



TEST REPORT
ON
3.75 TO 6 GHz
SINGLE POLE TWO THROW
ABSORPTIVE / NON-REFLECTIVE SWITCH MODULE

AMC MODEL No:
MSN-2DT-05-STANDARD
OPTION 36, 12X, LVT

Serial Numbers: 2MS909682 THRU 2MS909686

DESIGNED
BY
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REPORTED
BY
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October 26, 2004

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ISO9001 : 2000 CERTIFIED

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SINGLE POLE TWO THROW ABSORPTIVE / NON-REFLECTIVE SWITCH MODULE AMC MODEL No: MSN-2DT-05-STANDARD OPTION 36, 12X, LVT

FEATURES:

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

SPECIFICATIONS:

- FREQUENCY : 3.75 TO 6 GHz
- INSERTION LOSS : 1.4 dB MAXIMUM
- ISOLATION : 60 dB MINIMUM
- VSWR : 1.8:1
- SWITCHING SPEED : < 30 ns
- RISE / FALL TIME : < 10 ns
- MAXIMUM TOGGLE RATE : > 20 ns
- RF CONNECTORS : SMA FEMALE
- DC POWER SUPPLY : +5 V $\pm 10\%$ @ 100 mA MAXIMUM
-5 V $\pm 10\%$ @ 100 mA MAXIMUM
- CONTROL : TTL LOGIC "0"=ON J3-J1, "1"=ON J3-J2
- CONTROL INTERFACE : DC SOLDER PINS
- HARMONIC DISTORTION : ≤ 70 dB @ +10 dBm I/P
- FLATNESS ACROSS BAND (ON STATE) : ± 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 3RD ORDER INTERCEPT POINT, P_{OUT} 0dBm : +35 dBm
- 2 TONE 2ND ORDER INTERCEPT POINT, P_{OUT} 0dBm : +55 dBm
- 0.1 dB PASS BAND : 3.75 GHz TO 6 GHz
- 1 dB COMPRESSION POINT : +20 dBm



PRODUCT FEATURE

ZONE	REV.	DESCRIPTION	DATE	APPROVED
		ORIGINAL RELEASE	8/1/99	

DESCRIPTION:
 ANC MODEL MSN-2DT-05-STANDARD OPTION 36, 12X, LVT IS A SINGLE POLE TWO 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 3.75 TO 6 GHz BANDWIDTH.

SPECIFICATIONS:

- FREQUENCY: 3.75 GHz TO 6 GHz
- INSERTION LOSS: 1.4 dB MAXIMUM
- ISOLATION (ANY PORT): 90 dB MINIMUM
- SWITCHING SPEED: ANY STATE: <30 ns
- RISE/FALL TIME: <10 ns
- MAXIMUM TOGGLE RATE: >20 MHz
- RF CONNECTORS: SMA FEMALE
- DC POWER SUPPLY: +5V ±10% @ 100 mA MAXIMUM
- CONTROL: TTL LOGIC "0"=ON J3-J1 "1"=ON J3-J2
- CONTROL INTERFACE: DC SOLDER PINS
- HARMONIC DISTORTION: ≤ 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 0dBm: +35 dBm
- 2 TONE 2ND ORDER INTERCEPT POINT, POUT 0dBm: +55 dBm
- 0.1 dB PASS BAND: 3.75 GHz TO 6 GHz
- WEIGHT: 1.5 OUNCES TYPICAL
- SIZE: 1.00 (L) X 1.00 (W) X 0.40 (H)

REMOVABLE SMA (F) 3 PLACES
 0.08
 1.00
 0.84
 0.50
 0.25
 0.38
 1.00
 0.50
 0.25 TYP.
 0.20 TYP.
 0.38
 0.10 TYP.
 0.10
 0.10
 0.125
 0.125 (GFP)
 0.127 (P)
 MOUNTING SURFACE GP-GOLD PLATED P-PAINTED
 Ø0.089 THRU, TAP WITH 4-40 THD 0.250 DEEP ON MOUNTING SURFACE, 2 PLACES.
 Ø0.015 RF PIN 3 PLACES
 Ø0.020 SOLDER PIN 3 PLACES

AMERICAN MICROWAVE CORPORATION
 SOLID STATE SWITCH
 M/N: MSN-2DT-05-STANDARD
 O/N: 36, 12X, LVT
 S/N: FSCM 60483
 EI END -5V J3 +5V GND

M/N = MANUFACTURER PART NUMBER
 O/N = OPTION NUMBER
 S/N = SERIAL NUMBER

NOTE:
 DT=WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

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

ENVIRONMENTAL RATINGS:

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

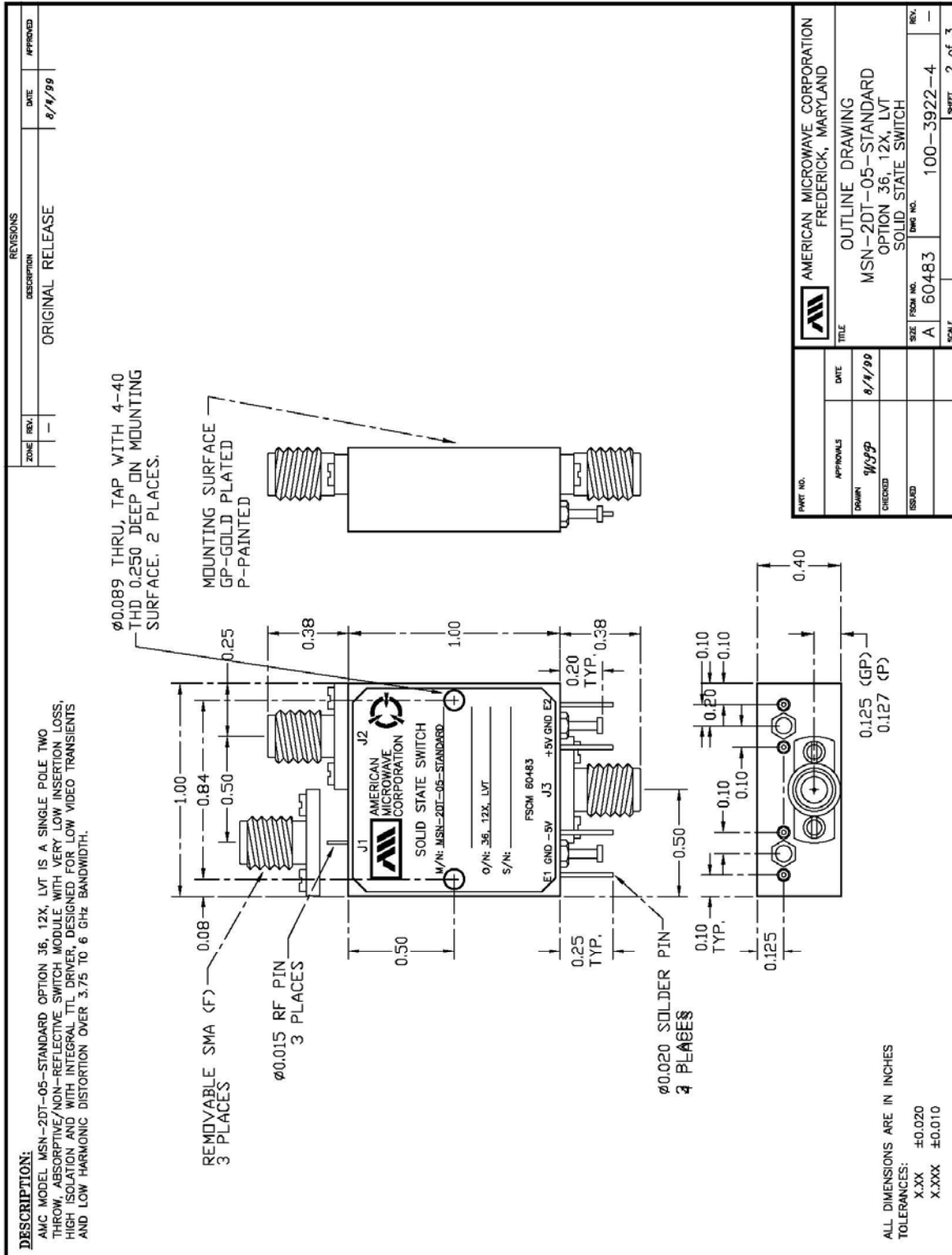
NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

PART NO.	DATE	TITLE	DRAWN	CHECKED	ISSUED
	8/1/99	PRODUCT FEATURE MSN-2DT-05-STANDARD OPTION 36, 12X, LVT SOLID STATE SWITCH	WJSP		

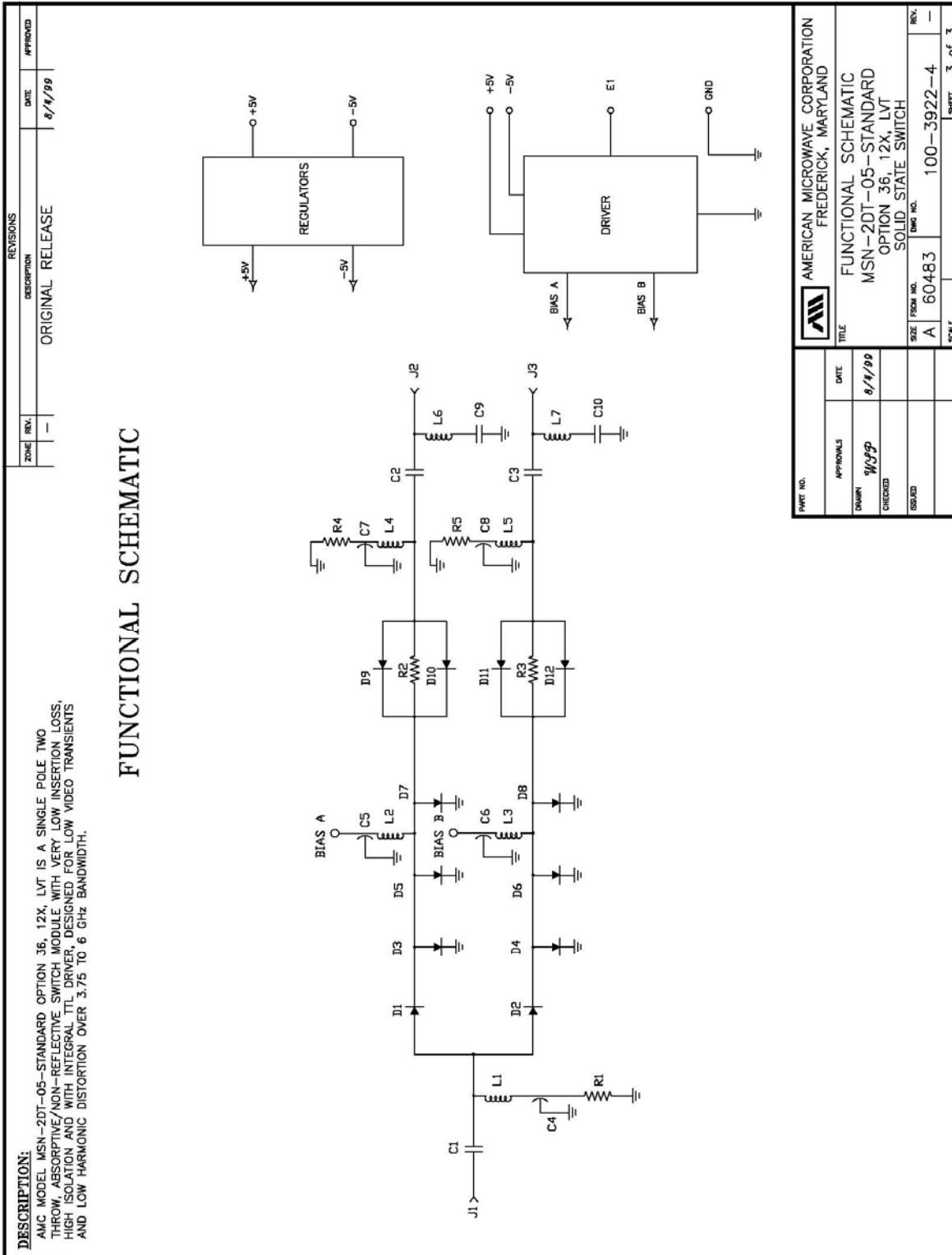
AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND	DATE	TITLE	DRAWN	CHECKED	ISSUED
	8/1/99	PRODUCT FEATURE MSN-2DT-05-STANDARD OPTION 36, 12X, LVT SOLID STATE SWITCH	WJSP		

SIZE FROM NO.	DRAWING NO.	REV.	SCALE	SHEET
A	60483	100-3922-4		1 of 3

OUTLINE DRAWING



FUNCTIONAL SCHEMATIC



FINAL TEST DATA

FINAL TEST DATA SHEETS

FOR

AMC MODEL NUMBER

MSN-2DT-05-STANDARD
OPTION 36, 12X, LVT

Serial Numbers:

2MS909682 THRU 2MS909686



FINAL TEST DATA

AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 36, 12X, LVT SERIAL NUMBER: **2MS909682**

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

DATE: 11-30-99

FINAL TEST DATA
 ON
 MICROWAVE SWITCH

CUSTOMER: Telemus
 JOB NO: 907133E-3
 MODEL NO: MSN-2DT-05-STANDARD
 SERIAL NO: 2MS909682

TECHNICIAN: H. Kohn
 OPTION NO: LVT, 12X, 36
 SPECIFICATION: _____

CURRENT DRAW: +5VDC @ 60 mA; -5VDC @ 70 mA FREQUENCY RANGE: 3.75-6 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
J3-J1 1.24 dB	15.13 dB	1.42 : 1	15.62 dB	1.40 : 1	23.53 dB	1.14 : 1
J3-J2 1.20 dB	15.79 dB	1.39 : 1	16.08 dB	1.37 : 1	18.62 dB	1.27 : 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	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
J3-J1 > 60 dB	12 nS	2 nS	14 nS	4 nS
J3-J2 > 60 dB	12 nS	2 nS	14 nS	4 nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Wiltron 37347A

QA/QC APPROVAL: Q4

DATED: DEC 07 1999



FINAL TEST DATA

AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 36, 12X, LVT SERIAL NUMBER: **2MS909683**

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

DATE: 11-30-99

FINAL TEST DATA
 ON
 MICROWAVE SWITCH

CUSTOMER: Telemus TECHNICIAN: H. Hahn
 JOB NO: 907133E-3
 MODEL NO: MSW-2DT-05-STANDARD OPTION NO: LVT, 12X, 36
 SERIAL NO: 2MS909683 SPECIFICATION:
 CURRENT DRAW: +5VDC @ 60 mA; -5VDC @ 70 mA FREQUENCY RANGE: 3.75-6 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
J3-J1 1.21 dB	15.49 dB	1.40 : 1	16.34 dB	1.36 : 1	18.57 dB	1.27 : 1
J3-J2 1.38 dB	15.15 dB	1.42 : 1	15.94 dB	1.38 : 1	27.86 dB	1.08 : 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	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
J3-J1 > 60 dB	12 nS	2 nS	16 nS	6 nS
J3-J2 > 60 dB	12 nS	2 nS	14 nS	4 nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Wiltron 37347A

QA/QC APPROVAL: 04 P1

DATED: DEC 07 1999

FINAL TEST DATA

AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 36, 12X, LVT SERIAL NUMBER: 2MS909684



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

DATE: 11-30-99

FINAL TEST DATA
 ON
 MICROWAVE SWITCH

CUSTOMER: Telemus
 JOB NO: 907133E-3
 MODEL NO: MSN-2DT-05-STANDARD
 SERIAL NO: 2MS909684
 CURRENT DRAW: +5VDC @ 60 mA; -5VDC @ 70 mA

TECHNICIAN: H. Hahn
 OPTION NO: LVT, 12X, 36
 SPECIFICATION: _____
 FREQUENCY RANGE: 3.75-6 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
J3-J1 1.25 dB	15.92 dB	1.38 : 1	16.26 dB	1.36 : 1	19.18 dB	1.25 : 1
J3-J2 1.32 dB	14.93 dB	1.44 : 1	14.66 dB	1.45 : 1	18.80 dB	1.26 : 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	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
J3-J1 > 60 dB	12 nS	2 nS	14 nS	4 nS
J3-J2 > 60 dB	12 nS	2 nS	14 nS	6 nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS
	dB	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Wiltron 37347A

QA/QC APPROVAL: Q4 PA

DATED: DEC 07 1999

FINAL TEST DATA

AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 36, 12X, LVT SERIAL NUMBER: 2MS909685


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

DATE: 11-30-99

FINAL TEST DATA
 ON
 MICROWAVE SWITCH

CUSTOMER: <u>Telemus</u>	TECHNICIAN: <u>H. Hahn</u>
JOB NO: <u>907133E-3</u>	OPTION NO: <u>LVT, 12X, 36</u>
MODEL NO: <u>MSN-2DT-05-STANDARD</u>	SPECIFICATION:
SERIAL NO: <u>2MS909685</u>	
CURRENT DRAW: <u>±5VDC @ 60 mA; -5VDC @ 70 mA</u> FREQUENCY RANGE: <u>3.75-6 GHz</u>	

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>J3-J1 1.19 dB</u>	<u>18.20 dB</u>	<u>1.28 : 1</u>	<u>18.11 dB</u>	<u>1.28 : 1</u>	<u>18.96 dB</u>	<u>1.25 : 1</u>
<u>J3-J2 1.28 dB</u>	<u>14.70 dB</u>	<u>1.45 : 1</u>	<u>15.24 dB</u>	<u>1.42 : 1</u>	<u>21.51 dB</u>	<u>1.18 : 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
dB	dB	1. : 1	dB	1. : 1	dB	1. : 1

ISOLATION	SWITCHING SPEED			
	DELAY ON	RISE TIME	DELAY OFF	FALL TIME
<u>J3-J1 > 60 dB</u>	<u>12 nS</u>	<u>2 nS</u>	<u>14 nS</u>	<u>4 nS</u>
<u>J3-J2 > 60 dB</u>	<u>12 nS</u>	<u>2 nS</u>	<u>14 nS</u>	<u>4 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
dB	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Wiltron 37347A

QA/QC APPROVAL: Q4 PS

DATED: DEC 07 1999

FINAL TEST DATA

AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 36, 12X, LVT SERIAL NUMBER: 2MS909686



AMERICAN MICROWAVE CORPORATION
 1311-G GROVE RD., FREDERICK MD 21704
 TEL. 301-662-4700 FAX: 301-662-4938

DATE: 11-30-99

FINAL TEST DATA
 ON
 MICROWAVE SWITCH

CUSTOMER: Telemus
 JOB NO: 907133E-3
 MODEL NO: MSN-2DT-05-STANDARD
 SERIAL NO: 2MS909686
 CURRENT DRAW: ±5VDC @ 60 mA; -5VDC @ 20 mA

TECHNICIAN: H. Hahn
 OPTION NO: LVT, 12X, 36
 SPECIFICATION: _____
 FREQUENCY RANGE: 3.75-6 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
<u>J3-J1 1.38 dB</u>	<u>18.42 dB</u>	<u>1.27 : 1</u>	<u>19.68 dB</u>	<u>1.23 : 1</u>	<u>18.58 dB</u>	<u>1.27 : 1</u>
<u>J3-J2 1.36 dB</u>	<u>12.94 dB</u>	<u>1.58 : 1</u>	<u>13.40 dB</u>	<u>1.54 : 1</u>	<u>24.15 dB</u>	<u>1.13 : 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
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>J3-J1 > 60 dB</u>	<u>12 nS</u>	<u>2 nS</u>	<u>14 nS</u>	<u>4 nS</u>
<u>J3-J2 > 60 dB</u>	<u>12 nS</u>	<u>2 nS</u>	<u>16 nS</u>	<u>6 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
dB	nS	nS	nS	nS

NOTE: Any additional test data on back

TESTED ON: Wiltron 37347A

QA/QC APPROVAL: QA PA

DATED: DEC 07 1999