



# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

PMI MODEL P2T-10M6G-45-R-5V-SFF-HIP20W-OPT10M500M IS A REFLECTIVE, SINGLE POLE, TWO THROW PIN DIODE SWITCH THAT IS OPTIMIZED OVER THE 10 MHz TO 500 MHz FREQUENCY RANGE AND DESIGNED TO OFFER DEGRADED PERFORMANCE FROM 10 MHz TO 6.0 GHz. THIS MODEL IS CAPABLE OF HANDLING AN INPUT POWER LEVEL OF 20 WATTS CW WHILE PROVIDING SWITCHING SPEEDS OF <100 ns AND REQUIRES A SINGLE +5 VDC, 45 mA SUPPLY. THIS MODEL INCORPORATES A TTL COMPATIBLE DRIVER FOR EASY SYSTEM INTEGRATION. THIS SWITCH IS OFFERED IN A SMALL HOUSING THAT MEASURES 1.20" x 1.0" x 0.5" AND IS SUPPLIED WITH SMA FEMALE CONNECTORS.



June 17, 2015

Designed by: Kevin Mason & PMI Engineering

Tested & Reported by: Kevin Mason

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# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

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## Product Feature Drawing

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	1	ORIGINAL RELEASE	05/02/15	X.M.
	2	REVISED SWITCHING SPEED DEFINITION	06/16/15	X.M.

**DESCRIPTION**

PMI MODEL P2T-10M6G-45-R-5V-SFF-HIP20W-OPT10M500M IS A REFLECTIVE, SINGLE POLE, TWO THROW PIN DIODE SWITCH THAT OPERATES OVER THE 10 MHz TO 500 MHz FREQUENCY RANGE. THIS MODEL IS CAPABLE OF HANDLING AN INPUT POWER LEVEL OF 20 WATTS CW WHILE PROVIDING SWITCHING SPEEDS OF <100 ns AND REQUIRES A SINGLE +5 VDC SUPPLY. THIS MODEL INCORPORATES A TTL COMPATIBLE DRIVER FOR EASY SYSTEM INTEGRATION.

**SPECIFICATIONS**

- FREQUENCY RANGE: 10 TO 500 MHz (AVAILABLE UP TO 6 GHz)
- ISOLATION: 45 dB TYPICAL
- INSERTION LOSS: 1.0 dB TYPICAL
- VSWR IN/OUT: 2.0:1 MAXIMUM
- OPERATING INPUT POWER: 20 WATTS CW MAXIMUM (NOT TO BE SWITCHED ANY HIGHER THAN 50 kHz [PRI])
- RF SWITCHING SPEED: 100 ns MAXIMUM (50% TTL TO 10% / 90% RF)
- IMPEDANCE: 50 OHMS
- DC VOLTAGE: +5 V @ 30 mA TYPICAL
- CONTROL SIGNAL: TTL LOGIC (SEE LOGIC TABLE)
- CONNECTORS: SMA(F) - REMOVABLE
- CONTROL CONNECTORS: SOLDER PINS
- FINISH: EPOXY PAINTED BLUE BOTTOM SIDE TO BE UNPAINTED (SILVER PLATED)

**ENVIRONMENTAL RATINGS**

- TEMPERATURE: -54 °C TO +85 °C (OPERATING)  
-55 °C TO +125 °C (STORAGE)
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D

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

**MECHANICAL OUTLINE**

**LOGIC TABLE**

CTL	J1 + J2	J1 + J3
0	ON	OFF
1	OFF	ON

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ISO 9001 CERTIFIED

APPROVALS		DATE	TITLE	
DRAWN	X. MASON	05/02/15	PRODUCT FEATURE	
CHECKED			P2T-10M6G-45-R-5V-SFF-HIP20W-OPT10M500M	
DESIGN			SIZE	REV.
			A	2
			FROM NO.	DWG NO.
			05XQ0	27025201
			SCALE	SHEET
			N/S	1 OF 1

ALL DIMENSIONS ARE IN INCHES  
TOLERANCES:  
XXX ±0.020  
X.XXX ±0.015

PMI CONFIDENTIAL AND PROPRIETARY

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# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

## Summary Data Sheet

TEST. ITEM NO	PARAMETERS	SPECIFIED VALUE	TEST RESULTS	QA QC
1	Frequency Range:	10 to 500 MHz	10 to 500 MHz	
2	Isolation:	45 dB Typical	46.0 dB (See Plot)	
3	Insertion Loss:	1.0 dB Typical	0.6 dB (See Plot)	
4	VSWR (In/Out):	2.0:1 Maximum	1.13:1 (See Plot)	
5	Operating Input Power:	20 Watts CW Maximum*	<b>Tested to 25 Watts CW</b> (See Pages 11 – 16)	
6	RF Switching Speed:	100 ns Maximum ("On" = 50% TTL to 90% RF) ("Off" = 50% TTL to 10% RF)	61.6ns "On" 51.6 ns "Off"	
7	DC Voltage:	+5 Volts @ 30 mA Typical	45 mA	
8	Control Signal:	TTL "0" (J1 to J2) Low Loss TTL "1" (J1 to J3) Low Loss	Verified / Pass	

\*Not to be Switched Any Higher than 50 kHz [PRI]

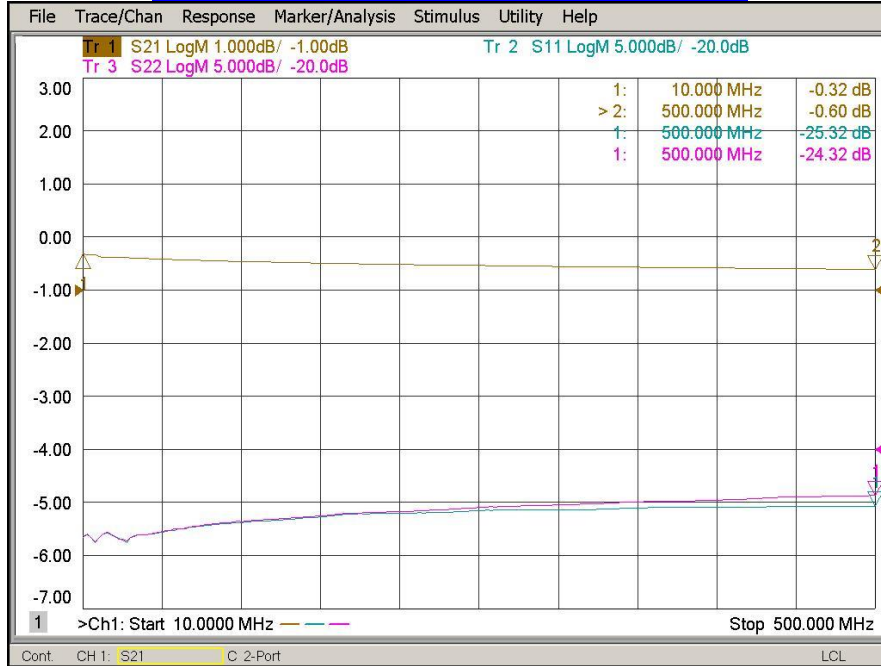
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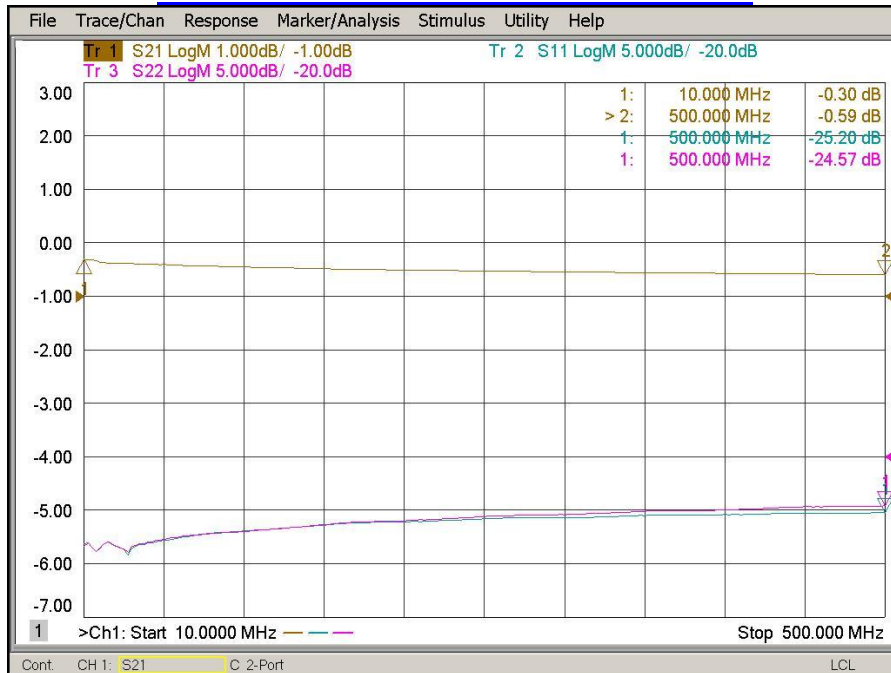
# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

## J1 – J2 Insertion Loss and Return Loss



## J1 – J3 Insertion Loss and Return Loss



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# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

## J1 to J2 Isolation Plot (J1 to J3 = "Low Loss State")



## J1 to J3 Isolation Plot (J1 to J2 = "Low Loss State")

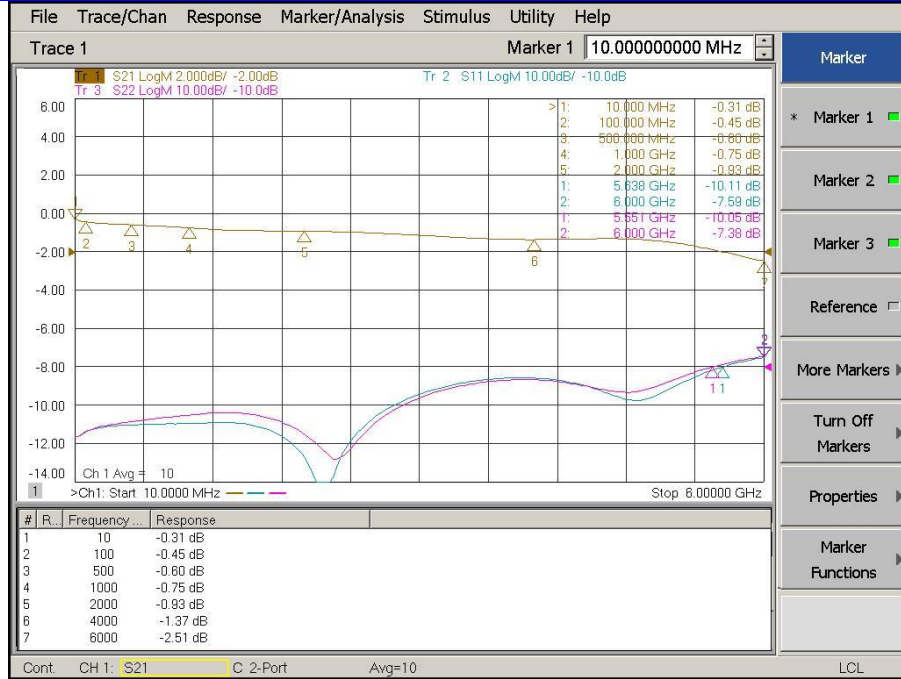




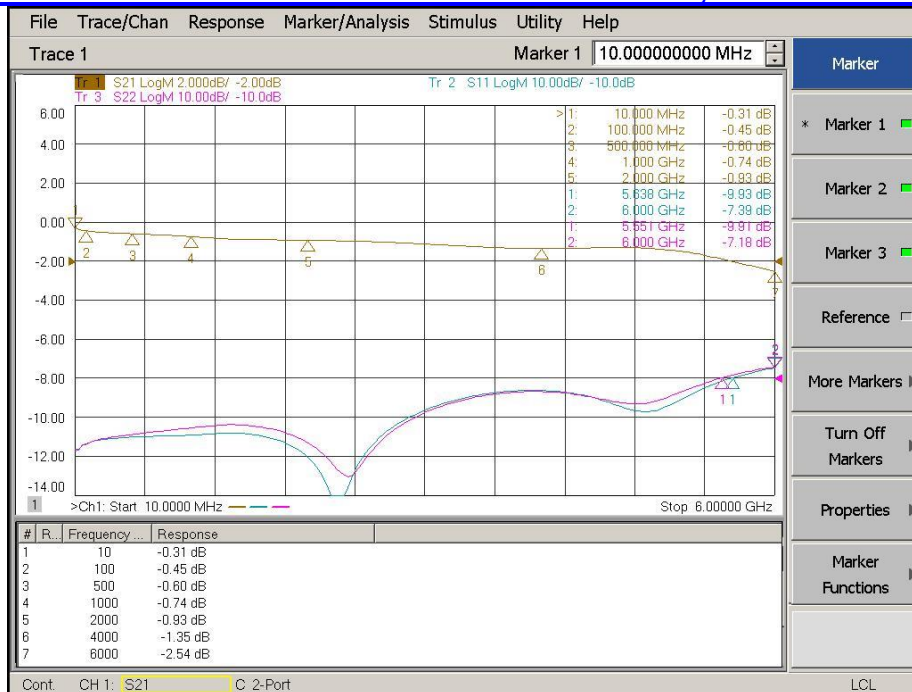
# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

## J1-J2 Broadband Insertion Loss and VSWR Plot, 10 TO 6000 MHz



## J1-J3 Broadband Insertion Loss and VSWR Plot, 10 TO 6000 MHz



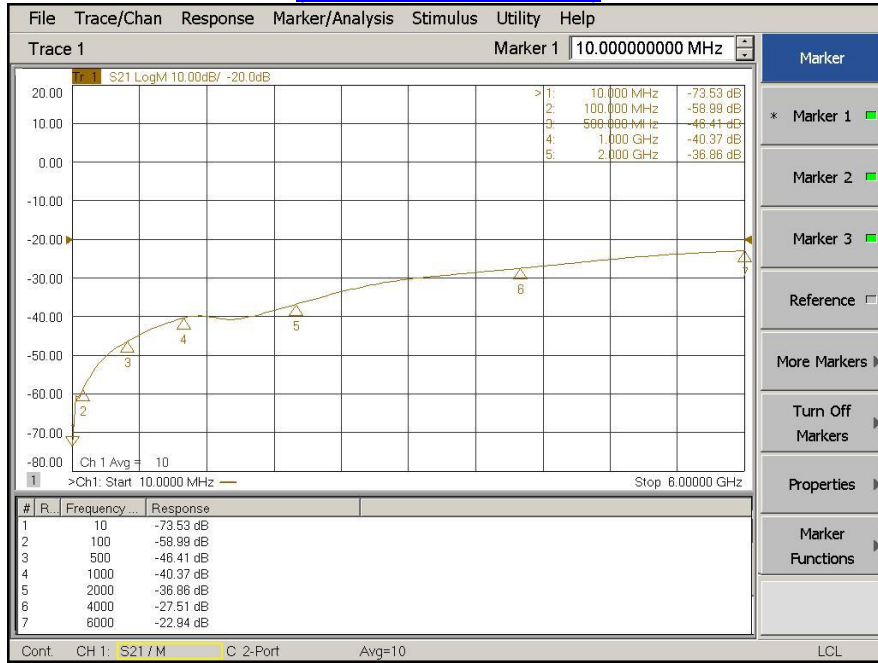
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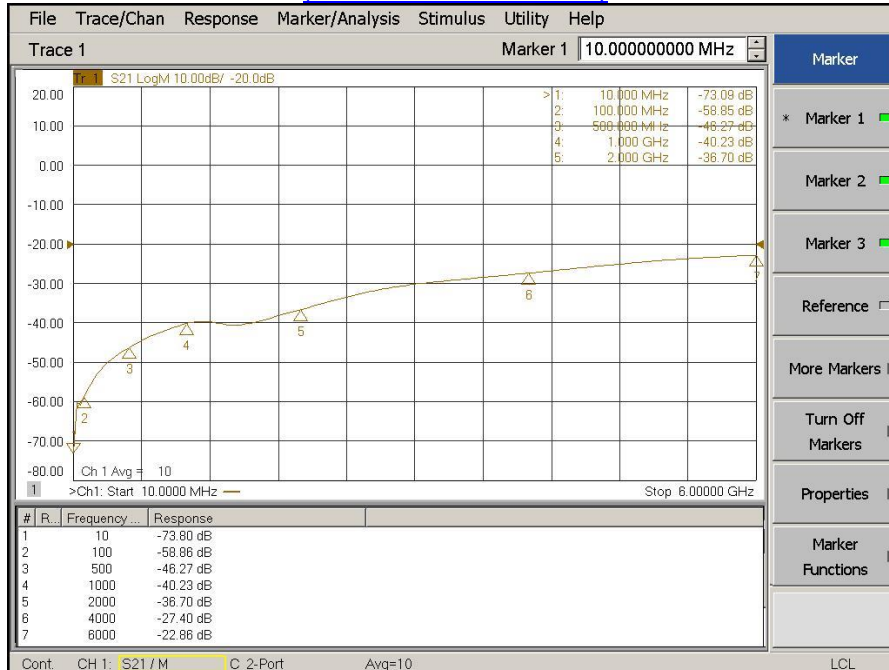
# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

## J1-J2 Broadband Isolation Plot, 10 to 6000 MHz (J1-J3 = "Low Loss State")



## J1-J3 Broadband Isolation Plot, 10 to 6000 MHz (J1-J2 = "Low Loss State")



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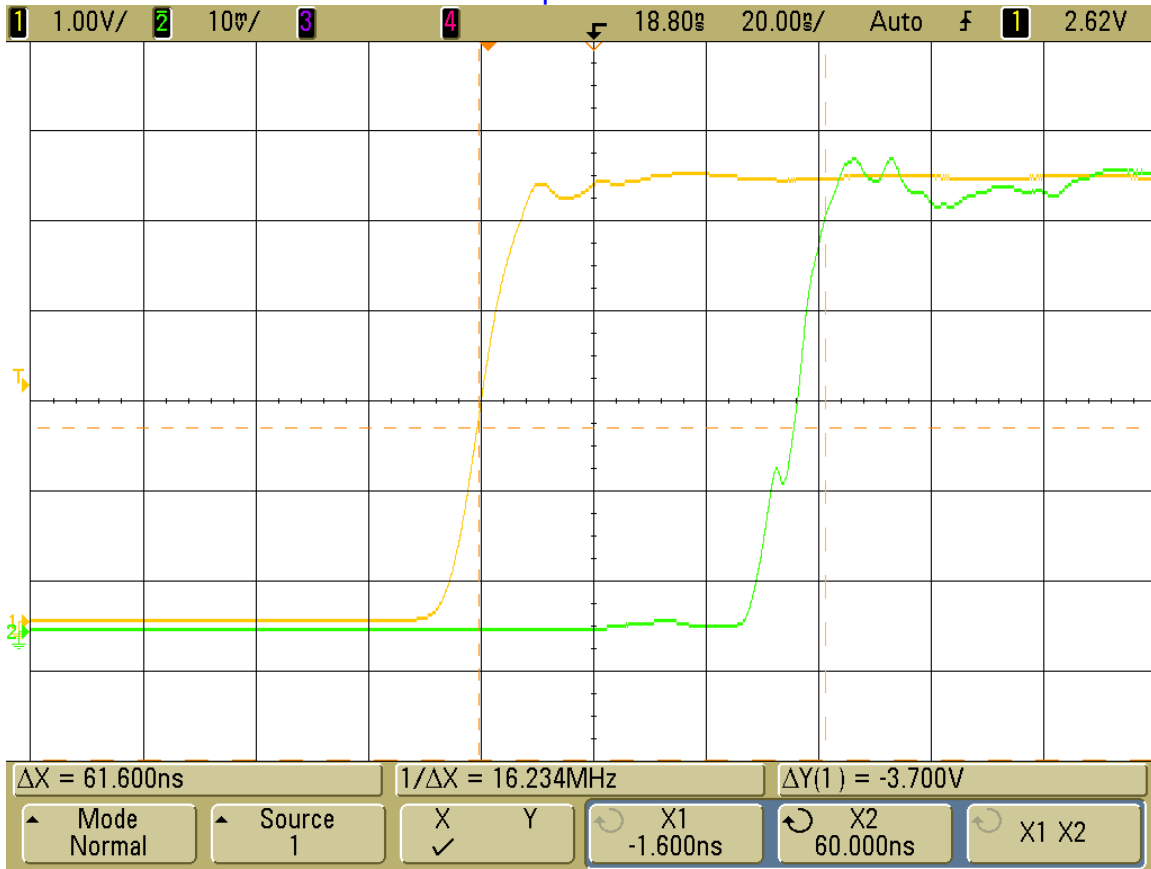


# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

## Switching Speed "On" & Rise Time

20 ns per Division



Yellow Trace: TTL Signal  
Green Trace: RF Signal

### Measured Values:

Switching Speed "On" (50% TTL to 90% RF) = 61.6 ns  
Rise Time (10% RF to 90% RF) = 13.6 ns

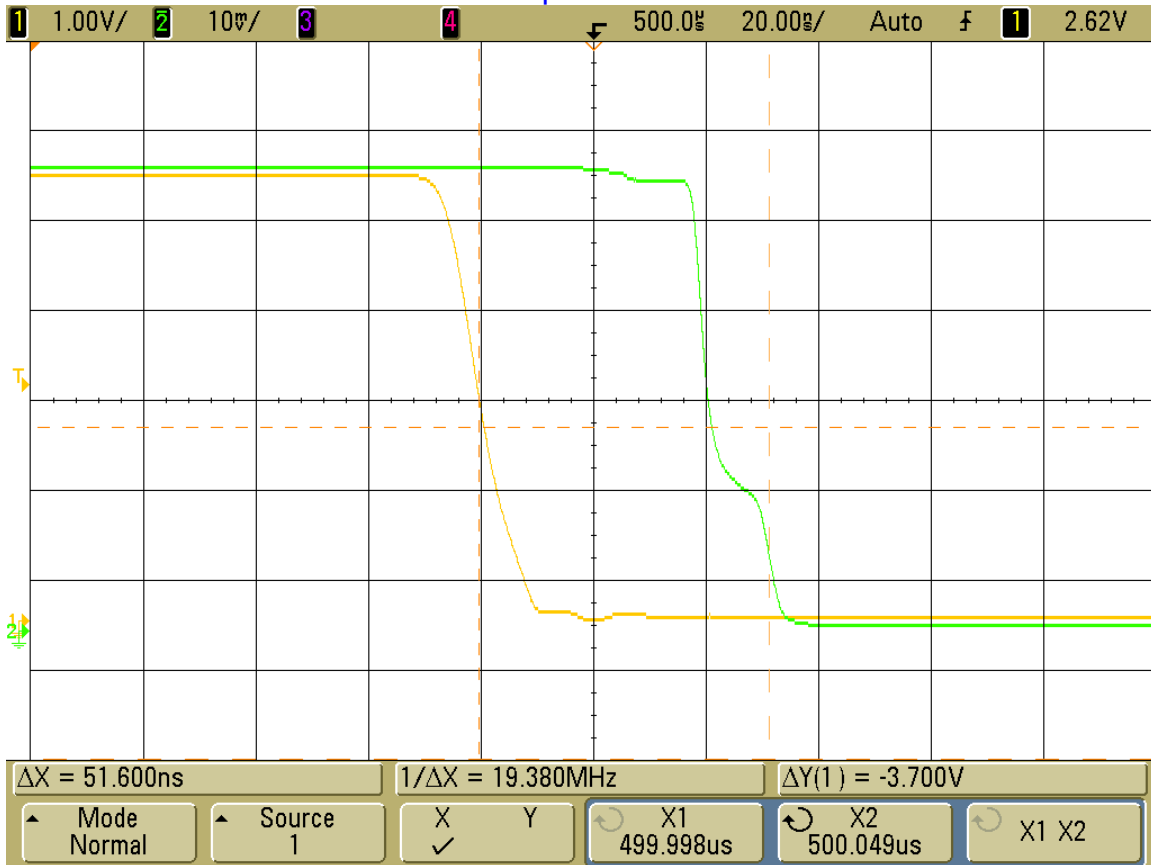


# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

## Switching Speed "Off" & Fall Time (50% TTL to 10% RF)

20 ns per Division



Yellow Trace: TTL Signal  
Green Trace: RF Signal

### Measured Values:

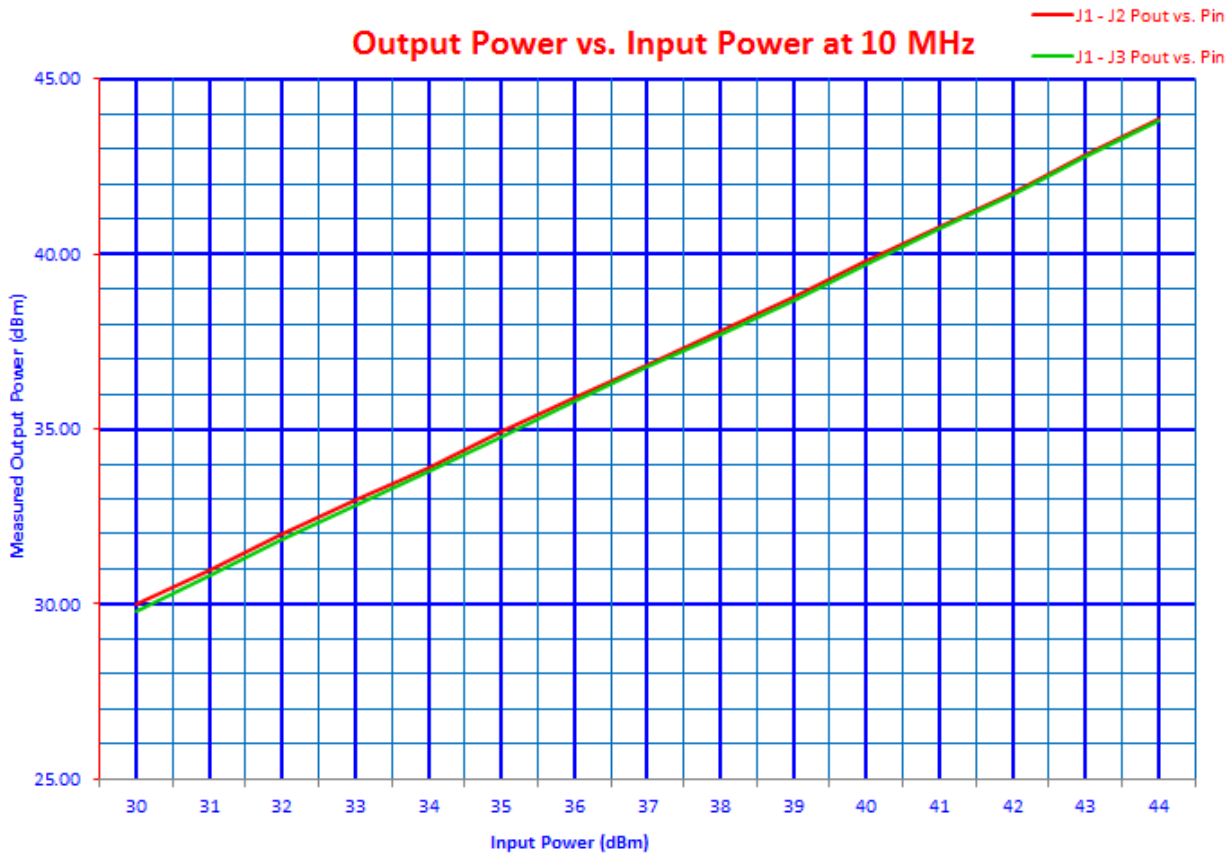
Switching Speed "Off" (50% TTL to 10% RF) = 51.6 ns  
Fall Time (90% RF to 10% RF) = 23.2 ns



# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

**High Power CW Output Power Vs. Input Power Graph**  
Frequency = 10 MHz





# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

**High Power CW Output Power Vs. Input Power Table**  
Frequency = 10 MHz

Input Power to Switch (dBm)	Input Power to Switch (W)	Output Power of Switch (J1 - J2) (dBm)	Output Power of Switch (J1 - J2) (W)	Switch Loss (J1 - J2) (dB)	Output Power of Switch (J1 - J3) (dBm)	Output Power of Switch (J1 - J3) (W)	Switch Loss (J1 - J3) (dB)
30	1.000	29.98	0.995	-0.02	29.79	0.953	-0.21
31	1.259	30.97	1.250	-0.03	30.80	1.202	-0.20
32	1.585	31.98	1.578	-0.02	31.83	1.524	-0.17
33	1.995	32.95	1.972	-0.05	32.81	1.910	-0.19
34	2.512	33.92	2.466	-0.08	33.80	2.399	-0.20
35	3.162	34.90	3.090	-0.10	34.79	3.013	-0.21
36	3.981	35.89	3.882	-0.11	35.79	3.793	-0.21
37	5.012	36.84	4.831	-0.16	36.75	4.732	-0.25
38	6.310	37.80	6.026	-0.20	37.72	5.916	-0.28
39	7.943	38.75	7.499	-0.25	38.68	7.379	-0.32
40	10.000	39.78	9.506	-0.22	39.69	9.311	-0.31
41	12.589	40.77	11.940	-0.23	40.72	11.803	-0.28
42	15.849	41.74	14.928	-0.26	41.68	14.723	-0.32
43	19.953	42.85	19.275	-0.15	42.79	19.011	-0.21
44	25.119	43.84	24.210	-0.16	43.79	23.933	-0.21

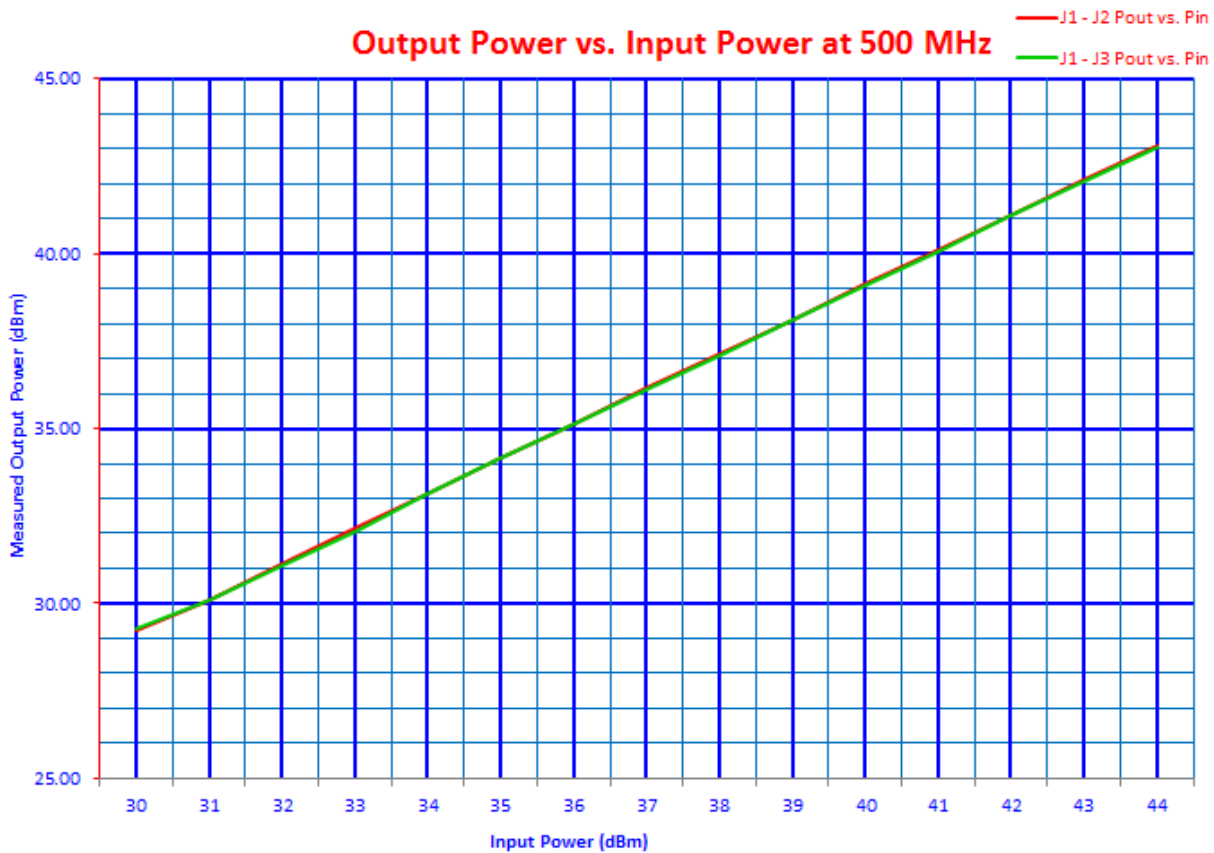
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# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

**High Power CW Output Power Vs. Input Power Graph**  
Frequency = 500 MHz





# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

**High Power CW Output Power Vs. Input Power Table**  
Frequency = 500 MHz

Input Power to Switch (dBm)	Input Power to Switch (W)	Output Power of Switch (J1 - J2) (dBm)	Output Power of Switch (J1 - J2) (W)	Switch Loss (J1 - J2) (dB)	Output Power of Switch (J1 - J3) (dBm)	Output Power of Switch (J1 - J3) (W)	Switch Loss (J1 - J3) (dB)
30	1.000	29.24	0.839	-0.76	29.30	0.851	-0.70
31	1.259	30.11	1.026	-0.89	30.08	1.019	-0.92
32	1.585	31.11	1.291	-0.89	31.07	1.279	-0.93
33	1.995	32.14	1.637	-0.86	32.05	1.603	-0.95
34	2.512	33.13	2.056	-0.87	33.12	2.051	-0.88
35	3.162	34.14	2.594	-0.86	34.13	2.588	-0.87
36	3.981	35.14	3.266	-0.86	35.12	3.251	-0.88
37	5.012	36.14	4.111	-0.86	36.12	4.093	-0.88
38	6.310	37.13	5.164	-0.87	37.10	5.129	-0.90
39	7.943	38.12	6.486	-0.88	38.09	6.442	-0.91
40	10.000	39.12	8.166	-0.88	39.08	8.091	-0.92
41	12.589	40.10	10.233	-0.90	40.05	10.116	-0.95
42	15.849	41.10	12.882	-0.90	41.06	12.764	-0.94
43	19.953	42.09	16.181	-0.91	42.05	16.032	-0.95
44	25.119	43.06	20.230	-0.94	43.04	20.137	-0.96

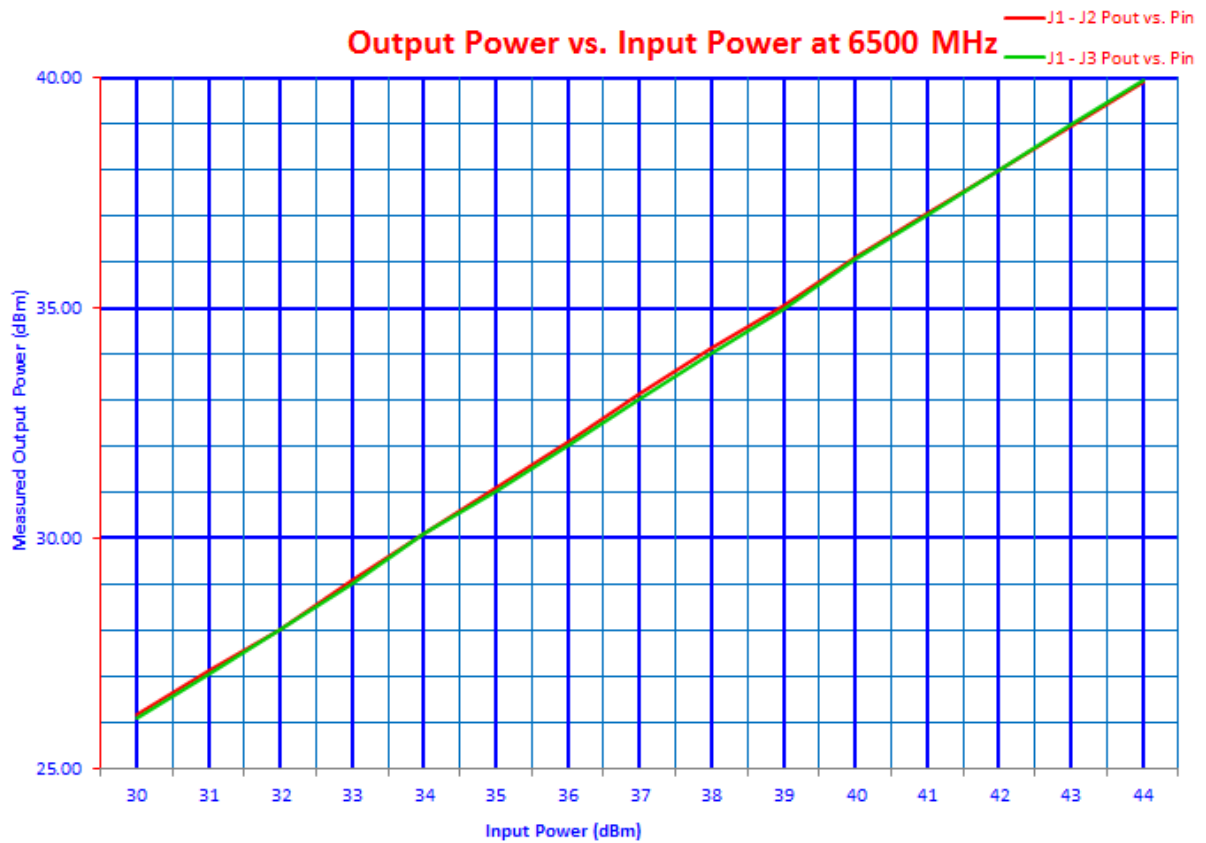


# Typical Characteristics For P2T-10M6G-45-R-5V-SFF- HIP20W-OPT10M500M

Serial No. PL17307/1524

## High Power CW Output Power Vs. Input Power Graph

Frequency = 6500 MHz



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Serial No. PL17307/1524

**High Power CW Output Power Vs. Input Power Table**  
Frequency = 6500 MHz

Input Power to Switch (dBm)	Input Power to Switch (W)	Output Power of Switch (J1 - J2) (dBm)	Output Power of Switch (J1 - J2) (W)	Switch Loss (J1 - J2) (dB)	Output Power of Switch (J1 - J3) (dBm)	Output Power of Switch (J1 - J3) (W)	Switch Loss (J1 - J3) (dB)
30	1.000	26.17	0.414	-3.83	26.08	0.406	-3.92
31	1.259	27.12	0.515	-3.88	27.04	0.506	-3.96
32	1.585	28.00	0.631	-4.00	28.03	0.635	-3.97
33	1.995	29.09	0.811	-3.91	29.01	0.796	-3.99
34	2.512	30.10	1.023	-3.90	30.08	1.019	-3.92
35	3.162	31.08	1.282	-3.92	31.01	1.262	-3.99
36	3.981	32.10	1.622	-3.90	32.02	1.592	-3.98
37	5.012	33.13	2.056	-3.87	33.03	2.009	-3.97
38	6.310	34.12	2.582	-3.88	34.03	2.529	-3.97
39	7.943	35.07	3.214	-3.93	34.98	3.148	-4.02
40	10.000	36.11	4.083	-3.89	36.05	4.027	-3.95
41	12.589	37.05	5.070	-3.95	37.02	5.035	-3.98
42	15.849	37.99	6.295	-4.01	38.00	6.310	-4.00
43	19.953	38.95	7.852	-4.05	38.98	7.907	-4.02
44	25.119	39.91	9.795	-4.09	39.95	9.890	-4.05