



**TEST REPORT**  
**ON**  
**8 TO 18.2 GHz**  
**SINGLE POLE THREE THROW**  
**ABSORPTIVE / NON-REFLECTIVE SWITCH MODULE**

**AMC MODEL No:**  
**MSN-3DT-05-STANDARD**  
**OPTION 818, 12X, LVT**

**Serial Numbers: 3MS909302 AND 3MS909303**

**DESIGNED  
BY  
R. Afable**

**TESTED  
BY  
R. Butler**

**REPORTED  
BY  
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*Handwritten signatures and initials in blue ink:*  
JRH, LC, JST, EEC, JJ, JRH, RB

**October 26, 2004**

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**ISO9001 : 2000 CERTIFIED**

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## SINGLE POLE THREE THROW ABSORPTIVE / NON-REFLECTIVE SWITCH MODULE AMC MODEL No: MSN-3DT-05-STANDARD OPTION 818, 12X, LVT

### FEATURES:

- **LOW INSERTION LOSS**
- **HIGH ISOLATION**
- **LOW VIDEO TRANSIENTS**
- **LOW HARMONIC DISTORTION**

### SPECIFICATIONS:

● FREQUENCY	: 8 TO 18.2 GHz
● INSERTION LOSS	: 3.75 dB MAXIMUM
● ISOLATION	: 60 dB MINIMUM
● VSWR	: 2.0:1
● SWITCHING SPEED	: < 30 ns
● RISE / FALL TIME	: < 10 ns
● MAXIMUM TOGGLE RATE	: > 20 ns
● RF CONNECTORS	: SMA FEMALE
● DC POWER SUPPLY	: +5 V $\pm$ 10% @ 150 mA MAXIMUM -5 V $\pm$ 10% @ 100 mA MAXIMUM
● CONTROL	: TTL LOGIC "0"=ON, "1"=ON
● CONTROL INTERFACE	: DC SOLDER PINS
● HARMONIC DISTORTION	: $\leq$ 70 dB @ +10 dBm I/P
● FLATNESS ACROSS BAND (ON STATE)	: $\pm$ 0.5 dB
● VIDEO LEAKAGE	: 100 mV PEAK TO PEAK, 500 MHz BANDWIDTH (-60 dBm TO -65 dBm LEAKAGE POWER OR ENERGY IN THE BAND OF INTEREST)
● 1 dB COMPRESSION POINT	: +20 dBm
● 2 TONE 3 <sup>RD</sup> ORDER INTERCEPT POINT, P <sub>OUT</sub> 0dBm	: +35 dBm
● 2 TONE 2 <sup>ND</sup> ORDER INTERCEPT POINT, P <sub>OUT</sub> 0dBm	: +55 dBm
● 0.1 dB PASS BAND	: 8 GHz TO 18.2 GHz



**PRODUCT FEATURE**

REV.	DESCRIPTION	DATE	APPROVED
1	ORIGINAL RELEASE, JOB# 907134E-1	11/06/08	

**DESCRIPTION:**  
 ANC MODEL MSN-3DT-05-STANDARD OPTION 818, 12X, LVT IS A SINGLE POLE THREE THROW, ABSORPTIVE/NON-REFLECTIVE SWITCH MODULE WITH VERY LOW INSERTION LOSS, HIGH ISOLATION AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR LOW VIDEO TRANSIENTS AND LOW HARMONIC DISTORTION OVER 8 TO 18.2 GHz BANDWIDTH.

**SPECIFICATIONS:**

- FREQUENCY: 8 GHz TO 18.2 GHz
- INSERTION LOSS: 3.75 dB MAXIMUM
- ISOLATION (ANY PORT): 67 dB MINIMUM
- VSWR (ANY PORT, ANY STATE): 2.0:1
- SWITCHING SPEED: <30 ns
- (50% TTL TO 10%/90% RF)
- RISE/FALL TIME: <10 ns (10% TO 90% RF)
- (90% TO 10% RF)
- MAXIMUM TOGGLE RATE: >20 MHz (50% DC)
- RF CONNECTORS: SMA FEMALE
- DC POWER SUPPLY: +5V ±10% @ 150 mA MAXIMUM
- CONTROL: -5V ±10% @ 100 mA MAXIMUM
- CONTROL INTERFACE: TTL LOGIC "0"=ON "1"=OFF
- HARMONIC DISTORTION: DC SOLDER PINS
- FLATNESS ACROSS BAND: ≤ 70dB @ +10 dBm I/P (ON STATE)
- VIDEO LEAKAGE: ≤ 100 mV PEAK TO PEAK, 500 MHz BANDWIDTH (-60 dBm TO -65 dBm LEAKAGE POWER OR ENERGY IN THE BAND OF INTEREST)
- 1 dB COMPRESSION POINT: +20 dBm
- 2 TONE 3RD ORDER INTERCEPT POINT, POUT OdBm: +35 dBm
- 2 TONE 2RD ORDER INTERCEPT POINT, POUT OdBm: +55 dBm
- 0.1 dB PASS BAND: 8 GHz TO 18.2 GHz
- WEIGHT: 2.5 OUNCES TYPICAL
- SIZE: 1.5 (L) X 1.5 (W) X 0.40 (H)

**SOLID STATE SWITCH**  
 MODEL NO: MSN-3DT-05  
 OPTION NO: 818, 12X, LVT  
 SERIAL NO:  
 PART NO:

**ENVIRONMENTAL RATINGS:**

- TEMPERATURE: -10°C TO +55°C (OPERATING)
- HUMIDITY: -40°C TO +71°C (STORAGE)
- SHOCK: 95% OVER TEMPERATURE
- VIBRATION: MIL-STD-202F, METHOD 2138 COND. B
- ALTITUDE: MIL-STD-202F, METHOD 2040 COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 105C COND. B
- MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

**BLOCK DIAGRAM**

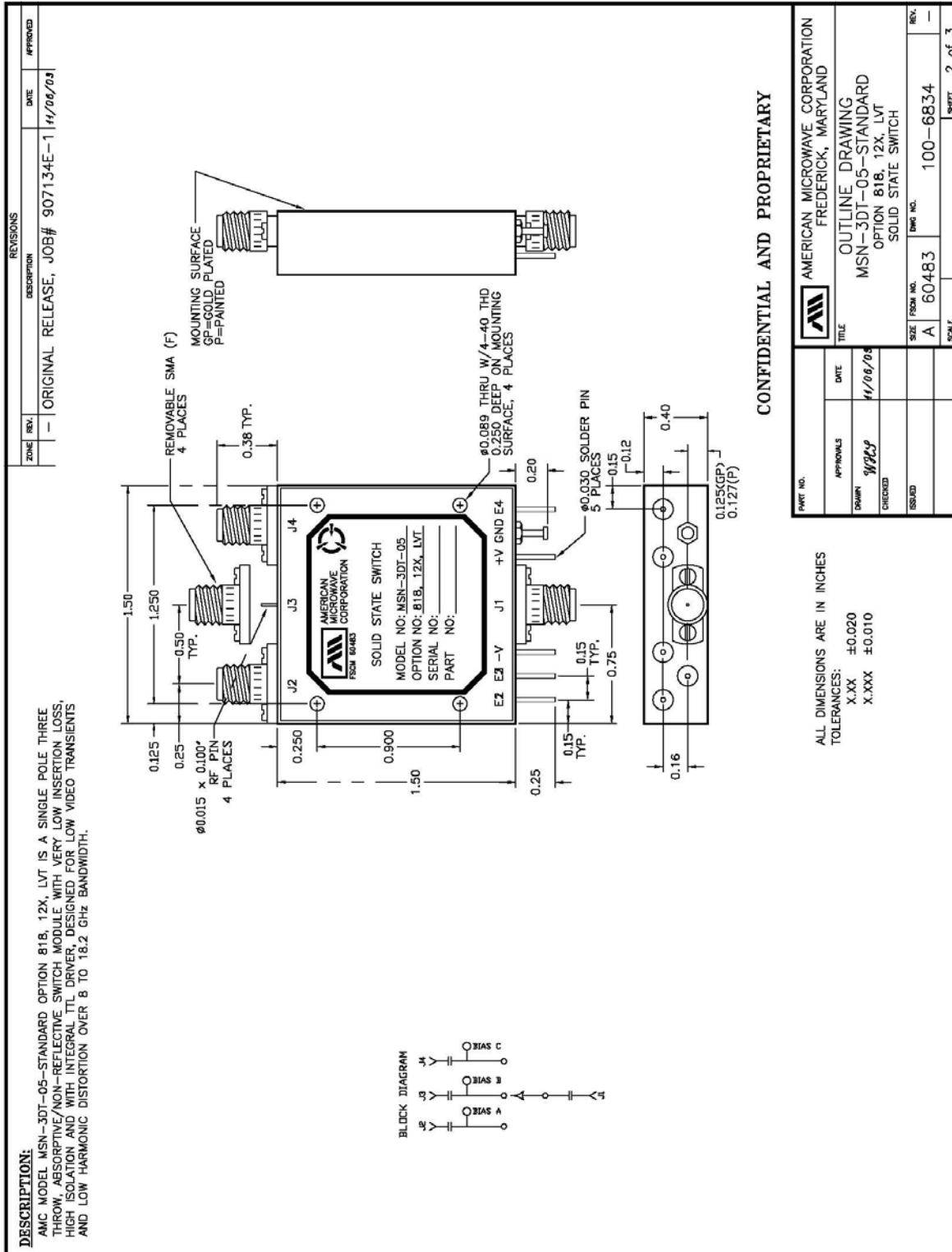
**REVISIONS**

REV.	DESCRIPTION	DATE	APPROVED
1	ORIGINAL RELEASE, JOB# 907134E-1	11/06/08	

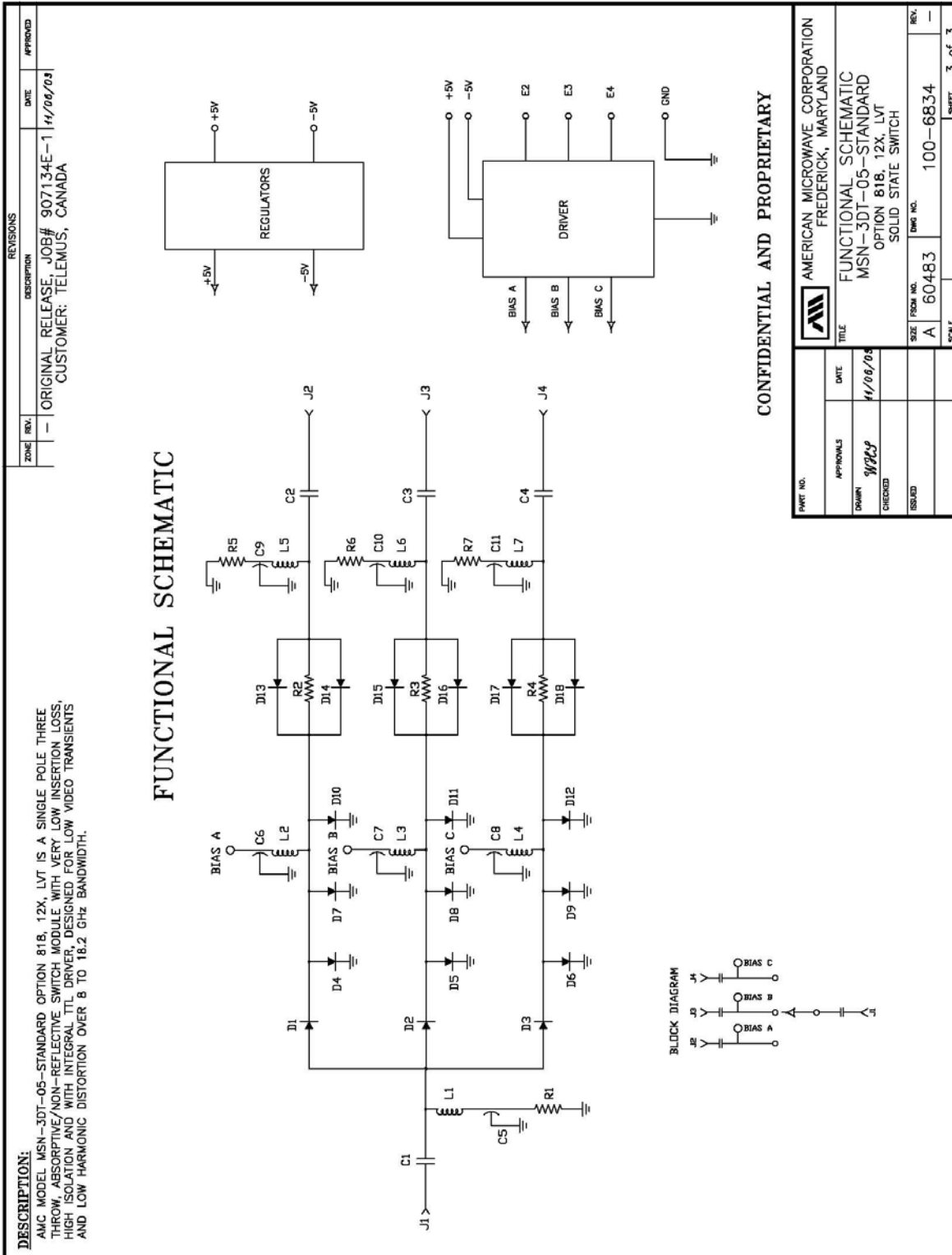
**CONFIDENTIAL AND PROPRIETARY**

PART NO.	AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND	DATE	11/06/08	APPROVED
DESIGN	WALP	CHECKED		
ESD				
SIZE	FROM NO. A 60483	DMG NO.	100-6834	REV.
SCALE				1 of 3

**OUTLINE DRAWING**



## FUNCTIONAL SCHEMATIC



## FINAL TEST DATA

FINAL TEST DATA SHEETS

FOR

AMC MODEL NUMBER

**MSN-3DT-05-STANDARD**  
OPTION 818, 12X, LVT

Serial Numbers:

**3MS909302 THRU 3MS909303**



**FINAL TEST DATA**

AMC MODEL NO: MSN-3DT-05-STANDARD OPTION 818, 12X, LVT SERIAL NUMBER: 3MS909302

AMERICAN MICROWAVE CORPORATION  
 1344 G GROVE RD., FREDERICK MD, 21704  
 T: 301-662-4700 FAX: 301-662-4938

DATE: 11-30-99

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: Telemus      TECHNICIAN: R. Butler  
 JOB NO: 907134E-1  
 MODEL NO: MSN-3DT-05-STD      OPTION NO: 818, 12X, LVT  
 SERIAL NO: 3MS909302      SPECIFICATION:  
 CURRENT DRAW: +5VDC @ 60 mA; -5VDC @ 40 mA      FREQUENCY RANGE: 8.6GHz to 18.2GHz

INSERTION LOSS (WORST CASE)	RETURN LOSS (WORST CASE)					
	INPUT dB	INPUT VSWR	OUTPUT ON dB	OUTPUT ON VSWR	OUTPUT OFF dB	OUTPUT OFF VSWR
<u>J4-J1 3.62 dB</u>	<u>9.3 dB</u>	<u>2.04: 1</u>	<u>9.7 dB</u>	<u>1.97: 1</u>	<u>9.5 dB</u>	<u>2.00: 1</u>
<u>J4-J2 3.57 dB</u>	<u>9.9 dB</u>	<u>1.93: 1</u>	<u>9.7 dB</u>	<u>1.96: 1</u>	<u>9.0 dB</u>	<u>2.09: 1</u>
<u>J4-J3 3.36 dB</u>	<u>11.3 dB</u>	<u>1.74: 1</u>	<u>12.7 dB</u>	<u>1.59: 1</u>	<u>9.6 dB</u>	<u>1.88: 1</u>
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
<u>J4-J1 760 dB</u>	<u>25 nS</u>	<u>10 nS</u>	<u>12 nS</u>	<u>2 nS</u>
<u>J4-J2 760 dB</u>	<u>25 nS</u>	<u>8 nS</u>	<u>17 nS</u>	<u>6 nS</u>
<u>J4-J3 760 dB</u>	<u>23 nS</u>	<u>10 nS</u>	<u>18 nS</u>	<u>5 nS</u>
dB	nS	nS	nS	nS
dB	nS	nS	nS	nS
dB	nS	nS	nS	nS
dB	nS	nS	nS	nS
dB	nS	nS	nS	nS
dB	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: 8350B/8757A

QA/QC APPROVAL: AB

DATED: 1/30/99





**FINAL TEST DATA**

AMC MODEL NO: MSN-3DT-05-STANDARD OPTION 818, 12X, LVT SERIAL NUMBER: 3MS909303

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

DATE: 11-30-99

FINAL TEST DATA  
 ON  
 MICROWAVE SWITCH

CUSTOMER: Telemus  
 JOB NO: 907134E-1  
 MODEL NO: MSN-3DT-05-570  
 SERIAL NO: 3MS909303  
 CURRENT DRAW: +5VDC @ 60 mA; -5VDC @ 40 mA

TECHNICIAN: R. Butler  
 OPTION NO: 818, 12X, LVT  
 SPECIFICATION:  
 FREQUENCY RANGE: 8.642 to 18.2 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
J4-J1 3.78 dB	9.00 dB	2.10 : 1	12.2 dB	1.64 : 1	9.4 dB	2.02 : 1
J4-J2 3.62 dB	9.54 dB	2.0 : 1	11.2 dB	1.74 : 1	9.3 dB	2.02 : 1
J4-J3 3.08 dB	9.8 dB	1.95 : 1	10.4 dB	1.86 : 1	11.0 dB	1.77 : 1
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J4-J1 760 dB	13 nS	3 nS	10 nS	2 nS
J4-J2 760 dB	13 nS	3 nS	10 nS	2 nS
J4-J3 >60 dB	14 nS	3 nS	10 nS	2 nS
dB	nS	nS	nS	nS
dB	nS	nS	nS	nS
dB	nS	nS	nS	nS
dB	nS	nS	nS	nS
dB	nS	nS	nS	nS
dB	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: 8350B/8757A

QA/QC APPROVAL: [Signature]

DATED: 11/30/99