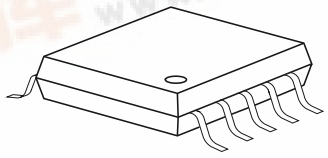
GaAs MMIC

CGY 99

Preliminary Data Sheet

- 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



P-TSSOP-10-2

ESD: **E**lectro**s**tatic **di**scharge 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

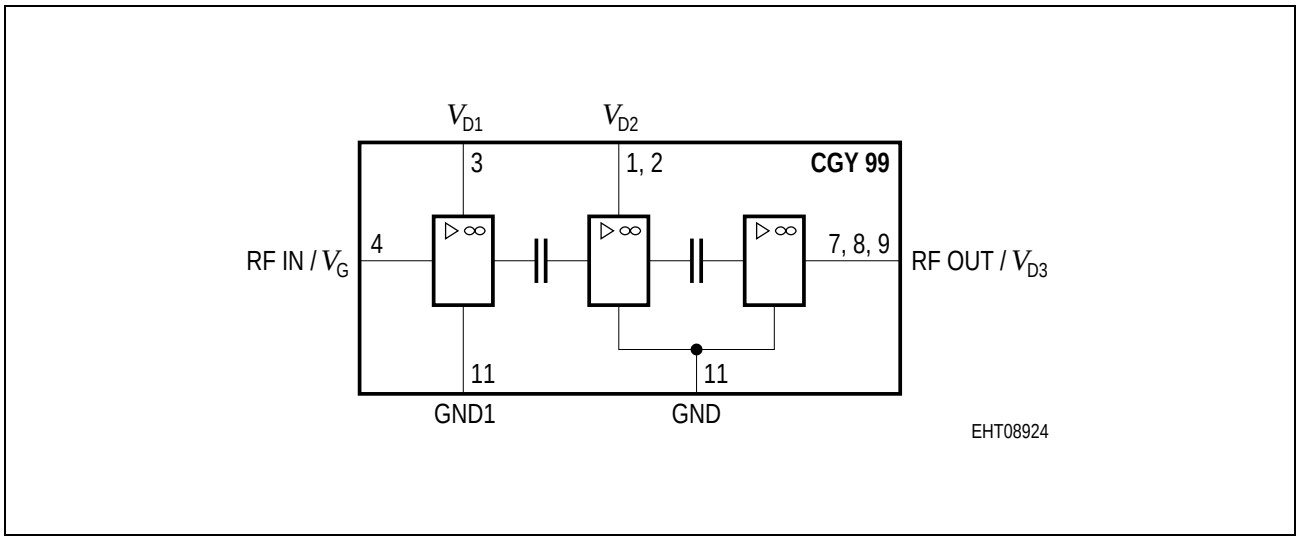


Figure 1 Functional Block Diagram

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

GSM-Operation

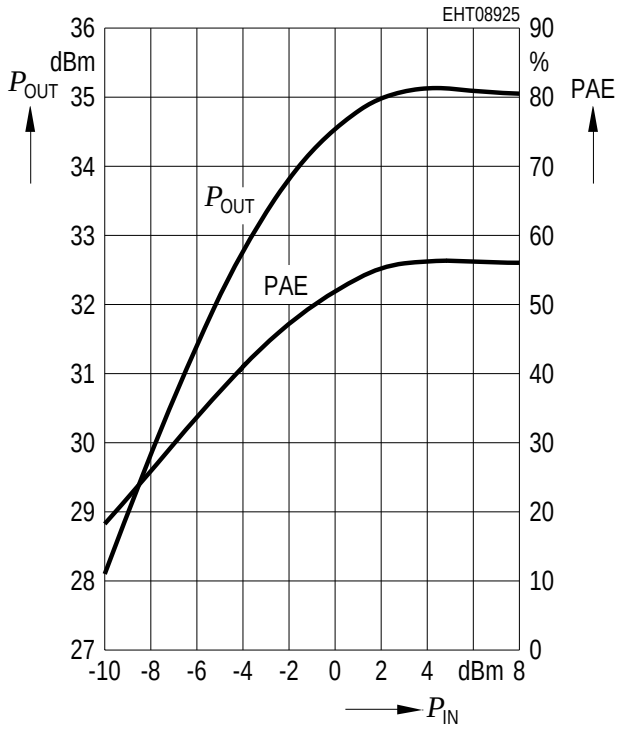
Electrical Characteristics (On GSM Application Board)

T_A = 25 °C, Z_S = Z_L = 50 Ω, duty cycle 12.5%, t_{on} = 577 µs, unless otherwise specified.

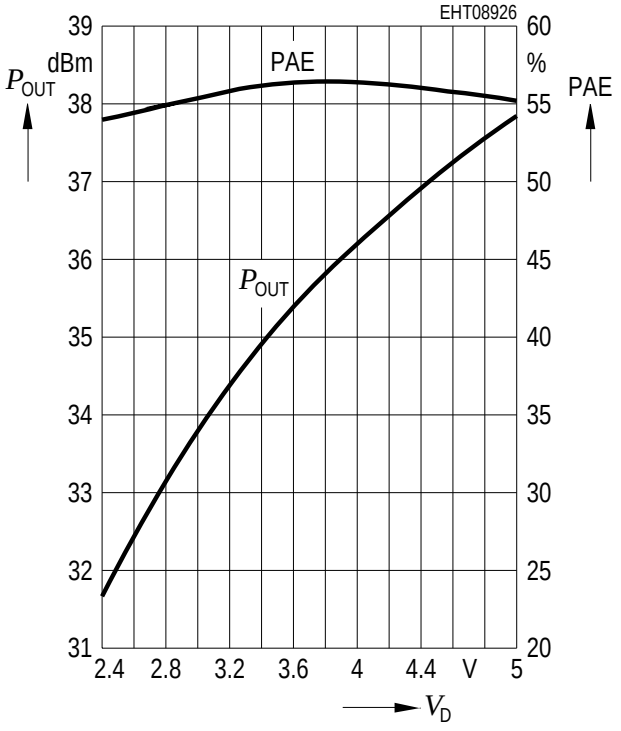
Parameters	Symbol	Limit Values			Unit	Test Conditions
		min.	typ.	max.		
Frequency range	f	880	–	915	MHz	–
Supply current	I_{DD}	–	1.6	–	A	V_D = 3.5 V, P_{in} = + 5 dBm
Power Gain	G	–	30	–	dB	V_D = 3.5 V, P_{in} = + 5 dBm
Output Power	P_o	–	33.2	–	dBm	V_D = 2.8 V, P_{in} = + 5 dBm
Output Power	P_o	–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

GSM-Measurements

CGY 99
f = 900 MHz, V_D = 3.5 V, V_G = – 0.9 V



CGY 99
f = 900 MHz, P_{in} = 5 dBm, V_G = – 0.9 V



PCN(DCS1800)-Operation

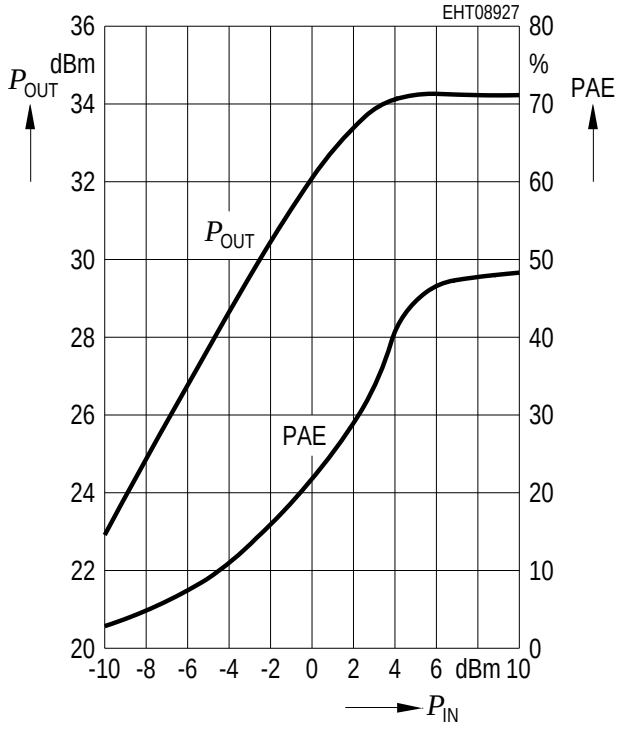
Electrical Characteristics (On GSM Application Board)

T_A = 25 °C, Z_S = Z_L = 50 Ω, duty cycle 12.5%, t_{on} = 577 µs, unless otherwise specified.

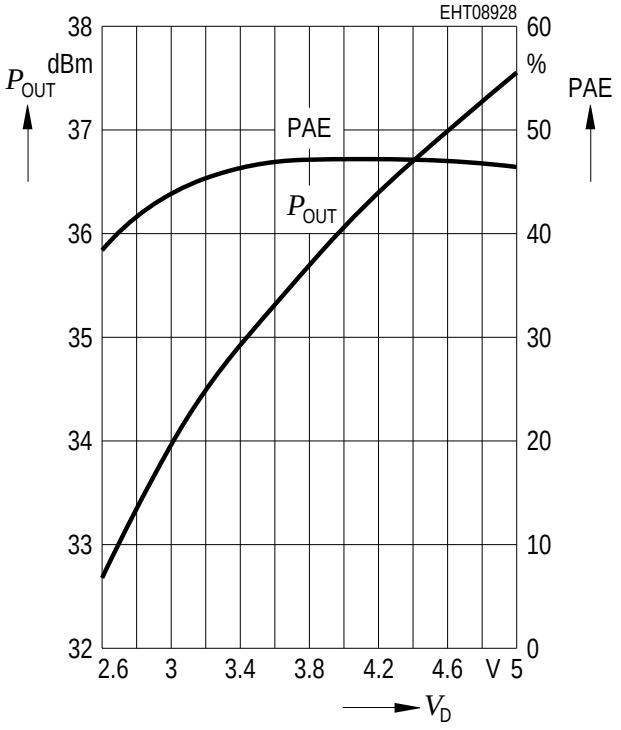
Parameters	Symbol	Limit Values			Unit	Test Conditions
		min.	typ.	max.		
Frequency range	f	1710	–	1785	MHz	–
Supply current	I_{DD}	–	1.6	–	A	V_D = 3.5 V, P_{in} = + 5 dBm
Power Gain	G	–	29	–	dB	V_D = 3.5 V, P_{in} = + 5 dBm
Output Power	P_o	–	32.1	–	dBm	V_D = 2.8 V, P_{in} = + 5 dBm
Output Power	P_o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

PCN-Measurements (Board Matched for Maximum Output Power)

CGY 99
f = 1750 MHz, V_G = – 0.58 V, V_D = 3.15 V

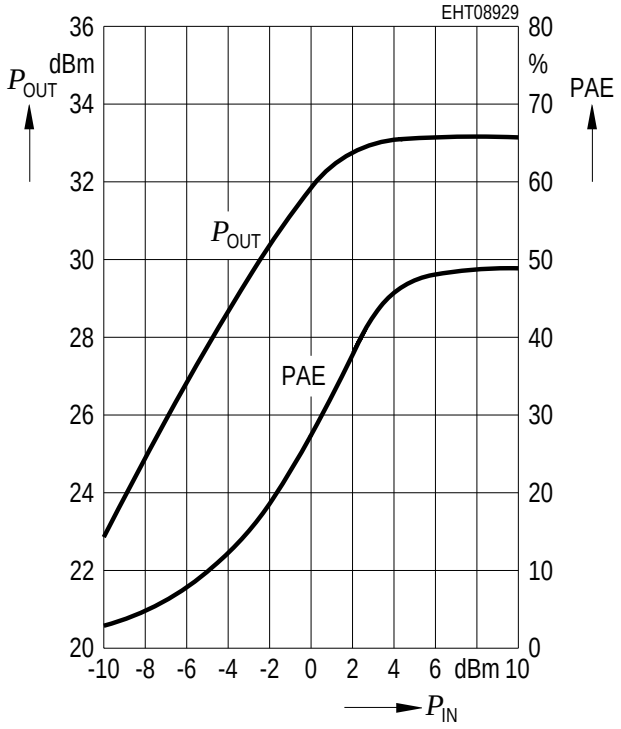


CGY 99
f = 1750 MHz, P_{in} = 5 dBm, V_G = – 0.58 V

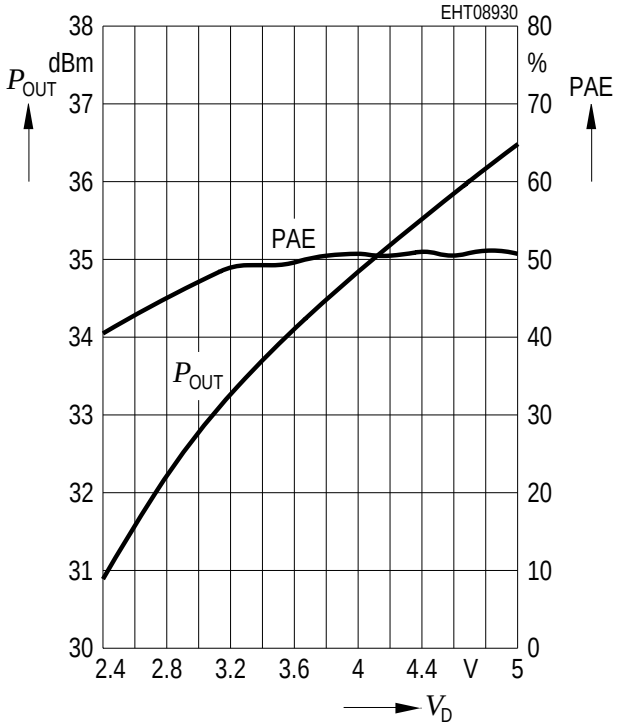


PCN-Measurements (Board Matched for Reduced Output Power)

CGY 99
f = 1750 MHz, V_G = – 0.58 V, V_D = 3.15 V



CGY 99
f = 1750 MHz, P_{in} = 5 dBm, V_G = – 0.58 V



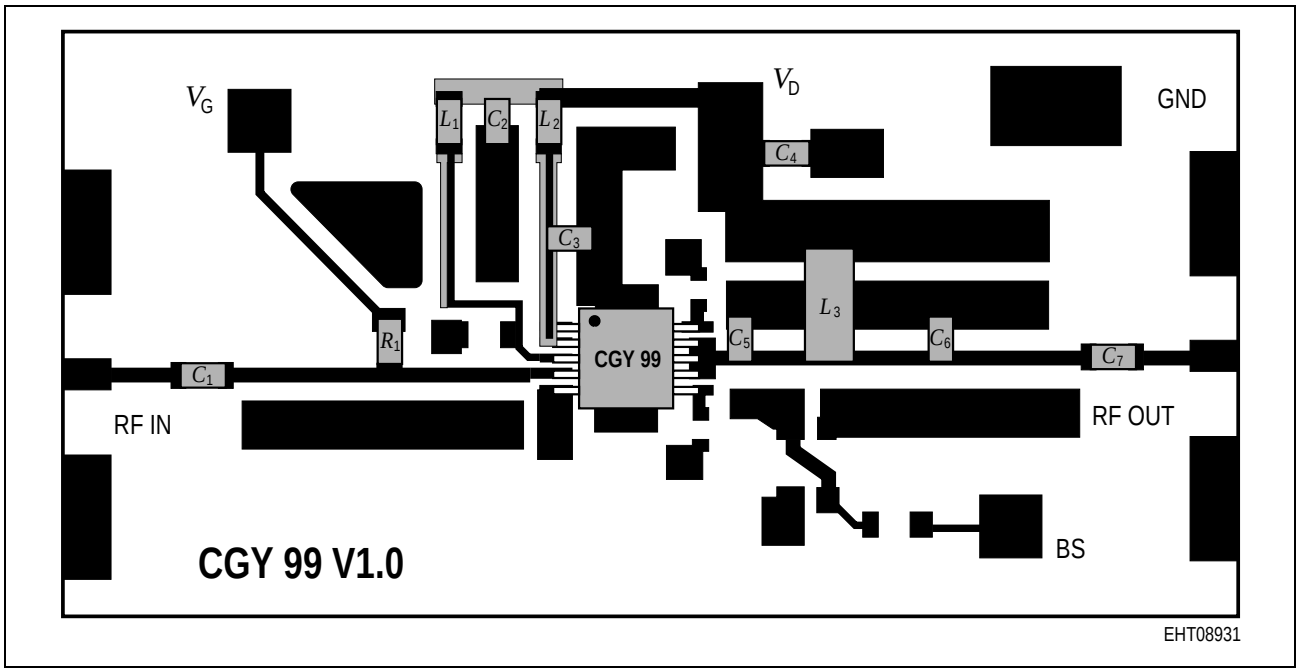


Figure 2 CGY 99 GSM Application Board

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[1)]
L_2	39 nH	0603	C_6	8.2 pF	0603[1)]
L_3	33 nH	[2)]	C_7	1 nF	0603
C_1	1 nF	0603	R_1	150 Ω	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

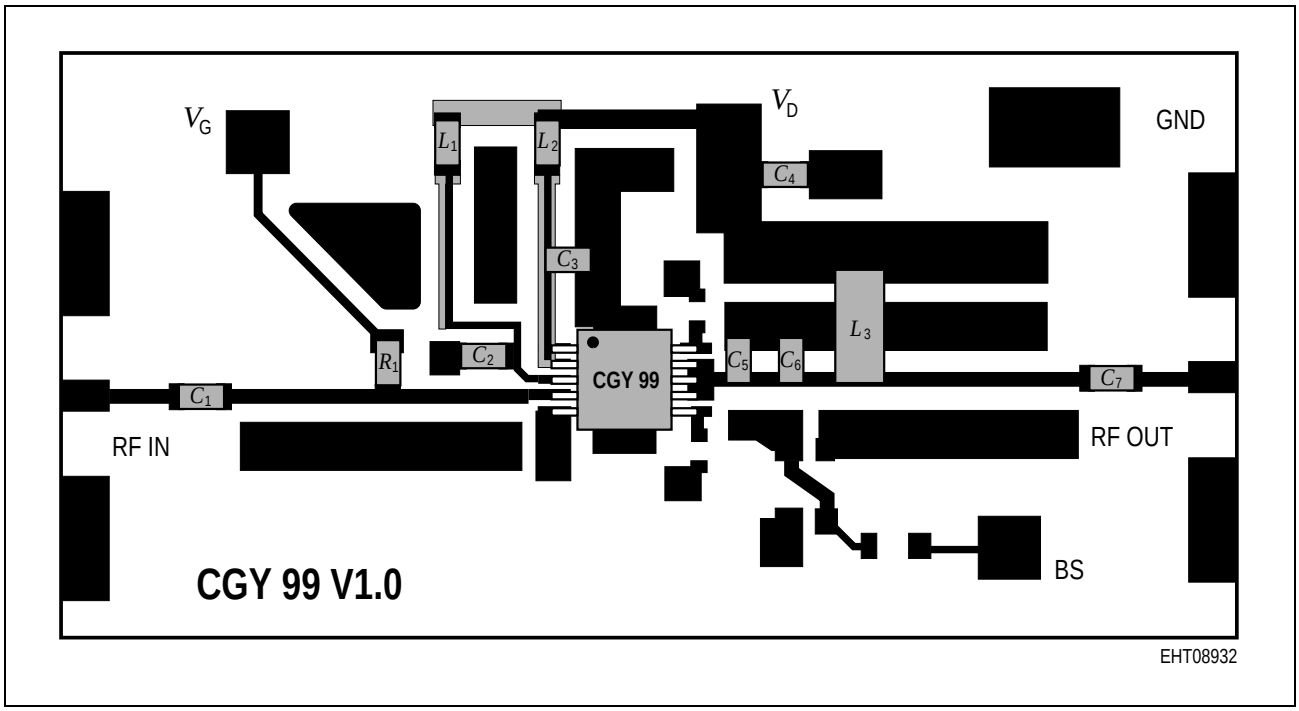


Figure 3 CGY 99 PCN Application Board

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[1)]
L_2	22 nH	0603	C_6	2.0 pF	0603[1)]
L_3	33 nH	[2)]	C_7	1 nF	0603
C_1	1 nF	0603	R_1	150 Ω	0603
C_2	56 pF	0603	–	–	–
C_3	4.7 pF	0603[1)]	–	–	–
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
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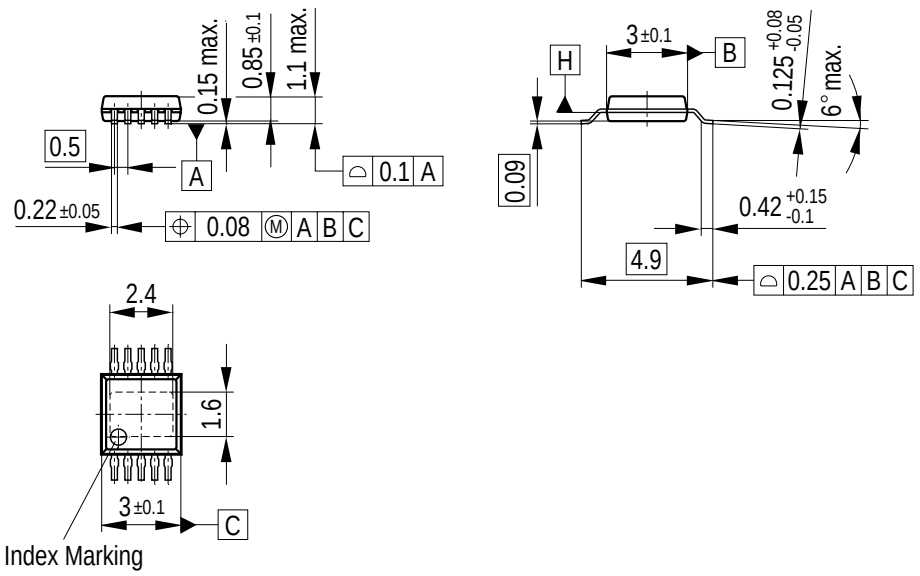
Package Outlines

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



Sorts of Packing
Package outlines for tubes, trays etc. are contained in our Data Book “Package Information”.

SMD = Surface Mounted Device

Dimensions in mm