



**SUMMARY TEST DATA
ON
HADA-D2002**

PL46304/2426

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>PL46304/2426</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°	-43.0 dBm See Plot	
3	Frequency Flatness:	±1.65 dB Max	±0.553 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)	+0.12 / -0.70 dB +0.62 / -1.94 dB See Plot	
6	Log Linearity:	±0.5 dB Max @ +25°C ±0.75 dB Max @ -40°C to +85°C	+0.40 / -0.35 dB +0.57 / -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%)	24.1 ns See Plot	
10	Fall Time:	500 ns Max (@ Pulse width 100usec input) (90% to 10%)	128.5 ns See Plot	
11	DC Offset: (Input 50 Ω terminated):	+95 mV +55/-100 mV (@ -40°C to +85°C)	92 mV @ +25°C 55 mV @ -40°C 92 mV @ +85°C	
12	Input VSWR:	3.0:1 Max @ +23 dBm	2.25:1 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: H. Winters

Date: 6-25-24



**SUMMARY TEST DATA
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Log Linearity and Log Accuracy @ +25°C

Output Voltage Offset= 0.092 Volts

Frequency		
2 GHz	INTERCEPT (mV)	2126
	SLOPE (mV/dB)	49.4

6 GHz	INTERCEPT (mV)	2144
	SLOPE (mV/dB)	49

10 GHz	INTERCEPT (mV)	2128
	SLOPE (mV/dB)	49.4

14 GHz	INTERCEPT (mV)	2129
	SLOPE (mV/dB)	49.3

18 GHz	INTERCEPT (mV)	2137
	SLOPE (mV/dB)	50

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

	-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)		
	349	589	835	1078	1350	1602	1821	2071	2320	Measured Value (mV)	Error(dB)	
	2	-5	-6	-10	15	20	-8	-5	-3	Error (mV)	MAX	MIN
	0.05	-0.10	-0.12	-0.20	0.30	0.40	-0.17	-0.11	-0.07	LINEARITY ERROR (dB)	0.40	-0.20
	-0.02	-0.22	-0.30	-0.44	0.00	0.04	-0.58	-0.58	-0.60	LOGGING ACCURACY (dB)	0.04	-0.60
	381	619	871	1115	1373	1621	1838	2089	2340	Measured Value (mV)	Error(dB)	
	-1	-7	0	-1	12	15	-12	-6	0	Error (mV)	MAX	MIN
	-0.01	-0.15	0.00	-0.02	0.25	0.32	-0.25	-0.12	0.00	LINEARITY ERROR (dB)	0.32	-0.25
	0.62	0.38	0.42	0.30	0.46	0.42	-0.24	-0.22	-0.20	LOGGING ACCURACY (dB)	0.62	-0.24
	356	596	845	1087	1338	1592	1815	2076	2339	Measured Value (mV)	Error(dB)	
	6	-1	1	-4	0	7	-17	-3	13	Error (mV)	MAX	MIN
	0.11	-0.03	0.01	-0.09	0.00	0.14	-0.35	-0.06	0.26	LINEARITY ERROR (dB)	0.26	-0.35
	0.12	-0.08	-0.10	-0.26	-0.24	-0.16	-0.70	-0.48	-0.22	LOGGING ACCURACY (dB)	0.12	-0.70
	356	596	845	1086	1354	1604	1819	2074	2327	Measured Value (mV)	Error(dB)	
	1	-5	-2	-8	14	17	-14	-5	1	Error (mV)	MAX	MIN
	0.03	-0.10	-0.05	-0.16	0.28	0.35	-0.28	-0.11	0.03	LINEARITY ERROR (dB)	0.35	-0.28
	0.12	-0.08	-0.10	-0.28	0.08	0.08	-0.62	-0.52	-0.46	LOGGING ACCURACY (dB)	0.12	-0.62
	347	587	829	1070	1343	1595	1832	2090	2338	Measured Value (mV)	Error(dB)	
	10	0	-8	-17	6	8	-5	3	1	Error (mV)	MAX	MIN
	0.21	0.01	-0.15	-0.33	0.12	0.16	-0.10	0.06	0.02	LINEARITY ERROR (dB)	0.21	-0.33
	-0.06	-0.26	-0.42	-0.60	-0.14	-0.10	-0.36	-0.20	-0.24	LOGGING ACCURACY (dB)	-0.06	-0.60
	0.344	0.324	0.425	0.455	0.354	0.293	0.233	0.192	0.202			
	0.381	0.619	0.871	1.115	1.373	1.621	1.838	2.090	2.340			
	0.347	0.587	0.829	1.070	1.338	1.592	1.815	2.071	2.320			

Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.40	-0.35

Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB)	0.62	-0.70

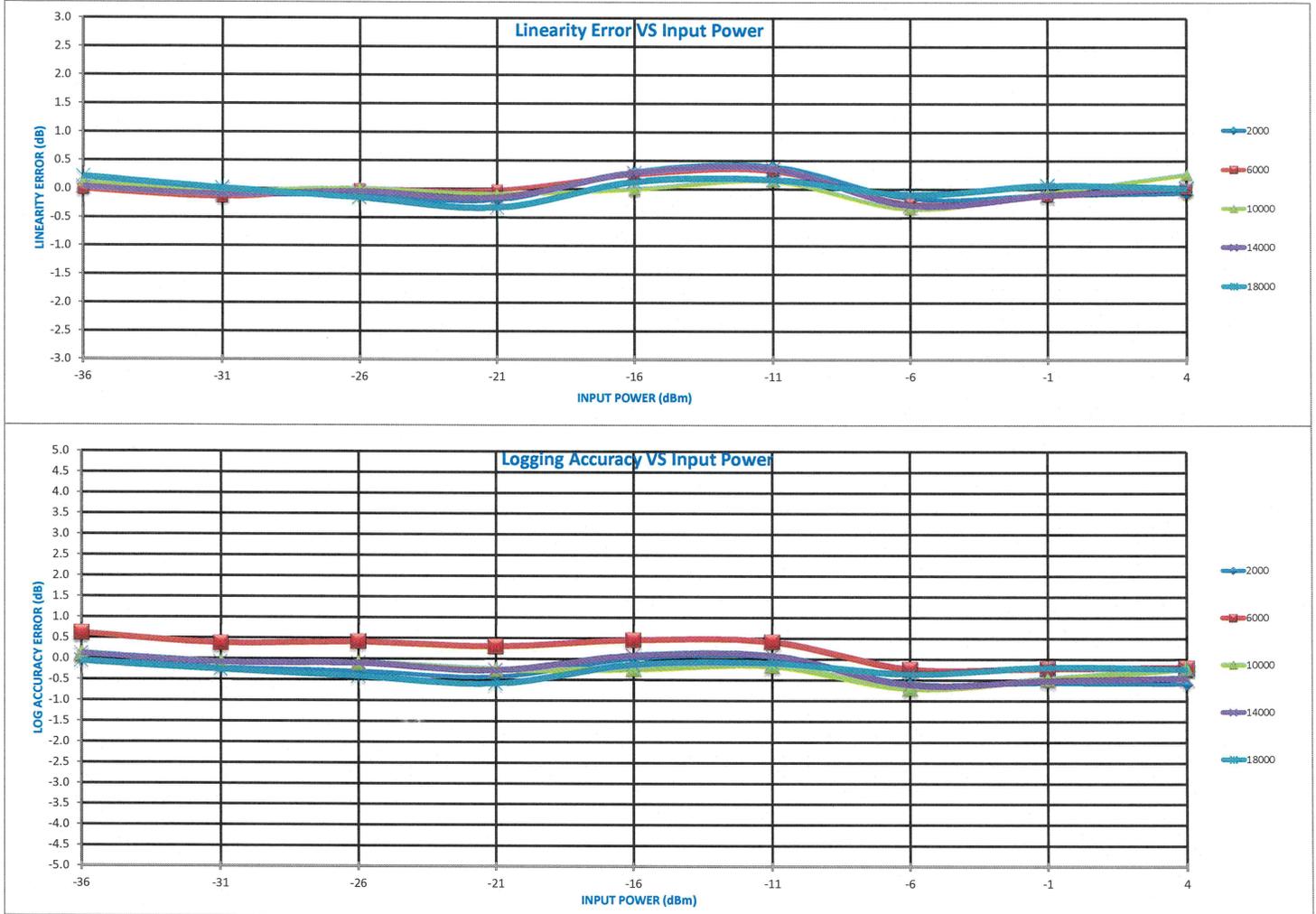
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SUMMARY TEST DATA
ON
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PL46304/2426

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= 0.055 Volts

Frequency

2 GHz	INTERCEPT (mV)	2078
	SLOPE (mV/dB)	48.7

6 GHz	INTERCEPT (mV)	2094
	SLOPE (mV/dB)	48.3

10 GHz	INTERCEPT (mV)	2076
	SLOPE (mV/dB)	48.6

14 GHz	INTERCEPT (mV)	2089
	SLOPE (mV/dB)	48.7

18 GHz	INTERCEPT (mV)	2092
	SLOPE (mV/dB)	49.6

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

	-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)		
	330	551	801	1046	1319	1570	1789	2028	2253		Measured Value (mV)	Error(dB)
	6	-16	-10	-9	20	28	3	-2	-20		Error (mV)	MAX MIN
	0.13	-0.34	-0.21	-0.18	0.42	0.57	0.06	-0.03	-0.42		LINEARITY ERROR (dB)	0.57 -0.42
	-0.40	-0.98	-0.98	-1.08	-0.62	-0.60	-1.22	-1.44	-1.94		LOGGING ACCURACY (dB)	-0.40 -1.94
	358	579	833	1084	1341	1587	1806	2042	2268		Measured Value (mV)	Error(dB)
	1	-19	-6	3	19	24	1	-4	-19		Error (mV)	MAX MIN
	0.02	-0.40	-0.13	0.07	0.39	0.49	0.03	-0.08	-0.40		LINEARITY ERROR (dB)	0.49 -0.40
	0.16	-0.42	-0.34	-0.32	-0.18	-0.26	-0.88	-1.16	-1.64		LOGGING ACCURACY (dB)	0.16 -1.64
	333	556	808	1054	1305	1559	1780	2028	2263		Measured Value (mV)	Error(dB)
	7	-13	-4	-1	7	17	-5	0	-8		Error (mV)	MAX MIN
	0.14	-0.27	-0.09	-0.03	0.13	0.36	-0.09	0.01	-0.16		LINEARITY ERROR (dB)	0.36 -0.27
	-0.34	-0.88	-0.84	-0.92	-0.90	-0.82	-1.40	-1.44	-1.74		LOGGING ACCURACY (dB)	-0.34 -1.74
	339	563	816	1063	1330	1579	1796	2037	2266		Measured Value (mV)	Error(dB)
	3	-17	-7	-3	20	26	-1	-3	-18		Error (mV)	MAX MIN
	0.06	-0.34	-0.14	-0.07	0.41	0.53	-0.02	-0.07	-0.36		LINEARITY ERROR (dB)	0.53 -0.36
	-0.22	-0.74	-0.68	-0.74	-0.40	-0.42	-1.08	-1.26	-1.68		LOGGING ACCURACY (dB)	-0.22 -1.68
	320	545	792	1036	1310	1562	1803	2046	2275		Measured Value (mV)	Error(dB)
	13	-10	-11	-15	11	15	9	4	-15		Error (mV)	MAX MIN
	0.25	-0.21	-0.22	-0.30	0.23	0.31	0.17	0.07	-0.31		LINEARITY ERROR (dB)	0.31 -0.31
	-0.60	-1.10	-1.16	-1.28	-0.80	-0.76	-0.94	-1.08	-1.50		LOGGING ACCURACY (dB)	-0.60 -1.50
	0.390	0.349	0.420	0.492	0.369	0.287	0.267	0.185	0.226			
	0.358	0.579	0.833	1.084	1.341	1.587	1.806	2.046	2.275			
	0.320	0.545	0.792	1.036	1.305	1.559	1.780	2.028	2.253			

Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.57	-0.42

Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB)	0.16	-1.94

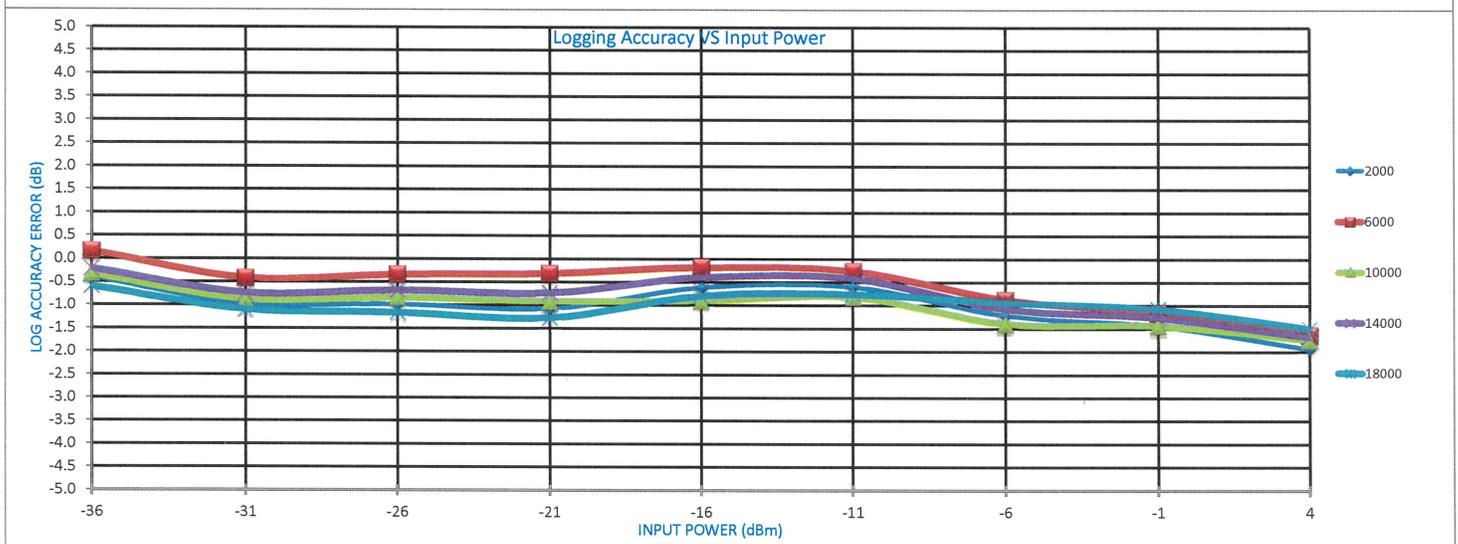
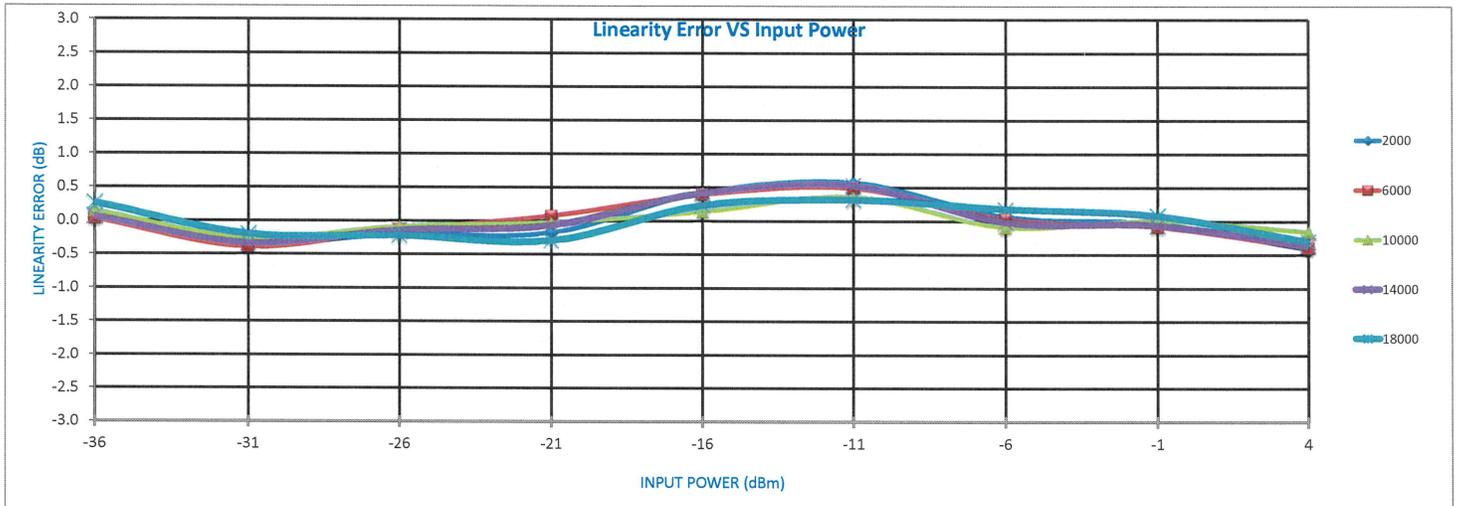
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Log Linearity and Log Accuracy @ -40°C



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

Output Voltage Offset= 0.092 Volts

Frequency

2 GHz	INTERCEPT (mV)	2117
	SLOPE (mV/dB)	49.8

6 GHz	INTERCEPT (mV)	2143
	SLOPE (mV/dB)	49.4

10 GHz	INTERCEPT (mV)	2128
	SLOPE (mV/dB)	49.9

14 GHz	INTERCEPT (mV)	2113
	SLOPE (mV/dB)	49.6

18 GHz	INTERCEPT (mV)	2114
	SLOPE (mV/dB)	50.1

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

	-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)		
	325	578	820	1062	1332	1582	1807	2058	2325		Measured Value (mV)	Error(dB)
	0	4	-3	-10	11	12	-12	-10	8		Error (mV)	MAX MIN
	-0.01	0.07	-0.06	-0.20	0.22	0.24	-0.24	-0.19	0.17		LINEARITY ERROR (dB)	0.24 -0.24
	-0.50	-0.44	-0.60	-0.76	-0.36	-0.36	-0.86	-0.84	-0.50		LOGGING ACCURACY (dB)	-0.36 -0.86
	361	613	861	1101	1359	1607	1827	2083	2355		Measured Value (mV)	Error(dB)
	-3	2	3	-4	7	8	-19	-10	15		Error (mV)	MAX MIN
	-0.05	0.05	0.07	-0.08	0.14	0.16	-0.38	-0.20	0.30		LINEARITY ERROR (dB)	0.30 -0.38
	0.22	0.26	0.22	0.02	0.18	0.14	-0.46	-0.34	0.10		LOGGING ACCURACY (dB)	0.26 -0.46
	335	590	834	1074	1325	1577	1807	2070	2354		Measured Value (mV)	Error(dB)
	3	9	3	-6	-5	-2	-21	-8	27		Error (mV)	MAX MIN
	0.06	0.17	0.07	-0.12	-0.09	-0.04	-0.43	-0.16	0.54		LINEARITY ERROR (dB)	0.54 -0.43
	-0.30	-0.20	-0.32	-0.52	-0.50	-0.46	-0.86	-0.60	0.08		LOGGING ACCURACY (dB)	0.08 -0.86
	326	580	824	1064	1330	1579	1799	2051	2324		Measured Value (mV)	Error(dB)
	-2	4	0	-8	10	11	-16	-12	13		Error (mV)	MAX MIN
	-0.05	0.08	0.00	-0.16	0.21	0.23	-0.33	-0.25	0.26		LINEARITY ERROR (dB)	0.26 -0.33
	-0.48	-0.40	-0.52	-0.72	-0.40	-0.42	-1.02	-0.98	-0.52		LOGGING ACCURACY (dB)	-0.40 -1.02
	316	570	806	1047	1318	1569	1807	2062	2320		Measured Value (mV)	Error(dB)
	4	8	-6	-16	5	6	-6	-2	6		Error (mV)	MAX MIN
	0.09	0.16	-0.12	-0.31	0.10	0.12	-0.13	-0.03	0.12		LINEARITY ERROR (dB)	0.16 -0.31
	-0.68	-0.60	-0.88	-1.06	-0.64	-0.62	-0.86	-0.76	-0.60		LOGGING ACCURACY (dB)	-0.60 -1.06
	0.452	0.432	0.553	0.543	0.412	0.382	0.281	0.322	0.352			
	0.361	0.613	0.861	1.101	1.359	1.607	1.827	2.083	2.355			
	0.316	0.570	0.806	1.047	1.318	1.569	1.799	2.051	2.320			

Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.54	-0.43

Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB)	0.26	-1.06

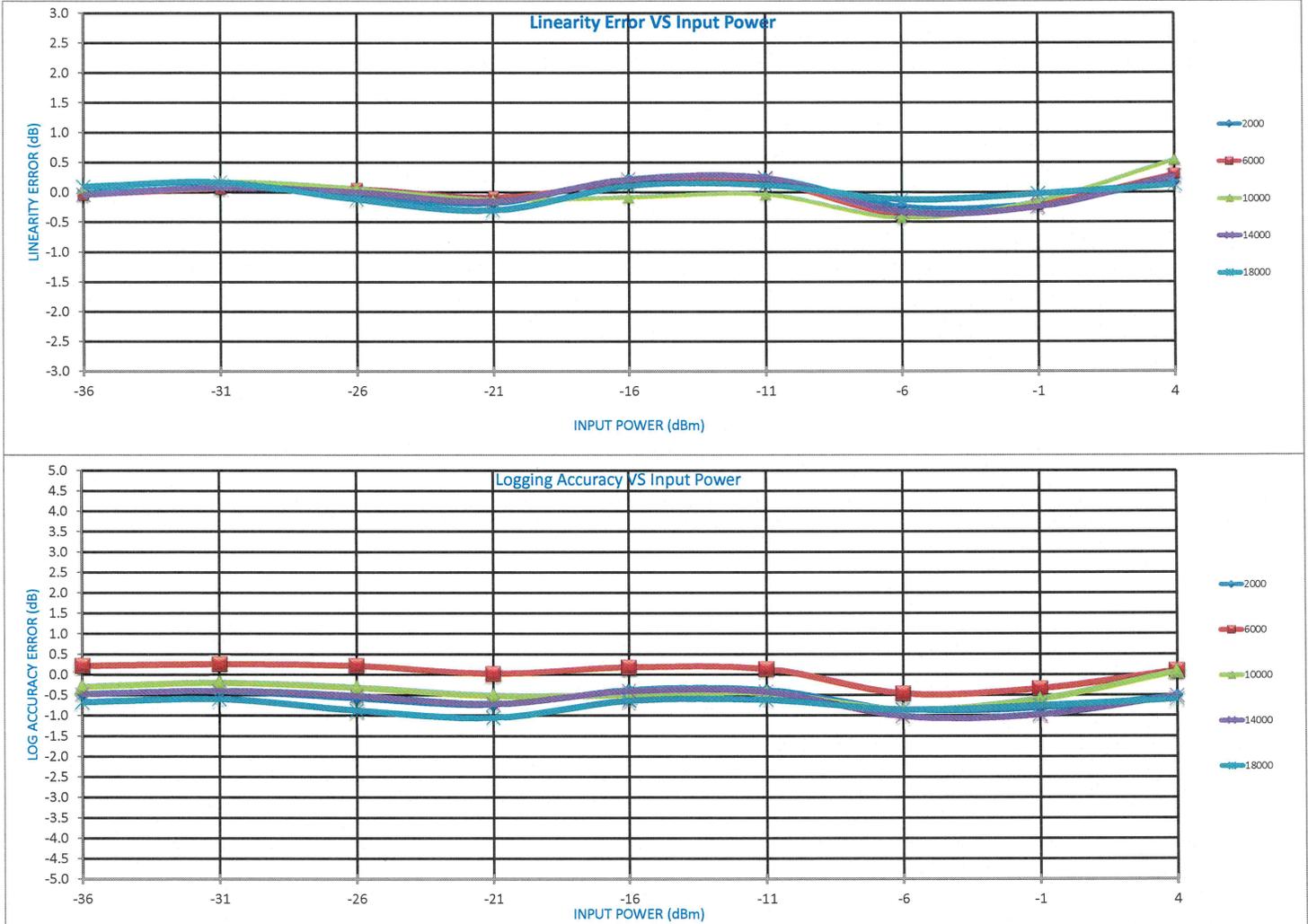
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Log Linearity and Log Accuracy @ +85°C



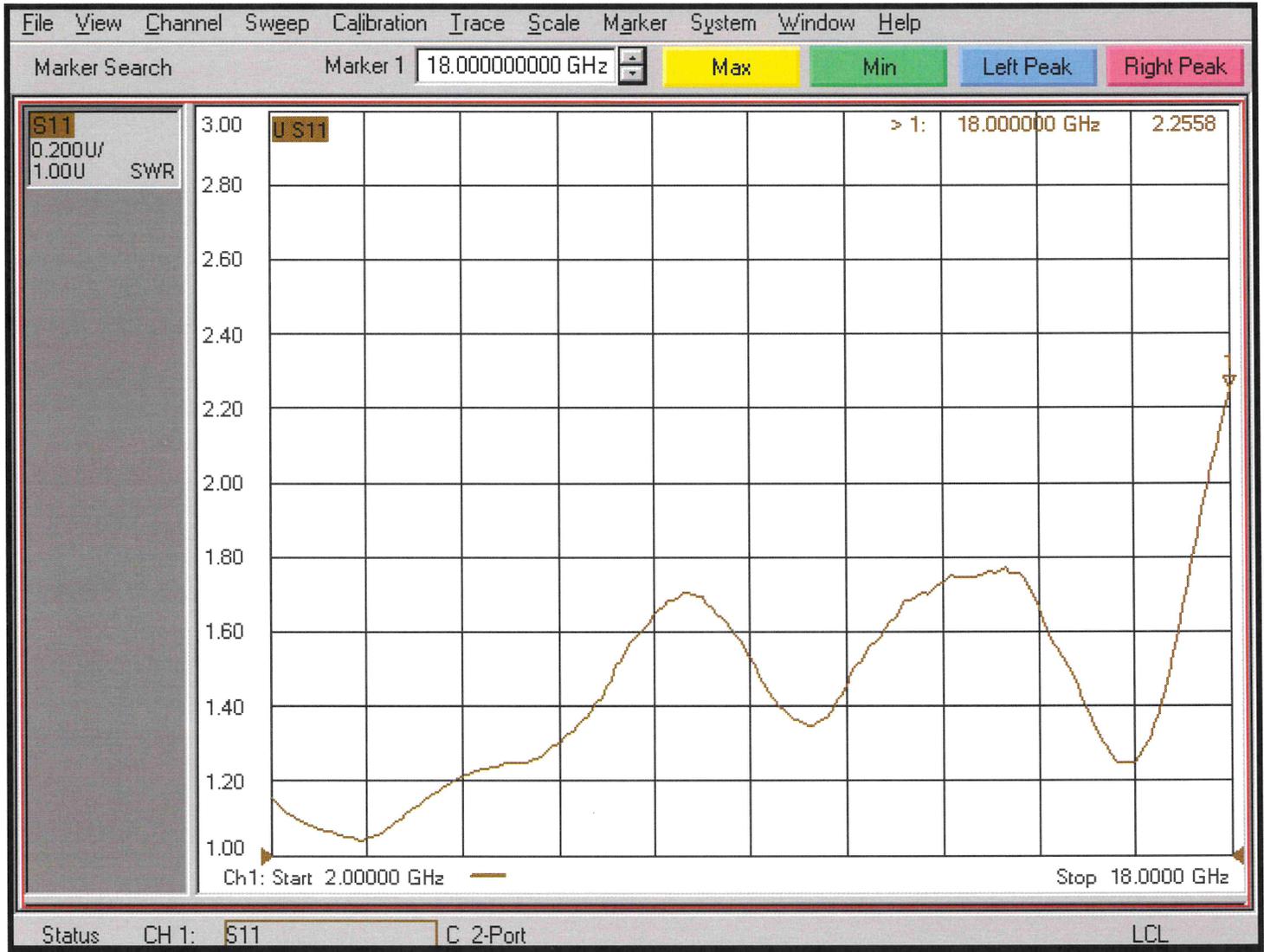
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VSWR 2.25:1



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**SUMMARY TEST DATA
ON
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PL46304/2426

TSS @ -43.0 dBm



MSO-X 3034T, MY59241076, 07.50.2021102830: Fri Jun 21 07:03:51 2024



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**SUMMARY TEST DATA
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PL46304/2426

Rise Time 24.1 ns



MSO-X 3034T, MY59241076, 07.50.2021102830: Fri Jun 21 06:43:51 2024



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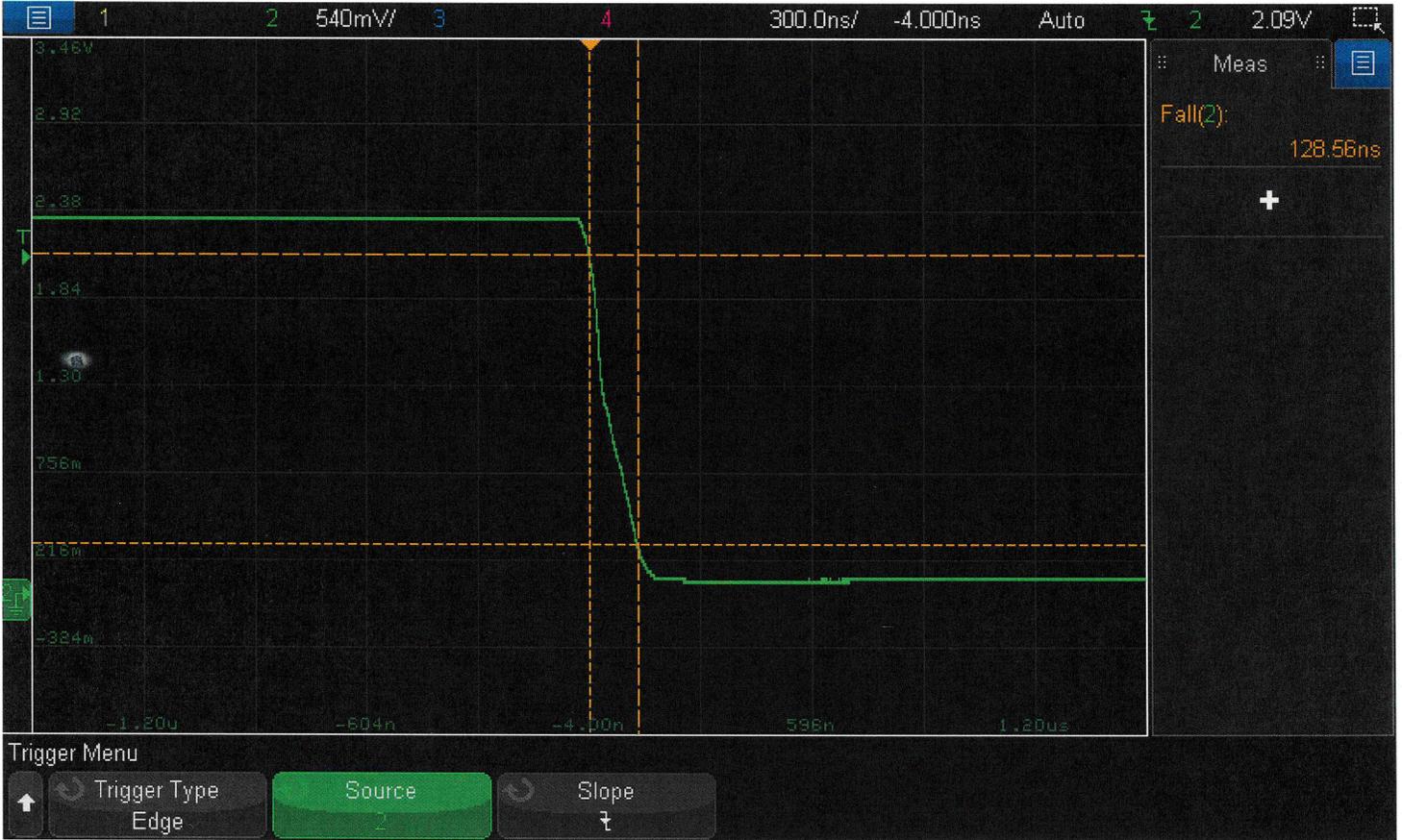
SUMMARY TEST DATA
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PL46304/2426

Fall Time 128.5 ns



MSO-X 3034T, MY59241076, 07.50.2021102830: Fri Jun 21 06:32:24 2024



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