



TEST DATA

FROM

300 MHz TO 18 GHz
(10 MHz TO 18 GHz OPTIONAL)

AND

FROM 80 MHz TO 2 GHz

HIGH ISOLATION

LOW INSERTION LOSS

AMPLITUDE (± 0.75 dB) AND PHASE ($\pm 7^\circ$) MATCHED

MINIATURE REFLECTIVE

SP8T

RADIAL SOLID STATE SWITCH

(SURFACE MOUNTABLE)

(1.5" DIAMETER X 0.4" THICK)

AMC MODEL No:

MSR-8DR-04-STANDARD

OPTIONS 0318, SPARWAR1, 4SSBB, 45004

(Serial Number: 8MS90879B)

REPORTED AND PREPARED

BY

RENE AFABLE

SEPTEMBER 27, 1999

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

E-MAIL ADDRESS: AMCPMI@AOL.COM

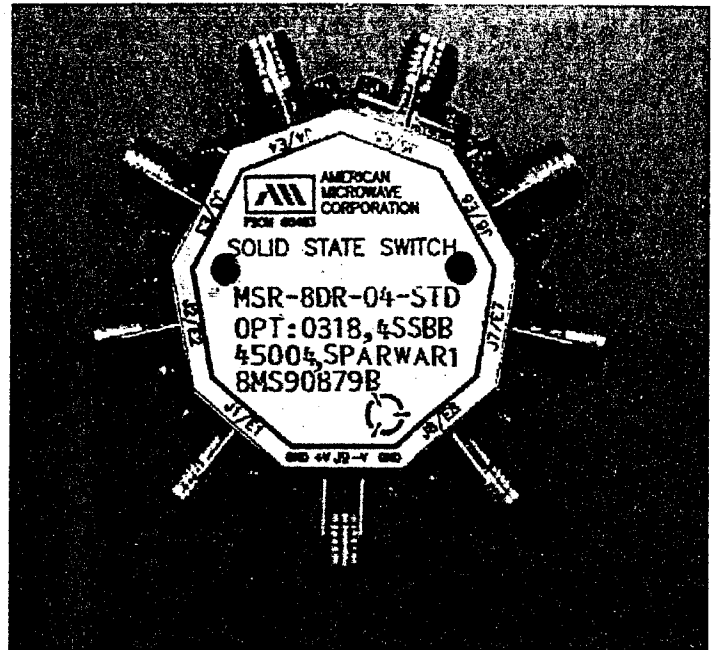
7311 G GROVE ROAD, FREDERICK, MARYLAND 21704 • Tel. (301) 662-4700 • Fax (301) 662-4938

SP8T REFLECTIVE RADIAL SOLID STATE SWITCH

**AMERICAN MICROWAVE
CORPORATION**

KEY FEATURES

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



AMC MODEL No: MSR-8DR-04-STANDARD OPTIONS 0318, SPARWAR1, 4SSBB, 45004

SPECIFICATIONS: (REFLECTIVE)

● FREQUENCY RANGE	:	200 MHz to 18 GHz (10MHz to 18GHz Optional)
● INSERTION LOSS	:	3.5 dB MAX.
	:	1.75 dB TYP. @ 300 MHz
	:	1.90 dB TYP. @ 2.0 GHz
	:	2.50 dB TYP. @ 10.0 GHz
	:	3.25 dB TYP. @ 18.0 GHz
● ISOLATION	:	≥ 70 dB MIN.
	:	≥ 100 dB TYP. @ 300 MHz
	:	≥ 90 dB TYP. @ 2.0 GHz
	:	≥ 80 dB TYP. @ 10.0 GHz
	:	≥ 70 dB TYP. @ 18.0 GHz
● VSWR	:	2.0:1
● SWITCHING SPEED	:	"RISE" 100nS MAX., 75nS TYP.
	:	"FALL" 50nS MAX., 45nS TYP.
	:	"ON" 125nS MAX., 115nS TYP.
	:	"OFF" 100nS MAX., 85nS TYP.
● CONTROL	:	Independent TTL Compatible (3 Bit Decoder available)
● VIDEO TRANSIENTS	:	≤2.0 V Peak to Peak, 300 MHZ Bandwidth
	:	≤1.20 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.

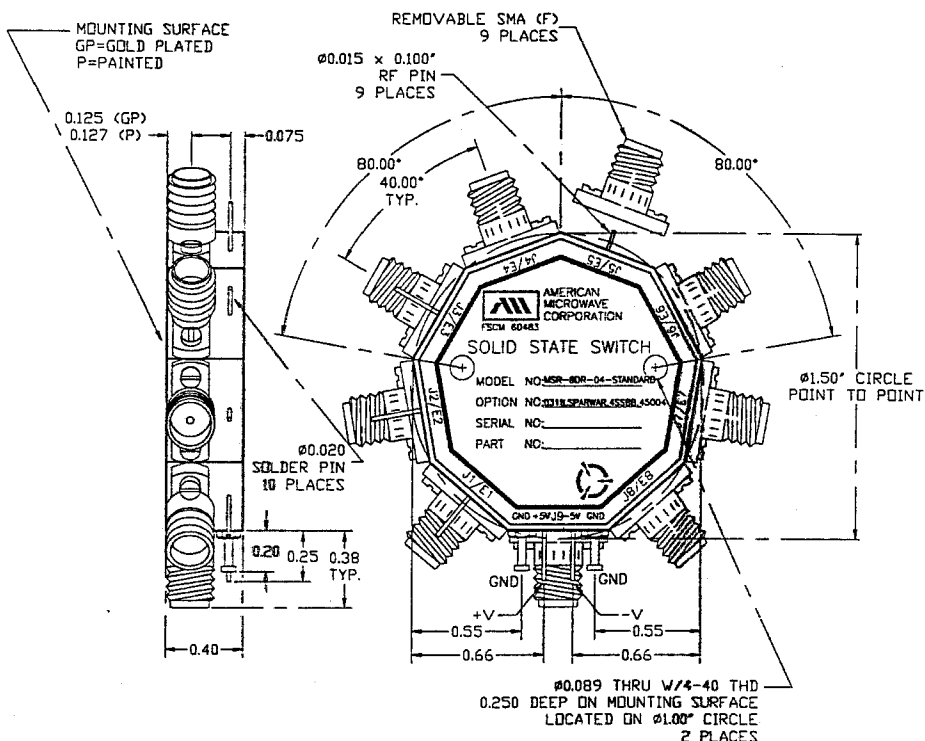
SEPTEMBER 27, 1999

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SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA



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.

SEPTEMBER 27, 1999

DESCRIPTION: MSR/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: 75ns TYPICAL, 100ns MAX.
 DELAY OFF: 75ns TYPICAL, 100ns MAX.
- POWER INPUT: (CW)+20dbm (STANDARD), +10 dbm (HIGH SPEED)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 USEC
- CONTROL: TTL LOGIC "0"=ON "1"=OFF
- POWER SUPPLY: +5V @ 400 mA MAX.
 -5V @ 75mA MAX.(REFLECTIVE)
 100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- SIZE: Ø1.500 CIRCLE POINT TO POINT X 0.400 (H)
- WEIGHT: 2.5 OUNCES TYPICAL

OPTIONS:

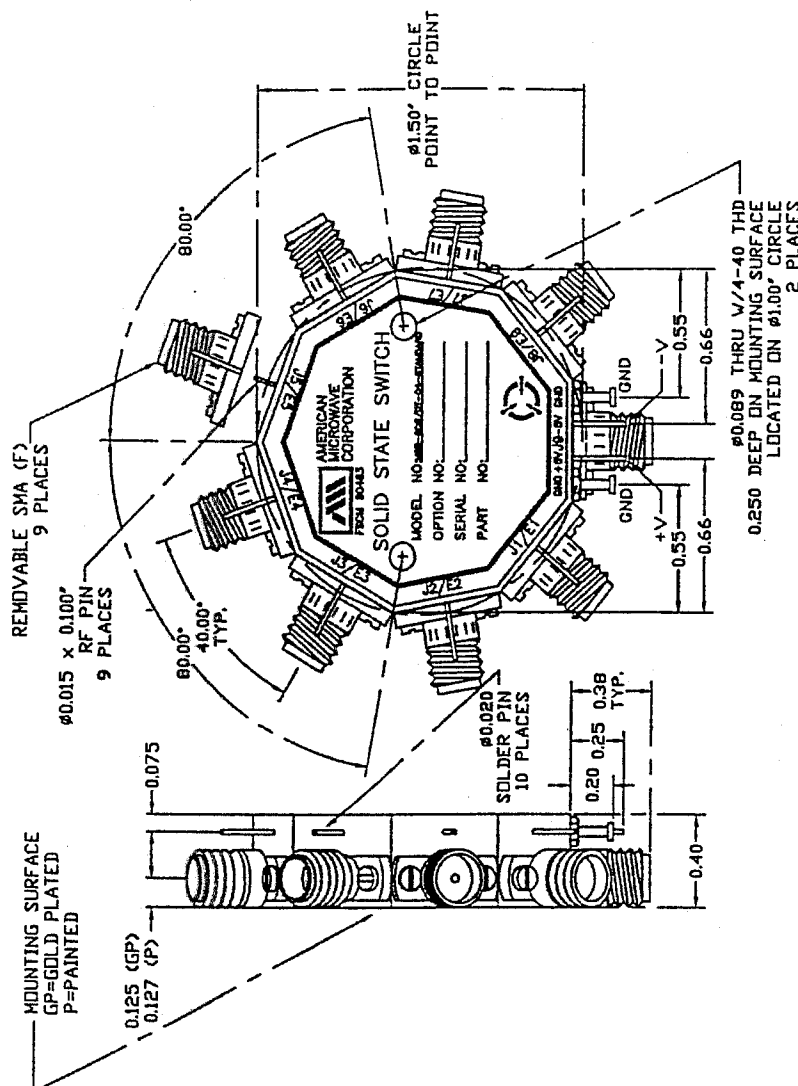
- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SR 3 BIT DECODER WITH SOLDER PIN
- 10M18 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 MHz AND 0.5db AT 18 GHz)
- 100M18 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 18 GHz)
- 118 1 GHz TO 18 GHz (NO CHANGE 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 "1"=ON "0"=OFF
- B04 DRIVERLESS, CURRENT CONTROLLED
- B05 HIGH SPEED, TURNON/TURNOFF 20 nsec MAXIMUM WHEN APPLICABLE OR OPTION HS
- B06 HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- B07 CUSTOM DESIGNED PRODUCT- SPECIFY INITIALS OF CUSTOMER
- B08 LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH
- B09 LOW INSERTION LOSS VERSION
- B10 HIGHER ISOLATION VERSION

ENVIRONMENTAL RATINGS:

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

ZONE	REV.	DESCRIPTION	DATE	APPROVED
		ORIGINAL RELEASE	10/25/99	



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

PART NO.		APPROVALS		DATE	
DRAWN		WSP, RBA		8/20/99	
CHECKED		WUP		8/23/99	
ISSUED		JA		8/31/99	
TITLE		AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND			
OUTLINE DRAWING		MSR-8DR/DT-04--STANDARD REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SOLID STATE SWITCH			
SIZE	FREQ. NO.	DWG. NO.	REV.		
A	60483	100-4191-1	-		
SCALE	N/S	SHEET	1	OF 2	

DESCRIPTION

AMC MODEL **MSR-8DR/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 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
REFLECTIVE OUT/OFF: 2.0:1
ABSORPTIVE OUT/OFF: 2.0:1
- SPEED: RISE: 10ns TYPICAL, 15ns MAX.
FALL: 10ns TYPICAL, 15ns MAX.
DELAY ON: 75ns TYPICAL, 100ns MAX.
DELAY OFF: 75ns TYPICAL, 100ns MAX.
- POWER INPUT: (CW)+20dbm (STANDARD), +10 dbm (HIGH SPEED)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 μ sec
- CONTROL: SEE LOGIC TABLE
- POWER SUPPLY: +5V ϕ 400 mA MAX.
-5V ϕ 75mA MAX.(RELECTIVE)
100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)
- SIZE: ϕ 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
- 10M1B 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 MHz AND 0.5db AT 18 GHz)
- 100M1B 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 18 GHz)
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- 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)
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- B01 -12V POWER SUPPLIES
- B02 -15V POWER SUPPLIES
- B03 REVERSE LOGIC "1"=ON "0"=OFF
- B04 DRIVERLESS, CURRENT CONTROLLED
- B05 HIGH SPEED, TURNON/TURNOFF 20 nsec MAXIMUM WHEN APPLICABLE OR OPTION HS
- B06 HIGH POWER - SPECIFY CW POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
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- SHOCK: MIL-STD-202F, METHOD 213B COND. B
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- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
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NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

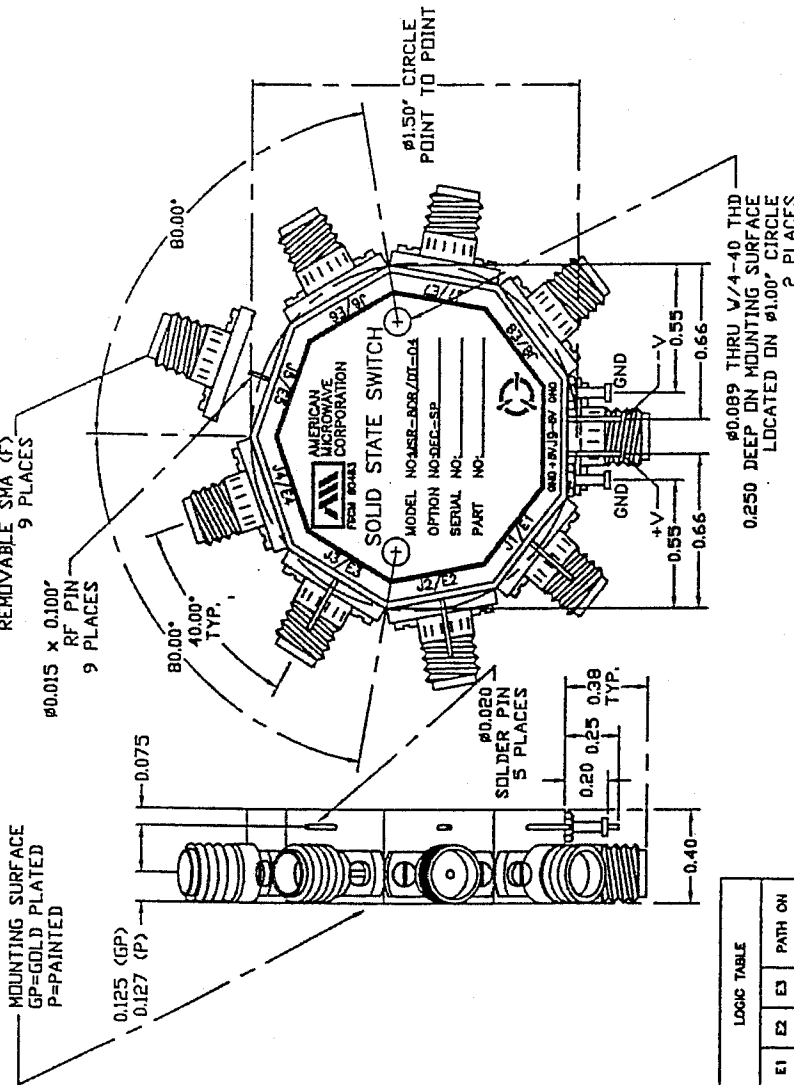
REVISIONS

DESCRIPTION

APPROVED

DATE 8/28/99

ORIGINAL RELEASE



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

APPROVALS	DATE
WPP, RPA	8/28/99
WPP	8/31/99
PA	8/31/99

PART NO.	DATE
60483	8/31/99

SIZE	FRM NO.	DWG NO.
A	60483	100-4191-2

SCALE	SHEET
1:1	1 of 2



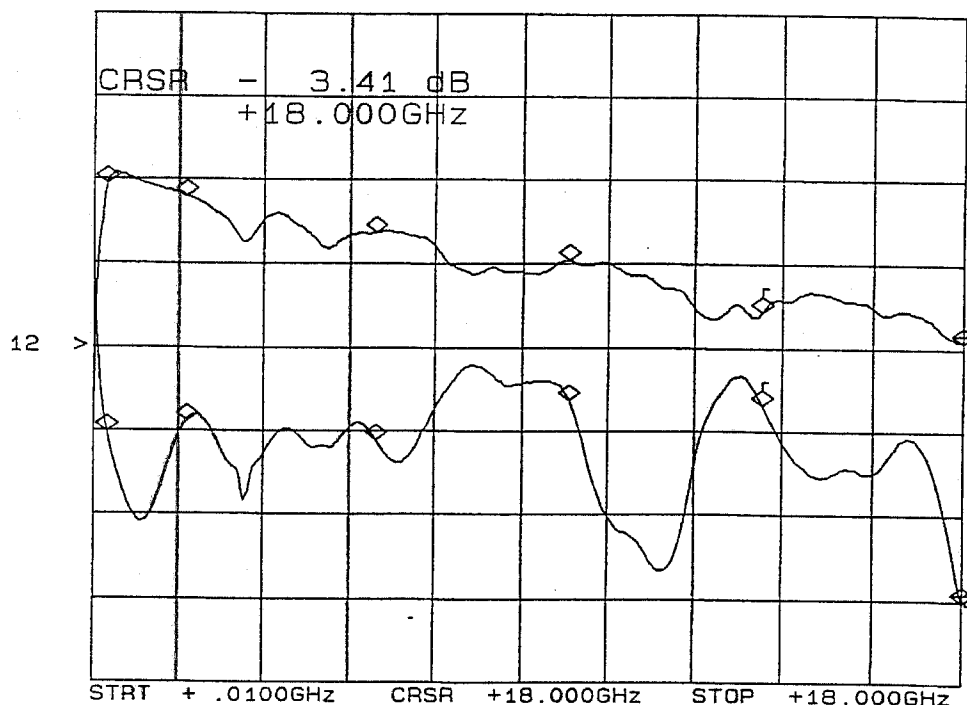
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J1

CH1: A -M S - 3.41 dB
 1.0 dB/ REF - 3.50 dB
 CH2: R -M REF - 24.56 dB
 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.55 dB	14.6 dB
2 GHz	1.70 dB	13.8 dB
6 GHz	2.13 dB	15.0 dB
10 GHz	2.44 dB	12.6 dB
14 GHz	3.06 dB	12.9 dB
18 GHz	3.41 dB	24.5 dB



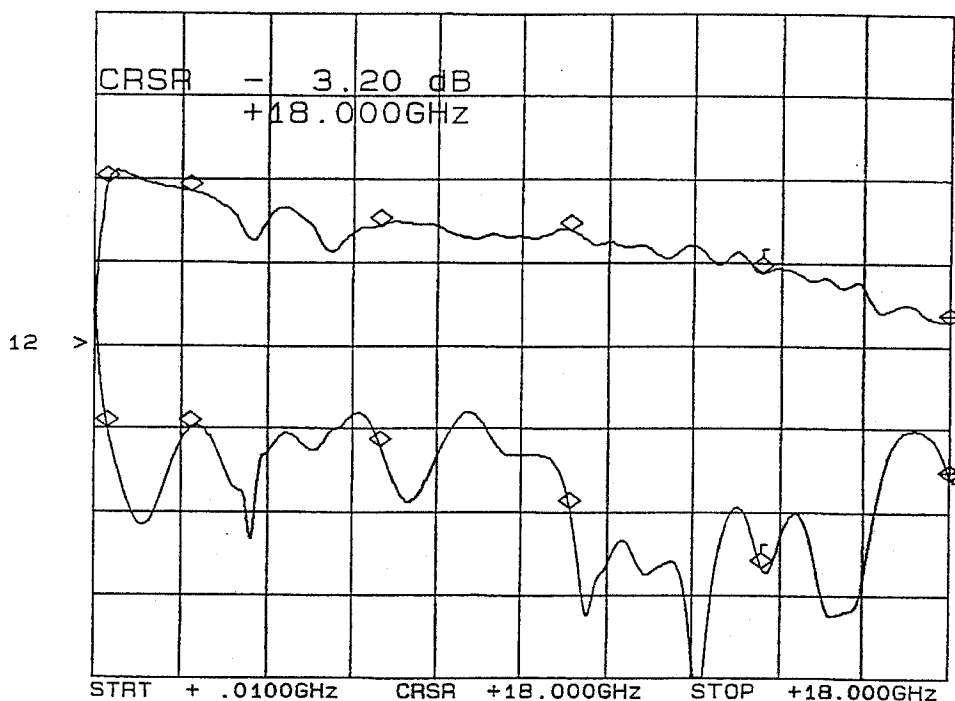
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J2

CH1: A -M S - 3.20 dB CH2: R -M - 17.59 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.54 dB	14.5 dB
2 GHz	1.64 dB	14.5 dB
6 GHz	2.05 dB	15.6 dB
10 GHz	2.10 dB	19.2 dB
14 GHz	2.60 dB	22.8 dB
18 GHz	3.20 dB	17.5 dB



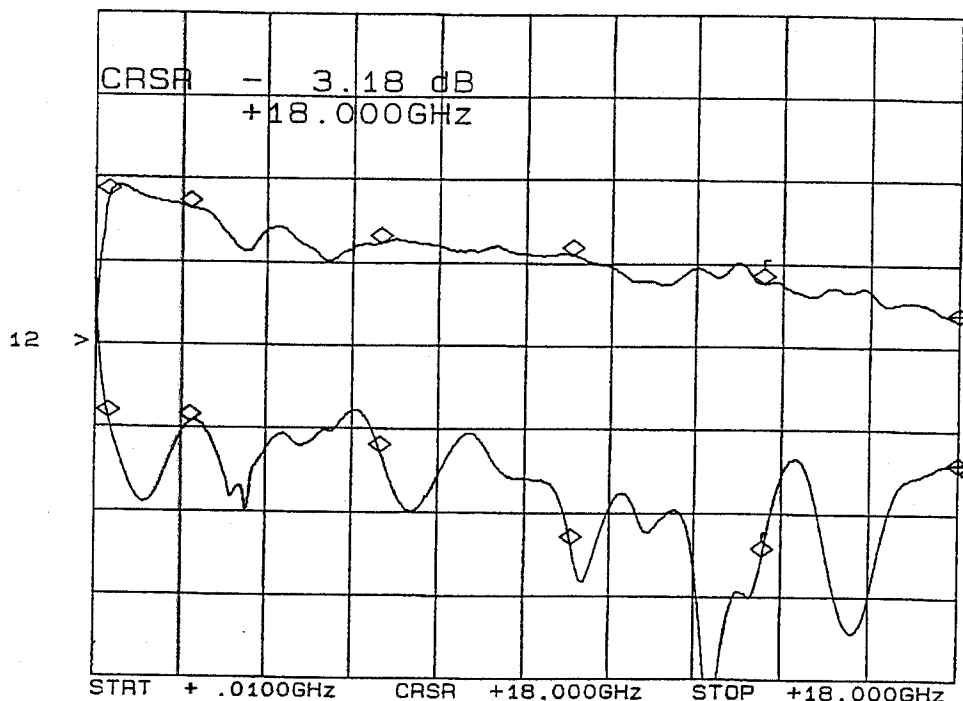
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : OPTIONS 0318, SPARWAR1, 4SSBB, 45004
ENGINEER : 8MS90879B
VOLTAGE & CURRENT DRAW : RENE AFABLE
: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J3

CH1: A -M S - 3.18 dB CH2: R -M REF - 17.03 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.71 dB	14.0 dB
2 GHz	1.84 dB	14.2 dB
6 GHz	2.26 dB	15.9 dB
10 GHz	2.39 dB	21.4 dB
14 GHz	2.72 dB	22.0 dB
18 GHz	3.18 dB	17.0 dB



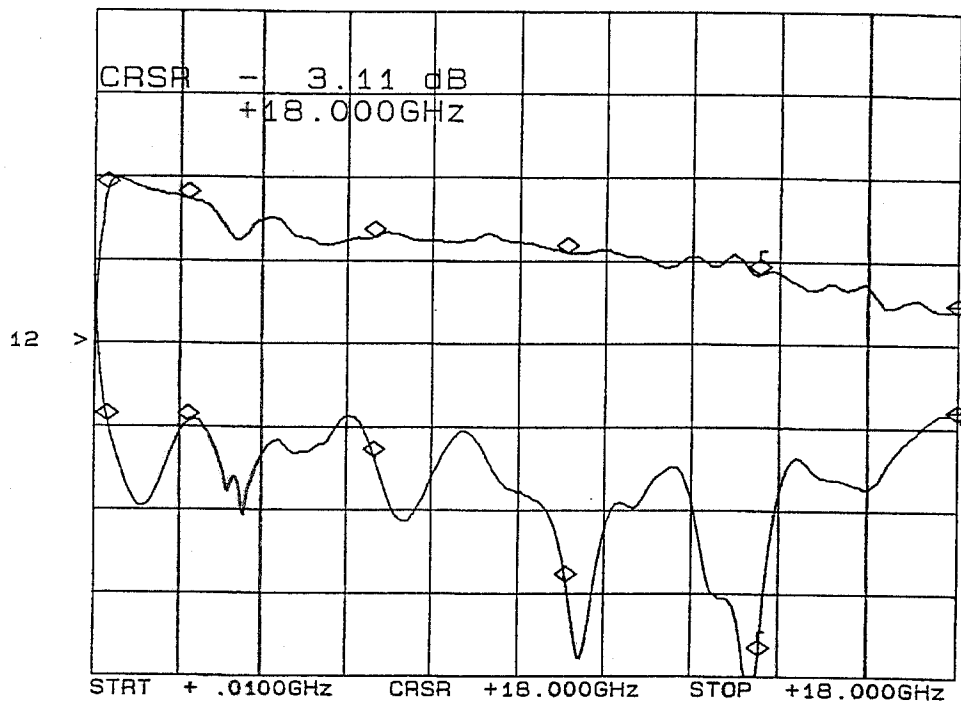
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J4

CH1: A -M S - 3.11 dB CH2: R -M REF - 13.98 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.64 dB	14.1 dB
2 GHz	1.75 dB	14.1 dB
6 GHz	2.20 dB	16.3 dB
10 GHz	2.38 dB	23.8 dB
14 GHz	2.65 dB	28.2 dB
18 GHz	3.11 dB	13.9 dB

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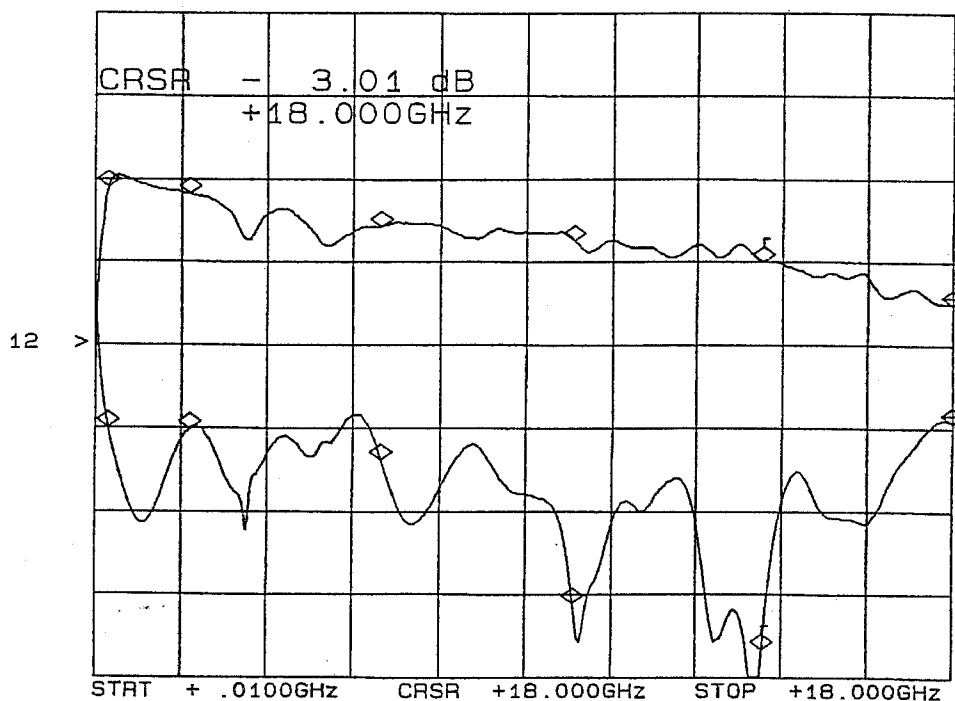
SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 0318, SPARWAR1, 4SSBB, 45004
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J5

CH1: A -M S - 3.01 dB CH2: R -M - 14.21 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.57 dB	14.5 dB
2 GHz	1.67 dB	14.5 dB
6 GHz	2.06 dB	16.3 dB
10 GHz	2.23 dB	25.0 dB
14 GHz	2.49 dB	27.8 dB
18 GHz	3.01 dB	14.2 dB

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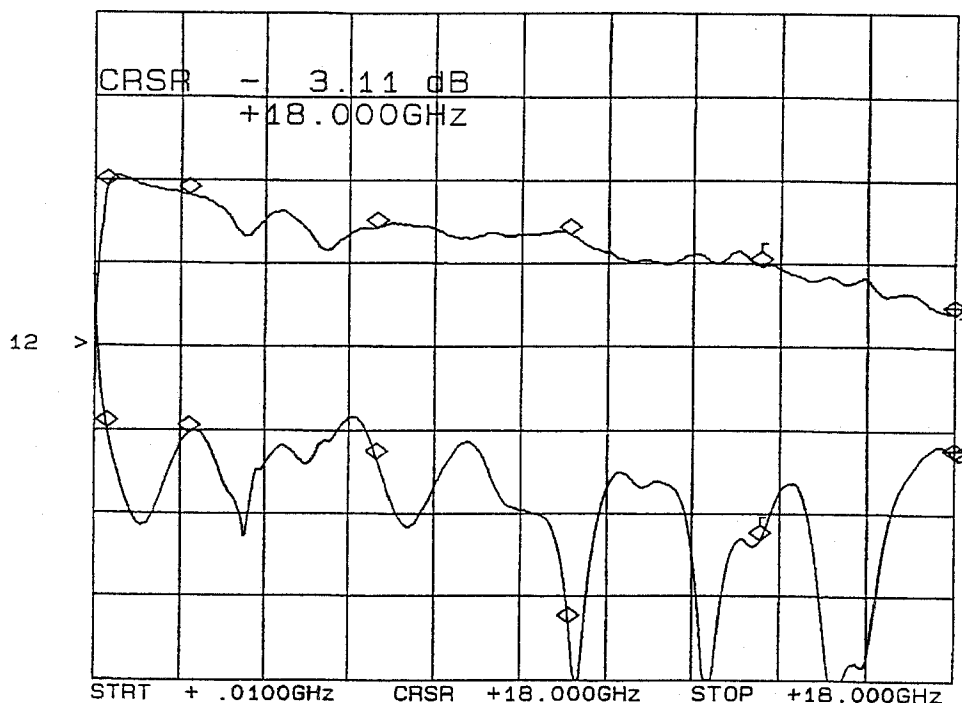
SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 0318, SPARWAR1, 4SSBB, 45004
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J6

CH1: A -M S - 3.11 dB CH2: R -M - 16.15 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.56 dB	14.4 dB
2 GHz	1.67 dB	14.6 dB
6 GHz	2.06 dB	16.2 dB
10 GHz	2.14 dB	26.1 dB
14 GHz	2.52 dB	21.1 dB
18 GHz	3.11 dB	16.1 dB

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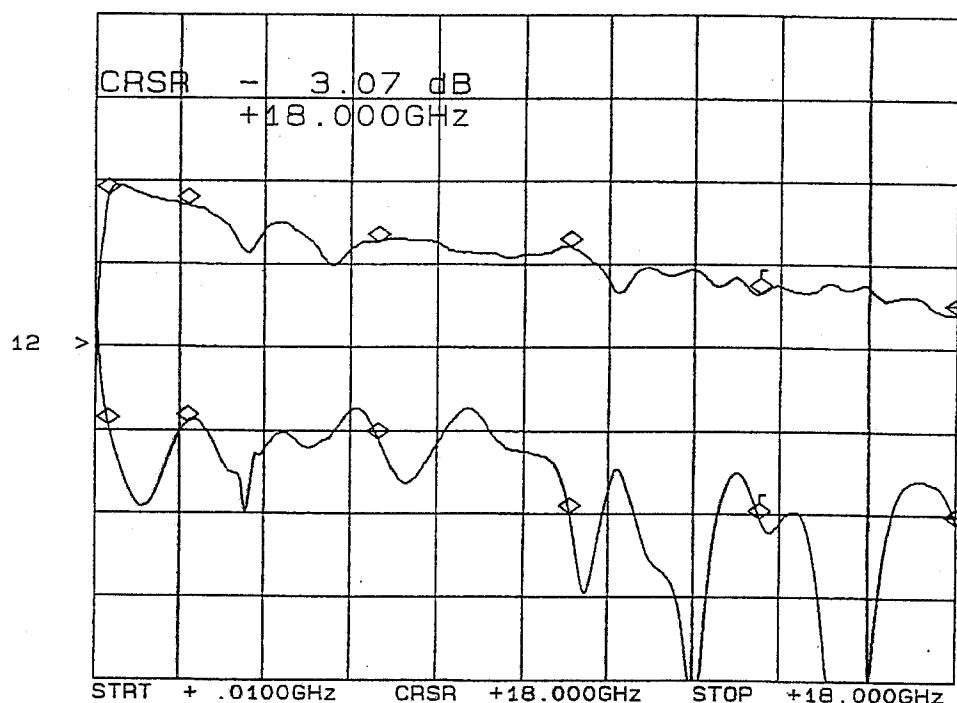
SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J7

CH1: A -M S - 3.07 dB CH2: R -M REF - 20.06 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.67 dB	14.1 dB
2 GHz	1.78 dB	13.9 dB
6 GHz	2.21 dB	14.9 dB
10 GHz	2.28 dB	19.4 dB
14 GHz	2.84 dB	19.7 dB
18 GHz	3.07 dB	20.0 dB

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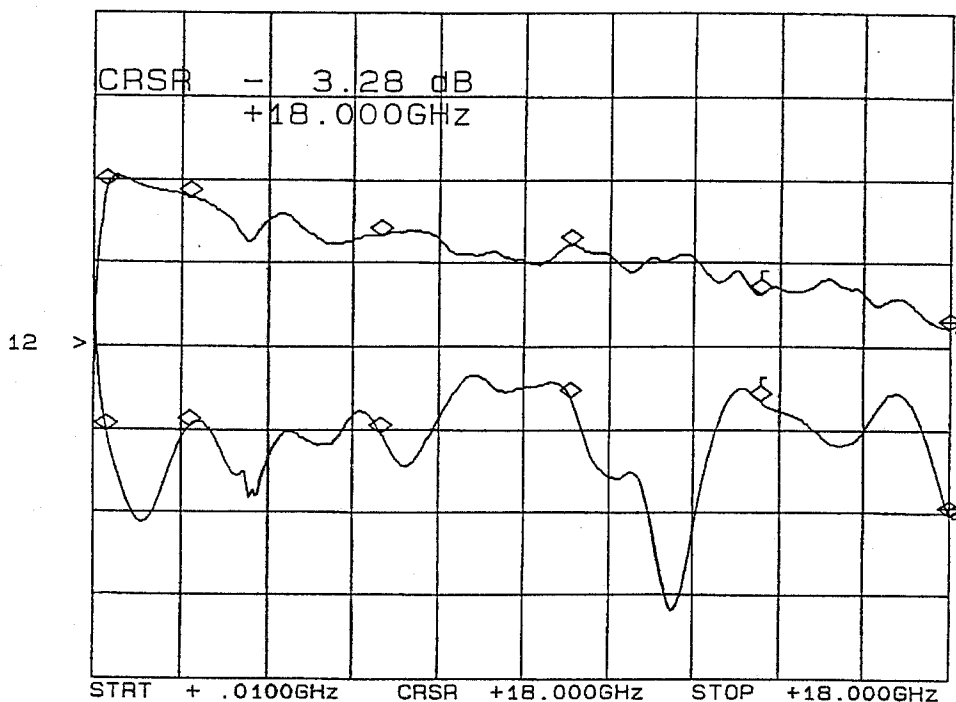
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA
OPTIONS 0318, SPARWAR1, 4SSBB, 45004

INSERTION LOSS & RETURN LOSS*

J9-J8

CH1: A -M S - 3.28 dB CH2: R -M - 19.63 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.57 dB	14.5 dB
2 GHz	1.70 dB	14.2 dB
6 GHz	2.16 dB	14.6 dB
10 GHz	2.27 dB	12.5 dB
14 GHz	2.87 dB	12.7 dB
18 GHz	3.28 dB	19.6 dB



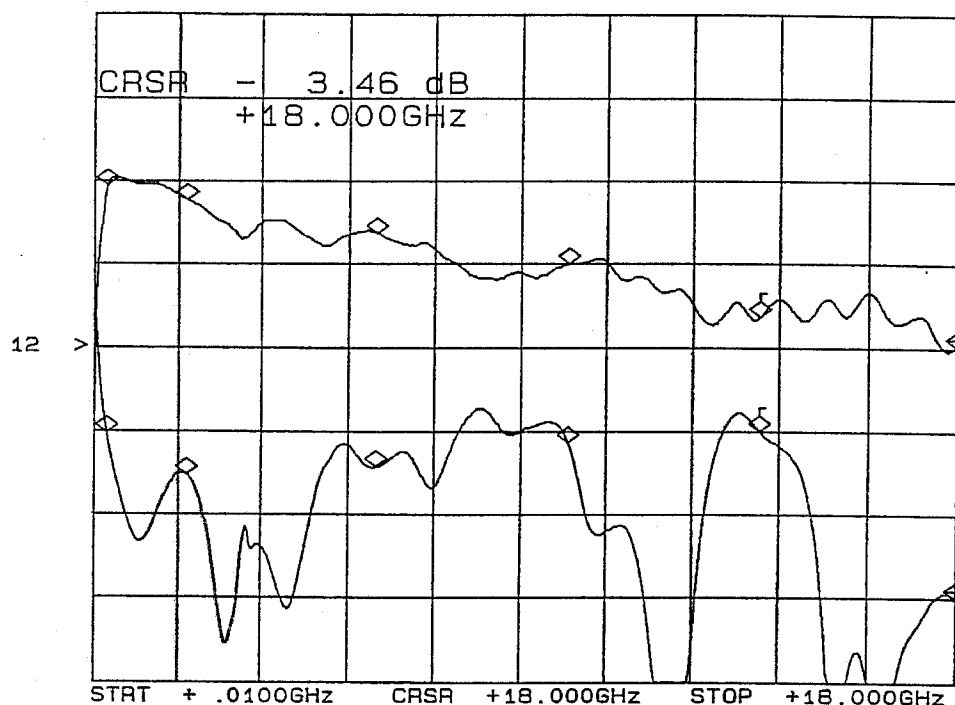
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J1-J9

CH1: A -M S - 3.46 dB CH2: R -M REF - 24.47 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.55 dB	14.6 dB
2 GHz	1.72 dB	17.0 dB
6 GHz	2.12 dB	16.6 dB
10 GHz	2.49 dB	15.1 dB
14 GHz	3.12 dB	14.4 dB
18 GHz	3.46 dB	24.4 dB

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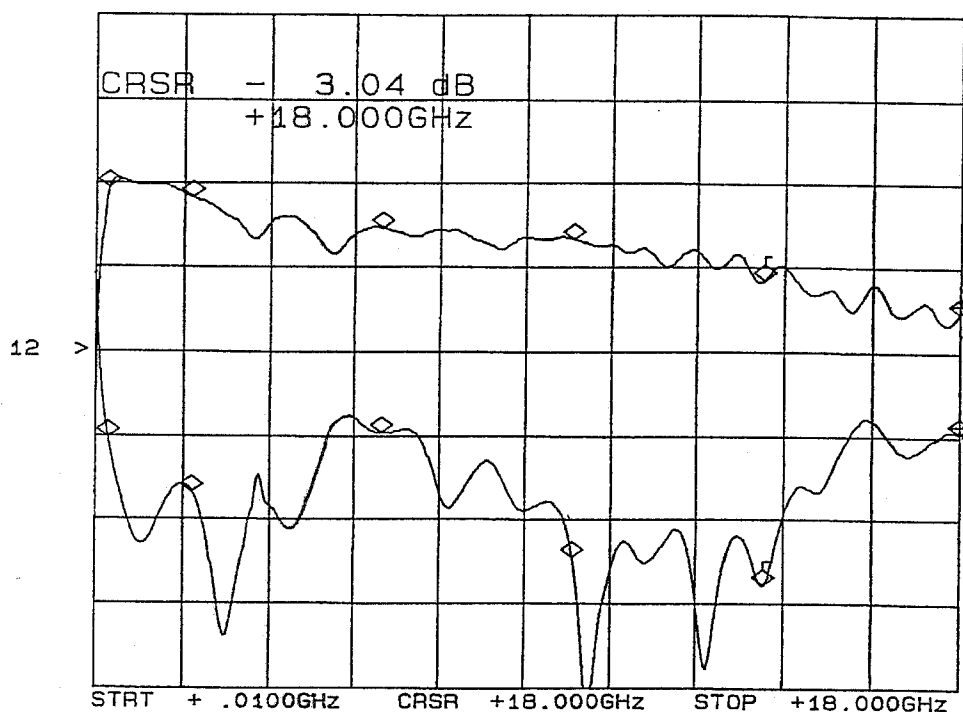
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	OPTIONS 0318, SPARWAR1, 4SSBB, 45004
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J2-J9

CH1: A -M S - 3.04 dB CH2: R -M REF - 14.34 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J2: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.55 dB	14.6 dB
2 GHz	1.66 dB	17.8 dB
6 GHz	2.03 dB	14.2 dB
10 GHz	2.16 dB	21.7 dB
14 GHz	2.64 dB	23.4 dB
18 GHz	3.04 dB	14.3 dB

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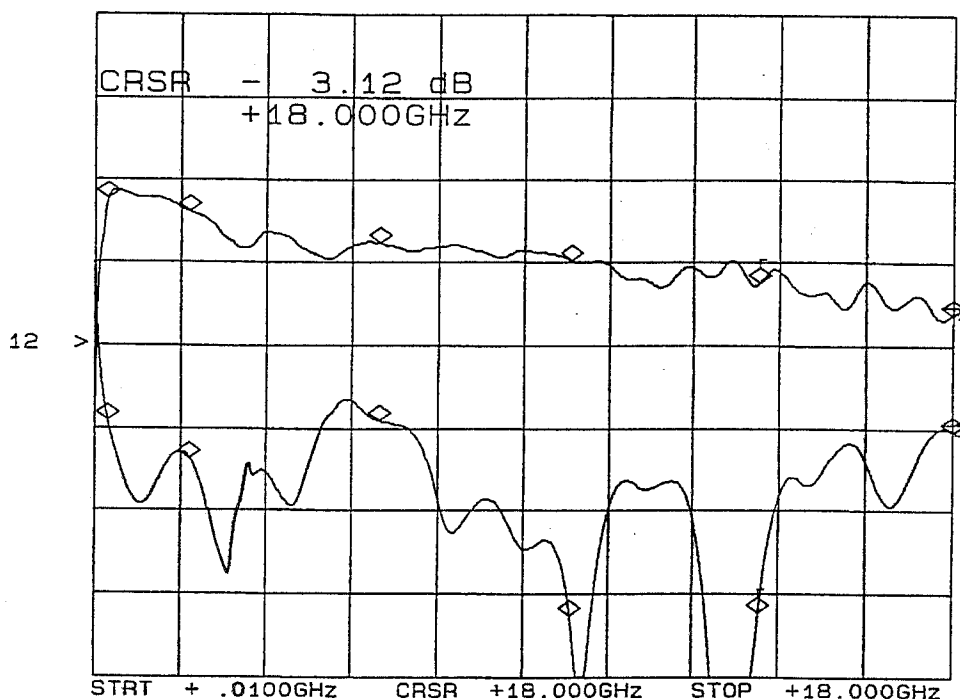
SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
	OPTIONS 0318, SPARWAR1, 4SSBB, 45004
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J3-J9

CH1: A -M S - 3.12 dB CH2: R -M - 14.72 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.72 dB	14.0 dB
2 GHz	1.88 dB	16.2 dB
6 GHz	2.26 dB	14.0 dB
10 GHz	2.48 dB	25.8 dB
14 GHz	2.73 dB	25.6 dB
18 GHz	3.12 dB	14.7 dB

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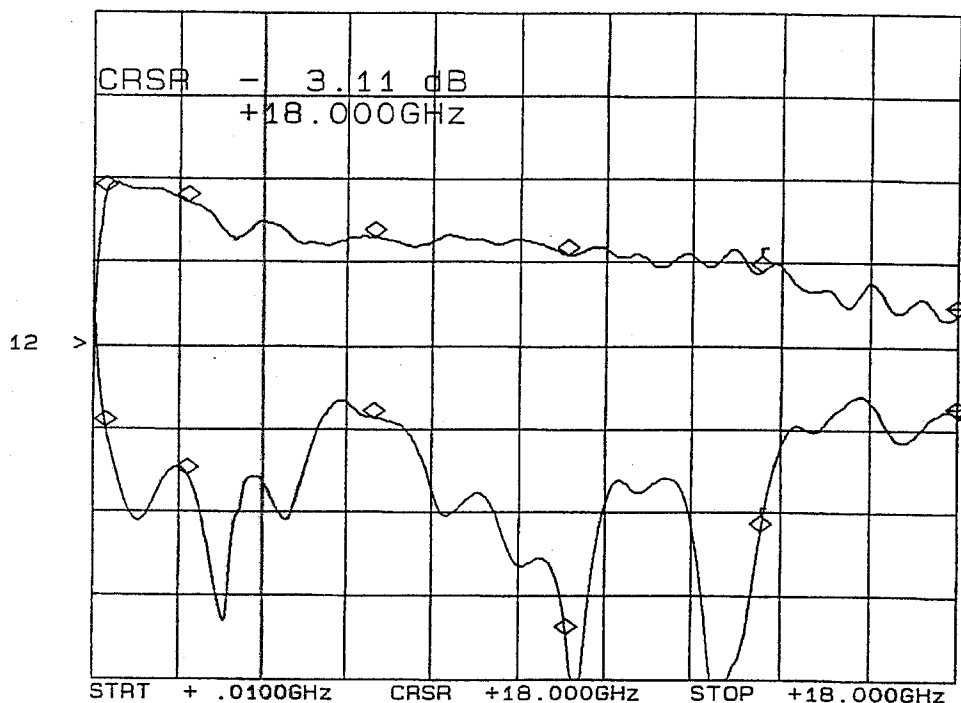
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : OPTIONS 0318, SPARWAR1, 4SSBB, 45004
ENGINEER : 8MS90879B
VOLTAGE & CURRENT DRAW : RENE AFABLE
: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J4-J9

CH1: A -M S - 3.11 dB CH2: R -M - 13.65 dB
1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.65 dB	14.3 dB
2 GHz	1.78 dB	17.2 dB
6 GHz	2.20 dB	13.7 dB
10 GHz	2.42 dB	26.8 dB
14 GHz	2.61 dB	20.2 dB
18 GHz	3.11 dB	13.6 dB

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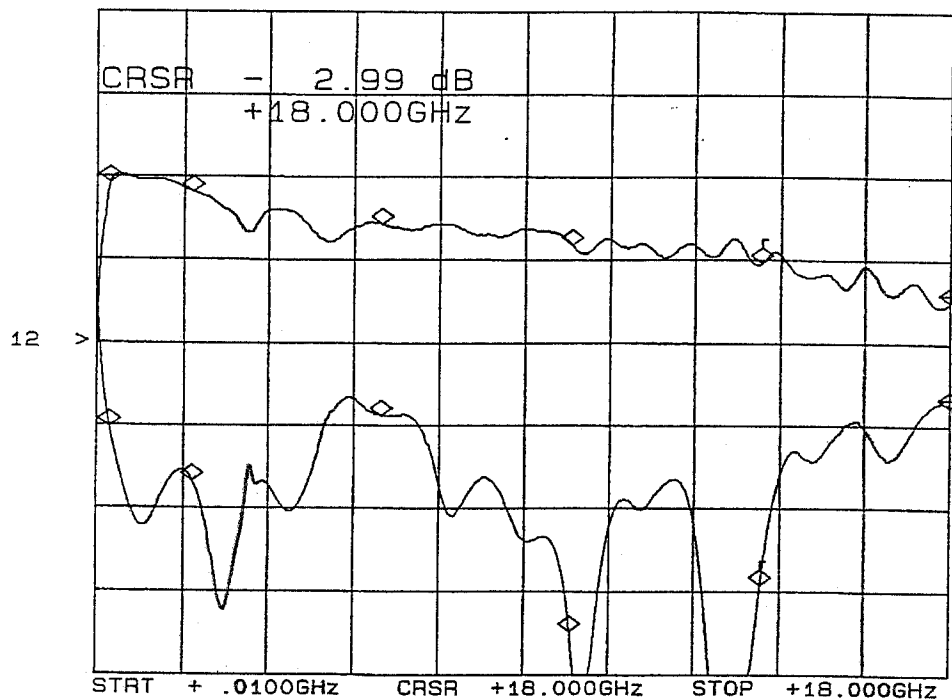
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J5-J9

CH1: A -M S - 2.99 dB
 1.0 dB/ REF - 3.50 dB
 CH2: R -M - 13.30 dB
 5.0 dB/ REF - 9.54 dB



*J5: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.57 dB	14.5 dB
2 GHz	1.67 dB	17.0 dB
6 GHz	2.06 dB	13.8 dB
10 GHz	2.31 dB	26.0 dB
14 GHz	2.52 dB	24.0 dB
18 GHz	2.99 dB	13.3 dB

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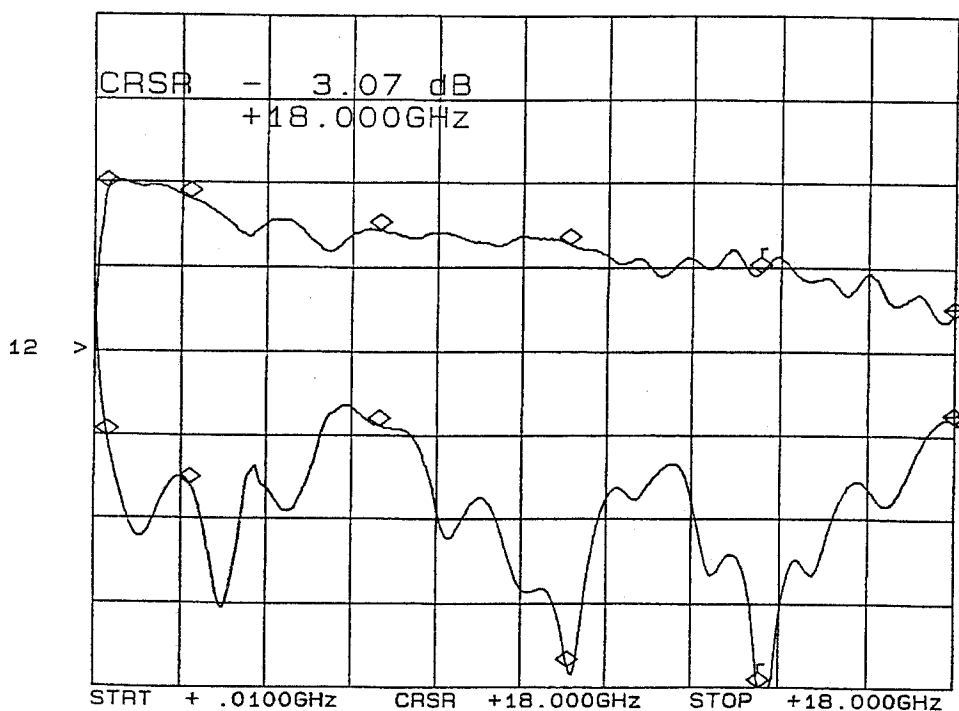
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J6-J9

CH1: A -M S - 3.07 dB CH2: R -M REF - 13.75 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J6: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.56 dB	14.5 dB
2 GHz	1.68 dB	17.4 dB
6 GHz	2.05 dB	13.9 dB
10 GHz	2.22 dB	28.1 dB
14 GHz	2.55 dB	30.8 dB
18 GHz	3.07 dB	13.7 dB

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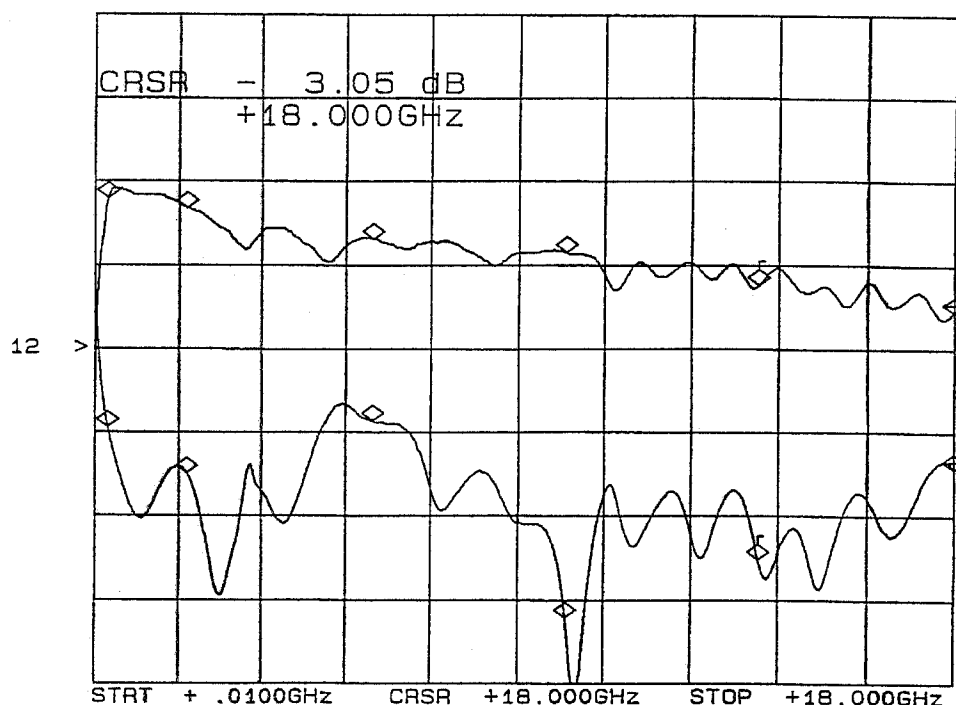
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J7-J9

CH1: A -M S - 3.05 dB CH2: R -M - 16.72 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J7: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.69 dB	14.1 dB
2 GHz	1.81 dB	16.9 dB
6 GHz	2.17 dB	13.8 dB
10 GHz	2.34 dB	25.5 dB
14 GHz	2.72 dB	22.0 dB
18 GHz	3.05 dB	16.7 dB

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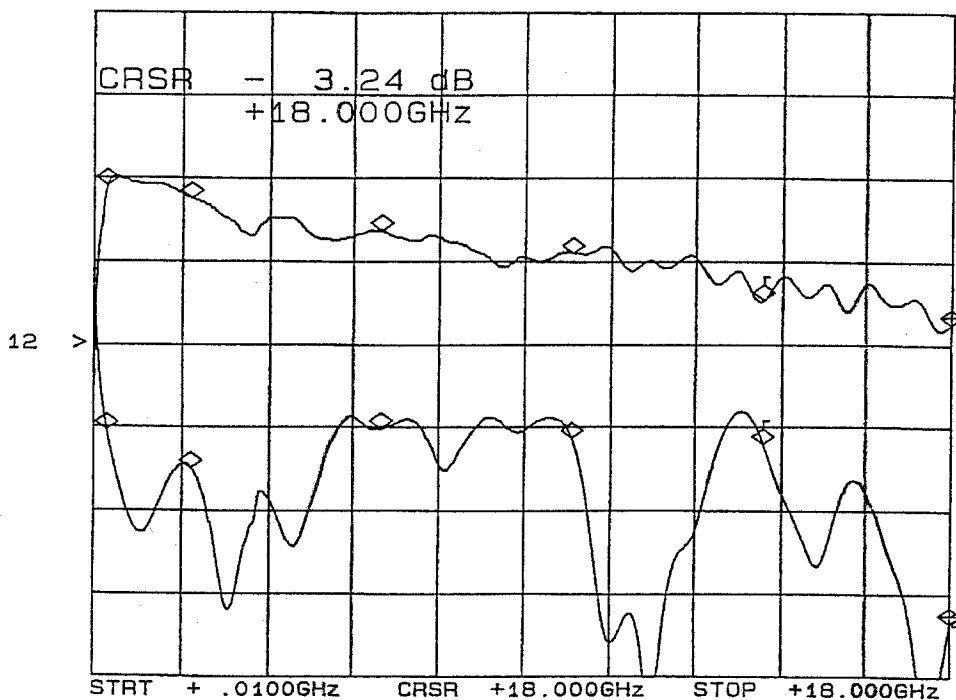
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J8-J9

CH1: A -M S - 3.24 dB CH2: R -M - 26.26 dB
 1.0 dB/ REF - 3.50 dB 5.0 dB/ REF - 9.54 dB



*J8: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
300 MHz	1.59 dB	14.6 dB
2 GHz	1.73 dB	16.9 dB
6 GHz	2.13 dB	14.5 dB
10 GHz	2.38 dB	15.1 dB
14 GHz	2.86 dB	16.5 dB
18 GHz	3.24 dB	26.2 dB



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	OPTIONS 0318, SPARWAR1, 4SSBB, 45004
ENGINEER	: 8MS90879B
VOLTAGE & CURRENT DRAW	: RENE AFABLE
	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SPECTRUM ANALYZER)

FREQUENCY	J1	J2	J3	J4	J5	J6	J7	J8
70 MHz	100 dB	101 dB	106 dB	106 dB	106 dB	106 dB	106 dB	103 dB
100 MHz	104 dB	102 dB	104 dB	106 dB	106 dB	105 dB	104 dB	104 dB
500 MHz	102 dB	103 dB	101 dB	102 dB	102 dB	104 dB	100 dB	103 dB
1 GHz	92 dB	95 dB	97 dB	98 dB	96 dB	97 dB	97 dB	93 dB
1.5 GHz	90 dB	97 dB	96 dB	96 dB	100 dB	102 dB	92 dB	100 dB
2 GHz	91 dB	89 dB	90 dB	90 dB	93 dB	92 dB	91 dB	90 dB
4 GHz	87 dB	94 dB	94 dB	90 dB	94 dB	93 dB	88 dB	95 dB
6 GHz	88 dB	89 dB	89 dB	93 dB	92 dB	92 dB	94 dB	88 dB
8 GHz	84 dB	86 dB	90 dB	88 dB	86 dB	86 dB	85 dB	86 dB
10 GHz	83 dB	86 dB	84 dB	84 dB	85 dB	83 dB	84 dB	78 dB
12 GHz	77 dB	80 dB	78 dB	80 dB	80 dB	80 dB	79 dB	80 dB
14 GHz	73 dB	82 dB	78 dB	80 dB	79 dB	80 dB	80 dB	80 dB
16 GHz	80 dB	78 dB	77 dB	75 dB	75 dB	76 dB	76 dB	78 dB
18 GHz	78 dB	72 dB	73 dB	74 dB	72 dB	72 dB	76 dB	76 dB

* J9: INPUT ARM

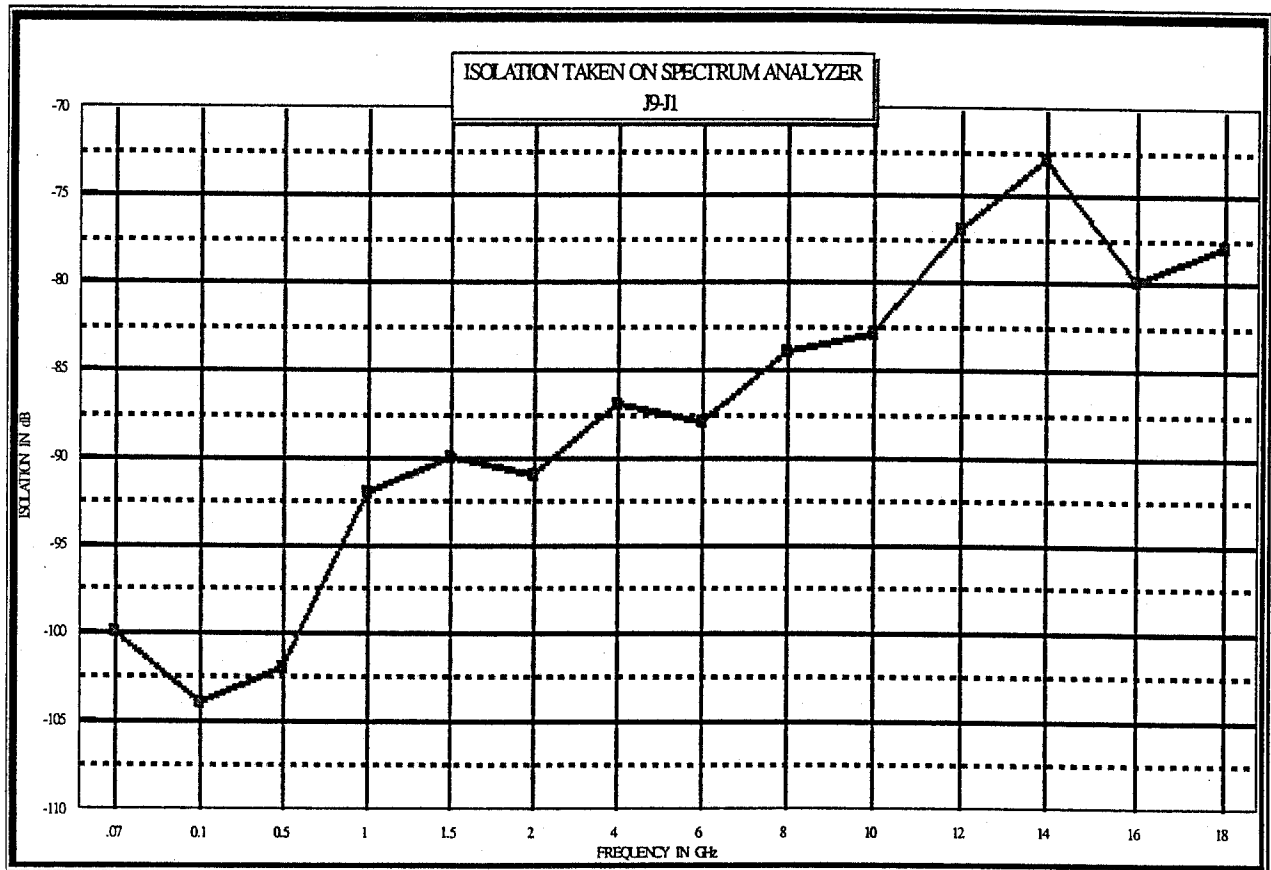
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA
 OPTIONS 0318, SPARWAR1, 4SSBB, 45004

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



*J9: INPUT ARM

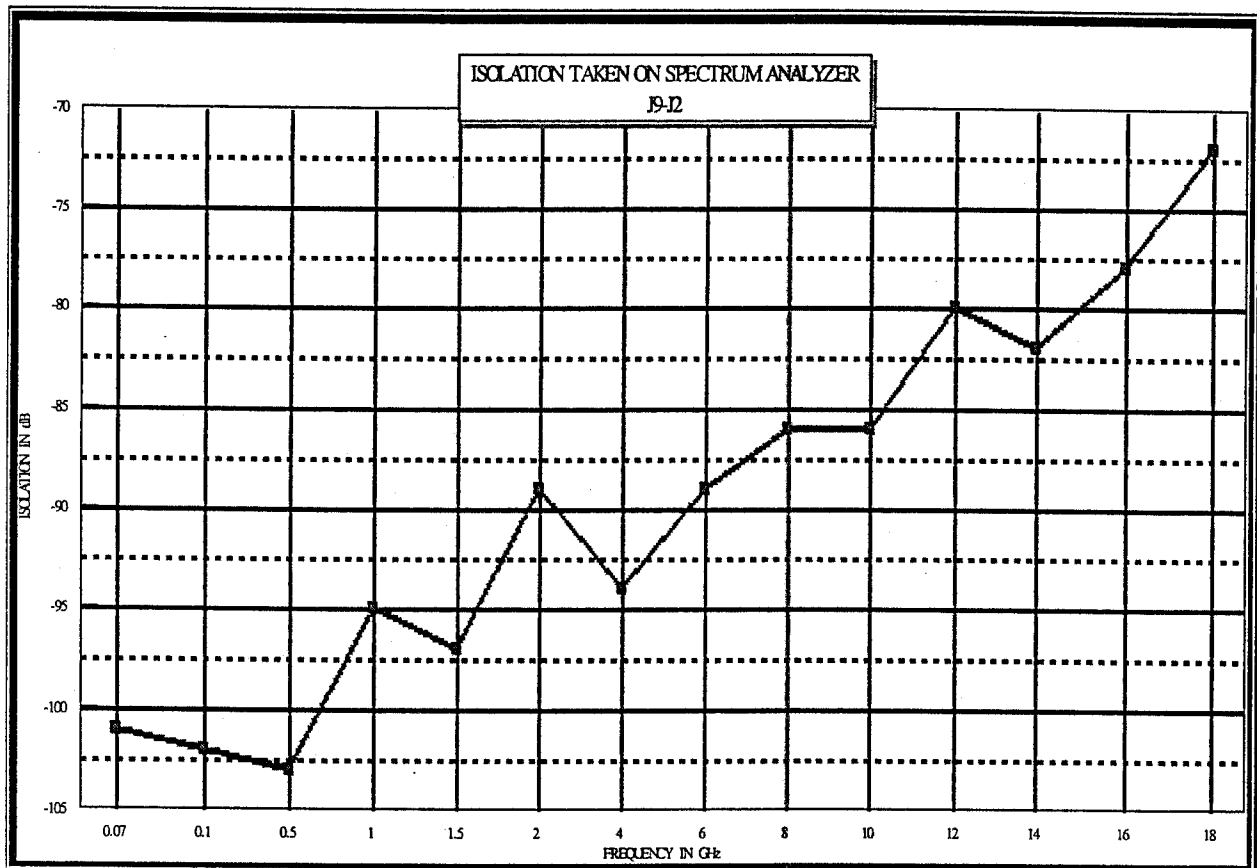
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

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



*J9: INPUT ARM

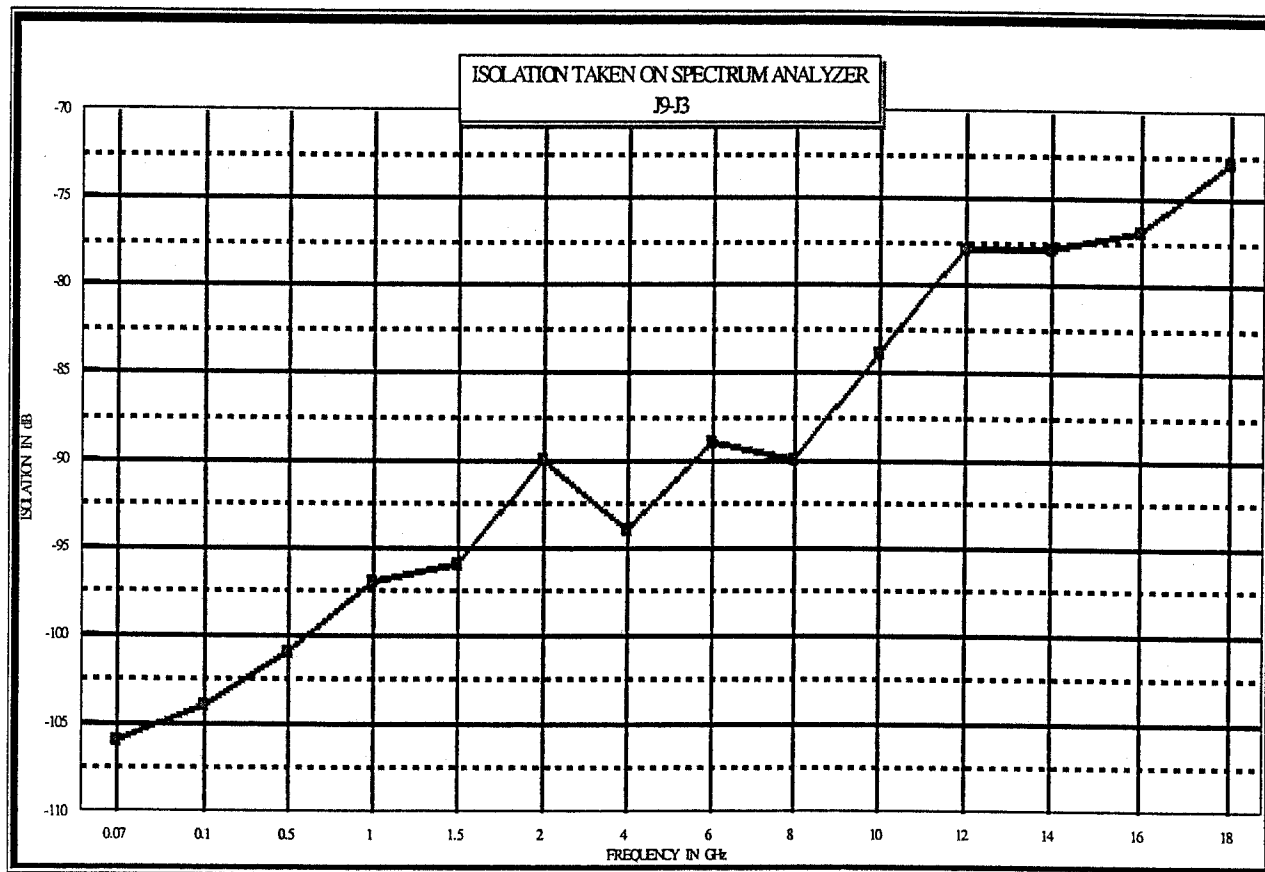
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

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



*J9: INPUT ARM

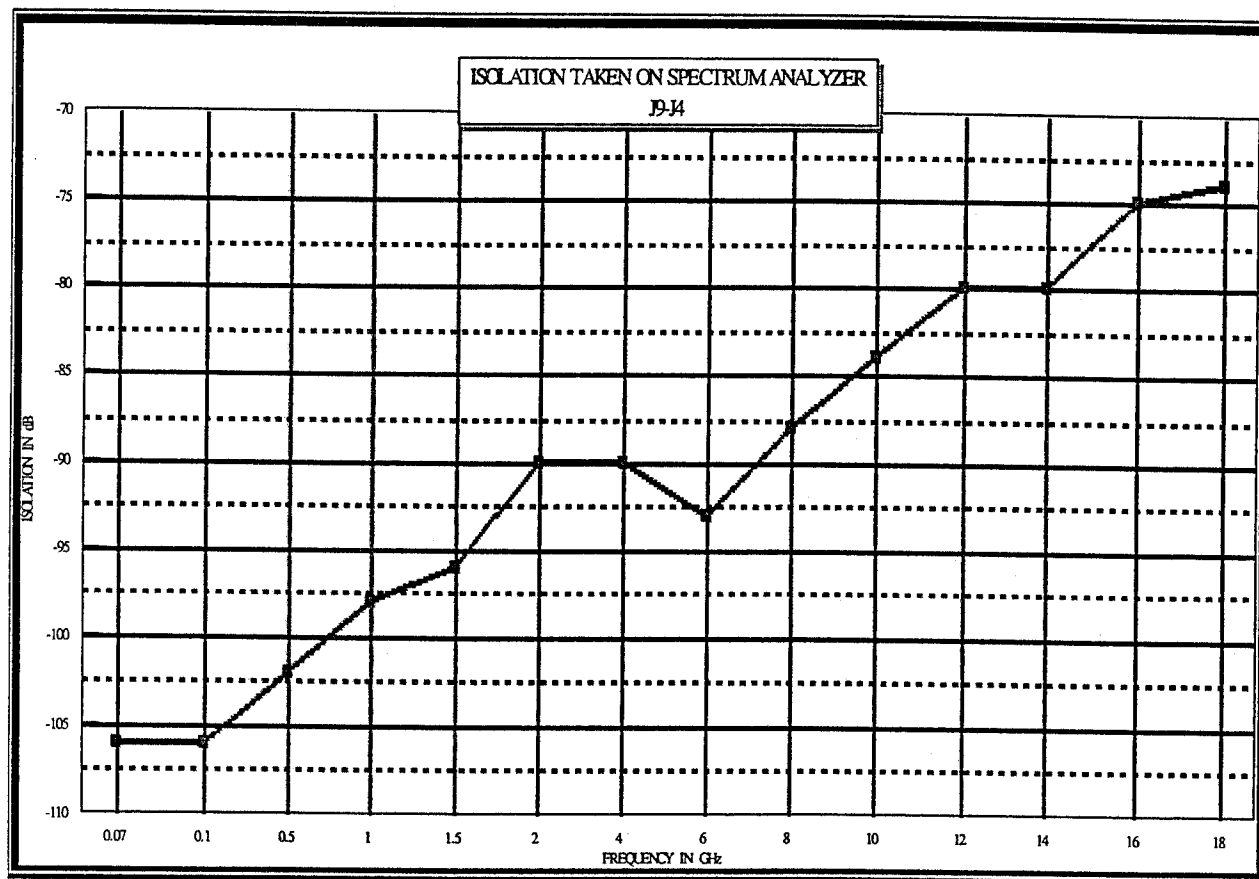
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

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



*J9: INPUT ARM

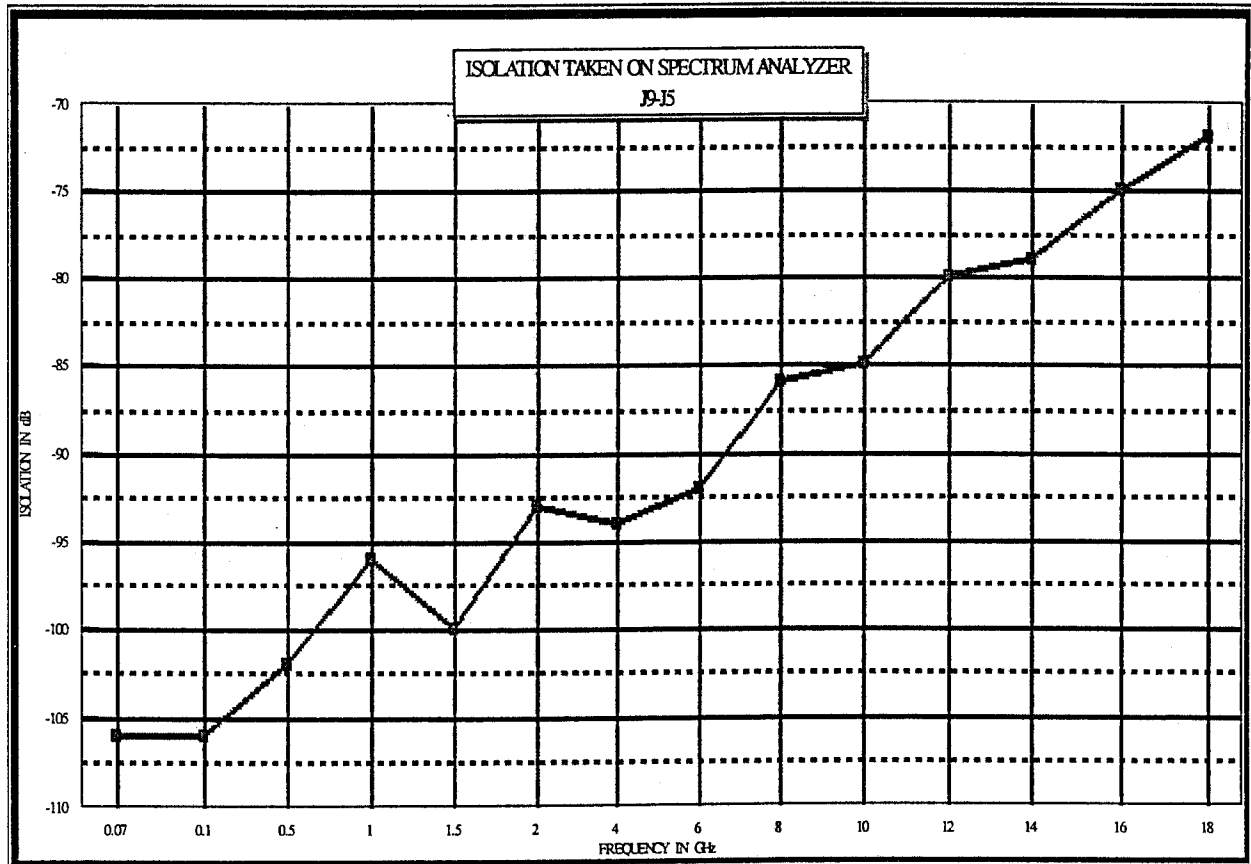
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 0318, SPARWAR1, 4SSBB, 45004
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

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



*J9: INPUT ARM

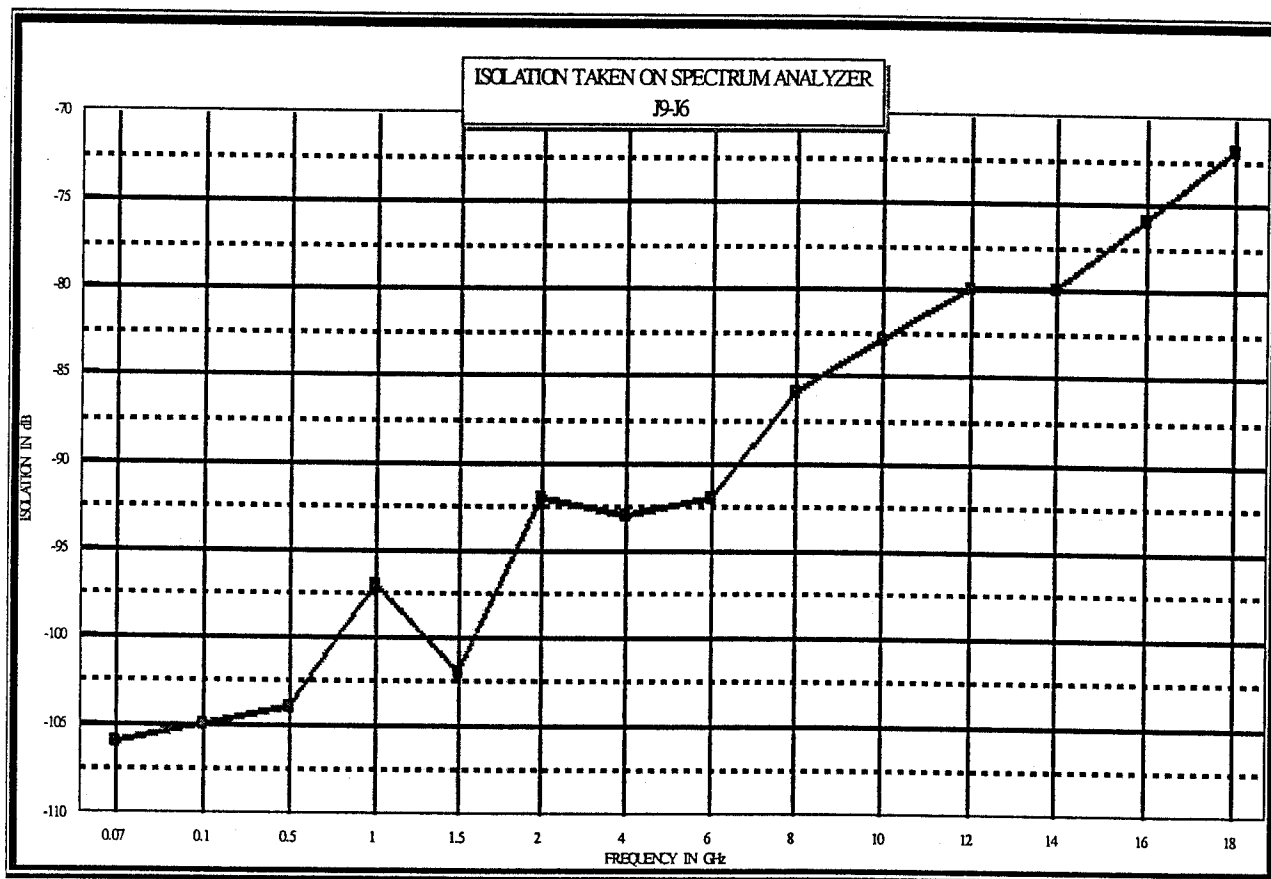
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

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



*J9: INPUT ARM

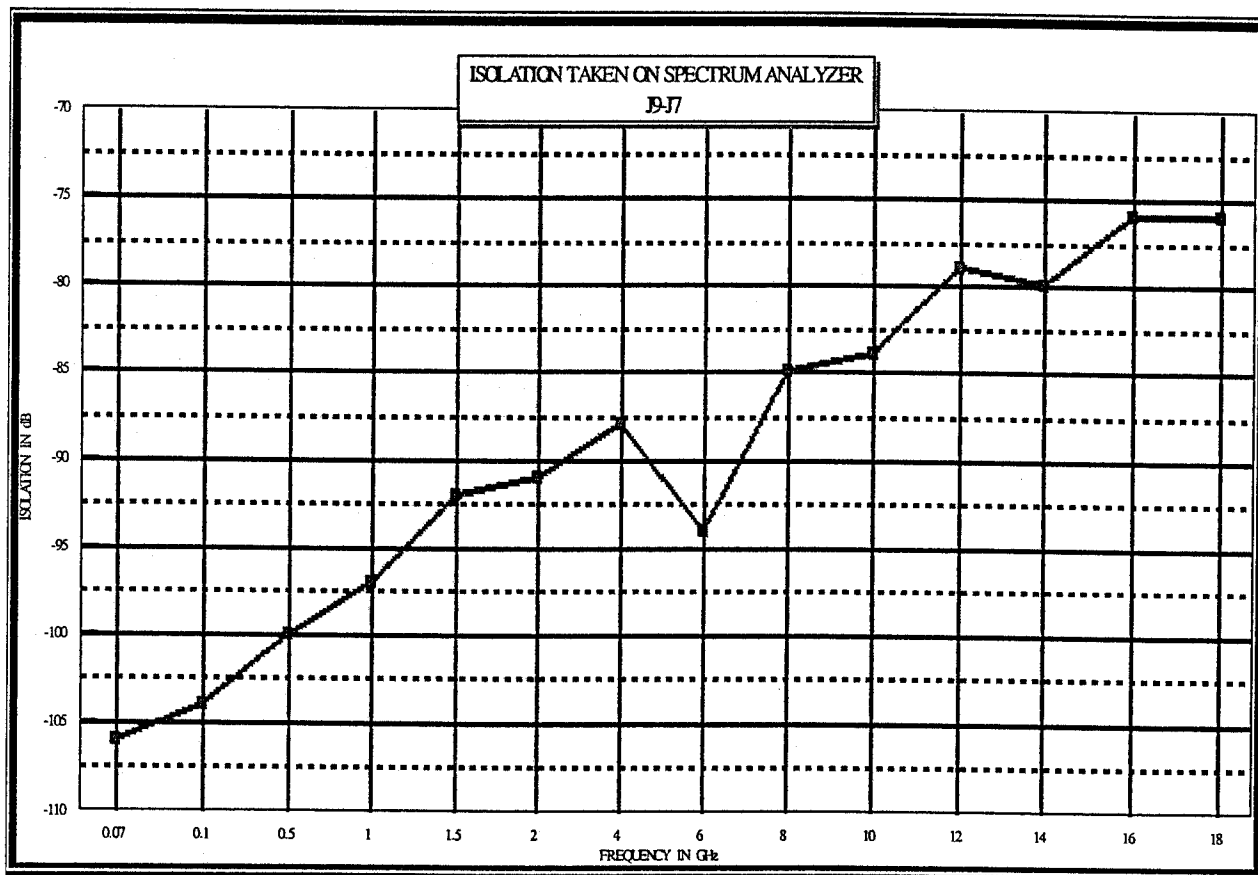
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

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



*J9: INPUT ARM

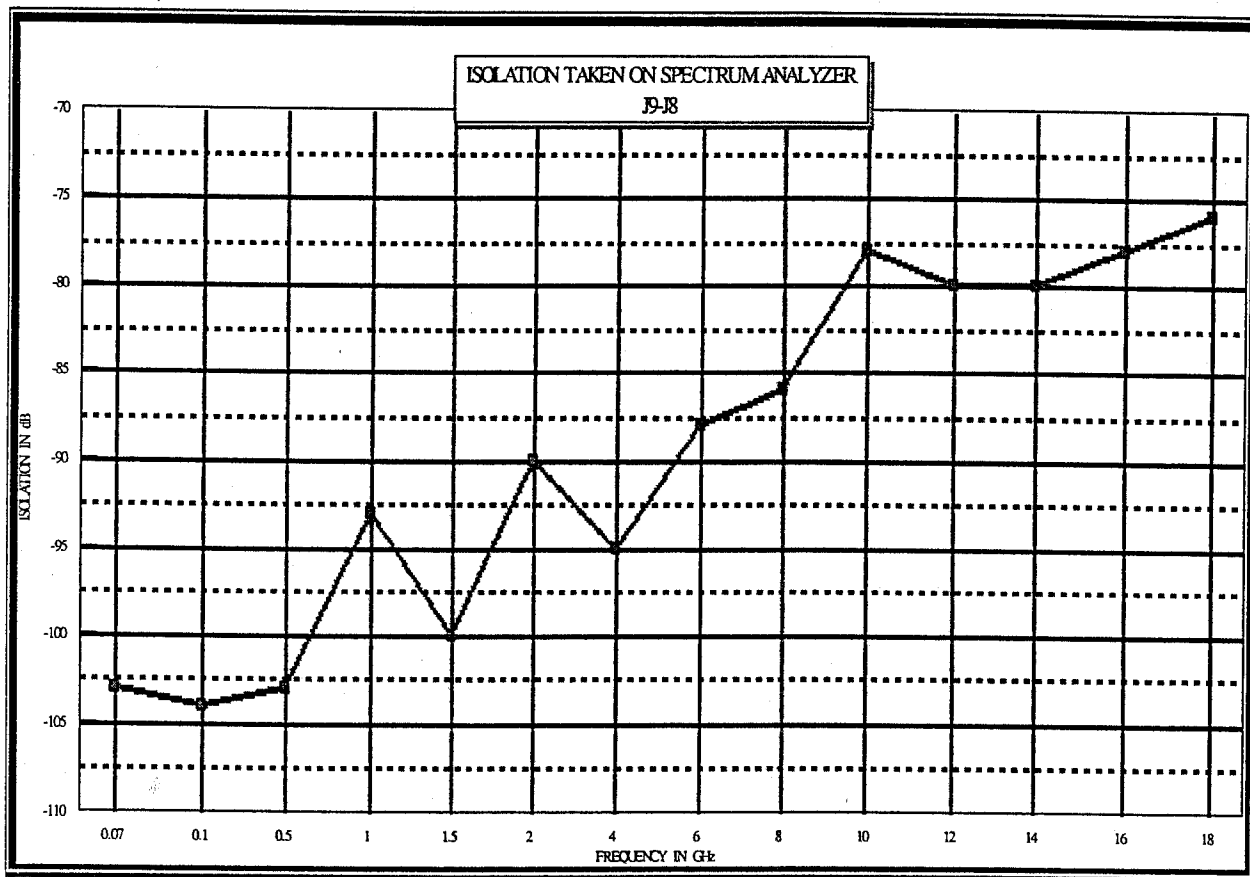
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

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



*J9: INPUT ARM

SEPTEMBER 27, 1999



**AMPLITUDE
DATA
BETWEEN
PORT TO PORT
FROM**

300 MHz TO 18 GHz

ON A

SP8T

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

**AMC MODEL No:
MSR-8DR-04-STANDARS
OPTIONS 0318, SPARWAR1, 4SSBB, 45004
(Serial Number: 8MS90879B)**

**REPORTED AND PREPARED
BY
RENE AFABLE**

SEPTEMBER 27, 1999

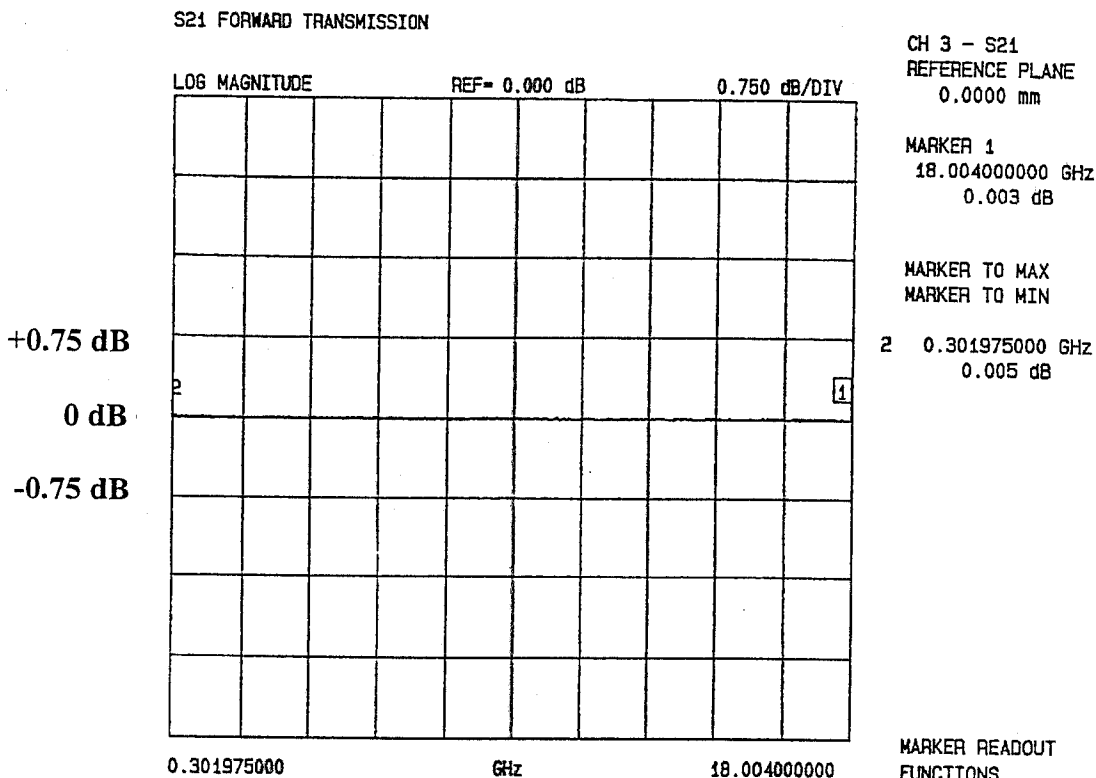
7311 G GROVE ROAD, FREDERICK, MARYLAND 21704 • Tel. (301) 662-4700 • Fax (301) 662-4938



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

AMPLITUDE*
J9-J1 (REFERENCE)



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
18 GHZ	0.003 dB	
300 MHz	0.005 dB	

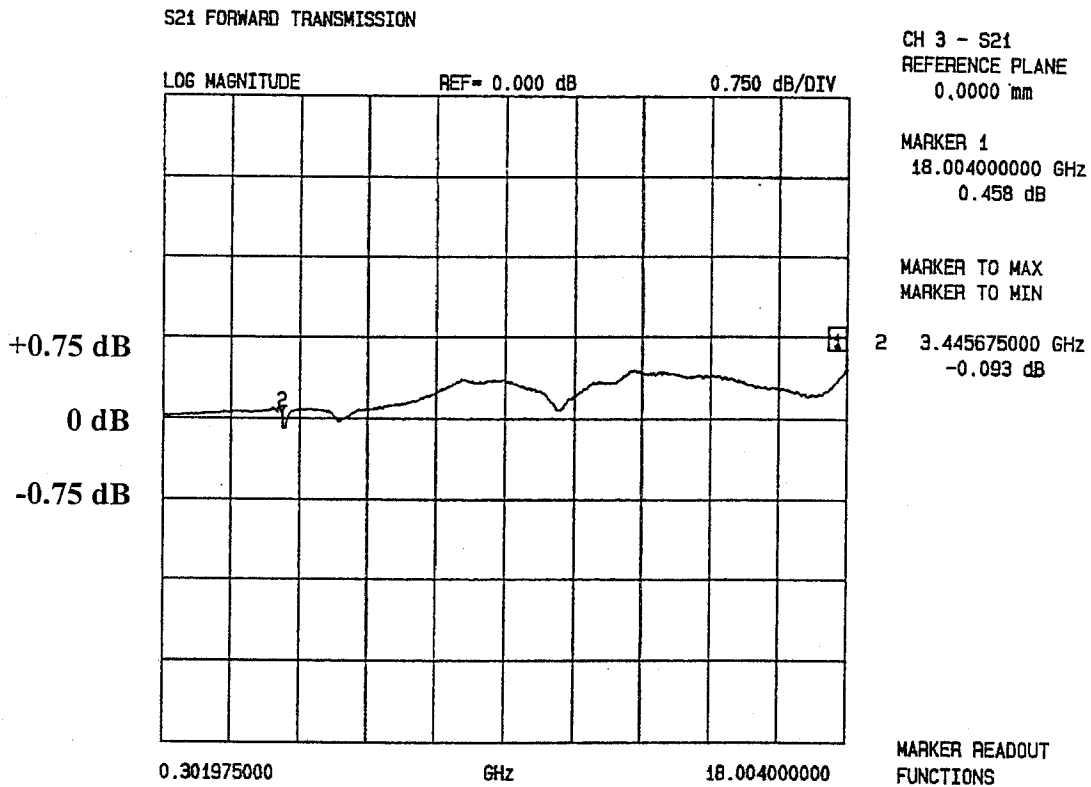
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

AMPLITUDE*
J9-J2



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
18 GHz	0.485 dB	
3.44 GHz		-0.093 dB

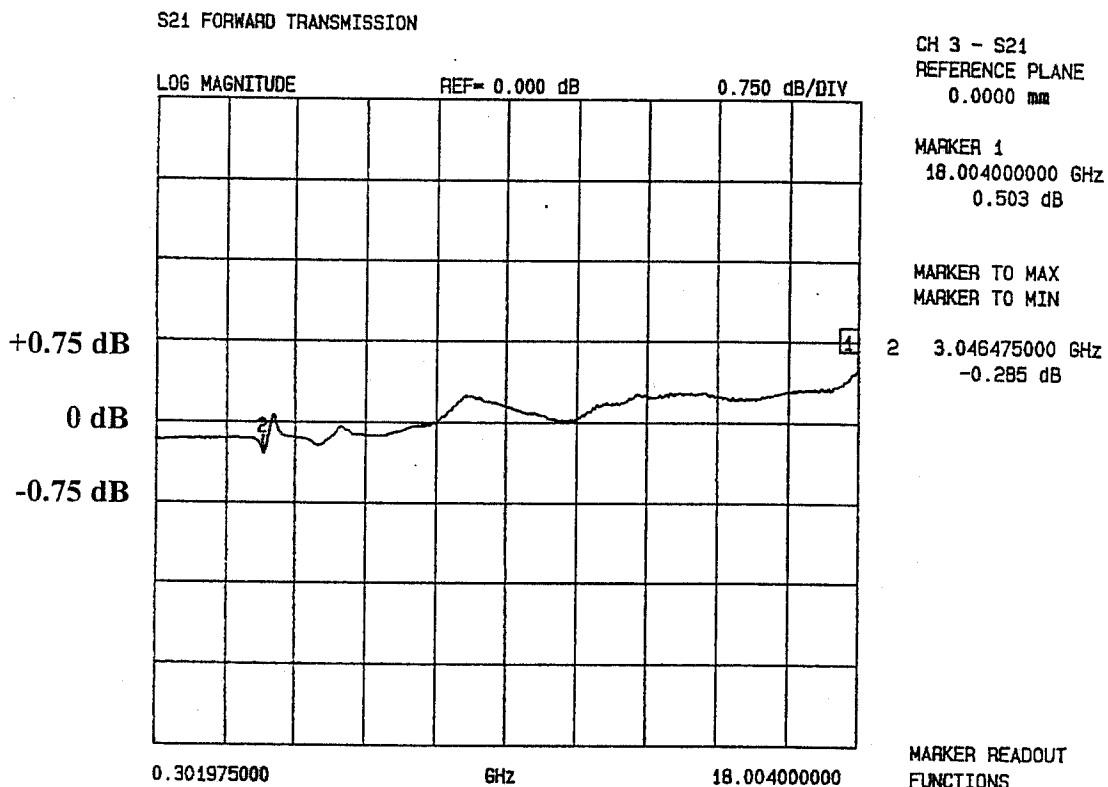
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

AMPLITUDE* J9-J3



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
18 GHZ	0.503 dB	
3.04 GHZ		-0.285 dB

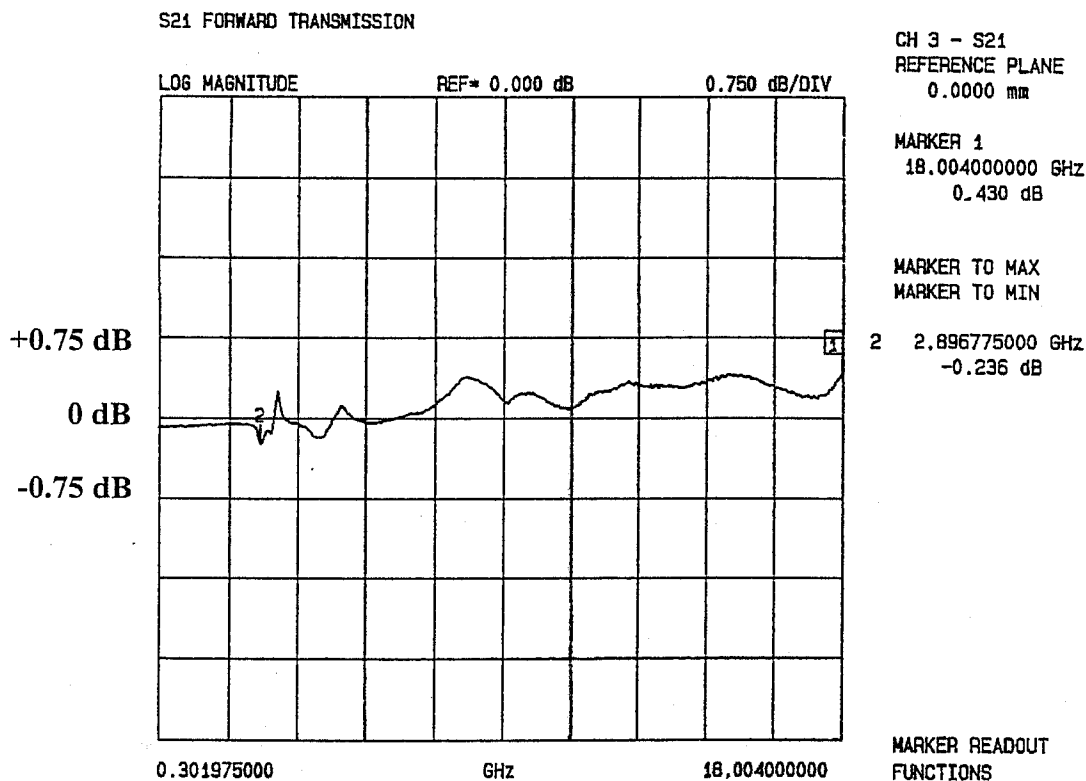
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

AMPLITUDE*
J9-J4



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
18 GHZ	0.430 dB	
2.89 GHz		-0.236 dB

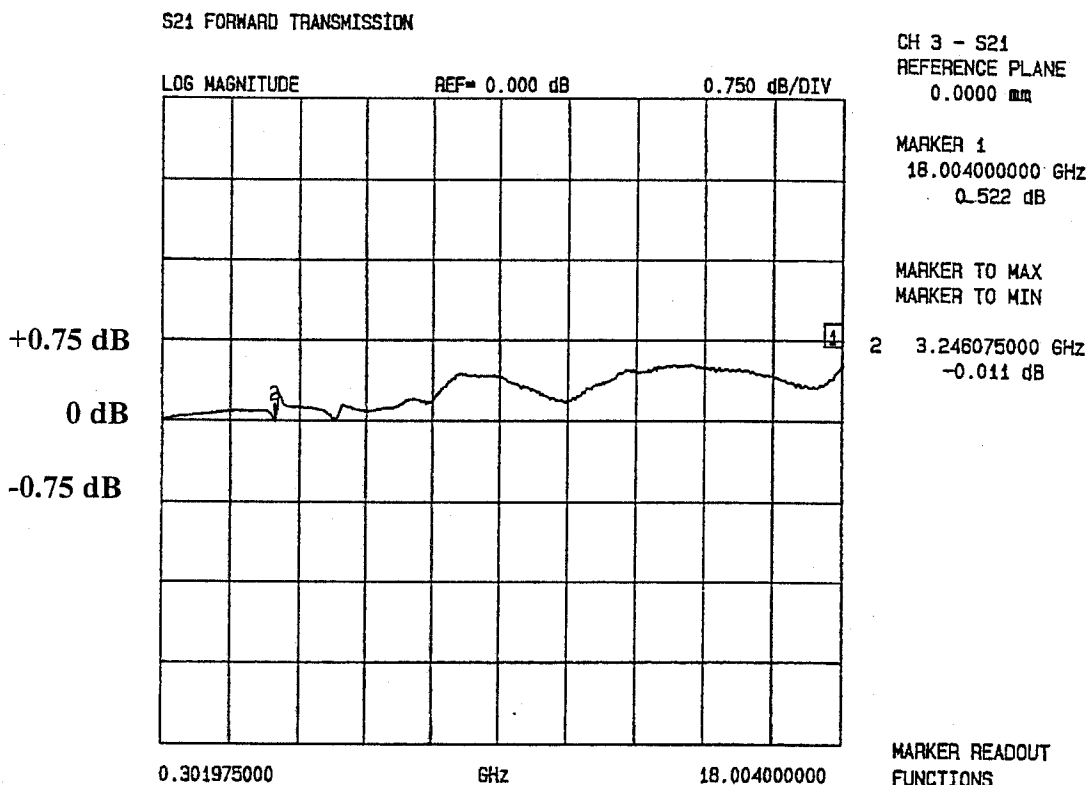
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

AMPLITUDE* J9-J5



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
18 GHz	0.522 dB	
3.24 GHz		-0.011 dB

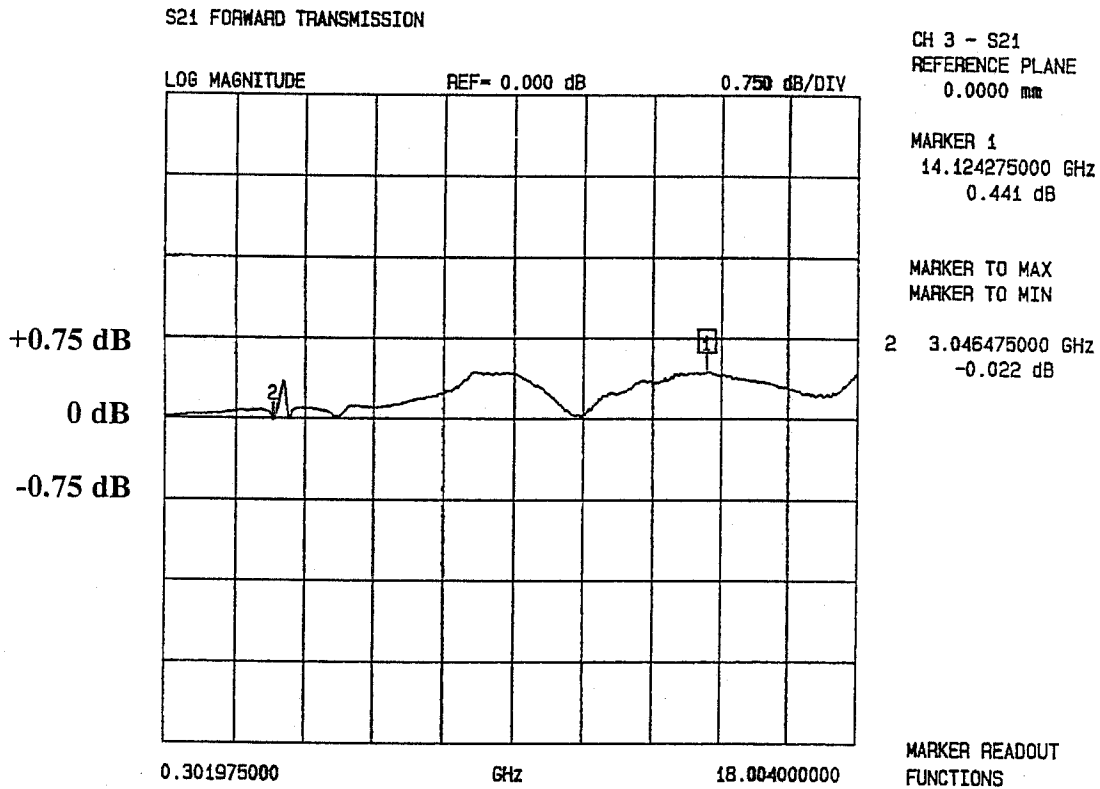
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

AMPLITUDE* J9-J6



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
14.12 GHz	0.441 dB	
3.04 GHz		-0.022 dB

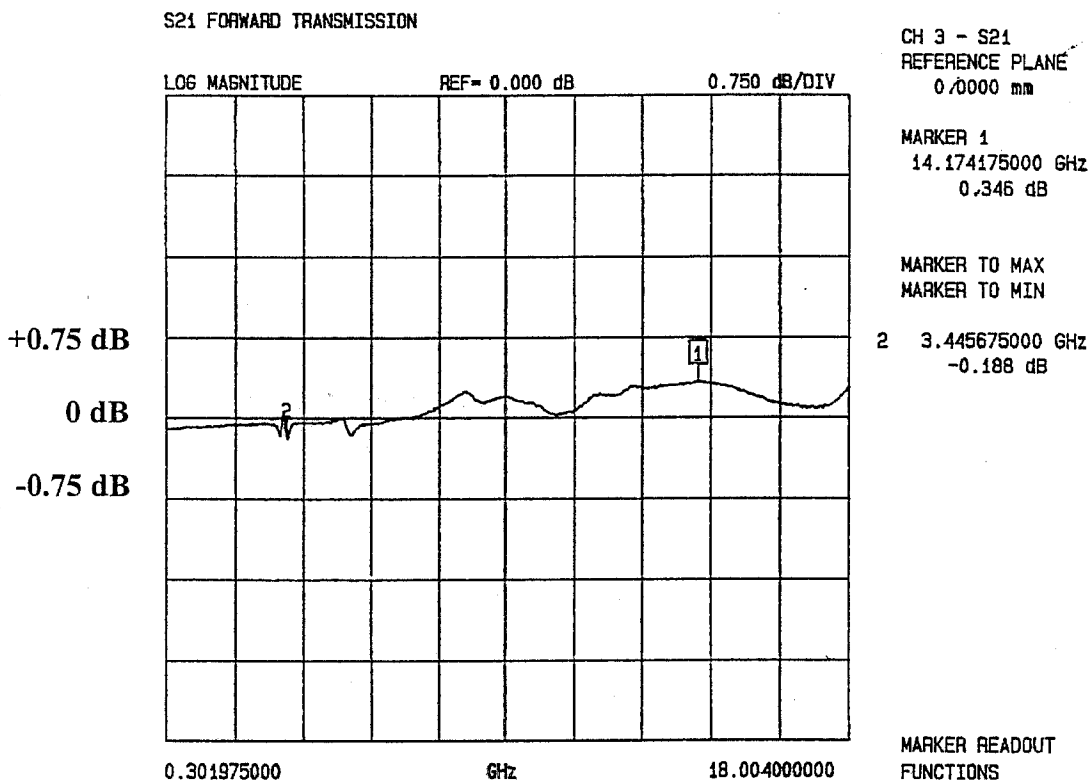
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

AMPLITUDE* J9-J7



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUM) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
14.17 GHZ	0.346 dB	
3.44 GHZ		-0.188 dB

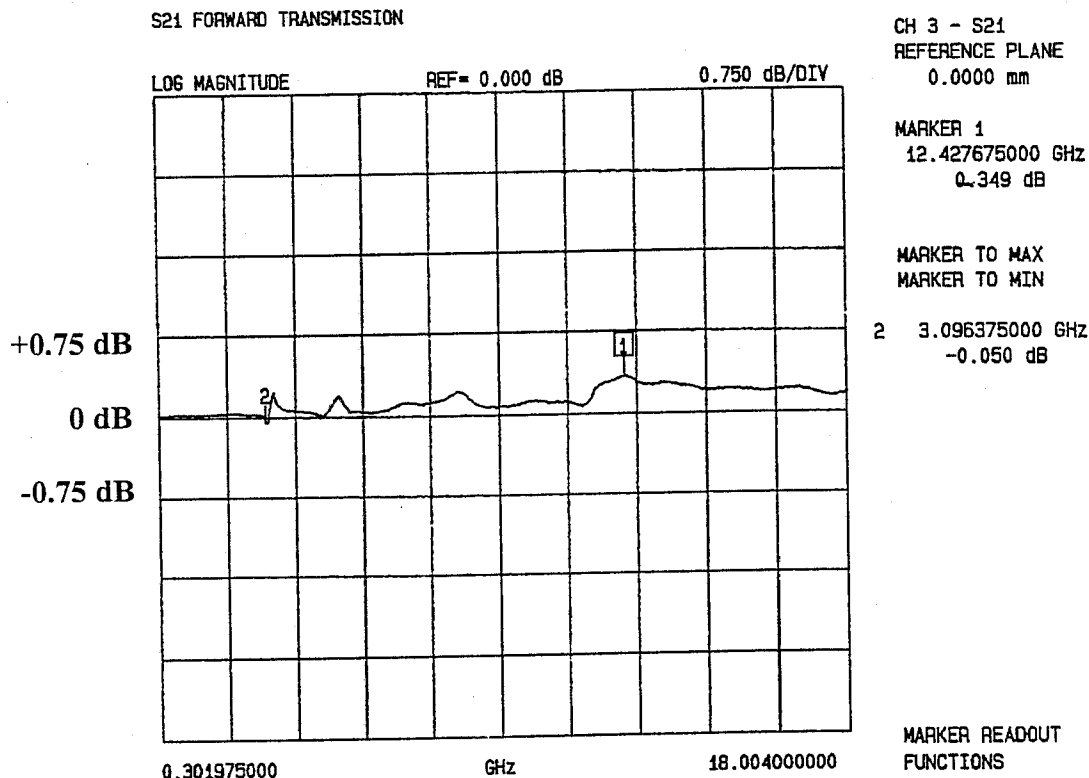
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 0318, SPARWAR1, 4SSBB, 45004
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

AMPLITUDE*
J9-J8



*J9: INPUT ARM

FREQUENCY	AMPLITUDE (MAXIMUN) (POSITIVE SIDE)	AMPLITUDE (MAXIMUM) (NEGATIVE SIDE)
12.42 GHZ	0.349 dB	
3.09 GHz		-0.050 dB

SEPTEMBER 27, 1999



**PHASE
DATA
BETWEEN
PORT TO PORT
FROM
300 MHz TO 18 GHz
ON A
SP8T**

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

**AMC MODEL No:
MSR-8DR-04-STANDARD
OPTIONS 0318, SPARWAR1, 4SSBB, 45004
(Serial Number: 8MS90879B)**

**REPORTED AND PREPARED
BY
RENE AFABLE**

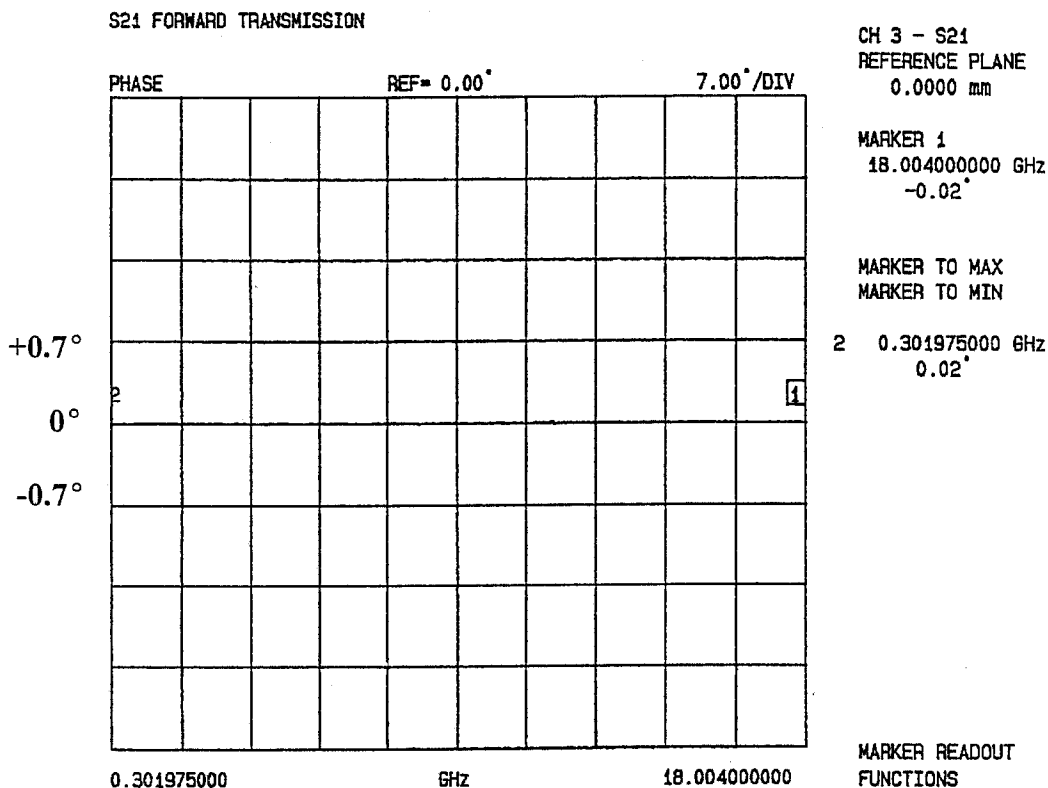
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

PHASE*
J9-J1 (REFERENCE)



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
18 GHZ		-0.02°
300 MHz	0.02°	

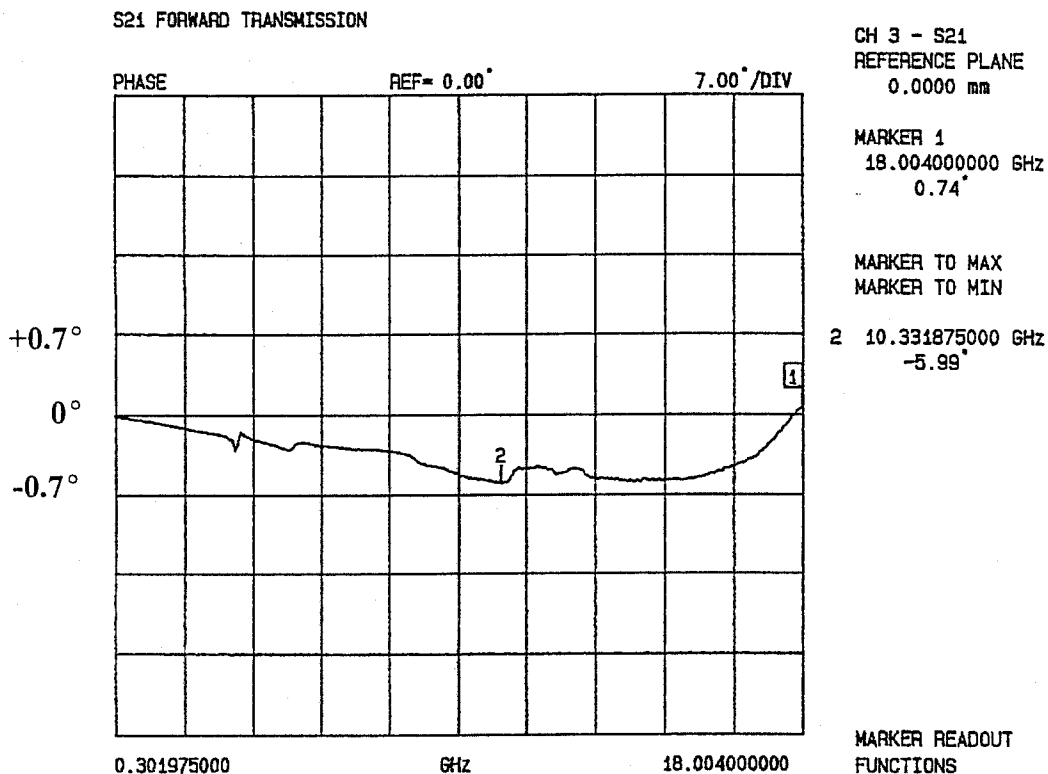
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 0318, SPARWAR1, 4SSBB, 45004
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

PHASE* J9-J2



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUN) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
18 GHZ	0.74°	
10.33 GHZ		-5.99°

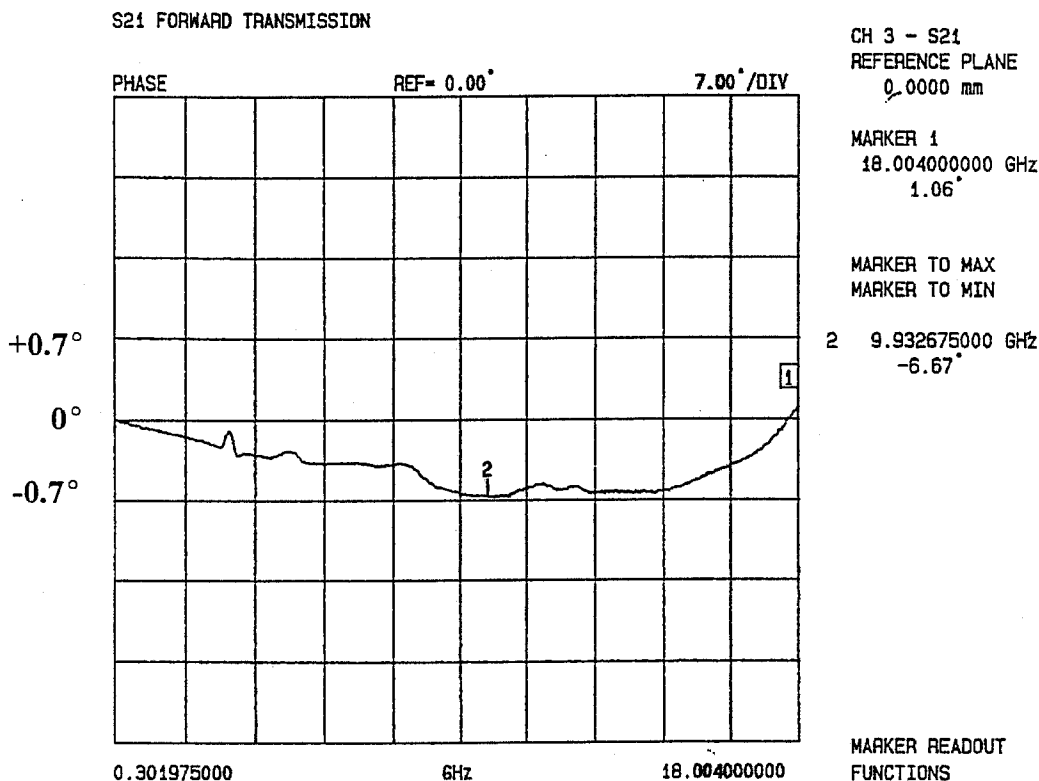
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 0318, SPARWAR1, 4SSBB, 45004
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

PHASE*
J9-J3



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
18 GHZ	1.06°	
9.93 GHZ		-6.67°

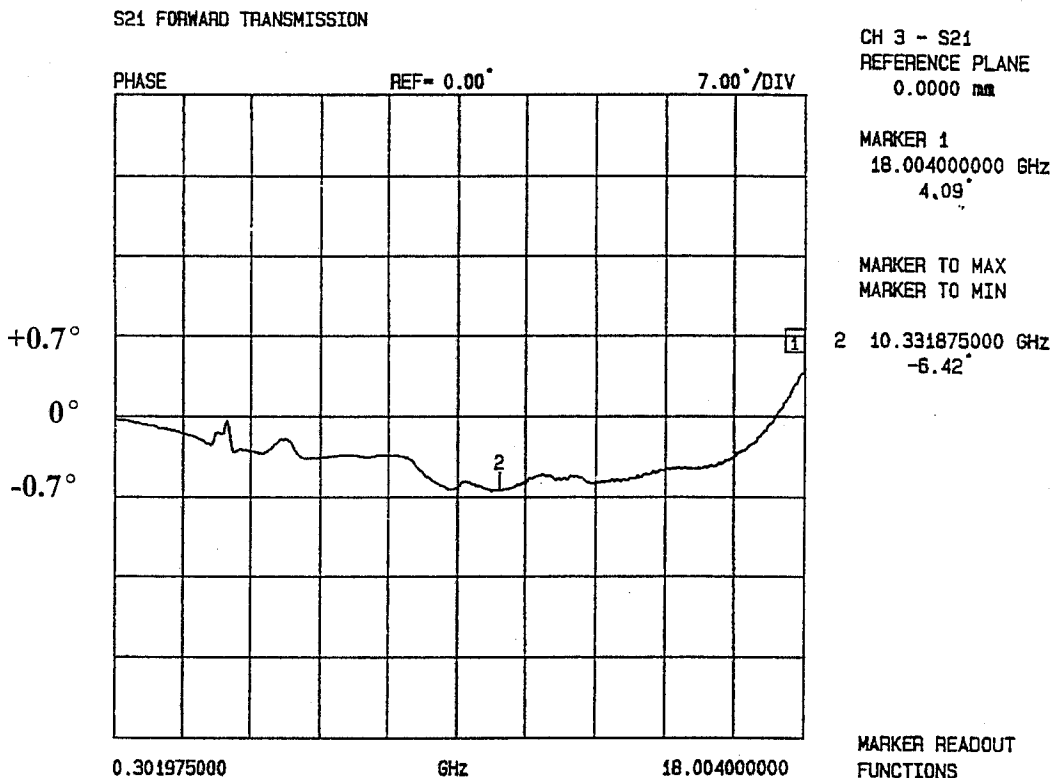
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

PHASE* J9-J4



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUN) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
18 GHZ	4.09°	
10.33 GHZ		-6.42°

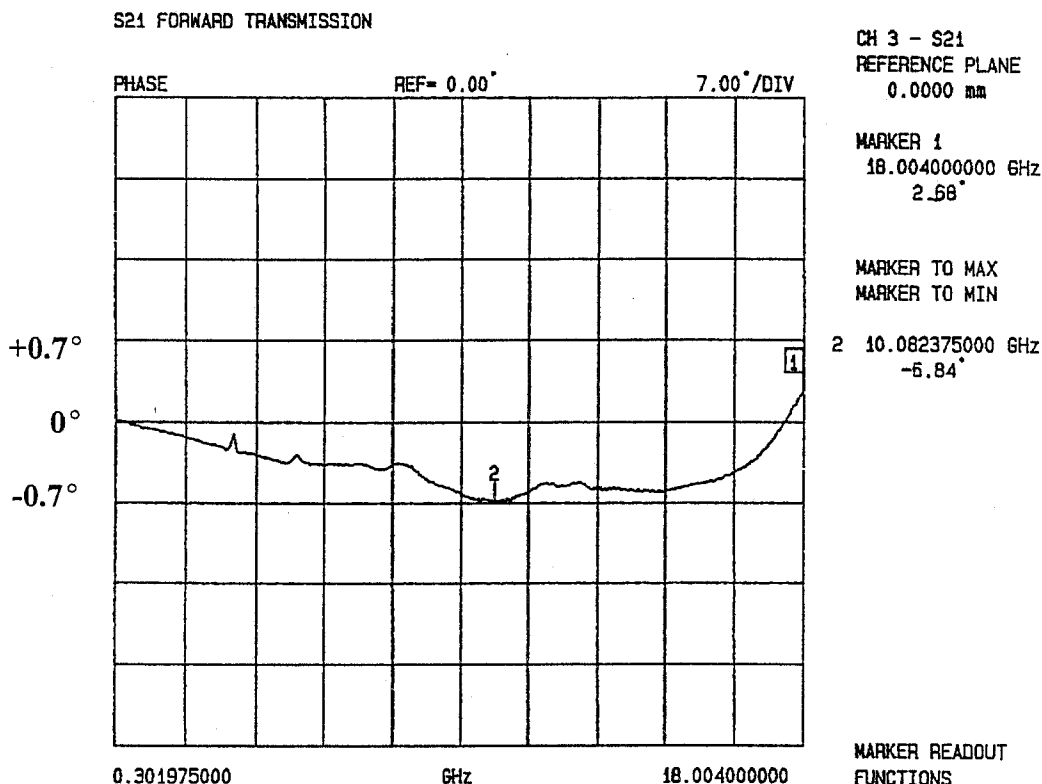
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 0318, SPARWAR1, 4SSBB, 45004
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

PHASE* J9-J5



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
18 GHZ	2.68°	
10.08 GHz		-6.84°

SEPTEMBER 27, 1999

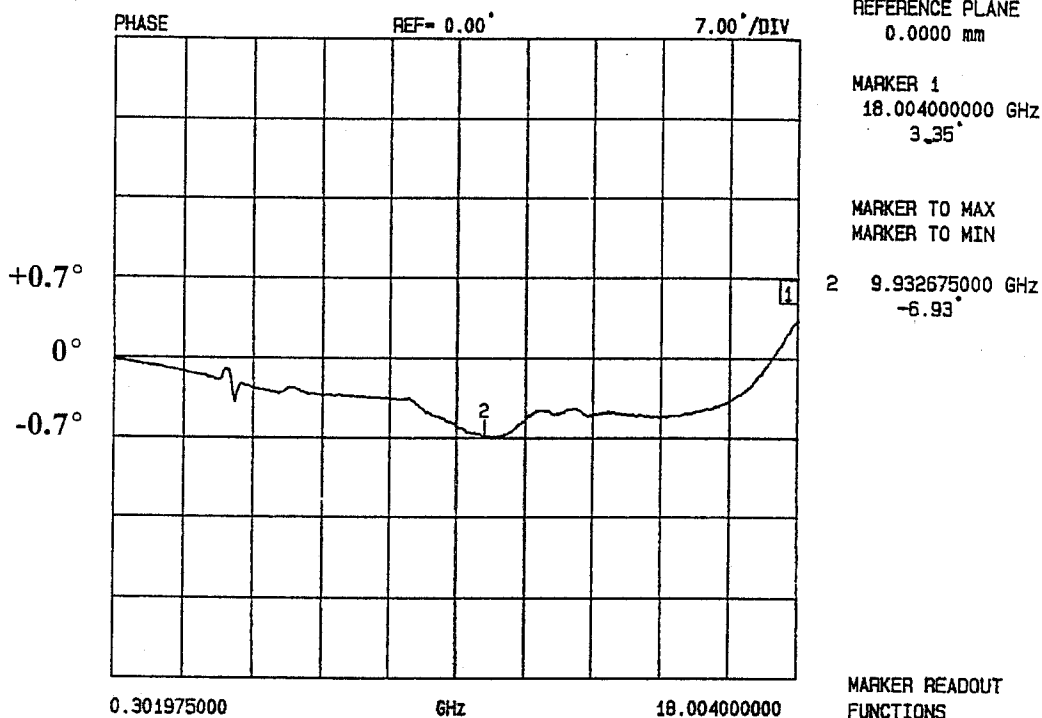


SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

PHASE*
J9-J6

S21 FORWARD TRANSMISSION



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
18 GHz	3.35°	
9.93 GHz		-6.93°

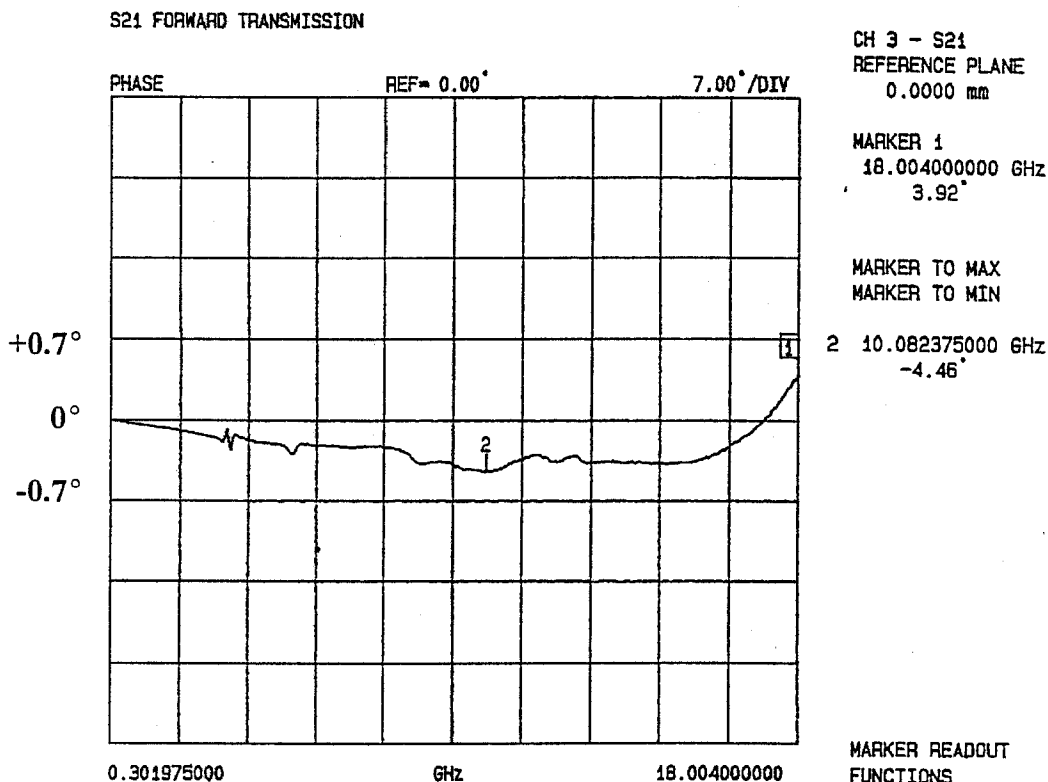
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

PHASE*
J9-J7



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
18 GHZ	3.92°	
10.08 GHZ		-4.46°

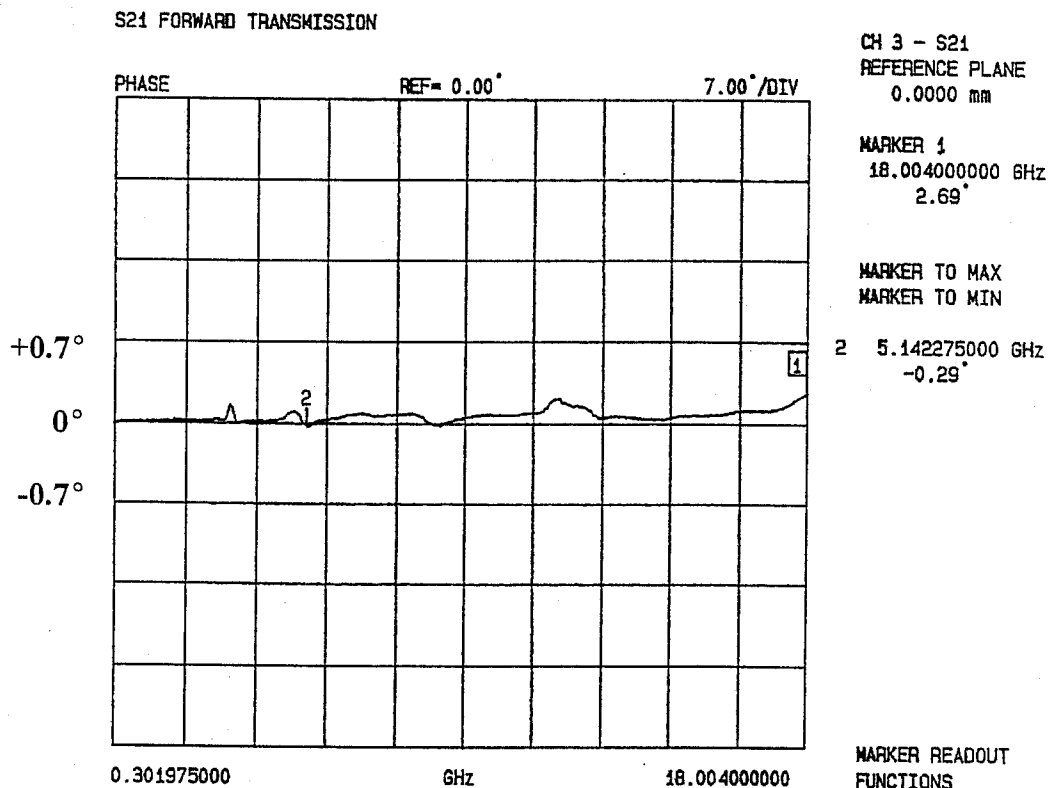
SEPTEMBER 27, 1999



SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

PHASE* J9-J8



*J9: INPUT ARM

FREQUENCY	PHASE (MAXIMUM) (POSITIVE SIDE)	PHASE (MAXIMUM) (NEGATIVE SIDE)
18 GHZ	2.69°	
5.14 GHZ		-0.29°

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TEST DATA

FROM

80 MHz TO 2 GHz

HIGH ISOLATION

LOW INSERTION LOSS

AMPLITUDE (± 0.75 dB) AND PHASE ($\pm 7^\circ$) MATCHED

MINIATURE REFLECTIVE

SP8T

RADIAL SOLID STATE SWITCH

(SURFACE MOUNTABLE)

AMC MODEL No:

MSR-8DR-04-STANDARD

OPTIONS 0318, SPARWAR1, 4SSBB, 45004

(Serial Number: 8MS90879B)

REPORTED AND PREPARED

BY

RENE AFABLE

SEPTEMBER 27, 1999

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

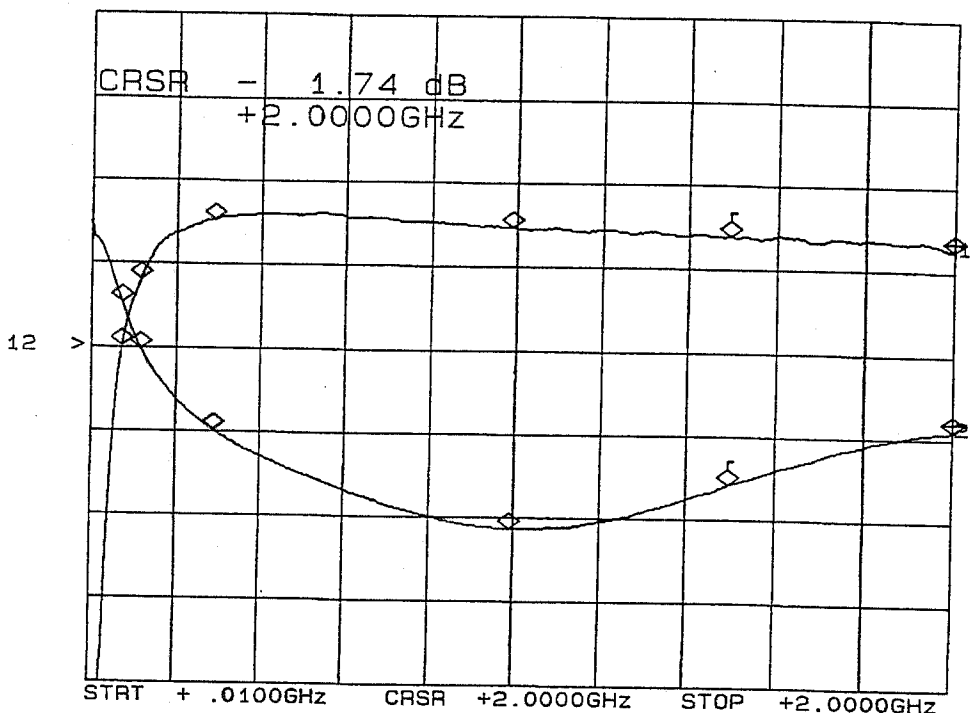


SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : OPTIONS 0318, SPARWAR1, 4SSBB, 45004
ENGINEER : 8MS90879B
VOLTAGE & CURRENT DRAW : RENE AFABLE
: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS* J9-J1

CH1: A -M - 1.74 dB CH2: R -M - 14.02 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	2.97 dB	6.84 dB
130 MHz	2.17 dB	9.58 dB
300 MHz	1.46 dB	14.4 dB
1.0 GHz	1.53 dB	20.1 dB
1.5 GHz	1.61 dB	17.4 dB
2.0 GHz	1.74 dB	14.0 dB



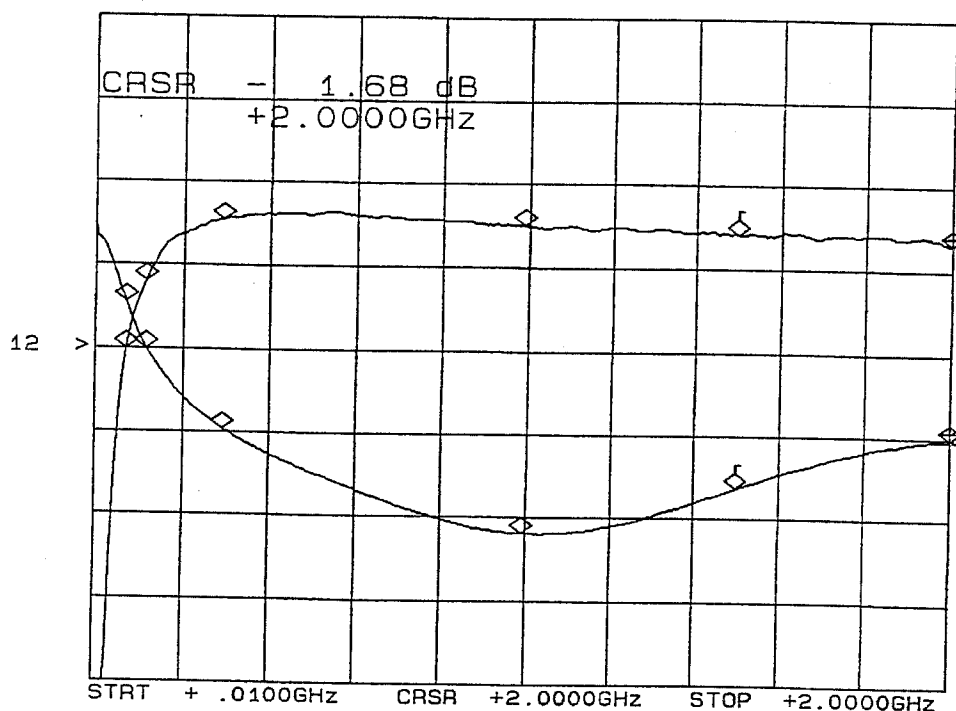
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J2

CH1: A -M - 1.68 dB CH2: R -M - 14.63 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	2.99 dB	6.71 dB
130 MHz	2.18 dB	9.45 dB
300 MHz	1.44 dB	14.2 dB
1.0 GHz	1.49 dB	20.4 dB
1.5 GHz	1.57 dB	17.6 dB
2.0 GHz	1.68 dB	14.6 dB

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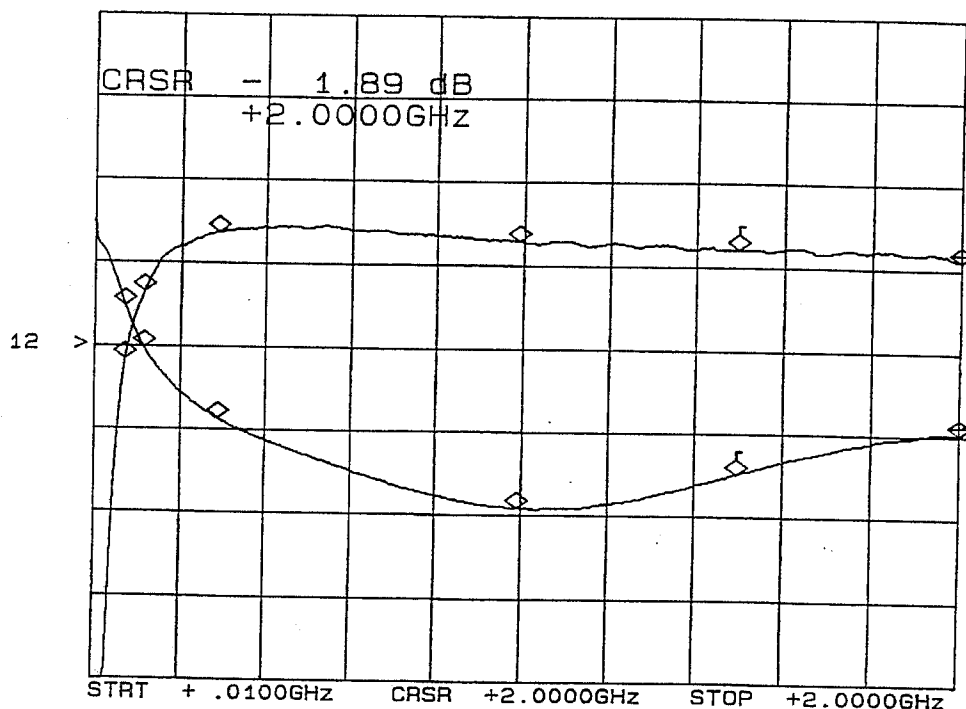
SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	OPTIONS 0318, SPARWAR1, 4SSBB, 45004
ENGINEER	: 8MS90879B
VOLTAGE & CURRENT DRAW	: RENE AFABLE
	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J3

CH1: A -M - 1.89 dB	CH2: R -M - 14.36 dB
1.0 dB/ REF - 3.00 dB	5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	3.14 dB	7.04 dB
130 MHz	2.33 dB	9.62 dB
300 MHz	1.62 dB	13.8 dB
1.0 GHz	1.70 dB	19.1 dB
1.5 GHz	1.77 dB	16.9 dB
2.0 GHz	1.89 dB	14.3 dB

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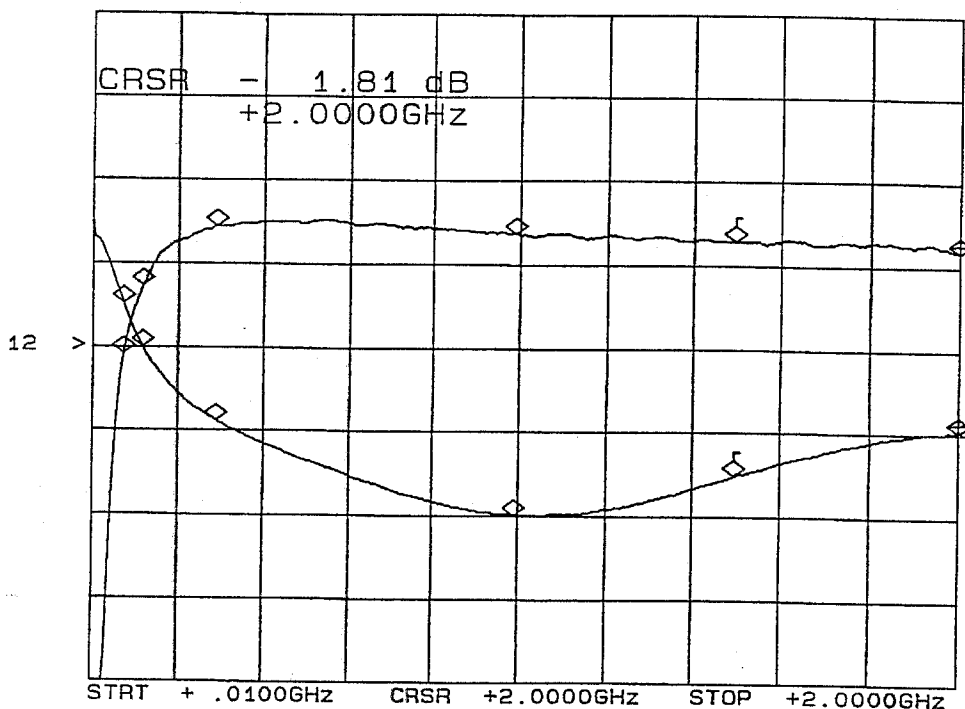
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J4

CH1: A -M - 1.81 dB CH2: R -M - 14.38 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	3.06 dB	6.89 dB
130 MHz	2.26 dB	9.53 dB
300 MHz	1.55 dB	13.9 dB
1.0 GHz	1.62 dB	19.4 dB
1.5 GHz	1.70 dB	17.1 dB
2.0 GHz	1.81 dB	14.3 dB



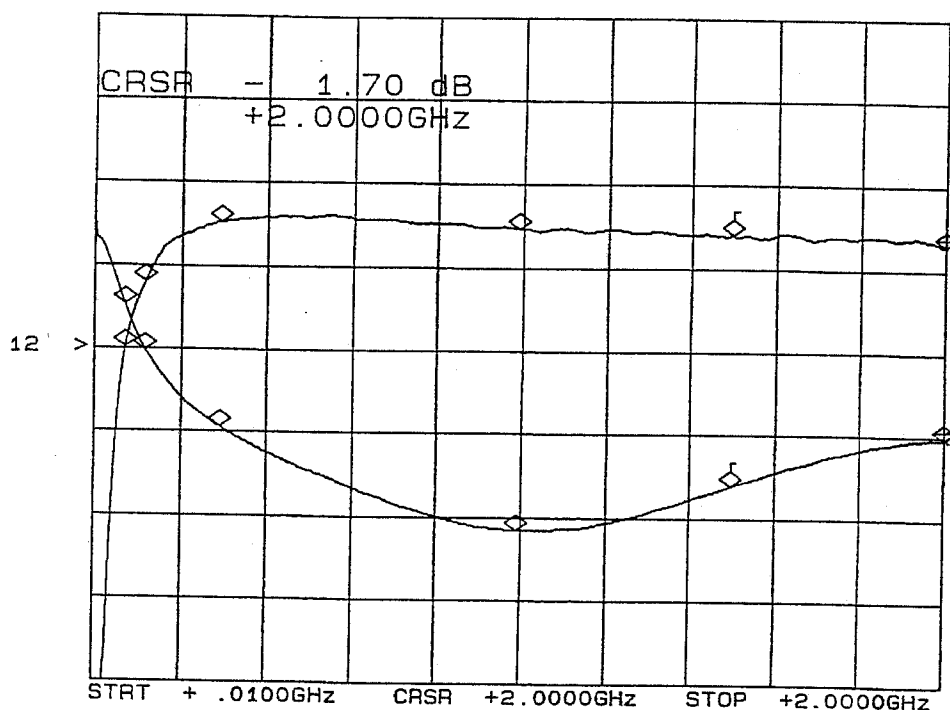
SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J5

CH1: A -M - 1.70 dB CH2: R -M - 14.65 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	2.96 dB	6.83 dB
130 MHz	2.18 dB	9.54 dB
300 MHz	1.47 dB	14.2 dB
1.0 GHz	1.52 dB	20.2 dB
1.5 GHz	1.59 dB	17.5 dB
2.0 GHz	1.70 dB	14.6 dB

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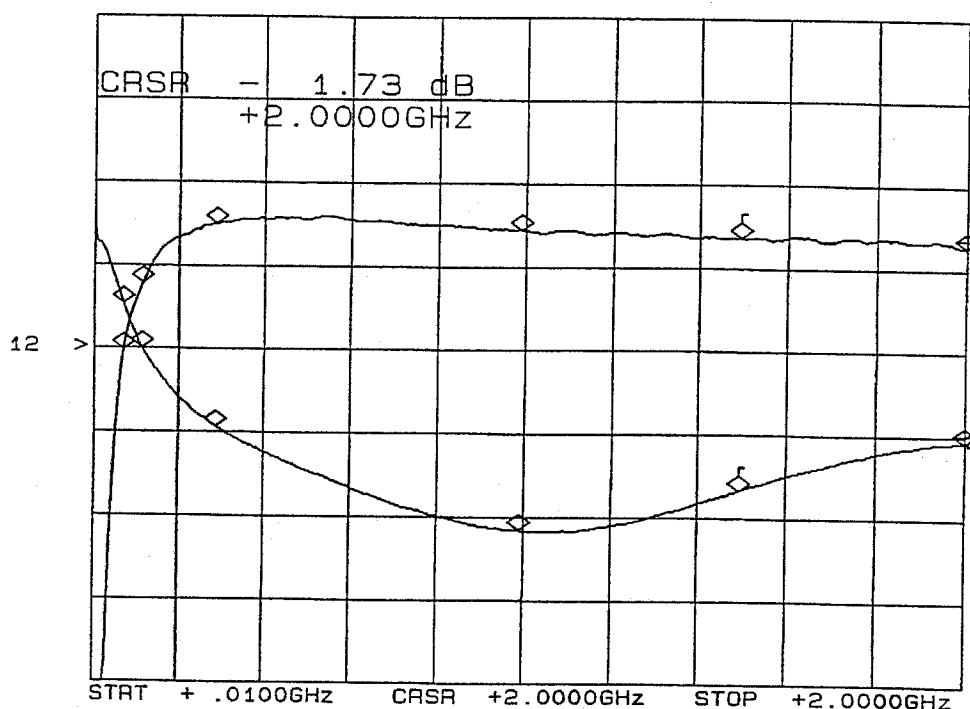
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J6

CH1: A -M - 1.73 dB
 1.0 dB/ REF - 3.00 dB
 CH2: R -M - 14.86 dB
 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	3.01 dB	6.79 dB
130 MHz	2.20 dB	9.50 dB
300 MHz	1.48 dB	14.1 dB
1.0 GHz	1.55 dB	20.3 dB
1.5 GHz	1.62 dB	17.8 dB
2.0 GHz	1.73 dB	14.8 dB

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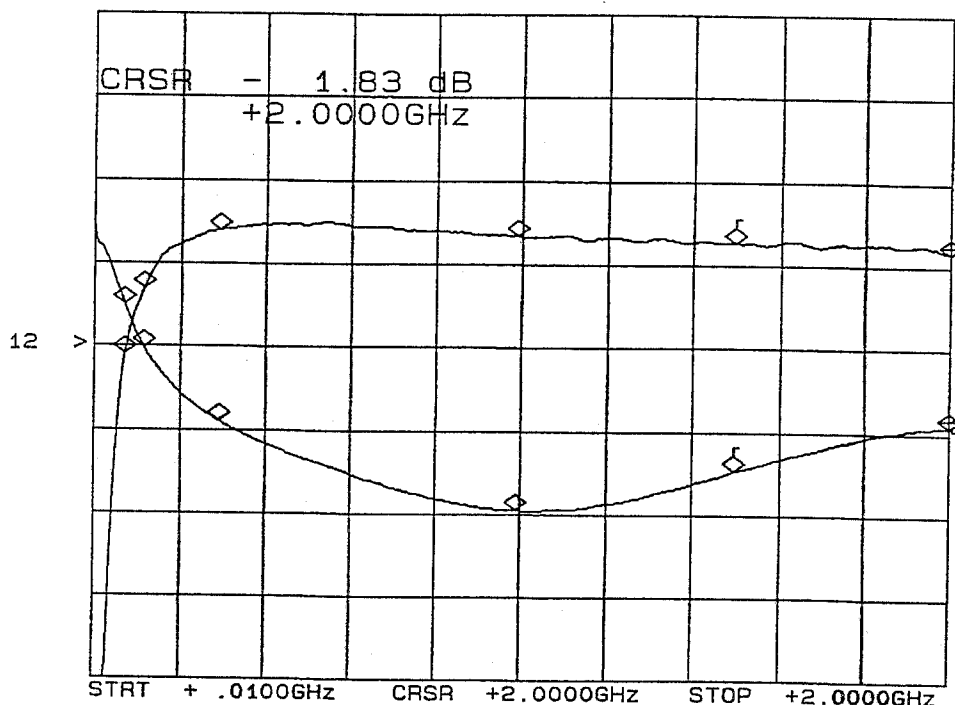
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J9-J7

CH1: A -M - 1.83 dB CH2: R -M - 14.10 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	3.09 dB	6.98 dB
130 MHz	2.29 dB	9.61 dB
300 MHz	1.57 dB	13.9 dB
1.0 GHz	1.65 dB	19.2 dB
1.5 GHz	1.71 dB	16.8 dB
2.0 GHz	1.83 dB	14.1 dB

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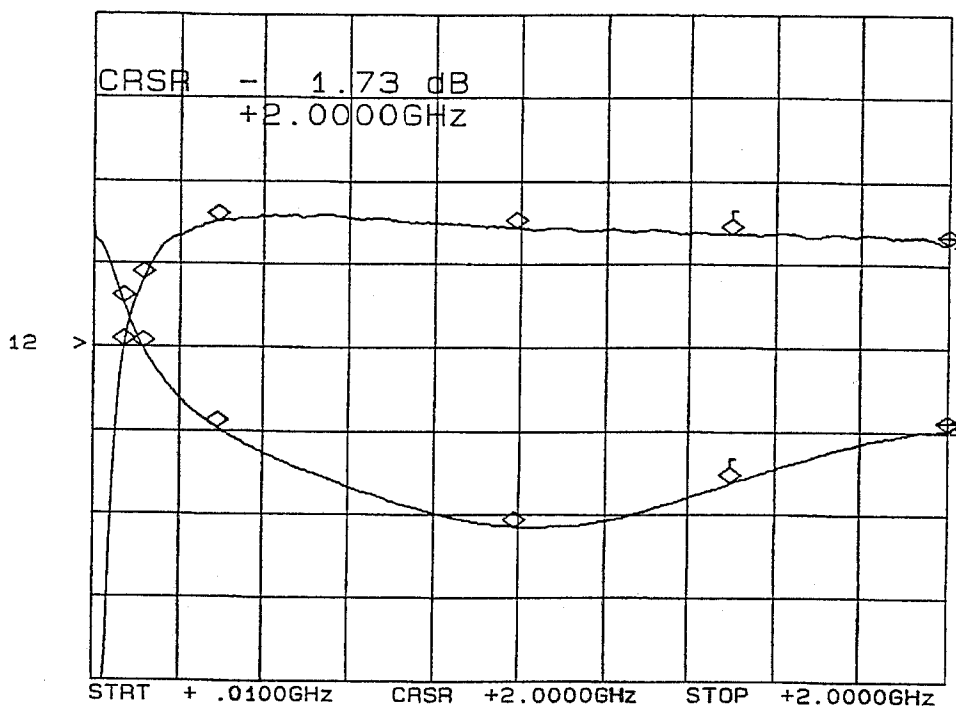
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA
OPTIONS 0318, SPARWAR1, 4SSBB, 45004

INSERTION LOSS & RETURN LOSS*

J9-J8

CH1: A -M - 1.73 dB CH2: R -M - 14.36 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J9: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	2.98 dB	6.87 dB
130 MHz	2.18 dB	9.60 dB
300 MHz	1.47 dB	14.3 dB
1.0 GHz	1.55 dB	20.2 dB
1.5 GHz	1.61 dB	17.6 dB
2.0 GHz	1.73 dB	14.3 dB



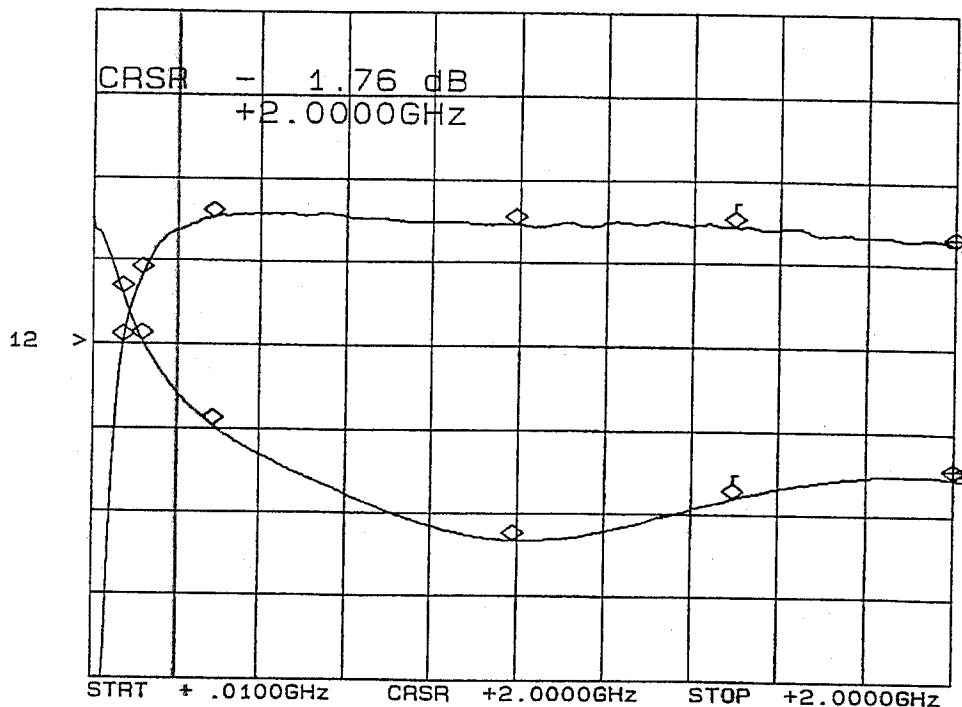
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J1-J9

CH1: A -M - 1.76 dB
 1.0 dB/ REF - 3.00 dB
 CH2: R -M - 17.22 dB
 5.0 dB/ REF - 9.54 dB



*J1: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	2.96 dB	6.52 dB
130 MHz	2.17 dB	9.33 dB
300 MHz	1.46 dB	14.3 dB
1.0 GHz	1.53 dB	21.1 dB
1.5 GHz	1.55 dB	18.5 dB
2.0 GHz	1.76 dB	17.2 dB

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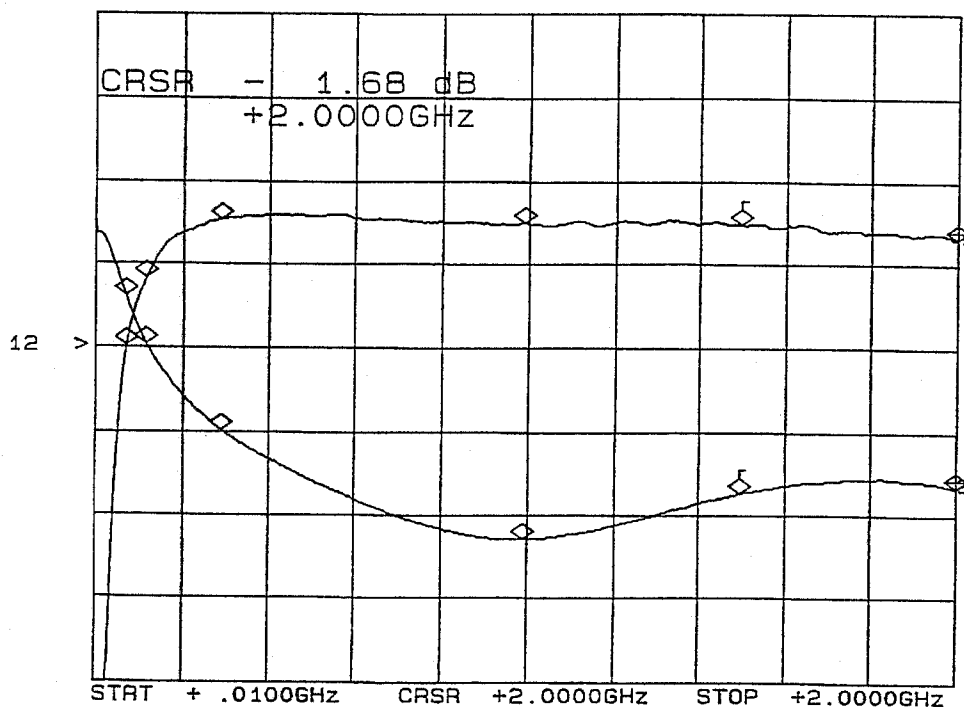
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J2-J9

CH1: A -M - 1.68 dB
 1.0 dB/ REF - 3.00 dB
 CH2: R -M - 17.76 dB
 5.0 dB/ REF - 9.54 dB



*J2: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	2.98 dB	6.45 dB
130 MHz	2.17 dB	9.25 dB
300 MHz	1.44 dB	14.3 dB
1.0 GHz	1.49 dB	20.9 dB
1.5 GHz	1.51 dB	18.1 dB
2.0 GHz	1.68 dB	17.7 dB

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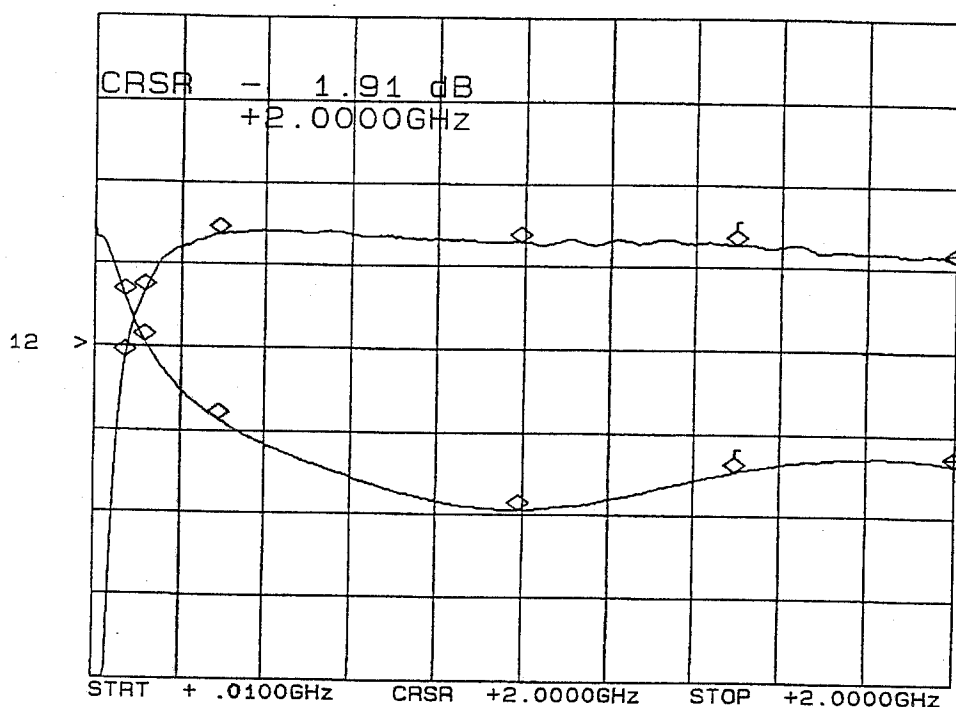
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J3-J9

CH1: A -M - 1.91 dB
 1.0 dB/ REF - 3.00 dB
 CH2: R -M - 16.29 dB
 5.0 dB/ REF - 9.54 dB



*J3: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	3.12 dB	6.46 dB
130 MHz	2.33 dB	9.18 dB
300 MHz	1.62 dB	13.8 dB
1.0 GHz	1.70 dB	19.1 dB
1.5 GHz	1.71 dB	16.8 dB
2.0 GHz	1.91 dB	16.2 dB

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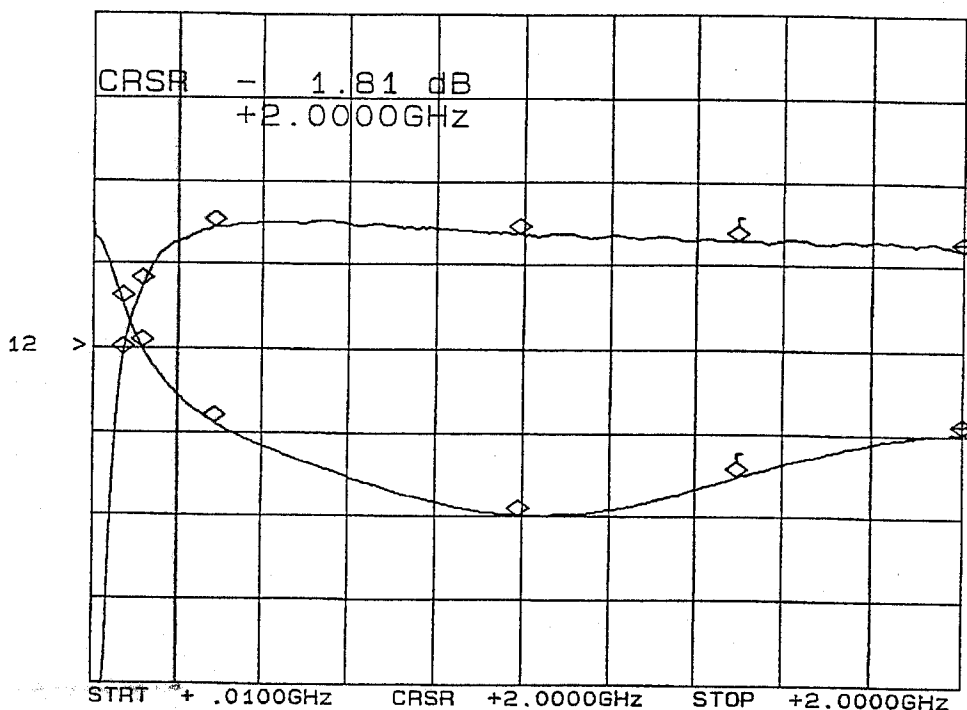
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J4-J9

CH1: A -M - 1.81 dB CH2: R -M - 14.38 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J4: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	3.04 dB	6.59 dB
130 MHz	2.26 dB	9.33 dB
300 MHz	1.56 dB	14.0 dB
1.0 GHz	1.64 dB	19.8 dB
1.5 GHz	1.67 dB	17.5 dB
2.0 GHz	1.81 dB	14.3 dB



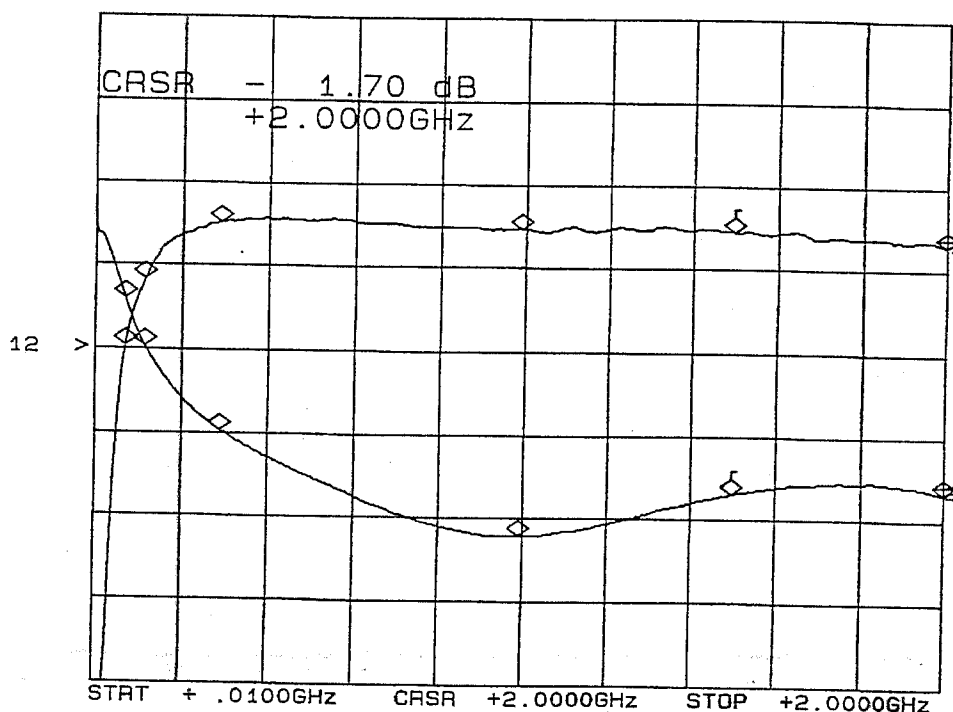
SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J5-J9

CH1: A -M - 1.70 dB CH2: R -M - 17.87 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J5: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	2.95 dB	6.52 dB
130 MHz	2.17 dB	9.30 dB
300 MHz	1.47 dB	14.2 dB
1.0 GHz	1.53 dB	20.5 dB
1.5 GHz	1.54 dB	17.9 dB
2.0 GHz	1.70 dB	17.8 dB



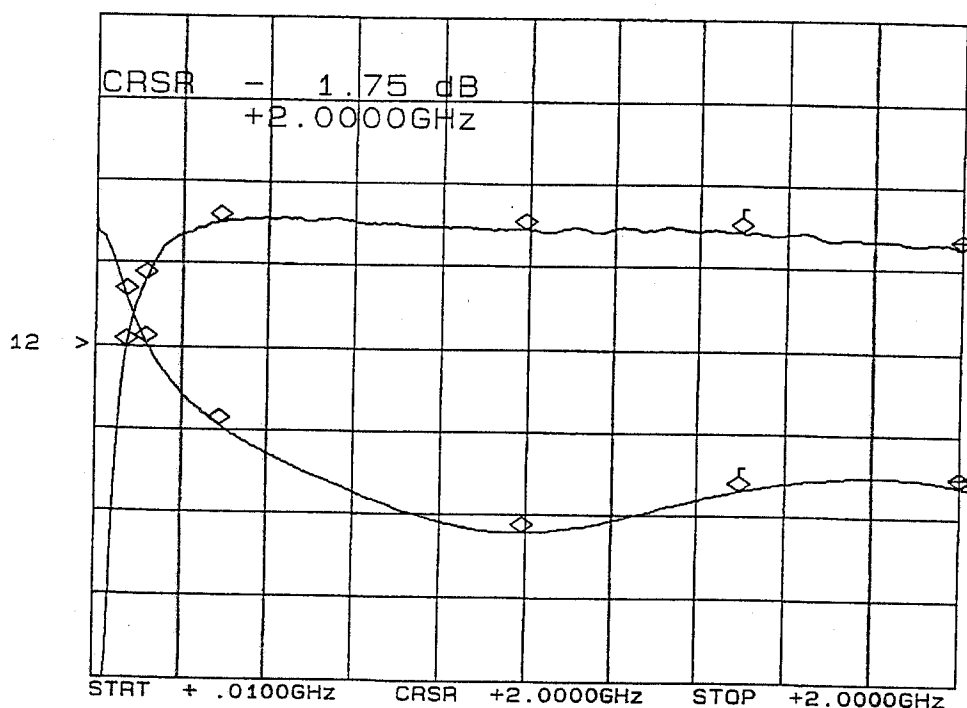
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J6-J9

CH1: A -M - 1.75 dB
 1.0 dB/ REF - 3.00 dB
 CH2: R -M - 17.59 dB
 5.0 dB/ REF - 9.54 dB



*J6: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	2.99 dB	6.49 dB
130 MHz	2.20 dB	9.26 dB
300 MHz	1.48 dB	14.2 dB
1.0 GHz	1.55 dB	20.5 dB
1.5 GHz	1.56 dB	17.9 dB
2.0 GHz	1.75 dB	17.5 dB

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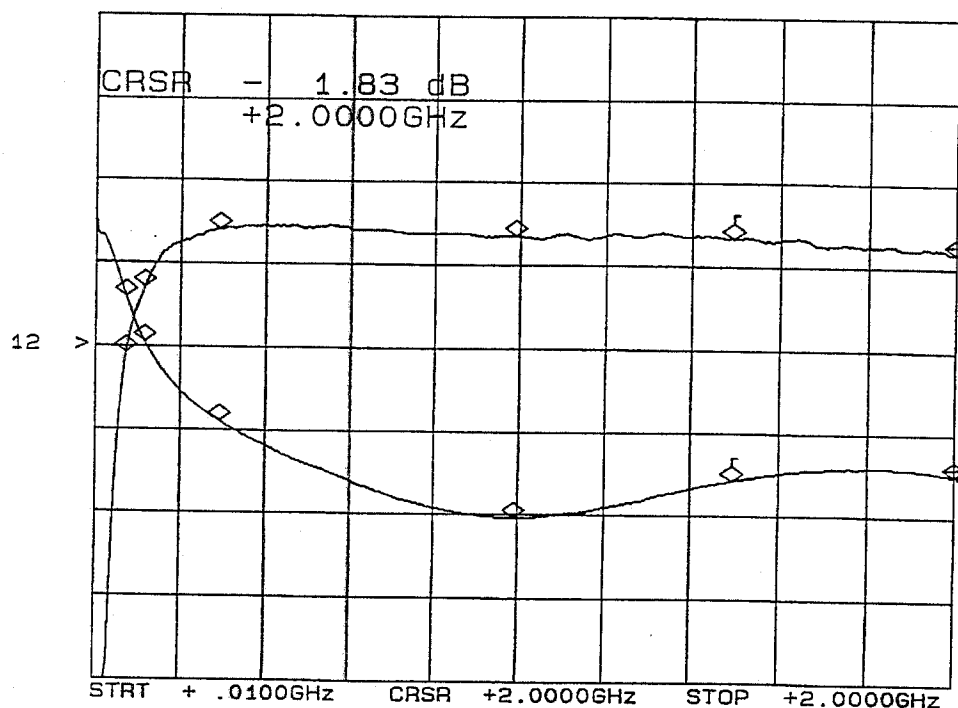
SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J7-J9

CH1: A -M - 1.83 dB CH2: R -M - 17.01 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J7: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	3.07 dB	6.51 dB
130 MHz	2.28 dB	9.24 dB
300 MHz	1.58 dB	13.9 dB
1.0 GHz	1.64 dB	19.6 dB
1.5 GHz	1.65 dB	17.3 dB
2.0 GHz	1.83 dB	17.0 dB

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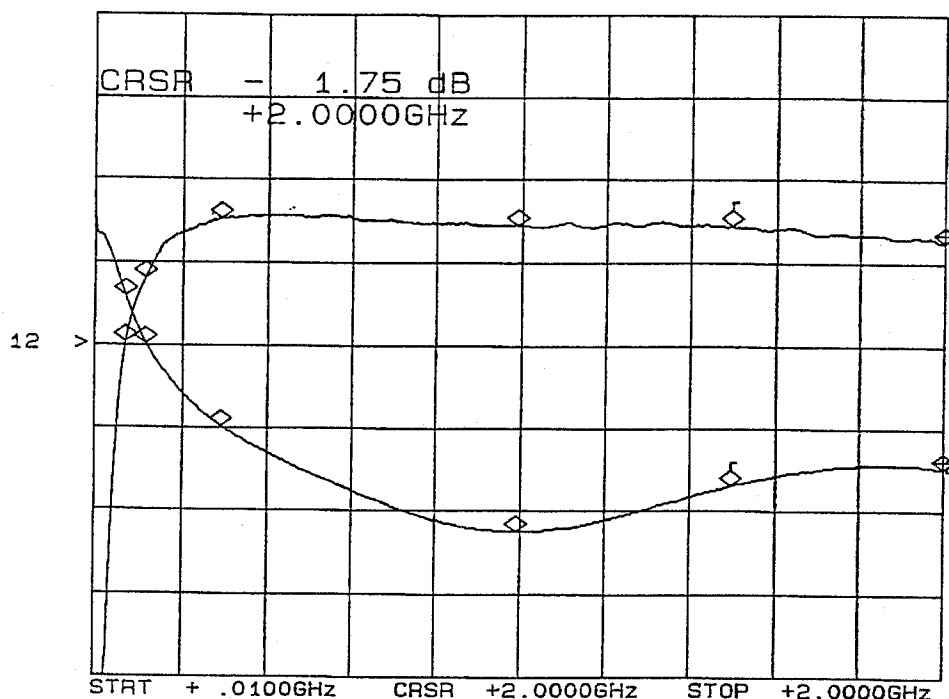
SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

INSERTION LOSS & RETURN LOSS*

J8-J9

CH1: A -M - 1.75 dB CH2: R -M - 16.92 dB
 1.0 dB/ REF - 3.00 dB 5.0 dB/ REF - 9.54 dB



*J8: INPUT ARM

FREQUENCY	INSERTION LOSS	RETURN LOSS
80 MHz	2.95 dB	6.53 dB
130 MHz	2.18 dB	9.34 dB
300 MHz	1.48 dB	14.3 dB
1.0 GHz	1.54 dB	20.7 dB
1.5 GHz	1.55 dB	17.9 dB
2.0 GHz	1.75 dB	16.9 dB

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SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

SWITCHING SPEED

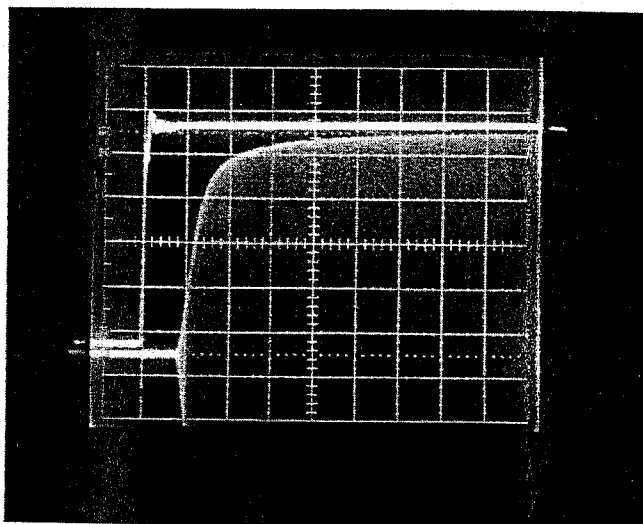
"Rise/Fall" Time: 10% RF to 90% RF & 90% RF to 10% RF
 "On/Off" Time: 50% TTL to 90% RF or 10% RF

TYPICAL OF ALL ARMS

"DELAY ON": 110 nS
 "RISE TIME": 60 nS

HORIZONTAL SCALE:
 50 nS PER DIVISION

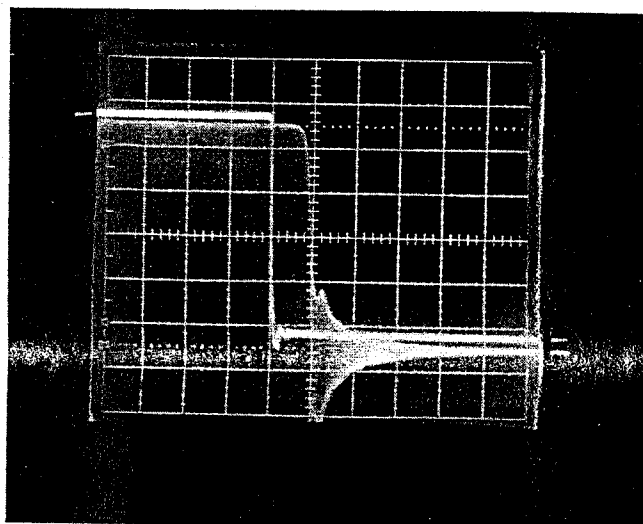
VERTICAL SCALE:
 10 mV PER DIVISION



"DELAY OFF": 80nS
 "FALL TIME": 40 nS

HORIZONTAL SCALE:
 50 nS PER DIVISION

VERTICAL SCALE:
 10 mV PER DIVISION



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SUMMARY TEST DATA

MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

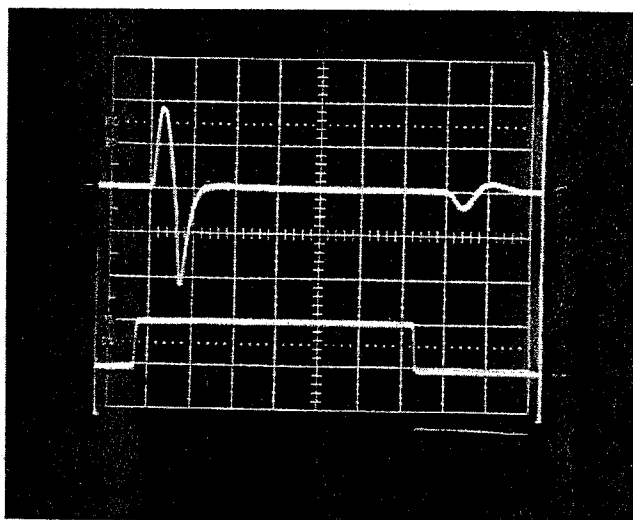
VIDEO TRANSIENTS

TYPICAL OF ALL ARMS

≤ 2.0 V P-P
MEASURED IN A
300 MHZ BANDWIDTH

VERTICAL SCALE:
0.5 V PER DIVISION

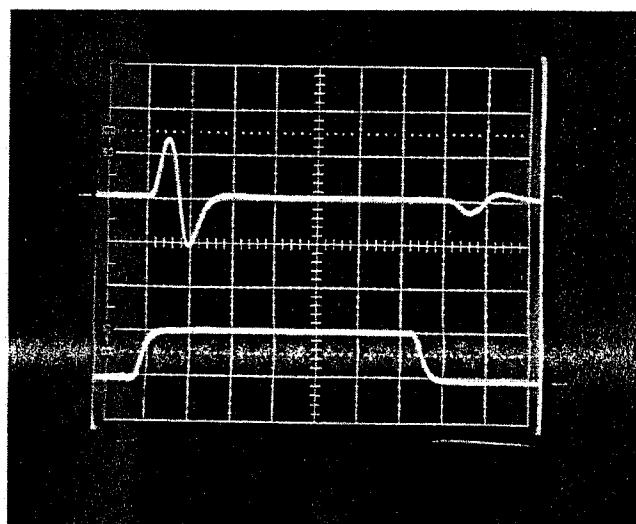
HORIZONTAL SCALE:
50 μ S PER DIVISION



≤ 1.2 V P-P
MEASURED IN A
20 MHZ BANDWIDTH

VERTICAL SCALE:
0.5 V PER DIVISION

HORIZONTAL SCALE:
50 μ S PER DIVISION



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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 0318, SPARWAR1, 4SSBB, 45004
(Serial Number: 8MS90879B)
FROM 300 MHz TO 18 GHz
REPORTED AND PREPARED
BY
RENE AFABLE
SEPTEMBER 27, 1999

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



SUMMARY TEST DATA

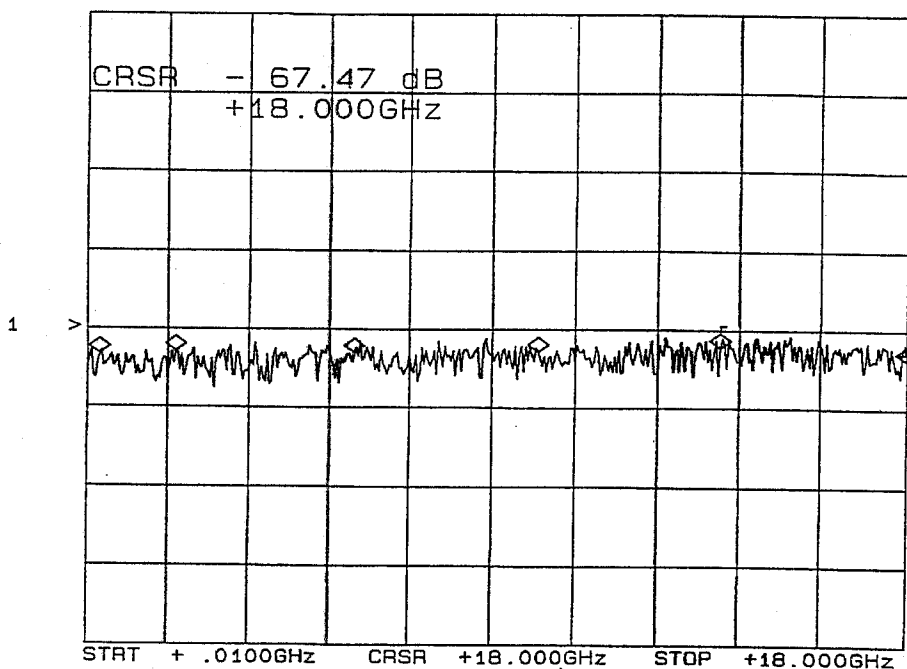
MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J1

CH1: A -M - 67.47 dB
 20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
300 MHz	67.2 dB
2 GHz	72.0 dB
6 GHz	67.3 dB
10 GHz	65.7 dB
14 GHz	63.7 dB
18 GHz	67.4 dB

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A2-4SSBB



SUMMARY TEST DATA

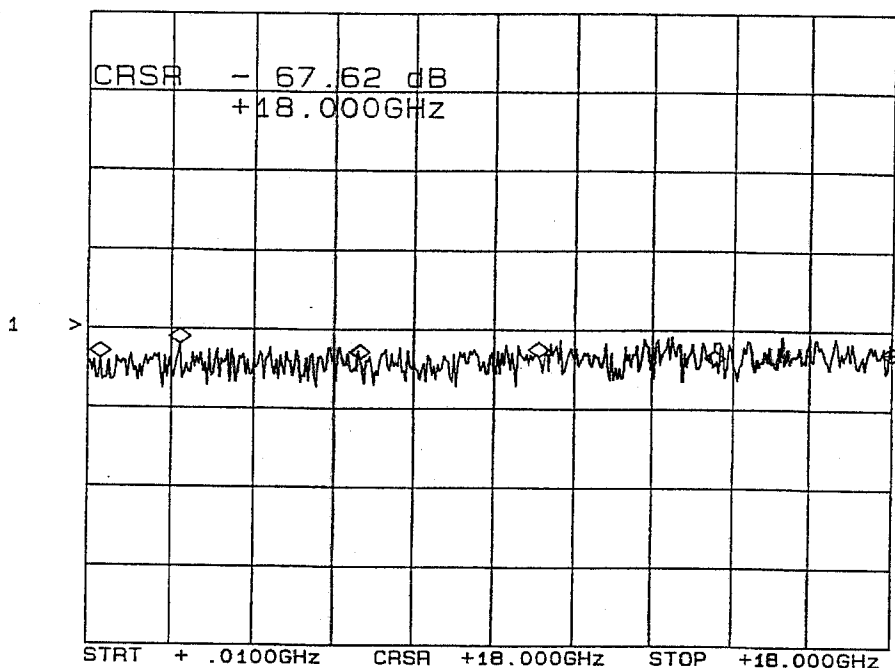
MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J2

CH1: A -M - 67.62 dB
 20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
300 MHz	67.5 dB
2 GHz	63.6 dB
6 GHz	67.5 dB
10 GHz	66.6 dB
14 GHz	68.5 dB
18 GHz	67.6 dB

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A3-4SSBB

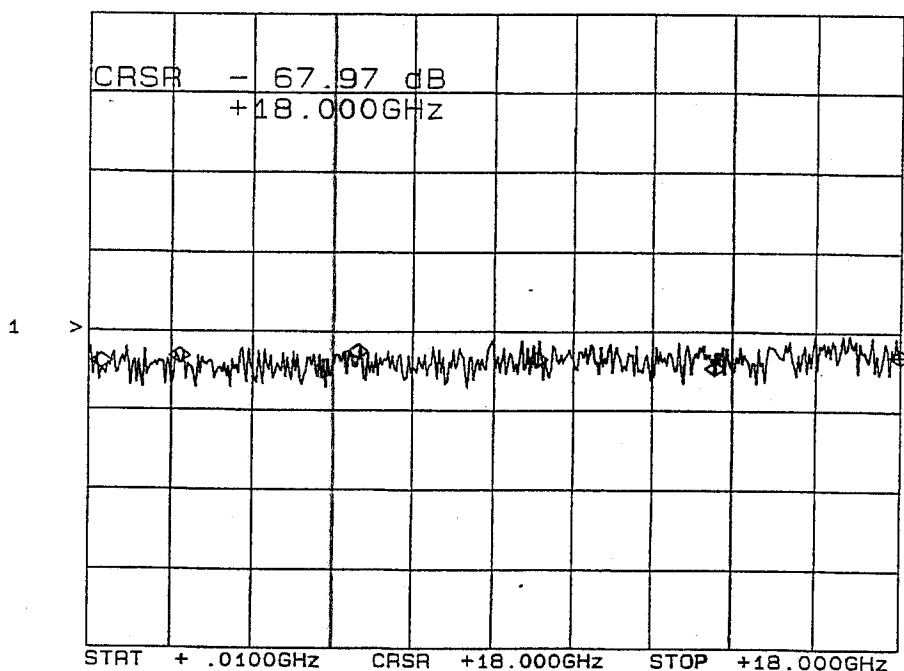


SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

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

CH1: A -M - 67.97 dB
 20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
300 MHz	69.5 dB
2 GHz	67.8 dB
6 GHz	66.8 dB
10 GHz	68.8 dB
14 GHz	71.0 dB
18 GHz	67.9 dB

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A4-4SSBB



SUMMARY TEST DATA

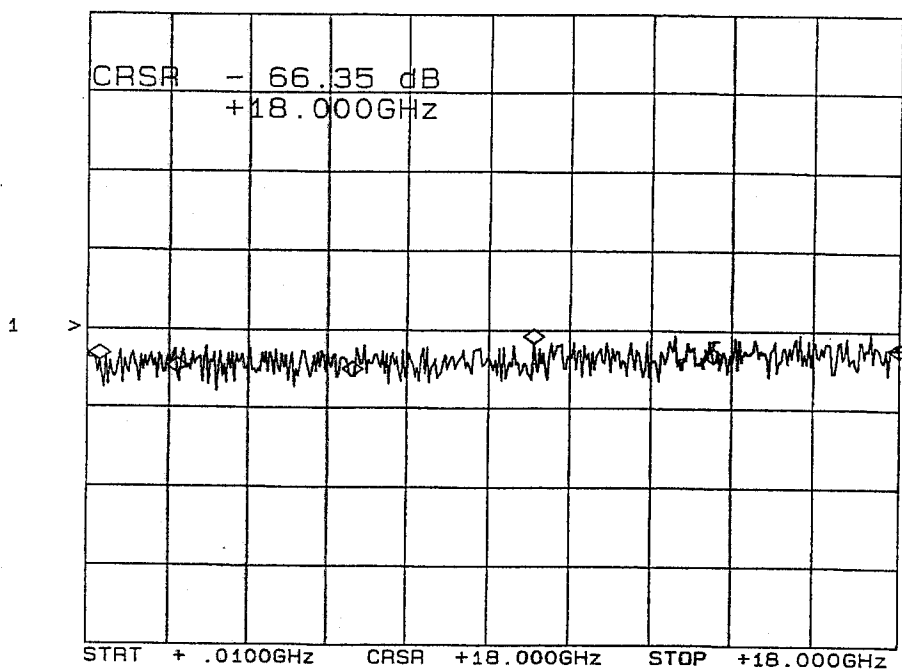
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J4

CH1: A -M - 66.35 dB
 20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
300 MHz	67.7 dB
2 GHz	70.8 dB
6 GHz	71.6 dB
10 GHz	63.2 dB
14 GHz	68.4 dB
18 GHz	66.3 dB

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A5-4SSBB



SUMMARY TEST DATA

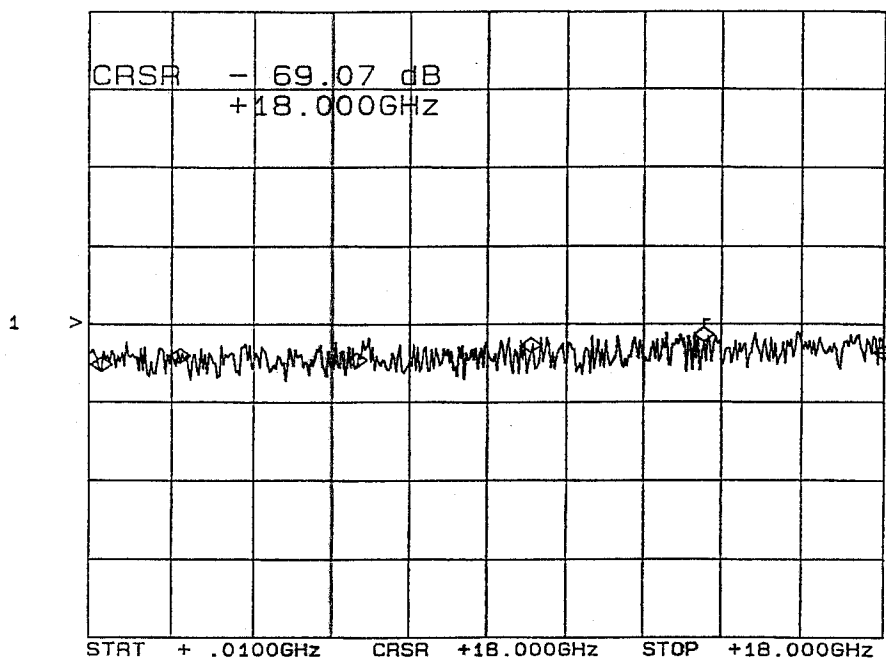
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J5

CH1: A -M - 69.07 dB
 20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
300 MHz	72.1 dB
2 GHz	69.9 dB
6 GHz	71.1 dB
10 GHz	67.1 dB
14 GHz	64.5 dB
18 GHz	69.0 dB

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A6-4SSBB



SUMMARY TEST DATA

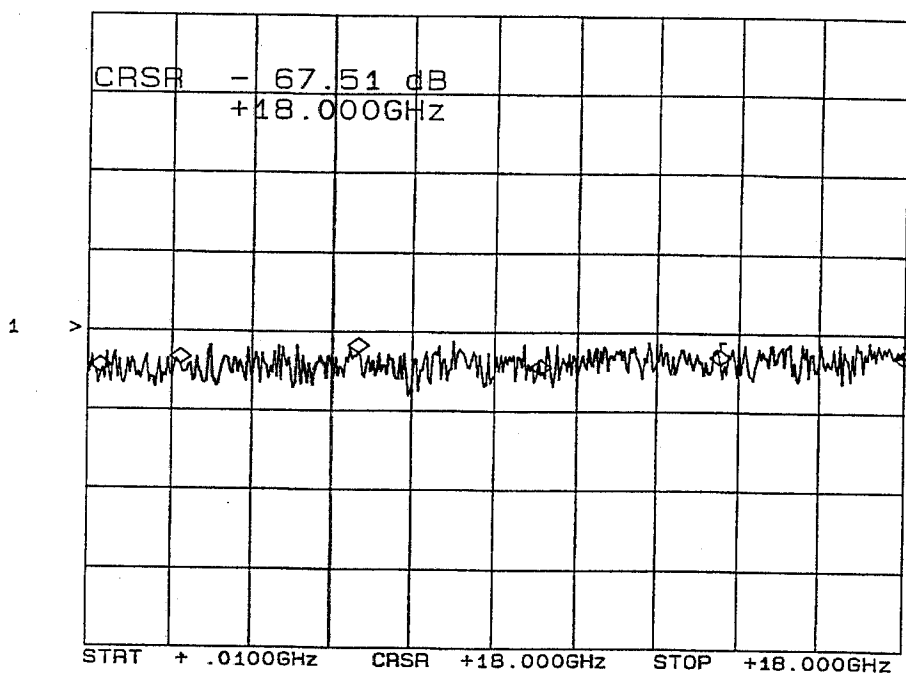
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : OPTIONS 0318, SPARWAR1, 4SSBB, 45004
ENGINEER : 8MS90879B
VOLTAGE & CURRENT DRAW : RENE AFABLE
: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J6

CH1: A -M - 67.51 dB
20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
300 MHz	70.7 dB
2 GHz	68.1 dB
6 GHz	65.3 dB
10 GHz	70.4 dB
14 GHz	67.8 dB
18 GHz	67.5 dB

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A7-4SSBB

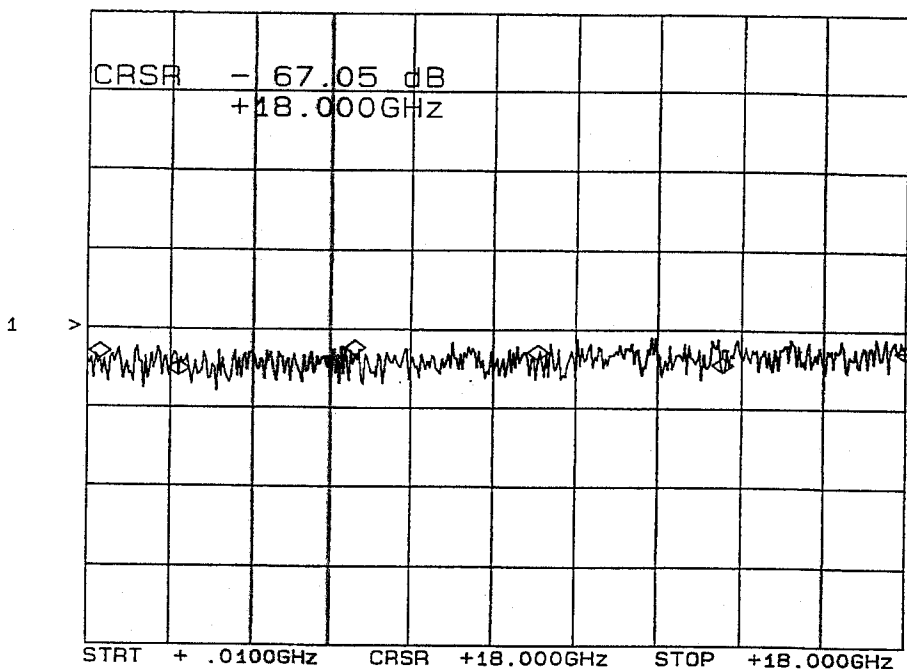


SUMMARY TEST DATA

MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

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

CH1: A -M - 67.05 dB
 20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
300 MHz	67.6 dB
2 GHz	71.6 dB
6 GHz	66.3 dB
10 GHz	67.5 dB
14 GHz	70.4 dB
18 GHz	67.0 dB

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A8-4SSBB



SUMMARY TEST DATA

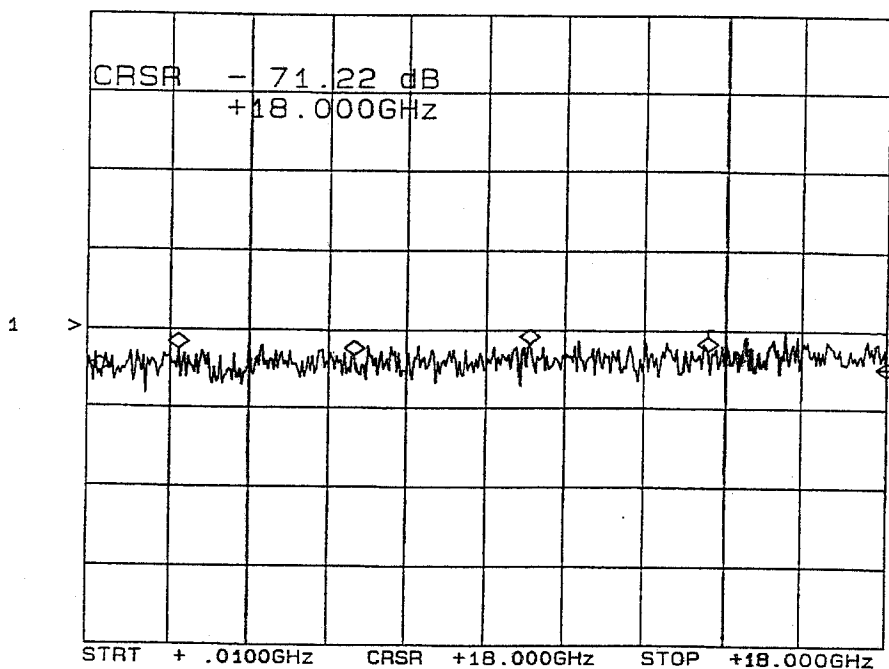
MODEL NUMBER	: MSR-8DR-04-STANDARD
SERIAL NUMBER	: 8MS90879B
ENGINEER	: RENE AFABLE
VOLTAGE & CURRENT DRAW	: +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J8

CH1: A -M - 71.22 dB
20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
300 MHz	71.0 dB
2 GHz	64.9 dB
6 GHz	66.1 dB
10 GHz	63.1 dB
14 GHz	65.0 dB
18 GHz	71.2 dB

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A9-4SSBB



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 0318, SPARWAR1, 4SSBB, 45004
(Serial Number: 8MS90879B)

FROM 80 MHz TO 2 GHz

REPORTED AND PREPARED
BY
RENE AFABLE

SEPTEMBER 27, 1999



SUMMARY TEST DATA

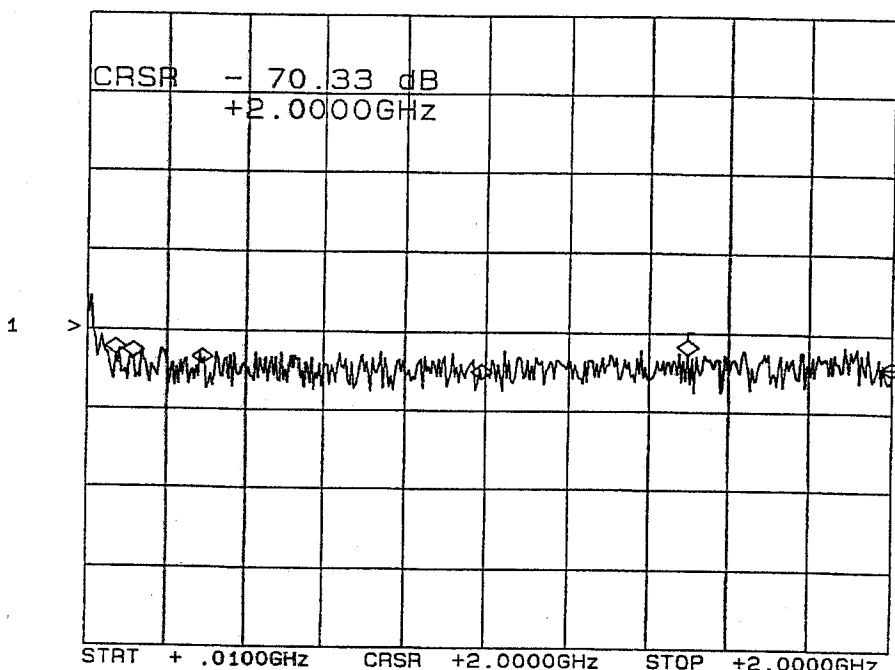
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J1

CH1: A -M - 70.33 dB
20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
80 MHz	65.9 dB
130 MHz	66.8 dB
300 MHz	68.3 dB
1.0 GHz	71.7 dB
1.5 GHz	65.2 dB
2.0 GHz	70.3 dB

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A11-4SSBB



SUMMARY TEST DATA

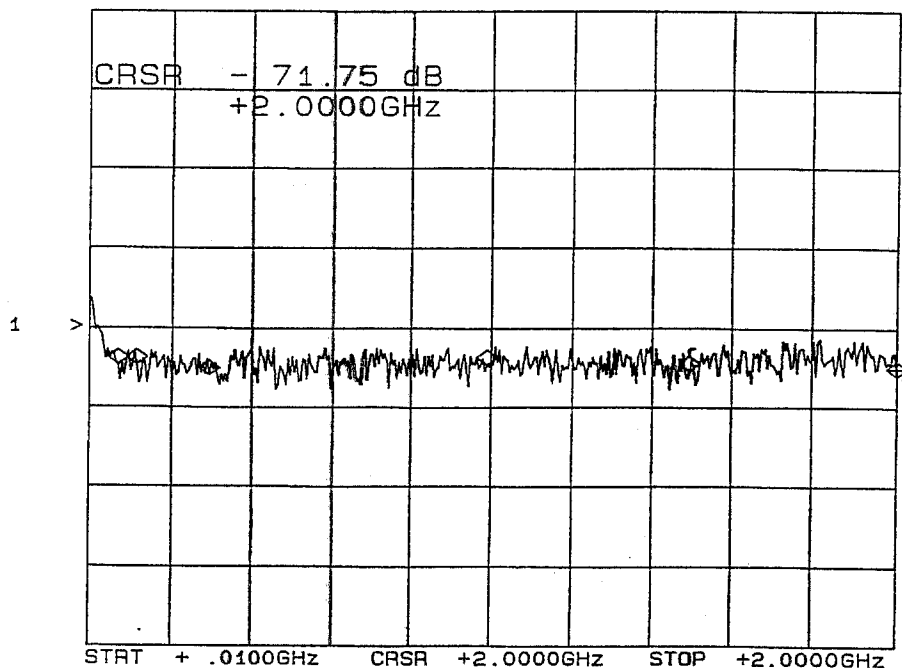
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J2

CH1: A -M - 71.75 dB
20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
80 MHz	68.9 dB
130 MHz	68.9 dB
300 MHz	71.5 dB
1.0 GHz	69.2 dB
1.5 GHz	70.5 dB
2.0 GHz	71.7 dB

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A12-4SSBB



SUMMARY TEST DATA

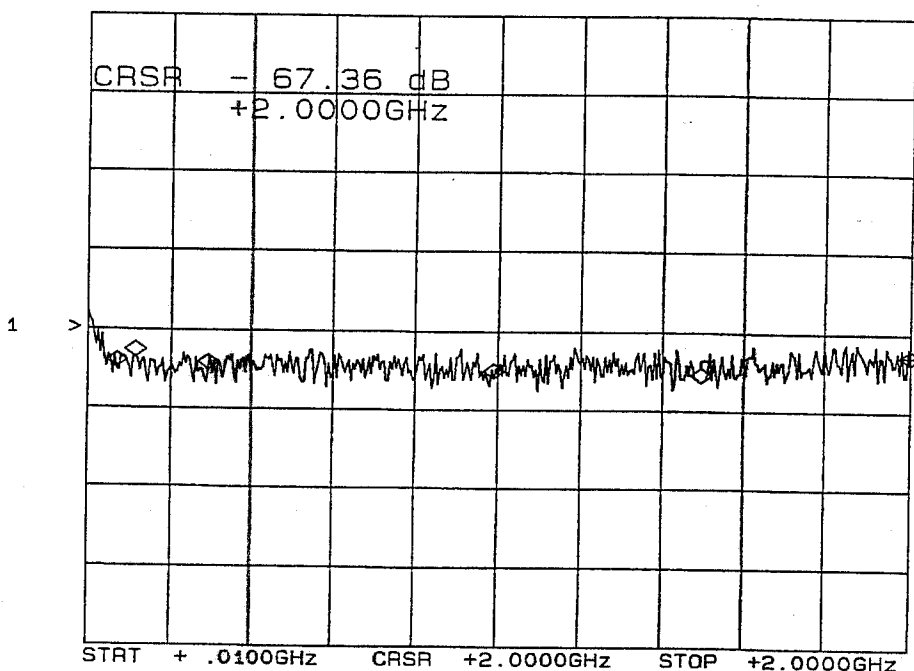
MODEL NUMBER : MSR-8DR-04-STANDARD
 SERIAL NUMBER : 8MS90879B
 ENGINEER : RENE AFABLE
 VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J3

CH1: A -M - 67.36 dB
 20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
80 MHz	69.5 dB
130 MHz	66.8 dB
300 MHz	69.8 dB
1.0 GHz	71.6 dB
1.5 GHz	72.6 dB
2.0 GHz	67.3 dB

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A13-4SSBB



SUMMARY TEST DATA

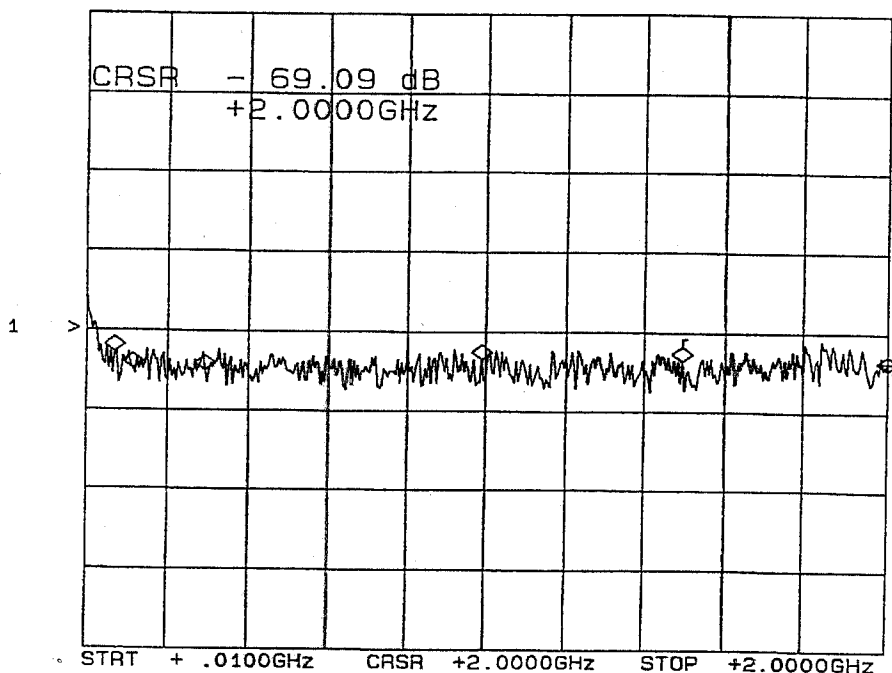
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J4

CH1: A -M - 69.09 dB
 20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
80 MHz	65.0 dB
130 MHz	69.3 dB
300 MHz	69.8 dB
1.0 GHz	66.7 dB
1.5 GHz	66.9 dB
2.0 GHz	69.0 dB

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A14-4SSBB



SUMMARY TEST DATA

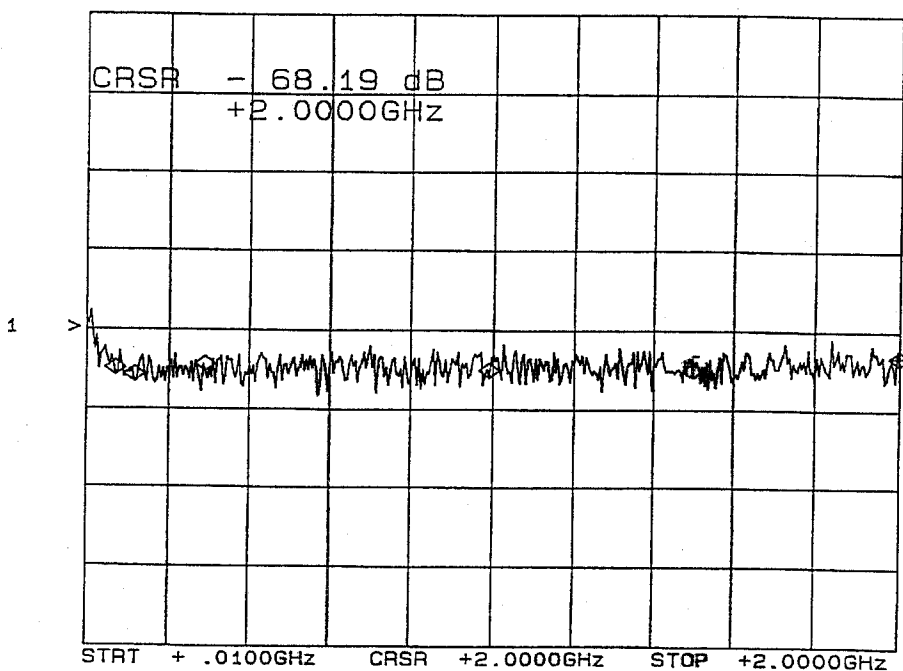
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J5

CH1: A -M - 68.19 dB
20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
80 MHz	71.2 dB
130 MHz	72.7 dB
300 MHz	70.3 dB
1.0 GHz	71.7 dB
1.5 GHz	71.8 dB
2.0 GHz	68.1 dB

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A15-4SSBB



SUMMARY TEST DATA

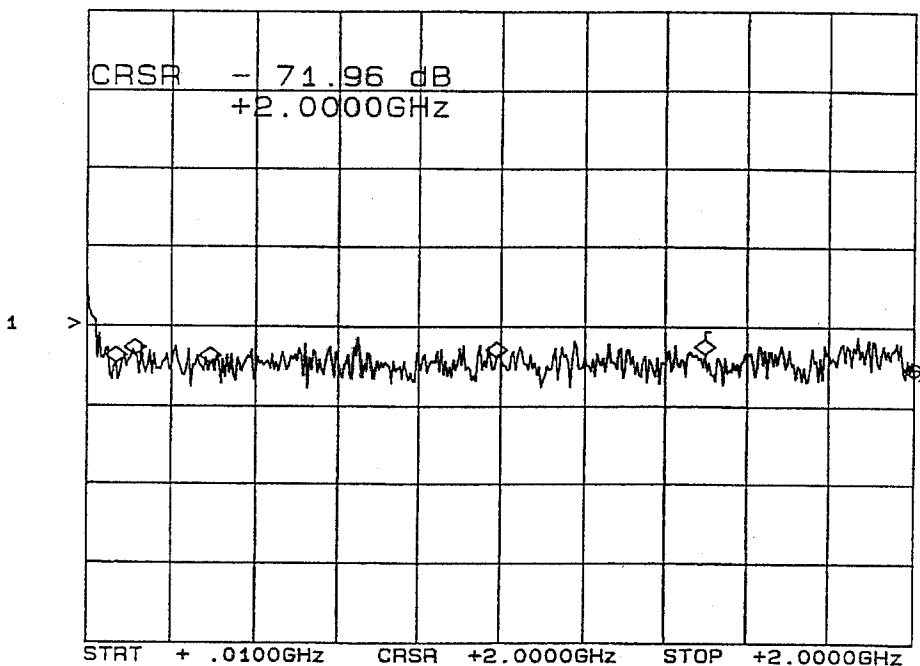
MODEL NUMBER : MSR-8DR-04-STANDARD
OPTIONS 0318, SPARWAR1, 4SSBB, 45004
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J6

CH1: A -M - 71.96 dB
20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
80 MHz	69.1 dB
130 MHz	67.1 dB
300 MHz	69.1 dB
1.0 GHz	67.4 dB
1.5 GHz	66.7 dB
2.0 GHz	71.9 dB

SEPTEMBER 27, 1999

A16-4SSBB



SUMMARY TEST DATA

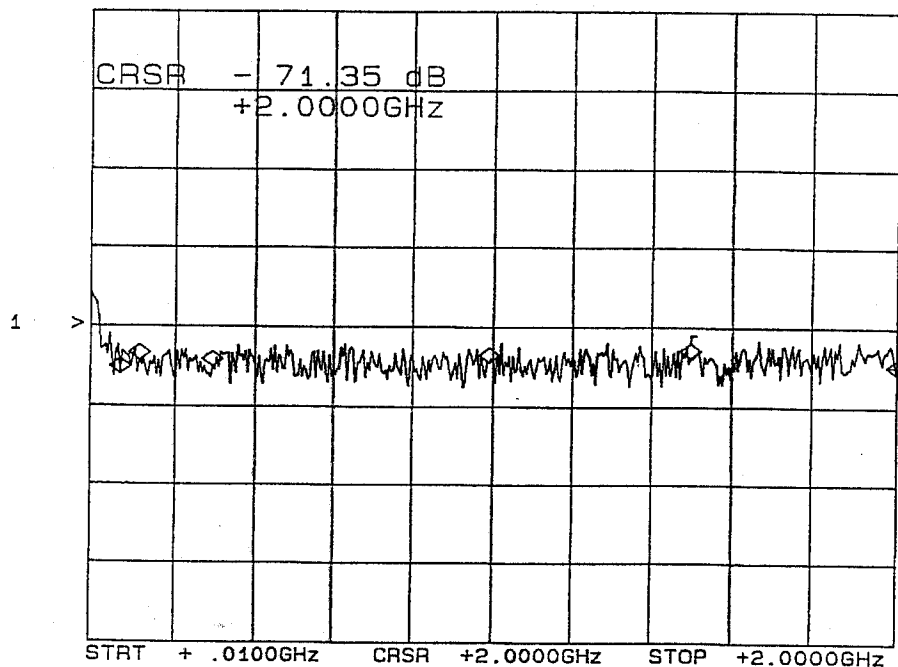
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J7

CH1: A -M - 71.35 dB
20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
80 MHz	71.6 dB
130 MHz	68.2 dB
300 MHz	69.9 dB
1.0 GHz	68.5 dB
1.5 GHz	67.4 dB
2.0 GHz	71.3 dB

SEPTEMBER 27, 1999

A17-4SSBB



SUMMARY TEST DATA

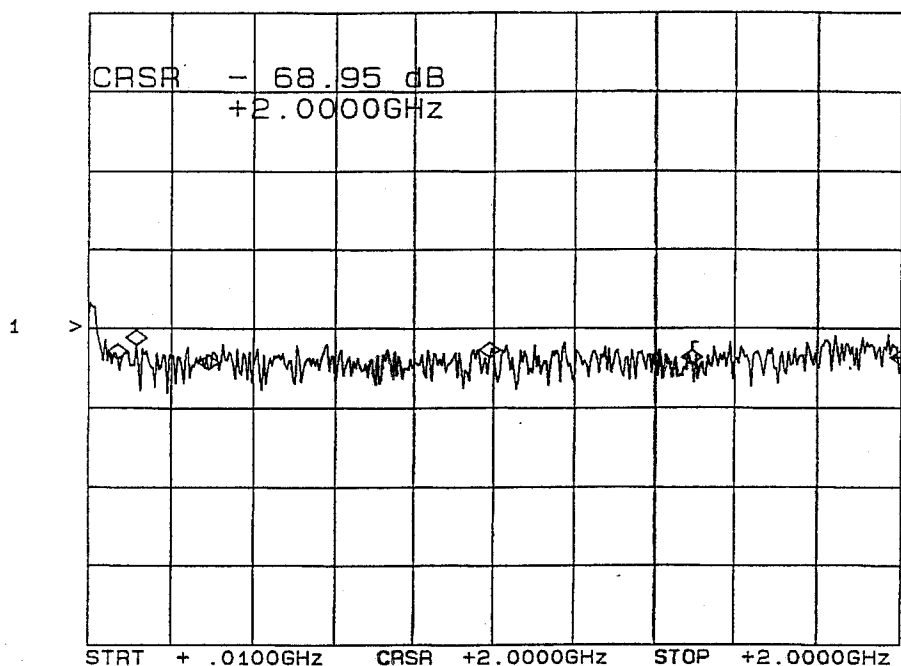
MODEL NUMBER : MSR-8DR-04-STANDARD
SERIAL NUMBER : 8MS90879B
ENGINEER : RENE AFABLE
VOLTAGE & CURRENT DRAW : +5vdc: @+3.4mA; -5vdc: @ -73.7mA

ISOLATION*

(AS MEASURED ON A SCALAR NETWORK ANALYZER)

J9-J8

CH1: A -M - 68.95 dB
 20.0 dB/ REF - 60.00 dB



*J9: INPUT ARM

FREQUENCY	ISOLATION
80 MHz	67.5 dB
130 MHz	64.2 dB
300 MHz	70.0 dB
1.0 GHz	66.9 dB
1.5 GHz	69.1 dB
2.0 GHz	68.9 dB

SEPTEMBER 27, 1999

A18-4SSBB