OptiMOS®-P2 Power-Transistor

AEC Qualified

RoHS

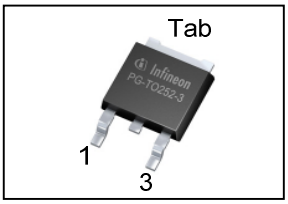
Product Summary

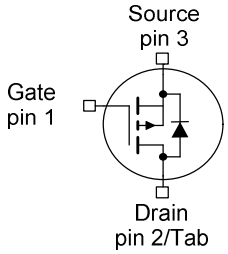
V_{DS}	-40	V
$R_{DS(on)}$	4.3	mΩ
I_D	-90	A

Features

- P-channel - Logic Level - Enhancement mode
- AEC qualified
- MSL1 up to 260°C peak reflow
- 175°C operating temperature
- Green package (RoHS compliant)
- 100% Avalanche tested

PG-TO252-3-313





Type	Package	Marking
IPD90P04P4L-04	PG-TO252-3-313	4P04L04

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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current[1)]	I_D	T_C=25°C, V_{GS}=-10V	-90	A
		T_C=100°C, V_{GS}=-10V[2)]	-90	
Pulsed drain current[2)]	$I_{D,pulse}$	T_C=25°C	-360	
Avalanche energy, single pulse[2)]	E_{AS}	I_D=-45A	60	mJ
Avalanche current, single pulse	I_{AS}	-	-90	A
Gate source voltage	V_{GS}	-	±16[3)]	V
Power dissipation	P_{tot}	T_C=25 °C	125	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[2]						
Thermal resistance, junction - case	R_{thJC}	-	-	-	1.2	K/W
SMD version, device on PCB	R_{thJA}	minimal footprint	-	-	62	
		6 cm^2 cooling area[4]	-	-	40	
Electrical characteristics, at T_j=25 °C, unless otherwise specified						
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D= -1mA	-40	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250µA	-1.2	-1.7	-2.2	
Zero gate voltage drain current	I_{DSS}	V_{DS}=-32V, V_{GS}=0V, T_j=25°C	-	-0.08	-1	µA
		V_{DS}=-32V, V_{GS}=0V, T_j=125°C[2]	-	-20	-200	
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=-85A	-	5.1	6.6	mΩ
		V_{GS}=-10V, I_D=-90A	-	3.6	4.3	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics[2]						
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-25V, f=1MHz	-	8900	11570	pF
Output capacitance	C_{oss}		-	2532	3800	
Reverse transfer capacitance	C_{rss}		-	100	200	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-20V, V_{GS}=-10V, I_D=-90A, R_G=3.5Ω	-	20	-	ns
Rise time	t_r		-	20	-	
Turn-off delay time	$t_{d(off)}$		-	140	-	
Fall time	t_f		-	60	-	
Gate Charge Characteristics[2]						
Gate to source charge	Q_{gs}	V_{DD}=-32V, I_D=-90A, V_{GS}=0 to -10V	-	31	40	nC
Gate to drain charge	Q_{gd}		-	24	48	
Gate charge total	Q_g		-	135	176	
Gate plateau voltage	$V_{plateau}$		-	-3.5	-	V
Reverse Diode						
Diode continous forward current[2]	I_S	T_C=25°C	-	-	-90	A
Diode pulse current[2]	$I_{S,pulse}$		-	-	-360	
Diode forward voltage	V_{SD}	V_{GS}=0V, I_F=-90A, T_j=25°C	-	-1	-1.3	V
Reverse recovery time[2]	t_{rr}	V_R=-20V, I_F=-50A, di_F/dt=-100A/µs	-	63	-	ns
Reverse recovery charge[2]	Q_{rr}		-	72.3	-	nC

[1] Current is limited by bondwire; with an R_{thJC} = 1.2K/W the chip is able to carry -136A at 25°C.

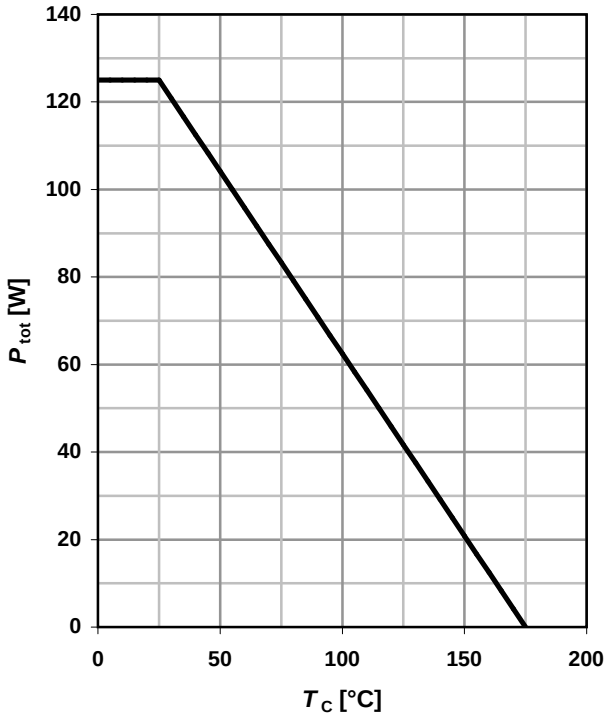
[2] Defined by design. Not subject to production test.

[3] V_{GS}=+5V/-16V according AEC; V_{GS}=+16V for max 168h at T_J=175°C

[4] 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.

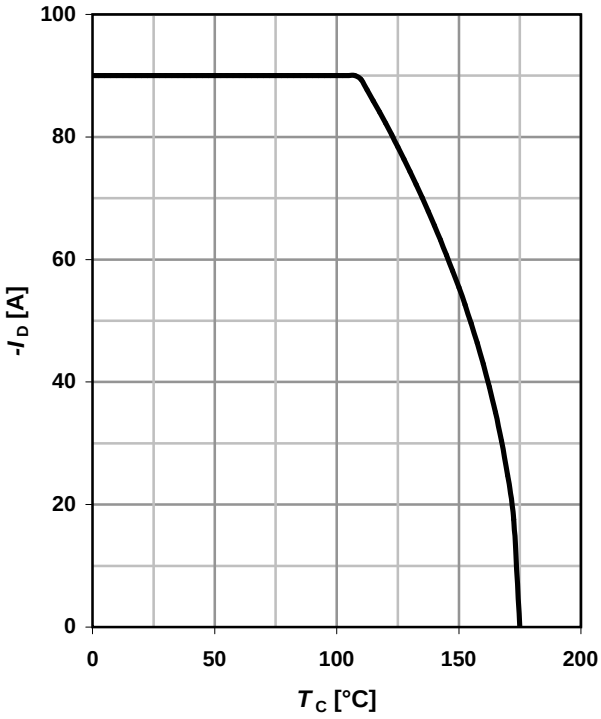
1 Power dissipation

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



2 Drain current

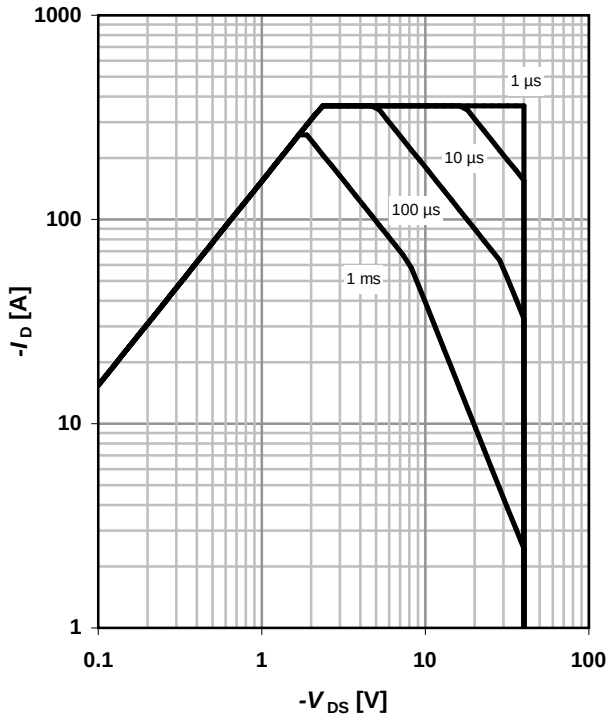
$I_D = f(T_C)$; $V_{GS} = -10V$



3 Safe operating area

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

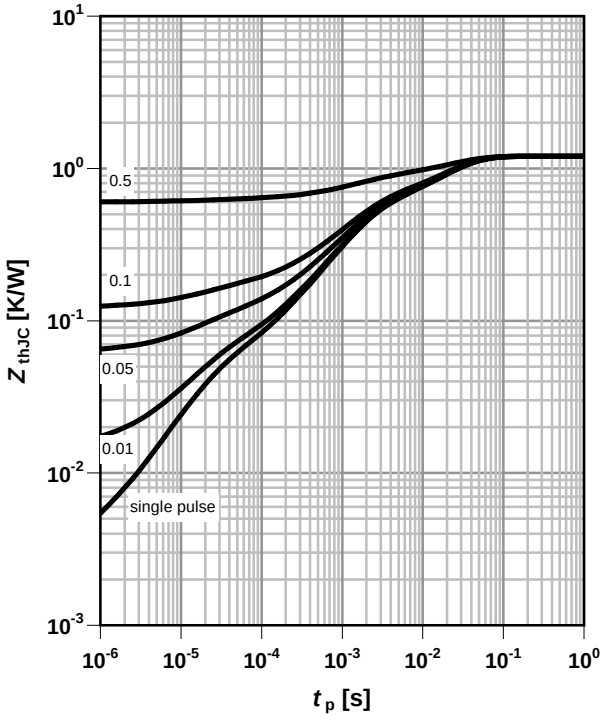
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJC} = f(t_p)$

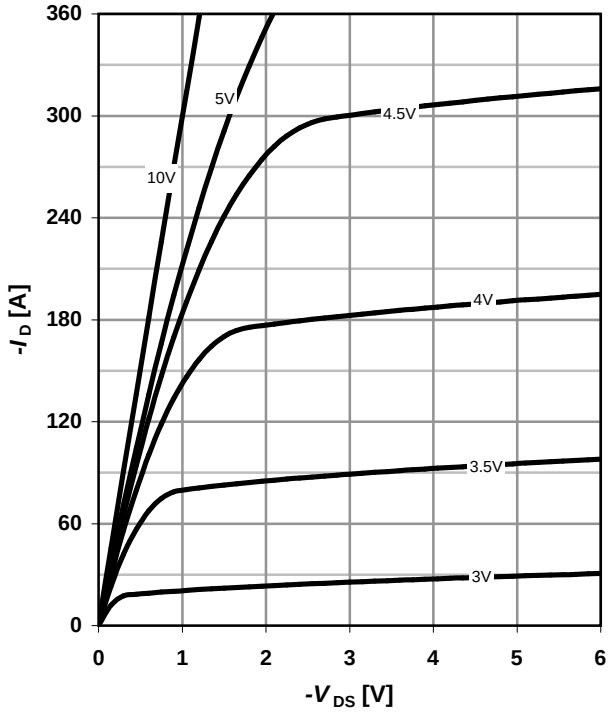
parameter: $D = t_p/T$



5 Typ. output characteristics

$I_D = f(V_{DS})$; $T_j = 25$ °C

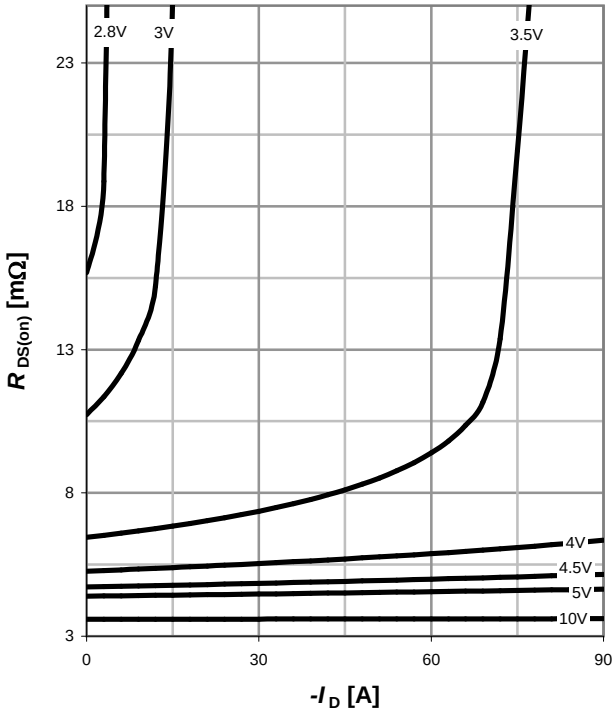
parameter: $-V_{GS}$



6 Typ. drain-source on-state resistance

$R_{DS(on)} = (I_D)$; $T_j = 25$ °C

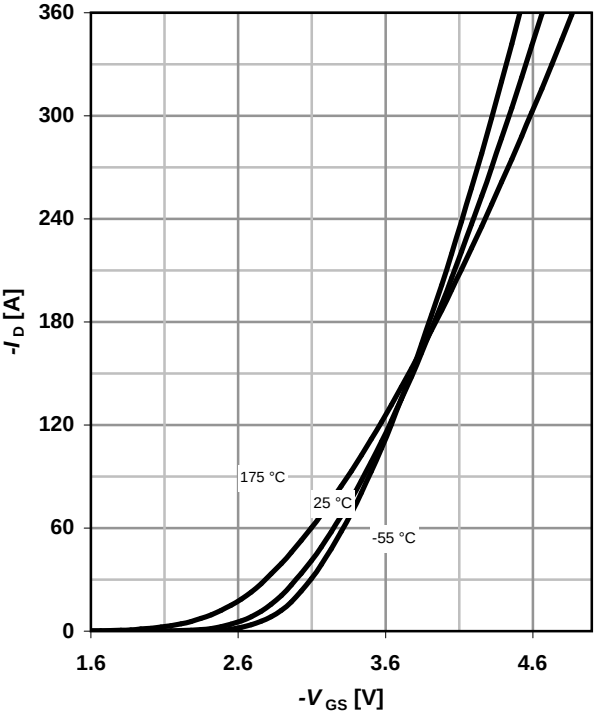
parameter: $-V_{GS}$



7 Typ. transfer characteristics

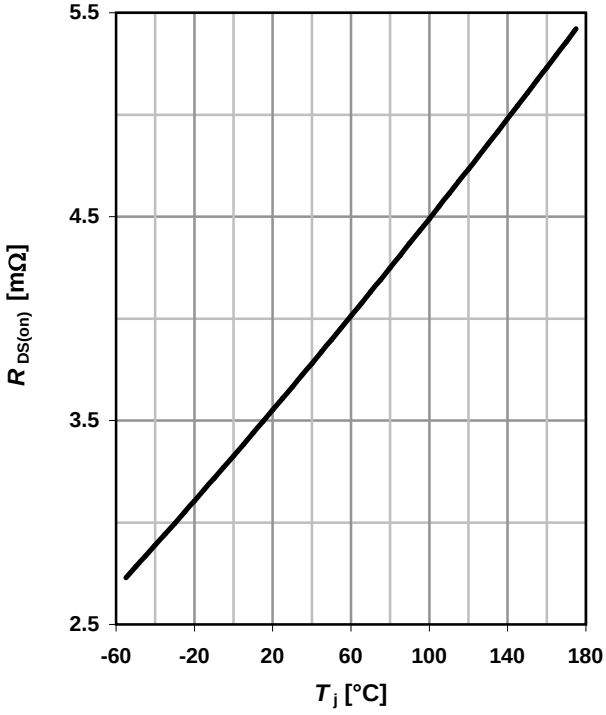
$I_D = f(V_{GS})$; $V_{DS} = -6$V

parameter: T_j



8 Typ. drain-source on-state resistance

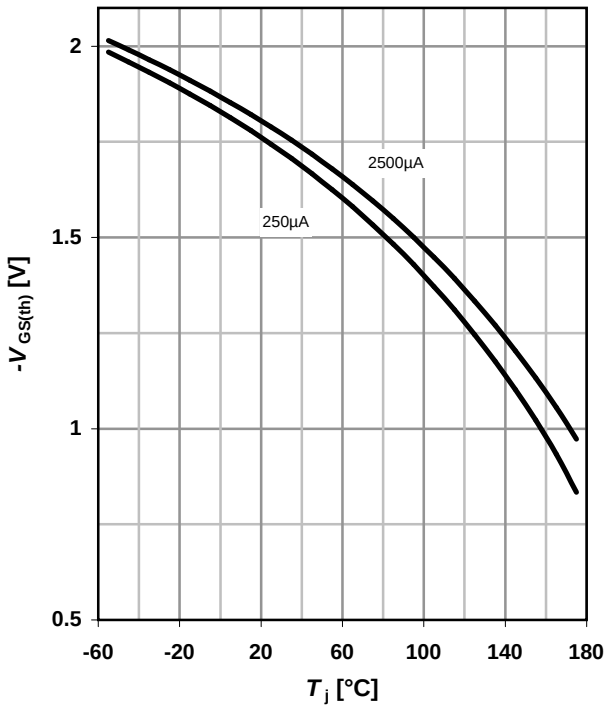
$R_{DS(on)} = f(T_j)$; $I_D = -70$ A; $V_{GS} = -10$ V



9 Typ. gate threshold voltage

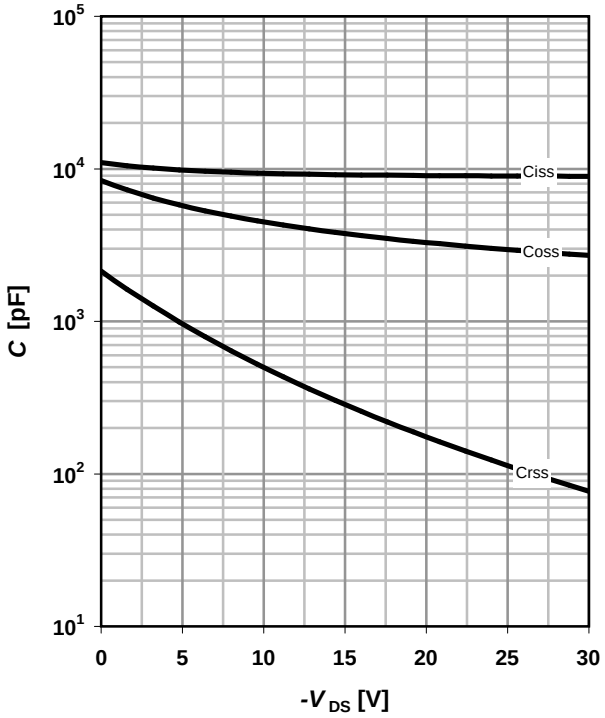
$V_{GS(th)} = f(T_j)$; $V_{GS} = V_{DS}$

parameter: $-I_D$



10 Typ. capacitances

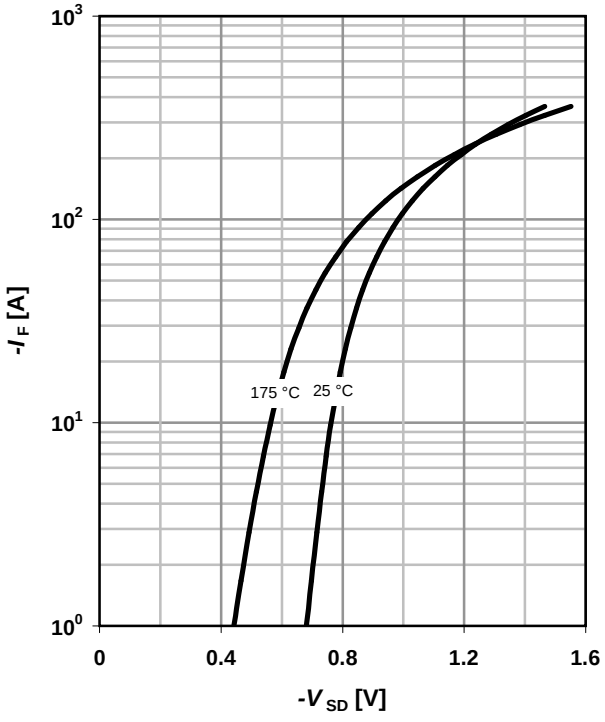
$C = f(V_{DS})$; $V_{GS} = 0$ V; f = 1 MHz



11 Typical forward diode characteristicis

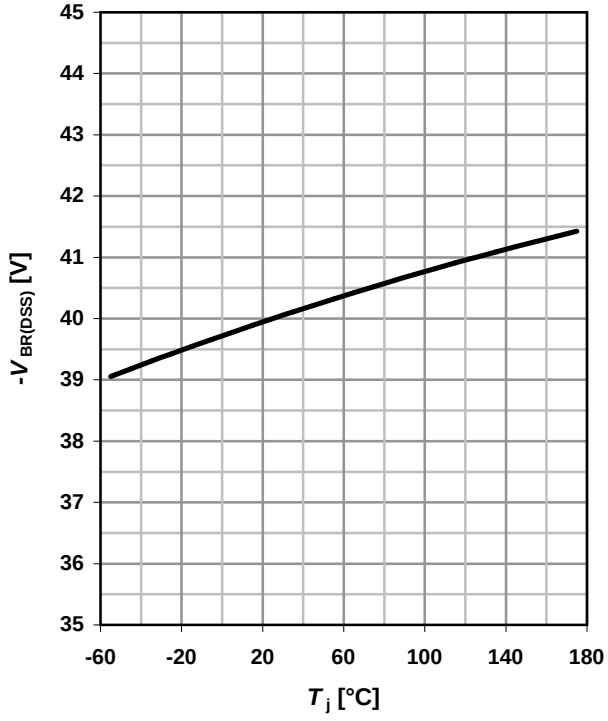
IF = f(V_{SD})

parameter: T_j



12 Drain-source breakdown voltage

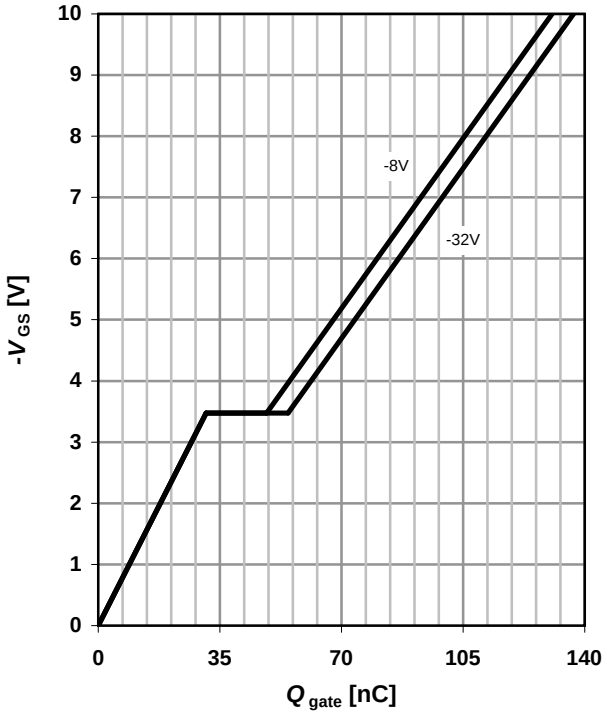
$V_{BR(DSS)} = f(T_j)$; I_D = -1 mA



13 Typ. gate charge

$V_{GS} = f(Q_{gate})$; I_D = -90 A pulsed

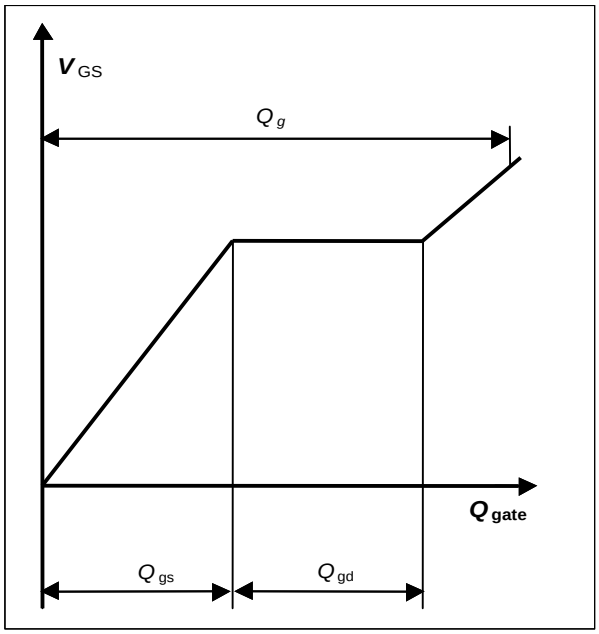
parameter: V_{DD}



14 Gate charge waveforms

$V_{GS} = f(Q_{gate})$; I_D = -90 A pulsed

parameter: V_{DD}



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If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

Revision History

Version	Date	Changes
0.1	29.01.2010	Initial Target Data Sheet
0.2	16.12.2010	Preliminary Data Sheet
1.0	27.04.2011	Final Data Sheet

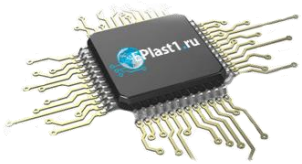
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- 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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