N-Ch 120V Fast Switching MOSFETs

Features

- Fast Switching
- Low Gate Charge and $R_{DS(on)}$
- Low Reverse transfer capacitances

Product Summary

Green

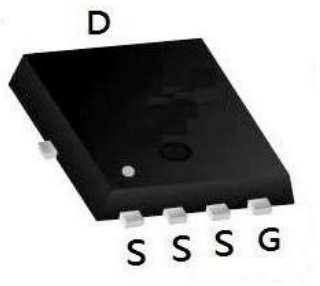
BVDSS	RDSON	ID
120V	7.7mΩ	80A

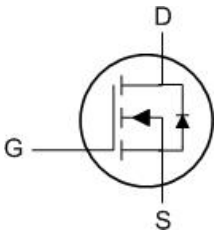
Applications

- DC-DC converter
- Portable Equipment
- Power management

100% DVDS Tested
100% Avalanche Tested

PDFN5060-8L Pin Configuration





Absolute Maximum Ratings:

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		120	V
I_D	Continuous Drain Current	T_C = 25 °C	80	A
	Continuous Drain Current	T_C = 100 °C	49	A
I_{DM}[a1]	Pulsed Drain Current		280	A
E_{AS}[a2]	Single pulse avalanche energy		300	mJ
V_{GS}	Gate-to-Source Voltage		±20	V
P_D	Power Dissipation		105	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		150, –55 to 150	℃
T_L	Maximum Temperature for Soldering		260	℃

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.19	℃/W

Electrical Characteristics (Tc= 25℃ unless otherwise specified):

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	120	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS} = 120V, V_{GS}= 0V	--	--	1	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =+20V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =-20V	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D = 250μA	1.4	1.8	2.2	V
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=20A	--	7.7	9.5	mΩ
		V_{GS}=4.5V, I_D=10A	--	9	11	mΩ

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 60V f = 1.0MHz	--	2410	--	pF
C_{oss}	Output Capacitance		--	282	--	
C_{rss}	Reverse Transfer Capacitance		--	8	--	

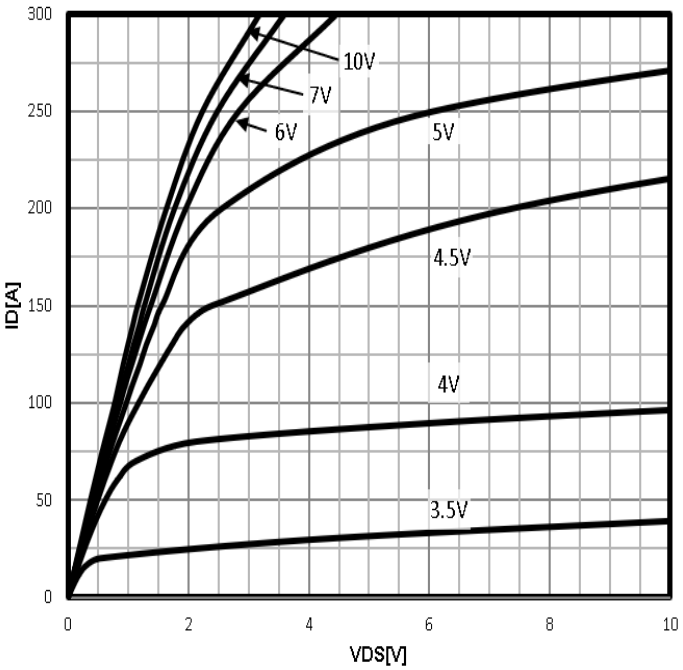
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =20A V_{DS} = 60V V_{GS} = 10V R_G = 5Ω	--	20	--	ns
tr	Rise Time		--	15	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	32	--	
t_f	Fall Time		--	10	--	
Q_g	Total Gate Charge	V_{GS} =0~10V V_{DS} = 60V I_D =20A	--	41	--	nC
Q_{gs}	Gate Source Charge		--	12	--	
Q_{gd}	Gate Drain Charge		--	10	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C =25 °C	--	--	80	A
V_{SD}	Diode Forward Voltage	I_S=20A, V_{GS}=0V	--	0.83	1.2	V
t_{rr}	Reverse Recovery time	I_S=40A, dI/dt=100A/μs	--	65	--	ns
Q_{rr}	Reverse Recovery Charge		--	109	--	nC

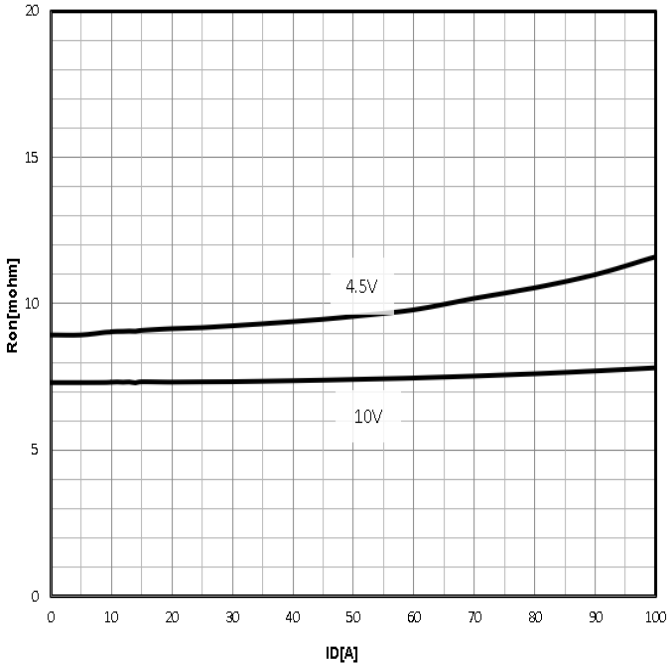
[a1]: Repetitive rating; pulse width limited by maximum junction temperature
[a2]: VDD=60V, L=0.5mH, Rg=25Ω, Starting TJ=25 ℃

Characteristics Curve:

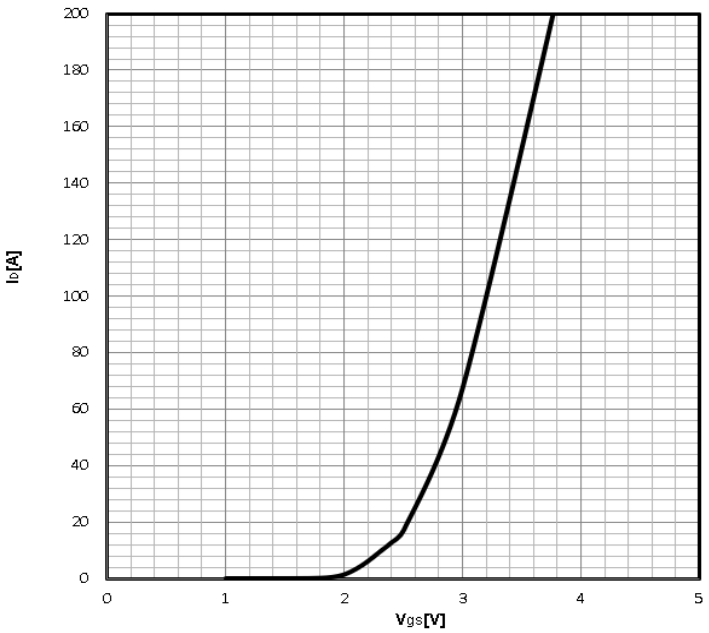
Typ. output characteristics
$I_D=f(V_{DS})$



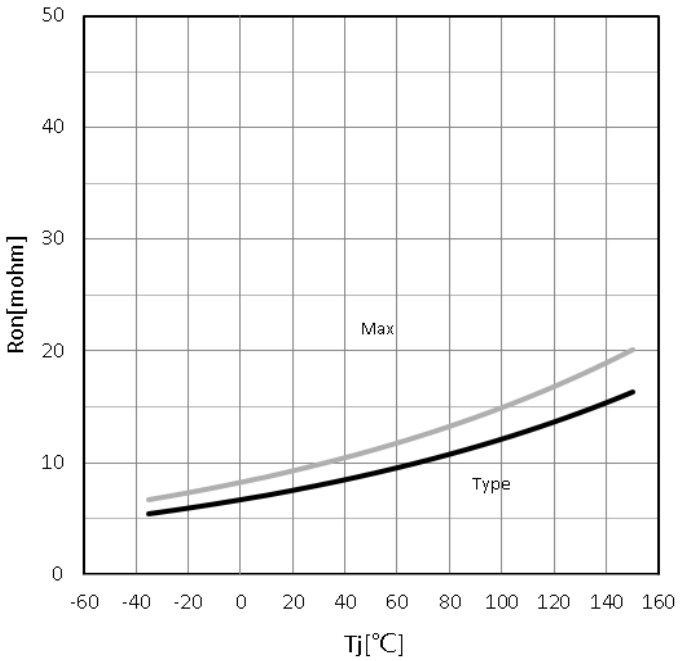
Typ. drain-source on resistance
$R_{DS(on)}=f(I_D)$



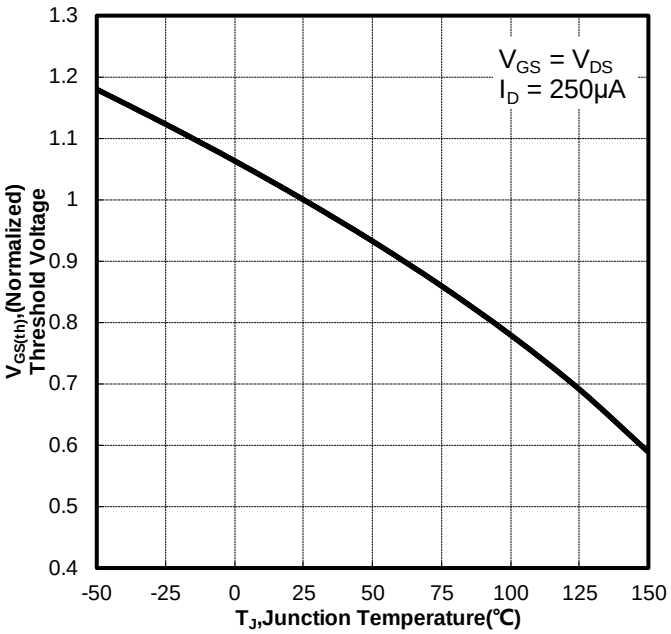
Typ. transfer characteristics
$I_D=f(V_{GS})$



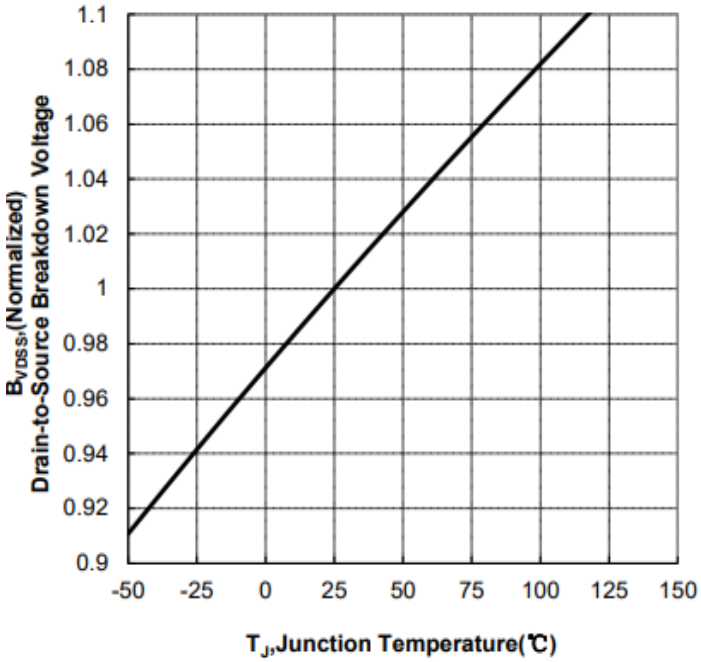
Drain-source on-state resistance $R_{DS(on)}=f(T_j)$;
I_D=20A; V_{GS}=10V



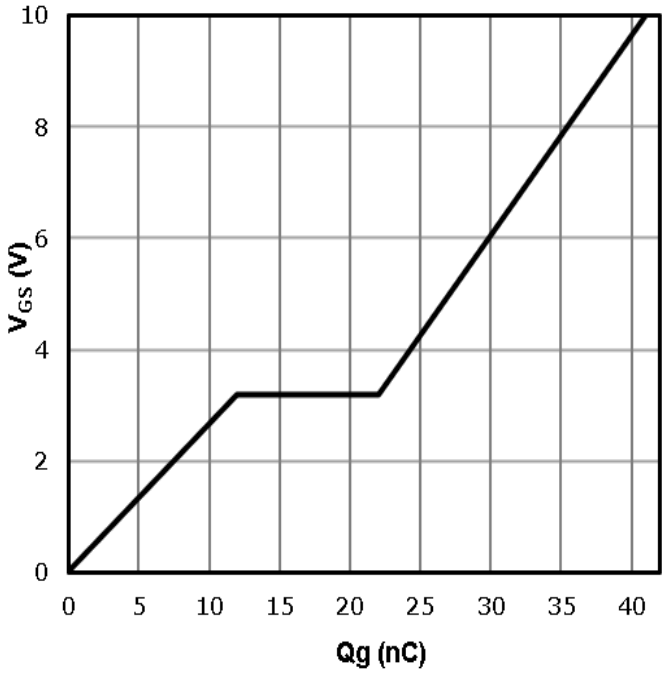
Gate Threshold Voltage $V_{TH}=f(T_j)$; $I_D=250uA$



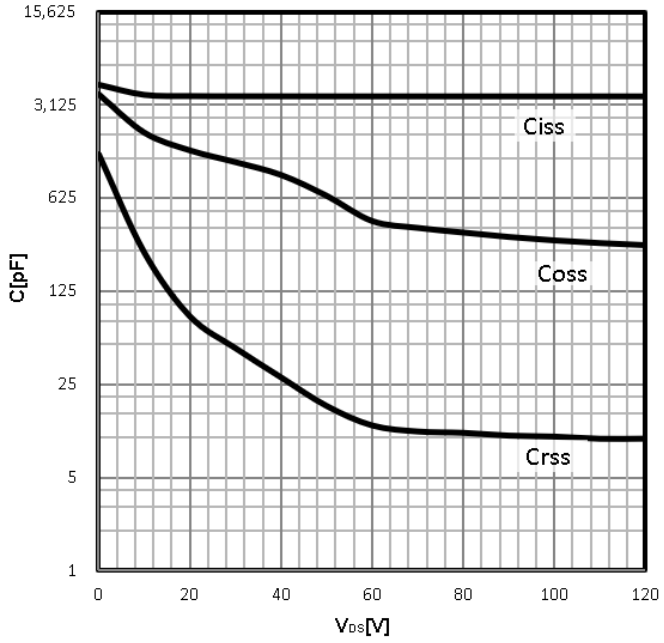
Drain-source breakdown voltage
$V_{BR(DSS)}=f(T_j)$; $I_D=250uA$



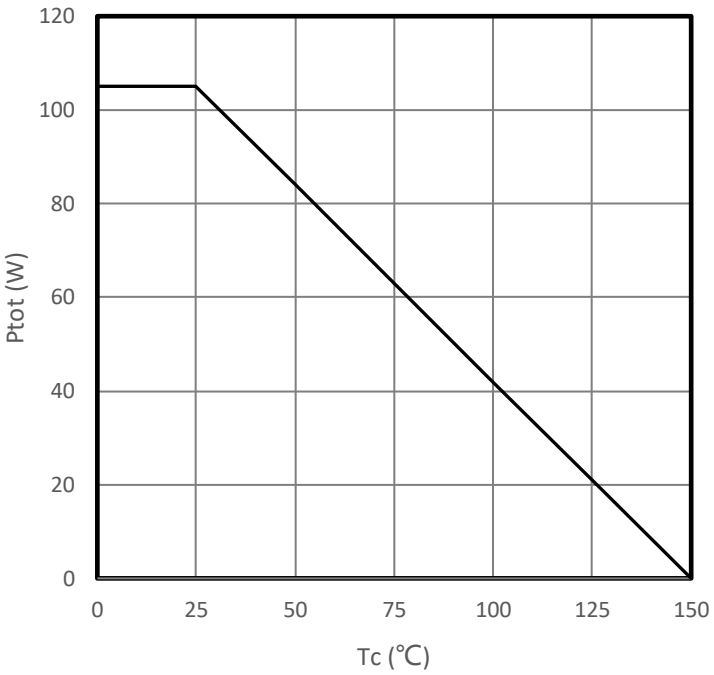
Typ. gate charge
$V_{GS}=f(Q_{gate})$



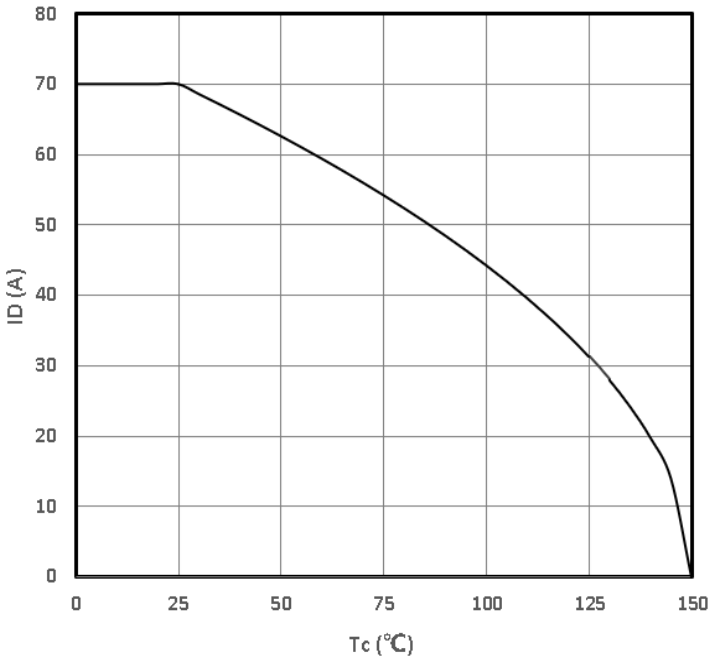
Typ. capacitances
$C=f(V_{DS})$; $V_{GS}=0V$; $f=1MHz$



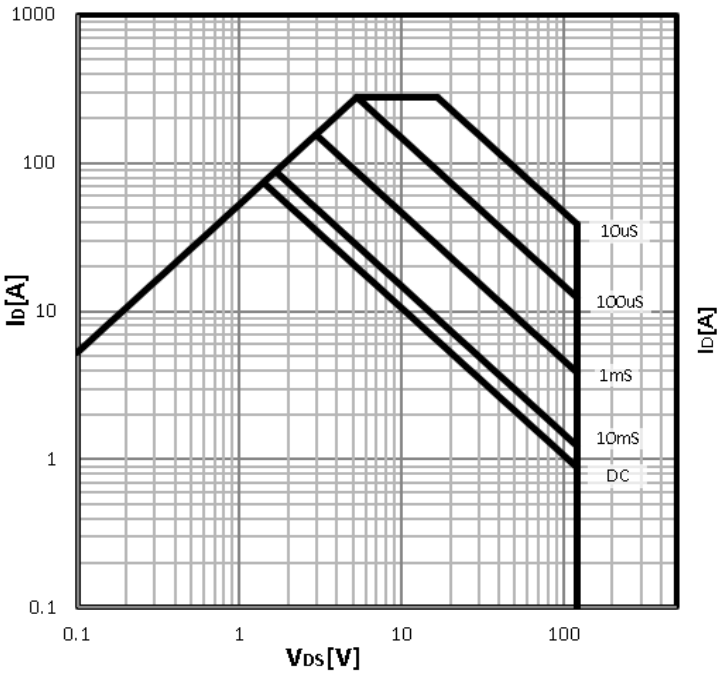
Power Dissipation
$P_{tot}=f(T_j)$



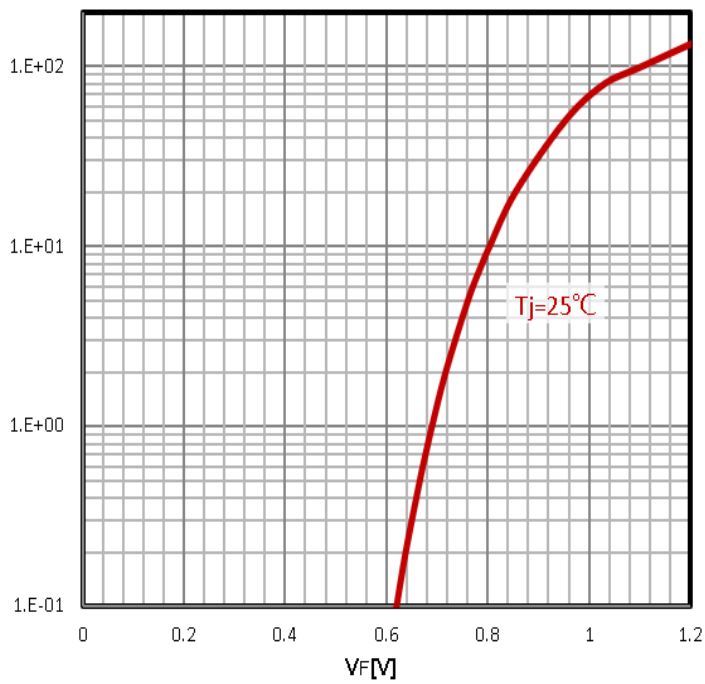
Maximum Drain Current
$I_D=f(T_C)$



Safe operating area $I_D=f(V_{DS})$

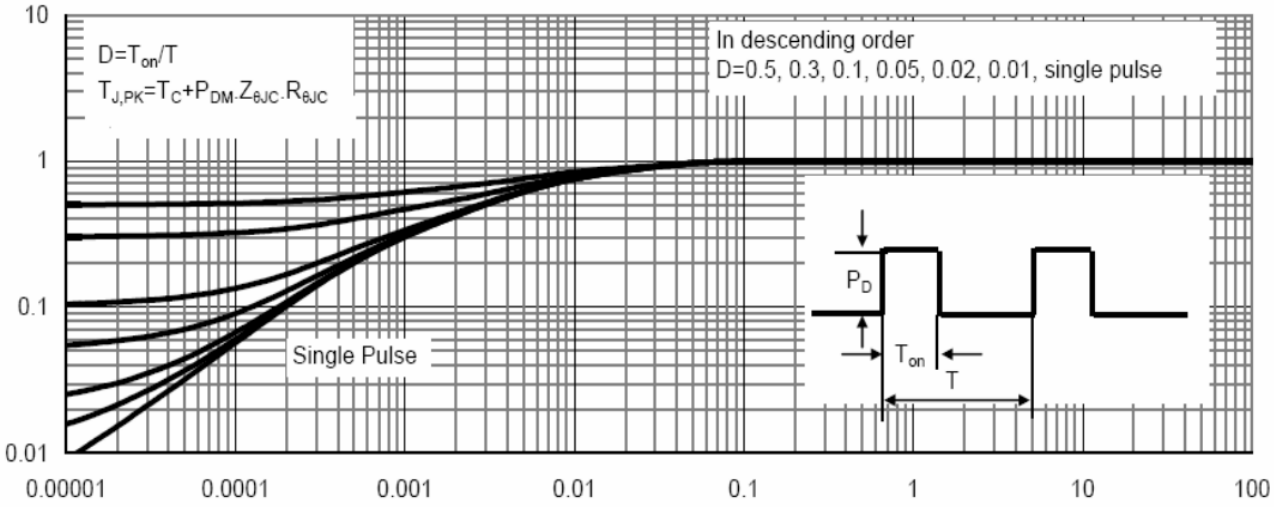


Body Diode Forward Voltage Variation
$I_F=f(V_{GS})$

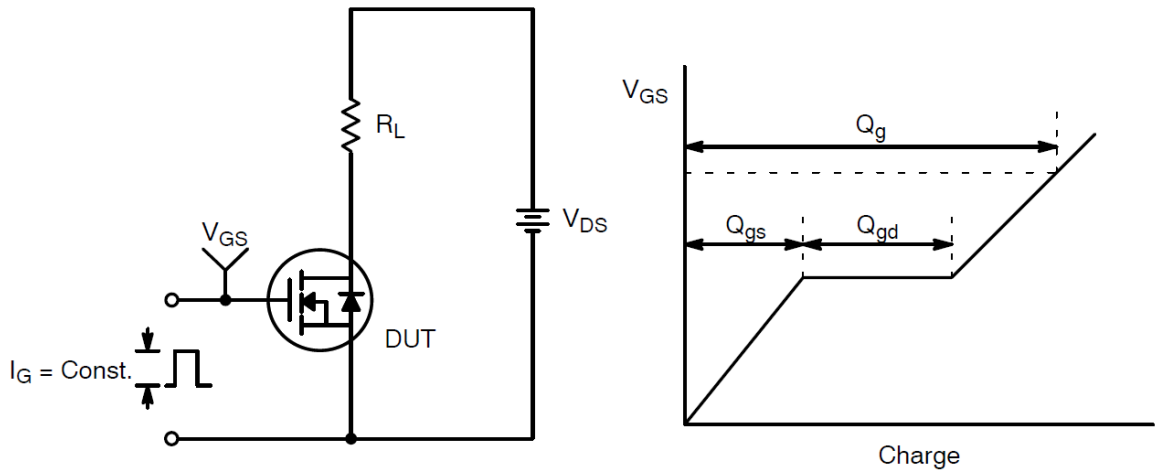


Max. transient thermal impedance

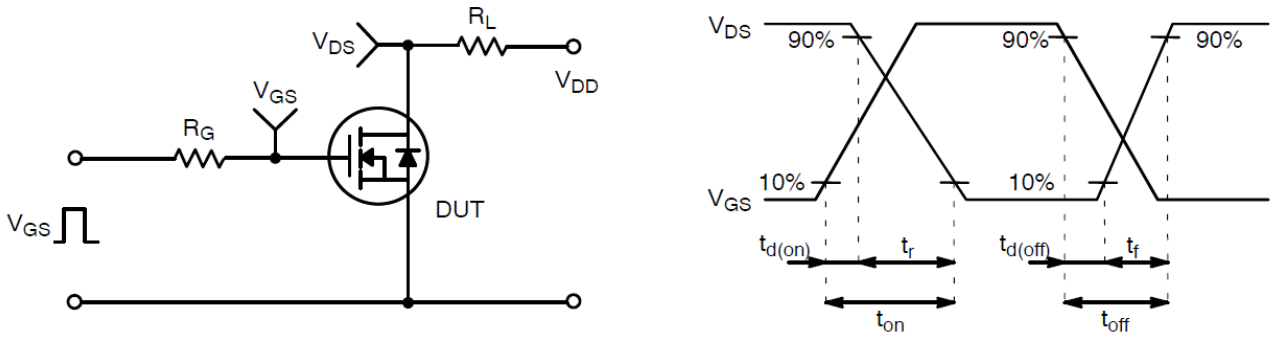
$Z_{thJC}=f(t_p)$



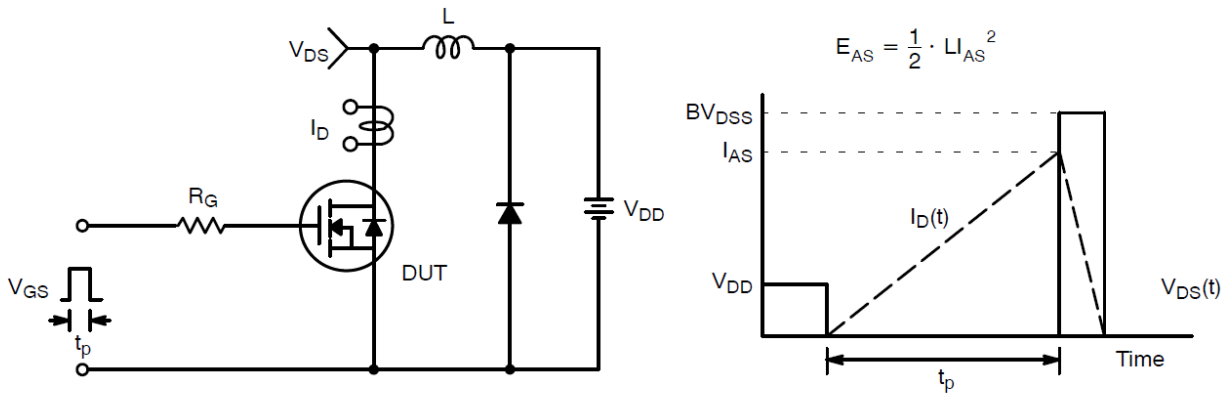
Test Circuit and Waveform:



Gate Charge Test Circuit & Waveform

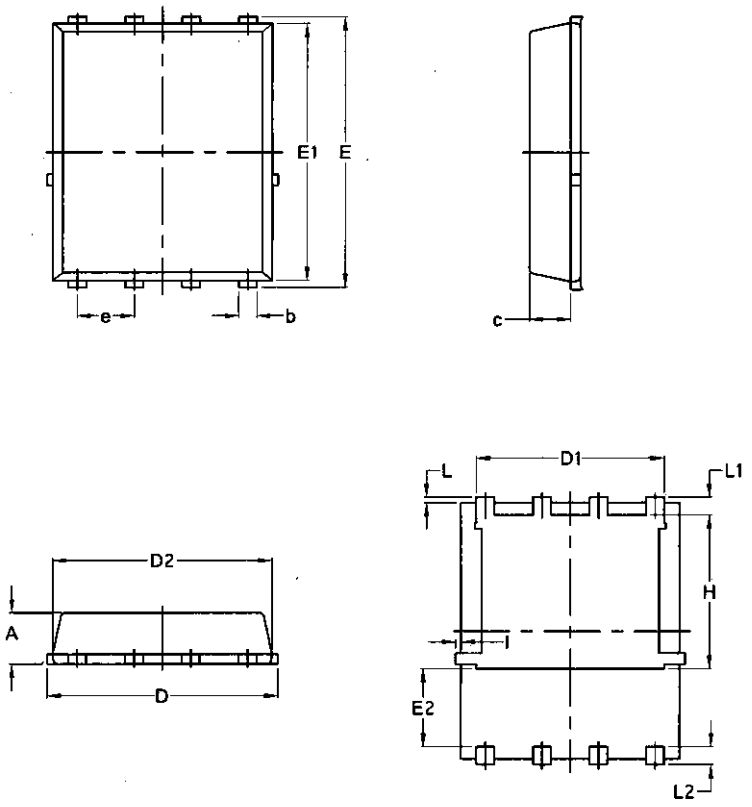


Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

Package Mechanical Data-PDFN5060-8L-Single



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070