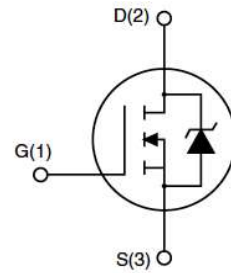


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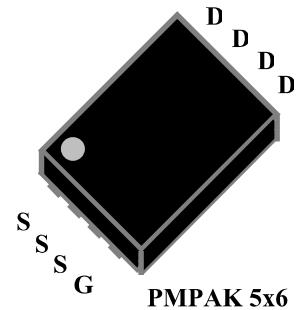
Features

- 20V,90A
- $R_{DS(ON)} = 2.9m\Omega$ (Typ.) @ $V_{GS} = 4.5V$
- $R_{DS(ON)} = 4.0m\Omega$ (Typ.) @ $V_{GS} = 2.5V$
- Lead free and Green Device Available
- Low $R_{DS(ON)}$ to Minimize Conductive Loss
- High Avalanche Current



Application

- Switch Mode Power Supply (SMPS)
- Load Switch



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

Symbol	Parameter		Max.	Units
V _{DSS}	Drain-Source Voltage		20	V
V _{GSS}	Gate-Source Voltage		±12	V
I _D	Continuous Drain Current	T _C = 25°C	90	A
		T _C = 100°C	60	A
I _{DM}	Pulsed Drain Current ^{note1}		360	A
E _{AS}	Single Pulsed Avalanche Energy ^{note2}		340	mJ
P _D	Power Dissipation	T _C = 25°C	87	W
R _{θJC}	Thermal Resistance, Junction to Case		1.72	°C/W
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +175	°C

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Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 20V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{GS} = \pm 12V, V_{DS} = 0V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.5	0.7	1.1	V
$R_{DS(on)}$	Static Drain-Source On-Resistance <small>note3</small>	$V_{GS} = 4.5V, I_D = 30A$	-	2.9	3.5	m Ω
		$V_{GS} = 2.5V, I_D = 20A$	-	4.1	5	
g_{FS}	Forward Transconductance	$V_{DS} = 5V, I_D = 15A$	-	40	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = 15V, V_{GS} = 0V,$ $f = 1.0MHz$	-	2800	-	pF
C_{oss}	Output Capacitance		-	353	-	pF
C_{rss}	Reverse Transfer Capacitance		-	265	-	pF
Q_g	Total Gate Charge	$V_{DS} = 4.5V, I_D = 12A,$ $V_{GS} = 10V$	-	32	-	nC
Q_{gs}	Gate-Source Charge		-	3	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	11	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 15V, R_L = 0.75\Omega,$ $R_G = 3\Omega, V_{GS} = 4.5V$	-	17	-	ns
t_r	Turn-On Rise Time		-	49	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	74	-	ns
t_f	Turn-Off Fall Time		-	26	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	90	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	360	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{SD} = 20A,$ $T_J = 25^{\circ}\text{C}$	-	-	1.2	V
t_{rr}	Reverse Recovery Time	$T_J = 25^{\circ}\text{C}, I_F = 20A,$ $di/dt = 100A/\mu s$	-	23	-	ns
Q_{rr}	Reverse Recovery Charge		-	10	-	nC

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

 2. $T_J = 25^{\circ}\text{C}, V_G = 4.5V, R_G = 25\Omega$

 3. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

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Typical Performance Characteristics

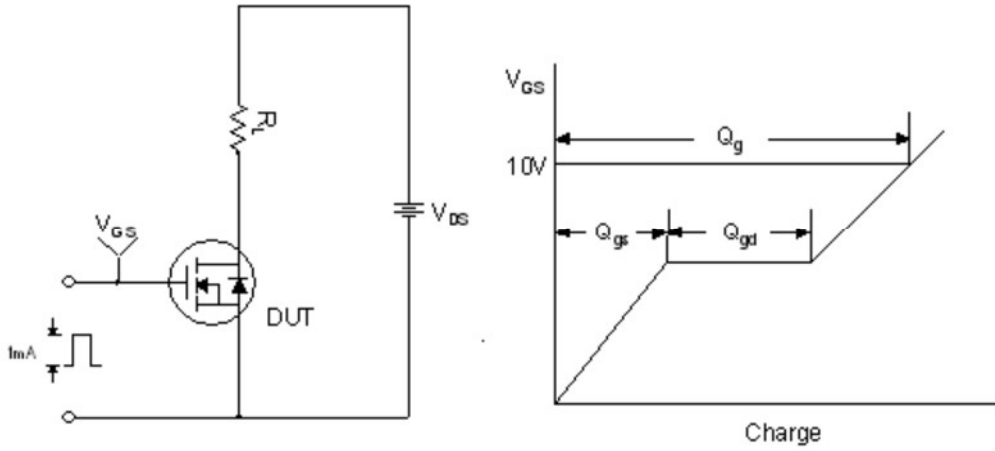


Figure 1. Gate Charge Test Circuit & Waveform

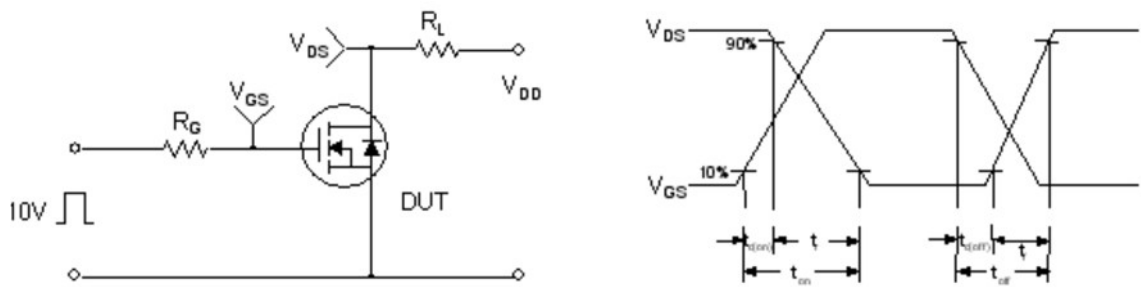


Figure 2. Resistive Switching Test Circuit & Waveforms

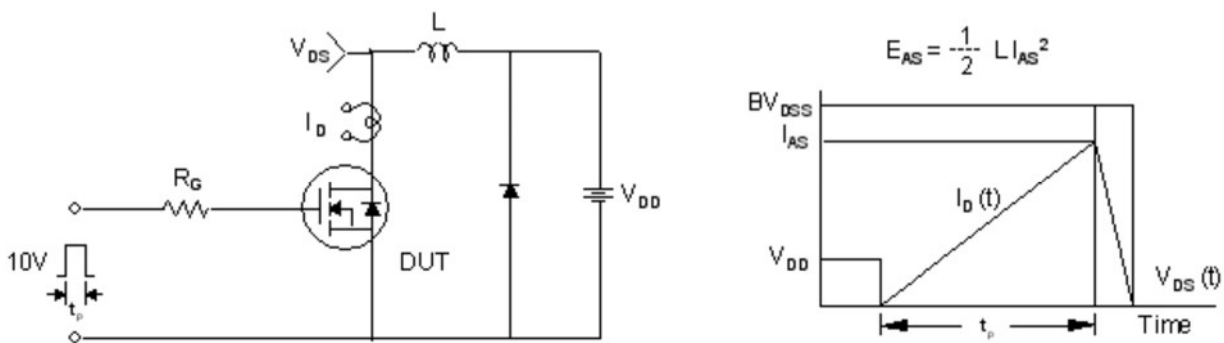


Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms

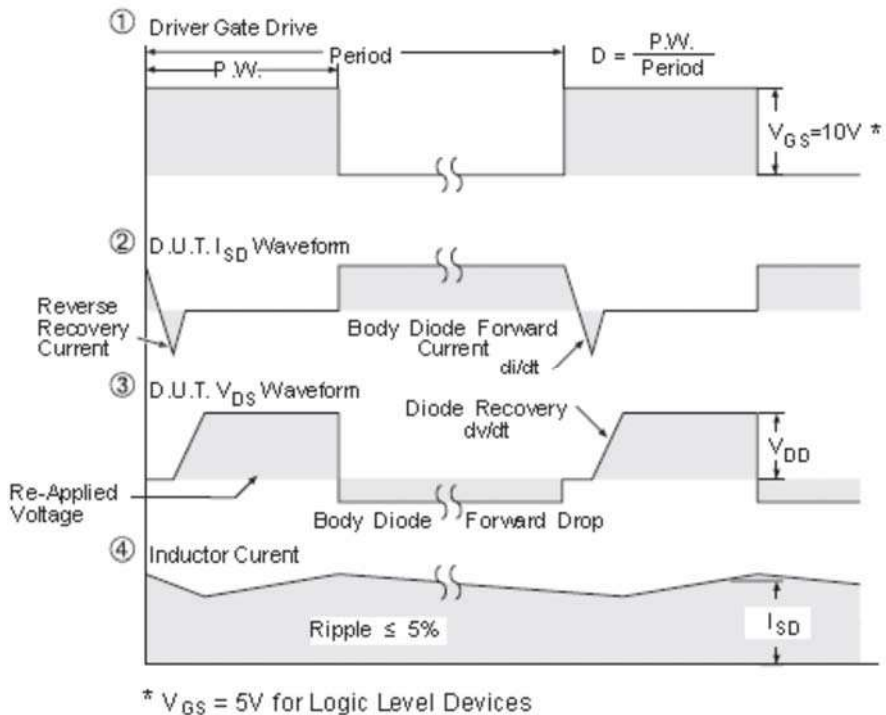
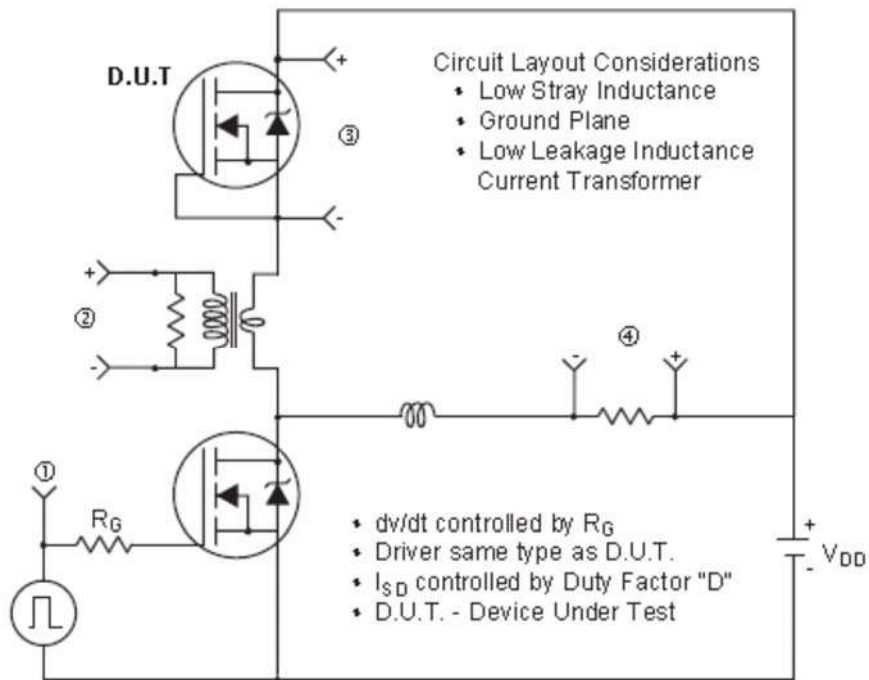


Figure 4. Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

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Figure 1: Output Characteristics

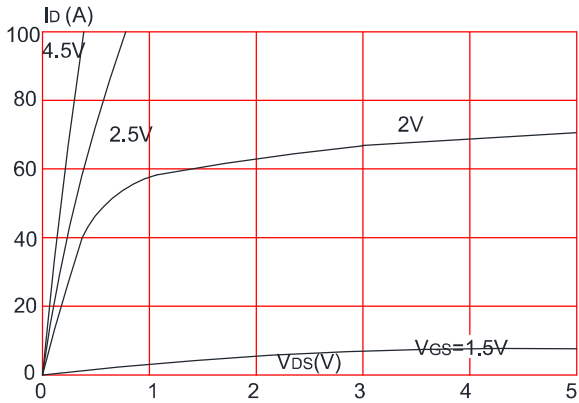


Figure 2: Typical Transfer Characteristics

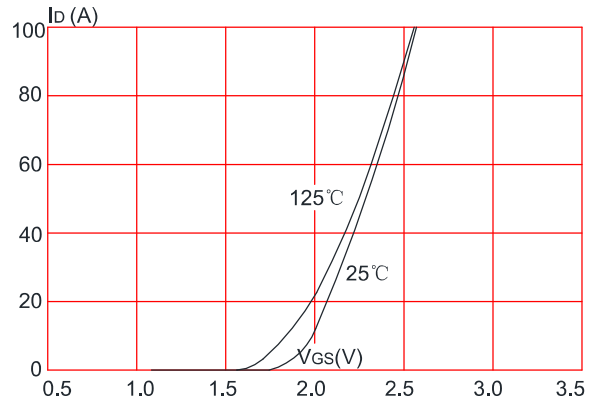


Figure 3: On-resistance vs. Drain Current

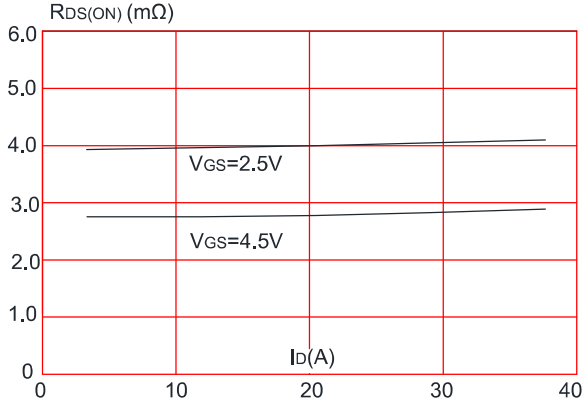


Figure 4: Body Diode Characteristics

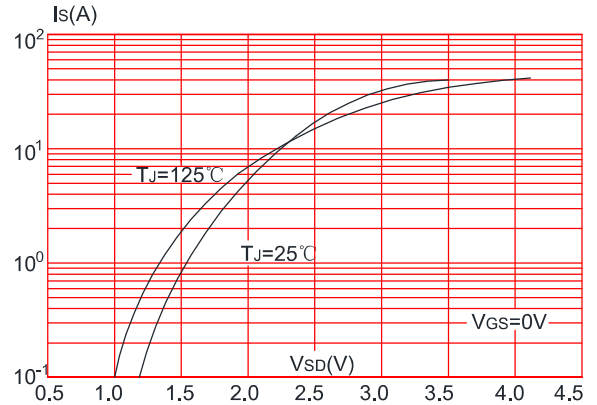


Figure 5: Gate Charge Characteristics

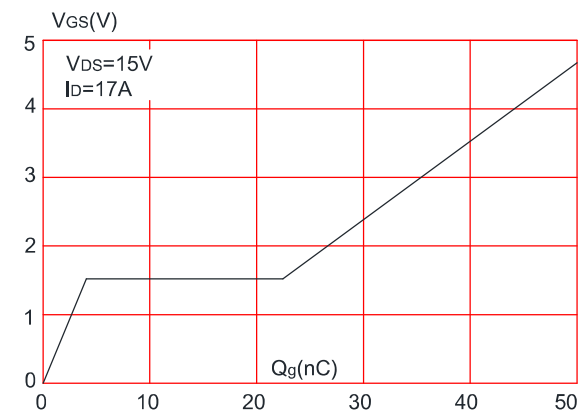
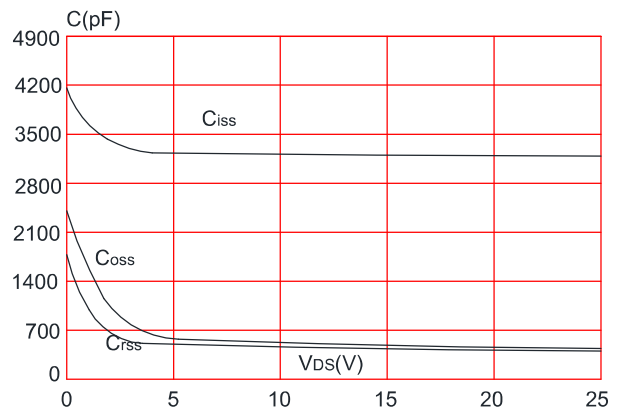


Figure 6: Capacitance Characteristics



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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

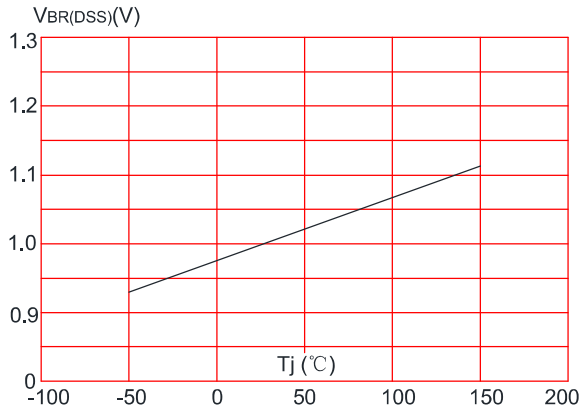


Figure 8: Normalized on Resistance vs. Junction Temperature

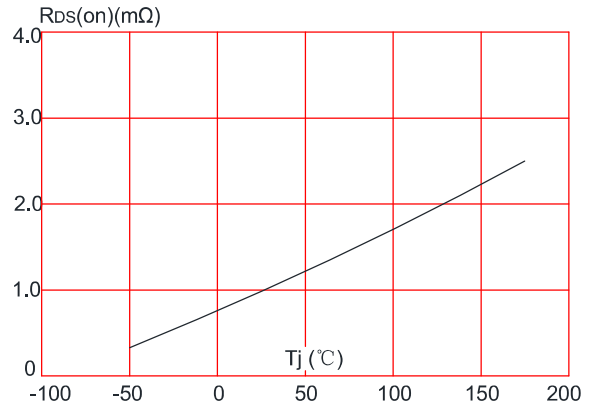


Figure 9: Maximum Safe Operating Area

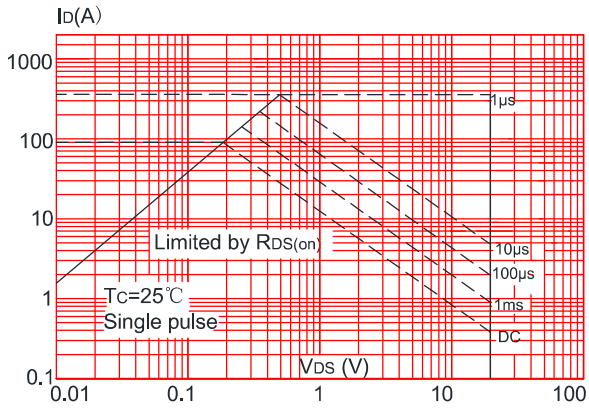


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

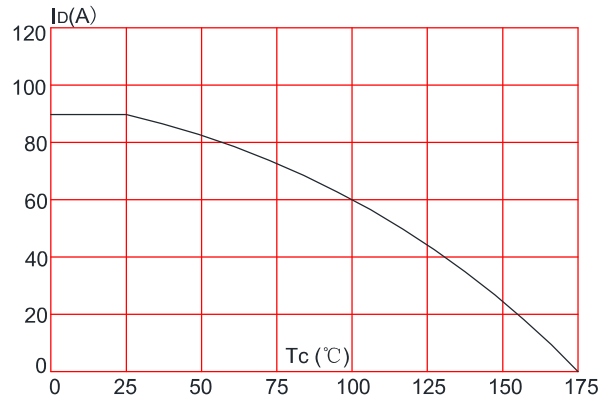
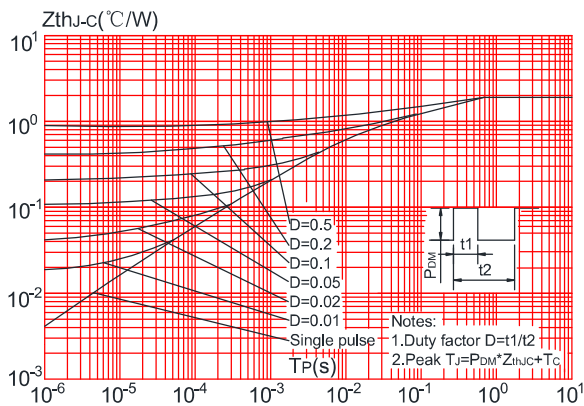


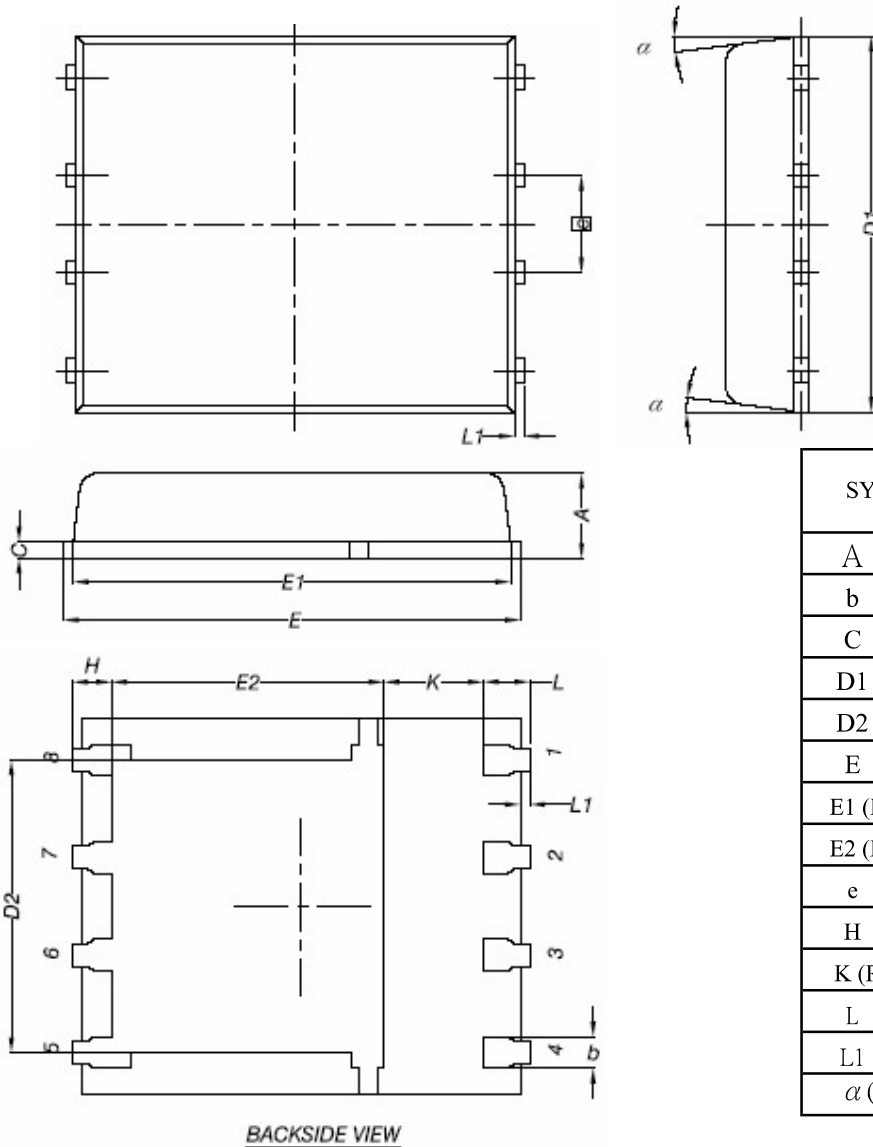
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



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Package Outline : PMPAK 5x6



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	-	-
D1	4.80	4.90	5.10
D2	-	-	4.20
E	5.90	6.00	6.10
E1 (Reference)	5.70	5.75	5.80
E2 (Reference)	3.38	3.58	3.78
e	1.27 BSC		
H	-	-	0.62
K (Reference)	0.70	-	-
L	0.51	0.61	0.71
L1	-	-	0.20
α (Reference)	0°	-	12°

- 1.All Dimension Are In Millimeters.
- 2.Dimension Does Not Include Mold Protrusions.