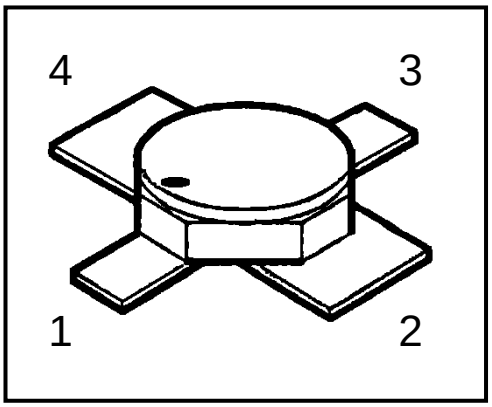
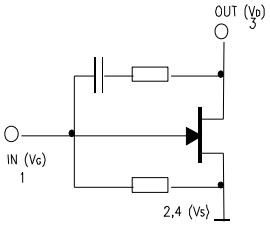
HiRel L- and S-Band GaAs General Purpose Amplifier

- ***HiRel* Discrete and Microwave Semiconductor**

- Single-stage monolithic microwave IC (MMIC-amplifier)
- Application range: 100 MHz to 3 GHz
- Gain: 9.5 dB typ. @ 1.8 GHz
- Low noise figure: 2.7 dB typ. @ 1.8 GHz
- Bandwidth: 3 GHz typ. @ -3 dB, VSWR < 2 : 1 *
  Operating voltage range: 3 to 5.5 V
- Input and output matched to 50 □
- Individual current control with neg. gate bias
- Hermetically sealed ceramic package micro-x



ESD: **E**lectro**s**tatic **d**ischarge sensitive device,
observe handling precautions!

Type	**Marking**	**Ordering Code**	**Circuit Diagram** (Pin Configuration)	**Package**
CGY41 (ql)	-	see below		Micro-X

(ql) Quality Level:	P: Professional Quality,	Ordering Code:	on request
	H: High Rel Quality,	Ordering Code:	on request
	S: Space Quality,	Ordering Code:	on request

(see order instructions for ordering example)

Maximum ratings	Symbol	Value	Unit
Drain-voltage	V_D	5.5	V
Gate-voltage	V_G	-4 ... 0.5	V
Drain-gate voltage	V_{DG}	9.5	V
RF Input power [1]	$P_{RF_{IN}}$	16	dBm
Channel temperature	T_{Ch}	175	°C
Storage temperature range	T_{stg}	-55...+175	°C
Total power dissipation ($T_S \leq 82$°C) [2]	P_{tot}	440	mW
Thermal resistance			
Channel-soldering point [2]	R_{thChS}	160	K/W

Notes: Exceeding any of the max. ratings may cause permanent damage to the device. Appropriate handling is required to protect the electrostatic sensitive MMIC against degradation due to excess voltage or current spikes. Proper ground connection of leads 2 and 4 (with min. inductance) is required to achieve the guaranteed RF performance, stable operating conditions and adequate cooling.

1) @ V_D > 4.5 V derating required.
2) Ts is measured on the source lead at the soldering point to the PCB.

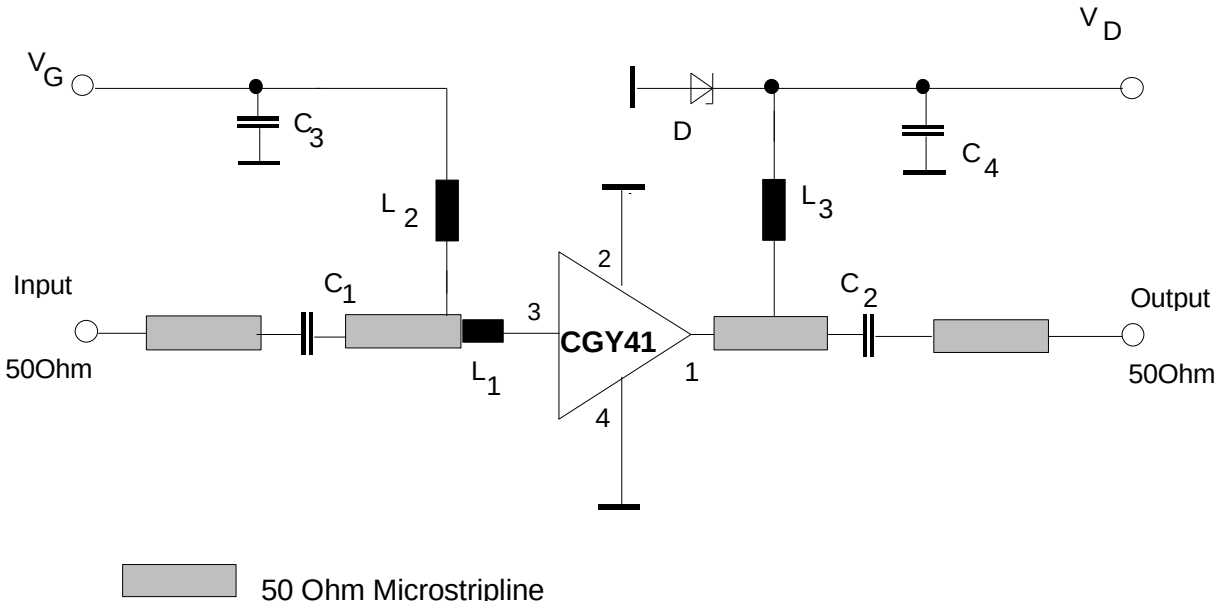
Electrical Characteristics

T_A = 25 °C, V_G = 0 V, V_D = 4.5 V, $R_S = R_L$ = 50 Ω unless otherwise specified

(for application circuit see next page)

Characteristics	Symbol	min	typ	max	Unit
Drain current	I_{DSS}	40	60	80	mA
Power gain f = 200 MHz f = 1800 MHz	*G*	 9.5 8.5	 10.5 9.5	 13 11	dB
Gain flatness f = 200 to 1000 MHz f = 800 to 1800 MHz	*GF*	 - -	 0.4 1.1	 - 2	dB
Noise figure f = 200 to 1000 MHz f = 800 to 1800 MHz	*F*	 - -	 2.5 2.7	 - 4.0	dB
Input return loss f = 200 to 1000 MHz f = 800 to 1800 MHz	RL_{IN}	 - -	 13 12	 - 9.5	dB
Output return loss f = 200 to 1000 MHz f = 800 to 1800 MHz	RL_{OUT}	 - -	 12 12	 - 9.5	dB
Third order intercept point Two tone intermodulation test f_1 = 806 MHz, f_2 = 810 MHz P_0 = 10 dBm (both carriers)	*IP3*	31	32	-	dBm
1dB gain compression f = 200 to 1800 MHz	$P_{1\,dB}$	-	18	-	dBm

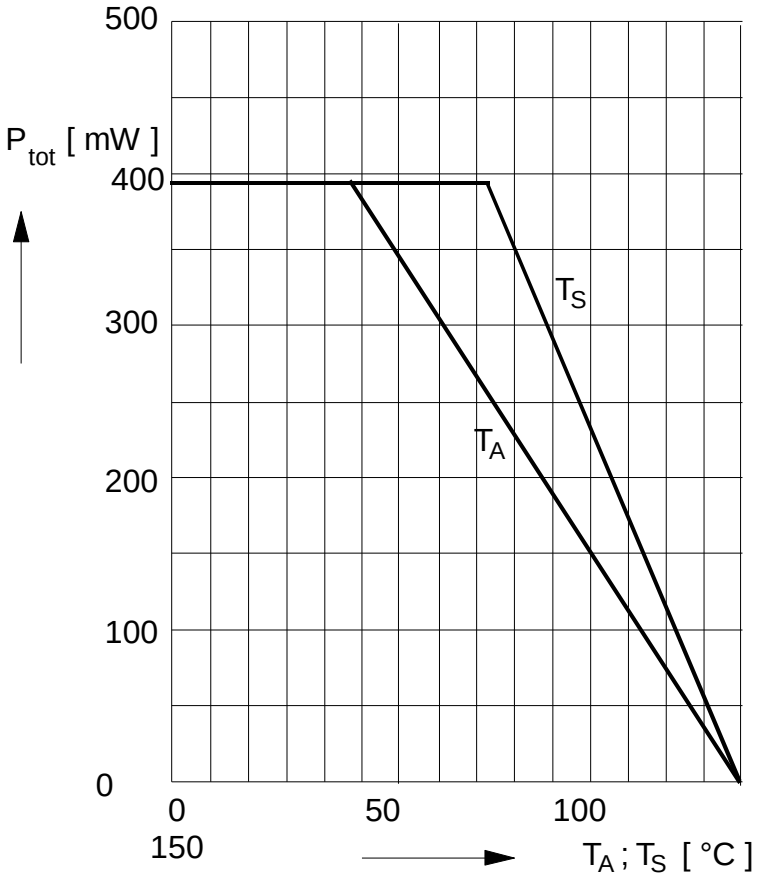
Application Circuit (f = 800 to 1800 MHz)



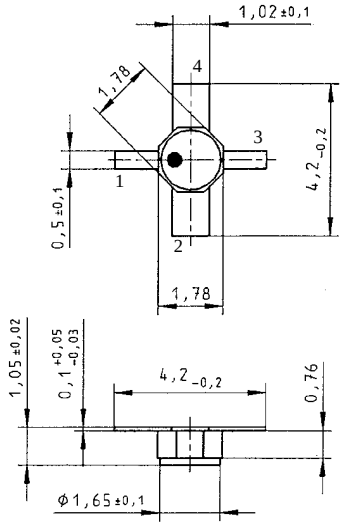
Legend of components

C_1 , C_2 C_3 , C_4	Chip capacitors 100 pF Chip capacitors 1 nF
L_1	For optimized input matching - discrete inductor: approx. 3nH, or - printed microstripline inductor: Z approx. 100 □□ l_e approx. 5 mm
L_2, L_3	- discrete inductor: approx. 40 nH, as e.g. 5 turns 0.25 mm copper wire on nylon rod with M3-thread, or - printed microstripline inductor
D	Z diode 5.6 V (type BZW 22 C5 V 6)

Total Power Dissipation $P_{tot} = f(T_S;T_A)$



Micro-X Package



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