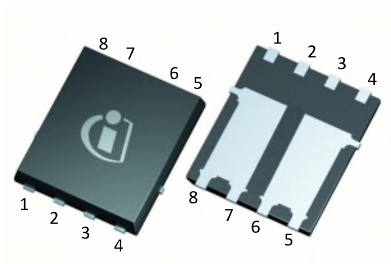
MOSFET

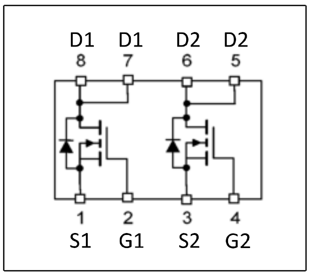
OptiMOS^{TM}-T2 Power Transistor, 60 V

TDSON-8-4 (SSO8 dual)



Features

- Dual N-channel,Normal Level
- Fast switching MOSFETs
- 175°C operating temperature
- Green product (RoHS compliant)
- 100% Avalanche tested
- Optimized technology for drives applications
- Halogen-free according to IEC61249-2-21
- Superior thermal resistance



Product validation

Fully qualified according to JEDEC for Industrial Applications

Table 1 Key Performance Parameters

Parameter	Value	Unit
V_{DS}	60	V
$R_{DS(on),max}$	15.5	mΩ
I_D	42	A

Type / Ordering Code	Package	Marking	Related Links
BSC155N06ND	PG-TDSON-8-4	155N06ND	-

Table of Contents

1 Maximum ratings

at T_A=25 °C, unless otherwise specified, one transistor active

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current[1]	I_D	-	-	42	A	V_{GS}=10 V, T_C=25 °C
Pulsed drain current[2]	$I_{D,pulse}$	-	-	168	A	T_A=25 °C
Avalanche energy, single pulse[3]	E_{AS}	-	-	40	mJ	I_D=10 A, R_{GS}=25 Ω
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	-	-	50	W	T_C=25 °C
Operating and storage temperature	T_j, T_{stg}	-55	-	175	°C	IEC climatic category; DIN IEC 68-1: 55/175/56

2 Thermal characteristics

Table 3 Thermal characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case, bottom	R_{thJC}	-	-	3	°C/W	-
Device on PCB, 6 cm² cooling area[4]	R_{thJA}	-	-	60	°C/W	-
Device on PCB, minimal footprint[5]	R_{thJA}	-	-	100	°C/W	-

[1] Rating refers to the product only with datasheet specified absolute maximum values, maintaining case temperature as specified. For other case temperatures please refer to Diagram 2. De-rating will be required based on the actual environmental conditions.

[2] See Diagram 3 for more detailed information

[3] See Diagram 13 for more detailed information

[4] Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm^2 (one layer, 70 µm thick) copper area for drain connection. PCB is vertical in still air.

[5] device mounted on a minimum pad (one layer, 70 µm thick)

3 Electrical characteristics

at T_j=25 °C, unless otherwise specified

Table 4 Static characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	60	-	-	V	V_{GS}=0 V, I_D=1 mA
Gate threshold voltage	$V_{GS(th)}$	2.0	3.0	4.0	V	V_{DS}=V_{GS}, I_D=20 μA
Zero gate voltage drain current	I_{DSS}	- -	0.1 10	1 100	μA	V_{DS}=60 V, V_{GS}=0 V, T_j=25 °C V_{DS}=60 V, V_{GS}=0 V, T_j=125 °C
Gate-source leakage current	I_{GSS}	-	-	100	nA	V_{GS}=20 V, V_{DS}=0 V
Drain-source on-state resistance	$R_{DS(on)}$	-	12.9	15.5	mΩ	V_{GS}=10 V, I_D=17 A

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance[1]	C_{iss}	-	1730	2250	pF	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz
Output capacitance[1]	C_{oss}	-	380	490	pF	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz
Reverse transfer capacitance[1]	C_{rss}	-	15	30	pF	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz
Turn-on delay time	$t_{d(on)}$	-	11	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=20 A, $R_{G,ext}$=11 Ω
Rise time	t_r	-	2	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=20 A, $R_{G,ext}$=11 Ω
Turn-off delay time	$t_{d(off)}$	-	19	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=20 A, $R_{G,ext}$=11 Ω
Fall time	t_f	-	9	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=20 A, $R_{G,ext}$=11 Ω

Table 6 Gate charge characteristics[2]

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge[1]	Q_{gs}	-	9	12	nC	V_{DD}=30 V, I_D=20 A, V_{GS}=0 to 10 V
Gate to drain charge[1]	Q_{gd}	-	2.0	4	nC	V_{DD}=30 V, I_D=20 A, V_{GS}=0 to 10 V
Gate charge total[1]	Q_g	-	21	29	nC	V_{DD}=30 V, I_D=20 A, V_{GS}=0 to 10 V
Gate plateau voltage	$V_{plateau}$	-	5.3	-	V	V_{DD}=30 V, I_D=20 A, V_{GS}=0 to 10 V

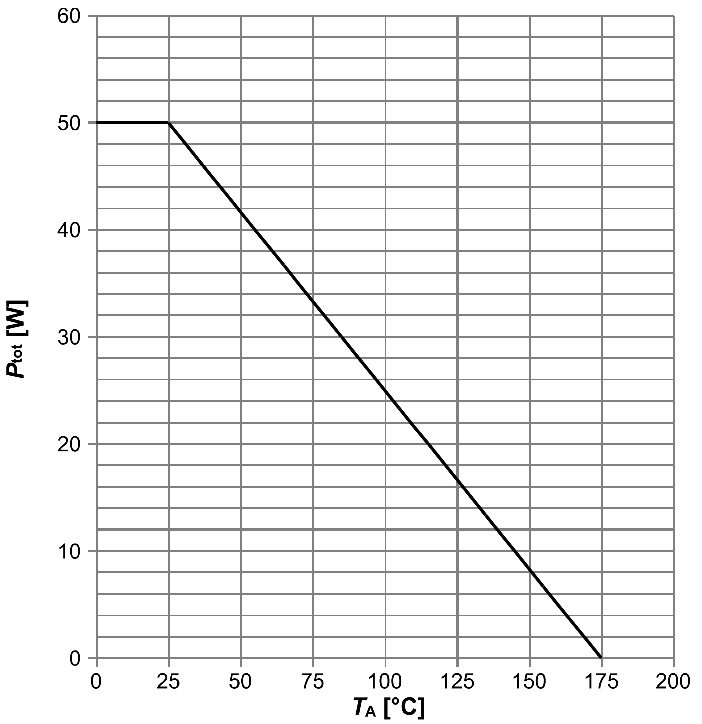
[1] Defined by design. Not subject to production test.
[2] See ″Gate charge waveforms″ for parameter definition

Table 7 Reverse diode

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continuous forward current	I_S	-	-	34	A	T_C=25 °C
Diode pulse current	$I_{S,pulse}$	-	-	168	A	T_C=25 °C
Diode forward voltage	V_{SD}	-	0.91	1.1	V	V_{GS}=0 V, I_F=17 A, T_j=25 °C
Reverse recovery time	t_{rr}	-	35	-	ns	V_R=15 V, I_F=9 A, di_F/dt=100 A/µs
Reverse recovery charge	Q_{rr}	-	35	-	nC	V_R=15 V, I_F=9 A, di_F/dt=100 A/µs

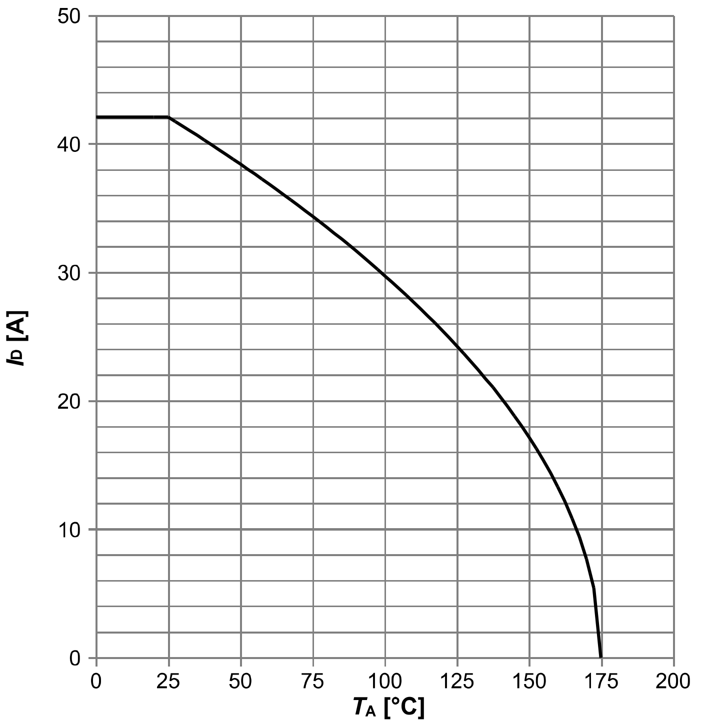
4 Electrical characteristics diagrams

Diagram 1: Power dissipation



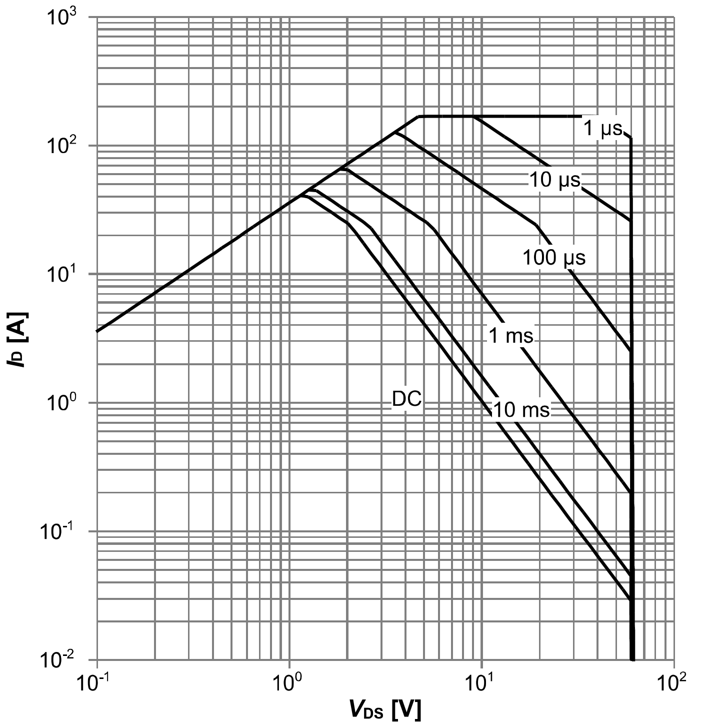
$P_{\mathrm{tot}}=f(T_{\mathrm{A}})$, minimal footprint

Diagram 2: Drain current



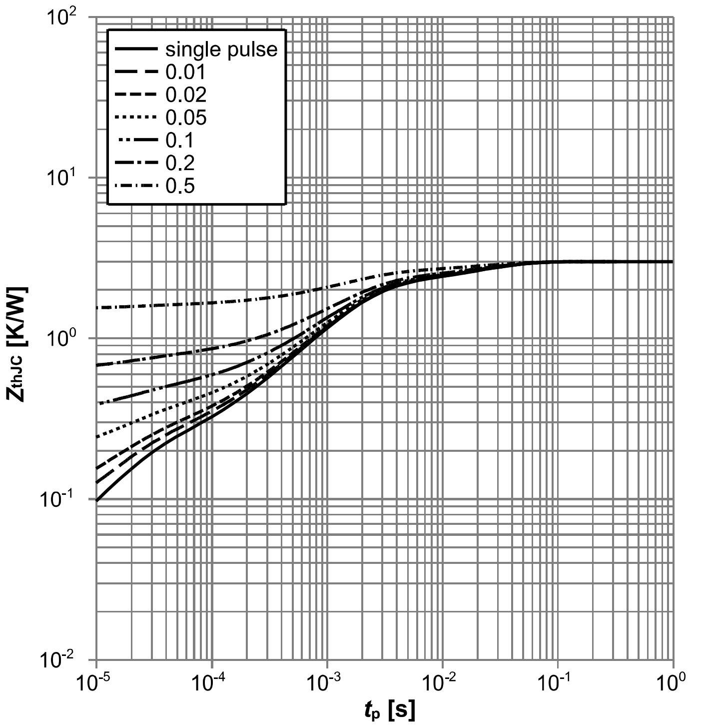
$I_{\mathrm{D}}=f(T_{\mathrm{A}})$; minimal footprint

Diagram 3: Safe operating area



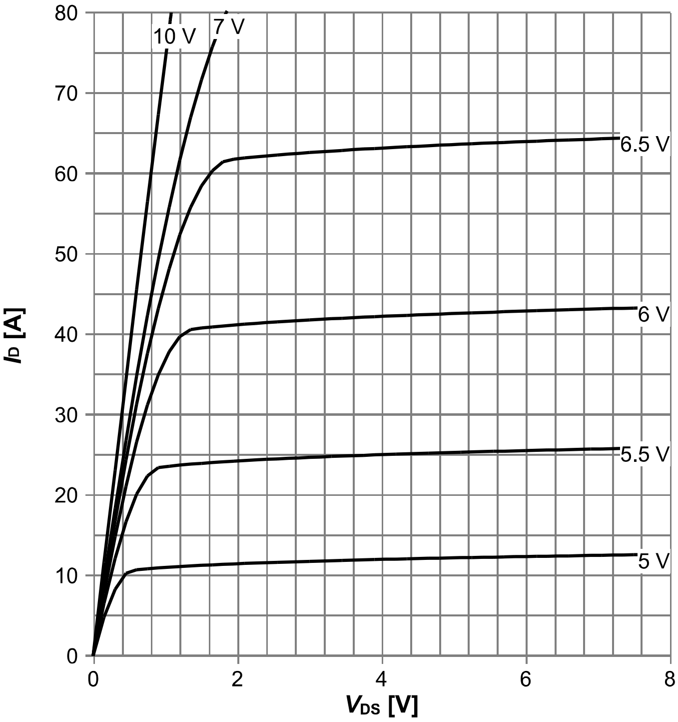
$I_{\mathrm{D}}=f(V_{\mathrm{DS}})$; $T_{\mathrm{C}}=25$ °C; $D=0$; parameter: t_{p}

Diagram 4: Max. transient thermal impedance



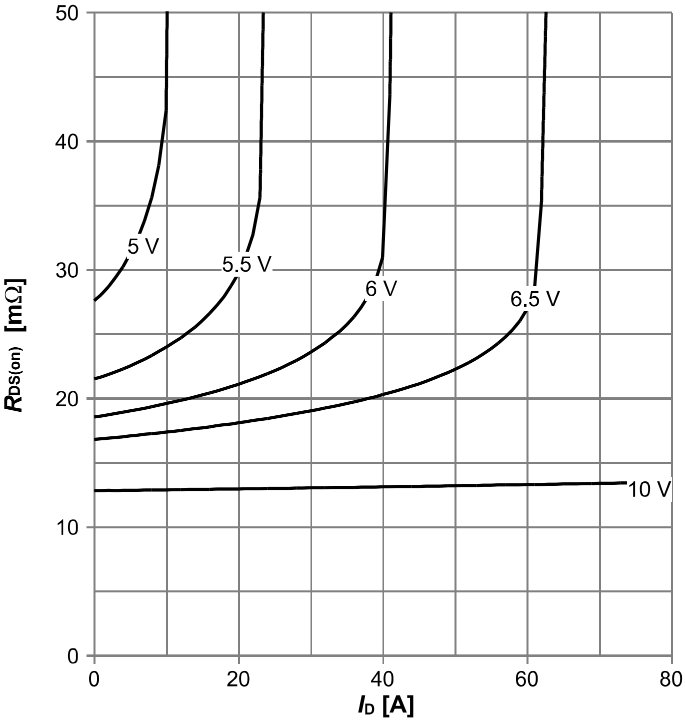
$Z_{\mathrm{thJC}}=f(t_{\mathrm{p}})$; parameter: $D=t_{\mathrm{p}}/T$

Diagram 5: Typ. output characteristics



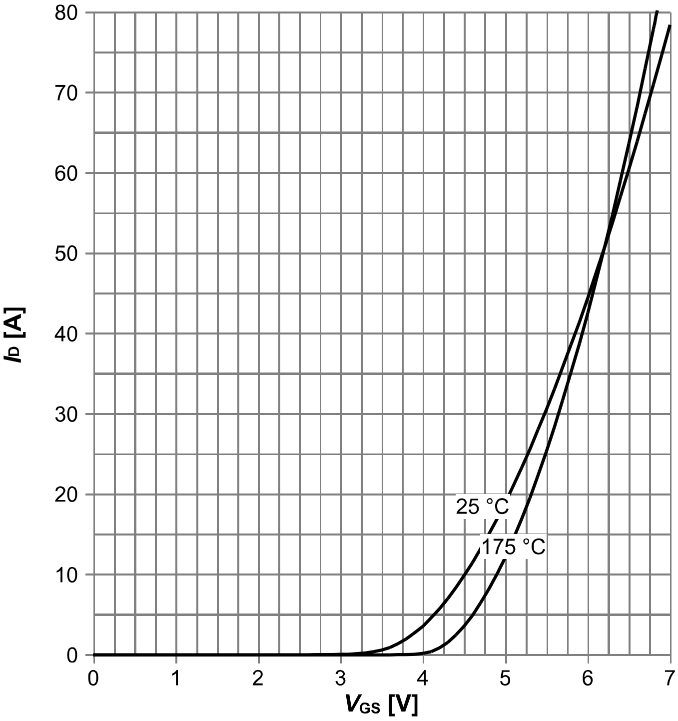
I_D=f(V_{DS}), T_j=25 °C; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



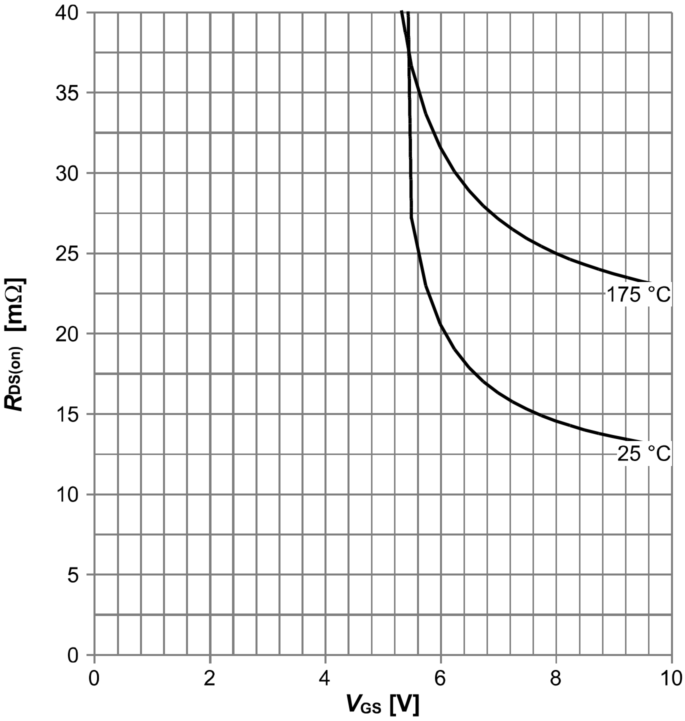
$R_{DS(on)}$=f(I_D), T_j=25 °C; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics



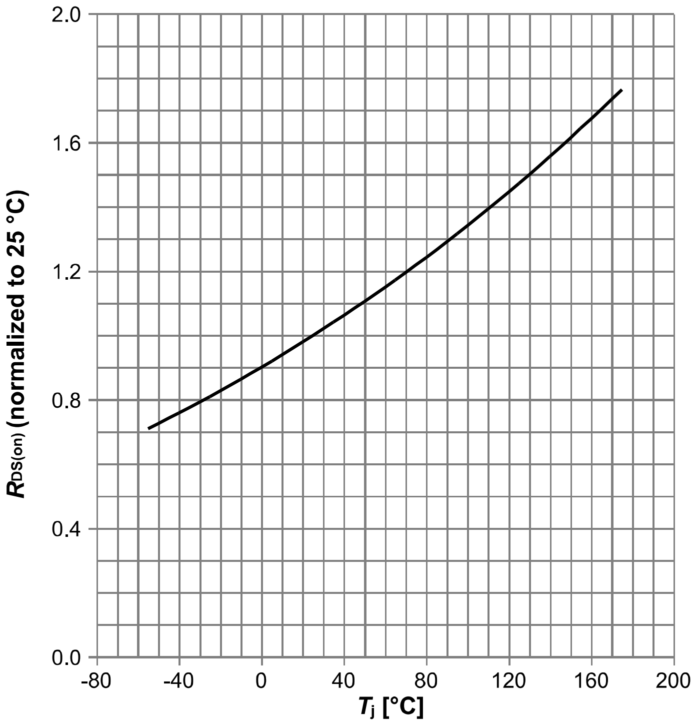
I_D=f(V_{GS}), |V_{DS}|>2|I_D|$R_{DS(on)max}$; parameter: T_j

Diagram 8: Typ. drain-source on resistance



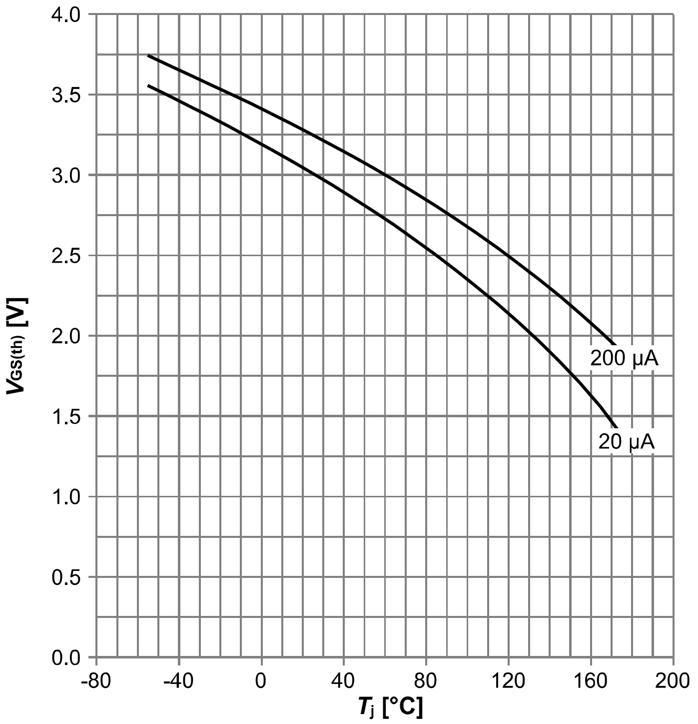
$R_{DS(on)}$=f(V_{GS}), I_D=17 A; parameter: T_j

Diagram 9: Normalized drain-source on resistance



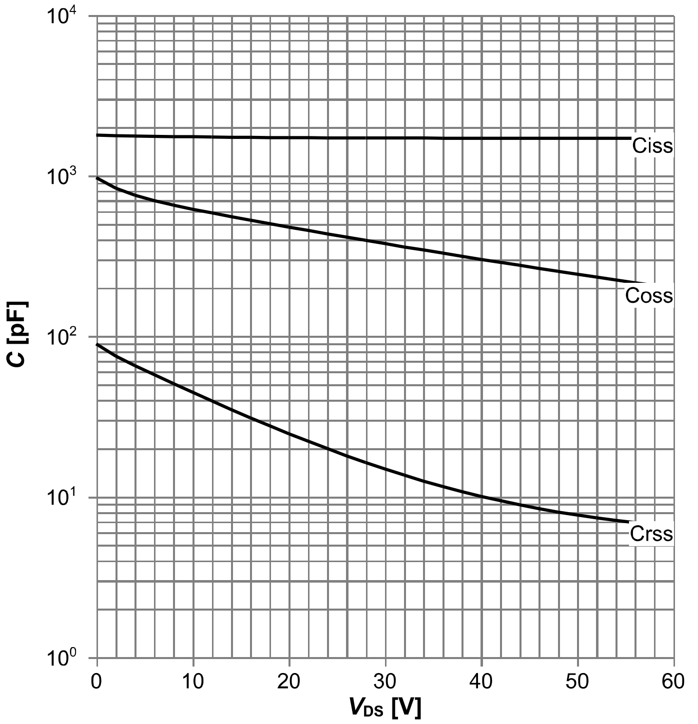
$R_{DS(on)}$=f(T_j), I_D=17 A, V_{GS}=10 V

Diagram 10: Typ. gate threshold voltage



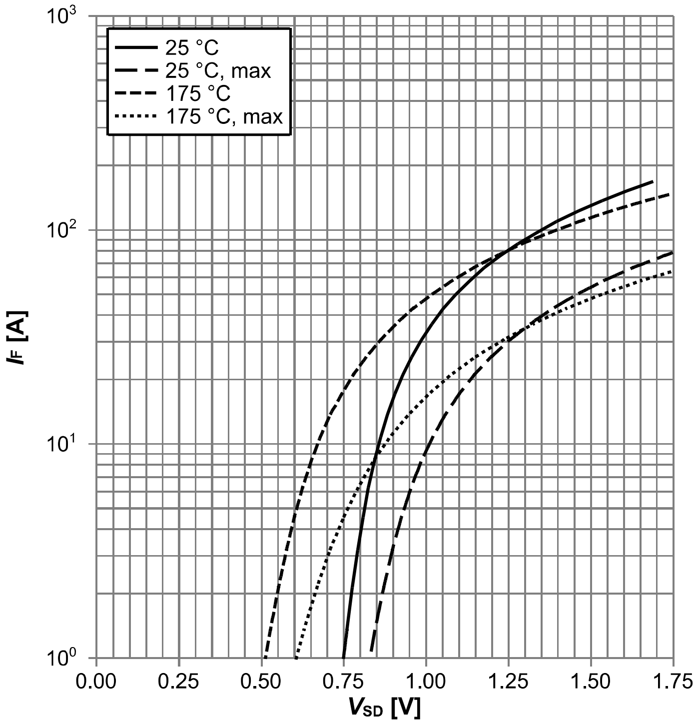
$V_{GS(th}$=f(T_j), V_{GS}=V_{DS}; parameter: I_D

Diagram 11: Typ. capacitances



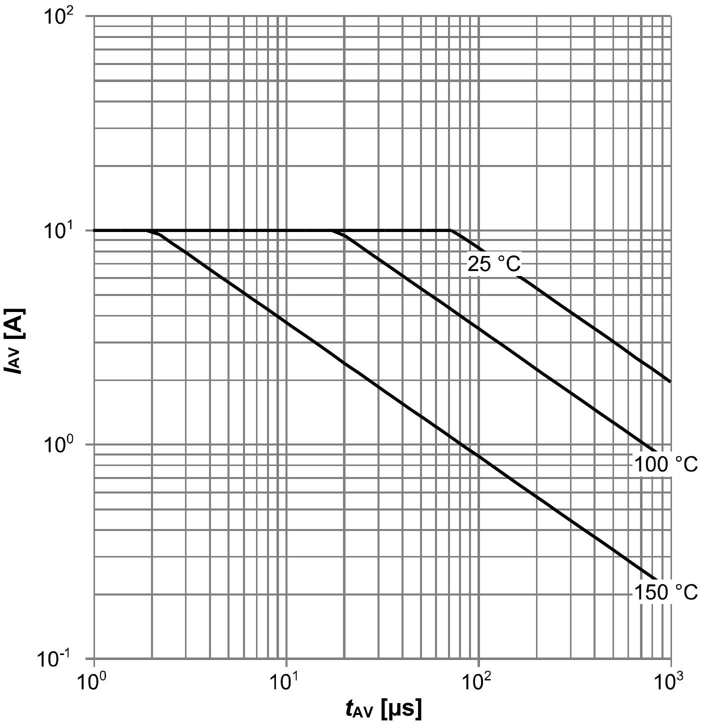
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz

Diagram 12: Forward characteristics of reverse diode



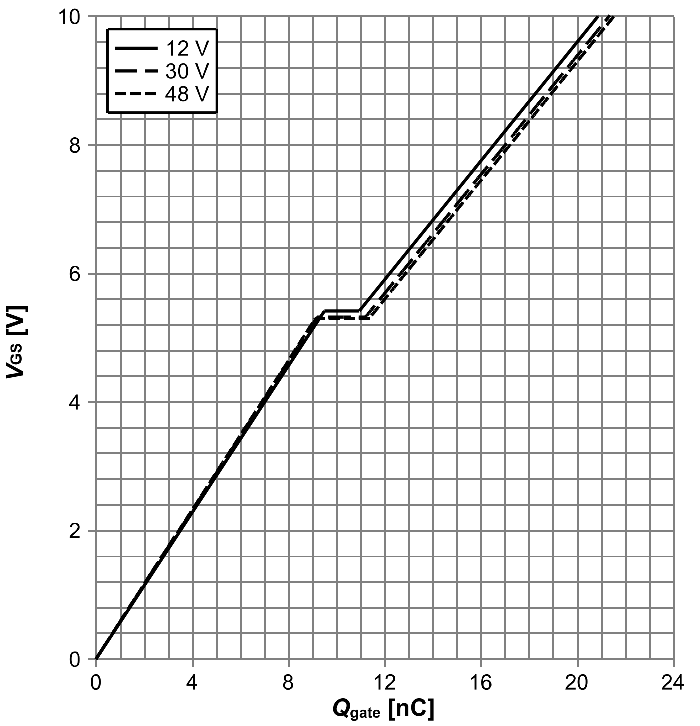
I_F=f(V_{SD}); parameter: T_j

Diagram 13: Avalanche characteristics



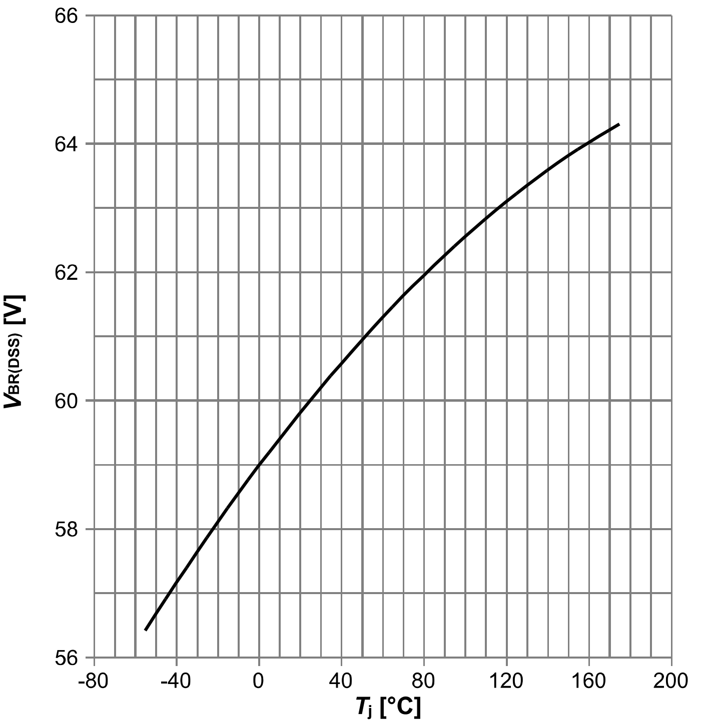
I_{AS}=f(t_{AV}); R_{GS}=25 Ω; parameter: $T_{j,start}$

Diagram 14: Typ. gate charge



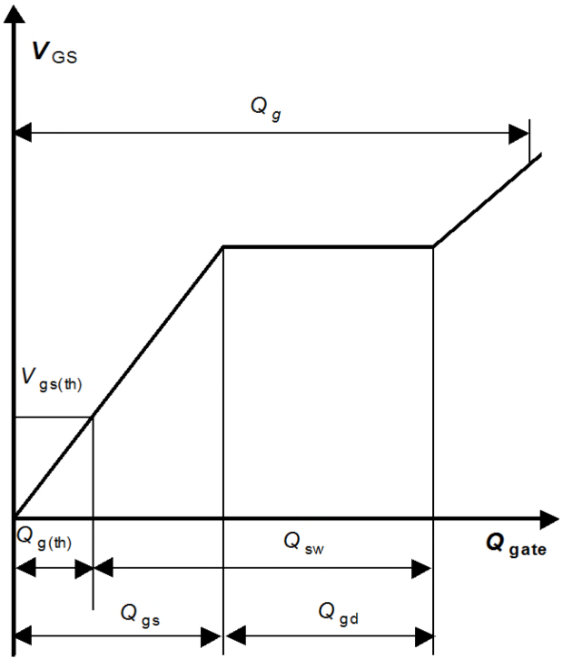
V_{GS}=f(Q_{gate}), I_D=20 A pulsed, T_j=25 °C; parameter: V_{DD}

Diagram 15: Drain-source breakdown voltage

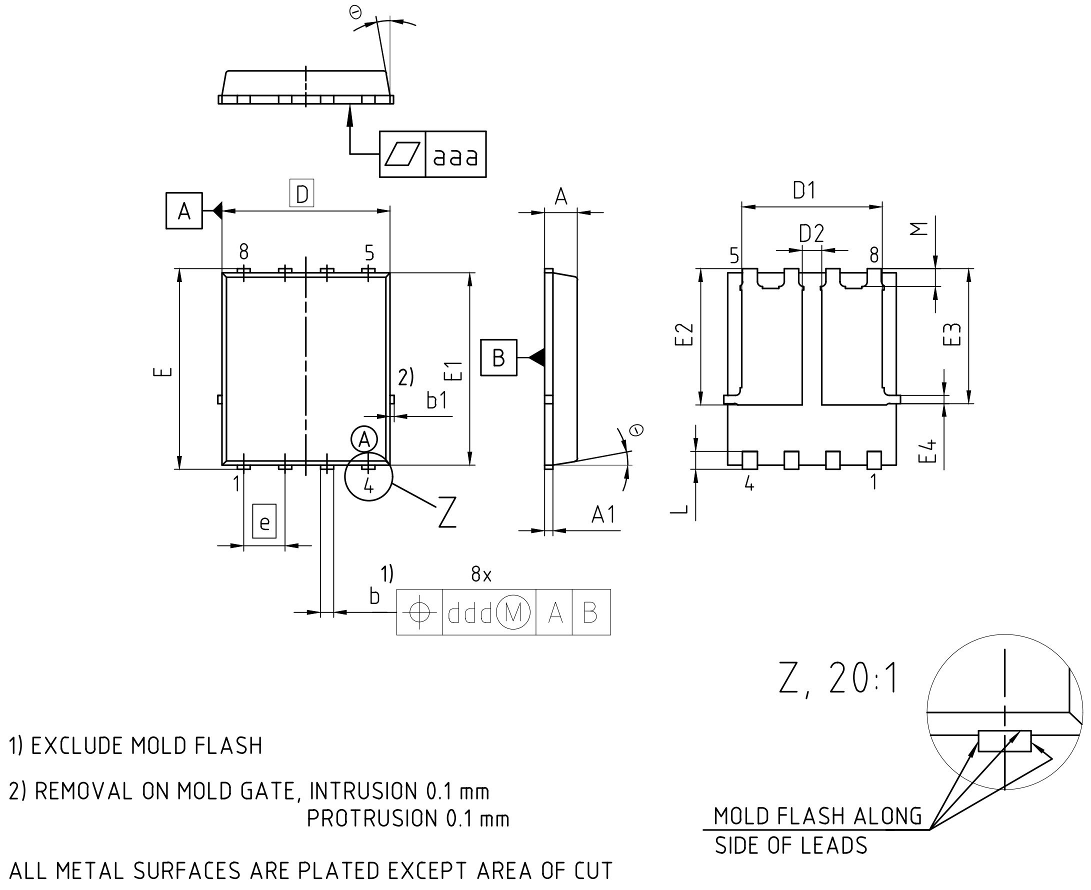


$V_{BR(DSS)}$=f(T_j); I_D=1 mA

Diagram Gate charge waveforms



5 Package Outlines



1) EXCLUDE MOLD FLASH

2) REMOVAL ON MOLD GATE, INTRUSION 0.1 mm
PROTRUSION 0.1 mm

ALL METAL SURFACES ARE PLATED EXCEPT AREA OF CUT

DIMENSIONS	MILLIMETERS	
	MIN.	MAX.
A	0.90	1.10
A1	0.15	0.35
b	0.34	0.54
b1	0.02	0.22
D	4.95	5.35
D1	4.20	4.40
D2	0.50	0.70
E	5.95	6.35
E1	5.70	6.10
E2	4.075	4.275
E3	4.035	4.235
E4	0.15	0.35
e	1.27	
L	0.45	0.65
M	0.45	0.65
Θ	8.5°	11.5°
aaa	0.05	
ddd	0.10	

DOCUMENT NO. Z8B00189767
REVISION 01
SCALE 5:1 0 1 2 3 4mm
EUROPEAN PROJECTION
ISSUE DATE 31.07.2018

Figure 1 Outline PG-TDSON-8-4, dimensions in mm

Revision History

BSC155N06ND

Revision: 2021-06-28, Rev. 2.1

Previous Revision

Revision	Date	Subjects (major changes since last revision)
2.0	2018-12-11	Release of final version
2.1	2021-06-28	Update current rating and footnotes

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 (“Beschaffenheitsgarantie”) .

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, 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.
In addition, any information given in this document is subject to customer’s compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer’s products and any use of the product of Infineon Technologies in customer’s applications.
The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer’s technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

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.