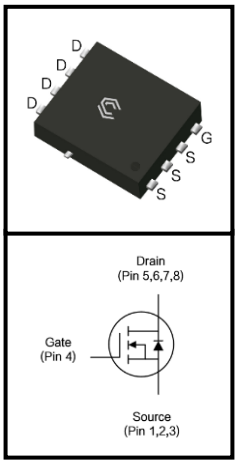
60V N-Channel MOSFET

FEATURES

- Super Low Gate Charge
- 100% EAS Guaranteed
- RoHS compliant
- Green Device Available
- Excellent C*dV/dt effect decline
- Advanced high cell density Trench technology



APPLICATIONS

- Load Switching
- Hard switched and high frequence circuits
- Uninterruptible power supply

RoHS

Device Marking and Package Information

Device	Package	Marking
CSN06N2P8	PDFN5×6	CSN06N2P8

Absolute Maximum Ratings T_C = 25℃, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage (V_{GS} = 0V)		V_{DSS}	60	V
Continuous Drain Current	(note1)	I_D	140	A
Pulsed Drain Current	(note2)	I_{DM}	560	A
Gate-Source Voltage		V_{GSS}	± 20	V
Single Pulse Avalanche Energy	(note3)	E_{AS}	320.17	mJ
Avalanche Current	(note3)	I_{AS}	29.4	A
Repetitive Avalanche Energy	(note3)	E_{AR}	1.3	mJ
Power Dissipation (T_C = 25℃)		P_D	108.4	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150	℃

Thermal Resistance

Parameter		Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	(note4)	R_{thJC}	1.15	℃/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	62.5	

Specifications T_J = 25℃, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0V, T_J = 25℃	--	--	1	uA
Gate-Source Leakage	I_{GSS}	V_{GS} = ± 20V	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	--	2.5	V
Drain-Source On-Resistance (note5)	$R_{DS(on)}$	V_{GS} = 10V, I_D = 30A	--	2.3	2.8	mΩ
		V_{GS} = 4.5V, I_D = 20A	--	3.0	3.6	mΩ
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} =30V, f = 1.0MHz	--	3685	--	pF
Output Capacitance	C_{oss}		--	1085	--	
Reverse Transfer Capacitance	C_{rss}		--	33	--	
Gate Resistance	R_g	V_{GS} = 0V,f = 1MHz	--	3.2	--	Ω
Total Gate Charge	Q_g	V_{DD} = 48V, I_D = 30A, V_{GS} = 10V	--	64.7	--	nC
Gate-Source Charge	Q_{gs}		--	6.7	--	
Gate-Drain Charge	Q_{gd}		--	10.7	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} =30V, I_D = 30A, R_G = 3Ω	--	14	--	ns
Turn-on Rise Time	t_r		--	83	--	
Turn-off Delay Time	$t_{d(off)}$		--	66	--	
Turn-off Fall Time	t_f		--	41	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25 ℃	--	--	140	A
Pulsed Diode Forward Current	I_{SM}		--	--	560	
Body Diode Voltage	V_{SD}	T_J = 25℃, I_{SD} = 30A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Time	t_{rr}	V_{DD} = 30V,I_S = 30A, di_F/dt =100A / μ s	--	39	--	ns
Reverse Recovery Charge	Q_{rr}		--	0.042	--	uC

Notes

1. I_D=80%I_{D-Max}
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. L=0.5mH, V_{DD} = 30V, R_G = 25 Ω, E_{AS}=60%E_{AS-Max},I_{AS}=60%I_{AS-Max} ,Starting T_J = 25 ℃
4. Reference standard for thermal resistance testing: JESD51-14
5. Pulse Test: Pulse width ≤ 300 μ s, Duty Cycle ≤ 1%

Typical Characteristics T_J = 25℃, unless otherwise noted

Figure 1. Output Characteristics

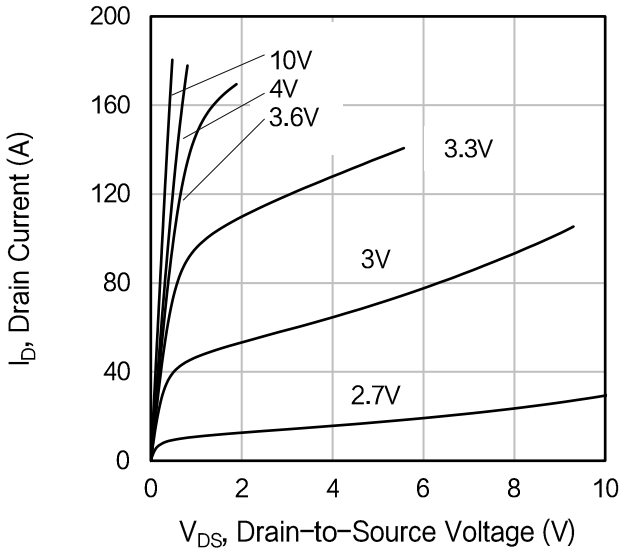


Figure 2. Body Diode Forward Voltage

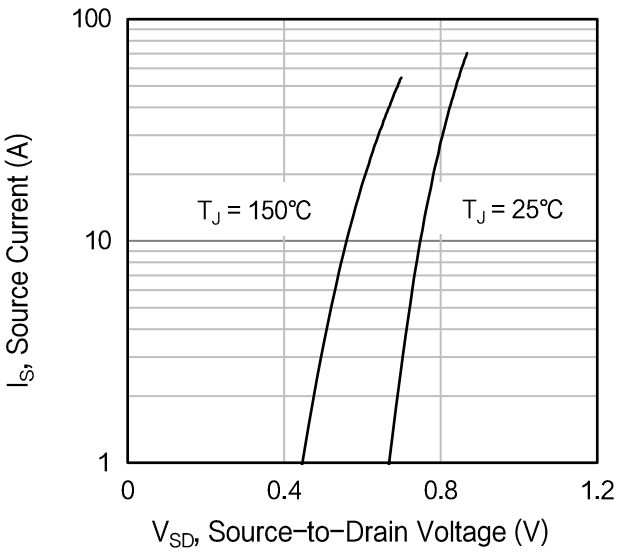


Figure 3. Drain Current vs. Temperature

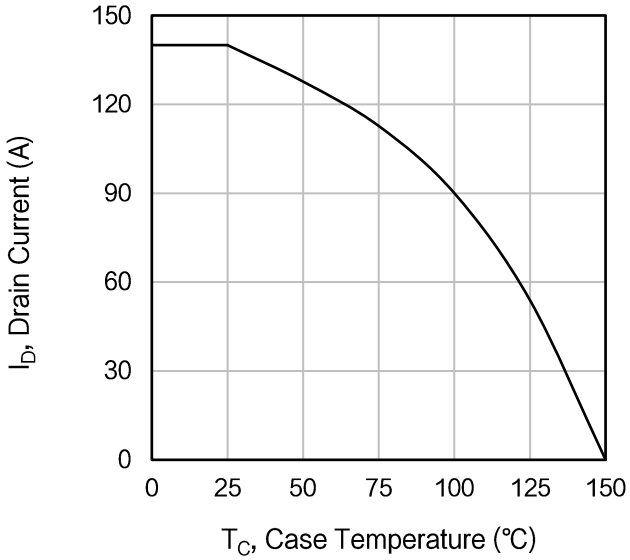


Figure 4. Transfer Characteristics

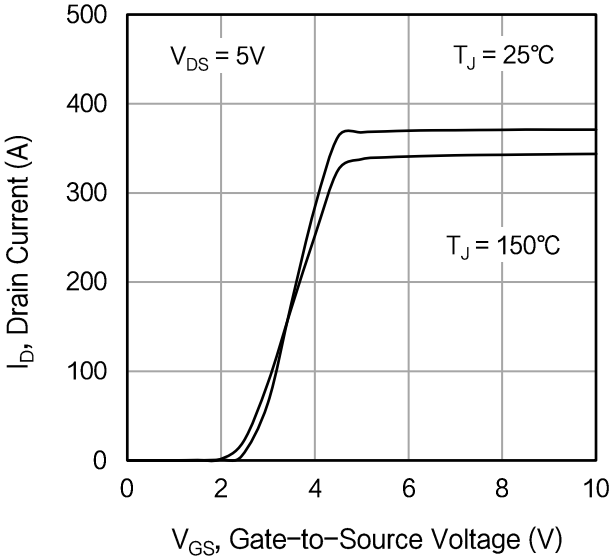


Figure 5. BV_{DSS} Variation vs. Temperature

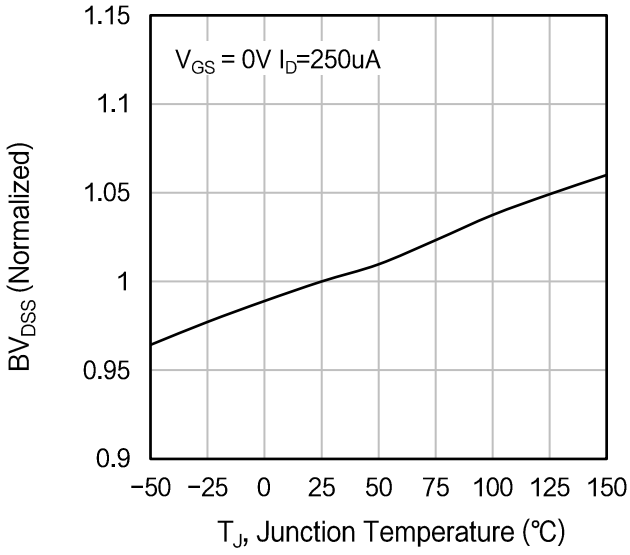
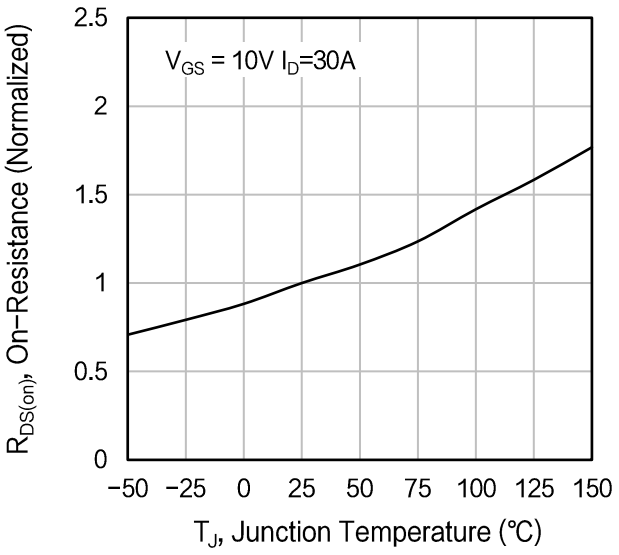


Figure 6. On-Resistance vs. Temperature



Typical Characteristics T_J = 25℃, unless otherwise noted

Fig.7 Threshold Voltage vs. Temperature

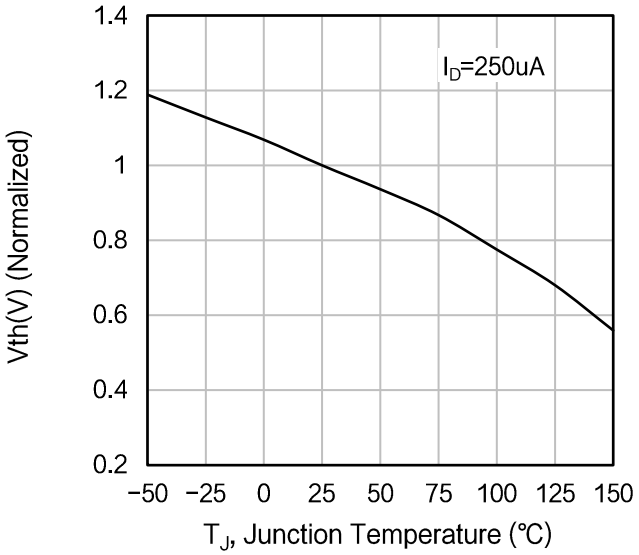


Figure 8. On−Resistance vs. Drain Current

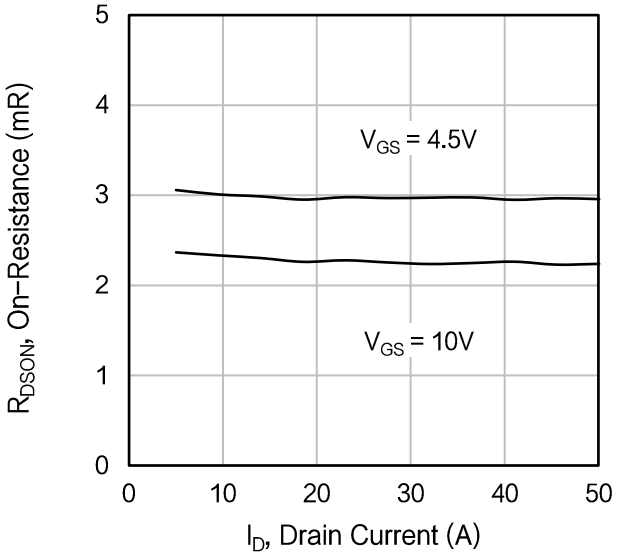


Figure 9. Capacitance

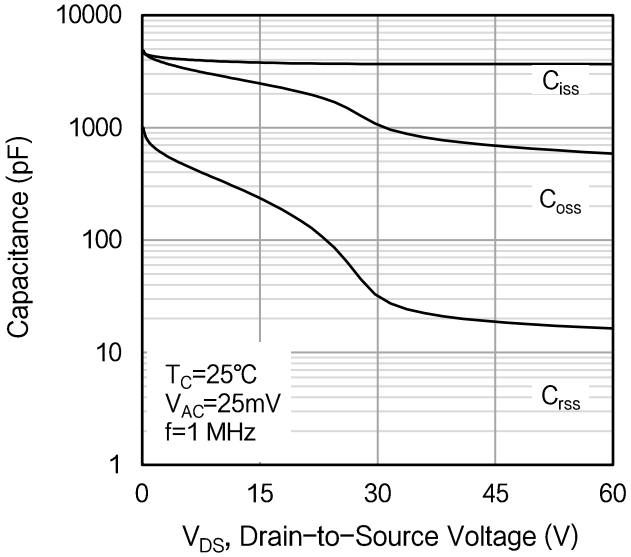


Figure 10. Gate Charge

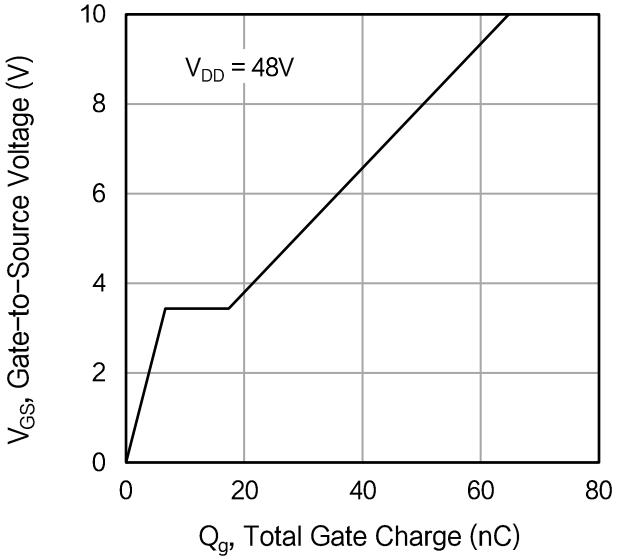


Figure 11. Safe Operating Area

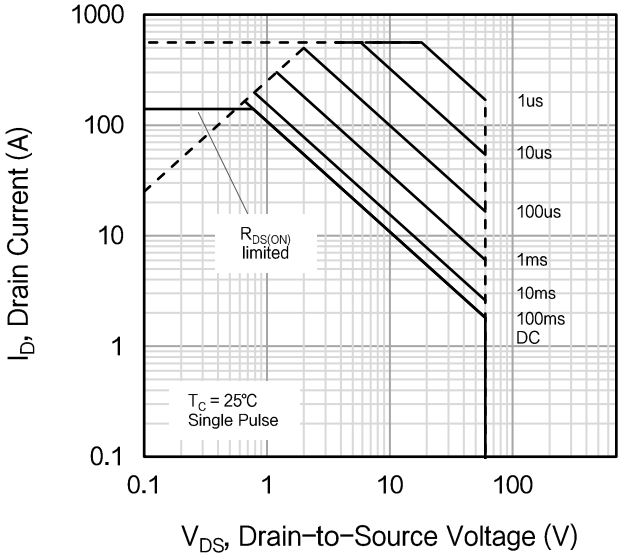


Figure 12. Transient Thermal Impedance

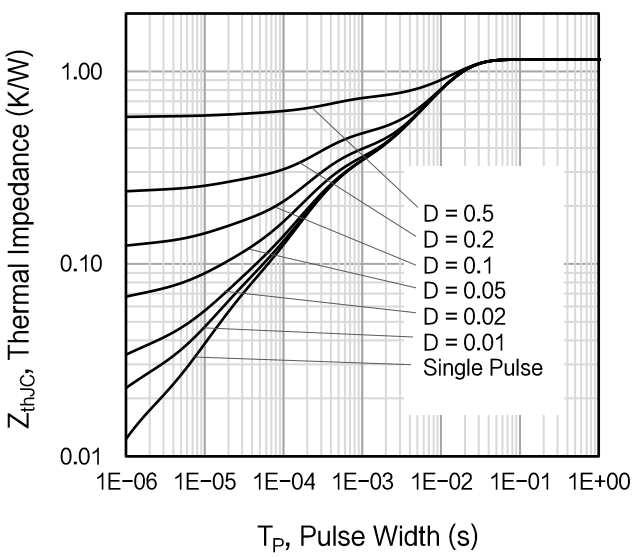


Figure A：Gate Charge Test Circuit and Waveform

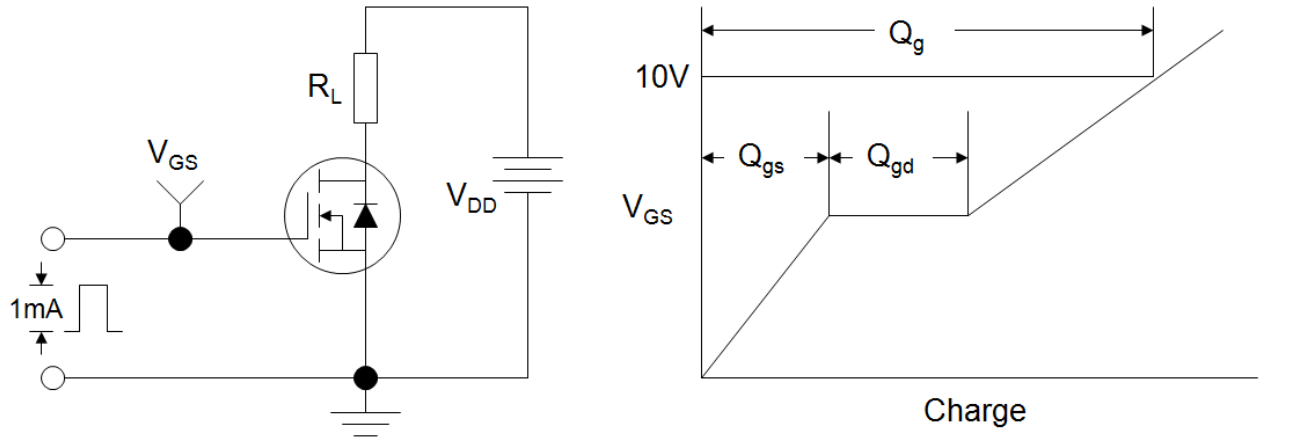


Figure B：Resistive Switching Test Circuit and Waveform

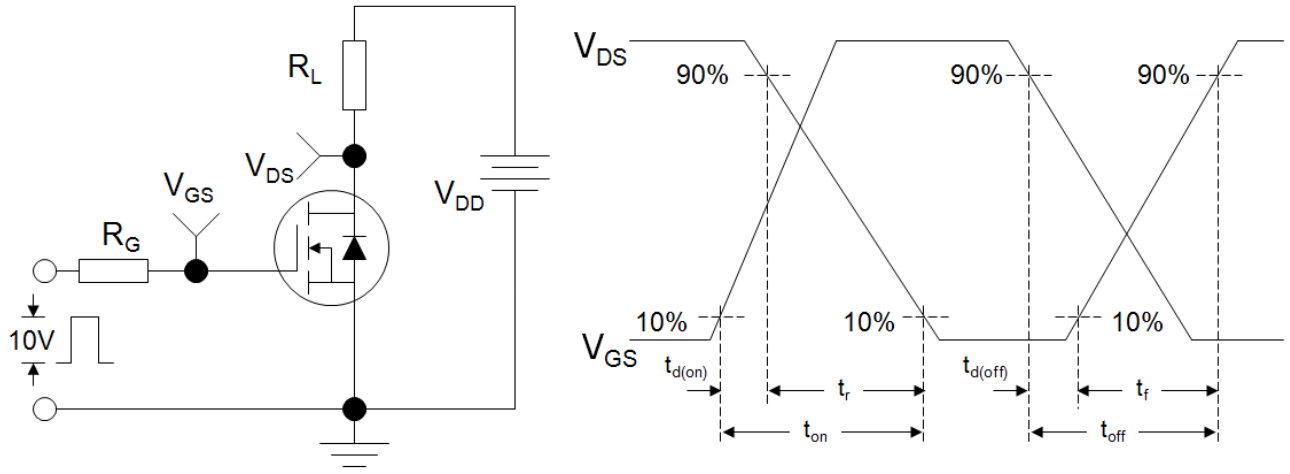
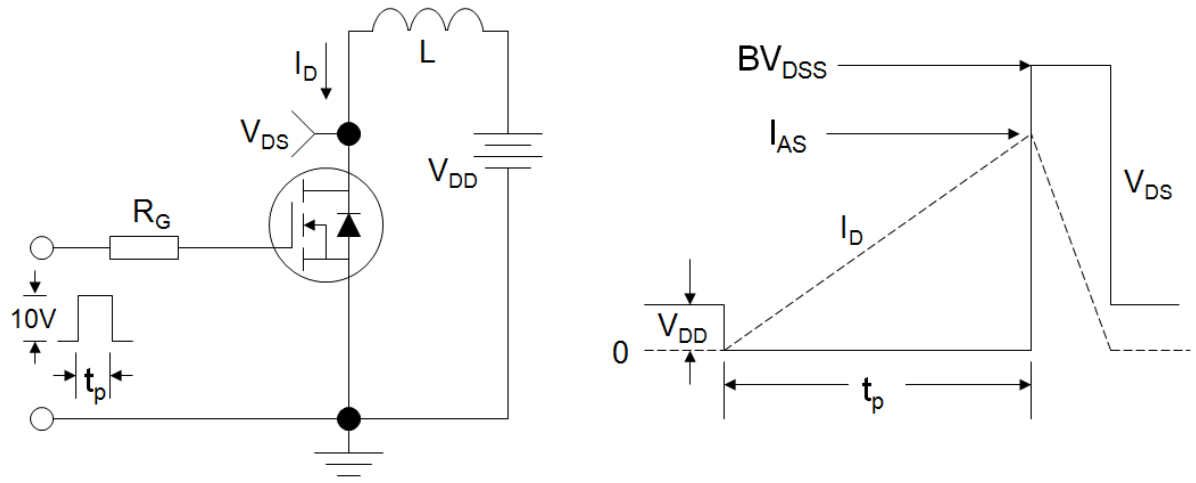
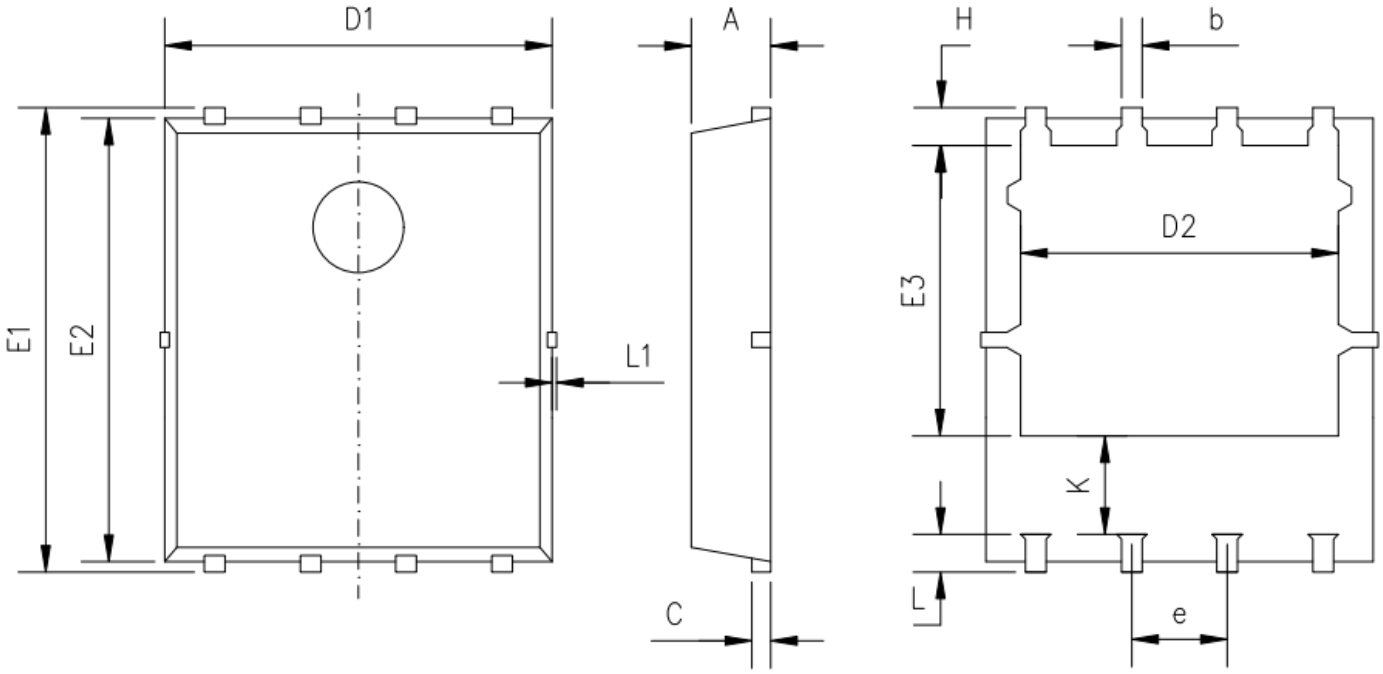


Figure C：Unclamped Inductive Switching Test Circuit and Waveform



PDFN5×6



SYMBOLS	MILLIMETERS	
	MIN	MAX
A	0.90	1.20
b	0.25	0.50
C	0.10	0.35
D1	4.80	5.40
D2	3.72	4.25
e	1.17	1.37
E1	5.90	6.35
E2	5.60	6.06
E3	3.33	3.92
H	0.40	0.71
L	0.30	0.84
L1	0.00	0.15
K	1.00	1.50

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