

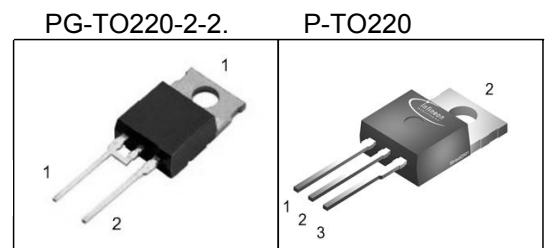
**Silicon Carbide Schottky Diode**

- Revolutionary semiconductor material - Silicon Carbide
- Switching behavior benchmark
- No reverse recovery
- No temperature influence on the switching behavior
- No forward recovery
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC<sup>0)</sup> for target applications

**thinQ!™ SiC Schottky Diode**

**Product Summary**

$V_{RRM}$	300	V
$Q_C$	23	nC
$I_F$	10	A



Type	Package	Ordering Code	Marking	Pin 1	Pin 2	Pin 3
SDP10S30	P-TO220-3	Q67040-S4372	D10S30	n.c.	C	A
SDT10S30	PG-TO220-2-2.	Q67040-S4447	D10S30	C	A	

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

Parameter	Symbol	Value	Unit
Continuous forward current, $T_C=100\text{ °C}$	$I_F$	10	A
RMS forward current, $f=50\text{ Hz}$	$I_{FRMS}$	14	
Surge non repetitive forward current, sine halfwave $T_C=25\text{ °C}$ , $t_p=10\text{ ms}$	$I_{FSM}$	36	
Repetitive peak forward current $T_j=150\text{ °C}$ , $T_C=100\text{ °C}$ , $D=0.1$	$I_{FRM}$	45	
Non repetitive peak forward current $t_p=10\text{ }\mu\text{s}$ , $T_C=25\text{ °C}$	$I_{FMAX}$	100	
$i^2t$ value, $T_C=25\text{ °C}$ , $t_p=10\text{ ms}$	$\int i^2 dt$	6.5	A <sup>2</sup> s
Repetitive peak reverse voltage	$V_{RRM}$	300	V
Surge peak reverse voltage	$V_{RSM}$	300	
Power dissipation, $T_C=25\text{ °C}$	$P_{tot}$	65	W
Operating and storage temperature	$T_j, T_{stg}$	-55... +175	°C

### Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Characteristics</b>					
Thermal resistance, junction - case	$R_{thJC}$	-	-	2.3	K/W

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Static Characteristics</b>					
Diode forward voltage	$V_F$				V
$I_F=10\text{A}, T_j=25^\circ\text{C}$		-	1.5	1.7	
$I_F=10\text{A}, T_j=150^\circ\text{C}$		-	1.5	1.9	
Reverse current	$I_R$				$\mu\text{A}$
$V_R=300\text{V}, T_j=25^\circ\text{C}$		-	15	200	
$V_R=300\text{V}, T_j=150^\circ\text{C}$		-	20	1000	

<sup>0</sup>J-STD20 and JESD22

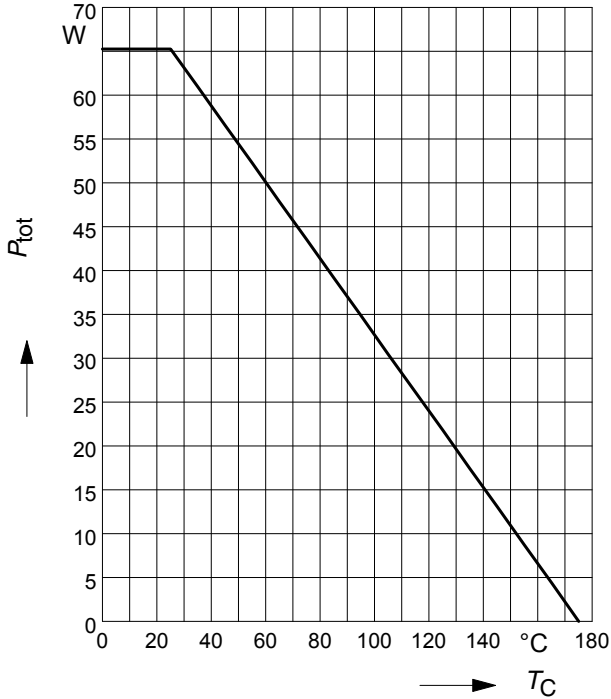
<sup>1</sup>Device on 40mm\*40mm\*1.5mm epoxy PCB FR4 with 6cm<sup>2</sup> (one layer, 70  $\mu\text{m}$  thick) copper area for drain connection. PCB is vertical without blown air.

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
Total capacitive charge <sup>1)</sup> $V_R=200\text{V}$ , $I_F=10\text{A}$ , $di_F/dt=-200\text{A}/\mu\text{s}$ , $T_j=150\text{°C}$	$Q_C$	-	23	-	nC
Switching time <sup>2)</sup> $V_R=200\text{V}$ , $I_F=10\text{A}$ , $di_F/dt=-200\text{A}/\mu\text{s}$ , $T_j=150\text{°C}$	$t_{rr}$	-	n.a.	-	ns
Total capacitance $V_R=0\text{V}$ , $T_C=25\text{°C}$ , $f=1\text{MHz}$ $V_R=150\text{V}$ , $T_C=25\text{°C}$ , $f=1\text{MHz}$ $V_R=300\text{V}$ , $T_C=25\text{°C}$ , $f=1\text{MHz}$	$C$	-	600 55 40	-	pF

**1 Power dissipation**

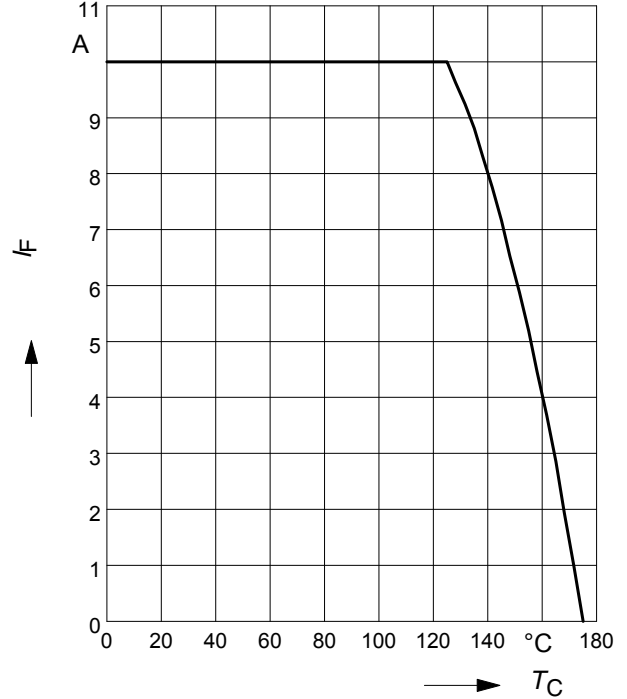
$P_{tot} = f(T_C)$



**2 Diode forward current**

$I_F = f(T_C)$

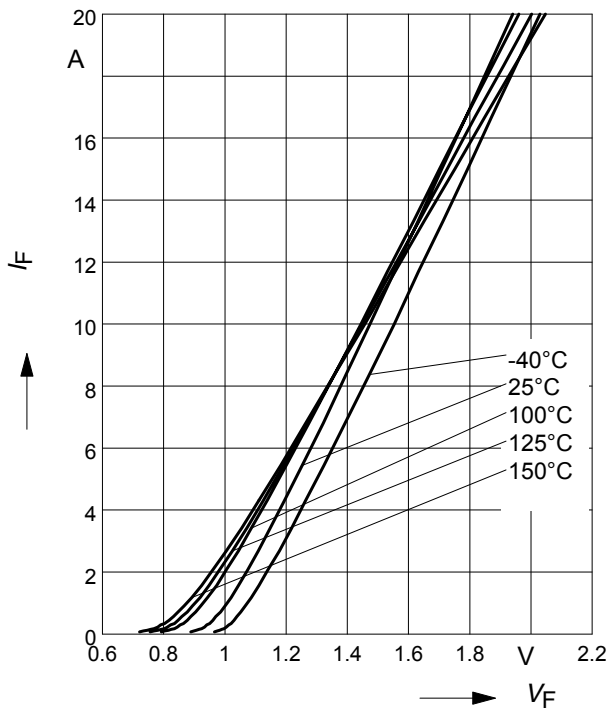
parameter:  $T_j \leq 175^\circ\text{C}$



**3 Typ. forward characteristic**

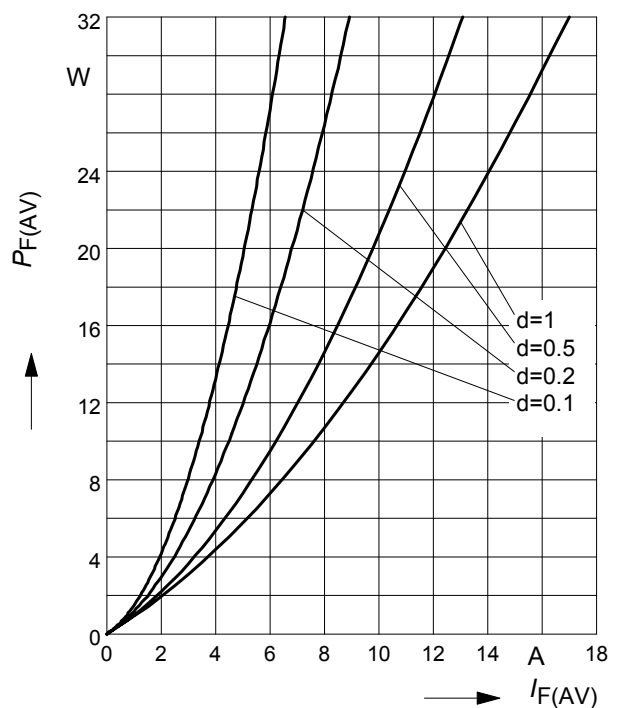
$I_F = f(V_F)$

parameter:  $T_j, t_p = 350 \mu\text{s}$



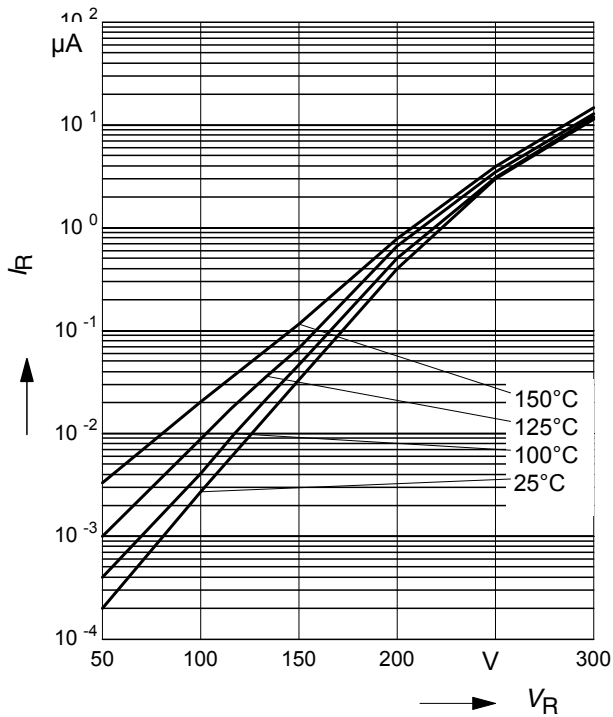
**4 Typ. forward power dissipation vs. average forward current**

$P_{F(AV)} = f(I_F) \quad T_C = 100^\circ\text{C}, d = t_p/T$



**5 Typ. reverse current vs. reverse voltage**

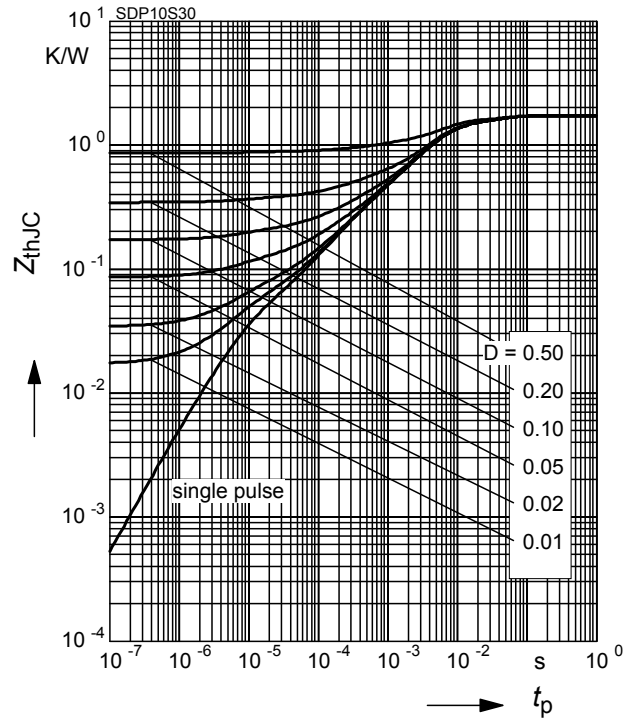
$$I_R = f(V_R)$$



**6 Transient thermal impedance**

$$Z_{thJC} = f(t_p)$$

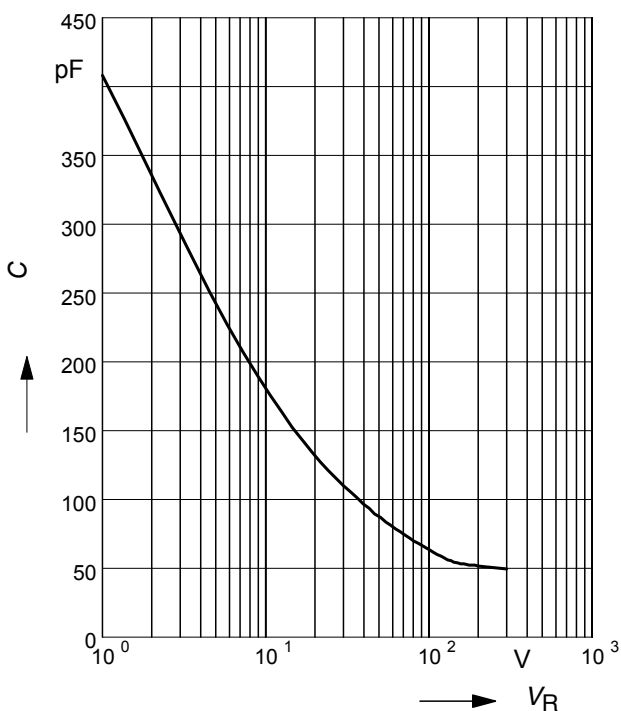
parameter :  $D = t_p/T$



**7 Typ. capacitance vs. reverse voltage**

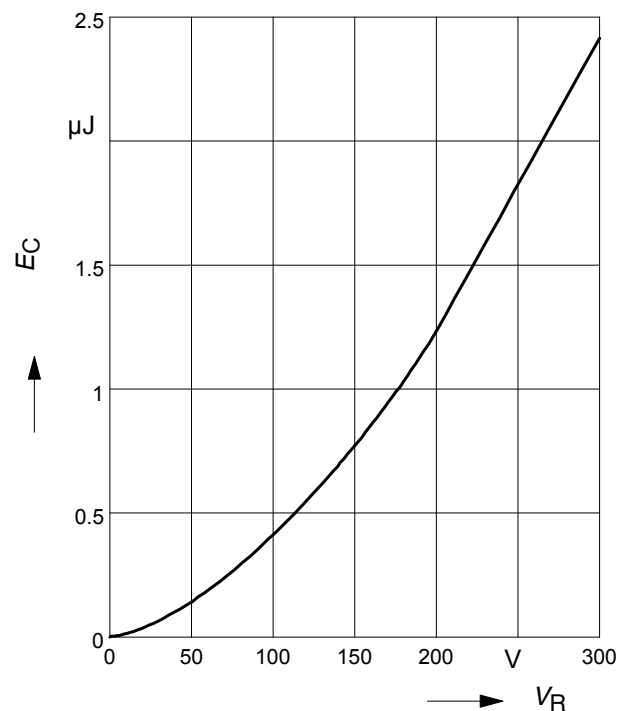
$$C = f(V_R)$$

parameter:  $T_C = 25\text{ }^\circ\text{C}$ ,  $f = 1\text{ MHz}$



**8 Typ. C stored energy**

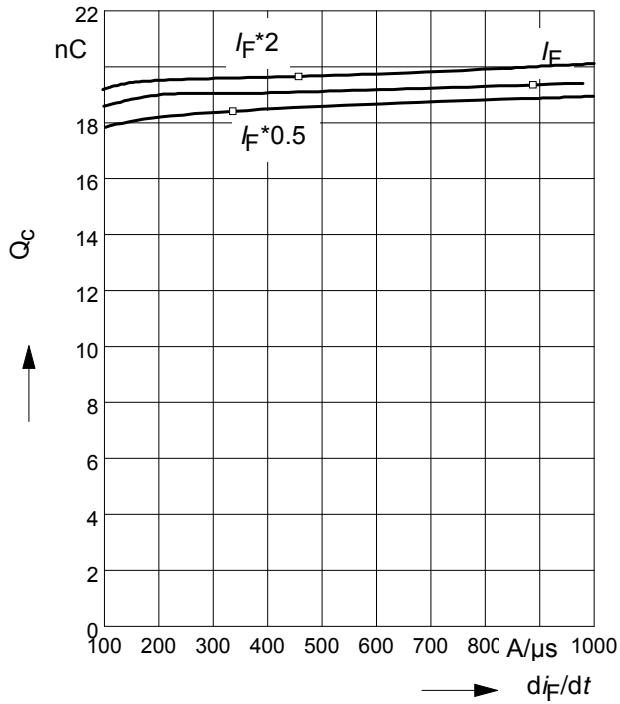
$$E_C = f(V_R)$$



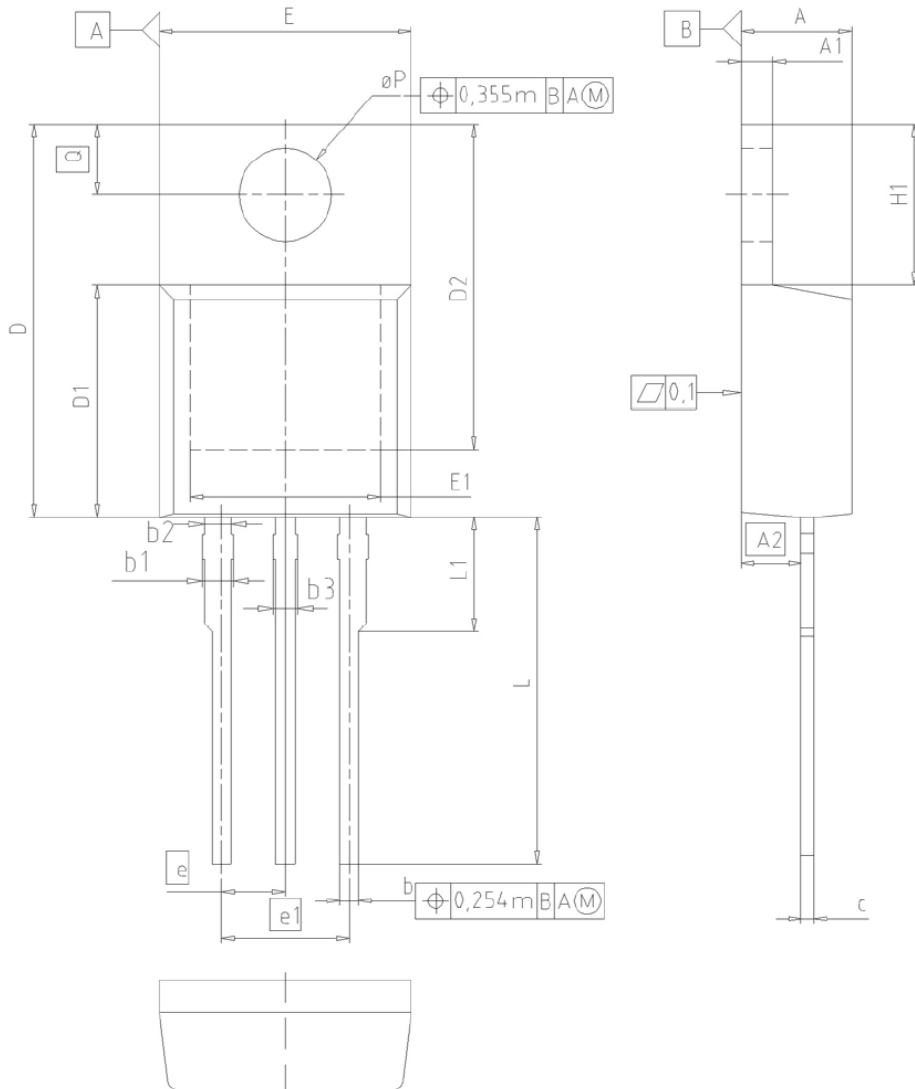
**9 Typ. capacitive charge vs. current slope**

$$Q_C = f(dI_F/dt)$$

parameter:  $T_j = 150\text{ }^\circ\text{C}$



P-TO220-3-1, P-TO220-3-21



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

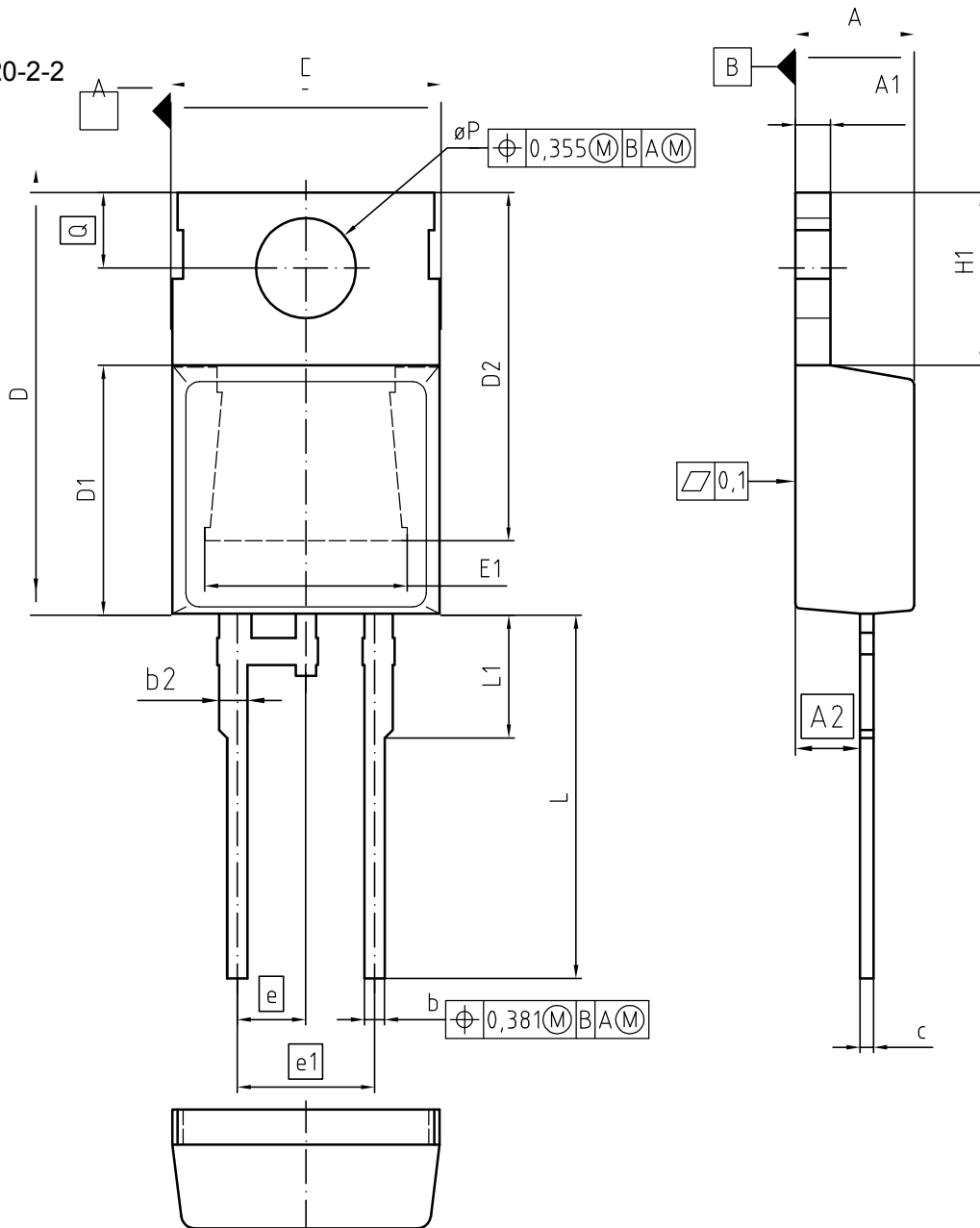
SCALE

EUROPEAN PROJECTION

ISSUE DATE  
23-08-2007

REVISION  
05

PG-TO-220-2-2



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.191	4.699	0.165	0.185
A1	1.170	1.400	0.046	0.055
b2	2.215	2.718	0.087	0.107
b	0.635	0.889	0.025	0.035
$\phi$	0.950	1.651	0.037	0.065
D	0.330	0.635	0.013	0.025
D1	14.808	15.950	0.583	0.628
D2	8.509	9.450	0.335	0.372
E1	12.850	14.245	0.506	0.561
E	9.677	10.363	0.381	0.408
e1	6.500	8.788	0.256	0.346
e	2.540		0.100	
N	5.080		0.200	
H	2		2	
L1	5.900	6.900	0.232	0.272
L	12.700	14.000	0.500	0.551
$\phi 1$	3.048	4.800	0.120	0.189
$\phi P$	3.550	3.886	0.140	0.153
$\phi$	2.540	3.048	0.100	0.120

DOCUMENT NO.  
Z8B00003320

SCALE

EUROPEAN PROJECTION

ISSUE DATE  
28-02-2007

REVISION  
02



**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.