



**TEST DATA**

**ON**

**MIL-STD-883 QUALIFIED**

**9.3 TO 9.9 GHz**  
**(10 MHz TO 18.0 GHz AVAILABLE)**

**LOW LOSS**

**HERMETICALLY SEALED**

**MINIATURE, REFLECTIVE**

**SP3T SOLID STATE RADIAL SWITCH**

**AMC MODEL No:**  
**SWN-1140-3DR-MSF303**

Serial Numbers: 3MS305022 AND 3MS305026

**DESIGNED**

**BY**

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

**TESTED**

**BY**

**R. Elad**

**REPORTED**

**BY**

**P. Wood**

**July 14, 2003**

**AMERICAN MICROWAVE CORPORATION., 7311-G Grove Road, Frederick, MD 21704**  
**Tel: 301-662-4700 • Fax: 301-662-4938 • Email: [sales@americanmicrowavecorp.com](mailto:sales@americanmicrowavecorp.com)**  
**Website: <http://www.americanmicrowavecorp.com>**

**ISO9001 : 1994 CERTIFIED**

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## MIL-STD-883 QUALIFIED SP3T, REFLECTIVE, SOLID STATE SWITCH AMC MODEL No: SWN-1140-3DR-MSF303

### FEATURES:

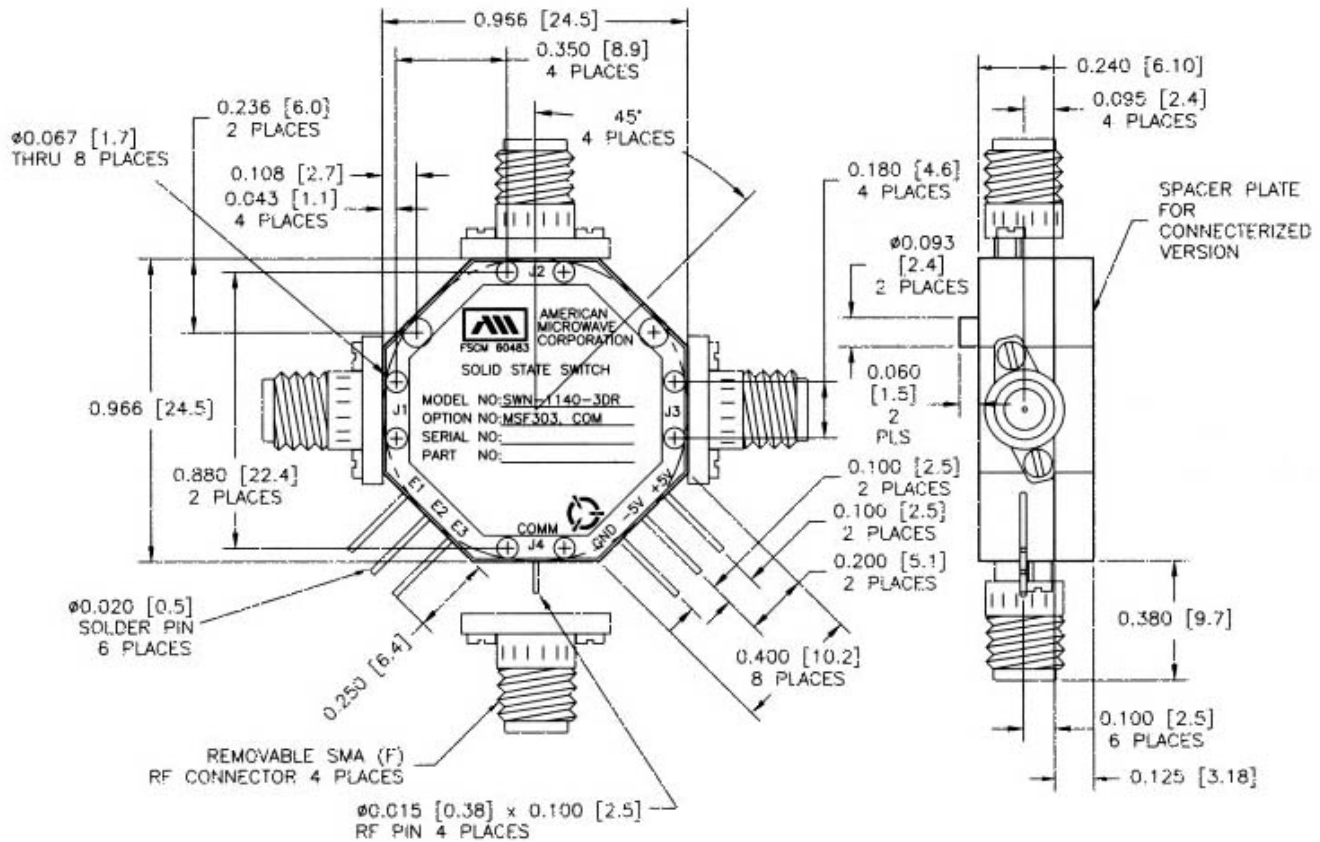
- MIL-STD-883 RELIABILITY
- HERMETICALLY SEALED
- HIGH ISOLATION
- LOW LOSS
- SMALL SIZE



### SPECIFICATIONS:

- FREQUENCY : 9.3 to 9.9 GHz (10 MHz TO 18 GHz AVAILABLE)
- INSERTION LOSS :  $\leq 2.7$  dB
- VSWR (ALL PORTS) :  $\geq 15.0$  dB (1.433:1)
- ISOLATION :  $\geq 70$  dB
- AMPLITUDE RIPPLE :  $\leq 0.05$  dB peak-to-peak
- PHASE RIPPLE :  $\leq 0.5$  Degrees peak-to-peak
- INPUT RF POWER :  $\geq +20$  dBm
- SWITCHING SPEED :  $\leq 100$  nS (50% TTL TO 90% RF)
- CONTROL : TTL (SEE LOGIC TABLE)
- OPERATING TEMPERATURE :  $-20^{\circ}\text{C}$  TO  $+60^{\circ}\text{C}$
- STORAGE TEMPERATURE :  $-65^{\circ}\text{C}$  TO  $+125^{\circ}\text{C}$
- POWER SUPPLY (POSITIVE) :  $+5$  VDC  $\pm 5\%$  @  $\leq 110$  mA MAXIMUM
- POWER SUPPLY (NEGATIVE) :  $-5$  VDC  $\pm 5\%$  @  $\leq 50$  mA MAXIMUM
- THERMAL RESISTANCE :  $10^{\circ}\text{C}$  per WATT
- INPUT RF SURVIVAL POWER : 1 WATT CW, 10 WATTS PEAK, 1 $\mu$ S
- CONNECTORS (RF) : REMOVABLE SMA FEMALE, 4-Places
- CONNECTORS (POWER) : SOLDER PINS
- CONNECTORS (CONTROL) : SOLDER PINS
- SIZE : 0.966" X 0.966" X 0.365" (w/ Spacer)  
24.5mm X 24.5mm X 9.28mm (w/Spacer)  
0.966" X 0.966" X 0.240"  
24.5mm X 24.5mm X 6.10mm
- WEIGHT : 1.5 oz. TYPICAL

### MECHANICAL OUTLINE



<b>ENVIRONMENTAL RATINGS</b>	
(CUSTOMER SPECIFIC REQUIREMENTS FOR EVENTUAL SPACE QUALIFICATION)	
•	TEMPERATURE
-20°C TO +60°C OPERATING	
-65°C TO +125°C STORAGE	
•	PRE-SEAL BURN-IN
MIL-STD-883 Method 1015, T <sub>c</sub> = 125°C	
•	STABILIZATION BAKE
MIL-STD-883 Method 1008, 24 Hours @ 150°C	
•	HERMETIC SEAL FINE LEAK TEST
MIL-STD-883 Method 1014, Condition A1	
•	HERMETIC SEAL GROSS LEAK TEST
MIL-STD-883 Method 1014, Condition C1	
•	VIBRATION
MIL-STD-202 Method 204, Condition B	
•	MECHANICAL SHOCK
MIL-STD-202 Method 213, Condition B	
•	BURN-IN
MIL-STD-883 Method 1015, T <sub>c</sub> = 125°C	
•	TEMPERATURE CYCLING
MIL-STD-883 Method 1010, Condition B1 (10 Cycles)	
•	FINAL ELECTRICAL TESTING
TAKEN OVER TEMPERATURE: +85°C, +25°C & -45°C	

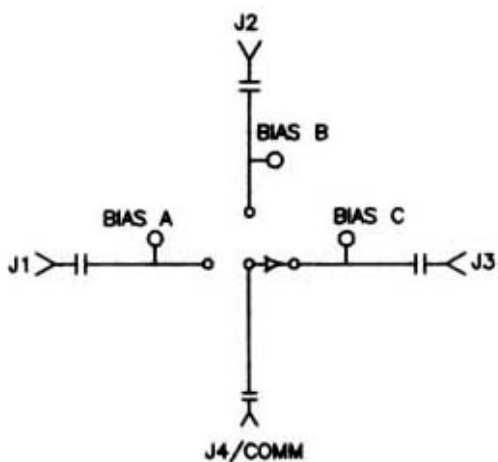
## CONTROL LOGIC TRUTH TABLE

LOGIC TABLE					
CONTROL TERMINAL TTL LEVEL			RF PORT CONNECTION		
E1	E2	E3	COM/J4 TO J1	COM/J4 TO J2	COM/J4 TO J3
LOW	HIGH	HIGH	INSERTION LOSS	ISOLATION	ISOLATION
HIGH	LOW	HIGH	ISOLATION	INSERTION LOSS	ISOLATION
HIGH	HIGH	LOW	ISOLATION	ISOLATION	INSERTION LOSS

LOGIC LOW = (0)  
 LOGIC HIGH = (1)

➔ COMMON ARM IS J4

## FUNCTIONAL BLOCK DIAGRAM

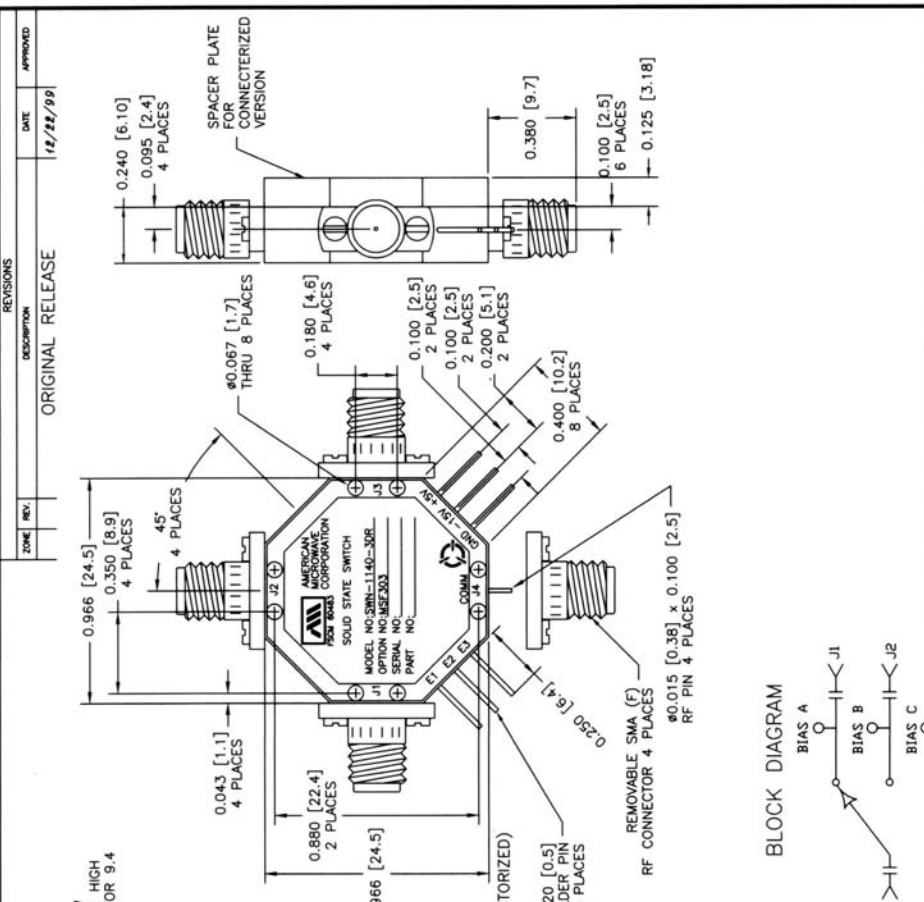


**PRODUCT FEATURE**

REVISIONS

DATE: 12/22/99

APPROVED



**DESCRIPTION:**  
 AMC MODEL SWN-1140-3DR OPTION MSF303 IS A SINGLE POLE THREE THROW HERMETICALLY SEALED, REFLECTIVE SWITCH MODULE WITH LOW INSERTION LOSS, HIGH ISOLATION, FAST SWITCHING TIMES AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR 9.4 TO 9.8 GHz OPERATION.

**SPECIFICATIONS:**

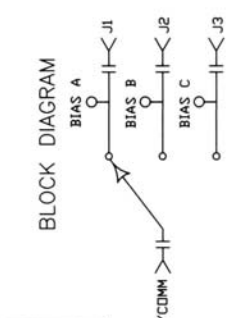
- FREQUENCY: 9.4 GHz TO 9.8 GHz
- INSERTION LOSS: 2.8 dB MAXIMUM
- ISOLATION: 60 dB MINIMUM
- VSWR (ALL PORTS): 2.0:1 MAXIMUM
- SWITCHING SPEED: 100 ns MAXIMUM (50% TTL TO 90% RF)
- RF POWER: 20 dBm (WITH 2 dB COMPRESSION)
- CONTROL: SEE LOGIC TABLE
- POWER SUPPLY: +5 VDC @ 110 mA MAXIMUM, -11 TO -15 VDC @ 50 mA MAXIMUM
- CONNECTORS (RF): REMOVABLE SMA FEMALE, 3 PLACES
- CONNECTORS (POWER): SOLDER PINS
- CONNECTORS (CONTROL): SOLDER PINS
- SIZE: 0.966" (L) x 0.966" (W) x 0.365" (H) (CONNECTORIZED), 0.966" (L) x 0.966" (W) x 0.240" (H)
- WEIGHT: 1.5 OUNCE TYPICAL

**LOGIC TABLE**

DASH	TERMINAL LEVEL			RF		
	E1	E2	E3	CDMM/J4 - J1	CDMM/J4 - J2	CDMM/J4 - J3
1	L	H	H	ISOLATION	ISOLATION	ISOLATION
	H	L	H	ISOLATION	ISOLATION	ISOLATION
	H	H	L	ISOLATION	ISOLATION	ISOLATION
2	H	L	L	ISOLATION	ISOLATION	ISOLATION
	L	L	L	ISOLATION	ISOLATION	ISOLATION

LOGIC L = LOW (0)  
 LOGIC H = HIGH (1)

**BLOCK DIAGRAM**



**ENVIRONMENTAL RATINGS:**

- TEMPERATURE: -54°C TO +100°C (OPERATING), -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- 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

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

**APPROVALS**

DATE: 12/22/99

DRAWN: WJp

CHECKED:

ISSUED:

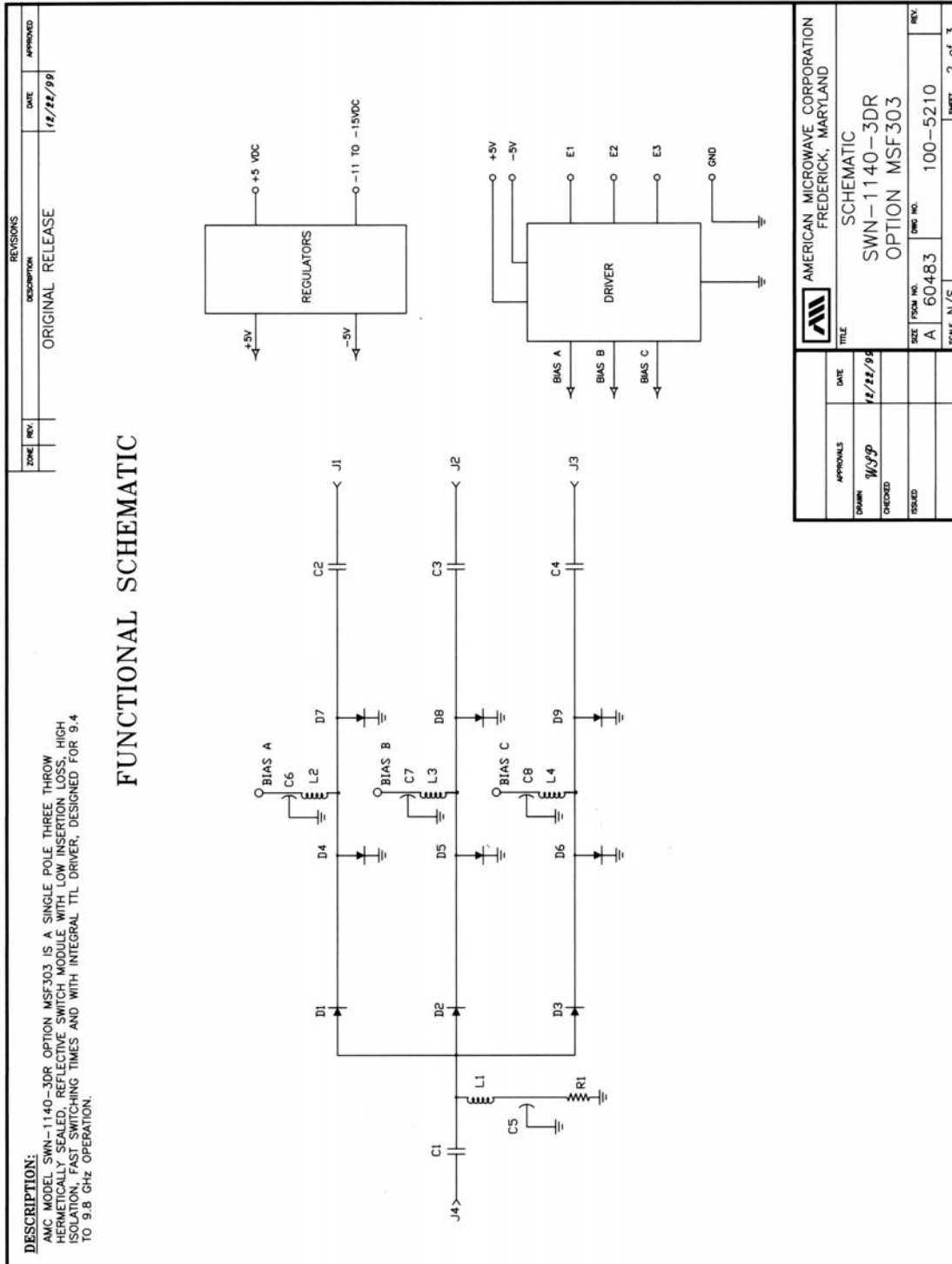
AMERICAN MICROWAVE CORPORATION  
 FREDERICK, MARYLAND

PRODUCT FEATURE  
 SWN-1140-3DR  
 OPTION MSF303

SIZE FROM NO. A 60483 DWG NO. 100-5210 REV. 1

SCALE N/S SHEET 1 of 3

**PRODUCT FEATURE  
 FUNCTIONAL SCHEMATIC**

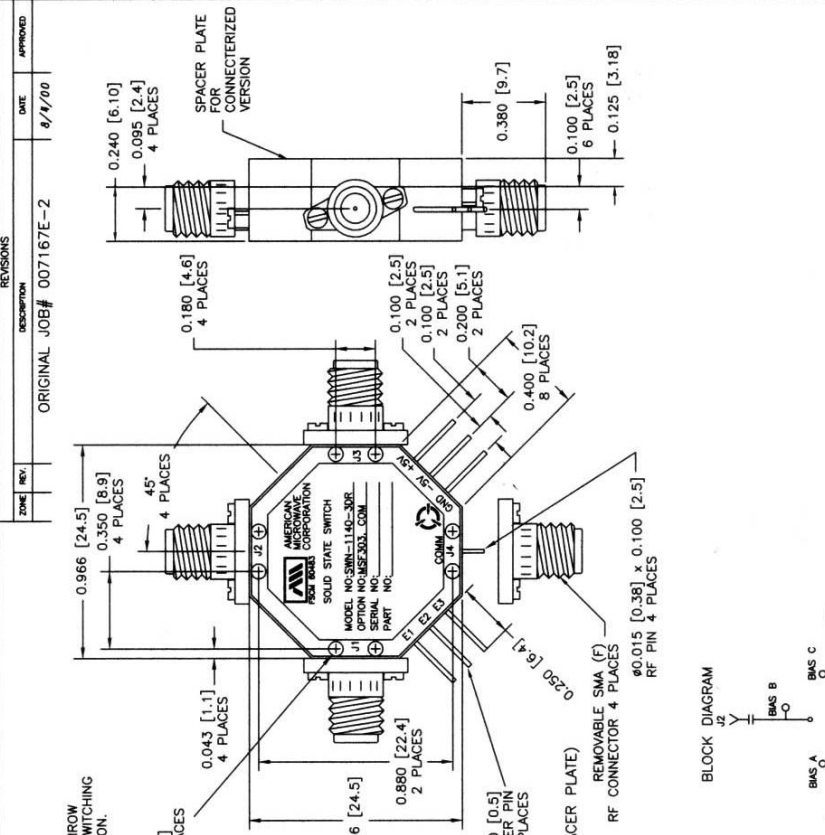


## PRODUCT FEATURE

SHOWING AMC STANDARD PRODUCT WITH STANDARD OPTIONS AND ENVIRONMENTALS

**REVISIONS**

ZONE	REV.	DESCRIPTION	DATE	APPROVED
		ORIGINAL JOB# 007167E-2	8/1/00	



SPACER PLATE FOR CONNECTORIZED VERSION

0.240 [6.10] 4 PLACES

0.085 [2.4] 4 PLACES

0.180 [4.6] 4 PLACES

0.100 [2.5] 2 PLACES

0.100 [2.5] 2 PLACES

0.200 [5.1] 2 PLACES

0.380 [9.7]

0.100 [2.5] 6 PLACES

0.125 [3.18]

0.350 [8.9] 4 PLACES

45°

0.043 [1.1] 4 PLACES

0.966 [24.5] 4 PLACES

0.067 [1.7] THRU 8 PLACES

AMERICAN MICROWAVE CORPORATION  
 1000 WEST BOULEVARD  
 FREDERICK, MARYLAND 21704  
 MODEL NO. SWN-1140-3DR  
 J1 OPTION NO. MSF303  
 SERIAL NO.  
 PART NO.

SOLID STATE SWITCH

RF PIN 4 PLACES

0.880 [22.4] 2 PLACES

0.020 [0.5] SOLDER PIN 6 PLACES

0.250 [6.4] REMOVABLE SMA (F) RF PIN 4 PLACES

0.400 [10.2] 8 PLACES

0.015 [0.38] x 0.100 [2.5] RF PIN 4 PLACES

**DESCRIPTION:**  
 AMC MODEL SWN-1140-3DR OPTION MSF303, COM IS A SINGLE POLE THREE THROW REFLECTIVE SWITCH MODULE WITH LOW INSERTION LOSS, HIGH ISOLATION, FAST SWITCHING SPEED AND WITH INTEGRAL TTL DRIVER, DESIGNED FOR 9.3 TO 9.9 GHz OPERATION.

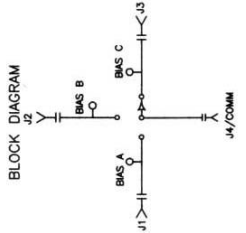
**SPECIFICATIONS:**

- FREQUENCY: 9.3 GHz TO 9.9 GHz
- INSERTION LOSS:  $\leq 2.7$  dB
- SWR (ALL PORTS):  $\leq 1.5$  dB
- ISOLATION:  $\geq 70$  dB
- AMPLITUDE RIPPLE:  $\leq 0.05$  dBpp
- PHASE RIPPLE:  $\leq 0.5$  Degpp
- INPUT POWER:  $\geq 20$  dBm (AT 2 dB COMPRESSION)
- SWITCHING SPEED:  $\leq 100$  ns (50% TTL TO 90% RF)
- CONTROL: TTL (SEE LOGIC TABLE)
- OPERATING TEMPERATURE:  $-20^{\circ}\text{C}$  TO  $+60^{\circ}\text{C}$
- STORAGE TEMPERATURE:  $-65^{\circ}\text{C}$  TO  $+125^{\circ}\text{C}$
- POWER SUPPLY:  $+5$  VDC  $\pm 5\%$  @  $\leq 110$  mA MAXIMUM  
 $-5$  VDC  $\pm 5\%$  @  $\leq 50$  mA MAXIMUM
- THERMAL RESISTANCE:  $10^{\circ}\text{C}/\text{W}$
- INPUT POWER: 1 WATT CW, 10W PEAK 1  $\mu\text{s}$
- CONNECTORS (RF): REMOVABLE SMA FEMALE, 4 PLACES
- CONNECTORS (POWER): SOLDER PINS
- CONNECTORS (CONTROL): SOLDER PINS
- SIZE:  $0.966''$  (L) x  $0.966''$  (W) x  $0.365''$  (H) (WITH SPACER PLATE)  
 $0.966''$  (L) x  $0.966''$  (W) x  $0.240''$  (H)
- WEIGHT: 1.5 OUNCE TYPICAL

**CONFIDENTIAL AND PROPRIETARY**

AMERICAN MICROWAVE CORPORATION FREDERICK, MARYLAND	
PRODUCT FEATURE	
SWN-1140-3DR	
OPTION: MSF303, COM	
DATE	8/1/00
DESIGNED	MSF303 / 9803
CHECKED	
ISSUED	
SIZE FROM NO.	A 60483
DWG NO.	100-5210-2
SCALE	N/S
SHEET	1 of 3

**BLOCK DIAGRAM**



ALL DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 X.XX  $\pm 0.020$   
 X.XXX  $\pm 0.010$

LOGIC TABLE			
RF			
TERMINAL LEVEL	CDMM/J4 - J1	CDMM/J4 - J2	CDMM/J4 - J3
E1	H	H	H
E2	L	L	L
E3	H	H	H
L	H	L	L
H	L	H	H
L	L	L	L
L	L	L	L

LOGIC L = LOW (0)  
 LOGIC H = HIGH (1)

**ENVIRONMENTAL RATINGS:**

- TEMPERATURE:  $-20^{\circ}\text{C}$  TO  $+60^{\circ}\text{C}$  (OPERATING)  
 $-65^{\circ}\text{C}$  TO  $+125^{\circ}\text{C}$  (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204B COND. B
- SHOCK: MIL-STD-202F, METHOD 204B COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION



**FINAL TEST DATA**

AS MEASURED AT +85°C, +25°C AND -45°C  
 AMC MODEL NO: SWN-1140-3DR-MSF303, SERIAL NUMBER: 3MS305022

**AS MEASURED AT +85°C FROM 9.3 TO 9.9 GHz**

PORTS	INSERTION LOSS	SWITCHING SPEED "ON"	SWITCHING SPEED "OFF"	ISOLATION
J4 TO J1	1.14 dB	50 nS	38 nS	81 dB
J4 TO J2	1.23 dB	50 nS	36 nS	80 dB
J4 TO J3	1.19 dB	48 nS	38 nS	80 dB

PORTS	INPUT RETURN LOSS	INPUT VSWR	OUTPUT RETURN LOSS	OUTPUT VSWR
J4 TO J1	22.80 dB	1.16 : 1	29.75 dB	1.07 : 1
J4 TO J2	21.80 dB	1.18 : 1	21.48 dB	1.18 : 1
J4 TO J3	20.10 dB	1.22 : 1	20.12 dB	1.22 : 1

**PHASE RIPPLE MEASURED : 0.4 degrees Peak to Peak**

**AMPLITUDE RIPPLE MEASURED : 0.05 degrees Peak to Peak**

**CURRENT DRAW DURING TESTS (WORST CASE): +5 VDC @ 90 mA, -5 VDC @ 22 mA**

**FINAL TEST DATA**

AS MEASURED AT +85°C, +25°C AND -45°C  
 AMC MODEL NO: SWN-1140-3DR-MSF303, SERIAL NUMBER: 3MS305022

**AS MEASURED AT +25°C FROM 9.3 TO 9.9 GHz**

PORTS	INSERTION LOSS	SWITCHING SPEED "ON"	SWITCHING SPEED "OFF"	ISOLATION
J4 TO J1	1.03 dB	50 nS	38 nS	80 dB
J4 TO J2	1.14 dB	50 nS	36 nS	80 dB
J4 TO J3	1.11 dB	48 nS	38 nS	82 dB

PORTS	INPUT RETURN LOSS	INPUT VSWR	OUTPUT RETURN LOSS	OUTPUT VSWR
J4 TO J1	22.59 dB	1.16 : 1	28.46 dB	1.08 : 1
J4 TO J2	21.90 dB	1.17 : 1	21.58 dB	1.18 : 1
J4 TO J3	20.07 dB	1.22 : 1	20.06 dB	1.22 : 1

**PHASE RIPPLE MEASURED : 0.4 degrees Peak to Peak**

**AMPLITUDE RIPPLE MEASURED : 0.05 degrees Peak to Peak**

**CURRENT DRAW DURING TESTS (WORST CASE): +5 VDC @ 90 mA. -5 VDC @ 22 mA**

**FINAL TEST DATA**

AS MEASURED AT +85°C, +25°C AND -45°C  
AMC MODEL NO: SWN-1140-3DR-MSF303, SERIAL NUMBER: 3MS305022

**AS MEASURED AT -45°C FROM 9.3 TO 9.9 GHz**

PORTS	INSERTION LOSS	SWITCHING SPEED "ON"	SWITCHING SPEED "OFF"	ISOLATION
J4 TO J1	1.06 dB	50 nS	38 nS	81 dB
J4 TO J2	1.16 dB	50 nS	36 nS	80 dB
J4 TO J3	1.14 dB	48 nS	38 nS	80 dB

PORTS	INPUT RETURN LOSS	INPUT VSWR	OUTPUT RETURN LOSS	OUTPUT VSWR
J4 TO J1	22.36 dB	1.16 : 1	26.88 dB	1.09 : 1
J4 TO J2	22.25 dB	1.17 : 1	21.31 dB	1.19 : 1
J4 TO J3	20.47 dB	1.21 : 1	20.17 dB	1.22 : 1

**PHASE RIPPLE MEASURED : 0.4 degrees Peak to Peak**

**AMPLITUDE RIPPLE MEASURED : 0.05 degrees Peak to Peak**

**CURRENT DRAW DURING TESTS (WORST CASE): +5 VDC @ 90 mA. -5 VDC @ 22 mA**

**FINAL TEST DATA**

AS MEASURED AT +85°C, +25°C AND -45°C  
AMC MODEL NO: SWN-1140-3DR-MSF303, SERIAL NUMBER: 3MS305026

**AS MEASURED AT +85°C FROM 9.3 TO 9.9 GHz**

PORTS	INSERTION LOSS	SWITCHING SPEED "ON"	SWITCHING SPEED "OFF"	ISOLATION
J4 TO J1	1.28 dB	52 nS	38 nS	80 dB
J4 TO J2	1.21 dB	50 nS	39 nS	80 dB
J4 TO J3	1.20 dB	49 nS	38 nS	83 dB

PORTS	INPUT RETURN LOSS	INPUT VSWR	OUTPUT RETURN LOSS	OUTPUT VSWR
J4 TO J1	26.64 dB	1.10 : 1	19.70 dB	1.23 : 1
J4 TO J2	31.98 dB	1.05 : 1	23.66 dB	1.14 : 1
J4 TO J3	19.99 dB	1.22 : 1	20.79 dB	1.20 : 1

**PHASE RIPPLE MEASURED : 0.3 degrees Peak to Peak**

**AMPLITUDE RIPPLE MEASURED : 0.05 degrees Peak to Peak**

**CURRENT DRAW DURING TESTS (WORST CASE): +5 VDC @ 90 mA. -5 VDC @ 22 mA**

**FINAL TEST DATA**

AS MEASURED AT +85°C, +25°C AND -45°C  
 AMC MODEL NO: SWN-1140-3DR-MSF303, SERIAL NUMBER: 3MS305026

**AS MEASURED AT +25°C FROM 9.3 TO 9.9 GHz**

PORTS	INSERTION LOSS	SWITCHING SPEED "ON"	SWITCHING SPEED "OFF"	ISOLATION
J4 TO J1	1.20 dB	50 nS	38 nS	81 dB
J4 TO J2	1.14 dB	50 nS	36 nS	81 dB
J4 TO J3	1.13 dB	48 nS	38 nS	83 dB

PORTS	INPUT RETURN LOSS	INPUT VSWR	OUTPUT RETURN LOSS	OUTPUT VSWR
J4 TO J1	26.58 dB	1.10 : 1	19.50 dB	1.24 : 1
J4 TO J2	31.31 dB	1.06 : 1	23.70 dB	1.14 : 1
J4 TO J3	19.91 dB	1.22 : 1	20.71 dB	1.20 : 1

**PHASE RIPPLE MEASURED : 0.3 degrees Peak to Peak**

**AMPLITUDE RIPPLE MEASURED : 0.05 degrees Peak to Peak**

**CURRENT DRAW DURING TESTS (WORST CASE): +5 VDC @ 90 mA. -5 VDC @ 22 mA**

**FINAL TEST DATA**

AS MEASURED AT +85°C, +25°C AND -45°C  
AMC MODEL NO: SWN-1140-3DR-MSF303, SERIAL NUMBER: 3MS305026

**AS MEASURED AT -45°C FROM 9.3 TO 9.9 GHz**

PORTS	INSERTION LOSS	SWITCHING SPEED "ON"	SWITCHING SPEED "OFF"	ISOLATION
J4 TO J1	1.22 dB	50 nS	38 nS	79 dB
J4 TO J2	1.17 dB	50 nS	36 nS	81 dB
J4 TO J3	1.16 dB	48 nS	38 nS	83 dB

PORTS	INPUT RETURN LOSS	INPUT VSWR	OUTPUT RETURN LOSS	OUTPUT VSWR
J4 TO J1	26.08 dB	1.10 : 1	18.86 dB	1.26 : 1
J4 TO J2	30.50 dB	1.06 : 1	23.18 dB	1.15 : 1
J4 TO J3	20.36 dB	1.21 : 1	20.64 dB	1.20 : 1

**PHASE RIPPLE MEASURED : 0.3 degrees Peak to Peak**

**AMPLITUDE RIPPLE MEASURED : 0.05 degrees Peak to Peak**

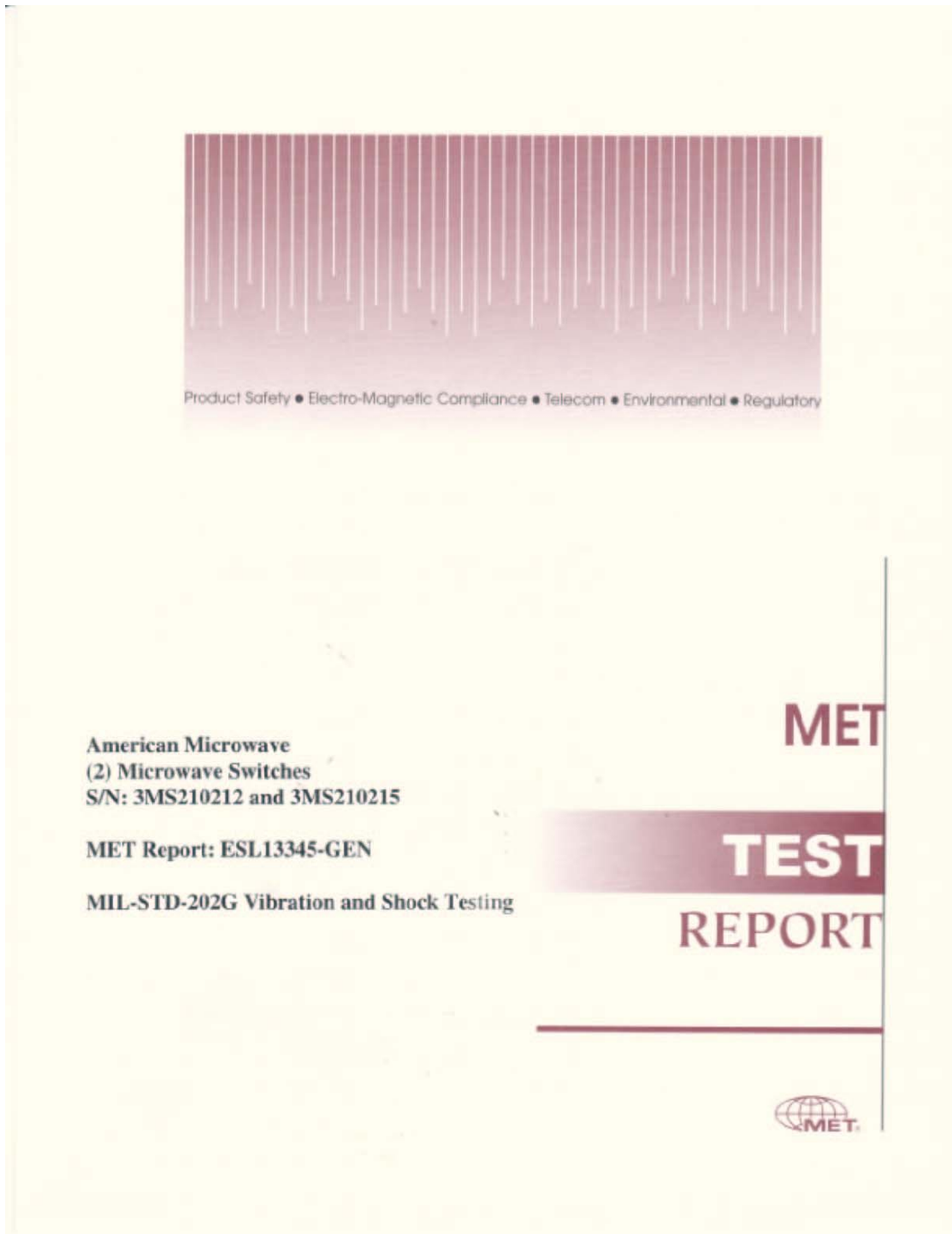
**CURRENT DRAW DURING TESTS (WORST CASE): +5 VDC @ 90 mA. -5 VDC @ 22 mA**

## **ENVIRONMENTAL TEST DATA**

**VIBRATION AND MECHANICAL SHOCK  
AS PERFORMED BY  
MET LABORATORIES, INC.  
MET TEST REPORT No: ESL13345-GEN**

**AND**

**BURN-IN AND TEMPERATURE CYCLING  
RECORDER CHARTS  
AS PERFORMED BY  
AMERICAN MICROWAVE CORPORATION**







**MET Laboratories, Inc.** Safety Certification - EMI - Telecom - Environmental Simulation - NEBS  
914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21250-3432 • PHONE (410) 354-3000 • FAX (410) 354-3313



February 12, 2003

Mr. Eric Schaub  
American Microwave  
7311-G Grove Road  
Frederick, MD 21701

Reference: MIL-STD-202G Vibration and Shock Testing of two microwave switches, S/N:  
3MS210212 & 3MS210215

Dear Mr. Schaub,

Enclosed you will find the data and photographs obtained from the testing performed by MET Laboratories, Inc on the two microwave switches, S/N: 3MS210212 & 3MS210215 on February 4 through February 6, 2003. The two microwave switches, S/N: 3MS210212 & 3MS210215 were subjected to a sinusoidal vibration test, in accordance with MIL-STD-202G, Method 204, Condition B and American Microwave Purchase Order Number 30200030. The visual inspection of the two microwave switches, S/N: 3MS210212 & 3MS210215 revealed no anomalies. The two microwave switches were also subjected to a half sine shock test, in accordance with MIL-STD-202G, Method 213B, Condition B and American Microwave Purchase Order Number 30200030. The visual inspection of the two microwave switches, S/N: 3MS210212 & 3MS210215 revealed no anomalies. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology. MET Laboratories Environmental Simulation Laboratory is accredited by A2LA and NVLAP.

If you have any questions about the results of the testing or if MET can be of further service to you in any way, please feel free to call us. Thank you for using MET's testing services.

Sincerely,

**MET LABORATORIES, INC.**

Bryan Windsor, Project Engineer  
Environmental Simulation Laboratory

Enclosures  
(\American Microwave\13345\ESL13345-GEN.wpd)

*The Nation's First Licensed Nationally Recognized Testing Laboratory*



Photograph 1: View Vertical Axis Vibration Test set-up



Photograph 2: View of Longitudinal Axis Vibration Test set-up



Photograph 3: View of Transverse Axis Vibration Test set-up

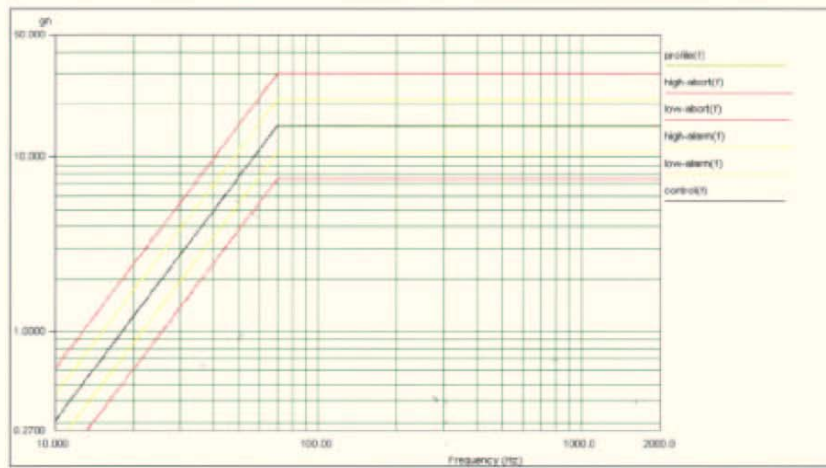


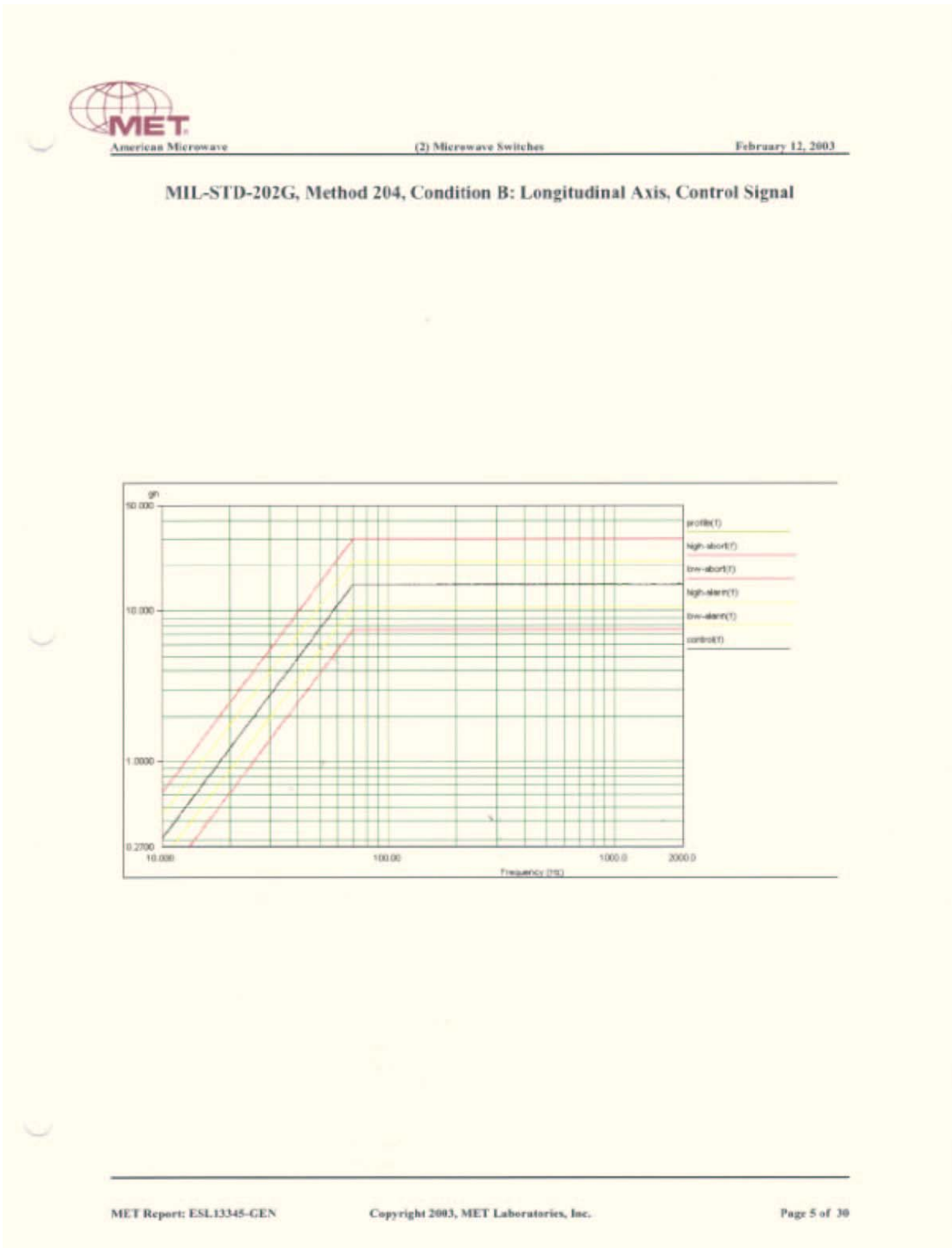
American Microwave

(2) Microwave Switches

February 12, 2003

MIL-STD-202G, Method 204, Condition B: Vertical Axis, Control Signal





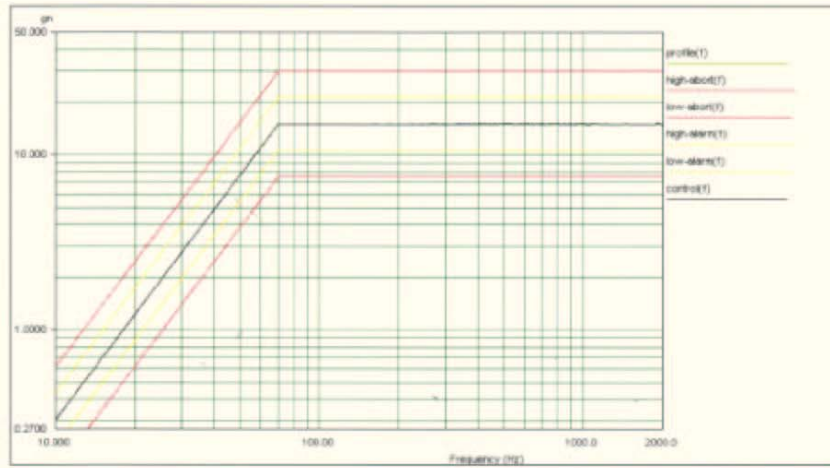


American Microwave

(2) Microwave Switches

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MIL-STD-202G, Method 204, Condition B: Transverse Axis, Control Signal





Photograph 4: View Positive Vertical Axis Shock Test set-up





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Photograph 5: View Negative Vertical Axis Shock Test set-up



Photograph 6: View of Positive Longitudinal Axis Shock Test set-up



Photograph 7: View of Negative Longitudinal Axis Shock Test set-up

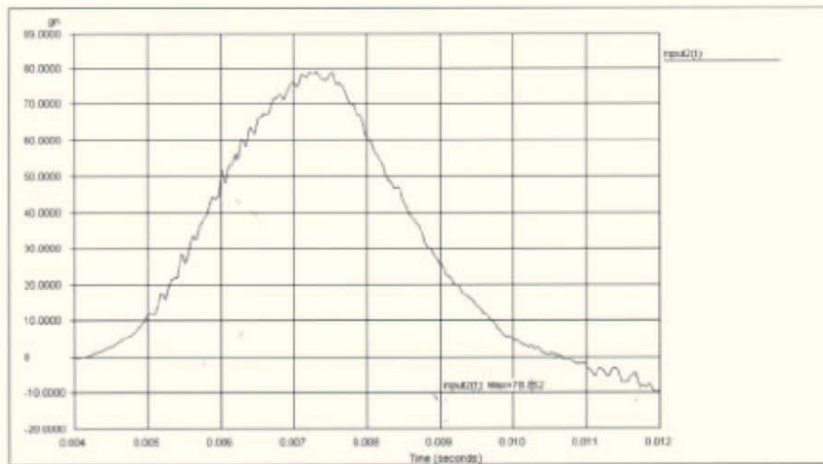


Photograph 8: View of Positive Transverse Axis Shock  
Test set-up





MIL-STD-202G, Method 213B, Condition B: Vertical Axis, Positive Pulse 1



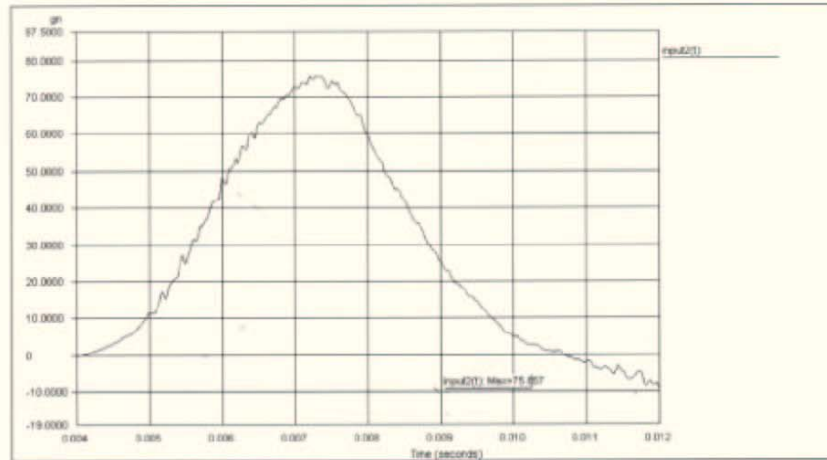


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(2) Microwave Switches

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MIL-STD-202G, Method 213B, Condition B: Vertical Axis, Positive Pulse 2



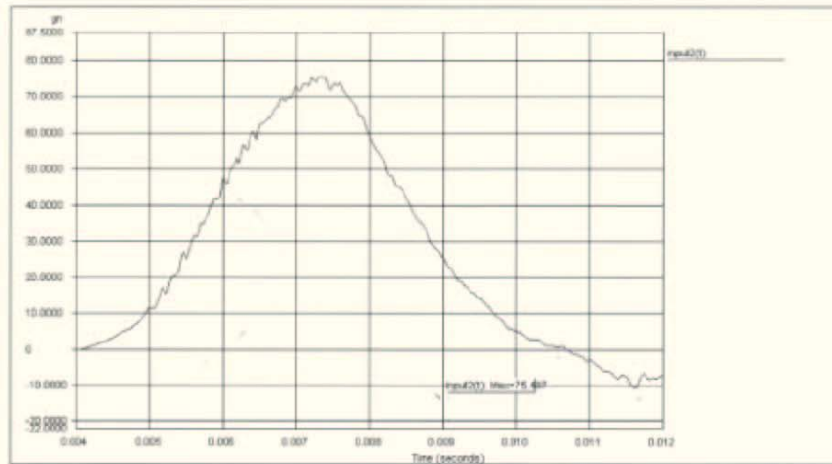


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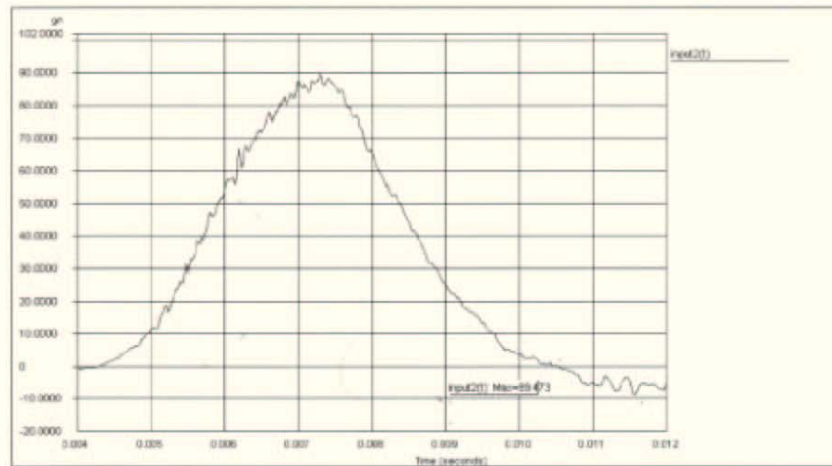
MIL-STD-202G, Method 213B, Condition B: Vertical Axis, Positive Pulse 3







MIL-STD-202G, Method 213B, Condition B: Vertical Axis, Negative Pulse 1



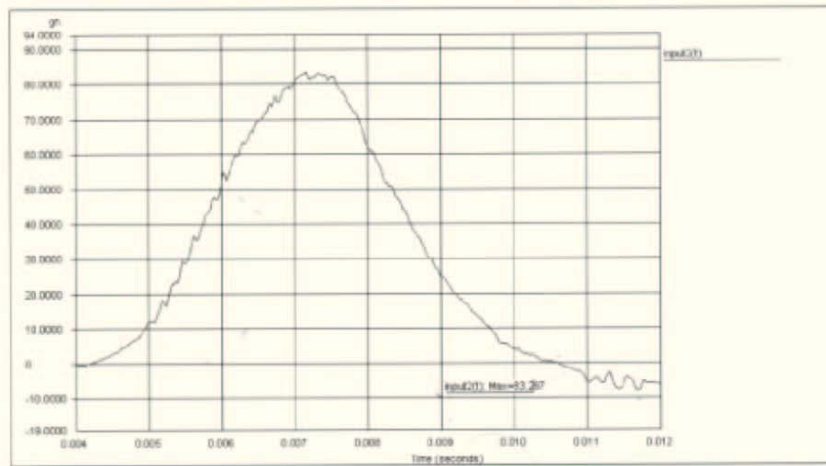


American Microwave

(2) Microwave Switches

February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Vertical Axis, Negative Pulse 2



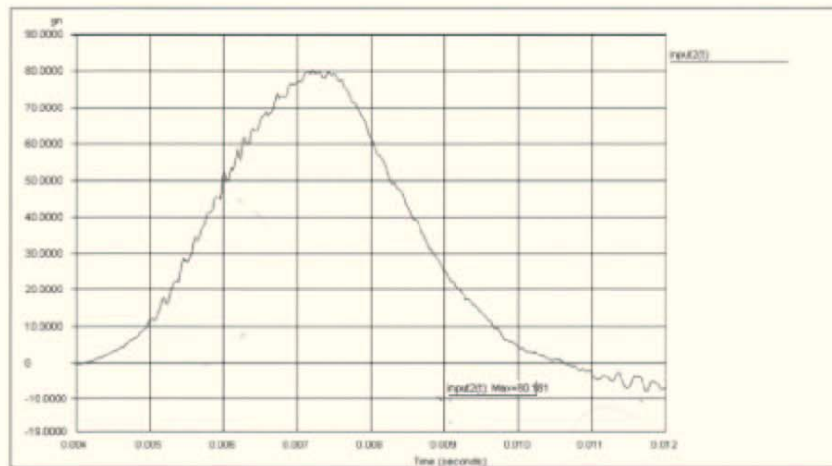


American Microwave

(2) Microwave Switches

February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Vertical Axis, Negative Pulse 3



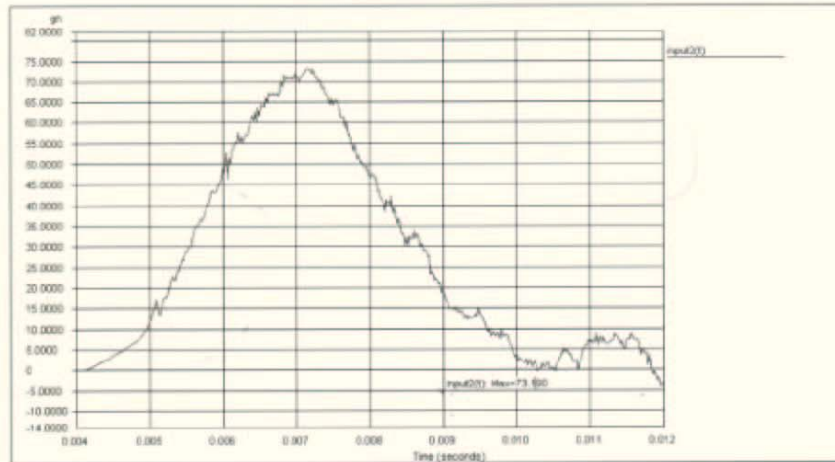


American Microwave

(2) Microwave Switches

February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Longitudinal Axis, Positive Pulse 1



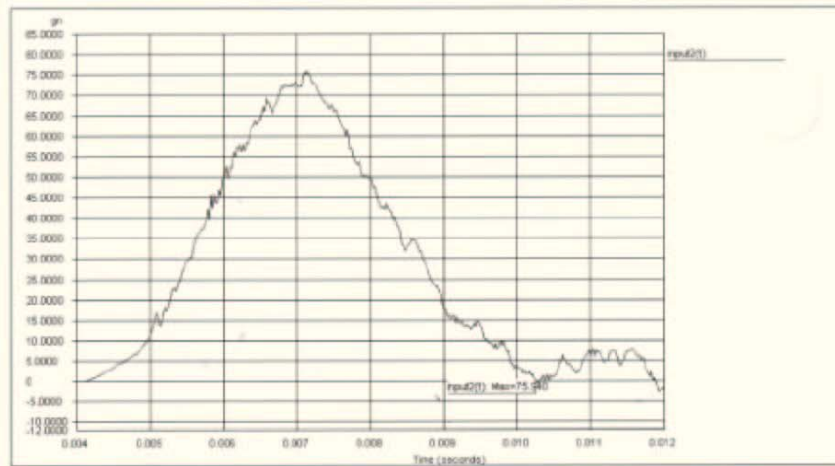


American Microwave

(2) Microwave Switches

February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Longitudinal Axis, Positive Pulse 2



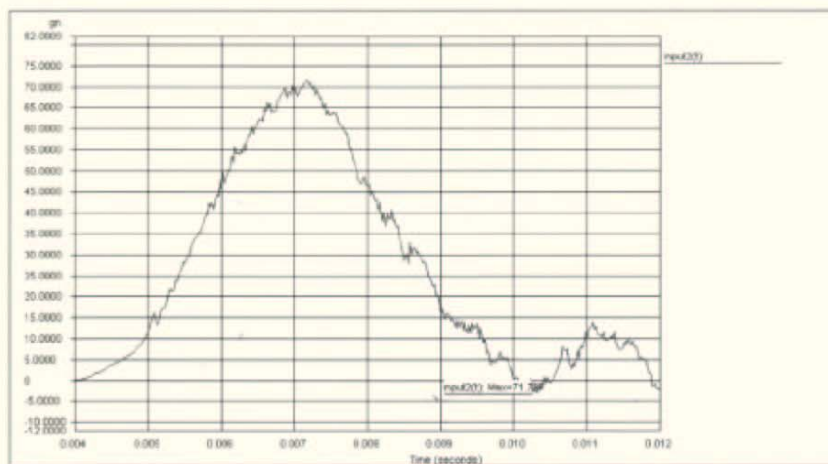


American Microwave

(2) Microwave Switches

February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Longitudinal Axis, Positive Pulse 3



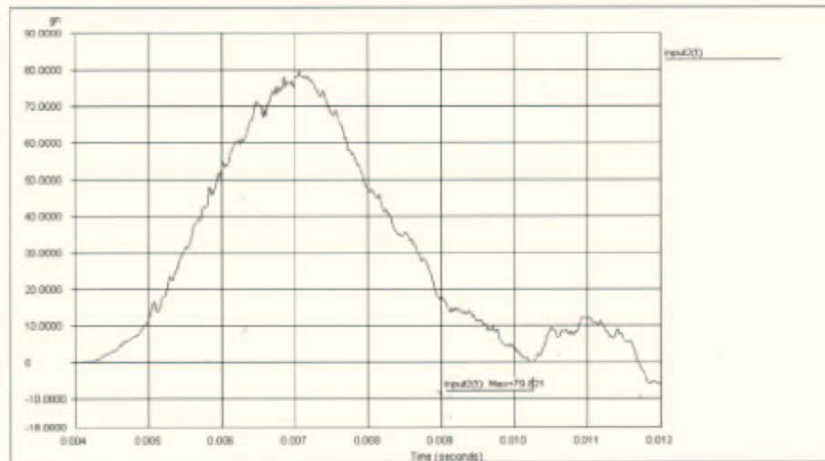


American Microwave

(2) Microwave Switches

February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Longitudinal Axis, Negative Pulse 1



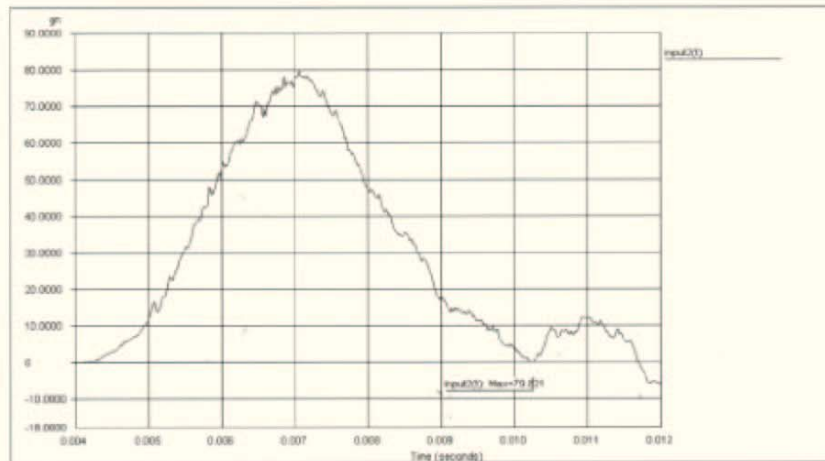


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(2) Microwave Switches

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MIL-STD-202G, Method 213B, Condition B: Longitudinal Axis, Negative Pulse 1







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(2) Microwave Switches

February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Longitudinal Axis, Negative Pulse 2



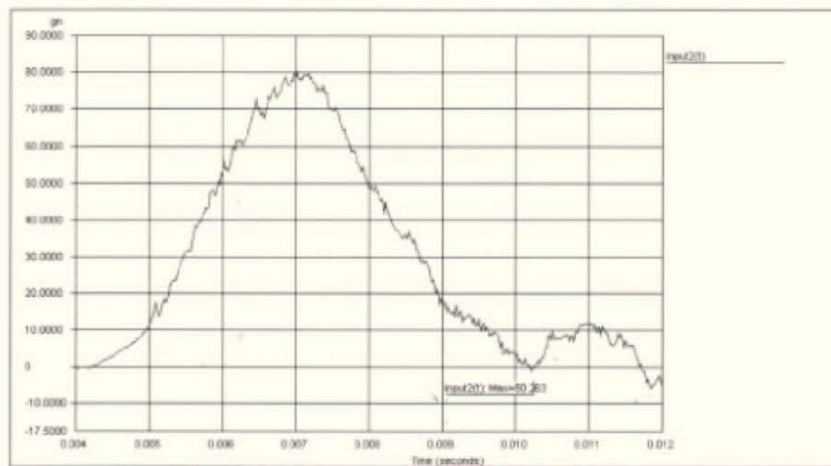


American Microwave

(2) Microwave Switches

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MIL-STD-202G, Method 213B, Condition B: Longitudinal Axis, Negative Pulse 3



American Microwave

(2) Microwave Switches

February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Transverse Axis, Positive Pulse 2

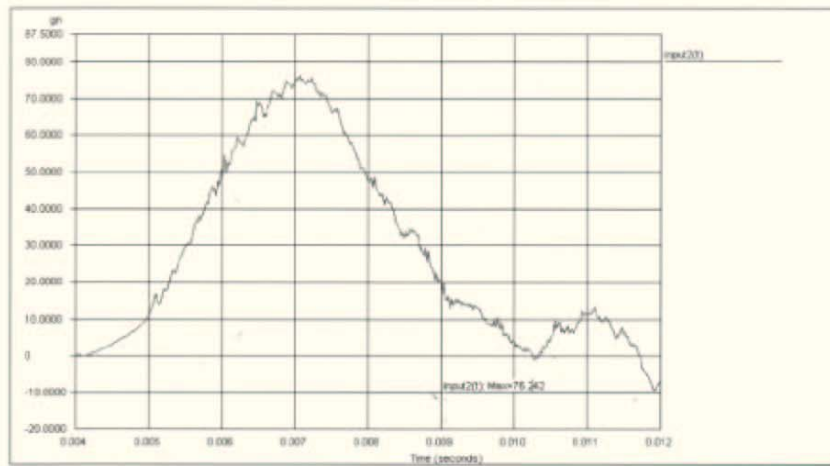


American Microwave

(2) Microwave Switches

February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Transverse Axis, Positive Pulse 1



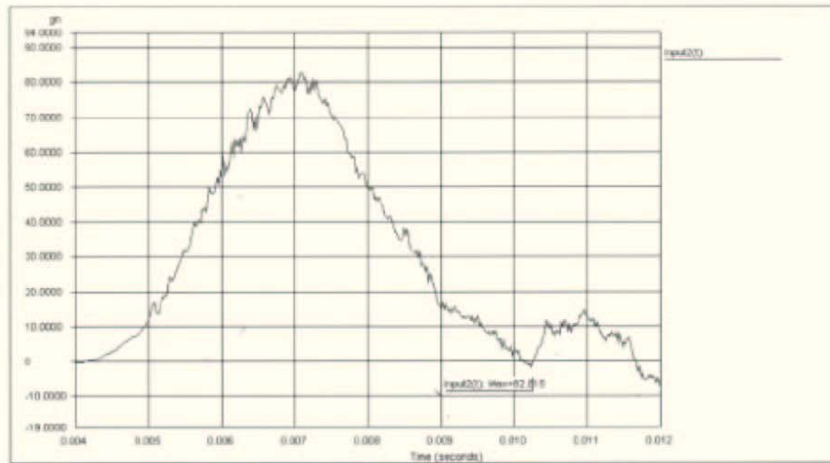


American Microwave

(2) Microwave Switches

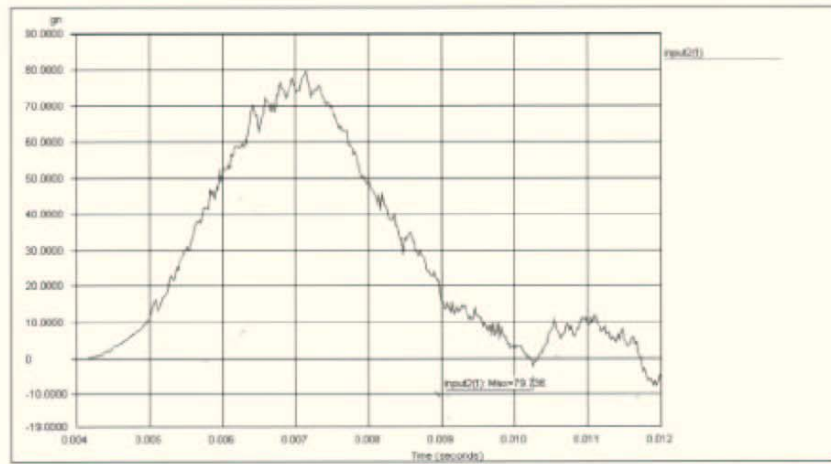
February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Transverse Axis, Positive Pulse 3





MIL-STD-202G, Method 213B, Condition B: Transverse Axis, Negative Pulse 1



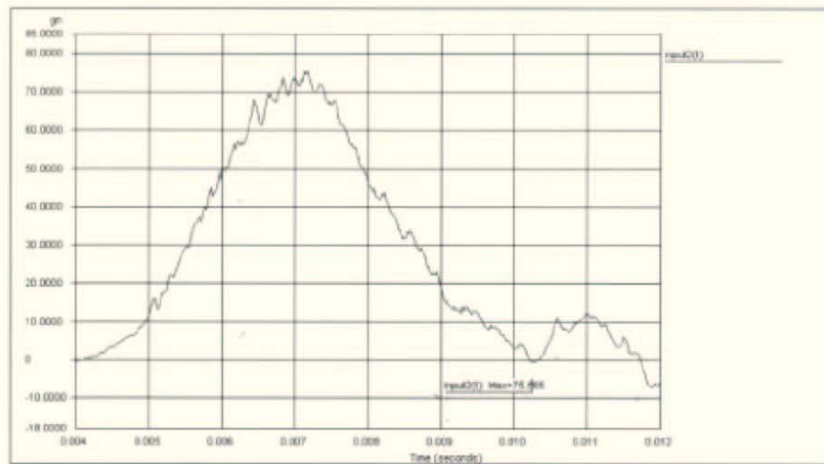


American Microwave

(2) Microwave Switches

February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Transverse Axis, Negative Pulse 2



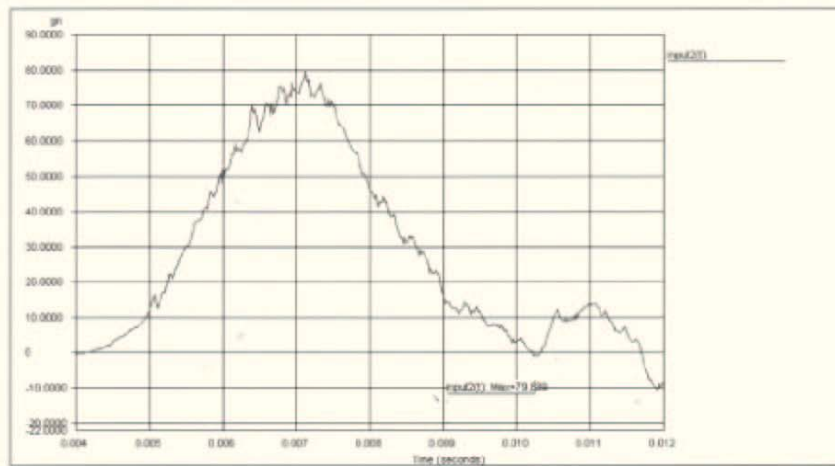


American Microwave

(2) Microwave Switches

February 11, 2003

MIL-STD-202G, Method 213B, Condition B: Transverse Axis, Negative Pulse 3





American Microwave

(2) Microwave Switches

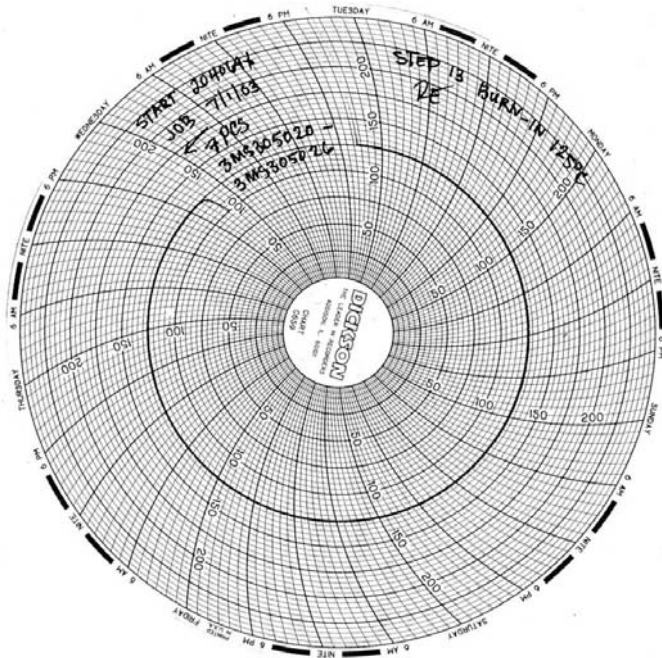
February 12, 2003

MIL-STD-202G, Method 213B, Condition B: Transverse Axis, Positive Pulse 2





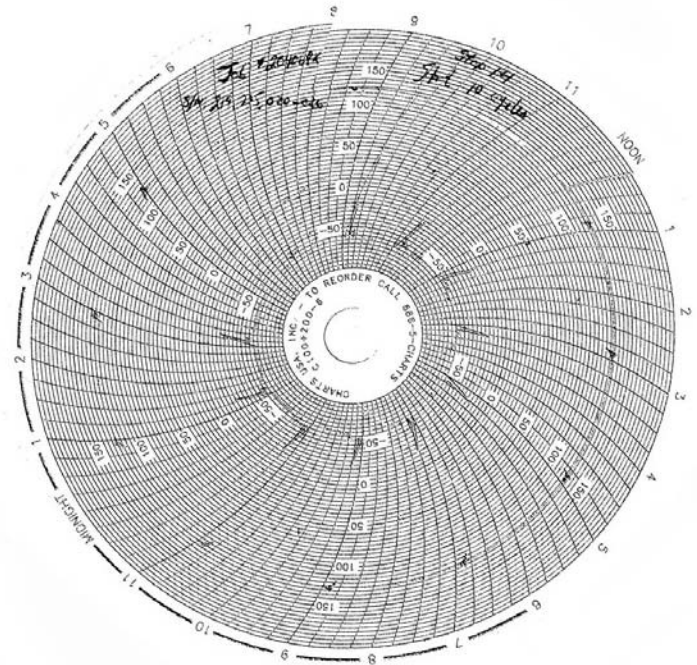
**ENVIRONMENTAL TEST DATA**  
**BURN-IN AND TEMPERATURE CYCLING RECORDER**



**← BURN-IN**

MIL-STD-883, METHOD 1015B, T<sub>c</sub> 125°C  
BURN-IN AT 125°C FOR 24 HOURS.  
CHART SHOWS 10:00AM TUESDAY  
JULY 1, 2003 TO 10:00AM WEDNESDAY  
JULY 2, 2003.  
(Units were further burned-in for a total of 240 hours)

**TEMPERATURE CYCLING →**  
MIL-STD-883, METHOD 1010, CONDITION  
B1 (10 CYCLES). -65°C TO +125°C



ALL TEMPERATURE TESTING, BURN-IN AND CYCLING WERE COMPLETED AT AMC.

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Website: <http://www.americanmicrowavecorp.com>