TYPICAL CHARACTERISTICS ON LM-1G18G-15-3W-500WP-SFF

PMI MODEL: LM-1G18G-15-3W-500WP-SFF IS A HIGH POWER LIMITER THAT OPERATES OVER THE 1.0 TO 18.0 GHz FREQUENCY RANGE. THIS MODEL IS CAPABLE OF HANDLING AN INPUT POWER OF 3 WATTS CW & 500 WATTS PEAK, HOUSED WITHIN A COMPACT 1.00" x 1.00" x 0.40" PACKAGE OUTFITTED WITH FIELD REPLACEABLE SMA FEMALE CONNECTORS.

June 07 , 2018

Designed By: Dr. Ashok Gorwara
Tested and Reported By:
Alfredo Lopez

TYPICAL CHARACTERISTICS ON LM-1G18G-15-3W-500WP-SFF

Outline Drawing

DESCRIPTION

PMI MODEL: LM-1G18G-15-3W-500WP-SFF IS A HIGH POWER LIMITER THAT OPERATES OVER THE 1.0 TO 18.0 GHz FREQUENCY RANGE. THIS MODEL IS CAPABLE OF HANDLING AN INPUT POWER OF 3 WATTS CW & 500 WATTS PEAK, HOUSED WITHIN A COMPACT 1.00" x 1.00" x 0.40" PACKAGE OUTFITTED WITH FIELD REPLACEABLE SMA FEMALE CONNECTORS.

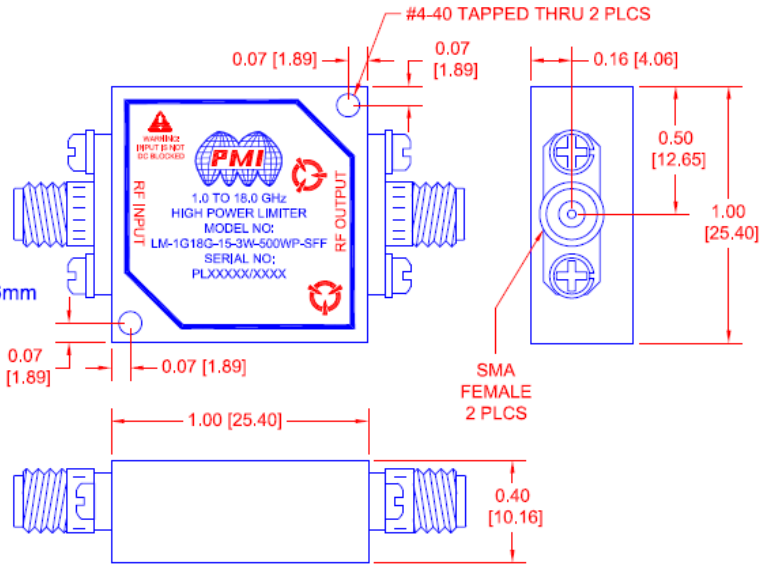
SPECIFICATIONS

- FREQUENCY RANGE: ——— 1.0 TO 18.0 GHz
- RF INPUT POWER: ——— 3 WATTS CW MAXIMUM
- PEAK INPUT POWER: ——— 500 WATTS MAXIMUM*
- RF LEAKAGE: ——— +17 dBm TYPICAL
- RECOVERY TIME: ——— 100 ns TYPICAL
- INSERTION LOSS @ -20 dBm INPUT POWER: - 2.5 dB MAXIMUM
- VSWR @ -20 dBm INPUT POWER: ——— 2.0:1 MAXIMUM
- CONNECTORS: ——— SMA FEMALE
- SIZE (EXCLUDING CONNECTORS): ——— 25.4mm x 25.4mm x 10.16mm
  1.00" x 1.00" x 0.40"
- FINISH: ——— GOLD PLATED

* = @ 0.1% DUTY CYCLE & 1 µs PULSE WIDTH

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A1	ORIGINAL RELEASE	2/26/18	

MECHANICAL OUTLINE



ENVIRONMENTAL RATINGS

- TEMPERATURE: ——— -55 °C TO +85 °C (OPERATING)
  -65 °C TO +125 °C (NON-OPERATING)
- HUMIDITY: ——— MIL-STD-202, METHOD 103B COND. B
- SHOCK: ——— MIL-STD-202, METHOD 213B COND. B
- VIBRATION: ——— MIL-STD-202, METHOD 204D COND. B
- ALTITUDE: ——— MIL-STD-202, METHOD 105C COND. B
- TEMPERATURE CYCLING: ——— MIL-STD-202, METHOD 107A COND. A

NOTE: SPECIFICATIONS WILL VARY OVER OPERATING TEMPERATURE
NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

ALL DIMENSIONS ARE IN INCH [mm]
TOLERANCES:
X.XX ± 0.020 [0.508]
X.XXX ± 0.010 [0.254]

PMI CONFIDENTIAL AND PROPRIETARY

PLANAR MONOLITHICS INDUSTRIES, INC.
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FREDERICK, MARYLAND 21704 USA
TEL: (301)-662-5019, FAX: (301)-662-1731
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ISO 9001 CERTIFIED

APPROVALS	DATE
DRAWN SPH	2/7/18
REDRAWN SPH	2/26/18
ISSUED	

TITLE: PRODUCT FEATURE
LM-1G18G-15-3W-500WP-SFF
1.0 to 18.0 GHz High Power Limiter

SIZE	FSCM NO.	DWG NO.	REV.
A	05XQ0	27034282	A1

SCALE N;S SHEET 1 OF 1

TYPICAL CHARACTERISTICS ON LM-1G18G-15-3W-500WP-SFF

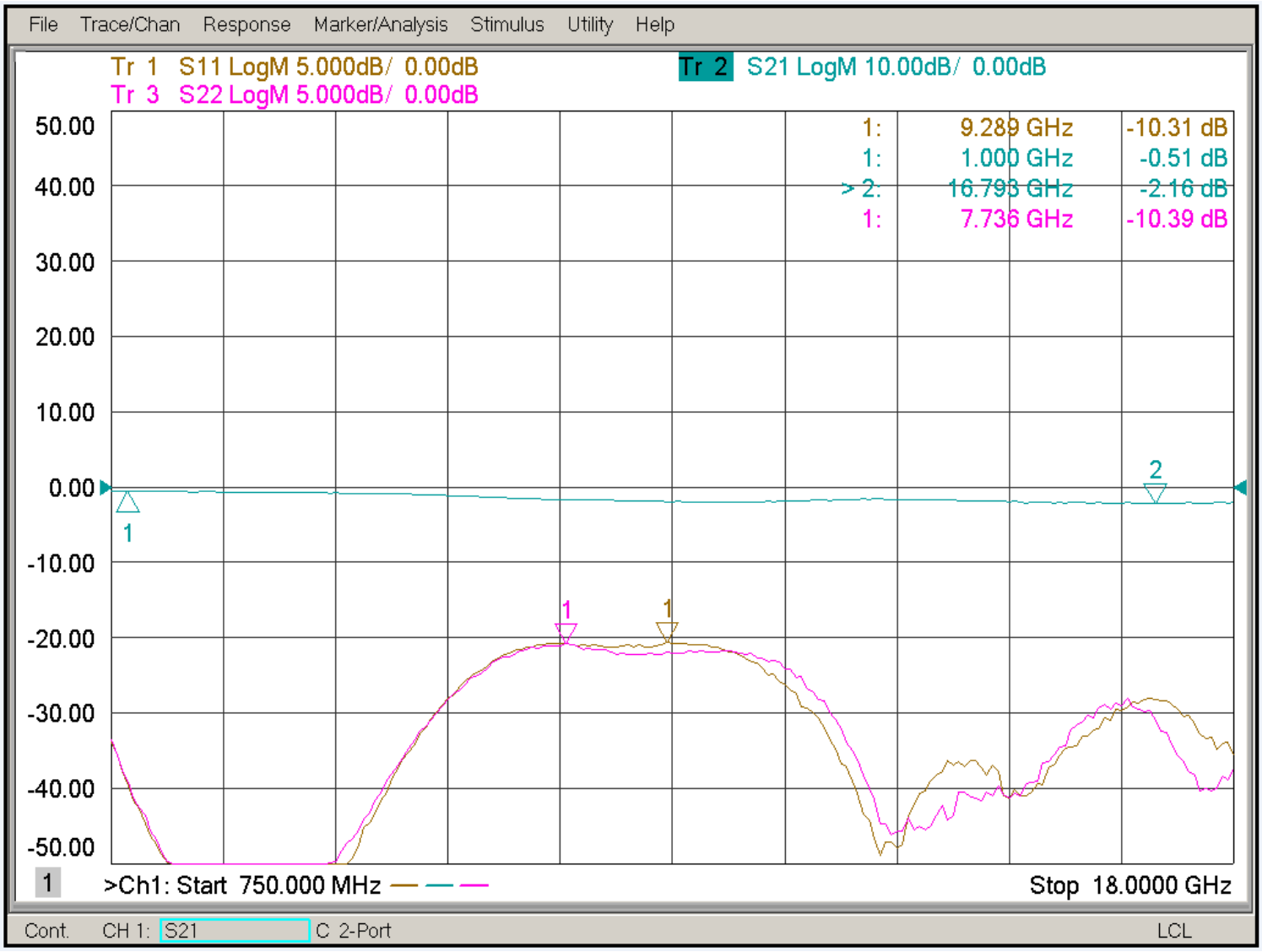
TYPICAL CHARACTERISTICS
ON
LM-1G18G-15-3W-500WP-SFF

Technical Specifications

TEST ITEM	PARAMETERS	SPECIFIED VALUE	TEST MEASUREMENT	TEST RESULT	QA QC
1	Frequency Range	1.0 to 18.0 GHz	**1.0 to 18.0 GHz**	Pass	
2	RF Input Power	3 Watts CW Maximum	**4W**	Pass	
3	Peak Input Power	500 W Maximum (@ 0.1% Duty Cycle & 1 µs Pulse Width)	**500W By Design**	Pass	
4	RF Leakage	+17 dBm Typical	**18.51 dBm**	Pass	
5	Recovery Time	100 ns Typical	**32.66 ns**	Pass	
6	Insertion Loss	2.5 dB Maximum *(@ -20 dBm Input Power)*	**2.16 dB**	Pass	
7	VSWR	2.0:1 Maximum *(@ -20 dBm Input Power)*	**1.88 :1**	Pass	

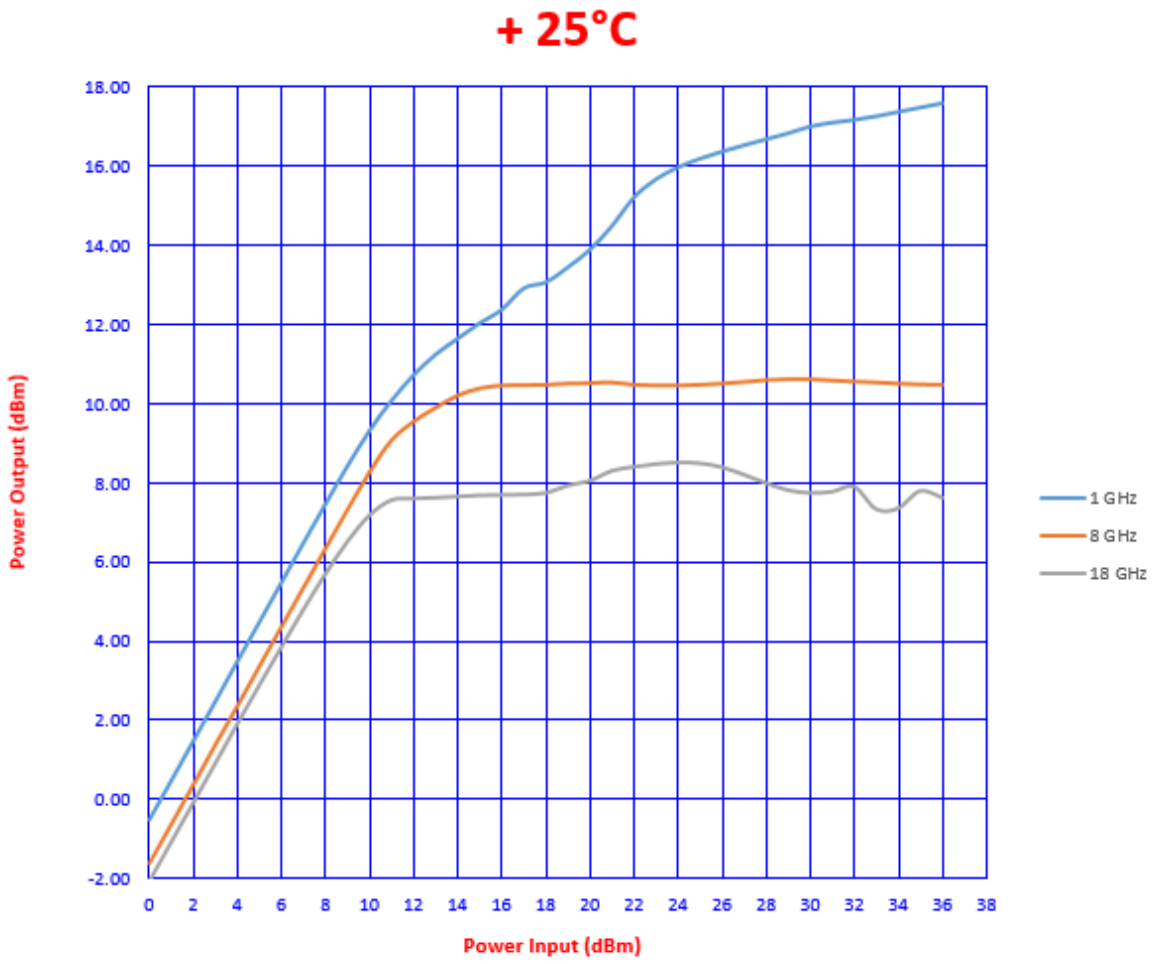
TYPICAL CHARACTERISTICS
ON
LM-1G18G-15-3W-500WP-SFF

(J1-J2) Insertion Loss and Return Loss



TYPICAL CHARACTERISTICS
ON
LM-1G18G-15-3W-500WP-SFF

Response Curve High Power Test.



TYPICAL CHARACTERISTICS ON LM-1G18G-15-3W-500WP-SFF

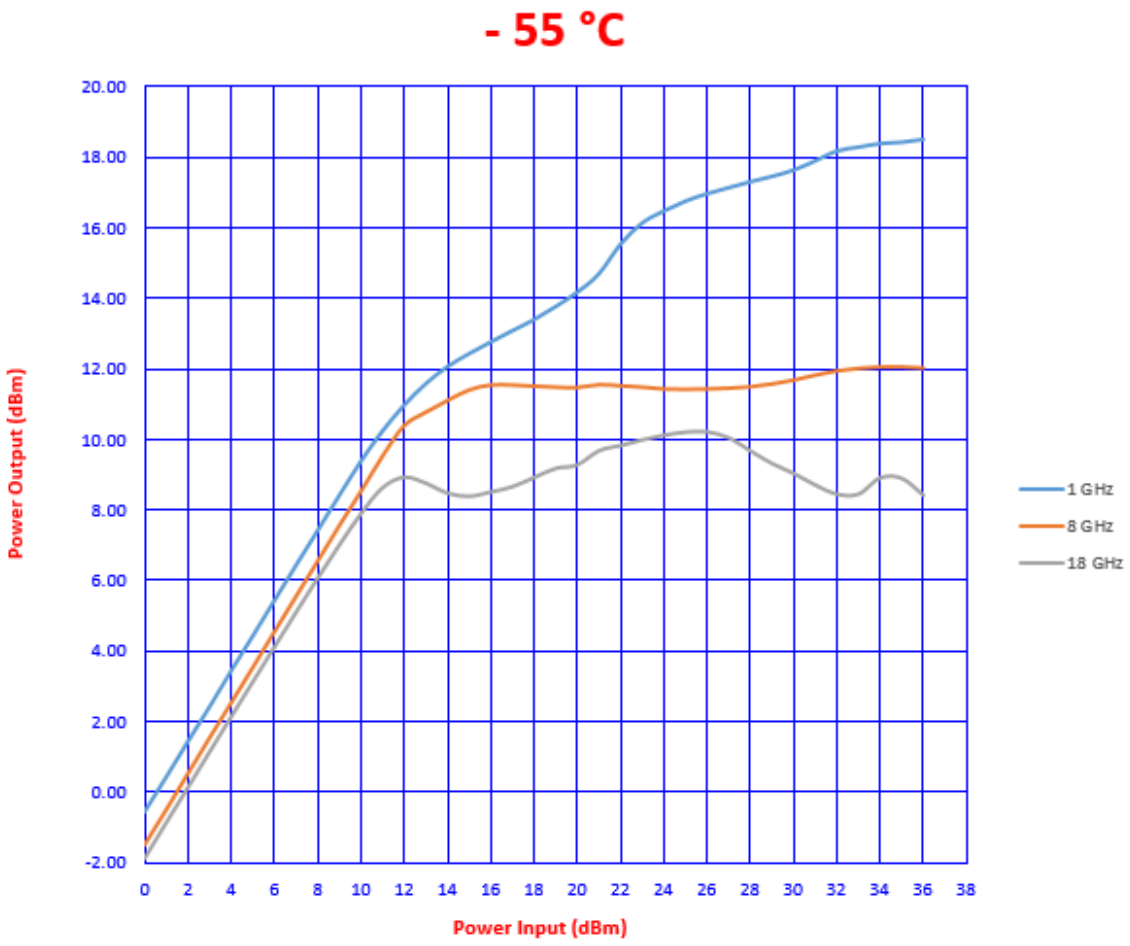
Data High Power Test

+25°C

1GHz			8 GHz			18 GHz			
POWER INPUT (dBm)	POWER OUTPUT (dBm)	LOSS	POWER INPUT (dBm)	POWER OUTPUT (dBm)	LOSS	POWER INPUT (dBm)	POWER OUTPUT (dBm)	LOSS	
0	-0.50	0.50	0	-1.60	1.60	0	-2.07	2.07	
1	0.49	0.51	1	-0.61	1.61	1	-1.07	2.07	
2	1.49	0.51	2	0.39	1.61	2	-0.08	2.08	
3	2.49	0.51	3	1.40	1.60	3	0.92	2.08	
4	3.50	0.50	4	2.38	1.62	4	1.92	2.08	
5	4.49	0.51	5	3.38	1.62	5	2.90	2.10	
6	5.49	0.51	6	4.38	1.62	6	3.86	2.14	
7	6.49	0.51	7	5.37	1.63	7	4.81	2.19	
8	7.47	0.53	8	6.36	1.64	8	5.71	2.29	
9	8.43	0.57	9	7.34	1.66	9	6.53	2.47	
10	9.32	0.68	10	8.29	1.71	10	7.19	2.81	
11	10.08	0.92	11	9.09	1.91	11	7.57	3.43	
12	10.72	1.28	12	9.56	2.44	12	7.61	4.39	
13	11.24	1.76	13	9.91	3.09	13	7.63	5.37	
14	11.64	2.36	14	10.22	3.78	14	7.66	6.34	
15	12.03	2.97	15	10.40	4.60	15	7.69	7.31	
16	12.37	3.63	16	10.47	5.53	16	7.70	8.30	
17	12.91	4.09	17	10.48	6.52	17	7.71	9.29	
18	13.06	4.94	18	10.49	7.51	18	7.75	10.25	
19	13.44	5.56	19	10.52	8.48	19	7.94	11.06	
20	13.88	6.12	20	10.53	9.47	20	8.06	11.94	
21	14.48	6.52	21	10.55	10.45	21	8.31	12.69	
22	15.20	6.80	22	10.49	11.51	22	8.41	13.59	
23	15.66	7.34	23	10.47	12.53	23	8.48	14.52	
24	15.96	8.04	24	10.47	13.53	24	8.52	15.48	
25	16.18	8.82	25	10.49	14.51	25	8.50	16.50	
26	16.36	9.64	26	10.52	15.48	26	8.40	17.60	
27	16.52	10.48	27	10.56	16.44	27	8.21	18.79	
28	16.67	11.33	28	10.61	17.39	28	8.00	20.00	
29	16.82	12.18	29	10.63	18.37	29	7.82	21.18	
30	16.99	13.01	30	10.63	19.37	30	7.75	22.25	
31	17.09	13.91	31	10.6	20.40	31	7.78	23.22	
32	17.16	14.84	32	10.57	21.43	32	7.91	24.09	
33	17.25	15.75	33	10.55	22.45	33	7.34	25.66	
34	17.36	16.64	34	10.52	23.48	34	7.36	26.64	
35	**17.47**	**17.53**	**35**	**10.5**	**24.50**	**35**	**7.8**	**27.20**	**PASS/3W**
36	**17.58**	**18.42**	**36**	**10.49**	**25.51**	**36**	**7.63**	**28.37**	**PASS/4W**

TYPICAL CHARACTERISTICS
ON
LM-1G18G-15-3W-500WP-SFF

Response Curve High Power Test.



TYPICAL CHARACTERISTICS ON LM-1G18G-15-3W-500WP-SFF

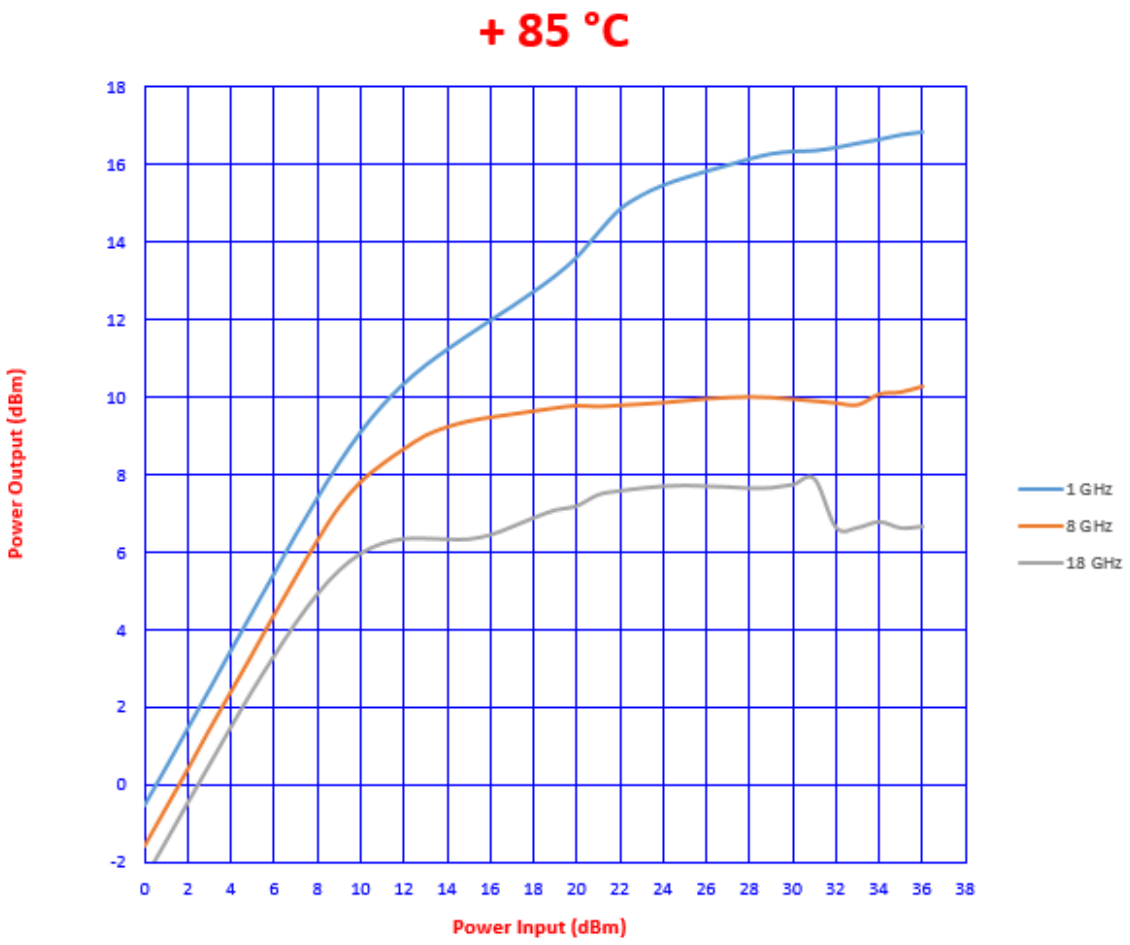
Data High Power Test

- 55°C

1 GHz			8 GHz			18 GHz			
POWER INPUT (dBm)	POWER OUTPUT (dBm)	LOSS	POWER INPUT (dBm)	POWER OUTPUT (dBm)	LOSS	POWER INPUT (dBm)	POWER OUTPUT (dBm)	LOSS	
0	-0.54	0.54	0	-1.48	1.48	0	-1.91	1.91	
1	0.44	0.56	1	-0.49	1.49	1	-0.90	1.90	
2	1.45	0.55	2	0.53	1.47	2	0.10	1.90	
3	2.43	0.57	3	1.54	1.46	3	1.11	1.89	
4	3.45	0.55	4	2.53	1.47	4	2.11	1.89	
5	4.44	0.56	5	3.53	1.47	5	3.10	1.90	
6	5.44	0.56	6	4.54	1.46	6	4.09	1.91	
7	6.44	0.56	7	5.54	1.46	7	5.08	1.92	
8	7.43	0.57	8	6.54	1.46	8	6.05	1.95	
9	8.42	0.58	9	7.54	1.46	9	6.99	2.01	
10	9.39	0.61	10	8.51	1.49	10	7.88	2.12	
11	10.25	0.75	11	9.51	1.49	11	8.62	2.38	
12	10.98	1.02	12	10.37	1.63	12	8.92	3.08	
13	11.59	1.41	13	10.75	2.25	13	8.75	4.25	
14	12.07	1.93	14	11.08	2.92	14	8.47	5.53	
15	12.44	2.56	15	11.38	3.62	15	8.38	6.62	
16	12.77	3.23	16	11.52	4.48	16	8.50	7.50	
17	13.09	3.91	17	11.52	5.48	17	8.65	8.35	
18	13.40	4.60	18	11.49	6.51	18	8.91	9.09	
19	13.77	5.23	19	11.46	7.54	19	9.17	9.83	
20	14.18	5.82	20	11.45	8.55	20	9.27	10.73	
21	14.70	6.30	21	11.53	9.47	21	9.67	11.33	
22	15.54	6.46	22	11.50	10.50	22	9.82	12.18	
23	16.14	6.86	23	11.46	11.54	23	9.98	13.02	
24	16.48	7.52	24	11.41	12.59	24	10.11	13.89	
25	16.76	8.24	25	11.40	13.60	25	10.20	14.80	
26	16.97	9.03	26	11.41	14.59	26	10.21	15.79	
27	17.14	9.86	27	11.43	15.57	27	10.04	16.96	
28	17.31	10.69	28	11.47	16.53	28	9.67	18.33	
29	17.46	11.54	29	11.55	17.45	29	9.31	19.69	
30	17.64	12.36	30	11.66	18.34	30	9.03	20.97	
31	17.90	13.10	31	11.80	19.20	31	8.7	22.30	
32	18.18	13.82	32	11.92	20.08	32	8.44	23.56	
33	18.29	14.71	33	11.99	21.01	33	8.44	24.56	
34	18.39	15.61	34	12.03	21.97	34	8.9	25.10	
35	**18.43**	**16.57**	**35**	**12.03**	**22.97**	**35**	**8.89**	**26.11**	**PASS/3W**
36	**18.51**	**17.49**	**36**	**12.00**	**24.00**	**36**	**8.41**	**27.59**	**PASS/4W**

TYPICAL CHARACTERISTICS
ON
LM-1G18G-15-3W-500WP-SFF

Response Curve High Power Test.



TYPICAL CHARACTERISTICS ON LM-1G18G-15-3W-500WP-SFF

Data High Power Test

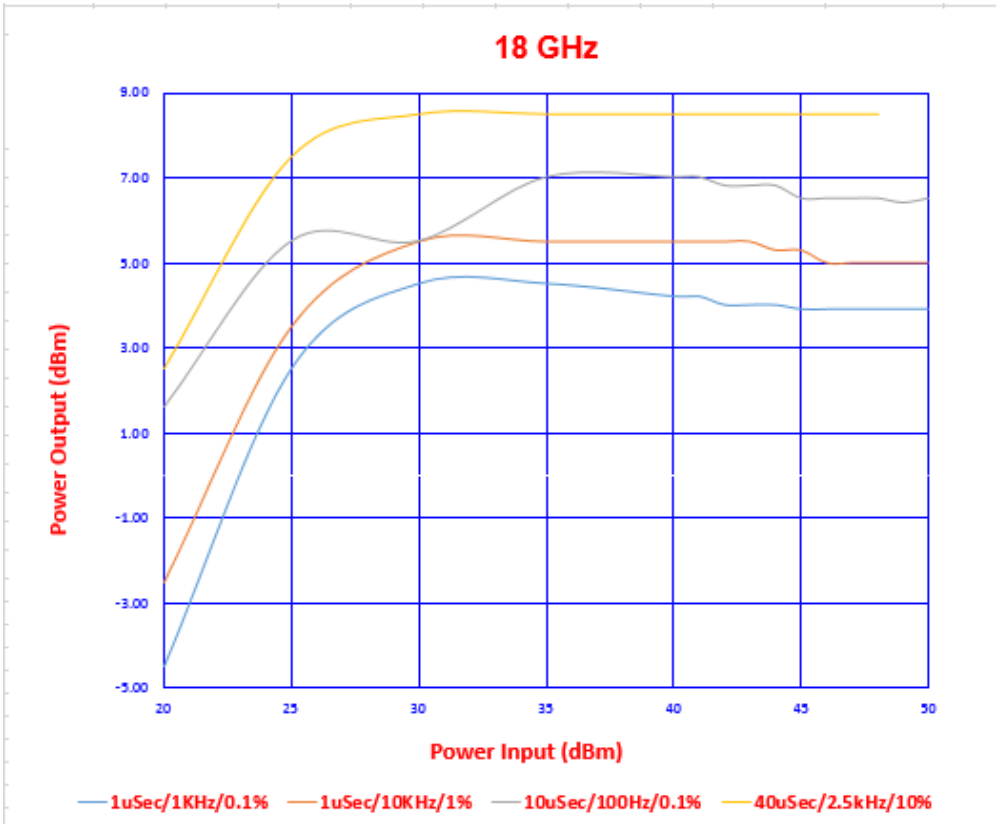
+ 85°C

1 GHz			8 GHz			18 GHz			
POWER INPUT (dBm)	POWER OUTPUT (dBm)	LOSS	POWER INPUT (dBm)	POWER OUTPUT (dBm)	LOSS	POWER INPUT (dBm)	POWER OUTPUT (dBm)	LOSS	
0	-0.52	0.52	0	-1.60	1.60	0	-2.44	2.44	
1	0.46	0.54	1	-0.61	1.61	1	-1.46	2.46	
2	1.46	0.54	2	0.38	1.62	2	-0.47	2.47	
3	2.46	0.54	3	1.40	1.60	3	0.51	2.49	
4	3.47	0.53	4	2.38	1.62	4	1.49	2.51	
5	4.47	0.53	5	3.37	1.63	5	2.44	2.56	
6	5.46	0.54	6	4.37	1.63	6	3.33	2.67	
7	6.46	0.54	7	5.34	1.66	7	4.18	2.82	
8	7.41	0.59	8	6.29	1.71	8	4.93	3.07	
9	8.31	0.69	9	7.15	1.85	9	5.54	3.46	
10	9.11	0.89	10	7.80	2.20	10	5.98	4.02	
11	9.79	1.21	11	8.26	2.74	11	6.24	4.76	
12	10.36	1.64	12	8.65	3.35	12	6.36	5.64	
13	10.83	2.17	13	9.00	4.00	13	6.37	6.63	
14	11.24	2.76	14	9.22	4.78	14	6.35	7.65	
15	11.62	3.38	15	9.37	5.63	15	6.35	8.65	
16	11.99	4.01	16	9.47	6.53	16	6.46	9.54	
17	12.35	4.65	17	9.55	7.45	17	6.67	10.33	
18	12.73	5.27	18	9.63	8.37	18	6.90	11.10	
19	13.14	5.86	19	9.71	9.29	19	7.10	11.90	
20	13.62	6.38	20	9.77	10.23	20	7.21	12.79	
21	14.26	6.74	21	9.75	11.25	21	7.50	13.50	
22	14.86	7.14	22	9.78	12.22	22	7.60	14.40	
23	15.22	7.78	23	9.81	13.19	23	7.67	15.33	
24	15.48	8.52	24	9.85	14.15	24	7.72	16.28	
25	15.67	9.33	25	9.90	15.10	25	7.74	17.26	
26	15.84	10.16	26	9.95	16.05	26	7.72	18.28	
27	16	11.00	27	9.98	17.02	27	7.70	19.30	
28	16.16	11.84	28	10.00	18.00	28	7.67	20.33	
29	16.29	12.71	29	9.98	19.02	29	7.68	21.32	
30	16.35	13.65	30	9.94	20.06	30	7.76	22.24	
31	16.37	14.63	31	9.89	21.11	31	7.91	23.09	
32	16.45	15.55	32	9.84	22.16	32	6.65	25.35	
33	16.56	16.44	33	9.79	23.21	33	6.65	26.35	
34	16.66	17.34	34	10.07	23.93	34	6.8	27.20	
35	**16.78**	**18.22**	**35**	**10.12**	**24.88**	**35**	**6.64**	**28.36**	PASS/3W
36	**16.85**	**19.15**	**36**	**10.27**	**25.73**	**36**	**6.68**	**29.32**	PASS/4W

TYPICAL CHARACTERISTICS ON LM-1G18G-15-3W-500WP-SFF

Peak Power Test

1usec/1KHz/0.1% - 1usec/10KHz/1%
10usec/100Hz/0.1% - 40usec/2.5KHz/10%



PULSE TEST - 0.1% DC - 1us PW - f=1KHz		
18 GHz	Output Power (dBm)	Output of Limiter (dBm)
	20	-4.50
	25	2.50
	30	4.50
	35	4.50
	40	4.20
	41	4.20
	42	4.00
	43	4.00
	44	4.00
	45	3.90
	46	3.90
	47	3.90
	48	3.90
	49	3.90
PASS	50	3.90

PULSE TEST - 1% DC - 1us PW - f=10 kHz		
18 GHz	Output Power (dBm)	Output of Limiter (dBm)
	20	-2.50
	25	3.50
	30	5.50
	35	5.50
	40	5.50
	41	5.50
	42	5.50
	43	5.50
	44	5.30
	45	5.30
	46	5.00
	47	5.00
	48	5.00
	49	5.00
PASS	50	5.00

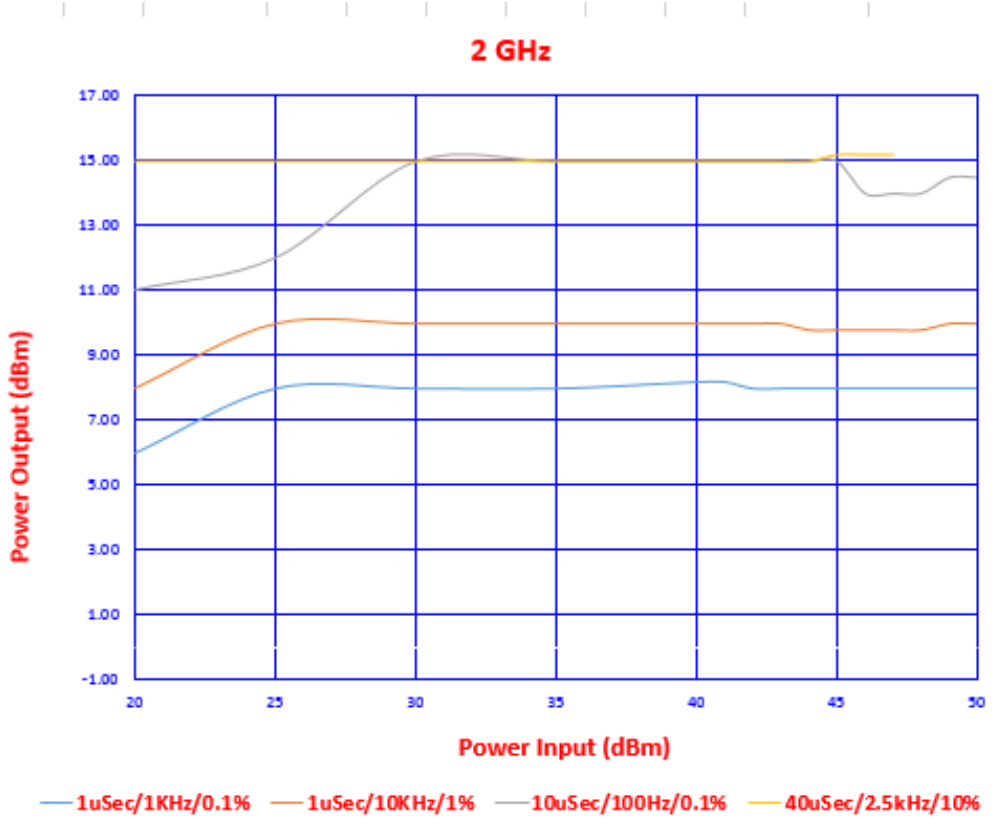
PULSE TEST - 0.1% DC - 10us PW - f=100 Hz		
18 GHz	Output Power (dBm)	Output of Limiter (dBm)
	20	1.60
	25	5.50
	30	5.50
	35	7.00
	40	7.00
	41	7.00
	42	6.80
	43	6.80
	44	6.80
	45	6.50
	46	6.50
	47	6.50
	48	6.50
	49	6.40
PASS	50	6.50

PULSE TEST - 10% DC - 40us PW - f=2.5 kHz		
18 GHz	Output Power (dBm)	Output of Limiter (dBm)
	20	2.50
	25	7.50
	30	8.50
	35	8.50
	40	8.50
	41	8.50
	42	8.50
	43	8.50
	44	8.50
	45	8.50
	46	8.50
	47	8.50
	48	8.50
PASS	49	8.50

TYPICAL CHARACTERISTICS ON LM-1G18G-15-3W-500WP-SFF

Peak Power Test

1usec/1KHz/0.1% - 1usec/10KHz/1%
10usec/100Hz/0.1% - 40usec/2.5KHz/10%



PULSE TEST - 0.1% DC - 1us PW - f=1KHz		
2 GHz	Output Power (dBm)	Output of Limiter (dBm)
	20	6.00
	25	8.00
	30	8.00
	35	8.00
	40	8.20
	41	8.20
	42	8.00
	43	8.00
	44	8.00
	45	8.00
	46	8.00
	47	8.00
	48	8.00
	49	8.00
PASS	50	8.00

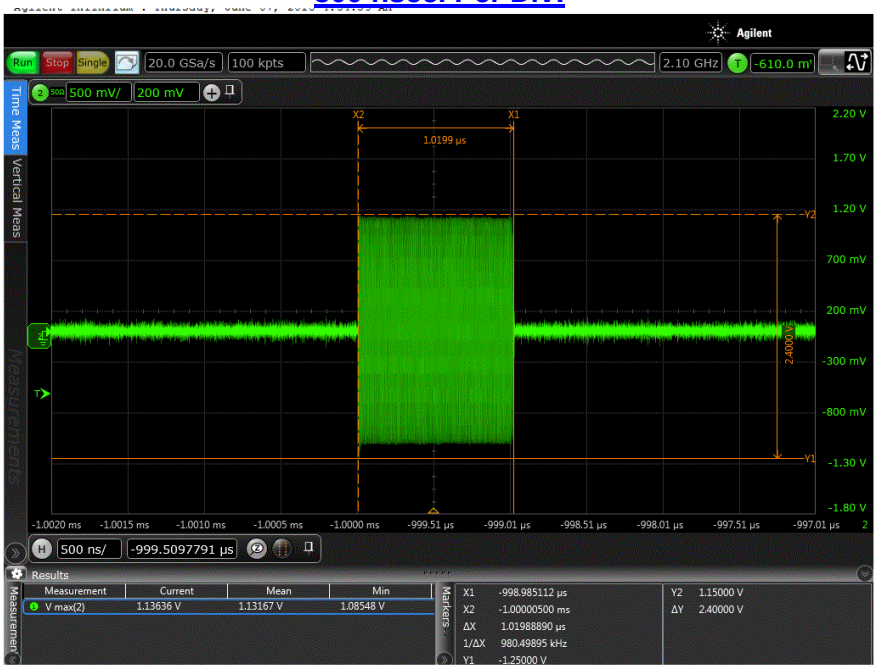
PULSE TEST - 1% DC - 1us PW - f=10 kHz		
2 GHz	Output Power (dBm)	Output of Limiter (dBm)
	20	8.00
	25	10.00
	30	10.00
	35	10.00
	40	10.00
	41	10.00
	42	10.00
	43	10.00
	44	9.80
	45	9.80
	46	9.80
	47	9.80
	48	9.80
	49	10.00
PASS	50	10.00

PULSE TEST - 0.1% DC - 10us PW - f=100 Hz		
2 GHz	Output Power (dBm)	Output of Limiter (dBm)
	20	11.00
	25	12.00
	30	15.00
	35	15.00
	40	15.00
	41	15.00
	42	15.00
	43	15.00
	44	15.00
	45	15.00
	46	14.00
	47	14.00
	48	14.00
	49	14.50
PASS	50	14.50

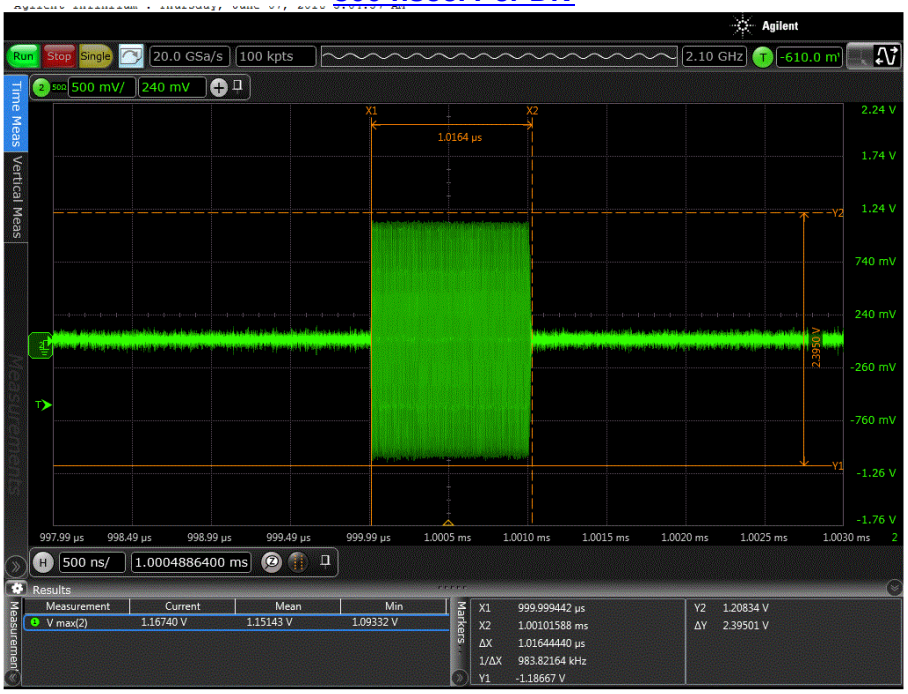
PULSE TEST - 10% DC - 40us PW - f=2.5 kHz		
2 GHz	Output Power (dBm)	Output of Limiter (dBm)
	20	15.00
	25	15.00
	30	15.00
	35	15.00
	40	15.00
	41	15.00
	42	15.00
	43	15.00
	44	15.00
	45	15.20
	46	15.20
	47	15.20
PASS	48	15.20

TYPICAL CHARACTERISTICS
ON
LM-1G18G-15-3W-500WP-SFF

Full Pulse RF Input 1 usec. / PRF 1KHz / DC 0.1% / Power 100 Watts
500 nsec. Per Div.

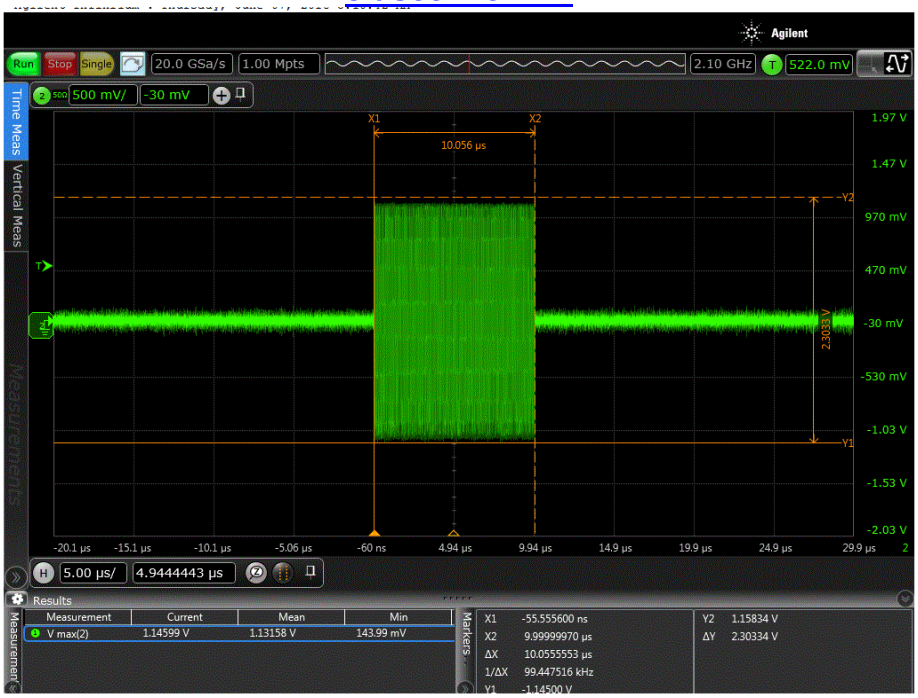


Full Pulse RF Input 1 usec. / PRF 10KHz / DC 1% / Power 100 Watts
500 nsec. Per Div

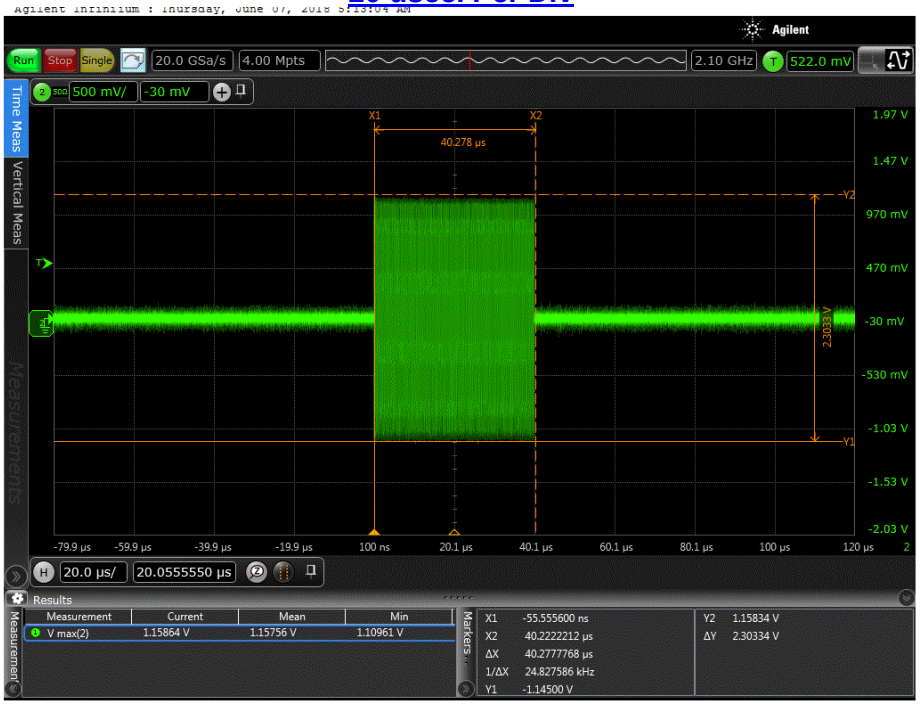


TYPICAL CHARACTERISTICS ON LM-1G18G-15-3W-500WP-SFF

Full Pulse RF Input 10 usec. / PRF 100Hz / DC 0.1% / Power 100 Watts
5 usec. Per Div



Full Pulse RF Input 40 usec. / PRF 2.5 KHz / DC 10% / Power 100 Watts
20 usec. Per Div



TYPICAL CHARACTERISTICS
ON
LM-1G18G-15-3W-500WP-SFF

Recovery Time – 20 nsec. Per Div.

TYPICAL CHARACTERISTICS
ON
LM-1G18G-15-3W-500WP-SFF

Rise Time Pulsed 1us/1KHz/DC 0.1%
10 nsec. Per Div.

TYPICAL CHARACTERISTICS
ON
LM-1G18G-15-3W-500WP-SFF

Rise Time Pulsed 10us/10KHz/DC 1%
20 nsec. Per Div.

TYPICAL CHARACTERISTICS
ON
LM-1G18G-15-3W-500WP-SFF

Rise Time Pulsed 40us/2.5 KHz/DC 10%
5 nsec. Per Div.