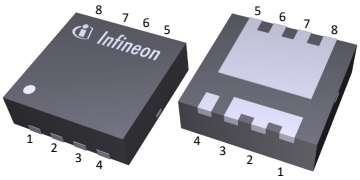
MOSFET

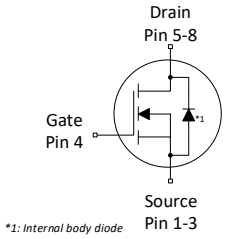
OptiMOS™ 6 Power-Transistor, 60 V

PG-TSDSON-8 FL



Features

- Optimized for low voltage drives and battery powered applications
- Optimized for high performance SMPS
- N-channel, normal level
- Very low on-resistance $R_{DS(on)}$
- Superior thermal resistance
- 100% avalanche tested
- Pb-free lead plating; RoHS compliant
- Halogen-free according to IEC61249-2-21



Product validation

Qualified for industrial applications according to the relevant tests of JEDEC JESD47, JESD22 and J-STD-020.

Table 1 Key performance parameters

Parameter	Value	Unit
V_{DS}	60	V
$R_{DS(on),max}$	2.5	mΩ
I_D	137	A
Q_{oss}	48	nC
Q_G	32	nC
Q_{rr} (1000A/µs)	101	nC

Part number	Package	Marking	Related links
ISZ025N06NM6	PG-TSDSON-8	025N6N6	-

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Table of contents

Description 1
Maximum ratings 3
Thermal characteristics 4
Electrical characteristics 5
Electrical characteristics diagrams 7
Package outlines 11
Revision history 12
Trademarks 13
Disclaimer 13

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1 Maximum ratings

at T_A=25 °C, unless otherwise specified

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Continuous drain current [1]	I_D	-	-	137	A	V_{GS}=10 V, T_C=25 °C
				97		V_{GS}=10 V, T_C=100 °C
				86		V_{GS}=8 V, T_C=100 °C
				22		V_{GS}=10V, T_A=25°C, R_{thJA}=60°C/W [2]
Pulsed drain current [3]	$I_{D,pulse}$	-	-	548	A	T_C=25 °C
Avalanche energy, single pulse [4]	E_{AS}	-	-	148	mJ	I_D=20 A, R_{GS}=25 Ω
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	-	-	100	W	T_C=25 °C
				2.5		T_A=25 °C, R_{THJA}=60 °C/W [2]
Operating and storage temperature	T_j, T_{stg}	-55	-	175	°C	-

[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] 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.

[3] See Diagram 3 for more detailed information

[4] See Diagram 13 for more detailed information

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2 Thermal characteristics

Table 3 Thermal characteristics

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}	-	0.75	1.5	°C/W	-
Thermal resistance, junction - ambient, 6 cm² cooling area [5)]	R_{thJA}		-	60		

5) 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.

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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	$V_{GS(th)}$	2.1	2.7	3.3	V	V_{DS}=V_{GS}, I_D=38 µA
Zero gate voltage drain current	I_{DSS}	-	0.1	1.0	µA	V_{DS}=48 V, V_{GS}=0 V, T_j=25 °C
			10	100		V_{DS}=48 V, V_{GS}=0 V, T_j=125 °C
Gate-source leakage current	I_{GSS}	-	10	100	nA	V_{GS}=20 V, V_{DS}=0 V
Drain-source on-state resistance	$R_{DS(on)}$	-	2.0	2.5	mΩ	V_{GS}=10 V, I_D=20 A
Drain-source on-state resistance [6]	$R_{DS(on)}$	-	2.3	3.2	mΩ	V_{GS}=8 V, I_D=10 A
Gate resistance	R_G	-	0.75	-	Ω	-
Transconductance [6]	g_{fs}	42	83	-	S	$\|V_{DS}\|\geq 2\|I_D\|R_{DS(on)max}$, I_D=20 A

[6] Defined by design. Not subject to production test.

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Input capacitance [7]	C_{iss}	-	2100	2700	pF	V_{GS}=0 V, V_{DS}=30 V, f=1 MHz
Output capacitance [7]	C_{oss}		770	1000		
Reverse transfer capacitance [7]	C_{rss}		31	54		
Turn-on delay time	$t_{d(on)}$	-	7.2	-	ns	V_{DD}=30 V, V_{GS}=10 V, I_D=20 A, $R_{G,ext}$=1.6 Ω
Rise time	t_r		1.5			
Turn-off delay time	$t_{d(off)}$		14.2			
Fall time	t_f		3.3			

[7] Defined by design. Not subject to production test.

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Table 6 Gate charge characteristics [8]

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	9.1	-	nC	V_{DD}=30 V, I_D=20 A, V_{GS}=0 to 10 V
Gate charge at threshold	$Q_{g(th)}$		5.6	-	nC	
Gate to drain charge [9]	Q_{gd}		6.9	10.4	nC	
Switching charge	Q_{sw}		10.4	-	nC	
Gate charge total [9]	Q_g		32	40.0	nC	
Gate plateau voltage	$V_{plateau}$		4.4	-	V	
Output charge [9]	Q_{oss}	-	48	64	nC	V_{DS}=30 V, V_{GS}=0 V

[8] See "Gate charge waveforms" for parameter definition

[9] Defined by design. Not subject to production test.

Table 7 Reverse diode

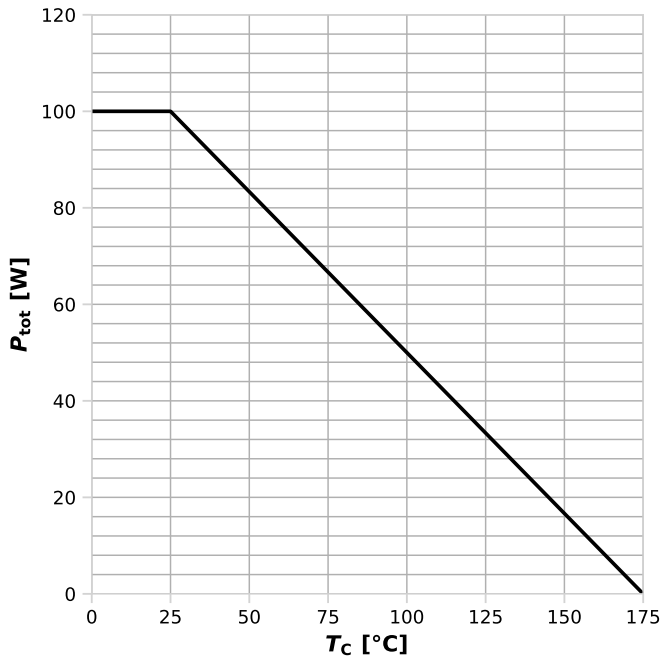
Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Diode continuous forward current	I_S	-	-	91	A	T_C=25 °C
Diode pulse current	$I_{S,pulse}$			548		
Diode forward voltage	V_{SD}	-	0.79	1.0	V	V_{GS}=0 V, I_F=20 A, T_j=25 °C
Reverse recovery time [10]	t_{rr}	-	26	52	ns	V_R=30 V, I_F=20 A, di_F/dt=100 A/µs
Reverse recovery charge [10]	Q_{rr}		18	36	nC	
Reverse recovery time [10]	t_{rr}	-	17	34	ns	V_R=30 V, I_F=20 A, di_F/dt=1000 A/µs
Reverse recovery charge [10]	Q_{rr}		101	202	nC	

[10] Defined by design. Not subject to production test.

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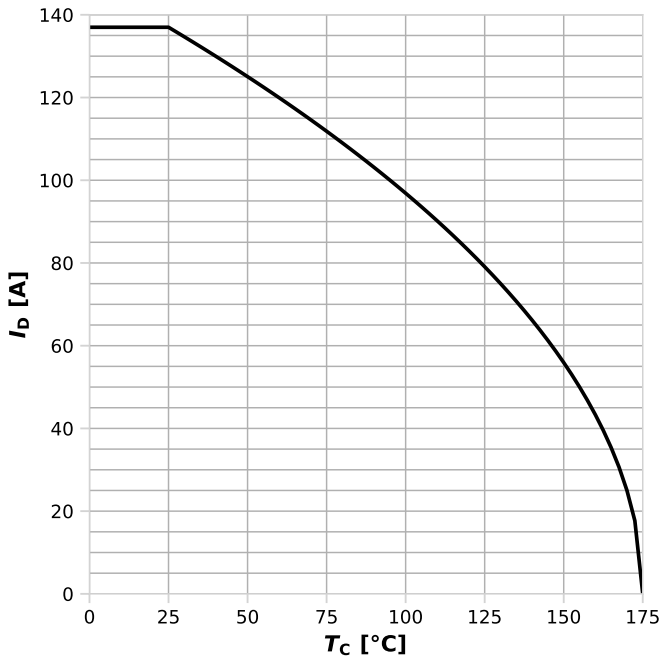
4 Electrical characteristics diagrams

Diagram 1: Power dissipation



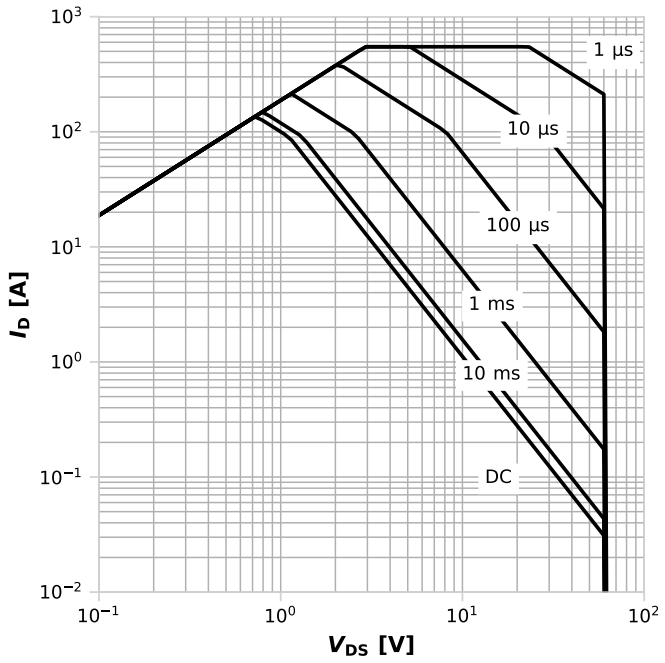
P_{tot}=f(T_C)

Diagram 2: Drain current



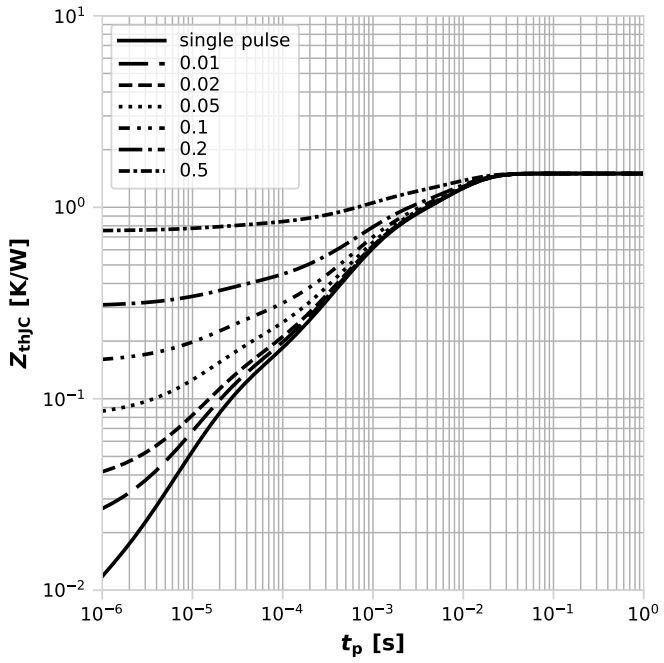
I_D=f(T_C); V_{GS}≥10 V

Diagram 3: Safe operating area



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

Diagram 4: Max. transient thermal impedance



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

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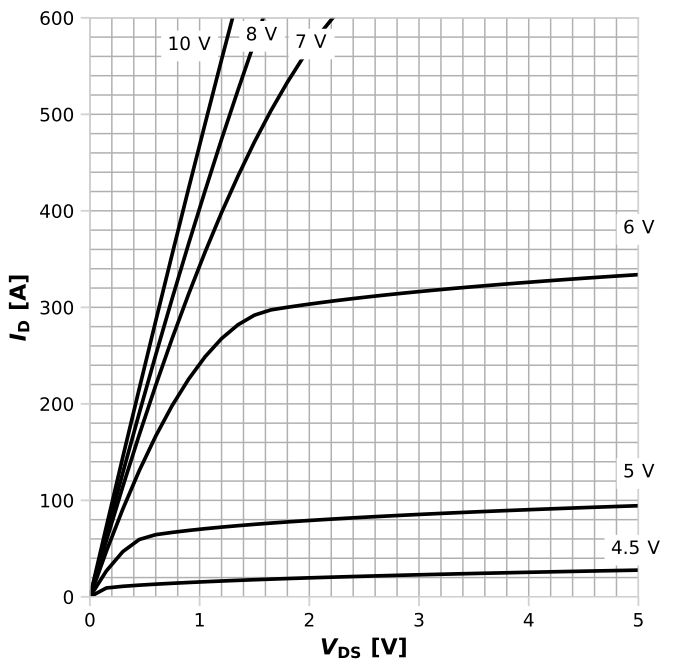
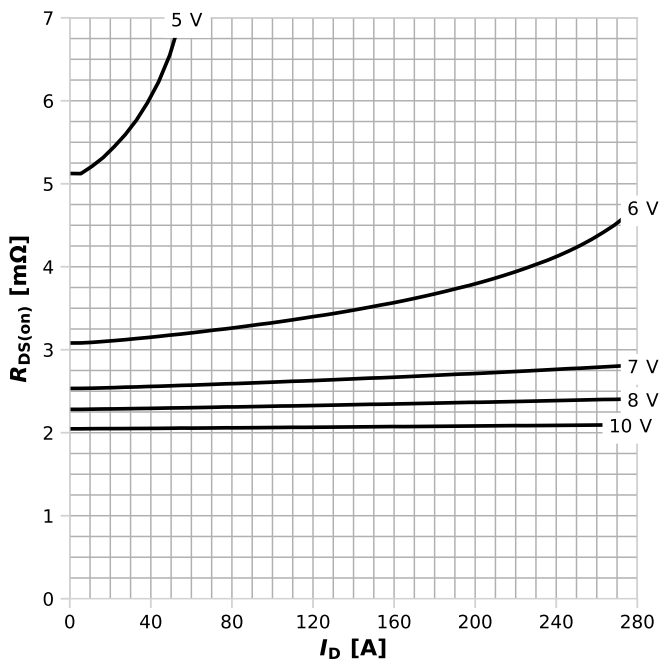
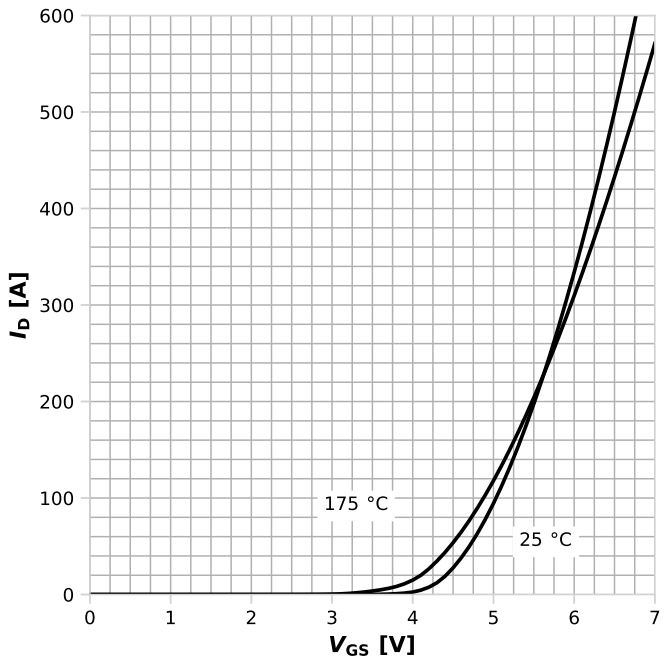
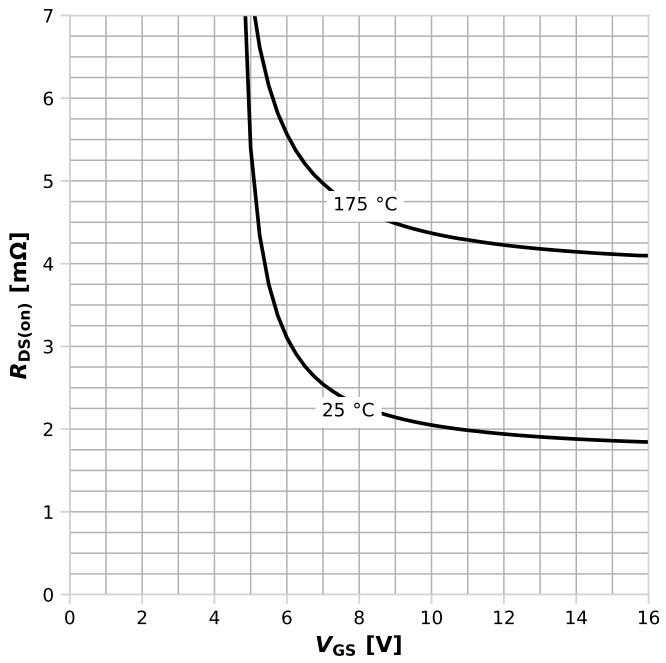
Diagram 5: Typ. output characteristics	Diagram 6: Typ. drain-source on resistance
	
$I_D=f(V_{DS})$, T_j=25 °C; parameter: V_{GS}	$R_{DS(on)}=f(I_D)$, T_j=25 °C; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics	Diagram 8: Typ. drain-source on resistance
	
$I_D=f(V_{GS})$, $\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$; parameter: T_j	$R_{DS(on)}=f(V_{GS})$, I_D=20 A; parameter: T_j

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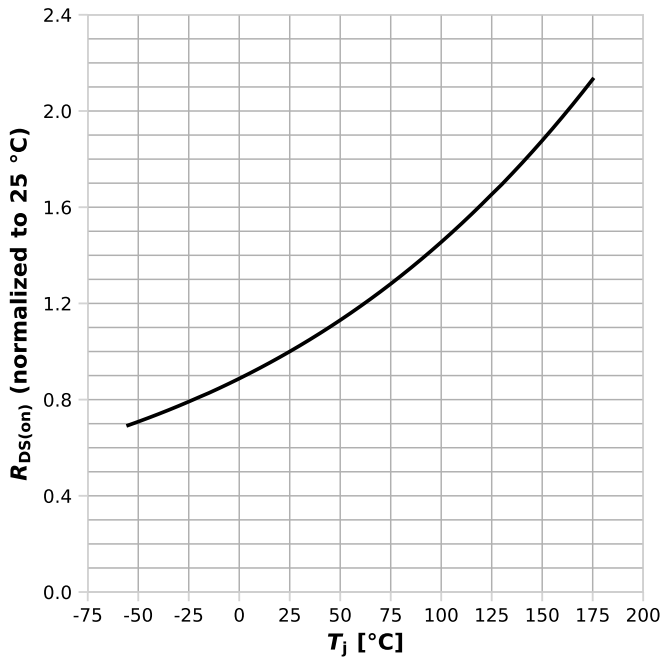
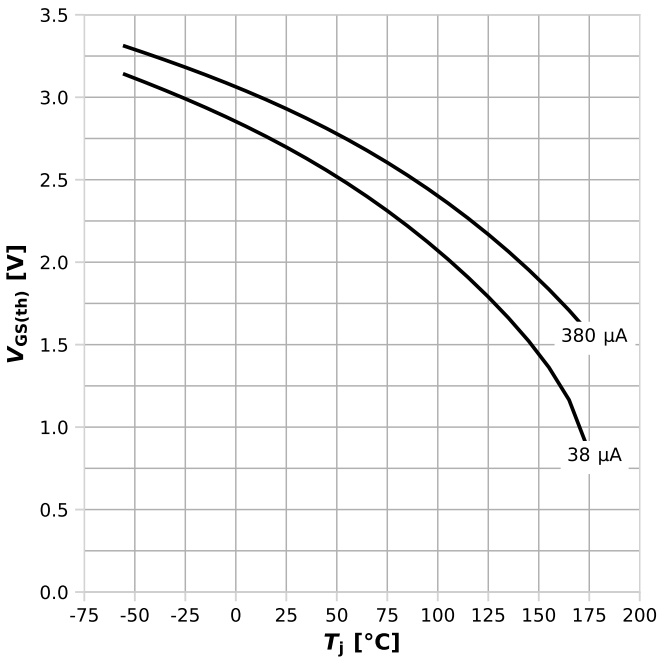
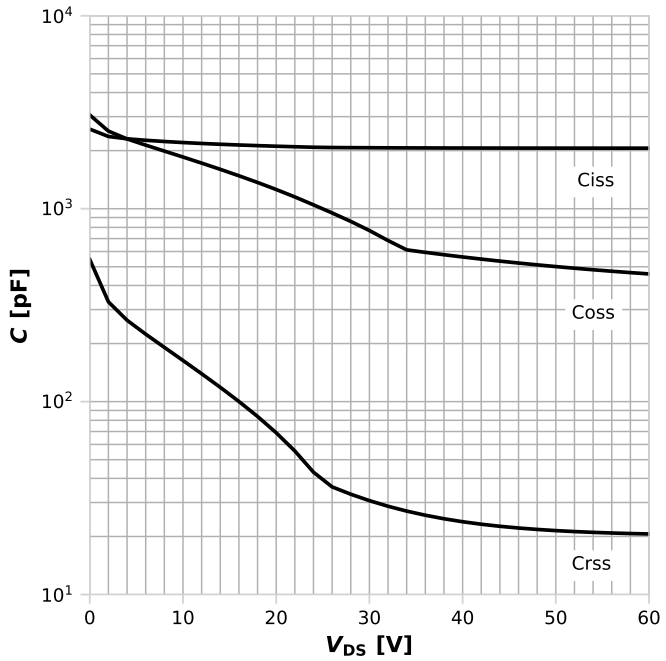
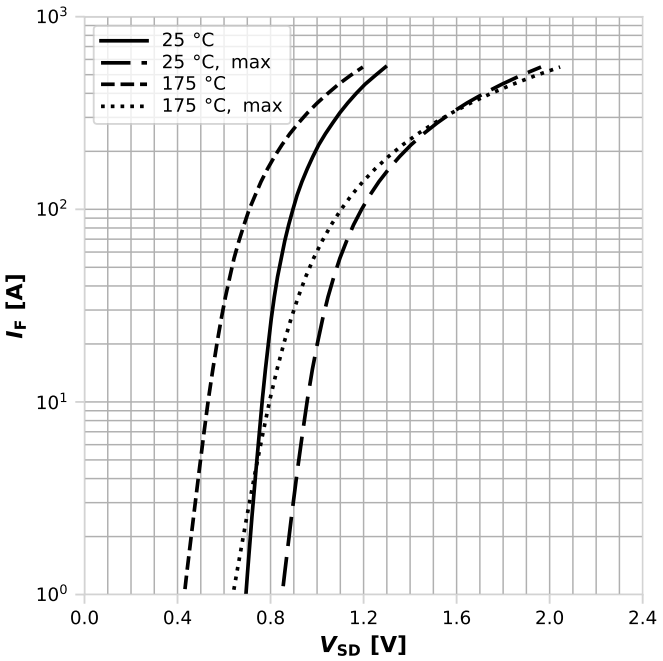
Diagram 9: Normalized drain-source on resistance	Diagram 10: Typ. gate threshold voltage
	
$R_{DS(on)}$=f(T_j), I_D=20 A, V_{GS}=10 V	$V_{GS(th)}$=f(T_j), V_{GS}=V_{DS}; parameter: I_D

Diagram 11: Typ. capacitances	Diagram 12: Forward characteristics of reverse diode
	
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz	I_F=f(V_{SD}); parameter: T_j

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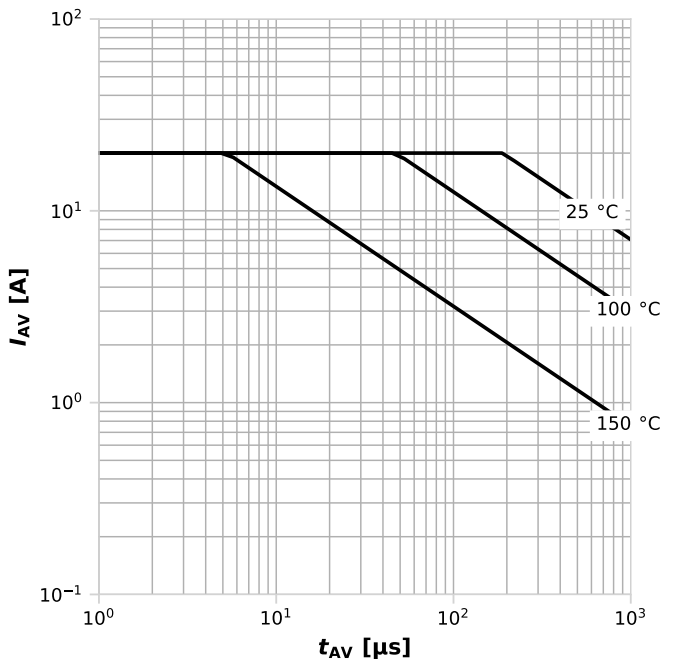
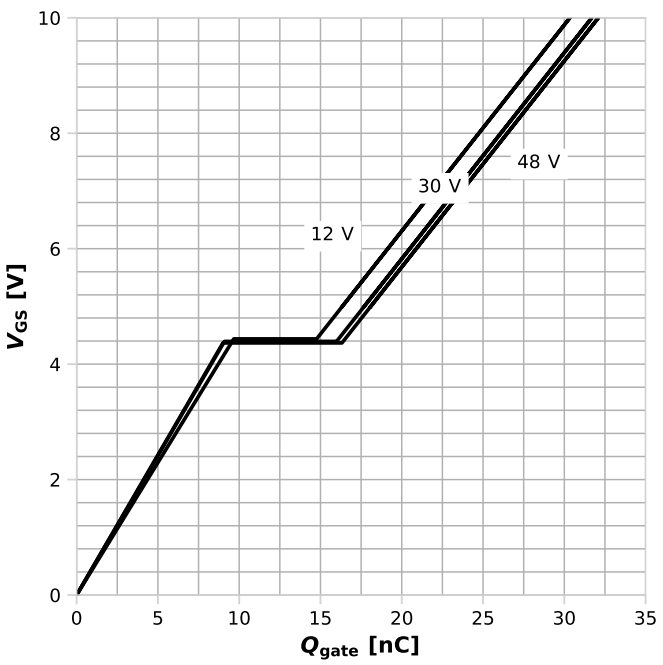
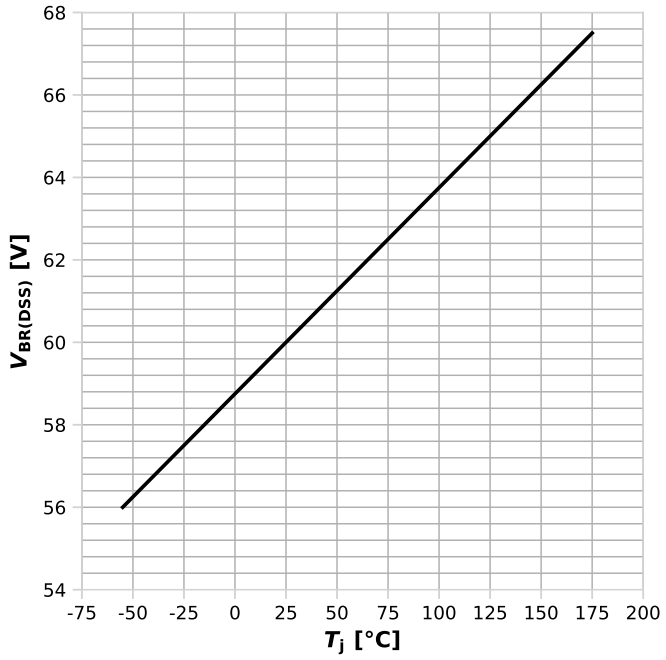
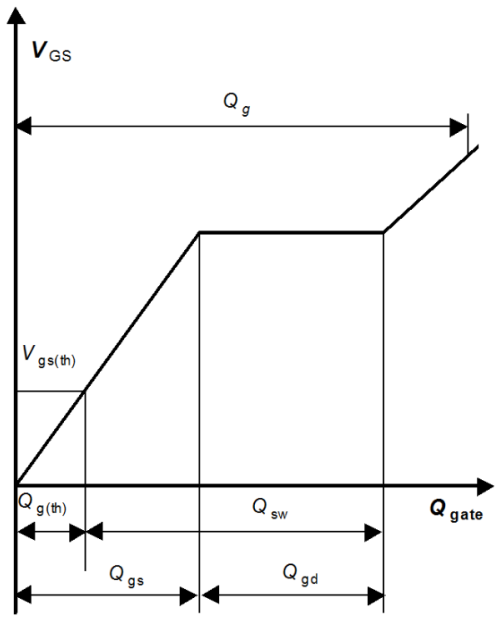
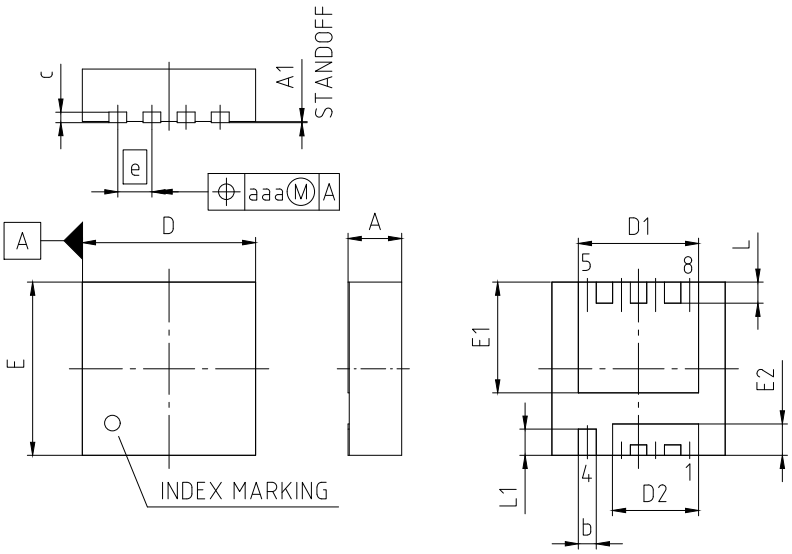
Diagram 13: Avalanche characteristics	Diagram 14: Typ. gate charge
	
I_{AS}=f(t_{AV}); R_{GS}=25 Ω; parameter: $T_{j,start}$	V_{GS}=f(Q_{gate}), I_D=20 A pulsed, T_j=25 °C; parameter: V_{DD}

Diagram 15: Min. drain-source breakdown voltage	Gate charge waveforms
	
$V_{BR(DSS)}$=f(T_j); I_D=10 mA	-

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5 Package outlines



PACKAGE - GROUP NUMBER:	PG-TSDSON-8-U03	
DIMENSIONS	MILLIMETERS	
	MIN.	MAX.
A	0.90	1.10
A1	0	0.05
b	0.24	0.44
c	0.10	0.30
D	3.20	3.40
D1	2.19	2.39
D2	1.54	1.74
E	3.20	3.40
E1	2.01	2.21
E2	0.50	0.70
e	0.65	
L	0.30	0.50
L1	0.40	0.60
aaa	0.06	
N	8	

NOTE:
DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURRS

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

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Revision history

ISZ025N06NM6

Revision 2025-07-07, Rev. 2.1

Previous revisions

Revision	Date	Subjects (major changes since last revision)
2.0	2024-05-07	Release of final
2.1	2025-07-07	Revised Rdson at Vgs from 6V to 8V

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