DASH NO.	APPLICATION		REVISIONS			
	NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED
			A1	INITIAL RELEASE		

PLANAR MONOLITHICS INDUSTRIES, INC.
4921 ROBERT J. MATHEWS PKWY #1
ELDORADO HILLS CA 95762

CONTRACT NO.	
DRAWN: J MERRINER 2-9-16	
CHECKED	
PROJ ENGR J MERRINER 2-9-16	
PROG MGR	
MFG.ENGR	
QA ENGR	
RELIABILITY:	
CUSTOMER	

ACCEPTANCE TEST PROCEDURE
MODEL: DLVA-18G40G-42-50-CD-1

PMI	SIZE A	CAGE CODE 71A34	DWG. NO. 28028357	REVISION A 1
	SCALE			SHEET 1 OF 15

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TABLE OF TESTS

The following tests may be performed in any convenient order.

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1.0 SCOPE

This procedure defines the tests required for the acceptance of a PMI Model DLVA-18G40G-42-0-CD-1 **This acceptance test procedure is to be used in conjunction with L-3 specification 40011533-000.**

2.0 TEST EQUIPMENT

Test equipment shall be inspected for current calibration and serviceability. Test connectors shall be cleaned and inspected prior to test set connection. Coaxial test cables shall be inspected for proper impedance (i.e. 93 ohm coax for video, 50 ohm coax for RF).

2.1 TEST EQUIPMENT SUBSTITUTION

Test Equipment with equivalent or better specifications than the equipment defined in table 1 may be substituted.

Table-1

Item No.	ITEM	MANUFACTURER	MODEL NUMBER
1	POWER SUPPLY	AGILENT	E3631A
2	PNA NETWORK ANALYZER	AGILENT	E8364B
3	OSCILLOSCOPE	AGILENT	INFINIIUM
4	DIGITAL MULTIMETER	AGILENT	3478A
5	AMMETER	FLUKE	8050A
6	POWER METER	AGILENT	437B
7	SIGNAL GENERATOR	HP	83731B

3.0 GENERAL REQUIREMENTS

Evidence supporting successful completion of in-process testing (including Burn-in & Temperature Cycling) shall be verified prior to formal acceptance testing. The UUT shall be laser welded prior to formal acceptance test to provide a tamper proof seal.

3.1 TEST CONDITIONS

Unless specified otherwise, testing shall be performed at an ambient temperature of 24 +/-4 degrees C and a relative humidity level not exceeding 90%. The UUT shall be conductively cooled in a manner that maintains the UUT case temperature within the specified ambient temperature window.

3.2 TEST FAILURE

If test failure is indicated, the test program for the UUT shall stop. Notify the cognizant engineering and quality representatives. The engineering and quality representatives shall assess the failure to assign cause. A written course of action shall be developed by engineering and quality to determine the root cause of the failure.

4.0 TEST PROCEDURE

In order to verify that the design of the UUT achieves the desired specification requirements the device must be tested and the results recorded. The following procedures and techniques will be followed using the various layout diagrams illustrated below: NOTE: THE LOG VIDEO LOAD FOR ALL VIDEO TESTS SHALL BE 100 +/-5 OHMS.

4.1 INPUT VSWR

a) Set up the test equipment according to figure 1.
b) Set the frequency sweep for 18 to 40 GHz.
c) Perform a one-port S11 calibration on the PNA with the power level set for -17dBm.
d) Connect the UUT to the PNA.
e) Apply DC power (+/-15VDC) to the UUT.
f) Set markers to 30 and 31 GHz.
g) Print the display and identify the results as "Graph 1 - Input VSWR".

4.2 TSS, DC OUTPUT OFFSET

a) Set up the equipment according to figure 1.
b) Set the PNA to CW mode at 31 GHz.
c) Set the PNA power level to the power off condition.
d) Connect the UUT to the PNA.
e) Apply DC p ower (+/-15VDC) to the UUT.
f) Set the oscilloscope scale to 50 mV per division.
g) Set the oscilloscope to AC coupling and measure the RMS noise voltage on the baseline.
h) Record the RMS noise voltage in the summary test data sheet.
i) Connect the video output of the UUT to a digital voltmeter (DVM), and measure the no signal DC offset.
j) Record the DC offset voltage in the summary test data sheet.
k) Set the PNA for a power level of -34 dBm, and measure the DC level on the DVM.
l) Verify that the DC level minus the no signal offset voltage is at least 2.5 times the RMS noise voltage.

m) Calculate the Signal to noise ratio by: 20 log (DC level @ -34 dBm – DC offset) / RMS noise voltage.
n) Enter the signal to noise ratio into the summary test data sheet.

4.3 LOGGING RANGE, LOG LINEARITY, LOG SLOPE, OUTPUT LEVEL STABILITY, FREQUENCY FLATNESS, DC CURRENT, LOG INTERCEPT

NOTE: The transition from one temperature to another shall be a minimum of 5°C per minute.

a) Set up the equipment as in Figure 3.
b) Set the frequency on the signal generator to 30 GHz.
c) Apply DC power (+/-15VDC) to the UUT.
d) Step the power level at the UUT input from -32 to +10 dBm in 3 dB steps.
e) Record the voltage at each power level and enter into an Excel data template to calculate log linearity, and produce a logging linearity graph with a slope of 50 +/-3 mV/dB. Step the frequency in 0.5 GHz increments, and repeat steps (d - e) at each increment up to 31 GHz.
f) Attach the graph of logging linearity and slope to the summary data sheet (Graph 2A).
g) Repeat steps (a) thru (e) at -54°C.
h) Attach the graph of logging linearity and slope @ -54°C to the summary data sheet (Graph 2B).
i) Repeat steps (a) thru (e) at +85°C.
j) Attach the graph of logging linearity and slope @ +85°C to the summary data sheet (Graph 2C).
k) Using the data obtained in steps (a) thru (j) calculate the p-p variation in output voltage at 30.5 GHz and -20 dBm over the temperature range.
l) Record the results of step (k) in the summary test data sheet.
m) Using the data obtained in steps (a) thru (j) calculate the p-p variation in output voltage at -23 dBm over the frequency range.
n) Record the results of step (m) in the summary test data sheet.
o) Set the RF power level to off.
p) Measure the plus and minus DC currents, and record the values in the summary test data sheet.
q) Set the RF power level to +10 dBm.
r) Repeat step (p).
s) Set the RF power level to 0 dBm, and the frequency to 30.5 GHz.
t) Measure and record the Log Intercept voltage on the summary test data sheet.

4.4 RISE TIME

a) Set up equipment as in Figure 2.
b) Set the Frequency on the Signal Generator to 18GHz.
c) Set the power level at the UUT input to -24 dBm.
d) Set the pulse Modulation to 20 uS PW and 1 mS rep rate.
e) Apply DC power (+/-15VDC) to the UUT.
f) Measure the time from 10% to 90% on the pulse leading edge.
g) Record the rise time in the summary data sheet.

4.5 RECOVERY TIME

a) Set up equipment as in Figure 2.
b) Set the Frequency on the Signal Generator to 18 GHz.
c) Set the power level at the UUT input to +10 dBm.
d) Set the pulse Modulation to 20 µS PW and 1 mS rep rate.
e) Apply DC power (+/-15VDC) to the UUT.
f) Measure the time from 90% to within ± 1 dB of the final baseline.
g) Record the recovery time in the summary data sheet.

5.0 MECHANICAL INSPECTION

a) Perform a visual and mechanical inspection to verify workmanship, and conformance to the L-3 outline drawing, paragraph 3.1.5 in L-3 specification 40011533-00, and PMI product feature drawing 27028354.
b) Record the inspection as pass / fail on the summary test data sheet.
c) Weigh the UUT on a scale, and record the weight in the summary test data sheet.

6.0 TEST DIAGRAMS

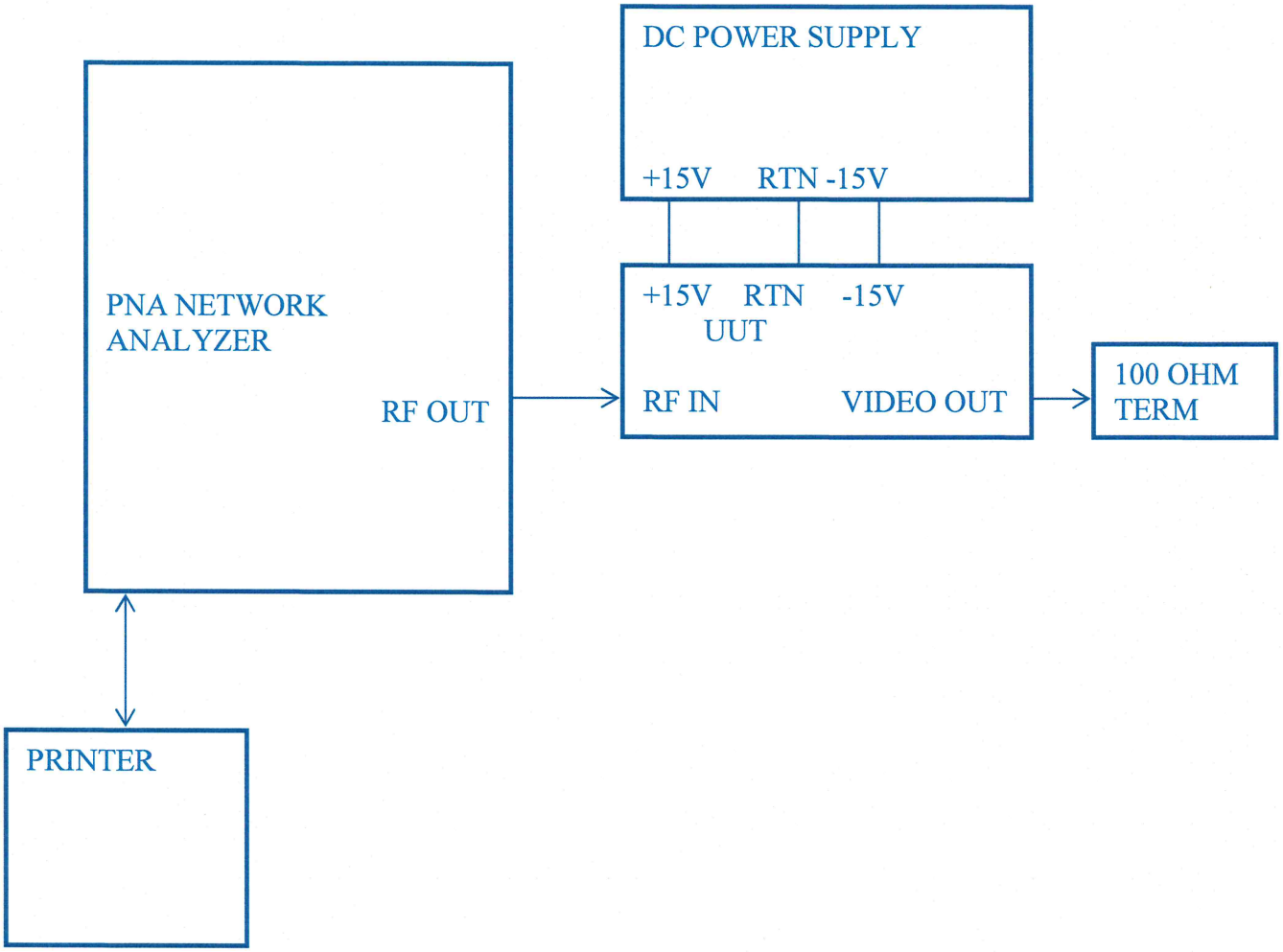

FIGURE 1
VSWR, TSS, DC OFFSET
SET-UP

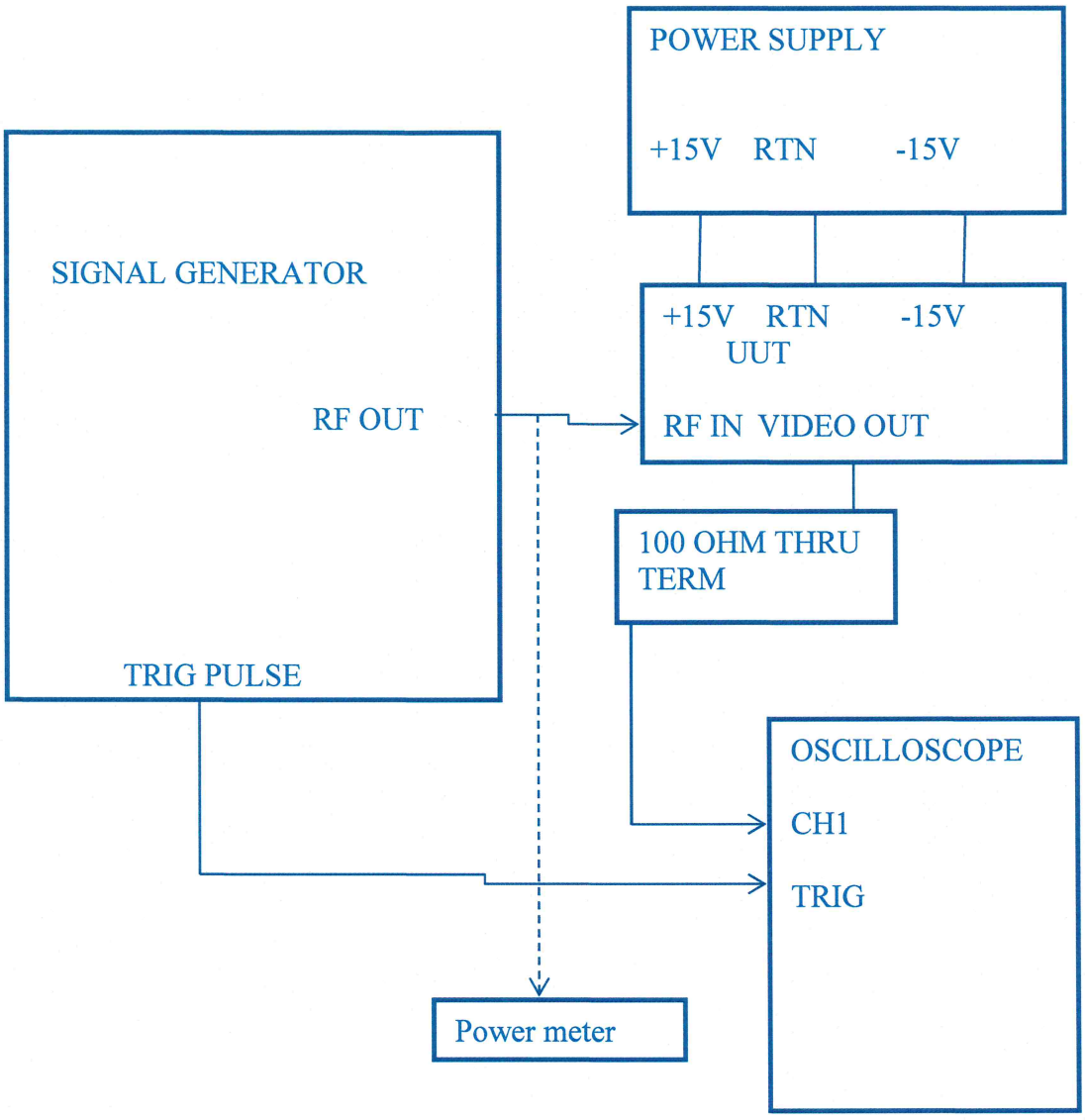

FIGURE 2

RISE TIME, RECOVERY TIME SET UP

PMI	SIZE A	CAGE CODE 71A34	DWG. NO. 28028357	REVISION A 1
	SCALE			SHEET 9 OF 15

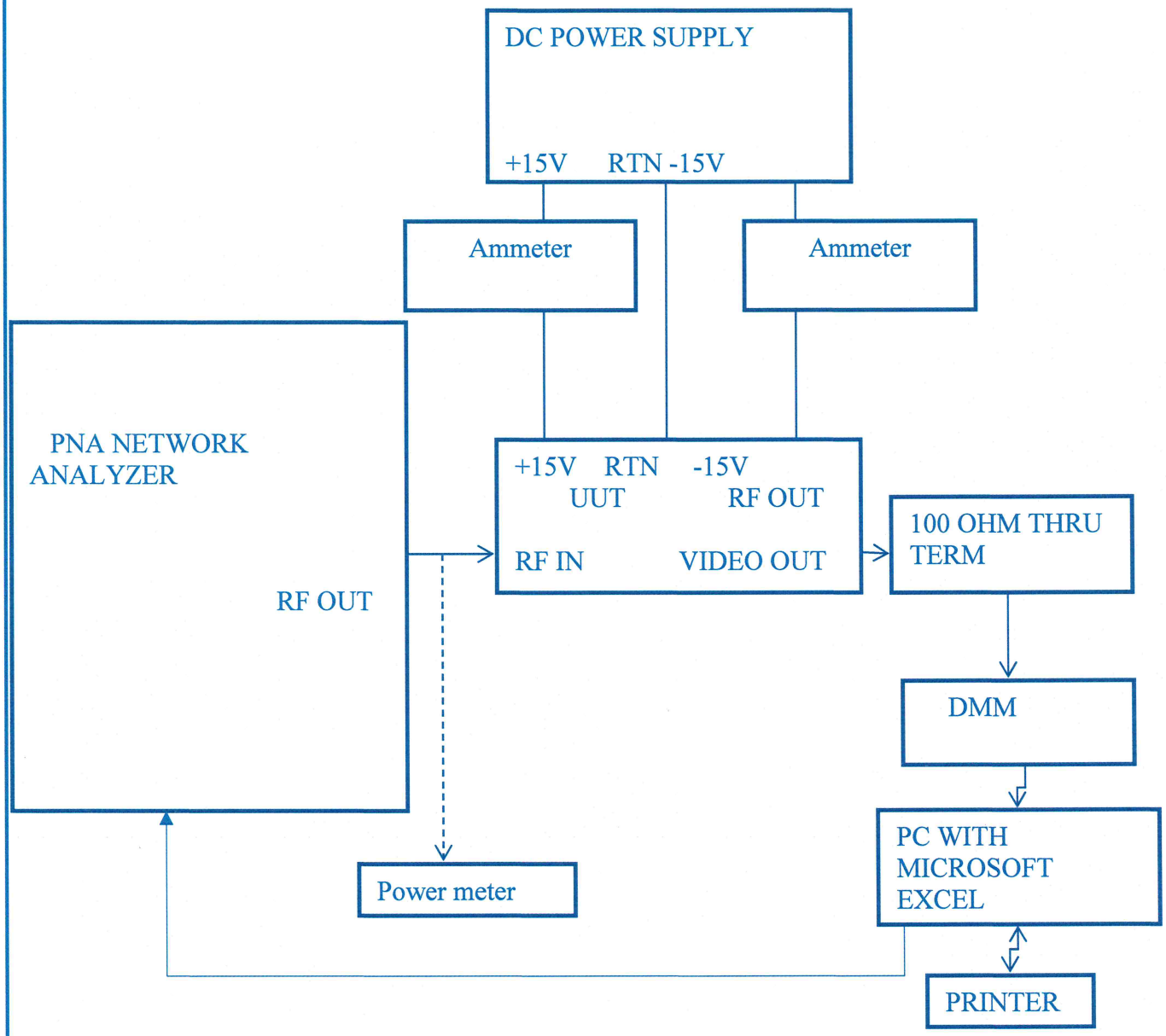

FIGURE 3

LOGGING RANGE, LOG LINEARITY, LOG SLOPE, LOG INTERCEPT, OUTPUT LEVEL STABILITY, DC CURRENT

SET-UP

PMI	SIZE A	CAGE CODE 71A34	DWG. NO. 28028357	REVISION A 1
	SCALE			SHEET 10 OF 15

SERIAL #46842/2433 **SUMMARY TEST DATA SHEET** DATE_08-12-24

REF.	NOMENCLATURE	VALUE	TOL	UNITS	+25^0 C
4.1	VSWR	1.5:1	MAX	N/A	GRAPH 1
4.2	TSS (S/N @-34 dBm)	8	MIN	dB	19.93
4.2	DC OFFSET	0 V	± 75	mV	32 mV
4.3	LOG RANGE & LOG LINEARITY @25°C	N/A	± 0.5	dB	GRAPH 2A
4.3	LOG RANGE & LOG LINEARITY @-54°C	N/A	± 0.5	dB	GRAPH 2B
4.3	LOG RANGE & LOG LINEARITY @+85°C	N/A	± 0.5	dB	GRAPH 2C
4.3	LOG SLOPE	50	± 3	dB	50.38/50.28
4.3	OUTPUT LEVEL STABILITY	N/A	±0.75	dB	PASS
4.3	FREQUENCY FLATNESS @-23 dBm	N/A	±0.25	dB	±0.2
4.3	LOG INTERCEPT	1.9	±0.2	V	1.843
4.3	DC CURRENT @+/-15VDC NO RF INPUT	+75	MAX	mA	40
		-60		mA	-40
4.3	DC CURRENT @+/-15VDC @+10 dBm	+125	MAX	mA	60
		-60		mA	-60
4.4	RISE TIME @-24 dBm	1	MAX	us	0.161
4.5	RECOVERY TIME	100	MAX	us	4.8
5.0	VISUAL & MECHANICAL INSPECTION	N/A	N/A	N/A	PASS
5.0	WEIGHT	1.4	MAX	OUNCES	1.24

TESTED BY Anton L.

QA PMI QA3 K. Hitter

PMI	SIZE A	CAGE CODE 71A34	DWG. NO. 28028357	REVISION A 1
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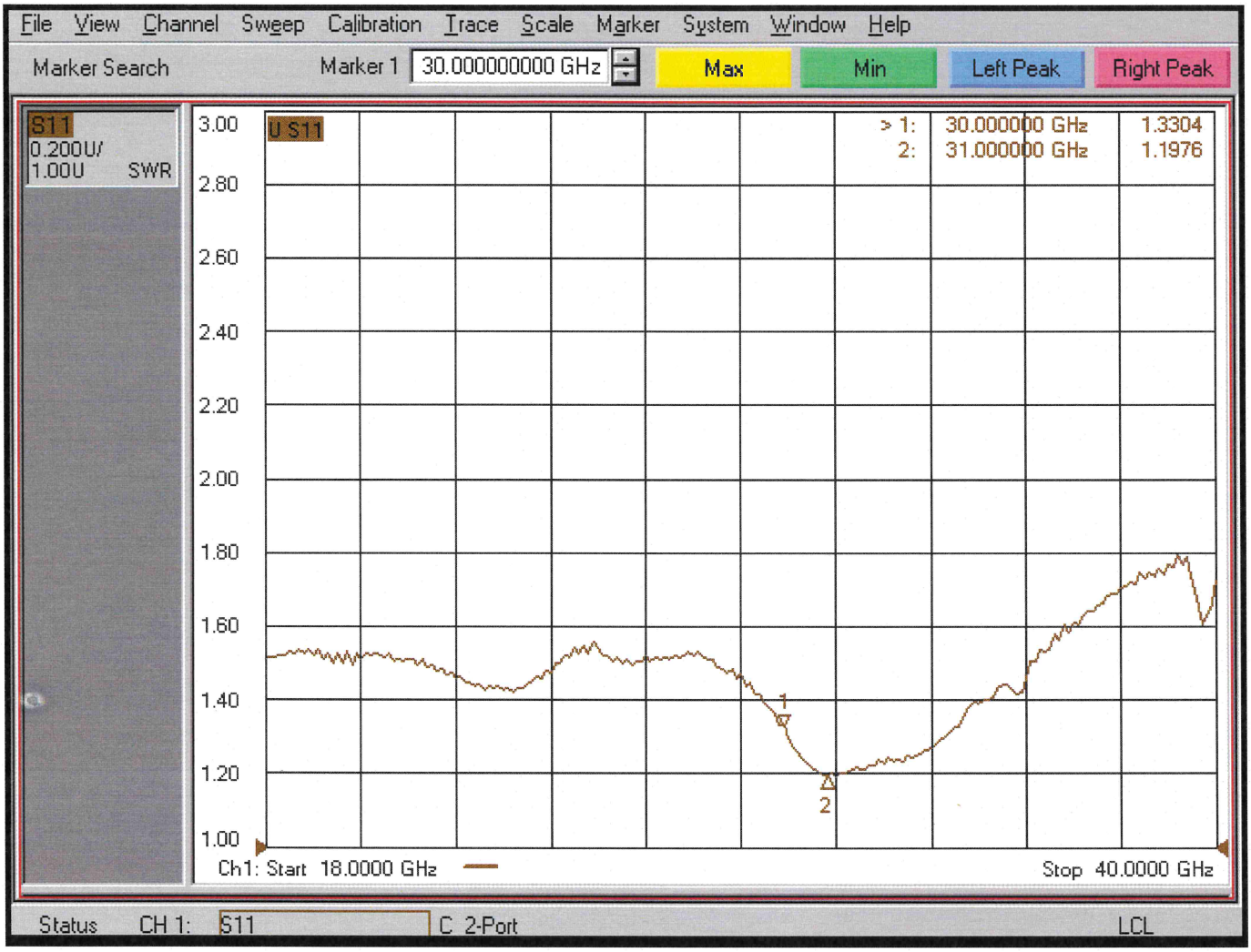
GRAPH #1 VSWR



PMI	SIZE A	CAGE CODE 71A34	DWG. NO. 28028357	REVISION A 1
	SCALE			SHEET 12 OF 15

GRAPH #2A

MODEL: DLVA-18G40G-42-50-CD-1
SERIAL NO: PL46842
DATE: 07/26/24
TESTED BY: Anton L.
Test Temp: +25C

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

Frequency			-32	-29	-26	-23	-20	-17	-14	-11	-8	-5	-2	1	4	7	10	RF Input Power (dBm)
30 GHz	INTERCEPT (mV)	1850	223	386	546	693	858	997	1150	1288	1440	1604	1750	1893	2050	2196	2360	Measured Value (mV)
	SLOPE (mV/dB)	50.38	-15	-3	6	2	16	4	6	-8	-7	6	1	-7	-1	-6	6	Error (mV)
			-0.29	-0.05	0.12	0.04	0.31	0.07	0.11	-0.15	-0.13	0.12	0.02	-0.14	-0.03	-0.13	0.13	LINEARITY ERROR (dB)

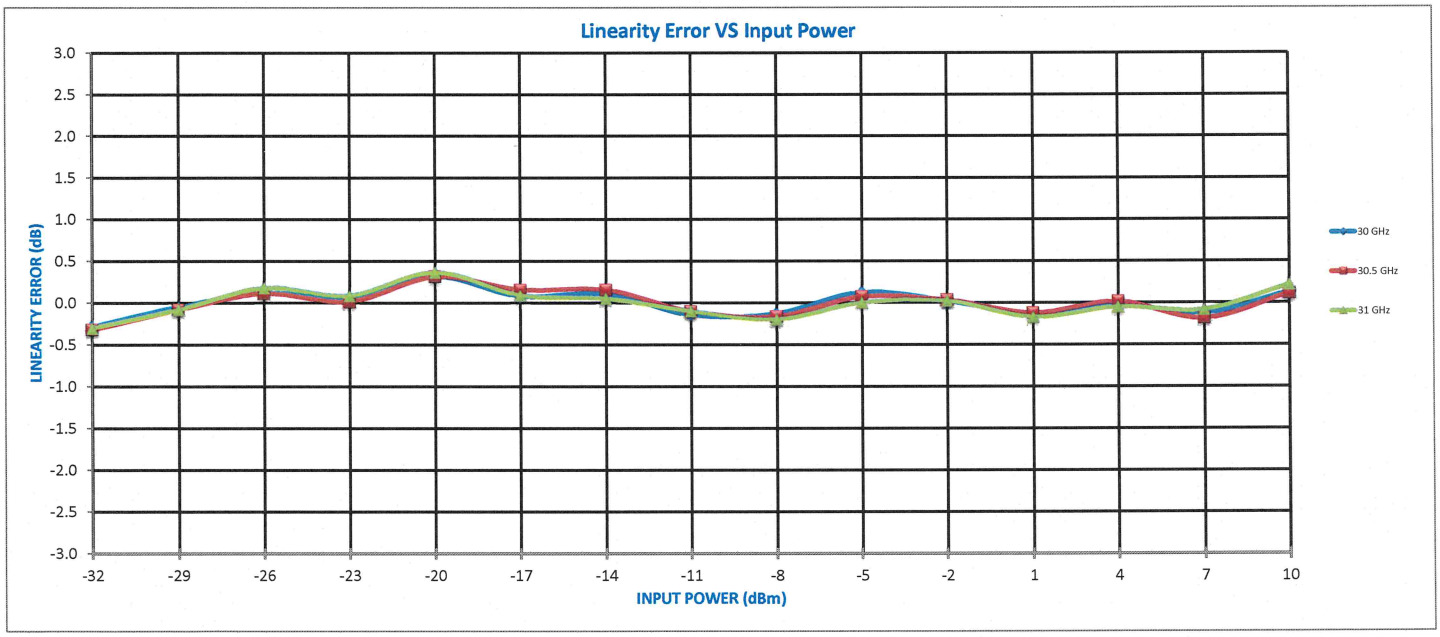
30.5 GHz	INTERCEPT (mV)	1838	211	374	535	681	847	990	1141	1279	1427	1590	1739	1882	2040	2181	2347	Measured Value (mV)
	SLOPE (mV/dB)	50.34	-16	-4	6	1	16	8	8	-5	-8	4	2	-6	1	-9	6	Error (mV)
			-0.32	-0.08	0.12	0.02	0.31	0.15	0.15	-0.10	-0.16	0.07	0.03	-0.13	0.01	-0.19	0.11	LINEARITY ERROR (dB)

31 GHz	INTERCEPT (mV)	1825	201	363	527	673	838	975	1124	1267	1413	1574	1726	1867	2024	2173	2339	Measured Value (mV)
	SLOPE (mV/dB)	50.28	-15	-4	9	4	18	4	3	-5	-10	0	1	-9	-3	-4	11	Error (mV)
			-0.30	-0.08	0.18	0.08	0.36	0.09	0.05	-0.10	-0.20	0.00	0.02	-0.17	-0.05	-0.09	0.21	LINEARITY ERROR (dB)

Error(dB)	
MAX	MIN
0.31	-0.29
0.31	-0.32
0.36	-0.30

Flatness +/- dB @-23dBm	0.20

0dBm Intercept	
1843	30 GHz
1832	30.5 GHz
1817	31 GHz



SIZE A	CAGE CODE 71A34	DWG. NO. 28028357	REVISION A 1
SCALE			SHEET 13 OF 15

GRAPH #2B

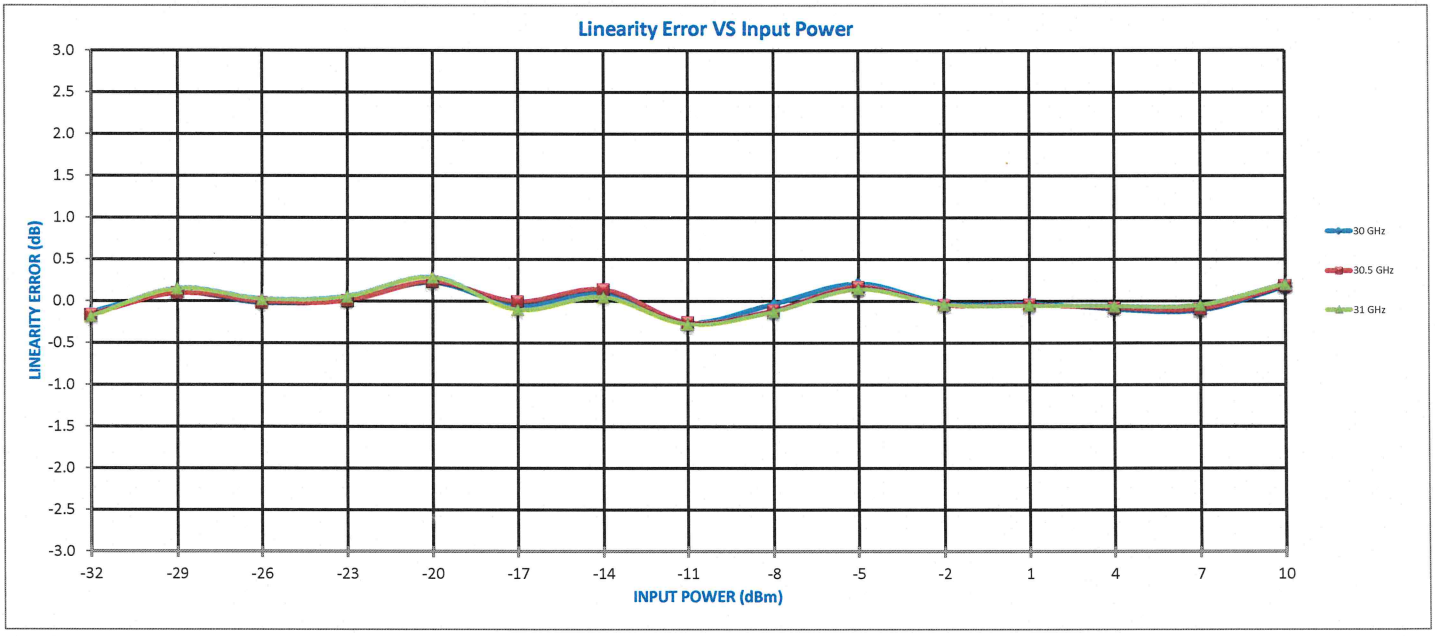
MODEL: DLVA-18G40G-42-50-CD-1
SERIAL NO: PL46842
DATE: 07/25/24
TESTED BY: Anton L.
Test Temp: -54C

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

Frequency			-32	-29	-26	-23	-20	-17	-14	-11	-8	-5	-2	1	4	7	10	RF Input Power (dBm)		
30 GHz	INTERCEPT (mV)	1858	243	406	550	703	864	1001	1159	1292	1454	1617	1756	1907	2054	2204	2369	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB)	50.25	-7	5	-2	1	11	-3	4	-13	-2	10	-2	-1	-5	-6	9	Error (mV)	MAX	MIN
			-0.14	0.10	-0.03	0.01	0.22	-0.06	0.09	-0.26	-0.04	0.20	-0.03	-0.02	-0.10	-0.11	0.17	LINEARITY ERROR (dB)	0.22	-0.26
30.5 GHz	INTERCEPT (mV)	1851	234	398	543	695	857	996	1154	1285	1443	1608	1748	1899	2048	2198	2363	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB)	50.27	-8	5	-1	0	12	0	7	-13	-6	8	-2	-2	-4	-5	9	Error (mV)	MAX	MIN
			-0.16	0.10	-0.02	0.01	0.23	-0.01	0.14	-0.26	-0.11	0.17	-0.05	-0.04	-0.08	-0.10	0.19	LINEARITY ERROR (dB)	0.23	-0.26
31 GHz	INTERCEPT (mV)	1847	233	400	544	696	858	989	1147	1281	1439	1603	1744	1894	2044	2195	2358	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB)	50.14	-9	7	1	3	14	-5	2	-14	-6	7	-2	-3	-3	-2	10	Error (mV)	MAX	MIN
			-0.18	0.15	0.02	0.05	0.28	-0.10	0.05	-0.28	-0.13	0.14	-0.04	-0.05	-0.06	-0.05	0.20	LINEARITY ERROR (dB)	0.28	-0.28

Flatness +/- dB @-23dBm	0.08

0dBm Intercept	1857	30 GHz
	1849	30.5 GHz
	1844	31 GHz



PMI	SIZE A	CAGE CODE 71A34	DWG. NO. 28028357	REVISION A 1
	SCALE			SHEET 14 OF 15

GRAPH #2C

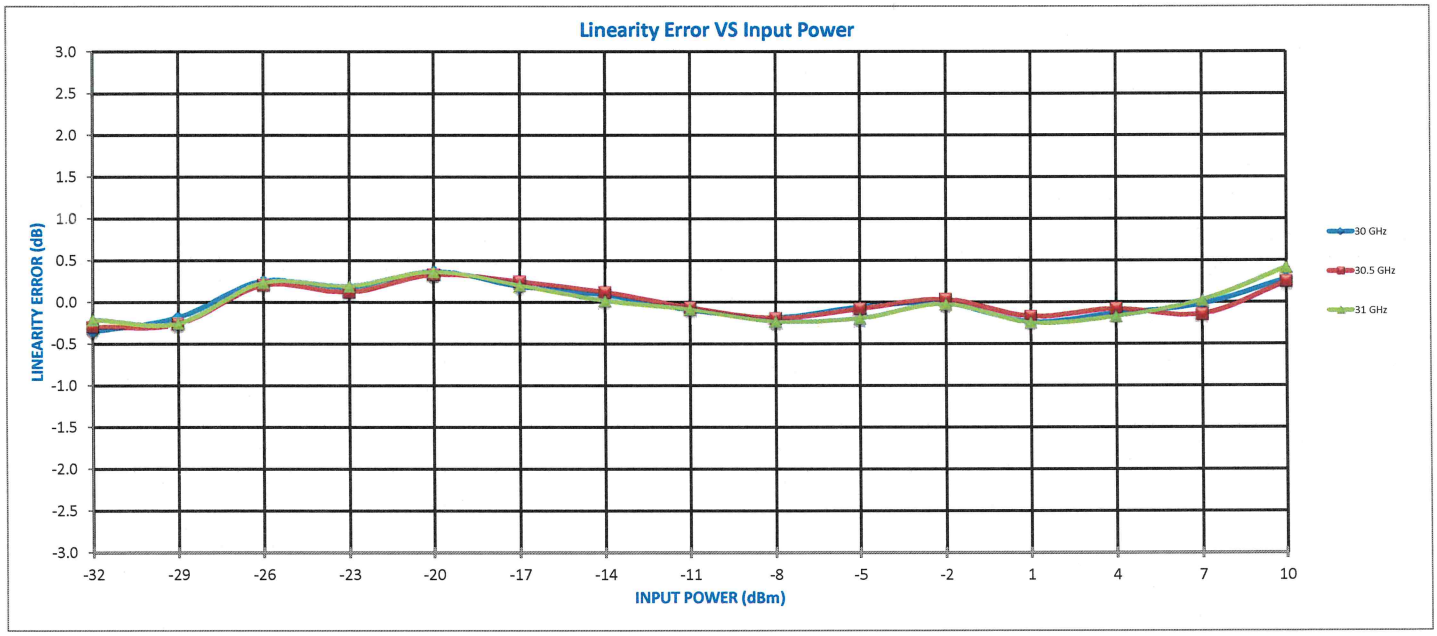
MODEL: DLVA-18G40G-42-50-CD-1
SERIAL NO: PL46842
DATE: 07/25/24
TESTED BY: Anton L.
Test Temp: +85C

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

Frequency			-32	-29	-26	-23	-20	-17	-14	-11	-8	-5	-2	1	4	7	10	RF Input Power (dBm)		
30 GHz	INTERCEPT (mV)	1803	168	328	502	648	811	953	1100	1242	1389	1547	1701	1841	1998	2155	2322	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB)	50.52	-18	-10	13	7	19	9	5	-5	-10	-3	-1	-12	-7	-1	14	Error (mV)	MAX	MIN
			-0.36	-0.19	0.25	0.14	0.37	0.18	0.09	-0.10	-0.19	-0.06	-0.01	-0.24	-0.14	-0.03	0.28	LINEARITY ERROR (dB)	0.37	-0.36
30.5 GHz	INTERCEPT (mV)	1787	158	311	486	633	795	942	1087	1229	1374	1531	1688	1829	1985	2133	2304	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB)	50.45	-15	-13	10	6	17	12	6	-3	-10	-4	2	-9	-4	-7	12	Error (mV)	MAX	MIN
			-0.30	-0.26	0.21	0.12	0.33	0.24	0.12	-0.07	-0.19	-0.08	0.03	-0.17	-0.08	-0.15	0.24	LINEARITY ERROR (dB)	0.33	-0.30
31 GHz	INTERCEPT (mV)	1773	149	298	474	623	783	926	1068	1214	1358	1511	1671	1811	1966	2127	2298	Measured Value (mV)	Error(dB)	
	SLOPE (mV/dB)	50.42	-11	-13	12	10	18	10	1	-4	-12	-10	-1	-13	-9	1	21	Error (mV)	MAX	MIN
			-0.21	-0.26	0.23	0.19	0.36	0.20	0.02	-0.09	-0.23	-0.20	-0.02	-0.25	-0.17	0.02	0.41	LINEARITY ERROR (dB)	0.41	-0.26

Flatness +/- dB @-23dBm	0.25

0dBm Intercept	1790	30 GHz
	1779	30.5 GHz
	1761	31 GHz



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	SCALE			SHEET 15 OF 15