# TEST REPORT

# ON

# 1 TO 18.2 GHz

# SINGLE POLE TWO THROW

# ABSORPTIVE / NON-REFLECTIVE SWITCH MODULE

## AMC MODEL No:

# MSN-2DT-05-STANDARD

## OPTION 118, 12X, LVT

**Serial Numbers: 2MS909672 THRU 2MS909681**


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

**TESTED**
**BY**
**R. Butler & H. Hahn**

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


## October 26, 2004


***AMERICAN MICROWAVE CORPORATION.***, 7311-G Grove Road, Frederick, MD 21704
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**ISO9001 : 2000 CERTIFIED**

# TABLE OF CONTENTS


- PRODUCT DESCRIPTION AND ELECTRICAL SPECIFICATIONS — PAGE 3
- PRODUCT FEATURE AND ENVIRONMENTAL SPECIFICATIONS — PAGE 4
- OUTLINE DRAWING — PAGE 5
- FUNCTIONAL SCHEMATIC — PAGE 6
- TEST DATA ON MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBERS 2MS909672 THRU 2MS909681 — PAGE 7
- TEST DATA FOR MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER 2MS909672 — PAGE 8
- TEST DATA FOR MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER 2MS909673 — PAGE 9
- TEST DATA FOR MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER 2MS909674 — PAGE 10
- TEST DATA FOR MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER 2MS909675 — PAGE 11
- TEST DATA FOR MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER 2MS909676 — PAGE 12
- TEST DATA FOR MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER 2MS909677 — PAGE 13
- TEST DATA FOR MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER 2MS909678 — PAGE 14
- TEST DATA FOR MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER 2MS909679 — PAGE 15
- TEST DATA FOR MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER 2MS909680 — PAGE 16
- TEST DATA FOR MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER 2MS909681 — PAGE 17

# SINGLE POLE TWO THROW
# ABSORPTIVE / NON-REFLECTIVE SWITCH MODULE
# AMC MODEL No: MSN-2DT-05-STANDARD OPTION 118, 12X, LVT

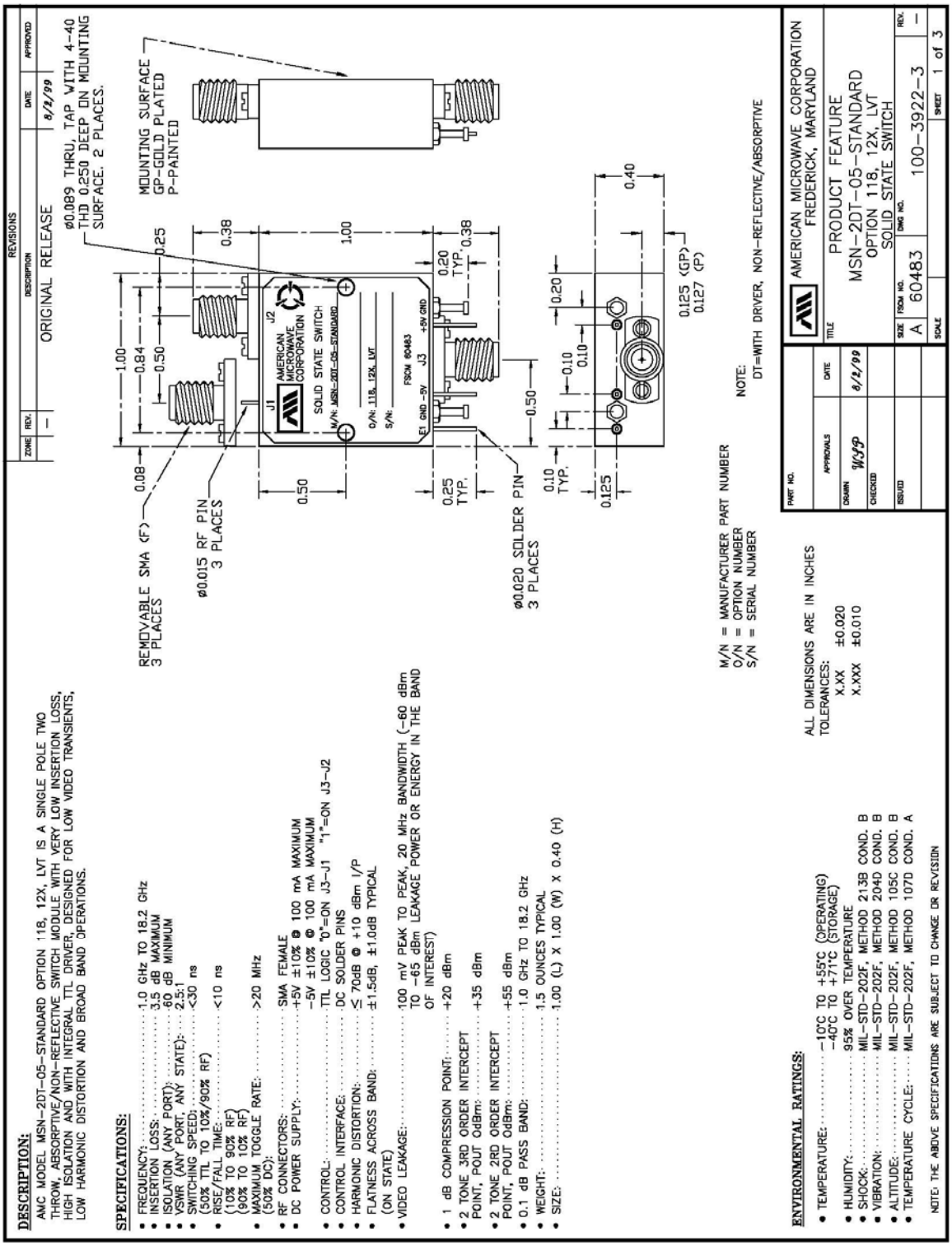
## FEATURES:

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

## SPECIFICATIONS:

| | | |
|---|---|---|
| FREQUENCY | : | 1 TO 18.2 GHz |
| INSERTION LOSS | : | 3.5 dB MAXIMUM |
| ISOLATION | : | 60 dB MINIMUM |
| VSWR | : | 2.5:1 |
| SWITCHING SPEED | : | < 30 ns |
| RISE / FALL TIME | : | < 10 ns |
| MAXIMUM TOGGLE RATE | : | > 20 ns |
| RF CONNECTORS | : | SMA FEMALE |
| DC POWER SUPPLY | : | +5 V ±10% @ 100 mA MAXIMUM<br>-5 V ±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) | : | ±1.5 dB, ±1.0 dB TYPICAL |
| VIDEO LEAKAGE | : | 100 mV PEAK TO PEAK, 20 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$^{RD}$ ORDER INTERCEPT POINT, $P_{OUT}$ 0dBm | : | +35 dBm |
| 2 TONE 2$^{nd}$ ORDER INTERCEPT POINT, $P_{OUT}$ 0dBm | : | +55 dBm |
| 0.1 dB PASS BAND | : | 1 GHz TO 18.2 GHz |
| 1 dB COMPRESSION POINT | : | +20 dBm |

# PRODUCT FEATURE

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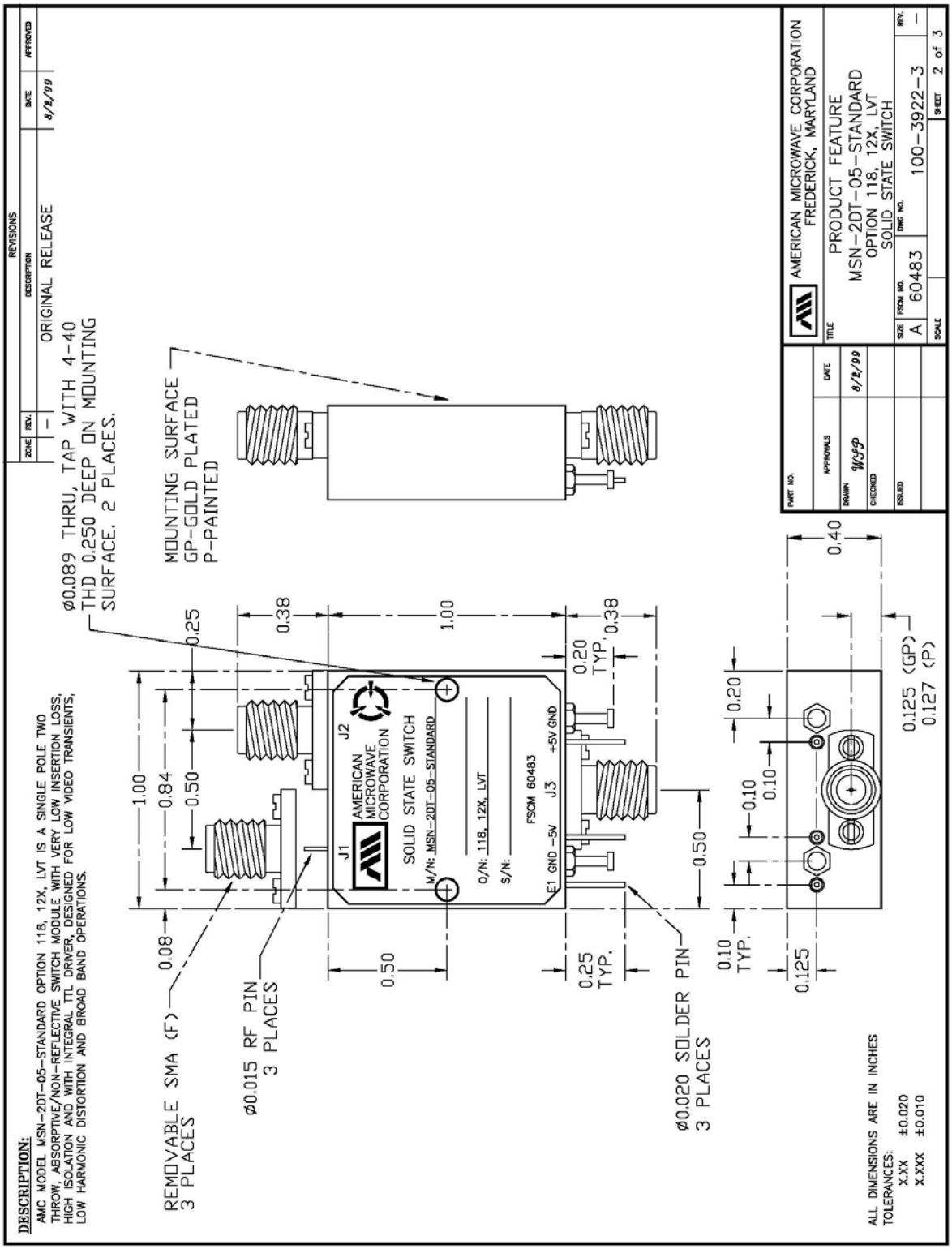
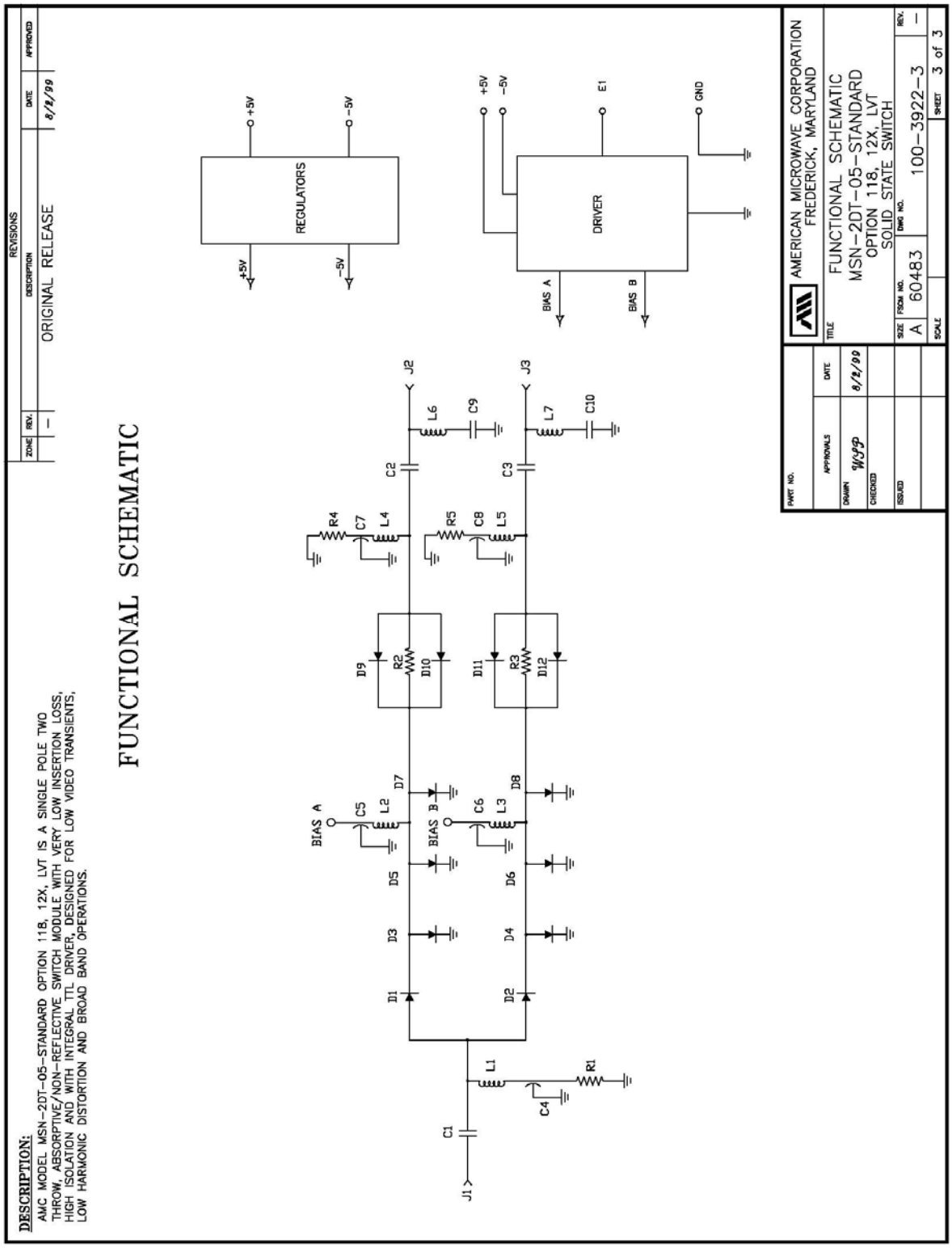
**Website: http://www.americanmicrowavecorp.com**

# OUTLINE DRAWING



T51-EJE-SW-1004

# FUNCTIONAL SCHEMATIC



# FINAL TEST DATA

## FINAL TEST DATA SHEETS

## FOR

## AMC MODEL NUMBER

# MSN-2DT-05-STANDARD
## OPTION 118, 12X, LVT

## Serial Numbers:

## 2MS909672 THRU 2MS909681

*AMERICAN MICROWAVE CORPORATION*, 7311-G Grove Road, Frederick, MD 21704
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Website: http://www.americanmicrowavecorp.com

# FINAL TEST DATA

## AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER: 2MS909672

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-2
MODEL NO: MSN-2DT-05-STANDARD
SERIAL NO: 2MS909672
CURRENT DRAW: +5 VDC @ 45 mA; -5 VDC @ 50mA

TECHNICIAN: R. Butler
OPTION NO: LVT, 12X, 118
SPECIFICATION: MIL-STD 454
FREQUENCY RANGE: 1 - 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 |
| J3-J1 3.70 dB | 11.25 dB | 1.75 : 1 | 10.91 dB | 1.79 : 1 | 7.85 dB | 2.36 : 1 |
| J3-J2 3.43 dB | 10.29 dB | 1.88 : 1 | 8.06 dB | 2.30 : 1 | 6.80 dB | 2.68 : 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 |
| J3-J1 >60dB | 23 nS | 6 nS | 22 nS | 7 nS |
| J3-J2 >60dB | 15 nS | 5 nS | 21 nS | 6 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 |
| dB | nS | nS | nS | nS |

NOTE: Any additional test data on back

TESTED ON: 8757A/8350B

QA/QC APPROVAL: Q4 PA

DATED: DEC 07 1999

# FINAL TEST DATA

## AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER: 2MS909673

AMERICAN MICROWAVE CORPORATION
311-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-2
MODEL NO: MSN-2DT-05-STANDARD
SERIAL NO: 2MS909673
CURRENT DRAW: +5 VDC @ 30 mA; -5 VDC @ 40 mA

TECHNICIAN: R. Butler
OPTION NO: LVT, 12X, 118
SPECIFICATION: MIL-STD 454
FREQUENCY RANGE: 1 - 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 |
| $J_3$-$J_1$ 4.30 dB | 7.52 dB | 2.45 : 1 | 8.11 dB | 2.29 : 1 | 6.74 dB | 2.70 : 1 |
| $J_3$-$J_2$ 4.30 dB | 6.99 dB | 2.61 : 1 | 6.72 dB | 2.71 : 1 | 6.67 dB | 2.72 : 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 |
| J3-J1 >60 dB | 21 nS | 6 nS | 20 nS | 7 nS |
| J3-J2 >60 dB | 20 nS | 7 nS | 21 nS | 8 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 |
| dB | nS | nS | nS | nS |

NOTE: Any additional test data on back

TESTED ON: 8757A/8350B

QA/QC APPROVAL: Q4 PA

DATED: DEC 07 1999

# FINAL TEST DATA

## AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER: 2MS909674

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-2
MODEL NO: MSN-2DT-05-STNDARD
SERIAL NO: 2MS909674
CURRENT DRAW: +5VDC @ 45 mA; -5 VDC @ 50mA

TECHNICIAN: H. Hahn
OPTION NO: LVT, 12X, 118
SPECIFICATION: MIL-STD 454
FREQUENCY RANGE: 1-18.2 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 |
| J3-J1 4.19 dB | 9.34 dB | 2.04 : 1 | 7.69 dB | 2.40 : 1 | 6.10 dB | 2.96 : 1 |
| J3-J2 4.08 dB | 9.27 dB | 2.05 : 1 | 8.04 dB | 2.31 : 1 | 6.95 dB | 2.63 : 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 |
| J3-J1 60 dB | 20 nS | 7 nS | 15 nS | 8 nS |
| J3-J2 60 dB | 20 nS | 6 nS | 22 nS | 8 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 |
| dB | nS | nS | nS | nS |

NOTE: Any additional test data on back

TESTED ON: Wiltron 37347A

QA/QC APPROVAL: Q4 PA

DATED: DEC 27 99

# FINAL TEST DATA

## AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER: 2MS909675

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-2
MODEL NO: MSN-2DT-05-STANDARD
SERIAL NO: 2MS909675
CURRENT DRAW: +5 VDC @ 30 mA; -5 VDC @ 40 mA

TECHNICIAN: R. Butler
OPTION NO: LVT, 12X, 118
SPECIFICATION: MIL-STD 454
FREQUENCY RANGE: 1 - 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 |
| $J_3$-$J_1$ 3.88 dB | 9.51 dB | 2.00 : 1 | 9.33 dB | 2.03 : 1 | 9.15 dB | 2.07 : 1 |
| $J_3$-$J_2$ 3.54 dB | 9.68 dB | 1.97 : 1 | 8.92 dB | 2.11 : 1 | 9.34 dB | 2.04 : 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 |
| J3-J1 >60 dB | 19 nS | 7 nS | 18 nS | 8 nS |
| J3-J2 >60 dB | 17 nS | 5 nS | 18 nS | 7 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 |
| dB | nS | nS | nS | nS |

NOTE: Any additional test data on back

TESTED ON: 8757A/8350B

QA/QC APPROVAL: Q4 PM

DATED: DEC 07 1999

# FINAL TEST DATA

## AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER: 2MS909676

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: 902133E-2
MODEL NO: MSN-2DT-05-STANDARD
SERIAL NO: 2MS909676
CURRENT DRAW: +5 VDC @ 45 mA; -5 VDC @ 50 mA

TECHNICIAN: R. Butler
OPTION NO: LVT, 12X, 118
SPECIFICATION: MIL-STD 454
FREQUENCY RANGE: 1 - 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 |
| J3-J1 3.52 dB | 11.51 dB | 1.72 : 1 | 10.39 dB | 1.86 : 1 | 11.75 dB | 1.69 : 1 |
| J3-J2 3.34 dB | 10.25 dB | 1.88 : 1 | 9.66 dB | 1.97 : 1 | 7.16 dB | 2.58 : 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 |
| J3-J1 >60 dB | 16 nS | 5 nS | 17 nS | 6 nS |
| J3-J2 >60 dB | 16 nS | 5 nS | 18 nS | 7 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 |
| dB | nS | nS | nS | nS |

NOTE: Any additional test data on back

TESTED ON: 8757A/8350B

QA/QC APPROVAL: Q4 PA

DATE: DEC 07 1999

# FINAL TEST DATA

## AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER: 2MS909677

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-2
MODEL NO: MSN-2DT-05-STANDARD
SERIAL NO: 2MS909677
CURRENT DRAW: +5 VDC @ 35 mA; -5 VDC @ 50 mA

TECHNICIAN: H. Hahn
OPTION NO: LVT, 12X, 118
SPECIFICATION: MIL-STD 454
FREQUENCY RANGE: 1 - 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 |
| J3-J1 3.92 dB | 10.04 dB | 1.92 : 1 | 9.68 dB | 1.98 : 1 | 10.11 dB | 1.91 : 1 |
| J3-J2 3.54 dB | 9.86 dB | 1.95 : 1 | 9.91 dB | 1.94 : 1 | 7.81 dB | 2.37 : 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 |
| J3-J1 >60 dB | 16 nS | 6 nS | 17 nS | 7 nS |
| J3-J2 >60 dB | 15 nS | 5 nS | 18 nS | 6 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 |
| dB | nS | nS | nS | nS |

NOTE: Any additional test data on back

TESTED ON: Wiltron 37347A

QA/QC APPROVAL: QA PH

DATED: DEC 07 1999

# FINAL TEST DATA

## AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER: 2MS909678

AMERICAN MICROWAVE CORPORATION

DATE: 11-30-99

FINAL TEST DATA
ON
MICROWAVE SWITCH

CUSTOMER: TELEMUS
JOB NO: 907133E-2
MODEL NO: MSN-2DT-05-STD
SERIAL NO: 2MS909678
CURRENT DRAW: +5VDC @ 45 mA; -5 VDC @ 50 mA

TECHNICIAN: C. Wendland
SPECIFICATION: MIL-STD 454
FREQUENCY RANGE: 1-18.2 GHz

| INSERTION LOSS | RETURN LOSS | | | | | |
|---|---|---|---|---|---|---|
| | INPUT dB | INPUT VSWR | OUTPUT ON dB | OUTPUT ON VSWR | OUTPUT OFF dB | OUTPUT OFF VSWR |
| J3 - J1 4.02 dB | 9.01 dB | 2.09 : 1 | 9.83 dB | 1.95 : 1 | 10.54 dB | 1.84 : 1 |
| J3 - J2 3.98 | 8.50 dB | 2.20 : 1 | 8.01 dB | 2.32 : 1 | 9.36 dB | 2.03 : 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 | 22 nS | 10 nS | 18 nS | 8 nS |
| J3-J2 >60 | 18 nS | 8 nS | 20 nS | 9 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 |
| | nS | nS | nS | nS |

NOTE: Any additional test data on back

TESTED ON: 8757A/8350B

TEST: CW
QA/QC: 04 PA
DATED: DEC 07 1999

# FINAL TEST DATA

## AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER: 2MS909679

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-2
MODEL NO: MSN-2DT-05-STANDARD
SERIAL NO: 2MS909679
CURRENT DRAW: +5VDC @60 mA; -5 VDC @60mA

TECHNICIAN: H. Hahn
OPTION NO: LVT, 12X, 118
SPECIFICATION:
FREQUENCY RANGE: 1-18.2 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 |
| J3-J1 3.70 dB | 10.00 dB | 1.92 : 1 | 8.94 dB | 2.11 : 1 | 8.81 dB | 2.14 : 1 |
| J3-J2 3.80 dB | 9.39 dB | 2.03 : 1 | 9.01 dB | 2.10 : 1 | 8.70 dB | 2.16 : 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 |
| J3-J1 >60 dB | 18 nS | 2 nS | 16 nS | 4 nS |
| J3-J2 >60 dB | 18 nS | 4 nS | 16 nS | 6 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 |
| dB | nS | nS | nS | nS |

NOTE: Any additional test data on back

TESTED ON: Wiltron 37347A

QA/QC APPROVAL: 04 P.21

DATED: DEC 07 1999

# FINAL TEST DATA

## AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER: 2MS909680

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-2
MODEL NO: MSN-2DT-05-STANDARD
SERIAL NO: 2MS909680
CURRENT DRAW: +5VDC @ 50mA; -5 VDC @ 50 mA

TECHNICIAN: H. Hahn
OPTION NO: LVT, 12X, 118
SPECIFICATION: MIL-STD 454
FREQUENCY RANGE: 1-18.2 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 |
| J3-J1 4.10 dB | 9.17 dB | 2.07 : 1 | 8.79 dB | 2.14 : 1 | 8.82 dB | 2.14 : 1 |
| J3-J2 3.96 dB | 8.27 dB | 2.26 : 1 | 8.29 dB | 2.25 : 1 | 8.54 dB | 2.20 : 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 |
| J3-J1 >60 dB | 14 nS | 5 nS | 20 nS | 10 nS |
| J3-J2 >60 dB | 26 nS | 10 nS | 18 nS | 8 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 |
| dB | nS | nS | nS | nS |

NOTE: Any additional test data on back

TESTED ON: Wiltron 37347A

QA/QC APPROVAL: 04 PS

DATED: DEC 07 1999

# FINAL TEST DATA

## AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 118, 12X, LVT SERIAL NUMBER: 2MS909681

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-2
MODEL NO: MSN-2DT-05-STANDARD
SERIAL NO: 2MS909681
CURRENT DRAW: +5VDC @ 50 mA; -5 VDC @ 50 mA

TECHNICIAN: H. Hahn
OPTION NO: LVT, 12X, 118
SPECIFICATION: MIL-STD 454
FREQUENCY RANGE: 1-18.2 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 |
| J3-J1 4.06 dB | 11.97 dB | 1.67 : 1 | 9.63 dB | 1.99 : 1 | 7.66 dB | 2.44 : 1 |
| J3-J2 3.60 dB | 7.92 dB | 2.34 : 1 | 8.48 dB | 2.21 : 1 | 9.33 dB | 2.04 : 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 |
| J3-J1 > 60 dB | 12 nS | 4 nS | 19 nS | 10 nS |
| J3-J2 > 60 dB | 18 nS | 6 nS | 14 nS | 4 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 |
| dB | nS | nS | nS | nS |

NOTE: Any additional test data on back

TESTED ON: Wiltron 37247A

QA/QC APPROVAL: 04 RA

DATED: DEC 07 1999