FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

XMit 2020.12.30.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Agilent	N5181A	TIG	2020-04-16	2023-04-16
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	2021-03-14	2022-03-14
Attenuator	S.M. Electronics	SA26B-20	AUY	2021-03-14	2022-03-14
Block - DC	Fairview Microwave	SD3379	AMW	2021-03-14	2022-03-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2021-07-06	2022-07-06

TEST DESCRIPTION

The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made at the edges of the main transmit bands as called out on the data sheets. Testing was done with an absence of modulation in a CW mode of operation.

The primary supply voltage was varied from 85 % to 115% of the nominal voltage Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30 ° to +50° C) and at 10°C intervals.

Where a ppm limit applies: ppm = (Measured Frequency / Measured Nominal Frequency - 1) * 1,000,000

Per the requirements of FCC 15.407:

“Manufacturers 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.”

No specific limits are provided in either FCC 15.407, the product specific rule part, or FCC 2.1055, the equipment authorization procedure for testing frequency stability. While there are no limits called out, any results less than 100ppm will still allow the radio to be operating within the band.

FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

element

TbtTx 2021.10.29.2 XMit 2020.12.30.0

EUT:	A-dec Gateway			**Work Order:**	A-DE0169
Serial Number:	521A000122			**Date:**	3-Dec-21
Customer:	A-dec, Inc.			**Temperature:**	20.6 °C
Attendees:	None			**Humidity:**	40.9% RH
Project:	None			**Barometric Pres.:**	1024 mbar
Tested by:	Jeff Alcoke	**Power:**	24 VDC via 110VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.407:2021	ANSI C63.10:2013

COMMENTS

Reference level offset includes: DC block, 20 dB attenuator, and measurement cable.

DEVIATIONS FROM TEST STANDARD

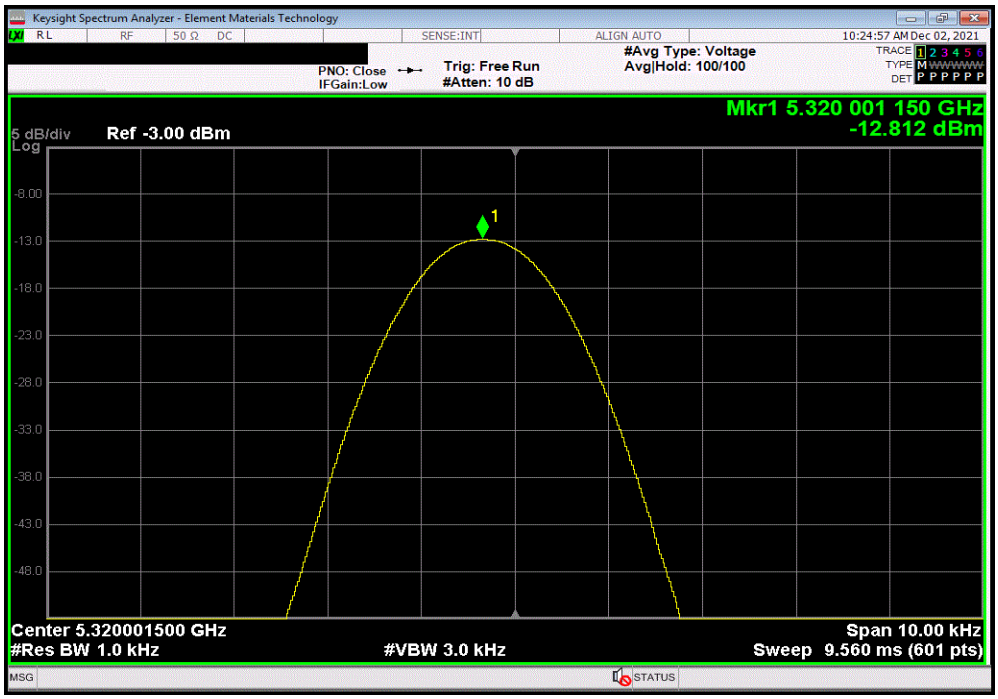
None

Configuration #	4	Signature

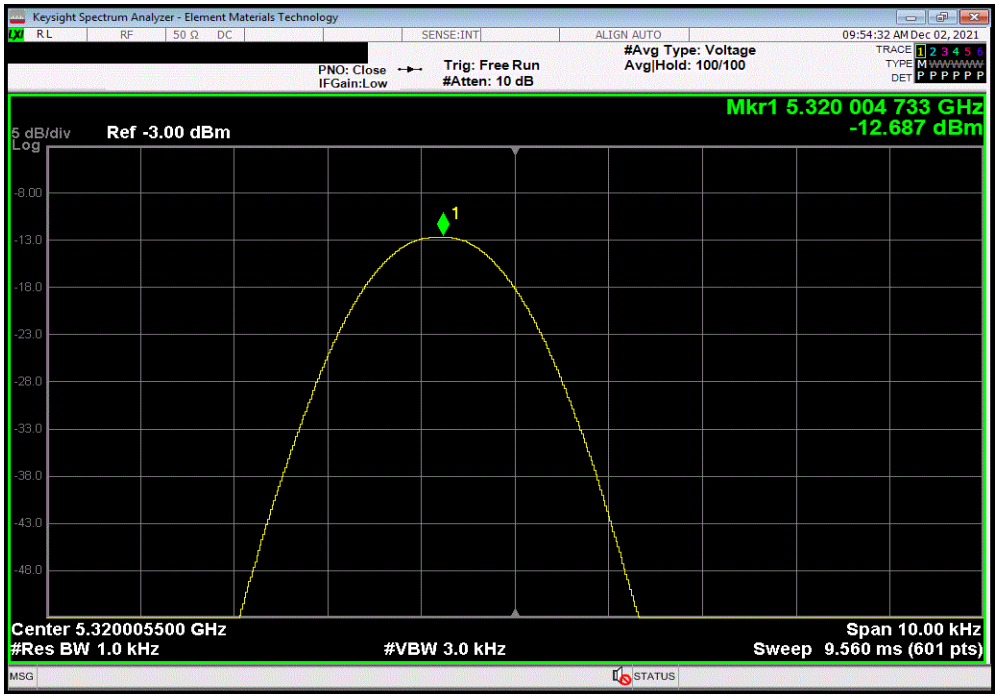
	Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz					
Voltage: 115%, 27.6 VDC	5320.00115	5320.004733	0.7	100	Pass
Voltage: 100%, 24 VDC	5320.004733	5320.004733	0	100	Pass
Voltage: 85%, 20.4 VDC	5320.001967	5320.004733	0.5	100	Pass
Temperature: +50°	5320.005151	5320.004733	0.1	100	Pass
Temperature: +40°	5319.99975	5320.004733	0.9	100	Pass
Temperature: +30°	5320.004234	5320.004733	0.1	100	Pass
Temperature: +20°	5320.0163	5320.004733	2.2	100	Pass
Temperature: +10°	5320.025416	5320.004733	3.9	100	Pass
Temperature: 0°	5320.036049	5320.004733	5.9	100	Pass
Temperature: -10°	5320.041916	5320.004733	7	100	Pass
Temperature: -20°	5320.040483	5320.004733	6.7	100	Pass
Temperature: -30°	5320.028549	5320.004733	4.5	100	Pass
5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz					
Voltage: 115%, 27.6 VDC	5500.0014	5500.00335	0.4	100	Pass
Voltage: 100%, 24 VDC	5500.00335	5500.00335	0	100	Pass
Voltage: 85%, 20.4 VDC	5500.0012	5500.00335	0.4	100	Pass
Temperature: +50°	5500.008067	5500.00335	0.9	100	Pass
Temperature: +40°	5499.999799	5500.00335	0.6	100	Pass
Temperature: +30°	5500.003867	5500.00335	0.1	100	Pass
Temperature: +20°	5500.015466	5500.00335	2.2	100	Pass
Temperature: +10°	5500.02565	5500.00335	4.1	100	Pass
Temperature: 0°	5500.036084	5500.00335	6	100	Pass
Temperature: -10°	5500.0435	5500.00335	7.3	100	Pass
Temperature: -20°	5500.041399	5500.00335	6.9	100	Pass
Temperature: -30°	5500.029983	5500.00335	4.8	100	Pass
5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz					
Voltage: 115%, 27.6 VDC	5700.000949	5700.001783	0.1	100	Pass
Voltage: 100%, 24 VDC	5700.001783	5700.001783	0	100	Pass
Voltage: 85%, 20.4 VDC	5700.0016	5700.001783	0	100	Pass
Temperature: +50°	5700.010833	5700.001783	1.6	100	Pass
Temperature: +40°	5699.99975	5700.001783	0.4	100	Pass
Temperature: +30°	5700.004233	5700.001783	0.4	100	Pass
Temperature: +20°	5700.0156	5700.001783	2.4	100	Pass
Temperature: +10°	5700.02755	5700.001783	4.5	100	Pass
Temperature: 0°	5700.037966	5700.001783	6.3	100	Pass
Temperature: -10°	5700.045166	5700.001783	7.6	100	Pass
Temperature: -20°	5700.04375	5700.001783	7.4	100	Pass
Temperature: -30°	5700.03275	5700.001783	5.4	100	Pass
5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz					
Voltage: 115%, 27.6 VDC	5825.001156	5825.001807	0.1	100	Pass
Voltage: 100%, 24 VDC	5825.001807	5825.001807	0	100	Pass
Voltage: 85%, 20.4 VDC	5825.001106	5825.001807	0.1	100	Pass
Temperature: +50°	5825.010832	5825.001807	1.5	100	Pass
Temperature: +40°	5824.999775	5825.001807	0.3	100	Pass
Temperature: +30°	5825.005761	5825.001807	0.7	100	Pass
Temperature: +20°	5825.01411	5825.001807	2.1	100	Pass
Temperature: +10°	5825.029095	5825.001807	4.7	100	Pass
Temperature: 0°	5825.038272	5825.001807	6.3	100	Pass
Temperature: -10°	5825.046111	5825.001807	7.6	100	Pass
Temperature: -20°	5825.044939	5825.001807	7.4	100	Pass
Temperature: -30°	5825.034	5825.001807	5.5	100	Pass

FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Voltage: 115%, 27.6 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5320.00115	5320.004733	0.7	100	Pass

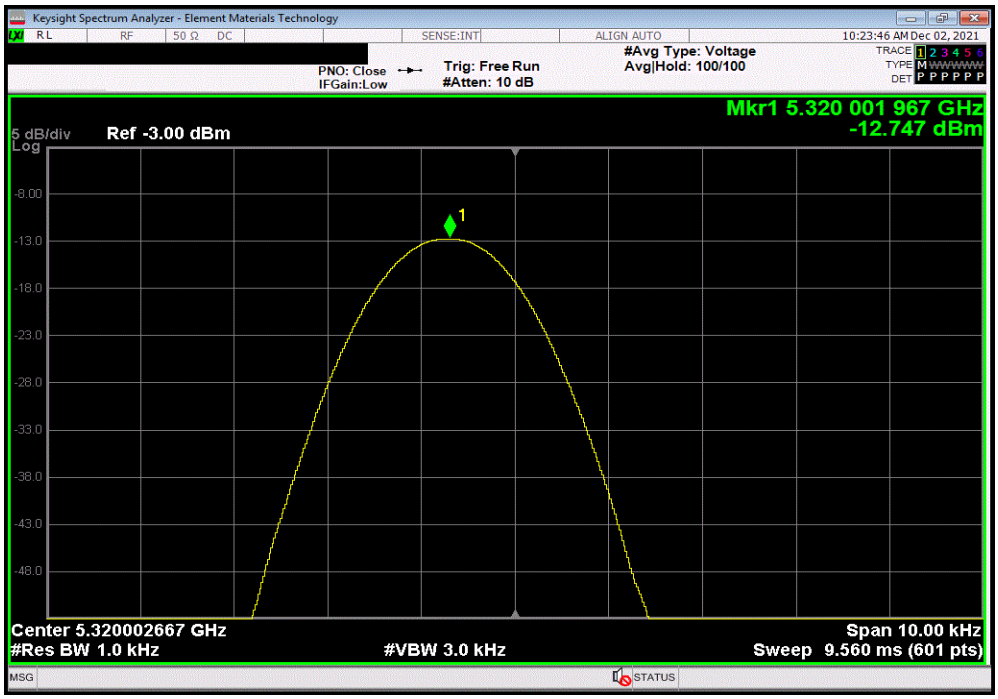


5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Voltage: 100%, 24 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5320.004733	5320.004733	0	100	Pass

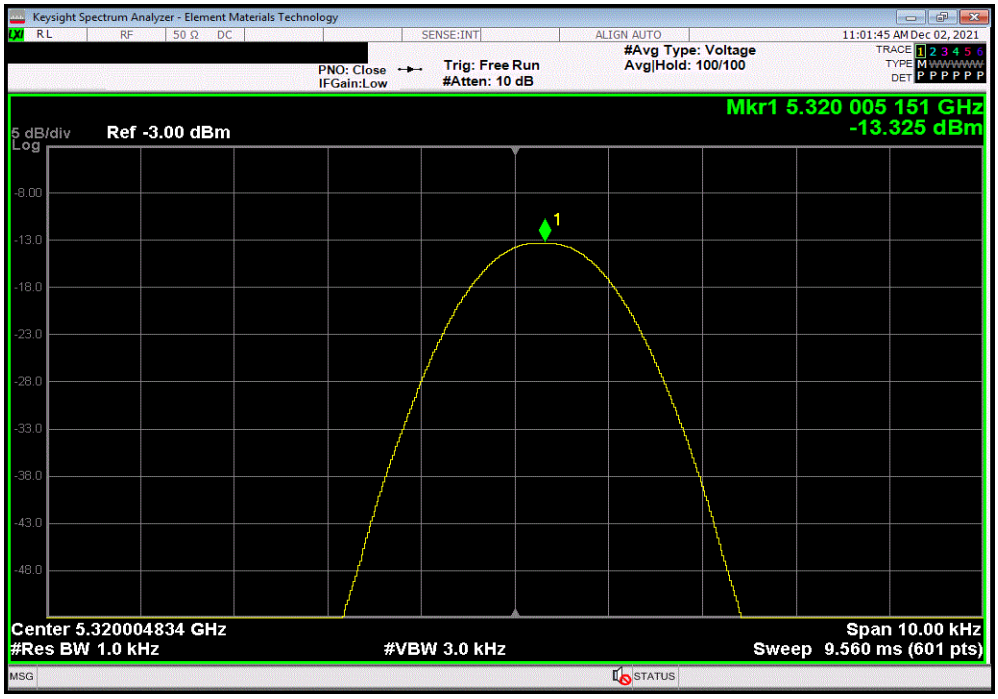


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Voltage: 85%, 20.4 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5320.001967	5320.004733	0.5	100	Pass

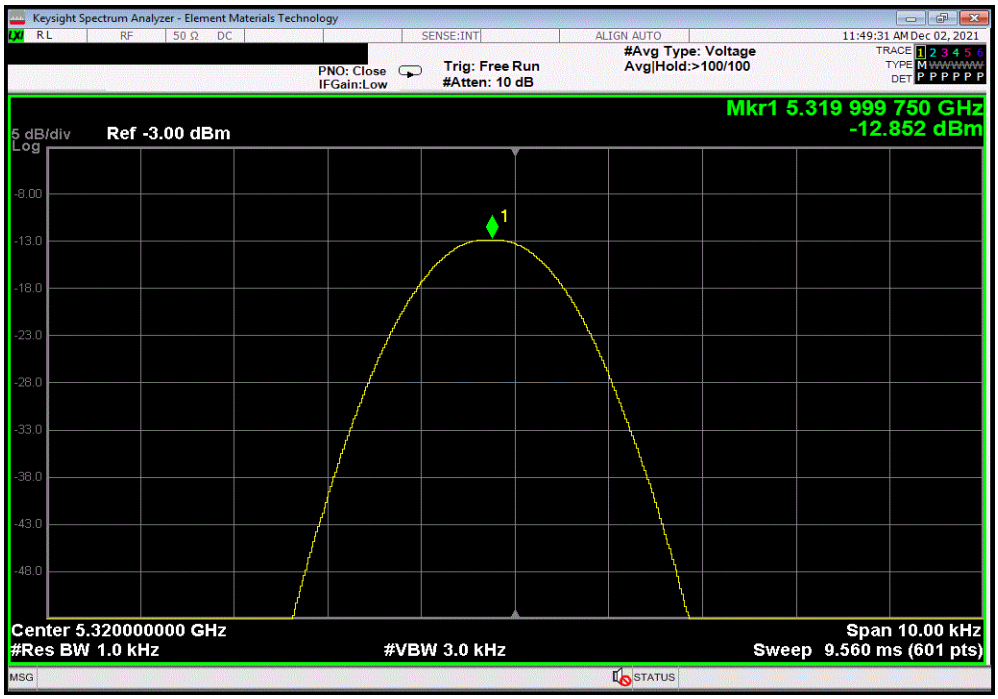


5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Temperature: +50°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5320.005151	5320.004733	0.1	100	Pass

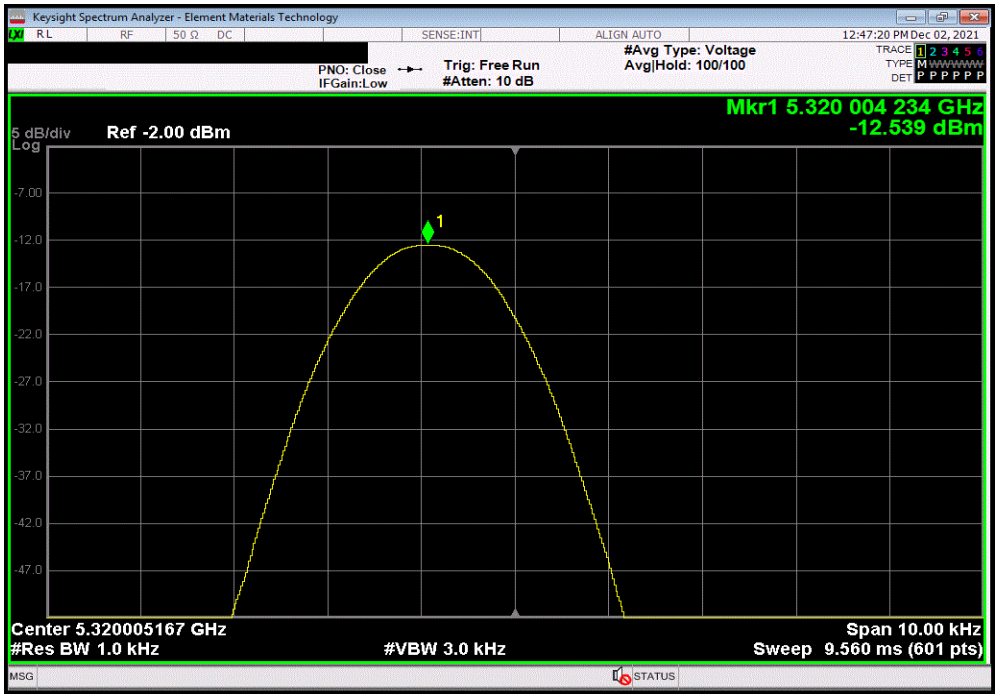


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

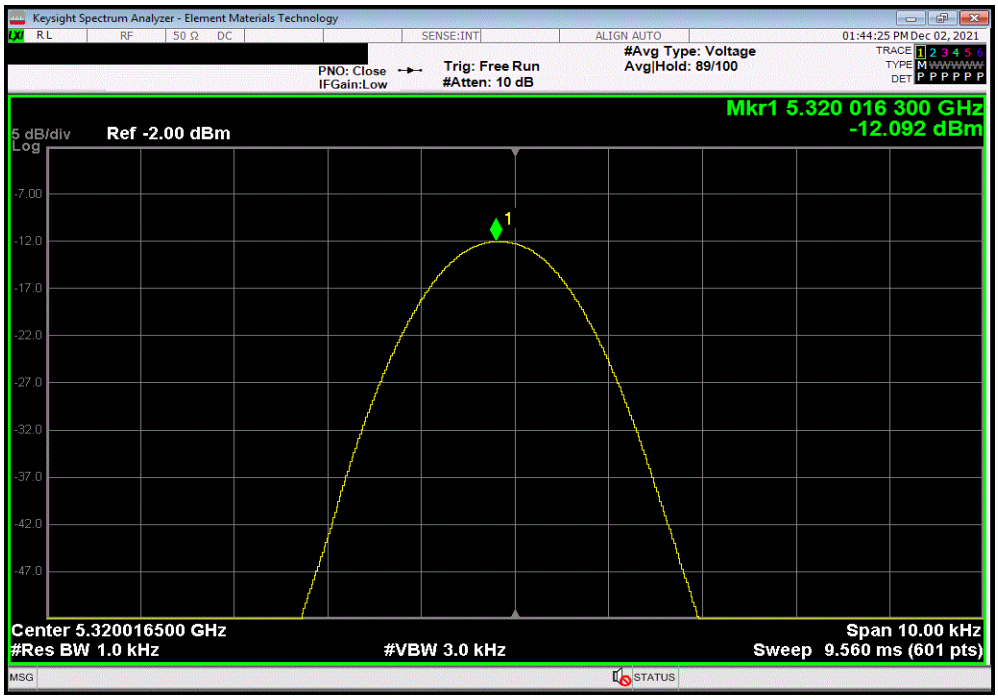
5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Temperature: +40°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5319.99975	5320.004733	0.9	100	Pass



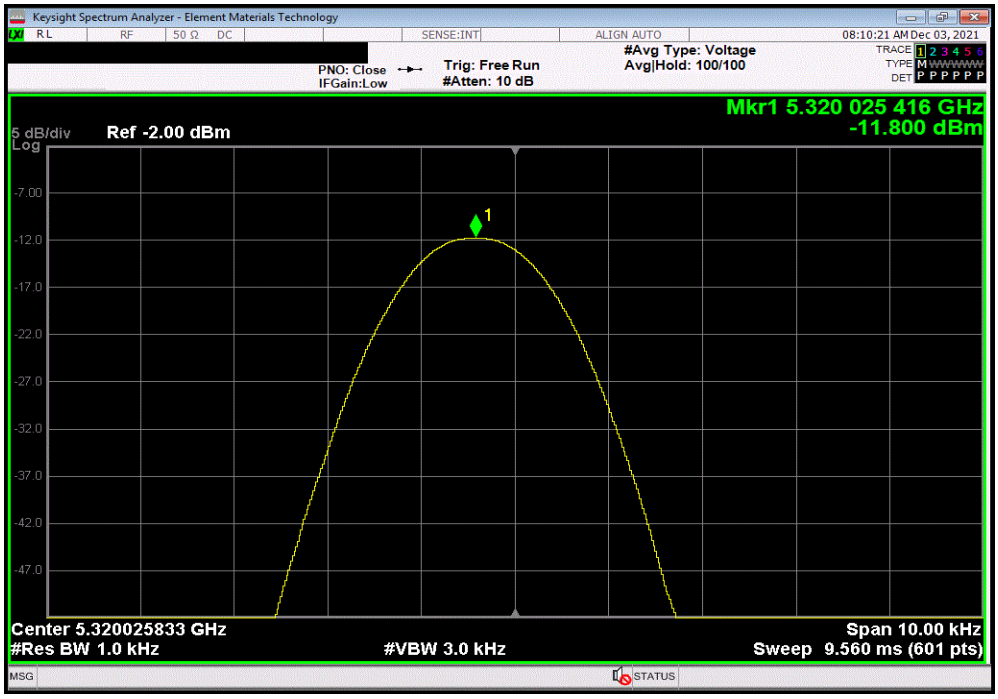
5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Temperature: +30°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5320.004234	5320.004733	0.1	100	Pass



5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Temperature: +20°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5320.0163	5320.004733	2.2	100	Pass

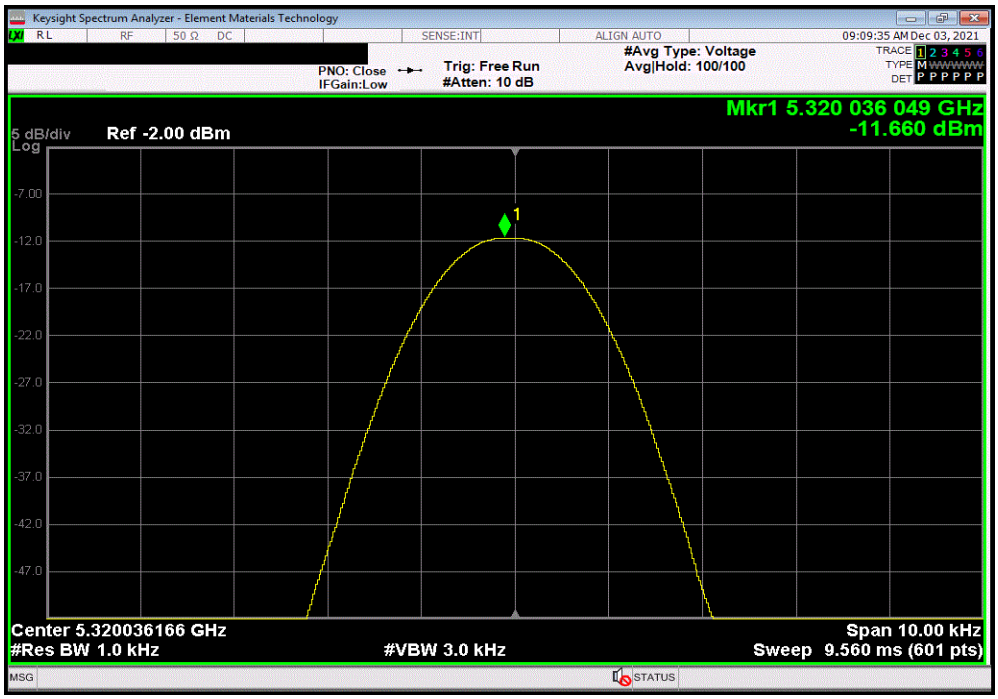


5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Temperature: +10°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5320.025416	5320.004733	3.9	100	Pass

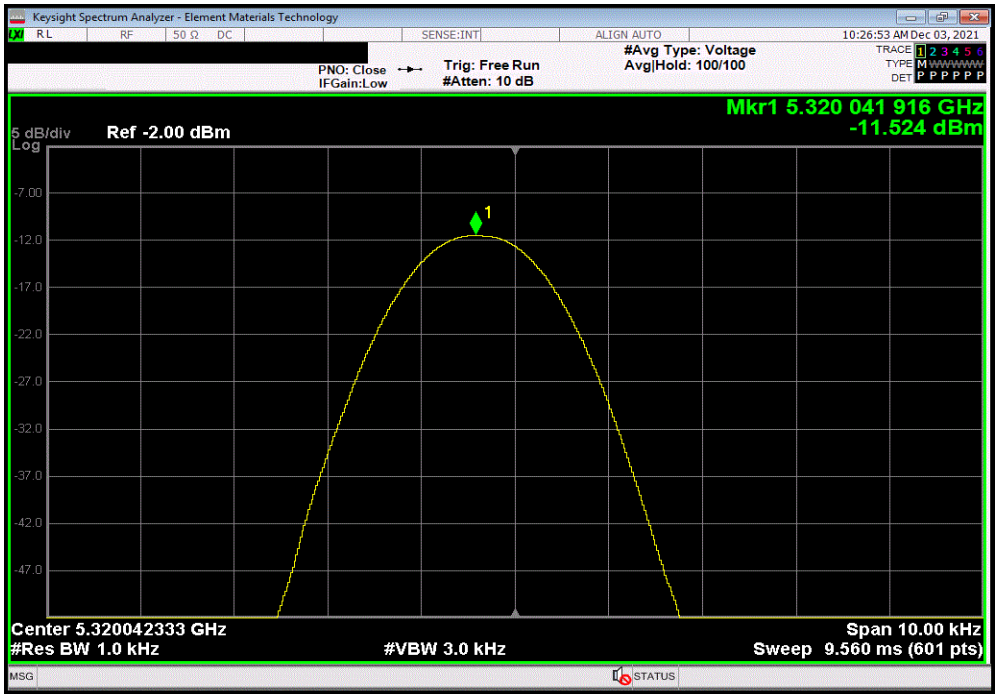


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Temperature: 0°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5320.036049	5320.004733	5.9	100	Pass

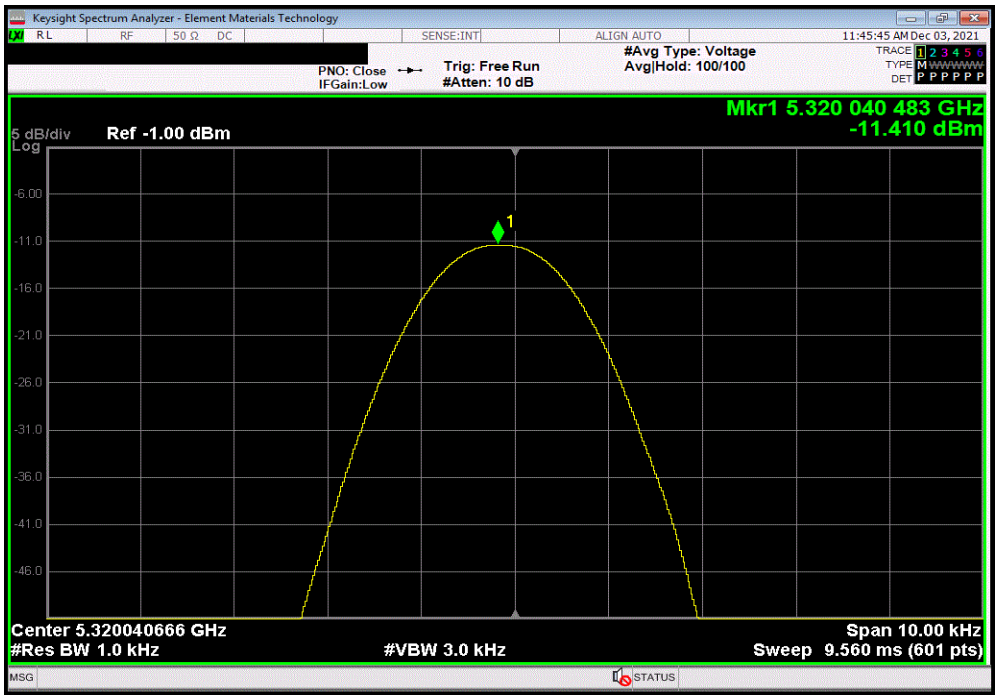


5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Temperature: -10°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5320.041916	5320.004733	7	100	Pass

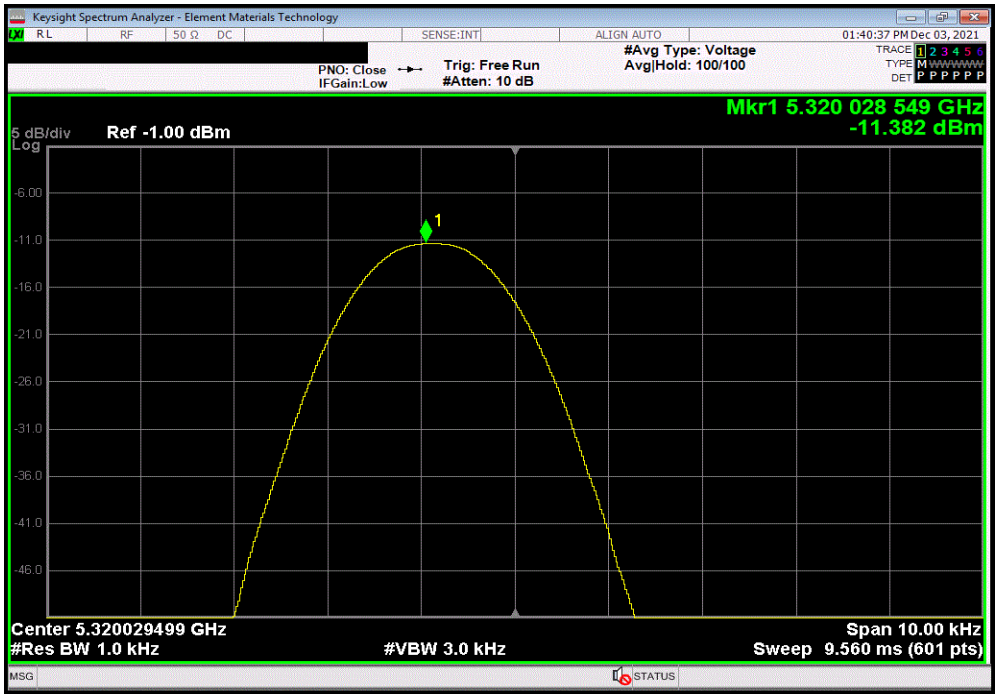


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

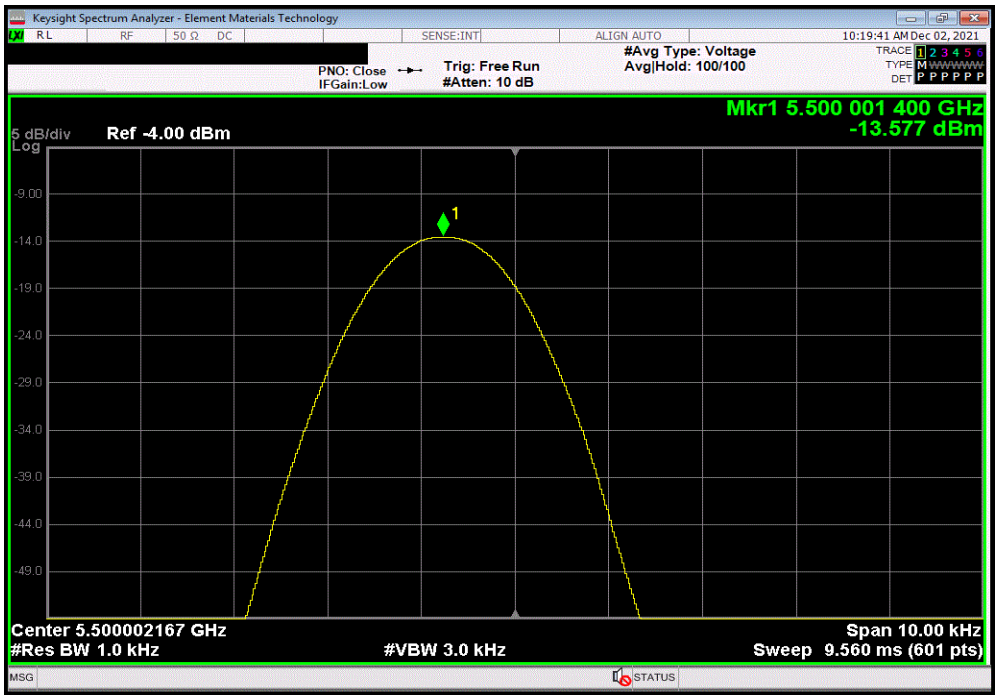
5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Temperature: -20°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5320.040483	5320.004733	6.7	100	Pass



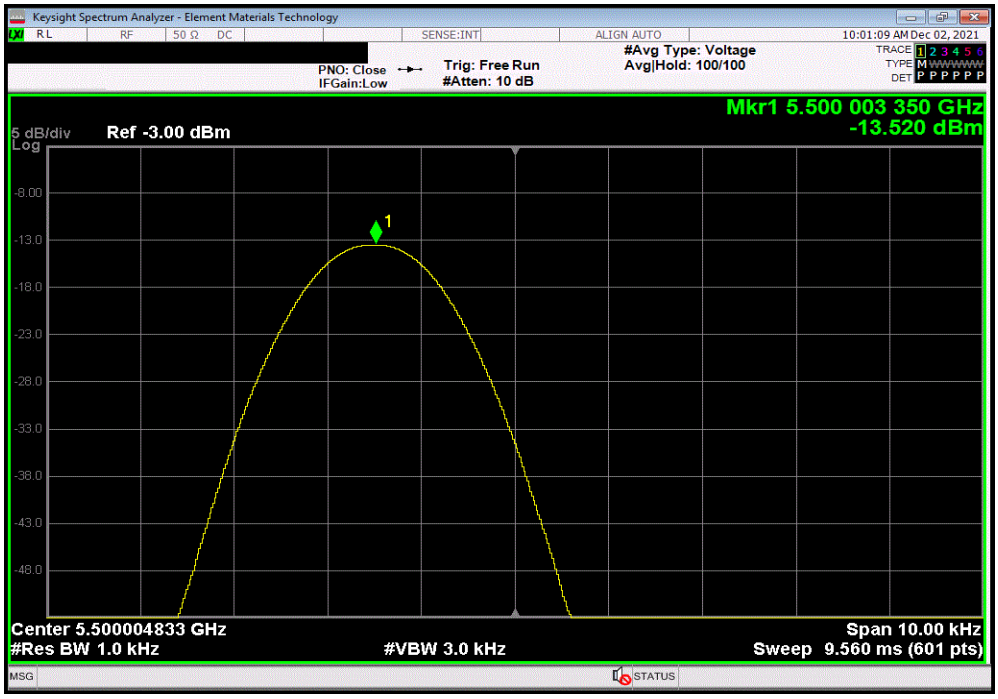
5250 - 5350 MHz Band, CW, Ch 64 = 5320 MHz, Temperature: -30°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5320.028549	5320.004733	4.5	100	Pass



5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Voltage: 115%, 27.6 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5500.0014	5500.00335	0.4	100	Pass

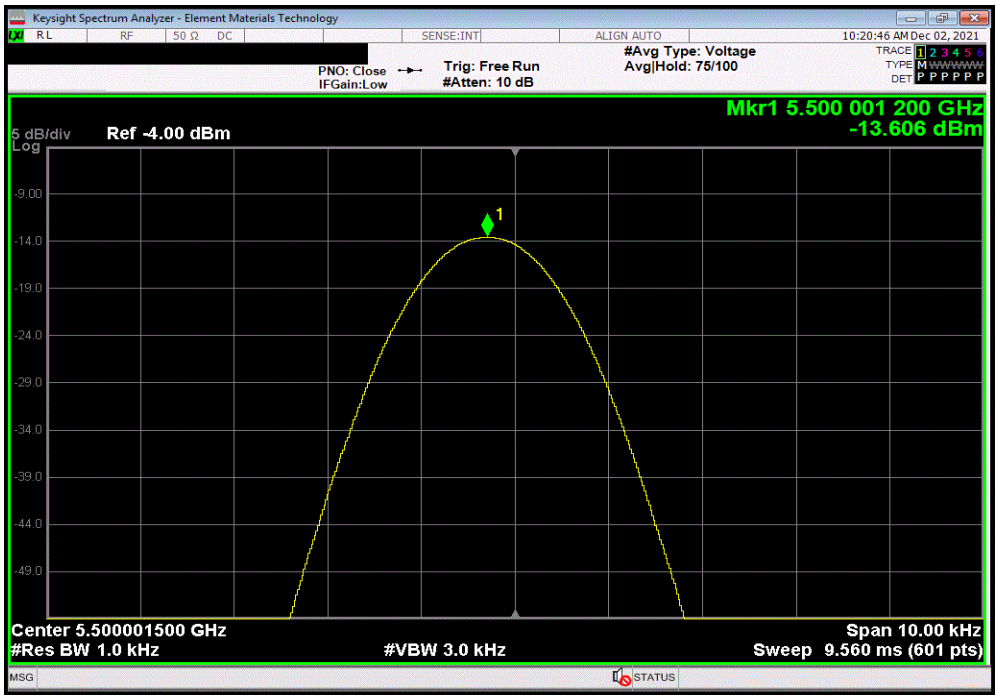


5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Voltage: 100%, 24 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5500.00335	5500.00335	0	100	Pass

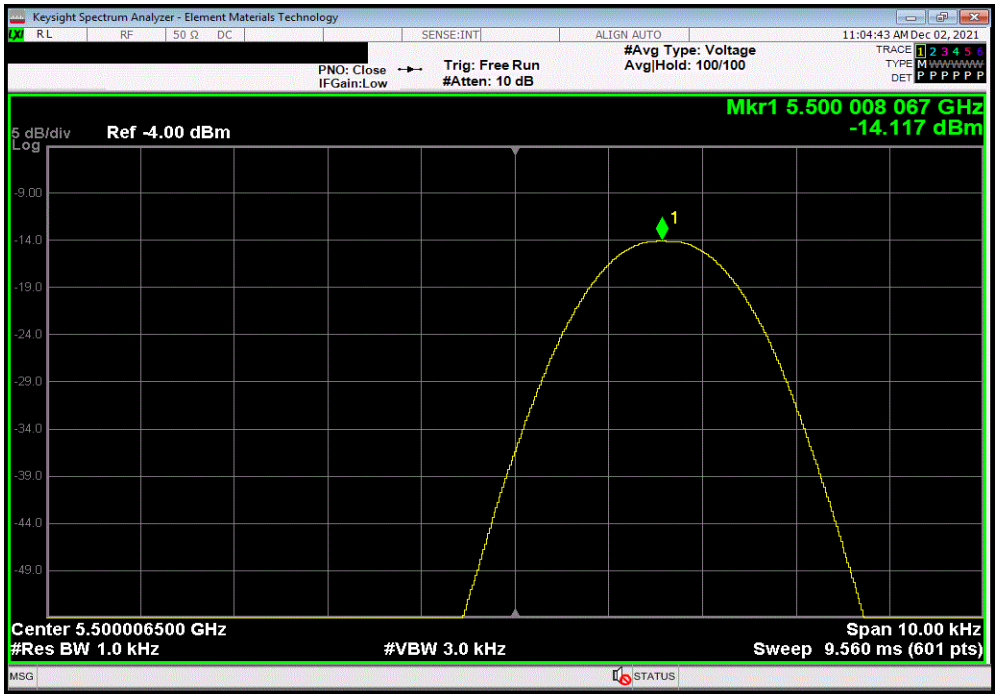


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Voltage: 85%, 20.4 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5500.0012	5500.00335	0.4	100	Pass

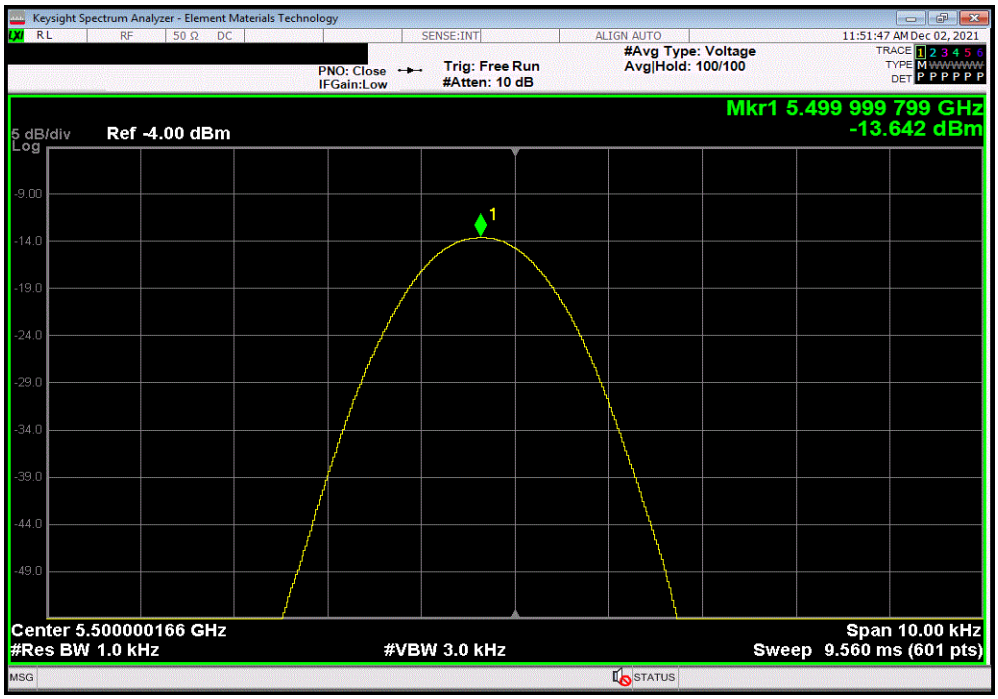


5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Temperature: +50°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5500.008067	5500.00335	0.9	100	Pass

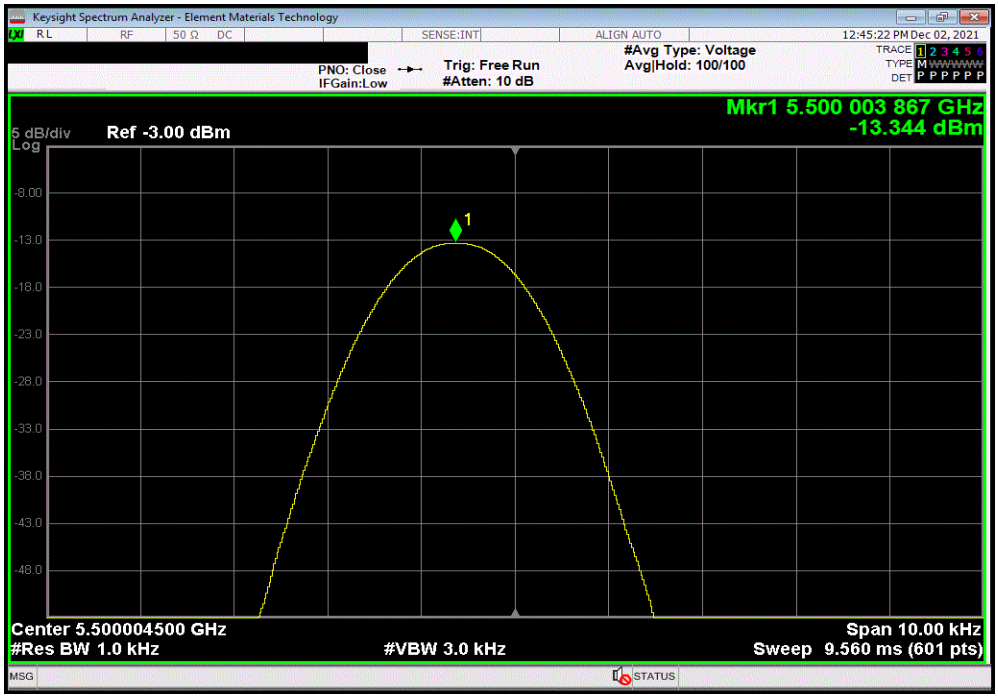


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Temperature: +40°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5499.999799	5500.00335	0.6	100	Pass

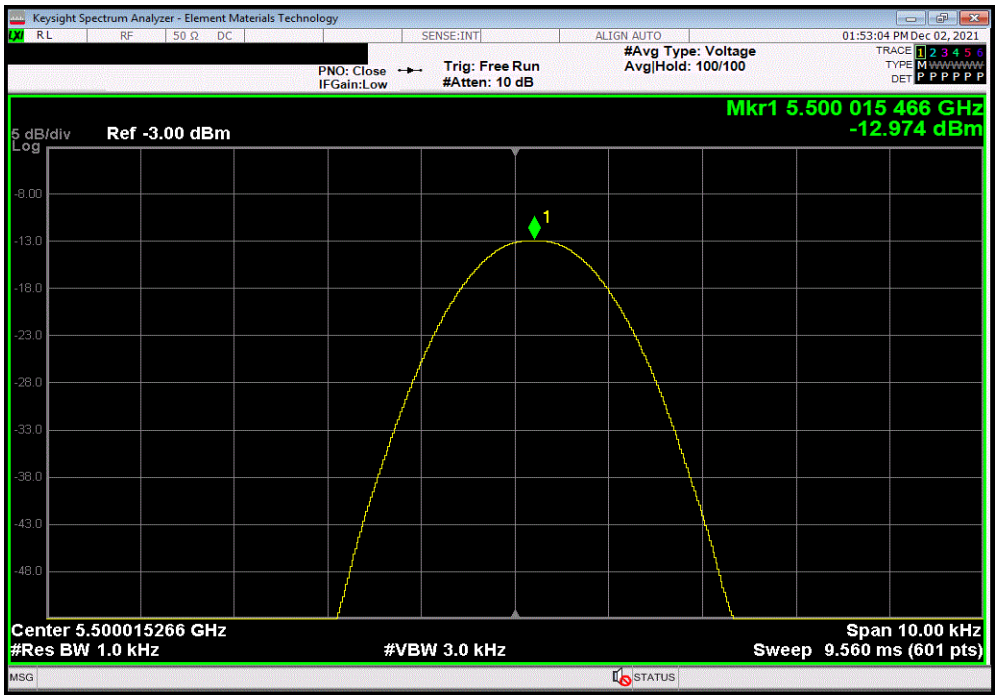


5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Temperature: +30°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5500.003867	5500.00335	0.1	100	Pass

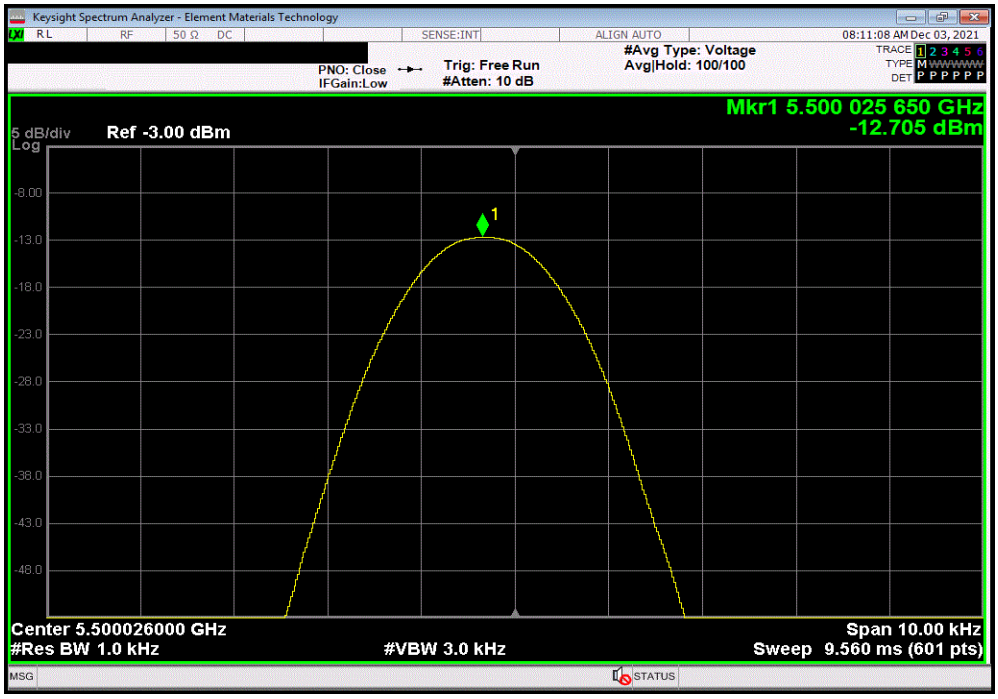


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Temperature: +20°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5500.015466	5500.00335	2.2	100	Pass

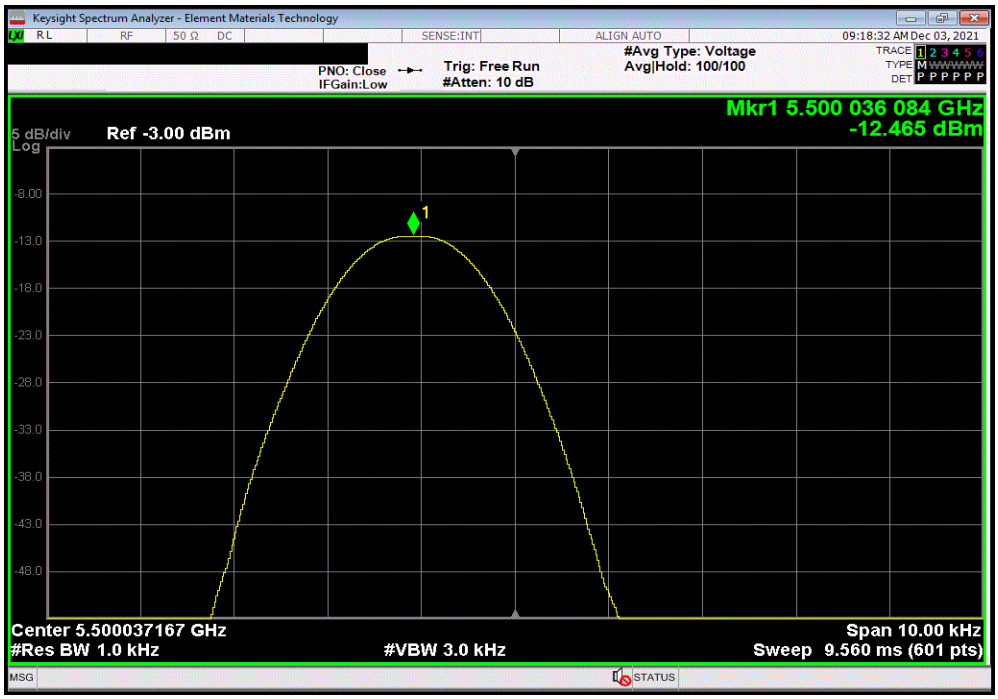


5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Temperature: +10°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5500.02565	5500.00335	4.1	100	Pass

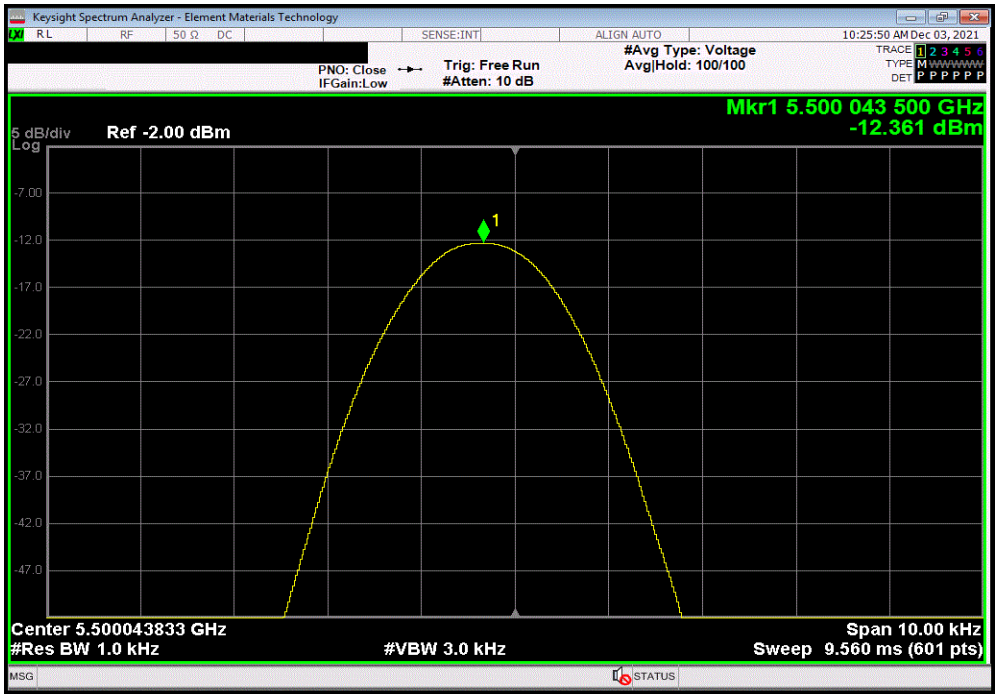


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Temperature: 0°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5500.036084	5500.00335	6	100	Pass

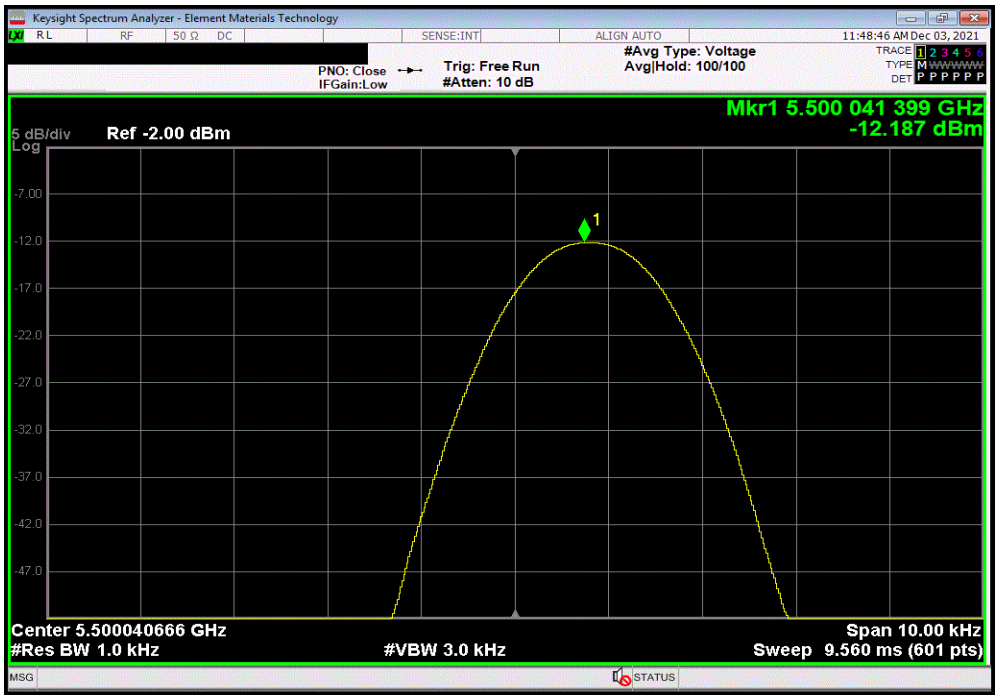


5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Temperature: -10°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5500.0435	5500.00335	7.3	100	Pass

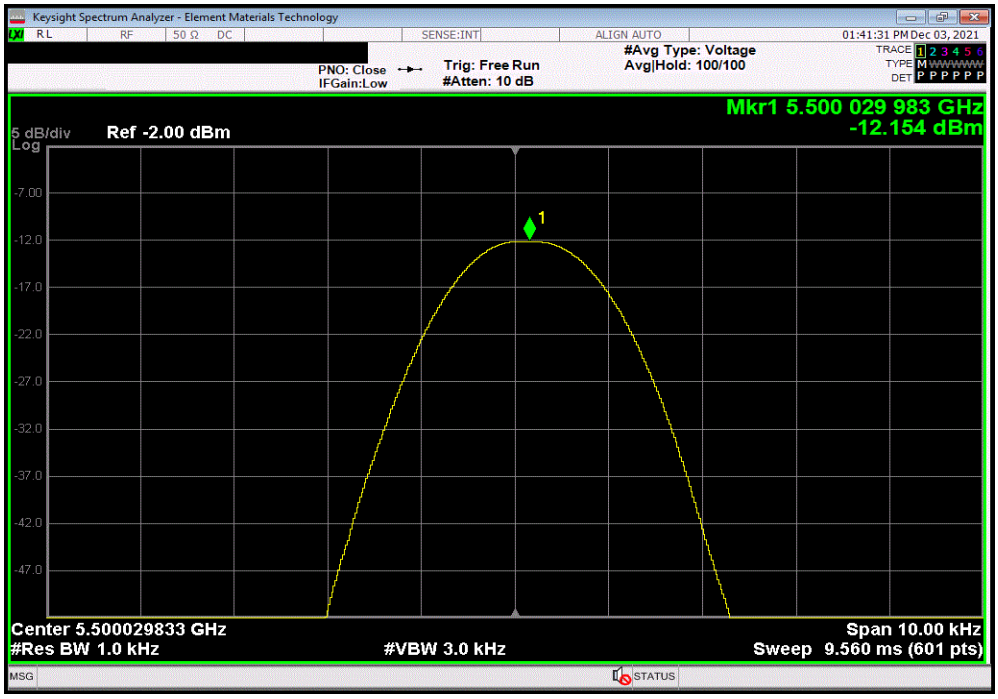


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Temperature: -20°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5500.041399	5500.00335	6.9	100	Pass

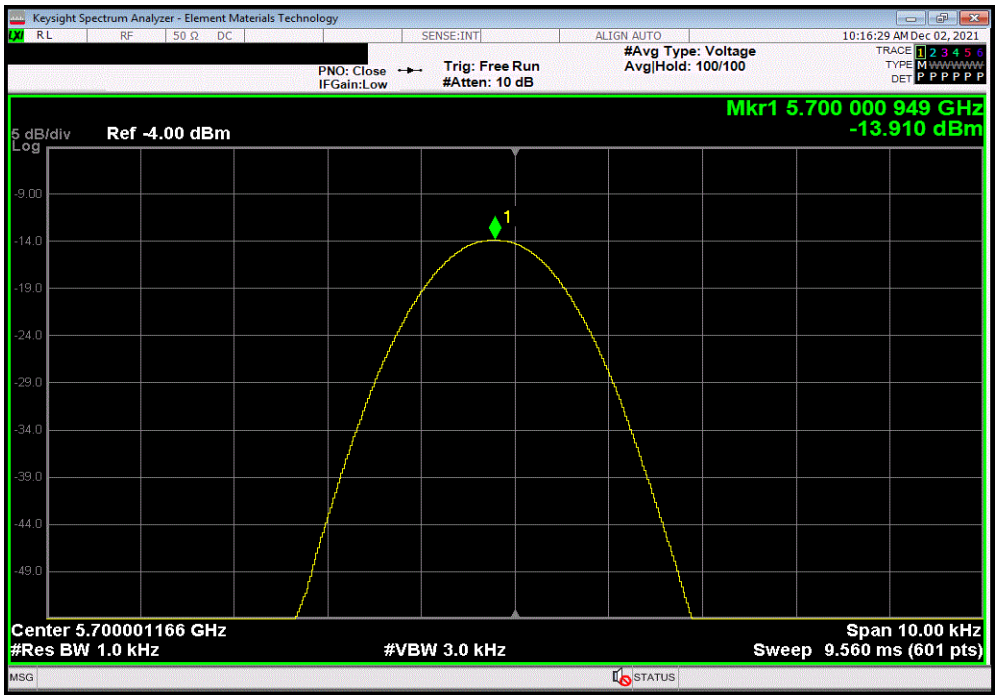


5470 - 5725 MHz Band, CW, Ch 100 = 5500 MHz, Temperature: -30°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5500.029983	5500.00335	4.8	100	Pass

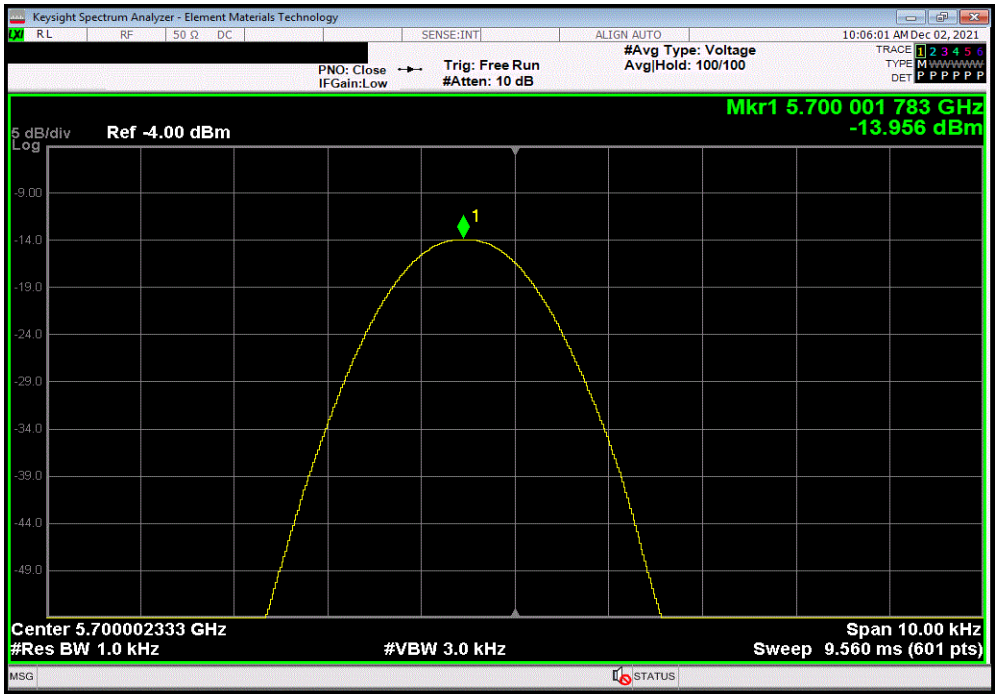


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Voltage: 115%, 27.6 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5700.000949	5700.001783	0.1	100	Pass

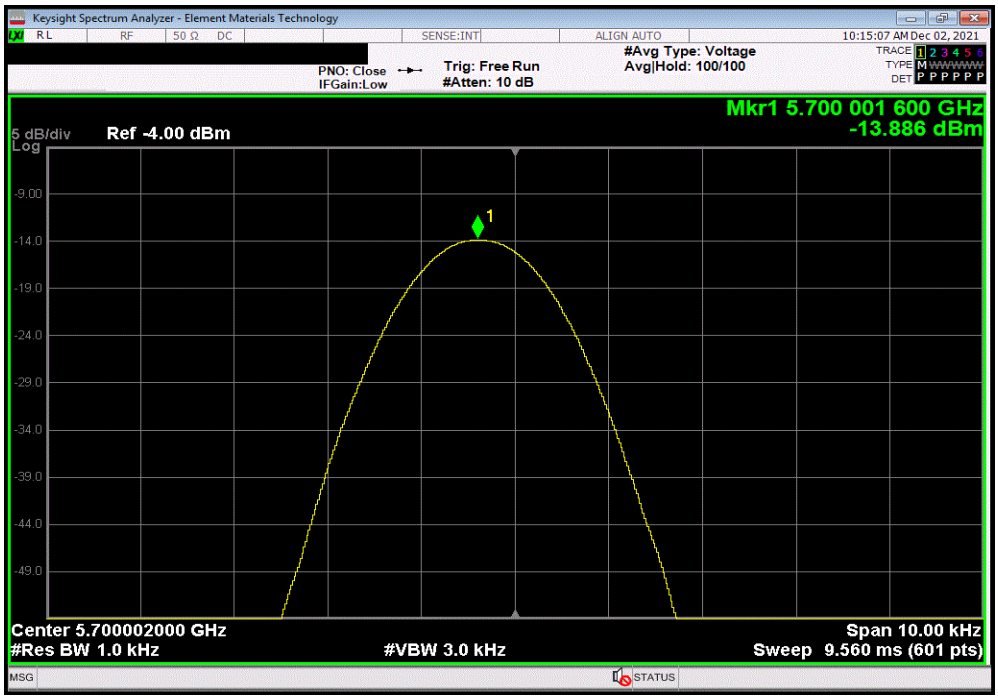


5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Voltage: 100%, 24 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5700.001783	5700.001783	0	100	Pass

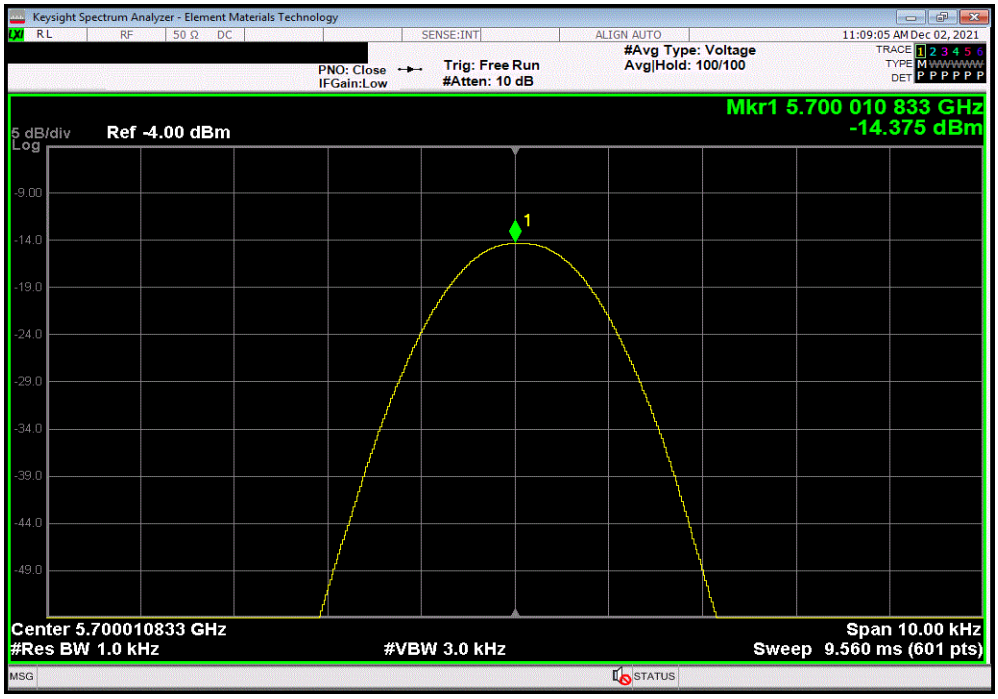


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Voltage: 85%, 20.4 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5700.0016	5700.001783	0	100	Pass

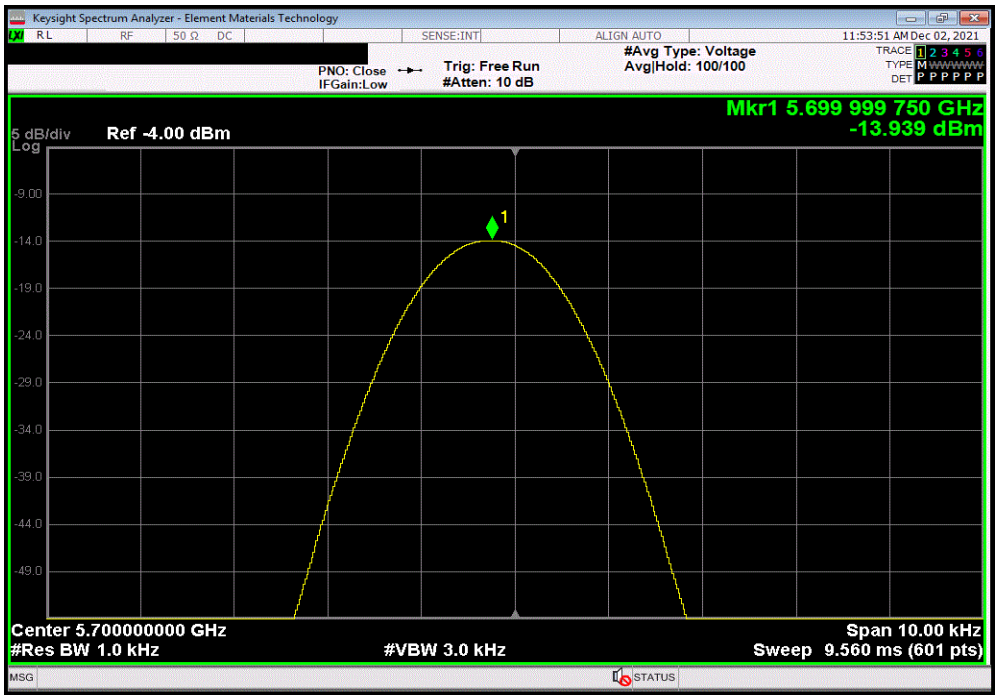


5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Temperature: +50°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5700.010833	5700.001783	1.6	100	Pass

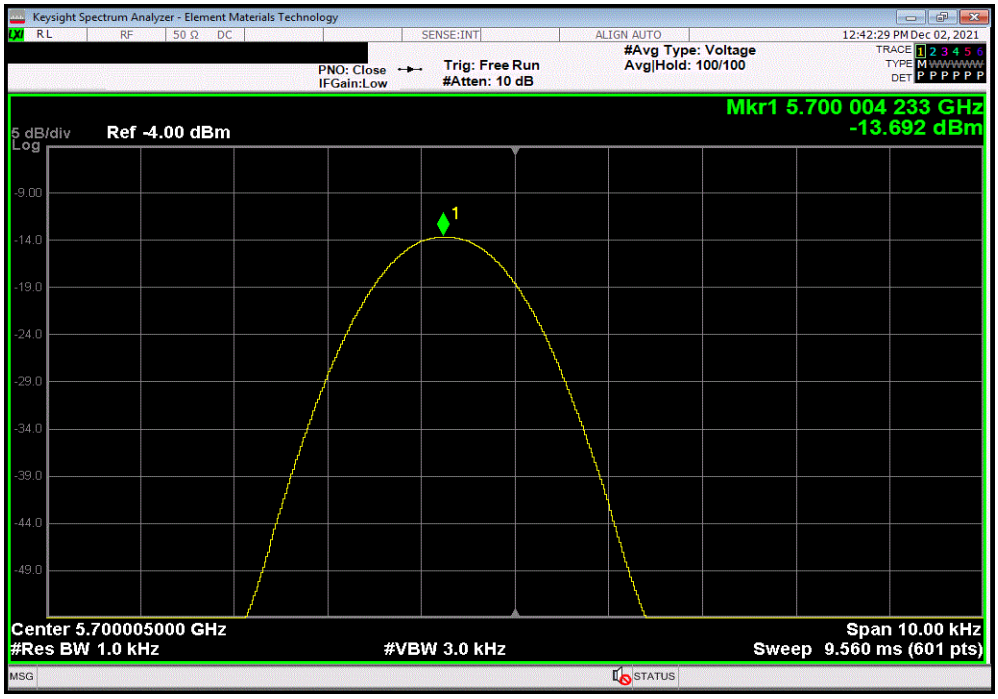


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Temperature: +40°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5699.99975	5700.001783	0.4	100	Pass

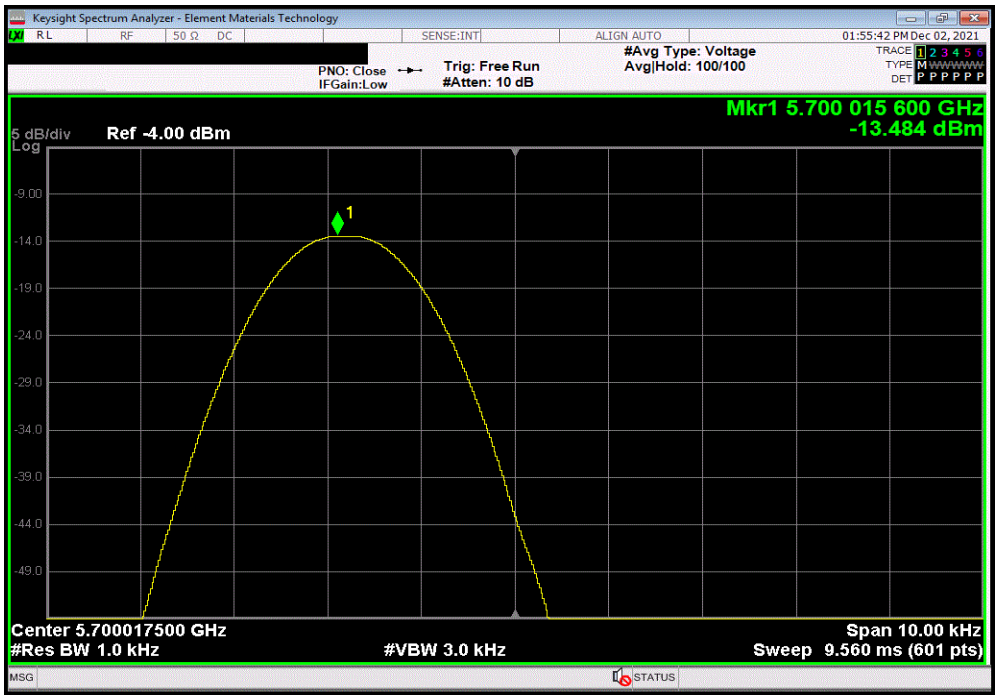


5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Temperature: +30°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5700.004233	5700.001783	0.4	100	Pass

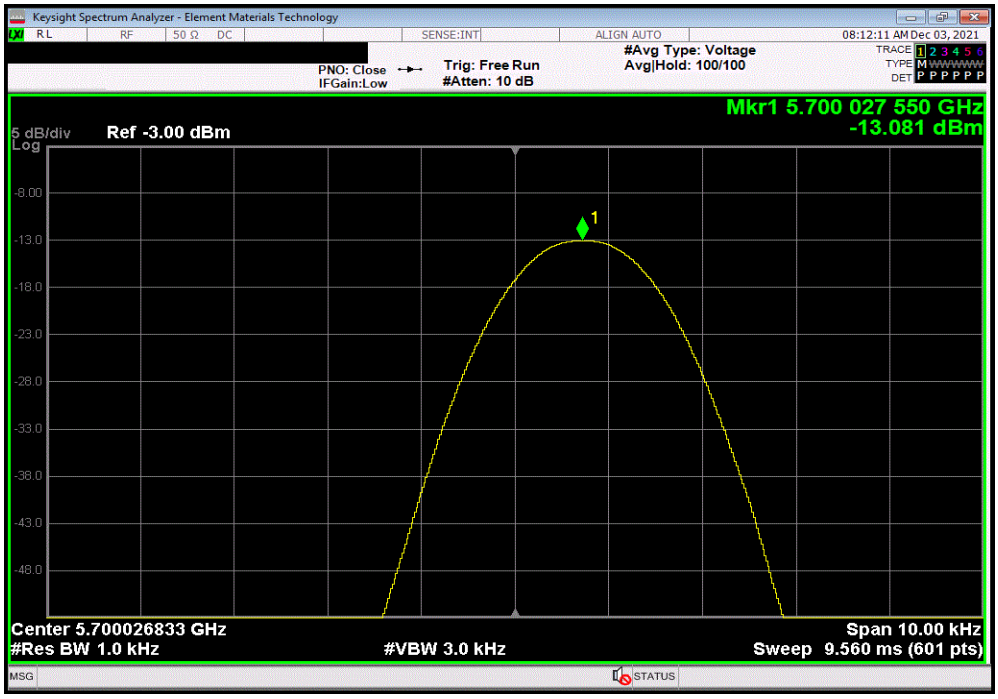


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Temperature: +20°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5700.0156	5700.001783	2.4	100	Pass

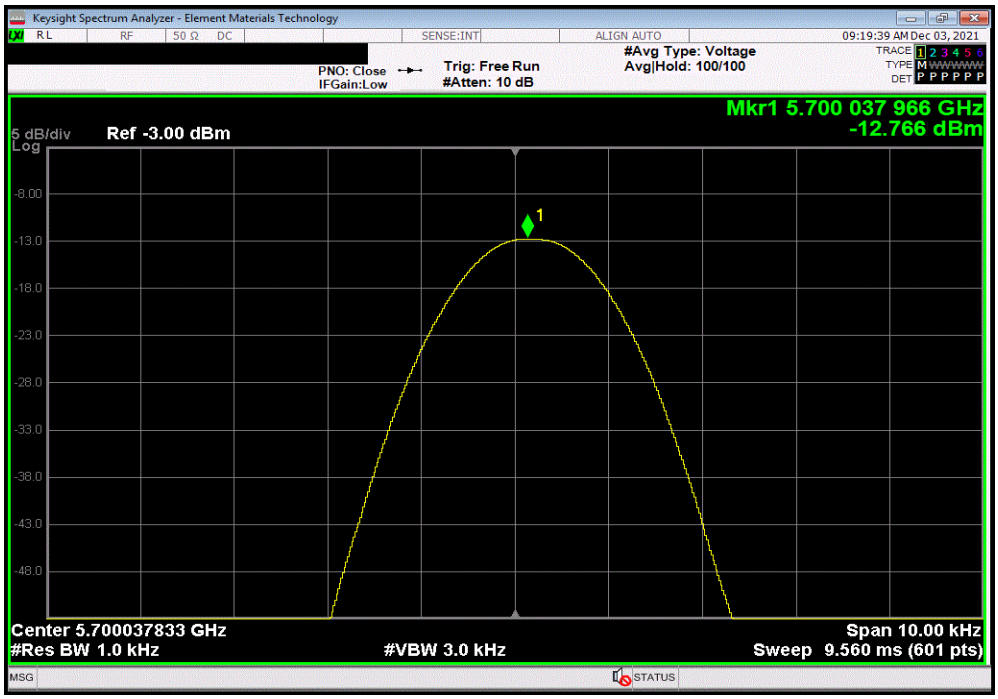


5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Temperature: +10°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5700.02755	5700.001783	4.5	100	Pass

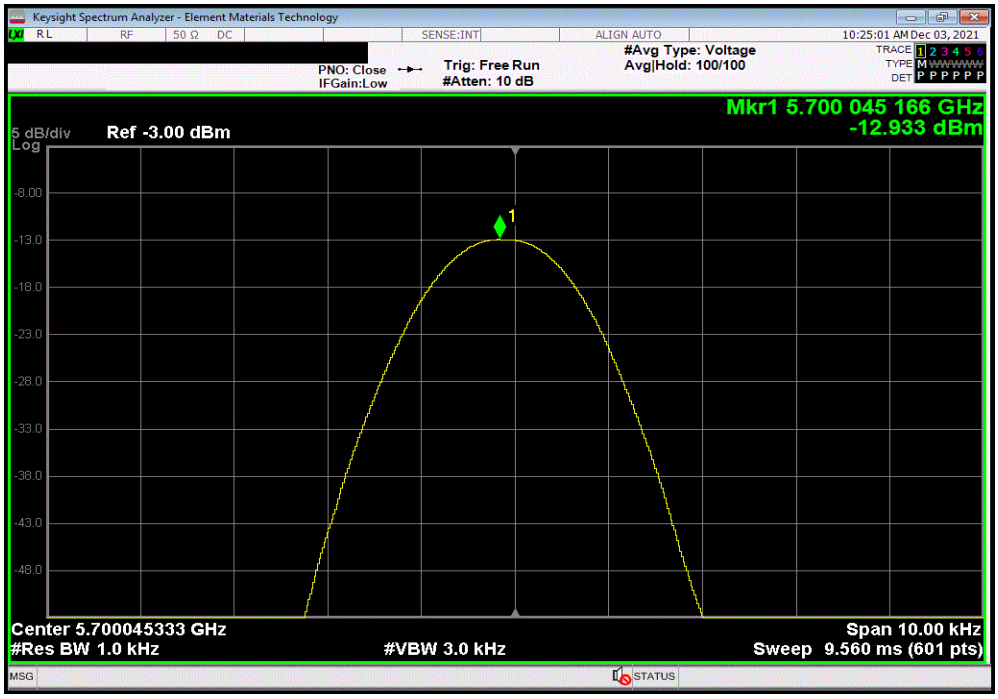


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Temperature: 0°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5700.037966	5700.001783	6.3	100	Pass

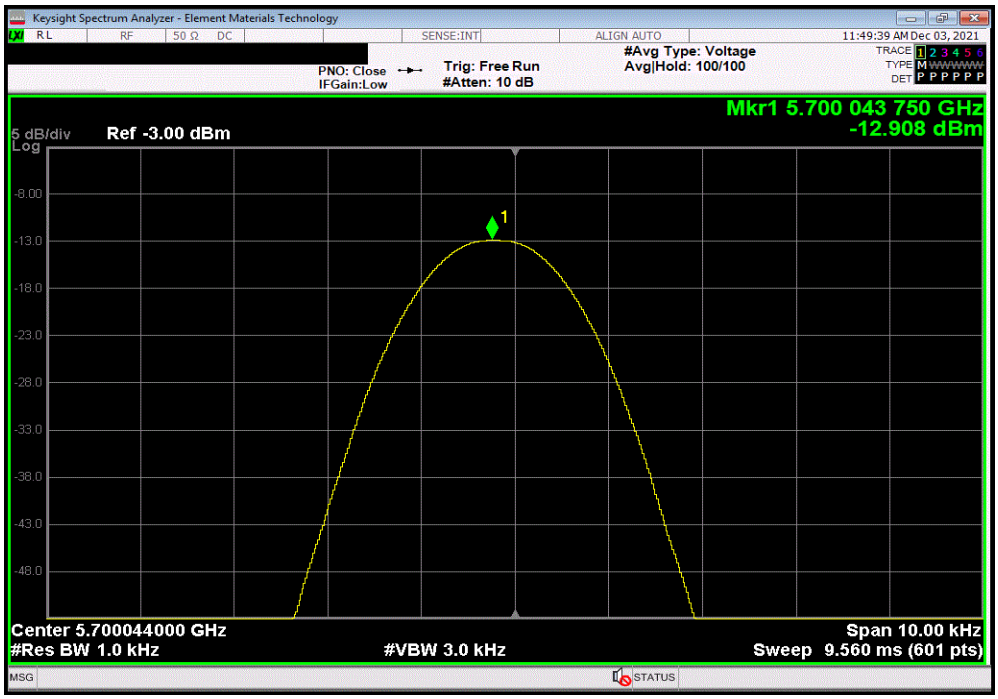


5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Temperature: -10°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5700.045166	5700.001783	7.6	100	Pass

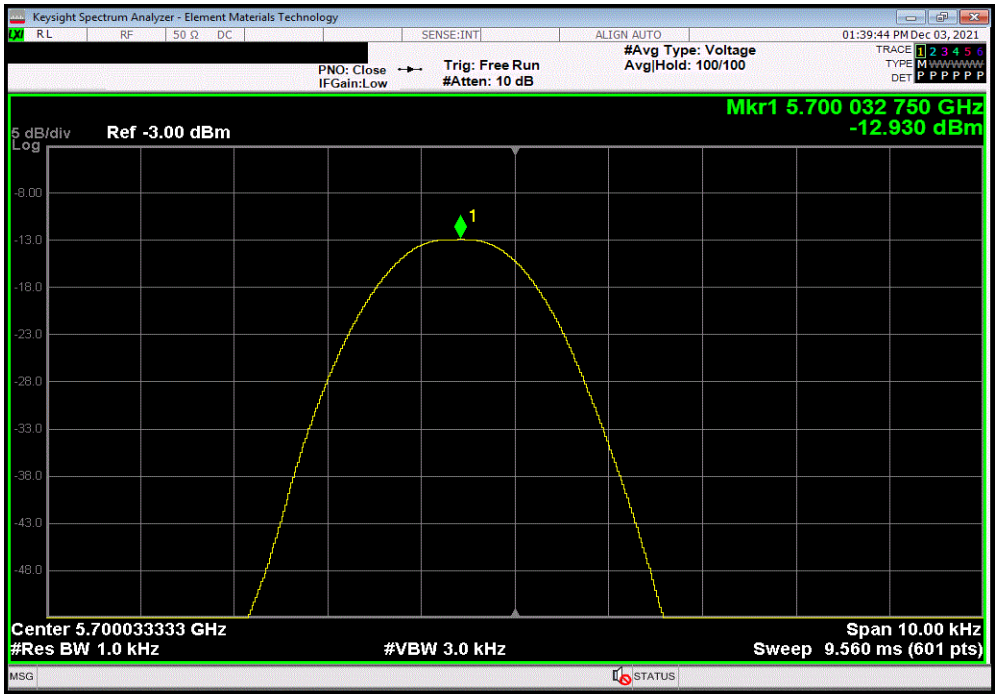


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Temperature: -20°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5700.04375	5700.001783	7.4	100	Pass

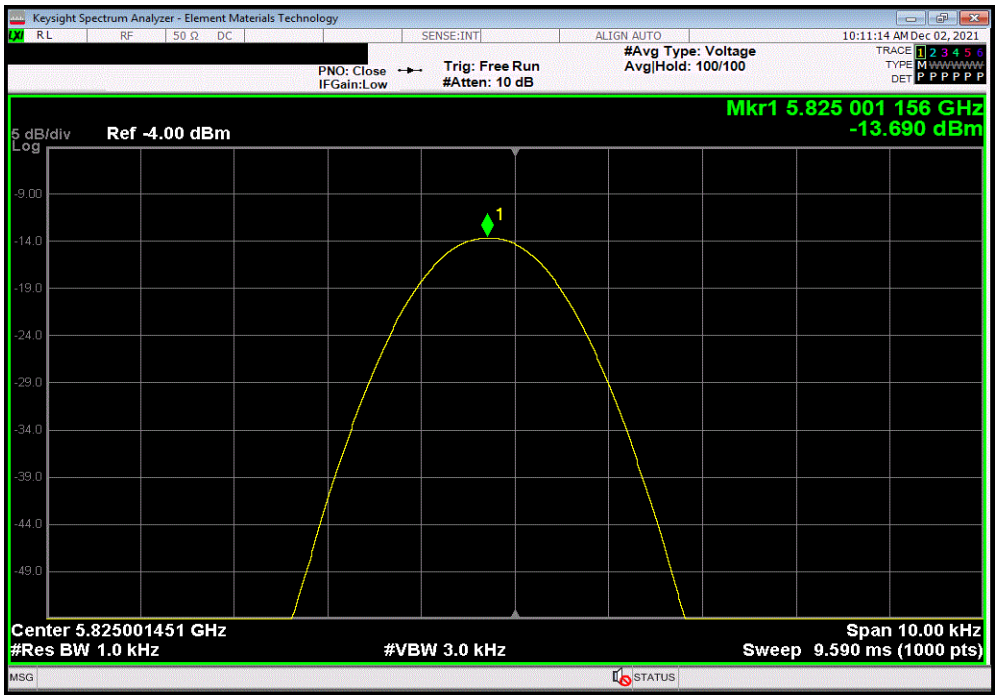


5470 - 5725 MHz Band, CW, Ch 140 = 5700 MHz, Temperature: -30°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5700.03275	5700.001783	5.4	100	Pass

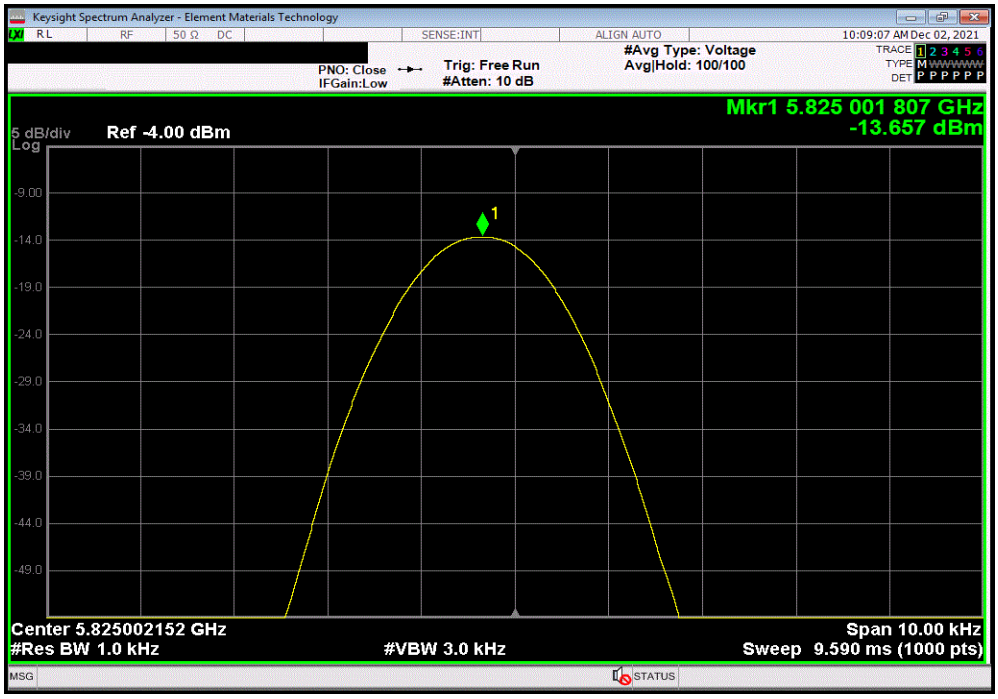


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Voltage: 115%, 27.6 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5825.001156	5825.001807	0.1	100	Pass

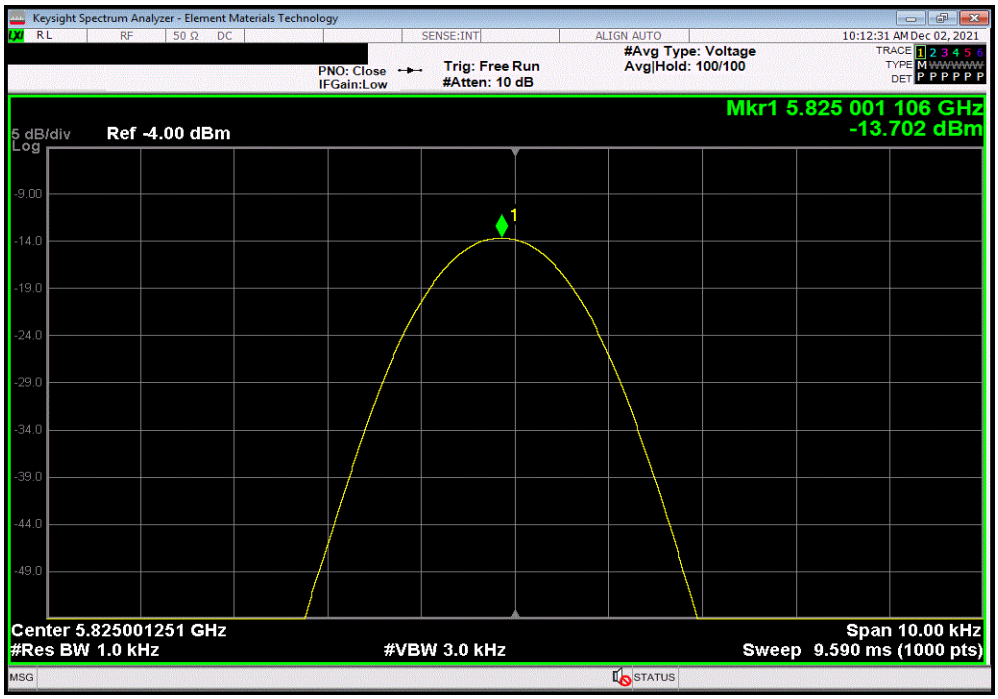


5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Voltage: 100%, 24 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5825.001807	5825.001807	0	100	Pass

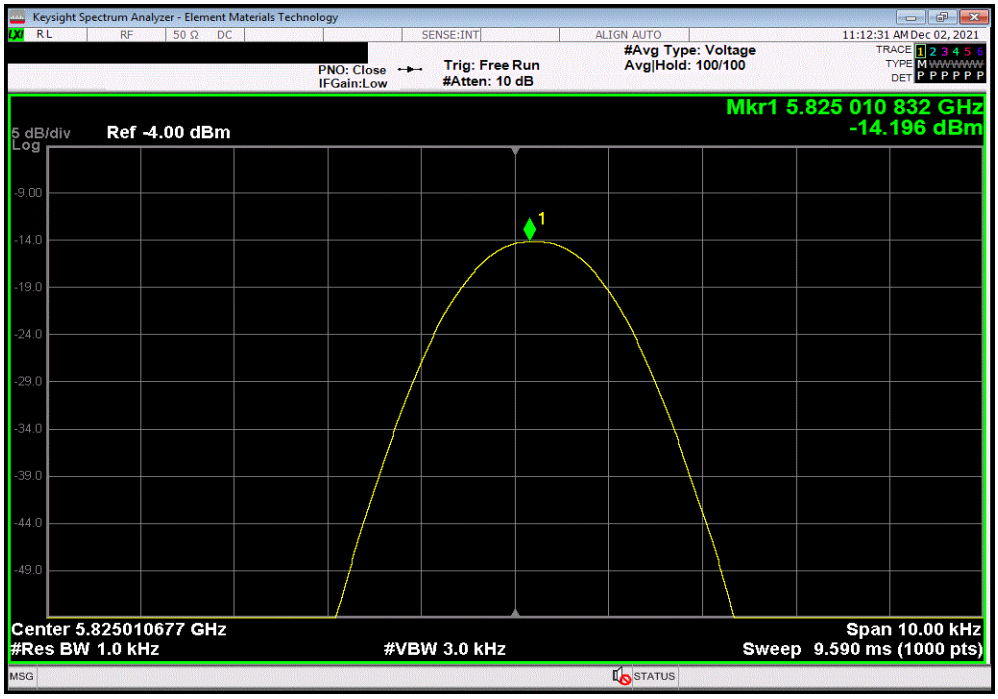


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Voltage: 85%, 20.4 VDC						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5825.001106	5825.001807	0.1	100	Pass

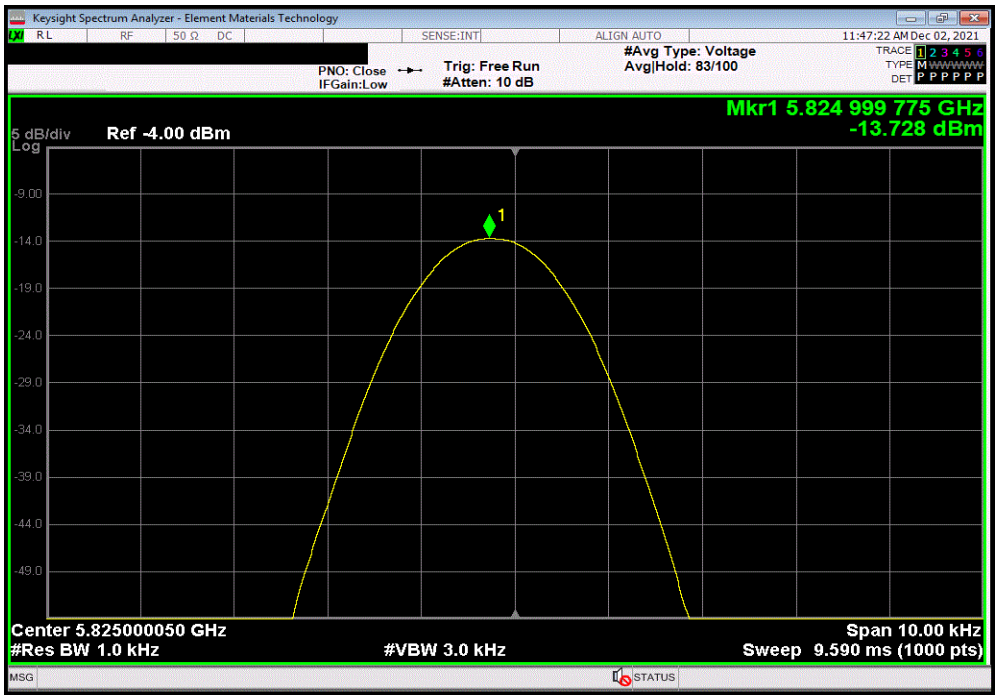


5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Temperature: +50°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5825.010832	5825.001807	1.5	100	Pass

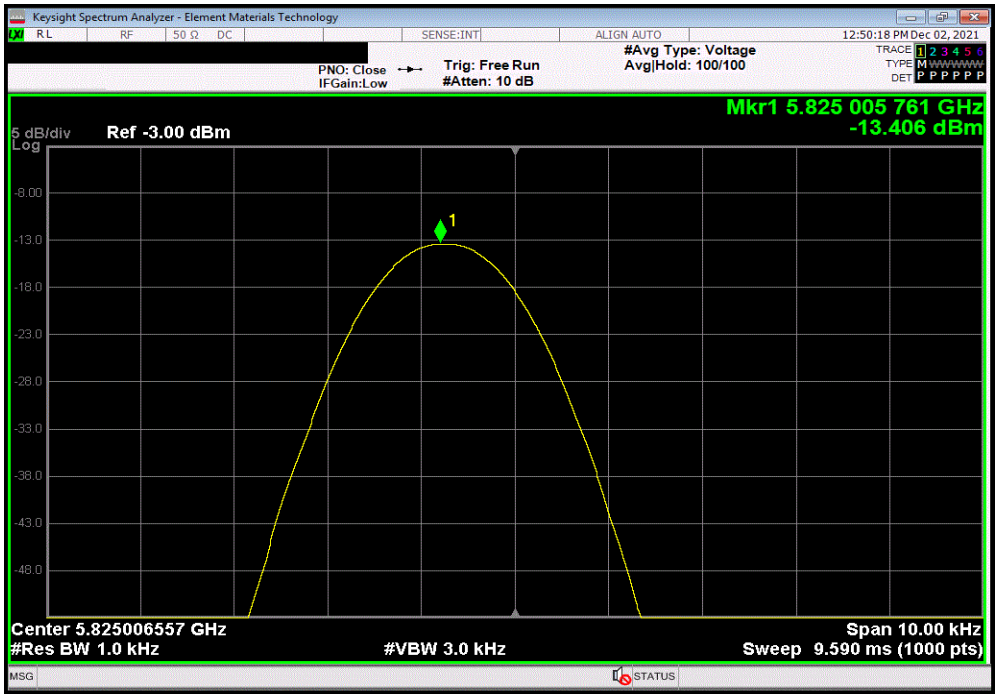


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Temperature: +40°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5824.999775	5825.001807	0.3	100	Pass

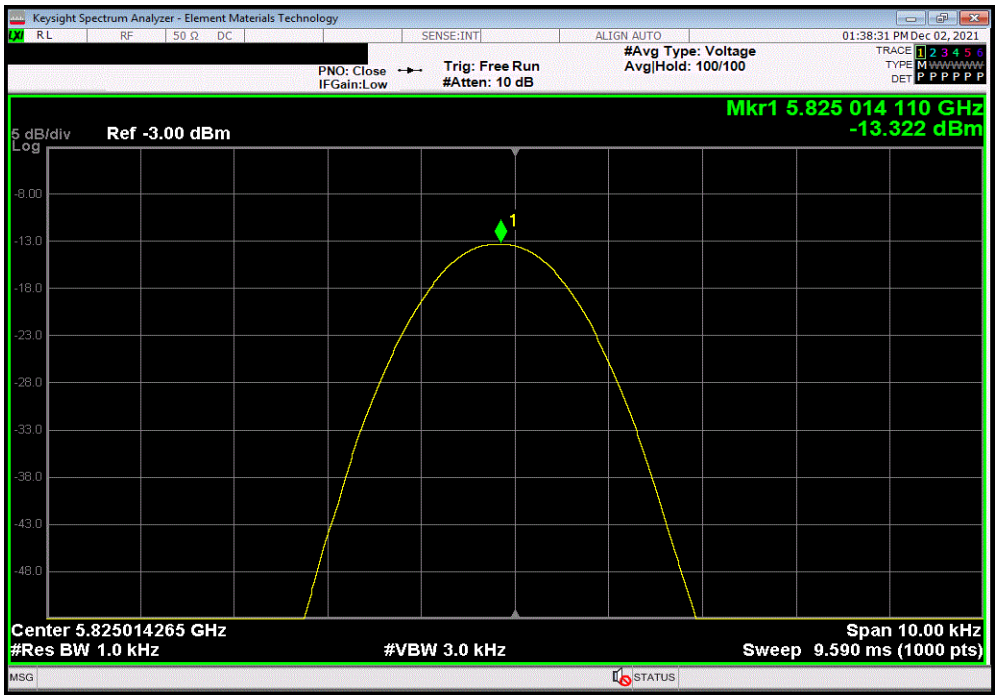


5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Temperature: +30°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5825.005761	5825.001807	0.7	100	Pass

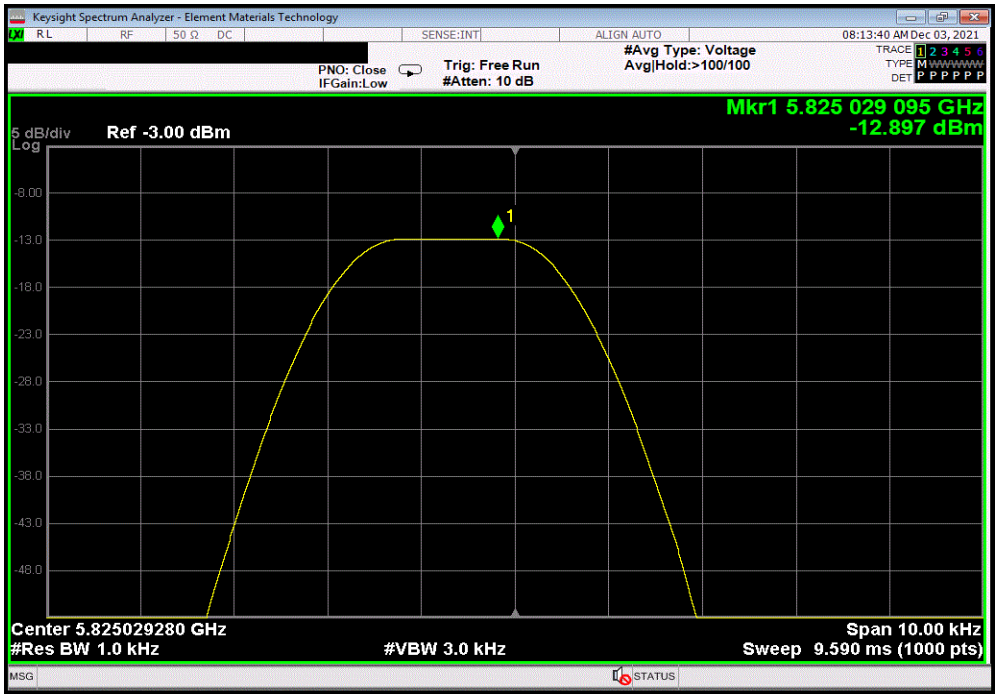


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Temperature: +20°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5825.01411	5825.001807	2.1	100	Pass

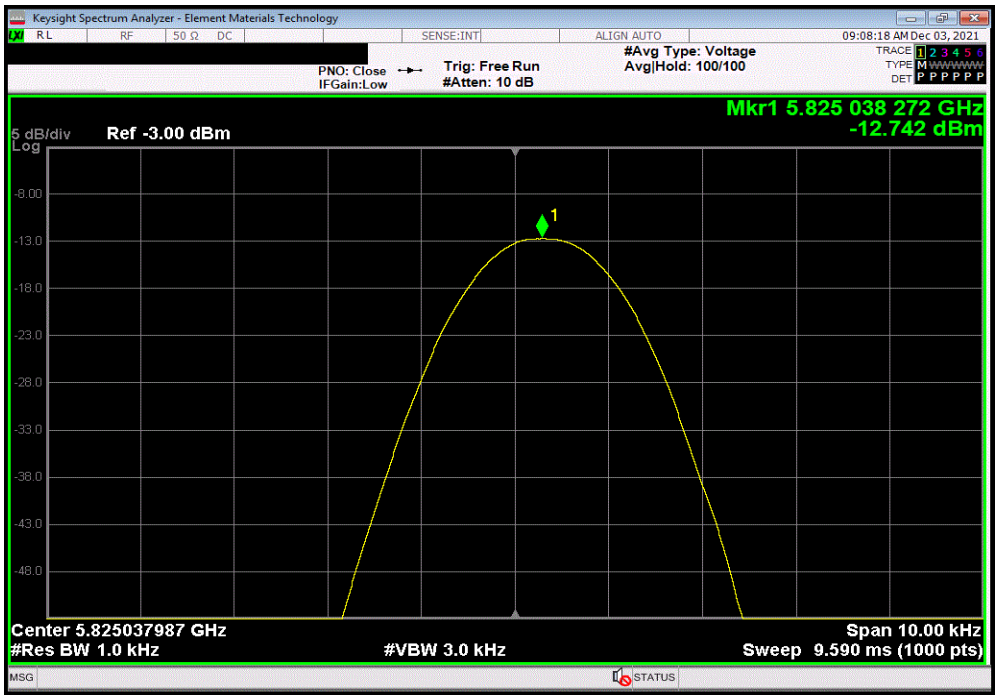


5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Temperature: +10°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5825.029095	5825.001807	4.7	100	Pass

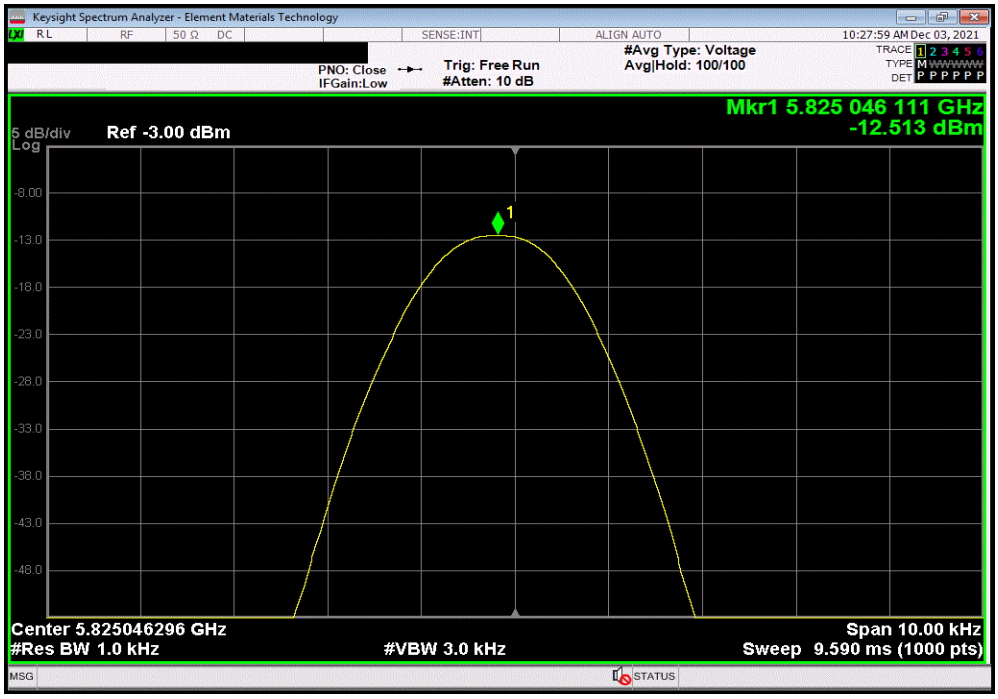


FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Temperature: 0°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5825.038272	5825.001807	6.3	100	Pass

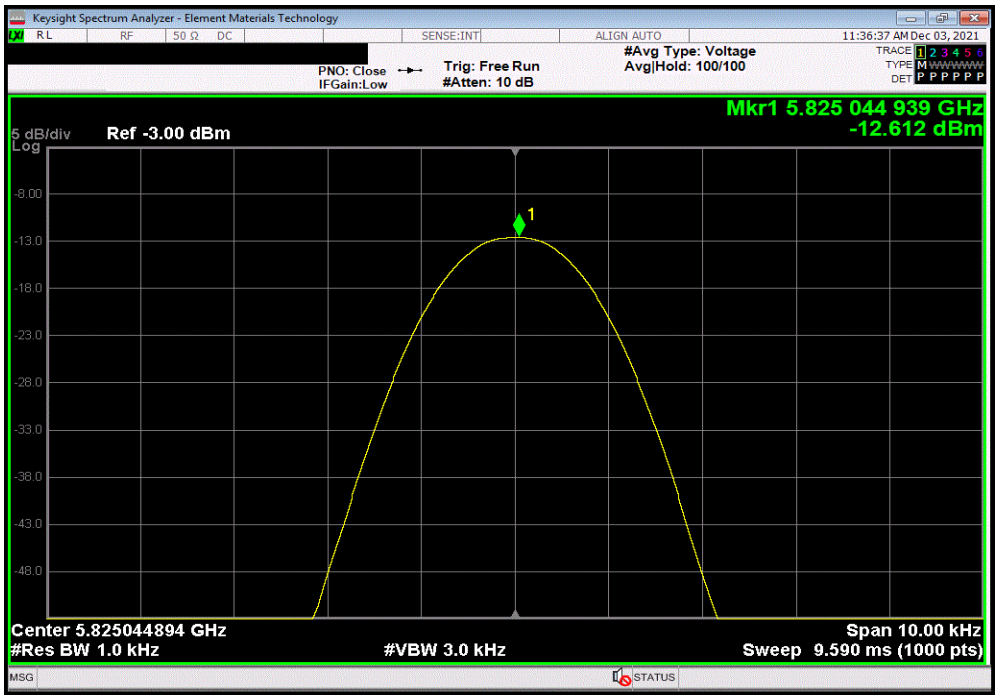


5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Temperature: -10°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5825.046111	5825.001807	7.6	100	Pass



FREQUENCY STABILITY - 5.3, 5.6, 5.8 GHz BANDS

5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Temperature: -20°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5825.044939	5825.001807	7.4	100	Pass



5725 - 5580 MHz Band, CW, Ch 165 = 5825 MHz, Temperature: -30°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		5825.034	5825.001807	5.5	100	Pass