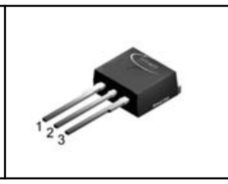
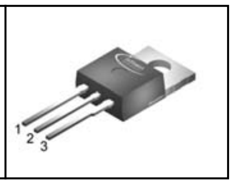
OptiMOS®-T Power-Transistor

Product Summary

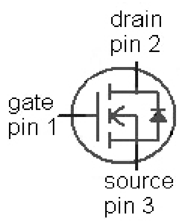
V_{DS}	100	V
$R_{DS(on),max}$ (SMD version)	15.4	mΩ
I_D	50	A

PG-TO263-3-2	PG-TO262-3-1	PG-TO220-3-1
		

Features

- N-channel - Enhancement mode
- Automotive AEC Q101 qualified
- MSL1 up to 260°C peak reflow
- 175°C operating temperature
- Green product (RoHS compliant)
- 100% Avalanche tested

Type	Package	Marking
IPB50N10S3L-16	PG-TO263-3-2	3N10L16
IPI50N10S3L-16	PG-TO262-3-1	3N10L16
IPP50N10S3L-16	PG-TO220-3-1	3N10L16



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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	T_C=25 °C, V_{GS}=10 V	50	A
		T_C=100 °C, V_{GS}=10 V[1)]	37	
Pulsed drain current[1)]	$I_{D,pulse}$	T_C=25 °C	200	
Avalanche energy, single pulse[1)]	E_{AS}	I_D=25A	330	mJ
Avalanche current, single pulse	I_{AS}		50	A
Gate source voltage[2)]	V_{GS}		±20	V
Power dissipation	P_{tot}	T_C=25 °C	100	W
Operating and storage temperature	T_j, T_{stg}		-55 ... +175	°C
IEC climatic category; DIN IEC 68-1			55/175/56	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics[1]						
Thermal resistance, junction - case	R_{thJC}		-	-	1.5	K/W
Thermal resistance, junction - ambient, leaded	R_{thJA}		-	-	62	
SMD version, device on PCB	R_{thJA}	minimal footprint	-	-	62	
		6 cm^2 cooling area[3]	-	-	40	
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= 1 mA	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=60µA	1.2	1.7	2.4	
Zero gate voltage drain current	I_{DSS}	V_{DS}=80 V, V_{GS}=0 V, T_j=25 °C	-	0.01	1	µA
		V_{DS}=80 V, V_{GS}=0 V, T_j=125 °C[2]	-	1	100	
Gate-source leakage current	I_{GSS}	V_{GS}=16V, V_{DS}=0V	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=50A	-	16.1	20.9	mΩ
		V_{GS}=4.5V, I_D=50A, SMD version	-	15.8	20.6	
		V_{GS}=10 V, I_D=50 A	-	13.1	15.7	
		V_{GS}=10 V, I_D=50 A, SMD version	-	12.8	15.4	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics[1]						
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	3215	4180	pF
Output capacitance	C_{oss}		-	730	949	
Reverse transfer capacitance	C_{rss}		-	63	95	
Turn-on delay time	$t_{d(on)}$	V_{DD}=20 V, V_{GS}=10 V, I_D=50 A, R_G=3.5 Ω	-	10	-	ns
Rise time	t_r		-	5	-	
Turn-off delay time	$t_{d(off)}$		-	28	-	
Fall time	t_f		-	5	-	
Gate Charge Characteristics[1]						
Gate to source charge	Q_{gs}	V_{DD}=80 V, I_D=70 A, V_{GS}=0 to 10 V	-	9	12	nC
Gate to drain charge	Q_{gd}		-	8	12	
Gate charge total	Q_g		-	49	64	
Gate plateau voltage	$V_{plateau}$		-	3.7	-	V
Reverse Diode						
Diode continous forward current[1]	I_S	T_C=25°C	-	-	50	A
Diode pulse current[1]	$I_{S,pulse}$		-	-	200	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=50 A, T_j=25 °C	0.6	1	1.2	V
Reverse recovery time[1]	t_{rr}	V_R=50V, I_F=I_S, di_F/dt=100A/µs	-	80	-	ns
Reverse recovery charge[1]	Q_{rr}		-	185	-	nC

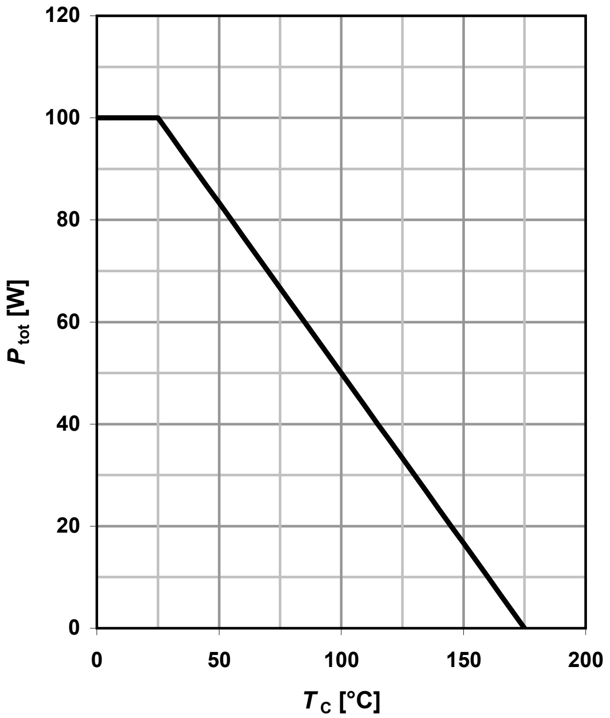
[1] Defined by design. Not subject to production test.

[2] Qualified with V_{GS} = +20/-5V.

[3] 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.

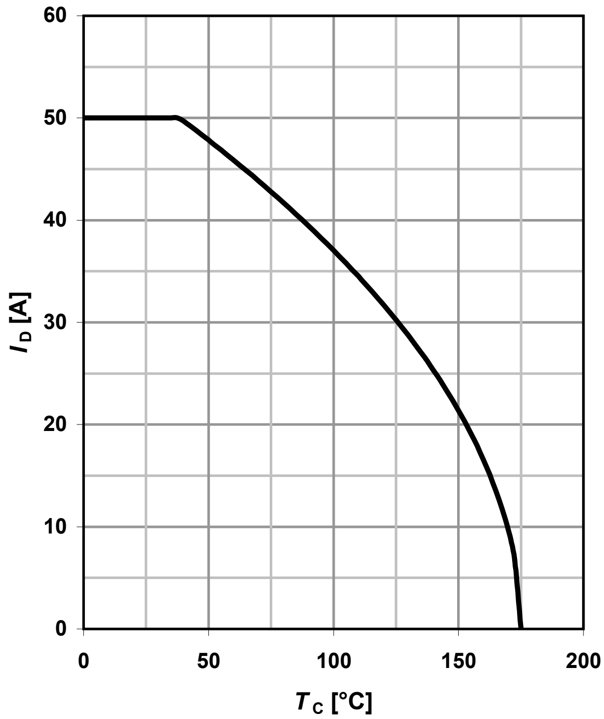
1 Power dissipation

$P_{tot} = f(T_C)$; $V_{GS} \geq 6$ V



2 Drain current

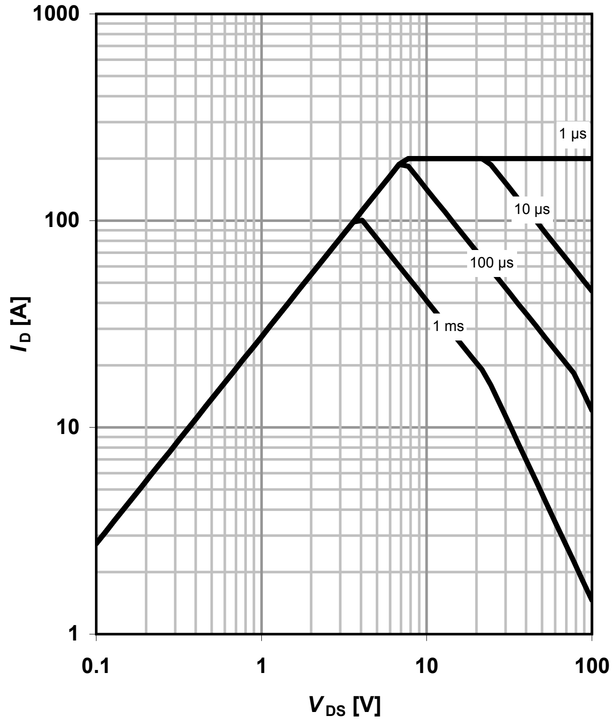
$I_D = f(T_C)$; $V_{GS} \geq 6$ V; SMD



3 Safe operating area

$I_D = f(V_{DS})$; $T_C = 25$ °C; $D = 0$; SMD

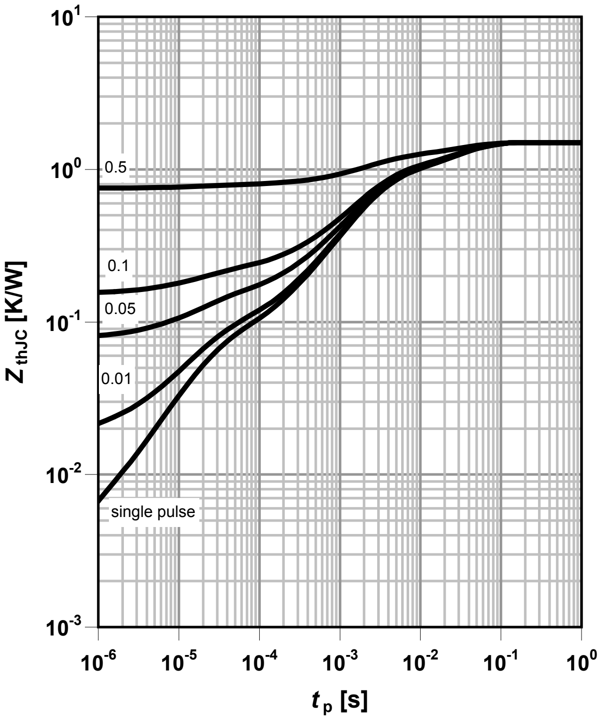
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJC} = f(t_p)$

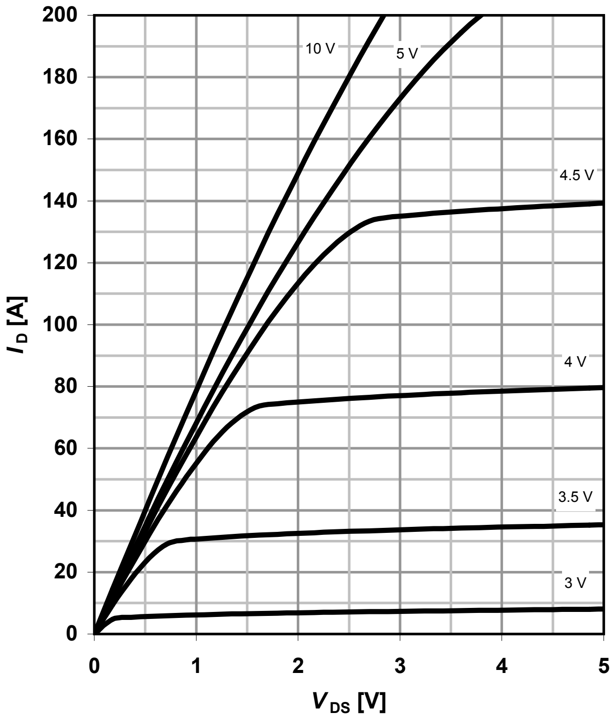
parameter: $D = t_p/T$



5 Typ. output characteristics

$I_D = f(V_{DS})$; $T_j = 25\ °C$; SMD

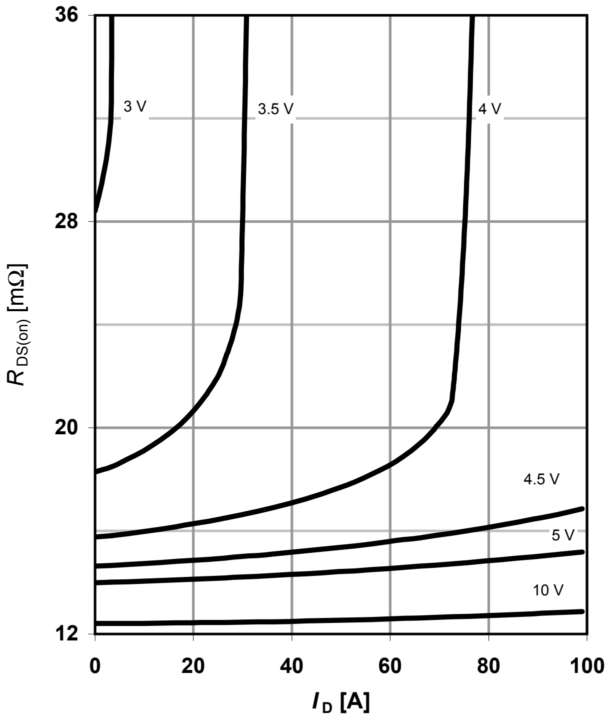
parameter: V_{GS}



6 Typ. drain-source on-state resistance

$R_{DS(on)} = f(I_D)$; $T_j = 25\ °C$; SMD

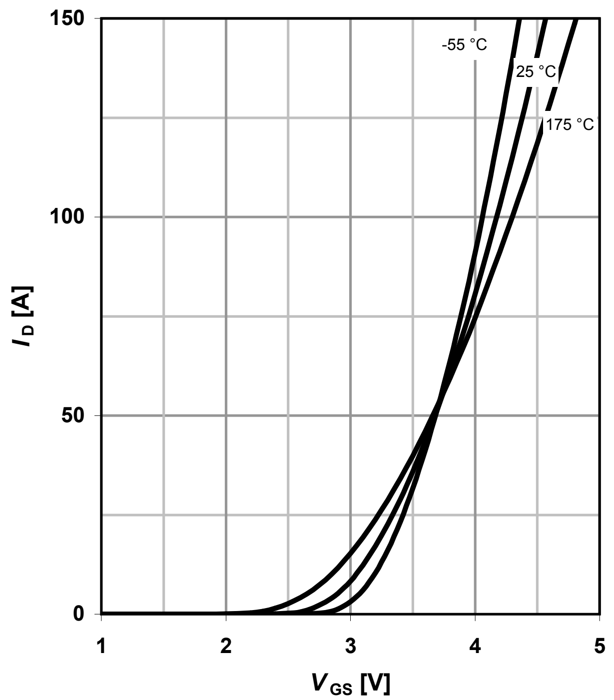
parameter: V_{GS}



7 Typ. transfer characteristics

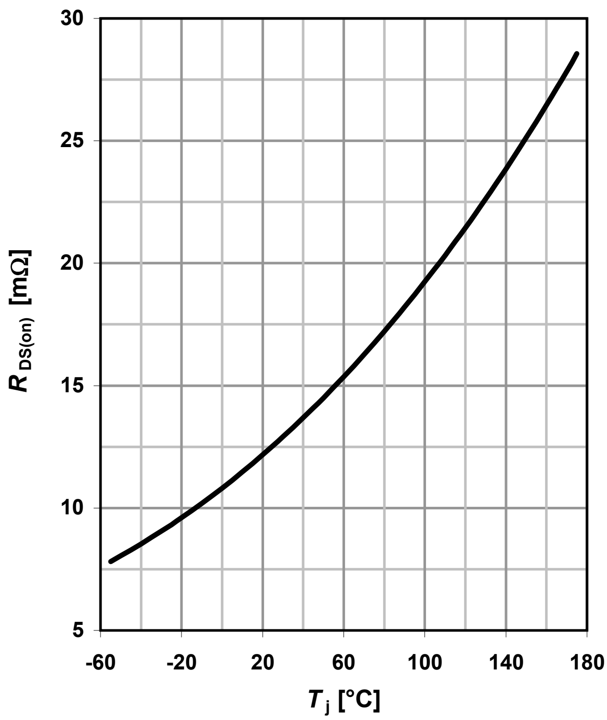
$I_D = f(V_{GS})$; $V_{DS} = 6V$

parameter: T_j



8 Typ. drain-source on-state resistance

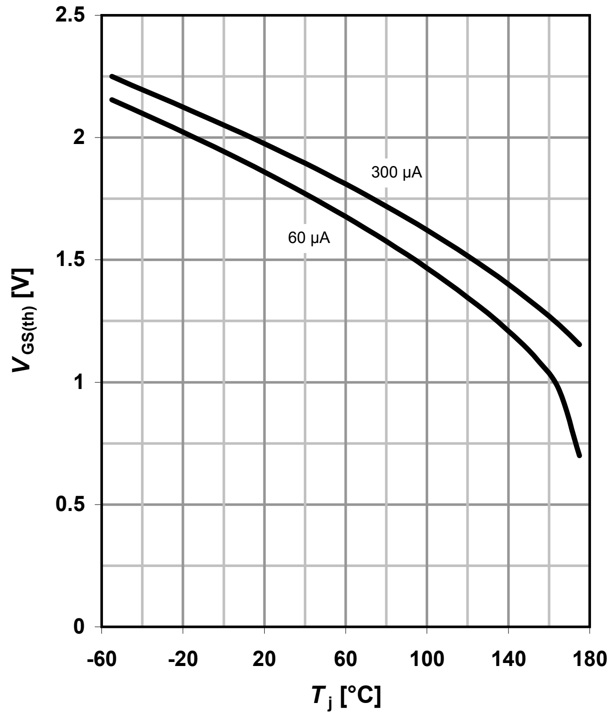
$R_{DS(on)} = f(T_j)$; $I_D = 50$ A; $V_{GS} = 10$ V; SMD



9 Typ. gate threshold voltage

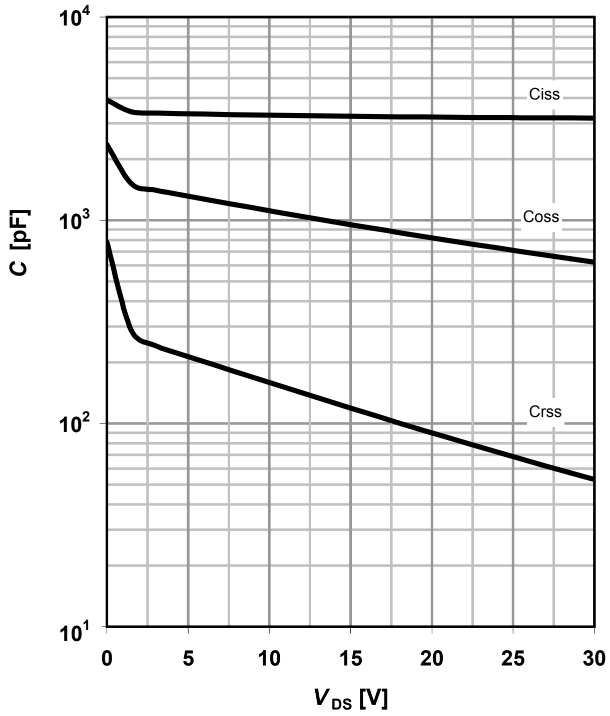
$V_{GS(th)} = f(T_j)$; $V_{GS} = V_{DS}$

parameter: I_D



10 Typ. capacitances

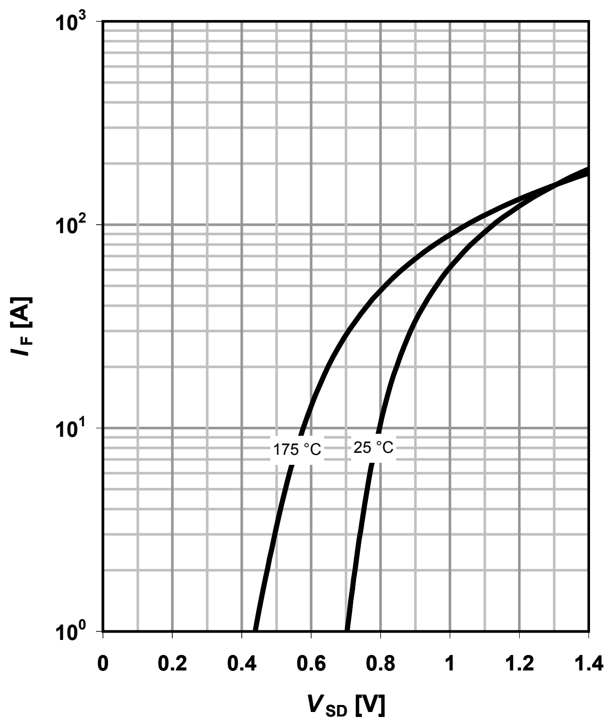
$C = f(V_{DS})$; $V_{GS} = 0$ V; $f = 1$ MHz



11 Typical forward diode characteristicis

IF = f(V_{SD})

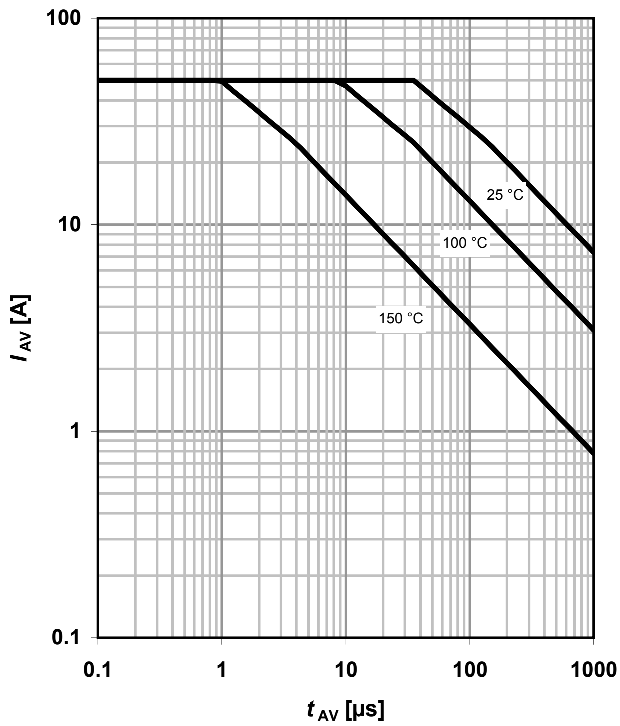
parameter: T_j



12 Typ. avalanche characteristics

$I_{AS} = f(t_{AV})$

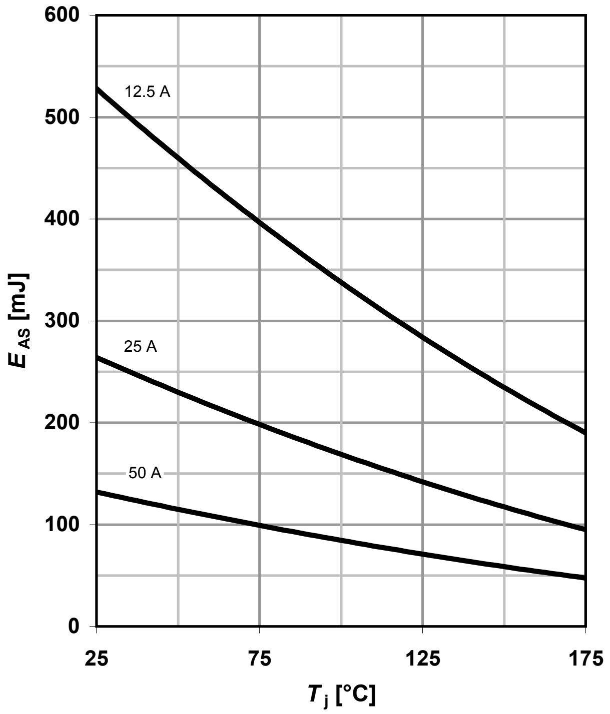
parameter: $T_{j(start)}$



13 Typical avalanche energy

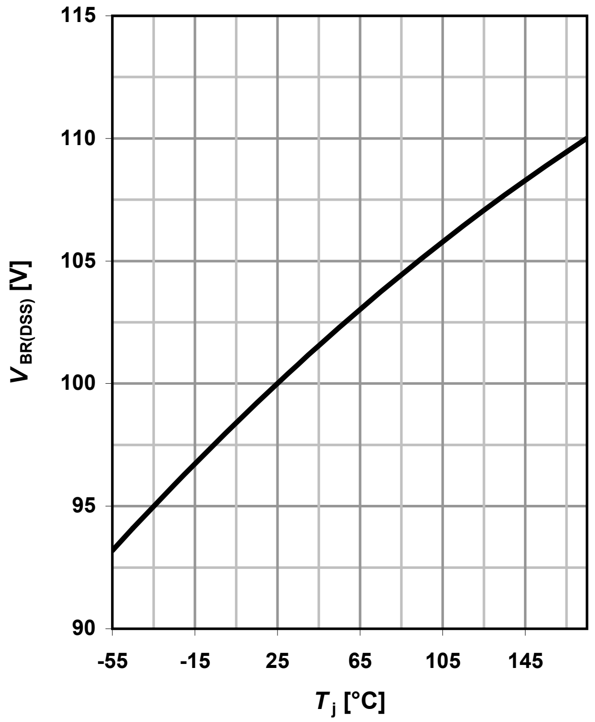
$E_{AS} = f(T_j)$

parameter: I_D



14 Typ. drain-source breakdown voltage

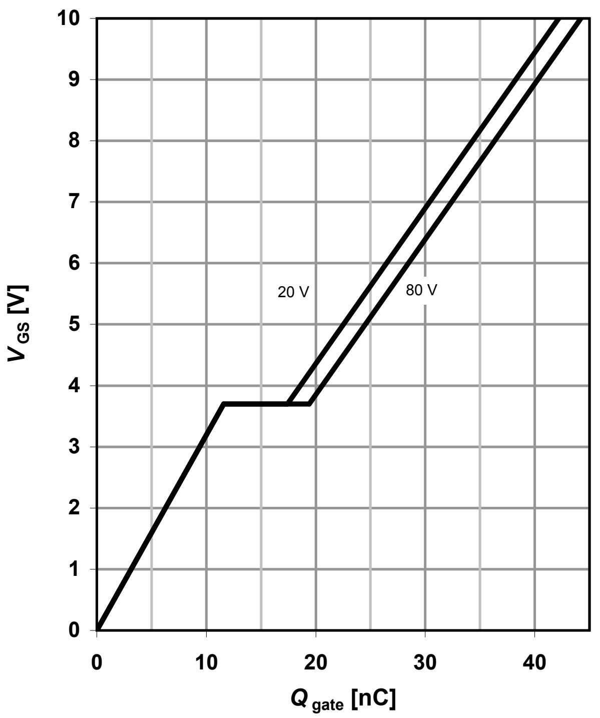
$V_{BR(DSS)} = f(T_j)$; $I_D = 1$ mA



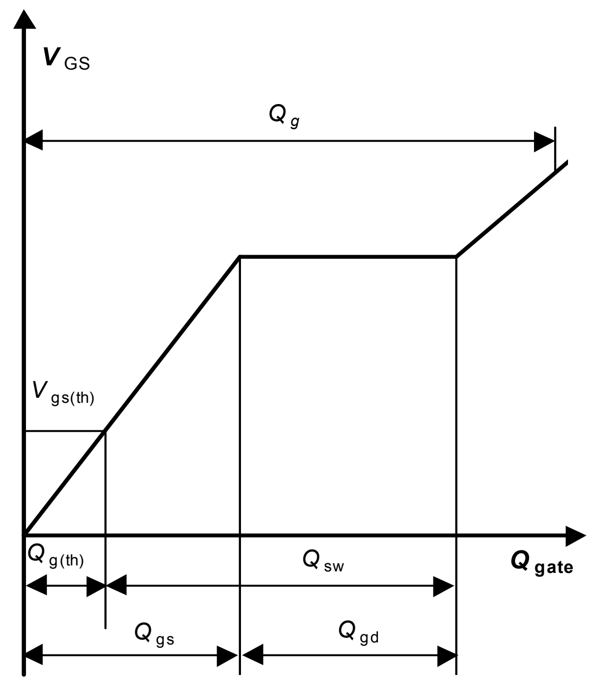
15 Typ. gate charge

$V_{GS} = f(Q_{gate})$; $I_D = 50$ A pulsed

parameter: V_{DD}



16 Gate charge waveforms



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Revision History

Version	Date	Changes
1.1	08.04.2008	Page 1: VGS changed from ±16V to ±20V
1.1	08.04.2008	Page 3: Footnote 2) added
1.1	09.04.2008	Page 1: EAS changed from 264mJ to 330mJ

Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

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