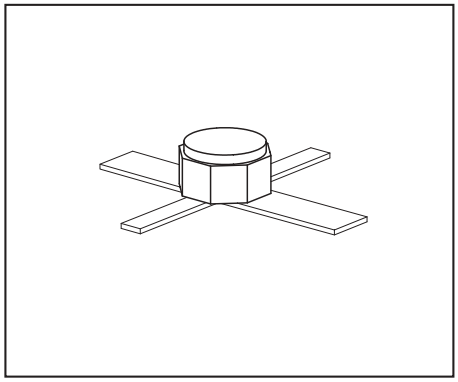
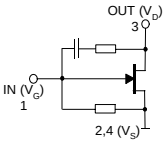
HiRel L- and S-Band GaAs General Purpose Amplifier



- **HiRel Discrete and Microwave Semiconductor**
- Single- stage monolithic mircrowave 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 Ω
- Individual currenet control with neg. gate bias
- Hermetically sealaed ceramic package micro-x

CGY41



ESD (**E**lectro**s**tatic **d**ischarge) sensitive device, observe handling precaution!

Type	Marking	Pin Configuration				Package
CGY41	-	1=inVG	2=Vs	3=Out	4=Vs	MICRO-X

(ql) Testing level: P: Professional testing
H: High Rel quality
S: Space quality
ES: ESA qualified

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-voltage	V_D	5.5	V
Drain-gate voltage	V_{DG}	9.5	
Gate-voltage	V_G	-4...0	
RF input power[1)]	$P_{RF,in}$	16	dBm
Channel temperature	T_{CH}	175	°C
Storage temperature	T_{stg}	-55...175	
Total power dissipation($T_S \leq 82°C$)[2)]	P_{tot}	440	mW

Thermal Resistance

Parameter	Symbol	Value	Unit
Channel- soldering point[2)]	R_{thChs}	155	K/W

[1] @ V_D >4.5V derating required.

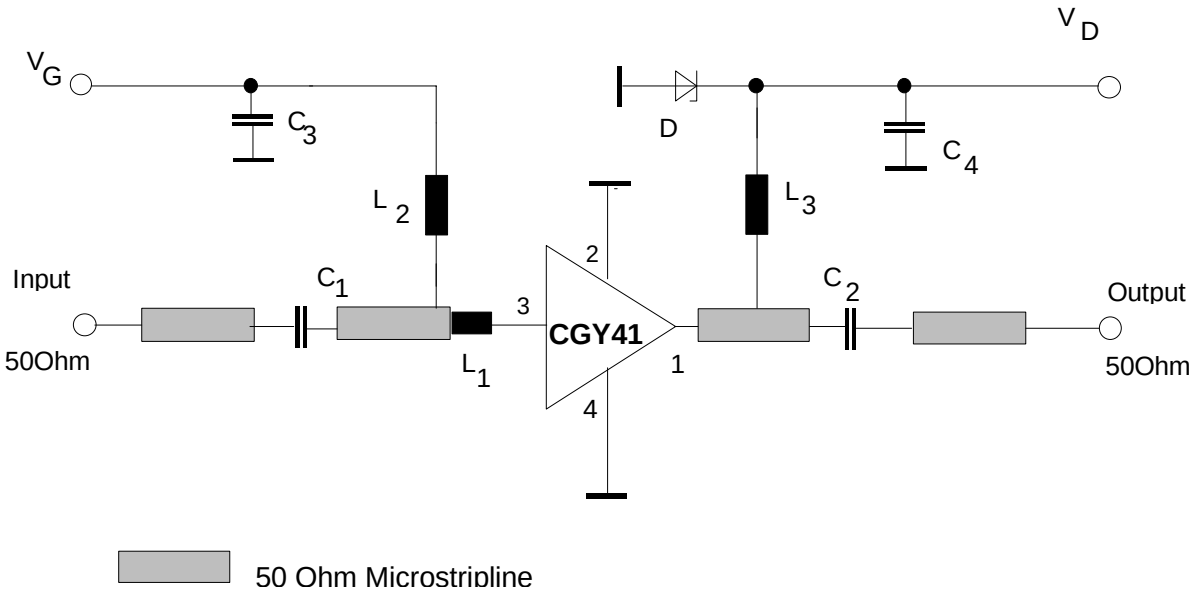
[2] T_S is measured on the source lead at the soldering point to the PCB.

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.

Electrical Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Drain current	I_D	40	60	80	mA
Power Gain	G				dB
f = 200 MHz		9.5	10.5	12	
f = 1800 MHz		8.5	9.5	11	
Gain flatness	ΔG				
f= 200 to 1000 MHz		-	0.4	-	
f= 800 to 1800 MHz		-	1.1	2	
Noise figure	F				
f= 200 to 1000 MHz		-	2.5	-	
f= 800 to 1800 MHz		-	2.7	4	
Input return loss	RL_{IN}				
f= 200 to 1000 MHz		-	13	-	
f= 800 to 1800 MHz		-	12	9.5	
Output return loss	RL_{OUT}				
f= 200 to 1000 MHz		-	12	-	
f= 800 to 1800 MHz		-	12	9.5	
Third order intercept point	$IP3$	31	32	-	dBm
Two tone intermodulation test					
f_1 = 806 MHz, f_2 = 810 MHz, P_0=10 dbm					
1dB gain compression	P_{1dB}	-	18	-	
f= 200 to 1800 MHz					
Gain control dynamic range,	G_{DYN}				dB
(per gate control voltage)		-	30	-	
f= 200 to 1000 MHz		-	20	-	
f= 800 to 1800 MHz					

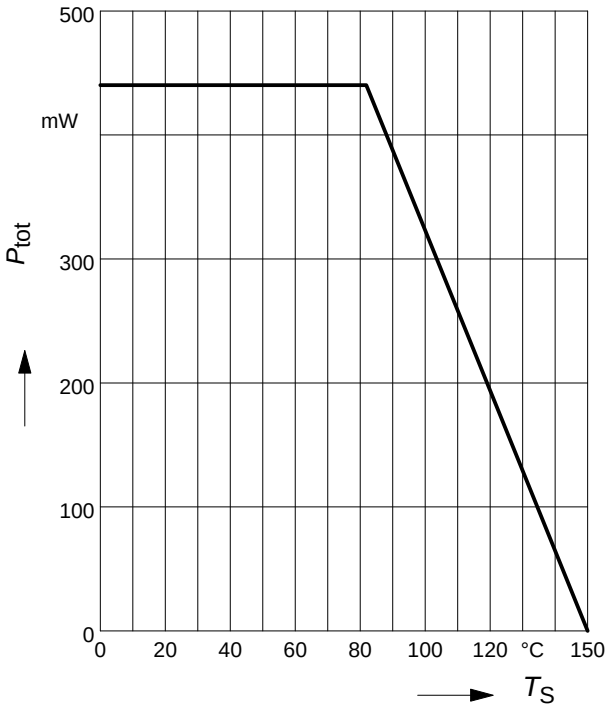
Application Circuit (f= 800 to 1800 MHz)



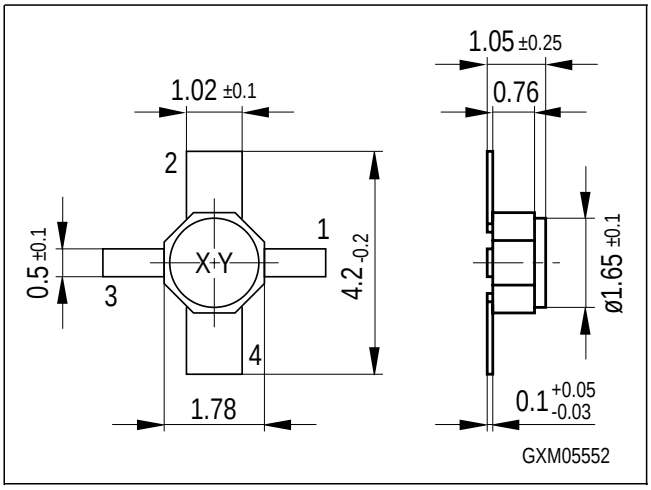
Legend of Components

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 W, 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 $P_{tot} = f(T_S)$



Mirco-X Package



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