



**SUMMARY TEST DATA
ON
HADA-D2002**

PL21809/1748

Customer: _____ Tested By: J.Emperador
SO No: _____ Temperature: +25°C -40C +85C
Model No: HADA-D2002 Date: 12/01/17
Serial No: PL21809/1748 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 QA 1
2	TSS:	-40 dBm Min @ -40°C to +85°	-41.0 dBm See Plot	
3	Frequency Flatness:	±1.65 dB Max	±0.90 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)	+0.80 dB -2.78 dB See Plot	
6	Log Linearity:	±0.5 dB Max @ +25°C ±0.75 dB Max @ -40°C to +85°C	-0.38 dB -0.57 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%)	18.28 ns See Plot	
10	Fall Time:	500 ns Max (@ Pulse width 100usec input) (90% to 10%)	104.37 ns See Plot	
11	DC Offset: (Input 50 Ω terminated):	+95 mV +55/-100 mV (@ -40°C to +85°C)	92 mV 118 mV See Plot	PMI QA 1

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12	Input VSWR:	3.0:1 Max @ +23 dBm	1.86: 1 See Plot	PMI QA 1
13	Propagation Delay:	60 ns Max	41 ns	
14	Power Supply:	+12 $\pm$ 1VDC @ 125 mA Max -12 $\pm$ 1VDC @ 75 mA Max	90 mA 43 mA	
15	Warm Up Time:	2 Minutes Max	2 Minutes	PMI QA 1

*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 $\pm$ 0.5 Ohms terminated.

QA/QC Approval:

PMI
QA 1

Date:

12/4/17

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SUMMARY TEST DATA ON HADA-D2002

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LOG TRANSFER WITH FREQUENCY @ +25C
MODEL: HADA-D2002
SERIAL NO: PL21809
TESTED BY: J.Emperador
DATE: 12/01/17

GRAPH #1



PLANAR MONOLITHICS INDUSTRIES
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EMAIL: SALES@PMI-RF.COM

Output Voltage Offset= 0.105 Volts

Frequency

2 GHz	INTERCEPT (mV)	2162
	SLOPE (mV/dB)	51

6 GHz	INTERCEPT (mV)	2188
	SLOPE (mV/dB)	50.9

10 GHz	INTERCEPT (mV)	2182
	SLOPE (mV/dB)	50.8

14 GHz	INTERCEPT (mV)	2194
	SLOPE (mV/dB)	49.8

18 GHz	INTERCEPT (mV)	2124
	SLOPE (mV/dB)	48.8

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

-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)
338	587	827	1072	1342	1613	1852	2121	2363	Measured Value (mV)
11	6	-9	-19	-4	12	-4	10	-3	Error (mV)
0.22	0.11	-0.18	-0.38	-0.08	0.24	-0.08	0.20	-0.05	LINEARITY ERROR (dB)
-0.24	-0.26	-0.46	-0.56	-0.16	0.26	0.04	0.42	0.26	LOGGING ACCURACY (dB)
365	613	860	1103	1367	1637	1875	2144	2396	Measured Value (mV)
10	4	-4	-16	-6	9	-8	7	4	Error (mV)
0.20	0.07	-0.08	-0.31	-0.12	0.18	-0.15	0.13	0.08	LINEARITY ERROR (dB)
0.30	0.26	0.20	0.06	0.34	0.74	0.50	0.88	0.92	LOGGING ACCURACY (dB)
363	611	858	1100	1359	1629	1872	2140	2388	Measured Value (mV)
10	4	-3	-15	-10	6	-5	9	3	Error (mV)
0.20	0.08	-0.05	-0.29	-0.19	0.12	-0.10	0.18	0.06	LINEARITY ERROR (dB)
0.26	0.22	0.16	0.00	0.18	0.58	0.44	0.80	0.76	LOGGING ACCURACY (dB)
403	647	899	1143	1397	1663	1892	2148	2384	Measured Value (mV)
1	-4	-1	-5	0	17	-3	4	-9	Error (mV)
0.02	-0.07	-0.01	-0.11	-0.01	0.34	-0.06	0.08	-0.18	LINEARITY ERROR (dB)
1.06	0.94	0.98	0.86	0.94	1.26	0.84	0.96	0.68	LOGGING ACCURACY (dB)
365	612	856	1097	1340	1602	1835	2083	2305	Measured Value (mV)
-3	0	0	-3	-4	14	3	7	-15	Error (mV)
-0.06	0.00	0.00	-0.06	-0.08	0.29	0.07	0.15	-0.30	LINEARITY ERROR (dB)
0.30	0.24	0.12	-0.06	-0.20	0.04	-0.30	-0.34	-0.90	LOGGING ACCURACY (dB)
0.60	0.60	0.70	0.70	0.60	0.60	0.60	0.60	0.90	
0.40	0.65	0.90	1.14	1.40	1.66	1.89	2.15	2.40	
0.34	0.59	0.83	1.07	1.34	1.60	1.84	2.08	2.31	

Logging Linearity vs Frequency	Error(dB)
	MAX MIN
LOGGING LINEARITY ERROR (dB)	0.34 -0.38

Logging Accuracy vs Frequency	Error(dB)
	MAX MIN
LOGGING ACCURACY ERROR (dB)	1.26 -0.90

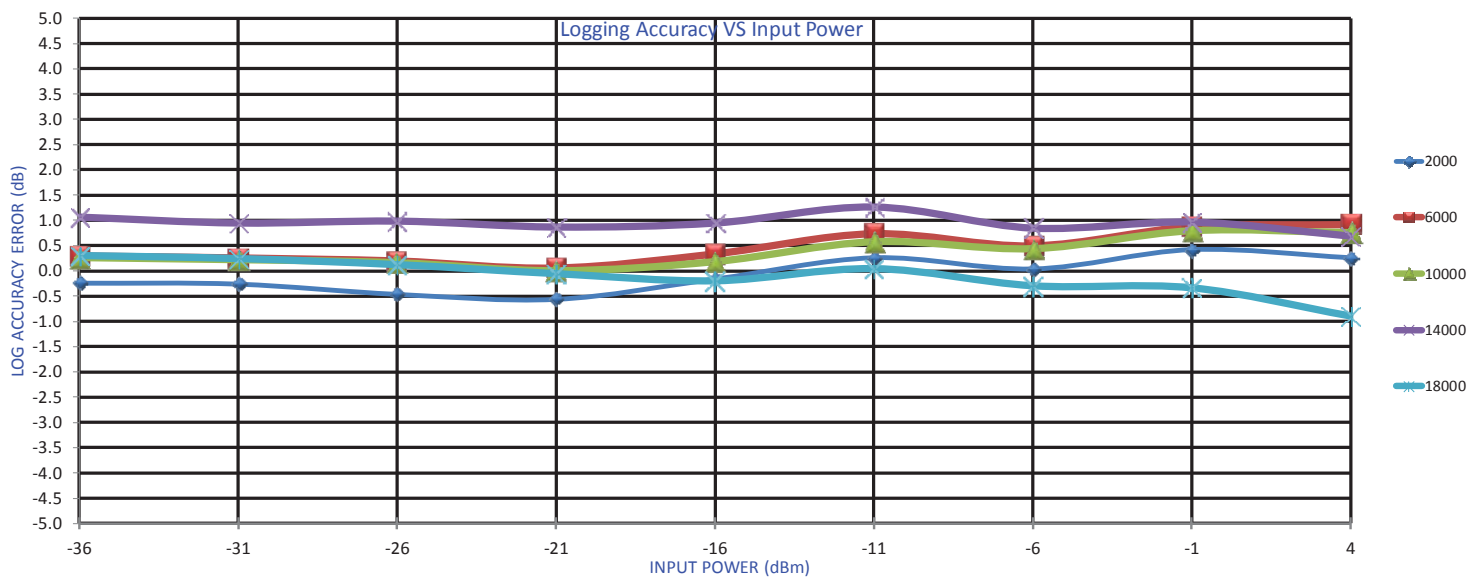
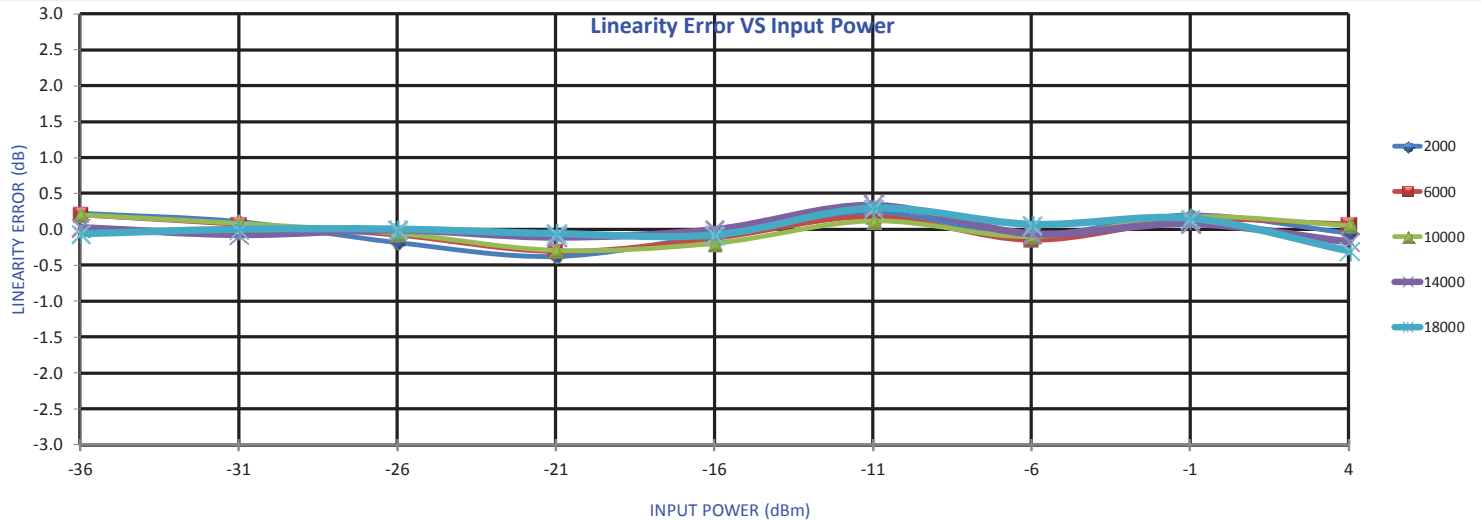
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**SUMMARY TEST DATA
ON
HADA-D2002**

PL21809/1748

LOG TRANSFER WITH FREQUENCY @ +25C
MODEL: HADA-D2002
SERIAL NO: PL21809
TESTED BY: J.Emperador



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SUMMARY TEST DATA ON HADA-D2002

PL21809/1748

LOG TRANSFER WITH FREQUENCY @ -40C
MODEL: HADA-D2002
SERIAL NO: PL21809
TESTED BY: J.Emperador
DATE: 12/01/17



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GRAPH #2

Output Voltage Offset= 0.092 Volts

Frequency

2 GHz	INTERCEPT (mV)	2080
	SLOPE (mV/dB)	49.2

6 GHz	INTERCEPT (mV)	2114
	SLOPE (mV/dB)	49.3

10 GHz	INTERCEPT (mV)	2109
	SLOPE (mV/dB)	49.2

14 GHz	INTERCEPT (mV)	2126
	SLOPE (mV/dB)	48.3

18 GHz	INTERCEPT (mV)	2048
	SLOPE (mV/dB)	47.3

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

	-36	-31	-26	-21	-16	-11	-6	-1	4	RF Input Power (dBm)
Measured Value (mV)	326	549	787	1025	1292	1558	1792	2044	2260	
Error (mV)	18	-5	-13	-21	-1	19	7	13	-17	
LINEARITY ERROR (dB)	0.36	-0.11	-0.27	-0.44	-0.01	0.39	0.15	0.27	-0.34	
LOGGING ACCURACY (dB)	-0.48	-1.02	-1.26	-1.50	-1.16	-0.84	-1.16	-1.12	-1.80	
Measured Value (mV)	355	578	825	1062	1323	1586	1822	2071	2303	
Error (mV)	16	-8	-7	-17	-2	15	4	7	-8	
LINEARITY ERROR (dB)	0.32	-0.15	-0.14	-0.34	-0.04	0.29	0.08	0.13	-0.16	
LOGGING ACCURACY (dB)	0.10	-0.44	-0.50	-0.76	-0.54	-0.28	-0.56	-0.58	-0.94	
Measured Value (mV)	354	577	823	1060	1315	1580	1820	2068	2297	
Error (mV)	16	-7	-7	-16	-7	12	6	8	-8	
LINEARITY ERROR (dB)	0.33	-0.13	-0.13	-0.32	-0.13	0.25	0.13	0.17	-0.17	
LOGGING ACCURACY (dB)	0.08	-0.46	-0.54	-0.80	-0.70	-0.40	-0.60	-0.64	-1.06	
Measured Value (mV)	394	615	865	1108	1357	1616	1846	2081	2298	
Error (mV)	6	-14	-6	-4	4	21	10	3	-21	
LINEARITY ERROR (dB)	0.13	-0.29	-0.11	-0.08	0.08	0.44	0.20	0.07	-0.43	
LOGGING ACCURACY (dB)	0.88	0.30	0.30	0.16	0.14	0.32	-0.08	-0.38	-1.04	
Measured Value (mV)	348	571	813	1049	1289	1548	1776	2013	2211	
Error (mV)	4	-10	-4	-5	-2	20	12	12	-27	
LINEARITY ERROR (dB)	0.08	-0.21	-0.09	-0.11	-0.04	0.43	0.25	0.25	-0.57	
LOGGING ACCURACY (dB)	-0.04	-0.58	-0.74	-1.02	-1.22	-1.04	-1.48	-1.74	-2.78	
Measured Value (mV)	0.70	0.70	0.80	0.90	0.70	0.70	0.70	0.70	0.90	
Error (mV)	0.39	0.62	0.87	1.11	1.36	1.62	1.85	2.08	2.30	
LINEARITY ERROR (dB)	0.33	0.55	0.79	1.03	1.29	1.55	1.78	2.01	2.21	

Logging Linearity vs Frequency	Error(dB)
	MAX MIN
LOGGING LINEARITY ERROR (dB)	0.44 -0.57

Logging Accuracy vs Frequency	Error(dB)
	MAX MIN
LOGGING ACCURACY ERROR (dB)	0.88 -2.78

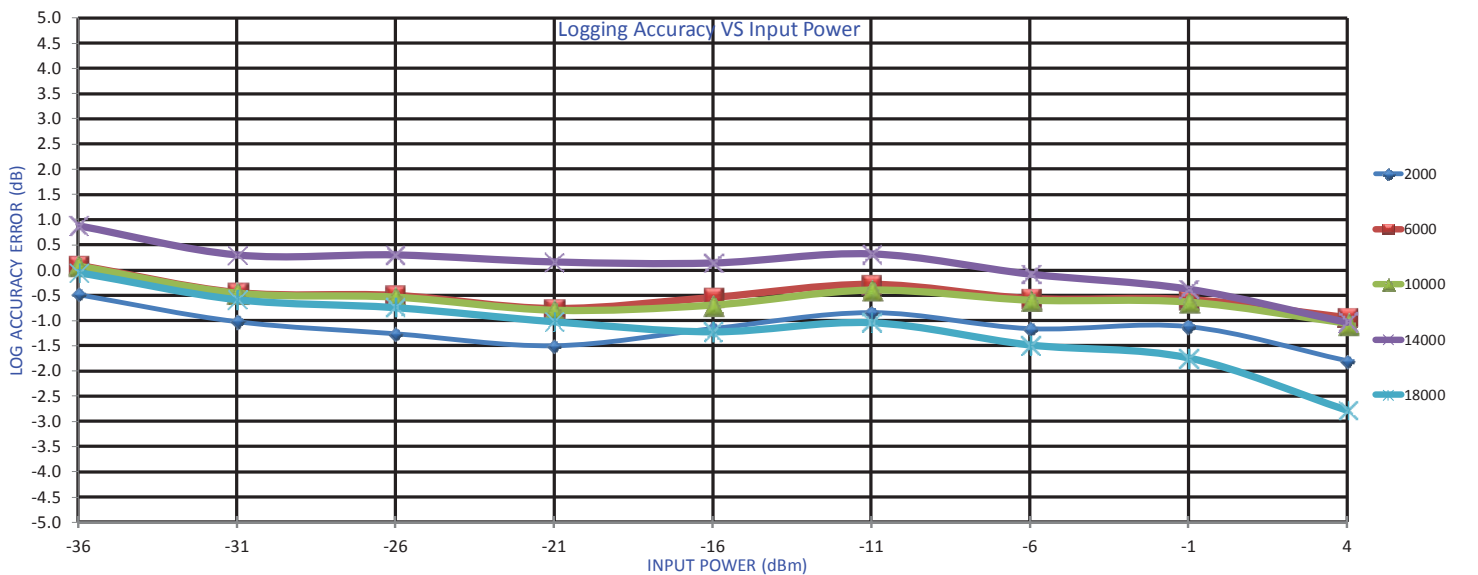
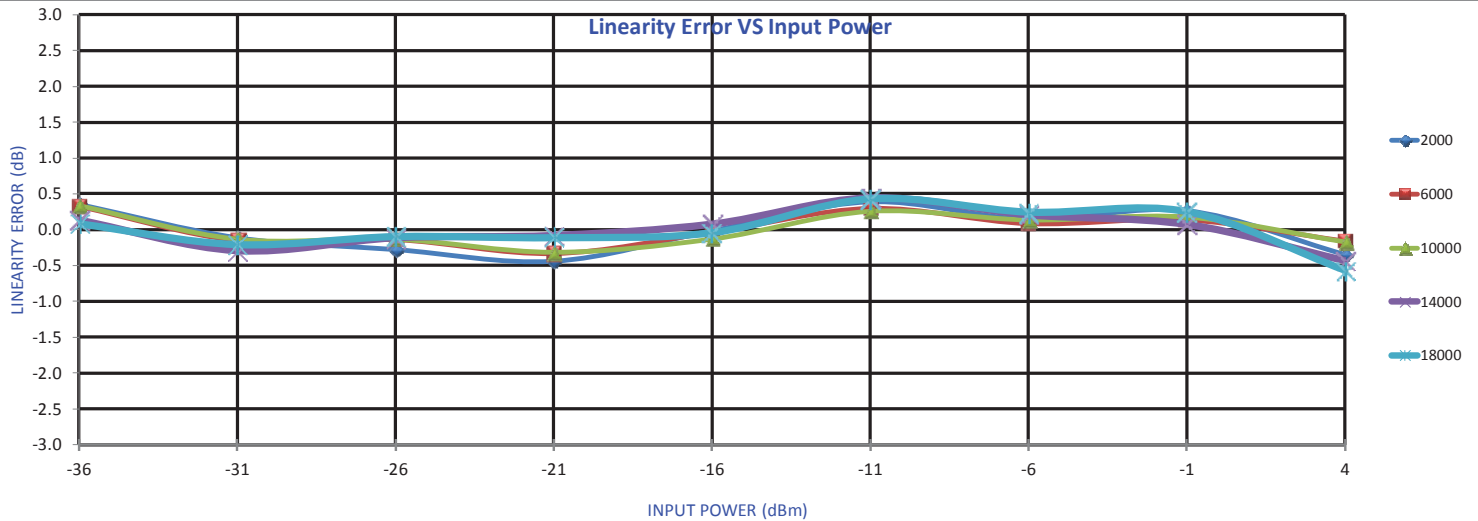
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SUMMARY TEST DATA ON HADA-D2002

PL21809/1748

LOG TRANSFER WITH FREQUENCY @ +85C
MODEL: HADA-D2002
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TESTED BY: J.Emperador
DATE: 12/01/17

GRAPH #3

Output Voltage Offset= 0.118 Volts



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Frequency			RF Input Power (dBm)												
2 GHz	INTERCEPT (mV)	2163	319	566	800	1047	1317	1591	1841	2117	2392	Measured Value (mV)		Error(dB)	
	SLOPE (mV/dB)	51.9	25	12	-13	-26	-15	-1	-10	6	22	Error (mV)		MAX	MIN
			0.48	0.24	-0.25	-0.50	-0.29	-0.01	-0.20	0.12	0.42	LINEARITY ERROR (dB)		0.48	-0.50
			-0.62	-0.68	-1.00	-1.06	-0.66	-0.18	-0.18	0.34	0.84	LOGGING ACCURACY (dB)		0.84	-1.06
6 GHz	INTERCEPT (mV)	2179	333	582	820	1065	1330	1603	1852	2131	2416	Measured Value (mV)		Error(dB)	
	SLOPE (mV/dB)	51.9	24	13	-9	-23	-18	-5	-15	4	29	Error (mV)		MAX	MIN
			0.46	0.25	-0.17	-0.45	-0.35	-0.09	-0.30	0.08	0.56	LINEARITY ERROR (dB)		0.56	-0.45
			-0.34	-0.36	-0.60	-0.70	-0.40	0.06	0.04	0.62	1.32	LOGGING ACCURACY (dB)		1.32	-0.70
10 GHz	INTERCEPT (mV)	2172	335	584	821	1065	1325	1598	1851	2128	2404	Measured Value (mV)		Error(dB)	
	SLOPE (mV/dB)	51.7	23	13	-8	-22	-21	-6	-11	7	25	Error (mV)		MAX	MIN
			0.44	0.26	-0.15	-0.43	-0.40	-0.12	-0.22	0.14	0.48	LINEARITY ERROR (dB)		0.48	-0.43
			-0.30	-0.32	-0.58	-0.70	-0.50	-0.04	0.02	0.56	1.08	LOGGING ACCURACY (dB)		1.08	-0.70
14 GHz	INTERCEPT (mV)	2173	358	608	848	1091	1349	1620	1859	2125	2388	Measured Value (mV)		Error(dB)	
	SLOPE (mV/dB)	50.7	12	8	-5	-16	-12	6	-9	3	13	Error (mV)		MAX	MIN
			0.24	0.17	-0.10	-0.31	-0.23	0.11	-0.18	0.06	0.25	LINEARITY ERROR (dB)		0.25	-0.31
			0.16	0.16	-0.04	-0.18	-0.02	0.40	0.18	0.50	0.76	LOGGING ACCURACY (dB)		0.76	-0.18
18 GHz	INTERCEPT (mV)	2125	344	594	831	1073	1317	1581	1824	2077	2332	Measured Value (mV)		Error(dB)	
	SLOPE (mV/dB)	49.7	7	8	-3	-9	-13	2	-3	2	9	Error (mV)		MAX	MIN
			0.13	0.17	-0.06	-0.18	-0.27	0.05	-0.06	0.04	0.17	LINEARITY ERROR (dB)		0.17	-0.27
			-0.12	-0.12	-0.38	-0.54	-0.66	-0.38	-0.52	-0.46	-0.36	LOGGING ACCURACY (dB)		-0.12	-0.66
Flatness +/- dB			0.40	0.40	0.50	0.40	0.30	0.40	0.30	0.50	0.80				
Max Video Output V			0.36	0.61	0.85	1.09	1.35	1.62	1.86	2.13	2.42				
Min Video Output V			0.32	0.57	0.80	1.05	1.32	1.58	1.82	2.08	2.33				
Logging Linearity vs Frequency												Error(dB)			
												MAX	MIN		
LOGGING LINEARITY ERROR (dB)												0.56	-0.50		
Logging Accuracy vs Frequency												Error(dB)			
												MAX	MIN		
LOGGING ACCURACY ERROR (dB)												1.32	-1.06		

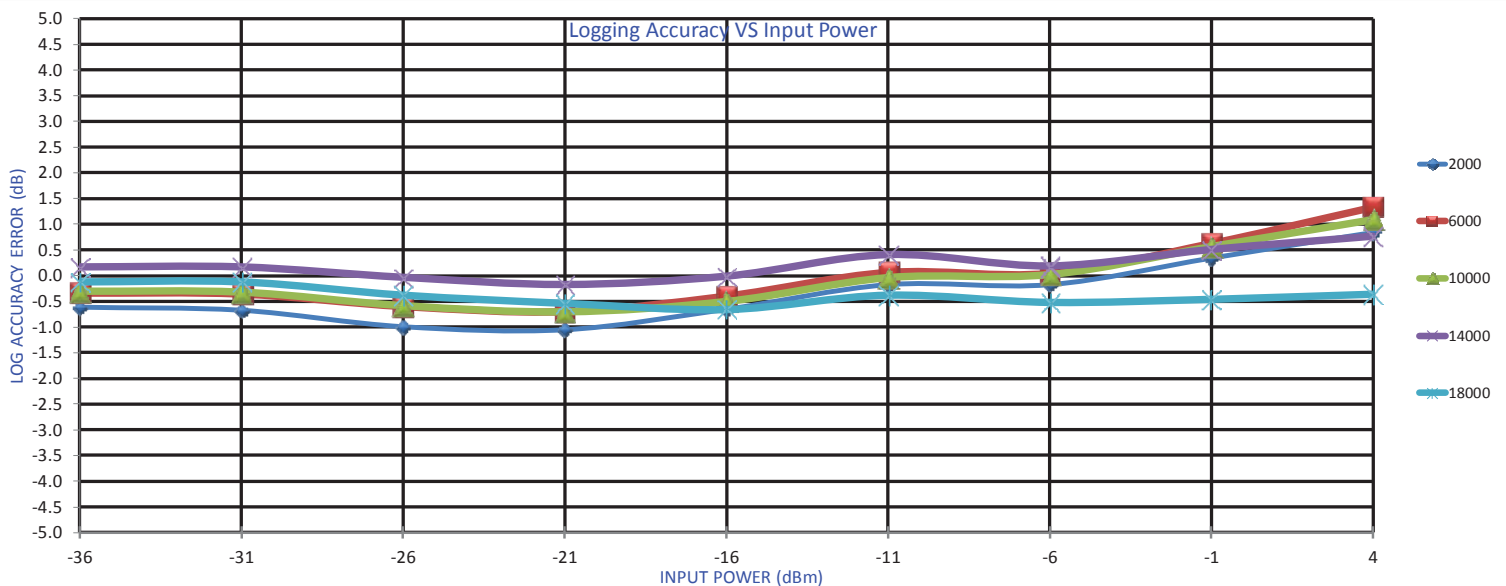
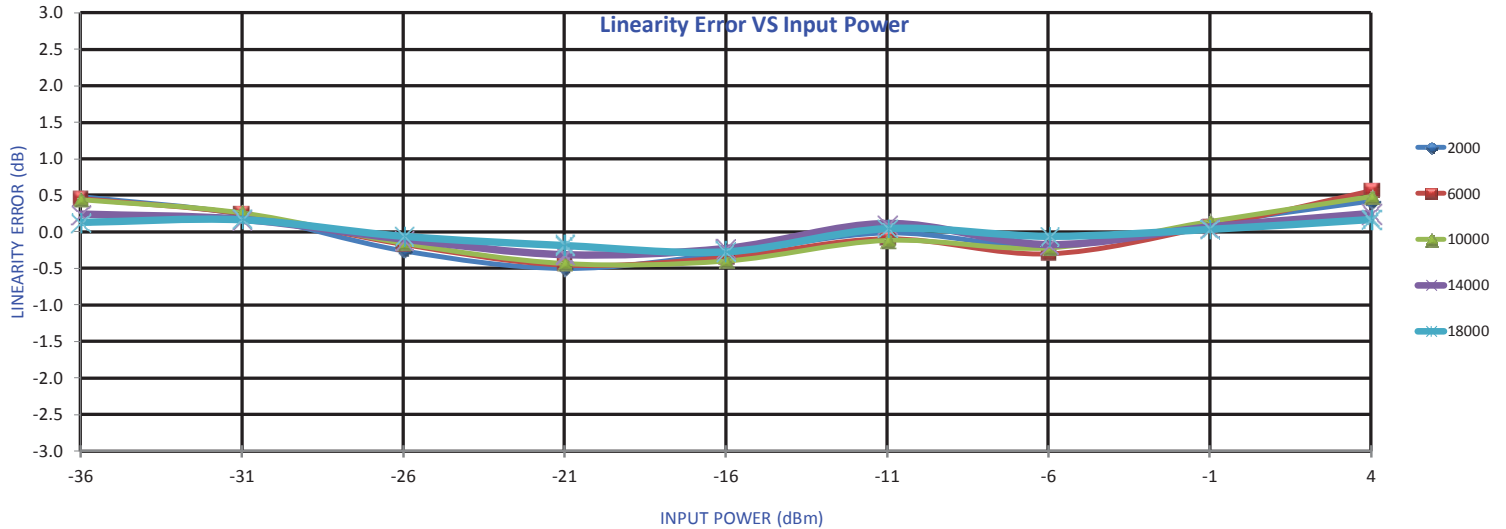
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PL21809/1748

LOG TRANSFER WITH FREQUENCY @ +85C
MODEL: HADA-D2002
SERIAL NO: PL21809
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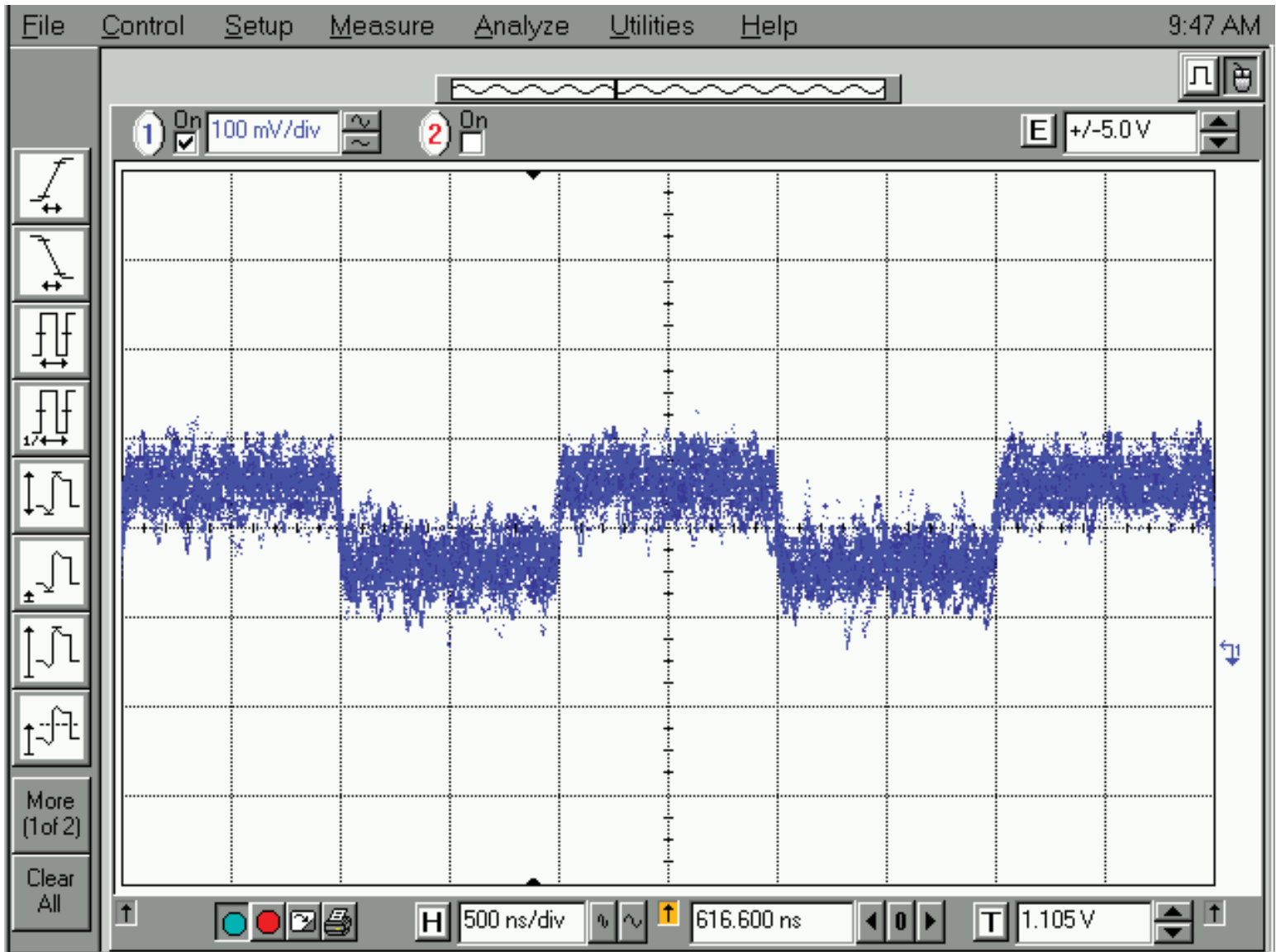
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**SUMMARY TEST DATA
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PL21809/1748

TSS @ -41.0 dBm

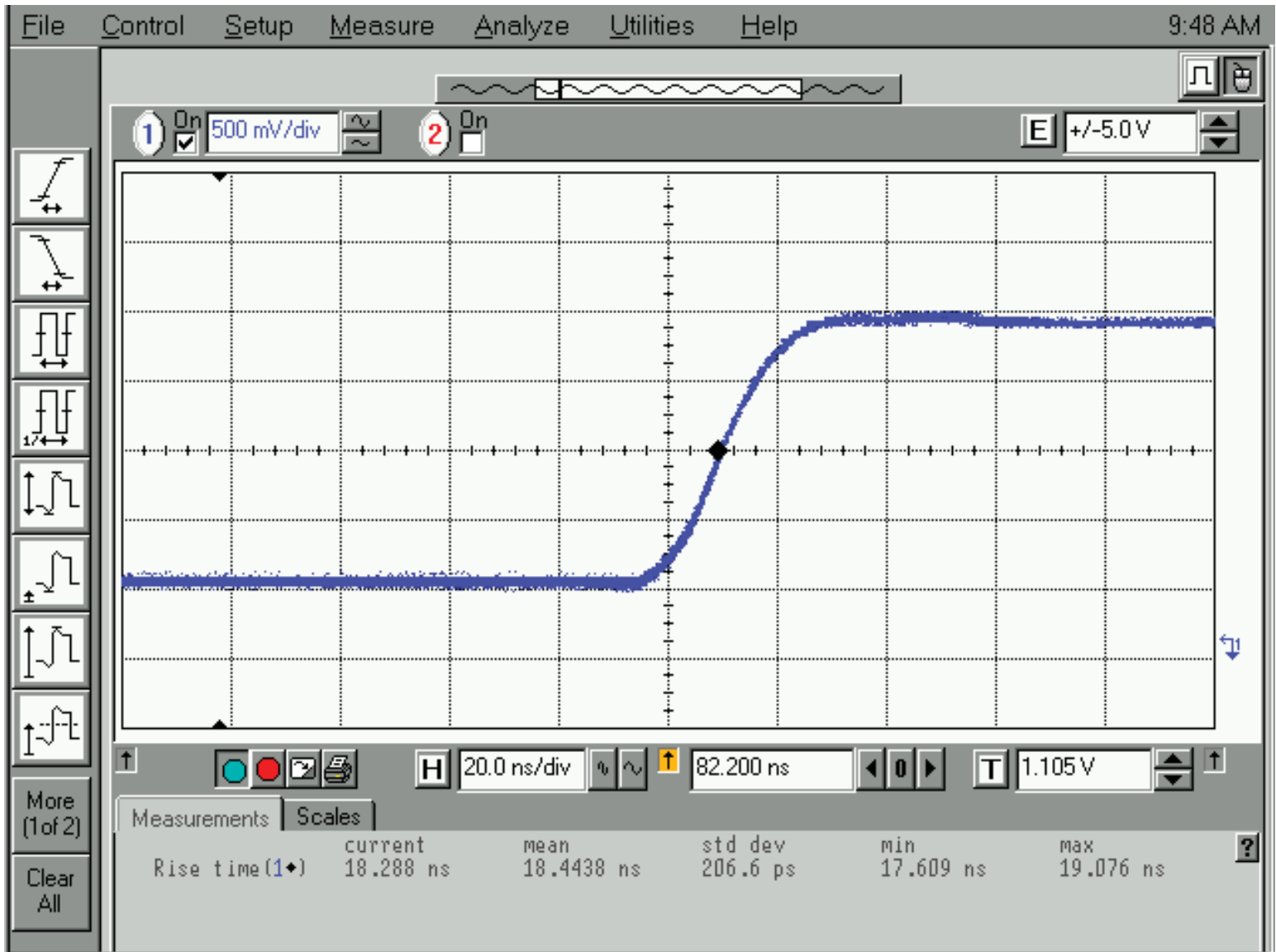




**SUMMARY TEST DATA
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PL21809/1748

Rise Time @ 18.28 ns

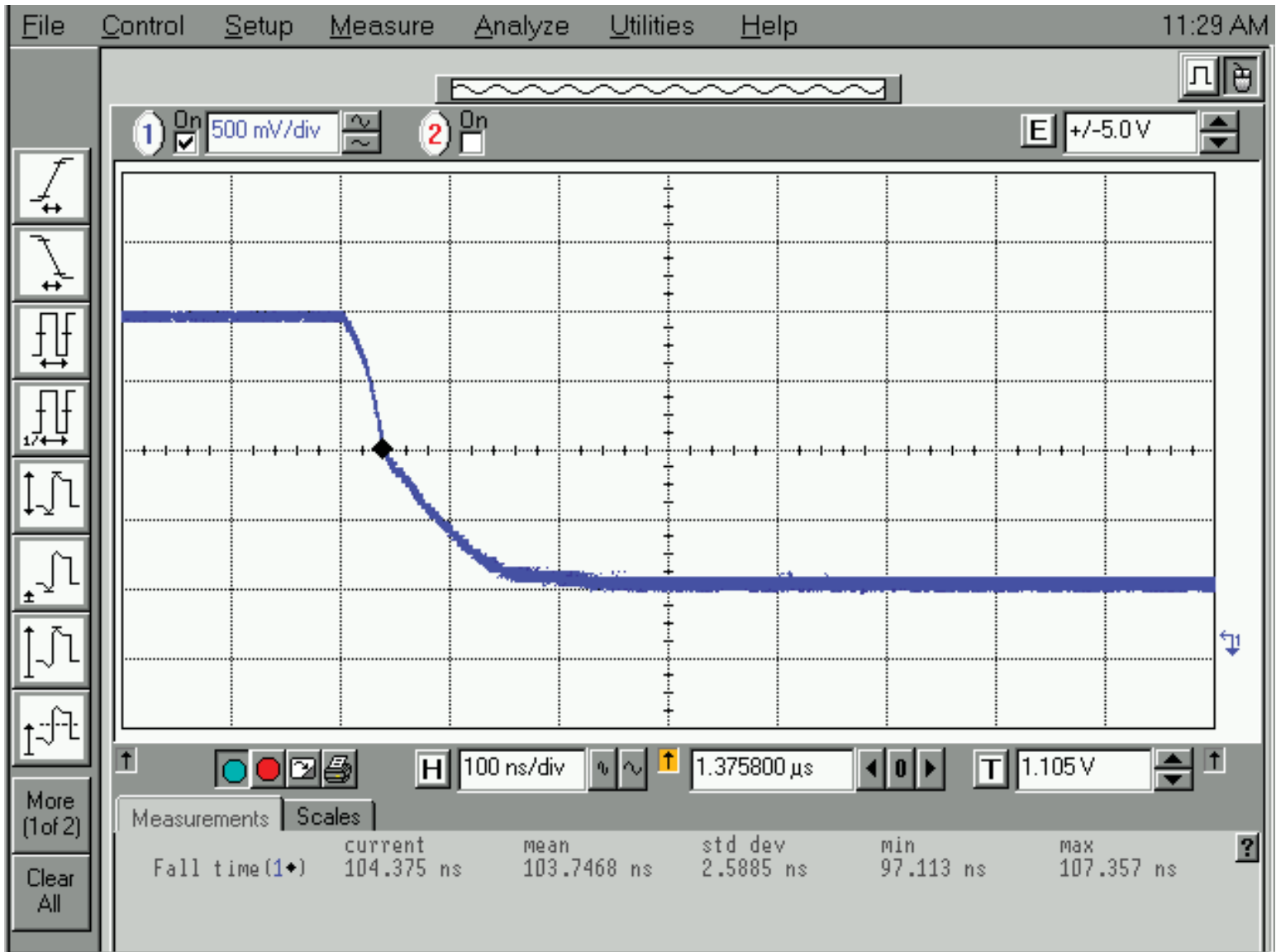




**SUMMARY TEST DATA
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Fall Time @ 104.37 ns





**SUMMARY TEST DATA
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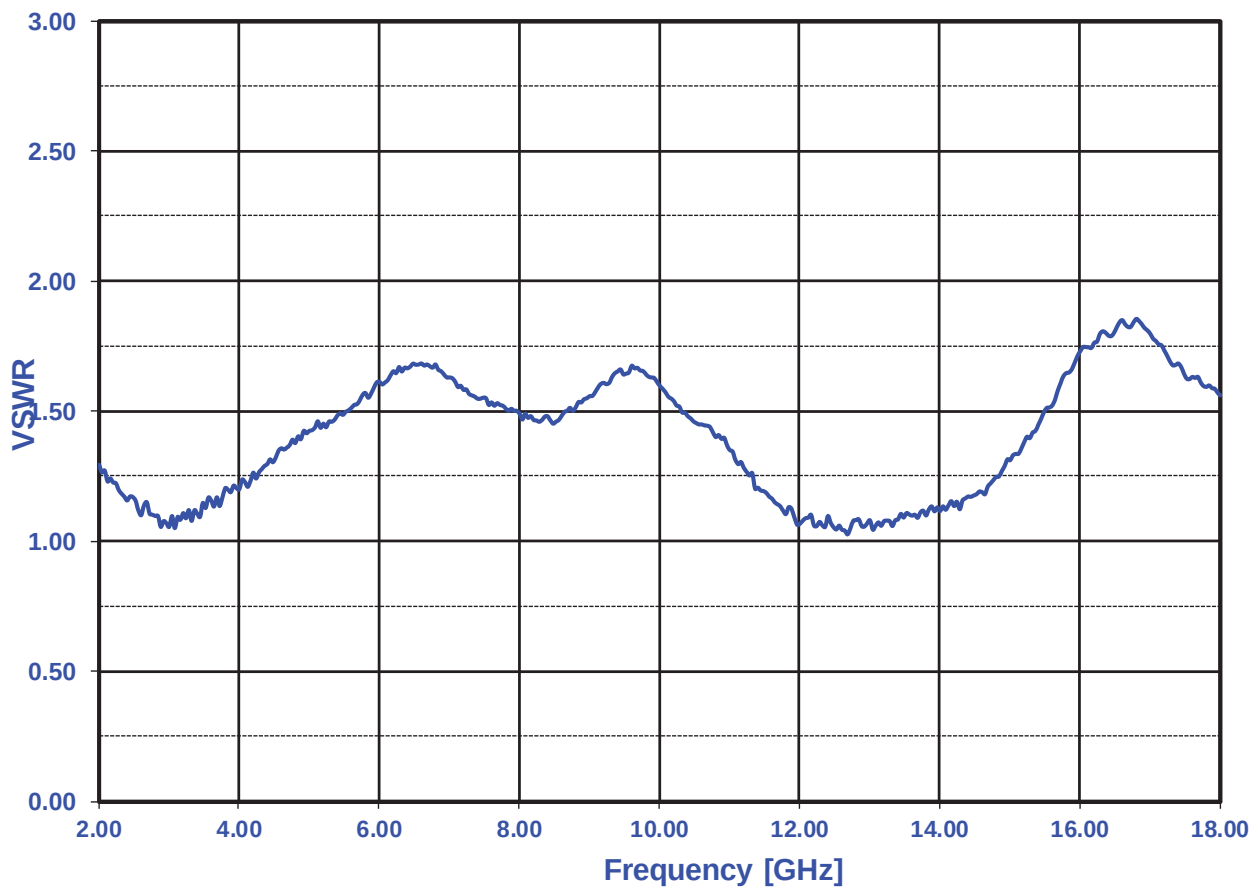
PL21809/1748

VSWR @ 1.86:1

Model Number: HADA-D2002
Serial Number: PL21809

Temperature: +25C

VSWR GRAPH



Input 1.86:1 Max
@ -23dBm