



**SUMMARY TEST DATA
ON
HADA-D2002**

PL38875/2252

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>5/30/24</u>
Serial No: <u>PL38875/2252</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°	-41.5 dBm See Plot	
3	Frequency Flatness:	±1.65 dB Max	±1.326 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)	+1.20 / +0.68 dB +1.20 / -2.58 dB See Plot	
6	Log Linearity:	±0.5 dB Max @ +25°C ±0.75 dB Max @ -40°C to +85°C	+0.43 / -0.29 dB +0.62 / -0.59 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%)	25.8 ns See Plot	
10	Fall Time:	500 ns Max (@ Pulse width 100usec input) (90% to 10%)	121.8 ns See Plot	
11	DC Offset: (Input 50 Ω terminated):	+95 mV +55/-100 mV (@ -40°C to +85°C)	64 mV @ +25°C 56 mV @ -40°C 72 mV @ +85°C	
12	Input VSWR:	3.0:1 Max @ +23 dBm	1.50:1 See Plot	

4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
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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. [Signature]*

Date: 5.30.24

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Log Linearity and Log Accuracy @ +25°C

Output Voltage Offset= 0.064 Volts

Frequency		
2 GHz	INTERCEPT (mV)	2168
	SLOPE (mV/dB)	50.4

6 GHz	INTERCEPT (mV)	2203
	SLOPE (mV/dB)	50.4

10 GHz	INTERCEPT (mV)	2201
	SLOPE (mV/dB)	50.4

14 GHz	INTERCEPT (mV)	2168
	SLOPE (mV/dB)	49.3

18 GHz	INTERCEPT (mV)	2111
	SLOPE (mV/dB)	48.7

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

	-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)
	353	605	854	1095	1366	1627	1859	2128	2358	Measured Value (mV)
	1	1	-2	-13	5	14	-6	11	-11	Error (mV)
	0.02	0.02	-0.04	-0.27	0.11	0.28	-0.12	0.22	-0.22	MAX
	0.06	0.10	0.08	-0.10	0.32	0.54	0.18	0.56	0.16	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	390	639	894	1138	1403	1658	1887	2154	2407	Measured Value (mV)
	1	-2	1	-7	6	9	-14	1	2	Error (mV)
	0.03	-0.03	0.03	-0.13	0.13	0.19	-0.27	0.03	0.05	MAX
	0.80	0.78	0.88	0.76	1.06	1.16	0.74	1.08	1.14	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	389	638	893	1136	1403	1657	1884	2146	2410	Measured Value (mV)
	1	-2	2	-7	8	10	-15	-5	7	Error (mV)
	0.03	-0.03	0.03	-0.14	0.16	0.20	-0.29	-0.09	0.15	MAX
	0.78	0.76	0.86	0.72	1.06	1.14	0.68	0.92	1.20	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	388	636	891	1133	1390	1641	1860	2113	2363	Measured Value (mV)
	-6	-5	4	0	11	15	-12	-5	-2	Error (mV)
	-0.13	-0.09	0.08	0.00	0.21	0.31	-0.24	-0.11	-0.03	MAX
	0.76	0.72	0.82	0.66	0.80	0.82	0.20	0.26	0.26	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	346	602	850	1088	1345	1597	1813	2058	2295	Measured Value (mV)
	-13	-1	4	-1	12	21	-6	-5	-11	Error (mV)
	-0.28	-0.01	0.08	-0.03	0.25	0.43	-0.13	-0.09	-0.22	MAX
	-0.08	0.04	0.00	-0.24	-0.10	-0.06	-0.74	-0.84	-1.10	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	0.442	0.371	0.442	0.502	0.582	0.612	0.743	0.963	1.154	
	0.390	0.639	0.894	1.138	1.403	1.658	1.887	2.154	2.410	
	0.346	0.602	0.850	1.088	1.345	1.597	1.813	2.058	2.295	

Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.43	-0.29

Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB)	1.20	-1.10

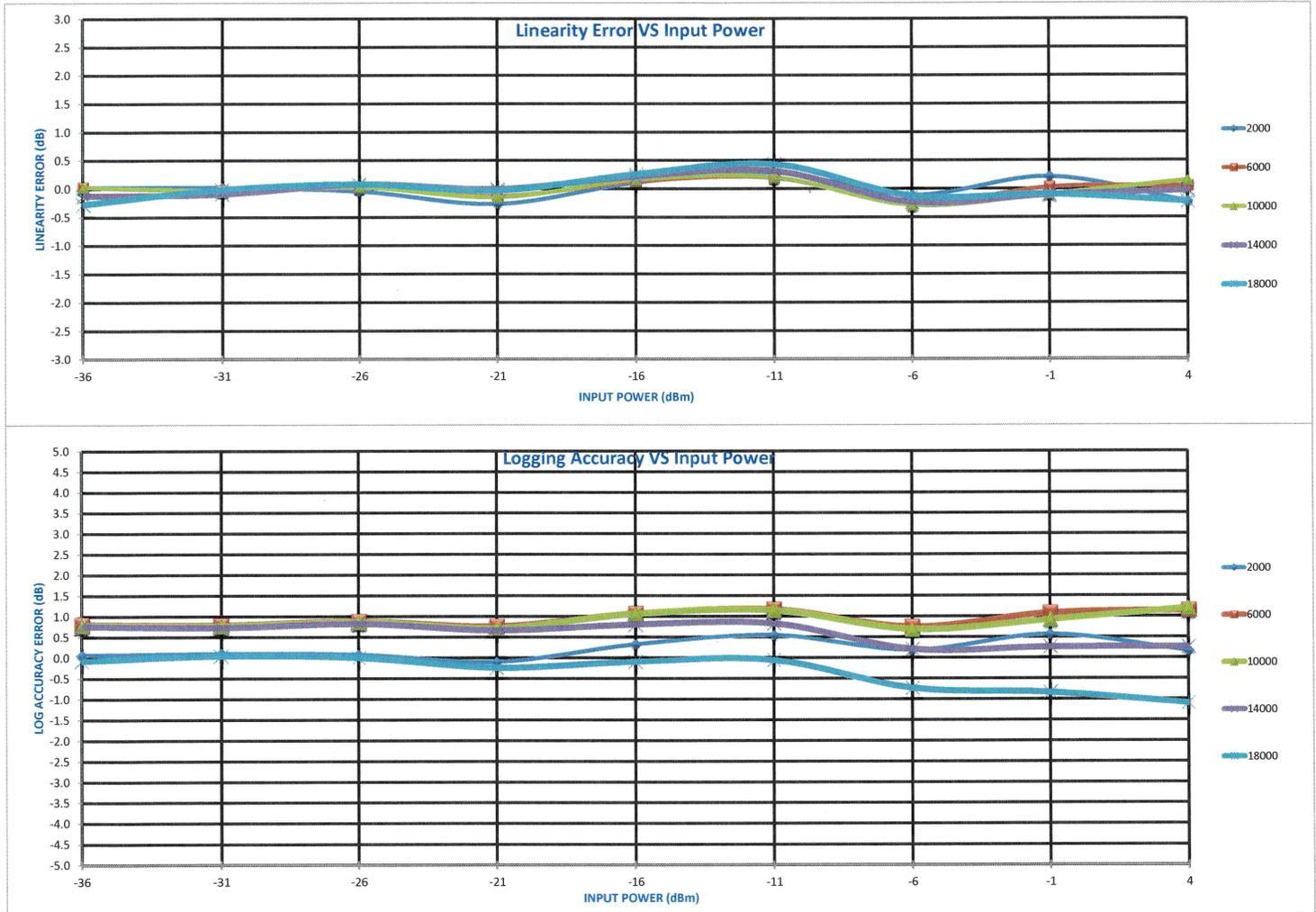
4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
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SUMMARY TEST DATA
ON
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PL38875/2252

Log Linearity and Log Accuracy @ +25°C



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

Output Voltage Offset= 0.056 Volts

Frequency	INTERCEPT (mV)	2111
2 GHz	SLOPE (mV/dB)	49.3

6 GHz	INTERCEPT (mV)	2149
	SLOPE (mV/dB)	49.4

10 GHz	INTERCEPT (mV)	2147
	SLOPE (mV/dB)	49.3

14 GHz	INTERCEPT (mV)	2117
	SLOPE (mV/dB)	48.3

18 GHz	INTERCEPT (mV)	2058
	SLOPE (mV/dB)	47.6

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

	-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)
	347	569	818	1061	1333	1592	1824	2073	2280	Measured Value (mV)
	11	-14	-11	-14	11	24	9	12	-28	Error (mV)
	0.22	-0.27	-0.22	-0.29	0.23	0.48	0.19	0.24	-0.56	MAX
	-0.06	-0.62	-0.64	-0.78	-0.34	-0.16	-0.52	-0.54	-1.40	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	381	603	857	1108	1373	1624	1857	2101	2331	Measured Value (mV)
	9	-16	-9	-5	14	18	4	1	-16	Error (mV)
	0.18	-0.32	-0.18	-0.09	0.27	0.36	0.08	0.02	-0.32	MAX
	0.62	0.06	0.14	0.16	0.46	0.48	0.14	0.02	-0.38	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	381	602	856	1105	1373	1622	1853	2092	2336	Measured Value (mV)
	10	-16	-8	-6	15	18	2	-6	-9	Error (mV)
	0.20	-0.32	-0.17	-0.12	0.31	0.36	0.04	-0.12	-0.17	MAX
	0.62	0.04	0.12	0.10	0.46	0.44	0.06	-0.16	-0.28	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	379	601	854	1103	1360	1608	1831	2064	2293	Measured Value (mV)
	2	-17	-6	1	16	23	4	-5	-18	Error (mV)
	0.05	-0.36	-0.13	0.02	0.34	0.47	0.08	-0.10	-0.36	MAX
	0.58	0.02	0.08	0.06	0.20	0.16	-0.38	-0.72	-1.14	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	342	565	815	1055	1312	1564	1779	2012	2221	Measured Value (mV)
	-1	-16	-5	-3	16	30	6	1	-28	Error (mV)
	-0.02	-0.34	-0.10	-0.06	0.33	0.62	0.13	0.02	-0.59	MAX
	-0.16	-0.70	-0.70	-0.90	-0.76	-0.72	-1.42	-1.76	-2.58	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	0.400	0.389	0.430	0.543	0.625	0.615	0.799	0.912	1.178	
	0.381	0.603	0.857	1.108	1.373	1.624	1.857	2.101	2.336	
	0.342	0.565	0.815	1.055	1.312	1.564	1.779	2.012	2.221	

Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.62	-0.59

Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB)	0.62	-2.58

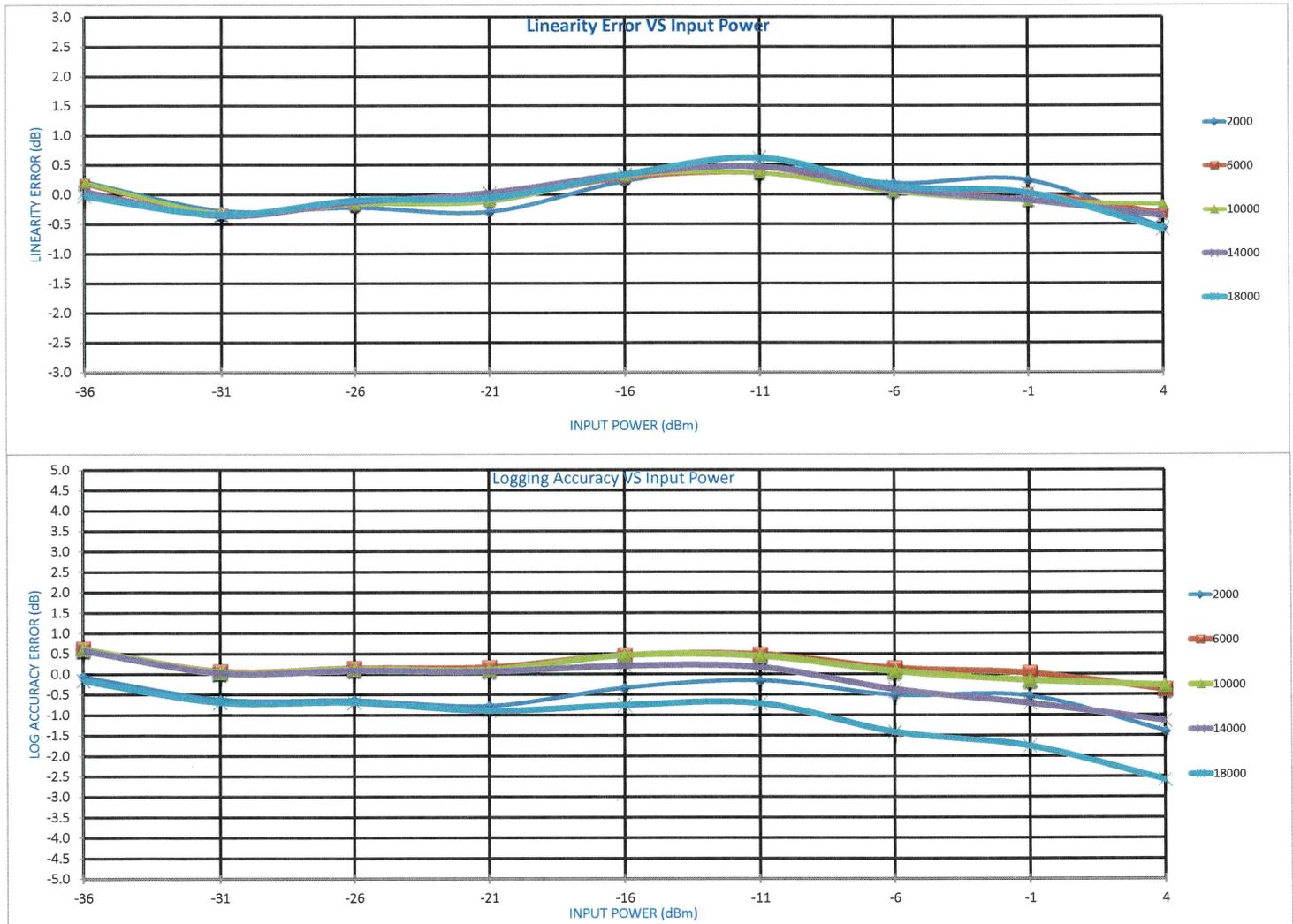
4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
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Log Linearity and Log Accuracy @ -40°C



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

Output Voltage Offset= 0.072 Volts

Frequency	INTERCEPT (mV)	SLOPE (mV/dB)
2 GHz	2122	50.4

Frequency	INTERCEPT (mV)	SLOPE (mV/dB)
6 GHz	2159	50.5

Frequency	INTERCEPT (mV)	SLOPE (mV/dB)
10 GHz	2149	50.2

Frequency	INTERCEPT (mV)	SLOPE (mV/dB)
14 GHz	2110	49.2

Frequency	INTERCEPT (mV)	SLOPE (mV/dB)
18 GHz	2050	48.6

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

	-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)
2 GHz	321	569	806	1042	1312	1572	1805	2081	2333	Measured Value (mV)
	13	9	-6	-22	-4	4	-14	10	10	Error (mV)
	0.25	0.18	-0.12	-0.43	-0.07	0.09	-0.29	0.19	0.20	MAX
	-0.58	-0.62	-0.88	-1.16	-0.76	-0.56	-0.90	-0.38	-0.34	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
6 GHz	353	601	846	1084	1349	1605	1832	2109	2384	Measured Value (mV)
	11	7	-1	-15	-2	1	-24	1	23	Error (mV)
	0.22	0.13	-0.01	-0.30	-0.05	0.02	-0.48	0.01	0.46	MAX
	0.06	0.02	-0.08	-0.32	-0.02	0.10	-0.36	0.18	0.68	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
10 GHz	350	598	843	1080	1346	1601	1826	2097	2371	Measured Value (mV)
	9	6	-1	-15	0	4	-22	-2	21	Error (mV)
	0.17	0.11	-0.01	-0.29	0.00	0.08	-0.44	-0.04	0.41	MAX
	0.00	-0.04	-0.14	-0.40	-0.08	0.02	-0.48	-0.06	0.42	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
14 GHz	339	590	834	1069	1327	1577	1796	2053	2321	Measured Value (mV)
	-1	5	3	-8	4	8	-19	-7	15	Error (mV)
	-0.01	0.09	0.06	-0.16	0.08	0.17	-0.38	-0.15	0.30	MAX
	-0.22	-0.20	-0.32	-0.62	-0.46	-0.46	-1.08	-0.94	-0.58	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
18 GHz	298	553	788	1023	1278	1528	1750	1993	2252	Measured Value (mV)
	-5	8	0	-8	4	12	-9	-9	7	Error (mV)
	-0.10	0.16	0.00	-0.16	0.09	0.24	-0.19	-0.18	0.15	MAX
	-1.04	-0.94	-1.24	-1.54	-1.44	-1.44	-2.00	-2.14	-1.96	MIN
										LINEARITY ERROR (dB)
										LOGGING ACCURACY (dB)
	0.553	0.482	0.583	0.613	0.713	0.774	0.824	1.166	1.326	
	0.353	0.601	0.846	1.084	1.349	1.605	1.832	2.109	2.384	
	0.298	0.553	0.788	1.023	1.278	1.528	1.750	1.993	2.252	

Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.46	-0.48

Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB)	0.68	-2.14

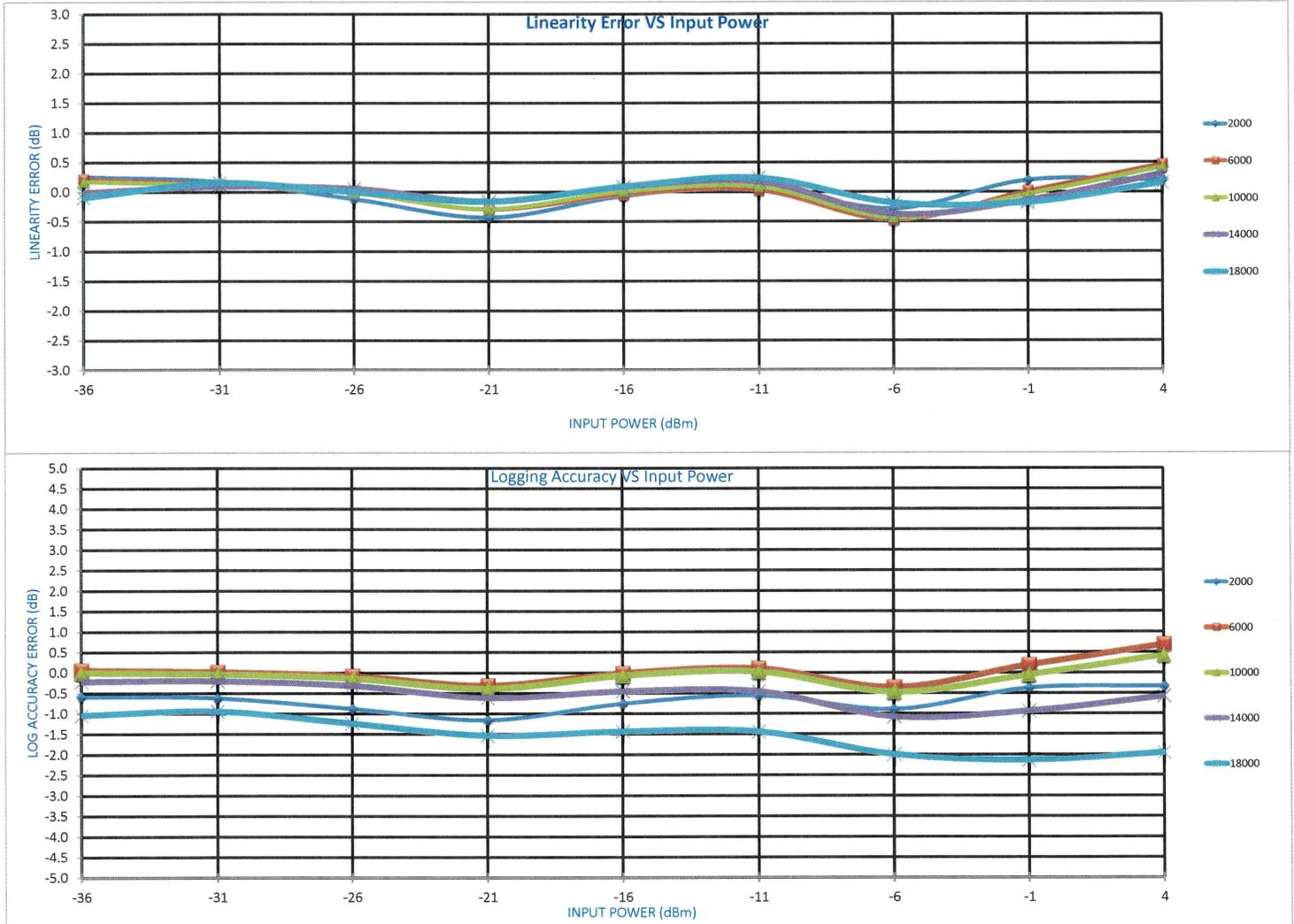
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Log Linearity and Log Accuracy @ +85°C



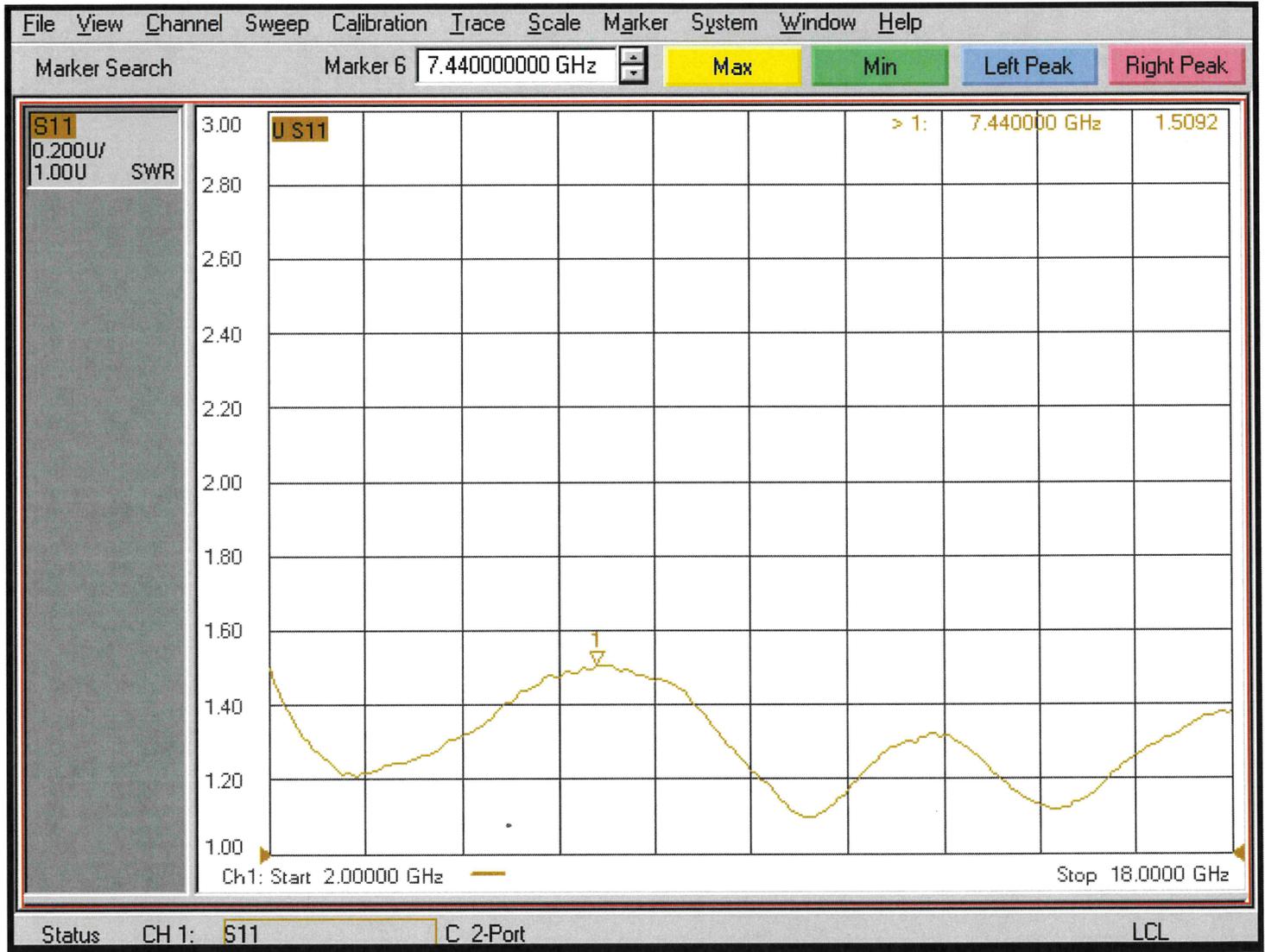
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VSWR 1.50:1



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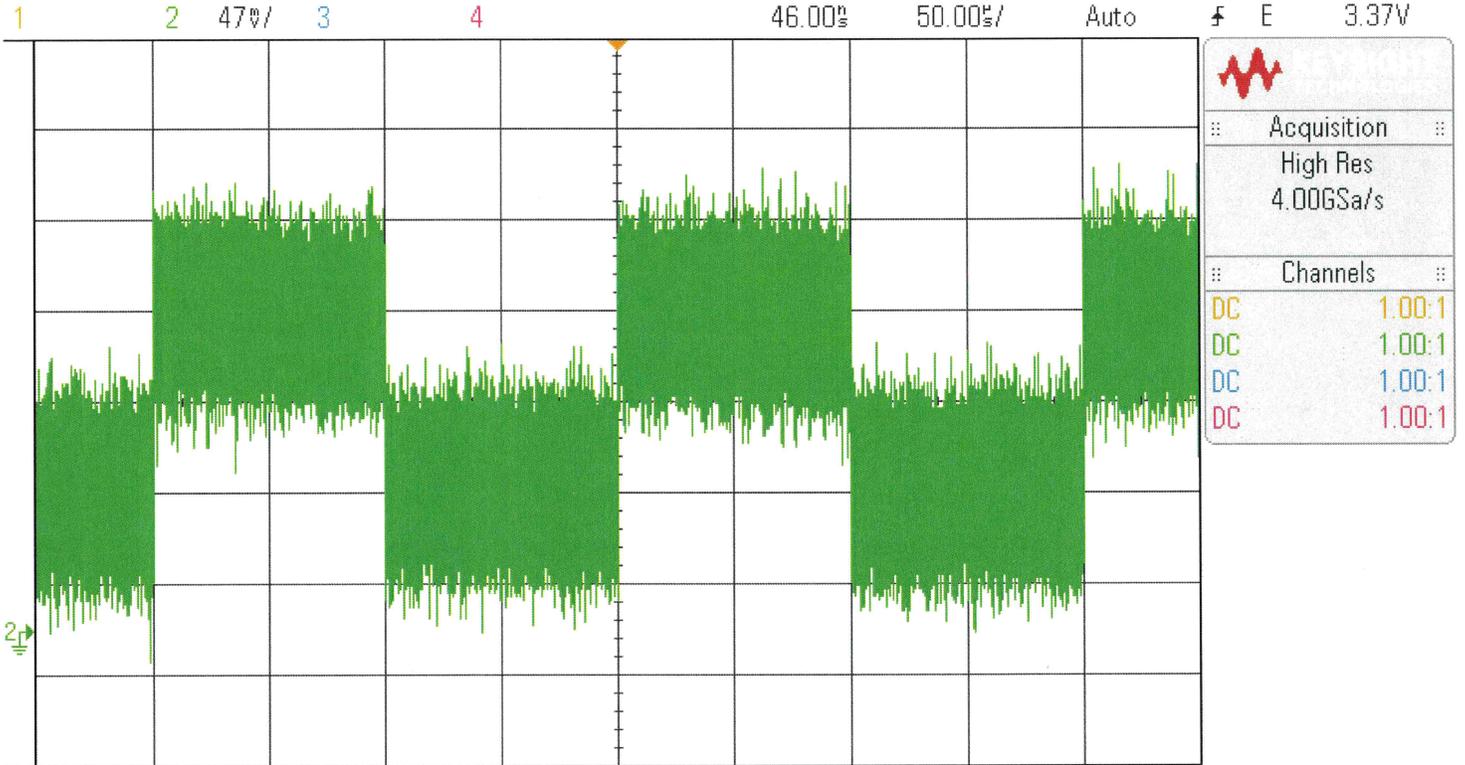


SUMMARY TEST DATA
ON
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PL38875/2252

TSS @ -41.5 dBm

DSO-X 3024A, MY54490369: Thu May 30 10:25:49 2024



Acquire Menu

Acq Mode High Res # Avgs 1

Segmented

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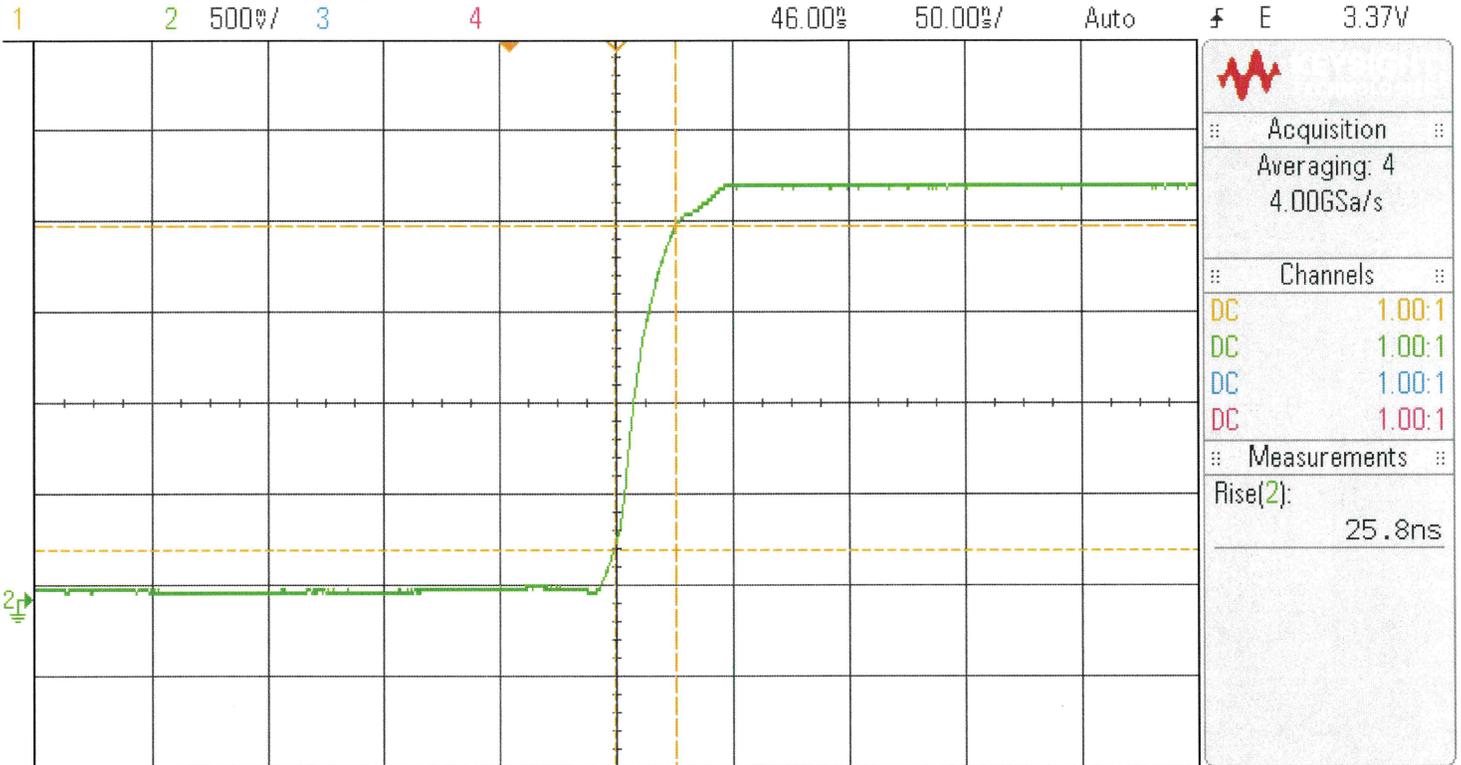


SUMMARY TEST DATA
ON
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PL38875/2252

Rise Time 25.8 ns

DSO-X 3024A, MY54490369: Thu May 30 10:24:31 2024



Trigger Menu

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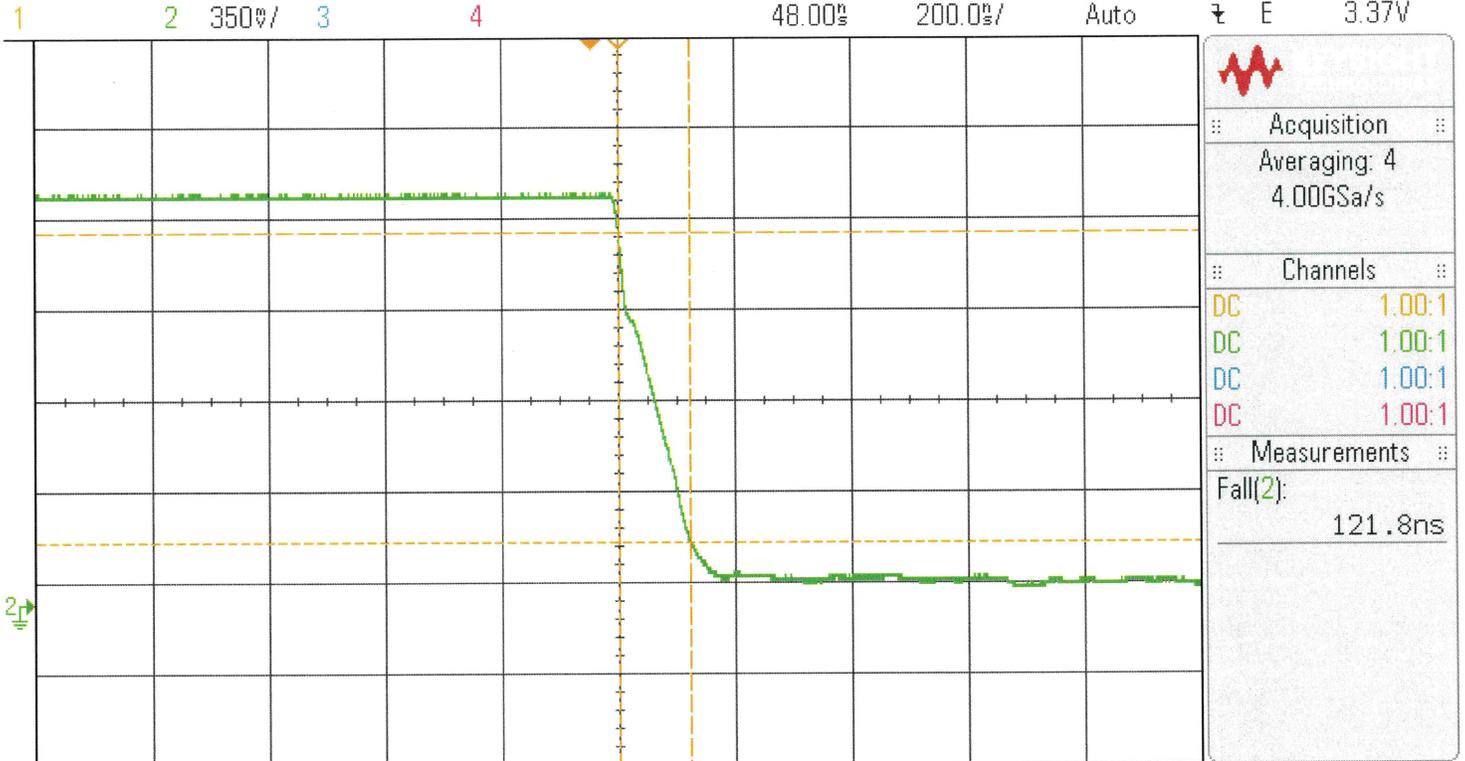


SUMMARY TEST DATA
ON
HADA-D2002

PL38875/2252

Fall Time 121.8 ns

DSO-X 3024A, MY54490369: Thu May 30 10:09:38 2024



Trigger Menu

Trigger Type: Edge | Source: Ext | Slope: τ