



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

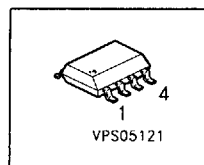
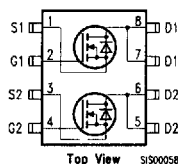


Preliminary Data
SIPMOS® Small-Signal-Transistor
Features

- Dual N Channel
- Enhancement mode
- Avalanche rated
- Logic Level
- dv/dt rated

Product Summary

Drain source voltage	V_{DS}	60	V
Drain-Source on-state resistance	$R_{DS(on)}$	0.15	Ω
Continuous drain current	I_D	2.6	A



Type	Package	Ordering Code
BSO 615N	SO 8	Q67041-S2843

Maximum Ratings, at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current, <i>one channel active</i>	I_D	2.6	A
Pulsed drain current, <i>one channel active</i> $T_A = 25\text{ }^\circ\text{C}$	I_{Dpulse}	10.4	
Avalanche energy, single pulse $I_D = 2.6\text{ A}$, $V_{DD} = 25\text{ V}$, $R_{GS} = 25\text{ }\Omega$	E_{AS}	60	mJ
Avalanche current, periodic limited by T_{jmax}	I_{AR}	2.6	A
Avalanche energy, periodic limited by T_{jmax}	E_{AR}	0.18	mJ
Reverse diode dv/dt $I_S = 2.6\text{ A}$, $V_{DS} = 40\text{ V}$, $di/dt = 200\text{ A}/\mu\text{s}$, $T_{jmax} = 150\text{ }^\circ\text{C}$	dv/dt	6	kV/ μs
Gate source voltage	V_{GS}	± 20	V
Power dissipation, <i>one channel active</i> $T_A = 25\text{ }^\circ\text{C}$	P_{tot}	2	W
Operating temperature	T_j	-55 ... +150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 ... +150	
IEC climatic category; DIN IEC 68-1		55/150/56	

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Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - soldering point	R_{thJS}	-	-	35	K/W
Thermal resistance @ 10 sec., min. footprint	$R_{th(JA)}$	-	-	100	
Thermal resistance @ 10 sec., 6 cm ² cooling area ¹⁾	$R_{th(JA)}$	-	-	62.5	

Electrical Characteristics, at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain- source breakdown voltage $V_{GS} = 0\text{ V}$, $I_D = 0.25\text{ mA}$	$V_{(BR)DSS}$	60	-	-	V
Gate threshold voltage, $V_{GS} = V_{DS}$ $I_D = 20\text{ }\mu\text{A}$	$V_{GS(th)}$	1.2	1.6	2	
Zero gate voltage drain current $V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_j = 25\text{ }^\circ\text{C}$ $V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_j = 150\text{ }^\circ\text{C}$	I_{DSS}	-	0.1 10	1 100	μA
Gate-source leakage current $V_{GS} = 20\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	-	10	100	
Drain-Source on-state resistance $V_{GS} = 4.5\text{ V}$, $I_D = 2.6\text{ A}$	$R_{DS(on)}$	-	0.12	0.15	Ω

¹ Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6 cm² (one layer, 70 μm thick) copper area for drain connection. PCB is vertical without blown air.

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Electrical Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Transconductance $V_{DS} \geq 2 \cdot I_D \cdot R_{DS(on)max}$, $I_D = 2.6 \text{ A}$	g_{fs}	2.4	5.5	-	S
Input capacitance $V_{GS} = 0 \text{ V}$, $V_{DS} = 25 \text{ V}$, $f = 1 \text{ MHz}$	C_{iss}	-	300	380	pF
Output capacitance $V_{GS} = 0 \text{ V}$, $V_{DS} = 25 \text{ V}$, $f = 1 \text{ MHz}$	C_{oss}	-	90	120	
Reverse transfer capacitance $V_{GS} = 0 \text{ V}$, $V_{DS} = 25 \text{ V}$, $f = 1 \text{ MHz}$	C_{rss}	-	50	65	
Turn-on delay time $V_{DD} = 30 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 2.6 \text{ A}$, $R_G = 16 \Omega$	$t_{d(on)}$	-	12	20	ns
Rise time $V_{DD} = 30 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 2.6 \text{ A}$, $R_G = 16 \Omega$	t_r	-	15	25	
Turn-off delay time $V_{DD} = 30 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 2.6 \text{ A}$, $R_G = 16 \Omega$	$t_{d(off)}$	-	20	30	
Fall time $V_{DD} = 30 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 2.6 \text{ A}$, $R_G = 16 \Omega$	t_f	-	15	25	

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Electrical Characteristics, at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified

Parameter at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Gate charge at threshold $V_{DD} = 40\text{ V}$, $I_D = 0.1\text{ A}$, $V_{GS} = 1\text{ V}$	$Q_{G(th)}$	-	0.4	0.6	nC
Gate charge at $V_{gs}=5V$ $V_{DD} = 40\text{ V}$, $I_D = 2.6\text{ A}$, $V_{GS} = 0\text{ to }5\text{ V}$	$Q_{G(5)}$	-	7	10	
Gate charge total $V_{DD} = 40\text{ V}$, $I_D = 2.6\text{ A}$, $V_{GS} = 0\text{ to }10\text{ V}$	Q_g	-	14	20	nC
Gate plateau voltage $V_{DD} = 40\text{ V}$, $I_D = 2.6\text{ A}$	$V_{(plateau)}$	-	3.6	-	V

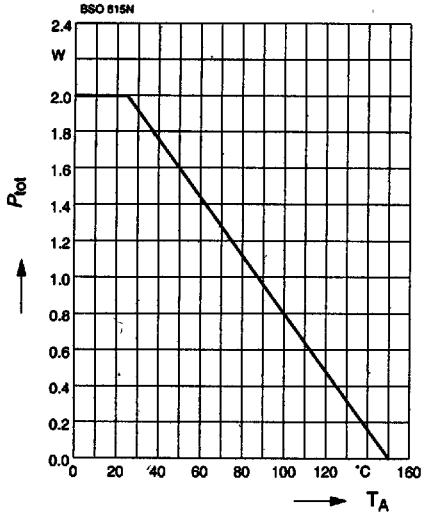
Reverse Diode

Inverse diode continuous forward current $T_A = 25\text{ }^\circ\text{C}$	I_S	-	-	2.6	A
Inverse diode direct current, pulsed $T_A = 25\text{ }^\circ\text{C}$	I_{SM}	-	-	10.4	
Inverse diode forward voltage $V_{GS} = 0\text{ V}$, $I_F = 5.2\text{ A}$	V_{SD}	-	0.95	1.2	V
Reverse recovery time $V_R = 30\text{ V}$, $I_F = I_S$, $di_F/dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	50	75	ns
Reverse recovery charge $V_R = 30\text{ V}$, $I_F = I_S$, $di_F/dt = 100\text{ A}/\mu\text{s}$	Q_{rr}	-	0.1	0.15	μC

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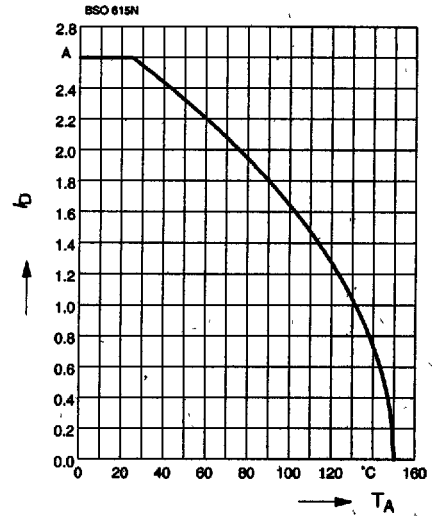
Power Dissipation

$P_{tot} = f(T_A), V_{GS} = 4,5 \text{ V}$



Drain current

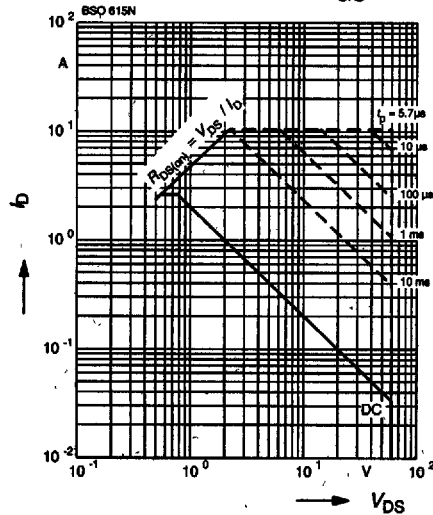
$I_D = f(T_A), V_{GS} = 4,5 \text{ V}$



Safe operating area

$I_D = f(V_{DS})$

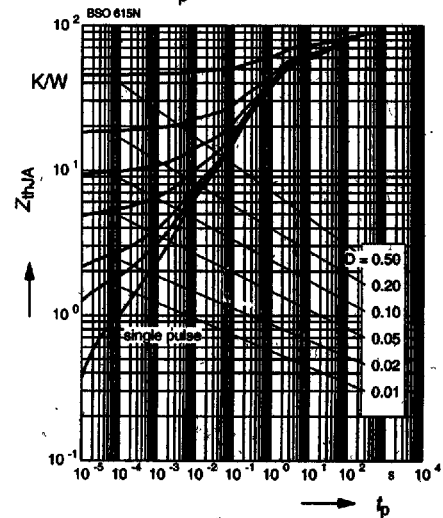
parameter : $D = 0, T_A = 25 \text{ °C}, V_{GS} = 4,5 \text{ V}$



Transient thermal impedance

$Z_{thJA} = f(t_p)$

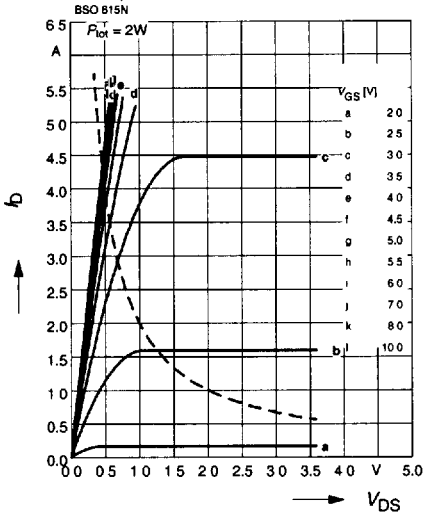
parameter : $D = t_p / T$



Typ. output characteristics

$I_D = f(V_{DS})$

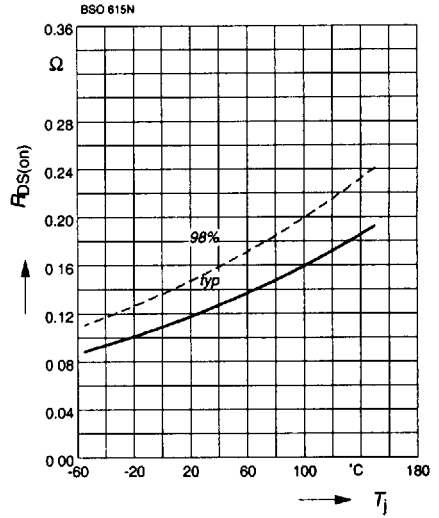
parameter: $t_p = 80 \mu s$



Drain-source on-resistance

$R_{DS(on)} = f(T_j)$

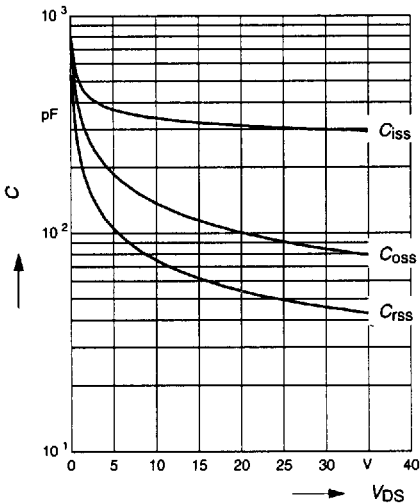
parameter: $I_D = 2.6 A, V_{GS} = 4.5 V$



Typ. capacitances

$C = f(V_{DS})$

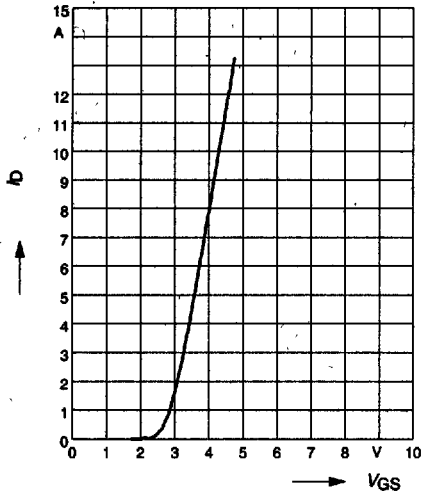
parameter: $V_{GS} = 0 V, f = 1 MHz$



Typ. transfer characteristics $I_D = f(V_{GS})$

parameter: $t_p = 80 \mu s$

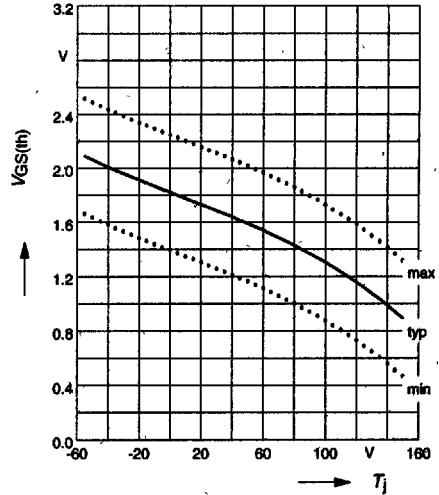
$V_{DS} \geq 2 \times I_D \times R_{DS(on) \max}$



Gate threshold voltage

$V_{GS(th)} = f(T_j)$

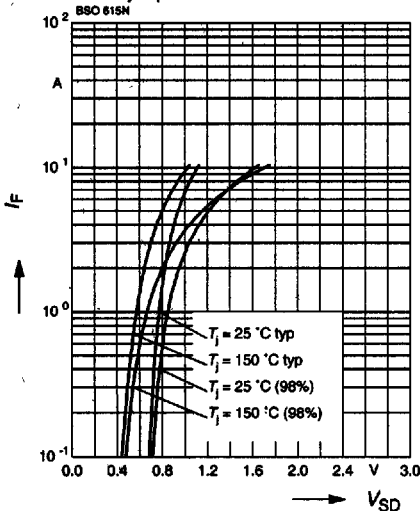
parameter: $V_{GS} = V_{DS}$, $I_D = 20 \mu A$



Forward characteristics of reverse diode

$I_F = f(V_{SD})$

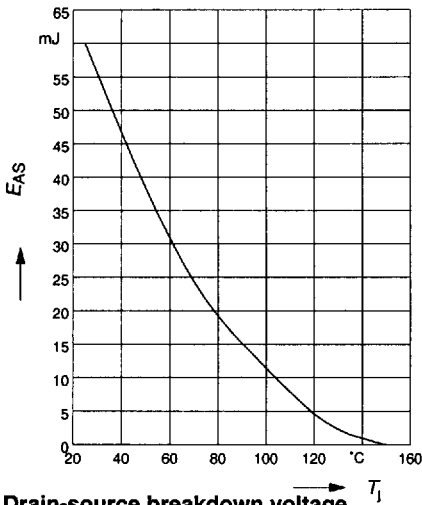
parameter: $T_j, t_p = 80 \mu s$



Avalanche Energy $E_{AS} = f(T_j)$

parameter: $I_D = 2.6 \text{ A}$, $V_{DD} = 25 \text{ V}$

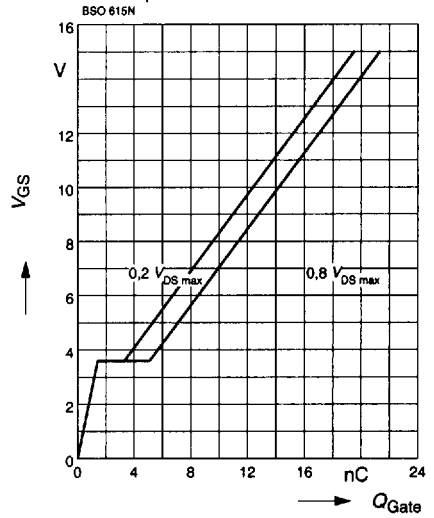
$R_{GS} = 25 \Omega$



Typ. gate charge

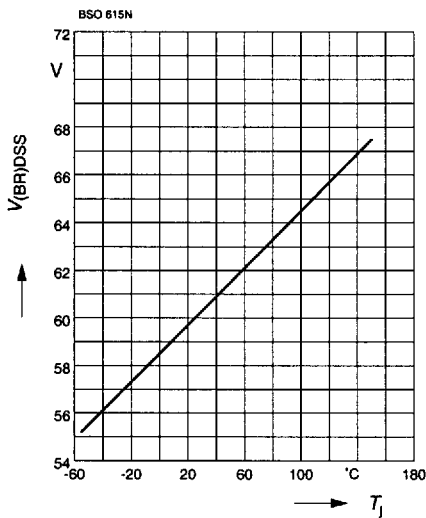
$V_{GS} = f(Q_{Gate})$

parameter: $I_D \text{ puls} = 2.6 \text{ A}$



Drain-source breakdown voltage

$V_{(BR)DSS} = f(T_j)$



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Gehäusemaßbilder

(Maße in mm, wenn nicht anders angegeben)

Package Outlines

(Dimensions in mm, unless otherwise specified)

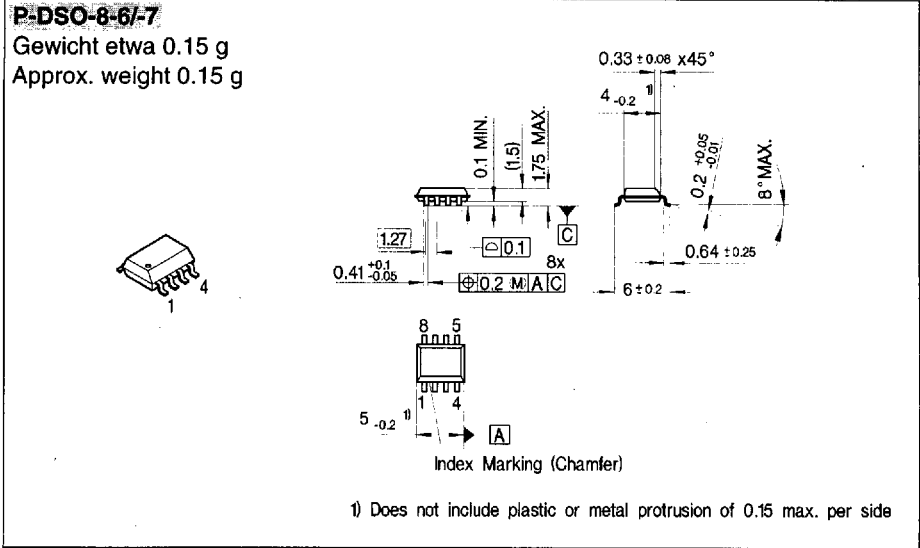


Bild 16

Figure 16

P-TO218-AA (P-TO218-2-1)

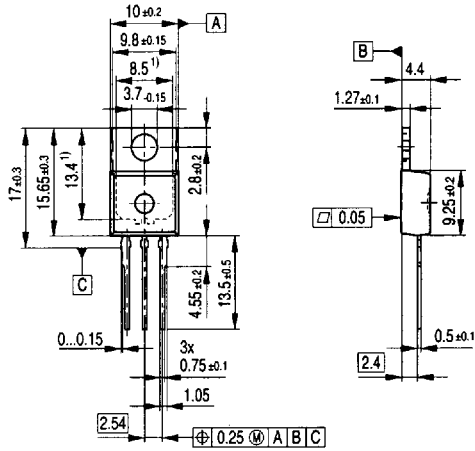
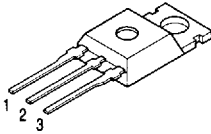
Gewicht etwa 4.9 g
Approx. weight 4.9 g

Bild 17

Figure 17

P-TO220-3-1

Gewicht etwa 1.8 g
Approx. weight 1.8 g



¹⁾ Typical

All metal surfaces tin plated, except area of cut.

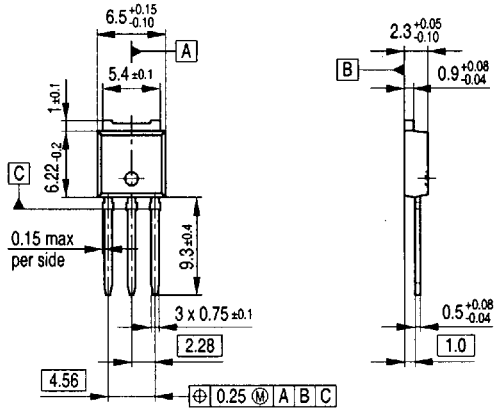
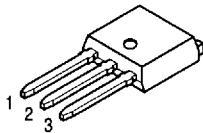
GPT05155

Bild 18

Figure 18

P-TO251-3-1

Gewicht etwa 2.0 g
Approx. weight 2.0 g



All metal surfaces tin plated, except area of cut.

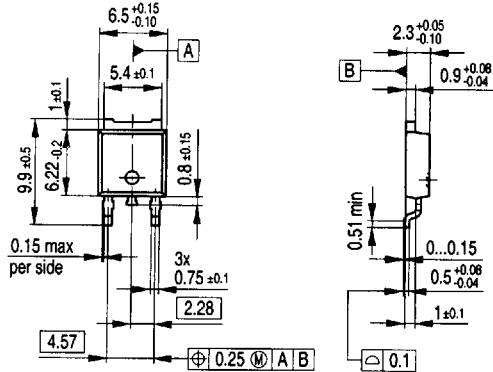
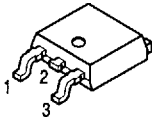
GPT09060

Bild 19

Figure 19

P-TO252-3-1

Gewicht etwa 0.38 g
Approx. weight 0.38 g



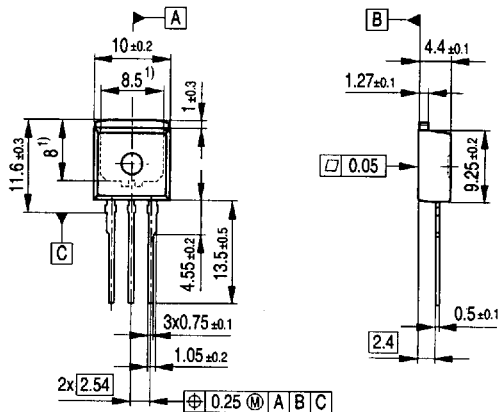
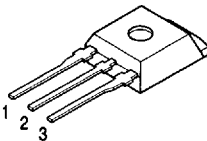
All metal surfaces tin plated, except area of cut.

GPT09051

Bild 20

Figure 20

P-TO262-3-1/I²PAK



1) Typical

Metal surface min. X = 7.25, Y = 7.35

All metal surfaces tin plated, except area of cut.

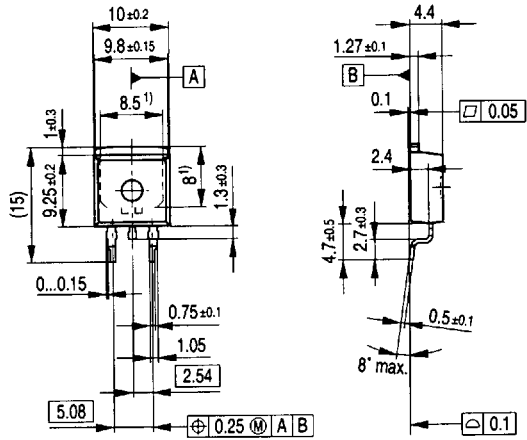
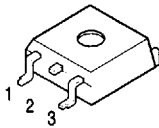
GPT08244

Bild 21

Figure 21

P-TO263-3-2/D²PAK

Gewicht etwa 1.38 g
Approx. weight 1.38 g



¹⁾ Typical

All metal surfaces tin plated, except area of cut.

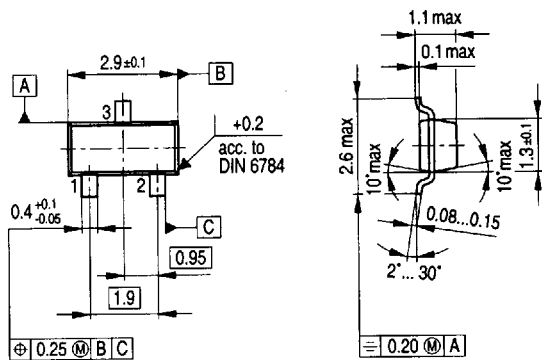
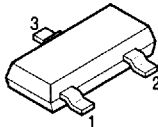
GPT09085

Bild 22

Figure 22

SOT-23 (P-SOT23-3-1)

Gewicht etwa 0.01 g
Approx. weight 0.01 g



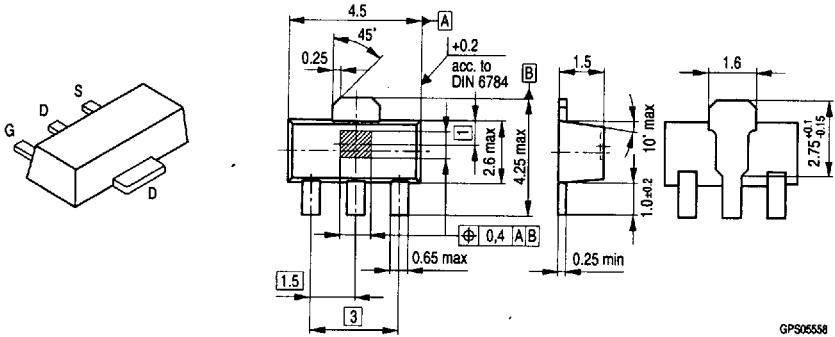
GPS05557

Bild 23

Figure 23

SOT-89

Gewicht etwa 0.01 g
Approx. weight 0.01 g



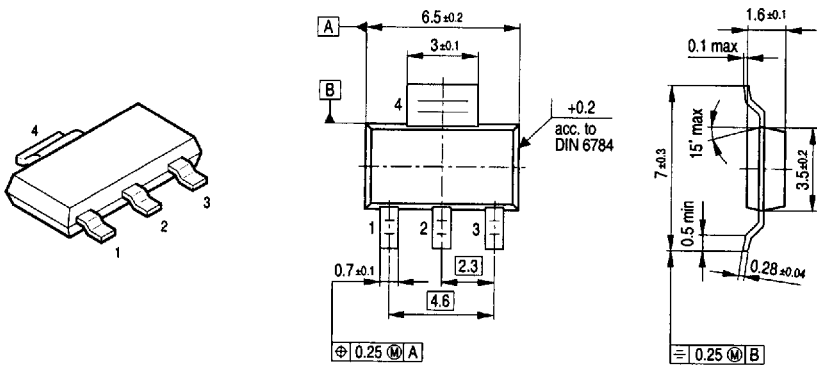
GPS05558

Bild 24

Figure 24

SOT-223 (P-SOT223-4-1)

Gewicht etwa 0.15 g
Approx. weight 0.15 g



GPS05560

Bild 25

Figure 25

TO-92

Gewicht etwa 0.23 g
Approx. weight 0.23 g

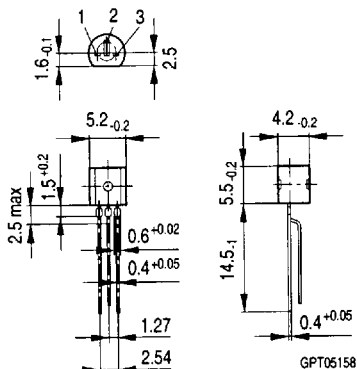
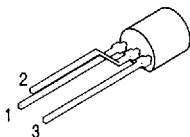


Bild 26

Figure 26

TO-92-E6288

Gewicht etwa 0.23 g
Approx. weight 0.23 g

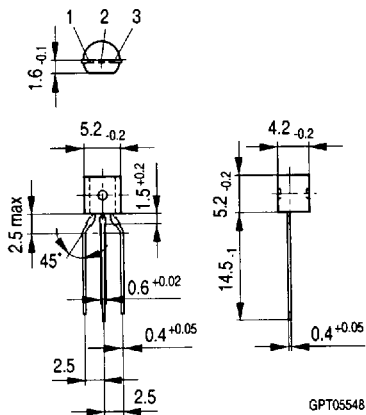
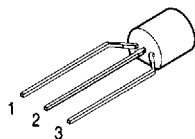


Bild 27

Figure 27

Sorts of Packing

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

SMD = Surface Mounted Device