



TEST REPORT  
ON  
0.5 TO 18 GHz  
SINGLE POLE SIX THROW  
REFLECTIVE SWITCH  
**AMC MODEL No:**  
**MSR-6DR-04-DEC-SP**

Serial Numbers: 6MS012166 THRU 6MS012175

DESIGNED  
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TESTED  
BY  
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REPORTED  
BY  
E. Elder

**October 29, 2004**

*JST*  
*JRH*  
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**ISO9001 : 2000 CERTIFIED**

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## SINGLE POLE SIX THROW REFLECTIVE SWITCH MODULE AMC MODEL No: MSR-6DR-04-DEC-SP

### FEATURES:

- **0.5 TO 18 GHz FREQUENCY RANGE**
- **LOW INSERTION LOSS**
- **HIGH ISOLATION**
- **INTEGRAL TTL DRIVER**

### SPECIFICATIONS:

- |                  |   |   |
|------------------|---|---|
| ● FREQUENCY      | : | 0.5 TO 18 GHz   |
| ● INSERTION LOSS | : | 3.5 dB MAXIMUM  |
| ● ISOLATION      | : | 0.5 TO 2 GHz: 60 dB<br>2 TO 18 GHz: 70 dB   |
| ● VSWR           | : | 2.0:1   |
| ● SPEED          | : | RISE: 10 ns TYPICAL, 15 ns MAXIMUM<br>FALL: 10 ns TYPICAL, 15 ns MAXIMUM<br>DELAY ON: 75 ns TYPICAL, 100 ns MAXIMUM<br>DELAY OFF: 75 ns TYPICAL, 100 ns MAXIMUM |
| ● POWER INPUT    | : | (CW) +20 dBm (STANDARD), +10 dBm (HIGH SPEED)   |
| ● SURVIVAL POWER | : | 1 WATT CW, 10 WATTS PEAK 1 uSEC   |
| ● CONTROL        | : | SEE LOGIC TABLE ON PRODUCT FEATURE BELOW  |
| ● POWER SUPPLY   | : | +5 V @ 300 mA MAXIMUM<br>-5 V @ 75 mA MAXIMUM   |

## PRODUCT FEATURE

ZONE	REV.	DESCRIPTION	DATE	APPROVED
		ORIGINAL RELEASE	8/19/07	

**DESCRIPTION**

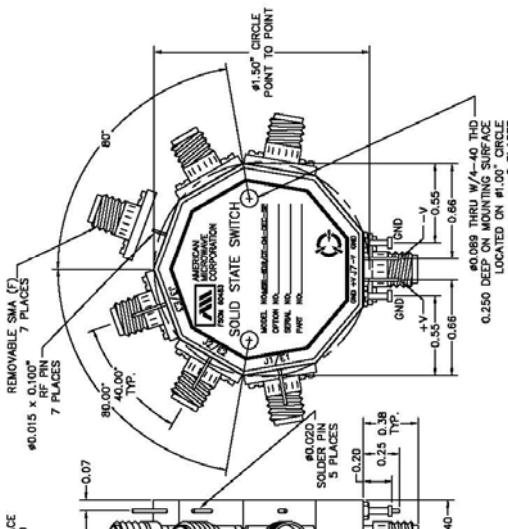
AMC MODEL MSR-6DR/DI-04-DEC-SP IS A 0.5 TO 18 GHz, SINGLE POLE SIX THROW REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH HAVING AN INSERTION LOSS OF 3.5 dB MAXIMUM (REFLECTIVE), 4.25 dB MAXIMUM (ABSORPTIVE/NON-REFLECTIVE), AND ISOLATION OF 60 dB MINIMUM BETWEEN 0.5 TO 2 GHz AND 70 dB MINIMUM BETWEEN 2 TO 18 GHz.

**SPECIFICATIONS:**

- FREQUENCY: . . . . . 0.5 GHz TO 18 GHz
- INSERTION LOSS: . . . . . REFLECTIVE: 3.5db  
ABSORPTIVE: 4.25db
- 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: . . . . . SEE LOGIC TABLE
- POWER SUPPLY: . . . . . +5V @ 300 mA MAX.  
-5V @ 75mA MAX.(REFLECTIVE)  
100mA MAX.(ABSORPTIVE/NON-REFLECTIVE)

**OPTIONS:**

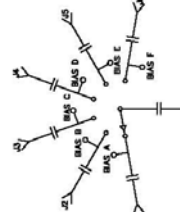
- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SP . . . . . 3-BIT DECODER WITH SOLDER PIN
- 10M18 . . . . . 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 MHz AND 0.5db AT 18 GHz)
- 100M18 . . . . . 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 18 GHz)
- 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 1.5db AT 2 GHz)
- 1020 . . . . . 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db 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 25 nsec MAXIMUM
- B06 . . . . . WHEN APPLICABLE 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
- B11 . . . . . 0.70" THICK VERSION



ENVIRONMENTAL RATINGS:

- TEMPERATURE: . . . . . -55°C TO +85°C (OPERATING)  
-65°C TO +125°C (STORAGE)
- HUMIDITY: . . . . . MIL-STD-202F, METHOD 1038 COND. B
- SHOCK: . . . . . MIL-STD-202F, METHOD 2138 COND. B
- VIBRATION: . . . . . MIL-STD-202F, METHOD 2040 COND. B
- ALTITUDE: . . . . . MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLER: . . . . . MIL-STD-202F, METHOD 107D COND. A

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



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



**AMERICAN MICROWAVE CORPORATION**  
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 ISO 9001:2000 CERTIFIED

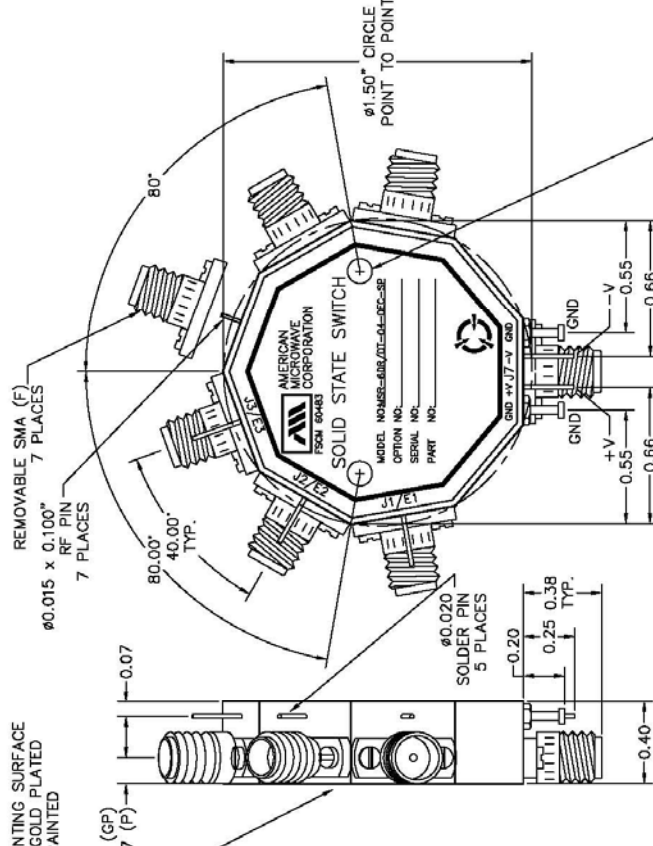
APPROVALS		DATE	TITLE
DESIGN	WJG	8/19/07	MSR-6DR/DI-04-DEC-SP
REVISION	JGJ	8/19/04	OR NON-REFLECTIVE/ABSORPTIVE SOLID STATE SWITCH
ISSUED			SIZE FROM NO. 60483

SCALE: N/S      SHEET 1 OF 3

**OUTLINE DRAWING**

ZONE	REV.	DESCRIPTION	DATE	APPROVED
		ORIGINAL RELEASE	8/14/07	

**MECHANICAL OUTLINE**



LOGIC TABLE		PATH ON
E1	E2	E3
L	L	L
H	L	L
L	H	L
H	H	L
L	L	H
H	L	H

**DESCRIPTION**  
 AMC MODEL MSR-6DR/DT-04-DEC-SP IS A 0.5 TO 1.8 GHz, SINGLE POLE SIX THROW REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SWITCH HAVING AN INSERTION LOSS OF 3.5 dB MAXIMUM (REFLECTIVE), 4.25 dB MAXIMUM (ABSORPTIVE/NON-REFLECTIVE), AND ISOLATION OF 60 dB MINIMUM BETWEEN 0.5 TO 2 GHz AND 70 dB MINIMUM BETWEEN 2 TO 18 GHz.

**REMOVABLE SMA (F)**  
 7 PLACES

**RF PIN**  
 7 PLACES

**MOUNTING SURFACE**  
 GP=GOLD PLATED  
 P=PAINTED

**SOLDER PIN**  
 5 PLACES

**LOGIC TABLE**

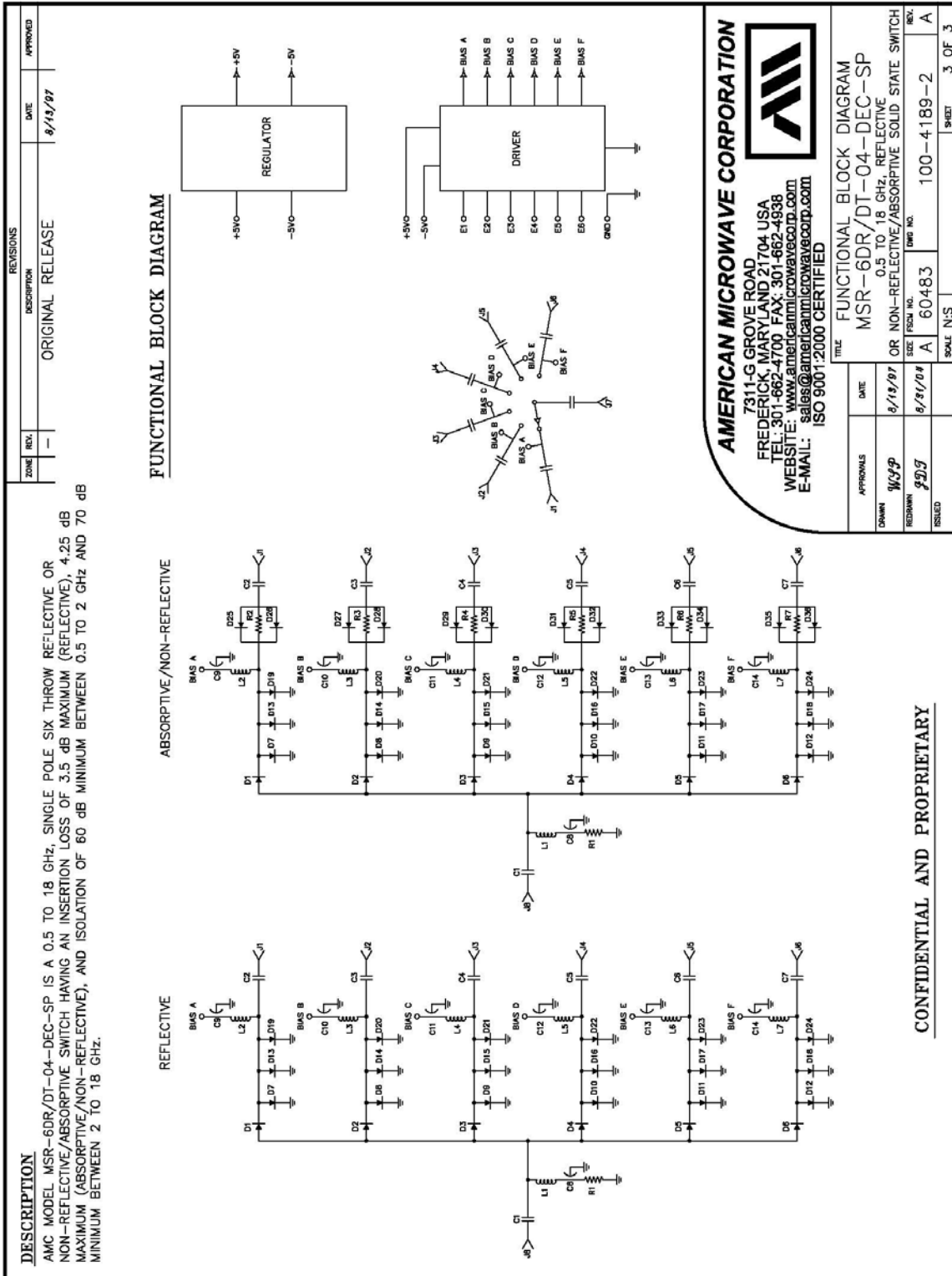
**AMERICAN MICROWAVE CORPORATION**  
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 ISO 9001:2000 CERTIFIED

**MECHANICAL OUTLINE**  
 MSR-6DR/DT-04-DEC-SP  
 0.5 TO 1.8 GHz REFLECTIVE  
 OR NON-REFLECTIVE/ABSORPTIVE SOLID STATE SWITCH

DATE	8/15/07
APPROVALS	WCP
DESIGN	WCP
ISSUED	WCP
REVISION	WCP
SIZE	FROM INCH
A	60483
REV.	100-4189-2
REV.	A
SCALE	N/S
SHEET	2 OF 3

ALL DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 X.00 ±0.020  
 X.00 ±0.010

**FUNCTIONAL SCHEMATIC**



CONFIDENTIAL AND PROPRIETARY



## FINAL TEST DATA

FINAL TEST DATA SHEETS

FOR

AMC MODEL NUMBER

# MSR-6DR-04-DEC-SP

Serial Numbers:

6MS012166 THRU 6MS012175



**FINAL TEST DATA**

AMC MODEL NO: MSR-6DR-04-DEC-SP SERIAL NUMBER: 6MS012166

FORM: 151-SW-DTA 2041099



AMERICAN MICROWAVE CORPORATION  
 1-G GROVE RD., FREDERICK MD. 21704  
 TEL: 301-662-4700 FAX: 301-662-4938

DATE: 1/31/01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: PLANET TECHNOLOGY  
 JOB NO: 010234E  
 MODEL NO: MSR-6DR-04-DEC-SP  
 SERIAL NO: 6MS012166  
 CURRENT DRAW: +5 VDC @ 250mA; -5 VDC @ 30 mA

TECHNICIAN: Henry Nino  
 OPTION NO: \_\_\_\_\_  
 SPECIFICATION: \_\_\_\_\_  
 FREQUENCY RANGE: 0.5-18

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J7-J1 3.43 dB	12.74 dB	1.60 : 1	12.80 dB	1.59 : 1	dB	1. : 1
J7-J2 3.47 dB	12.84 dB	1.59 : 1	12.72 dB	1.60 : 1	dB	1. : 1
J7-J3 3.33 dB	12.83 dB	1.59 : 1	12.90 dB	1.59 : 1	dB	1. : 1
J7-J4 3.32 dB	12.83 dB	1.59 : 1	13.07 dB	1.57 : 1	dB	1. : 1
J7-J5 3.35 dB	12.90 dB	1.59 : 1	13.07 dB	1.57 : 1	dB	1. : 1
J7-J6 3.40 dB	12.88 dB	1.59 : 1	12.79 dB	1.60 : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J7-J1 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J2 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J3 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J4 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J5 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J6 >70 dB	< 106 nS	< 15 nS	< 100 nS	< 15 nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Wiltron 37347A

PROGRAM MANAGER/SUPERVISOR APPROVAL: Henry Nino DATED: \_\_\_\_\_  
 QA/QC APPROVAL: 04 Donald Harmon DATED: 2/5/01  
 VICE PRESIDENT/GENERAL MANAGER APPROVAL: PH DATED: 2/5/01



**FINAL TEST DATA**

**AMC MODEL NO: MSR-6DR-04-DEC-SP SERIAL NUMBER: 6MS012167**

FORM: 151-SW-DTA 2841099



AMERICAN MICROWAVE CORPORATION  
 7311-G GROVE RD., FREDERICK MD. 21704  
 TEL: 301-662-4700 FAX: 301-662-4938

DATE: 1/31/01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: PLANET TECHNOLOGY  
 JOB NO: 010234E

TECHNICIAN: Henry Nino

MODEL NO: MSR-6DR-04-DEC-SP

OPTION NO: \_\_\_\_\_

SERIAL NO: 6MS012167

SPECIFICATION: \_\_\_\_\_

CURRENT DRAW: +5 VDC @ 250mA; -5 VDC @ 30 mA FREQUENCY RANGE: 0.5-18

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J7-J1 3.44 dB	10.71 dB	1.82 : 1	11.93 dB	1.68 : 1		
J7-J2 3.40 dB	12.22 dB	1.65 : 1	13.16 dB	1.56 : 1		
J7-J3 3.23 dB	11.36 dB	1.74 : 1	12.14 dB	1.66 : 1		
J7-J4 3.33 dB	11.62 dB	1.71 : 1	12.20 dB	1.65 : 1		
J7-J5 3.44 dB	12.71 dB	1.60 : 1	12.58 dB	1.61 : 1		
J7-J6 3.43 dB	12.87 dB	1.59 : 1	13.22 dB	1.56 : 1		
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J7-J1 >70 dB	< 100 nS	<15 nS	< 100 nS	<15 nS
J7-J2 >70 dB	< 100 nS	<15 nS	< 100 nS	<15 nS
J7-J3 >70 dB	< 100 nS	<15 nS	< 100 nS	<15 nS
J7-J4 >70 dB	< 100 nS	<15 nS	< 100 nS	<15 nS
J7-J5 >70 dB	< 100 nS	<15 nS	< 100 nS	<15 nS
J7-J6 >70 dB	< 106 nS	<15 nS	< 100 nS	<15 nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Wiltron 37347A

PROGRAM MANAGER/SUPERVISOR APPROVAL: Henry Nino DATED: \_\_\_\_\_

QA/QC APPROVAL: Q4 Donald Harmon DATED: 2/5/01

VICE PRESIDENT/GENERAL MANAGER APPROVAL: [Signature] DATED: 2/5/01

**FINAL TEST DATA**

AMC MODEL NO: MSR-6DR-04-DEC-SP SERIAL NUMBER: 6MS012168

FORM: 151-SW-DTA /1099



AMERICAN MICROWAVE CORPORATION  
 7311-G GROVE RD., FREDERICK MD. 21704  
 TEL: 301-662-4700 FAX: 301-662-4938

DATE: 1-31-01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: PLANET TECHNOLOGY

TECHNICIAN: H.H.

JOB NO: 010234E

MODEL NO: MSR-6DR-04-DEC-SP

OPTION NO: \_\_\_\_\_

SERIAL NO: 6MS012168

SPECIFICATION: \_\_\_\_\_

CURRENT DRAW: +5VDC @ 250mA; -5 VDC @ 30 mA FREQUENCY RANGE: 0.5-18

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J7-J1 <u>3.45</u> dB	<u>13.26</u> dB	1.56 : 1	<u>13.55</u> dB	1.53 : 1	dB	1. : 1
J7-J2 <u>3.58</u> dB	<u>13.25</u> dB	1.56 : 1	<u>12.82</u> dB	1.57 : 1	dB	1. : 1
J7-J3 <u>3.37</u> dB	<u>13.33</u> dB	1.55 : 1	<u>13.61</u> dB	1.53 : 1	dB	1. : 1
J7-J4 <u>3.39</u> dB	<u>13.32</u> dB	1.55 : 1	<u>13.64</u> dB	1.53 : 1	dB	1. : 1
J7-J5 <u>3.45</u> dB	<u>13.29</u> dB	1.55 : 1	<u>13.77</u> dB	1.52 : 1	dB	1. : 1
J7-J6 <u>3.49</u> dB	<u>13.34</u> dB	1.55 : 1	<u>13.65</u> dB	1.52 : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J7-J1 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J7-J2 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J7-J3 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J7-J4 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J7-J5 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J7-J6 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Wittron 37347A

PROGRAM MANAGER/SUPERVISOR APPROVAL: Henry Niro DATED: \_\_\_\_\_

QA/QC APPROVAL: Q4 Donald Harmon DATED: 2/5/01

VICE PRESIDENT/GENERAL MANAGER APPROVAL: [Signature] DATED: 2/5/01

## FINAL TEST DATA

AMC MODEL NO: MSR-6DR-04-DEC-SP SERIAL NUMBER: 6MS012169

FORM: 151-SW-DTA 8/1099



AMERICAN MICROWAVE CORPORATION  
7311-G GROVE RD., FREDERICK MD. 21704  
TEL: 301-662-4700 FAX: 301-662-4938

DATE: 1-31-01

### FINAL TEST DATA ON MICROWAVE SWITCH

CUSTOMER: PLANET TECHNOLOGY      TECHNICIAN: HH

JOB NO: 010234E

MODEL NO: MSR-6DR-04-DEC-SP      OPTION NO: \_\_\_\_\_

SERIAL NO: 6MS012169      SPECIFICATION: \_\_\_\_\_

CURRENT DRAW: +5 VDC @ 250 mA; -5 VDC @ 30 mA      FREQUENCY RANGE: 0.5-18

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J7-J1 <u>3.61</u> dB	<u>14.10</u> dB	1.49 : 1	<u>14.40</u> dB	1.47 : 1	dB	1. : 1
J7-J2 <u>3.53</u> dB	<u>13.54</u> dB	1.53 : 1	<u>13.99</u> dB	1.50 : 1	dB	1. : 1
J7-J3 <u>3.41</u> dB	<u>13.95</u> dB	1.50 : 1	<u>12.65</u> dB	1.61 : 1	dB	1. : 1
J7-J4 <u>3.43</u> dB	<u>14.11</u> dB	1.49 : 1	<u>14.10</u> dB	1.40 : 1	dB	1. : 1
J7-J5 <u>3.58</u> dB	<u>13.88</u> dB	1.51 : 1	<u>13.88</u> dB	1.51 : 1	dB	1. : 1
J7-J6 <u>3.69</u> dB	<u>13.91</u> dB	1.51 : 1	<u>14.13</u> dB	1.49 : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J7-J1 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J7-J2 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J7-J3 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J7-J4 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J7-J5 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J7-J6 <u>70</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Wittron 37347A

PROGRAM MANAGER/SUPERVISOR APPROVAL: Henry Nino      DATED: \_\_\_\_\_

QA/QC APPROVAL: Q4 Donald Harmon      DATED: 2/5/01

VICE PRESIDENT/GENERAL MANAGER APPROVAL: [Signature]      DATED: 2/5/01



## FINAL TEST DATA

AMC MODEL NO: MSR-6DR-04-DEC-SP SERIAL NUMBER: 6MS012170

FORM: 151-SW-DTA 3/1099



AMERICAN MICROWAVE CORPORATION  
7311-G GROVE RD., FREDERICK MD. 21704  
TEL: 301-662-4700 FAX: 301-662-4938

DATE: 1-31-01

### FINAL TEST DATA ON MICROWAVE SWITCH

CUSTOMER: PLANET TECHNOLOGY      TECHNICIAN: HH

JOB NO: 010234E

MODEL NO: MSR-6DR-04-DEC-SP      OPTION NO: \_\_\_\_\_

SERIAL NO: 6MS012170      SPECIFICATION: \_\_\_\_\_

CURRENT DRAW: +5 VDC @ 250 mA; -5 VDC @ 30 mA      FREQUENCY RANGE: 0.5-18

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J7-J1 <u>3.54</u> dB	<u>14.29</u> dB	<u>1.48</u> : 1	<u>14.29</u> dB	<u>1.48</u> : 1	dB	1. : 1
J7-J2 <u>3.41</u> dB	<u>14.27</u> dB	<u>1.48</u> : 1	<u>13.59</u> dB	<u>1.53</u> : 1	dB	1. : 1
J7-J3 <u>3.55</u> dB	<u>12.27</u> dB	<u>1.64</u> : 1	<u>11.59</u> dB	<u>1.71</u> : 1	dB	1. : 1
J7-J4 <u>3.31</u> dB	<u>14.36</u> dB	<u>1.47</u> : 1	<u>14.47</u> dB	<u>1.47</u> : 1	dB	1. : 1
J7-J5 <u>3.53</u> dB	<u>14.26</u> dB	<u>1.48</u> : 1	<u>13.49</u> dB	<u>1.54</u> : 1	dB	1. : 1
J7-J6 <u>3.50</u> dB	<u>14.16</u> dB	<u>1.49</u> : 1	<u>14.02</u> dB	<u>1.50</u> : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J7-J1 <u>70</u> dB	<u>85</u> nS	<u>3</u> nS	<u>40</u> nS	<u>4</u> nS
J7-J2 <u>70</u> dB	<u>80</u> nS	<u>4</u> nS	<u>40</u> nS	<u>4</u> nS
J7-J3 <u>70</u> dB	<u>75</u> nS	<u>4</u> nS	<u>40</u> nS	<u>4</u> nS
J7-J4 <u>70</u> dB	<u>75</u> nS	<u>5</u> nS	<u>40</u> nS	<u>4</u> nS
J7-J5 <u>70</u> dB	<u>75</u> nS	<u>4</u> nS	<u>40</u> nS	<u>4</u> nS
J7-J6 <u>70</u> dB	<u>75</u> nS	<u>5</u> nS	<u>40</u> nS	<u>4</u> nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Witttron 37347A

PROGRAM MANAGER/SUPERVISOR APPROVAL: Henry Nino      DATED: \_\_\_\_\_

QA/QC APPROVAL: Q4 Donald Harmon      DATED: 2/5/01

VICE PRESIDENT/GENERAL MANAGER APPROVAL: [Signature]      DATED: 2/5/01



**FINAL TEST DATA**

AMC MODEL NO: MSR-6DR-04-DEC-SP SERIAL NUMBER: 6MS012171

FORM: 151-SW-DTA 28/1099



AMERICAN MICROWAVE CORPORATION  
 1-G GROVE RD., FREDERICK MD. 21704  
 TEL: 301-662-4700/FAX: 301-662-4938

DATE: 1/31/01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: PLANET TECHNOLOGY      TECHNICIAN: Henry Nino  
 JOB NO: 010234E  
 MODEL NO: MSR-6DR-04-DEC-SP      OPTION NO: \_\_\_\_\_  
 SERIAL NO: 6MS012171      SPECIFICATION: \_\_\_\_\_  
 CURRENT DRAW: +5 VDC @ 250mA; -5 VDC @ 30mA      FREQUENCY RANGE: 0.5-18

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J7-J1 3.44 dB	13.51 dB	1.54 : 1	12.75 dB	1.60 : 1	dB	1. : 1
J7-J2 3.39 dB	13.27 dB	1.55 : 1	11.54 dB	1.72 : 1	dB	1. : 1
J7-J3 3.20 dB	13.65 dB	1.52 : 1	12.01 dB	1.67 : 1	dB	1. : 1
J7-J4 3.39 dB	12.83 dB	1.59 : 1	12.54 dB	1.62 : 1	dB	1. : 1
J7-J5 3.37 dB	13.59 dB	1.53 : 1	12.14 dB	1.66 : 1	dB	1. : 1
J7-J6 3.46 dB	13.34 dB	1.55 : 1	12.72 dB	1.60 : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J7-J1 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J2 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J3 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J4 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J5 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J6 >70 dB	< 106 nS	< 15 nS	< 100 nS	< 15 nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Wil from 37347A

PROGRAM MANAGER/SUPERVISOR APPROVAL: Henry Nino      DATED: \_\_\_\_\_  
 QA/QC APPROVAL: (04) Donald Harmon      DATED: 2/5/01  
 VICE PRESIDENT/GENERAL MANAGER APPROVAL: [Signature]      DATED: 2/3/01

## FINAL TEST DATA

AMC MODEL NO: MSR-6DR-04-DEC-SP SERIAL NUMBER: 6MS012172

FORM: 151-SW-DTA /1099



AMERICAN MICROWAVE CORPORATION  
7311-G GROVE RD., FREDERICK MD. 21704  
TEL: 301-662-4700 FAX: 301-662-4938

DATE: 1/27/01

### FINAL TEST DATA ON MICROWAVE SWITCH

CUSTOMER: PLANET TECHNOLOGY  
JOB NO: 010234E  
MODEL NO: MSR-6DR-04-DEC-SP  
SERIAL NO: 6MS012172  
CURRENT DRAW: +5VDC @ 250mA; -5VDC @ 30mA FREQUENCY RANGE: 0.5-18

TECHNICIAN: C. ROTH  
OPTION NO: \_\_\_\_\_  
SPECIFICATION: \_\_\_\_\_

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J7-J1 <u>3.57</u> dB	<u>13.0</u> dB	<u>1.57</u> : 1	<u>13.20</u> dB	<u>1.56</u> : 1	dB	1. : 1
J7-J2 <u>3.52</u> dB	<u>13.01</u> dB	<u>1.58</u> : 1	<u>13.15</u> dB	<u>1.56</u> : 1	dB	1. : 1
J7-J3 <u>3.39</u> dB	<u>13.25</u> dB	<u>1.56</u> : 1	<u>12.21</u> dB	<u>1.65</u> : 1	dB	1. : 1
J7-J4 <u>3.39</u> dB	<u>13.29</u> dB	<u>1.55</u> : 1	<u>12.49</u> dB	<u>1.62</u> : 1	dB	1. : 1
J7-J5 <u>3.55</u> dB	<u>13.11</u> dB	<u>1.57</u> : 1	<u>13.22</u> dB	<u>1.56</u> : 1	dB	1. : 1
J7-J6 <u>3.52</u> dB	<u>13.10</u> dB	<u>1.57</u> : 1	<u>13.21</u> dB	<u>1.56</u> : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J7-J1 <u>770</u> dB	<u>80</u> nS	<u>14</u> nS	<u>36</u> nS	<u>6</u> nS
J7-J2 <u>770</u> dB	<u>82</u> nS	<u>15</u> nS	<u>36</u> nS	<u>6</u> nS
J7-J3 <u>770</u> dB	<u>82</u> nS	<u>14</u> nS	<u>36</u> nS	<u>6</u> nS
J7-J4 <u>770</u> dB	<u>82</u> nS	<u>14</u> nS	<u>36</u> nS	<u>6</u> nS
J7-J5 <u>770</u> dB	<u>82</u> nS	<u>15</u> nS	<u>36</u> nS	<u>6</u> nS
J7-J6 <u>770</u> dB	<u>82</u> nS	<u>14</u> nS	<u>36</u> nS	<u>6</u> nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP 8720D

PROGRAM MANAGER/SUPERVISOR APPROVAL: Henry Nino DATED: \_\_\_\_\_

QA/QC APPROVAL: (04) Donald Harmon DATED: 2/15/01

VICE PRESIDENT/GENERAL MANAGER APPROVAL: [Signature] DATED: 1/27/01





**FINAL TEST DATA**

AMC MODEL NO: MSR-6DR-04-DEC-SP SERIAL NUMBER: 6MS012173

FORM: 151-SW-DT 78/1099



AMERICAN MICROWAVE CORPORATION  
7311-G GROVE RD., FREDERICK MD. 21704  
TEL: 301-662-4700 FAX: 301-662-4938

FINAL TEST DATA  
ON  
MICROWAVE SWITCH

DATE: 1/27/01

CUSTOMER: PLANET TECHNOLOGY      TECHNICIAN: C. RATHS  
 JOB NO: 010234E  
 MODEL NO: MSR-6DR-04-DEC-SP  
 SERIAL NO: 6MS012173  
 CURRENT DRAW: +5VDC @ 10 mA; -5 VDC @ 20 mA      OPTION NO: \_\_\_\_\_  
 SPECIFICATION: \_\_\_\_\_  
 FREQUENCY RANGE: 0.5-18

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J7-J1 <u>3.32</u> dB	<u>14.04</u> dB	<u>1.50</u> : 1	<u>13.49</u> dB	<u>1.54</u> : 1	dB	1. : 1
J7-J2 <u>3.75</u> dB	<u>13.59</u> dB	<u>1.53</u> : 1	<u>13.79</u> dB	<u>1.51</u> : 1	dB	1. : 1
J7-J3 <u>3.33</u> dB	<u>14.50</u> dB	<u>1.46</u> : 1	<u>13.92</u> dB	<u>1.50</u> : 1	dB	1. : 1
J7-J4 <u>3.50</u> dB	<u>13.48</u> dB	<u>1.54</u> : 1	<u>11.05</u> dB	<u>1.78</u> : 1	dB	1. : 1
J7-J5 <u>3.40</u> dB	<u>14.17</u> dB	<u>1.49</u> : 1	<u>13.59</u> dB	<u>1.53</u> : 1	dB	1. : 1
J7-J6 <u>3.64</u> dB	<u>14.27</u> dB	<u>1.48</u> : 1	<u>13.79</u> dB	<u>1.51</u> : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J7-J1 <u>70</u> dB	<u>80</u> nS	<u>12</u> nS	<u>38</u> nS	<u>6</u> nS
J7-J2 <u>70</u> dB	<u>78</u> nS	<u>10</u> nS	<u>38</u> nS	<u>6</u> nS
J7-J3 <u>70</u> dB	<u>80</u> nS	<u>12</u> nS	<u>38</u> nS	<u>6</u> nS
J7-J4 <u>70</u> dB	<u>74</u> nS	<u>8</u> nS	<u>38</u> nS	<u>6</u> nS
J7-J5 <u>70</u> dB	<u>80</u> nS	<u>8</u> nS	<u>38</u> nS	<u>6</u> nS
J7-J6 <u>70</u> dB	<u>78</u> nS	<u>12</u> nS	<u>38</u> nS	<u>6</u> nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP 8720D

PROGRAM MANAGER/SUPERVISOR APPROVAL: Henry Nino      DATED: \_\_\_\_\_  
 QA/QC APPROVAL: 04 Donald Haseman      DATED: 2/5/01  
 VICE PRESIDENT/GENERAL MANAGER APPROVAL: [Signature]      DATED: 1/27/01

## FINAL TEST DATA

AMC MODEL NO: MSR-6DR-04-DEC-SP SERIAL NUMBER: 6MS012174

FORM: 151-SW-DTA :1099



AMERICAN MICROWAVE CORPORATION  
7311-G GROVE RD., FREDERICK MD. 21704  
TEL: 301-662-4700 FAX: 301-662-4938

DATE: 1/27/01

### FINAL TEST DATA ON MICROWAVE SWITCH

CUSTOMER: PLANET TECHNOLOGY      TECHNICIAN: C. RUTHS  
 JOB NO: 010234E  
 MODEL NO: MSR-6DR-04-DEC-SP      OPTION NO: \_\_\_\_\_  
 SERIAL NO: 6MS012174      SPECIFICATION: \_\_\_\_\_  
 CURRENT DRAW: ±5VDC @ 250mA; -5VDC @ 25mA      FREQUENCY RANGE: 0.5-18

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J7-J1 <u>3.44</u> dB	<u>14.44</u> dB	<u>1.47</u> : 1	<u>13.99</u> dB	<u>1.50</u> : 1	dB	1. : 1
J7-J2 <u>3.45</u> dB	<u>14.42</u> dB	<u>1.47</u> : 1	<u>12.83</u> dB	<u>1.59</u> : 1	dB	1. : 1
J7-J3 <u>3.39</u> dB	<u>14.62</u> dB	<u>1.45</u> : 1	<u>14.01</u> dB	<u>1.50</u> : 1	dB	1. : 1
J7-J4 <u>3.46</u> dB	<u>14.24</u> dB	<u>1.48</u> : 1	<u>12.70</u> dB	<u>1.60</u> : 1	dB	1. : 1
J7-J5 <u>3.44</u> dB	<u>14.22</u> dB	<u>1.48</u> : 1	<u>14.14</u> dB	<u>1.49</u> : 1	dB	1. : 1
J7-J6 <u>3.61</u> dB	<u>14.04</u> dB	<u>1.50</u> : 1	<u>11.03</u> dB	<u>1.78</u> : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J7-J1 <u>70</u> dB	<u>74</u> nS	<u>8</u> nS	<u>38</u> nS	<u>6</u> nS
J7-J2 <u>70</u> dB	<u>76</u> nS	<u>8</u> nS	<u>36</u> nS	<u>4</u> nS
J7-J3 <u>70</u> dB	<u>84</u> nS	<u>10</u> nS	<u>38</u> nS	<u>4</u> nS
J7-J4 <u>70</u> dB	<u>76</u> nS	<u>8</u> nS	<u>38</u> nS	<u>6</u> nS
J7-J5 <u>70</u> dB	<u>82</u> nS	<u>8</u> nS	<u>38</u> nS	<u>6</u> nS
J7-J6 <u>70</u> dB	<u>74</u> nS	<u>8</u> nS	<u>38</u> nS	<u>6</u> nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP 8720D

PROGRAM MANAGER/SUPERVISOR APPROVAL: Henry Dino      DATED: \_\_\_\_\_

QA/QC APPROVAL: 04 Ronald Harmon      DATED: 2/5/01

VICE PRESIDENT/GENERAL MANAGER APPROVAL: [Signature]      DATED: 1/27/01

## FINAL TEST DATA

AMC MODEL NO: MSR-6DR-04-DEC-SP SERIAL NUMBER: 6MS012175

FORM: 151-SW-DTA 28/1099



AMERICAN MICROWAVE CORPORATION  
 7-G GROVE RD., FREDERICK, MD, 21704  
 TEL: 301-662-4700 FAX: 301-662-4938

DATE: 1/31/01

### FINAL TEST DATA ON MICROWAVE SWITCH

CUSTOMER: PLANET TECHNOLOGY      TECHNICIAN: Henry Nino  
 JOB NO: 010234E  
 MODEL NO: MSR-6DR-04-DEC-SP      OPTION NO: \_\_\_\_\_  
 SERIAL NO: 6MS012175      SPECIFICATION: \_\_\_\_\_  
 CURRENT DRAW: +5 VDC @ 250mA; -5 VDC @ 30mA      FREQUENCY RANGE: 0.5-18

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J7-J1 3.60 dB	12.81 dB	1.59 : 1	12.88 dB	1.59 : 1	dB	1. : 1
J7-J2 3.53 dB	12.30 dB	1.64 : 1	11.73 dB	1.70 : 1	dB	1. : 1
J7-J3 3.56 dB	12.86 dB	1.59 : 1	12.87 dB	1.59 : 1	dB	1. : 1
J7-J4 3.55 dB	12.93 dB	1.58 : 1	12.81 dB	1.59 : 1	dB	1. : 1
J7-J5 3.58 dB	12.78 dB	1.60 : 1	13.16 dB	1.53 : 1	dB	1. : 1
J7-J6 3.59 dB	12.10 dB	1.66 : 1	12.77 dB	1.60 : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1
	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J7-J1 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J2 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J3 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J4 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J5 >70 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J7-J6 >70 dB	< 106 nS	< 15 nS	< 100 nS	< 15 nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Wil from 37347A

PROGRAM MANAGER/SUPERVISOR APPROVAL: Henry Nino      DATED: \_\_\_\_\_

QA/QC APPROVAL: 04 Donald Harmon      DATED: 2/5/01

VICE PRESIDENT/GENERAL MANAGER APPROVAL: [Signature]      DATED: 2/5/01