

Appendix A: Test Result of Conducted Test

20dB Occupied Bandwidth

Test Result

Mode	Channel.	20dB Bandwidth [MHz]	99% OBW [MHz]	Verdict
GFSK	LCH	1.027	0.88780	PASS
GFSK	MCH	1.024	0.89469	PASS
GFSK	HCH	0.9680	0.90352	PASS
$\pi/4$ DQPSK	LCH	1.316	1.1876	PASS
$\pi/4$ DQPSK	MCH	1.291	1.1884	PASS
$\pi/4$ DQPSK	HCH	1.282	1.1748	PASS
8DPSK	LCH	1.300	1.1909	PASS
8DPSK	MCH	1.311	1.2076	PASS
8DPSK	HCH	1.300	1.1822	PASS

Test Graph

Graphs

GFSK/LCH



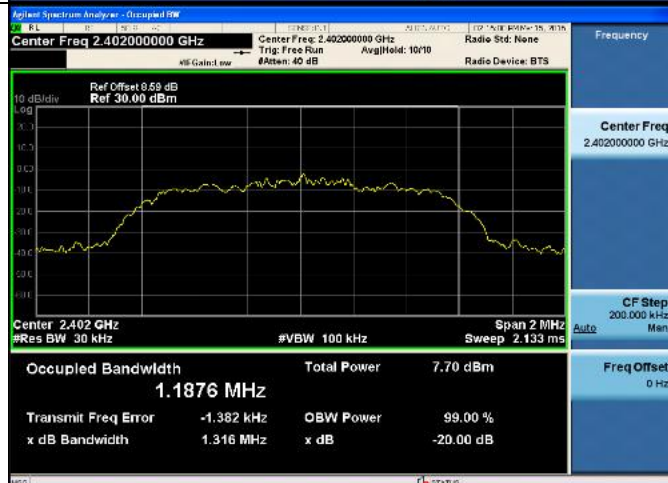
GFSK/MCH



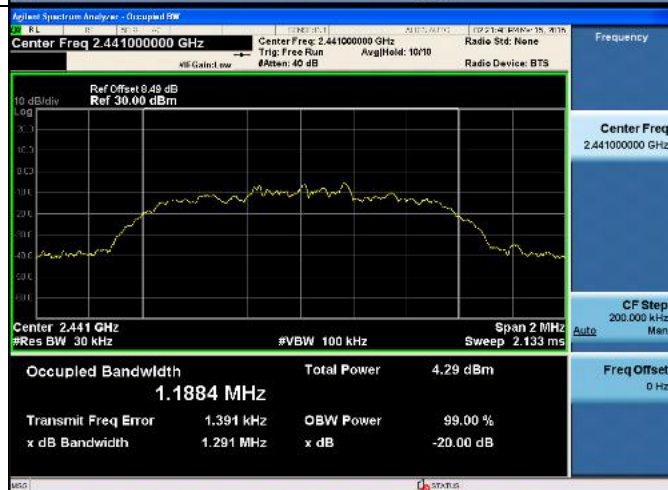
GFSK/HCH



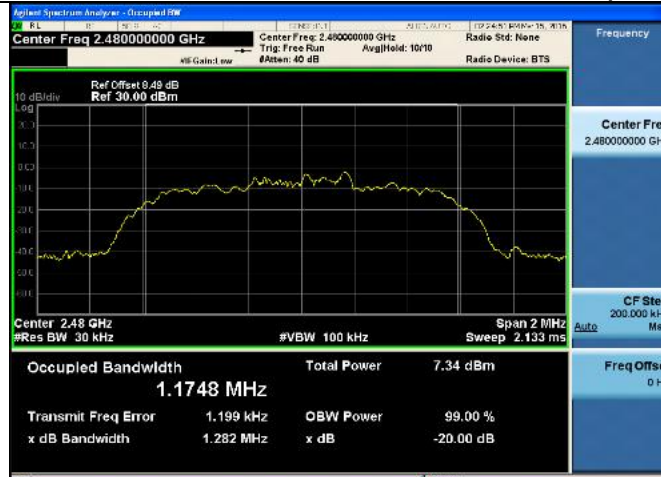
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



TT/4DQPSK/HCH



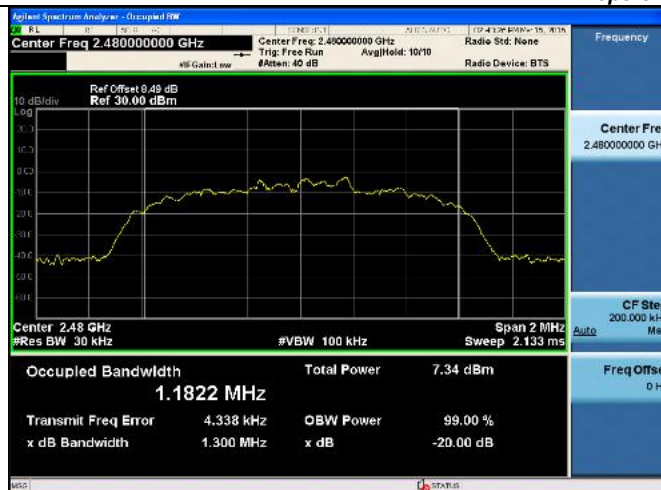
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



Carrier Frequency Separation

Result Table

Mode	Channel.	Carrier Frequency Separation [MHz]	Verdict
GFSK	LCH	1.032	PASS
GFSK	MCH	1.190	PASS
GFSK	HCH	1.118	PASS
$\pi/4$ DQPSK	LCH	1.156	PASS
$\pi/4$ DQPSK	MCH	0.986	PASS
$\pi/4$ DQPSK	HCH	0.912	PASS
8DPSK	LCH	0.976	PASS
8DPSK	MCH	0.984	PASS
8DPSK	HCH	1.314	PASS

Test Graph



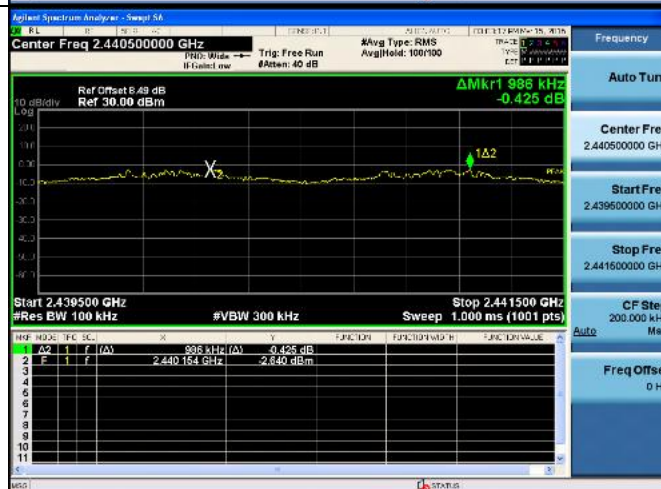
GFSK/HCH



$\pi/4$ DQPSK/LCH



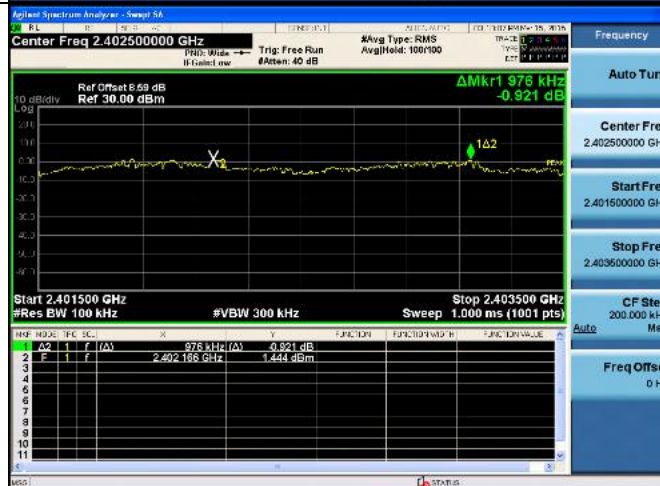
$\pi/4$ DQPSK/MCH



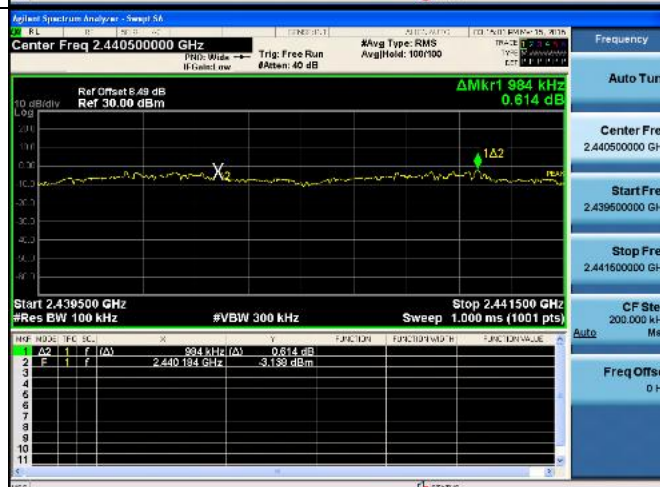
TT/4DQPSK/HCH



8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



Dwell Time

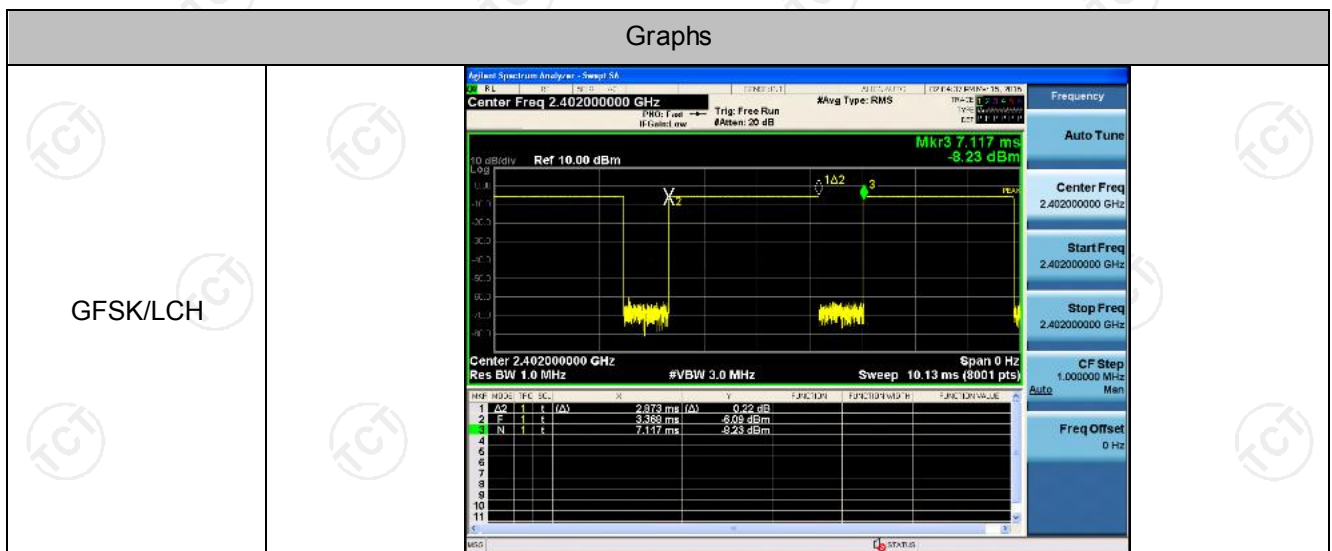
Result Table

The Dwell Time=Burst Width*Total Hops. The detailed calculations are showed as follows:

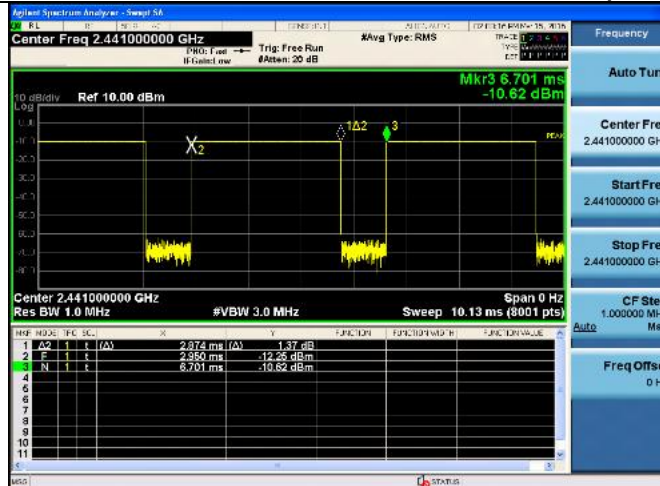
- The duration for dwell time calculation: $0.4[s] \times \text{hopping number} = 0.4[s] \times 79[\text{ch}] = 31.6[s \cdot \text{ch}]$;
- The burst width [ms/hop/ch], which is directly measured, refers to the duration on one channel hop.
- The hops per second for all channels: The selected EUT Conf uses a slot type of 5-Tx&1-Rx and a hopping rate of 1600 [ch*hop/s] for all channels. So the final hopping rate for all channels is $1600/6 = 266.67 [\text{ch} \cdot \text{hop/s}]$
- The hops per second on one channel: $266.67 [\text{ch} \cdot \text{hops/s}] / 79 [\text{ch}] = 3.38 [\text{hop/s}]$;
- The total hops for all channels within the dwell time calculation duration: $3.38 [\text{hop/s}] \times 31.6[s \cdot \text{ch}] = 106.67 [\text{hop} \cdot \text{ch}]$;
- The dwell time for all channels hopping: $106.67 [\text{hop} \cdot \text{ch}] \times \text{Burst Width} [\text{ms/hop/ch}]$.

Mode	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Duty Cycle [%]	Verdict
GFSK	LCH	2.873	106.7	0.307	76.62	PASS
GFSK	MCH	2.874	106.7	0.307	76.63	PASS
GFSK	HCH	2.873	106.7	0.307	76.62	PASS
$\pi/4$ DQPSK	LCH	2.877	106.7	0.307	76.70	PASS
$\pi/4$ DQPSK	MCH	2.877	106.7	0.307	76.70	PASS
$\pi/4$ DQPSK	HCH	2.877	106.7	0.307	76.70	PASS
8DPSK	LCH	2.879	106.7	0.307	76.76	PASS
8DPSK	MCH	2.879	106.7	0.307	76.76	PASS
8DPSK	HCH	2.878	106.7	0.307	76.76	PASS

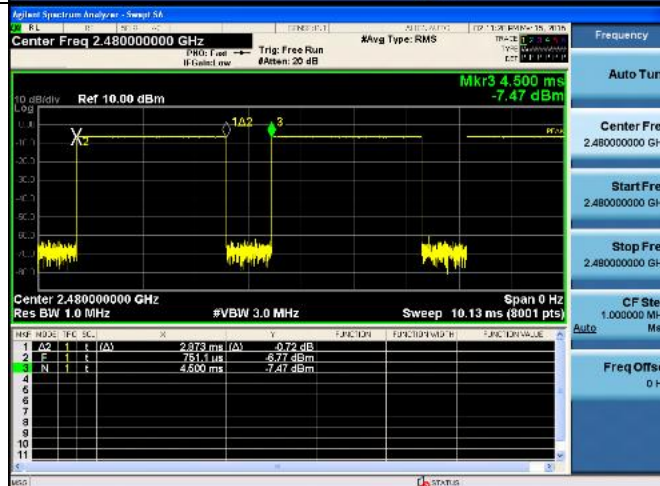
Test Graph



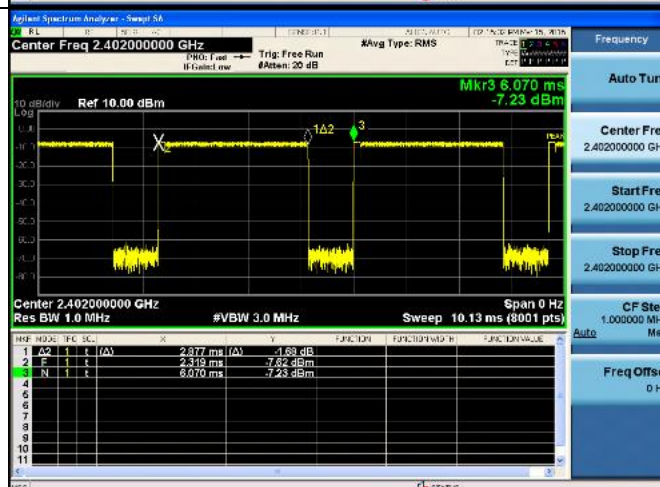
GFSK/MCH

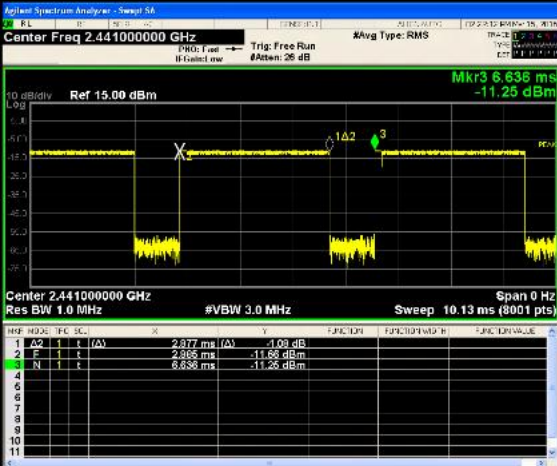
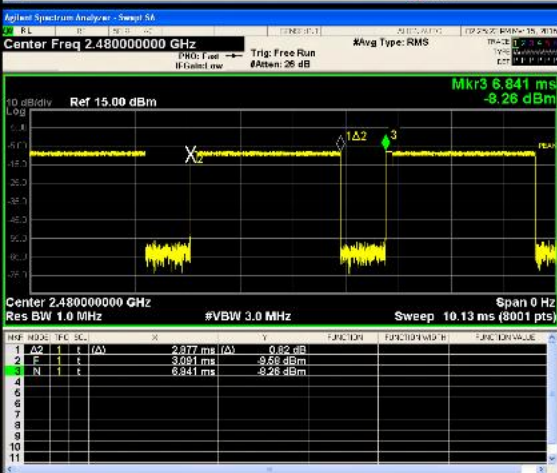
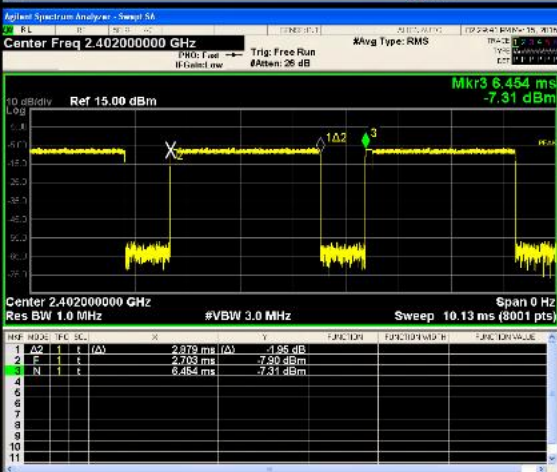


GFSK/HCH

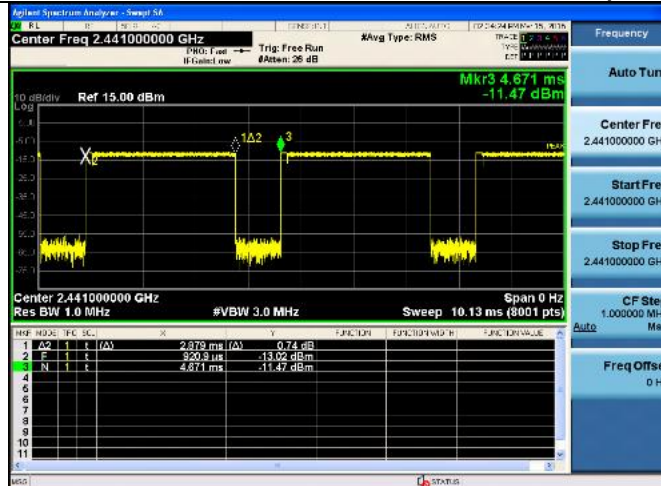


$\pi/4$ DQPSK/LCH

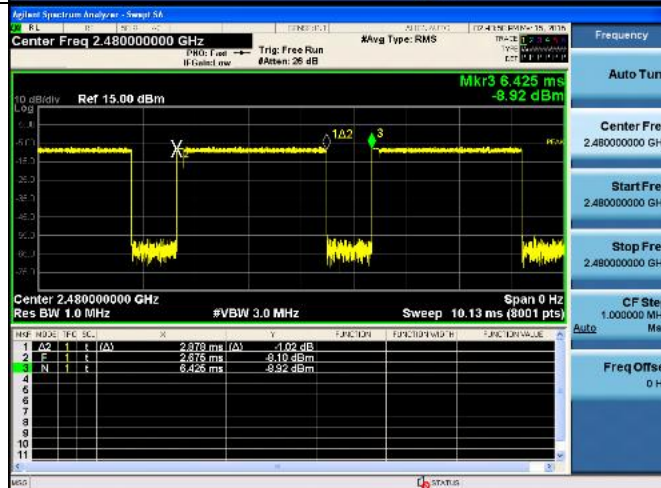


$\pi/4$ DQPSK/MCH	 <table data-bbox="596 512 1155 658"><thead><tr><th>RF</th><th>MODE</th><th>FREQ</th><th>SC</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION MD</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>A2</td><td>1</td><td>t</td><td>(Δ)</td><td>2.877 ms</td><td>(Δ)</td><td>-1.08 dB</td><td></td></tr><tr><td>2</td><td>F</td><td>1</td><td>t</td><td></td><td>2.885 ms</td><td></td><td>-11.68 dBm</td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>t</td><td></td><td>6.636 ms</td><td></td><td>-11.25 dBm</td><td></td></tr></tbody></table>	RF	MODE	FREQ	SC	X	Y	FUNCTION	FUNCTION MD	FUNCTION VALUE	1	A2	1	t	(Δ)	2.877 ms	(Δ)	-1.08 dB		2	F	1	t		2.885 ms		-11.68 dBm		3	N	1	t		6.636 ms		-11.25 dBm		Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Man Freq Offset 0 Hz
RF	MODE	FREQ	SC	X	Y	FUNCTION	FUNCTION MD	FUNCTION VALUE																														
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RF	MODE	FREQ	SC	X	Y	FUNCTION	FUNCTION MD	FUNCTION VALUE																														
1	A2	1	t	(Δ)	2.877 ms	(Δ)	0.82 dB																															
2	F	1	t		3.081 ms		-9.63 dBm																															
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8DPSK/LCH	 <table data-bbox="596 1476 1155 1644"><thead><tr><th>RF</th><th>MODE</th><th>FREQ</th><th>SC</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION MD</th><th>FUNCTION VALUE</th></tr></thead><tbody><tr><td>1</td><td>A2</td><td>1</td><td>t</td><td>(Δ)</td><td>2.879 ms</td><td>(Δ)</td><td>-1.86 dB</td><td></td></tr><tr><td>2</td><td>F</td><td>1</td><td>t</td><td></td><td>2.703 ms</td><td></td><td>-7.90 dBm</td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>t</td><td></td><td>6.454 ms</td><td></td><td>-7.31 dBm</td><td></td></tr></tbody></table>	RF	MODE	FREQ	SC	X	Y	FUNCTION	FUNCTION MD	FUNCTION VALUE	1	A2	1	t	(Δ)	2.879 ms	(Δ)	-1.86 dB		2	F	1	t		2.703 ms		-7.90 dBm		3	N	1	t		6.454 ms		-7.31 dBm		Frequency Auto Tune Center Freq 2.402000000 GHz Start Freq 2.402000000 GHz Stop Freq 2.402000000 GHz CF Step 1.000000 MHz Man Freq Offset 0 Hz
RF	MODE	FREQ	SC	X	Y	FUNCTION	FUNCTION MD	FUNCTION VALUE																														
1	A2	1	t	(Δ)	2.879 ms	(Δ)	-1.86 dB																															
2	F	1	t		2.703 ms		-7.90 dBm																															
3	N	1	t		6.454 ms		-7.31 dBm																															

8DPSK/MCH



8DPSK/HCH

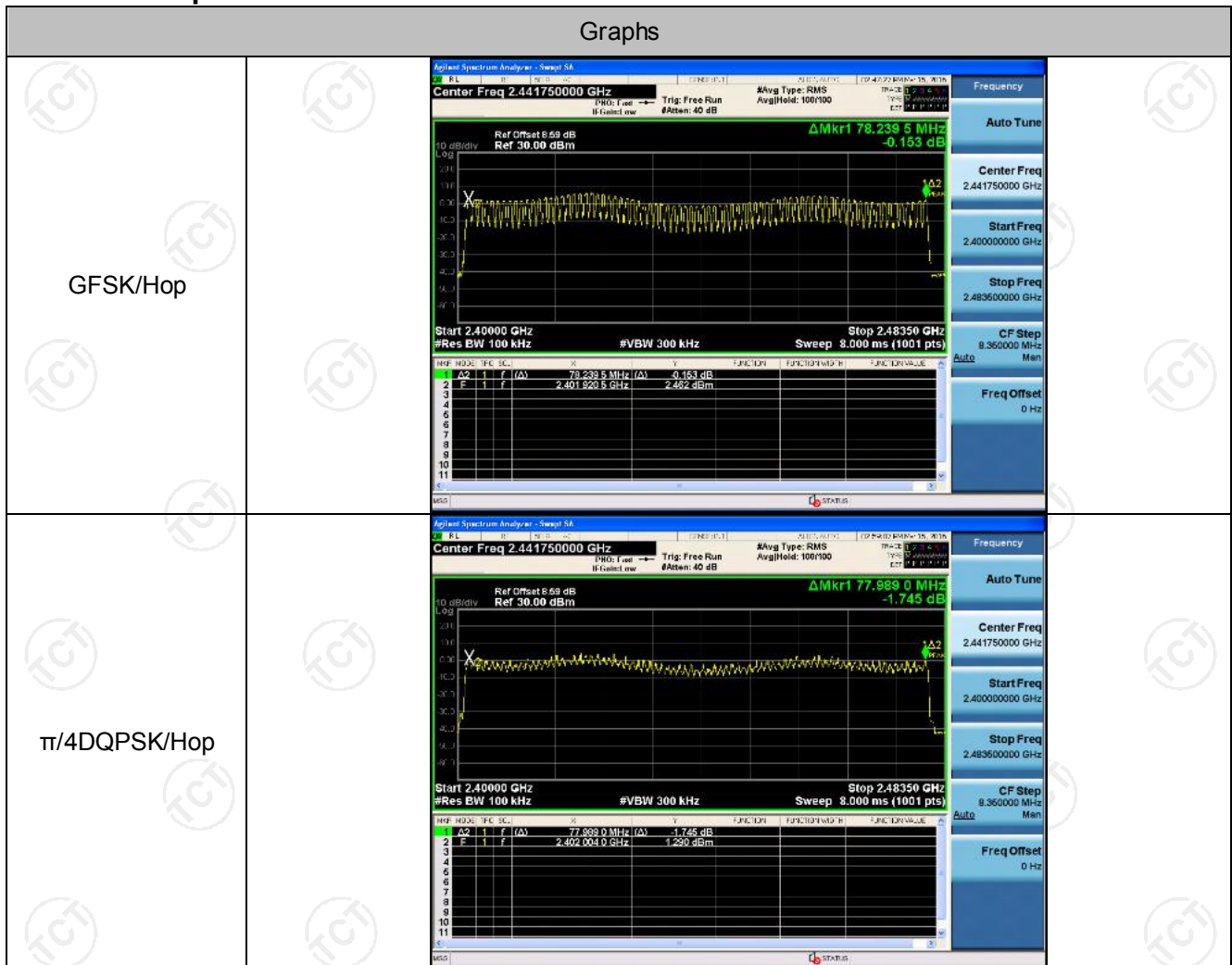


Hopping Channel Number

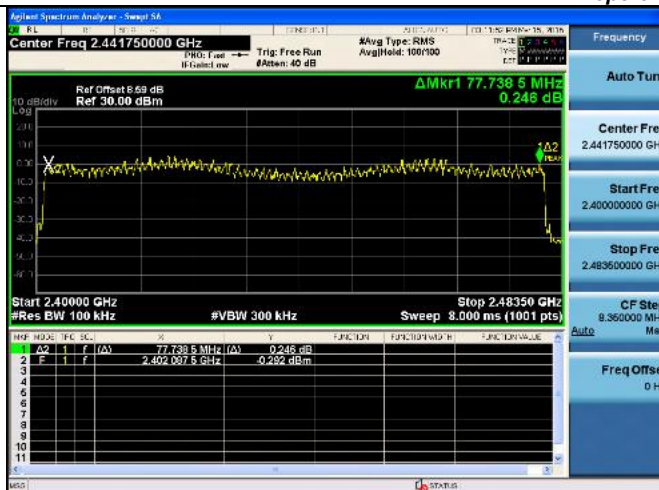
Result Table

Mode	Channel.	Number of Hopping Channel	Verdict
GFSK	Hop	79	PASS
$\pi/4$ DQPSK	Hop	79	PASS
8DPSK	Hop	79	PASS

Test Graph



8DPSK/Hop

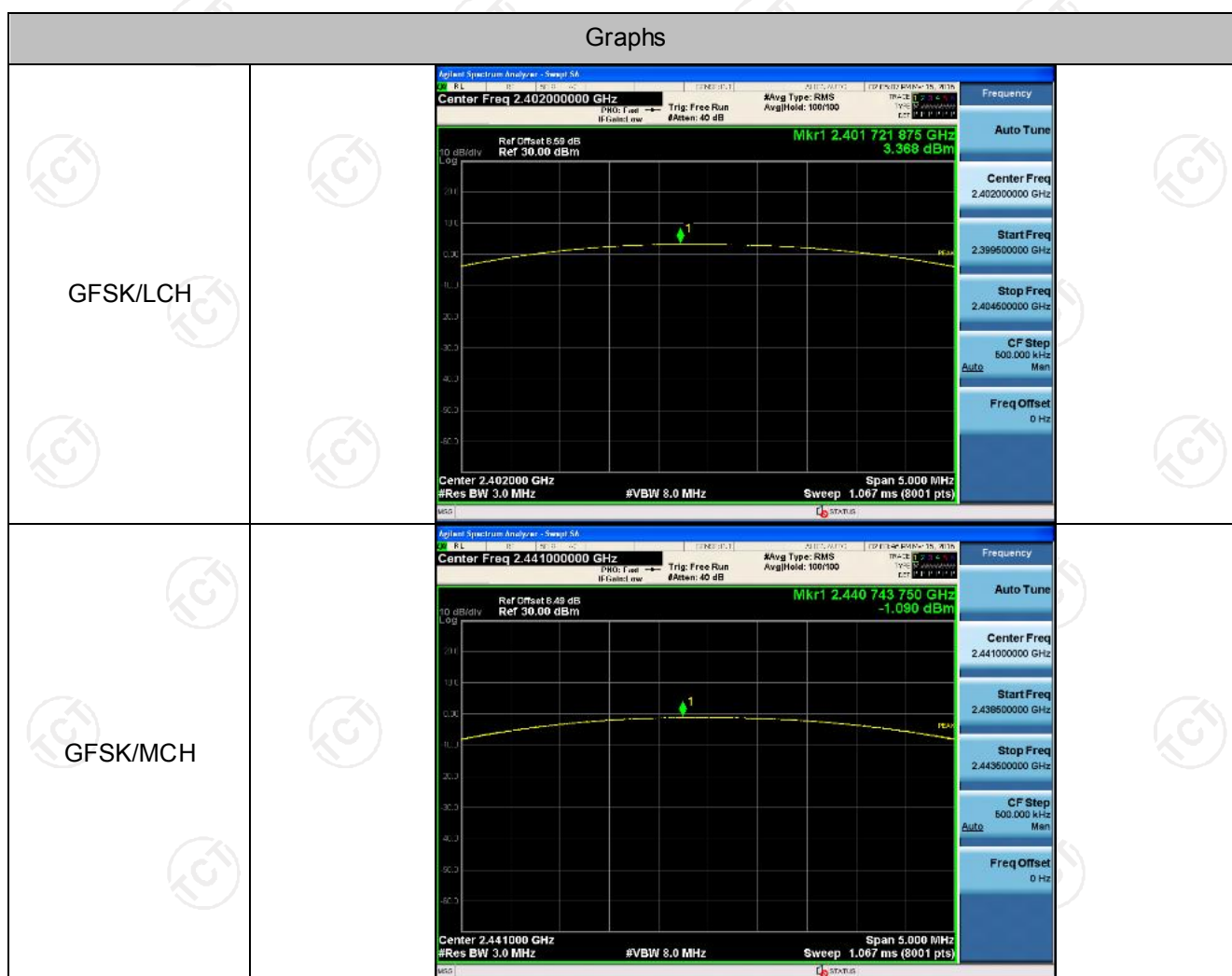


Conducted Peak Output Power

Result Table

Mode	Channel.	Maximum Peak Output Power [dBm]	Verdict
GFSK	LCH	3.368	PASS
GFSK	MCH	-1.090	PASS
GFSK	HCH	2.413	PASS
$\pi/4$ DQPSK	LCH	2.408	PASS
$\pi/4$ DQPSK	MCH	-1.678	PASS
$\pi/4$ DQPSK	HCH	1.544	PASS
8DPSK	LCH	2.617	PASS
8DPSK	MCH	-1.568	PASS
8DPSK	HCH	1.837	PASS

Test Graph



GFSK/HCH		Frequency Auto Tune Center Freq 2.48000000 GHz Start Freq 2.47750000 GHz Stop Freq 2.48250000 GHz CF Step 500.000 kHz Auto Man Freq Offset 0 Hz
$\pi/4$DQPSK/LCH		Frequency Auto Tune Center Freq 2.40200000 GHz Start Freq 2.39950000 GHz Stop Freq 2.40450000 GHz CF Step 500.000 kHz Auto Man Freq Offset 0 Hz
$\pi/4$DQPSK/MCH		Frequency Auto Tune Center Freq 2.44100000 GHz Start Freq 2.43850000 GHz Stop Freq 2.44350000 GHz CF Step 500.000 kHz Auto Man Freq Offset 0 Hz

TT/4DQPSK/HCH	 Agilent Spectrum Analyzer - Sweep SA Center Freq 2.48000000 GHz Ref Offset 6.48 dB Ref 30.00 dBm Mkr1 2.479 965 GHz 1.544 dBm Span 5.000 MHz #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.000 ms (1001 pts)	Frequency Auto Tune Center Freq 2.48000000 GHz Start Freq 2.47750000 GHz Stop Freq 2.48250000 GHz CF Step 500.000 kHz Auto Man Freq Offset 0 Hz
8DPSK/LCH	 Agilent Spectrum Analyzer - Sweep SA Center Freq 2.40200000 GHz Ref Offset 6.58 dB Ref 30.00 dBm Mkr1 2.402 030 GHz 2.617 dBm Span 5.000 MHz #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.000 ms (1001 pts)	Frequency Auto Tune Center Freq 2.40200000 GHz Start Freq 2.39950000 GHz Stop Freq 2.40450000 GHz CF Step 500.000 kHz Auto Man Freq Offset 0 Hz
8DPSK/MCH	 Agilent Spectrum Analyzer - Sweep SA Center Freq 2.44100000 GHz Ref Offset 6.48 dB Ref 30.00 dBm Mkr1 2.440 900 GHz -1.568 dBm Span 5.000 MHz #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.000 ms (1001 pts)	Frequency Auto Tune Center Freq 2.44100000 GHz Start Freq 2.43850000 GHz Stop Freq 2.44350000 GHz CF Step 500.000 kHz Auto Man Freq Offset 0 Hz

8DPSK/HCH

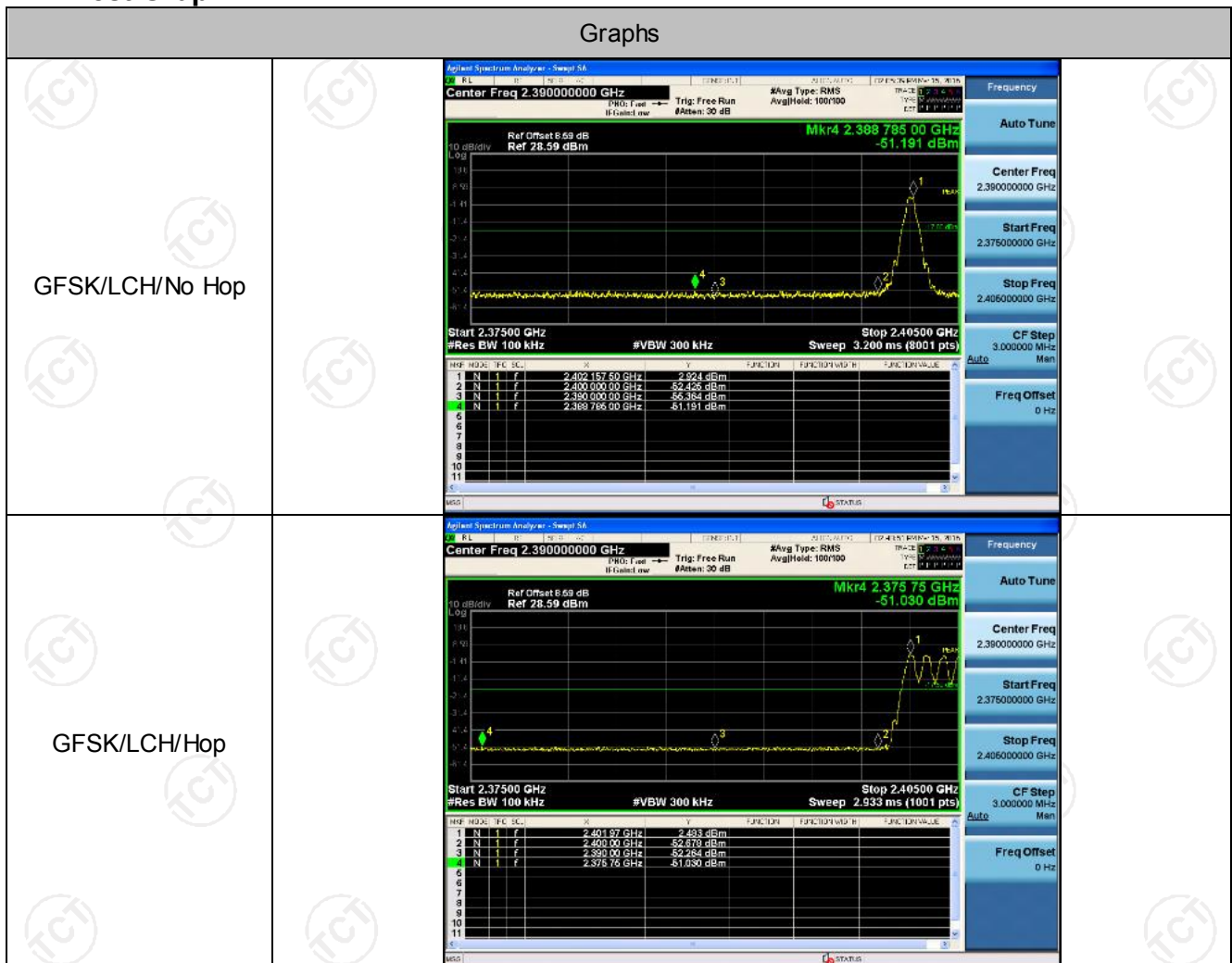


Band-edge for RF Conducted Emissions

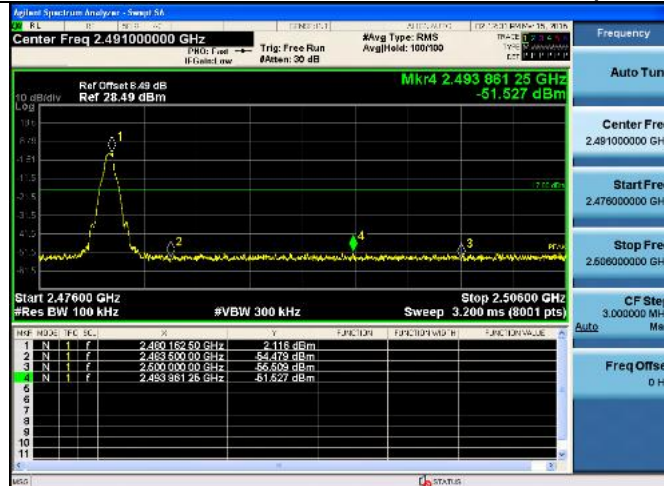
Result Table

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	2.924	Off	-51.191	-17.08	PASS
			2.483	On	-51.030	-17.52	PASS
GFSK	HCH	2480	2.116	Off	-51.527	-17.88	PASS
			1.261	On	-50.518	-18.74	PASS
$\pi/4$ DQPSK	LCH	2402	1.466	Off	-51.293	-18.53	PASS
			0.845	On	-50.680	-19.16	PASS
$\pi/4$ DQPSK	HCH	2480	0.446	Off	-51.285	-19.55	PASS
			-0.570	On	-49.935	-20.57	PASS
8DPSK	LCH	2402	1.075	Off	-51.795	-18.93	PASS
			0.892	On	-50.646	-19.11	PASS
8DPSK	HCH	2480	0.492	Off	-51.270	-19.51	PASS
			0.087	On	-50.467	-19.91	PASS

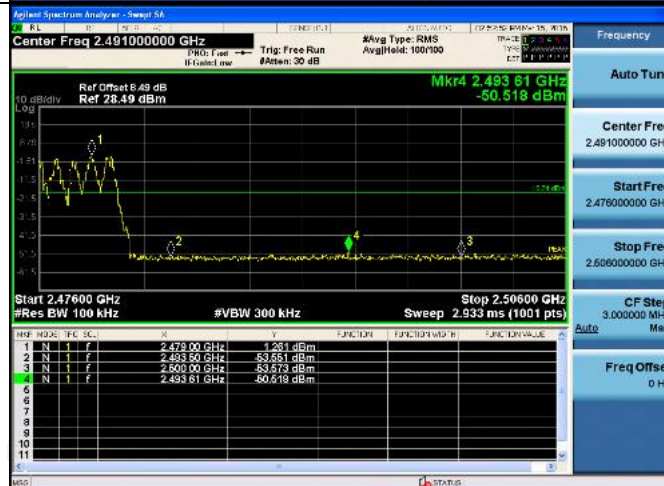
Test Graph



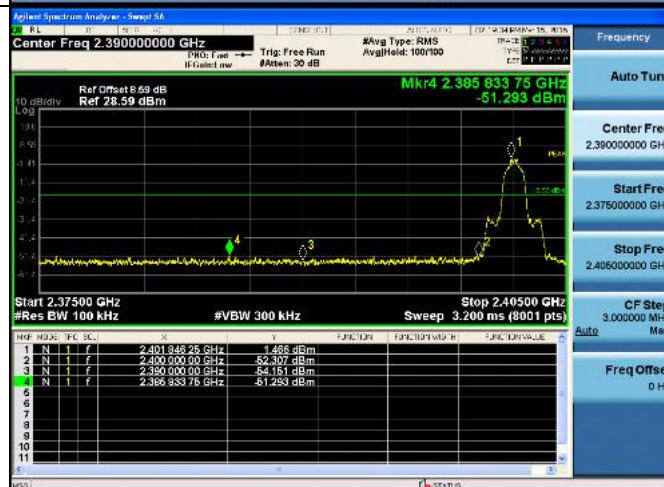
GFSK/HCH/No Hop



GFSK/HCH/Hop



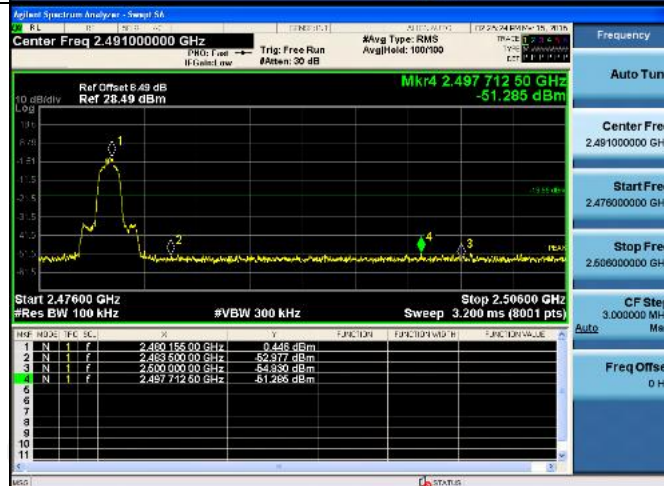
$\pi/4$ DQPSK/LCH/No Hop



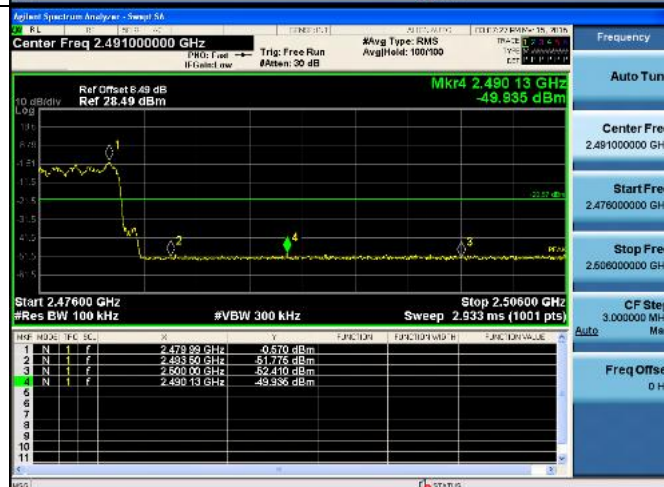
$\pi/4$ DQPSK/LCH/Hop



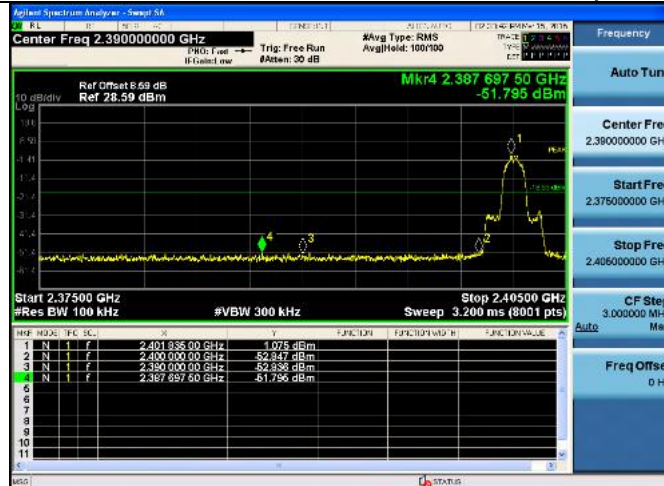
$\pi/4$ DQPSK/HCH/No Hop



$\pi/4$ DQPSK/HCH/Hop



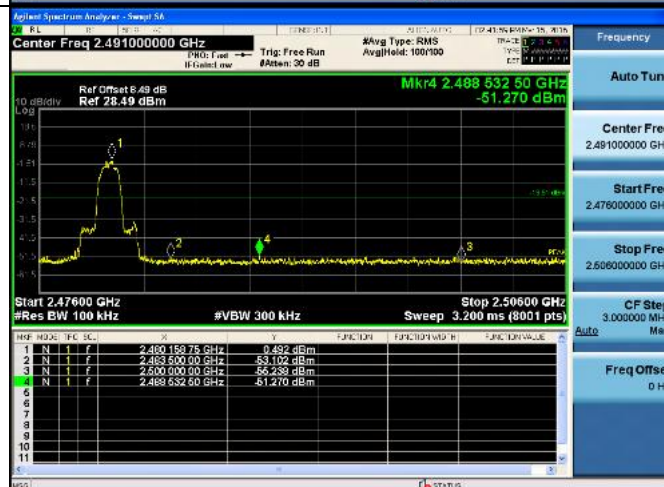
8DPSK/LCH/No Hop



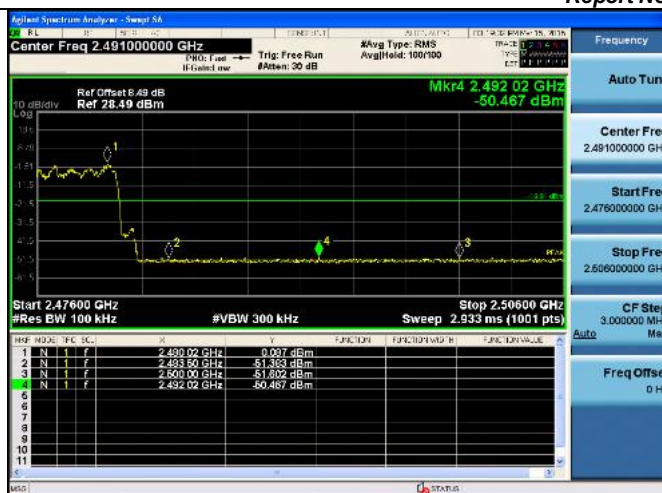
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



8DPSK/HCH/Hop

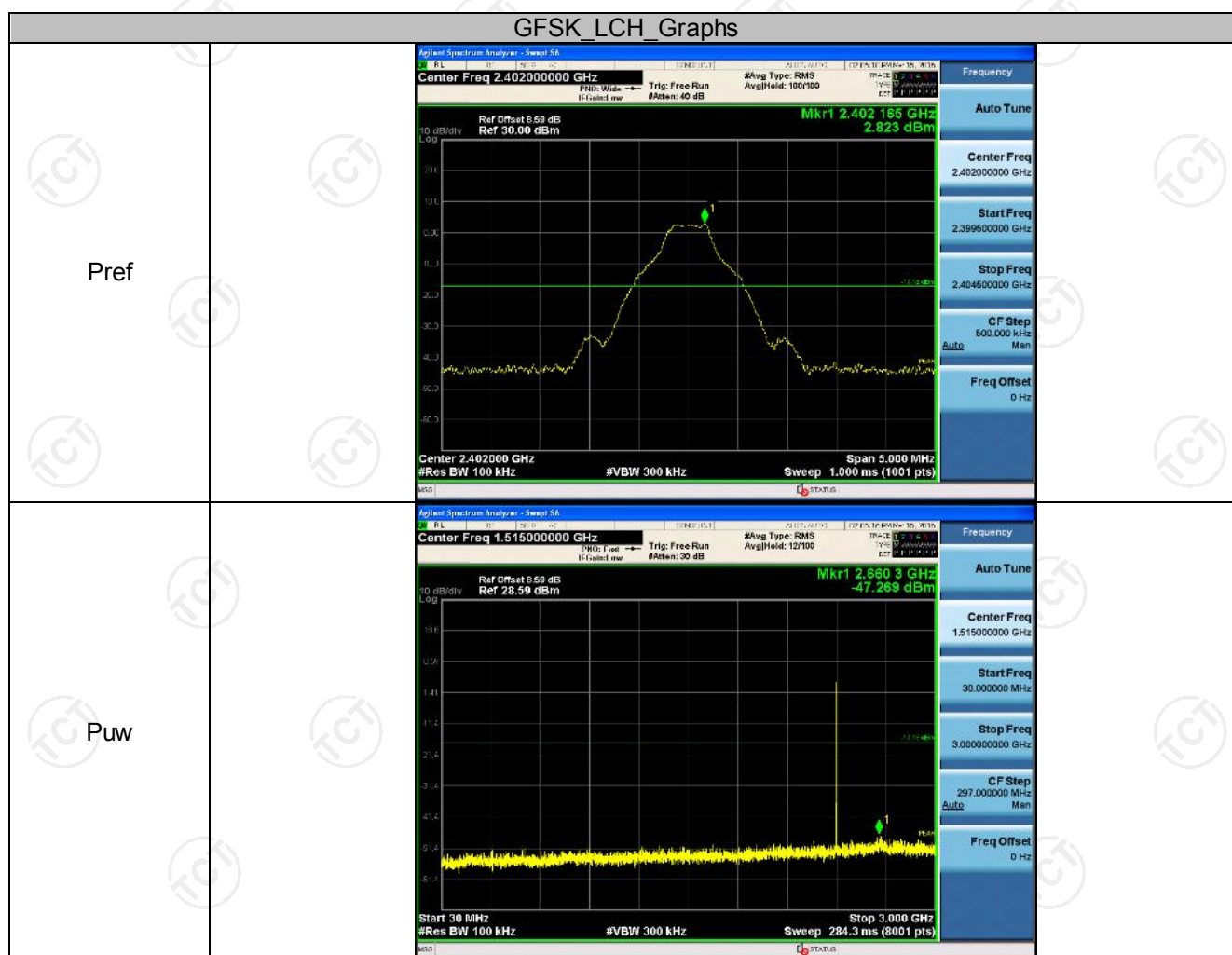


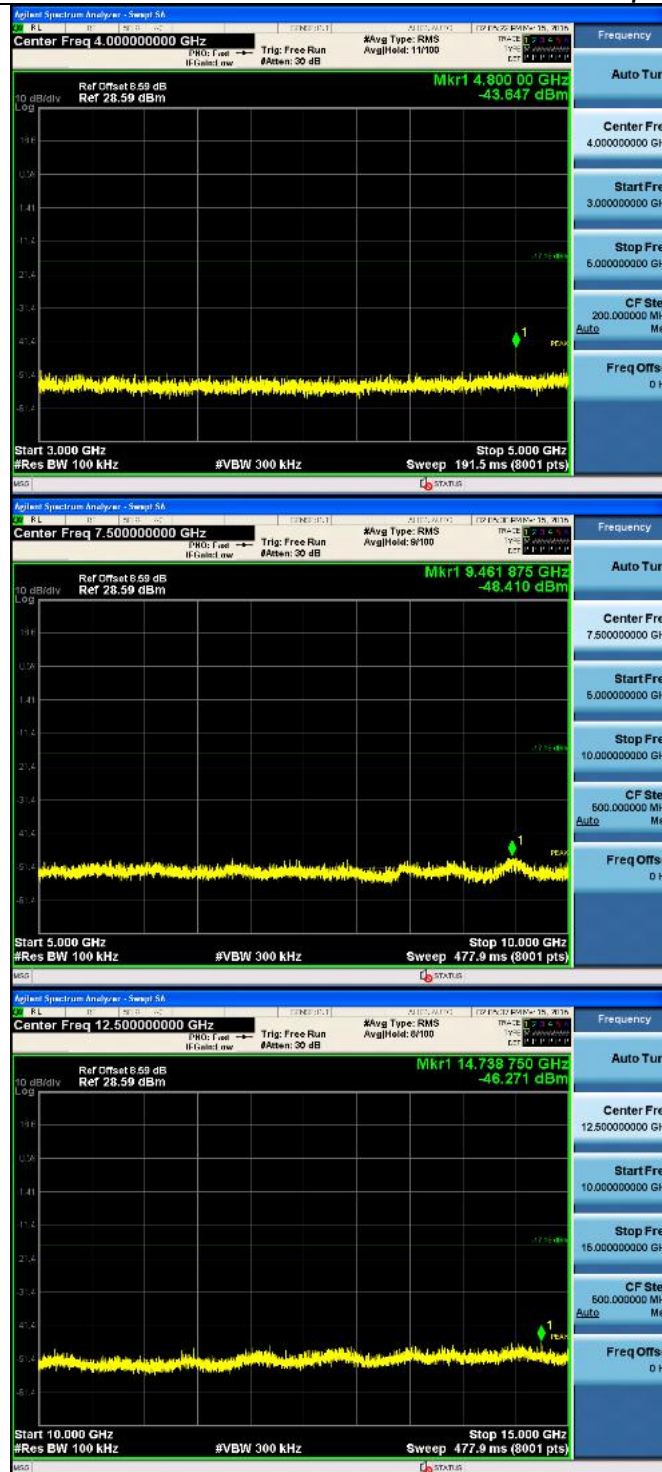
RF Conducted Spurious Emissions

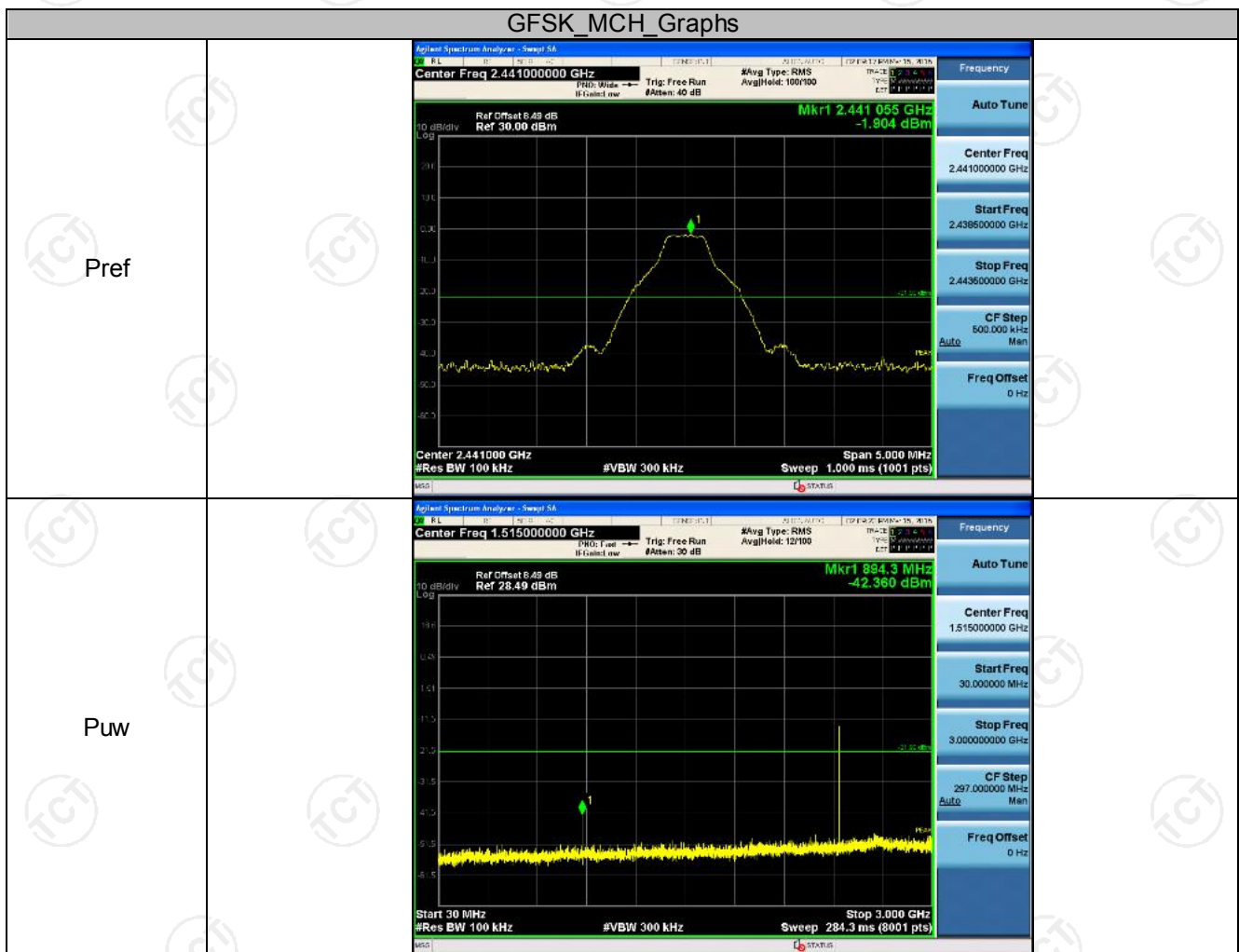
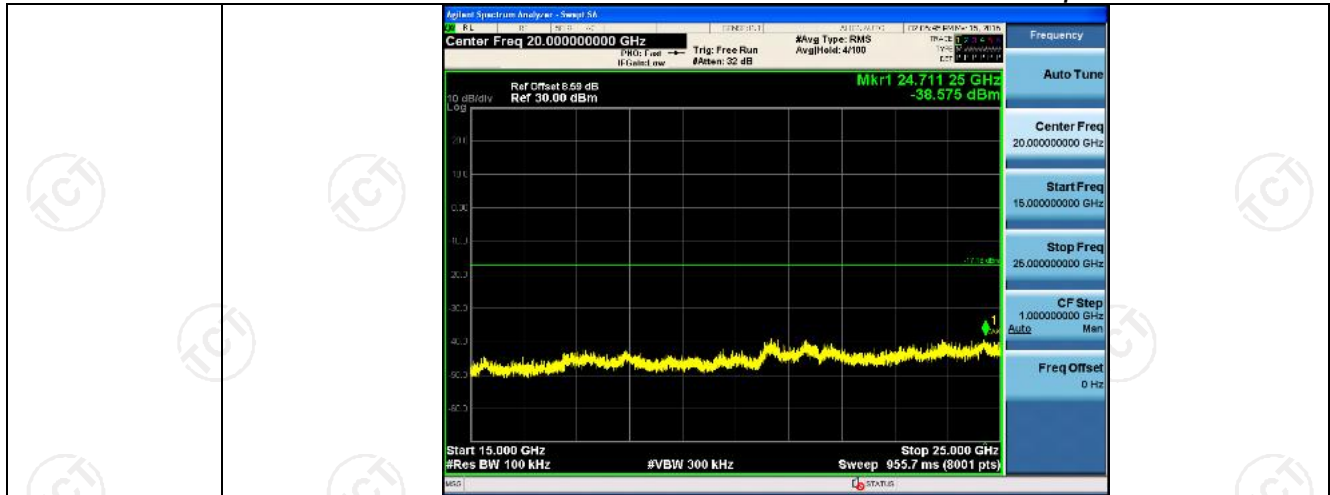
Result Table

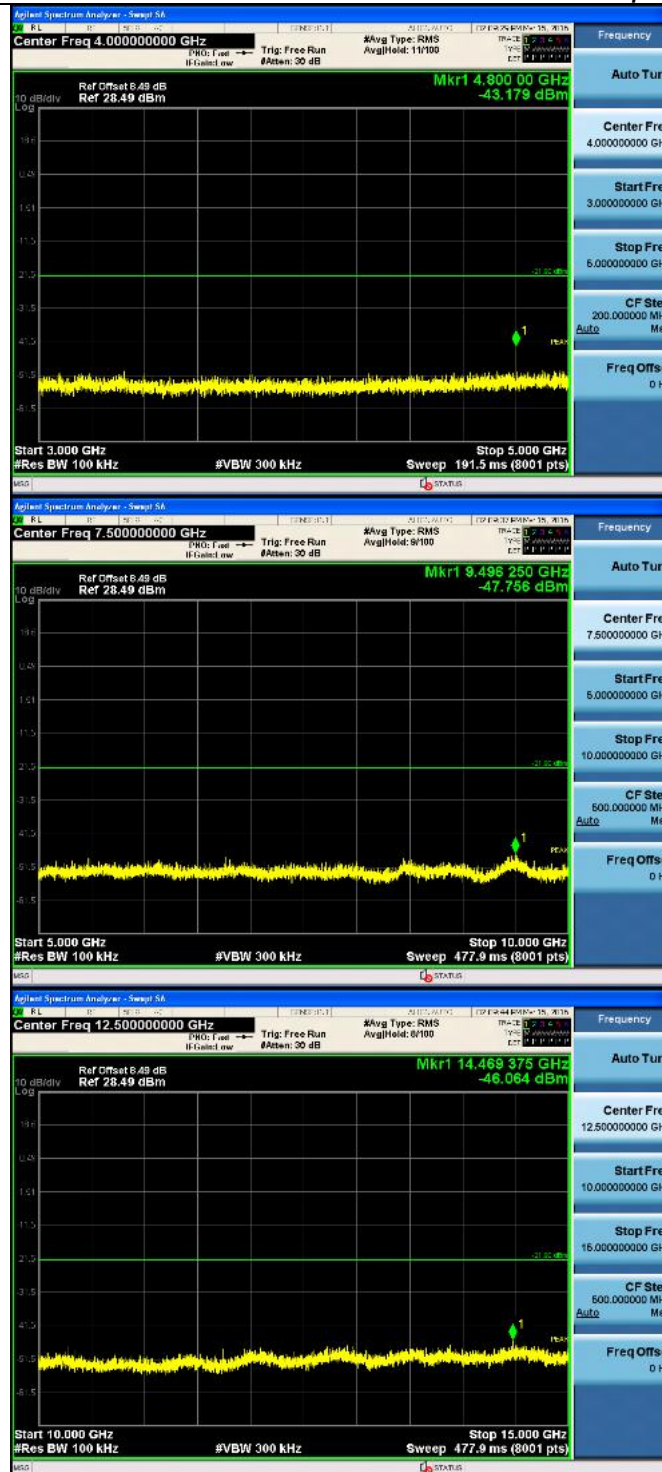
Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
GFSK	LCH	2.823	<Limit	PASS
GFSK	MCH	-1.904	<Limit	PASS
GFSK	HCH	2.095	<Limit	PASS
$\pi/4$ DQPSK	LCH	1.472	<Limit	PASS
$\pi/4$ DQPSK	MCH	-2.747	<Limit	PASS
$\pi/4$ DQPSK	HCH	0.476	<Limit	PASS
8DPSK	LCH	0.916	<Limit	PASS
8DPSK	MCH	-2.779	<Limit	PASS
8DPSK	HCH	0.71	<Limit	PASS

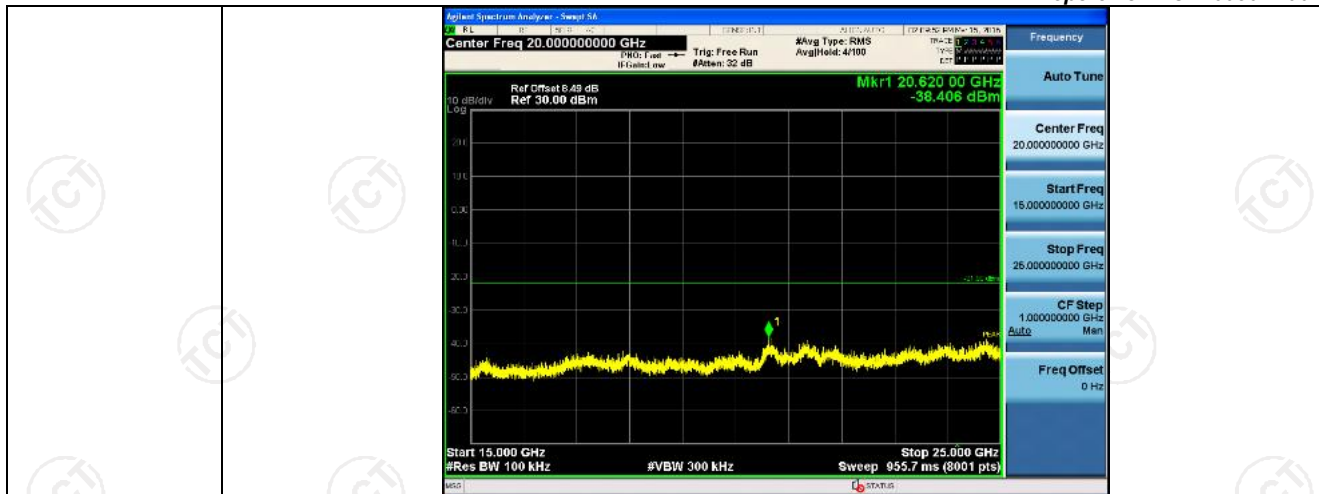
Test Graph



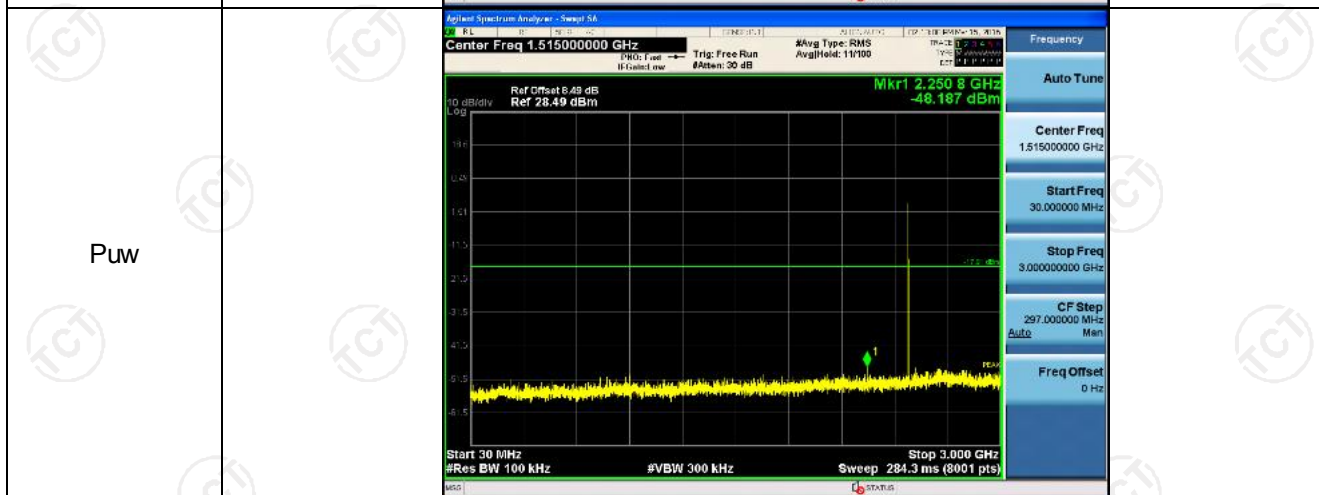


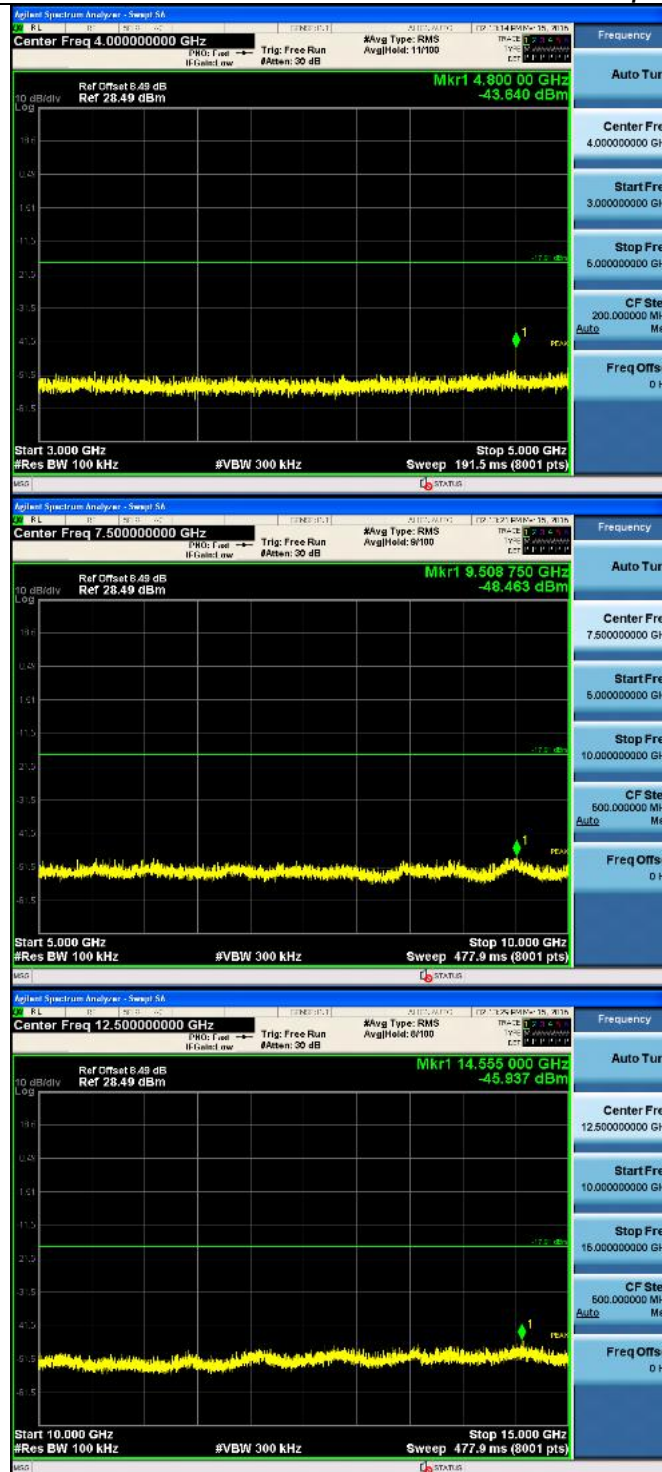


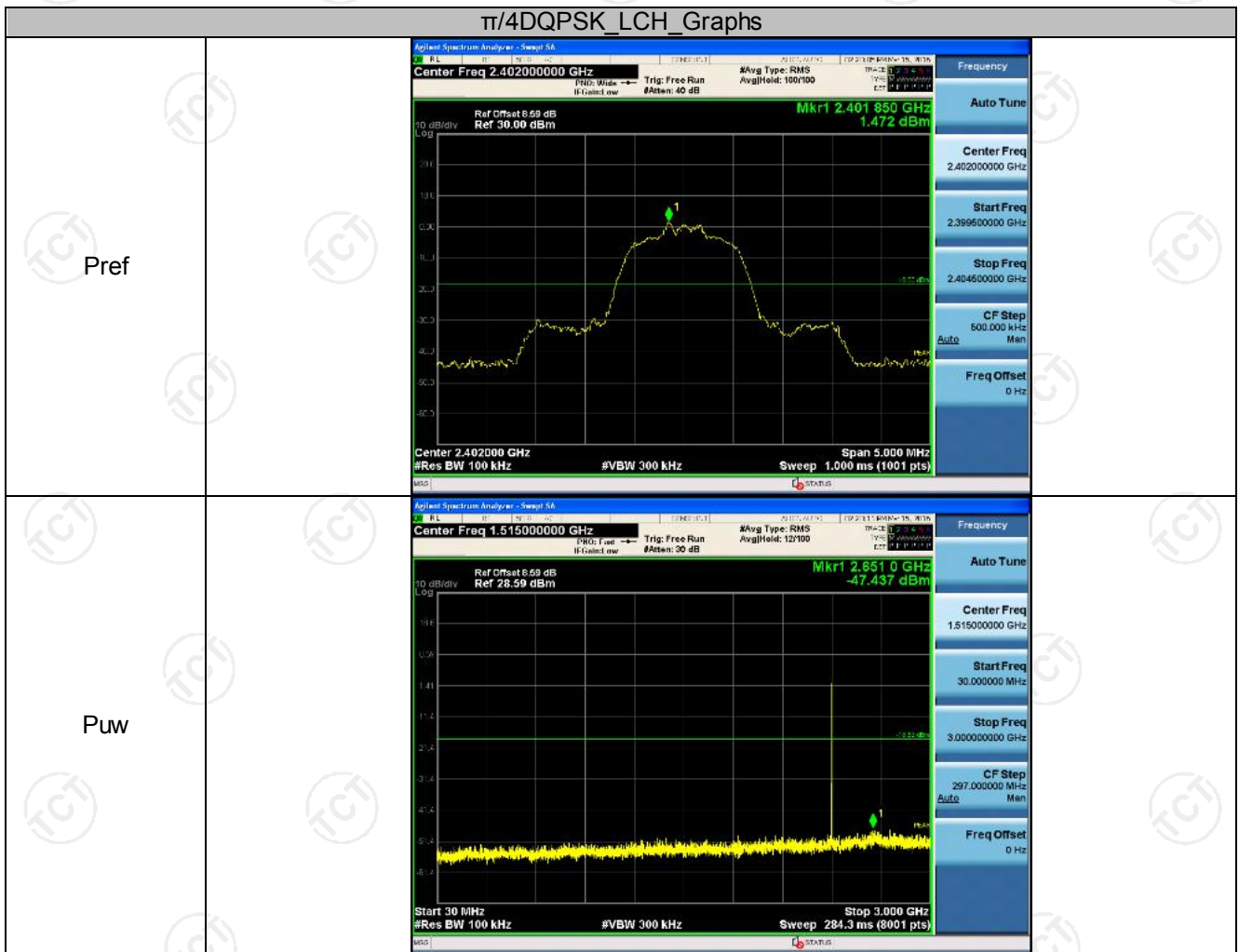
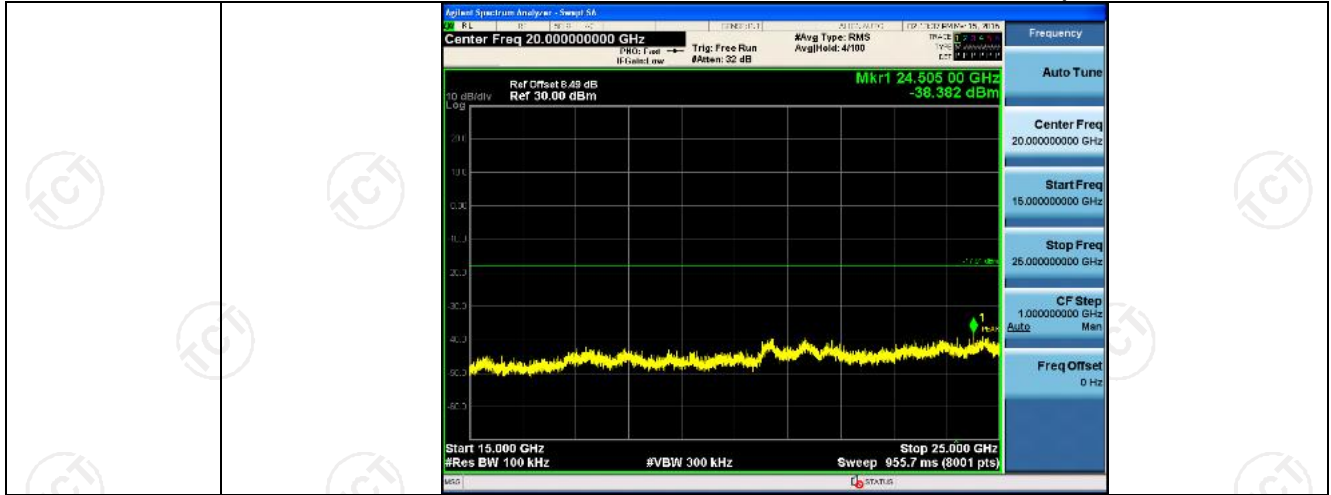


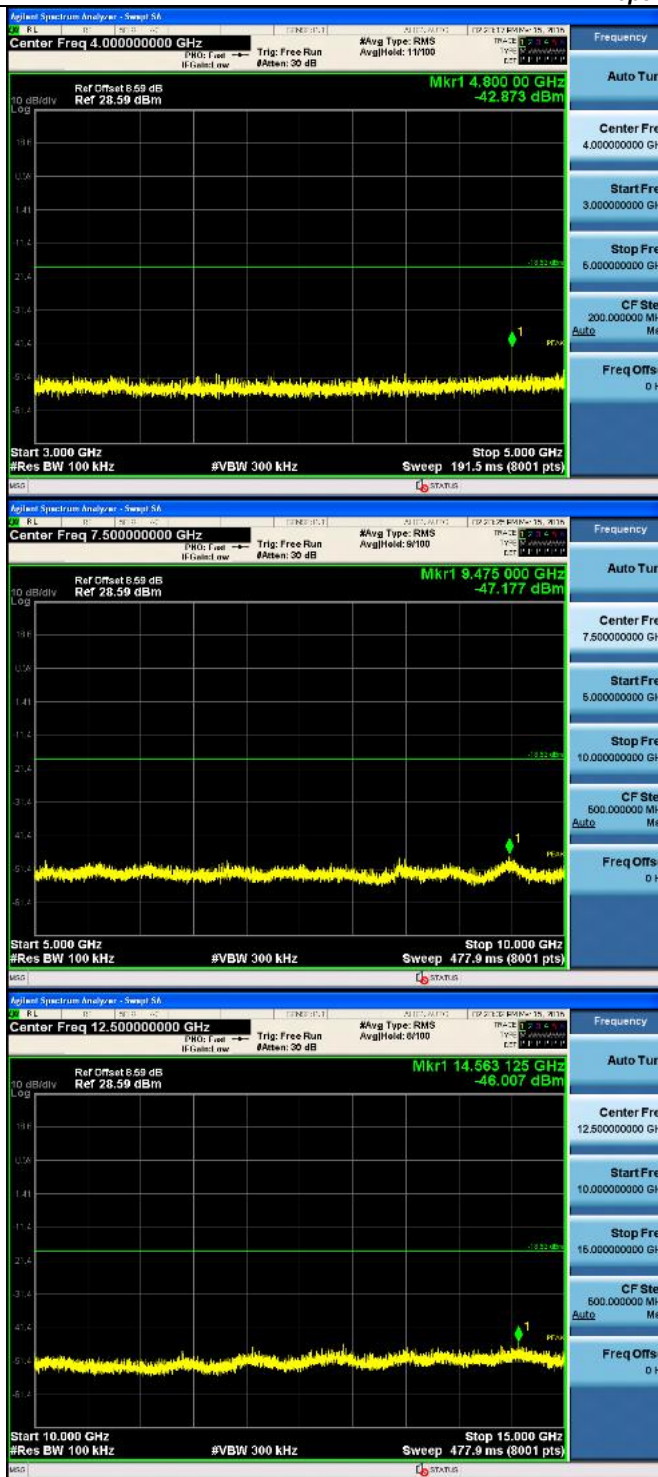


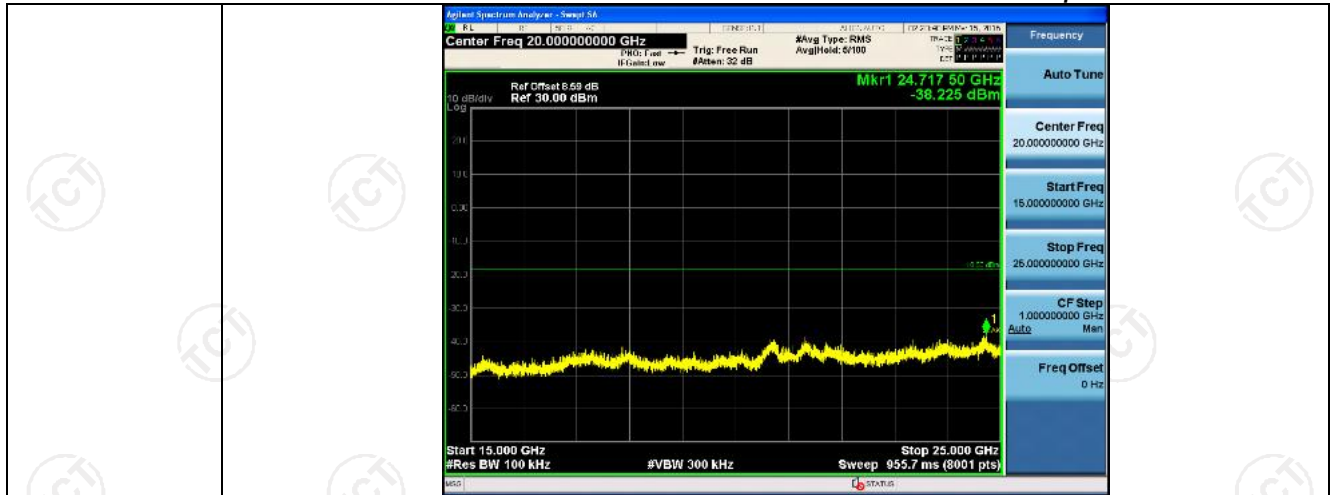
GFSK_HCH_Graphs

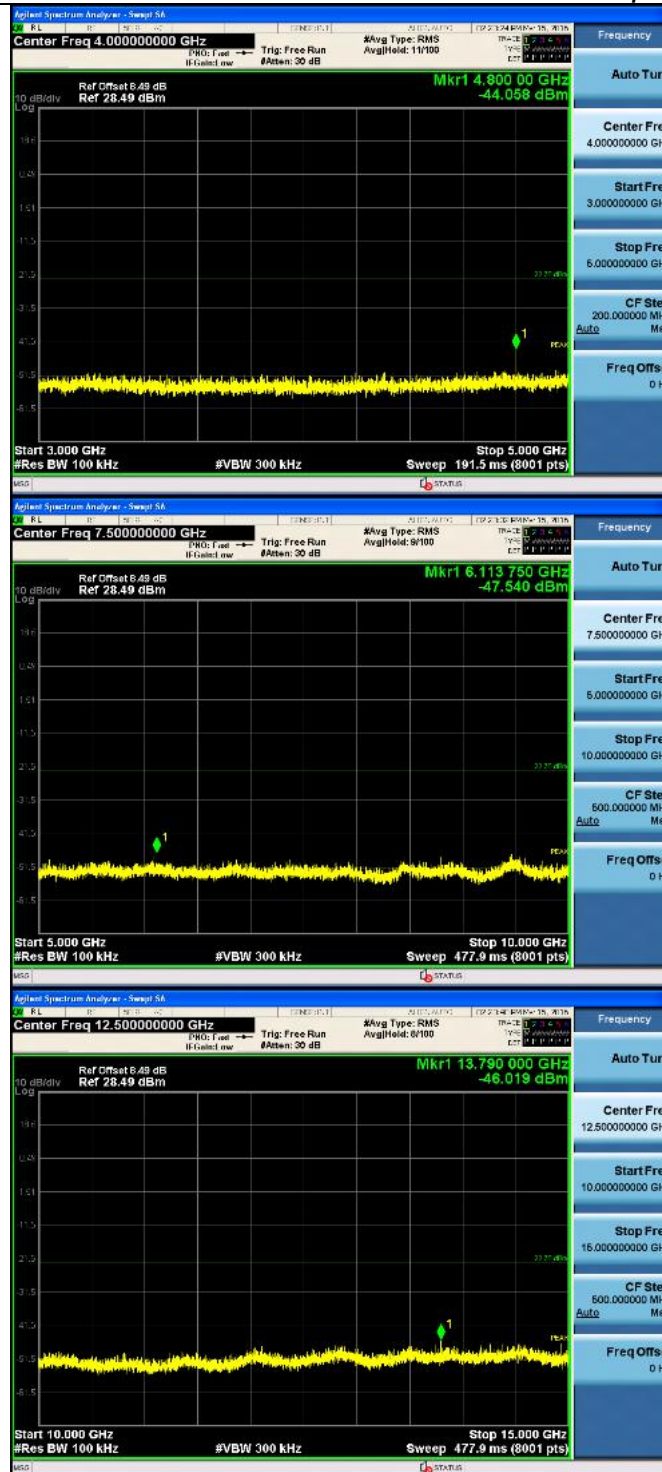


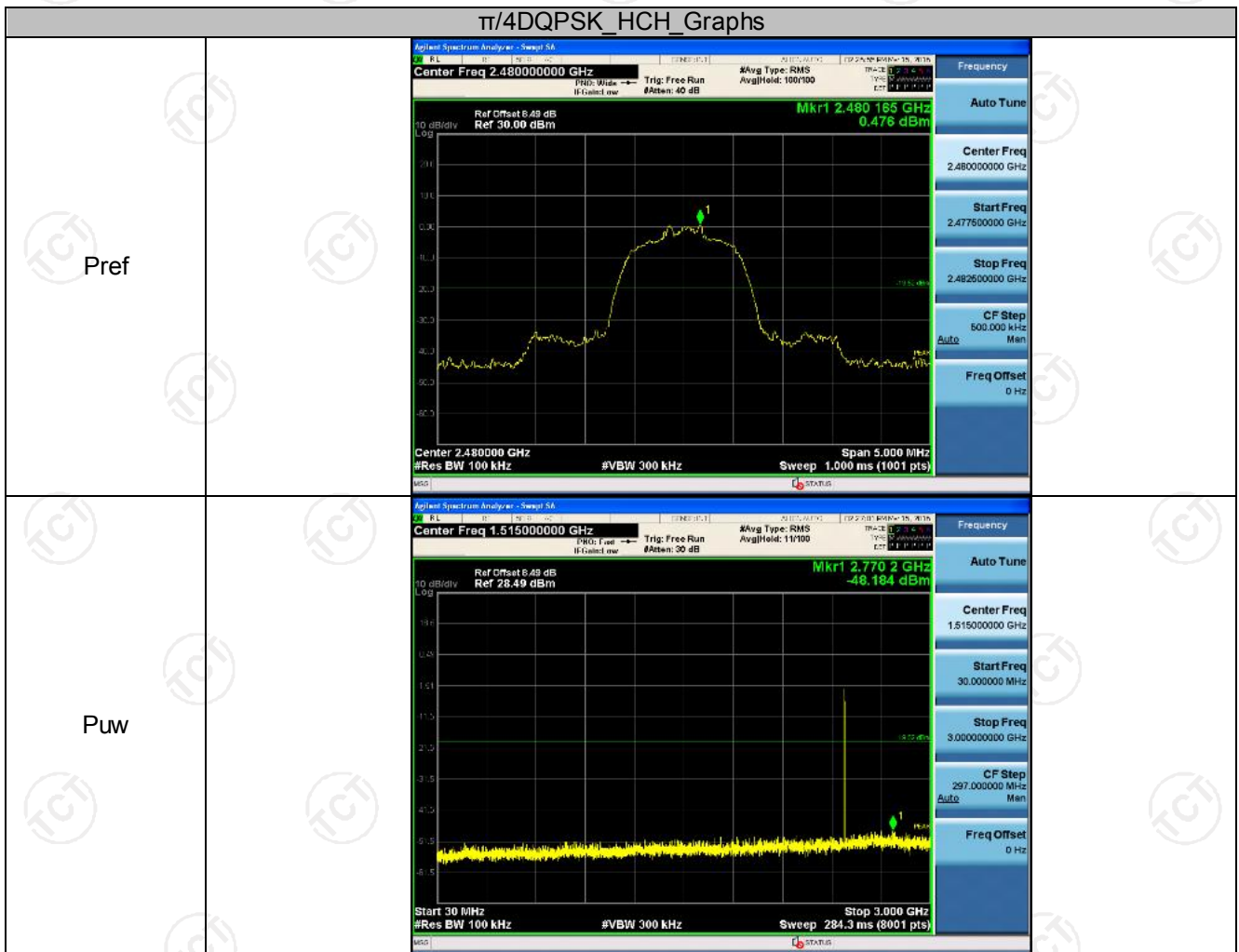
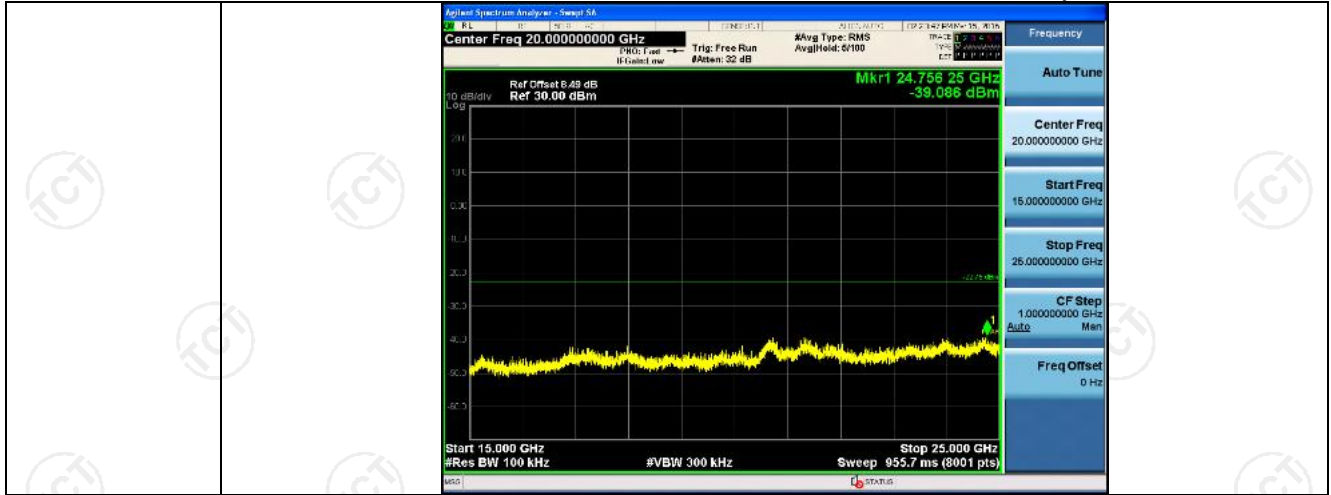


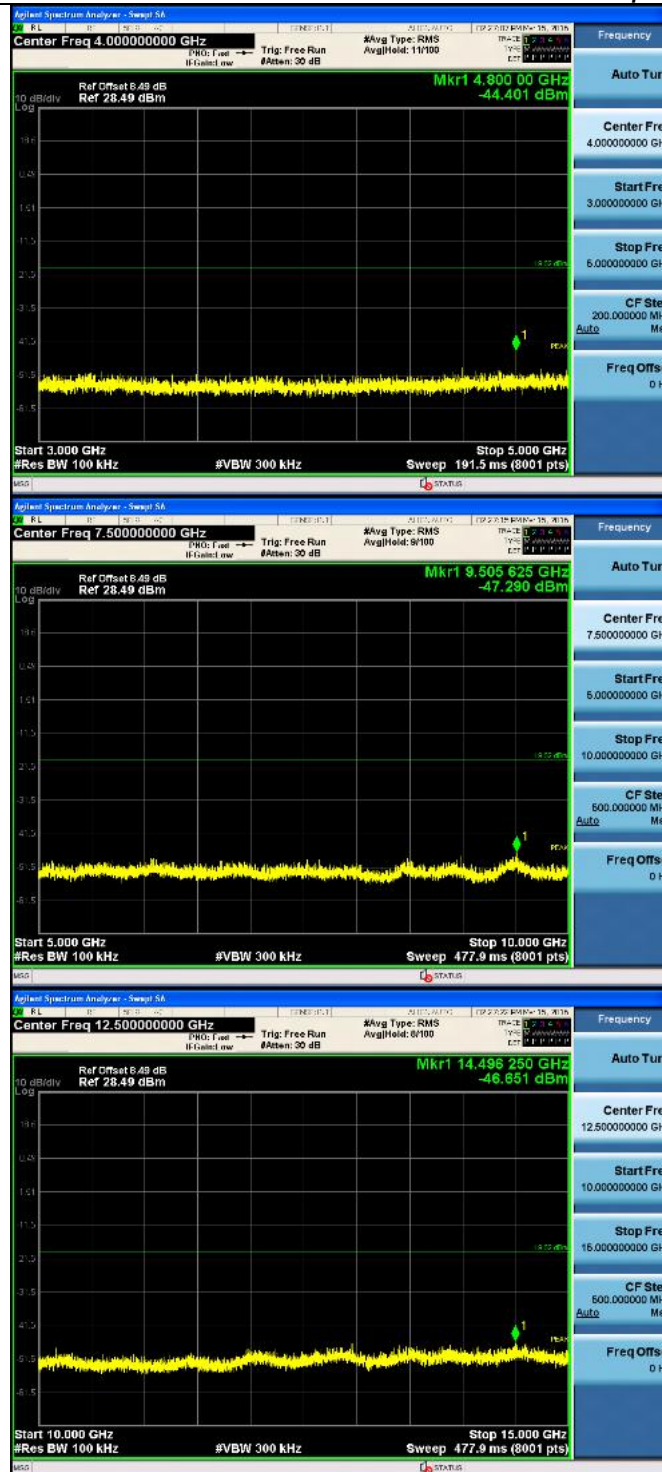


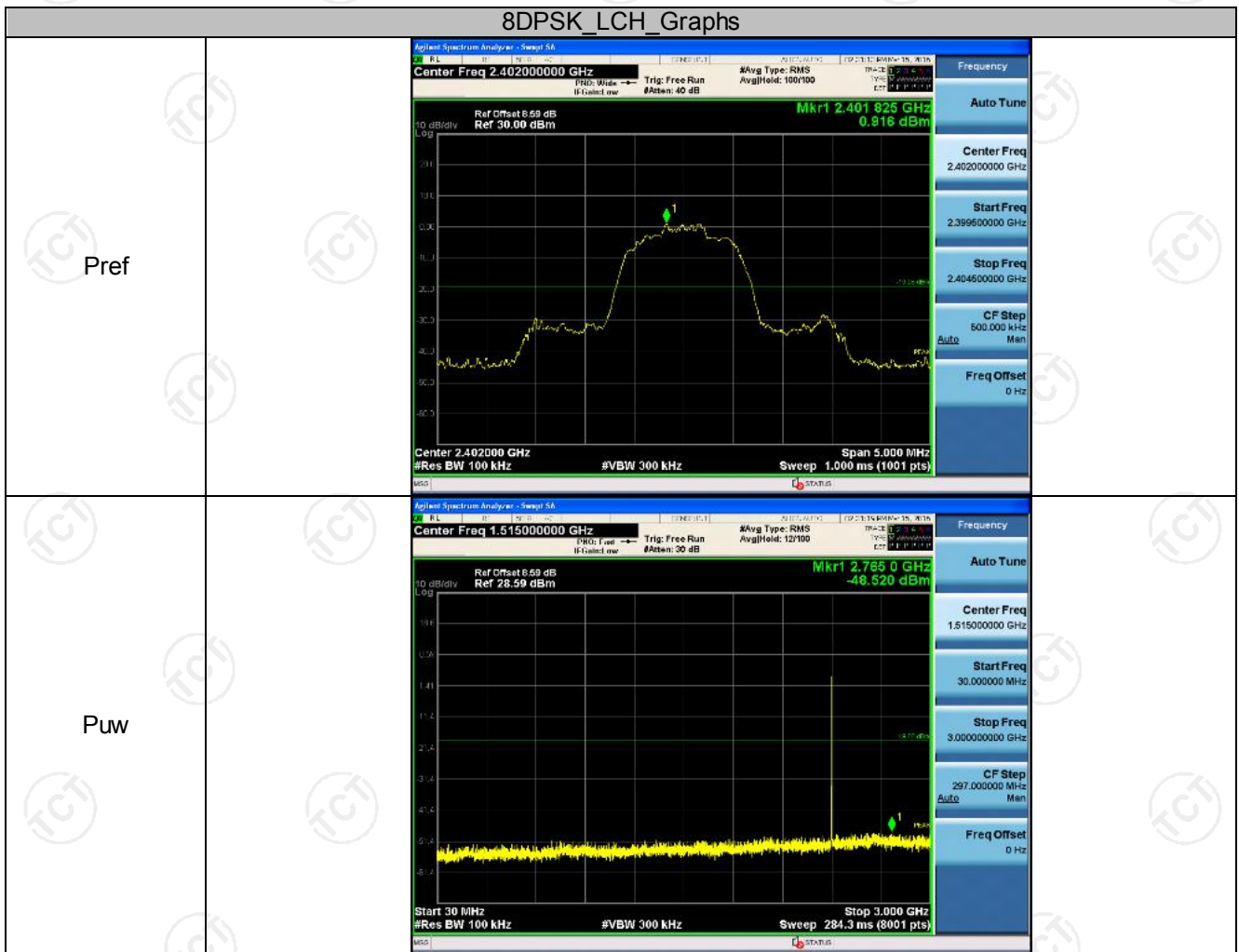
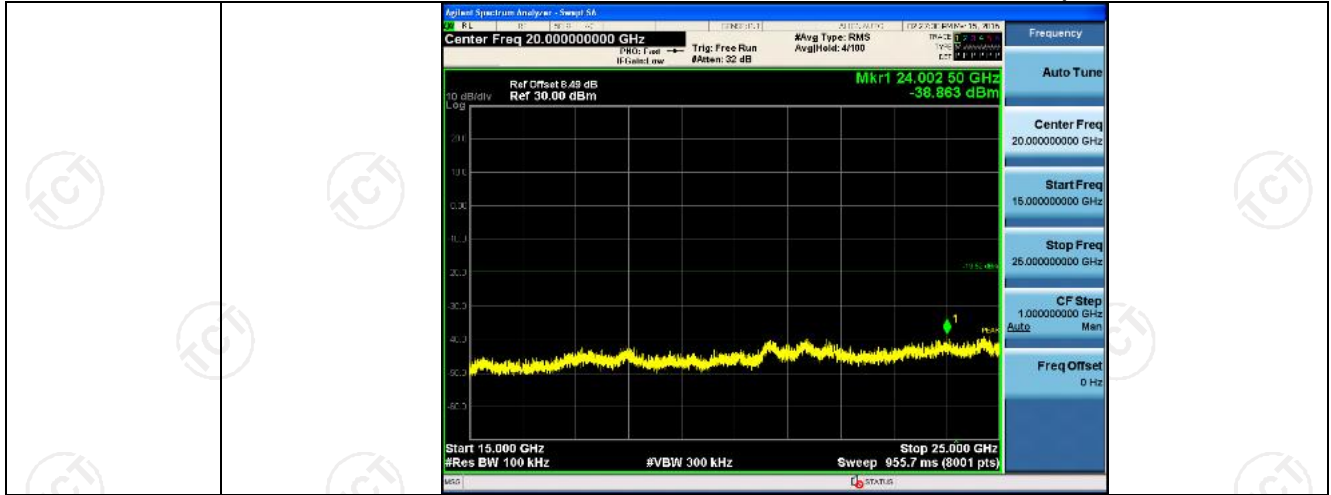


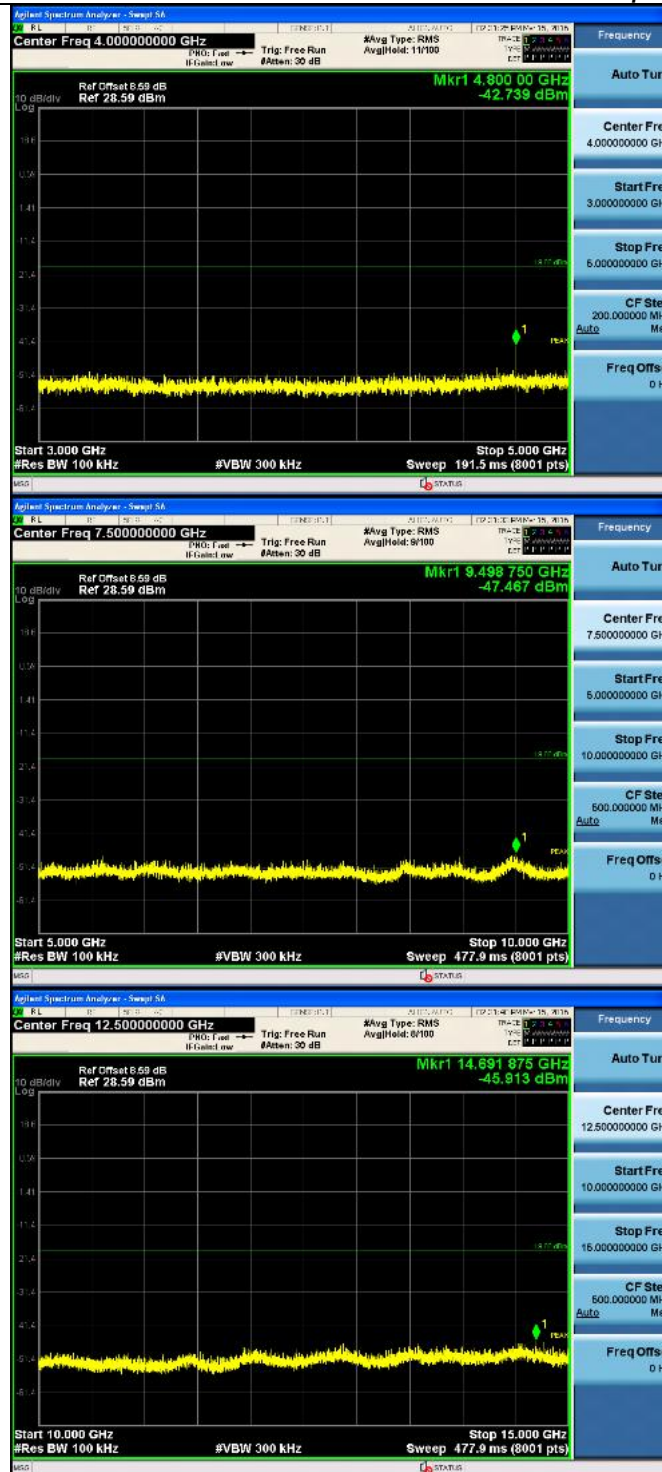


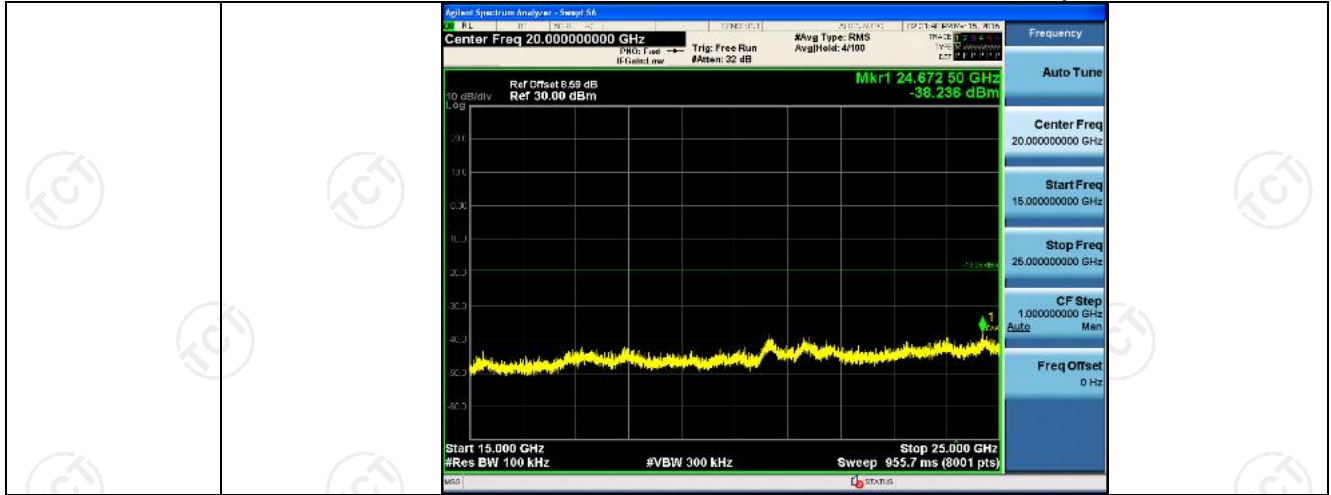




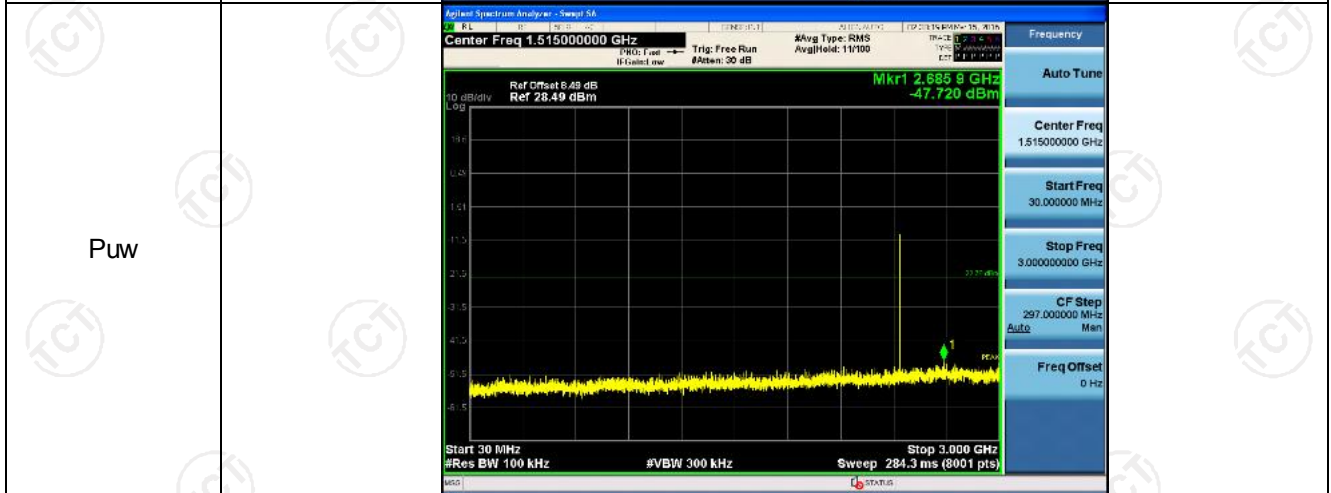


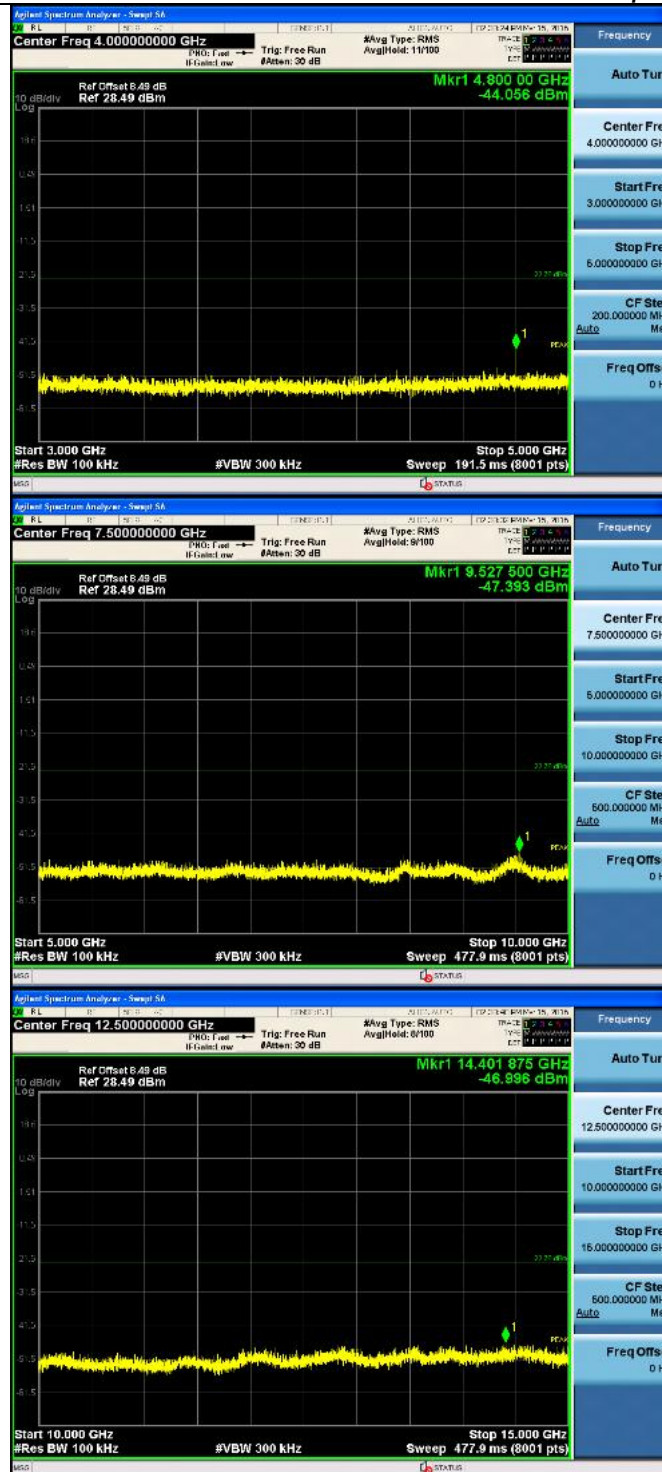


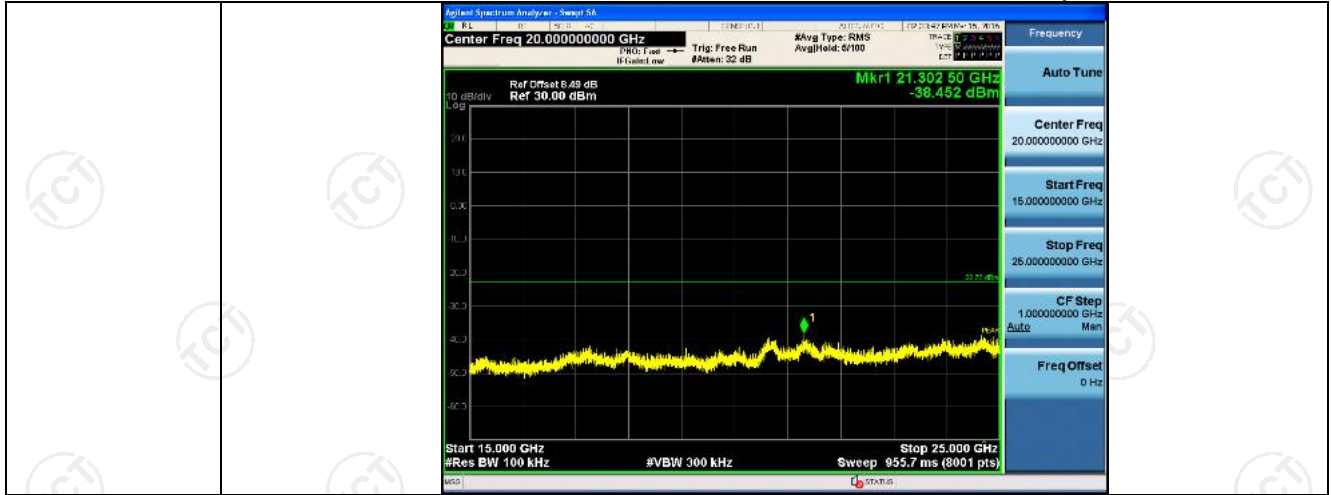




8DPSK_MCH_Graphs







8DPSK_HCH_Graphs

