



**AMERICAN MICROWAVE
CORPORATION**

TEST DATA

FROM

**10 MHz TO 5 GHz
(10 MHz TO 18 GHz OPTIONAL)**

SLIMLINE

LOW INSERTION LOSS

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

MINIATURE REFLECTIVE

SP8T

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

ON

**AMC MODEL No:
MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
(Serial Number: 8MS90879)**

**REPORTED AND PREPARED
BY
RENE AFABLE**

AUGUST 31, 1999

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

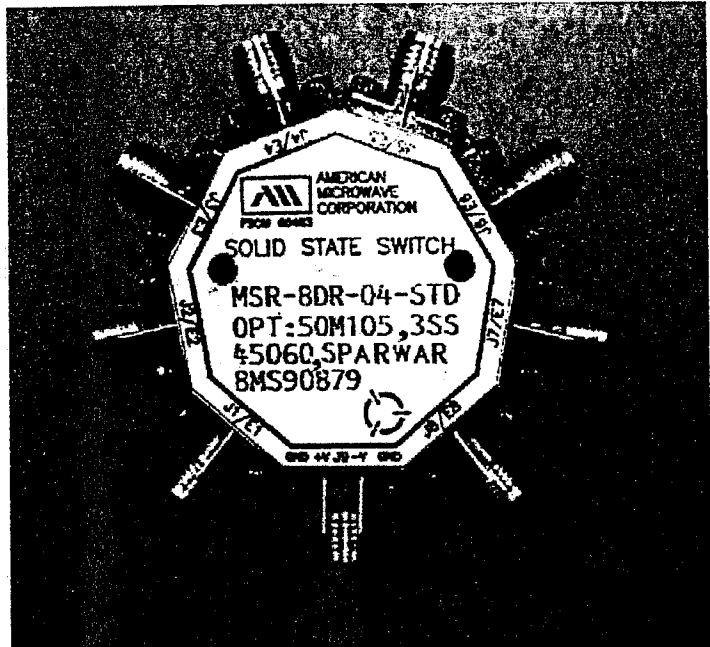
E-MAIL ADDRESS: AMCPMI@AOL.COM

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



AMERICAN MICROWAVE CORPORATION

SP8T REFLECTIVE RADIAL SOLID STATE SWITCH



KEY FEATURES

- 10 MHz TO 5 GHz
(10MHz to 18GHz optional)
- HIGH ISOLATION
- LOW INSERTION LOSS
- MINIATURE
- TTL LOGIC COMPATIBLE

AMC MODEL No: MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060

SPECIFICATIONS: (REFLECTIVE)

• FREQUENCY RANGE	:	10 MHz to 5 GHz (10MHz to 18GHz Optional)
• INSERTION LOSS	:	3.0 dB MAX.
	:	1.90 dB TYP. @ 10 MHz
	:	2.00 dB TYP. @ 2.0 GHz
	:	2.50 dB TYP. @ 3.0 GHz
	:	3.00 dB TYP. @ 5.0 GHz
• ISOLATION	:	≥ 65 dB MIN.
	:	≥ 90 dB TYP. @ 10 MHz
	:	≥ 75 dB TYP. @ 2.0 GHz
	:	≥ 70 dB TYP. @ 3.0 GHz
	:	≥ 65 dB TYP. @ 5.0 GHz
• VSWR	:	2.0:1
• SWITCHING SPEED	:	"RISE" 120nS MAX., 100nS TYP.
	:	"FALL" 120nS MAX., 100nS TYP.
	:	"ON" 200nS MAX., 175nS TYP.
	:	"OFF" 250nS MAX., 230nS TYP.
• CONTROL	:	Independent TTL Compatible (3 Bit Decoder available)
• VIDEO TRANSIENTS	:	≤3.9 V Peak to Peak, 300 MHz Bandwidth
	:	≤3.8 V Peak to Peak, 20 MHz Bandwidth
• RF INPUT POWER	:	+20dBm Operating, 1 Watt Survival (Other power Levels available)
• DC POWER SUPPLY	:	+5vdc @ +25mA MAX.
(Other supply voltages available)	:	-5vdc @ -75mA MAX.
• SIZE	:	1.5" Dia. circle point to point X 0.40" (H)
• WEIGHT	:	≤ 2.5 oz.

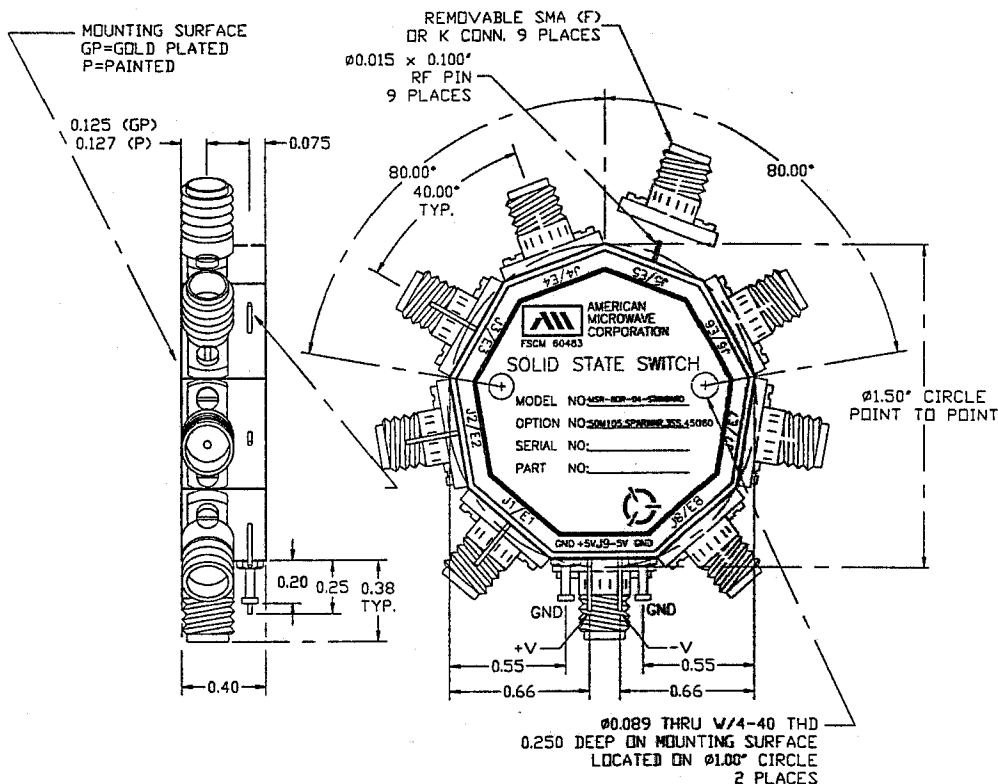
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SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @ +3.1mA; -5vdc: @ -47.2mA



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.

AUGUST 31, 1999

DESCRIPTION:
 R/DT-04-STANDARD IS A SINGLE POLE EIGHT THROW, REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH MODULE WITH LOW LOSS, HIGH SPEED AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR BROAD BAND OPERATIONS.

SPECIFICATIONS:

- FREQUENCY: 0.5 GHz TO 18 GHz
- INSERTION LOSS: REFLECTIVE: 4.0db
 ABSORPTIVE: 4.5db
- 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: 75ps TYPICAL, 100ns MAX.
 DELAY OFF: 75ns TYPICAL, 100ns MAX.
- POWER INPUT: (CW)+20dBm (STANDARD), +10 dBm (HIGH SPEED)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL: TTL LOGIC "0"-ON "1"-OFF
- POWER SUPPLY: +5V @ 400 mA MAX.
 -5V @ 75mA MAX.(RELECTIVE)
 100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- SIZE: Ø1.500 CIRCLE POINT TO POINT X 0.400 (H)
- WEIGHT: 2.5 OUNCES TYPICAL

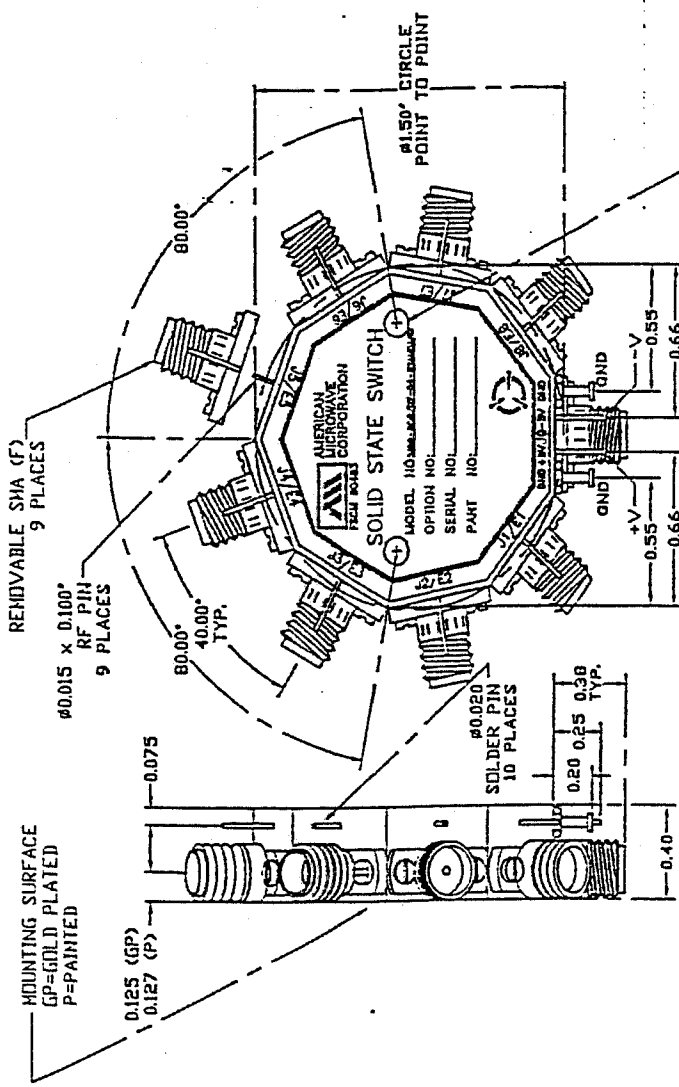
OPTIONS:

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SF 3 BIT DECODER WITH SOLDER PIN
- 10M1B 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 GHz AND 0.5db AT 18 GHz)
- 100M1B 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 18 GHz)
- 11B 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 21B 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 41B 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 81B 8 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 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 +65°C (OPERATING)
 -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
 MIL-STD-202F, METHOD 213B COND. B
- SHOCK: MIL-STD-202F, METHOD 204D, COND. B
- VIBRATION: MIL-STD-202F, METHOD 105G COND. B
- ALTITUDE: MIL-STD-202F, METHOD 107D COND. A
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 103B COND. B

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION



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

PART NO.		APPROVALS		DATE	
DRAWN: JVC/p		R.R.A.		9/28/99	
CHECKED: JWP		JWP		9/23/99	
SERIAL: JWP		JWP		9/31/99	
TITLE		AMERICAN MICROWAVE CORPORATION		FREDERICK, MARYLAND	
OUTLINE DRAWING		MSR-8DR/DT-04-STANDARD		REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE	
SIZE: TFCJ NO.		A		60483	
REV.		100-4191-1		1 of 2	

DESCRIPTION: R/DT-04-DEC-SP IS A SINGLE POLE EIGHT THROW, REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH MODULE WITH LOW LOSS, HIGH SPEED AND WITH INTEGRAL TIL 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 2 GHz: 60db
2 GHz TO 18 GHz: 70db
- VSWR: REFLECTIVE IN/OUT: 2.0:1
ABSORPTIVE IN/OUT: 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: SEE LOGIC TABLE
- POWER SUPPLY: +5V @ 400 mA MAX.
-5V @ 75mA MAX.(REFLECTIVE)
100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- SIZE: #1.500 CIRCLE POINT TO POINT X 0.400 (H)
- WEIGHT: 2.5 OUNCES TYPICAL

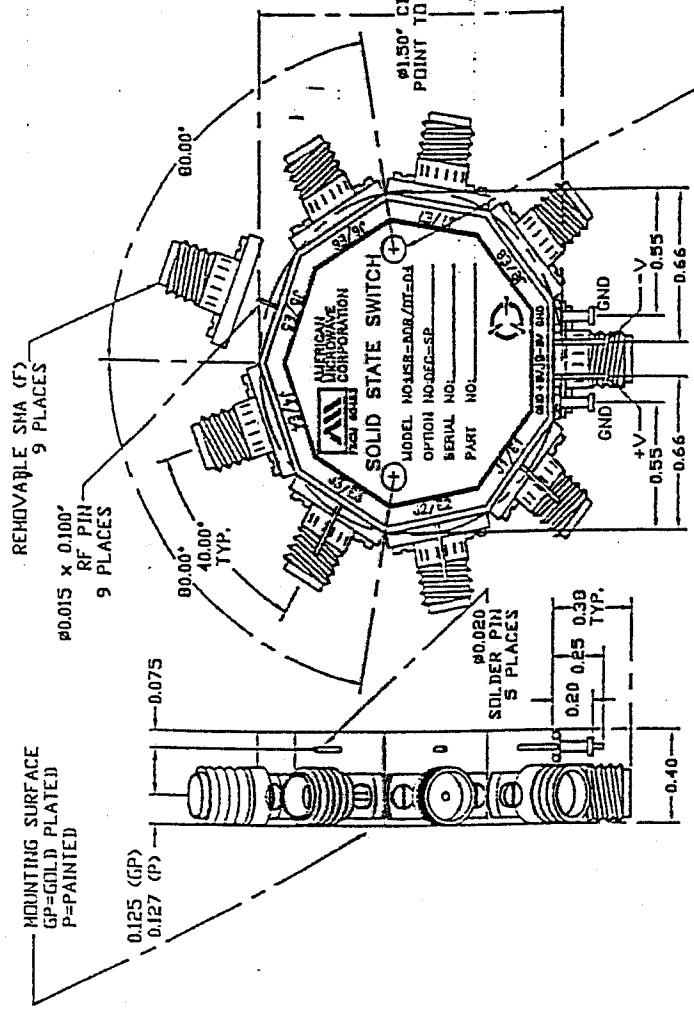
OPTIONS:

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SP: 3 BIT DECODER WITH SOLDER PIN
- 10M18: 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 GHz AND 0.5db AT 18 GHz)
- 100M18: 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.6db 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
- B08: 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

LOGIC TABLE

E1	E2	E3	PATH ON
L	L	L	J1
H	L	L	J2
L	H	L	J3
H	H	L	J4
L	L	H	J5
H	L	H	J6
L	H	H	J7
H	H	H	J8

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



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

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

OUTLINE DRAWING

MSR-8DR/DT-04-DEC-SP
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE
SOLID STATE SWITCH

DATE: 8/28/99
DRAWN: JCP, RRD
CHECKED: WJP
ISSUED: JN

SIZE: A
PART NO.: 60483
SCALE: 1:1

SHEET: 1 of 2



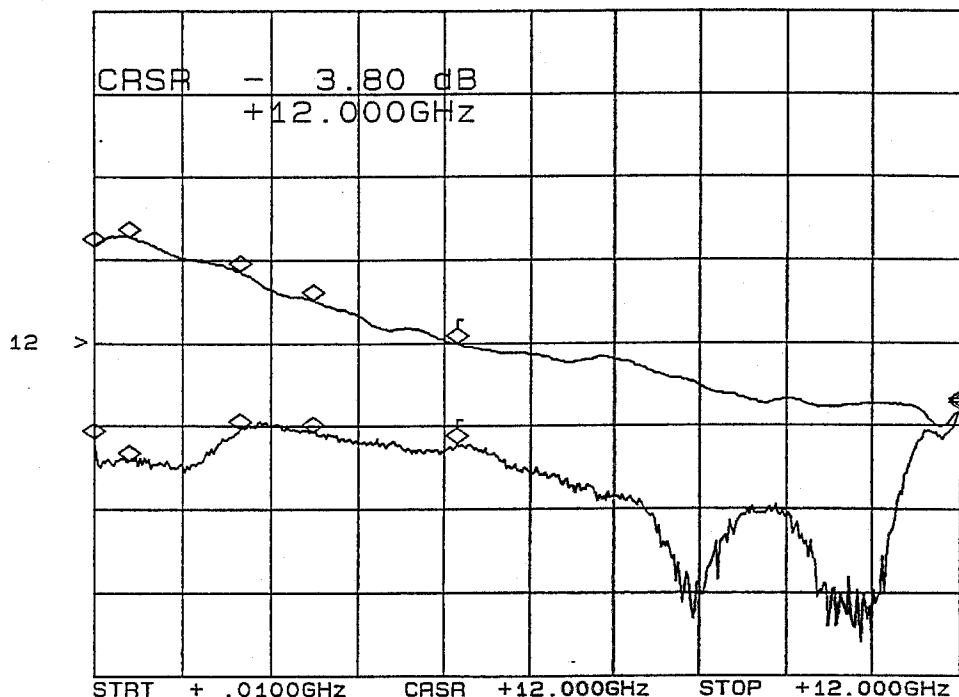
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J9-J1

CH1: A -M - 3.80 dB CH2: B -M - 13.35 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.83 dB	15.2 dB
500 MHz	1.72 dB	16.6 dB
2.0 GHz	2.13 dB	14.6 dB
3.0 GHz	2.46 dB	14.8 dB
5.0 GHz	3.00 dB	15.5 dB
12.0 GHz	3.80 dB	13.3 dB



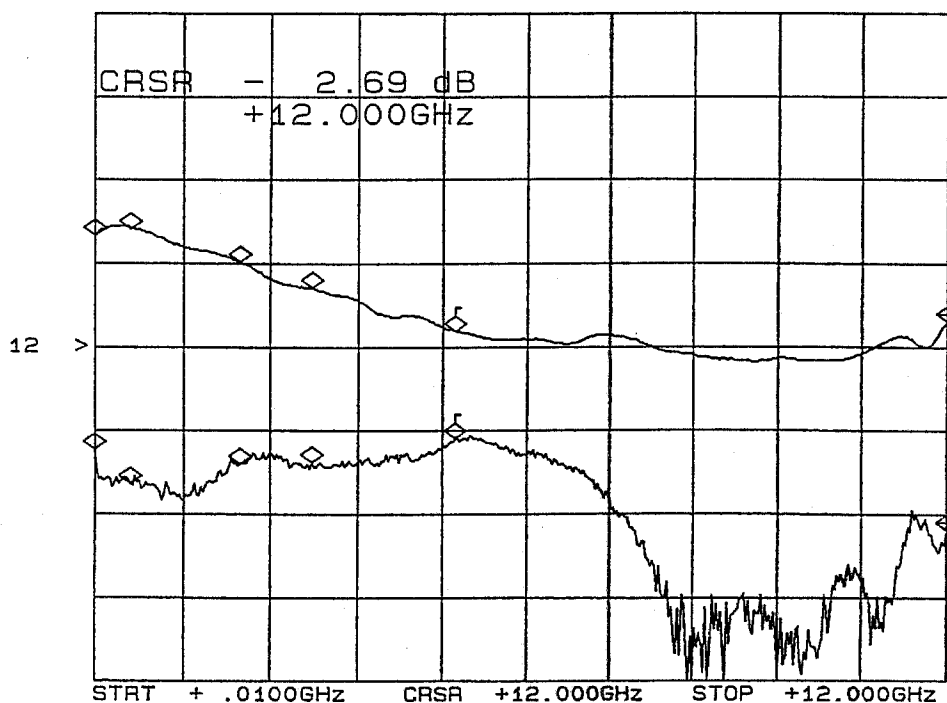
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J9-J2

CH1: A -M - 2.69 dB CH2: B -M - 20.47 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.66 dB	15.6 dB
500 MHz	1.57 dB	17.6 dB
2.0 GHz	1.97 dB	16.5 dB
3.0 GHz	2.28 dB	16.4 dB
5.0 GHz	2.79 dB	15.0 dB
12.0 GHz	2.69 dB	20.4 dB

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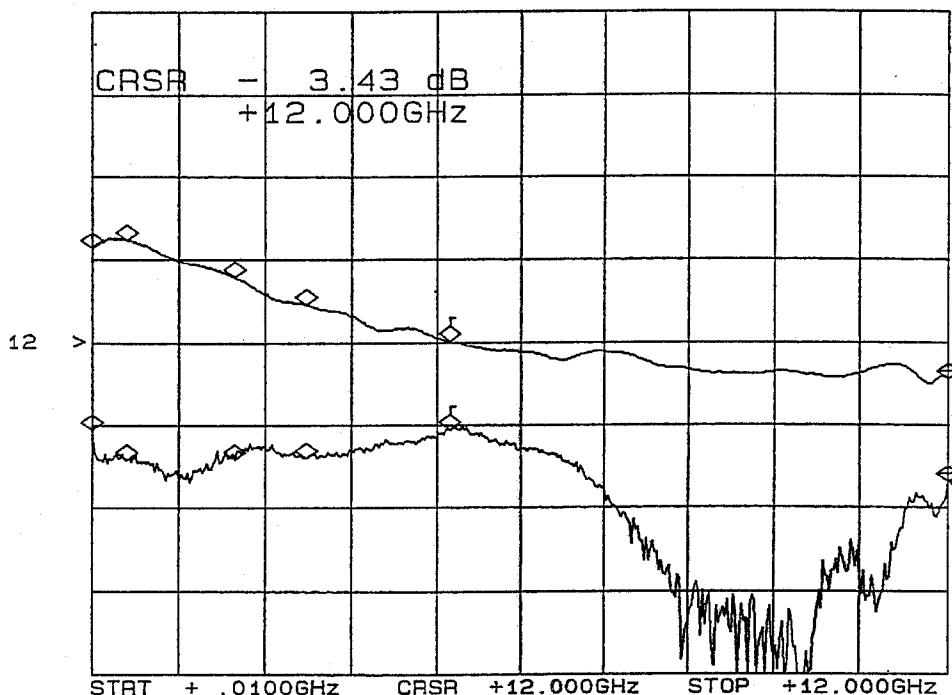
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J9-J3

CH1: A -M - 3.43 dB CH2: B -M - 17.91 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.86 dB	14.7 dB
500 MHz	1.76 dB	16.5 dB
2.0 GHz	2.20 dB	16.5 dB
3.0 GHz	2.53 dB	16.4 dB
5.0 GHz	2.98 dB	14.7 dB
12.0 GHz	3.43 dB	17.9 dB



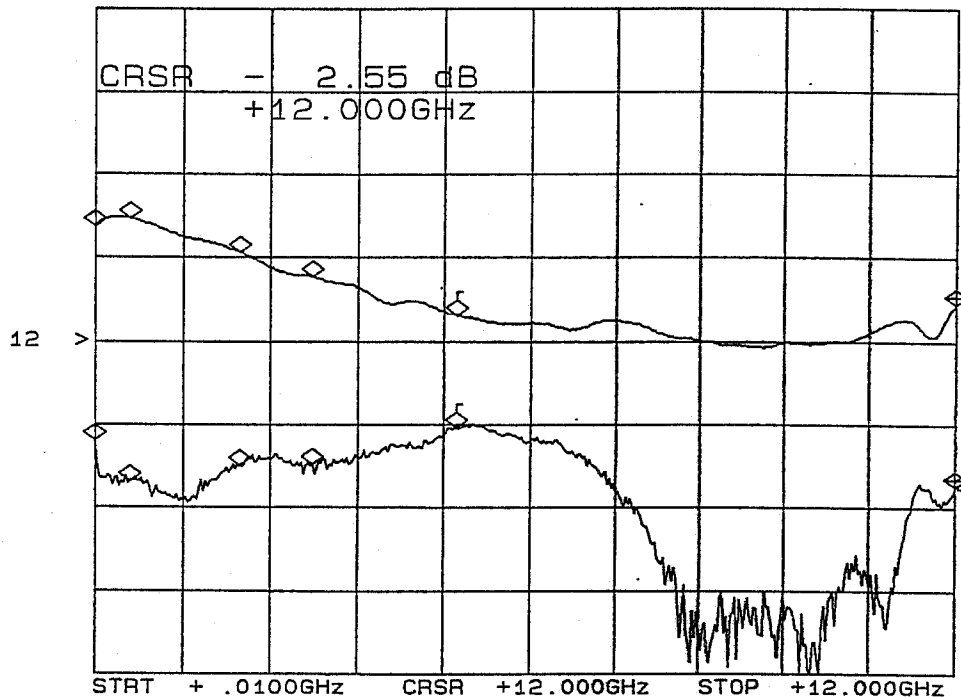
SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J9-J4

CH1: A -M - 2.55 dB CH2: B -M - 18.24 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.62 dB	15.4 dB
500 MHz	1.53 dB	17.9 dB
2.0 GHz	1.92 dB	17.0 dB
3.0 GHz	2.22 dB	16.8 dB
5.0 GHz	2.68 dB	14.6 dB
12.0 GHz	2.55 dB	18.2 dB

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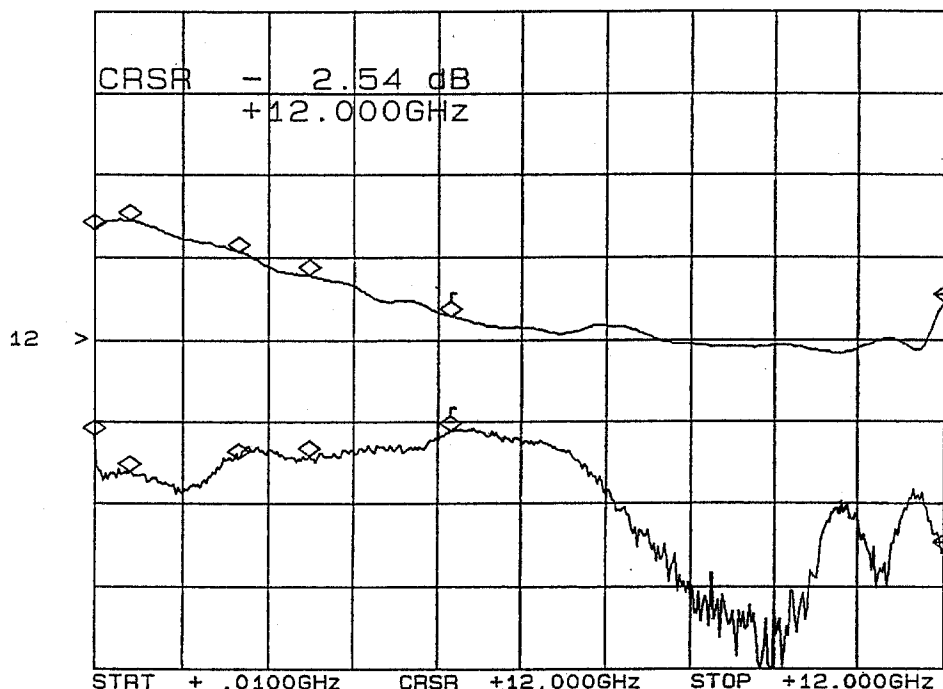
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J9-J5

CH1: A -M - 2.54 dB CH2: B -M - 22.23 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.65 dB	15.3 dB
500 MHz	1.55 dB	17.5 dB
2.0 GHz	1.92 dB	16.7 dB
3.0 GHz	2.21 dB	16.5 dB
5.0 GHz	2.70 dB	15.0 dB
12.0 GHz	2.54 dB	22.2 dB



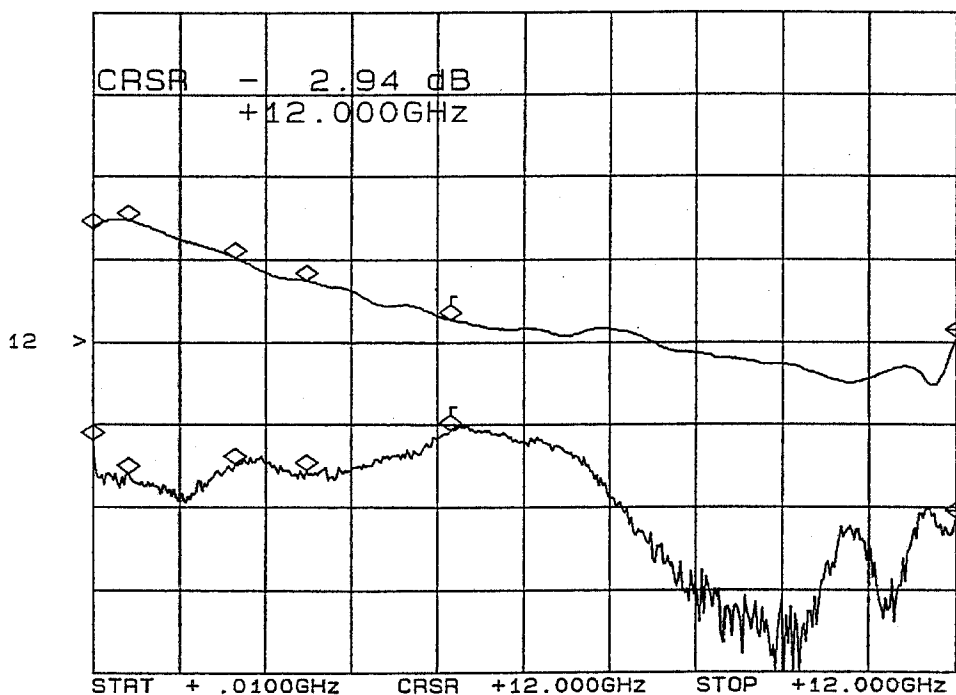
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MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J9-J6

CH1: A -M REF - 2.94 dB 1.0 dB/ REF - 3.00 dB
 CH2: B -M REF - 20.18 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.61 dB	15.4 dB
500 MHz	1.53 dB	17.4 dB
2.0 GHz	1.96 dB	16.8 dB
3.0 GHz	2.23 dB	17.2 dB
5.0 GHz	2.71 dB	14.4 dB
12.0 GHz	2.94 dB	20.1 dB



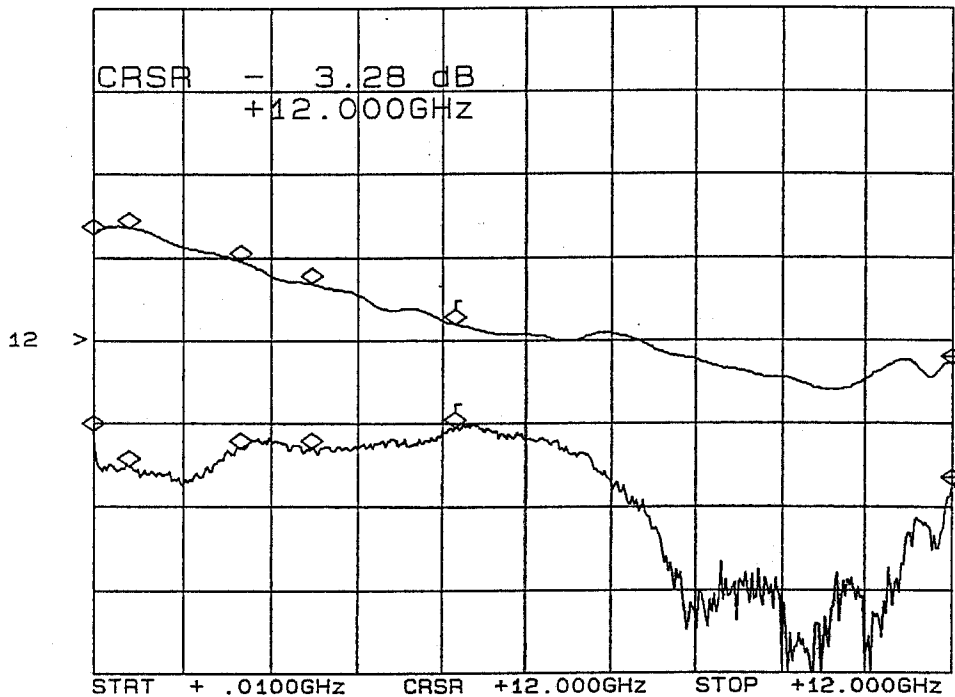
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J9-J7

CH1: A -M - 3.28 dB CH2: B -M - 18.22 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.72 dB	15.0 dB
500 MHz	1.64 dB	17.1 dB
2.0 GHz	2.03 dB	16.0 dB
3.0 GHz	2.30 dB	16.0 dB
5.0 GHz	2.79 dB	14.7 dB
12.0 GHz	3.28 dB	18.2 dB



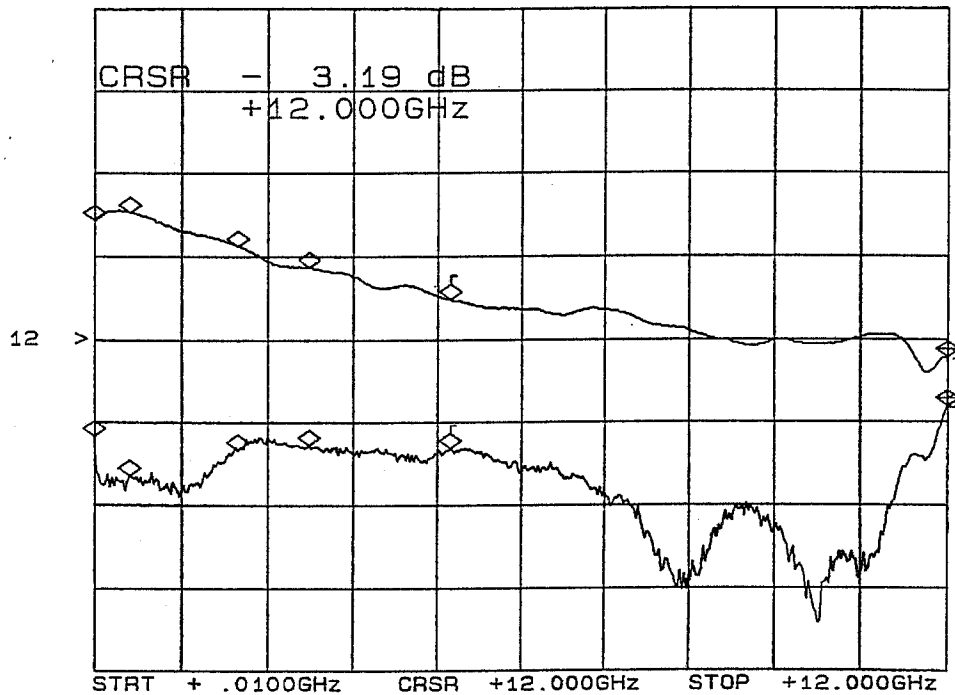
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J9-J8

CH1: A -M - 3.19 dB CH2: B -M - 13.52 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.56 dB	15.3 dB
500 MHz	1.47 dB	17.8 dB
2.0 GHz	1.87 dB	16.2 dB
3.0 GHz	2.12 dB	15.9 dB
5.0 GHz	2.51 dB	16.1 dB
12.0 GHz	3.19 dB	13.5 dB



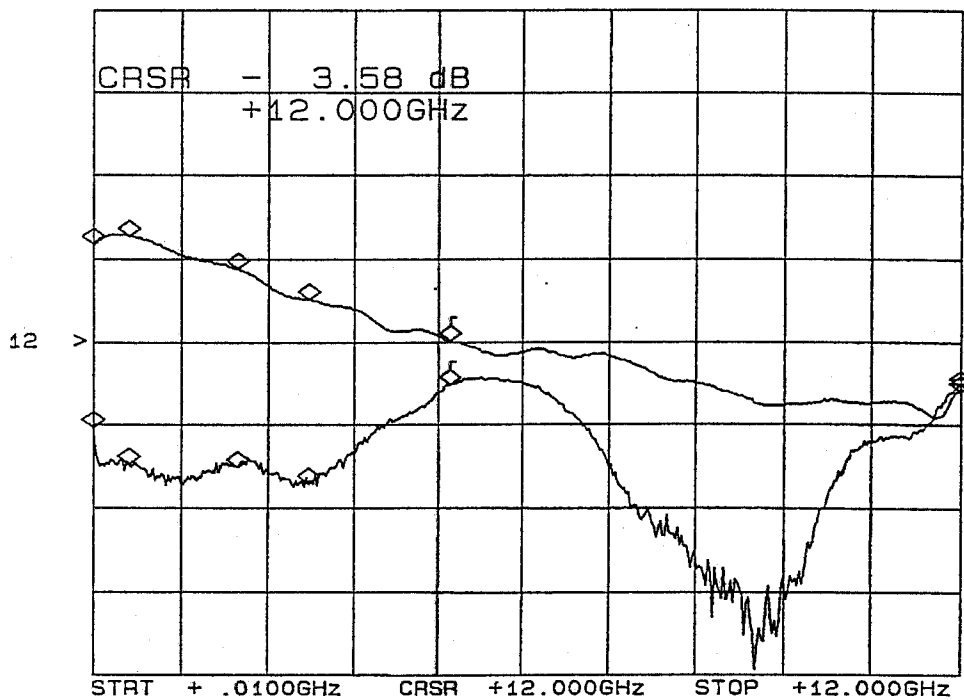
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J1-J9

CH1: A -M REF - 3.58 dB 1.0 dB/ REF - 3.00 dB
 CH2: B -M REF - 12.17 dB 5.0 dB/ REF - 9.54 dB



*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.81 dB	14.6 dB
500 MHz	1.72 dB	16.9 dB
2.0 GHz	1.11 dB	17.0 dB
3.0 GHz	2.47 dB	18.0 dB
5.0 GHz	2.97 dB	12.0 dB
12.0 GHz	3.58 dB	12.1 dB



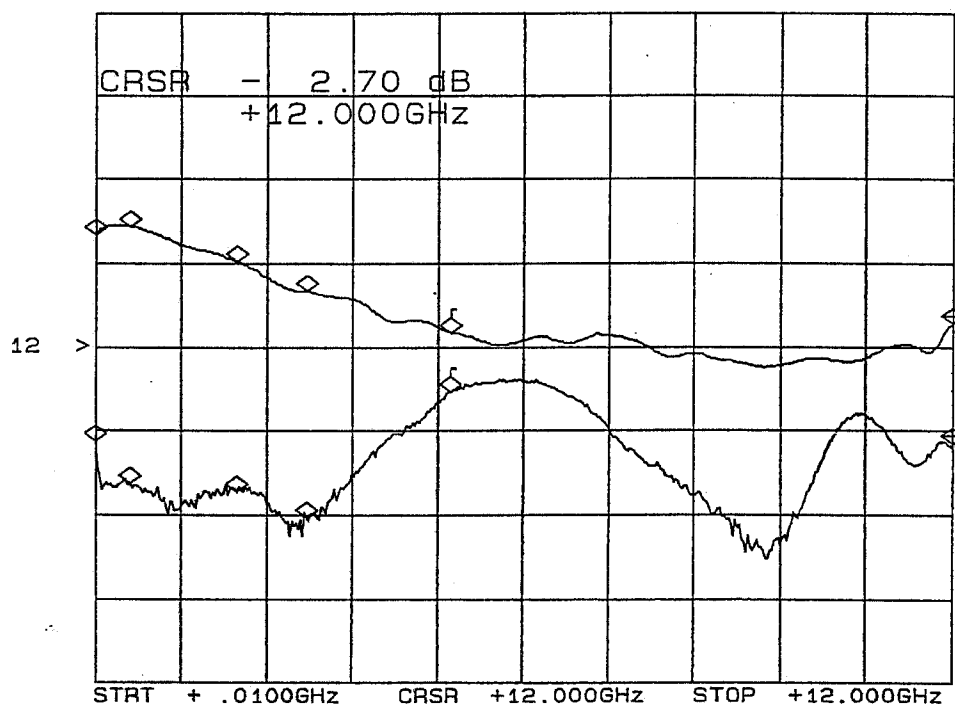
SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J2-J9

CH1: A -M - 2.70 dB CH2: B -M - 15.30 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J2: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.66 dB	15.1 dB
500 MHz	1.56 dB	17.6 dB
2.0 GHz	1.97 dB	18.1 dB
3.0 GHz	2.32 dB	19.6 dB
5.0 GHz	2.81 dB	12.1 dB
12.0 GHz	2.70 dB	15.3 dB

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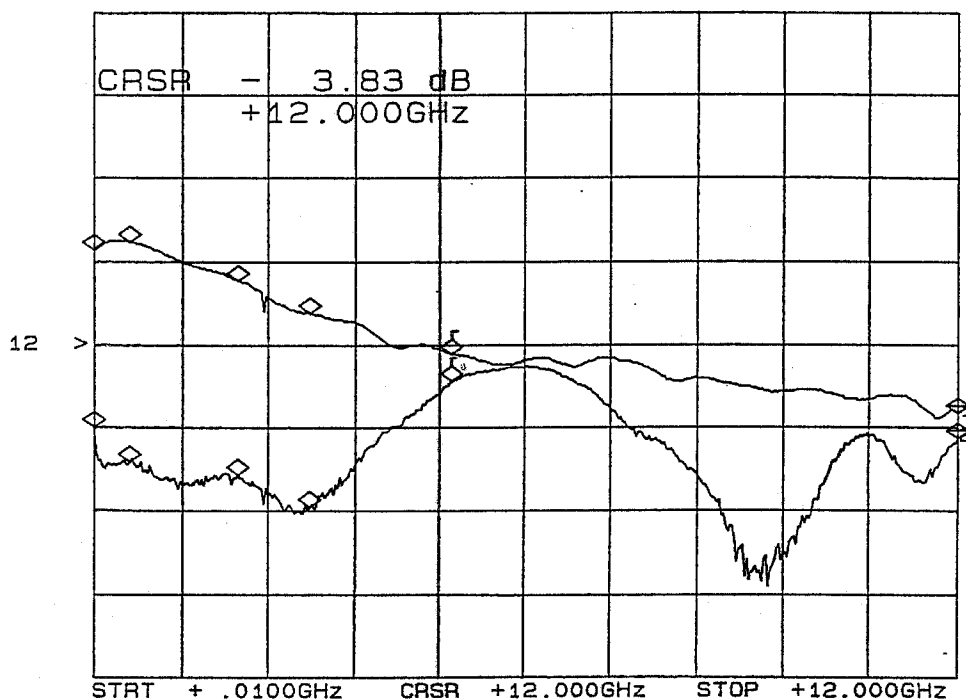
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J3-J9

CH1: A -M - 3.83 dB CH2: B -M - 15.16 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.85 dB	14.7 dB
500 MHz	1.76 dB	16.7 dB
2.0 GHz	2.21 dB	17.9 dB
3.0 GHz	2.61 dB	19.5 dB
5.0 GHz	3.10 dB	11.7 dB
12.0 GHz	3.83 dB	15.1 dB



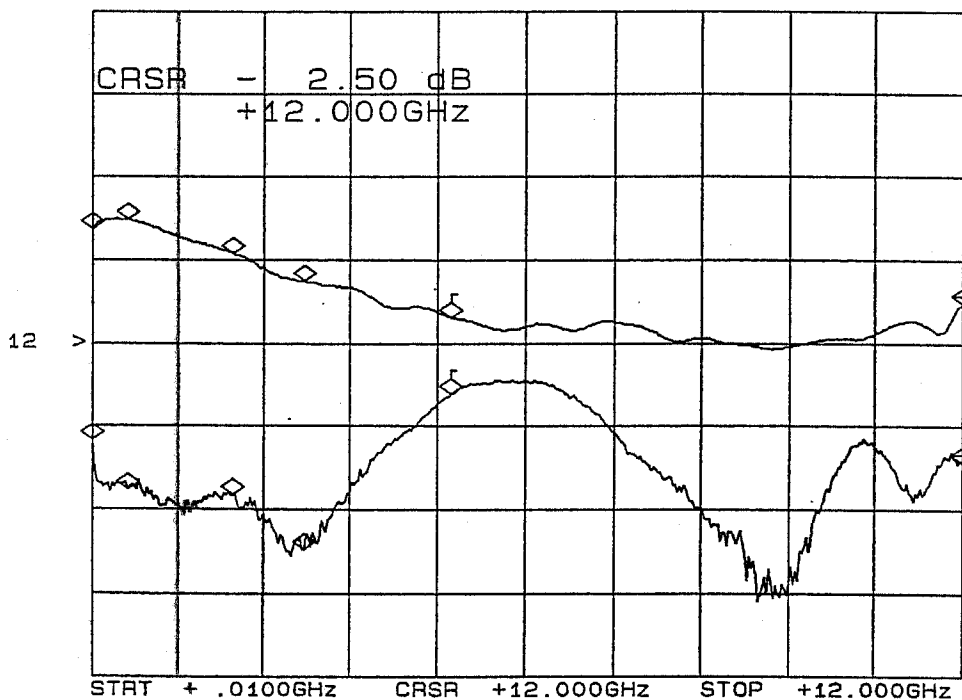
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA
OPTIONS 10M5, SPARWAR, 3SS, 45060

INSERTION LOSS & RETURN LOSS*

J4-J9

CH1: A -M - 2.50 dB CH2: B -M - 16.65 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.61 dB	15.3 dB
500 MHz	1.51 dB	18.3 dB
2.0 GHz	1.92 dB	18.6 dB
3.0 GHz	2.25 dB	21.8 dB
5.0 GHz	2.67 dB	12.5 dB
12.0 GHz	2.50 dB	16.6 dB



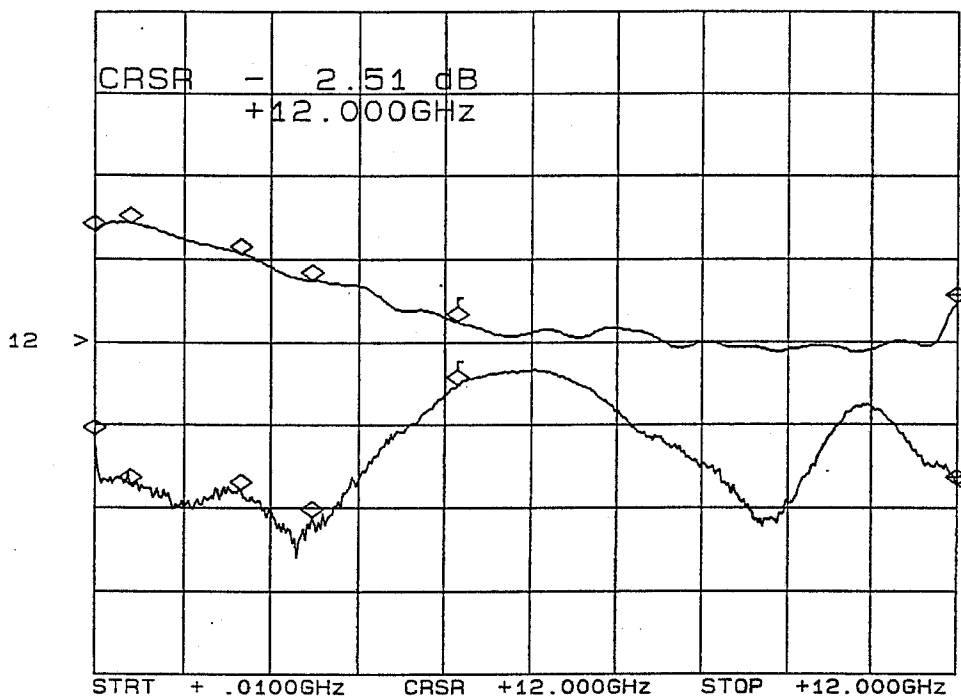
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J5-J9

CH1: A -M - 2.51 dB CH2: B -M - 18.16 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J5: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.66 dB	15.1 dB
500 MHz	1.56 dB	18.1 dB
2.0 GHz	1.92 dB	18.4 dB
3.0 GHz	2.24 dB	20.0 dB
5.0 GHz	2.75 dB	12.0 dB
12.0 GHz	2.51 dB	18.1 dB



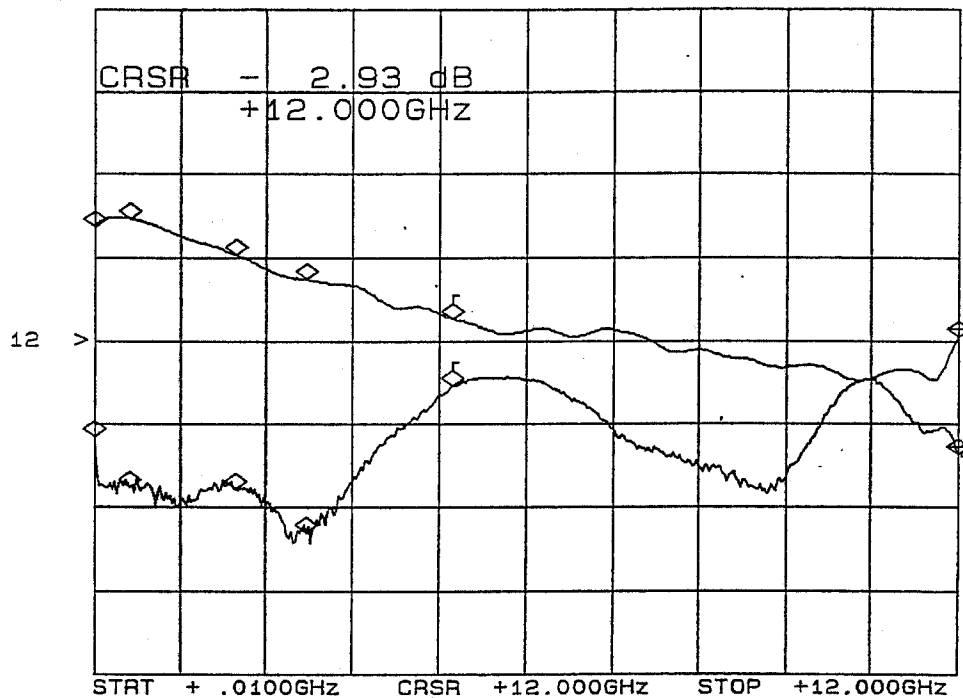
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA
OPTIONS 10M5, SPARWAR, 3SS, 45060

INSERTION LOSS & RETURN LOSS*

J6-J9

CH1: A -M - 2.93 dB CH2: B -M - 16.31 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J6: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.61 dB	15.2 dB
500 MHz	1.53 dB	18.3 dB
2.0 GHz	1.95 dB	18.4 dB
3.0 GHz	2.24 dB	20.9 dB
5.0 GHz	2.72 dB	12.2 dB
12.0 GHz	2.93 dB	16.3 dB



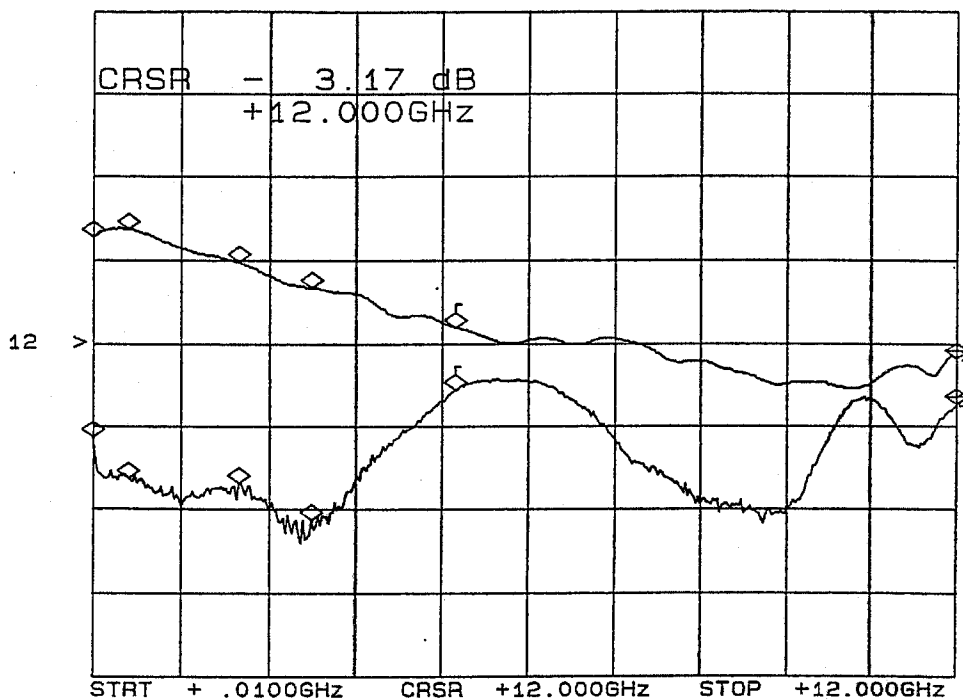
SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J7-J9

CH1: A -M - 3.17 dB CH2: B -M - 13.14 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J7: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.72 dB	15.2 dB
500 MHz	1.63 dB	17.6 dB
2.0 GHz	2.01 dB	17.9 dB
3.0 GHz	2.31 dB	20.1 dB
5.0 GHz	2.79 dB	12.3 dB
12.0 GHz	3.17 dB	13.1 dB

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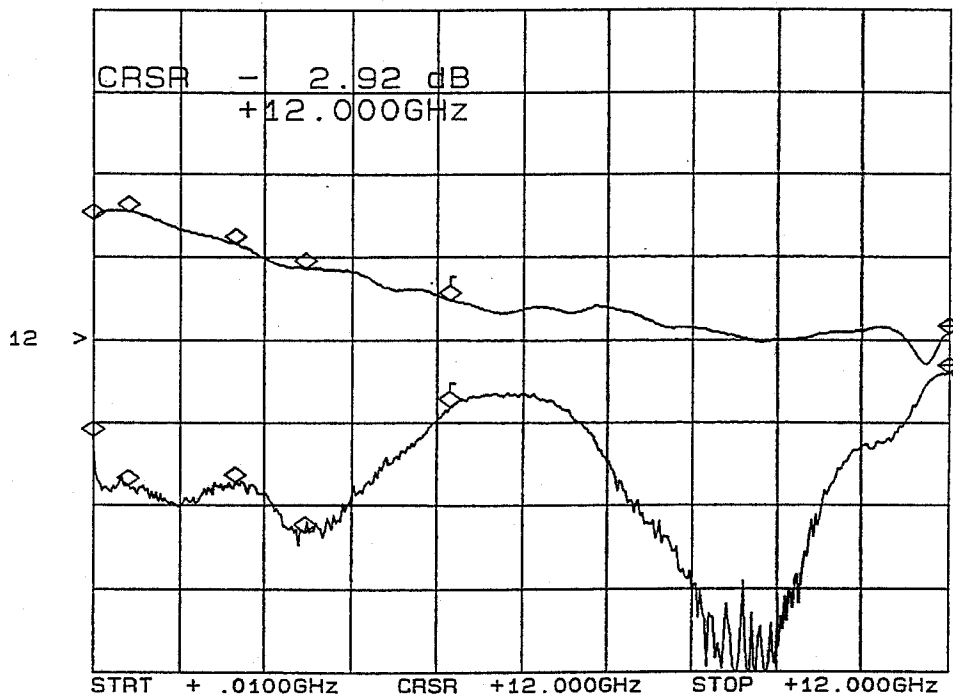
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

INSERTION LOSS & RETURN LOSS*

J8-J9

CH1: A -M - 2.92 dB CH2: B -M - 11.51 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J8: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
10 MHz	1.54 dB	15.3 dB
500 MHz	1.45 dB	18.3 dB
2.0 GHz	1.84 dB	18.1 dB
3.0 GHz	2.11 dB	21.1 dB
5.0 GHz	2.50 dB	13.4 dB
12.0 GHz	2.92 dB	11.5 dB



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*

(AS MEASURED ON A SPECTRUM ANALYZER)

FREQUENCY	J1	J2	J3	J4	J5	J6	J7	J8
70 MHz	92 dB	96 dB	95 dB	95 dB	94 dB	95 dB	95 dB	91 dB
100 MHz	87 dB	87 dB	92 dB	90 dB	93 dB	93 dB	92 dB	90 dB
500 MHz	78 dB	77 dB	80 dB	80 dB	82 dB	83 dB	82 dB	79 dB
1 GHz	77 dB	80 dB	81 dB	79 dB	81 dB	81 dB	78 dB	79 dB
1.5 GHz	76 dB	79 dB	80 dB	78 dB	77 dB	78 dB	75 dB	73 dB
2 GHz	72 dB	72 dB	73 dB	73 dB	73 dB	74 dB	73 dB	71 dB
4 GHz	69 dB	71 dB	71 dB	70 dB	71 dB	71 dB	68 dB	71 dB
6 GHz	64 dB	66 dB	66 dB	66 dB	67 dB	68 dB	68 dB	67 dB
8 GHz	62 dB	64 dB	65 dB	64 dB	64 dB	64 dB	62 dB	62 dB
10 GHz	64 dB	63 dB	64 dB	62 dB	62 dB	63 dB	60 dB	61 dB
12 GHz	61 dB	61 dB	61 dB	61 dB	60 dB	62 dB	62 dB	62 dB
14 GHz	67 dB	65 dB	64 dB	62 dB	61 dB	62 dB	60 dB	65 dB
16 GHz	52 dB	57 dB	58 dB	56 dB	56 dB	58 dB	58 dB	58 dB
18 GHz	54 dB	49 dB	48 dB	48 dB	47 dB	48 dB	49 dB	49 dB

* J9: INPUT ARM

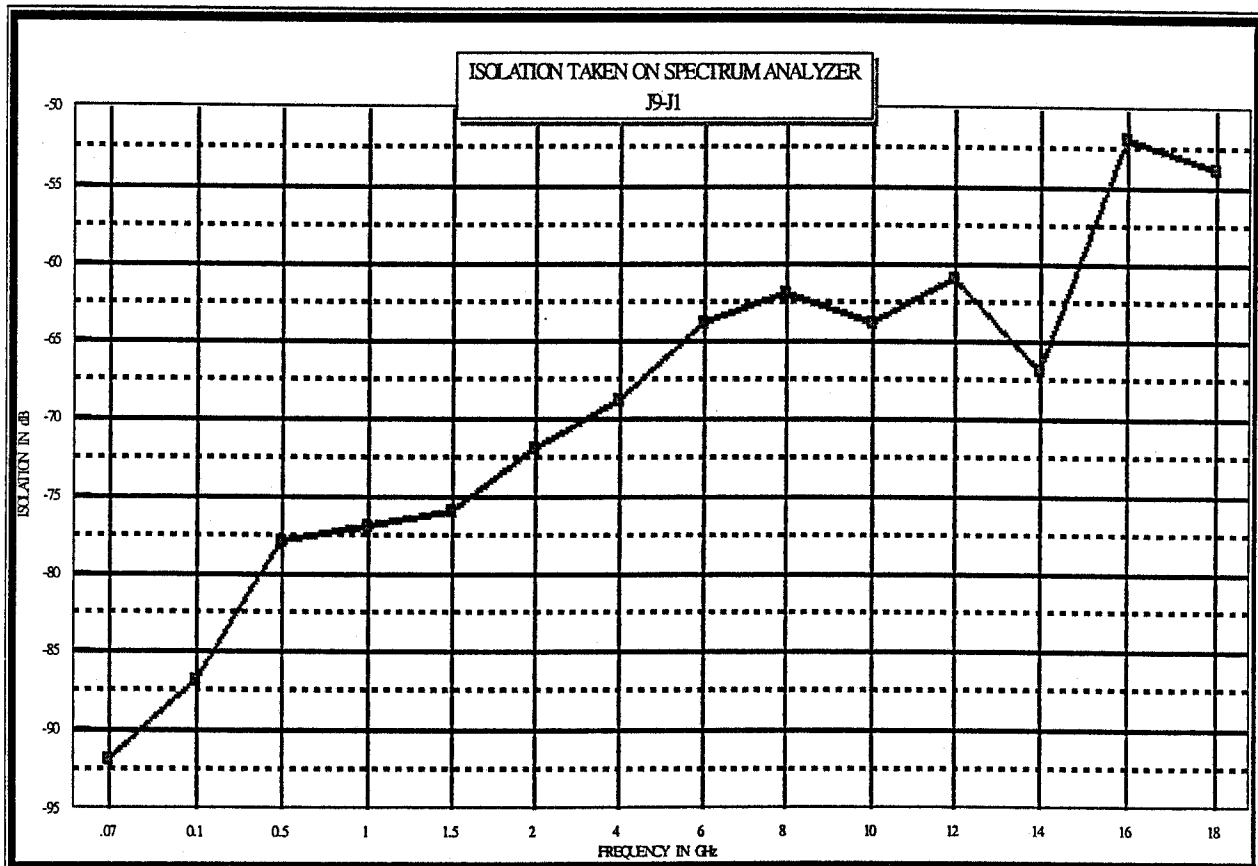
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*
 (AS MEASURED ON A SPECTRUM ANALYZER)
 J9-J1



*J9: INPUT ARM

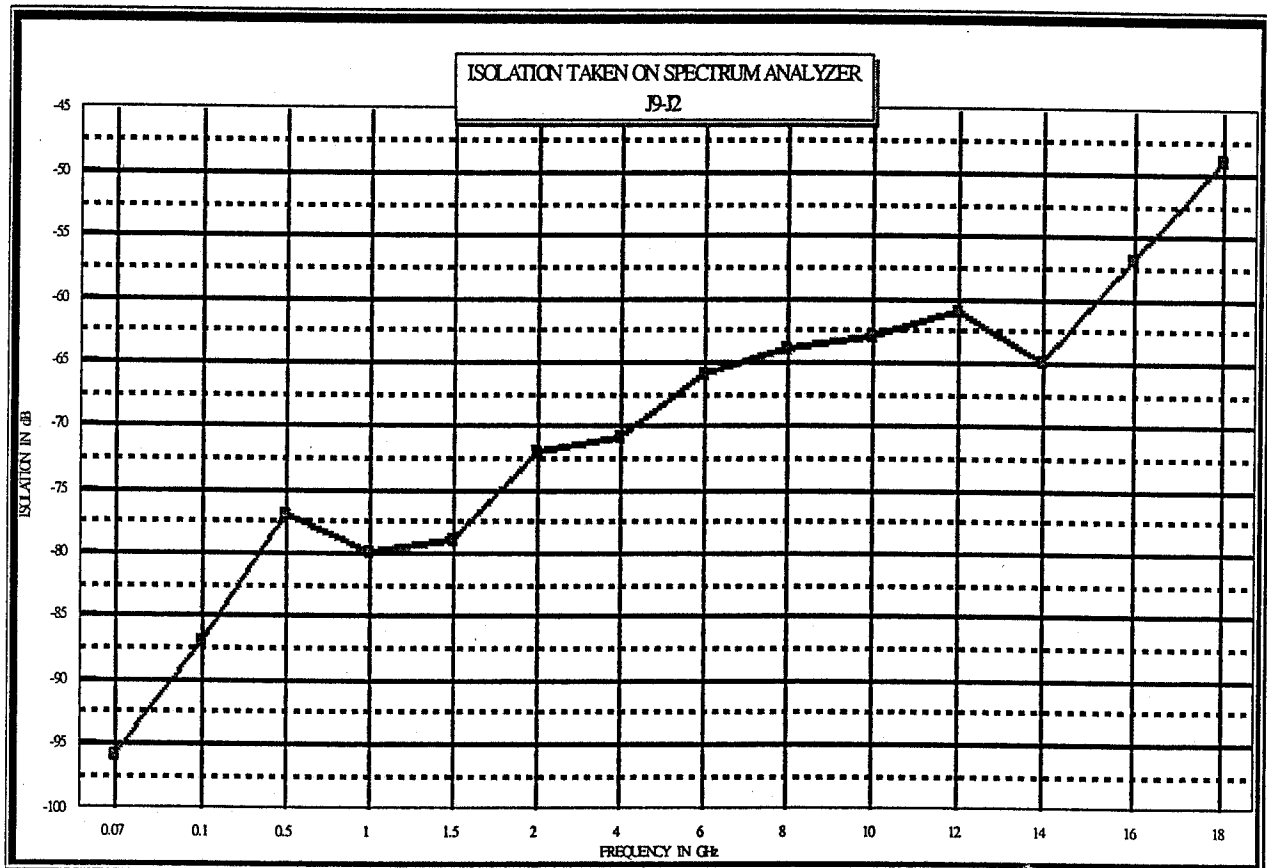
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 OPTIONS 10M5, SPARWAR, 3SS, 45060
 SERIAL NUMBER : 8MS90879
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*
 (AS MEASURED ON A SPECTRUM ANALYZER)
 J9-J2



*J9: INPUT ARM

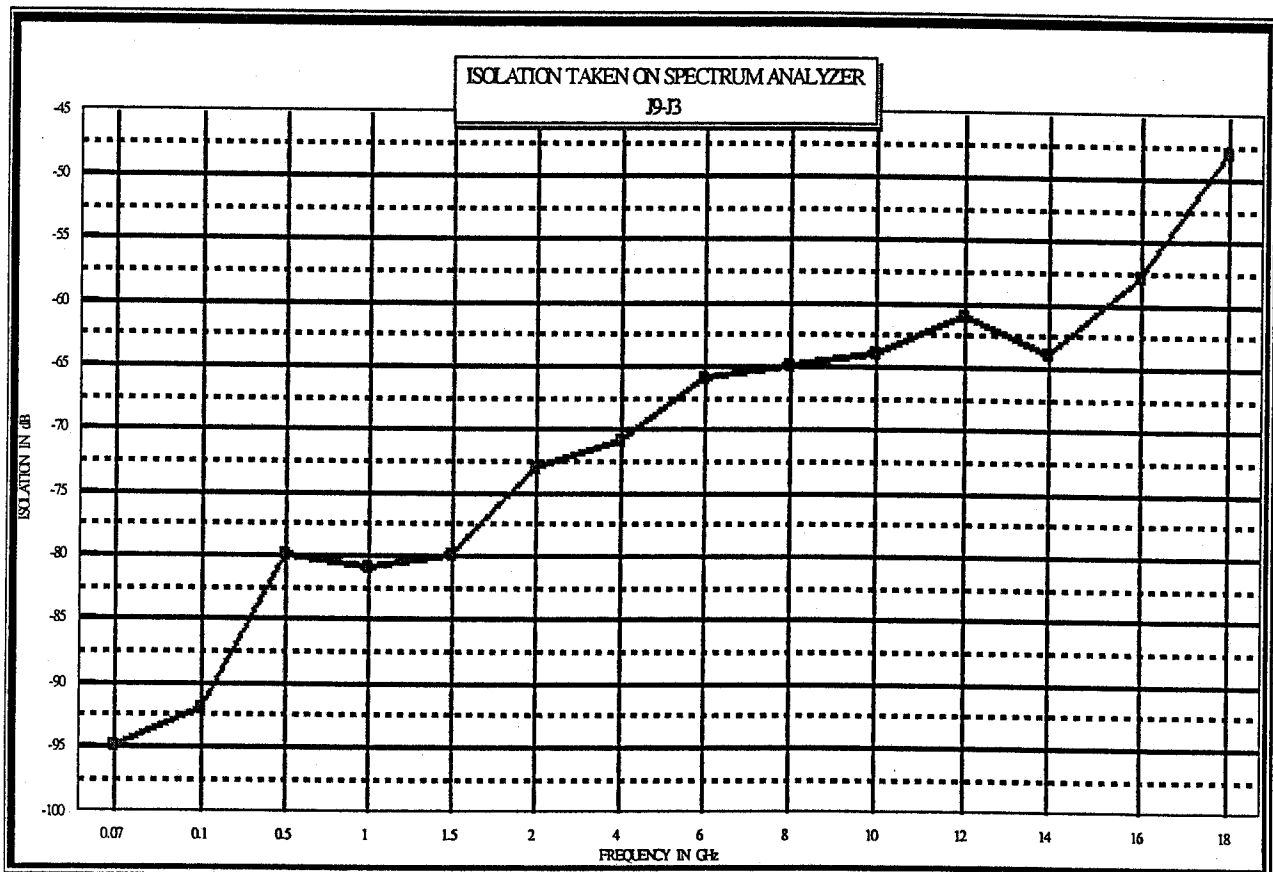
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : OPTIONS 10M5, SPARWAR, 3SS, 45060
ENGINEER : 8MS90879
VOLTAGE & CURRENT DRAW : RENE AFABLE
: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*
 (AS MEASURED ON A SPECTRUM ANALYZER)
 J9-J3



*J9: INPUT ARM

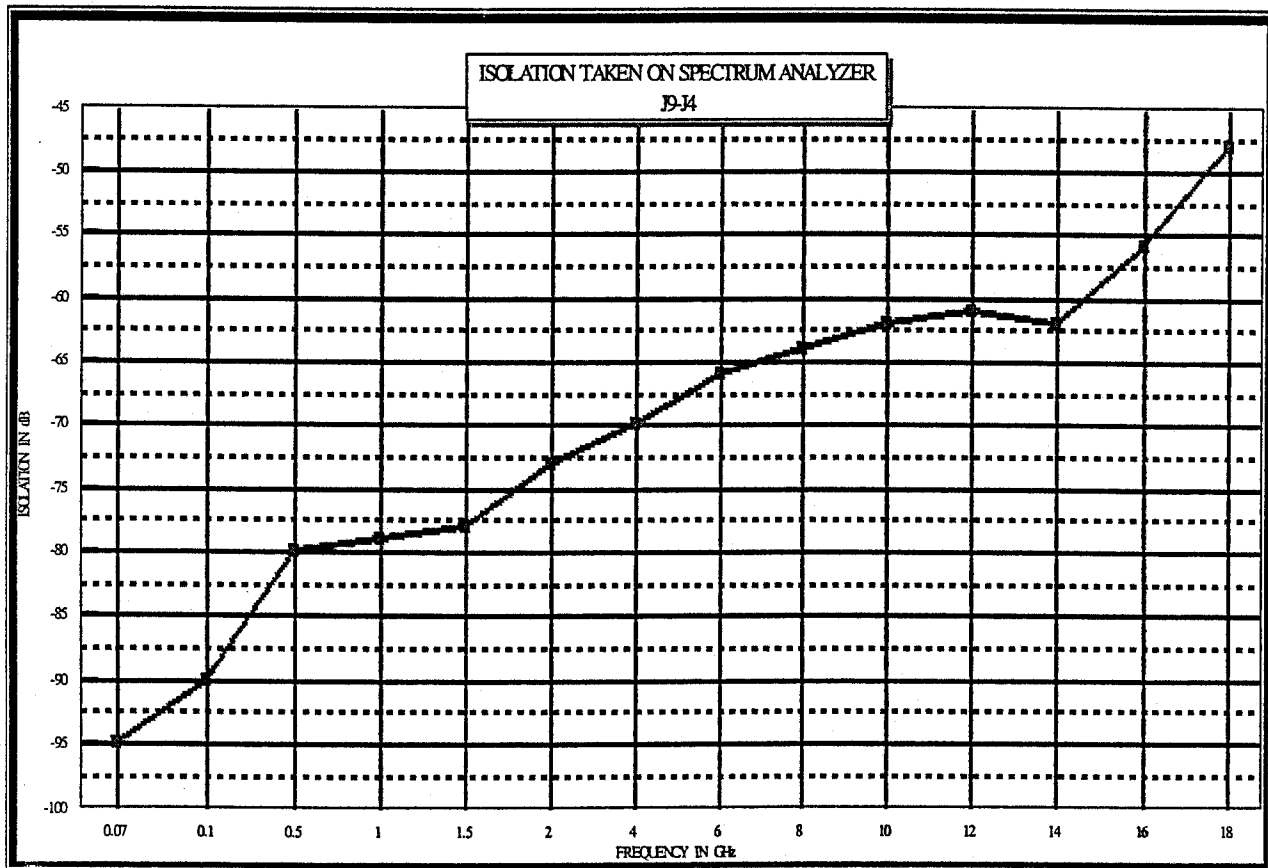
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*
(AS MEASURED ON A SPECTRUM ANALYZER)
J9-J4



*J9: INPUT ARM

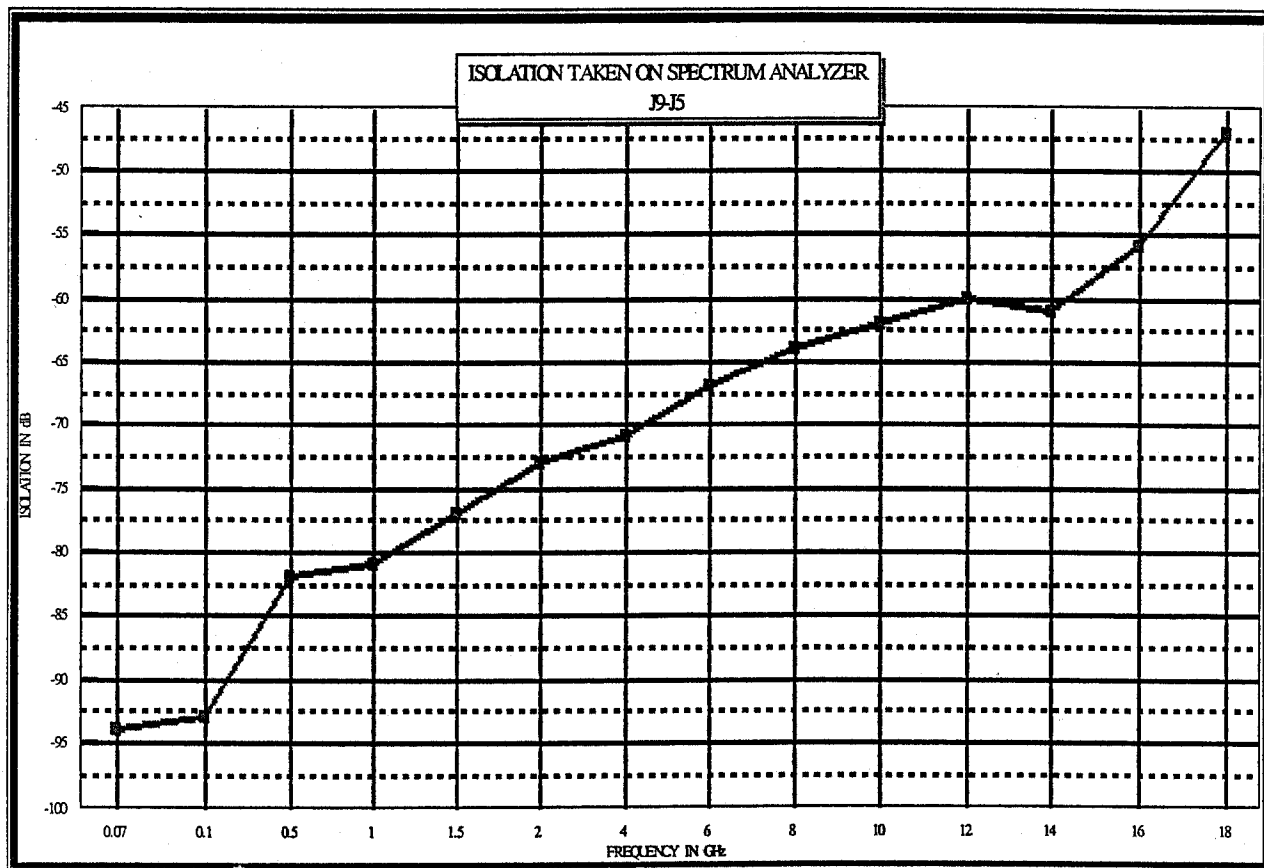
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*
(AS MEASURED ON A SPECTRUM ANALYZER)
J9-J5



*J9: INPUT ARM

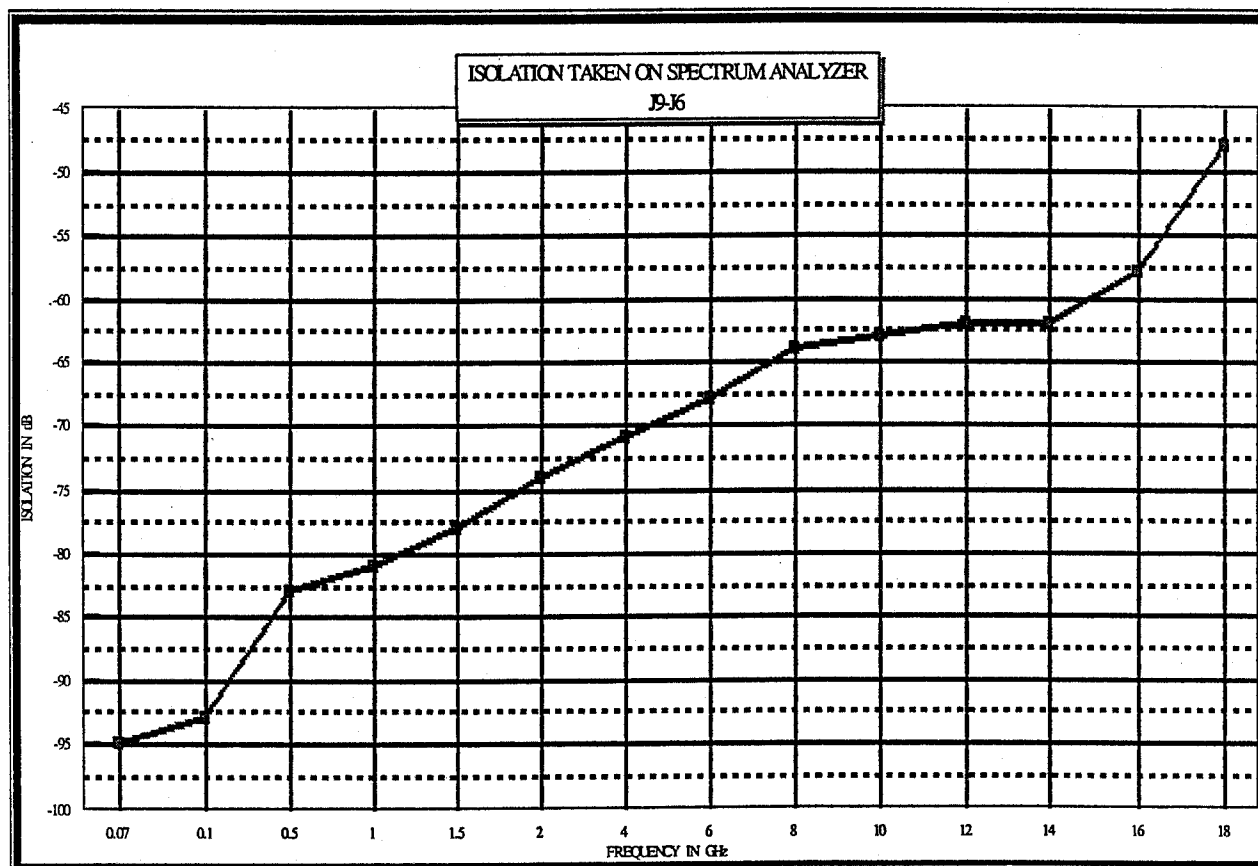
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION* (AS MEASURED ON A SPECTRUM ANALYZER) J9-J6



*J9: INPUT ARM

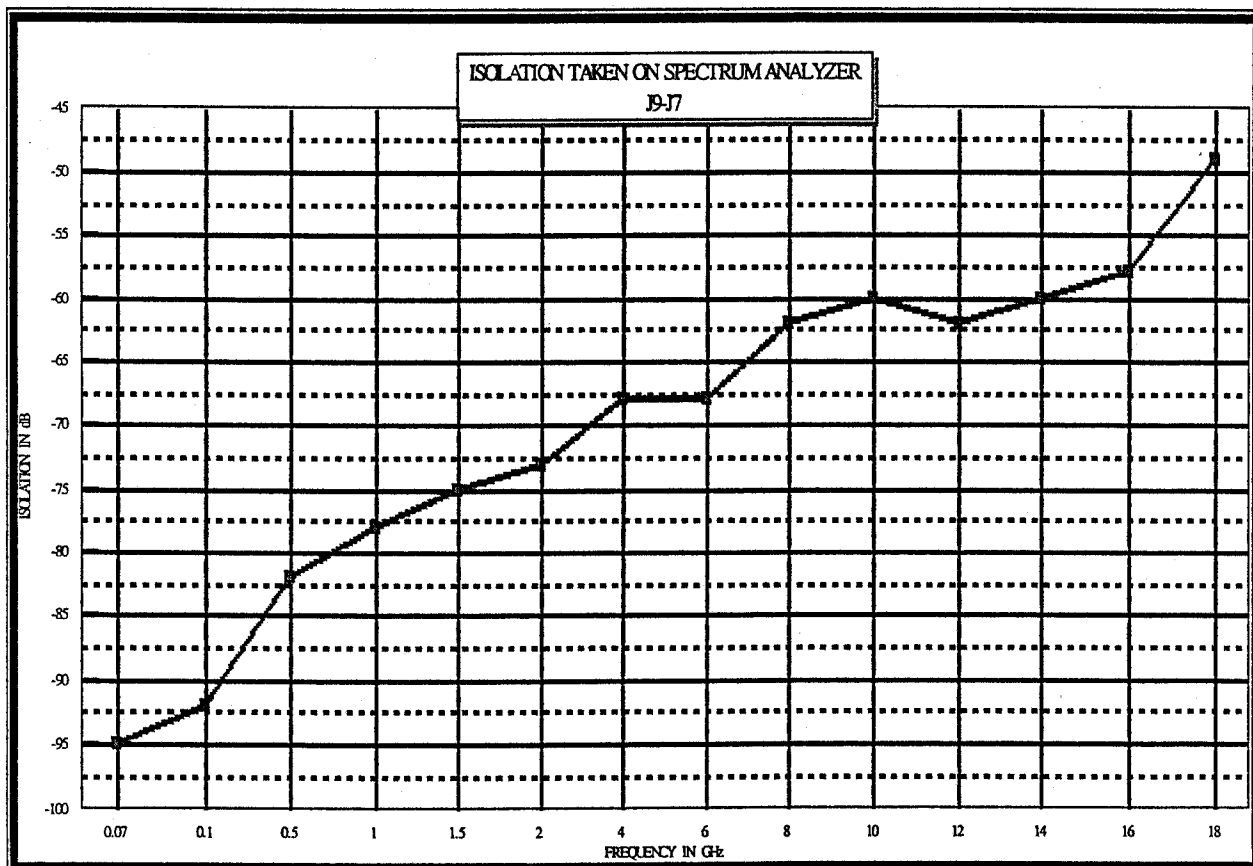
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*
(AS MEASURED ON A SPECTRUM ANALYZER)
J9-J7



*J9: INPUT ARM

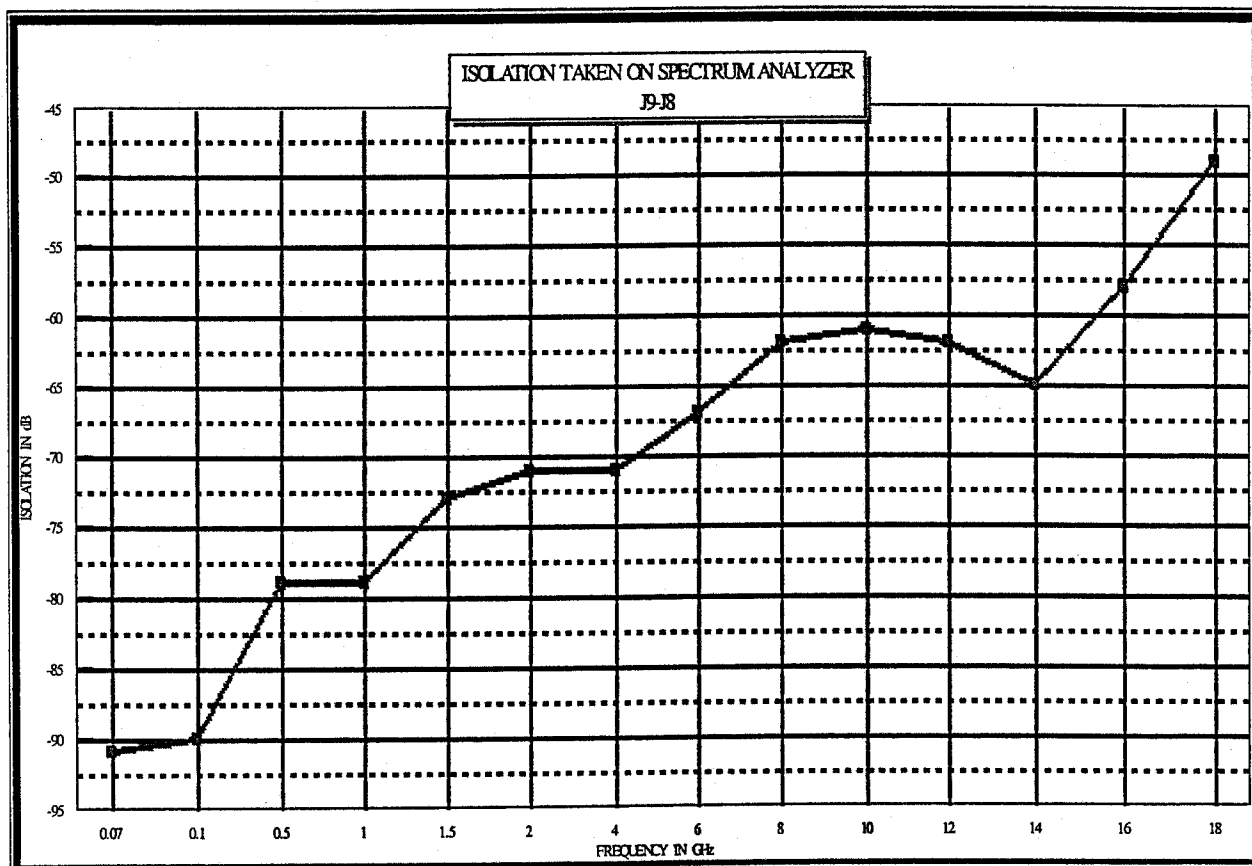
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*
(AS MEASURED ON A SPECTRUM ANALYZER)
J9-J8



*J9: INPUT ARM

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**AMPLITUDE
DATA
BETWEEN
PORT TO PORT
FROM**

40 MHz TO 5 GHz

ON A

SP8T

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

**AMC MODEL No:
MSR-8DR-04-STANDARS
OPTIONS 10M5, SPARWAR, 3SS, 45060
(Serial Number: 8MS90879)**

**REPORTED AND PREPARED
BY
RENE AFABLE**

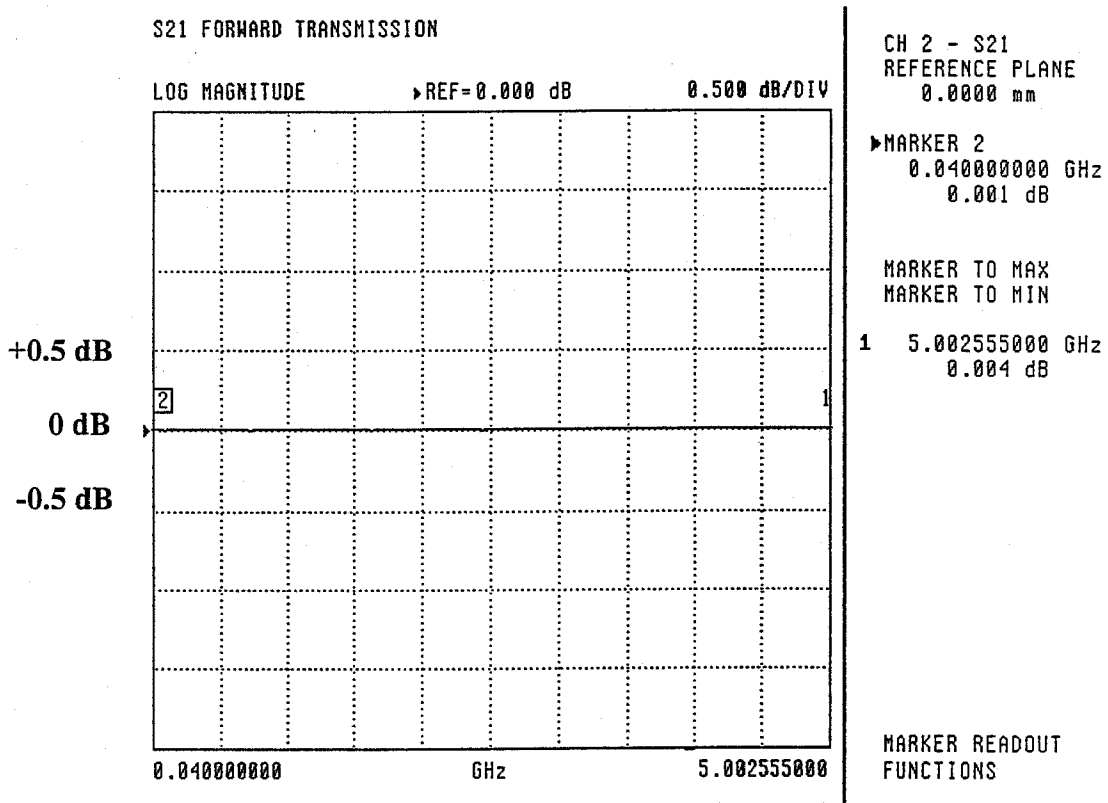
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

AMPLITUDE* J9-J1 (REFERENCE)



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
400 MHZ	0.001 dB	
5 GHz	0.004 dB	

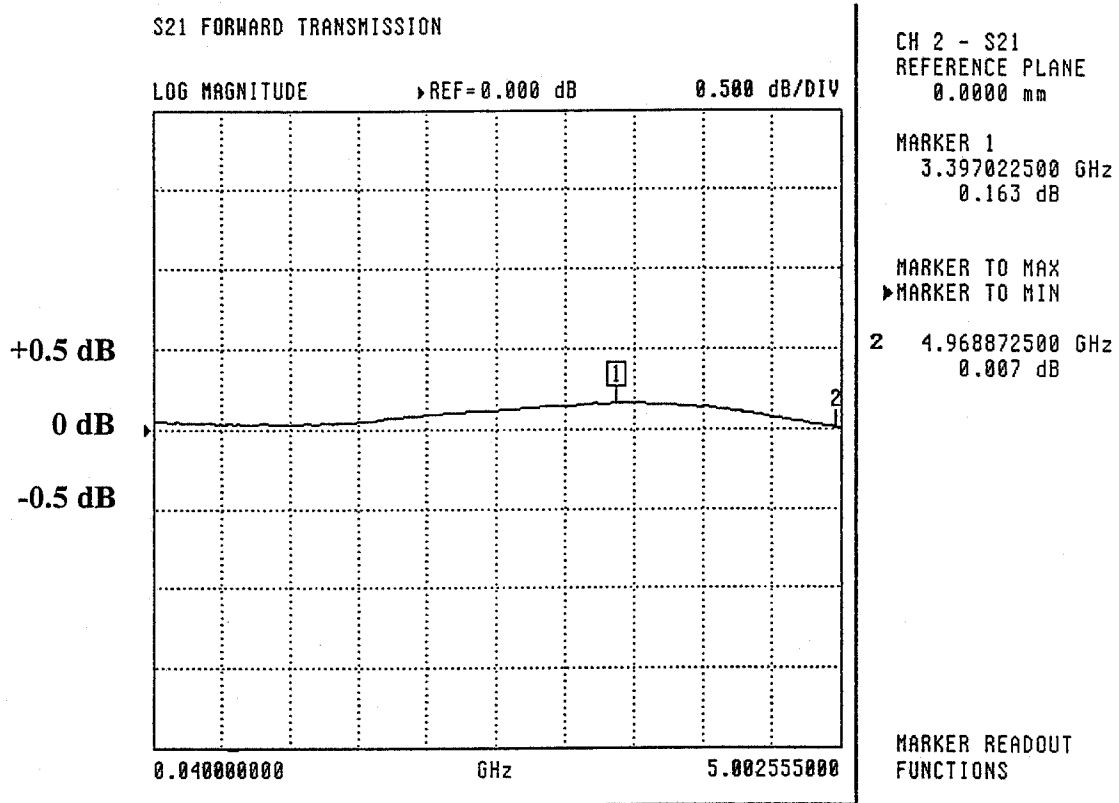
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

AMPLITUDE*
J9-J2



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
3.39 GHz	0.163 dB	
5.96 GHz	0.007 dB	

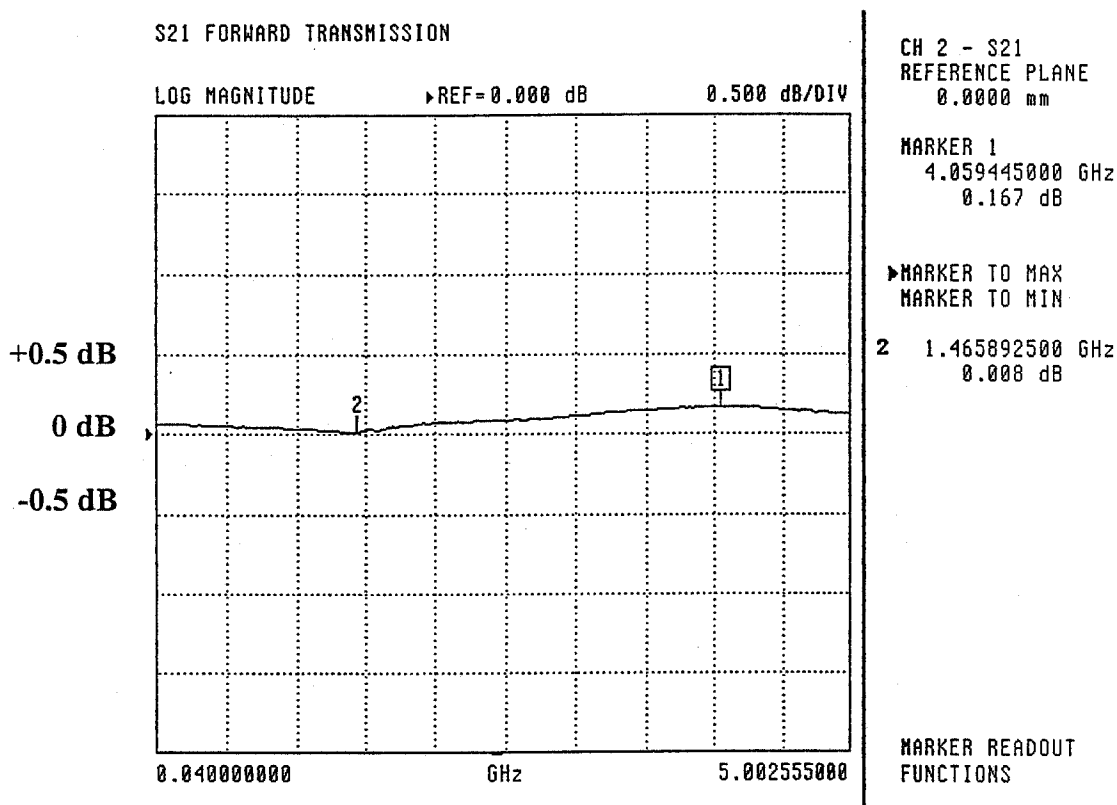
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA
OPTIONS 10M5, SPARWAR, 3SS, 45060

AMPLITUDE* J9-J3



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
4.05 GHz	0.167 dB	
1.46 GHz	0.008 dB	

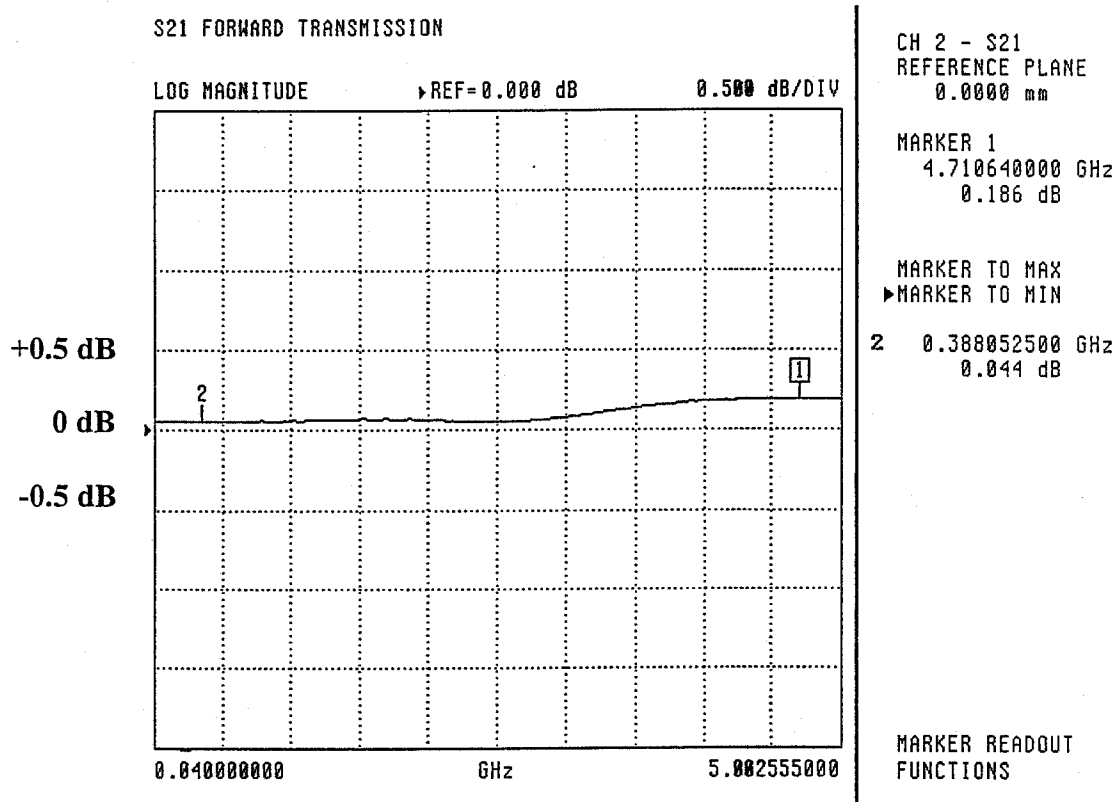
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

AMPLITUDE* J9-J4



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
4.71 GHz	0.186 dB	
388 MHz	0.044 dB	

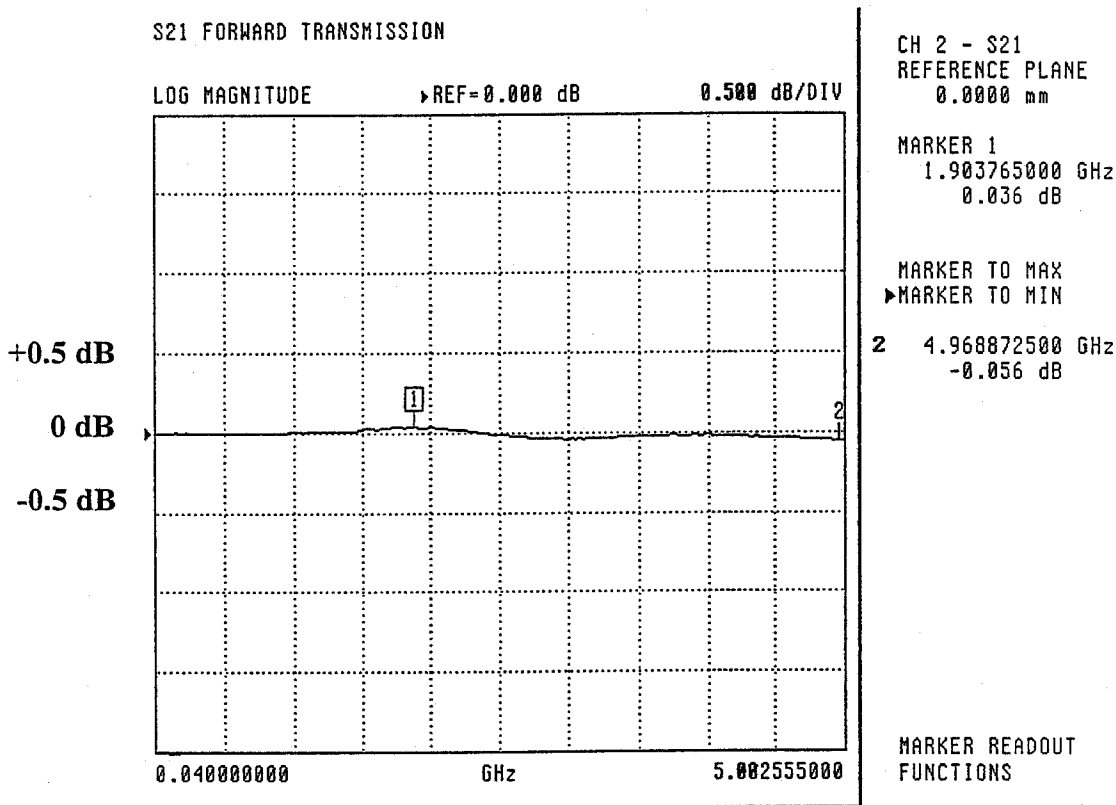
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

AMPLITUDE*
J9-J5



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
1.90 GHZ	0.036 dB	
4.96 GHZ		-0.056 dB

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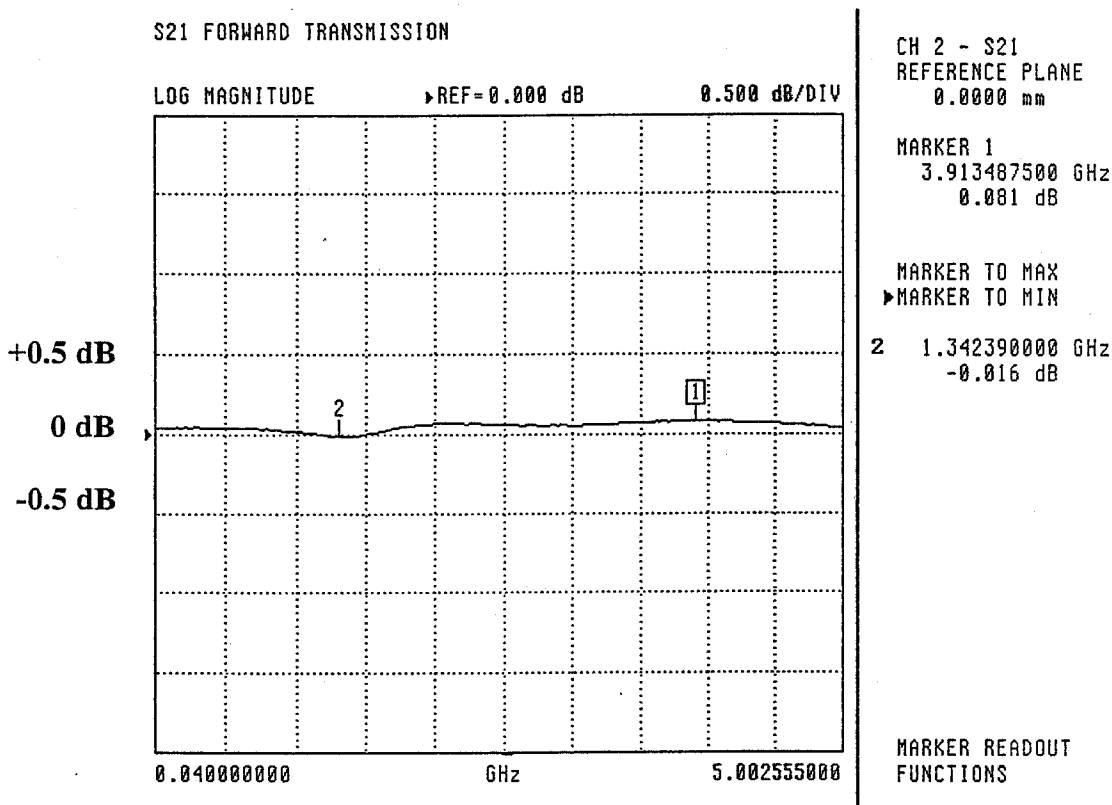


SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

AMPLITUDE*

J9-J6



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
3.91 GHZ	0.081 dB	
1.34 GHZ		-0.016 dB

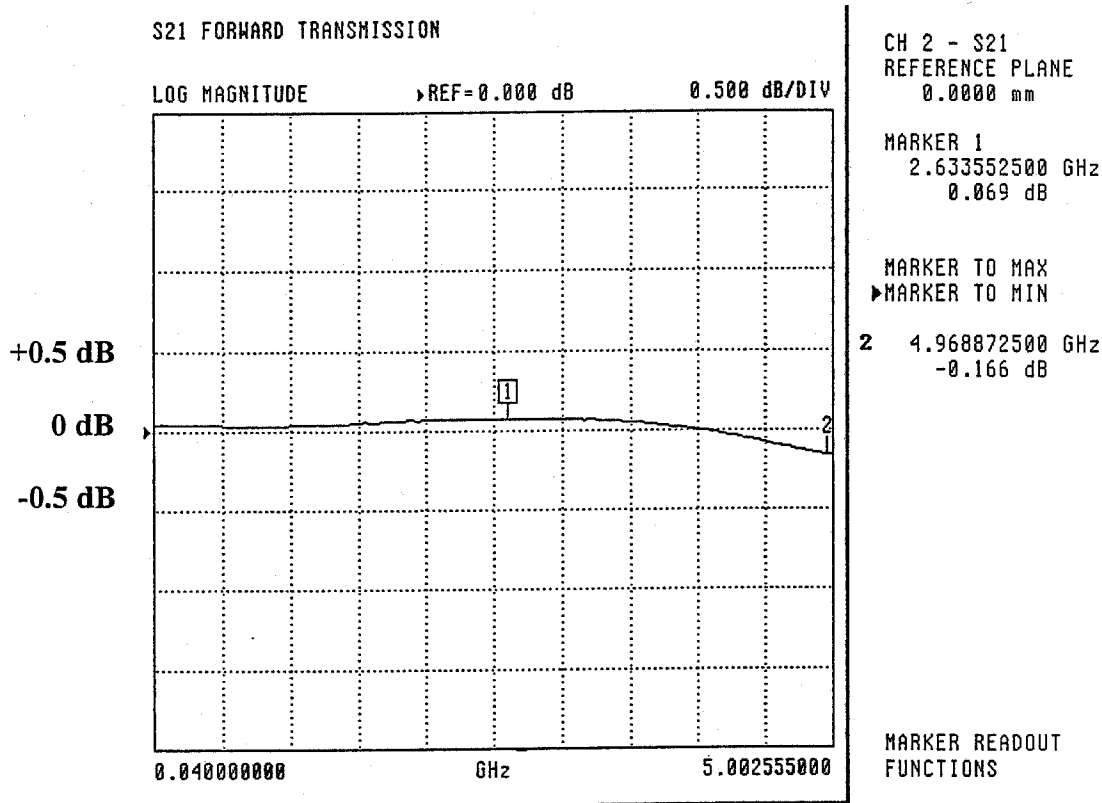
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

AMPLITUDE*
J9-J7



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
2.63 GHZ	0.069 dB	
4.96 GHZ		-0.166 dB

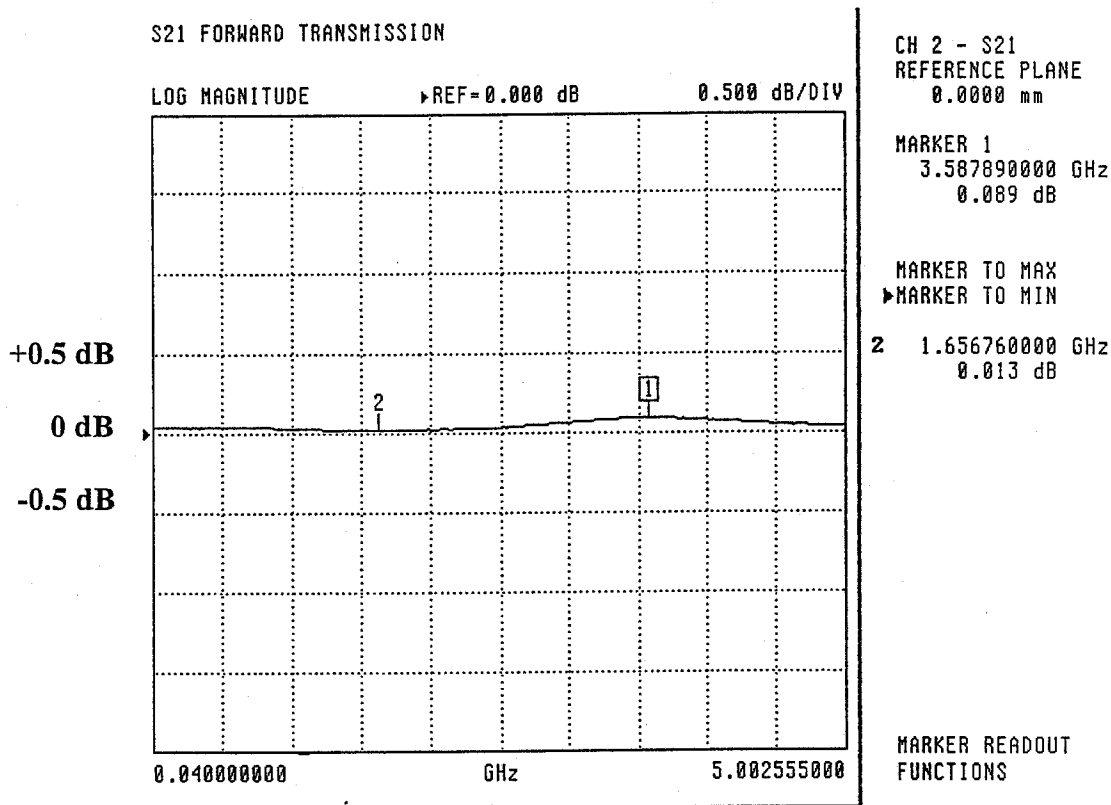
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

AMPLITUDE*
J9-J8



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
3.58 GHz	0.089 dB	
1.65 GHz	0.013 dB	

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PHASE
DATA
BETWEEN
PORT TO PORT
FROM
40 MHz TO 5 GHz
ON A
SP8T

RADIAL SOLID STATE SWITCH
(SURFACE MOUNTABLE)

AMC MODEL No:
MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
(Serial Number: 8MS90879)

REPORTED AND PREPARED
BY
RENE AFABLE

AUGUST 31, 1999

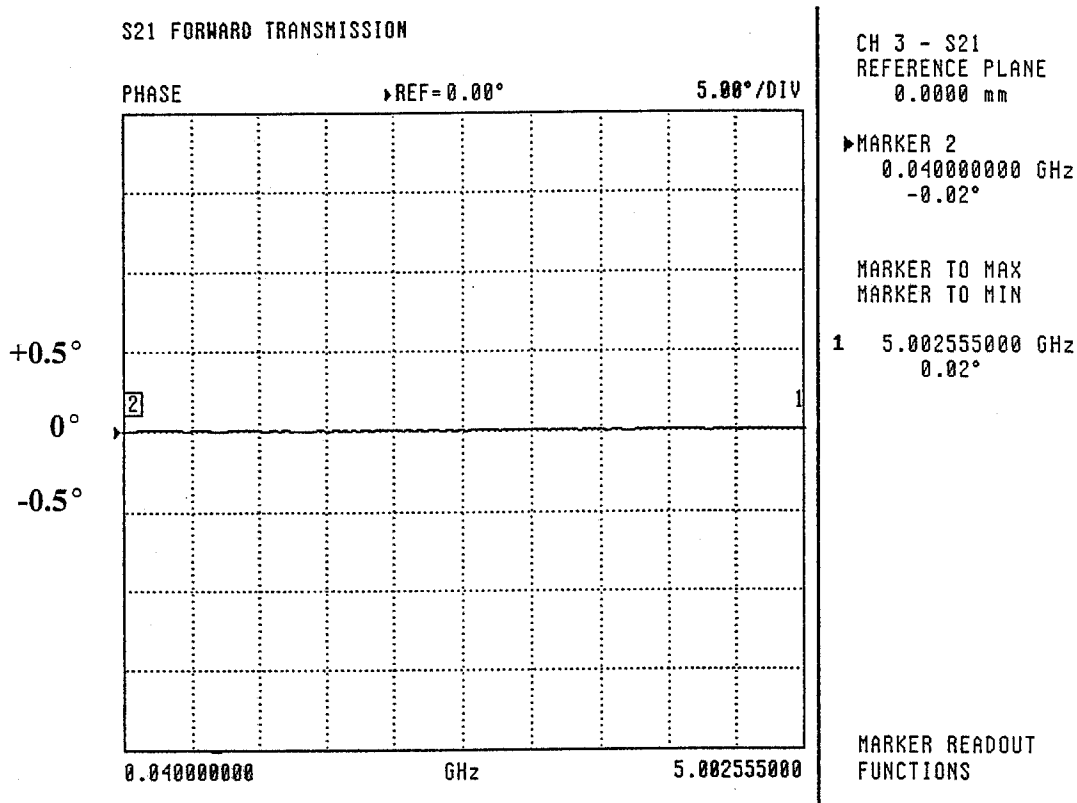
7311 G GROVE ROAD, FREDERICK, MARYLAND 21704 • Tel. (301) 662-4700 • Fax (301) 662-4938



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

PHASE* J9-J1 (REFERENCE)



*J9: INPUT ARM

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

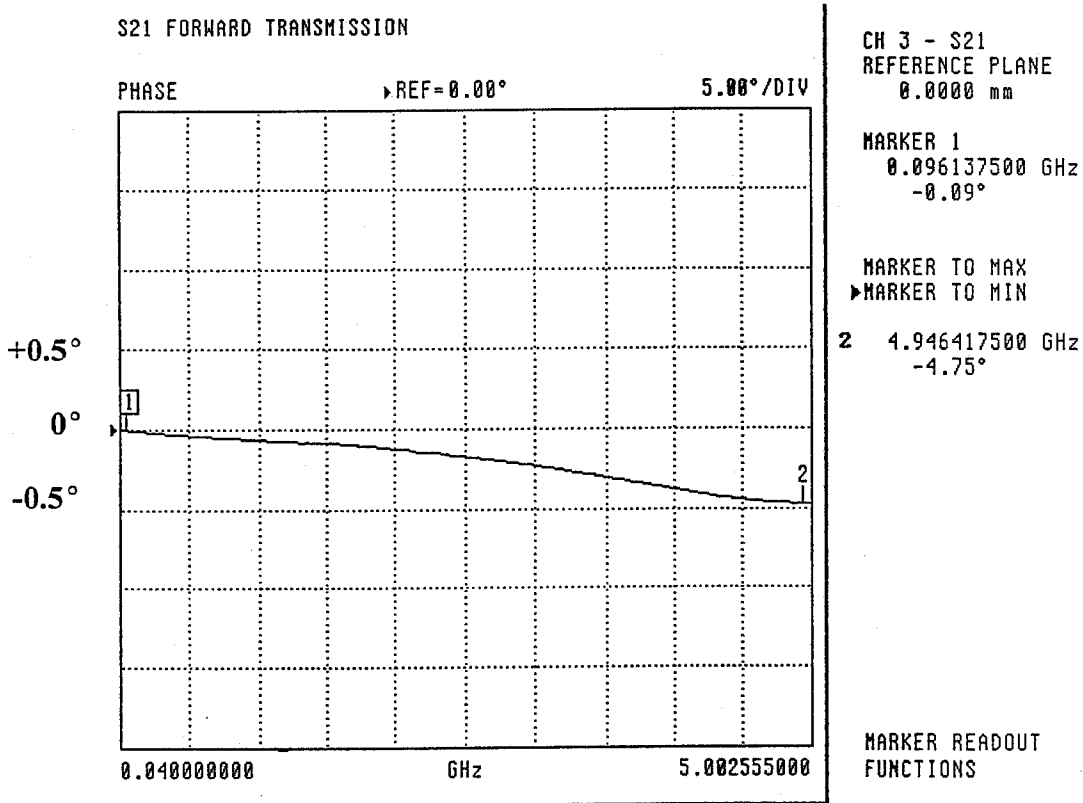
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

PHASE* J9-J2



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
4.94 GHZ		-4.75°
96 MHz		-0.09°

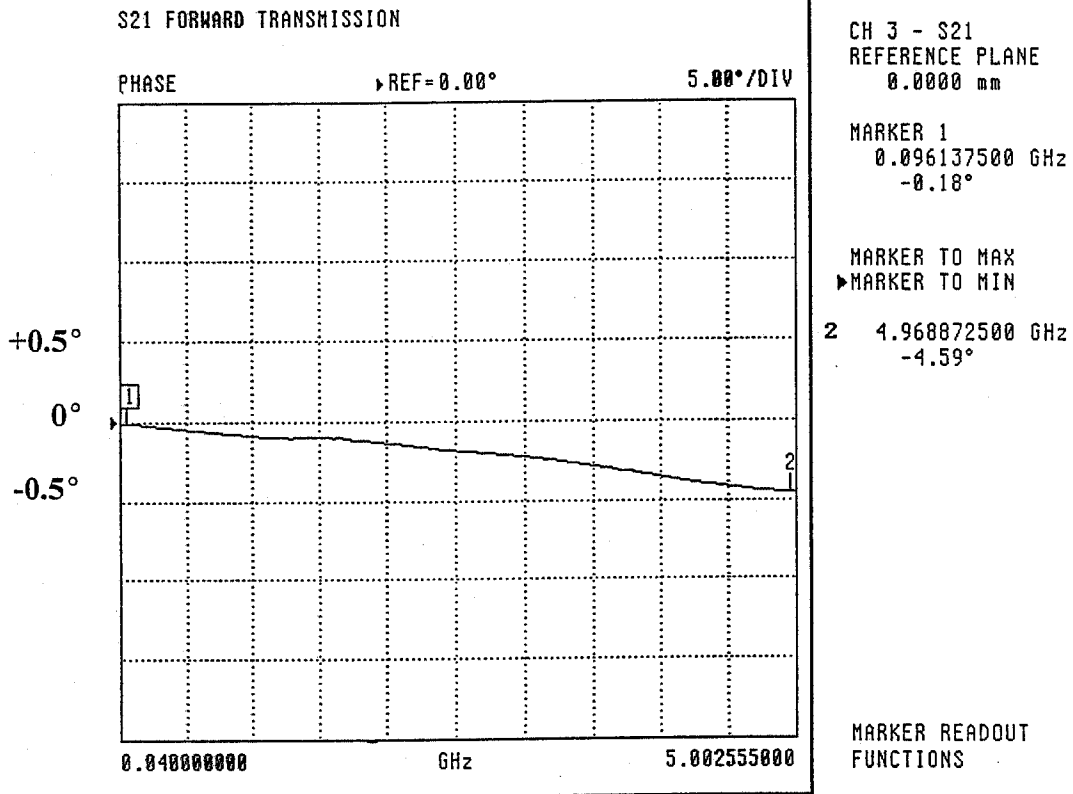
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

PHASE*
 J9-J3



*J9: INPUT ARM

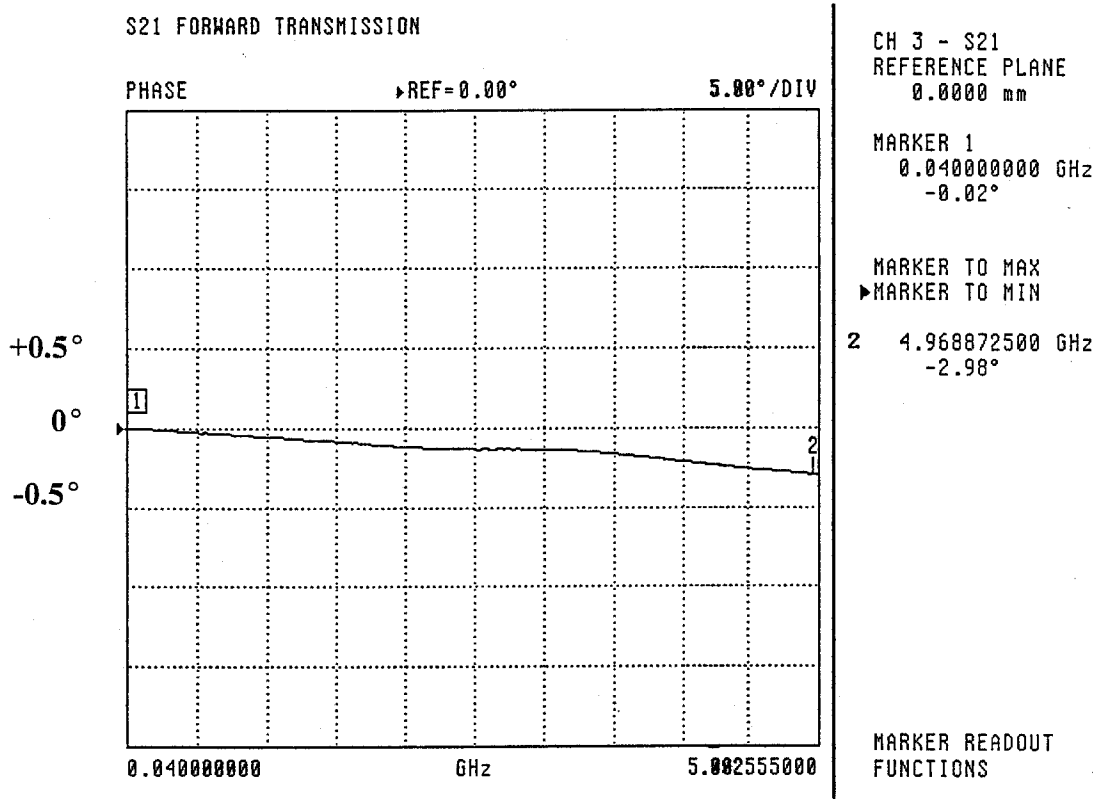
FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
4.96 GHZ		-4.59°
96 MHz		-0.18°

AUGUST 31, 1999

SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

PHASE* J9-J4



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
40 MHZ		-0.02°
4.96 GHz		-2.98°

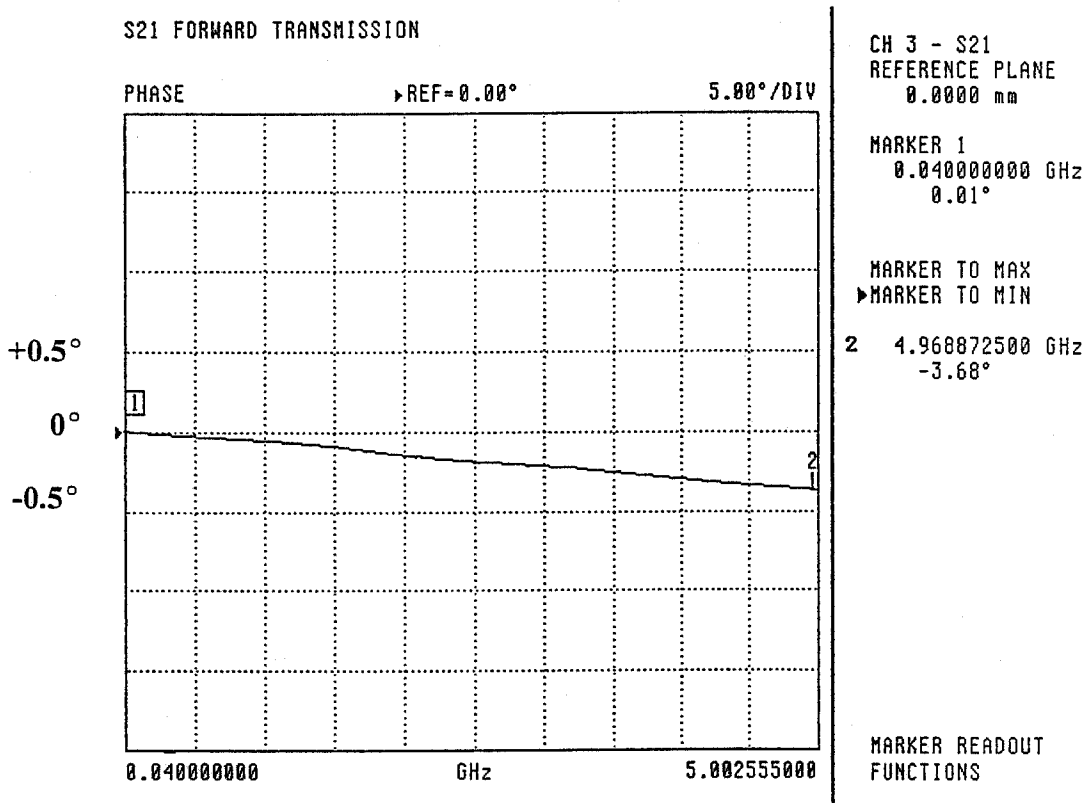
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

PHASE*
J9-J5



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
40 MHZ	0.01°	
4.96 GHz		-3.68°

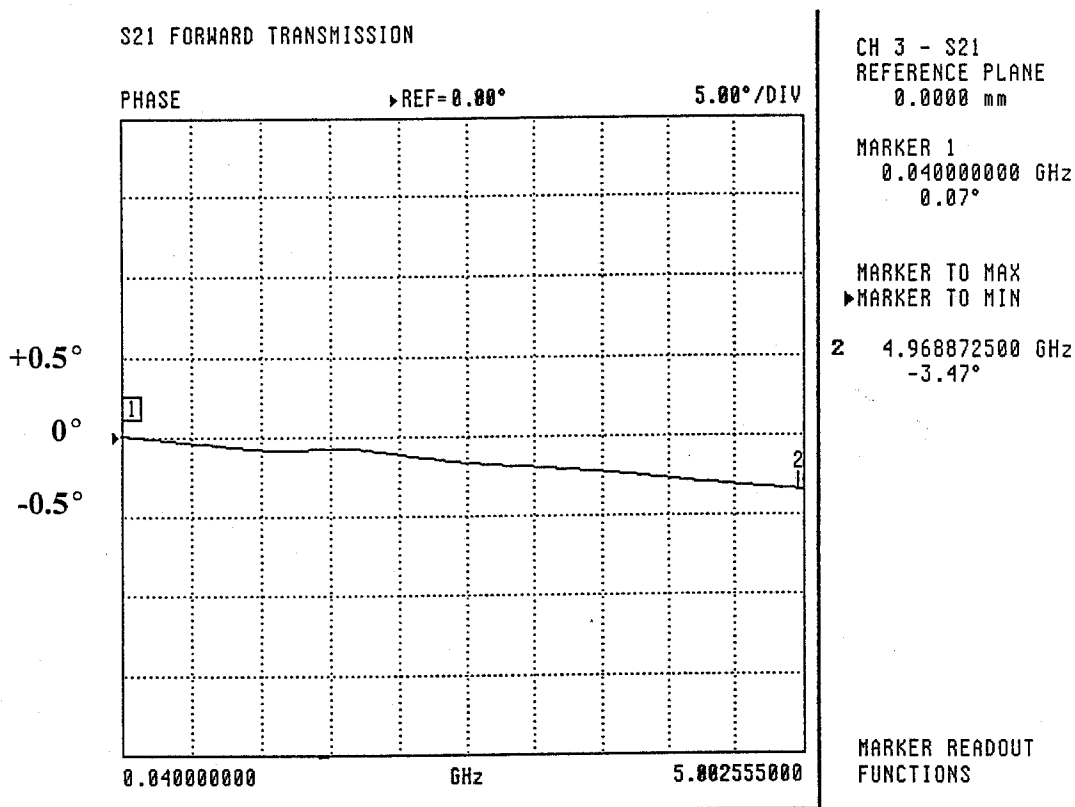
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

PHASE* J9-J6



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
40 MHZ	0.07°	
4.96 GHz		-3.47°

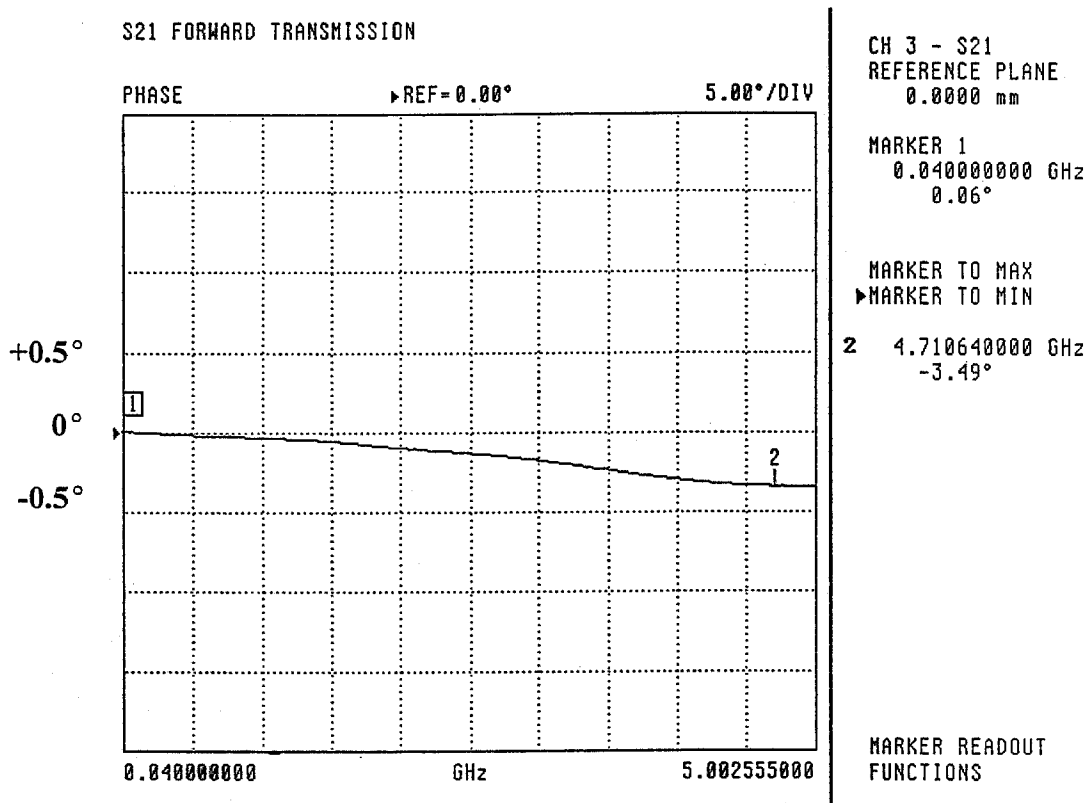
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

PHASE*
J9-J7



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
40 MHZ	0.06°	
4.71 GHZ		-3.49°

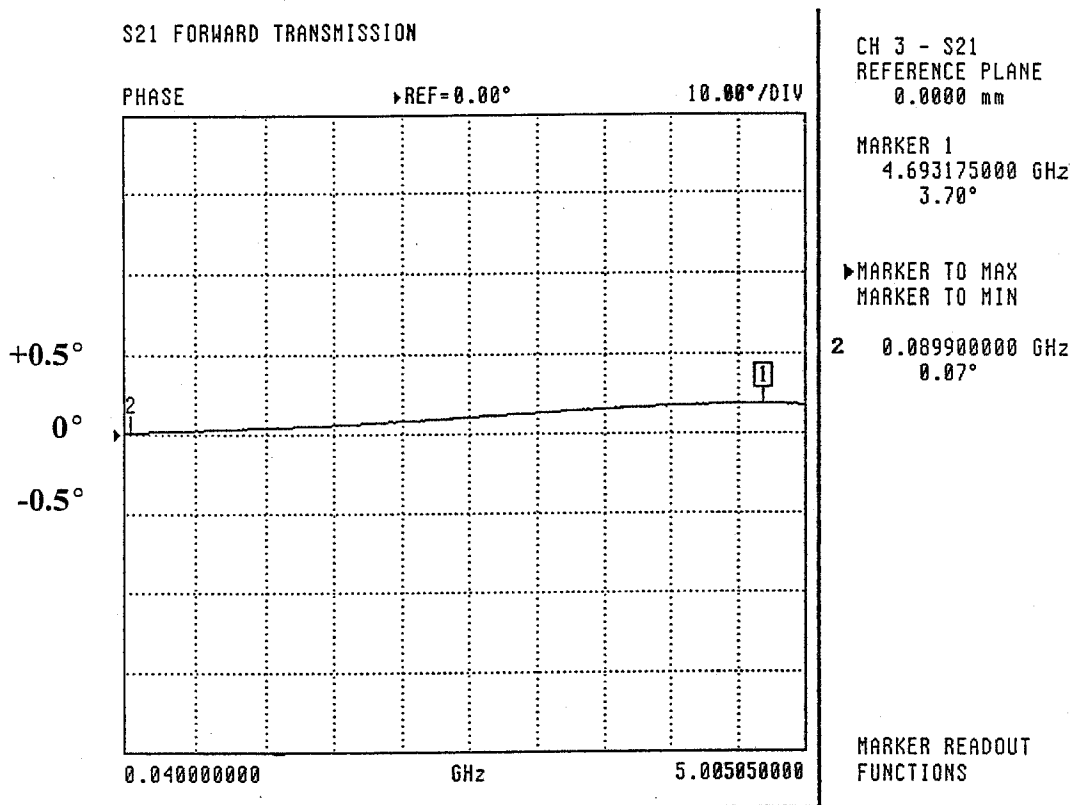
AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

PHASE*
J9-J8



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
4.69 GHZ	3.70°	
89 MHz	0.07°	

AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

SWITCHING SPEED

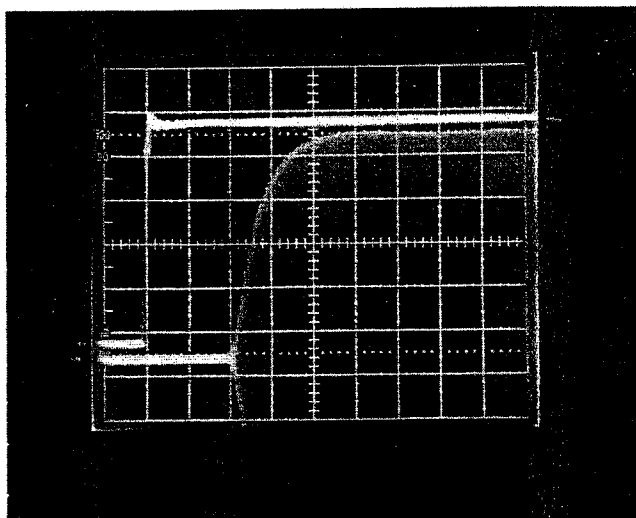
"Rise/Fall" Time: 10% RF to 90% RF & 90% RF to 10% RF
 "On/Off" Time: 50% TTL to 90% RF or 10% RF

TYPICAL OF ALL ARMS

"DELAY ON": 175 nS
 "RISE TIME": 65 nS

HORIZONTAL SCALE:
 50 nS PER DIVISION

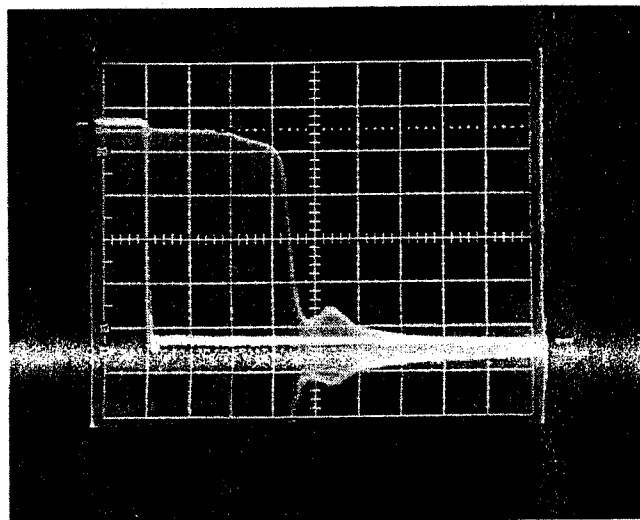
VERTICAL SCALE:
 10 mV PER DIVISION



"DELAY OFF": 40 nS
 "FALL TIME": 90 nS

HORIZONTAL SCALE:
 50 nS PER DIVISION

VERTICAL SCALE:
 10 mV PER DIVISION



AUGUST 31, 1999



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER	: 8MS90879
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.1mA; -5vdc: @ -47.2mA

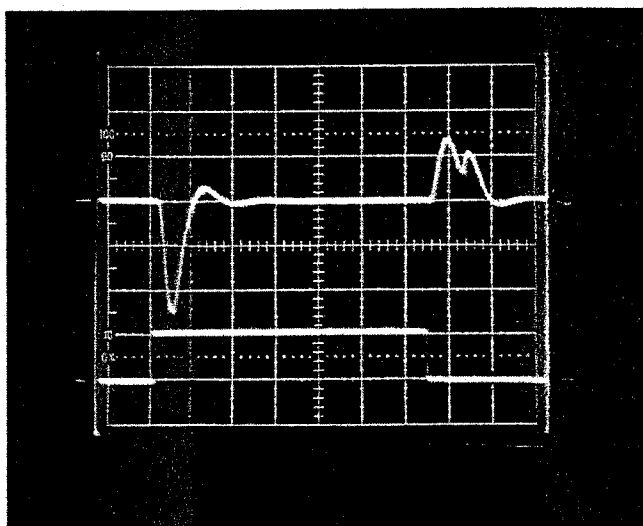
VIDEO TRANSIENTS

TYPICAL OF ALL ARMS

≤ 3.9 V P-P
MEASURED IN A
300 MHZ BANDWIDTH

VERTICAL SCALE:
1 V PER DIVISION

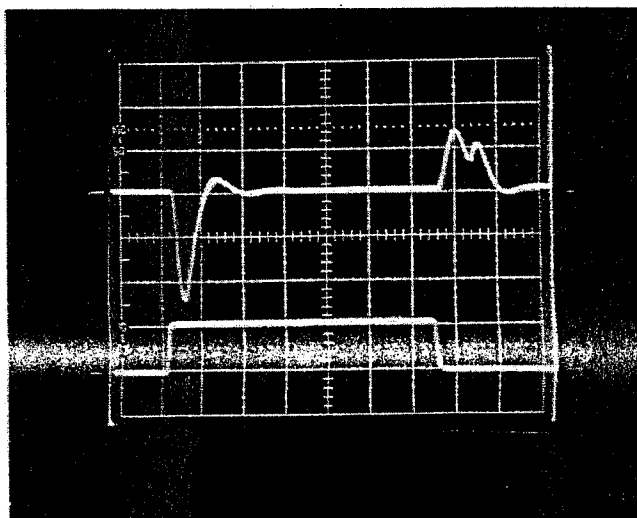
HORIZONTAL SCALE:
0.2 μ S PER DIVISION



≤ 3.8 V P-P
MEASURED IN A
20 MHZ BANDWIDTH

VERTICAL SCALE:
1 V PER DIVISION

HORIZONTAL SCALE:
0.2 μ S PER DIVISION



AUGUST 31, 1999



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

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

ON A
SP8T
RADIAL SOLID STATE SWITCH
(SURFACE MOUNTABLE)

AMC MODEL No:
MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
(Serial Number: 8MS90879)

FROM 10 MHz TO 12 GHz

REPORTED AND PREPARED
BY
RENE AFABLE

AUGUST 31, 1999

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

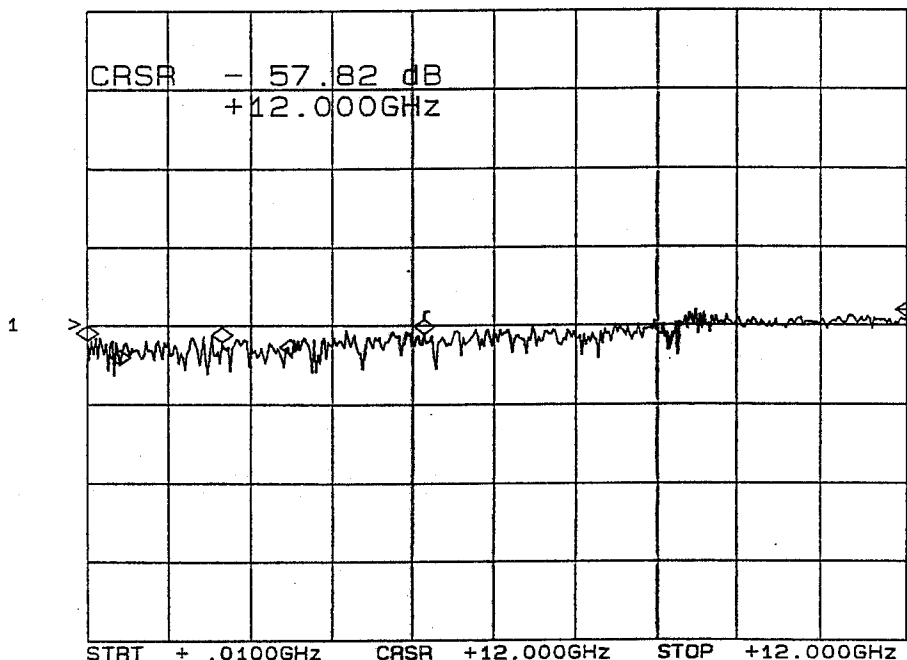


SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)
J9-J1

CH1: A -M - 57.82 dB
 20.0 dB/ REF - 60.00 dB



***J9: INPUT ARM**

FREQUENCY	ISOLATION
10 MHz	63.7 dB
500 MHz	69.8 dB
2.0 GHz	64.2 dB
3.0 GHz	67.1 dB
5.0 GHz	61.9 dB
12.0 GHz	57.8 dB

AUGUST 31, 1999

A2-3SS



SUMMARY TEST DATA

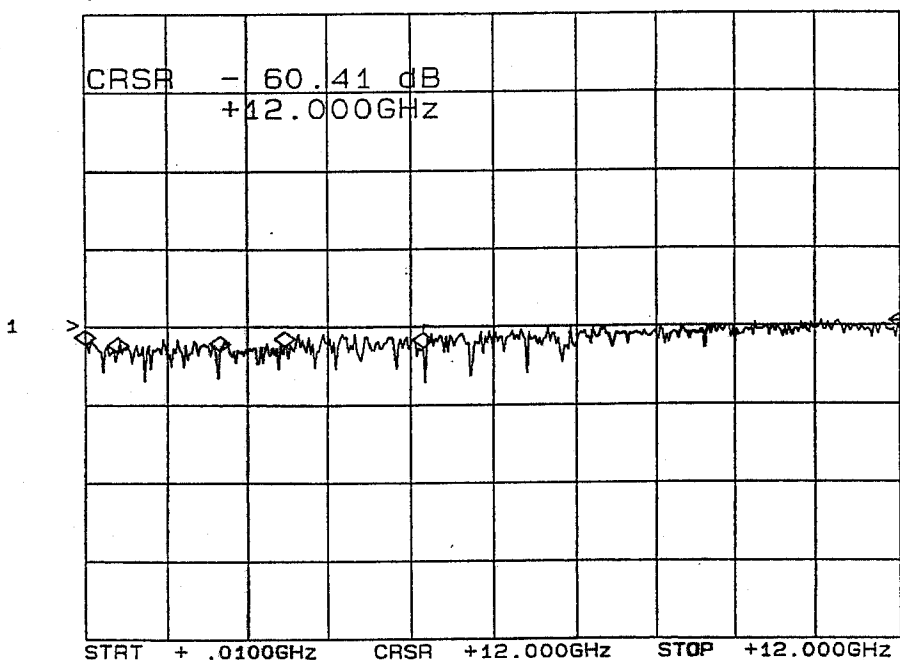
MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J2

CH1: A -M - 60.41 dB
20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
10 MHz	64.5 dB
500 MHz	66.4 dB
2.0 GHz	66.0 dB
3.0 GHz	64.7 dB
5.0 GHz	65.2 dB
12.0 GHz	60.4 dB

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A3-3SS



SUMMARY TEST DATA

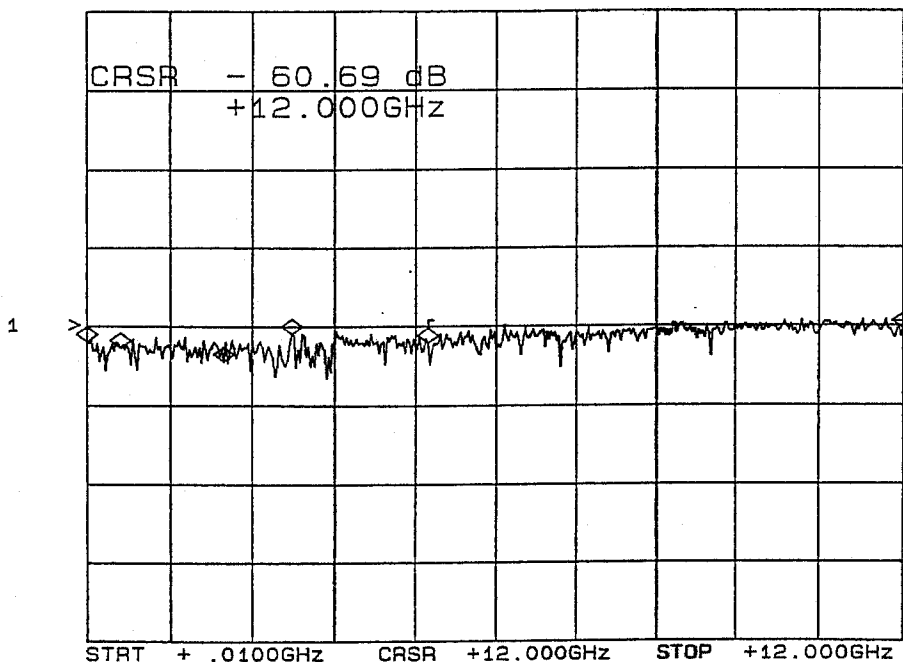
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J3

CH1: A -M - 60.69 dB
 20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
10 MHz	63.6 dB
500 MHz	65.2 dB
2.0 GHz	68.6 dB
3.0 GHz	61.8 dB
5.0 GHz	64.1 dB
12.0 GHz	60.6 dB

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A4-3SS



SUMMARY TEST DATA

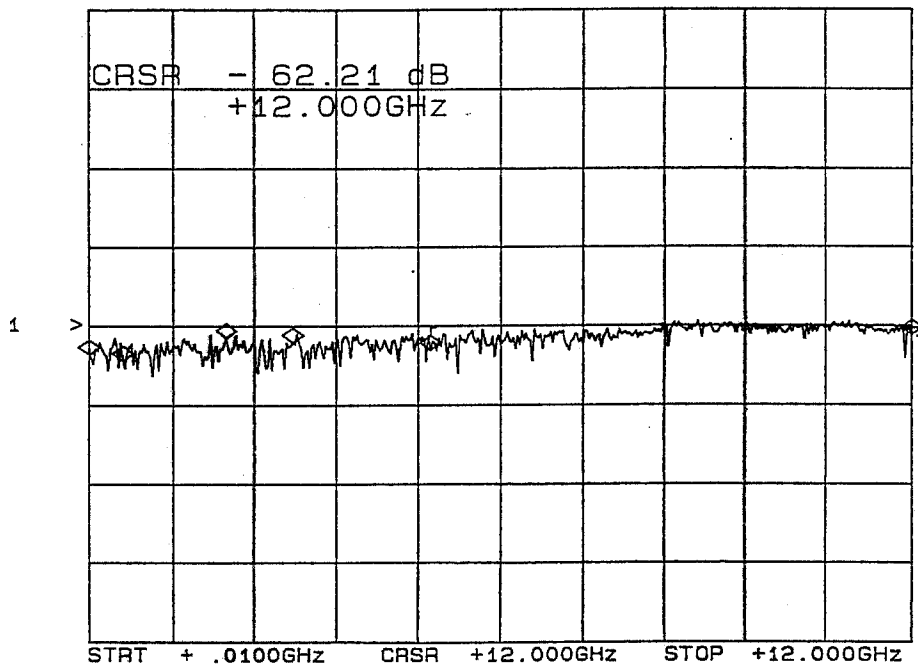
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J4

CH1: A -M - 62.21 dB
20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
10 MHz	67.2 dB
500 MHz	68.7 dB
2.0 GHz	62.9 dB
3.0 GHz	63.8 dB
5.0 GHz	66.0 dB
12.0 GHz	62.2 dB

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A5-3SS



SUMMARY TEST DATA

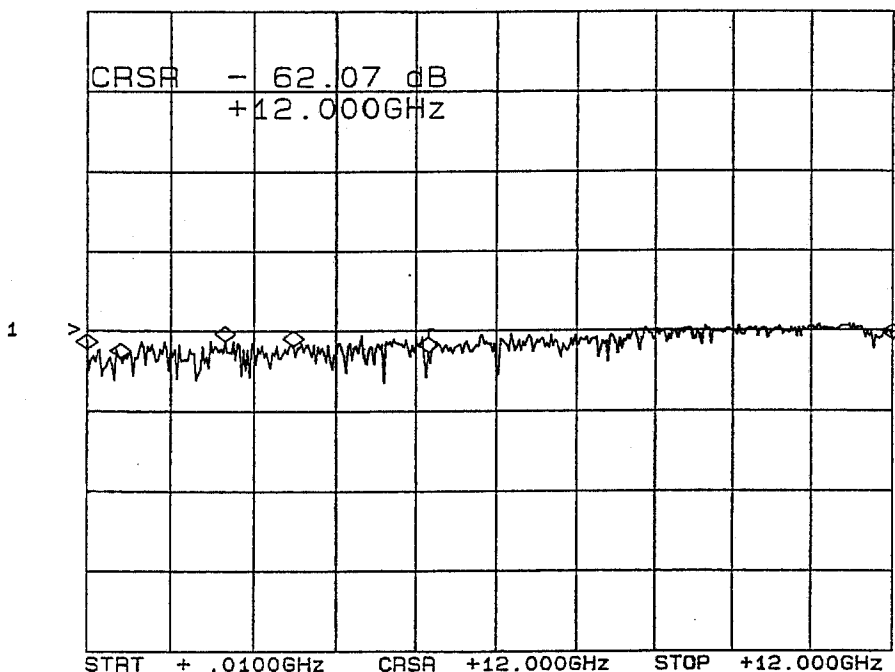
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J5

CH1: A -M - 62.07 dB
20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
10 MHz	64.4 dB
500 MHz	66.6 dB
2.0 GHz	62.3 dB
3.0 GHz	63.5 dB
5.0 GHz	65.3 dB
12.0 GHz	62.0 dB

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A6-3SS



SUMMARY TEST DATA

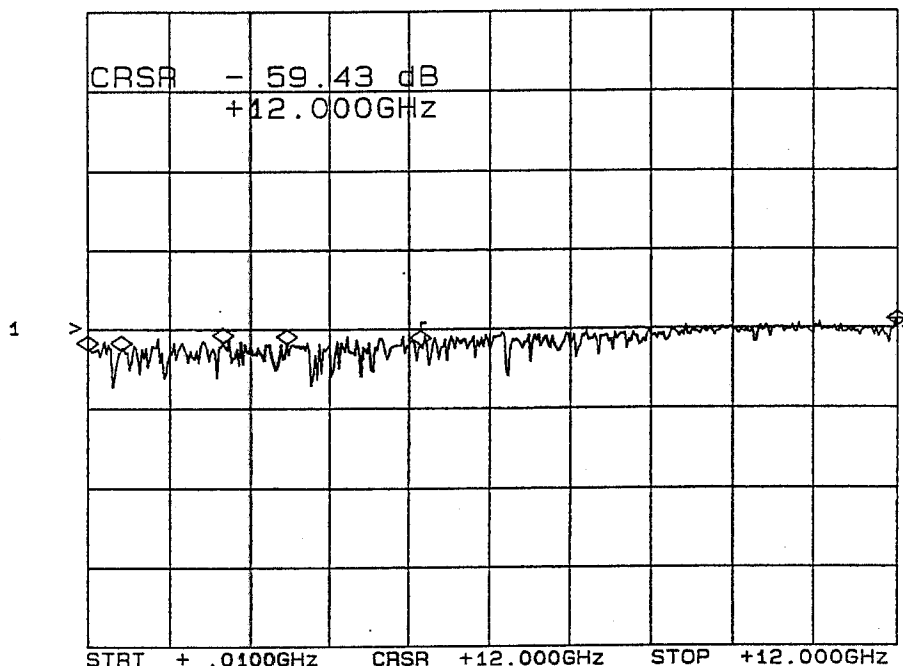
MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 10M5, SPARWAR, 3SS, 45060
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J6

CH1: A -M - 59.43 dB
 20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
10 MHz	65.3 dB
500 MHz	65.3 dB
2.0 GHz	63.1 dB
3.0 GHz	63.5 dB
5.0 GHz	64.0 dB
12.0 GHz	59.4 dB

AUGUST 31, 1999

A7-3SS



SUMMARY TEST DATA

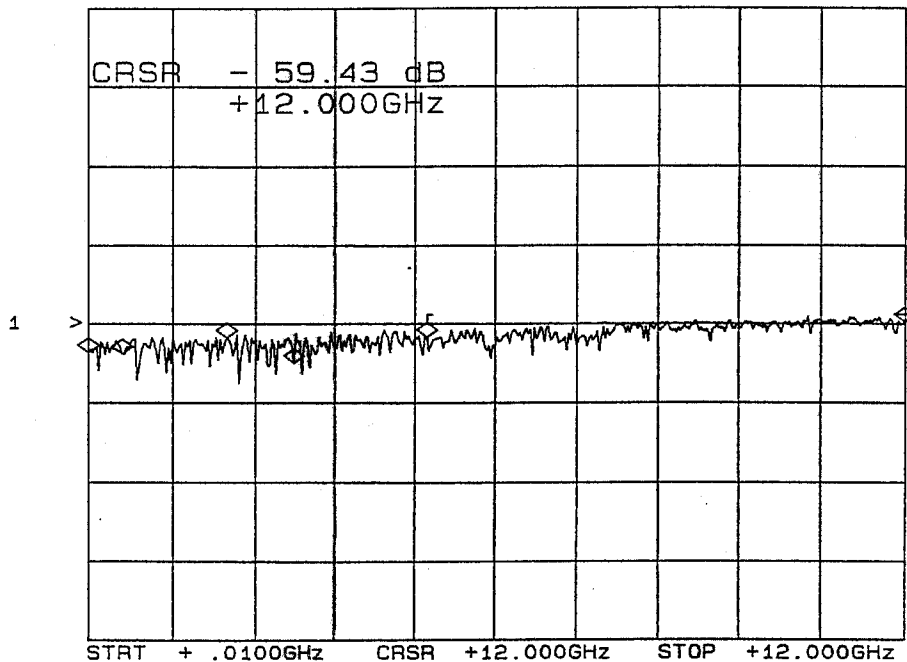
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J7

CH1: A -M - 59.43 dB
20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
10 MHz	67.2 dB
500 MHz	67.6 dB
2.0 GHz	63.2 dB
3.0 GHz	69.7 dB
5.0 GHz	63.2 dB
12.0 GHz	59.4 dB

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A8-3SS

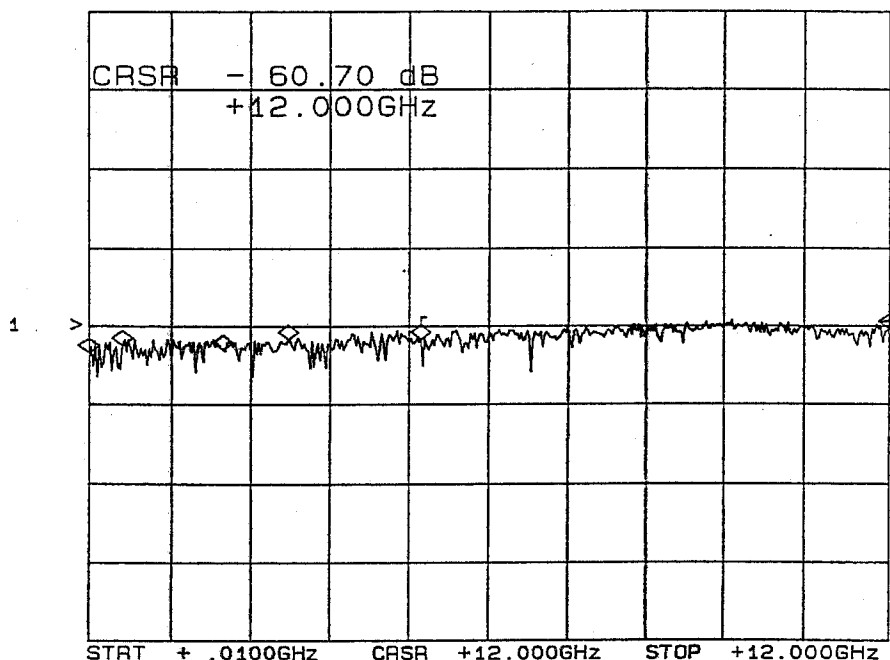


SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.1mA; -5vdc: @ -47.2mA

ISOLATION*
 (AS MEASURED ON A SCALAR NETWORK ANALYZER)
 J9-J8

CH1: A -M - 60.70 dB
 20.0 dB/ REF - 60.00 dB



***J9: INPUT ARM**

FREQUENCY	ISOLATION
10 MHz	66.9 dB
500 MHz	64.6 dB
2.0 GHz	65.8 dB
3.0 GHz	63.3 dB
5.0 GHz	63.0 dB
12.0 GHz	60.7 dB

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