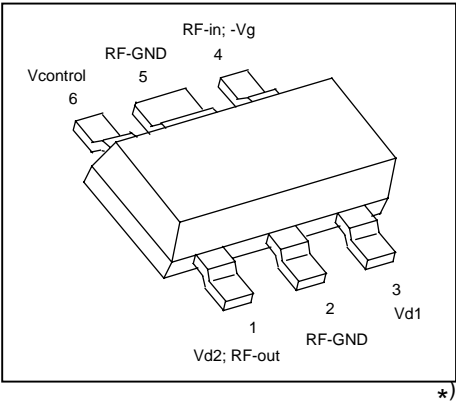


GaAs MMIC

Preliminary Data

- Variable gain amplifier (MMIC-Amplifier) for mobile communication
- Gain Control range over 50dB
- Positive Control Voltage
- 50Ω input and output matched
- Low power consumption
- Operating voltage range: 2.7 to 6 V
- Frequency range 800 MHz ... 2.5 GHz



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

Type	Marking	Ordering code (taped)	Package ¹⁾
CGY 121 B	Y0S	Q62702-G0071	MW-6

Maximum ratings

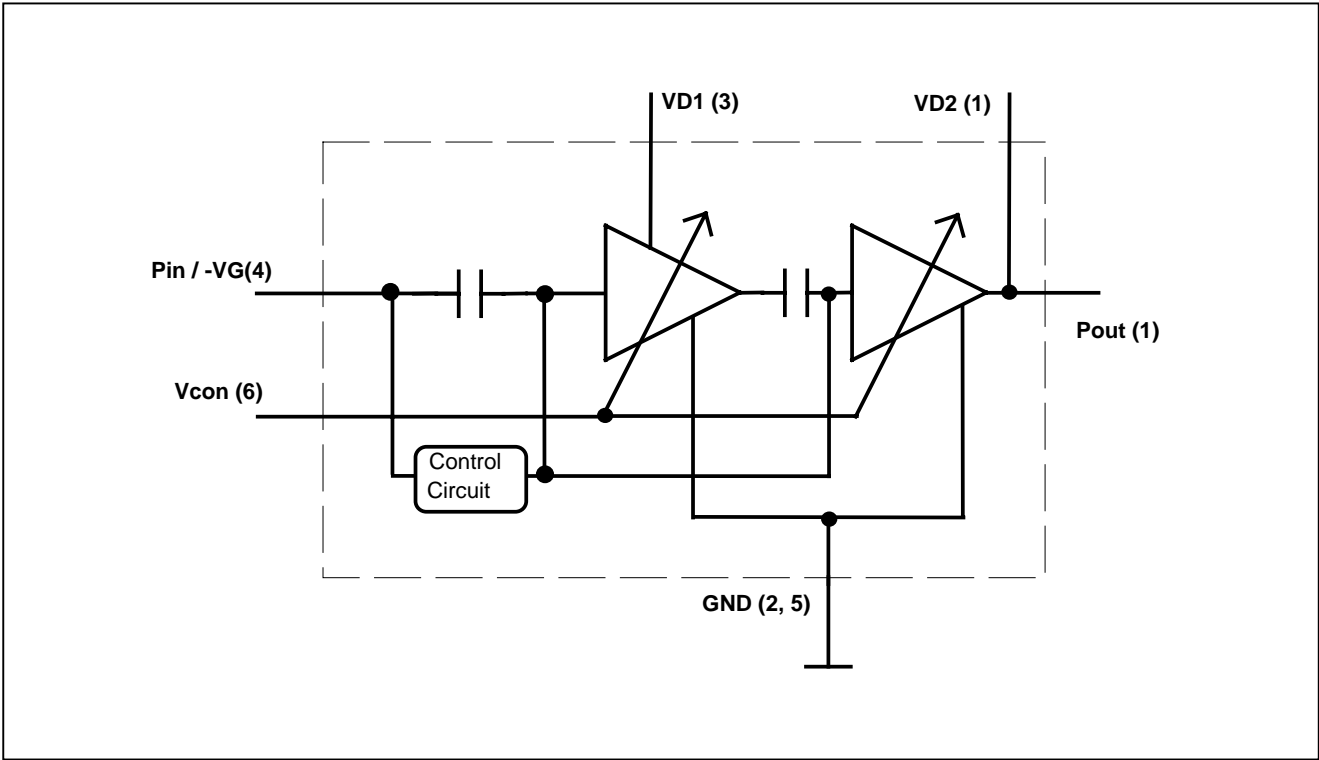
Characteristics	Symbol		Unit
Drain voltage	V_D	8	V
Neg. supply voltage	V_G	-8	V
Pos. control voltage	V_{con}	4	V
Channel temperature	T_{Ch}	150	°C
Storage temperature range	T_{stg}	-55...+150	°C
Total power dissipation ($T_S \leq 81^\circ\text{C}$) ²⁾	P_{tot}	550	mW

Thermal resistance

Characteristics	Symbol		Unit
Channel-soldering point (GND)	R_{thChS}	125	K/W

¹⁾ Dimensions see page 9.
²⁾ Please care for sufficient heat dissipation on the pcb!
^{*)} Pin-out changed compared to CGY120: 180° rotation

Functional block diagram:



Pin #		Configuration
1	VD2 / Pout	Drain voltage 2nd stage / RF-Output
2	RF-Gnd	
3	VD1	Drain voltage 1st stage
4	VG / Pin	Negative voltage at current control circuit (-4V) / RF-Input
5	RF-Gnd	
6	Vcontrol	Positive voltage for gain control (0V....3V)

Electrical characteristics

($T_A = 25^\circ\text{C}$, $f = 900\text{ MHz}$, $V_g = -4\text{V}$, $R_S = R_L = 50\ \Omega$ unless otherwise specified)

Characteristics	Symbol	min	typ	max	Unit
Power Gain $V_d=5\text{V}$; $I=70\text{mA}$; $V_{con}=3\text{V}$	G	-	21.5	-	dB
Input return loss $V_d=5\text{V}$; $I=70\text{mA}$; $V_{con}=3\text{V}$	RL_{in}	-	15	-	dB
Output return loss $V_d=5\text{V}$; $I=70\text{mA}$; $V_{con}=3\text{V}$	RL_{out}	-	11	-	dB
Gain Control Range $V_{con}=3\text{ V} \dots 0\text{V}$; $V_d=5\text{V}$; $I=70\text{mA}$	dG	-	55	-	dB
1dB gain compression $V_d=5\text{V}$; $I=70\text{mA}$; $V_{con}=3\text{V}$	P_{1dB}	-	16	-	dBm

Electrical characteristics

($T_A = 25^\circ\text{C}$, $f = 1800\text{ MHz}$, $V_g=-4\text{V}$, $R_S = R_L = 50\ \Omega$ unless otherwise specified)

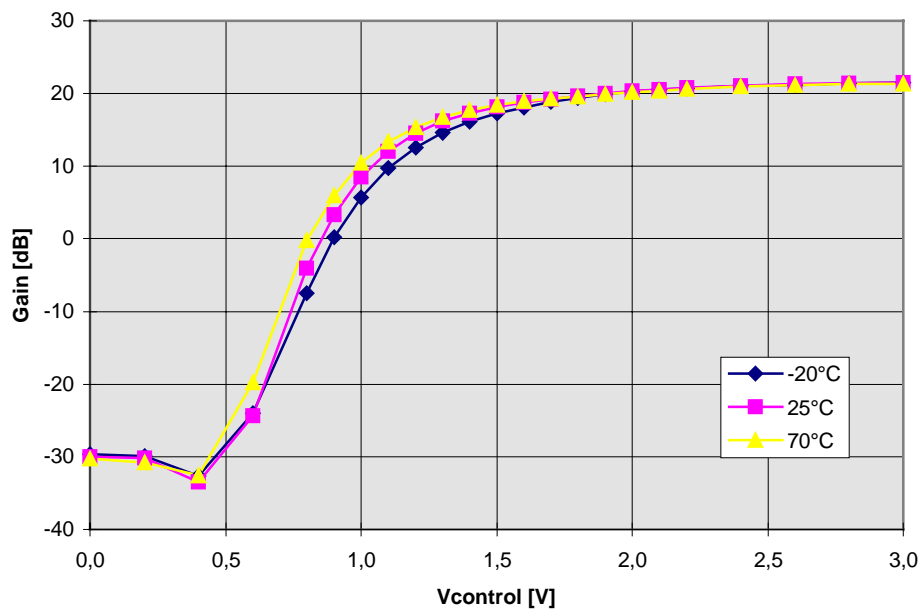
Characteristics	Symbol	min	typ	max	Unit
Power Gain $V_d=5\text{V}$; $I=70\text{mA}$; $V_{con}=3\text{V}$	G	-	19.5	-	dB
Input return loss $V_d=5\text{V}$; $I=70\text{mA}$; $V_{con}=3\text{V}$	RL_{in}	-	10	-	dB
Output return loss $V_d=5\text{V}$; $I=70\text{mA}$; $V_{con}=3\text{V}$	RL_{out}	-	8	-	dB
Gain Control Range $V_{con}=3\text{ V} \dots 0\text{V}$; $V_d=5\text{V}$; $I=70\text{mA}$	dG	-	55	-	dB
1dB gain compression $V_d=5\text{V}$; $I=70\text{mA}$; $V_{con}=3\text{V}$	P_{1dB}	-	16	-	dBm

DC characteristics

Characteristics	Symbol	min	typ	max	Unit
Gate current (Pin 4) $V_g=-4\text{V}$	I_g	-	1.0	-	mA
Control current (Pin 6) $V_g=-4\text{V}$; $V_{con}=0\text{V} \dots 3\text{V}$	I_c	-	0.5	-	mA
Supply current $V_g = -4\text{V}$; $V_{con} = 3\text{V}$	I_d	-	70	-	mA

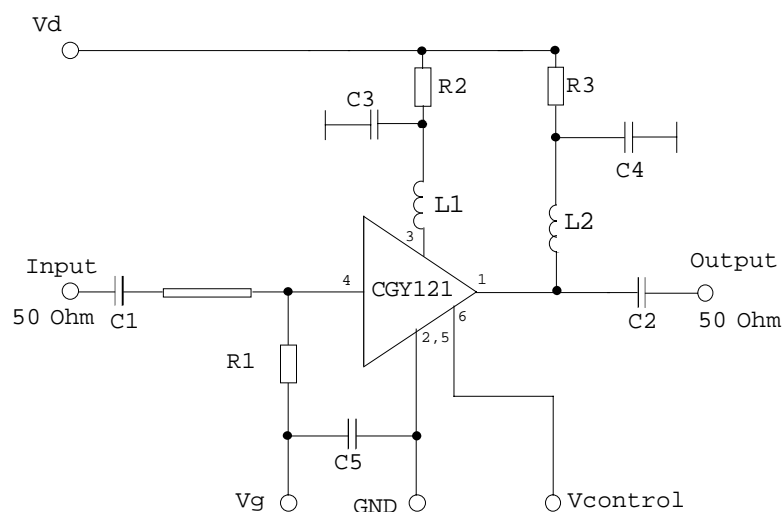
Gain vs. Vcontrol and temperature

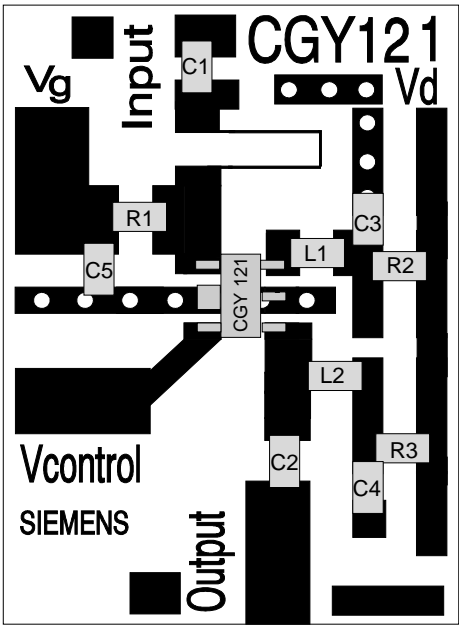
Operating Conditions : $V_d=3V$, $V_g=-4V$, $I_d=70mA$, $f=900MHz$, $P_{in}=-10dBm$



Application Circuit

$f = 900 \text{ MHz}$



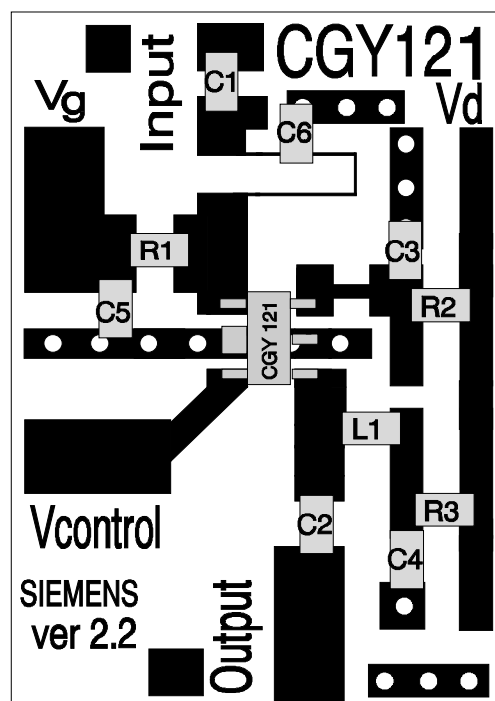
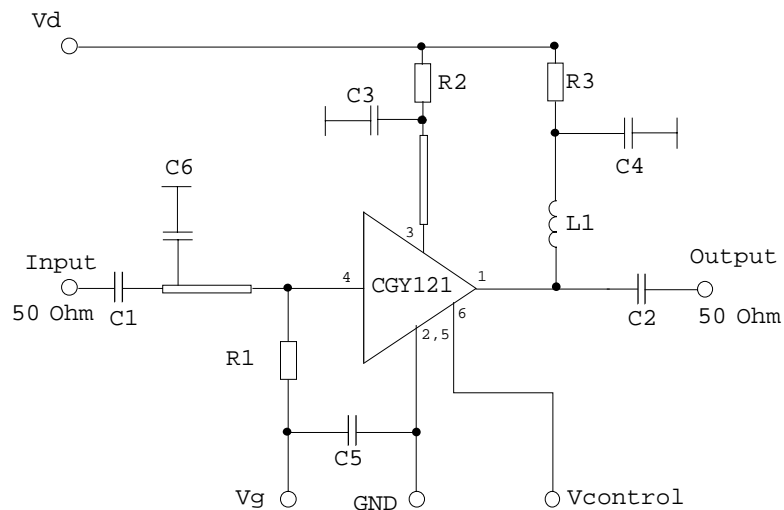


Parts List

Frequency	900 MHz	
C1, C2 (Siemens Size 0603)	22 pF	0603
C3, C4 (Siemens Size 0603)	100 nF	0603
C5 (Siemens Size 0603)	47 nF	0603
L1 (Coilcraft 0805CS-150XKBC)	15 nH	0805
L2 (Coilcraft 0805CS-270XMBC)	27 nH	0805
R1 (Siemens B 54102-A1271-J60)	270 Ohm	0805
R2 (Siemens B 54102-A1120-J60)	12 Ohm	0805
R3	6.8 Ohm	0805

Application Circuit

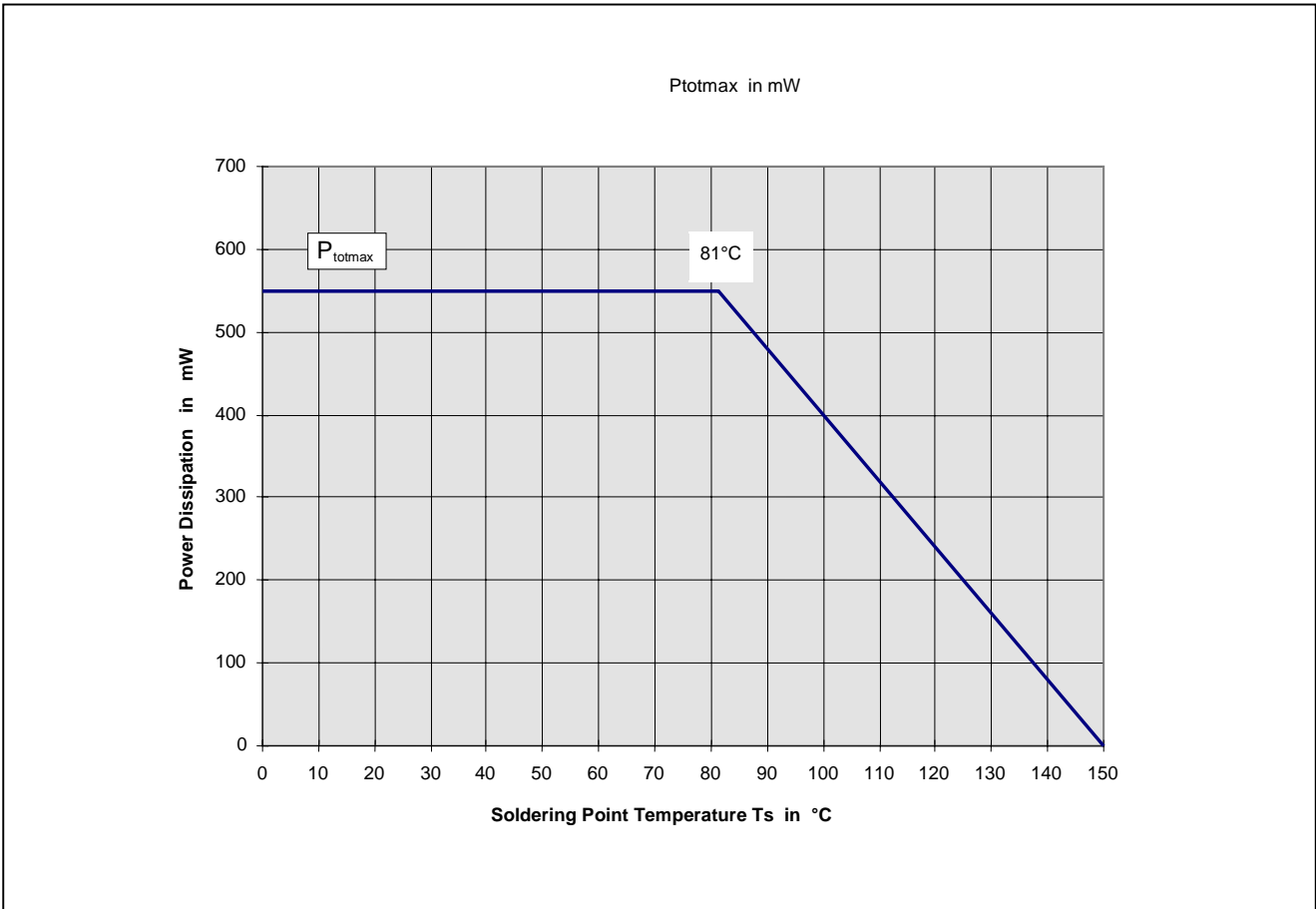
$f = 1900 \text{ MHz}$



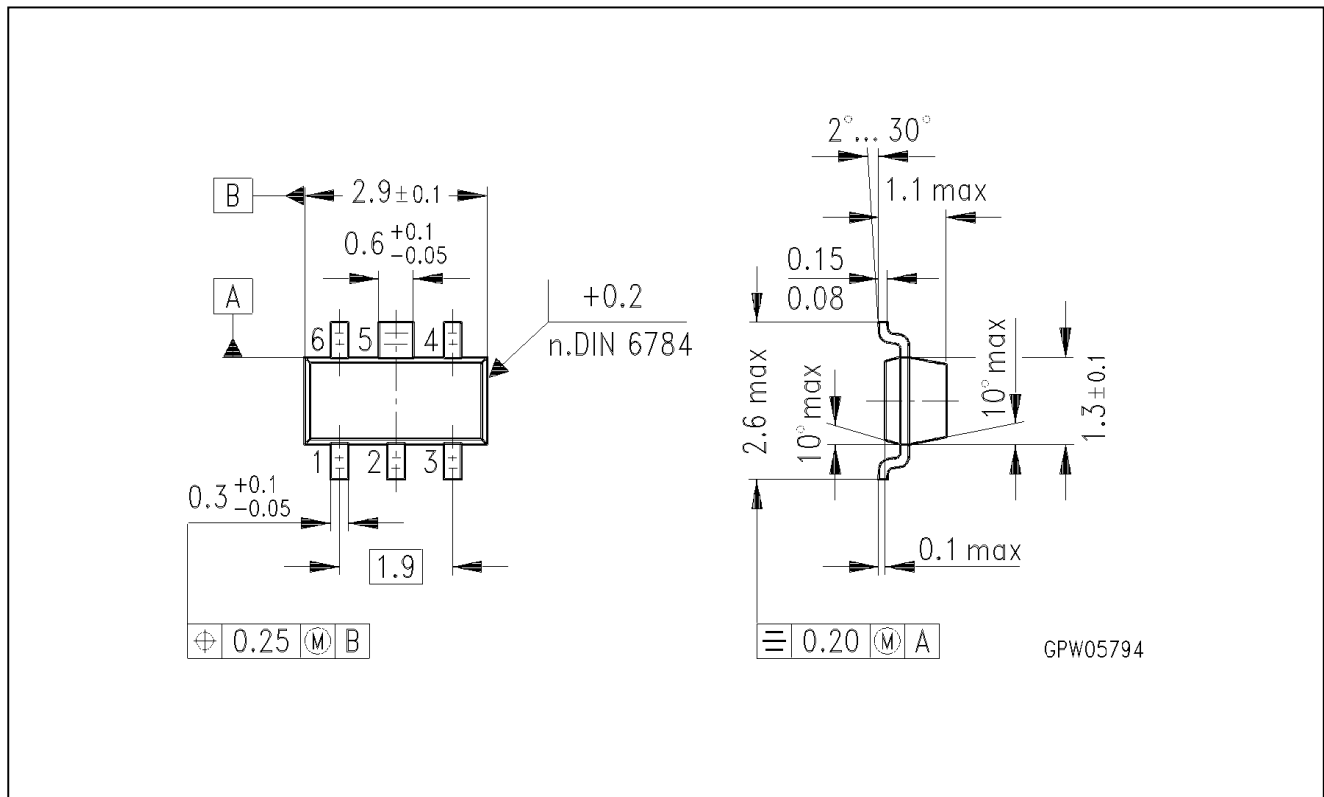
Parts List

Frequency	1900 MHz	
C1, C2 (Siemens size 0603)	12 pF	0603
C3, C4 (Siemens size 0603)	100 nF	0603
C5 (Siemens size 0603)	47 nF	0603
C6 (Siemens size 0603)	1.2 pF	0603
L1 (Coilcraft 0805CS-270XKBC)	15 nH	0805
R1 (Siemens B 54102-A1271-J60)	270 Ohm	0805
R2 (Siemens B 54102-A1120-J60)	12 Ohm	0805
R3	6.8 Ohm	0805

Total Power Dissipation $P_{tot} = f(T_s)$



Semiconductor Device Outline MW-6



Published by Siemens AG, Bereich Halbleiter, Marketing-Kommunikation, Balanstraße 73, D-81541 München.

copyright Siemens AG 1997. All Rights Reserved.

As far as patents or other rights of third parties are concerned, liability is only assumed for components per se, not for applications, processes and circuits implemented within components or assemblies.

The information describes the type of component and shall not be considered as assured characteristics.

Terms of delivery and rights to change design reserved.

For questions on technology, delivery, and prices please contact the Offices of Semiconductor Group in Germany or the Siemens Companies and Representatives worldwide (see address list).

Due to technical requirements components may contain dangerous substances. For information on the type in question please contact your nearest Siemens Office, Semiconductor Group.

Siemens AG is an approved CECC manufacturer.