REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	ENGINEERING RELEASE	3/28/91	S. RUMNEY
	B	PER ECN # 91-017	6/14/91	B. SICOTTE
	C	ADDED IMMERSION AND VISUAL INSPECTION	7/10/91	B. SICOTTE
	D	PER ECN # 92-004	2/11/92	B. SICOTTE
	E	PER ECN # 92-006	3/23/92	

REV STATUS	REV																
OF SHEETS	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

REV STATUS	REV																
OF SHEETS	SHEET	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

CONTRACT No.:			AMERICAN MICROWAVE CORPORATION FREDERICK, MD 21701		
DRAWN		DATE			
CHECK			ACCEPTANCE TEST PROCEDURE WESTINGHOUSE PDS 24433		
APPD.	S. RUMNEY	3/28/91			
ENGR.		3/23/92			
PROD.					
QC.		3-24-92			
			SIZE: A	FSCM: 60483	DRAWING No: 100-2236
			REV: E	SCALE: MA	SHEET 1 OF 17

ACCEPTANCE

TEST PROCEDURE
(ATP)

FOR

WESTINGHOUSE

MODEL NUMBER PDS24433

SINGLE POLE, SEVEN THROW

PIN DIODE SWITCH

Drawing Number: 100-2236
Revision E

TABLE OF CONTENTS

TABLE OF CONTENTS 3

1.0 SCOPE 5

2.0 EQUIPMENT LIST 5

3.0 INSERTION LOSS 6
3.1 Normalization of the test measurement system. 6
3.2 Measurement of the Unit Under Test (UUT). 6

4.0 VSWR 7
4.1 Normalization of the test measurement system. 7
4.2 Measurement of the input VSWR of the UUT. 8

5.0 Isolation (RF signal on/off ratio) 9
5.1 Normalization of the test measurement system. 9
5.2 Measurement of Isolation 9

6.0 Switching Speed 9
6.1 Measurement of switching speed. 9

Test Data Sheet I 11

Test Data Sheet II 12

Test Data Sheet III 13

Test Data Sheet IV 15

Appendix A 16

Appendix B 17
1.0 Sample RF Power Measurement 17
2.0 Measurement of DC voltage 17

Acceptance test procedure (ATP) preconditioning

As a precondition to performing this ATP, the unit under test (UUT) must be screened per the requirements in table A. All procedures reference MIL-S-3928D except where noted.

Description	Requirements	Test Method of MIL-S-3928D
Visual and Mechanical inspection		4.7.1

1.0 SCOPE

The purpose of this document is to provide an electrical testing procedure for the Westinghouse model number PDS24433 single pole, seven throw PIN diode switch. This document is **not** a substitute for the American Microwave standard test procedures. This procedure is only to be performed by a test technician experienced in the testing of RF and microwave devices.

2.0 EQUIPMENT LIST

The following equipment is to be used in conjunction with this Acceptance Test Procedure (ATP) provided that all said equipment has displayed a valid calibration notice that can be traced to the National Institute of Standards and Technologies (NIST).

TABLE OF APPROVED TEST EQUIPMENT

SN	ITEM	MANUFACTURER	MODEL NUMBER
1	RF Source	Hewlett Packard	8350B
2	Not used	Not used	Not used
3	Power Meter (see note 1)	Hewlett Packard	436A
4	Power Supply	Hewlett Packard	721A
5	Termination, 50 ohm	Mid-West	2444
6	Power Supply	Hewlett Packard	721A
7	Detector	Hewlett Packard	11664A
8	Network Analyzer	Hewlett Packard	8757A
9	VSWR Bridge	Hewlett Packard	85027E
10	Voltmeter (see note 1)	Beckman	DM25
11	Calibrated Short/Open	Wiltron	
12	Not used	Not used	Not used
13	Not used	Not used	Not used
14	Pulse Generator	Hewlett Packard	8013B
15	Oscilloscope	Tektronix	485
16	Signal Generator	Hewlett Packard	618 C
17	Double Balanced Mixer	Vari-L	DBM-1800
18	Low Pass Filter, 20 Mhz	Mini-Circuits	TBD
19	PDS24433 drive module (schematic is enclosed as appendix A)	AMC	SK-321

20	Signal Generator	Hewlett Packard	618-B

table i

Note 1: Further to paragraph 1.0, this test procedure assumes a rudimentary knowledge of testing techniques. The test equipment referenced to this note are listed as acceptable for measuring required voltages and output power for verification purposes. Sample applications of the equipment are contained in Appendix B for reference and may be applied to measure any specified RF power or DC voltage.

3.0 INSERTION LOSS

3.1 Normalization of the test measurement system.

3.1.1 Connect the test equipment as in figure i with swept frequencies set to: START = 1.215 GHz, STOP = 1.400 GHz. Set RF power level to +0 dBm

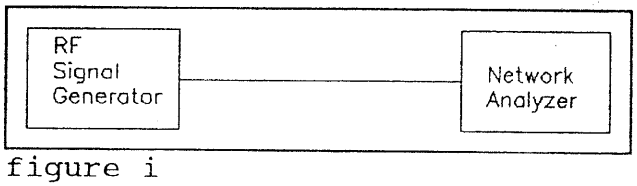


figure i

3.1.2 Store the through line reference level in the internal memory of the Network Analyzer.

3.2 Measurement of the Unit Under Test (UUT).

3.2.1 Connect the test equipment and the UUT as in figure ii with J8 as RF input and J1 as RF output. Set RF power level to +0 dBm.

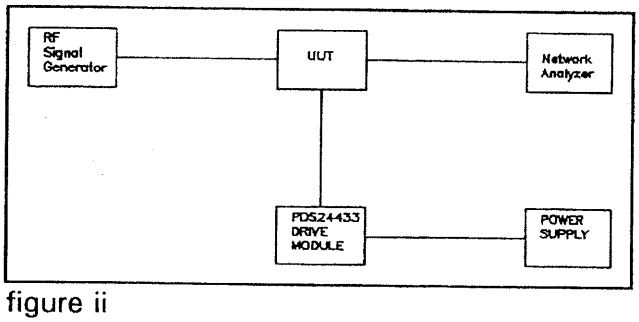


figure ii

3.2.2 Apply the Digital code of 000 to the UUT via the PDS24433 drive module (SN 19 on the approved equipment list).

3.2.3 Observe and record on Test Data Sheet I the maximum insertion loss displayed on the Network Analyzer. Maximum Insertion loss to be 1.4 dB.

3.2.4 Repeat 3.2.1 through 3.2.3 for RF outputs J2 through J7 using the control codes listed in table ii.

3-BIT CONTROL CODE	RF PORT ENABLED J8 IS COMMON PORT
000	J1
001	J2
010	J3
011	J4
100	J5
101	J6
110	J7
111	NOT USED

table ii

3.2.5 Record on Test Data Sheet II the worst case insertion loss match between output arms J1 - J7

4.0 VSWR

4.1 Normalization of the test measurement system.

4.1.1 Connect the equipment as shown in figure iii with the calibrated short connected to the VSWR bridge. Set RF power level to +0 dBm

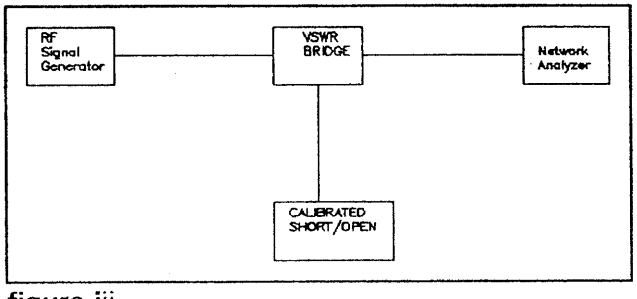


figure iii

4.1.2 Store the Short circuit reference in the internal memory of the Network Analyzer.

4.1.3 Connect the equipment as shown in figure iii with the calibrated open connected to the VSWR bridge.

4.1.4 Store the open circuit reference in the internal memory of the Network Analyzer.

4.1.5 Connect the equipment as shown in figure iii with the calibrated short connected to the VSWR bridge.

4.1.6 Store the short circuit reference in the internal memory of the Network Analyzer.

4.2 Measurement of the input VSWR of the UUT.

4.2.1 Connect the UUT and the equipment as shown in figure iv with Rf input J8 connected to the VSWR bridge and a 50 Ω terminated connected to J1.

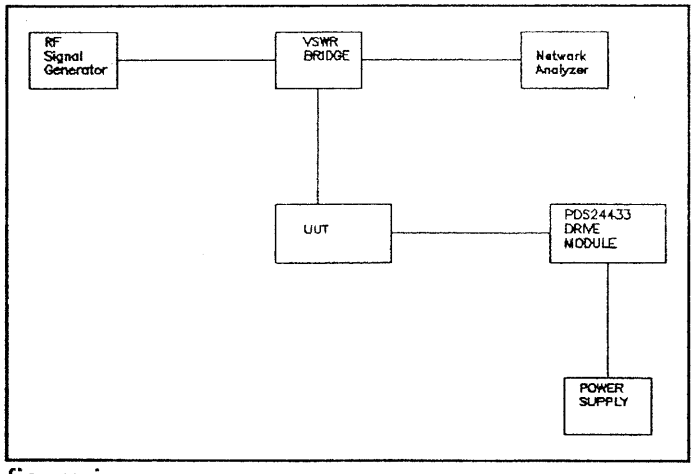


figure iv

4.2.2 Enable the RF path J8 to J1 by applying a logic 000 to the PDS24433 drive module.

4.2.3 Observe and record the maximum VSWR shown on test data sheet III. VSWR to be 1.9:1 Maximum

4.2.4 Repeat 4.2.1 through 4.2.3 for RF outputs J2 through J7 per table ii.

4.3 Measurement of the output VSWR of the UUT.

4.3.1 Connect the UUT and the equipment as shown in figure iv with RF output J1 connected to the VSWR bridge and a 50 Ω termination connected to J8.

4.3.2 Enable the RF path J1 to J8 by applying a logic 000 to the PDS24433 drive module.

4.3.3 Observe and record the maximum VSWR shown on test data sheet III. VSWR to be 1.9:1 Maximum

4.3.4 Repeat 4.3.1 through 4.3.3 for RF outputs J2 through J7 per table ii.

5.0 Isolation (RF signal on/off ratio)

5.1 Normalization of the test measurement system.

5.1.1 Set up the equipment and the UUT as shown in figure v with J8 connected to the RF signal generator, J1 connected to the Network Analyzer, and a 50 Ω termination connected to the unusedRF ports on the UUT. Set RF power level to +0 dBm.

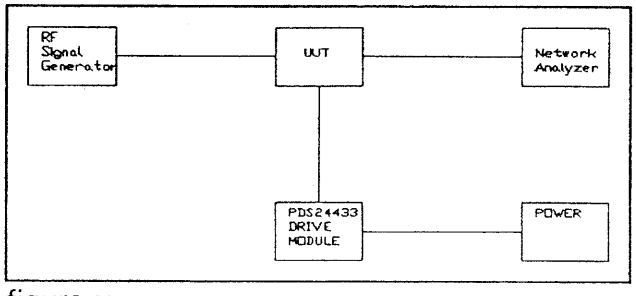


figure v

5.1.2 Enable the RF path J1 through J8 by applying a logic 000 to the PDS24433 drive module.

5.1.3 Store the displayed insertion loss in the internal memory of the Network Analyzer.

5.2 Measurement of Isolation

5.2.1 Disable the RF path J1 to J8 by an adjacent RF path, in this case the J8 to J2 path is appropriate.

5.2.2 Observe and record the minimum Isolation on test data sheet IV. Minimum Isolation to be -43 dB.

5.2.3 Repeat 5.1 through 5.2.2 for RF ports J2 through J7 per table ii.

6.0 Switching Speed

6.1 Measurement of switching speed.

6.1.1 Set up the equipment as shown in figure vi with J8 connected to RF 1 and J1 connected to the Mixer. Terminate all unused ports in a 50 Ω termination. Adjust the

pulse width on the pulse generator to 10 μsec TTL "high" and 10 μsec TTL "low".

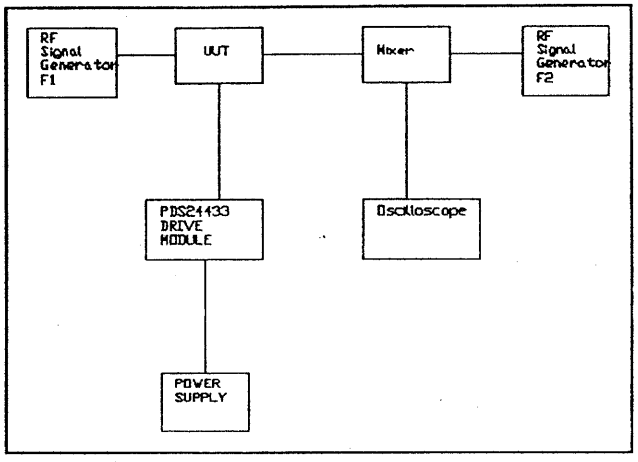


figure vi

6.1.2 Toggle between the J8 to J1 port and an adjacent RF port, in this case J8 to J2, by applying alternating enabling codes of 000 and 001 to the PDS24433 drive module.

6.1.3 Measure the RF on time by observing the time delay between the 50% voltage point of the pulsed TTL drive input and the 95% voltage point of the on going RF output (90% RF power). Record the on time on test data sheet I.

6.1.4 Measure the RF off time by observing the time delay between the 50% voltage point of the pulsed TTL drive input and the 32% voltage point of the off going RF output (10% RF power). Record the off time on test data sheet I.

6.1.5 Repeat 6.1.1 through 6.1.5 for RF ports J2 through J7 per table ii.

Drawing Number:100-2236
Revision: E
March 23, 1992

Westinghouse
PDS24433 REV.____
Test Data Sheet I

Serial Number_____ Technician:_____

Dated:_____

Approved:_____

Dated:_____

Frequency: 1.215 GHz to 1.400 GHz

DC Power: +20 VDC @ 215 mA MAX
-20 VDC @ 35 mA MAX

3.2.3 Insertion loss:

Enabled RF Path J8 TO	Maximum Measured Insertion loss	Specified Insertion Loss	PASS Y/N
J1		1.4 db MAX	
J2		1.4 db MAX	
J3		1.4 db MAX	
J4		1.4 db MAX	
J5		1.4 db MAX	
J6		1.4 db MAX	
J7		1.4 db MAX	

Drawing Number:100-2236
Revision: E
March 23, 1992

Westinghouse
PDS24433 REV.____
Test Data Sheet II

Serial Number_____ Technician:_____

Dated:_____

Approved:_____

Dated:_____

Frequency: 1.215 GHz to 1.400 GHz

DC Power: +20 VDC @ 215 mA MAX
-20 VDC @ 35 mA MAX

Insertion Loss Match:

Enabled RF Path J8 to	WORST CASE INSERTION LOSS MATCH TO ANY OTHER OUTPUT ARM AT ANY FREQUENCY FROM 1.215 GHz TO 1.400 GHz			Specified Insertion Loss Match	PASS Y/N
	IL MATCH	REF ARM	FREQ. GHz		
J1				IL MATCH WITHIN 0.2 dB	
J2				IL MATCH WITHIN 0.2 dB	
J3				IL MATCH WITHIN 0.2 dB	
J4				IL MATCH WITHIN 0.2 dB	
J5				IL MATCH WITHIN 0.2 dB	
J6				IL MATCH WITHIN 0.2 dB	
J7				IL MATCH WITHIN 0.2 dB	

Westinghouse
PDS24433 REV.____
Test Data Sheet III

Serial Number_____ Technician:_____

Dated:_____

Approved:_____

Dated:_____

4.2.3 Input VSWR

Enabled RF Path J8 to	Measured Input VSWR	Specified Input VSWR	Pass Y/N
J1		1.9:1	
J2		1.9:1	
J3		1.9:1	
J4		1.9:1	
J5		1.9:1	
J6		1.9:1	
J7		1.9:1	

4.3.3 Output VSWR

Enabled RF Path __ to J8	Measured Output VSWR	Specified Output VSWR	Pass Y/N
J1		1.9:1	
J2		1.9:1	
J3		1.9:1	
J4		1.9:1	
J5		1.9:1	
J6		1.9:1	

J7		1.9:1	

Westinghouse
PDS24433 REV._____
Test Data Sheet IV

Serial Number_____ Technician:_____

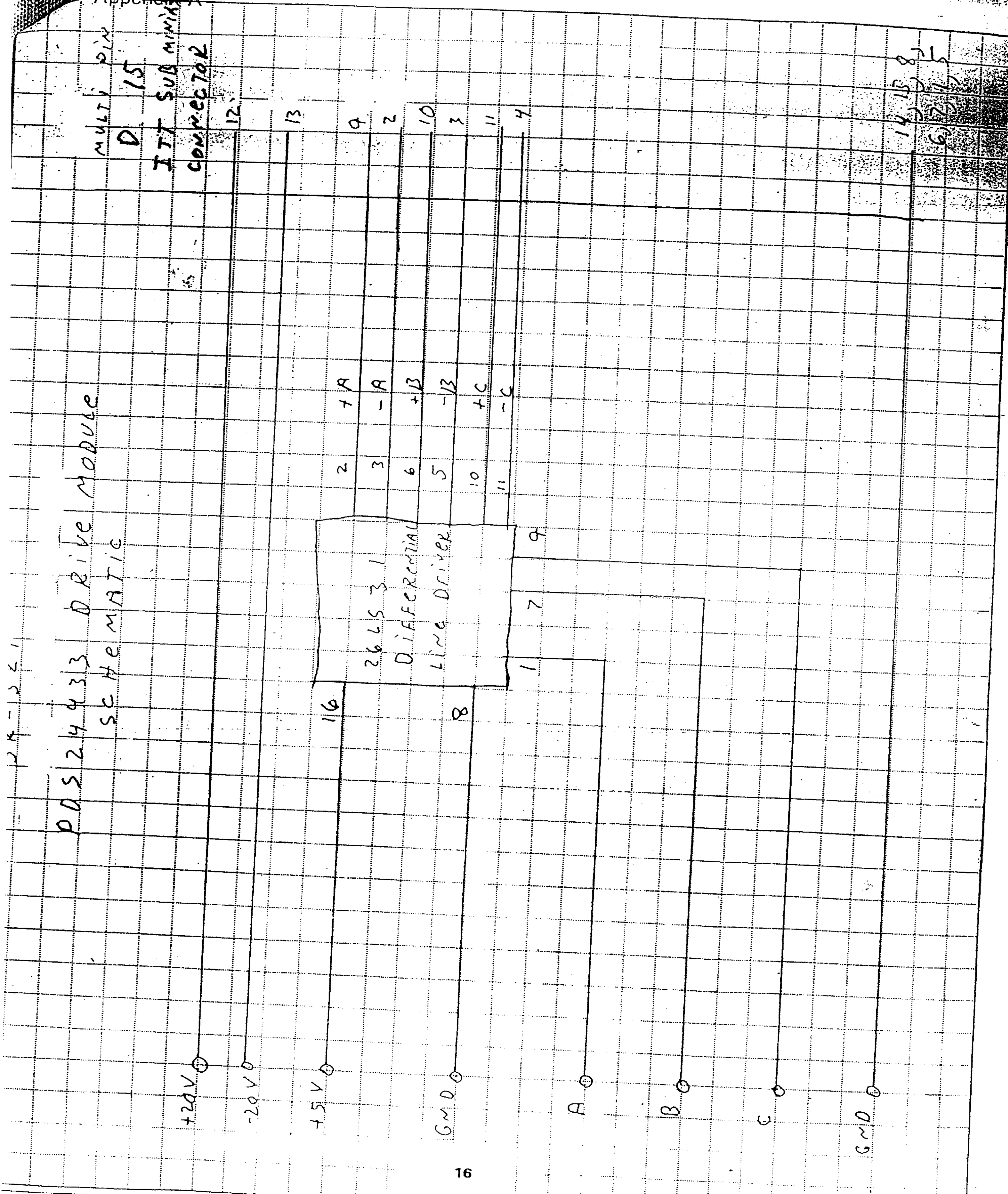
Dated:_____

Approved:_____

5.2.2 Isolation

"OFF" RF Path J8 to	Measured Isolation	Specified Isolation	Pass Y/N
J1		-43 dB min	
J2		-43 dB min	
J3		-43 dB min	
J4		-43 dB min	
J5		-43 dB min	
J6		-43 dB min	
J7		-43 dB min	

APPENDIX A


DDS24433 Drive Module
Schematic
MULTI PIN
D 15
ITT SUB MINIATURE
CONNECTOR
26LS31
Differential
Line Driver
+A
-A
+B
-B
+C
-C
+20V
-20V
+5V
GND
A
B
C
GND

Appendix B

1.0 Sample RF Power Measurement

1.1 Set up equipment as shown in figure i

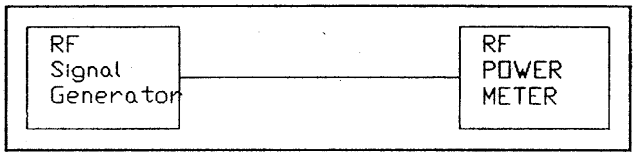


figure i

1.2 Adjust the RF Signal Generator power until the power level displayed on the RF Power Meter reads +0 dBm.

1.3 The RF Signal Generator is now calibrated in power. Disconnect the RF power meter.

2.0 Measurement of DC voltage

2.1 Set up equipment as shown in figure ii.

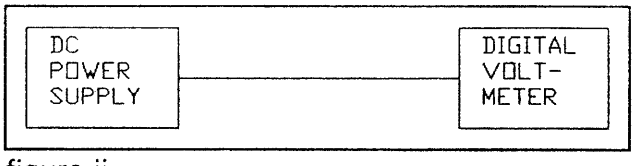


figure ii

2.2 Adjust the voltage on the DC Power Supply until the Digital Voltmeter reads +20 Volts.

2.3 Repeat 2.2 for -20 Volts.