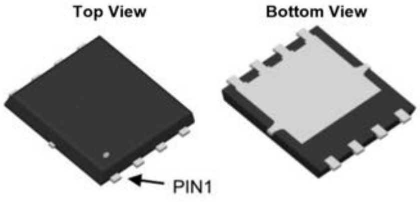
Features

- V_{DS} = -30V, I_D = -80A
  $R_{DS(ON)}$ $^{TYP.}$= 3.9mΩ @ V_{GS} = -10V
  $R_{DS(ON)}$ $^{TYP.}$= 5.4mΩ @ V_{GS} = -4.5V

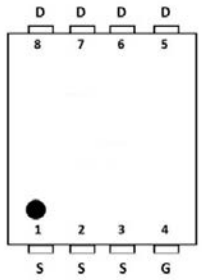
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

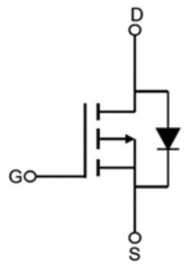


PDFN5x6-8L

Application

- PWM Applications
- Load Switch
- Power Management





Absolute Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-to-Source Voltage		-30	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	-80	A
		T_C = 100°C	-57	
I_{DM}	Pulsed Drain Current (1)		320	A
E_{AS}	Single Pulsed Avalanche Energy (2)		363	mJ
P_D	Power Dissipation	T_C = 25°C	52	W
		T_C = 100°C	21	
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient(3)	43	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.4	

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = -250μA, V_{GS} = 0V	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -30V, V_{GS} = 0V	-	-	-1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1.2	-1.7	-2.2	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = -10V, I_D = -20A	-	3.9	5.9	mΩ
		V_{GS} = -4.5V, I_D = -10A	-	5.4	8.0	mΩ
Dynamic Characteristics						
R_g	Gate Resistance	f = 1MHz	-	3.9	-	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = -15V, f = 1MHz	-	7747	-	pF
C_{oss}	Output Capacitance		-	871	-	pF
C_{rss}	Reverse Transfer Capacitance		-	559	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to -10V V_{DS} = -15V, I_D = -20A	-	121	-	nC
Q_{gs}	Gate Source Charge		-	23	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	18	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = -10V, V_{DD} = -15V I_D= -20A, R_{GEN} = 3Ω	-	28	-	ns
t_r	Turn-On Rise Time		-	83	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	77	-	ns
t_f	Turn-Off Fall Time		-	66	-	ns
Body Diode Characteristics						
I_S	Maximum Continuous Body Diode Forward Current		-	-	-80	A
I_{SM}	Maximum Pulsed Body Diode Forward Current		-	-	-320	A
V_{SD}	Body Diode Forward Voltage	V_{GS} = 0V, I_S = -30A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I_F = -20A, di/dt = 100A/us	-	30	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	19.5	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25C, V_{DD}=-15V, V_G=-10V, R_G=25ohm, L=0.5mH, I_{AS}=-38.08A, V_{DD}=0V during time in avalanche.
3. $R_{θJA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.
4. Pulse Test: Pulse Width⩽300μs, Duty Cycle⩽0.5%.

Typical Performance Characteristics

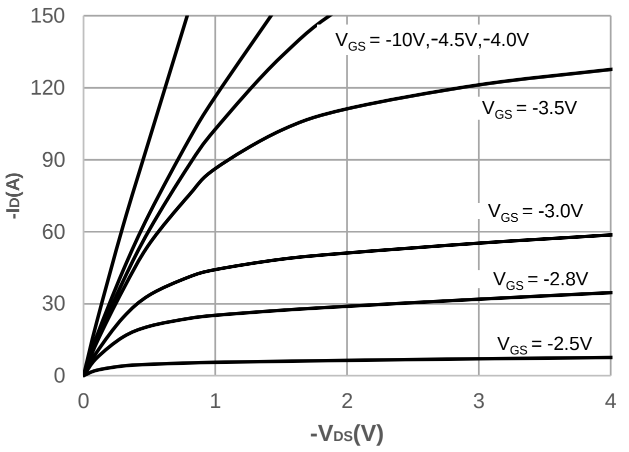


Figure 5: Output Characteristics

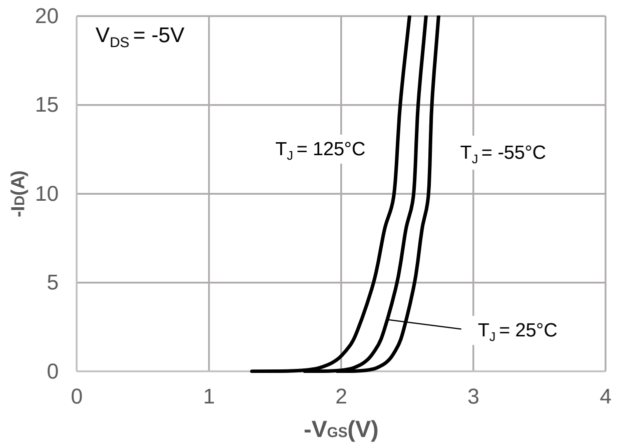


Figure 6: Typical Transfer Characteristics

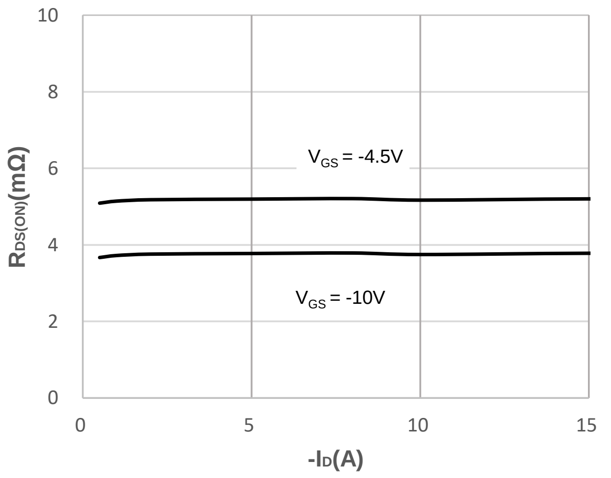


Figure 7: On-resistance vs. Drain Current

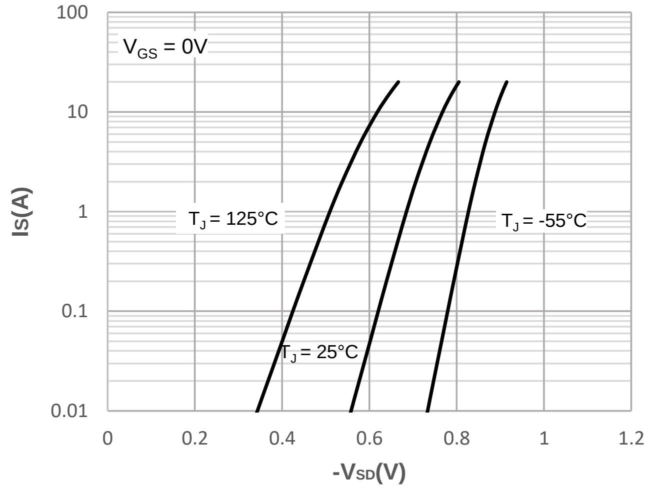


Figure 8: Body Diode Characteristics

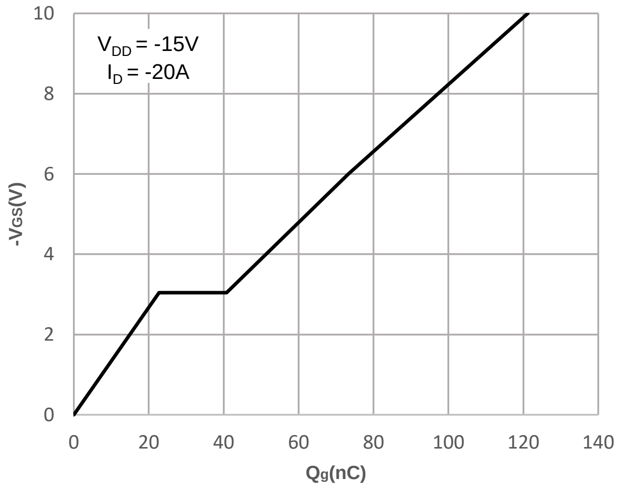


Figure 9: Gate Charge Characteristics

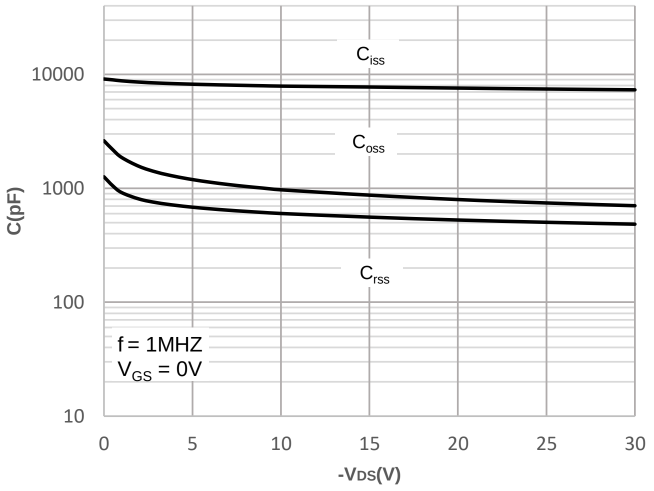


Figure 10: Capacitance Characteristics

Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

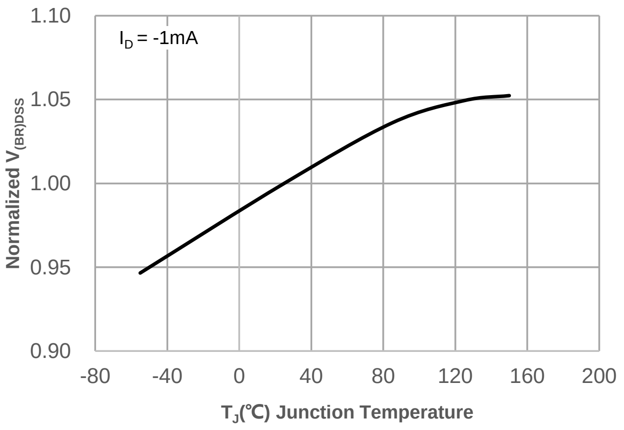


Figure 12: Normalized on Resistance vs. Junction Temperature

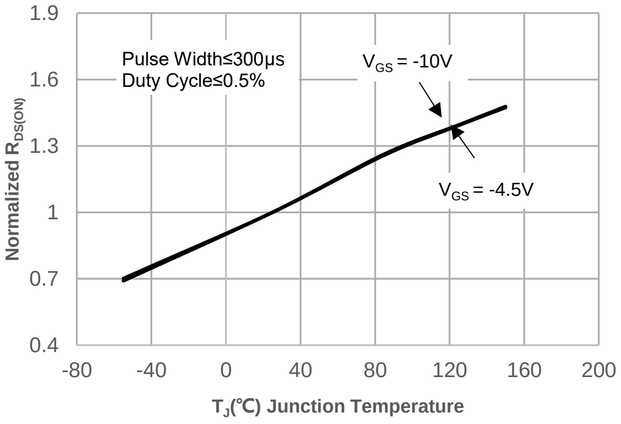


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

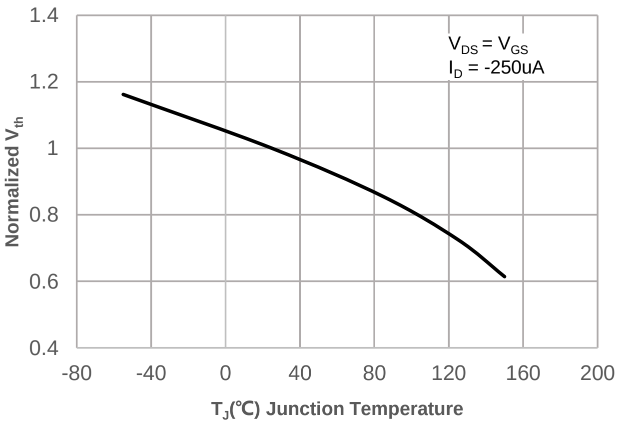


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

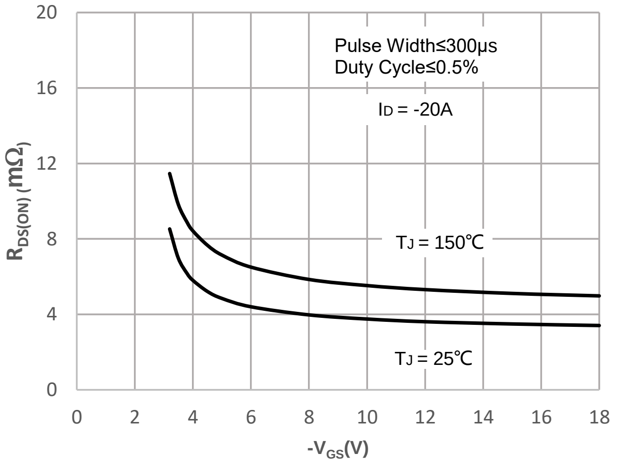
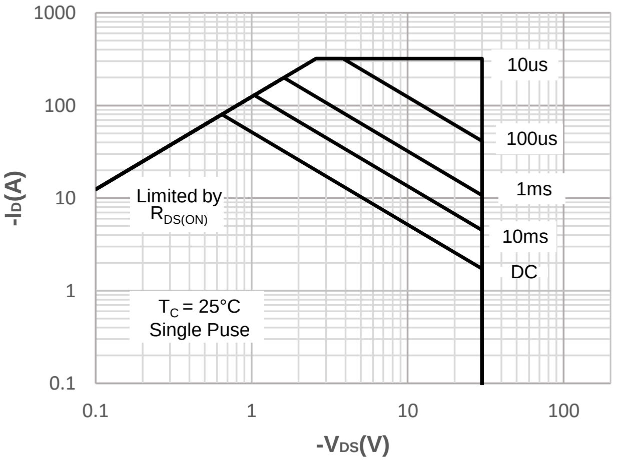


Figure 15: Maximum Safe Operating Area



Typical Performance Characteristics

Figure 1: Power De-rating

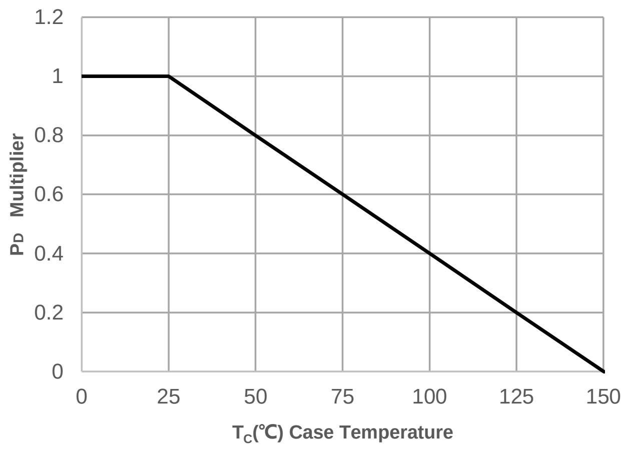


Figure 2: Current De-rating

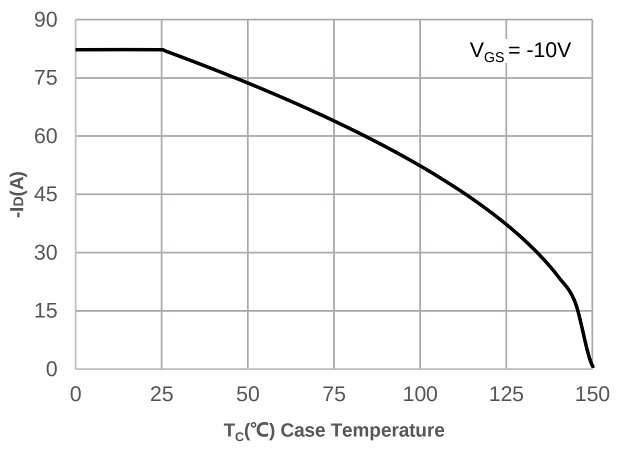


Figure 3: Normalized Maximum Transient Thermal Impedance

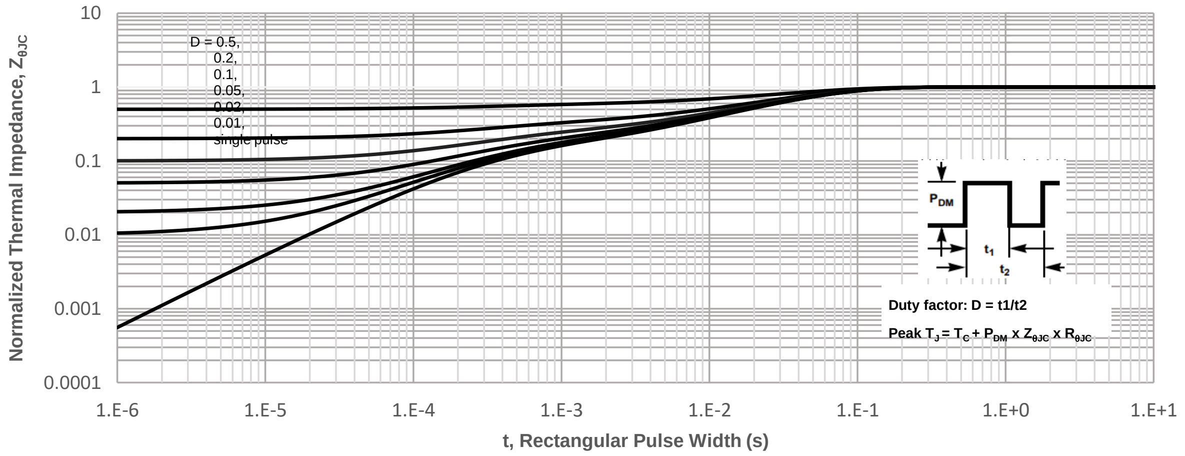
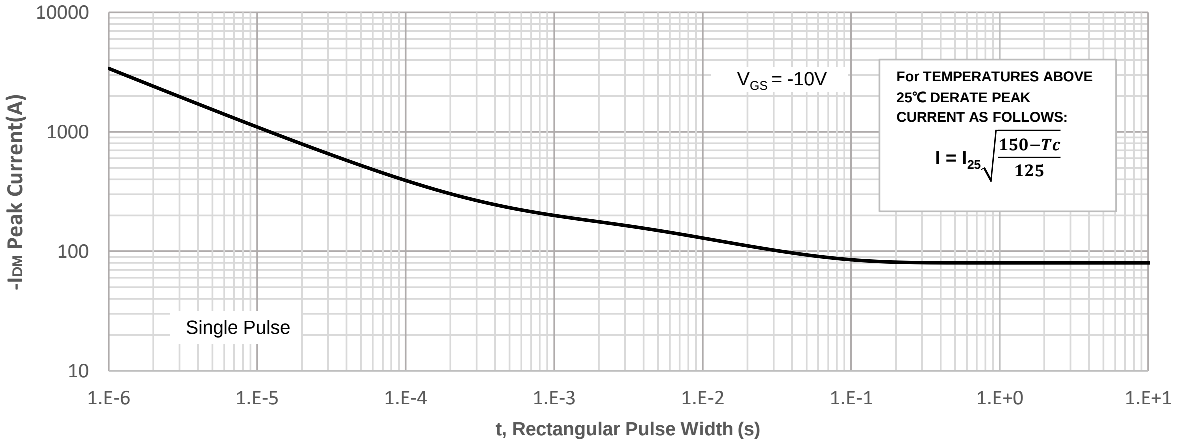


Figure 4: Peak Current Capacity



Test Circuit

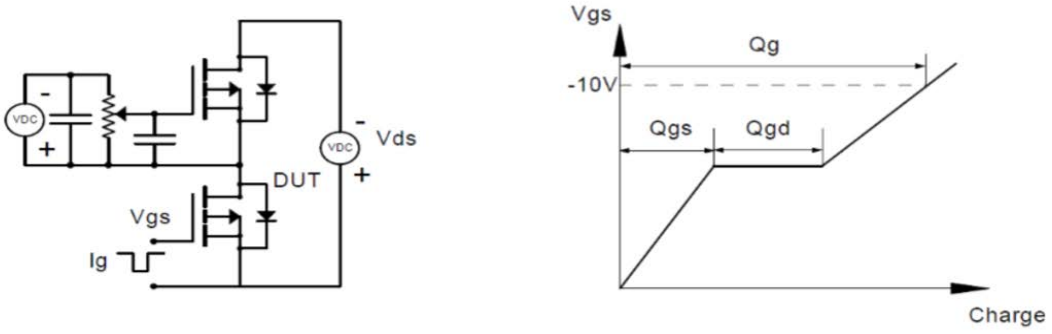


Figure 1: Gate Charge Test Circuit & Waveform

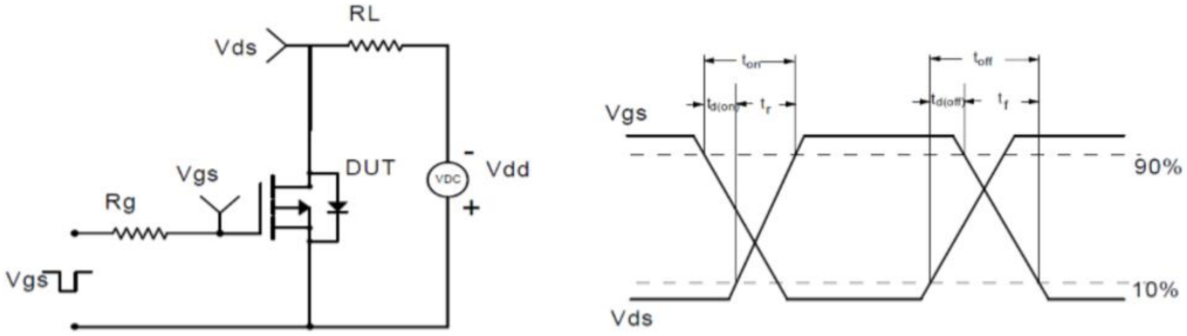


Figure 2: Resistive Switching Test Circuit & Waveform

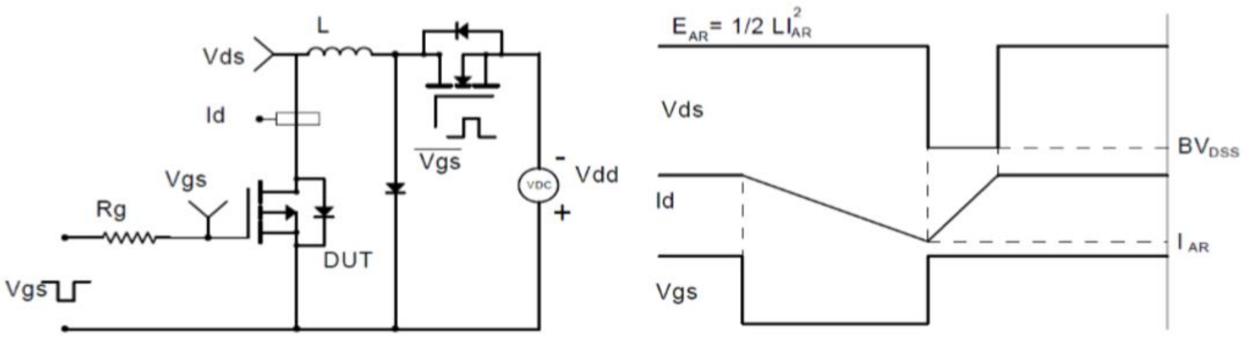


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

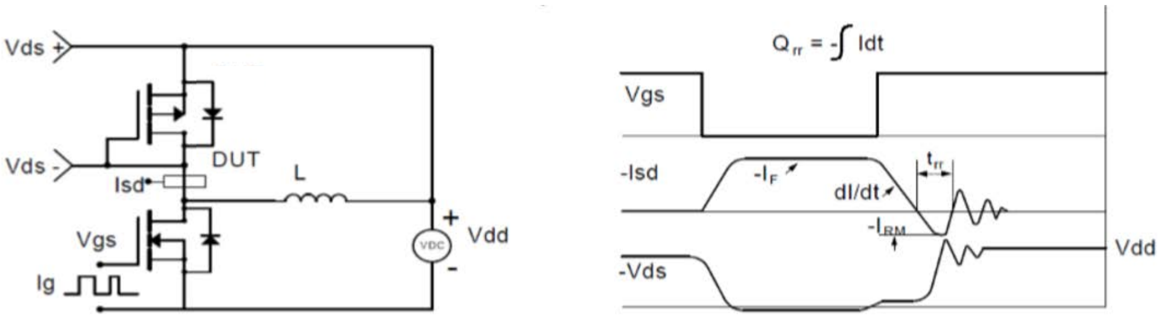
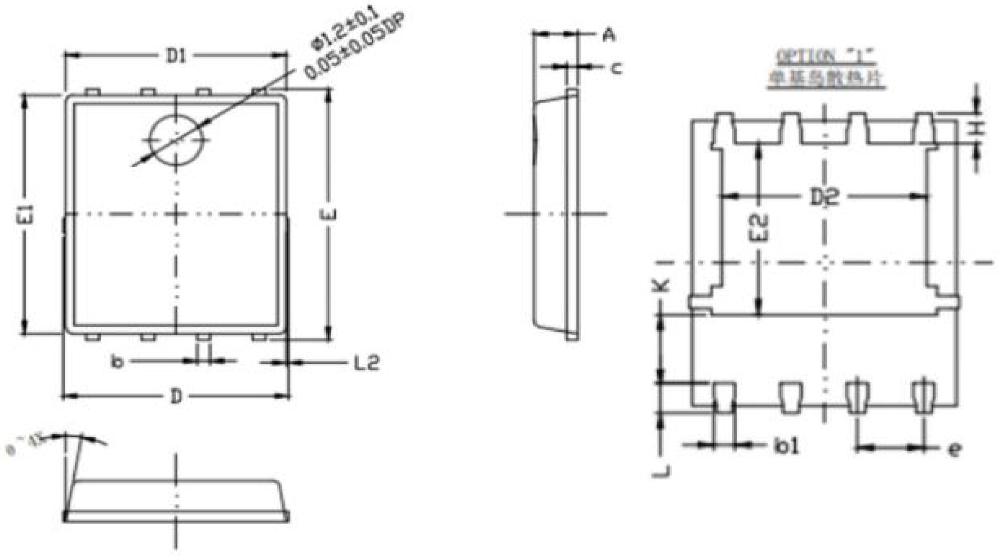


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(PDFN5X6-8L)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.25	0.30	0.35
b1	0.30	0.40	0.45
c	0.22	0.25	0.28
D	--	--	5.30
D1	4.90	5.05	5.20
D2	3.90 REF		
D3	1.70 REF		
E	6.00	6.15	6.30
E1	5.70	5.85	6.00
E2	3.50 REF		
e	1.10	1.27	1.40
H	0.51	0.61	0.71
K	1.10	--	--
L	0.51	0.61	0.71
L2	--	--	0.10
θ	8°	~	12°