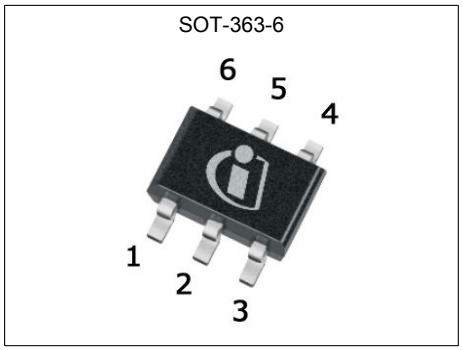
MOSFET

OptiMOS™2 Small-Signal-Transistor, 30 V

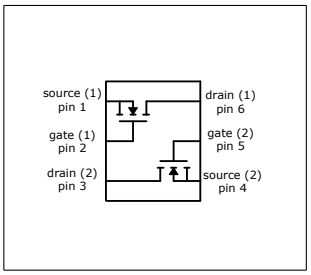


Features

- Dual N-channel
- Enhancement mode
- Logic level (4.5V rated)
- Avalanche rated
- Qualified according to AEC Q101
- 100% lead-free; RoHS compliant
- Halogen-free according to IEC61249-2-21

Table 1 Key Performance Parameters

Parameter	Value	Unit
V_{DS}	30	V
$R_{DS(on),max}$, V_{GS}=4.5 V	600	mΩ
$R_{DS(on),max}$, V_{GS}=10 V	400	mΩ
I_D	0.88	A



Type / Ordering Code	Package	Marking	Related Links
BSD340N	PG-SOT363	XGs	-

Table of Contents

1 Maximum ratings

at T_A=25 °C, unless otherwise specified, only one of both transistors in operation.

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current	I_D	- -	- -	0.88 0.71	A	T_A=25 °C T_A=70 °C
Pulsed drain current	$I_{D,pulse}$	-	-	3.5	A	T_A=25 °C
Avalanche energy, single pulse	E_{AS}	-	-	1.6	mJ	I_D=0.88 A, R_{GS}=16 Ω
Reverse diode dv/dt	dv/dt	-	-	6	kV/µs	I_D=0.88 A, V_{DS}=16 V, di/dt=200 A/µs, $T_{j,max}$=150 °C
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	-	-	0.5	W	T_A=25 °C
Operating and storage temperature	T_j, T_{stg}	-55	-	150	°C	IEC climatic category; DIN IEC 68-1: 55/150/56
ESD Class	-	-	0	-	-	JESD22-A114 -HBM, ESD Class 0 = < 250V
Soldering Temperature	-	-	260	-	°C	-

2 Thermal characteristics

Table 3 Thermal characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - ambient, minimal footprint[1)]	R_{thJA}	-	-	250	K/W	-

3 Electrical characteristics

Table 4 Static characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	30	-	-	V	V_{GS}=0 V, I_D=250 µA
Gate threshold voltage	$V_{GS(th)}$	1.2	1.6	2.0	V	V_{DS}=0 V, I_D=1.6 µA
Drain-source leakage current	I_{DSS}	- -	- -	0.01 5	A	V_{DS}=30 V, V_{GS}=0 V, T_j=25 °C V_{DS}=30 V, V_{GS}=0 V, T_j=150 °C
Gate-source leakage current	I_{GSS}	-	-	10	nA	V_{GS}=20 V, V_{DS}=0 V
Drain-source on-state resistance	$R_{DS(on)}$	- -	447 286	600 400	mΩ	V_{GS}=4.5 V, I_D=0.29 A V_{GS}=10 V, I_D=0.88 A
Transconductance	g_{fs}	-	1.2	-	S	|V_{DS}|>2|I_D|$R_{DS(on)max}$, I_D=0.71 A

[1)] Performed on 40 mm x 40 mm FR4 PCB. The traces are 1mm wide, 70m thick and 20mm long; they are present on both sides of the PCB

Table 5 Dynamic characteristics[1)]

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	31	41	pF	V_{GS}=0 V, V_{DS}=15 V, f=1 MHz
Output capacitance	C_{oss}	-	12	16	pF	V_{GS}=0 V, V_{DS}=15 V, f=1 MHz
Reverse transfer capacitance	C_{rss}	-	2.4	3.6	pF	V_{GS}=0 V, V_{DS}=15 V, f=1 MHz
Turn-on delay time	$t_{d(on)}$	-	2.6	-	ns	V_{DD}=15 V, V_{GS}=10 V, I_D=0.88 A, $R_{G,ext}$=6 Ω
Rise time	t_r	-	6.3	-	ns	V_{DD}=15 V, V_{GS}=10 V, I_D=0.88 A, $R_{G,ext}$=6 Ω
Turn-off delay time	$t_{d(off)}$	-	4.6	-	ns	V_{DD}=15 V, V_{GS}=10 V, I_D=0.88 A, $R_{G,ext}$=6 Ω
Fall time	t_f	-	2.5	-	ns	V_{DD}=15 V, V_{GS}=10 V, I_D=0.88 A, $R_{G,ext}$=6 Ω

Table 6 Gate charge characteristics[1)]

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	0.11	0.15	nC	V_{DD}=15 V, I_D=0.88 A, V_{GS}=0 to 10 V
Gate to drain charge	Q_{gd}	-	0.08	0.1	nC	V_{DD}=15 V, I_D=0.88 A, V_{GS}=0 to 10 V
Gate charge total	Q_g	-	0.46	0.7	nC	V_{DD}=15 V, I_D=0.88 A, V_{GS}=0 to 10 V
Gate plateau voltage	$V_{plateau}$	-	3.6	-	V	V_{DD}=15 V, I_D=0.88 A, V_{GS}=0 to 10 V

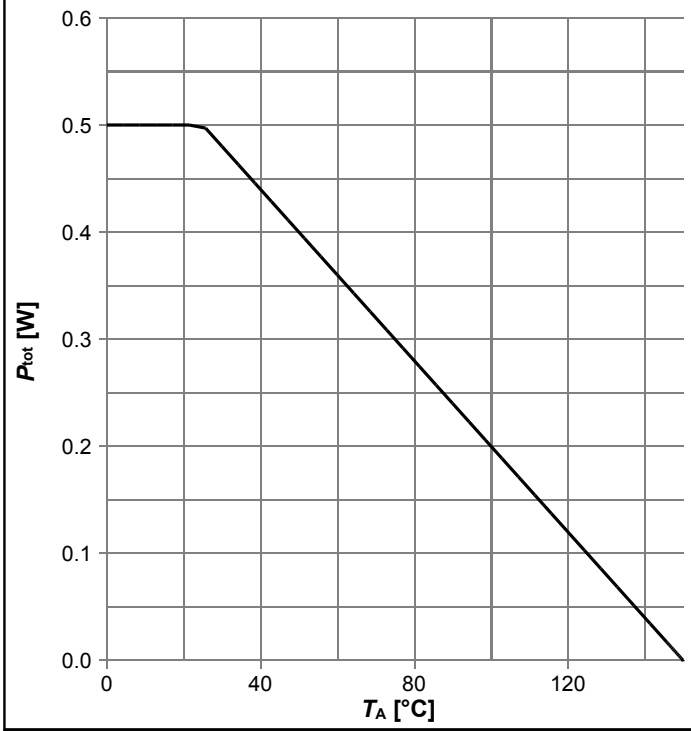
Table 7 Reverse diode

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continous forward current	I_S	-	-	0.45	A	T_A=25 °C
Diode pulse current	$I_{S,pulse}$	-	-	3.5	A	T_A=25 °C
Diode forward voltage	V_{SD}	-	0.89	1.1	V	V_{GS}=0 V, I_F=0.88 A, T_j=25 °C
Reverse recovery time[1)]	t_{rr}	-	7.8	-	ns	V_R=15 V, I_F=0.88 A, di_F/dt=100 A/µs
Reverse recovery charge[1)]	Q_{rr}	-	1.9	-	nC	V_R=15 V, I_F=0.88 A, di_F/dt=100 A/µs

[1)] Defined by design. Not subjected to production test.

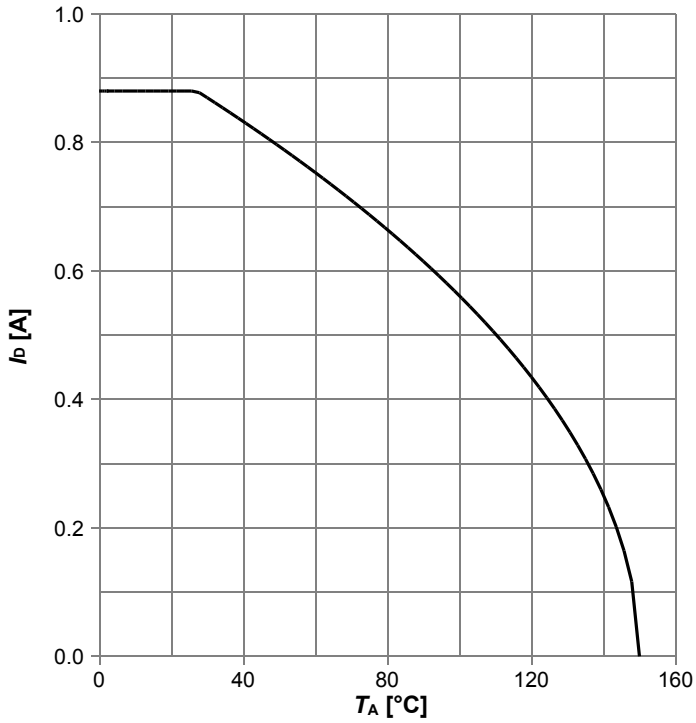
4 Electrical characteristics diagrams

Diagram 1: Power dissipation



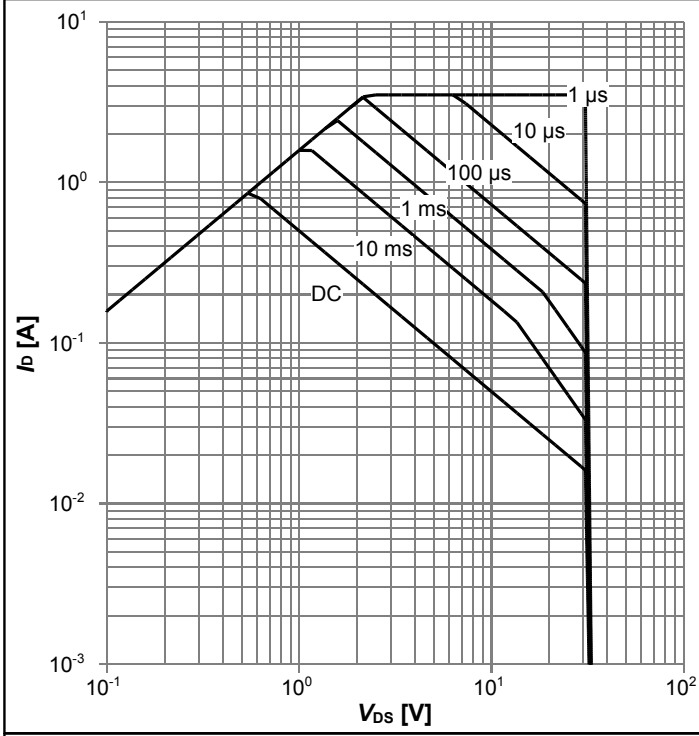
$P_{tot}=f(T_A)$

Diagram 2: Drain current



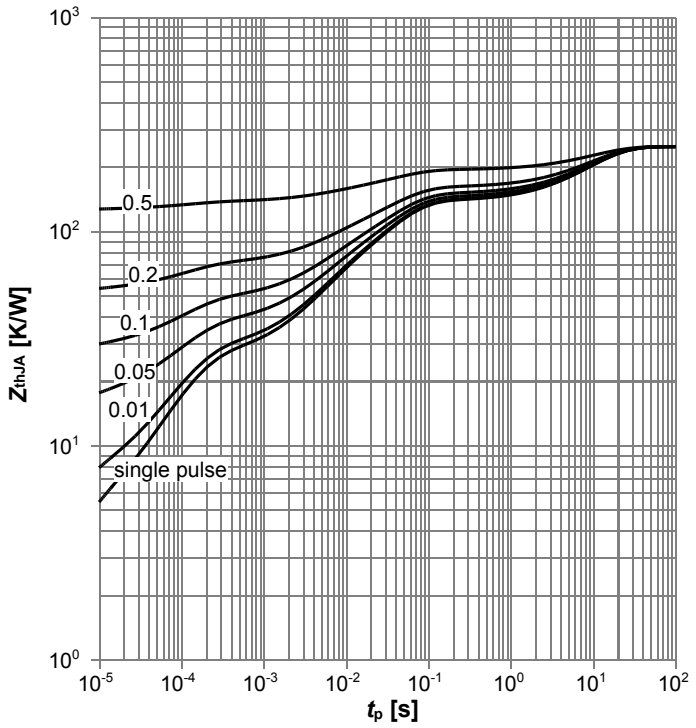
$I_D=f(T_A)$; $V_{GS}\geq 10$ V

Diagram 3: Safe operating area



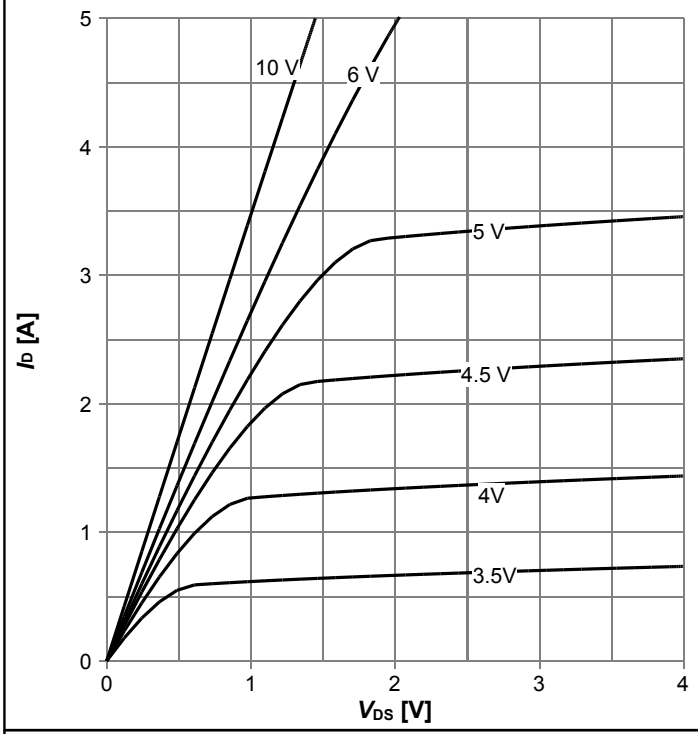
$I_D=f(V_{DS})$; $T_A=25$ °C; $D=0$; parameter: t_p

Diagram 4: Max. transient thermal impedance



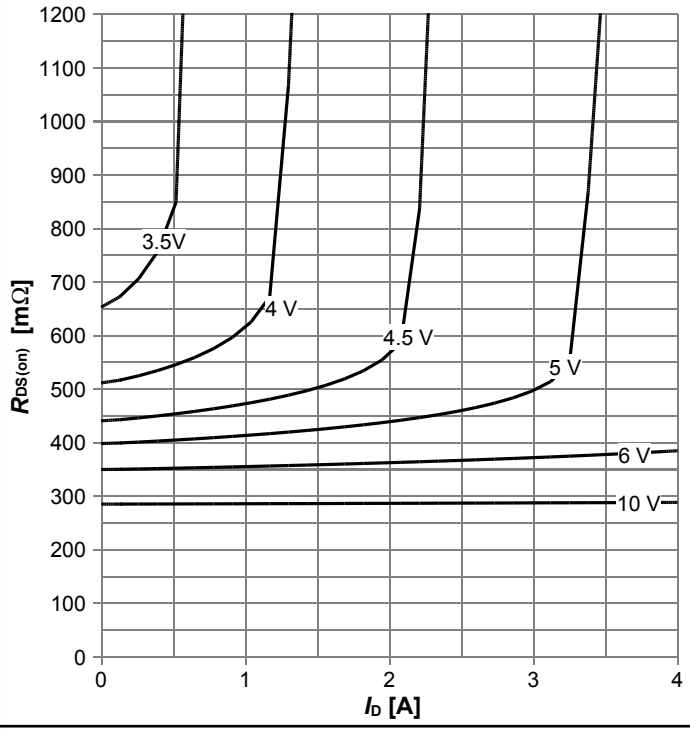
$Z_{thJA}=f(t_p)$; parameter: $D=t_p/T$

Diagram 5: Typ. output characteristics



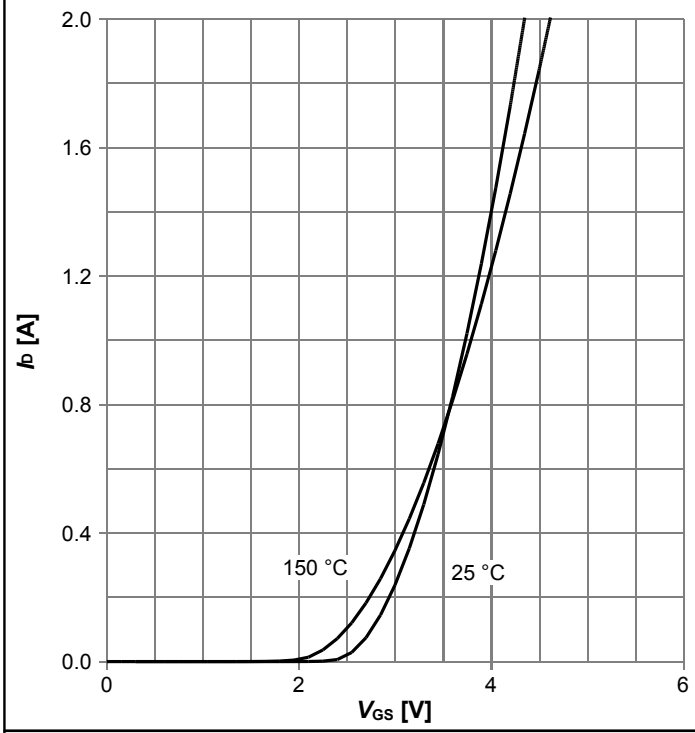
$I_D=f(V_{DS})$; $T_j=25$ °C; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



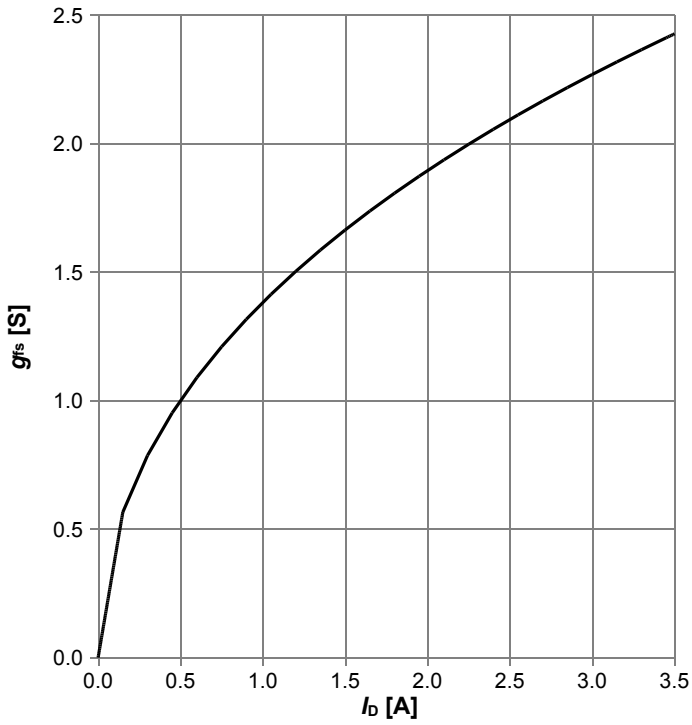
$R_{DS(on)}=f(I_D)$; $T_j=25$ °C; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics



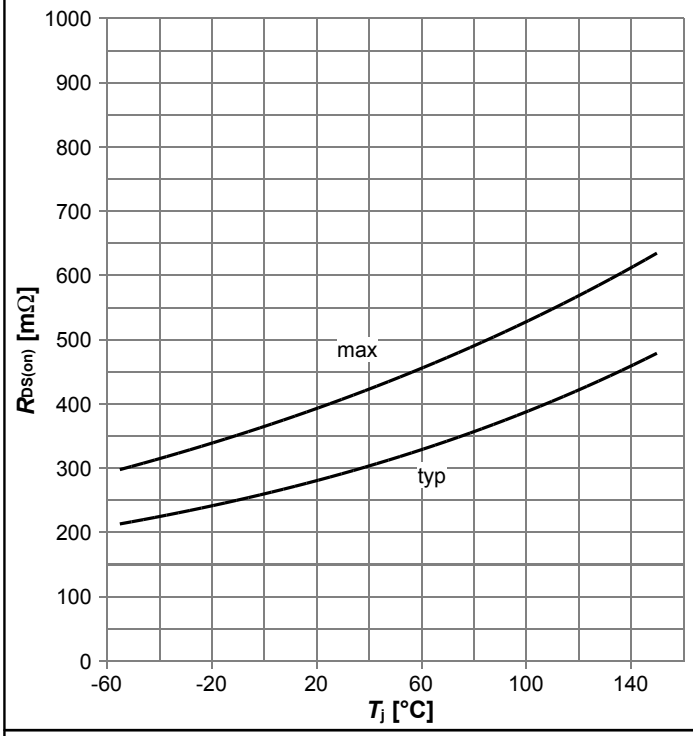
$I_D=f(V_{GS})$; $|V_{DS}|>2|I_D|R_{DS(on)max}$

Diagram 8: Typ. forward transconductance



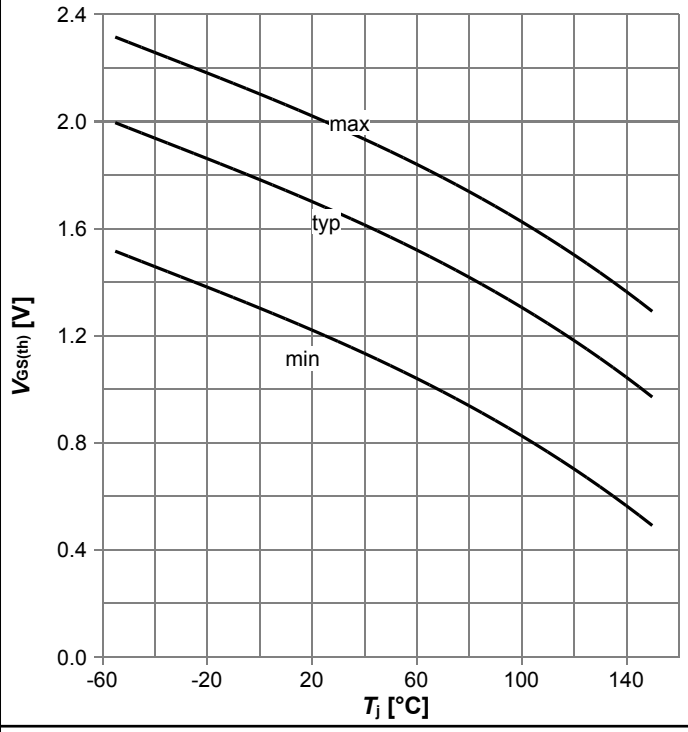
$g_{fs}=f(I_D)$; $T_j=25$ °C

Diagram 9: Drain-source on-state resistance



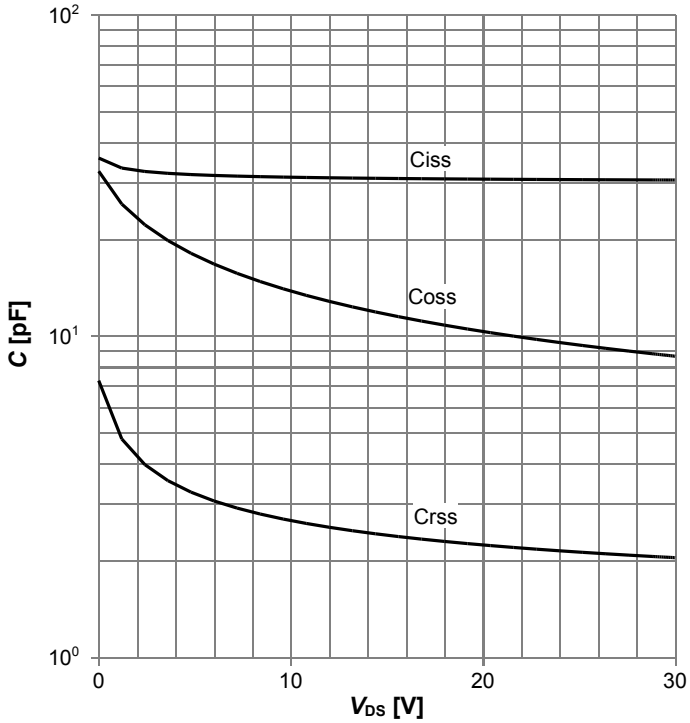
$R_{DS(on)}$=f(T_j); I_D=0.88 A; V_{GS}=10 V

Diagram 10: Typ. gate threshold voltage



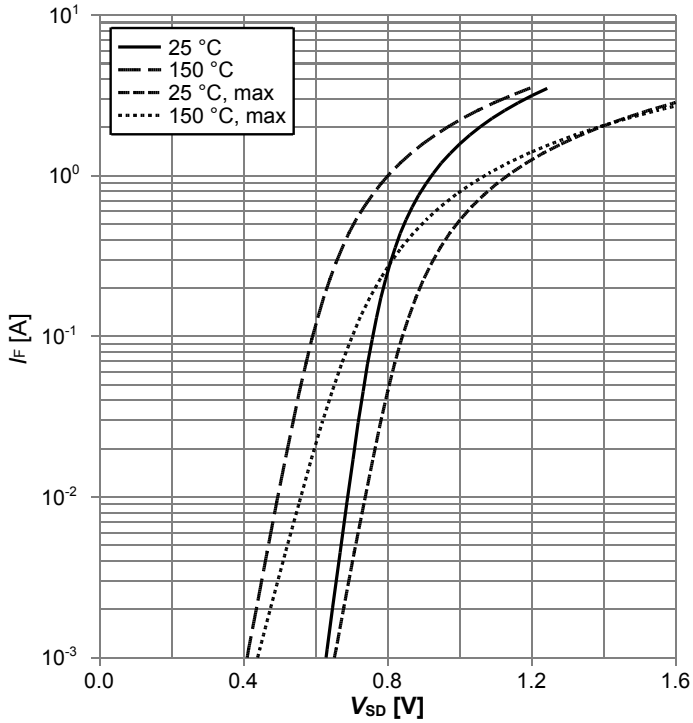
$V_{GS(th)}$=f(T_j); V_{DS}=V_{GS}; I_D=1.6 µA; parameter: I_D

Diagram 11: Typ. capacitances



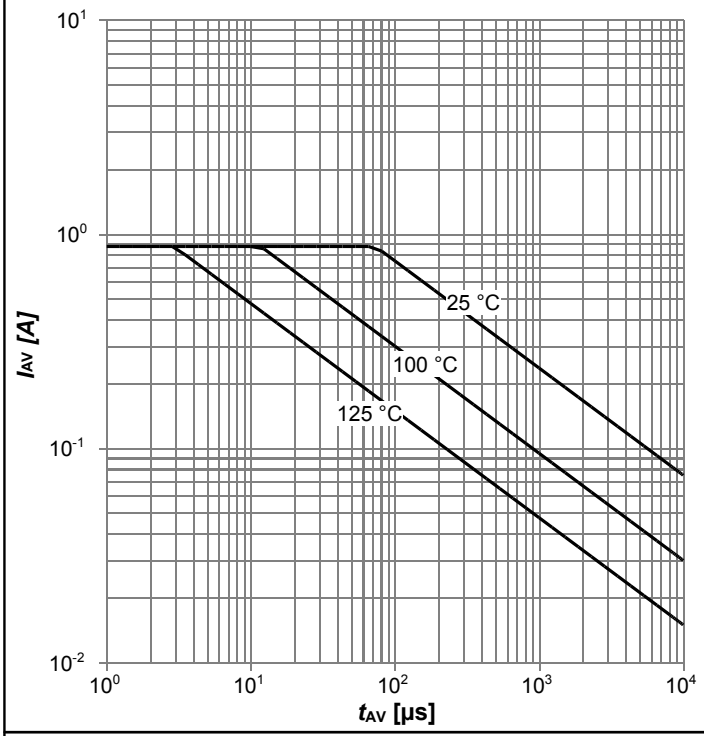
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz; T_j=25°C

Diagram 12: Forward characteristics of reverse diode



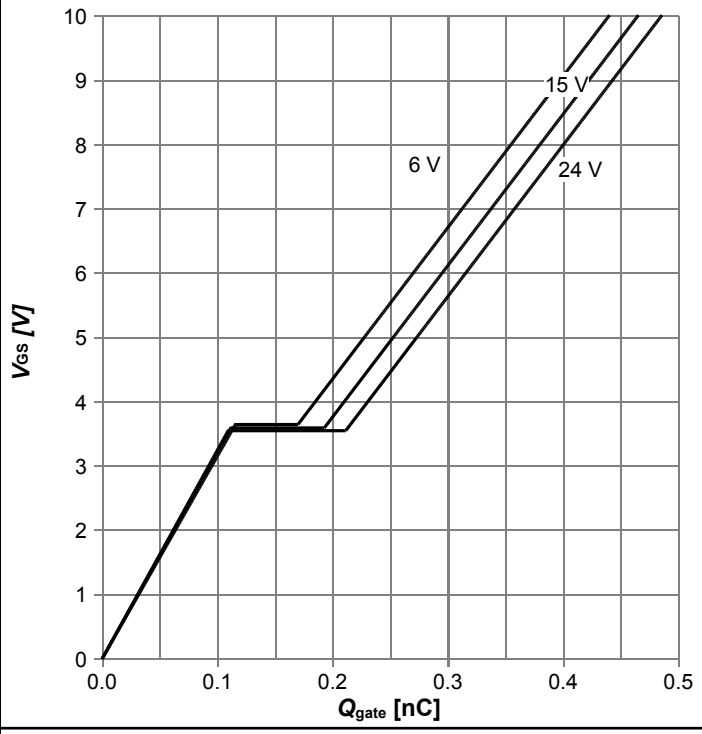
I_F=f(V_{SD}); parameter: T_j

Diagram 13: Avalanche characteristics



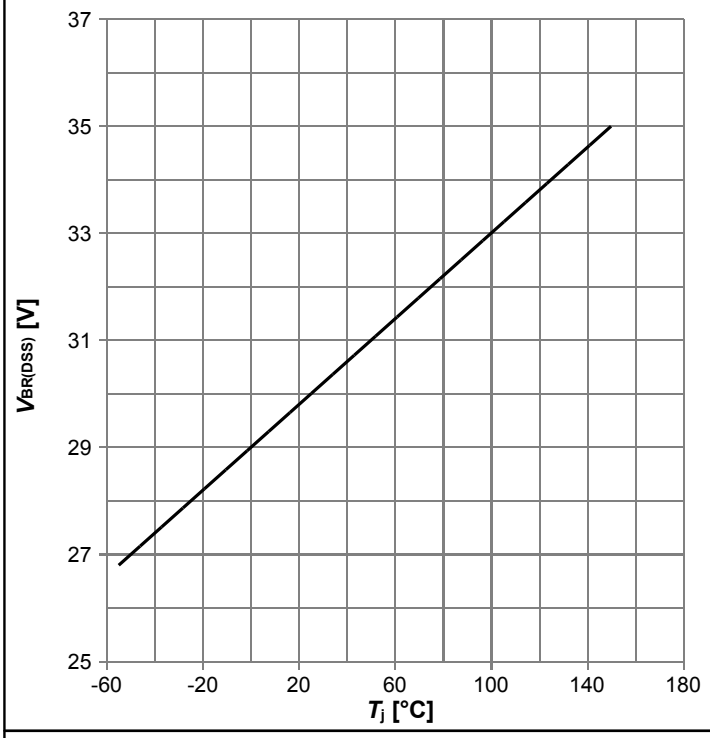
I_{AS}=f(t_{AV}); R_{GS}=16 Ω; parameter: $T_{j(start)}$

Diagram 14: Typ. gate charge



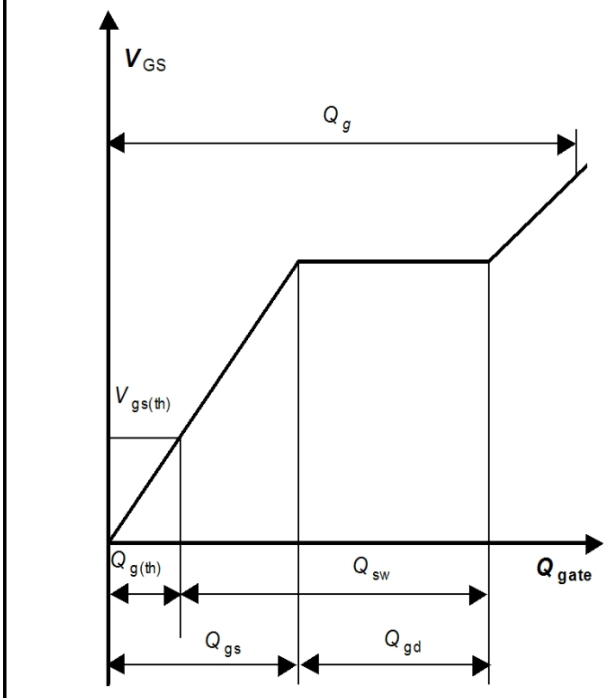
V_{GS}=f(Q_{gate}); I_D=0.88 A pulsed; parameter: V_{DD}

Diagram 15: Drain-source breakdown voltage



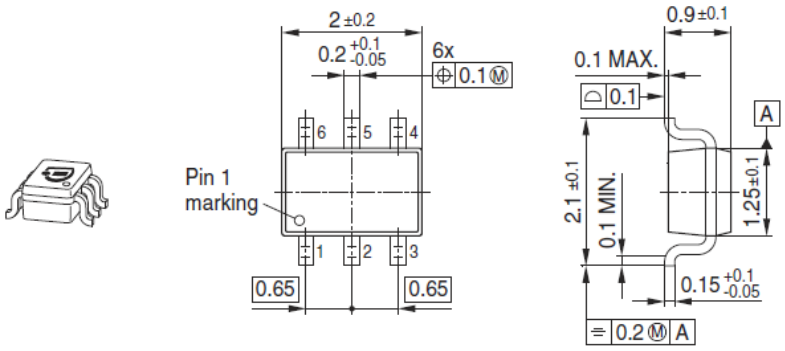
$V_{BR(DSS)}$=f(T_j); I_D=250 µA

Gate charge waveforms



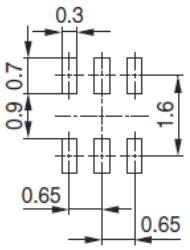
5 Package Outlines

Package Outline

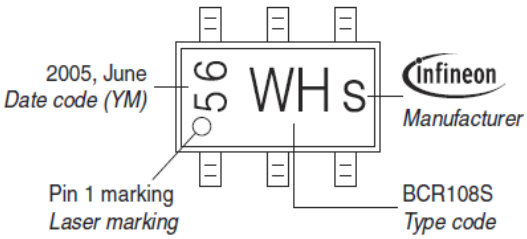


Foot Print

Soldering Type: Reflow Soldering



Marking Layout (Example)



Tape and Reel

Reel ø180 mm: 3.000 Pieces/Reel
Reels/Box: 1 x 3.000 = 3.000
Reels/Box: 10 x 3.000 = 30.000

Reel ø330 mm: 10.000 Pieces/Reel
Reels/Box: 1 x 10.000 = 10.000

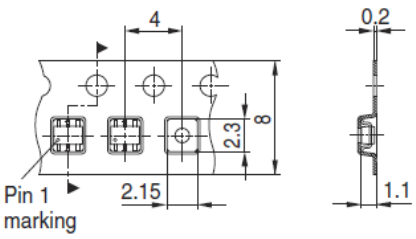


Figure 1 Outline PG-SOT363, dimensions in mm

Revision History

BSD340N

Revision: 2016-06-23, Rev. 2.0

Previous Revision

Revision	Date	Subjects (major changes since last revision)
2.0	2016-06-23	Release of final version

We Listen to Your Comments
Any information within this document that you feel is wrong, unclear or missing at all? Your feedback will help us to continuously improve the quality of this document. Please send your proposal (including a reference to this document) to:
erratum@infineon.com

Published by
Infineon Technologies AG
81726 München, Germany

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 your 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.