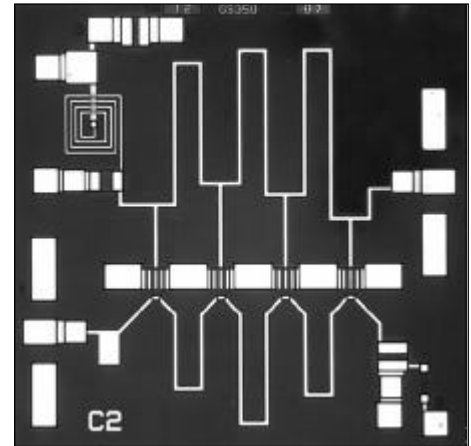


Monolithic Broadband Amplifier, 2 - 18GHz

Features

- Broadband, cascadable gain block
- AGC control with gate bias
- Output power, 15dBm, typical
- Gain flatness ± 0.5 dB, typical
- On chip DC blocking capacitors at input and output
- Space - qualified version available



Description

The P35-4150 is a high performance monolithic broadband amplifier designed for use in a wide range of applications including telecommunications, instrumentation and electronic warfare. The amplifier gives typically 5.0dB gain over the frequency range 2GHz to 18GHz. On chip input and output blocking capacitors simplify assembly and allow the amplifiers to be cascaded easily.

The die is fabricated using MOC's F20 Gallium Arsenide MESFET MMIC process. It is fully protected using Silicon Nitride passivation for excellent performance and reliability.

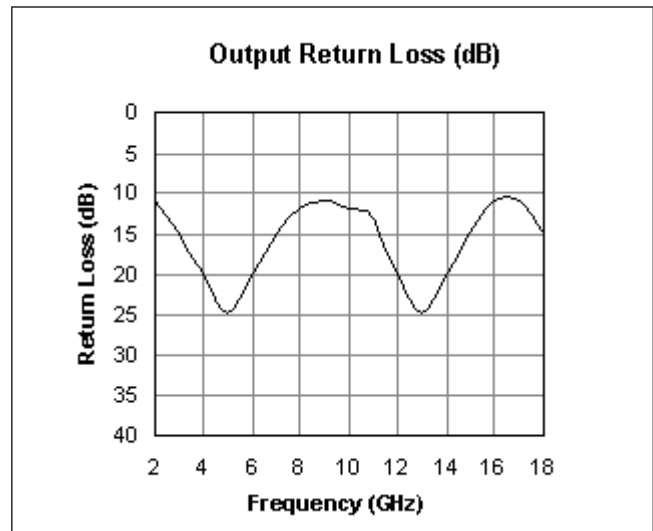
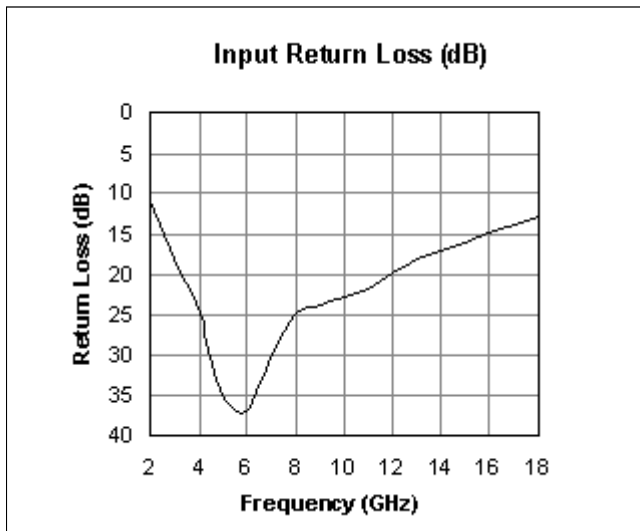
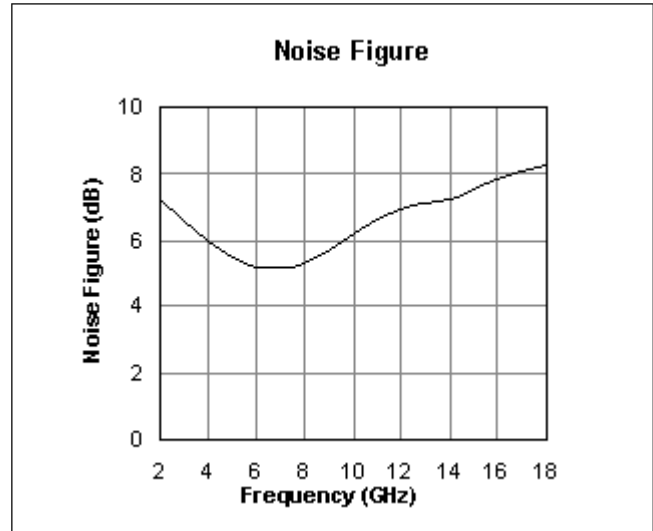
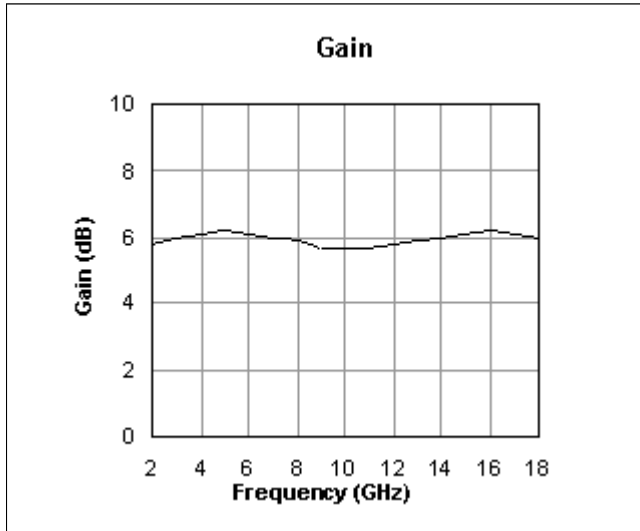
Electrical Performance

Ambient temperature = $22 \pm 3^\circ\text{C}$, $Z_O = 50\Omega$, $V_d = 5\text{V}$, $I_d = 50\% I_{dss}$

Parameter	Conditions	Min	Typ	Max	Units
Small signal gain ¹	2GHz - 18GHz	5.0	6.0	-	dB
Gain Flatness	2GHz - 18GHz		± 0.5	± 1.0	dB
Input Return Loss ³	2GHz - 18GHz	9	10	-	dB
Output Return Loss ³	2GHz - 18GHz	9	10	-	dB
Noise figure	2GHz - 18GHz		7.5	8.5	dB
Output Power at 1dB compression	2GHz	17.0	18.0	-	dBm
	18GHz	14.0	15.0	-	dBm
Reverse Isolation	2GHz	-	28.0	-	dBm
Drain Voltage V_d		+4.5	+5.0	+5.5	Volts
Gate Voltage V_g ²	For $I_d = 60\text{mA}$	0	-0.6	-5	Volts

1. At 50% I_{dss} , which will be in the range 40-80mA.
2. Gain control can be achieved with variation of V_g typically 3dB/volt.
3. Two wires (25 μm diameter), maximum length 0.33mm at RF in and RF out.

Typical Performance at 22°C



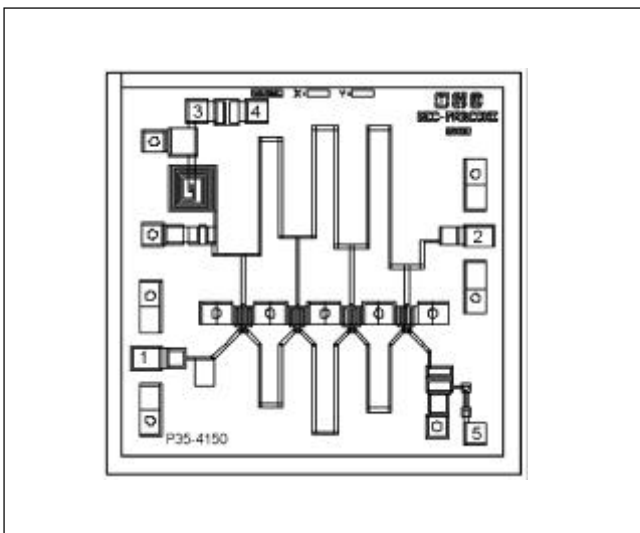
Absolute Maximum Ratings

Max Vds	+6.0V
Max Vgs	-5.0V
Die operating temperature	-55°C to 125°C
Storage temperature	-65°C to +150°

Operation

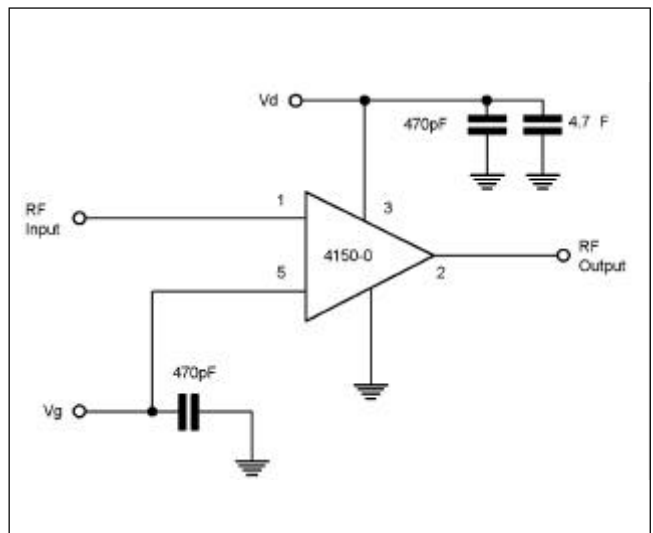
To operate the P35-4150-0, a drain supply of 5V is connected to pad 3. The amplifier circuit is controlled by the voltage applied at pad 5 and should be set to give a drain current of 50% I_{dss} which will be in the range of 40-80mA, typically 60mA. The voltage required for this is typically -0.6V. Gain control achieved with the variation of V_g is typically 3dB/volt at 50% I_{dss} . Decoupling capacitors of 470pF are required at the gate and drain bias inputs. Additional drain decoupling with a 4.7 μ F capacitor is recommended. The RF connections should be made with two wires (25 μ m diam), Maximum length 0.3mm at RF in and RF out. See application note P35-41AN2 for more details. It is recommended that the die is mounted with silver loaded epoxy and bonding to all pads is with 25 μ m diameter gold wire using thermal compression bonding. Gain variation with temperature is typically 0.015dB/ $^{\circ}$ C.

Die Outline



Die size:	2.21 x 2.135mm
Bond pad size:	120 μ m square
Die thickness	200 μ m

Die Bias Connections



Pad Details

Pin	Function
1	RF IN
2	RF OUT
3	Drain Voltage V_d
4	N/C
5	Gate Voltage V_g

Ordering Information: P35-4150-0 Die

The data and product specifications are subject to change without notice. These devices should not be used for device qualification and production without prior notice.

462/SM/00593/200 Issue 2/1

The logo for Marconi, featuring the word "Marconi" in a stylized, cursive font with a horizontal line underneath.

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MOC, Caswell, Towcester, Northants, NN12 8EQ, Tel:+44 1327 356468 Fax +44 1327 356698