



**AMERICAN MICROWAVE  
CORPORATION**

**TEST DATA**

**ON**

**0.4 GHz TO 18 GHz  
(10 MHz TO 18 GHz OPTIONAL)**

**AND**

**0.04 GHz TO 2 GHz**

**AMPLITUDE ( $\pm 0.5$  dB) AND PHASED ( $\pm 5^\circ$ ) MATCHED**

**LOW INSERTION LOSS**

**HIGH SPEED**

**REFLECTIVE**

**SP4T**

**RADIAL SOLID STATE SWITCH  
(SURFACE MOUNTABLE)**

**AMC MODEL Nos:**

**SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SS  
(Serial Number: 4MS908196) (Pages 2 - 39)**

**AND**

**SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SSH  
(Serial Number: 4MS908195) (Pages 40 - 80)**

**REPORTED AND PREPARED  
BY  
RENE AFABLE**

**AUGUST 17, 1999**

**WEB PAGE: [HTTP://WWW.AMWAVE.COM](http://www.amwave.com)**

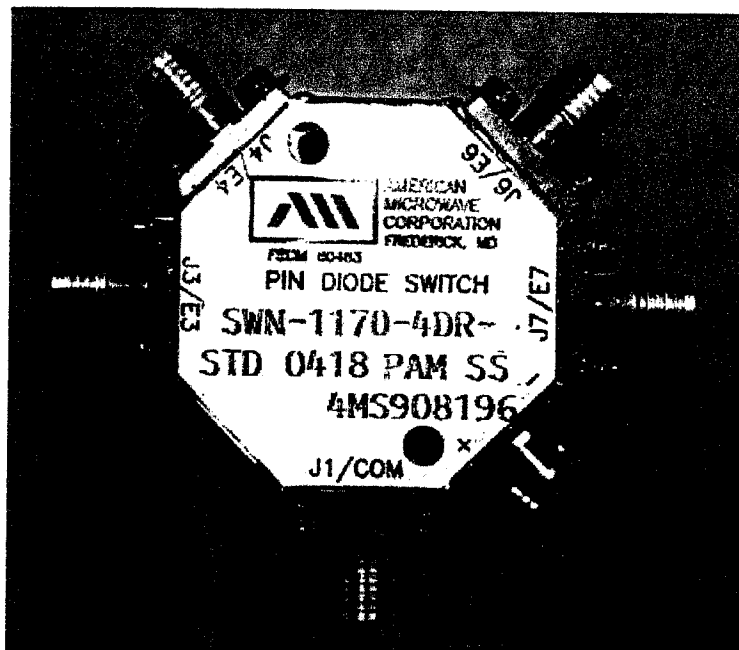
**E-MAIL ADDRESS: [AMCPMI@AOL.COM](mailto:AMCPMI@AOL.COM)**

**7311 G GROVE ROAD, FREDERICK, MARYLAND 21704 • Tel. (301) 662-4700 • Fax (301) 662-4938**



**AMERICAN MICROWAVE CORPORATION**

**SP4T REFLECTIVE  
SOLID STATE PIN DIODE SWITCH**



KEY FEATURES

- 0.4 GHz TO 18 GHz  
(10MHz to 18GHz optional)
- AMPLITUDE AND PHASED  
MATCHED
- LOW INSERTION LOSS
- HIGH SPEED
- TTL LOGIC COMPATIBLE

**AMC MODEL No: SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SS**

SPECIFICATIONS: (REFLECTIVE)

• FREQUENCY RANGE	:	0.4 GHz to 18 GHz (10MHz to 18GHz Optional)
• INSERTION LOSS	:	3.0 dB MAX.
	:	1.50 dB TYP. @ 0.4 GHz
	:	1.50 dB TYP. @ 2.0 GHz
	:	1.75 dB TYP. @ 6.0 GHz
	:	2.00 dB TYP. @ 12.0 GHz
	:	3.00 dB TYP. @ 18.0 GHz
• ISOLATION	:	≥ 50 dB MIN.
	:	≥ 90 dB TYP. @ 0.4 GHz
	:	≥ 80 dB TYP. @ 2.0 GHz
	:	≥ 70 dB TYP. @ 6.0 GHz
	:	≥ 60 dB TYP. @ 12.0 GHz
	:	≥ 50 dB TYP. @ 18.0 GHz
• VSWR	:	2.0:1
• SWITCHING SPEED	:	"RISE" 15nS MAX., 10nS TYP.
	:	"FALL" 15nS MAX., 10nS TYP.
	:	"ON" 100nS MAX., 75nS TYP.
	:	"OFF" 100nS MAX., 75nS TYP.
• CONTROL	:	Independent TTL Compatible (2 Bit Decoder available)
• VIDEO TRANSIENTS	:	≤1.6 V Peak to Peak, 300 MHZ Bandwidth
	:	≤810 mV Peak to Peak, 20 MHZ Bandwidth
• RF INPUT POWER	:	+20dBm Operating, 1 Watt Survival (Other power Levels available)
• DC POWER SUPPLY	:	+5vdc @ +25mA MAX.
(Other supply voltages available)	:	-5vdc @ -50mA MAX.
• SIZE	:	1.25" X 1.25" X 0.70"
• WEIGHT	:	≤ 1.5 oz. TYP.

**AUGUST 17, 1999**

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### SUMMARY TEST DATA

**MODEL NUMBER**

**: SWN-1170-4DR-STD OPTIONS 0418, PAM, SS**

**SERIAL NUMBER**

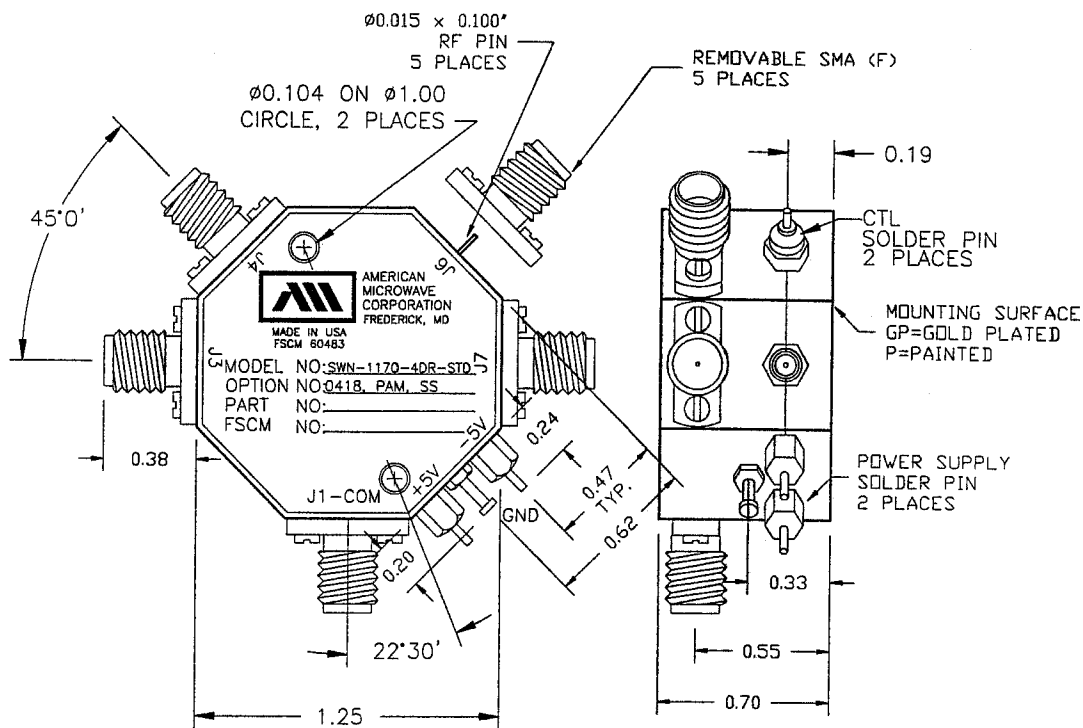
**: 4MS908196**

**ENGINEER**

**: RENE AFABLE**

**VOLTAGE & CURRENT DRAW**

**: +5vdc: @+1.5mA; -5vdc: @ -21.5mA**



**ALL DIMENSIONS ARE IN INCHES**

**TOLERANCES:**

X.XX	±0.020
X.XXX	±0.010

**ENVIRONMENTAL RATINGS:**

- **TEMPERATURE:**..... -55°C TO +85°C (OPERATING)  
-65°C TO +125°C (STORAGE)
- **HUMIDITY:**..... MIL-STD-202F, METHOD 103B COND. B
- **SHOCK:**..... MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION:**..... MIL-STD-202F, METHOD 204D COND. B
- **ALTITUDE:**..... MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE:**..... MIL-STD-202F, METHOD 107D COND. A

**NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION.**

**AUGUSR 17, 1999**

**DESCRIPTION**  
 AMC MODEL 1170-4DR/DT OPTION SS IS A PHASE AND AMPLITUDE MATCHED SINGLE POLE THROW, REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH MODULE WITH LOW LOSS, HIGH SPEED AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR BROAD BAND OPERATIONS.

**SPECIFICATIONS:**

- FREQUENCY: 0.5 GHz TO 18 GHz
- REFLECTIVE: 3.0db
- ABSORPTIVE: 3.5db
- ISOLATION: 0.5 GHz TO 2 GHz: 80db  
2 GHz TO 12 GHz: 60db  
12 GHz TO 18 GHz: 50db
- VSWR: REFLECTIVE IN/OUT: 2.0:1  
REFLECTIVE IN/OUT: 2.0:1  
ABSORPTIVE IN/OUT: 2.0:1  
ABSORPTIVE OUT/OFF: 2.0:1
- SPEED: RISE: 10ns TYPICAL, 15ns MAX.  
FALL: 10ns TYPICAL, 15ns MAX.  
DELAY ON: 75ns TYPICAL, 100ns MAX.  
DELAY OFF: 75ns TYPICAL, 100ns MAX.
- POWER INPUT: (CW)+20dBm (STANDARD), +10 dBm (HIGH SPEED)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL: TTL LOGIC "0"=ON "1"=OFF
- POWER SUPPLY: +5V @ 25 mA MAX.  
-5V @ 50mA MAX.(REFLECTIVE)  
150mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- SIZE: 1.25" (L) x 1.25" (W) x 0.70" (H)
- WEIGHT: 1.5 oz.

**OPTIONS:**

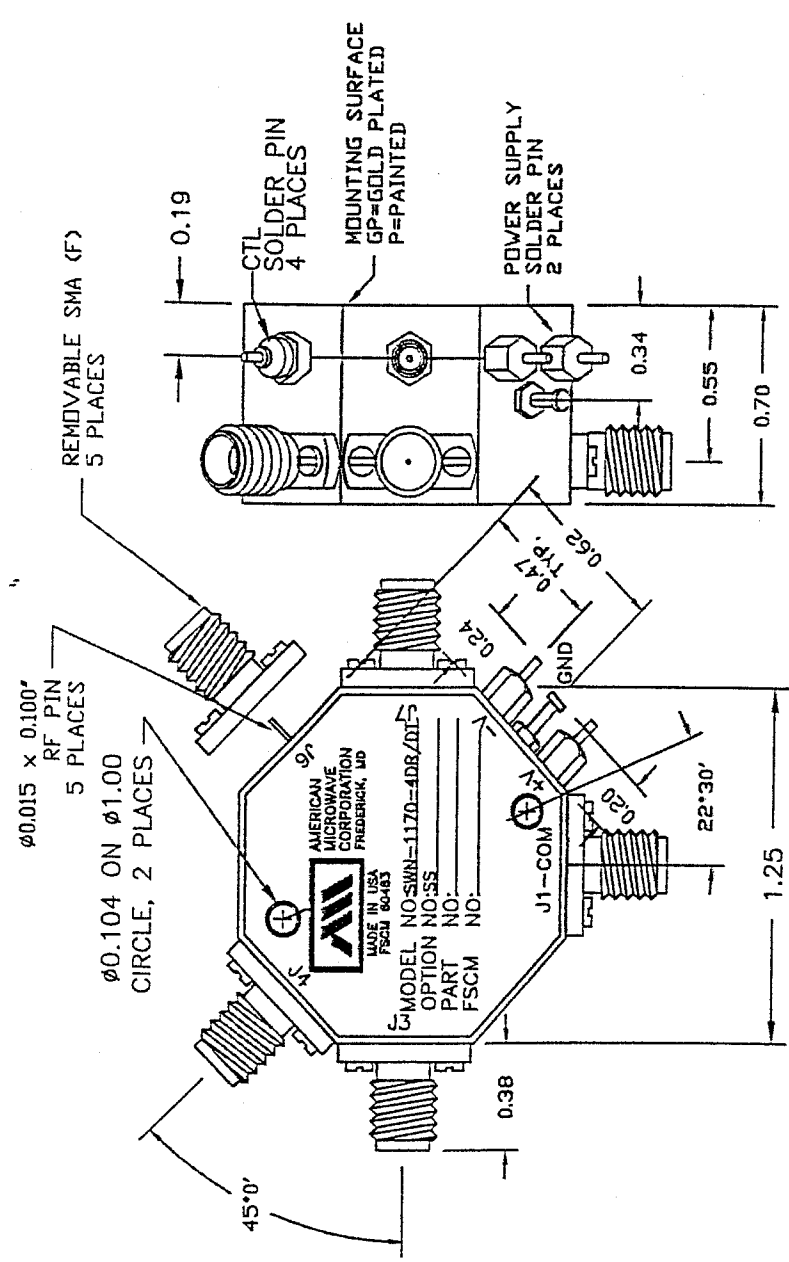
- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SP
- 10M18
- 100M18
- 11B
- 218
- 412
- 618
- 1218
- 100M20
- 220
- 1020
- B01
- B02
- B03
- B04
- B05
- B06
- B07
- B08
- B09
- B10
- B11
- B12

- 2 BIT DECODER WITH SOLDER PIN
- 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 MHz AND 0.5db AT 18 GHz)
- 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 18 GHz)
- 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 12 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 100 MHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 1.0db AT 20 GHz)
- 2 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- -12V POWER SUPPLIES
- -15V POWER SUPPLIES
- REVERSE LOGIC "1"=ON "0"=OFF
- DRIVERLESS, CURRENT CONTROLLED
- HIGH SPEED, TURNON/TURNOFF 20 nsec MAXIMUM WHEN APPLICABLE OR OPTION HS
- HIGH POWER - SPECIFY CW POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER
- LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH
- LOW INSERTION LOSS VERSION
- HIGHER ISOLATION VERSION
- 0.40" THICK VERSION
- 0.86" THICK VERSION

**ENVIRONMENTAL RATINGS:**

- TEMPERATURE: -55°C TO +85°C (OPERATING)  
-65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 109C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION



NOTE:  
 DR=WITH DRIVER, REFLECTIVE  
 DT=WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

CONTRACT NO.		APPROVALS		DATE	TITLE
DESIGN	WSP, RRA	DATE	8/21/99	OUTLINE DRAWING	AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND
CHECKED	WSP	DATE	8/21/99	SWN-1170-4DR/DT OPTION SS	
ISSUED	RA	DATE	8/21/99	REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE	
SIZE	FSCM NO.	SCALE	N/S	DWG NO.	100-5007-1
	A 60483				
					SHEET 1 of 2

**DESCRIPTION**  
 AMC MODEL 1170-4DR/DT-DEC-SP OPTION SS IS A PHASE AND AMPLITUDE MATCHED SINCE FOUR THROW, REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH MODULE WITH LOW LOSS, HIGH SPEED AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR BROAD BAND OPERATIONS.

**SPECIFICATIONS:**

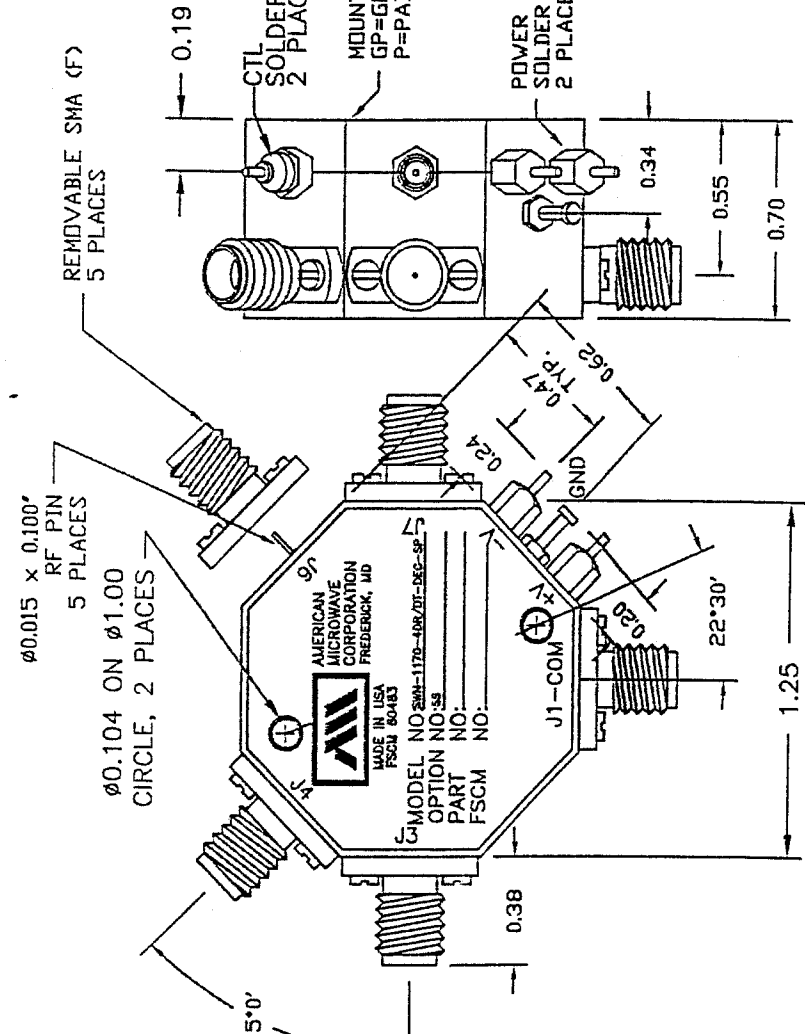
- FREQUENCY: 0.5 GHz TO 18 GHz
- REFLECTIVE: 3.0db
- ABSORPTIVE: 3.5db
- ISOLATION: 0.5 GHz TO 2 GHz: 80db  
 2 GHz TO 12 GHz: 60db  
 12 GHz TO 18 GHz: 50db
- VSWR: REFLECTIVE IN/OUT: 2.0:1  
 ABSORPTIVE IN/OUT: 2.0:1  
 ABSORPTIVE OUT/OFF: 2.0:1
- SPEED: RISE: 10ns TYPICAL, 15ns MAX.  
 FALL: 10ns TYPICAL, 15ns MAX.  
 DELAY ON: 75ns TYPICAL, 100ns MAX.  
 DELAY OFF: 75ns TYPICAL, 100ns MAX.  
 (CW)+20dBm (STANDARD), +10 dBm (HIGH SPEED)
- POWER INPUT: 1 WATT CW, 10 WATTS PEAK 1 usec
- SURVIVAL POWER: SEE LOGIC TABLE
- CONTROL: +5V @ 25 mA MAX.  
 +5V @ 50mA MAX.(REFLECTIVE)  
 100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- POWER SUPPLY: -5V @ 1.25" (L) x 1.25" (W) x 0.70" (H)
- SIZE: 1.5 oz.
- WEIGHT: 1.5 oz.

**OPTIONS:**

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SP 10M18 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 MHz AND 0.5db AT 18 GHz)
- 100M18 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 18 GHz)
- 11B 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 21B 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 41B 4 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 61B 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 121B 12 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 100M20 100 MHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 1.0db AT 20 GHz)
- 220 2 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- 1020 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- B01 -12V POWER SUPPLIES
- B02 -15V POWER SUPPLIES
- B03 REVERSE LOGIC "1"=ON "0"=OFF
- B04 DRIVERLESS, CURRENT CONTROLLED
- B05 HIGH SPEED, TURNON/TURNOFF 20 nsec MAXIMUM WHEN APPLICABLE OR OPTION HS
- B06 HIGH POWER - SPECIFY CW POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- B07 CUSTOM DESIGNED PRODUCT- SPECIFY INITIALS OF CUSTOMER
- B08 LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH
- B09 LOW INSERTION LOSS VERSION
- B10 HIGHER ISOLATION VERSION
- B11 0.40" THICK VERSION
- B12 0.88" THICK VERSION

LOGIC TABLE

E6	E7	RF ON
L	L	J3
H	L	J4
L	H	J6
H	H	J7



NOTE:  
 DR=WITH DRIVER, REFLECTIVE  
 DT=WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

ALL DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 X.XX ±0.020  
 X.XXX ±0.010

- ENVIRONMENTAL RATINGS:**
- TEMPERATURE: -55°C TO +85°C (OPERATING)  
 -65°C TO +125°C (STORAGE)
  - HUMIDITY: MIL-STD-202F, METHOD 1039 COND. B
  - SHOCK: MIL-STD-202F, METHOD 2139 COND. B
  - VIBRATION: MIL-STD-202F, METHOD 204D COND. B
  - ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
  - TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

CONTRACT NO. \_\_\_\_\_

AMERICAN MICROWAVE CORPORATION  
 FREDERICK, MARYLAND

OUTLINE DRAWING

SWN-1170-4DR/DT-DEC-SP OPTION SS  
 REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE  
 RADIAL SOLID STATE SWITCH

APPROVALS: \_\_\_\_\_ DATE: 8/21/99

DRAWN: WJP, JRL DATE: 8/21/99

CHECKED: WJP DATE: 8/21/99

ISSUED: JH DATE: 8/21/99

SIZE: A FSCM NO. 60483 DWG NO. 100-5007-2 REV. -

SCALE: N/S SHEET 1 of 2



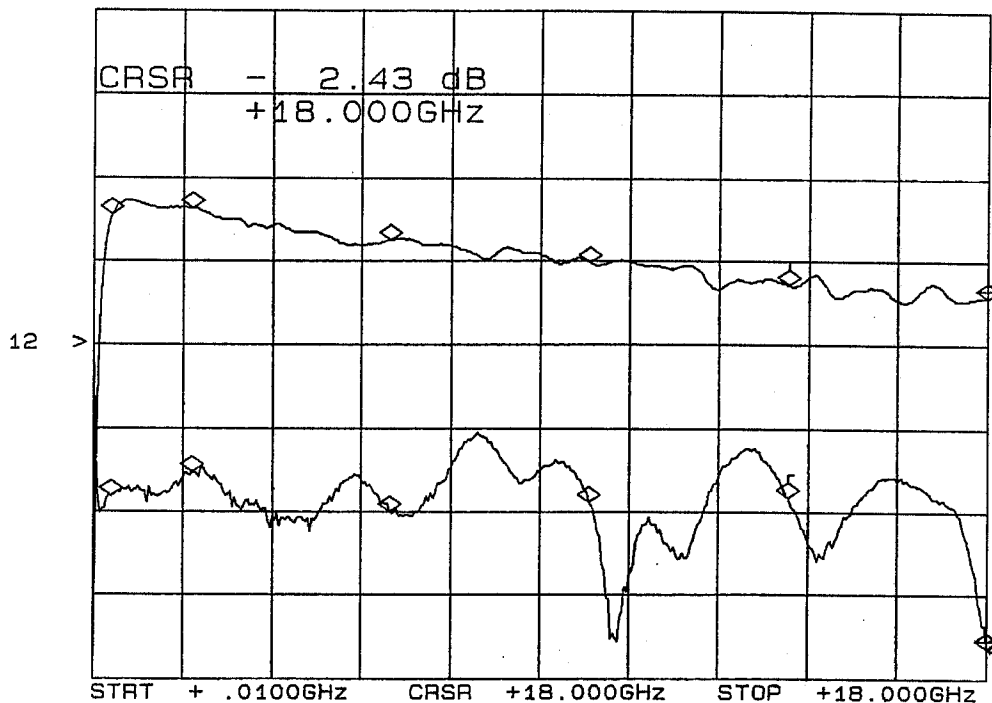
## SUMMARY TEST DATA

<b>MODEL NUMBER</b>	: SWN-1170-4DR-STD OPTIONS 0418, PAM, SS
<b>SERIAL NUMBER</b>	: 4MS908196
<b>ENGINEER</b>	: RENE AFABLE
<b>VOLTAGE &amp; CURRENT DRAW</b>	: +5vdc: @+1.5mA; -5vdc: @ -21.5mA

### INSERTION LOSS & RETURN LOSS\*

J1-J3

CH1: A -M - 2.43 dB      CH2: B -M - 27.68 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	1.44 dB	18.5 dB
2.0 GHz	1.36 dB	17.0 dB
6.0 GHz	1.73 dB	19.5 dB
10.0 GHz	2.01 dB	18.8 dB
14.0 GHz	2.28 dB	18.6 dB
18.0 GHz	2.43 dB	27.6 dB

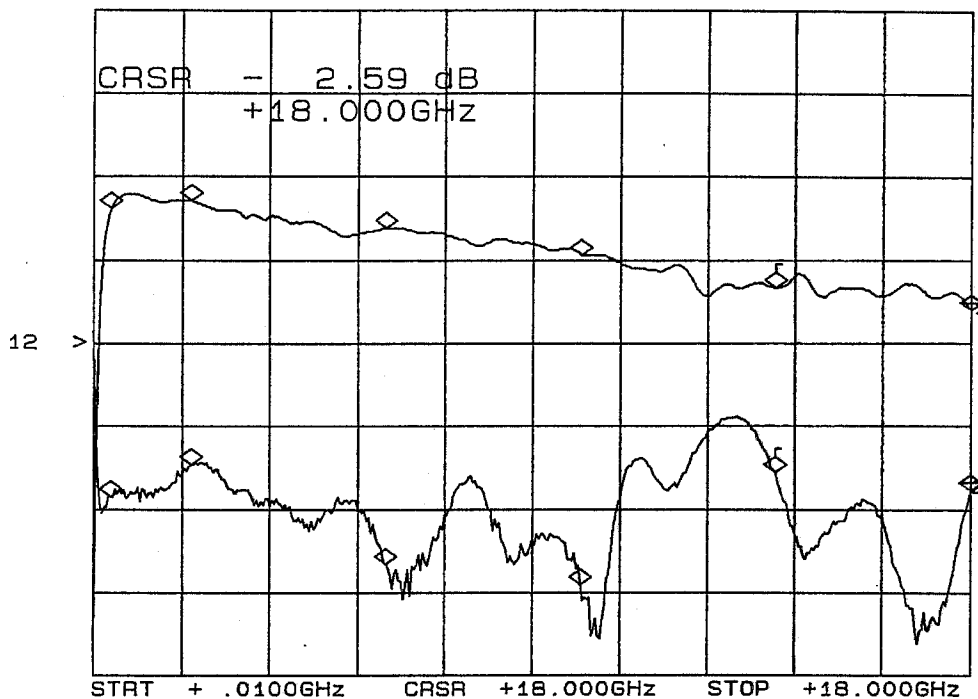


### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

#### INSERTION LOSS & RETURN LOSS\* J1-J4

CH1: A -M - 2.59 dB      CH2: B -M - 18.32 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	1.38 dB	18.7 dB
2.0 GHz	1.28 dB	16.8 dB
6.0 GHz	1.60 dB	22.7 dB
10.0 GHz	1.92 dB	24.0 dB
14.0 GHz	2.31 dB	17.2 dB
18.0 GHz	2.59 dB	18.3 dB



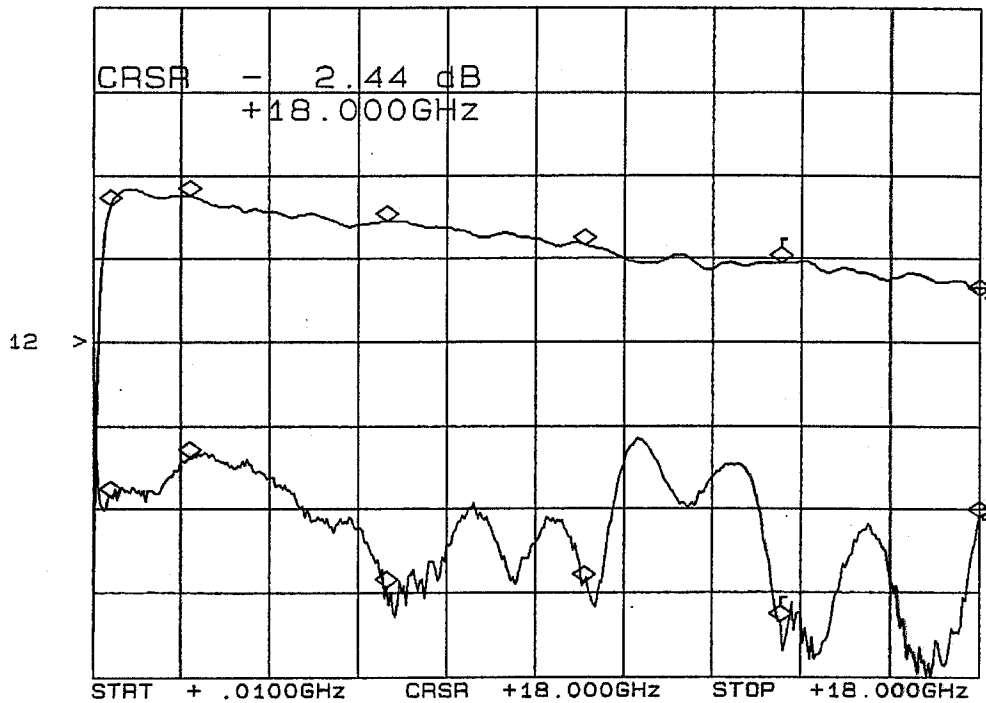
### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

### INSERTION LOSS & RETURN LOSS\*

J1-J6

CH1: A -M - 2.44 dB      CH2: B -M - 19.97 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	1.35 dB	18.7 dB
2.0 GHz	1.25 dB	16.2 dB
6.0 GHz	1.55 dB	24.1 dB
10.0 GHz	1.83 dB	23.8 dB
14.0 GHz	2.04 dB	26.2 dB
18.0 GHz	2.44 dB	19.9 dB





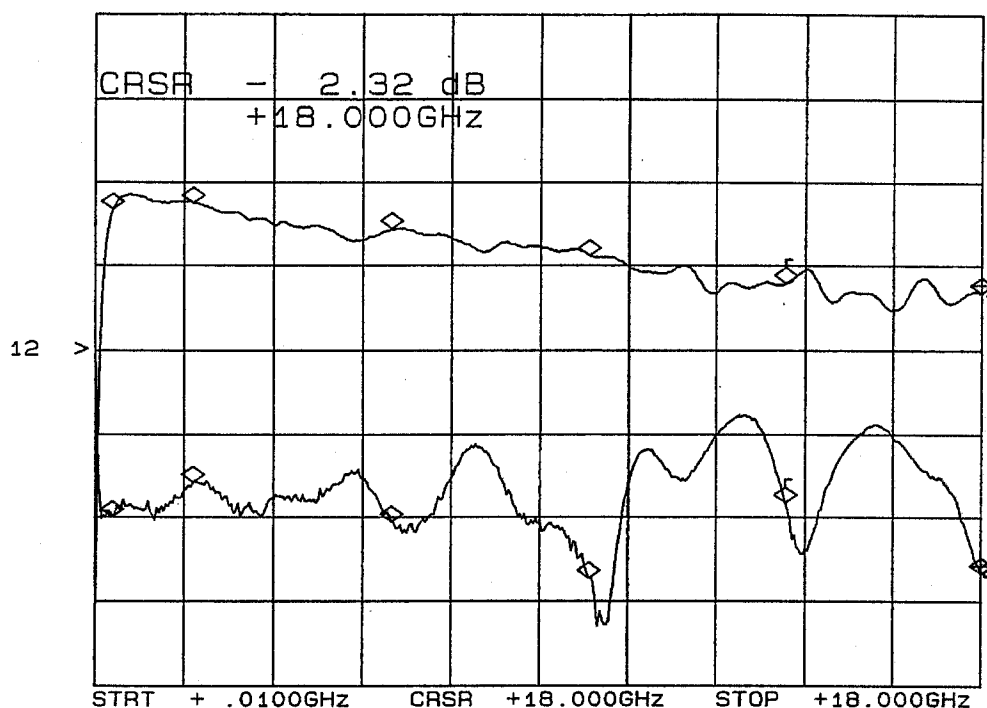
## SUMMARY TEST DATA

MODEL NUMBER	: SWN-1170-4DR-STD OPTIONS 0418, PAM, SS
SERIAL NUMBER	: 4MS908196
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+1.5mA; -5vdc: @ -21.5mA

### INSERTION LOSS & RETURN LOSS\*

J1-J7

CH1: A -M - 2.32 dB      CH2: B -M - 22.82 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	1.32 dB	19.4 dB
2.0 GHz	1.23 dB	17.4 dB
6.0 GHz	1.55 dB	19.7 dB
10.0 GHz	2.87 dB	23.1 dB
14.0 GHz	2.20 dB	18.6 dB
18.0 GHz	2.32 dB	22.8 dB

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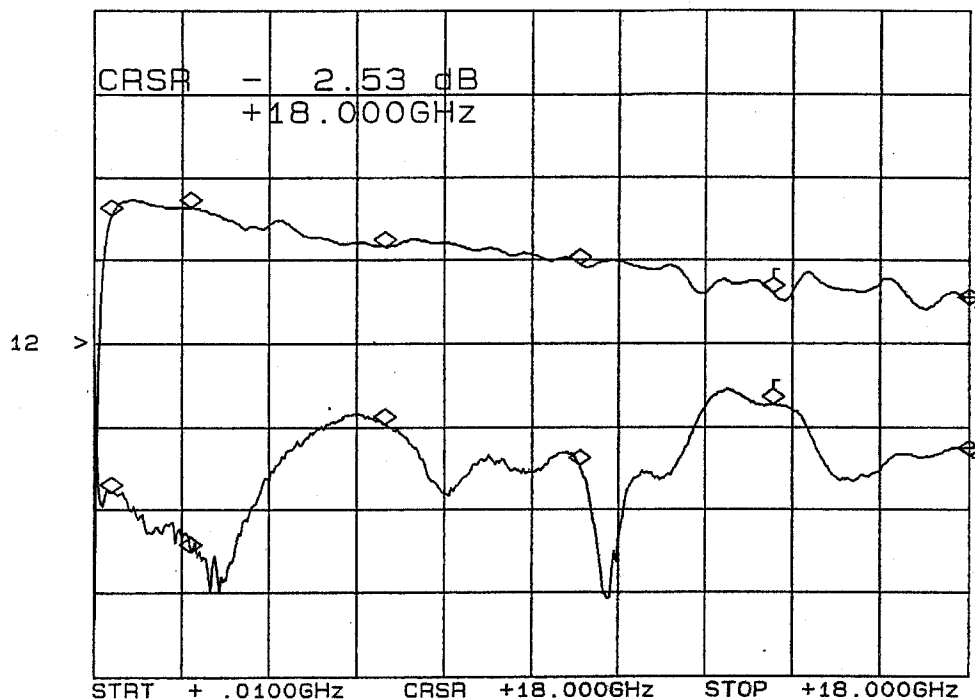
## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

### INSERTION LOSS & RETURN LOSS\*

J3-J1

CH1: A -M - 2.53 dB      CH2: B -M - 16.18 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	1.44 dB	18.3 dB
2.0 GHz	1.39 dB	21.8 dB
6.0 GHz	1.84 dB	14.2 dB
10.0 GHz	2.04 dB	17.4 dB
14.0 GHz	2.43 dB	13.0 dB
18.0 GHz	2.53 dB	16.1 dB



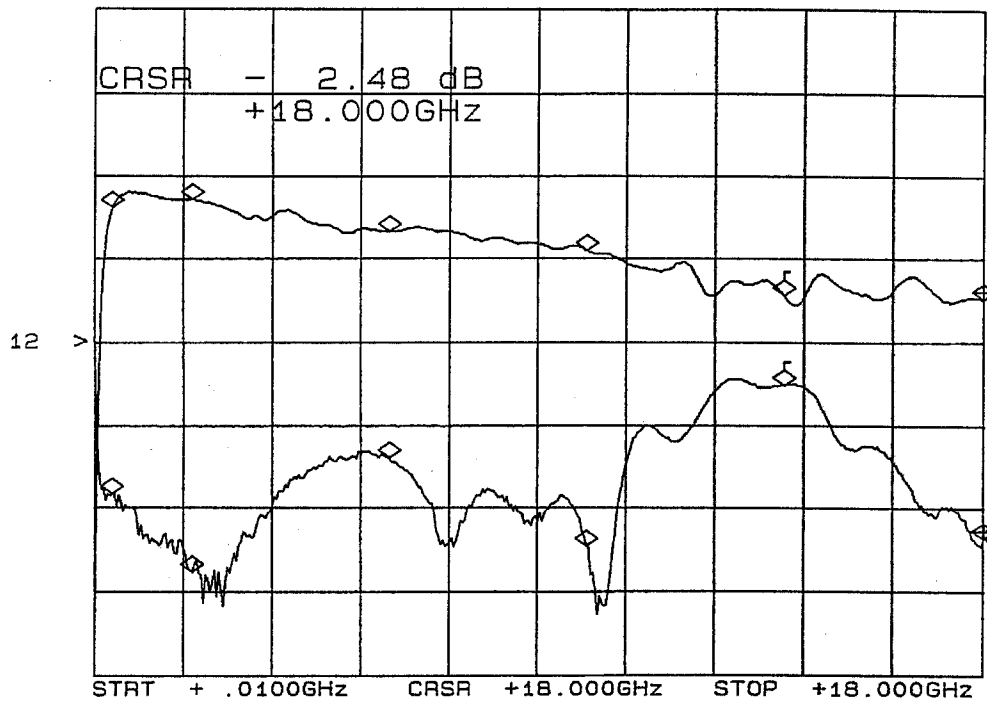
### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

#### INSERTION LOSS & RETURN LOSS\*

J4-J1

CH1: A -M - 2.48 dB      CH2: B -M - 21.33 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	1.37 dB	18.6 dB
2.0 GHz	1.28 dB	23.3 dB
6.0 GHz	1.66 dB	16.4 dB
10.0 GHz	1.89 dB	21.8 dB
14.0 GHz	2.43 dB	12.0 dB
18.0 GHz	2.48 dB	21.3 dB



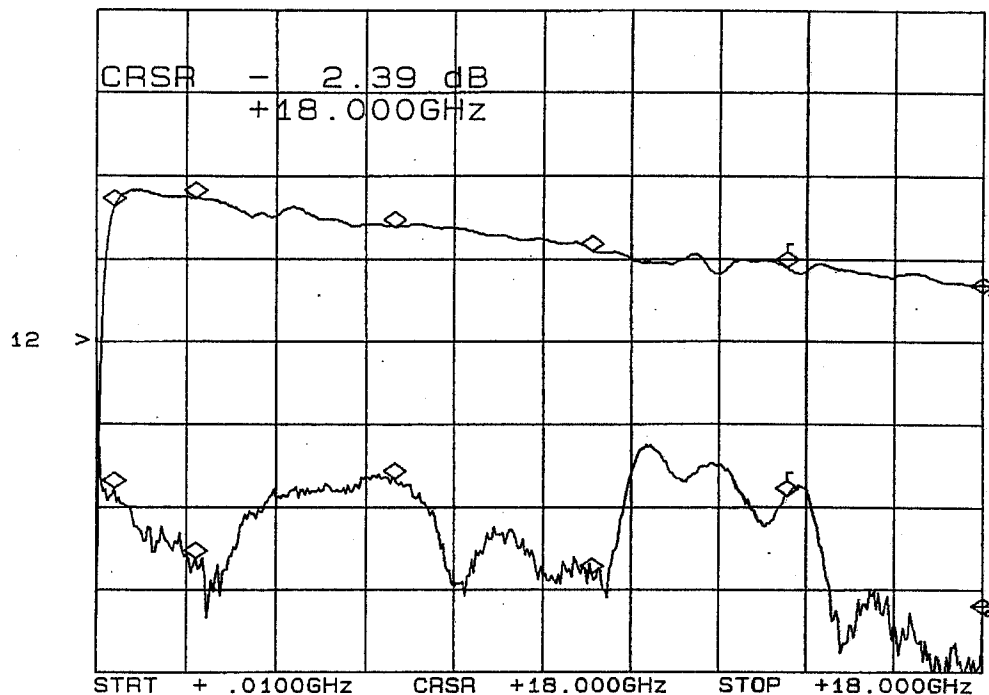
## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

### INSERTION LOSS & RETURN LOSS\*

J6-J1

CH1: A -M - 2.39 dB      CH2: B -M - 25.92 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J6: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	1.35 dB	18.3 dB
2.0 GHz	1.25 dB	22.5 dB
6.0 GHz	1.60 dB	17.7 dB
10.0 GHz	2.89 dB	23.5 dB
14.0 GHz	2.09 dB	18.8 dB
18.0 GHz	2.39 dB	25.9 dB

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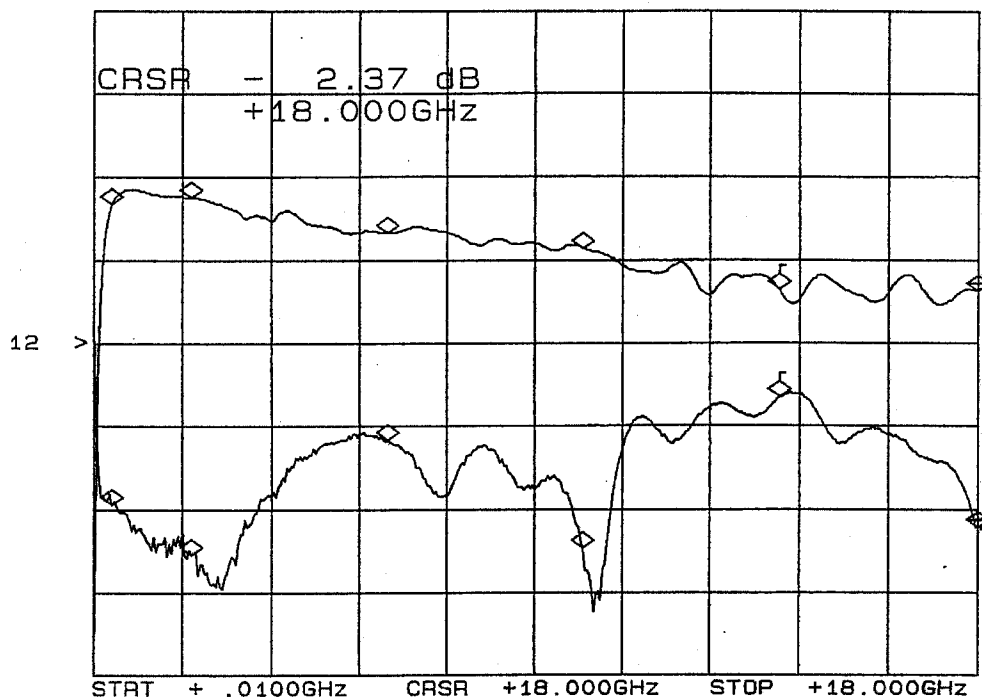
## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

### INSERTION LOSS & RETURN LOSS\*

J7-J1

CH1: A -M - 2.37 dB      CH2: B -M - 20.56 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J7: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	1.32 dB	19.2 dB
2.0 GHz	1.23 dB	22.1 dB
6.0 GHz	1.66 dB	15.3 dB
10.0 GHz	1.85 dB	21.7 dB
14.0 GHz	2.34 dB	12.7 dB
18.0 GHz	2.37 dB	20.5 dB

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## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

### ISOLATION\*

(AS MEASURED ON A SPECTRUM ANALYZER)

FREQUENCY	J3	J4	J6	J7
100 MHz	98 dB	98 dB	93 dB	95 dB
200 MHz	99 dB	96 dB	94 dB	94 dB
400 MHz	92 dB	92 dB	92 dB	93 dB
500 MHz	81 dB	78 dB	81 dB	83 dB
1 GHz	81 dB	82 dB	80 dB	81 dB
2 GHz	80 dB	80 dB	80 dB	80 dB
4 GHz	74 dB	74 dB	74 dB	73 dB
6 GHz	71 dB	70 dB	70 dB	71 dB
8 GHz	70 dB	70 dB	68 dB	69 dB
10 GHz	68 dB	65 dB	67 dB	67 dB
12 GHz	65 dB	65 dB	64 dB	64 dB
14 GHz	61 dB	61 dB	62 dB	62 dB
16 GHz	60 dB	59 dB	60 dB	60 dB
18 GHz	56 dB	50 dB	57 dB	56 dB

\* J1: INPUT ARM

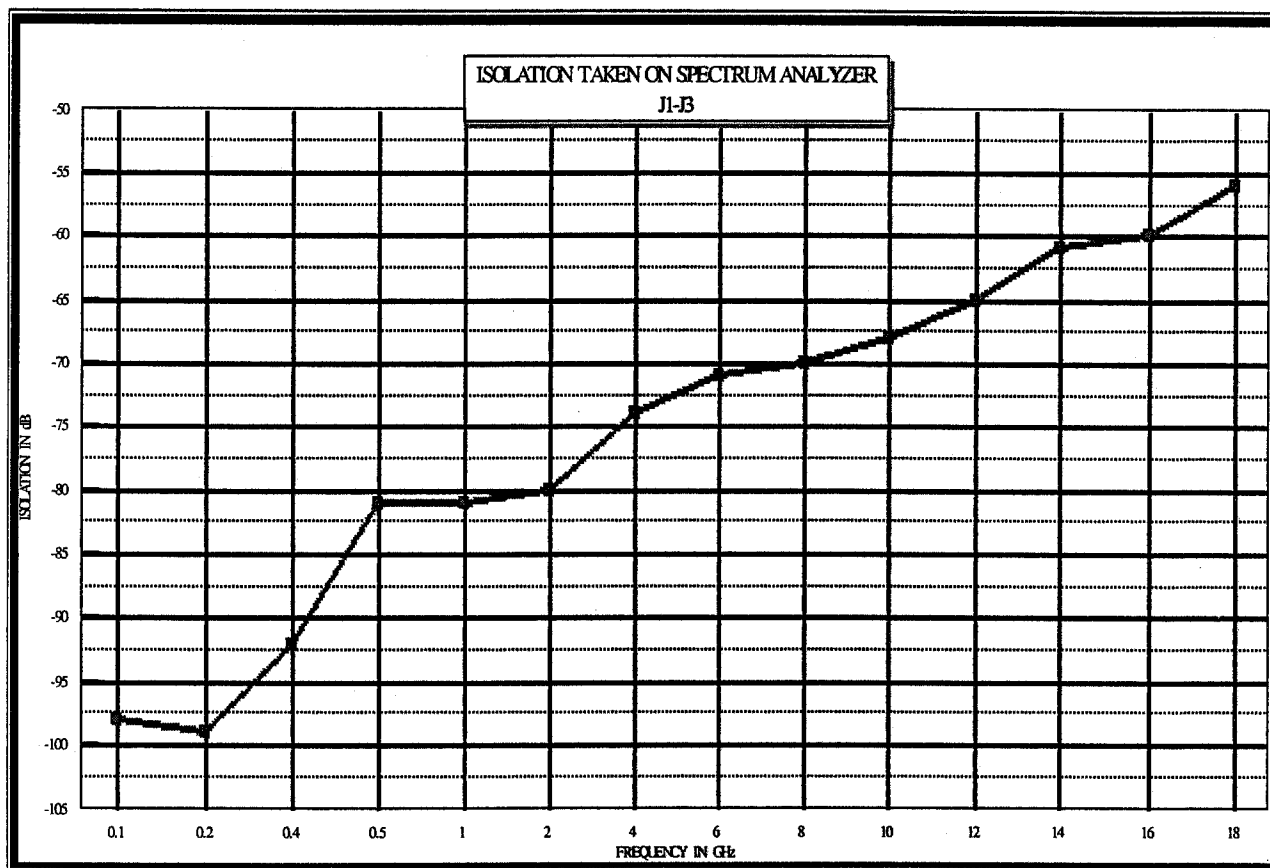
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DT-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +1.5mA; -5vdc @ -21.5mA

**ISOLATION\***  
 (AS MEASURED ON A SPECTRUM ANALYZER)  
 J1-J3



\*J1: INPUT ARM

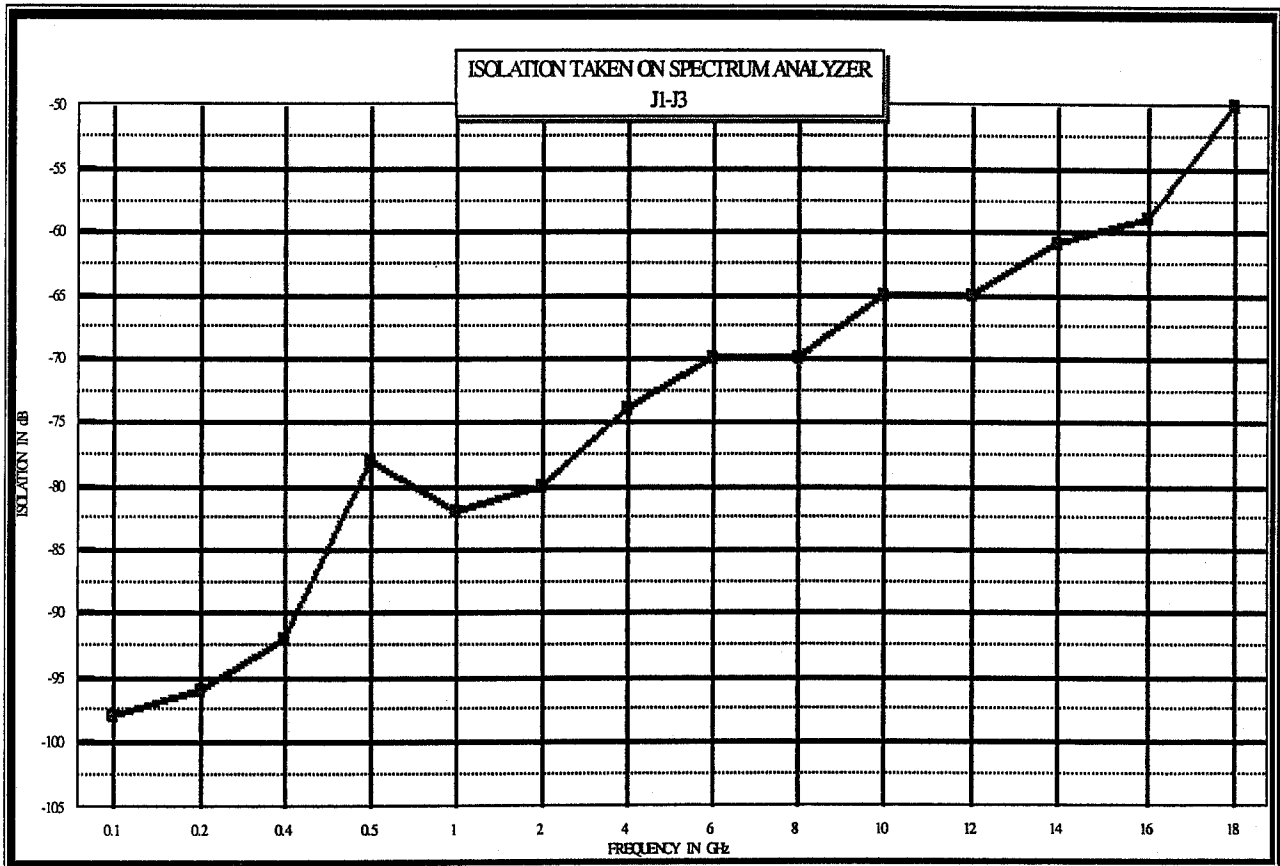
AUGUST 17, 1999



**SUMMARY TEST DATA**

**MODEL NUMBER** : SWN-1170-4DT-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +1.5mA; -5vdc @ -21.5mA

**ISOLATION\***  
 (AS MEASURED ON A SPECTRUM ANALYZER)  
**J1-J4**



\*J1: INPUT ARM

AUGUST 17, 1999

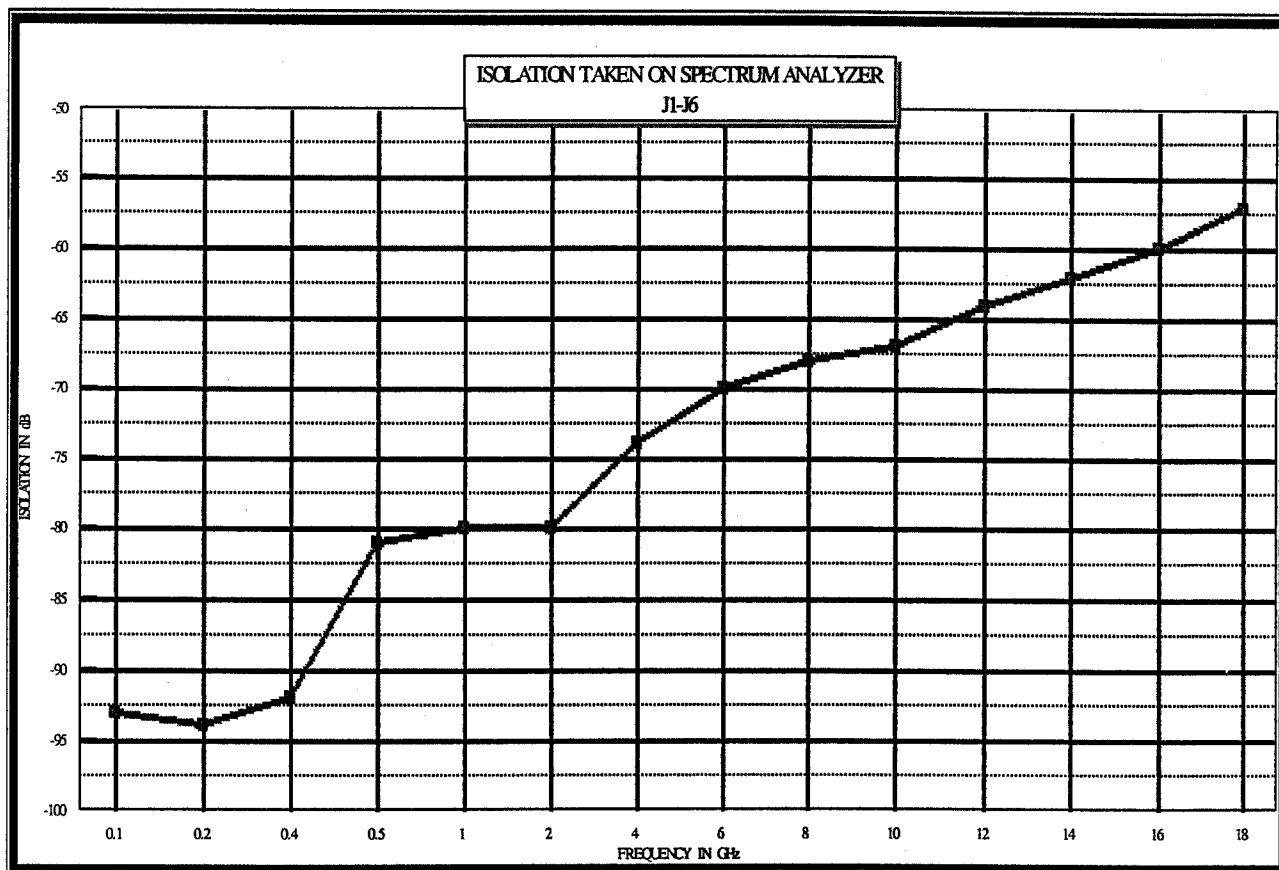




## SUMMARY TEST DATA

MODEL NUMBER : SWN-1170-4DT-STD OPTIONS 0418, PAM, SS  
SERIAL NUMBER : 4MS908196  
ENGINEER : RENE AFABLE  
VOLTAGE & CURRENT DRAW : +5vdc: @ +1.5mA; -5vdc @ -21.5mA

**ISOLATION\***  
(AS MEASURED ON A SPECTRUM ANALYZER)  
J1-J6



\*J1: INPUT ARM

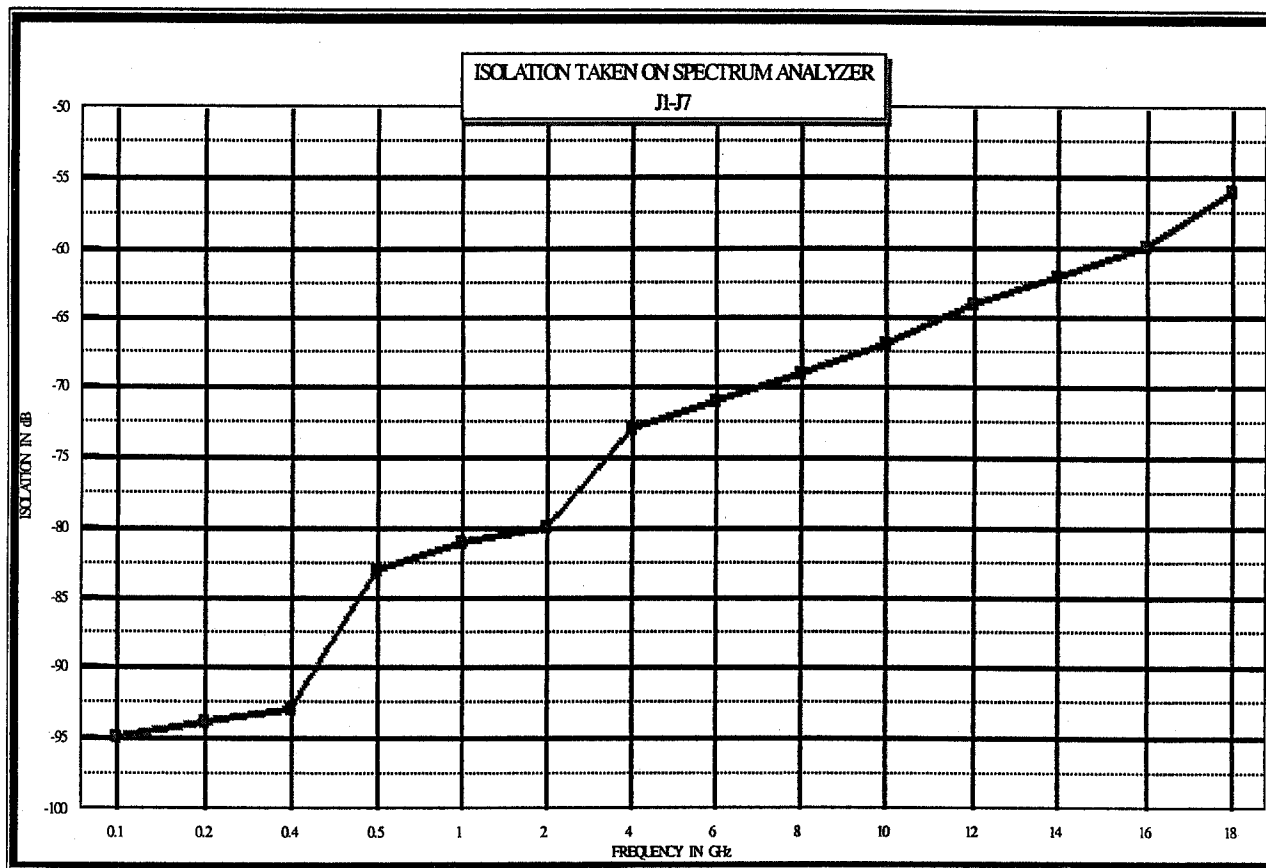
AUGUST 17, 1999



### SUMMARY TEST DATA

MODEL NUMBER	: SWN-1170-4DT-STD OPTIONS 0418, PAM, SS
SERIAL NUMBER	: 4MS908196
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @ +1.5mA; -5vdc @ -21.5mA

**ISOLATION\***  
(AS MEASURED ON A SPECTRUM ANALYZER)  
J1-J7



\*J1: INPUT ARM

AUGUST 17, 1999



**AMERICAN MICROWAVE  
CORPORATION**

**AMPLITUDE  
DATA  
BETWEEN  
PORT TO PORT  
FROM  
0.4 GHz TO 18 GHz  
ON  
SP4T**

**RADIAL SOLID STATE SWITCH  
(SURFACE MOUNTABLE)**

**AMC MODEL No:  
SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SS  
(Serial Number: 4MS908196)**

**AUGUST 17, 1999**

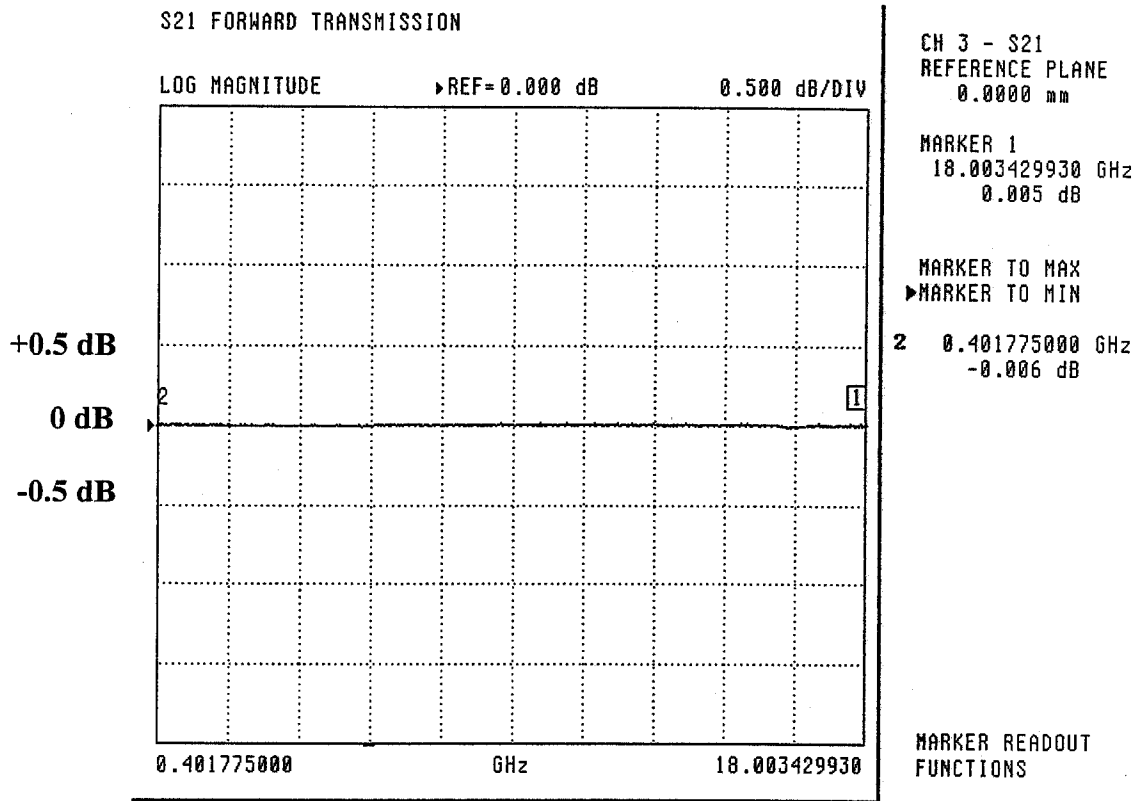
7311 G GROVE ROAD, FREDERICK, MARYLAND 21704 • Tel. (301) 662-4700 • Fax (301) 662-4938



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

**AMPLITUDE\***  
**J1-J3 (REFERENCE)**



\*J1: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
400 MHZ		-0.006 dB
18 GHz	0.005 dB	

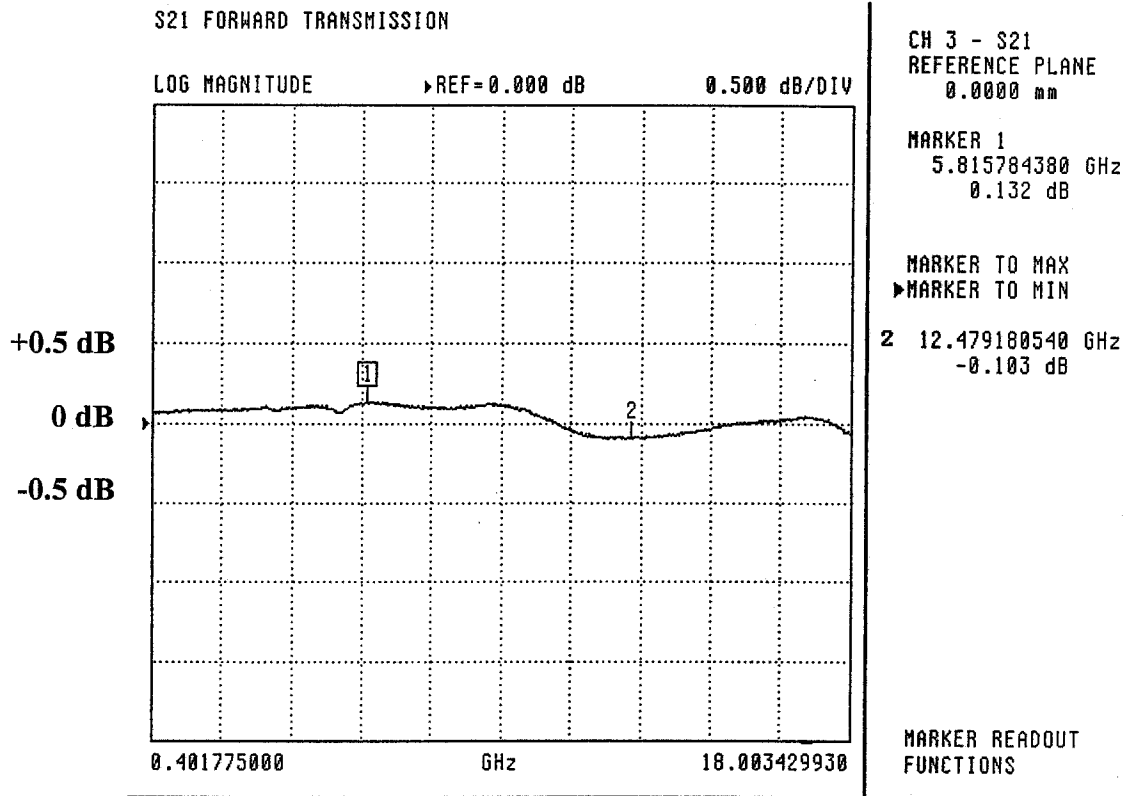
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

**AMPLITUDE\***  
J1-J4



\*J1: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
5.81 GHZ	0.132 dB	
12.47 GHZ		-0.103 dB

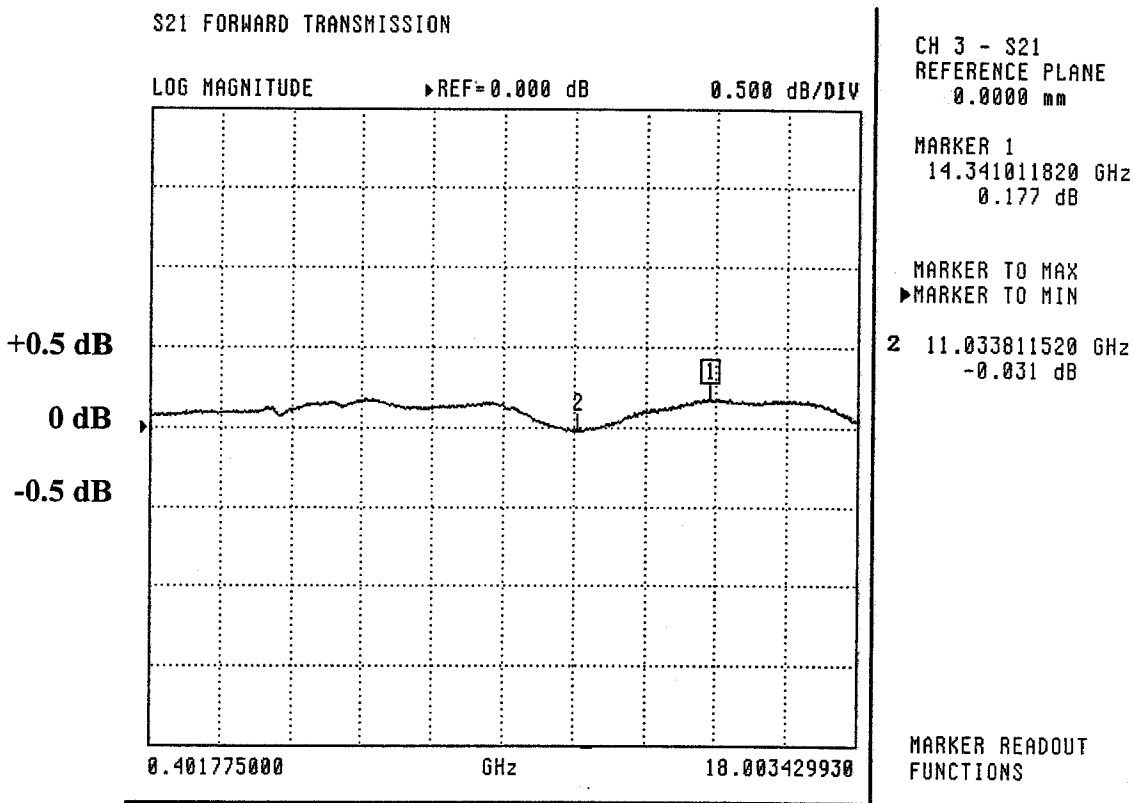
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

**AMPLITUDE\***  
J1-J6



\*J1: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
14.34 GHz	0.177 dB	
11.03 GHz		-0.031 dB

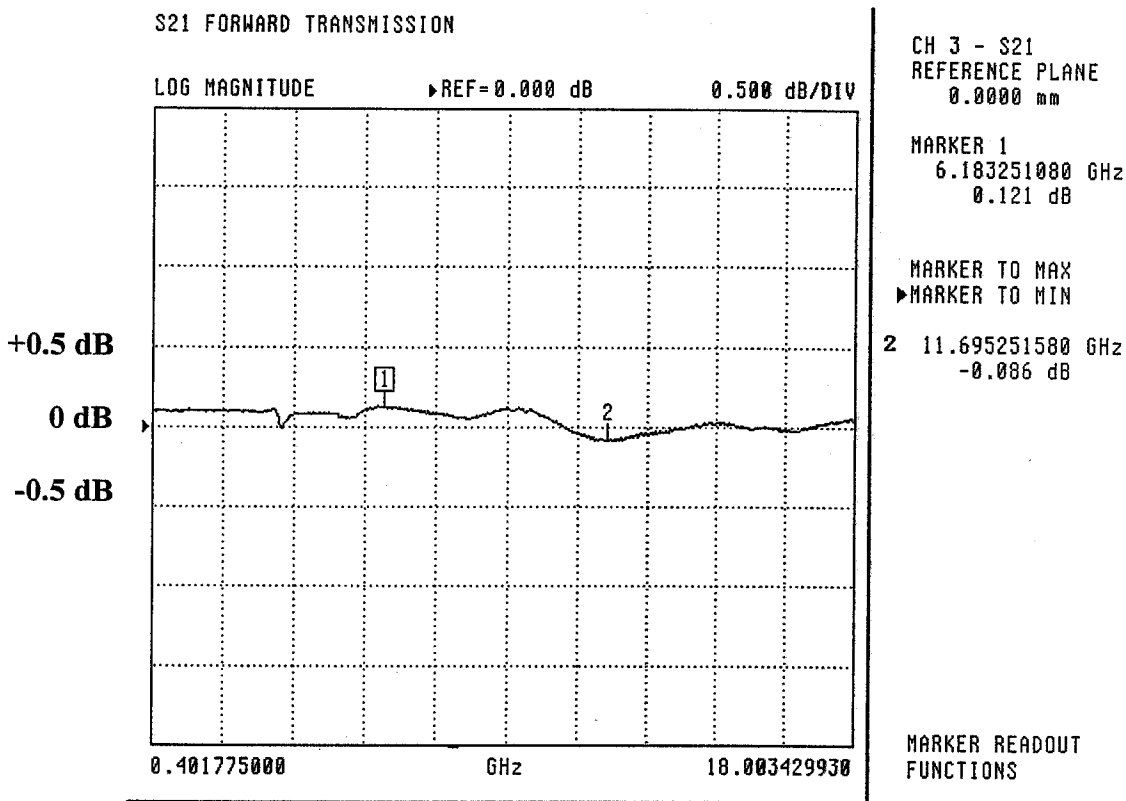
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

#### AMPLITUDE\* J1-J7



\*J1: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
6.18 GHz	0.121 dB	
11.69 GHz		-0.086 dB

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**PHASE  
DATA  
BETWEEN  
PORT TO PORT  
FROM  
0.4 GHz TO 18 GHz  
ON A  
SP4T**

**RADIAL SOLID STATE SWITCH  
(SURFACE MOUNTABLE)**

**AMC MODEL No:  
SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SS  
(Serial Number: 4MS908196)**

**AUGUST 17, 1999**

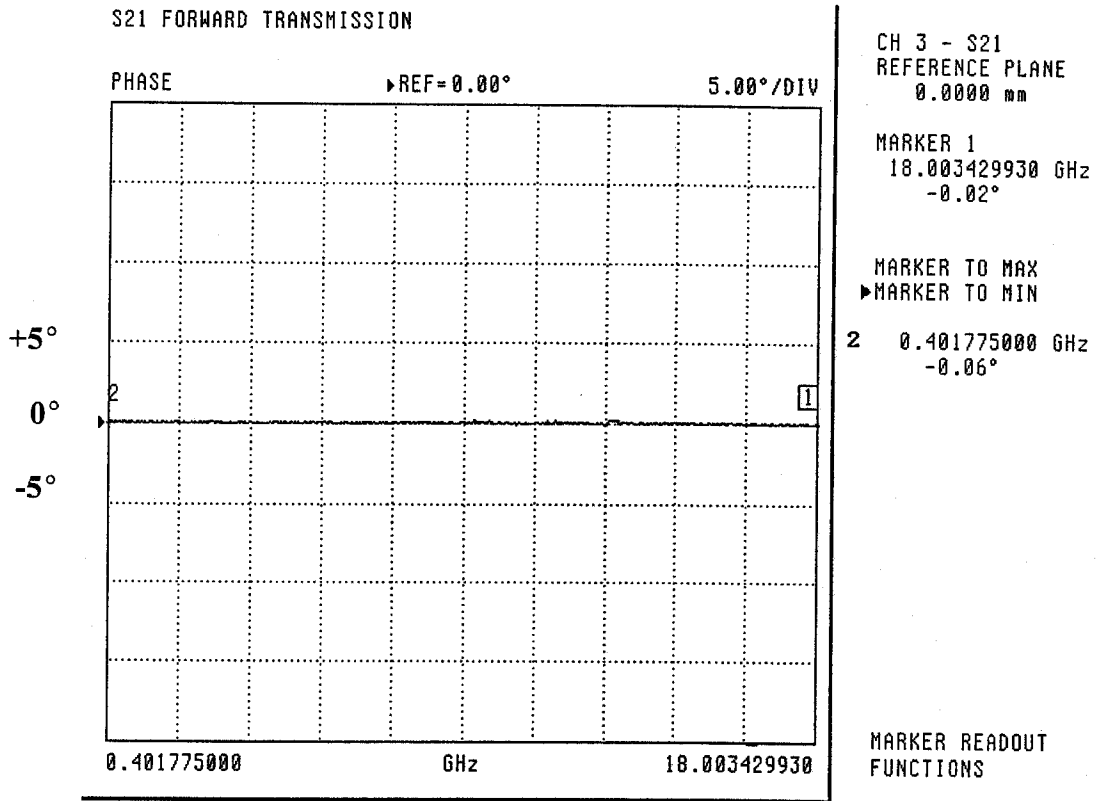




### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

#### PHASE\* J1-J3 (REFERENCE)



\*J1: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
400 MHZ		-0.06°
18 GHz		-0.02°

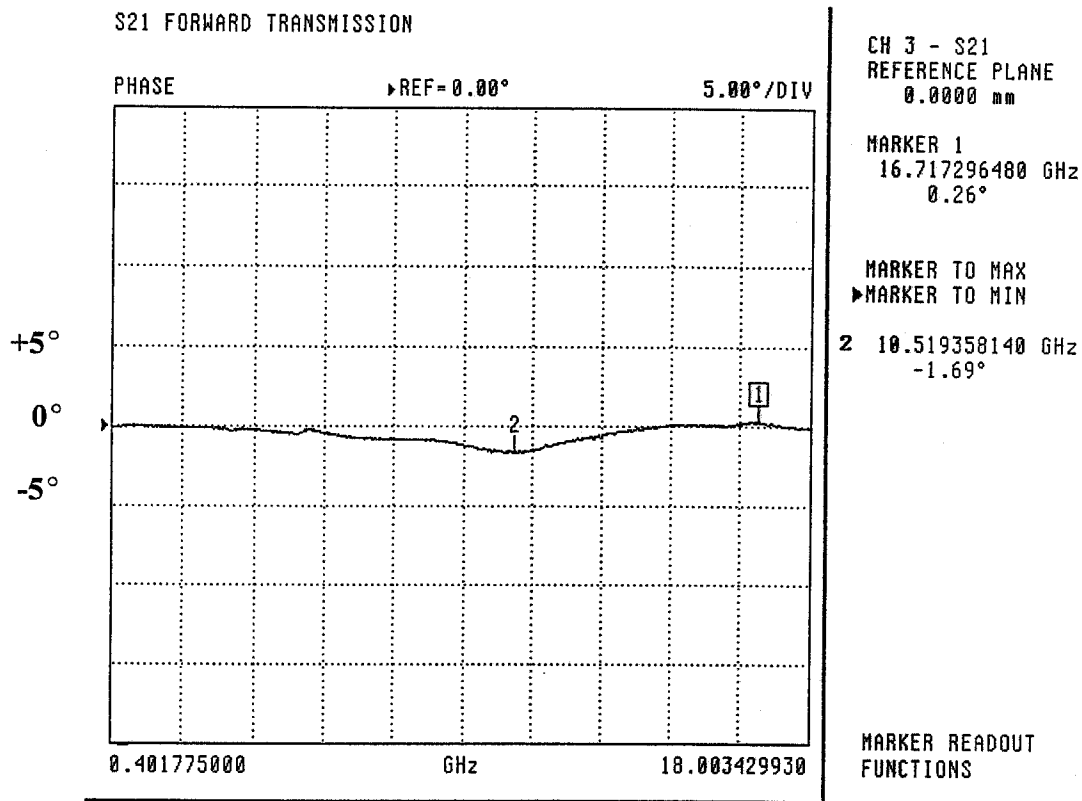
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

#### PHASE\* J1-J4



\*J1: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
16.71 GHZ	0.26°	
10.51 GHZ		-1.69°

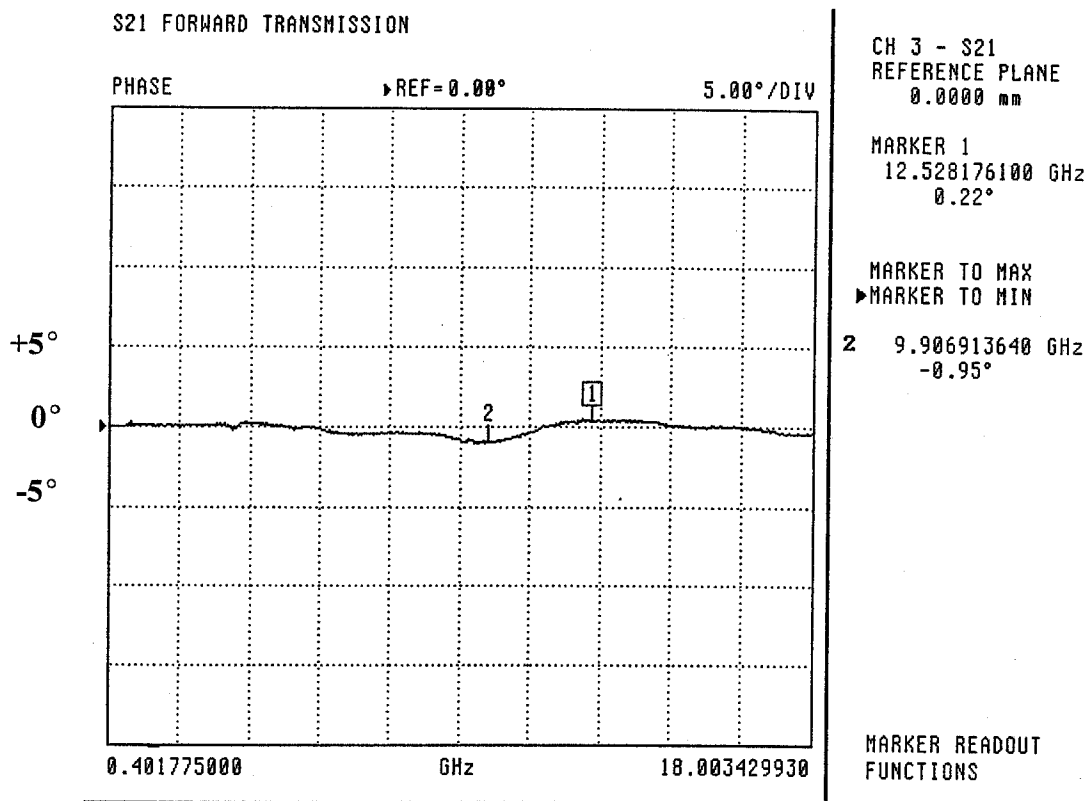
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

**PHASE\***  
J1-J6



\*J1: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
12.52 GHZ	0.22°	
9.90 GHZ		-0.95°

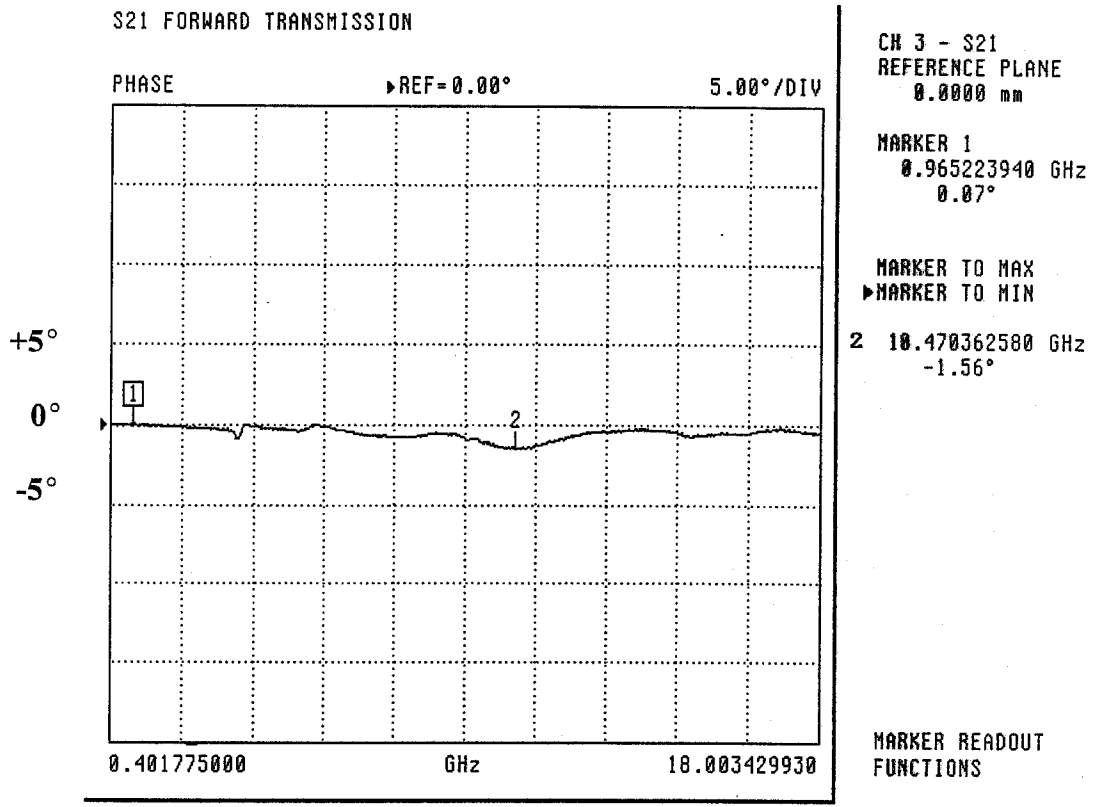
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

#### PHASE\* J1-J7



\*J1: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
0.96 GHZ	0.07°	
10.47 GHZ		-1.56°

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**TEST DATA**

**FROM**

**0.04 GHz TO 2 GHz**

**ON A**

**SP4T**

**RADIAL SOLID STATE SWITCH**

**(SURFACE MOUNTABLE)**

**AMC MODEL No:**

**SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SS**

**(Serial Number: 4MS908196)**

**AUGUST 17, 1999**



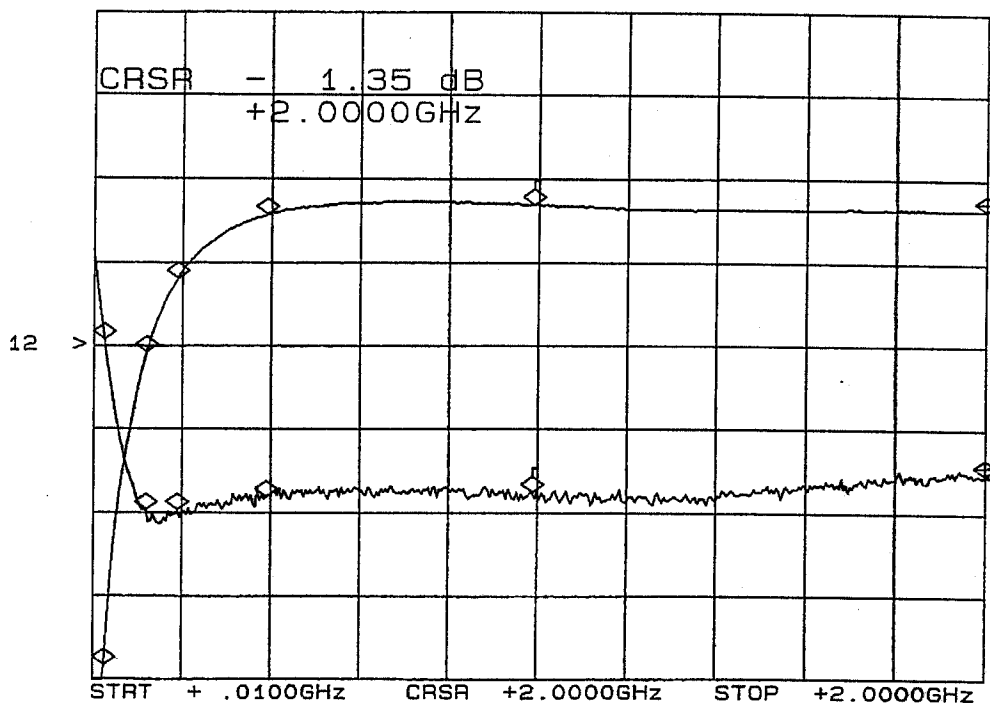
### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

#### INSERTION LOSS & RETURN LOSS\*

J1-J3

CH1: A -M - 1.35 dB      CH2: B -M - 17.18 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	6.82 dB	9.11 dB
130 MHz	3.07 dB	19.2 dB
200 MHz	2.17 dB	19.3 dB
400 MHz	1.42 dB	18.5 dB
1 GHz	1.29 dB	18.1 dB
2 GHz	1.35 dB	17.1 dB



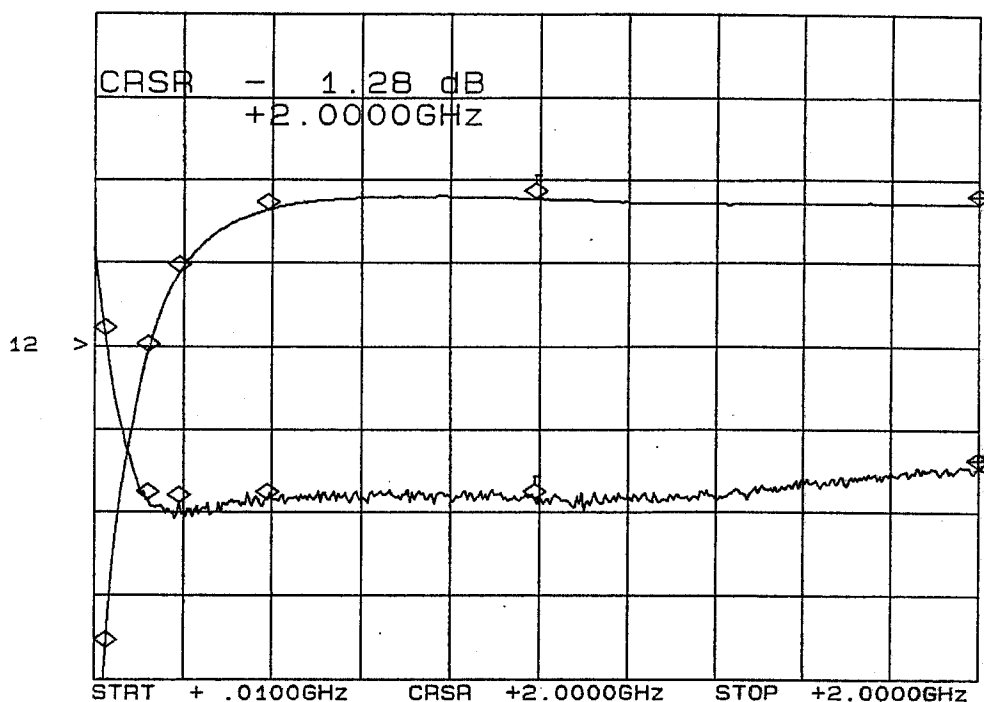
## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

### INSERTION LOSS & RETURN LOSS\*

J1-J4

CH1: A -M - 1.28 dB      CH2: B -M - 16.75 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	6.60 dB	8.78 dB
130 MHz	3.05 dB	18.7 dB
200 MHz	2.11 dB	18.9 dB
400 MHz	1.36 dB	18.7 dB
1 GHz	1.22 dB	18.6 dB
2 GHz	1.28 dB	16.7 dB

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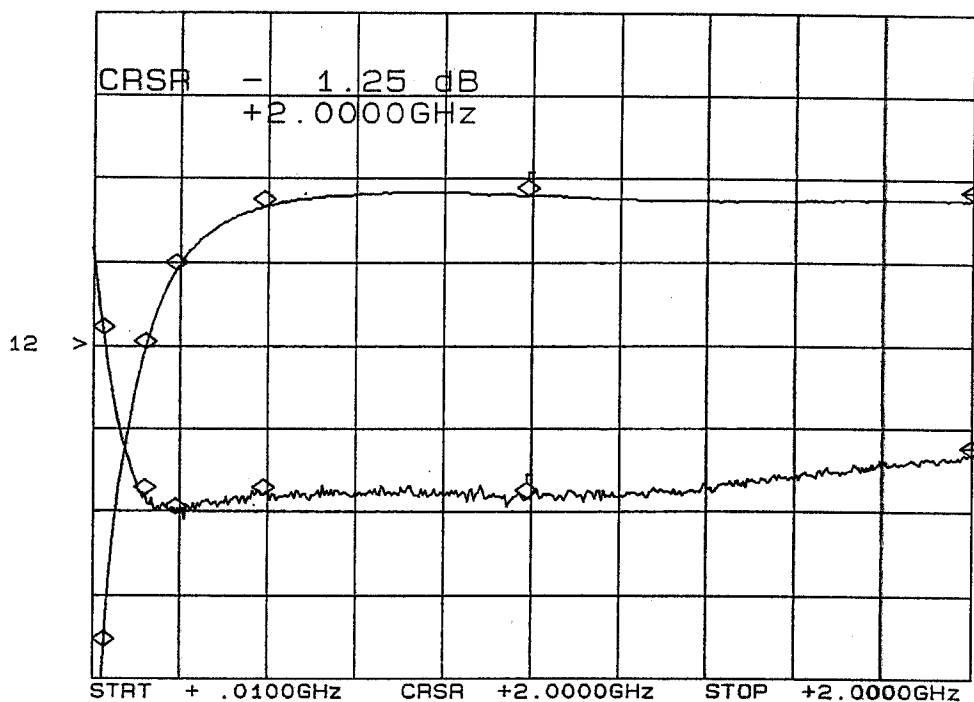
### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

#### INSERTION LOSS & RETURN LOSS\*

J1-J6

CH1: A -M - 1.25 dB      CH2: B -M - 16.14 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	6.60 dB	8.83 dB
130 MHz	3.03 dB	18.5 dB
200 MHz	2.09 dB	19.7 dB
400 MHz	1.33 dB	18.4 dB
1 GHz	1.21 dB	18.7 dB
2 GHz	1.25 dB	16.1 dB





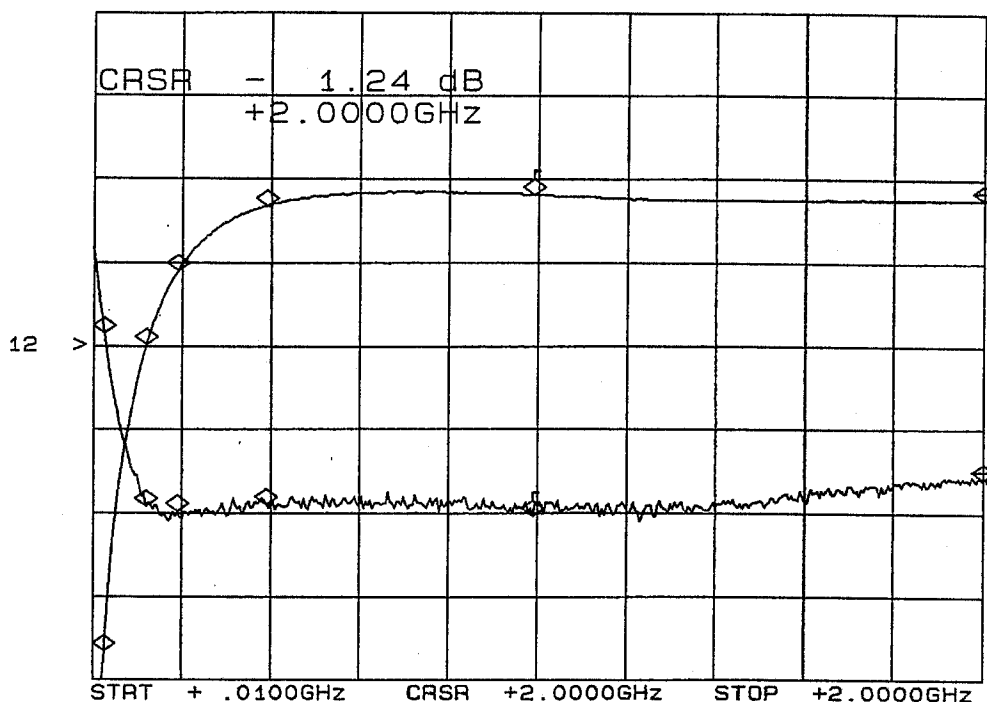
### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

#### INSERTION LOSS & RETURN LOSS\*

J1-J7

CH1: A -M - 1.24 dB      CH2: B -M - 17.46 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	6.65 dB	8.71 dB
130 MHz	2.96 dB	19.0 dB
200 MHz	2.08 dB	19.4 dB
400 MHz	1.31 dB	19.0 dB
1 GHz	1.18 dB	19.6 dB
2 GHz	1.24 dB	17.4 dB



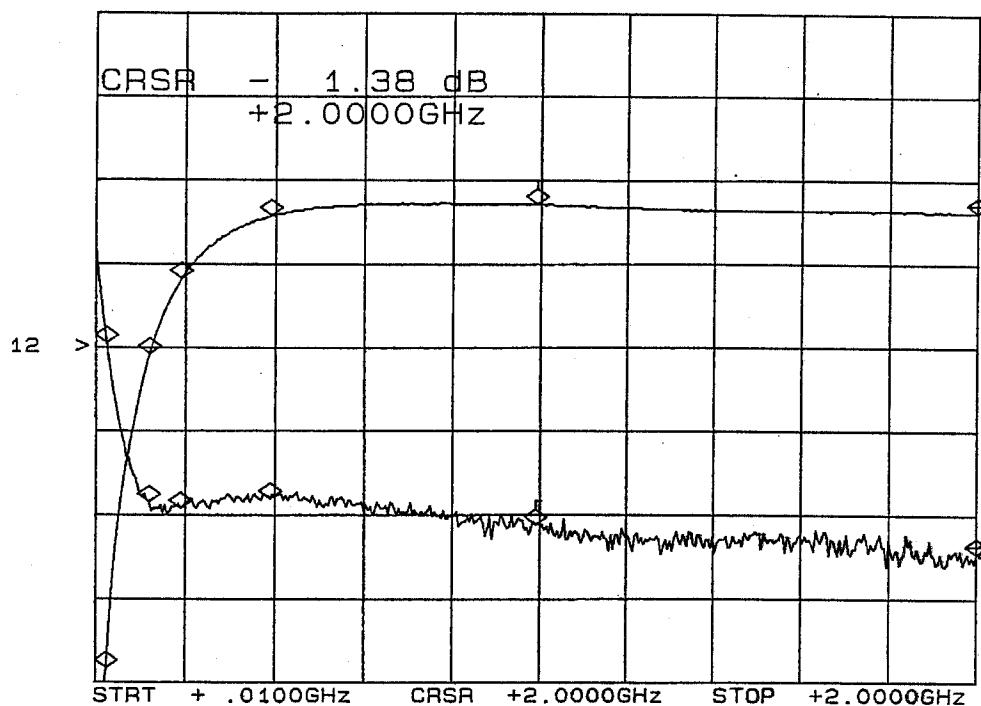
## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

### INSERTION LOSS & RETURN LOSS\*

J3-J1

CH1: A -M - 1.38 dB      CH2: B -M - 21.81 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	6.82 dB	9.17 dB
130 MHz	3.06 dB	18.7 dB
200 MHz	2.17 dB	19.1 dB
400 MHz	1.42 dB	18.5 dB
1 GHz	1.28 dB	20.1 dB
2 GHz	1.38 dB	21.8 dB

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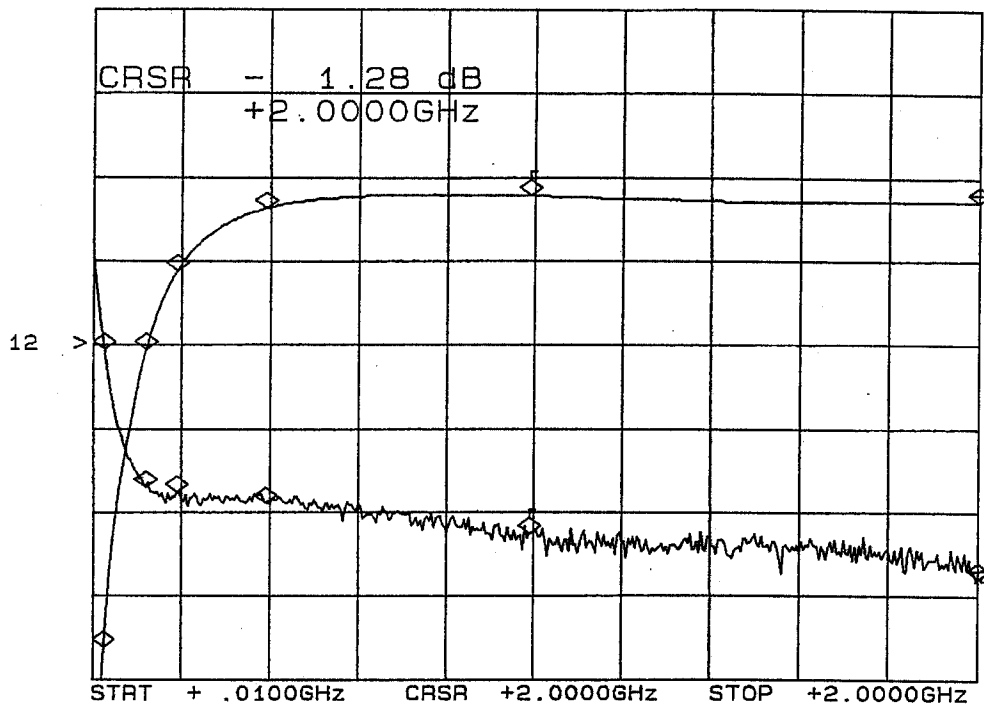


### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

#### INSERTION LOSS & RETURN LOSS\* J4-J1

CH1: A -M - 1.28 dB      CH2: B -M - 23.48 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	6.60 dB	9.74 dB
130 MHz	3.05 dB	17.9 dB
200 MHz	2.10 dB	18.2 dB
400 MHz	1.36 dB	18.8 dB
1 GHz	1.20 dB	20.7 dB
2 GHz	1.28 dB	23.4 dB



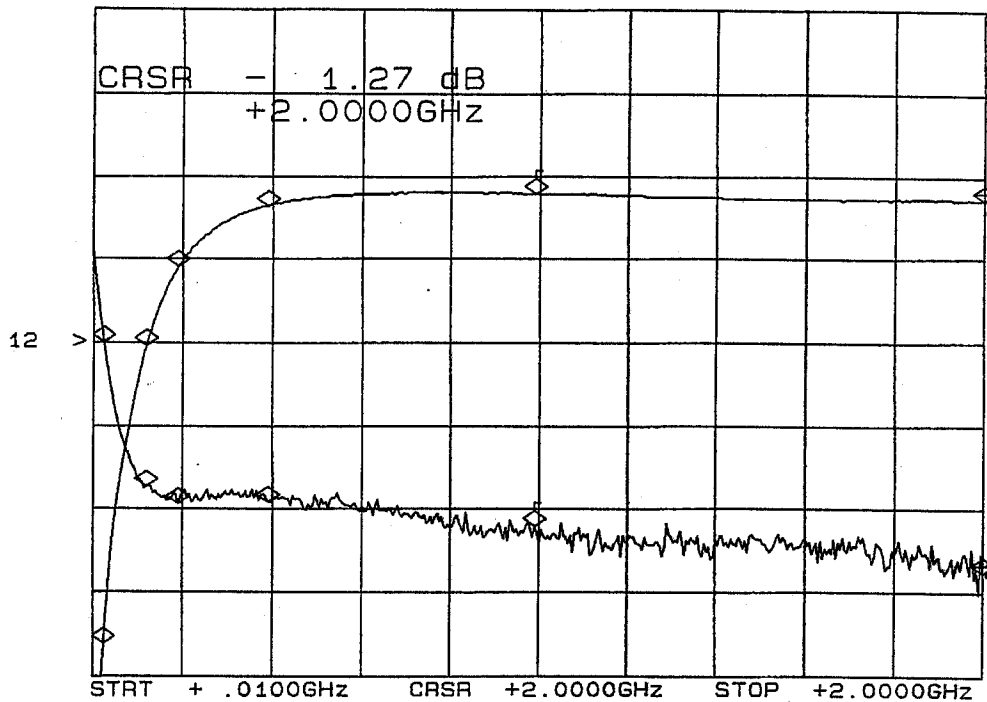
### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+1.5mA; -5vdc: @ -21.5mA

#### INSERTION LOSS & RETURN LOSS\*

J6-J1

CH1: A -M - 1.27 dB      CH2: B -M - 23.97 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J6: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	6.61 dB	9.46 dB
130 MHz	3.03 dB	18.0 dB
200 MHz	2.09 dB	19.1 dB
400 MHz	1.34 dB	19.0 dB
1 GHz	1.20 dB	20.5 dB
2 GHz	1.27 dB	23.3 dB



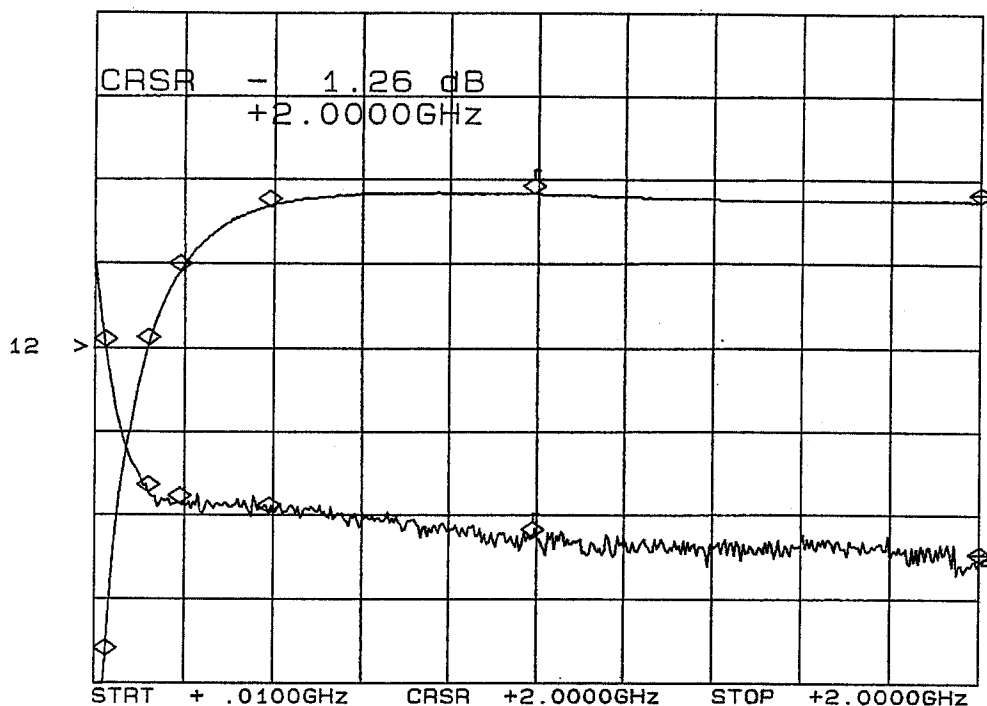
## SUMMARY TEST DATA

<b>MODEL NUMBER</b>	: SWN-1170-4DR-STD OPTIONS 0418, PAM, SS
<b>SERIAL NUMBER</b>	: 4MS908196
<b>ENGINEER</b>	: RENE AFABLE
<b>VOLTAGE &amp; CURRENT DRAW</b>	: +5vdc: @+1.5mA; -5vdc: @ -21.5mA

### INSERTION LOSS & RETURN LOSS\*

J7-J1

CH1: A -M - 1.26 dB      CH2: B -M - 22.30 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J7: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	6.65 dB	9.38 dB
130 MHz	2.95 dB	18.1 dB
200 MHz	2.08 dB	18.8 dB
400 MHz	1.31 dB	19.4 dB
1 GHz	1.17 dB	20.8 dB
2 GHz	1.26 dB	22.3 dB

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## SUMMARY TEST DATA

MODEL NUMBER	: SWN-1170-4DR-STD	OPTIONS 0418, PAM, SS
SERIAL NUMBER	: 4MS908196	
ENGINEER	: RENE AFABLE	
VOLTAGE & CURRENT DRAW	: +5vdc: @+1.5mA; -5vdc: @ -21.5mA	

### SWITCHING SPEED

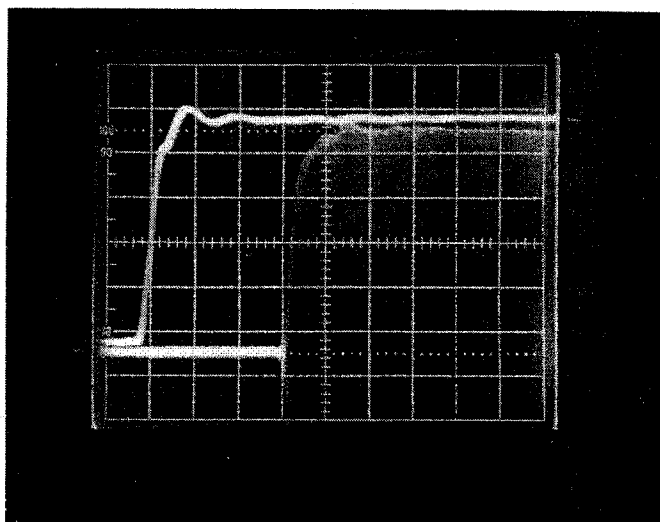
"Rise/Fall" Time: 10% RF to 90% RF & 90% RF to 10% RF  
 "On/Off" Time: 50% TTL to 90% RF or 10% RF

### TYPICAL OF ALL ARMS

"DELAY ON": 36 nS  
 "RISE TIME": 5 nS

HORIZONTAL SCALE:  
 10 nS PER DIVISION

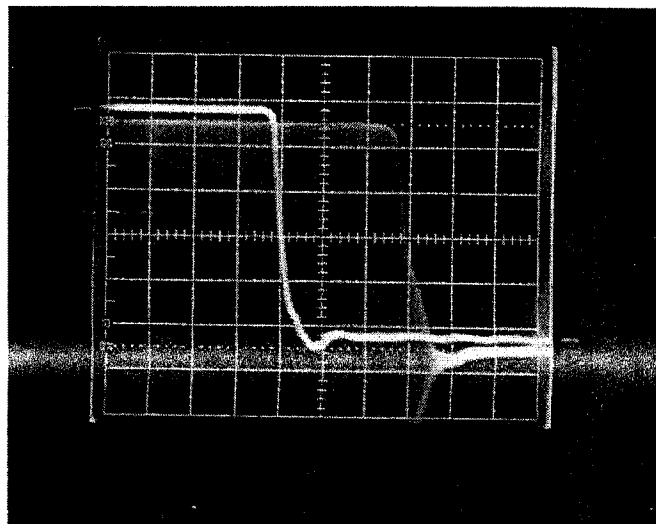
VERTICAL SCALE:  
 10 mV PER DIVISION



"DELAY OFF": 34 nS  
 "FALL TIME": 8 nS

HORIZONTAL SCALE:  
 10 nS PER DIVISION

VERTICAL SCALE:  
 10 mV PER DIVISION



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## SUMMARY TEST DATA

<b>MODEL NUMBER</b>	<b>: SWN-1170-4DR-STD</b>	<b>OPTIONS 0418, PAM, SS</b>
<b>SERIAL NUMBER</b>	<b>: 4MS908196</b>	
<b>ENGINEER</b>	<b>: RENE AFABLE</b>	
<b>VOLTAGE &amp; CURRENT DRAW</b>	<b>: +5vdc: @+1.5mA; -5vdc: @ -21.5mA</b>	

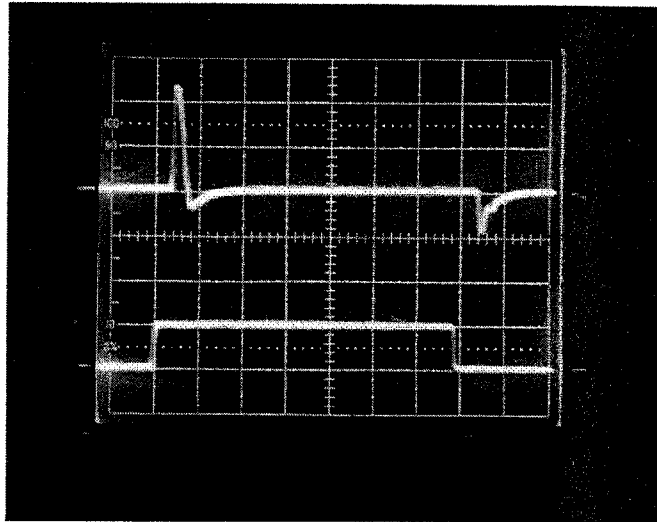
### VIDEO TRANSIENTS

TYPICAL OF ALL ARMS

**$\leq 1.6$  V P-P**  
**MEASURED IN A**  
**300 MHZ BANDWIDTH**

**VERTICAL SCALE:**  
**0.5 V PER DIVISION**

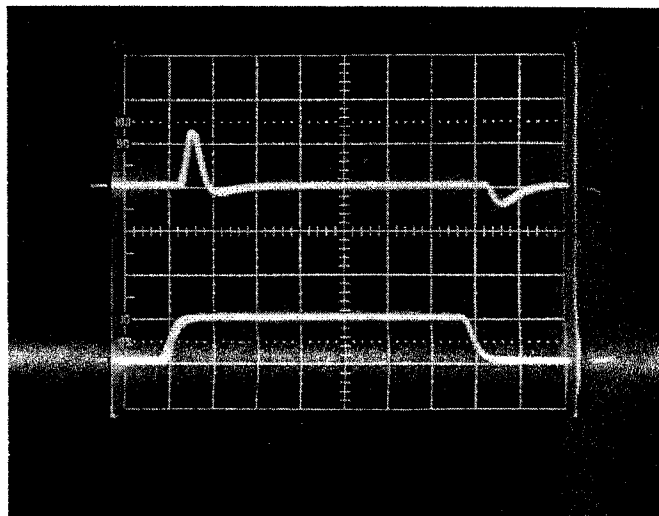
**HORIZONTAL SCALE:**  
**50 nS PER DIVISION**



**$\leq 810$  mV P-P**  
**MEASURED IN A**  
**20 MHZ BANDWIDTH**

**VERTICAL SCALE:**  
**0.5 V PER DIVISION**

**HORIZONTAL SCALE:**  
**50 nS PER DIVISION**



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**APPENDIX A-SS**  
**MISCELLANEOUS**  
**TEST DATA AND PLOTS**  
**ON**  
**ISOLATION**  
**AS**  
**MEASURED**  
**ON A SCALAR NETWORK**

**ANALYZER**  
**(NOISE FLOOR OF SCALAR NETWORK ANALYZER IS -70 dB)**

**ON A**  
**SP4T**  
**RADIAL SOLID STATE SWITCH**  
**(SURFACE MOUNTABLE)**

**AMC MODEL No:**  
**SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SS**  
**(Serial Number: 4MS908196)**

**FROM 0.4 GHz TO 18 GHz**

**AND**

**FROM 0.04 GHz TO 2 GHz**

**AUGUST 17, 1999**





## SUMMARY TEST DATA

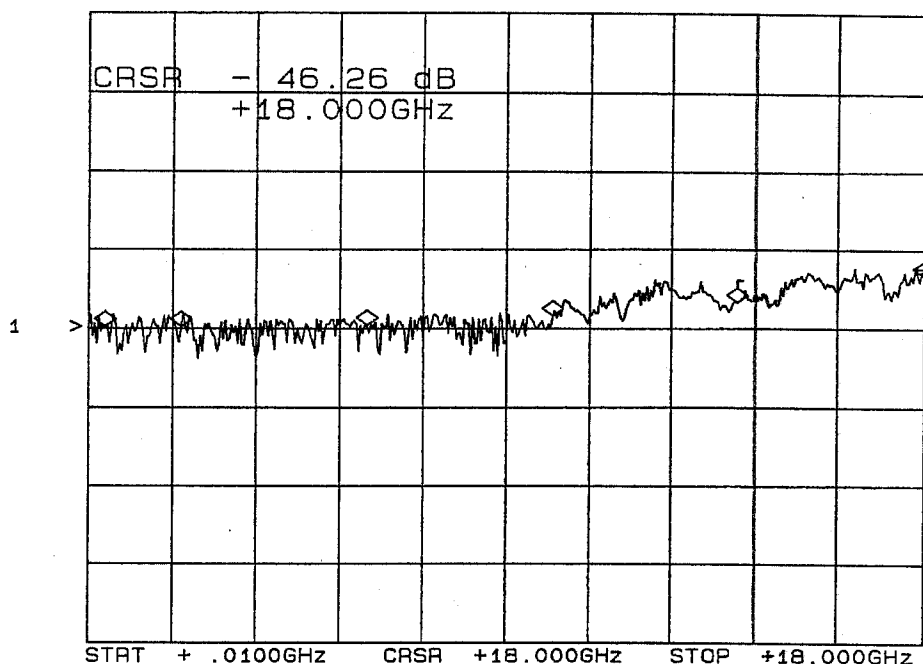
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +1.5mA; -5vdc @ -21.5mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J3

CH1: A -M - 46.26 dB  
20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
400 MHz	67.5 dB
2.0 GHz	69.1 dB
6.0 GHz	72.3 dB
10.0 GHz	58.1 dB
14.0 GHz	51.0 dB
18.0 GHz	46.2 dB

AUGUST 17 1999



## SUMMARY TEST DATA

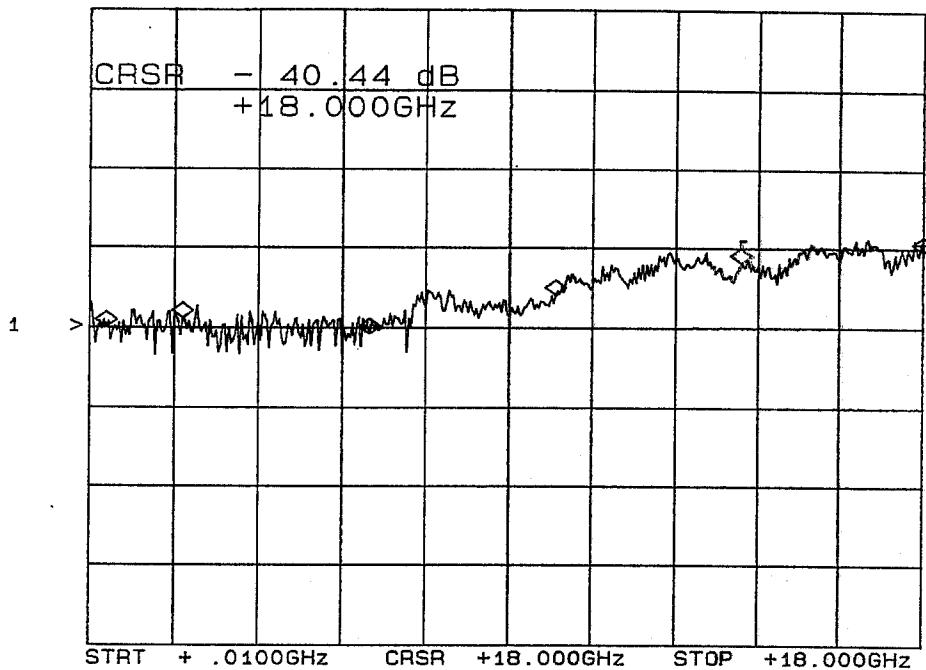
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc @ +1.5mA; -5vdc @ -21.5mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J4

CH1: A -M - 40.44 dB  
 20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
400 MHz	73.1 dB
2.0 GHz	71.6 dB
6.0 GHz	65.5 dB
10.0 GHz	50.3 dB
14.0 GHz	42.9 dB
18.0 GHz	40.4 dB

AUGUST 17, 1999

A3-SS



## SUMMARY TEST DATA

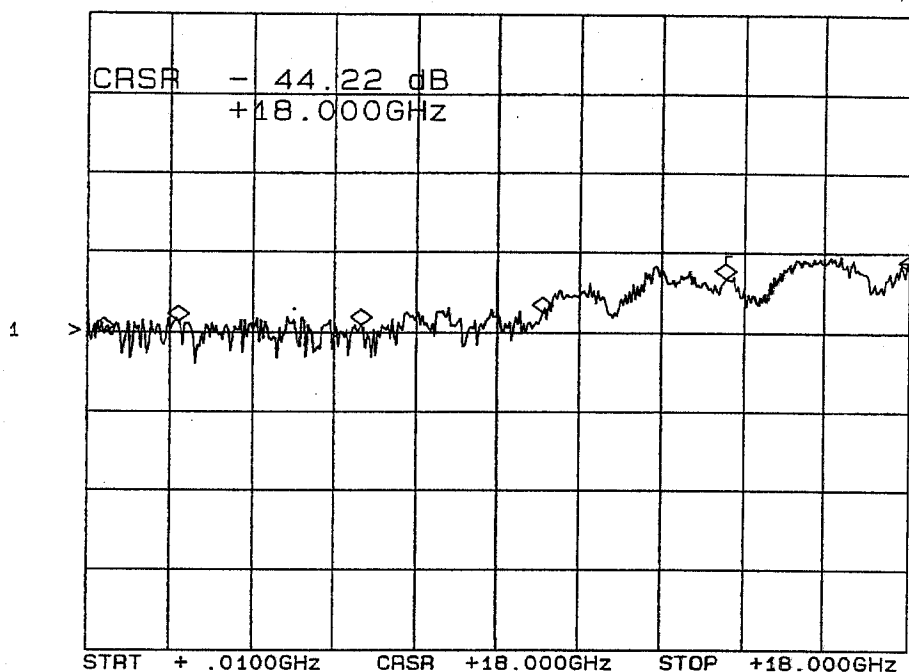
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +1.5mA; -5vdc @ -21.5mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J6

CH1: A -M - 44.22 dB  
20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
400 MHz	69.2 dB
2.0 GHz	68.6 dB
6.0 GHz	67.3 dB
10.0 GHz	56.7 dB
14.0 GHz	45.3 dB
18.0 GHz	44.2 dB

AUGUST 17, 1999

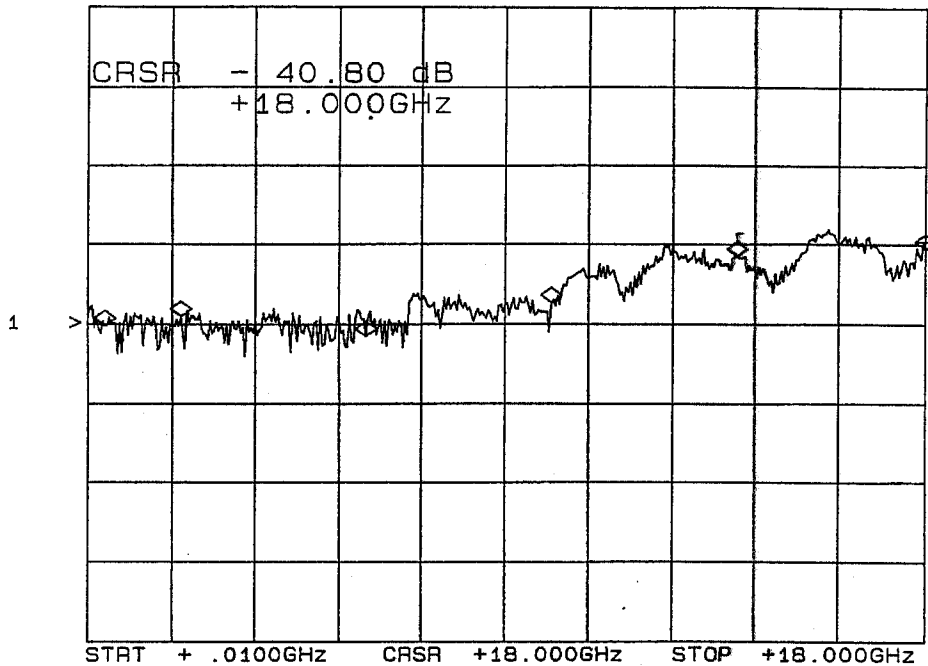


## SUMMARY TEST DATA

MODEL NUMBER	: SWN-1170-4DR-STD OPTIONS 0418, PAM, SS
SERIAL NUMBER	: 4MS908196
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @ +1.5mA; -5vdc @ -21.5mA

**ISOLATION\***  
(AS MEASURED ON A SCALAR NETWORK ANALYZER)  
J1-J7

CH1: A -M - 40.80 dB  
20.0 dB/ REF - 60.00 dB



**\*J1: INPUT ARM**

FREQUENCY	ISOLATION
400 MHz	66.3 dB
2.0 GHz	65.0 dB
6.0 GHz	66.0 dB
10.0 GHz	54.4 dB
14.0 GHz	42.2 dB
18.0 GHz	40.8 dB

AUGUST 17, 1999



**ISOLATION  
DATA AND PLOTS  
FROM  
0.04 GHz TO 2 GHz  
AS  
MEASURED  
ON A SCALAR NETWORK  
ANALYZER  
(NOISE FLOOR OF SCALAR NETWORK ANALYZER IS -70 dB)  
ON A  
SP4T  
RADIAL SOLID STATE SWITCH  
(SURFACE MOUNTABLE)**

**AMC MODEL No:  
SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SS  
(Serial Number: 4MS908196)**

**AUGUST 17, 1999**



## SUMMARY TEST DATA

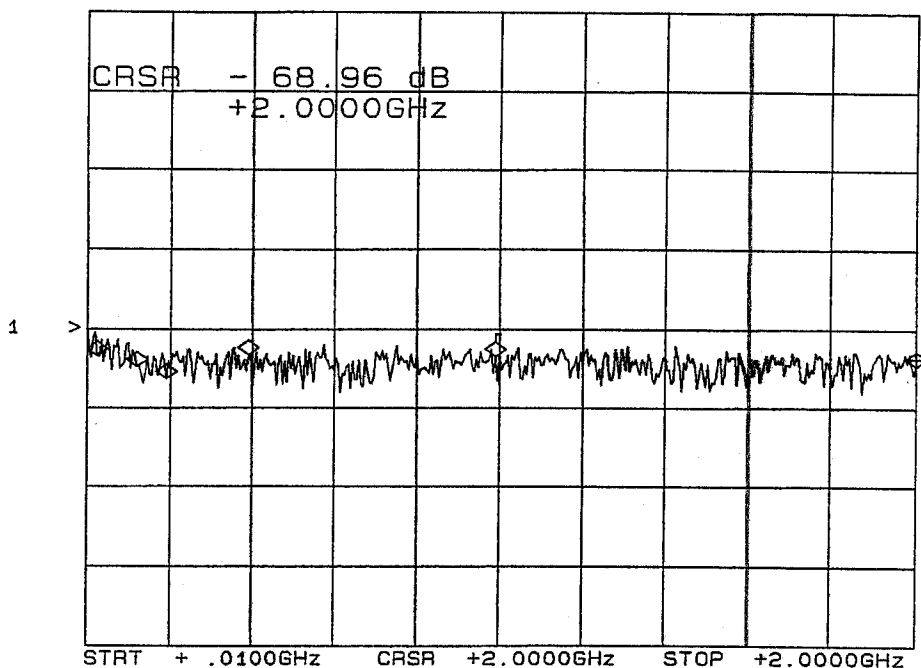
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +1.5mA; -5vdc @ -21.5mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J3

CH1: A -M - 68.96 dB  
20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
40 MHz	66.6 dB
130 MHz	69.2 dB
200 MHz	72.5 dB
400 MHz	66.4 dB
1 GHz	66.6 dB
2 GHz	68.9 dB

AUGUST 17, 1999

A7-SS



## SUMMARY TEST DATA

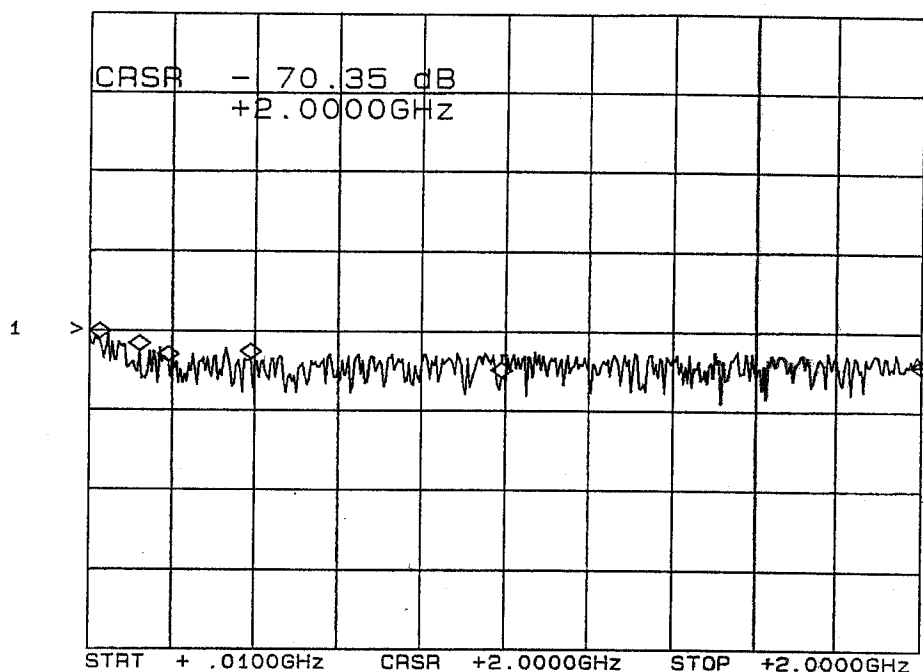
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +1.5mA; -5vdc @ -21.5mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J4

CH1: A -M - 70.35 dB  
 20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
40 MHz	61.6 dB
130 MHz	64.7 dB
200 MHz	67.5 dB
400 MHz	66.8 dB
1 GHz	71.4 dB
2 GHz	70.3 dB

AUGUST 17, 1999

A8-SS

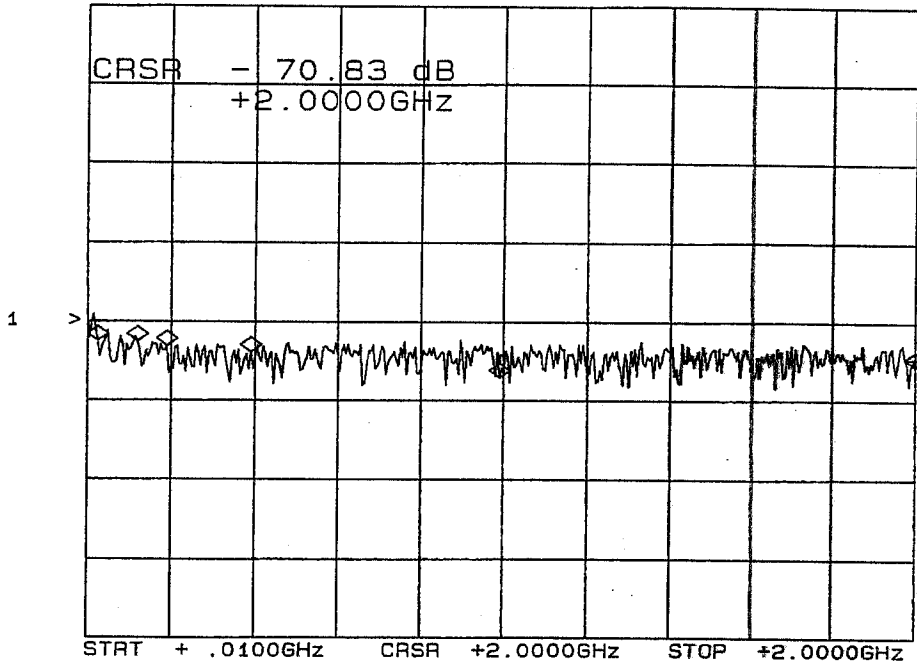


### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +1.5mA; -5vdc @ -21.5mA

**ISOLATION\***  
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)  
**J1-J6**

CH1: A -M - 70.83 dB  
 20.0 dB/ REF - 60.00 dB



**\*J1: INPUT ARM**

FREQUENCY	ISOLATION
40 MHz	63.8 dB
130 MHz	67.4 dB
200 MHz	66.7 dB
400 MHz	69.1 dB
1 GHz	70.2 dB
2 GHz	70.8 dB

AUGUST 17, 1999





## SUMMARY TEST DATA

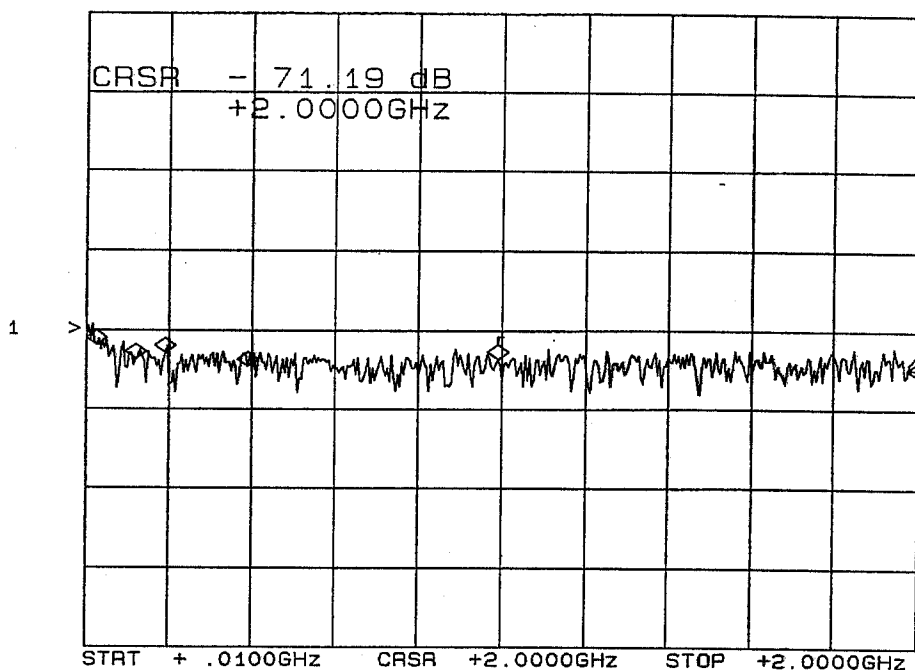
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SS  
**SERIAL NUMBER** : 4MS908196  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc @ +1.5mA; -5vdc @ -21.5mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J7

CH1: A -M - 71.19 dB  
 20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
40 MHz	63.5 dB
130 MHz	67.2 dB
200 MHz	65.6 dB
400 MHz	68.9 dB
1 GHz	67.1 dB
2 GHz	71.1 dB

AUGUST 17, 1999

A10-SS



**AMERICAN MICROWAVE  
CORPORATION**

**TEST DATA**

**ON**

**0.4 GHz TO 18 GHz  
(10 MHz TO 18 GHz OPTIONAL)**

**AND**

**0.04 GHz TO 2 GHz**

**AMPLITUDE ( $\pm 0.5$  dB) AND PHASED ( $\pm 5^\circ$ ) MATCHED**

**LOW INSERTION LOSS**

**HIGH ISOLATION**

**HIGH SPEED**

**REFLECTIVE**

**SP4T**

**RADIAL SOLID STATE SWITCH  
(SURFACE MOUNTABLE)**

**AMC MODEL No:  
SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SSH  
(Serial Number: 4MS908195) (Pages 40 - 80)**

**REPORTED AND PREPARED  
BY  
RENE AFABLE**

**AUGUST 17, 1999**

**WEB PAGE: [HTTP://WWW.AMWAVE.COM](http://www.amwave.com)**

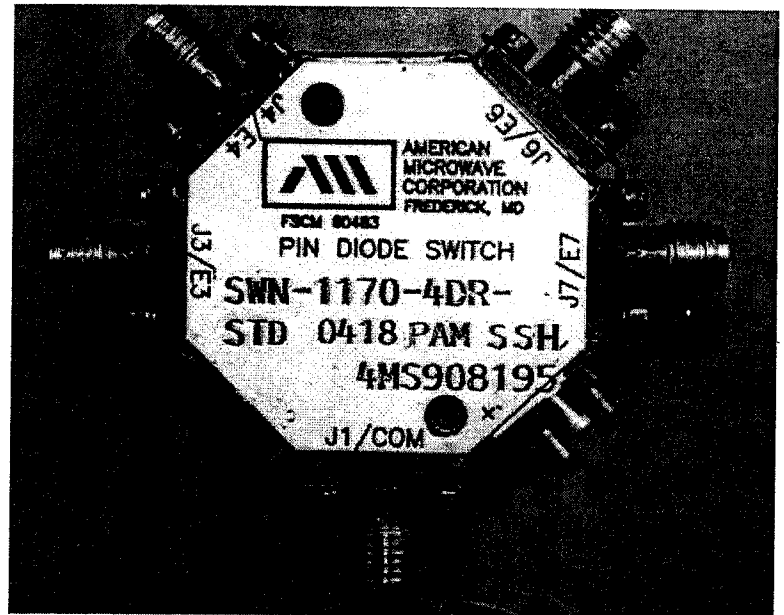
**E-MAIL ADDRESS: [AMCPMI@AOL.COM](mailto:AMCPMI@AOL.COM)**

**7311 G GROVE ROAD, FREDERICK, MARYLAND 21704 • Tel. (301) 662-4700 • Fax (301) 662-4938**



**AMERICAN MICROWAVE CORPORATION**

**SP4T REFLECTIVE  
SOLID STATE PIN DIODE SWITCH**



**KEY FEATURES**

- 0.4 GHz TO 18 GHz  
(10MHz to 18GHz optional)
- AMPLITUDE AND PHASED  
MATCHED
- LOW INSERTION LOSS
- HIGH ISOLATION
- HIGH SPEED
- TTL LOGIC COMPATIBLE

**AMC MODEL No: SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SSH**

**SPECIFICATIONS: (REFLECTIVE)**

• FREQUENCY RANGE	:	0.4 GHz to 18 GHz (10MHz to 18GHz Optional)
• INSERTION LOSS	:	3.0 dB MAX.
	:	0.70 dB TYP. @ 0.4 GHz
	:	0.75 dB TYP. @ 2.0 GHz
	:	0.75 dB TYP. @ 2.0 GHz
	:	1.25 dB TYP. @ 6.0 GHz
	:	1.75 dB TYP. @ 12.0 GHz
	:	3.00 dB TYP. @ 18.0 GHz
• ISOLATION	:	≥ 75 dB MIN.
	:	≥ 85 dB TYP. @ 0.4 GHz
	:	≥ 90 dB TYP. @ 2.0 GHz
	:	≥ 85 dB TYP. @ 6.0 GHz
	:	≥ 80 dB TYP. @ 12.0 GHz
	:	≥ 75 dB TYP. @ 20.0 GHz
• VSWR	:	2.0:1
• SWITCHING SPEED	:	"RISE" 15nS MAX., 10nS TYP.
	:	"FALL" 15nS MAX., 10nS TYP.
	:	"ON" 100nS MAX., 75nS TYP.
	:	"OFF" 100nS MAX., 75nS TYP.
• CONTROL	:	Independent TTL Compatible (2 Bit Decoder available)
• VIDEO TRANSIENTS	:	≤3.4 V Peak to Peak, 300 MHZ Bandwidth
	:	≤1.24 V Peak to Peak, 20 MHZ Bandwidth
• RF INPUT POWER	:	+20dBm Operating, 1 Watt Survival (Other power Levels available)
• DC POWER SUPPLY	:	+5vdc @ +200mA MAX.
(Other supply voltages available)	:	- 5vdc @ - 100mA MAX.
• SIZE	:	1.25" X 1.25" X 0.70"
• WEIGHT	:	≤ 1.5 oz. TYP.

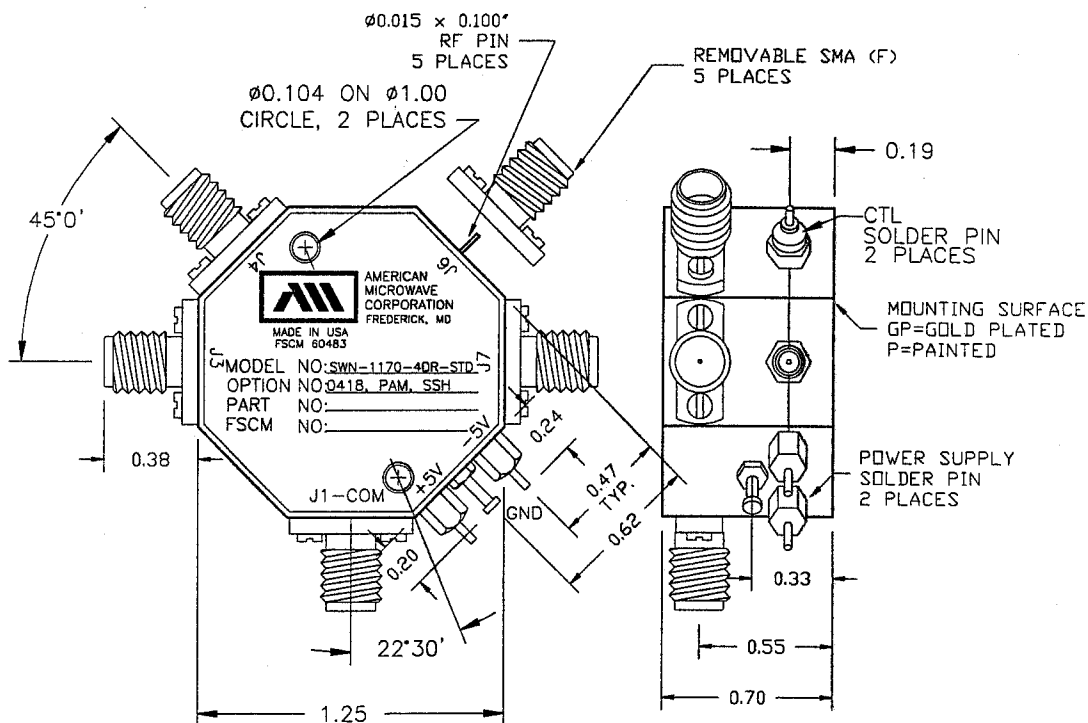
**AUGUST 17, 1999**

7311 G GROVE ROAD, FREDERICK, MARYLAND 21704 • Tel. (301) 662-4700 • Fax (301) 662-4938



### SUMMARY TEST DATA

<b>MODEL NUMBER</b>	<b>: SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH</b>
<b>SERIAL NUMBER</b>	<b>: 4MS908195</b>
<b>ENGINEER</b>	<b>: RENE AFABLE</b>
<b>VOLTAGE &amp; CURRENT DRAW</b>	<b>: +5vdc: @+184mA; -5vdc: @ -38mA</b>



ALL DIMENSIONS ARE IN INCHES

TOLERANCES:

X.XX	±0.020
X.XXX	±0.010

**ENVIRONMENTAL RATINGS:**

- TEMPERATURE:..... -55°C TO +85°C (OPERATING)  
-65°C TO +125°C (STORAGE)
- HUMIDITY:..... MIL-STD-202F, METHOD 103B COND. B
- SHOCK:..... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION:..... MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE:..... MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE:..... MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION.

AUGUSR 17, 1999

DESCRIPTION:  
AMC MODEL SWN-1170-4DR/DI-STANDARD IS A SINGLE POLE FOUR THROW, REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH MODULE WITH HIGH ISOLATION, LOW LOSS, HIGH SPEED, AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR BROAD BAND OPERATIONS.

**SPECIFICATIONS:**

- FREQUENCY: 0.5 GHz TO 18 GHz
- REFLECTIVE: 3.0db
- ABSORPTIVE: 3.75db
- ISOLATION: 0.5 GHz TO 2 GHz: 60db
- 2 GHz TO 18 GHz: 70db
- VSWR: REFLECTIVE IN/OUT: 2.0:1
- ABSORPTIVE IN/OUT: 2.0:1
- ABSORPTIVE OUT/OFF: 2.0:1
- SPEED: RISE: 10ns TYPICAL, 15ns MAX.
- FALL: 10ns TYPICAL, 15ns MAX.
- DELAY ON: 75ns TYPICAL, 100ns MAX.
- DELAY OFF: 75ns TYPICAL, 100ns MAX.
- POWER INPUT: (CW)+20dbm (STANDARD), +10 dbm (HIGH SPEED)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL: TTL LOGIC "0"=ON "1"=OFF
- POWER SUPPLY: +5V @ 200 mA MAX.
- -5V @ 75mA MAX.(REFLECTIVE)
- 100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- SIZE: 1.25" (L) x 1.25" (W) x 0.70" (H)
- WEIGHT: 1.5 oz.

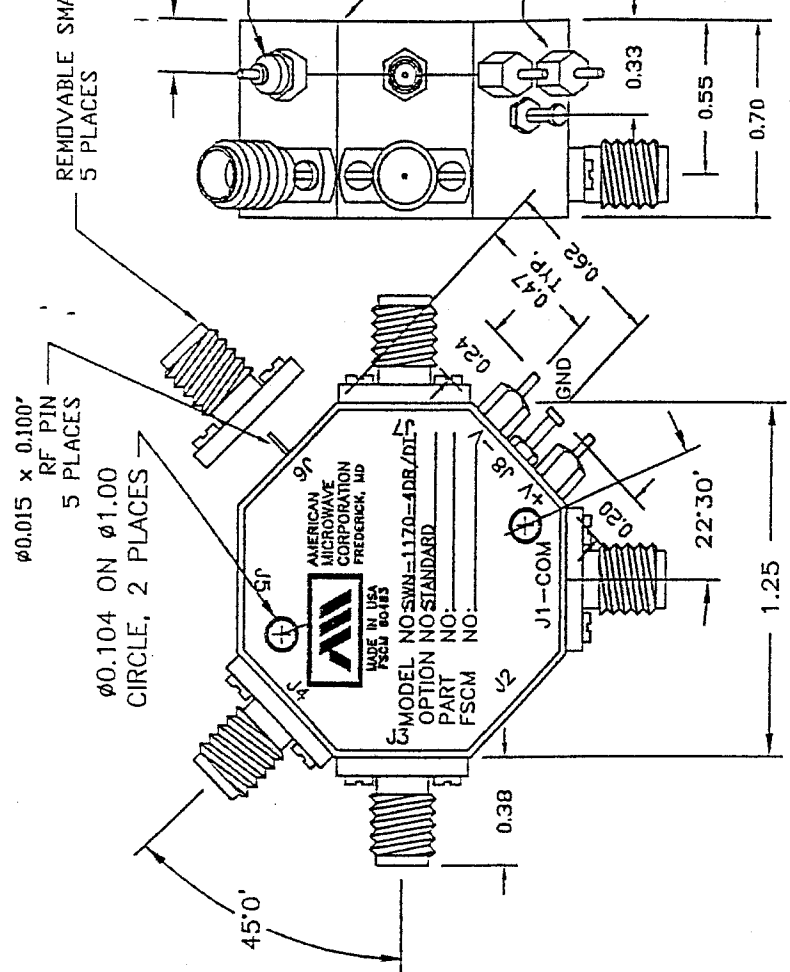
**OPTIONS:**

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SP 2 BIT DECODER WITH SOLDER PIN
- 10M1B 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 GHz AND 0.5db AT 18 GHz)
- 100M1B 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 18 GHz)
- 11B 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 21B 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 412 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 121B 12 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 100M20 100 MHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 1.0db AT 20 GHz)
- 220 2 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- 1020 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- B01 -12V POWER SUPPLIES
- B02 -15V POWER SUPPLIES
- B03 REVERSE LOGIC "1"=ON "0"=OFF
- B04 DRIVERLESS, CURRENT CONTROLLED
- B05 HIGH SPEED, TURNON/TURNOFF 20 nsec MAXIMUM WHEN APPLICABLE OR OPTION HS
- B06 HIGH POWER - SPECIFY CW POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- B07 CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER
- B08 LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH
- B09 LOW INSERTION LOSS VERSION
- B10 HIGHER ISOLATION LOSS VERSION
- B11 0.40" THICK VERSION
- B12 0.80" THICK VERSION

**ENVIRONMENTAL RATINGS:**

- TEMPERATURE: -55C TO +85C (OPERATING)
- -65C TO +125C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE DR REVISION



NOTE:  
DR=WITH DRIVER, REFLECTIVE  
DT=WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

CONTRACT NO.		DATE	
APPROVALS	DATE	TITLE	
DRAWN: WJP, R.R.d	1/26/99	AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND	
CHECKED: WJP	1/27/99	OUTLINE DRAWING	
ISSUED: JN	1/29/99	SWN-1170-4DR/DI-STANDARD	
		REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE	
		RADIAL SOLID STATE SWITCH	
		SIZE	DWG NO.
		A	100-4172-1
		SCALE	N/S
		SHEET	1 of 2

**DESCRIPTION:**  
AMC MODEL SWN-1170-4DR/DT-DEC-SP IS A SINGLE POLE FOUR THROW, REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH MODULE WITH HIGH ISOLATION, LOW LOSS, HIGH SPEED AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR BROAD BAND OPERATIONS.

**SPECIFICATIONS:**

- FREQUENCY: 0.5 GHz TO 18 GHz
- INSERTION LOSS: REFLECTIVE: 3.0db  
ABSORPTIVE: 3.75db
- ISOLATION: 0.5 GHz TO 2 GHz: 60db  
2 GHz TO 18 GHz: 70db
- VSWR: REFLECTIVE IN/OUT: 2.0:1  
ABSORPTIVE IN/OUT: 2.0:1  
ABSORPTIVE OUT/OFF: 2.0:1
- SPEED: RISE: 10ns TYPICAL, 15ns MAX.  
FALL: 10ns TYPICAL, 15ns MAX.  
DELAY ON: 75ns TYPICAL, 100ns MAX.  
DELAY OFF: 75ns TYPICAL, 100ns MAX.
- POWER INPUT: (CW)+20dbm (STANDARD), +10 dbm (HIGH SPEED)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 USEC
- CONTROL: TTL LOGIC "0"-ON "1"-OFF
- POWER SUPPLY: +5V @ 200 mA MAX.  
-5V @ 75mA MAX.(REFLECTIVE)  
100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- SIZE: 1.25" (L) x 1.25" (W) x 0.70" (H)
- WEIGHT: 1.5 oz.

**OPTIONS:**

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SP 2 BIT DECODER WITH SOLDER PIN
- 10M1B 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 MHz AND 0.5db AT 18 GHz)
- 100M1B 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 18 GHz)
- 11B 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 21B 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 41B 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 61B 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 121B 12 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 100M20 100 MHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 1.0db AT 20 GHz)
- 220 2 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- 1020 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- B01 -12V POWER SUPPLIES
- B02 -15V POWER SUPPLIES
- B03 REVERSE LOGIC "1"-ON "0"-OFF
- B04 DRIVERLESS, CURRENT CONTROLLED
- B05 HIGH SPEED, TURNON/TURNOFF 20 nsec MAXIMUM WHEN APPLICABLE OR OPTION NS
- B06 HIGH POWER - SPECIFY CW POWER, PULSE POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- B07 CUSTOM DESIGNED PRODUCT- SPECIFY INITIALS OF CUSTOMER
- B08 LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH
- B09 LOW INSERTION LOSS VERSION
- B10 HIGHER ISOLATION VERSION
- B11 0.40" THICK VERSION
- B12 0.88" THICK VERSION

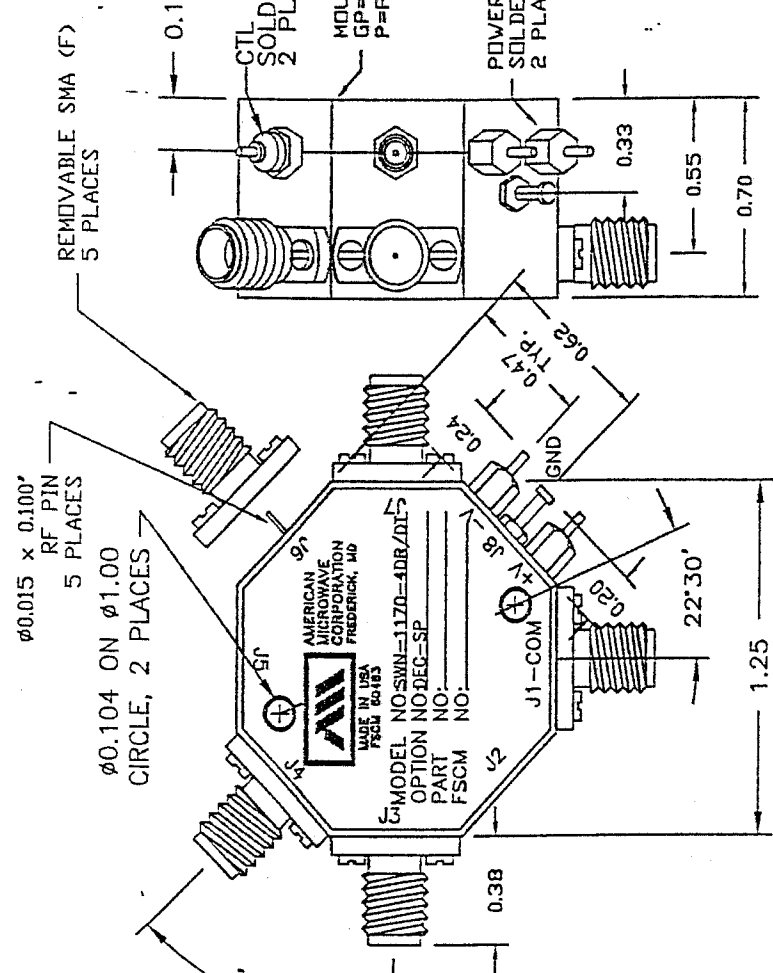
**ENVIRONMENTAL RATINGS:**

- TEMPERATURE: -55°C TO +85°C (OPERATING)  
-85°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

**ENVIRONMENTAL RATINGS:**

- TEMPERATURE: -55°C TO +85°C (OPERATING)  
-85°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION



LOGIC TABLE

E6	E7	RF ON
L	L	J3
H	L	J4
L	H	J6
H	H	J7

NOTE:  
DR=WITH DRIVER, REFLECTIVE  
DT=WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

CONTRACT NO. \_\_\_\_\_

APPROVALS: \_\_\_\_\_ DATE 1/28/99

DESIGN: WJP, R.R.J. DATE 1/28/99

CHECKED: WJP DATE 1/28/99

ISSUED: RA DATE 1/28/99

AMERICAN MICROWAVE CORPORATION  
FREDERICK, MARYLAND

TITLE: OUTLINE DRAWING  
SWN-1170-4DR/DT-DEC-SP  
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE  
RADIAL SOLID STATE SWITCH

SIZE: A FSCM NO. 60483 DWP NO. 100-4172-2 REV. -

SCALE: N/S SHEET 1 of 2

ZONE	REV.	DESCRIPTION	DATE	APPROVED
		ORIGINAL RELEASE	7/26/99	

REVISIONS

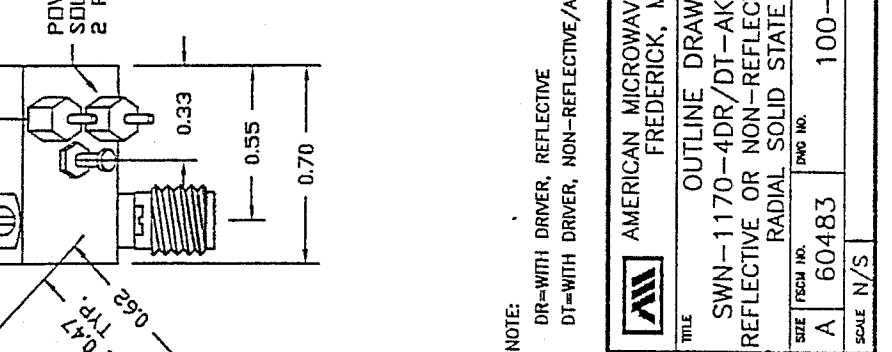
AMC MODEL SWN-1170-4DR-DT-4KG-STANDARD IS A SINGLE POLE FOUR THROW, REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH MODULE WITH VERY HIGH ISOLATION, LOW LOSS, HIGH SPEED AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR BROAD BAND OPERATIONS.

**SPECIFICATIONS:**

- FREQUENCY: 0.5 GHz TO 18 GHz
- REFLECTIVE: 4.0dB
- ABSORPTIVE: 4.5dB
- ISOLATION: 0.5 GHz TO 6 GHz: 110dB
- 6 GHz TO 18 GHz: 100dB
- VSWR: REFLECTIVE IN/OUT: 2.0:1
- ABSORPTIVE IN/OUT: 2.0:1
- ABSORPTIVE OUT/OFF: 2.0:1
- SPEED: RISE: 10ns TYPICAL, 15ns MAX.
- FALL: 10ns TYPICAL, 15ns MAX.
- DELAY ON: 75ns TYPICAL, 100ns MAX.
- DELAY OFF: 75ns TYPICAL, 100ns MAX.
- POWER INPUT: (CW)+20dBm (STANDARD), +10 dBm (HIGH SPEED)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1  $\mu$ SEC
- CONTROL: TTL LOGIC "0"=ON "1"=OFF
- POWER SUPPLY: +5V  $\phi$  200 mA MAX.
- -5V  $\phi$  75mA MAX.(REFLECTIVE)
- 100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- SIZE: 1.25" (L) x 1.25" (W) x 0.70" (H)
- WEIGHT: 1.5 oz.

**OPTIONS:**

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SP
- 10M18
- 100M18
- 118
- 218
- 412
- 612
- 1218
- 100M20
- 220
- 1020
- B01
- B02
- B03
- B04
- B05
- B06
- B07
- B08
- B09
- B10
- B11
- B12



NOTE: DR=WITH DRIVER, REFLECTIVE  
DT=WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

CONTRACT NO.	APPROVALS	DATE	TITLE
	WSP, SRP, WUP, PA	7/20/99	OUTLINE DRAWING
		7/29/99	SWN-1170-4DR-DT-4KG-STANDARD
		7/29/99	REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE
		7/29/99	RADIAL SOLID STATE SWITCH

SIZE	FRGM NO.	PWG NO.	REV.
A	60483	100-4789-1	-

AMERICAN MICROWAVE CORPORATION  
FREDERICK, MARYLAND

SCALE	SHEET
N/S	1 of 2

ALL DIMENSIONS ARE IN INCHES  
TOLERANCES:  
X.XX  $\pm$ 0.020  
X.XXX  $\pm$ 0.010

**ENVIRONMENTAL RATINGS:**

- TEMPERATURE: -55°C TO +85°C (OPERATING)
- -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

**DESCRIPTION**

AMC MODEL SWN-1170-4DR/DT-AKG-DEC-SP IS A SINGLE POLE FOUR THROW, REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH MODULE WITH VERY HIGH ISOLATION, LOW LOSS, HIGH SPEED AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR BROAD BAND OPERATIONS.

**SPECIFICATIONS:**

- FREQUENCY: 0.5 GHz TO 18 GHz
- REFLECTIVE: 4.0dB
- ABSORPTIVE: 4.5dB
- INSERTION LOSS: 0.5 GHz TO 6 GHz: 110dB
- ISOLATION: 6 GHz TO 18 GHz: 100dB
- VSWR: REFLECTIVE IN/OUT: 2.0:1
- ABSORPTIVE IN/OUT: 2.0:1
- ABSORPTIVE OUT/OFF: 2.0:1
- SPEED: RISE: 10ns TYPICAL, 15ns MAX.
- FALL: 10ns TYPICAL, 15ns MAX.
- DELAY ON: 75ns TYPICAL, 100ns MAX.
- DELAY OFF: 75ns TYPICAL, 100ns MAX.
- (CW)+20dBm (STANDARD), +10 dBm (HIGH SPEED)
- POWER INPUT: 1 WATT CW, 10 WATTS PEAK 1  $\mu$ sec
- SURVIVAL POWER: TTL LOGIC "0"=ON "1"=OFF
- CONTROL: +5V  $\phi$  200 mA MAX.
- POWER SUPPLY: -5V  $\phi$  75mA MAX.(REFLECTIVE)
- SIZE: 1.25" (L) x 1.25" (W) x 0.70" (H)
- WEIGHT: 1.5 oz.

**OPTIONS:**

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SP
- 10M1B
- 100M1B
- 11B
- 21B
- 412
- 618
- 1218
- 100M20
- 220
- 1020
- B01
- B02
- B03
- B04
- B05
- B08
- B07
- B08
- B09
- B10
- B11
- B12

LOGIC TABLE

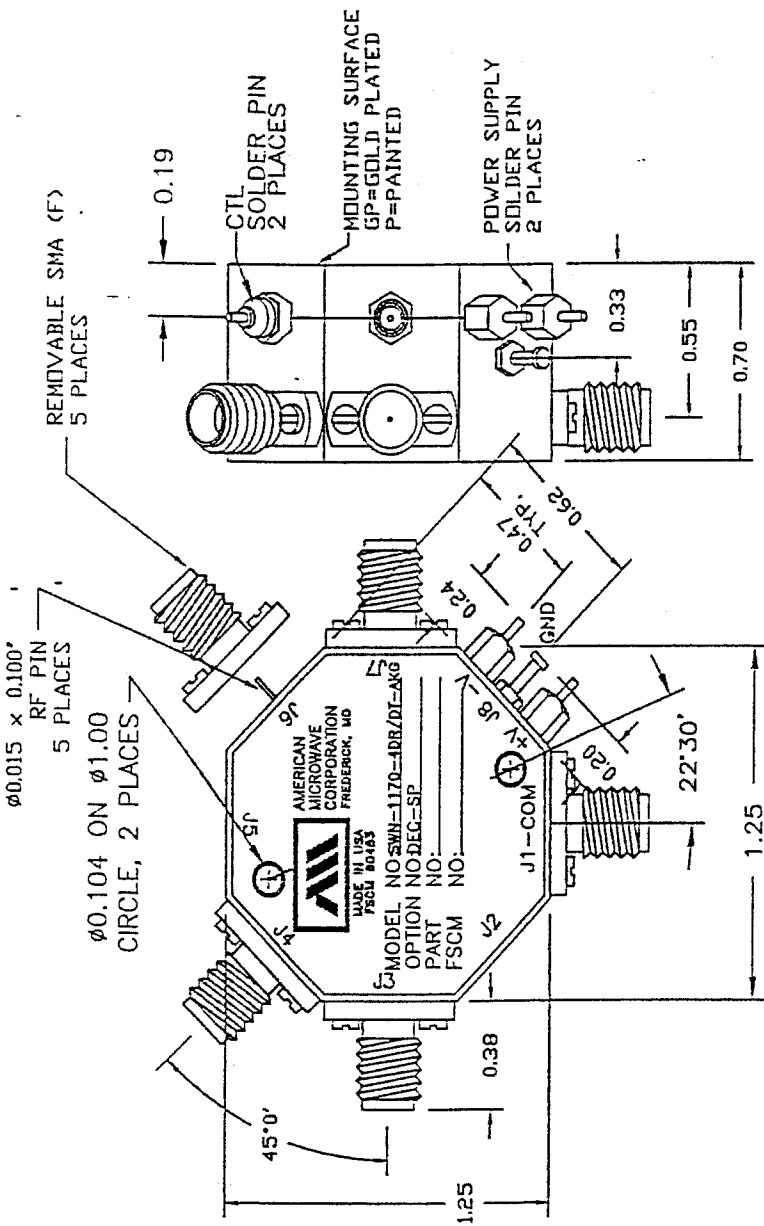
E6	E7	RF ON
L	L	J3
H	L	J4
L	H	J6
H	H	J7

**ENVIRONMENTAL RATINGS:**

- TEMPERATURE: -55°C TO +85°C (OPERATING)
- HUMIDITY: -65°C TO +125°C (STORAGE)
- SHOCK: MIL-STD-202F, METHOD 103B COND. B
- VIBRATION: MIL-STD-202F, METHOD 213B COND. B
- ALTITUDE: MIL-STD-202F, METHOD 204D COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 105C COND. B
- MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

ZONE	REV.	DESCRIPTION	DATE	APPROVED
		ORIGINAL RELEASE	7/28/99	



**NOTE:**

- DR=WITH DRIVER, REFLECTIVE
- DT=WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

CONTRACT NO.		APPROVALS		DATE	TITLE
DRAWN: W.P.P., R.P.S.		CHECKED: W.P.P., R.P.S.		7/28/99	OUTLINE DRAWING
ISSUED: PA 7/29/99		SIZE: A		FSCM NO. 60483	SWN-1170-4DR/DT-AKG-DEC-SP
SCALE: N/S		REV.:		DWG NO. 100-4789-2	REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE
SHEET 1 of 2		AMERICAN MICROWAVE CORPORATION		FREDERICK, MARYLAND	





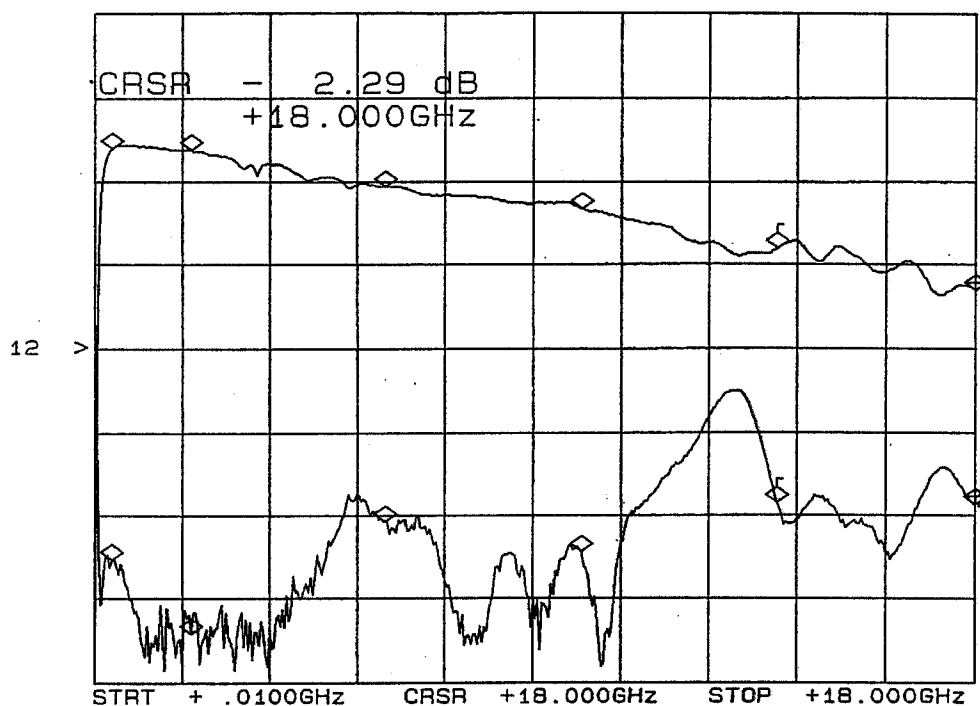
## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

### INSERTION LOSS & RETURN LOSS\*

J1-J3

CH1: A -M - 2.29 dB      CH2: B -M - 18.82 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	0.58 dB	22.1 dB
2.0 GHz	0.61 dB	26.5 dB
6.0 GHz	1.04 dB	19.8 dB
10.0 GHz	1.32 dB	21.6 dB
14.0 GHz	1.79 dB	18.6 dB
18.0 GHz	2.29 dB	18.8 dB



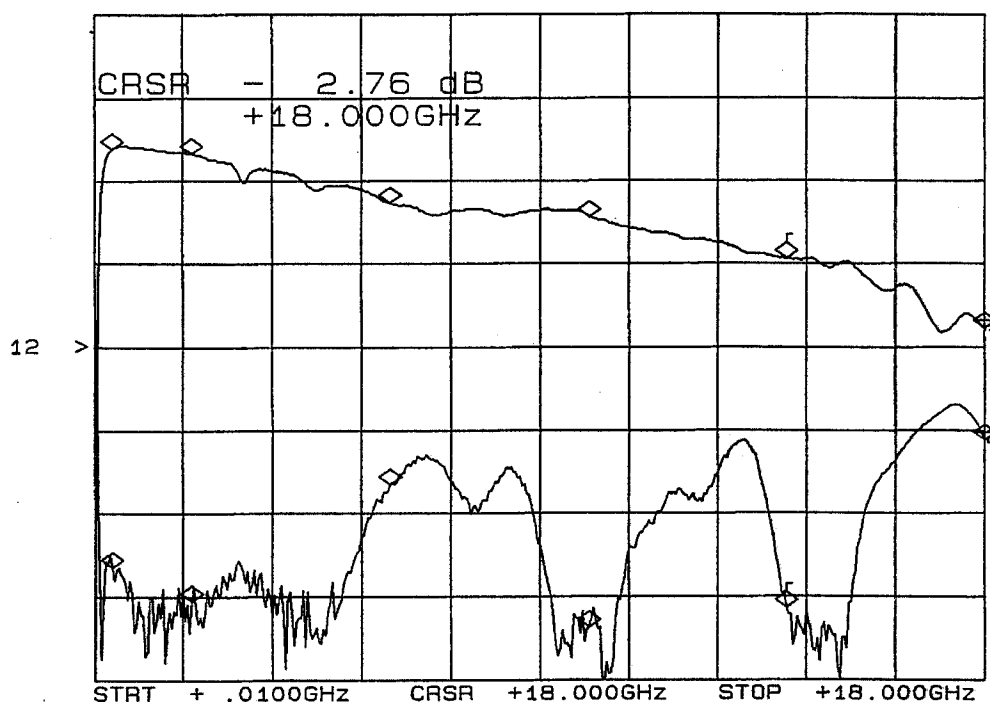
## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

### INSERTION LOSS & RETURN LOSS\*

J1-J4

CH1: A -M - 2.76 dB      CH2: B -M - 15.02 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	0.60 dB	22.7 dB
2.0 GHz	0.66 dB	24.7 dB
6.0 GHz	1.26 dB	17.7 dB
10.0 GHz	1.42 dB	26.2 dB
14.0 GHz	1.92 dB	25.1 dB
18.0 GHz	2.76 dB	15.0 dB

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## SUMMARY TEST DATA

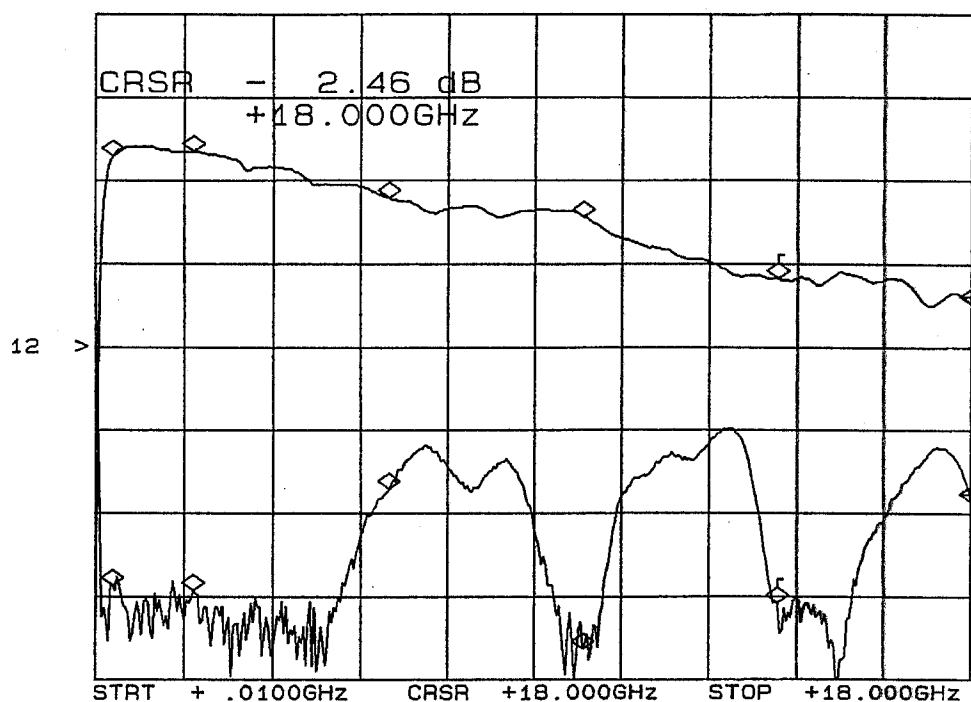
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**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

### INSERTION LOSS & RETURN LOSS\*

J1-J6

CH1: A -M - 2.46 dB  
 1.0 dB/ REF - 3.00 dB

CH2: B -M - 18.78 dB  
 5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	0.70 dB	23.8 dB
2.0 GHz	0.64 dB	24.1 dB
6.0 GHz	1.20 dB	18.0 dB
10.0 GHz	1.42 dB	27.6 dB
14.0 GHz	2.17 dB	24.9 dB
18.0 GHz	2.46 dB	18.7 dB

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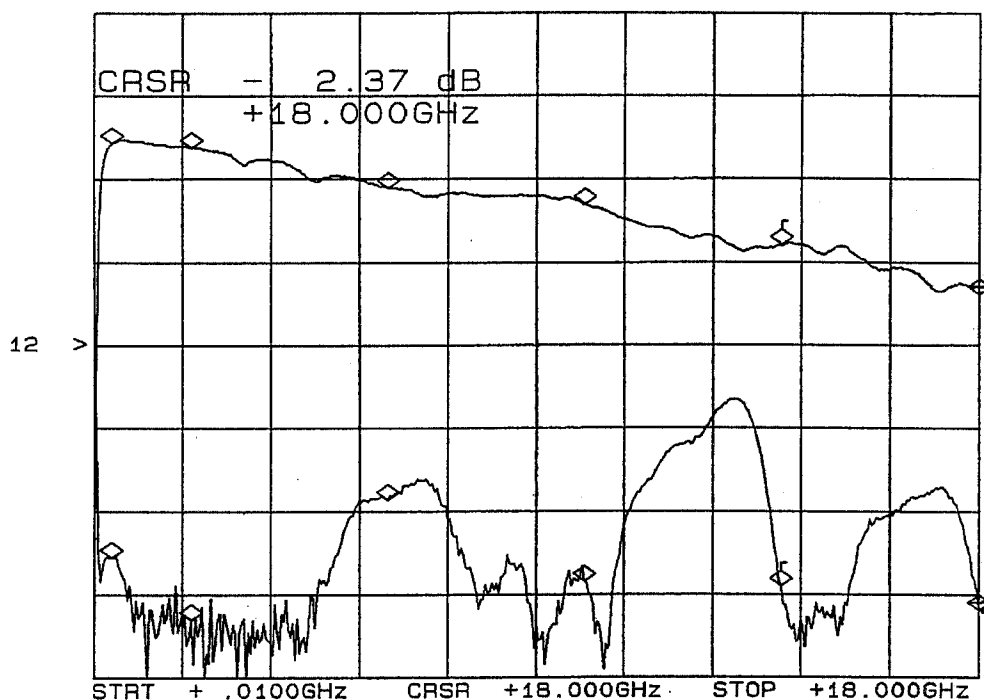
## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

### INSERTION LOSS & RETURN LOSS\*

J1-J7

CH1: A -M - 2.37 dB      CH2: B -M - 25.49 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	0.56 dB	22.2 dB
2.0 GHz	0.61 dB	25.9 dB
6.0 GHz	1.10 dB	18.7 dB
10.0 GHz	1.30 dB	23.6 dB
14.0 GHz	1.77 dB	23.9 dB
18.0 GHz	2.37 dB	25.4 dB

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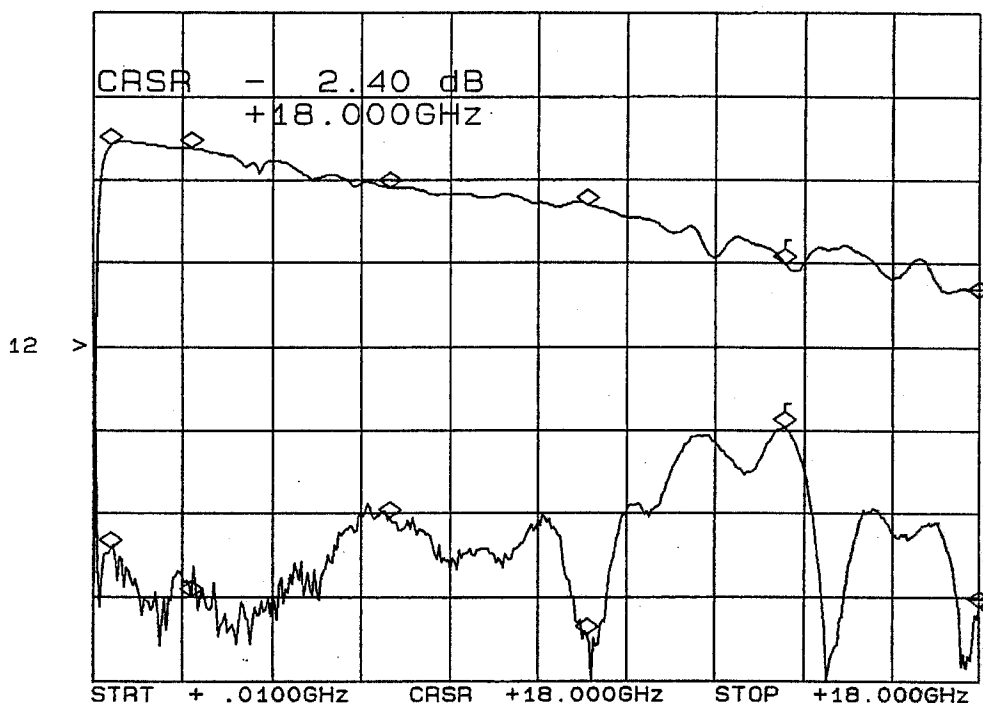
### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

#### INSERTION LOSS & RETURN LOSS\*

J3-J1

CH1: A -M REF - 2.40 dB      CH2: B -M REF - 25.10 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	0.56 dB	21.5 dB
2.0 GHz	0.61 dB	24.5 dB
6.0 GHz	1.08 dB	19.7 dB
10.0 GHz	1.29 dB	26.6 dB
14.0 GHz	2.00 dB	14.2 dB
18.0 GHz	2.40 dB	25.1 dB



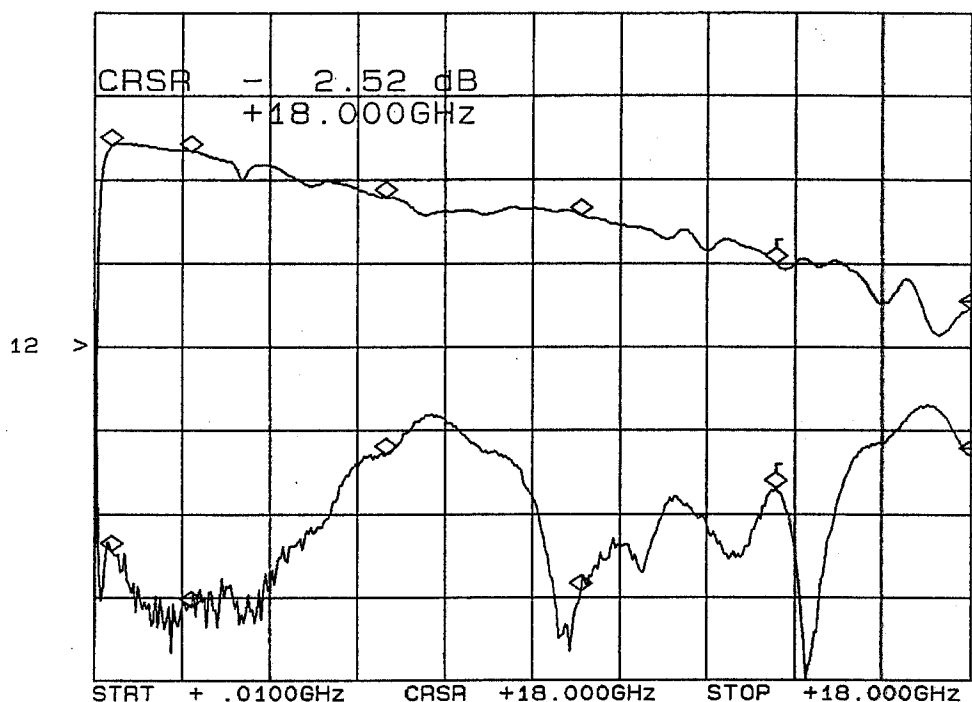
## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

### INSERTION LOSS & RETURN LOSS\*

J4-J1

CH1: A -M - 2.52 dB      CH2: B -M - 16.03 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	0.59 dB	21.7 dB
2.0 GHz	0.65 dB	25.0 dB
6.0 GHz	1.19 dB	15.9 dB
10.0 GHz	1.41 dB	24.0 dB
14.0 GHz	1.99 dB	17.9 dB
18.0 GHz	2.52 dB	16.0 dB

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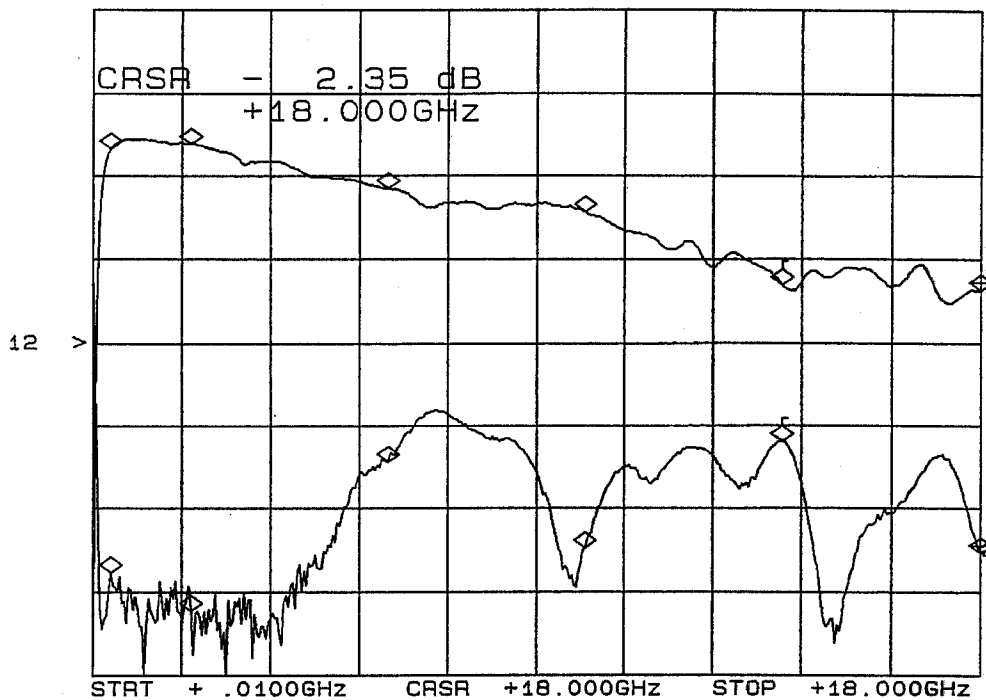
### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

#### INSERTION LOSS & RETURN LOSS\*

J6-J1

CH1: A -M - 2.35 dB      CH2: B -M - 22.22 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J6: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	0.66 dB	23.3 dB
2.0 GHz	0.60 dB	25.6 dB
6.0 GHz	1.14 dB	16.6 dB
10.0 GHz	1.44 dB	21.8 dB
14.0 GHz	2.29 dB	15.4 dB
18.0 GHz	2.35 dB	22.2 dB



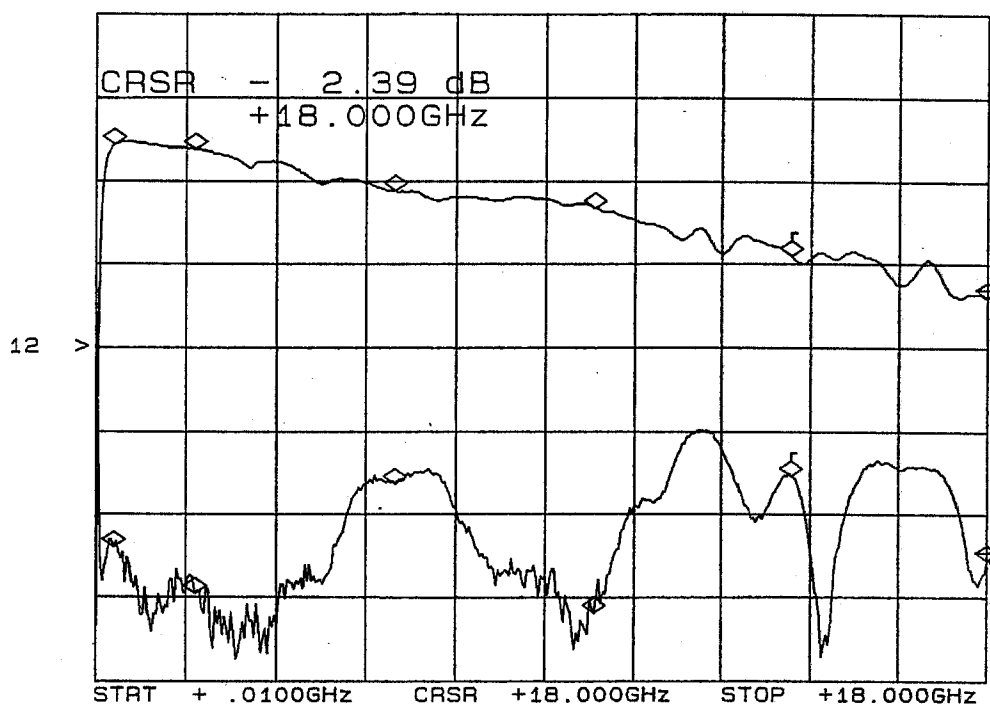
## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

### INSERTION LOSS & RETURN LOSS\*

J7-J1

CH1: A -M - 2.39 dB      CH2: B -M - 22.33 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J7: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
400 MHz	0.54 dB	21.5 dB
2.0 GHz	0.60 dB	24.2 dB
6.0 GHz	1.11 dB	17.6 dB
10.0 GHz	1.31 dB	25.4 dB
14.0 GHz	1.89 dB	17.1 dB
18.0 GHz	2.39 dB	22.3 dB

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## SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

### ISOLATION\*

(AS MEASURED ON A SPECTRUM ANALYZER)

FREQUENCY	J3	J4	J6	J7
100 MHz	73 dB	73 dB	70 dB	71 dB
200 MHz	85 dB	85 dB	80 dB	80 dB
400 MHz	86 dB	88 dB	91 dB	89 dB
500 MHz	88 dB	88 dB	88 dB	88 dB
1 GHz	93 dB	90 dB	94 dB	92 dB
2 GHz	95 dB	98 dB	90 dB	93 dB
4 GHz	99 dB	90 dB	99 dB	101 dB
6 GHz	104 dB	101 dB	88 dB	104 dB
8 GHz	91 dB	87 dB	89 dB	88 dB
10 GHz	90 dB	91 dB	85 dB	91 dB
12 GHz	87 dB	83 dB	91 dB	88 dB
14 GHz	79 dB	85 dB	81 dB	79 dB
16 GHz	78 dB	78 dB	88 dB	82 dB
18 GHz	83 dB	83 dB	83 dB	79 dB

\* J1: INPUT ARM

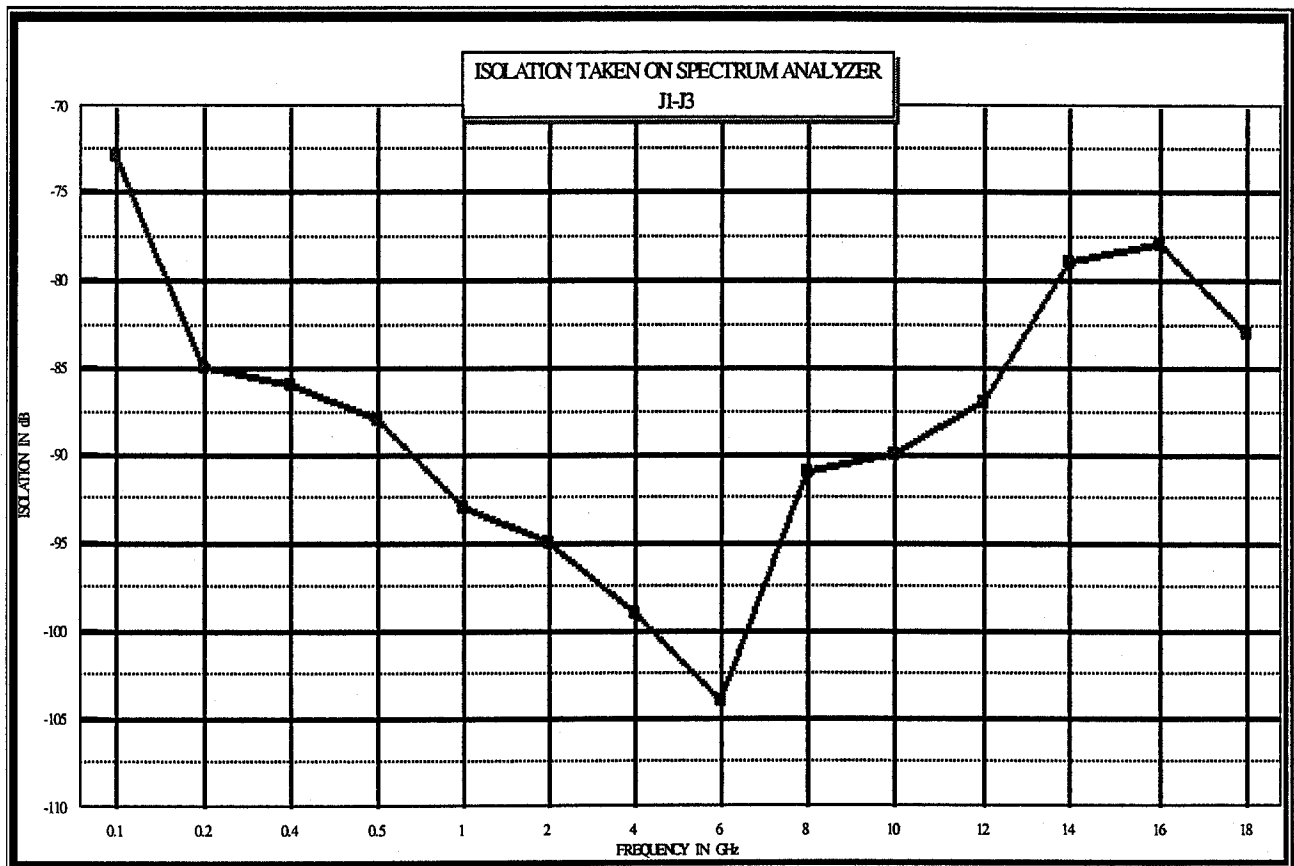
AUGUST 17, 1999



## SUMMARY TEST DATA

MODEL NUMBER	: SWN-1170-4DT-STD OPTIONS 0418, PAM, SSH
SERIAL NUMBER	: 4MS908195
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @ +184mA; -5vdc @ -38mA

**ISOLATION\***  
(AS MEASURED ON A SPECTRUM ANALYZER)  
J1-J3



\*J1: INPUT ARM

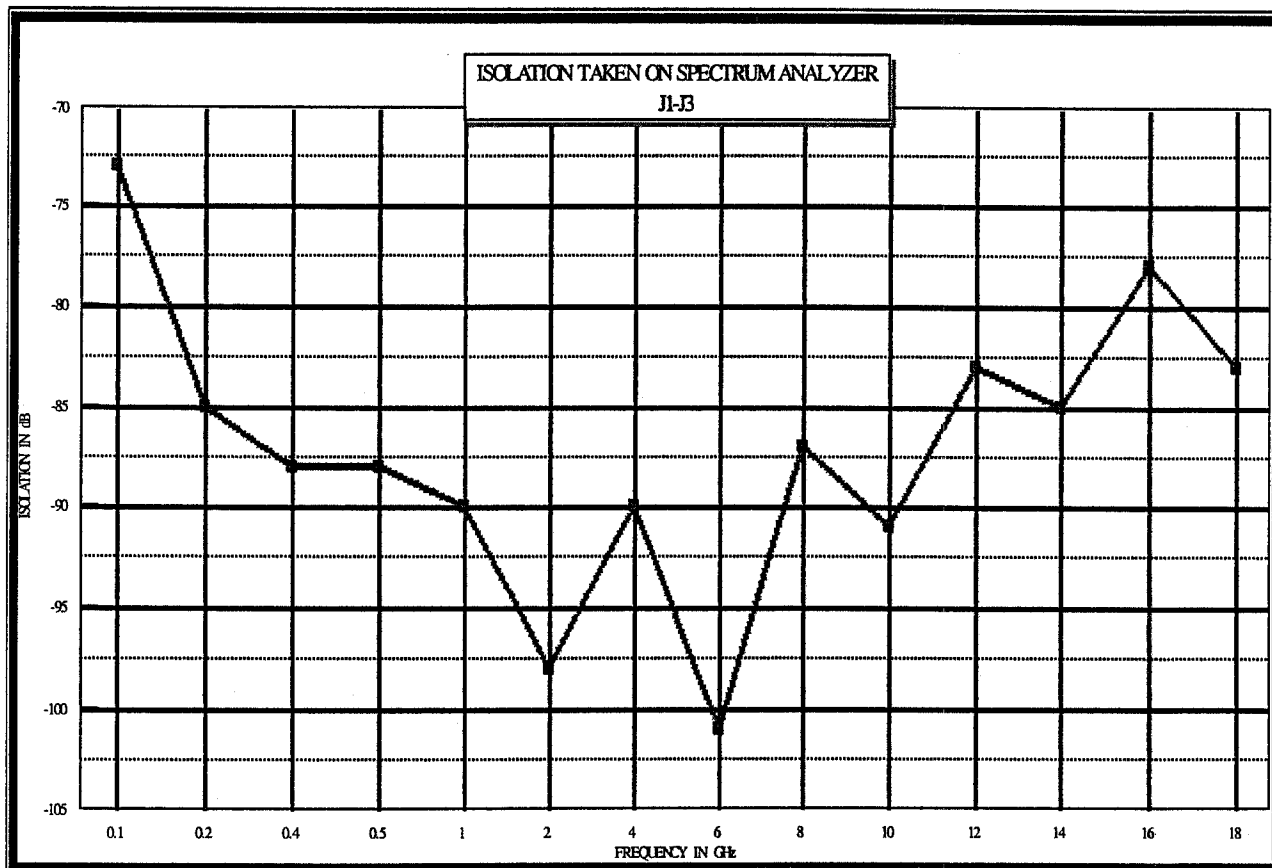
AUGUST 17, 1999



### SUMMARY TEST DATA

<b>MODEL NUMBER</b>	<b>: SWN-1170-4DT-STD OPTIONS 0418, PAM, SSH</b>
<b>SERIAL NUMBER</b>	<b>: 4MS908195</b>
<b>ENGINEER</b>	<b>: RENE AFABLE</b>
<b>VOLTAGE &amp; CURRENT DRAW</b>	<b>: +5vdc: @ +184mA; -5vdc @ -38mA</b>

**ISOLATION\***  
(AS MEASURED ON A SPECTRUM ANALYZER)  
J1-J4



\*J1: INPUT ARM

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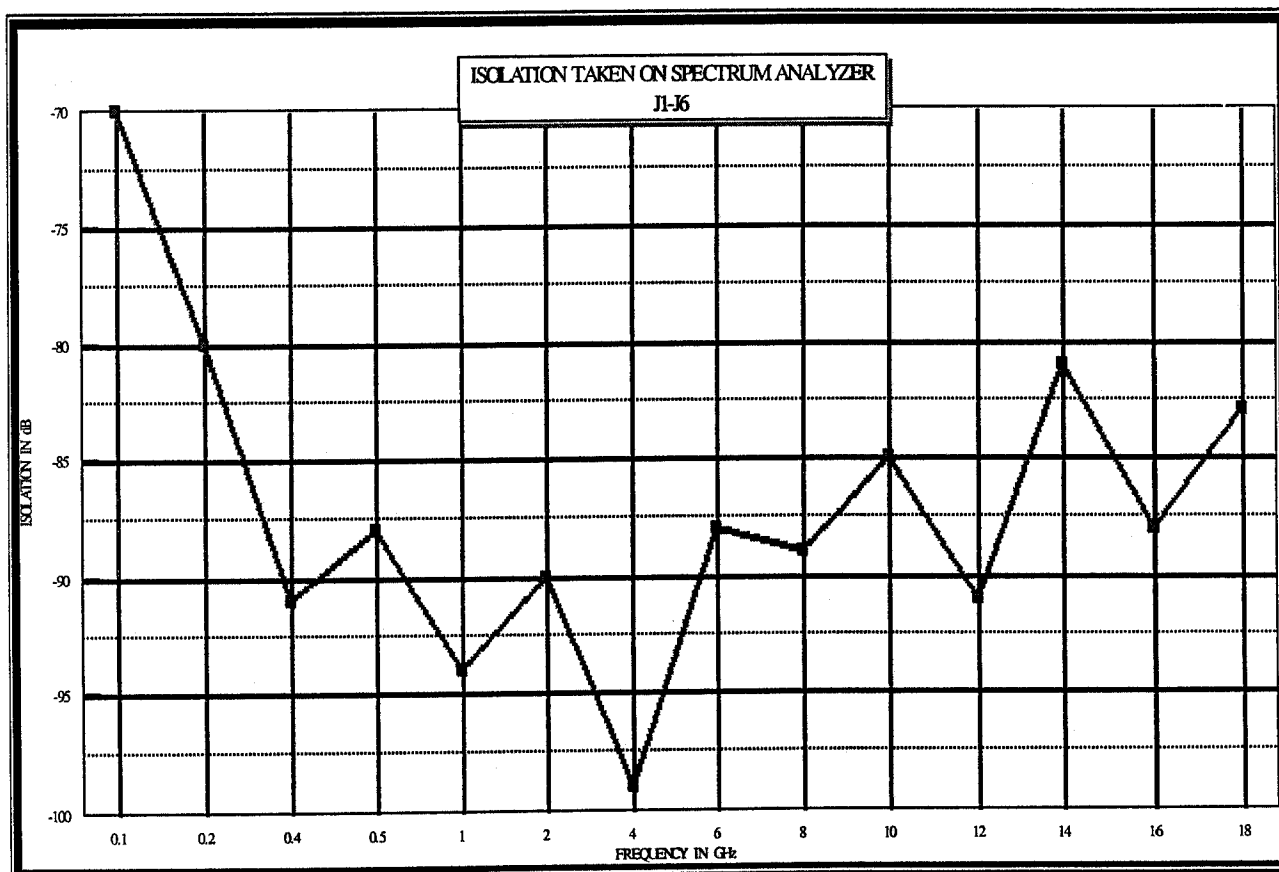
## SUMMARY TEST DATA

MODEL NUMBER	: SWN-1170-4DT-STD OPTIONS 0418, PAM, SSH
SERIAL NUMBER	: 4MS908195
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @ +184mA; -5vdc @ -38mA

### ISOLATION\*

(AS MEASURED ON A SPECTRUM ANALYZER)

J1-J6



\*J1: INPUT ARM

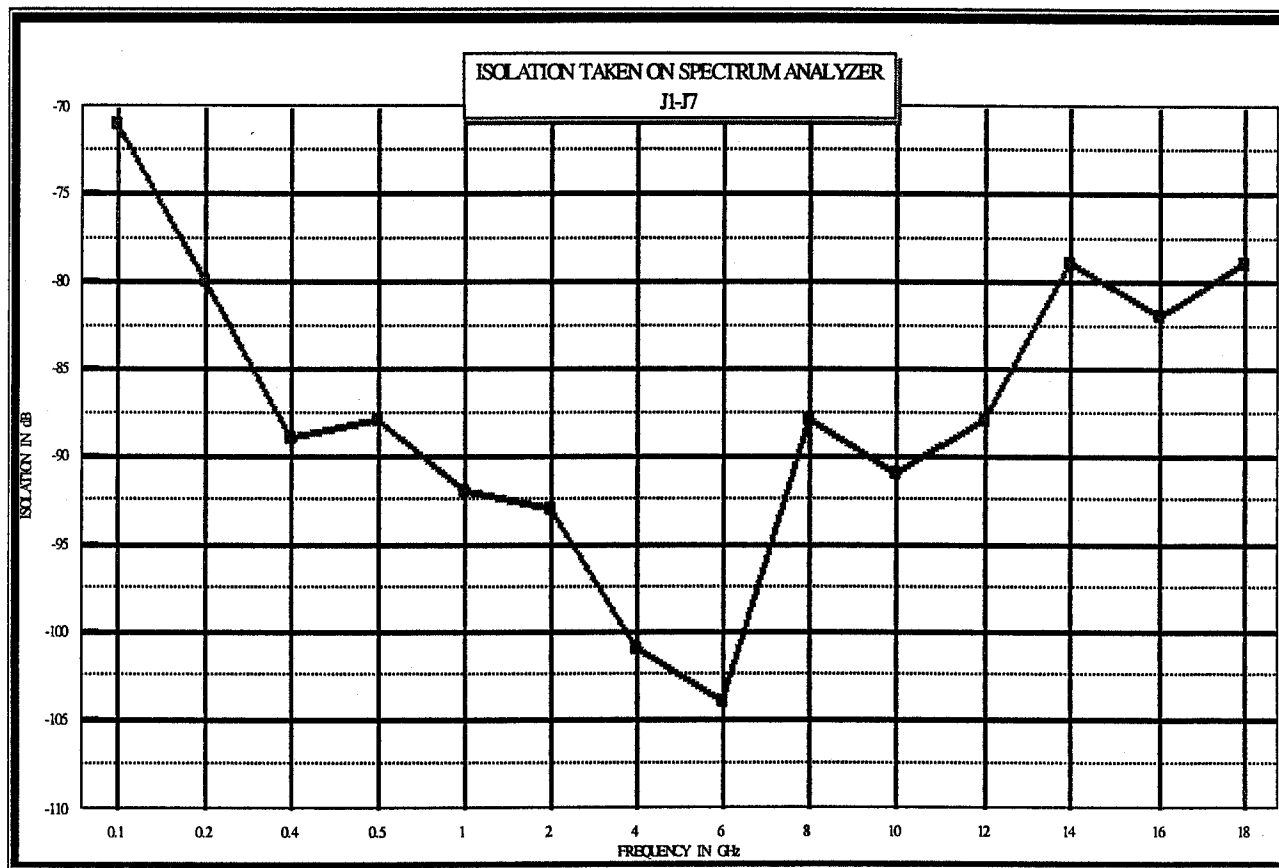
AUGUST 17, 1999



### SUMMARY TEST DATA

MODEL NUMBER	: SWN-1170-4DT-STD OPTIONS 0418, PAM, SSH
SERIAL NUMBER	: 4MS908195
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @ +184mA; -5vdc @ -38mA

**ISOLATION\***  
(AS MEASURED ON A SPECTRUM ANALYZER)  
J1-J7



\*J1: INPUT ARM

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**AMPLITUDE  
DATA  
BETWEEN  
PORT TO PORT  
FROM  
0.4 GHz TO 18 GHz  
ON A  
SP4T**

**RADIAL SOLID STATE SWITCH  
(SURFACE MOUNTABLE)**

**AMC MODEL No:  
SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SSH  
(Serial Number: 4MS908195)**

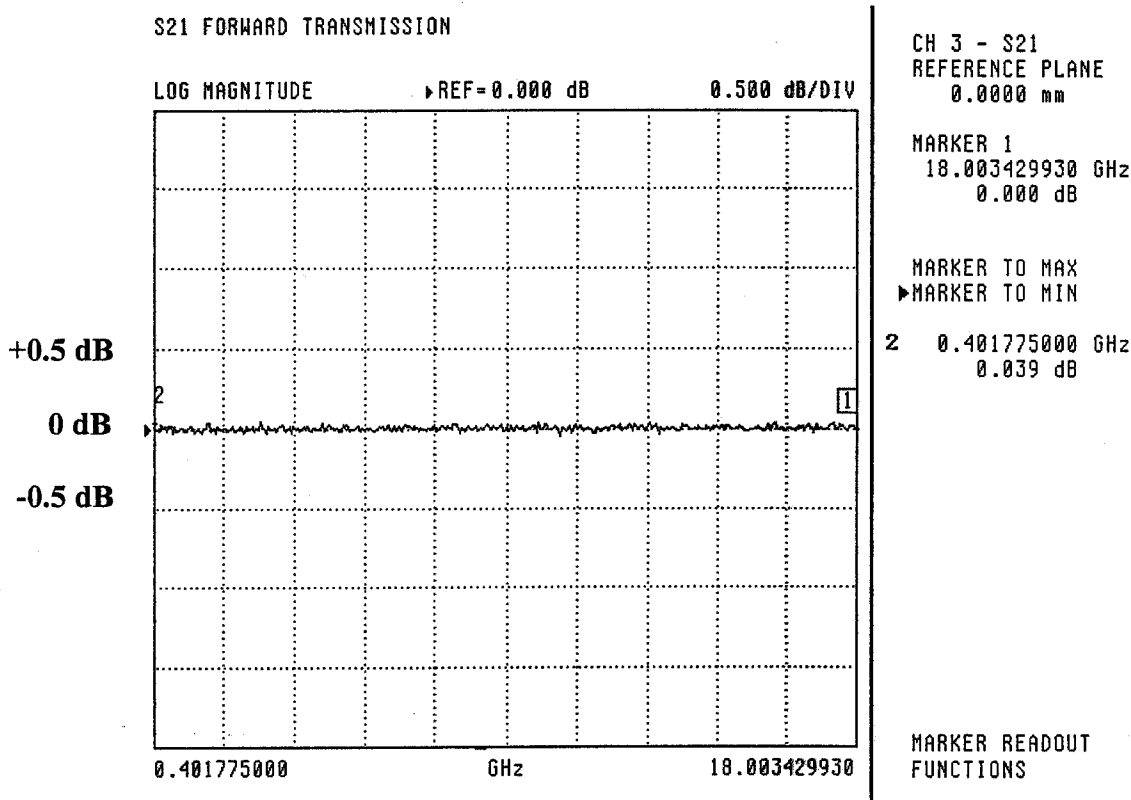
**AUGUST 17, 1999**



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

**AMPLITUDE\***  
**J1-J3 (REFERENCE)**



\*J1: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
400 MHZ	0.039 dB	
18 GHz	0.000 dB	

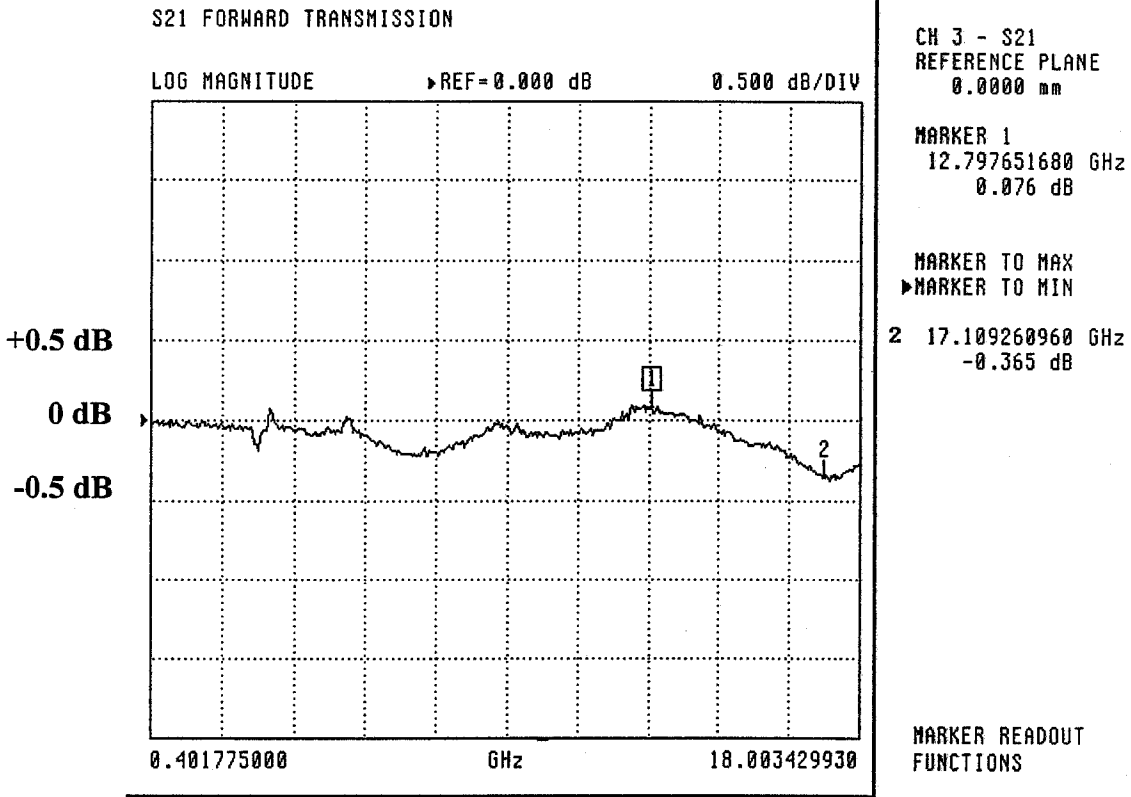
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

#### AMPLITUDE\* J1-J4



\*J1: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
12.79 GHZ	0.076 dB	
17.10 GHZ		-0.365 dB

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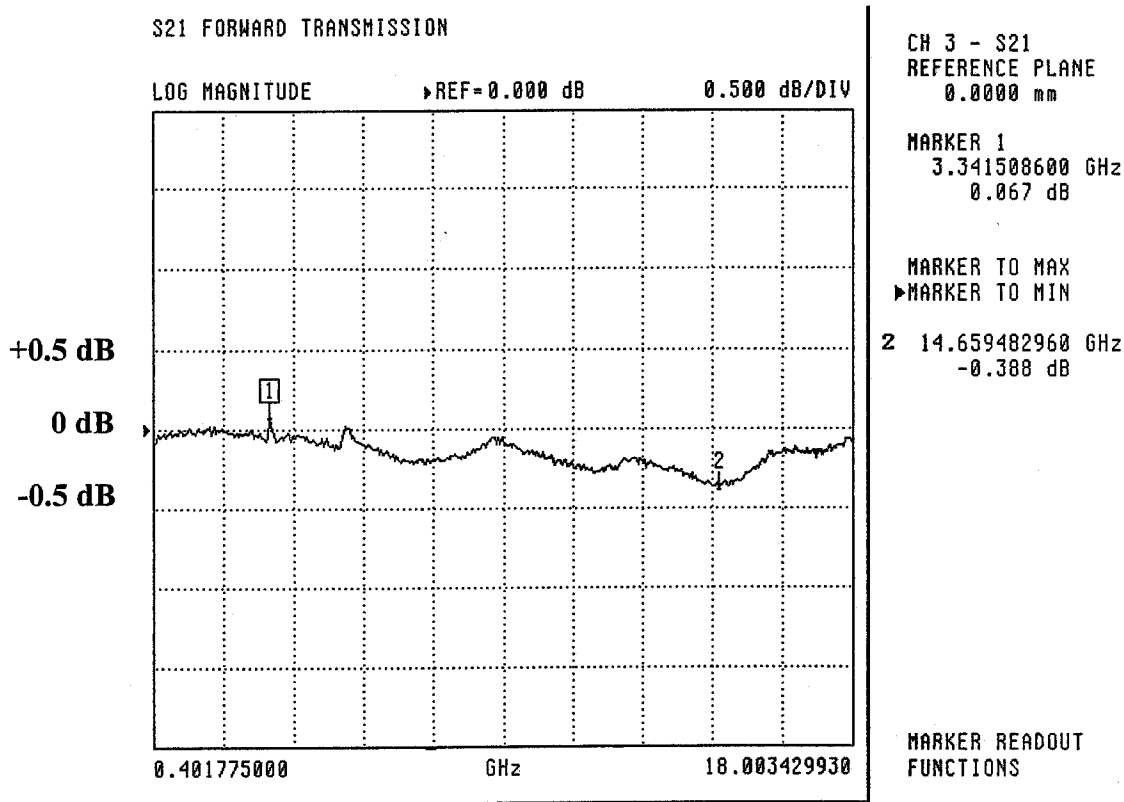




### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

**AMPLITUDE\***  
J1-J6



\*J1: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
3.34 GHZ	0.067 dB	
14.65 GHZ		-0.388 dB

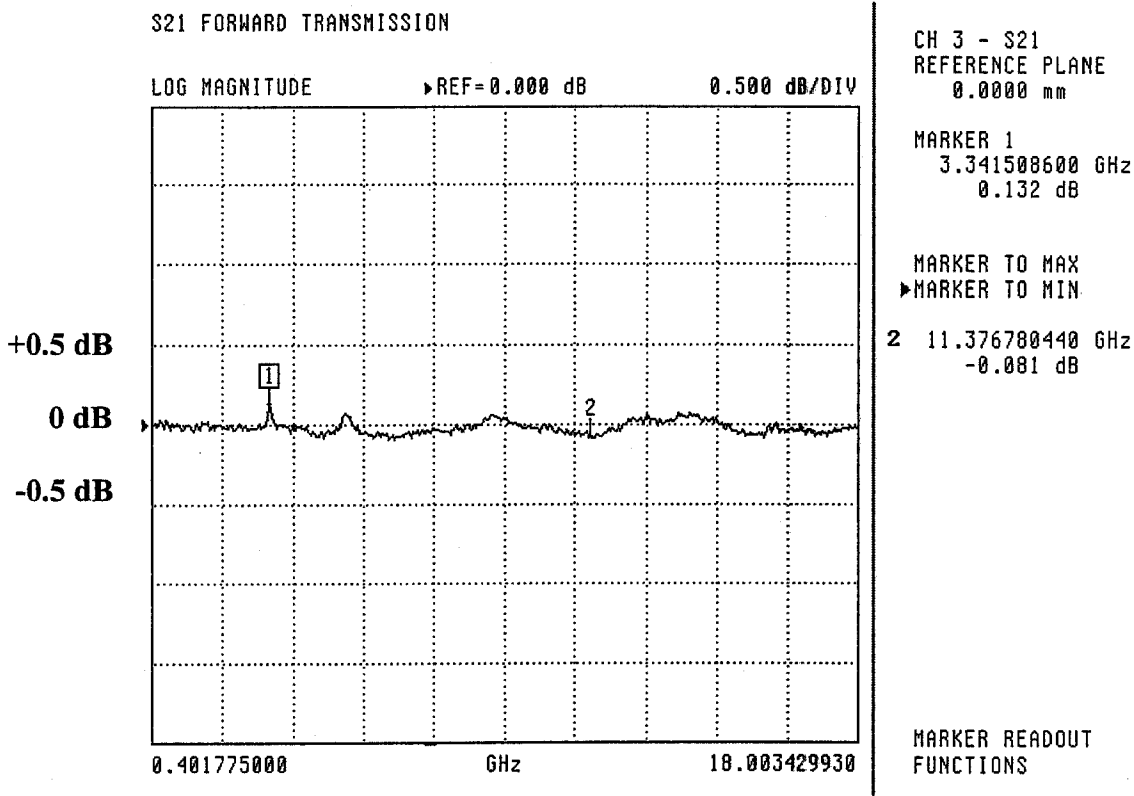
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

**AMPLITUDE\***  
J1-J7



\*J1: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
3.34 GHz	0.132 dB	
11.37 GHz		-0.081 dB

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**PHASE  
DATA  
BETWEEN  
PORT TO PORT  
FROM  
0.4 GHz TO 18 GHz  
ON A  
SP4T**

**RADIAL SOLID STATE SWITCH  
(SURFACE MOUNTABLE)**

**AMC MODEL No:  
SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SSH  
(Serial Number: 4MS908195)**

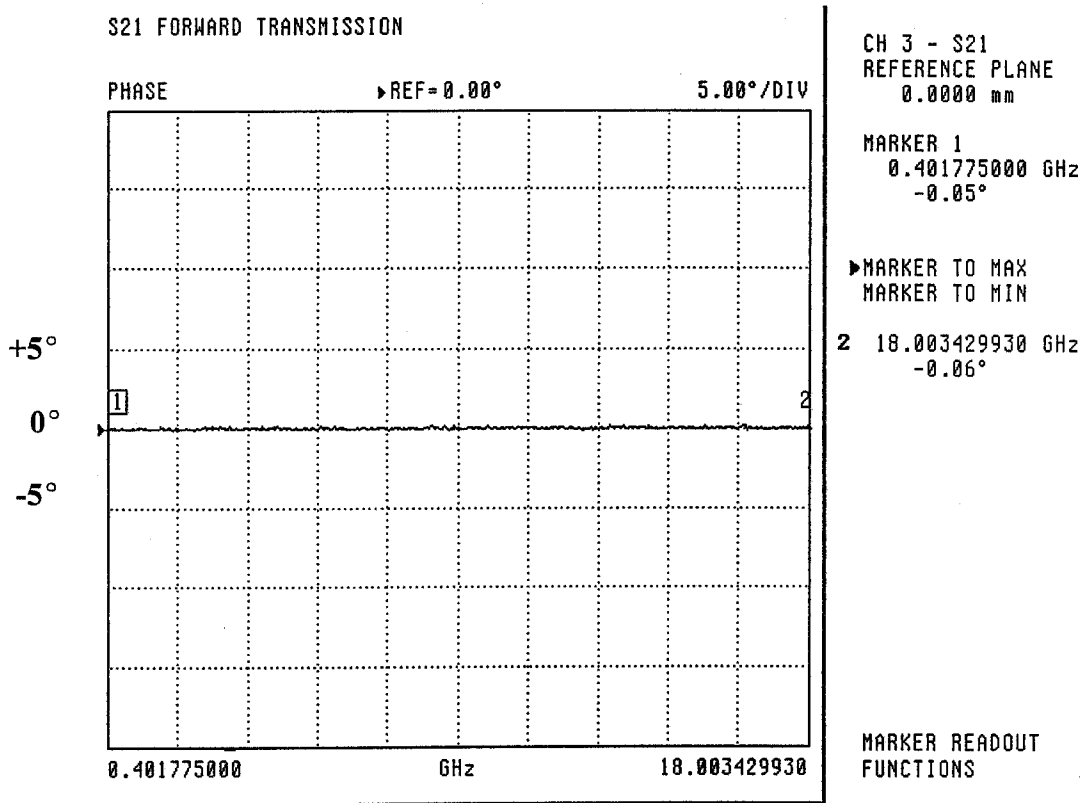
**AUGUST 17, 1999**



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

**PHASE\***  
J1-J3 (REFERENCE)



\*J1: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
400 MHZ		-0.05°
18 GHz		-0.06°

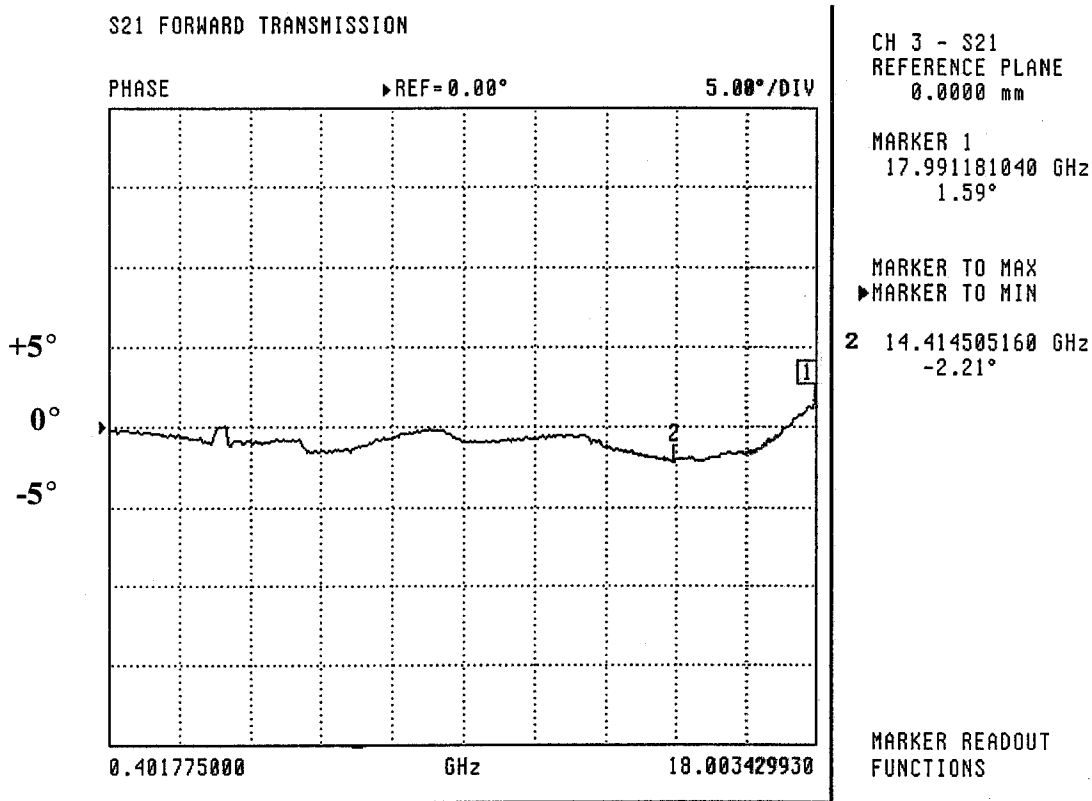
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

#### PHASE\* J1-J4



\*J1: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
17.99 GHZ	1.59°	
14.41 GHZ		-2.21°

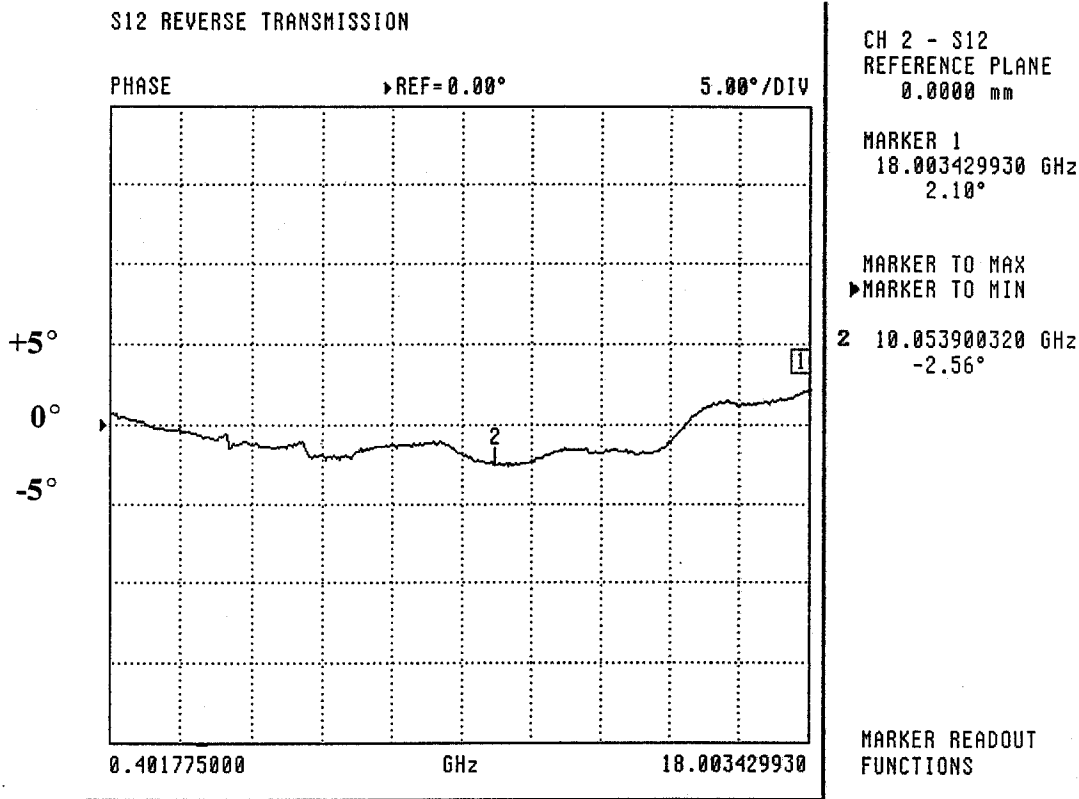
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

**PHASE\***  
J1-J6



\*J1: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
18.00 GHZ	2.10°	
109.05 GHZ		-2.56°

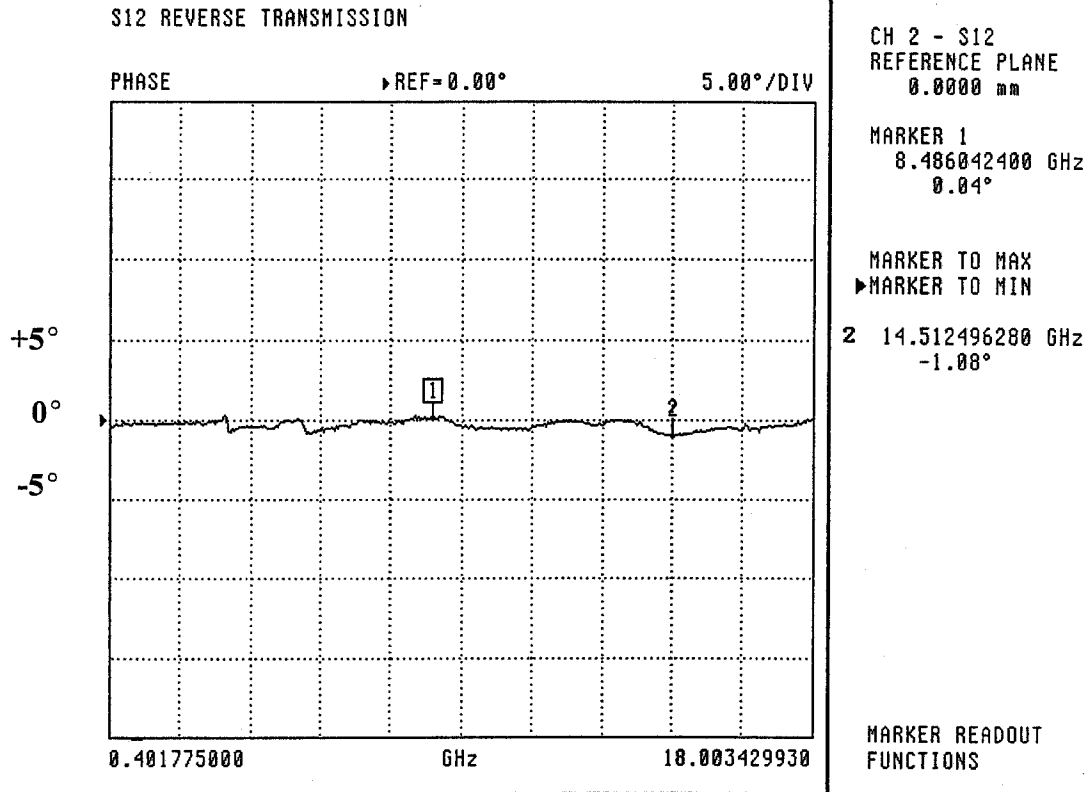
AUGUST 17, 1999



### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

#### PHASE\* J1-J7



\*J1: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
8.48 GHz	0.04°	
14.51 GHz		-1.08°

AUGUST 17, 1999



**TEST DATA**

**FROM**

**0.04 GHz TO 2 GHz**

**ON A**

**SP4T**

**RADIAL SOLID STATE SWITCH**

**(SURFACE MOUNTABLE)**

**AMC MODEL No:**

**SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SSH**

**(Serial Number: 4MS908195)**

**AUGUST 17, 1999**



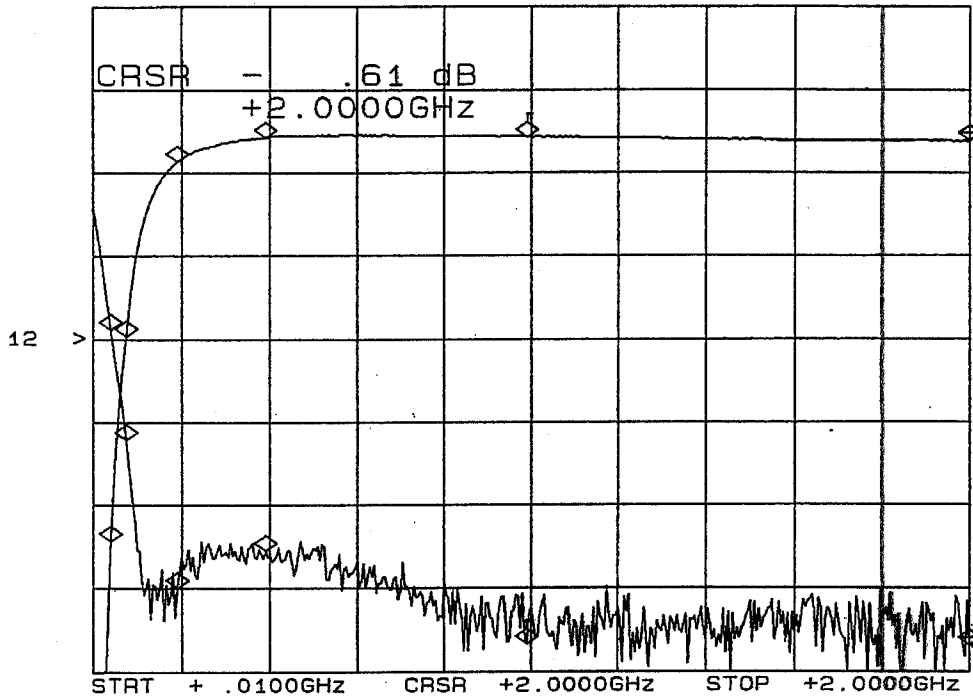


### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

#### INSERTION LOSS & RETURN LOSS\* J1-J3

CH1: A -M - .61 dB      CH2: B -M - 27.92 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	5.43 dB	8.89 dB
50 MHz	2.94 dB	15.5 dB
200 MHz	0.85 dB	24.4 dB
400 MHz	0.56 dB	22.3 dB
1 GHz	0.56 dB	27.8 dB
2 GHz	0.61 dB	27.9 dB



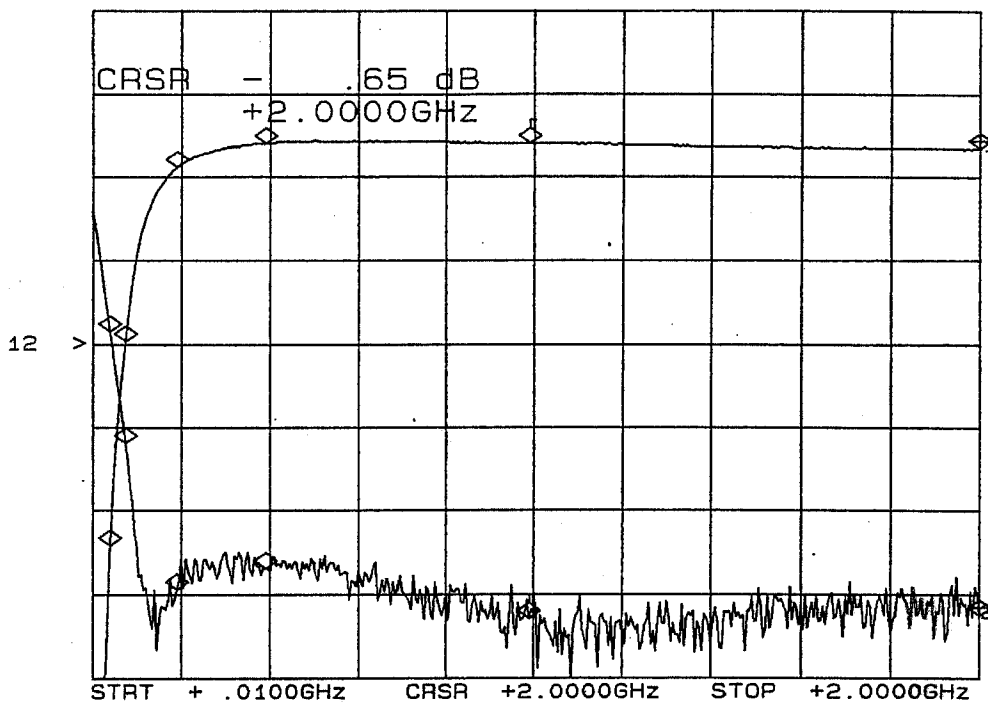
### SUMMARY TEST DATA

<b>MODEL NUMBER</b>	: SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH
<b>SERIAL NUMBER</b>	: 4MS908195
<b>ENGINEER</b>	: RENE AFABLE
<b>VOLTAGE &amp; CURRENT DRAW</b>	: +5vdc: @+184mA; -5vdc: @ -38mA

#### INSERTION LOSS & RETURN LOSS\*

J1-J4

CH1: A -M - .65 dB      CH2: B -M - 25.73 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	5.40 dB	8.74 dB
50 MHz	2.95 dB	15.4 dB
200 MHz	0.87 dB	24.2 dB
400 MHz	0.58 dB	22.9 dB
1 GHz	0.58 dB	25.9 dB
2 GHz	0.65 dB	25.7 dB



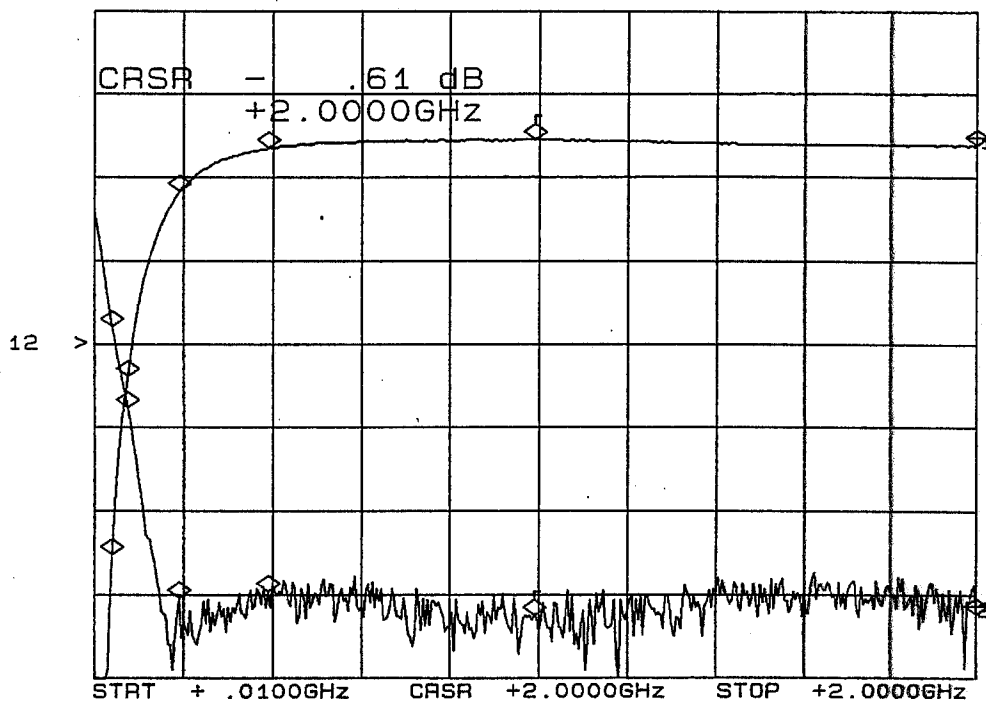
### SUMMARY TEST DATA

<b>MODEL NUMBER</b>	: SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH
<b>SERIAL NUMBER</b>	: 4MS908195
<b>ENGINEER</b>	: RENE AFABLE
<b>VOLTAGE &amp; CURRENT DRAW</b>	: +5vdc: @+184mA; -5vdc: @ -38mA

#### INSERTION LOSS & RETURN LOSS\*

J1-J6

CH1: A -M - .61 dB      CH2: B -M - 25.63 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	5.50 dB	8.40 dB
50 MHz	3.37 dB	13.3 dB
200 MHz	1.17 dB	24.6 dB
400 MHz	0.65 dB	24.3 dB
1 GHz	0.55 dB	25.7 dB
2 GHz	0.61 dB	25.6 dB



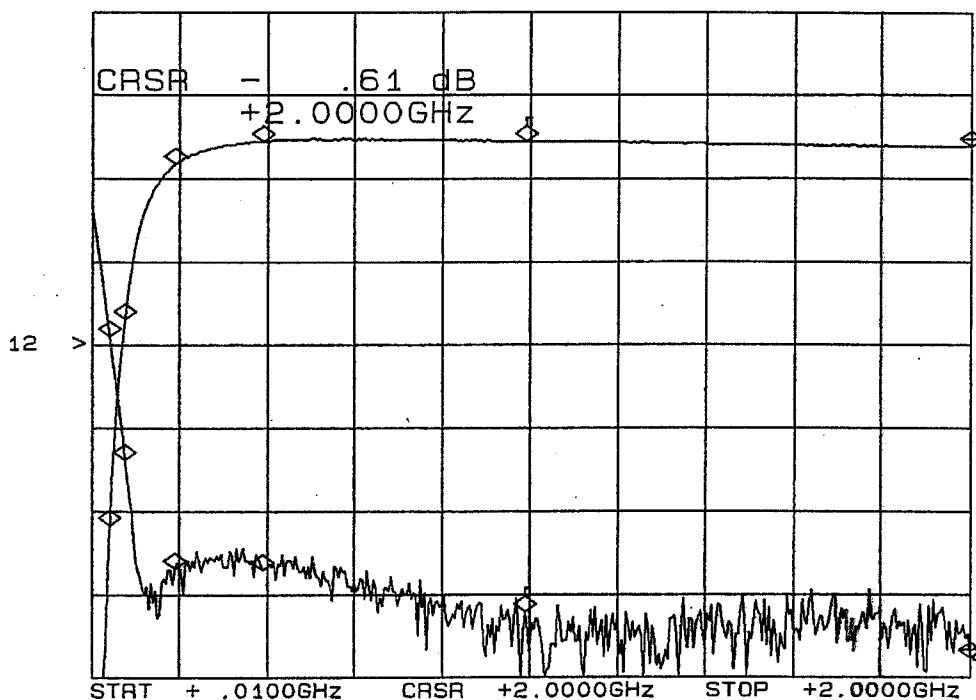
### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

#### INSERTION LOSS & RETURN LOSS\*

J1-J7

CH1: A -M - .61 dB      CH2: B -M - 28.32 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	5.16 dB	9.01 dB
50 MHz	2.68 dB	16.3 dB
200 MHz	0.82 dB	22.9 dB
400 MHz	0.54 dB	23.0 dB
1 GHz	0.54 dB	25.5 dB
2 GHz	0.61 dB	28.3 dB

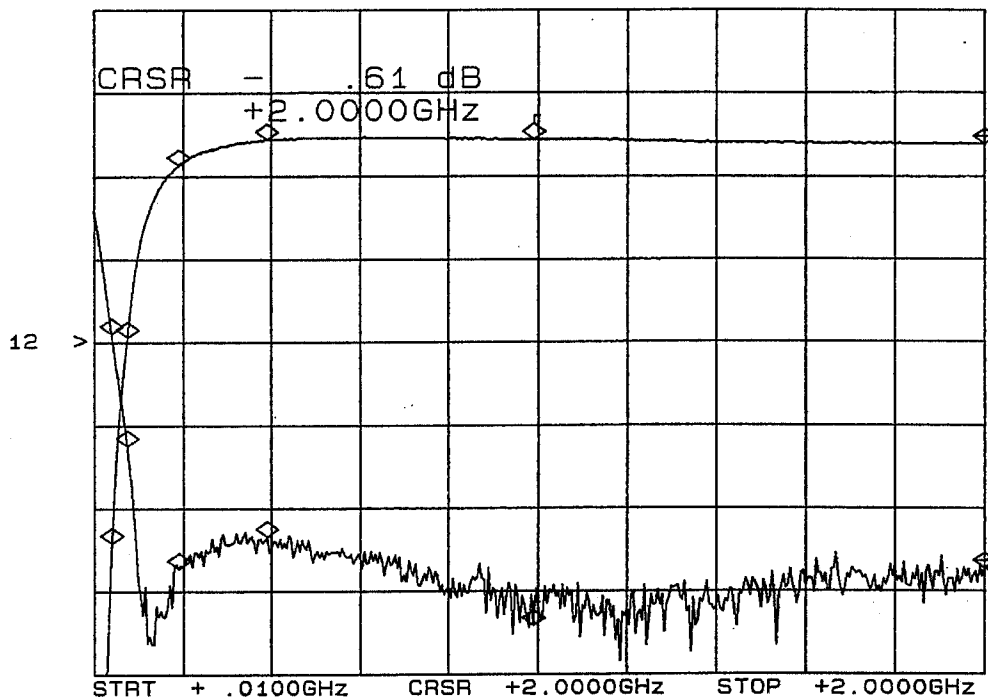


### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

#### INSERTION LOSS & RETURN LOSS\* J3-J1

CH1: A -M - .61 dB      CH2: B -M - 23.12 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	5.42 dB	8.93 dB
50 MHz	2.94 dB	15.6 dB
200 MHz	0.84 dB	22.7 dB
400 MHz	0.55 dB	21.5 dB
1 GHz	0.54 dB	25.6 dB
2 GHz	0.61 dB	23.1 dB



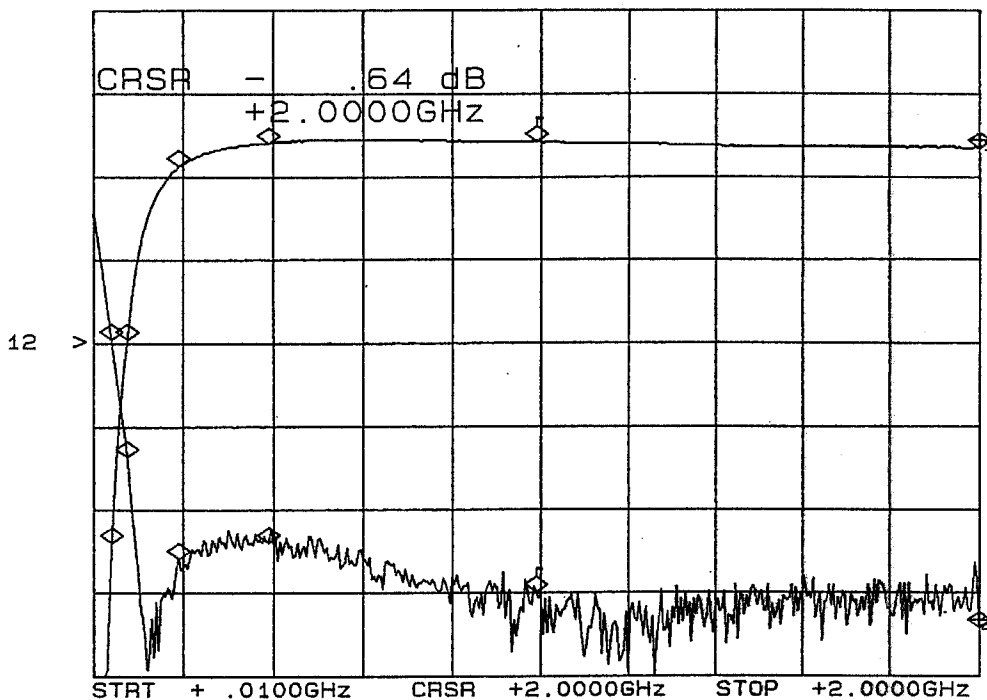
### SUMMARY TEST DATA

MODEL NUMBER	: SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH
SERIAL NUMBER	: 4MS908195
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+184mA; -5vdc: @ -38mA

#### INSERTION LOSS & RETURN LOSS\*

J4-J1

CH1: A -M - .64 dB      CH2: B -M - 26.63 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	5.39 dB	9.32 dB
50 MHz	2.94 dB	16.2 dB
200 MHz	0.86 dB	22.4 dB
400 MHz	0.58 dB	21.5 dB
1 GHz	0.57 dB	24.4 dB
2 GHz	0.64 dB	26.6 dB

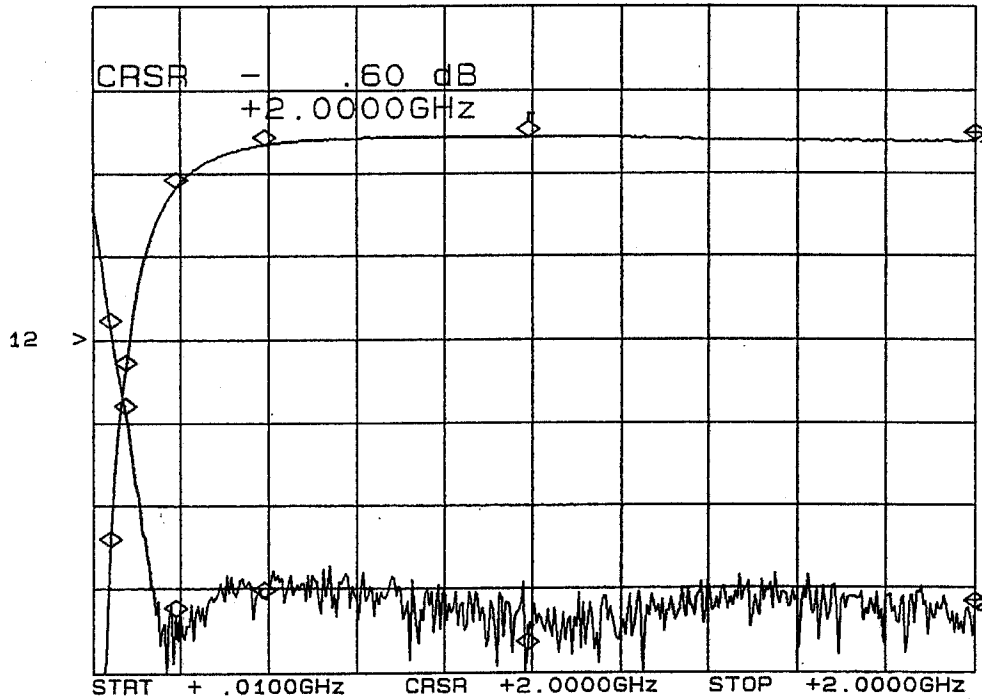


### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @+184mA; -5vdc: @ -38mA

#### INSERTION LOSS & RETURN LOSS\* J6-J1

CH1: A -M - .60 dB      CH2: B -M - 25.79 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J6: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	5.48 dB	8.82 dB
50 MHz	3.35 dB	13.9 dB
200 MHz	1.16 dB	26.1 dB
400 MHz	0.64 dB	25.0 dB
1 GHz	0.54 dB	28.1 dB
2 GHz	0.60 dB	25.7 dB



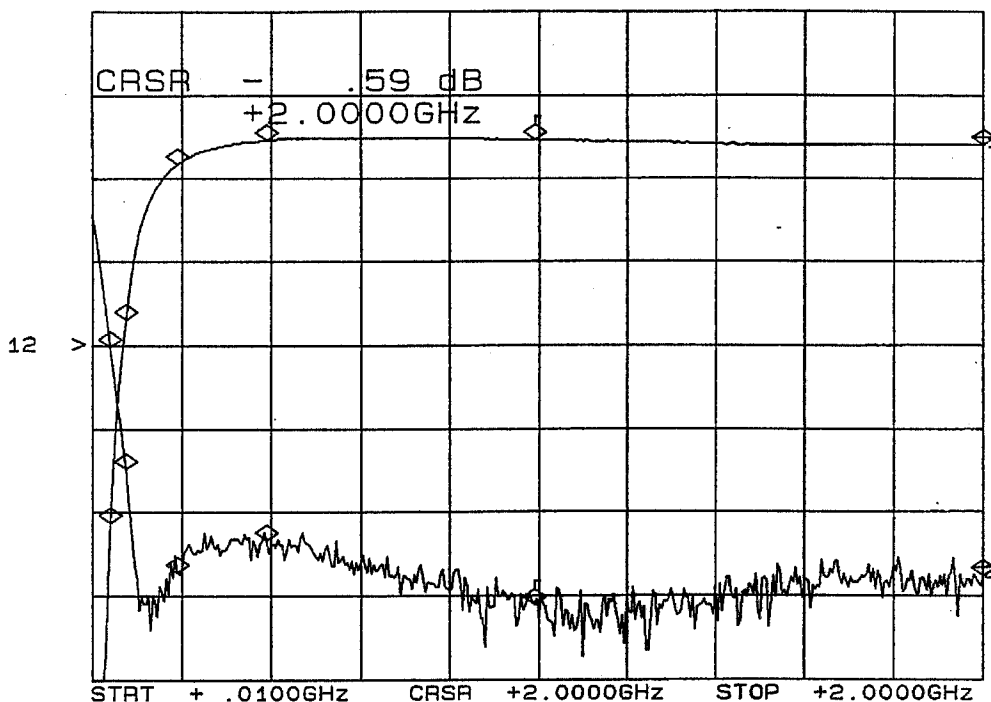
### SUMMARY TEST DATA

<b>MODEL NUMBER</b>	: SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH
<b>SERIAL NUMBER</b>	: 4MS908195
<b>ENGINEER</b>	: RENE AFABLE
<b>VOLTAGE &amp; CURRENT DRAW</b>	: +5vdc: @+184mA; -5vdc: @ -38mA

#### INSERTION LOSS & RETURN LOSS\*

J7-J1

CH1: A -M - .59 dB      CH2: B -M - 23.29 dB  
 1.0 dB/ REF - 3.00 dB      5.0 dB/ REF - 9.54 dB



\*J7: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
40 MHz	5.12 dB	9.56 dB
50 MHz	2.67 dB	16.9 dB
200 MHz	0.81 dB	23.1 dB
400 MHz	0.53 dB	21.2 dB
1 GHz	0.53 dB	25.1 dB
2 GHz	0.59 dB	23.2 dB





## SUMMARY TEST DATA

MODEL NUMBER	: SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH
SERIAL NUMBER	: 4MS908195
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+184mA; -5vdc: @ -38mA

### SWITCHING SPEED

"Rise/Fall" Time: 10% RF to 90% RF & 90% RF to 10% RF

"On/Off" Time: 50% TTL to 90% RF or 10% RF

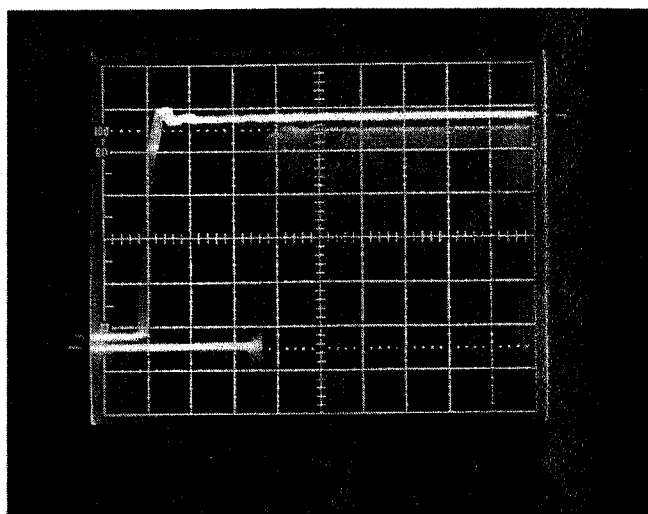
TYPICAL OF ALL ARMS

"DELAY ON": 55 nS

"RISE TIME": 4 nS

HORIZONTAL SCALE:  
20 nS PER DIVISION

VERTICAL SCALE:  
10 mV PER DIVISION

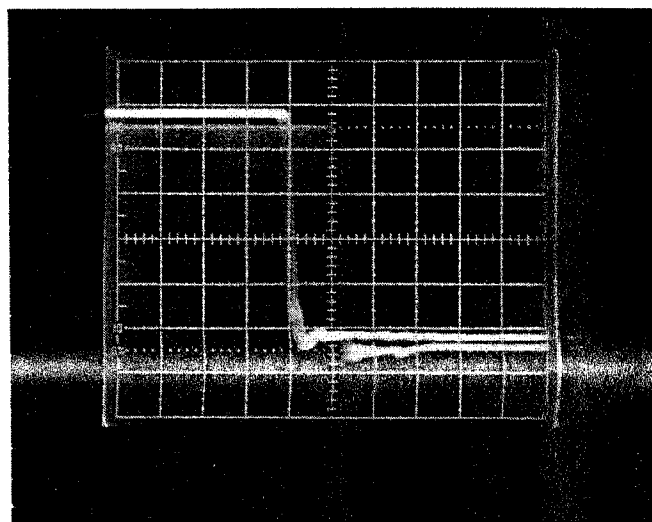


"DELAY OFF": 28 nS

"FALL TIME": 2 nS

HORIZONTAL SCALE:  
20 nS PER DIVISION

VERTICAL SCALE:  
10 mV PER DIVISION



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## SUMMARY TEST DATA

MODEL NUMBER	: SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH
SERIAL NUMBER	: 4MS908195
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @ +184mA; -5vdc: @ -38mA

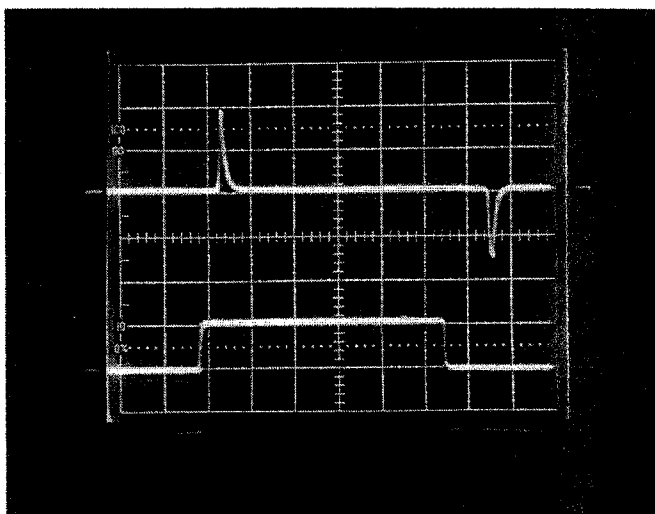
### VIDEO TRANSIENTS

TYPICAL OF ALL ARMS

$\leq 3.4$  V P-P  
MEASURED IN A  
300 MHZ BANDWIDTH

VERTICAL SCALE:  
1.0 V PER DIVISION

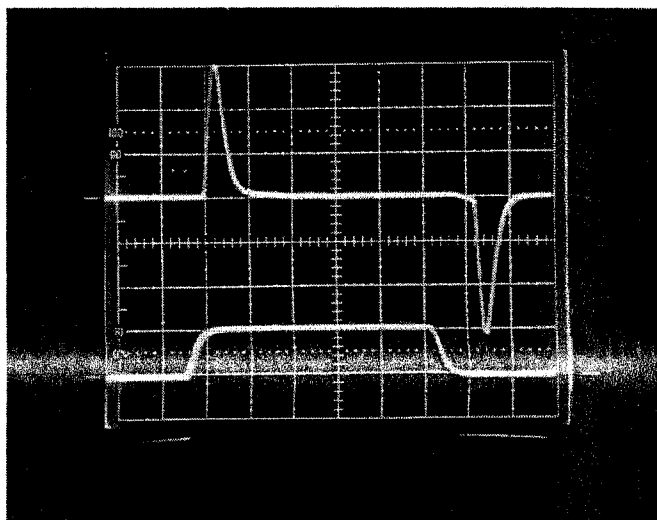
HORIZONTAL SCALE:  
50 nS PER DIVISION



$\leq 1.24$  V P-P  
MEASURED IN A  
20 MHZ BANDWIDTH

VERTICAL SCALE:  
0.2 V PER DIVISION

HORIZONTAL SCALE:  
50 nS PER DIVISION



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**APPENDIX A-SSH**  
**MISCELLANEOUS**  
**TEST DATA AND PLOTS**  
**ON**  
**ISOLATION**  
**AS**  
**MEASURED**  
**ON A SCALAR NETWORK**

**ANALYZER**  
(NOISE FLOOR OF SCALAR NETWORK ANALYZER IS -70 dB)

**ON A**  
**SP4T**

**RADIAL SOLID STATE SWITCH**  
(SURFACE MOUNTABLE)

**AMC MODEL No:**  
**SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SSH**  
(Serial Number: 4MS906195)

**FROM 0.4 GHz TO 18 GHz**  
**AND**

**FROM 0.04 GHz TO 2 GHz**

**AUGUST 17, 1999**

7311 G GROVE ROAD, FREDERICK, MARYLAND 21704 • Tel. (301) 662-4700 • Fax (301) 662-4938



## SUMMARY TEST DATA

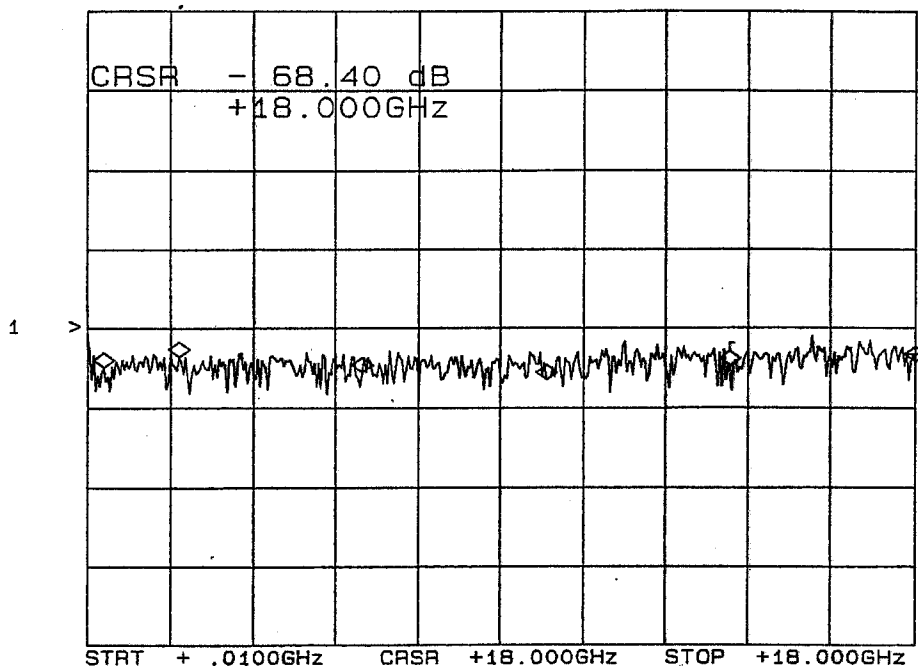
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +184mA; -5vdc @ -38mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J3

CH1: A -M - 68.40 dB  
20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
400 MHz	69.7 dB
2.0 GHz	67.1 dB
6.0 GHz	70.7 dB
10.0 GHz	73.0 dB
14.0 GHz	69.3 dB
18.0 GHz	68.4 dB

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A2-SSH



## SUMMARY TEST DATA

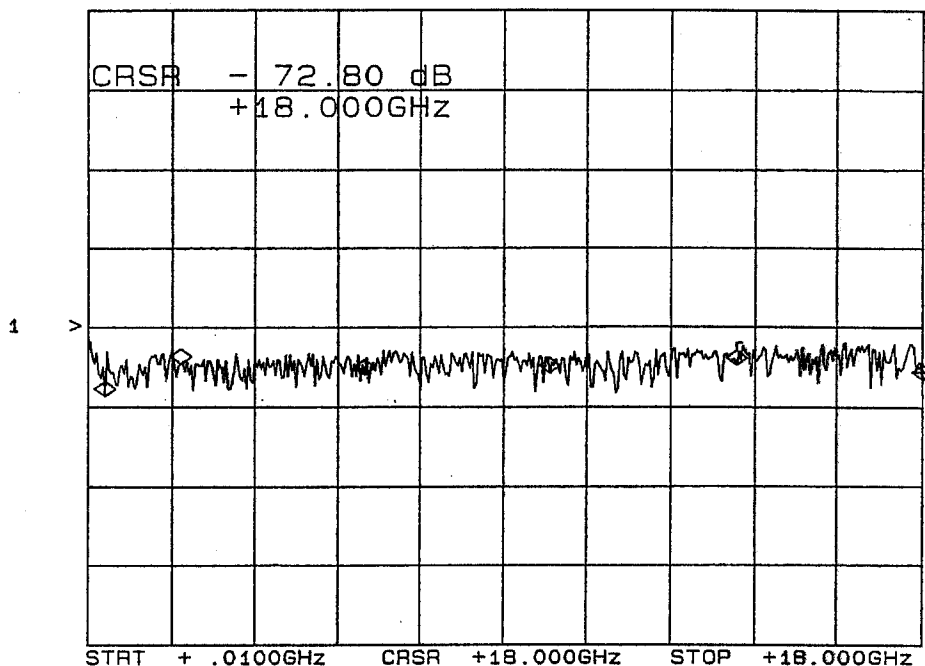
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +184mA; -5vdc @ -38mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J4

CH1: A -M - 72.80 dB  
 20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
400 MHz	77.1 dB
2.0 GHz	69.1 dB
6.0 GHz	71.7 dB
10.0 GHz	71.2 dB
14.0 GHz	69.3 dB
18.0 GHz	72.8 dB

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A3-SSH



## SUMMARY TEST DATA

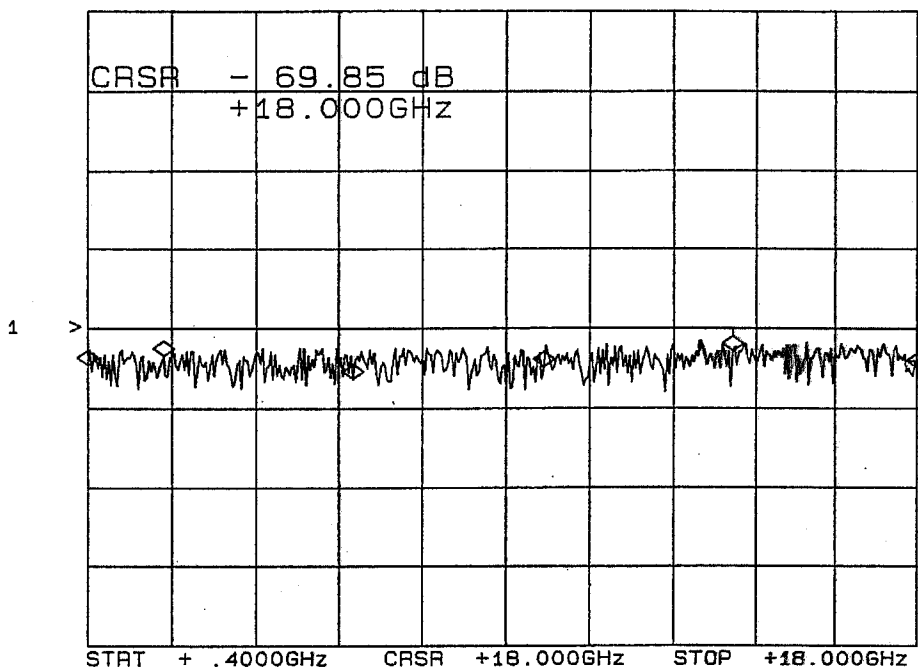
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +184mA; -5vdc @ -38mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J6

CH1: A -M - 69.85 dB  
 20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
400 MHz	66.5 dB
2.0 GHz	67.0 dB
6.0 GHz	75.3 dB
10.0 GHz	66.9 dB
14.0 GHz	67.3 dB
18.0 GHz	69.8 dB

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A4-SSH



## SUMMARY TEST DATA

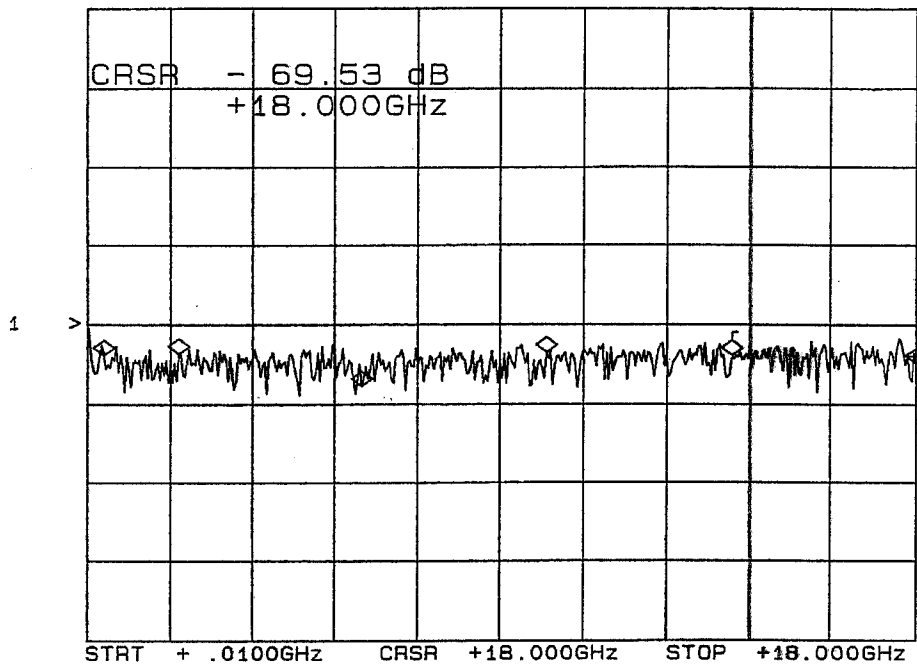
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +184mA; -5vdc @ -38mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J7

CH1: A -M - 69.53 dB  
20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
400 MHz	66.7 dB
2.0 GHz	71.5 dB
6.0 GHz	70.4 dB
10.0 GHz	66.2 dB
14.0 GHz	67.4 dB
18.0 GHz	69.5 dB

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A5-SSH



**ISOLATION  
DATA AND PLOTS  
FROM  
0.04 GHz TO 2 GHz  
AS  
MEASURED  
ON A SCALAR NETWORK  
ANALYZER  
(NOISE FLOOR OF SCALAR NETWORK ANALYZER IS -70 dB)  
ON A  
SP4T  
RADIAL SOLID STATE SWITCH  
(SURFACE MOUNTABLE)  
AMC MODEL No:  
SWN-1170-4DR-STANDARD OPTIONS 0418, PAM, SSH  
(Serial Number: 4MS908195)**

**AUGUST 17, 1999**





### SUMMARY TEST DATA

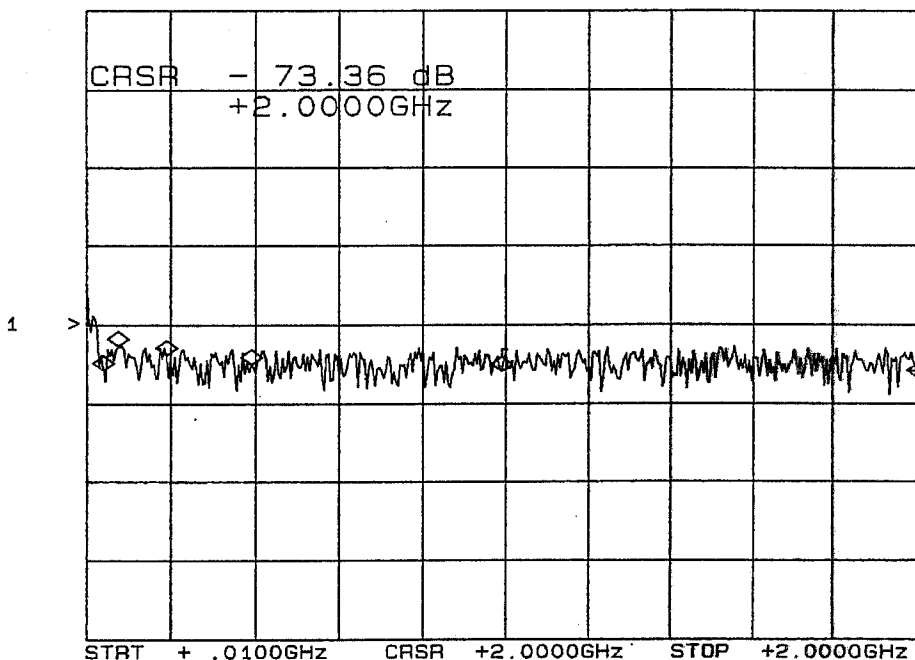
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +184mA; -5vdc @ -38mA

#### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J3

CH1: A -M - 73.36 dB  
 20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
40 MHz	71.3 dB
50 MHz	65.0 dB
200 MHz	67.6 dB
400 MHz	69.6 dB
1 GHz	71.8 dB
2 GHz	73.3 dB

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A7-SSH

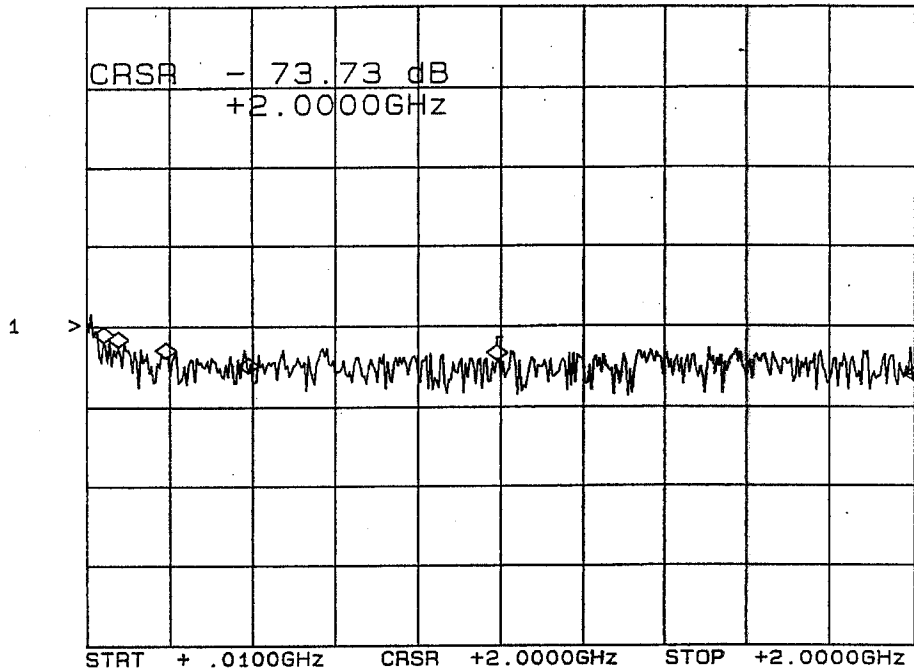


### SUMMARY TEST DATA

**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +184mA; -5vdc @ -38mA

**ISOLATION\***  
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)  
 J1-J4

CH1: A -M - 73.73 dB  
 20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
40 MHz	63.5 dB
50 MHz	64.7 dB
200 MHz	67.5 dB
400 MHz	71.4 dB
1 GHz	68.3 dB
2 GHz	73.7 dB

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A8-SSH



## SUMMARY TEST DATA

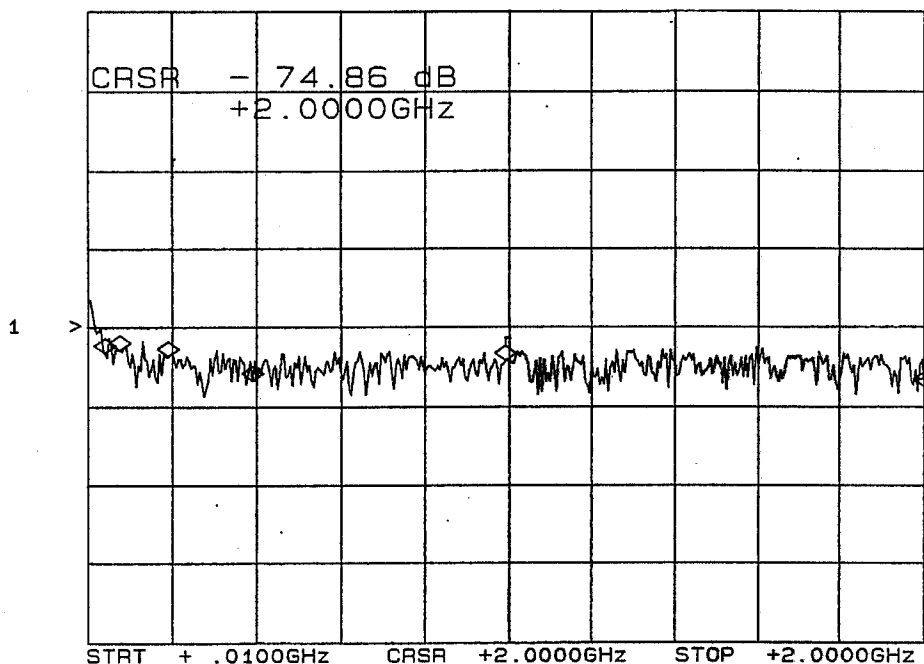
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +184mA; -5vdc @ -38mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J6

CH1: A -M - 74.86 dB  
20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
40 MHz	66.2 dB
50 MHz	65.5 dB
200 MHz	67.0 dB
400 MHz	73.2 dB
1 GHz	68.1 dB
2 GHz	74.8 dB

AUGUST 17, 1999

A9-SSH



## SUMMARY TEST DATA

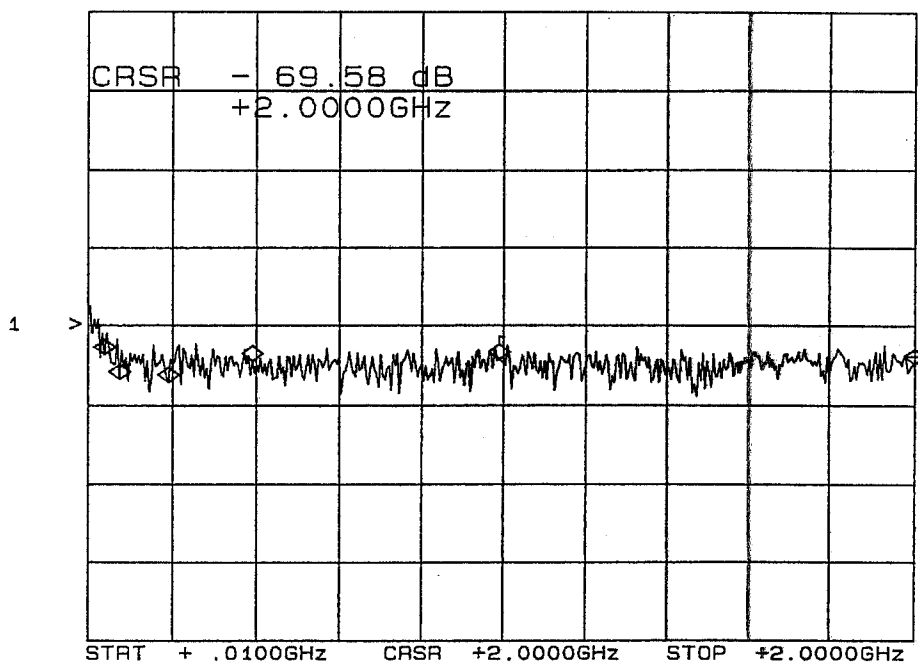
**MODEL NUMBER** : SWN-1170-4DR-STD OPTIONS 0418, PAM, SSH  
**SERIAL NUMBER** : 4MS908195  
**ENGINEER** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** : +5vdc: @ +184mA; -5vdc @ -38mA

### ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J1-J7

CH1: A -M - 69.58 dB  
20.0 dB/ REF - 60.00 dB



\*J1: INPUT ARM

FREQUENCY	ISOLATION
40 MHz	67.2 dB
50 MHz	73.0 dB
200 MHz	73.8 dB
400 MHz	68.4 dB
1 GHz	68.1 dB
2 GHz	69.5 dB

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A10-SSH