SUMMARY TEST DATA ON HADA-D2002

Customer: [redacted]
SO No: [redacted]
Model No: HADA-D2002
Serial No: PL46950/2430

Tested By: D. Weinrob
Temperature: +25°C
Date: 07/25/24
Drawing No: 27620222 **Rev:** A1

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 dBm See Plot**	
3	Frequency Flatness:	±1.65 dB Max	**0.58 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 dB / -0.2 dB** **1.02 dB / -2.52 dB See Plot**	
6	Log Linearity:	±0.5 dB Max @ +25°C ±0.75 dB Max @ -40°C to +85°C	**0.35 dB / -0.23 dB 0.39 dB / -0.4 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%)	**21 ns See Plot**	
10	Fall Time:	500 ns Max (@ Pulse width 100usec input) (90% to 10%)	**135 ns See Plot**	
11	DC Offset: (Input 50 Ω terminated):	+95 mV +55/-100 mV (@ -40°C to +85°C)	**135 mV @ +25°c 136 mV @ -40°c 84 mV @ +85°c See Plot**	

4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
Email: sales@pmi-rf.com

SUMMARY TEST DATA ON HADA-D2002

12	Input VSWR:	3.0:1 Max @ +23 dBm	**1.98:1** **See Plot**	PMI QA3
13	Propagation Delay:	60 ns Max	**45 ns** **See Plot**	
14	Power Supply:	+12 ± 1VDC @ 125 mA Max -12 ± 1VDC @ 75 mA Max	**+12 ± 1VDC @ 90mA** **-12 ± 1VDC @ 50mA**	
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. Lutes **Date:** 7.25.24

4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
Email: sales@pmi-rf.com

SUMMARY TEST DATA ON HADA-D2002

LOG TRANSFER WITH FREQUENCY @ +25C
MODEL: HADA-D2002
SERIAL NO: PL46950
TESTED BY: D. Weinrob
DATE: 7/8/2024

GRAPH #1

PLANAR MONOLITHICS INDUSTRIES
4921 Robert J. Mathews Parkway Suit 1
El Dorado Hills, CA 95762
TEL: 916-542-1401 FAX: 916-265-2597
EMAIL: SALES@PMI-RF.COM

Output Voltage Offset= 0.135 Volts

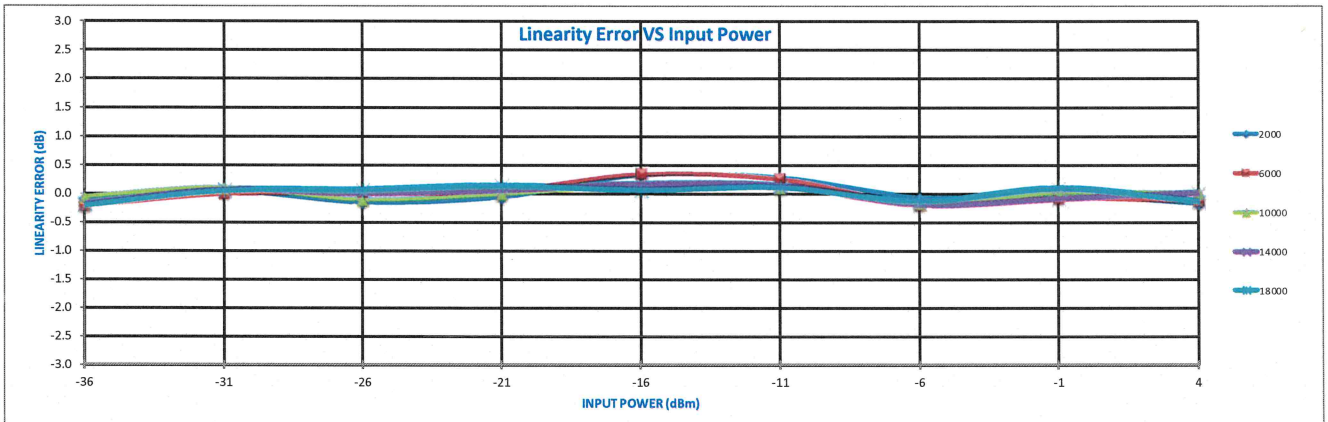
Frequency			-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)		
2 GHz	INTERCEPT (m	2151	351	607	846	1100	1369	1616	1848	2100	2341	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	49.9	-5	2	-8	-4	16	14	-4	-1	-9	Error (mV)	MAX	MIN
			-0.10	0.04	-0.17	-0.08	0.32	0.27	-0.08	-0.02	-0.19	LINEARITY ERROR (dB)	0.32	-0.19
			0.02	0.14	-0.08	0.00	0.38	0.32	-0.04	0.00	-0.18	LOGGING ACCURACY (dB)	0.38	-0.18
6 GHz	INTERCEPT (m	2174	390	647	893	1142	1403	1645	1869	2121	2364	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	49.2	-11	0	-1	2	17	13	-9	-4	-7	Error (mV)	MAX	MIN
			-0.23	-0.01	-0.01	0.05	0.35	0.26	-0.19	-0.07	-0.14	LINEARITY ERROR (dB)	0.35	-0.23
			0.80	0.94	0.86	0.84	1.06	0.90	0.38	0.42	0.28	LOGGING ACCURACY (dB)	1.06	0.28
10 GHz	INTERCEPT (m	2148	344	602	842	1097	1354	1603	1840	2099	2349	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	50	-3	5	-5	-1	6	5	-8	1	0	Error (mV)	MAX	MIN
			-0.06	0.10	-0.11	-0.01	0.12	0.10	-0.16	0.01	0.01	LINEARITY ERROR (dB)	0.12	-0.16
			-0.12	0.04	-0.16	-0.06	0.08	0.06	-0.20	-0.02	-0.02	LOGGING ACCURACY (dB)	0.08	-0.20
14 GHz	INTERCEPT (m	2148	368	626	869	1118	1369	1614	1844	2095	2346	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	49.2	-9	3	0	3	8	7	-9	-4	1	Error (mV)	MAX	MIN
			-0.18	0.07	0.00	0.06	0.16	0.14	-0.19	-0.09	0.01	LINEARITY ERROR (dB)	0.16	-0.19
			0.36	0.52	0.38	0.36	0.38	0.28	-0.12	-0.10	-0.08	LOGGING ACCURACY (dB)	0.52	-0.12
18 GHz	INTERCEPT (m	2158	387	644	889	1137	1378	1625	1858	2113	2347	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	48.9	-10	2	3	6	3	5	-6	4	-7	Error (mV)	MAX	MIN
			-0.21	0.05	0.06	0.13	0.05	0.10	-0.13	0.08	-0.13	LINEARITY ERROR (dB)	0.13	-0.21
			0.74	0.88	0.78	0.74	0.56	0.50	0.16	0.26	-0.06	LOGGING ACCURACY (dB)	0.88	-0.06
	Flatness +/- dB		0.465	0.455	0.516	0.455	0.495	0.425	0.293	0.263	0.233			
	Max Video Output V		0.390	0.647	0.893	1.142	1.403	1.645	1.869	2.121	2.364			
	Min Video Output V		0.344	0.602	0.842	1.097	1.354	1.603	1.840	2.095	2.341			

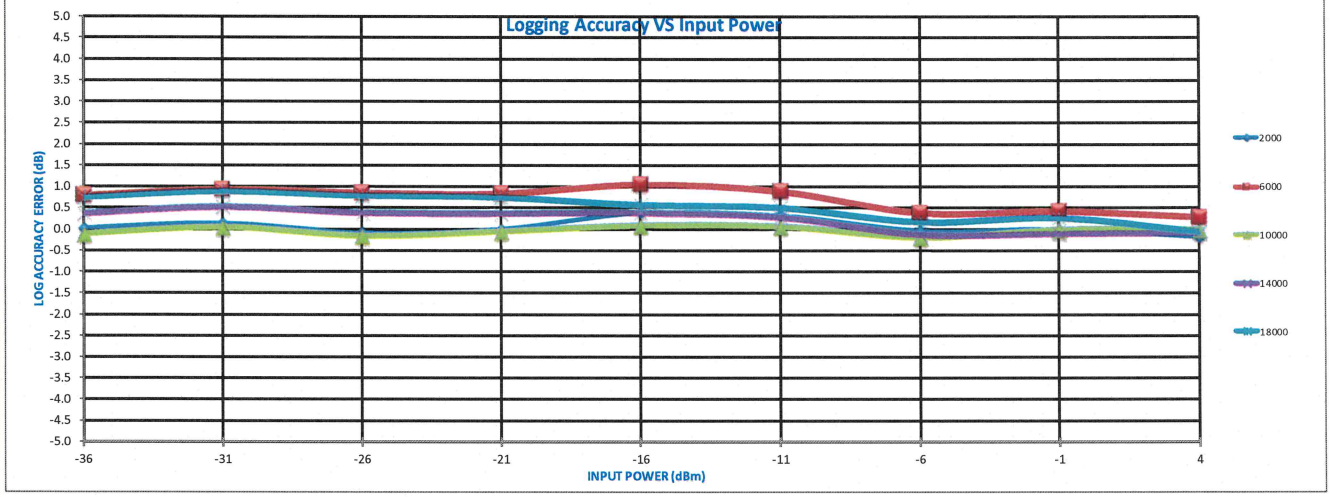
Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.35	-0.23

Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB	1.06	-0.20

SUMMARY TEST DATA
ON
HADA-D2002

LOG TRANSFER WITH FREQUENCY @ +25C
MODEL: HADA-D2002
SERIAL NO: PL46950
TESTED BY: D. Weinrob





4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
Email: sales@pmi-rf.com

SUMMARY TEST DATA
ON
HADA-D2002

LOG TRANSFER WITH FREQUENCY @ -40C
MODEL: HADA-D2002
SERIAL NO: PL46950
TESTED BY: D. Weinrob
DATE: 7/8/2024

GRAPH #2

PLANAR MONOLITHICS INDUSTRIES
4921 Robert J. Mathews Parkway Suit 1
El Dorado Hills, CA 95762
TEL: 916-542-1401 FAX: 916-265-2597
EMAIL: SALES@PMI-RF.COM

Output Voltage Offset= 0.136 Volts

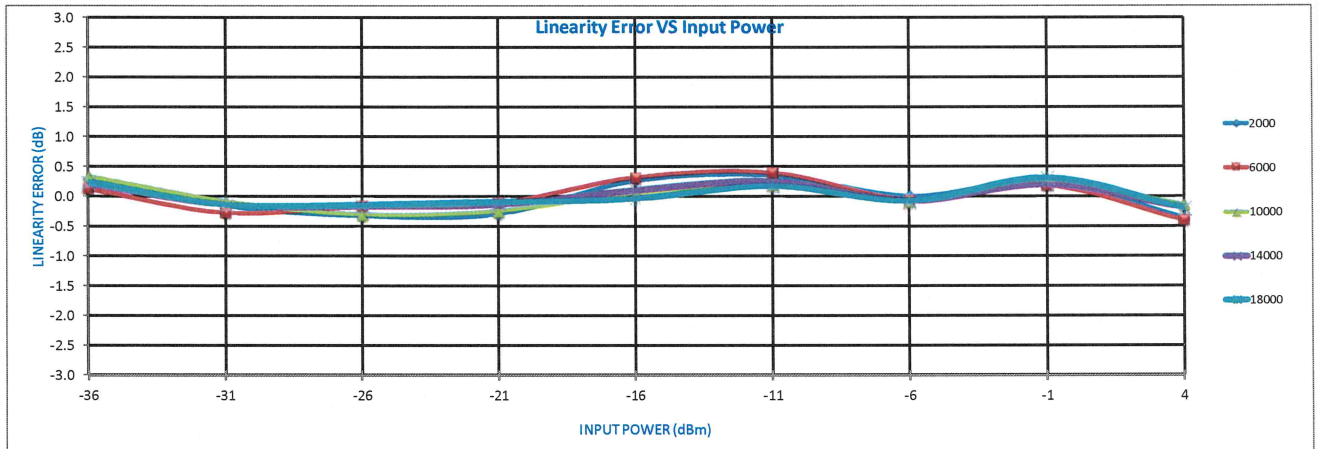
Frequency			-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)		
2 GHz	INTERCEPT (m	2134	366	592	831	1080	1355	1607	1837	2097	2314	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	49.5	14	-8	-16	-15	13	17	0	13	-18	Error (mV)	MAX	MIN
			0.28	-0.16	-0.33	-0.30	0.26	0.35	0.00	0.25	-0.36	LINEARITY ERROR (dB)	0.35	-0.36
			0.32	-0.16	-0.38	-0.40	0.10	0.14	-0.26	-0.06	-0.72	LOGGING ACCURACY (dB)	0.32	-0.72
6 GHz	INTERCEPT (m	2153	401	626	875	1122	1387	1635	1857	2113	2329	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	48.8	6	-13	-8	-6	15	19	-3	9	-19	Error (mV)	MAX	MIN
			0.12	-0.27	-0.17	-0.11	0.31	0.39	-0.06	0.18	-0.40	LINEARITY ERROR (dB)	0.39	-0.40
			1.02	0.52	0.50	0.44	0.74	0.70	0.14	0.26	-0.42	LOGGING ACCURACY (dB)	1.02	-0.42
10 GHz	INTERCEPT (m	2123	354	581	818	1069	1332	1587	1821	2086	2314	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	49.6	17	-4	-15	-12	3	10	-4	13	-7	Error (mV)	MAX	MIN
			0.34	-0.08	-0.31	-0.24	0.06	0.20	-0.08	0.26	-0.14	LINEARITY ERROR (dB)	0.34	-0.31
			0.08	-0.38	-0.64	-0.62	-0.36	-0.26	-0.58	-0.28	-0.72	LOGGING ACCURACY (dB)	0.08	-0.72
14 GHz	INTERCEPT (m	2126	377	604	847	1093	1349	1601	1829	2087	2312	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	48.9	10	-7	-9	-7	5	12	-4	10	-10	Error (mV)	MAX	MIN
			0.21	-0.15	-0.18	-0.14	0.10	0.25	-0.08	0.20	-0.20	LINEARITY ERROR (dB)	0.25	-0.20
			0.54	0.08	-0.06	-0.14	-0.02	0.02	-0.42	-0.26	-0.76	LOGGING ACCURACY (dB)	0.54	-0.76
18 GHz	INTERCEPT (m	2128	387	612	855	1101	1347	1601	1832	2094	2313	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	48.7	11	-7	-7	-5	-2	8	-4	15	-10	Error (mV)	MAX	MIN
			0.24	-0.14	-0.15	-0.10	-0.04	0.17	-0.08	0.30	-0.20	LINEARITY ERROR (dB)	0.30	-0.20
			0.74	0.24	0.10	0.02	-0.06	0.02	-0.36	-0.12	-0.74	LOGGING ACCURACY (dB)	0.74	-0.74
	Flatness +/- dB		0.479	0.458	0.581	0.540	0.560	0.489	0.367	0.275	0.173			
	Max Video Output V		0.401	0.626	0.875	1.122	1.387	1.635	1.857	2.113	2.329			
	Min Video Output V		0.354	0.581	0.818	1.069	1.332	1.587	1.821	2.086	2.312			

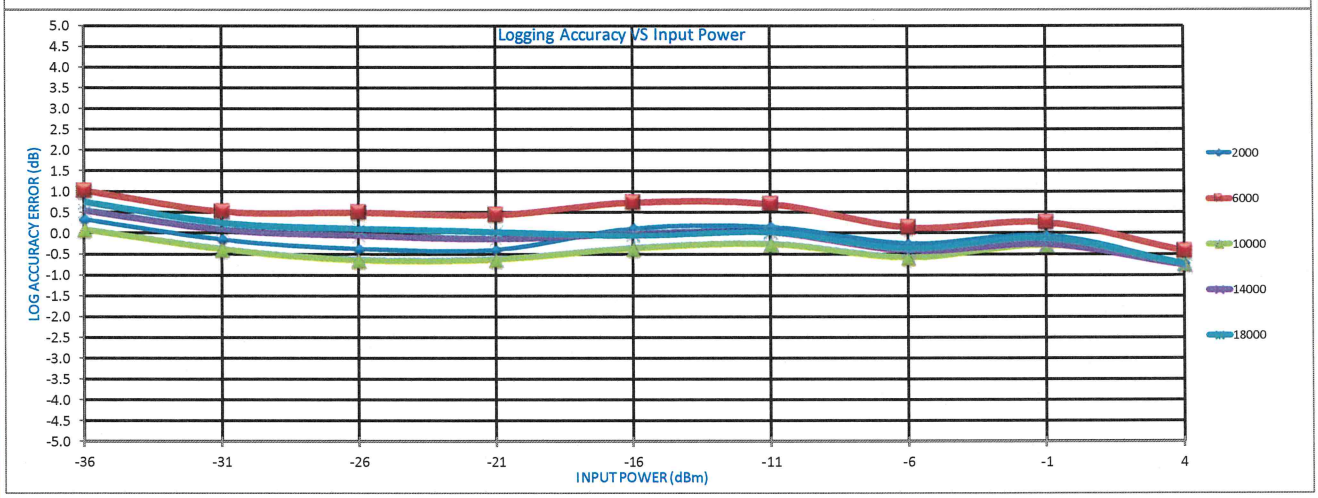
Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.39	-0.40

Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB	1.02	-0.76

SUMMARY TEST DATA
ON
HADA-D2002

LOG TRANSFER WITH FREQUENCY @ -40C
MODEL: HADA-D2002
SERIAL NO: PL46950
TESTED BY: D. Weinrob





4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
Email: sales@pmi-rf.com

SUMMARY TEST DATA
ON
HADA-D2002

LOG TRANSFER WITH FREQUENCY @ +85C
MODEL: HADA-D2002
SERIAL NO: PL46950
TESTED BY: D. Weinrob
DATE: 7/8/2024

GRAPH #3

PLANAR MONOLITHICS INDUSTRIES
4921 Robert J. Mathews Parkway Suit 1
El Dorado Hills, CA 95762
TEL: 916-542-1401 FAX: 916-265-2597
EMAIL: SALES@PMI-RF.COM

Output Voltage Offset= 0.084 Volts

Frequency			-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)		
2 GHz	INTERCEPT (m	2042	273	521	753	1005	1268	1511	1747	1988	2236	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	49.2	0	3	-11	-5	12	9	0	-5	-3	Error (mV)	MAX	MIN
			0.01	0.05	-0.23	-0.10	0.25	0.19	-0.01	-0.10	-0.06	LINEARITY ERROR (dB)	0.25	-0.23
			-1.54	-1.58	-1.94	-1.90	-1.64	-1.78	-2.06	-2.24	-2.28	LOGGING ACCURACY (dB)	-1.54	-2.28
6 GHz	INTERCEPT (m	2070	311	563	800	1046	1304	1541	1769	2012	2269	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	48.7	-5	3	-3	-1	13	7	-9	-9	4	Error (mV)	MAX	MIN
			-0.11	0.06	-0.07	-0.02	0.28	0.14	-0.18	-0.19	0.09	LINEARITY ERROR (dB)	0.28	-0.19
			-0.78	-0.74	-1.00	-1.08	-0.92	-1.18	-1.62	-1.76	-1.62	LOGGING ACCURACY (dB)	-0.74	-1.76
10 GHz	INTERCEPT (m	2041	269	516	749	1002	1252	1499	1741	1990	2246	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	49.4	5	5	-9	-3	0	1	-4	-2	7	Error (mV)	MAX	MIN
			0.10	0.10	-0.18	-0.05	0.01	0.01	-0.09	-0.04	0.14	LINEARITY ERROR (dB)	0.14	-0.18
			-1.62	-1.68	-2.02	-1.96	-1.96	-2.02	-2.18	-2.20	-2.08	LOGGING ACCURACY (dB)	-1.62	-2.20
14 GHz	INTERCEPT (m	2032	286	535	769	1016	1261	1503	1735	1974	2233	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	48.4	-3	4	-4	1	4	4	-6	-9	8	Error (mV)	MAX	MIN
			-0.05	0.09	-0.08	0.02	0.08	0.08	-0.12	-0.19	0.16	LINEARITY ERROR (dB)	0.16	-0.19
			-1.28	-1.30	-1.62	-1.68	-1.78	-1.94	-2.30	-2.52	-2.34	LOGGING ACCURACY (dB)	-1.28	-2.52
18 GHz	INTERCEPT (m	2041	309	560	794	1039	1276	1519	1754	1995	2226	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB	47.9	-7	4	-2	4	1	5	0	2	-7	Error (mV)	MAX	MIN
			-0.16	0.08	-0.03	0.08	0.03	0.10	0.00	0.04	-0.14	LINEARITY ERROR (dB)	0.10	-0.16
			-0.82	-0.80	-1.12	-1.22	-1.48	-1.62	-1.92	-2.10	-2.48	LOGGING ACCURACY (dB)	-0.80	-2.48
	Flatness +/- dB		0.431	0.482	0.523	0.452	0.534	0.431	0.349	0.390	0.441			
	Max Video Output V		0.311	0.563	0.800	1.046	1.304	1.541	1.769	2.012	2.269			
	Min Video Output V		0.269	0.516	0.749	1.002	1.252	1.499	1.735	1.974	2.226			

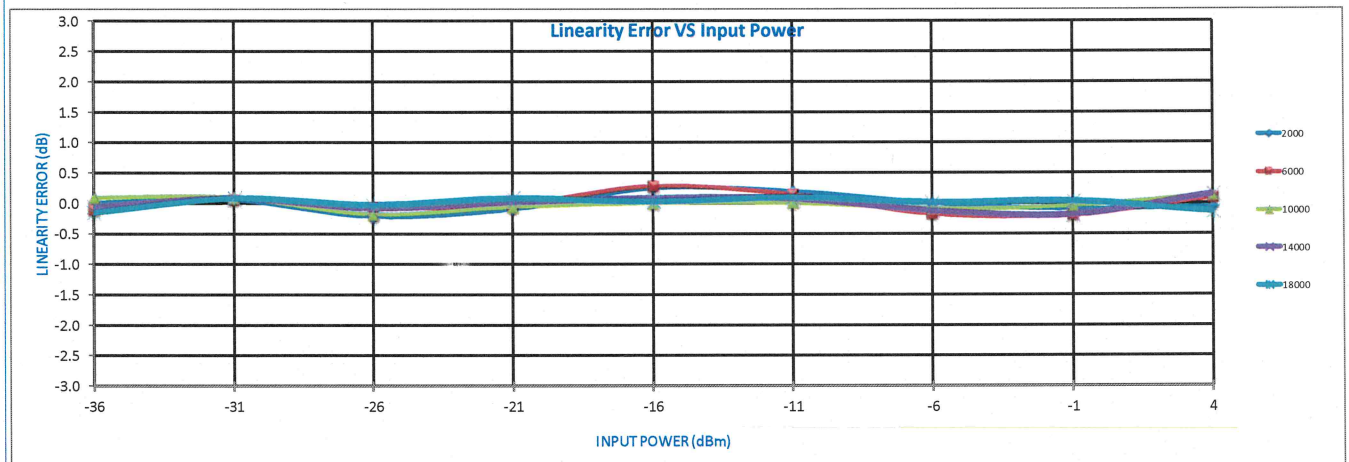
Logging Linearity vs Frequency	Error(dB)	
	MAX	MIN
LOGGING LINEARITY ERROR (dB)	0.28	-0.23

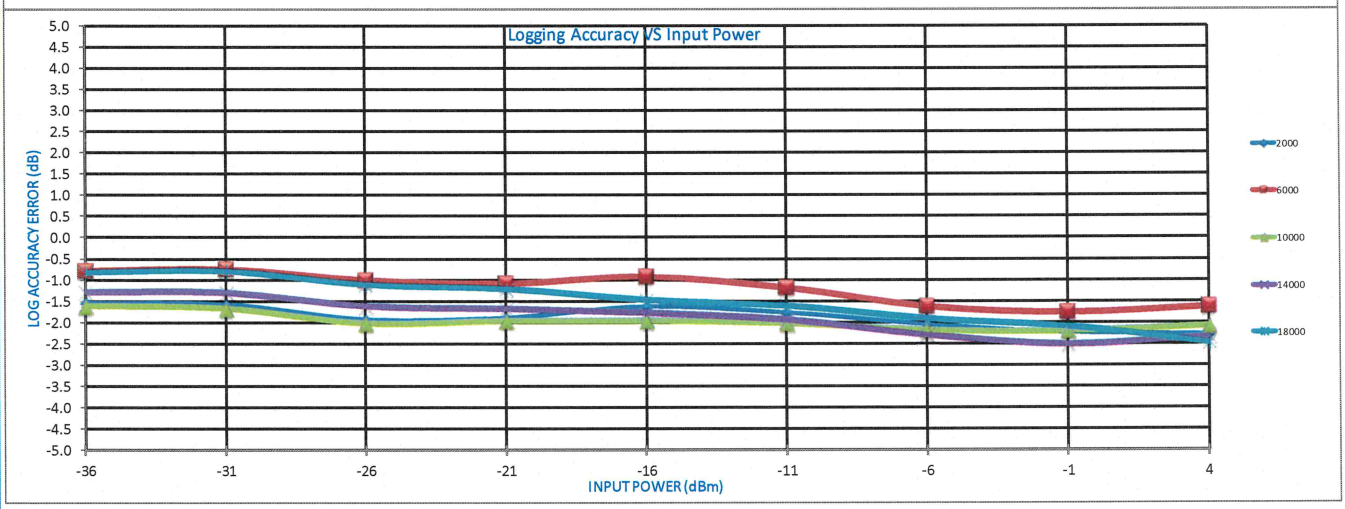
Logging Accuracy vs Frequency	Error(dB)	
	MAX	MIN
LOGGING ACCURACY ERROR (dB)	-0.74	-2.52

4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
Email: sales@pmi-rf.com

SUMMARY TEST DATA
ON
HADA-D2002

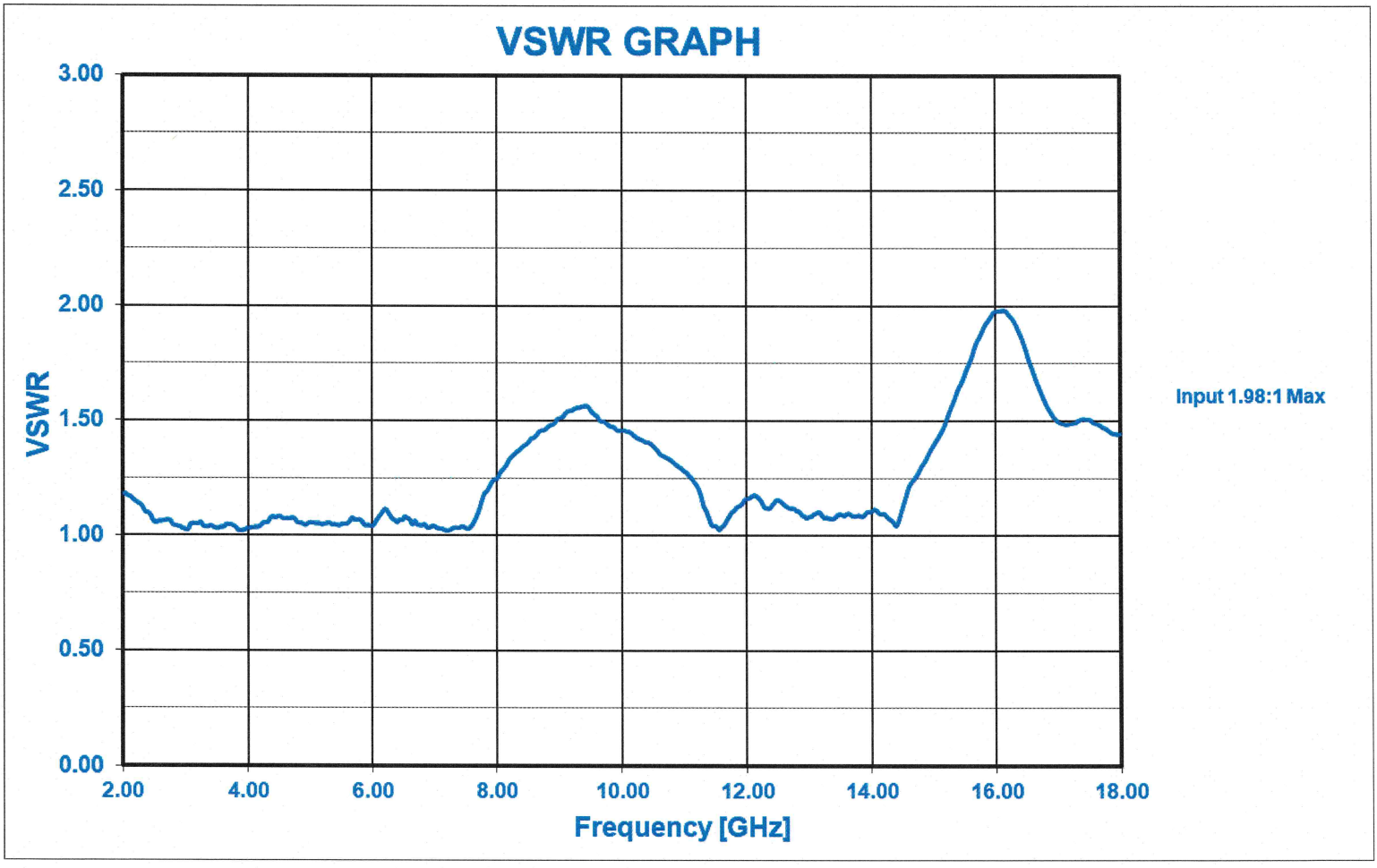
LOG TRANSFER WITH FREQUENCY @ +85C
MODEL: HADA-D2002
SERIAL NO: PL46950
TESTED BY: D. Weinrob





4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
Email: sales@pmi-rf.com

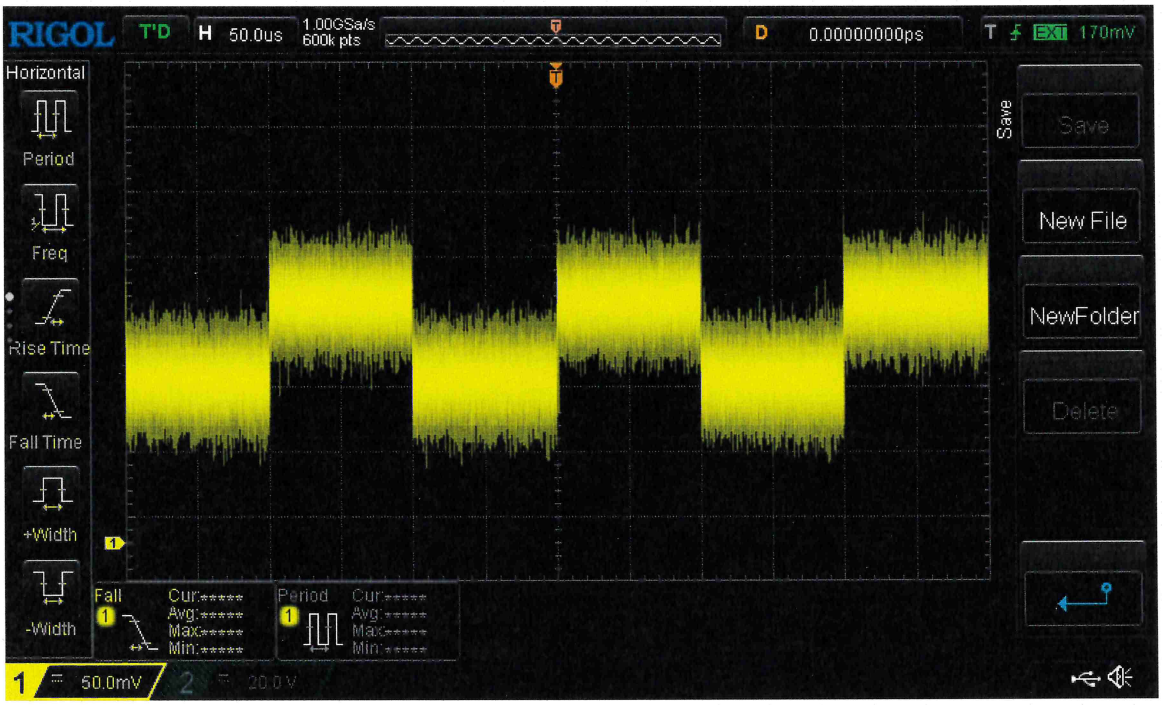
SUMMARY TEST DATA
ON
HADA-D2002



4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
Email: sales@pmi-rf.com

SUMMARY TEST DATA
ON
HADA-D2002

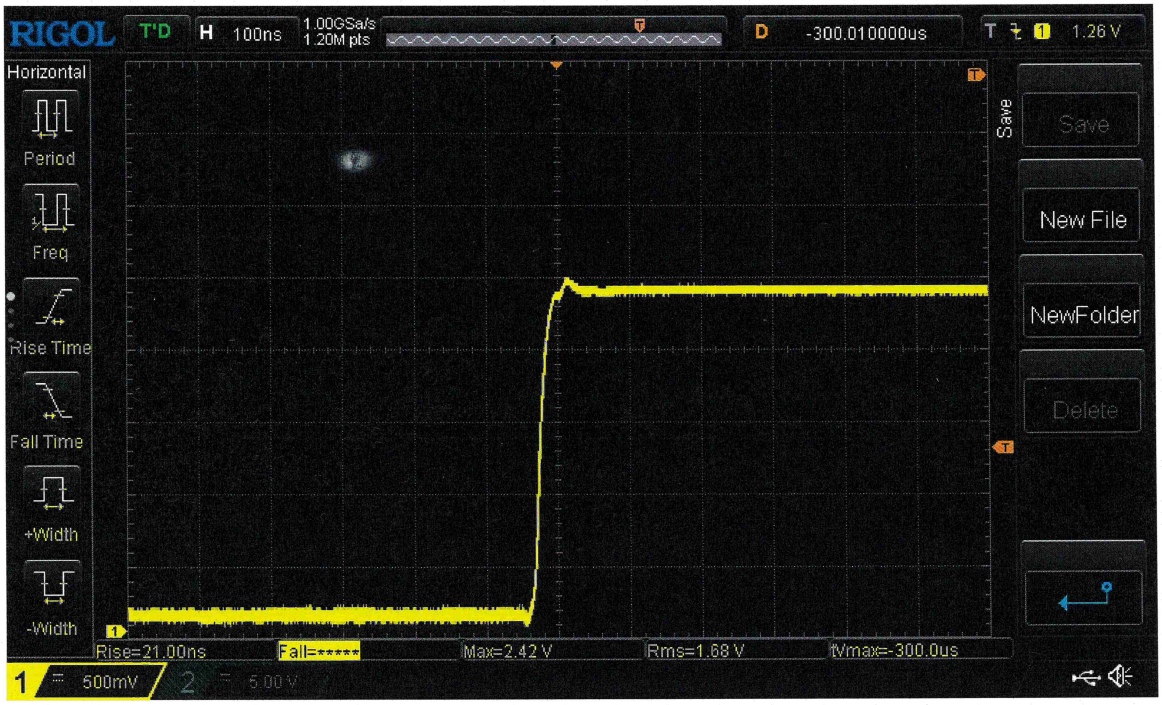
TSS = -42 dBm



4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
Email: sales@pmi-rf.com

SUMMARY TEST DATA
ON
HADA-D2002

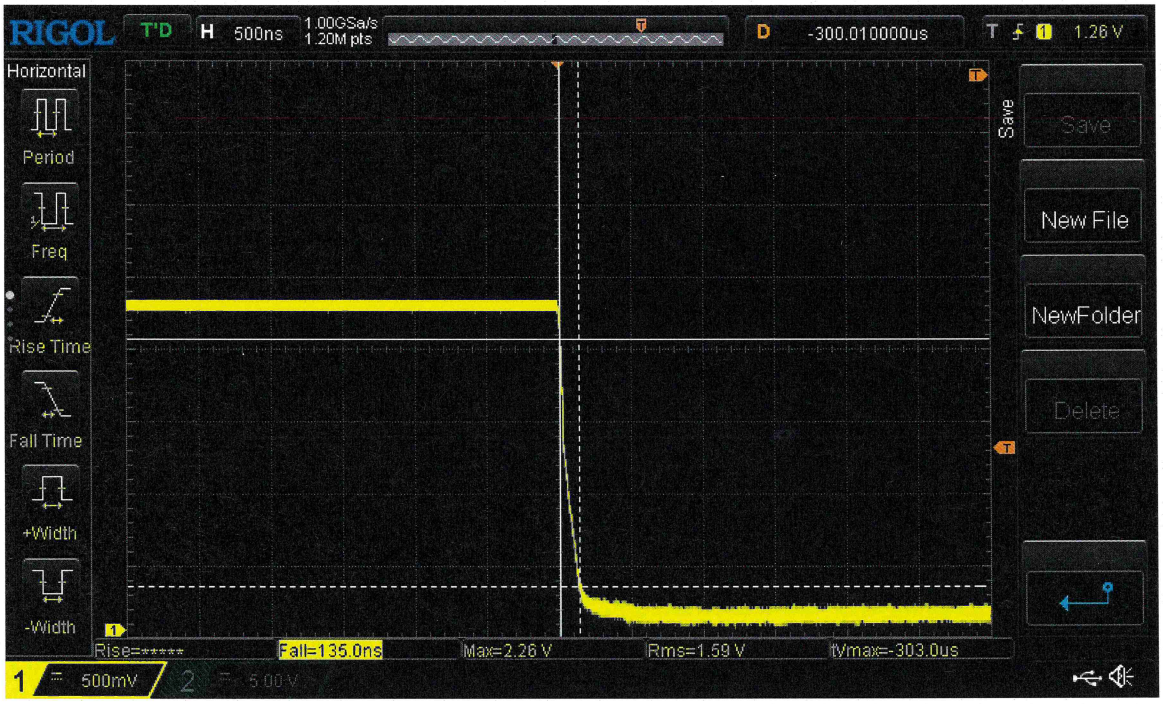
Rise Time = 21 ns



4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
Email: sales@pmi-rf.com

SUMMARY TEST DATA
ON
HADA-D2002

Fall Time = 135 ns



4921 Robert J. Mathews Pkwy Suite 1, El Dorado Hills, CA 95762 USA Phone: (916)542-1401 Fax: (916)265-2597
Email: sales@pmi-rf.com