



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.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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



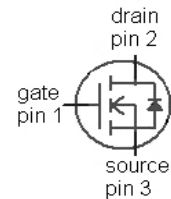
OptiMOS™ Power-Transistor
Features

- For fast switching converters and sync. rectification
- N-channel enhancement - logic level
- 175 °C operating temperature
- Avalanche rated
- Pb-free lead plating, RoHS compliant
- Halogen-free according to IEC61249-2-21


Product Summary

| | | |
|------------------|-----|----|
| V_{DS} | 60 | V |
| $R_{DS(on),max}$ | 6.5 | mΩ |
| I_D | 80 | A |

| Type | IPB065N06L G | IPP065N06L G |
|----------------|--------------|--------------|
| | | |
| Package | PG-TO263-3-2 | PG-TO220-3-1 |
| Marking | 065N06L | 065N06L |


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

| Parameter | Symbol | Conditions | Value | Unit |
|-------------------------------------|-------------------|--|-------------|-------|
| Continuous drain current | I_D | $T_C=25\text{ °C}^1$ | 80 | A |
| | | $T_C=100\text{ °C}$ | 80 | |
| Pulsed drain current | $I_{D,pulse}$ | $T_C=25\text{ °C}^2$ | 320 | |
| Avalanche energy, single pulse | E_{AS} | $I_D=80\text{ A}$, $R_{GS}=25\text{ Ω}$ | 530 | mJ |
| Reverse diode dv/dt | dv/dt | $I_D=80\text{ A}$, $V_{DS}=48\text{ V}$, $di/dt=200\text{ A/μs}$, $T_{j,max}=175\text{ °C}$ | 6 | kV/μs |
| Gate source voltage | V_{GS} | | ±20 | V |
| Power dissipation | P_{tot} | $T_C=25\text{ °C}$ | 250 | W |
| Operating and storage temperature | T_j , T_{stg} | | -55 ... 175 | °C |
| IEC climatic category; DIN IEC 68-1 | | | 55/175/56 | |

¹⁾ Current is limited by bondwire; with an $R_{thjC}=0.6\text{ K/W}$ the chip is able to carry 125 A.

²⁾ See figure 3

| Parameter | Symbol | Conditions | Values | | | Unit |
|-----------|--------|------------|--------|------|------|------|
| | | | min. | typ. | max. | |

Thermal characteristics

| | | | | | | |
|-------------------------------------|------------|--|---|---|-----|-----|
| Thermal resistance, junction - case | R_{thJC} | | - | - | 0.6 | K/W |
| SMD version, device on PCB | R_{thJA} | minimal footprint | - | - | 62 | |
| | | 6 cm ² cooling area ³⁾ | - | - | 40 | |

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

| | | | | | | |
|----------------------------------|---------------|--|-----|------|-----|---------------|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}=0\text{ V}, I_D=1\text{ mA}$ | 60 | - | - | V |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=180\text{ }\mu\text{A}$ | 1.2 | 1.6 | 2 | |
| Zero gate voltage drain current | I_{DSS} | $V_{DS}=60\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ °C}$ | - | 0.01 | 1 | μA |
| | | $V_{DS}=60\text{ V}, V_{GS}=0\text{ V}, T_j=125\text{ °C}$ | - | 1 | 100 | |
| Gate-source leakage current | I_{GSS} | $V_{GS}=20\text{ V}, V_{DS}=60\text{ V}$ | - | 1 | 100 | nA |
| Drain-source on-state resistance | $R_{DS(on)}$ | $V_{GS}=10\text{ V}, I_D=80\text{ A}$ | - | 5.4 | 6.5 | m Ω |
| | | $V_{GS}=4.5\text{ V}, I_D=53\text{ A}$ | - | 6.5 | 8.4 | |
| | | $V_{GS}=10\text{ V}, I_D=80\text{ A},$ SMD version | | 5.1 | 6.2 | |
| | | $V_{GS}=4.5\text{ V}, I_D=53\text{ A},$ SMD version | | 6.2 | 8.1 | |
| Gate resistance | R_G | | - | 2.2 | - | Ω |
| Transconductance | g_{fs} | $ V_{DS} >2 I_D R_{DS(on)max},$ $I_D=80\text{ A}$ | 63 | 126 | - | S |

³⁾ Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70 μm thick) copper area for drain connection. PCB is vertical in still air.

| Parameter | Symbol | Conditions | Values | | | Unit |
|-----------|--------|------------|--------|------|------|------|
| | | | min. | typ. | max. | |

Dynamic characteristics

| | | | | | | |
|------------------------------|--------------|--|---|------|------|----|
| Input capacitance | C_{iss} | $V_{GS}=0\text{ V}, V_{DS}=30\text{ V},$ $f=1\text{ MHz}$ | - | 3800 | 5100 | pF |
| Output capacitance | C_{oss} | | - | 890 | 1200 | |
| Reverse transfer capacitance | C_{rss} | | - | 220 | 330 | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD}=30\text{ V}, V_{GS}=4.5\text{ V},$ $I_D=80\text{ A}, R_G=1.6\ \Omega$ | - | 11 | 17 | ns |
| Rise time | t_r | | - | 21 | 32 | |
| Turn-off delay time | $t_{d(off)}$ | | - | 60 | 90 | |
| Fall time | t_f | | - | 20 | 30 | |

Gate Charge Characteristics⁴⁾

| | | | | | | |
|--------------------------|---------------|--|---|-----|-----|----|
| Gate to source charge | Q_{gs} | $V_{DD}=30\text{ V}, I_D=80\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$ | - | 13 | 18 | nC |
| Gate charge at threshold | $Q_{g(th)}$ | | - | 6 | 8 | |
| Gate to drain charge | Q_{gd} | | - | 42 | 63 | |
| Switching charge | Q_{sw} | | - | 49 | 72 | |
| Gate charge total | Q_g | | - | 118 | 157 | |
| Gate plateau voltage | $V_{plateau}$ | | - | 3.5 | - | V |
| Output charge | Q_{oss} | $V_{DD}=30\text{ V}, V_{GS}=0\text{ V}$ | - | 35 | 47 | |

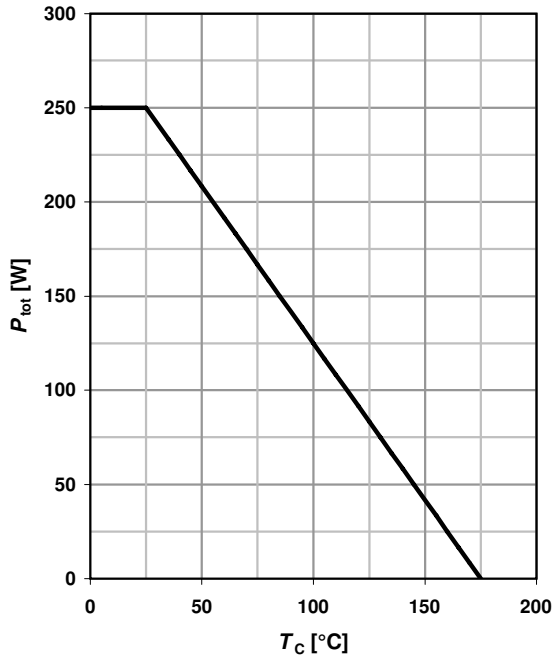
Reverse Diode

| | | | | | | |
|----------------------------------|---------------|---|---|------|-----|----|
| Diode continuous forward current | I_S | $T_C=25\text{ }^\circ\text{C}$ | - | - | 80 | A |
| Diode pulse current | $I_{S,pulse}$ | | - | - | 320 | |
| Diode forward voltage | V_{SD} | $V_{GS}=0\text{ V}, I_F=80\text{ A},$ $T_j=25\text{ }^\circ\text{C}$ | - | 0.95 | 1.3 | V |
| Reverse recovery time | t_{rr} | $V_R=30\text{ V}, I_F=I_S,$ $di_F/dt=100\text{ A}/\mu\text{s}$ | - | 60 | 76 | ns |
| Reverse recovery charge | Q_{rr} | | - | 92 | 115 | nC |

⁴⁾ See figure 16 for gate charge parameter definition

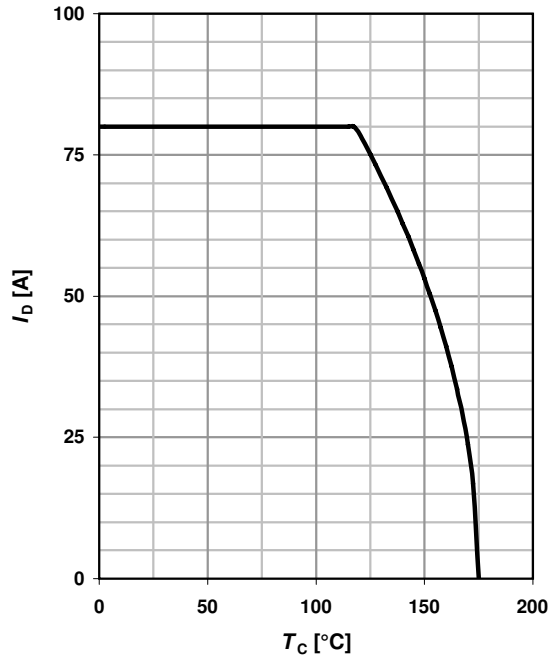
1 Power dissipation

$P_{tot}=f(T_C)$



2 Drain current

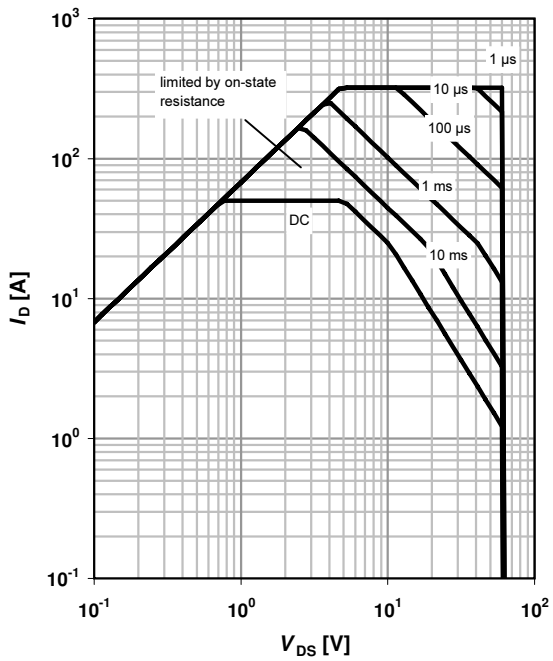
$I_D=f(T_C); V_{GS} \geq 10\text{ V}$



3 Safe operating area

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

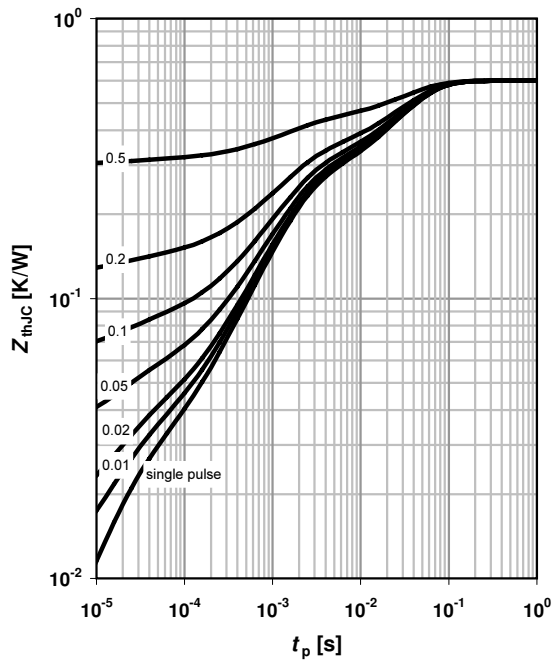
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJC}=f(t_p)$

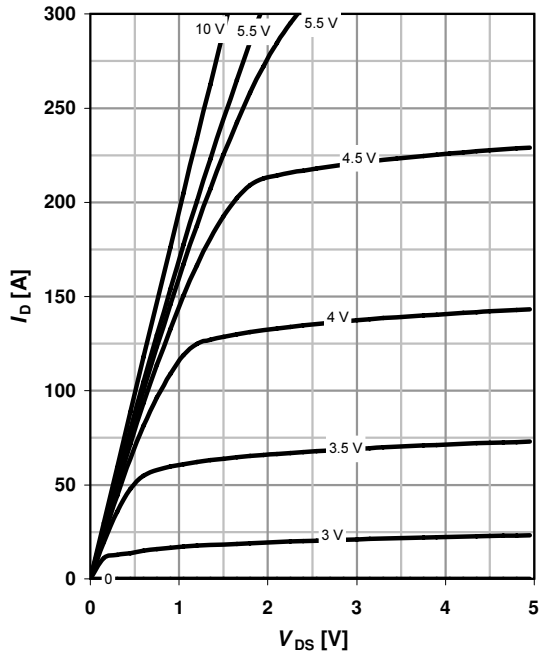
parameter: $D=t_p/T$



5 Typ. output characteristics

$I_D = f(V_{DS}); T_j = 25\text{ °C}$

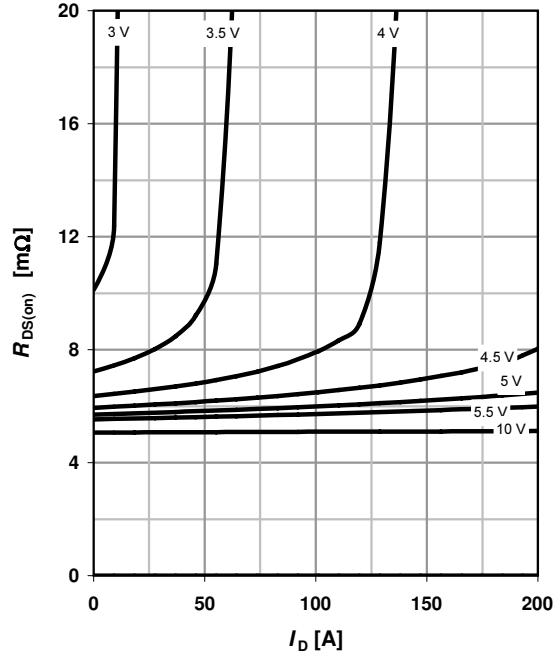
parameter: V_{GS}



6 Typ. drain-source on resistance

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

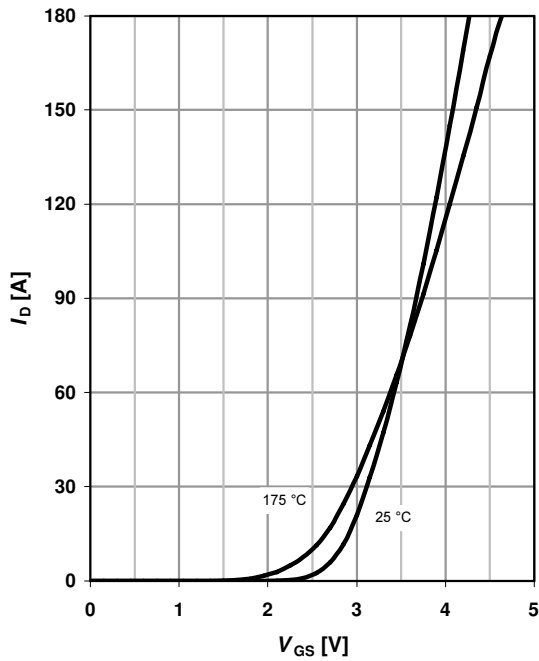
parameter: V_{GS}



7 Typ. transfer characteristics

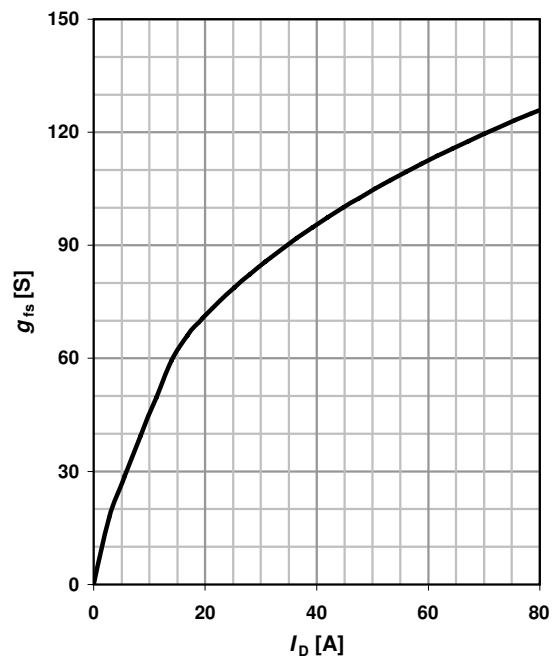
$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|R_{DS(on)max}$

parameter: T_j



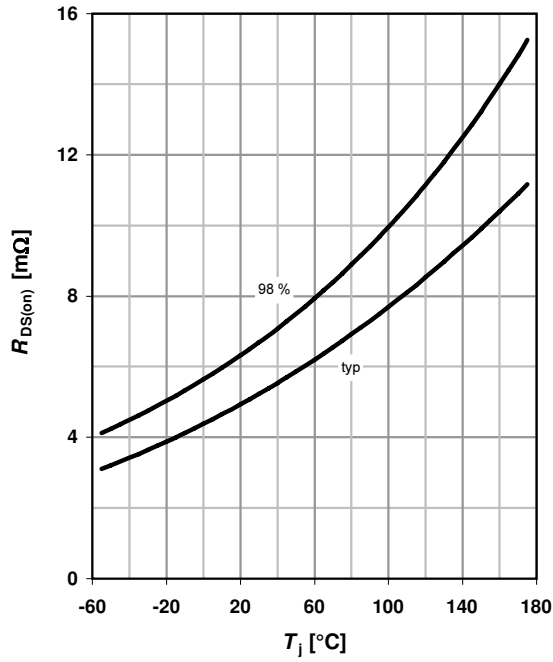
8 Typ. forward transconductance

$g_{fs} = f(I_D); T_j = 25\text{ °C}$



9 Drain-source on-state resistance

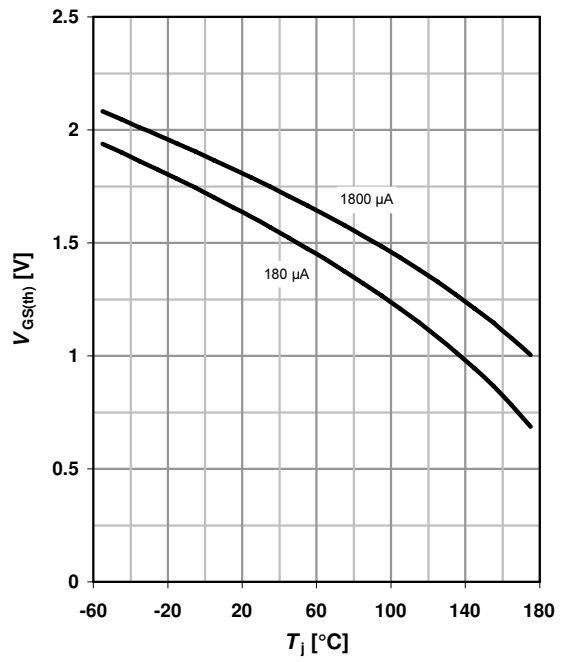
$R_{DS(on)} = f(T_j); I_D = 80 \text{ A}; V_{GS} = 10 \text{ V}$



10 Typ. gate threshold voltage

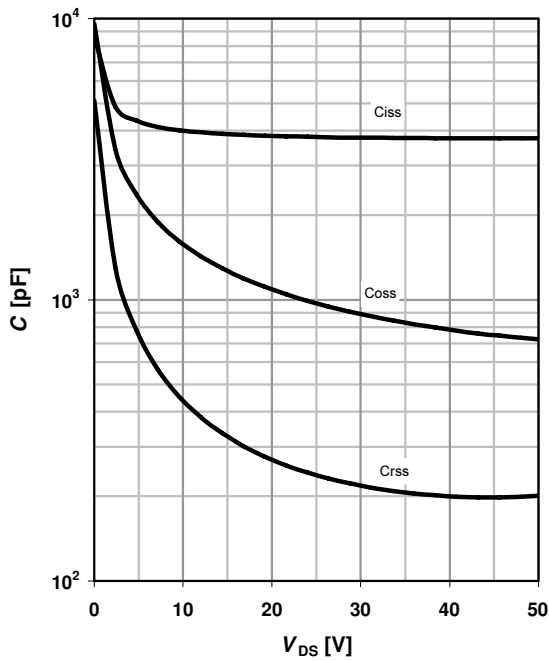
$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}$

parameter: I_D



11 Typ. capacitances

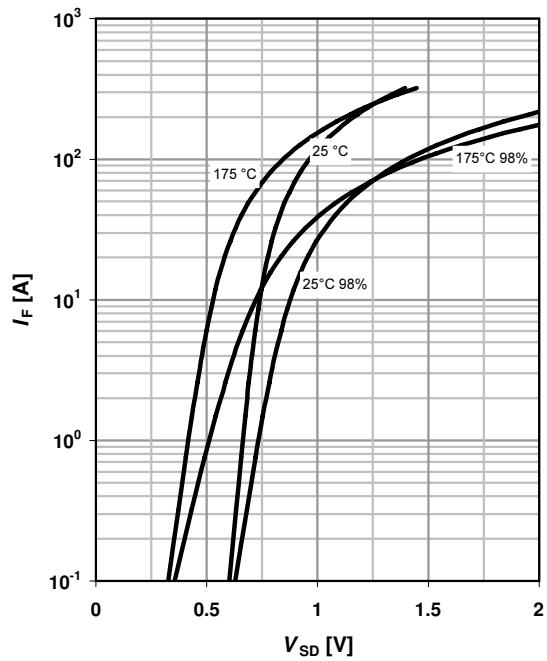
$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$



12 Forward characteristics of reverse diode

$I_F = f(V_{SD})$

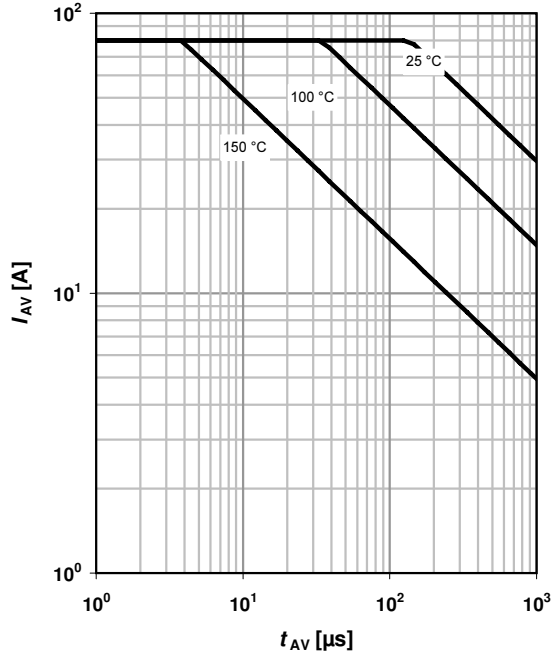
parameter: T_j



13 Avalanche characteristics

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

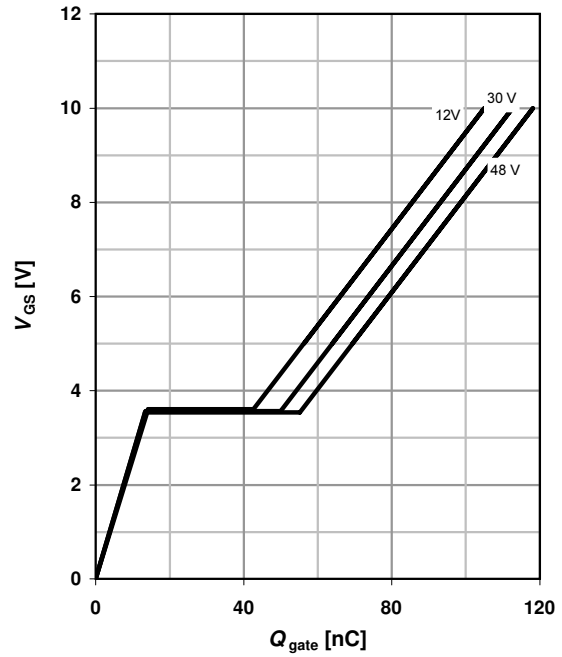
parameter: $T_{j(start)}$



14 Typ. gate charge

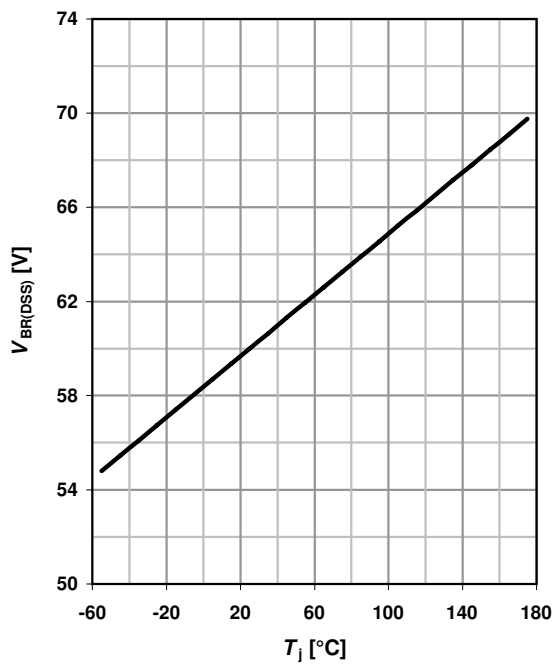
$V_{GS}=f(Q_{gate}); I_D=80 \text{ A pulsed}$

parameter: V_{DD}

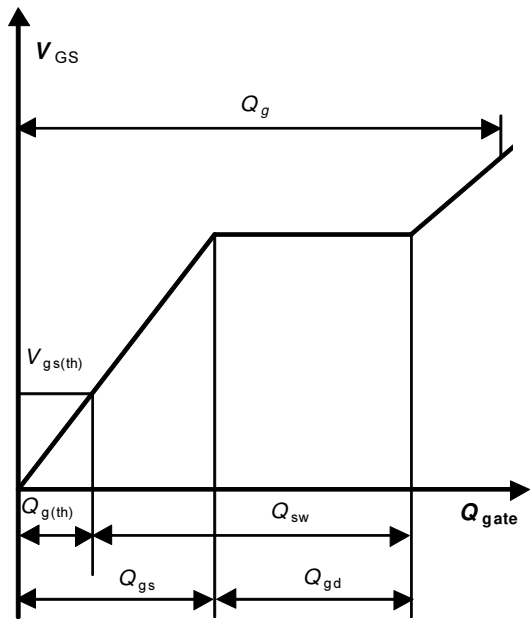


15 Drain-source breakdown voltage

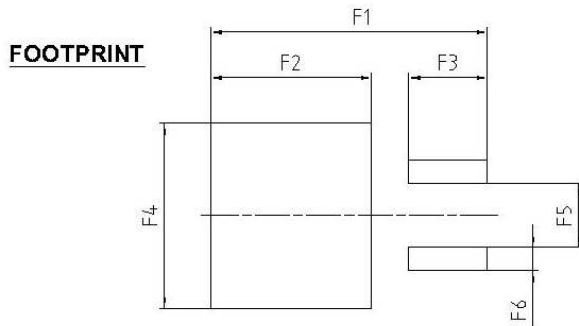
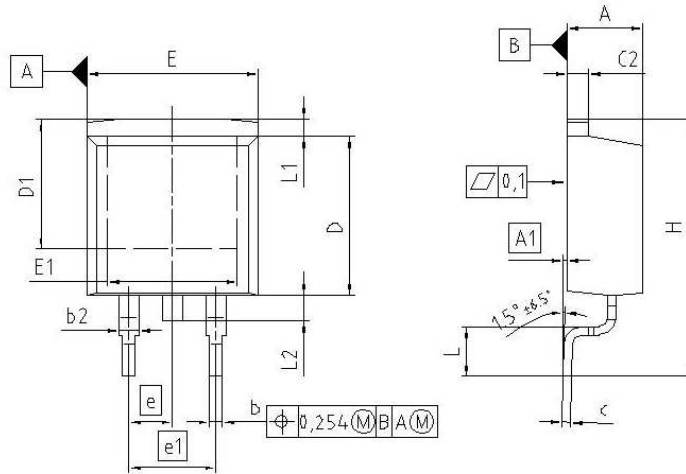
$V_{BR(DSS)}=f(T_j); I_D=1 \text{ mA}$



16 Gate charge waveforms



PG-TO-263 (D²-Pak)



| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|--------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 4.300 | 4.572 | 0.169 | 0.180 |
| A1 | 0.000 | 0.254 | 0.000 | 0.010 |
| b | 0.650 | 0.850 | 0.026 | 0.033 |
| b2 | 0.950 | 1.321 | 0.037 | 0.052 |
| c | 0.330 | 0.650 | 0.013 | 0.026 |
| c2 | 0.170 | 1.400 | 0.046 | 0.055 |
| D | 8.509 | 9.450 | 0.335 | 0.372 |
| D1 | 7.100 | - | 0.280 | - |
| E | 9.800 | 10.312 | 0.386 | 0.406 |
| E1 | 6.500 | - | 0.256 | - |
| e | 2.540 | | 0.100 | |
| e1 | 5.080 | | 0.200 | |
| N | 2 | | 2 | |
| H | 14.605 | 15.875 | 0.575 | 0.625 |
| L | 2.200 | 3.000 | 0.087 | 0.118 |
| L1 | - | 1.600 | - | 0.063 |
| L2 | 1.000 | 1.778 | 0.039 | 0.070 |
| F1 | 16.050 | 16.250 | 0.632 | 0.640 |
| F2 | 9.300 | 9.500 | 0.366 | 0.374 |
| F3 | 4.500 | 4.700 | 0.177 | 0.185 |
| F4 | 10.700 | 10.900 | 0.421 | 0.429 |
| F5 | 3.630 | 3.830 | 0.143 | 0.151 |
| F6 | 1.100 | 1.300 | 0.043 | 0.051 |

REFERENCE
JEDEC TO263

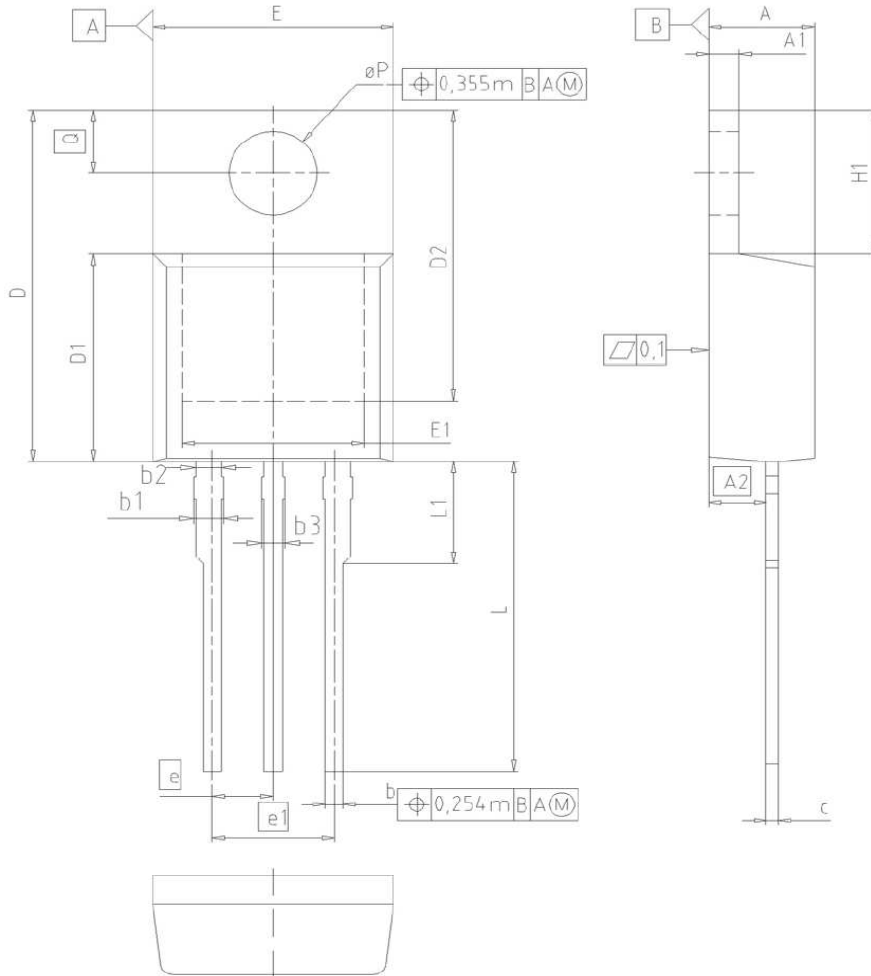
SCALE

EUROPEAN PROJECTION

ISSUE DATE
12-02-2006

FILE
TO263_2

PG-TO220-3: Outline



| 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 |
| ϕP | 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 München, Germany
© Infineon Technologies AG 2006.
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).

Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office. The Infineon Technologies component described in this Data Sheet may be used in life-support devices or systems and/or automotive, aviation and aerospace applications 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, automotive, aviation and aerospace 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.