



TEST DATA

ON

500 MHz TO 18 GHz

FROM 100 MHz TO 2 GHz

AND

FROM 2 GHz TO 6 GHz

MINIATURE

HIGH SPEED

PHASE ($\pm 5^\circ$) AND AMPLITUDE (± 0.5 dB) MATCHED

TRANSFER SWITCH

AMC MODEL No:

SWN-2181-TRA OPTIONS 0518, 2SH

(Serial Number: TMS90639)

REPORTED AND PREPARED

BY

RENE AFABLE

MARCH 3, 2000

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

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



MINIATURE TRANSFER SWITCH



KEY FEATURES

- 500 MHz TO 18 GHz
(10MHz to 18GHz optional)
- LOW INSERTION LOSS
- HIGH SPEED
- TTL LOGIC COMPATIBLE
- SURFACE MOUNTABLE

AMC MODEL No: SWN-2181-TRA OPTIONS 0518, 2SH

SPECIFICATIONS: (NON-REFLECTIVE)

● FREQUENCY RANGE	:	500 MHz to 18 GHz (10MHz to 18GHz Optional)
● INSERTION LOSS	:	3.0 dB MAX.
	:	1.30 dB TYP. @ 500 MHz
	:	1.40 dB TYP. @ 2.0 GHz
	:	1.75 dB TYP. @ 6.0 GHz
	:	2.75 dB TYP. @ 14.0 GHz
	:	3.00 dB TYP. @ 18.0 GHz
● ISOLATION	:	≥ 60 dB MIN.
	:	≥ 35 dB TYP. @ 500 MHz
	:	≥ 90 dB TYP. @ 2.0 GHz
	:	≥ 80 dB TYP. @ 6.0 GHz
	:	≥ 70 dB TYP. @ 14.0 GHz
	:	≥ 70 dB TYP. @ 18.0 GHz
● VSWR	:	2.0:1
● SWITCHING SPEED	:	"RISE" 15nS MAX., 10nS TYP.
(10%/90% RF TO 90%/10% RF)	:	"FALL" 15nS MAX., 10nS TYP.
(50% TTL TO 90%/10% RF)	:	"ON" 75nS MAX., 100nS TYP.
	:	"OFF" 75nS MAX., 100nS TYP.
● CONTROL	:	SINGLE CONTROL TTL COMPATIBLE
● VIDEO TRANSIENTS	:	≤900 mV Peak to Peak, 300 MHZ Bandwidth
	:	≤220 mV Peak to Peak, 20 MHZ Bandwidth
● RF INPUT POWER	:	+20dBm Operating, 1 Watt Survival (Other power Levels available)
● DC POWER SUPPLY	:	+5vdc @ +100mA MAX.
(Other supply voltages available)	:	- 12vdc @ -100mA MAX.
● SIZE	:	1.00"(L) X 1.00"(W) X 0.50"(H)
● WEIGHT	:	≤ 1.5 oz.

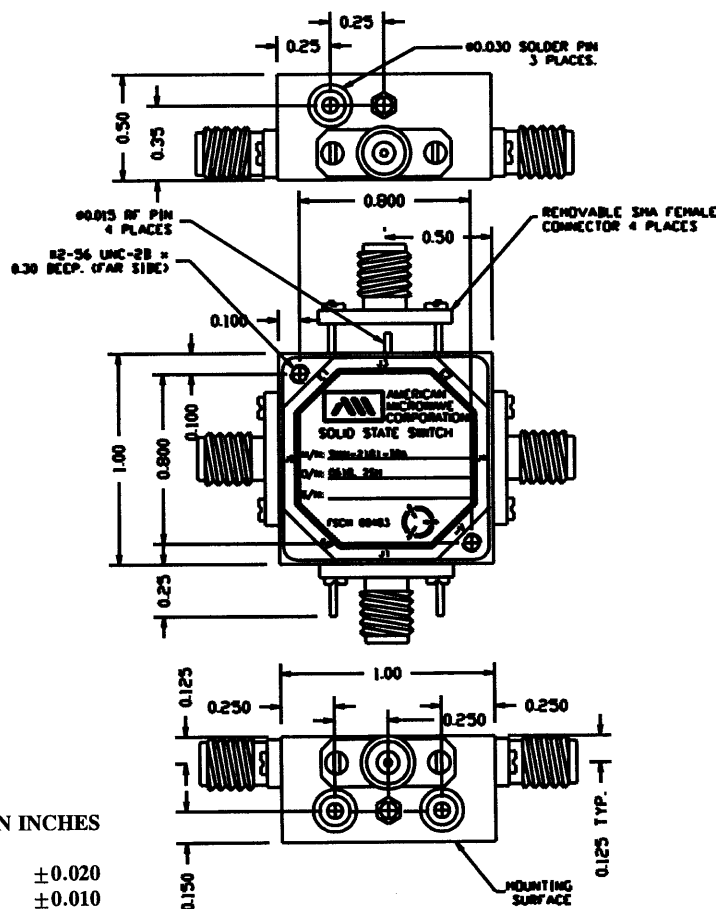
MARCH 3, 2000

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SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA



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.

MARCH 3, 2000

REVISIONS	DATE	APPROVED
DESCRIPTION	02/18/00	
ORIGINAL RELEASE		
ZONE	REV.	

DESCRIPTION:
 AMC MODEL SWN-2181-TRA IS A TRANSFER SWITCH MODULE WITH LOW INSERTION LOSS, HIGH ISOLATION AND WITH INTEGRAL TTL DRIVER IN A SMALL 1.0" x 1.0" x 0.5" PACKAGE, DESIGNED FOR 0.5 GHz TO 18 GHz OPERATION.

SPECIFICATIONS:

- FREQUENCY: - 0.5 GHz TO 18 GHz
- INSERTION LOSS: - 3.5 dB MAX. @ 18 GHz
- ISOLATION: - 0.5 GHz TO 18 GHz: 60 dB MINIMUM
- VSWR: - IN/OUT: 2.0:1
- SPEED: - RISE: 10ns TYPICAL, 15ns MAXIMUM
 FALL: 10ns TYPICAL, 15ns MAXIMUM
 DELAY ON: 75ns TYPICAL, 100ns MAXIMUM
 DELAY OFF: 75ns TYPICAL, 100ns MAXIMUM
- POWER INPUT: - (CW)+27 dBm(500 mW) (STANDARD), +10 dBm (HIGH SPEED)
- SURVIVAL POWER: - 75 WATTS CW, 10 WATTS PEAK 1 usec PULSE WIDTH
- POWER SUPPLY: - +5V @ 100 mA MAXIMUM
 -5V @ 100 mA MAXIMUM
- CONTROL: - SEE TABLE 1
- SIZE: - 1.00 (L) x 1.00 (W) x 0.50 (H)
- WEIGHT: - 1.5 OUNCES TYPICAL

OPTIONS:

- SINGLE CONTROL WITH SOLDER PIN STANDARD
- IND-SP - INDEPENDANT CONTROL WITH SOLDER PIN
- 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
- 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

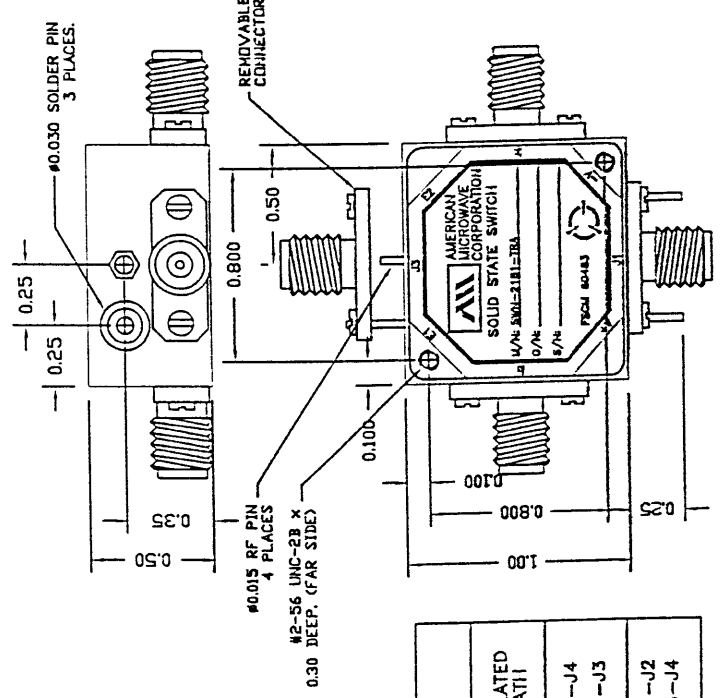
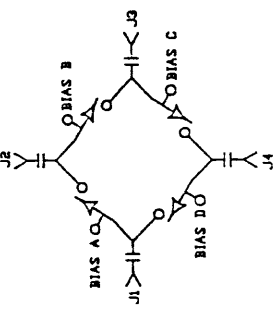


TABLE 1

TTL LOGIC	LOW LOSS PATH	ISOLATED PATH
0	J1-J2 J3-J4	J1-J4 J2-J3
1	J1-J4 J2-J3	J1-J2 J3-J4

BLOCK DIAGRAM



ALL DIMENSIONS ARE IN INCHES

TOLERANCES:
 X.XX ±0.020
 X.XXX ±0.010

CONTRACT NO.	AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND
TITLE	OUTLINE DRAWING SWN-2181-TRA TRANSFER SWITCH
APPROVALS	DATE
DRAWN: Wyp & Rd	02/18/00
CHECKED: [Signature]	2/22/00
ISSUED: [Signature]	2/22/00
SIZE	FSCM NO.
A	60483
SCALE	N/S
REV.	DWG NO.
-	100-4708-1
SHEET	1 of 3

ZONE	REV.	DESCRIPTION	DATE	APPROVED
		ORIGINAL RELEASE	02/18/00	

DESCRIPTION:
 AMC MODEL SWN-2181-TRA-IND-SP IS A TRANSFER SWITCH MODULE WITH LOW INSERTION LOSS, HIGH ISOLATION AND WITH INTEGRAL TTL DRIVER IN A SMALL 1.0" x 1.0" x 0.5" PACKAGE, DESIGNED FOR 0.5 GHz TO 18 GHz OPERATION.

SPECIFICATIONS:

- FREQUENCY: - 0.5 GHz TO 18 GHz
- INSERTION LOSS: - 3.5 dB MAX. @ 18 GHz
- ISOLATION: - 0.5 GHz TO 18 GHz: 60 dB MINIMUM
- VSWR: - IN/OUT: 2.0:1
- SPEED: - RISE: 10ns TYPICAL, 15ns MAXIMUM
 FALL: 10ns TYPICAL, 15ns MAXIMUM
 DELAY ON: 75ns TYPICAL, 100ns MAXIMUM
 DELAY OFF: 75ns TYPICAL, 100ns MAXIMUM
- POWER INPUT: - (CW)+27 dBm(500 mW) (STANDARD), +10 dBm (HIGH SPEED)
- SURVIVAL POWER: - -75 WATTS CW, 10 WATTS PEAK 1 usec PULSE WIDTH
- POWER SUPPLY: - +5V @ 100 mA MAXIMUM
 -5V @ 100 mA MAXIMUM
- CONTROL: - SEE TABLE 1
- SIZE: - 1.00 (L) x 1.00 (W) x 0.50 (H)
- WEIGHT: - 1.5 OUNCES TYPICAL

OPTIONS:

- SINGLE CONTROL WITH SOLDER PIN STANDARD
- IND-SP - INDEPENDANT CONTROL WITH SOLDER PIN
- 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
- 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

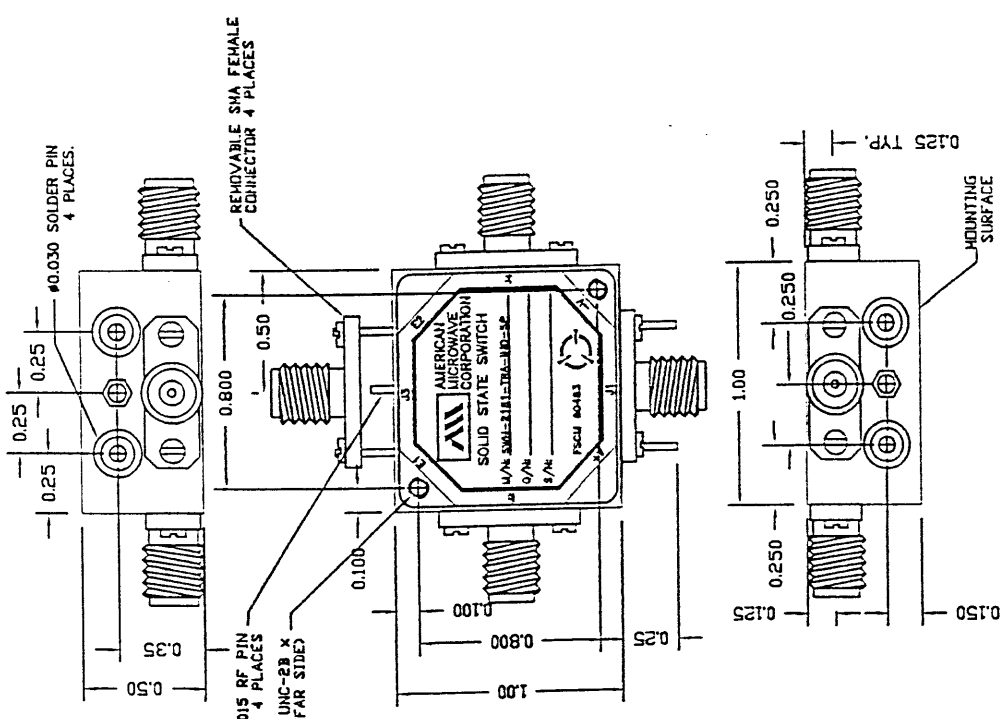
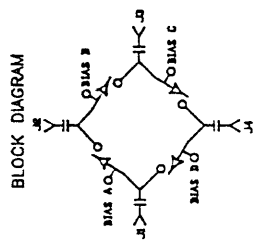


TABLE 1

CTL	TTL LOGIC	LOW LOSS PART	ISOLATED PART
E1	0	J1-J2 J3-J4	J1-J2 J3-J4
E2	0	J1-J4 J2-J3	J1-J4 J2-J3



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

CONTRACT NO.		AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND	
APPROVALS	DATE	TITLE	
DRAWN Wyp & Rd	02/18/00	OUTLINE DRAWING	
CHECKED RA	2/21/00	SWN-2181-TRA-IND-SP	
ISSUED WJ	2/21/00	TRANSFER SWITCH	
SIZE A	FSCM NO. 60483	DWG NO. 100-4708-2	REV. -
SCALE N/S		SHEET 1 of 3	

DESCRIPTION:
 AMC MODEL SWN-TRA-618 IS A TRANSFER SWITCH MODULE WITH LOW INSERTION LOSS, HIGH ISOLATION AND WITH INTEGRAL TTL DRIVER IN A SMALL 1.0" x 1.0" x 0.5" PACKAGE, DESIGNED FOR 6 GHz TO 18 GHz OPERATION.

- SPECIFICATIONS:**
- FREQUENCY: - 6.0 GHz TO 18.0 GHz
 - INSERTION LOSS: - 3.0 dB MAX, 2.5 dB TYP.
 - ISOLATION: - 65 dB MIN
 - SPEED: - DELAY ON: 500ns MAX, 100ns TYP.
 - DELAY OFF: 500ns MAX, 100ns TYP.
 - POWER INPUT: - CW, +20 dBm (TYPICAL)
 - SURVIVAL POWER: - 1 WATT CW, 10 WATTS PEAK 1 usec
 - CONTROL: - SEE TABLE 1
 - POWER SUPPLY: - +5V Φ 150 mA MAX.
 -12V Φ 150 mA MAX.
 - TEMPERATURE: - -54°C TO +85°C
 - CONNECTORS: - SMA FEMALE (REMOVABLE)
 - SIZE - 1.00" (L) x 1.00" (W) x 0.50" (H)
 - WEIGHT - 1.5 OZ.

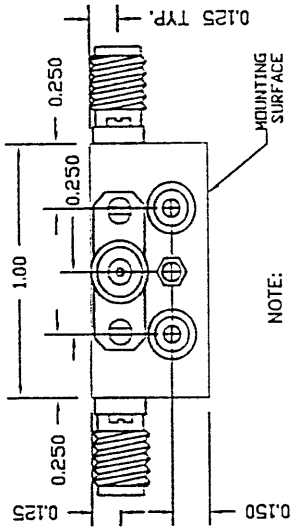
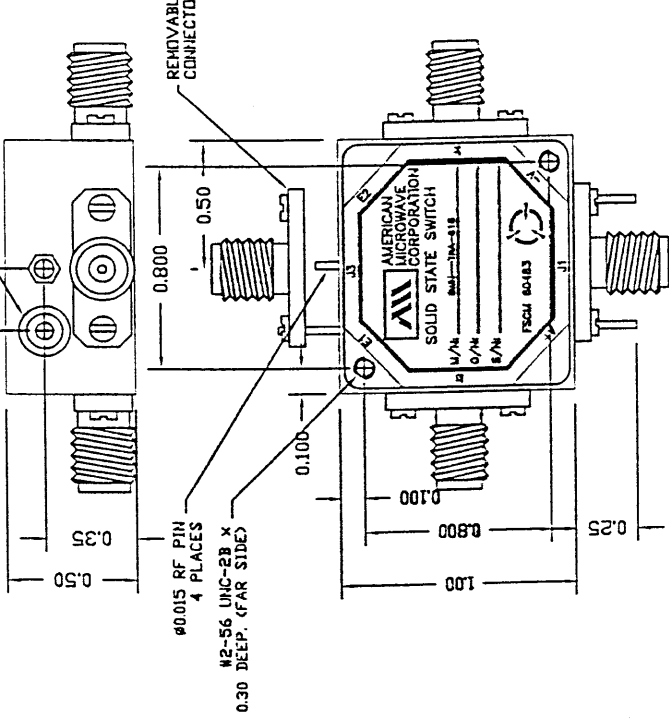
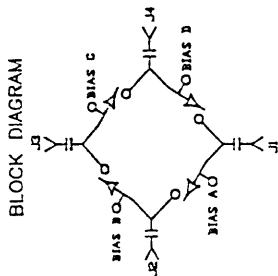


TABLE 1

TTL LOGIC	LOW LOSS PATH	ISOLATED PATH
0	J1-J2 J3-J4	J1-J4 J2-J3
1	J1-J4 J2-J3	J1-J2 J3-J4



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

CONTRACT NO. AMERICAN MICROWAVE CORPORATION
 FREDERICK, MARYLAND

TITLE: OUTLINE DRAWING FOR INDRA (SW09)
 SWN-TRA-618
 TRANSFER SWITCH

DATE: 02/18/00
 DRAWN: JY & Bud
 CHECKED: [Signature]
 ISSUED: [Signature]

SIZE: A
 FSCU NO.: 60483
 DWG NO.: 100-4708-3
 REV.:

SCALE: N/S
 SHEET: 1 of 3

DESCRIPTION:

AMC MODEL SWN-2181-TRA-26 IS A TRANSFER SWITCH MODULE WITH LOW INSERTION LOSS, HIGH ISOLATION AND WITH INTEGRAL TTL DRIVER IN A SMALL 1.0" x 1.0" x 0.5" PACKAGE, DESIGNED FOR 2 GHz TO 6 GHz OPERATION.

SPECIFICATIONS:

- FREQUENCY: - 2.0 GHz TO 6.0 GHz
- INSERTION LOSS: - 2.0 dB MAX, 1.6 dB TYP.
- ISOLATION: - 65 dB MIN
- SPEED: - DELAY ON: 500ns MAX., 100ns TYP.
- DELAY OFF: 500ns MAX., 100ns TYP.
- POWER INPUT: - CW, +20 dBm (TYPICAL)
- SURVIVAL POWER: - 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL: - SEE TABLE 1
- POWER SUPPLY: - +5V @ 150 mA MAX.
- 12V @ 150 mA MAX.
- TEMPERATURE: - -54°C TO +85°C
- CONNECTORS: - SMA FEMALE (REMOVABLE)
- SIZE - 1.00" (L) x 1.00" (W) x 0.50" (H)
- WEIGHT - 1.5 OZ.

BLOCK DIAGRAM

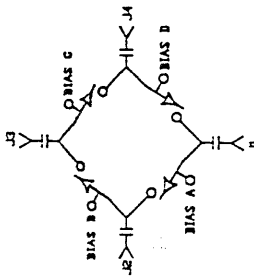


TABLE 1

TTL LOGIC	LOW LOSS PATH	ISOLATED PATH
0	J1-J2 J3-J4	J1-J4 J2-J3
1	J1-J4 J2-J3	J1-J2 J3-J4

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

ALL DIMENSIONS ARE IN INCHES

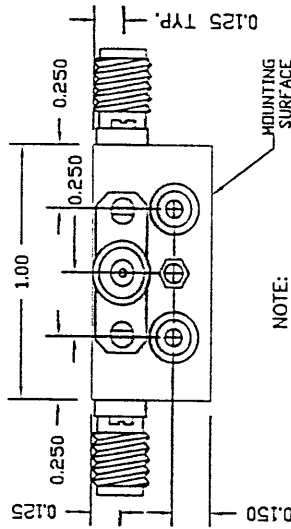
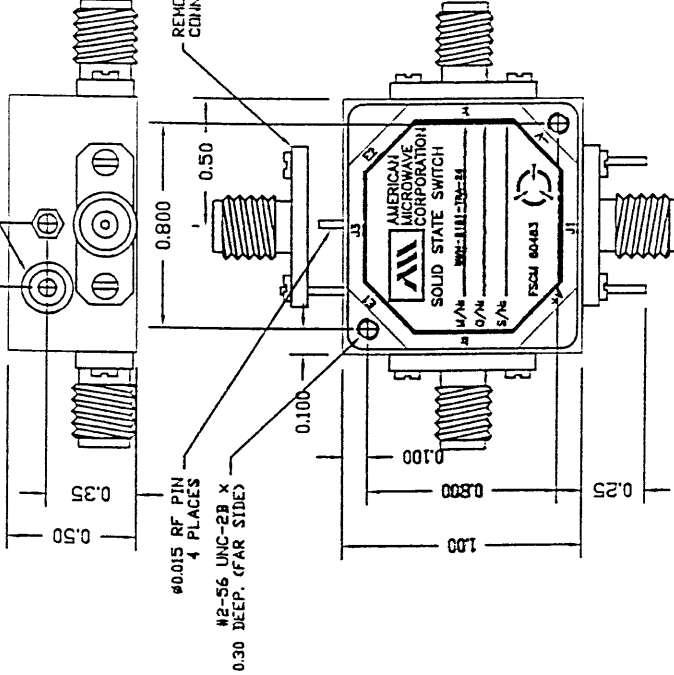
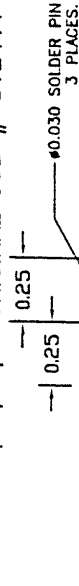
TOLERANCES:

- X.XX ±0.020
- X.XXX ±0.010

REVISIONS

DATE 1/15/99

DESCRIPTION ORIGINAL JOB # 812411-6E



NOTE:

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

CONTRACT NO.

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

TITLE
OUTLINE DRAWING FOR INDRA (SW07)
SWN-2181-TRA-26
TRANSFER SWITCH

APPROVALS	DATE
DRAWN Xy & Jd	02/18/00
CHECKED [Signature]	2/24/00
ISSUED [Signature]	2/24/00

REV. 100-4708-4

SIZE FSCM NO. A 60483
DWG NO. 100-4708-4
SCALE N/S

SHEET 1 of 3

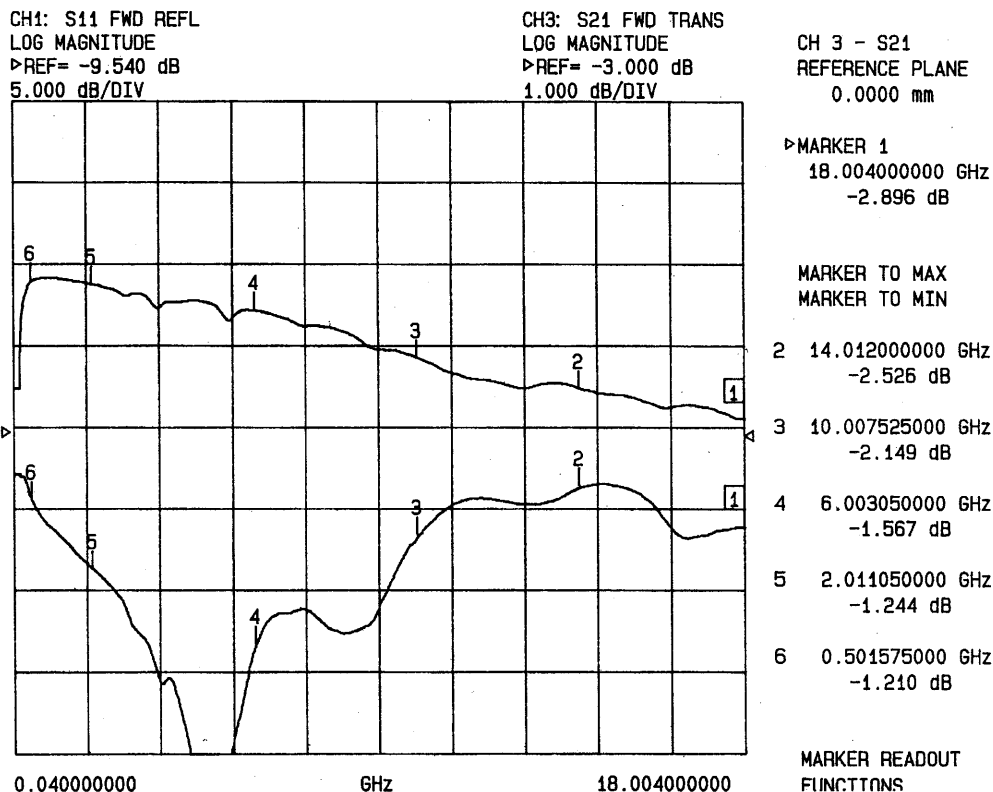


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J1-J2



*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
500 MHz	1.21 dB	13.99 dB
2.0 GHz	1.24 dB	18.27 dB
6.0 GHz	1.56 dB	22.86 dB
10.0 GHz	2.14 dB	16.22 dB
14.0 GHz	2.52 dB	13.19 dB
18.0 GHz	2.89 dB	15.64 dB

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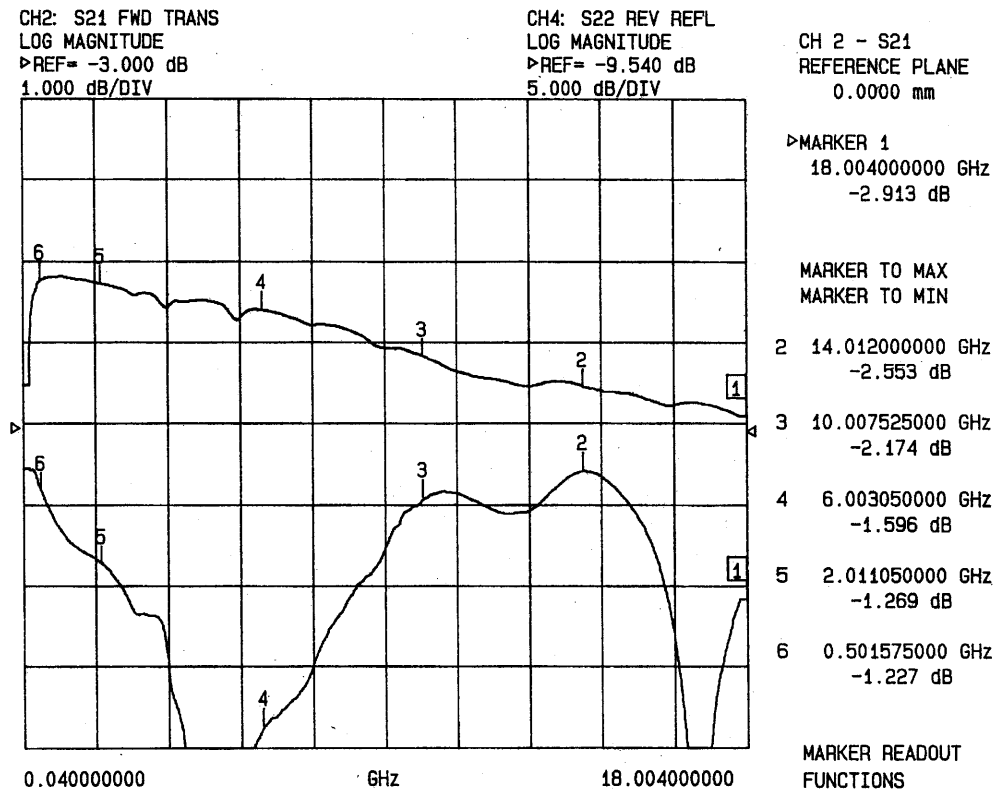


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J2-J1



*J2: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
500 MHz	1.22 dB	13.66 dB
2.0 GHz	1.26 dB	18.14 dB
6.0 GHz	1.59 dB	28.27 dB
10.0 GHz	2.17 dB	14.12 dB
14.0 GHz	2.55 dB	12.43 dB
18.0 GHz	2.91 dB	20.32 dB

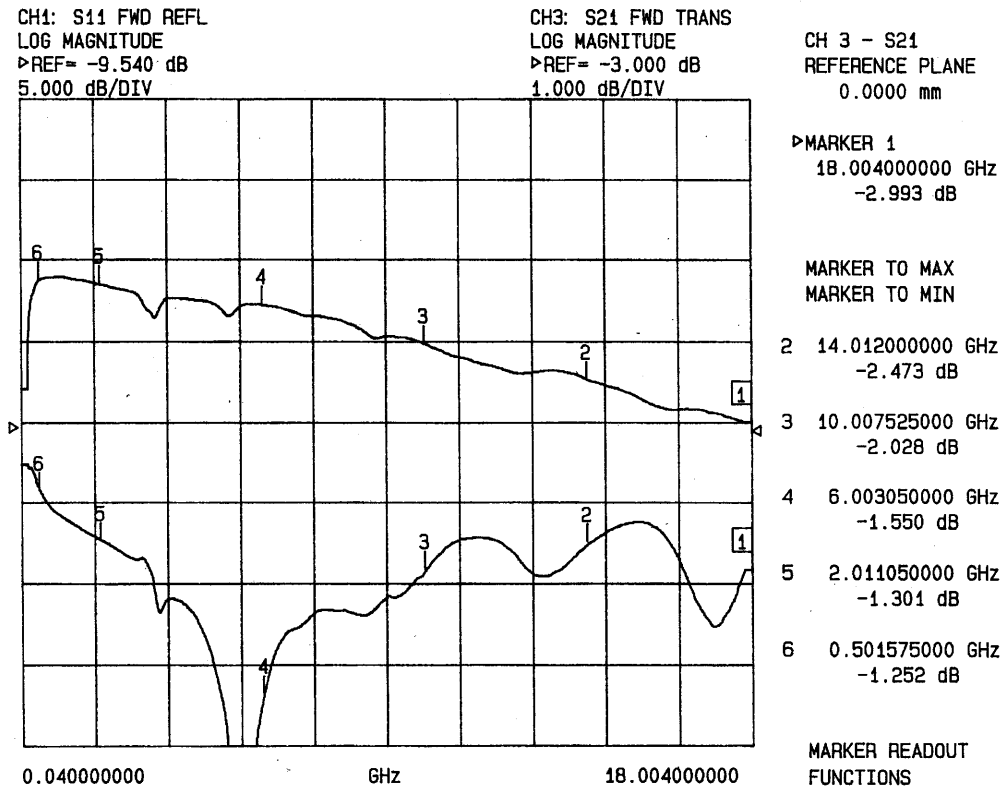
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*
J3-J4



*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
500 MHz	1.25 dB	13.74 dB
2.0 GHz	1.30 dB	16.87 dB
6.0 GHz	1.55 dB	26.32 dB
10.0 GHz	2.02 dB	18.67 dB
14.0 GHz	2.47 dB	17.04 dB
18.0 GHz	2.99 dB	18.69 dB

MARCH 3, 2000

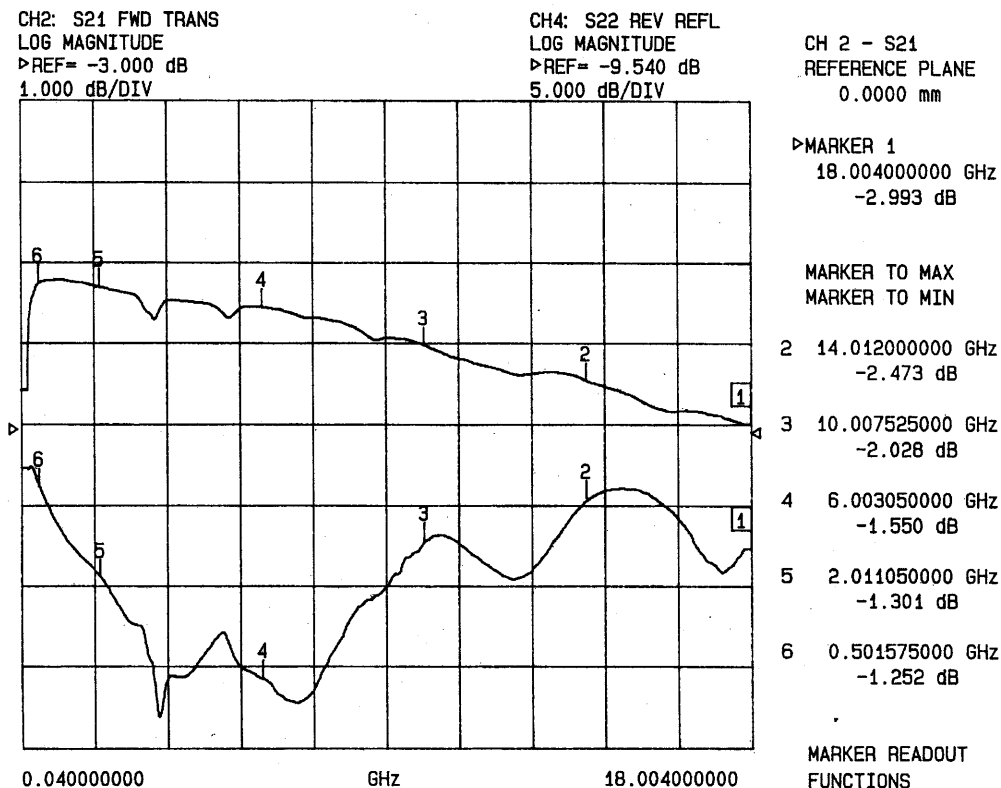


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J4-J3



*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
500 MHz	1.25 dB	13.32 dB
2.0 GHz	1.30 dB	19.00 dB
6.0 GHz	1.55 dB	25.31 dB
10.0 GHz	2.02 dB	16.67 dB
14.0 GHz	2.47 dB	14.13 dB
18.0 GHz	2.99 dB	17.16 dB

MARCH 3, 2000

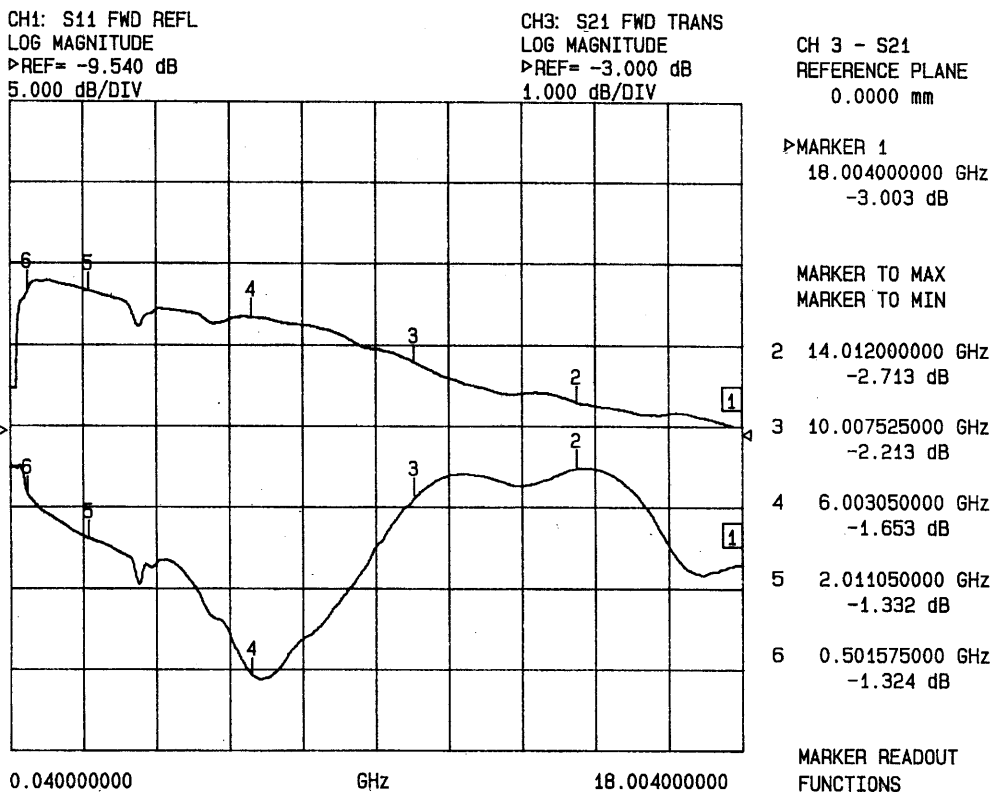


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J1-J4



*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	1.32 dB	13.81 dB
4.0 GHz	1.33 dB	16.48 dB
6.0 GHz	1.65 dB	24.93 dB
8.0 GHz	2.21 dB	13.91 dB
12.0 GHz	2.71 dB	12.13 dB
18.0 GHz	3.00 dB	18.06 dB

MARCH 3, 2000

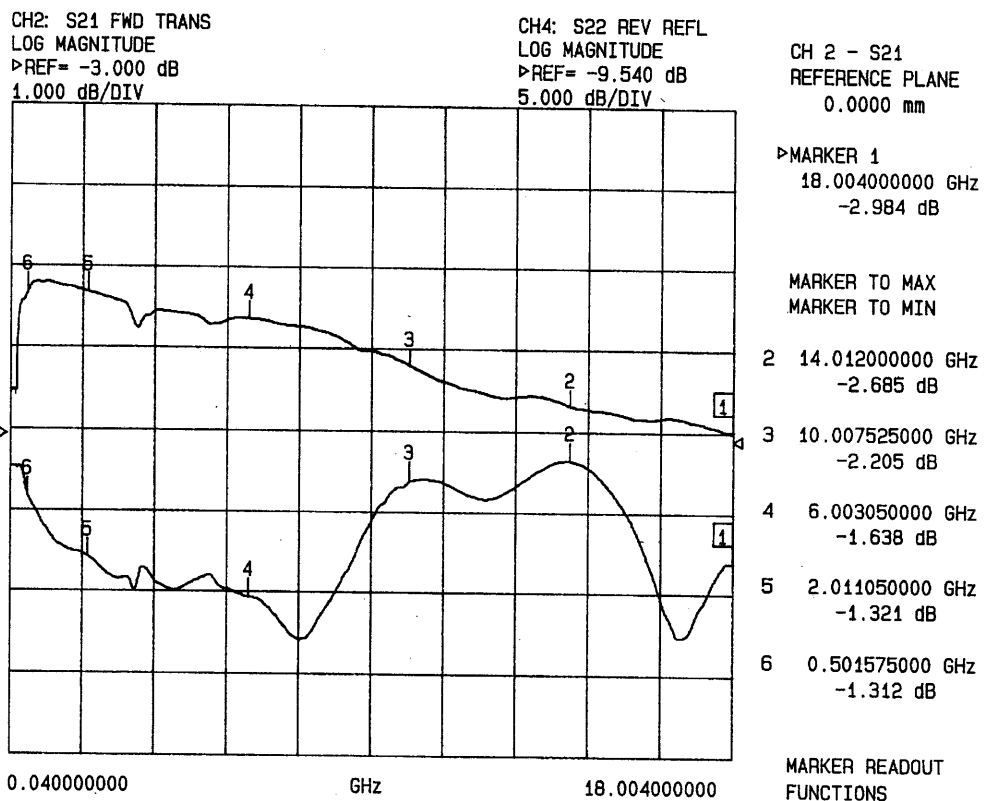


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J4-J1



*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	1.31 dB	13.66 dB
4.0 GHz	1.32 dB	17.43 dB
6.0 GHz	1.63 dB	19.89 dB
8.0 GHz	2.20 dB	12.57 dB
12.0 GHz	2.68 dB	11.32 dB
18.0 GHz	2.98 dB	17.60 dB

MARCH 3, 2000

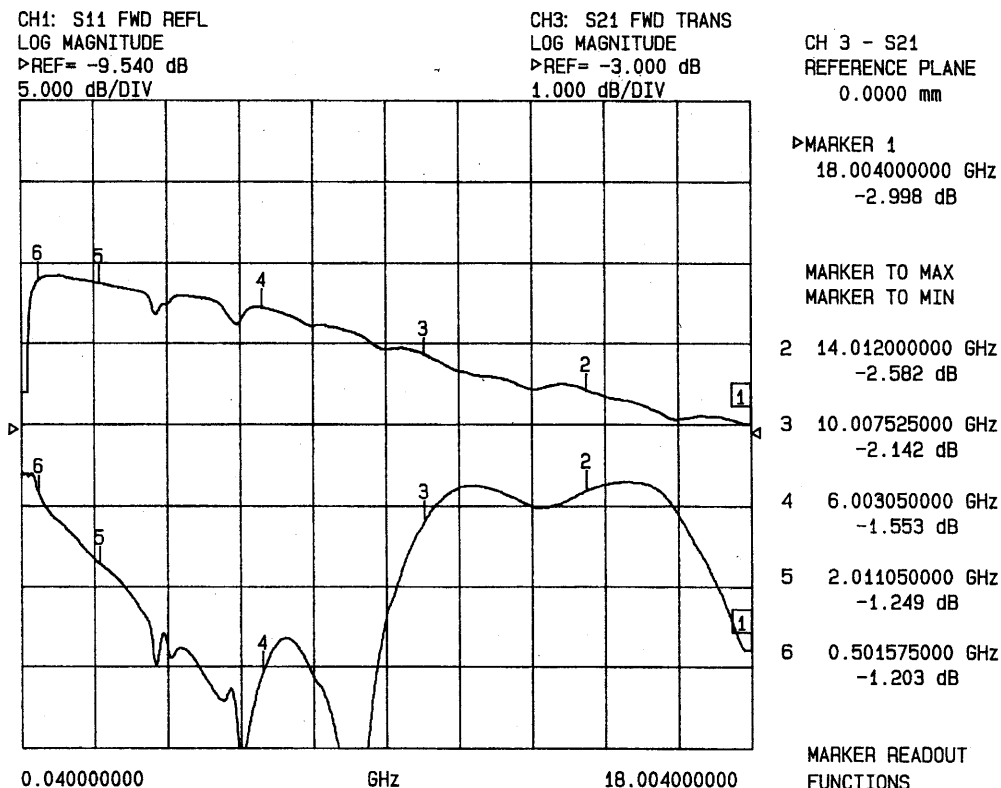


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J2-J3



*J2: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	1.20 dB	13.82 dB
4.0 GHz	1.24 dB	18.15 dB
6.0 GHz	1.55 dB	24.76 dB
8.0 GHz	2.14 dB	15.34 dB
12.0 GHz	2.58 dB	13.49 dB
18.0 GHz	2.99 dB	23.52 dB

MARCH 3, 2000

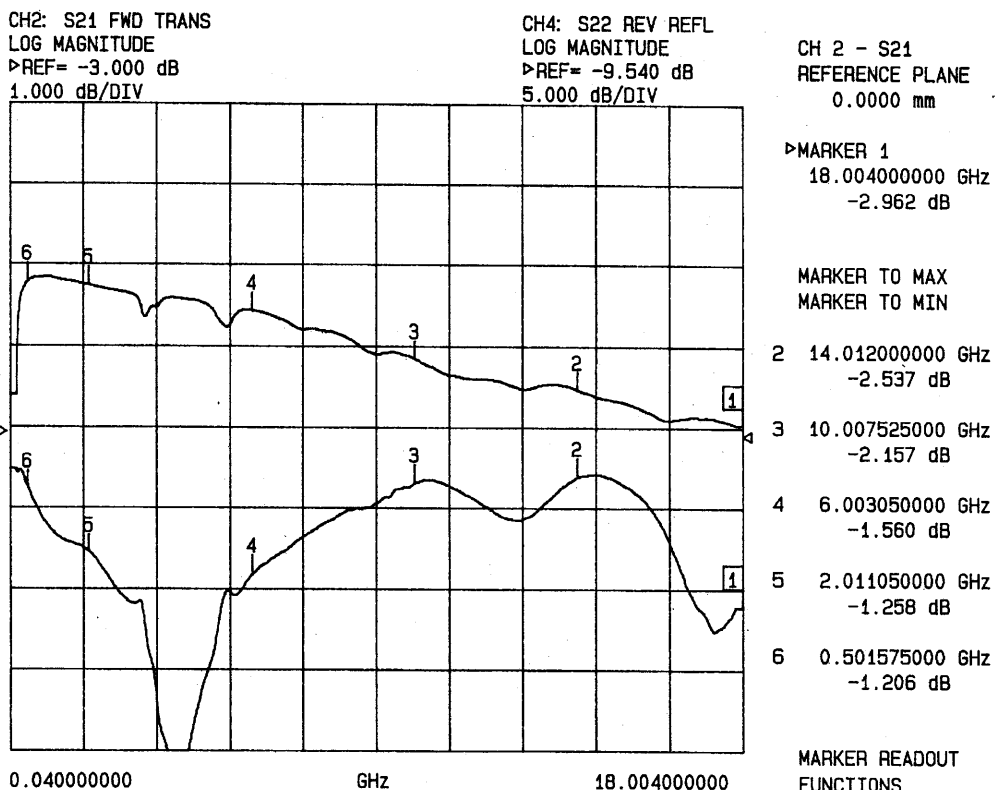


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J3-J2



*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	1.20 dB	13.34 dB
4.0 GHz	1.25 dB	17.31 dB
6.0 GHz	1.56 dB	18.62 dB
8.0 GHz	2.15 dB	12.91 dB
12.0 GHz	2.53 dB	12.54 dB
18.0 GHz	2.96 dB	20.60 dB

MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

ISOLATION*

(AS MEASURED ON A SPECTRUM ANALYZER)

FREQUENCY	J1-J2	J3-J4	J1-J4	J2-J3
200 MHZ	16 dB	17 dB	17 dB	36 dB
500 MHZ	35 dB	35 dB	51 dB	71 dB
1 GHz	79 dB	78 dB	97 dB	97 dB
2 GHz	108 dB	97 dB	112 dB	92 dB
4 GHz	109 dB	96 dB	110 dB	78 dB
6 GHz	89 dB	86 dB	109 dB	83 dB
8 GHz	82 dB	86 dB	81 B	92 dB
10 GHz	90 dB	96 dB	98 dB	86 dB
12 GHz	63 dB	67 dB	72 dB	74 dB
14 GHz	71 dB	77 dB	70 dB	79 dB
16 GHz	68 dB	67 dB	65 dB	77 dB
18 GHz	85 dB	76 dB	88 dB	74 dB

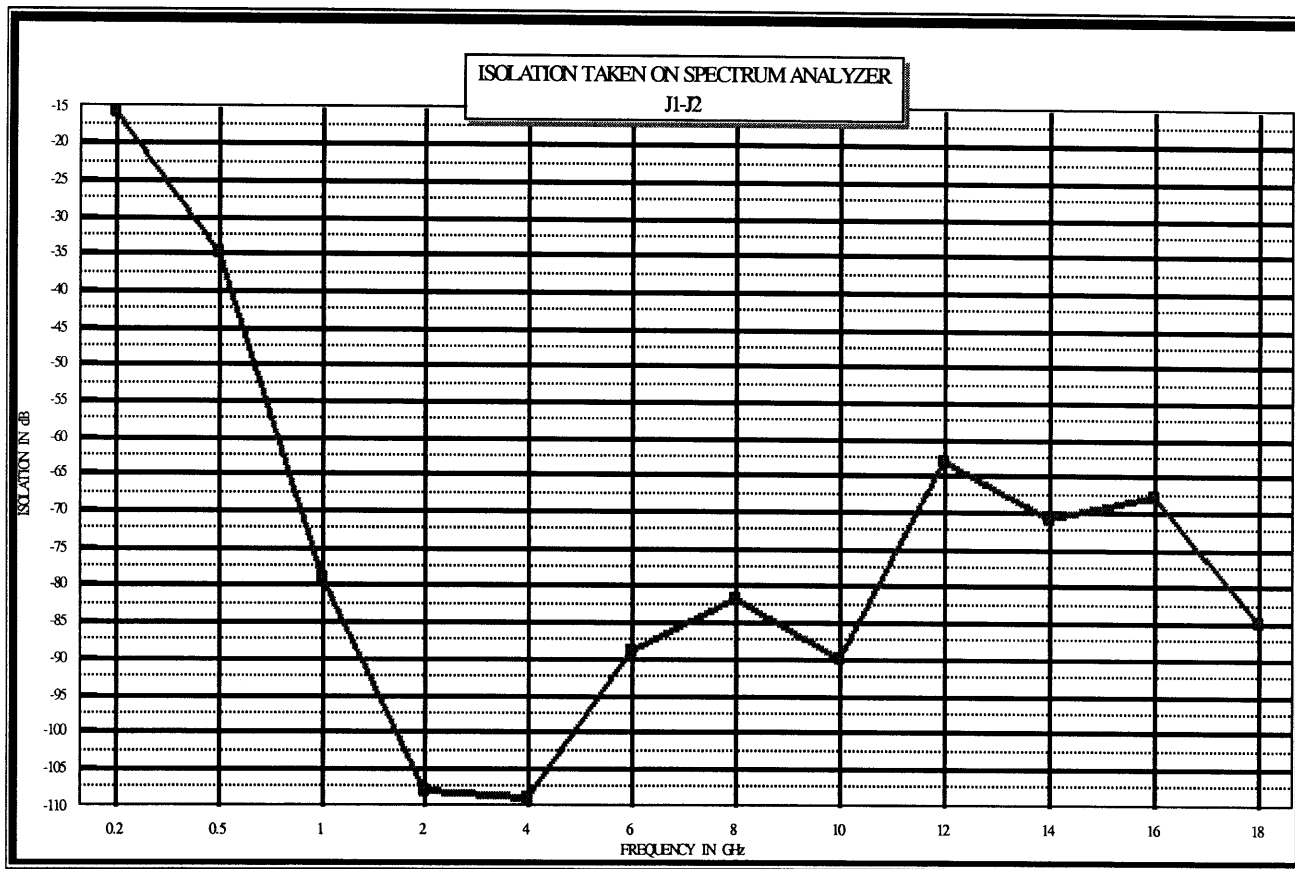
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

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



*J1: INPUT ARM

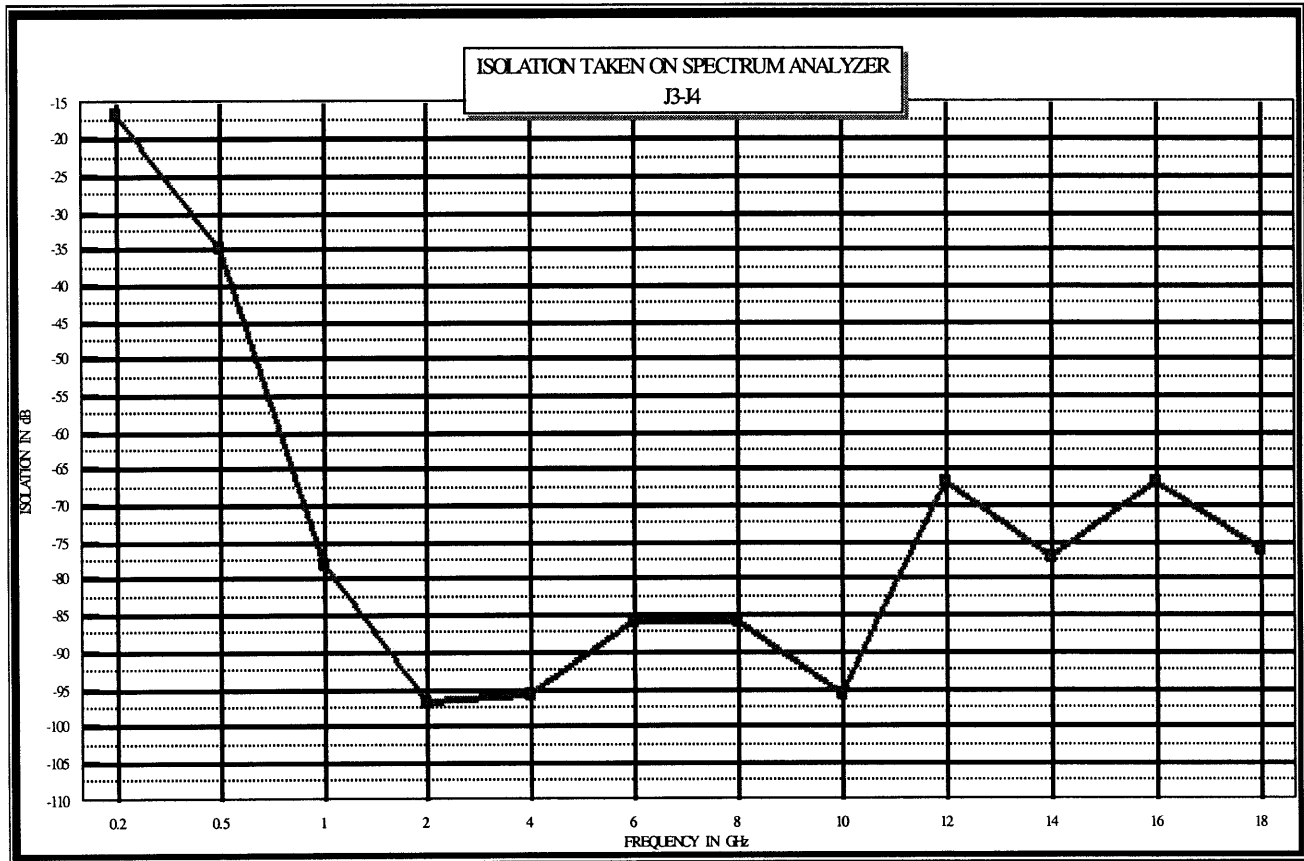
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

ISOLATION*
 (AS MEASURED ON A SPECTRUM ANALYZER)
J3-J4



*J3: INPUT ARM

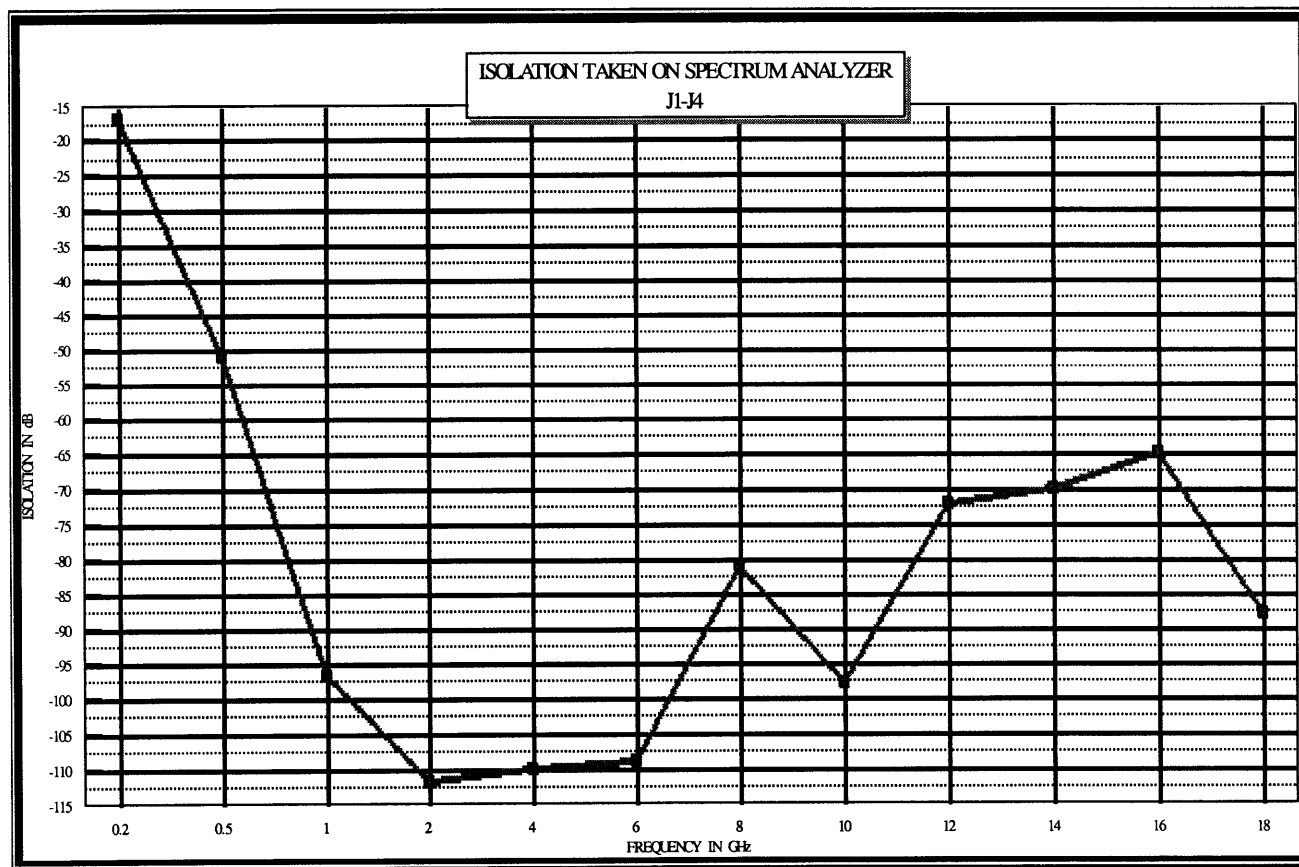
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER	: SWN-2181-TRA	OPTIONS 0518, 2SH
SERIAL NUMBER	: TMS90639	
ENGINEER	: RENE AFABLE	
VOLTAGE & CURRENT DRAW	: +5vdc: +87mA; -12vdc: -70mA	

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



*J1: INPUT ARM

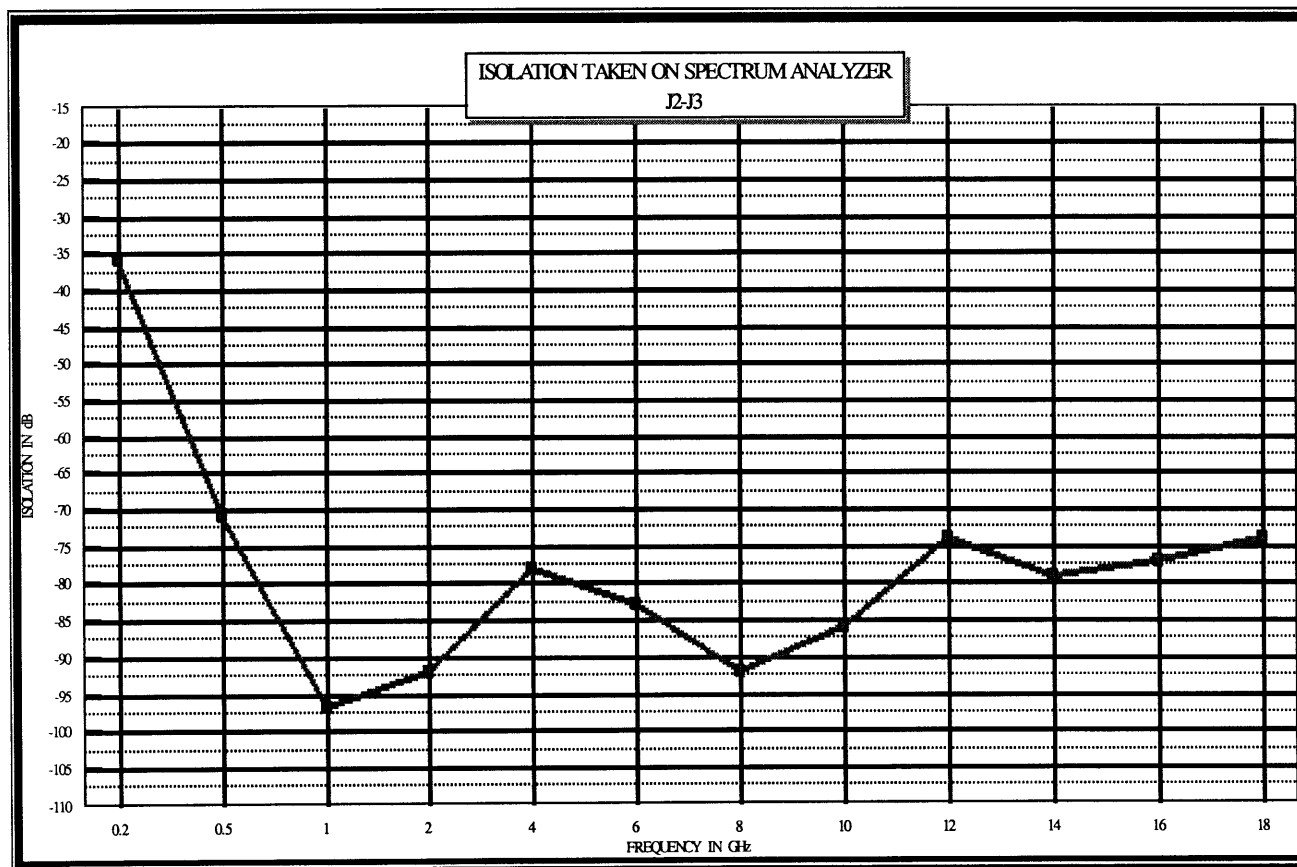
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

ISOLATION* (AS MEASURED ON A SPECTRUM ANALYZER) J2-J3



*J2: INPUT ARM

MARCH 3, 2000



TEST DATA
FROM
100 MHz TO 2 GHz
MINIATURE
HIGH SPEED
TRANSFER SWITCH
AMC MODEL No:
SWN-2181-TRA OPTIONS 0518, 2SH
(Serial Number: TMS90639)
REPORTED AND PREPARED
BY
RENE AFABLE

MARCH 3, 2000

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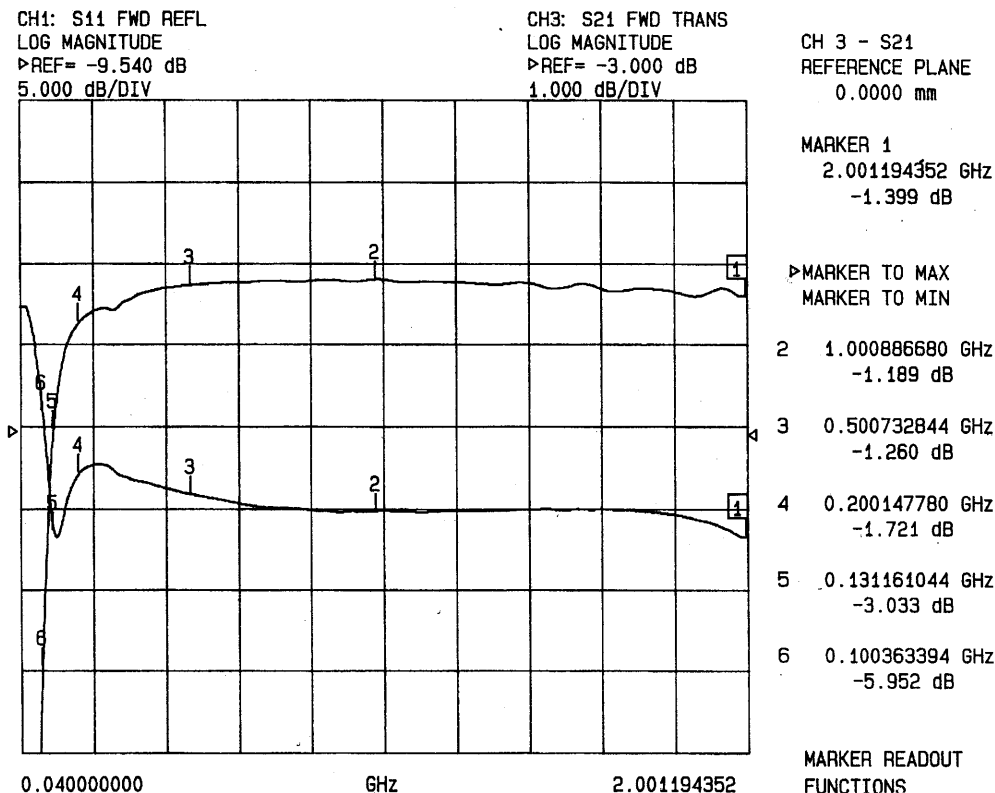


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J1-J2



*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
100 MHz	5.95 dB	8.50 dB
130 MHz	3.03 dB	15.84 dB
200 MHz	1.72 dB	12.36 dB
500 MHz	1.26 dB	13.63 dB
1.0 GHz	1.18 dB	14.69 dB
2.0 GHz	1.39 dB	16.24 dB

MARCH 3, 2000

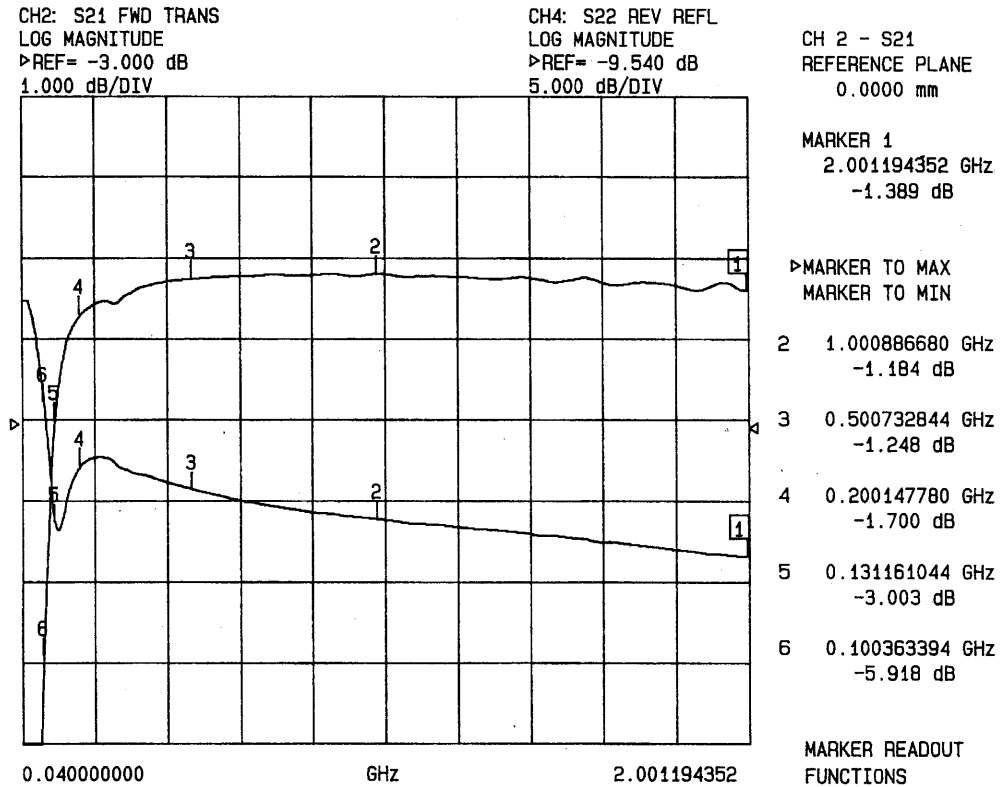


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J2-J1



*J2: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
100 MHz	5.91 dB	8.43 dB
130 MHz	3.00 dB	15.91 dB
200 MHz	1.70 dB	12.39 dB
500 MHz	1.24 dB	13.83 dB
1.0 GHz	1.18 dB	15.69 dB
2.0 GHz	1.38 dB	17.97 dB

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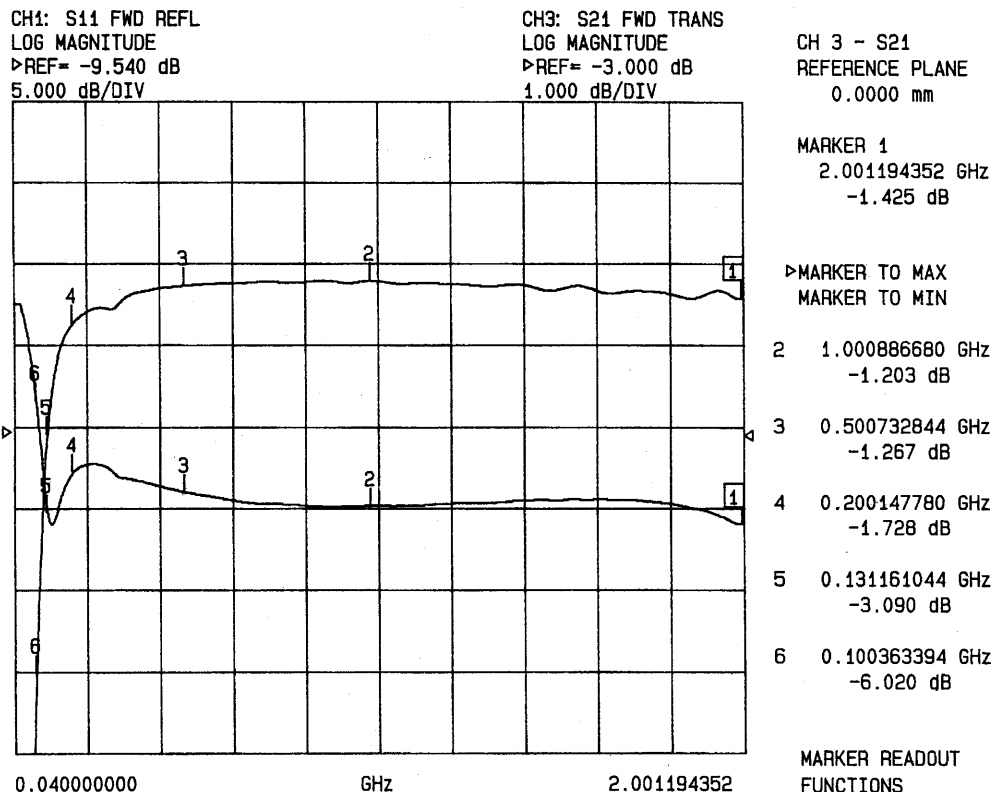


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J3-J4



*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
100 MHz	6.02 dB	7.96 dB
130 MHz	3.09 dB	14.80 dB
200 MHz	1.72 dB	12.31 dB
500 MHz	1.26 dB	13.52 dB
1.0 GHz	1.20 dB	14.37 dB
2.0 GHz	1.42 dB	15.51 dB

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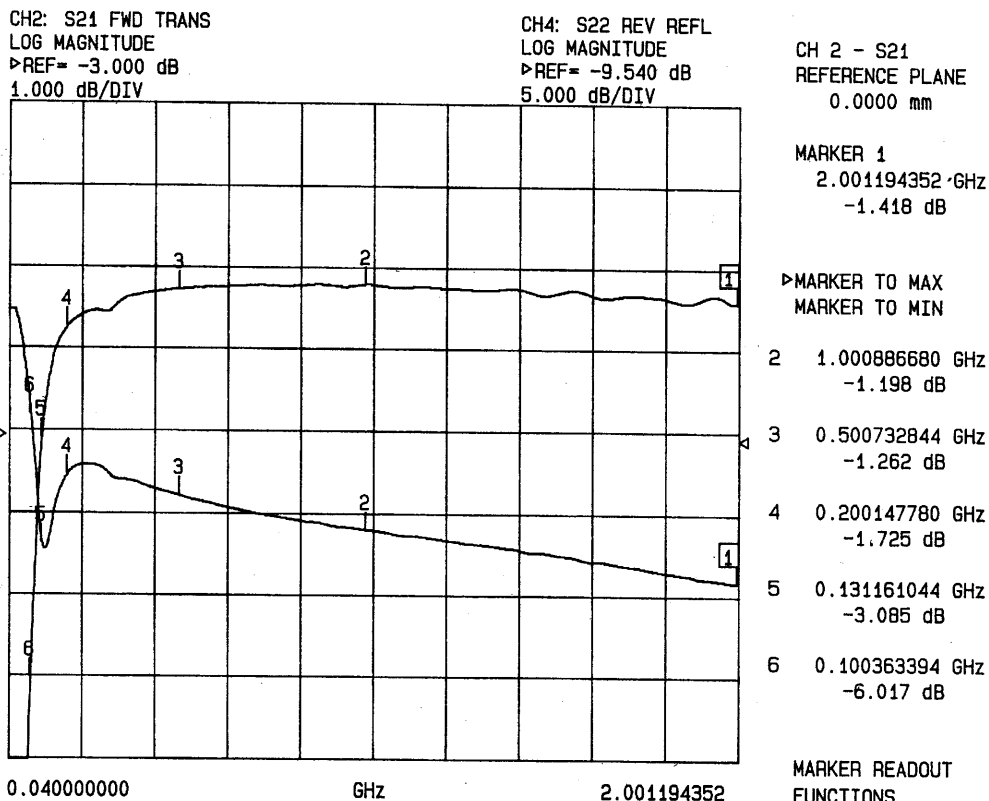


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J4-J3



*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
100 MHz	6.01 dB	8.57 dB
130 MHz	3.08 dB	16.35 dB
200 MHz	1.72 dB	12.17 dB
500 MHz	1.26 dB	13.49 dB
1.0 GHz	1.19 dB	15.54 dB
2.0 GHz	1.41 dB	18.70 dB

MARCH 3, 2000

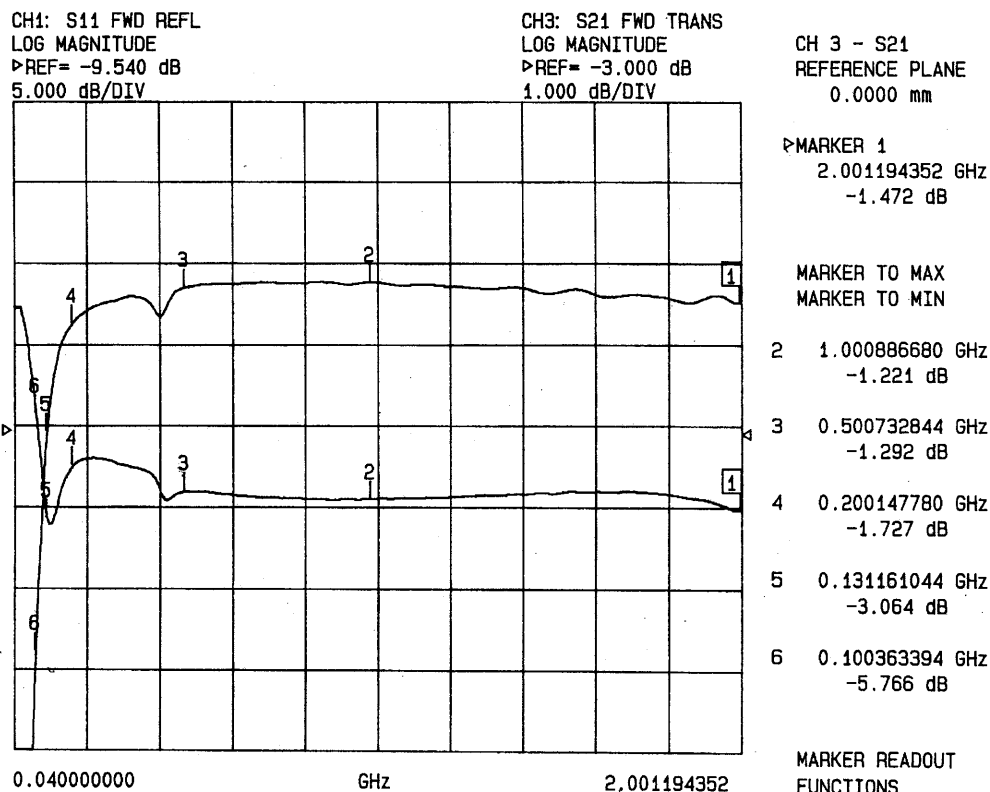


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J1-J4



*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
100 MHz	5.76 dB	8.79 dB
130 MHz	3.06 dB	15.29 dB
200 MHz	1.72 dB	12.05 dB
500 MHz	1.29 dB	13.61 dB
1.0 GHz	1.22 dB	14.05 dB
2.0 GHz	1.47 dB	14.73 dB

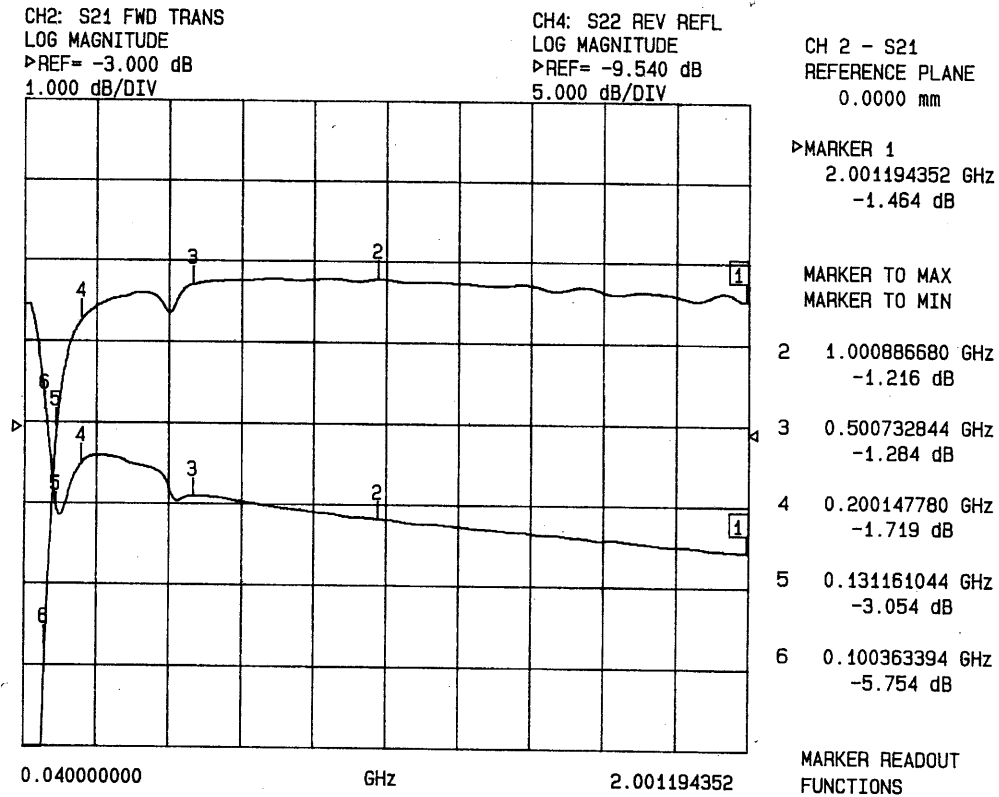
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*
J4-J1



FREQUENCY	INSERTION LOSS	RETURN LOSS
100 MHz	5.75 dB	8.72 dB
130 MHz	3.05 dB	15.00 dB
200 MHz	1.71 dB	11.97 dB
500 MHz	1.28 dB	14.04 dB
1.0 GHz	1.21 dB	15.46 dB
2.0 GHz	1.46 dB	17.40 dB

MARCH 3, 2000

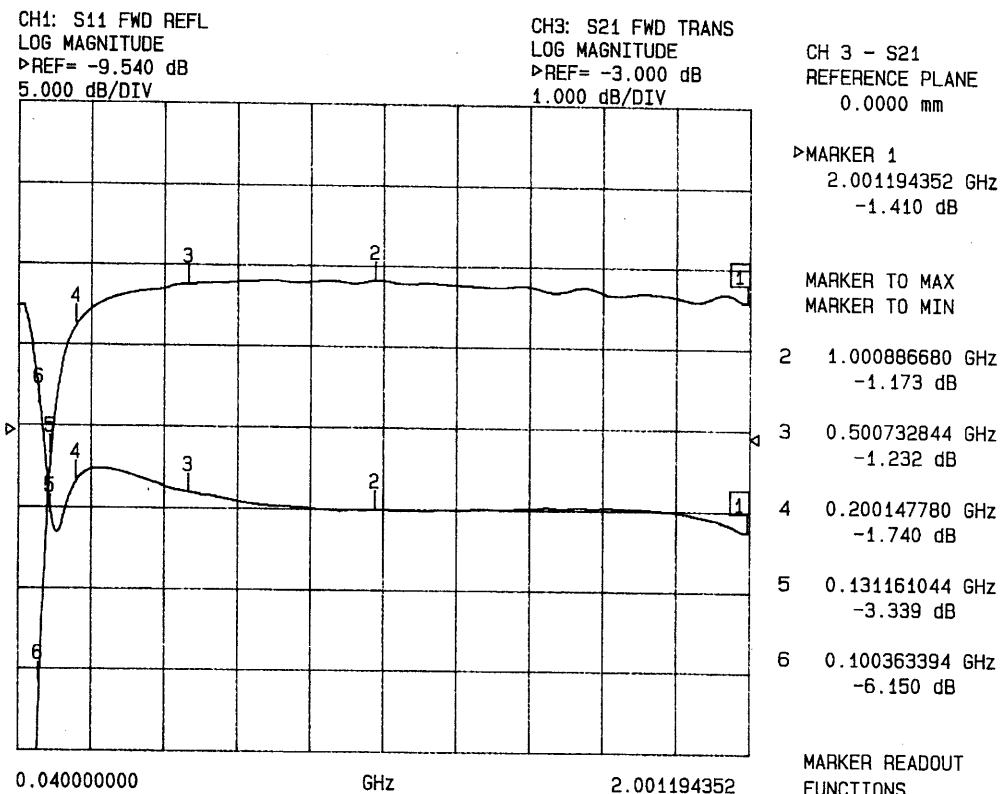


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J2-J3



*J2: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
100 MHz	6.15 dB	8.19 dB
130 MHz	3.33 dB	14.92 dB
200 MHz	1.74 dB	12.84 dB
500 MHz	1.23 dB	13.56 dB
1.0 GHz	1.17 dB	14.56 dB
2.0 GHz	1.41 dB	15.80 dB

MARCH 3, 2000

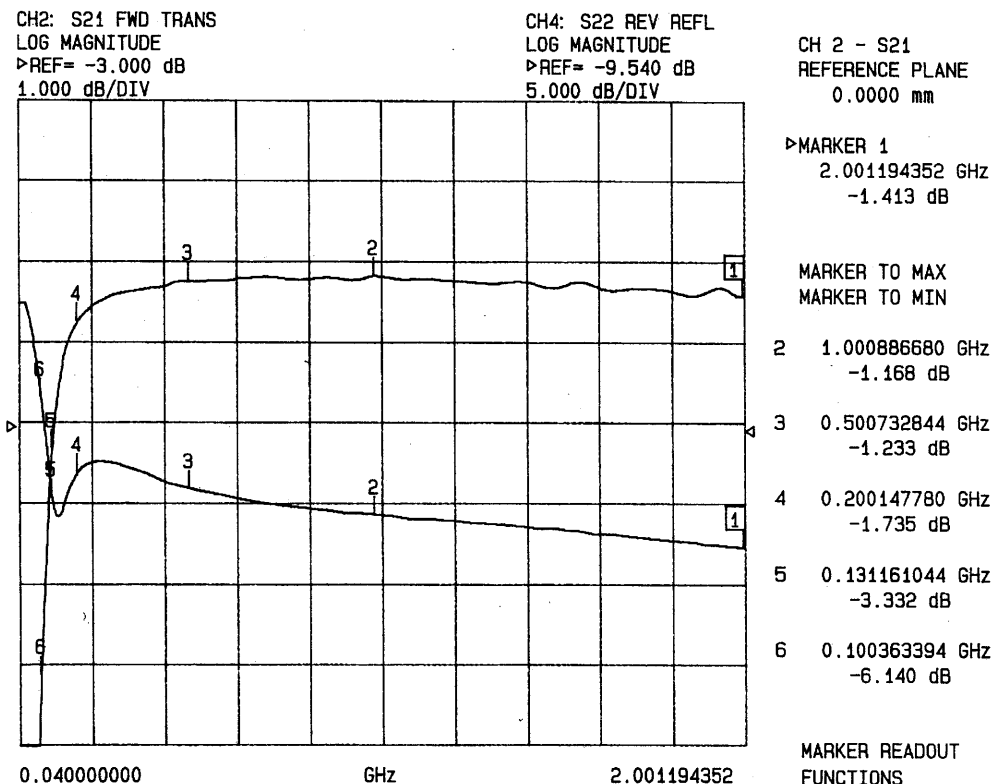


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J3-J2



*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
100 MHz	6.14 dB	7.89 dB
130 MHz	3.33 dB	14.23 dB
200 MHz	1.73 dB	12.65 dB
500 MHz	1.23 dB	13.62 dB
1.0 GHz	1.16 dB	15.24 dB
2.0 GHz	1.41 dB	17.24 dB

MARCH 3, 2000



**AMERICAN MICROWAVE
CORPORATION**

**TEST DATA
FROM
2 GHz TO 6 GHz
MINIATURE
HIGH SPEED
TRANSFER SWITCH
AMC MODEL No:
SWN-2181-TRA OPTIONS 0518, 2SH
(Serial Number: TMS90639)
REPORTED AND PREPARED
BY
RENE AFABLE**

MARCH 3, 2000

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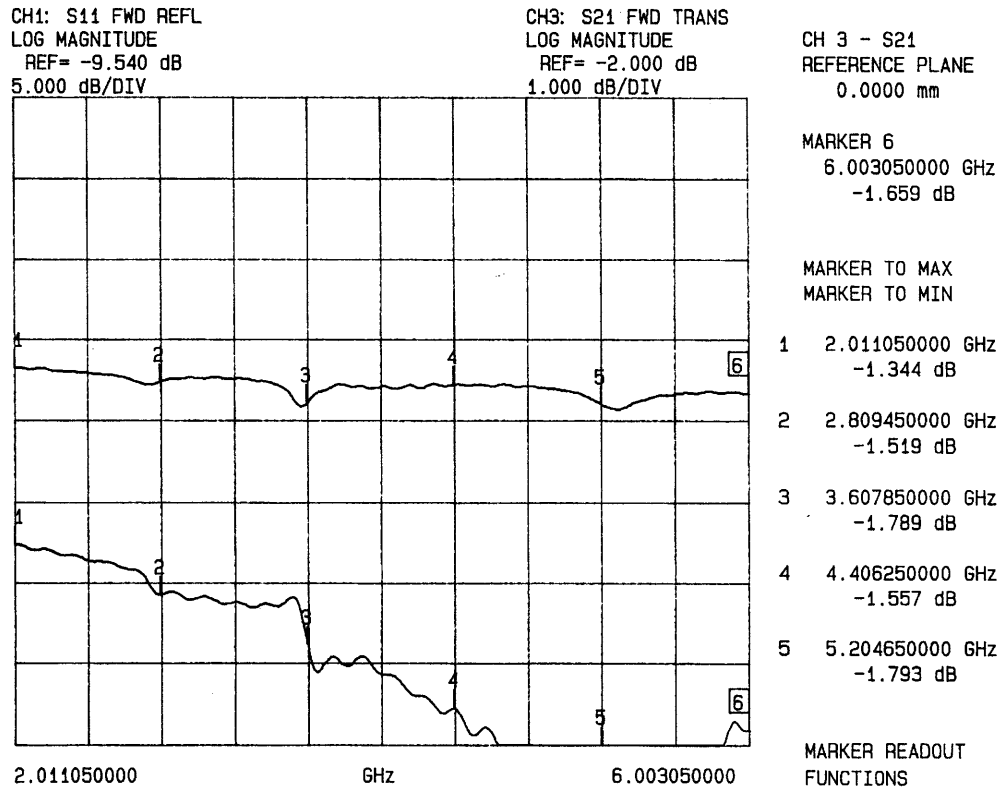


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J1-J2



*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	1.34 dB	17.11 dB
2.8 GHz	1.51 dB	20.26 dB
3.6 GHz	1.78 dB	23.40 dB
4.4 GHz	1.55 dB	27.29 dB
5.2 GHz	1.79 dB	37.65 dB
6.0 GHz	1.65 dB	28.68 dB

MARCH 3, 2000

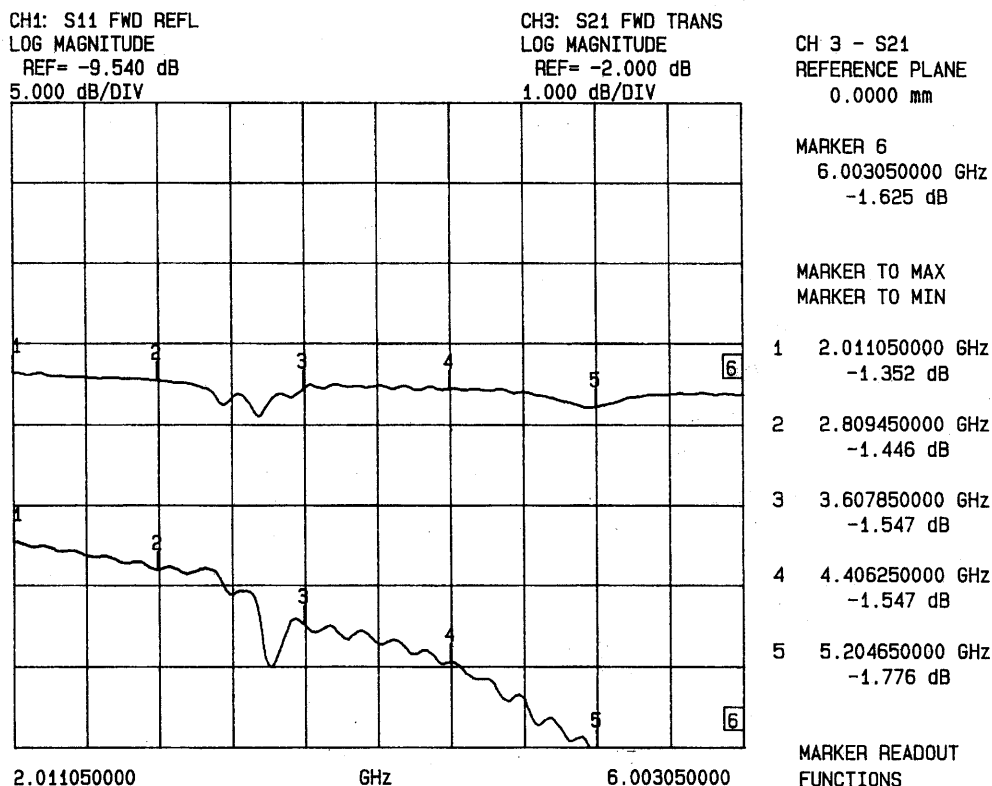


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J3-J4



*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	1.35 dB	16.80 dB
2.8 GHz	1.44 dB	18.55 dB
3.6 GHz	1.54 dB	21.98 dB
4.4 GHz	1.54 dB	24.27 dB
5.2 GHz	1.77 dB	31.89 dB
6.0 GHz	1.62 dB	30.09 dB

MARCH 3, 2000

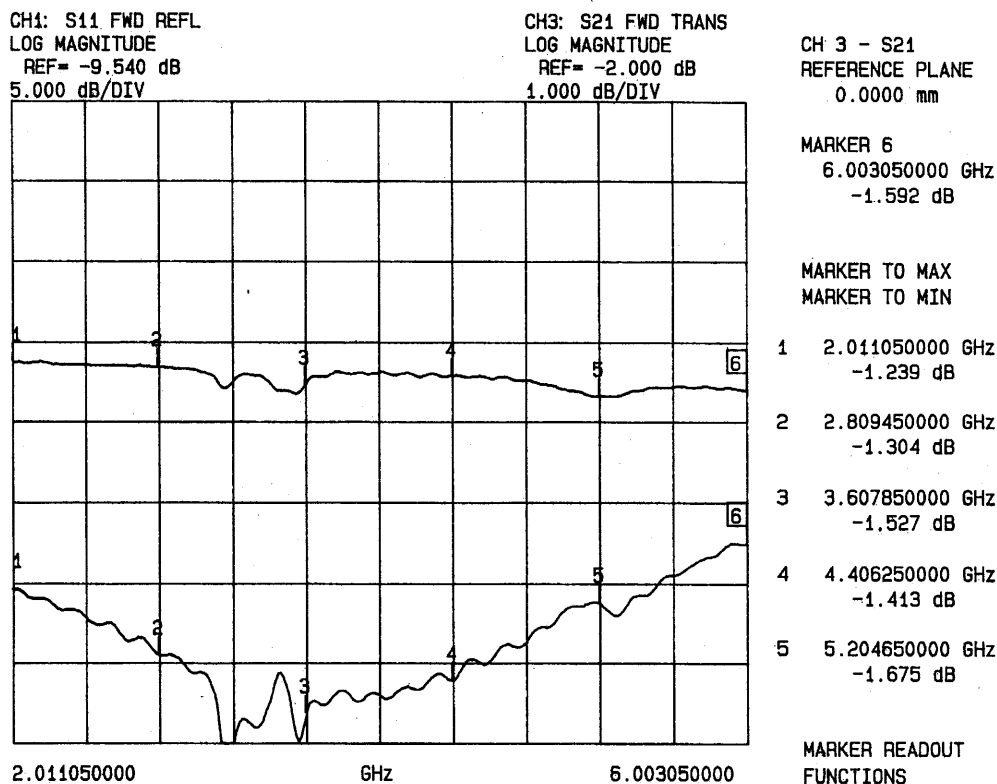


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J1-J4



*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	1.23 dB	19.85 dB
2.8 GHz	1.30 dB	24.03 dB
3.6 GHz	1.52 dB	27.74 dB
4.4 GHz	1.41 dB	25.59 dB
5.2 GHz	1.67 dB	20.73 dB
6.0 GHz	1.59 dB	17.04 dB

MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

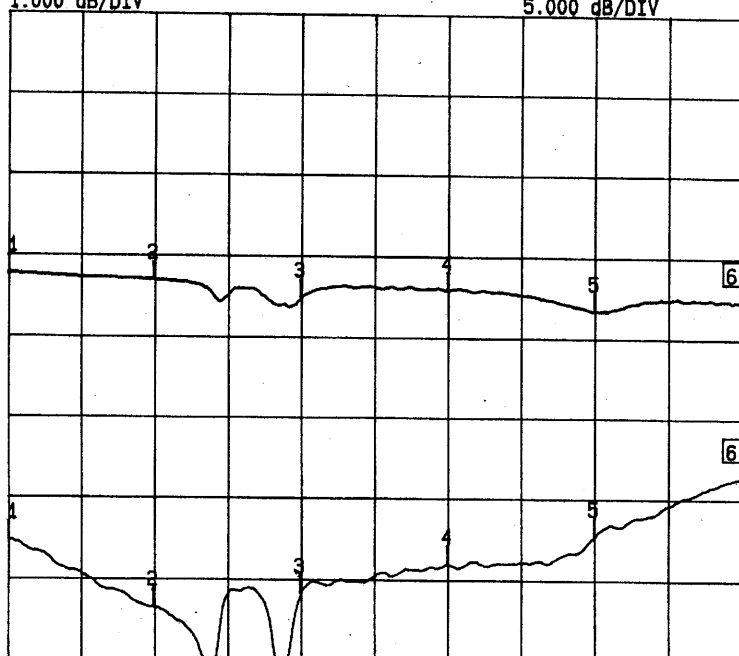
INSERTION LOSS & RETURN LOSS*

J4-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
 6.003050000 GHz
 -1.530 dB

MARKER TO MAX
 MARKER TO MIN

- 1 2.011050000 GHz -1.217 dB
- 2 2.809450000 GHz -1.289 dB
- 3 3.607850000 GHz -1.512 dB
- 4 4.406250000 GHz -1.406 dB
- 5 5.204650000 GHz -1.656 dB

2.011050000 GHz 6.003050000

MARKER READOUT FUNCTIONS

*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	1.21 dB	22.17 dB
2.8 GHz	1.28 dB	26.27 dB
3.6 GHz	1.51 dB	25.43 dB
4.4 GHz	1.40 dB	23.54 dB
5.2 GHz	1.65 dB	21.80 dB
6.0 GHz	1.53 dB	18.19 dB

MARCH 3, 2000

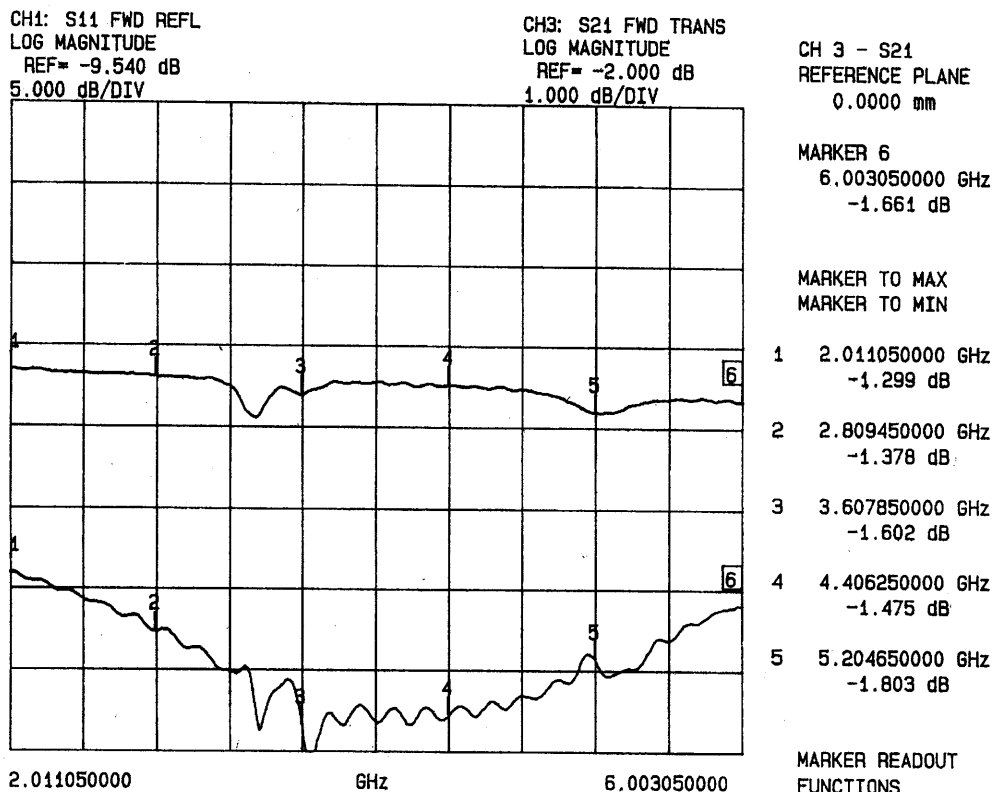


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS*

J2-J3



*J2: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	1.29 dB	18.55 dB
2.8 GHz	1.37 dB	22.17 dB
3.6 GHz	1.60 dB	27.90 dB
4.4 GHz	1.47 dB	27.33 dB
5.2 GHz	1.80 dB	23.82 dB
6.0 GHz	1.66 dB	20.46 dB

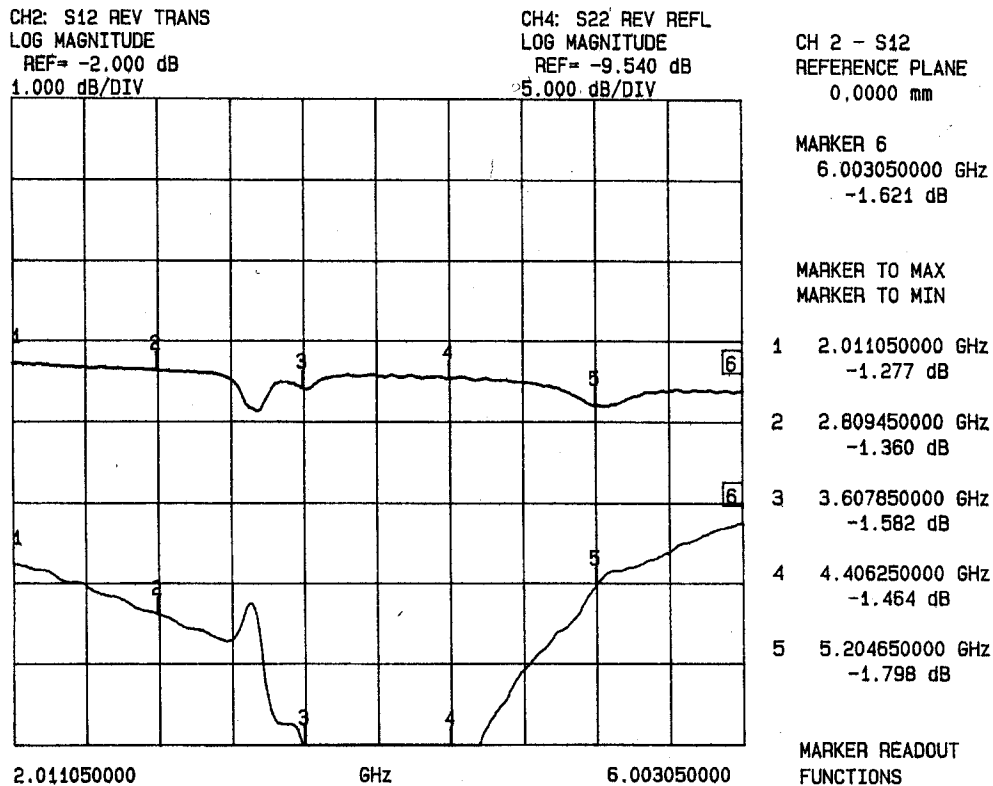
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

INSERTION LOSS & RETURN LOSS* J3-J2



2.011050000

GHz

6.003050000

*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
2.0 GHz	1.27 dB	18.36 dB
2.8 GHz	1.36 dB	21.49 dB
3.6 GHz	1.58 dB	30.71 dB
4.4 GHz	1.46 dB	33.92 dB
5.2 GHz	1.79 dB	19.66 dB
6.0 GHz	1.62 dB	15.78 dB

MARCH 3, 2000



**PHASE
DATA
BETWEEN
PORT TO PORT
ON
A**

TRANSFER SWITCH

**AMC MODEL No:
SWN-2181-TRA OPTIONS 0518, 2SH
(Serial Number: TMS90639)**

**REPORTED AND PREPARED
BY
RENE AFABLE**

MARCH 3, 2000

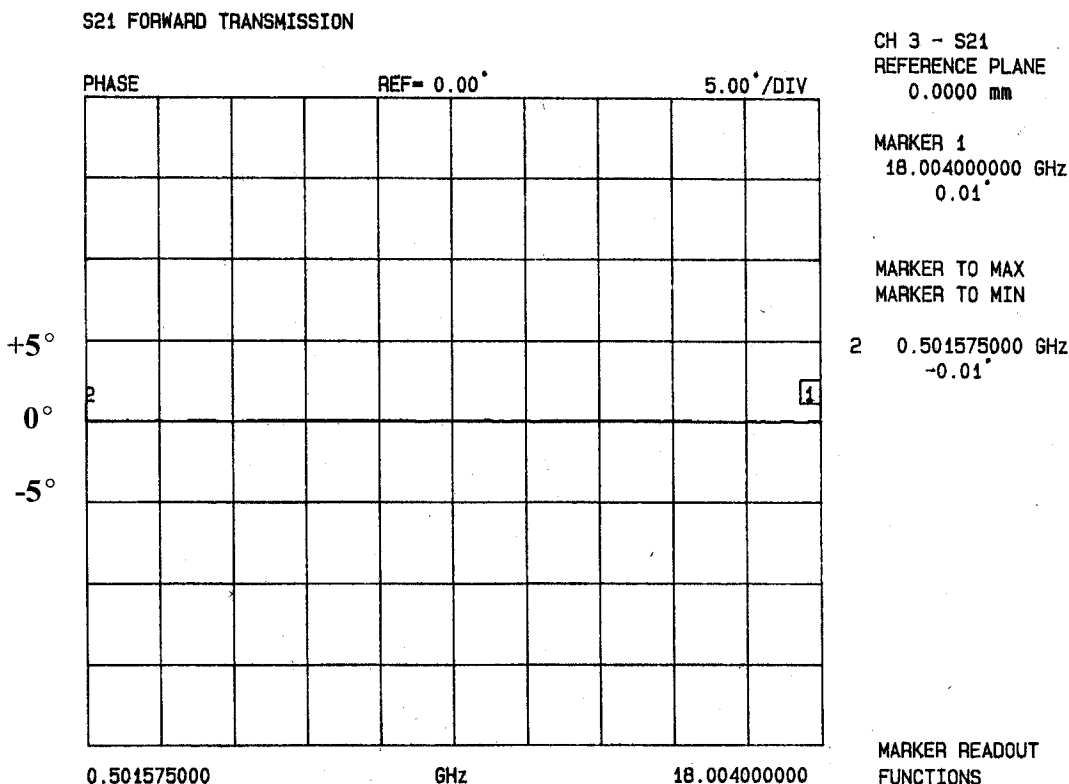
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SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

PHASE*
J1-J2 (REFERENCE)



*J1: INPUT ARM

FREQUENCY	PHASE (PEAK) (POSITIVE SIDE)	PHASE (PEAK) (NEGATIVE SIDE)
500 MHZ		-0.01°
18.0 GHz	0.01°	

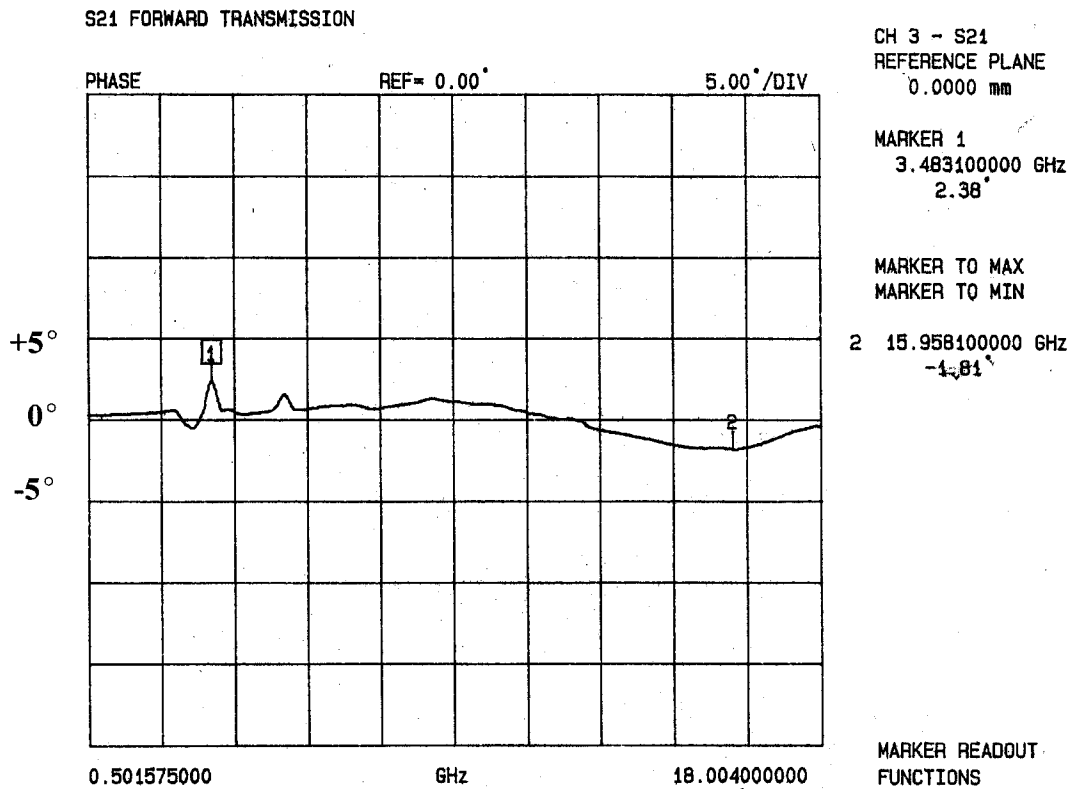
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

PHASE*
J3-J4



*J3: INPUT ARM

FREQUENCY	PHASE (PEAK) (POSITIVE SIDE)	PHASE (PEAK) (NEGATIVE SIDE)
3.48 GHZ	2.38°	
15.95 GHZ		-1.81°

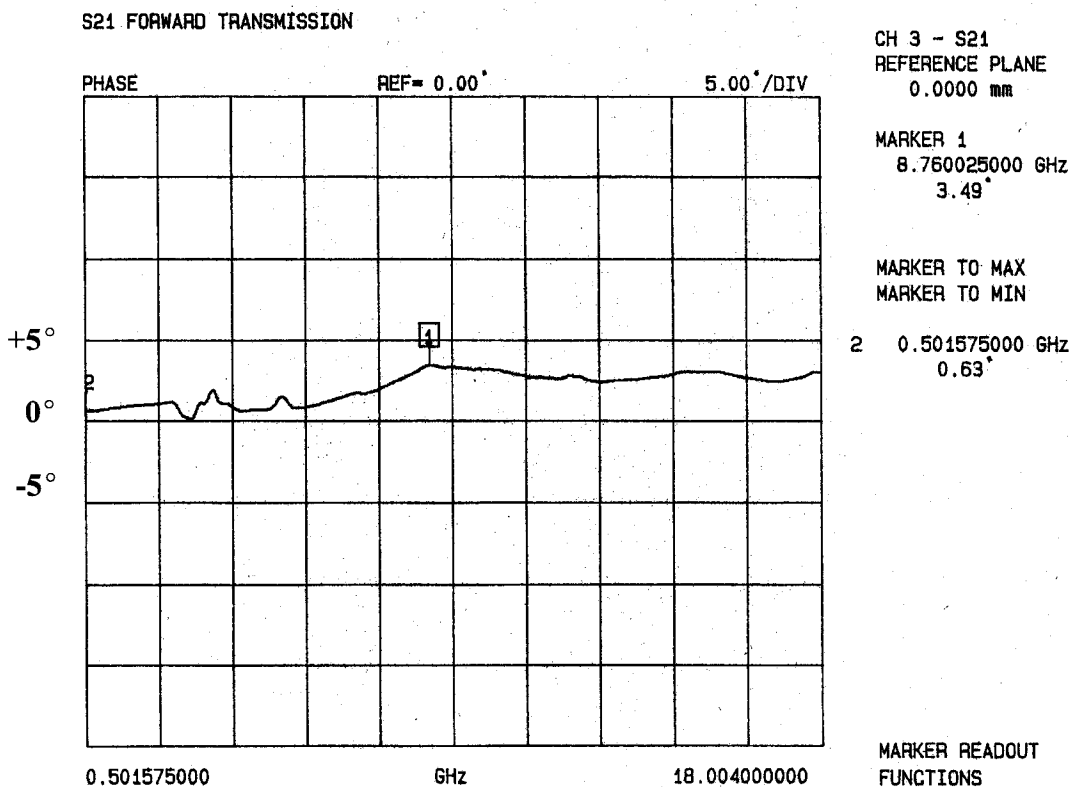
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

PHASE* J1-J4



*J1: INPUT ARM

FREQUENCY	PHASE (PEAK) (POSITIVE SIDE)	PHASE (PEAK) (NEGATIVE SIDE)
500 MHZ	0.63°	
8.76 GHz	3.49°	

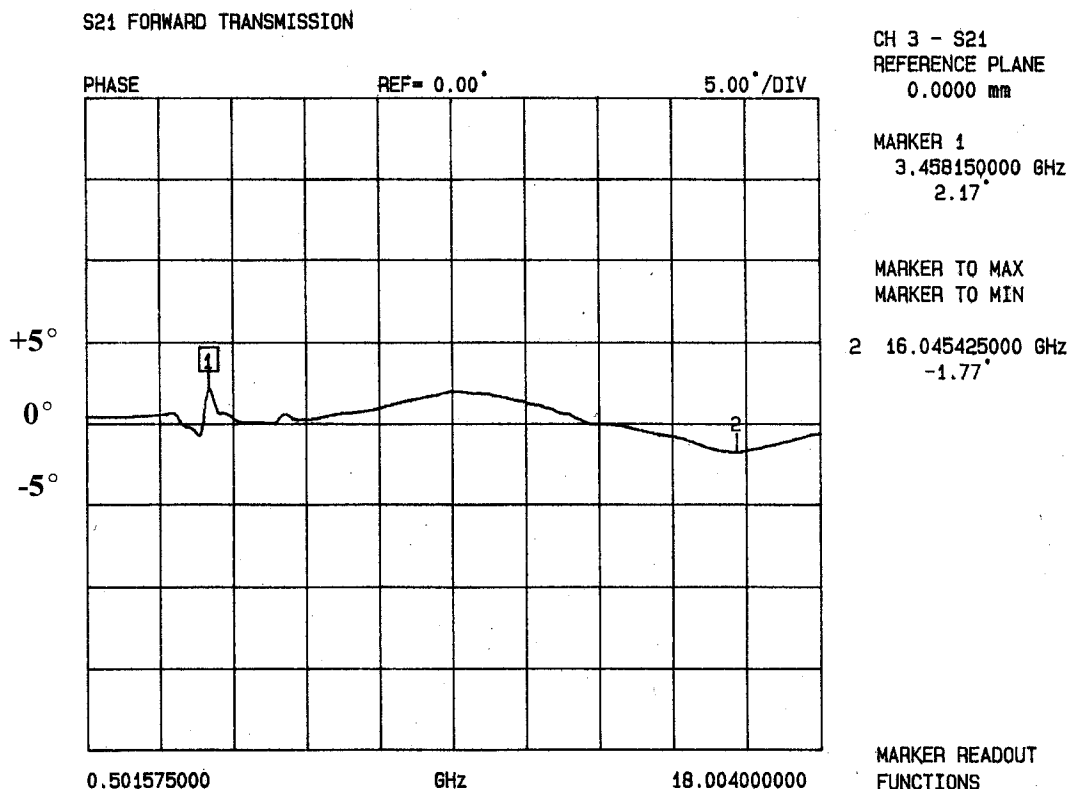
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

PHASE*
J2-J3



*J2: INPUT ARM

FREQUENCY	PHASE (PEAK) (POSITIVE SIDE)	PHASE (PEAK) (NEGATIVE SIDE)
3.45 GHZ	2.17°	
16.04 GHZ		-1.77°

MARCH 3, 2000



**AMPLITUDE
DATA
BETWEEN
PORT TO PORT
ON
A**

TRANSFER SWITCH

**AMC MODEL No:
SWN-2181-TRA OPTIONS 0518, 2SH
(Serial Number: TMS90639)**

**REPORTED AND PREPARED
BY
RENE AFABLE**

MARCH 3, 2000

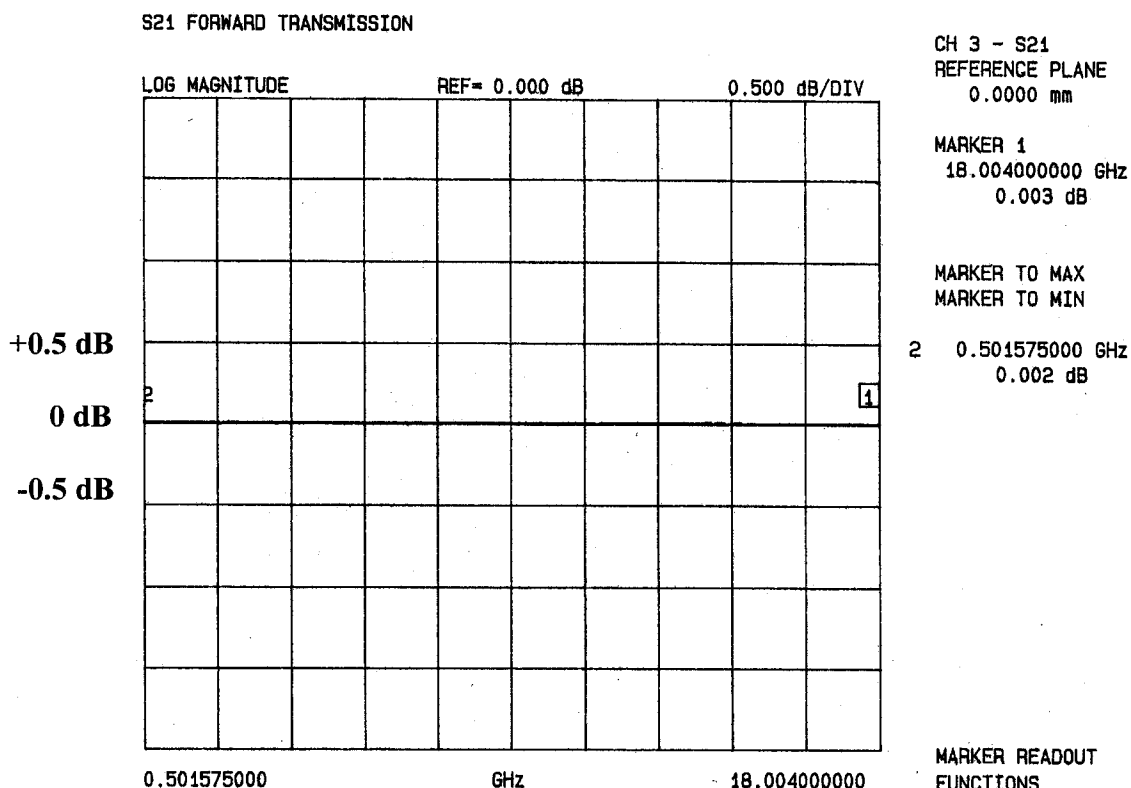
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SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

AMPLITUDE* J1-J2 (REFERENCE)



*J1: INPUT ARM

FREQUENCY	AMPLITUDE (PEAK) (POSITIVE SIDE)	AMPLITUDE (PEAK) (NEGATIVE SIDE)
500 MHZ	0.002 dB	
18.0 GHz	0.003 dB	

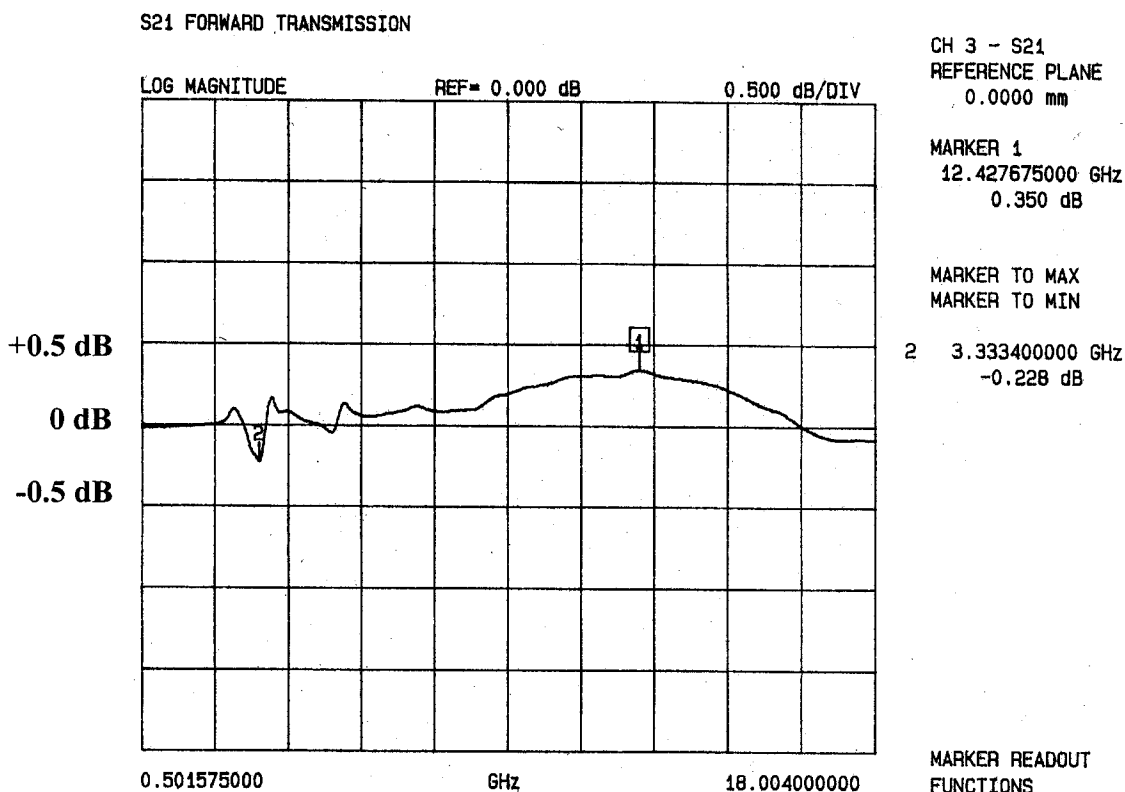
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

AMPLITUDE* J3-J4



*J3: INPUT ARM

FREQUENCY	AMPLITUDE (PEAK) (POSITIVE SIDE)	AMPLITUDE (PEAK) (NEGATIVE SIDE)
3.33 GHZ		-0.228 dB
12.42 GHZ	0.350 dB	

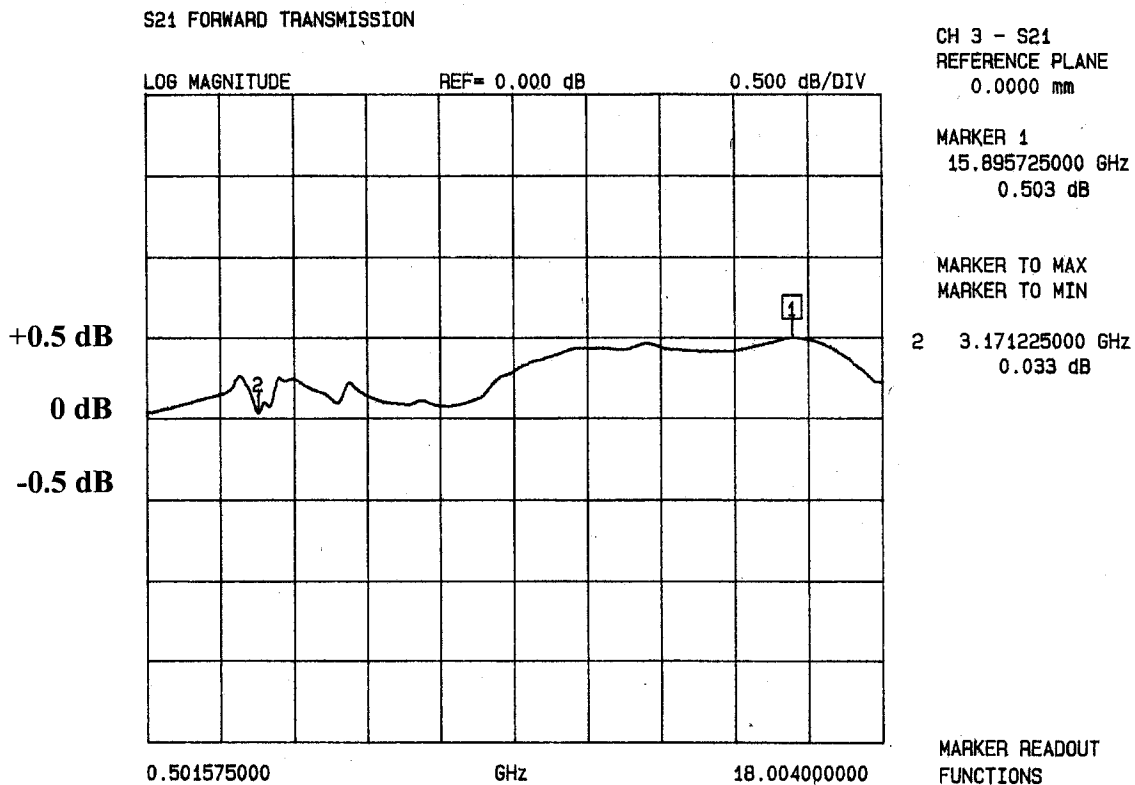
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

AMPLITUDE* J1-J4



*J1: INPUT ARM

FREQUENCY	AMPLITUDE (PEAK) (POSITIVE SIDE)	AMPLITUDE (PEAK) (NEGATIVE SIDE)
3.17 GHZ	0.033 dB	
15.89 GHz	0.503 dB	

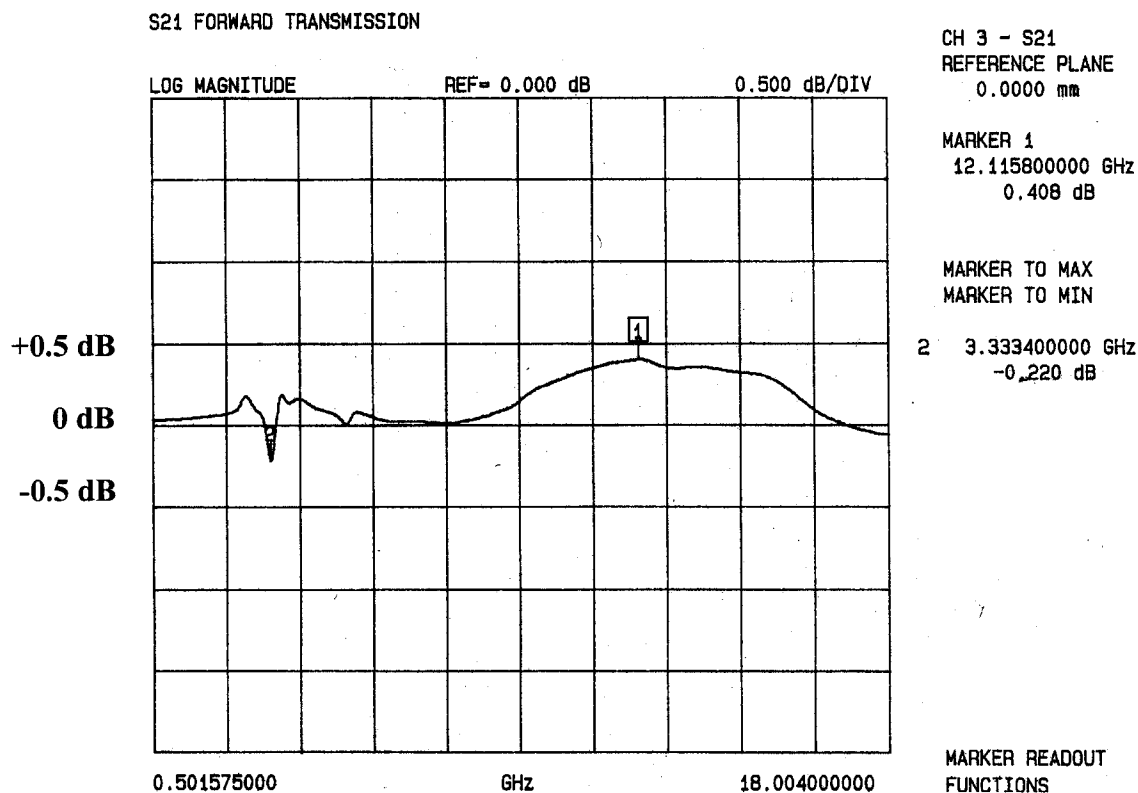
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

AMPLITUDE* J2-J3



*J2: INPUT ARM

FREQUENCY	AMPLITUDE (PEAK) (POSITIVE SIDE)	AMPLITUDE (PEAK) (NEGATIVE SIDE)
3.33 GHZ		-0.220 dB
12.11 GHZ	0.408 dB	

MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

SWITCHING SPEED

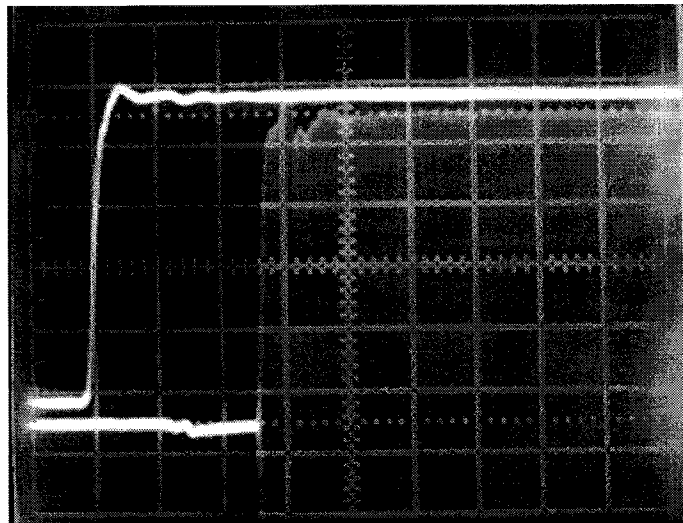
"Rise/Fall" Time: 10% RF to 90% RF & 90% RF to 10% RF
 "On/Off" Time: 50% TTL to 90% RF or 10% RF

TYPICAL OF ALL ARMS

"DELAY ON": 56 nS
 "RISE TIME": 2 nS

HORIZONTAL SCALE:
 20 nS PER DIVISION

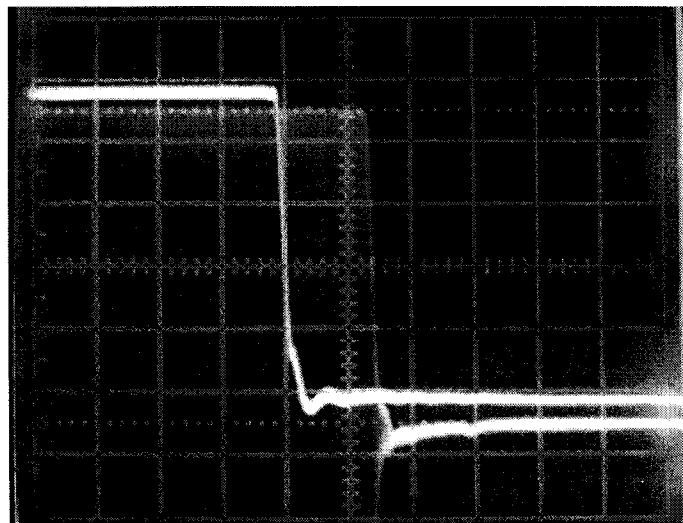
VERTICAL SCALE:
 10 mV PER DIVISION



"DELAY OFF": 30 nS
 "FALL TIME": 2 nS

HORIZONTAL SCALE:
 20 nS PER DIVISION

VERTICAL SCALE:
 10 mV PER DIVISION



MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER	: SWN-2181-TRA	OPTIONS 0518, 2SH
SERIAL NUMBER	: TMS90639	
ENGINEER	: RENE AFABLE	
VOLTAGE & CURRENT DRAW	: +5vdc: +87mA; -12vdc: -70mA	

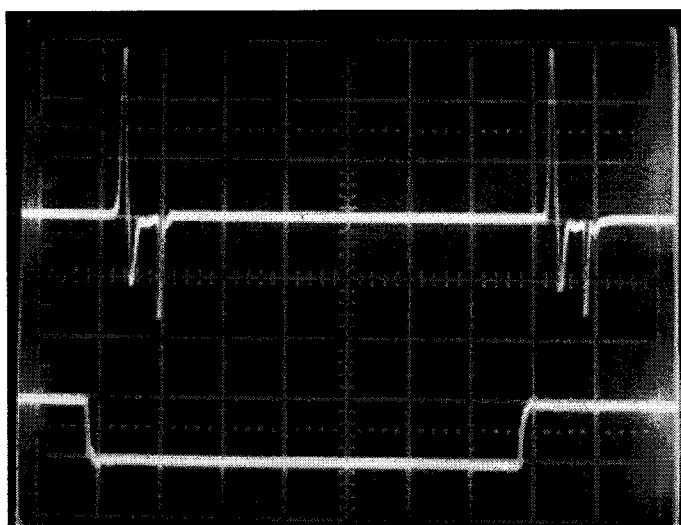
VIDEO TRANSIENTS

TYPICAL OF ALL ARMS

≤900 mV P-P
MEASURED IN A
300 MHZ BANDWIDTH

VERTICAL SCALE:
200 mV PER DIVISION

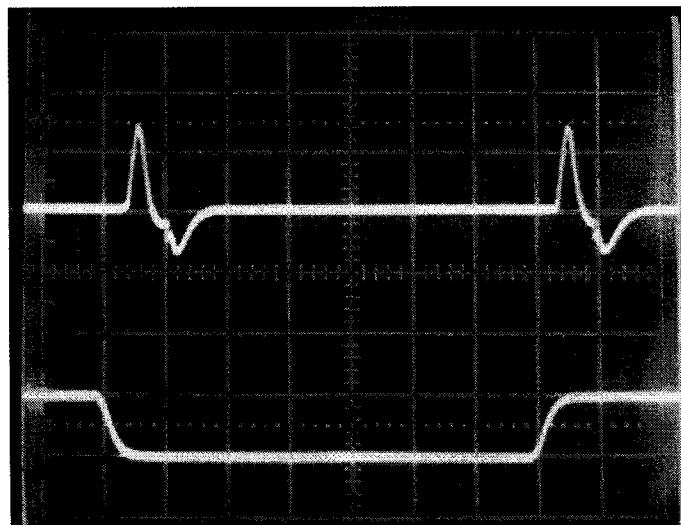
HORIZONTAL SCALE:
50 nS PER DIVISION



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

VERTICAL SCALE:
100 mV PER DIVISION

HORIZONTAL SCALE:
50 nS PER DIVISION



MARCH 3, 2000



APPENDIX A
MISCELLANEOUS
TEST DATA AND PLOTS
ON
ISOLATION
AS
MEASURED
ON A VECTOR NETWORK
ANALYZER
ON A
TRANSFER SWITCH
AMC MODEL No:
SWN-2181-TRA OPTIONS 0518, 2SH
(Serial Number: TMS90639)
FROM 500 MHz TO 18 GHz
FROM 100 MHz TO 2 GHz
AND
FROM 2 GHz TO 6 GHz
MARCH 3, 2000

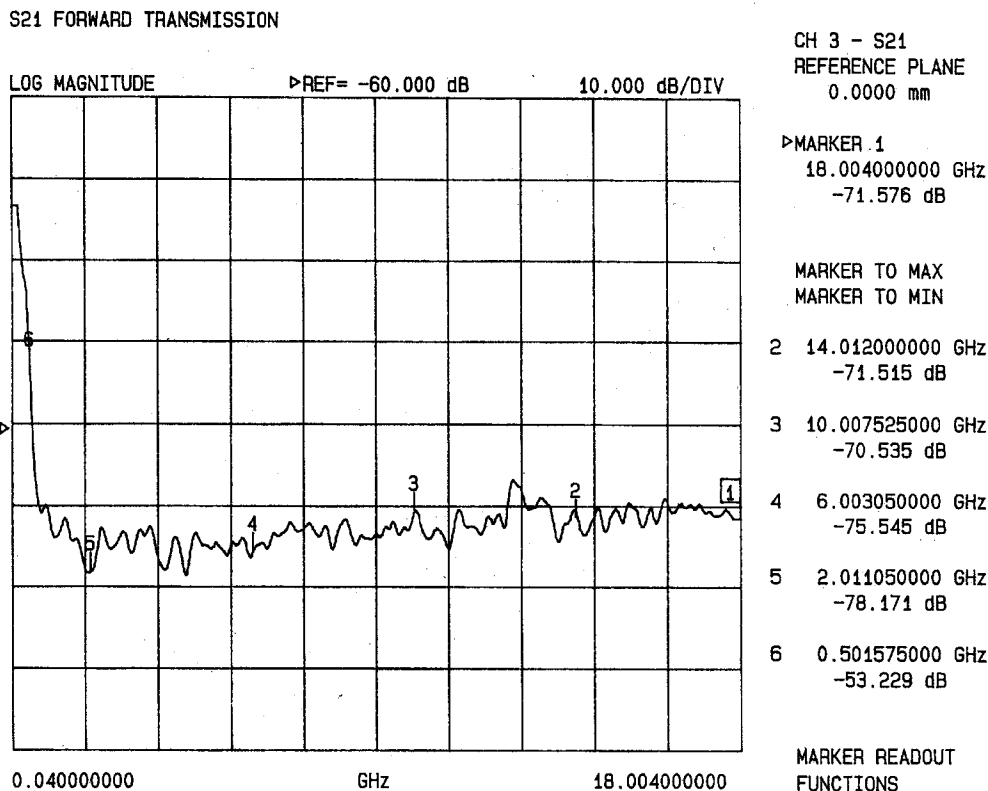
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SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

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



*J1: INPUT ARM

FREQUENCY	ISOLATION
500 MHz	53.22 dB
2.0 GHz	78.17 dB
6.0 GHz	75.54 dB
10.0 GHz	70.53 dB
14.0 GHz	71.51 dB
18.0 GHz	71.57 dB

MARCH 3, 2000

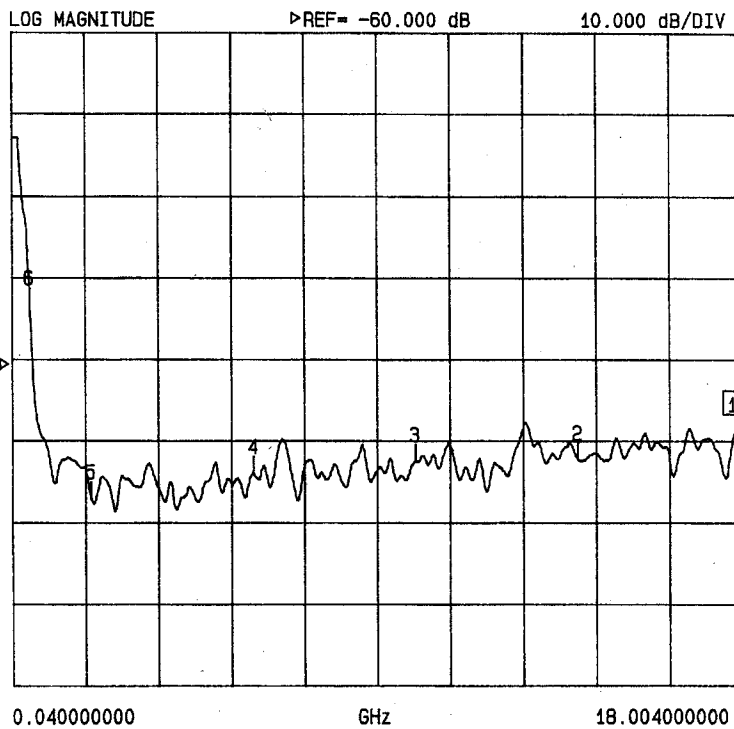


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

ISOLATION*
 (AS MEASURED ON A VECTOR NETWORK ANALYZER)
J3-J4

S21 FORWARD TRANSMISSION



CH 3 - S21
 REFERENCE PLANE
 0.0000 mm
 >MARKER 1
 18.004000000 GHz
 -68.873 dB
 MARKER TO MAX
 MARKER TO MIN
 2 14.012000000 GHz
 -72.453 dB
 3 10.007525000 GHz
 -72.598 dB
 4 6.003050000 GHz
 -74.144 dB
 5 2.011050000 GHz
 -77.273 dB
 6 0.501575000 GHz
 -53.389 dB
 MARKER READOUT
 FUNCTIONS

***J3: INPUT ARM**

FREQUENCY	ISOLATION
500 MHz	53.38 dB
2.0 GHz	77.27 dB
6.0 GHz	74.14 dB
10.0 GHz	72.59 dB
14.0 GHz	72.45 dB
18.0 GHz	68.87 dB

MARCH 3, 2000

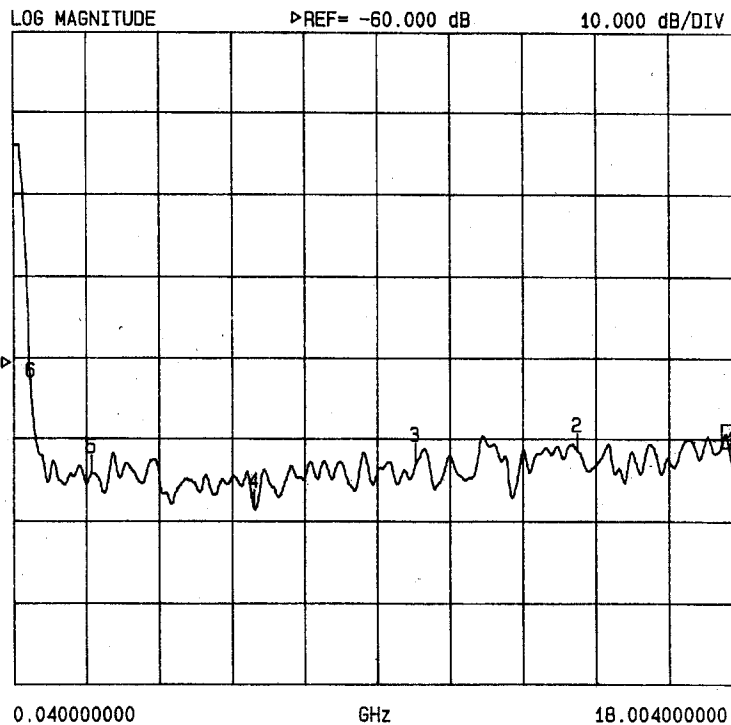


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

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

S21 FORWARD TRANSMISSION



CH 3 - S21
 REFERENCE PLANE
 0.0000 mm
 >MARKER 1
 18.004000000 GHz
 -73.377 dB
 MARKER TO MAX
 MARKER TO MIN
 2 14.012000000 GHz
 -71.674 dB
 3 10.007525000 GHz
 -72.789 dB
 4 6.003050000 GHz
 -78.603 dB
 5 2.011050000 GHz
 -74.271 dB
 6 0.501575000 GHz
 -64.874 dB
 MARKER READOUT
 FUNCTIONS

*J1: INPUT ARM

FREQUENCY	ISOLATION
500 MHz	64.87 dB
2.0 GHz	74.27 dB
6.0 GHz	78.60 dB
10.0 GHz	72.78 dB
14.0 GHz	71.67 dB
18.0 GHz	73.37 dB

MARCH 3, 2000

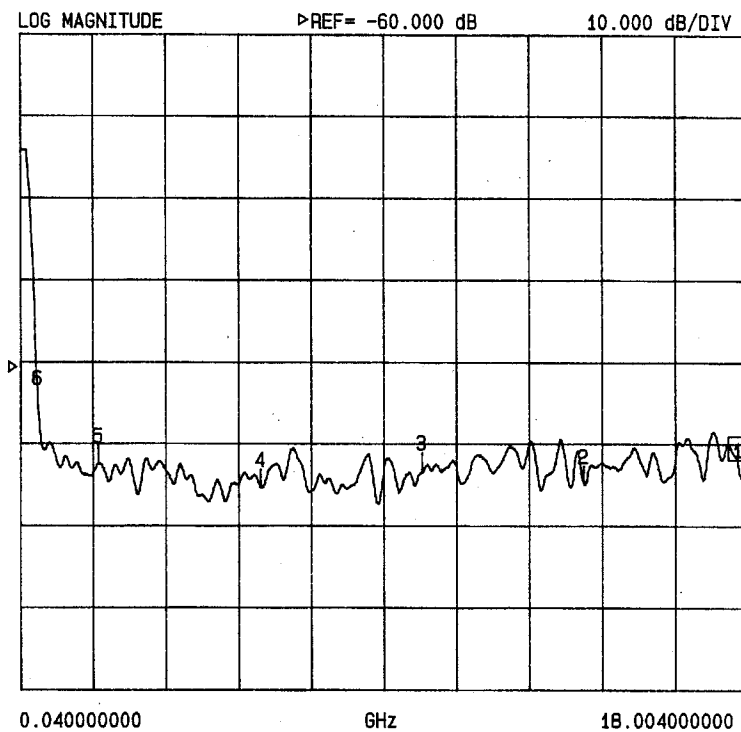


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

ISOLATION*
 (AS MEASURED ON A VECTOR NETWORK ANALYZER)
J2-J3

S21 FORWARD TRANSMISSION



CH 3 - S21
 REFERENCE PLANE
 0.0000 mm
 >MARKER 1
 18.004000000 GHz
 -74.142 dB
 MARKER TO MAX
 MARKER TO MIN
 2 14.012000000 GHz
 -74.981 dB
 3 10.007525000 GHz
 -73.343 dB
 4 6.003050000 GHz
 -75.416 dB
 5 2.011050000 GHz
 -72.417 dB
 6 0.501575000 GHz
 -65.261 dB
 MARKER READOUT
 FUNCTIONS

*J2: INPUT ARM

FREQUENCY	ISOLATION
500 MHz	65.26 dB
2.0 GHz	72.41 dB
6.0 GHz	75.41 dB
10.0 GHz	73.34 dB
14.0 GHz	74.98 dB
18.0 GHz	74.14 dB

MARCH 3, 2000



**ISOLATION
DATA AND PLOTS
FROM
100 MHz TO 2 GHz
AS
MEASURED
ON A VECTOR NETWORK
ANALYZER
ON A
TRANSFER SWITCH**

**AMC MODEL No:
SWN-2181-TRA OPTIONS 0518, 2SH
(Serial Number: TMS90639)**

**REPORTED AND PREPARED
BY
RENE AFABLE**

MARCH 3, 2000

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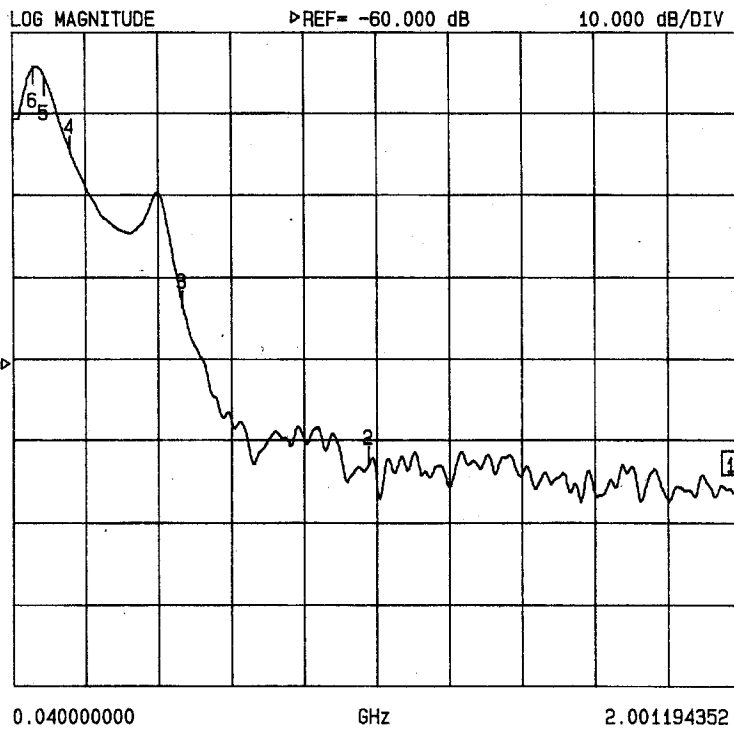


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

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

S21 FORWARD TRANSMISSION



CH 3 - S21
 REFERENCE PLANE
 0.0000 mm

MARKER 1
 2.001194352 GHz
 -76.490 dB

>MARKER TO MAX
 MARKER TO MIN

2 1.000886680 GHz
 -73.027 dB

3 0.500732844 GHz
 -53.711 dB

4 0.200147780 GHz
 -35.009 dB

5 0.131161044 GHz
 -25.661 dB

6 0.100363394 GHz
 -24.372 dB

MARKER READOUT
 FUNCTIONS

*J1: INPUT ARM

FREQUENCY	ISOLATION
100 MHz	24.37 dB
130 MHz	25.66 dB
200 MHz	35.00 dB
500 MHz	53.71 dB
1.0 GHz	73.02 dB
2.0 GHz	76.49 dB

MARCH 3, 2000

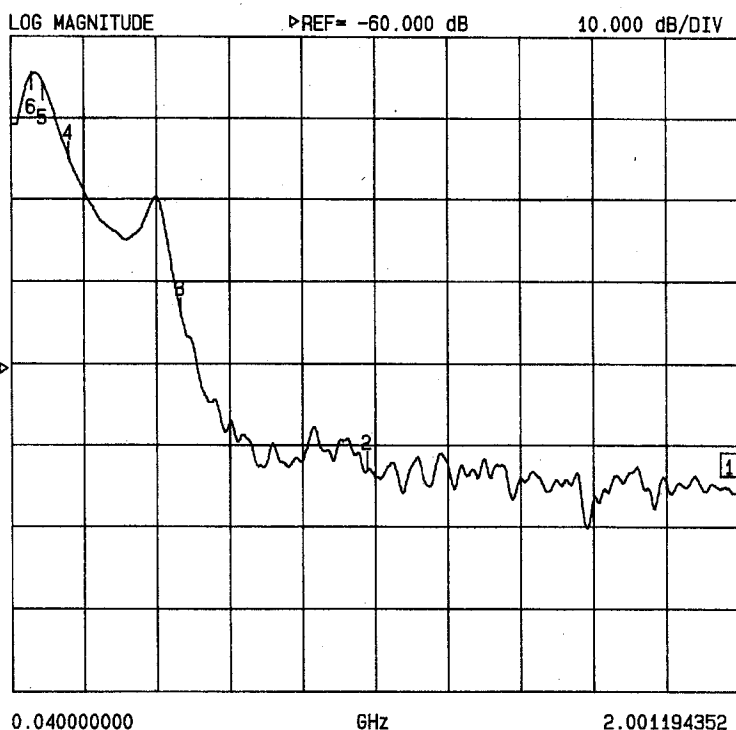


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

ISOLATION*
 (AS MEASURED ON A VECTOR NETWORK ANALYZER)
J3-J4

S21 FORWARD TRANSMISSION



CH 3 - S21
REFERENCE PLANE
0.0000 mm

MARKER 1
2.001194352 GHz
-75.992 dB

>MARKER TO MAX
MARKER TO MIN

2 1.000886680 GHz
-73.169 dB

3 0.500732844 GHz
-54.139 dB

4 0.200147780 GHz
-35.144 dB

5 0.131161044 GHz
-25.826 dB

6 0.100363394 GHz
-24.565 dB

MARKER READOUT
FUNCTIONS

***J3: INPUT ARM**

FREQUENCY	ISOLATION
100 MHz	24.56 dB
130 MHz	25.82 dB
200 MHz	35.14 dB
500 MHz	54.13 dB
1.0 GHz	73.16 dB
2.0 GHz	75.99 dB

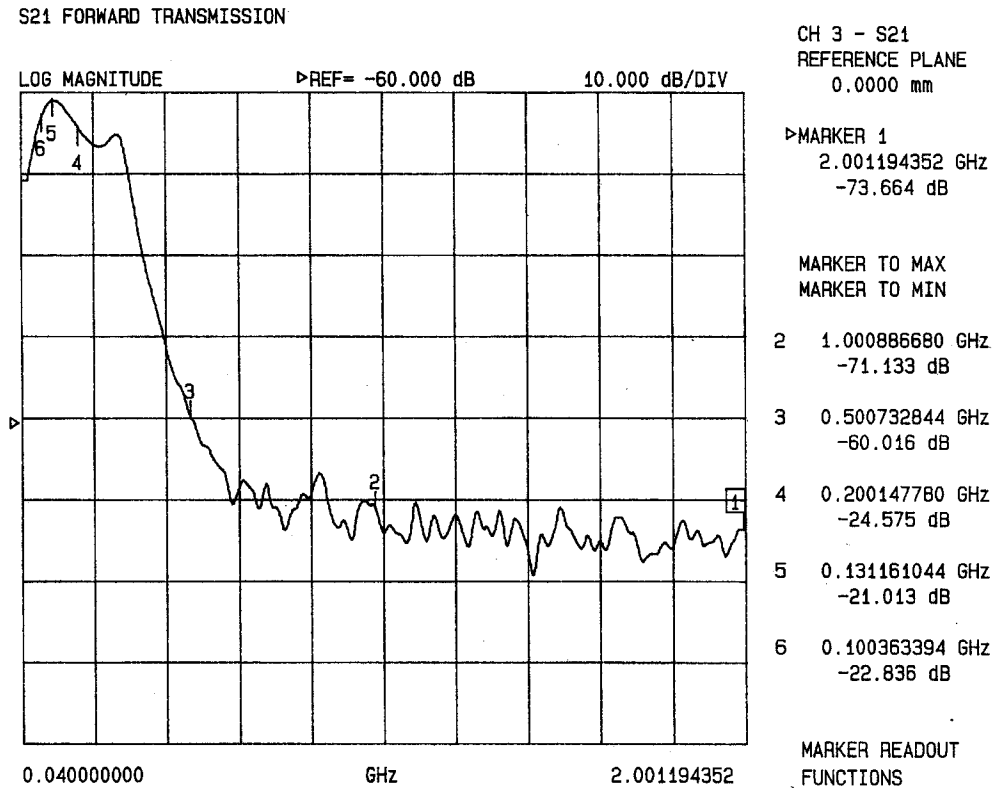
MARCH 3, 2000



SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

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



*J1: INPUT ARM

FREQUENCY	ISOLATION
100 MHz	22.83 dB
130 MHz	21.01 dB
200 MHz	24.57 dB
500 MHz	60.01 dB
1.0 GHz	71.13 dB
2.0 GHz	73.66 dB

MARCH 3, 2000

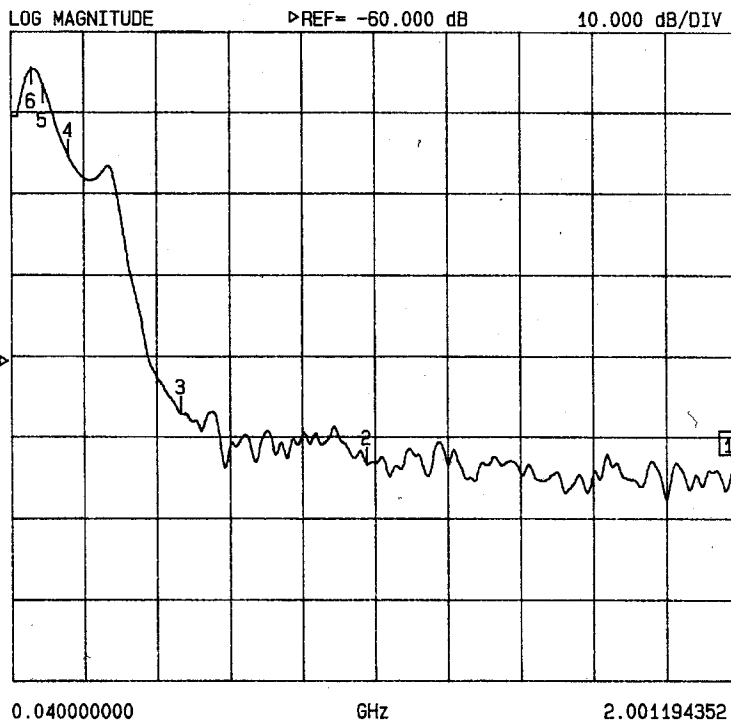


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

ISOLATION*
 (AS MEASURED ON A VECTOR NETWORK ANALYZER)
 J2-J3

S21 FORWARD TRANSMISSION



CH 3 - S21
 REFERENCE PLANE
 0.0000 mm
 MARKER 1
 2.001194352 GHz
 -74.454 dB
 MARKER TO MAX
 MARKER TO MIN
 2 1.000886680 GHz
 -73.433 dB
 3 0.500732844 GHz
 -67.256 dB
 4 0.200147780 GHz
 -35.684 dB
 5 0.131161044 GHz
 -26.801 dB
 6 0.100363394 GHz
 -24.600 dB
 MARKER READOUT
 FUNCTIONS

*J2: INPUT ARM

FREQUENCY	ISOLATION
100 MHz	24.60 dB
130 MHz	26.80 dB
200 MHz	35.68 dB
500 MHz	67.25 dB
1.0 GHz	73.43 dB
2.0 GHz	74.45 dB

MARCH 3, 2000



**ISOLATION
DATA AND PLOTS
FROM
2 GHz TO 6 GHz
AS
MEASURED
ON A VECTOR NETWORK
ANALYZER
ON A
TRANSFER SWITCH**

**AMC MODEL No:
SWN-2181-TRA OPTIONS 0518, 2SH
(Serial Number: TMS90639)**

**REPORTED AND PREPARED
BY
RENE AFABLE**

MARCH 3, 2000

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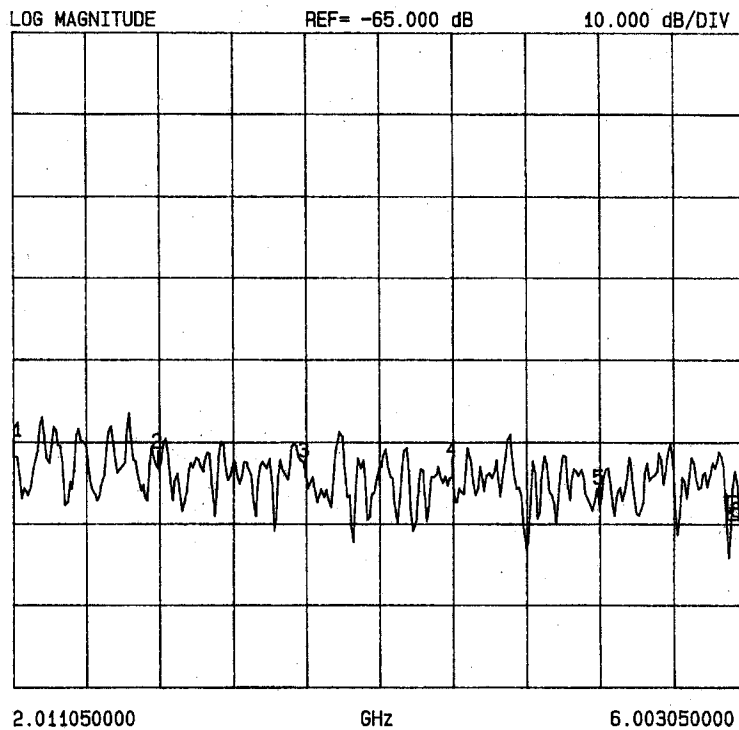


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

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

S12 REVERSE TRANSMISSION



CH 2 - S12
 REFERENCE PLANE
 0.0000 mm
 MARKER 6
 6.003050000 GHz
 -86.637 dB
 MARKER TO MAX
 MARKER TO MIN
 1 2.011050000 GHz
 -76.829 dB
 2 2.809450000 GHz
 -78.358 dB
 3 3.607850000 GHz
 -79.371 dB
 4 4.406250000 GHz
 -79.219 dB
 5 5.204650000 GHz
 -82.609 dB
 MARKER READOUT
 FUNCTIONS

*J1: INPUT ARM

FREQUENCY	ISOLATION
2.0 GHz	76.82 dB
2.8 GHz	78.35 dB
3.6 GHz	79.37 dB
4.4 GHz	79.21 dB
5.2 GHz	82.60 dB
6.0 GHz	86.63 dB

MARCH 3, 2000

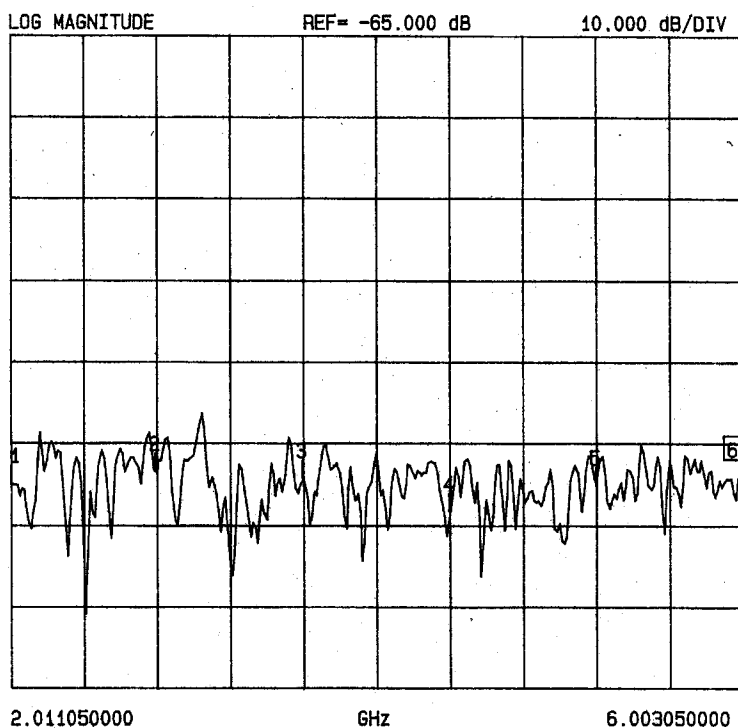


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

ISOLATION*
 (AS MEASURED ON A VECTOR NETWORK ANALYZER)
J3-J4

S12 REVERSE TRANSMISSION



CH 2 - S12
 REFERENCE PLANE
 0.0000 mm
 MARKER 6
 6.003050000 GHz
 -79.185 dB
 MARKER TO MAX
 MARKER TO MIN
 1 2.011050000 GHz
 -80.002 dB
 2 2.809450000 GHz
 -78.544 dB
 3 3.607850000 GHz
 -79.347 dB
 4 4.406250000 GHz
 -83.418 dB
 5 5.204650000 GHz
 -80.254 dB
 MARKER READOUT
 FUNCTIONS

*J3: INPUT ARM

FREQUENCY	ISOLATION
2.0 GHz	80.00 dB
2.8 GHz	78.54 dB
3.6 GHz	79.34 dB
4.4 GHz	83.41 dB
5.2 GHz	80.25 dB
6.0 GHz	79.18 dB

MARCH 3, 2000

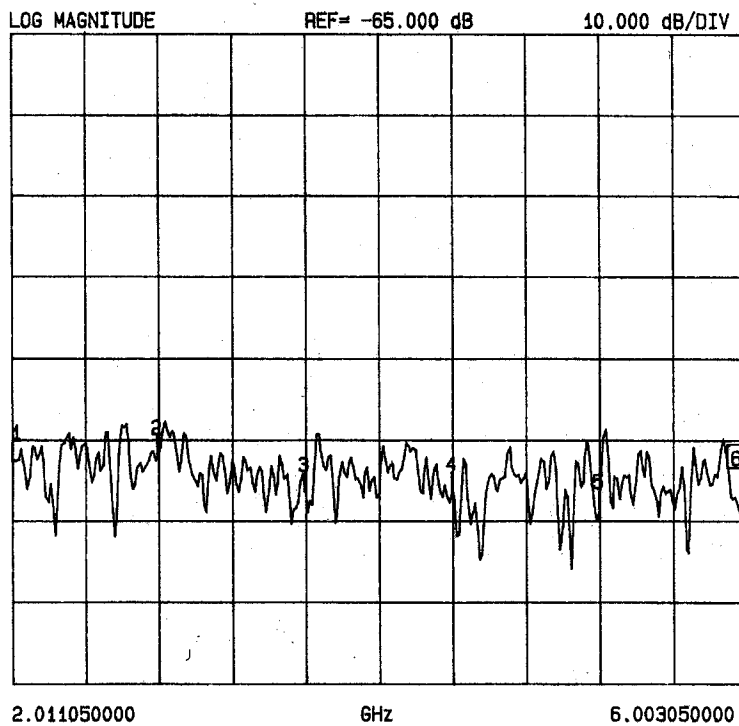


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

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

S12 REVERSE TRANSMISSION



CH 2 - S12
REFERENCE PLANE
0.0000 mm

MARKER 6
6.003050000 GHz
-80.532 dB

MARKER TO MAX
MARKER TO MIN

- 1 2.011050000 GHz
-77.521 dB
- 2 2.809450000 GHz
-76.747 dB
- 3 3.607850000 GHz
-81.538 dB
- 4 4.406250000 GHz
-81.175 dB
- 5 5.204650000 GHz
-83.538 dB

MARKER READOUT
FUNCTIONS

*J1: INPUT ARM

FREQUENCY	ISOLATION
2.0 GHz	77.52 dB
2.8 GHz	76.74 dB
3.6 GHz	81.53 dB
4.4 GHz	81.17 dB
5.2 GHz	83.53 dB
6.0 GHz	80.53 dB

MARCH 3, 2000

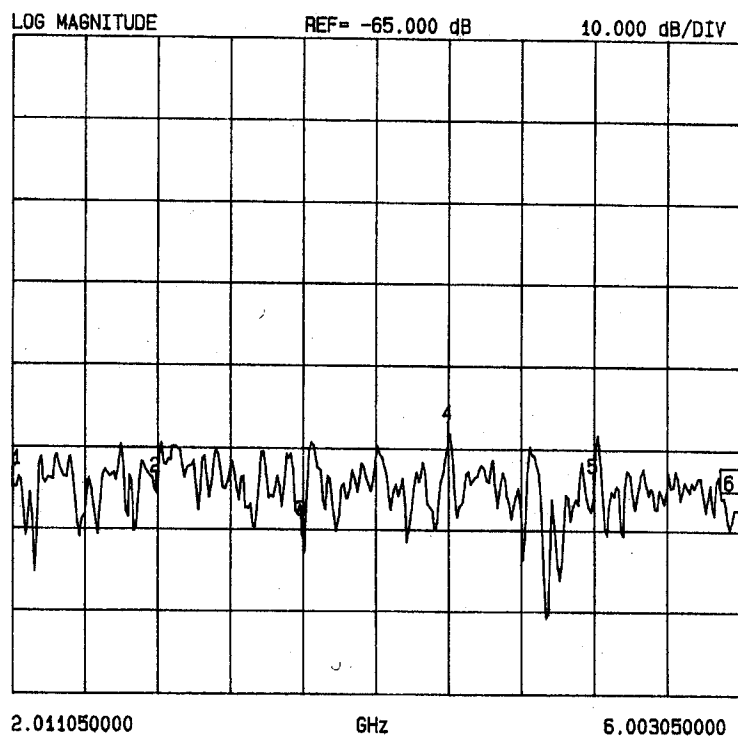


SUMMARY TEST DATA

MODEL NUMBER : SWN-2181-TRA OPTIONS 0518, 2SH
SERIAL NUMBER : TMS90639
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: +87mA; -12vdc: -70mA

ISOLATION*
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)
 J2-J3

S12 REVERSE TRANSMISSION



CH 2 - S12
 REFERENCE PLANE
 0.0000 mm

MARKER 6
 6.003050000 GHz
 -82.382 dB

MARKER TO MAX
 MARKER TO MIN

- 1 2.011050000 GHz
-79.853 dB
- 2 2.809450000 GHz
-80.660 dB
- 3 3.607850000 GHz
-85.915 dB
- 4 4.406250000 GHz
-73.870 dB
- 5 5.204650000 GHz
-80.474 dB

MARKER READOUT FUNCTIONS

*J2: INPUT ARM

FREQUENCY	ISOLATION
2.0 GHz	79.85 dB
2.8 GHz	80.66 dB
3.6 GHz	85.91 dB
4.4 GHz	73.87 dB
5.2 GHz	80.47 dB
6.0 GHz	82.38 dB

MARCH 3, 2000