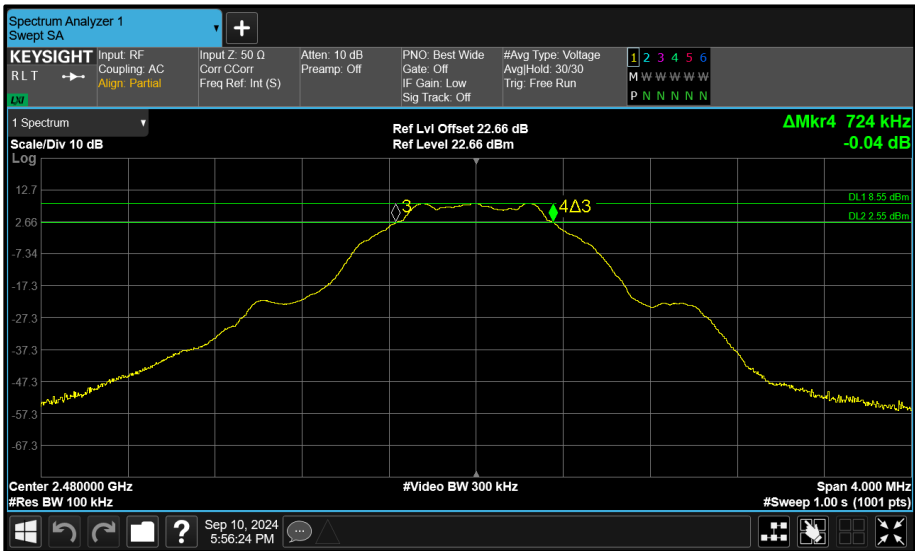


Figure 81 - Core 1 (B) 2480 MHz (CH39) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	iPA GFSK (LE 2M)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	B (Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	-	1.184	-	-	≥500.0
2440	-	1.264	-	-	≥500.0
2480	-	1.264	-	-	≥500.0

Table 22 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	-	2.088	-	-	-
2440	-	2.080	-	-	-
2480	-	2.080	-	-	-

Table 23 - 99% Bandwidth Results

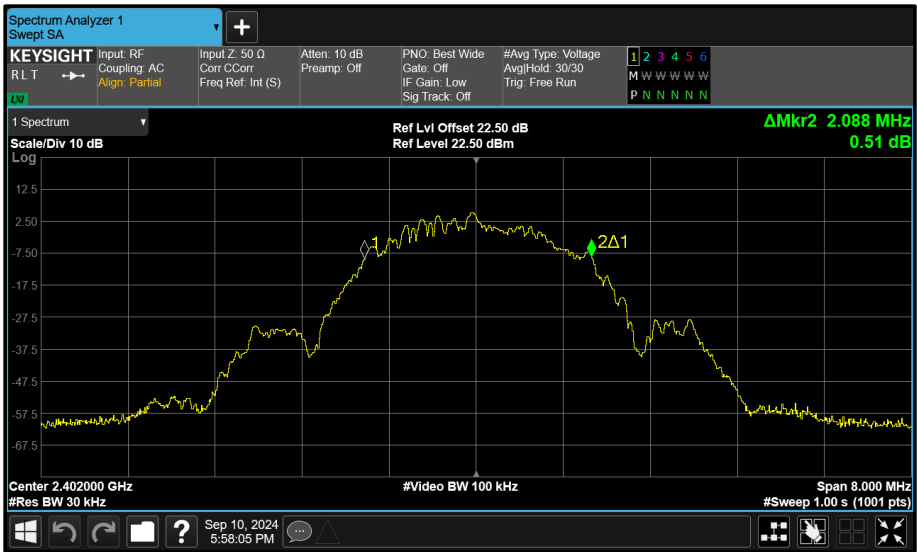


Figure 82 - Core 1 (B) 2402 MHz (CH37) 99% Bandwidth

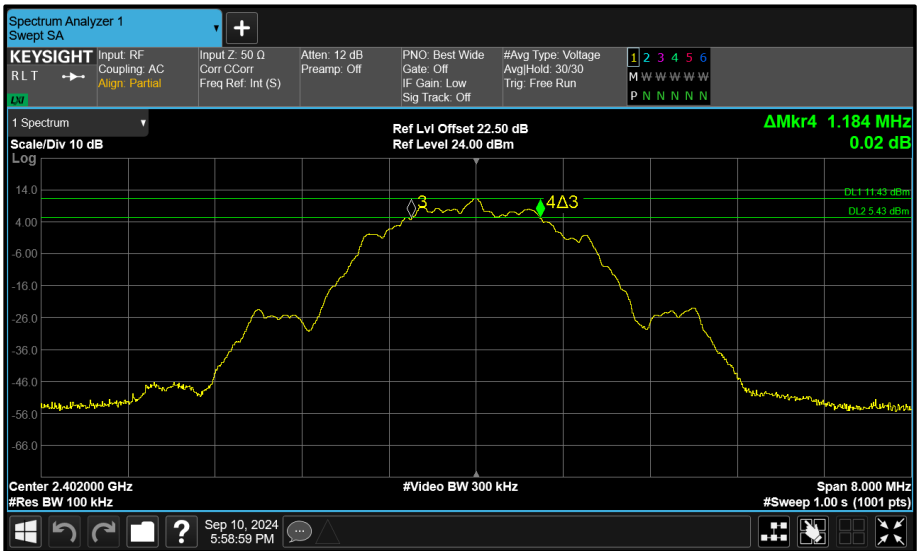


Figure 83 - Core 1 (B) 2402 MHz (CH37) 6 dB Bandwidth

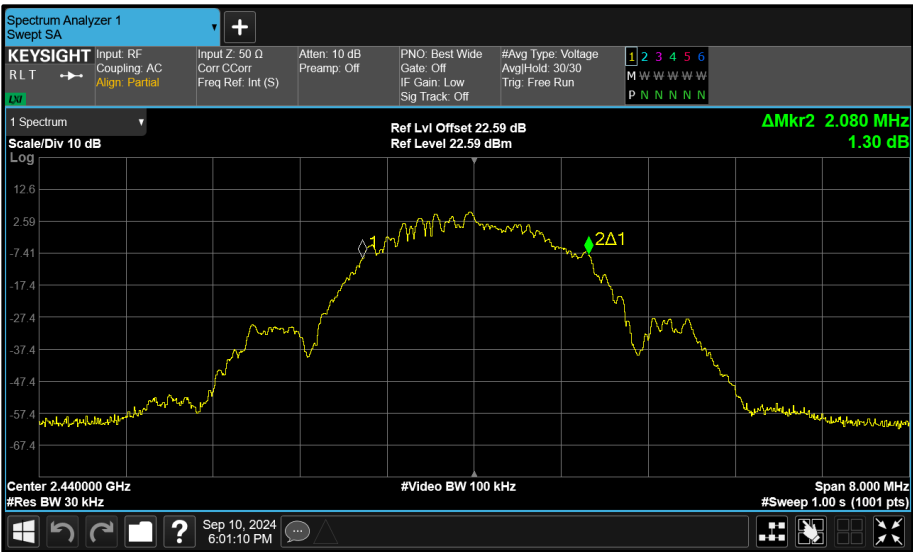


Figure 84 - Core 1 (B) 2440 MHz (CH17) 99% Bandwidth

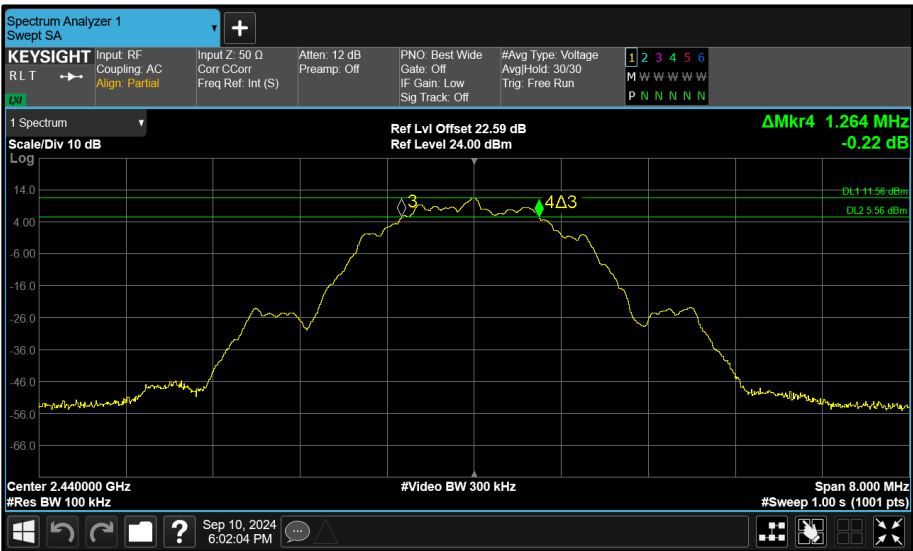


Figure 85 - Core 1 (B) 2440 MHz (CH17) 6 dB Bandwidth

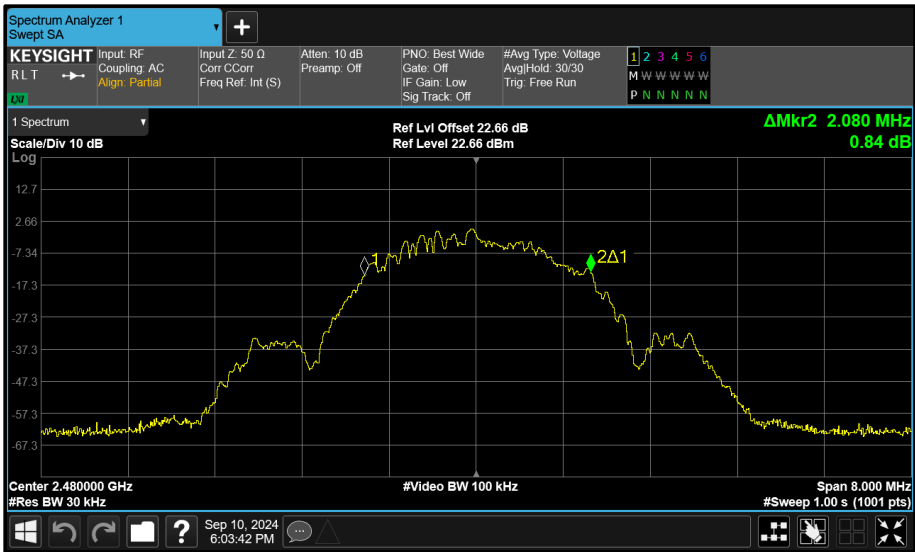


Figure 86 - Core 1 (B) 2480 MHz (CH39) 99% Bandwidth

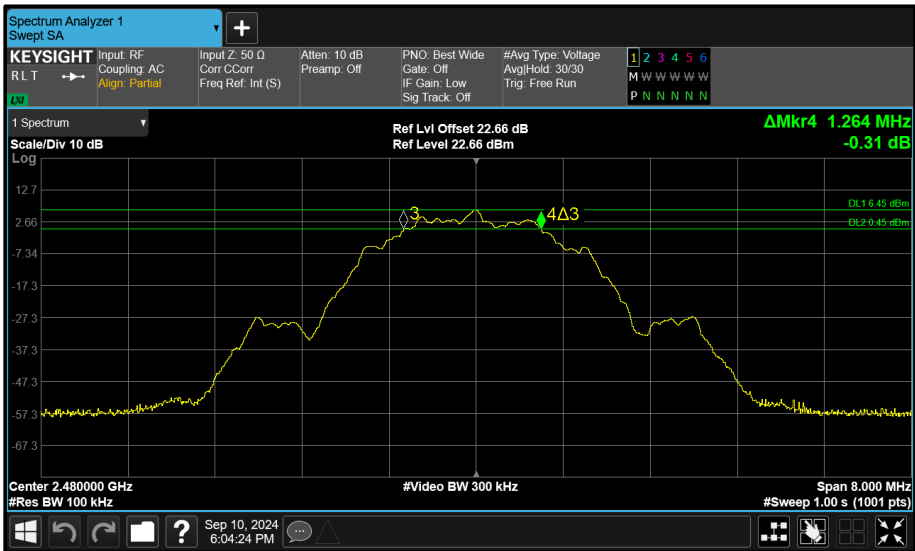


Figure 87 - Core 1 (B) 2480 MHz (CH39) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	iPA $\pi/4$ DQPSK (4-DH5)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	C (Core 2)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	-	-	1.880	-	≥ 500.0
2441	-	-	1.888	-	≥ 500.0
2476	-	-	1.888	-	≥ 500.0

Table 24 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	-	-	2.328	-	-
2441	-	-	2.328	-	-
2476	-	-	2.320	-	-

Table 25 - 99% Bandwidth Results

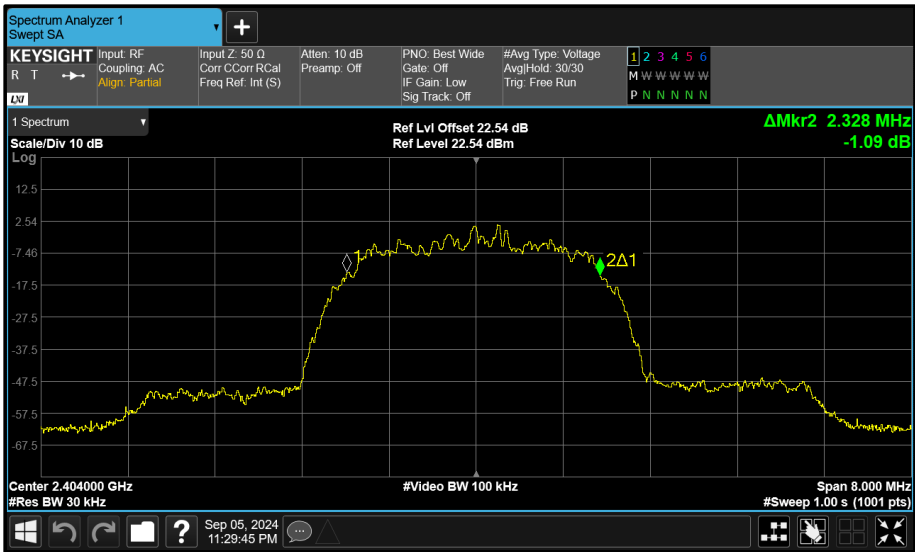


Figure 88 - Core 2 (C) 2404 MHz (CH2) 99% Bandwidth

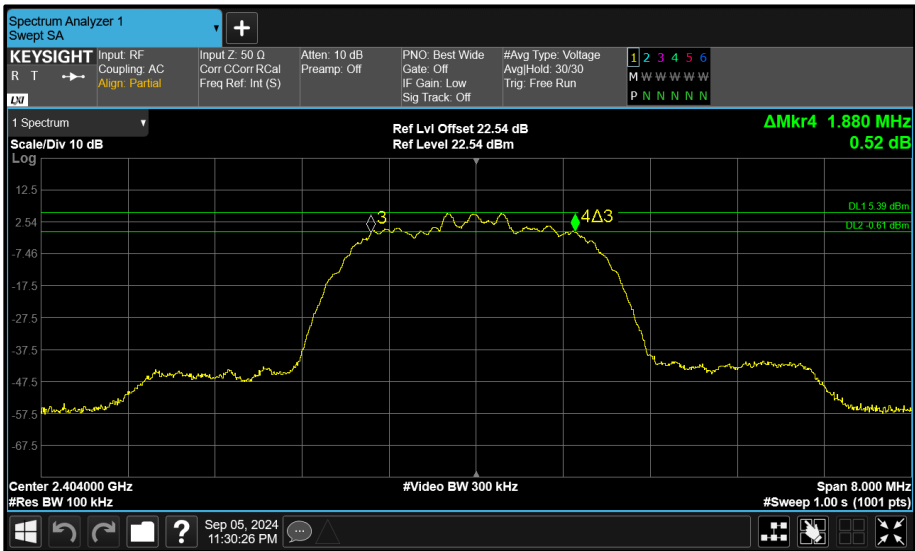


Figure 89 - Core 2 (C) 2404 MHz (CH2) 6 dB Bandwidth



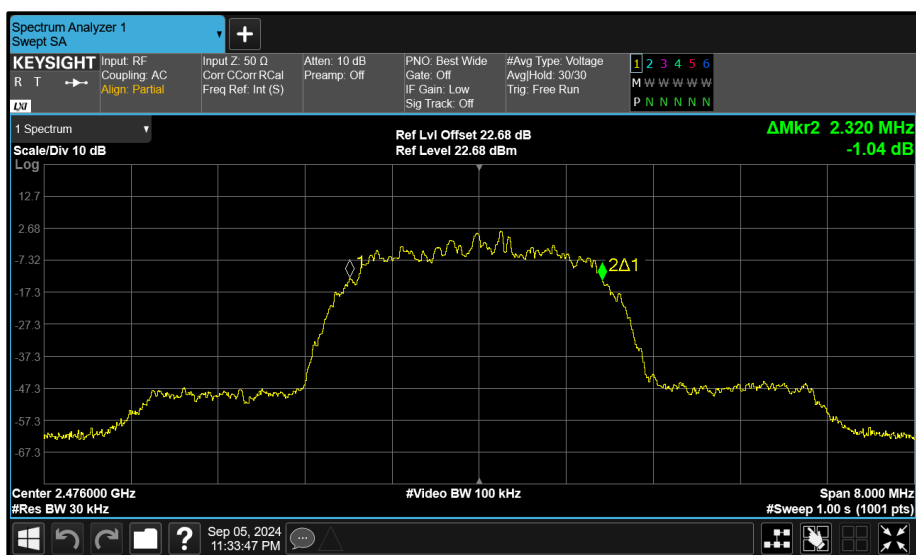


Figure 92 - Core 2 (C) 2476 MHz (CH74) 99% Bandwidth

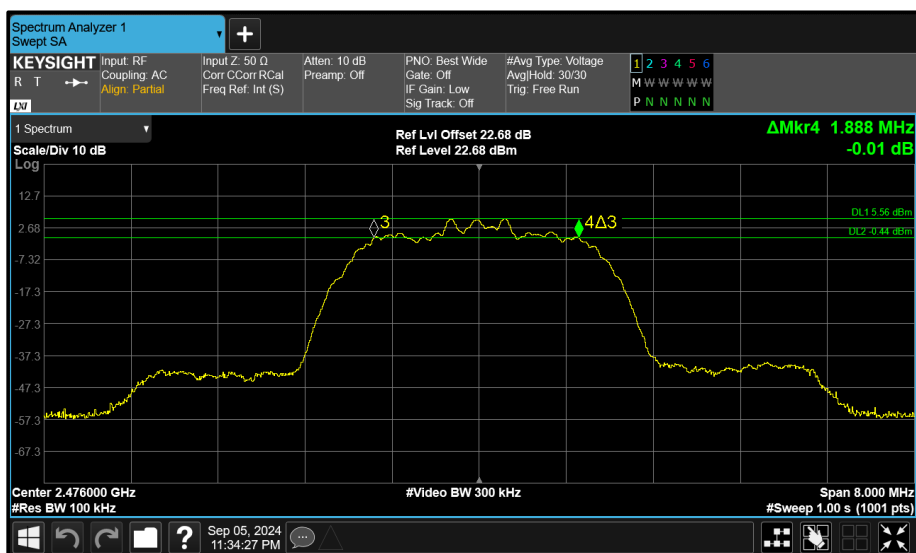


Figure 93 - Core 2 (C) 2476 MHz (CH74) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	iPA $\pi/4$ DQPSK (8-DH5)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	C (Core 2)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	-	-	0.975	-	≥ 500.0
2441	-	-	1.020	-	≥ 500.0
2476	-	-	1.020	-	≥ 500.0

Table 26 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	-	-	4.635	-	-
2441	-	-	4.635	-	-
2476	-	-	4.635	-	-

Table 27 - 99% Bandwidth Results

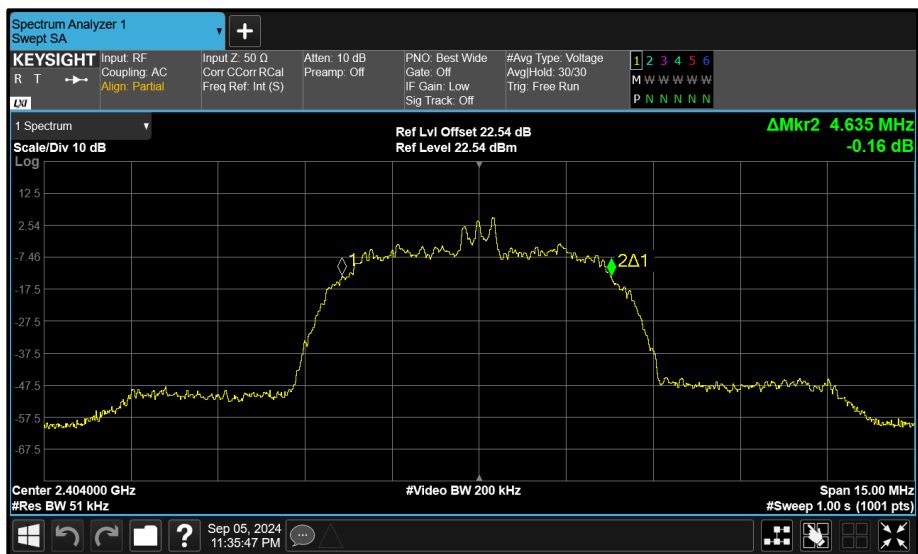


Figure 94 - Core 2 (C) 2404 MHz (CH2) 99% Bandwidth

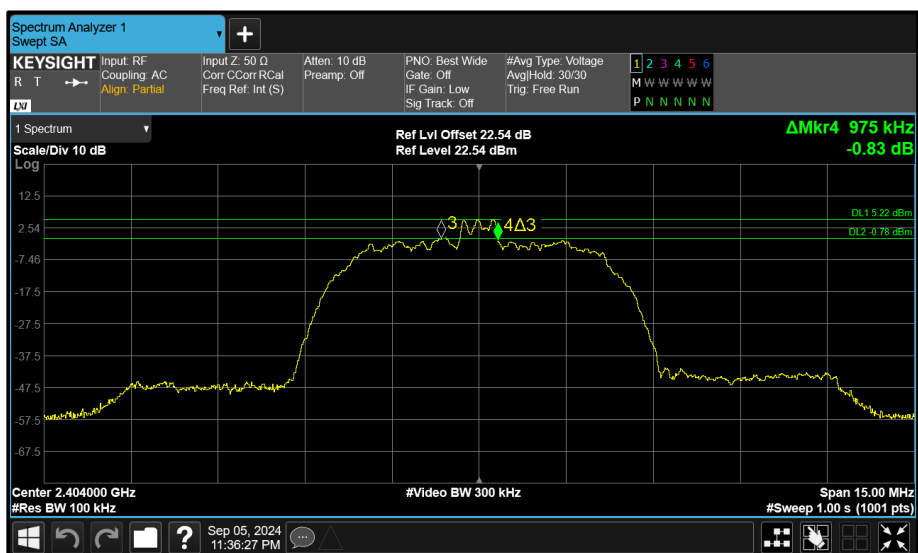


Figure 95 - Core 2 (C) 2404 MHz (CH2) 6 dB Bandwidth

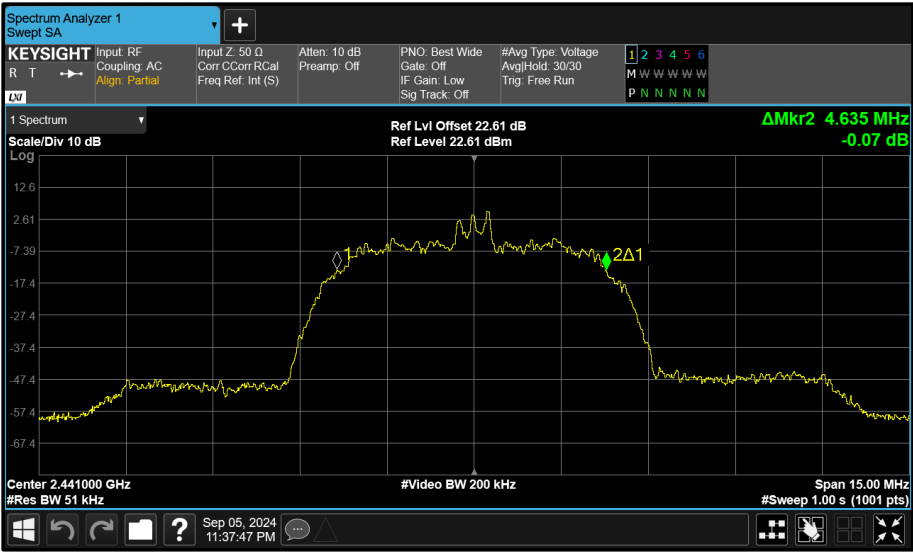


Figure 96 - Core 2 (C) 2441 MHz (CH39) 99% Bandwidth

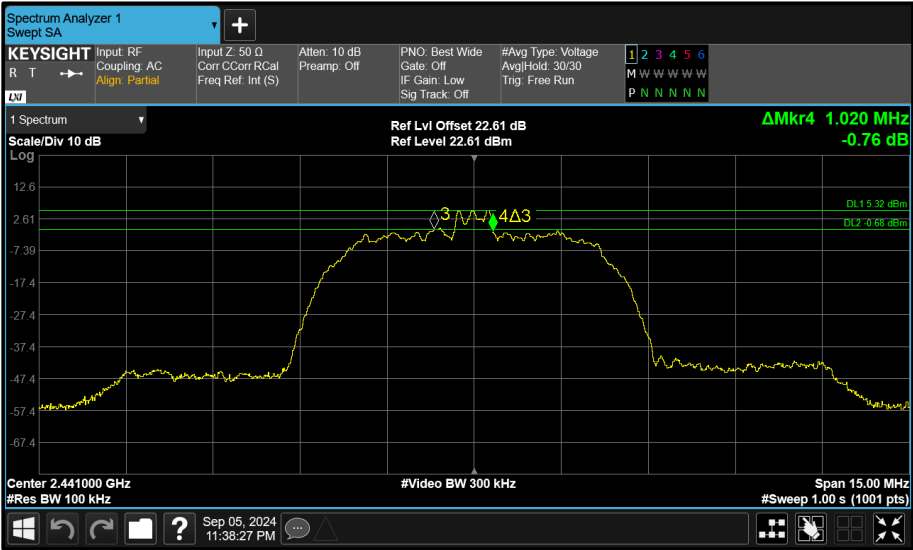


Figure 97 - Core 2 (C) 2441 MHz (CH39) 6 dB Bandwidth

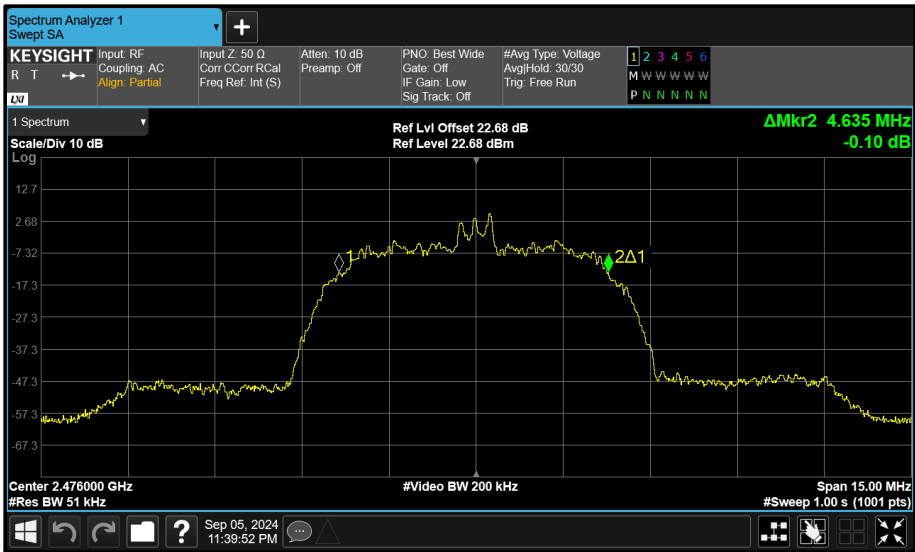


Figure 98 - Core 2 (C) 2476 MHz (CH74) 99% Bandwidth

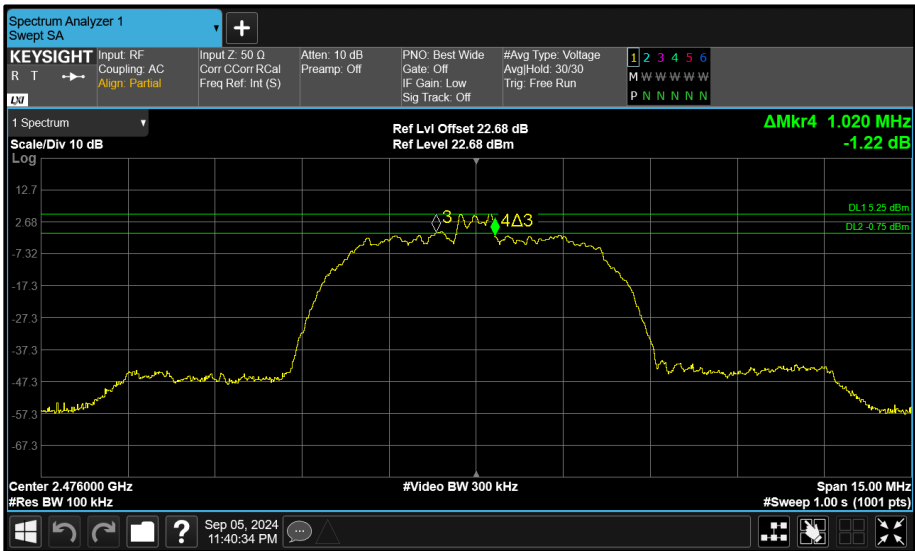


Figure 99 - Core 2 (C) 2476 MHz (CH74) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	iPA GFSK (LE 1M)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	C (Core 2)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	-	-	0.724	-	≥500.0
2440	-	-	0.716	-	≥500.0
2480	-	-	0.708	-	≥500.0

Table 28 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	-	-	1.036	-	-
2440	-	-	1.040	-	-
2480	-	-	1.036	-	-

Table 29 - 99% Bandwidth Results

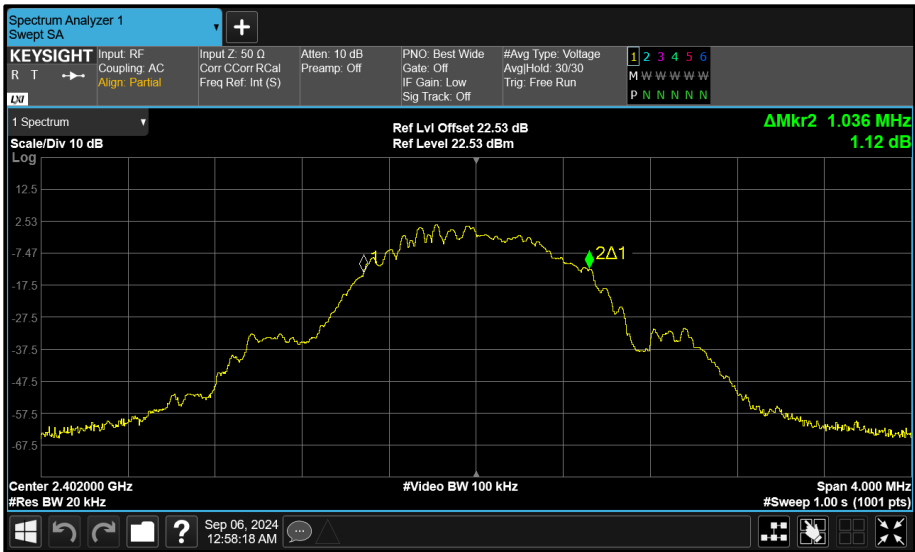


Figure 100 - Core 2 (C) 2402 MHz (CH37) 99% Bandwidth

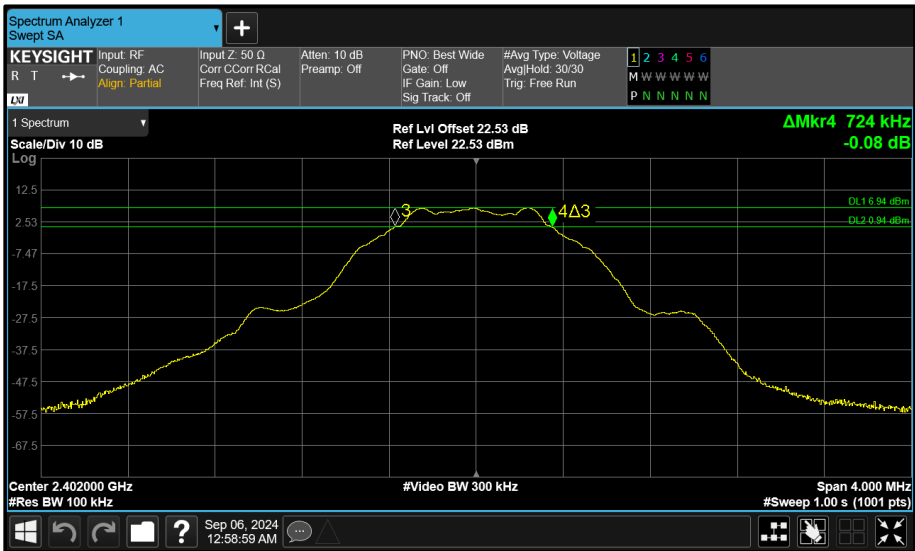


Figure 101 - Core 2 (C) 2402 MHz (CH37) 6 dB Bandwidth

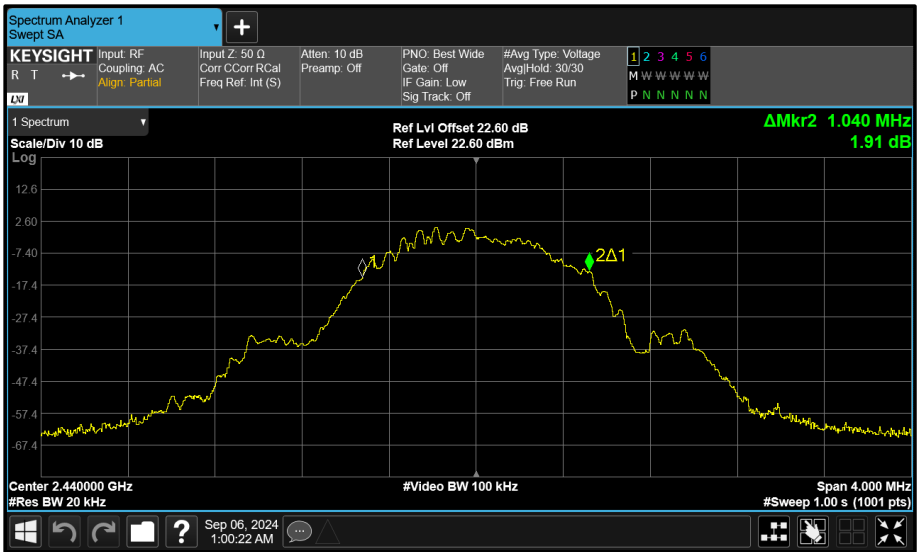


Figure 102 - Core 2 (C) 2440 MHz (CH17) 99% Bandwidth

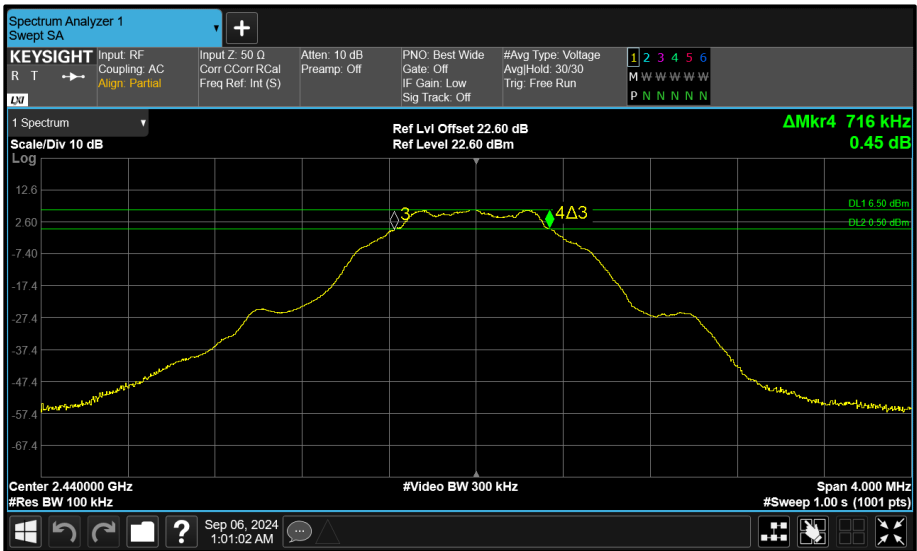


Figure 103 - Core 2 (C) 2440 MHz (CH17) 6 dB Bandwidth

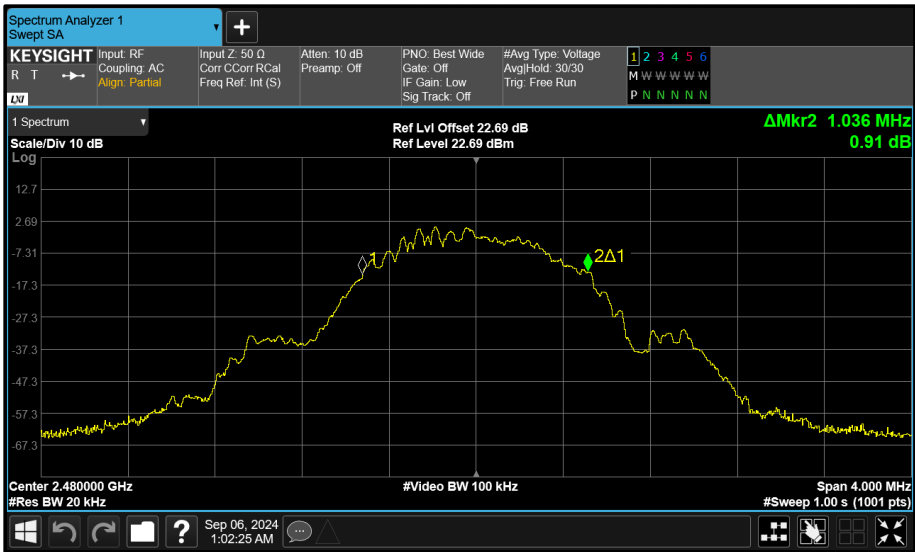


Figure 104 - Core 2 (C) 2480 MHz (CH39) 99% Bandwidth

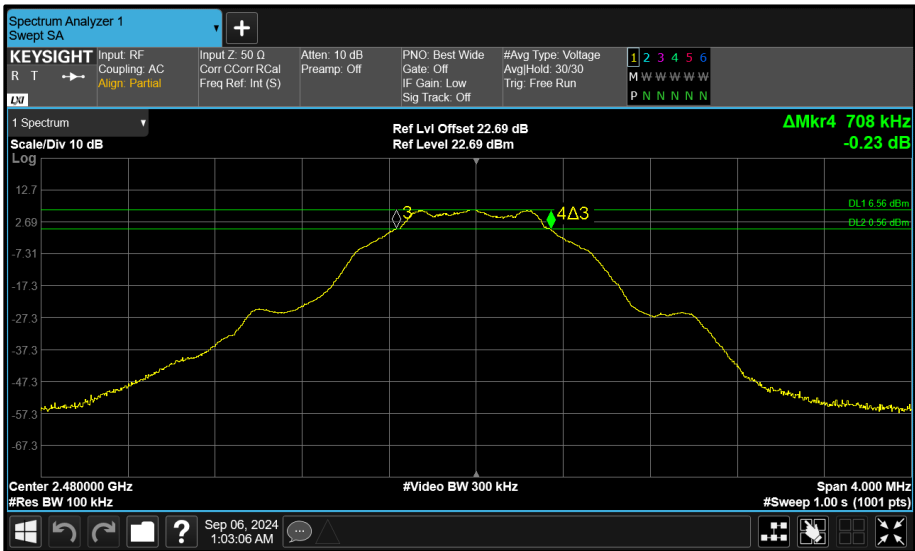


Figure 105 - Core 2 (C) 2480 MHz (CH39) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	iPA GFSK (LE 2M)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	C (Core 2)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	-	-	1.256	-	≥500.0
2440	-	-	1.264	-	≥500.0
2480	-	-	1.256	-	≥500.0

Table 30 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	-	-	2.088	-	-
2440	-	-	2.096	-	-
2480	-	-	2.088	-	-

Table 31 - 99% Bandwidth Results

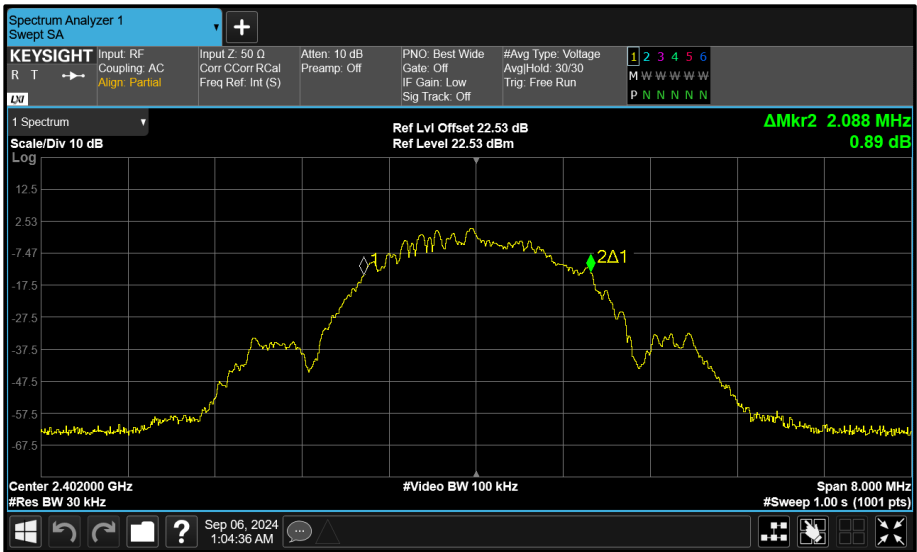


Figure 106 - Core 2 (C) 2402 MHz (CH37) 99% Bandwidth

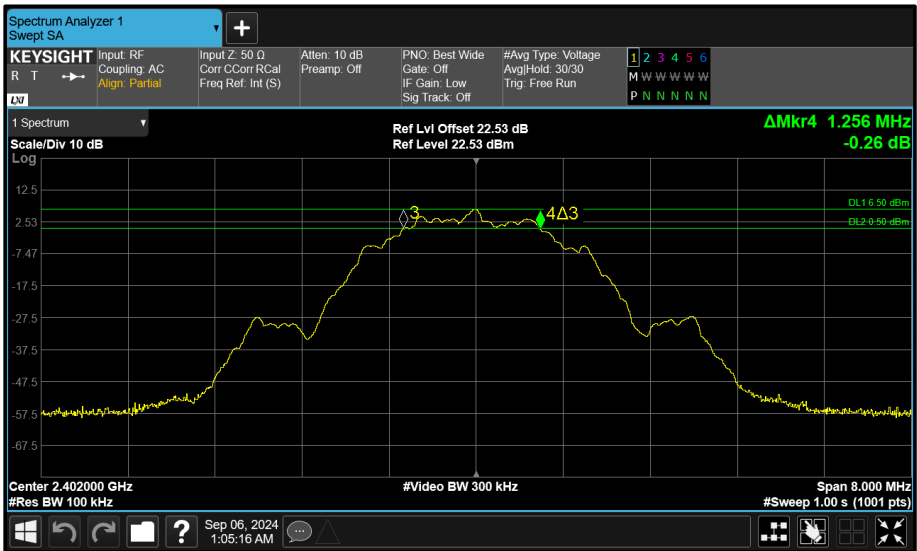


Figure 107 - Core 2 (C) 2402 MHz (CH37) 6 dB Bandwidth

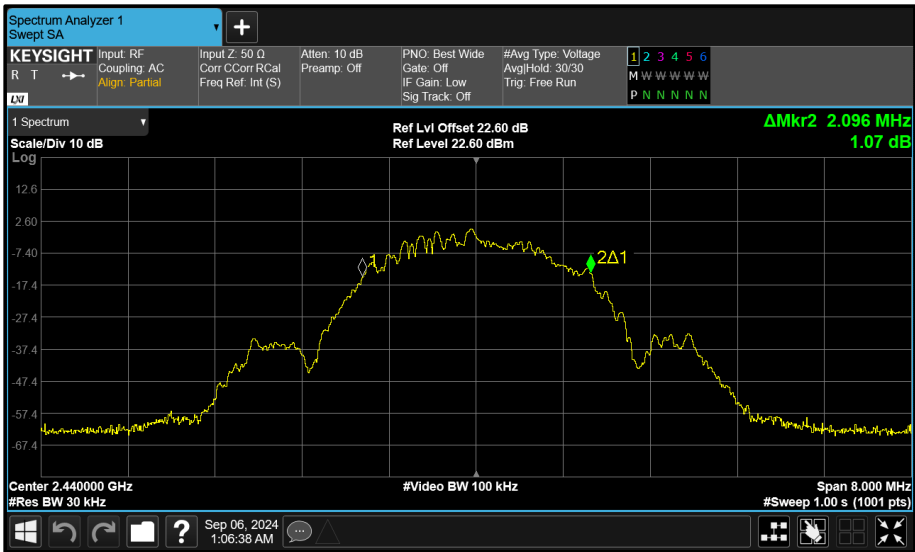


Figure 108 - Core 2 (C) 2440 MHz (CH17) 99% Bandwidth

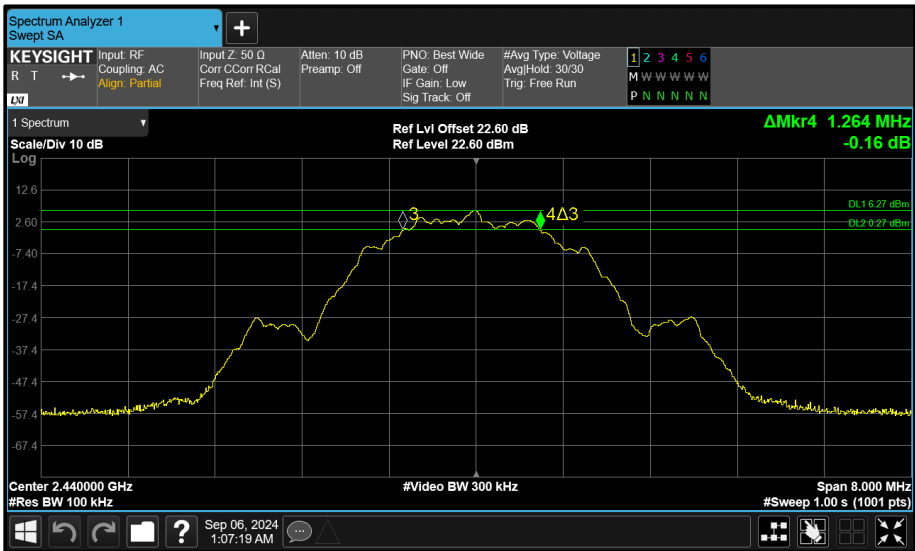


Figure 109 - Core 2 (C) 2440 MHz (CH17) 6 dB Bandwidth

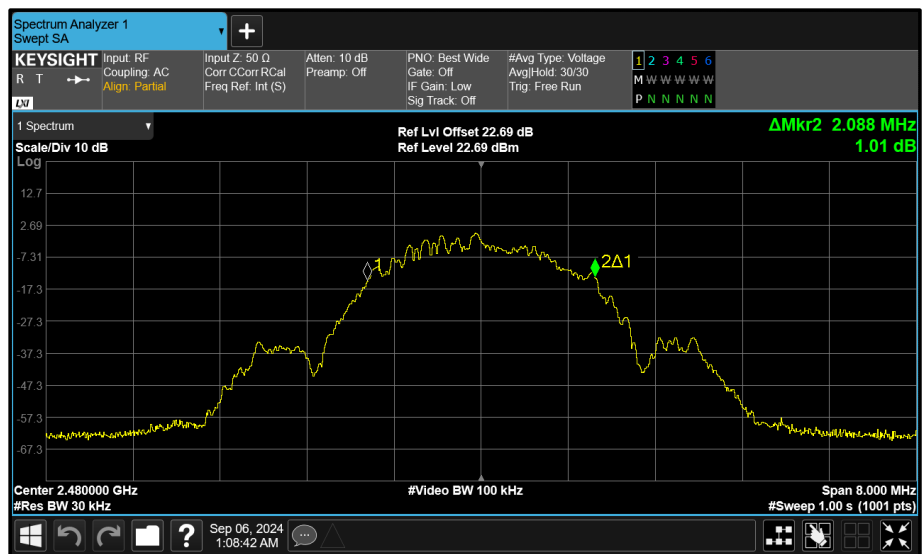


Figure 110 - Core 2 (C) 2480 MHz (CH39) 99% Bandwidth

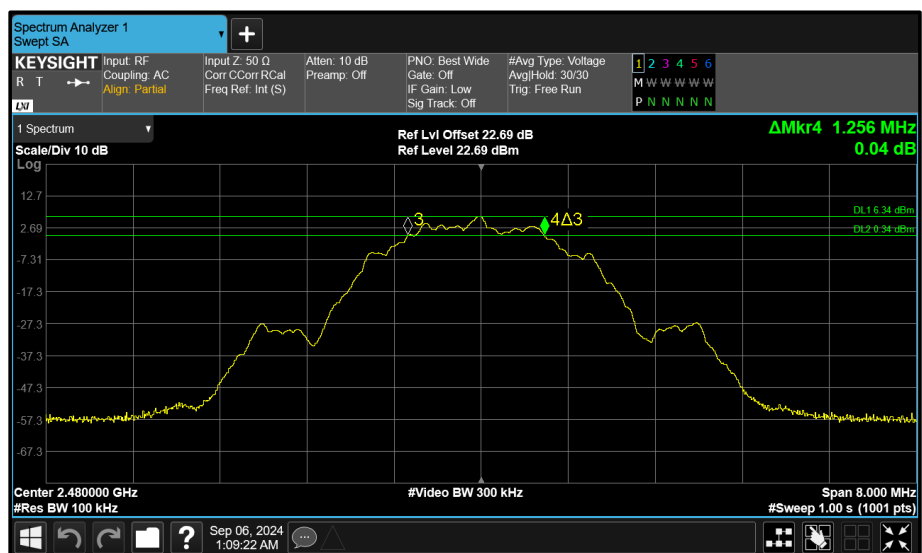


Figure 111 - Core 2 (C) 2480 MHz (CH39) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

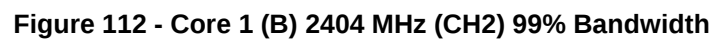
DUT Configuration			
Mode:	ePA $\pi/4$ DQPSK (4-DH5)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	B (Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	-	1.848	-	-	≥ 500.0
2441	-	1.904	-	-	≥ 500.0
2476	-	1.904	-	-	≥ 500.0

Table 32 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	-	2.320	-	-	-
2441	-	2.328	-	-	-
2476	-	2.328	-	-	-

Table 33 - 99% Bandwidth Results



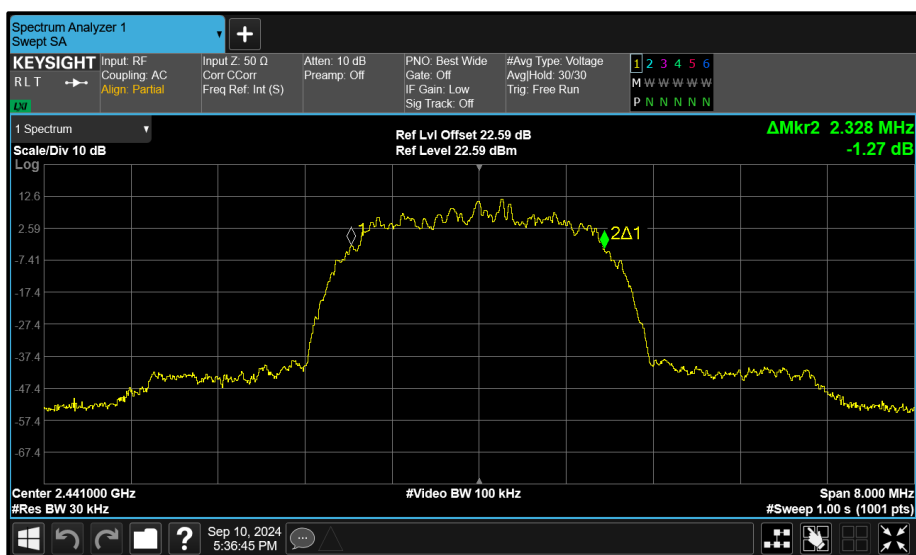


Figure 114 - Core 1 (B) 2441 MHz (CH39) 99% Bandwidth

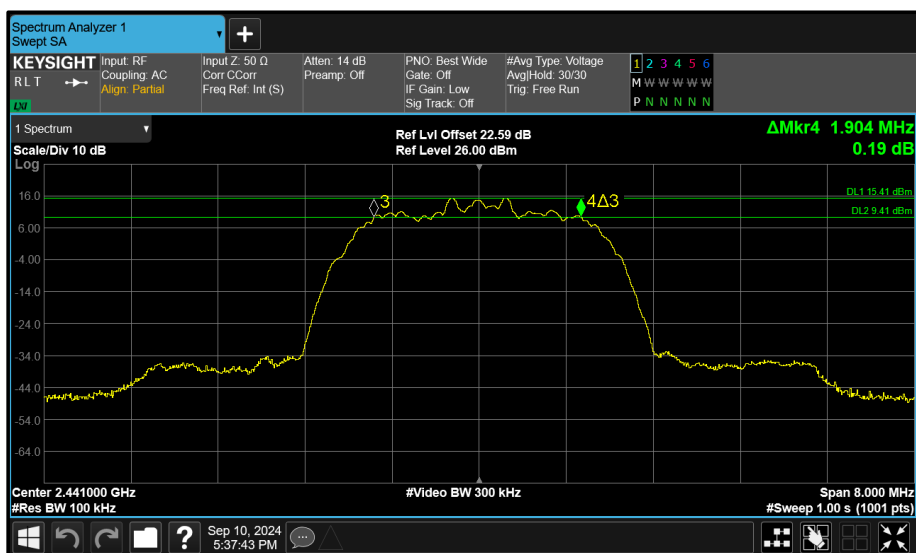


Figure 115 - Core 1 (B) 2441 MHz (CH39) 6 dB Bandwidth

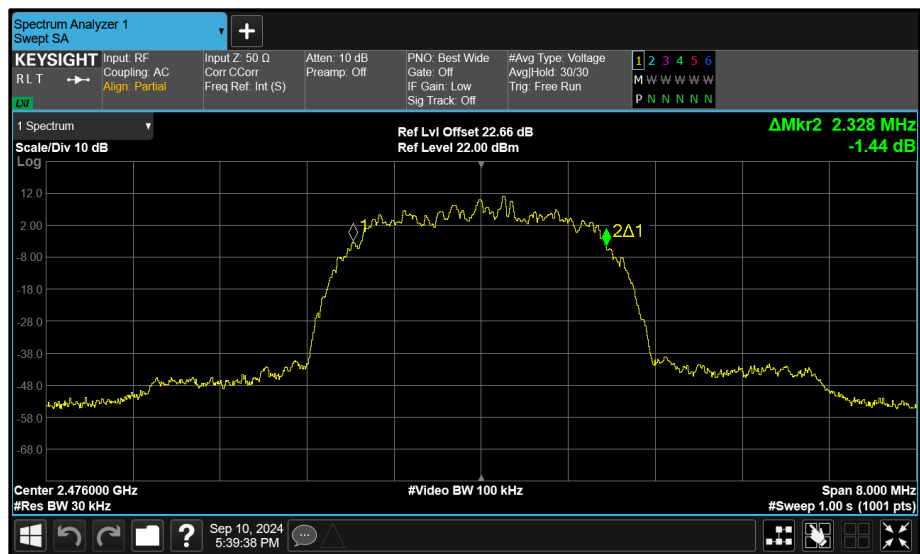


Figure 116 - Core 1 (B) 2476 MHz (CH74) 99% Bandwidth

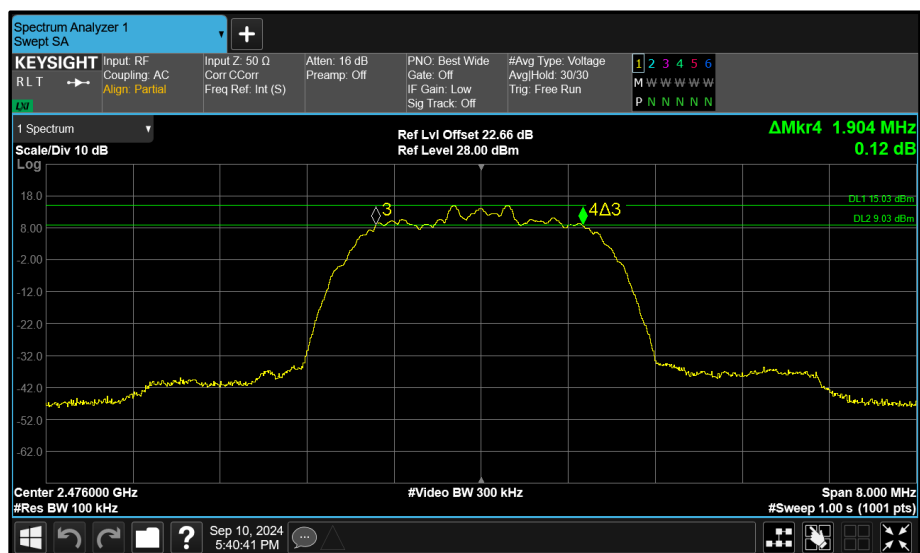


Figure 117 - Core 1 (B) 2476 MHz (CH74) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	ePA $\pi/4$ DQPSK (8-DH5)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	B (Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	-	0.660	-	-	≥ 500.0
2441	-	1.035	-	-	≥ 500.0
2476	-	1.020	-	-	≥ 500.0

Table 34 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	-	4.620	-	-	-
2441	-	4.635	-	-	-
2476	-	4.635	-	-	-

Table 35 - 99% Bandwidth Results

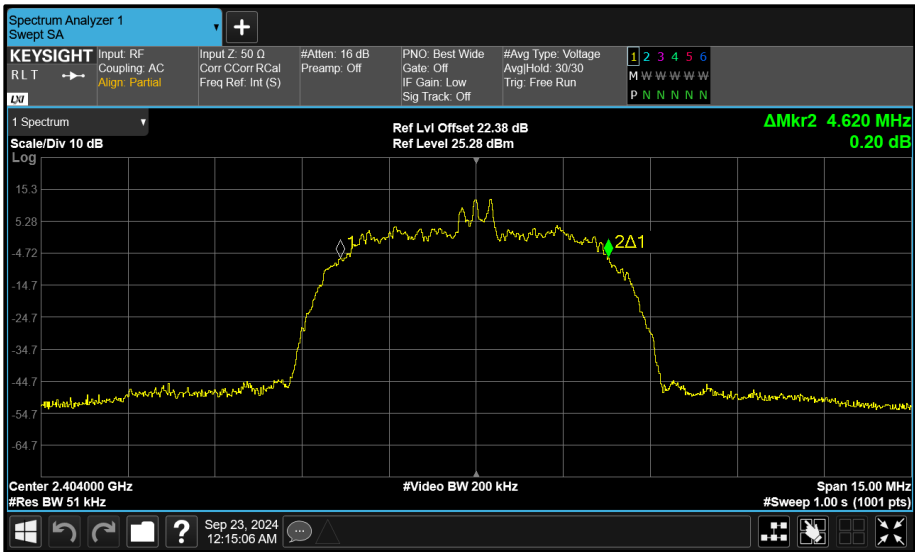


Figure 118 - Core 1 (B) 2404 MHz (CH2) 99% Bandwidth

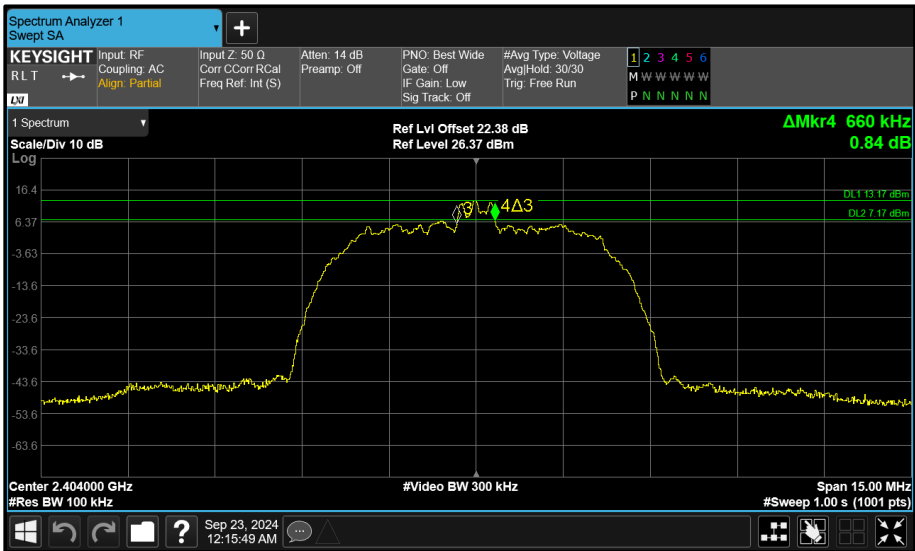


Figure 119 - Core 1 (B) 2404 MHz (CH2) 6 dB Bandwidth

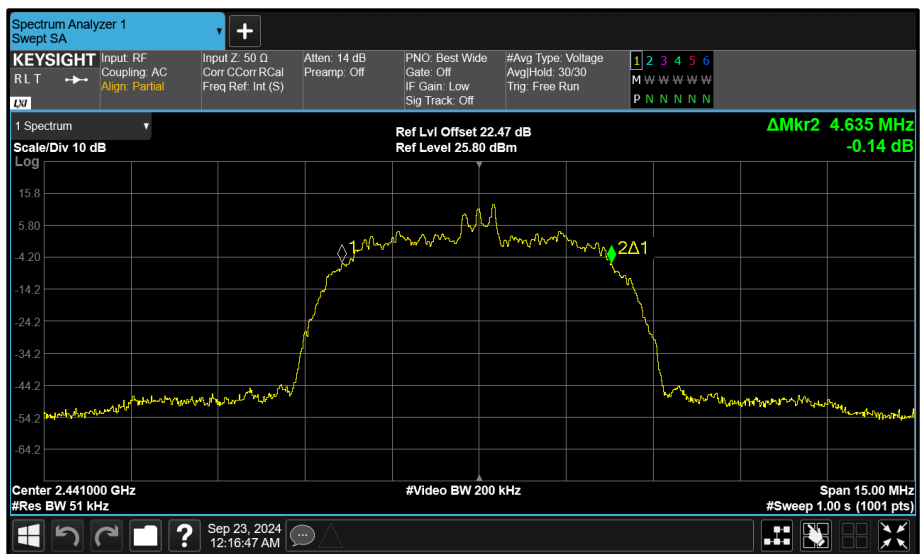


Figure 120 - Core 1 (B) 2441 MHz (CH39) 99% Bandwidth

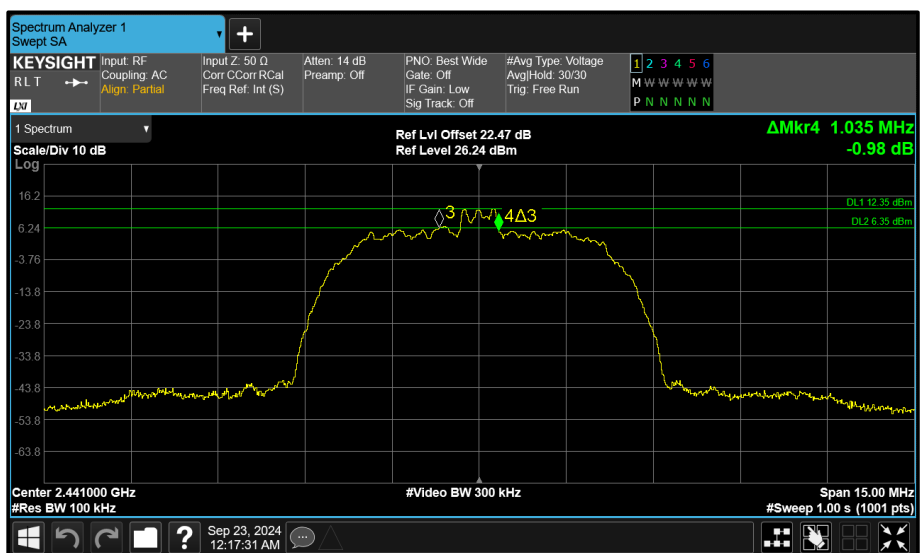


Figure 121 - Core 1 (B) 2441 MHz (CH39) 6 dB Bandwidth

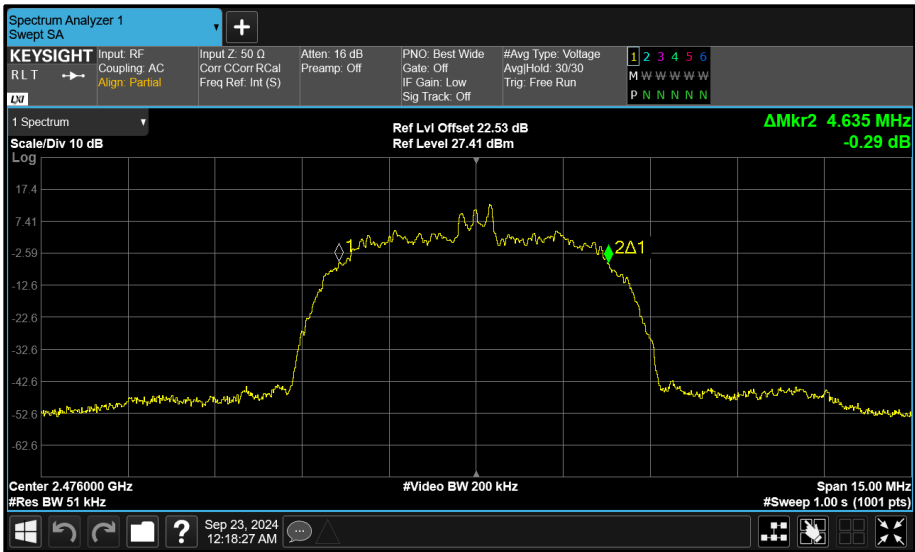


Figure 122 - Core 1 (B) 2476 MHz (CH74) 99% Bandwidth

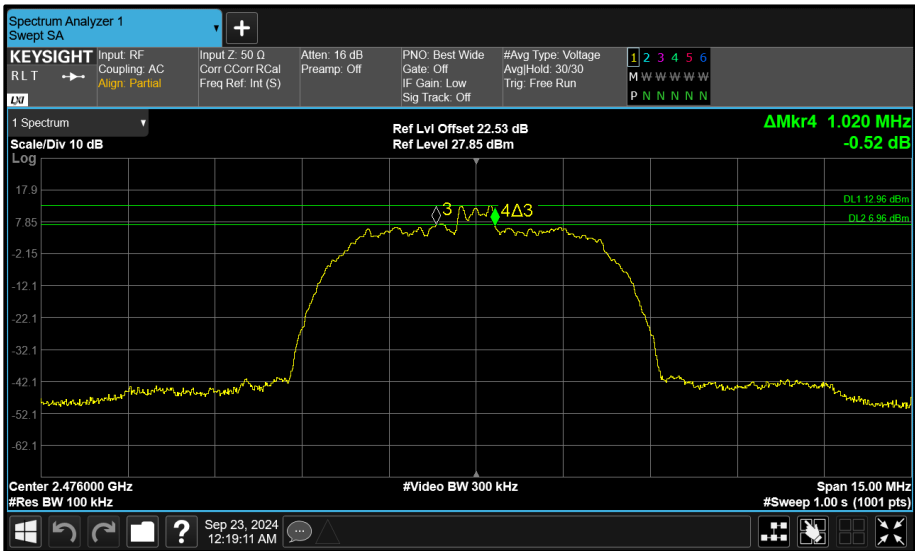


Figure 123 - Core 1 (B) 2476 MHz (CH74) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	ePA GFSK (LE 1M)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	A (Core 0)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	0.668	-	-	-	≥500.0
2440	0.668	-	-	-	≥500.0
2480	0.692	-	-	-	≥500.0

Table 36 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	1.040	-	-	-	-
2440	1.040	-	-	-	-
2480	1.040	-	-	-	-

Table 37 - 99% Bandwidth Results

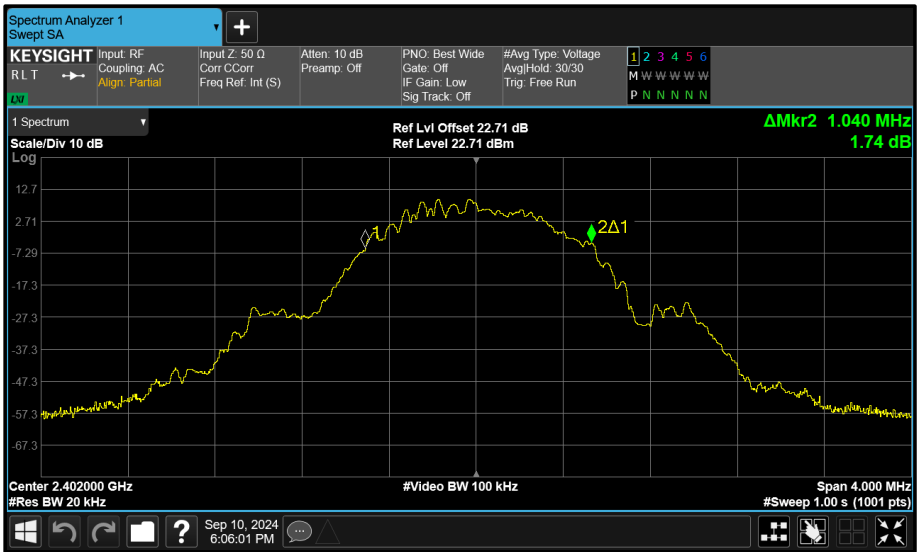


Figure 124 - Core 0 (A) 2402 MHz (CH37) 99% Bandwidth

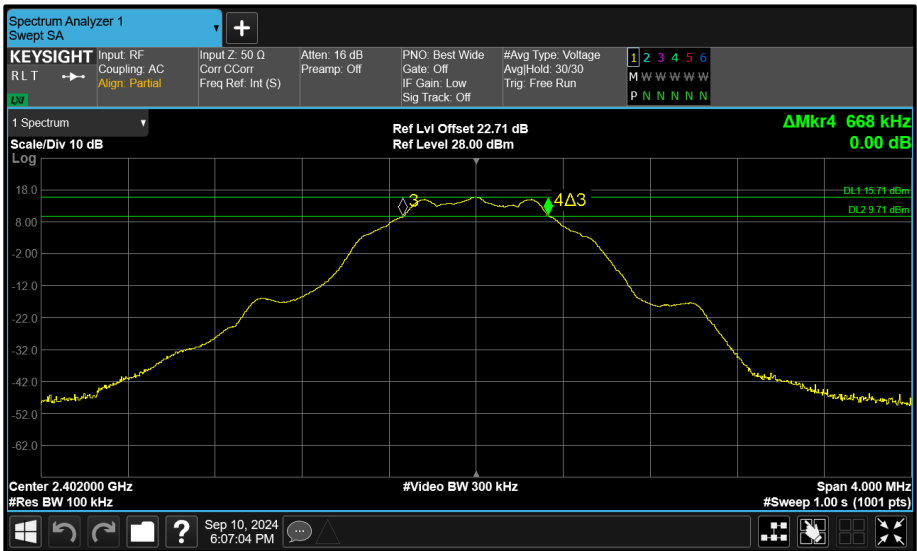


Figure 125 - Core 0 (A) 2402 MHz (CH37) 6 dB Bandwidth

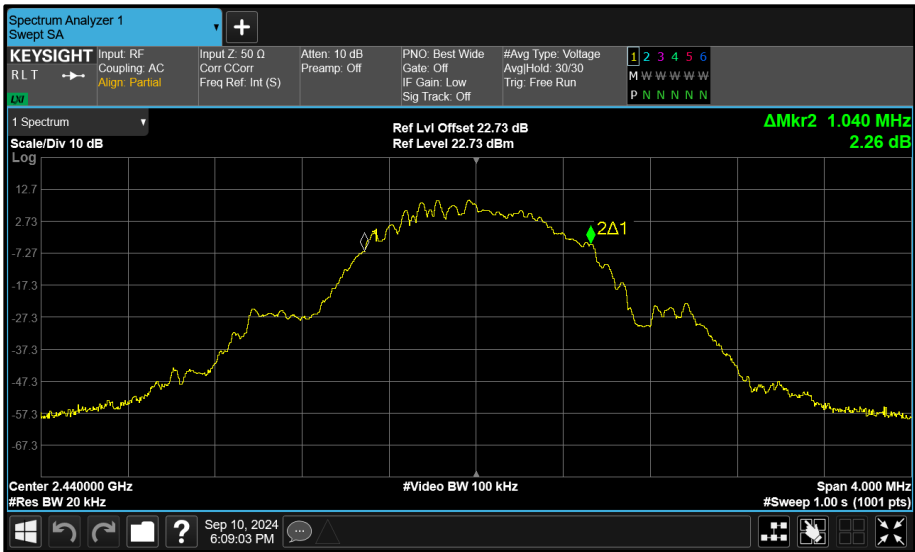


Figure 126 - Core 0 (A) 2440 MHz (CH17) 99% Bandwidth

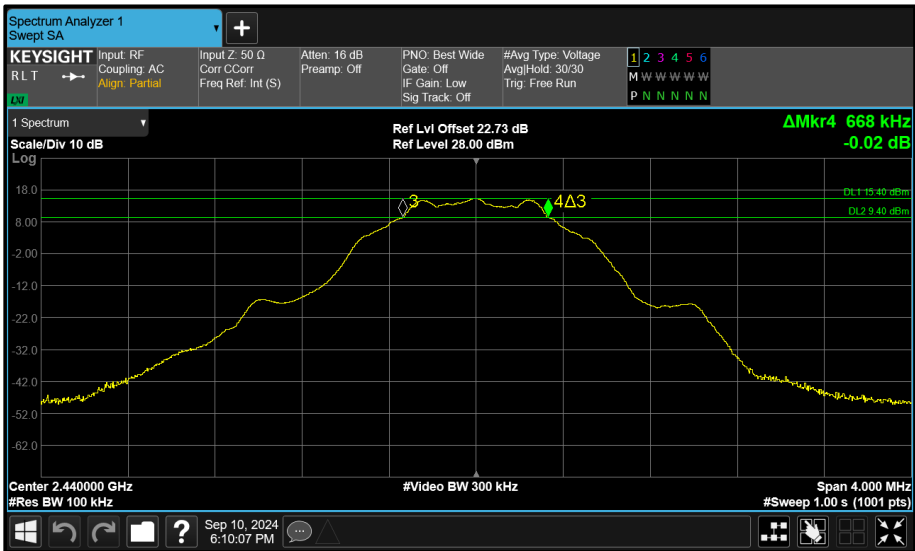


Figure 127 - Core 0 (A) 2440 MHz (CH17) 6 dB Bandwidth

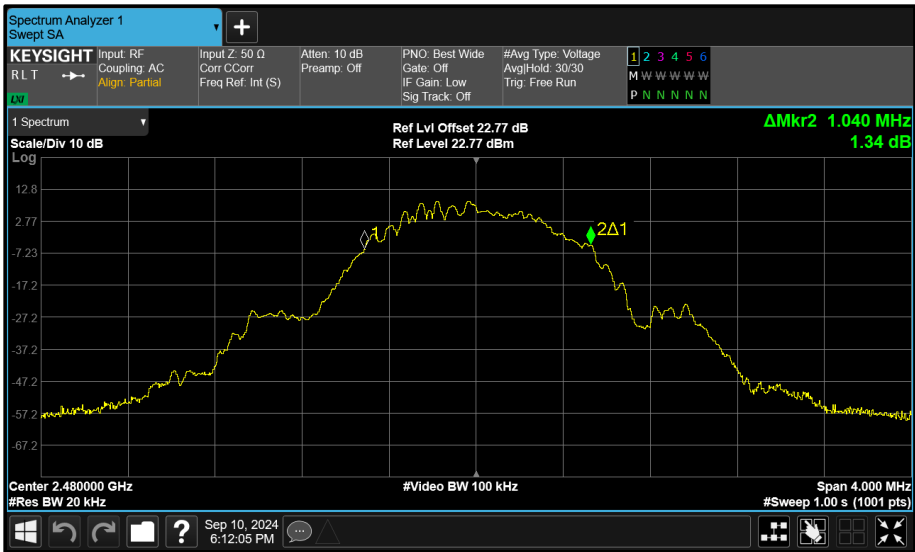


Figure 128 - Core 0 (A) 2480 MHz (CH39) 99% Bandwidth

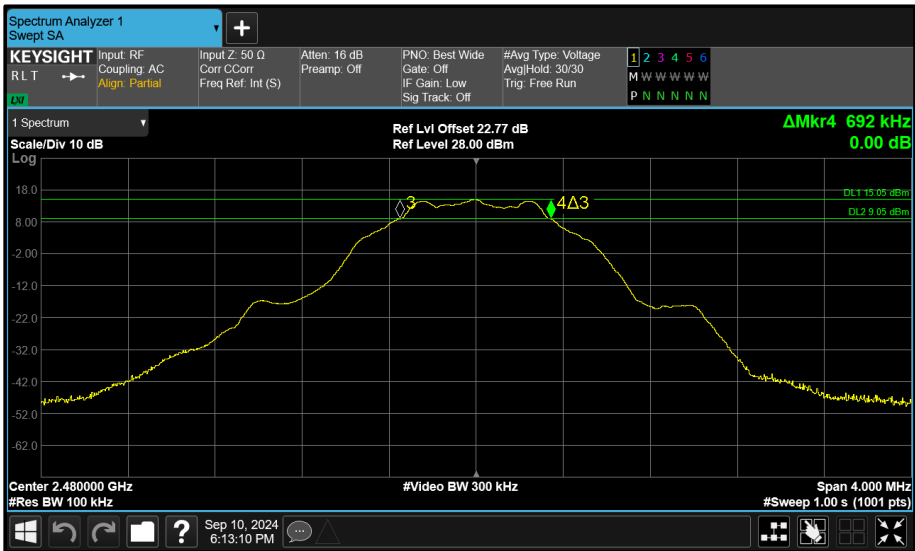


Figure 129 - Core 0 (A) 2480 MHz (CH39) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	ePA GFSK (LE 2M)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	A (Core 0)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	1.160	-	-	-	≥500.0
2440	1.160	-	-	-	≥500.0
2480	1.256	-	-	-	≥500.0

Table 38 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	2.088	-	-	-	-
2440	2.080	-	-	-	-
2480	2.088	-	-	-	-

Table 39 - 99% Bandwidth Results

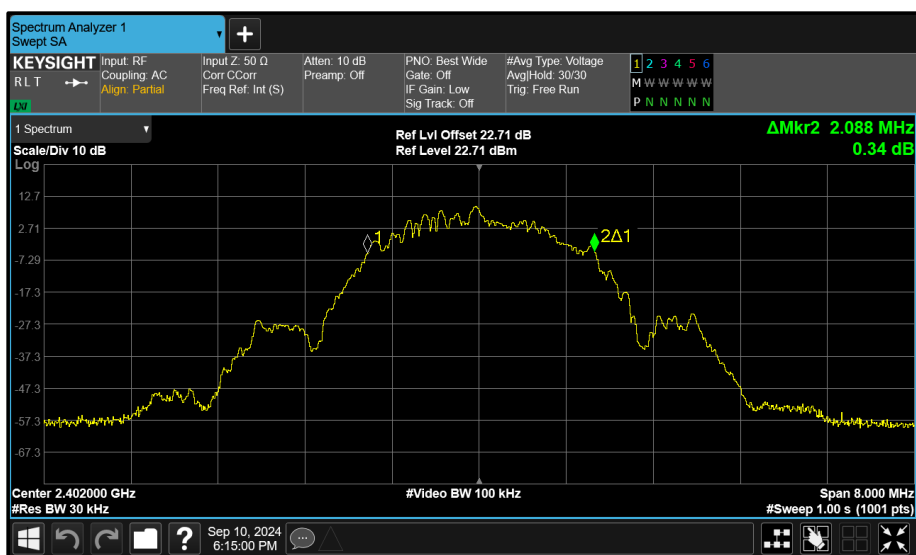


Figure 130 - Core 0 (A) 2402 MHz (CH37) 99% Bandwidth

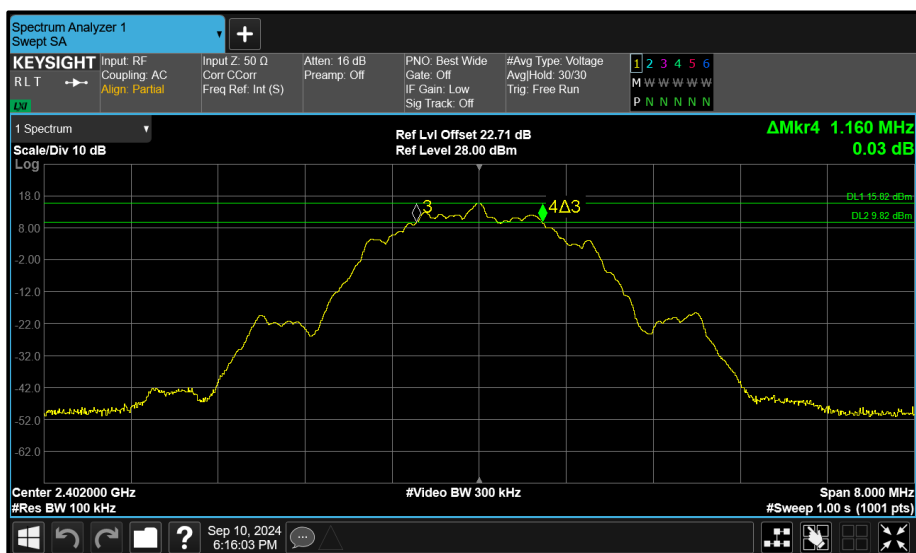


Figure 131 - Core 0 (A) 2402 MHz (CH37) 6 dB Bandwidth

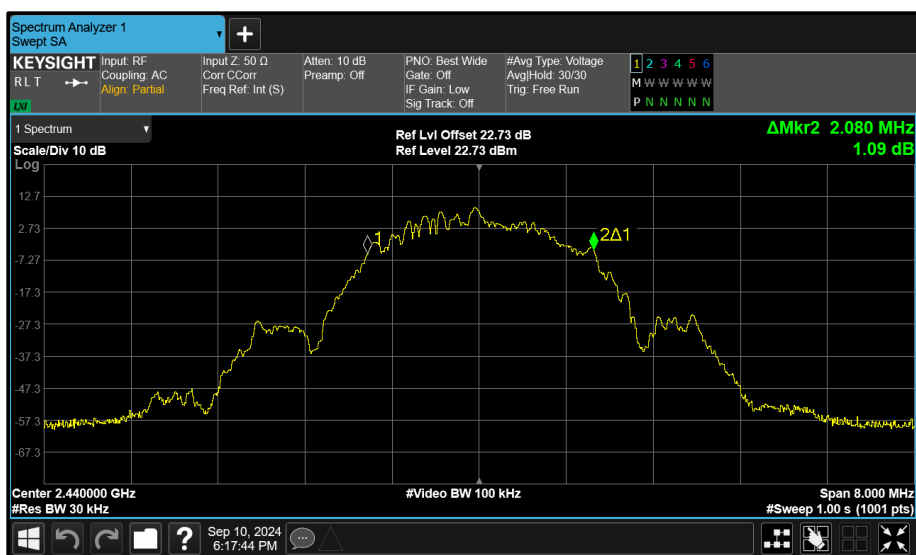


Figure 132 - Core 0 (A) 2440 MHz (CH17) 99% Bandwidth

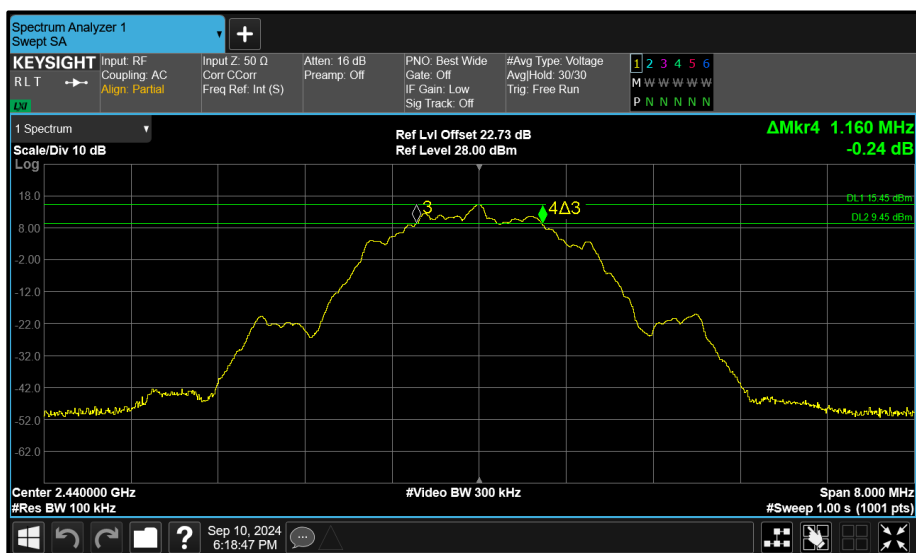


Figure 133 - Core 0 (A) 2440 MHz (CH17) 6 dB Bandwidth

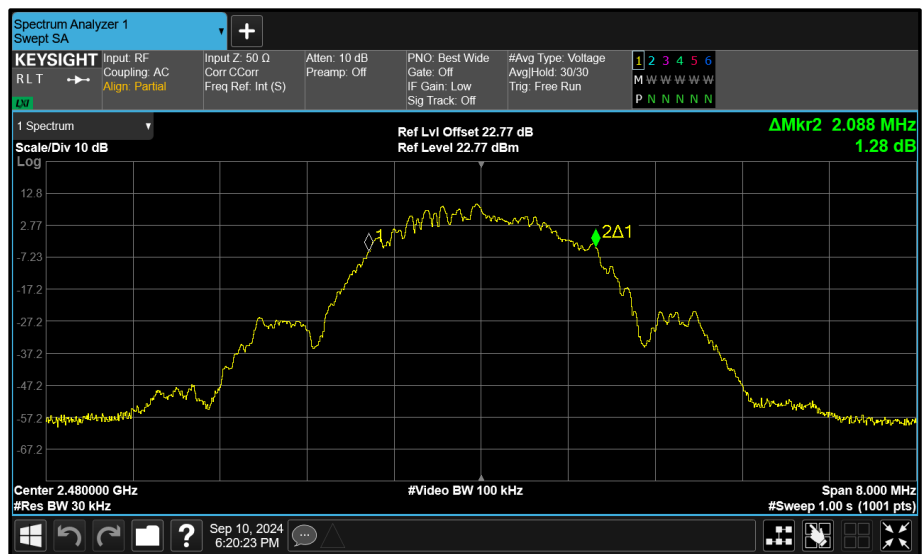


Figure 134 - Core 0 (A) 2480 MHz (CH39) 99% Bandwidth

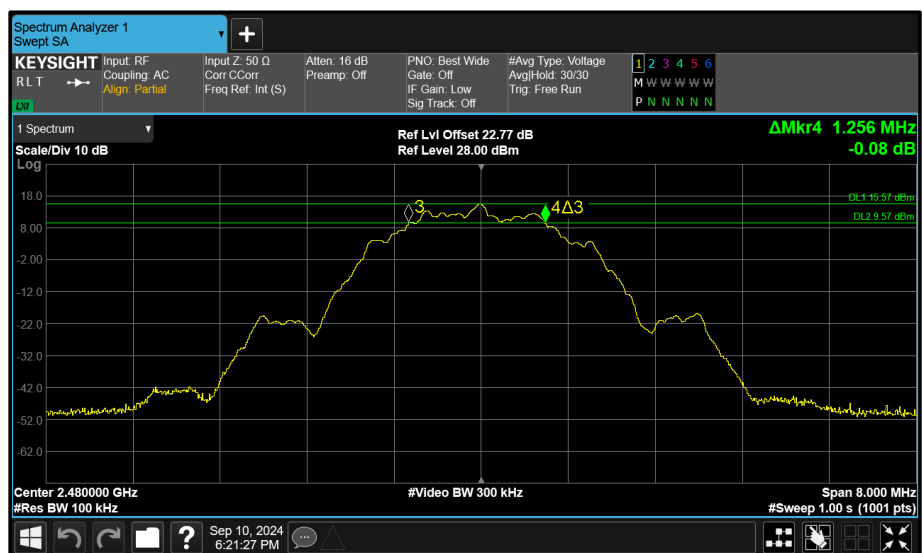


Figure 135 - Core 0 (A) 2480 MHz (CH39) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	iPA $\pi/4$ DQPSK (4-DH5)	Duty Cycle (%):	-
Antenna Configuration:	Beamforming	DCCF (dB):	-
Active Port(s):	A+B (Core 0 + Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	1.872	1.592	-	-	≥ 500.0
2441	1.880	1.904	-	-	≥ 500.0
2476	1.880	1.904	-	-	≥ 500.0

Table 40 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	2.344	2.328	-	-	-
2441	2.344	2.328	-	-	-
2476	2.344	2.336	-	-	-

Table 41 - 99% Bandwidth Results

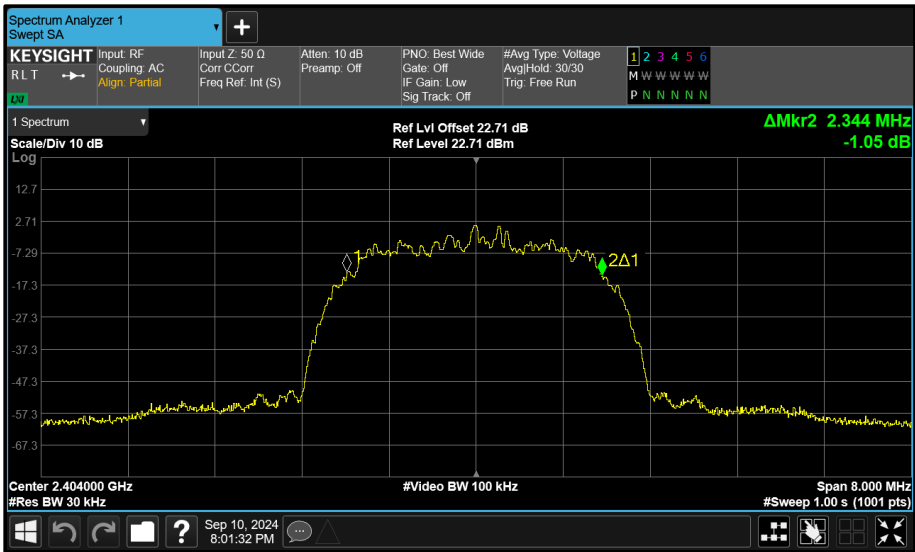


Figure 136 - Core 0 (A) 2404 MHz (CH2) 99% Bandwidth

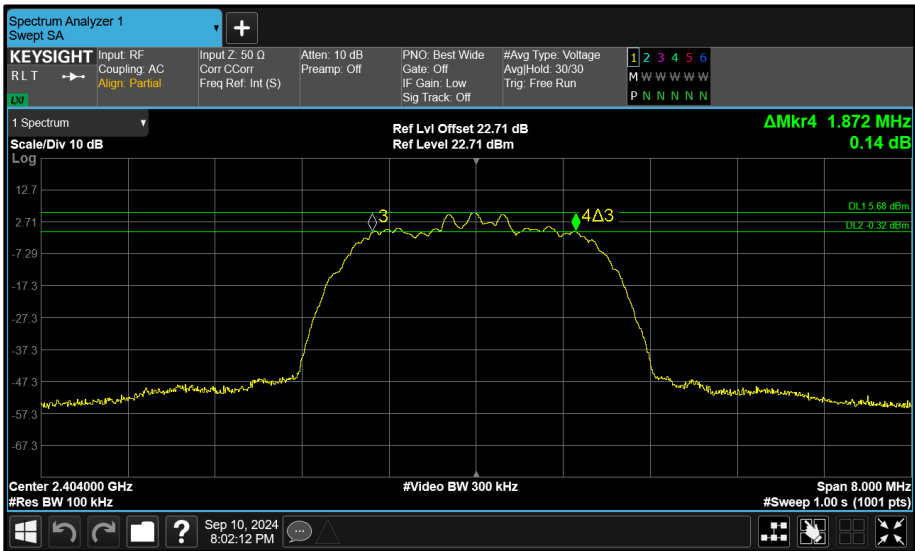


Figure 137 - Core 0 (A) 2404 MHz (CH2) 6 dB Bandwidth

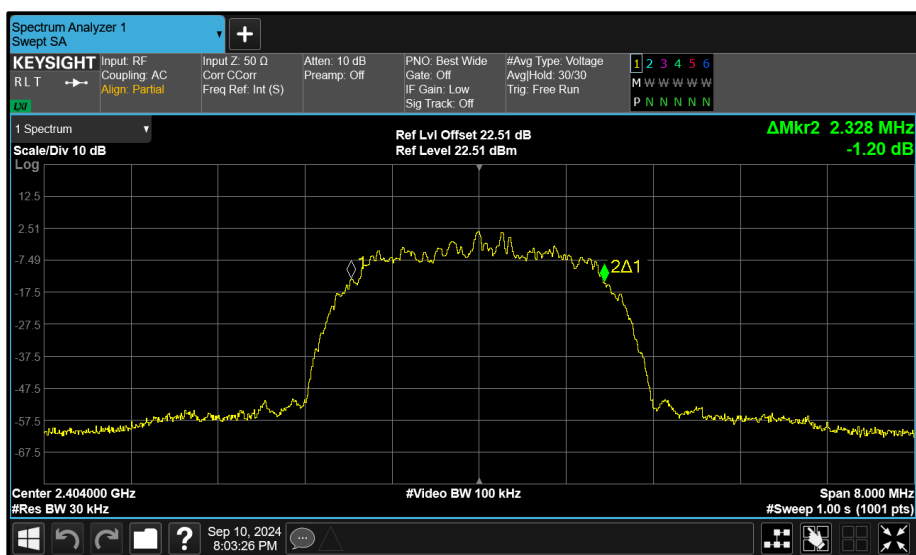


Figure 138 - Core 1 (B) 2404 MHz (CH2) 99% Bandwidth

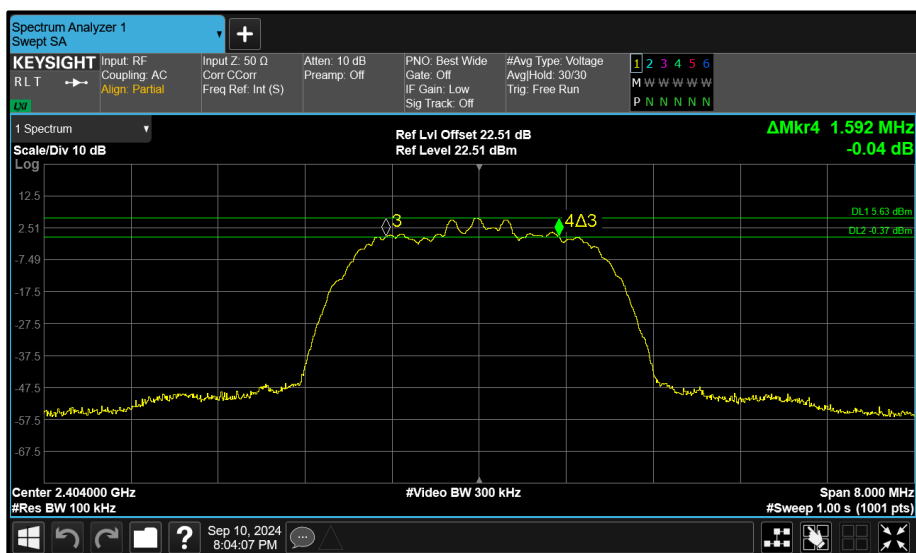


Figure 139 - Core 1 (B) 2404 MHz (CH2) 6 dB Bandwidth

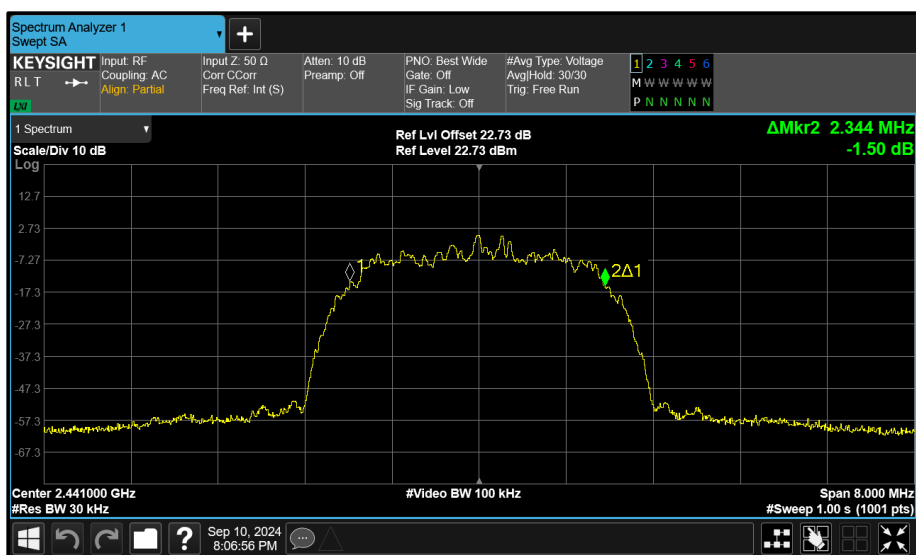


Figure 140 - Core 0 (A) 2441 MHz (CH39) 99% Bandwidth

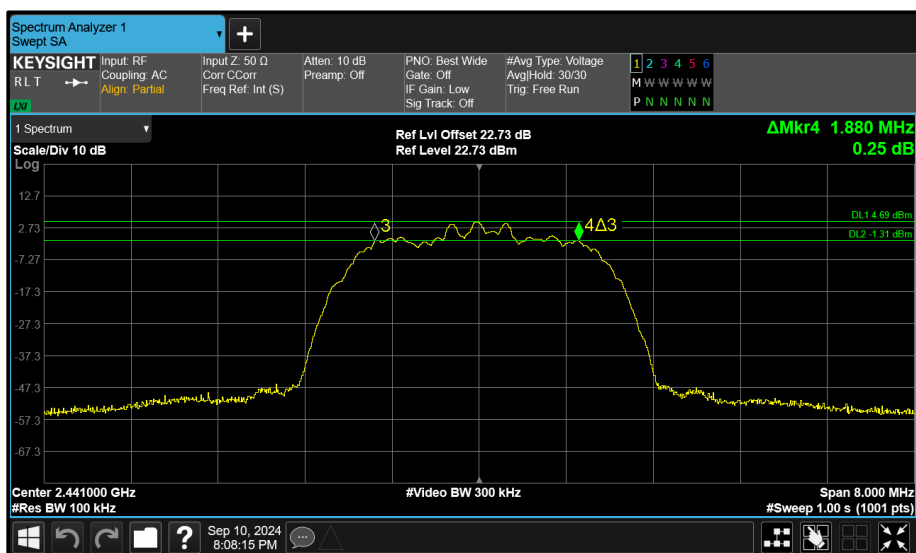


Figure 141 - Core 0 (A) 2441 MHz (CH39) 6 dB Bandwidth

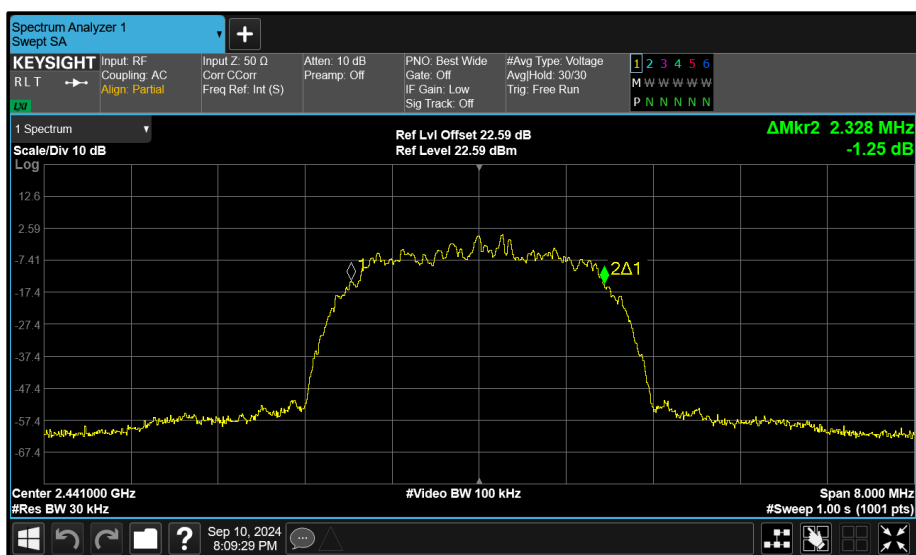


Figure 142 - Core 1 (B) 2441 MHz (CH39) 99% Bandwidth

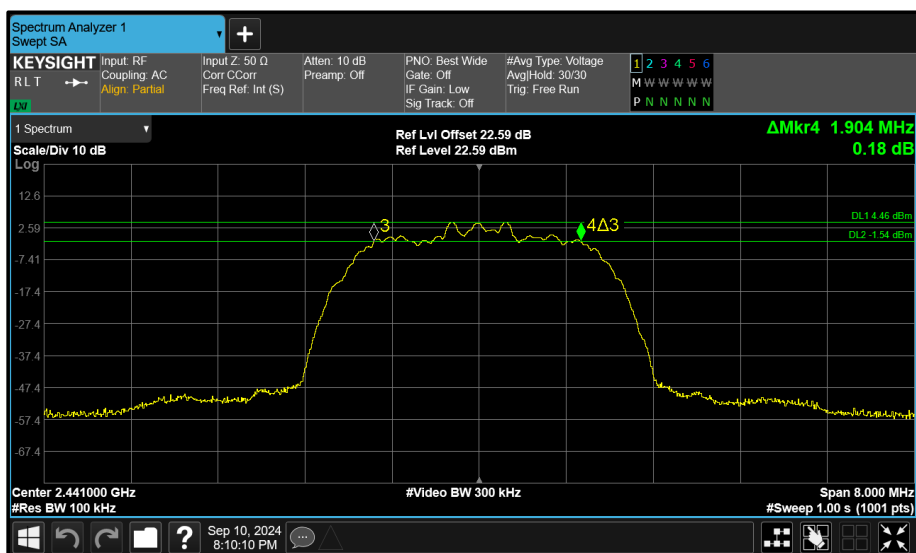


Figure 143 - Core 1 (B) 2441 MHz (CH39) 6 dB Bandwidth

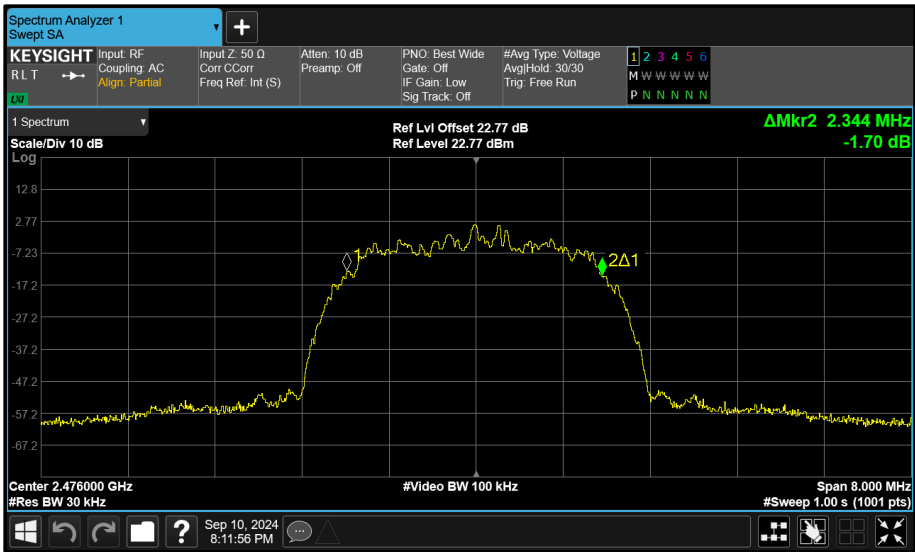


Figure 144 - Core 0 (A) 2476 MHz (CH74) 99% Bandwidth

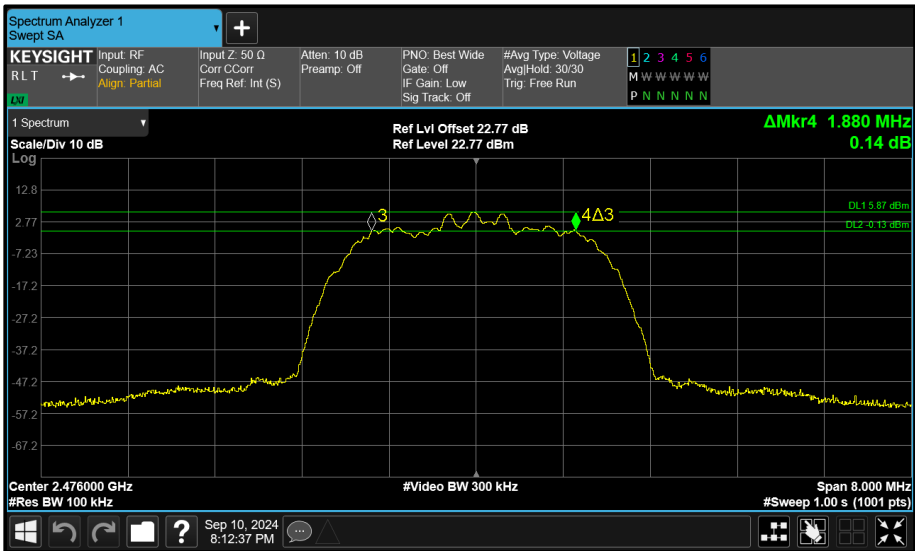


Figure 145 - Core 0 (A) 2476 MHz (CH74) 6 dB Bandwidth

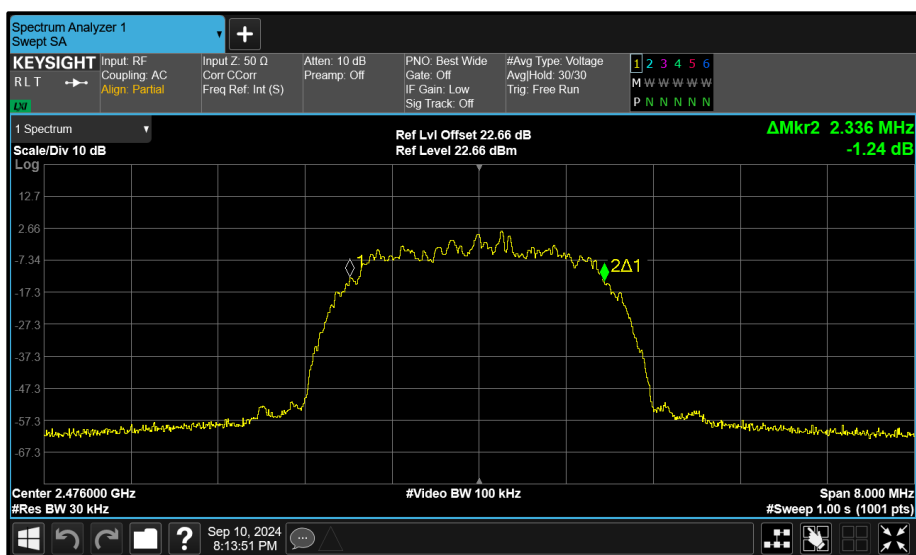


Figure 146 - Core 1 (B) 2476 MHz (CH74) 99% Bandwidth

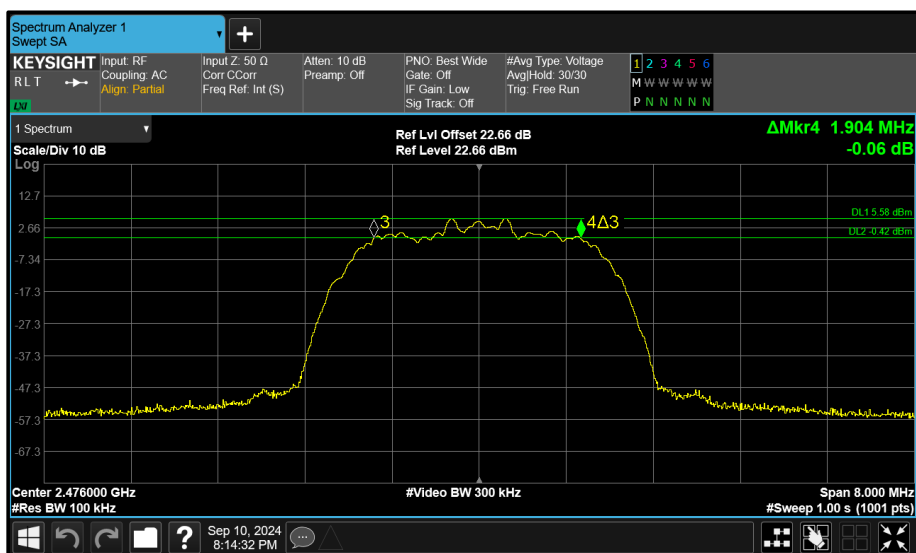


Figure 147 - Core 1 (B) 2476 MHz (CH74) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	iPA $\pi/4$ DQPSK (8-DH5)	Duty Cycle (%):	-
Antenna Configuration:	Beamforming	DCCF (dB):	-
Active Port(s):	A+B (Core 0 + Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	0.660	0.660	-	-	≥ 500.0
2441	0.945	1.020	-	-	≥ 500.0
2476	1.005	1.020	-	-	≥ 500.0

Table 42 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2404	4.695	4.620	-	-	-
2441	4.710	4.635	-	-	-
2476	4.710	4.635	-	-	-

Table 43 - 99% Bandwidth Results

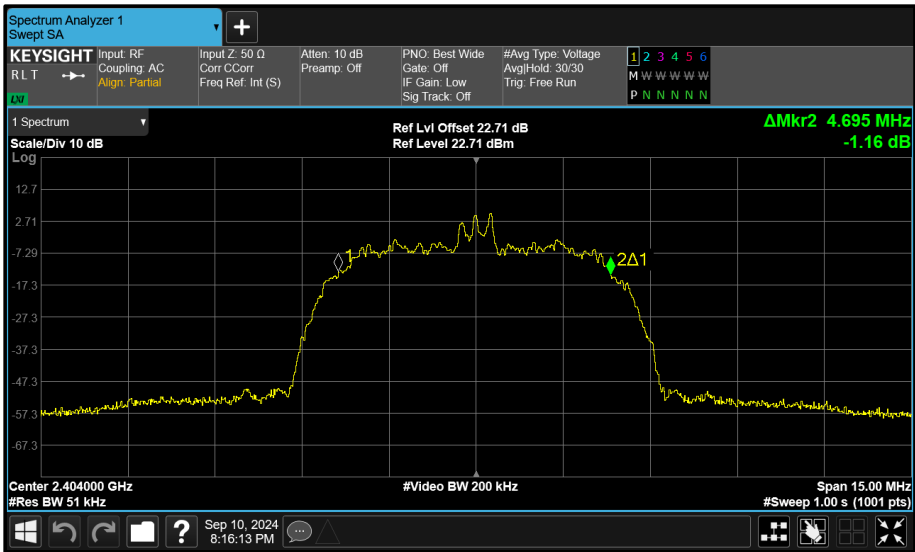


Figure 148 - Core 0 (A) 2404 MHz (CH2) 99% Bandwidth

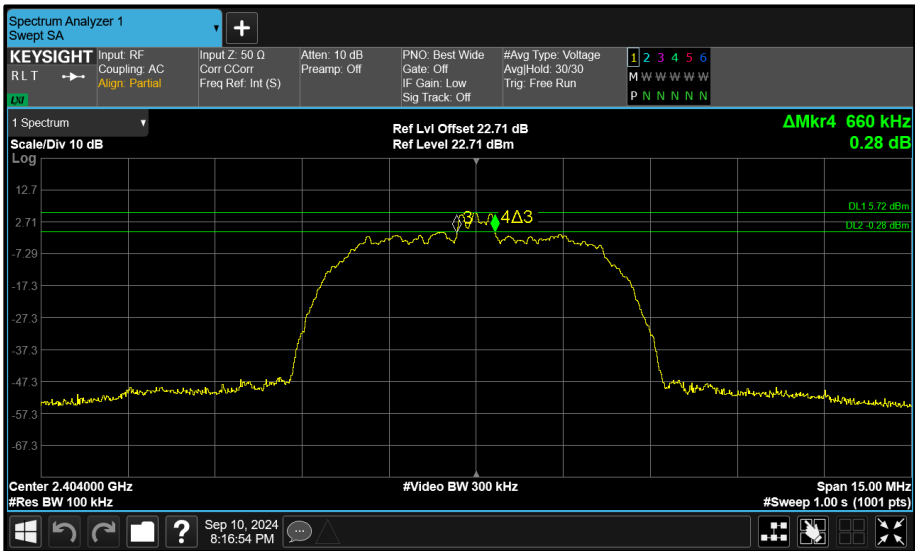


Figure 149 - Core 0 (A) 2404 MHz (CH2) 6 dB Bandwidth

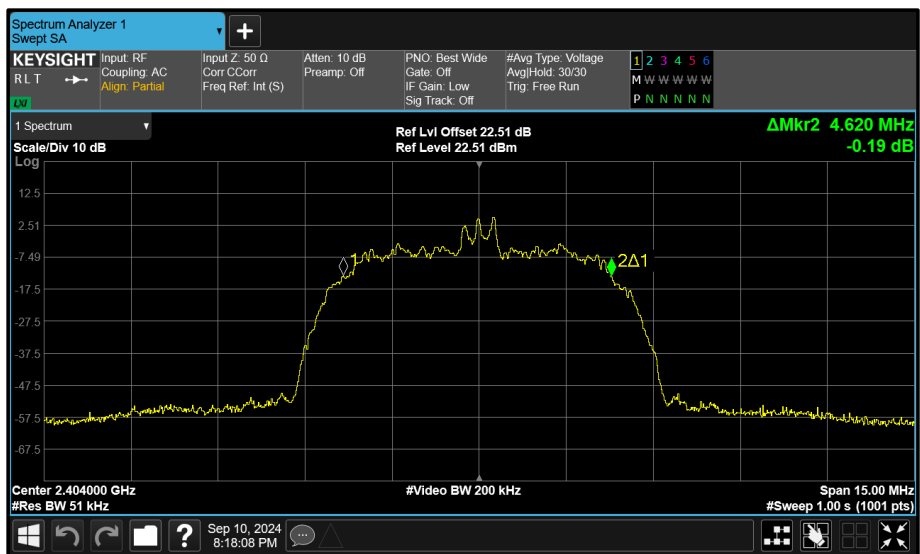


Figure 150 - Core 1 (B) 2404 MHz (CH2) 99% Bandwidth

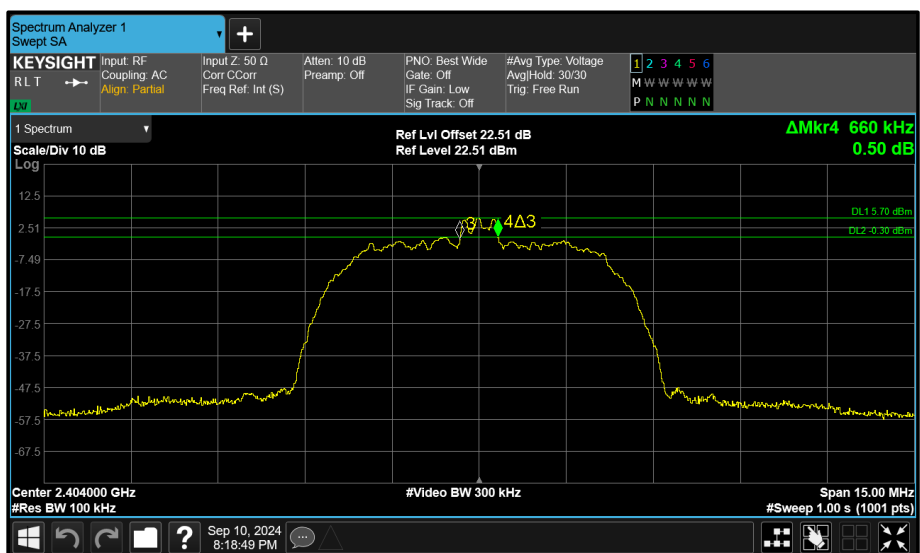


Figure 151 - Core 1 (B) 2404 MHz (CH2) 6 dB Bandwidth