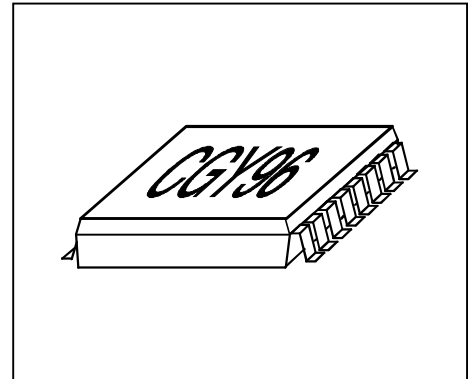


GaAs MMIC

- Power amplifier for GSM class 4 phones
- 3.2 W (35dBm) output power at 3.5 V
- Overall power added efficiency 50 %
- Fully integrated 3 stage amplifier
- Power ramp control
- Input matched to 50 ohms, simple output match

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



Type	Marking	Ordering code (taped)	Package
CGY 96	CGY 96	Q62702G63	MW 16

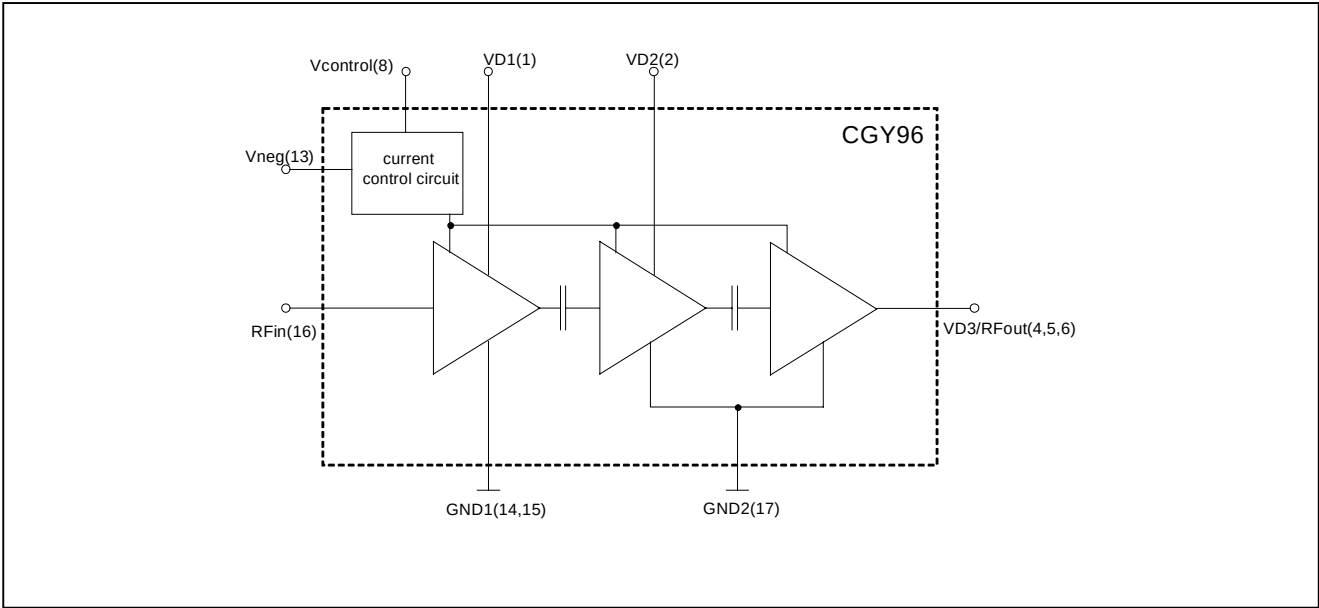
Maximum ratings

Characteristics	Symbol	max. Value	Unit
Positive supply voltage	V_D	9	V
Supply current	I_D	4	A
Channel temperature	T_{Ch}	150	°C
Storage temperature	T_{stg}	-55...+150	°C
Pulse peak power dissipation <i>duty cycle 12.5%, $t_{on}=0.577ms$</i>	P_{Pulse}	tbd	W
Total power dissipation ($T_s \leq 80\text{ °C}$) <i>T_s: Temperature at soldering point</i>	P_{tot}	tbd	W

Thermal Resistance

Characteristics	Symbol	max. Value	Unit
Channel-soldering point	R_{thChS}	tbd	K/W

Functional block diagramm:



Pin #	Name	Configuration
1	VD1	Drain voltage 1st stage
2	VD2	Drain voltage 2nd stage
3	n.c.	-
4,5,6	VD3 / RFout	Drain 3rd stage and RF-output
7	n.c.	-
8	Vcontrol	Control voltage for power ramping
9,10,11,12	n.c.	-
13	Vneg	negative voltage for current control circuit
14,15	Gnd1	Ground pin 1st stage
16	RFin	RF Input
(17)	GND2	Ground (backside of MW16 package)

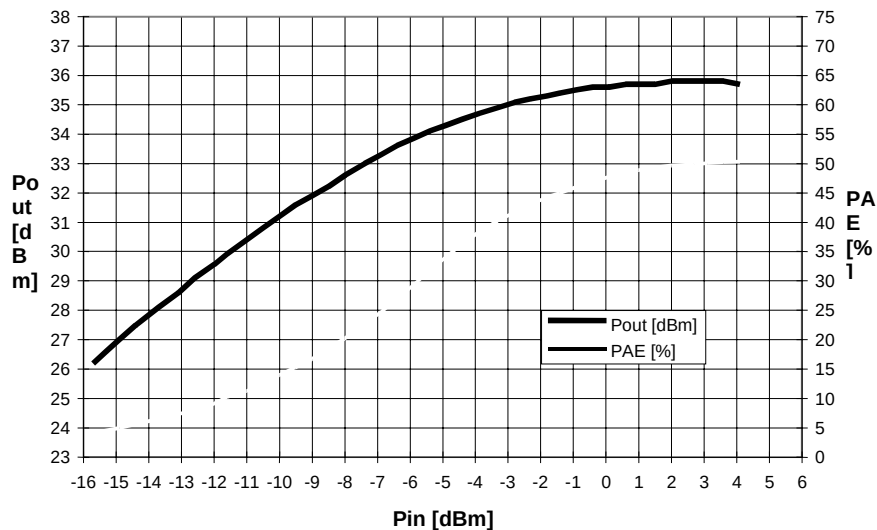
Electrical characteristics

($T_A = 25^\circ\text{C}$, $V_{\text{neg}} = -5\text{V}$, $V_{\text{control}} = 2.2\text{V}$; duty cycle 12.5%, $t_{\text{on}} = 577\mu\text{sec}$)

Characteristics	Symbol	min	typ	max	Unit
Frequency range	f	880	-	915	MHz
Supply current $P_{\text{in}} = 0\text{dBm}$	I_D	-	1.8	-	A
Supply current neg. voltage gener. $V_{\text{aux}} = 3.5\text{V}$	I_{AUX}	-	10	-	mA
Gain (small signal)	G	-	40	-	dB
Power gain $P_{\text{in}} = 0\text{dBm}$	G_P	-	35	-	dB
Output Power $P_{\text{in}} = 0\text{dBm}$, $V_{\text{control}} = 2.0\text{V} \dots 2.5\text{V}$	P_{OUT}	-	35	-	dBm
Overall Power added Efficiency $P_{\text{in}} = 0\text{dBm}$	η	-	50	-	%
Dynamic range output power $V_{\text{control}} = 0.2 \dots 2.2\text{V}$		-	80	-	dB
Harmonics $P_{\text{in}} = 0\text{dBm}$	$H(2f_0)$	-	-40	-	dBc
	$H(3f_0)$	-	-43	-	dBc
	$H(4f_0)$	-	-44	-	dBc
Noise Power in RX (935-960MHz) $P_{\text{in}} = 0\text{dBm}$, $P_{\text{out}} = 35\text{dBm}$, 100kHz RBW	N_{RX}	-	-81	-	dBm
Stability all spurious outputs < -60dBc, VSWR load, all phase angles		-	10 : 1	-	-
Input VSWR		-	1.7 : 1	-	-

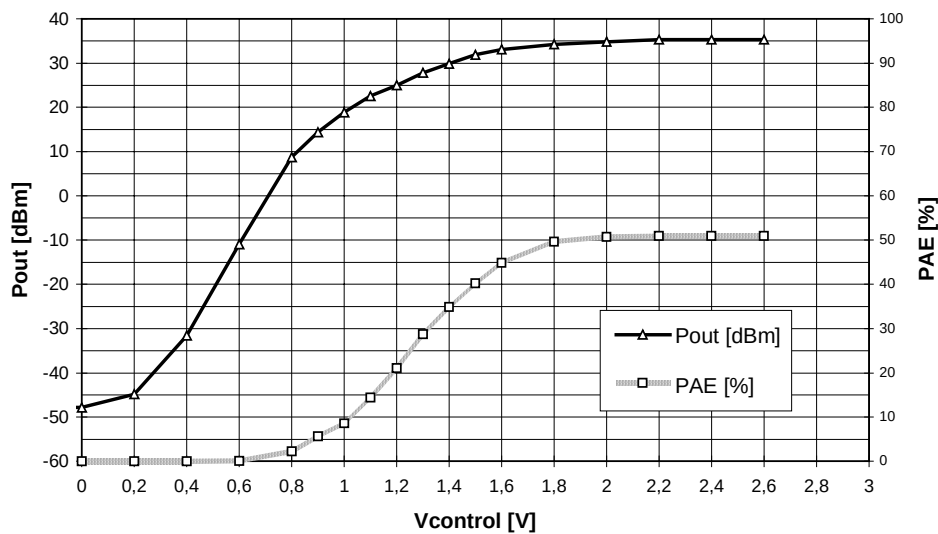
Output Power and PAE vs. Input Power

(Vd=3.5V, Vcontrol=2.2V, f=900MHz, duty cycle 12.5%, ton=577μs)

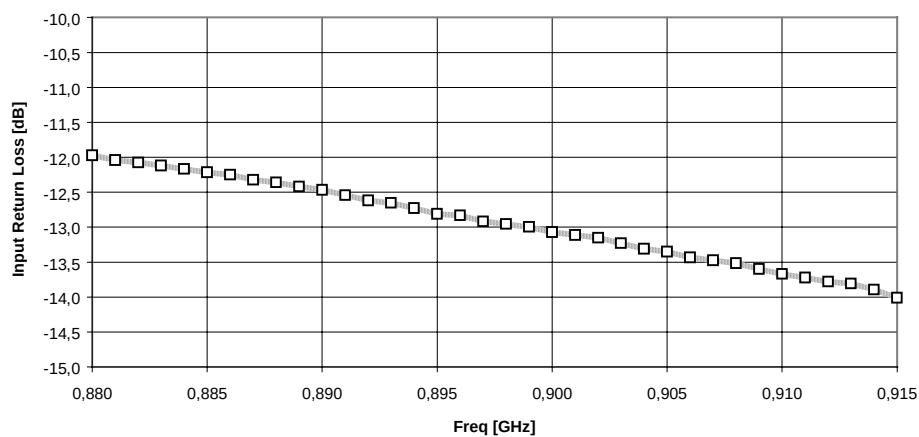
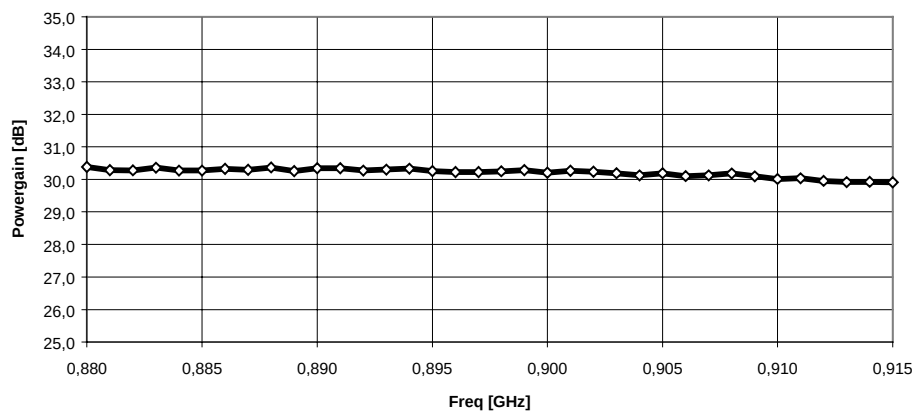


Output Power and PAE vs. Control Voltage:

(Vd=3.5V, Pin=0dBm, f=900MHz, duty cycle 12.5%, ton=577μs)

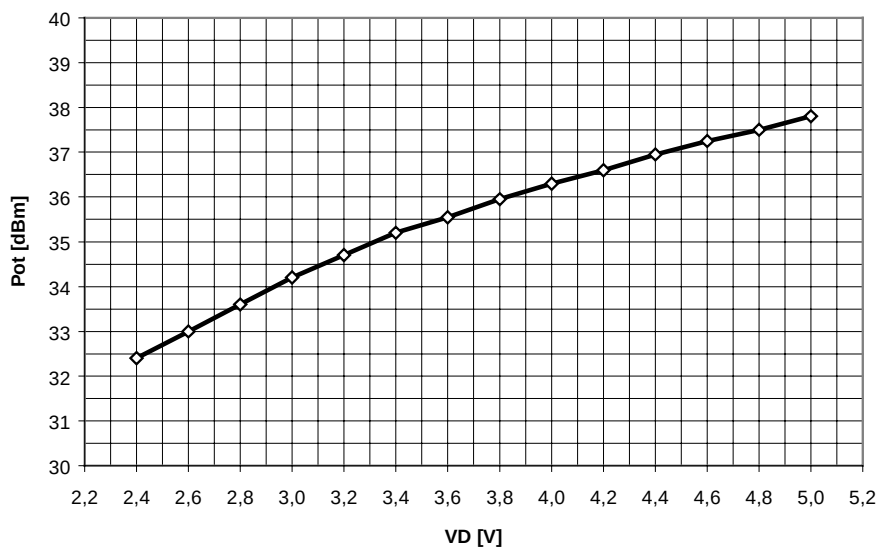


Power Gain and Input Return Loss vs. Frequency
(Vd=3.5V, Vcontrol=2.2V, Pin=5dBm, duty cycle 12.5%, ton=577μs)



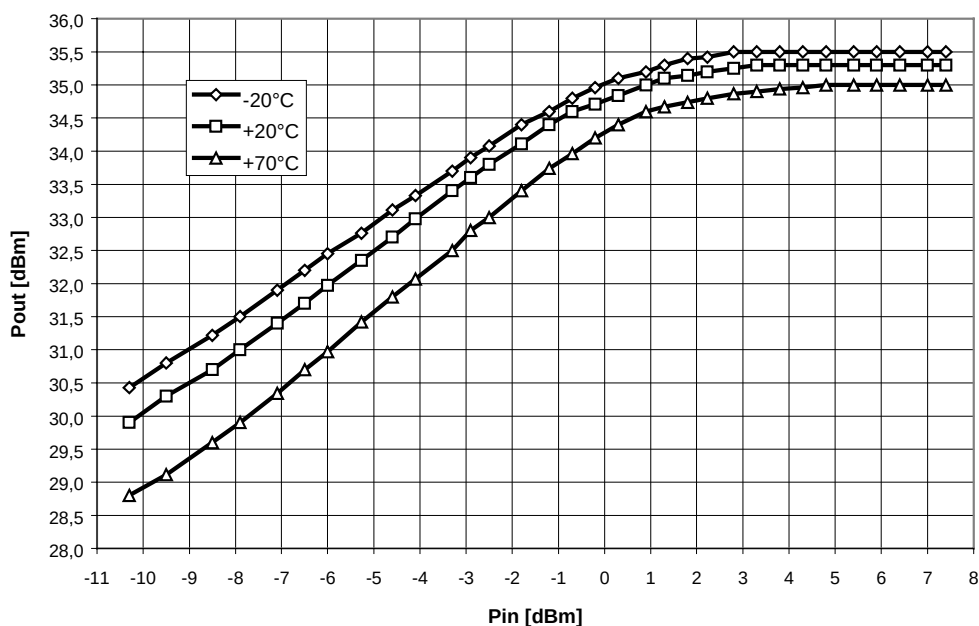
Output Power vs. Drain Voltage

(matched for $V_D=3.5V$, $V_{control}=2.2V$, $P_{in}=0dBm$, duty cycle 12.5%, $t_{on}=577\mu s$)



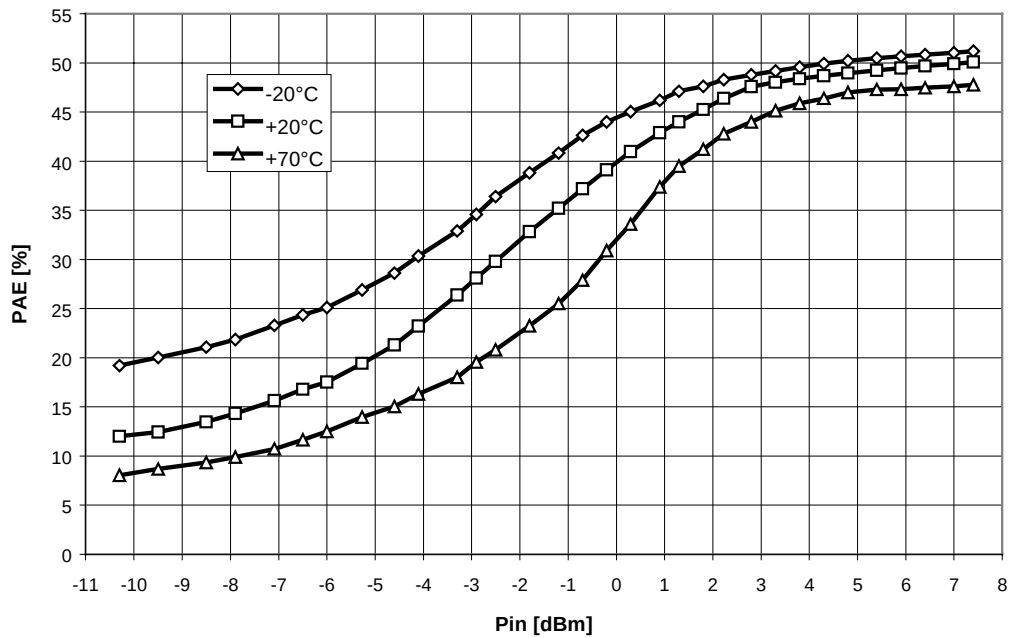
Output Power at different Temperatures

($V_D=3.5V$, $V_{control}=2.2V$, $f=900MHz$, duty cycle 12.5%, $t_{on}=577\mu s$)

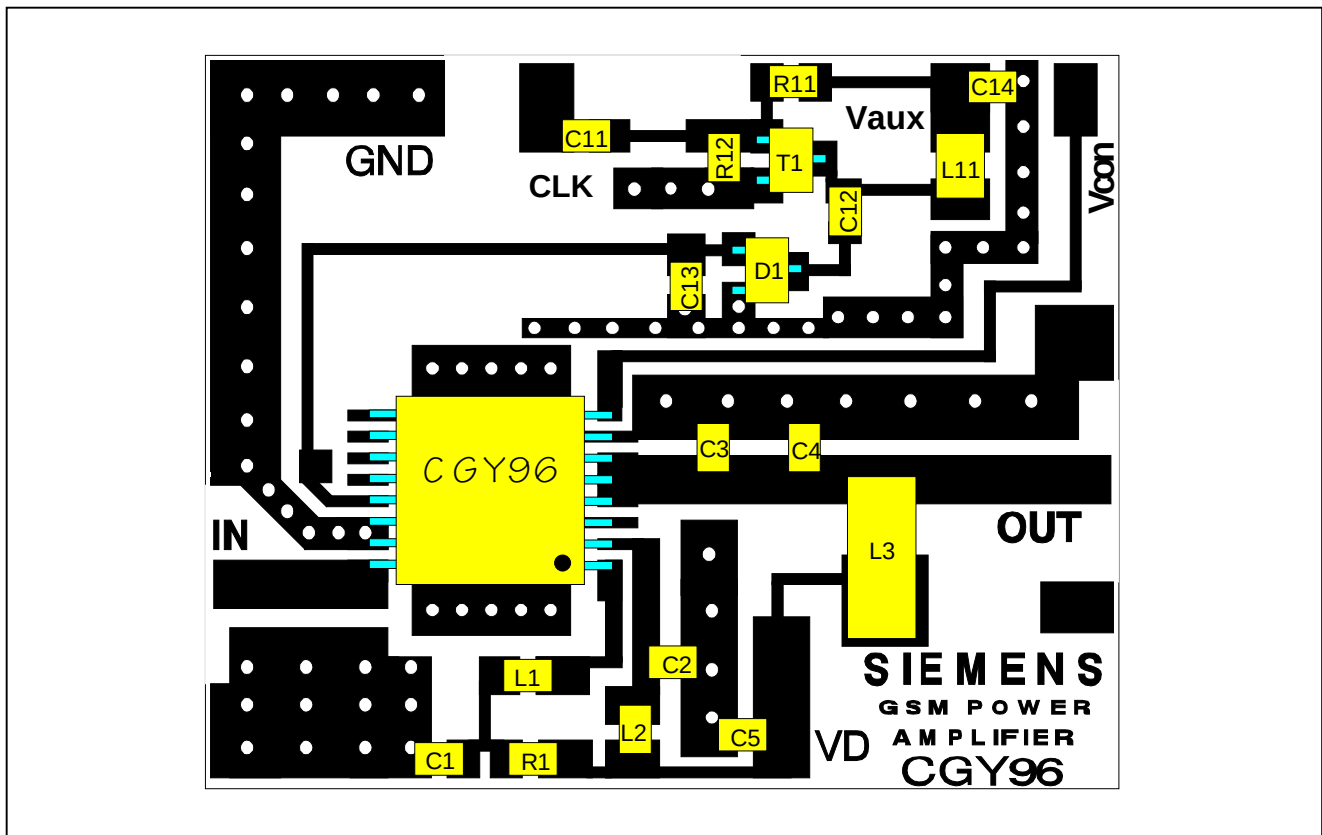


PAE at different Temperatures

(Vd=3.5V, Vcontrol=2.2V, f=900MHz, duty cycle 12.5%, ton=577μs)



CGY 96 Evaluation Board



(Size 34mm x 27mm)

Connections:

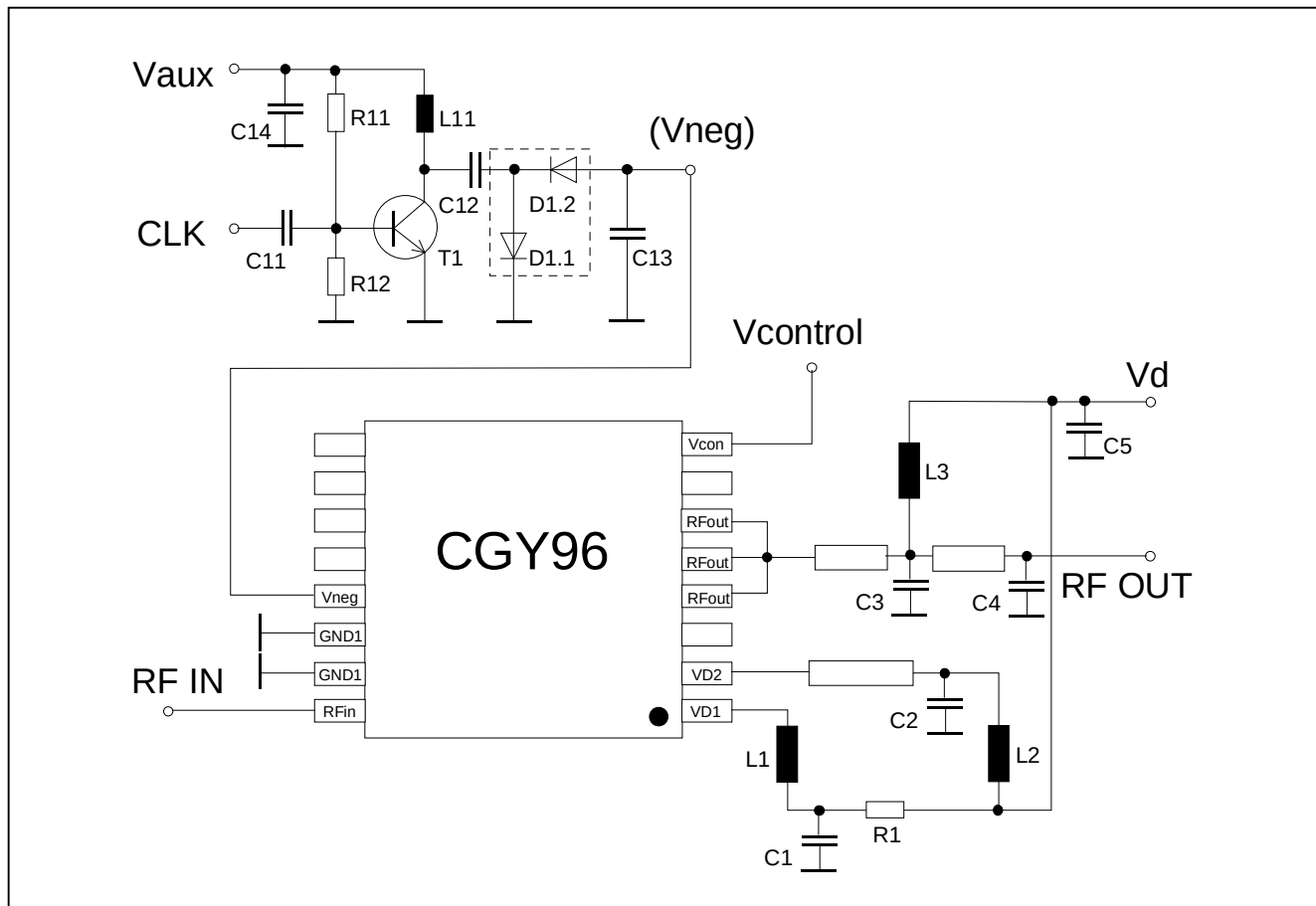
- Vd 2.7 to 6VDC, pulsed (GSM: 12,5% duty cycle, $t_{on}=0.577ms$)
- Vaux 2.7 to 6VDC
- Vcontrol 0.2 to 2.2 VDC (0.2V: min Pout, 2.2V: max Pout)
- CLK 5 MHz to 15 MHz (with a 10uH inductor)
or 150 kHz to 250 kHz (with a 100uH inductor instead of the 10uH)
(rectangular signal, 50% duty, 0 Volt to Vd voltage level)

Power on sequence:

1. continuous clock (CLK) on
2. turn on Vaux ==> check negative voltage at pin#13 (-5.....-10V)
3. turn on Vcontrol (may be at the same time as 2)
turn on Drainvoltage Vd
turn on Input Power

Operation without using the negative voltage generator:

Operation without using the on board negative voltage generator is possible. In that case apply -5....-8 V directly at pin#13 (Vneg-Pin). The devices in front of pin 13 are not necessary in that case.



Part List:

CGY96		Negative Voltage Generator	
L1	33nH	D1	BAS40-04W
L2	33nH	T1	BC848B
L3	33nH*	L11	10uH
C1	1nF	C11	1nF
C2	12pF	C12	1nF
C3	10pF**	C13	47nF
C4	2.2pF**	C14	1nF
C5	1nF	R11	3.8kOhm
R1	3.3Ohm	R12	680Ohm

* 33nH SMD-Inductor for drain3: Part Number BV1250
distribution by

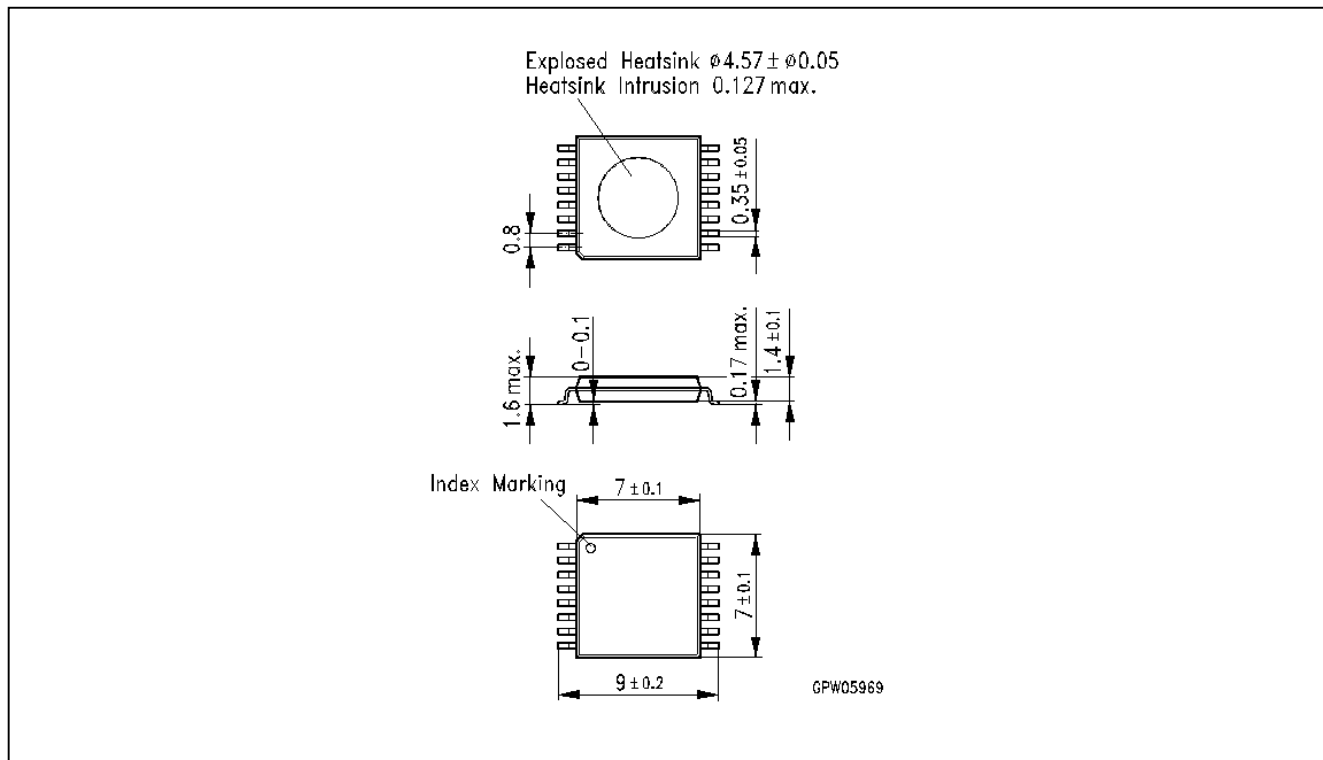
Horst David GmbH, 85375 Neufarn, Germany

Phone-No ..8165/9548-0 , Fax-No ..8165/9548-28

** for maximum efficiency use high quality capacitors for
the output matching: Part Number ACCU-P0603
distribution by

AVX GmbH, 85757 Karlsfeld, Germany

Phone-No ..8131/9004-0



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