



**SUMMARY TEST DATA
ON
HADA-D2002**

PL46306/2426

Customer: _____	Tested By: <u>Anton L.</u>
SO No: _____	Temperature: <u>+25°C -40°C +85°C</u>
Model No: <u>HADA-D2002</u>	Date: <u>6/25/24</u>
Serial No: <u>PL46306/2426</u>	Drawing No: <u>27620222</u> Rev: <u>A1</u>

TEST. ITEM NO	PARAMETERS	SPECIFIED VALUE	TEST RESULTS	QA QC
1	Frequency Range:	2.0 GHz – 18.0 GHz	2.0 GHz – 18.0 GHz See Plot	PMI QA3
2	TSS:	-40 dBm Min @ -40°C to +85°	-42.5 dBm See Plot	
3	Frequency Flatness:	±1.65 dB Max	±0.642 dB See Plot	
4	Input / Output Characteristics: (93 Ω)	Y = 2150 + 50X [X: Input (dBm), Y: Output (mv)]	Pass	
5	Logging Accuracy	±1.5 dB Max (@ +25°C, 10 GHz)* [-36 dBm ≤ INPUT ≤ +4 dBm] ±3.1 dB Max (Note)	+0.08 / -0.48 dB +1.14 / -1.08 dB See Plot	
6	Log Linearity:	±0.5 dB Max @ +25°C ±0.75 dB Max @ -40°C to +85°C	+0.31 / -0.33 dB +0.61 / -0.43 dB See Plot	
7	Maximum Input Power (CW):	+23 dBm	Pass	
8	Duty Cycle:	100%	Pass	
9	Rise Time:	30 ns Max (10% to 90%)	25.3 ns See Plot	
10	Fall Time:	500 ns Max (@ Pulse width 100usec input) (90% to 10%)	150.8 ns See Plot	
11	DC Offset: (Input 50 Ω terminated):	+95 mV +55/-100 mV (@ -40°C to +85°C)	77 mV @ +25°C 61 mV @ -40°C 108 mV @ +85°C	
12	Input VSWR:	3.0:1 Max @ +23 dBm	1.60:1 See Plot	

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13	Propagation Delay:	60 ns Max	45 ns	PMI QA3
14	Power Supply:	+12 ± 1VDC @ 125 mA Max -12 ± 1VDC @ 75 mA Max	90 mA 40 mA	
15	Warm Up Time:	2 Minutes Max	2 Minutes	

*Notes: Includes Frequency Flatness. Input Power, Temperature Deviation and Deviation for DC Offset. The test shall be performed using RG-62 (or equivalent), 5 meter, 93±0.5 Ohms terminated.

QA/QC Approval: K. Vinton

Date: 6-25-24



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Log Linearity and Log Accuracy @ +25°C

Output Voltage Offset= 0.077 Volts

Frequency	INTERCEPT (mV)	SLOPE (mV/dB)
2 GHz	2193	50.2

Frequency	INTERCEPT (mV)	SLOPE (mV/dB)
6 GHz	2180	49.6

Frequency	INTERCEPT (mV)	SLOPE (mV/dB)
10 GHz	2141	49.7

Frequency	INTERCEPT (mV)	SLOPE (mV/dB)
14 GHz	2165	49.9

Frequency	INTERCEPT (mV)	SLOPE (mV/dB)
18 GHz	2184	49.7

Flatness +/- dB
Max Video Output V
Min Video Output V

	-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)	
	383	632	890	1135	1404	1657	1880	2138	2393		Measured Value (mV)
	-3	-5	2	-4	14	16	-12	-5	-1		Error (mV)
	-0.06	-0.10	0.04	-0.08	0.27	0.31	-0.24	-0.10	-0.02		MAX
	0.66	0.64	0.80	0.70	1.08	1.14	0.60	0.76	0.86		MIN
											LINEARITY ERROR (dB)
											0.31
											-0.24
											LOGGING ACCURACY (dB)
											1.14
											0.60
	387	638	896	1142	1396	1647	1870	2125	2379		Measured Value (mV)
	-8	-5	5	3	9	12	-13	-6	0		Error (mV)
	-0.15	-0.09	0.11	0.07	0.19	0.25	-0.26	-0.12	0.00		MAX
	0.74	0.76	0.92	0.84	0.92	0.94	0.40	0.50	0.58		MIN
											LINEARITY ERROR (dB)
											0.25
											-0.26
											LOGGING ACCURACY (dB)
											0.94
											0.40
	345	601	854	1098	1346	1601	1826	2087	2349		Measured Value (mV)
	-5	2	6	1	1	7	-17	-4	9		Error (mV)
	-0.11	0.04	0.12	0.03	0.02	0.14	-0.33	-0.09	0.18		MAX
	-0.10	0.02	0.08	-0.04	-0.08	0.02	-0.48	-0.26	-0.02		MIN
											LINEARITY ERROR (dB)
											0.18
											-0.33
											LOGGING ACCURACY (dB)
											0.08
											-0.48
	362	616	872	1115	1379	1631	1851	2110	2365		Measured Value (mV)
	-7	-2	4	-2	12	15	-15	-5	0		Error (mV)
	-0.14	-0.05	0.08	-0.05	0.24	0.30	-0.29	-0.10	0.01		MAX
	0.24	0.32	0.44	0.30	0.58	0.62	0.02	0.20	0.30		MIN
											LINEARITY ERROR (dB)
											0.30
											-0.29
											LOGGING ACCURACY (dB)
											0.62
											0.02
	389	638	893	1137	1400	1649	1878	2134	2377		Measured Value (mV)
	-5	-4	2	-3	12	12	-8	0	-6		Error (mV)
	-0.09	-0.09	0.04	-0.05	0.23	0.24	-0.16	-0.01	-0.12		MAX
	0.78	0.76	0.86	0.74	1.00	0.98	0.56	0.68	0.54		MIN
											LINEARITY ERROR (dB)
											0.24
											-0.16
											LOGGING ACCURACY (dB)
											1.00
											0.54
	0.441	0.371	0.421	0.441	0.582	0.562	0.542	0.512	0.441		
	0.389	0.638	0.896	1.142	1.404	1.657	1.880	2.138	2.393		
	0.345	0.601	0.854	1.098	1.346	1.601	1.826	2.087	2.349		

Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.31	-0.33

Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB)	1.14	-0.48

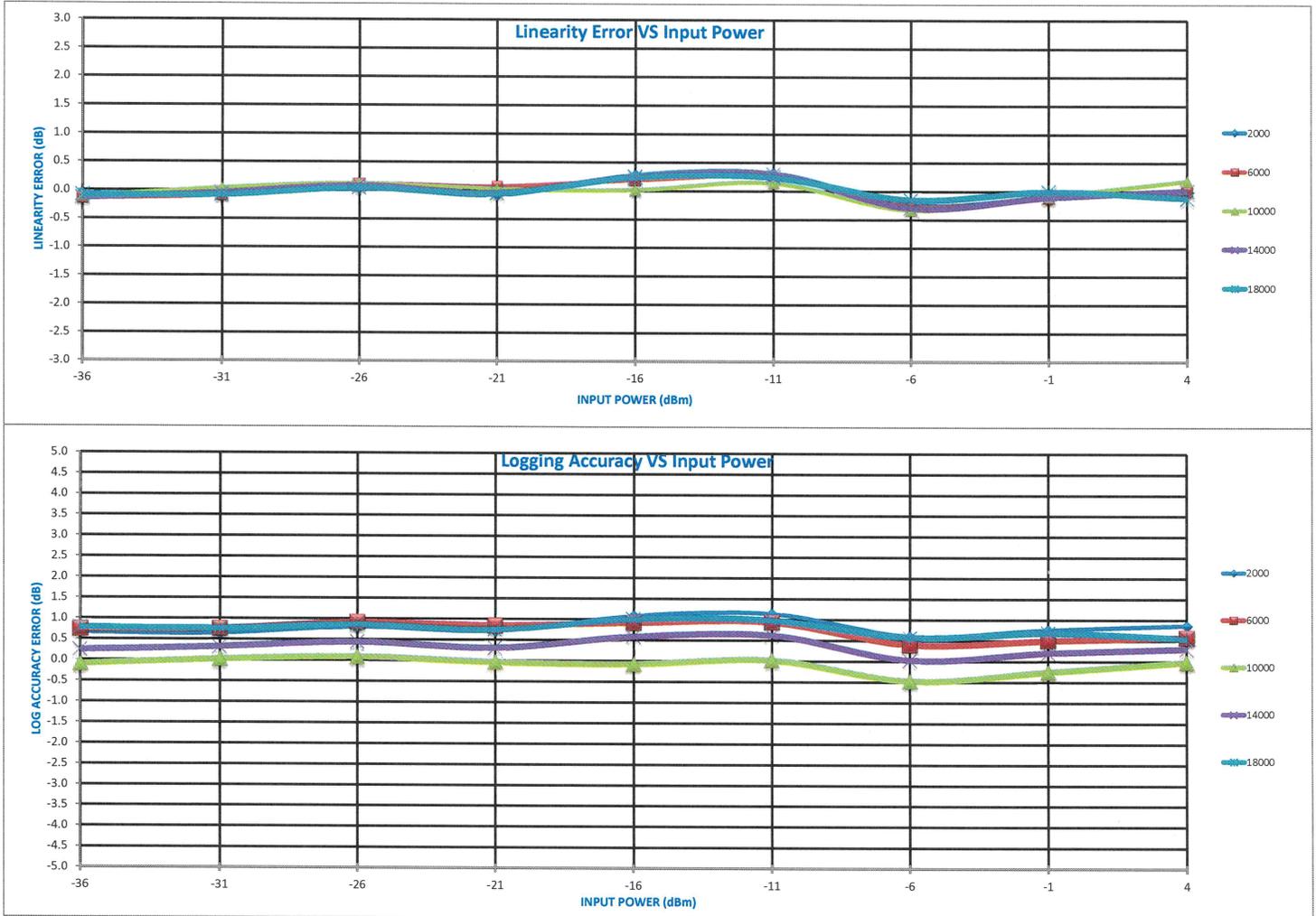
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SUMMARY TEST DATA
ON
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PL46306/2426

Log Linearity and Log Accuracy @ +25°C



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**SUMMARY TEST DATA
ON
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Log Linearity and Log Accuracy @ -40°C

Output Voltage Offset= 0.061 Volts

Frequency		
2 GHz	INTERCEPT (mV)	2168
	SLOPE (mV/dB)	49.3

6 GHz	INTERCEPT (mV)	2152
	SLOPE (mV/dB)	48.7

10 GHz	INTERCEPT (mV)	2112
	SLOPE (mV/dB)	48.9

14 GHz	INTERCEPT (mV)	2139
	SLOPE (mV/dB)	49.1

18 GHz	INTERCEPT (mV)	2155
	SLOPE (mV/dB)	49.1

Flatness +/- dB	
Max Video Output V	
Min Video Output V	

	-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)
	393	623	880	1132	1398	1647	1875	2113	2349	Measured Value (mV)
	1	-16	-6	0	19	21	3	-6	-16	Error (mV)
	0.01	-0.32	-0.11	0.00	0.39	0.44	0.06	-0.12	-0.33	MAX
	0.86	0.46	0.60	0.64	0.96	0.94	0.50	0.26	-0.02	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	394	626	884	1136	1388	1636	1862	2100	2328	Measured Value (mV)
	-4	-16	-2	7	15	20	2	-3	-19	Error (mV)
	-0.09	-0.33	-0.03	0.14	0.31	0.41	0.05	-0.07	-0.39	MAX
	0.88	0.52	0.68	0.72	0.76	0.72	0.24	0.00	-0.44	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	351	587	843	1088	1335	1590	1814	2065	2296	Measured Value (mV)
	-2	-10	2	2	5	16	-4	2	-11	Error (mV)
	-0.03	-0.20	0.04	0.05	0.10	0.32	-0.09	0.05	-0.23	MAX
	0.02	-0.26	-0.14	-0.24	-0.30	-0.20	-0.72	-0.70	-1.08	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	367	602	860	1108	1371	1621	1844	2088	2317	Measured Value (mV)
	-4	-14	-2	1	18	22	0	-2	-19	Error (mV)
	-0.07	-0.29	-0.04	0.01	0.36	0.45	-0.01	-0.04	-0.38	MAX
	0.34	0.04	0.20	0.16	0.42	0.42	-0.12	-0.24	-0.66	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	385	619	874	1124	1385	1631	1867	2105	2330	Measured Value (mV)
	-2	-13	-4	1	16	17	7	0	-21	Error (mV)
	-0.04	-0.27	-0.08	0.01	0.33	0.34	0.14	-0.01	-0.43	MAX
	0.70	0.38	0.48	0.48	0.70	0.62	0.34	0.10	-0.40	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	0.439	0.398	0.418	0.490	0.642	0.581	0.622	0.490	0.541	
	0.394	0.626	0.884	1.136	1.398	1.647	1.875	2.113	2.349	
	0.351	0.587	0.843	1.088	1.335	1.590	1.814	2.065	2.296	

Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.45	-0.43

Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB)	0.96	-1.08

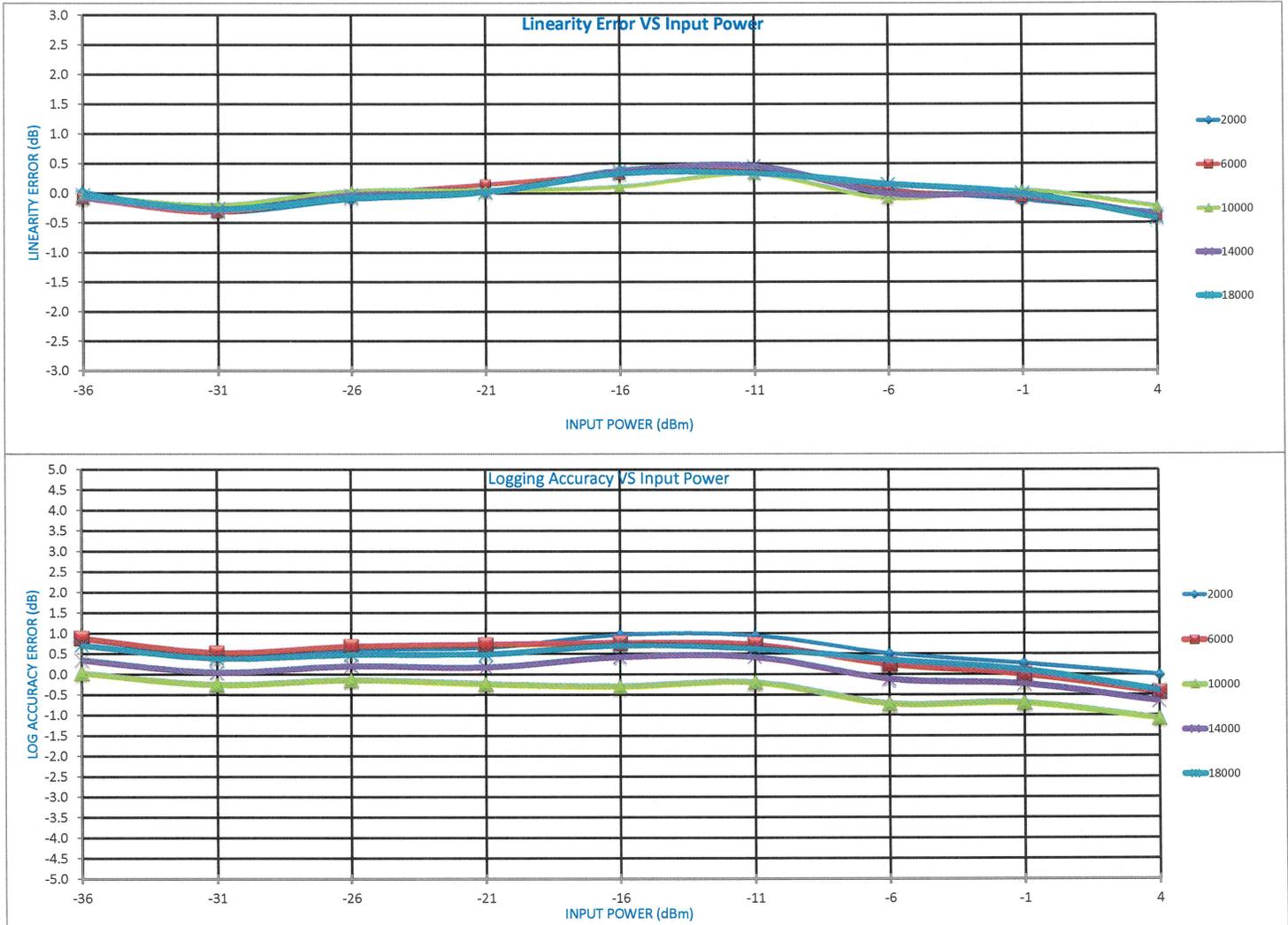
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Log Linearity and Log Accuracy @ -40°C



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**SUMMARY TEST DATA
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Log Linearity and Log Accuracy @ +85°C

Output Voltage Offset= 0.108 Volts

Frequency

2 GHz	INTERCEPT (mV)	2177
	SLOPE (mV/dB)	50.2

6 GHz	INTERCEPT (mV)	2168
	SLOPE (mV/dB)	49.7

10 GHz	INTERCEPT (mV)	2127
	SLOPE (mV/dB)	49.8

14 GHz	INTERCEPT (mV)	2141
	SLOPE (mV/dB)	49.8

18 GHz	INTERCEPT (mV)	2151
	SLOPE (mV/dB)	49.4

Flatness +/- dB
Max Video Output V
Min Video Output V

	-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)		
	374	621	869	1111	1379	1632	1857	2121	2393		Measured Value (mV)	Error(dB)
	6	2	-2	-11	6	8	-18	-6	15		Error (mV)	MAX MIN
	0.12	0.03	-0.03	-0.21	0.12	0.15	-0.37	-0.11	0.30		LINEARITY ERROR (dB)	0.30 -0.37
	0.48	0.42	0.38	0.22	0.58	0.64	0.14	0.42	0.86		LOGGING ACCURACY (dB)	0.86 0.14
	383	629	879	1119	1375	1625	1850	2110	2387		Measured Value (mV)	Error(dB)
	4	1	3	-6	2	4	-20	-8	20		Error (mV)	MAX MIN
	0.08	0.03	0.06	-0.11	0.04	0.07	-0.40	-0.17	0.41		LINEARITY ERROR (dB)	0.41 -0.40
	0.66	0.58	0.58	0.38	0.50	0.50	0.00	0.20	0.74		LOGGING ACCURACY (dB)	0.74 0.00
	343	591	834	1075	1323	1575	1807	2069	2356		Measured Value (mV)	Error(dB)
	8	7	1	-6	-7	-4	-21	-8	30		Error (mV)	MAX MIN
	0.16	0.15	0.03	-0.13	-0.15	-0.08	-0.42	-0.16	0.61		LINEARITY ERROR (dB)	0.61 -0.42
	-0.14	-0.18	-0.32	-0.50	-0.54	-0.50	-0.86	-0.62	0.12		LOGGING ACCURACY (dB)	0.12 -0.86
	354	601	847	1087	1350	1600	1824	2083	2359		Measured Value (mV)	Error(dB)
	5	3	0	-9	5	6	-19	-9	18		Error (mV)	MAX MIN
	0.09	0.05	0.00	-0.18	0.10	0.12	-0.38	-0.17	0.37		LINEARITY ERROR (dB)	0.37 -0.38
	0.08	0.02	-0.06	-0.26	0.00	0.00	-0.52	-0.34	0.18		LOGGING ACCURACY (dB)	0.18 -0.52
	375	620	865	1104	1369	1617	1843	2100	2354		Measured Value (mV)	Error(dB)
	3	0	-2	-10	8	9	-12	-2	5		Error (mV)	MAX MIN
	0.05	0.01	-0.03	-0.20	0.17	0.18	-0.24	-0.04	0.10		LINEARITY ERROR (dB)	0.18 -0.24
	0.50	0.40	0.30	0.08	0.38	0.34	-0.14	0.00	0.08		LOGGING ACCURACY (dB)	0.50 -0.14
	0.402	0.382	0.452	0.442	0.562	0.573	0.502	0.522	0.392			
	0.383	0.629	0.879	1.119	1.379	1.632	1.857	2.121	2.393			
	0.343	0.591	0.834	1.075	1.323	1.575	1.807	2.069	2.354			

Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.61	-0.42

Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB)	0.86	-0.86

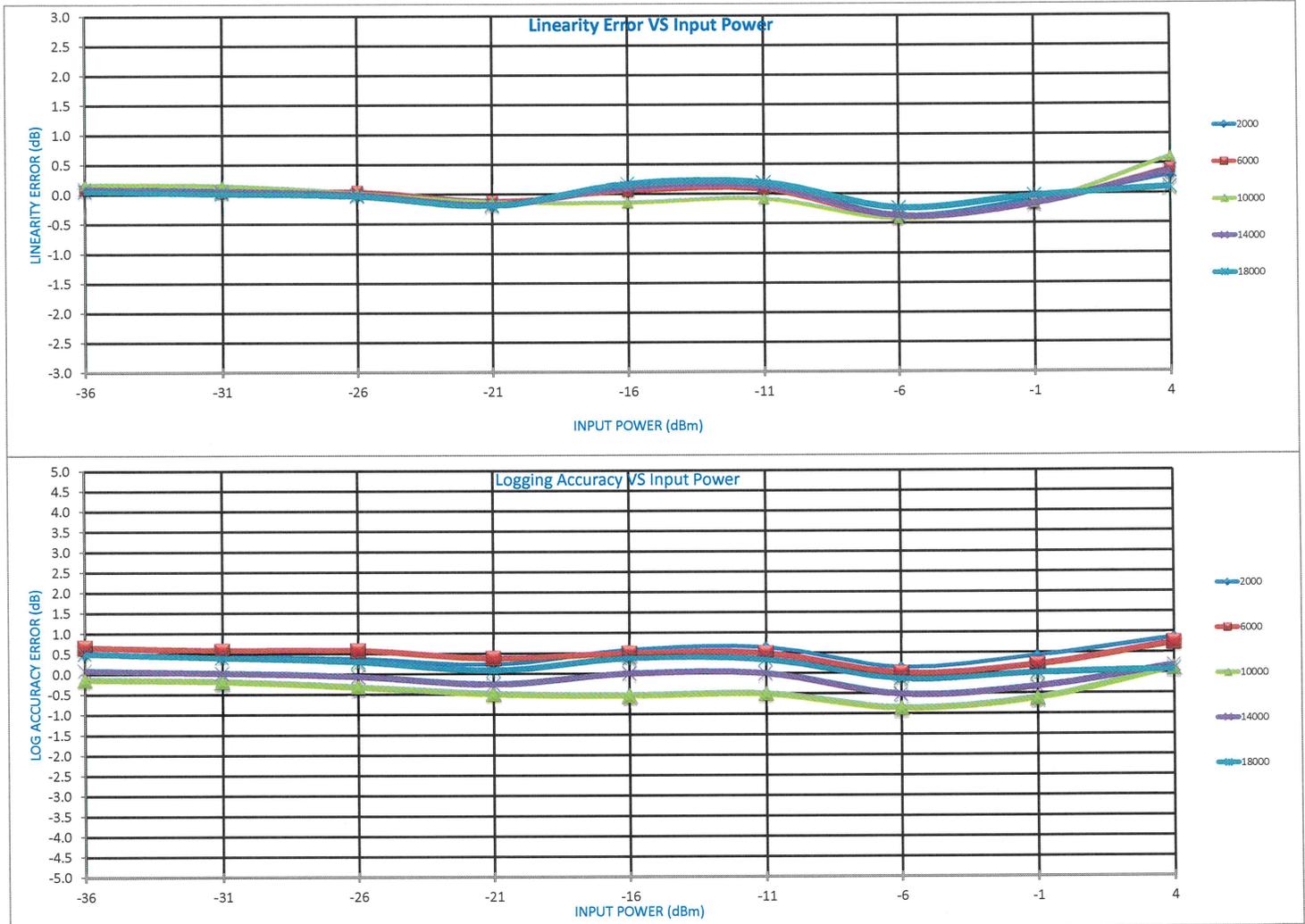
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Log Linearity and Log Accuracy @ +85°C



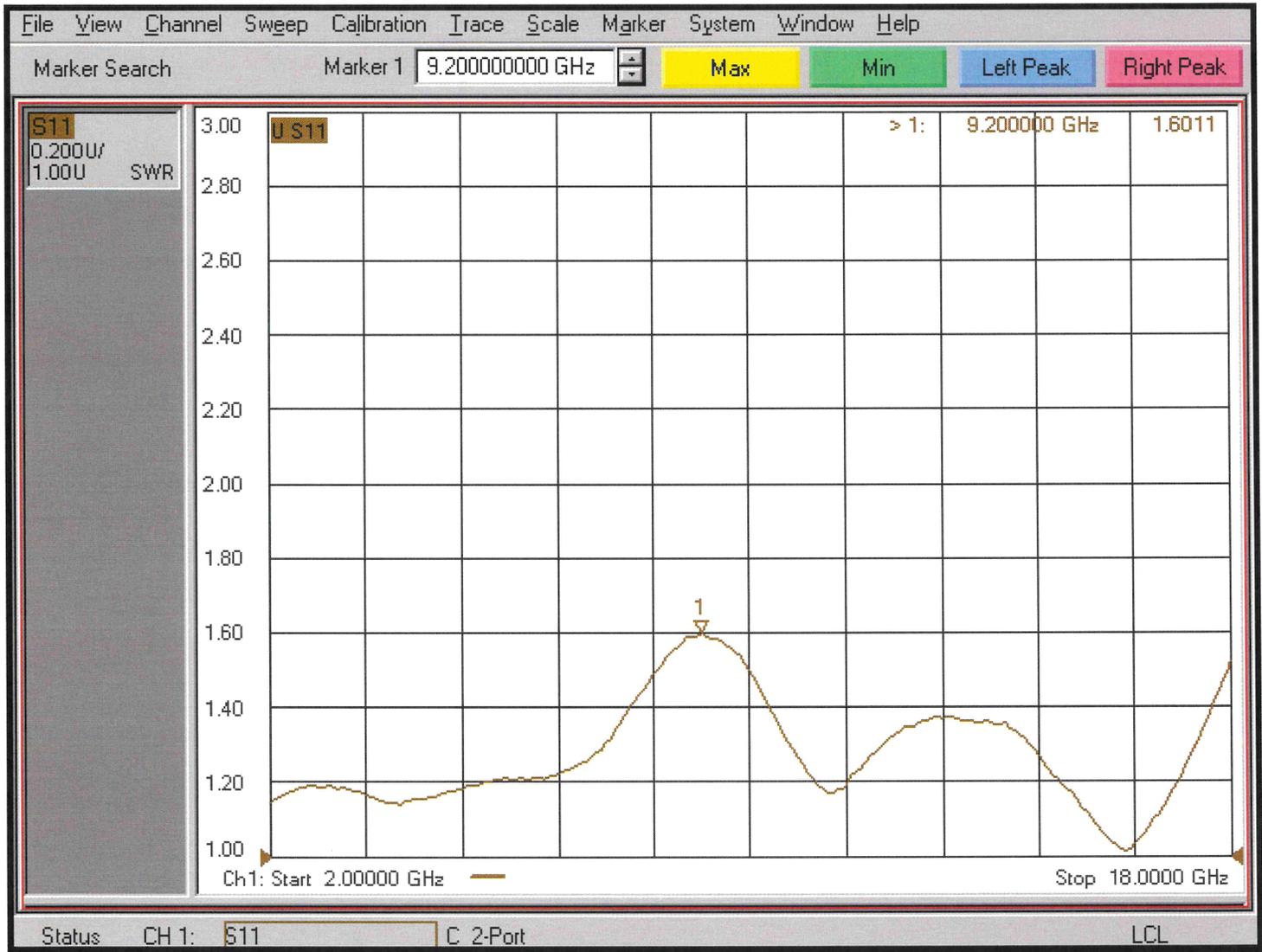
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VSWR 1.60:1



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**SUMMARY TEST DATA
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TSS @ -42.5 dBm



M50-X 3034T, MY59241076, 07.50.2021102830: Fri Jun 21 07:06:13 2024



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**SUMMARY TEST DATA
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Rise Time 25.3 ns



MSO-X 3034T, MY59241076, 07.50.2021102830: Fri Jun 21 06:45:55 2024



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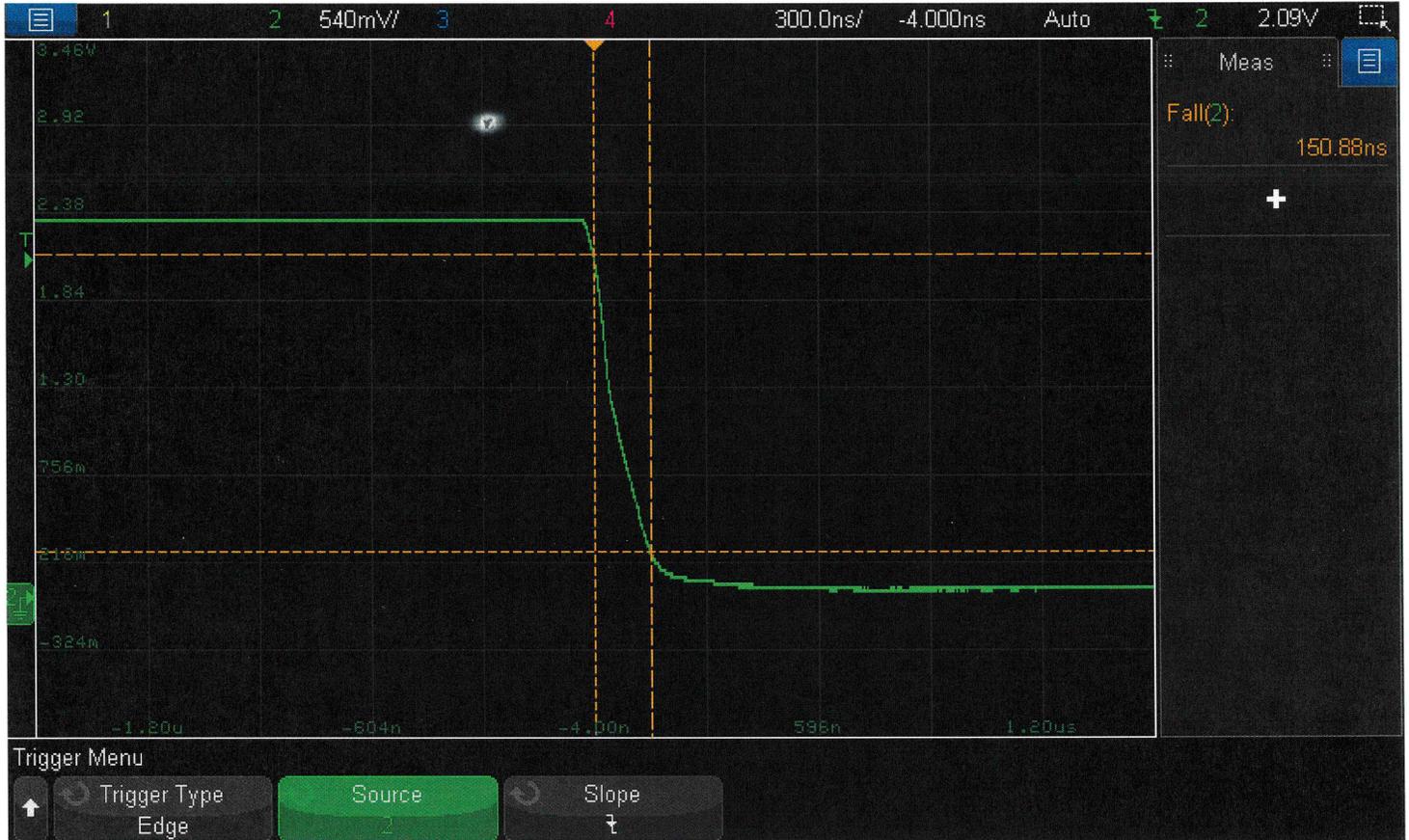
SUMMARY TEST DATA
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PL46306/2426

Fall Time 150.8 ns



MSO-X 3034T, MY59241076, 07.50.2021102830: Fri Jun 21 06:28:55 2024



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