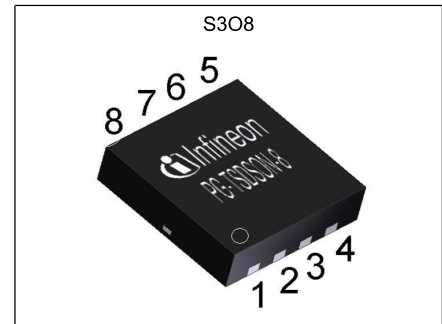


## MOSFET

### OptiMOS™3 Power-Transistor, 100 V

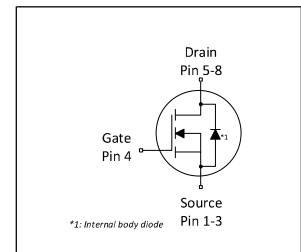
#### Features

- Ideal for high frequency switching
- Optimized technology for DC/DC converters
- Excellent gate charge x  $R_{DS(on)}$  product (FOM)
- N-channel, Logic level
- 100% avalanche tested
- Pb-free plating; RoHS compliant
- Qualified according to JEDEC<sup>1)</sup> for target applications
- Halogen-free according to IEC61249-2-21



**Table 1 Key Performance Parameters**

Parameter	Value	Unit
$V_{DS}$	100	V
$R_{DS(on),max}$	15	$m\Omega$
$I_D$	47	A



RoHS

Type / Ordering Code	Package	Marking	Related Links
BSZ150N10LS3 G	PG-TSDSON-8	150N10L	-

<sup>1)</sup> J-STD20 and JESD22

## Table of Contents

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## 1 Maximum ratings

at  $T_A=25\text{ °C}$ , unless otherwise specified

**Table 2 Maximum ratings**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current <sup>1)</sup>	$I_D$	-	-	47 30 8	A	$V_{GS}=10\text{ V}$ , $T_C=25\text{ °C}$ $V_{GS}=10\text{ V}$ , $T_C=100\text{ °C}$ $V_{GS}=10\text{ V}$ , $T_A=25\text{ °C}$ , $R_{thJA}=60\text{ K/W}^2)$
Pulsed drain current <sup>3)</sup>	$I_{D,pulse}$	-	-	188	A	$T_C=25\text{ °C}$
Avalanche energy, single pulse <sup>4)</sup>	$E_{AS}$	-	-	80	mJ	$I_D=20\text{ A}$ , $R_{GS}=25\text{ }\Omega$
Gate source voltage	$V_{GS}$	-20	-	20	V	-
Power dissipation	$P_{tot}$	-	-	63 2.1	W	$T_C=25\text{ °C}$ $T_A=25\text{ °C}$ , $R_{thJA}=60\text{ K/W}^2)$
Operating and storage temperature	$T_j$ , $T_{stg}$	-55	-	150	°C	IEC climatic category; DIN IEC 68-1: 55/150/56

## 2 Thermal characteristics

**Table 3 Thermal characteristics**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	$R_{thJC}$	-	-	2	K/W	-
Device on PCB, minimal footprint	$R_{thJA}$	-	-	62	K/W	-
Device on PCB, 6 cm <sup>2</sup> cooling area <sup>2)</sup>	$R_{thJA}$	-	-	60	K/W	-

<sup>1)</sup> 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.

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

<sup>3)</sup> See figure 3 for more detailed information

<sup>4)</sup> See figure 13 for more detailed information

### 3 Electrical characteristics

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

**Table 4 Static characteristics**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	100	-	-	V	$V_{GS}=0\text{ V}$ , $I_D=1\text{ mA}$
Gate threshold voltage	$V_{GS(th)}$	1.1	1.7	2.1	V	$V_{DS}=V_{GS}$ , $I_D=33\text{ }\mu\text{A}$
Zero gate voltage drain current	$I_{DSS}$	-	0.1 10	1 100	$\mu\text{A}$	$V_{DS}=100\text{ V}$ , $V_{GS}=0\text{ V}$ , $T_j=25\text{ °C}$ $V_{DS}=100\text{ V}$ , $V_{GS}=0\text{ V}$ , $T_j=125\text{ °C}$
Gate-source leakage current	$I_{GSS}$	-	10	100	nA	$V_{GS}=20\text{ V}$ , $V_{DS}=0\text{ V}$
Drain-source on-state resistance	$R_{DS(on)}$	-	16 13	20 15	$\text{m}\Omega$	$V_{GS}=4.5\text{ V}$ , $I_D=20\text{ A}$ $V_{GS}=10\text{ V}$ , $I_D=20\text{ A}$
Gate resistance	$R_G$	-	1.2	-	$\Omega$	-
Transconductance	$g_{fs}$	21	42	-	S	$ V_{DS} >2 I_D /R_{DS(on)max}$ , $I_D=20\text{ A}$

**Table 5 Dynamic characteristics**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance <sup>1)</sup>	$C_{iss}$	-	1900	2500	pF	$V_{GS}=0\text{ V}$ , $V_{DS}=50\text{ V}$ , $f=1\text{ MHz}$
Output capacitance <sup>1)</sup>	$C_{oss}$	-	280	370	pF	$V_{GS}=0\text{ V}$ , $V_{DS}=50\text{ V}$ , $f=1\text{ MHz}$
Reverse transfer capacitance	$C_{rss}$	-	12	-	pF	$V_{GS}=0\text{ V}$ , $V_{DS}=50\text{ V}$ , $f=1\text{ MHz}$
Turn-on delay time	$t_{d(on)}$	-	8.1	-	ns	$V_{DD}=50\text{ V}$ , $V_{GS}=10\text{ V}$ , $I_D=10\text{ A}$ , $R_{G,ext}=1.6\text{ }\Omega$
Rise time	$t_r$	-	4.6	-	ns	$V_{DD}=50\text{ V}$ , $V_{GS}=10\text{ V}$ , $I_D=10\text{ A}$ , $R_{G,ext}=1.6\text{ }\Omega$
Turn-off delay time	$t_{d(off)}$	-	23.4	-	ns	$V_{DD}=50\text{ V}$ , $V_{GS}=10\text{ V}$ , $I_D=10\text{ A}$ , $R_{G,ext}=1.6\text{ }\Omega$
Fall time	$t_f$	-	3.9	-	ns	$V_{DD}=50\text{ V}$ , $V_{GS}=10\text{ V}$ , $I_D=10\text{ A}$ , $R_{G,ext}=1.6\text{ }\Omega$

**Table 6 Gate charge characteristics<sup>2)</sup>**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	$Q_{gs}$	-	5.2	-	nC	$V_{DD}=50\text{ V}$ , $I_D=10\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$
Gate charge at threshold	$Q_{g(th)}$	-	2.7	-	nC	$V_{DD}=50\text{ V}$ , $I_D=10\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$
Gate to drain charge	$Q_{gd}$	-	4.1	-	nC	$V_{DD}=50\text{ V}$ , $I_D=10\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$
Switching charge	$Q_{sw}$	-	7.7	-	nC	$V_{DD}=50\text{ V}$ , $I_D=10\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$
Gate charge total <sup>1)</sup>	$Q_g$	-	26	35	nC	$V_{DD}=50\text{ V}$ , $I_D=10\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$
Gate plateau voltage	$V_{plateau}$	-	2.7	-	V	$V_{DD}=50\text{ V}$ , $I_D=10\text{ A}$ , $V_{GS}=0\text{ to }10\text{ V}$
Output charge <sup>1)</sup>	$Q_{oss}$	-	28	37	nC	$V_{DD}=50\text{ V}$ , $V_{GS}=0\text{ V}$

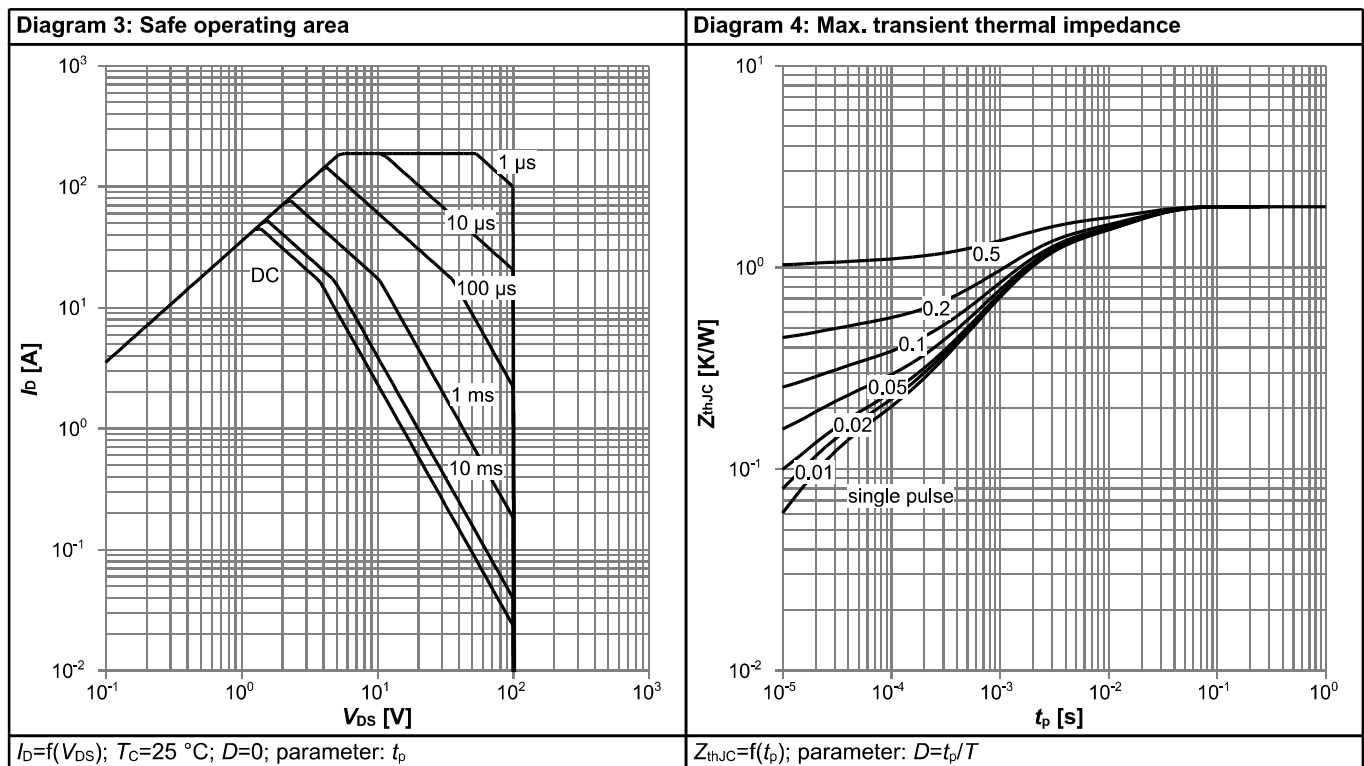
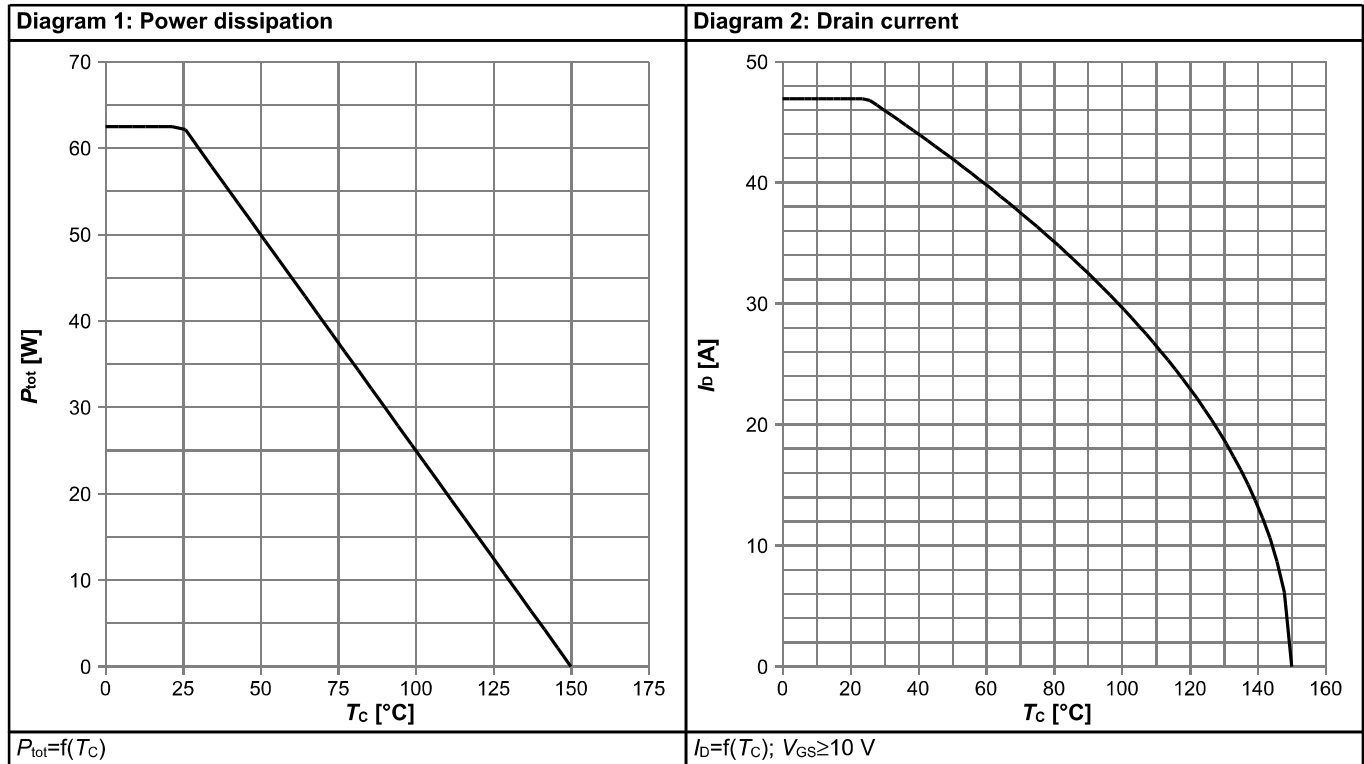
<sup>1)</sup> Defined by design. Not subjected to production test

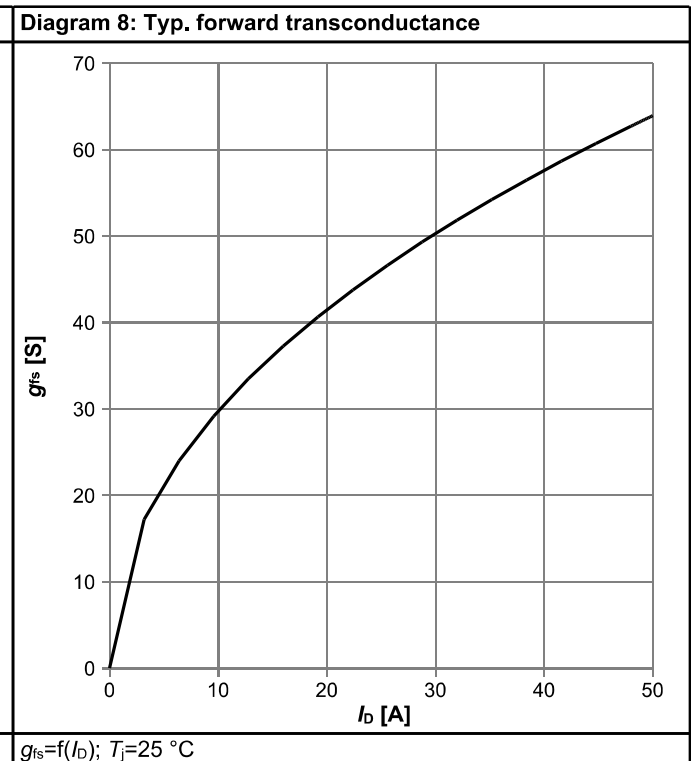
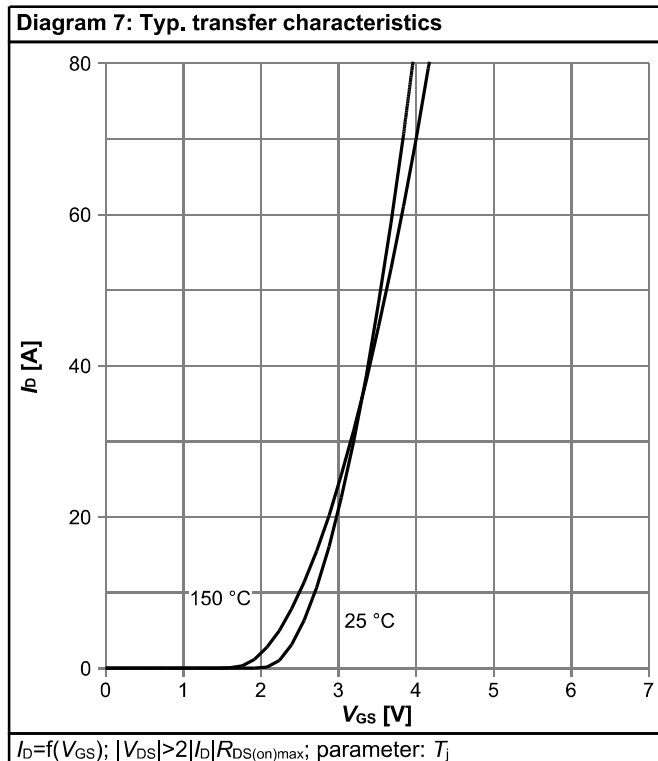
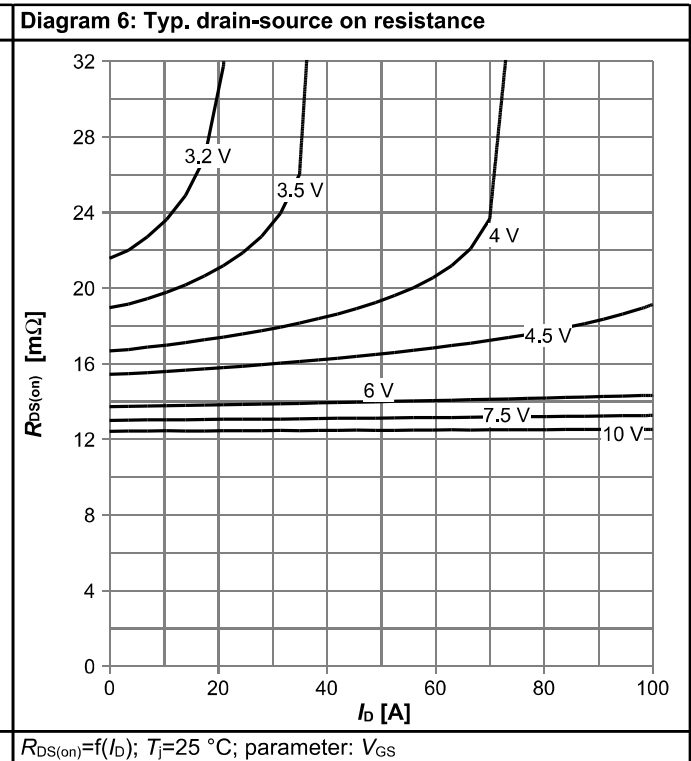
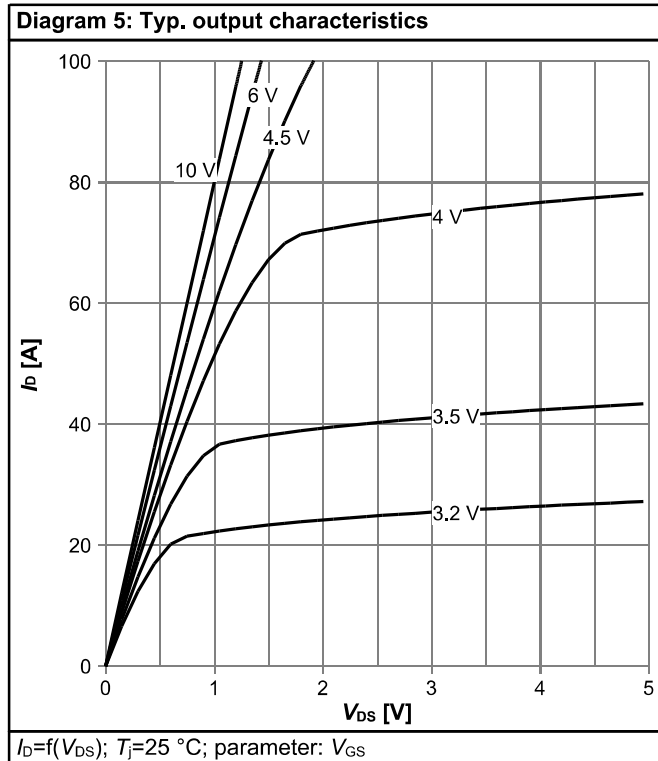
<sup>2)</sup> See "Gate charge waveforms" for parameter definition.

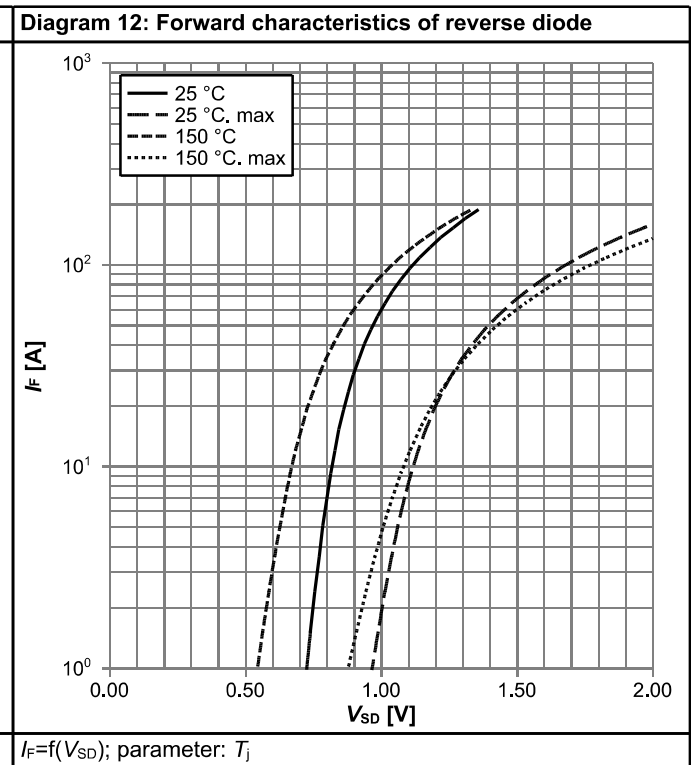
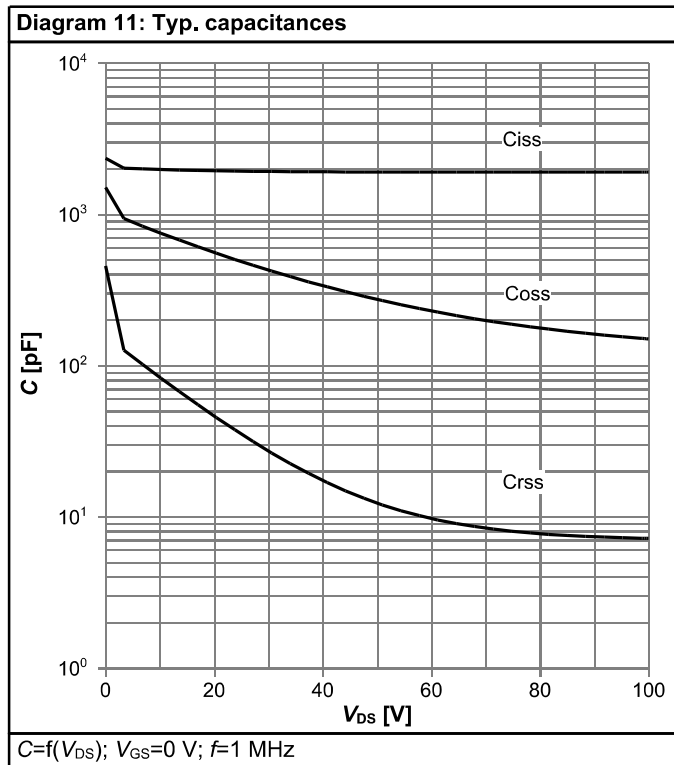
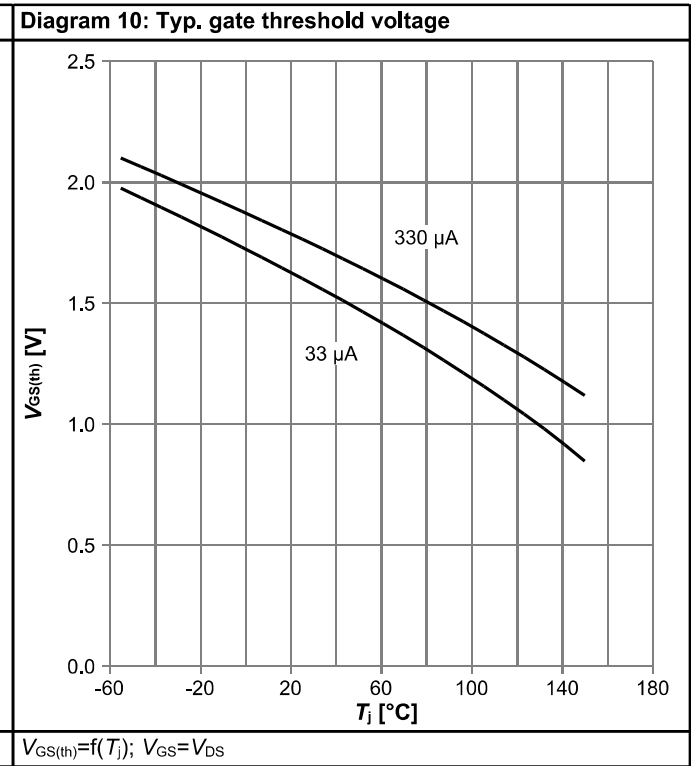
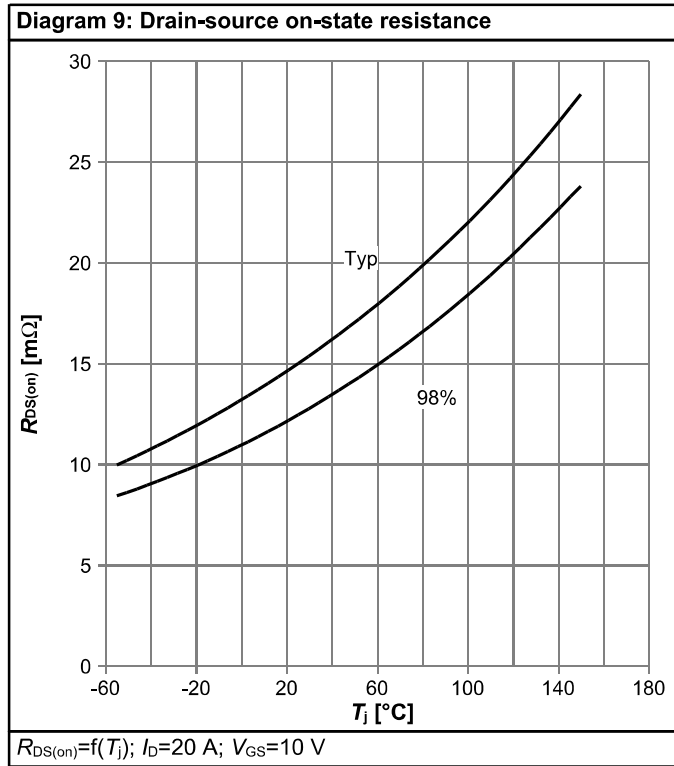
**Table 7 Reverse diode**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continuous forward current	$I_S$	-	-	45	A	$T_C=25\text{ °C}$
Diode pulse current	$I_{S,pulse}$	-	-	188	A	$T_C=25\text{ °C}$
Diode forward voltage	$V_{SD}$	-	0.87	1.2	V	$V_{GS}=0\text{ V}, I_F=20\text{ A}, T_j=25\text{ °C}$
Reverse recovery time	$t_{rr}$	-	53	-	ns	$V_R=50\text{ V}, I_F=10\text{ A}, di_F/dt=100\text{ A}/\mu\text{s}$
Reverse recovery charge	$Q_{rr}$	-	84	-	nC	$V_R=50\text{ V}, I_F=10\text{ A}, di_F/dt=100\text{ A}/\mu\text{s}$

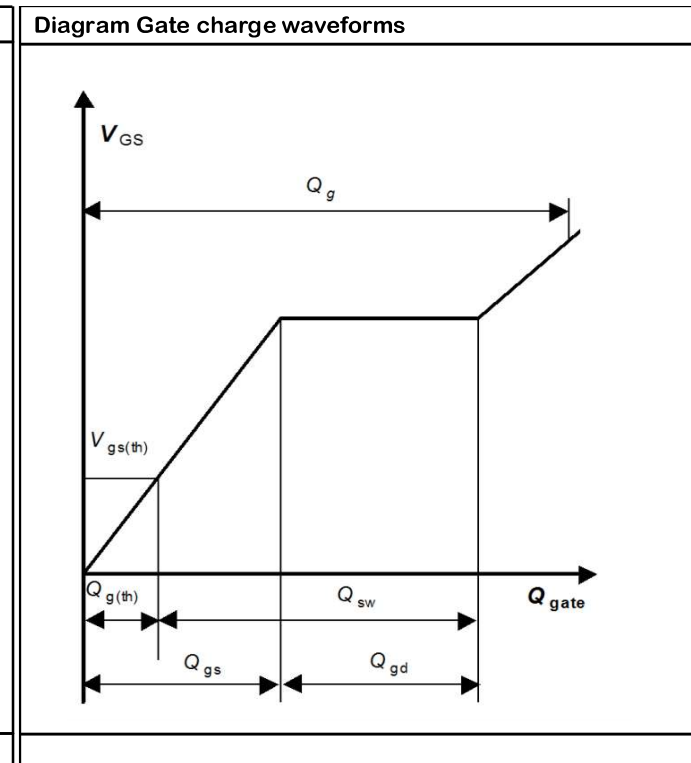
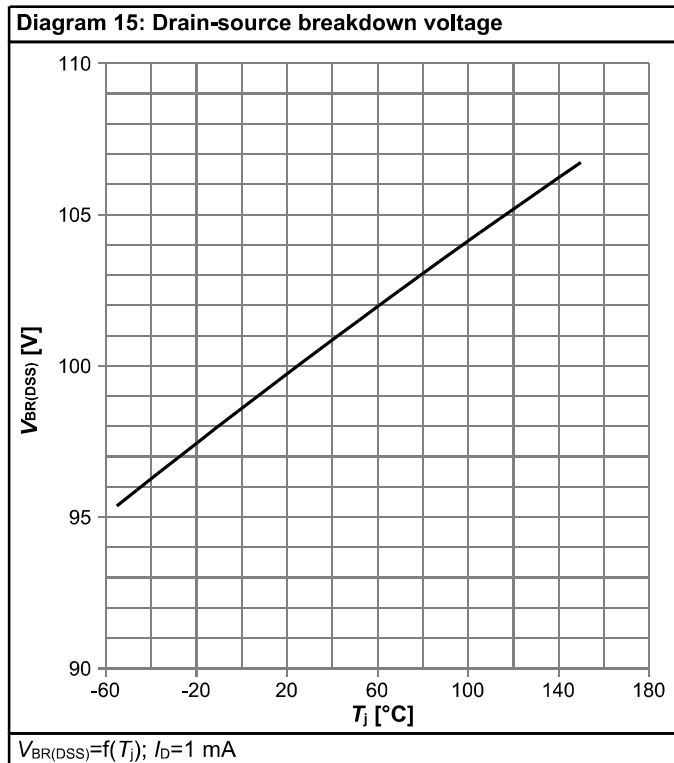
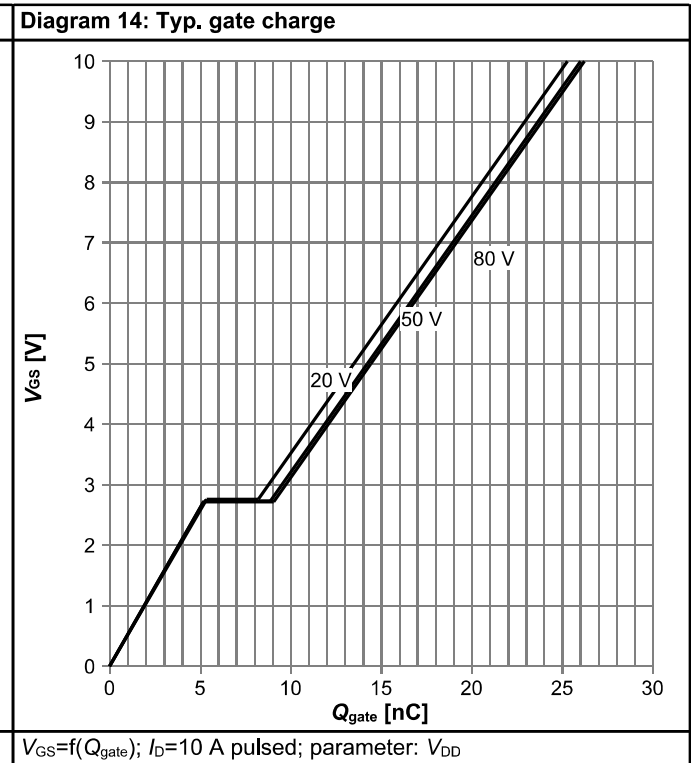
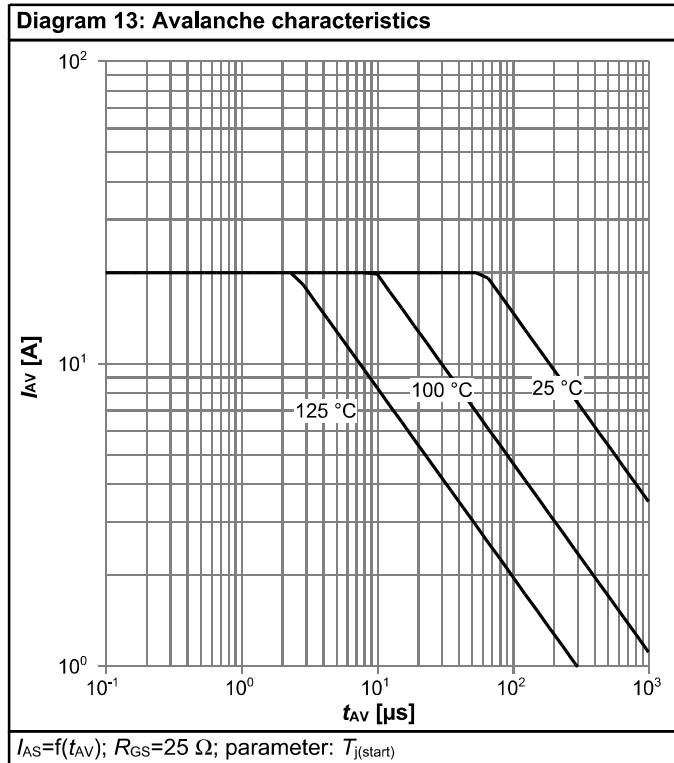
## 4 Electrical characteristics diagrams



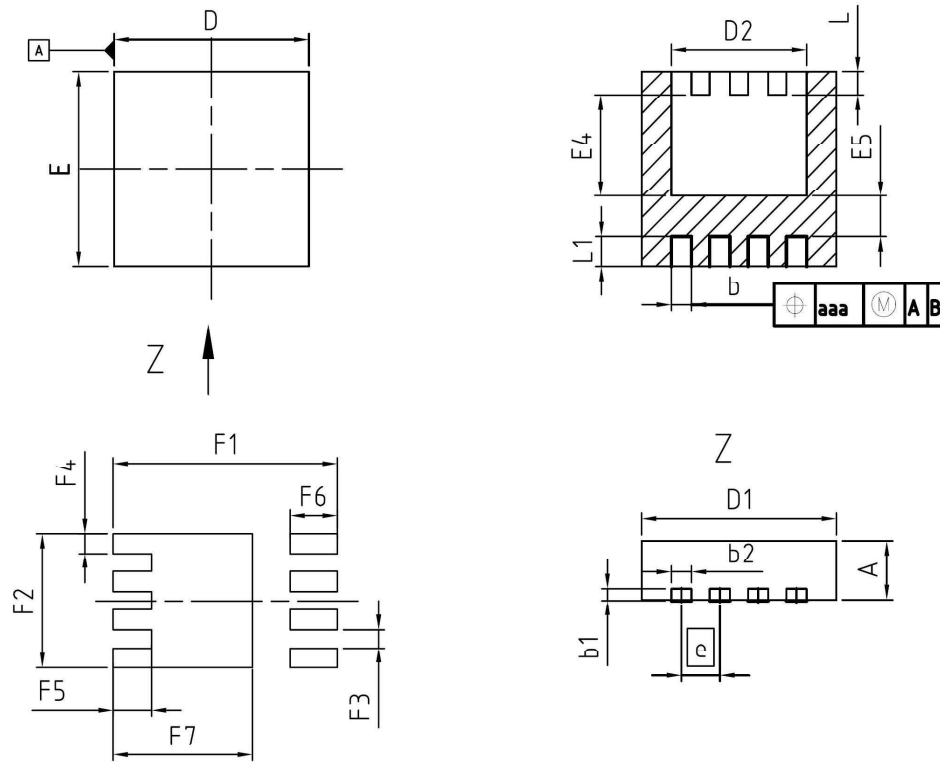








## 5 Package Outlines



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.10	0.035	0.043
b	0.24	0.44	0.009	0.017
b1	0.10	0.30	0.004	0.012
b2	0.20	0.44	0.008	0.017
D=D1	3.20	3.40	0.126	0.134
D2	2.15	2.45	0.085	0.096
E	3.20	3.40	0.126	0.134
E4	1.60	1.81	0.063	0.071
E5	0.59	0.86	0.023	0.034
e	0.65		0.026	
N	8		8	
L	0.30	0.56	0.012	0.022
L1	0.33	0.60	0.013	0.024
aaa	0.25		0.010	
F1	3.80		0.150	
F2	2.29		0.090	
F3	0.31		0.012	
F4	0.34		0.013	
F5	0.65		0.026	
F6	0.80		0.031	
F7	2.36		0.093	

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SCALE

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REVISION  
02

Figure 1 Outline PG-TSDSON-8, dimensions in mm/inches

## Revision History

BSZ150N10LS3 G

**Revision: 2022-01-26, Rev. 2.4**

Previous Revision

Revision	Date	Subjects (major changes since last revision)
2.3	2021-03-16	Update Id Max current rating
2.4	2022-01-26	Update switching symbol and footnotes

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