



**AMERICAN MICROWAVE
CORPORATION**

TEST DATA

ON

2 GHz TO 4 GHz

2.4 GHz TO 2.5 GHz

AND

1.5 GHz TO 4.8 GHz

HIGH POWER (80 WATTS)

COLD SWITCHING

REFLECTIVE

SPDT

SOLID STATE SWITCH

AMC MODEL No:

SWN-218-2DR-STANDARD OPTIONS 204F, HPR80W, LIL

(Serial Number: 2MS005139)

PREPARED

BY

KATIE BAISEY

MAY 15, 2000

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

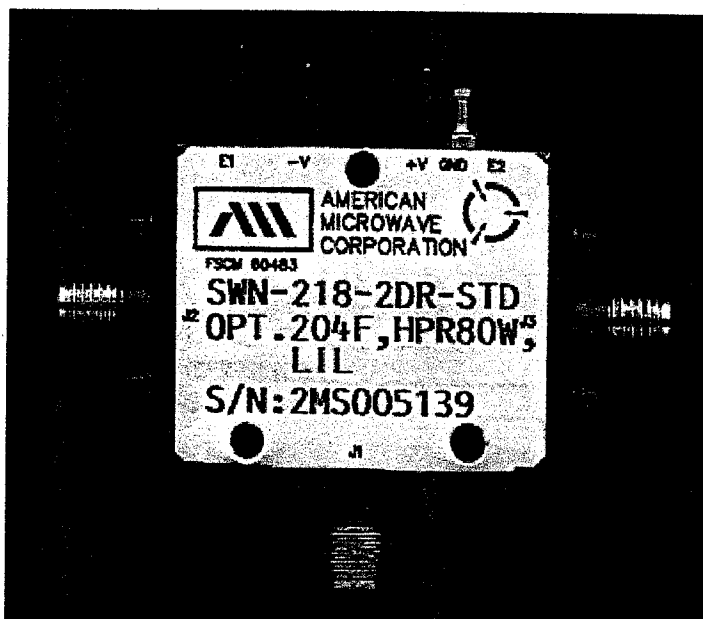
E-MAIL ADDRESS: AMCPMI@AOL.COM

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



**AMERICAN MICROWAVE
CORPORATION**

SPDT REFLECTIVE HIGH POWER COLD SWITCHING SWITCH



KEY FEATURES

- 2 GHz TO 4 GHz
- HIGH POWER
- LOW INSERTION LOSS
- TTL LOGIC COMPATIBLE

AMC MODEL No: SWN-218-2DR-STD OPTIONS 204F, HPR80W, LIL

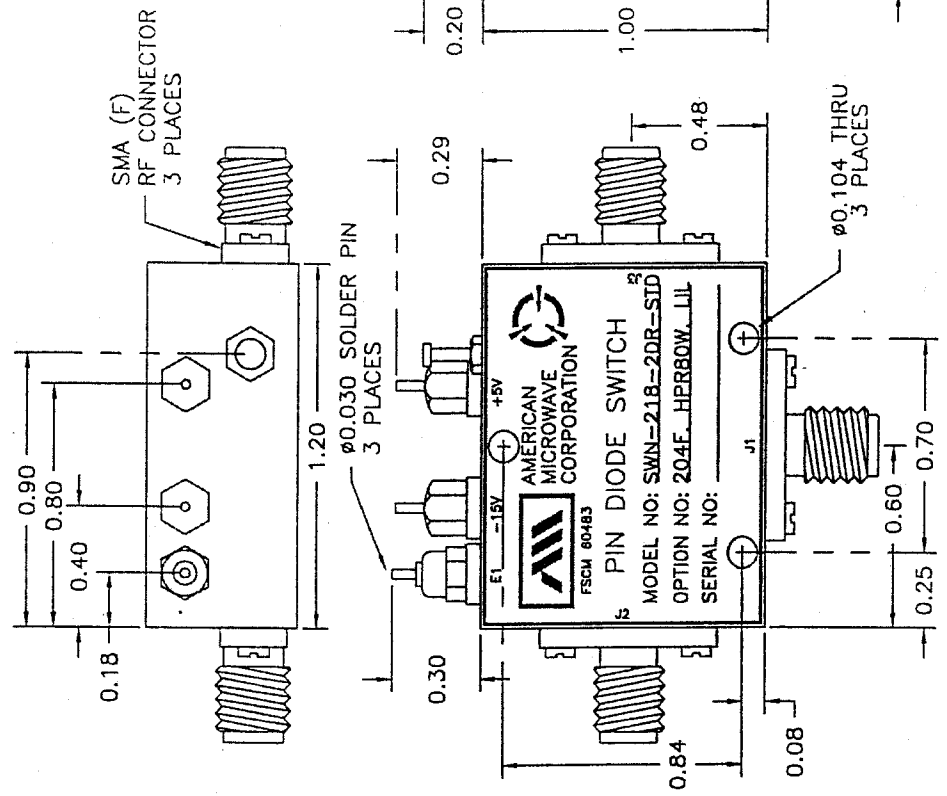
SPECIFICATIONS: (REFLECTIVE)

• FREQUENCY RANGE	:	2 GHz to 4 GHz (Other Frequencies Available)
• INSERTION LOSS	:	1.25 dB MAX.
	:	0.75 dB TYP. @ 2.0 GHz
	:	0.60 dB TYP. @ 3.0 GHz
	:	1.25 dB TYP. @ 4.0 GHz
• ISOLATION	:	≥ 35 dB MIN.
	:	≥ 35 dB TYP. @ 2.0 GHz
	:	≥ 38 dB TYP. @ 3.0 GHz
	:	≥ 35 dB TYP. @ 4.0 GHz
• VSWR	:	2.0:1
• SWITCHING SPEED	:	"RISE" 100nS MAX., 75nS TYP.
	:	"FALL" 275nS MAX., 250nS TYP.
	:	"ON" 200nS MAX., 175nS TYP.
	:	"OFF" 350nS MAX., 325nS TYP.
• CONTROL	:	TTL Compatible (Independent control available)
• VIDEO TRANSIENTS	:	≤0.59 V Peak to Peak, 300 MHZ Bandwidth
	:	≤220 mV Peak to Peak, 20 MHZ Bandwidth
• RF INPUT POWER	:	80 Watts Cold Switching (Other power Levels available)
• DC POWER SUPPLY	:	+5vdc @ +50mA MAX.
(Other supply voltages available)	:	-15vdc @ +50mA MAX.
• SIZE	:	1.20" X 1.00" X 0.50"
• WEIGHT	:	≤ 1.5 oz.

MAY 15, 2000

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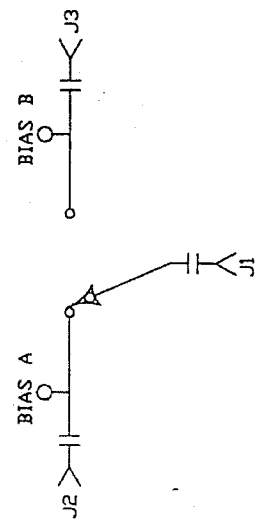
DESCR: AMC MODEL SWN-218-2DR-STANDARD OPTIONS 204F, HPR80W, LIL IS A SINGLE POLE TWO THROW, HIGH POWER (80 WATTS) REFLECTIVE COLD SWITCHING SWITCH MODULE WITH VERY LOW INSERTION LOSS AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR 2.4 TO 2.5 GHz OPERATION.



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

- SPECIFICATIONS:**
- FREQUENCY: 2.4 GHz TO 2.5 GHz
 - INSERTION LOSS: 0.8 dB MAX.
 - ISOLATION: 40 dB MIN.
 - VSWR (ALL PORTS): 2.0:1
 - SWITCHING SPEED: 1 us MAX.
 - RF POWER: 80 WATTS.
 - CONTROL: TTL SINGLE ENDED 1 BIT
 - POWER SUPPLY: +5 VDC @ 100 mA MAXIMUM
-15 VDC @ 75 mA MAXIMUM
 - CONNECTORS (RF): SMA FEMALE, 3 PLACES
 - CONNECTORS (POWER): SOLDER PINS
 - CONNECTORS (CONTROL): SOLDER PINS
 - LOGIC "0": J1 TO J2
 - LOGIC "1": J1 TO J3
 - SIZE: 1.20" (L) x 1.00" (W) x 0.50" (H)
 - WEIGHT: 1.5 OUNCE TYPICAL

BLOCK DIAGRAM



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

APPROVALS		DATE
DESIGN	WSP, RBL	05/15/00
CHECKED	DA	5/19/00
ISSUED	WSP	5/19/00

TITLE		REV.
AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND		
PRODUCT FEATURE		
SWN-218-2DR-STANDARD		
OPTIONS 204F, HPR80W, LIL		
SIZE	FSCM NO.	DWG. NO.
A	60483	100-4427-11

DESCRIPTION: SWN-2DR/DT-STANDARD IS A SINGLE POLE TWO THROW, REFLECTIVE OR ABSORPTIVE/NON-REFLECTIVE SWITCH MODULE WITH VERY LOW INSERTION LOSS, HIGH ISOLATION AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR BROAD BAND OPERATIONS.

SPECIFICATIONS:

- FREQUENCY: 0.5 GHz TO 18 GHz
- REFLECTIVE: 2.5db
- ABSORPTIVE: 3.5db
- 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"= J1-J2 ON "1"= J1-J3 ON
- POWER SUPPLY: +5V @ 100 mA MAX.
- -5V @ 75mA MAX.(REFLECTIVE)
- 100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- CONNECTORS: SMA FEMALE
- RF CONTROL SOLDER PIN
- SIZE: 1.20" (L) x 1.00" (W) x 0.50" (H)
- WEIGHT: 1.5 OUNCE TYPICAL

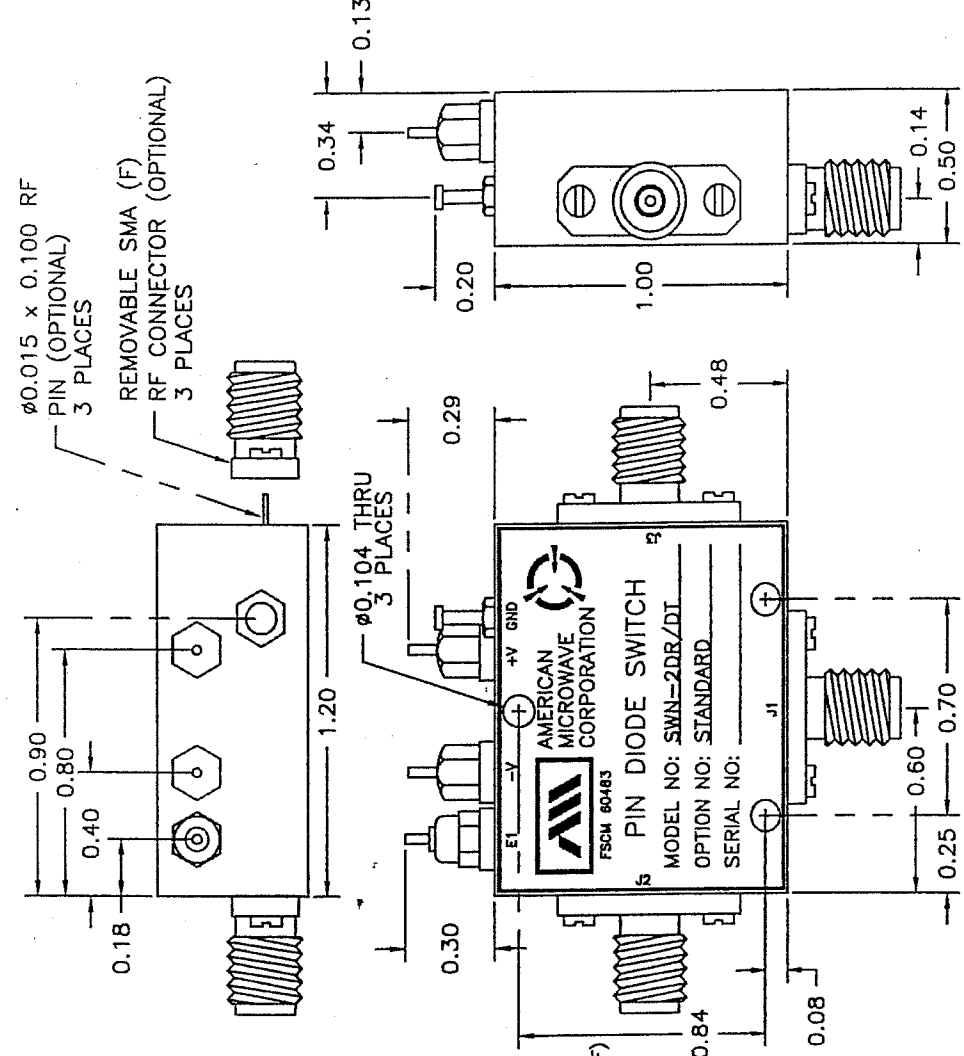
OPTIONS:

- SINGLE CONTROL WITH SOLDER PIN STANDARD
- IND-SP INDEPENDANT CONTROL WITH SOLDER PIN (LOGIC "0" = ON "1" = OFF)
- 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)
- 412 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 HS
- B06 HIGH POWER - SPECIFY CW POWER, PEAK 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

ENVIRONMENTAL RATINGS:

- TEMPERATURE: -55°C TO +85°C (OPERATING)
- -55°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



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

APPROVALS		DATE
DRAWN: WJPP, BRD		1/29/99
CHECKED: WJP		1/29/99
ISSUED: PA		1/29/99
TITLE: AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND		
OUTLINE DRAWING		
SWN-2DR/DT-STANDARD		
SOLID STATE SWITCH		
SIZE: A	FSCM NO. 60483	DWG NO. 100-4427-1
SCALE: N/S	SHEET 1 of 2	

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

DESCRIPTION:
 AMC MODEL SWN-2DR/DT-IND-SP IS A SINGLE POLE TWO THROW, REFLECTIVE OR ABSORPTIVE PIN DIODE SWITCH MODULE WITH VERY LOW INSERTION LOSS, HIGH ISOLATION AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR BROAD BAND OPERATIONS.

SPECIFICATIONS:

- FREQUENCY: 0.5 GHz TO 18 GHz
- REFLECTIVE: 2.5db
- ABSORPTIVE: 3.5db
- INSERTION LOSS: 0.5 GHz TO 2 GHz: 60db
- ISOLATION: 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 μ sec
- CONTROL: TTL LOGIC "0" = J1-J2 ON "1" = J1-J3 ON
- POWER SUPPLY: +5V @ 100 mA MAX.
- -5V @ 75mA MAX.(REFLECTIVE)
- 100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- CONNECTORS: SMA FEMALE
- RF CONTROL: SOLDER PIN
- SIZE: 1.20" (L) x 1.00" (W) x 0.50" (H)
- WEIGHT: 1.5 OUNCE TYPICAL

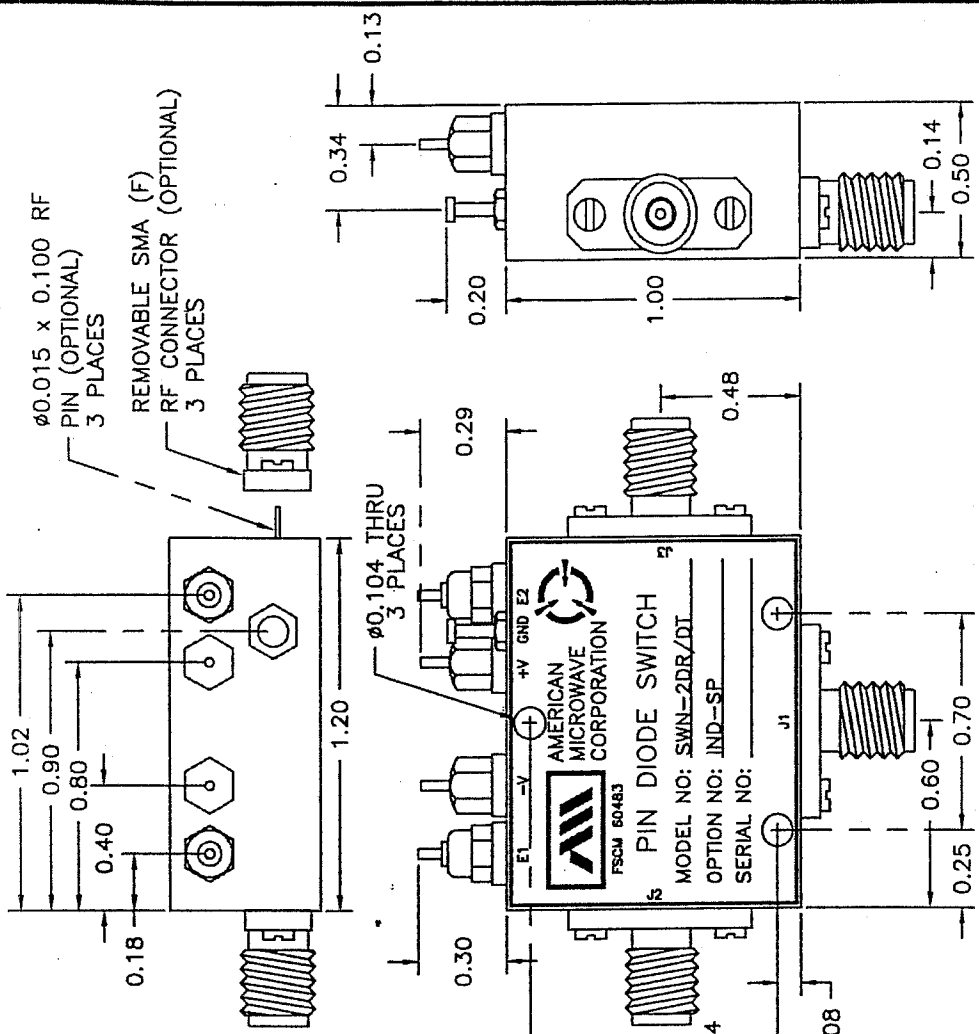
OPTIONS:

- SINGLE CONTROL WITH SOLDER PIN STANDARD
- IND-SP INDEPENDANT CONTROL WITH SOLDER PIN (LOGIC "0" = ON "1" = OFF)
- 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)
- 118 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 218 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 412 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 618 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 1218 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 INSERTION LOSS VERSION
- B09 HIGHER ISOLATION VERSION
- B10 HIGHER ISOLATION 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 105C 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

APPROVALS		DATE	TITLE
DRAWN	1/29/90	1/29/90	AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND
CHECKED	YIP	2/29/90	OUTLINE DRAWING
ISSUED	7/29/91		SWN-2DR/DT-IND-SP SOLID STATE SWITCH
SIZE	A	FSCM NO. 60483	DWG NO. 100-4427-2
SCALE	N/S		REV. 1 of 2

DESCRIPTION: SWN-2DR/DI-AKG-STANDARD IS A SINGLE POLE TWO 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.
- POWER INPUT: (CW)+20dBm (STANDARD), +10 dBm (HIGH SPEED)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL: TTL LOGIC "0" = J1-J2 ON "1" = J1-J3 ON
- POWER SUPPLY: +5V @ 100 mA MAX.
- -5V @ 75mA MAX.(REFLECTIVE)
- 100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- SIZE: 1.2" (L) x 1.00" (W) x 0.50" (H)
- WEIGHT: 1.2 oz.

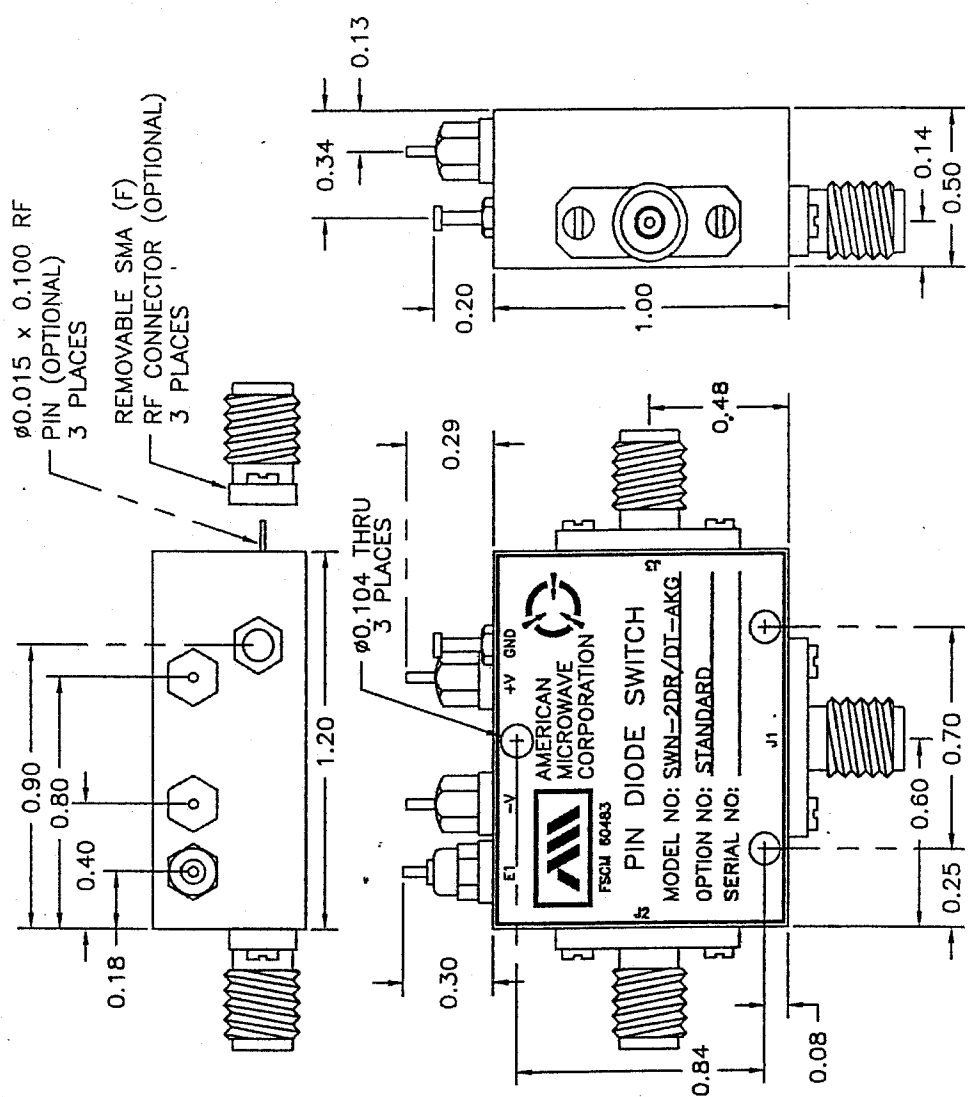
OPTIONS:

- SINGLE CONTROL WITH SOLDER PIN STANDARD
- IND-SP: INDEPENDANT CONTROL WITH SOLDER PIN (LOGIC "0" = ON "1" = OFF)
- 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)
- 118: 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 218: 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 418: 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 618: 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 1218: 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

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



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

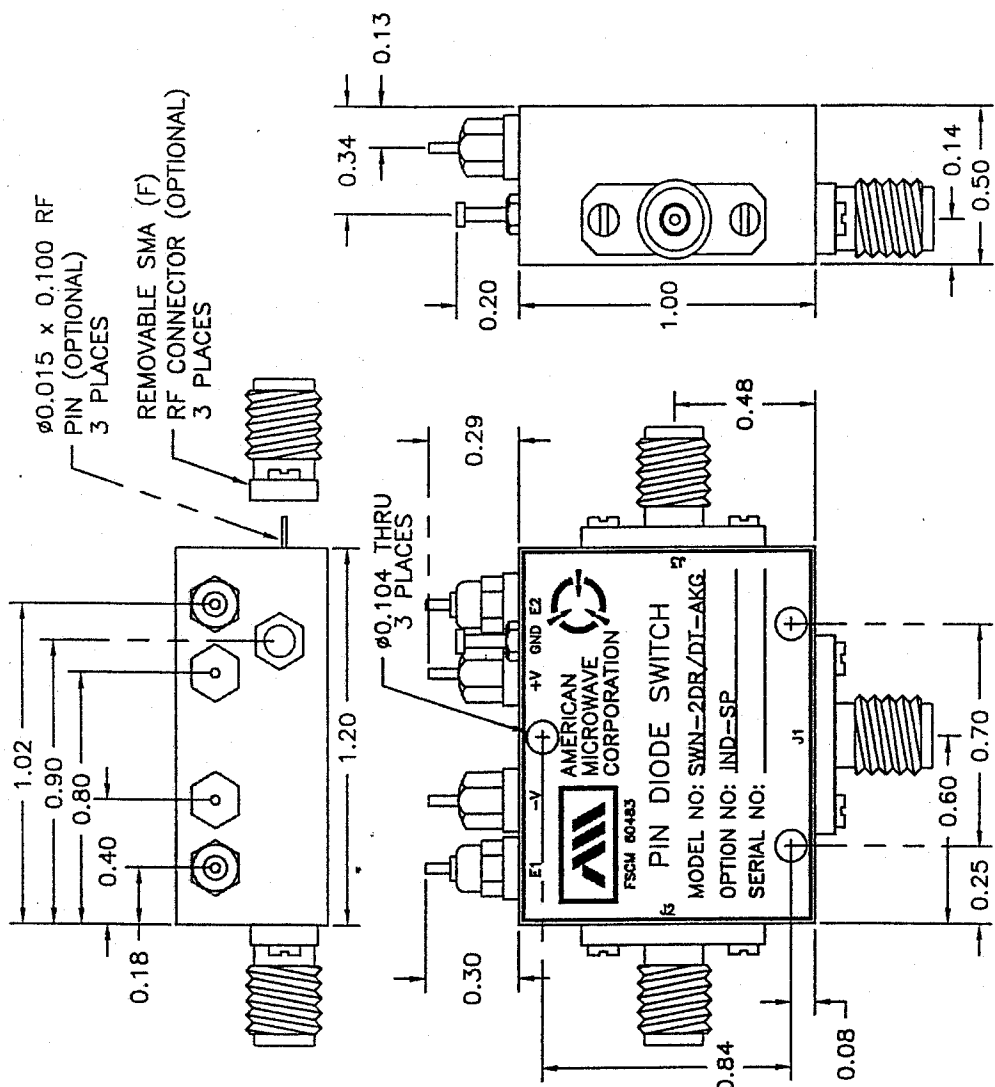
APPROVALS		DATE
DRAWN: WSP, RBA	1/27/99	
CHECKED: WIP	7/29/99	
ISSUED: BA	7/29/99	
TITLE: AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND		
OUTLINE DRAWING		
SWN-2DR/DI-AKG-STANDARD		
SOLID STATE SWITCH		
SIZE: A	FSCM NO: 60483	DWG NO: 100-4790-1
SCALE: N/S		SHEET: 1 of 2

DESCRIPTION: SWN-2DR/DT-AKG-IND-SP IS A SINGLE POLE TWO 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
 - INSERTION LOSS: 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 usec
 - CONTROL: TTL LOGIC "0" = J1-J2 ON "1" = J1-J3 ON
 - POWER SUPPLY: +5V @ 100 mA MAX.
-5V @ 75mA MAX.(REFLECTIVE)
100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
 - SIZE: 1.2" (L) x 1.00" (W) x 0.50" (H)
 - WEIGHT: 1.2 oz.

- OPTIONS:**
- SINGLE CONTROL WITH SOLDER PIN STANDARD
 - IND-SP INDEPENDANT CONTROL WITH SOLDER PIN (LOGIC "0" = ON "1" = OFF)
 - 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)
 - 118 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
 - 412 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
 - 618 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
 - 1218 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, PEAK 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

ZONE REV: ORIGINAL RELEASE DATE: 1/27/99 APPROVED:



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

APPROVALS		DATE
DRAWN: WSP, RRL		1/27/99
CHECKED: WSP		1/29/99
ISSUED: CA		1/29/99
SIZE: A	FSCM NO. 60483	DWG NO. 100-4790-2
SCALE: N/S	SHEET 1 of 2	

AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND	
OUTLINE DRAWING	
SWN-2DR/DT-AKG-IND-SP	
SOLID STATE SWITCH	
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-218-2DR/DT-SIS IS A SINGLE SUPPLY, SINGLE POLE TWO THROW, REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH MODULE WITH VERY LOW INSERTION LOSS AND INTEGRAL TTL DRIVER, DESIGNED FOR BROAD BAND OPERATIONS.

SPECIFICATIONS:

- FREQUENCY: 0.5 GHz TO 18 GHz
- REFLECTIVE: 2.5db
- ABSORPTIVE: 3.0db
- ISOLATION: 0.5 GHz TO 2 GHz: 55db
2 GHz TO 12 GHz: 45db
12 GHz TO 18 GHz: 25db
- VSWR: REFLECTIVE IN/OUT: 2.0:1
ABSORPTIVE IN/OUT: 2.0:1
REFLECTIVE OUT/OFF: 2.0:1
ABSORPTIVE OUT/OFF: 2.0:1
- SPEED: RISE: 15ns TYPICAL, 20ns MAX.
FALL: 15ns TYPICAL, 20ns 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"= J1-J2 ON "1"= J1-J3 ON
- POWER SUPPLY: +5V @ 100 mA MAX.
- CONNECTORS: SMA FEMALE
SOLDER PIN
SIZE: (L) 1.2" X (W) 1.0" X (H) 0.5"
WEIGHT: 1.5 OUNCE TYPICAL

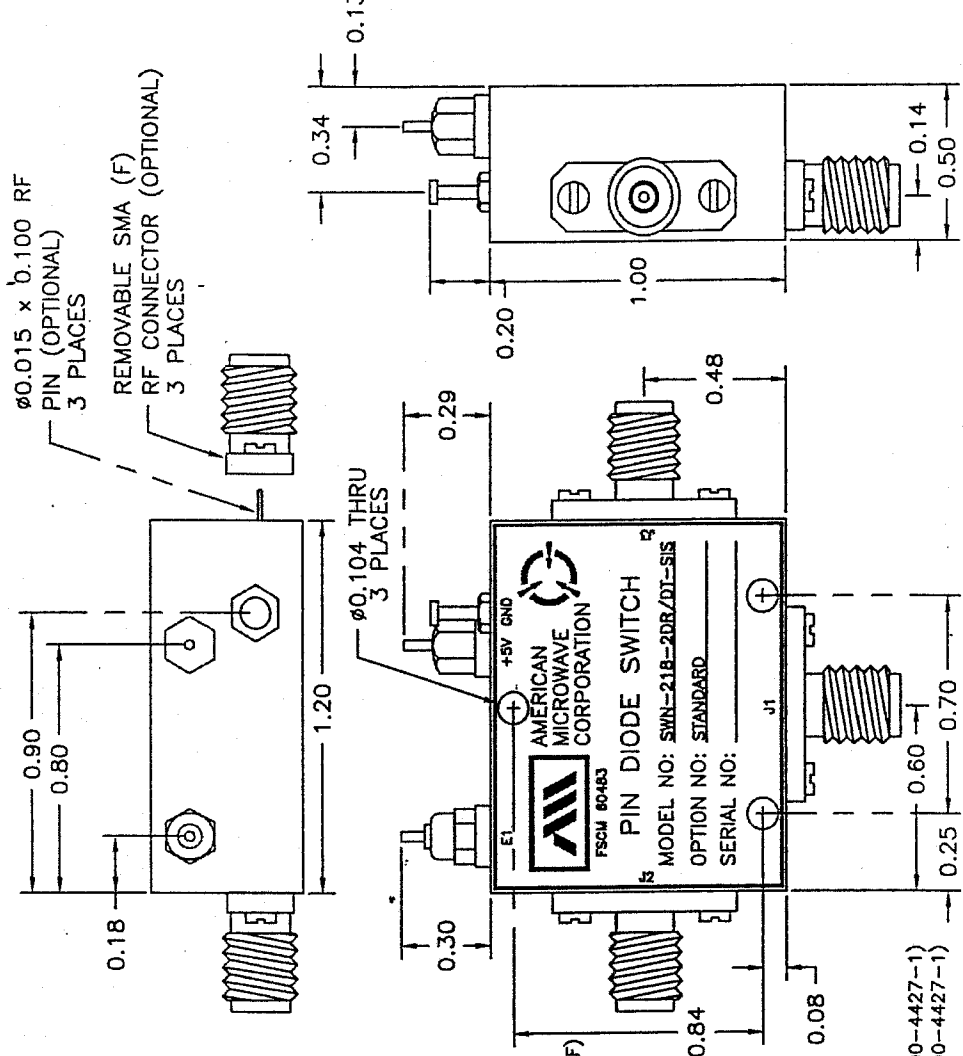
OPTIONS:

- SINGLE CONTROL WITH SOLDER PIN STANDARD
- IND-SP INDEPENDANT CONTROL WITH SOLDER PIN (LOGIC "0" = ON "1" = OFF)
- 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)
- 218 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 412 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 618 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 1218 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 (NOT AVAILABLE WITH SINGLE SUPPLY, SEE 100-4427-1)
- B02 -15V POWER SUPPLIES (NOT AVAILABLE WITH SINGLE SUPPLY, SEE 100-4427-1)
- B03 REVERSE LOGIC "1"=ON "0"=OFF
- B04 DRIVERLESS, CURRENT CONTROLLED (NOT AVAILABLE WITH SINGLE SUPPLY, SEE 100-4427-1)
- B05 HIGH SPEED, TURNON/TURNOFF 20 nsec MAXIMUM WHEN APPLICABLE OR OPTION HS
- B06 HIGH POWER - SPECIFY CW POWER, PEAK 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

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



APPROVALS		DATE	TITLE
DRAWN	9/9/99	7/12/99	OUTLINE DRAWING
CHECKED	WJP	7/19/99	SWN-218-2DR/DT-SIS-STANDARD
ISSUED	WJP	7/19/99	REFLECTIVE OR NON-REFLECTIVE (ABSORPTIVE)
REV.			SOLID STATE SWITCH
SCALE	N/S	DWG NO.	100-4427-5
		REV.	
			AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND

DESCRIPTION: SWN-218-2DR-DT-SIS IS A SINGLE SUPPLY, SINGLE POLE TWO THROW, REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH MODULE WITH VERY LOW INSERTION LOSS AND INTEGRAL TTL DRIVER, DESIGNED FOR BROAD BAND OPERATIONS.

SPECIFICATIONS:

- FREQUENCY: 0.5 GHz TO 18 GHz
- INSERTION LOSS: REFLECTIVE: 2.5db
ABSORPTIVE: 3.0db
- ISOLATION: 0.5 GHz TO 2 GHz: 55db
2 GHz TO 12 GHz: 45db
12 GHz TO 18 GHz: 25db
- VSWR: REFLECTIVE IN/OUT: 2.0:1
ABSORPTIVE IN/OUT: 2.0:1
- SPEED: RISE: 15ns TYPICAL, 20ns MAX.
FALL: 15ns TYPICAL, 20ns 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" = J1-J2 ON "1" = J1-J3 ON
- POWER SUPPLY: +5V @ 100 mA MAX.
- CONNECTORS: SMA FEMALE
SOLDER PIN
(L) 1.2" X (W) 1.0" X (H) 0.5"
- SIZE: 1.5 OUNCE TYPICAL

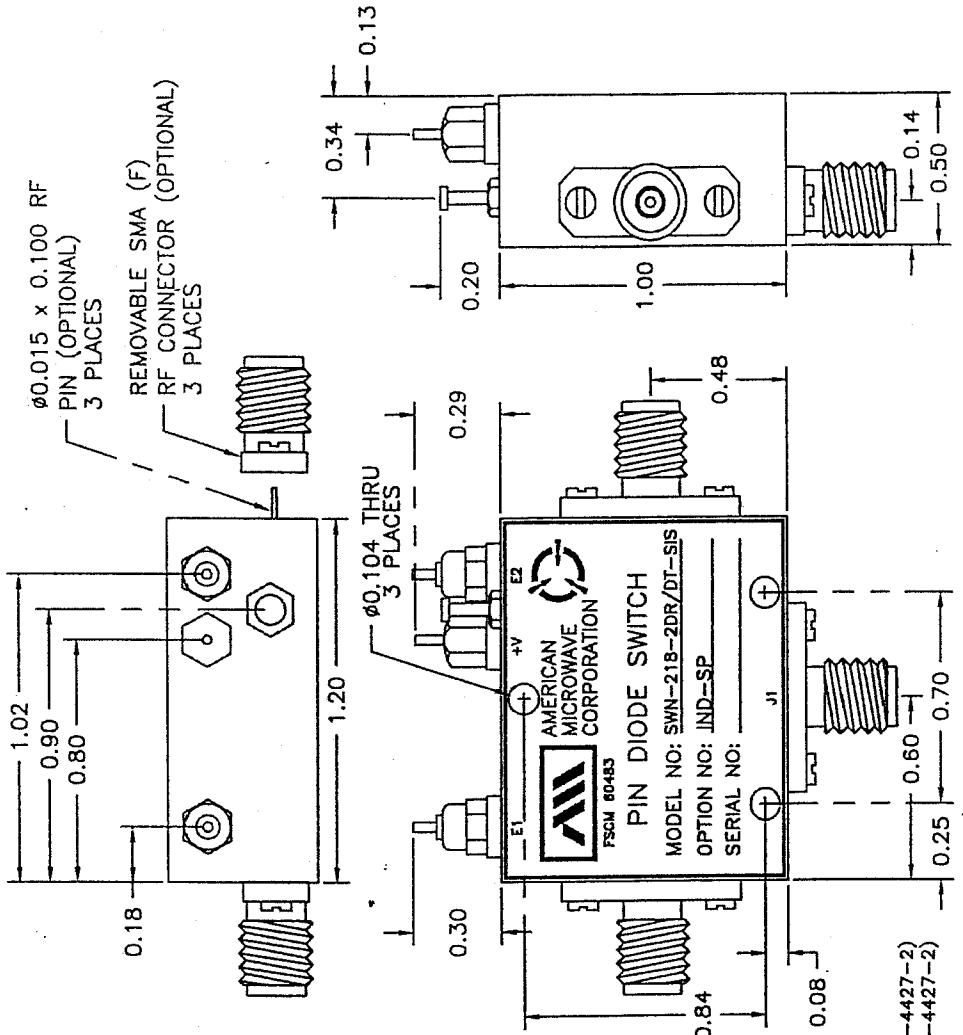
OPTIONS:

- SINGLE CONTROL WITH SOLDER PIN STANDARD**
- IND-SP: INDEPENDANT CONTROL WITH SOLDER PIN (LOGIC "0" = ON "1" = OFF)
 - 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)
 - 118: 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
 - 218: 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
 - 412: 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
 - 618: 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
 - 1218: 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 (NOT AVAILABLE WITH SINGLE SUPPLY, SEE 100-4427-2)
 - B02: -15V POWER SUPPLIES (NOT AVAILABLE WITH SINGLE SUPPLY, SEE 100-4427-2)
 - B03: REVERSE LOGIC "1"=ON "0"=OFF
 - B04: DRIVERLESS, CURRENT CONTROLLED (NOT AVAILABLE WITH SINGLE SUPPLY, SEE 100-4427-2)
 - B05: HIGH SPEED, TURNON/TURNOFF 20 nsec MAXIMUM WHEN APPLICABLE OR OPTION HS
 - B06: HIGH POWER - SPECIFY CW POWER, PEAK 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

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 DR REVISION



APPROVALS	DATE	TITLE
DRAWN: J.R.A.	7/12/99	AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND
CHECKED: [Signature]	7/19/99	OUTLINE DRAWING SWN-218-2DR/DT-SIS-IND-SP REFLECTIVE OR NON-REFLECTIVE(ABSORPTIVE) SOLID STATE SWITCH
ISSUED: [Signature]	7/19/99	SIZE: FSCJ NO. 60483 DWG NO. 100-4427-6 REV. A
		SCALE N/S SHEET 1 of 2

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

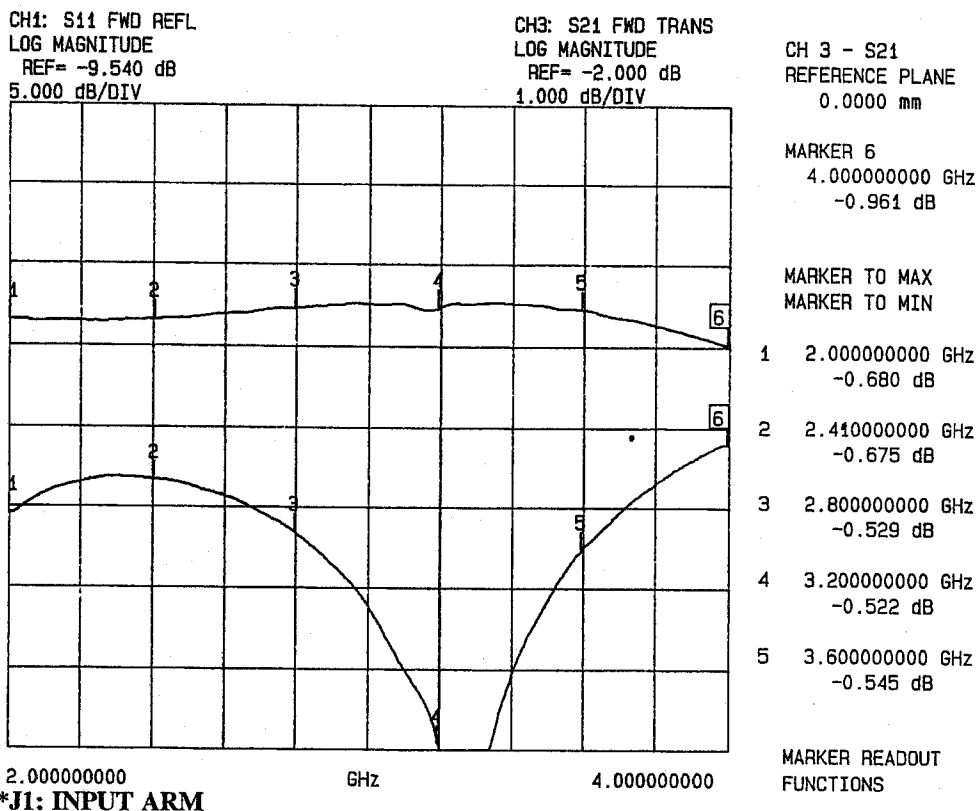


SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

INSERTION LOSS & RETURN LOSS*

J1-J2



FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	0.68 dB	14.9 dB
2.4 GHz	0.67 dB	12.8 dB
2.8 GHz	0.52 dB	16.1 dB
3.2 GHz	0.52 dB	20.1 dB
3.6 GHz	0.54 dB	17.0 dB
4.0 GHz	0.96 dB	10.5 dB

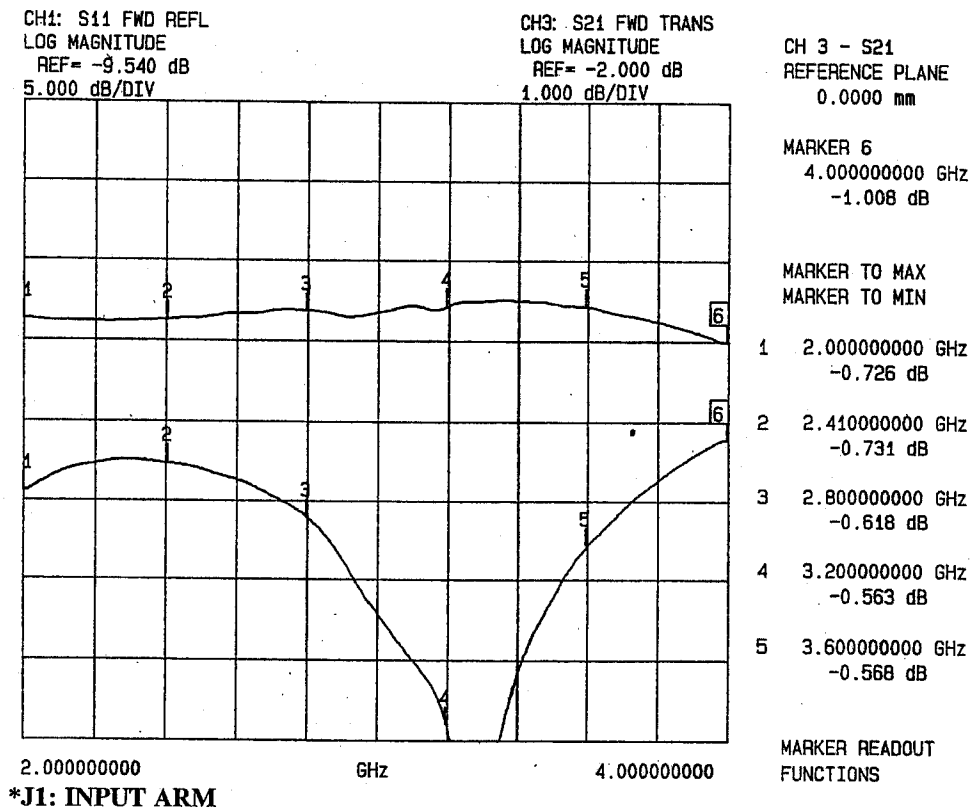


SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

INSERTION LOSS & RETURN LOSS*

J1-J3

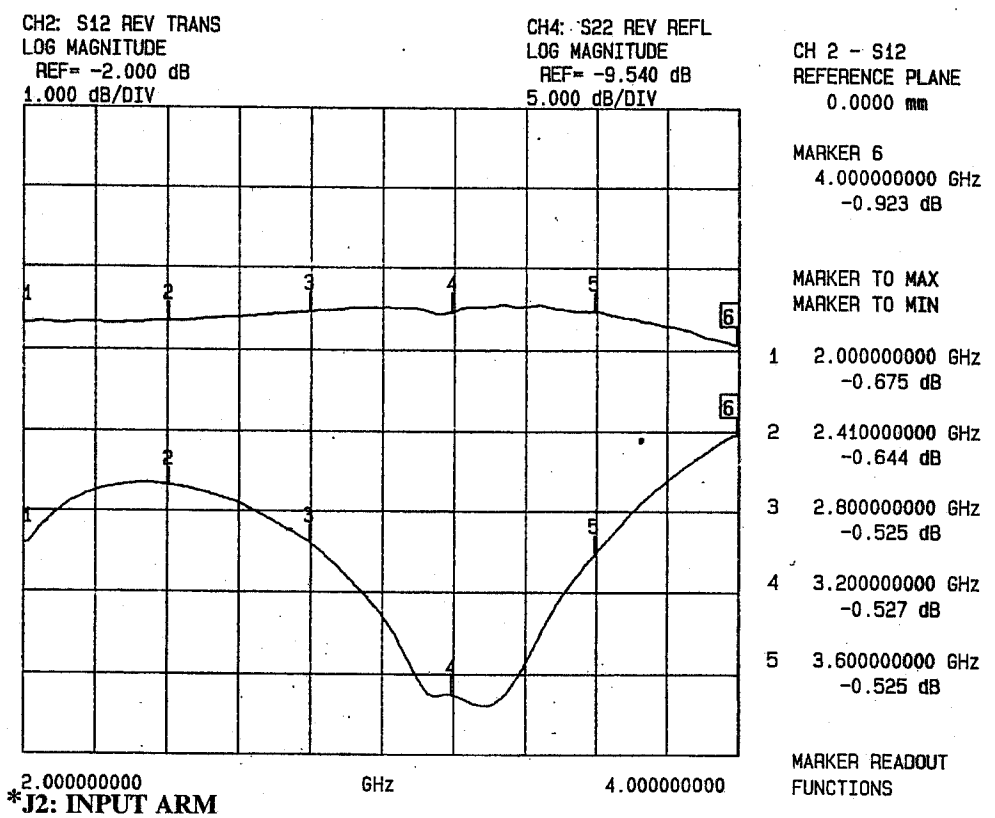


FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	0.72 dB	13.8 dB
2.4 GHz	0.73 dB	12.1 dB
2.8 GHz	0.61 dB	15.5 dB
3.2 GHz	0.56 dB	28.5 dB
3.6 GHz	0.56 dB	17.3 dB
4.0 GHz	1.00 dB	10.5 dB



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA
INSERTION LOSS & RETURN LOSS*
J2-J1



FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	0.67 dB	16.5 dB
2.4 GHz	0.64 dB	12.9 dB
2.8 GHz	0.52 dB	16.5 dB
3.2 GHz	0.52 dB	25.8 dB
3.6 GHz	0.52 dB	17.1 dB
4.0 GHz	0.92 dB	9.70 dB



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

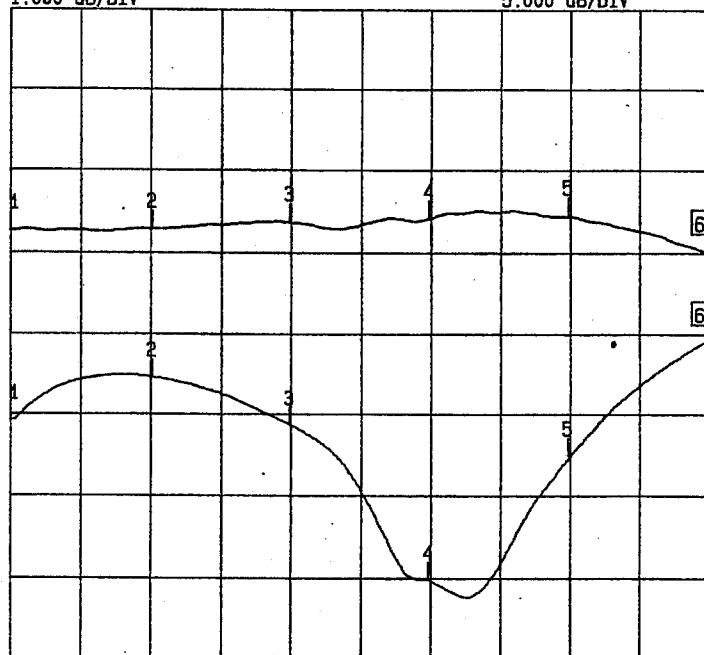
INSERTION LOSS & RETURN LOSS*

J3-J1

CH2: S12 REV TRANS
 LOG MAGNITUDE
 REF= -2.000 dB
 1.000 dB/DIV

CH4: S22 REV REFL
 LOG MAGNITUDE
 REF= -9.540 dB
 5.000 dB/DIV

CH 2 - S12
 REFERENCE PLANE
 0.0000 mm



MARKER 6
 4.000000000 GHz
 -0.976 dB

MARKER TO MAX
 MARKER TO MIN

- 1 2.000000000 GHz -0.722 dB
- 2 2.410000000 GHz -0.707 dB
- 3 2.800000000 GHz -0.628 dB
- 4 3.200000000 GHz -0.578 dB
- 5 3.600000000 GHz -0.551 dB

MARKER READOUT
 FUNCTIONS

2.000000000

GHz

4.000000000

*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	0.72 dB	14.9 dB
2.4 GHz	0.70 dB	12.2 dB
2.8 GHz	0.62 dB	15.2
3.2 GHz	0.57 dB	24.6 dB
3.6 GHz	0.55 dB	17.1 dB
4.0 GHz	0.97 dB	10.0 dB



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

ISOLATION*

(AS MEASURED ON A SPECTRUM ANALYZER)

FREQUENCY	J2	J3
500 MHz	37 dB	37 dB
1.0 GHz	28 dB	27 dB
1.5 GHz	26 dB	25 dB
2.0 GHz	37 dB	35 dB
2.5 GHz	40 dB	39 dB
3.0 GHz	38 dB	38 dB
3.5 GHz	38 dB	37 dB
4.0 GHz	35 dB	34 dB
4.5 GHz	34 dB	32 dB
5.0 GHz	32 dB	31 dB
5.5 GHz	27 dB	26 dB
6.0 GHz	21 dB	22 dB

* J1: INPUT ARM

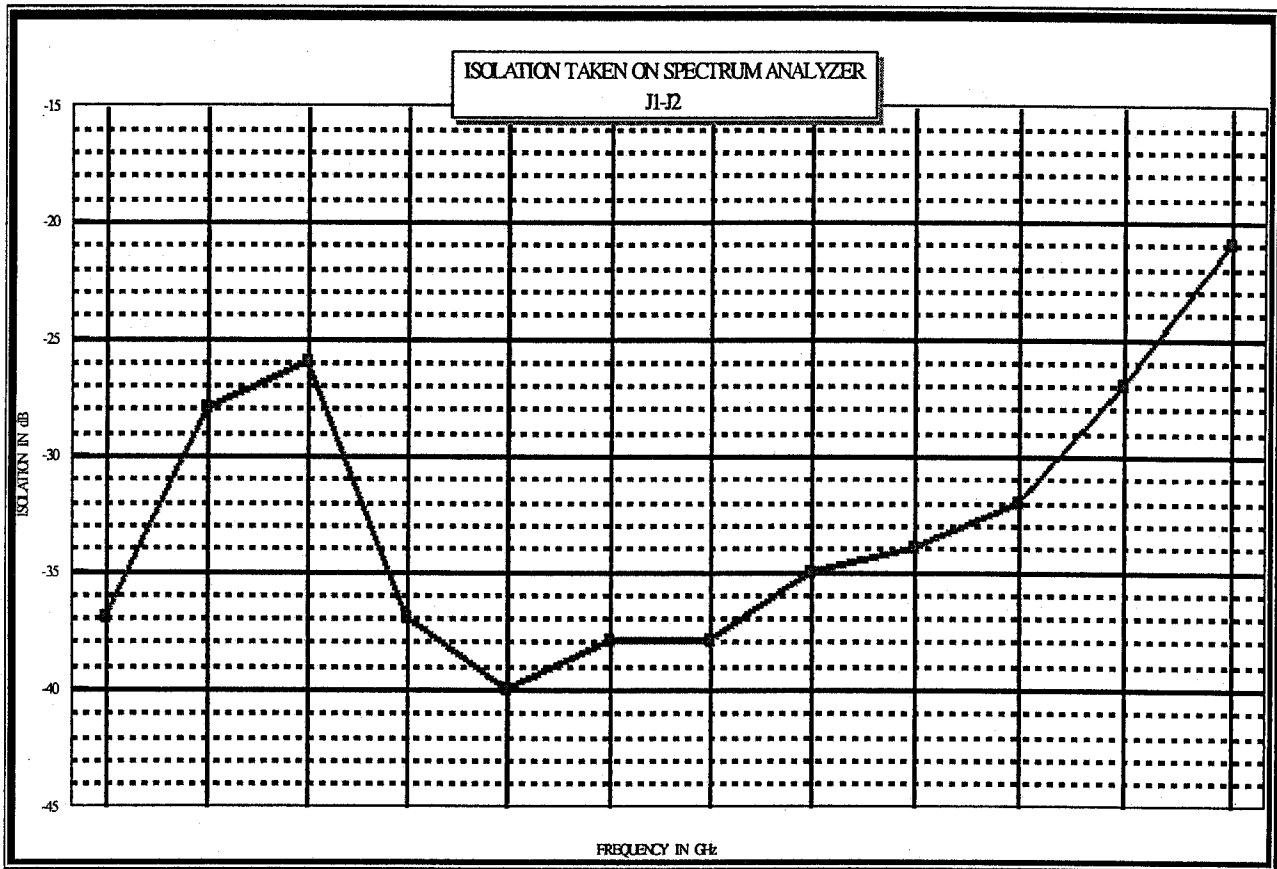
MAY 15, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; @ -15vdc @ -2.1mA

ISOLATION*
 (AS MEASURED ON A SPECTRUM ANALYZER)
 J1-J2



*J1: INPUT ARM

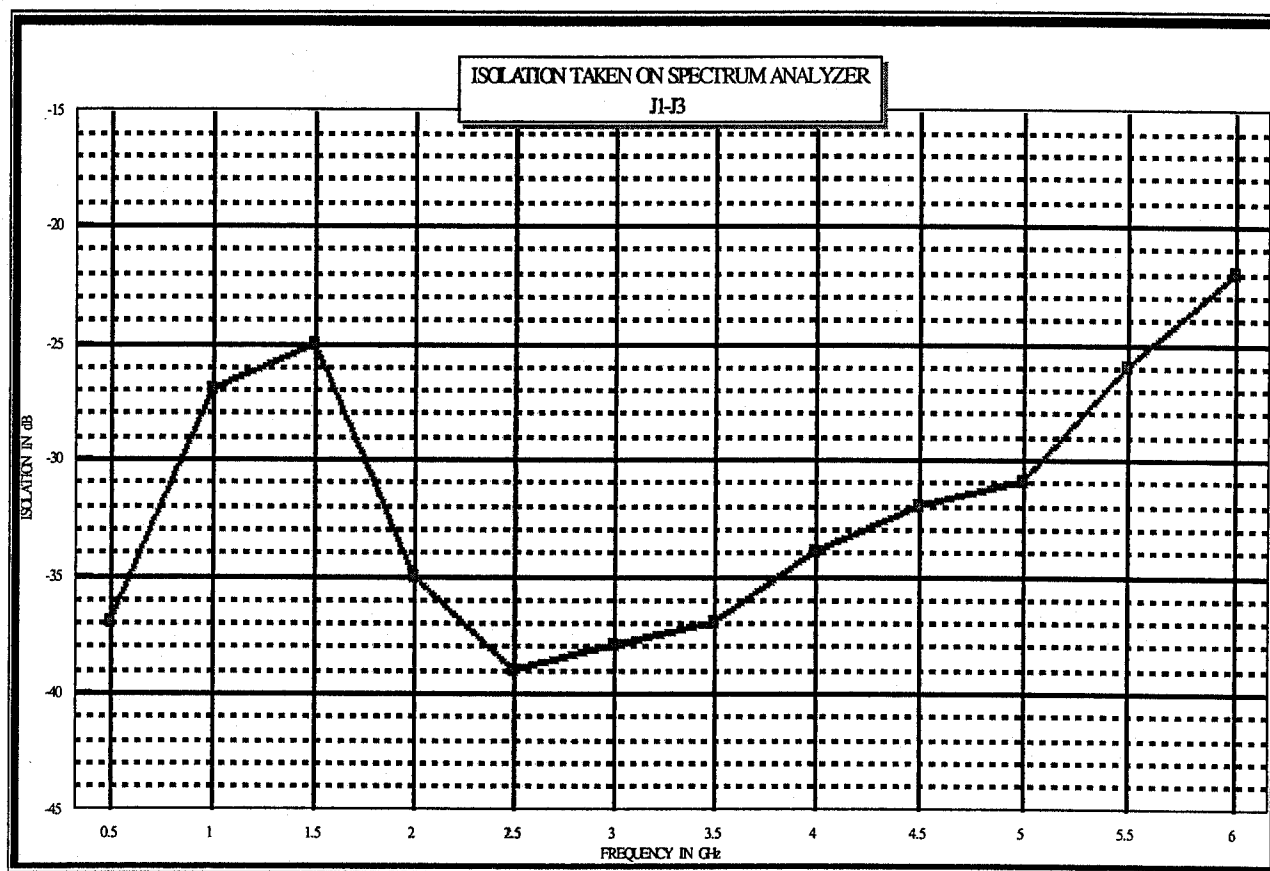
MAY 15, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
 SERIAL NUMBER : 2MS005139
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; @ -15vdc @ -2.1mA

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



*J1: INPUT ARM

MAY 15, 2000

PAGE 17



**AMERICAN MICROWAVE
CORPORATION**

TEST DATA
FROM
2.4 GHz TO 2.5 GHz
HIGH POWER (80 WATTS)
COLD SWITCHING
REFLECTIVE
SPDT
SOLID STATE SWITCH
AMC MODEL No:
SWN-218-2DR-STANDARD
OPTIONS 204F, HPR80W, LIL
(Serial Number: 2MS005139)

**PREPARED
BY
KATIE BAISEY**

MAY 15, 2000

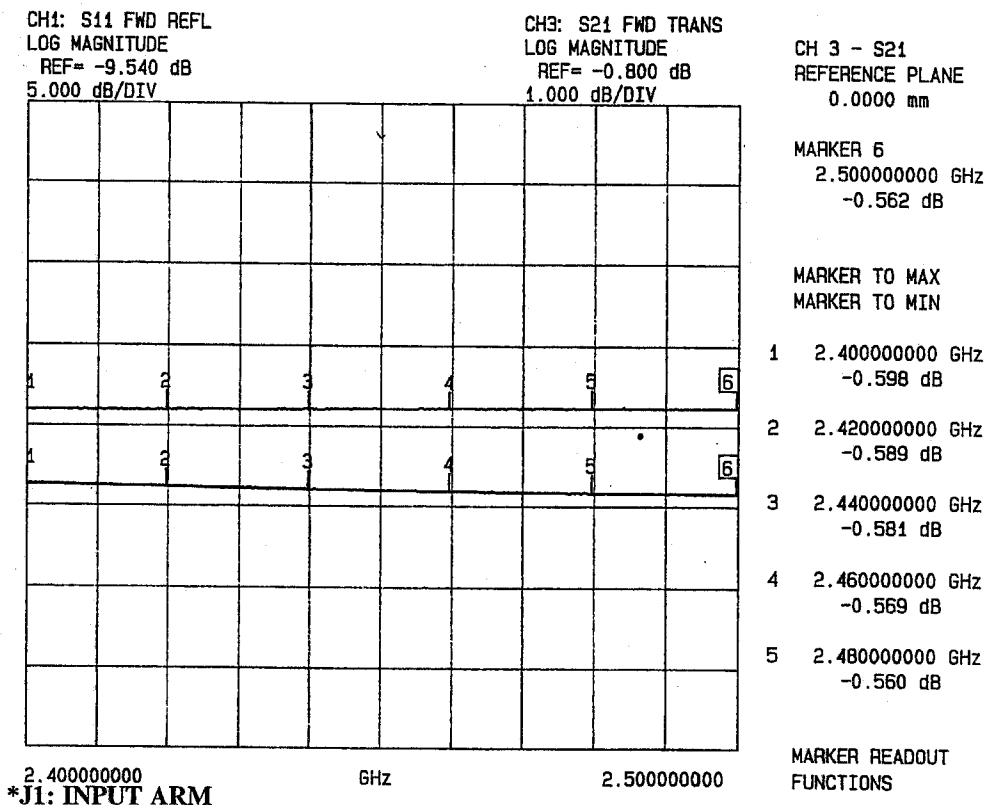


SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

INSERTION LOSS & RETURN LOSS*

J1-J2



FREQUENCY	INSERTION LOSS	RETURN LOSS
2.4 GHz	0.59 dB	13.2 dB
2.4 GHz	0.58 dB	13.3 dB
2.4 GHz	0.58 dB	13.4 dB
2.4 GHz	0.56 dB	13.6 dB
2.4 GHz	0.56 dB	13.7 dB
2.5 GHz	0.56 dB	13.7 dB



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

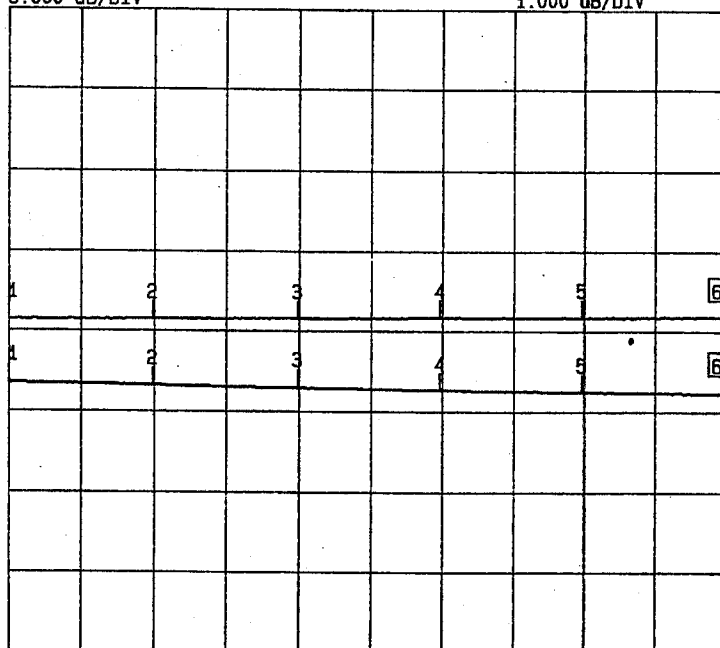
INSERTION LOSS & RETURN LOSS*

J1-J3

CH1: S11 FWD REFL
 LOG MAGNITUDE
 REF= -9.540 dB
 5.000 dB/DIV

CH3: S21 FWD TRANS
 LOG MAGNITUDE
 REF= -0.800 dB
 1.000 dB/DIV

CH 3 - S21
 REFERENCE PLANE
 0.0000 mm



MARKER 6
 2.500000000 GHz
 -0.617 dB

MARKER TO MAX
 MARKER TO MIN

- 1 2.400000000 GHz
-0.651 dB
- 2 2.420000000 GHz
-0.643 dB
- 3 2.440000000 GHz
-0.636 dB
- 4 2.460000000 GHz
-0.624 dB
- 5 2.480000000 GHz
-0.623 dB

2.400000000
 *J1 INPUT ARM

GHz

2.500000000

MARKER READOUT
FUNCTIONS

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.4 GHz	0.65 dB	12.7 dB
2.4 GHz	0.64 dB	12.9 dB
2.4 GHz	0.63 dB	13.0 dB
2.4 GHz	0.62 dB	13.2 dB
2.4 GHz	0.62 dB	13.3 dB
2.5 GHz	0.61 dB	13.4 dB



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : OPTIONS 204F, HPR80W, LIL
ENGINEER : 2MS005139
VOLTAGE & CURRENT DRAW : RENE AFABLE
: +5vdc @ +37.9mA; -15vdc @ -2.1mA

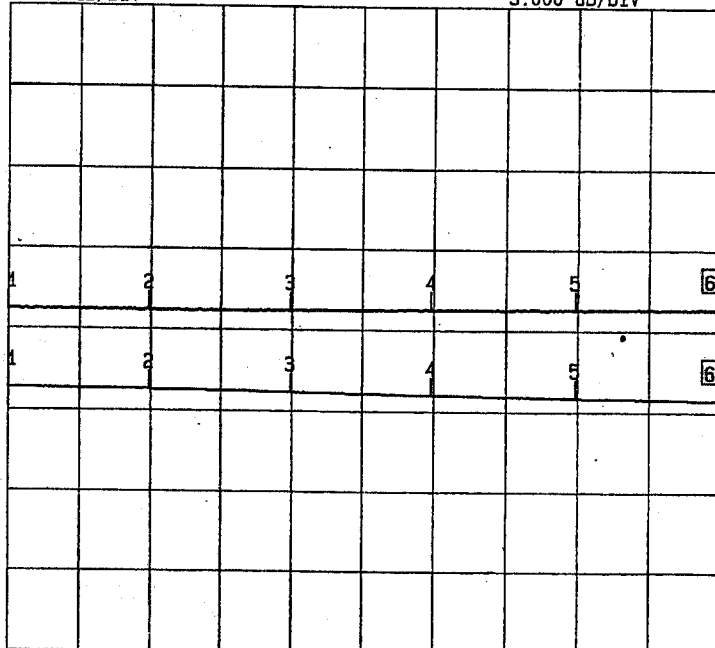
INSERTION LOSS & RETURN LOSS*

J2-J1

CH2: S12 REV TRANS
 LOG MAGNITUDE
 REF= -0.800 dB
 1.000 dB/DIV

CH4: S22 REV REFL
 LOG MAGNITUDE
 REF= -9.540 dB
 5.000 dB/DIV

CH 2 - S12
 REFERENCE PLANE
 0.0000 mm



MARKER 6
 2.500000000 GHz
 -0.523 dB

MARKER TO MAX
 MARKER TO MIN

- 1 2.400000000 GHz
-0.560 dB
- 2 2.420000000 GHz
-0.564 dB
- 3 2.440000000 GHz
-0.558 dB
- 4 2.460000000 GHz
-0.545 dB
- 5 2.480000000 GHz
-0.536 dB

2.400000000 GHz 2.500000000
 *J2: INPUT ARM

MARKER READOUT FUNCTIONS

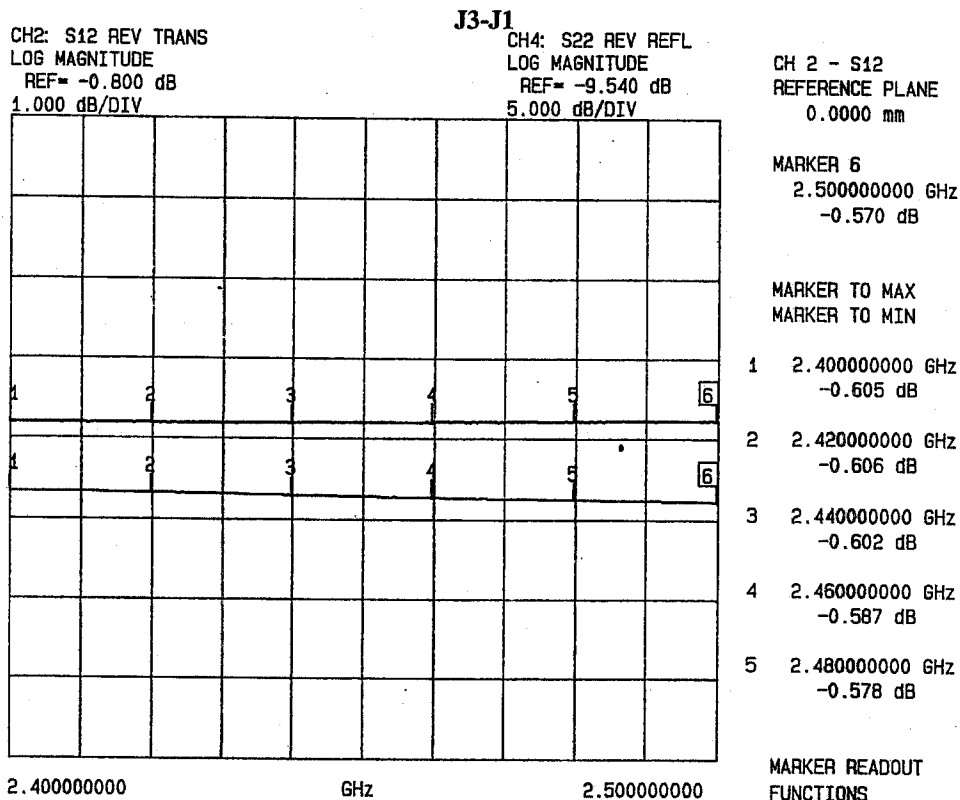
FREQUENCY	INSERTION LOSS	RETURN LOSS
2.4 GHz	0.56 dB	13.1 dB
2.4 GHz	0.56 dB	13.2 dB
2.4 GHz	0.55 dB	13.3 dB
2.4 GHz	0.54 dB	13.5 dB
2.4 GHz	0.53 dB	13.6 dB
2.5 GHz	0.52 dB	13.8 dB



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

INSERTION LOSS & RETURN LOSS*



*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.4 GHz	0.60 dB	12.8 dB
2.4 GHz	0.60 dB	12.9 dB
2.4 GHz	0.60 dB	13.0 dB
2.4 GHz	0.58 dB	13.1 dB
2.4 GHz	0.57 dB	13.3 dB
2.5 GHz	0.57 dB	13.4 dB



**AMERICAN MICROWAVE
CORPORATION**

TEST DATA

FROM

1.5 GHz TO 4.8GHz

HIGH POWER (80 WATTS)

COLD SWITCHING

REFLECTIVE

SPDT

SOLID STATE SWITCH

AMC MODEL No:

SWN-218-2DR-STANDARD

OPTIONS 204F, HPR80W, LIL

(Serial Number: 2MS005139)

PREPARED

BY

KATIE BAISEY

MAY 15, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
 SERIAL NUMBER : 2MS005139
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

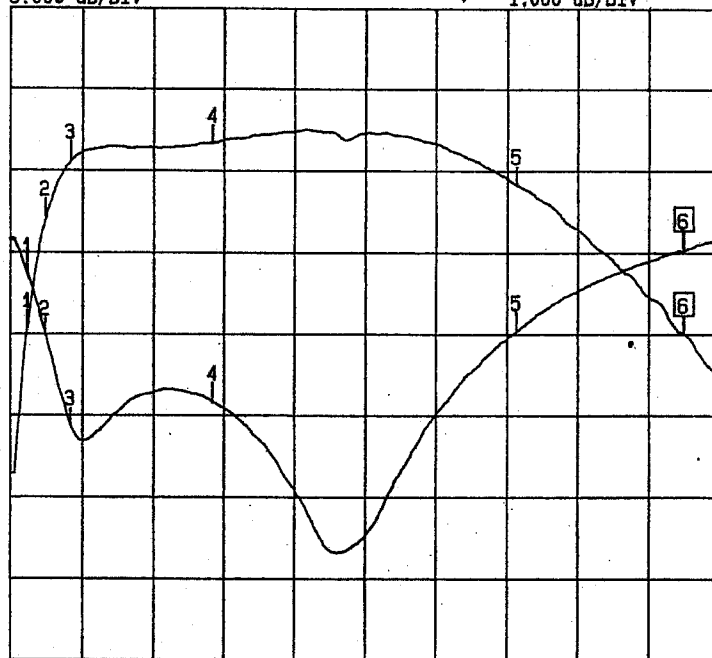
INSERTION LOSS & RETURN LOSS*

J1-J2

CH1: S11 FWD REFL
 LOG MAGNITUDE
 REF= -9.540 dB
 5.000 dB/DIV

CH3: S21 FWD TRANS
 LOG MAGNITUDE
 REF= -3.000 dB
 1.000 dB/DIV

CH 3 - S21
 REFERENCE PLANE
 0.0000 mm



MARKER 6
 4.830400000 GHz
 -2.998 dB

MARKER TO MAX
 MARKER TO MIN

- 1 1.599375000 GHz
-2.937 dB
- 2 1.686700000 GHz
-1.567 dB
- 3 1.811450000 GHz
-0.875 dB
- 4 2.510050000 GHz
-0.659 dB
- 5 4.007050000 GHz
-1.170 dB

MARKER READOUT
 FUNCTIONS

1.512050000
 *J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.5 GHz	2.93 dB	5.8 dB
1.6 GHz	1.56 dB	9.6 dB
1.8 GHz	0.87 dB	15.2 dB
2.5 GHz	0.65 dB	13.7 dB
4.0 GHz	1.17 dB	9.30 dB
4.8 GHz	2.99 dB	4.20 dB



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

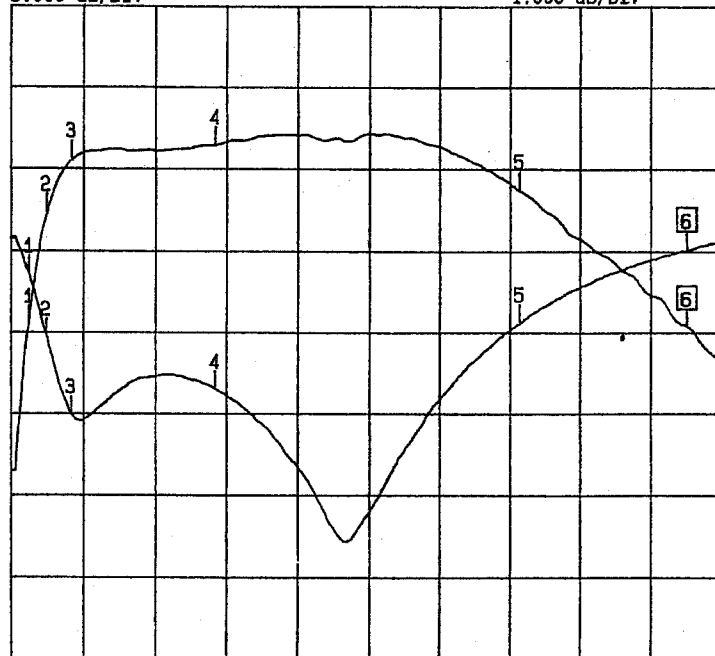
INSERTION LOSS & RETURN LOSS*

J1-J3

CH1: S11 FWD REFL
 LOG MAGNITUDE
 REF= -9.540 dB
 5.000 dB/DIV

CH3: S21 FWD TRANS
 LOG MAGNITUDE
 REF= -3.000 dB
 1.000 dB/DIV

CH 3 - S21
 REFERENCE PLANE
 0.0000 mm



MARKER 6
 4.830400000 GHz
 -2.925 dB

MARKER TO MAX
 MARKER TO MIN

- 1 1.599375000 GHz
-2.880 dB
- 2 1.686700000 GHz
-1.522 dB
- 3 1.811450000 GHz
-0.880 dB
- 4 2.510050000 GHz
-0.699 dB
- 5 4.007050000 GHz
-1.260 dB

MARKER READOUT FUNCTIONS

1.512050000
 *J1: INPUT ARM

GHz

5.005050000

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.5 GHz	2.88 dB	5.8 dB
1.6 GHz	1.52 dB	9.8 dB
1.8 GHz	0.88 dB	14.6 dB
2.5 GHz	0.69 dB	13.0 dB
4.0 GHz	1.26 dB	8.90 dB
4.8 GHz	2.92 dB	4.40 dB



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

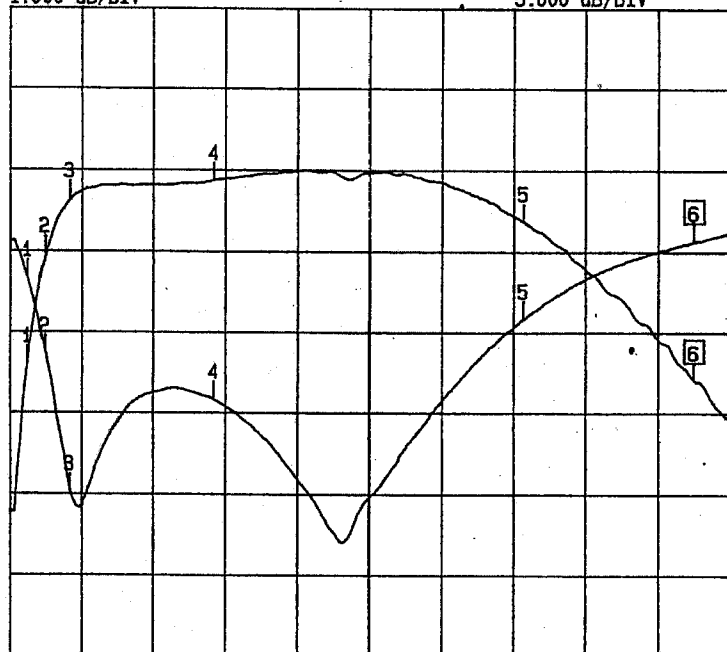
INSERTION LOSS & RETURN LOSS*

J2-J1

CH2: S12 REV TRANS
 LOG MAGNITUDE
 REF= -2.500 dB
 1.000 dB/DIV

CH4: S22 REV REFL
 LOG MAGNITUDE
 REF= -9.540 dB
 5.000 dB/DIV

CH 2 - S12
 REFERENCE PLANE
 0.000 mm



MARKER 6
 4.830400000 GHz
 -3.092 dB

MARKER TO MAX
 MARKER TO MIN

- 1 1.599375000 GHz
-2.886 dB
- 2 1.686700000 GHz
-1.535 dB
- 3 1.811450000 GHz
-0.849 dB
- 4 2.510050000 GHz
-0.619 dB
- 5 4.007050000 GHz
-1.120 dB

1.512050000
 *J2: INPUT ARM

GHz

5.005050000

MARKER READOUT
FUNCTIONS

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.5 GHz	2.88 dB	6.10 dB
1.6 GHz	1.53 dB	10.8 dB
1.8 GHz	0.84 dB	19.4 dB
2.5 GHz	0.61 dB	13.6 dB
4.0 GHz	1.12 dB	8.60 dB
4.8 GHz	3.09 dB	3.80 dB



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

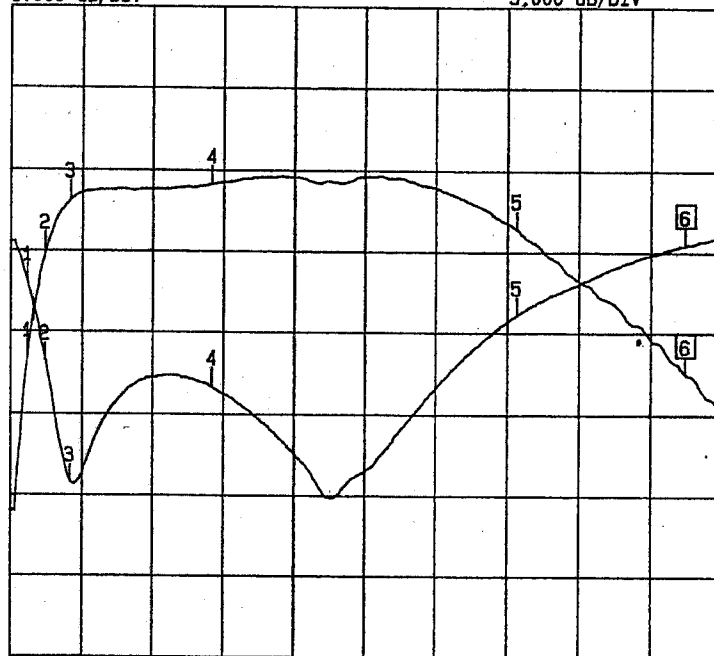
INSERTION LOSS & RETURN LOSS*

J3-J1

CH2: S12 REV TRANS
 LOG MAGNITUDE
 REF= -2.500 dB
 1.000 dB/DIV

CH4: S22 REV REFL
 LOG MAGNITUDE
 REF= -9.540 dB
 5.000 dB/DIV

CH 2 - S12
 REFERENCE PLANE
 0.0000 mm



MARKER 6
 4.830400000 GHz
 -3.011 dB

MARKER TO MAX
 MARKER TO MIN

- 1 1.599375000 GHz
-2.830 dB
- 2 1.686700000 GHz
-1.485 dB
- 3 1.811450000 GHz
-0.854 dB
- 4 2.510050000 GHz
-0.661 dB
- 5 4.007050000 GHz
-1.210 dB

1.512050000
 *J3: INPUT ARM

GHz

5.005050000

MARKER READOUT
 FUNCTIONS

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.5 GHz	2.83 dB	6.30 dB
1.6 GHz	1.48 dB	11.4 dB
1.8 GHz	0.85 dB	18.7 dB
2.5 GHz	0.66 dB	12.8 dB
4.0 GHz	1.21 dB	8.40 dB
4.8 GHz	3.01 dB	4.00 dB

MAY 15, 2000



**PHASE
DATA
BETWEEN
PORT TO PORT
FROM
2 GHz TO 4 GHz
ON A
SPDT
SOLID STATE SWITCH**

**AMC MODEL No:
SWN-218-2DR-STANDARD
OPTIONS 204F, HPR80W, LIL
(Serial Number: 2MS005139)**

**PREPARED
BY
KATIE BAISEY**

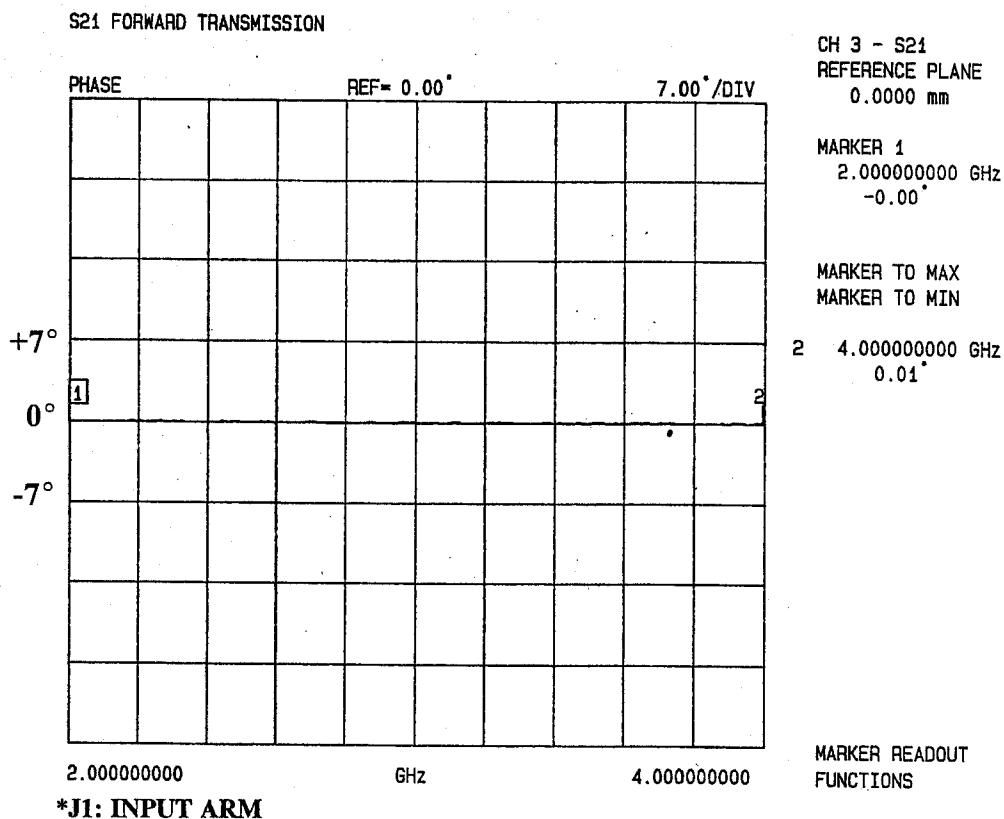
MAY 15, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : OPTION 204F, HPR80W, LIL
ENGINEER : 2MS005139
VOLTAGE & CURRENT DRAW : RENE AFABLE
: +5vdc: @+37.9mA; -15vdc: @ -2.1mA

PHASE* J1-J2 (REFERENCE)



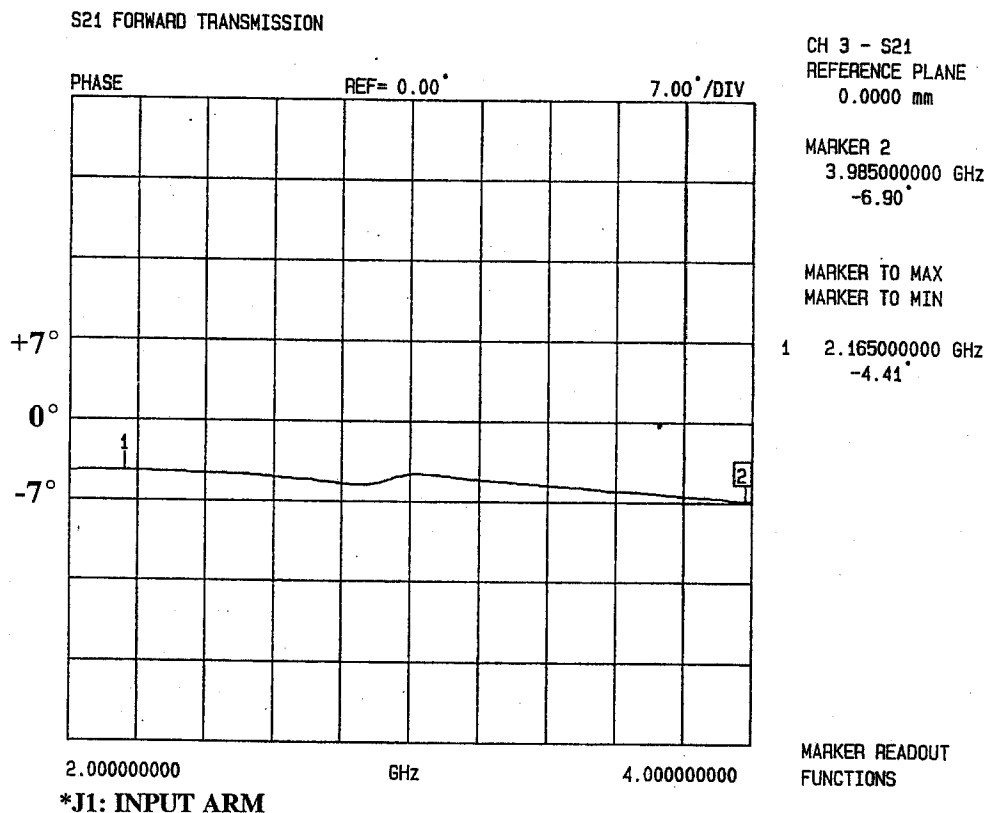
FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
2.0 GHz	0.00°	
4.0 GHz	0.01°	



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+37.9mA; -15vdc: @ -2.1mA

PHASE* J1-J3



FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
2.16 GHz		-4.41°
3.98 GHz		-6.90°



**PHASE
DATA
BETWEEN
PORT TO PORT
FROM**

2.4 GHz TO 2.5 GHz

ON A

SPDT

SOLID STATE SWITCH

**AMC MODEL No:
SWN-218-2DR-STANDARD
OPTIONS 204F, HPR80W, LIL
(Serial Number: 2MS005139)**

**PREPARED
BY
KATIE BAISEY**

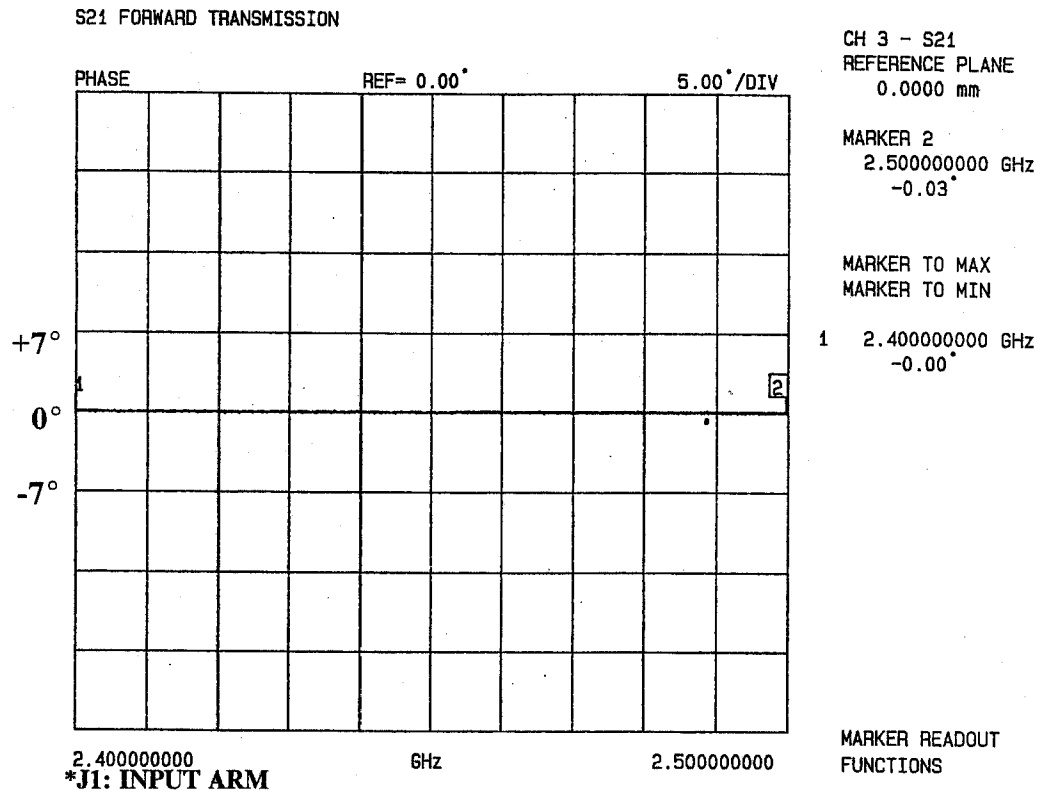
MAY 15, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : OPTION 204F, HPR80W, LIL
ENGINEER : 2MS005139
VOLTAGE & CURRENT DRAW : RENE AFABLE
: +5vdc: @+37.9mA; -15vdc: @ -2.1mA

PHASE* J1-J2 (REFERENCE)



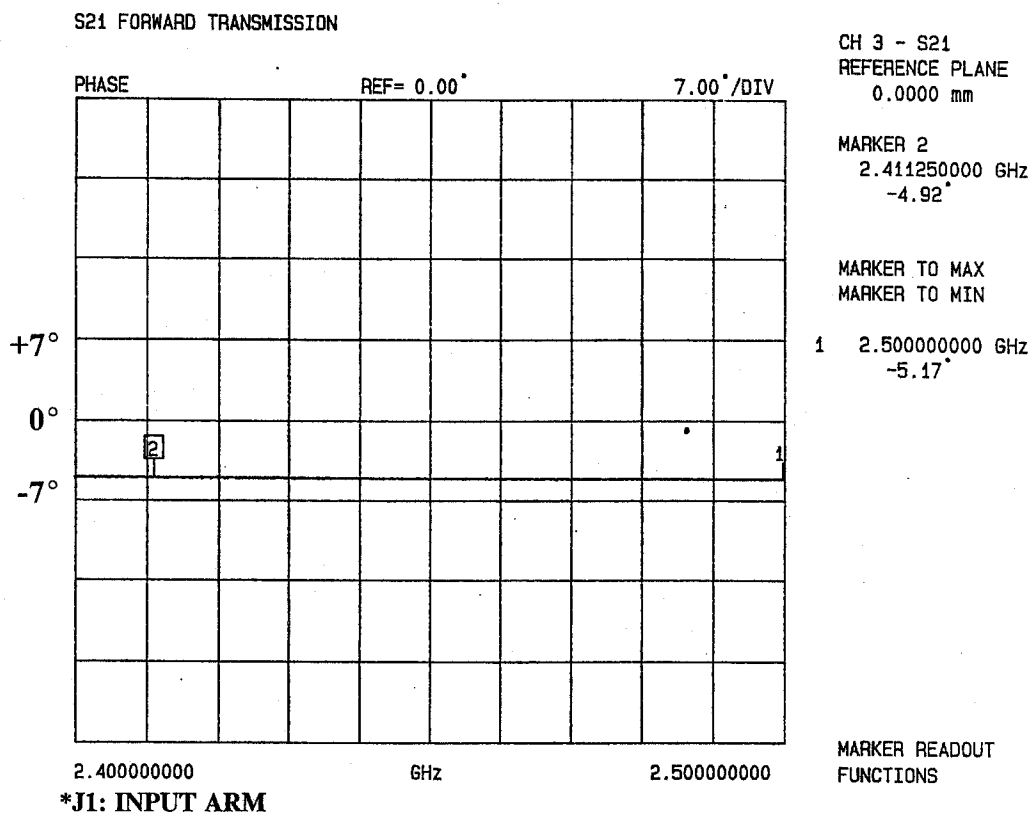
FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
2.4 GHz	0.00°	
2.5 GHz		-0.03°



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+37.9mA; -15vdc: @ -2.1mA

PHASE*
J1-J3



FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
2.5 GHz		-5.17°
2.4 GHz		-4.92°

MAY 15, 2000



**AMPLITUDE
DATA
BETWEEN
PORT TO PORT
FROM
2 GHz TO 4 GHz
ON A
SPDT
SOLID STATE SWITCH
AMC MODEL No:
SWN-218-2DR-STANDARD
OPTIONS 204F, HPR80W, LIL
(Serial Number: 2MS005139)**

**PREPARED
BY
KATIE BAISEY**

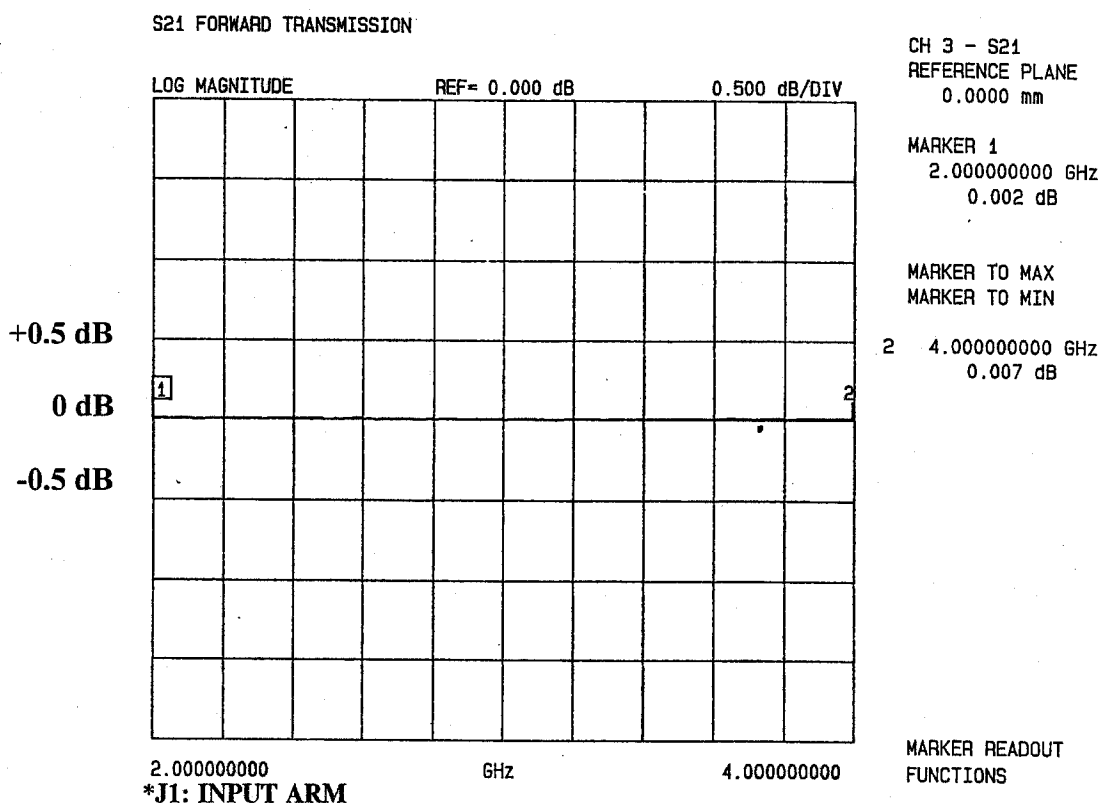
MAY 15, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+37.9mA; -15vdc: @ -2.1mA

AMPLITUDE* J1-J2 (REFERENCE)



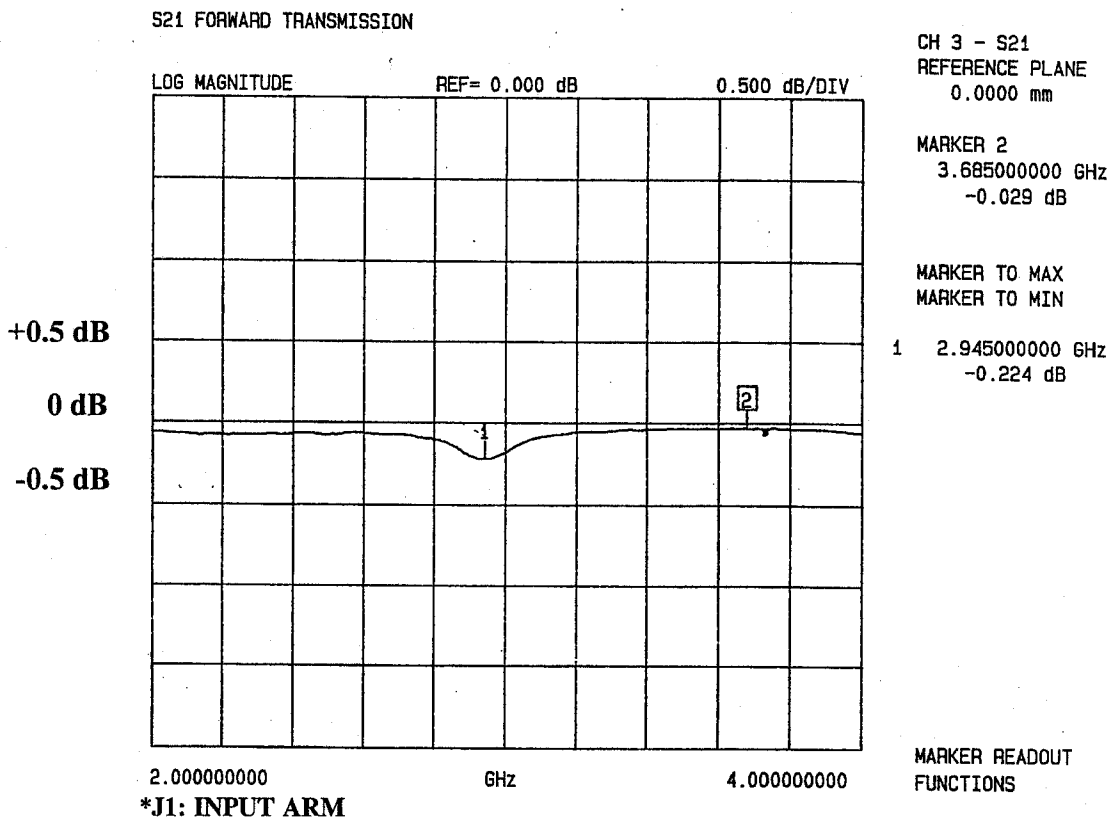
FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
2.0 GHz	0.002 dB	
4.0 GHz	0.007 dB	



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+37.9mA; -15vdc: @ -2.1mA

AMPLITUDE*
J1-J3



FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
2.94 GHz		-0.224 dB
3.68 GHz		-0.029 dB



**AMPLITUDE
DATA
BETWEEN
PORT TO PORT
FROM
2.4 GHz TO 2.5 GHz
ON A
SPDT
SOLID STATE SWITCH
AMC MODEL No:
SWN-218-2DR-STANDARD
OPTIONS 204F, HPR80W, LIL
(Serial Number: 2MS005139)**

**PREPARED
BY
KATIE BAISEY**

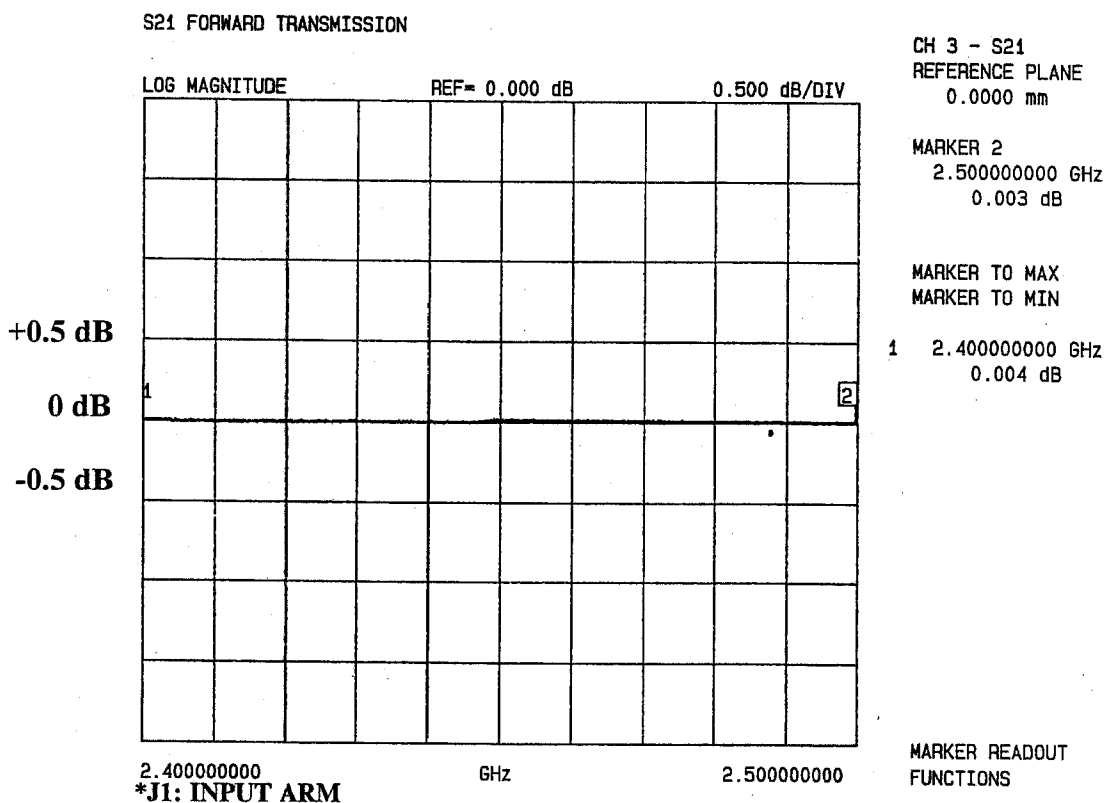
MAY 15, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+37.9mA; -15vdc: @ -2.1mA

AMPLITUDE* J1-J2 (REFERENCE)



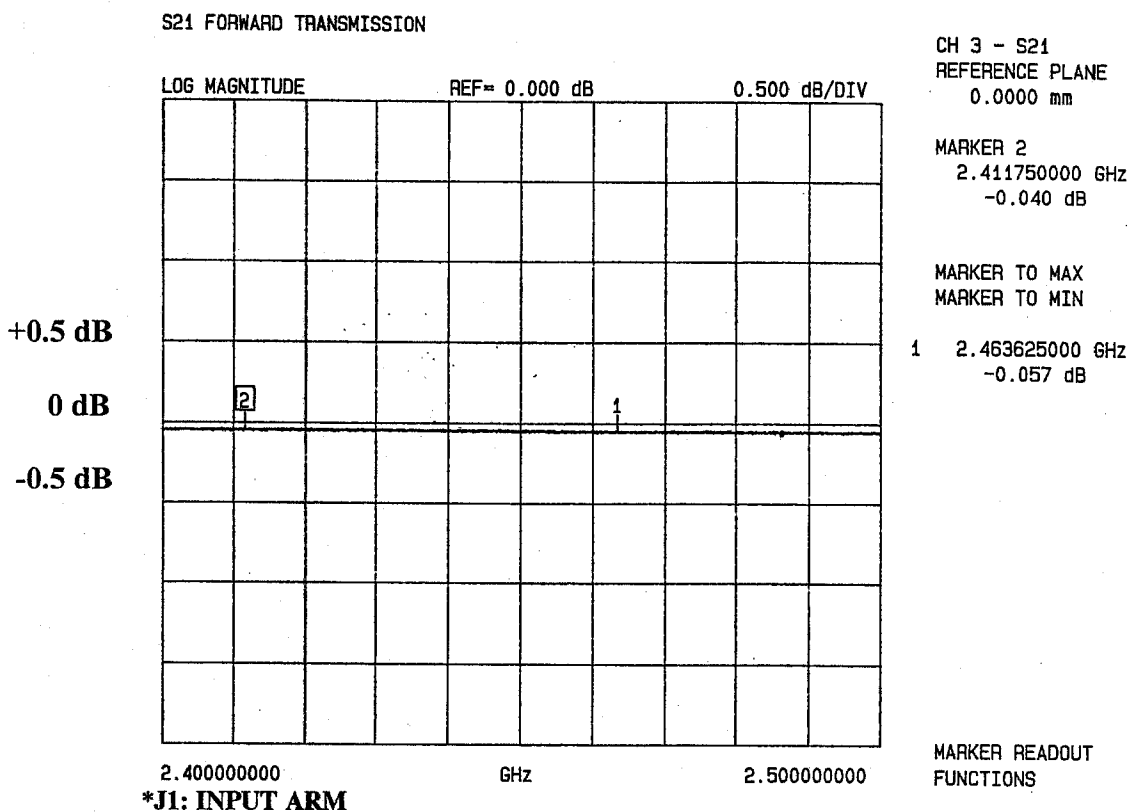
FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
2.4 GHz	0.004 dB	
2.5 GHz	0.003 dB	



SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+37.9mA; -15vdc: @ -2.1mA

AMPLITUDE* J1-J3



FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
2.4 GHz		-0.057 dB
2.4 GHz		-0.040 dB



SUMMARY TEST DATA

MODEL NUMBER	: SWN-218-2DR-STANDARD
	OPTIONS 204F, HPR80W, LIL
SERIAL NUMBER	: 2MS005139
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc @ +37.9mA; -15vdc @ -2.1mA

SWITCHING SPEED

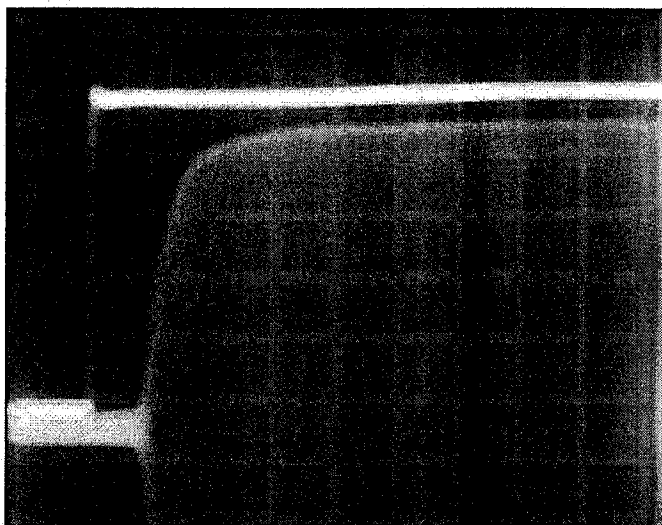
"Rise/Fall" Time: 10% RF to 90% RF & 90% RF to 10% RF
 "On/Off" Time: 50% TTL to 90% RF or 10% RF

TYPICAL OF ALL ARMS

"DELAY ON": 170 nS
 "RISE TIME": 80 nS

HORIZONTAL SCALE:
 100 nS PER DIVISION

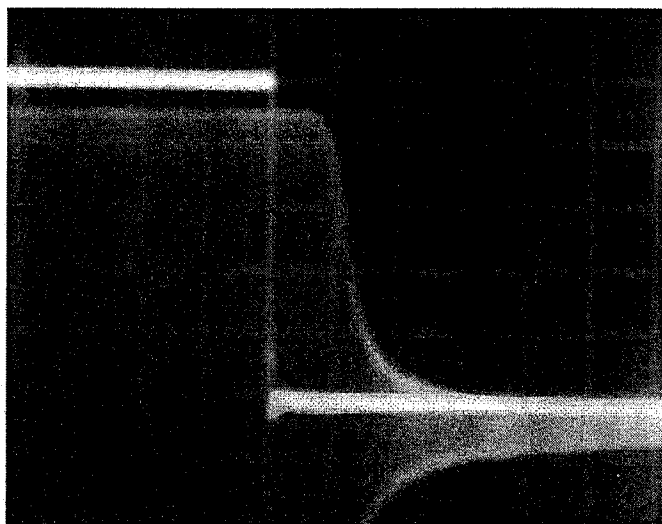
VERTICAL SCALE:
 10 mV PER DIVISION



"DELAY OFF": 340 nS
 "FALL TIME": 140 nS

HORIZONTAL SCALE:
 100 nS PER DIVISION

VERTICAL SCALE:
 10 mV PER DIVISION



MAY 15, 2000



SUMMARY TEST DATA

MODEL NUMBER	: SWN-218-2DR-STANDARD
	OPTIONS 204F, HPR80W, LIL
SERIAL NUMBER	: 2MS005139
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc @+37.9mA; -15vdc @ -2.1mA

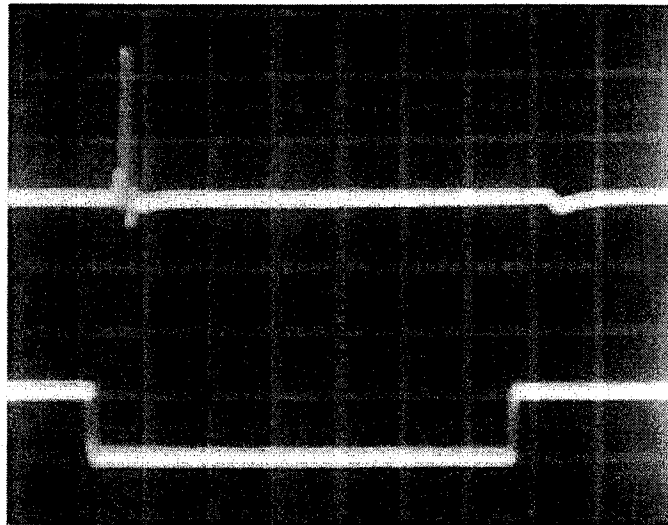
VIDEO TRANSIENTS

TYPICAL OF ALL ARMS

≤ 0.59 V P-P
MEASURED IN A
300 MHZ BANDWIDTH

VERTICAL SCALE:
0.2 V PER DIVISION

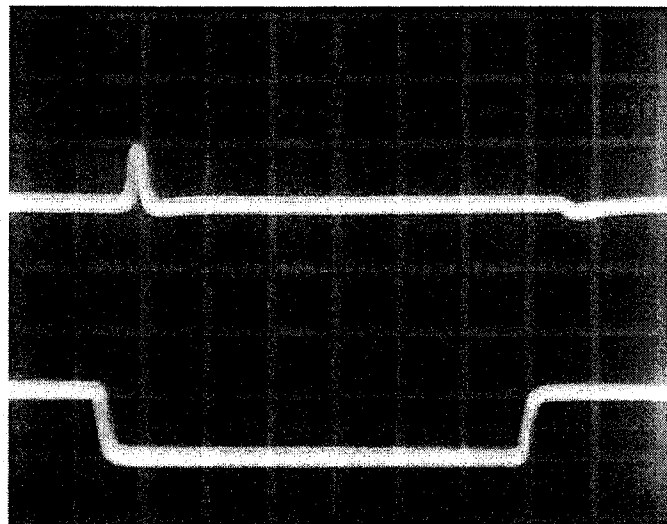
HORIZONTAL SCALE:
100 nS PER DIVISION



≤ 220 mV P-P
MEASURED IN A
20 MHZ BANDWIDTH

VERTICAL SCALE:
0.2 V PER DIVISION

HORIZONTAL SCALE:
100 nS PER DIVISION



MAY 15, 2000



APPENDIX A

MISCELLANEOUS

TEST DATA AND PLOTS

ON

ISOLATION

AS

MEASURED

ON A VECTOR NETWORK ANALYZER

ON A

SPDT

SOLID STATE SWITCH

AMC MODEL No:
SWN-218-2DR-STANDARD OPTIONS 204F, HPR80W, LIL
(Serial Number: 2MS005139)

FROM 2 GHz TO 4 GHz

2.4 GHz TO 2.5 GHz

AND

FROM 1.5 GHz TO 4.8 GHz

MAY 15, 2000

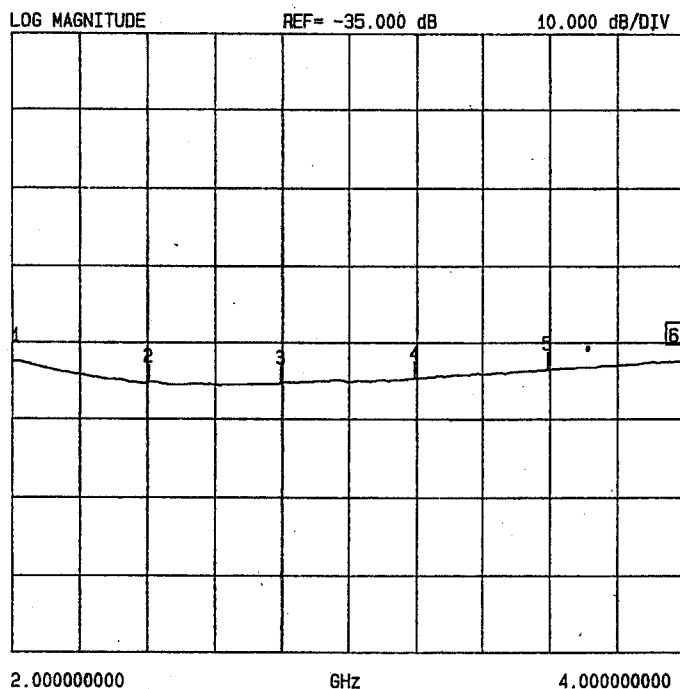


SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

ISOLATION*
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)
J1-J2

S21 FORWARD TRANSMISSION



CH 3 - S21
 REFERENCE PLANE
 0.0000 mm
 MARKER 6
 4.000000000 GHz
 -37.408 dB
 MARKER TO MAX
 MARKER TO MIN
 1 2.000000000 GHz
 -37.401 dB
 2 2.410000000 GHz
 -40.220 dB
 3 2.800000000 GHz
 -40.315 dB
 4 3.200000000 GHz
 -39.676 dB
 5 3.600000000 GHz
 -38.541 dB
 MARKER READOUT
 FUNCTIONS

*J1: INPUT ARM

FREQUENCY	ISOLATION
2.0 GHz	37.4 dB
2.4 GHz	40.2 dB
2.8 GHz	40.3 dB
3.2 GHz	39.6 dB
3.6 GHz	38.5 dB
4.0 GHz	37.4 dB

MAY 15, 2000

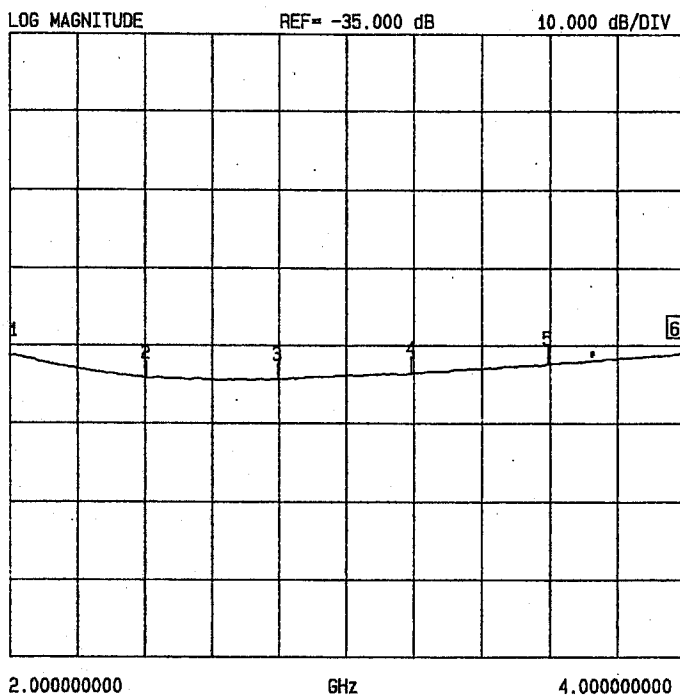


SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

ISOLATION*
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)
 J1-J3

S21 FORWARD TRANSMISSION



CH 3 - S21
 REFERENCE PLANE
 0.0000 mm
 MARKER 6
 4.000000000 GHz
 -36.100 dB
 MARKER TO MAX
 MARKER TO MIN
 1 2.000000000 GHz
 -36.324 dB
 2 2.410000000 GHz
 -39.210 dB
 3 2.800000000 GHz
 -39.443 dB
 4 3.200000000 GHz
 -38.582 dB
 5 3.600000000 GHz
 -37.374 dB
 MARKER READOUT
 FUNCTIONS

*J1: INPUT ARM

FREQUENCY	ISOLATION
2.0 GHz	36.3 dB
2.4 GHz	39.2 dB
2.8 GHz	39.4 dB
3.2 GHz	38.5 dB
3.6 GHz	37.3 dB
4.0 GHz	36.1 dB

MAY 15, 2000



**AMERICAN MICROWAVE
CORPORATION**

**ISOLATION
DATA AND PLOTS
FROM
2.4 GHz TO 2.5 GHz
AS
MEASURED
ON A VECTOR NETWORK
ANALYZER
ON A
SOLID STATE SWITCH
AMC MODEL No:
SWN-218-2DR-STANDARD
OPTIONS 204F, HPR80W, LIL
(Serial Number: 2MS005139)**

**PREPARED
BY
KATIE BAISEY**

MAY 15, 2000

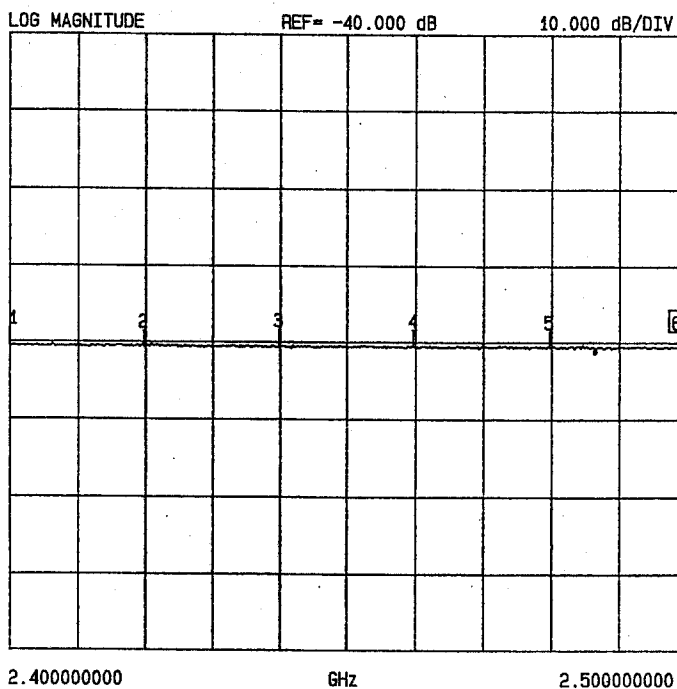


SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

ISOLATION*
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)
 J1-J2

S21 FORWARD TRANSMISSION



CH 3 - S21
 REFERENCE PLANE
 0.0000 mm
 MARKER 6
 2.500000000 GHz
 -40.650 dB
 MARKER TO MAX
 MARKER TO MIN
 1 2.400000000 GHz
 -40.400 dB
 2 2.420000000 GHz
 -40.730 dB
 3 2.440000000 GHz
 -40.510 dB
 4 2.460000000 GHz
 -40.558 dB
 5 2.480000000 GHz
 -40.679 dB
 MARKER READOUT
 FUNCTIONS

*J1: INPUT ARM

FREQUENCY	ISOLATION
2.4 GHz	40.4 dB
2.4 GHz	40.7 dB
2.4 GHz	40.5 dB
2.4 GHz	40.5 dB
2.4 GHz	40.6 dB
2.5 GHz	40.6 dB

MAY 15, 2000



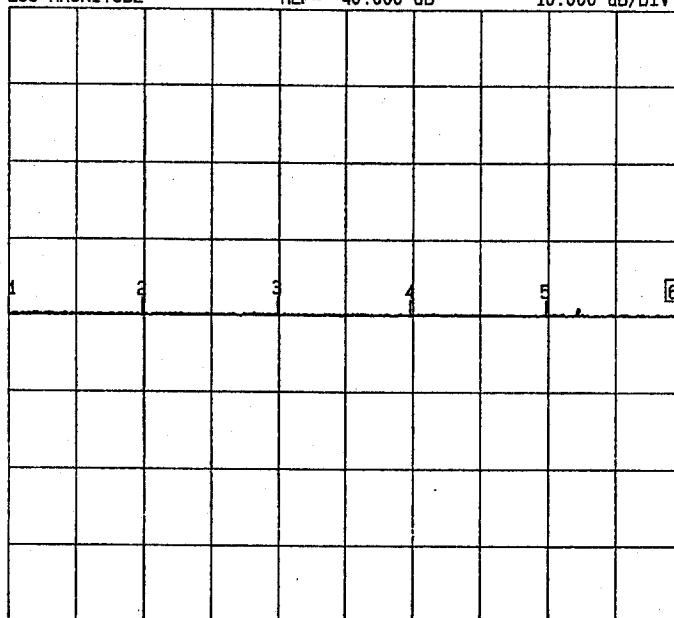
SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

ISOLATION*
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)
J1-J3

S21 FORWARD TRANSMISSION

LOG MAGNITUDE REF= -40.000 dB 10.000 dB/DIV



CH 3 - S21
REFERENCE PLANE
0.0000 mm

MARKER 6
2.500000000 GHz
-40.082 dB

MARKER TO MAX
MARKER TO MIN

- 1 2.400000000 GHz
-39.889 dB
- 2 2.420000000 GHz
-39.937 dB
- 3 2.440000000 GHz
-39.762 dB
- 4 2.460000000 GHz
-40.066 dB
- 5 2.480000000 GHz
-40.016 dB

MARKER READOUT
FUNCTIONS

2.400000000 GHz 2.500000000

***J1: INPUT ARM**

FREQUENCY	ISOLATION
2.4 GHz	39.8 dB
2.4 GHz	39.9 dB
2.4 GHz	39.7 dB
2.4 GHz	40.0 dB
2.4 GHz	40.0 dB
2.5 GHz	40.0 dB

MAY 15, 2000



**AMERICAN MICROWAVE
CORPORATION**

**ISOLATION
DATA AND PLOTS
FROM
1.5 GHz TO 4.8 GHz
AS
MEASURED
ON A VECTOR NETWORK
ANALYZER
ON A
SOLID STATE SWITCH
AMC MODEL No:
SWN-218-2DR-STANDARD
OPTIONS 204F, HPR80W, LIL
(Serial Number: 2MS005139)**

**PREPARED
BY
KATIE BAISEY**

MAY 15, 2000



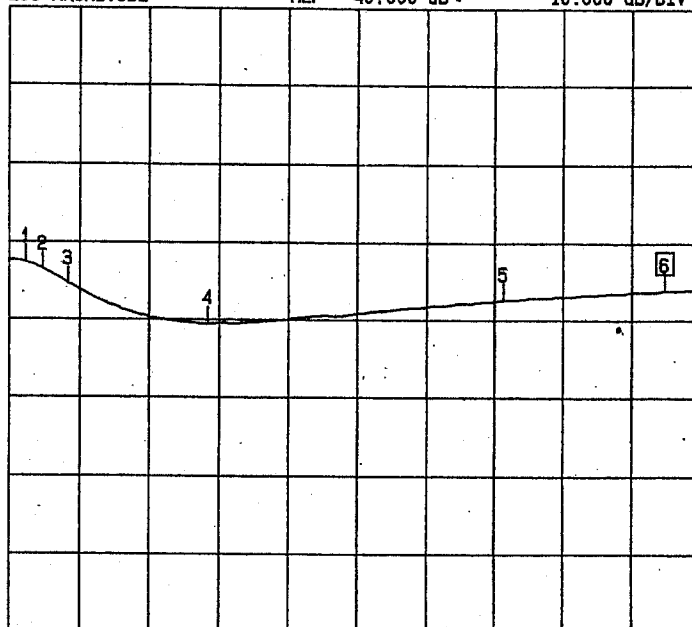
SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : OPTIONS 204F, HPR80W, LIL
ENGINEER : 2MS005139
VOLTAGE & CURRENT DRAW : RENE AFABLE
: +5vdc @ +37.9mA; -15vdc @ -2.1mA

ISOLATION*
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)
J1-J2

S21 FORWARD TRANSMISSION

LOG MAGNITUDE REF= -40.000 dB . 10.000 dB/DIV



CH 3 - S21
REFERENCE PLANE
0.0000 mm

MARKER 6
4.830400000 GHz
-36.162 dB

MARKER TO MAX
MARKER TO MIN

- 1 1.599375000 GHz
-32.648 dB
- 2 1.686700000 GHz
-33.551 dB
- 3 1.811450000 GHz
-35.406 dB
- 4 2.510050000 GHz
-40.562 dB
- 5 4.007050000 GHz
-37.417 dB

1.512050000 GHz 5.005050000

*J1: INPUT ARM

MARKER READOUT
FUNCTIONS

FREQUENCY	ISOLATION
1.5 GHz	32.6 dB
1.6 GHz	33.5 dB
1.8 GHz	35.4 dB
2.5 GHz	40.5 dB
4.0 GHz	37.4 dB
4.8 GHz	36.1 dB

MAY 15, 2000

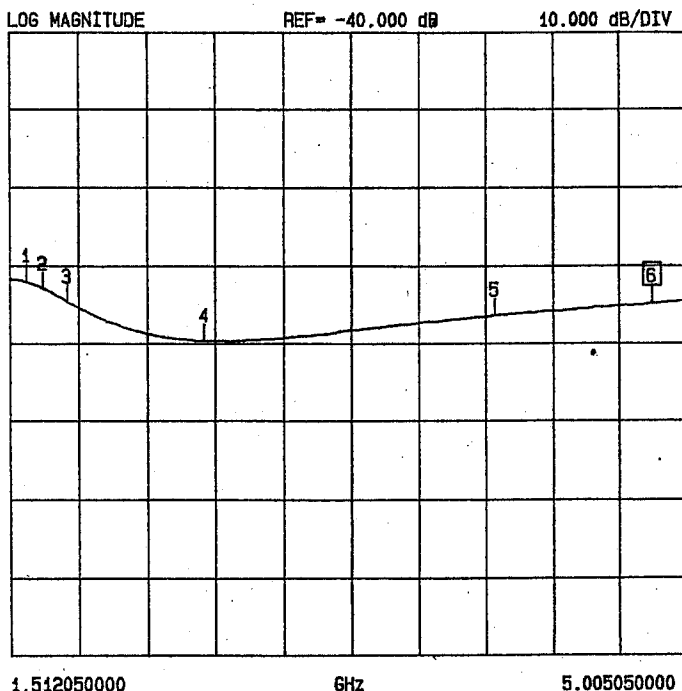


SUMMARY TEST DATA

MODEL NUMBER : SWN-218-2DR-STANDARD
SERIAL NUMBER : 2MS005139
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc @ +37.9mA; -15vdc @ -2.1mA

ISOLATION*
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)
 J1-J3

S21 FORWARD TRANSMISSION



CH 3 - S21
 REFERENCE PLANE
 0.0000 mm

MARKER 6
 4.830400000 GHz
 -34.743 dB

MARKER TO MAX
 MARKER TO MIN

- 1 1.599375000 GHz
-32.031 dB
- 2 1.686700000 GHz
-32.877 dB
- 3 1.811450000 GHz
-34.639 dB
- 4 2.510050000 GHz
-39.673 dB
- 5 4.007050000 GHz
-36.305 dB

1.512050000

GHz

5.005050000

*J1: INPUT ARM

MARKER READOUT
FUNCTIONS

FREQUENCY	ISOLATION
1.5 GHz	32.0 dB
1.6 GHz	32.8 dB
1.8 GHz	34.6 dB
2.5 GHz	39.6 dB
4.0 GHz	36.3 dB
4.8 GHz	34.7 dB

MAY 15, 2000