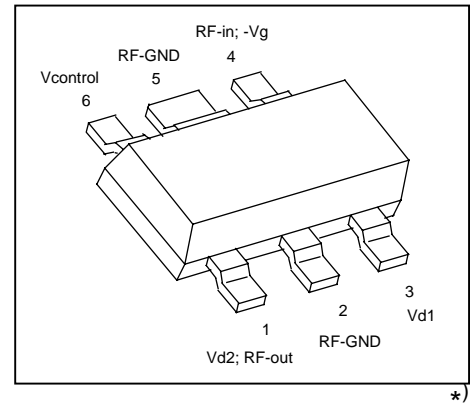


## GaAs MMIC

### 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 <sup>1)</sup>
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 ( $T_S \leq 81^\circ\text{C}$ ) <sup>2)</sup>	$P_{tot}$	550	mW

### Thermal resistance

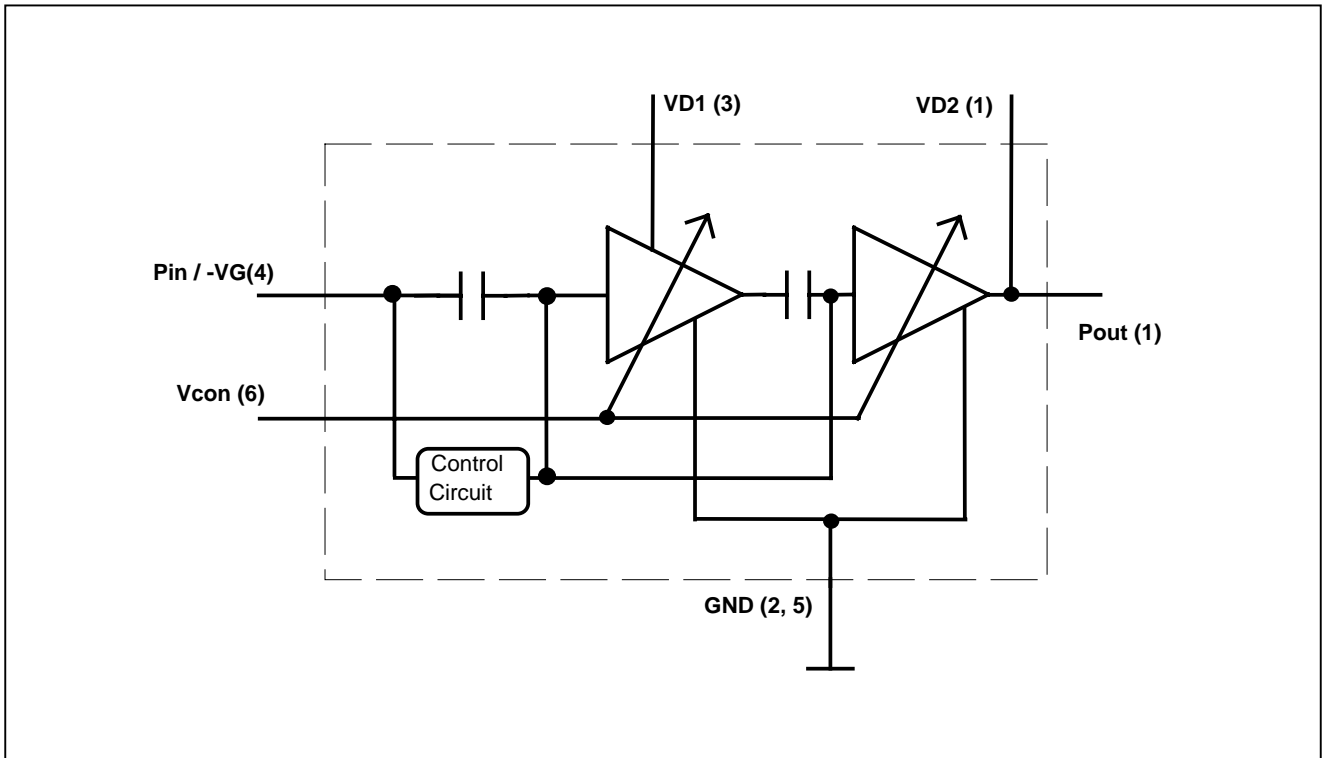
Characteristics	Symbol		Unit
Channel-soldering point (GND)	$R_{thChS}$	125	K/W

<sup>1)</sup> Dimensions see page 9.

<sup>2)</sup> Please care for sufficient heat dissipation on the pcb!

<sup>\*)</sup> Pin-out changed compared to CGY120: 180° rotation

**Functional block diagram:**



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

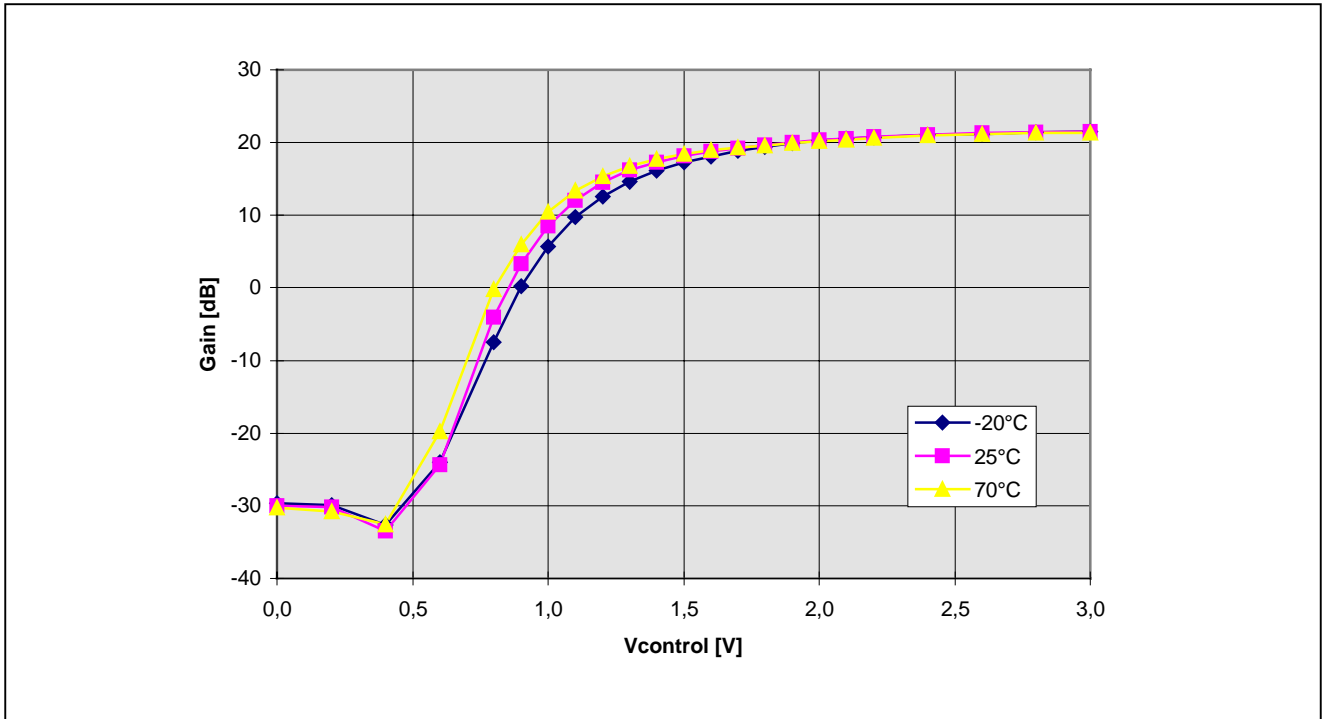
Characteristics	Symbol	min	typ	max	Unit
Power Gain $V_d=5\text{V}$ ; $I=70\text{mA}$ ; $V_{con}=3\text{V}$	$G$	-	19.5	-	dB
Input return loss $V_d=5\text{V}$ ; $I=70\text{mA}$ ; $V_{con}=3\text{V}$	$RL_{in}$	-	10	-	dB
Output return loss $V_d=5\text{V}$ ; $I=70\text{mA}$ ; $V_{con}=3\text{V}$	$RL_{out}$	-	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) $V_g=-4\text{V}$ ; $V_{con}=0\text{V}\dots3\text{V}$	$I_c$	-	0.5	-	mA
Supply current $V_g = -4\text{V}$ ; $V_{con} = 3\text{V}$	$I_d$	-	70	-	mA

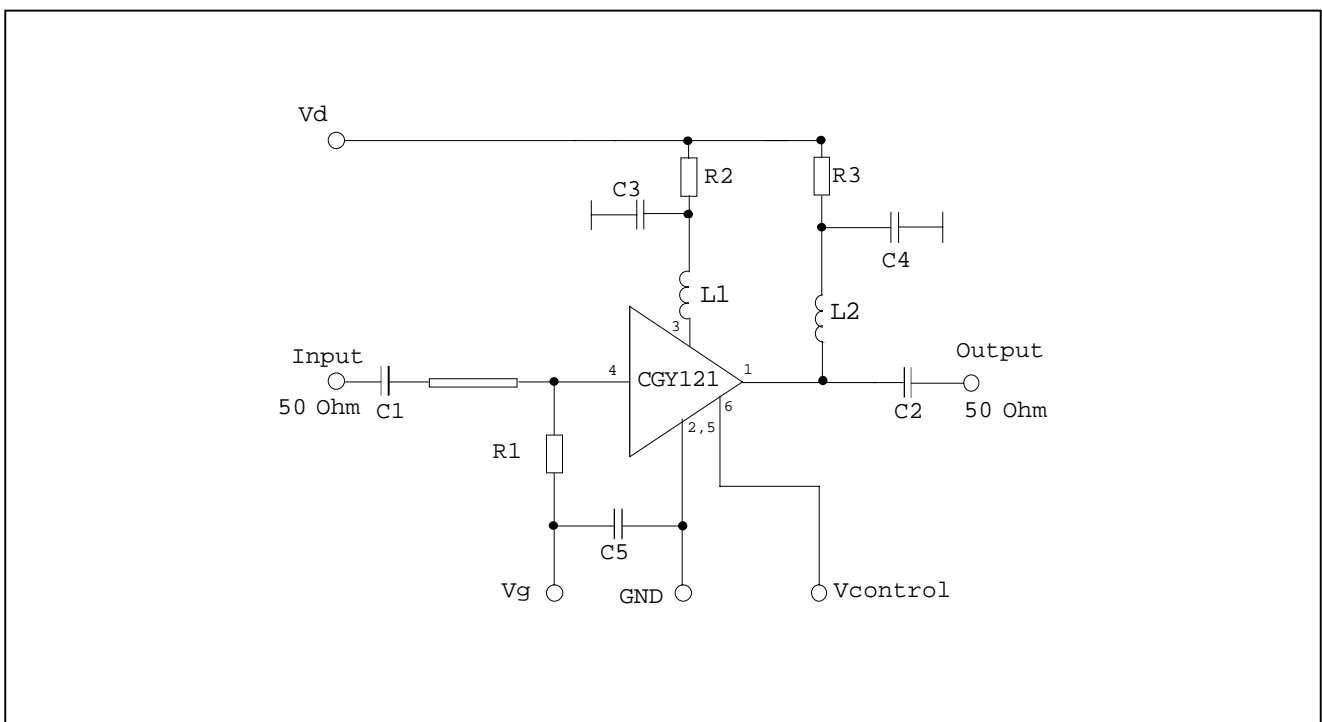
**Gain vs. Vcontrol and temperature**

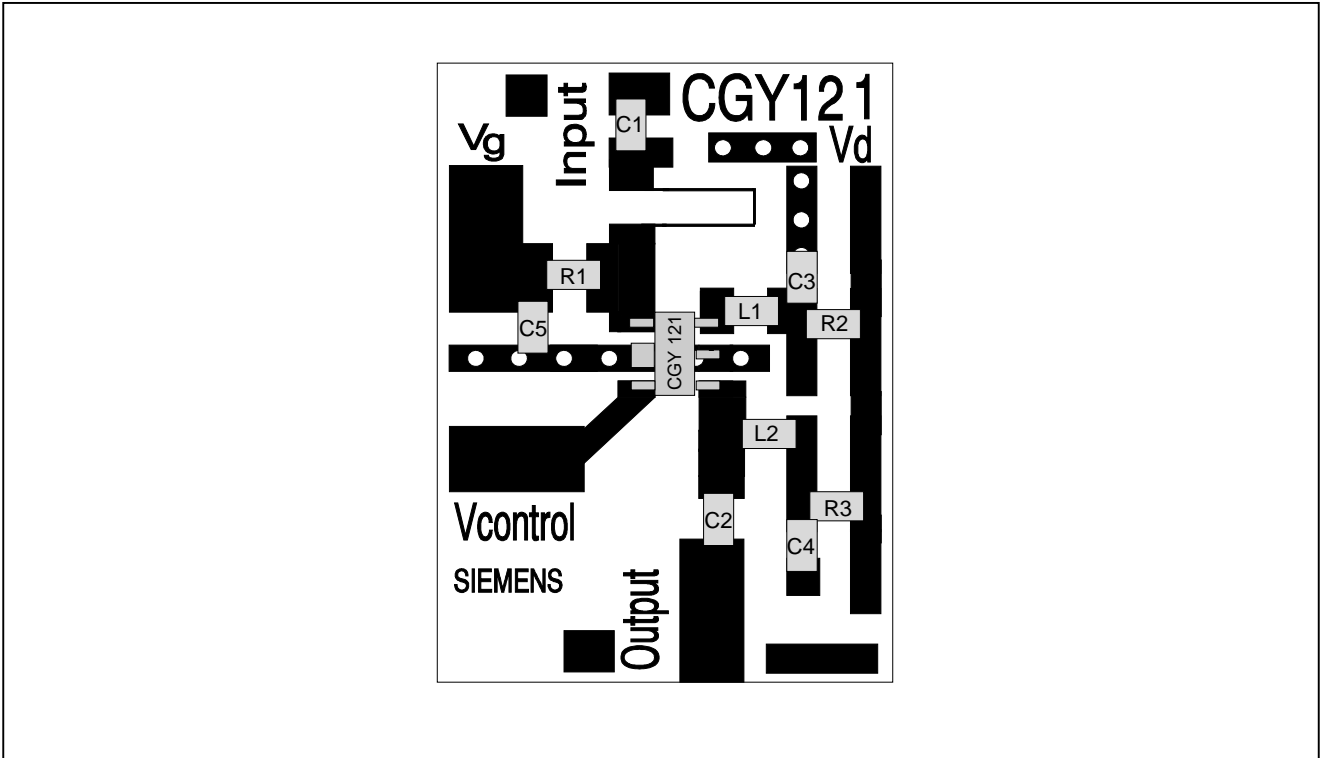
Operating Conditions :  $V_d=3V$ ,  $V_g=-4V$ ,  $I_d=70mA$ ,  $f=900MHz$ ,  $P_{in}=-10dBm$



**Application Circuit**

$f = 900 \text{ MHz}$



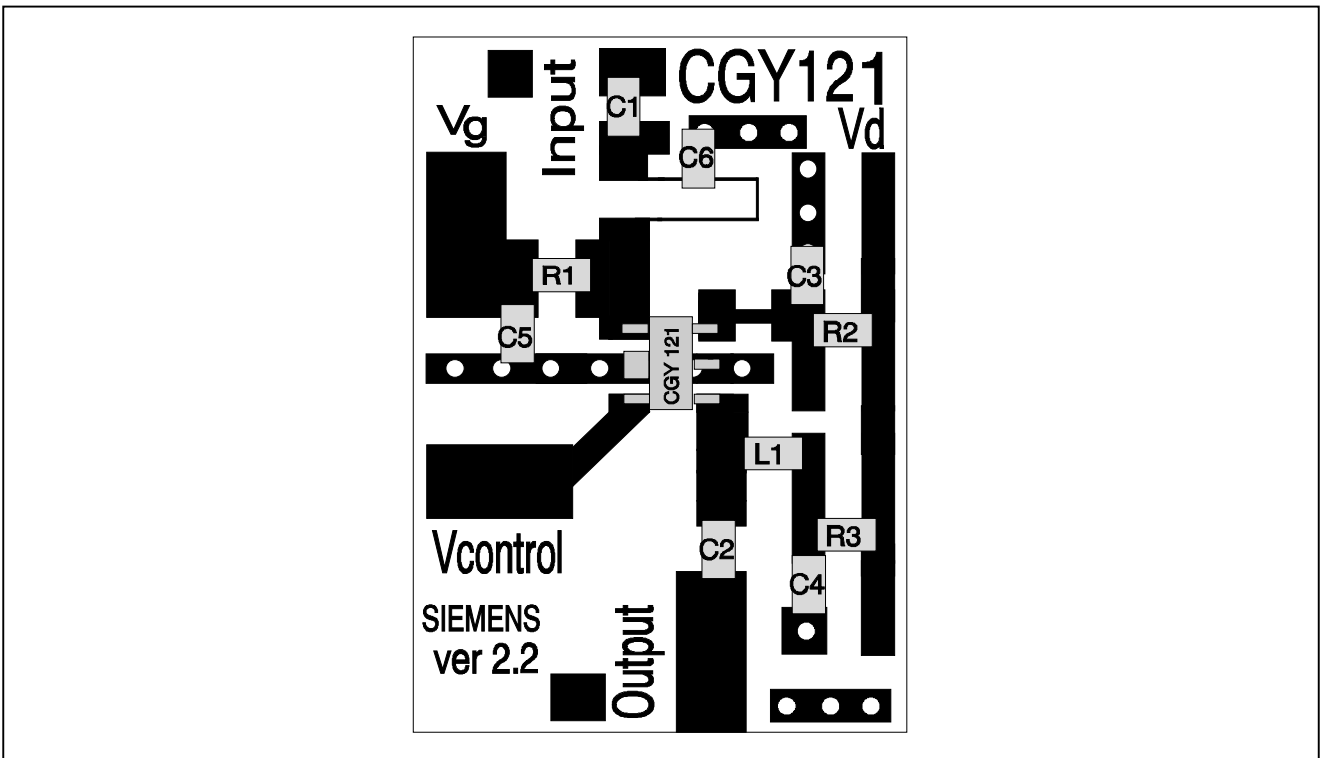
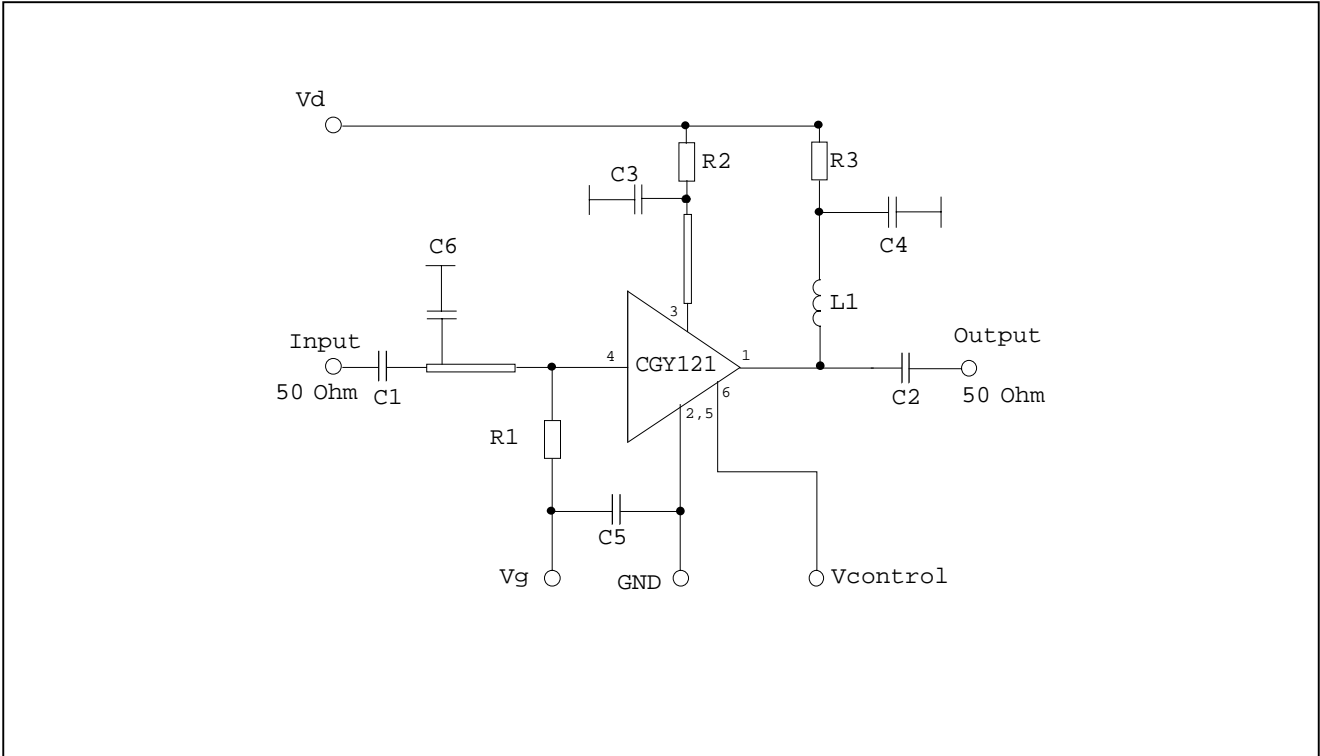


## Parts List

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

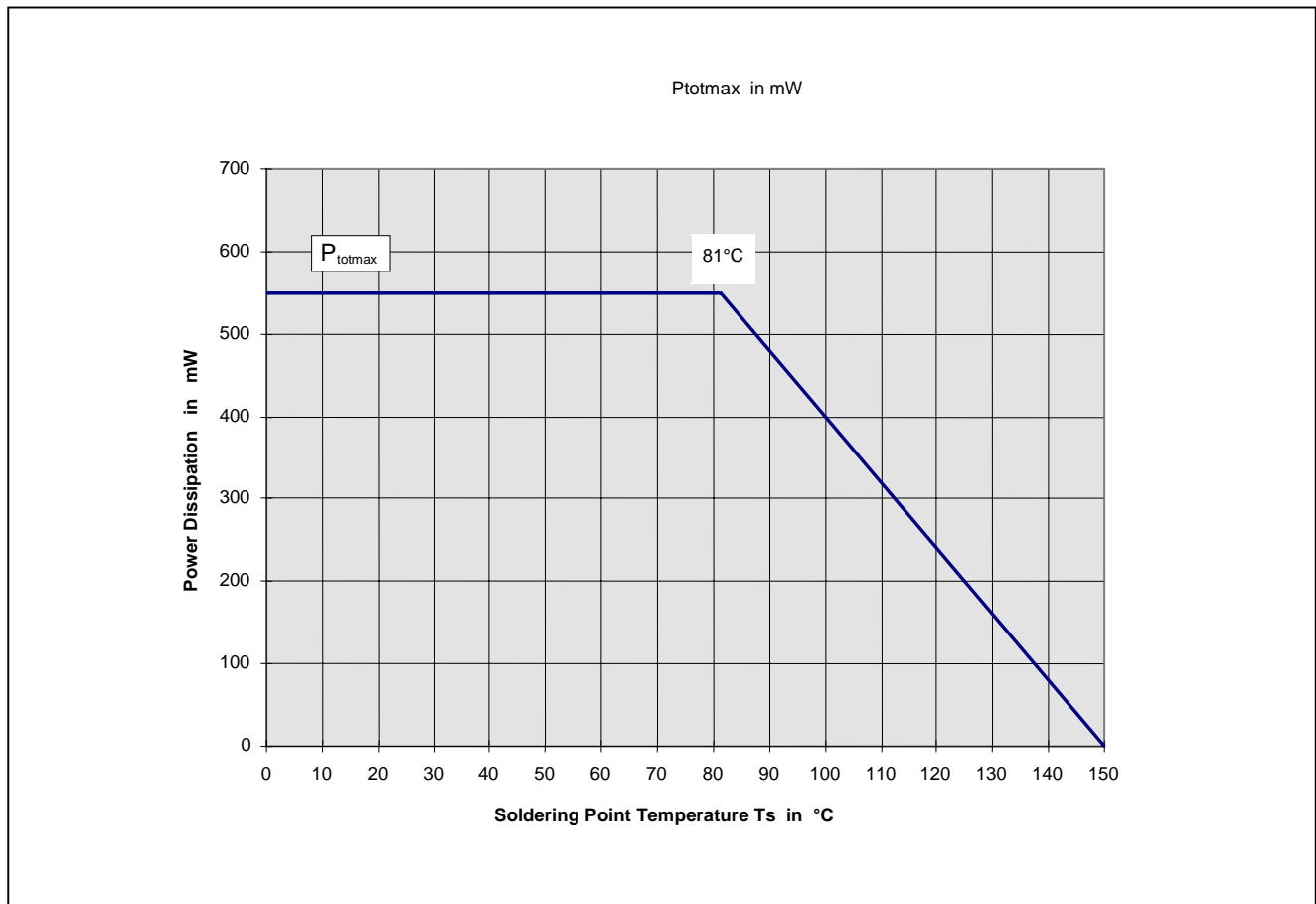
f = 1900 MHz



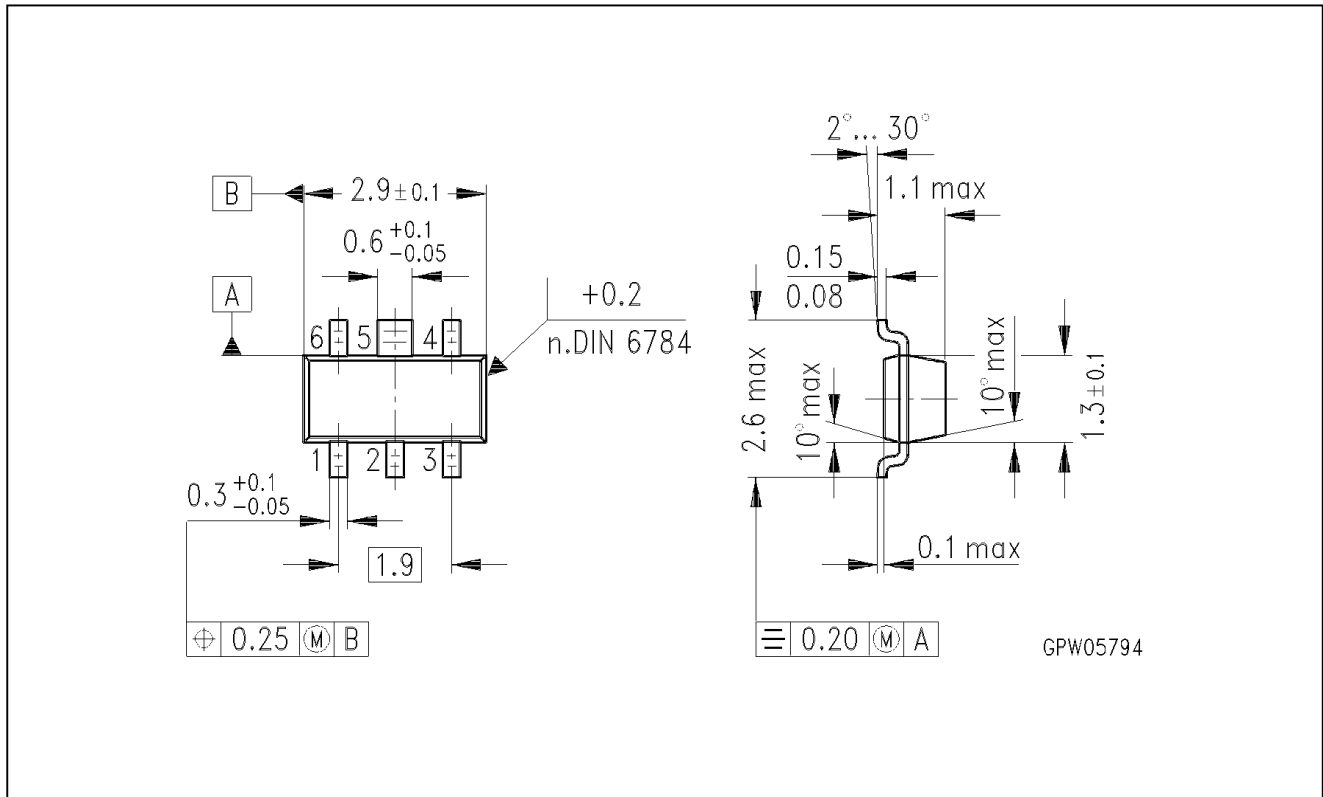
## Parts List

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**



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