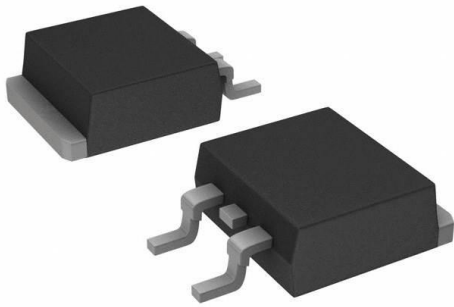


IPB80N06S209ATMA1 Datasheet

www.digi-electronics.com



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	IPB80N06S209ATMA1-DG
Manufacturer	Infineon Technologies
Manufacturer Product Number	IPB80N06S209ATMA1
Description	MOSFET N-CH 55V 80A TO263-3
Detailed Description	N-Channel 55 V 80A (Tc) 190W (Tc) Surface Mount P G-TO263-3-2



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

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Purchase and inquiry

Manufacturer Product Number:

IPB80N06S209ATMA1

Series:

OptiMOS™

FET Type:

N-Channel

Drain to Source Voltage (Vdss):

55 V

Drive Voltage (Max Rds On, Min Rds On):

10V

Vgs(th) (Max) @ Id:

4V @ 125µA

Vgs (Max):

±20V

FET Feature:

-

Operating Temperature:

-55°C ~ 175°C (Tj)

Supplier Device Package:

PG-T0263-3-2

Base Product Number:

IPB80N

Manufacturer:

Infineon Technologies

Product Status:

Discontinued at Digi-Key

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

80A (Tc)

Rds On (Max) @ Id, Vgs:

8.8mOhm @ 50A, 10V

Gate Charge (Qg) (Max) @ Vgs:

80 nC @ 10 V

Input Capacitance (Ciss) (Max) @ Vds:

2360 pF @ 25 V

Power Dissipation (Max):

190W (Tc)

Mounting Type:

Surface Mount

Package / Case:

TO-263-3, D2PAK (2 Leads + Tab), TO-263AB

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



IPB80N06S2-09

IPP80N06S2-09

OptiMOS® Power-Transistor

Features

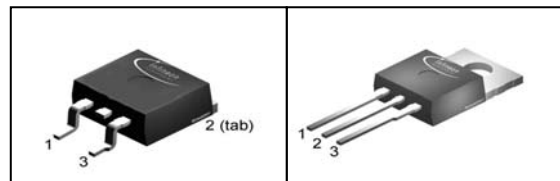
- N-channel - Enhancement mode
- Automotive AEC Q101 qualified
- MSL1 up to 260°C peak reflow
- 175°C operating temperature
- Green package (lead free)
- Ultra low Rds(on)
- 100% Avalanche tested

Product Summary

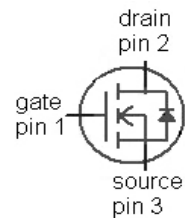
V_{DS}	55	V
$R_{DS(on),max}$ (SMD version)	8.8	m Ω
I_D	80	A

PG-TO263-3-2

PG-TO220-3-1



Type	Package	Ordering Code	Marking
IPB80N06S2-09	PG-TO263-3-2	SP0002-18741	2N0609
IPP80N06S2-09	PG-TO220-3-1	SP0002-18740	2N0609



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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current ¹⁾	I_D	$T_C=25^\circ\text{C}$, $V_{GS}=10\text{V}$	80	A
		$T_C=100^\circ\text{C}$, $V_{GS}=10\text{V}^{2)}$	80	
Pulsed drain current ²⁾	$I_{D,pulse}$	$T_C=25^\circ\text{C}$	320	
Avalanche energy, single pulse ²⁾	E_{AS}	$I_D=80\text{A}$	370	mJ
Gate source voltage ⁴⁾	V_{GS}		± 20	V
Power dissipation	P_{tot}	$T_C=25^\circ\text{C}$	190	W
Operating and storage temperature	T_j, T_{stg}		-55 ... +175	$^\circ\text{C}$
IEC climatic category; DIN IEC 68-1			55/175/56	



IPB80N06S2-09

IPP80N06S2-09

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics²⁾						
Thermal resistance, junction - case	R_{thJC}		-	-	0.8	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 ⁵⁾	-	-	40	

Electrical characteristics, at $T_j=25\text{ °C}$, unless otherwise specified

Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=1\text{ mA}$	55	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=125\text{ }\mu\text{A}$	2.1	3.0	4.0	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=55\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ °C}$	-	0.01	1	μA
		$V_{DS}=55\text{ V}, V_{GS}=0\text{ V}, T_j=125\text{ °C}^{2)}$	-	1	100	
Gate-source leakage current	I_{GSS}	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$	-	1	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=50\text{ A},$	-	7.6	9.1	m Ω
		$V_{GS}=10\text{ V}, I_D=50\text{ A},$ SMD version	-	7.3	8.8	



IPB80N06S2-09

IPP80N06S2-09

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Dynamic characteristics²⁾

Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=25\text{ V},$ $f=1\text{ MHz}$	-	2360	-	pF
Output capacitance	C_{oss}		-	610	-	
Reverse transfer capacitance	C_{rss}		-	150	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=30\text{ V}, V_{GS}=10\text{ V},$ $I_D=80\text{ A}, R_G=4.7\ \Omega$	-	14	-	ns
Rise time	t_r		-	29	-	
Turn-off delay time	$t_{d(off)}$		-	39	-	
Fall time	t_f		-	28	-	

Gate Charge Characteristics²⁾

Gate to source charge	Q_{gs}	$V_{DD}=44\text{ V}, I_D=80\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	12	16	nC
Gate to drain charge	Q_{gd}		-	24	37	
Gate charge total	Q_g		-	60	80	
Gate plateau voltage	$V_{plateau}$		-	5.5	-	V

Reverse Diode

Diode continuous forward current ²⁾	I_S	$T_C=25\text{ }^\circ\text{C}$	-	-	80	A
Diode pulse current ²⁾	$I_{S,pulse}$		-	-	320	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=80\text{ A},$ $T_J=25\text{ }^\circ\text{C}$	-	0.9	1.3	V
Reverse recovery time ²⁾	t_{rr}	$V_R=30\text{ V}, I_F=I_S,$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	50	63	ns
Reverse recovery charge ²⁾	Q_{rr}		-	76	95	

¹⁾ Current is limited by bondwire; with an $R_{thJC} = 0.8\text{ K/W}$ the chip is able to carry 99 A at 25°C. For detailed information see Application Note ANPS071E at www.infineon.com/optimos

²⁾ Defined by design. Not subject to production test.

³⁾ See diagram 13.

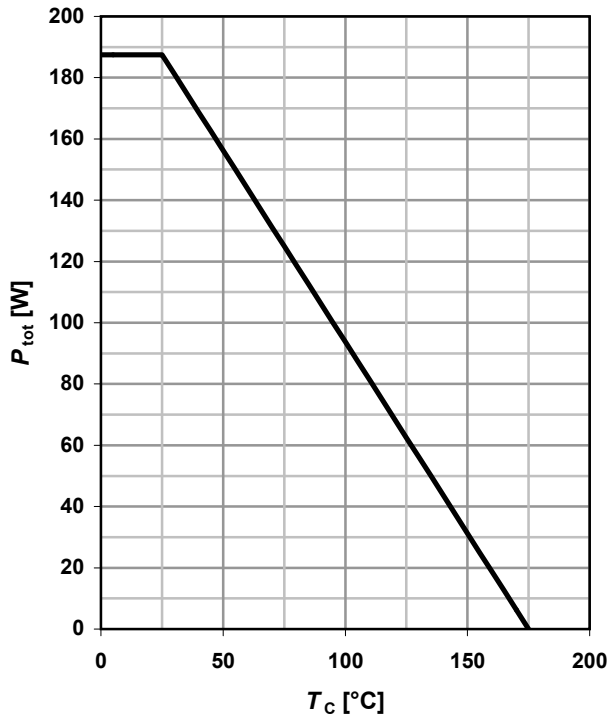
⁴⁾ Qualified at -20V and +20V.

⁵⁾ 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.



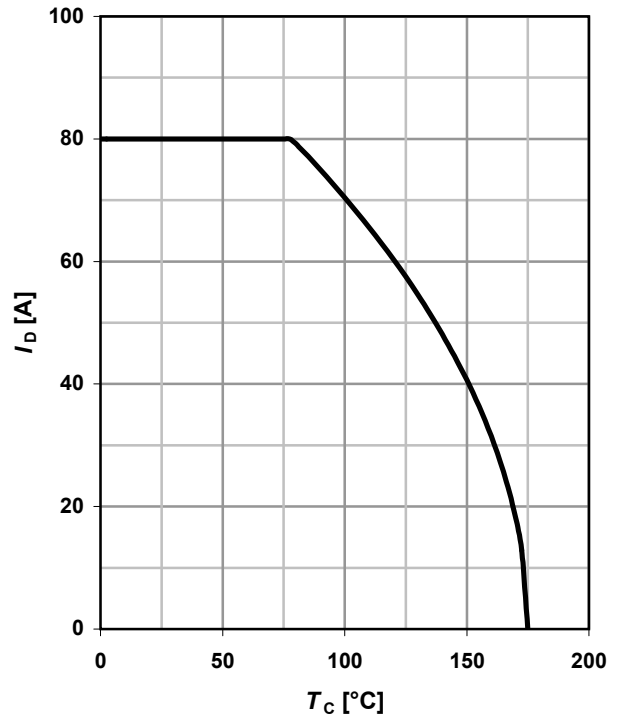
1 Power dissipation

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



2 Drain current

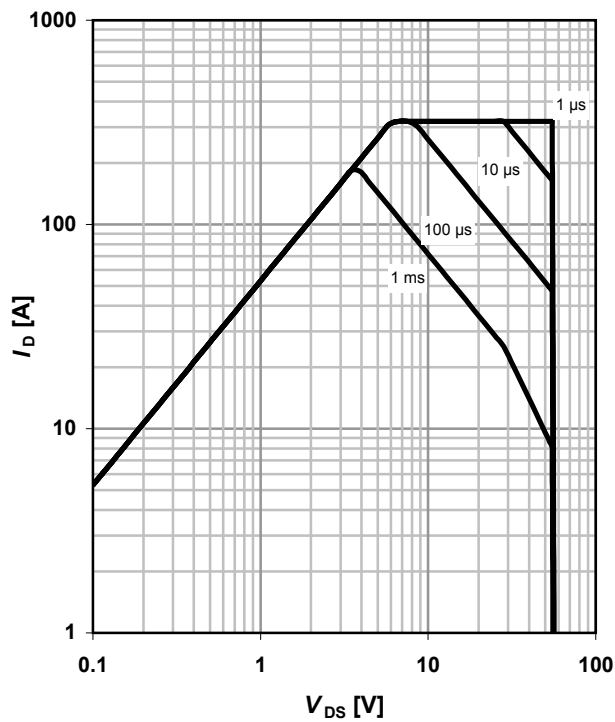
$I_D = f(T_C); V_{GS} \geq 10 V$



3 Safe operating area

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

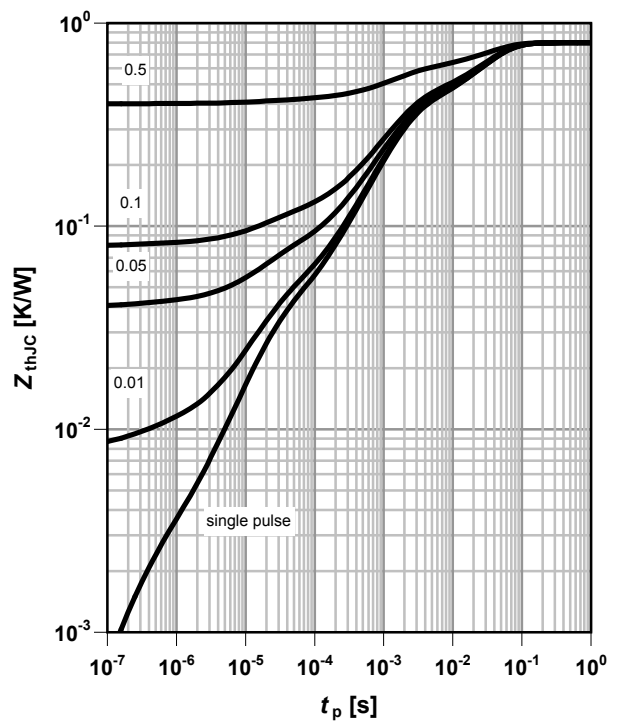
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJC} = f(t_p)$

parameter: $D = t_p/T$

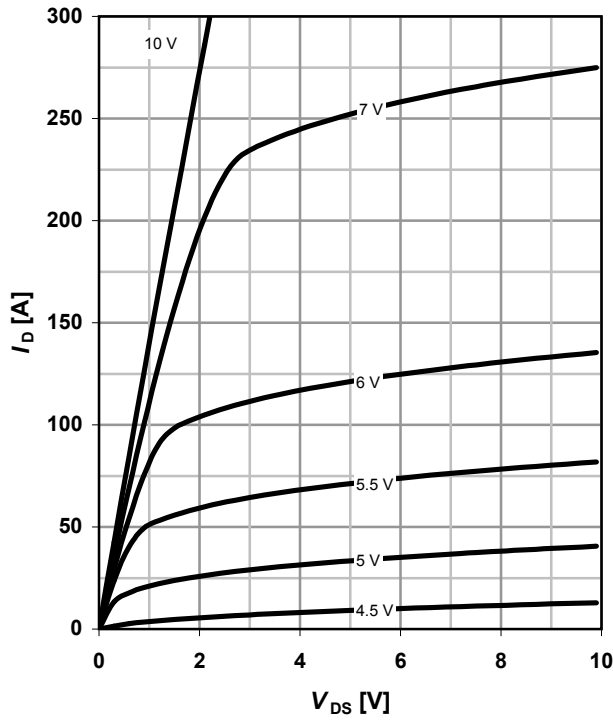




5 Typ. output characteristics

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

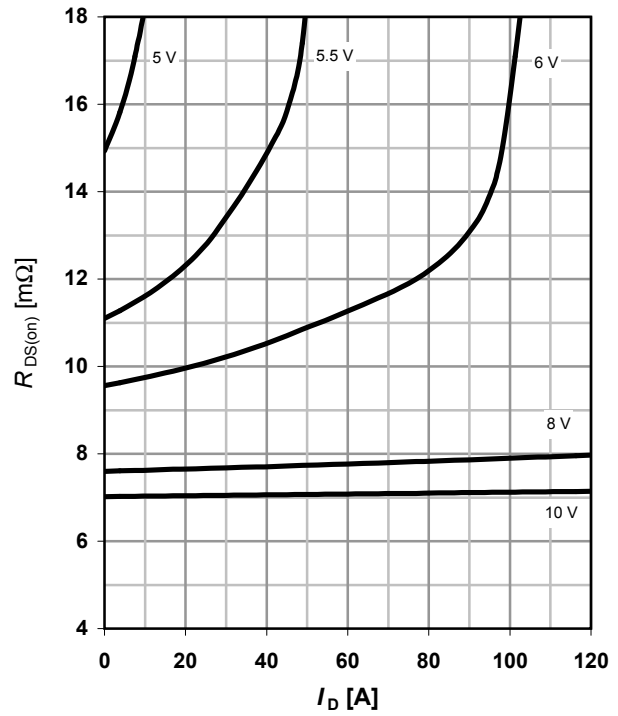
parameter: V_{GS}



6 Typ. drain-source on-state resistance

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

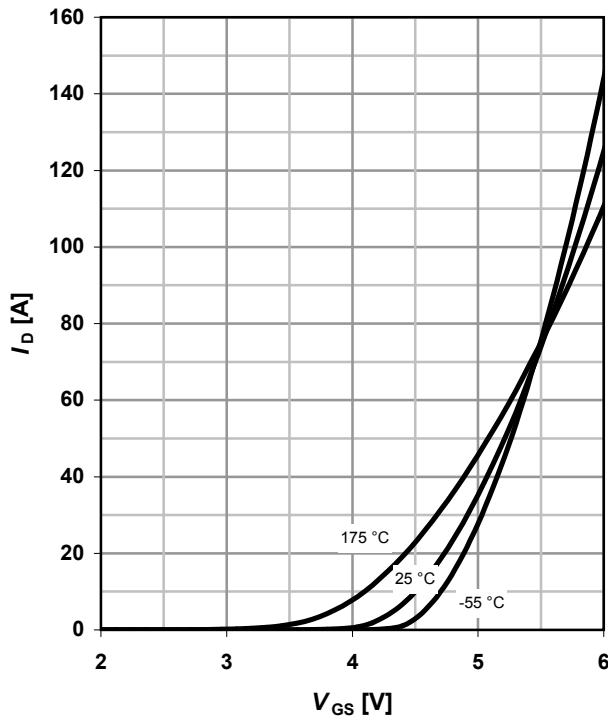
parameter: V_{GS}



7 Typ. transfer characteristics

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

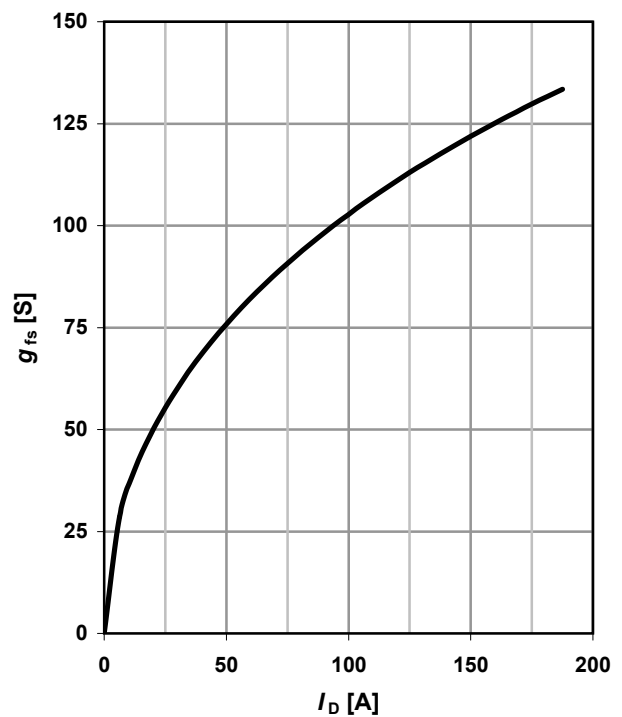
parameter: T_j



8 Typ. Forward transconductance

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

parameter: g_{fs}

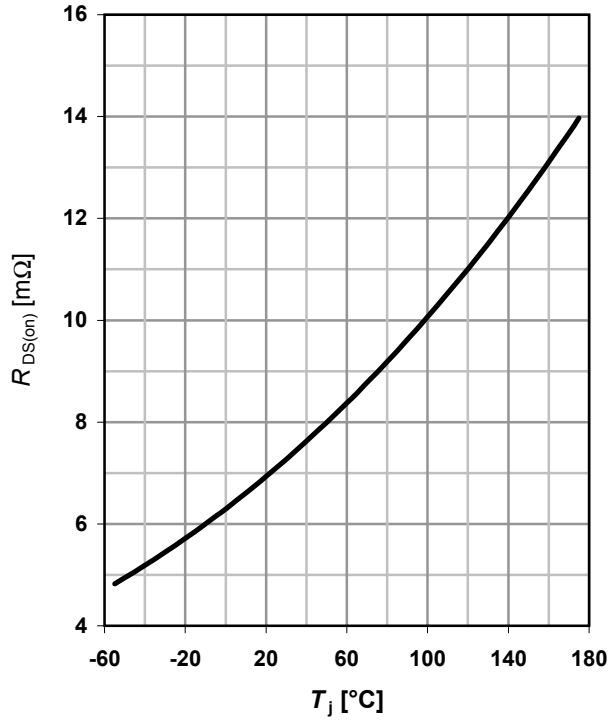




9 Typ. Drain-source on-state resistance

$R_{DS(ON)} = f(T_j)$

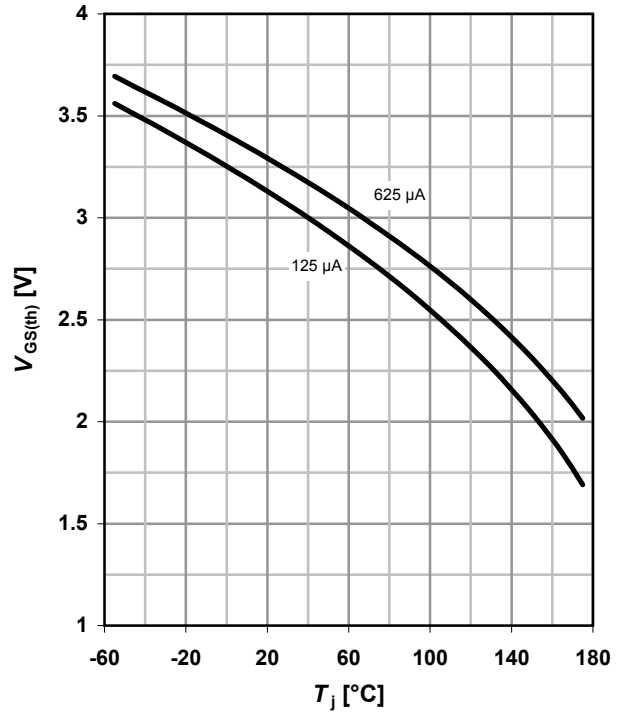
parameter: $I_D = 80\text{ A}$; $V_{GS} = 10\text{ V}$



10 Typ. gate threshold voltage

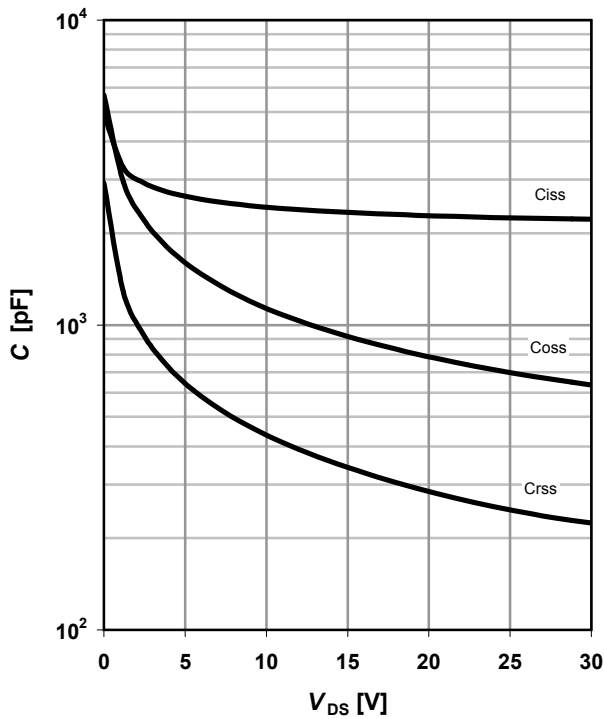
$V_{GS(th)} = f(T_j)$; $V_{GS} = V_{DS}$

parameter: I_D



11 Typ. capacitances

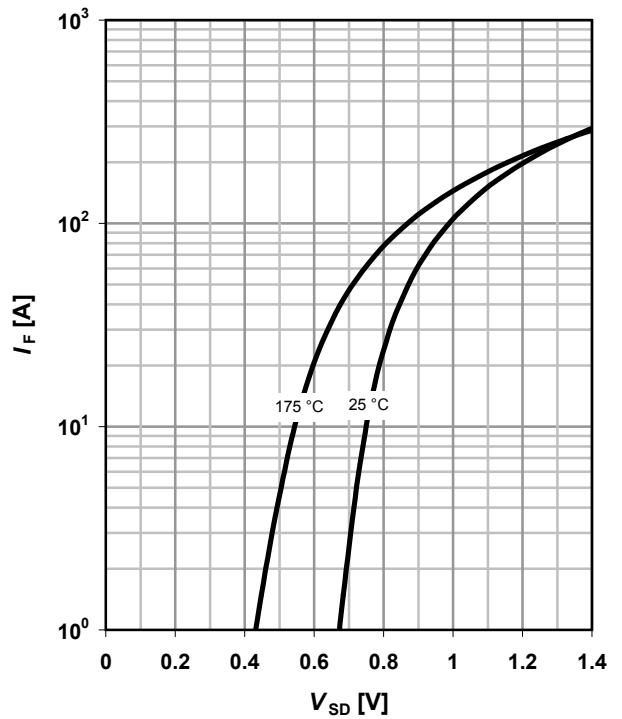
$C = f(V_{DS})$; $V_{GS} = 0\text{ V}$; $f = 1\text{ MHz}$



12 Typical forward diode characteristics

$I_F = f(V_{SD})$

parameter: T_j

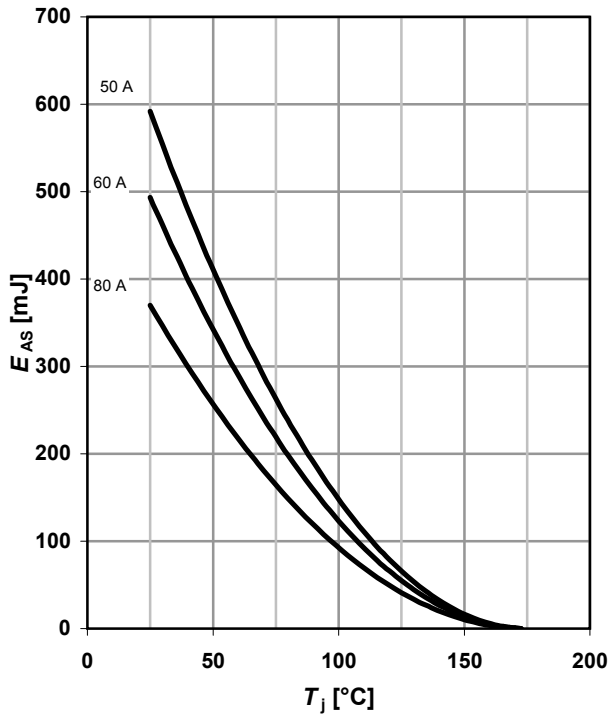




13 Typical avalanche energy

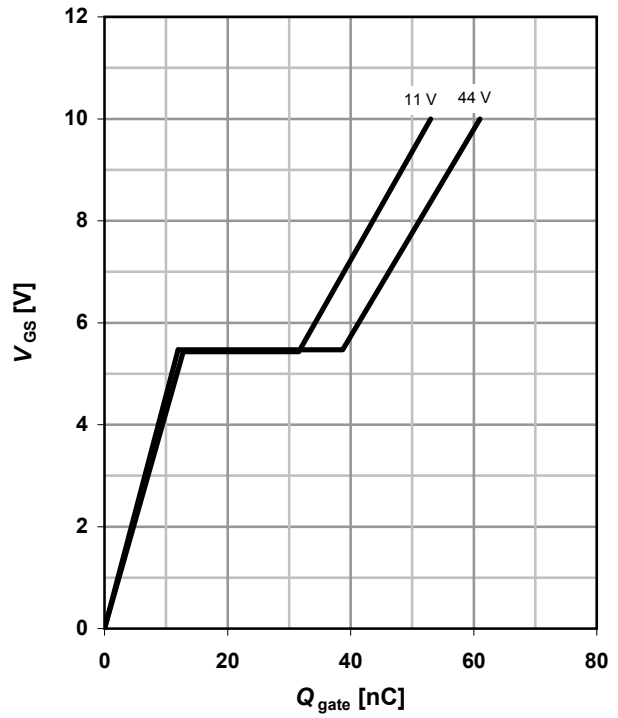
$E_{AS} = f(T_j)$

parameter: I_D



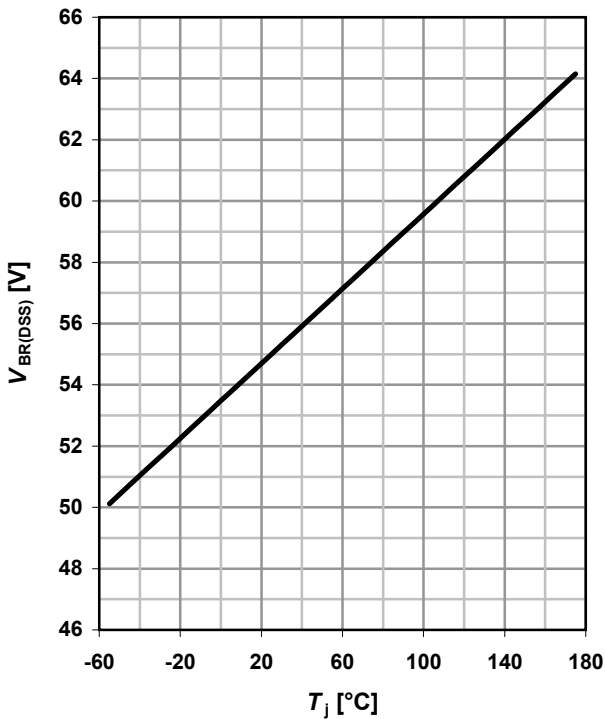
14 Typ. gate charge

$V_{GS} = f(Q_{gate}); I_D = 80 \text{ A pulsed}$

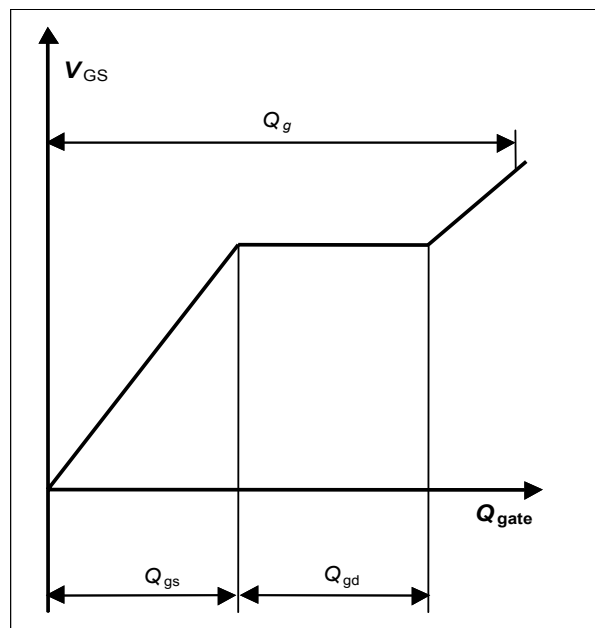


15 Typ. drain-source breakdown voltage

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



16 Gate charge waveforms





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