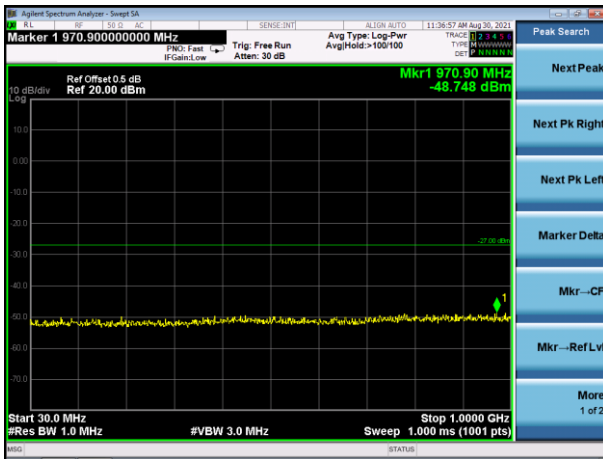
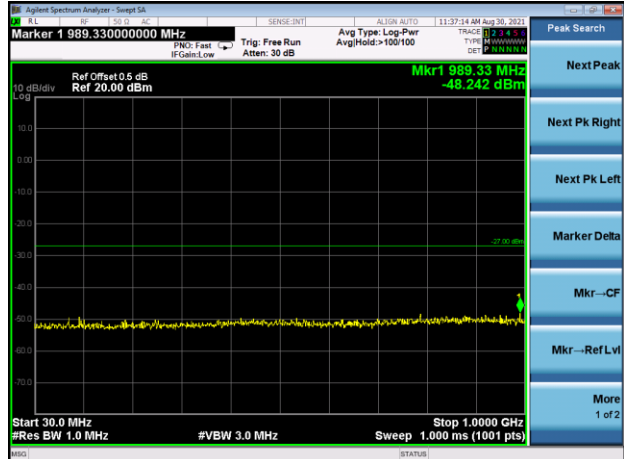


Test Plot

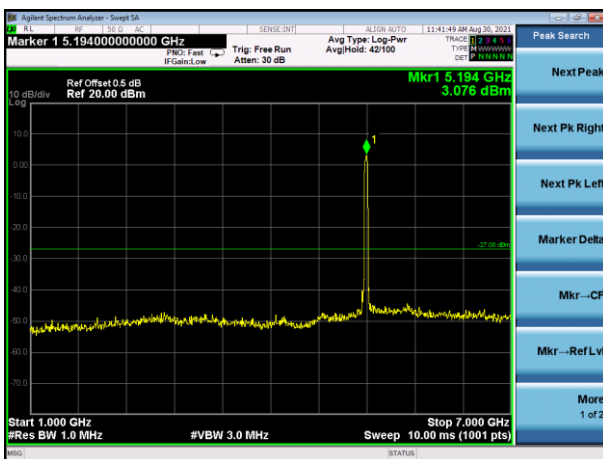
802.11n40 on channel 38



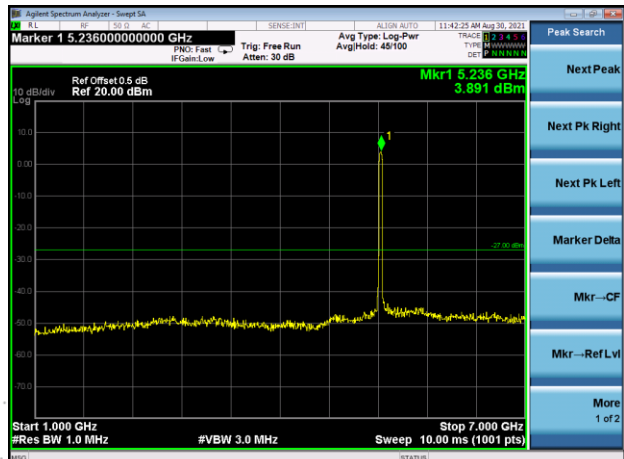
802.11n40 on channel 46



802.11n40 on channel 38



802.11n40 on channel 46



802.11n40 on channel 38

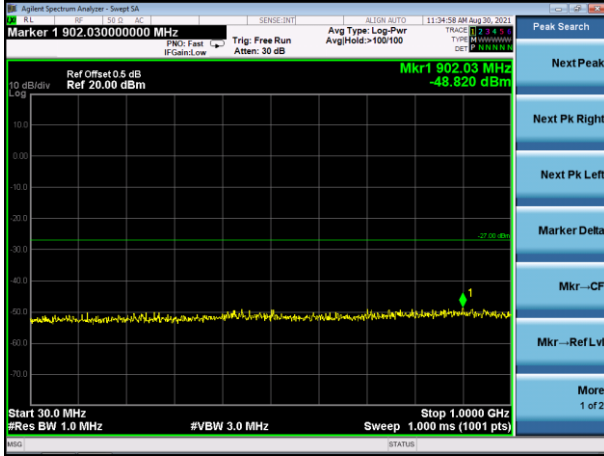


802.11n40 on channel 46

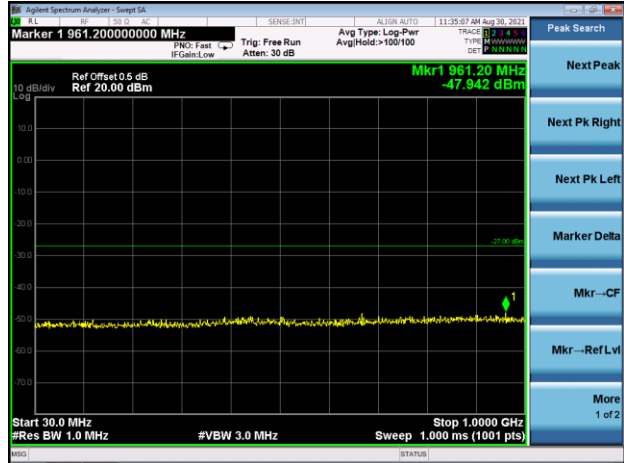


Test Plot

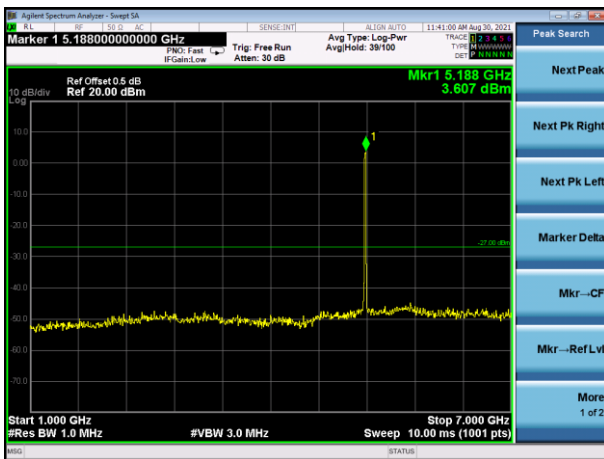
802.11ac20 on channel 36



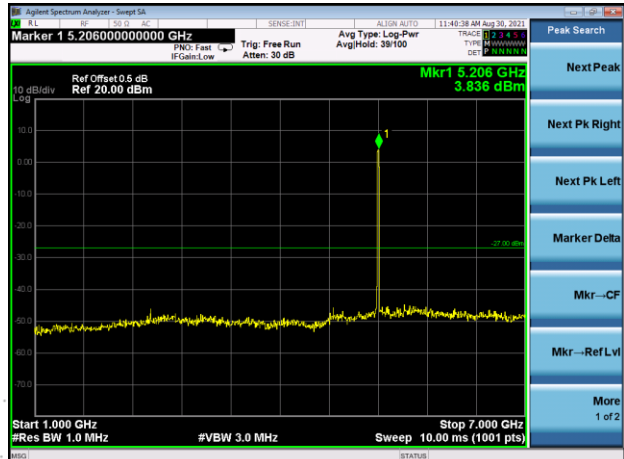
802.11ac20 on channel 40



802.11ac20 on channel 36



802.11ac20 on channel 40



802.11ac20 on channel 36

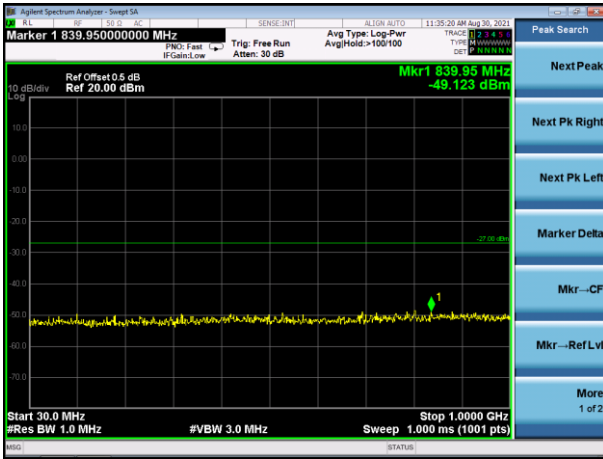


802.11ac20 on channel 40

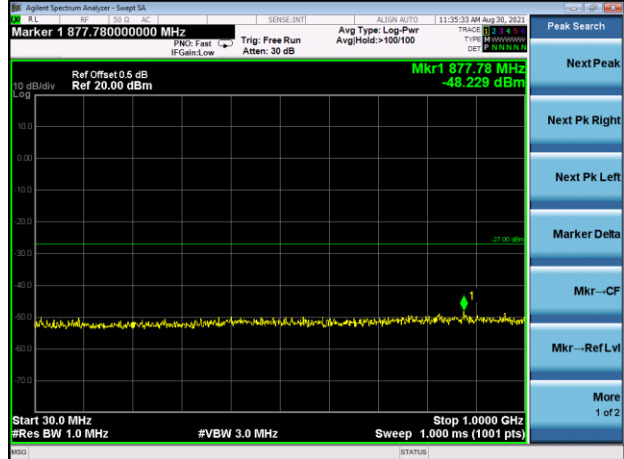


Test Plot

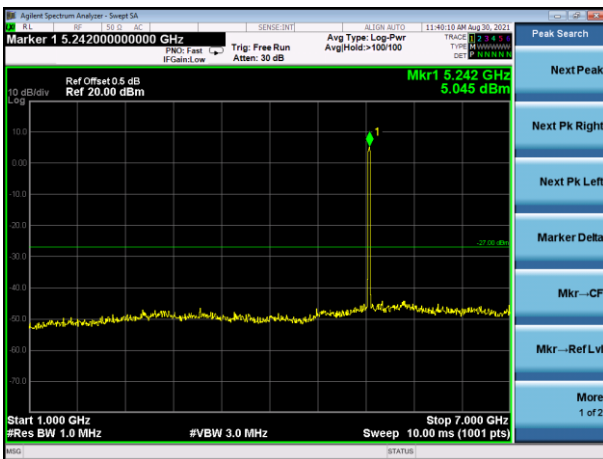
802.11ac20 on channel 48



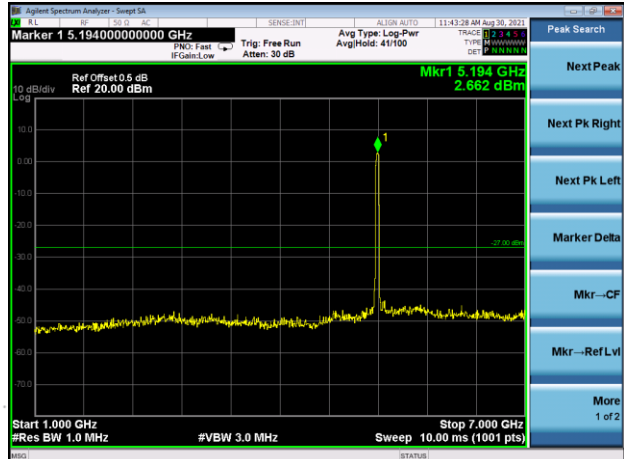
802.11ac40 on channel 38



802.11ac20 on channel 48



802.11ac40 on channel 38



802.11ac20 on channel 48

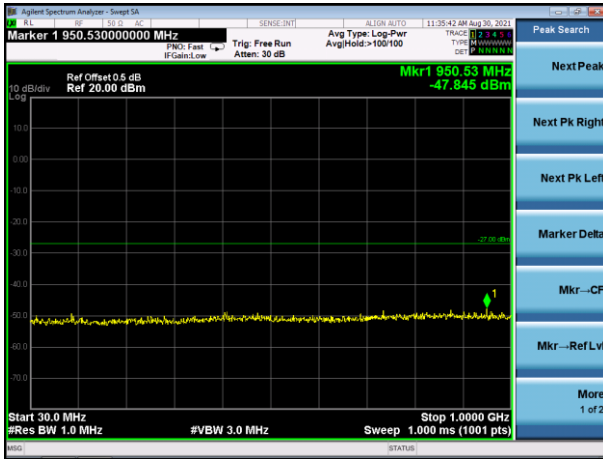


802.11ac40 on channel 38

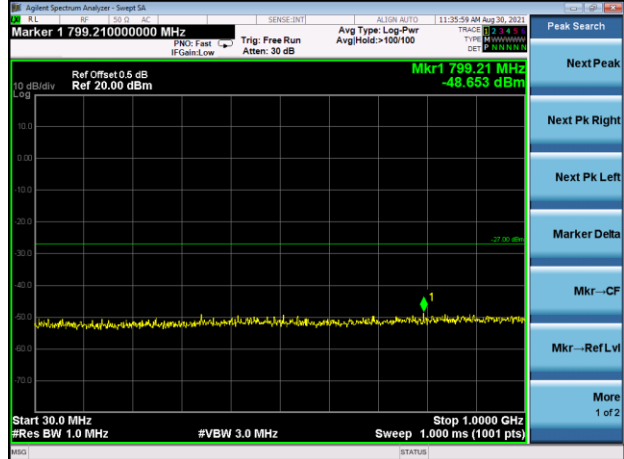


Test Plot

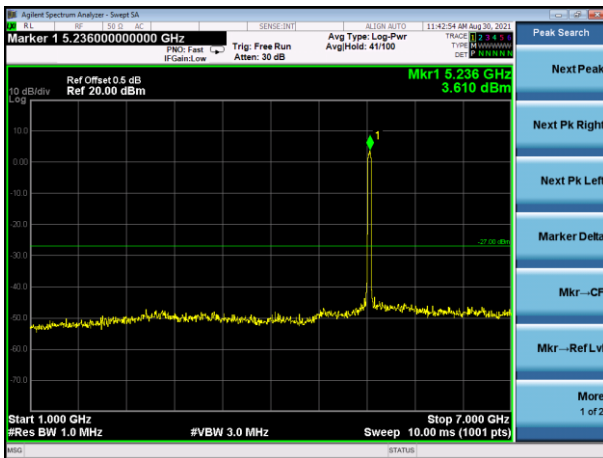
802.11ac40 on channel 46



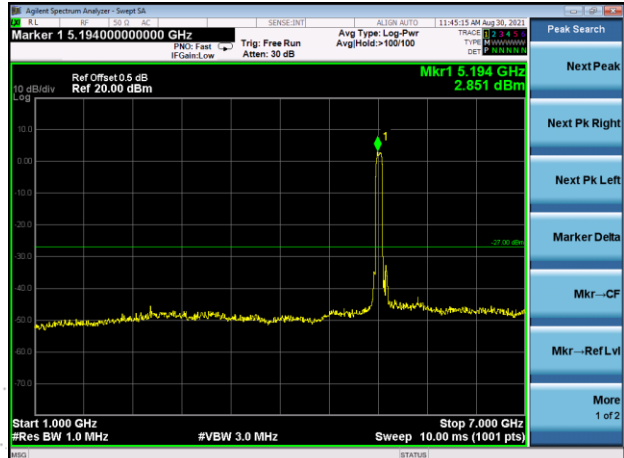
802.11ac80 on channel 42



802.11 ac40 on channel 46



802.11ac80 on channel 42



802.11 ac40 on channel 46

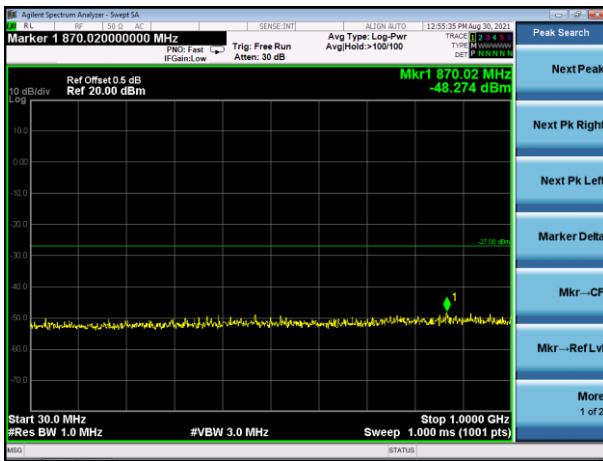


802.11ac80 on channel 42

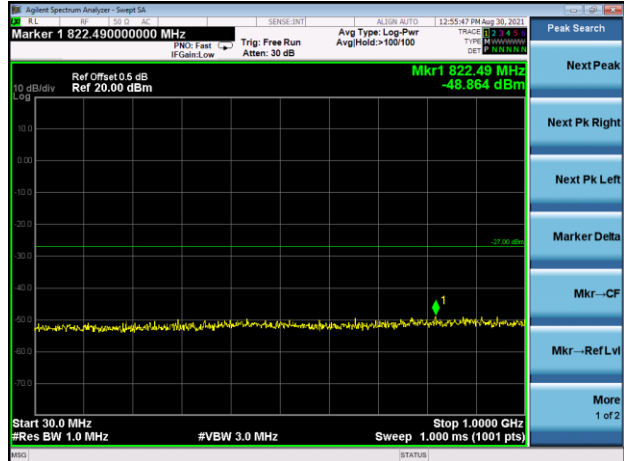


5.8G Test Plot

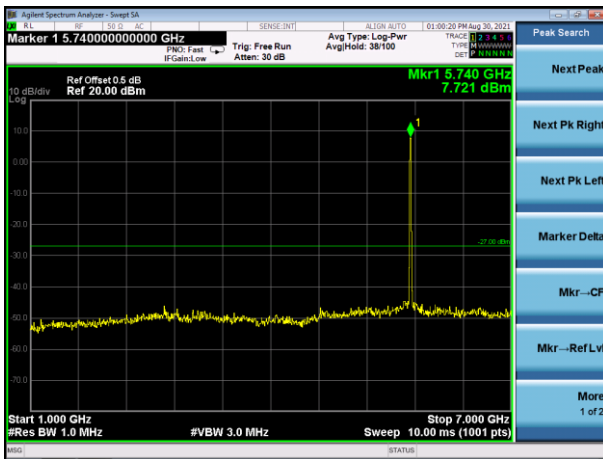
802.11a on channel 149



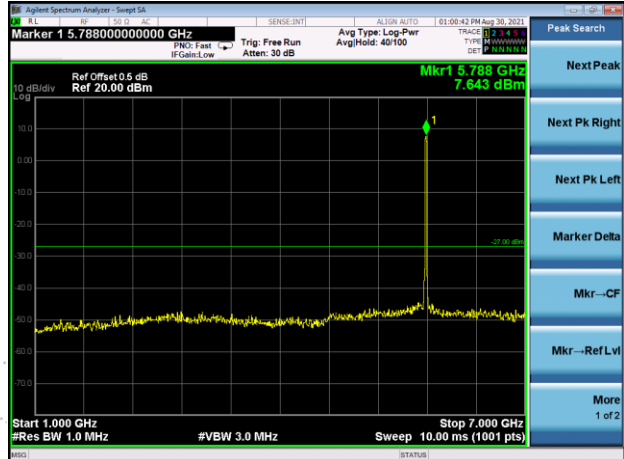
802.11a on channel 157



802.11a on channel 149



802.11a on channel 157



802.11a on channel 149

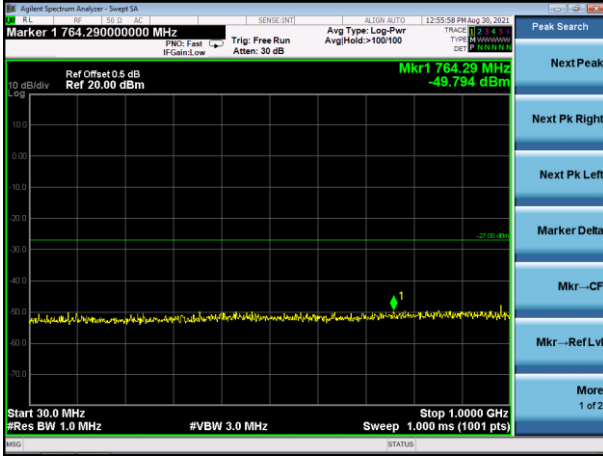


802.11a on channel 157

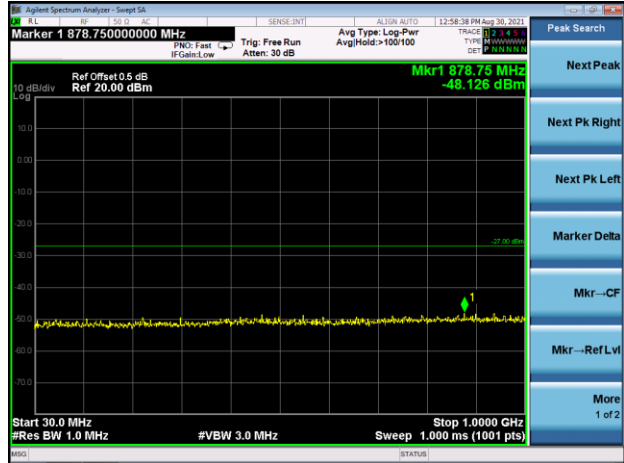


Test Plot

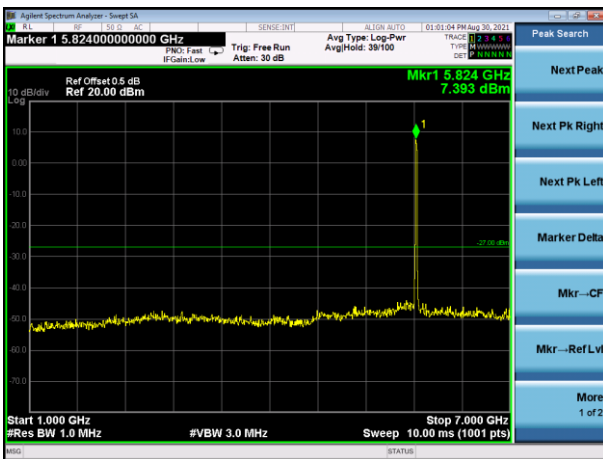
802.11a on channel 165



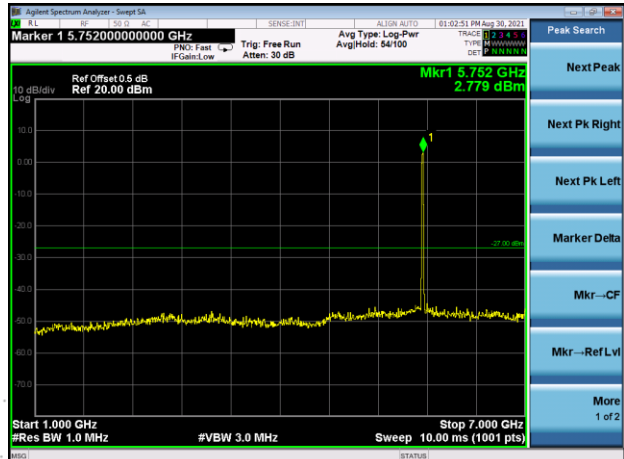
802.11n20 on channel 149



802.11a on channel 165



802.11n20 on channel 149



802.11a on channel 165

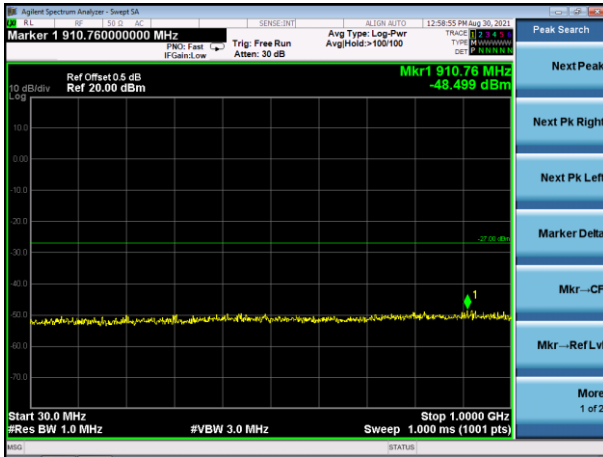


802.11n20 on channel 149

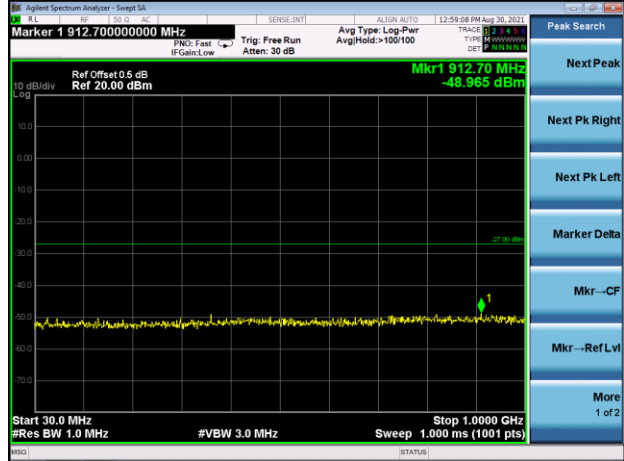


Test Plot

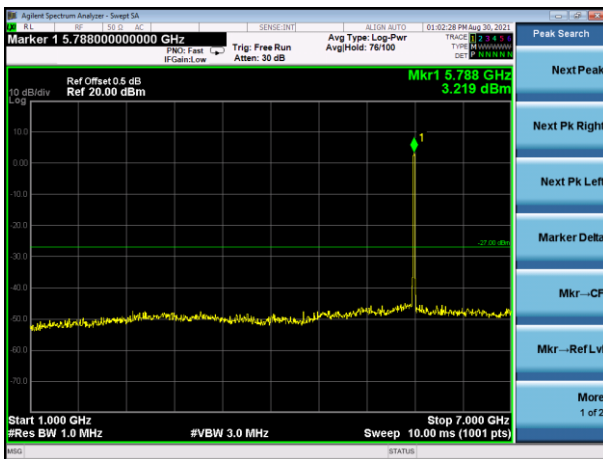
802.11n20 on channel 157



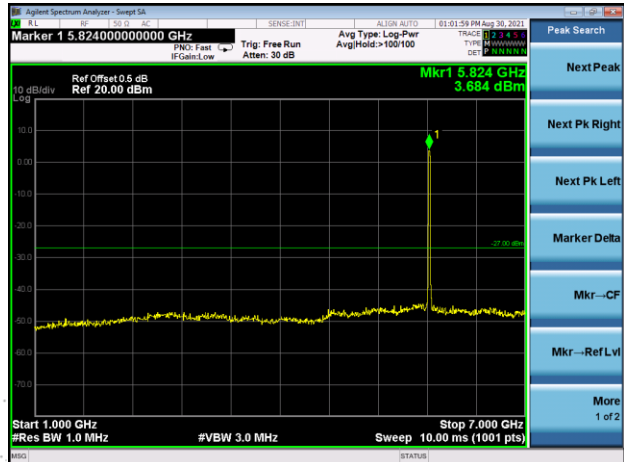
802.11n20 on channel 165



802.11n20 on channel 157



802.11n20 on channel 165



802.11n20 on channel 157

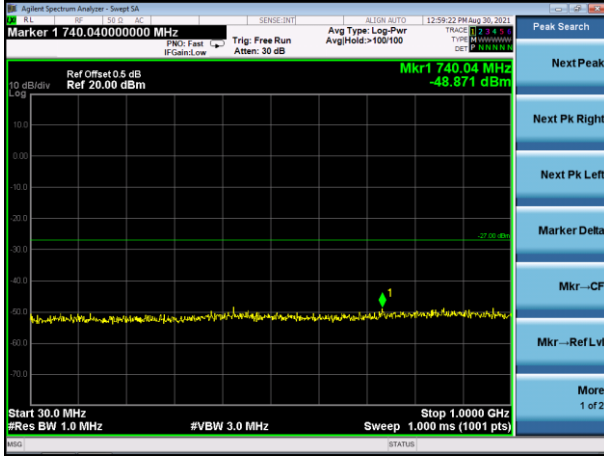


802.11n20 on channel 165

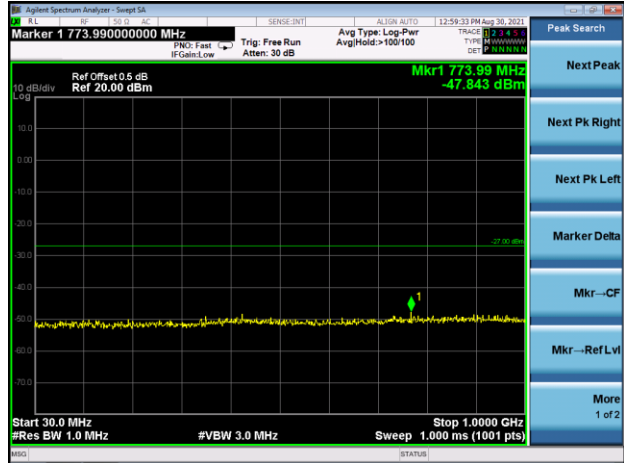


Test Plot

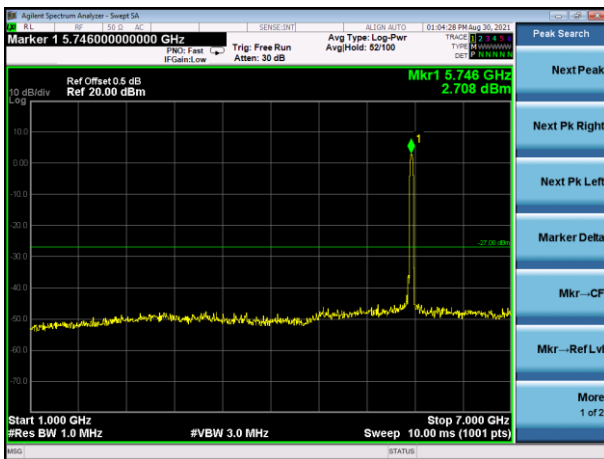
802.11n40 on channel 151



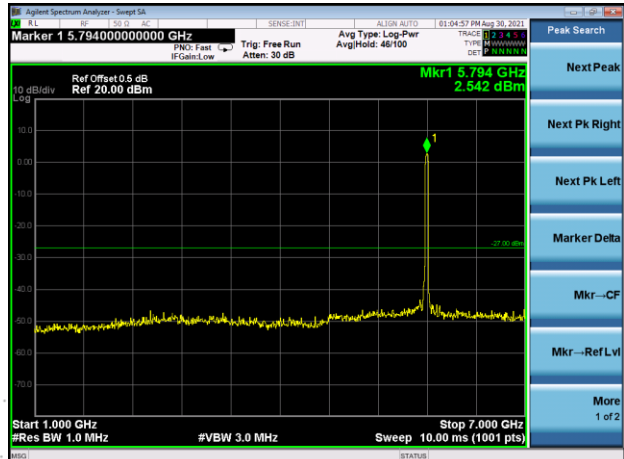
802.11n40 on channel 159



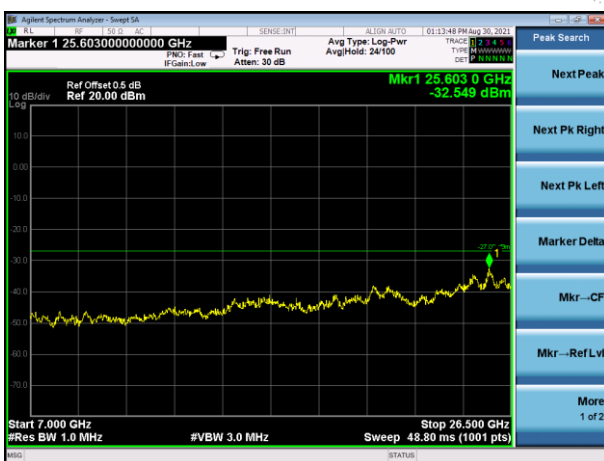
802.11n40 on channel 151



802.11n40 on channel 159



802.11n40 on channel 151

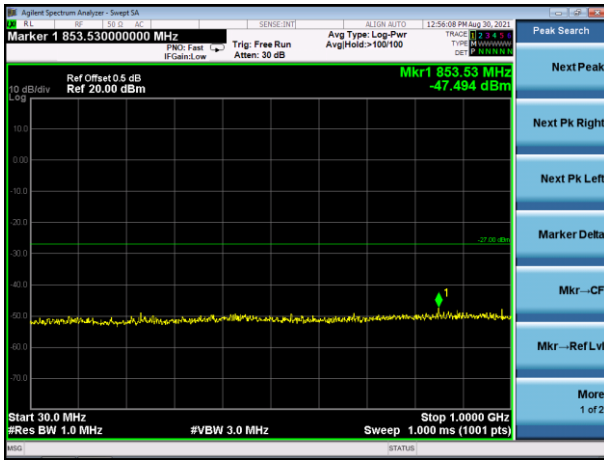


802.11n40 on channel 159

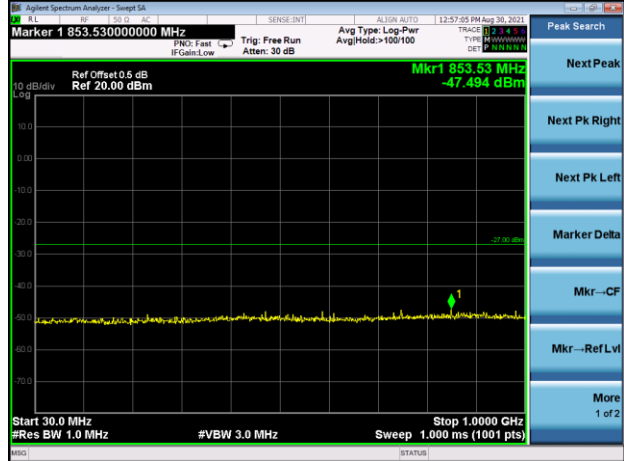


Test Plot

802.11ac20 on channel 149



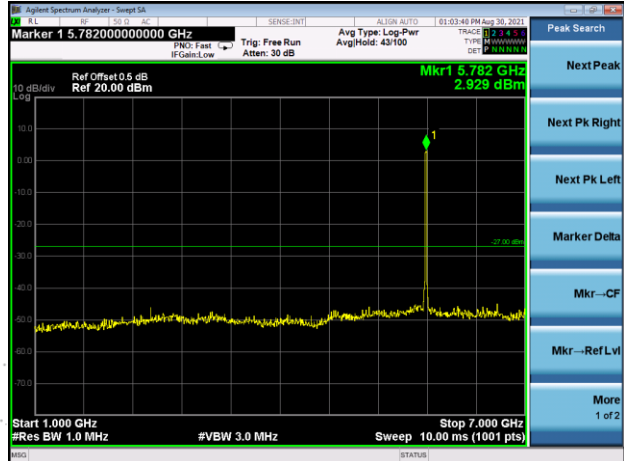
802.11ac20 on channel 157



802.11ac20 on channel 149



802.11ac20 on channel 157



802.11ac20 on channel 149

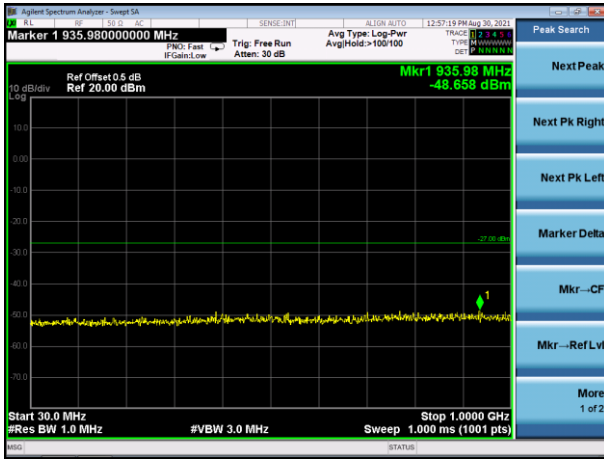


802.11ac20 on channel 157

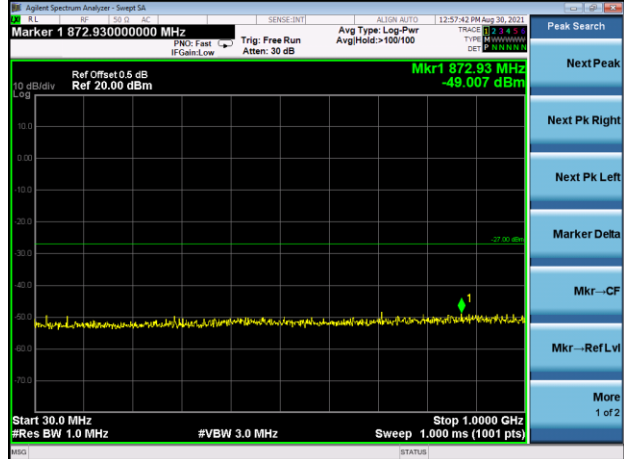


Test Plot

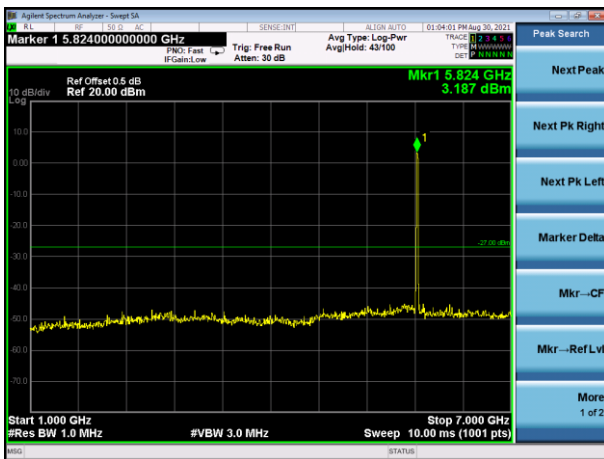
802.11ac20 on channel 165



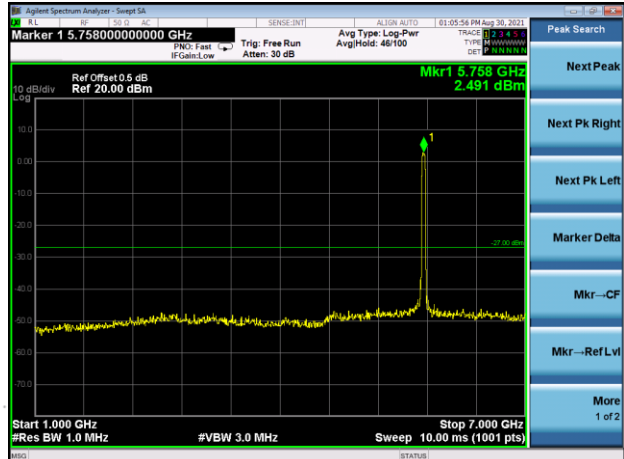
802.11ac40 on channel 151



802.11ac20 on channel 165



802.11ac40 on channel 151



802.11ac20 on channel 165

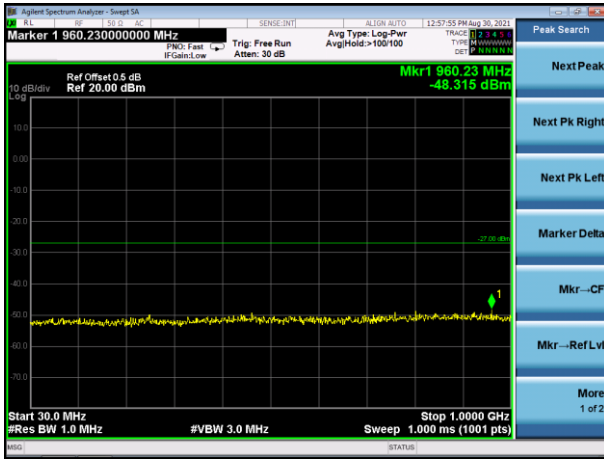


802.11ac40 on channel 151

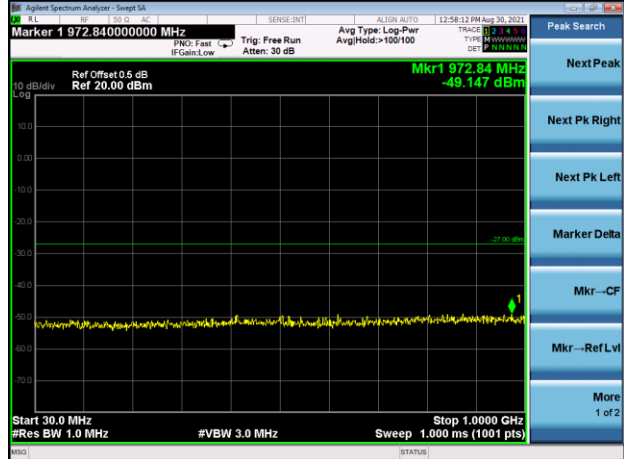


Test Plot

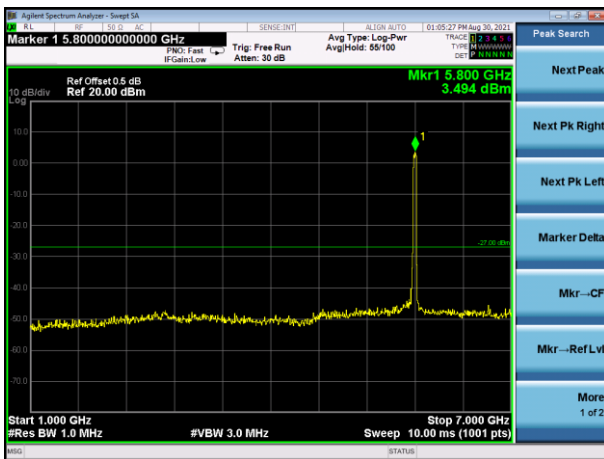
802.11ac40 on channel 159



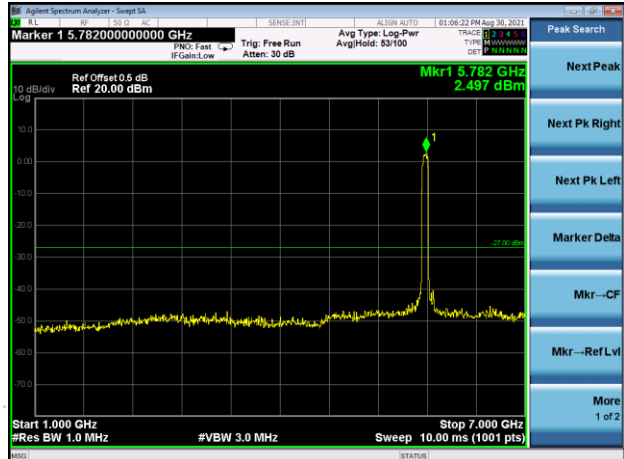
802.11ac80 on channel 155



802.11 ac40 on channel 159



802.11ac80 on channel 155



802.11 ac40 on channel 159



802.11ac80 on channel 155



13. FREQUENCY STABILITY MEASUREMENT

13.1 Block Diagram Of Test Setup



13.2 Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification)..

13.3 Test procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f) / f_c \times 10^6$ ppm and he limit is less than ± 20 ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is $-20^\circ\text{C} \sim 70^\circ\text{C}$.

13.4 Test Result

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC120V/60Hz
Test Mode :	TX Frequency U-NII-1 (5180-5240MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency : 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.30	5180.0056	5180	0.0056	1.0906
		V max (V)	3.80	5180.0023	5180	0.0023	0.4408
		V min (V)	2.81	5180.0108	5180	0.0108	2.0890
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

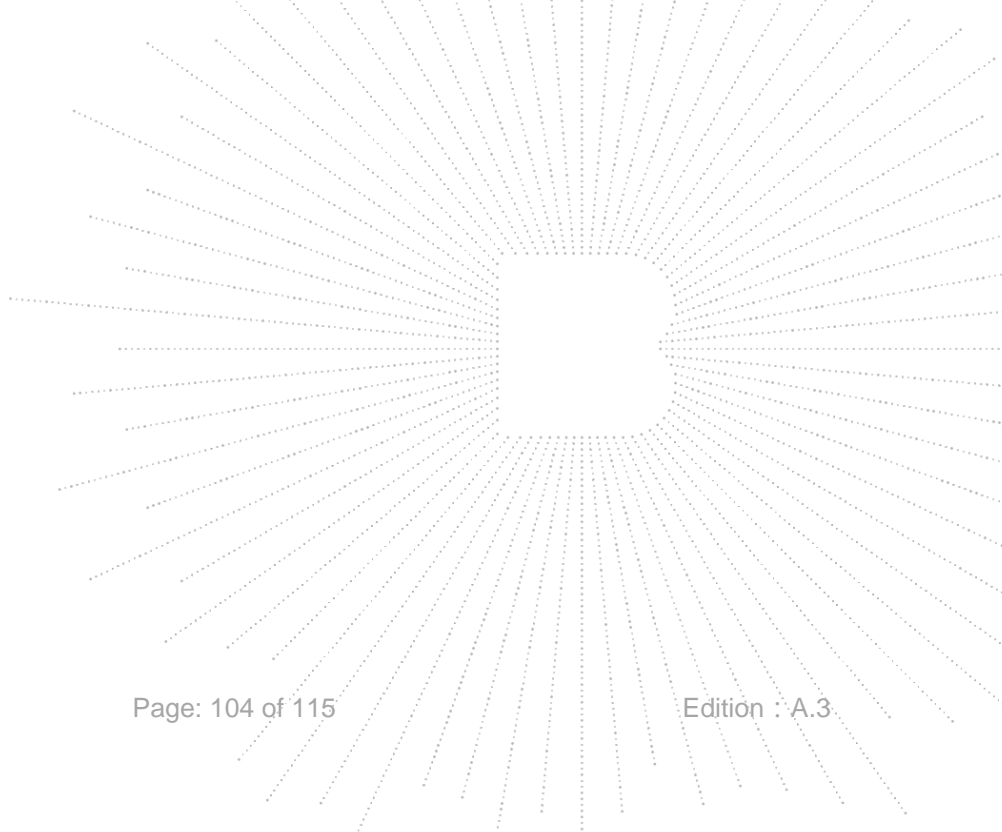
TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5180.0066	5180	0.0066	1.2645
		T (°C)	-10	5180.0086	5180	0.0086	1.6536
		T (°C)	0	5180.0040	5180	0.0040	0.7780
		T (°C)	10	5180.0130	5180	0.0130	2.5038
		T (°C)	20	5180.0047	5180	0.0047	0.9056
		T (°C)	30	5180.0110	5180	0.0110	2.1259
		T (°C)	40	5180.0065	5180	0.0065	1.2584
		T (°C)	50	5180.0082	5180	0.0082	1.5907
		T (°C)	60	5180.0086	5180	0.0086	1.6641
		T (°C)	70	5180.0037	5180	0.0037	0.7214
Limits				5150-5250 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.30	5200.0020	5200	0.0020	0.3837
		V max (V)	3.80	5200.0106	5200	0.0106	2.0480
		V min (V)	2.81	5200.0034	5200	0.0034	0.6457
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5200.00072	5200	0.00072	0.1390
		T (°C)	-10	5200.00714	5200	0.00714	1.3724
		T (°C)	0	5200.00253	5200	0.00253	0.4861
		T (°C)	10	5200.00229	5200	0.00229	0.4398
		T (°C)	20	5200.00161	5200	0.00161	0.3102
		T (°C)	30	5200.00235	5200	0.00235	0.4522
		T (°C)	40	5200.01345	5200	0.01345	2.5871
		T (°C)	50	5200.00729	5200	0.00729	1.4028
		T (°C)	60	5200.00269	5200	0.00269	0.5182
		T (°C)	70	5200.01304	5200	0.01304	2.5078
Limits				5150-5250 MHz			
Result				Complies			

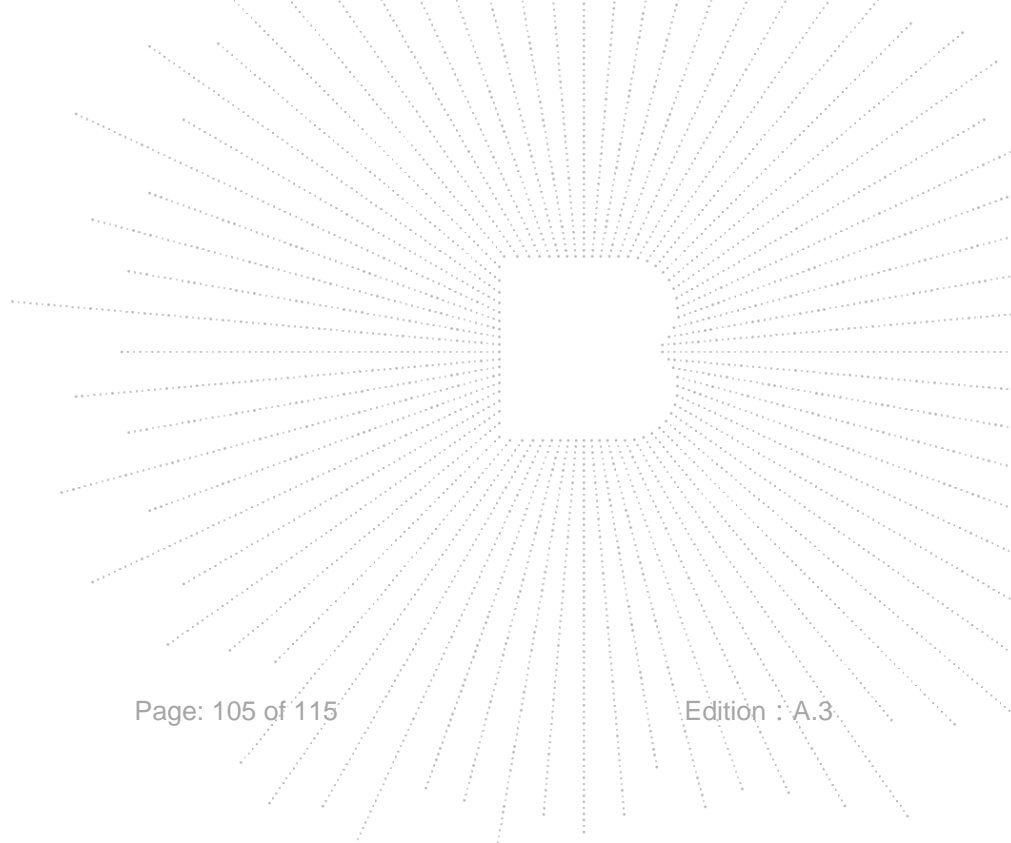


Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.30	5240.0058	5240	0.0058	1.1064
		V max (V)	3.80	5240.0007	5240	0.0007	0.1289
		V min (V)	2.81	5240.0059	5240	0.0059	1.1337
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5240.0069	5240	0.0069	1.3078
		T (°C)	-10	5240.0015	5240	0.0015	0.2925
		T (°C)	0	5240.0093	5240	0.0093	1.7830
		T (°C)	10	5240.0069	5240	0.0069	1.3121
		T (°C)	20	5240.0099	5240	0.0099	1.8906
		T (°C)	30	5240.0015	5240	0.0015	0.2941
		T (°C)	40	5240.0039	5240	0.0039	0.7473
		T (°C)	50	5240.0075	5240	0.0075	1.4247
		T (°C)	60	5240.0113	5240	0.0113	2.1517
		T (°C)	70	5240.0034	5240	0.0034	0.6456
Limits				5150-5250 MHz			
Result				Complies			



Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC120V/60Hz
Hzst Mode :	TX Frequency(5745-5825MHz)		

Voltage vs. Frequency Stabilit

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.30	5745.01041	5745	0.01041	1.8126
		V max (V)	3.80	5745.01056	5745	0.01056	1.8374
		V min (V)	2.81	5745.00062	5745	0.00062	0.1083
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

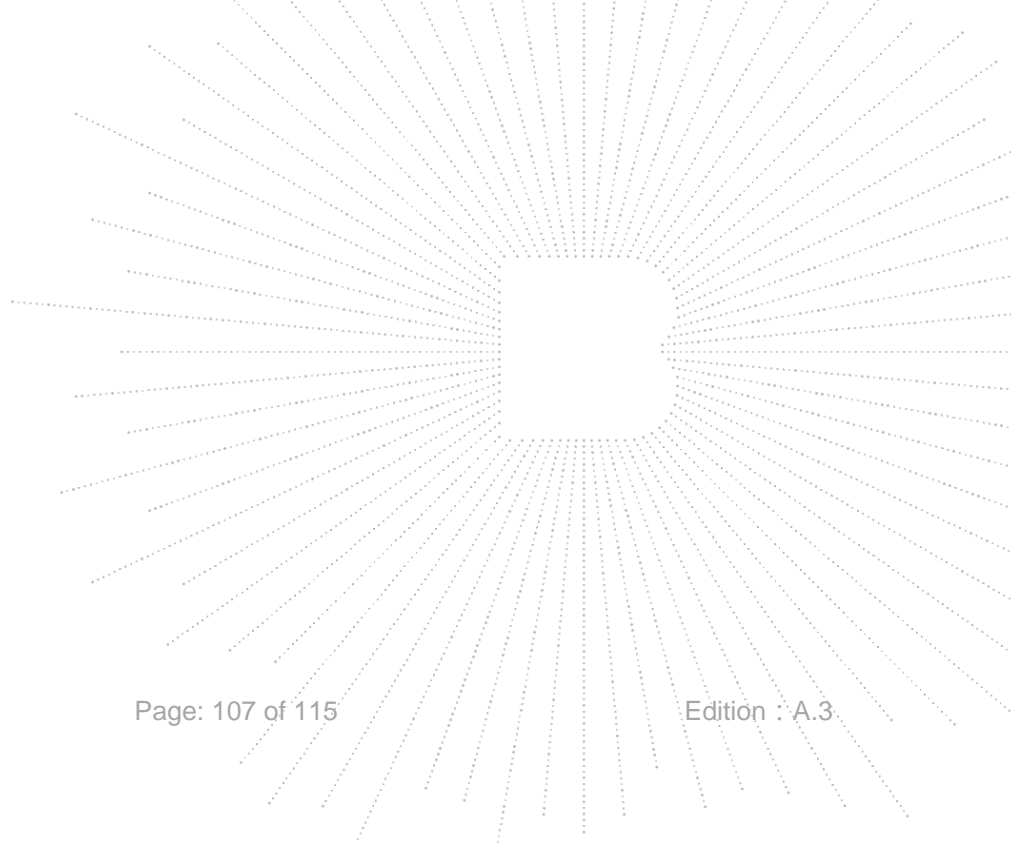
TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5745.00656	5745	0.00656	1.1427
		T (°C)	-10	5745.00687	5745	0.00687	1.1955
		T (°C)	0	5745.00196	5745	0.00196	0.3405
		T (°C)	10	5745.01237	5745	0.01237	2.1536
		T (°C)	20	5745.01132	5745	0.01132	1.9706
		T (°C)	30	5745.00583	5745	0.00583	1.0143
		T (°C)	40	5745.00816	5745	0.00816	1.4201
		T (°C)	50	5745.00062	5745	0.00062	0.1079
		T (°C)	60	5745.00988	5745	0.00988	1.7191
		T (°C)	70	5745.00249	5745	0.00249	0.4329
Limits				5725-5850 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.30	5785.01240	5785	0.01240	2.1436
		V max (V)	3.80	5785.00293	5785	0.00293	0.5069
		V min (V)	2.81	5785.00364	5785	0.00364	0.6298
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5785.00142	5785	0.00142	0.2450
		T (°C)	-10	5785.00562	5785	0.00562	0.9716
		T (°C)	0	5785.00164	5785	0.00164	0.2837
		T (°C)	10	5785.01044	5785	0.01044	1.8044
		T (°C)	20	5785.00196	5785	0.00196	0.3382
		T (°C)	30	5785.01217	5785	0.01217	2.1042
		T (°C)	40	5785.00185	5785	0.00185	0.3197
		T (°C)	50	5785.01219	5785	0.01219	2.1068
		T (°C)	60	5785.00157	5785	0.00157	0.2711
		T (°C)	70	5785.01275	5785	0.01275	2.2043
Limits				5725-5850 MHz			
Result				Complies			



Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.30	5825.00986	5825	0.00986	1.6928
		V max (V)	3.80	5825.00463	5825	0.00463	0.7940
		V min (V)	2.81	5825.00818	5825	0.00818	1.4040
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5825.00994	5825	0.00994	1.7064
		T (°C)	-10	5825.00778	5825	0.00778	1.3351
		T (°C)	0	5825.00825	5825	0.00825	1.4160
		T (°C)	10	5825.00147	5825	0.00147	0.2529
		T (°C)	20	5825.00103	5825	0.00103	0.1773
		T (°C)	30	5825.01308	5825	0.01308	2.2459
		T (°C)	40	5825.00551	5825	0.00551	0.9453
		T (°C)	50	5825.01009	5825	0.01009	1.7319
		T (°C)	60	5825.01065	5825	0.01065	1.8287
		T (°C)	70	5825.01139	5825	0.01139	1.9555
Limits				5725-5850 MHz			
Result				Complies			

