



**TEST REPORT**  
**ON**  
**0.1 GHz TO 18 GHz**  
**MINIATURE, REFLECTIVE**  
**SP5T SOLID STATE RECTANGULAR SWITCH**

**AMC MODEL No:**  
**MSNN-5DR-035T-CS00318-01**

Serial Numbers: 5MS305028-5MS305047

**DESIGNED**  
**BY**  
**A. K. Gorwara & R. Afable**

**TESTED**  
**BY**  
**T. PHUNG**

**REPORTED**  
**BY**  
**W. STEINHAUS**

**February 9, 2004.**

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**ISO9001 : 1994 CERTIFIED**

*Handwritten signatures and initials:*  
JWS  
DRH  
WAS  
JPT  
LC  
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## SP5T, REFLECTIVE, SOLID STATE SWITCH AMC MODEL No: MSNN-5DR-035T-CS00318-01

### FEATURES:

- **0.1 TO 18 GHz FREQUENCY RANGE**
- **REFLECTIVE**
- **SLIM LINE**

### SPECIFICATIONS:

- **FREQUENCY** : 0.1 GHz TO 18 GHz
- **INSERTION LOSS** : 4.0 dB Maximum
- **ISOLATION** : 50 dB Minimum
- **VSWR** : 2.2:1
- **RF POWER RATING** : +23 dBm CW Maximum
- **SWITCHING TIME** : 100 nS Maximum
- **CONTROLS** : See Logic Table
- **DC POWER SUPPLY** : +5V @ 150 mA Maximum  
-5V @ 50 mA Maximum
- **SIZE** : 1.70" (L) x 1.50" (W) x 0.35" (H)

### ENVIRONMENTAL RATINGS:

ENVIRONMENTAL RATINGS	
TEMPERATURE	-55°C TO +85°C OPERATING
	-65°C TO +125°C NON-OPERATING
HUMIDITY	20% TO 95% NON-CONDENSING
ALTITUDE RATINGS	SEA LEVEL TO 10,000 FEET OPERATING
	SEA LEVEL TO 50,000 FEET NON-OPERATING



**PRODUCT FEATURE**

**REVISIONS**

ZONE	REV	DESCRIPTION	DATE	APPROVED
		ORIGINAL RELEASE JOB# 303038E	5/13/03	

**PIN DIODE SWITCH**  
 AMERICAN MICROWAVE CORPORATION  
 FSCM 60483  
 MODEL NO: MSNN-5DR-035T-CS00318-01  
 OPTION NO: 5MSXXXXXX  
 SERIAL NO: 5MSXXXXXX  
 PART NO: CS00318-01

**CONFIDENTIAL AND PROPRIETARY**

**PRODUCT DESCRIPTION:**  
 AMC MODEL MSNN-5DR-035T-CS00318-01 IS A SLIM LINE SINGLE POLE FIVE THROW SOLID STATE SWITCH THAT WORKS FROM 0.1 GHz TO 18 GHz WITH A BUILT IN TTL DRIVER.

**SPECIFICATIONS:**

- FREQUENCY RANGE: 0.1 TO 18 GHz
- INSERTION LOSS: 4.0 dB MAXIMUM
- ISOLATION: 50 dB MINIMUM
- VSWR: 2.2:1
- RF POWER RATING: +23 dBm CW MAXIMUM
- SWITCHING TIME: 100 nSec MAXIMUM
- CONTROLS: SEE LOGIC TABLE BELOW
- DC POWER SUPPLY: +5V @ 150 mA MAXIMUM  
-5V @ 50 mA MAXIMUM
- SIZE: 1.70L x 1.50W x 0.35H

**LOGIC TABLE**

SELECT	E1	E2	E3
J1	0	0	0
J2	0	0	1
J3	0	1	0
J4	0	1	1
J5	1	0	0
OFF	1	1	1

**ENVIRONMENTAL RATINGS:**

**TEMPERATURE RATINGS:**

- OPERATING: -55°C TO +85°C
- NON-OPERATING: -65°C TO +125°C

**HUMIDITY:** 20% TO 95% NON-CONDENSING

**ALTITUDE RATINGS:**

- OPERATING: SEA LEVEL TO 10,000 ft.
- NON-OPERATING: SEA LEVEL TO 50,000 ft.

**\*NOTE:** THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION.

**ALL DIMENSIONS ARE IN INCHES**  
 TOLERANCES:  
 .0000 .0010  
 .0010 .0020  
 .0020 .0050

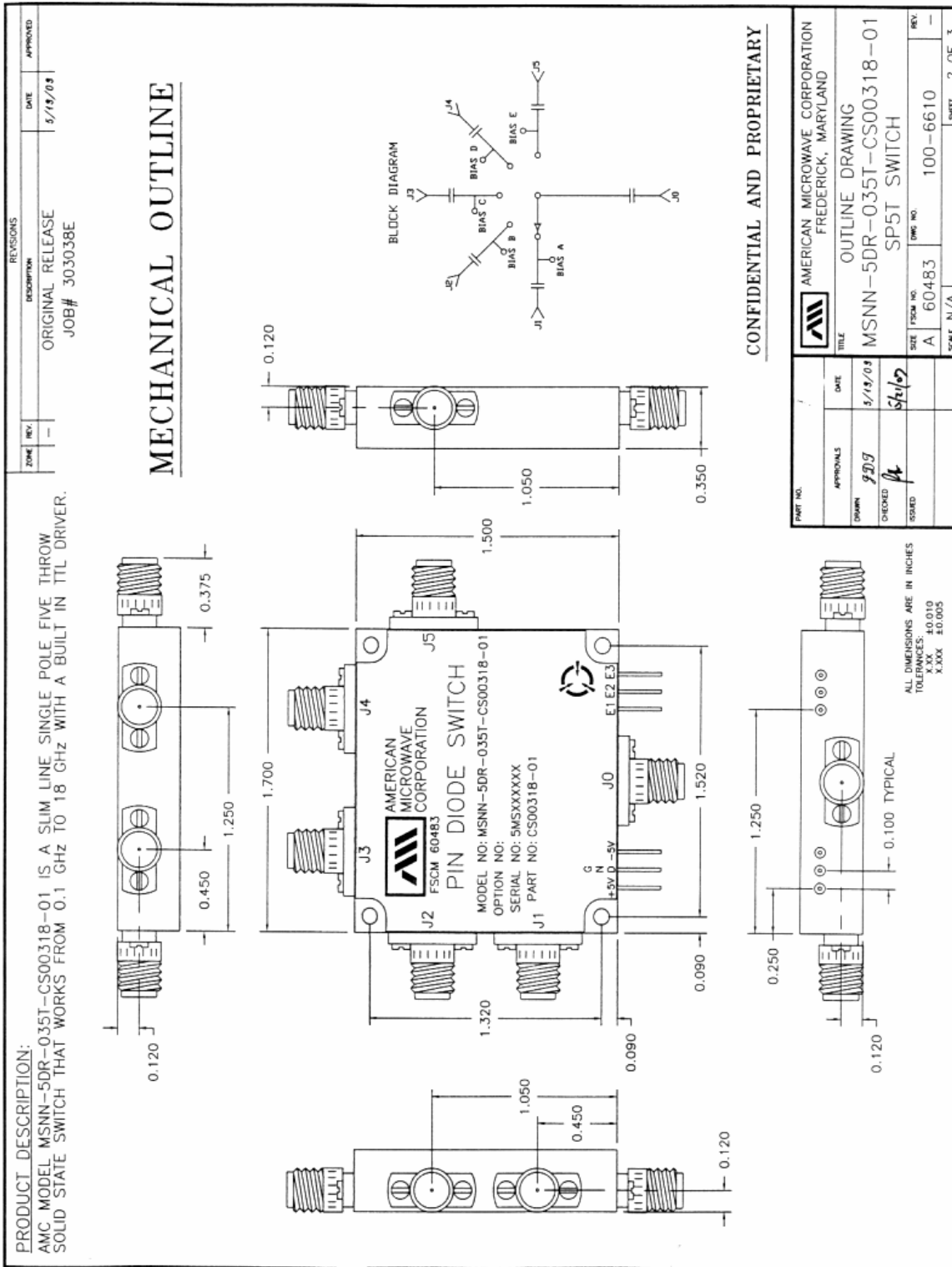
APPROVALS	DATE
DESIGNED: <i>9/10/03</i>	5/13/03
CHECKED: <i>fa</i>	
CREATED: <i>9/10/03</i>	

**AMERICAN MICROWAVE CORPORATION**  
 FREDERICK, MARYLAND

**TITLE:** PRODUCT FEATURE  
**MSNN-5DR-035T-CS00318-01**  
**SP5T SWITCH**

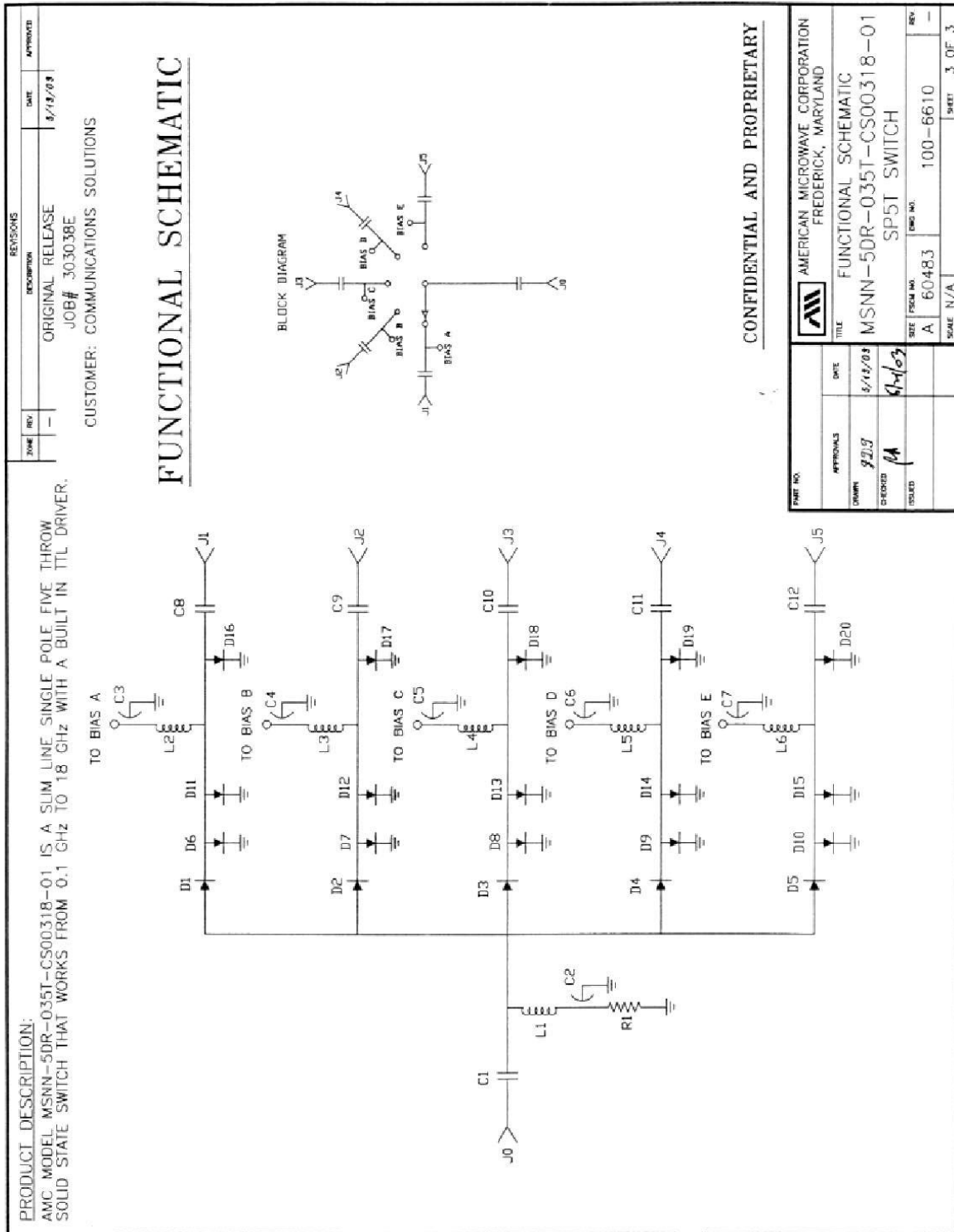
SIZE: FSCM NO. 60483    ENG. NO. 100-6610    REV. -  
 SCALE: N/A    SHEET 1 OF 3

**MECHANICAL OUTLINE**





**FUNCTIONAL SCHEMATIC**



**FINAL TEST DATA**

FINAL TEST DATA SHEETS

FOR

AMC MODEL NUMBER

**MSNN-5DR-035T-CS00318-01**

Serial Numbers:

**5MS305028 - 5MS305047**

**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305028

FORM: SW-DTA  
 DATE: June 6, 2003



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FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: Comm. Solutions  
 JOB NO: 303038E  
 MODEL NO: MSNN-5DR-03T-CS00318-01  
 SERIAL NO: 5MS305028  
 CURRENT DRAW: +5 VDC @ 103 mA; -5 VDC @ 24 mA

TECHNICIAN: T. Phung  
 CUSTOMER PART NO:  
 OPTION NO: None  
 SPECIFICATION: MIL-STD-454  
 FREQUENCY RANGE: 0.1 GHz - 18.0 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
J0-J1	2.66 dB @ 0.1-18 GHz	14.17 dB	1.49 : 1	14.25 dB	1.48 : 1	dB	: 1
J0-J2	2.33 dB @ 0.1-18 GHz	17.91 dB	1.29 : 1	17.08 dB	1.33 : 1	dB	: 1
J0-J3	2.65 dB @ 0.1-18 GHz	13.63 dB	1.53 : 1	14.57 dB	1.46 : 1	dB	: 1
J0-J4	2.66 dB @ 0.1-18 GHz	14.40 dB	1.47 : 1	15.97 dB	1.38 : 1	dB	: 1
J0-J5	2.58 dB @ 0.1-18 GHz	13.13 dB	1.57 : 1	12.34 dB	1.64 : 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1

ISOLATION		SWITCHING SPEED			
		DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1	70.78 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J2	70.03 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J3	71.92 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J4	71.24 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J5	74.14 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS

\* DENOTES A FAILURE

TESTED ON: HP8722ES

QA/QC APPROVAL: Dwight V. Smith PS DATED: 6/6/03





**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305029

FORM: SW-DTA  
 DATE: June 6, 2003



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FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: Comm. Solutions      TECHNICIAN: T. Phung  
 JOB NO: 303038E      CUSTOMER PART NO: \_\_\_\_\_  
 MODEL NO: MSNN-5DR-03T-CS00318-01      OPTION NO: None  
 SERIAL NO: 5MS305029      SPECIFICATION: MIL-STD-454  
 CURRENT DRAW: + 5 VDC @ 103 mA; - 5 VDC @ 23 mA      FREQUENCY RANGE: 0.1 GHz - 18.0 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
J0-J1	2.66 dB @ 0.1-18 GHz	12.97 dB	1.58 : 1	11.75 dB	1.70 : 1	dB	: 1
J0-J2	2.27 dB @ 0.1-18 GHz	13.46 dB	1.54 : 1	13.21 dB	1.56 : 1	dB	: 1
J0-J3	2.33 dB @ 0.1-18 GHz	12.43 dB	1.63 : 1	14.01 dB	1.50 : 1	dB	: 1
J0-J4	2.56 dB @ 0.1-18 GHz	12.73 dB	1.60 : 1	13.94 dB	1.50 : 1	dB	: 1
J0-J5	2.44 dB @ 0.1-18 GHz	11.63 dB	1.71 : 1	11.16 dB	1.77 : 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1

ISOLATION		SWITCHING SPEED			
		DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1	69.50 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J2	70.94 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J3	68.19 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J4	63.97 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J5	70.06 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS

\* DENOTES A FAILURE

TESTED ON: HP8722ES

QA/QC APPROVAL: Dwight V. Smith      02      DATED: 6/06/03



**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305030

FORM: SW-DTA  
 DATE: June 6, 2003



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FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER:	Comm. Solutions	TECHNICIAN:	T. Phung
JOB NO:	303038E	CUSTOMER PART NO:	
MODEL NO:	MSNN-5DR-03T-CS00318-01	OPTION NO:	None
SERIAL NO:	5MS305030	SPECIFICATION:	MIL-STD-454
CURRENT DRAW:	+ 5 VDC @ 92 mA; - 5 VDC @ 24 mA	FREQUENCY RANGE:	0.1 GHz - 18.0 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
J0-J1	2.62 dB @ 0.1-18 GHz	12.99 dB	1.58 : 1	15.07 dB	1.43 : 1	dB	: 1
J0-J2	2.63 dB @ 0.1-18 GHz	13.77 dB	1.52 : 1	14.78 dB	1.45 : 1	dB	: 1
J0-J3	3.01 dB @ 0.1-18 GHz	11.97 dB	1.67 : 1	12.39 dB	1.63 : 1	dB	: 1
J0-J4	2.28 dB @ 0.1-18 GHz	11.93 dB	1.68 : 1	13.15 dB	1.56 : 1	dB	: 1
J0-J5	2.74 dB @ 0.1-18 GHz	12.25 dB	1.65 : 1	13.77 dB	1.52 : 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1

ISOLATION		SWITCHING SPEED			
		DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1	68.66 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J2	67.74 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J3	72.36 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J4	71.09 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J5	65.72 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS

\* DENOTES A FAILURE

TESTED ON: HP8722ES

QA/QC APPROVAL: Dwight V. Smith **Q2** DATED: 6/06/03

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**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305031

FORM: SW-DTA  
 DATE: June 6, 2003



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FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: Comm. Solutions      TECHNICIAN: T. Phung  
 JOB NO: 303038E      CUSTOMER PART NO: \_\_\_\_\_  
 MODEL NO: MSNN-5DR-03T-CS00318-01      OPTION NO: None  
 SERIAL NO: 5MS305031      SPECIFICATION: MIL-STD-454  
 CURRENT DRAW: + 5 VDC @ 104 mA; - 5 VDC @ 24 mA      FREQUENCY RANGE: 0.1 GHz - 18.0 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
J0-J1	2.74 dB @ 0.1-18 GHz	12.07 dB	1.66 : 1	14.57 dB	1.46 : 1	dB	: 1
J0-J2	2.49 dB @ 0.1-18 GHz	13.28 dB	1.55 : 1	12.73 dB	1.60 : 1	dB	: 1
J0-J3	2.94 dB @ 0.1-18 GHz	11.35 dB	1.74 : 1	10.57 dB	1.84 : 1	dB	: 1
J0-J4	2.69 dB @ 0.1-18 GHz	11.50 dB	1.73 : 1	12.11 dB	1.66 : 1	dB	: 1
J0-J5	2.87 dB @ 0.1-18 GHz	12.07 dB	1.66 : 1	12.36 dB	1.64 : 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1

ISOLATION		SWITCHING SPEED			
		DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1	62.48 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J2	64.30 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J3	69.07 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J4	64.57 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
J0-J5	71.18 dB @ 0.1-18 GHz	50 nS	nS	50 nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS

\* DENOTES A FAILURE

TESTED ON: HP8722ES

QA/QC APPROVAL: Dwight V. Smith Q2 DATED: 6/06/03





**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305033

FORM: 424-SW-DTA  
 DATE: 6-27-03



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FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: COMMUNICATIONS SOLUTIONS      TECHNICIAN: T. PHUNG  
 JOB NO: 303038E  
 MODEL NO: MSNN-5DR-035T-CS00318-01      OPTION NO: \_\_\_\_\_  
 SERIAL NO: 5MS305033      SPECIFICATION: \_\_\_\_\_  
 CURRENT DRAW: + 5 VDC @ 100 mA; - 5 VDC @ 28 mA      FREQUENCY RANGE: 0.1 - 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
J0-J1 <u>2.81</u> dB @ 0.1-18 GHz	<u>12.50</u> dB	<u>1.62</u> : 1	<u>13.54</u> dB	<u>1.53</u> : 1		
J0-J2 <u>2.77</u> dB @ 0.1-18 GHz	<u>13.97</u> dB	<u>1.50</u> : 1	<u>17.37</u> dB	<u>1.31</u> : 1		
J0-J3 <u>2.43</u> dB @ 0.1-18 GHz	<u>13.86</u> dB	<u>1.51</u> : 1	<u>14.70</u> dB	<u>1.45</u> : 1		
J0-J4 <u>2.24</u> dB @ 0.1-18 GHz	<u>15.15</u> dB	<u>1.42</u> : 1	<u>16.38</u> dB	<u>1.36</u> : 1		
J0-J5 <u>2.58</u> dB @ 0.1-18 GHz	<u>14.01</u> dB	<u>1.50</u> : 1	<u>14.27</u> dB	<u>1.48</u> : 1		
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1 <u>56</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>30</u> nS	<u>2</u> nS
J0-J2 <u>58</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>30</u> nS	<u>2</u> nS
J0-J3 <u>60</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>30</u> nS	<u>2</u> nS
J0-J4 <u>58</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>30</u> nS	<u>2</u> nS
J0-J5 <u>60</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>30</u> nS	<u>2</u> nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP 8722ES

QA/QC APPROVAL: Dwight V. Smith Q2 DATED: 6/27/03

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**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305034

FORM: 424-SW-DTA  
 DATE: 7-03-03



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FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: COMMUNICATIONS SOLUTIONS      TECHNICIAN: T. PHUNG  
 JOB NO: 303038E  
 MODEL NO: MSNN-5DR-035T-CS00318-01      OPTION NO:  
 SERIAL NO: 5MS 305034      SPECIFICATION:  
 CURRENT DRAW: +5 VDC @ 94 mA; -5 VDC @ 27 mA      FREQUENCY RANGE: 0.1 - 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
J0-J1 <u>2.10</u> dB @ 0.1-18 GHz	<u>13.94</u> dB	<u>1.50</u> : 1	<u>13.60</u> dB	<u>1.53</u> : 1	dB	: 1
J0-J2 <u>1.95</u> dB @ 0.1-18 GHz	<u>14.19</u> dB	<u>1.49</u> : 1	<u>12.98</u> dB	<u>1.58</u> : 1	dB	: 1
J0-J3 <u>1.83</u> dB @ 0.1-18 GHz	<u>15.86</u> dB	<u>1.38</u> : 1	<u>14.84</u> dB	<u>1.44</u> : 1	dB	: 1
J0-J4 <u>1.89</u> dB @ 0.1-18 GHz	<u>16.22</u> dB	<u>1.37</u> : 1	<u>15.44</u> dB	<u>1.41</u> : 1	dB	: 1
J0-J5 <u>1.81</u> dB @ 0.1-18 GHz	<u>14.73</u> dB	<u>1.47</u> : 1	<u>15.81</u> dB	<u>1.39</u> : 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1 <u>58</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J2 <u>63</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J3 <u>60</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J4 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J5 <u>62</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>40</u> nS	<u>5</u> nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP8722ES  
 QA/QC APPROVAL: Dwight V. Smith **Q2** DATED: 7/07/03



**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305035

FORM: 424-SW-DTA  
 DATE: 7-03-03



AMERICAN MICROWAVE CORPORATION  
 7311-G GROVE RD., FREDERICK MD 21704  
 TEL: 301-662-4700 FAX: 301-662-4938  
 URL: WWW.AMERICANMICROWAVECORP.COM  
 E-MAIL: SALES@AMERICANMICROWAVECORP.COM

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: COMMUNICATIONS SOLUTIONS      TECHNICIAN: T. PHUNG  
 JOB NO: 303038E  
 MODEL NO: MSNN-5DR-035T-CS00318-01      OPTION NO: \_\_\_\_\_  
 SERIAL NO: 5MS305035      SPECIFICATION: \_\_\_\_\_  
 CURRENT DRAW: +5 VDC @ 94mA; -5 VDC @ 27mA      FREQUENCY RANGE: 0.1 - 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
J0-J1 <u>2.28</u> dB @ 0.1-18 GHz	<u>11.35</u> dB	<u>1.74</u> : 1	<u>12.35</u> dB	<u>1.64</u> : 1	dB	: 1
J0-J2 <u>2.15</u> dB @ 0.1-18 GHz	<u>12.28</u> dB	<u>1.64</u> : 1	<u>12.55</u> dB	<u>1.62</u> : 1	dB	: 1
J0-J3 <u>2.09</u> dB @ 0.1-18 GHz	<u>13.65</u> dB	<u>1.52</u> : 1	<u>13.69</u> dB	<u>1.52</u> : 1	dB	: 1
J0-J4 <u>2.46</u> dB @ 0.1-18 GHz	<u>13.50</u> dB	<u>1.54</u> : 1	<u>16.28</u> dB	<u>1.36</u> : 1	dB	: 1
J0-J5 <u>2.24</u> dB @ 0.1-18 GHz	<u>13.73</u> dB	<u>1.52</u> : 1	<u>14.82</u> dB	<u>1.44</u> : 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1 <u>62</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>35</u> nS	<u>5</u> nS
J0-J2 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>35</u> nS	<u>5</u> nS
J0-J3 <u>59</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>35</u> nS	<u>5</u> nS
J0-J4 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>35</u> nS	<u>5</u> nS
J0-J5 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>35</u> nS	<u>5</u> nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP8722Es

QA/QC APPROVAL: Dwight V. Smith      **Q2** DATED: 7/07/03

**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305036

FORM: 424-SW-DTA  
 DATE: 7-03-03



AMERICAN MICROWAVE CORPORATION  
 7311-G GROVE RD., FREDERICK MD 21704  
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 URL: WWW.AMERICANMICROWAVECORP.COM  
 E-MAIL: SALES@AMERICANMICROWAVECORP.COM

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: COMMUNICATIONS SOLUTIONS      TECHNICIAN: T. PHUNG  
 JOB NO: 303038E  
 MODEL NO: MSNN-5DR-035T-CS00318-01      OPTION NO: \_\_\_\_\_  
 SERIAL NO: 5MS305036      SPECIFICATION: \_\_\_\_\_  
 CURRENT DRAW: +5 VDC @122mA; -5 VDC @26 mA      FREQUENCY RANGE: 0.1 - 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
J0-J1	<u>2.11</u> dB @ 0.1-18 GHz	<u>13.26</u> dB	<u>56</u> : 1	<u>13.51</u> dB	<u>54</u> : 1	<u>13.51</u> dB	<u>54</u> : 1
J0-J2	<u>2.32</u> dB @ 0.1-18 GHz	<u>13.79</u> dB	<u>50</u> : 1	<u>13.66</u> dB	<u>52</u> : 1	<u>13.66</u> dB	<u>52</u> : 1
J0-J3	<u>2.19</u> dB @ 0.1-18 GHz	<u>12.76</u> dB	<u>60</u> : 1	<u>13.67</u> dB	<u>52</u> : 1	<u>13.67</u> dB	<u>52</u> : 1
J0-J4	<u>2.07</u> dB @ 0.1-18 GHz	<u>13.32</u> dB	<u>55</u> : 1	<u>14.07</u> dB	<u>49</u> : 1	<u>14.07</u> dB	<u>49</u> : 1
J0-J5	<u>2.26</u> dB @ 0.1-18 GHz	<u>12.38</u> dB	<u>63</u> : 1	<u>14.18</u> dB	<u>49</u> : 1	<u>14.18</u> dB	<u>49</u> : 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1

ISOLATION		SWITCHING SPEED			
		DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1	<u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>40</u> nS	<u>4</u> nS
J0-J2	<u>60</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>40</u> nS	<u>4</u> nS
J0-J3	<u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>40</u> nS	<u>4</u> nS
J0-J4	<u>62</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>40</u> nS	<u>4</u> nS
J0-J5	<u>59</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>40</u> nS	<u>4</u> nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP8722ES

QA/QC APPROVAL: Dwight V Smith Q2 DATED: 7/07/03



**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305037

FORM: 424-SW-DTA  
 DATE: 7.03.03



AMERICAN MICROWAVE CORPORATION  
 7311-G GROVE RD., FREDERICK MD 21704  
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 URL: WWW.AMERICANMICROWAVECORP.COM  
 E-MAIL: SALES@AMERICANMICROWAVECORP.COM

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: COMMUNICATIONS SOLUTIONS      TECHNICIAN: T. PHUNG  
 JOB NO: 303038E  
 MODEL NO: MSNN-5DR-035T-CS00318-01      OPTION NO:  
 SERIAL NO: 5MS305037      SPECIFICATION:  
 CURRENT DRAW: +5 VDC @ 94mA; -5 VDC @ 27mA      FREQUENCY RANGE: 0.1 - 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
J0-J1 <u>2.37</u> dB @ 0.1-18 GHz	<u>14.85</u> dB	<u>44</u> : 1	<u>15.97</u> dB	<u>38</u> : 1		
J0-J2 <u>2.13</u> dB @ 0.1-18 GHz	<u>15.56</u> dB	<u>40</u> : 1	<u>15.25</u> dB	<u>42</u> : 1		
J0-J3 <u>2.27</u> dB @ 0.1-18 GHz	<u>16.31</u> dB	<u>36</u> : 1	<u>14.20</u> dB	<u>48</u> : 1		
J0-J4 <u>2.25</u> dB @ 0.1-18 GHz	<u>13.94</u> dB	<u>50</u> : 1	<u>15.56</u> dB	<u>40</u> : 1		
J0-J5 <u>2.40</u> dB @ 0.1-18 GHz	<u>15.22</u> dB	<u>42</u> : 1	<u>15.99</u> dB	<u>38</u> : 1		
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
ISOLATION	SWITCHING SPEED					
	DELAY ON	RISE TIME	DELAY OFF	FALLTIME		
J0-J1 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS		
J0-J2 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS		
J0-J3 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS		
J0-J4 <u>63</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS		
J0-J5 <u>62</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS		
dB @ GHz	nS	nS	nS	nS		
dB @ GHz	nS	nS	nS	nS		
dB @ GHz	nS	nS	nS	nS		
dB @ GHz	nS	nS	nS	nS		

NOTE: Any additional test data on back

TESTED ON: Hp 8722ES

QA/QC APPROVAL: Dwight V. Smith **02** DATED: 7/07/03

**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305038

FORM: 424-SW-DTA  
 DATE: 7-03-03



AMERICAN MICROWAVE CORPORATION  
 7311-G GROVE RD., FREDERICK MD. 21704  
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 URL: WWW.AMERICANMICROWAVECORP.COM  
 E-MAIL: SALES@AMERICANMICROWAVECORP.COM

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: COMMUNICATIONS SOLUTIONS      TECHNICIAN: T. PHUNG  
 JOB NO: 303038E  
 MODEL NO: MSNN-5DR-035T-CS00318-01      OPTION NO: \_\_\_\_\_  
 SERIAL NO: 5MS305038      SPECIFICATION: \_\_\_\_\_  
 CURRENT DRAW: +5 VDC @ 94 mA; -5 VDC @ 27 mA      FREQUENCY RANGE: 0.1 - 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
J0-J1 <u>2.34</u> dB @ 0.1-18 GHz	<u>14.07</u> dB	<u>1.88</u> : 1	<u>14.65</u> dB	<u>1.45</u> : 1	dB	1. : 1
J0-J2 <u>2.30</u> dB @ 0.1-18 GHz	<u>13.98</u> dB	<u>1.50</u> : 1	<u>13.90</u> dB	<u>1.51</u> : 1	dB	1. : 1
J0-J3 <u>2.27</u> dB @ 0.1-18 GHz	<u>15.11</u> dB	<u>1.43</u> : 1	<u>15.86</u> dB	<u>1.38</u> : 1	dB	1. : 1
J0-J4 <u>2.55</u> dB @ 0.1-18 GHz	<u>14.30</u> dB	<u>1.48</u> : 1	<u>13.24</u> dB	<u>1.56</u> : 1	dB	1. : 1
J0-J5 <u>2.35</u> dB @ 0.1-18 GHz	<u>15.01</u> dB	<u>1.43</u> : 1	<u>14.86</u> dB	<u>1.44</u> : 1	dB	1. : 1
dB @ GHz	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB @ GHz	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB @ GHz	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB @ GHz	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB @ GHz	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1 <u>62</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J2 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J3 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J4 <u>62</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J5 <u>63</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: 7/8/03

QA/QC APPROVAL: Dwight V. Smith **Q2** DATED: 7/07/03

**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305039

FORM: 424-SW-DTA  
 DATE: 7-03-03



AMERICAN MICROWAVE CORPORATION  
 7311-G GROVE RD., FREDERICK MD. 21704  
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 URL: WWW.AMERICANMICROWAVECORP.COM  
 E-MAIL: SALES@AMERICANMICROWAVECORP.COM

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: COMMUNICATIONS SOLUTIONS      TECHNICIAN: T. PHUNG  
 JOB NO: 303038E  
 MODEL NO: MSNN-5DR-035T-CS00318-01      OPTION NO: \_\_\_\_\_  
 SERIAL NO: 5MS305039      SPECIFICATION: \_\_\_\_\_  
 CURRENT DRAW: +5 VDC @ 94 mA; -5 VDC @ 27 mA      FREQUENCY RANGE: 0.1 - 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
J0-J1 <u>3.18</u> dB @ 0.1-18 GHz	<u>15.13</u> dB	<u>4.2</u> : 1	<u>15.59</u> dB	<u>4.0</u> : 1	dB	: 1
J0-J2 <u>3.12</u> dB @ 0.1-18 GHz	<u>16.03</u> dB	<u>3.8</u> : 1	<u>14.76</u> dB	<u>4.5</u> : 1	dB	: 1
J0-J3 <u>2.66</u> dB @ 0.1-18 GHz	<u>14.82</u> dB	<u>4.4</u> : 1	<u>16.28</u> dB	<u>3.6</u> : 1	dB	: 1
J0-J4 <u>2.72</u> dB @ 0.1-18 GHz	<u>16.87</u> dB	<u>3.3</u> : 1	<u>16.23</u> dB	<u>3.7</u> : 1	dB	: 1
J0-J5 <u>3.30</u> dB @ 0.1-18 GHz	<u>16.61</u> dB	<u>3.5</u> : 1	<u>12.20</u> dB	<u>6.5</u> : 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
ISOLATION	SWITCHING SPEED					
	DELAY ON	RISE TIME	DELAY OFF	FALLTIME		
J0-J1 <u>64</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>5</u> nS	<u>40</u> nS	<u>5</u> nS		
J0-J2 <u>82</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>5</u> nS	<u>40</u> nS	<u>5</u> nS		
J0-J3 <u>62</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>5</u> nS	<u>40</u> nS	<u>5</u> nS		
J0-J4 <u>60</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>5</u> nS	<u>40</u> nS	<u>5</u> nS		
J0-J5 <u>64</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>5</u> nS	<u>40</u> nS	<u>5</u> nS		
dB @ GHz	nS	nS	nS	nS		
dB @ GHz	nS	nS	nS	nS		
dB @ GHz	nS	nS	nS	nS		
dB @ GHz	nS	nS	nS	nS		
dB @ GHz	nS	nS	nS	nS		

NOTE: Any additional test data on back

TESTED ON: #18722Es

QA/QC APPROVAL: Dwight V. Smith Q2 DATED: 7/07/03



**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305040

FORM: 424-SW-DTA  
 DATE: 7-03-03



AMERICAN MICROWAVE CORPORATION  
 7311-G GROVE RD., FREDERICK MD 21704  
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 E-MAIL: SALES@AMERICANMICROWAVECORP.COM

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: COMMUNICATIONS SOLUTIONS      TECHNICIAN: T. PHUNG  
 JOB NO: 303038E  
 MODEL NO: MSNN-5DR-035T-CS00318-01      OPTION NO: \_\_\_\_\_  
 SERIAL NO: 5MS305040      SPECIFICATION: \_\_\_\_\_  
 CURRENT DRAW: + 5 VDC @ 94 mA; - 5 VDC @ 27 mA      FREQUENCY RANGE: 0.1 - 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
J0-J1 <u>2.21</u> dB @ 0.1-18 GHz	<u>14.28</u> dB	<u>48</u> : 1	<u>15.49</u> dB	<u>40</u> : 1	dB	: 1
J0-J2 <u>2.31</u> dB @ 0.1-18 GHz	<u>14.33</u> dB	<u>48</u> : 1	<u>14.27</u> dB	<u>48</u> : 1	dB	: 1
J0-J3 <u>2.40</u> dB @ 0.1-18 GHz	<u>13.74</u> dB	<u>52</u> : 1	<u>13.35</u> dB	<u>55</u> : 1	dB	: 1
J0-J4 <u>2.21</u> dB @ 0.1-18 GHz	<u>14.41</u> dB	<u>47</u> : 1	<u>15.19</u> dB	<u>42</u> : 1	dB	: 1
J0-J5 <u>2.26</u> dB @ 0.1-18 GHz	<u>15.67</u> dB	<u>39</u> : 1	<u>15.83</u> dB	<u>39</u> : 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1
dB @ GHz	dB	: 1	dB	: 1	dB	: 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J2 <u>63</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J3 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J4 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS
J0-J5 <u>62</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>40</u> nS	<u>5</u> nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP8722ES

QA/QC APPROVAL: Dwight V. Smith **02** DATED: 7/07/03

**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305041

FORM: 424-SW-DTA  
 DATE: 7-03-03



AMERICAN MICROWAVE CORPORATION  
 7311-G GROVE RD., FREDERICK MD. 21704  
 TEL: 301-662-4700 FAX: 301-662-4938  
 URL: WWW.AMERICANMICROWAVECORP.COM  
 E-MAIL: SALES@AMERICANMICROWAVECORP.COM

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: COMMUNICATIONS SOLUTIONS      TECHNICIAN: T. PHUNG  
 JOB NO: 303038E  
 MODEL NO: MSNN-5DR-035T-CS00318-01      OPTION NO: \_\_\_\_\_  
 SERIAL NO: 5MS305041      SPECIFICATION: \_\_\_\_\_  
 CURRENT DRAW: +5 VDC @ 94mA; -5 VDC @ 27mA      FREQUENCY RANGE: 0.1 - 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
J0-J1	<u>2.18</u> dB @ 0.1-18 GHz	<u>15.17</u> dB	<u>1.42</u> : 1	<u>14.22</u> dB	<u>1.48</u> : 1		
J0-J2	<u>1.90</u> dB @ 0.1-18 GHz	<u>16.25</u> dB	<u>1.36</u> : 1	<u>14.28</u> dB	<u>1.48</u> : 1		
J0-J3	<u>2.02</u> dB @ 0.1-18 GHz	<u>14.65</u> dB	<u>1.45</u> : 1	<u>14.82</u> dB	<u>1.44</u> : 1		
J0-J4	<u>2.19</u> dB @ 0.1-18 GHz	<u>13.14</u> dB	<u>1.57</u> : 1	<u>13.20</u> dB	<u>1.46</u> : 1		
J0-J5	<u>2.13</u> dB @ 0.1-18 GHz	<u>13.41</u> dB	<u>1.54</u> : 1	<u>13.07</u> dB	<u>1.57</u> : 1		
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1
	dB @ GHz	dB	: 1	dB	: 1	dB	: 1

ISOLATION		SWITCHING SPEED			
		DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1	<u>58</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>35</u> nS	<u>5</u> nS
J0-J2	<u>60</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>35</u> nS	<u>5</u> nS
J0-J3	<u>63</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>35</u> nS	<u>5</u> nS
J0-J4	<u>57</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>35</u> nS	<u>5</u> nS
J0-J5	<u>60</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>3</u> nS	<u>35</u> nS	<u>5</u> nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS
	dB @ GHz	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: HP 8722ES

QA/QC APPROVAL: Dwight K. Smith **02** DATED: 7/07/03

**FINAL TEST DATA**

AMC MODEL NO: MSNN-5DR-03T-CS00318-01, SERIAL NUMBER: 5MS305042

FORM: 424-SW-DTA  
 DATE: 7-03-03



AMERICAN MICROWAVE CORPORATION  
 7311-G GROVE RD., FREDERICK MD, 21704  
 TEL: 301-662-4700 FAX: 301-662-4938  
 URL: WWW.AMERICANMICROWAVECORP.COM  
 E-MAIL: SALES@AMERICANMICROWAVECORP.COM

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: COMMUNICATIONS SOLUTIONS      TECHNICIAN: T. PHUNG  
 JOB NO: 303038E  
 MODEL NO: MSNN-5DR-035T-CS00318-01      OPTION NO: \_\_\_\_\_  
 SERIAL NO: 5MS305042      SPECIFICATION: \_\_\_\_\_  
 CURRENT DRAW: +5 VDC @ 94 mA; -5 VDC @ 27 mA      FREQUENCY RANGE: 0.1 - 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
J0-J1 <u>2.15</u> dB @ 0.1-18 GHz	<u>14.90</u> dB:1	<u>44</u> : 1	<u>15.79</u> dB:1	<u>39</u> : 1	dB:1	: 1
J0-J2 <u>2.46</u> dB @ 0.1-18 GHz	<u>12.51</u> dB:1	<u>62</u> : 1	<u>13.24</u> dB:1	<u>56</u> : 1	dB:1	: 1
J0-J3 <u>1.72</u> dB @ 0.1-18 GHz	<u>14.53</u> dB:1	<u>46</u> : 1	<u>14.97</u> dB:1	<u>43</u> : 1	dB:1	: 1
J0-J4 <u>1.98</u> dB @ 0.1-18 GHz	<u>13.68</u> dB:1	<u>52</u> : 1	<u>17.26</u> dB:1	<u>32</u> : 1	dB:1	: 1
J0-J5 <u>2.05</u> dB @ 0.1-18 GHz	<u>15.06</u> dB:1	<u>43</u> : 1	<u>15.72</u> dB:1	<u>39</u> : 1	dB:1	: 1
dB @ GHz	dB:1	: 1	dB:1	: 1	dB:1	: 1
dB @ GHz	dB:1	: 1	dB:1	: 1	dB:1	: 1
dB @ GHz	dB:1	: 1	dB:1	: 1	dB:1	: 1
dB @ GHz	dB:1	: 1	dB:1	: 1	dB:1	: 1
dB @ GHz	dB:1	: 1	dB:1	: 1	dB:1	: 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALLTIME
J0-J1 <u>62</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>30</u> nS	<u>5</u> nS
J0-J2 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>30</u> nS	<u>5</u> nS
J0-J3 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>30</u> nS	<u>5</u> nS
J0-J4 <u>63</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>30</u> nS	<u>5</u> nS
J0-J5 <u>61</u> dB @ 0.1-18 GHz	<u>50</u> nS	<u>4</u> nS	<u>30</u> nS	<u>5</u> nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS
dB @ GHz	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: #8722ES  
 QA/QC APPROVAL: [Signature] Q2      DATED: 7/7/03