



Appendix D. LTE Adaptivity Test Report

Applied Standard:

FCC Part 90Z

KDB 552295 D01 CBP Guidance for 3650 3700 Band v02r02

Unrestricted contention based protocol Description:

The device uses spectrum sensing to determine if the other devices are transmitting and then find ways to share the bandwidth.

Definitions and abbreviations:

1. Adaptivity: Mechanism by which equipment can adapt to radio environment by identifying other transmissions present in the operating band.
2. UUT: Unit Under Test

Test purpose:

To check if the UUT can meet the threshold level detection, a CW tone and a bandwidth limited AWGN signal were used to simulate other occupations in 3650-3700MHz band. Observe if the UUT will detect the interference signals and interrupt transmit or not.

Conclusion:

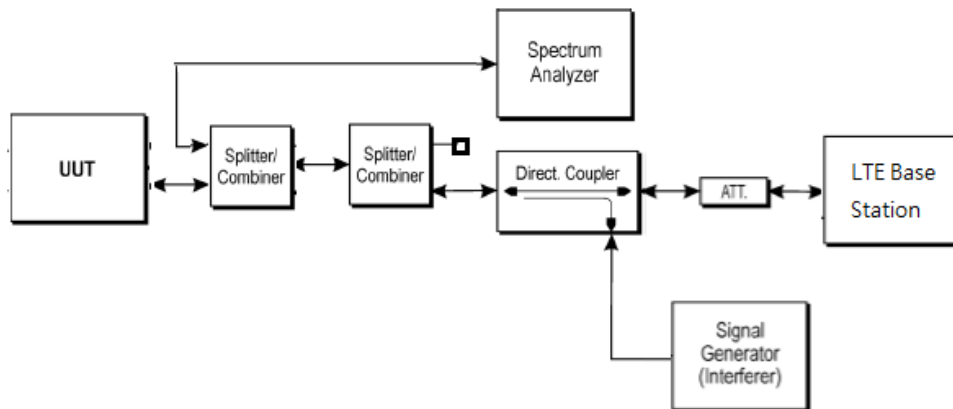
According the test result, the UUT can detect the interference and interrupt its transmission when a CW tone level above -8dBm is detected or a bandwidth limited AWGN level above -59dBm/MHz is detected.

Note: UUT were set to maximum declaration power level during the test.

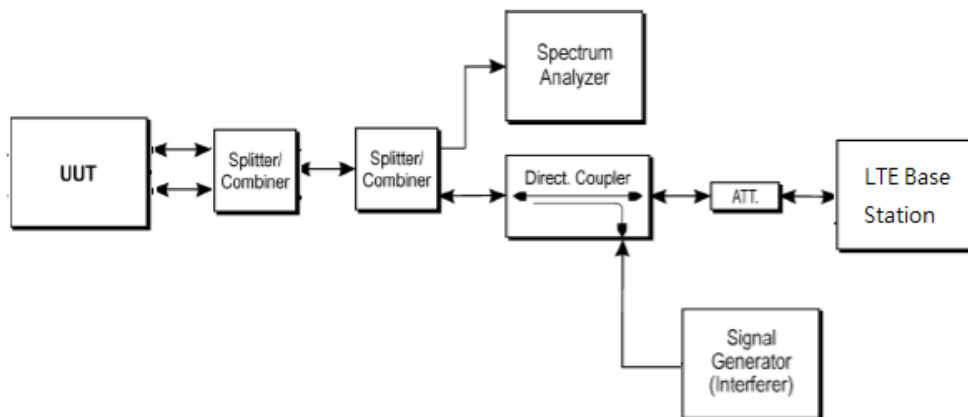
1. UUT Information

Product Feature & Specification	
Equipment	LTE Outdoor CPE (Band 43)
Brand Name	Greenpacket
Model Name	OT-350
FCC ID	W9V-OT350-GP
EUT supports Radios application	LTE
EUT IMEI	351918062407695
EUT Stage	Pre-production

2. Test Setup for Level Calibration



3. Test Setup for Level Measurement





4. Test Procedures

CW Tone Testing

- a. UUT links to the LTE base station with maximum declaration output power.
- b. Check the UUT signal by the spectrum analyzer with zero span setting.
- c. Inject CW tone signal by generator at specified frequency.
- d. Raise the signal level in step c. until UUT transmission stops.
- e. Record the CW tone signal frequency and level.
- f. Repeat step a. to e. with each LTE bandwidth and CW tone frequencies.

Bandwidth limited AWGN level Testing

- a. UUT links to the LTE base station with maximum declaration output power..
- b. Check the UUT signal by the spectrum analyzer with zero span setting.
- c. Inject band limited AWGN signal by signal generator at specified frequency.
- d. Raise the signal level in step c. until UUT transmission stops.
- e. Record the band limited AWGN signal frequency and level.
- f. Repeat step a. to e. with each LTE bandwidth.



5. Test Summary of Test

Low Channel

Channel	UUT LTE_BW (MHz)	UUT Frequency (MHz)	SG Frequency (MHz)	CW LEVEL (dBm)	AWGN Bandwidth (MHz)	AWGN LEVEL (dBm/MHz)
44115	5	3652.5	3650.34	-26	5	-61
	5	3652.5	3652.5	-26		
	5	3652.5	3654.66	-14		
44140	10	3655	3650.59	-15	10	-59
	10	3655	3655	-26		
	10	3655	3659.41	-18		
44165	15	3657.5	3650.84	-26	15	-61
	15	3657.5	3657.5	-26		
	15	3657.5	3664.16	-8		
44190	20	3660	3651.09	-15	20	-60.5
	20	3660	3660	-28		
	20	3660	3668.91	-17		

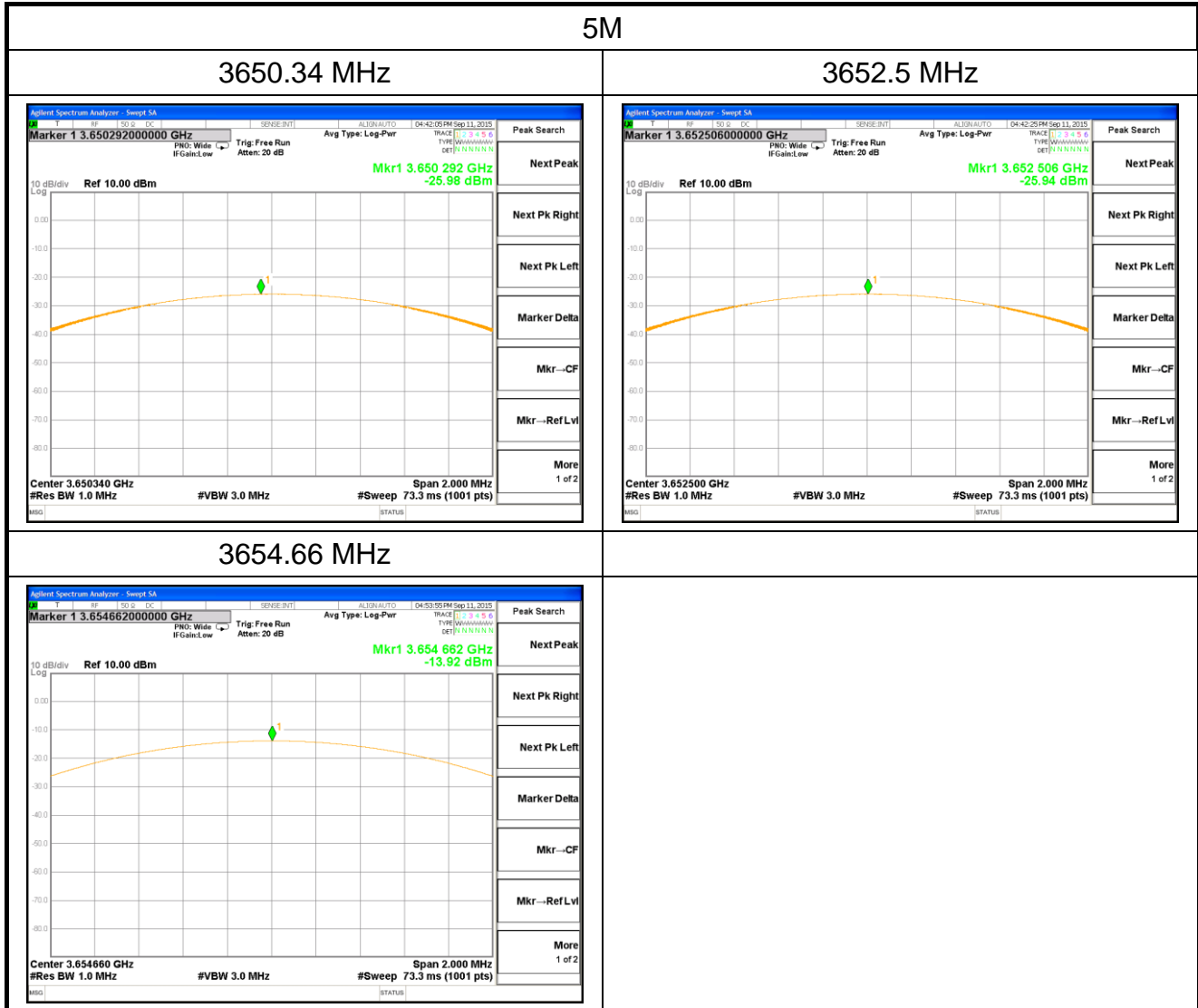
High Channel

Channel	UUT LTE_BW (MHz)	UUT Frequency (MHz)	SG Frequency (MHz)	CW LEVEL (dBm)	AWGN Bandwidth (MHz)	AWGN LEVEL (dBm/MHz)
44565	5	3697.5	3695.34	-21	5	-60
	5	3697.5	3697.5	-27		
	5	3697.5	3699.66	-14		
44540	10	3695	3690.59	-20	10	-60
	10	3695	3695	-29		
	10	3695	3699.41	-21		
44515	15	3692.5	3685.84	-8	15	-60
	15	3692.5	3692.5	-28		
	15	3692.5	3699.16	-10		
44490	20	3690	3681.09	-16	20	-60.5
	20	3690	3690	-28		
	20	3690	3698.91	-17		



6. Test Plots of Adaptivity Test

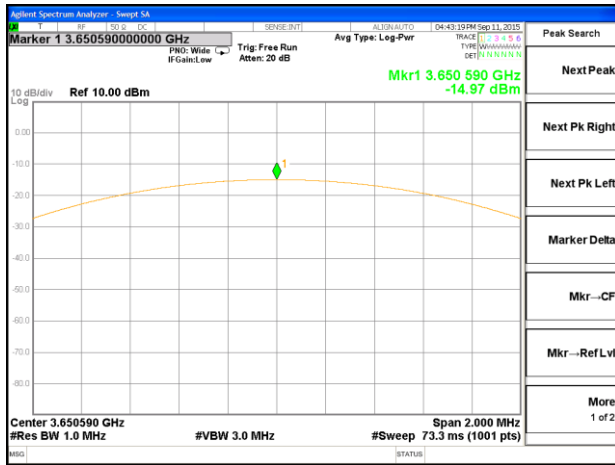
Low Channel CW interference signal level



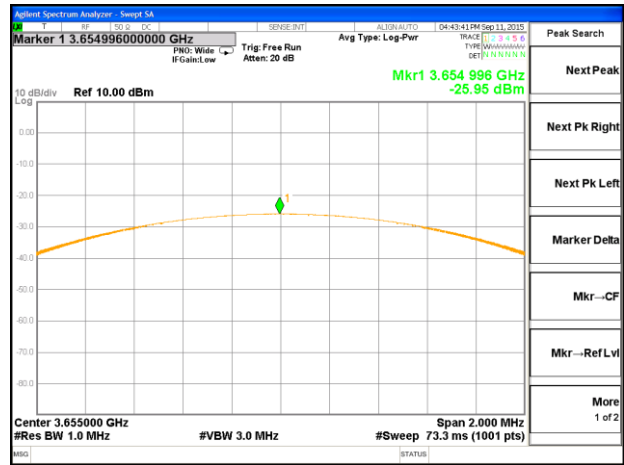


10M

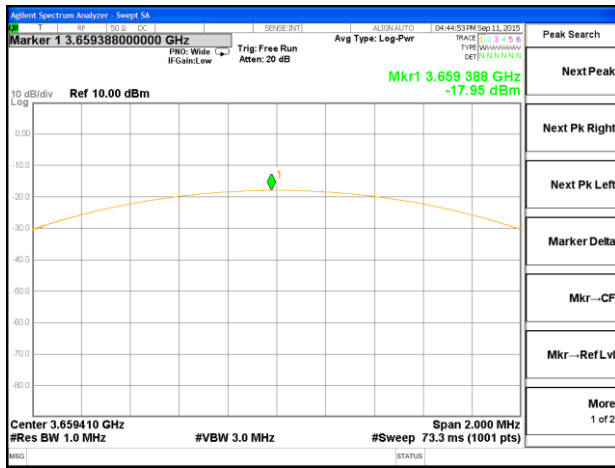
3650.59 MHz



3655 MHz



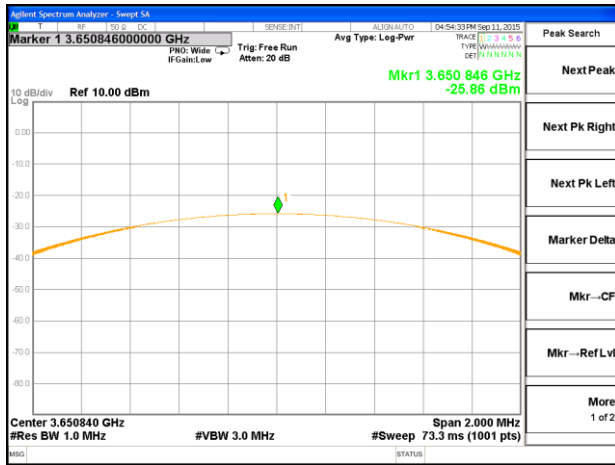
3659.41 MHz



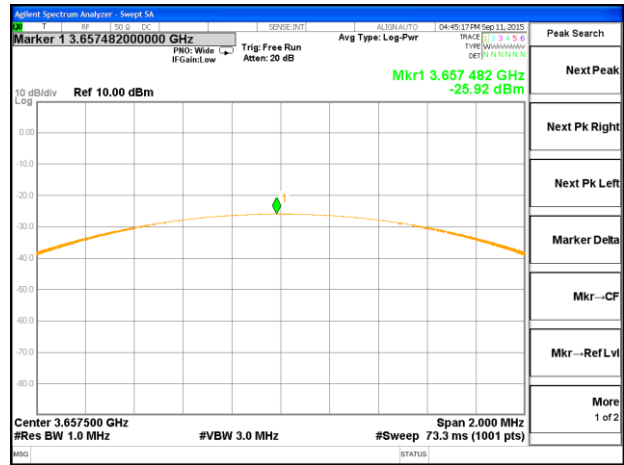


15M

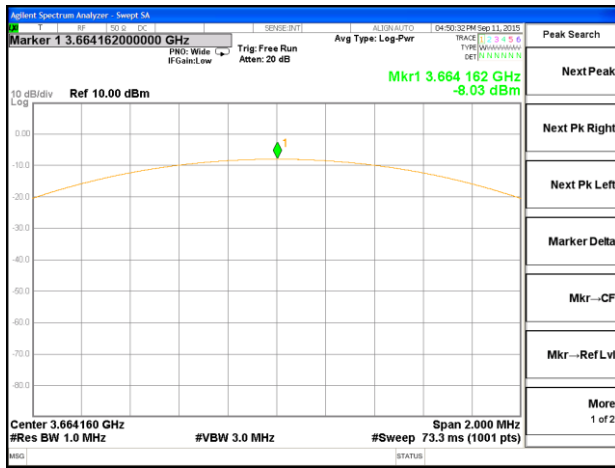
3650.84 MHz



3657.5 MHz



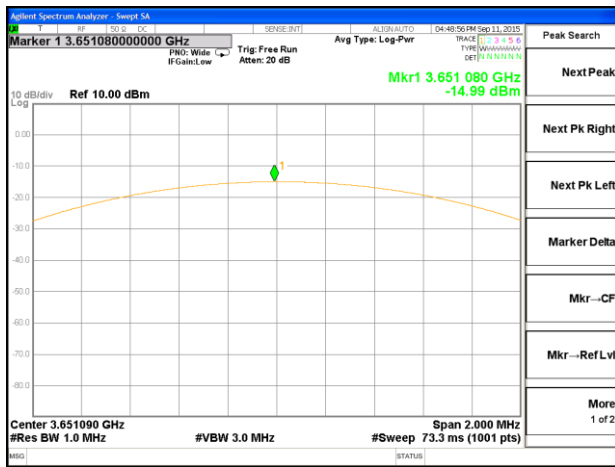
3664.16 MHz



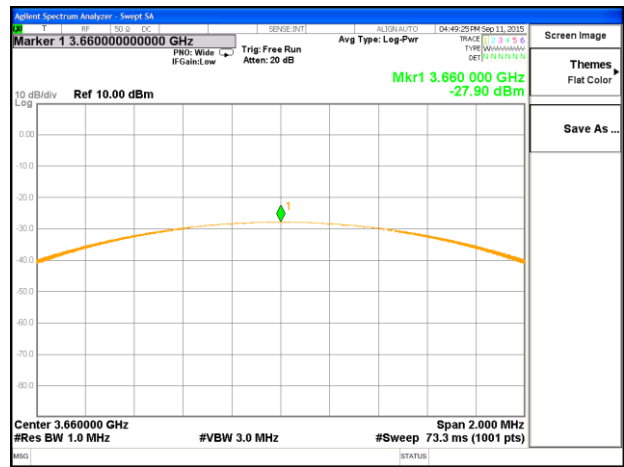


20M

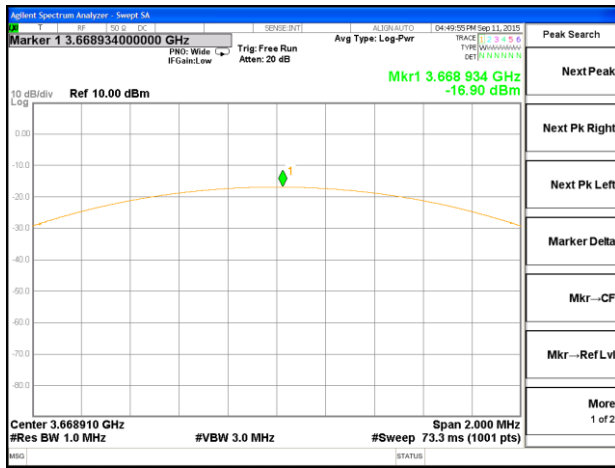
3651.09 MHz



3660 MHz

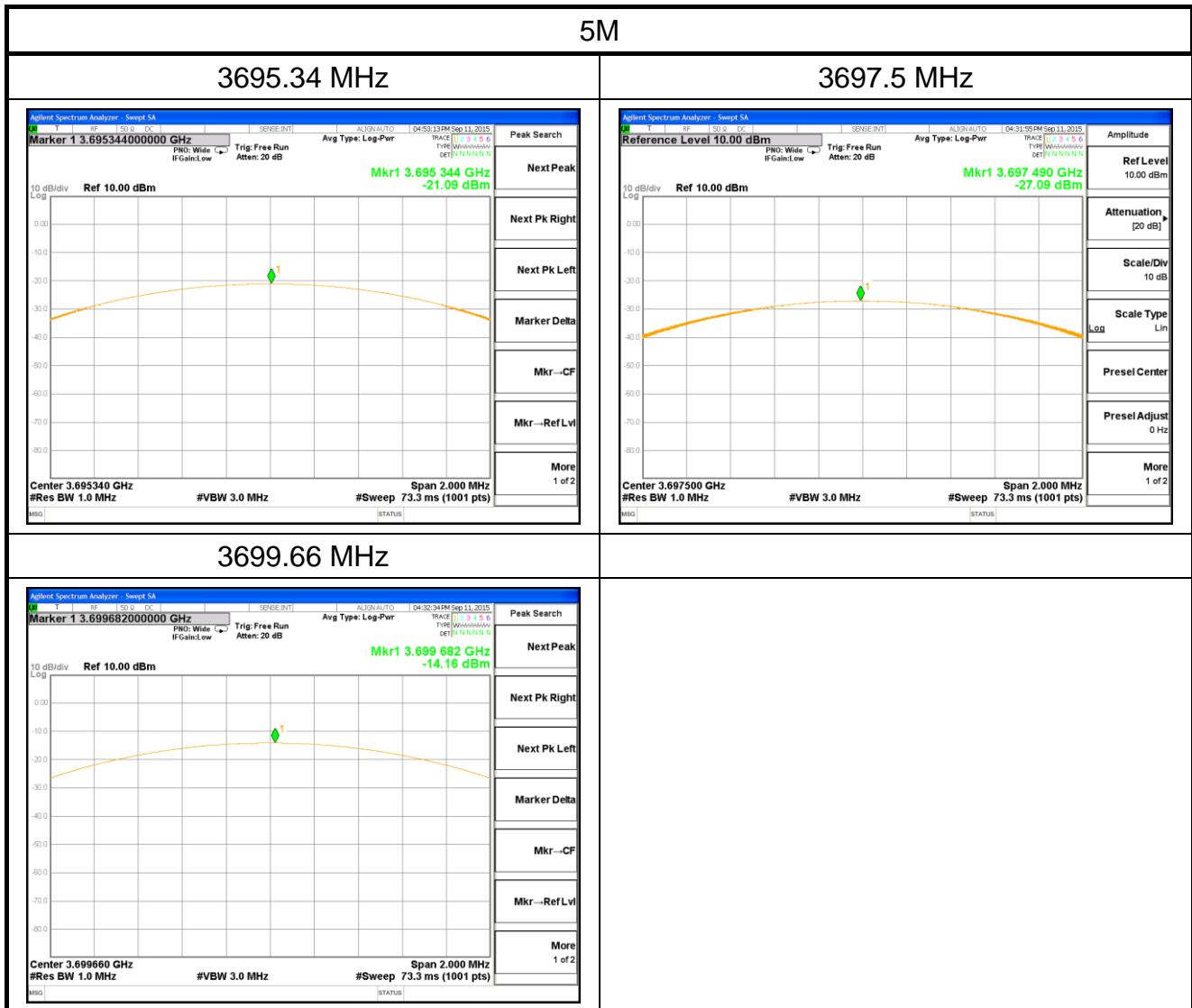


3668.91 MHz





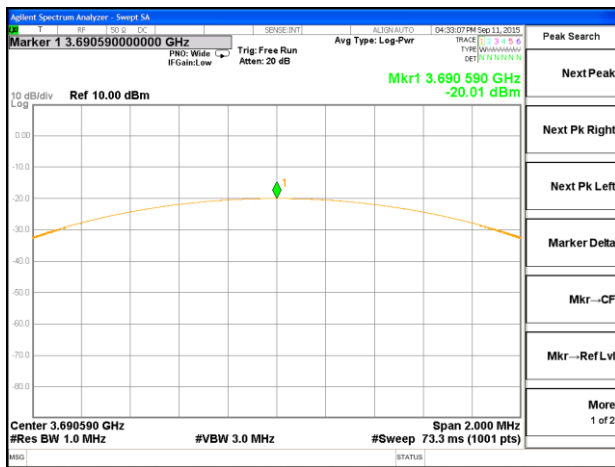
High Channel CW interference signal level



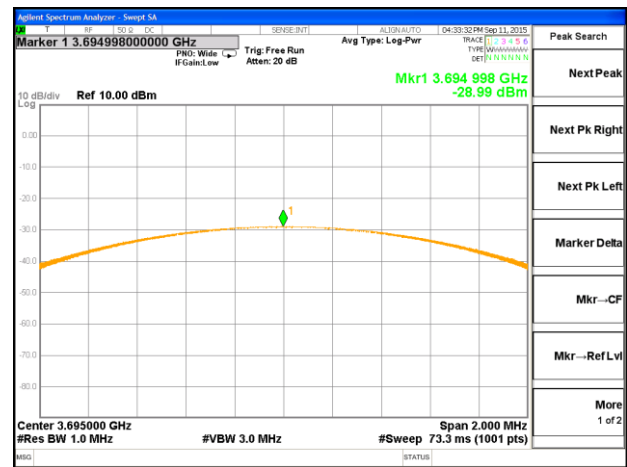


10M

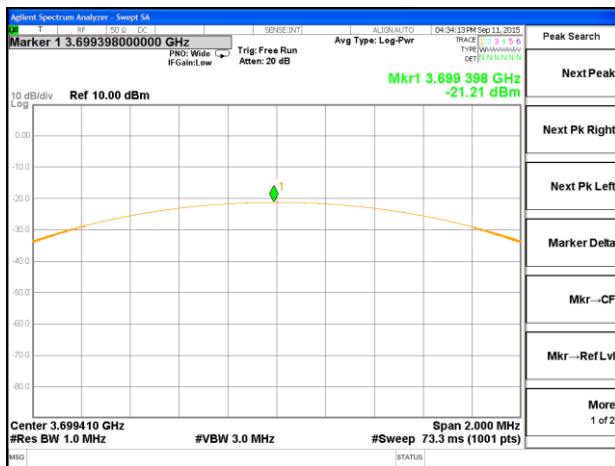
3690.59 MHz



3695 MHz



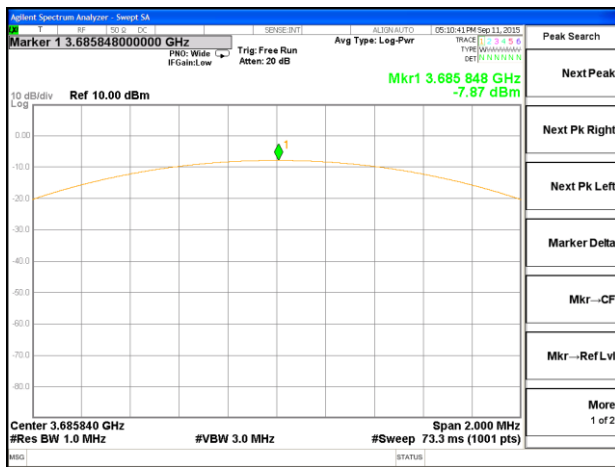
3699.41 MHz



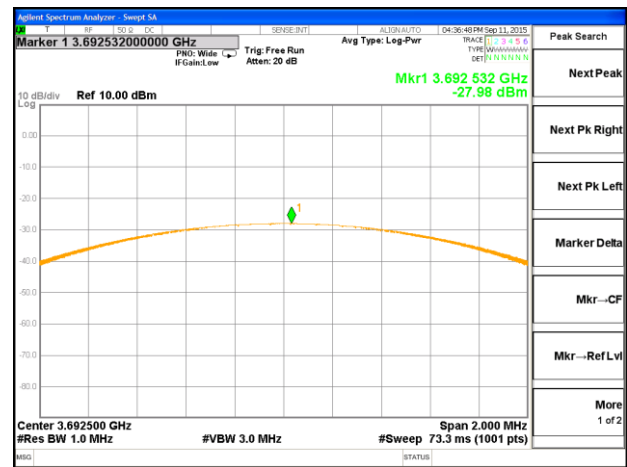


15M

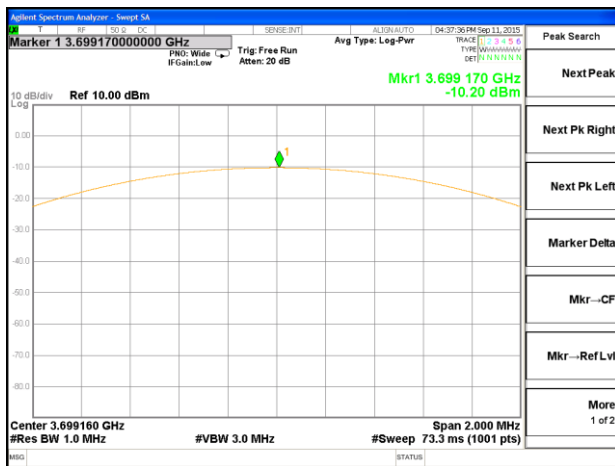
3685.84 MHz



3692.5 MHz



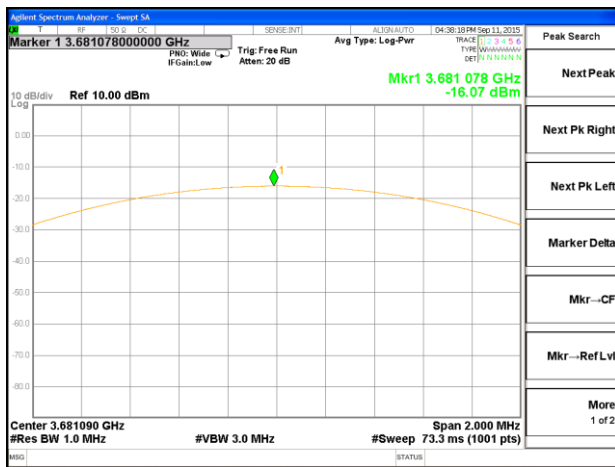
3699.16 MHz



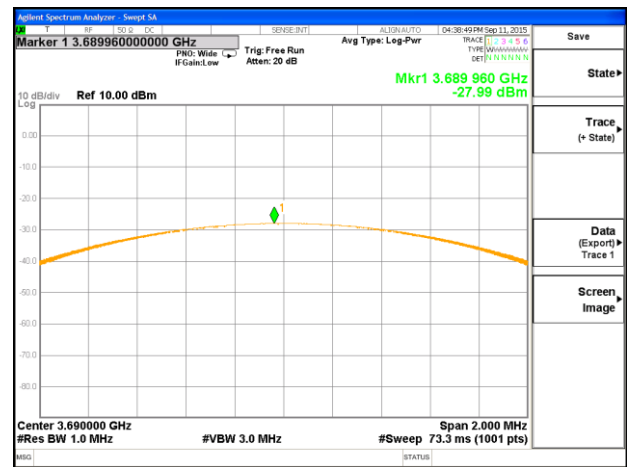


20M

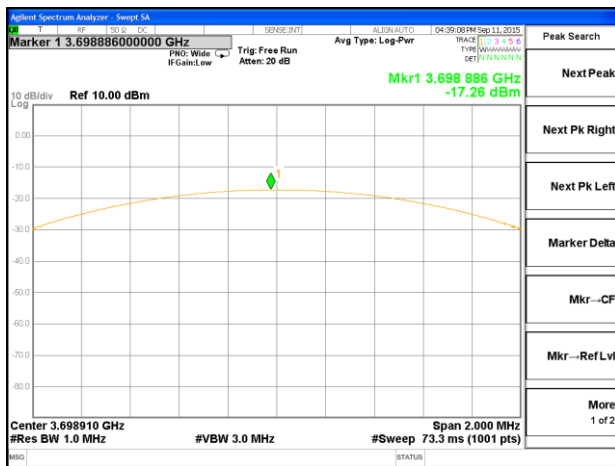
3681.09 MHz



3690 MHz

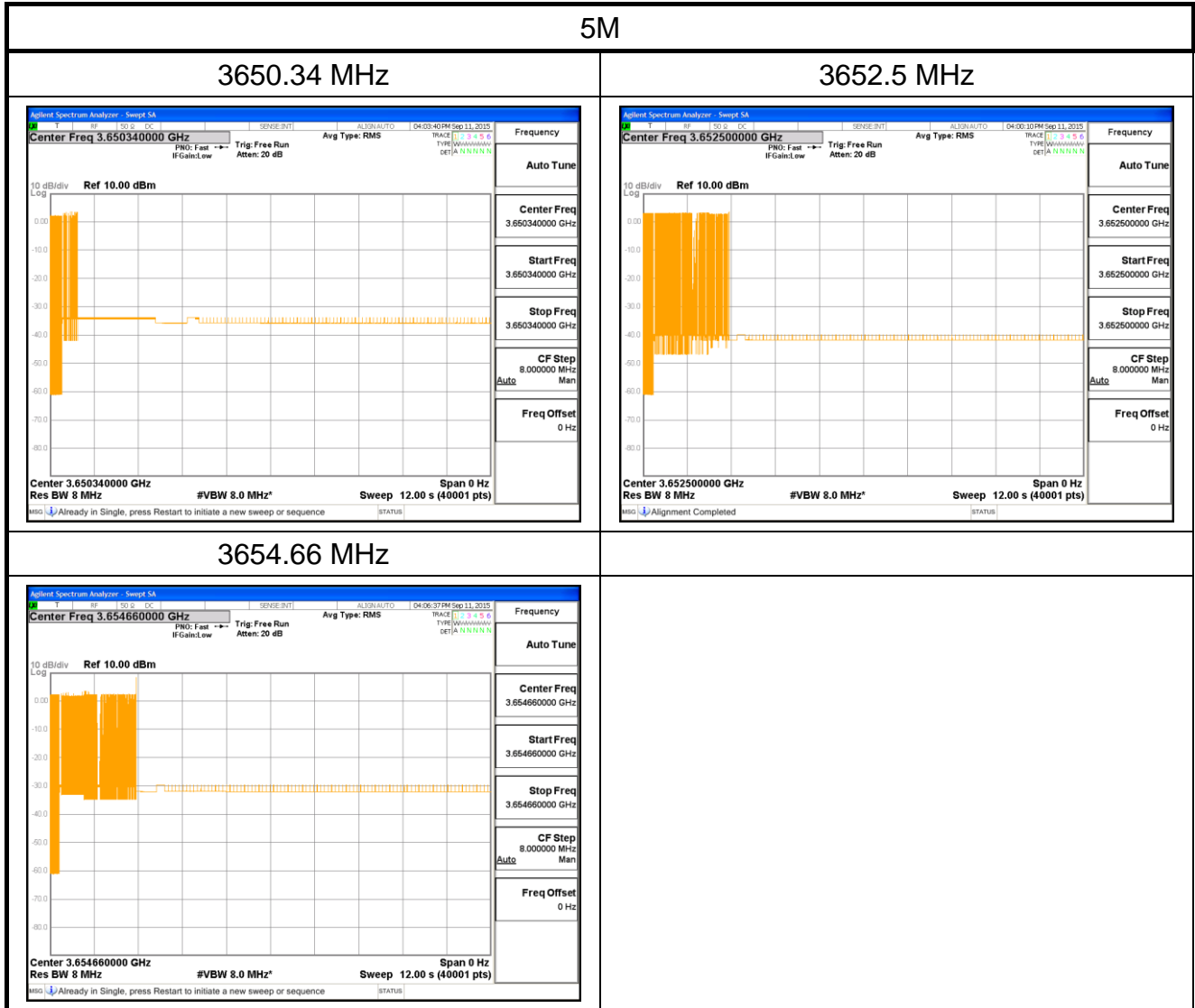


3698.91 MHz





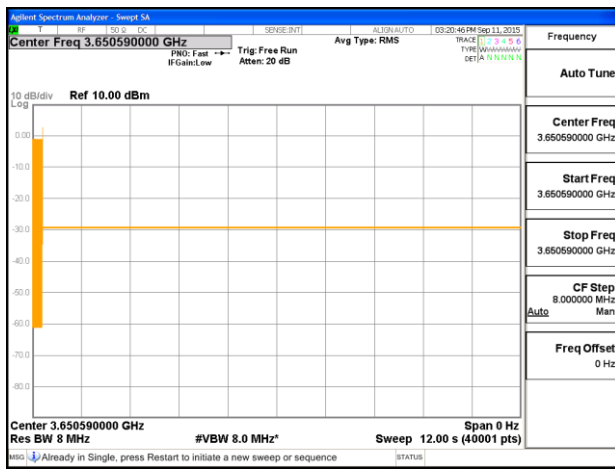
Low Channel CW interruption photo



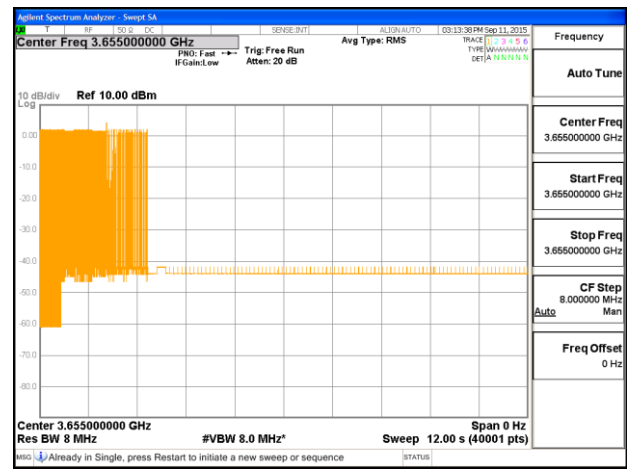


10M

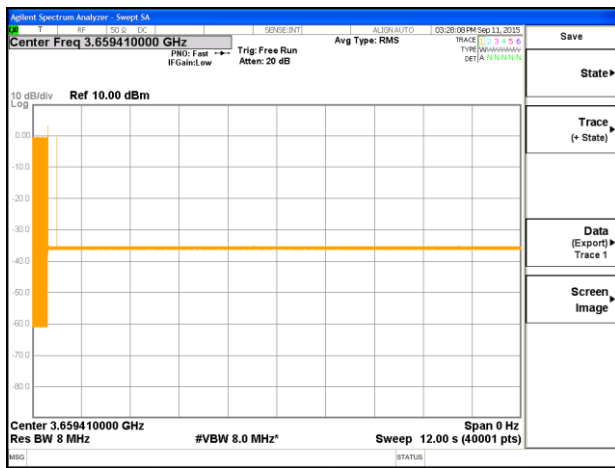
3650.59 MHz



3655 MHz



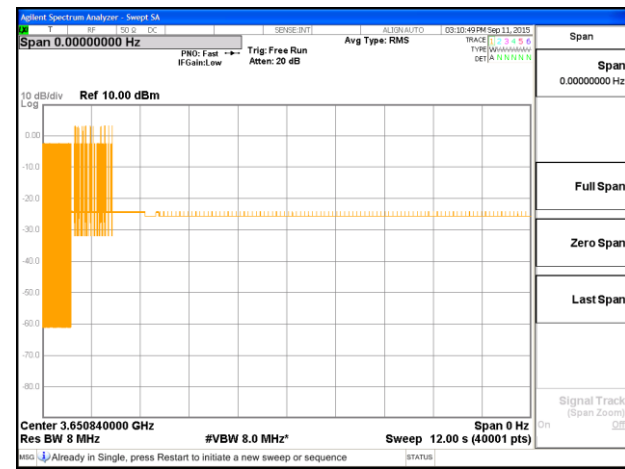
3659.41 MHz



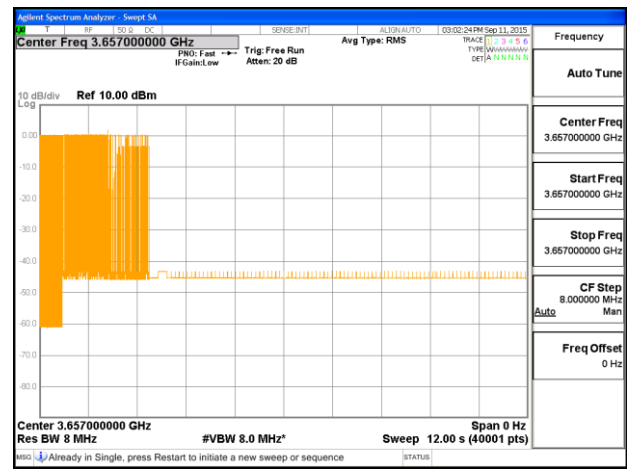


15M

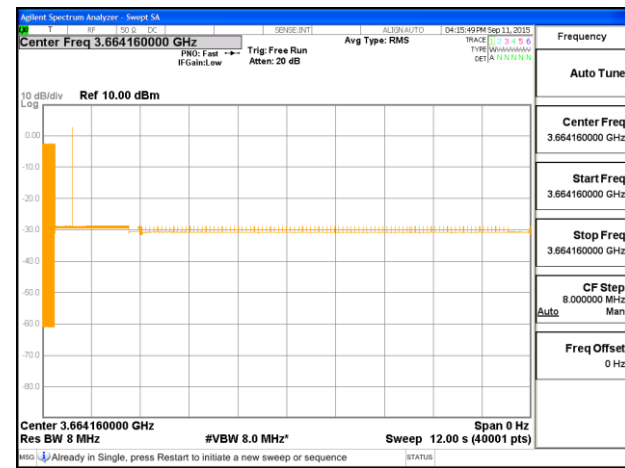
3650.84 MHz



3657.5 MHz



3664.16 MHz



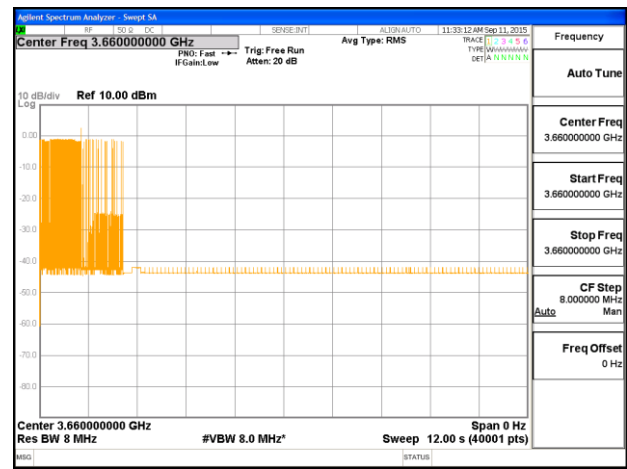


20M

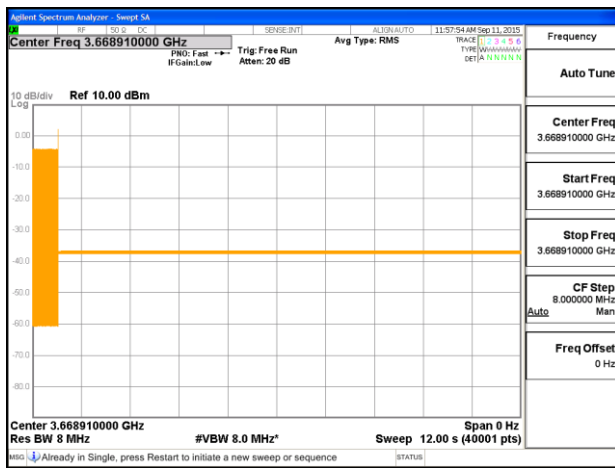
3651.09 MHz



3660 MHz

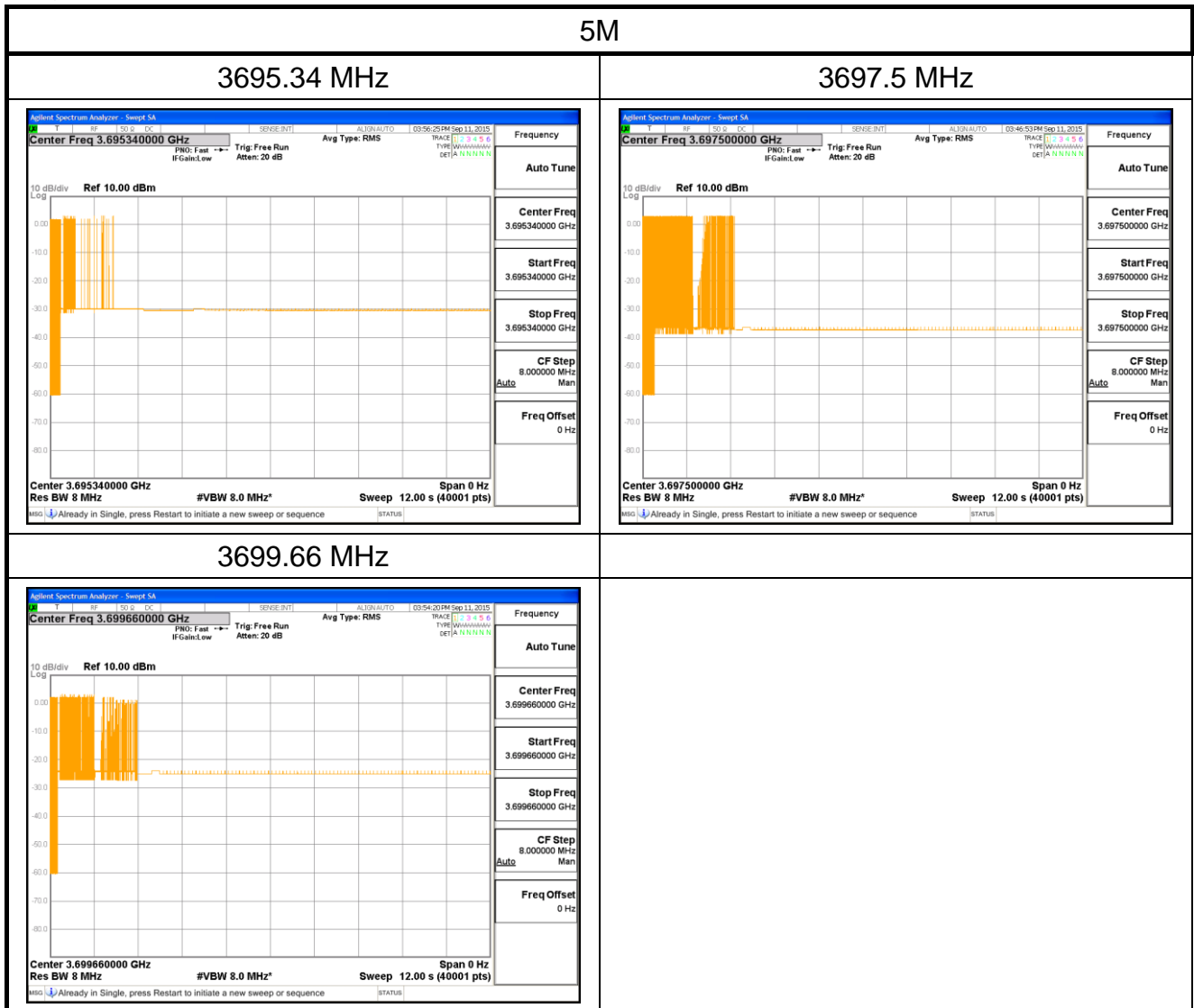


3668.91 MHz





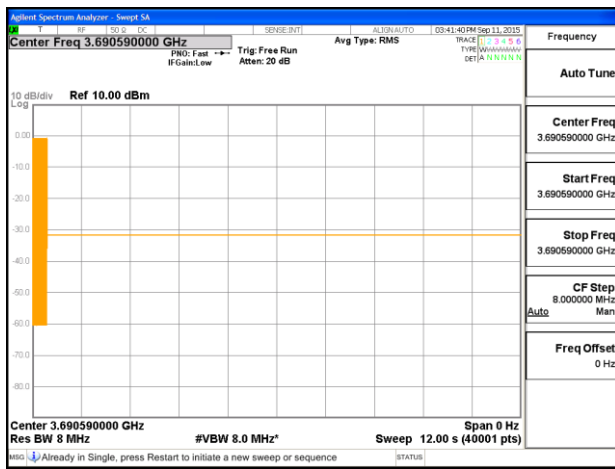
High Channel CW interruption photo



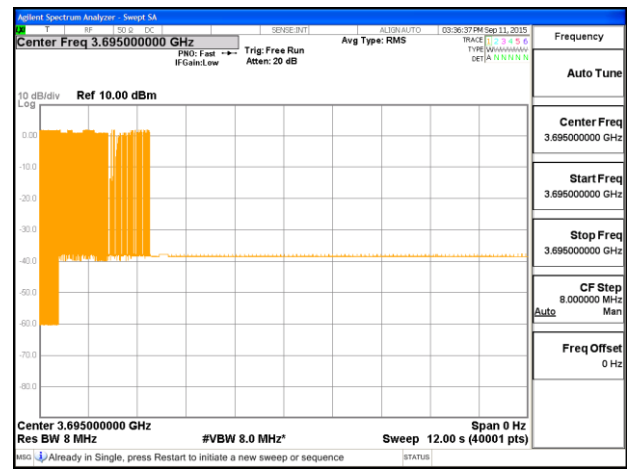


10M

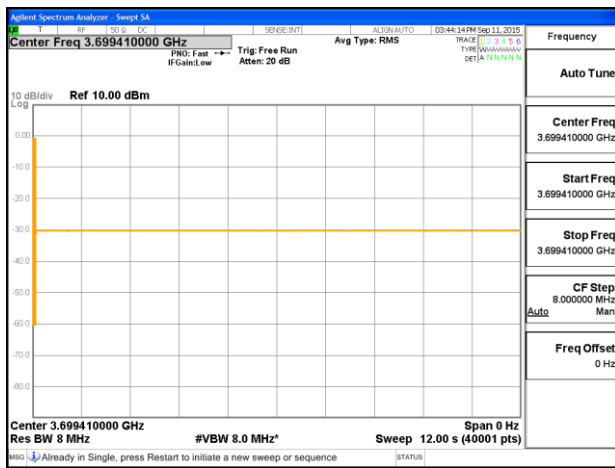
3690.59 MHz



3695 MHz



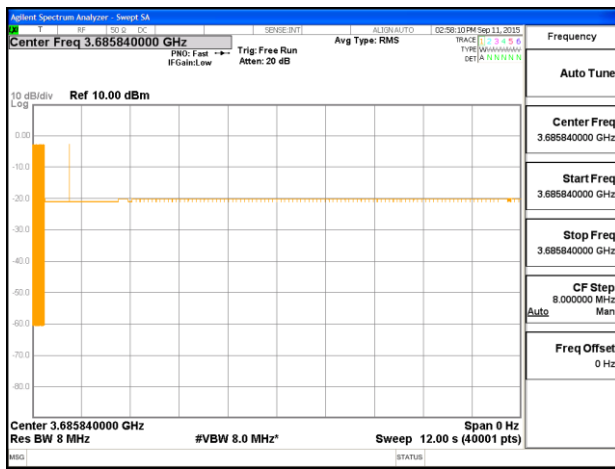
3699.41 MHz



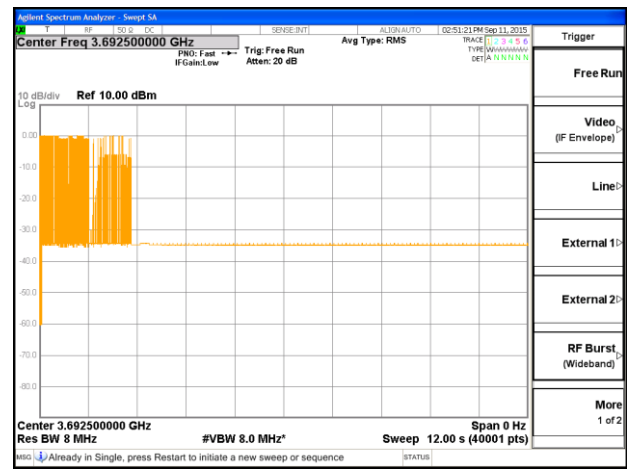


15M

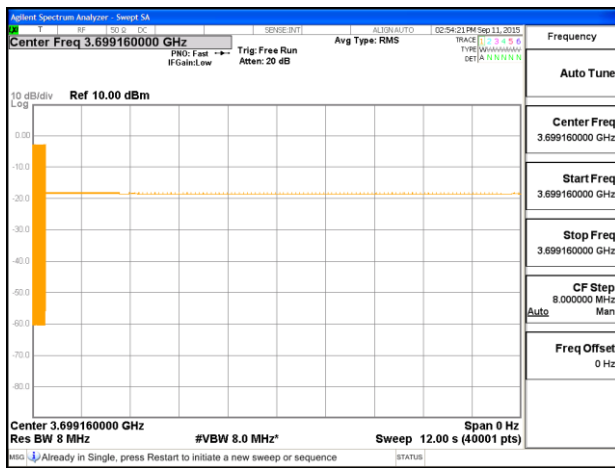
3685.84 MHz



3692.5 MHz



3699.16 MHz



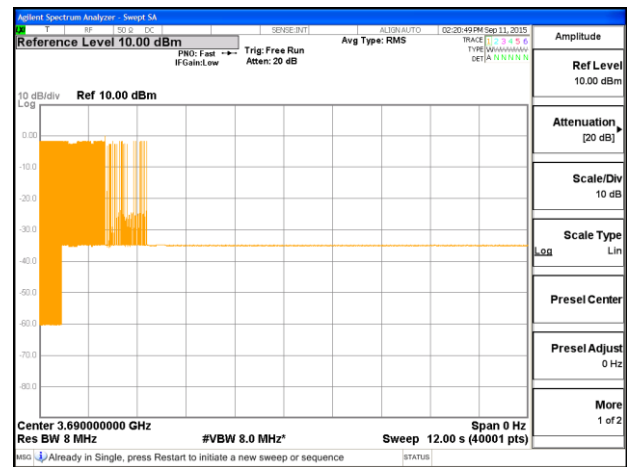


20M

3681.09 MHz



3690 MHz



3698.91 MHz



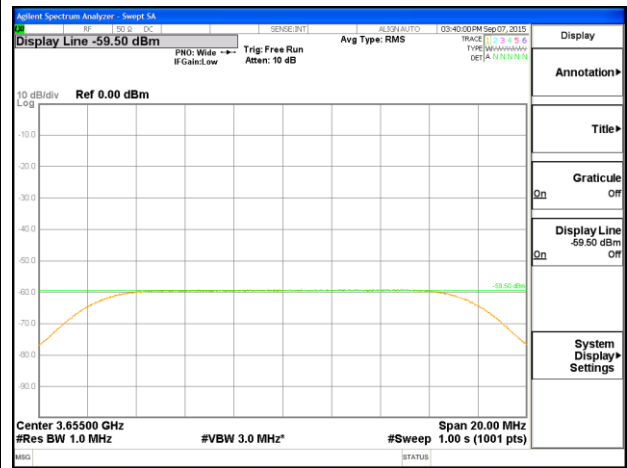


Low Channel AWGN interference signal level

Interferer 5MHz
3652.5MHz



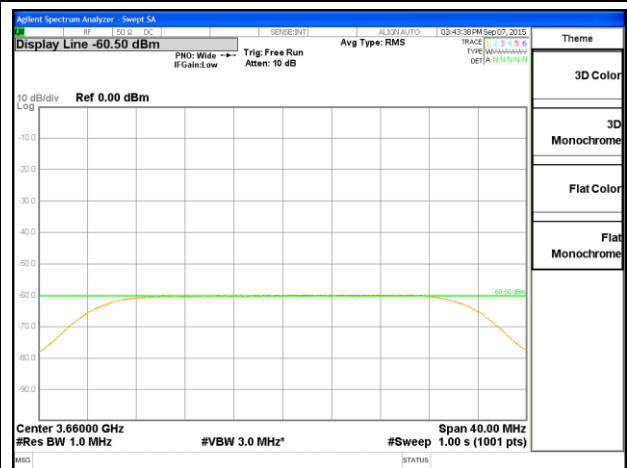
Interferer 10MHz
3655MHz



Interferer 15MHz
3657.5MHz

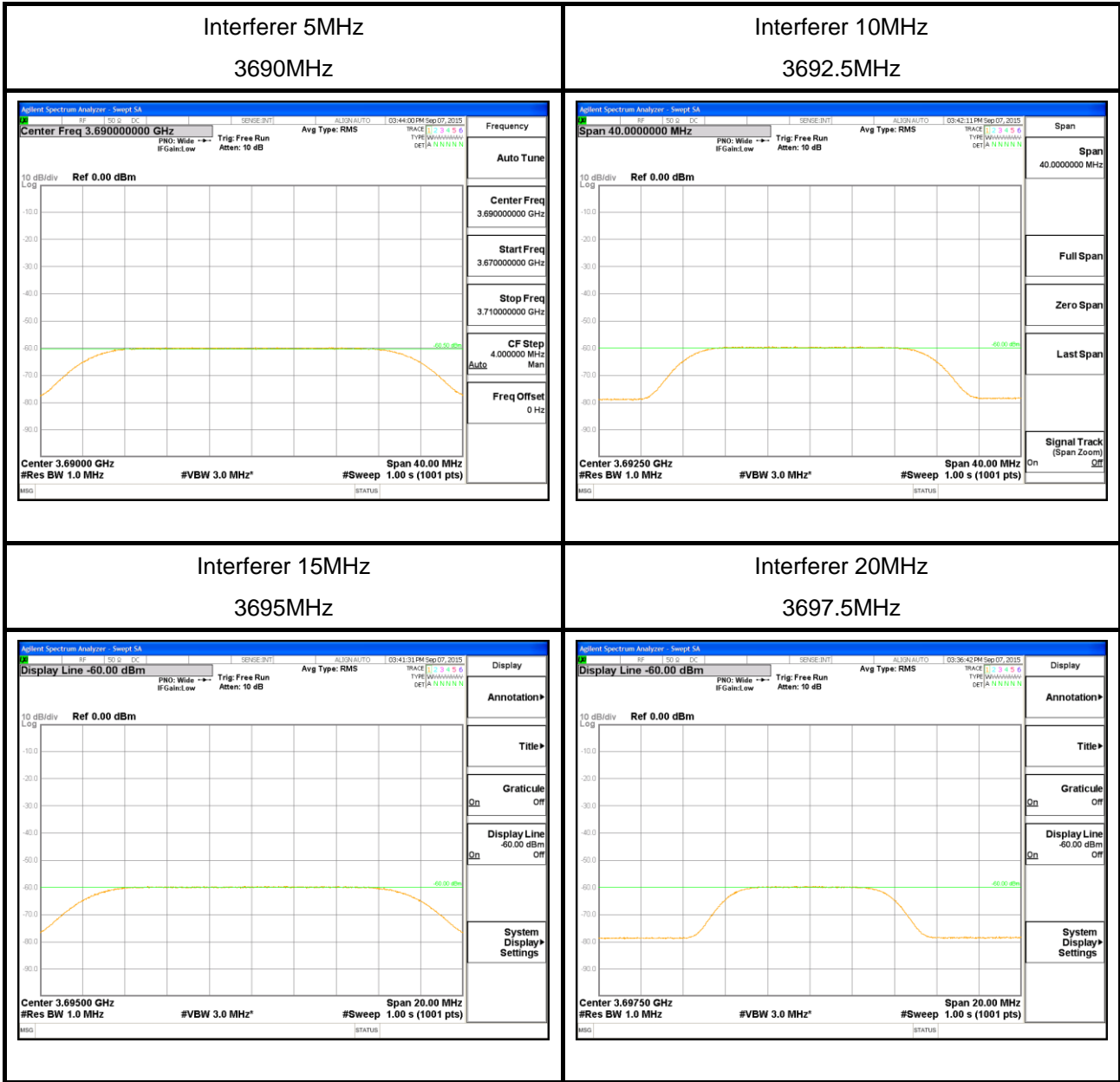


Interferer 20MHz
3660MHz





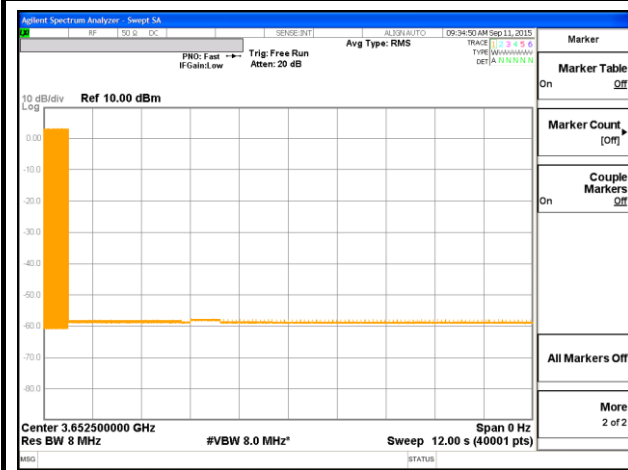
High Channel AWGN interference signal level





Low Channel AWGN interruption photo

Interferer 5MHz
3652.5MHz



Interferer 10MHz
3655MHz



Interferer 15MHz
3657.5MHz



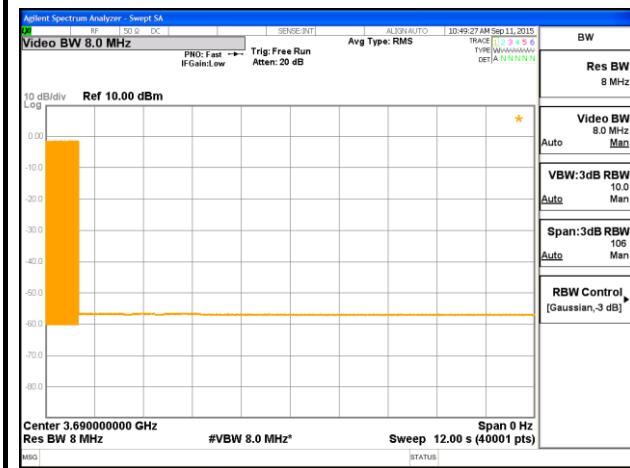
Interferer 20MHz
3660MHz





High Channel AWGN interruption photo

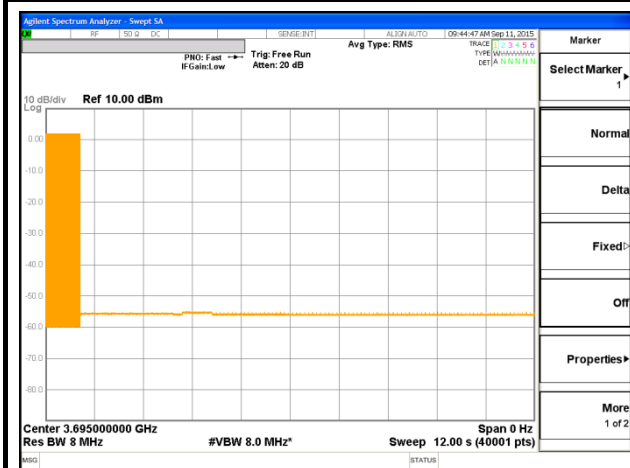
Interferer 5MHz
3690MHz



Interferer 10MHz
3692.5MHz



Interferer 15MHz
3695MHz

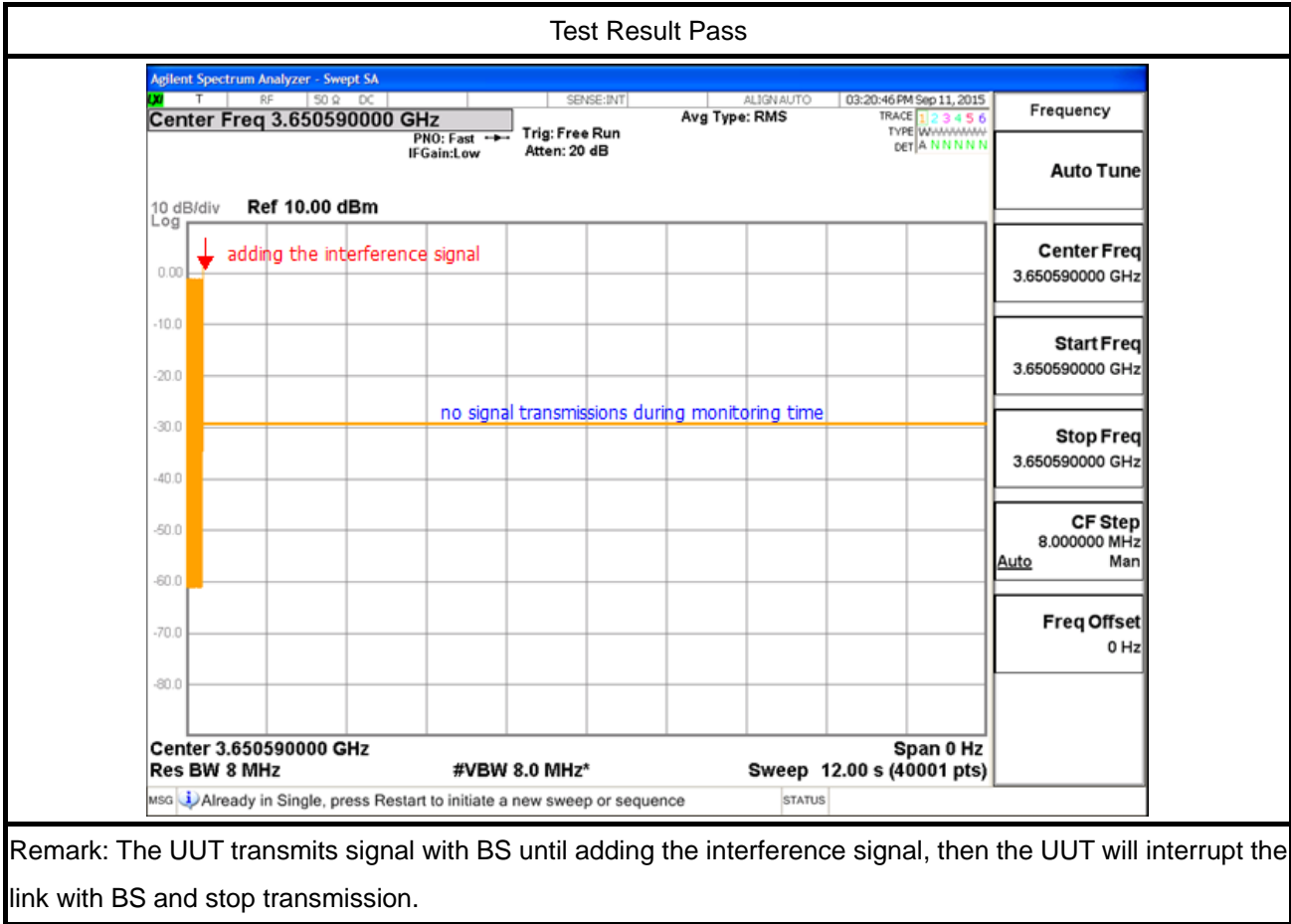


Interferer 20MHz
3697.5MHz





Example of test photo



7. Measurement Instruments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal. Date	Test Date	Due Date	Remark
Spectrum Analyzer	Agilent	N9030A	MY52350276	3Hz~44GHz	Mar. 18, 2015	Sep,07,2015 ~ Sep,14,2015	Mar. 17, 2016	Conducted (TH02-HY)
Signal Generator (Interferer)	Rohde & Schwarz	SMJ100A	101375	9kHz~6GHz	Feb. 12, 2015	Sep,7,2015 ~ Sep,14,2015	Feb. 11, 2016	Conducted (TH02-HY)
Signal Generator	Agilent	E4438C	MY49070755	250KHz ~ 6GHz	Oct. 08, 2014	Sep,7,2015 ~ Sep,14,2015	Oct. 07, 2015	DFS (DFS02-HY)