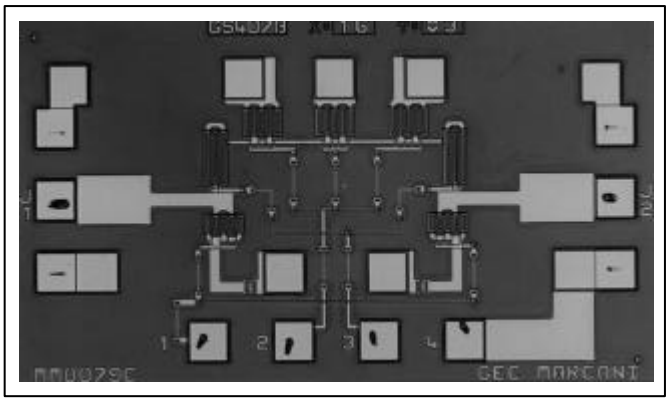
SINGLE BIT ABSORPTIVE STEP ATTENUATOR, DC - 20GHz



Features

- Broadband DC - 20GHz
- Low insertion loss; 2.2dB typ at 10GHz
- Fast switching speed
- High isolation; typ 45dB at 10GHz
- Through GaAs vias for improved performance

Description

The P35-4310-000-200 is a high performance Gallium Arsenide monolithic single bit absorptive step attenuator. It is suitable for use in broadband communications, instrumentation and electronic warfare applications. The attenuator is controlled by the application of complimentary 0V/-5V or 0/-8V signals to the control lines in accordance with the truth tables below.

The die is fabricated using MCL's 0.5µm gate length MESFET process (S20). It is fully protected using Silicon Nitride passivation for excellent performance and reliability.

Electrical Performance

Ambient temperature = 22±3°C , Z_o = 50Ω, Control voltages = 0V/-5V unless otherwise stated

Parameter	Condition	Min	Typ	Max	Units
Insertion Loss	DC - 10GHz	-	2.2	2.5	dB
(reference state)	10GHz - 18GHz	-	3.0	3.4	dB
	18GHz - 20GHz	-	3.4	3.8	dB
Maximum Attenuation	DC - 10GHz	42	45	-	dB
	10GHz - 18GHz	38	40	-	dB
	18GHz - 20GHz	35	38	-	dB
Input Return Loss[1]	50MHz - 20GHz	13	16	-	dB
Output Return Loss[1]	50MHz - 20GHz	13	16	-	dB
Switching Speed	50% control to 10%90%RF	-	5	10	ns
1dB power compression point[2]	2-18 GHz	18	22	-	dBm

Notes

1. Return Loss measured in low loss switch state.
Input power at which insertion loss compresses by 1dB.

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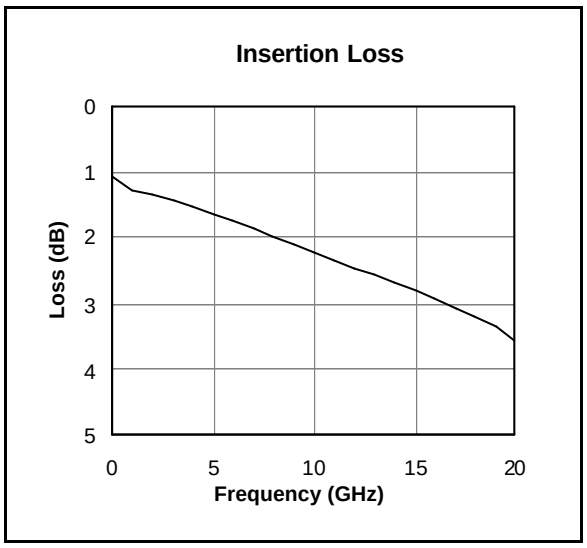
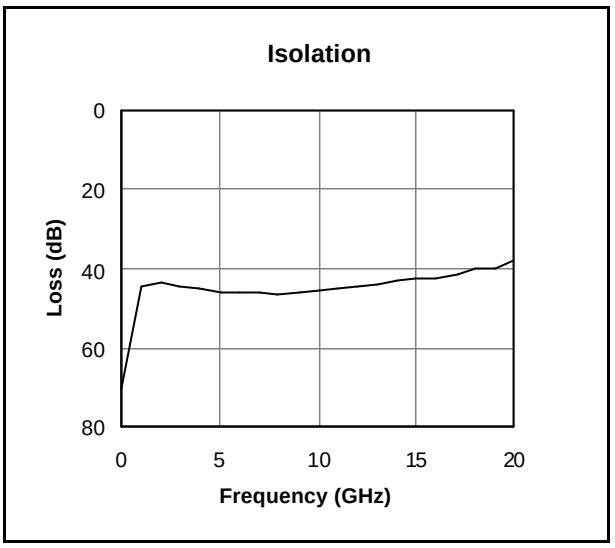
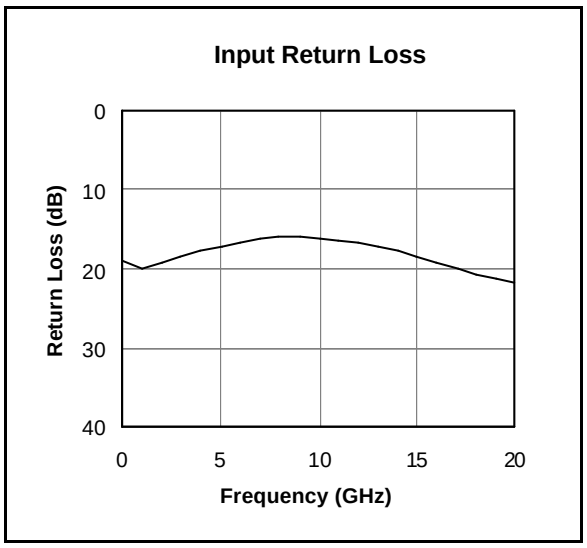
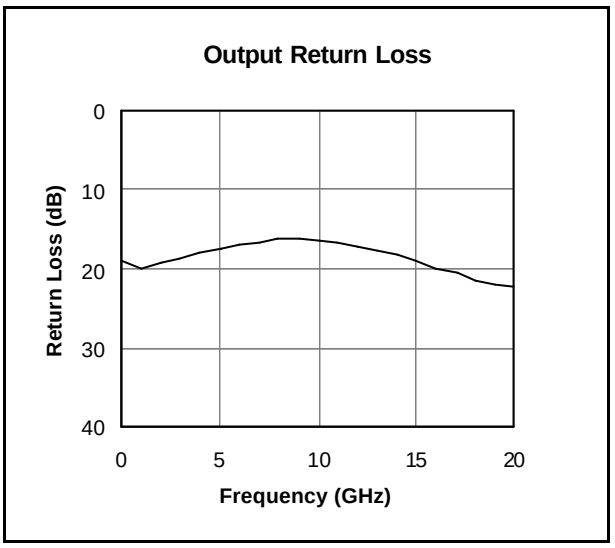
Typical Performance at 22° C









Absolute Maximum Ratings

Max control voltage	-8V
Max I/P power	+25 dBm
Operating temperature	-60°C to +125°C
Storage temperature	-65°C to +150°C

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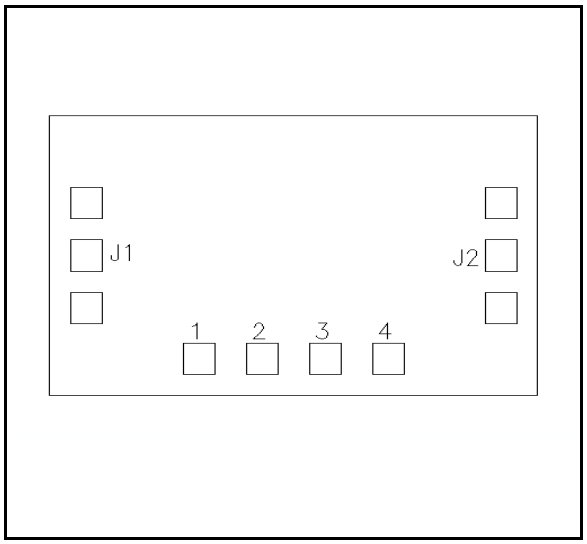
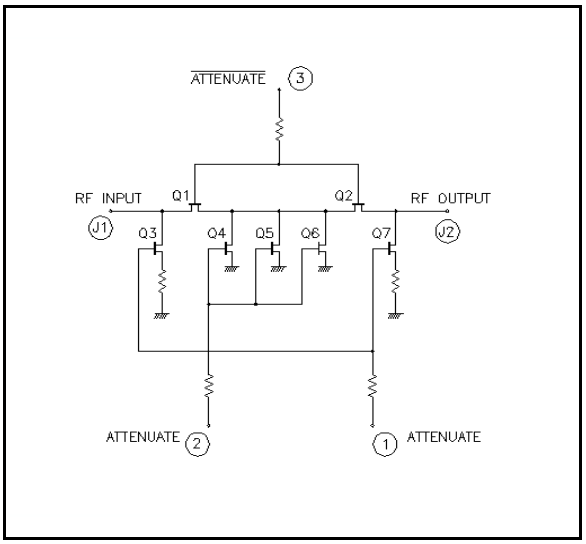
Chip Outline



Electrical Schematic



Die size 2.91 x 1.11mm
Bond pad size 120µm x 120µm minimum
Die thickness: 200µm

Attenuation Truth Table

			State
1	2	3	Control Line
-5V	-5V	0V	Low Loss
0V	0V	-5V	Attenuation

Pad Details

Control Line	State
J1	RF INPUT
J2	RF OUTPUT
1	Attenuate J1-J2
2	Attenuate J1-J2
3	Enable J1-J2
4	N/C

Handling, Mounting and Bonding Instructions

The back of the die is gold metallized and can be die-attached manually onto gold, eutectically with Au-Sn (80:20) or with low temperature conductive epoxy. The maximum allowable die temperature is 310°C for 2 minutes. Bonds should be made onto the exposed gold pads with 17 or 25 microns pure gold or half-hard gold wire. Bonding should be achieved with the die face at 225°C to 275°C with a heated thermosonic wedge (approx. 125°C) and a maximum force of 60 grams. Ball bonds may be used but care must be taken to ensure the ball size is compatible with the bonding pads shown. The length of the bond wires should be minimised to reduce parasitic inductance, particularly those to the RF and ground pads.

Ordering Information

P35-4310-000-20

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