



Typical Characteristics ON P3T-89-45-R-SFF

PMI MODEL: P3T-89-45-R-SFF IS A 8.0 TO 9.0 GHz, SP3T REFLECTIVE SWITCH CAPABLE OF SWITCHING WITHIN 100 ns MAXIMUM. THIS UNIT HAS A MAXIMUM INSERTION LOSS OF 2.7 dB AND ISOLATION OF 45 dB MINIMUM WITH A VSWR OF 1.8:1.



January 5, 2021

Designed By:

Dr. Ashok / S. Palacio / N. Shanmugam

Tested & Reported By:

Alfredo López



Typical Characteristics ON P3T-89-45-R-SFF

Outline Drawing

DESCRIPTION

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SPECIFICATIONS

- FREQUENCY: 8.0 TO 9.0 GHz
- INSERTION LOSS: 2.5 dB TYPICAL
2.7 dB MAXIMUM
- ISOLATION: 45 dB MINIMUM
- VSWR: 1.8:1 MAXIMUM
- LOGIC CONTROL: SEE LOGIC TABLE BELOW
- SWITCHING SPEED: 100 ns MAXIMUM
- POWER HANDLING: 10 W CW MINIMUM
57 dBm PEAK @ 1 μs PULSE WIDTH, 1% DUTY CYCLE
- SUPPLY: +5 V @ 85 mA
-15 V @ 75 mA
- 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 FREE OF PAINT
- PACKAGE: HERMETIC

LOGIC CONTROL TTL					
L1	L2	L3	COMM-J1	COMM-J2	COMM-J3
TTL LO	TTL HI	TTL HI	INSERTION LOSS	ISOLATION	ISOLATION
TTL HI	TTL LO	TTL HI	ISOLATION	INSERTION LOSS	ISOLATION
TTL HI	TTL HI	TTL LO	ISOLATION	ISOLATION	INSERTION LOSS

ENVIRONMENTAL RATINGS

- TEMPERATURE: -54 °C TO +95 °C (OPERATING)
-65 °C TO +125 °C (STORAGE)
- HUMIDITY: MIL-STD-202, METHOD 103B COND. B MAINTAIN
RH 95±4% @ 63 °C (ALLOWED RF 85% WHEN
TEMPERATURE-DOWN TRANSITION TIME.) THE
RATE OF TEMPERATURE CHANGE: ABOVE 8
°C/HOURS
- SHOCK: MIL-STD-202, METHOD 213, COND J
20G (DURING OPERATION) & 125g, 6 ms SAW
TOOTH TYPE, 3-AXIS (NO OPERATION)
- VIBRATION: MIL-STD-202, METHOD 214, COND A
12G 30 MIN. X, Y, Z-AXIS (DURING OPERATION)
& 20G 30 MIN X, Y, Z-AXIS (DURING OPERATION)
- ALTITUDE: MIL-STD-202, METHOD 105C, COND B
200Km (8.47e-7 hPa or 6.353e-7 torr/DURING
OPERATION)
- TEMPERATURE CYCLE: MIL-STD-202, METHOD 107D COND. A

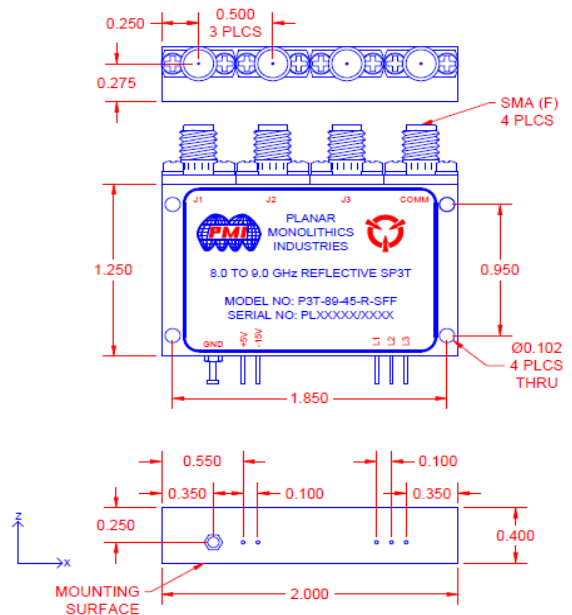
NOTE: SPECIFICATIONS WILL VARY OVER OPERATING TEMPERATURE
NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

PMI CONFIDENTIAL AND PROPRIETARY

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

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A1	ORIGINAL RELEASE	1/4/2021	
	A2	ECN # 25-0049	2/24/2025	

MECHANICAL OUTLINE



PLANAR MONOLITHICS INDUSTRIES, INC.
7311-F GROVE ROAD
FREDERICK, MARYLAND 21704 USA
TEL: (301)-662-5019, FAX: (301)-662-1731
WEB: www.pmi-rf.com, EMAIL: sales@pmi-rf.com
ISO 9001 CERTIFIED



APPROVALS		DATE	TITLE			REV.
DRAWN ALC		1/4/21	PRODUCT FEATURE P3T-89-45-R-SFF 8.0 to 9.0 GHz, Single Pole, Three Throw Reflective Switch			
CHECKED			SIZE A	PSQM NO. 05XQ0	DWG NO. 27038961	A2
ISSUED			SCALE N:S		SHEET 1 OF 2	

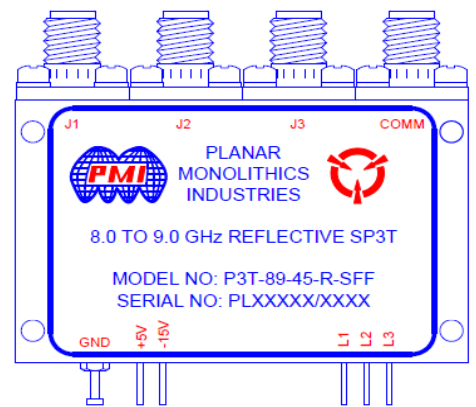
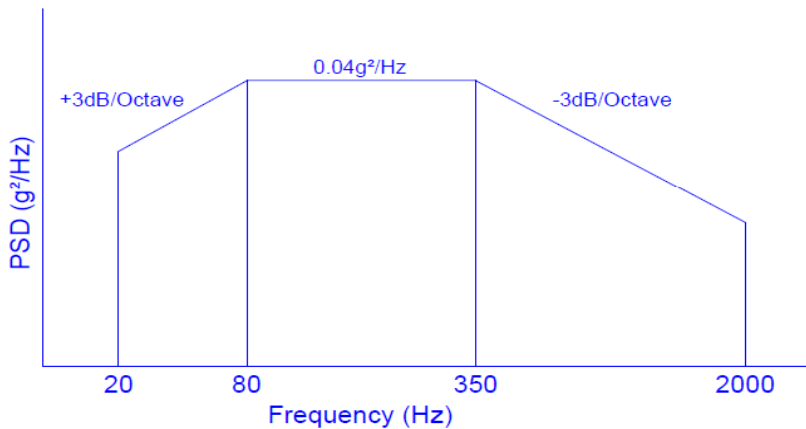


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Mechanical Outline

VIBRATION TESTING PROFILE:

1. VIBRATION DIRECTION IS Z-AXIS
2. VIBRATION FREQUENCY IS RANDOM VIBRATION 20-2000 Hz AND EXCLUDES RESONANCE FREQUENCY OF A TEST ZIG
3. VIBRATION MAGNITUDE IS 6grms, 0.04g²/Hz ±3 dB OCTAVE FOR 10 MINUTES



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 ARE IN INCHES (mm)
 TOLERANCES:
 X.XX ±0.020
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CHECKED			SIZE	FIGM NO.	DWG NO.
ISSUED			A	05XQ0	27038961
			SCALE	N:S	SHEET 2 OF 2
					REV. A2



Typical Characteristics ON P3T-89-45-R-SFF

Technical Specifications

TEST ITEM NO.	PARAMETERS	SPECIFIED VALUE	TEST RESULTS			QA QC
			+25°C	-54°C	+95°C	
1	Frequency Range:	8.0 to 9.0 GHz	8.0 to 9.0 GHz	8.0 to 9.0 GHz	8.0 to 9.0 GHz	
2	Insertion Loss:	2.5 dB Typ. 2.7 dB Max.	2.6 dB See Graphs	2.55 dB See Graphs	2.65 dB See Graphs	
3	Isolation:	45 dB Min.	48 dB See Graphs	49 dB See Graphs	46 dB See Graphs	
4	Input Power:	10 W CW Min. +57 dBm @ 1 μ s Pulse Width & 1% Duty Cycle	Pass +20 Watts CW See Graph	Pass +20 Watts CW See Graph	Pass +20 Watts CW See Graph	
5	VSWR:	1.8:1 Typ.	In 1.33:1 Out 1.43 :1 See Graphs	In 1.34:1 Out 1.44 :1 See Graphs	In 1.34:1 Out 1.41 :1 See Graphs	
6	Switching Speed:	100 ns Max.	Speed ON - 83ns	Speed ON - 83ns	Speed ON - 83ns	
			Speed OFF - 98 ns	Speed OFF - 98 ns	Speed OFF - 98 ns	
			Rise Time - 70 ns	Rise Time - 70 ns	Rise Time - 70 ns	
			Fall Time - 43 ns	Fall Time - 43 ns	Fall Time - 43 ns	
			See Graph	See Graph	See Graph	
7	Amplitude Balance	\pm 0.25 dB Max	0.15 dB See Graph	0.18 dB See Graph	0.15 dB See Graph	
8	Insertion Loss Flatness (Variation from a Best Fit Straight Line)	\pm 0.2 dB Max.	0.11 dB See Graph	0.15 dB See Graph	0.09 dB See Graph	
9	Video Transients	1 mV Peak to Peak Max.	500 μ V See Plots	500 μ V See Plots	500 μ V See Plots	
10	Control Logic:	See Table Below	Pass	Pass	Pass	
11	Supply:	+5 V @ 85 mA -15 V @ 75 mA	+5 V @ 73 mA -15 V @ 0 mA	+5 V @ 70 mA -15 V @ 0 mA	+5 V @ 75 mA -15 V @ 0 mA	

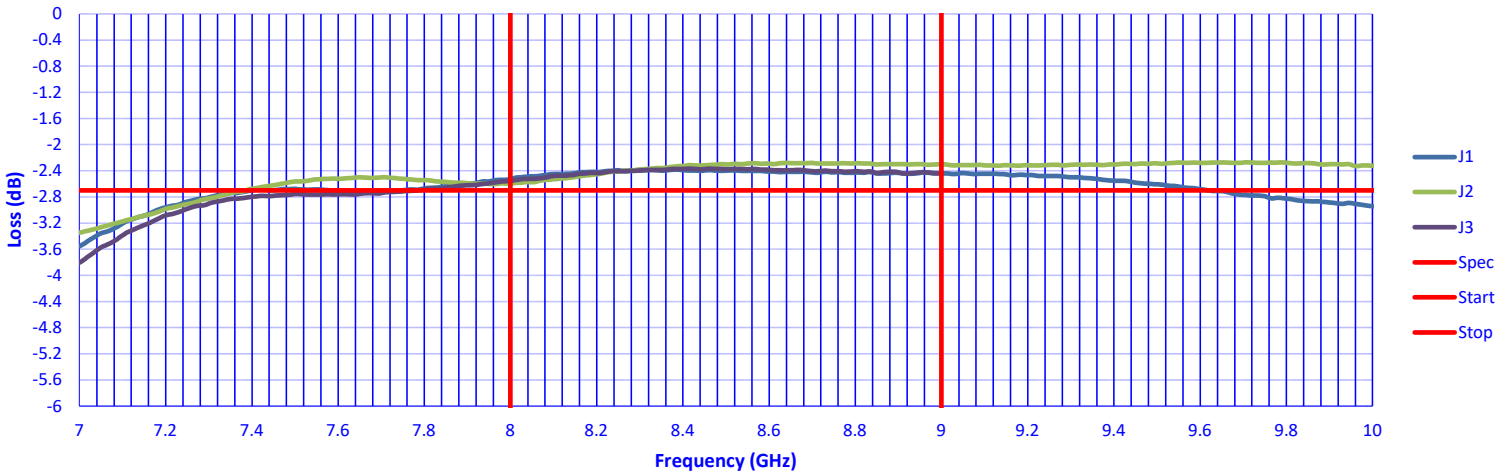
Logic Control TTL					
L1	L2	L3	COMM-J1	COMM-J2	COMM-J3
LOW	HIGH	HIGH	INSERTION LOSS	ISOLATION	ISOLATION
HIGH	LOW	HIGH	ISOLATION	INSERTION LOSS	ISOLATION
HIGH	HIGH	LOW	ISOLATION	ISOLATION	INSERTION LOSS

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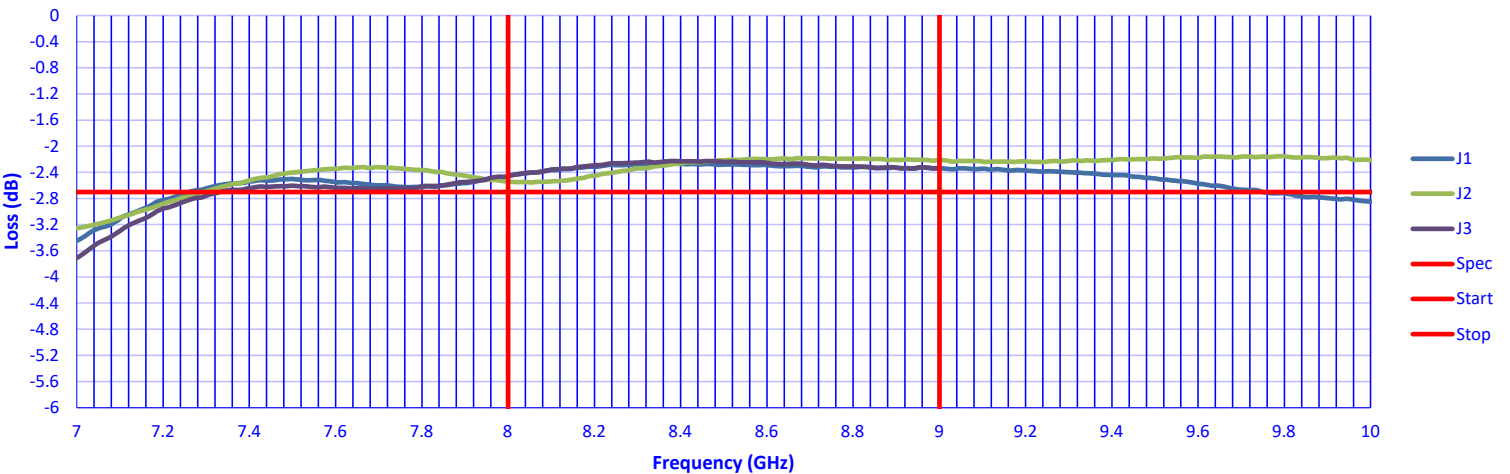


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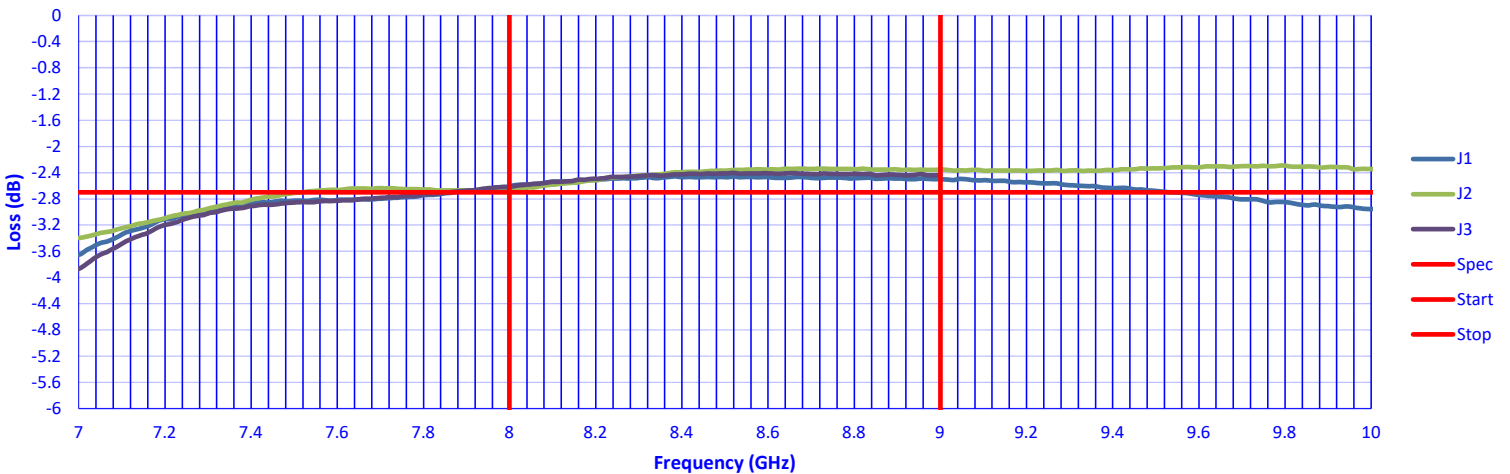
Insertion Loss (+25°C)



Insertion Loss (-54°C)

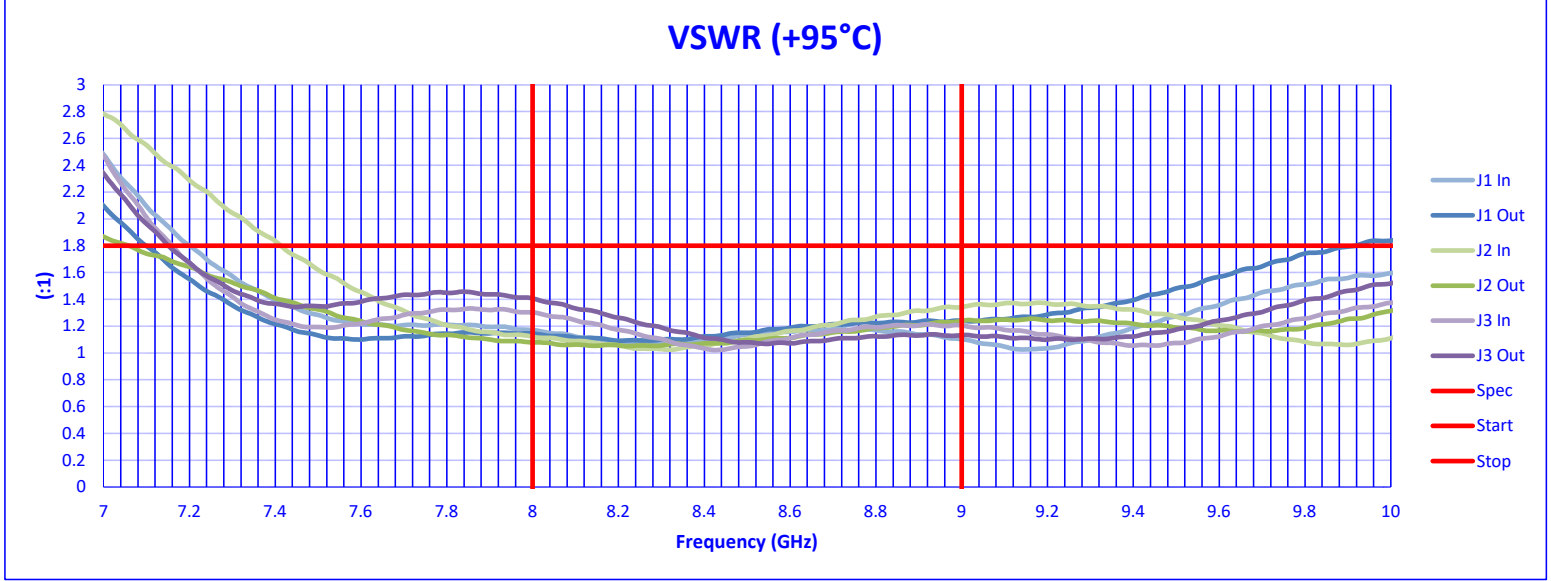
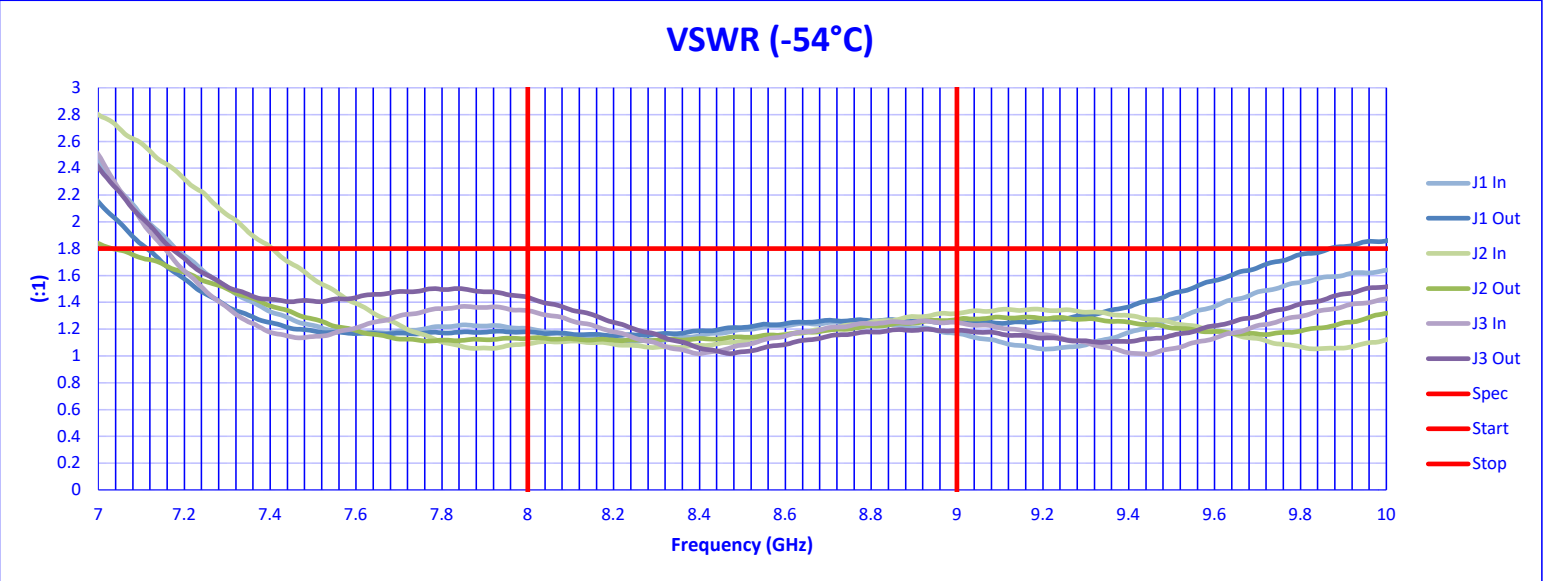
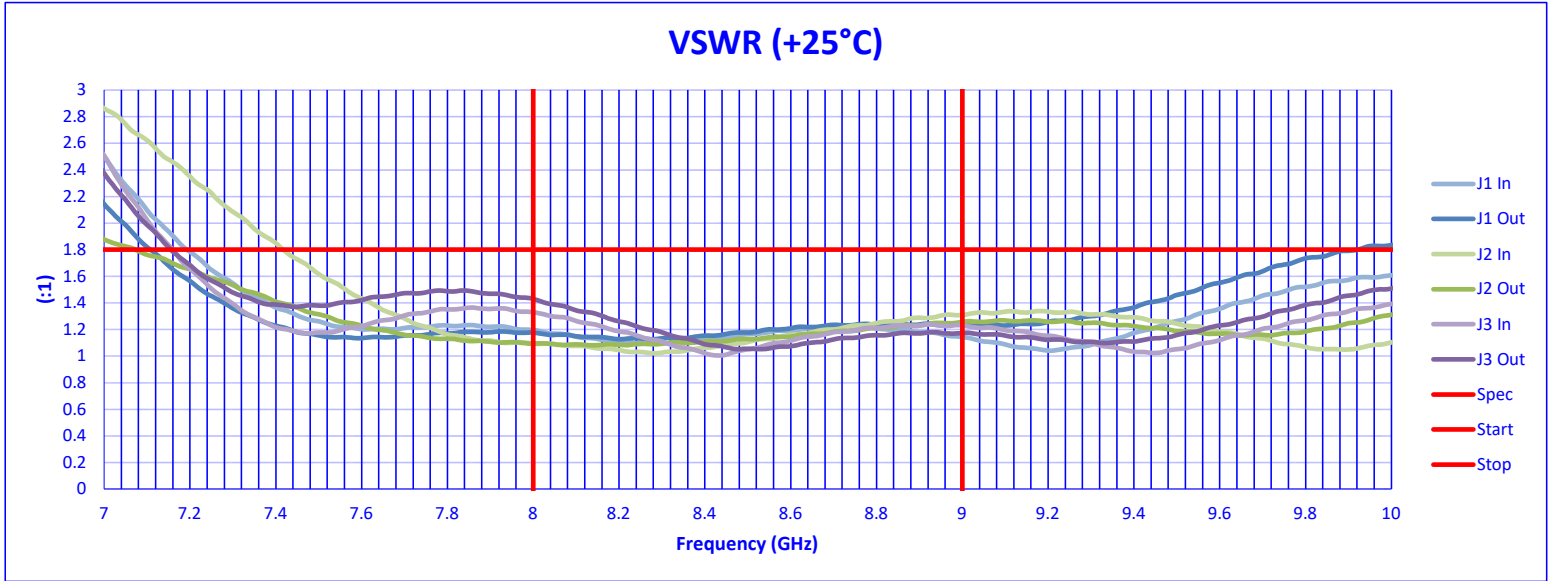


Insertion Loss (+95°C)



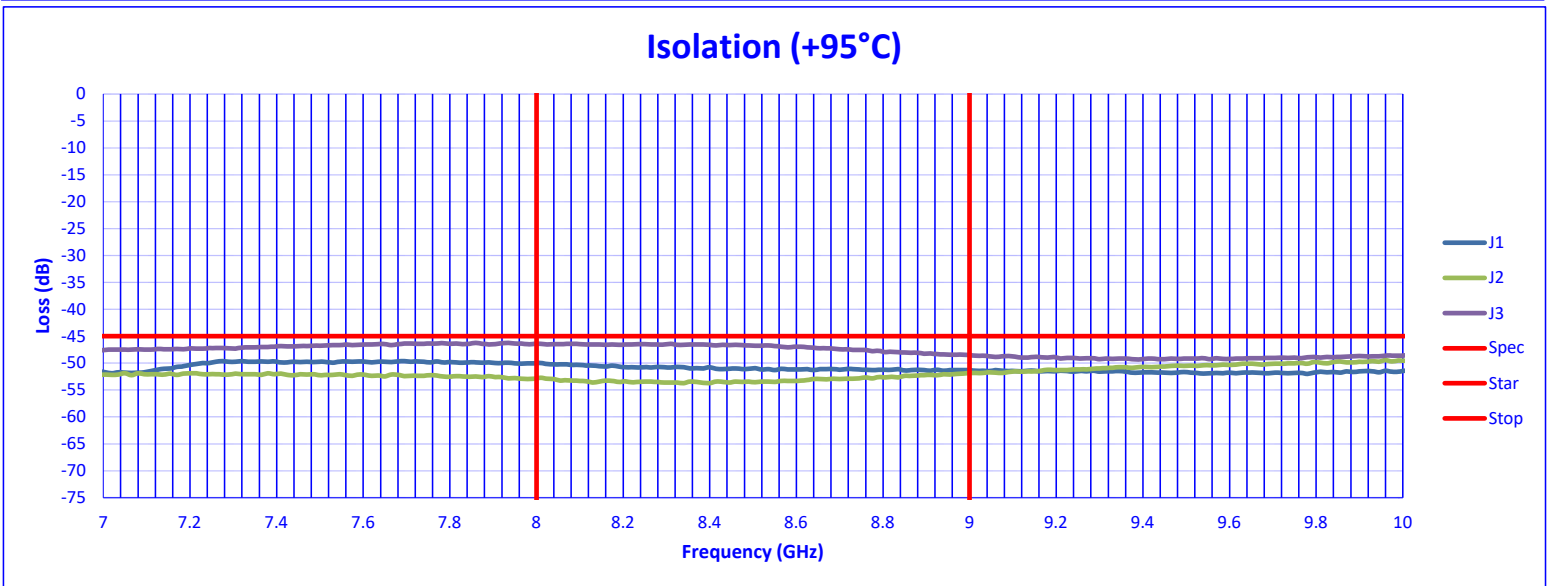
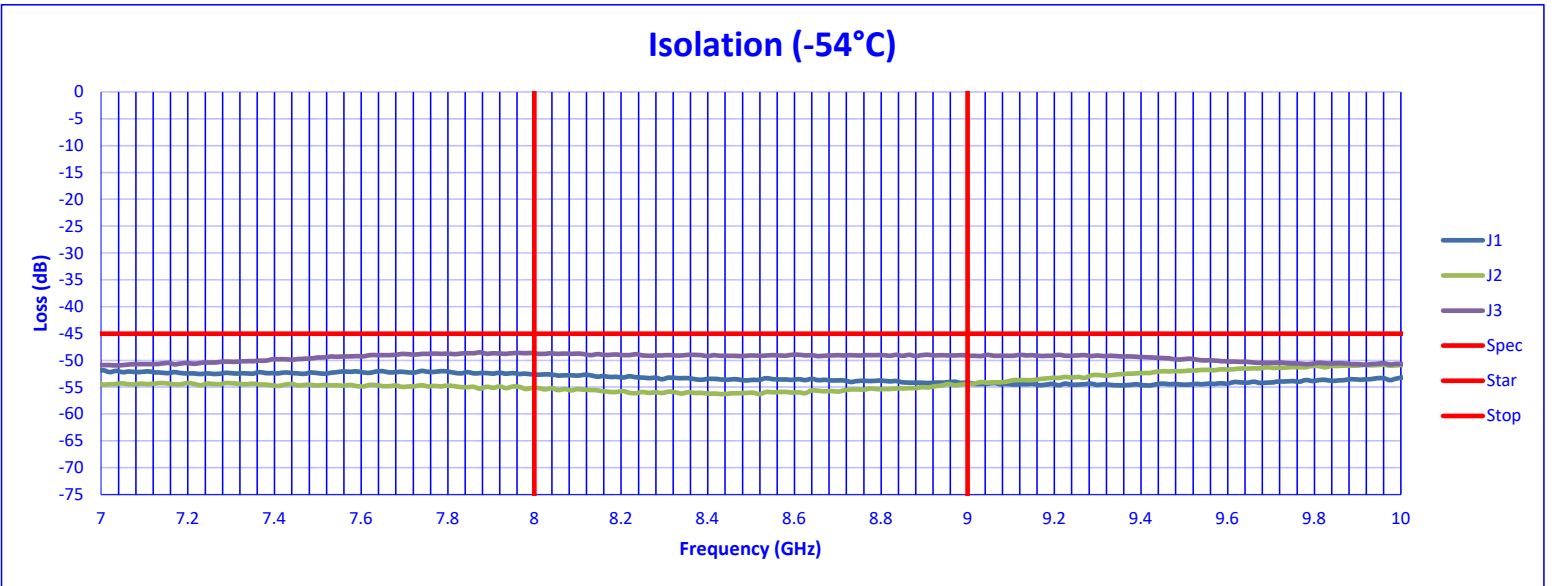
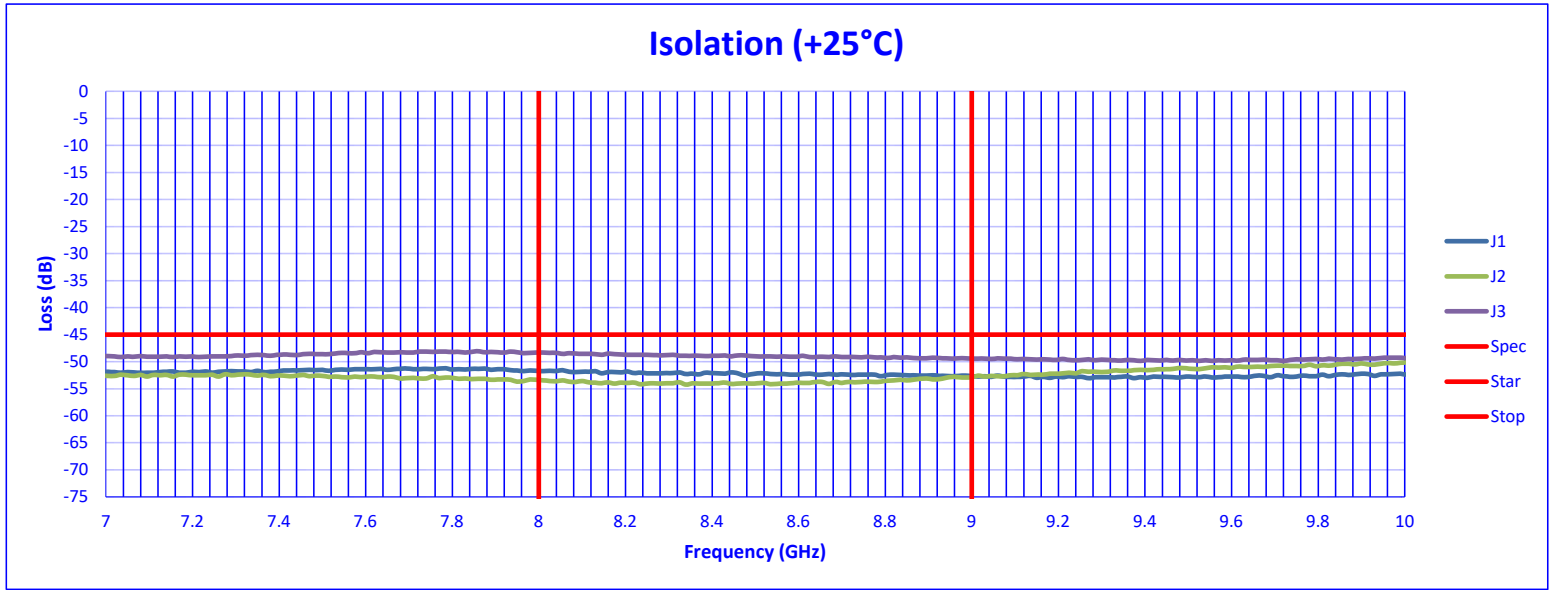


Typical Characteristics ON P3T-89-45-R-SFF





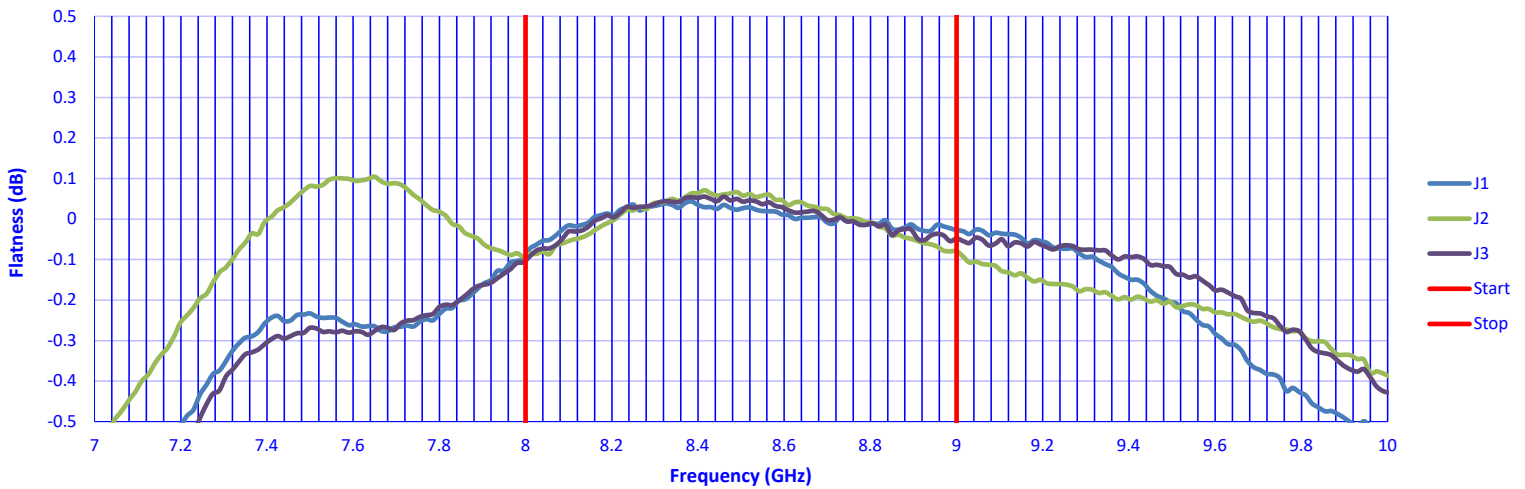
Typical Characteristics ON P3T-89-45-R-SFF



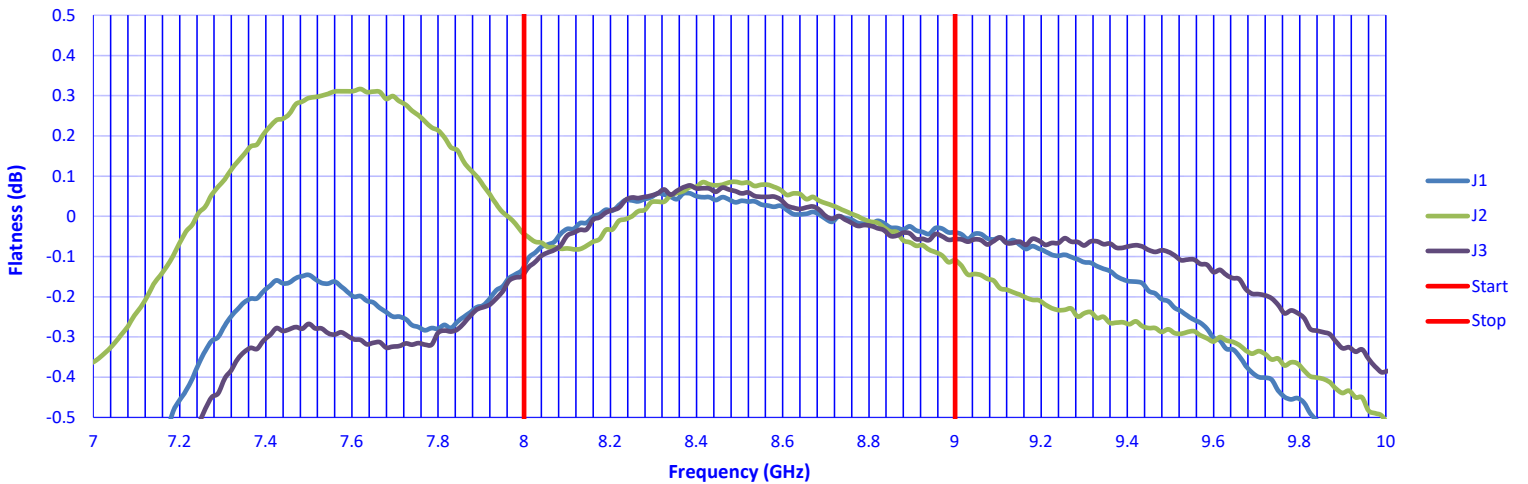


Typical Characteristics ON P3T-89-45-R-SFF

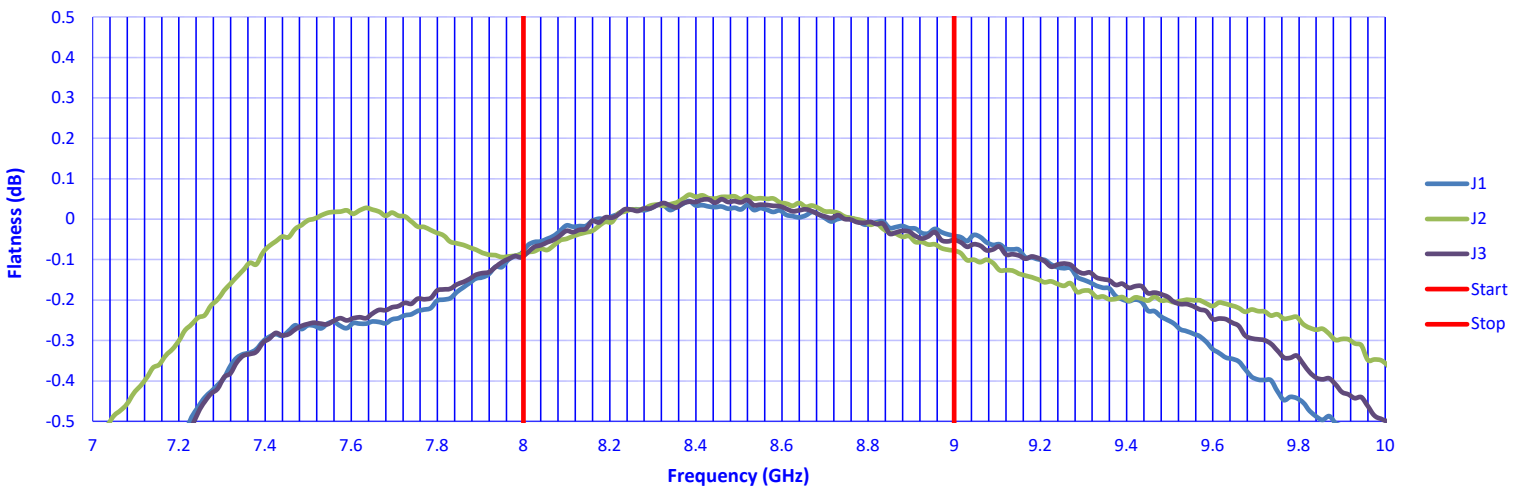
Insertion Loss Flatness (Variation from a Best Fit Straight Line) +25°C



Insertion Loss Flatness (Variation from a Best Fit Straight Line) -54°C



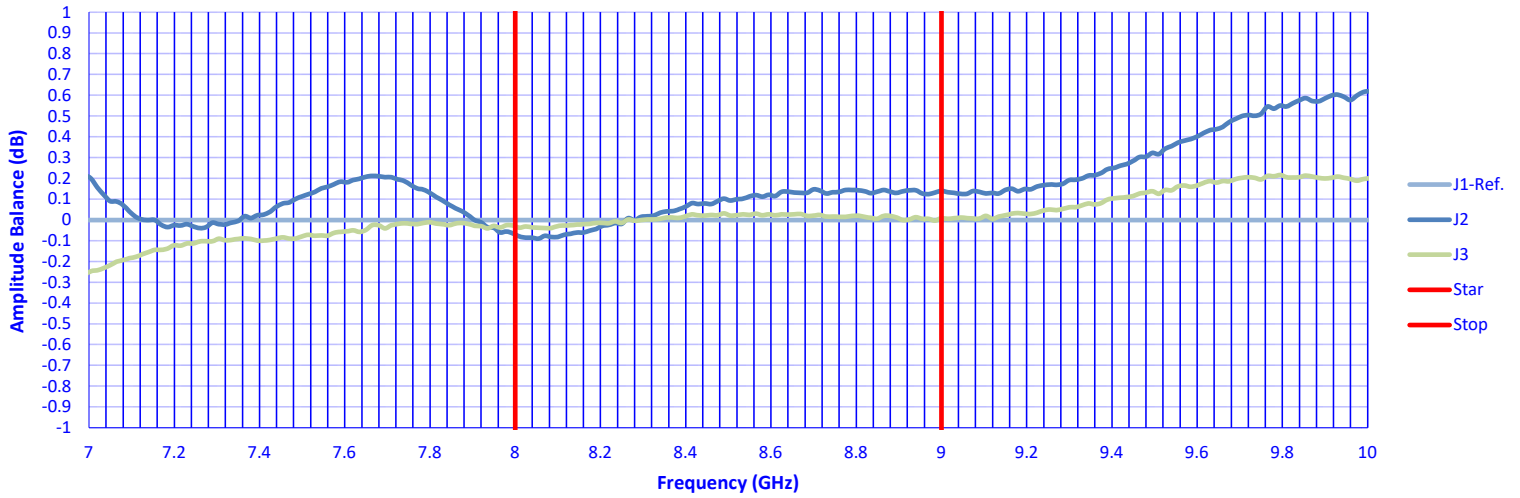
Insertion Loss Flatness (Variation from a Best Fit Straight Line) +95°C



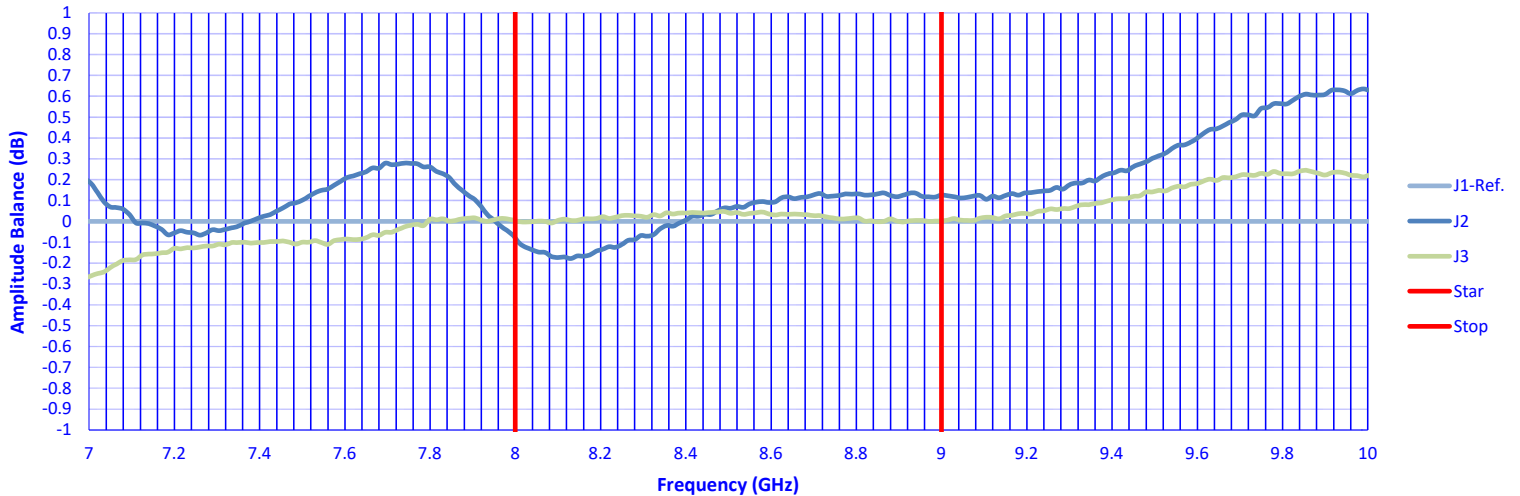


Typical Characteristics ON P3T-89-45-R-SFF

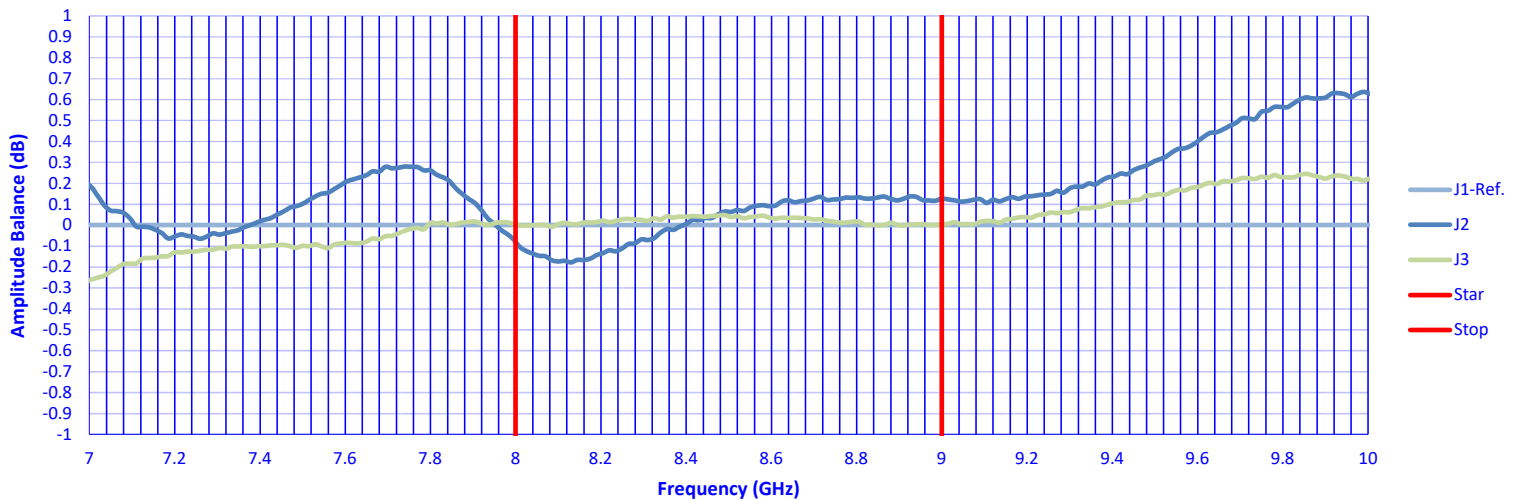
Amplitude Balance (+25°C)



Amplitude Balance (-54°C)



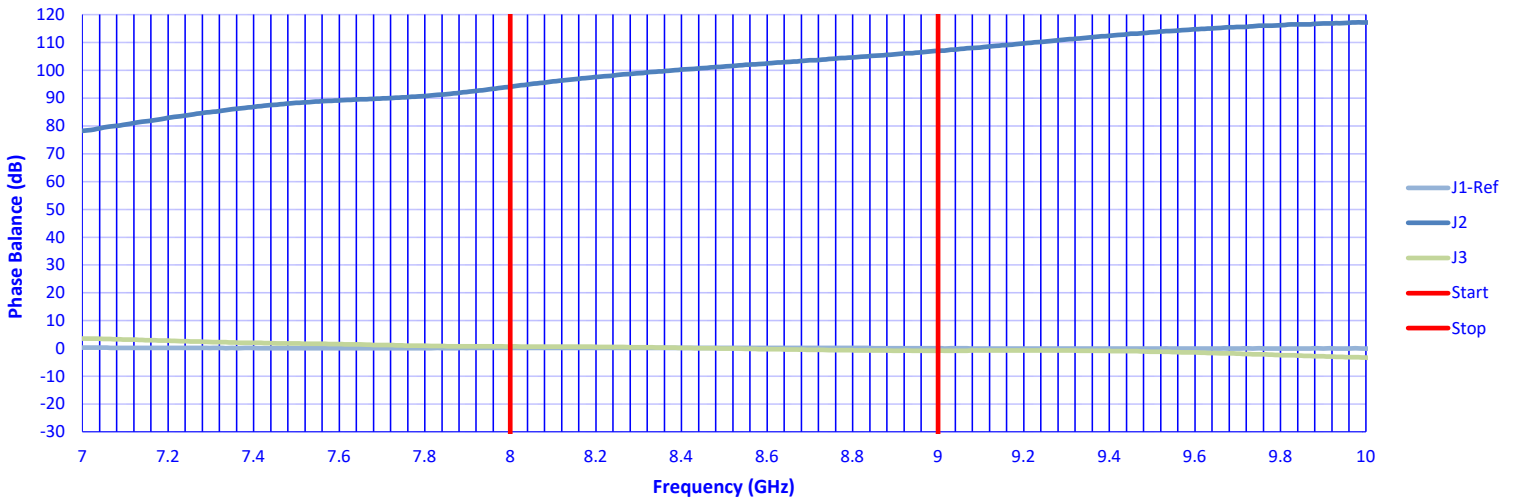
Amplitude Balance (+95°C)



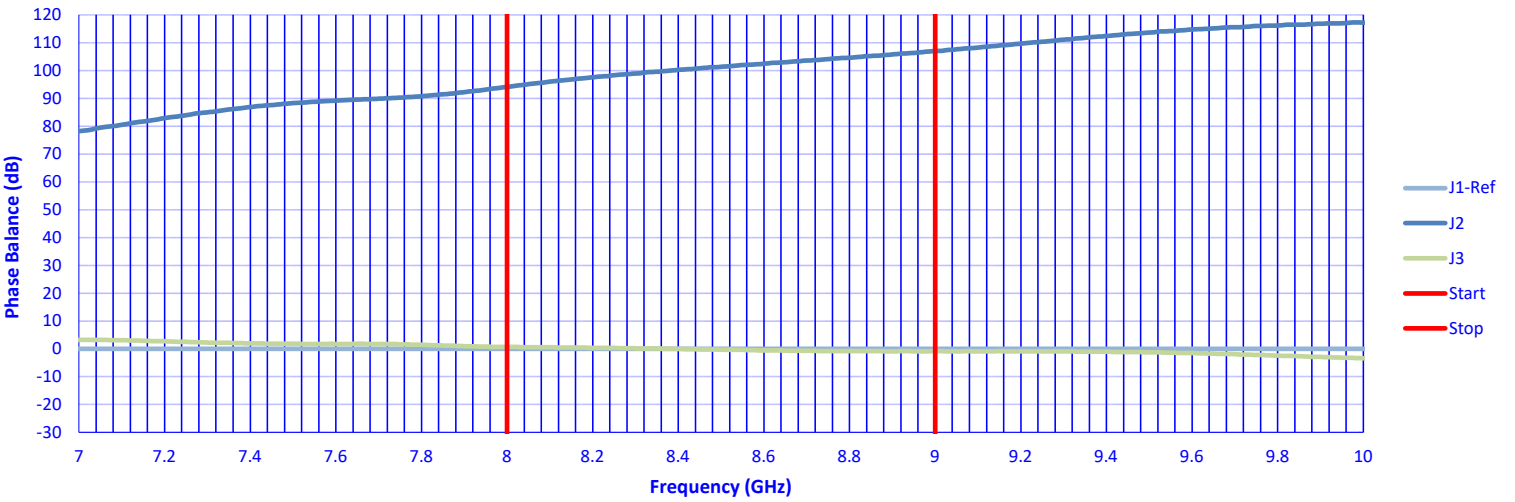


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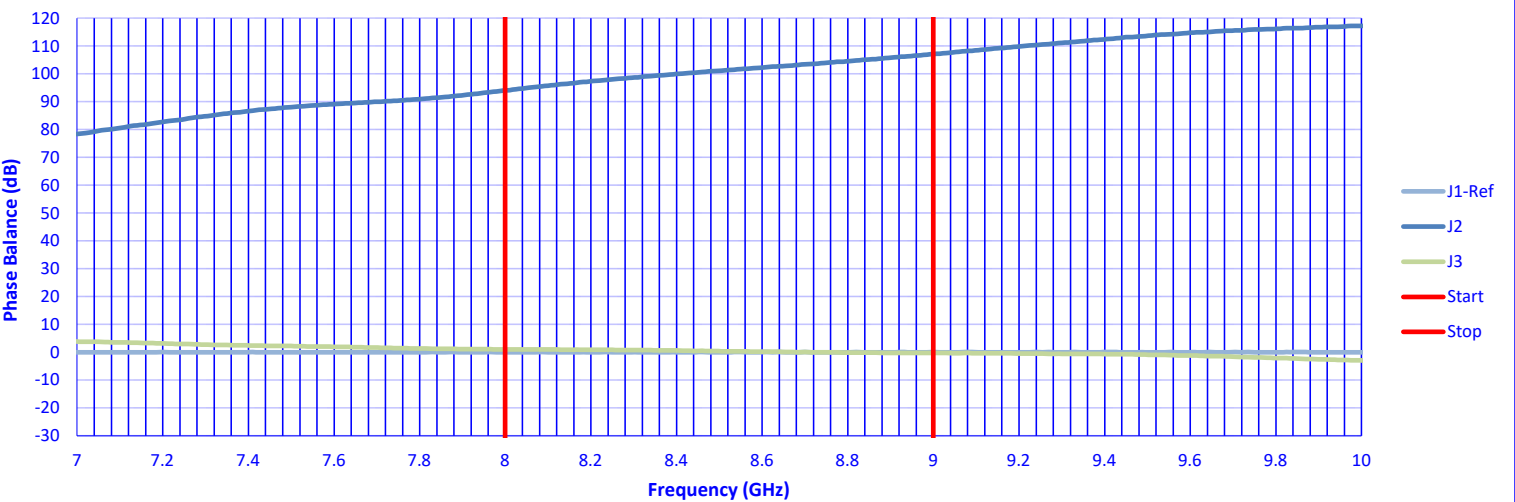
Phase Balance (+25°C)



Phase Balance (-54°C)



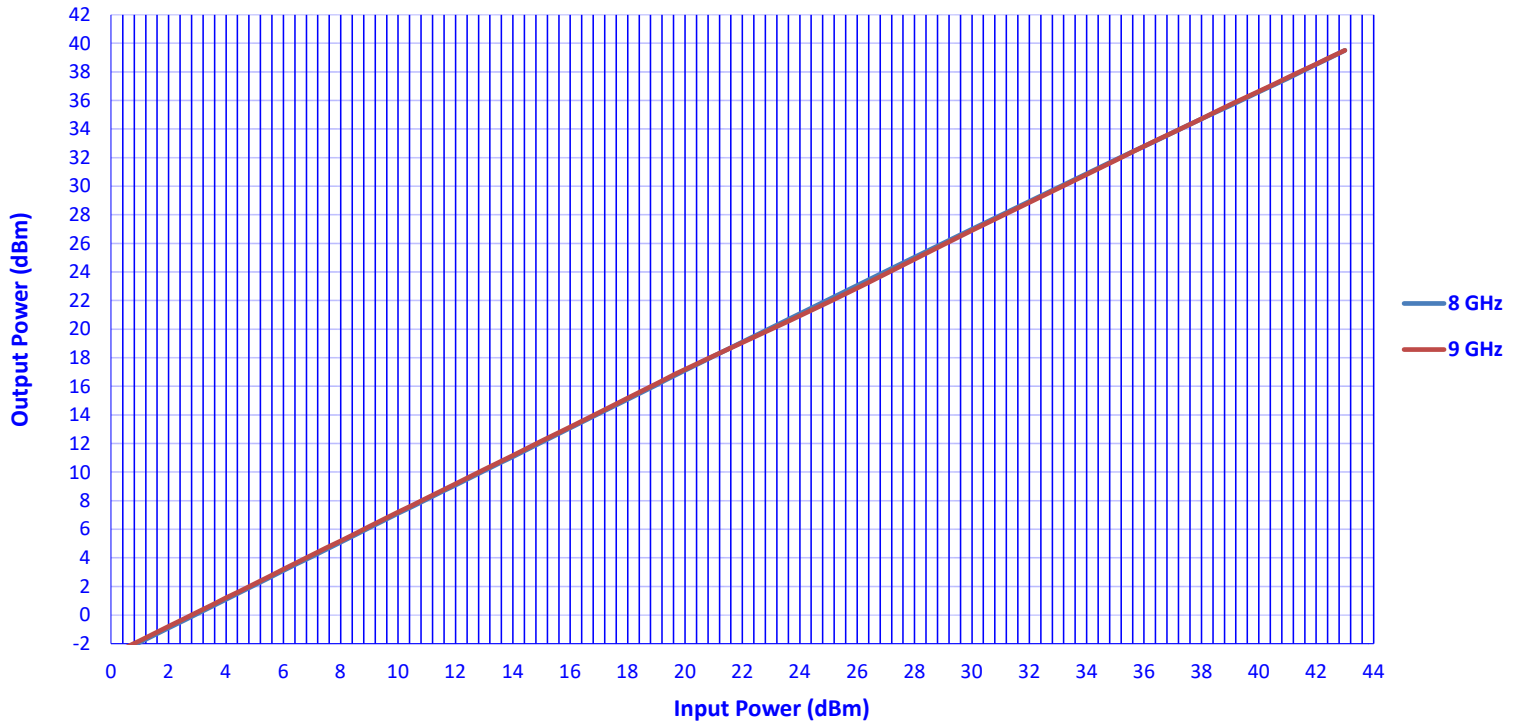
Phase Balance (+95°C)





Typical Characteristics ON P3T-89-45-R-SFF

High Power Test Graph (CW)



High Power Test Data (CW)								Power Input (Watts)
8 GHz				9 GHz				
Power In (dBm)	Power Out (dBm)	Loss	Compression (dBm)	Power In (dBm)	Power Out (dBm)	Loss	Compression (dBm)	
0	-2.902	2.902	0.000	0	-2.781	2.781	0.000	
1	-1.899	2.899	0.003	1	-1.780	2.780	0.001	
2	-0.900	2.900	0.002	2	-0.781	2.781	0.000	
3	0.097	2.903	0.001	3	0.196	2.804	0.023	
4	1.101	2.899	0.003	4	1.198	2.802	0.021	
5	2.103	2.897	0.005	5	2.201	2.800	0.019	
6	3.104	2.896	0.006	6	3.201	2.799	0.018	
7	4.107	2.893	0.009	7	4.203	2.797	0.016	
8	5.109	2.891	0.011	8	5.204	2.797	0.015	
9	6.109	2.891	0.011	9	6.203	2.797	0.016	
10	7.111	2.889	0.013	10	7.199	2.801	0.020	
11	8.101	2.899	0.003	11	8.190	2.810	0.029	
12	9.097	2.903	0.001	12	9.185	2.815	0.034	
13	10.090	2.910	0.008	13	10.179	2.821	0.040	
14	11.091	2.909	0.007	14	11.176	2.824	0.043	
15	12.092	2.908	0.006	15	12.176	2.824	0.043	
16	13.093	2.907	0.005	16	13.169	2.831	0.050	
17	14.095	2.905	0.003	17	14.170	2.830	0.049	
18	15.099	2.901	0.001	18	15.170	2.830	0.049	
19	16.107	2.893	0.009	19	16.180	2.820	0.039	
20	17.125	2.875	0.027	20	17.196	2.804	0.023	
25	22.080	2.920	0.018	25	21.900	3.100	0.319	
30	27.000	3.000	0.098	30	26.900	3.100	0.319	1
35	31.850	3.150	0.248	35	31.820	3.180	0.399	3
36	32.800	3.200	0.298	36	32.800	3.200	0.419	4
37	33.750	3.250	0.348	37	33.760	3.240	0.459	5
38	34.720	3.280	0.378	38	34.730	3.270	0.489	6
39	35.650	3.350	0.448	39	35.700	3.300	0.519	8
40	36.600	3.400	0.498	40	36.650	3.350	0.569	10
41	37.550	3.450	0.548	41	37.600	3.400	0.619	13
42	38.520	3.480	0.578	42	38.560	3.440	0.659	16
43	39.520	3.480	0.578	43	39.520	3.480	0.699	20

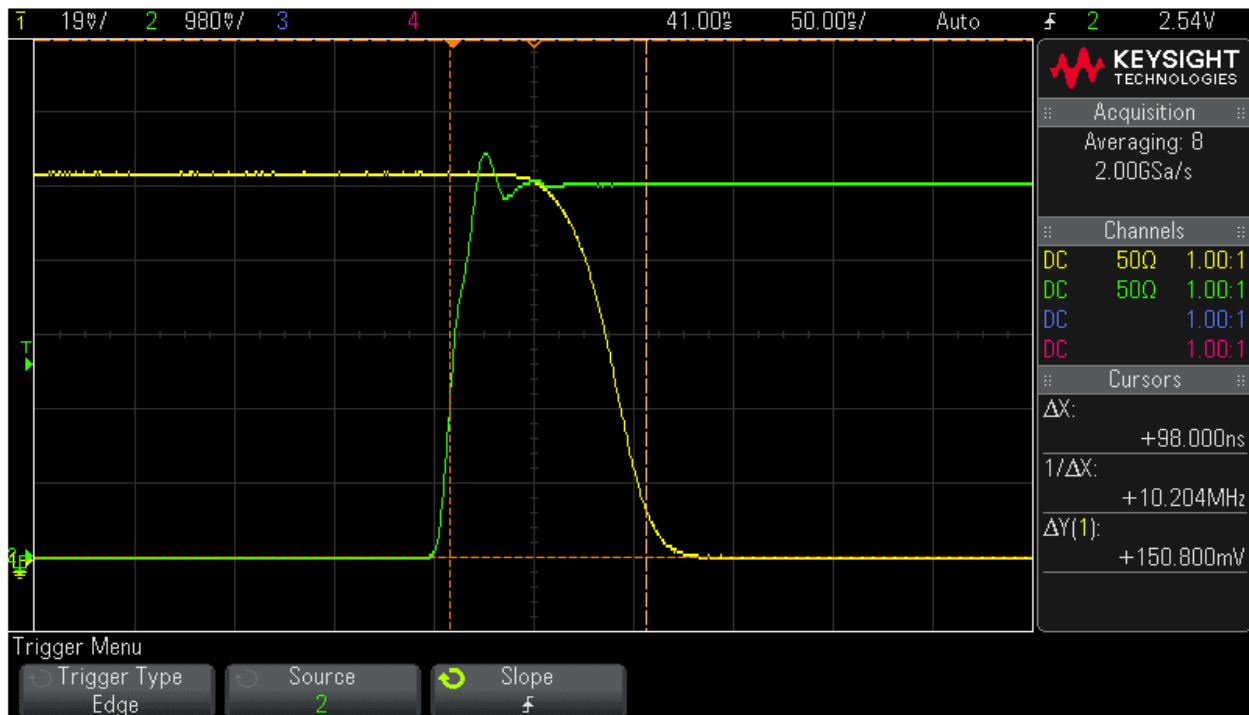


Typical Characteristics ON P3T-89-45-R-SFF

Switching Speed ON = (Measured value 83 ns)
50ns Per Div.



Switching Speed OFF = (Measured value = 98 ns)
50ns Per Div.

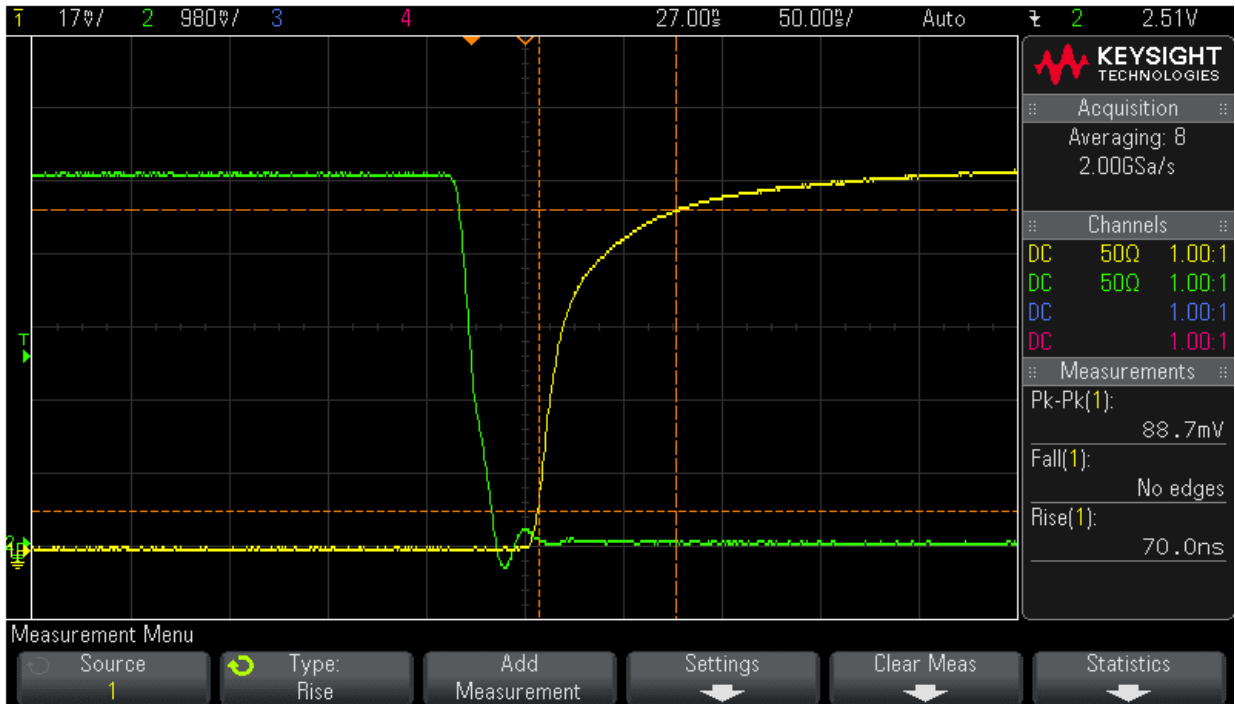


Green Trace = TTL Signal

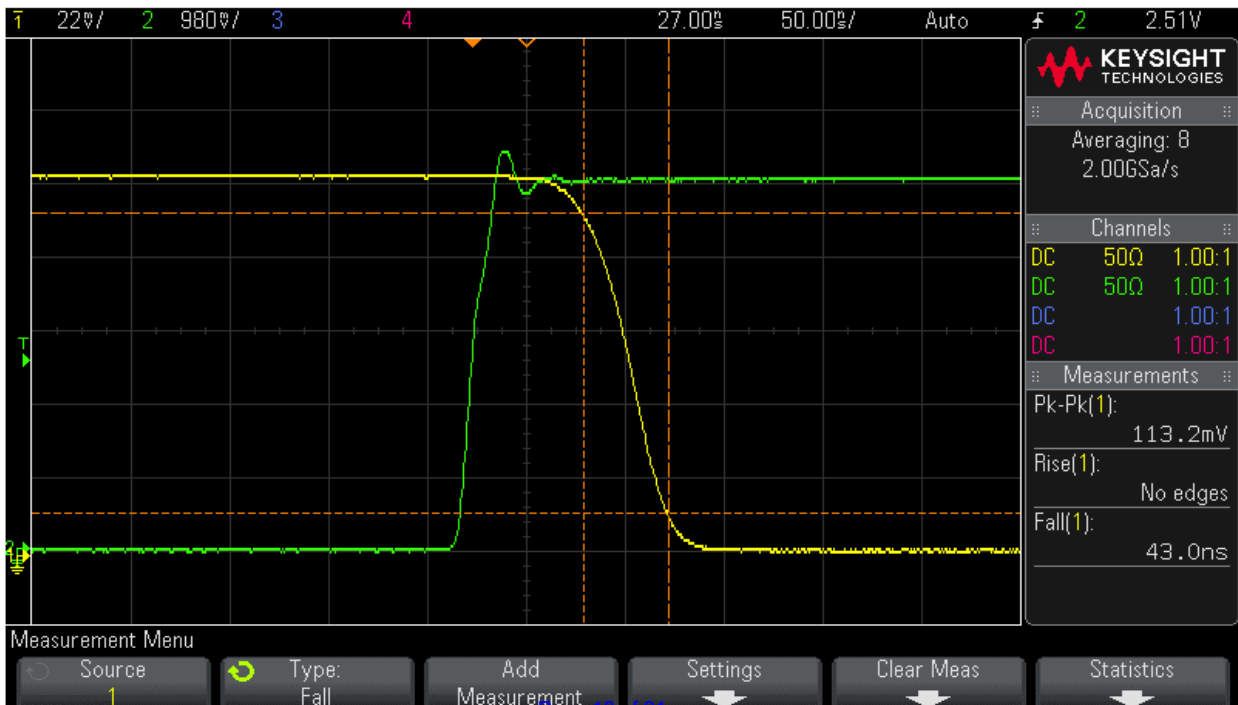


Typical Characteristics ON P3T-89-45-R-SFF

Rise Time = (Measured value 70 ns)
50ns Per Div.



Fall Time = (Measured value = 43 ns)
50ns Per Div.



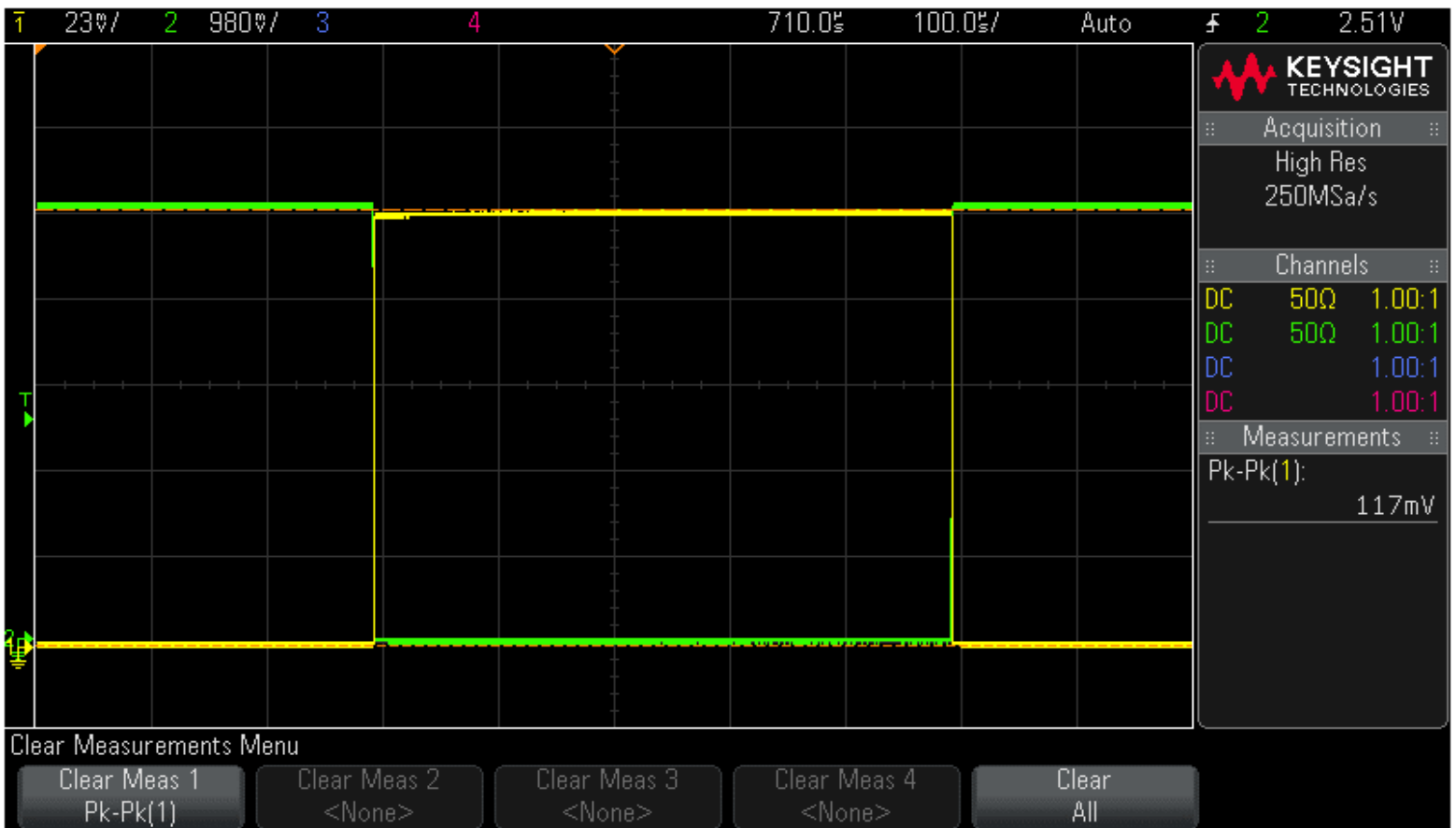
Green Trace = TTL Signal
Yellow Trace = RF Signal

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Full Pulse
100 μ s Per Div.

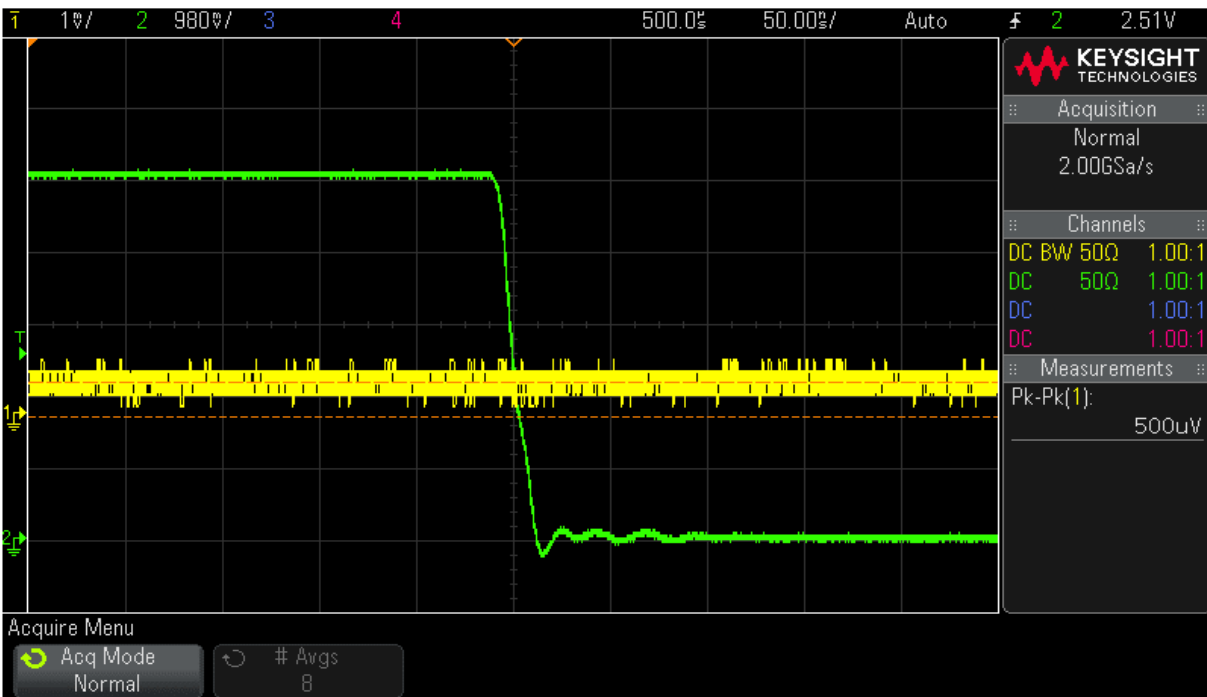


Green Trace = TTL Signal
Yellow Trace = RF Signal

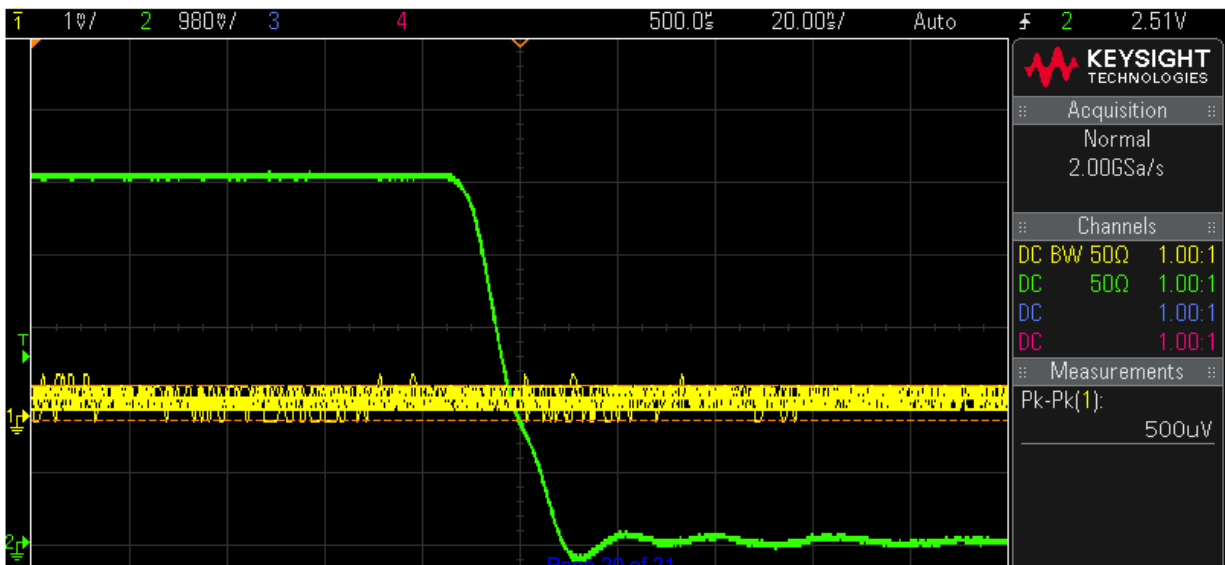


Typical Characteristics ON P3T-89-45-R-SFF

Output Video Transients
BW = 350MHz, 50Ω
Measured Value (500μV P-P)



Output Video Transients
BW = 350MHz, 50Ω
Measured Value (500 230 μV P-P)





Green Trace = TTL Signal
Yellow Trace = RF Signal

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