



**TEST REPORT**  
**ON**  
**1 TO 18 GHz**  
**SINGLE POLE THREE THROW**  
**REFLECTIVE HIGH POWER SWITCH**

**AMC MODEL No:**  
**MSN-3DR-PE**  
**OPTION 118, HPR05W**

**Serial Numbers: 3MS105104 THRU 3MS105108**

**DESIGNED**  
**BY**  
**R. Afable**

**TESTED**  
**BY**  
**T. Phung / H. Nino**

**REPORTED**  
**BY**  
**E. Elder**

**October 28, 2004**

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**Website: <http://www.americanmicrowavecorp.com>**

**ISO9001 : 2000 CERTIFIED**

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## SINGLE POLE THREE THROW REFLECTIVE HIGH POWER SWITCH AMC MODEL No: MSN-3DR-PE OPTION 118, HPR05W

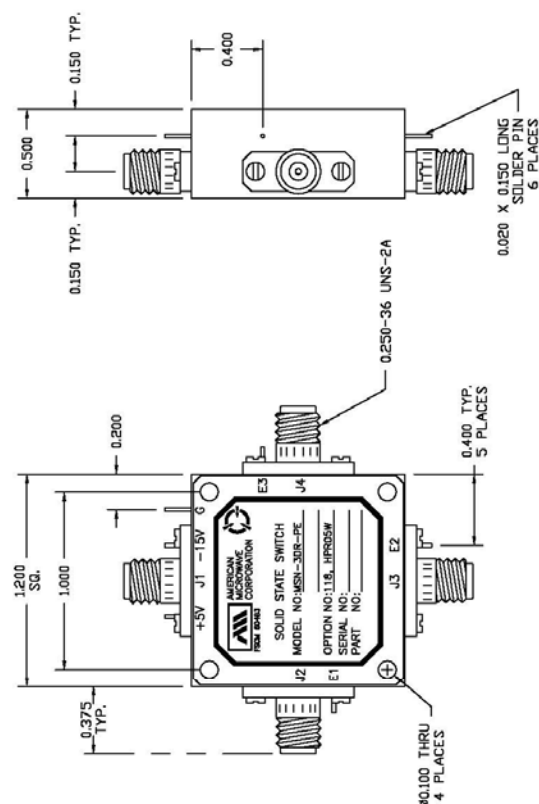
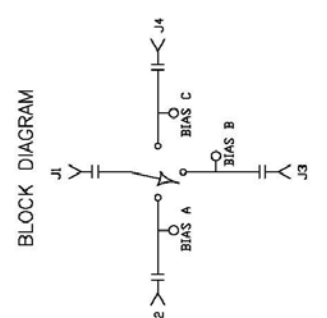
### FEATURES:

- **1 TO 18 GHz FREQUENCY RANGE**
- **HIGH POWER CAPABILITIES**
- **LOW INSERTION LOSS**

### SPECIFICATIONS:

- |                  |  |
|------------------|--|
| ● FREQUENCY      | : 1 TO 18 GHz                              |
| ● INSERTION LOSS | : 3.3 dB MINIMUM                           |
| ● ISOLATION      | : 65 dB MINIMUM                            |
| ● VSWR           | : 2.0:1 MAXIMUM                            |
| ● SPEED          | : RISE: 10 ns TYPICAL, 15 ns MAXIMUM       |
|                  | : FALL: 10 ns TYPICAL, 15 ns MAXIMUM       |
|                  | : DELAY ON: 75 ns TYPICAL, 100 ns MAXIMUM  |
|                  | : DELAY OFF: 75 ns TYPICAL, 100 ns MAXIMUM |
| ● POWER INPUT    | : 0.5 WATT                                 |
| ● SURVIVAL POWER | : 1 WATT CW, 10 WATTS PEAK 1 us            |
| ● CONTROL        | : TTL LOGIC "0"=ON, "1"=OFF                |
| ● POWER SUPPLY   | : +5 V @ 40 mA MAXIMUM                     |
|                  | : -15 V @ 40 mA MAXIMUM                    |

**PRODUCT FEATURE**

<p>REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ZONE</th> <th>REV.</th> <th>DESCRIPTION</th> <th>DATE</th> <th>APPROVED</th> </tr> <tr> <td></td> <td>1</td> <td>ORIGINAL JOB# 101013E</td> <td>02/02/01</td> <td></td> </tr> </table>	ZONE	REV.	DESCRIPTION	DATE	APPROVED		1	ORIGINAL JOB# 101013E	02/02/01		 <p>0.500 0.150 TYP. 0.150 TYP. 0.400 0.020 X 0.150 LONG SOLDER PIN 6 PLACES</p> <p>0.200 1.200 SQ. 1.000 0.375 TYP. 0.250-36 UNS-2A 0.400 TYP. 5 PLACES 80.000 THRU 4 PLACES</p>	<p>AMERICAN MICROWAVE CORPORATION      FREDERICK, MARYLAND</p> <p>PRODUCT FEATURE      MSN-3DR-PE      OPTIONS: 118, HPR05W</p> <p>SIZE FROM NO. A 60483 ENG. NO. 100-5953      SCALE 1:25:1 SHEET 1 of 3</p>
ZONE	REV.	DESCRIPTION	DATE	APPROVED								
	1	ORIGINAL JOB# 101013E	02/02/01									
<p><b>DESCRIPTION:</b>          AMC MODEL MSN-3DR-PE IS A SINGLE POLE THREE THROW, REFLECTIVE HIGH POWER SWITCH MODULE WITH LOW INSERTION LOSS, AND WITH INTEGRAL TTL DRIVER DESIGNED FOR 1 GHz TO 18 GHz OPERATION.</p> <p><b>SPECIFICATIONS:</b></p> <ul style="list-style-type: none"> <li>● FREQUENCY: . . . . . 1 GHz TO 18 GHz</li> <li>● INSERTION LOSS: . . . . . 3.3 dB MINIMUM</li> <li>● ISOLATION: . . . . . 65 dB MINIMUM</li> <li>● VSWR: . . . . . 2.0:1 MAXIMUM</li> <li>● SPEED: . . . . . RISE: 10ns TYPICAL, 15ns MAX. FALL: 10ns TYPICAL, 15ns MAX. DELAY ON: 75ns TYPICAL, 100ns MAX. DELAY OFF: 75ns TYPICAL, 100ns MAX.</li> <li>● POWER INPUT: . . . . . 0.5 WATT</li> <li>● SURVIVAL POWER: . . . . . 1 WATT CW, 10 WATTS PEAK 1 usec</li> <li>● CONTROL: . . . . . TTL LOGIC "0"=ON "1"=OFF</li> <li>● POWER SUPPLY: . . . . . +5V @ 40 mA MAX. -15V @ 40 mA MAX.</li> </ul>	<p><b>BLOCK DIAGRAM</b></p> 	<p><b>ENVIRONMENTAL RATINGS:</b></p> <ul style="list-style-type: none"> <li>● TEMPERATURE: . . . . . -55°C TO +85°C (OPERATING)</li> <li>● TEMPERATURE: . . . . . -55°C TO +125°C (STORAGE)</li> <li>● HUMIDITY: . . . . . MIL-STD-202F, METHOD 103B COND. B</li> <li>● SHOCK: . . . . . MIL-STD-202F, METHOD 213B COND. B</li> <li>● VIBRATION: . . . . . MIL-STD-202F, METHOD 204D COND. B</li> <li>● ALTITUDE: . . . . . MIL-STD-202F, METHOD 105C COND. B</li> <li>● TEMPERATURE CYCLE: . . . . . MIL-STD-202F, METHOD 107D COND. A</li> </ul> <p>NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION</p>										

**OUTLINE DRAWING**

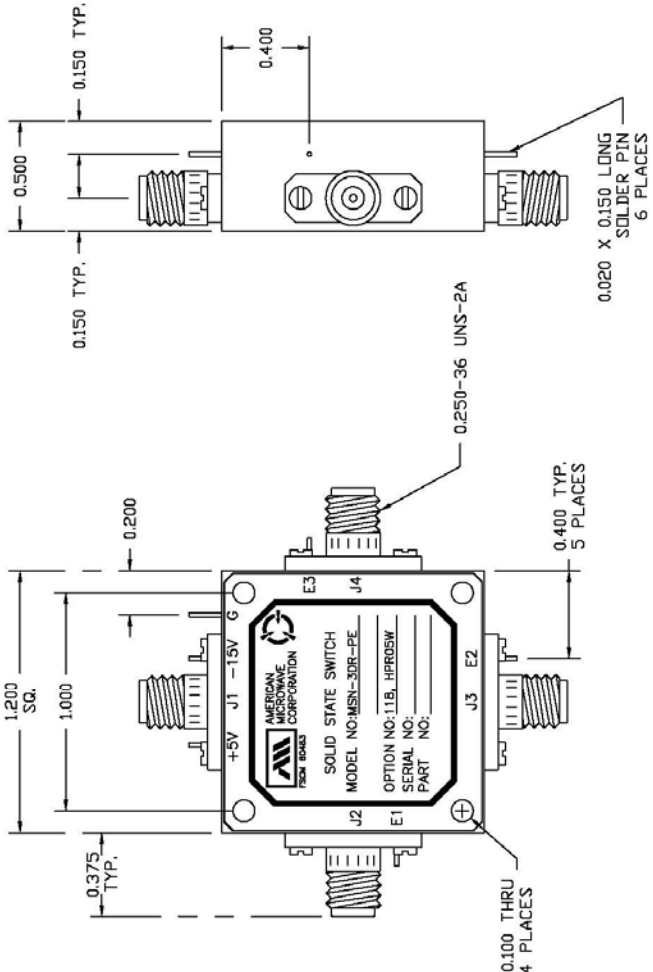
REVISIONS		DATE	APPROVED
ZONE	REV.	DESCRIPTION	DATE
		ORIGINAL JOB# 101013E	02/02/04

**DESCRIPTION:**  
 AMC MODEL MSN-3DR-PE IS A SINGLE POLE THREE THROW, REFLECTIVE HIGH POWER SWITCH MODULE WITH LOW INSERTION LOSS, AND WITH INTEGRAL TTL DRIVER DESIGNED FOR 1 GHz TO 18 GHz OPERATION.

PART NO.	DATE	TITLE	AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND
APPROVALS	02/02/04	OUTLINE DRAWING	
DRAWN: <i>WPC</i>	CHECKED:	MSN-3DR-PE	
ISSUED:		OPTIONS: 118, HPR05W	
		SIZE FROM NO. A 60483	REV. -
		SCALE 1.5:1	SHEET 2 of 3

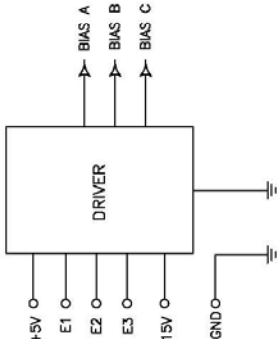
  



0.500  
0.150 TYP.  
0.150 TYP.  
0.400  
0.250-36 UNS-2A  
0.020 X 0.150 LONG SOLDER PIN 6 PLACES  
1.200 SQ.  
1.000  
0.375 TYP.  
0.200  
0.400 TYP. 5 PLACES  
φ0.100 THRU 4 PLACES

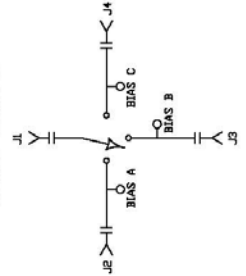
ALL DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 X.XX ±0.020  
 X.XXX ±0.010



DRIVER  
 BIAS A  
 BIAS B  
 BIAS C  
 -15V  
 GND

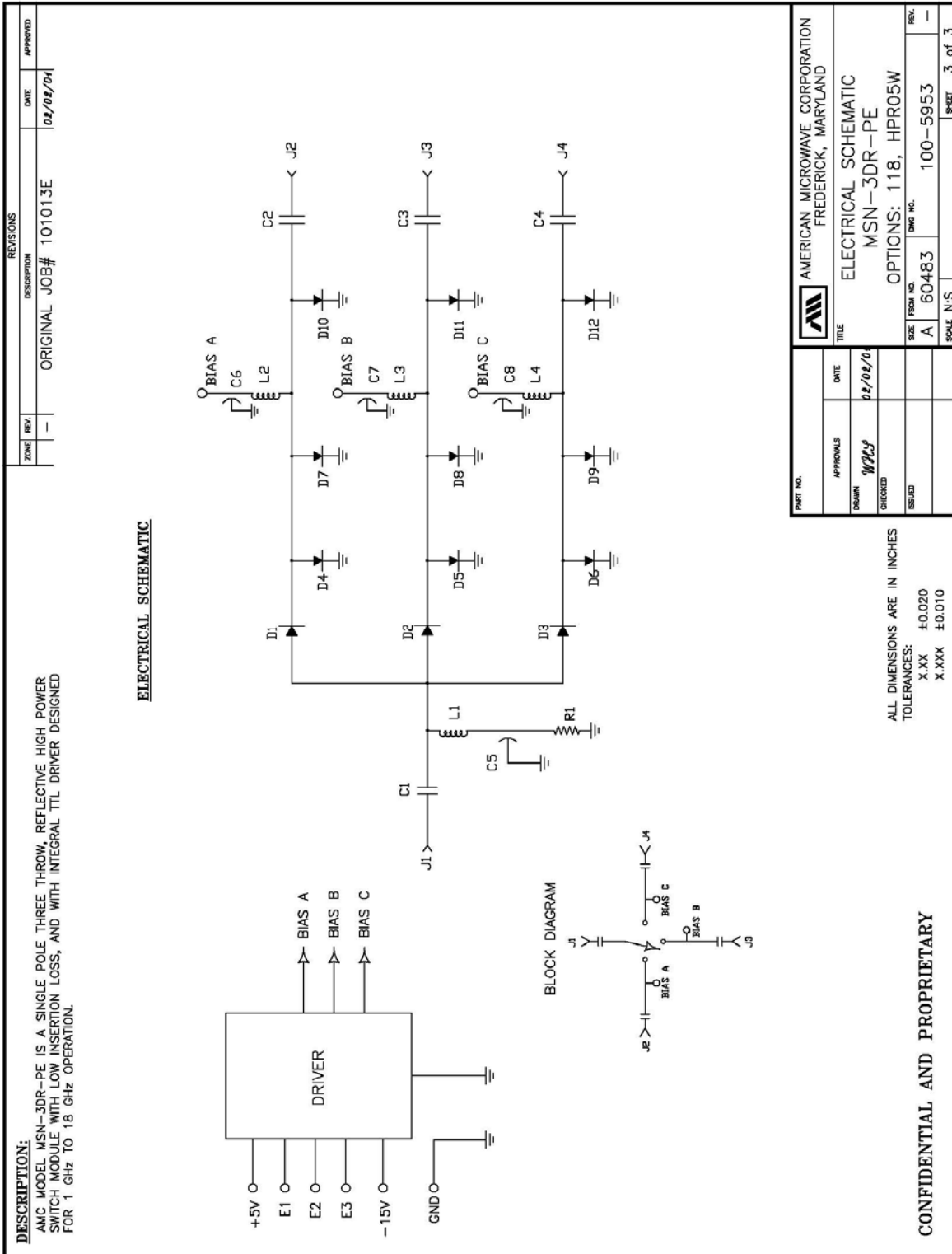
**BLOCK DIAGRAM**



J1  
BIAS A  
BIAS B  
BIAS C  
J4  
J2  
J3

**CONFIDENTIAL AND PROPRIETARY**

## FUNCTIONAL SCHEMATIC



## FINAL TEST DATA

FINAL TEST DATA SHEETS

FOR

AMC MODEL NUMBER

**MSN-3DR-PE**  
**OPTION 118, HPR05W**

Serial Numbers:

**3MS105104 THRU 3MS105108**





## FINAL TEST DATA

AMC MODEL NO: MSN-3DR-PE OPTION 118, HPR05W SERIAL NUMBER: 3MS105105

FORM: 100-5955



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: 6-15-01

CUSTOMER: PASTERNAK  
 JOB NO: 101013E  
 MODEL NO: MSN-3DR-PE  
 SERIAL NO: 3MS105105  
 CURRENT DRAW: +5 VDC @ 40mA; -15 VDC @ 20mA

TECHNICIAN: T. PHUNG  
 OPTION NO: 118, HPR05W  
 SPECIFICATION: \_\_\_\_\_  
 FREQUENCY RANGE: 1 GHz TO 18 GHz

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 2.34 dB	10.65 dB	1.83 : 1	13.34 dB	1.55 : 1	— dB	1. : 1
J1-J3 2.31 dB	12.71 dB	1.60 : 1	13.91 dB	1.51 : 1	— dB	1. : 1
J1-J4 2.17 dB	12.20 dB	1.65 : 1	15.92 dB	1.38 : 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
	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
J1-J2 > 65 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J1-J3 > 65 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
J1-J4 > 65 dB	< 100 nS	< 15 nS	< 100 nS	< 15 nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP 8720D

QA/QC APPROVAL: \_\_\_\_\_

INSP.  
BY  
QT

DATED: 6/21/01

**FINAL TEST DATA**

AMC MODEL NO: MSN-3DR-PE OPTION 118, HPR05W SERIAL NUMBER: 3MS105106

FORM: 100-5955



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: 6-15-04

CUSTOMER: PASTERNAK  
 JOB NO: 101013E  
 MODEL NO: MSN-3DR-PE  
 SERIAL NO: 3MS105106  
 CURRENT DRAW: +5 VDC @ 40mA; -15 VDC @ 20mA

TECHNICIAN: T. PHUNG  
 OPTION NO: 118, HPR05W  
 SPECIFICATION: \_\_\_\_\_  
 FREQUENCY RANGE: 1 GHz TO 18 GHz

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 <u>2.34</u> dB	<u>9.80</u> dB	<u>1.96</u> : 1	<u>14.96</u> dB	<u>1.44</u> : 1	<u>—</u> dB	<u>1. : 1</u>
J1-J3 <u>2.74</u> dB	<u>10.96</u> dB	<u>1.79</u> : 1	<u>9.92</u> dB	<u>1.94</u> : 1	<u>—</u> dB	<u>1. : 1</u>
J1-J4 <u>2.17</u> dB	<u>12.16</u> dB	<u>1.65</u> : 1	<u>17.21</u> dB	<u>1.32</u> : 1	<u>—</u> dB	<u>1. : 1</u>
	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	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
J1-J2 <u>&gt;65</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J1-J3 <u>&gt;65</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J1-J4 <u>&gt;65</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
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP 8720D

QA/QC APPROVAL: \_\_\_\_\_

INSP.  
BY  
01

DATED: 6/21/04



**FINAL TEST DATA**

AMC MODEL NO: MSN-3DR-PE OPTION 118, HPR05W SERIAL NUMBER: 3MS105107

FORM: 100-5955



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: 6-15-01

CUSTOMER: PASTERNAK  
 JOB NO: 101013E  
 MODEL NO: MSN-3DR-PE  
 SERIAL NO: 3MS105107  
 CURRENT DRAW: +5 VDC @ 40mA; -15 VDC @ 20 mA

TECHNICIAN: T. PHUNG  
 OPTION NO: 118, HPR05W  
 SPECIFICATION: \_\_\_\_\_  
 FREQUENCY RANGE: 1 GHz TO 18 GHz

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 <u>2.04</u> dB	<u>15.50</u> dB	<u>1.40</u> : 1	<u>15.00</u> dB	<u>1.43</u> : 1	<u>    </u> dB	<u>1. : 1</u>
J1-J3 <u>2.42</u> dB	<u>13.92</u> dB	<u>1.50</u> : 1	<u>12.38</u> dB	<u>1.63</u> : 1	<u>    </u> dB	<u>1. : 1</u>
J1-J4 <u>2.40</u> dB	<u>13.56</u> dB	<u>1.53</u> : 1	<u>12.18</u> dB	<u>1.65</u> : 1	<u>    </u> dB	<u>1. : 1</u>
	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	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
J1-J2 <u>&gt;65</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J1-J3 <u>&gt;65</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J1-J4 <u>&gt;65</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
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP 8720D

QA/QC APPROVAL: INSP. BY 01 DATED: 6/21/01



**FINAL TEST DATA**

AMC MODEL NO: MSN-3DR-PE OPTION 118, HPR05W SERIAL NUMBER: 3MS105108

FORM: 100-5955



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

DATE: 6/15/01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: PASTERNAK    TECHNICIAN: T. PHUNG  
 JOB NO: 101013E  
 MODEL NO: MSN-3DR-PE    OPTION NO: 118, HPR05W  
 SERIAL NO: 3MS105108    SPECIFICATION:  
 CURRENT DRAW: +5 VDC @40 mA; -15 VDC @20 mA                                  FREQUENCY RANGE: 1 GHz TO 18 GHz

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 <u>2.98</u> dB	<u>11.01</u> dB	<u>1.78</u> : 1	<u>17.50</u> dB	<u>1.31</u> : 1	— dB	1. : 1
J1-J3 <u>2.17</u> dB	<u>12.18</u> dB	<u>1.65</u> : 1	<u>16.29</u> dB	<u>1.36</u> : 1	— dB	1. : 1
J1-J4 <u>2.40</u> dB	<u>12.43</u> dB	<u>1.63</u> : 1	<u>14.64</u> dB	<u>1.46</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
	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
J1-J2 <u>&gt; 65</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J1-J3 <u>&gt; 65</u> dB	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS	<u>&lt; 100</u> nS	<u>&lt; 15</u> nS
J1-J4 <u>&gt; 65</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
	nS	nS	nS	nS
	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP 8720D

QA/QC APPROVAL: INSP. BY Q1    DATED: 6/21/01