



**DATA**

**ON**

**4 MHz TO 6.0 GHz**

**AND**

**4 MHz TO 20 MHz**

**LOW HARMONIC**

**HIGH ISOLATION**

**REFLECTIVE**

**DPDT**

**TRANSFER SWITCH**

**(SURFACE MOUNTABLE)**

**AMC MODEL No:**

**SWN-2181-TRA OPTIONS 4M6,IND,AC**

**(Serial Number: TMS80907)**

**DESIGNED**

**BY**

**ASH GORWARA, RENE AFABLE, & WAYNE PURDHAM**

**REPORT PREPARED**

**BY**

**RENE AFABLE**

**OCTOBER 15,1998**

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

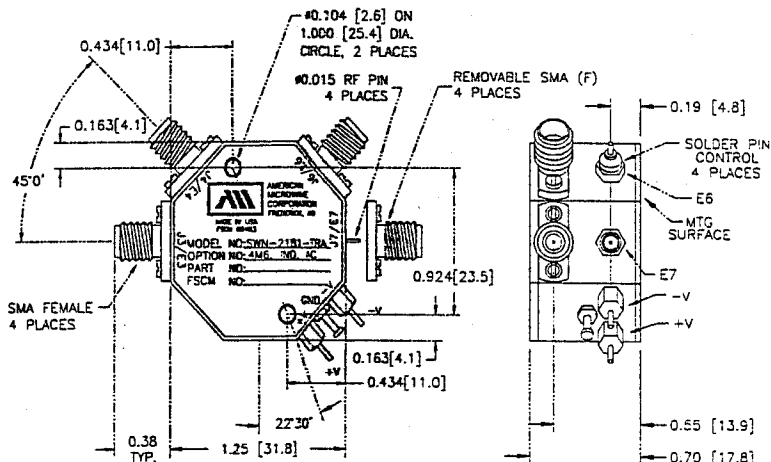
**E-MAIL ADDRESS: [AMCPMI@AOL.COM](mailto:AMCPMI@AOL.COM)**

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

**DPDT REFLECTIVE  
PIN-DIODE SWITCH**

**KEY FEATURES**

- 4 MHz TO 6 GHz  
(10MHz to 18GHz optional)
- HIGH ISOLATION
- LOW HARMONIC
- TTL LOGIC COMPATIBLE
- SURFACE MOUNTABLE



**AMC MODEL No: SWN-2181-TRA OPTIONS 4M6,IND,AC**

**SPECIFICATIONS: (REFLECTIVE)**

• FREQUENCY RANGE	:	4 MHz to 6.0 GHz (10MHz to 18GHz Optional)
• INSERTION LOSS	:	3.5 dB MAX.
	:	2.50 dB TYP. @ 4.0 Mhz
	:	2.10 dB TYP. @ 2.0 Ghz
	:	3.00 dB TYP. @ 4.0 GHz
	:	3.50 dB TYP. @ 6.0 GHz
• ISOLATION	:	≥ 50 dB MIN.
	:	≥ 70 dB TYP. @ 4.0 Mhz
	:	≥ 60 dB TYP. @ 2.0 Ghz
	:	≥ 50 dB TYP. @ 4.0 GHz
	:	≥ 50 dB TYP. @ 6.0 GHz
• VSWR	:	2.0:1
• SWITCHING SPEED	:	"RISE" 150nS MAX., 100nS TYP.
	:	"FALL" 50nS MAX., 30nS TYP.
	:	"ON" 600nS MAX., 500nS TYP.
	:	"OFF" 200nS MAX., 150nS TYP.
• CONTROL	:	TTL Compatible (Independent or with Decoder)
• VIDEO TRANSIENTS	:	≤3.0 V Peak to Peak, 300 MHZ Bandwidth
	:	≤3.0 V Peak to Peak, 20 MHZ Bandwidth
• RF INPUT POWER	:	+20dBm Operating, 1 Watt Survival (Other power Levels available)
• DC POWER SUPPLY	:	+5vdc @ +150mA MAX.
(Other supply voltages available)	:	- 5vdc @ -100mA MAX.
• SIZE	:	1.25" X 1.25" X 0.7"
• WEIGHT	:	≤ 2.0 oz.

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AMC MODEL SWN-2181-TRA IS A REFLECTIVE DPDT SWITCH MODULE WITH INTEGRAL TTL DRIVER.

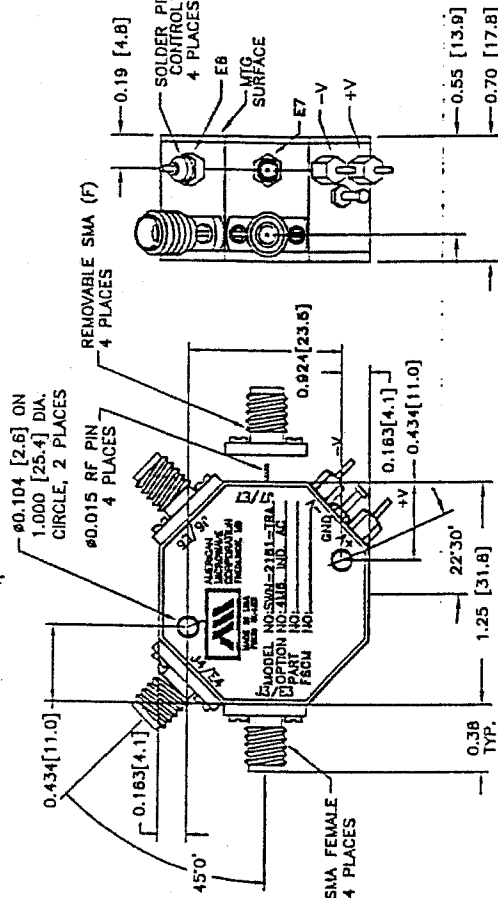
**SPECIFICATIONS**

- FREQUENCY RANGE ..... 0.004-6 GHz
- INSERTION LOSS ..... 0.004-6 GHz, 3.0 dB MAXIMUM
- ISOLATION ..... 0.004-6 GHz, 25 dB MINIMUM
- VSWR (ON) ..... 2.0:1 MAXIMUM
- RF POWER RATING ..... 1W CW, 75W PEAK (1μS, PW MAXIMUM)
- SWITCHING TIME
  - RISE (10% RF TO 90% RF) ..... 150 ns MAXIMUM
  - FALL (90% RF TO 10% RF) ..... 50 ns MAXIMUM
  - ON (50% TTL TO 90% RF) ..... 600 ns MAXIMUM
  - OFF (50% TTL TO 10% RF) ..... 200 ns MAXIMUM
- HARMONICS ..... -40 dBc @ +10 dBm  
 ..... -30 dBc @ LOW FREQUENCY
- CONTROL ..... TTL, LOW POWER SCHOTTKY, (UNITY LOAD)  
 (SEE TRUTH TABLE)  
 LOGIC "0" = ISOLATION  
 LOGIC "1" = INSERTION LOSS
- POWER SUPPLY ..... +5VDC ±5% @ 150 mA MAXIMUM  
 ..... -5VDC ±5% @ 100 mA MAXIMUM
- CONNECTORS
  - RF INPUT/OUTPUT ..... SMA (FEMALE)
  - POWER ..... SOLDER PIN
  - CONTROL ..... SOLDER PIN
- SIZE ..... 1.25" x 1.25" x 0.70"

**AVAILABLE OPTIONS**

- 4M6 ..... 4 MHz TO 6 GHz FREQUENCY RANGE
- IND ..... INDEPENDENT CONTROL
- AC ..... SPECIAL CUSTOMER SPECIFICATION

**MECHANICAL OUTLINE**



TRUTH TABLE

E3	E4	E6	E7	RF PATH ON
1	0	0	1	J3-J7
1	0	1	0	J3-J6
0	1	0	1	J4-J7
0	1	1	0	J4-J6

- NOTES:
- 1) DIMENSIONS ARE IN INCHES [MILLIMETERS]
  - 2) TOLERANCES: X.XX ±0.020  
 X.XXX ±0.010
  - 3) WEIGHT: APPROX. 2.0 OZ

**ENVIRONMENTAL RATINGS**

- TEMPERATURE:
  - OPERATING ..... -65°C TO +110°C
  - NON-OPERATING ..... -65°C TO +125°C
- 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



**AMERICAN MICROWAVE CORPORATION**  
 7311G GROVE RD., FREDERICK, MD. 21701  
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**PRODUCT FEATURE**  
**SWN-2181-TRA OPTION 4M6, IND, AC**  
 4 MHz-6 GHz, DPDT SWITCH MODULE

APPROVALS	DATE
DRAWN R.R.A.	04/20/98
CHECKED	



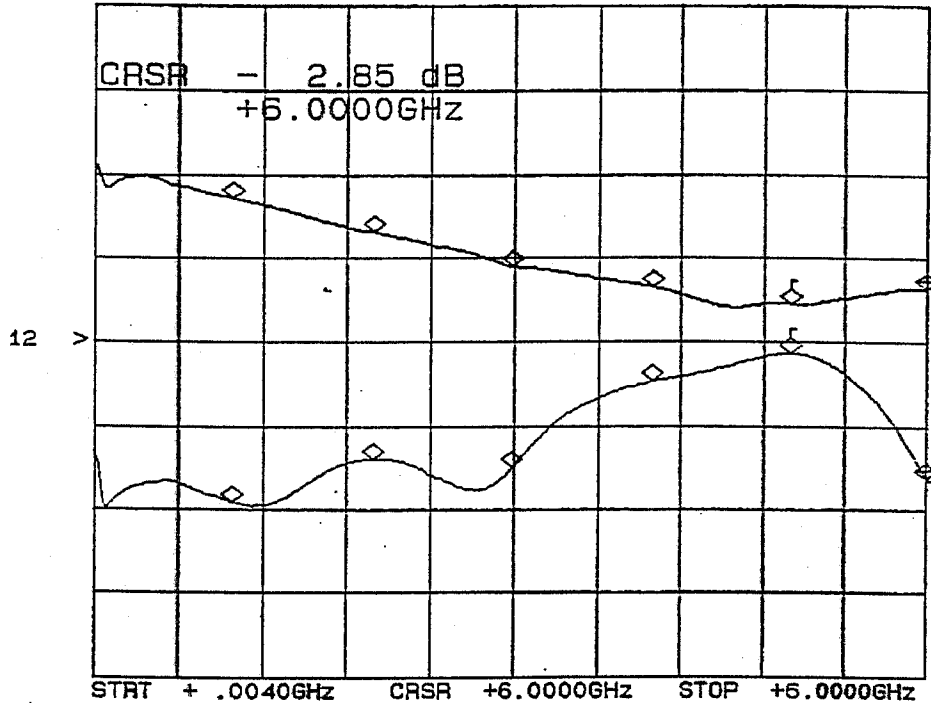
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MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
 SERIAL NUMBER : TMS80907  
 TECHNICIAN : RENE AFABLE  
 VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J3-J7

CH1: C -M S - 2.85 dB      CH2: R -M - 17.58 dB  
 1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.78 dB	19.0 dB
2.0 GHz	2.17 dB	16.3 dB
3.0 GHz	2.59 dB	16.9 dB
4.0 GHz	2.83 dB	11.8 dB
5.0 GHz	3.03 dB	10.1 dB
6.0 GHz	2.85 dB	17.5 dB

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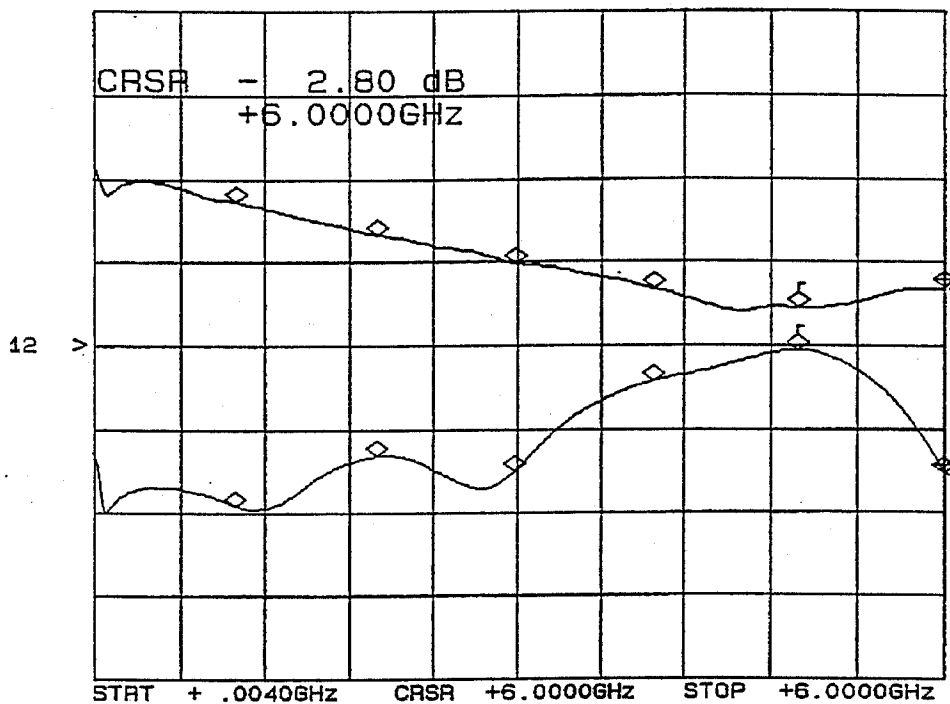
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 VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J3-J6

CH1: C -M S - 2.80 dB      CH2: R -M - 17.05 dB  
 1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.76 dB	19.0 dB
2.0 GHz	2.18 dB	18.0 dB
3.0 GHz	2.50 dB	16.9 dB
4.0 GHz	2.82 dB	11.5 dB
5.0 GHz	3.09 dB	9.74 dB
6.0 GHz	2.80 dB	17.0 dB

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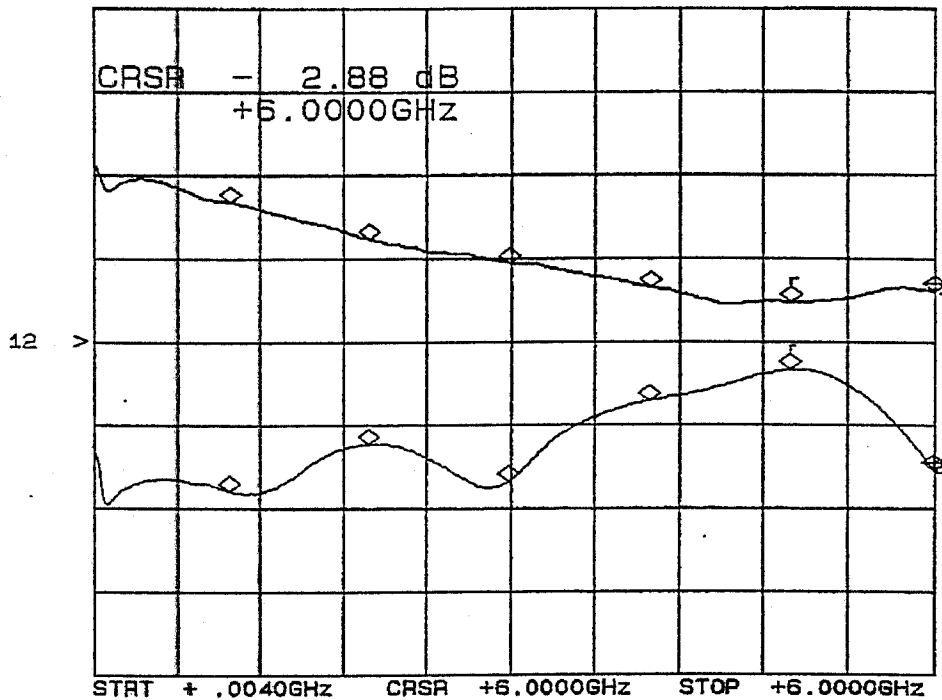
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 TECHNICIAN : RENE AFABLE  
 VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J4-J6

CH1: C -M S - 2.88 dB      CH2: R -M - 17.20 dB  
 1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.82 dB	18.4 dB
2.0 GHz	2.26 dB	15.8 dB
3.0 GHz	2.54 dB	17.8 dB
4.0 GHz	2.83 dB	13.0 dB
5.0 GHz	3.01 dB	11.1 dB
6.0 GHz	2.88 dB	17.2 dB

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# SUMMARY TEST DATA

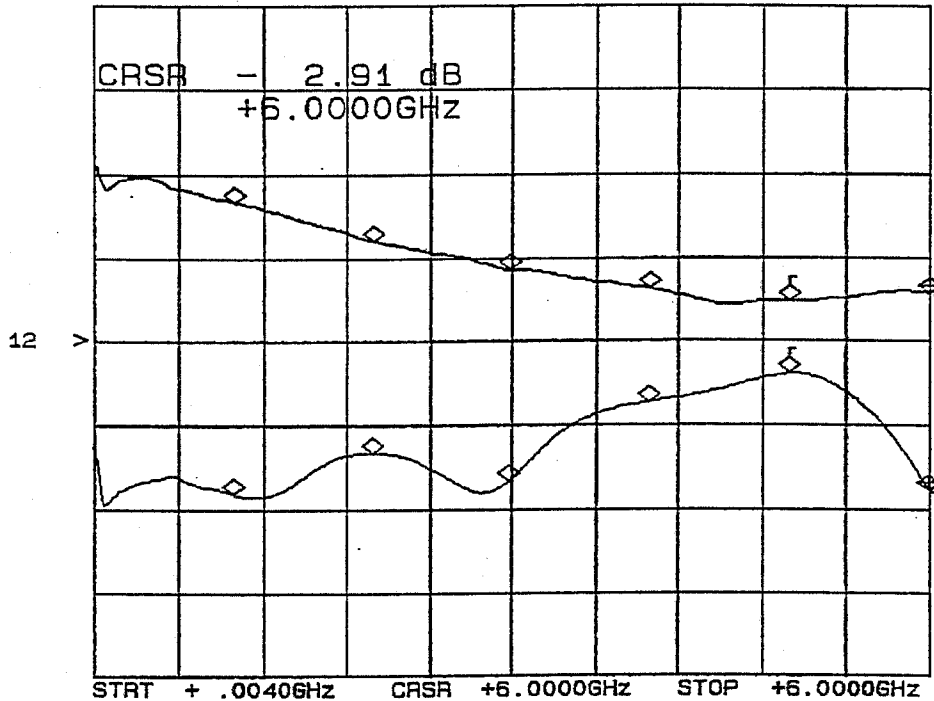


**MODEL NUMBER** : SWN-2181-TRA OPTION 4M6,IND,AC  
**SERIAL NUMBER** : TMS80907  
**TECHNICIAN** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** :  $\pm 5$ vdc: +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J4-J7

CH1: C -M S - 2.91 dB      CH2: R -M - 18.33 dB  
 1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.80 dB	18.5 dB
2.0 GHz	2.27 dB	16.1 dB
3.0 GHz	2.82 dB	17.7 dB
4.0 GHz	2.85 dB	13.0 dB
5.0 GHz	3.01 dB	11.4 dB
6.0 GHz	2.91 dB	18.3 dB

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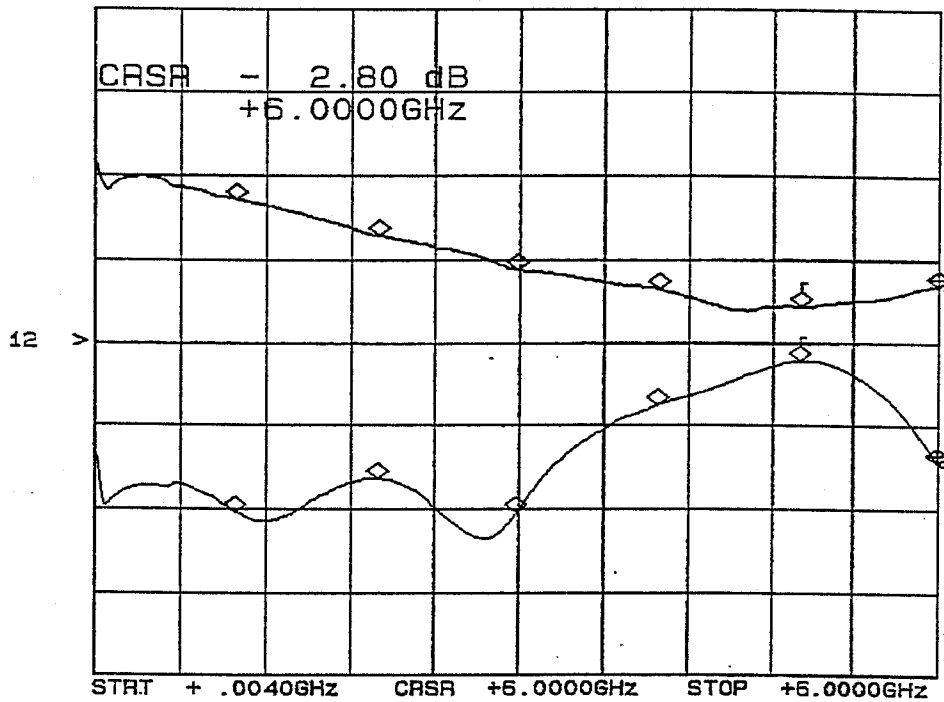
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SERIAL NUMBER	: TMS80907
TECHNICIAN	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: $\pm 5\text{vdc}$ : +85mA, -28.3mA

### INSERTION LOSS & RETURN LOSS\*

J7-J3

CH1: C -M S - 2.80 dB	CH2: A -M - 16.67 dB
1.0 dB/ REF - 3.50 dB	5.0 dB/ REF - 9.54 dB



\*J7: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.77 dB	19.8 dB
2.0 GHz	2.20 dB	17.6 dB
3.0 GHz	2.60 dB	16.7 dB
4.0 GHz	2.83 dB	13.2 dB
5.0 GHz	3.04 dB	10.5 dB
6.0 GHz	2.80 dB	16.6 dB

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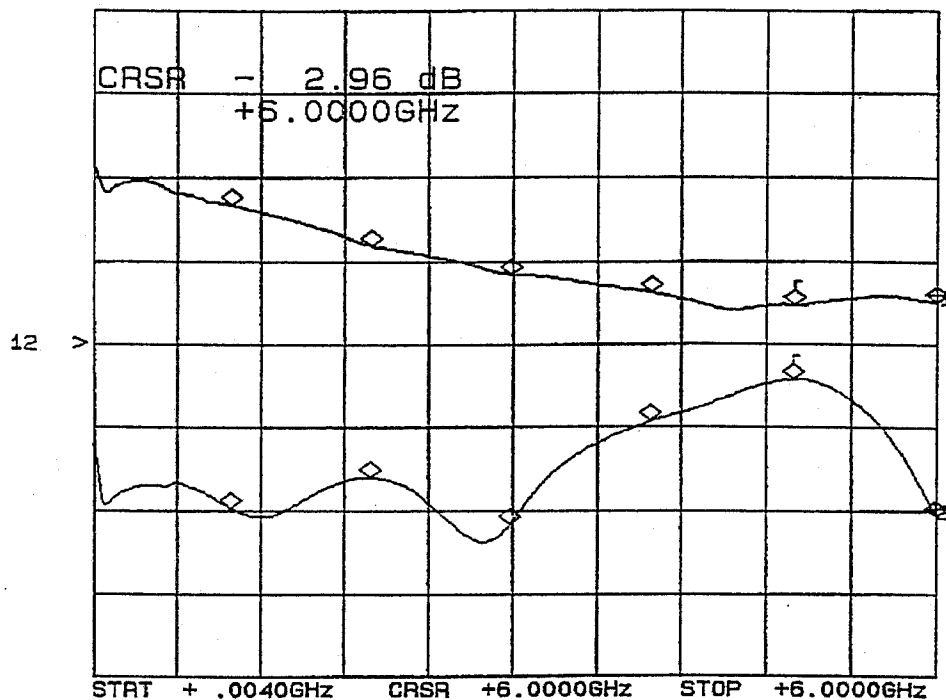
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SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5$ vdc: +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J7-J4

CH1: C -M S - 2.96 dB      CH2: R -M - 19.75 dB  
1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J7: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.82 dB	19.3 dB
2.0 GHz	2.29 dB	17.4 dB
3.0 GHz	2.84 dB	20.2 dB
4.0 GHz	2.85 dB	14.1 dB
5.0 GHz	3.00 dB	11.5 dB
6.0 GHz	2.96 dB	19.7 dB

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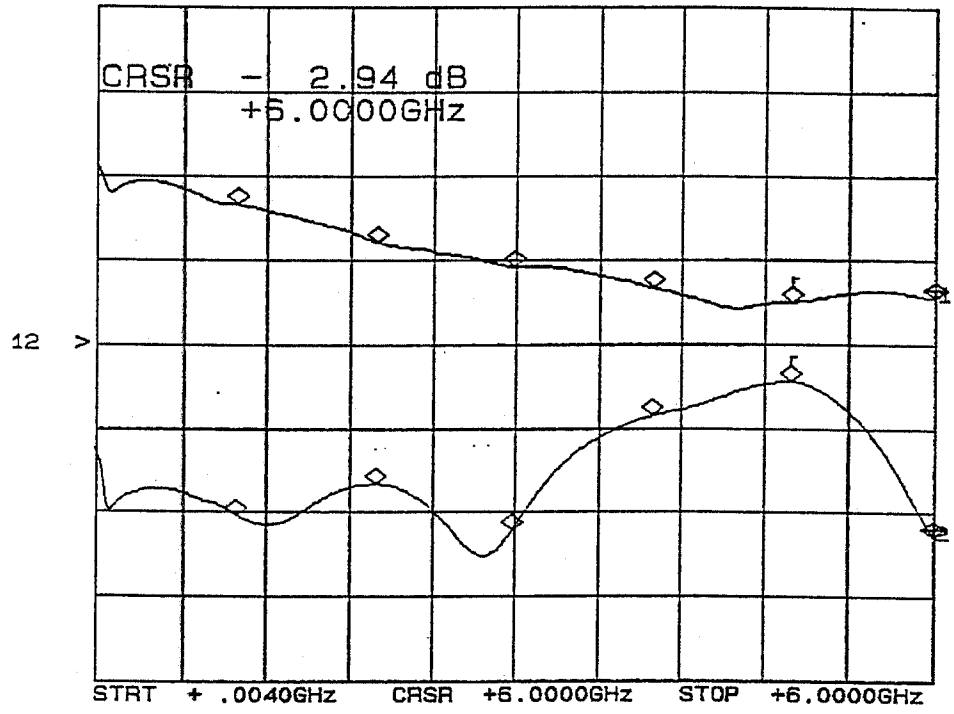
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 SERIAL NUMBER : TMS80907  
 TECHNICIAN : RENE AFABLE  
 VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J6-J4

CH1: C -M S - 2.94 dB      CH2: R -M - 20.91 dB  
 1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J6: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.82 dB	19.8 dB
2.0 GHz	2.27 dB	17.7 dB
3.0 GHz	2.56 dB	20.5 dB
4.0 GHz	2.82 dB	13.8 dB
5.0 GHz	2.98 dB	11.8 dB
6.0 GHz	2.94 dB	20.9 dB

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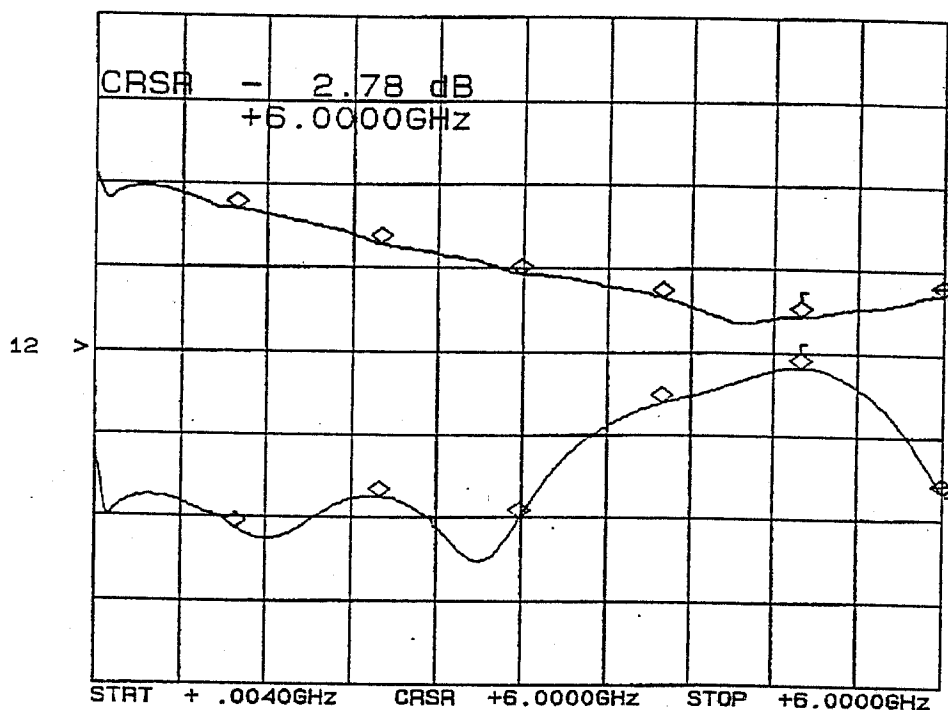
# SUMMARY TEST DATA

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SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J6-J3

CH1: C -M S - 2.78 dB  
1.0 dB/ REF - 3.50 dB  
CH2: R -M - 17.88 dB  
5.0 dB/ REF - 9.54 dB



\*J6: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
1.0 GHz	1.79 dB	20.1 dB
2.0 GHz	2.21 dB	18.2 dB
3.0 GHz	2.56 dB	19.4 dB
4.0 GHz	2.83 dB	12.4 dB
5.0 GHz	3.05 dB	10.3 dB
6.0 GHz	2.78 dB	17.8 dB

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## SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-FRA OPTION 4M6,IND,AC  
SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5$ vdc: +85mA, -28.3mA

### ISOLATION\* (AS MEASURED ON A SPECTRUM ANALYZER)

FREQUENCY	J3-J7	J3-J6	J4-J6	J4-J7
100 MHZ	78 dB	78 dB	72 dB	75 dB
500 MHZ	77 dB	77 dB	76 dB	78 dB
1 GHz	74 dB	74 dB	74 dB	72 dB
2 GHz	64 dB	70 dB	62 dB	68 dB
4 GHz	68 dB	61 dB	56 dB	62 dB
6 GHz	55 dB	57 dB	55 dB	62 dB
8 GHz	51 dB	56 dB	53 dB	67 dB
10 GHz	49 dB	52 dB	50 dB	62 dB

\* J3: INPUT ARM

\* J4: INPUT ARM

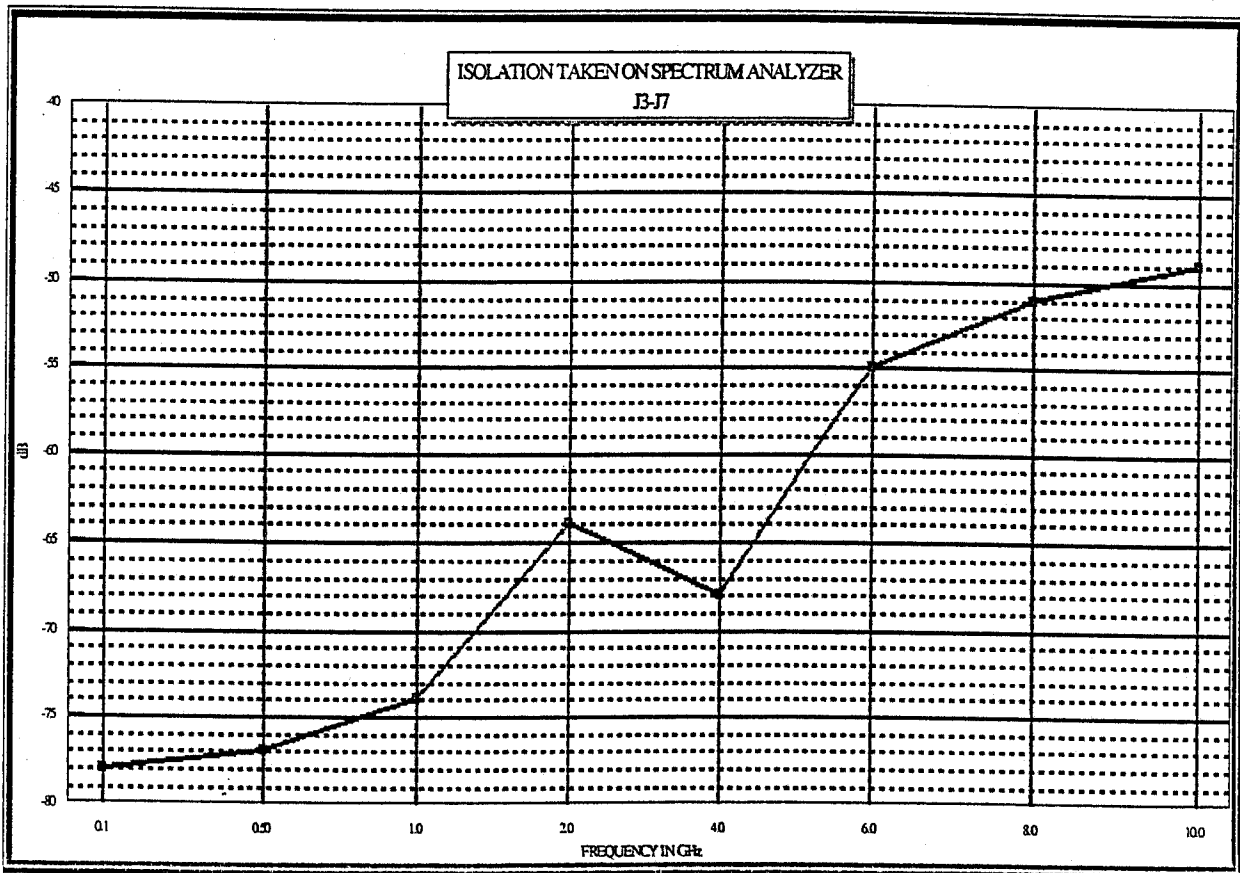
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SERIAL NUMBER	: TMS80907
TECHNICIAN	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: $\pm 5\text{vdc}$ : +85mA, -28.3mA

## ISOLATION\* (AS MEASURED ON A SPECTRUM ANALYZER) J3-J7



\*J3: INPUT ARM

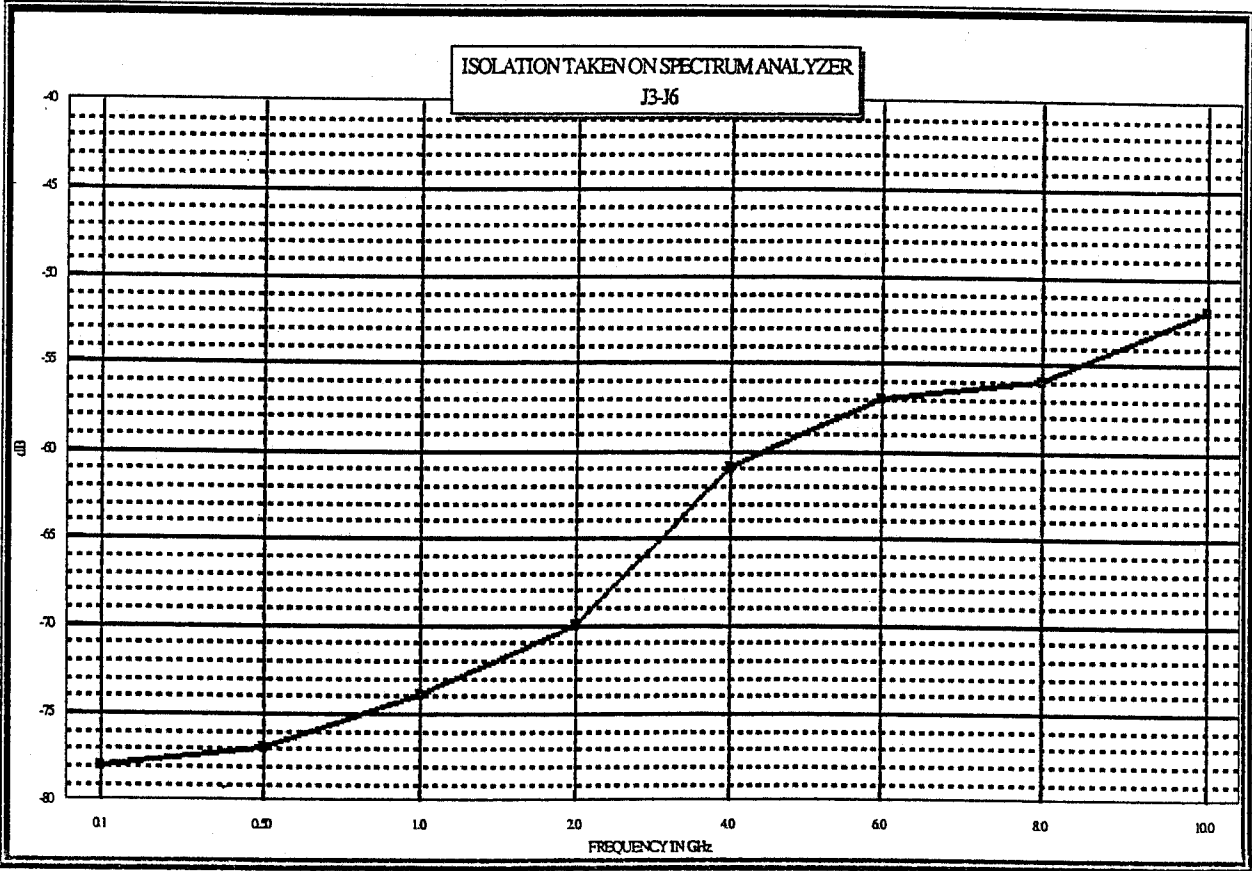
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SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## ISOLATION\* (AS MEASURED ON A SPECTRUM ANALYZER) J3-J6



\*J3: INPUT ARM

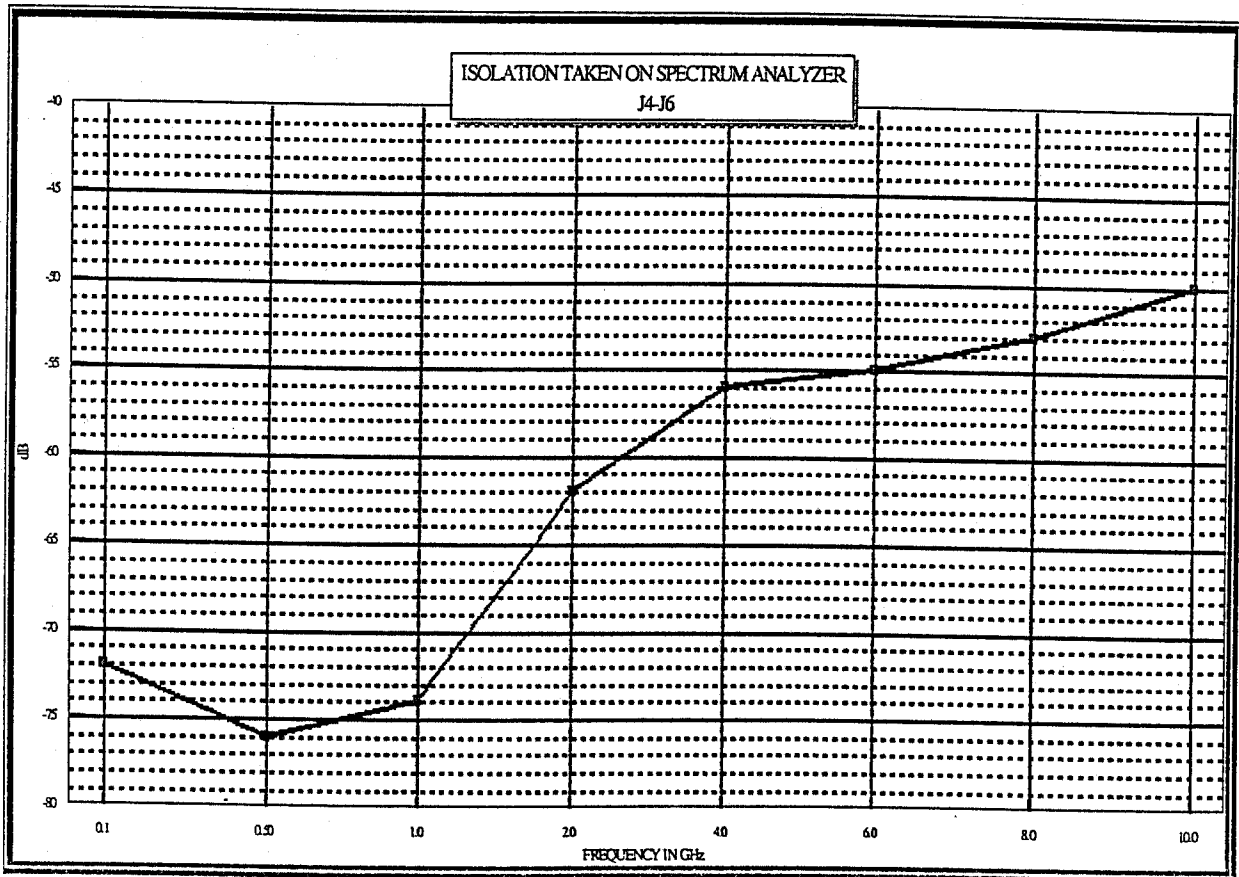
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VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## ISOLATION\* (AS MEASURED ON A SPECTRUM ANALYZER) J4-J6



\*J4: INPUT ARM

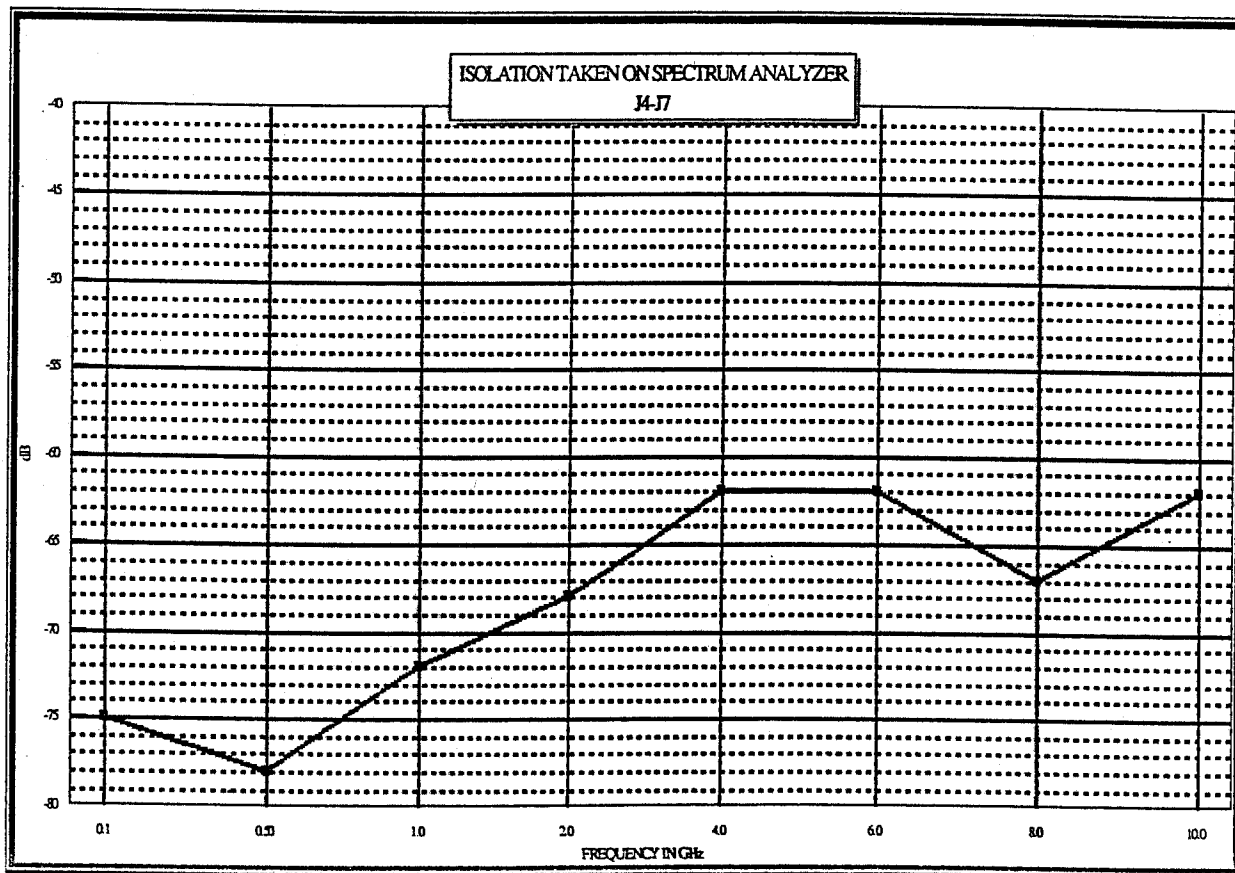
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## ISOLATION\* (AS MEASURED ON A SPECTRUM ANALYZER) J4-J7



\*J4: INPUT ARM

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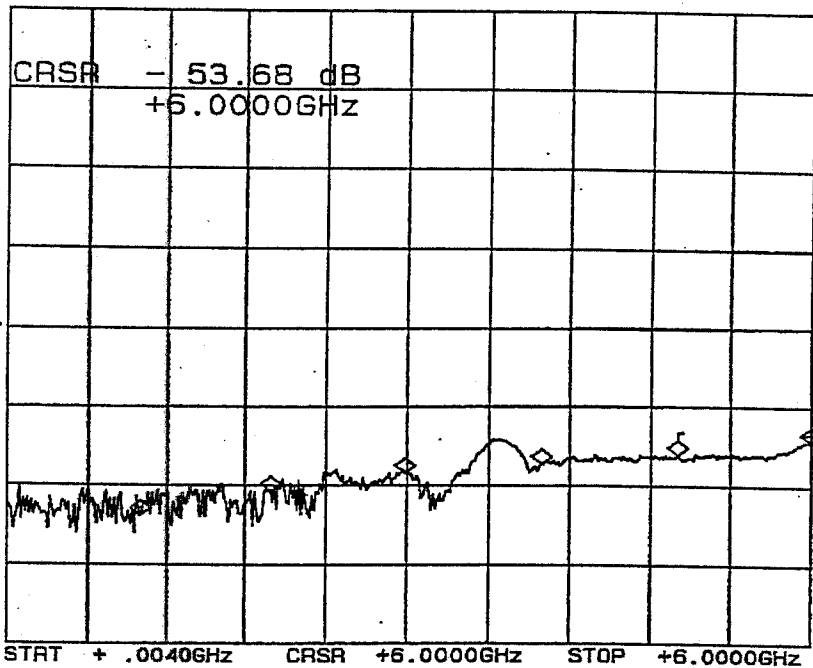


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TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## ISOLATION\* (AS MEASURED ON A SCALAR NETWORK ANALYZER) J3-J7

CH1: C -M - 53.68 dB  
20.0 dB/ REF - 25.00 dB



\*J3: INPUT ARM

FREQUENCY	ISOLATION
1.0 GHz	61.3 dB
2.0 GHz	62.3 dB
3.0 GHz	66.2 dB
4.0 GHz	60.7 dB
5.0 GHz	61.7 dB
6.0 GHz	61.1 dB

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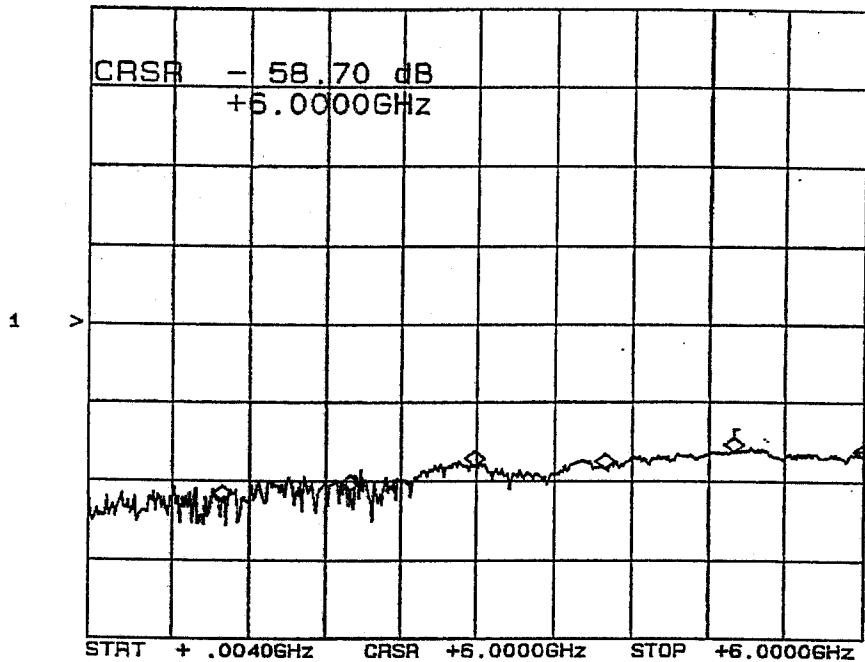


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 SERIAL NUMBER : TMS80907  
 TECHNICIAN : RENE AFABLE  
 VOLTAGE & CURRENT DRAW :  $\pm 5$ vdc: +85mA, -28.3mA

**ISOLATION\***  
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)  
 J3-J6

CH1: C -M - 58.70 dB  
 20.0 dB/ REF - 25.00 dB



\*J3: INPUT ARM

FREQUENCY	ISOLATION
1.0 GHz	65.7 dB
2.0 GHz	63.9 dB
3.0 GHz	60.3 dB
4.0 GHz	61.5 dB
5.0 GHz	57.5 dB
6.0 GHz	58.7 dB

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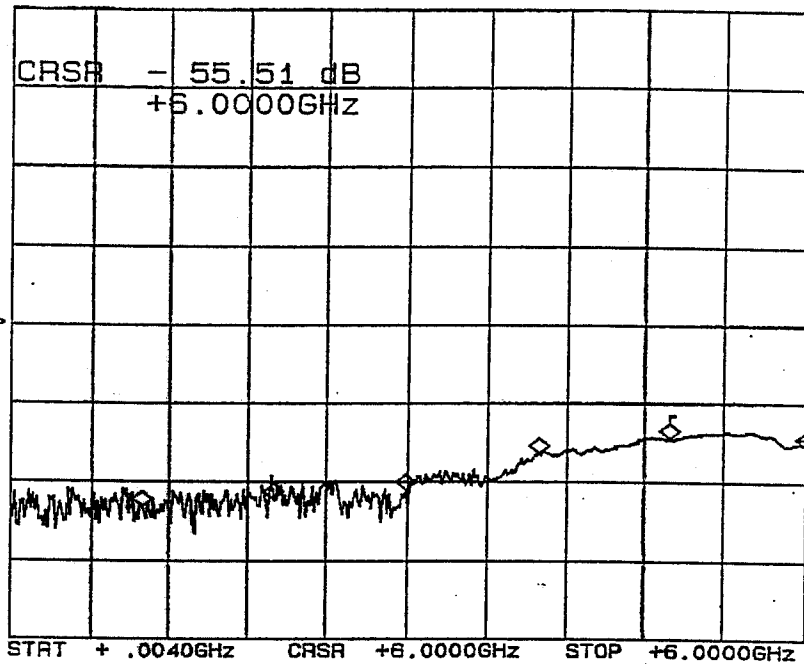


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SERIAL NUMBER	: TMS80907
TECHNICIAN	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: $\pm 5$ vdc: +85mA, -28.3mA

### ISOLATION\* (AS MEASURED ON A SCALAR NETWORK ANALYZER) J4-J6

CH1: C -M - 55.51 dB  
20.0 dB/ REF - 25.00 dB



\*J4: INPUT ARM

FREQUENCY	ISOLATION
1.0 GHz	70.0 dB
2.0 GHz	68.7 dB
3.0 GHz	66.7 dB
4.0 GHz	57.4 dB
5.0 GHz	54.0 dB
6.0 GHz	55.0 dB

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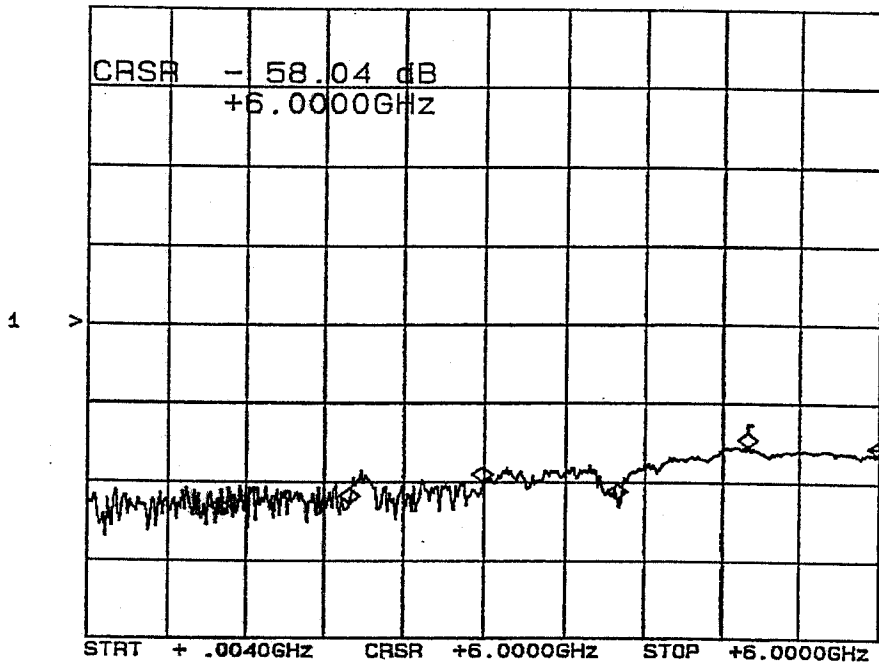


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TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

#### ISOLATION\* (AS MEASURED ON A SCALAR NETWORK ANALYZER) J4-J7

CH1: C -M - 58.04 dB  
20.0 dB/ REF - 25.00 dB



\*J4: INPUT ARM

FREQUENCY	ISOLATION
1.0 GHz	67.6 dB
2.0 GHz	66.8 dB
3.0 GHz	63.3 dB
4.0 GHz	71.0 dB
5.0 GHz	56.2 dB
6.0 GHz	58.0 dB

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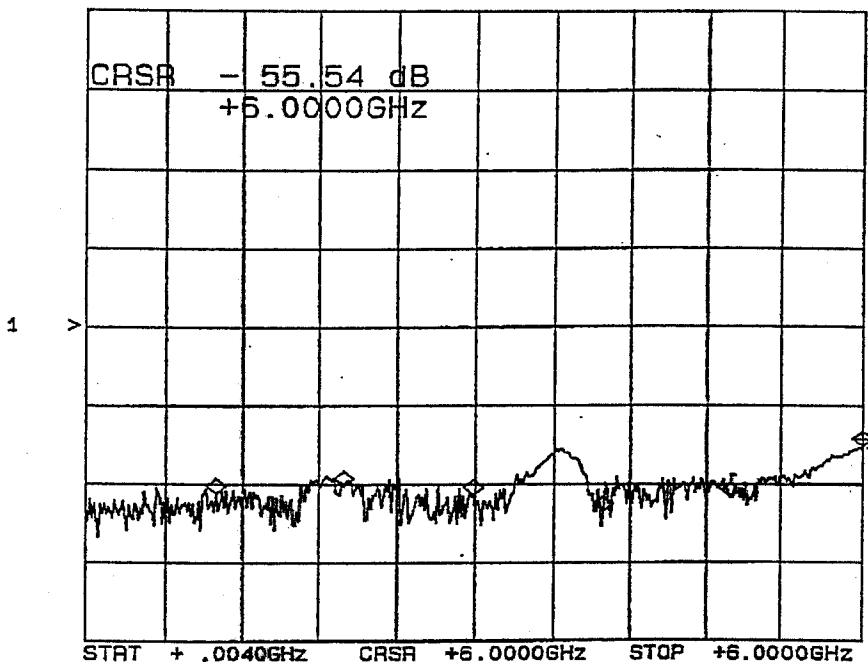


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## ISOLATION\* (AS MEASURED ON A SCALAR NETWORK ANALYZER) J7-J3

CH1: C -M - 55.54 dB  
20.0 dB/ REF - 25.00 dB



\*J7: INPUT ARM

FREQUENCY	ISOLATION
1.0 GHz	66.8 dB
2.0 GHz	66.2 dB
3.0 GHz	63.4 dB
4.0 GHz	62.7 dB
5.0 GHz	63.1 dB
6.0 GHz	55.5 dB

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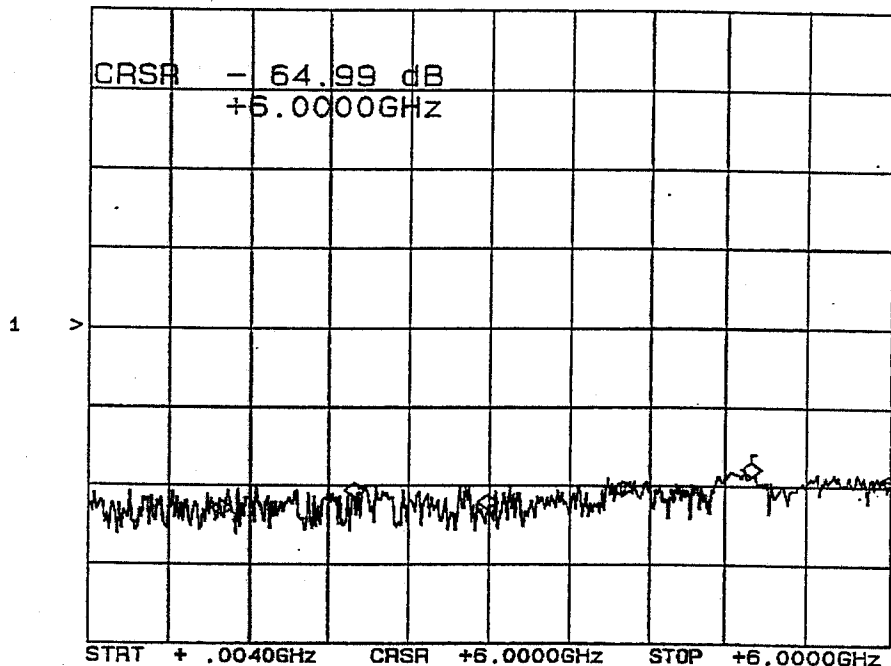


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**ISOLATION\***  
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)  
 J7-J4

CH1: C -M - 64.99 dB  
 20.0 dB/ REF - 25.00 dB



\*J7: INPUT ARM

FREQUENCY	ISOLATION
1.0 GHz	68.4 dB
2.0 GHz	71.5 dB
3.0 GHz	65.2 dB
4.0 GHz	63.5 dB
5.0 GHz	61.9 dB
6.0 GHz	64.9 dB

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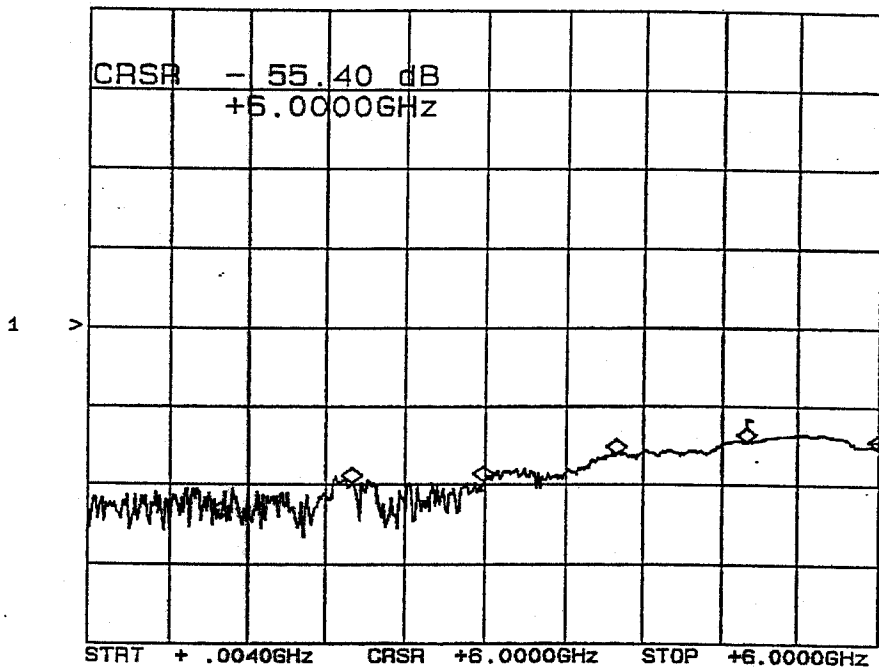


### SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

#### ISOLATION\* (AS MEASURED ON A SCALAR NETWORK ANALYZER) J6-J4

CH1: C -M - 55.40 dB  
20.0 dB/ REF - 25.00 dB



\*J6: INPUT ARM

FREQUENCY	ISOLATION
1.0 GHz	71.4 dB
2.0 GHz	68.5 dB
3.0 GHz	65.5 dB
4.0 GHz	56.6 dB
5.0 GHz	53.7 dB
6.0 GHz	55.4 dB

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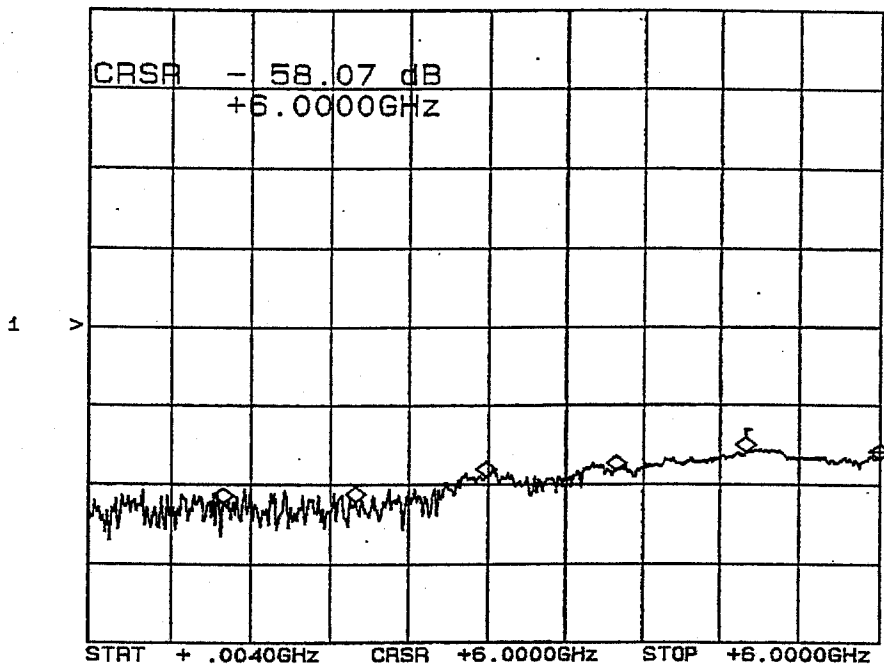


## SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

### ISOLATION\* (AS MEASURED ON A SCALAR NETWORK ANALYZER) J6-J3

CH1: C -M - 58.07 dB  
20.0 dB/ REF - 25.00 dB



\*J6: INPUT ARM

FREQUENCY	ISOLATION
1.0 GHz	72.8 dB
2.0 GHz	73.8 dB
3.0 GHz	62.3 dB
4.0 GHz	61.3 dB
5.0 GHz	57.2 dB
6.0 GHz	58.0 dB

OCTOBER 15, 1998





**AMERICAN MICROWAVE  
CORPORATION**

**DATA**

**ON**

**4 MHz TO 20 MHz**

**LOW LOSS**

**HIGH ISOLATION**

**REFLECTIVE**

**DPDT**

**TRANSFER SWITCH**

**(SURFACE MOUNTABLE)**

**AMC MODEL No:**

**SWN-2181-TRA OPTIONS 4M6,IND,AC**

**(Serial Number: TMS80907)**

**OCTOBER 15,1998**

**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**



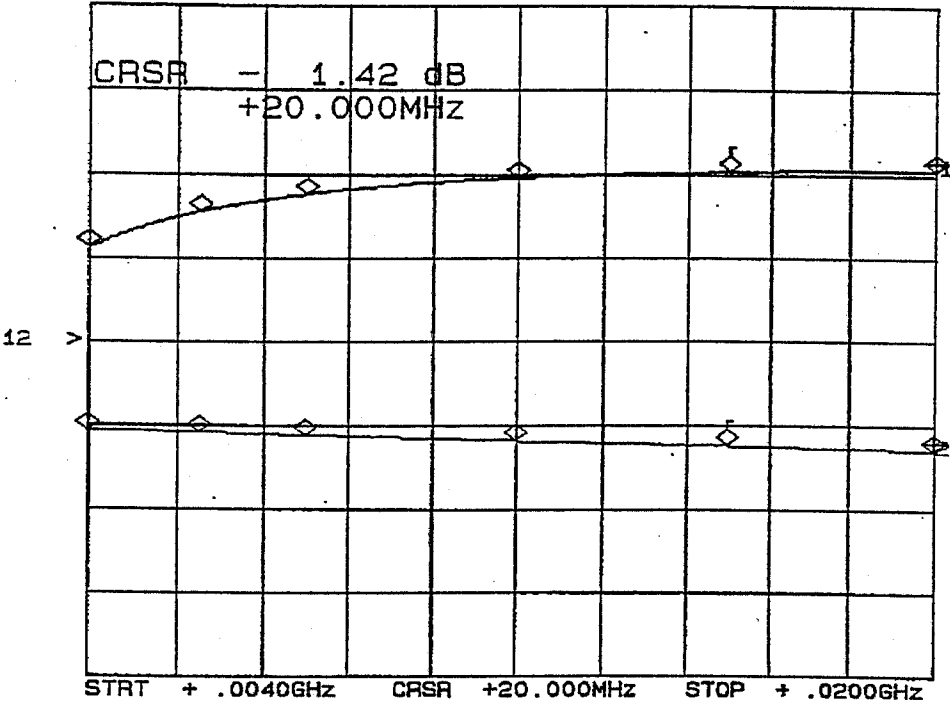
SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
 SERIAL NUMBER : TMS80907  
 TECHNICIAN : RENE AFABLE  
 VOLTAGE & CURRENT DRAW : ±5vdc: +85mA, -28.3mA

INSERTION LOSS & RETURN LOSS\*

J3-J7

CH1: C -M S - 1.42 dB      CH2: R -M - 15.92 dB  
 1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
4 MHz	2.36 dB	14.7 dB
6 MHz	1.93 dB	14.8 dB
8 MHz	1.72 dB	15.0 dB
12 MHz	1.52 dB	15.3 dB
16 MHz	1.45 dB	15.6 dB
20 MHz	1.42 dB	15.9 dB

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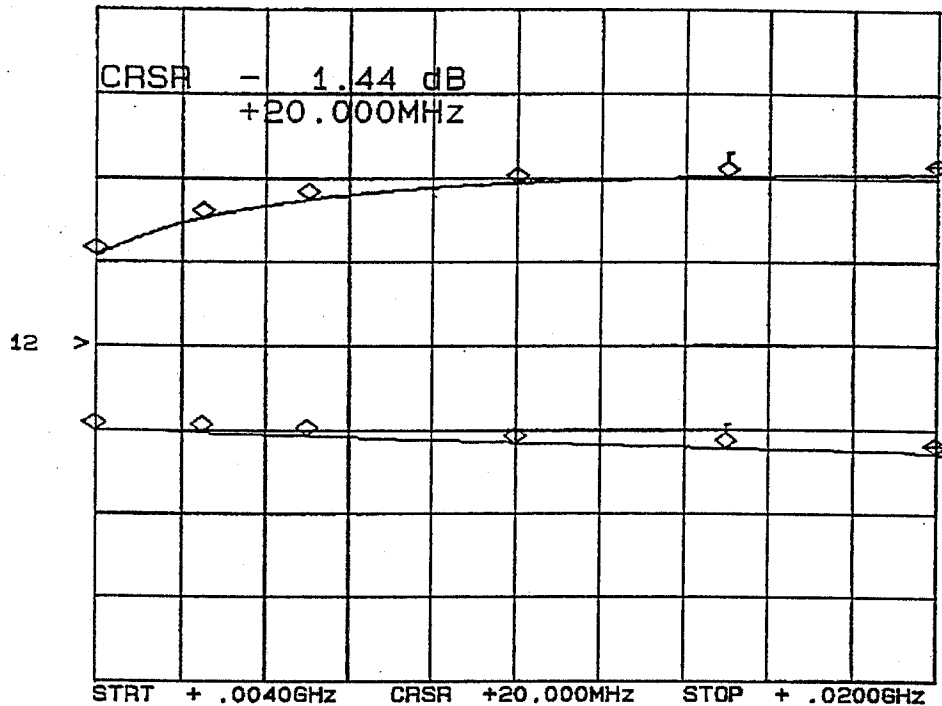
## SUMMARY TEST DATA

MODEL NUMBER	: SWN-2181-TRA OPTION 4M6,IND,AC
SERIAL NUMBER	: TMS80907
TECHNICIAN	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: $\pm 5\text{vdc}$ : +85mA, -28.3mA

### INSERTION LOSS & RETURN LOSS\*

J3-J6

CH1: C -M S - 1.44 dB	CH2: R -M - 15.80 dB
1.0 dB/ REF - 3.50 dB	5.0 dB/ REF - 9.54 dB



\*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
4 MHz	2.42 dB	14.4 dB
6 MHz	1.98 dB	14.8 dB
8 MHz	1.74 dB	14.8 dB
12 MHz	1.54 dB	15.2 dB
16 MHz	1.47 dB	15.5 dB
20 MHz	1.44 dB	15.8 dB

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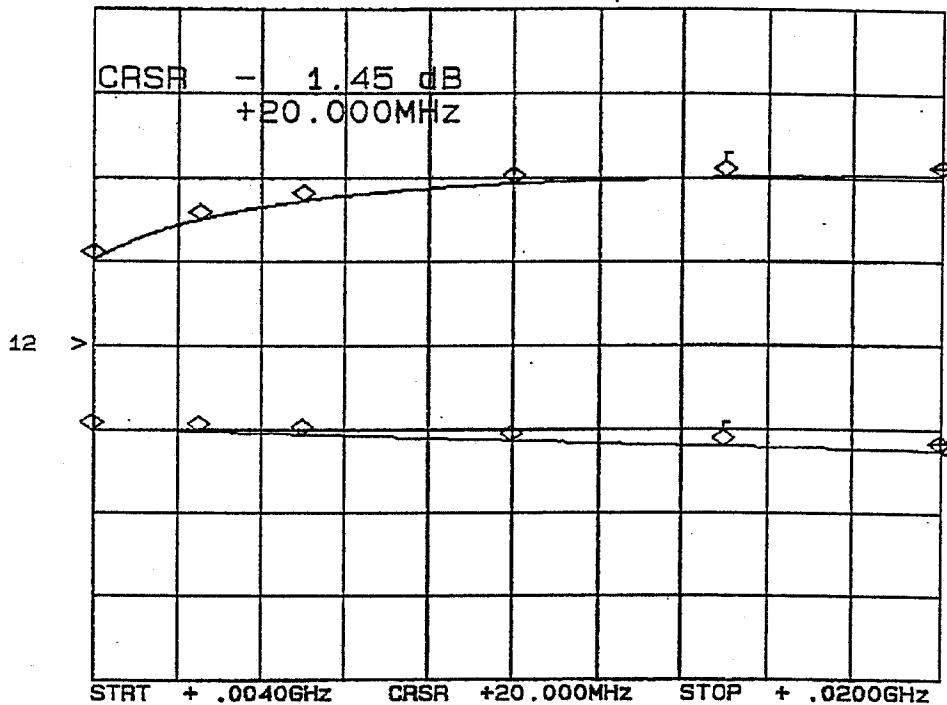
# SUMMARY TEST DATA

**MODEL NUMBER** : SWN-2181-TRA OPTION 4M6,IND,AC  
**SERIAL NUMBER** : TMS80907  
**TECHNICIAN** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J4-J6

CH1: C -M S - 1.45 dB      CH2: R -M - 15.71 dB  
 1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
4 MHz	2.45 dB	14.5 dB
6 MHz	1.38 dB	14.5 dB
8 MHz	1.76 dB	14.7 dB
12 MHz	1.55 dB	15.1 dB
16 MHz	1.48 dB	15.4 dB
20 MHz	1.45 dB	15.7 dB

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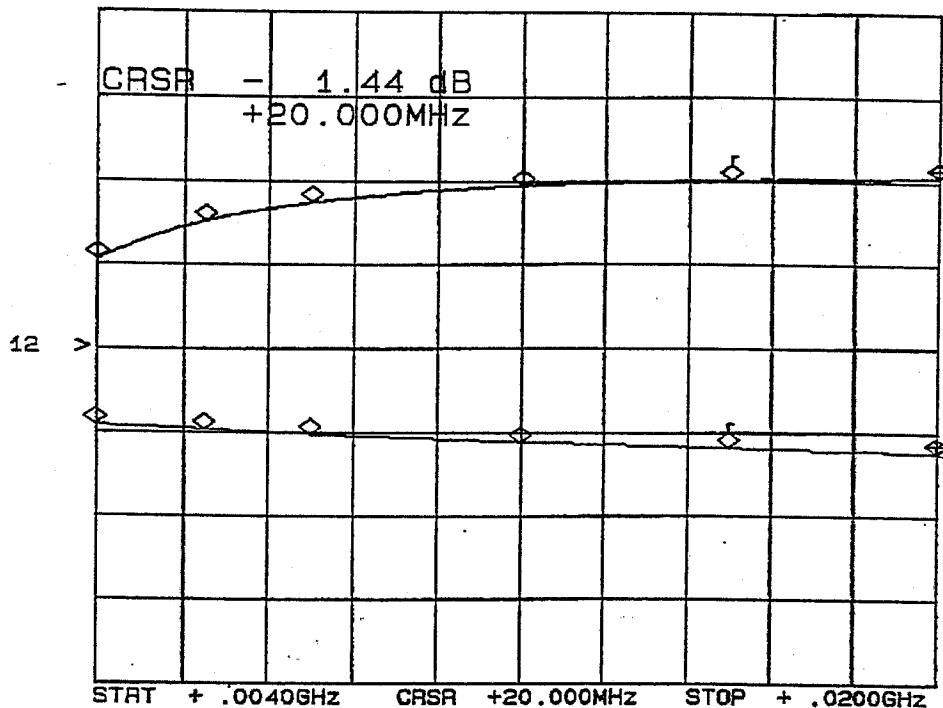
# SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J4-J7

CH1: C -M S - 1.44 dB      CH2: R -M - 15.65 dB  
1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
4 MHz	2.44 dB	14.0 dB
6 MHz	1.97 dB	14.2 dB
8 MHz	1.75 dB	14.5 dB
12 MHz	1.54 dB	15.0 dB
16 MHz	1.47 dB	15.3 dB
20 MHz	1.44 dB	15.6 dB

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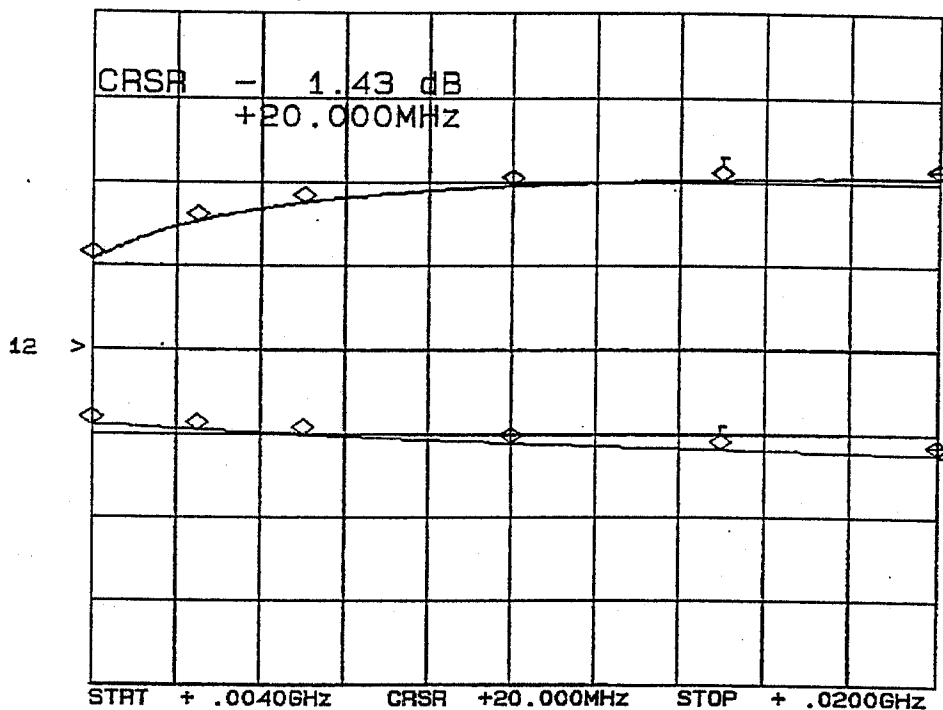
## SUMMARY TEST DATA

MODEL NUMBER	: SWN-2181-TRA OPTION 4M6,IND,AC
SERIAL NUMBER	: TMS80907
TECHNICIAN	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: ±5vdc: +85mA, -28.3mA

### INSERTION LOSS & RETURN LOSS\*

J7-J3

CH1: C -M S - 1.43 dB	CH2: R -M - 15.67 dB
1.0 dB/ REF - 3.50 dB	5.0 dB/ REF - 9.54 dB



\*J7: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
4 MHz	2.42 dB	13.8 dB
6 MHz	1.95 dB	14.1 dB
8 MHz	1.73 dB	14.4 dB
12 MHz	1.53 dB	14.9 dB
16 MHz	1.46 dB	15.3 dB
20 MHz	1.43 dB	15.6 dB

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# SUMMARY TEST DATA

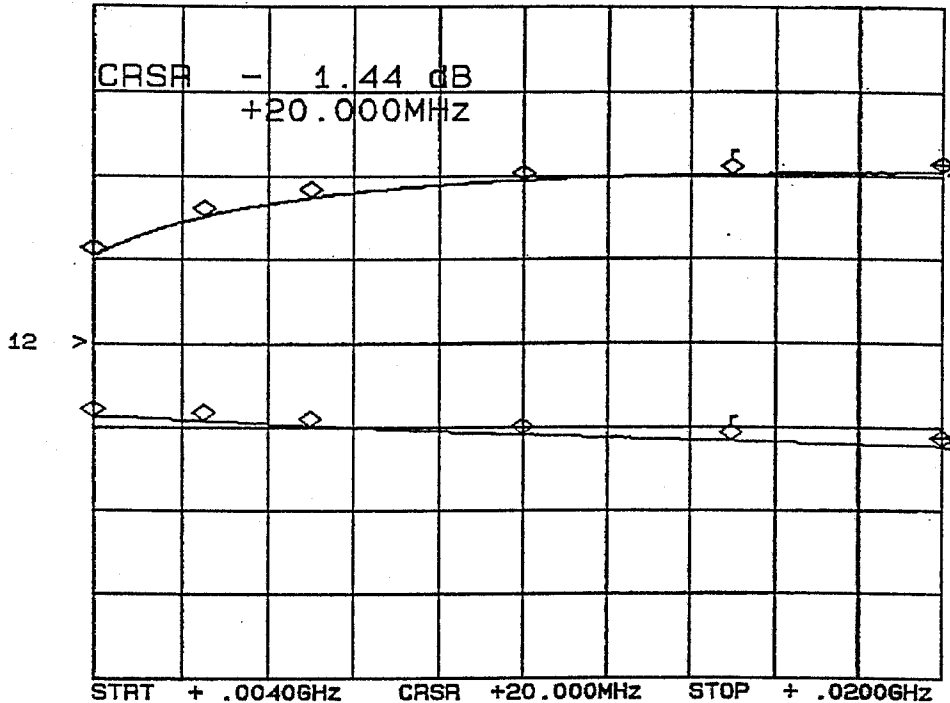


**MODEL NUMBER** : SWN-2181-TRA OPTION 4M6,IND,AC  
**SERIAL NUMBER** : TMS80907  
**TECHNICIAN** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J7-J4

CH1: C -M S - 1.44 dB      CH2: R -M - 15.59 dB  
 1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J7: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
4 MHz	2.46 dB	13.7 dB
6 MHz	1.97 dB	14.0 dB
8 MHz	1.75 dB	14.3 dB
12 MHz	1.54 dB	14.8 dB
16 MHz	1.47 dB	15.2 dB
20 MHz	1.44 dB	15.5 dB

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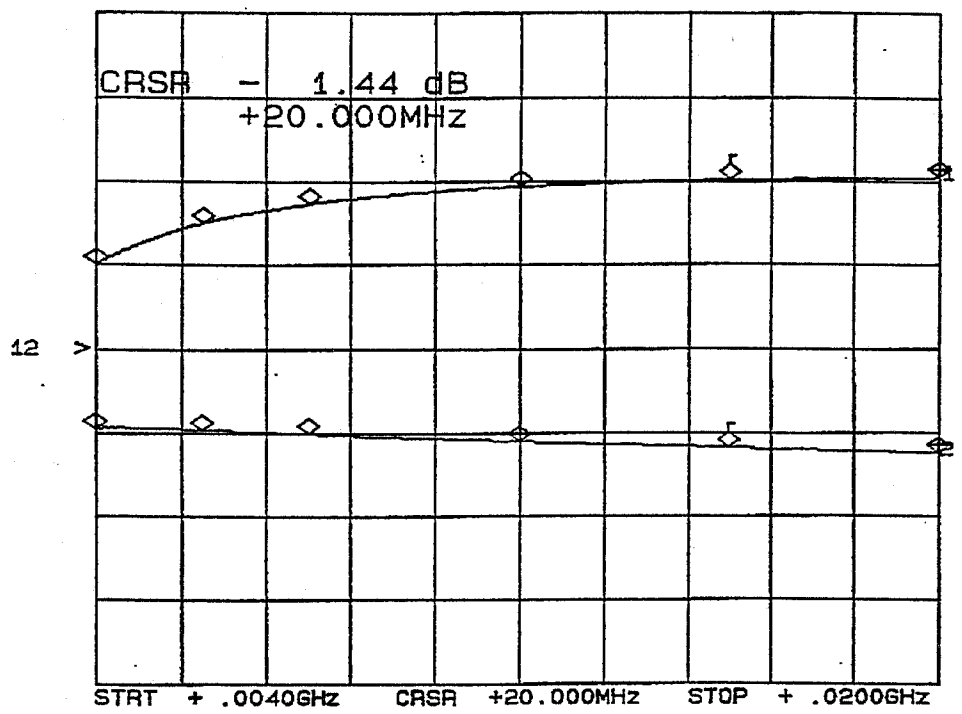
# SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
 SERIAL NUMBER : TMS80907  
 TECHNICIAN : RENE AFABLE  
 VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J6-J4

CH1: C -M S - 1.44 dB      CH2: F -M REF - 15.64 dB  
 1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J6 INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
4 MHz	2.48 dB	14.1 dB
6 MHz	1.99 dB	14.2 dB
8 MHz	1.76 dB	14.5 dB
12 MHz	1.55 dB	14.3 dB
16 MHz	1.47 dB	15.3 dB
20 MHz	1.44 dB	15.6 dB

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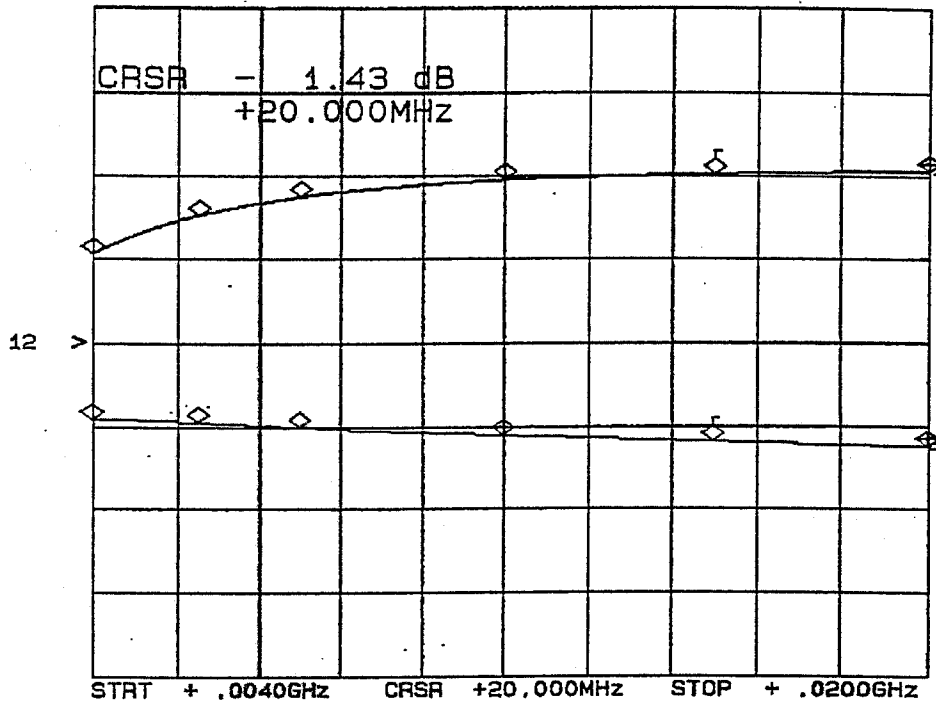
# SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
 SERIAL NUMBER : TMS80907  
 TECHNICIAN : RENE AFABLE  
 VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## INSERTION LOSS & RETURN LOSS\*

J6-J3

CH1: C -M S - 1.43 dB      CH2: R -M - 15.65 dB  
 1.0 dB/ REF - 3.50 dB      5.0 dB/ REF - 9.54 dB



\*J6: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
4 MHz	2.42 dB	13.9 dB
6 MHz	1.96 dB	14.2 dB
8 MHz	1.74 dB	14.4 dB
12 MHz	1.54 dB	14.9 dB
16 MHz	1.47 dB	15.3 dB
20 MHz	1.43 dB	15.6 dB

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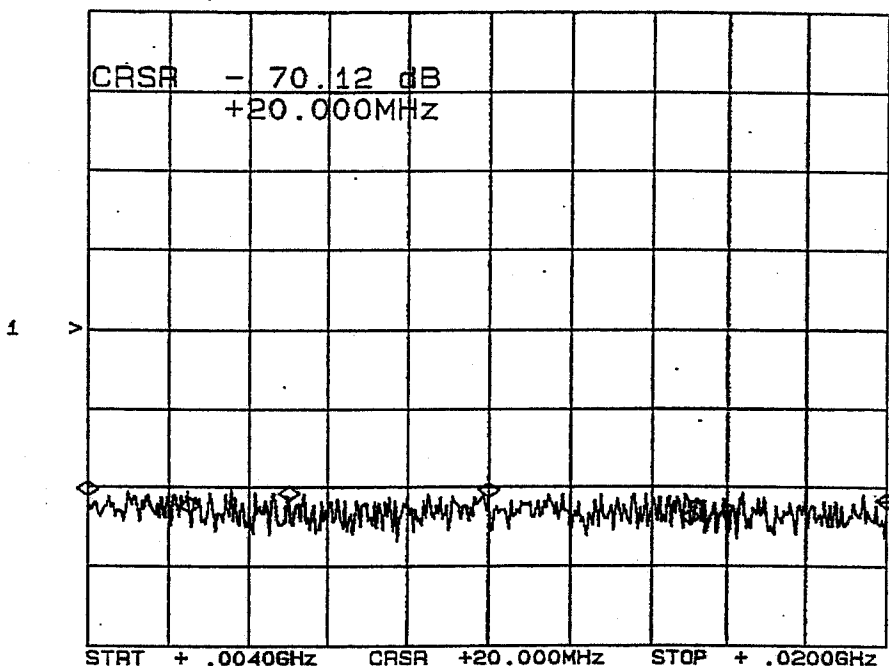


# SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## ISOLATION\* (AS MEASURED ON A SCALAR NETWORK ANALYZER) J3-J7

CH1: C -M - 70.12 dB  
20.0 dB/ REF - 25.00 dB



\*J3: INPUT ARM

FREQUENCY	ISOLATION
1.0 GHz	73.1 dB
2.0 GHz	67.0 dB
3.0 GHz	73.6 dB
4.0 GHz	70.7 dB
5.0 GHz	68.2 dB
6.0 GHz	70.1 dB

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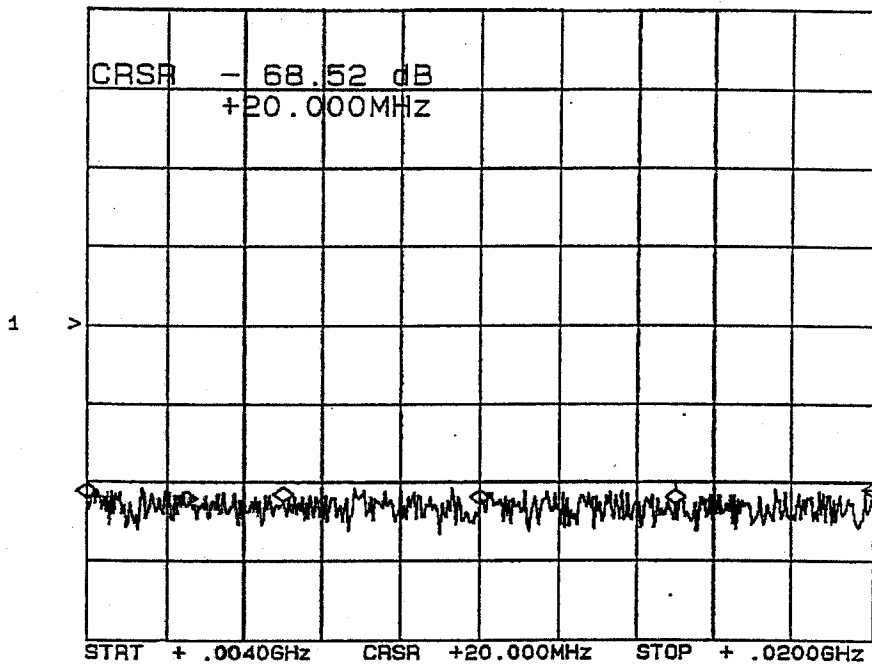


### SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

#### ISOLATION\* (AS MEASURED ON A SCALAR NETWORK ANALYZER) J3-J6

CH1: C -M - 68.52 dB  
20.0 dB/ REF - 25.00 dB



\*J3: INPUT ARM

FREQUENCY	ISOLATION
4 MHz	72.2 dB
6 MHz	73.8 dB
8 MHz	67.9 dB
12 MHz	70.9 dB
16 MHz	73.9 dB
20 MHz	68.5 dB

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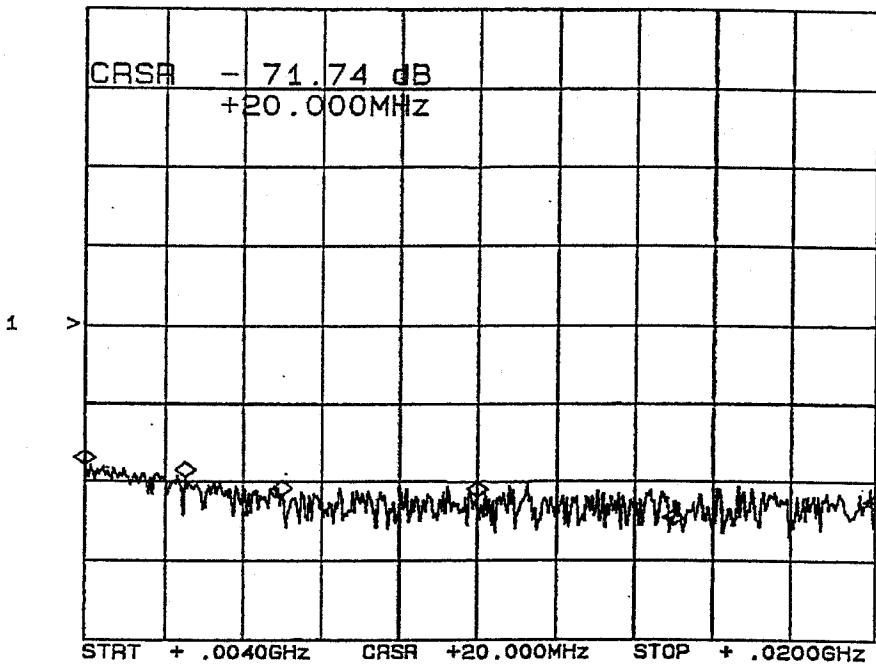


# SUMMARY TEST DATA

**MODEL NUMBER** : SWN-2181-TRA OPTION 4M6,IND,AC  
**SERIAL NUMBER** : TMS80907  
**TECHNICIAN** : RENE AFABLE  
**VOLTAGE & CURRENT DRAW** :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

**ISOLATION\***  
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)  
 J4-J6

CH1: C -M - 71.74 dB  
 20.0 dB/ REF - 25.00 dB



\*J4: INPUT ARM

FREQUENCY	ISOLATION
4 MHz	60.7 dB
6 MHz	67.5 dB
8 MHz	69.3 dB
12 MHz	70.4 dB
16 MHz	68.7 dB
20 MHz	71.4 dB

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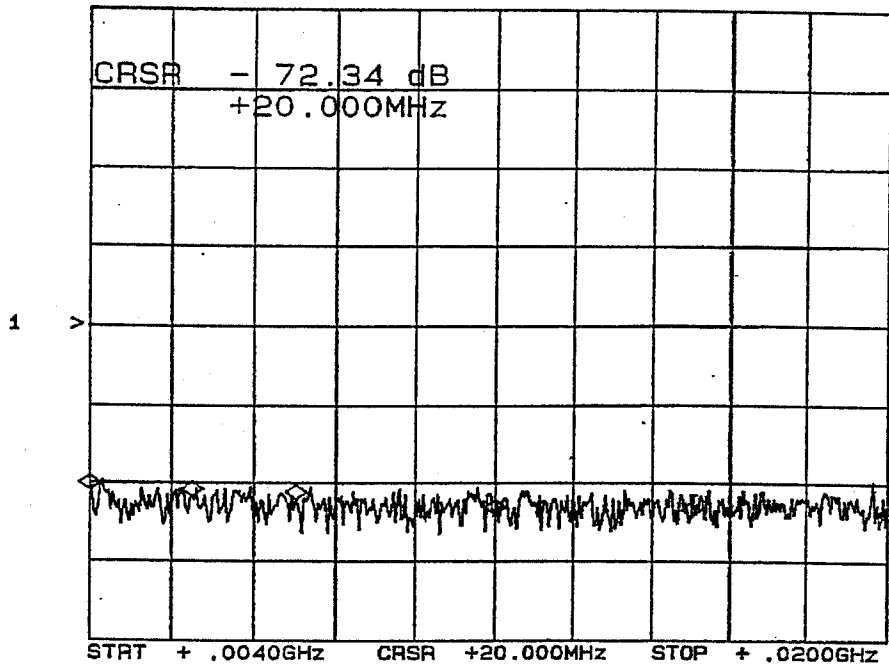


# SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
 SERIAL NUMBER : TMS80907  
 TECHNICIAN : RENE AFABLE  
 VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

**ISOLATION\***  
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)  
 J4-J7

CH1: C -M - 72.34 dB  
 20.0 dB/ REF - 25.00 dB



\*J4: INPUT ARM

FREQUENCY	ISOLATION
4 MHz	66.4 dB
6 MHz	66.8 dB
8 MHz	67.2 dB
12 MHz	73.4 dB
16 MHz	72.4 dB
20 MHz	72.3 dB

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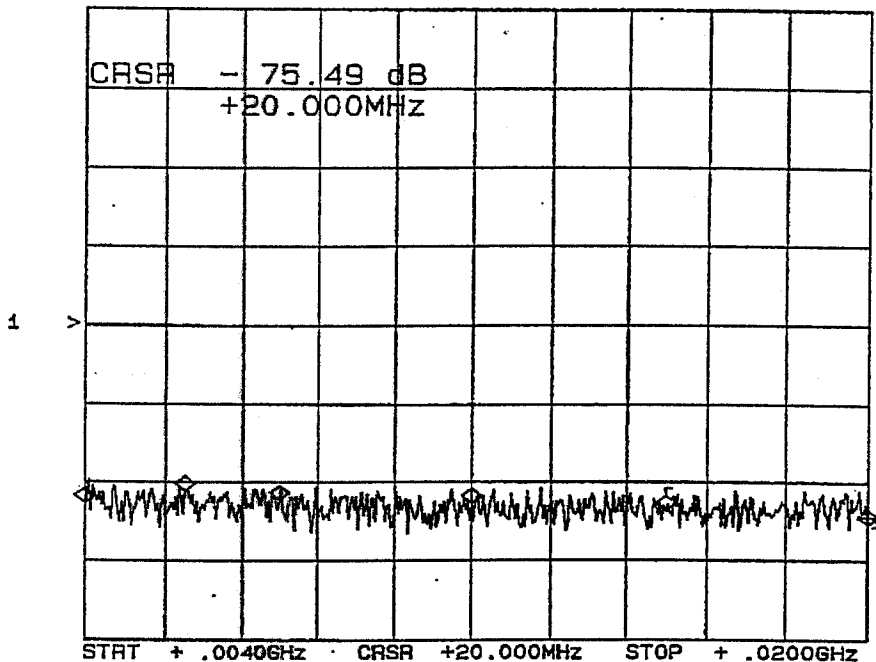


# SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
 SERIAL NUMBER : TMS80907  
 TECHNICIAN : RENE AFABLE  
 VOLTAGE & CURRENT DRAW :  $\pm 5$ vdc: +85mA, -28.3mA

**ISOLATION\***  
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)  
 J7-J3

CH1: C -M - 75.49 dB  
 20.0 dB/ REF - 25.00 dB



\*J7: INPUT ARM

FREQUENCY	ISOLATION
4 MHz	66.4 dB
6 MHz	73.9 dB
8 MHz	71.5 dB
12 MHz	72.5 dB
16 MHz	75.1 dB
20 MHz	75.4 dB

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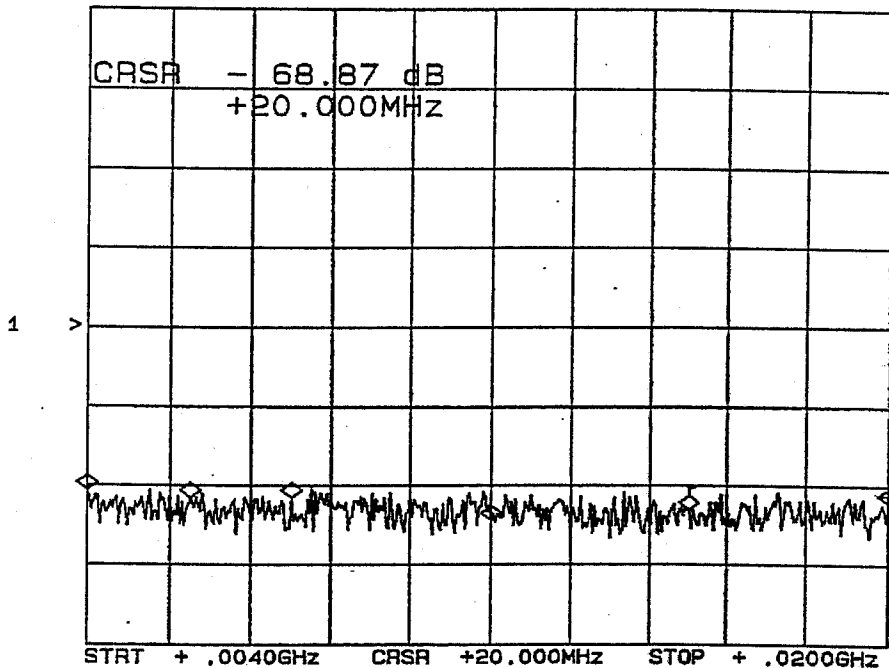


# SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## ISOLATION\* (AS MEASURED ON A SCALAR NETWORK ANALYZER) J7-J4

CH1: C -M - 68.87 dB  
20.0 dB/ REF - 25.00 dB



\*J7: INPUT ARM

FREQUENCY	ISOLATION
4 MHz	66.8 dB
6 MHz	71.8 dB
8 MHz	72.7 dB
12 MHz	72.8 dB
16 MHz	78.2 dB
20 MHz	68.8 dB

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# SUMMARY TEST DATA

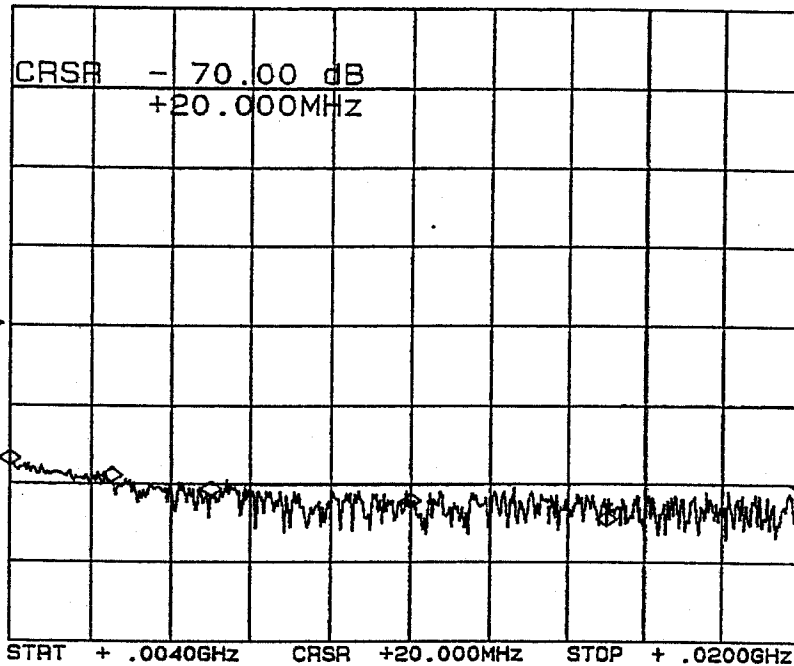
MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

## ISOLATION\*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J6-J4

CH1: C -M - 70.00 dB  
20.0 dB/ REF - 25.00 dB



\*J6: INPUT ARM

FREQUENCY	ISOLATION
4 MHz	59.8 dB
6 MHz	65.9 dB
8 MHz	68.4 dB
12 MHz	72.2 dB
16 MHz	71.3 dB
20 MHz	70.0 dB

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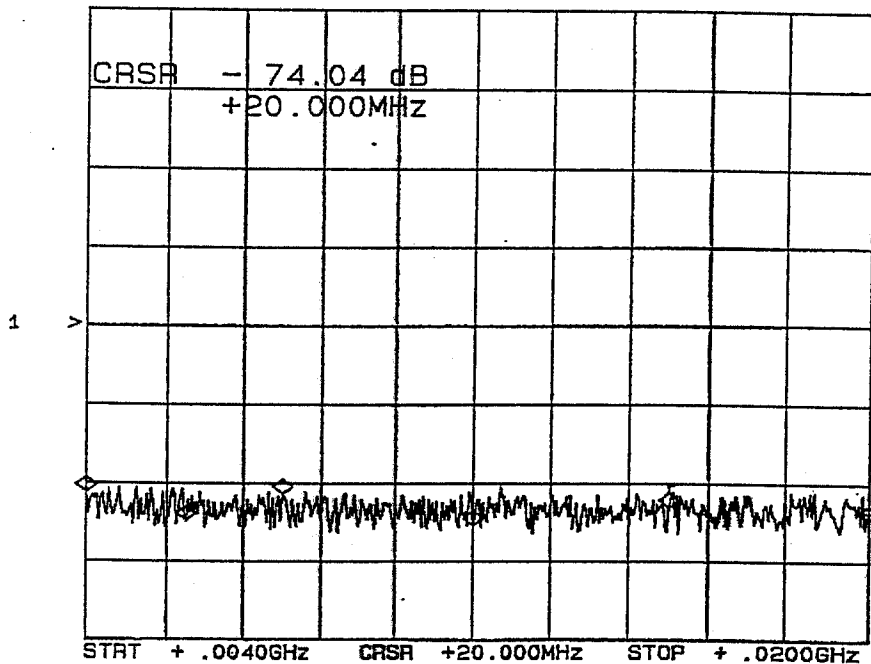


## SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5$ vdc: +85mA, -28.3mA

**ISOLATION\***  
(AS MEASURED ON A SCALAR NETWORK ANALYZER)  
J6-J3

CH1: C -M - 74.04 dB  
20.0 dB/ REF - 25.00 dB



\*J6: INPUT ARM

FREQUENCY	ISOLATION
4 MHz	65.8 dB
6 MHz	71.2 dB
8 MHz	73.1 dB
12 MHz	72.9 dB
16 MHz	68.4 dB
20 MHz	74.0 dB

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## SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

### SWITCHING SPEED

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

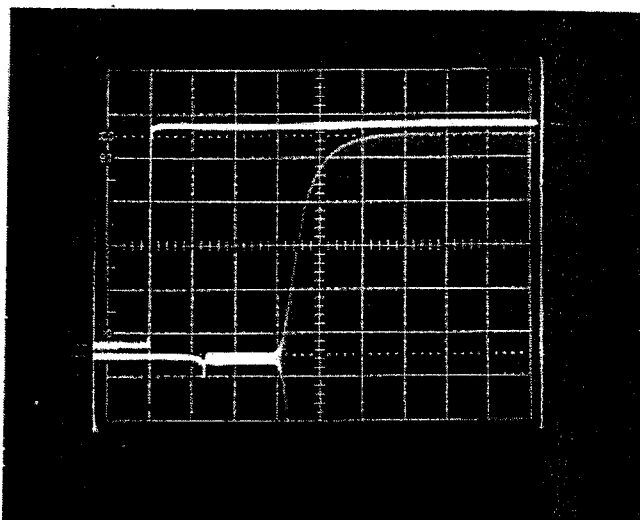
"On/Off" Time: 50% TTL to 90% RF or 10% RF

### TYPICAL OF ALL ARMS

"DELAY ON": 420nS  
"RISE TIME": 100nS

HORIZONTAL SCALE:  
100nS PER DIVISION

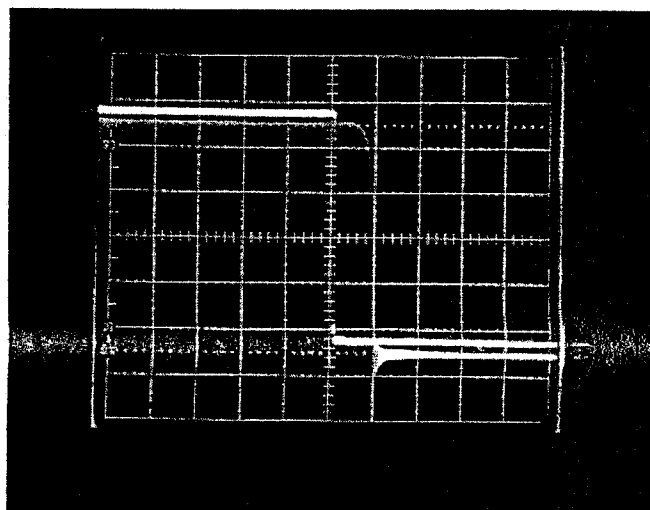
VERTICAL SCALE:  
10mV PER DIVISION



"DELAY OFF": 100nS  
"FALL TIME": 20nS

HORIZONTAL SCALE:  
100nS PER DIVISION

VERTICAL SCALE:  
10mV PER DIVISION



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# SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTION 4M6,IND,AC  
SERIAL NUMBER : TMS80907  
TECHNICIAN : RENE AFABLE  
VOLTAGE & CURRENT DRAW :  $\pm 5\text{vdc}$ : +85mA, -28.3mA

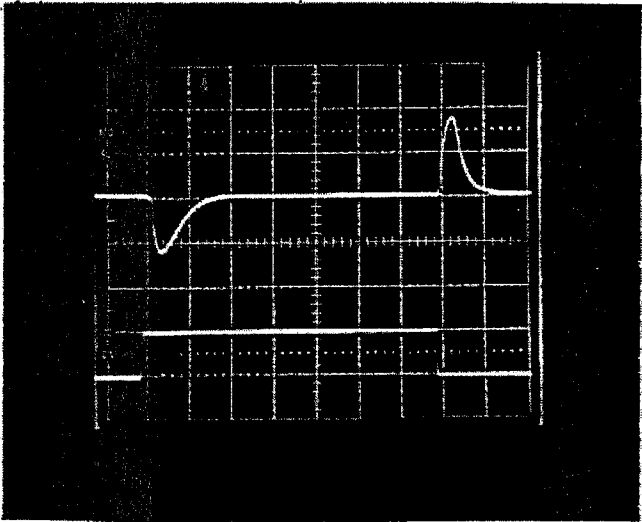
## VIDEO TRANSIENTS

TYPICAL OF ALL ARMS

$\leq 3.0 \text{ V P-P}$   
MEASURED IN A  
300 MHZ BANDWIDTH

VERTICAL SCALE:  
1.0V PER DIVISION

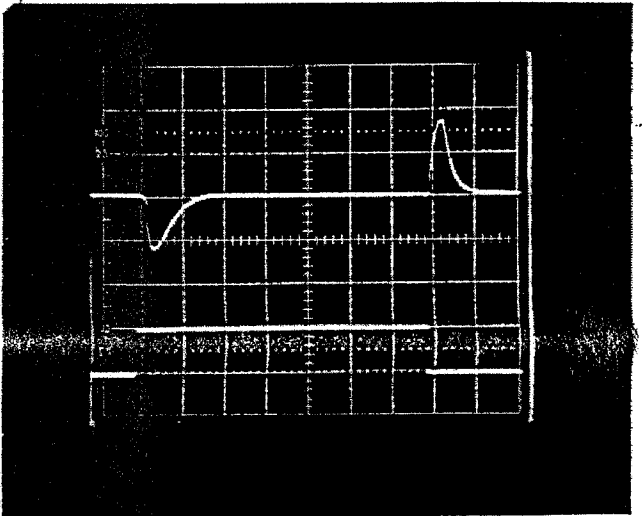
HORIZONTAL SCALE:  
0.5 $\mu\text{s}$  PER DIVISION



$\leq 3.0 \text{ V P-P}$   
MEASURED IN A  
20 MHZ BANDWIDTH

VERTICAL SCALE:  
1.0V PER DIVISION

HORIZONTAL SCALE:  
0.5 $\mu\text{s}$  PER DIVISION



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