



**AMERICAN MICROWAVE
CORPORATION**

TEST DATA

ON

2.0 TO 18.0 GHz

REFLECTIVE

SP4T, PIN DIODE SWITCH

AMC MODEL No : SWN-4TDR-HILL

U.S. AIR FORCE PART NUMBER : 16VE087-1

**NSN : 5985-01-060-0113WF
(SERIAL NUMBER : 6MS50729)**

**ELECTRICAL DESIGNS
BY
A. K. GORWARA**

**REPORT PREPARED
BY
P. D. WOOD**

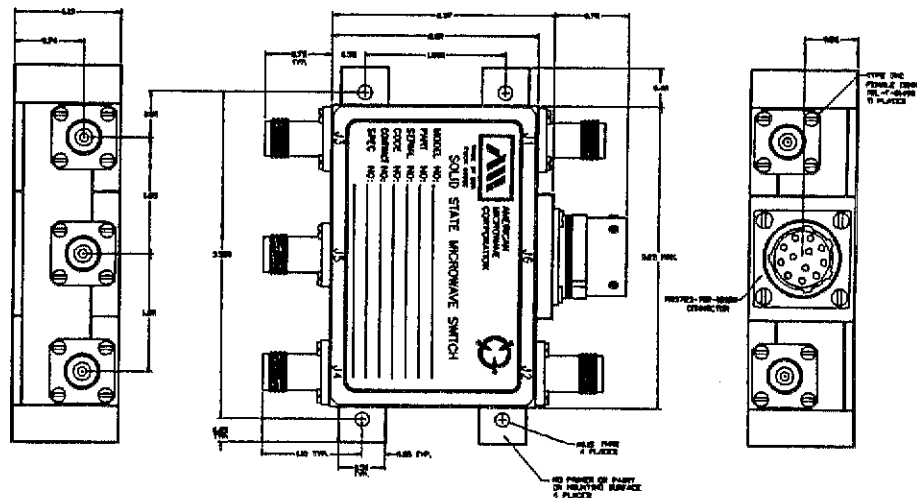
**THE
AMERICAN MICROWAVE
CORPORATION**

OCTOBER 31, 1995

7311G GROVE ROAD, FREDERICK, MARYLAND 21701 • Tel. (301) 662-4700 • Fax (301) 662-4938

AMERICAN MICROWAVE CORPORATION

2.0 TO 18.0 GHz REFLECTIVE, SP4T PIN DIODE SWITCH



• 2.0 TO 18.0 GHz • REFLECTIVE • MIL-SPEC RF & MULTIPIN CONNECTOR

AMC MODEL No: SWN-4TDR-HILL

SPECIFICATIONS:

• FREQUENCY RANGE	: 2.0 TO 18.0 GHz
• INSERTION LOSS (ONE CHANNEL)	: 2.0 TO 11.0 GHz @ 2.0 dB TYP. (2.5 dB MAX.) : 11.0 TO 16.0 GHz @ 2.5 dB TYP. (2.8 dB MAX.) : 16.0 TO 18.0 GHz @ 2.75 dB TYP. (3.1 dB MAX.)
• INSERTION LOSS (TWO CHANNEL)	: 2.0 TO 11.0 GHz @ 5.5 dB TYP. (8.4 dB MAX.) : 11.0 TO 16.0 GHz @ 7.1 dB TYP. (8.7 dB MAX.) : 16.0 TO 18.0 GHz @ 7.5 dB TYP. (9.0 dB MAX.)
• INSERTION LOSS BALANCE	: 2.0 TO 18.0 GHz @ 1.5 dB TYP. (2.2 dB MAX.) (Either Arm Terminated)
• VSWR (ONE CHANNEL)	: 2.0:1 (-9.54 dBr) TYP., [2.2:1 (-8.50 dBr) MAX.]
• VSWR (TWO CHANNELS)	: 2.6:1 (-7.04 dBr) TYP., [4.4:1 (-4.00 dBr) MAX.]
• ISOLATION	: 70 dB TYP., 45 dB MIN.
• SWITCHING SPEED	: ON : 130 nS TYP. } 200 nS MAX. : OFF : 75 nS TYP. }
• VIDEO TRANSIENTS	: 150 mV P-P IN A 300 MHz BW, 60 mV P-P IN A 20 MHz BW.
• POWER HANDLING CAPABILITY	: 1 Watt CW / 100 Watts Peak with a 0.005% Duty Cycle (1 RF Channel @ Insertion Loss) : 250 mW CW / 25 Watts Peak (2 RF Channels @ Insertion Loss)
• CONTROL	: TTL Compatible
• DC POWER (ONE CHANNEL)	: + 5 vdc @ 84 mA TYP., 105 mA MAX. : - 15 vdc @ 30 mA TYP., 60 mA MAX.
• DC POWER (TWO CHANNELS)	: + 5 vdc @ 58 mA TYP., 70 mA MAX. : - 15 vdc @ 58 mA TYP., 70 mA MAX.
• CONNECTORS	: TNC FEMALE RF CONNECTORS TO MIL-T-81490 : MULTIPIN CONTROL CONNECTOR TO M83723-72R-1212N
• SIZE	: 3.23" X 2.20" X 1.13", <13 oz.

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SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 3

SERIAL NUMBER

: 4MS50729

TECHNICIAN

: RENE AFABLE

VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)

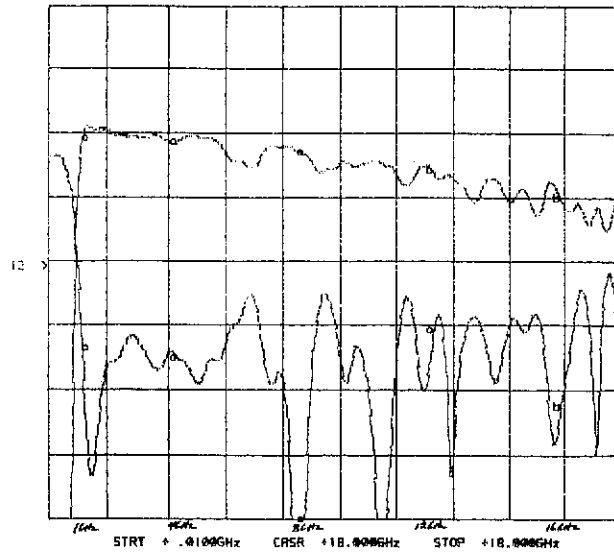
- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



INSERTION LOSS

J5-J1

CH1: 6 -11 REF : 2.58 dB 1.0 dB/ REF : 3.10 dB
 CH2: 6 -11 REF : 12.28 dB 5.0 dB/ REF : 8.52 dB



FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.13 dB	-15.19 dBr
2.0 GHz	1.10 dB	-16.19 dBr
4.0 GHz	1.21 dB	-15.90 dBr
6.0 GHz	1.50 dB	-12.04 dBr
8.0 GHz	1.38 dB	-31.40 dBr
10.0 GHz	1.49 dB	-20.32 dBr
12.0 GHz	1.68 dB	-13.78 dBr
14.0 GHz	1.83 dB	-17.08 dBr
16.0 GHz	2.06 dB	-19.83 dBr
18.0 GHz	2.59 dB	-13.20 dBr

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 4

SERIAL NUMBER

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TECHNICIAN

: RENE AFABLE

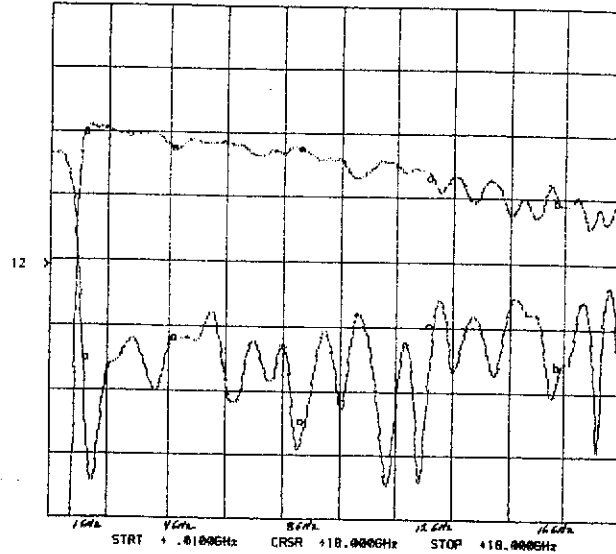
VOLTAGE & CURRENT DRAW

**: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
 - 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)**



**INSERTION LOSS
 J5-J2**

CH1: A -M - 2.00 dB
 1.0 dB/ REF - 3.10 dB
 CH2: B -M - 11.91 dB
 5.0 dB/ REF - 0.52 dB



FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.07 dB	-16.08 dB
2.0 GHz	1.04 dB	-16.36 dB
4.0 GHz	1.26 dB	-14.34 dB
6.0 GHz	1.23 dB	-17.18 dB
8.0 GHz	1.33 dB	-20.86 dB
10.0 GHz	1.61 dB	-25.75 dB
12.0 GHz	1.78 dB	-13.31 dB
14.0 GHz	1.90 dB	-15.87 dB
16.0 GHz	2.14 dB	-16.40 dB
18.0 GHz	2.80 dB	-11.91 dB

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 5

SERIAL NUMBER

: 4MS50729

TECHNICIAN

: RENE AFABLE

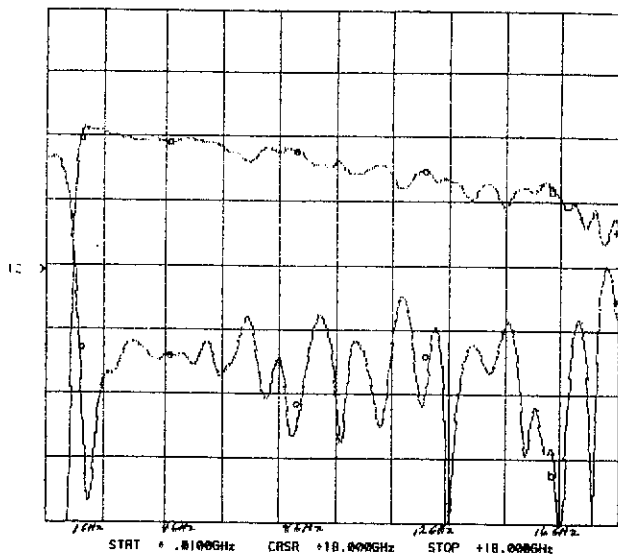
VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
 - 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



INSERTION LOSS
 J5-J3

CH1: A -M - 2.56 dB CH2: B -M - 11.33 dB
 1.0 dB/ REF - 3.10 dB 5.0 dB/ REF - 8.52 dB



FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.12 dB	-14.91 dB _r
2.0 GHz	1.07 dB	-16.86 dB _r
4.0 GHz	1.18 dB	-15.54 dB _r
6.0 GHz	1.37 dB	-13.93 dB _r
8.0 GHz	1.35 dB	-19.28 dB _r
10.0 GHz	1.59 dB	-16.09 dB _r
12.0 GHz	1.62 dB	-15.49 dB _r
14.0 GHz	1.88 dB	-15.97 dB _r
16.0 GHz	1.91 dB	-24.66 dB _r
18.0 GHz	2.56 dB	-11.33 dB _r

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 6

SERIAL NUMBER

: 4MS50729

TECHNICIAN

: RENE AFABLE

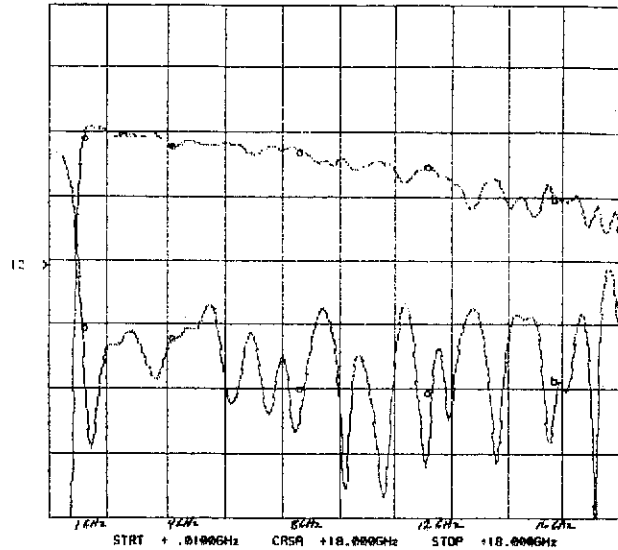
VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
 - 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



INSERTION LOSS
 J5-J4

CH1: A -M - 2.60 dB CH2: B -M - 12.02 dB
 1.0 dB/ REF - 3.10 dB 5.0 dB/ REF - 8.52 dB



FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.19 dB	-13.70 dB _r
2.0 GHz	1.12 dB	-15.09 dB _r
4.0 GHz	1.29 dB	-14.48 dB _r
6.0 GHz	1.30 dB	-16.21 dB _r
8.0 GHz	1.35 dB	-18.55 dB _r
10.0 GHz	1.54 dB	-18.59 dB _r
12.0 GHz	1.59 dB	-18.69 dB _r
14.0 GHz	1.81 dB	-23.81 dB _r
16.0 GHz	2.11 dB	-17.91 dB _r
18.0 GHz	2.60 dB	-12.02 dB _r

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 7

SERIAL NUMBER

: 4MS50729

TECHNICIAN

: RENE AFABLE

VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)

- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)

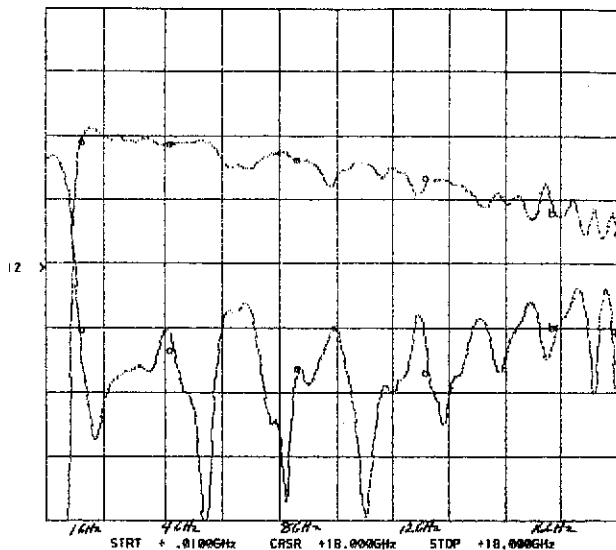


INSERTION LOSS

J1-J5

OUTPUT ON

CH1: A -M - 2.56 dB CH2: B -R - 14.06 dB
 1.0 dB/ REF - 3.10 dB 5.0 dB/ REF - 8.52 dB



FREQUENCY	RETURN LOSS OUTPUT ON
1.0 GHz	-13.50 dBr
2.0 GHz	-17.53 dBr
4.0 GHz	-15.15 dBr
6.0 GHz	-12.00 dBr
8.0 GHz	-16.54 dBr
10.0 GHz	-27.00 dBr
12.0 GHz	-16.88 dBr
14.0 GHz	-15.89 dBr
16.0 GHz	-13.44 dBr
18.0 GHz	-14.08 dBr

OCTOBER 31, 1995

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SWN-4TDR-HILL

PAGE 8

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TECHNICIAN

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VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
 - 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)

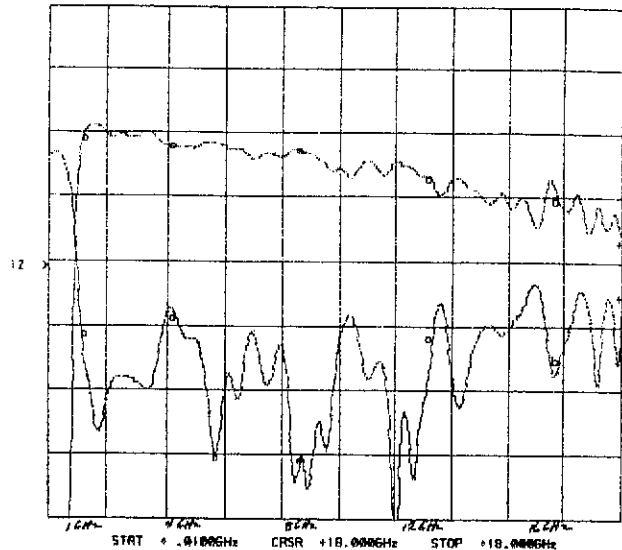


INSERTION LOSS

J2-J5

OUTPUT ON

CH1: A -M - 2.83 dB CH2: B -M - 11.26 dB
 1.0 dB/ REF - 3.10 dB 5.0 dB/ REF - 8.52 dB



FREQUENCY	RETURN LOSS OUTPUT ON
1.0 GHz	-14.00 dBr
2.0 GHz	-17.50 dBr
4.0 GHz	-12.80 dBr
6.0 GHz	-17.30 dBr
8.0 GHz	-24.10 dBr
10.0 GHz	-17.40 dBr
12.0 GHz	-14.33 dBr
14.0 GHz	-13.84 dBr
16.0 GHz	-16.04 dBr
18.0 GHz	-11.26 dBr

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 9

SERIAL NUMBER

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TECHNICIAN

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VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)

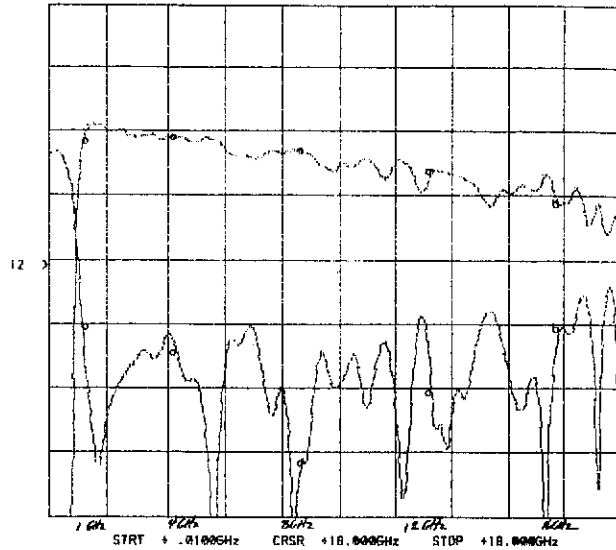


INSERTION LOSS

J3-J5

OUTPUT ON

CH1: A -M - 2.83 dB CH2: B -M - 16.97 dB
1.0 dB/ REF - 3.10 dB 5.0 dB/ REF - 8.52 dB



FREQUENCY	RETURN LOSS OUTPUT ON
1.0 GHz	-13.50 dB
2.0 GHz	-18.54 dB
4.0 GHz	-15.68 dB
6.0 GHz	-14.60 dB
8.0 GHz	-24.20 dB
10.0 GHz	-18.87 dB
12.0 GHz	-18.89 dB
14.0 GHz	-13.24 dB
16.0 GHz	-13.72 dB
18.0 GHz	-16.97 dB

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 10

SERIAL NUMBER

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TECHNICIAN

: RENE AFABLE

VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
 - 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)

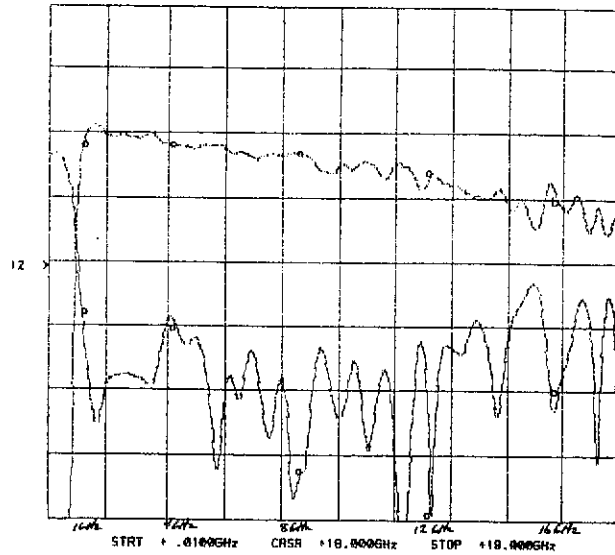


INSERTION LOSS

J4-J5

OUTPUT ON

CH1: A -M - 2.81 dB CH2: B -M - 16.07 dB
 1.0 dB/ REF - 3.10 dB 5.0 dB/ REF - 0.52 dB



FREQUENCY	RETURN LOSS OUTPUT ON
1.0 GHz	-12.30 dB
2.0 GHz	-17.34 dB
4.0 GHz	-13.57 dB
6.0 GHz	-18.30 dB
8.0 GHz	-24.70 dB
10.0 GHz	-22.72 dB
12.0 GHz	-28.03 dB
14.0 GHz	-20.25 dB
16.0 GHz	-18.42 dB
18.0 GHz	-16.07 dB

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 11

SERIAL NUMBER

: 4MS50729

TECHNICIAN

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VOLTAGE & CURRENT DRAW

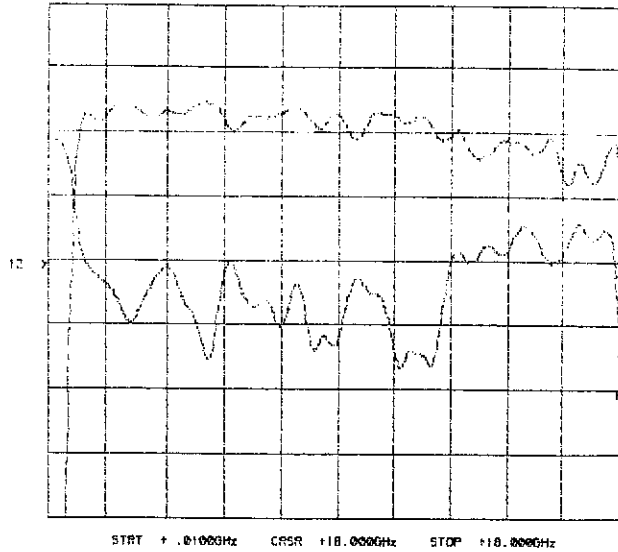
: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)

- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



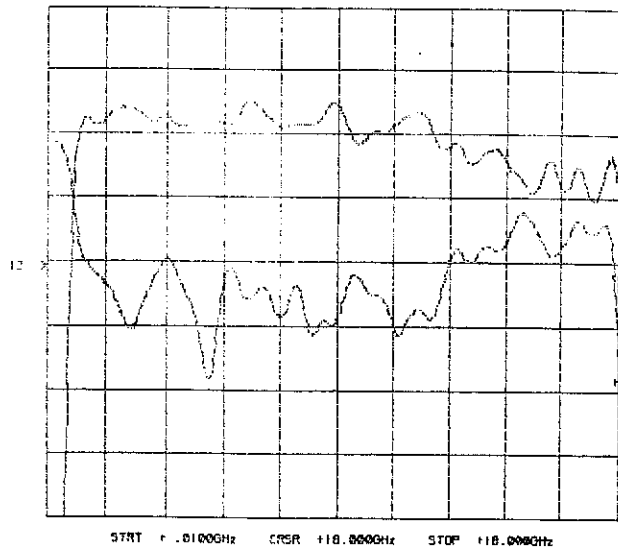
**TWO CHANNEL INSERTION LOSS
J5-J1 (J3 TERMINATED)**

CH1: 0 -11 - 5.84 dB CH2: 0 -11 - 22.06 dB
2.0 dB/ REF - 9.00 dB 5.0 dB/ REF - 9.54 dB



J5-J2 (J1 TERMINATED)

CH1: 0 -11 - 6.38 dB CH2: 0 -11 - 13.70 dB
2.0 dB/ REF - 9.00 dB 5.0 dB/ REF - 9.54 dB



OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 12

SERIAL NUMBER

: 4MS50729

TECHNICIAN

: RENE AFABLE

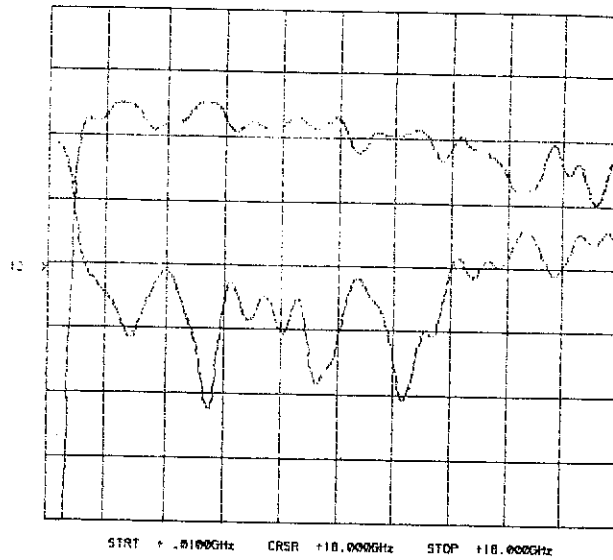
VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



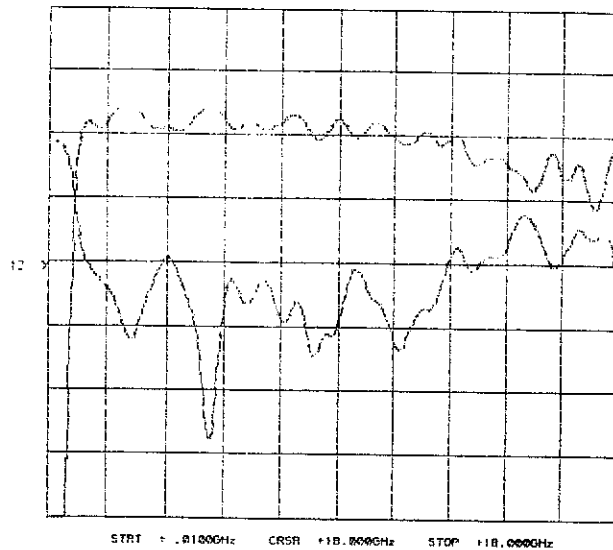
**TWO CHANNEL INSERTION LOSS
J5-J3 (J4 TERMINATED)**

CH1: 0 -11 - 5.92 dB CH2: 0 -11 - 14.95 dB
2.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



J5-J4 (J2 TERMINATED)

CH1: 0 -11 - 5.75 dB CH2: 0 -11 - 13.97 dB
2.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 13

SERIAL NUMBER

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TECHNICIAN

: RENE AFABLE

VOLTAGE & CURRENT DRAW

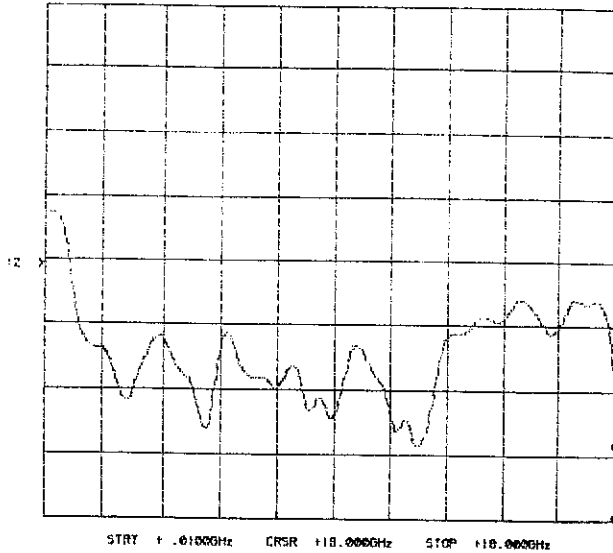
: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)

- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



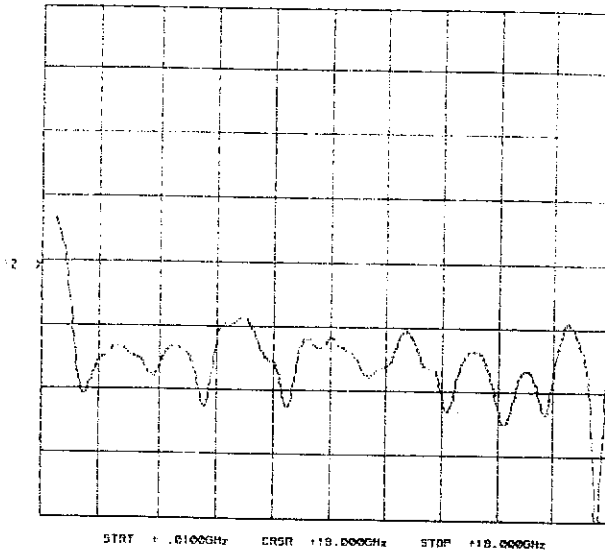
**TWO CHANNEL RETURN LOSS
J5 (J1, J3 SELECTED)**

CH1: A -M -45.24 dB CH2: B -M -18.38 dB
2.0 dB/ REF - 0.00 dB 5.0 dB/ REF - 4.00 dB



J1 (J1, J3 SELECTED)

CH1: A -M -43.73 dB CH2: B -M - 8.36 dB
2.0 dB/ REF - 0.00 dB 5.0 dB/ REF - 4.00 dB



OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 14

SERIAL NUMBER

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TECHNICIAN

: RENE AFABLE

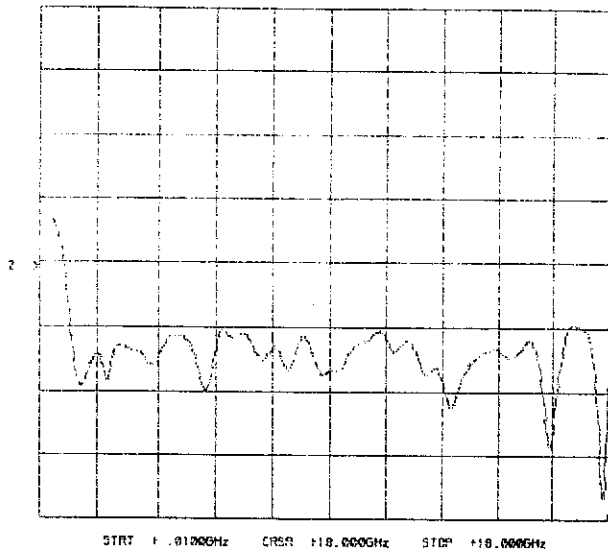
VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



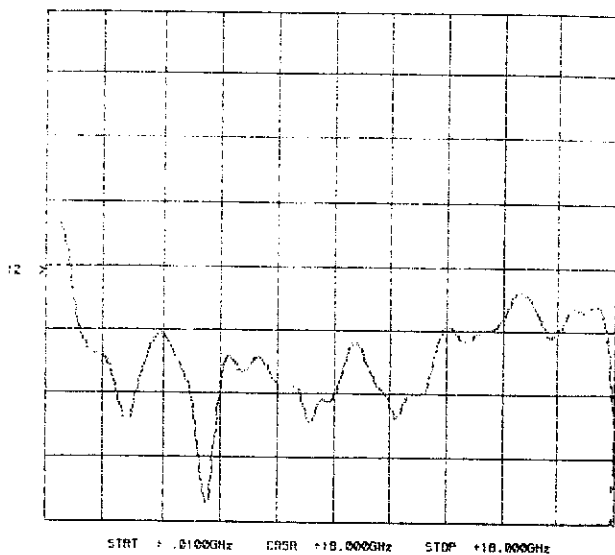
**TWO CHANNEL RETURN LOSS
J3 (J1, J3 SELECTED)**

CH1: A -11 52.05 dB CH2: B -11 5.18 dB
2.0 dB/ REF - 9.00 dB 5.0 dB/ REF - 4.00 dB



J5 (J2, J4 SELECTED)

CH1: A -11 47.05 dB CH2: B -11 21.38 dB
2.0 dB/ REF - 9.00 dB 5.0 dB/ REF - 4.00 dB



OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 15

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TECHNICIAN

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VOLTAGE & CURRENT DRAW

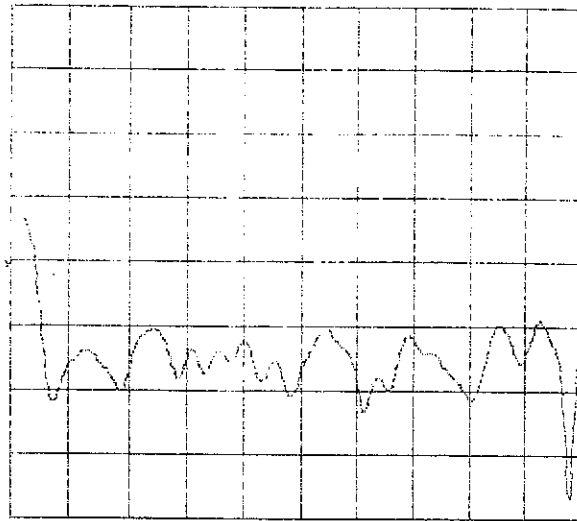
: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)

- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



TWO CHANNEL RETURN LOSS J2 (J2, J4 SELECTED)

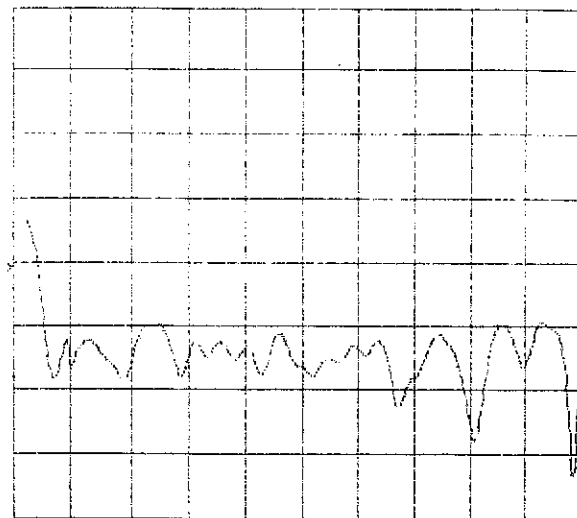
CH1: A -M - 93.77 dB CH2: B -M - 7.00 dB
2.0 dB REF - 9.00 dB 5.0 dB REF - 4.00 dB



START + .01000GHz CENTER +18.000GHz STOP +18.000GHz

J4 (J2, J4 SELECTED)

CH1: A -M - 98.20 dB CH2: B -M - 9.79 dB
2.0 dB REF - 9.00 dB 5.0 dB REF - 4.00 dB



START + .01000GHz CENTER +18.000GHz STOP +18.000GHz

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 16

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TECHNICIAN

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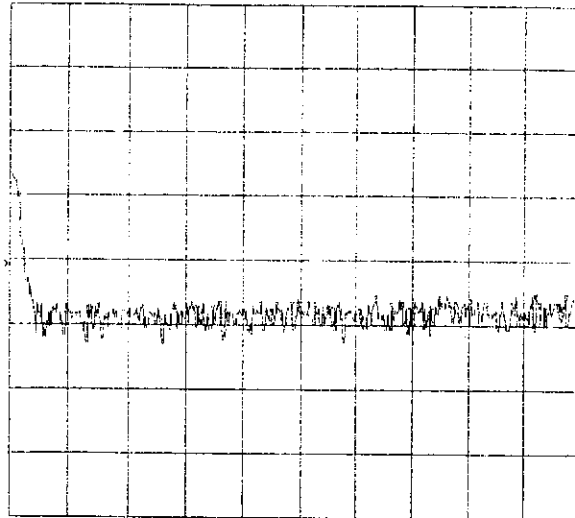
VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



ISOLATION J1
AS MEASURED ON A NETWORK ANALYSER

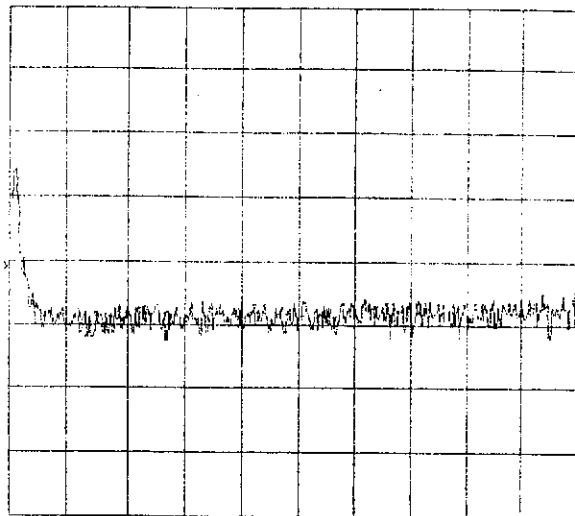
CH1: A -M - 59.45 dB
20.0 dB/ REF - 45.00 dB



STRT + .0100GHz CRSR +18.000GHz STOP +18.000GHz

ISOLATION J2

CH1: A -M - 54.46 dB
20.0 dB/ REF - 45.00 dB



STRT + .0100GHz CRSR +18.000GHz STOP +18.000GHz

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 17

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TECHNICIAN

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VOLTAGE & CURRENT DRAW

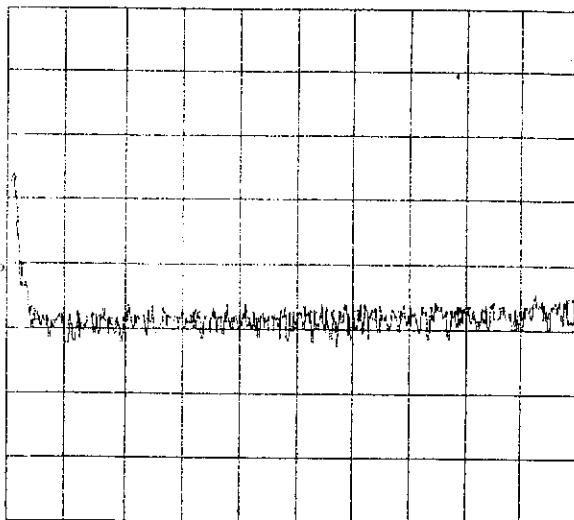
: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)

- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



ISOLATION J3
AS MEASURED ON A NETWORK ANALYSER

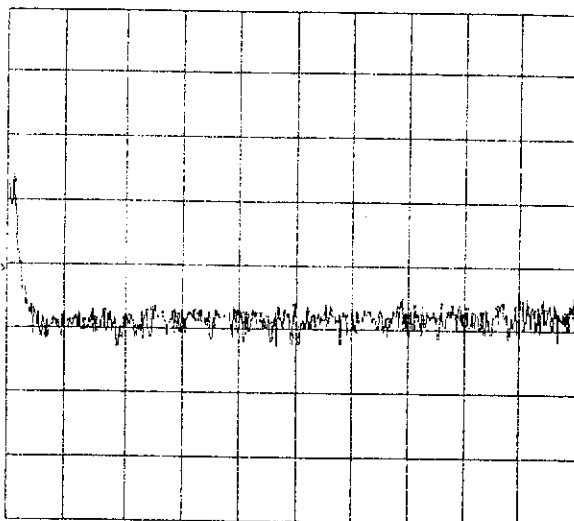
CH1: A -M - 55.73 dB
29.9 dB/ REF - 45.00 dB



START + .01000GHz CRSR +10.0000GHz STOP +10.0000GHz

ISOLATION J4

CH1: A -M - 60.44 dB
29.9 dB/ REF - 45.00 dB



START + .01000GHz CRSR +10.0000GHz STOP +10.0000GHz

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 18

SERIAL NUMBER

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TECHNICIAN

: RENE AFABLE

VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)

- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



ISOLATION
AS MEASURED ON A SPECTRUM ANALYSER

FREQUENCY	J1	J2	J3	J4
0.5 GHz	76 dB	78 dB	78 dB	79 dB
1.0 GHz	84 dB	83 dB	80 dB	80 dB
2.0 GHz	84 dB	84 dB	82 dB	82 dB
4.0 GHz	88 dB	84 dB	75 dB	74 dB
6.0 GHz	90 dB	86 dB	76 dB	76 dB
8.0 GHz	79 dB	80 dB	78 dB	82 dB
10.0 GHz	72 dB	68 dB	68 dB	69 dB
12.0 GHz	72 dB	71 dB	64 dB	66 dB
14.0 GHz	78 dB	74 dB	66 dB	70 dB
16.0 GHz	68 dB	66 dB	62 dB	64 dB
18.0 GHz	60 dB	60 dB	56 dB	58 dB

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 19

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TECHNICIAN

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VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



SWITCHING SPEED

"ON" : 50% TTL TO 90% RF

"OFF" : 50% TTL TO 10% RF

J4 ARM MEASURED

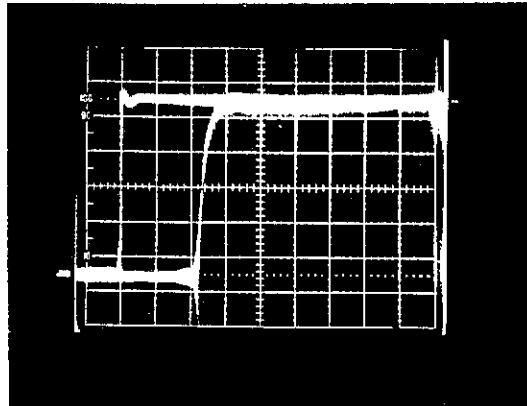
TYPICAL OF ALL ARMS

"ON"

Horizontal Scale:
50nS Per Division

Vertical Scale:
5mV Per Division

50 nS/div. SWN-4TDR-HILL J4



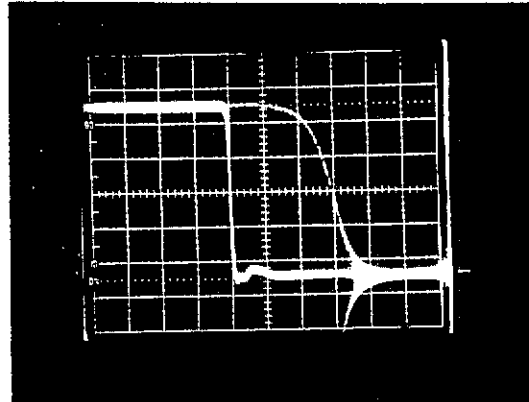
S/N: 4MS50729

"OFF"

Horizontal Scale:
20nS Per Division

Vertical Scale:
5mV Per Division

20 nS/div. SWN-4TDR-HILL J4



S/N: 4MS50729

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 20

SERIAL NUMBER

: 4MS50729

TECHNICIAN

: RENE AFABLE

VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)

- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)

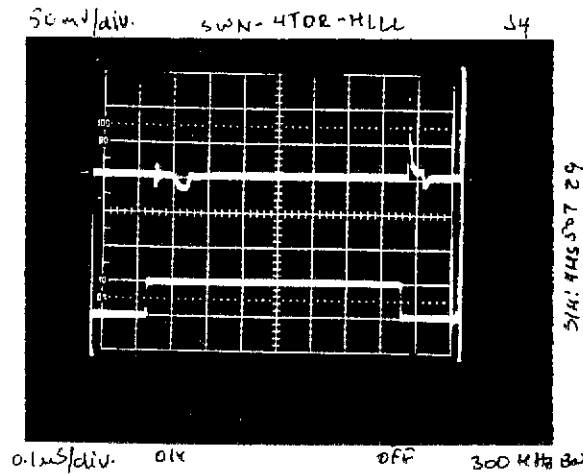


VIDEO TRANSIENTS
TYPICAL OF ALL ARMS
J4 ARM MEASURED

300 MHz BANDWIDTH

Horizontal Scale:
0.1 μ S Per Division

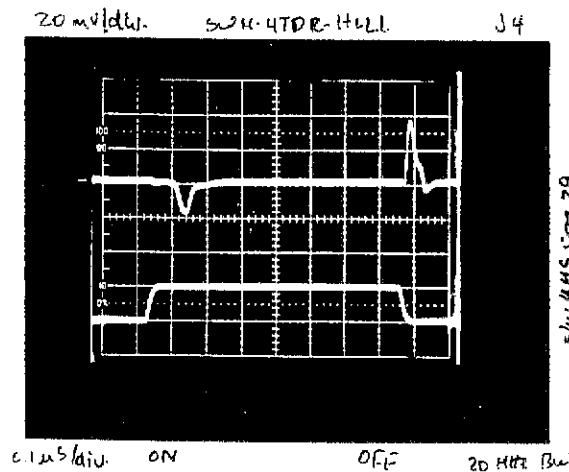
Vertical Scale:
50mV Per Division



20 MHz BANDWIDTH

Horizontal Scale:
0.1 μ S Per Division

Vertical Scale:
20mV Per Division



OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 21

SERIAL NUMBER

: 4MS50729

TECHNICIAN

: RENE AFABLE

VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)

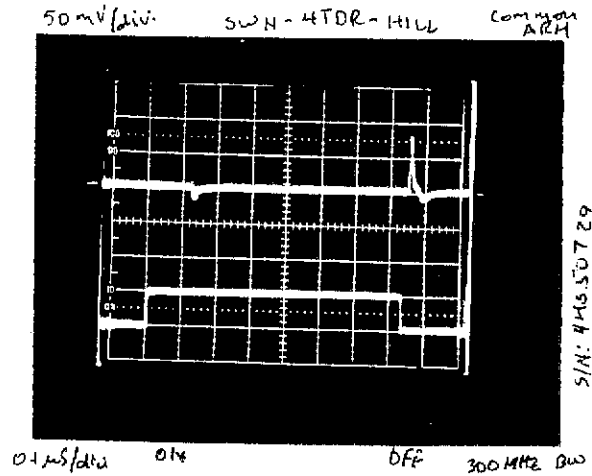


VIDEO TRANSIENTS
TYPICAL OF ALL ARMS
COMMON ARM MEASURED

300 MHz BANDWIDTH

Horizontal Scale:
0.1 μ S Per Division

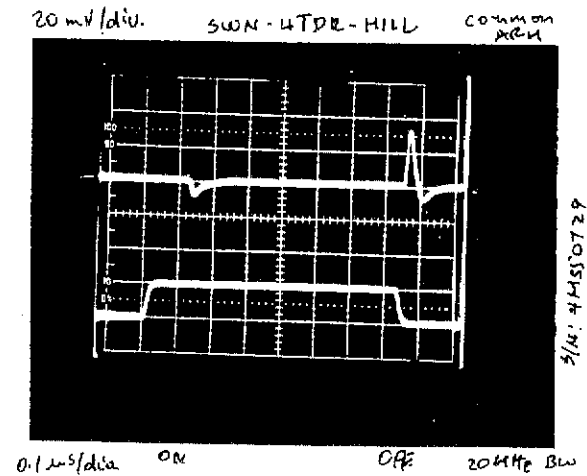
Vertical Scale:
50mV Per Division



20 MHz BANDWIDTH

Horizontal Scale:
0.1 μ S Per Division

Vertical Scale:
20mV Per Division



OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 26

SERIAL NUMBER

: 4MS50729

TECHNICIAN

:

VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
 - 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



TEST DATA AS PRESENTED TO THE CUSTOMER

FORM: SW-2/0614/95



AMERICAN MICROWAVE CORPORATION
 7311C GROVE ROAD, FREDERICK MD. 21701
 TEL: (301)662-4700 FAX: (301)662-4638

DEVELOPMENT TEST DATA ON
 SP4T SOLID STATE MICROWAVE SWITCH
 PART NO. 16VE087C-1
 AMC MODEL SWN-4TDR-HILL

JOB NO: 409166E _____ AMC MODEL NO: SWN-4TDR-HILL _____ PART NO: 16VE087-C1 _____
 OPTION: NONE _____ CUSTOMER: HILL AIR FORCE BASE _____ SERIAL NO: 4MS50729 _____
 DATE: 9-21-95 _____ TESTED BY: H. HAHN _____

TEST ITEM NO.	PARAMETERS	SPECIFIED VALUE	MEASURED * VALUE
1	FREQUENCY PARAGRAPH: 2.1 PARAGRAPH: 3.2.1.1	2 GHz TO 18.0 GHz	2.0-18.0GHz
2	INSERTION LOSS (TYPICAL SWEEP DATA) PARAGRAPH: 2.3.1 PARAGRAPH: 3.2.1.3 (PARAGRAPH 3.2.1.3.1)	2 GHz TO 11 GHz 2.5 dB MAXIMUM	J5-J1 -1.82 dB
			J5-J2 -1.73 dB
			J5-J3 -1.82 dB
			J5-J4 -1.75 dB
		11 GHz TO 16 GHz 2.8 dB MAXIMUM	J5-J1 -2.34 dB
			J5-J2 -2.37 dB
			J5-J3 -2.09 dB
			J5-J4 -2.36 dB
		16 GHz TO 18 GHz 3.1 dB MAXIMUM	J5-J1 -2.62 dB
			J5-J2 -2.77 dB
			J5-J3 -2.69 dB
			J5-J4 -2.62 dB

* :WHEREVER APPLICABLE TEST TO BE PERFORMED WITH TYPICAL RF INPUT POWER LEVELS OF 0 dBm AND AT AMBIENT ROOM CONDITIONS.

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 25

SERIAL NUMBER

: 4MS50729

TECHNICIAN

:

VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
 - 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



TEST DATA AS PRESENTED TO THE CUSTOMER

DEVELOPMENT TEST DATA ON
 SP4T SOLID STATE MICROWAVE SWITCH
 PART NO. 16VE087C-1
 AMC MODEL SWN-4TDR-HILL



AMERICAN MICROWAVE CORPORATION
 2711C CRANE ROAD, FREDERICK MD, 21701
 TEL: (301)462-4700 FAX: (301)462-4954

JOB NO: 409166E _____ AMC MODEL NO: SWN-4TDR-HILL _____ PART NO: 16VE087-C1 _____
 OPTION: NONE _____ CUSTOMER: HILL AIR FORCE BASE _____ SERIAL NO: 4MS50729 _____
 DATE: 9-21-95 _____ TESTED BY: H. HALL _____

TEST ITEM NO.	PARAMETERS	SPECIFIED VALUE	MEASURED * VALUE
3	BALANCE (WORST CASE) (TYPICAL SWEPT DATA OF ALL CHANNELS) PARAGRAPH: 2.3.3.1 PARAGRAPH: 3.2.1.3.2	0.7 dB MAXIMUM	- 0.38 dB MAXIMUM
4	TWO CHANNEL INSERTION LOSS (TYPICAL SWEPT DATA) PARAGRAPH: 2.3.2 PARAGRAPH: 3.2.1.3.1	2 GHz TO 11 GHz 8.4 dB MAXIMUM	J5-J1 (U1 TERMINATED) -5.07 dB
			J5-J2 (U1 TERMINATED) -5.14 dB
			J5-J3 (U4 TERMINATED) -5.32 dB
			J5-J4 (U2 TERMINATED) -5.07 dB
		11 GHz TO 16 GHz 8.7 dB MAXIMUM	J5-J1 (U1 TERMINATED) -5.76 dB
			J5-J2 (U1 TERMINATED) -6.91 dB
			J5-J3 (U4 TERMINATED) -6.46 dB
			J5-J4 (U2 TERMINATED) -6.66 dB
		16 GHz TO 18 GHz 9.0 dB MAXIMUM	J5-J1 (U1 TERMINATED) -6.60 dB
			J5-J2 (U1 TERMINATED) -7.07 dB
			J5-J3 (U4 TERMINATED) -7.02 dB
			J5-J4 (U2 TERMINATED) -7.28 dB
5	INSERTION LOSS BALANCE (EITHER ARM TERMINATED) (TYPICAL SWEPT DATA) PARAGRAPH: 2.3.3.2 PARAGRAPH: 3.2.1.3.2	2.2 dB MAXIMUM	J1, J3 - 1.17 dB MAXIMUM
			J2, J4 - 0.79 dB MAXIMUM

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 24

SERIAL NUMBER

: 4MS50729

TECHNICIAN

:

VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)
 - 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



TEST DATA AS PRESENTED TO THE CUSTOMER

DEVELOPMENT TEST DATA

SP4T SOLID STATE MICROWAVE SWITCH

PART NO. 16VE087C-1

AMC MODEL SWN-4TDR-HILL



AMERICAN MICROWAVE CORPORATION
 7511C CRANE ROAD, FREDERICK MD. 21701
 TEL: (301)662-4700 FAX: (301)662-4638

JOB NO: 409166E AMC MODEL NO: SWN-4TDR-HILL PART NO: 16VE087-C1
 OPTION: NONE CUSTOMER: HILL AIR FORCE BASE SERIAL NO: 4MS50729
 DATE: 9-21-95 TESTED BY: H. HATH

TEST ITEM NO.	PARAMETERS	SPECIFIED VALUE	MEASURED * VALUE
6	VSWR (ONE CHANNEL) (TYPICAL SWEEP DATA) PARAGRAPH: 2.3.4.1 PARAGRAPH: 3.2.1.4	2.2:1 MAXIMUM (-8.5dB)	J1 -10.45 dB
			J2 -10.48 dB
			J3 -9.49 dB
			J4 -9.98 dB
7	VSWR (TWO CHANNELS) (TYPICAL SWEEP DATA) PARAGRAPH: 2.3.4.2 PARAGRAPH: 3.2.1.4	4.4:1 MAXIMUM (-4.0dB)	J5 (J1, μ SELECTED) -6.73 dB
			J1 (J1, μ SELECTED) -8.19 dB
			J3 (J1, μ SELECTED) -8.62 dB
			J5 (J2, μ SELECTED) -5.63 dB
			J2 (J2, μ SELECTED) -6.99 dB
8	ISOLATION (TYPICAL SWEEP DATA) PARAGRAPH: 2.2 PARAGRAPH: 3.2.1.2	45dB MINIMUM	J1-J2 -60 dB
			J1-J3 -58 dB
			J1-J4 -60 dB
			J2-J3 -60 dB
			J2-J4 -59 dB
			J3-J4 -57 dB

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 23

SERIAL NUMBER

: 4MS50729

TECHNICIAN

:

VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)

- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



TEST DATA AS PRESENTED TO THE CUSTOMER

DEVELOPMENT TEST DATA ON
 SP4T SOLID STATE MICROWAVE SWITCH
 PART NO. 16VE087C-1
 AMC MODEL SWN-4TDR-HILL



AMERICAN MICROWAVE CORPORATION
 7810 GROVE ROAD, FREDERICK MD, 21701
 TEL: (301)462-7700 FAX: (301)462-1838

JOB NO: 409166E AMC MODEL NO: SWN-4TDR-HILL PART NO: 16VE087-C1
 OPTION: NONE CUSTOMER: HILL AIR FORCE BASE SERIAL NO: 4MS50729
 DATE: 9-21-95 TESTED BY: H. HALL

TEST ITEM NO.	PARAMETERS	SPECIFIED VALUE	MEASURED * VALUE
9	SWITCHING SPEED (TYPICAL PHOTOGRAPHS) PARAGRAPH: 2.3.5 PARAGRAPH: 3.2.1.5	200 nS MAX	J5-J1 ON/30 nS OFF 75 nS
			J5-J2 ON/30 nS OFF 75 nS
			J5-J3 ON/30 nS OFF 75 nS
			J5-J4 ON/30 nS OFF 75 nS
10	DC POWER ONE RF CHANNEL PARAGRAPH: 3.2.1.7	+5 VOLTS @105 MA	+ 84 mA
		-15 VOLTS @60 MA	- 30 mA
11	DC POWER TWO RF CHANNELS PARAGRAPH: 3.2.1.7	+5 VOLTS @70 MA	+ 58 mA
		-15 VOLTS @70 MA	- 42 mA

OCTOBER 31, 1995

SUMMARY TEST DATA

SWN-4TDR-HILL

PAGE 22

SERIAL NUMBER

: 4MS50729

TECHNICIAN

:

VOLTAGE & CURRENT DRAW

: + 5 vdc @ 84mA(One Arm On), 58mA(Two Arms On)

- 15 vdc @ 30mA(One Arm On), 42mA(Two Arms On)



TEST DATA AS PRESENTED TO THE CUSTOMER

DEVELOPMENT TEST DATA ON
SP4T SOLID STATE MICROWAVE SWITCH
PART NO. 16VE087C-1
AMC MODEL SWN-4TDR-HILL



AMERICAN MICROWAVE CORPORATION
73116 CROSS ROAD, FREDERICK, MD. 21701
TEL: (301)662-6780 FAX: (301)662-4696

JOB NO: 409166E _____ AMC MODEL NO: SWN-4TDR-HILL _____ PART NO: 16VE087-C1 _____
OPTION: NONE _____ CUSTOMER: HILL AIR FORCE BASE _____ SERIAL NO: 4MS50729 _____
DATE: 9-21-95 _____ TESTED BY: H. HAH _____

TEST ITEM NO.	PARAMETERS	SPECIFIED VALUE	AMC QA
12	VISUAL AND MECHANICAL INSPECTION PER SCD PARAGRAPH: 6.5	MATERIALS	OK PAS
		CONSTRUCTION	PAS
		CONNECTORS	PAS
		MARKING	PAS
		PROCESSES	PAS
		GAUGING	PAS
		DIMENSIONS	PAS
		FINISH	PAS
		WORKMANSHIP	PAS
		PARTS	PAS

TESTED BY: 16/16 _____ DATE: 9-21-95 _____
APPROVED BY: [Signature] _____ DATE: 9-24-95 _____
WITNESSED BY: _____ DATE: _____

OCTOBER 31, 1995