TEST REPORT

ON

9.5 TO 10 GHz

SINGLE POLE TWO THROW

ABSORPTIVE / NON-REFLECTIVE SWITCH MODULE

AMC MODEL No:

MSN-2DT-05-STANDARD

OPTION 910, 12X, LVT

Serial Numbers: 2MS909692 THRU 2MS909696

DESIGNED
BY
Dr. A. Gorwara

TESTED
BY
R. Butler

REPORTED
BY
E. Elder

August 6, 2004

LG
JDT
PA MJS
DRH
JKM

AMERICAN MICROWAVE CORPORATION., 7311-G Grove Road, Frederick, MD 21704
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ISO9001 : 1994 CERTIFIED

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T12-EJE-SW-0804

SINGLE POLE TWO THROW, ABSORPTIVE / NON-REFLECTIVE SWITCH MODULE AMC MODEL No: MSN-2DT-05-STANDARD OPTIONS 910, 12X, LVT

FEATURES:

- **2.0 dB LOW INSERTION LOSS**
- **60 dB ISOLATION**
- **ABSORPTIVE / NON-REFLECTIVE**
- **INTEGRAL TTL DRIVER**
- **DESIGNED FOR LOW VIDEO TRANSIENT**

SPECIFICATIONS:

FREQUENCY	:	9.5 GHz TO 10 GHz
INSERTION LOSS	:	2.0 dB MAXIMUM
ISOLATION	:	60 dB MINIMUM
VSWR	:	1.5:1
SWITCHING SPEED (50% TTL TO 10%/90% RF)	:	<30 nS
RISE / FALL TIME (10% TO 90% RF) (90% TO 10% RF)	:	<10 nS
MAXIMUM TOGGLE RATE (50% DC)	:	>20 MHz
RF CONNECTORS	:	SMA FEMALE
DC POWER SUPPLY	:	+5V ±10% @ 100 mA MAXIMUM
	:	-5V ±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} 0 dBm	:	+35 dBm
2 TONE, 2ND ORDER INTERCEPT POINT, P_{OUT} 0 dBm	:	+55 dBm
0.1 dB PASS BAND	:	9.5 GHz to 10.0 GHz

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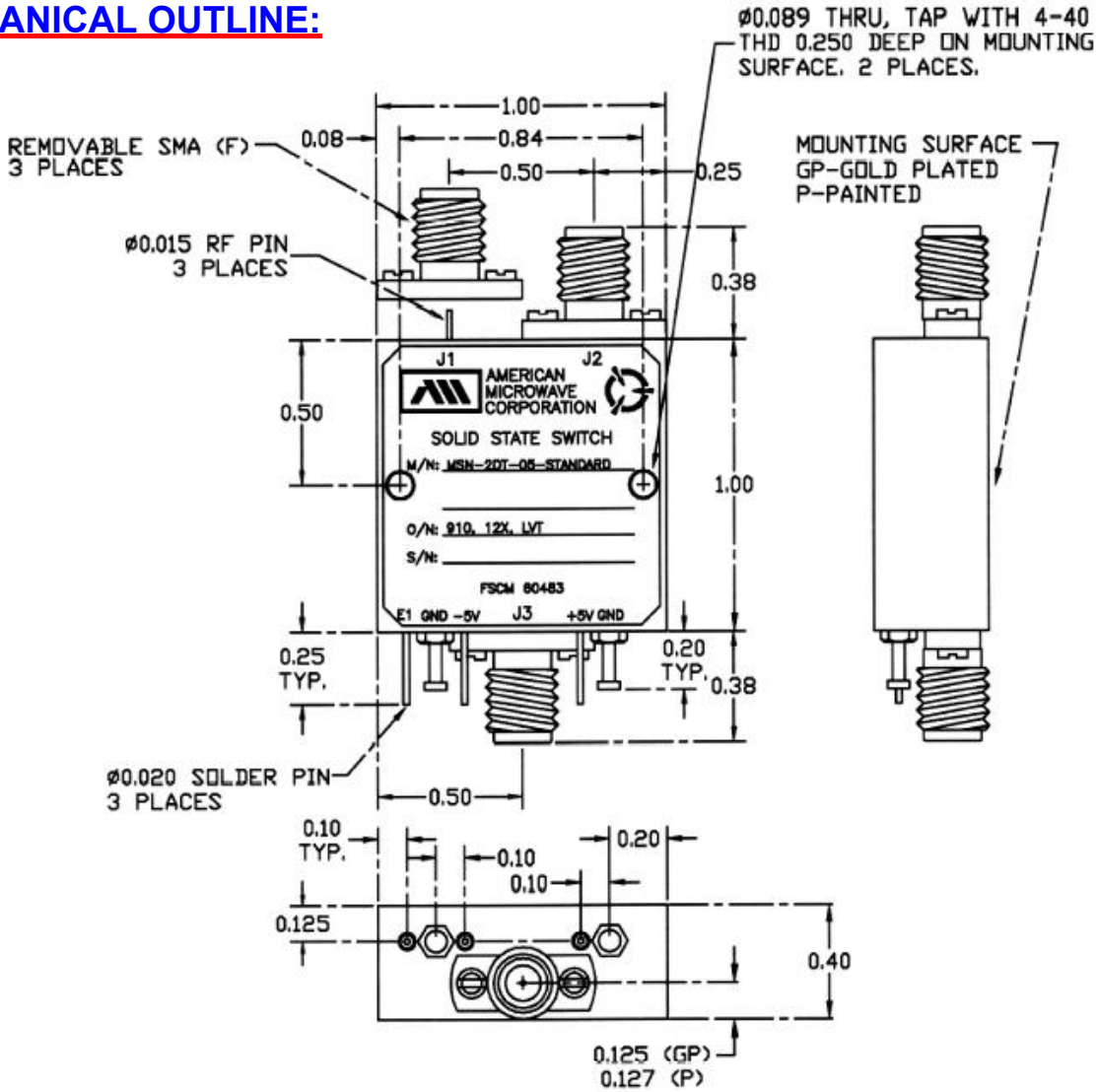
MECHANICAL OUTLINE:



ENVIRONMENTAL RATINGS:

• TEMPERATURE	:	-10°C TO +55°C (OPERATING)
	:	-40°C TO +71°C (STORAGE)
• HUMIDITY	:	95% OVER TEMPERATURE
• 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

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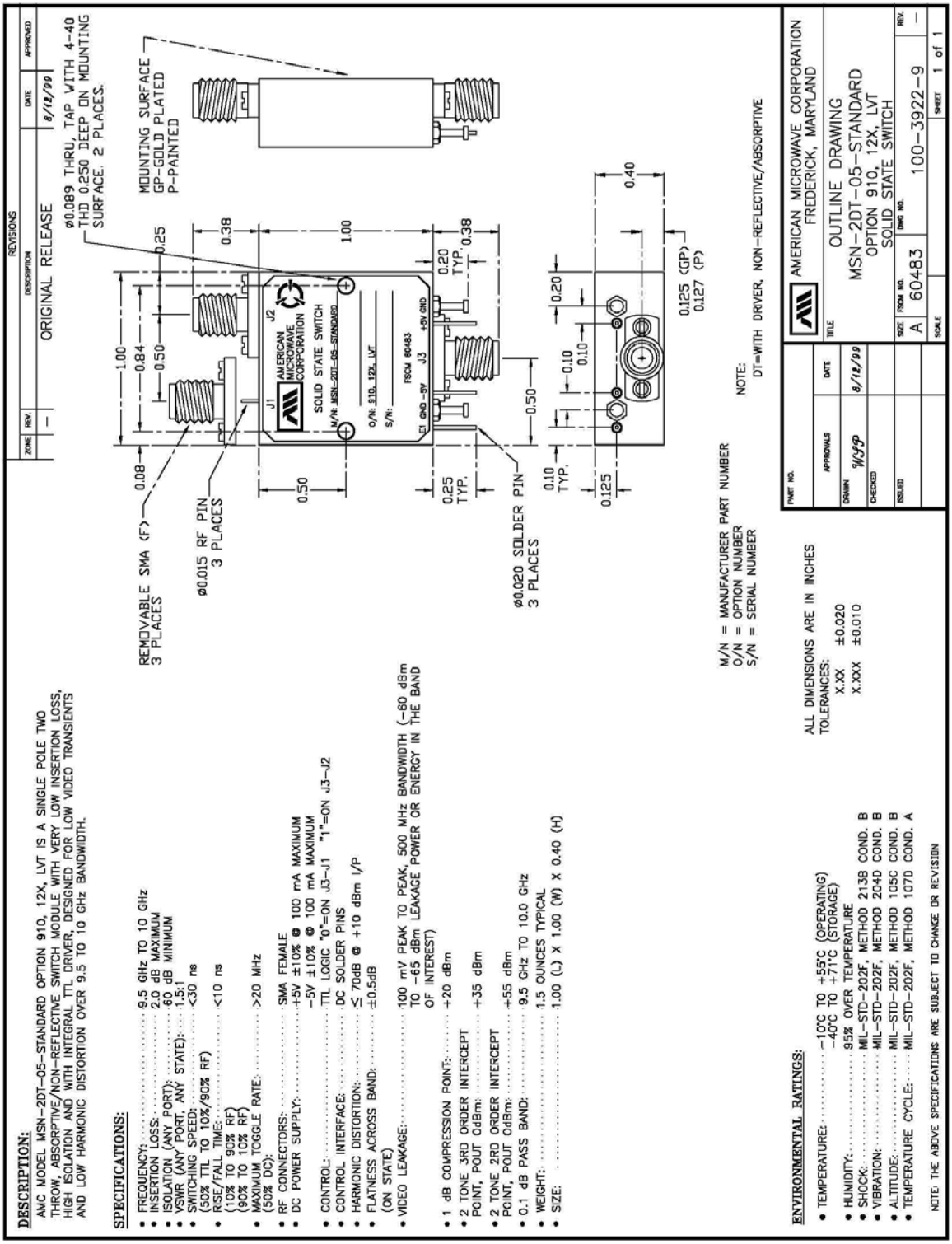
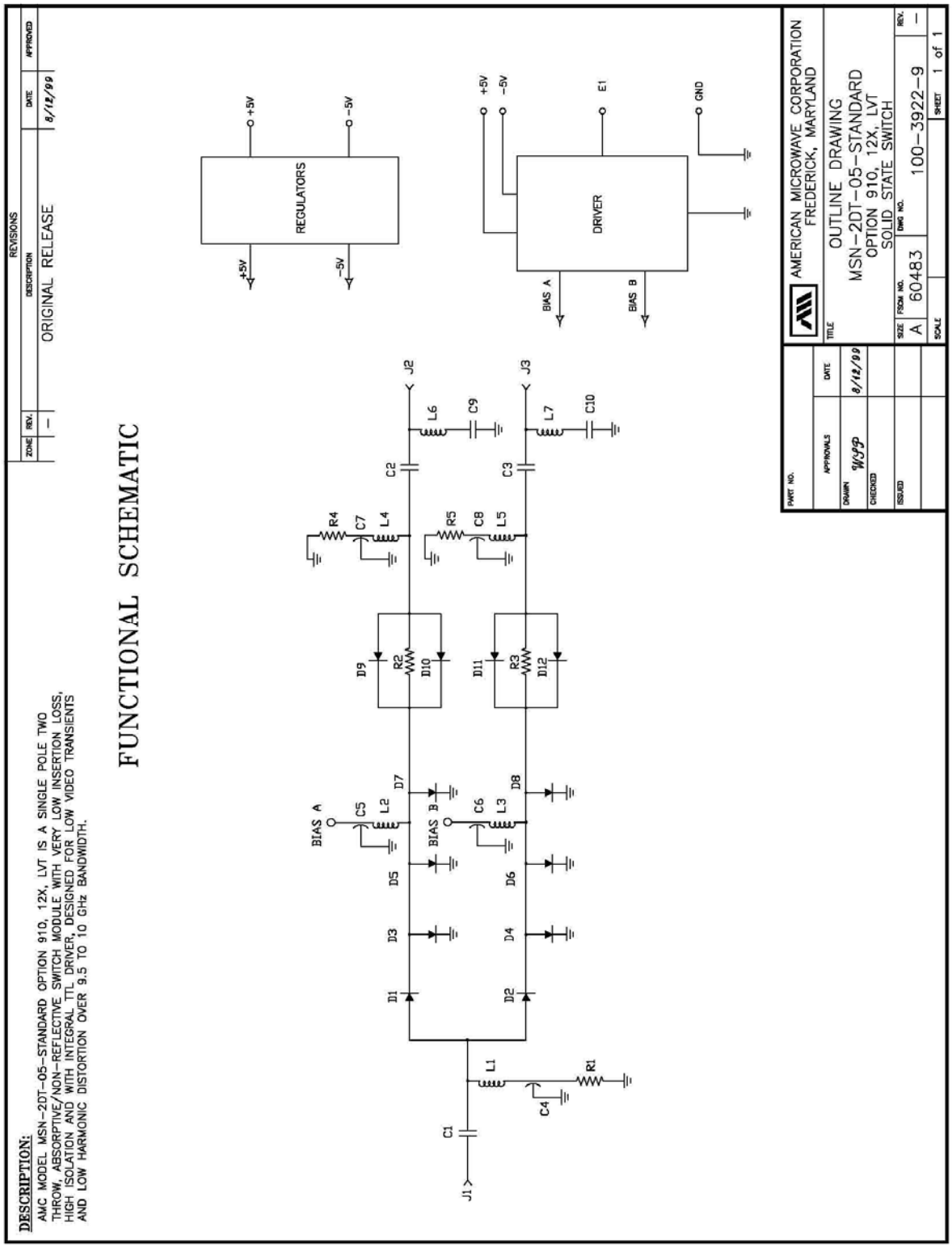
PRODUCT FEATURE



FUNCTIONAL SCHEMATIC



FINAL TEST DATA

FINAL TEST DATA SHEETS

FOR

AMC MODEL NUMBER

MSN-2DT-05-STANDARD
OPTION 910, 12X, LVT

Serial Numbers:

2MS909692 THRU 2MS909696

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FINAL TEST DATA

AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 910, 12X, LVT, SERIAL NUMBER: 2MS909692

FORM: SW-DTA 1099

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-8
MODEL NO: MSN-2DT-05-STD
SERIAL NO: 2MS909692
CURRENT DRAW: +5 VDC @ 100 mA; -5 VDC @ 60 mA

TECHNICIAN: R. Butler
OPTION NO: 910, 12X, LVT
SPECIFICATION:
FREQUENCY RANGE: 9.5 GHz to 10 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 1.51 dB	15.5 dB	1.40 : 1	20.6 dB	1.20 : 1	18.9 dB	1.25 : 1
J3-J2 1.55 dB	15.2 dB	1.41 : 1	17.9 dB	1.29 : 1	18.5 dB	1.26 : 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	< 30 nS	< 10 nS	< 30 nS	< 10 nS
J3-J2 >60 dB	< 30 nS	< 10 nS	< 30 nS	< 10 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: 8350B/8757A HP

QA/QC APPROVAL: [illegible]

DATED: 11/30/99

FINAL TEST DATA

AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 910, 12X, LVT, SERIAL NUMBER: 2MS909693

FORM: SW-DTA 1099

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-8
MODEL NO: MSN-2DT-05-STD
SERIAL NO: 2MS909693
CURRENT DRAW: +5VDC @ 100 mA; -5VDC @ 60 mA

TECHNICIAN: R. Butler
OPTION NO:
SPECIFICATION:
FREQUENCY RANGE: 9.5GHz to 10GHz

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 1.54 dB	14.8 dB	1.44 : 1	15.7 dB	1.39 : 1	20.7 dB	1.20 : 1
J3-J2 1.88 dB	14.4 dB	1.46 : 1	15.3 dB	1.41 : 1	18.8 dB	1.25 : 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	< 30 nS	< 10 nS	< 30 nS	< 10 nS
J3-J2 > 60 dB	< 30 nS	< 10 nS	< 30 nS	< 10 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: 8350B/8757A HP

QA/QC APPROVAL:

DATED: 11/30/99

FINAL TEST DATA

AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 910, 12X, LVT, SERIAL NUMBER: 2MS909694

FORM: SW-DTA [illegible]1099

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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-8
MODEL NO: MSN-2DT-05-STD
SERIAL NO: 2MS909694
CURRENT DRAW: +5 VDC @ 100 mA; -5 VDC @ 60 mA

TECHNICIAN: R. Butler
OPTION NO: 910, 12x LVT
SPECIFICATION:
FREQUENCY RANGE: 9.5 GHz to 10 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 1.45 dB	19.35 dB	1.24 : 1	19.62 dB	1.23 : 1	15.6 dB	1.39 : 1
J3-J2 1.73 dB	15.75 dB	1.39 : 1	19.60 dB	1.23 : 1	17.0 dB	1.32 : 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	< 30 nS	< 10 nS	< 30 nS	< 10 nS
J3-J2 > 60 dB	< 30 nS	< 10 nS	< 30 nS	< 10 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

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TECHNICIAN: R. Butler
OPTION NO:
SPECIFICATION:
FREQUENCY RANGE: 9.5 GHz to 10 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 1.48 dB	16.4 dB	1.35 : 1	20.4 dB	1.21 : 1	23.4 dB	1.14 : 1
J3-J2 1.48 dB	15.4 dB	1.40 : 1	17.9 dB	1.29 : 1	26.0 dB	1.10 : 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	< 30 nS	< 10 nS	< 30 nS	< 10 nS
J3-J2 > 60 dB	< 30 nS	< 10 nS	< 30 nS	< 10 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: 8350B/8757A HP

QA/QC APPROVAL: [signature]

DATED: 11/30/99

FINAL TEST DATA

AMC MODEL NO: MSN-2DT-05-STANDARD OPTION 910, 12X, LVT, SERIAL NUMBER: 2MS909696

FORM: SW-DTA 1099

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DATE: 11-30-99

FINAL TEST DATA
ON
MICROWAVE SWITCH

CUSTOMER: Telemus
JOB NO: 907133E-8
MODEL NO: MSN-2DT-05-STD
SERIAL NO: 2MS909696
CURRENT DRAW: +5 VDC @ 100 mA; -5 VDC @ 60 mA

TECHNICIAN: R. Butler
OPTION NO: 910, 12X LVT
SPECIFICATION:
FREQUENCY RANGE: 9.5 GHz to 10 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 1.59 dB	15.7 dB	1.38 : 1	18.1 dB	1.28 : 1	20.1 dB	1.22 : 1
J3-J2 1.42 dB	15.7 dB	1.39 : 1	23.5 dB	1.14 : 1	17.1 dB	1.32 : 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	< 30 nS	< 10 nS	< 30 nS	< 10 nS
J3-J2 > 60 dB	< 30 nS	< 10 nS	< 30 nS	< 10 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: 8350B/87574 HP

QA/QC APPROVAL: JD

DATED: 11/30/99