



**AMERICAN MICROWAVE
CORPORATION**

TEST DATA

ON

1.0 TO 2.0 GHz

HIGH SPEED

LOW INSERTION LOSS

60dB DYNAMIC RANGE

150nS, VOLTAGE VARIABLE (G-VVAN)

AND

500nS, DIGITALLY VARIABLE (G-DVAN)

ABSORPTIVE, PIN DIODE ATTENUATORS

WITH

**REMOVABLE SMA RF CONNECTORS
FOR SURFACE MOUNT CAPABILITY**

AMC MODEL Nos:

G-VVAN-1020-60-MP & G-DVAN-1020-60-8

Serial Number: AH50322, AH50328, AH50318 & AH50319

DESIGNED

BY

A. K. Gorwara

REPORTED

BY

P. D. Wood

FEBRUARY 17, 1996

1.0 TO 2.0 GHz, HIGH SPEED, 60 dB, VARIABLE PIN DIODE ATTENUATOR

- 60dB DYNAMIC RANGE
- LATCHING STROBE CAPABILITY
- 150 nS, SWITCHING SPEED (VVAN)
- 500 nS, MAXIMUM SWITCHING SPEED (DVAN)
- 5dB & 10dB/VOLT, VOLTAGE VARIABLE MODELS (VVAN)
- 8, 10, 11 & 12-BIT DIGITALLY VARIABLE MODELS (DVAN)
- REMOVABLE SMA RF CONNECTORS FOR SURFACE MOUNT CAPABILITY

AMC MODEL No: G-VVAN-1020-60-MP & G-DVAN-1020-60-8 SPECIFICATIONS:

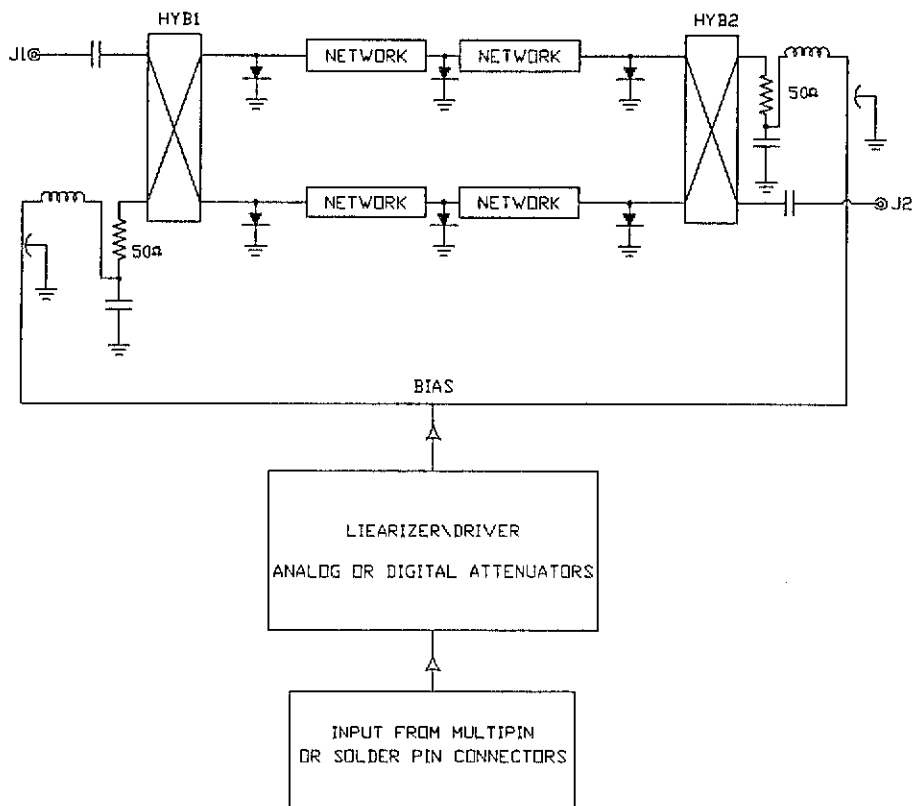
MODEL (G-DVAN/G-VVAN)	FREQUENCY RANGE(GHz)	INSERTION LOSS, MAX.	VSWR MAX.	FLATNESS @ 10dB	FLATNESS @ 20dB	FLATNESS @ 40dB	FLATNESS @ 60dB
1020	1.0 to 2.0 GHz	2.0 dB	2.0:1	± 0.45 dB	± 0.8 dB	± 1.5 dB	± 1.6 dB
1020E (Extended Range)	0.75 to 2.25 GHz	2.2 dB	2.2:1	± 0.65 dB	± 1.5 dB	± 3.0 dB	± 3.5 dB

- **DEVIATION FROM LINEARITY** : 0 TO 30 dB ± 0.5 dB
: 30 TO 50 dB ± 1.0 dB
: 50 TO 60 dB ± 1.5 dB
- **MONOTICITY** : GUARANTEED
- **SWITCHING SPEED** : 150 nS (G-VVAN), VOLTAGE VARIABLE MODELS
: 500 nS (G-DVAN), DIGITALLY VARIABLE MODELS
- **TEMPERATURE COEFFICIENT** : ± 0.025 dB/°C
- **RF POWER RATINGS** : + 20 dBm OPERATING, + 30 dBm SURVIVAL
- **CONTROL** : 10dB/VOLT(STANDARD) ANALOG TRANSFER FUNCTION (G-VVAN)
: (5dB/VOLT TRANSFER FUNCTION ALSO AVAILABLE)
: 8-BIT(STANDARD) POSITIVE TRUE BINARY (G-DVAN)
: (10-BIT, 11-BIT OR 12-BIT ALSO AVAILABLE)
- **DC POWER SUPPLY** : ± 12vdc(STANDARD) or ± 15vdc,
: @ +125 mA, -50 mA MAX.(VOLTAGE VARIABLE G-VVAN MODEL)
: @ +150 mA, -75 mA MAX.(8-BIT DIGITALLY VARIABLE G-DVAN MODEL)
- **CONNECTORS** : REMOVABLE SMA FEMALE (STANDARD) FOR RF
: 15 PIN MULTIPIN (STANDARD, OPTION "MP" ON G-VVAN) FOR POWER
AND CONTROL(SOLDER PIN CONTROLS, OPTION "SP" ON G-VVAN,
AND OTHER OPTIONS AVAILABLE)
- **SIZE** : 2.0" X 2.6" X 0.5"
- **WEIGHT** : < 4 oz.

HIGH SPEED DIGITAL AND ANALOG ATTENUATORS AVAILABLE IN OTHER FREQUENCIES
AND MECHANICAL OUTLINES, CONTACT FACTORY FOR DETAILS.



FUNCTIONAL SCHEMATIC



ENVIRONMENTAL RATINGS

- TEMPERATURE : -55°C to +85°C (Operating), -65°C to +125°C (Storage)
- HUMIDITY : MIL-STD-202F, METHOD 103B CONDITION B
- SHOCK : MIL-STD-202F, METHOD 312B CONDITION B
- VIBRATION : MIL-STD-202F, METHOD 204D CONDITION B
- ALTITUDE : MIL-STD-202F, METHOD 105C CONDITION B
- TEMPERATURE CYCLING : MIL-STD-202F, METHOD 107D CONDITION A

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ON
1.0 TO 2.0 GHz
HIGH SPEED
60dB DYNAMIC RANGE
150nS, VOLTAGE VARIABLE (G-VVAN)
ABSORPTIVE, PIN DIODE ATTENUATOR
WITH
REMOVABLE SMA RF CONNECTORS
FOR SURFACE MOUNT CAPABILITY
AMC MODEL NO:
G-VVAN-1020-60-MP & G-VVAN-1020-60-SP
Serial Numbers: AII50322, AII50328, AII50318, & AII50319

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**G-VVAN-1020
 VOLTAGE CONTROLLED MODELS AVAILABLE**

FREQUENCY	MODEL NUMBER	CONTROL
1.0 TO 2.0 GHz	G-VVAN-1020-60-MP	10dB/Volt Analog Control with (Standard) Multipin Connector (ITT CANNON MDM-15PSP)
1.0 TO 2.0 GHz	G-VVAN-1020-60-SP	10dB/Volt Analog Control with (Optional) Solder Pin Voltages & Control

- G-VVAN : VOLTAGE VARIABLE ATTENUATOR

**STANDARD G-VVAN MULTIPIN ANALOG CONTROL PINOUTS
 (OPTION "MP")**

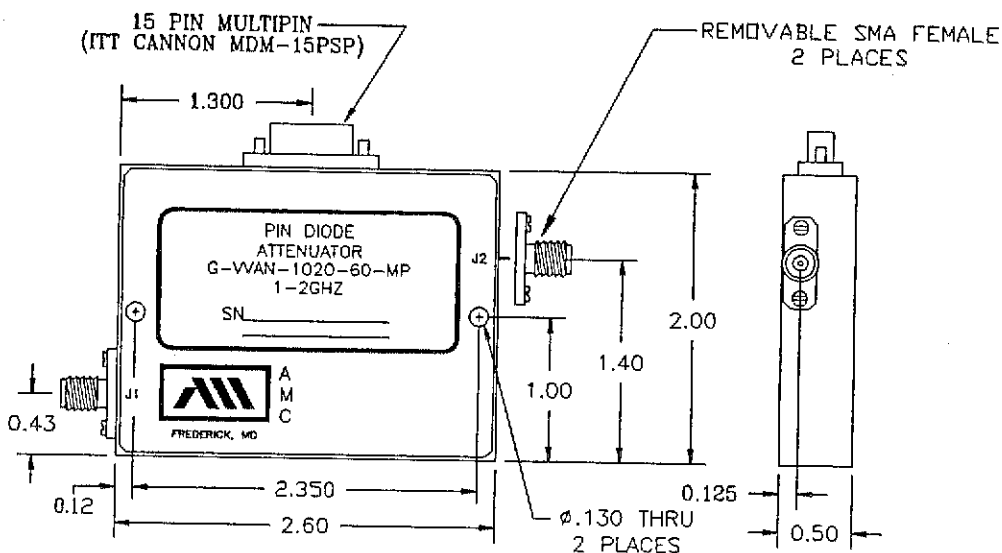
MP-MULTIPIN	CONNECTOR PINOUT FOR VOLTAGE VARIABLE ATTENUATORS (G-VVAN UNITS)
PIN 3	ANALOG INPUT
PIN 4	GROUND
PIN 13	+ 12 or + 15 VDC
PIN 14	-12 or -15 VDC
ALL OTHER PINS NOT USED	

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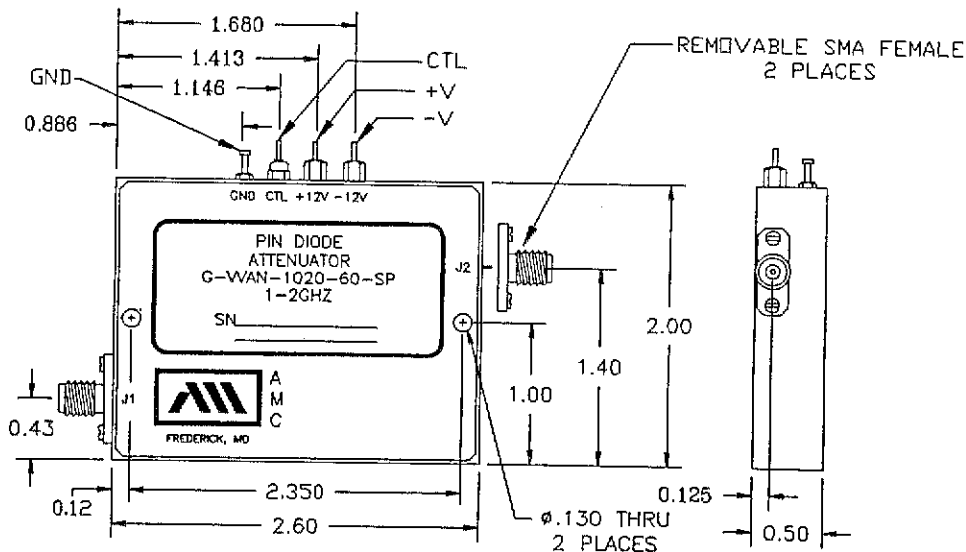
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G-VVAN-1020-60-MP
 VOLTAGE VARIABLE ATTENUATOR
 WITH MULTIPIN CONNECTOR
 (1.0 TO 2.0 GHz)



G-VVAN-1020-60-SP
 VOLTAGE VARIABLE ATTENUATOR
 WITH SOLDER PIN VOLTAGE AND CONTROL CONNECTORS
 (1.0 TO 2.0 GHz)



ALL DIMENSIONS ARE IN INCHES, TOLERANCE: X.XX ±0.020, X.XXX ±0.010

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SERIAL NUMBER : AH50322
 TECHNICIAN : ROBERTA GRAY
 VOLTAGE AND CURRENT DRAW : $\pm 12\text{vdc}$ @ +100mA, -20mA MAX.

G-VVAN-1020-60-MP
CONTROL VOLTAGE vs ATTENUATION
 AS MEASURED OVER THE SWEPT FREQUENCY RANGE OF 1.0 TO 2.0 GHz

CURRENT DRAW -12vdc	CURRENT DRAW +12vdc	CONTROL VOLTAGE	NOMINAL ATTENUATION	FLATNESS IN dB PEAK TO PEAK	RETURN LOSS
-7.35mA	+36.5 mA	0 volts	1.51 dB (Insertion Loss)		17.05 dB
		0.3 volts	1.93 dB		
		0.5 volts	4.24 dB		
-7.42 mA	37.8 mA	1.0 volts	10.10 dB	0.39 dB	20.47 dB
		1.5 volts	15.15 dB		
-7.31 mA	39.4 mA	2.0 volts	20.10 dB	1.20 dB	17.80 dB
		2.5 volts	24.68 dB		
-7.19 mA	41.9 mA	3.0 volts	30.63 dB	1.85 dB	16.52 dB
		3.5 volts	34.50 dB		
-7.08 mA	45.1 mA	4.0 volts	40.05 dB	2.13 dB	15.86 dB
		4.5 volts	44.50 dB		
-6.96 mA	50.9 mA	5.0 volts	50.60 dB	2.33 dB	15.31 dB
		5.5 volts	56.42 dB		
-6.82 mA	60.5 mA	6.0 volts	60.55 dB	2.50 dB	14.98 dB

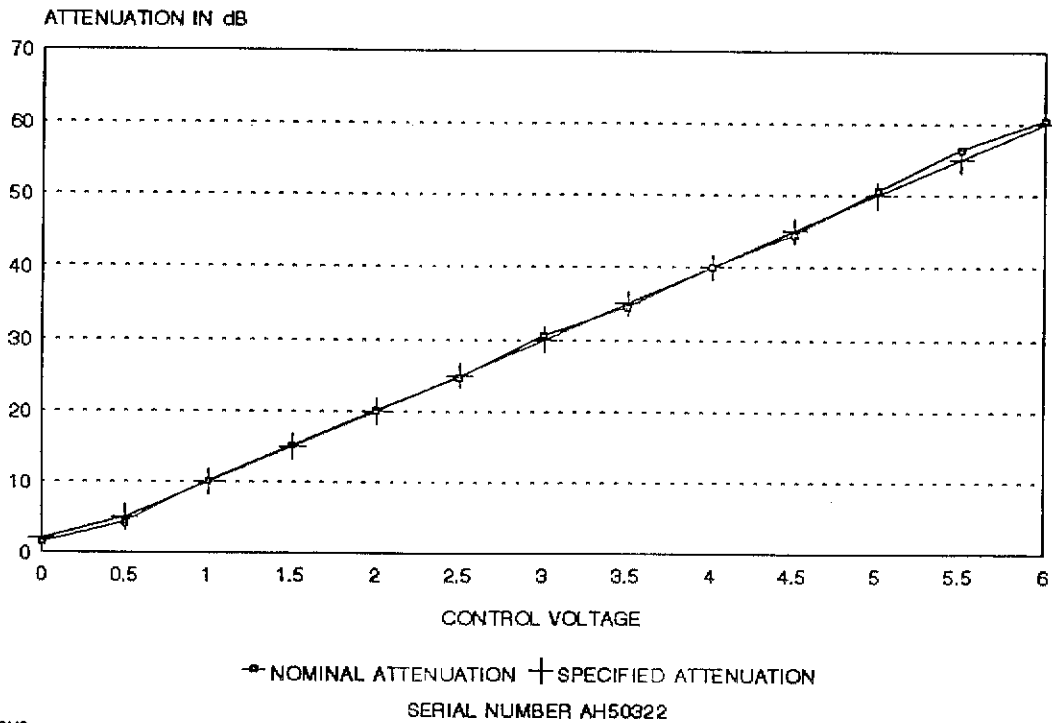
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AMERICAN MICROWAVE CORPORATION



SERIAL NUMBER : AH50322
TECHNICIAN : ROBERTA GRAY
VOLTAGE AND CURRENT DRAW : $\pm 12\text{vdc}$ @ $+100\text{mA}$, -20mA MAX.

G-VVAN-1020-60-MP
CONTROL VOLTAGE vs ATTENUATION
AS MEASURED OVER THE SWEPT FREQUENCY RANGE OF 1.0 TO 2.0 GHz



VVAN1-2A.CH3

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SERIAL NUMBER : AH50322
TECHNICIAN : ROBERTA GRAY
VOLTAGE AND CURRENT DRAW : $\pm 12\text{vdc}$ @ $+100\text{mA}$, -20mA MAX.

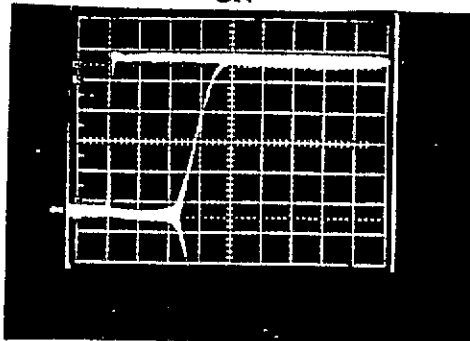
G-VVAN-1020-60-MP SWITCHING SPEED

(RISE/FALL : 10% RF TO 90% RF/ 90% RF TO 10% RF)
(ON/OFF : 50% CONTROL TO 90% RF/10% RF)

"ON"

20nS PER DIVISION:
28nS "RISE"
68nS "ON"

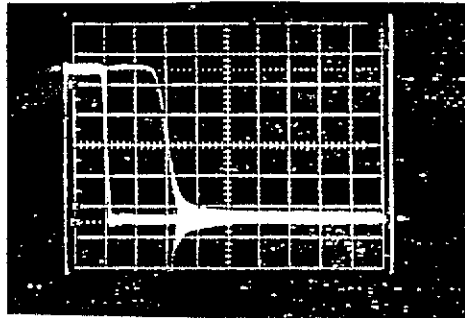
50 dB ATTENUATION



"OFF"

20nS PER DIVISION:
20nS "FALL"
60nS "OFF"

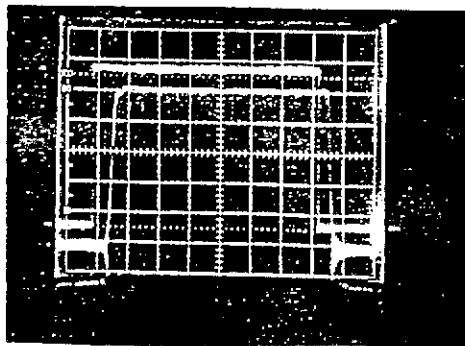
50 dB ATTENUATION



ENTIRE PULSE

100nS PER DIVISION:

50 dB ATTENUATION



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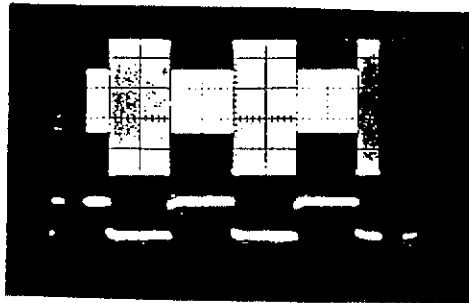
SERIAL NUMBER : AH50322
TECHNICIAN : ROBERTA GRAY
VOLTAGE AND CURRENT DRAW : $\pm 12\text{vdc}$ @ $+100\text{mA}$, -20mA MAX.

G-VVAN-1020-60-MP SWITCHING SPEED

(RISE/FALL : 10% RF TO 90% RF/ 90% RF TO 10% RF)
(ON/OFF : 50% CONTROL TO 90% RF/10% RF)

200 μ S PULSE

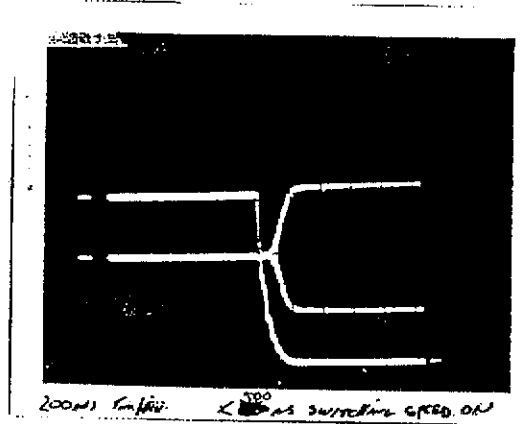
50 μ S PER DIVISION:
15dB ATTENUATION



200 μ S pulse 50 ns/div 15dB

CONTROL vs RF

200ns PER DIVISION:



200ns switching speed OK

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AMERICAN MICROWAVE CORPORATION



SERIAL NUMBER : AH50322
 TECHNICIAN : ROBERTA GRAY
 VOLTAGE AND CURRENT DRAW : ±12vdc @ +100mA, -20mA MAX.

G-VVAN-1020-60-MP
ACTUAL DATA AS PRESENTED TO THE CUSTOMER



FORM: ATT-02/0791

DATE: 5/2/95

ATTENUATOR FINAL TEST DATA

JOB NO: 412237E MODEL NO: _____ SERIAL NO: AH50322
 CUSTOMER: M.B. ELECTRONIQUE TECHNICIAN: B GRAY
 SPECIFICATION: TH FREQUENCY RANGE: 1.365-1.435 GHz

CONTROL VOLTAGE VS ATTENUATION

CONTROL VOLTAGE	MEASURED NOMINAL ATTENUATOR IN dB	FLATNESS IN dB P-P (PEAK TO PEAK)	RETURN LOSS IN dB	
			J1	J2
INSERTION LOSS	1.21		19.75	19.75
0.3	2.06			
0.5	4.39			
1	10.17	.03		
1.5	15.30			
2	19.78	.06		
2.5	25.49			
3	30.69	.10		
3.5	35.24			
4	40.50	.10		
4.5	45.02			
5	50.25	.13		
5.5	54.42			
6.0	60.13	.18		

TESTED BY: B Gray
 DATED: 5/2/95

QA/QC BY: Red
 DATED: 5/2/95

FEBRUARY 17, 1996

AMERICAN MICROWAVE CORPORATION



SERIAL NUMBER : AH50328
 TECHNICIAN : ROBERTA GRAY
 VOLTAGE AND CURRENT DRAW : $\pm 12\text{vdc @ } +100\text{mA, } -20\text{mA MAX.}$

G-VVAN-1020-60-MP
ACTUAL DATA AS PRESENTED TO THE CUSTOMER



FORM: ATT-02/0791

DATE: 5/16/95

ATTENUATOR FINAL TEST DATA

JOB NO: 412237E MODEL NO: _____ SERIAL NO: AH50328
 CUSTOMER: MR ELECTRONIQUE TECHNICIAN: B GRAY
 SPECIFICATION: TH FREQUENCY RANGE: 1.365-1.435 GHz

CONTROL VOLTAGE VS ATTENUATION

CONTROL VOLTAGE	MEASURED NOMINAL ATTENUATOR IN dB	FLATNESS IN dB P-P (PEAK TO PEAK)	RETURN LOSS IN dB	
			J1	J2
INSERTION LOSS	1.18		22.82	23.42
0.3	2.03			
0.5	4.28			
1	9.95	.05		
1.5	15.02			
2	19.70	.09		
2.5	25.43			
3	30.30	.10		
3.5	34.77			
4	39.95	.08		
4.5	44.77			
5	50.31	.12		
5.5	55.18			
6.0	60.09	.15		

TESTED BY: B Gray
 DATED: 5/16/95

QA/QC BY: [Signature]
 DATED: 5/16/95

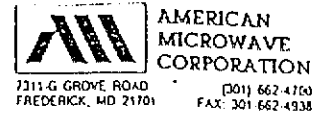
FEBRUARY 17, 1996

AMERICAN MICROWAVE CORPORATION



SERIAL NUMBER : AH50319
 TECHNICIAN : ROBERTA GRAY
 VOLTAGE AND CURRENT DRAW : ±12vdc @ +100mA, -20mA MAX.

G-VVAN-1020-60-MP
ACTUAL DATA AS PRESENTED TO THE CUSTOMER



FORM: ATT-02/0791

DATE: 5/2/95

ATTENUATOR FINAL TEST DATA

JOB NO: 412 237E MODEL NO: _____ SERIAL NO: AH50318
 CUSTOMER: MR ELECTRONIQUE TECHNICIAN: B GRAY
 SPECIFICATION: TH FREQUENCY RANGE: 1.365-1.435 GHz

CONTROL VOLTAGE VS ATTENUATION

CONTROL VOLTAGE	MEASURED NOMINAL ATTENUATOR IN dB	FLATNESS IN dB P-P (PEAK TO PEAK)	RETURN LOSS IN dB	
			J1	J2
INSERTION LOSS	<u>1.15</u>		<u>20.53</u>	<u>20.67</u>
0.3	<u>1.92</u>			
0.5	<u>4.26</u>			
1	<u>10.14</u>	<u>.03</u>		
1.5	<u>15.33</u>			
2	<u>19.78</u>	<u>.07</u>		
2.5	<u>24.78</u>			
3	<u>29.97</u>	<u>.09</u>		
3.5	<u>35.00</u>			
4	<u>40.44</u>	<u>.10</u>		
4.5	<u>44.97</u>			
5	<u>50.06</u>	<u>.10</u>		
5.5	<u>55.68</u>			
6.0	<u>60.72</u>	<u>.20</u>		

TESTED BY: B Gray
 DATED: 5/2/95

QA/QC BY: AB
 DATED: 5/2/95

FEBRUARY 17, 1996



INFORMATION
ON
1.0 TO 2.0 GHz
HIGH SPEED
LOW INSERTION LOSS
60dB DYNAMIC RANGE
500nS, DIGITALLY VARIABLE (DVAN)
ABSORPTIVE, PIN DIODE ATTENUATORS
WITH
REMOVABLE SMA RF CONNECTORS
FOR SURFACE MOUNT CAPABILITY

AMC MODEL No:
G-DVAN-1020-60-8

FEBRUARY 17, 1996

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G-DVAN-1020
DIGITALLY CONTROLLED MODELS AVAILABLE

FREQUENCY	MODEL NUMBER	CONTROL
1.0 TO 2.0 GHz	G-DVAN-1020-60-8	8-Bit (Standard) Digital Control with 15-Pin Multipin Connector (ITT CANNON MDM-15PSP) STANDARD
1.0 TO 2.0 GHz	G-DVAN-1020-60-10	10-Bit (Optional) Digital Control with 15-Pin Multipin Connector (ITT CANNON MDM-15PSP) STANDARD
1.0 TO 2.0 GHz	G-DVAN-1020-60-11	11-Bit (Optional) Digital Control with 15-Pin Multipin Connector (ITT CANNON MDM-15PSP) STANDARD
1.0 TO 2.0 GHz	G-DVAN-1020-60-12	12-Bit (Optional) Digital Control with 15-Pin Multipin Connector (ITT CANNON MDM-15PSP) STANDARD

G-DVAN : DIGITALLY VARIABLE ATTENUATOR

AVAILABLE G-DVAN DIGITAL CONTROL PINOUTS

PINOUT	8-BIT (STANDARD)	10-BIT	11-BIT	12-BIT
PIN 1	NOT USED	NOT USED	0.06 dB	0.03 dB
PIN 2	LATCHING STROBE * (OPTIONAL)	LATCHING STROBE * (OPTIONAL)	LATCHING STROBE * (OPTIONAL)	0.06 dB
PIN 3	NOT USED	0.13 dB	0.13 dB	0.13 dB
PIN 4	GROUND	GROUND	GROUND	GROUND
PIN 5	0.25 dB (LSB)	0.25 dB	0.25 dB	0.25 dB
PIN 6	0.5 dB	0.5 dB	0.5 dB	0.5 dB
PIN 7	1.0 dB	1.0 dB	1.0 dB	1.0 dB
PIN 8	2.0 dB	2.0 dB	2.0 dB	2.0 dB
PIN 9	4.0 dB	4.0 dB	4.0 dB	4.0 dB
PIN 10	8.0 dB	8.0 dB	8.0 dB	8.0 dB
PIN 11	16.0 dB	16.0 dB	16.0 dB	16.0 dB
PIN 12	32.0 dB (MSB)	32.0 dB (MSB)	32.0 dB (MSB)	32.0 dB (MSB)
PIN 13	+ 12 OR + 15 VDC	+ 12 OR + 15 VDC	+ 12 OR + 15 VDC	+ 12 OR + 15 VDC
PIN 14	-12 OR -15 VDC	-12 OR -15 VDC	-12 OR -15 VDC	-12 OR -15 VDC
PIN 15	NOT USED	0.06 dB (LSB)	0.03 dB (LSB)	0.016 dB (LSB)

* Order "L" Suffix Models for Latching Strobe Capability, See "HOW TO ORDER" for more details.

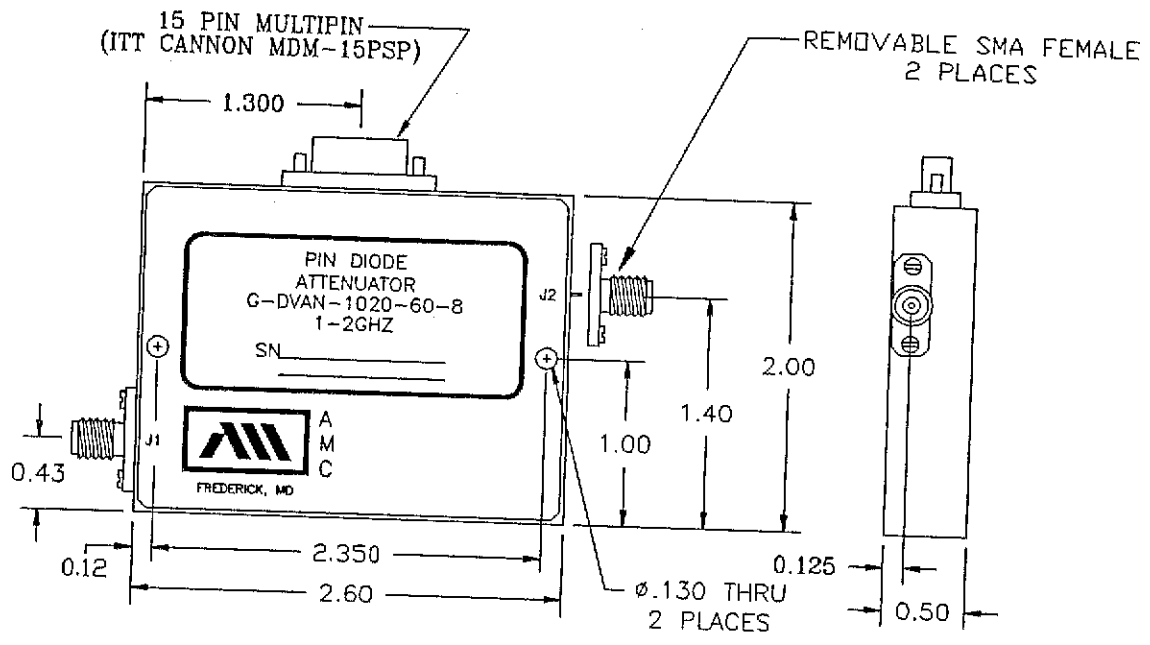
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AMERICAN MICROWAVE CORPORATION



G-DVAN-1020-60-8

DIGITALLY VARIABLE ATTENUATOR
WITH MULTIPIN CONNECTOR
(1.0 TO 2.0 GHz)



DIMENSIONS ARE IN INCHES, TOLERANCE: X.XX ±0.020, X.XXX ±0.010

G-DVAN-1020-60-8

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AVAILABLE OPTIONS AND HOW TO ORDER

EXAMPLE

G-DVAN - 4080 - 60 - 8 - X - GP
 1 2 3 4 5 6

- 1 : G-DVAN : DIGITALLY VARIABLE ATTENUATOR NEW
- 2 : FREQUENCY OF OPERATION (e.g. 4.0 to 8.0 GHz)
- 3 : DYNAMIC RANGE IN dB
- 4 : NUMBER OF DIGITAL BITS (e.g. 8, 10, 11 or 12-bits)
- 5 : X=ANY COMBINATION OF THE DVAN OPTIONS GIVEN BELOW.
- 6 : GOLD PLATED (GP) MOUNTING SURFACE
 All other sides are Painted.
 PAINTED (P) MOUNTING SURFACE
 This is Standard for all products

EXAMPLE

G-VVAN - 6012 - 60 - MP - 3 - GP
 1 2 3 4 5 6

- 1 : G-VVAN : VOLTAGE VARIABLE ATTENUATOR NEW
- 2 : FREQUENCY OF OPERATION (e.g. 6.0 to 12.0 GHz)
- 3 : DYNAMIC RANGE IN dB
- 4 : CONTROL CONNECTOR OPTION
 - MP : Standard Connector for Analog Units
 (ITT Cannon 15-Pin Multipin Connector MDM-15PSP).
 - SP : Solder Pins for both Voltage and Control
- 5 : ADDITIONAL OPTIONS AS GIVEN BELOW
- 6 : GOLD PLATED (GP) MOUNTING SURFACE
 All other sides are Painted.
 PAINTED (P) MOUNTING SURFACE
 This is Standard for all products

ADDITIONAL G-DVAN AND G-VVAN OPTIONS

OPTION No:	G-DVAN AVAILABLE OPTIONS (DIGITALLY VARIABLE)	OPTION No:	G-VVAN AVAILABLE OPTIONS (VOLTAGE VARIABLE)
1	Two SMA Male Removable RF Connectors	1	Two SMA Male Removable RF Connectors
2	One SMA Male & One SMA Female Removable RF Connector	2	One SMA Male & One SMA Female Removable RF Connector
3	Not/Applicable	3	5 dB/Volt Transfer Function
4	0 to 30dB Attenuation Range	4	0 to 30 dB Attenuation Range
5	± 15 vdc Supply Voltage	5	± 15 vdc Supply Voltage
L	Latching Strobe Capability	6	Substitute G-CVAN product code for the G-VVAN product code for Current Controlled (Non-Linearized) Attenuators (AVAILABLE WITH OPTIONS 1, 2, & 4 AND EITHER MP OR SP CONTROL CONNECTORS)

ORDERING:

AMERICAN MICROWAVE CORPORATION
 7311-G GROVE ROAD, FREDERICK, MARYLAND 21704
 TELEPHONE NUMBER : 301-662-4700
 FACSIMILE NUMBER : 301-662-4938

PLEASE CALL OR FAX FOR CATALOGS, TEST REPORTS AND ORDERING INFORMATION ON ANY OF OUR PRODUCTS.

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