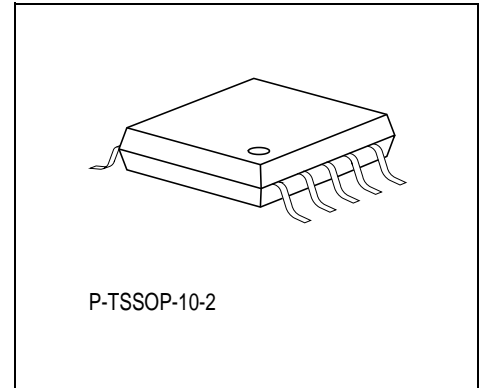


## GaAs MMIC

### Preliminary Data Sheet

## CGY 99

- Broadband 3-stage Power Amplifier (800 ... 2400 MHz)
- GSM, AMPS, PCN, PCS
- Operating voltage range: 2.7 to 6.0 V
- $P_{out} = 35.0$  dBm at  $V_D = 3.5$  V
- Overall power added efficiency 55%
- Easy external matching

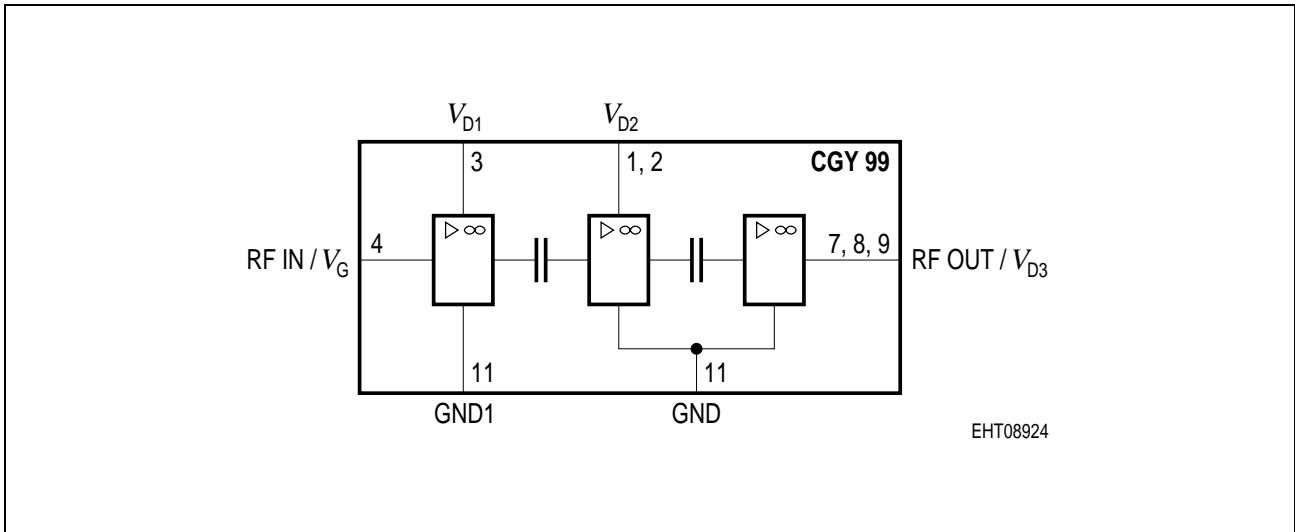


ESD: **E**lectro**s**tatic **d**ischarge sensitive device, observe handling precautions!

Type	Marking	Ordering Code (taped)	Package
CGY 99	t.b.d.	t.b.d.	P-TSSOP-10-2

Maximum Ratings	Symbol	Value	Unit
Positive supply voltage	$V_D$	6	V
Channel temperature	$T_{Ch}$	150	°C
Storage temperature	$T_{stg}$	- 55 ... + 150	°C
Total power dissipation ( $T_s \leq 81$ °C) $T_s$ : Temperature at soldering point	$P_{tot}$	4.0	W
Pulse peak power duty cycle 12.5%, $t_{on} = 0.577$ ms	$P_{Pulse}$	10.0	W

Thermal Resistance	Symbol	Value	Unit
Channel-soldering point	$R_{thChS}$	14	K/W



**Figure 1 Functional Block Diagram**

Pin #	Name	Configuration
1,2	VD2	Drain voltage 2 <sup>nd</sup> stage
3	VD1	Drain voltage 1 <sup>st</sup> stage
4	RFin/VG	RF input/gate voltage
5	n.c.	—
6	n.c.	—
7, 8, 9	VD3/RFout	RF output/drain voltage 3 <sup>rd</sup> stage
10	n.c.	—
11	GND	Ground 2 <sup>nd</sup> and 3 <sup>rd</sup> stage (backside of P-TSSOP-10-2 package)

**GSM-Operation**
**Electrical Characteristics (On GSM Application Board)**

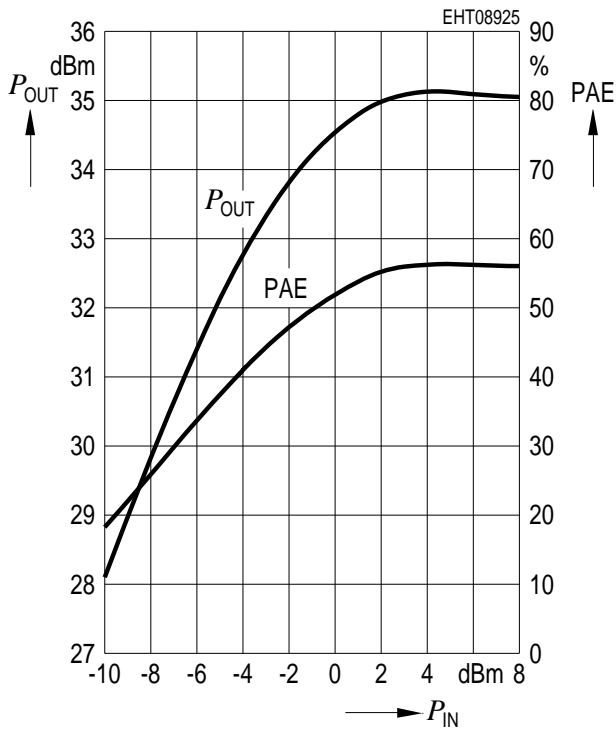
$T_A = 25\text{ }^\circ\text{C}$ ,  $Z_S = Z_L = 50\ \Omega$ , duty cycle 12.5%,  $t_{on} = 577\ \mu\text{s}$ , unless otherwise specified.

Parameters	Symbol	Limit Values			Unit	Test Conditions
		min.	typ.	max.		
Frequency range	$f$	880	–	915	MHz	–
Supply current	$I_{DD}$	–	1.6	–	A	$V_D = 3.5\text{ V}$ , $P_{in} = +5\text{ dBm}$
Power Gain	$G$	–	30	–	dB	$V_D = 3.5\text{ V}$ , $P_{in} = +5\text{ dBm}$
Output Power	$P_o$	–	33.2	–	dBm	$V_D = 2.8\text{ V}$ , $P_{in} = +5\text{ dBm}$
Output Power	$P_o$	–	34.4	–	dBm	$V_D = 3.2\text{ V}$ , $P_{in} = +5\text{ dBm}$
Output Power	$P_o$	–	35.0	–	dBm	$V_D = 3.5\text{ V}$ , $P_{in} = +5\text{ dBm}$
Overall Power added Efficiency	PAE	–	55	–	%	$V_D = 3.5\text{ V}$ , $P_{in} = +5\text{ dBm}$
Harmonics	–				dBc	–
$2f_0$		–	– 40	–		
$3f_0$		–	– 40	–		
Input VSWR	–	–	2 : 1	–	–	$V_D = 3.5\text{ V}$ or $V_D = 4.8\text{ V}$
Load mismatch Load VSWR = 20 : 1 for all phase	–	No module damage for 10 s.			–	$P_{in} = 5\text{ dBm}$ , $V_D \leq 4.6\text{ V}$ , $Z_S = 50\ \Omega$
Stability Load VSWR = 5 : 1 for all phase	–	All spurious output more than 70 dB below desired signal level			–	$P_{in} = 5\text{ dBm}$ , $V_D = 4.6\text{ V}$ , $Z_S = 50\ \Omega$

**GSM-Measurements**

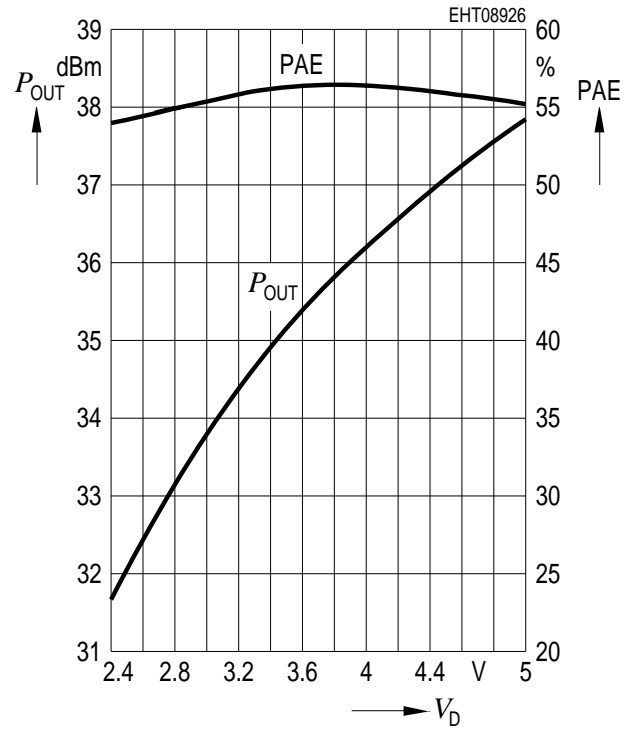
**CGY 99**

$f = 900 \text{ MHz}$ ,  $V_D = 3.5 \text{ V}$ ,  $V_G = -0.9 \text{ V}$



**CGY 99**

$f = 900 \text{ MHz}$ ,  $P_{in} = 5 \text{ dBm}$ ,  $V_G = -0.9 \text{ V}$



**PCN(DCS1800)-Operation**
**Electrical Characteristics (On GSM Application Board)**

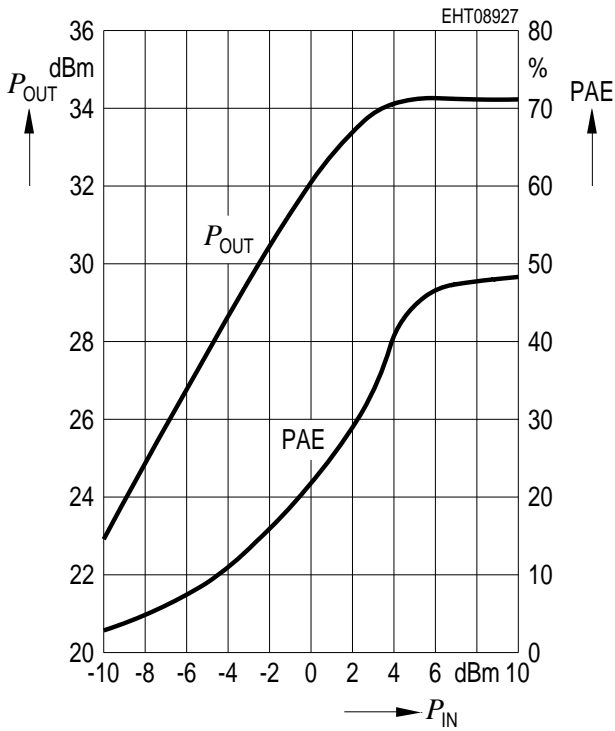
$T_A = 25\text{ }^\circ\text{C}$ ,  $Z_S = Z_L = 50\ \Omega$ , duty cycle 12.5%,  $t_{on} = 577\ \mu\text{s}$ , unless otherwise specified.

Parameters	Symbol	Limit Values			Unit	Test Conditions
		min.	typ.	max.		
Frequency range	$f$	1710	–	1785	MHz	–
Supply current	$I_{DD}$	–	1.6	–	A	$V_D = 3.5\text{ V}$ , $P_{in} = +5\text{ dBm}$
Power Gain	$G$	–	29	–	dB	$V_D = 3.5\text{ V}$ , $P_{in} = +5\text{ dBm}$
Output Power	$P_o$	–	32.1	–	dBm	$V_D = 2.8\text{ V}$ , $P_{in} = +5\text{ dBm}$
Output Power	$P_o$	–	33.4	–	dBm	$V_D = 3.2\text{ V}$ , $P_{in} = +5\text{ dBm}$
Output Power	$P_o$	–	34.0	–	dBm	$V_D = 3.5\text{ V}$ , $P_{in} = +5\text{ dBm}$
Overall Power added Efficiency	PAE	–	45	–	%	$V_D = 3.5\text{ V}$ , $P_{in} = +5\text{ dBm}$
Harmonics	–				dBc	–
$2f_0$		–	– 40	–		
$3f_0$		–	– 40	–		
Input VSWR	–	–	2 : 1	–	–	$V_D = 3.5\text{ V}$ or $V_D = 4.8\text{ V}$
Load mismatch Load VSWR = 20 : 1 for all phase	–	No module damage for 10 s.			–	$P_{in} = 5\text{ dBm}$ , $V_D \leq 4.6\text{ V}$ , $Z_S = 50\ \Omega$
Stability Load VSWR = 5 : 1 for all phase	–	All spurious output more than 70 dB below desired signal level.			–	$P_{in} = 5\text{ dBm}$ , $V_D = 4.6\text{ V}$ , $Z_S = 50\ \Omega$

**PCN-Measurements (Board Matched for Maximum Output Power)**

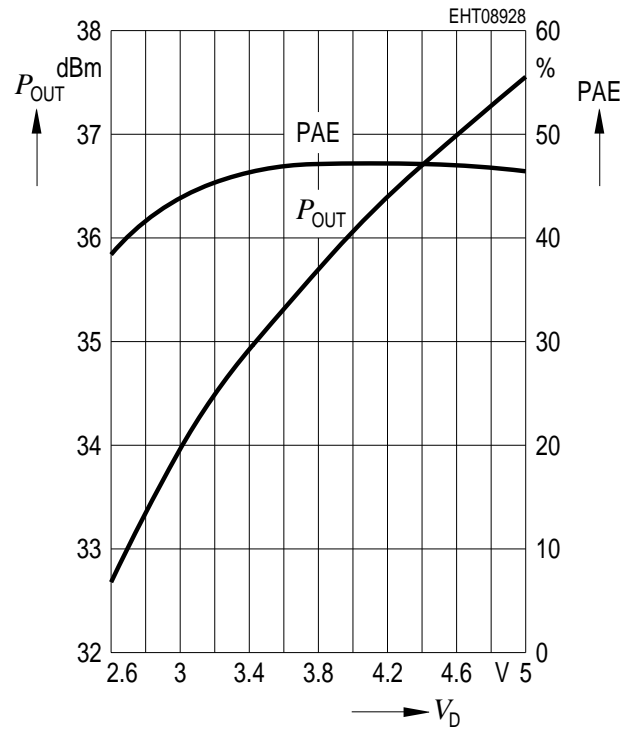
**CGY 99**

$f = 1750 \text{ MHz}$ ,  $V_G = -0.58 \text{ V}$ ,  $V_D = 3.15 \text{ V}$



**CGY 99**

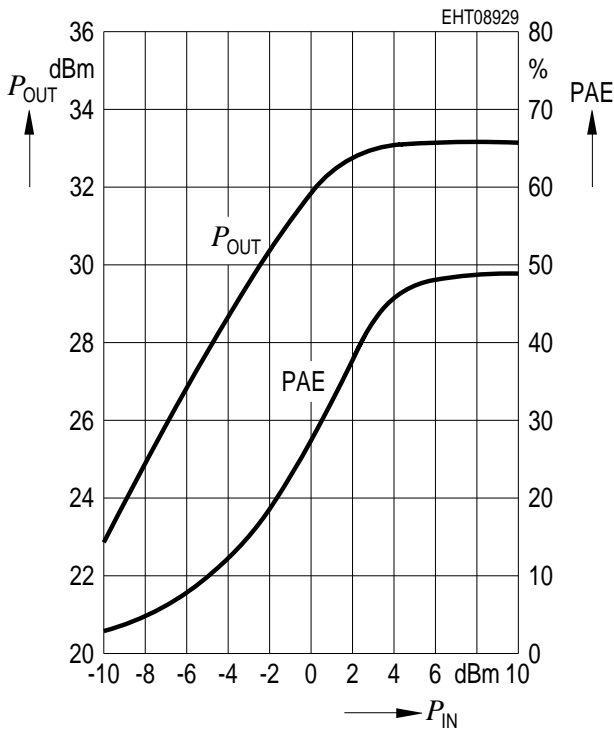
$f = 1750 \text{ MHz}$ ,  $P_{in} = 5 \text{ dBm}$ ,  $V_G = -0.58 \text{ V}$



**PCN-Measurements (Board Matched for Reduced Output Power)**

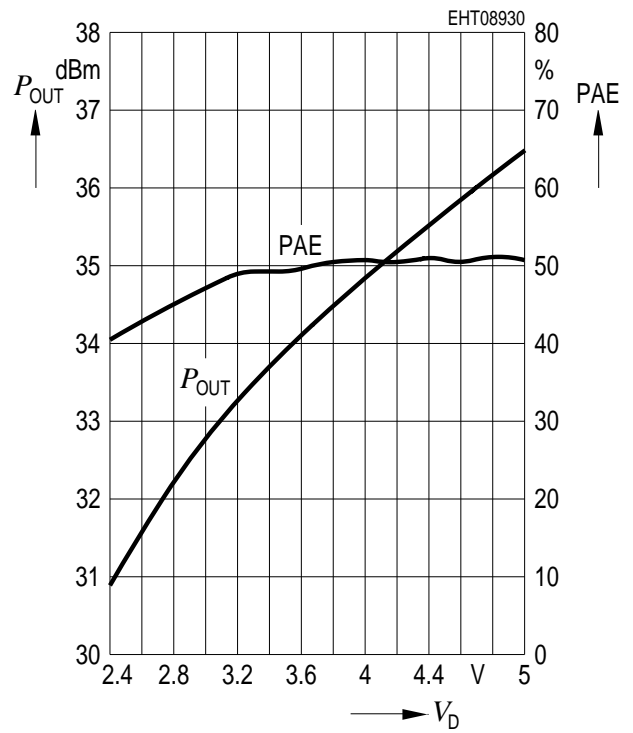
**CGY 99**

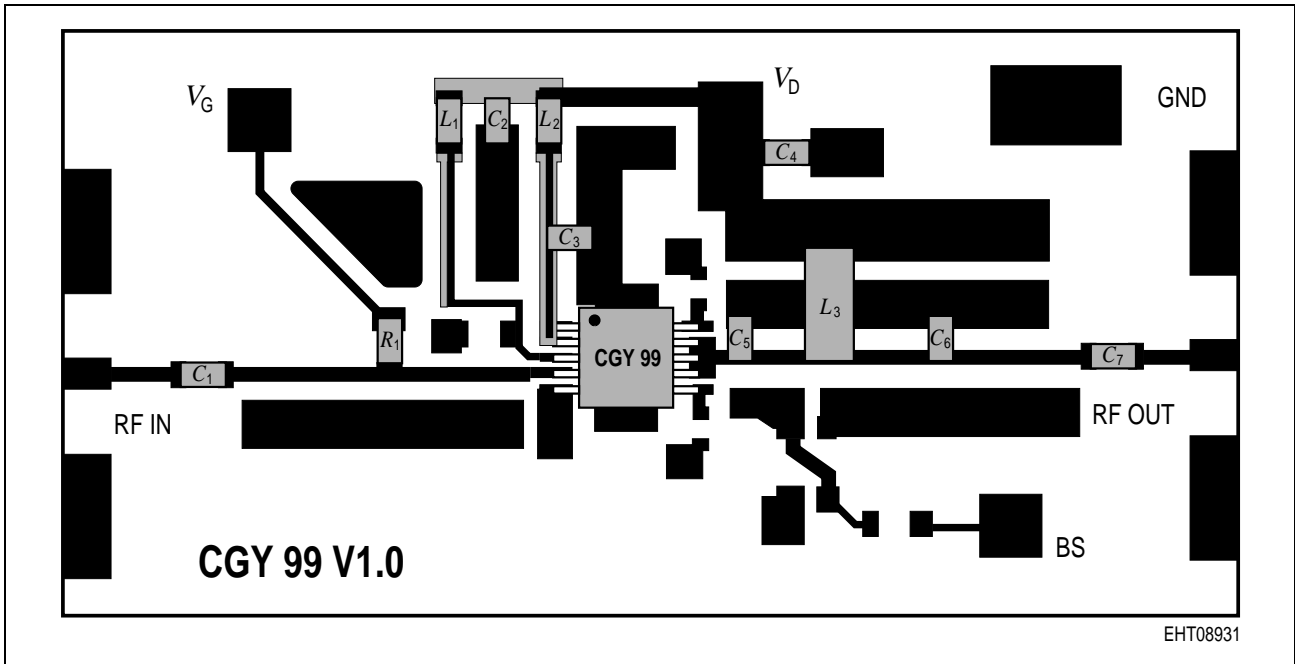
$f = 1750 \text{ MHz}$ ,  $V_G = -0.58 \text{ V}$ ,  $V_D = 3.15 \text{ V}$



**CGY 99**

$f = 1750 \text{ MHz}$ ,  $P_{in} = 5 \text{ dBm}$ ,  $V_G = -0.58 \text{ V}$





EHT08931

**Figure 2 CGY 99 GSM Application Board**

Bordmaterial: FR4/0.2 mm

Boardsize: 38 mm × 19 mm

**Part List**

	Value	Part Type		Value	Part Type
$L_1$	1.5 nH	0603	$C_5$	12 pF	0603 <sup>1)</sup>
$L_2$	39 nH	0603	$C_6$	8.2 pF	0603 <sup>1)</sup>
$L_3$	33 nH	2)	$C_7$	1 nF	0603
$C_1$	1 nF	0603	$R_1$	150 $\Omega$	0603
$C_2$	1 nF	0603	–	–	–
$C_3$	1 nF	0603	–	–	–
$C_4$	100 nF	0603	–	–	–

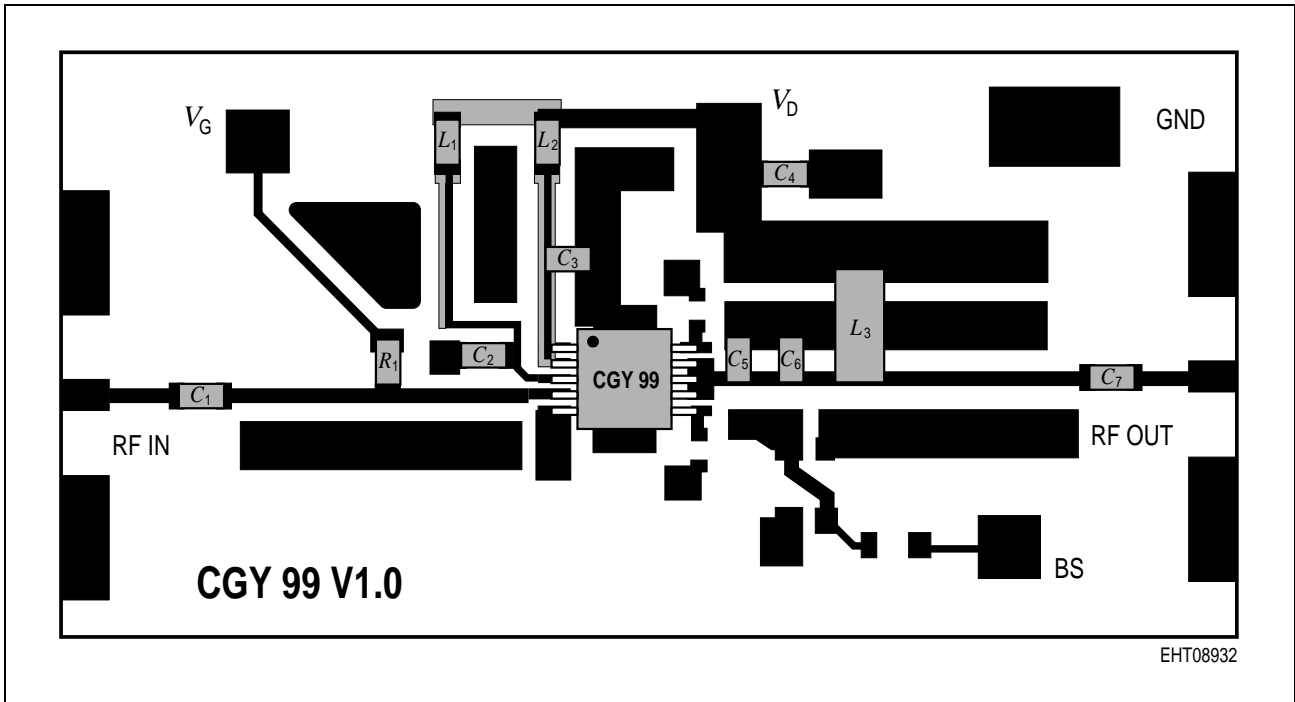
1) For maximum efficiency use high quality capacitors for the output matching:

Part Number ACCU-P0603, distribution by  
AVX Gmb, 85757 Karlsfeld, Germany  
Phone-No +498131/9004-0

2) 33 nH SMD-Inductor for drain3:

Part Number BV1250, distribution by  
Horst David GmbH, 85375 Neufarn, Germany  
Phone-No +498165/9548-0, Fax-No +498165/9548-28





**Figure 3 CGY 99 PCN Application Board**

Bordmaterial: FR4/0.2 mm

Boardsize: 38 mm × 19 mm

**Part List**

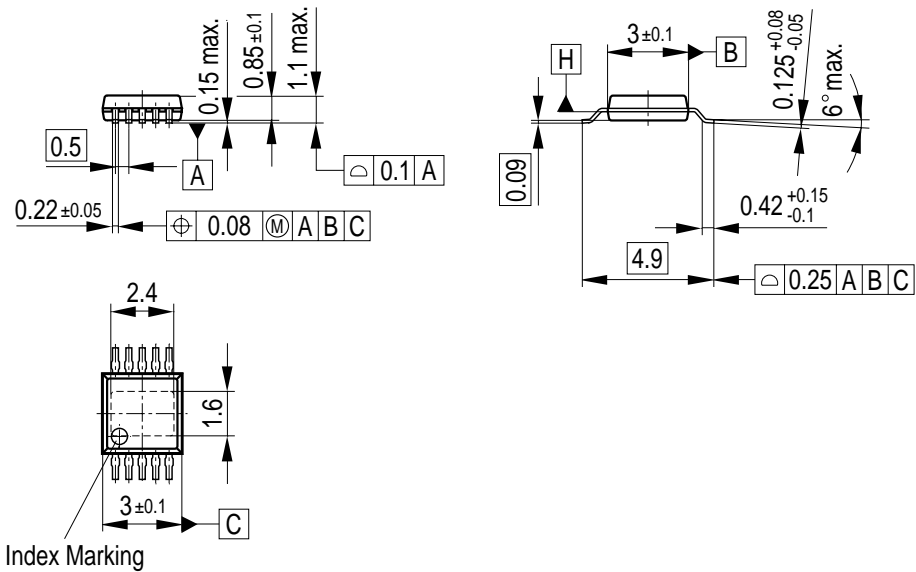
	Value	Part Type		Value	Part Type
$L_1$	22 nH	0603	$C_5$	4.7 pF	0603 <sup>1)</sup>
$L_2$	22 nH	0603	$C_6$	2.0 pF	0603 <sup>1)</sup>
$L_3$	33 nH	2)	$C_7$	1 nF	0603
$C_1$	1 nF	0603	$R_1$	150 $\Omega$	0603
$C_2$	56 pF	0603	–	–	–
$C_3$	4.7 pF	0603 <sup>1)</sup>	–	–	–
$C_4$	100 nF	0603	–	–	–

<sup>1)</sup> For maximum efficiency use high quality capacitors for the output matching:  
 Part Number ACCU-P0603, distribution by  
 AVX Gmb, 85757 Karlsfeld, Germany  
 Phone-No +498131/9004-0

<sup>2)</sup> 33 nH SMD-Inductor for drain3:  
 Part Number BV1250, distribution by  
 Horst David GmbH, 85375 Neufarn, Germany  
 Phone-No +498165/9548-0, Fax-No +498165/9548-28

Package Outlines

**P-TSSOP-10-2**  
(Plastic Thin Shrink Small Outline Package)



GPS09230

**Sorts of Packing**

Package outlines for tubes, trays etc. are contained in our Data Book "Package Information".

**SMD = Surface Mounted Device**

Dimensions in mm