

DATASHEET

N-Channel Enhancement Mode Power MOSFET

Description

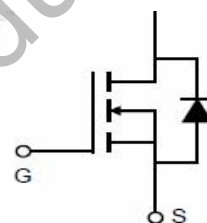
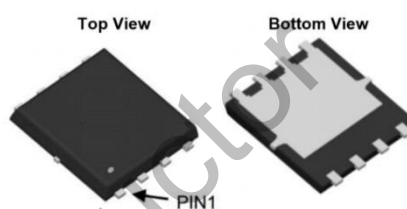
This Power MOSFET is produced using advanced SGT technology.

This devices provide an excellent gate charge and $R_{DS(on)}$, which leads to extremely communication and conduction losses. So it is very suitable for AC/DC power conversion, load switch and industrial power applications.

Features

- $V_{DS}=40V$, $I_D=360A$
- $R_{DS(on)}$ Typ= $0.85m\Omega$ @ $V_{GS}=10V$
- Low FOM $R_{DS(on)} \times Q_{gd}$
- 100% avalanche tested
- Easy to use/drive
- RoHS compliant

PDFN5*6-8L



Schematic diagram

Applications

- Power Management
- PWM Application
- Load Switch

100% UIS TESTED!

100% ΔV_{ds} TESTED!



Package Marking and Ordering Information

Device	Marking	Package	Packing	Reel size	Reel (pcs)	Per Carton (pcs)
360N04		PDFN5*6	Reel	13inch	5000	50000

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Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-source Voltage		V_{DS}	40	V
Gate-source Voltage		V_{GS}	± 20	V
Continuous Drain Current ⁽²⁾	$T_C=25^{\circ}\text{C}$	I_D	360	A
	$T_C=100^{\circ}\text{C}$		240	
Pulsed Drain Current($T_C=25^{\circ}\text{C}$, T_p Limited By T_{jmax}) ⁽³⁾		I_{DM}	360	A
Maximum Power Dissipation($T_C=25^{\circ}\text{C}$)		P_D	196	W
Avalanche energy , single Pulse($L=0.5\text{mH}$) ⁽¹⁾		E_{AS}	843	mJ
Operating Junction And Storage Temperature		T_j, T_{stg}	-55 To 150	$^{\circ}\text{C}$
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T_L	300	$^{\circ}\text{C}$

* Drain current limited by maximum junction temperature.

Thermal Resistance

Parameter	Symbol	Max	Unit
Junction-to-Case	$R_{\theta JC}$	1.3	$^{\circ}\text{C/W}$

Notes:

- 1) $L=0.3\text{mH}$, $V_{DD}=30\text{V}$, Start $T_j=25^{\circ}\text{C}$.
- 2) Limited by maximum junction temperature.
- 3) Repetitive Rating: Pulse width limited by maximum junction temperature.

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Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
Off Characteristic						
Drain-source breakdown voltage	BV _{DSS}	40	-	-	V	V _{GS} =0V, I _D =250μA
Zero gate voltage drain current	I _{DSS}	-	-	1	μA	V _{DS} =40V, V _{GS} =0V, T _J =25℃
Gate-source leakage current	I _{GSS}	-	-	± 1	uA	V _{GS} =± 24V, V _{DS} =0V
On Characteristics						
Gate threshold voltage	V _{GS(th)}	1.5	1.9	2.5	V	V _{DS} =V _{GS} , I _D =250μA
Drain-source on-state resistance	R _{DS(on)}	-	0.85	1.1	mΩ	V _{GS} =10V, I _D =30A
Dynamic Characteristic						
Input Capacitance	C _{iss}	-	7350	-	PF	V _{GS} =0V, V _{DS} =15V, f=1.0MHz
Output Capacitance	C _{oss}	-	1850	-		
Reverse Transfer Capacitance	C _{rss}	-	302	-		
Switching Characteristics						
Turn-on delay time	t _{d(on)}	-	23	-	nS	V _{DS} = 15V, V _{GS} =10V R _G = 3Ω, I _D = 30A
Turn-on Rise time	t _r	-	28	-		
Turn-off delay time	t _{d(off)}	-	74	-		
Turn-off Fall time	t _f	-	36	-		
Gate Total Charge	Q _G	-	155	-	nC	V _{GS} =10V, V _{DS} =15V, I _D =30A
Gate-Source Charge	Q _{gs}	-	54	-		
Gate-Drain Charge	Q _{gd}	-	49	-		
Drain-Source Diode Characteristics						
Body Diode Forward Voltage	V _{SD}	-	-	1.2	V	V _{GS} =0V, I _{SD} =30A, T _J = 25℃
Body Diode Forward Current	I _S	-	-	150	A	-
Body Diode Reverse Recovery Time	T _{rr}	-	56	-	ns	T _J =25℃ , I _{SD} =20A, V _{GS} =0V, d _i /d _t =100A/μs
Body Diode Reverse Recovery Charge	Q _{rr}	-	112	-	nC	

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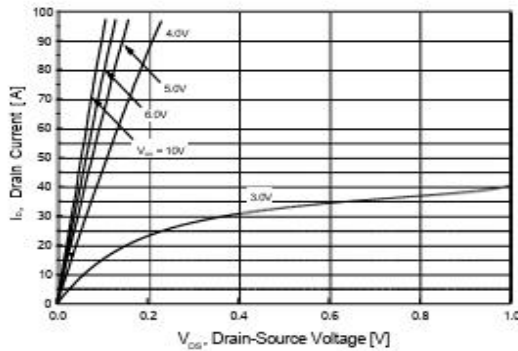


Fig.1 On-Region Characteristics

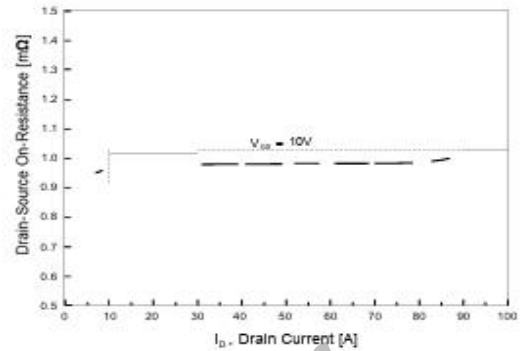


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

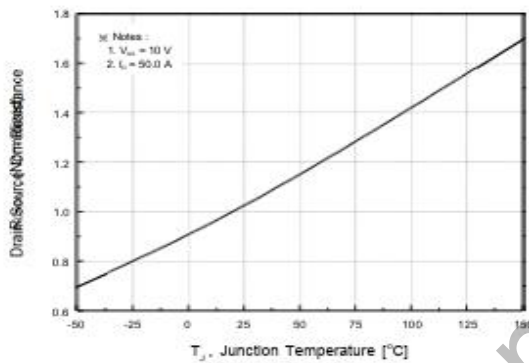


Fig.3 On-Resistance Variation with Temperature

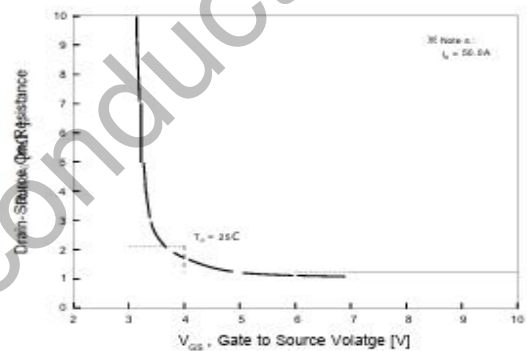


Fig.4 On-Resistance Variation with Gate to Source Voltage

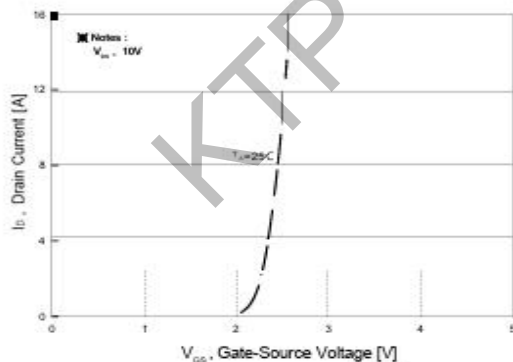


Fig.5 Transfer Characteristics

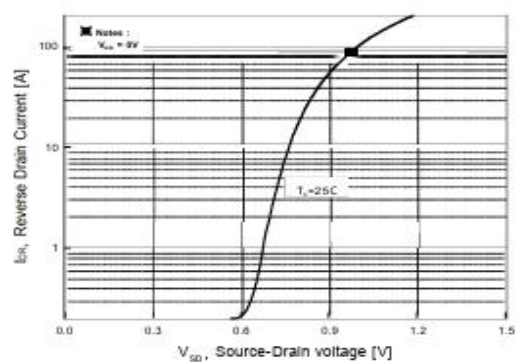


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

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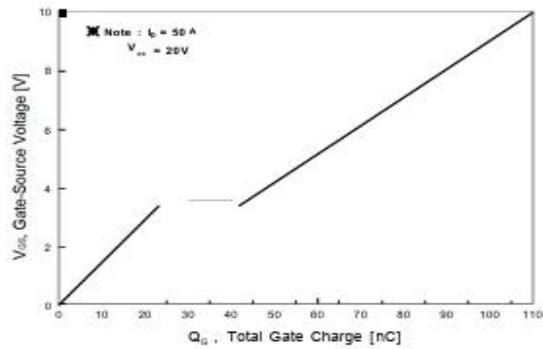


Fig.7 Gate Charge Characteristics

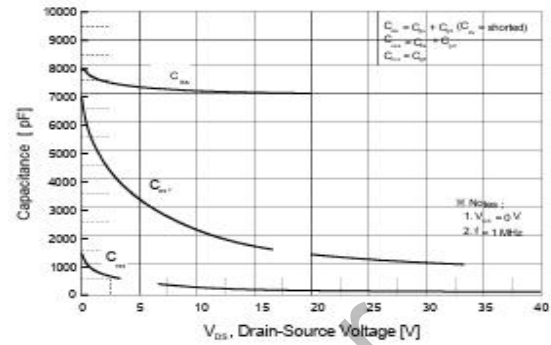


Fig.8 Capacitance Characteristics

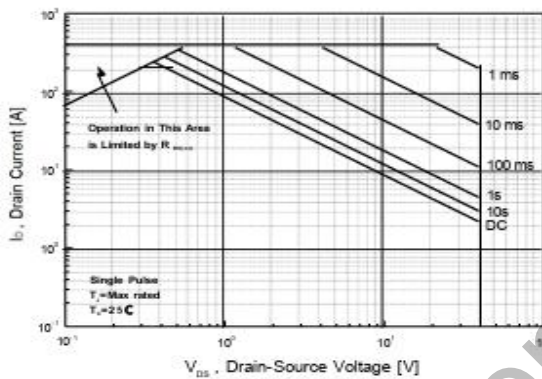


Fig.9 Maximum Safe Operating Area

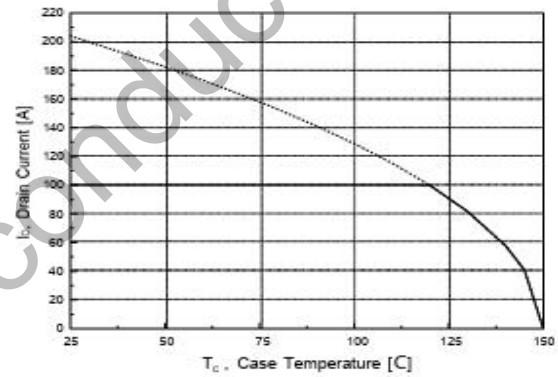


Fig.10 Maximum Drain Current vs. Case Temperature

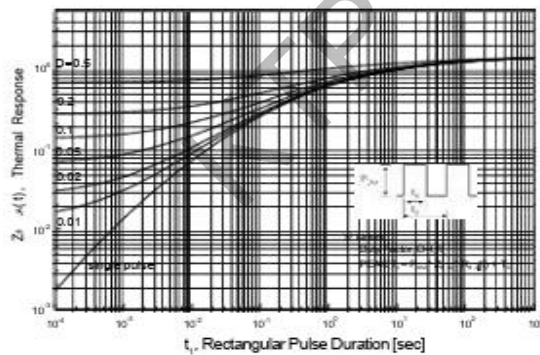
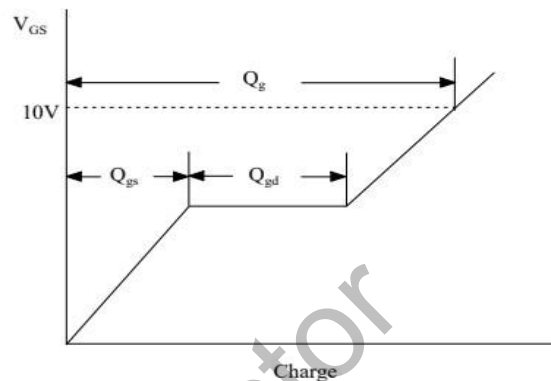
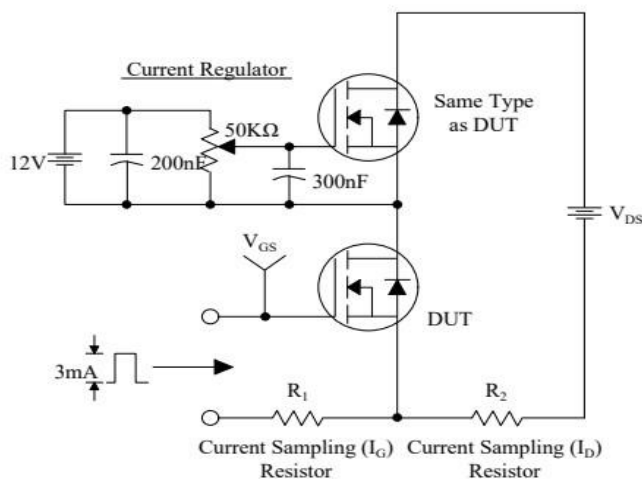


Fig.11 Transient Thermal Response Curve

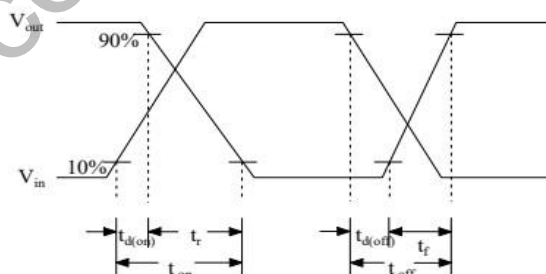
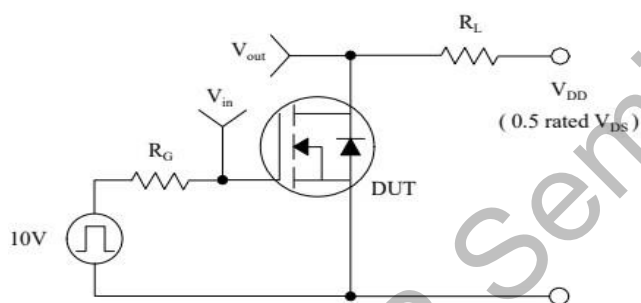
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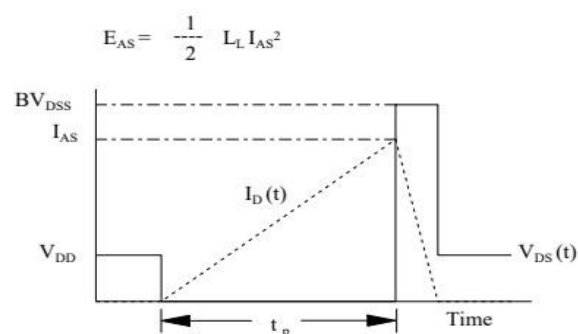
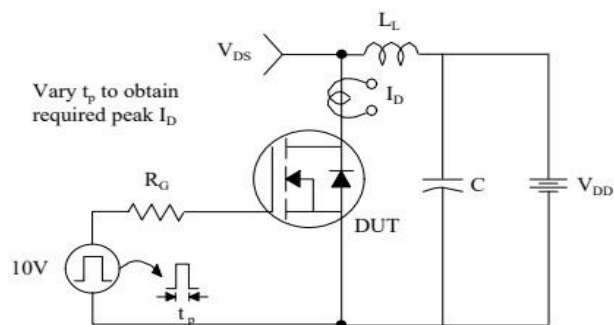
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



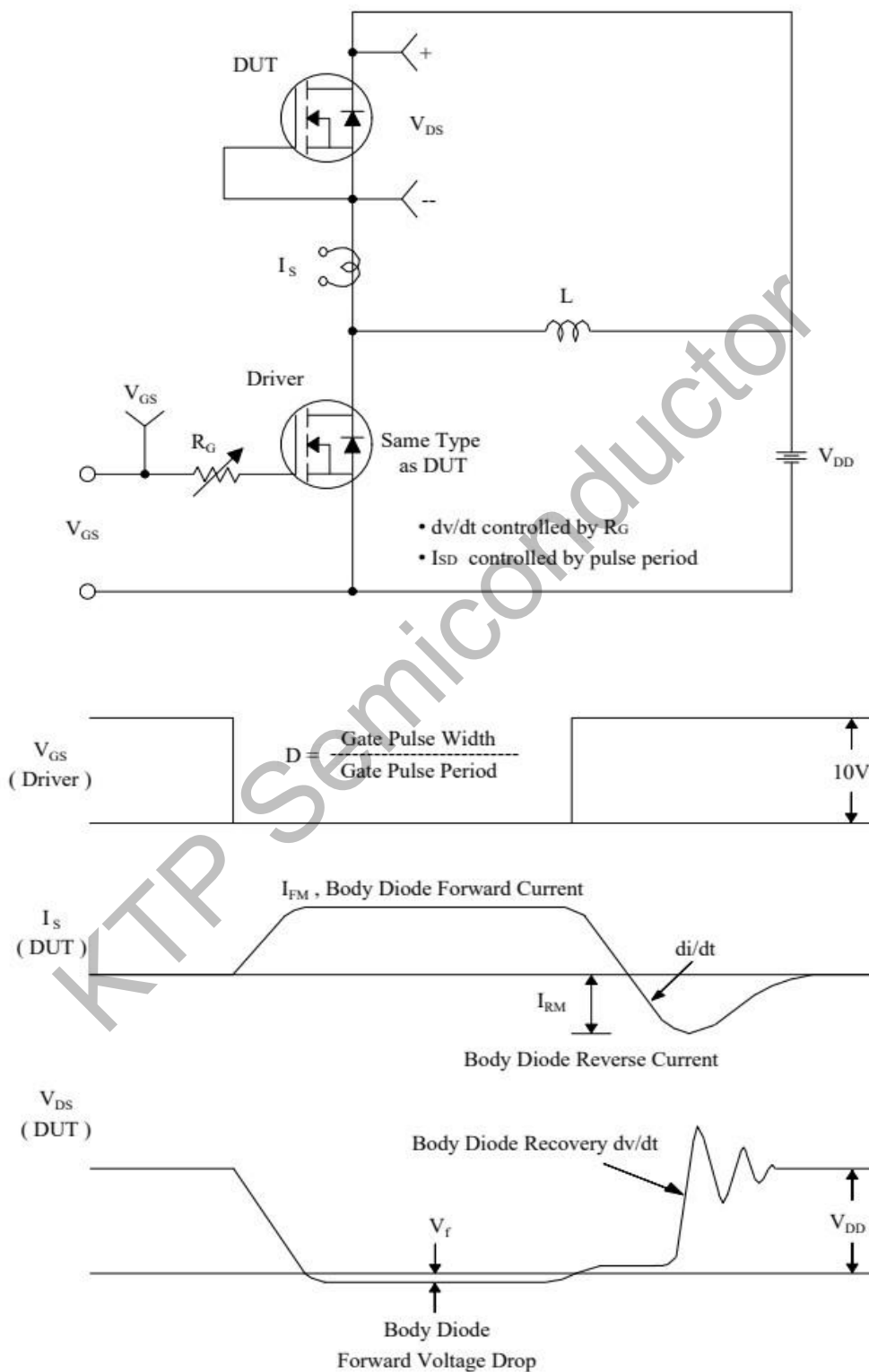
Unclamped Inductive Switching Test Circuit & Waveforms



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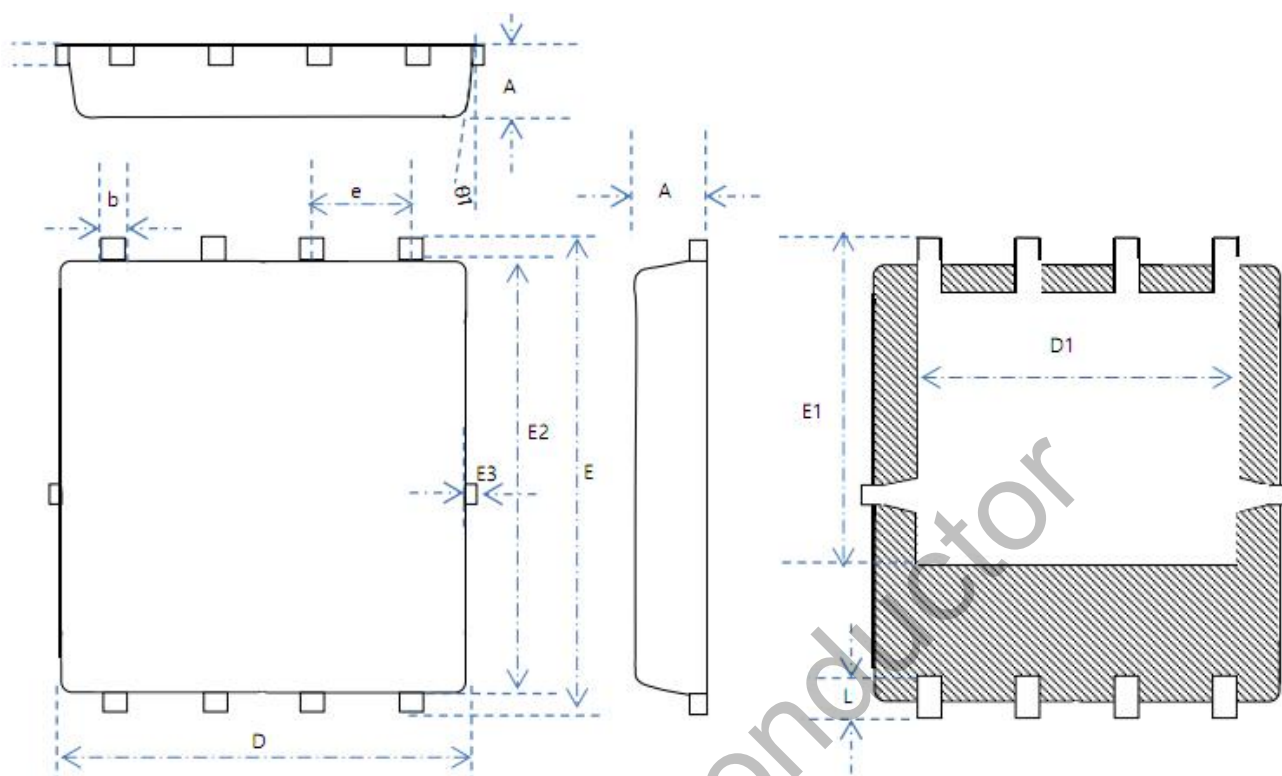
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Peak Diode Recovery dv/dt Test Circuit & Waveforms



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SYMBOL	Mechanical Dimensions/mm			SYMBOL	Mechanical Dimensions/mm		
	MIN	NOM	MAX		MIN	NOM	MAX
A	0.85	0.95	1.05	D	5.10	5.20	5.30
A1	0.254 REF			e	1.270 TYPE		
b	-	0.30	-	D1	3.90	4.0	4.10
E	5.85	6.05	6.25	L	0.54	0.64	0.74
E1	3.90	4.10	4.30				
E2	5.45	5.55	5.65	θ1	8°	10°	12°
E3	-	-	0.15				