THE DATASHEET OF

BSO150N03MDGXUMA1

OptiMOS™3 M-Series Power-MOSFET

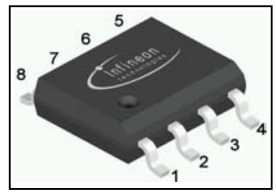
Features

- Dual N-channel
- Optimized for 5V driver application (Notebook, VGA, POL)
- Low FOM_{SW} for High Frequency SMPS
- 100% Avalanche tested
- Very low on-resistance $R_{DS(on)}$ @ V_{GS}=4.5 V
- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Qualified for consumer level application
- Pb-free plating; RoHS compliant
- Halogen-free according to IEC61249-2-21

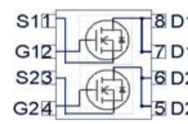
Product Summary

V_{DS}		30	V
$R_{DS(on),max}$	V_{GS}=10 V	15	mΩ
	V_{GS}=4.5 V	18.2	
I_D		9.3	A

PG-DSO-8



Type	Package	Marking
BSO150N03MD G	PG-DSO-8	150N03MD



Maximum ratings, at T_j=25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value		Unit
			10 secs	steady state	
Continuous drain current[1)]	I_D	V_{GS}=10 V, T_A=25 °C	9.3	8	A
		V_{GS}=10 V, T_A=90 °C	6.4	5.4	
		V_{GS}=4.5 V, T_A=25 °C	8.4	7	
		V_{GS}=4.5 V, T_A=90 °C	5.8	4.9	
Pulsed drain current[2)]	$I_{D,pulse}$	T_A=25 °C	65		
Avalanche current, single pulse[3)]	I_{AS}	T_A=25 °C	9.3		
Avalanche energy, single pulse	E_{AS}	I_D=9.3 A, R_{GS}=25 Ω	20		mJ
Gate source voltage	V_{GS}		±20		V
Power dissipation[1)]	P_{tot}	T_A=25 °C	2	1.4	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 150		°C
IEC climatic category; DIN IEC 68-1			55/150/56		

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - soldering point	R_{thJS}		-	-	50	K/W
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint, $t_p \leq 10$ s	-	-	110	
		minimal footprint, steady state	-	-	150	
		6 cm^2 cooling area[1), $t_p \leq 10$ s	-	-	62.5	
		6 cm^2 cooling area[1), steady state	-	-	90	

Electrical characteristics, at T_j=25 °C, unless otherwise specified

Parameter	Symbol	Conditions	min.	typ.	max.	Unit
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=1 mA	30	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250 µA	1	-	2	
Zero gate voltage drain current	I_{DSS}	V_{DS}=30 V, V_{GS}=0 V, T_j=25 °C	-	0.1	10	µA
		V_{DS}=30 V, V_{GS}=0 V, T_j=125 °C	-	10	100	
Gate-source leakage current	I_{GSS}	V_{GS}=16 V, V_{DS}=0 V	-	10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=4.5 V, I_D=8.4 A	-	14.6	18.2	mΩ
		V_{GS}=10 V, I_D=9.3 A	-	12.5	15	
Gate resistance	R_G		0.5	1.1	1.9	Ω
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=9.3 A	12	24	-	S

[1)] 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. One transistor active.

[2)] See figure 3 for more detailed information

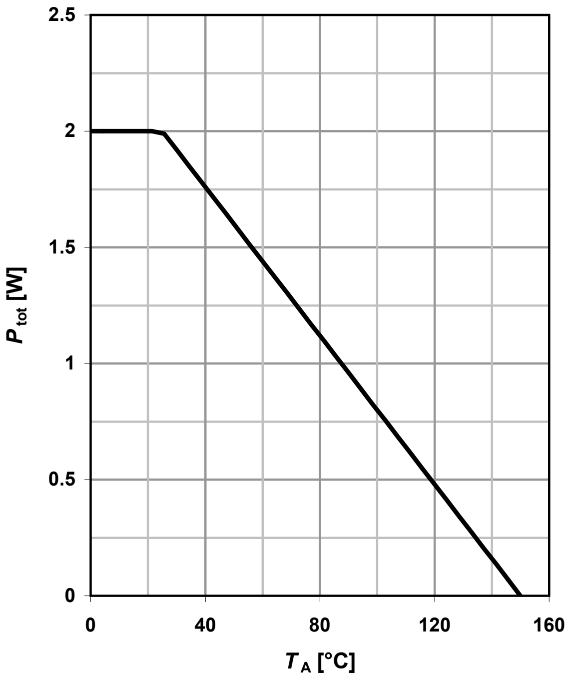
[3)] See figure 13 for more detailed information

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=15 V, f=1 MHz	-	970	1300	pF
Output capacitance	C_{oss}		-	340	450	
Reverse transfer capacitance	C_{rss}		-	20	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=15 V, V_{GS}=4.5 V, I_D=9.3 A, R_G=1.6 Ω	-	7.3	-	ns
Rise time	t_r		-	3.8	-	
Turn-off delay time	$t_{d(off)}$		-	8.7	-	
Fall time	t_f		-	4.2	-	
Gate Charge Characteristics[4)]						
Gate to source charge	Q_{gs}	V_{DD}=15 V, I_D=9.3 A, V_{GS}=0 to 4.5 V	-	2.8	-	nC
Gate charge at threshold	$Q_{g(th)}$		-	1.5	-	
Gate to drain charge	Q_{gd}		-	1.4	-	
Switching charge	Q_{sw}		-	2.6	-	
Gate charge total	Q_g		-	6.1	8	
Gate plateau voltage	$V_{plateau}$		-	2.9	-	V
Gate charge total	Q_g	V_{DD}=15 V, I_D=9.3 A, V_{GS}=0 to 10 V	-	12.6	17	nC
Gate charge total, sync. FET	$Q_{g(sync)}$	V_{DS}=0.1 V, V_{GS}=0 to 4.5 V	-	5.3	7.0	
Output charge	Q_{oss}	V_{DD}=15 V, V_{GS}=0 V	-	8.9	12	
Reverse Diode						
Diode continuous forward current	I_S	T_A=25 °C	-	-	2.4	A
Diode pulse current	$I_{S,pulse}$		-	-	65	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=9.3 A, T_j=25 °C	-	0.87	1.1	V
Reverse recovery charge	Q_{rr}	V_R=15 V, I_F=I_S, di_F/dt=400 A/µs	-	-	10	nC

[4)] See figure 16 for gate charge parameter definition

1 Power dissipation

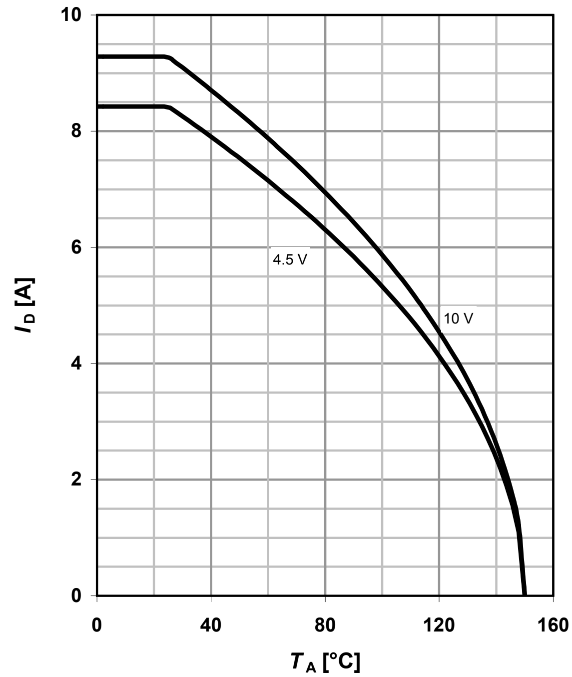
P_{tot}=f(T_A); t_p≤10 s



2 Drain current

I_D=f(T_A); t_p≤10 s

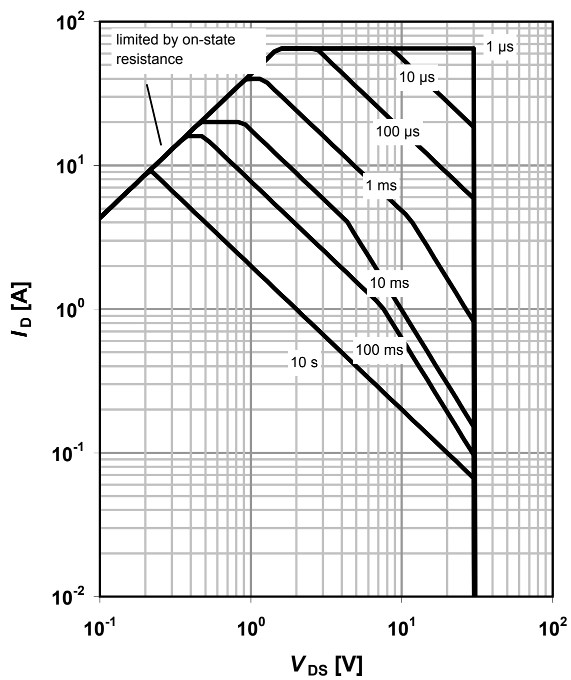
parameter: V_{GS}



3 Safe operating area

I_D=f(V_{DS}); T_A=25 °C[2)]; D=0

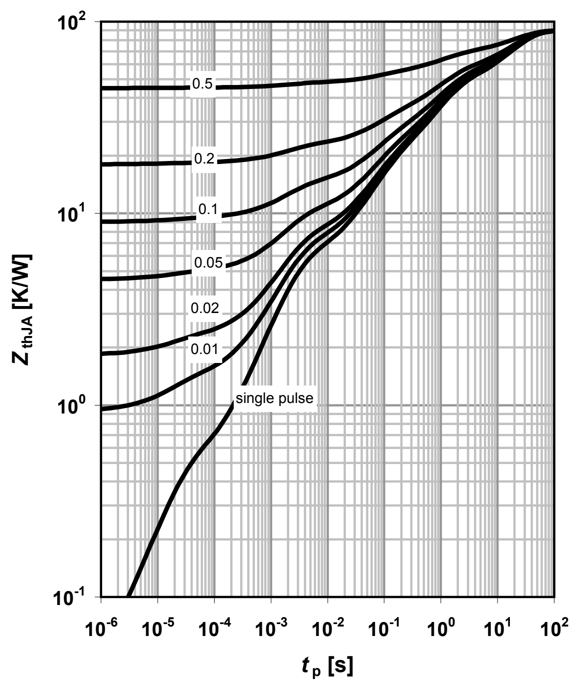
parameter: t_p



4 Max. transient thermal impedance

Z_{thJA}=f(t_p)[2)]

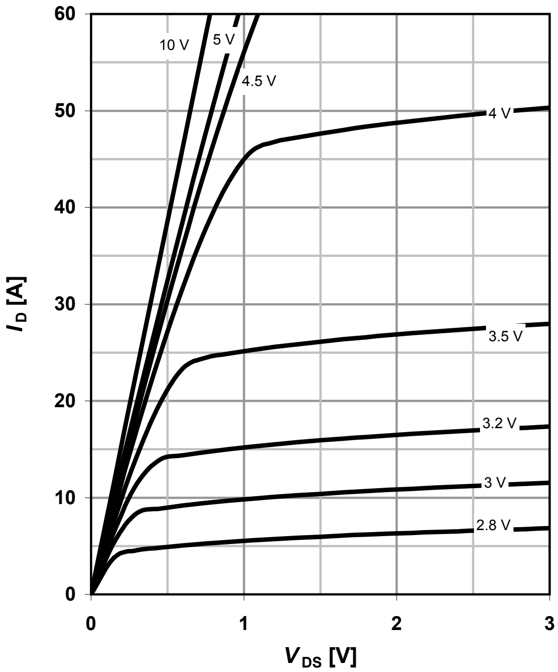
parameter: $D=t_p/T$



5 Typ. output characteristics

I_D=f(V_{DS}); T_j=25 °C

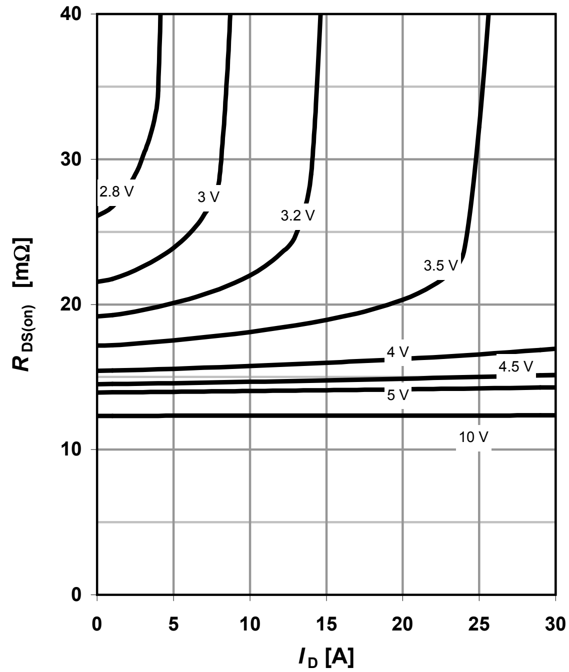
parameter: V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)}$=f(I_D); T_j=25 °C

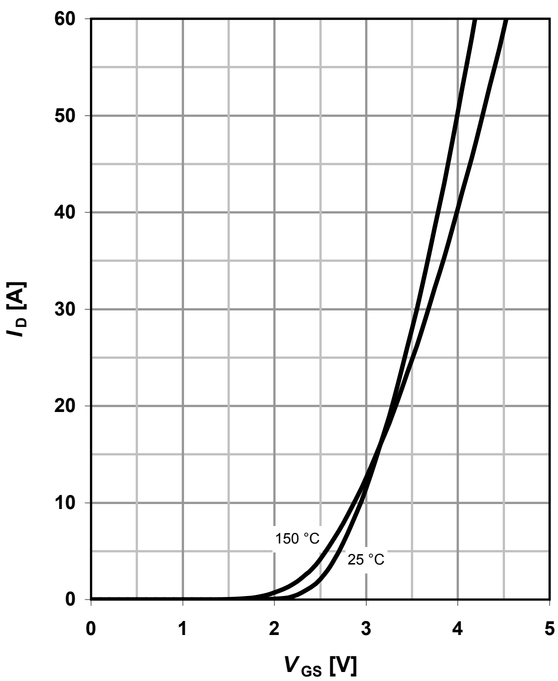
parameter: V_{GS}



7 Typ. transfer characteristics

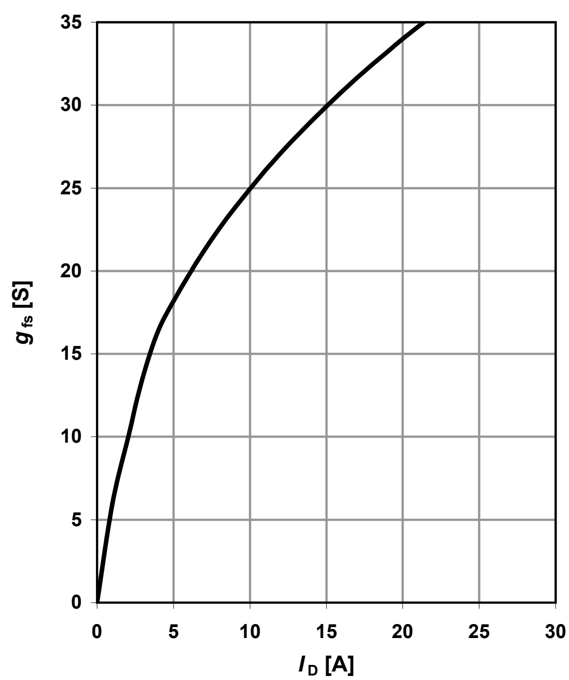
I_D=f(V_{GS}); $|V_{DS}|>2|I_D|R_{DS(on)max}$

parameter: T_j



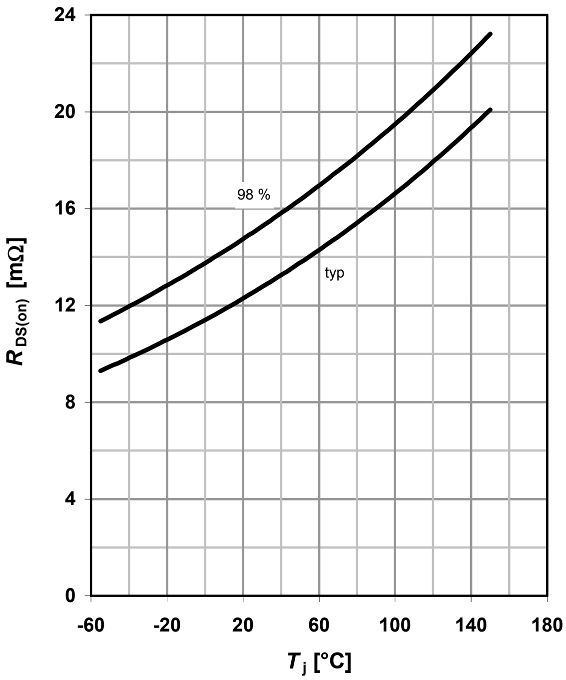
8 Typ. forward transconductance

g_{fs}=f(I_D); T_j=25 °C



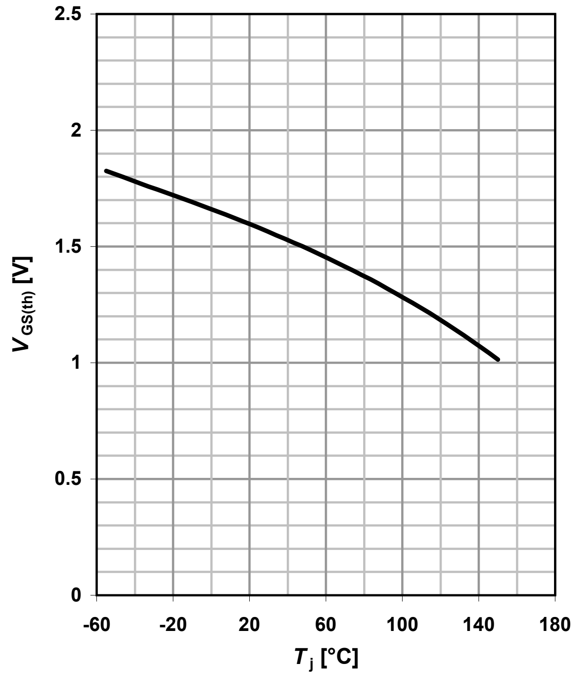
9 Drain-source on-state resistance

$R_{DS(on)}$=f(T_j); I_D=9.3 A; V_{GS}=10 V



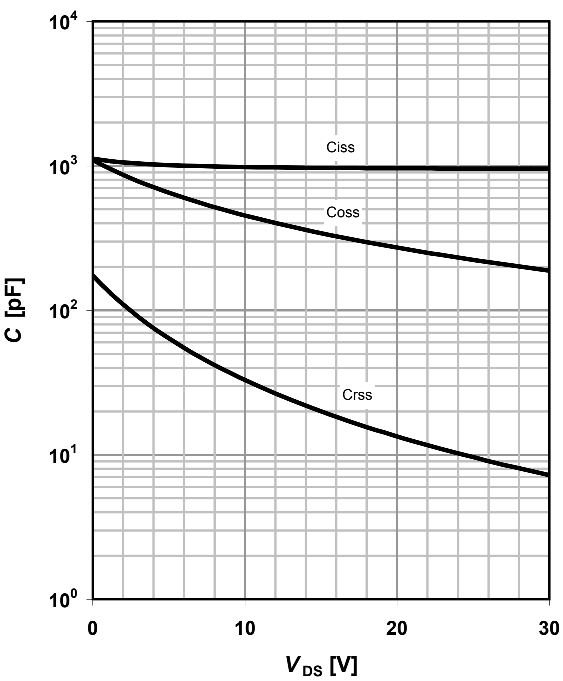
10 Typ. gate threshold voltage

$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}; I_D=250 µA



11 Typ. capacitances

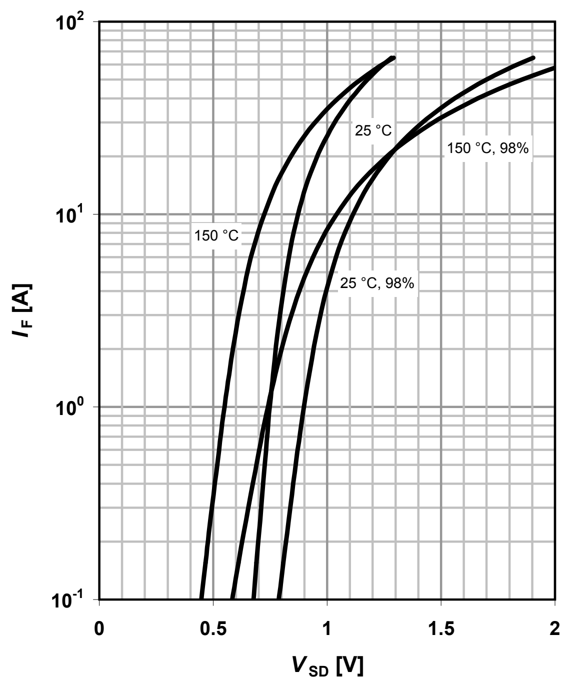
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz



12 Forward characteristics of reverse diode

I_F=f(V_{SD})

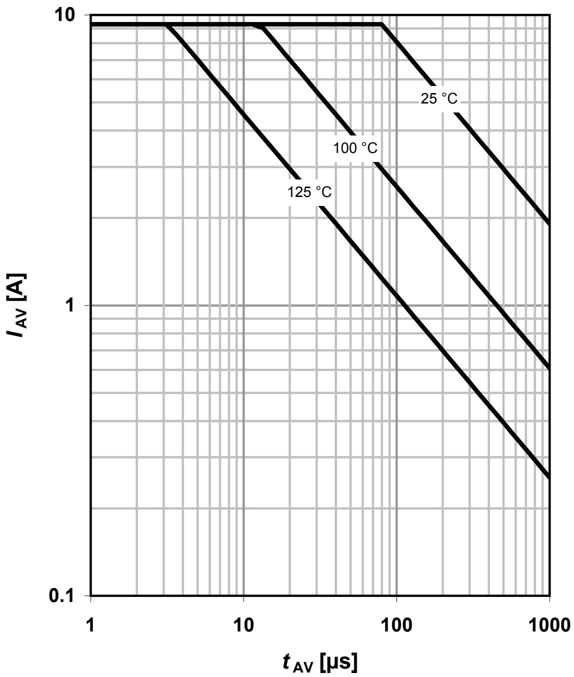
parameter: T_j



13 Avalanche characteristics

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

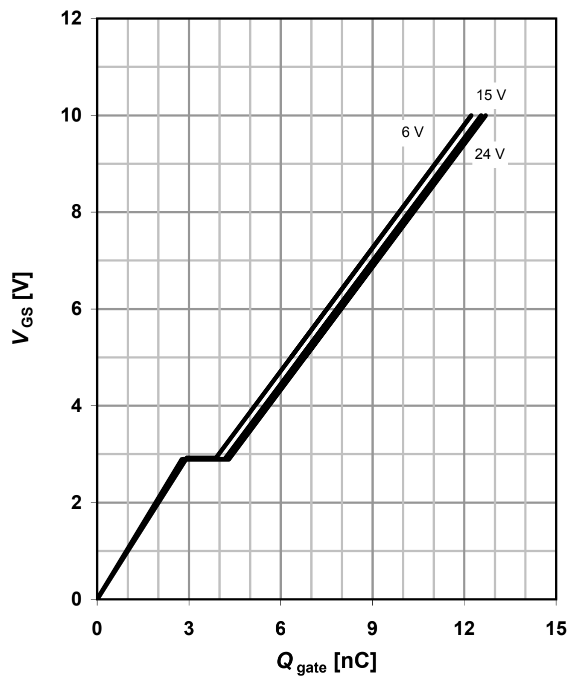
parameter: $T_{j(start)}$



14 Typ. gate charge

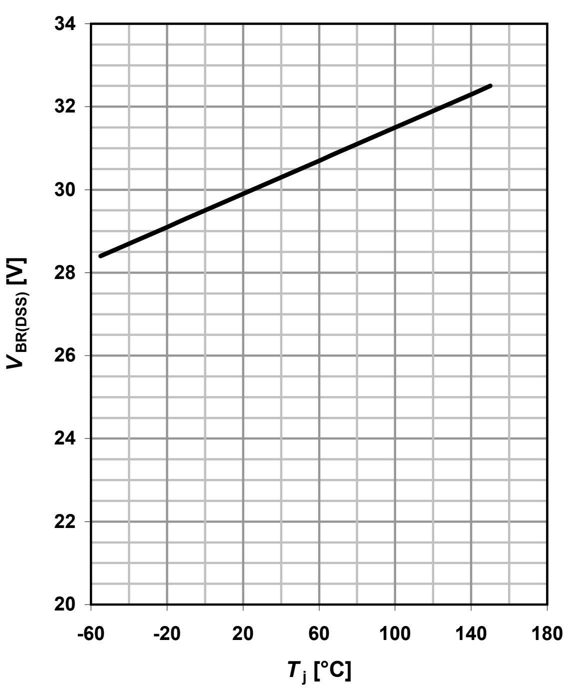
V_{GS}=f(Q_{gate}); I_D=9.3 A pulsed

parameter: V_{DD}

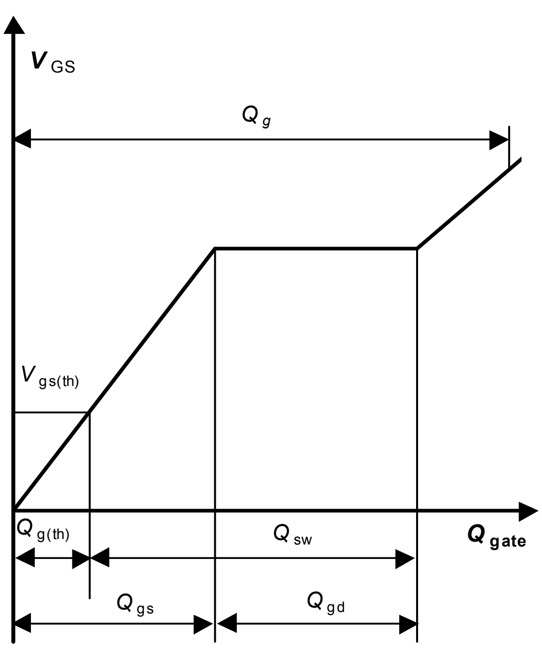


15 Drain-source breakdown voltage

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

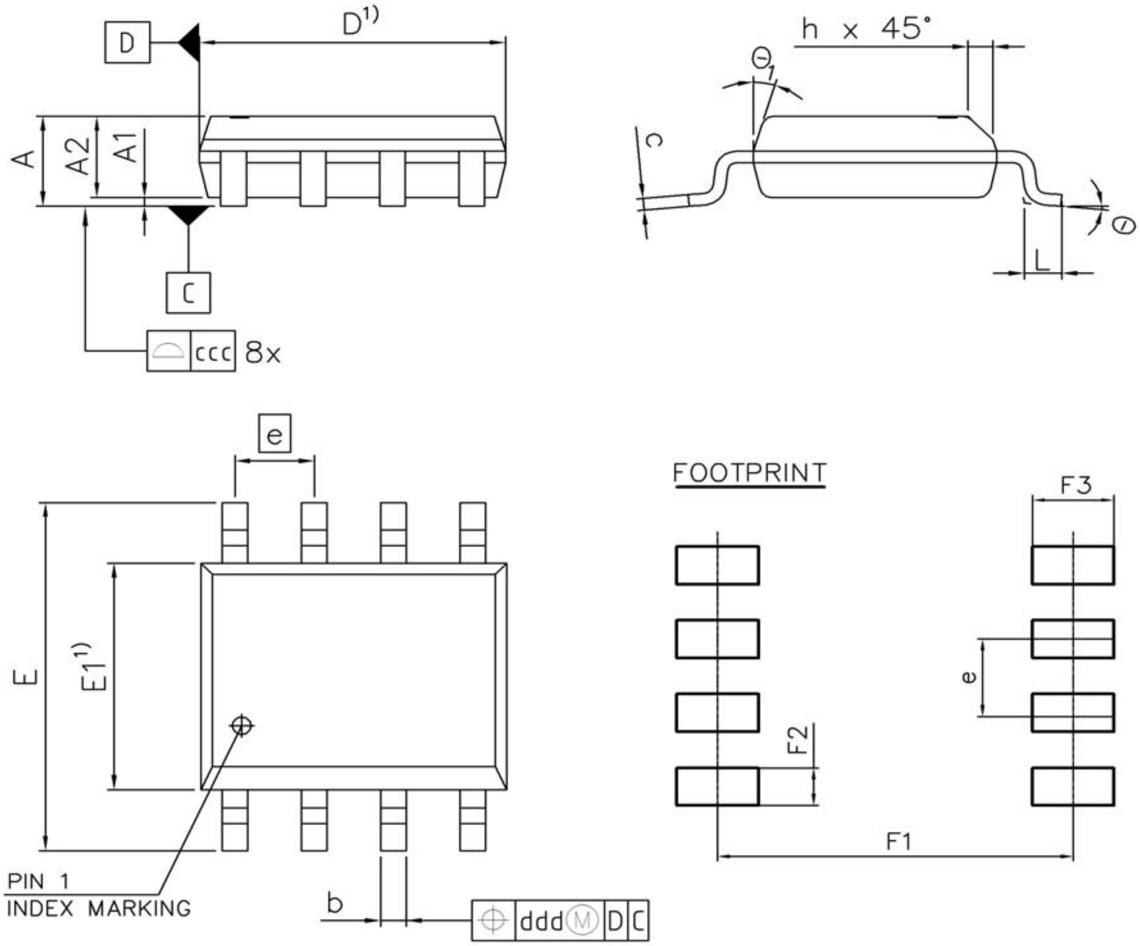


16 Gate charge waveforms



Package Outline

PG-DSO-8: Outline



1) DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	-	1.75	-	0.069
A1	0.10	-	0.004	-
A2	1.25	1.65	0.049	0.065
b	0.35	0.51	0.014	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
e	1.27		0.050	
N	8		8	
L	0.39	0.89	0.015	0.035
h	0.23	0.50	0.009	0.020
Θ	0°	8°	0°	8°
Θ1	-	19°	-	19°
ccc	0.10		0.004	
ddd	0.25		0.010	
F1	5.59	5.79	0.220	0.228
F2	0.55	0.75	0.022	0.030
F3	1.21	1.41	0.048	0.056

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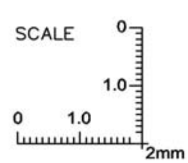
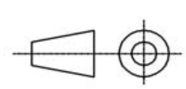


EUROPEAN PROJECTION



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