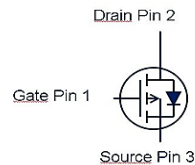
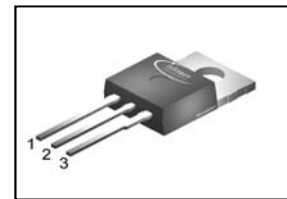


**SIPMOS<sup>®</sup> Small-Signal-Transistor**
**Features**

- P-Channel
- Enhancement mode
- Avalanche rated
- dv/dt rated
- 175°C operating temperature
- Pb-free lead finishing; RoHS compliant
- Halogen-free according to IEC61249-2-21
- Qualified according to AEC Q101

**Product Summary**

$V_{DS}$	-60	V
$R_{DS(on),max}$	0.13	$\Omega$
$I_D$	-18.7	A


**PG-TO220-3-1**

**Halogen-Free**


Type	Package	Tape and reel information	Marking	Lead free
SPP18P06PH	PG-TO220-3	50pcs/tube	18P06P	Yes

**Maximum ratings, at  $T_j=25\text{ °C}$ , unless otherwise specified**

Parameter	Symbol	Conditions	Value	Unit
			steady state	
Continuous drain current	$I_D$	$T_A=25\text{ °C}$	-18.7	A
		$T_A=100\text{ °C}$	-13.2	
Pulsed drain current	$I_{D,pulse}$	$T_A=25\text{ °C}$	-74.8	
Avalanche energy, single pulse	$E_{AS}$	$I_D=18.7\text{ A}$ , $R_{GS}=25\ \Omega$	151	mJ
Avalanche energy, periodic limited by $T_{jmax}$	$E_{AR}$		8	
Reverse diode dv/dt	dv/dt	$I_D=18.7\text{ A}$ , $V_{DS}=48\text{ V}$ , $di/dt=-200\text{ A}/\mu\text{s}$ , $T_{j,max}=175\text{ °C}$	-6	kV/ $\mu\text{s}$
Gate source voltage	$V_{GS}$		$\pm 20$	V
Power dissipation	$P_{tot}$	$T_A=25\text{ °C}^{(1)}$	81.1	W
Operating and storage temperature	$T_j$ , $T_{stg}$		"-55 ... +175"	$^{\circ}\text{C}$
ESD class			Class 1C (>1000V <2000V)	
Soldering temperature			260 $^{\circ}\text{C}$	
IEC climatic category; DIN IEC 68-1			55/150/56	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

**Thermal characteristics**

Thermal resistance, junction - case	$R_{thJC}$		-	-	1.85	K/W
Thermal resistance, junction - ambient, leaded	$R_{thJA}$		-	-	62	
SMD version, device on PCB:	$R_{thJA}$	minimal footprint	-	-	62	K/W
		6 cm <sup>2</sup> cooling area <sup>1)</sup>	-	-	40	

**Electrical characteristics, at  $T_j=25\text{ °C}$ , unless otherwise specified**
**Static characteristics**

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=-250\text{ }\mu\text{A}$	-60	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-1000\text{ }\mu\text{A}$	-2.1	2.7	-4	
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=-60\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ °C}$	-	-0.1	-1	$\mu\text{A}$
		$V_{DS}=-60\text{ V}, V_{GS}=0\text{ V}, T_j=150\text{ °C}$	-	-10	-100	
Gate-source leakage current	$I_{GSS}$	$V_{GS}=-20\text{ V}, V_{DS}=0\text{ V}$	-	-10	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=-10\text{ V}, I_D=-13.2\text{ A}$	-	102	130	m $\Omega$
Transconductance	$g_{fs}$	$ V_{DS} >2 I_D R_{DS(on)max}, I_D=-13.2\text{ A}$	5	10	-	S

<sup>1)</sup> Device on 40mm\*40mm\*1.5mm epoxy PCB FR4 with 6 cm<sup>2</sup> (one layer, 70  $\mu\text{m}$  thick) copper area for drain connection. PCB is vertical without blown air.

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

**Dynamic characteristics**

Input capacitance	$C_{iss}$	$V_{GS}=0\text{ V}, V_{DS}=-25\text{ V},$ $f=1\text{ MHz}$	-	690	860	pF
Output capacitance	$C_{oss}$		-	230	290	
Reverse transfer capacitance	$C_{rss}$		-	95	120	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=-30\text{ V}, V_{GS}=-$ $10\text{ V}, I_D=-13.2\text{ A},$ $R_G=2.7\ \Omega$	-	12.0	18.0	ns
Rise time	$t_r$		-	5.8	8.7	
Turn-off delay time	$t_{d(off)}$		-	25	37	
Fall time	$t_f$		-	11	16.5	

**Gate Charge Characteristics**

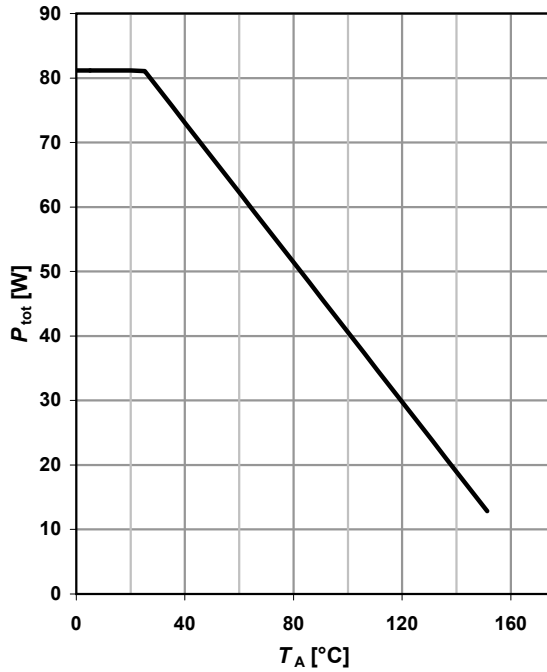
Gate to source charge	$Q_{gs}$	$V_{DD}=-48\text{ V}, I_D=-$ $18.6\text{ A}, V_{GS}=0\text{ to }-10\text{ V}$	-	-4.1	-5.5	nC
Gate to drain charge	$Q_{gd}$		-	-11	-17	
Gate charge total	$Q_g$		-	-21	-28	
Gate plateau voltage	$V_{plateau}$		-	-5.94	-	V

**Reverse Diode**

Diode continuous forward current	$I_S$	$T_A=25\text{ }^\circ\text{C}$	-	-	18.60	A
Diode pulse current	$I_{S,pulse}$		-	-	-74.8	
Diode forward voltage	$V_{SD}$	$V_{GS}=0\text{ V}, I_F=-18.6\text{ A},$ $T_j=25\text{ }^\circ\text{C}$	-	-0.99	-1.33	V
Reverse recovery time	$t_{rr}$	$V_R=30\text{ V}, I_F= I_S ,$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	70	105	ns
Reverse recovery charge	$Q_{rr}$		-	139	208	nC

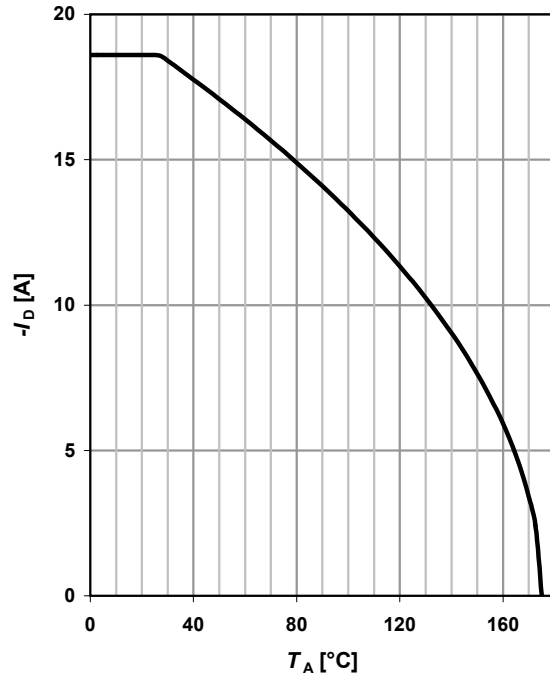
**1 Power dissipation**

$$P_{\text{tot}} = f(T_A)$$



**2 Drain current**

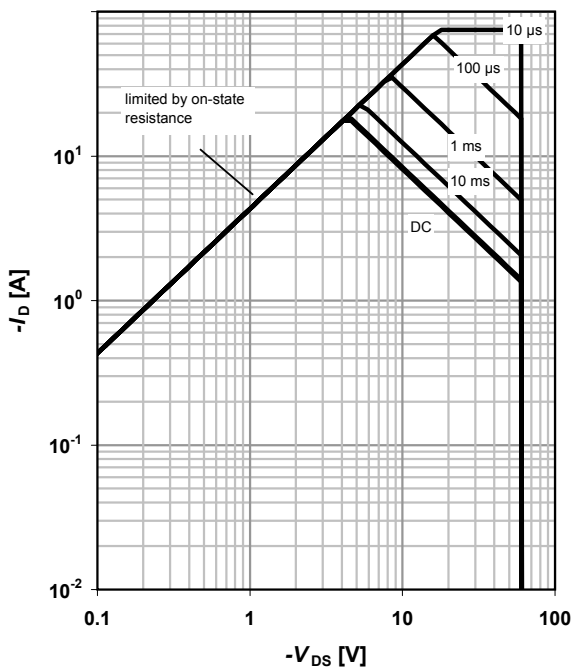
$$I_D = f(T_A); |V_{\text{GS}}| \geq 10 \text{ V}$$



**3 Safe operating area**

$$I_D = f(V_{\text{DS}}); T_A = 25 \text{ °C}^1; D = 0$$

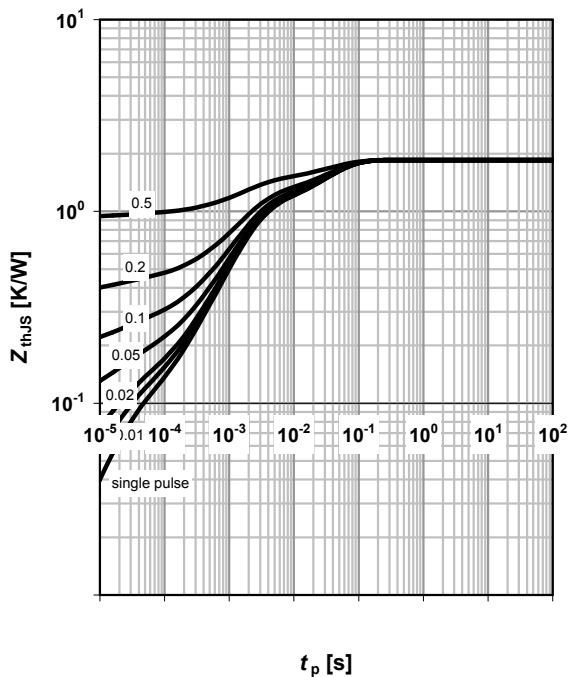
parameter:  $t_p$



**4 Max. transient thermal impedance**

$$Z_{\text{thJA}} = f(t_p)$$

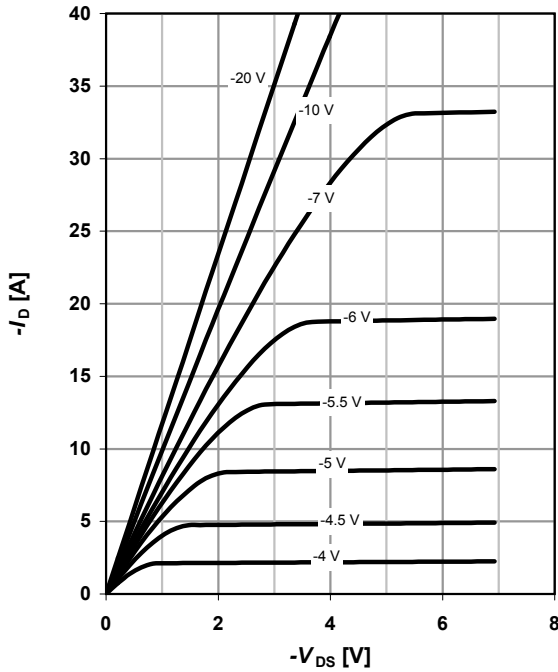
parameter:  $D = t_p / T$



**5 Typ. output characteristics**

$I_D = f(V_{DS}); T_j = 25\text{ }^\circ\text{C}$

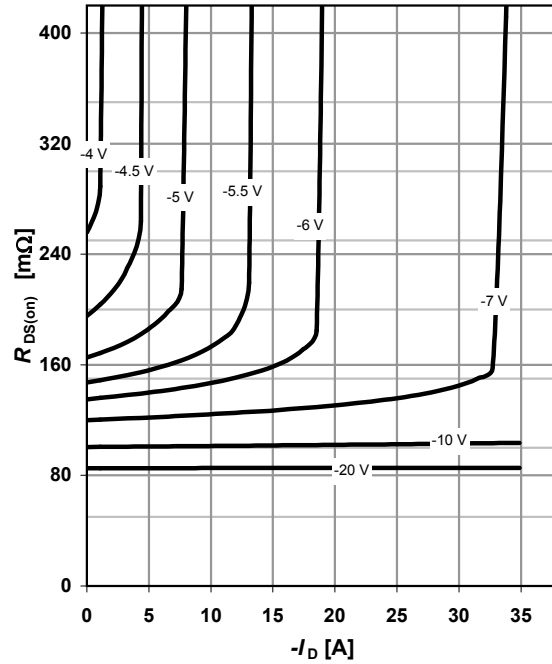
parameter:  $V_{GS}$



**6 Typ. drain-source on resistance**

$R_{DS(on)} = f(I_D); T_j = 25\text{ }^\circ\text{C}$

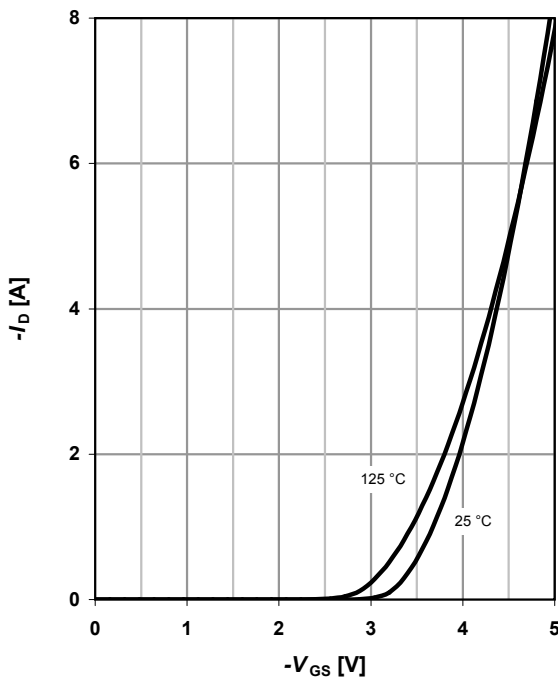
parameter:  $V_{GS}$



**7 Typ. transfer characteristics**

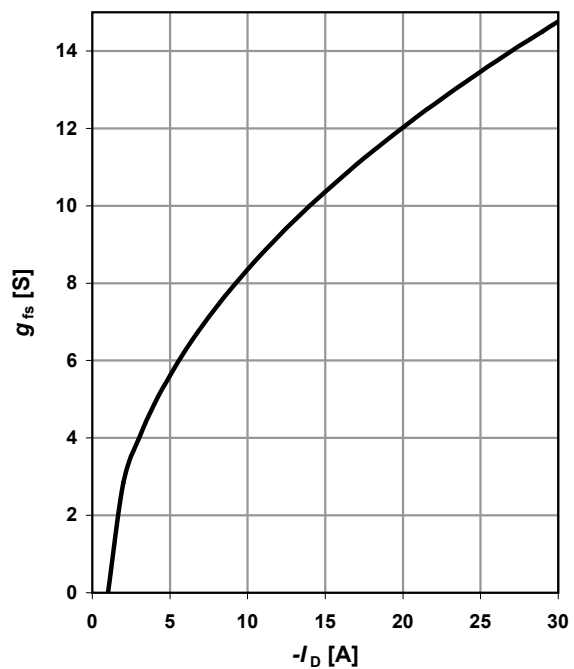
$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|R_{DS(on)max}$

parameter:  $T_j$



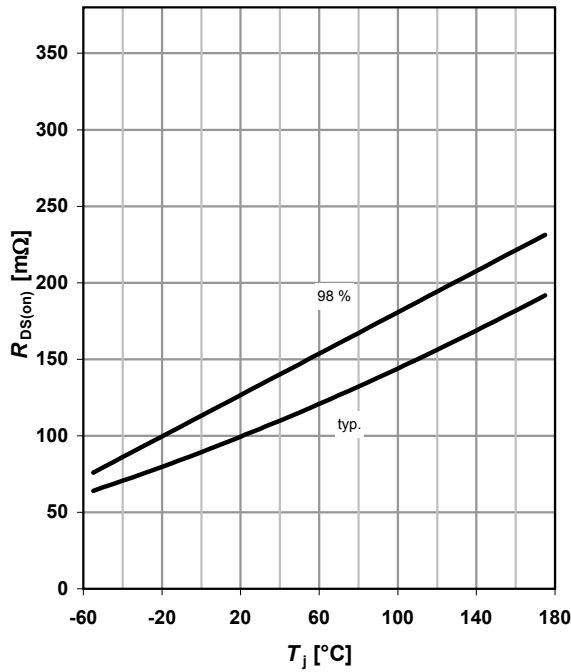
**8 Typ. forward transconductance**

$g_{fs} = f(I_D); T_j = 25\text{ }^\circ\text{C}$



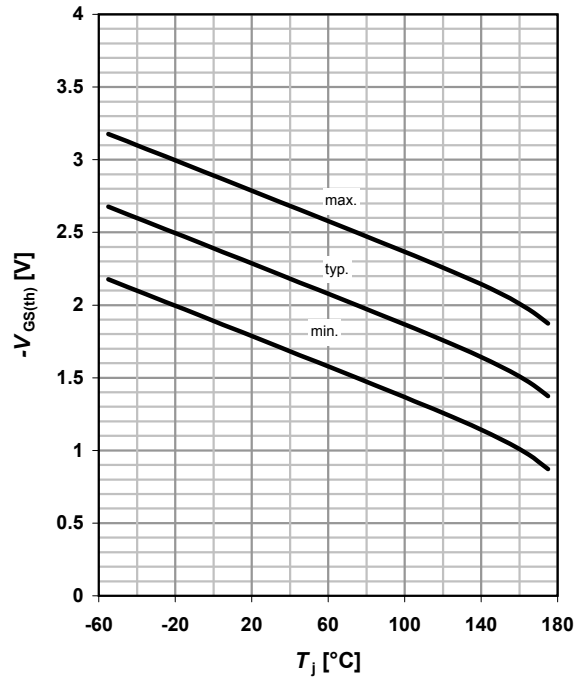
**9 Drain-source on-state resistance**

$R_{DS(on)} = f(T_j); I_D = -13.2 \text{ A}; V_{GS} = -10 \text{ V}$



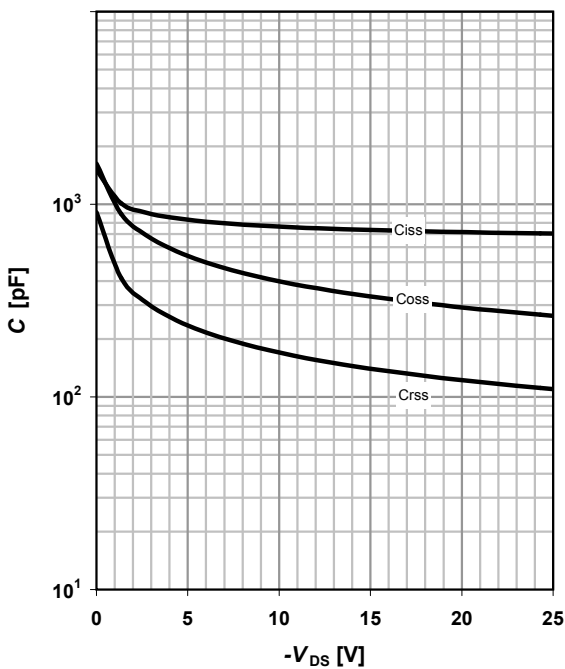
**10 Typ. gate threshold voltage**

$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}; I_D = -1000 \mu\text{A}$



**11 Typ. capacitances**

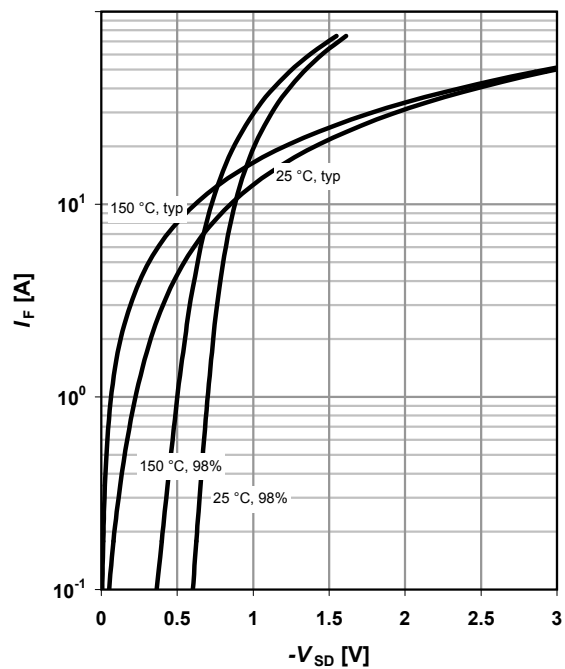
$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$



**12 Forward characteristics of reverse diode**

$I_F = f(V_{SD})$

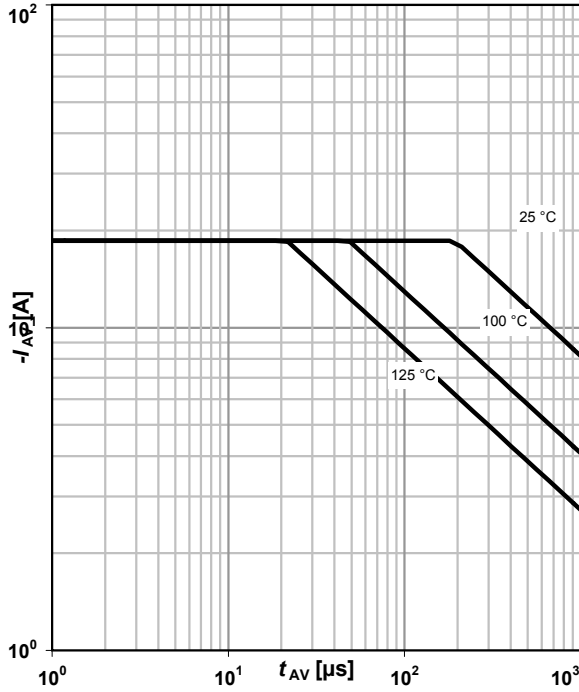
parameter:  $T_j$



**13 Avalanche characteristics**

$I_{AS}=f(t_{AV}); R_{GS}=25 \Omega$

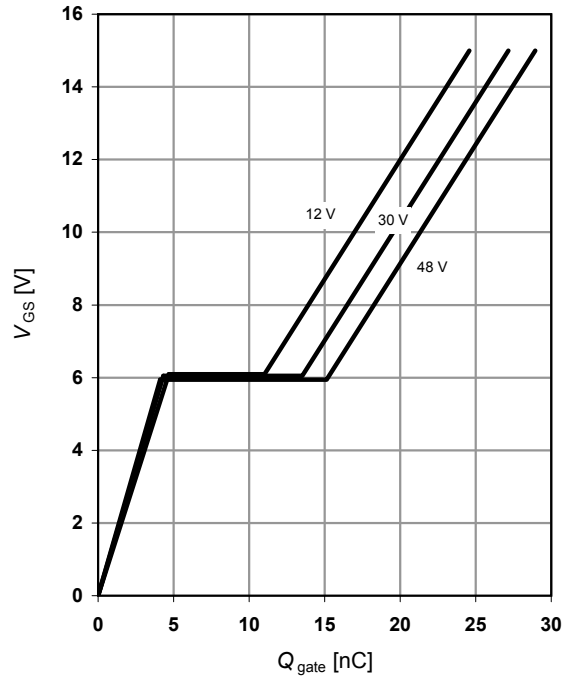
parameter:  $T_{j(start)}$



**14 Typ. gate charge**

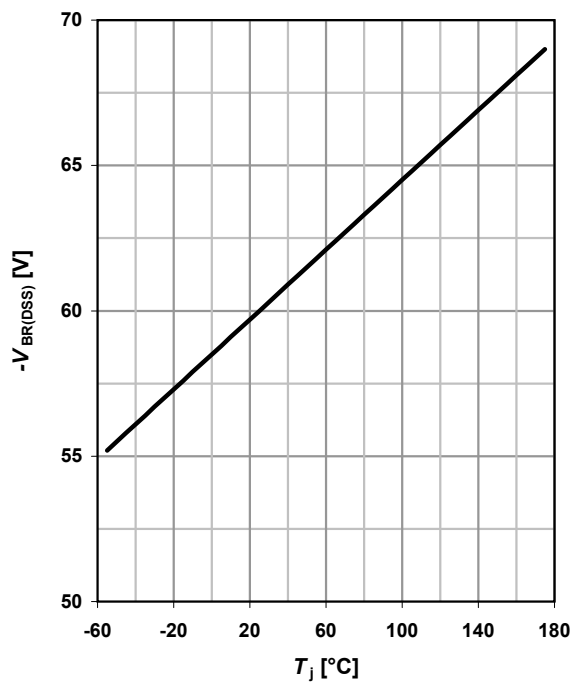
$V_{GS}=f(Q_{gate}); I_D=-18.6 \text{ A pulsed}$

parameter:  $V_{DD}$

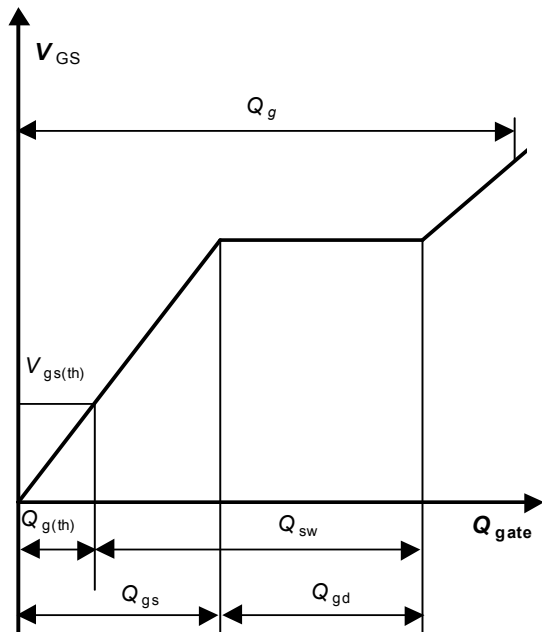


**15 Drain-source breakdown voltage**

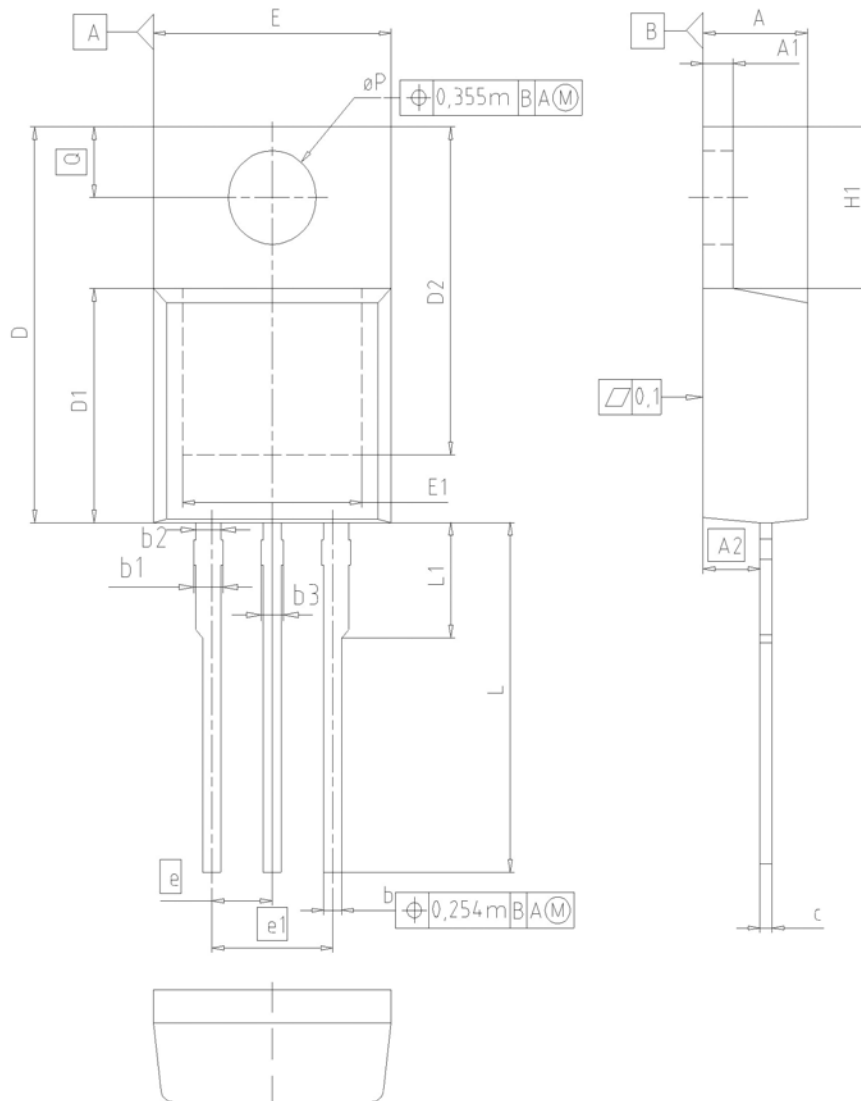
$V_{BR(DSS)}=f(T_j); I_D=-250 \mu A$



**16 Gate charge waveforms**



Package Outline: PG-TO220-3



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.57	0.169	0.180
A1	1.17	1.40	0.046	0.055
A2	2.15	2.72	0.085	0.107
b	0.65	0.86	0.026	0.034
b1	0.95	1.40	0.037	0.055
b2	0.95	1.15	0.037	0.045
b3	0.65	1.15	0.026	0.045
c	0.33	0.60	0.013	0.024
D	14.81	15.95	0.583	0.628
D1	8.51	9.45	0.335	0.372
D2	12.19	13.10	0.480	0.516
E	9.70	10.36	0.382	0.408
E1	6.50	8.60	0.256	0.339
e	2.54		0.100	
e1	5.08		0.200	
N	3		3	
H1	5.90	6.90	0.232	0.272
L	13.00	14.00	0.512	0.551
L1	-	4.80	-	0.189
øP	3.60	3.89	0.142	0.153
Q	2.60	3.00	0.102	0.118

**DOCUMENT NO.**  
Z8B00003318

**SCALE**

**EUROPEAN PROJECTION**

**ISSUE DATE**  
23-08-2007

**REVISION**  
05



**Published by**  
**Infineon Technologies AG**  
**81726 Munich, Germany**  
**© 2008 Infineon Technologies AG**  
**All Rights Reserved.**

#### **Legal Disclaimer**

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

#### **Information**

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office ([www.infineon.com](http://www.infineon.com)).

#### **Warnings**

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office. Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Infineon:](#)

[SPP18P06P H](#)