Typical Characteristics
ON
P2T-0R5G8G-45-R-50W-AL

PMI MODEL: P2T-0R5G8G-45-R-50W-AL IS A SINGLE POLE, TWO THROW REFLECTIVE SWITCH DESIGNED TO OPERATE OVER THE 0.5GHz TO 8.0 GHz FREQUENCY RANGE. THIS MODEL IS DESIGNED TO HANDLE 50 WATTS AVERAGE INPUT POWER.

June 15, 2020

Designed By:

Dr. Ashok Gorwara

Tested and Reported By:

Alfredo Lopez

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Typical Characteristics
ON
P2T-0R5G8G-45-R-50W-AL

Outline Drawing

DESCRIPTION

PMI MODEL: P2T-0R5G8G-45-R-50W-AL IS A SINGLE POLE, TWO THROW REFLECTIVE SWITCH DESIGNED TO OPERATE OVER THE 0.5 GHz TO 8.0 GHz FREQUENCY RANGE. THIS MODEL IS DESIGNED TO HANDLE 50 WATTS AVERAGE INPUT POWER.

SPECIFICATIONS

- FREQUENCY — 0.5 TO 8.0 GHz
- RF INPUT POWER: — 50 WATTS AVERAGE (COLD SWITCHING)
- INSERTION LOSS: —
  1.30 dB MAX, 0.90 dB TYP @ 0.5 - 1.0 GHz
  1.40 dB MAX, 1.00 dB TYP @ 1.0 - 2.0 GHz
  1.60 dB MAX, 1.30 dB TYP @ 2.0 - 4.0 GHz
  2.30 dB MAX, 2.00 dB TYP @ 4.0 - 6.0 GHz
  2.60 dB MAX, 2.40 dB TYP @ 6.0 - 8.0 GHz
- ISOLATION: ———
  48 dB MIN, 52 dB TYP @ 0.5 - 1.0 GHz
  42 dB MIN, 45 dB TYP @ 1.0 - 2.0 GHz
  36 dB MIN, 38 dB TYP @ 2.0 - 4.0 GHz
  35 dB MIN, 37 dB TYP @ 4.0 - 6.0 GHz
  30 dB MIN, 33 dB TYP @ 6.0 - 8.0 GHz
- VSWR: ———
  1.5:1 MAX, 1.30:1 TYP @ 0.5 - 1.0 GHz
  1.5:1 MAX, 1.30:1 TYP @ 1.0 - 2.0 GHz
  1.5:1 MAX, 1.30:1 TYP @ 2.0 - 4.0 GHz
  1.9:1 MAX, 1.80:1 TYP @ 4.0 - 6.0 GHz
  2.0:1 MAX, 1.80:1 TYP @ 6.0 - 8.0 GHz
- SWITCHING SPEED: — 100 ns Max.
- HOT SWITCHING: — 40 Watts (CW) Max (1KHz, 50% Duty Cycle, At 0.5 To 8GHz)
  10 Watts (CW) Max (1MHz, 50% Duty Cycle, At 8GHz
  16 Watts (CW) Max (1MHz, 50% Duty Cycle, At 0.5GHz
- POWER SUPPLY: — +5V @ 100 mA MAXIMUM
- CONTROL: ——— TTL (SEE LOGIC TABLE BELOW)
- FINISH: ——— PAINTED BLUE
  (NO PAINT ON MOUNTING SURFACE)
- CONNECTORS: ——— FIELD REPLACEABLE SMA FEMALE

LOGIC TABLE		
CTL	J1 - J2	J1 - J3
0	ON	OFF
1	OFF	ON

ENVIRONMENTAL RATINGS

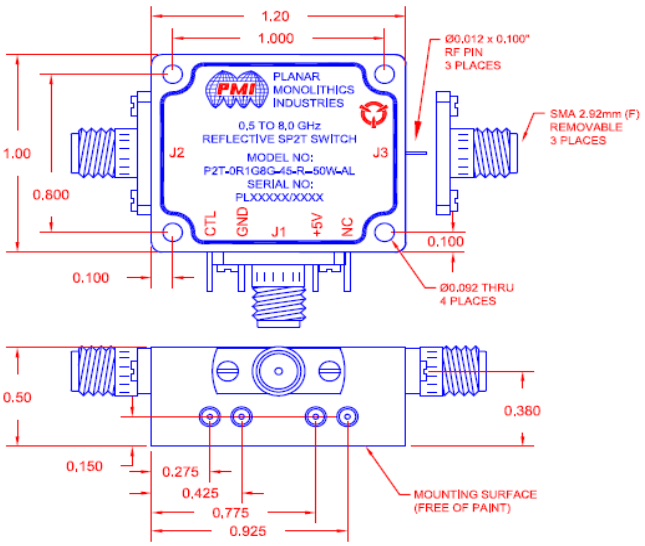
- TEMPERATURE: ——— -45 °C TO +85 °C (OPERATING)
  -54 °C TO +125 °C (STORAGE)
- ENVIRONMENTAL: ——— MIL-STD-810E
- EMI/EMC: ——— MIL-STD-461

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

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

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A1	INITIAL RELEASE	03/20/20	

MECHANICAL OUTLINE



PMI CONFIDENTIAL AND PROPRIETARY

PLANAR MONOLITHICS INDUSTRIES, INC.
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FREDERICK, MARYLAND 21704 USA
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ISO 9001 CERTIFIED

APPROVALS	DATE
DRAWN GJR	03/20/20
REDRAWN	
ISSUED	

TITLE: PRODUCT FEATURE
P2T-0R5G8G-45-R-50W-AL
0.5 to 8.0 GHz Reflective SP2T Switch

SIZE	FSCM NO.	DWG NO.	REV.
A	05XQ0	27038360	A1

SCALE N:S SHEET 1 OF 1

Typical Characteristics
ON
P2T-0R5G8G-45-R-50W-AL

Technical Specifications

TEST ITEM NO	PARAMETERS	SPECIFIED VALUE	TEST RESULTS			QA QC
			+25°C	-45°C	+85°C	
1	Frequency Range:	0.5 to 8.0 GHz	0.5 to 8.0 GHz	0.5 to 8.0 GHz	0.5 to 8.0 GHz	
2	RF Input Power:	50 Watts Average (Cold Switching)	Pass 63 Watts CW (+48dBm) See Graph	Pass 63 Watts CW (+48dBm) See Graph	Pass 63 Watts CW (+48dBm) See Graph	
3		1.30 dB MAX, 0.90 dB TYP @ 0.5 - 1.0 GHz 1.40 dB MAX, 1.00 dB TYP @ 1.0 - 2.0 GHz 1.60 dB MAX, 1.30 dB TYP @ 2.0 - 4.0 GHz 2.30 dB MAX, 2.00 dB TYP @ 4.0 - 6.0 GHz 2.60 dB MAX, 2.40 dB TYP @ 6.0 - 8.0 GHz	1.08 dB 1.15 dB 1.42 dB 2.07 dB 2.26 dB See Graphs	1.11 dB 1.13 dB 1.34 dB 1.99 dB 2.13 dB See Graphs	1.26 dB 1.33 dB 1.58 dB 2.25 dB 2.5 dB See Graphs	
4		48 dB MIN, 52 dB TYP @ 0.5 - 1.0 GHz 42 dB MIN, 45 dB TYP @ 1.0 - 2.0 GHz 36 dB MIN, 38 dB TYP @ 2.0 - 4.0 GHz 35 dB MIN, 37 dB TYP @ 4.0 - 6.0 GHz 30 dB MIN, 33 dB TYP @ 6.0 - 8.0 GHz	52.47 dB 45.76 dB 39.08 dB 37.17 dB 34.31 dB See Graphs	54.22 dB 47.14 dB 39.65 dB 37.7 dB 34.74 dB See Graphs	50.34 dB 43.82 dB 38.5 dB 36.42 dB 33.2 dB See Graphs	
5		1.5:1 MAX, 1.30:1 TYP @ 0.5 - 1.0 GHz 1.5:1 MAX, 1.30:1 TYP @ 1.0 - 2.0 GHz 1.5:1 MAX, 1.30:1 TYP @ 2.0 - 4.0 GHz 1.9:1 MAX, 1.80:1 TYP @ 4.0 - 6.0 GHz 2.0:1 MAX, 1.8:1 TYP @ 6.0 - 8.0 GHz	1.34 :1 1.31 :1 1.34 :1 1.85 :1 1.74 :1 See Graphs	1.38 :1 1.31 :1 1.31 :1 1.9 :1 1.78 :1 See Graphs	1.41 :1 1.34 :1 1.36 :1 1.87 :1 1.74 :1 See Graphs	
6	Switching Speed:	100 ns Max.	Rise Time - 29.3 ns Fall Time - 6 ns Speed ON - 65 ns Speed OFF - 32.6 ns See Plots	Rise Time - 29.3 ns Fall Time - 6 ns Speed ON - 65 ns Speed OFF - 32.6 ns See Plots	Rise Time - 29.3 ns Fall Time - 6 ns Speed ON - 65 ns Speed OFF - 32.6 ns See Plots	
7	Video Transients:	1V P-P Max.	868.75mV P-P See Plots	868.75mV P-P See Plots	868.75mV P-P See Plots	
8	Amplitude Balance	± 0.5 dB Max.	0.17 dB See Graph	0.17 dB See Graph	0.17 dB See Graph	
9	Phase Balance	± 5° Max.	1.29° See Graph	1.43° See Graph	1.55° See Graph	
10	Hot Switching:	40 Watts (CW) Max. (1KHz, 50% Duty Cycle, At 0.5 To 8GHz) 10Watts (CW) Max. (1MHz, 50% Duty Cycle, At 8GHz) 16Watts (CW) Max. (1MHz, 50% Duty Cycle, At 0.5GHz)	Pass 40 Watts @ 0.5 to 8GHz - Tested from 1KHz TTL PRF & 50% Duty Cycle Pass 16 Watts @ 0.5GHz and 10Watts @ 8GHz - Tested from 1MHz TTL PRF & 50% Duty Cycle	Pass 40 Watts @ 0.5 to 8GHz - Tested from 1KHz TTL PRF & 50% Duty Cycle Pass 16 Watts @ 0.5GHz and 10Watts @ 8GHz - Tested from 1MHz TTL PRF & 50% Duty Cycle	Pass 40 Watts @ 0.5 to 8GHz - Tested from 1KHz TTL PRF & 50% Duty Cycle Pass 16 Watts @ 0.5GHz and 10Watts @ 8GHz - Tested from 1MHz TTL PRF & 50% Duty Cycle	
11	Power Supply:	+5 VDC @ 100 mA Maximum	+5 VDC @ 30 mA	+5 VDC @ 27 mA	+5 VDC @ 33 mA	

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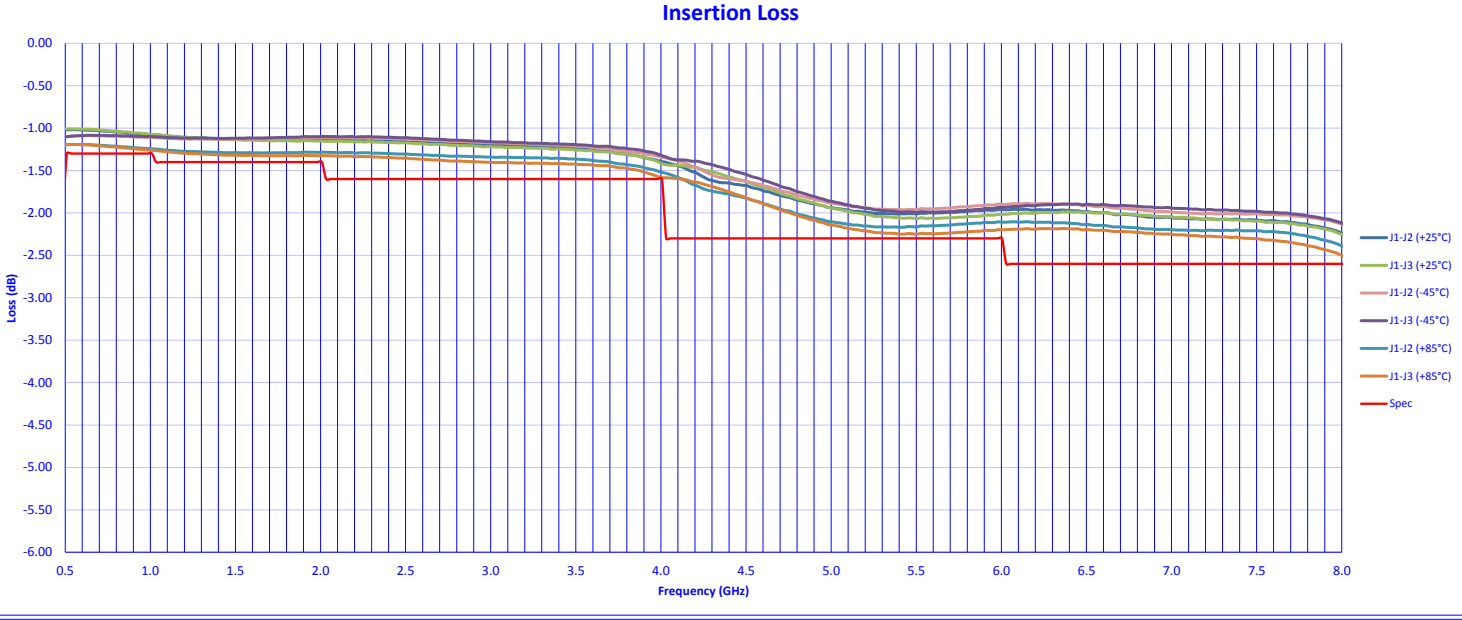

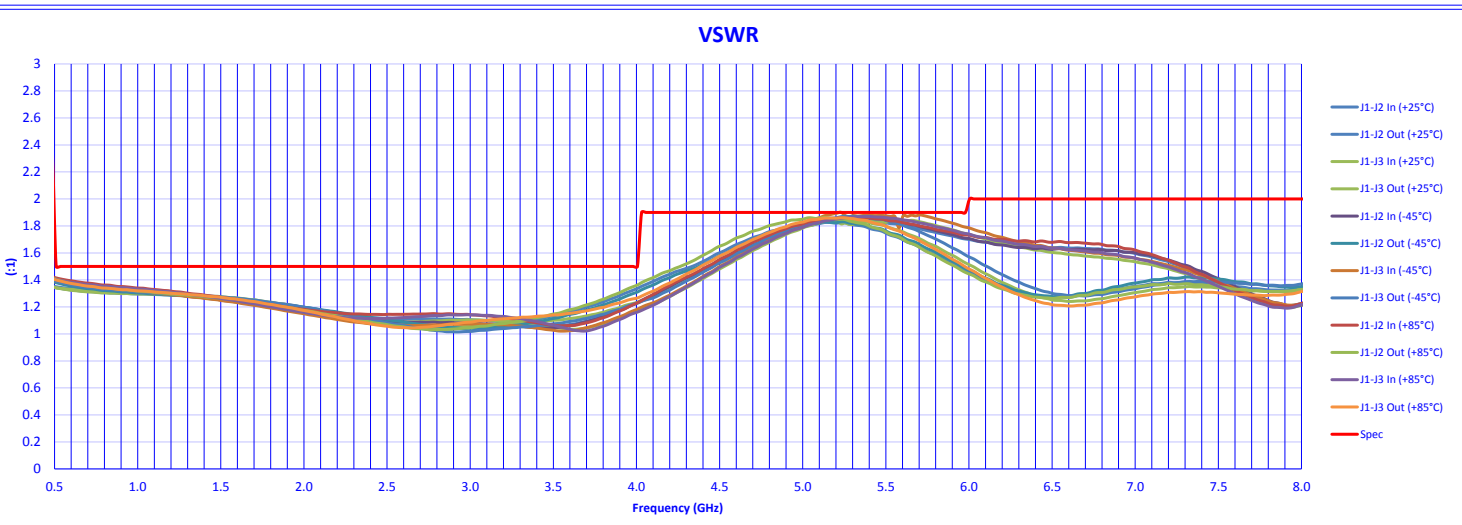

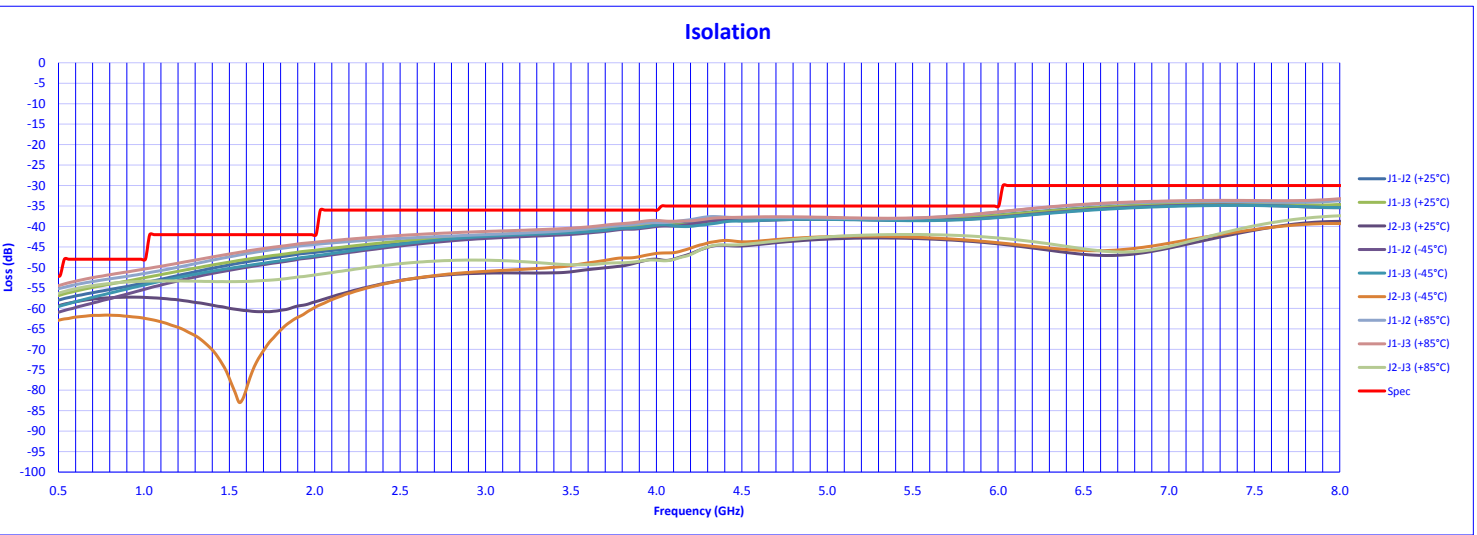

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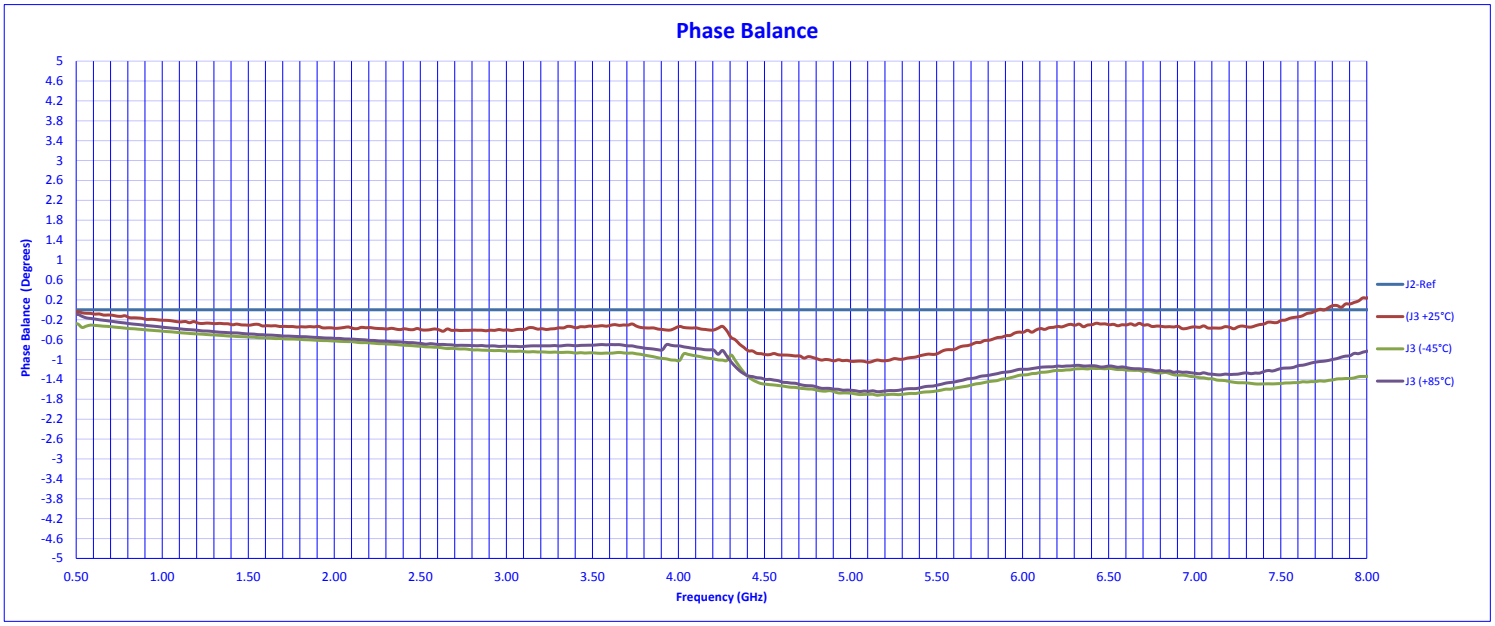

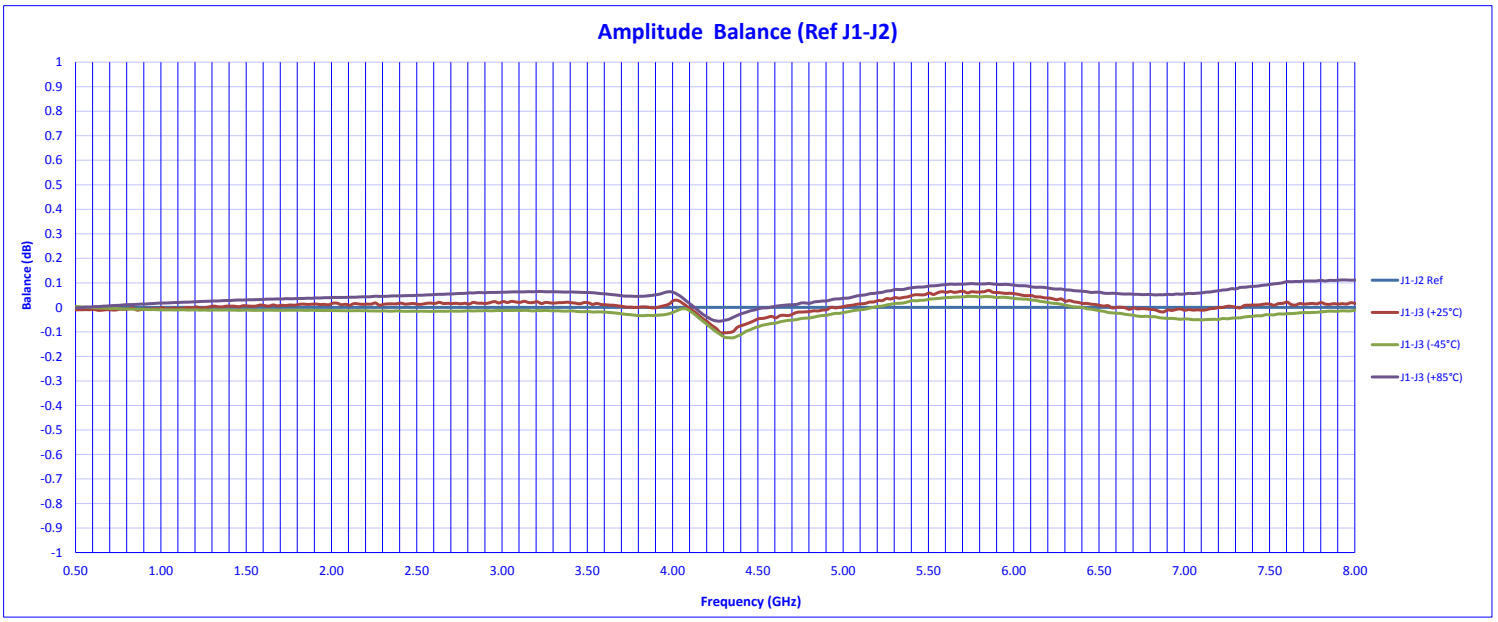

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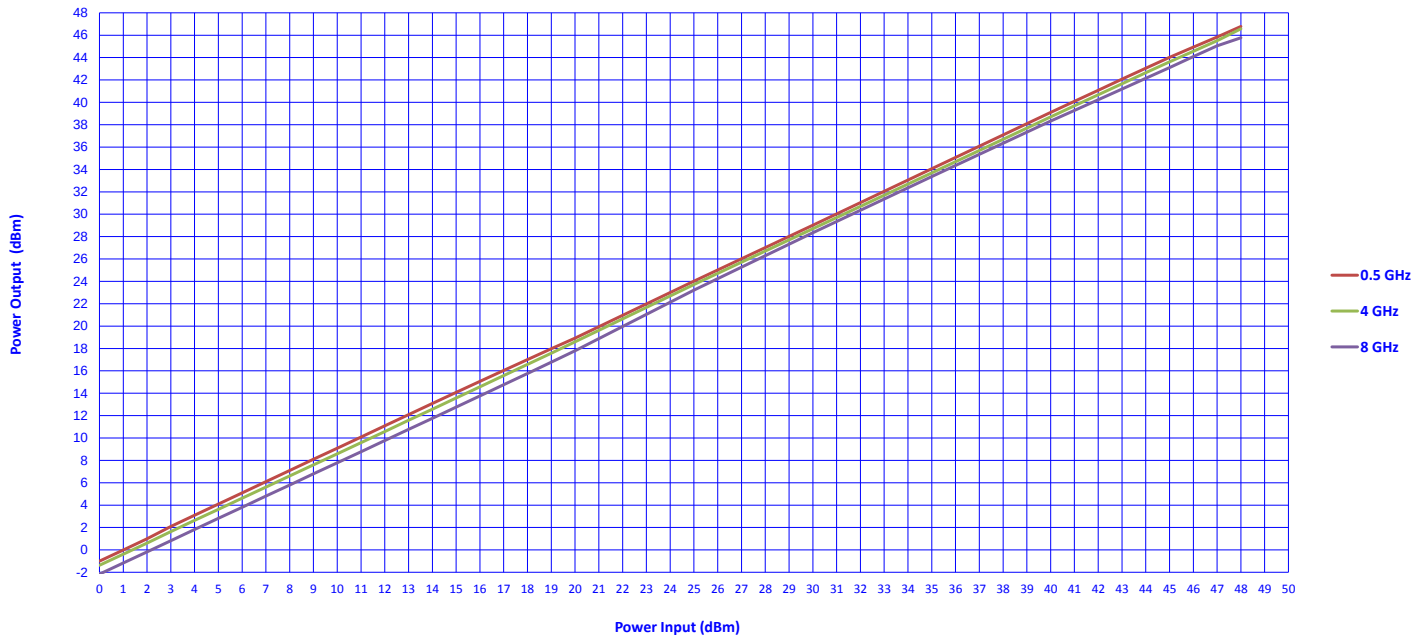

High Power Test Data												
0.5 GHz				4 GHz				8 GHz				
Power In (dBm)	Power Out (dBm)	Loss	Compression (dBm)	Power In (dBm)	Power Out (dBm)	Loss	Compression (dBm)	Power In (dBm)	Power Out (dBm)	Loss	Compression (dBm)	
0	-1.006	1.006	0.000	0	-1.375	1.375	0.000	0	-2.170	2.170	0.000	
1	-0.006	1.006	0.000	1	-0.383	1.383	0.008	1	-1.175	2.175	0.005	
2	0.998	1.002	-0.003	2	0.612	1.388	0.013	2	-0.180	2.180	0.010	
3	2.090	0.910	-0.095	3	1.635	1.365	-0.010	3	0.820	2.180	0.010	
4	3.091	0.909	-0.096	4	2.633	1.367	-0.008	4	1.819	2.181	0.011	
5	4.091	0.909	-0.096	5	3.628	1.372	-0.003	5	2.817	2.183	0.013	
6	5.091	0.910	-0.096	6	4.620	1.380	0.005	6	3.812	2.188	0.018	
7	6.094	0.906	-0.099	7	5.613	1.387	0.012	7	4.806	2.194	0.024	
8	7.093	0.908	-0.098	8	6.609	1.391	0.016	8	5.803	2.197	0.027	
9	8.092	0.908	-0.098	9	7.596	1.404	0.029	9	6.799	2.201	0.031	
10	9.085	0.915	-0.091	10	8.591	1.409	0.034	10	7.784	2.216	0.046	
11	10.087	0.913	-0.092	11	9.583	1.417	0.042	11	8.771	2.229	0.059	
12	11.091	0.909	-0.096	12	10.577	1.423	0.048	12	9.772	2.228	0.058	
13	12.090	0.910	-0.095	13	11.583	1.417	0.042	13	10.766	2.234	0.064	
14	13.088	0.912	-0.093	14	12.578	1.422	0.047	14	11.763	2.237	0.067	
15	14.075	0.925	-0.080	15	13.578	1.422	0.047	15	12.762	2.238	0.068	
16	15.057	0.943	-0.063	16	14.573	1.427	0.052	16	13.760	2.240	0.070	
17	16.037	0.963	-0.042	17	15.573	1.427	0.052	17	14.761	2.239	0.069	
18	17.009	0.991	-0.015	18	16.577	1.423	0.048	18	15.766	2.234	0.064	
19	17.975	1.025	0.019	19	17.584	1.416	0.041	19	16.776	2.224	0.054	
20	18.930	1.070	0.065	20	18.599	1.401	0.026	20	17.792	2.208	0.038	
25	24.010	0.990	-0.016	25	23.710	1.290	-0.085	25	23.210	1.790	-0.380	
30	29.020	0.980	-0.025	30	28.700	1.300	-0.075	30	28.340	1.660	-0.510	
35	34.070	0.930	-0.076	35	33.690	1.310	-0.065	35	33.360	1.640	-0.530	
40	39.100	0.900	-0.106	40	38.700	1.300	-0.075	40	38.330	1.670	-0.500	
41	40.090	0.910	-0.096	41	39.690	1.310	-0.065	41	39.270	1.730	-0.440	
42	41.080	0.920	-0.085	42	40.680	1.320	-0.055	42	40.230	1.770	-0.400	
43	42.080	0.920	-0.085	43	41.660	1.340	-0.035	43	41.190	1.810	-0.360	
44	43.050	0.950	-0.055	44	42.640	1.360	-0.015	44	42.150	1.850	-0.320	
45	44.020	0.980	-0.026	45	43.620	1.380	0.005	45	43.110	1.890	-0.280	
46	44.930	1.070	0.065	46	44.560	1.440	0.065	46	44.090	1.910	-0.260	
47	45.830	1.170	0.165	47	45.500	1.500	0.125	47	45.050	1.950	-0.220	
48	**46.780**	**1.220**	**0.214**	**48**	**46.570**	**1.430**	**0.055**	**48**	**45.770**	**2.230**	**0.060**	**63 Watts**

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Typical Characteristics
ON
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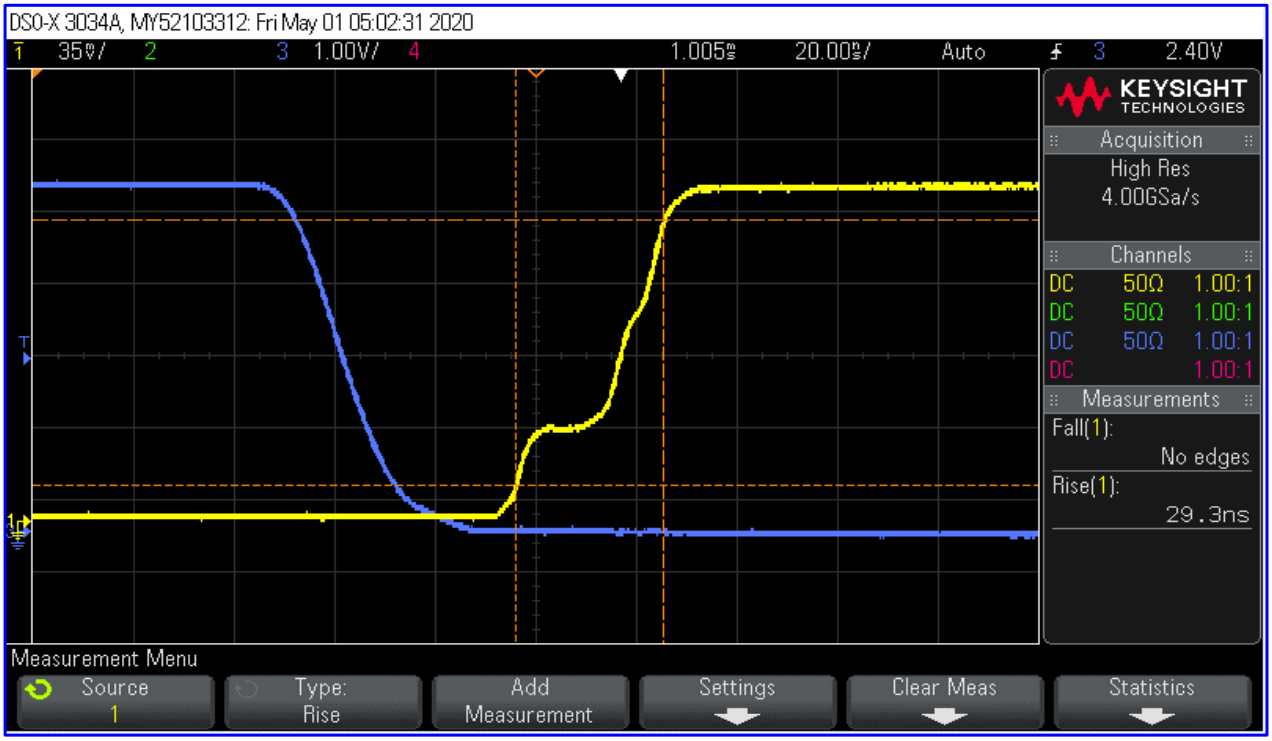
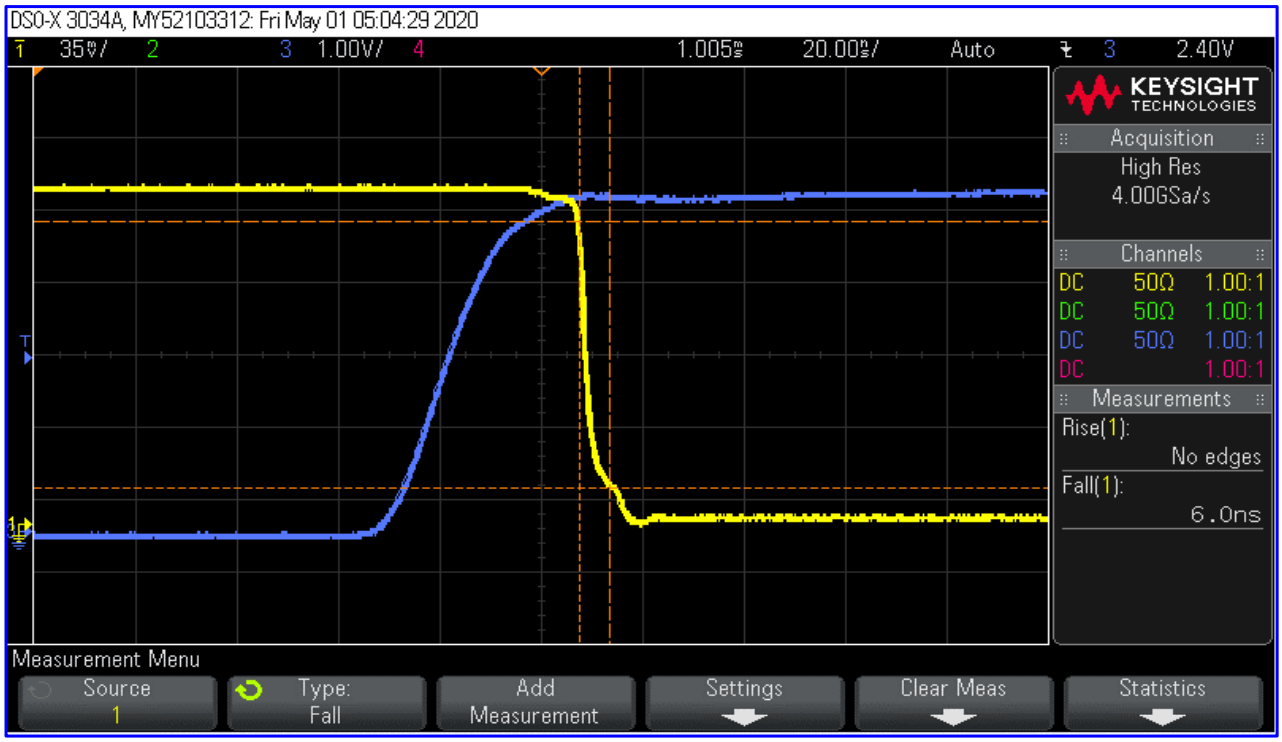
Rise Time = (29.3ns)
20 ns Per Div.



Fall Time = (6 ns)
20 ns Per Div.



Blue Trace = TTL Signal
Yellow Trace = RF Signal

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Typical Characteristics
ON
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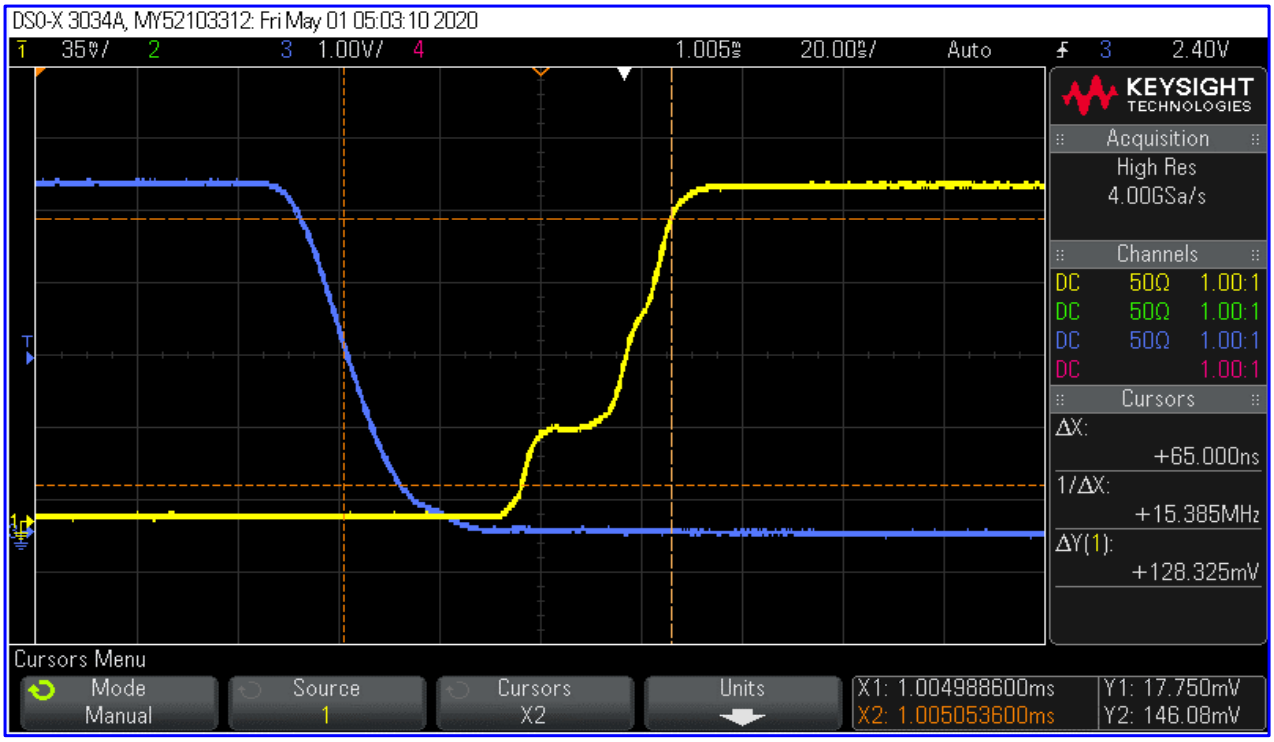
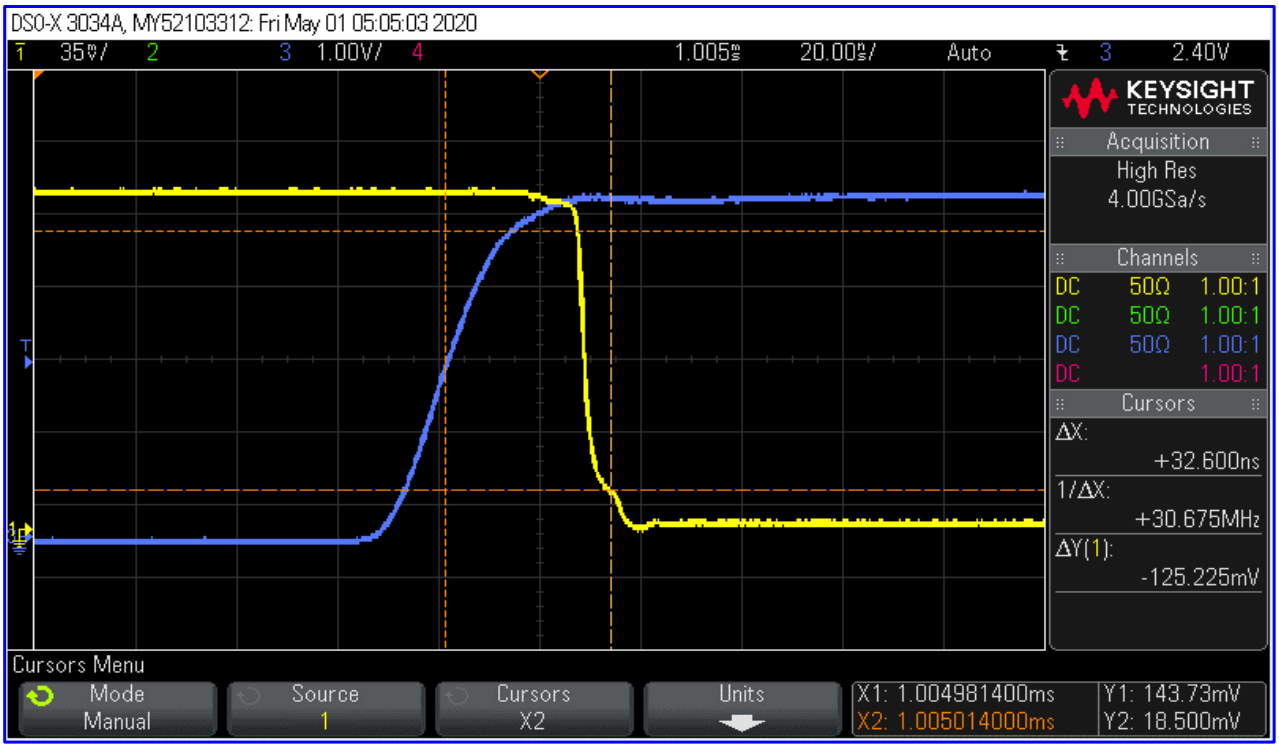
Switching Speed ON = (65 ns)
20 ns Per Div.



Switching Speed OFF = (32.60ns)
20 ns Per Div.



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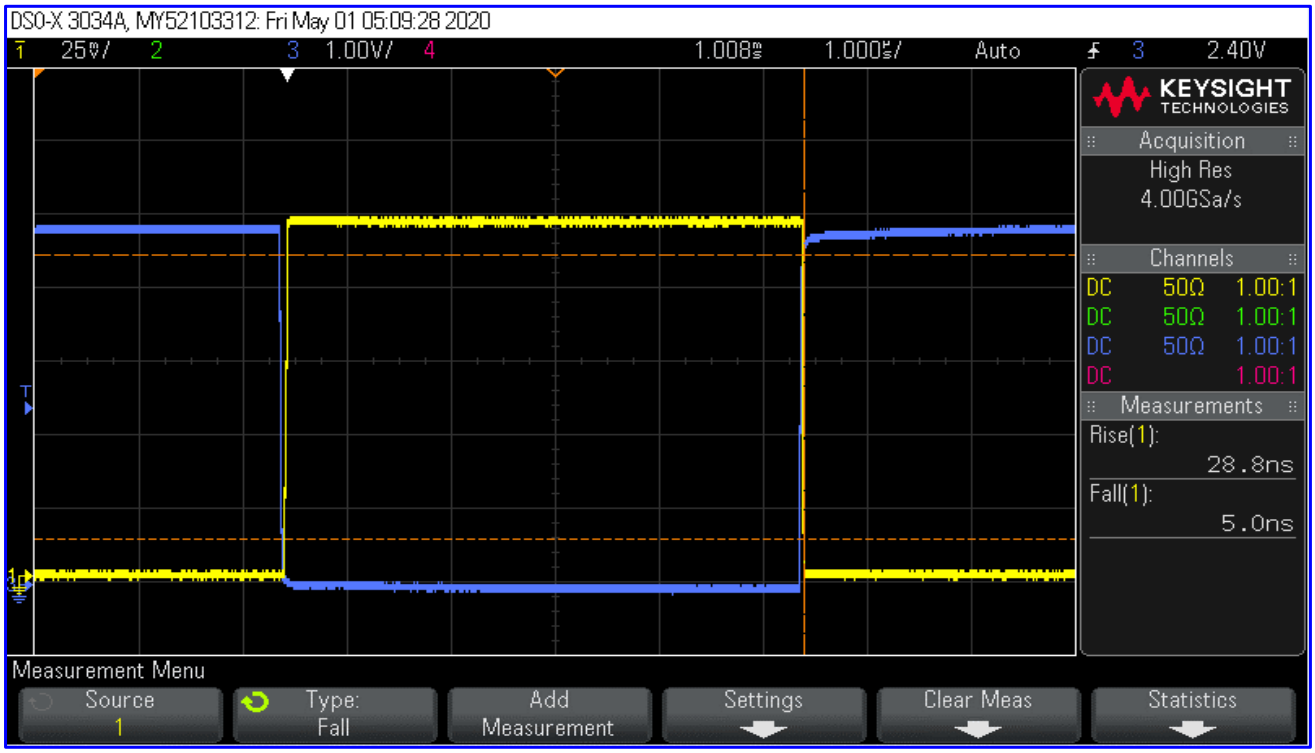
Full Pulse
1 us Per Div.



Blue Trace = TTL Signal
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Typical Characteristics
ON
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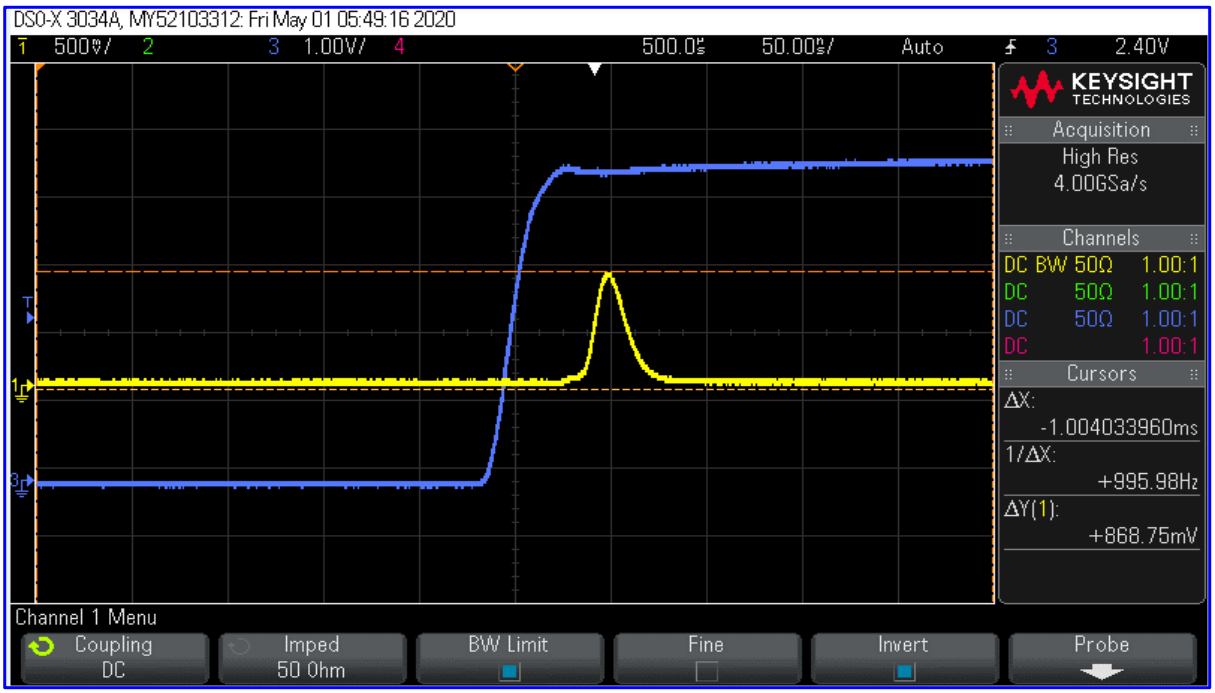
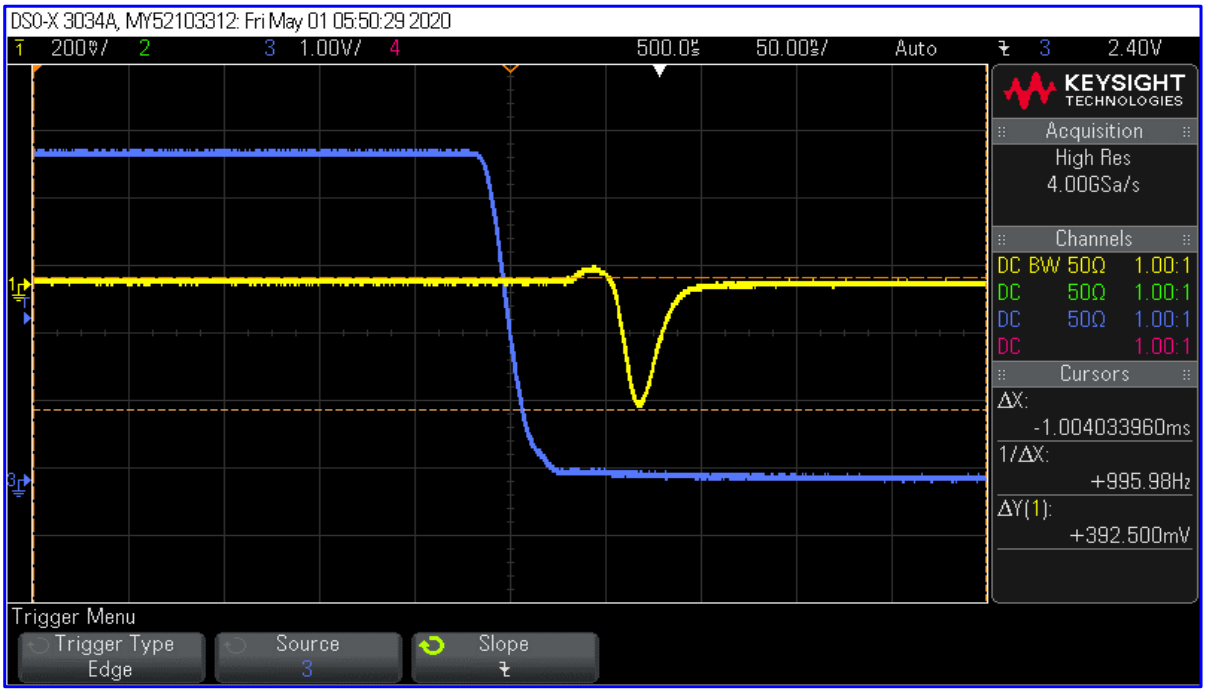
Output Video Transients
BW = 350MHz, 50Ω
Measured Value (868.75 mV P-P)



Output Video Transients
BW = 350MHz, 50Ω
Measured Value (392.5 mV P-P)



TTL Signal (Trigger) = Blue
Video Signal = Yellow

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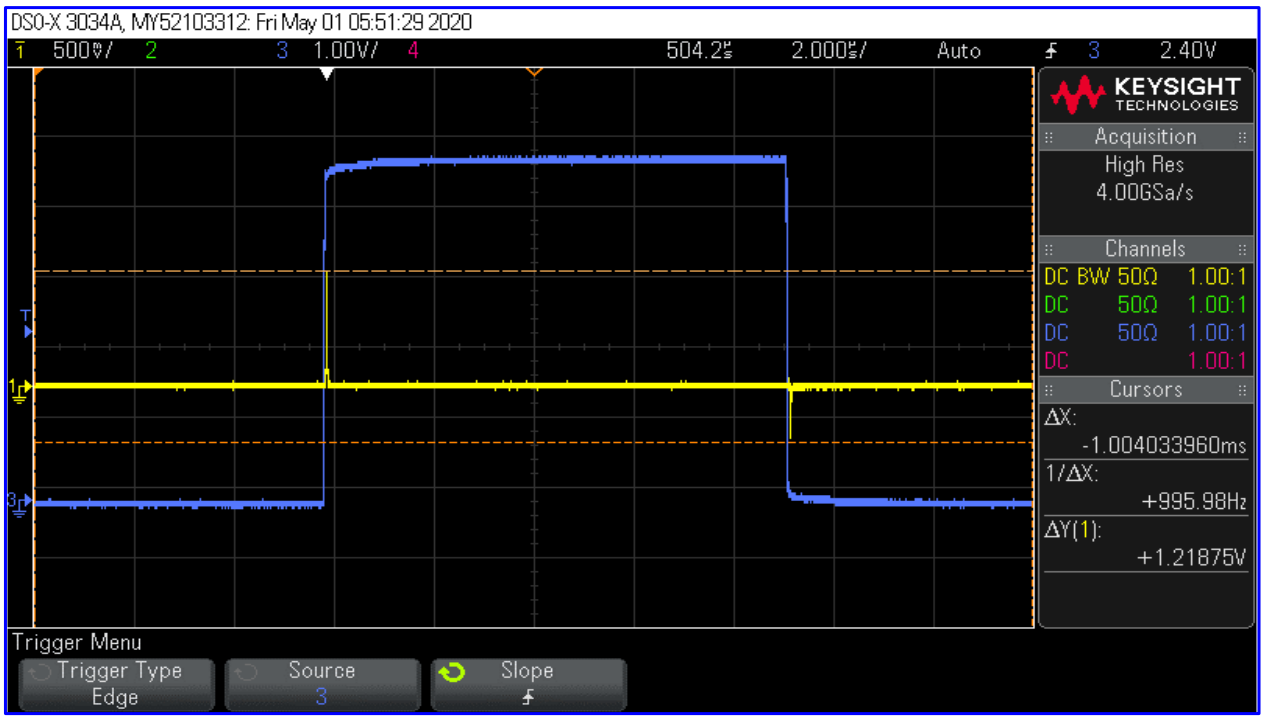
Full Pulse TTL And Output Video Transients
BW = 350MHz, 50Ω



TTL Signal (Trigger) = Blue
Video Signal = Yellow

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Typical Characteristics
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Hot Switching

Switching Rate 1KHz - 50% Duty Cycle												Power Input (Watts)
0.5GHz		1GHz		2GHz		4GHz		6GHz		8GHz		
Power In (dbm)	Status	Power In (dbm)	Status	Power In (dbm)	Status	Power In (dbm)	Status	Power In (dbm)	Status	Power In (dbm)	Status	
10	Pass	10	Pass	10	Pass	10	Pass	10	Pass	10	Pass	
15	Pass	15	Pass	15	Pass	15	Pass	15	Pass	15	Pass	
20	Pass	20	Pass	20	Pass	20	Pass	20	Pass	20	Pass	
25	Pass	25	Pass	25	Pass	25	Pass	25	Pass	25	Pass	
30	Pass	30	Pass	30	Pass	30	Pass	30	Pass	30	Pass	
35	Pass	35	Pass	35	Pass	35	Pass	35	Pass	35	Pass	
36	Pass	36	Pass	36	Pass	36	Pass	36	Pass	36	Pass	
37	Pass	37	Pass	37	Pass	37	Pass	37	Pass	37	Pass	
38	Pass	38	Pass	38	Pass	38	Pass	38	Pass	38	Pass	
39	Pass	39	Pass	39	Pass	39	Pass	39	Pass	39	Pass	
40	Pass	40	Pass	40	Pass	40	Pass	40	Pass	40	Pass	10
41	Pass	41	Pass	41	Pass	41	Pass	41	Pass	41	Pass	13
42	Pass	42	Pass	42	Pass	42	Pass	42	Pass	42	Pass	16
43	Pass	43	Pass	43	Pass	43	Pass	43	Pass	43	Pass	20
44	Pass	44	Pass	44	Pass	44	Pass	44	Pass	44	Pass	25
45	Pass	45	Pass	45	Pass	45	Pass	45	Pass	45	Pass	32
46	Pass	46	Pass	46	Pass	46	Pass	46	Pass	46	Pass	40
Do Not Exceed		Do Not Exceed		Do Not Exceed		Do Not Exceed		Do Not Exceed		Do Not Exceed		50

Switching Rate 1MHz - 50% Duty Cycle				Power Input (Watts)
0.5GHz		8GHz		
Power In (dbm)	Status	Power In (dbm)	Status	
10	Pass	10	Pass	
15	Pass	15	Pass	
20	Pass	20	Pass	
25	Pass	25	Pass	
30	Pass	30	Pass	1
35	Pass	35	Pass	3
36	Pass	36	Pass	4
37	Pass	37	Pass	5
38	Pass	38	Pass	6
39	Pass	39	Pass	8
40	Pass	40	Pass	10
41	Pass	Do Not Exceed		13
42	Pass			16
Do Not Exceed				20

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