



**TYPICAL CHARACTERISTICS
ON
PSM-1G1R1G-TRSW-2500W**

PMI MODEL PSM-1G1R1G-TRSW-2500W IS AN INTEGRATED TRANSMIT / RECEIVE (T/R) MODULE THAT IS DESIGNED FOR USE IN AN IFF APPLICATION. THIS T/R MODULE OPERATES FROM 1.0 GHz TO 1.1 GHz AND HANDLES PEAK INPUT POWER LEVELS UP TO 2.5kW PEAK HAVING A MAXIMUM PULSE WIDTH OF 17 μ s AND A DUTY CYCLE OF 2%.



March 16, 2018

Designed By: Dr. Ashok Gorwara & N. Shanmugan & S. Palacio

**Tested and Reported By:
Alfredo Lopez**

Page 1 of 14



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TABLE OF CONTENTS

• Outline Drawing	Pages 3, 5
• Summary Data	Page 6
• Insertion Loss and Return Loss	Page 7, 8
• Isolation	Page 9, 10
• High Power Test.	Page 11, 12
• Switching Speed	Page 13, 14



TYPICAL CHARACTERISTICS ON PSM-1G1R1G-TRSW-2500W

OUTLINE DRAWING

DESCRIPTION

PMI MODEL NO. PSM-1G1R1G-TRSW-2500W IS AN INTEGRATED TRANSMIT / RECEIVE (T/R) MODULE THAT IS DESIGNED FOR USE IN AN IFF APPLICATION. THIS T/R MODULE OPERATES FROM 1.0 GHz TO 1.1 GHz AND HANDLES PEAK INPUT POWER LEVELS UP TO 2.5 kW HAVING A MAXIMUM PULSE WIDTH OF 17 μ s AND A DUTY CYCLE OF 2%.

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	1	ORIGINAL RELEASE	08/18/18	
	A1	ECN # 16-0140	10/07/18	
	B1	ECN #16-0179	11/29/18	

SPECIFICATIONS

- FREQUENCY RANGE: 1.0 TO 1.1 GHz
- RF INPUT POWER: 2.5 kW PEAK (J1 ONLY)
- PULSE WIDTH: 17 μ s MAXIMUM
- DUTY CYCLE: 2% MAXIMUM
- PRF: 800 Hz
- INSERTION LOSS: 0.8 dB TYPICAL, 1.0 dB MAXIMUM (J1 TO J2 & J1 TO J3, TRANSMIT MODE)
0.8 dB TYPICAL, 0.8 dB MAXIMUM (J2 TO J4 & J3 TO J5, RECEIVE MODE)
- ISOLATION: 25 dB MINIMUM (J2 TO J3)
60 dB MINIMUM (J2 TO J4)
60 dB MINIMUM (J3 TO J5)
- SWITCHING RATE: 2 kHz MAXIMUM
- SWITCHING SPEED: 250 ns TYPICAL (50% TTL TO 10% OR 90% RF)
- SWITCHING CONTROLS: TTL LOGIC (SEE TABLES 1 & 2)
- DC SUPPLIES: +50 V, 60 mA TYPICAL
+5 V, 400 mA TYPICAL
- CONNECTORS: SMA FEMALE
- SIZE: 7.75" x 3.00" x 0.575"
- SEALING: HERMETIC
- FINISH: BLUE EPOXY POLIMIDE COATING IAW MIL-C-22750, TYPE I OVER EPOXY POLIMIDE PRIMER IAW MIL-P-23377, TYPE I, CLASS 1 OR 3. MOUNTING SURFACE TO BE FREE OF PAINT.

TTL	FUNCTION
"0"	TRANSMIT TO J2 ISOLATION TO J3
"1"	TRANSMIT TO J3 ISOLATION TO J2

TTL	FUNCTION
"0"	RECEIVE MODE
"1"	TRANSMIT MODE

PIN	FUNCTION
1	+50 V
2	GROUND
3	NOT USED
4	+5 V
5	GROUND
6	TTL 1
7	NOT USED
8	NOT USED
9	TTL 2

NOTE: COLD SWITCHING ONLY OR DAMAGE WILL OCCUR
NOTE: WHEN IN RECEIVE MODE NO HIGH POWER TO BE PRESENT AT J1
NOTE: SOURCE & LOAD TERMINATIONS TO BE BETTER THAN 1.5:1

ENVIRONMENTAL RATINGS

- TEMPERATURE: -45 °C TO +85 °C (OPERATING - BASE PLATE)
-54 °C TO +125 °C (STORAGE)
- ENVIRONMENTAL: MIL-STD-810E
- EMI/EMC: MIL-STD-461

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

PMI CONFIDENTIAL AND PROPRIETARY

PLANAR MONOLITHICS INDUSTRIES, INC.
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ISO 9001 CERTIFIED



APPROVALS		DATE	TITLE		
DRAWN	<i>M. Berry</i>	11/29/18	PRODUCT FEATURE PSM-1G1R1G-TRSW-2500W		
CHECKED			SIZE	FSM NO.	DWG NO.
ISSUED			A	05XQ0	27028600
			SCALE	N:S	SHEET 1 OF 3
					REV. B1

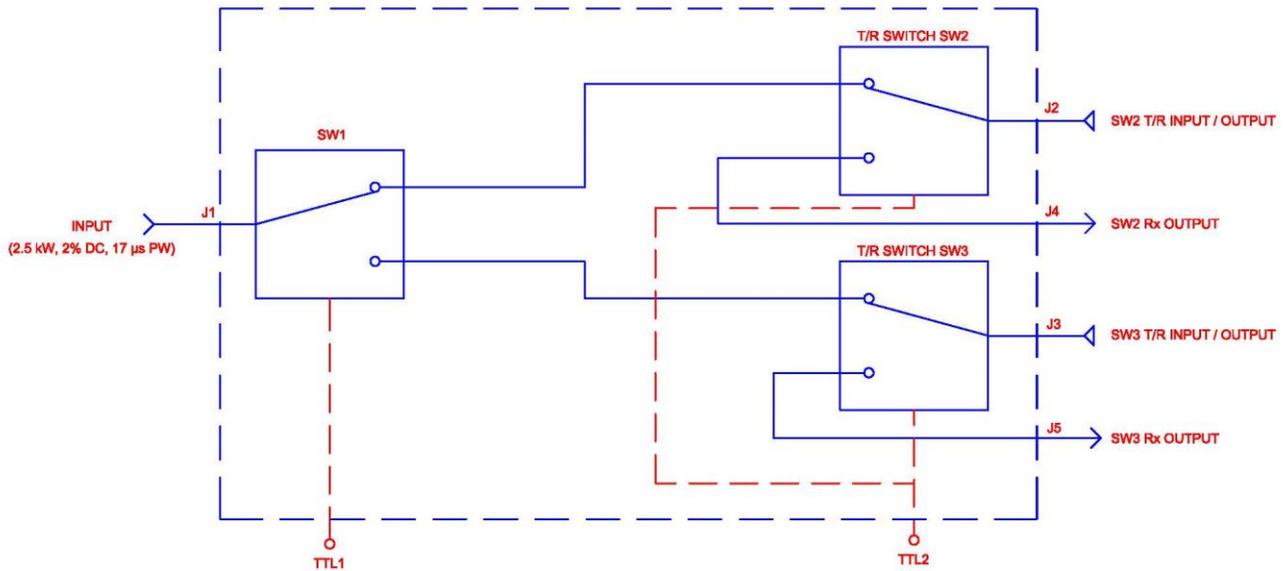


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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	1	ORIGINAL RELEASE	02/10/10	
	A1	ECN # 16-0140	10/07/10	
	B1	ECN # 16-0179	11/20/10	



FUNCTIONAL BLOCK DIAGRAM

STATES OF OPERATION

STATE #1: RECEIVE MODE - BOTH T/R SWITCHES (SW2 & SW3) WILL BE IN RECEIVE MODE AND THE POWER AMPLIFIER WILL BE OFF SUCH THAT HIGH POWER IS NOT PRESENT AT SW1.

STATE #2: IN THIS MODE BOTH T/R SWITCHES (SW2 & SW3) WILL BE IN TRANSMIT MODE AND SW1 WILL BE FEEDING SW2.

STATE #3: IN THIS MODE BOTH T/R SWITCHES (SW2 & SW3) WILL BE IN TRANSMIT MODE AND SW1 WILL BE FEEDING SW3.

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APPROVALS		DATE	TITLE			REV.
DRAWN: <i>M. Berry</i>		11/20/10	PRODUCT FEATURE PSM-1G1R1G-TRSW-2500W			B1
CHECKED:			SIZE: A	FORM NO. 05XQ0	DWG NO. 27028600	
ISSUED:			SCALE: N:S		SHEET: 2 OF 3	

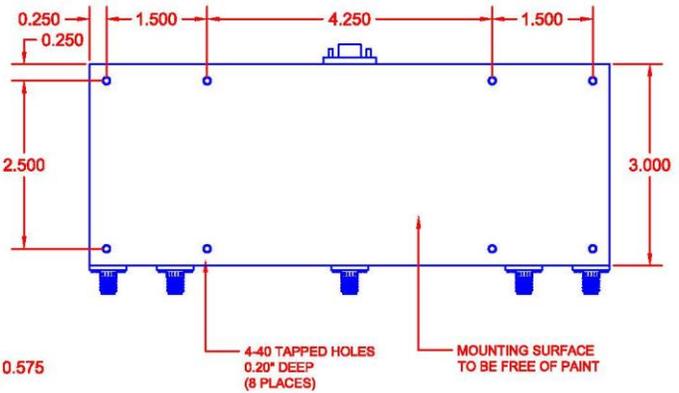
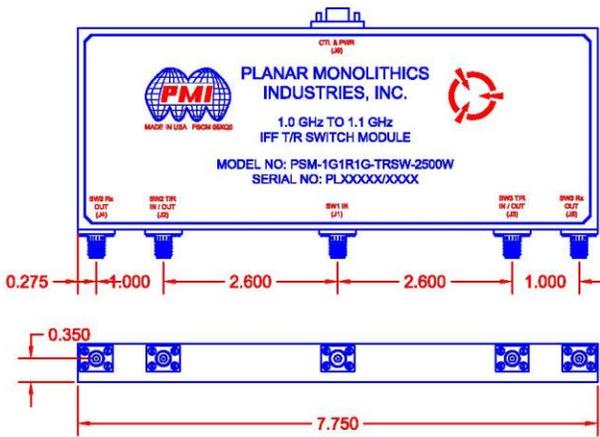
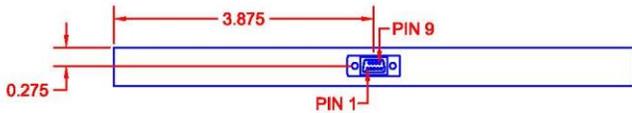


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	1	ORIGINAL RELEASE	08/18/18	
	A1	ECN # 16-0140	10/07/18	
	B1	ECN # 16-0179	11/29/18	



MECHANICAL LAYOUT

ENVIRONMENTAL RATINGS

- TEMPERATURE: _____ -45 °C TO +85 °C (OPERATING - BASE PLATE)
 _____ -54 °C TO +125 °C (STORAGE)
- ENVIRONMENTAL: _____ MIL-STD-810E
- EMI/EMC: _____ MIL-STD-461

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

ALL DIMENSIONS
 ARE IN INCHES (mm)
 TOLERANCES:
 X.XX ±0.020
 X.XXX ±0.010

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APPROVALS		DATE	TITLE		
DRAWN	<i>M. Berry</i>	11/29/18	PRODUCT FEATURE PSM-1G1R1G-TRSW-2500W		
CHECKED			SIZE	FSCM NO.	DWG NO.
ISSUED			A	05XQ0	27028600
			SCALE	N:S	SHEET 3 OF 3
					REV. B1



**TYPICAL CHARACTERISTICS
ON
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SUMMARY DATA

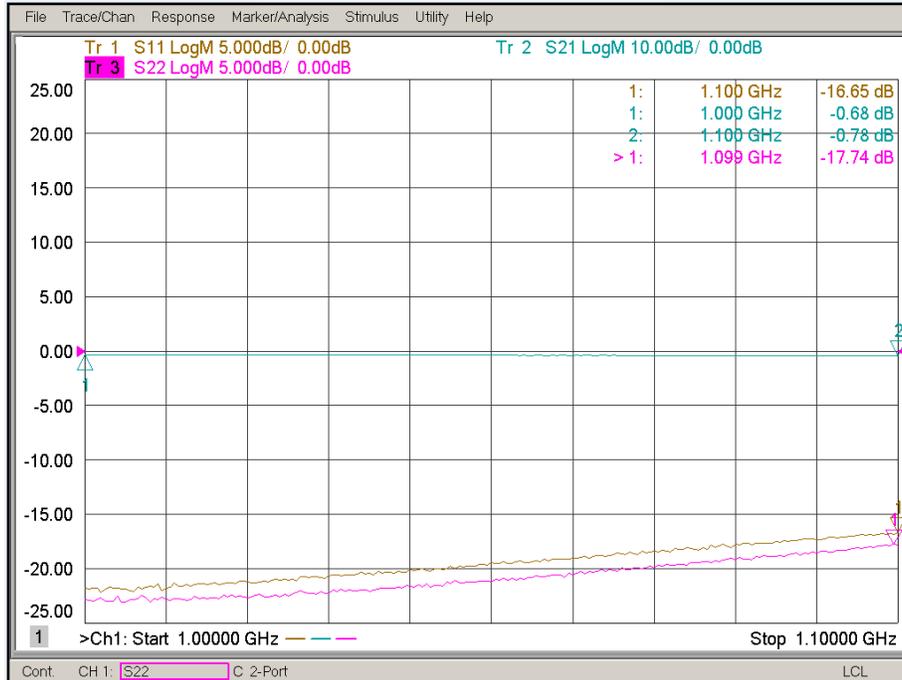
TEST. ITEM NO	PARAMETERS	SPECIFIED VALUE	TEST RESULTS	QA QC
1	Frequency Range	1.0 To 1.1 GHz	1.0 To 1.1 GHz (See Plots)	
2	RF Input Power	2.5 kW Peak, 17 us 2% Duty Cycle, 600 Hz	Not Tested Peak Power CW Power 125.89 W (See Plot)	
3	Insertion Loss	0.8 dB Typical, 1.0 dB Maximum ¹ 0.6 dB Typical, 0.8 dB Maximum ²	0.78 dB 0.45 dB (See Plots)	
4	Isolation	25 dB Minimum (J2 To J3) 60 dB Minimum (J2 To J4, J3 To J5)	33.99 dB 60.70 dB (See Plots)	
5	Switching Rate	2 kHz Maximum	2 kHz	
6	Switching Speed	250 ns Typical (50% TTL To 10% Or 90% RF)	ON: 620 ns OFF: 344 ns (See Plots)	
7	DC Supplies	+50 V @ 60 mA Typical +5 V @ 400 mA Typical	+50V @ 30 mA +5V @ 350 mA	

1. J1 To J2 & J1 To J3, Transmit Mode
2. J2 To J4 & J3 To J5, Receive Mode



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Insertion Loss J1-J2 (TX)



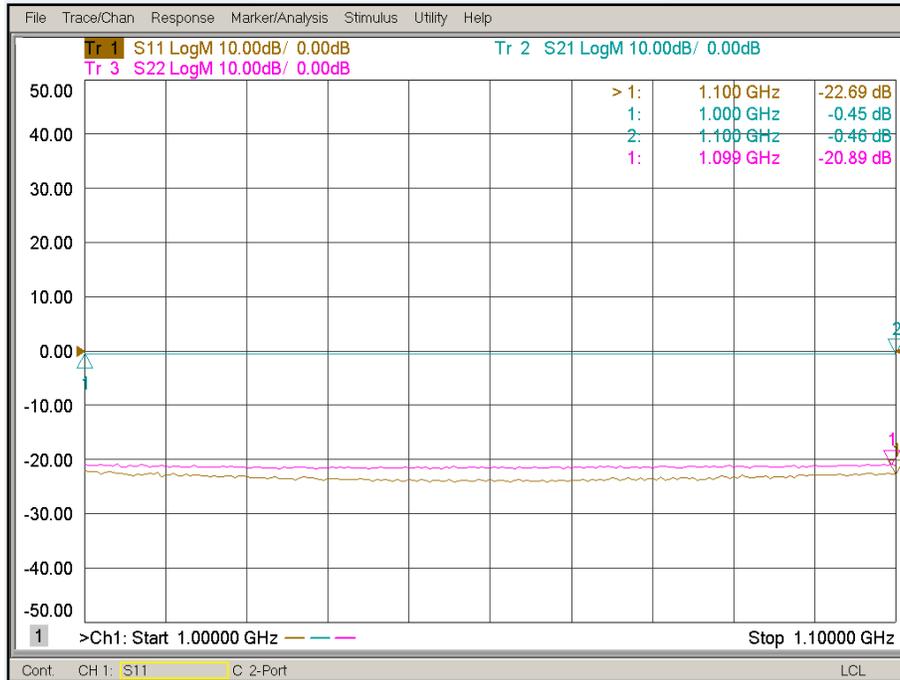
Insertion Loss J1-J3 (TX)



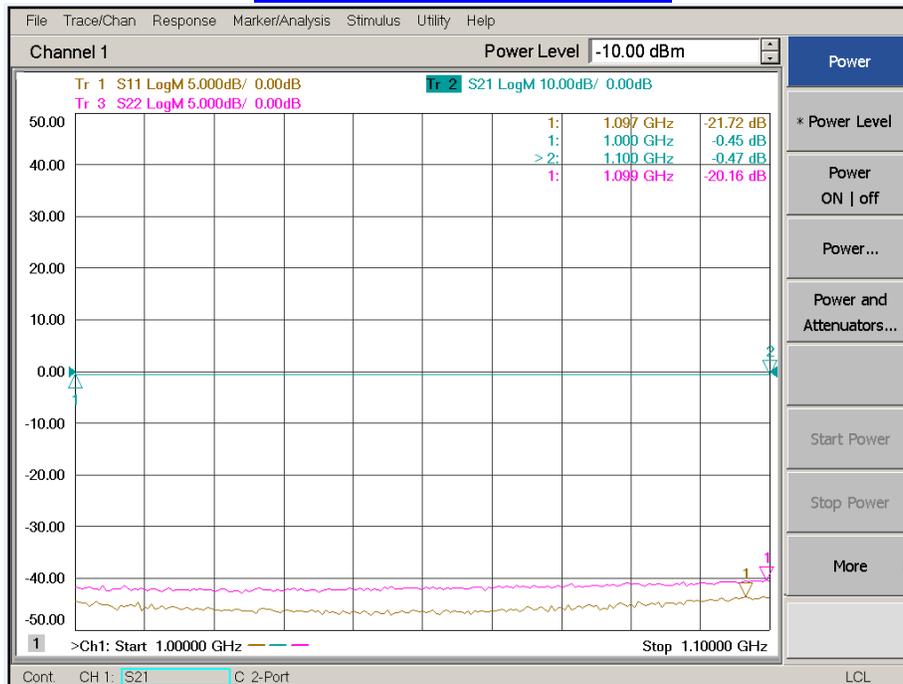


TYPICAL CHARACTERISTICS ON PSM-1G1R1G-TRSW-2500W

Insertion Loss J2-J4 (RX)



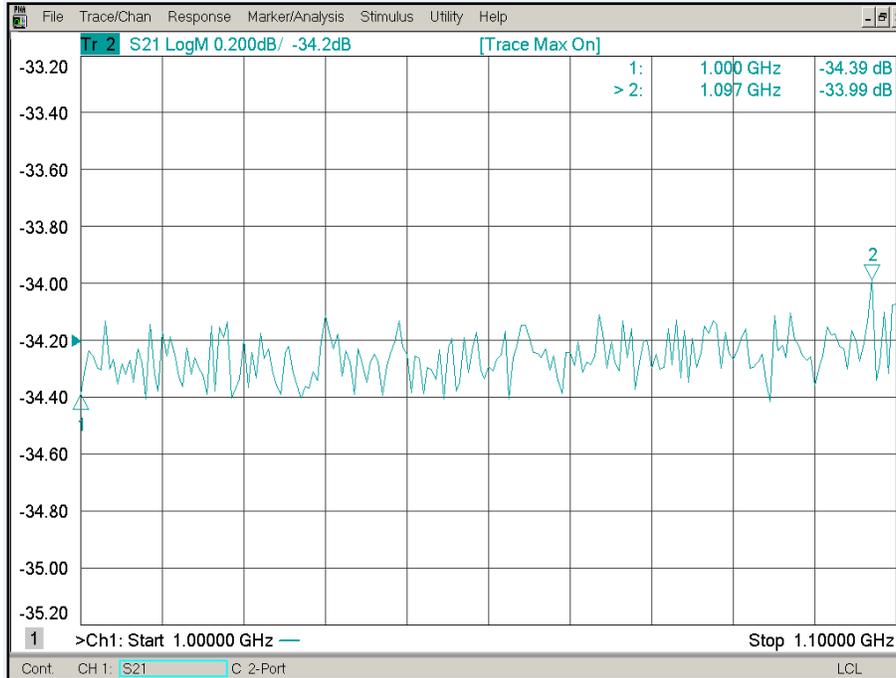
Insertion Loss J3-J5 (RX)



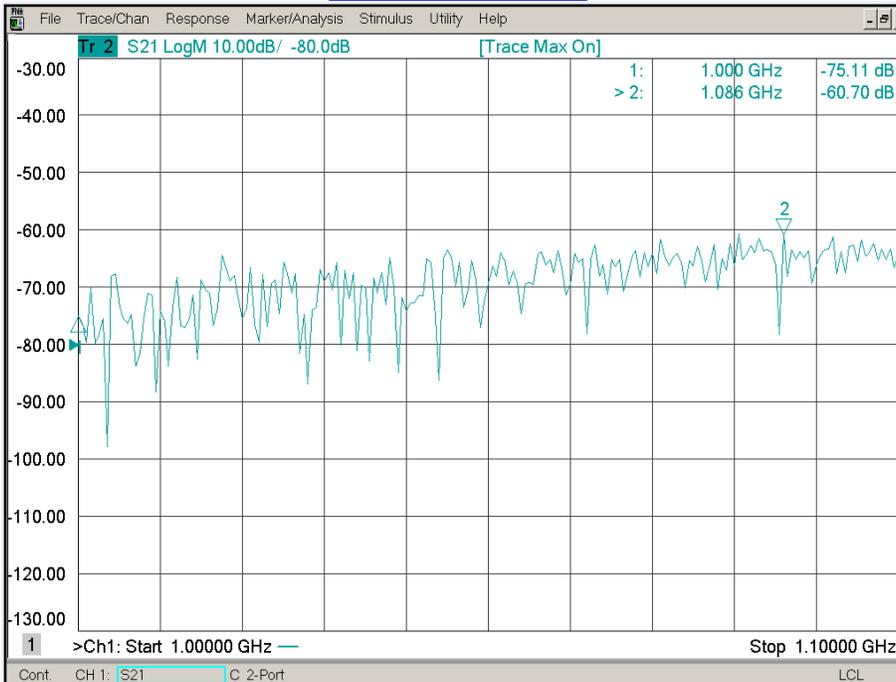


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Insolation J2-J3



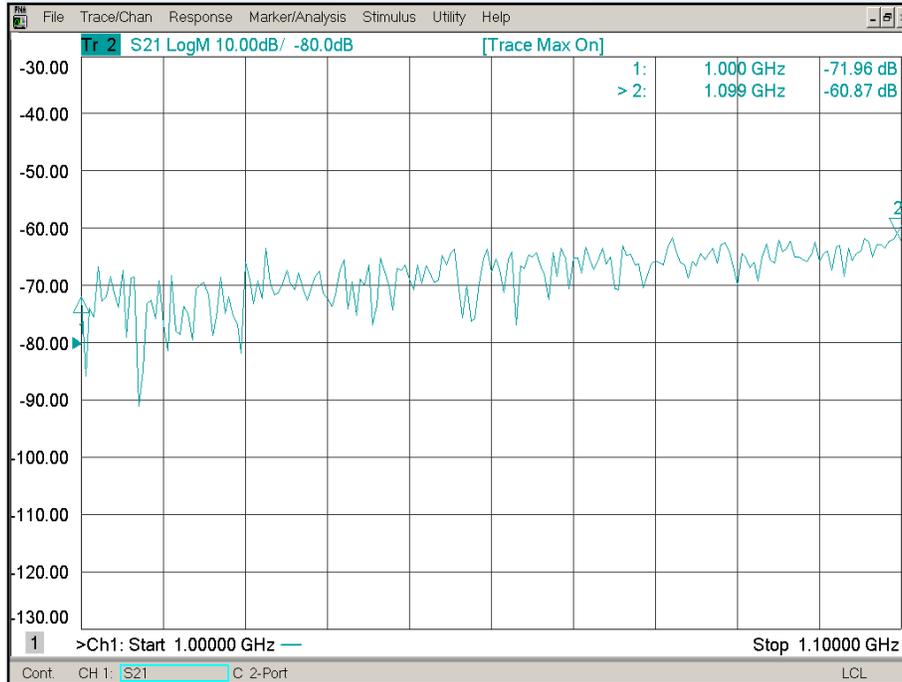
Insolation J2-J4





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Insolation J3-J5





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High Power Test

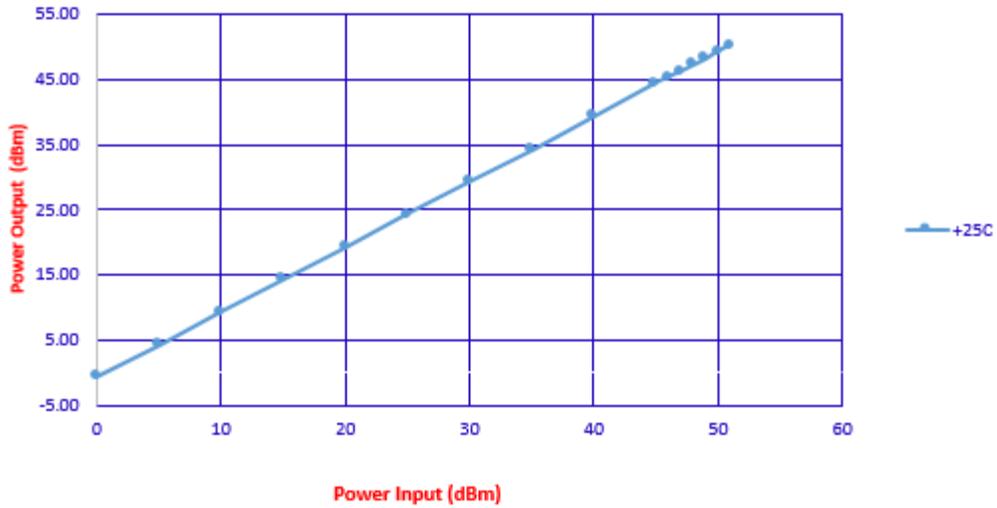


+25 C			-45 C			+85 C		
POWER INPUT (dBm)	POWER INPUT (Watts)	POWER OUTPUT (dBm)	POWER INPUT (dBm)	POWER INPUT (Watts)	POWER OUTPUT (dBm)	POWER INPUT (dBm)	POWER INPUT (Watts)	POWER OUTPUT (dBm)
0	0.001	-0.60	0	0.001	-0.58	0	0.001	-0.55
5	0.003	4.38	5	0.003	4.24	5	0.003	4.27
10	0.01	9.33	10	0.01	9.24	10	0.01	8.32
15	0.03	14.34	15	0.03	14.05	15	0.03	14.28
20	0.01	19.34	20	0.01	18.02	20	0.01	19.36
25	0.31	24.35	25	0.31	23.96	25	0.31	24.27
30	1	29.40	30	1	29.02	30	1	29.27
35	3.16	34.38	35	3.16	34.03	35	3.16	34.25
40	10	39.39	40	10	39.13	40	10	39.23
45	31.62	44.30	45	31.62	44.13	45	31.62	44.24
46	39.81	45.27	46	39.81	45.08	46	39.81	45.20
47	50.11	46.28	47	50.11	46.10	47	50.11	46.16
48	63.09	47.28	48	63.09	47.17	48	63.09	47.12
49	79.43	48.29	49	79.43	48.17	49	79.43	48.14
50	100	49.26	50	100	49.19	50	100	49.17
51	125.89	50.23	51	125.89	50.15	51	125.89	50.03



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J1-J3 (1GHz)

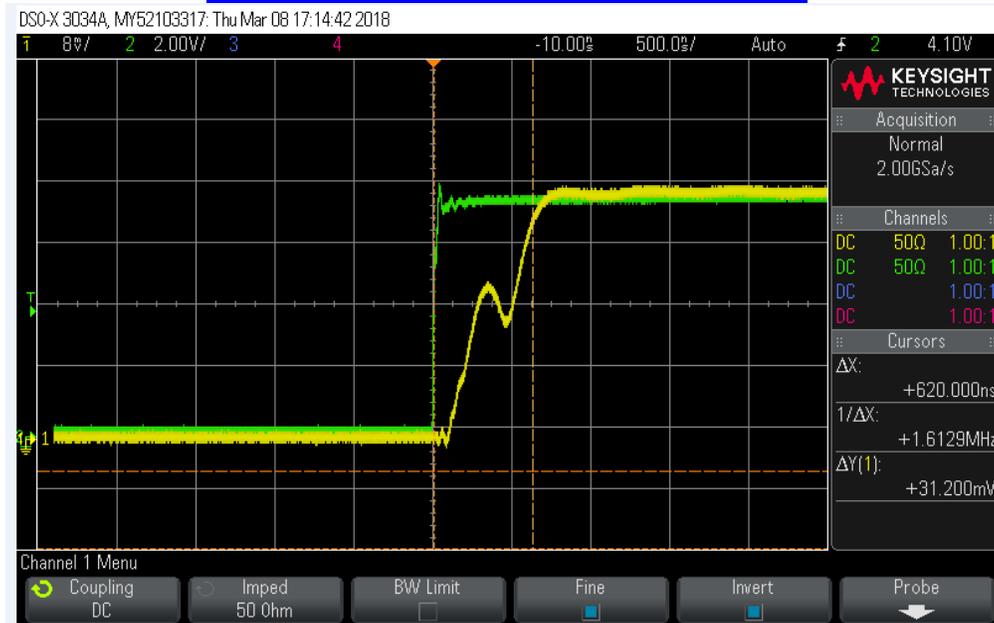


POWER INPUT (dBm)	POWER INPUT (Watts)	POWER OUTPUT (dBm)
0	0.001	-0.65
5	0.003	4.33
10	0.01	9.35
15	0.03	14.30
20	0.01	19.28
25	0.31	24.30
30	1	29.35
35	3.16	34.28
40	10	39.37
45	31.62	44.38
46	39.81	45.30
47	50.11	46.33
48	63.09	47.28
49	79.43	48.29
50	100	49.26
51	125.89	50.25



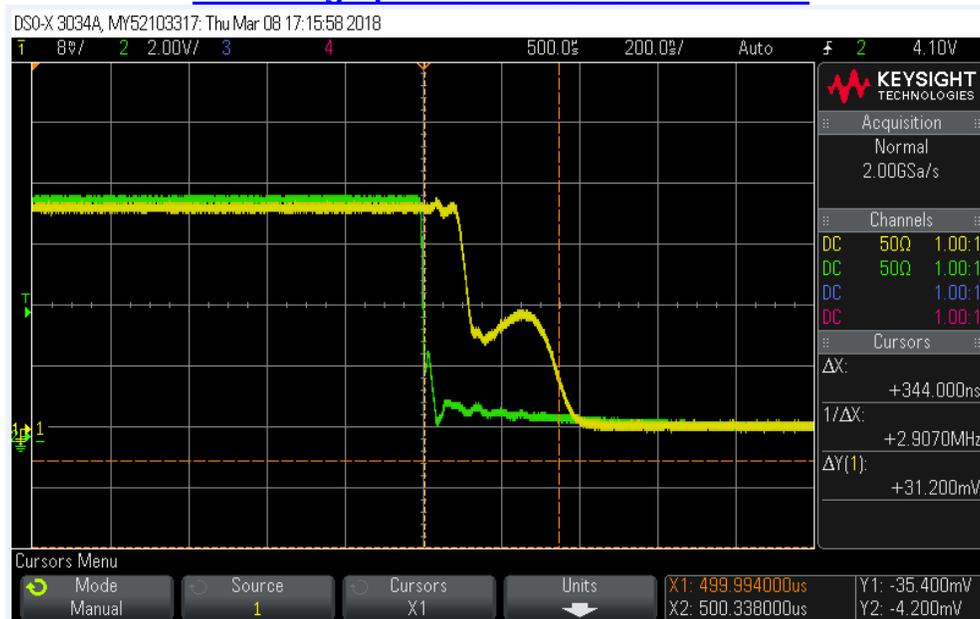
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Switching Speed ON 500 nsec. Per. Div.



Green Trace: TTL Signal
Yellow Trace: RF Output Crystal Detector

Switching Speed OFF 200 nsec. Per. Div.

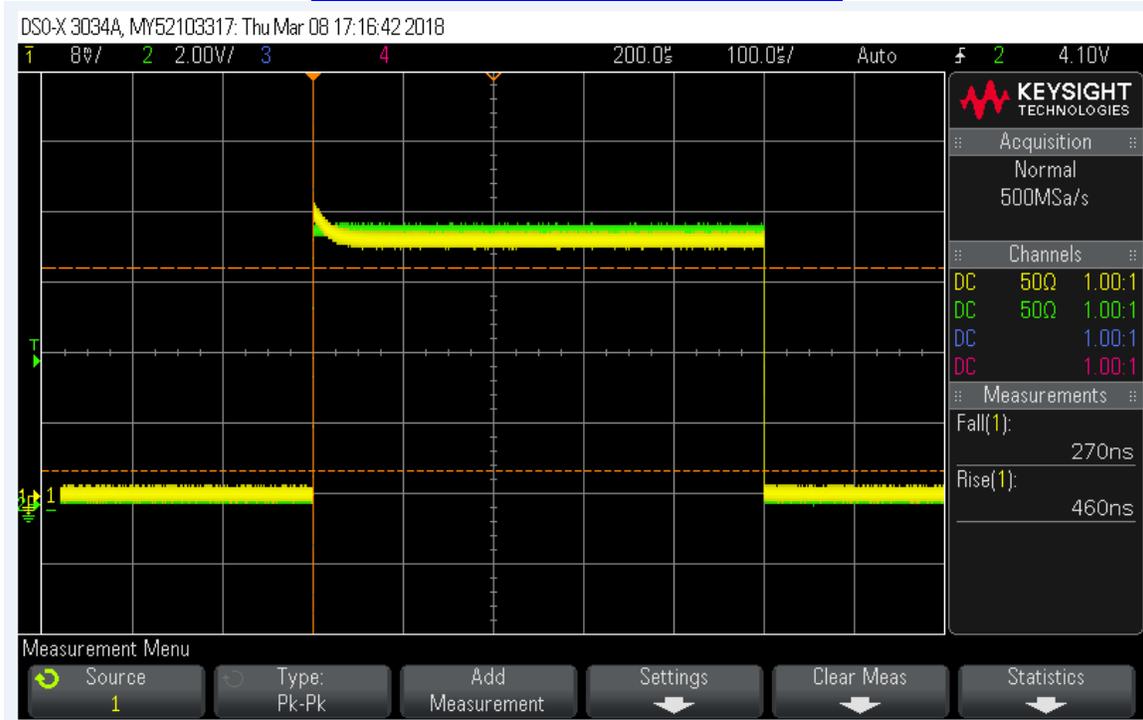


Green Trace: TTL Signal
Yellow Trace: RF Output Crystal Detector



**TYPICAL CHARACTERISTICS
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Full Pulse, Rise Time and Fall Time



Green Trace: TTL Signal
Yellow Trace: RF Output Cristal Detector