

100V N-Channel MOSFET

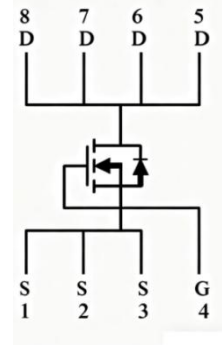
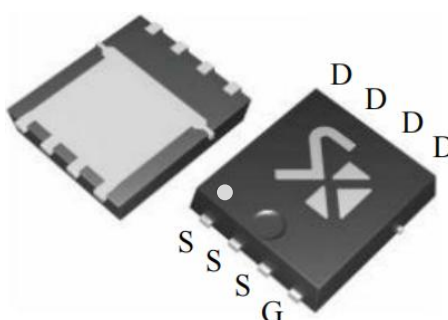
Features

- $R_{DS(ON),max}=8.5m\Omega@V_{GS}=4.5V$
- $R_{DS(ON),max}=5.2m\Omega@V_{GS}=10V$
- Proprietary new trench technology
- Low gate charge minimize switching loss
- Fast recovery body diode

Applications

- Synchronous Rectification
- Power Management
- Load Switch

$BV_{DSS}, T_C=25^{\circ}C$	$R_{DS(ON),max}@10V$	$I_D, T_C=25^{\circ}C$
100V	5.2m Ω	108A



PDFN5*6

Absolute Maximum Ratings($T_C=25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage ⁽¹⁾	V_{DS}	100	V
Gate-Source Operation Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	108	A
Drain Current-Continuous@ $T_C=100^{\circ}C$		68	A
Pulsed Drain Current at $V_{GS}=10V^{(2)}$	I_{DM}	430	A
Single Pulse Avalanche Energy@ $L=0.3mH$	E_{AS}	190	mJ
Peak Diode Recovery	dv/dt	5.0	V/ns
Power Dissipation	P_D	125	W
Derating Factor above 25 $^{\circ}C$		1.0	W/ $^{\circ}C$
Operating and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^{\circ}C$

Note: (1) $T_J=+25^{\circ}C$ to $+150^{\circ}C$

(2). Repetitive rating; pulse width limited by maximum junction temperature.

Thermal Characteristics

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.0	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	$^{\circ}C/W$

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V,I _D =250μA	100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V,V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V			±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250μA	1.2		2.6	V
Drain-Source on Resistance ⁽³⁾	R _{DS(on)}	V _{GS} =10V,I _D =40A		4.8	5.2	mΩ
		V _{GS} =4.5V,I _D =20A		7.0	8.5	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =50V, f=1.0MHz		2938		pF
Output Capacitance	C _{oss}			457		
Reverse Transfer Capacitance	C _{rss}			13		
Gate Series Resistance	R _G	f=1.0MHz		1.0		Ω
Total Gate Charge	Q _g	V _{DD} =50V, V _{GS} =10V, I _D =40A		62		nC
Gate Source Charge	Q _{gs}			10		
Gate Drain Charge	Q _{gd}			20		
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	V _{GS} =10V, I _D =40A, V _{DD} =50V, R _G =6Ω		27		ns
Rise Timer	t _r			15		
Turn-Off Delay Time	t _{d(OFF)}			52		
Fall Timer	t _f			15		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V,I _S =40A			1.1	V
Reverse Recovery Time	t _{rr}	I _F =40A, di/dt=100A/μs		40		ns
Reverse Recovery Charge	Q _{rr}			66		nC

(3).Pulse width $\leq 380\mu s$; duty cycle $\leq 2\%$.

Typical Characteristics

Fig.1 Typ. transfer characteristics

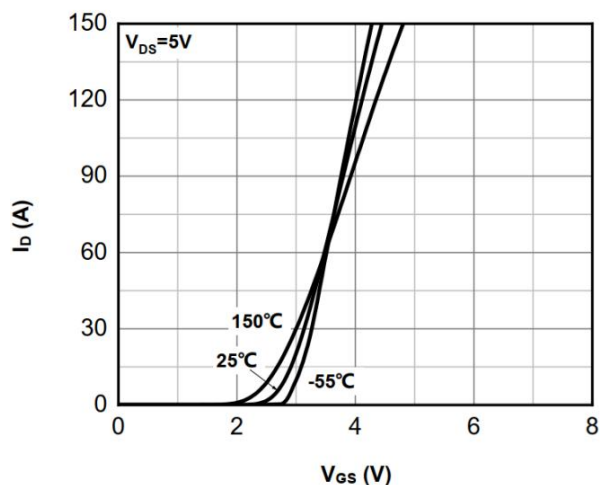


Fig.2 Typ. output characteristics

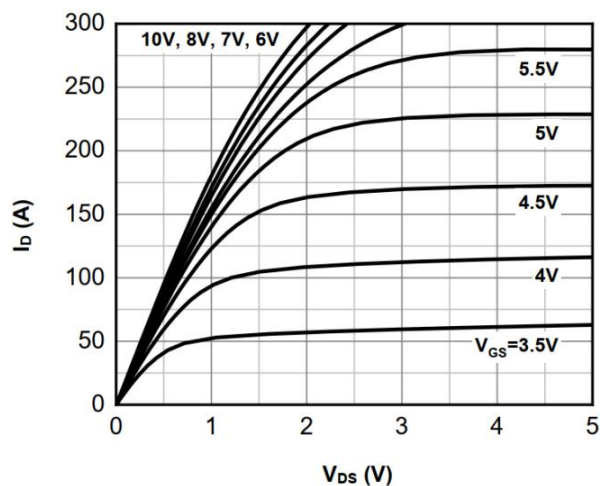


Fig.3 Normalized on-resistance vs drain current

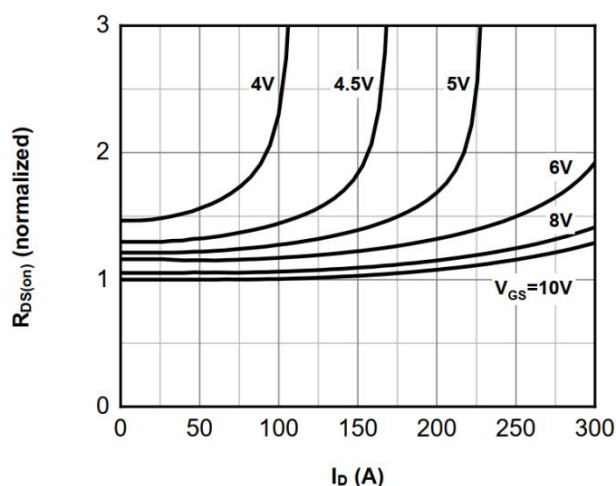


Fig.4 Typ. on-resistance vs gate-source voltage

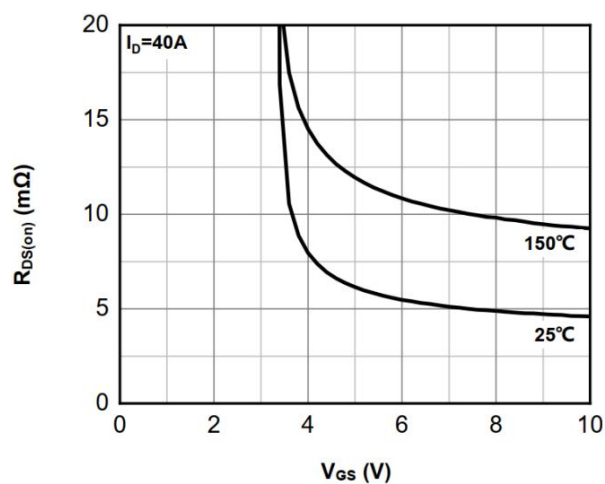


Fig.5 Normalized on-resistance vs junction temperature

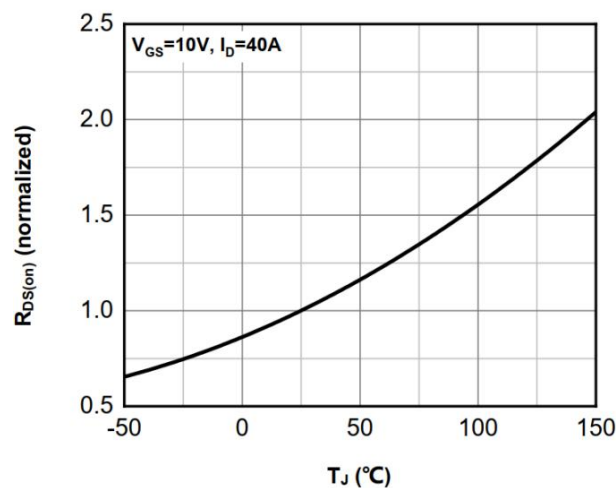


Fig.6 Typ. gate charge

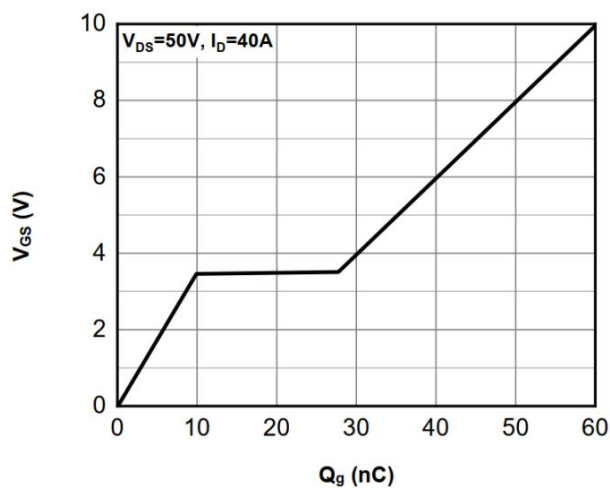


Fig.7 Typ. forward characteristics of body diode

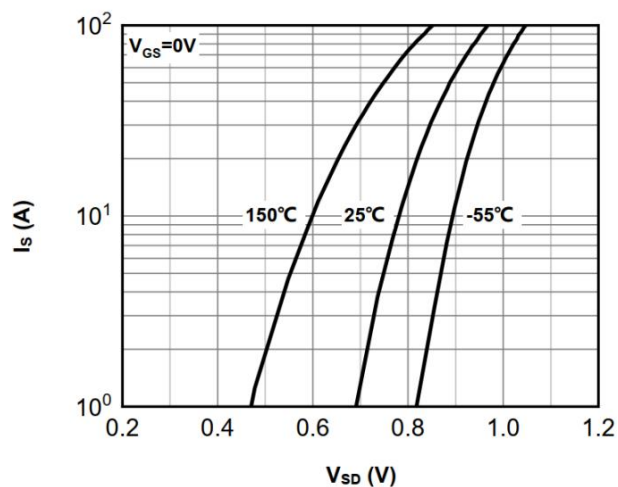


Fig.8 Safe operating area

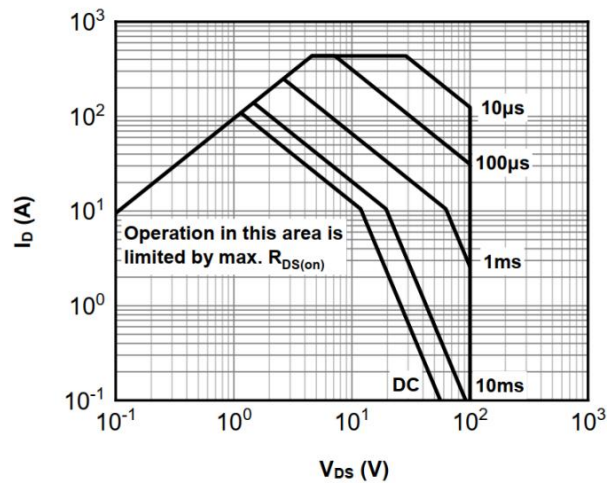


Fig.9 Typ. Capacitance

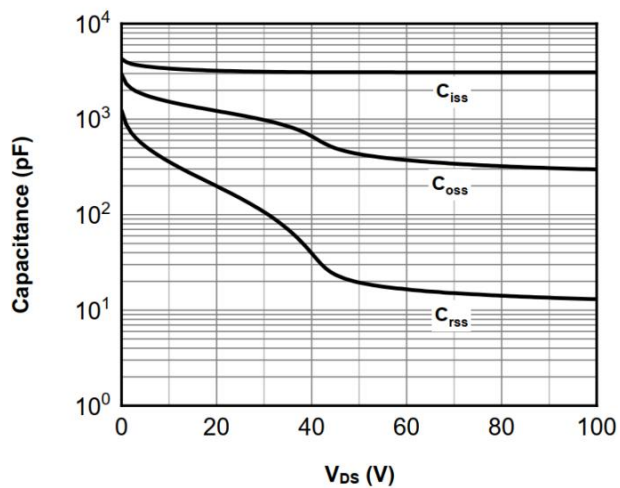
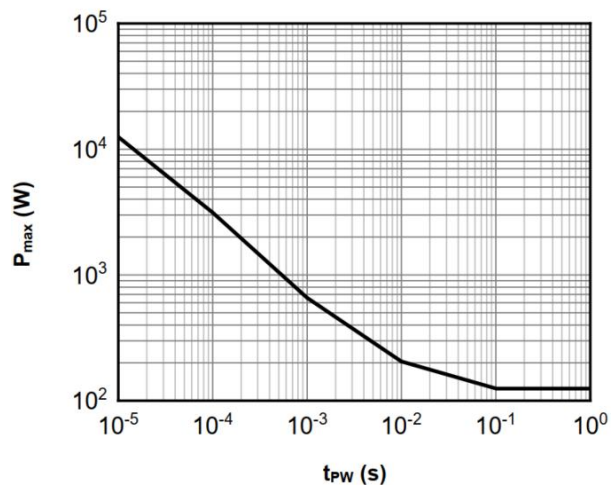


Fig.10 Single pulse maximum power dissipation



Test Circuit and Waveforms

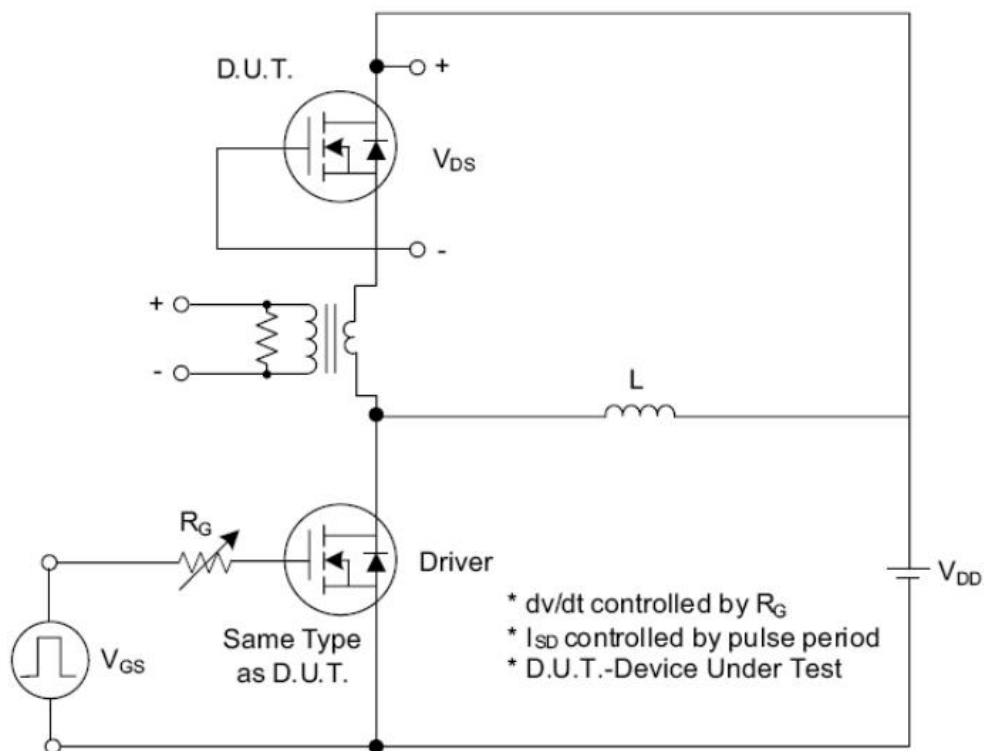


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

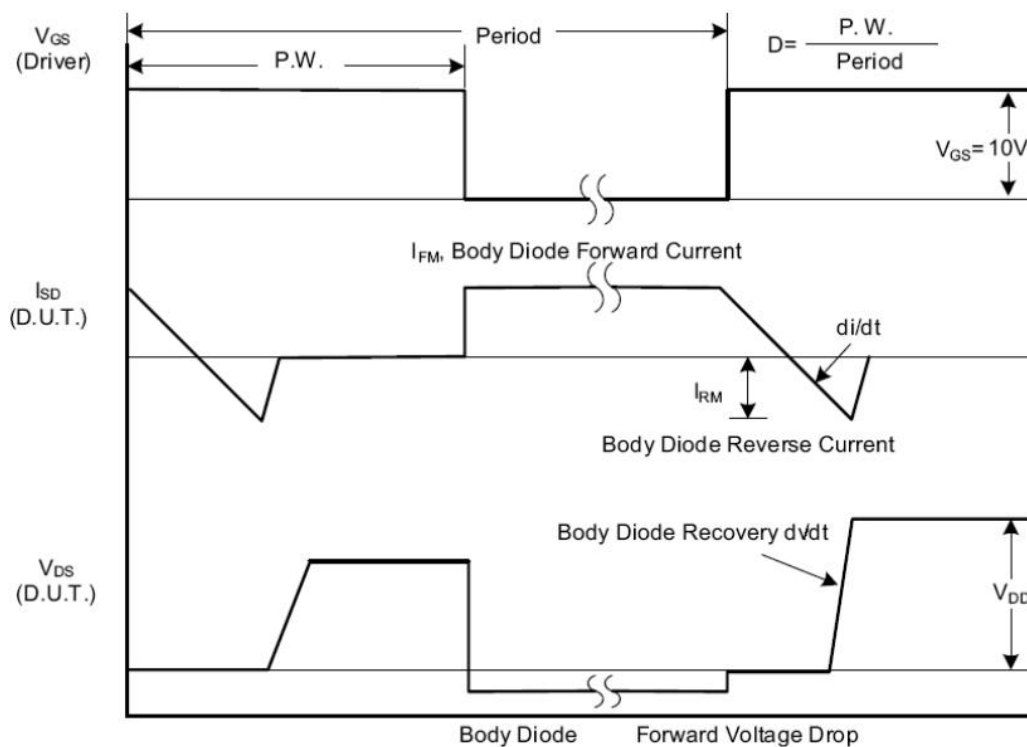


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

Test Circuit and Waveforms(Cont.)

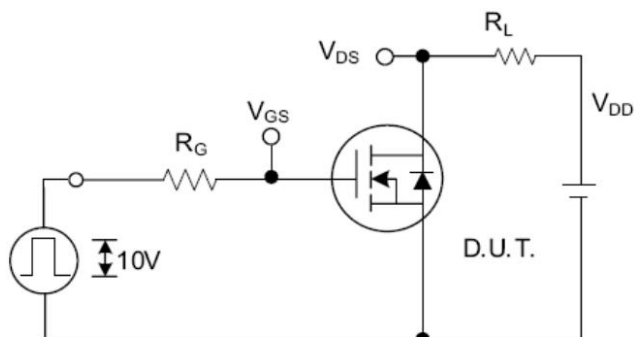


Fig. 2.1 Switching Test Circuit

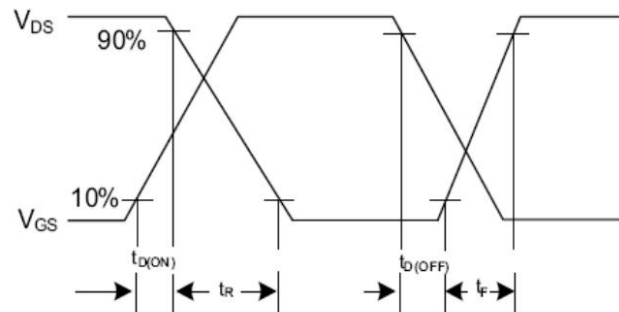


Fig. 2.2 Switching Waveforms

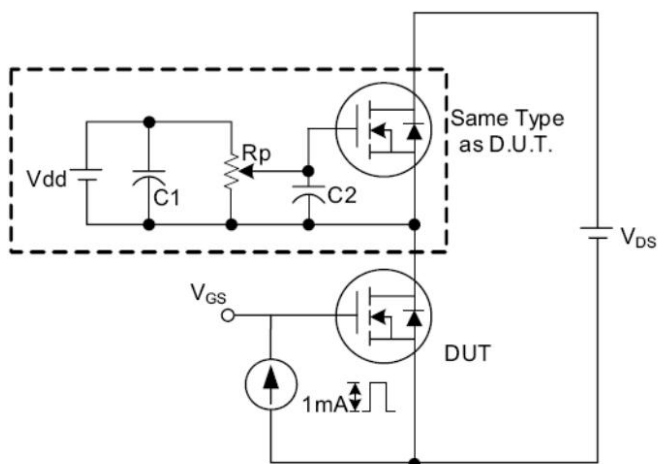


Fig. 3.1 Gate Charge Test Circuit

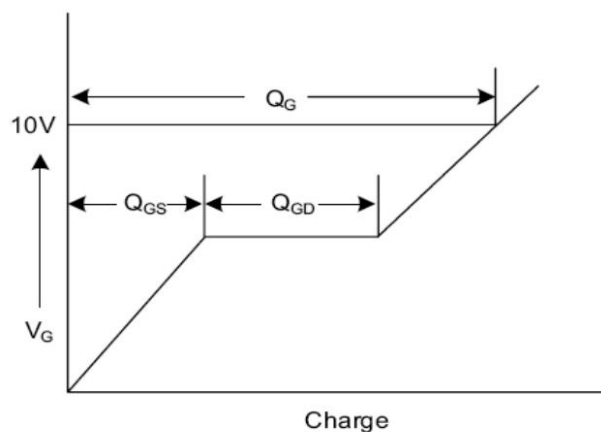


Fig. 3.2 Gate Charge Waveform

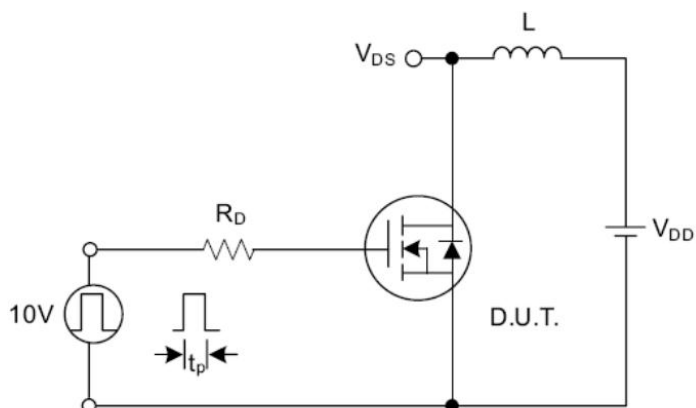


Fig. 4.1 Unclamped Inductive Switching Test Circuit

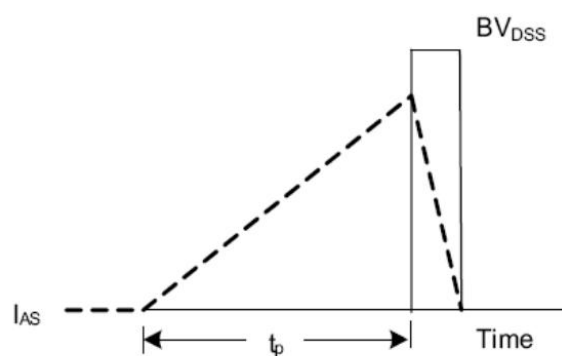
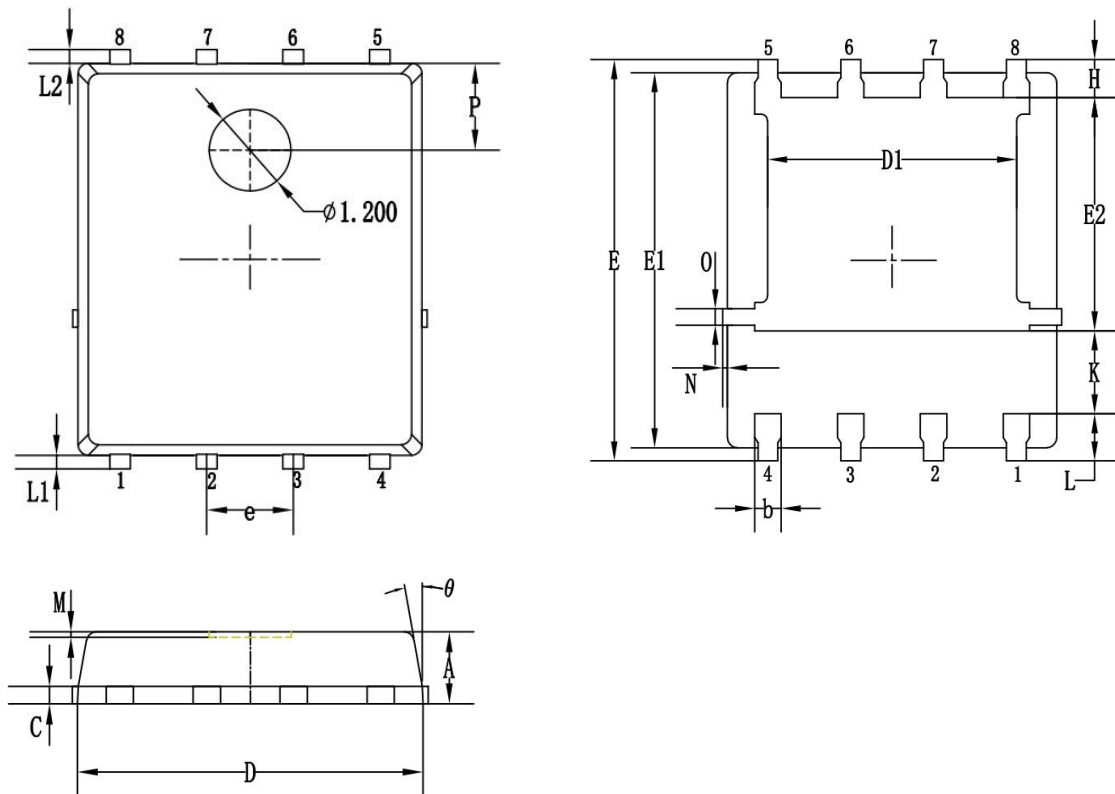


Fig. 4.2 Unclamped Inductive Switching Waveforms

Package Information

PDFN5*6

Dimensions in mm



Symbo l	Millimeters			Symbo l	Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	0.90	1.05	1.20	H	0.48	0.58	0.68
b	0.35	0.40	0.50	K	1.17	1.27	1.37
C	0.20	0.25	0.35	L	0.64	0.74	0.84
D	4.90	5.05	5.20	L1/12	0.20 REF.		
D1	3.72	3.82	3.92	θ	8°	10°	12°
E	6.00	6.15	6.30	M	0.08 REF.		
E1	5.6	5.75	5.90	N	0	-	0.15
E2	3.47	3.57	3.67	O	0.25 REF.		
e	1.27 BSC.			P	1.28 REF.		

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