

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

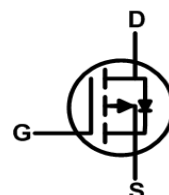
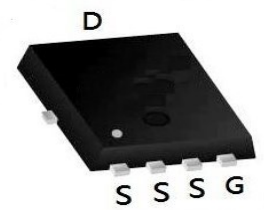
- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

Product Summary



BVDSS	RDSON	ID
- 60V	10 mΩ	-60A

PDFN5060-8L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	-60	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	-38	A
I_{DM}	Pulsed Drain Current ²	-240	A
EAS	Single Pulse Avalanche Energy ³	337	mJ
I_{AS}	Avalanche Current	---	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	114	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	60	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	1.1	$^\circ\text{C/W}$

Electrical Characteristics ($T_J=25\text{ }^{\circ}\text{C}$, unless otherwise noted)

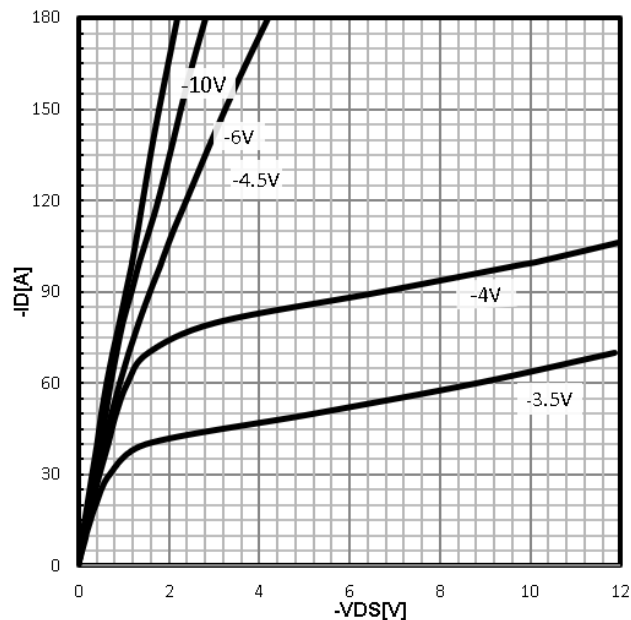
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-60	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=-1\text{mA}$	---	---	---	V/ $^{\circ}\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V$, $I_D=-20A$	---	10	13	m Ω
		$V_{GS}=-4.5V$, $I_D=-10A$	---	12	16	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-1.3	-1.8	-2.3	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	mV/ $^{\circ}\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-60V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=-60V$, $V_{GS}=0V$, $T_J=55^{\circ}\text{C}$	---	---	100	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=-5V$, $I_D=-3A$	---	---	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	12.5	---	Ω
Q_g	Total Gate Charge (-4.5V)	$V_{DS}=-30V$, $V_{GS}=-10V$, $I_D=-10A$	---	38	---	nC
Q_{gs}	Gate-Source Charge		---	6.9	---	
Q_{gd}	Gate-Drain Charge		---	4.98	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-30V$, $V_{GS}=-10V$, $R_G=3\Omega$, $I_D=-10A$ $R_L=3\Omega$	---	20	---	ns
T_r	Rise Time		---	25	---	
$T_{d(off)}$	Turn-Off Delay Time		---	60	---	
T_f	Fall Time		---	30	---	
C_{iss}	Input Capacitance	$V_{DS}=-30V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	2630	---	pF
C_{oss}	Output Capacitance		---	484	---	
C_{rss}	Reverse Transfer Capacitance		---	9.4	---	

Diode Characteristics

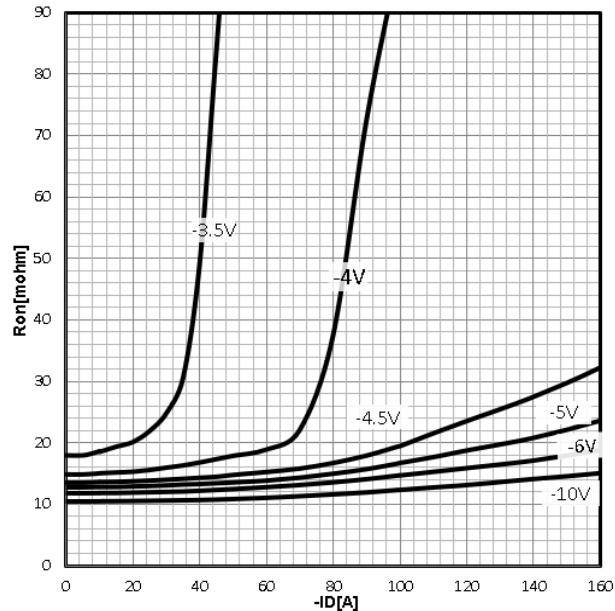
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	-60	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=-5A$, $T_J=25^{\circ}\text{C}$	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	$I_F=-10A$, $di/dt=100A/\mu s$, $T_J=25^{\circ}\text{C}$	---	50	---	nS
Q_{rr}	Reverse Recovery Charge		---	80	---	nC

Characteristics Curve:

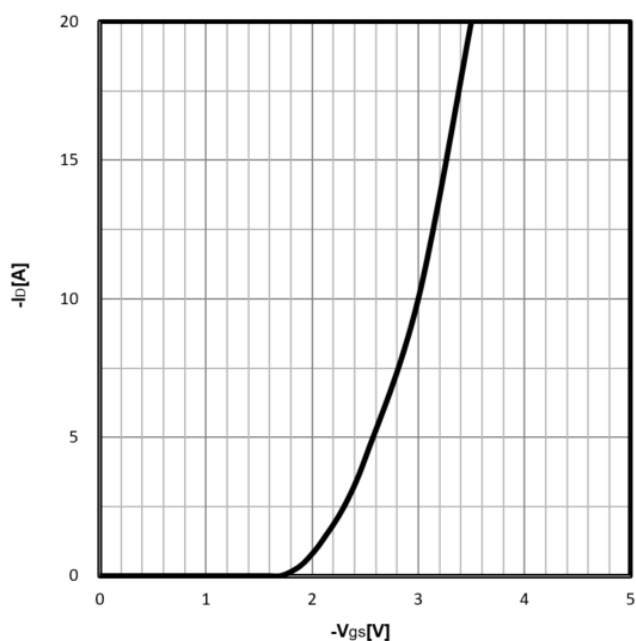
Typ. output characteristics
 $-I_D = f(-V_{DS})$



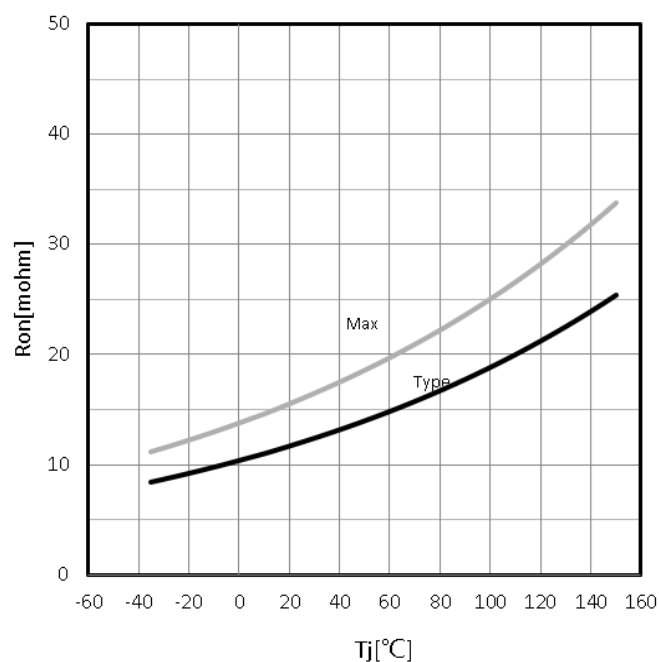
Typ. drain-source on resistance
 $R_{DS(on)} = f(-I_D)$



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

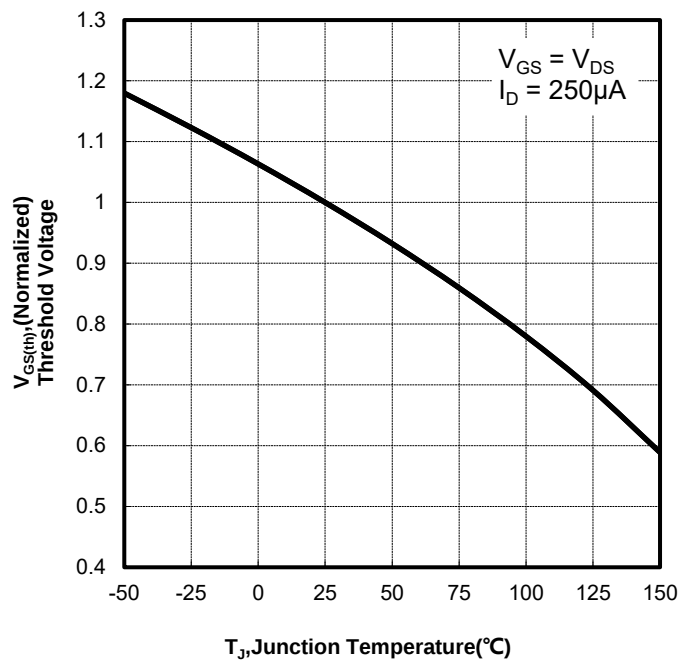


Drain-source on-state resistance
 $R_{DS(on)} = f(T_j); I_D = -20A; V_{GS} = -10V$



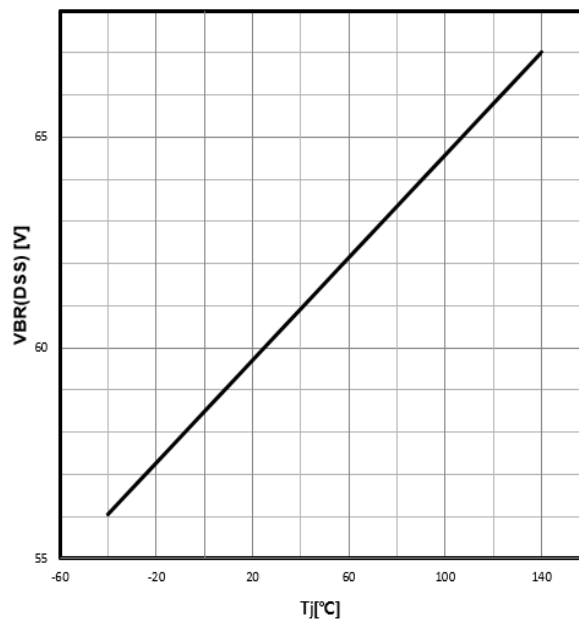
Gate Threshold Voltage

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



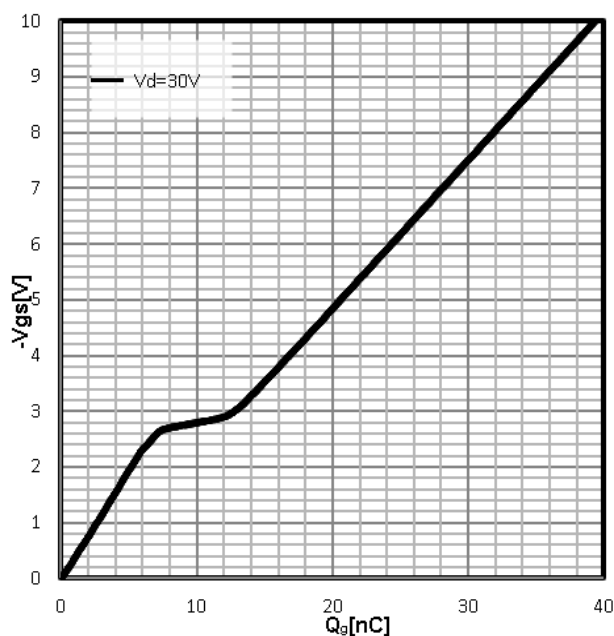
Drain-source breakdown voltage

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



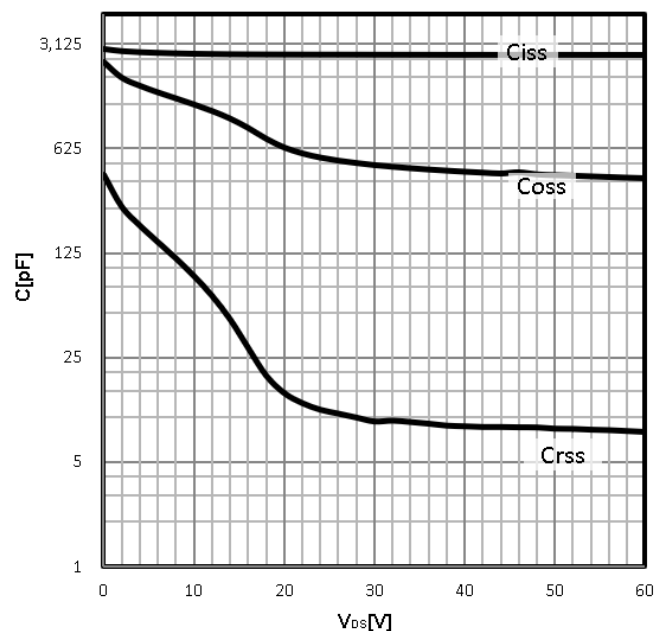
Typ. gate charge

$$V_{GS} = f(Q_{gate}); I_D = -10A$$

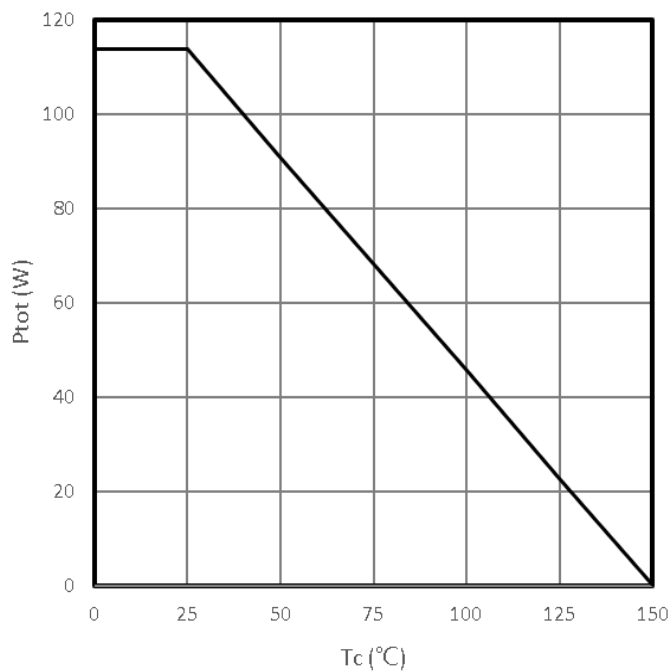


Typ. Capacitances

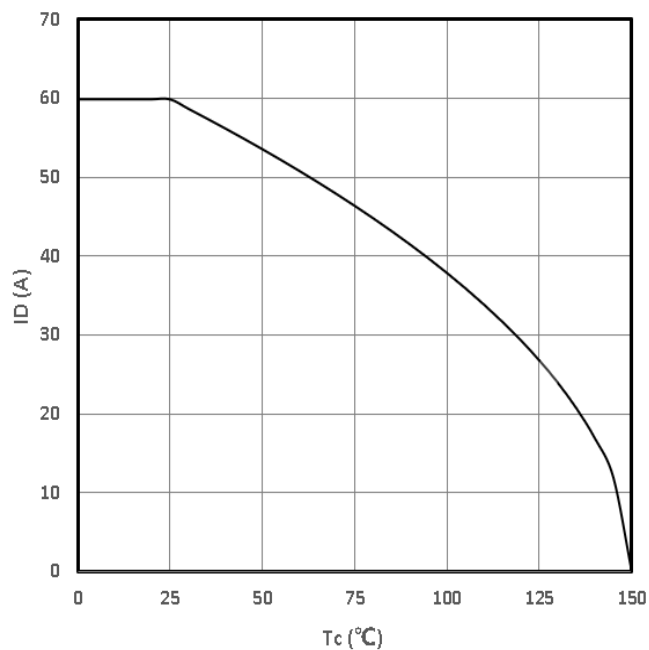
$$C = f(-V_{DS}); V_{GS} = 0V; f = 1MHz$$



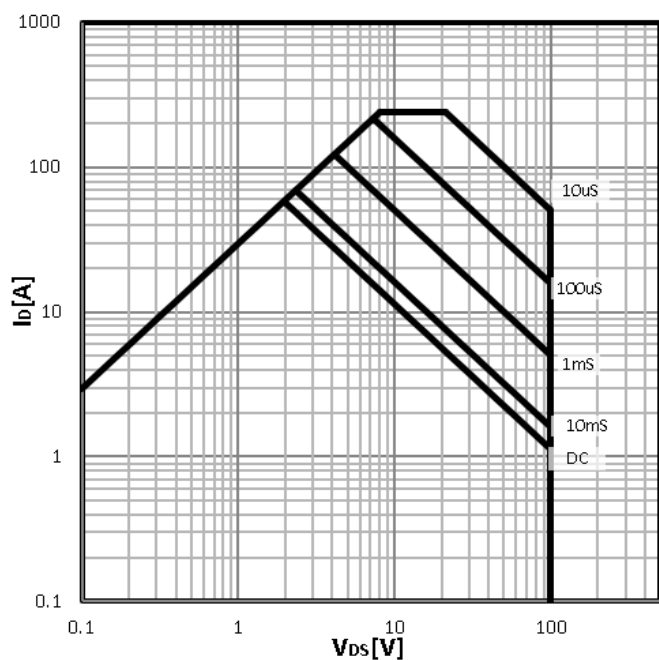
Power Dissipation
 $P_{tot}=f(T_C)$



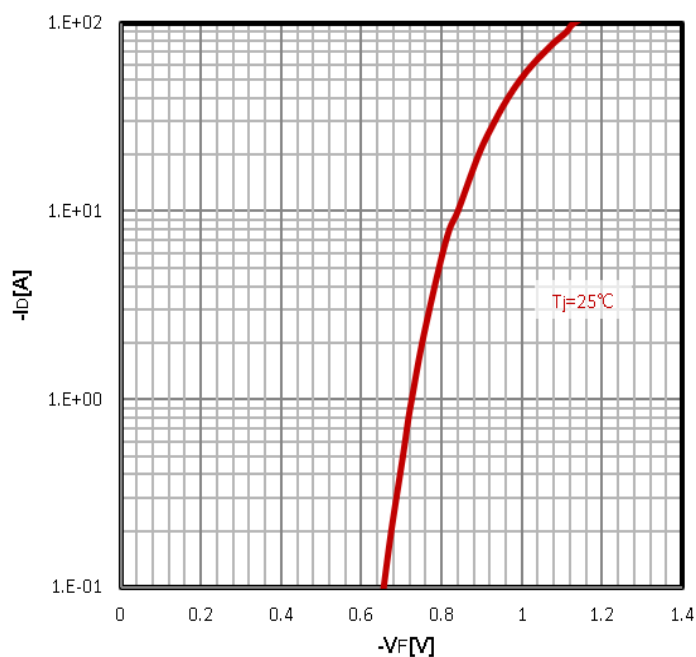
Maximum Drain Current
 $-I_D=f(T_C)$



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



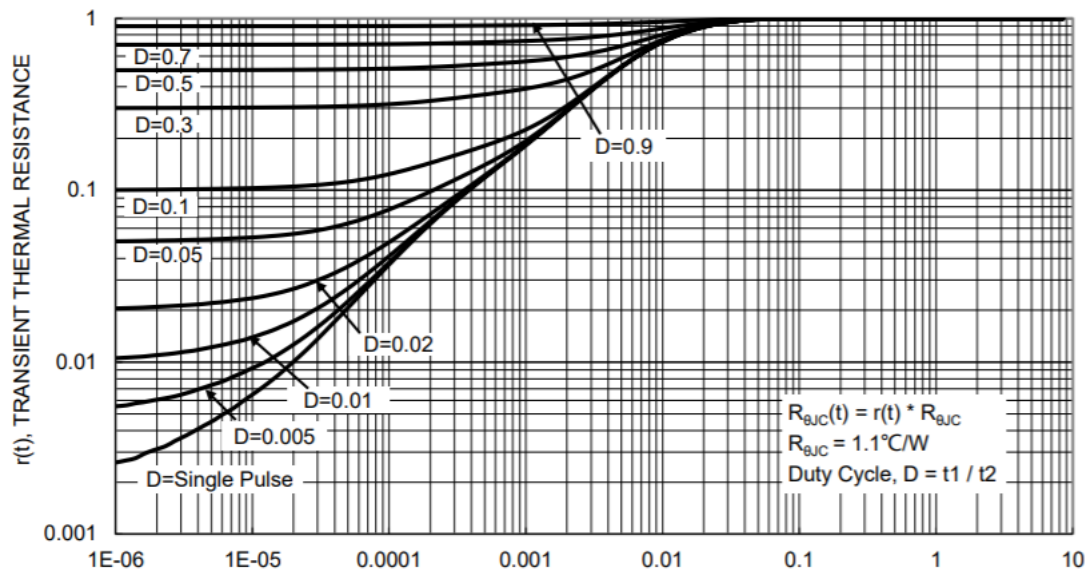
Body Diode Forward Voltage Variation
 $-I_F=f(-V_{DS})$

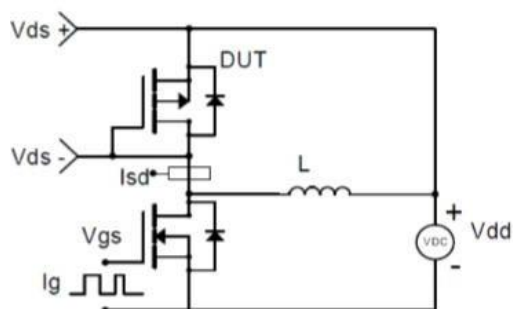
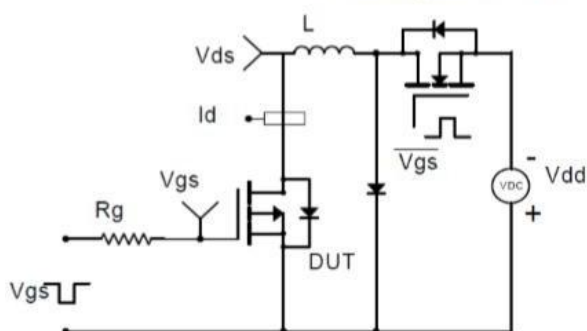
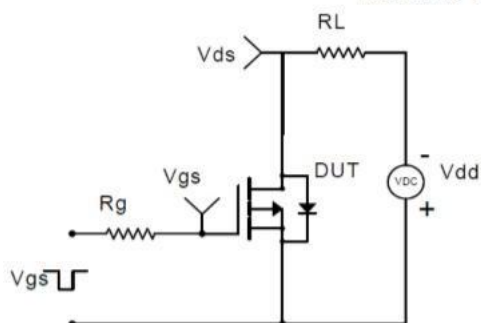




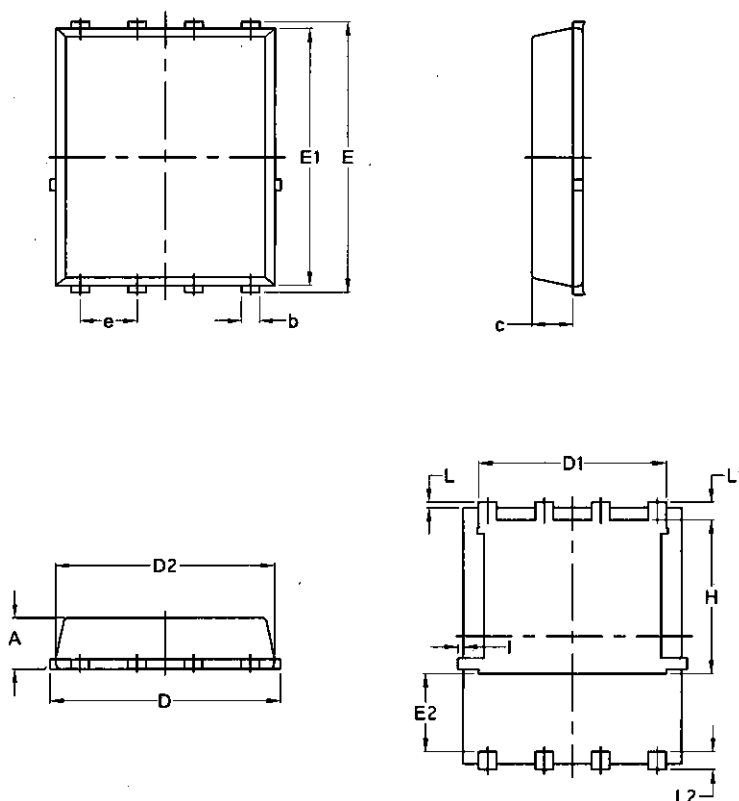
Max. transient thermal impedance

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





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