



**TEST REPORT**  
**ON**  
**9 TO 10.5 GHz**  
**SINGLE POLE FOUR THROW**  
**PIN DIODE SWITCH**

**AMC MODEL No:**  
**MSNN-4DT-04T-STANDARD**  
**OPTION 911, HERM**

Serial Numbers: 4MS106202 THRU 4MS106205 AND 4MS106207 THRU 4MS106211

DESIGNED  
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**September 7, 2004**

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**ISO9001 : 1994 CERTIFIED**

*WTS DRH FA H*  
*JKM JDT KC HZ*  
*ESC HS H*

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## **SINGLE POLE FOUR THROW NON-REFLECTIVE / TERMINATED PIN DIODE SWITCH AMC MODEL No: MSNN-4DT-04T-STANDARD OPTIONS 911, HERM**

### **FEATURES:**

- **9 TO 10.5 GHz FREQUENCY RANGE**
- **HERMETICALLY SEALED**

### **SPECIFICATIONS:**

- |                  |  |
|------------------|--|
| ● FREQUENCY      | : 9 TO 10.5 GHz  |
| ● INSERTION LOSS | : 2.5 dB MAXIMUM   |
| ● ISOLATION      | : 60 dB MINIMUM  |
| ● VSWR           | : 1.8:1 MAXIMUM  |
| ● SPEED          | : DELAY ON: 150 nS MAXIMUM<br>: DELAY OFF: 150 nS MAXIMUM  |
| ● RF POWER       | : 20 dB MINIMUM  |
| ● CONTROL        | : TTL LOGIC "0"=ON, "1"=OFF                                |
| ● POWER SUPPLY   | : +5 VOLTS @ 150 mA MAXIMUM<br>: -5 VOLTS @ 150 mA MAXIMUM |



**PRODUCT FEATURE**

ZONE REV.	REVISIONS DESCRIPTION ORIGINAL JOB # 004071E	DATE 5/18/00	APPROVED
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**DESCRIPTION:**  
 THE MSNN-4DT-04T WITH OPTIONS 911, HERM, IS A HERMETICALLY SEALED UNIT OPTIMIZED FOR THE 9 TO 11 GHz FREQUENCY RANGE.

**SPECIFICATIONS:**

- FREQUENCY: . . . . . 9.0 GHz TO 11 GHz
- INSERTION LOSS: . . . . . 2.5 dB MAXIMUM
- ISOLATION: . . . . . 60 dB MINIMUM
- VSWR: . . . . . 1.8:1 MAXIMUM
- SPEED: . . . . . DELAY ON: 150ns MAXIMUM  
 DELAY OFF: 150ns MAXIMUM
- RF POWER: . . . . . 20 dBm MINIMUM
- CONTROL: . . . . . TTL LOGIC "0"=ON "1"=OFF
- POWER SUPPLY: . . . . . +5V @ 150 mA MAXIMUM  
 -5V @ 100 mA MAXIMUM

**ENVIRONMENTAL RATINGS:**

- TEMPERATURE: . . . . . -55°C TO +65°C (OPERATING)  
 -65°C TO +125°C (STORAGE)
- HUMIDITY: . . . . . MIL-STD-202F, METHOD 103B COND. B
- SHOCK: . . . . . MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: . . . . . MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: . . . . . MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: . . . . . MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

ALL DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 X.XX ±0.010  
 X.XXX ±0.005

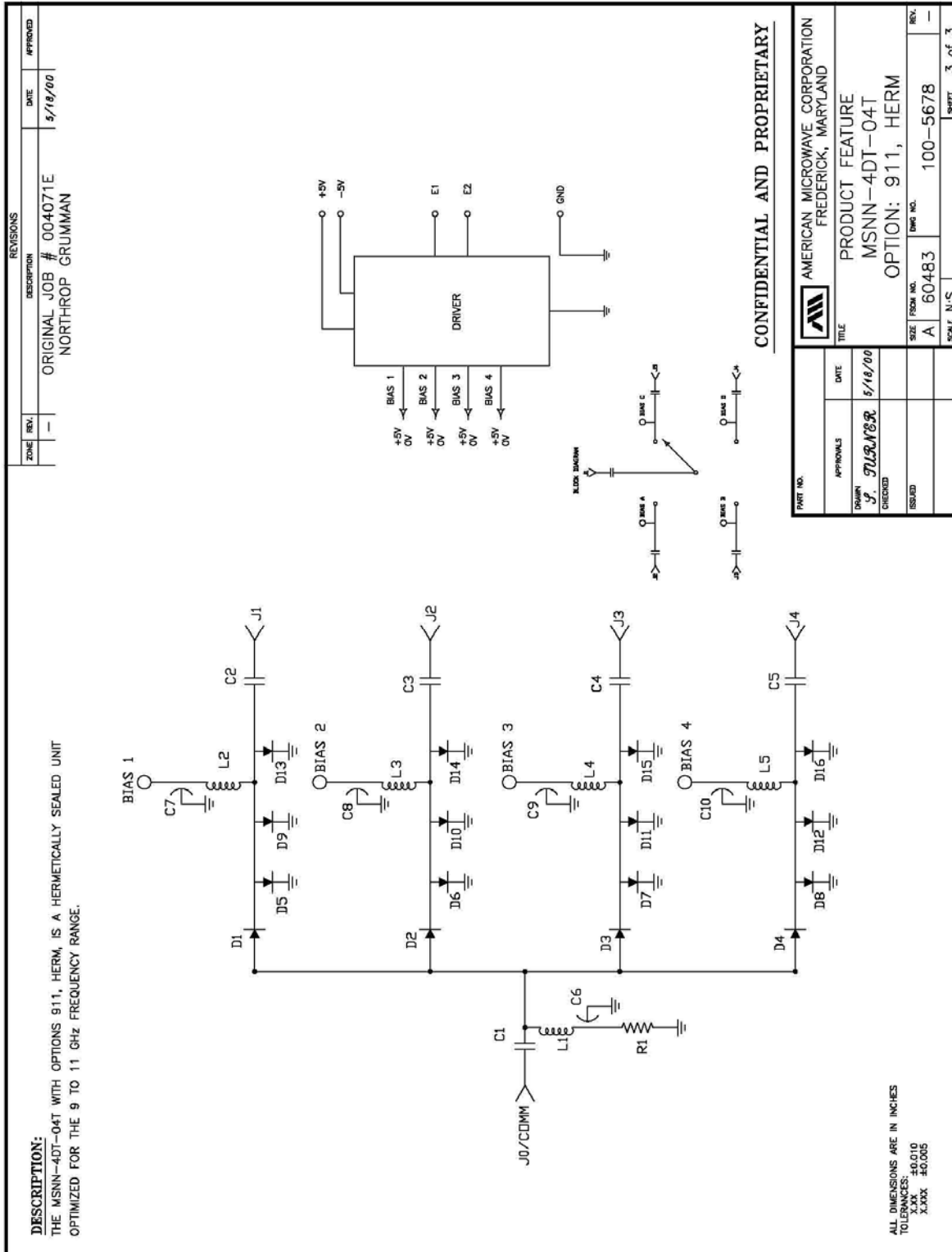
  

PART NO.	AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND	DATE	5/18/00
APPROVALS	TITLE	SIZE	DRG NO.
DESIGN J. J. J. J.	PRODUCT FEATURE MSNN-4DT-04T OPTION: 911, HERM	A	60483
CHECKED		SCALE	2:1
ISSUED		REV.	100-5678
			SHEET 1 of 3





**FUNCTIONAL SCHEMATIC**



## FINAL TEST DATA

FINAL TEST DATA SHEETS

FOR

AMC MODEL NUMBER

**MSNN-4DT-04T-STANDARD**  
**OPTION 911, HERM**

Serial Numbers:

**4MS106202 THRU 4MS106205 AND 4MS106207 THRU 4MS106211**



**FINAL TEST DATA**

AMC MODEL NO: MSNN-4DT-04T-STD OPTIONS 911, HERM, SERIAL NUMBER: 4MS106202

FORM: 088-SW-DT/ 12/00

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

DATE: 9/12/01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: NORTHROP GRUMMAN      TECHNICIAN: T. PHUNG  
 JOB NO: 104077  
 MODEL NO: MSNN-4DT-04T-STD      OPTION NO: 911, HERM  
 SERIAL NO: 4MS106202      SPECIFICATION:  
 RRENT DRAW: + 5 VDC @ 20 mA; - 5 VDC @ 40 mA      FREQUENCY RANGE: 9 - 10.5 GHz

INSERTION LOSS (WORSE CASE)	RETURN LOSS (WORSE CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 2.21 dB	16.88 dB	1.33 : 1	16.49 dB	1.35 : 1	15.80 dB	1.39 : 1
J1-J3 2.12 dB	16.22 dB	1.37 : 1	16.79 dB	1.34 : 1	20.12 dB	1.22 : 1
J1-J4 2.31 dB	14.49 dB	1.46 : 1	16.07 dB	1.37 : 1	21.93 dB	1.17 : 1
J1-J5 2.28 dB	17.46 dB	1.31 : 1	19.95 dB	1.22 : 1	21.73 dB	1.18 : 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 >60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J3 >60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J4 >60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J5 >60 dB	< 150 nS	— nS	< 150 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

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

QA/QC APPROVAL: INSP. BY \_\_\_\_\_ DATED: 9/12/01





**FINAL TEST DATA**

AMC MODEL NO: MSNN-4DT-04T-STD OPTIONS 911, HERM, SERIAL NUMBER: 4MS106203

FORM: 088-SW-DT 7/2/00



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

DATE: 9/12/01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: NORTHROP GRUMMAN      TECHNICIAN: T. PHUNG  
 JOB NO: 104077  
 MODEL NO: MSNN-4DT-04T-STD      OPTION NO: 911, HERM  
 SERIAL NO: 4MS106203      SPECIFICATION:  
 CURRENT DRAW: +5 VDC @20 mA; -5 VDC @40 mA      FREQUENCY RANGE: 9 - 10.5 GHz

INSERTION LOSS (WORSE CASE)	RETURN LOSS (WORSE CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 2.09 dB	21.13 dB	1.19 : 1	16.35 dB	1.36 : 1	13.72 dB	1.52 : 1
J1-J3 2.06 dB	15.01 dB	1.43 : 1	15.53 dB	1.40 : 1	21.13 dB	1.19 : 1
J1-J4 2.24 dB	13.14 dB	1.57 : 1	11.62 dB	1.71 : 1	12.07 dB	1.66 : 1
J1-J5 2.26 dB	17.69 dB	1.30 : 1	14.49 dB	1.46 : 1	12.33 dB	1.64 : 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 >60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J3 >60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J4 >60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J5 >60 dB	< 150 nS	— nS	< 150 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

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

QA/QC APPROVAL: INSP. BY n1 DATED: 9/12/01



**FINAL TEST DATA**

AMC MODEL NO: MSNN-4DT-04T-STD OPTIONS 911, HERM, SERIAL NUMBER: 4MS106204

FORM: 088-SW-DT 12/00

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: 9/12/01

CUSTOMER: NORTHROP GRUMMAN      TECHNICIAN: T. PHUNG  
 JOB NO: 104077  
 MODEL NO: MSNN-4DT-04T-STD      OPTION NO: 911, HERM  
 SERIAL NO: 4MS106204      SPECIFICATION:  
 CURRENT DRAW: +5 VDC @ 20 mA; -5 VDC @ 40 mA      FREQUENCY RANGE: 9 - 10.5 GHz

INSERTION LOSS (WORSE CASE)	RETURN LOSS (WORSE CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 <u>2.38</u> dB	<u>14.56</u> dB	<u>1.46</u> : 1	<u>17.21</u> dB	<u>1.32</u> : 1	<u>21.31</u> dB	<u>1.19</u> : 1
J1-J3 <u>2.31</u> dB	<u>16.20</u> dB	<u>1.37</u> : 1	<u>16.98</u> dB	<u>1.33</u> : 1	<u>17.65</u> dB	<u>1.30</u> : 1
J1-J4 <u>2.59</u> dB	<u>16.35</u> dB	<u>1.36</u> : 1	<u>16.86</u> dB	<u>1.34</u> : 1	<u>18.04</u> dB	<u>1.29</u> : 1
J1-J5 <u>2.29</u> dB	<u>18.12</u> dB	<u>1.28</u> : 1	<u>14.19</u> dB	<u>1.49</u> : 1	<u>13.66</u> dB	<u>1.52</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

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J1-J2 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J3 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J4 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J5 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</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

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

QA/QC APPROVAL: INSP BY Q1 \_\_\_\_\_ DATED: 9/12/01



**FINAL TEST DATA**

AMC MODEL NO: MSNN-4DT-04T-STD OPTIONS 911, HERM, SERIAL NUMBER: 4MS106205

FORM: 088-SW-DT, 12/00



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

DATE: 9/12/01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: NORTHROP GRUMMAN      TECHNICIAN: T. PHUNG  
 JOB NO: 104077  
 MODEL NO: MSNN-4DT-04T-STD      OPTION NO: 911, HERM  
 SERIAL NO: 4MS106205      SPECIFICATION:  
 TEST DRAW: +5 VDC @ 120 mA; -5 VDC @ 40 mA      FREQUENCY RANGE: 9 - 10.5 GHz

INSERTION LOSS (WORSE CASE)	RETURN LOSS (WORSE CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 2.07 dB	20.57 dB	1.21 : 1	14.94 dB	1.44 : 1	14.28 dB	1.48 : 1
J1-J3 2.03 dB	15.99 dB	1.38 : 1	13.60 dB	1.53 : 1	16.17 dB	1.37 : 1
J1-J4 2.42 dB	12.12 dB	1.66 : 1	12.32 dB	1.64 : 1	19.62 dB	1.23 : 1
J1-J5 2.09 dB	15.74 dB	1.39 : 1	12.56 dB	1.62 : 1	12.69 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	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 > 60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J3 > 60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J4 > 60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J5 > 60 dB	< 150 nS	— nS	< 150 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

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

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



**FINAL TEST DATA**

AMC MODEL NO: MSNN-4DT-04T-STD OPTIONS 911, HERM, SERIAL NUMBER: 4MS106207

FORM: 088-SW-DTA 12/00



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

DATE: 9/12/01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: NORTHROP GRUMMAN      TECHNICIAN: T. PHUNG  
 JOB NO: 104077  
 MODEL NO: MSNN-4DT-04T-STD      OPTION NO: 911, HERM  
 SERIAL NO: 4MS106207      SPECIFICATION:  
 CURRENT DRAW: +5 VDC @ 220 mA; -5 VDC @ 40 mA      FREQUENCY RANGE: 9 - 10.5 GHz

INSERTION LOSS (WORSE CASE)	RETURN LOSS (WORSE CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 <u>2.25</u> dB	<u>16.04</u> dB	<u>1.37</u> : 1	<u>16.35</u> dB	<u>1.56</u> : 1	<u>14.61</u> dB	<u>1.46</u> : 1
J1-J3 <u>1.94</u> dB	<u>15.95</u> dB	<u>1.38</u> : 1	<u>13.56</u> dB	<u>1.53</u> : 1	<u>14.74</u> dB	<u>1.45</u> : 1
J1-J4 <u>2.13</u> dB	<u>16.25</u> dB	<u>1.36</u> : 1	<u>13.44</u> dB	<u>1.54</u> : 1	<u>14.07</u> dB	<u>1.49</u> : 1
J1-J5 <u>2.31</u> dB	<u>15.75</u> dB	<u>1.39</u> : 1	<u>14.76</u> dB	<u>1.45</u> : 1	<u>13.00</u> dB	<u>1.58</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

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J1-J2 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J3 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J4 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J5 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</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

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

QA/QC APPROVAL: INSP. BY 01 DATED: 9/12/01



**FINAL TEST DATA**

AMC MODEL NO: MSNN-4DT-04T-STD OPTIONS 911, HERM, SERIAL NUMBER: 4MS106208

FORM: 088-SW-DTA-12/00



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

DATE: 9/12/01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: NORTHROP GRUMMAN      TECHNICIAN: T. PHUNG  
 JOB NO: 104077  
 MODEL NO: MSNN-4DT-04T-STD      OPTION NO: 911, HERM  
 SERIAL NO: 4MS106208      SPECIFICATION:  
 RRENT DRAW: + 5 VDC @ 20 mA; - 5 VDC @ 40 mA      FREQUENCY RANGE: 9 - 10.5 GHz

INSERTION LOSS (WORSE CASE)	RETURN LOSS (WORSE CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 2.37 dB	13.30 dB	1.55 : 1	16.69 dB	1.34 : 1	14.39 dB	1.47 : 1
J1-J3 2.16 dB	14.23 dB	1.48 : 1	13.05 dB	1.57 : 1	14.14 dB	1.49 : 1
J1-J4 2.17 dB	14.09 dB	1.49 : 1	15.17 dB	1.42 : 1	14.61 dB	1.46 : 1
J1-J5 2.25 dB	14.05 dB	1.49 : 1	14.64 dB	1.46 : 1	14.95 dB	1.44 : 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 >60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J3 >60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J4 >60 dB	< 150 nS	— nS	< 150 nS	— nS
J1-J5 >60 dB	< 150 nS	— nS	< 150 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

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

QA/QC APPROVAL: INSP. BY 01 DATED: 9/12/01

**FINAL TEST DATA**

AMC MODEL NO: MSNN-4DT-04T-STD OPTIONS 911, HERM, SERIAL NUMBER: 4MS106209

FORM: 088-SW-DTA-07/00



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

DATE: 9/12/04

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: NORTHROP GRUMMAN      TECHNICIAN: T. PHUNG  
 JOB NO: 104077  
 MODEL NO: MSNN-4DT-04T-STD      OPTION NO: 911, HERM  
 SERIAL NO: 4MS106209      SPECIFICATION:  
 CURRENT DRAW: +5 VDC @ 20 mA; -5 VDC @ 40 mA      FREQUENCY RANGE: 9 - 10.5 GHz

INSERTION LOSS (WORSE CASE)	RETURN LOSS (WORSE CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 <u>2.25</u> dB	<u>17.15</u> dB	<u>1.32</u> : 1	<u>19.15</u> dB	<u>1.25</u> : 1	<u>16.34</u> dB	<u>1.36</u> : 1
J1-J3 <u>2.40</u> dB	<u>15.25</u> dB	<u>1.42</u> : 1	<u>16.73</u> dB	<u>1.34</u> : 1	<u>20.91</u> dB	<u>1.20</u> : 1
J1-J4 <u>2.17</u> dB	<u>15.25</u> dB	<u>1.42</u> : 1	<u>13.47</u> dB	<u>1.54</u> : 1	<u>16.27</u> dB	<u>1.36</u> : 1
J1-J5 <u>2.17</u> dB	<u>19.21</u> dB	<u>1.25</u> : 1	<u>14.67</u> dB	<u>1.45</u> : 1	<u>13.70</u> dB	<u>1.52</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

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J1-J2 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J3 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J4 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J5 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</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

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

QA/QC APPROVAL: INSP BY 01 DATED: 9/12/04



**FINAL TEST DATA**

AMC MODEL NO: MSNN-4DT-04T-STD OPTIONS 911, HERM, SERIAL NUMBER: 4MS106210

FORM: 088-SW-DTA-07/02/00



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

DATE: 9/12/01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: NORTHROP GRUMMAN      TECHNICIAN: T. PHUNG  
 JOB NO: 104077  
 MODEL NO: MSNN-4DT-04T-STD      OPTION NO: 911, HERM  
 SERIAL NO: 4MS106210      SPECIFICATION:  
 TEST DRAW: +5 VDC @ 20 mA; -5 VDC @ 40 mA      FREQUENCY RANGE: 9 - 10.5 GHz

INSERTION LOSS (WORSE CASE)	RETURN LOSS (WORSE CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 <u>2.01</u> dB	<u>21.78</u> dB	<u>1.18</u> : 1	<u>18.21</u> dB	<u>1.28</u> : 1	<u>13.77</u> dB	<u>1.52</u> : 1
J1-J3 <u>2.26</u> dB	<u>16.74</u> dB	<u>1.34</u> : 1	<u>13.79</u> dB	<u>1.51</u> : 1	<u>13.96</u> dB	<u>1.50</u> : 1
J1-J4 <u>2.22</u> dB	<u>16.04</u> dB	<u>1.37</u> : 1	<u>13.09</u> dB	<u>1.57</u> : 1	<u>12.41</u> dB	<u>1.63</u> : 1
J1-J5 <u>2.18</u> dB	<u>17.44</u> dB	<u>1.31</u> : 1	<u>13.05</u> dB	<u>1.57</u> : 1	<u>12.82</u> dB	<u>1.59</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

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J1-J2 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J3 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J4 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J5 <u>&gt;60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</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

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

QA/QC APPROVAL: INSP. BY 01 DATED: 9/12/01



**FINAL TEST DATA**

AMC MODEL NO: MSNN-4DT-04T-STD OPTIONS 911, HERM, SERIAL NUMBER: 4MS106211

FORM: 088-SW-D 0 12/00



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

DATE: 9/12/01

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: NORTHROP GRUMMAN      TECHNICIAN: T. PHUNG  
 JOB NO: 104077  
 MODEL NO: MSNN-4DT-04T-STD      OPTION NO: 911, HERM  
 SERIAL NO: 4MS106211      SPECIFICATION:  
 CURRENT DRAW: +5 VDC @ 20 mA; -5 VDC @ 40 mA      FREQUENCY RANGE: 9 - 10.5 GHz

INSERTION LOSS (WORSE CASE)	RETURN LOSS (WORSE CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
J1-J2 <u>2.22</u> dB	<u>14.67</u> dB	<u>1.45</u> : 1	<u>14.69</u> dB	<u>1.45</u> : 1	<u>12.06</u> dB	<u>1.66</u> : 1
J1-J3 <u>2.31</u> dB	<u>14.81</u> dB	<u>1.44</u> : 1	<u>12.01</u> dB	<u>1.67</u> : 1	<u>15.17</u> dB	<u>1.42</u> : 1
J1-J4 <u>2.18</u> dB	<u>15.82</u> dB	<u>1.39</u> : 1	<u>15.53</u> dB	<u>1.40</u> : 1	<u>18.51</u> dB	<u>1.27</u> : 1
J1-J5 <u>2.20</u> dB	<u>16.04</u> dB	<u>1.37</u> : 1	<u>13.04</u> dB	<u>1.57</u> : 1	<u>13.27</u> dB	<u>1.55</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

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J1-J2 <u>&gt; 60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J3 <u>&gt; 60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J4 <u>&gt; 60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</u> nS
J1-J5 <u>&gt; 60</u> dB	<u>&lt; 150</u> nS	<u>—</u> nS	<u>&lt; 150</u> nS	<u>—</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

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

QA/QC APPROVAL: INSP. BY QI \_\_\_\_\_ DATED: 9/12/01