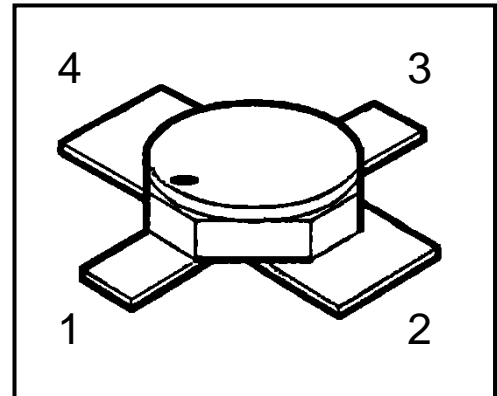
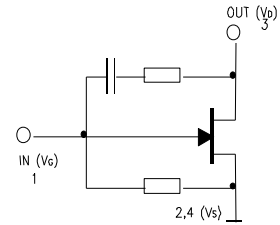


## HiRel L- and S-Band GaAs General Purpose Amplifier

- **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  $\Omega$
- Individual current control with neg. gate bias
- Hermetically sealed ceramic package micro-x



ESD: **E**lectrostatic **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,  
H: High Rel Quality,  
S: Space Quality,

Ordering Code: on request

Ordering Code: on request

Ordering Code: on request

(see order instructions for ordering example)

<b>Maximum ratings</b>	<b>Symbol</b>	<b>Value</b>	<b>Unit</b>
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 <sup>1)</sup>	$P_{RFIN}$	16	dBm
Channel temperature	$T_{Ch}$	175	°C
Storage temperature range	$T_{stg}$	-55...+175	°C
Total power dissipation ( $T_s \leq 82^\circ\text{C}$ ) <sup>2)</sup>	$P_{tot}$	440	mW
<b>Thermal resistance</b>			
Channel-soldering point <sup>2)</sup>	$R_{thChS}$	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.

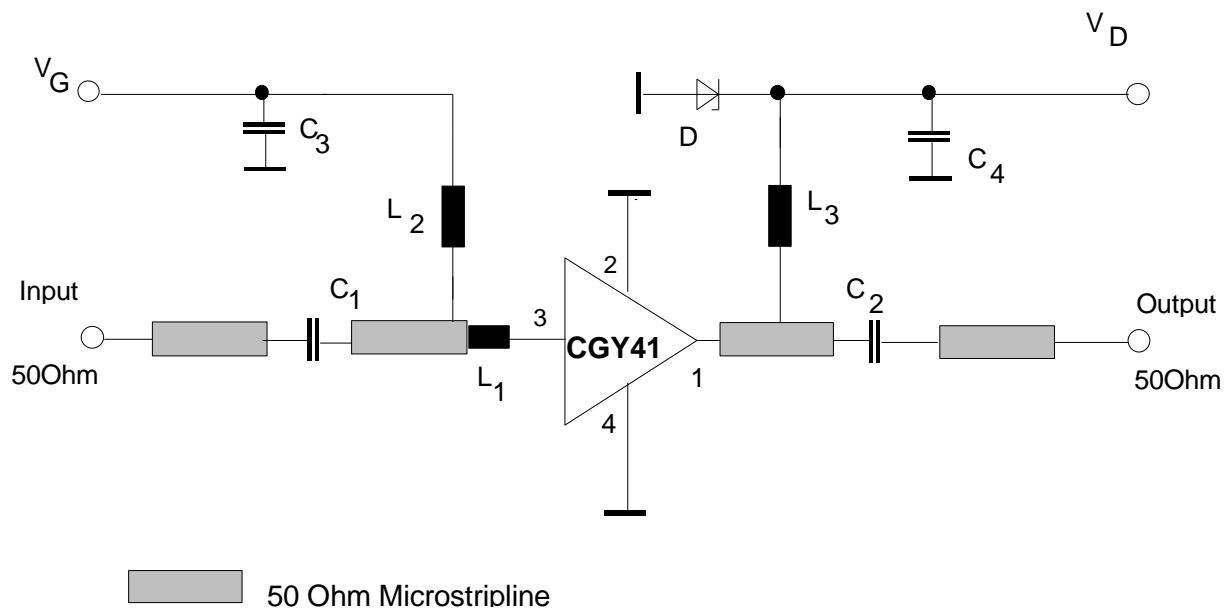
1) @  $V_D > 4.5$  V derating required.

2)  $T_s$  is measured on the source lead at the soldering point to the PCB.

**Electrical Characteristics**

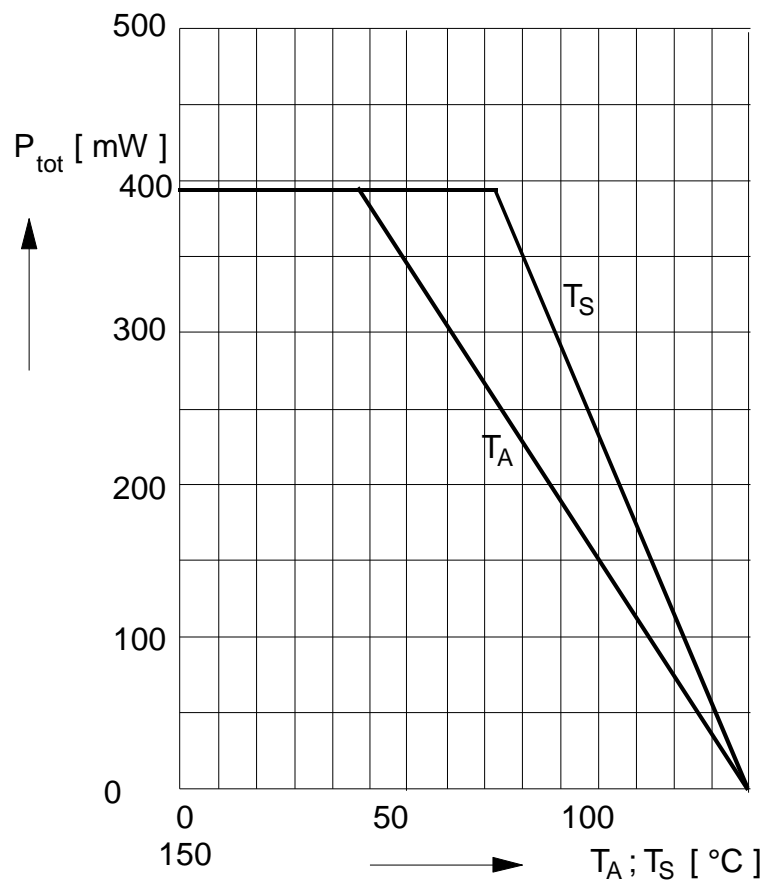
$T_A = 25\text{ }^\circ\text{C}$ ,  $V_G = 0\text{ V}$ ,  $V_D = 4.5\text{ V}$ ,  $R_S = R_L = 50\text{ }\Omega$  unless otherwise specified  
(for application circuit see next page)

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 <sub>1</sub> = 806 MHz, f <sub>2</sub> = 810 MHz P <sub>0</sub> = 10 dBm ( both carriers )	$IP3$	31	32	-	dBm
1dB gain compression f = 200 to 1800 MHz	$P_{1\text{ dB}}$	-	18	-	dBm

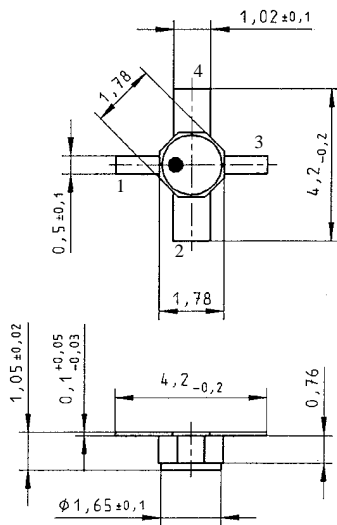
**Application Circuit ( f = 800 to 1800 MHz )**

**Legend of components**

$C_1, C_2$	Chip capacitors 100 pF
$C_3, C_4$	Chip capacitors 1 nF
$L_1$	For optimized input matching - discrete inductor: approx. 3nH, or - printed microstripline inductor: Z approx. 100 $\square\square$ $l_e$ 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  $P_{\text{tot}} = f(T_S; T_A)$



## Micro-X Package



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