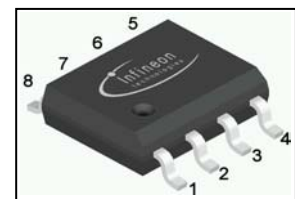


OptiMOS[®]-P Small-Signal-Transistor
Features

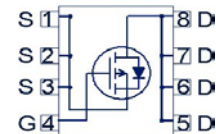
- P-Channel
- Enhancement mode
- Logic level
- 150°C operating temperature
- Avalanche rated
- dv/dt rated
- Ideal for fast switching buck converter

Product Summary

V_{DS}	-30	V
$R_{DS(on),max}$	13	mΩ
I_D	-11.3	A

P-DSO-8


Type	Package	Ordering Code	Marking
BSO130P03S	P-DSO-8	Q67042-S4233	130P3S


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

Parameter	Symbol	Conditions	Value		Unit
			≤10 secs	steady state	
Continuous drain current	I_D	$T_A=25\text{ °C}^{1)}$	-11.3	-9.2	A
		$T_A=70\text{ °C}^{1)}$	-9.1	-7.4	
Pulsed drain current	$I_{D,pulse}$	$T_A=25\text{ °C}^{2)}$	-45		
Avalanche energy, single pulse	E_{AS}	$I_D=11.3\text{ A}, R_{GS}=25\text{ Ω}$	148		mJ
Reverse diode dv/dt	dv/dt	$I_D=11.3\text{ A}, V_{DS}=20\text{ V},$ $di/dt=-200\text{ A/μs},$ $T_{j,max}=150\text{ °C}$	-6		kV/μs
Gate source voltage	V_{GS}		±25		V
Power dissipation	P_{tot}	$T_A=25\text{ °C}^{1)}$	2.36	1.56	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}		-	-	35	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	-	-	53	
		6 cm ² cooling area ¹⁾ , steady state	-	-	80	

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

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0$ V, $I_D=-250$ μ A	-30	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=-140$ μ A	-1	-1.5	-2.2	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-30$ V, $V_{GS}=0$ V, $T_j=25$ °C	-	-0.1	-1	μ A
		$V_{DS}=-30$ V, $V_{GS}=0$ V, $T_j=125$ °C	-	-10	-100	
Gate-source leakage current	I_{GSS}	$V_{GS}=-25$ V, $V_{DS}=0$ V	-	-10	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=-10$ V, $I_D=-11.3$ A	-	9.9	13.0	m Ω
Transconductance	g_{fs}	$ V_{DS} > 2 I_D R_{DS(on)max}$, $I_D=-9.5$ A	14	27	-	S

¹⁾ Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70 μ m thick) copper area for drain connection. PCB is vertical in still air.

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Dynamic characteristics

Input capacitance	C_{iss}	$V_{GS}=0\text{ V}$, $V_{DS}=-25\text{ V}$, $f=1\text{ MHz}$	-	2650	3520	pF
Output capacitance	C_{oss}		-	708	942	
Reverse transfer capacitance	C_{rss}		-	580	870	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=-15\text{ V}$, $V_{GS}=-10\text{ V}$, $I_D=-1\text{ A}$, $R_G=6\ \Omega$	-	13	20	ns
Rise time	t_r		-	16	24	
Turn-off delay time	$t_{d(off)}$		-	70	105	
Fall time	t_f		-	62	93	

Gate Charge Characteristics³⁾

Gate to source charge	Q_{gs}	$V_{DD}=-24\text{ V}$, $I_D=11.3\text{ A}$, $V_{GS}=0\text{ to }-10\text{ V}$	-	-7	-9	nC
Gate charge at threshold	$Q_{g(th)}$		-	-3.7	-5.0	
Gate to drain charge	Q_{gd}		-	-21	-32	
Switching charge	Q_{sw}		-	-25	-36	
Gate charge total	Q_g		-	-61	-81	
Gate plateau voltage	$V_{plateau}$		-	-2.6	-	V
Output charge	Q_{oss}	$V_{DD}=-15\text{ V}$, $V_{GS}=0\text{ V}$	-	-22	-29	

Reverse Diode

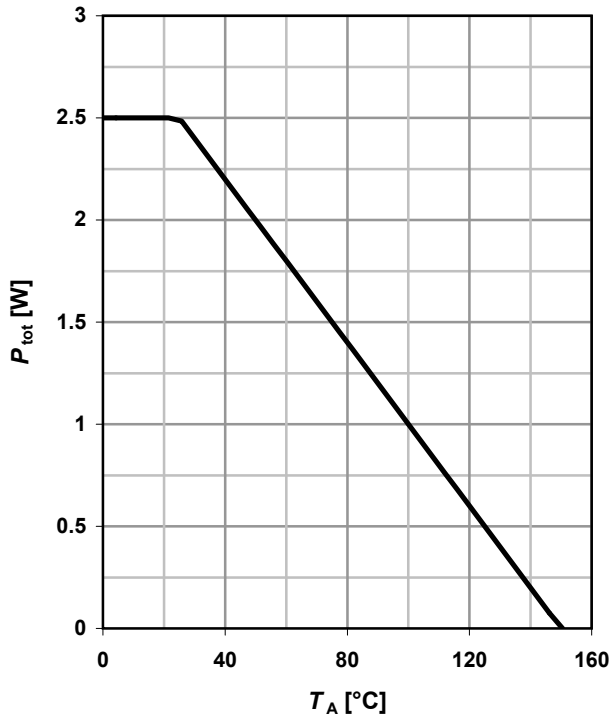
Diode continuous forward current	I_S	$T_A=25\text{ }^\circ\text{C}$	-	-	-2.1	A
Diode pulse current	$I_{S,pulse}$		-	-	-45	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}$, $I_F=-11.3\text{ A}$, $T_j=25\text{ }^\circ\text{C}$	-	-0.84	-1.2	V
Reverse recovery time	t_{rr}	$V_R=15\text{ V}$, $I_F=-11.3\text{ A}$, $di_F/dt=100\text{ A}/\mu\text{s}$	-	26	33	ns
Reverse recovery charge	Q_{rr}		-	16	20	nC

²⁾ See figure 3

³⁾ See figure 16 for gate charge parameter definition

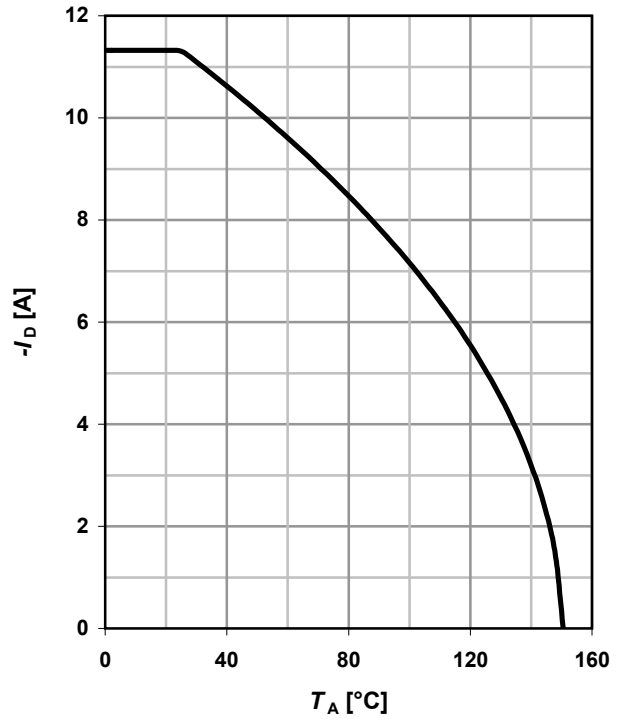
1 Power dissipation

$P_{tot}=f(T_A); t_p \leq 10 \text{ s}$



2 Drain current

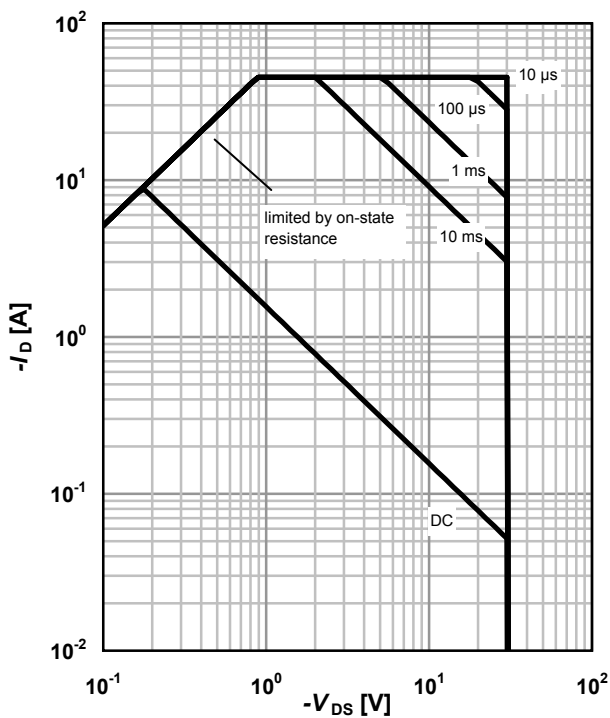
$I_D=f(T_A); |V_{GS}| \geq 10 \text{ V}; t_p \leq 10 \text{ s}$



3 Safe operation area

$I_D=f(V_{DS}); T_A=25 \text{ °C}^1; D=0$

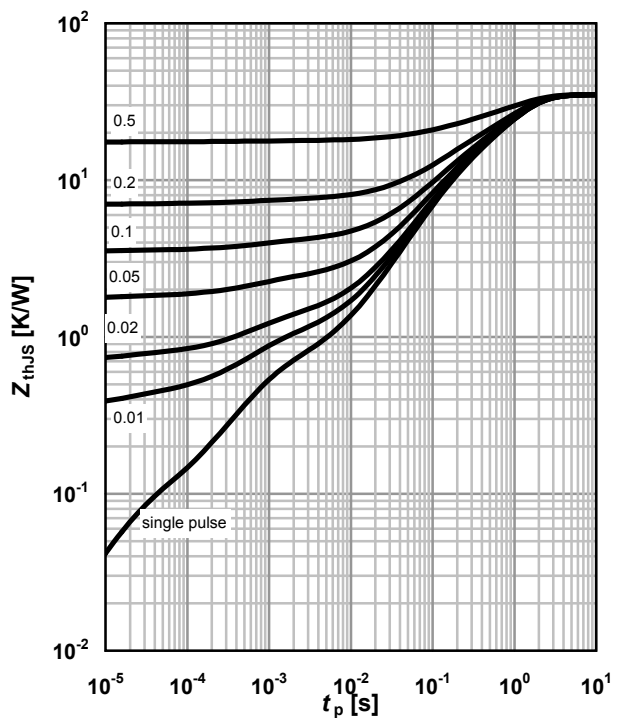
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJS}=f(t_p)$

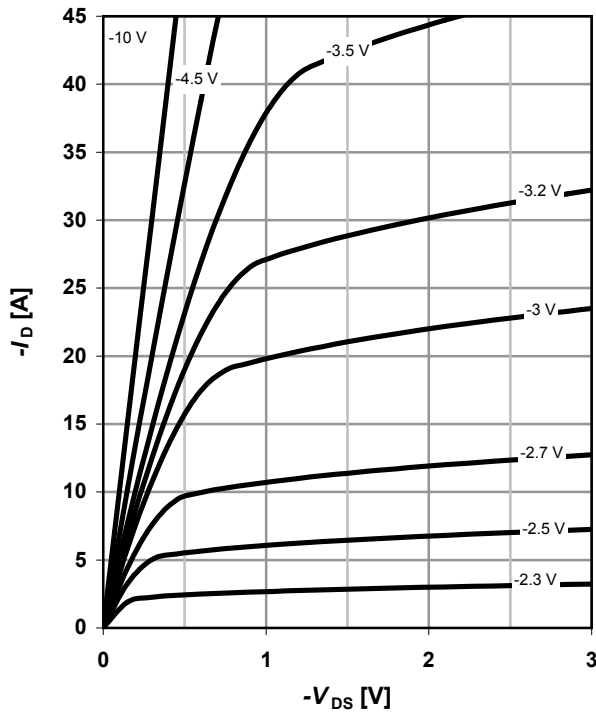
parameter: $D=t_p/T$



5 Typ. output characteristics

$I_D = f(V_{DS}); T_j = 25\text{ }^\circ\text{C}$

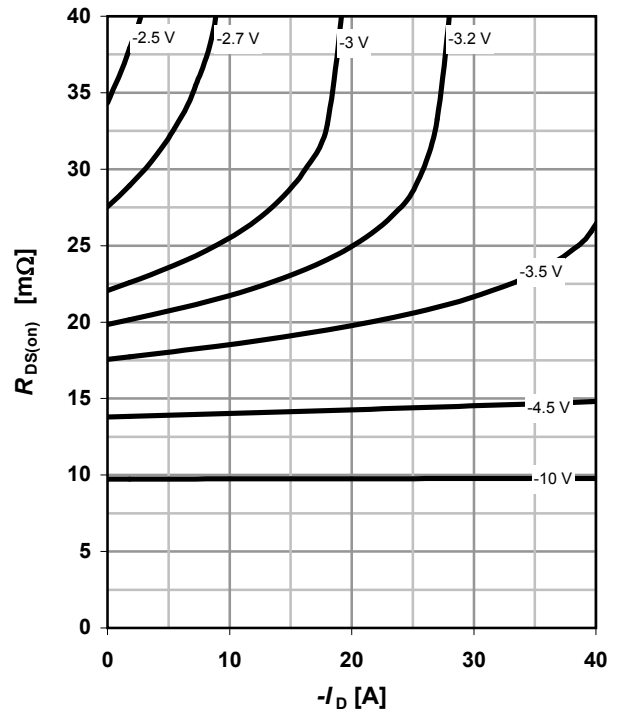
parameter: V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)} = f(I_D); T_j = 25\text{ }^\circ\text{C}$

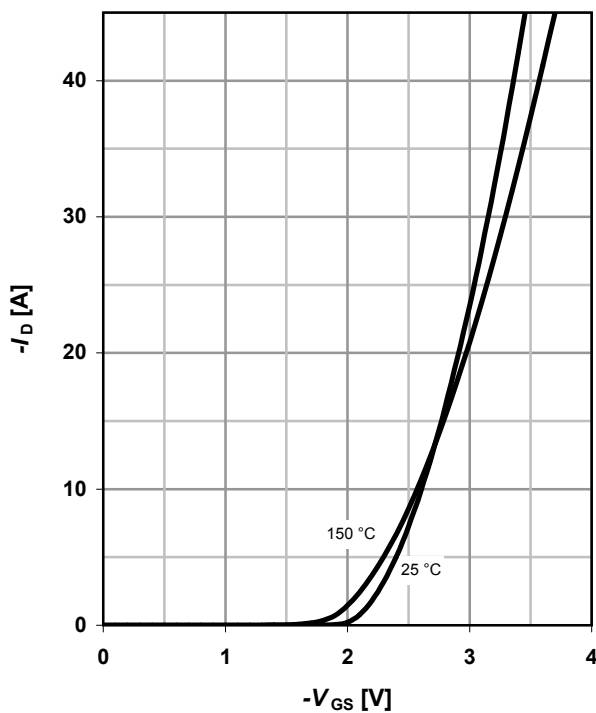
parameter: V_{GS}



7 Typ. transfer characteristics

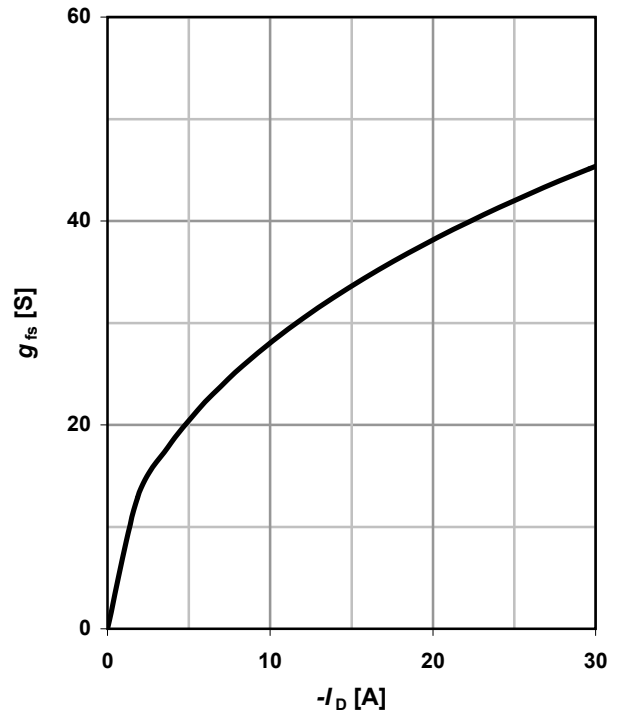
$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|R_{DS(on)max}$

parameter: T_j



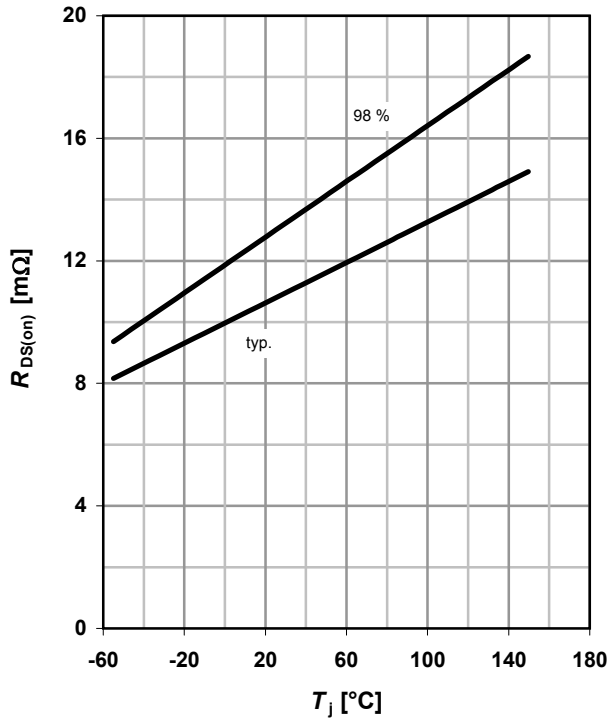
8 Typ. forward transconductance

$g_{fs} = f(I_D); T_j = 25\text{ }^\circ\text{C}$



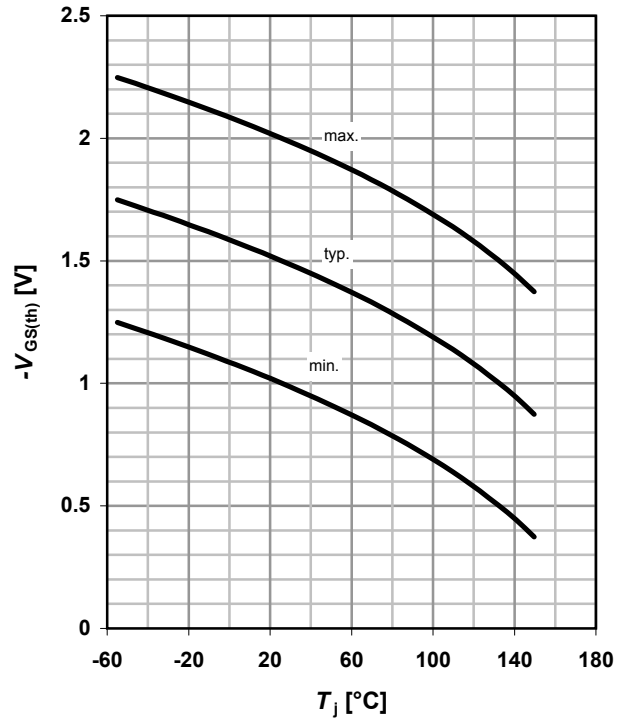
9 Drain-source on-state resistance

$R_{DS(on)} = f(T_j); I_D = -11.3 \text{ A}; V_{GS} = -10 \text{ V}$



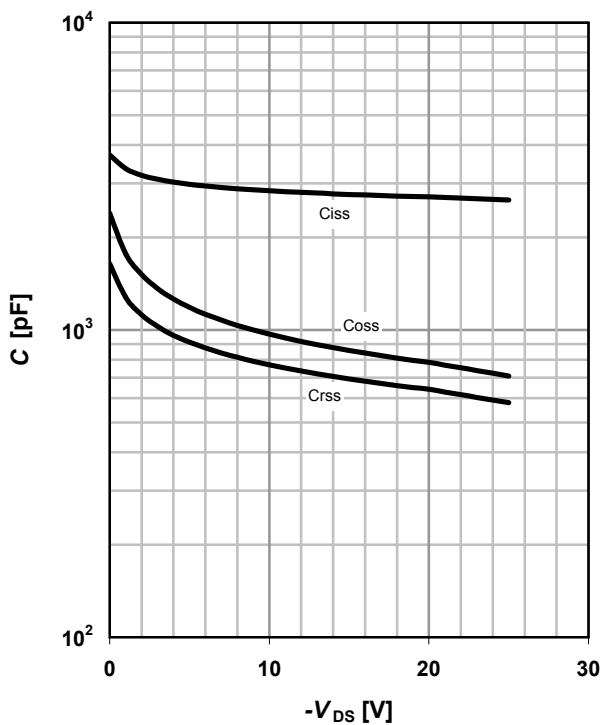
10 Typ. gate threshold voltage

$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}; I_D = -140 \mu\text{A}$



11 Typ. capacitances

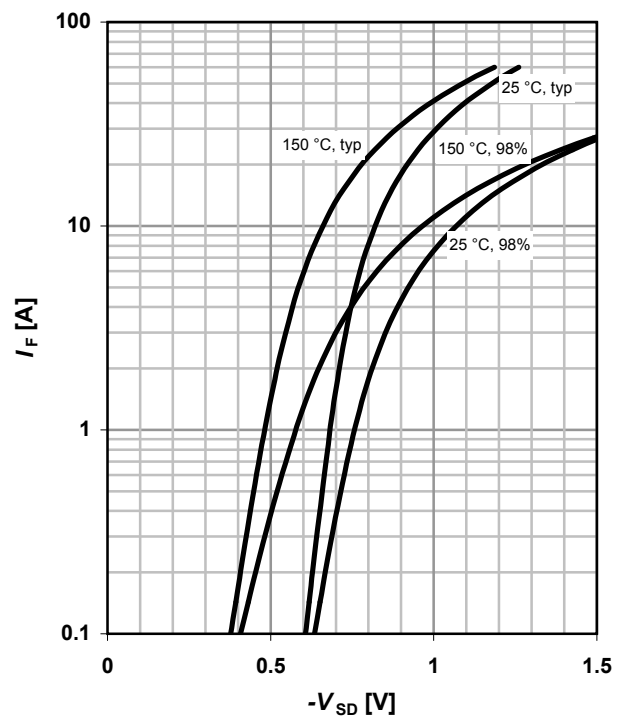
$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$



12 Forward characteristics of reverse diode

$I_F = f(V_{SD})$

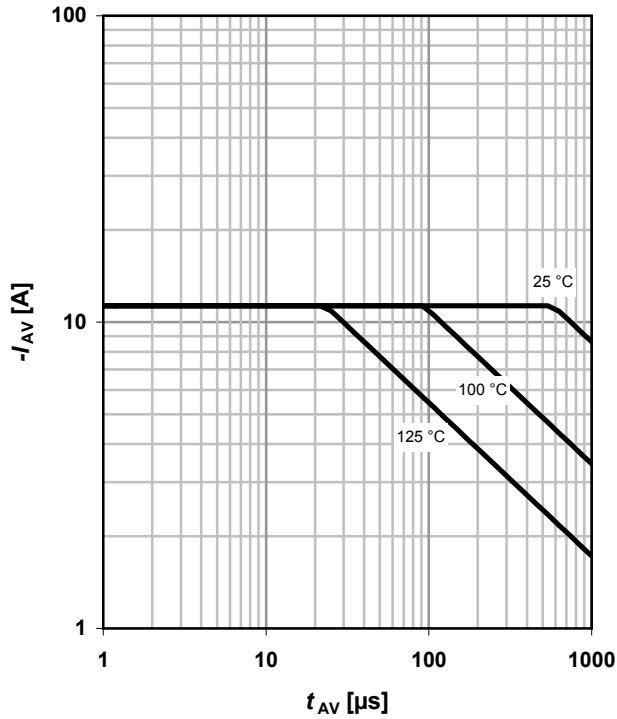
parameter: T_j



13 Avalanche characteristics

$I_{AS}=f(t_{AV}); R_{GS}=25 \Omega$

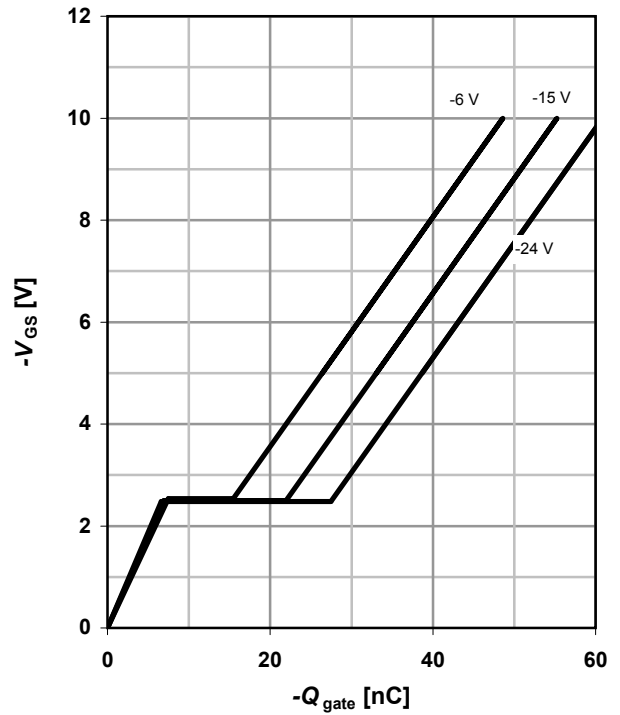
parameter: $T_{j(\text{start})}$



14 Typ. gate charge

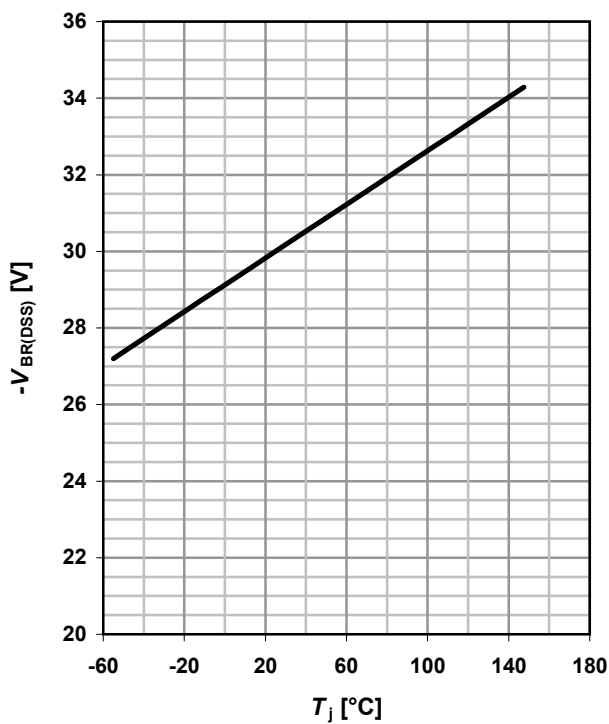
$V_{GS}=f(Q_{\text{gate}}); I_D=-5.5 \text{ A pulsed}$

parameter: V_{DD}

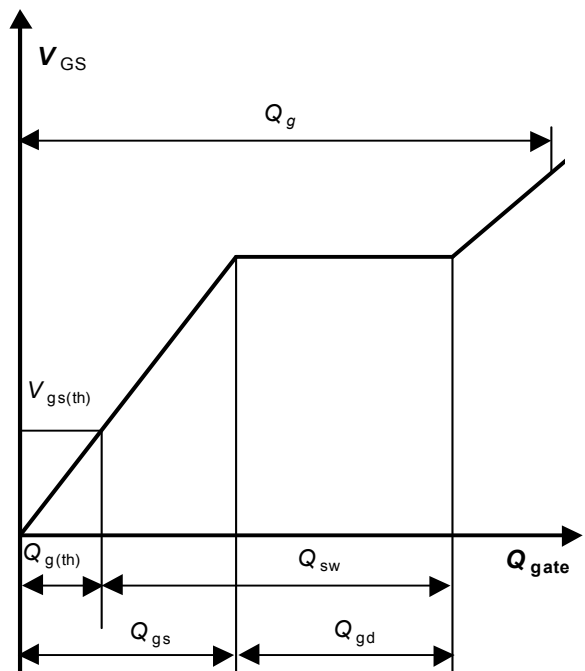


15 Drain-source breakdown voltage

$V_{BR(DSS)}=f(T_j); I_D=-250 \mu\text{A}$

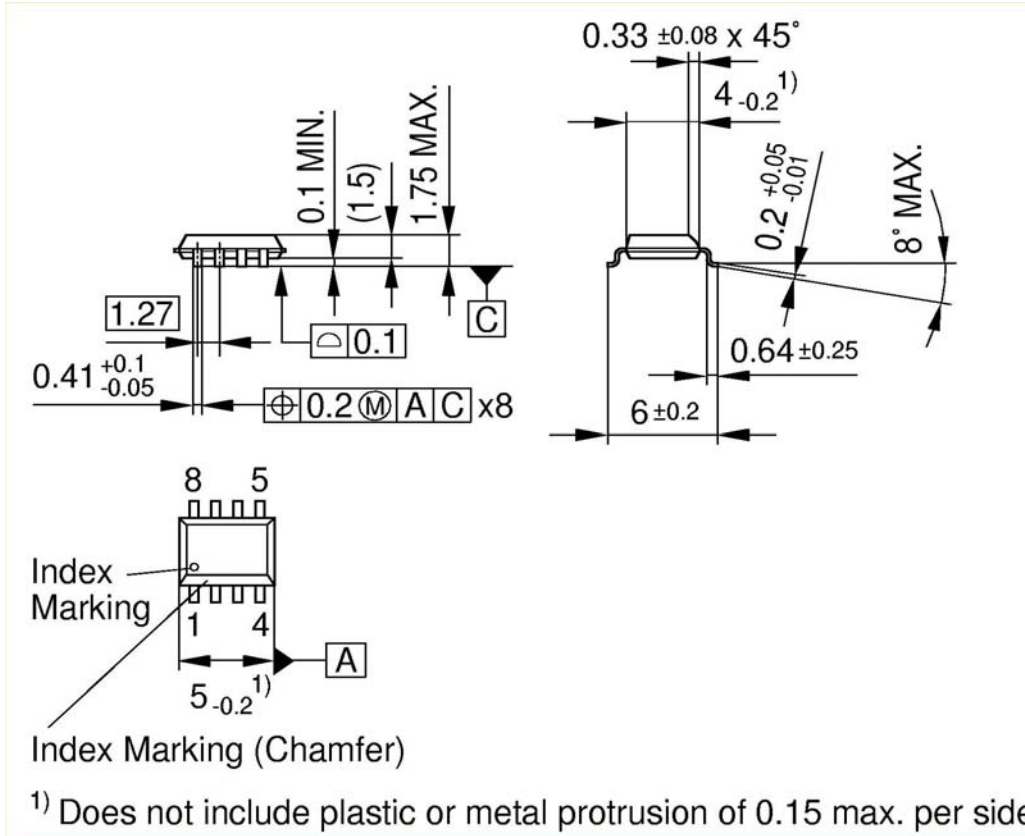


16 Gate charge waveforms

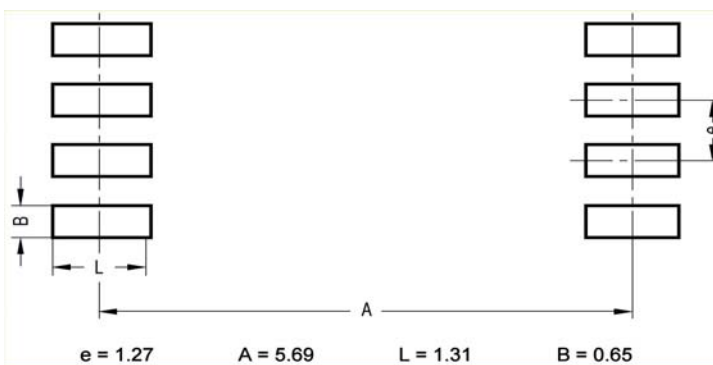


Package Outline

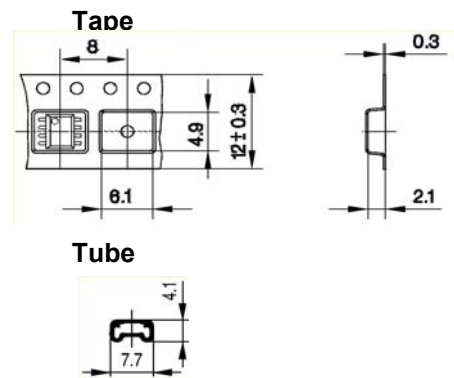
P-DSO-8: Outline



Footprint



Packaging



Dimensions in mm

Published by
Infineon Technologies AG
Bereich Kommunikation
St.-Martin-Straße 53
D-81541 München
© Infineon Technologies AG 1999
All Rights Reserved.

Attention please!

The information herein is given to describe certain components and shall not be considered as warranted characteristics.

Terms of delivery and rights to technical change reserved.

We hereby disclaim any and all warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts started herein.

Infineon Technologies is an approved CECC manufacturer.

Information

For further information on technology, delivery terms and conditions and prices, please contact your nearest Infineon Technologies office in Germany or our Infineon Technologies representatives worldwide (see address list).

Warnings

Due to technical requirements, components may contain dangerous substances.
For information on the types in question, please contact your nearest Infineon Technologies office.

Infineon Technologies' components may only be used in life-support devices or systems with the expressed written approval of Infineon Technologies if a failure of such components can reasonably be expected to cause the failure of that life-support 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.



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.