



**SUMMARY TEST DATA  
ON  
HADA-D2002**

<b>Customer:</b> _____	<b>Tested By:</b> <u>D. Weinrob</u>
<b>SO No:</b> _____	<b>Temperature:</b> <u>+25°C</u>
<b>Model No:</b> <u>HADA-D2002</u>	<b>Date:</b> <u>09/27/24</u>
<b>Serial No:</b> <u>PL47860/2439</u>	<b>Drawing No:</b> <u>27620222</u> <b>Rev:</b> <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 dBm See Plot	
3	Frequency Flatness:	±1.65 dB Max	0.79 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)	0.36 dB / -0.74 dB 0.62 dB / -1.40 dB See Plot	
6	Log Linearity:	±0.5 dB Max @ +25°C ±0.75 dB Max @ -40°C to +85°C	0.29 dB / -0.19 dB 0.50 dB / -0.37 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%)	20 ns See Plot	
10	Fall Time:	500 ns Max (@ Pulse width 100usec input) (90% to 10%)	415 ns See Plot	
11	DC Offset: (Input 50 Ω terminated):	+95 mV +55/-100 mV (@ -40°C to +85°C)	79 mV @ +25°c 53 mV @ -40°c 82 mV @ +85°c See Plot	

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12	Input VSWR:	3.0:1 Max @ +23 dBm	1.67:1 See Plot	PMI QA3
13	Propagation Delay:	60 ns Max	45 ns	
14	Power Supply:	+12 ± 1VDC @ 125 mA Max -12 ± 1VDC @ 75 mA Max	+12 ± 1VDC @ 100mA -12 ± 1VDC @ 40mA	
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:  Date: 9-30-24



## SUMMARY TEST DATA ON HADA-D2002

LOG TRANSFER WITH FREQUENCY @ +25C  
 MODEL: HADA-D2002  
 SERIAL NO: PL47860  
 TESTED BY: D. Weinrob  
 DATE: 9/26/2024



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GRAPH #1

Output Voltage Offset= 0.079 Volts

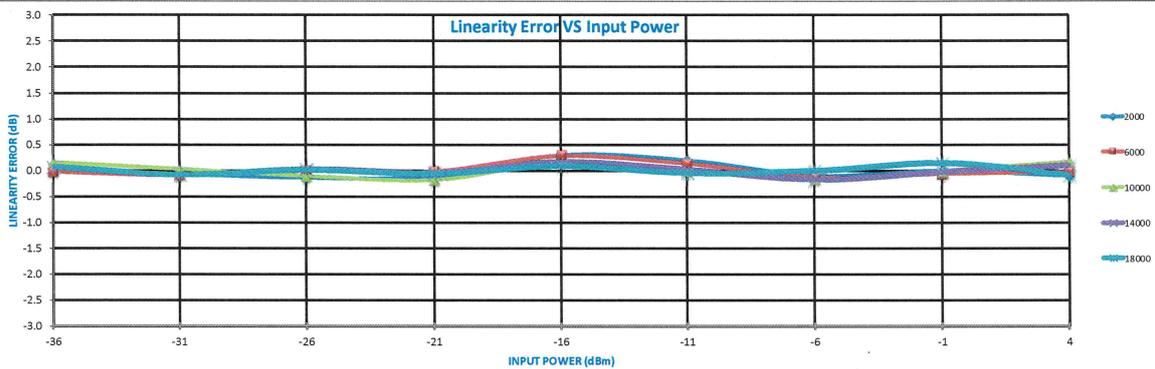
Frequency		-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)			
2 GHz	INTERCEPT (m)	2135											Measured Value (mV)	Error(dB)
	SLOPE (mV/dB)	50.6											Error (mV)	MAX MIN
			315	563	812	1066	1340	1588	1826	2084	2332		LINEARITY ERROR (dB)	0.29 -0.14
			0.04	-0.06	-0.14	-0.12	0.29	0.20	-0.10	0.00	-0.10		LOGGING ACCURACY (dB)	-0.20 -0.76
6 GHz	INTERCEPT (m)	2158											Measured Value (mV)	Error(dB)
	SLOPE (mV/dB)	50.3											Error (mV)	MAX MIN
			345	593	849	1100	1367	1611	1849	2104	2358		LINEARITY ERROR (dB)	0.28 -0.14
			-1	-5	-1	-1	14	7	-7	-4	-1		LOGGING ACCURACY (dB)	0.34 -0.16
10 GHz	INTERCEPT (m)	2154											Measured Value (mV)	Error(dB)
	SLOPE (mV/dB)	51.4											Error (mV)	MAX MIN
			313	563	813	1066	1340	1589	1837	2102	2368		LINEARITY ERROR (dB)	0.16 -0.19
			8	1	-6	-10	8	0	-9	-1	8		LOGGING ACCURACY (dB)	0.36 -0.74
14 GHz	INTERCEPT (m)	2190											Measured Value (mV)	Error(dB)
	SLOPE (mV/dB)	50.9											Error (mV)	MAX MIN
			361	608	868	1119	1384	1631	1876	2138	2399		LINEARITY ERROR (dB)	0.16 -0.18
			3	-5	1	-3	8	1	-9	-2	5		LOGGING ACCURACY (dB)	0.98 0.16
18 GHz	INTERCEPT (m)	2198											Measured Value (mV)	Error(dB)
	SLOPE (mV/dB)	50.8											Error (mV)	MAX MIN
			372	618	877	1127	1389	1636	1892	2154	2396		LINEARITY ERROR (dB)	0.14 -0.09
			4	-4	1	-4	4	-3	-1	7	-5		LOGGING ACCURACY (dB)	1.08 0.36
Flatness +/- dB		0.581	0.541	0.640	0.600	0.482	0.472	0.650	0.689	0.659				
Max Video Output V		0.372	0.618	0.877	1.127	1.389	1.636	1.892	2.154	2.399				
Min Video Output V		0.313	0.563	0.812	1.066	1.340	1.588	1.826	2.084	2.332				
Logging Linearity vs Frequency												Error(dB)		
												MAX MIN		
												LOGGING LINEARITY ERROR (dB)	0.29 -0.19	
Logging Accuracy vs Frequency												Error(dB)		
												MAX MIN		
												LOGGING ACCURACY ERROR (dB)	1.08 -0.76	

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## SUMMARY TEST DATA ON HADA-D2002

LOG TRANSFER WITH FREQUENCY @ +25C  
MODEL: HADA-D2002  
SERIAL NO: PL47860  
TESTED BY: D. Weinrob



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## SUMMARY TEST DATA ON HADA-D2002

LOG TRANSFER WITH FREQUENCY @ -40C  
 MODEL: HADA-D2002  
 SERIAL NO: PL47860  
 TESTED BY: D. Weinrob  
 DATE: 9/25/2024



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GRAPH #2

Output Voltage Offset= 0.053 Volts

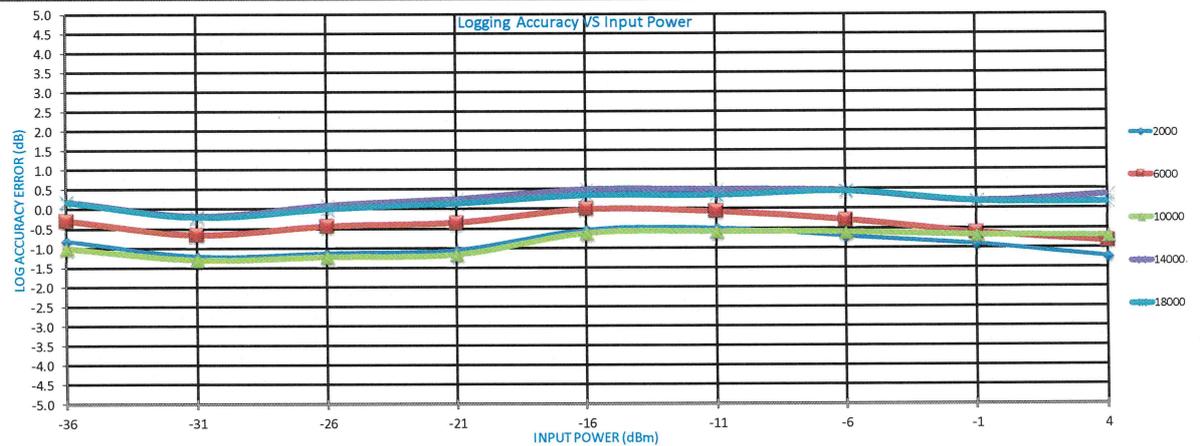
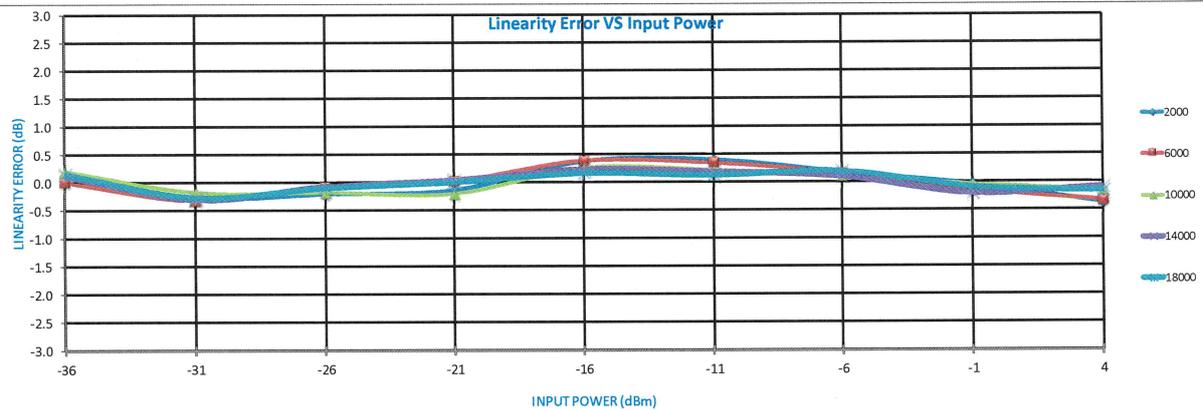
Frequency		RF Input Power (dBm)										Measured Value (mV)		Error(dB)	
		-36	-31	-26	-21	-16	-11	-6	-1	4			MAX	MIN	
2 GHz	INTERCEPT (m)	309	539	793	1047	1323	1575	1814	2054	2288					
	SLOPE (mV/dB)	6	-14	-11	-7	18	20	8	-2	-19	Error (mV)		0.40	-0.37	
		0.13	-0.28	-0.21	-0.14	0.37	0.40	0.17	-0.04	-0.37	LINEARITY ERROR (dB)		0.40	-0.37	
		-0.82	-1.22	-1.14	-1.06	-0.54	-0.50	-0.72	-0.92	-1.24	LOGGING ACCURACY (dB)		-0.50	-1.24	
6 GHz	INTERCEPT (m)	335	567	828	1082	1349	1596	1835	2069	2308					
	SLOPE (mV/dB)	0	-17	-4	1	19	17	8	-7	-17	Error (mV)		0.38	-0.34	
		0.00	-0.33	-0.09	0.02	0.38	0.35	0.15	-0.14	-0.34	LINEARITY ERROR (dB)		0.38	-0.34	
		-0.30	-0.66	-0.44	-0.36	-0.02	-0.08	-0.30	-0.62	-0.84	LOGGING ACCURACY (dB)		-0.02	-0.84	
10 GHz	INTERCEPT (m)	300	535	789	1042	1319	1571	1820	2066	2315					
	SLOPE (mV/dB)	10	-9	-9	-10	13	11	6	-3	-8	Error (mV)		0.25	-0.20	
		0.20	-0.18	-0.18	-0.20	0.25	0.21	0.11	-0.05	-0.15	LINEARITY ERROR (dB)		0.25	-0.20	
		-1.00	-1.30	-1.22	-1.16	-0.62	-0.58	-0.60	-0.68	-0.70	LOGGING ACCURACY (dB)		-0.58	-1.30	
14 GHz	INTERCEPT (m)	359	590	854	1112	1374	1624	1872	2109	2367					
	SLOPE (mV/dB)	6	-15	-4	2	12	9	5	-10	-4	Error (mV)		0.23	-0.31	
		0.11	-0.31	-0.07	0.04	0.23	0.19	0.10	-0.20	-0.09	LINEARITY ERROR (dB)		0.48	-0.20	
		0.18	-0.20	0.08	0.24	0.48	0.48	0.44	0.18	0.34	LOGGING ACCURACY (dB)		0.48	-0.20	
18 GHz	INTERCEPT (m)	359	589	850	1107	1367	1617	1872	2109	2358					
	SLOPE (mV/dB)	8	-14	-5	0	8	7	10	-5	-8	Error (mV)		0.19	-0.28	
		0.15	-0.28	-0.10	0.00	0.17	0.13	0.19	-0.10	-0.16	LINEARITY ERROR (dB)		0.44	-0.22	
		0.18	-0.22	0.00	0.14	0.34	0.34	0.44	0.18	0.16	LOGGING ACCURACY (dB)		0.44	-0.22	
Flatness +/- dB		0.586	0.547	0.646	0.696	0.547	0.527	0.577	0.547	0.785					
Max Video Output V		0.359	0.590	0.854	1.112	1.374	1.624	1.872	2.109	2.367					
Min Video Output V		0.300	0.535	0.789	1.042	1.319	1.571	1.814	2.054	2.288					
Logging Linearity vs Frequency												Error(dB)		MAX	MIN
LOGGING LINEARITY ERROR (dB)														0.40	-0.37
Logging Accuracy vs Frequency												Error(dB)		MAX	MIN
LOGGING ACCURACY ERROR (dB)														0.48	-1.30

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MODEL: HADA-D2002  
SERIAL NO: PL47860  
TESTED BY: D. Weinrob



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## SUMMARY TEST DATA ON HADA-D2002

LOG TRANSFER WITH FREQUENCY @ +85C  
 MODEL: HADA-D2002  
 SERIAL NO: PL47860  
 TESTED BY: D. Weinrob  
 DATE: 9/25/2024



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GRAPH #3

Output Voltage Offset= 0.082 Volts

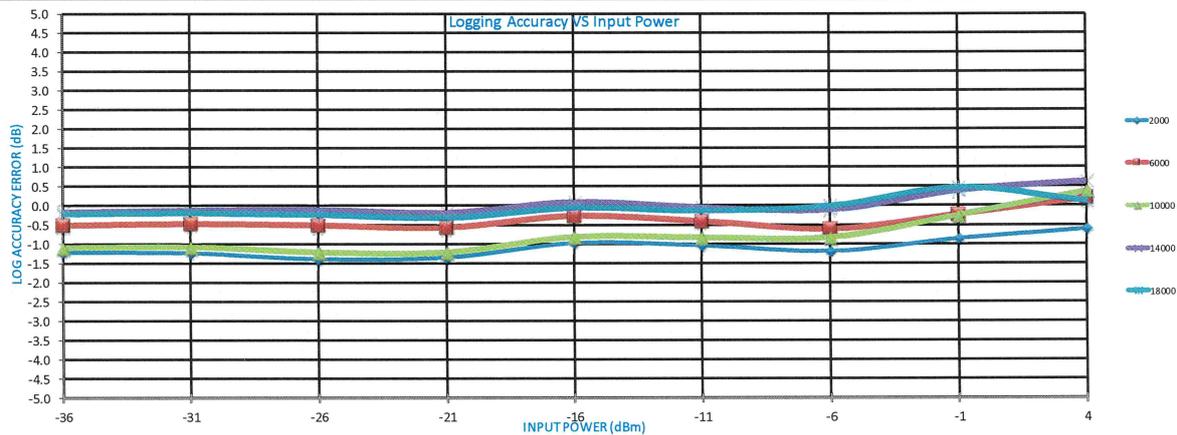
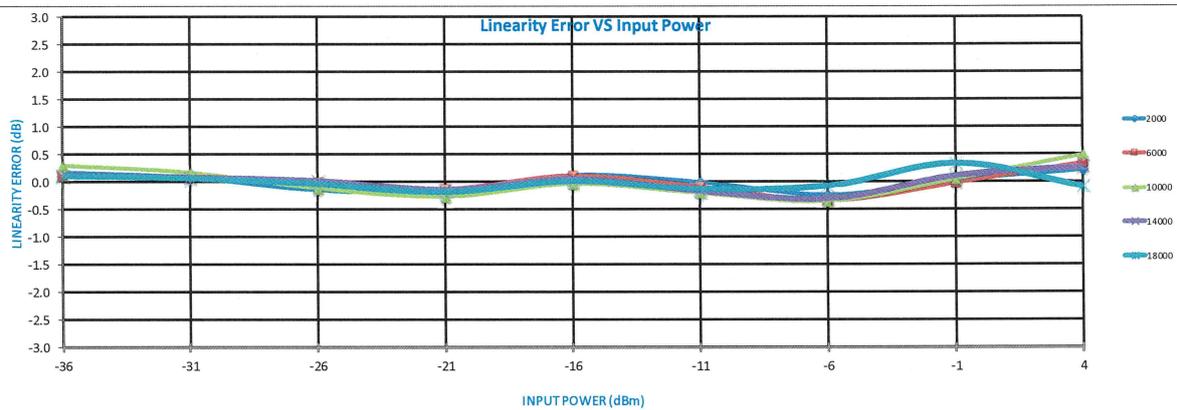
Frequency	Intercept (m)	Slope (mV/dB)	RF Input Power (dBm)								Measured Value (mV)		Error(dB)										
2 GHz	INTERCEPT (m)	2107	-36	-31	-26	-21	-16	-11	-6	-1	4	289	538	780	1032	1301	1548	1790	2057	2320	Error (mV)	MAX	MIN
	SLOPE (mV/dB)	50.7	8	4	-8	-9	6	-1	-12	1	11	0.17	0.08	-0.15	-0.18	0.12	-0.01	-0.24	0.02	0.21	LINEARITY ERROR (dB)	0.21	-0.24
			-1.22	-1.24	-1.40	-1.36	-0.98	-1.04	-1.20	-0.86	-0.60										LOGGING ACCURACY (dB)	-0.60	-1.40
6 GHz	INTERCEPT (m)	2140	324	576	824	1071	1336	1579	1819	2088	2359	5	4	-1	-7	5	-5	-17	-1	17	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB)	50.6	0.10	0.08	-0.02	-0.13	0.11	-0.09	-0.35	-0.03	0.33	0.30	0.17	-0.12	-0.27	-0.04	-0.21	-0.36	0.05	0.50	Error (mV)	MAX	MIN
			-0.52	-0.48	-0.52	-0.58	-0.28	-0.42	-0.62	-0.24	0.18	LINEARITY ERROR (dB)	0.33	-0.35									
												LOGGING ACCURACY (dB)	0.18	-0.62									
10 GHz	INTERCEPT (m)	2136	295	546	789	1039	1309	1558	1808	2087	2368	15	9	-6	-14	-2	-11	-19	2	26	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB)	51.6	0.30	0.17	-0.12	-0.27	-0.04	-0.21	-0.36	0.05	0.50	0.30	0.17	-0.12	-0.27	-0.04	-0.21	-0.36	0.05	0.50	Error (mV)	MAX	MIN
			-1.10	-1.08	-1.22	-1.22	-0.82	-0.84	-0.84	-0.26	0.36	LINEARITY ERROR (dB)	0.50	-0.36									
												LOGGING ACCURACY (dB)	0.36	-1.22									
14 GHz	INTERCEPT (m)	2165	341	593	844	1090	1354	1597	1844	2119	2381	6	4	1	-7	3	-9	-16	5	13	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB)	50.8	0.12	0.07	0.01	-0.14	0.05	-0.17	-0.31	0.10	0.26	0.12	0.07	0.01	-0.14	0.05	-0.17	-0.31	0.10	0.26	Error (mV)	MAX	MIN
			-0.18	-0.14	-0.12	-0.20	0.08	-0.06	-0.12	0.38	0.62	LINEARITY ERROR (dB)	0.26	-0.31									
												LOGGING ACCURACY (dB)	0.62	-0.20									
18 GHz	INTERCEPT (m)	2157	339	590	838	1084	1347	1593	1849	2123	2355	5	3	-2	-9	1	-7	-4	17	-4	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB)	50.6	0.11	0.06	-0.04	-0.18	0.01	-0.13	-0.08	0.33	-0.09	0.11	0.06	-0.04	-0.18	0.01	-0.13	-0.08	0.33	-0.09	Error (mV)	MAX	MIN
			-0.22	-0.20	-0.24	-0.32	-0.06	-0.14	-0.02	0.46	0.10	LINEARITY ERROR (dB)	0.33	-0.18									
												LOGGING ACCURACY (dB)	0.46	-0.32									
Flatness +/- dB			0.511	0.541	0.629	0.570	0.521	0.482	0.580	0.649	0.600	Logging Linearity vs Frequency			Error(dB)								
Max Video Output V			0.341	0.593	0.844	1.090	1.354	1.597	1.849	2.123	2.381	LOGGING LINEARITY ERROR (dB)			0.50	-0.36							
Min Video Output V			0.289	0.538	0.780	1.032	1.301	1.548	1.790	2.057	2.320	Logging Accuracy vs Frequency			Error(dB)								
			LOGGING ACCURACY ERROR (dB)			0.62	-1.40																

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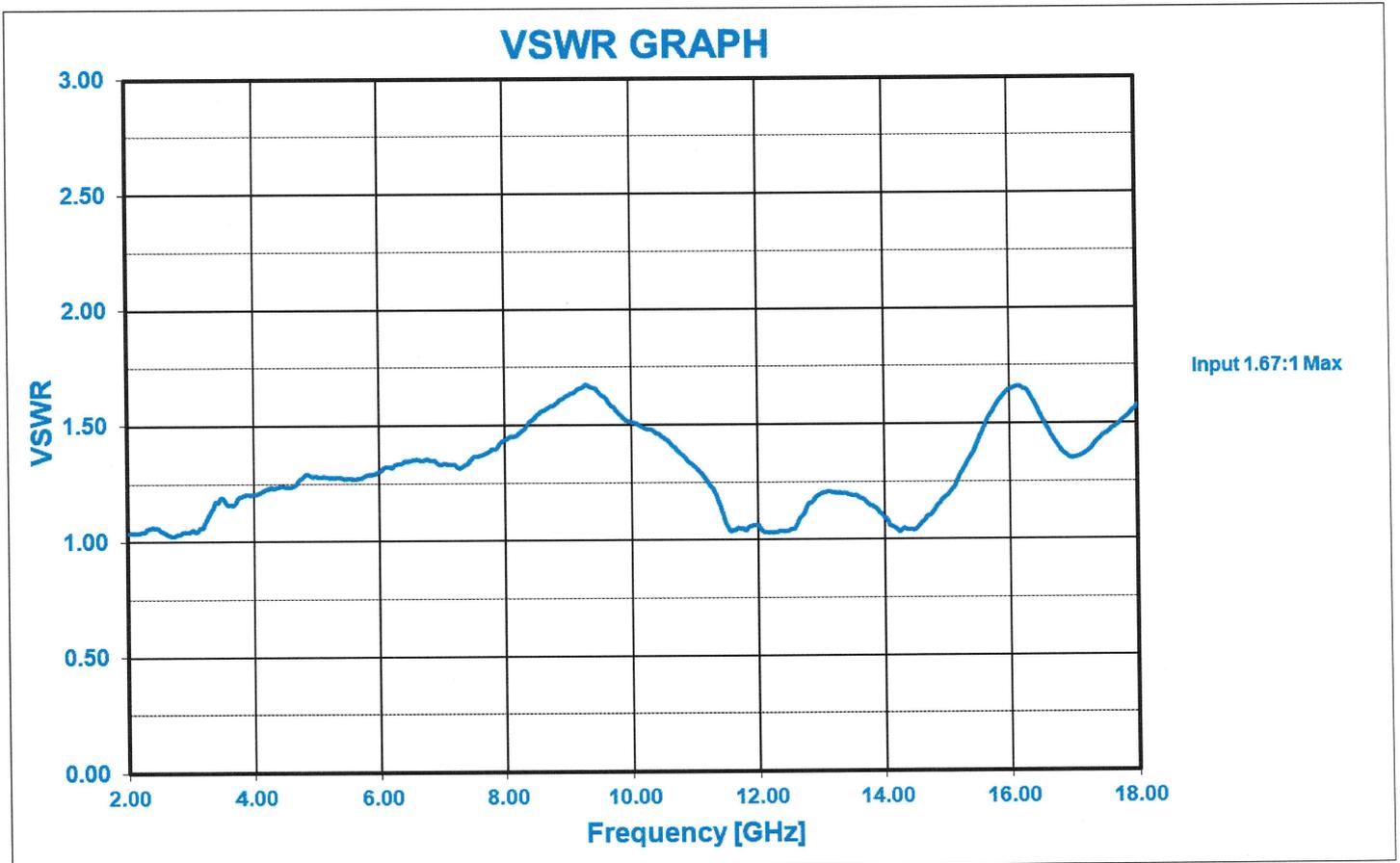
LOG TRANSFER WITH FREQUENCY @ +85C  
MODEL: HADA-D2002  
SERIAL NO: PL47860  
TESTED BY: D. Weinrob



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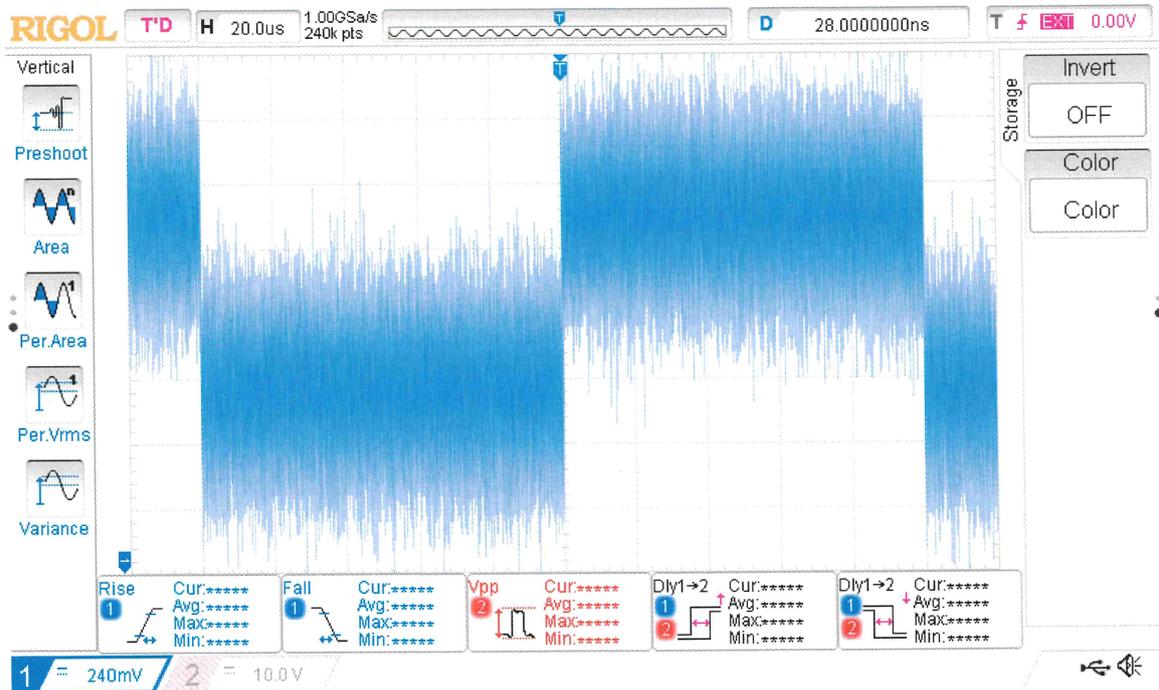


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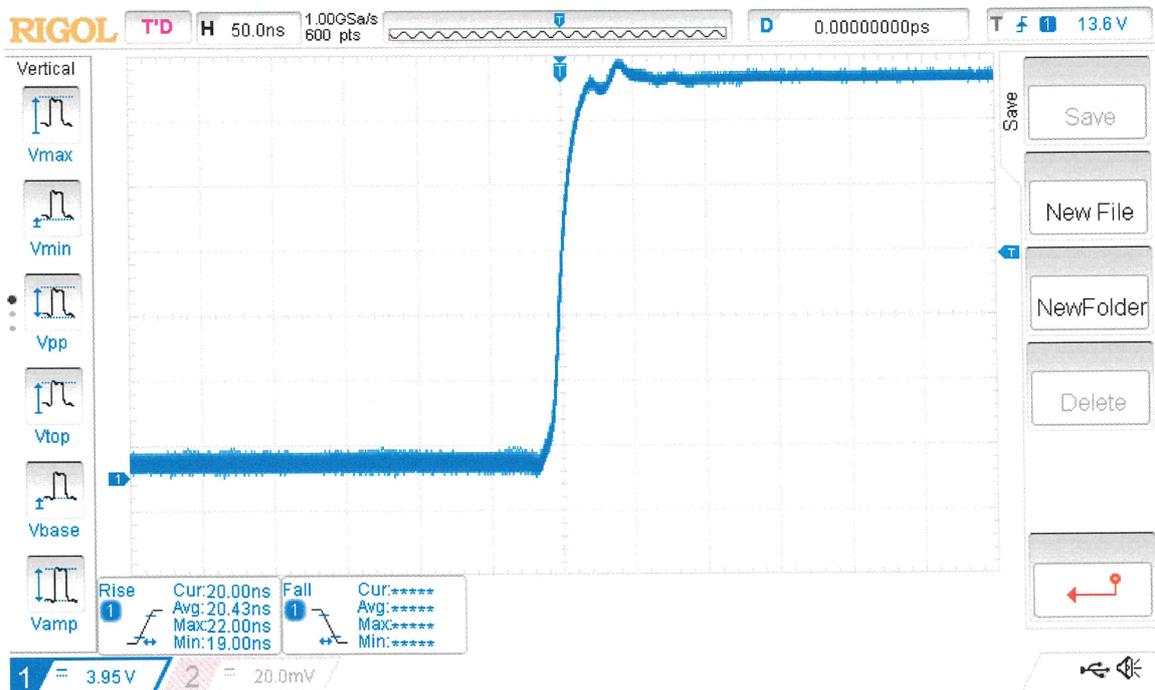
**TSS = -42 dBm**





**SUMMARY TEST DATA  
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HADA-D2002**

Rise Time = 20 ns





**SUMMARY TEST DATA  
ON  
HADA-D2002**

**Fall Time = 415 ns**

