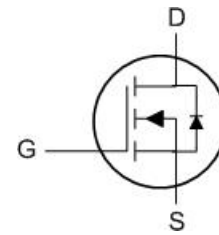




Features

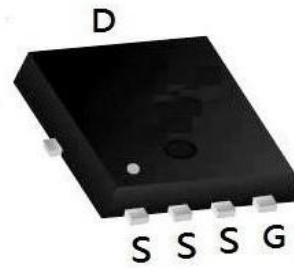
- Fast Switching
- Low Gate Charge and $R_{DS(on)}$
- Low Reverse transfer capacitances



Applications

- DC-DC converter
- Portable Equipment
- Power management

PDFN5060-8L Pin Configuration



100% DVDS Tested
100% Avalanche Tested

Product Summary

BVDSS	RDS(on)	ID
120V	7.7mΩ	80A

Absolute Maximum Ratings:

Symbol	Parameter	Value	Units
V_{DSS}	Drain-to-Source Voltage	120	V
I_D	Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	80
	Continuous Drain Current	$T_C = 100\text{ }^\circ\text{C}$	49
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	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	260	$^\circ\text{C}$

Thermal Characteristics:

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



Electrical Characteristics (T_c= 25°C 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 _{riss}	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
t _r	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	--	41	--	nC
Q _{gs}	Gate Source Charge	V _{DS} = 60V	--	12	--	
Q _{gd}	Gate Drain Charge	I _D =20A	--	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

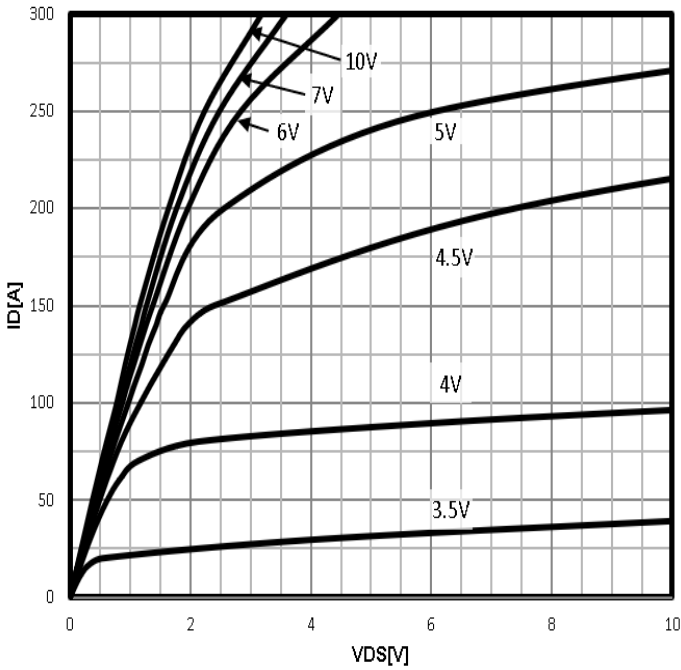
a1 : Repetitive rating; pulse width limited by maximum junction temperature

a2 : VDD=60V, L=0.5mH, Rg=25Ω, Starting T_J=25 °C

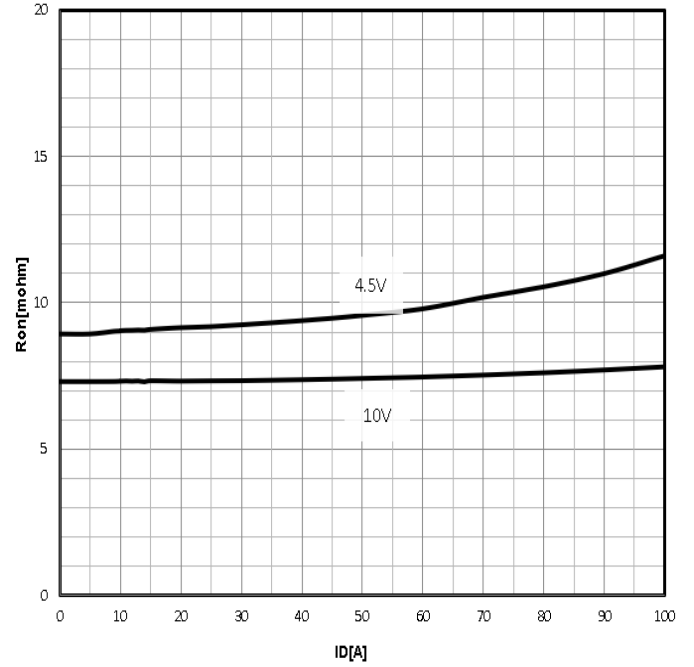


Characteristics Curve:

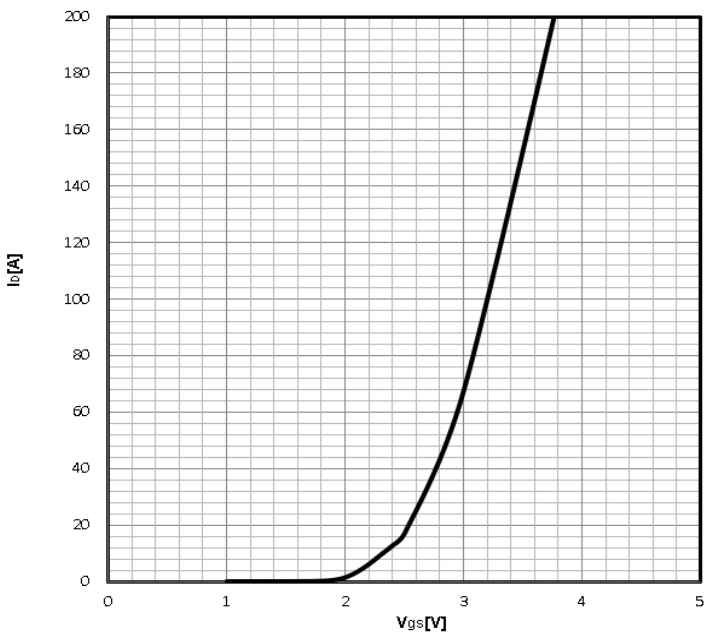
Typ. output characteristics
 $I_D=f(V_{DS})$



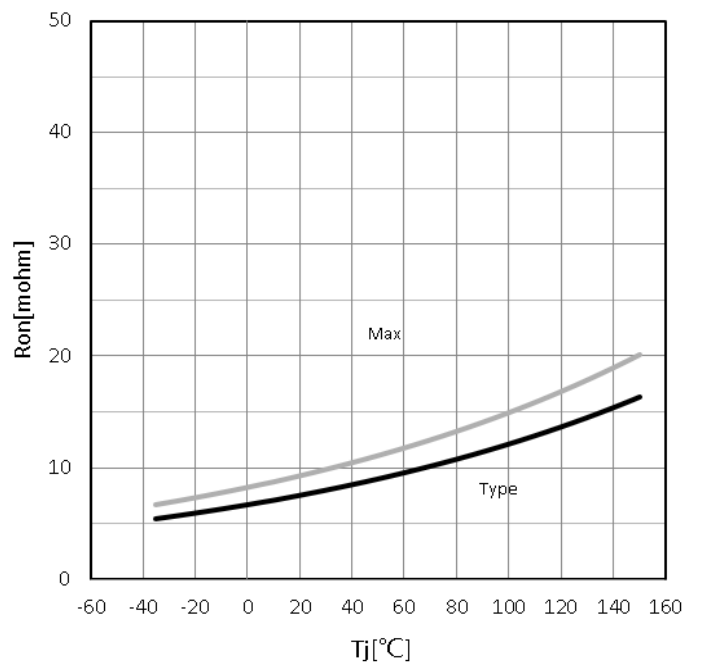
Typ. drain-source on resistance
 $R_{DS(on)}=f(I_D)$



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

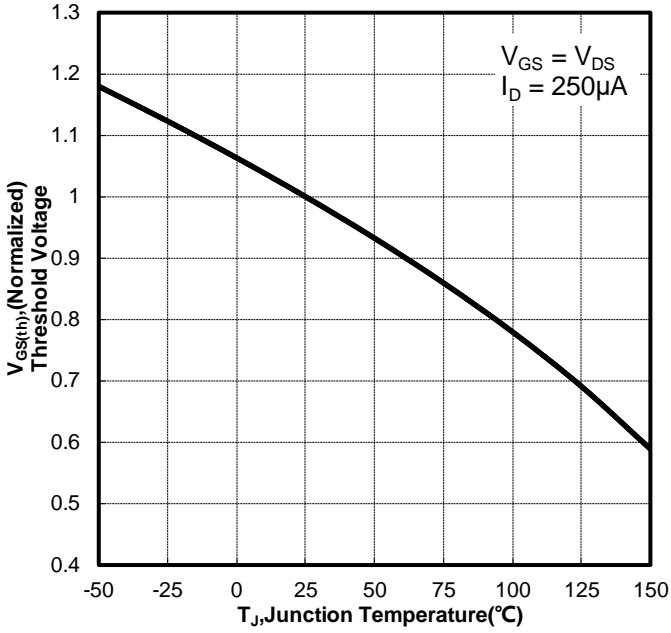


Drain-source on-state resistance
 $R_{DS(on)}=f(T_j)$;
 $I_D=20A; V_{GS}=10V$

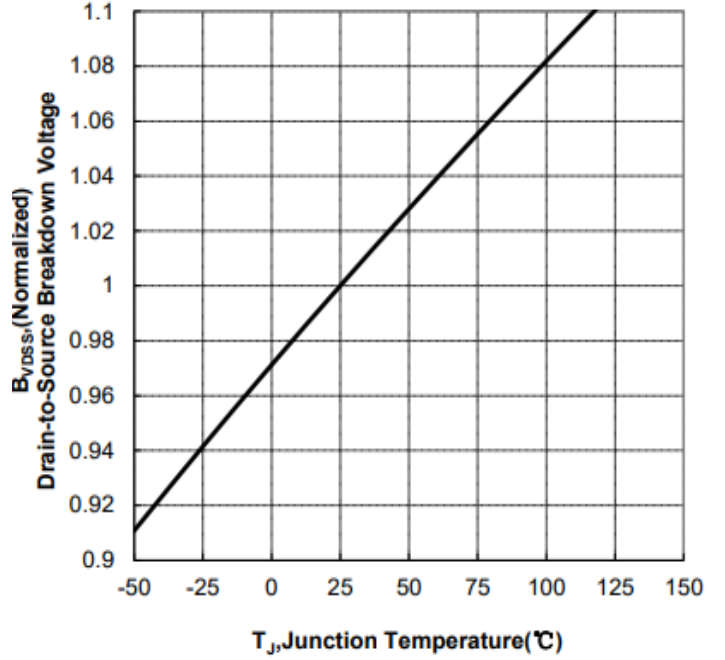




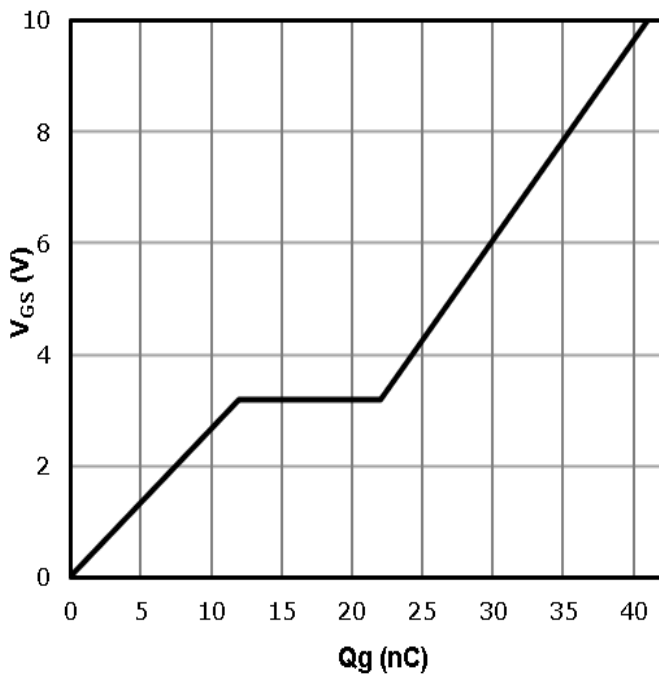
Gate Threshold Voltage
 $V_{TH}=f(T_j)$;
 $I_D=250\mu A$



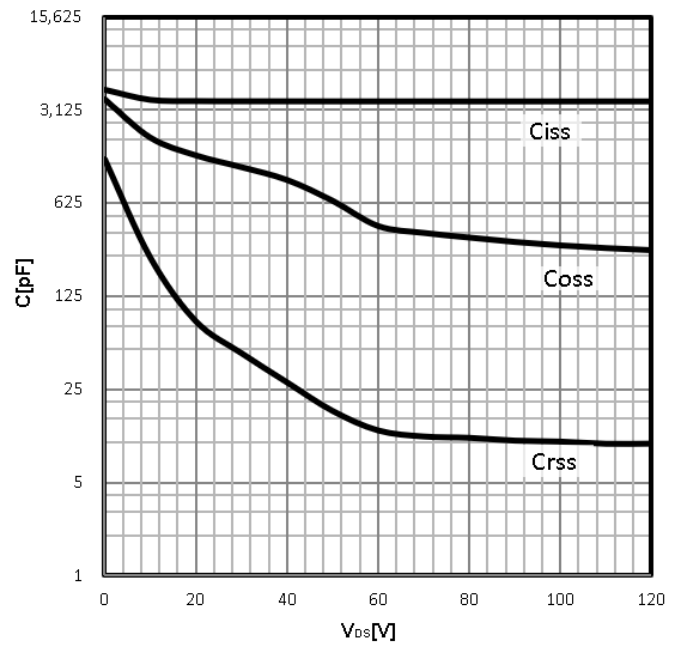
Drain-source breakdown voltage
 $V_{BR(DSS)}=f(T_j)$; $I_D=250\mu A$



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



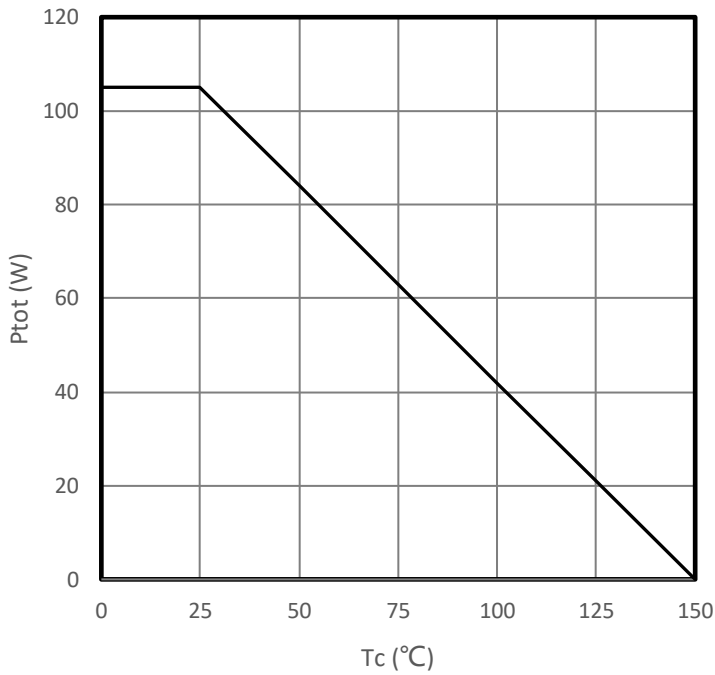
Typ. capacitances
 $C=f(V_{DS})$; $V_{GS}=0V$; $f=1MHz$





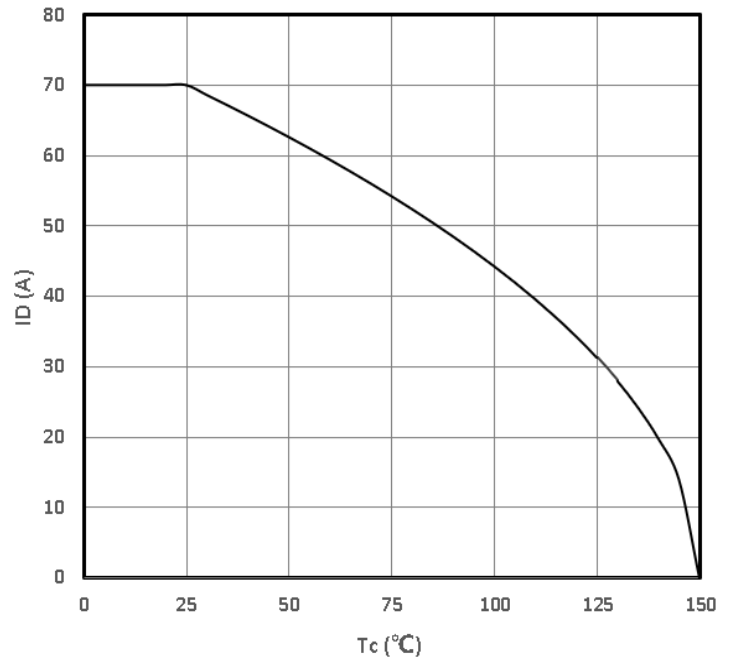
Power Dissipation

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



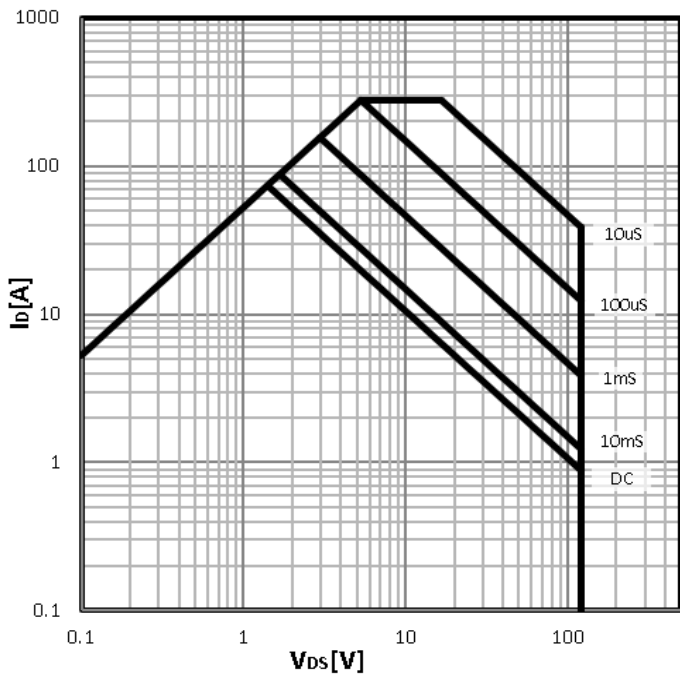
Maximum Drain Current

$$I_D=f(T_c)$$



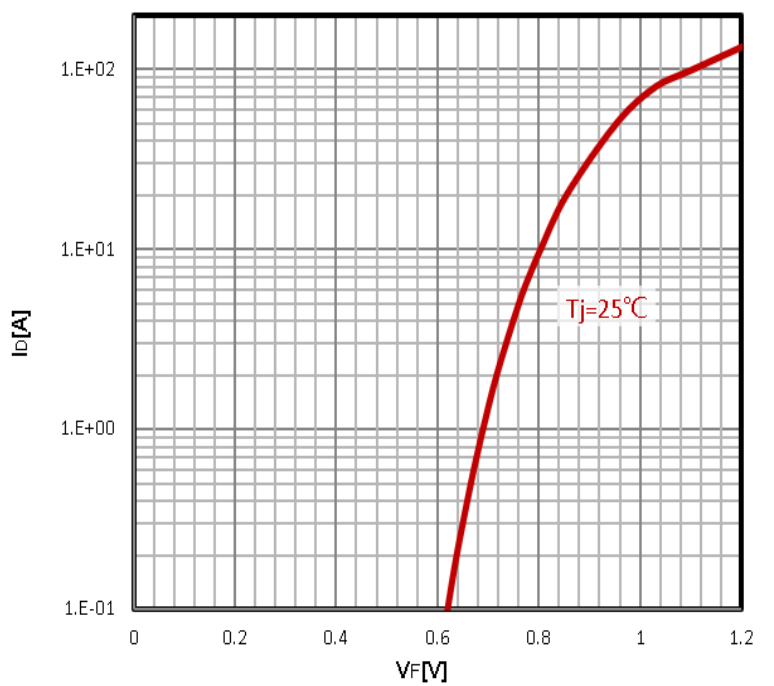
Safe operating area

$$I_D=f(V_{DS})$$



Body Diode Forward Voltage Variation

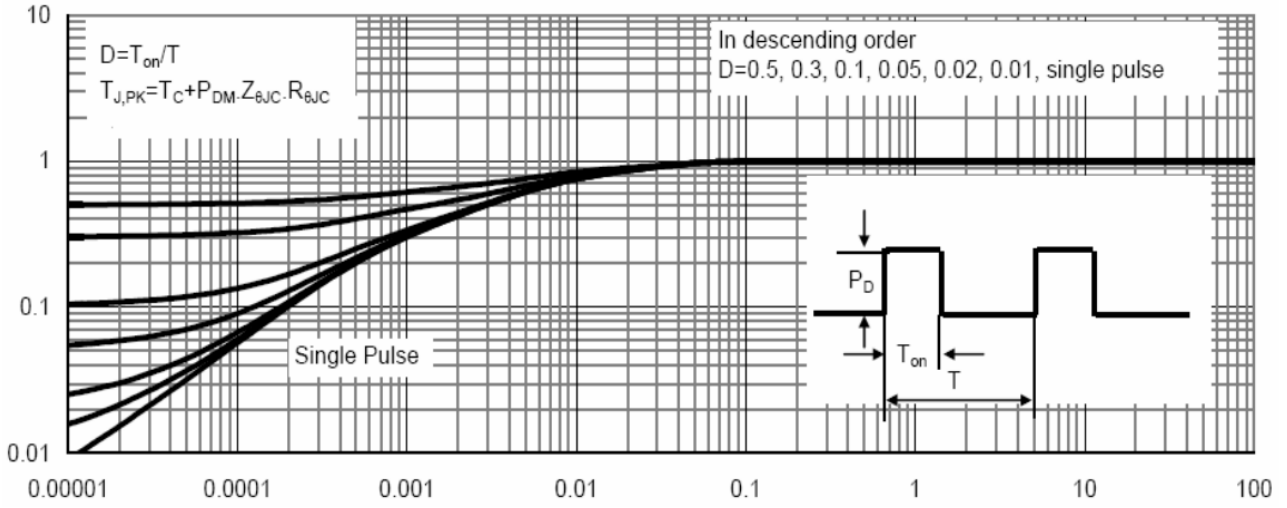
$$I_F=f(V_{GS})$$





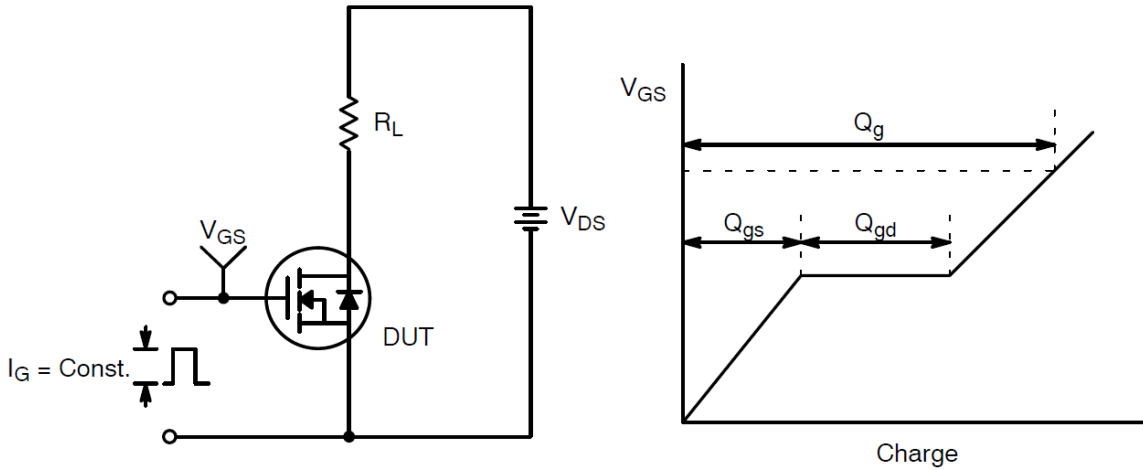
Max. transient thermal impedance

$$Z_{thJC} = f(t_p)$$

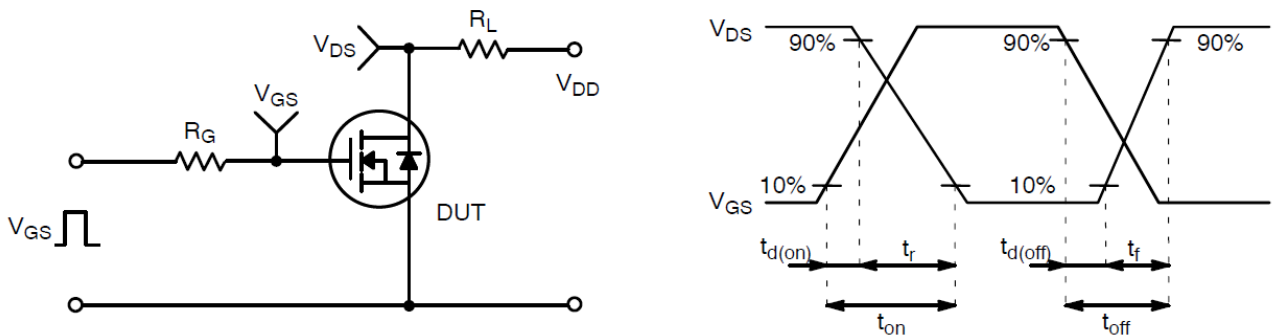




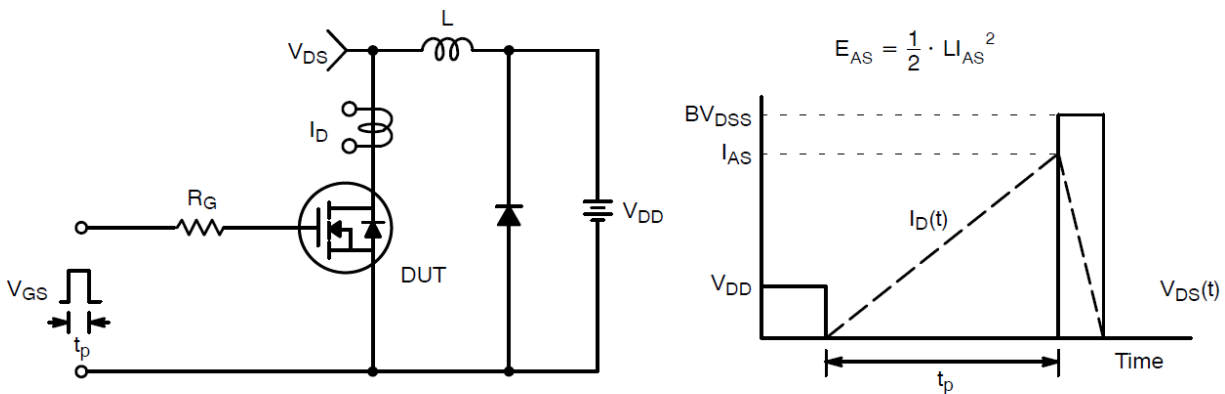
Test Circuit and Waveform:



Gate Charge Test Circuit & Waveform



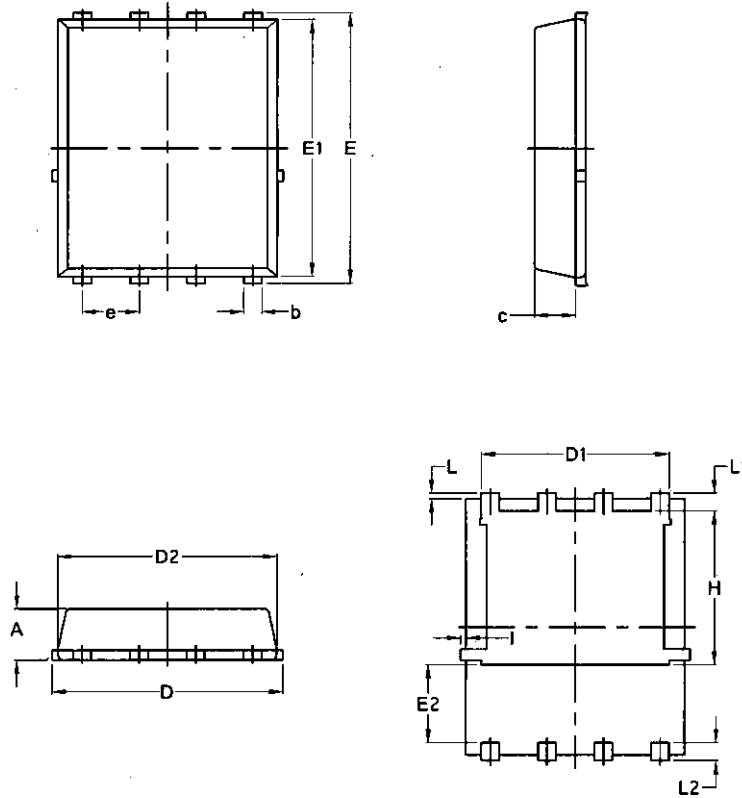
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Package Mechanical Data-PDFN5060-8L-Single



Symbol	Common			
	mm		Inch	
	Min	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



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