

1 Mechanical Tests

Appearance and Structure

Scanner Unit	Good
Display Unit	Good

2 Electrical Tests

2.1 Working of each operation unit

Scanner Unit	Good
Keyboard Unit	Good
STBY Key	Good
TX/PRF Key	Good
EBL1/EBL2 key	Good
VRM1/VRM2 key	Good
ALARM ACK key	Good
ACQ key	Good
TGT CNCL key	Good
PANEL key	Good
USER KEY1 key	Good
USER KEY2 key	Good
MOB key	Good
ENT key	Good
CLR/INFO key	Good
FUNC key	Good
OFF CENT/5 key	Good
RR/HL/8 key	Good
TM/RM/4 key	Good
AZI MODE/1 key	Good
MAP2 key	Good
VECT/3 key	Good
MARK/6 key	Good
DAY/NIGHT/7	Good
AZ/9 key	Good
TT MENU key	Good
TGT DATA key	Good
TRAILS/0 key	Good
+/-RANGE key	Good
ACQ/ENT key	Good
RADAR MENU key	Good
MULTI Control	Good
AUTO-RAIN Control	Good
AUTO-SEA Control	Good
GAIN/PL Control	Good
Electronic bearing line dial	Good
Variable range marker dial	Good
Track ball	Good

2.2 Scanner

VSWR	frequency (MHz)	VSWR
	9380	1.02
	9410	1.03
	9440	1.04
Scanner Rotation Speed		27 /48 rpm

2.3 Transmitter

Magnetron Ser. No.	A0019A
Operating Frequency	
(at 0.08 μ s pulse 0.5 NM-SP1)	9401.3 MHz
(at 0.25 μ s pulse 3NM -MP1)	9402.5 MHz
(at 0.5 μ s pulse 3NM -MP2)	9401.7 MHz
(at 0.8 μ s pulse 3NM -LP1)	9401.7 MHz
(at 1.0 μ s pulse 24NM -LP1)	9401.0 MHz
Peak Output Power	
(at 0.08 μ s pulse 0.5 NM-SP1)	6.45 kw
(at 0.25 μ s pulse 3NM -MP1)	6.84 kw
(at 0.5 μ s pulse 3NM -MP2)	7.81 kw
(at 0.8 μ s pulse 3NM -LP1)	8.29 kw
(at 1.0 μ s pulse 24NM -LP1)	8.35 kw
Pulse Length	
(at 0.08 μ s pulse 0.5 NM-SP1)	0.088 μ s
(at 0.25 μ s pulse 3NM -MP1)	0.248 μ s
(at 0.5 μ s pulse 3NM -MP2)	0.470 μ s
(at 0.8 μ s pulse 3NM -LP1)	0.788 μ s
(at 1.0 μ s pulse 24NM -LP1)	1.020 μ s

2.4 Receiver

MIC Front-end Ser. No.	U0586A
Diode limiter Ser. No.	B7192A
IF Center Frequency	60 MHz
IF Bandwidth	20/6/3 MHz

2.5 Display

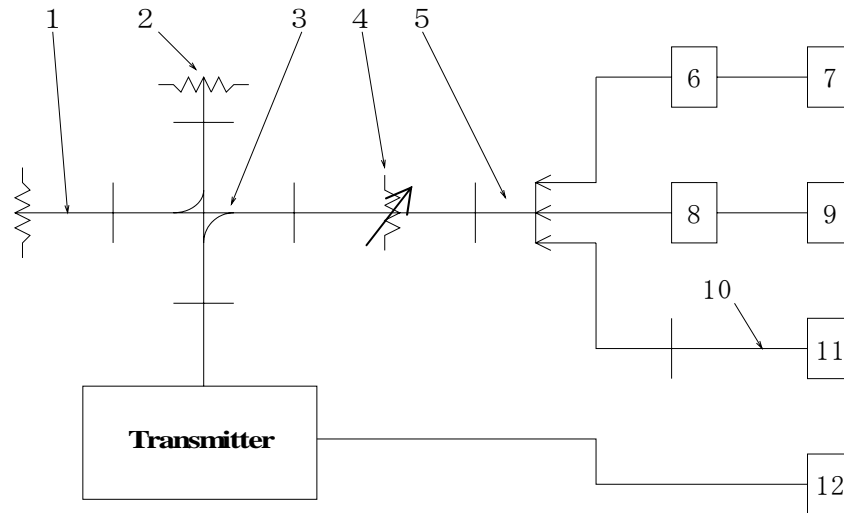
Input Voltage and Current(at 24NM-LP1)	DC.24V 6.17A(148W)
Repetition Frequency	
(0.08 μ s)	2251 Hz
(0.25 μ s)	1704 Hz
(0.5 μ s)	1205 Hz
(0.8 μ s)	752 Hz
(1.0 μ s)	651 Hz

3 Overall Tests

Working Time of Timer	1min30sec
Input Variation (21.6Vdc – 42Vdc)	Good
Overall Sensitivity	Good
Minimum Range	Good
Bearing Accuracy	Good
Mechanical Noise	Good

(Sec. 2.1046) 1.0 RF Power Output

(Sec. 2.1049) 2.0 Occupied Bandwidth



1:Dummy Load	PE6815	PASTERNAK
2:High Power Dummy Load	PE6824	PASTERNAK
3:Direction Coupler	5D363	SHIMADARIKA
Coupling 30dB		
Directivity 30dB		
4:Attenuator	8495B	HP
5:Adaptor	X281A	HP
6:Power Sensor	N1921A	Agilent
7:Power Meter	N1911A	Agilent
8:Crystal Detector	423B	HP
9:Oscilloscope	TDS3034B	Tektronix
10:Coaxial Cable	JUNFLON DGM024	JUNKOSHA
11:Spectrum Analyzer	E4448A	Agilent
12:Frequency Counter	5302A	HP

Measurement Point : Transmitter Output

FCC Submittal Material Data

(Sec. 2.1046)

1.0 RF Power Output

1.1 Peak Power

(at 0.08 μ s pulse 0.5 NM-SP1)	6.45 kw
(at 0.25 μ s pulse 3NM -MP1)	6.84 kw
(at 0.5 μ s pulse 3NM -MP2)	7.81 kw
(at 0.8 μ s pulse 3NM -LP1)	8.29 kw
(at 1.0 μ s pulse 24NM -LP1)	8.35 kw

1.2 Average Power

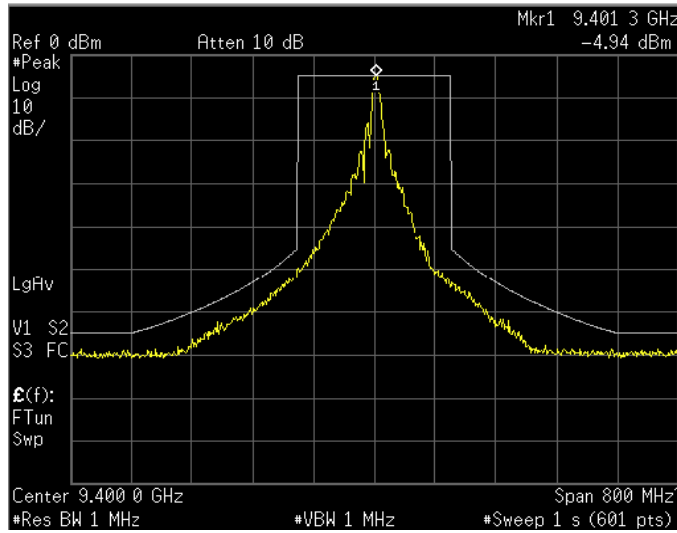
(at 0.08 μ s pulse 0.5 NM-SP1)	1.28 w
(at 0.25 μ s pulse 3NM -MP1)	2.89 w
(at 0.5 μ s pulse 3NM -MP2)	4.42 w
(at 0.8 μ s pulse 3NM -LP1)	4.91 w
(at 1.0 μ s pulse 24NM -LP1)	5.54 w

1.3 Load Impedance

VSWR 1.05 at 9.36 – 9.46 GHz

(Sec. 2.1049) 2.0 Occupied Bandwidth
 2.1 0.08 μ S Pulse PRF 2251Hz
 0.08 μ S Pulse Length 0.088 μ S

Scale
 10dB/Div



RF Spectrum
 0.08 μ S Pulse
 OBW=47.0 MHz

Scale 80MHz/Div
 Center Frequency 9400MHz

Scale
 50mV/Div



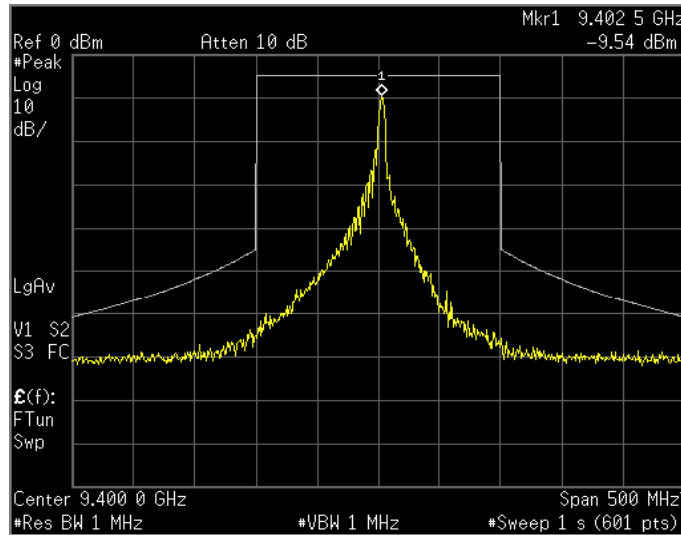
← - 3 dB
 Detected RF
 Pulse
 0.08 μ S Pulse

Scale 0.04 μ S/Div

(Sec. 2.1049)

2.2 0.25 μ S Pulse PRF 1707Hz
0.25 μ S Pulse Length 0.248 μ S

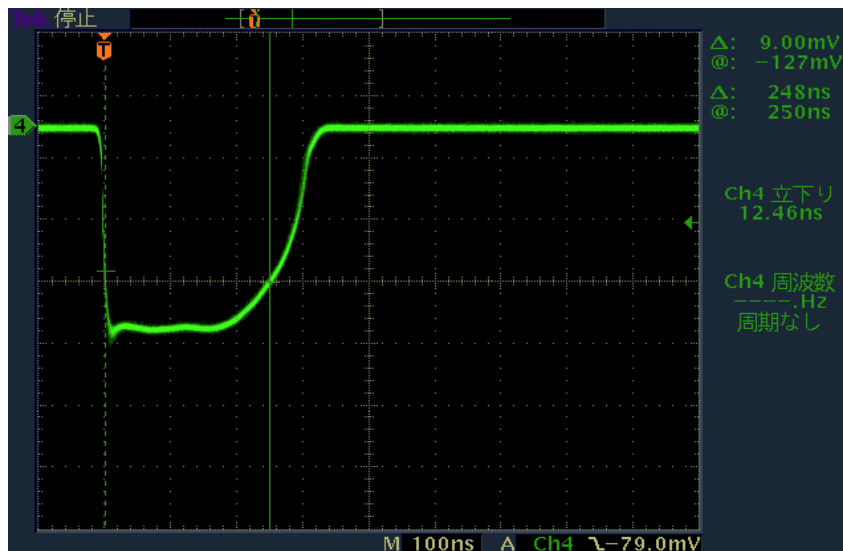
Scale
10dB/Div



RF Spectrum
0.25 μ S Pulse
OBW=26.0MHz

Scale 50MHz/Div
Center Frequency 9400MHz

Scale
50mV/Div



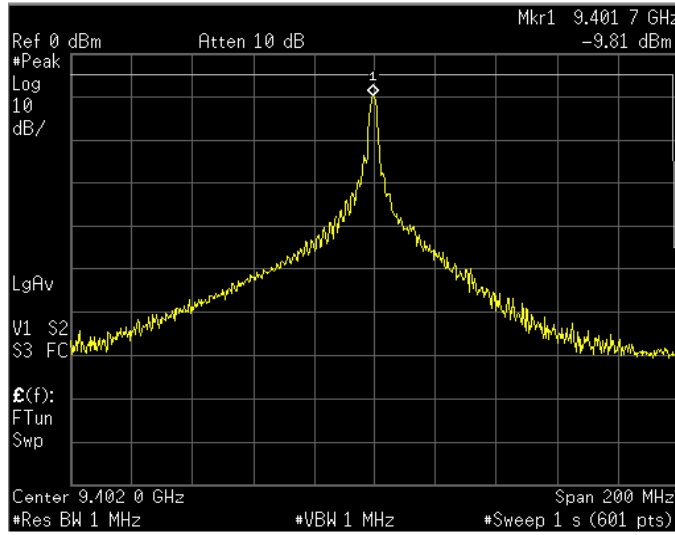
← - 3 dB
Detected RF
Pulse
0.25 μ S Pulse

Scale 0.10 μ S/Div

(Sec. 2.1049)

2.3 0.5 μ S Pulse PRF 1205Hz
0.5 μ S Pulse Length 0.47 μ S

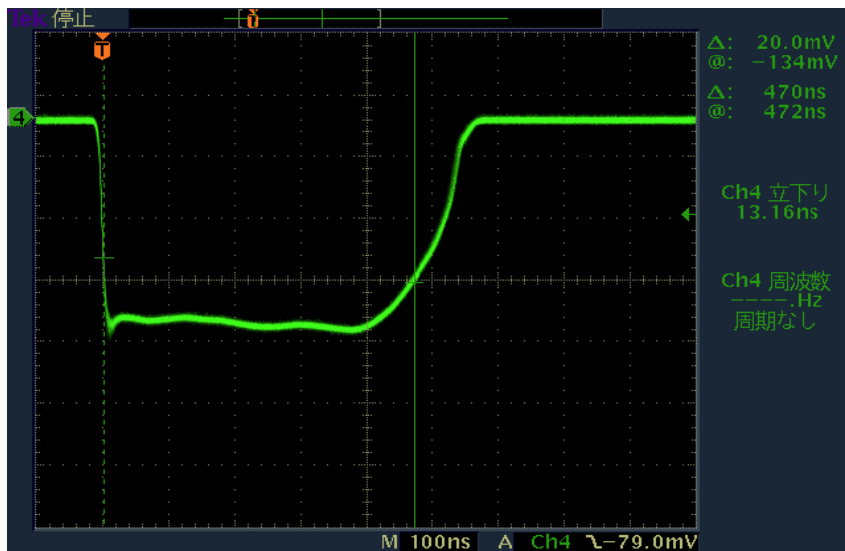
Scale
10dB/Div



RF Spectrum
0.5 μ S Pulse
OBW=15.0MHz

Scale 20MHz/Div
Center Frequency 9402MHz

Scale
50mV/Div



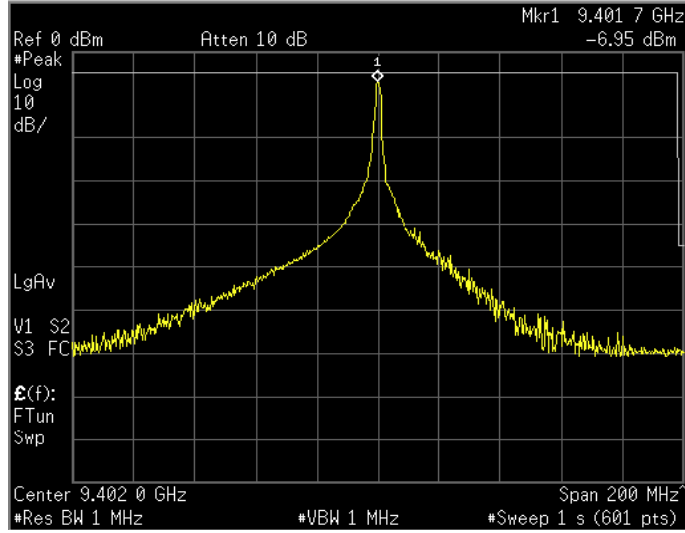
← - 3 dB
Detected RF
Pulse
0.5 μ S Pulse

Scale 0.1 μ S/Div

(Sec. 2.1049)

2.4 0.8 μ S Pulse PRF 752Hz
0.8 μ S Pulse Length 0.788 μ S

Scale
10dB/Div



RF Spectrum
1.0 μ S Pulse

OBW=8.1MHz

Scale 20MHz/Div
Center Frequency 9402MHz

Scale
50mV/Div



← -3 dB

Detected RF
Pulse

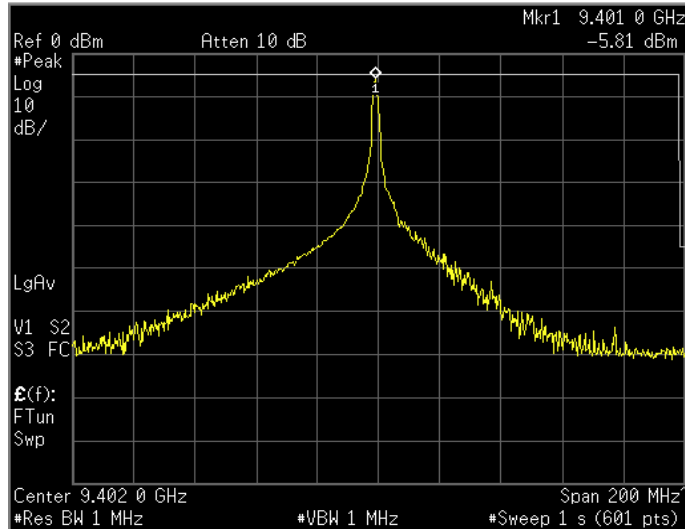
1.0 μ S Pulse

Scale 0.2 μ S/Div

(Sec. 2.1049)

2.5 1.0 μ S Pulse PRF 651Hz
1.0 μ S Pulse Length 1.02 μ S

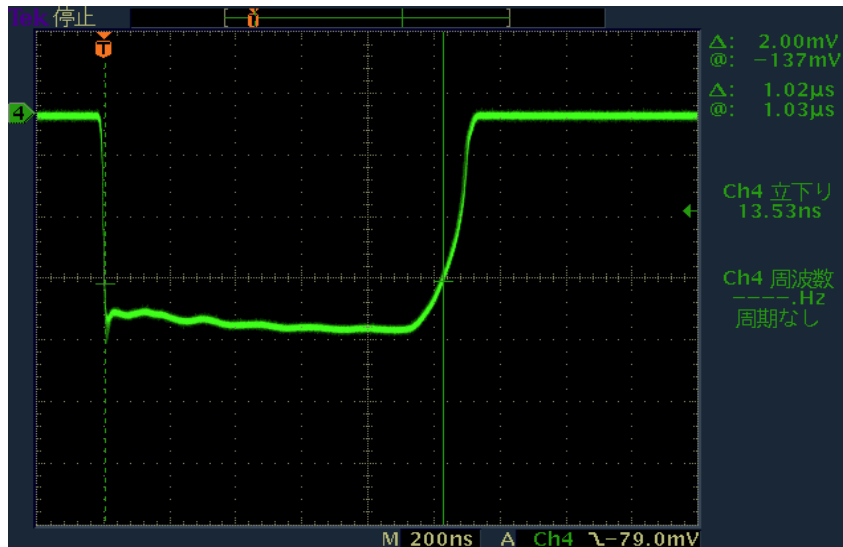
Scale
10dB/Div



RF Spectrum
1.0 μ S Pulse
OBW=7.0MHz

Scale 20MHz/Div
Center Frequency 9402MHz

Scale
50mV/Div

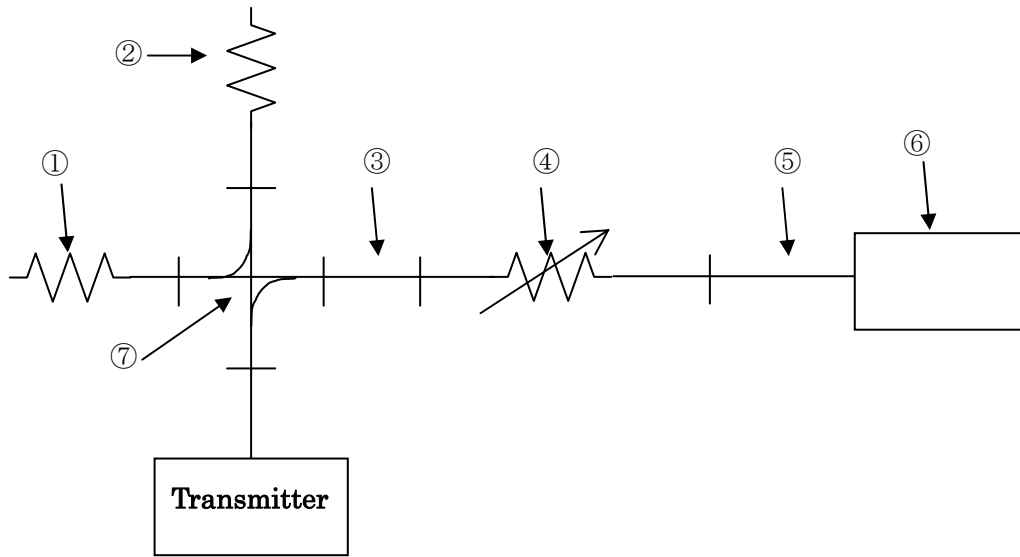


← - 3 dB
Detected RF Pulse
1.0 μ S Pulse

Scale 0.2 μ S/Div

(Sec.2.1051) Spurious emission at antenna terminals

Condition 1: 0 to 20GHz



① Dummy Load	PE6815	PASTERNAK
② High Power Dummy Load	PE6824	PASTERNAK
③ Adaptor	X281A	HP
④ Attenuator	8495B	HP
⑤ Coaxial Cable	JUNFLON DGM024	JUNKOSHA
⑥ Spectrum Analyzer	E4448A	Agilent
⑦ Direction Coupler	5D363	SHIMADARIKA
Coupling	: 30dB	
Directivity	: 30dB	

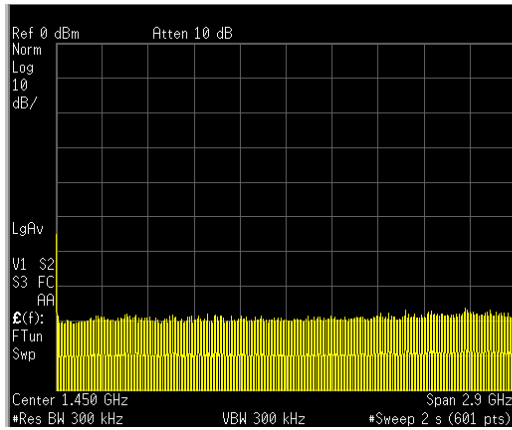
Attenuation 4 : 40dB
 Measurement Point : Transmitter Output

(2.1051)

Scale

↑ 10dB/Div

→290MHz/Div



Spurious signal

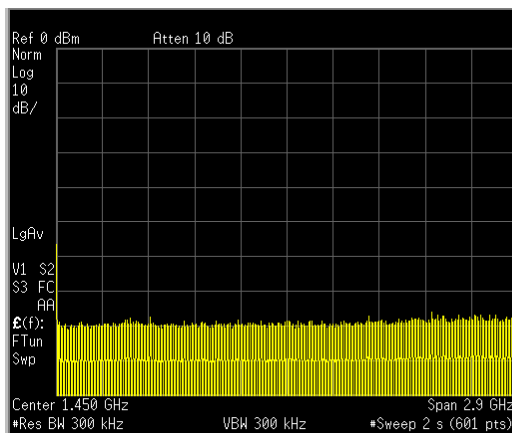
OFF

0 to 2.9GHz

Scale

↑ 10dB/Div

→290MHz/Div



Spurious signal

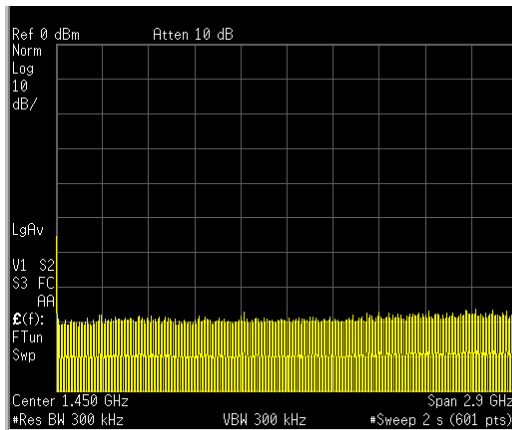
Stand-By

0 to 2.9GHz

Scale

↑ 10dB/Div

→290MHz/Div



Spurious signal

0.080 μ s Pulse

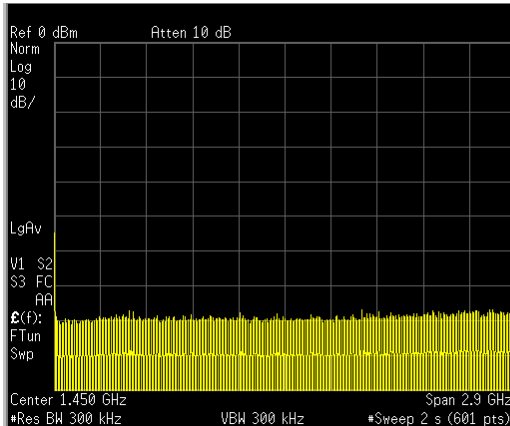
0 to 2.9GHz

(2.1051)

Scale

↑ 10dB/Div

→290MHz/Div



Spurious signal

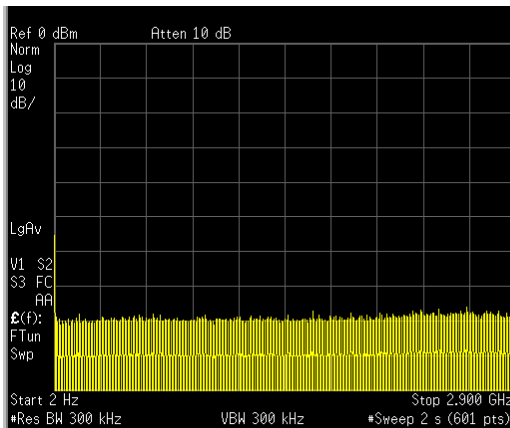
0.25 μ s Pulse

0 to 2.9GHz

Scale

↑ 10dB/Div

→290MHz/Div



Spurious signal

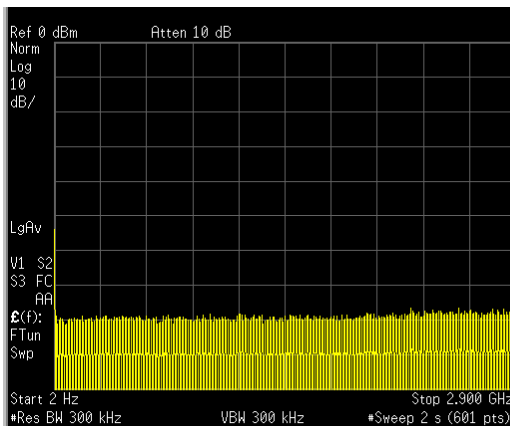
0.5 μ s Pulse

0 to 2.9GHz

Scale

↑ 10dB/Div

→290MHz/Div



Spurious signal

0.8 μ s Pulse

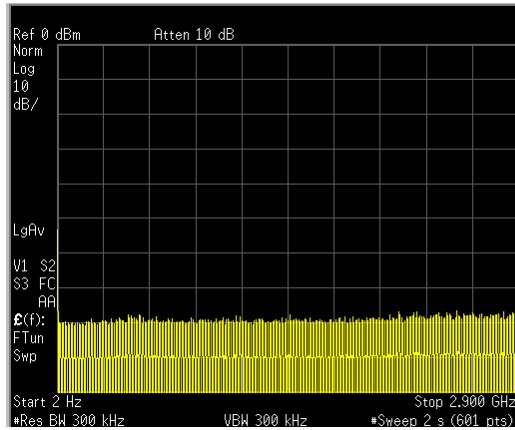
0 to 2.9GHz

(2.1051)

Scale

↑ 10dB/Div

→ 290MHz/Div



Spurious signal

1.0 μ s Pulse

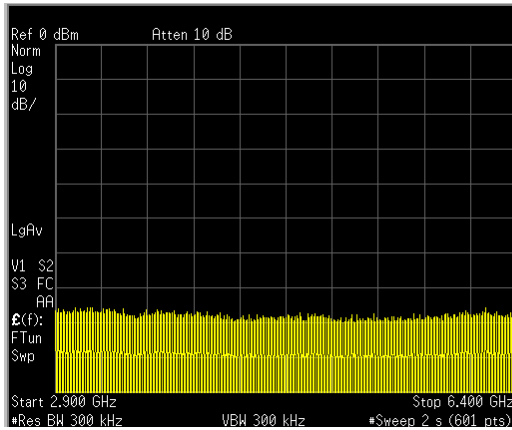
0 to 2.9GHz

(2.1051)

Scale

↑ 10dB/Div

→ 350MHz/Div



Spurious signal

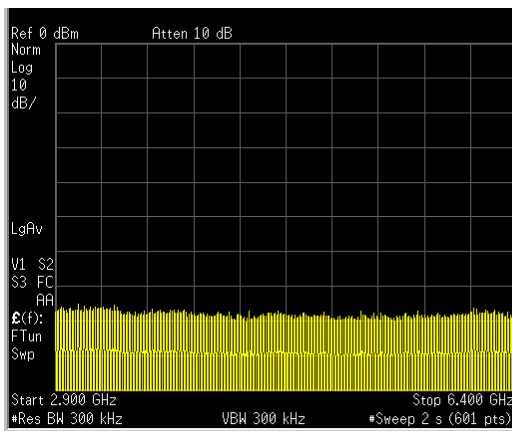
OFF

2.9 to 6.4GHz

Scale

↑ 10dB/Div

→ 350MHz/Div



Spurious signal

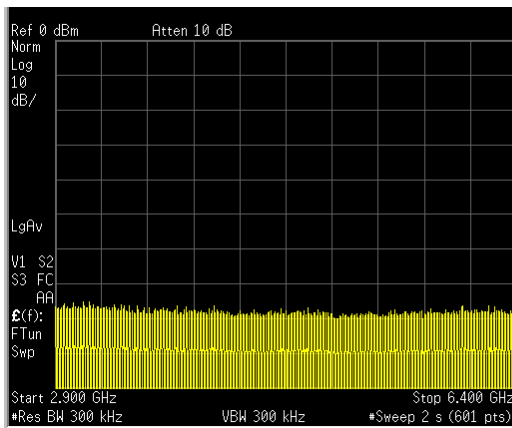
Stand-By

2.9 to 6.4GHz

Scale

↑ 10dB/Div

→ 350MHz/Div



Spurious signal

0.080 μ s Pulse

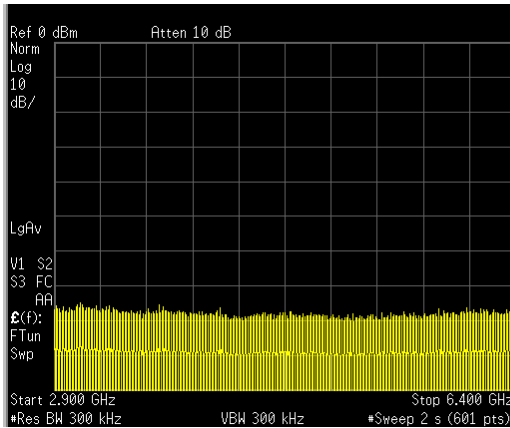
2.9 to 6.4GHz

(2.1051)

Scale

↑ 10dB/Div

→ 350MHz/Div



Spurious signal

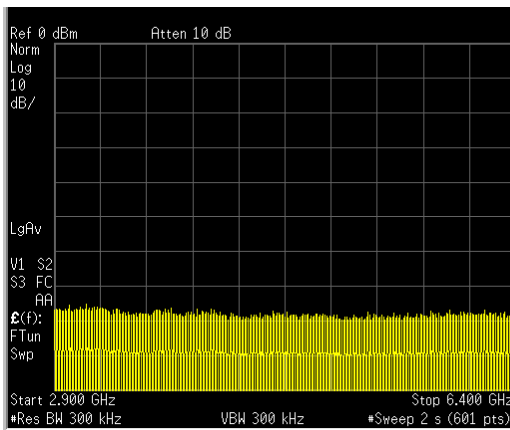
0.25 μ s Pulse

2.9 to 6.4GHz

Scale

↑ 10dB/Div

→ 350MHz/Div



Spurious signal

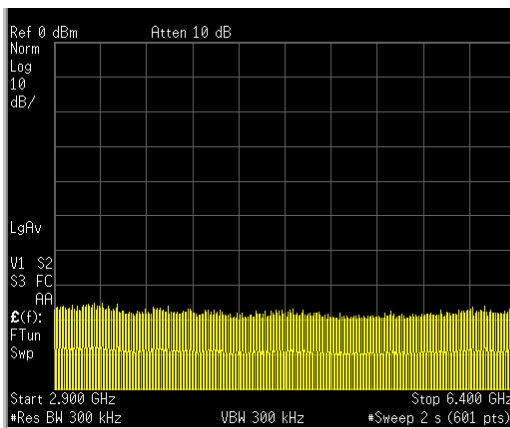
0.5 μ s Pulse

2.9 to 6.4GHz

Scale

↑ 10dB/Div

→ 350MHz/Div



Spurious signal

0.80 μ s Pulse

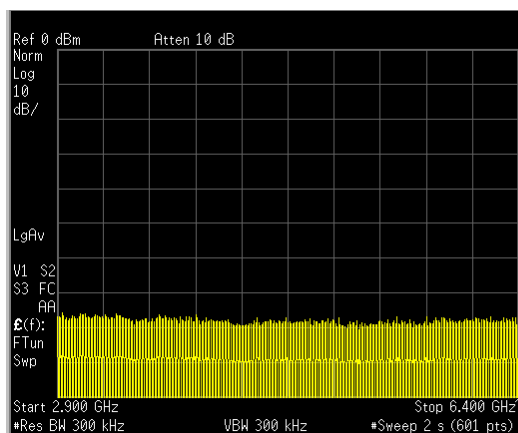
2.9 to 6.4GHz

(2.1051)

Scale

↑ 10dB/Div

→ 350MHz/Div



Spurious signal

1.0 μ s Pulse

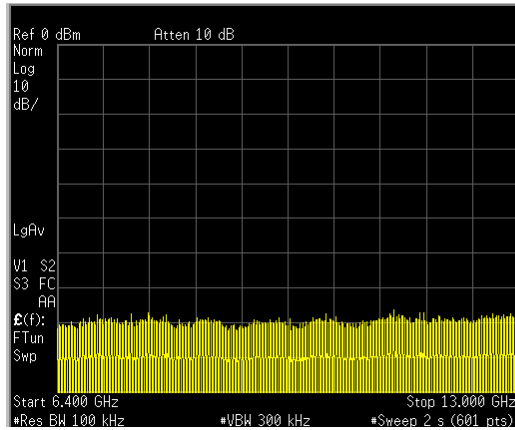
2.9 to 6.4GHz

(2.1051)

Scale

↑ 10dB/Div

→660MHz/Div



Spurious signal

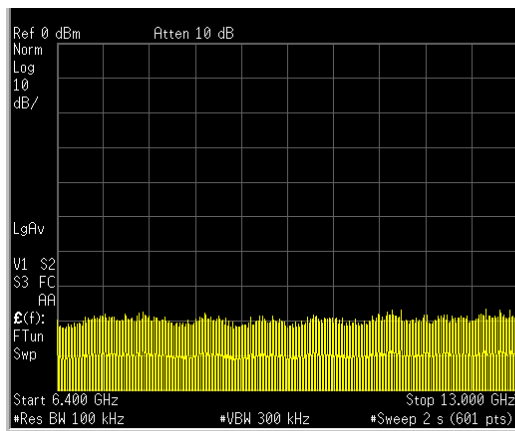
OFF

6.4 to 13GHz

Scale

↑ 10dB/Div

→660MHz/Div



Spurious signal

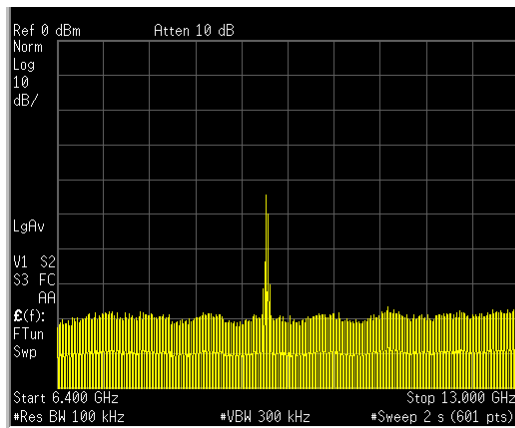
Stand-By

6.4 to 13GHz

Scale

↑ 10dB/Div

→660MHz/Div



Spurious signal

0.080 μ s Pulse

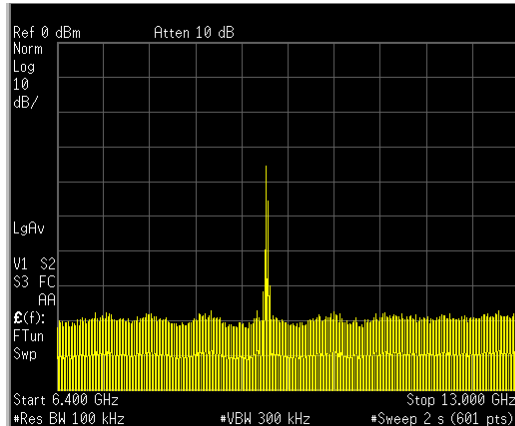
6.4 to 13GHz

(2.1051)

Scale

↑ 10dB/Div

→660MHz/Div



Spurious signal

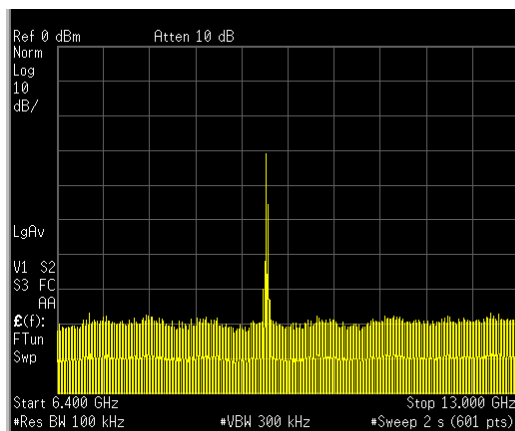
0.25 μ s Pulse

6.4 to 13GHz

Scale

↑ 10dB/Div

→660MHz/Div



Spurious signal

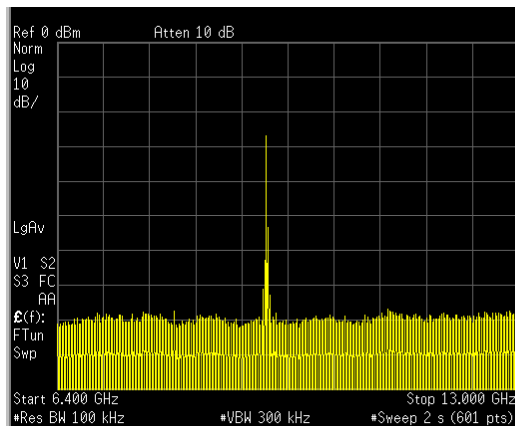
0.5 μ s Pulse

6.4 to 13GHz

Scale

↑ 10dB/Div

→660MHz/Div



Spurious signal

0.80 μ s Pulse

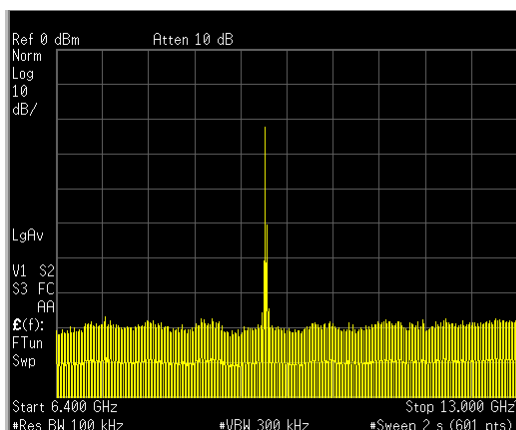
6.4 to 13GHz

(2.1051)

Scale

↑ 10dB/Div

→ 660MHz/Div



Spurious signal

1.0 μ s Pulse

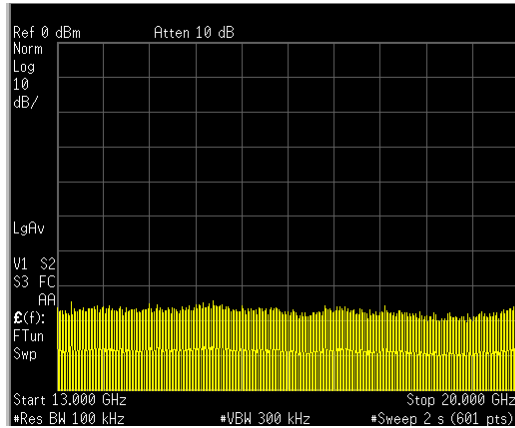
6.4 to 13GHz

(2.1051)

Scale

↑ 10dB/Div

→ 700MHz/Div



Spurious signal

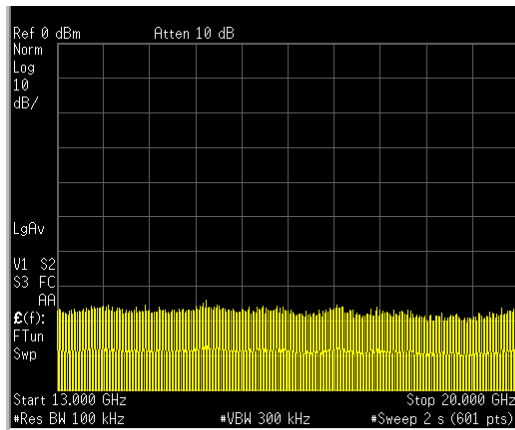
OFF

13 to 20GHz

Scale

↑ 10dB/Div

→ 700MHz/Div



Spurious signal

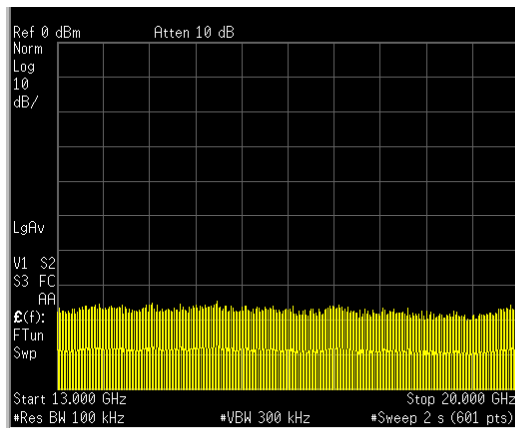
Stand-By

13 to 20GHz

Scale

↑ 10dB/Div

→ 700MHz/Div



Spurious signal

0.080 μ s Pulse

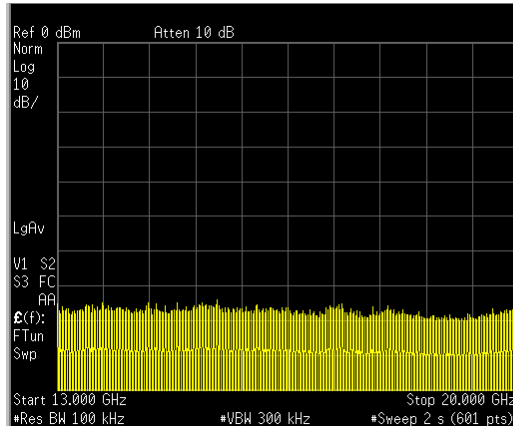
13 to 20GHz

(2.1051)

Scale

↑ 10dB/Div

→ 700MHz/Div



Spurious signal

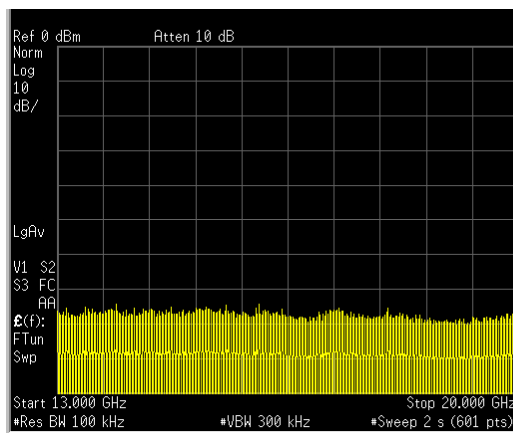
0.25 μ s Pulse

13 to 20GHz

Scale

↑ 10dB/Div

→ 700MHz/Div



Spurious signal

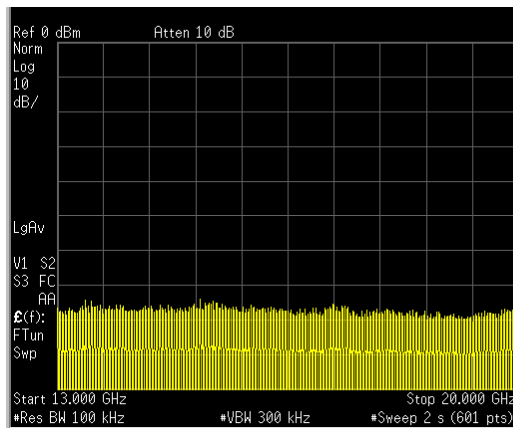
0.5 μ s Pulse

13 to 20GHz

Scale

↑ 10dB/Div

→ 700MHz/Div



Spurious signal

0.80 μ s Pulse

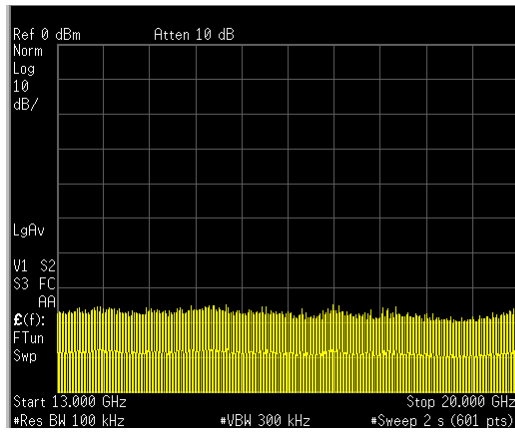
13 to 20GHz

(2.1051)

Scale

↑ 10dB/Div

→ 700MHz/Div



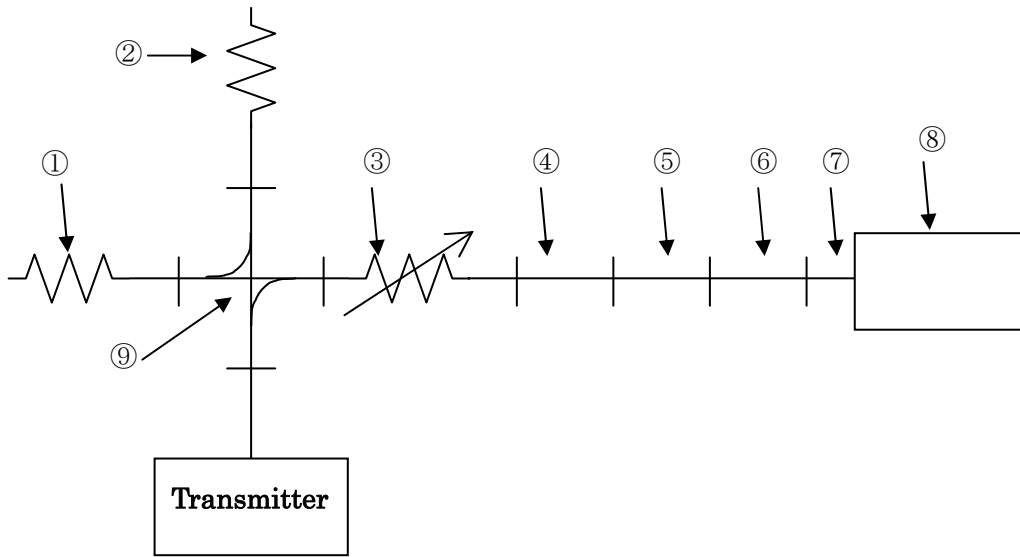
Spurious signal

1.0 μ s Pulse

13 to 20GHz

(Sec.2.1051) Spurious emission at antenna terminals

Condition 2: 12 to 28GHz



①Dummy Load	PE6815	PASTERNAK
②High Power Dummy Load	PE6824	PASTERNAK
③Attenuator	X382A	HP
④Taperd W/G	195-XV KU	AIRCOM
⑤Taperd W/G	11518A	HP
⑥Adaptor	22093-KF20	FLANN
⑦Coaxial Cable	SUCOFLEX101	HUBER+SUHNER
⑧Spectrum Analyzer	E4448A	Agilent
⑨Direction Coupler	5D363	SHIMADARIKA
Coupling	: 30dB	
Directivity	: 30dB	

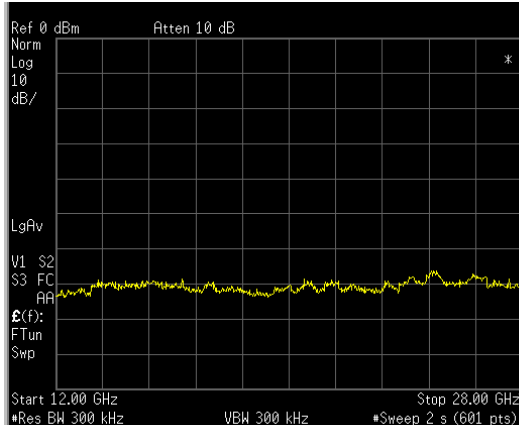
Attenuation 3 : 40dB
 Measurement Point : Transmitter Output

(2.1051)

Scale

↑ 10dB/Div

→ 1.6GHz/Div



Spurious signal

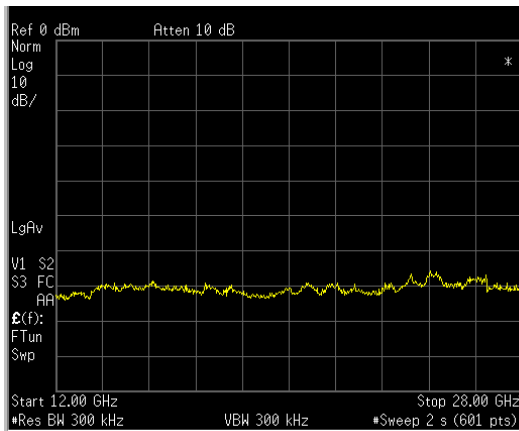
OFF

12 to 28GHz

Scale

↑ 10dB/Div

→ 1.6GHz/Div



Spurious signal

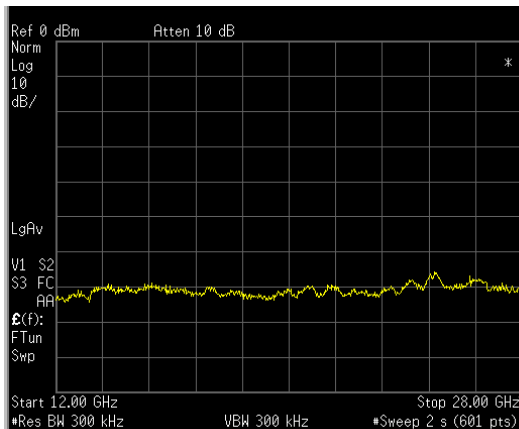
Stand-By

12 to 28GHz

Scale

↑ 10dB/Div

→ 1.6GHz/Div



Spurious signal

0.080 μ s Pulse

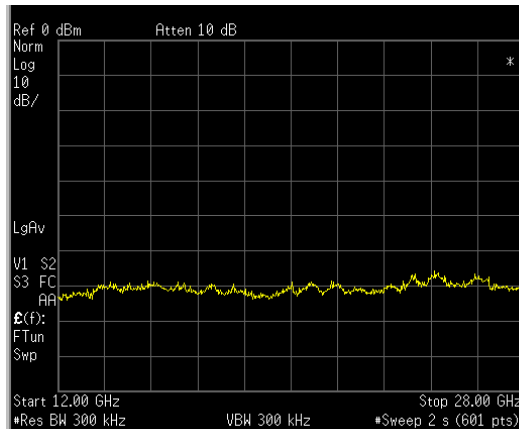
12 to 28GHz

(2.1051)

Scale

↑ 10dB/Div

→ 1.6GHz/Div



Spurious signal

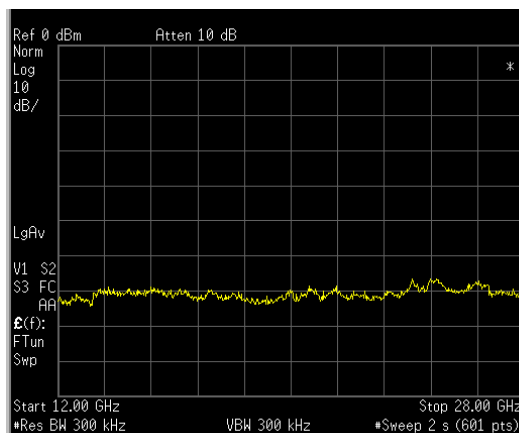
0.25 μ s Pulse

12 to 28GHz

Scale

↑ 10dB/Div

→ 1.6GHz/Div



Spurious signal

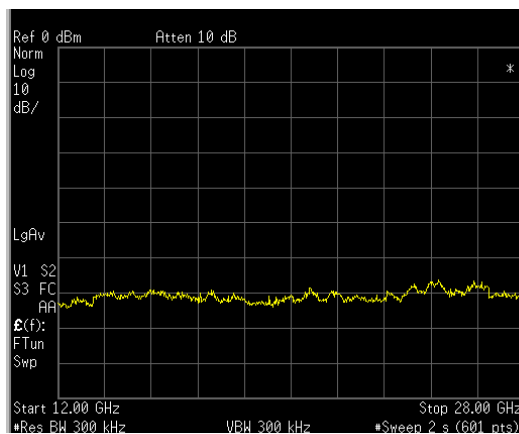
0.5 μ s Pulse

12 to 28GHz

Scale

↑ 10dB/Div

→ 1.6GHz/Div



Spurious signal

0.80 μ s Pulse

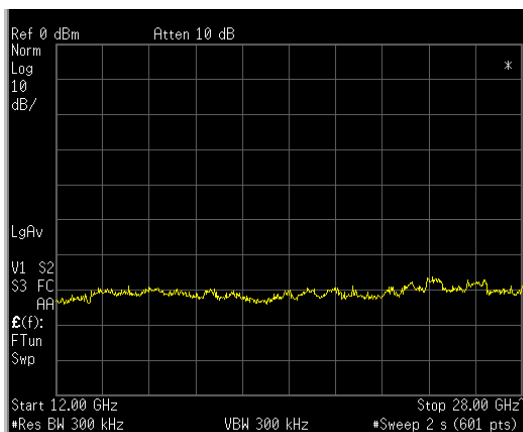
12 to 28GHz

(2.1051)

Scale

↑ 10dB/Div

→ 1.6GHz/Div



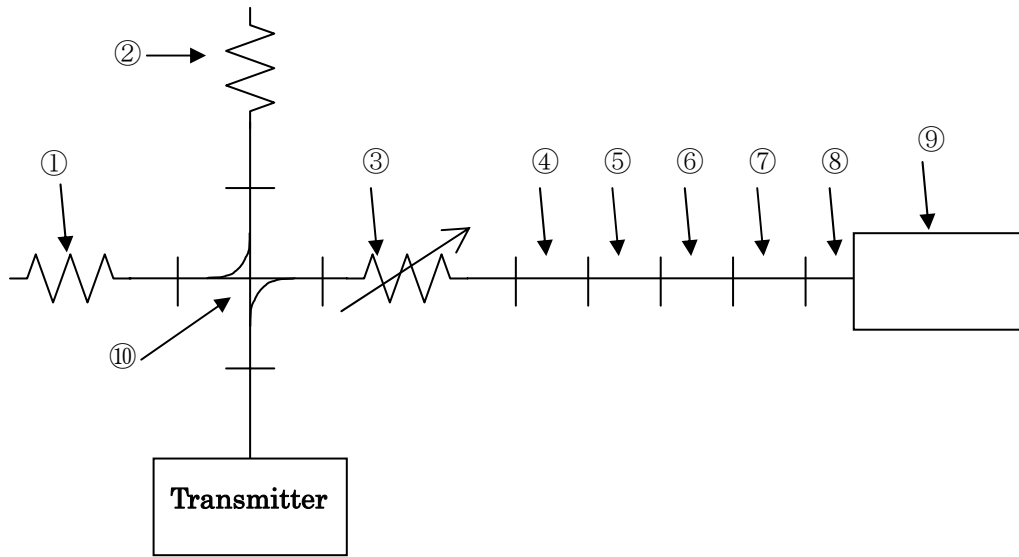
Spurious signal

1.0 μ s Pulse

12 to 28GHz

(Sec.2.1051) Spurious emission at antenna terminals

Condition 3: 28 to 50GHz



① Dummy Load	PE6815	PASTERNAK
② High Power Dummy Load	PE6824	PASTERNAK
③ Attenuator	X382A	HP
④ Taperd W/G	195-XV KU	AIRCOM
⑤ Taperd W/G	11518A	HP
⑥ Taperd W/G	11520A	HP
⑦ Adaptor	22093-KF20	FLANN
⑧ Coaxial Cable	SUCOFLEX101	HUBER+SUHNER
⑨ Spectrum Analyzer	E4448A	Agilent
⑩ Direction Coupler	5D363	SHIMADARIKA
Coupling	: 30dB	
Directivity	: 30dB	

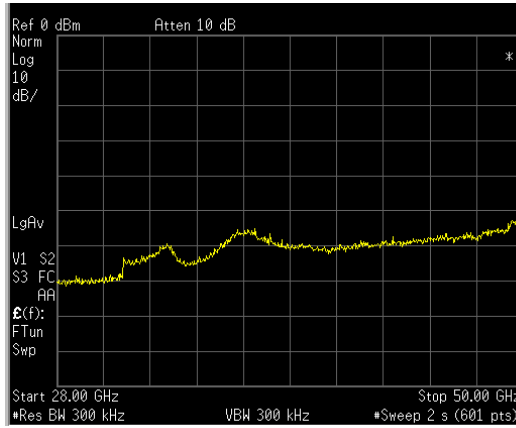
Attenuation 3 : 40dB
 Measurement Point : Transmitter Output

(2.1051)

Scale

↑ 10dB/Div

→ 2.2GHz/Div



Spurious signal

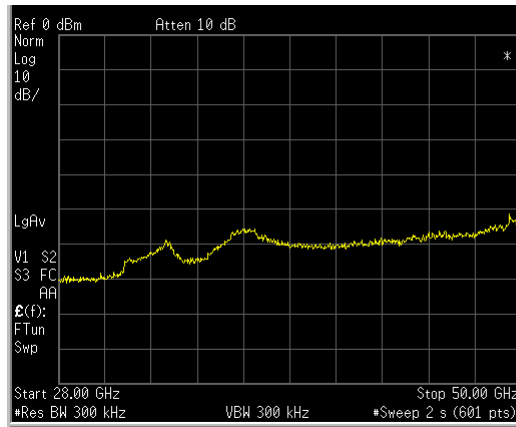
OFF

28 to 50GHz

Scale

↑ 10dB/Div

→ 2.2GHz/Div



Spurious signal

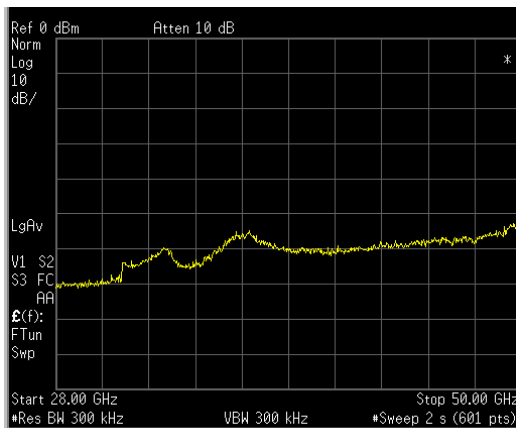
Stand-By

28 to 50GHz

Scale

↑ 10dB/Div

→ 2.2GHz/Div



Spurious signal

0.080 μ s Pulse

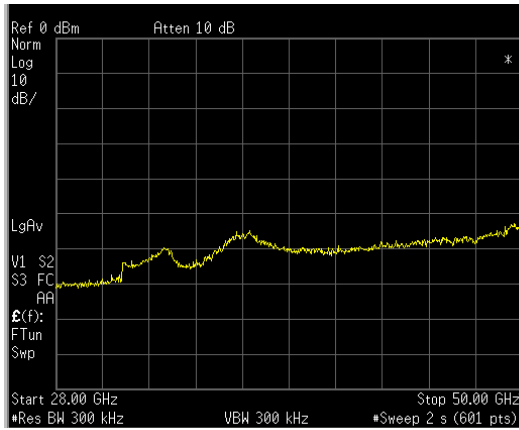
28 to 50GHz

(2.1051)

Scale

↑ 10dB/Div

→ 2.2GHz/Div



Spurious signal

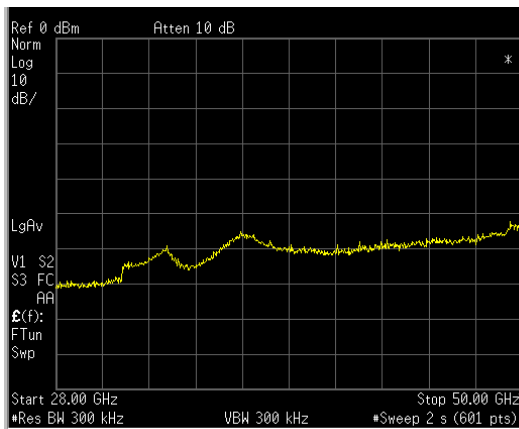
0.25 μ s Pulse

28 to 50GHz

Scale

↑ 10dB/Div

→ 2.2GHz/Div



Spurious signal

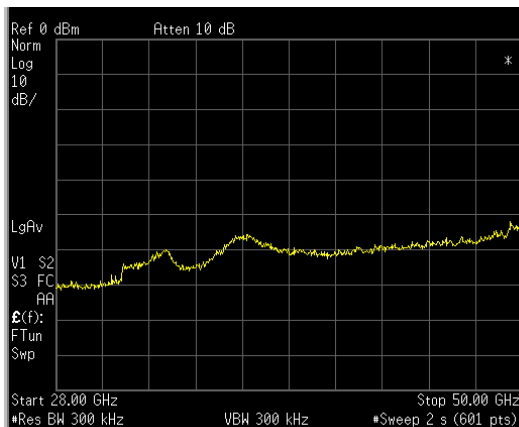
0.5 μ s Pulse

28 to 50GHz

Scale

↑ 10dB/Div

→ 2.2GHz/Div



Spurious signal

0.80 μ s Pulse

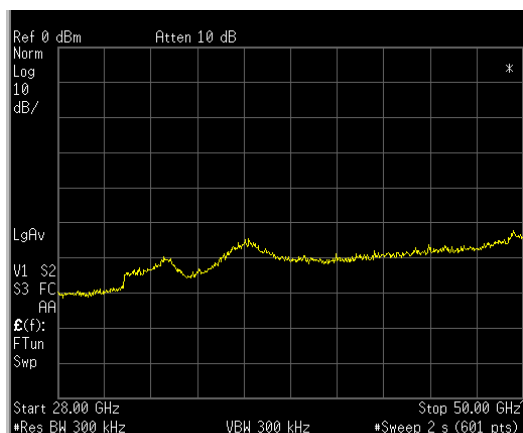
28 to 50GHz

(2.1051)

Scale

↑ 10dB/Div

→ 2.2GHz/Div

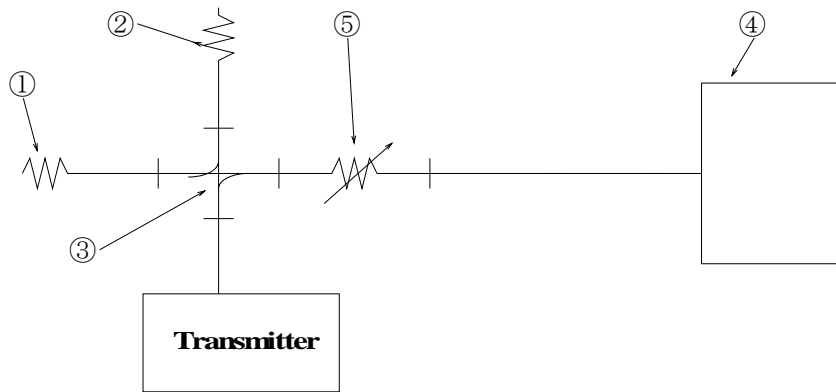


Spurious signal

1.0 μ s Pulse

28 to 50GHz

(Sec.2.1055) 4.0 Frequency Stability



1. Dummy Load	PE6815	PASTERNAK
2. High Power Dummy Load	PE6824	PASTERNAK
3. Directional Coupler	5D363	SHIMADARIKA
Coupling	30dB	
Directivity	30dB	
4. Spectrum Analyzer	E4448A	Agilent
5. Attenuator	8495B	HP
Temperature Chamber	T-15S	TABAI

Measurement Procedure

- 1 The antenna pedestal, Transceiver and display unit were set up in the temperature chamber and the measurement equipment were set outside the temperature chamber.
- 2 With power removed , the temperature was decreased to $-30\text{ }^{\circ}\text{C}$ and permitted to stabilize for three hours. Power was applied and measured warm-up time. After 30 minutes place the radar in X-MIT, measured frequency at DC +20.4V (24V-15%), DC +27.6V (24V+15%).
- 3 With power off , the temperature was raised in $10\text{ }^{\circ}\text{C}$ steps. The sample was permitted to stabilize at each step for at least three hours. Power was applied and measured warm-up time. After 30 minutes place the radar in X-MIT, measured frequency at DC +20.4V (24V-15%), DC +27.6V (24V+15%).

Temperature [°C]	Operating Frequency [MHz]						Warm-Up Time (min) <X-MIT>
	0.08 μ S Pulse		0.25 μ S Pulse		0.5 μ S Pulse		
	20.4	27.6	20.4	27.6	20.4	27.6	
- 25	9409	9410	9410	9409	9410	9410	30
- 20	9409	9409	9409	9409	9410	9410	30
- 10	9406	9406	9408	9409	9410	9410	30
0	9404	9404	9405	9406	9407	9407	30
+10	9402	9403	9404	9404	9404	9404	30
+20	9401	9401	9403	9402	9402	9402	30
+30	9399	9399	9400	9400	9400	9400	30
+40	9398	9398	9399	9399	9400	9400	30
+50	9398	9398	9399	9399	9400	9400	30
+55	9398	9398	9399	9399	9400	9400	30

Temperature [°C]	Operating Frequency [MHz]						Warm-Up Time (m) <X-MIT>
	0.8 μ S Pulse		1.0 μ S Pulse				
	20.4	27.6	20.4	27.6			
- 25	9410	9409	9407	9408			30
- 20	9409	9408	9407	9408			30
- 10	9408	9408	9407	9407			30
0	9405	9405	9404	9404			30
+10	9403	9403	9402	9402			30
+20	9402	9402	9401	9401			30
+30	9399	9399	9398	9398			30
+40	9398	9398	9397	9397			30
+50	9398	9397	9396	9395			30
+55	9398	9397	9396	9395			30

SECTION 5

TEST: Spurious Emissions Field Strength

EQUIPMENT: JMA-5312 S/N LB00221

FCC SPECIFICATION: Sections 2.1053.

MINIMUM STANDARD: Mean power of emissions originating in equipment lowest generated frequency to at least 40 GHz shall be attenuated below the mean power of the transmitter by at least 43 plus 10 log (mean power in watts) decibels. Since transmitter mean power is 5.54 watts maximum (long pulse) or 37.4 dBm:

$$\begin{aligned} \text{Emissions} &\leq 37.4 \text{ dBm} - [43 + 10 \log(5.54)] \text{ dBm} \\ &\leq -13.0 \text{ dBm} \end{aligned}$$

TEST RESULTS: No spurious emissions observed above minimum standard.

TEST CONDITIONS: $T_{amb} = 20^{\circ}\text{C}$ to 25°C $RH_{amb} = 40\% \sim 60\%$
Eut input = 24 VDC

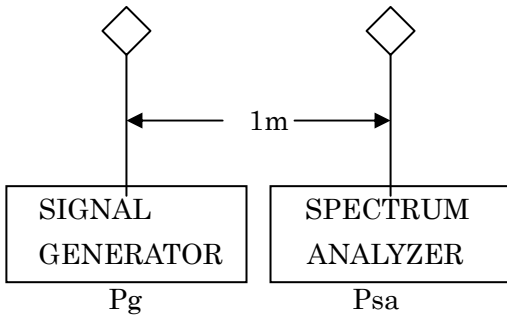
STABILIZATION: EUT energized for 10 minutes minimum.

TEST EQUIPMENT: JRC Original – Shielded Room
Other equipment – see test set-ups.

DATE: July,24 August,2.2008

TEST ENGINEER: M.ITOH

CALIBRATION OF TESTS 1~5 (0~1GHz)



A signal source of known amplitude was used as a calibrating signal with identical antenna on the generator and the spectrum analyzer.

From previous testing in the shielded room, the antenna factors are considered much greater than path loss.

Hence half of the difference in signals P_g and P_{sa} is due to each antenna.

The calibrating signal on the analyzer is therefore:

$$P_{cal} = P_{sa} - (P_{sa} - P_g) / 2 = (P_{sa} + P_g) / 2 \text{ dBm.}$$

The log ref level on the analyzer is adjusted so as to read other signals directly:

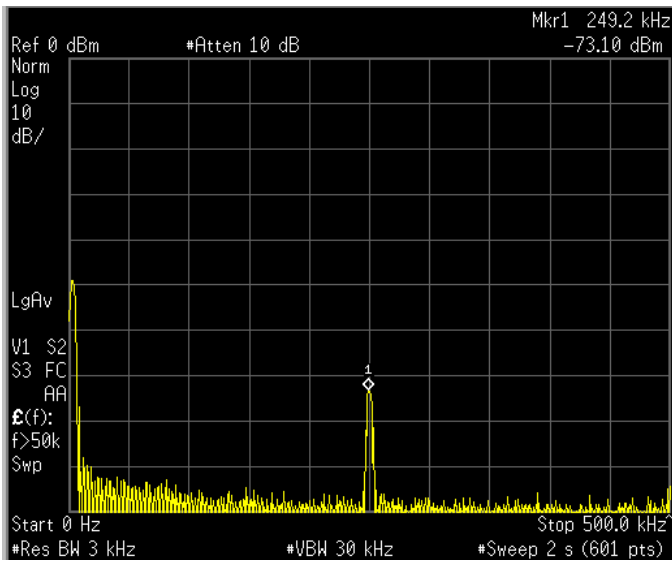
$$\text{LRL (adjusted)} = \text{LRL(set)} + P_{cal} - P_{sa} \text{ dBm.}$$

The calibrating signal used was selected on the basis of best average amplitude over the frequency range of interest.

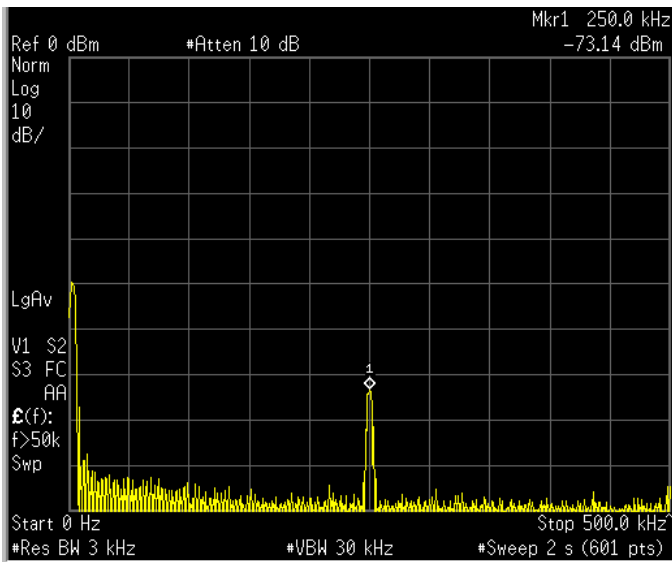
TEST	CAL sig	P_{sa}	P_g	P_{cal}	LRL(set)	LRL(adj)
1	250 kHz	-73	0	-36.5	0	36.5
2	2.5 MHz	-55	0	-27.5	0	27.5
3	25 MHz	-29	0	-14.5	0	14.5
4	250 MHz	-33	0	-16.5	0	16.5
5	500 MHz	-28	0	-14.0	0	14.0

TEST #1 Frequency Band: 0~500KHz

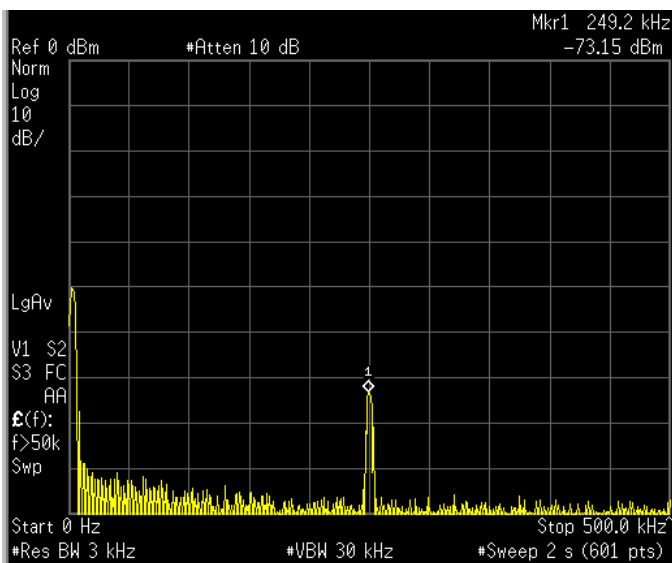
Log Ref. Level:36.5 dBm



Ambient



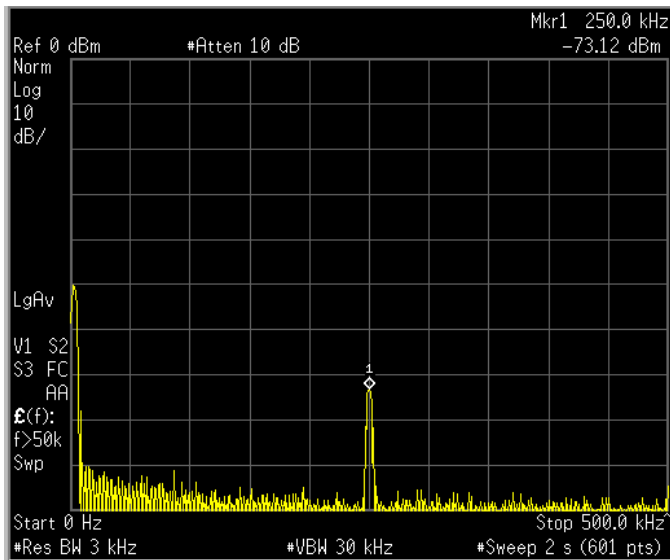
Stand-By



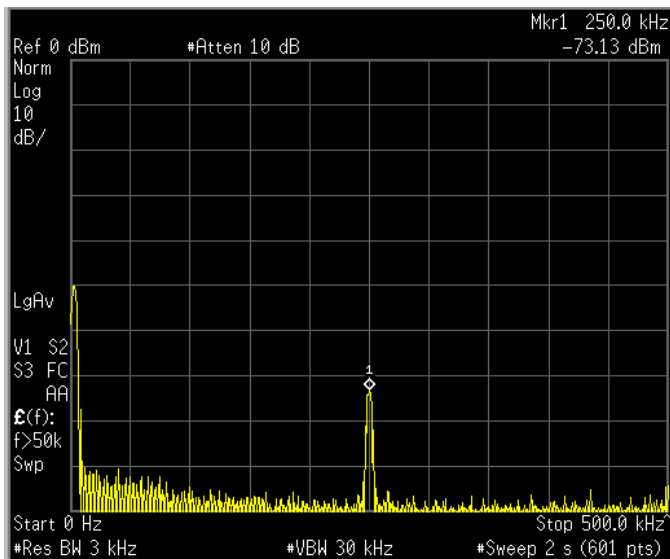
0.08 μ S Pulse

TEST #1 Frequency Band: 0~500KHz

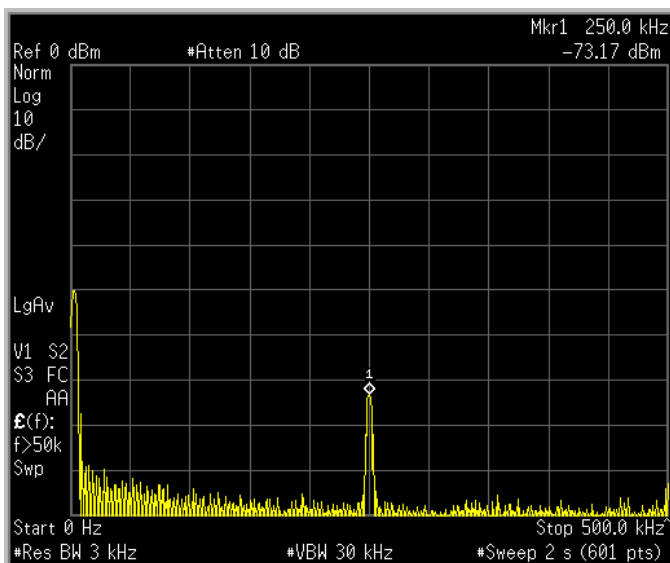
Log Ref. Level:36.5 dBm



0.25 μ S Pulse



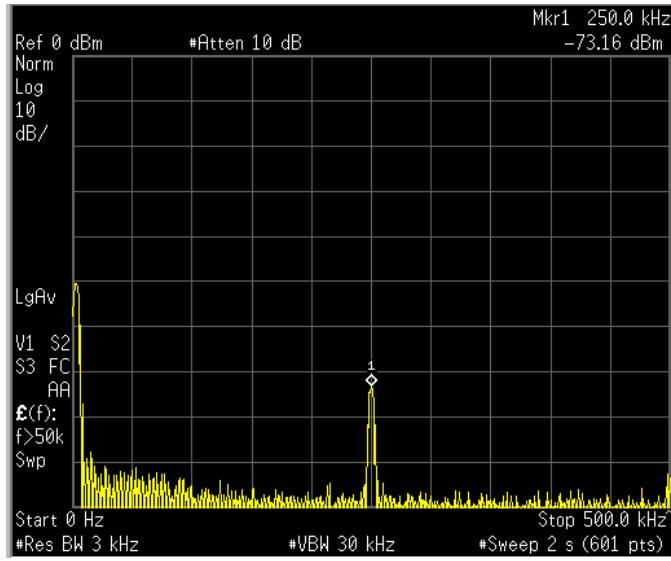
0.5 μ S Pulse



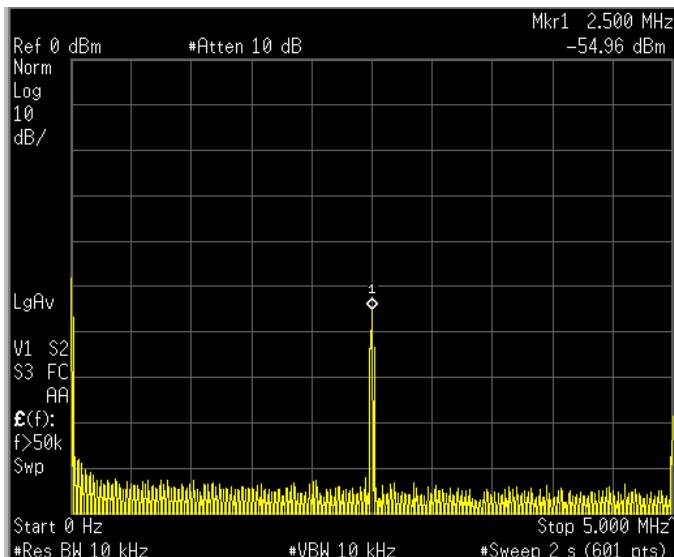
0.8 μ S Pulse

TEST #1 Frequency Band: 0~500KHz

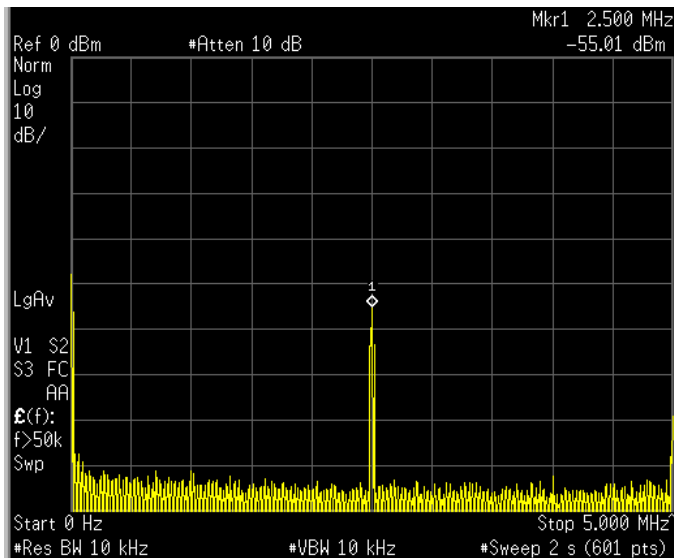
Log Ref. Level:36.5 dBm



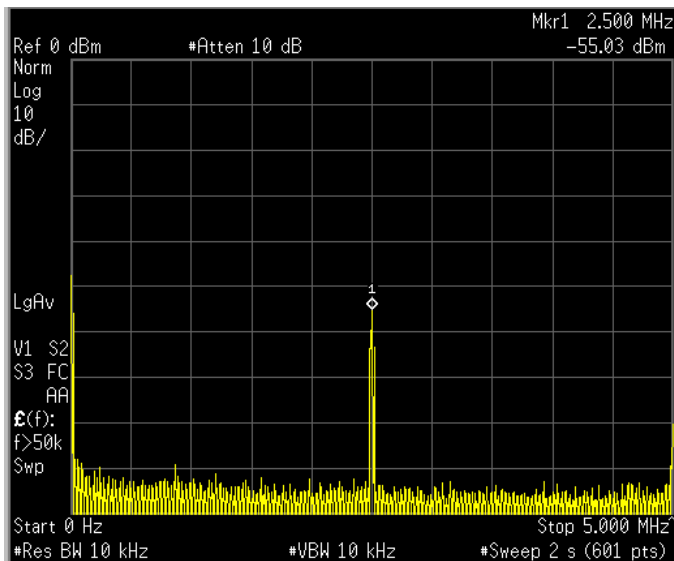
1.0 μ S Pulse



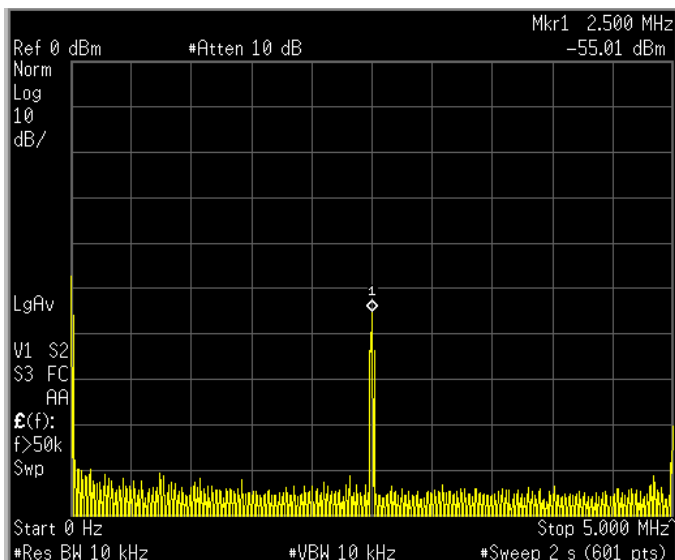
Ambient



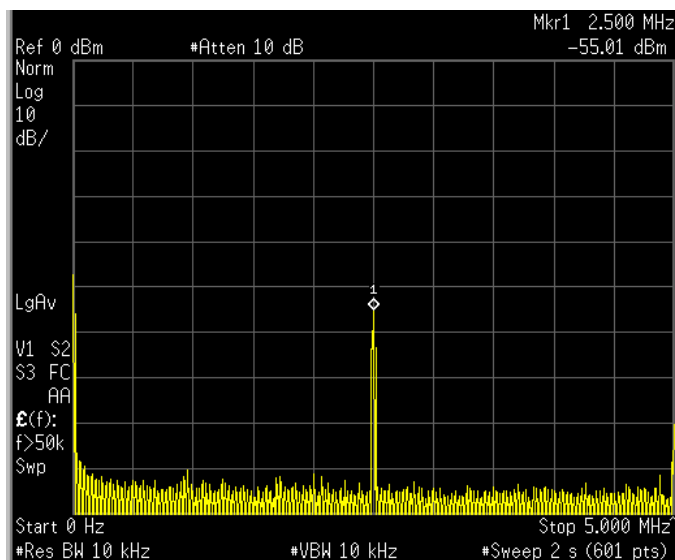
Stand-By



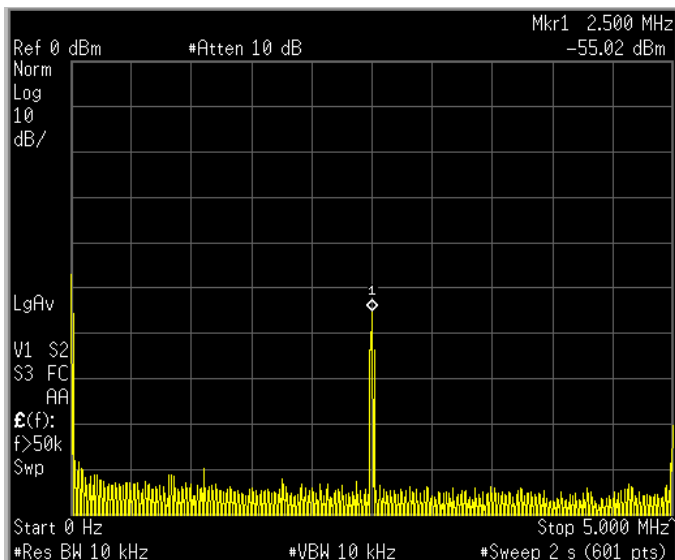
0.08 μ S Pulse



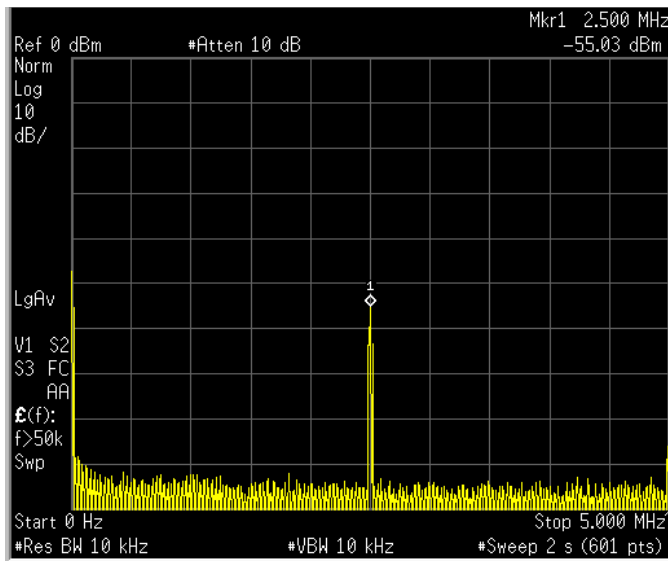
0.25 μ S Pulse



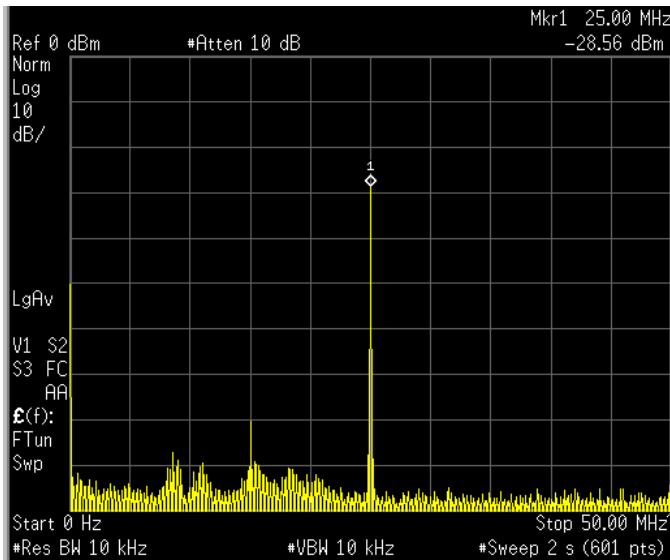
0.5 μ S Pulse



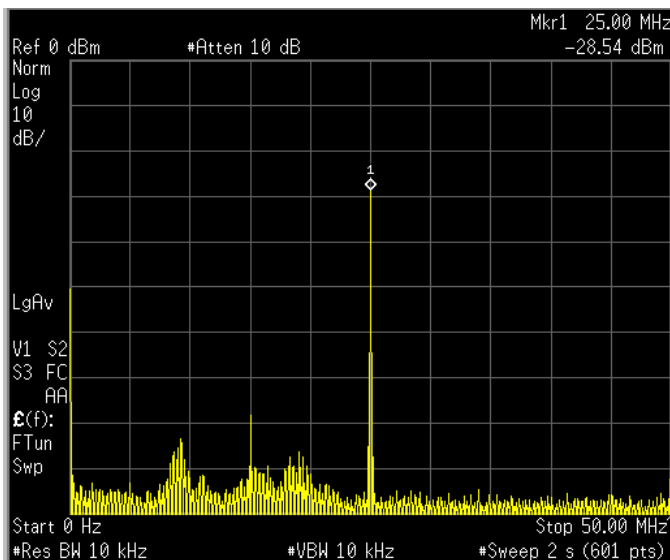
0.8 μ S Pulse



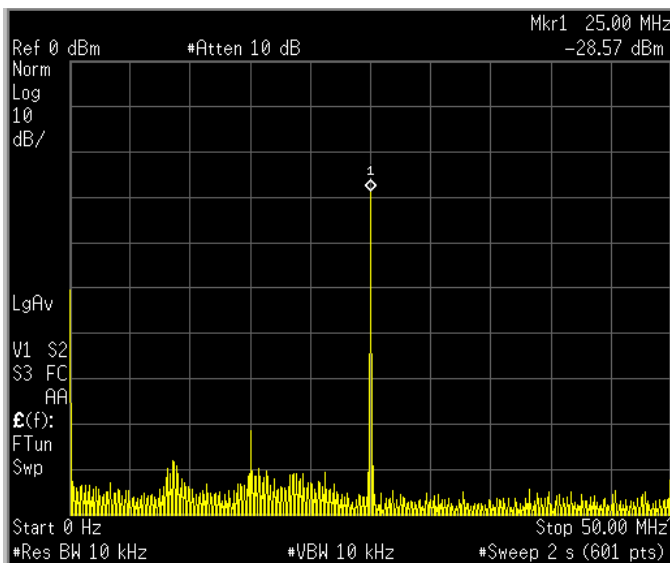
1.0 μ S Pulse



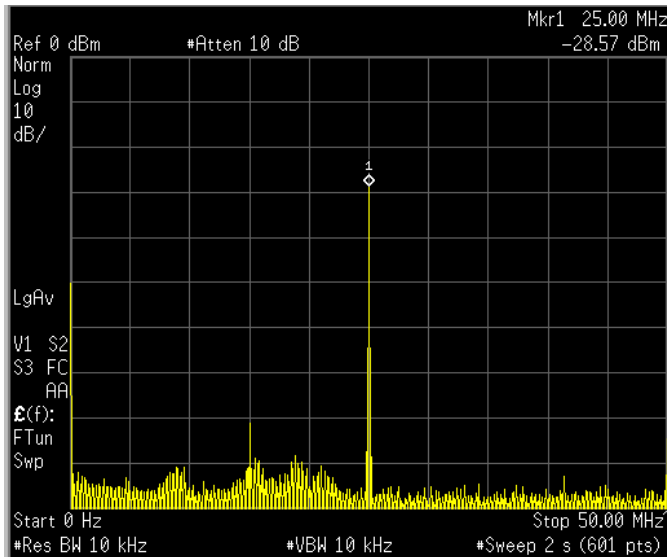
Ambient



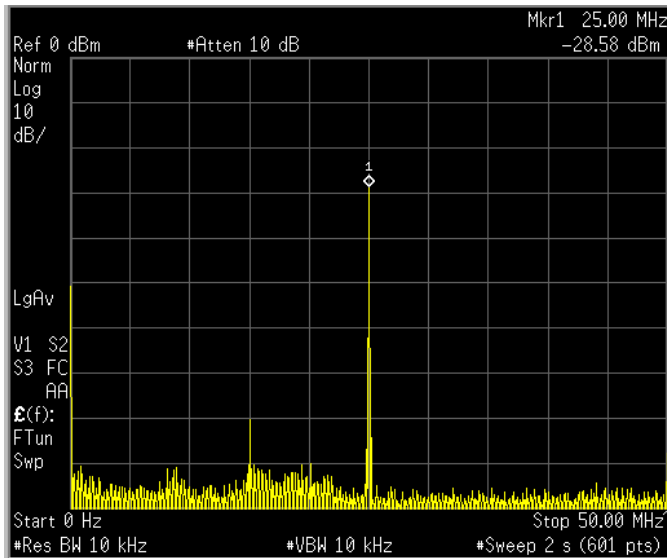
Stand-By



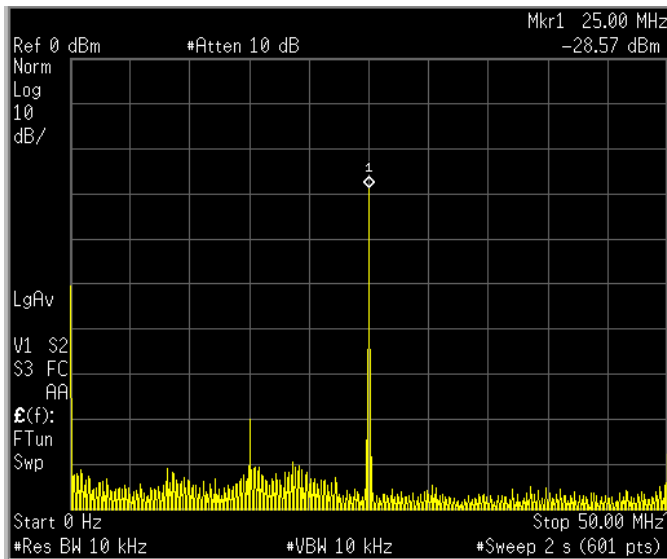
0.08 μ S Pulse



0.25 μ S Pulse



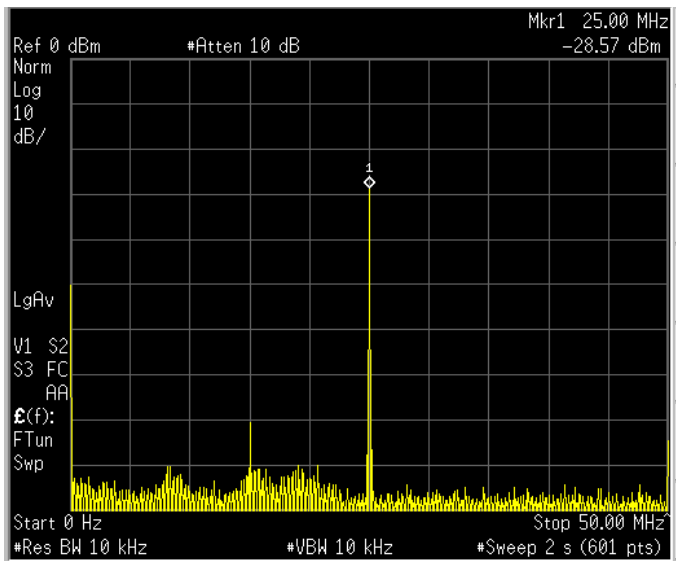
0.5 μ S Pulse



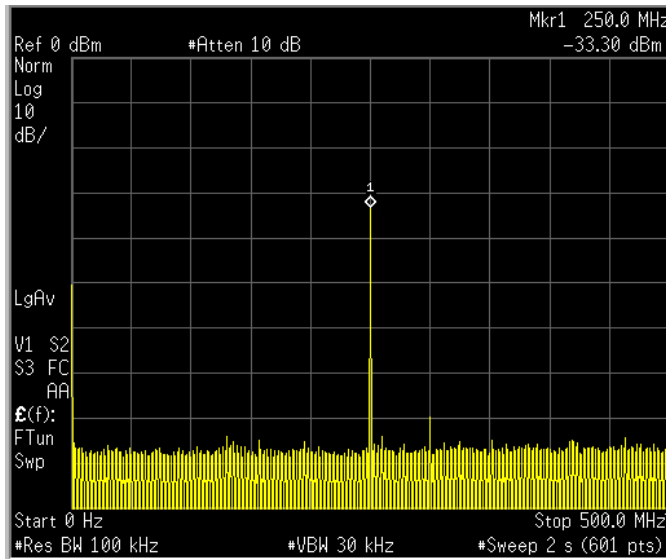
0.8 μ S Pulse

TEST #3 Frequency Band: 0~50MHz

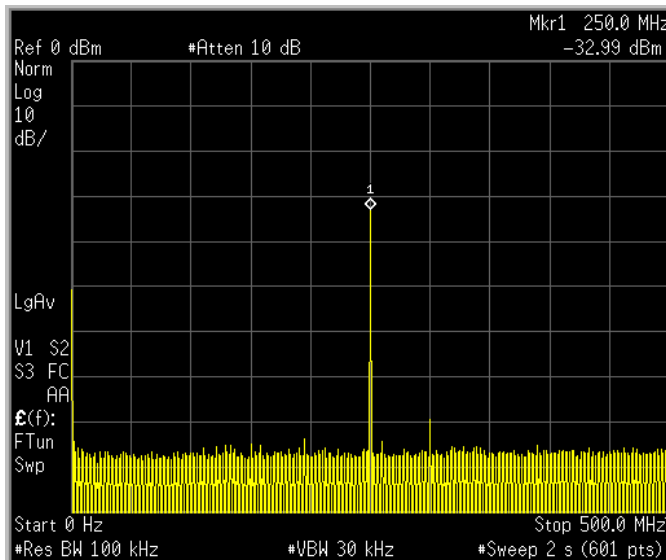
Log Ref. Level:14.5 dBm



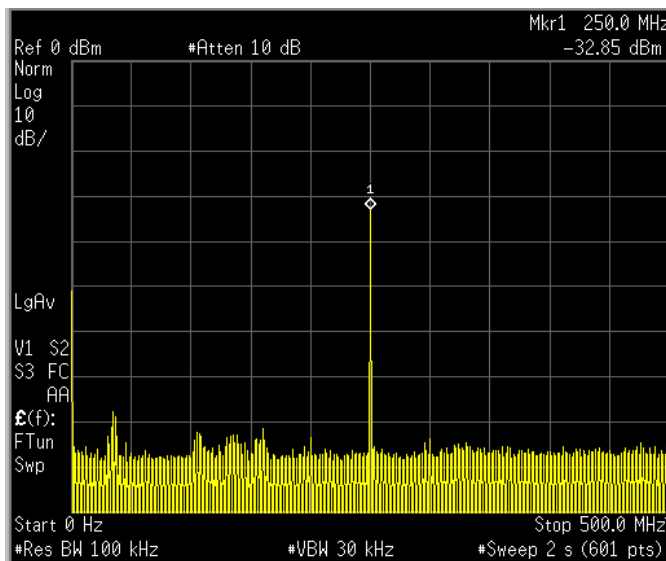
1.0 μ S Pulse



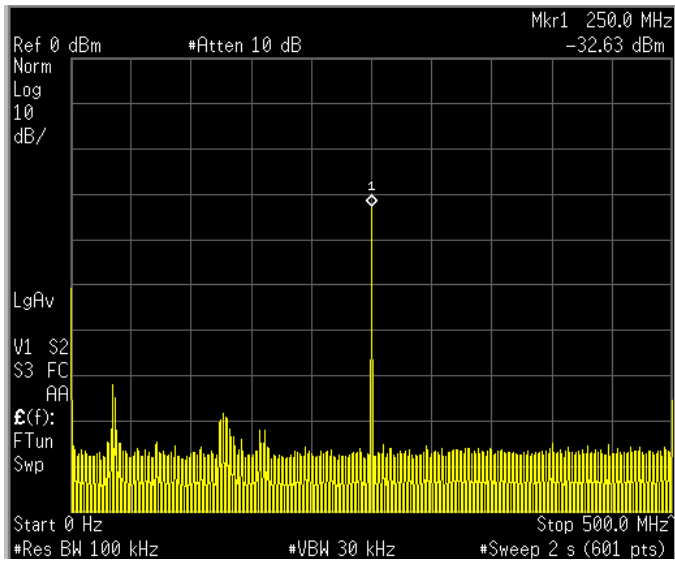
Ambient



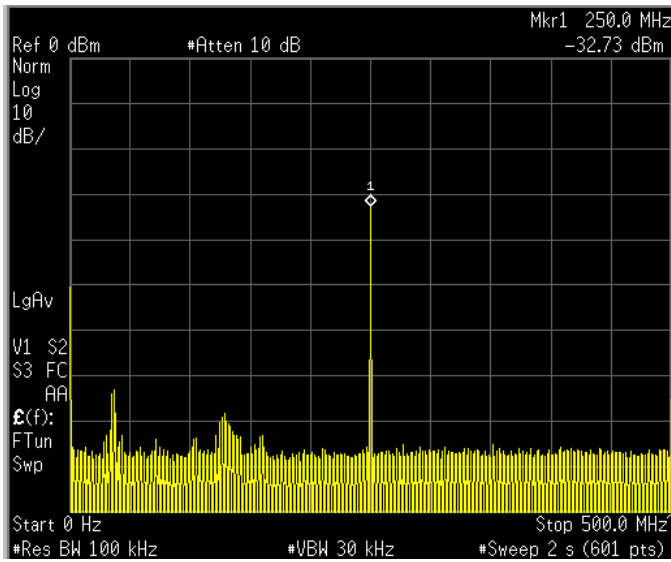
Stand-By



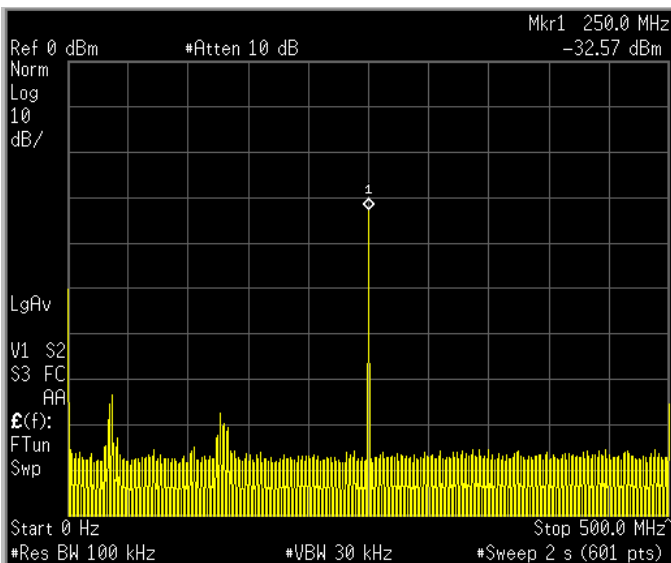
0.08 μ S Pulse



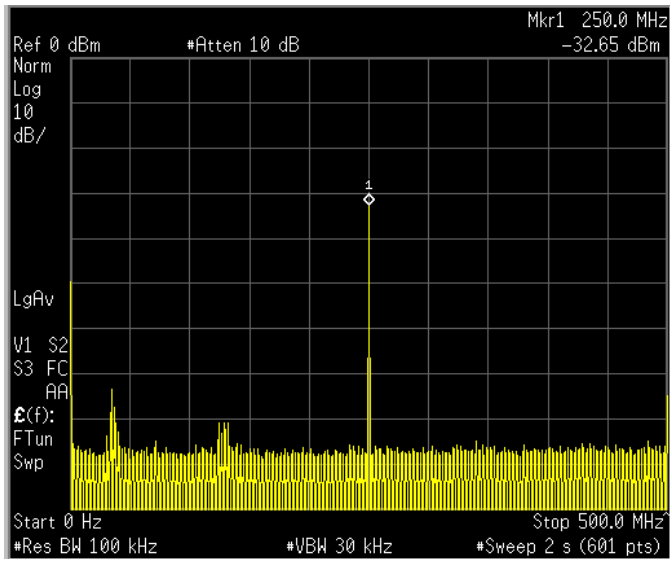
0.25 μ S Pulse



0.5 μ S Pulse



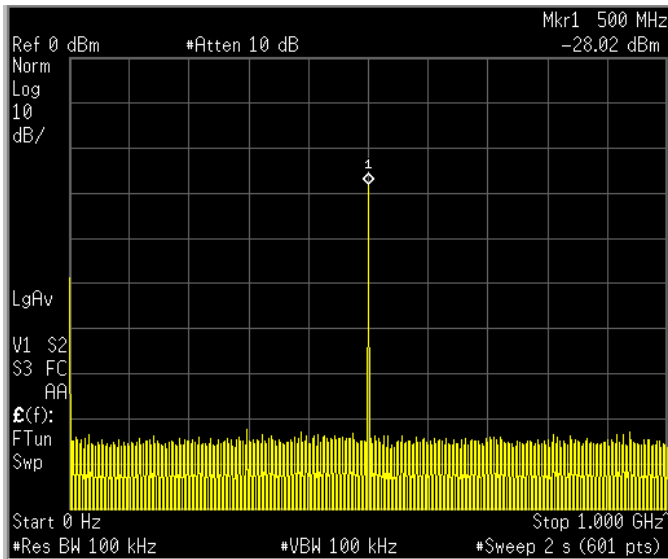
0.8 μ S Pulse



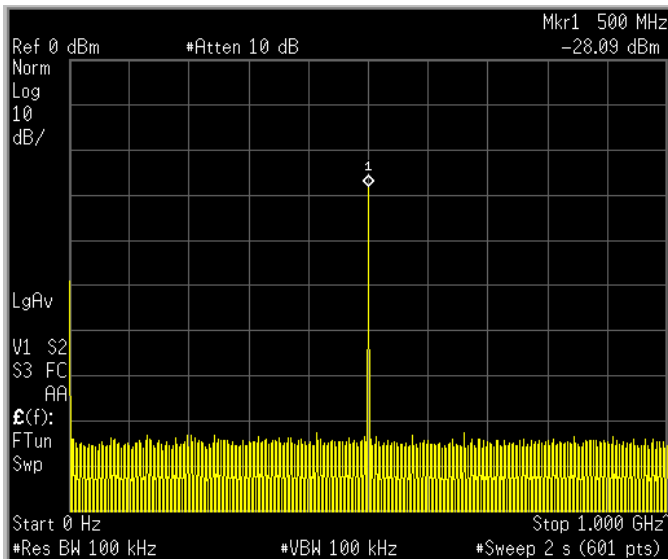
1.0 μ S Pulse

TEST #5 Frequency Band: 0~1GHz

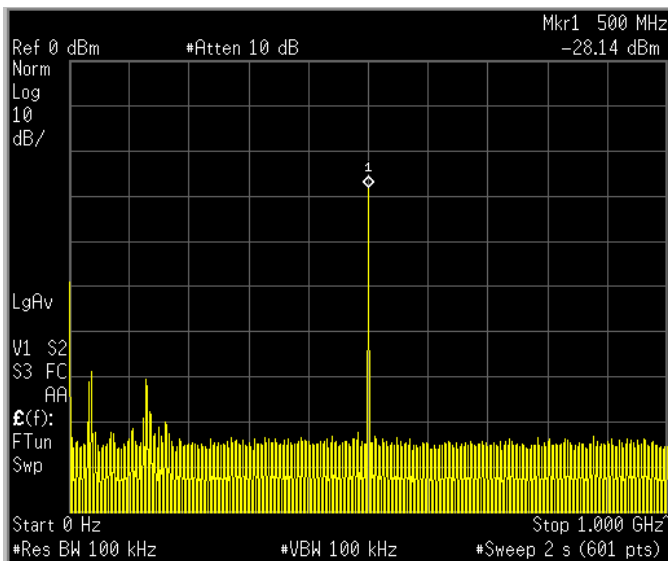
Log Ref. Level:14.0 dBm



Ambient



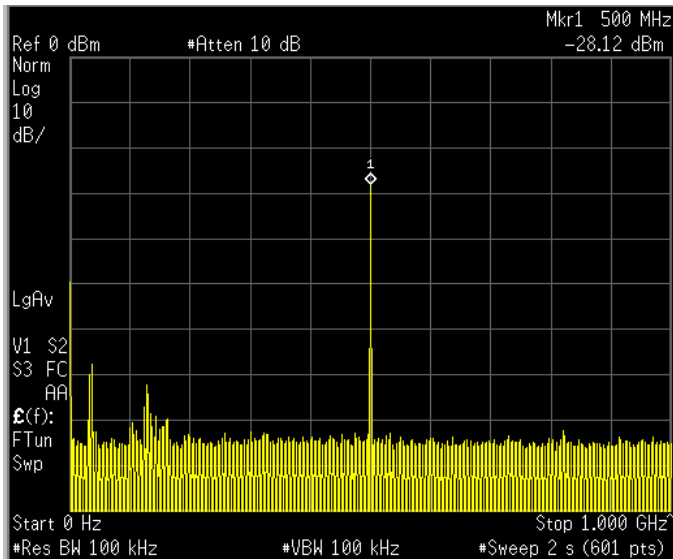
Stand-By



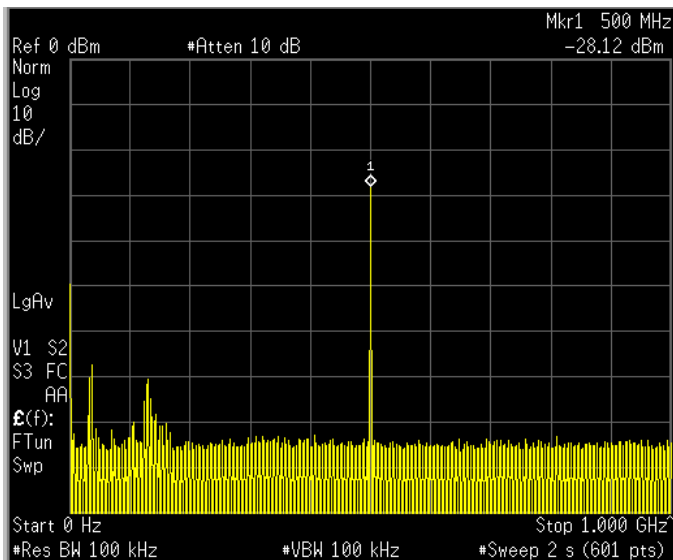
0.08 μ S Pulse

TEST #5 Frequency Band: 0~1GHz

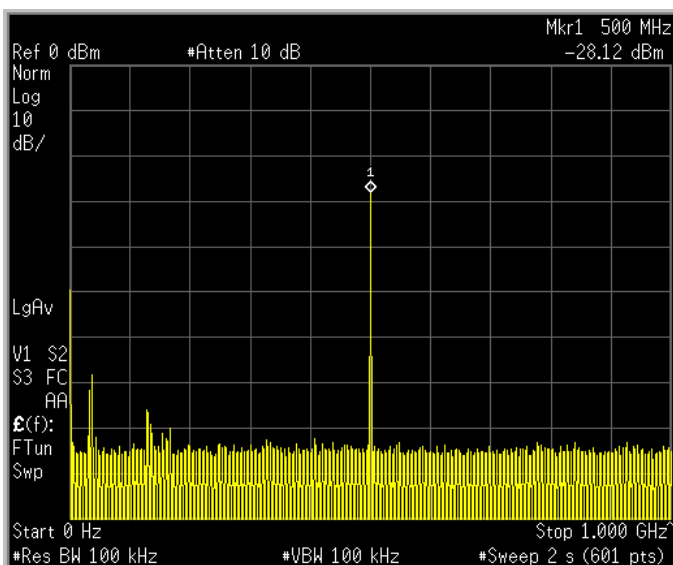
Log Ref. Level:14.0 dBm



0.25 μ S Pulse



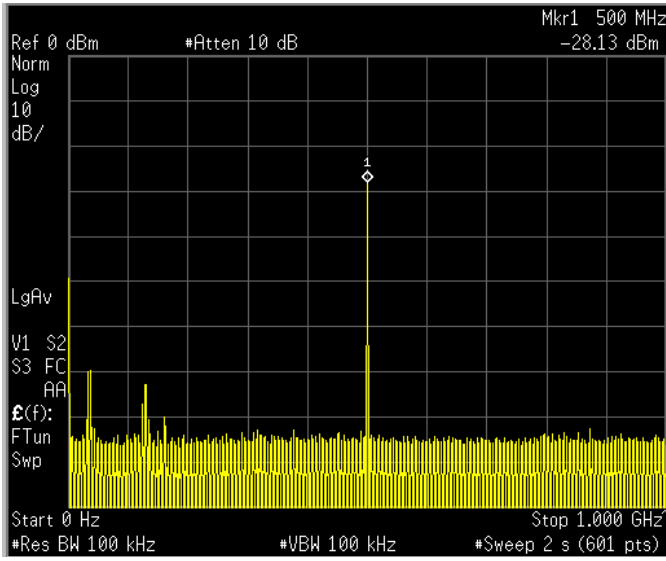
0.5 μ S Pulse



0.8 μ S Pulse

TEST #5 Frequency Band: 0~1GHz

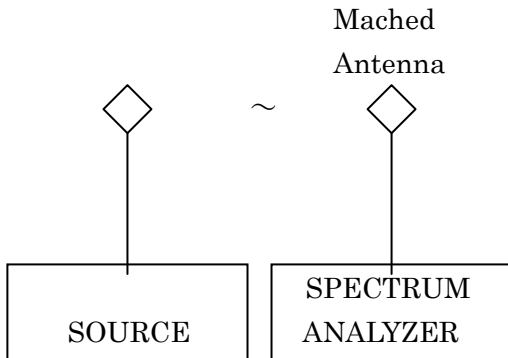
Log Ref. Level:14.0 dBm



1.0 μ S Pulse

CALIBRATION OF TESTS 6~11 (1~50 GHz)

Instead of using a signal source of known amplitude to calibrate the receiving system, the path and antenna characteristics were computed.



$$1.64 P_t$$

The power density at distance R is : $P = \frac{1.64 P_t}{4 \pi R^2}$

Where P_t is power transmitted.

$$P G \lambda^2$$

The power to the analyzer is : $P_{sa} = P_{Ar} = \frac{P G \lambda^2}{4 \pi}$

Where G is the receiving antenna gain and A_r is the effective area of the receiving antenna

$$\text{Hence } P_{sa} = \frac{1.64 P_t}{4 \pi R^2} \times \frac{P G \lambda^2}{4 \pi} = \frac{1.6 G \lambda^2}{16 \pi^2} \times P_t \text{ at 1 meter}$$

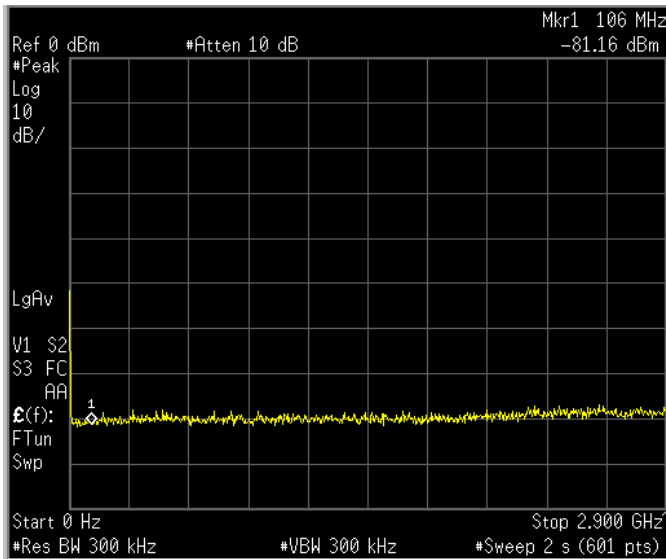
$$\text{and } P_t = \frac{16 \pi^2 P_{sa}}{1.64 G \lambda^2} = \frac{96.3 P_{sa}}{G \lambda^2}$$

$$= P_{sa} \text{ (dBm)} + 19.8 \text{ (dB)} - G \text{ (dB)} - 20 \log \lambda \text{ (dB)}$$

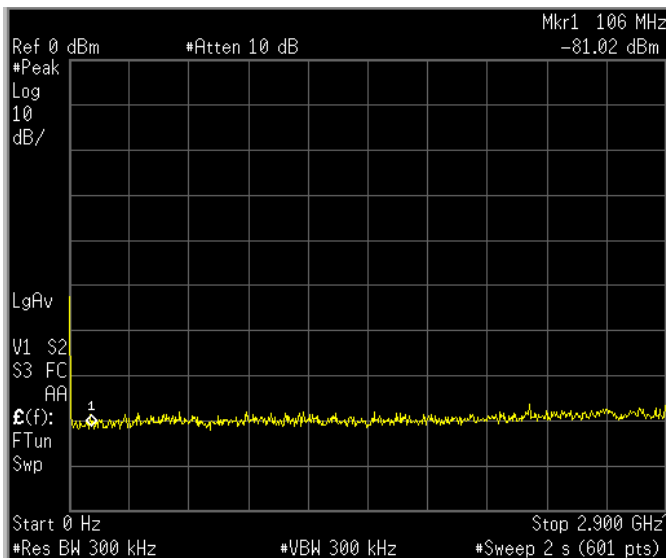
TEST	HORN GAIN (AVG) dB		WAVELENGTH (dB)		Pt - Psa		LOG REF LEVEL	
	LO	HI	LO	HI	LO	HI		
6		6	-10.5	-21.6	24.3	35.4	0 dBm	0 – 2.9 G
7		6	-21.3	-28.0	35.1	41.8	0 dBm	2.9 – 6.4 G
8		6	-27.6	-34.1	41.4	47.9	0 dBm	6.4 – 12.5G
9		6	-31.2	-35.6	45.0	49.4	0 dBm	12.5 – 20 G
10	23.3	24.9	-35.6	-38.8	32.1	33.7	0 dBm	12.4 – 28 G
11	23.6	25.1	-39.4	-42.5	35.6	37.2	0 dBm	28 – 50 G

TEST #6 Frequency Band: 0~2.9 GHz

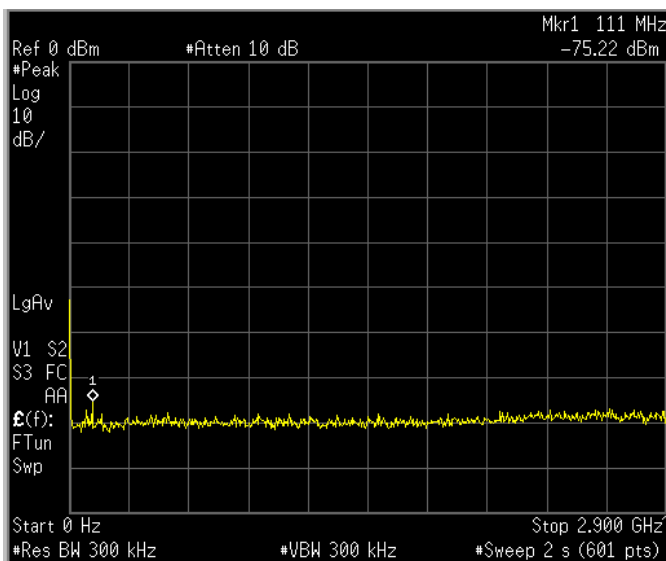
Log Ref. Level:0 dBm



Ambient



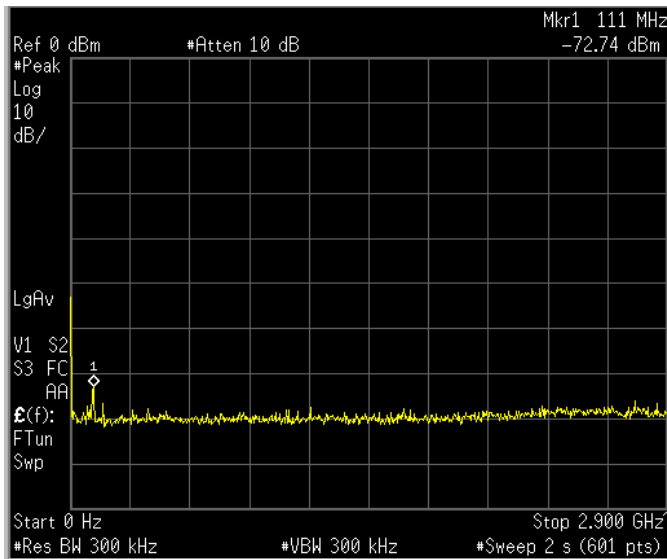
Stand-By



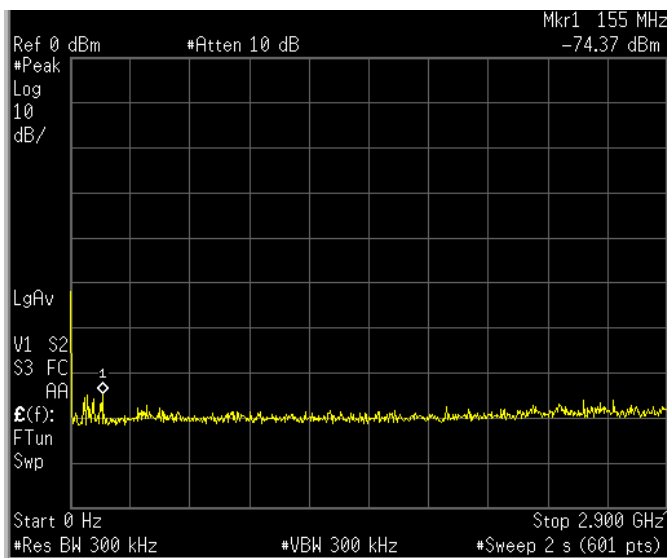
0.08 μ S Pulse

TEST #6 Frequency Band: 0~2.9 GHz

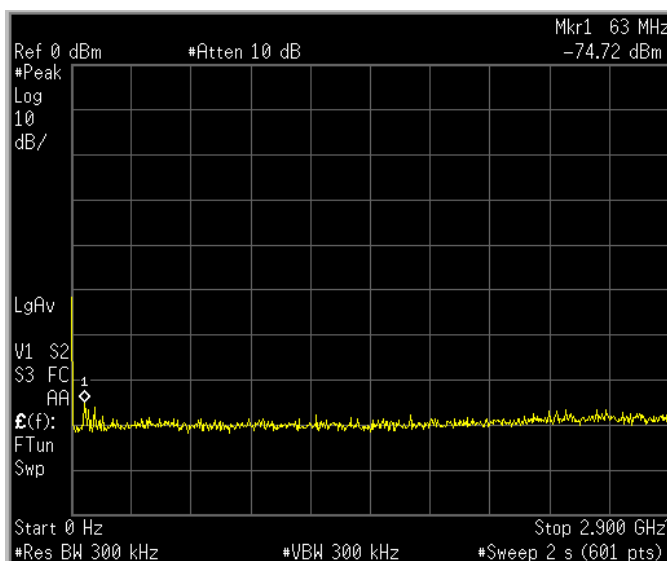
Log Ref. Level:0 dBm



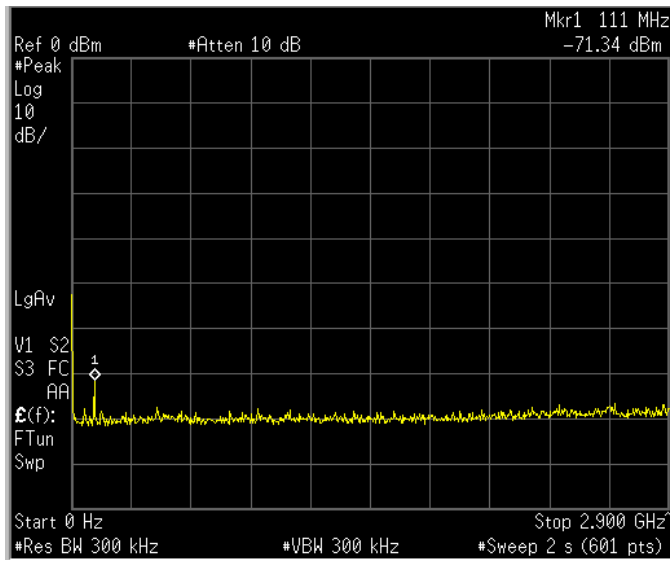
0.25 μ S Pulse



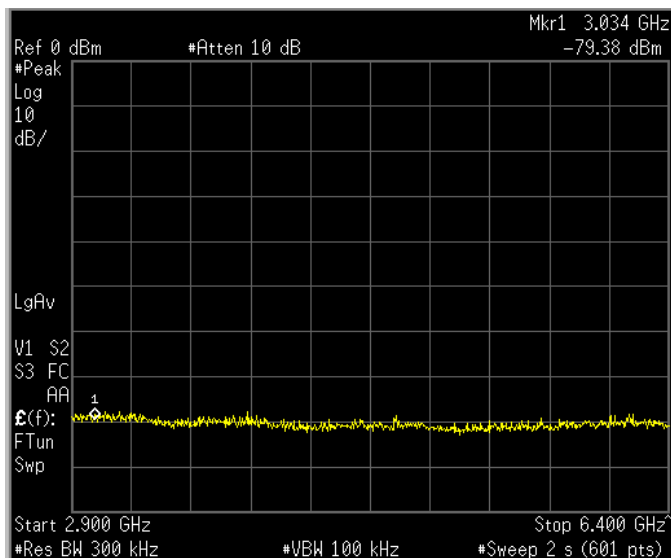
0.5 μ S Pulse



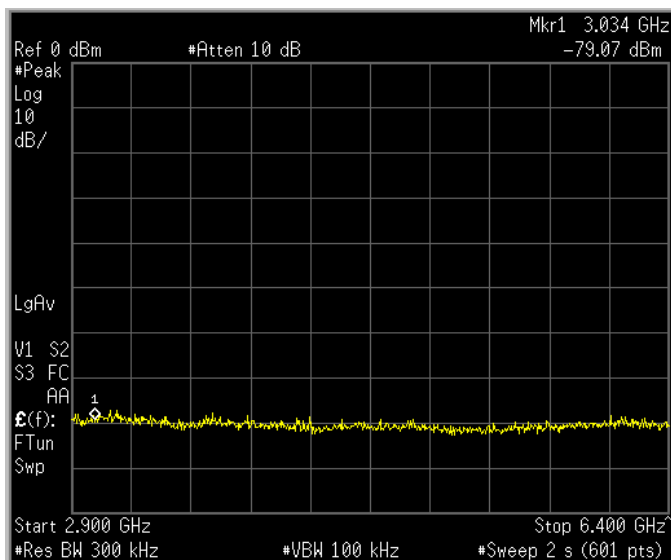
0.8 μ S Pulse



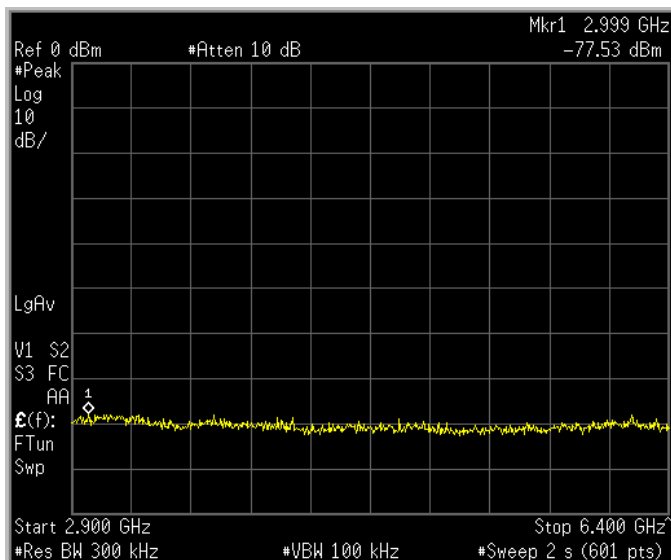
1.0 μ S Pulse



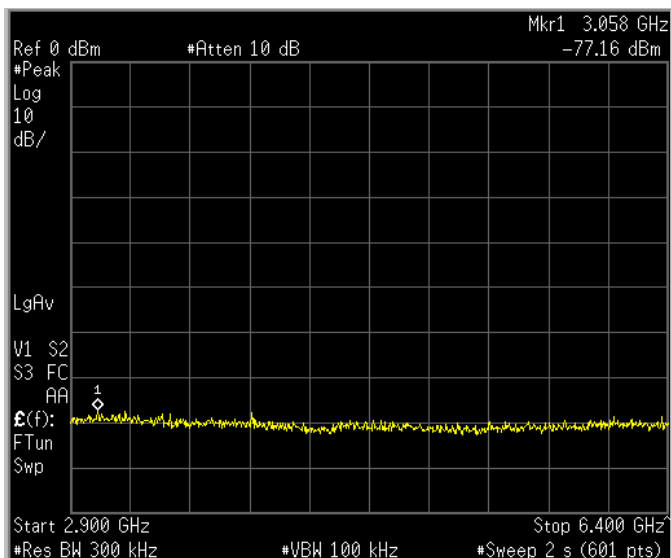
Ambient



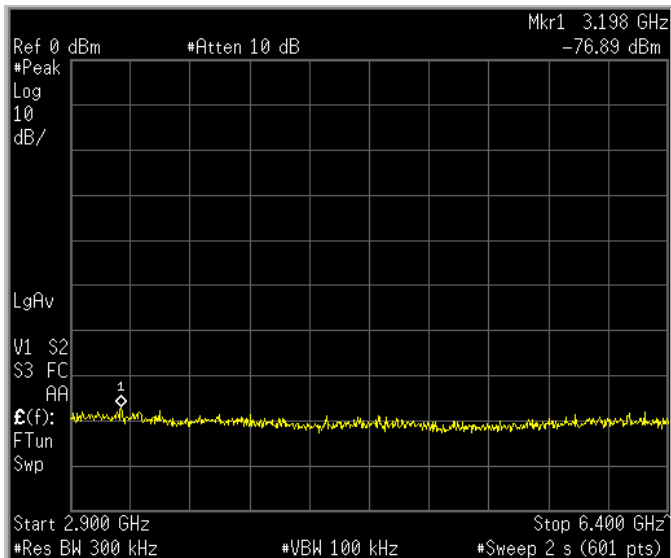
Stand-By



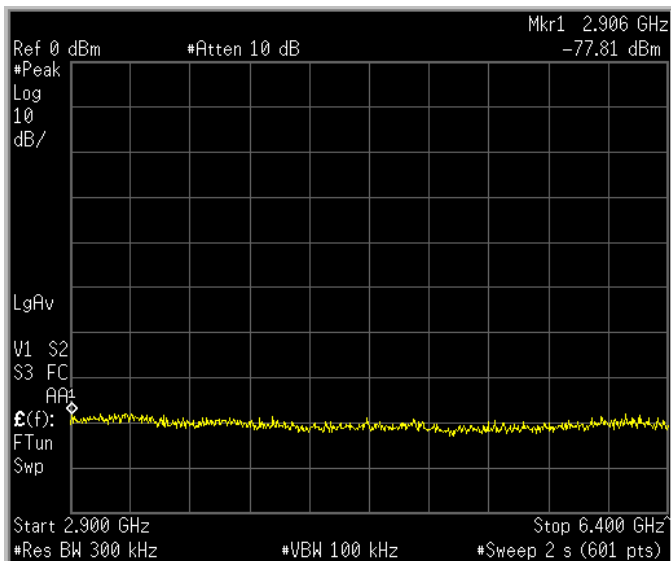
0.08 μ S Pulse



0.25 μ S Pulse



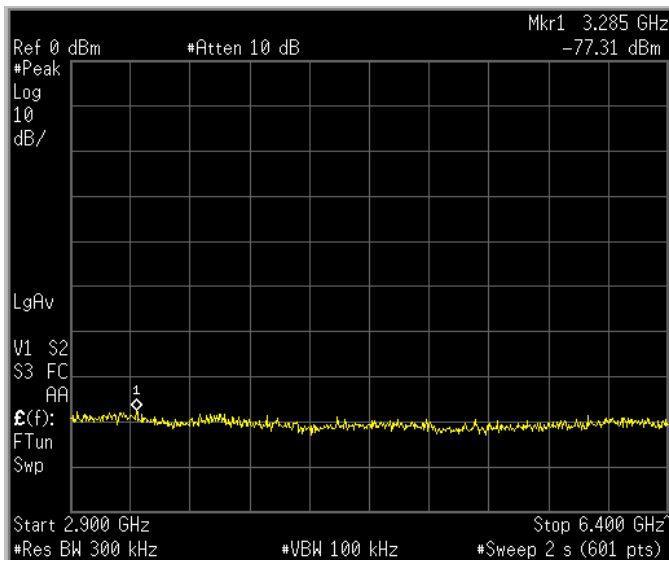
0.5 μ S Pulse



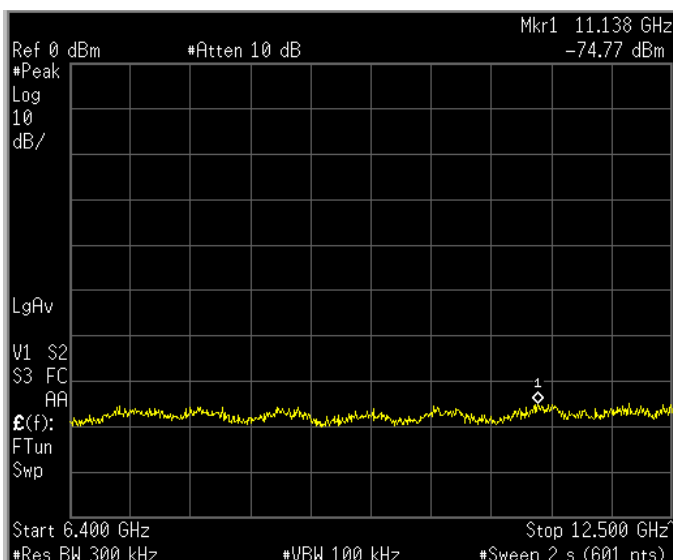
0.8 μ S Pulse

TEST #7 Frequency Band: 2.9~6.4GHz

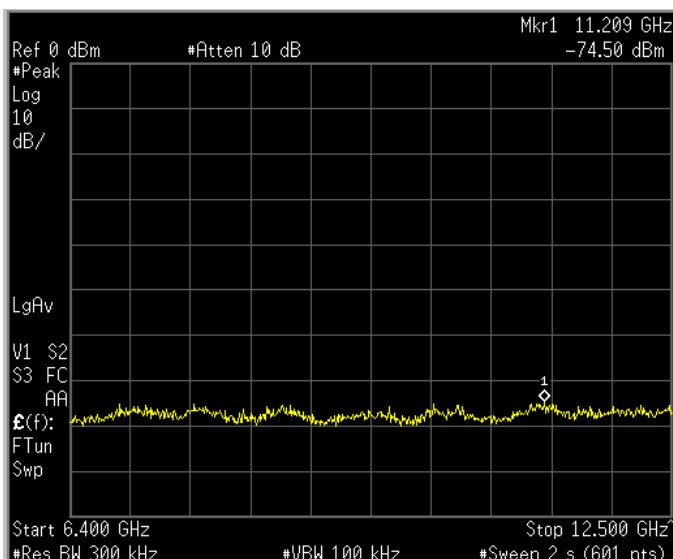
Log Ref. Level:0 dBm



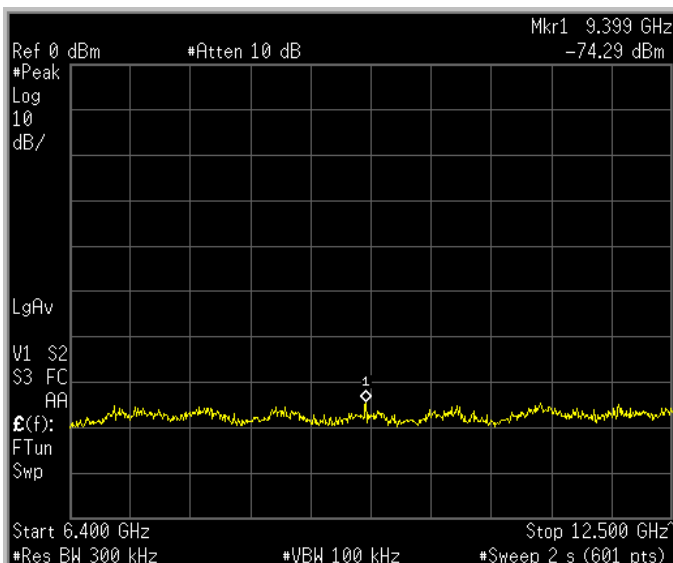
1.0 μ S Pulse



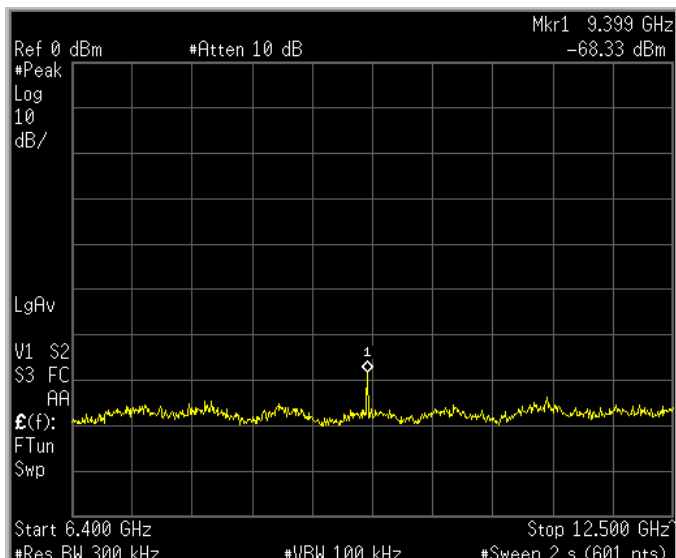
Ambient



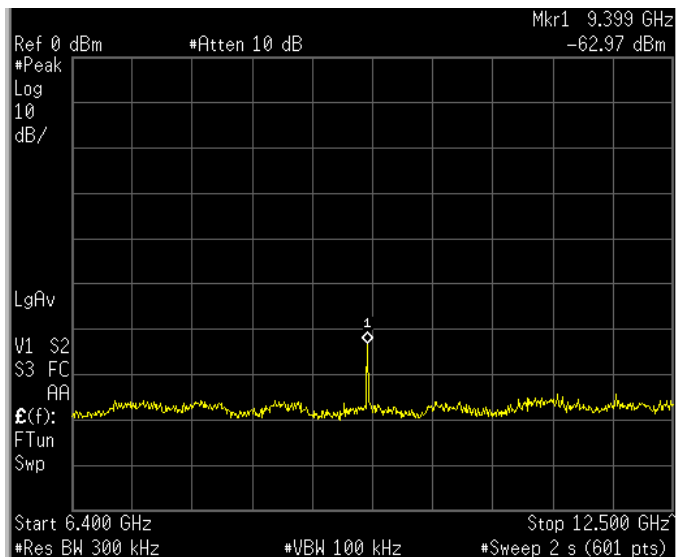
Stand-By



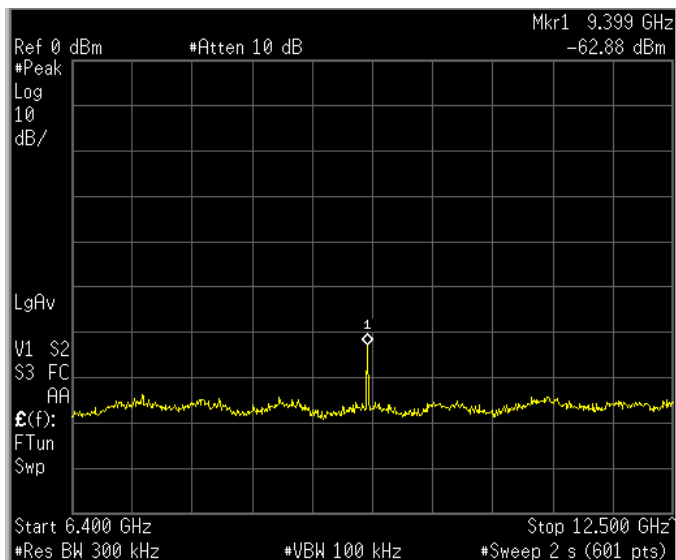
0.08 μ S Pulse



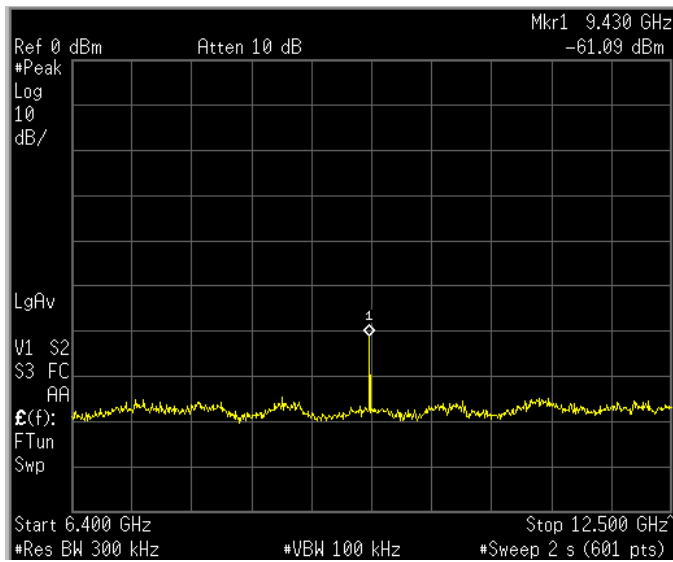
0.25 μ S Pulse



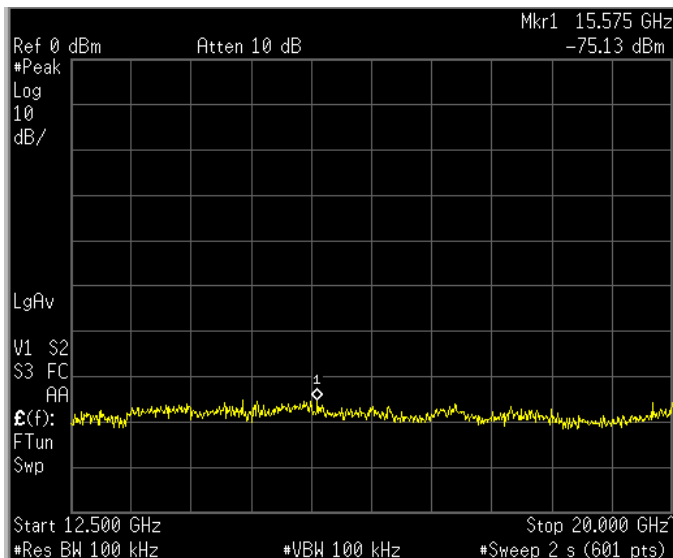
0.5 μ S Pulse



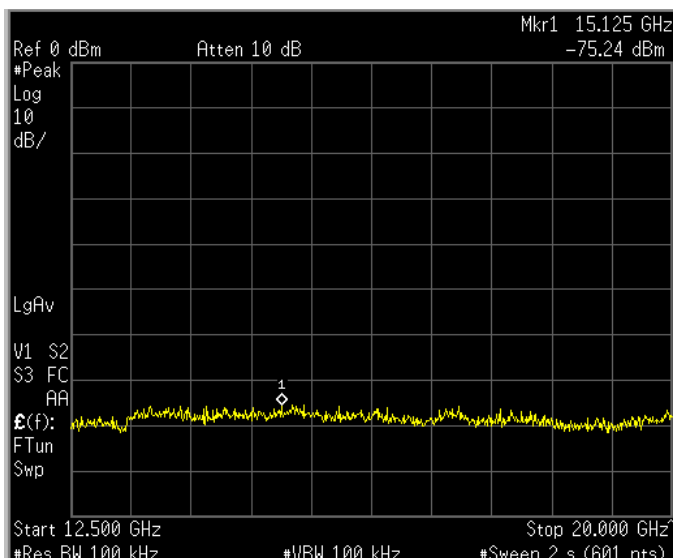
0.8 μ S Pulse



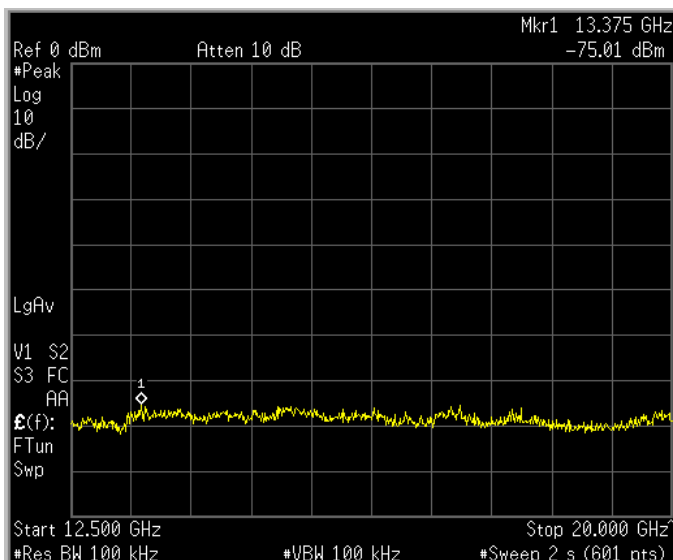
1.0 μ S Pulse



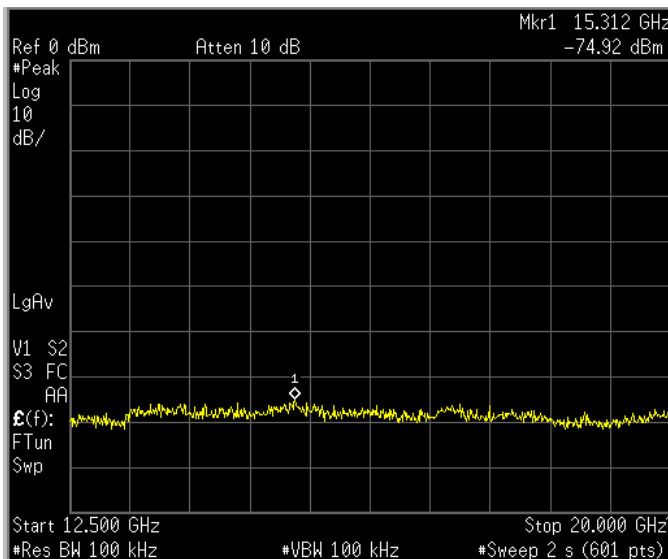
Ambient



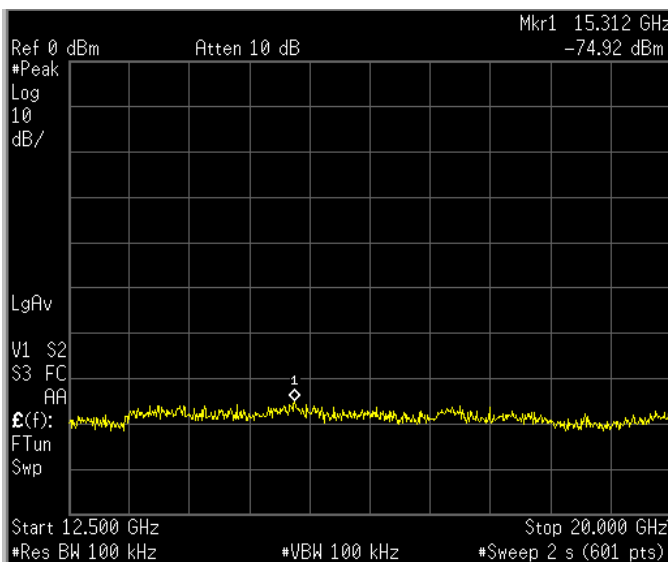
Stand-By



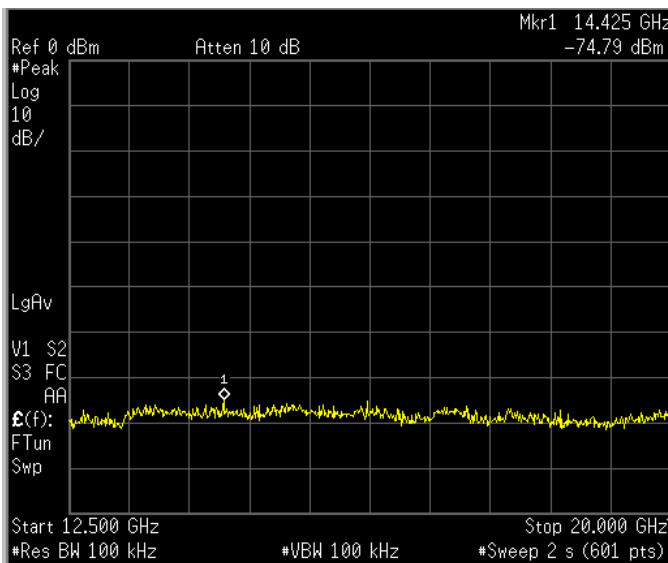
0.08 μ S Pulse



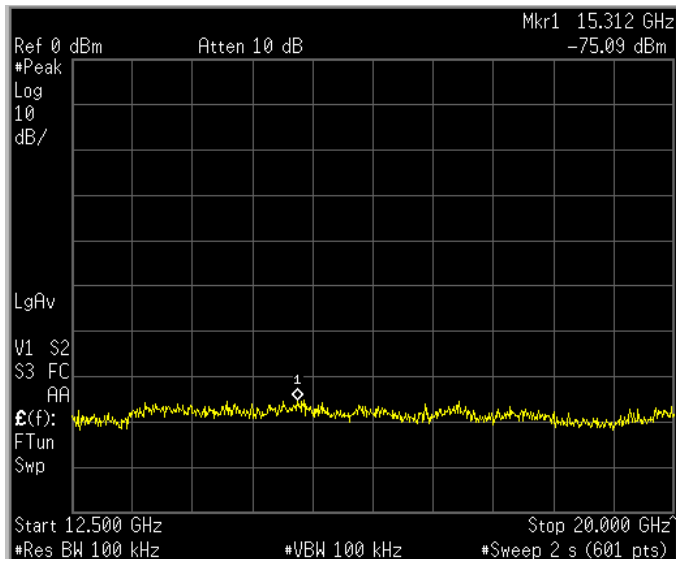
0.25 μ S Pulse



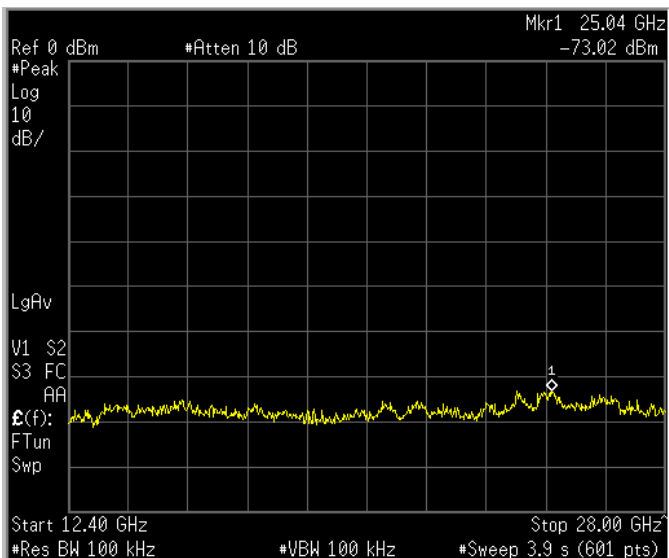
0.5 μ S Pulse



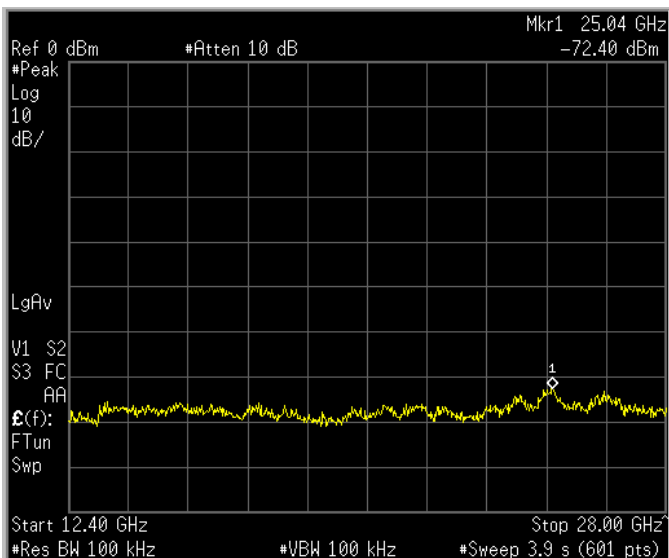
0.8 μ S Pulse



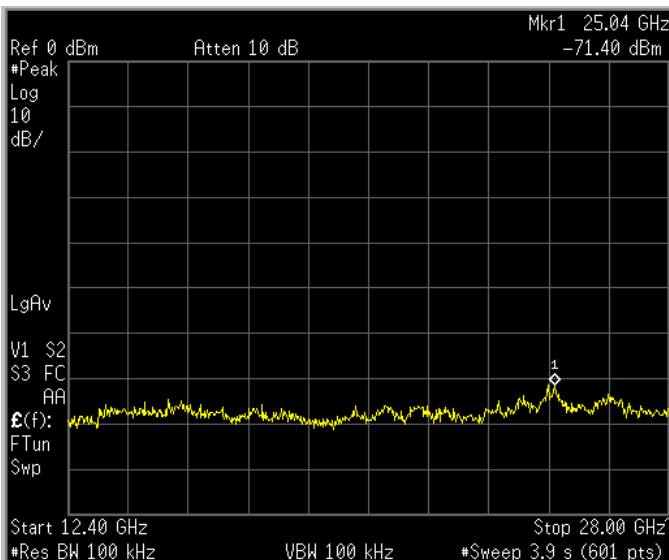
1.0 μ S Pulse



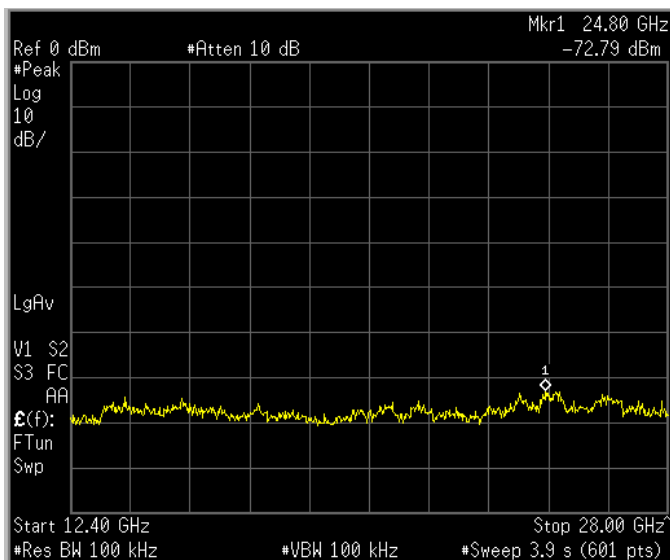
Ambient



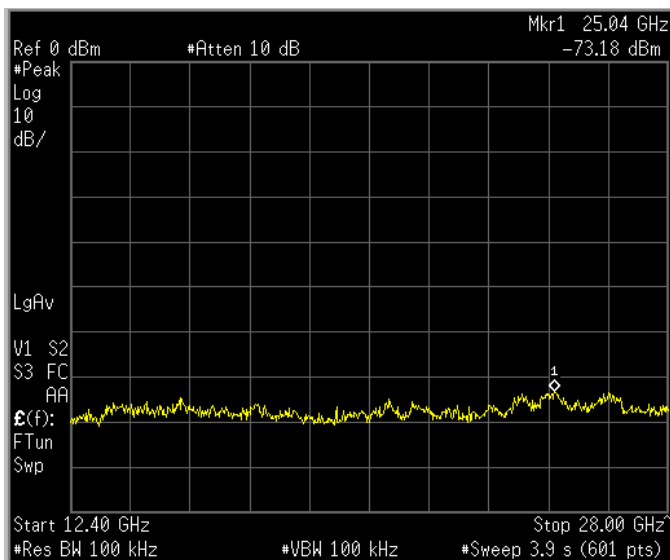
Stand-By



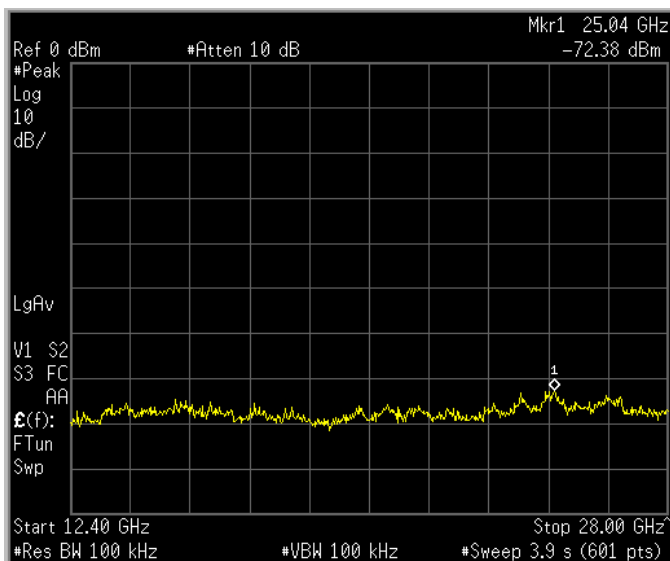
0.08 μ S Pulse



0.25 μ S Pulse



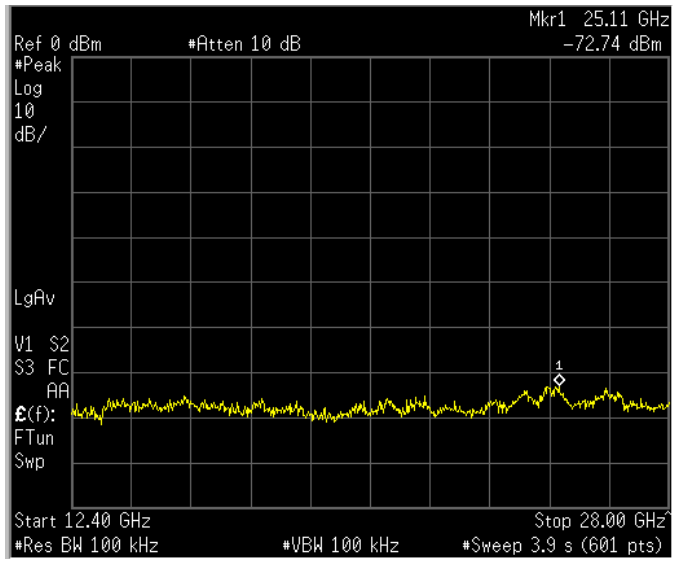
0.5 μ S Pulse



0.8 μ S Pulse

TEST #10 Frequency Band: 12.4~28GHz

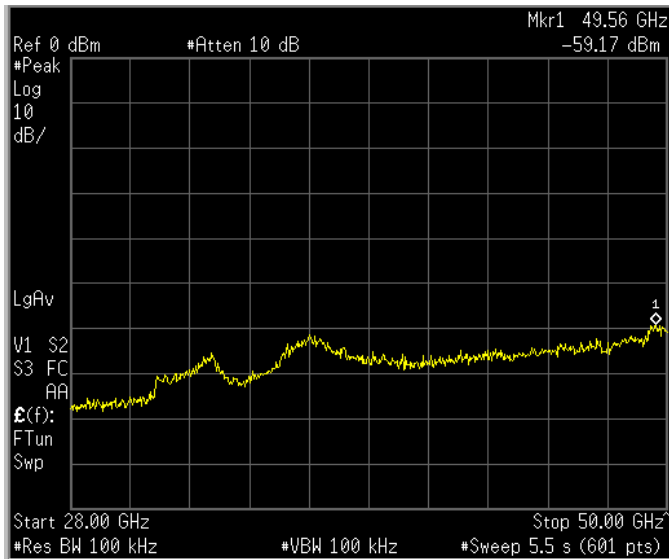
Log Ref. Level:0 dBm



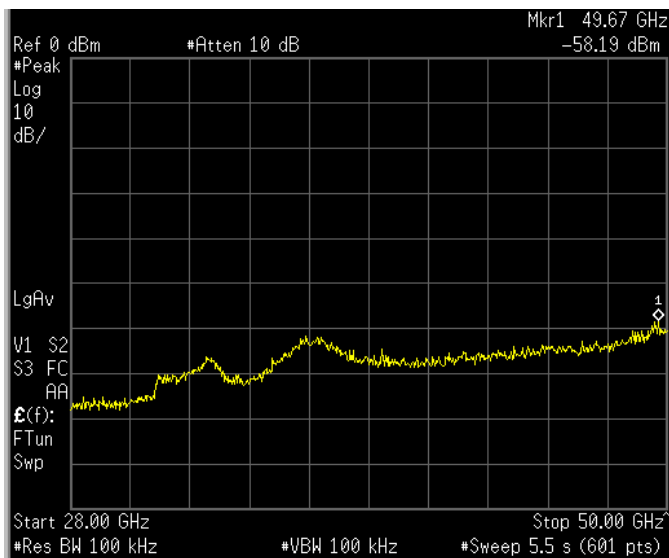
1.0 μ S Pulse

TEST #11 Frequency Band: 28~50GHz

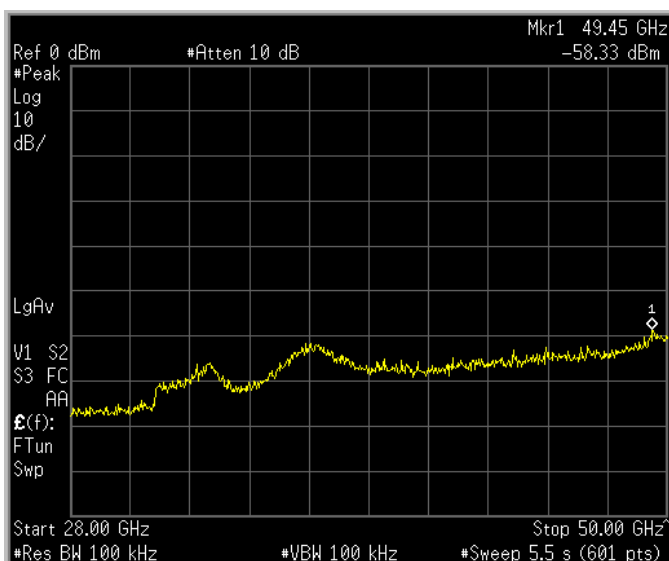
Log Ref. Level:0 dBm



Ambient



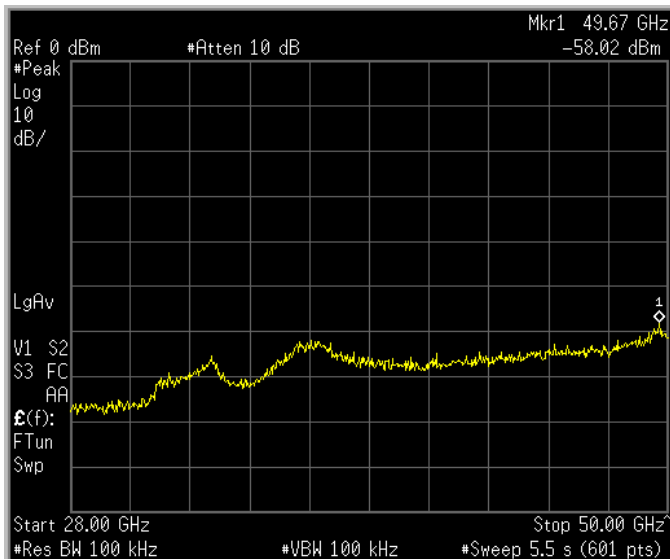
Stand-By



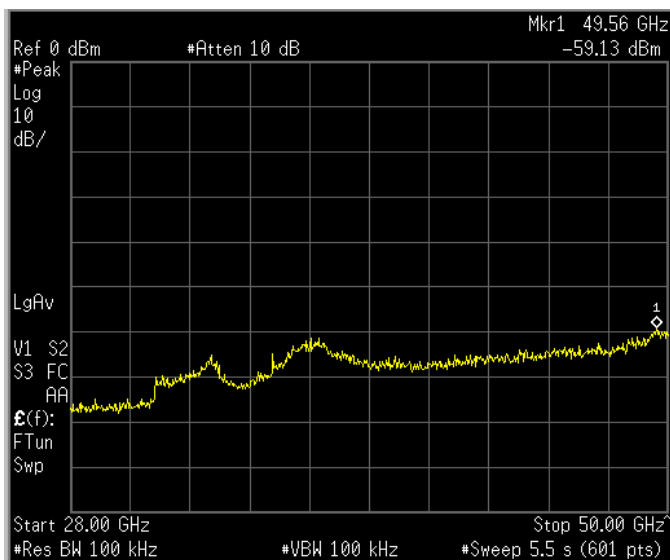
0.08 μ S Pulse

TEST #11 Frequency Band: 28~50GHz

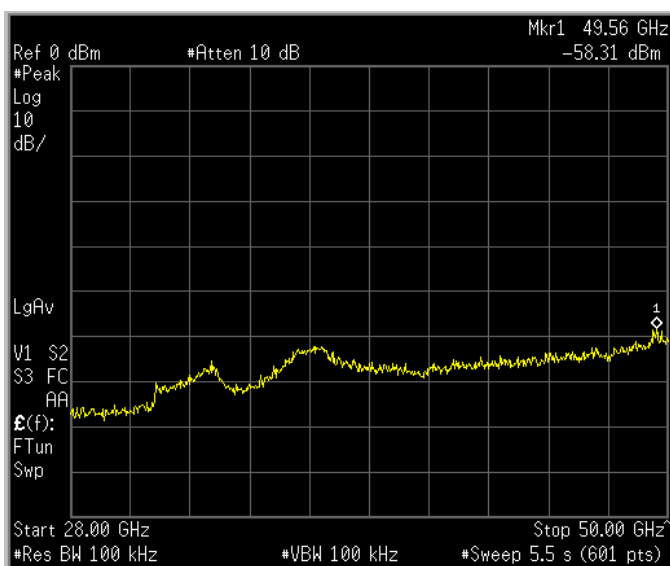
Log Ref. Level:0 dBm



0.25 μ S Pulse



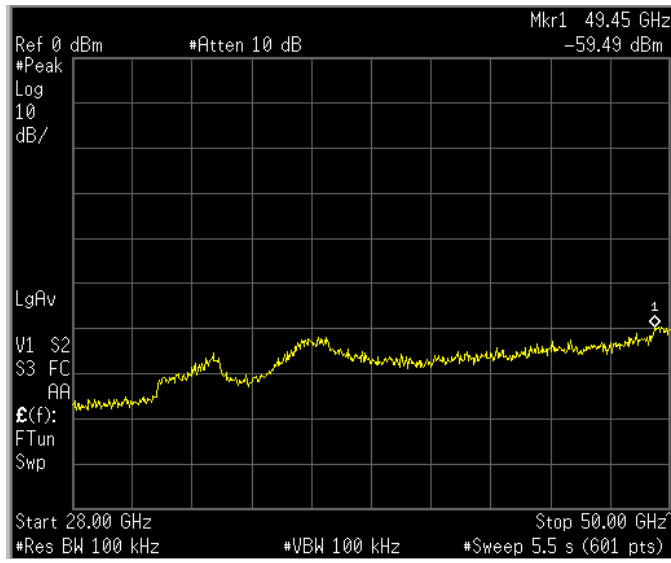
0.5 μ S Pulse



0.8 μ S Pulse

TEST #11 Frequency Band: 28~50GHz

Log Ref. Level:0 dBm



1.0 μ S Pulse