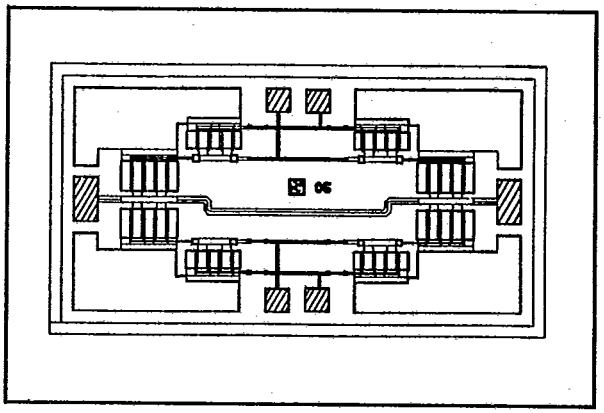
T-62-11

MA4GM251

GaAs MMIC C-Band (4 - 8 GHz) Receiver Protector Switch Chip



Features

- ISOLATES RECEIVER BY 40 dB
- LOW INSERTION LOSS (0.4 dB)
- RETURN LOSS IN INSERTION LOSS STATE (15 dB)
- OPERATING POWER CAPABILITY
  4 WATTS IN ISOLATION STATE
  1 WATT IN INSERTION LOSS STATE

Description

The MA4GM251-500 is a C-Band [4-8 GHz] Receiver Protector Switch Chip. It reflectively isolates the Receiver from the incident power, providing approximately 40 dB protection. When the switch is in the through states it presents an Insertion Loss of 0.4 dB and an Input Return Loss of approximately 15 dB across the band. The MA4GM251-500 can be used out of band, from 2 to 12 GHz if lower isolation is adequate. This switch requires two control voltages: -7 and -14 volts for insertion loss state. Typical applications are as low power, fast protector switches for Telecommunications and EW Receivers.

ELECTRICAL SPECIFICATIONS[1] @ 25°C

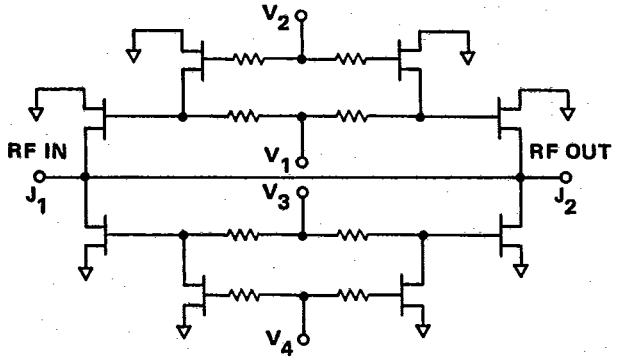
Parameters	Symbol	Test Conditions (T_A=25°C)	Frequency	Model # — MA4GM251 Min	Nominal	Max.	Units
Insertion Loss[5]	L	See Truth Table	5 GHz 8 GHz	— —	.4 .5	.6 .8	dB dB
Isolation	I	See Truth Table	5 GHz 8 GHz	40 38	42 40	— —	dB dB
Return Loss	L_R	Insertion Loss State	5 GHz	18	19	—	—
Compression Point[2]	$P_{-1\ dB}$	See Truth Table	5 GHz	—	30	—	dBm
Control Voltage	V_C	See Truth Table	—	—	—	—	V
Leakage Current	I_{GSL}	See Truth Table	—	—	—	100	μA
Switching Time	T_S	10% - 90% RF	—	—	3	—	nS

Notes:
1. This data is based on performance of sample devices in a chip test fixture.
2. Compression point is specified in the insertion loss state.

ABSOLUTE MAXIMUM RATINGS @ 25°C

Symbol	Parameters	Units	Recommended Maximum
V_C	Control Voltage	V	V_1, V_3 = -9 V V_2, V_4 = -15 V
P_{in}	Isolation State Insertion Loss State	W W	4 1
T_{st}	Storage Temperature	°C	-55 to +150
T_{op}	Operating Temperature	°C	-55 to +125

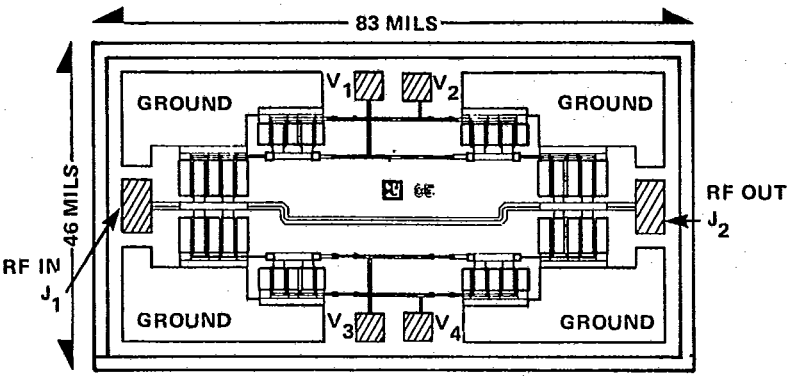
SWITCH SCHEMATIC DIAGRAM



TRUTH TABLE FOR SWITCH CONTROL FUNCTION

CONTROL LEVEL				CONDITION OF RF OUTPUT J_2
V_1	V_2	V_3	V_4	
-7	-14	-7	-14	LOW LOSS
0	0	0	0	ISOLATION

BONDING DIAGRAM



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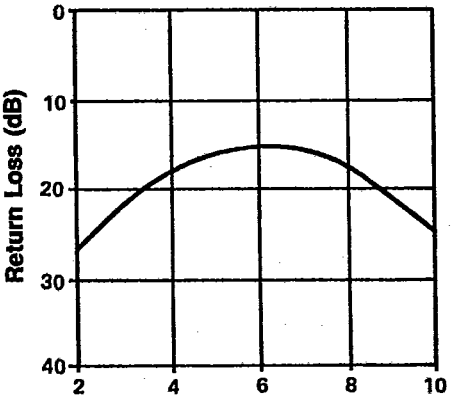
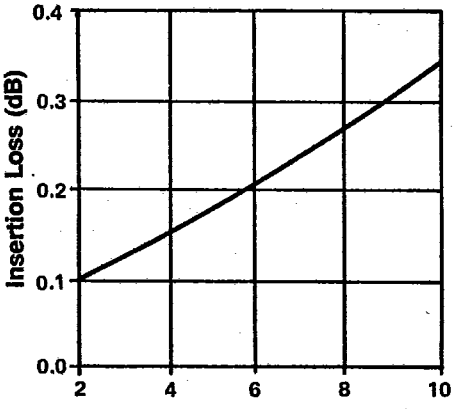
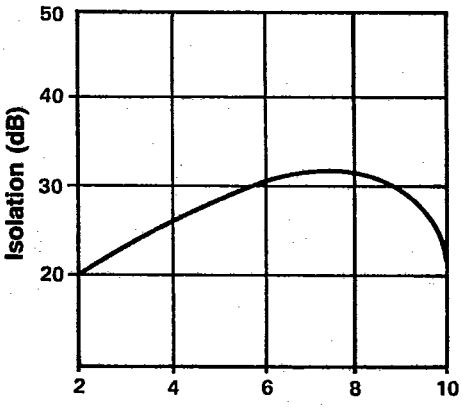
TYPICAL PERFORMANCE CURVES



C-Band Switch Return Loss (dB) vs. Frequency (GHz).



C-Band Switch Insertion Loss (dB) vs. Frequency (GHz).



C-Band Switch Isolation (dB) vs. Frequency (GHz).