



60V 18mΩ Dual N-Ch Power MOSFET

Features

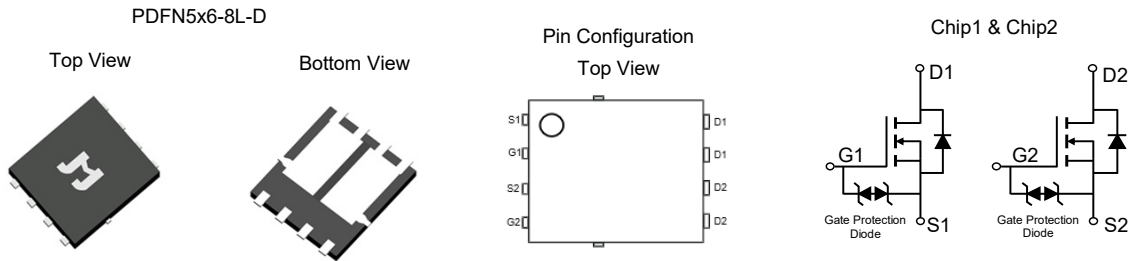
- Low ON Resistance, $R_{DS(ON)}$
- Low Gate Charge, Q_g
- 100% UIS and R_g Tested
- ESD-enhanced Gate Pin @ HBM Class-2 of 1.1kV Typical
- Pb-free Lead Plating, Halogen-free, RoHS-compliant

Product Summary

Parameter	Value	Unit
V_{DS}	60	V
$V_{GS(th_Typ)}$	1.8	V
I_D (@ $V_{GS} = 10V$) ⁽¹⁾	23	A
$R_{DS(ON_Typ)}$ (@ $V_{GS} = 10V$)	18.0	mΩ
$R_{DS(ON_Typ)}$ (@ $V_{GS} = 4.5V$)	25	mΩ

Applications

- Power Management in Computing, CE, IE 4.0, Communications
- Current Switching in DC/DC & AC/DC (SR) Sub-systems
- Load Switching, Quick/Wireless Charging, Motor Driving

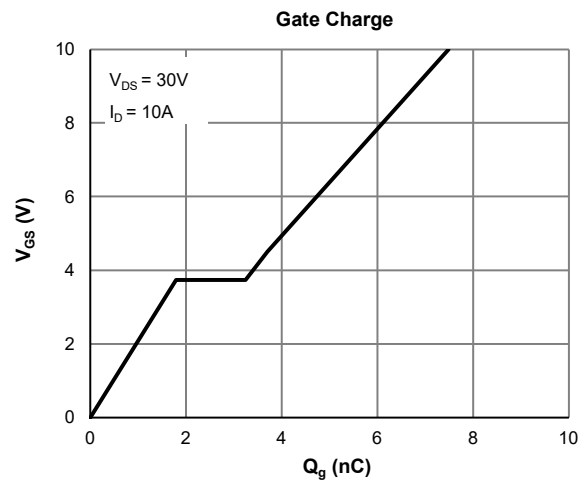
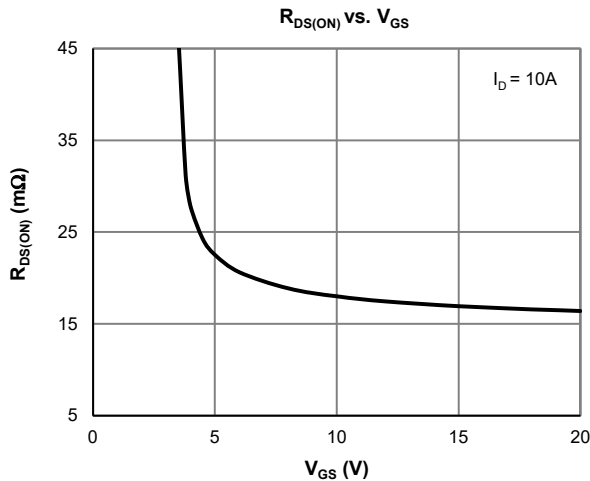


Ordering Information

Device	Package	# of Pins	Marking	MSL	T_J (°C)	Media	Quantity (pcs)
JMSL0620AGDE-13	PDFN5x6-8L-D	8	L0620AD	1	-55 to 150	13-inch Reel	5000

Absolute Maximum Ratings (@ $T_A = 25^\circ C$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	60	V
Gate-to-Source Voltage	V_{GS}	±20	V
Human Body Model (per JESD22-A114)	V_{ESD_GS}	1.1	kV
Continuous Drain Current ⁽¹⁾	I_D	$T_C = 25^\circ C$	23
		$T_C = 100^\circ C$	14.3
Pulsed Drain Current ⁽²⁾	I_{DM}	50	A
Avalanche Energy ⁽³⁾	E_{AS}	26	mJ
Power Dissipation ⁽⁴⁾	P_D	$T_C = 25^\circ C$	22
		$T_C = 100^\circ C$	8.6
Junction & Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C





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

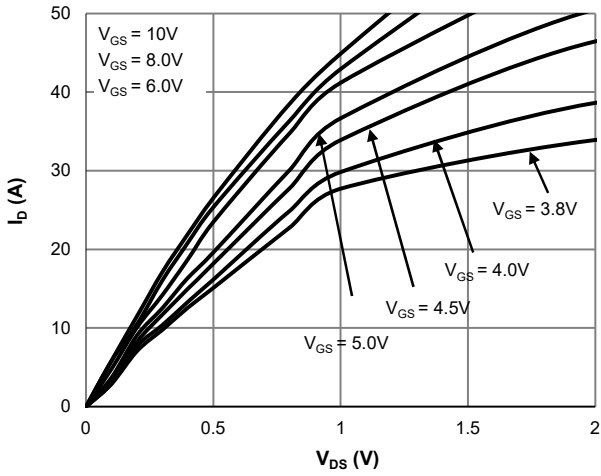
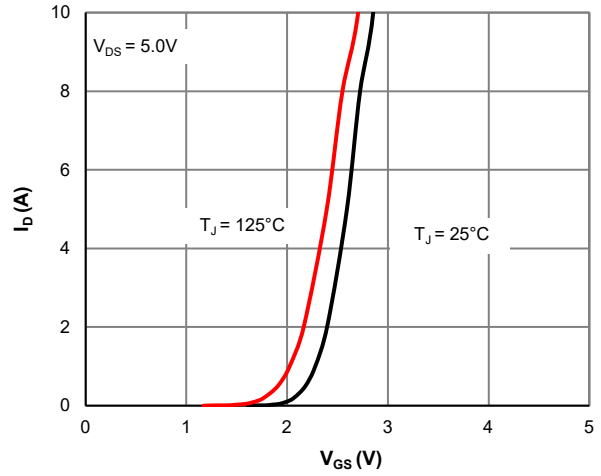
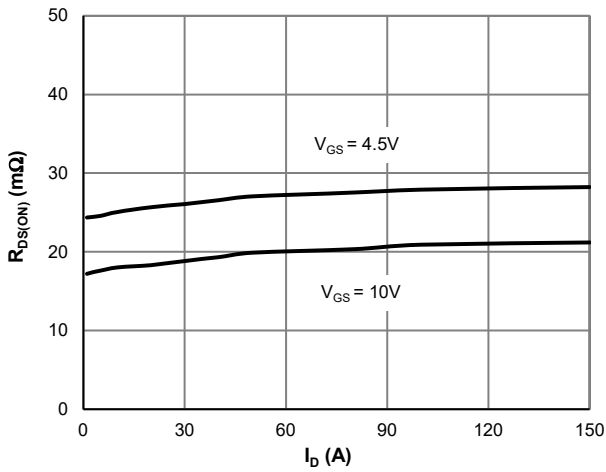
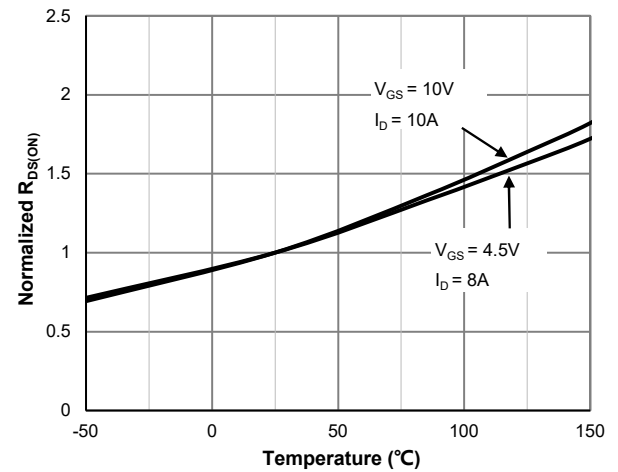
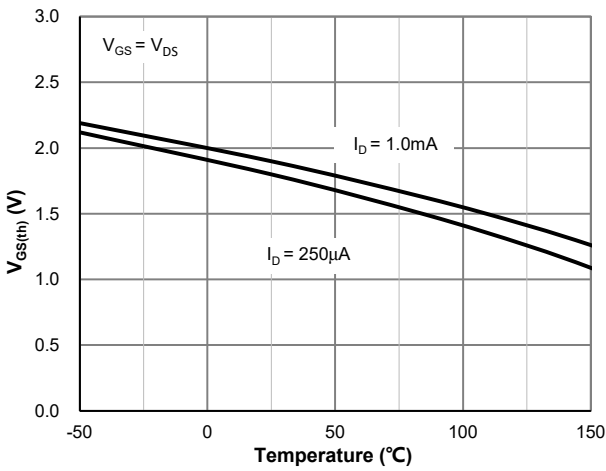
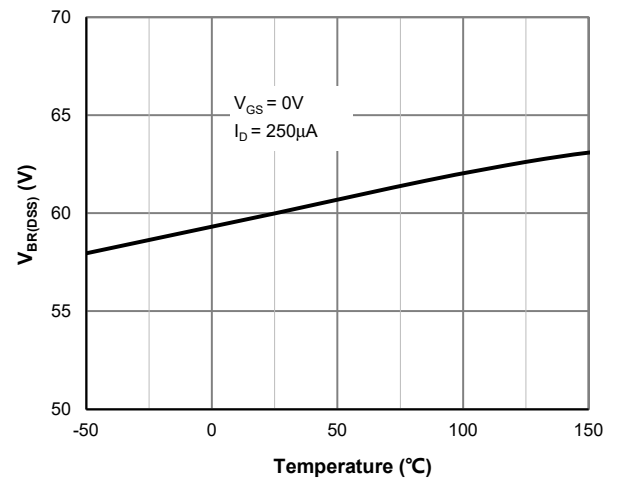
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48\text{V}, V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$			1.0 5.0	μA
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$			± 10	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.2	1.8	2.5	V
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{V}, I_D = 10\text{A}$		18.0	23	$\text{m}\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 8\text{A}$		25	33	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{V}, I_D = 10\text{A}$		15.5		S
Diode Forward Voltage	V_{SD}	$I_S = 1\text{A}, V_{GS} = 0\text{V}$		0.73	1.0	V
Diode Continuous Current	I_S	$T_C = 25^\circ\text{C}$			22	A
DYNAMIC PARAMETERS ⁽⁵⁾						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 30\text{V}, f = 1\text{MHz}$		409		pF
Output Capacitance	C_{oss}			143		pF
Reverse Transfer Capacitance	C_{rss}			24		pF
Gate Resistance	R_g	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1\text{MHz}$		3.5		Ω
SWITCHING PARAMETERS ⁽⁵⁾						
Total Gate Charge (@ $V_{GS} = 10\text{V}$)	Q_g	$V_{GS} = 0 \text{ to } 10\text{V}$ $V_{DS} = 30\text{V}, I_D = 10\text{A}$		7.5		nC
Total Gate Charge (@ $V_{GS} = 4.5\text{V}$)	Q_g			3.7		nC
Gate Source Charge	Q_{gs}			1.8		nC
Gate Drain Charge	Q_{gd}			1.5		nC
Turn-On DelayTime	$t_{D(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 30\text{V}$ $R_L = 3\Omega, R_{GEN} = 6\Omega$		4.4		ns
Turn-On Rise Time	t_r			23		ns
Turn-Off DelayTime	$t_{D(off)}$			11.5		ns
Turn-Off Fall Time	t_f			3.2		ns
Body Diode Reverse Recovery Time	t_{rr}		$I_F = 10\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		15.2	
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 10\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		5.4		nC

Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	75	87	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	5.8	6.7	$^\circ\text{C}/\text{W}$

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under $T_{J_Max} = 150^\circ\text{C}$.
3. E_{AS} of 26 mJ is based on starting $T_J = 25^\circ\text{C}$, $L = 3.0\text{mH}$, $I_{AS} = 4.2\text{A}$, $V_{GS} = 10\text{V}$, $V_{DD} = 30\text{V}$; 100% test at $L = 0.3\text{mH}$, $I_{AS} = 10\text{A}$.
4. The power dissipation P_D is based on $T_{J_Max} = 150^\circ\text{C}$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

Figure 1: Saturation Characteristics

Figure 2: Transfer Characteristics

Figure 3: $R_{DS(ON)}$ vs. Drain Current

Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

Figure 5: $V_{GS(th)}$ vs. Junction Temperature

Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

Typical Electrical & Thermal Characteristics

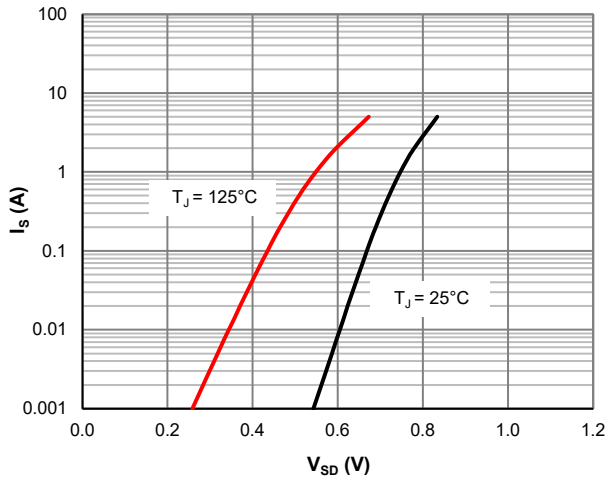


Figure 7: Body-Diode Characteristics

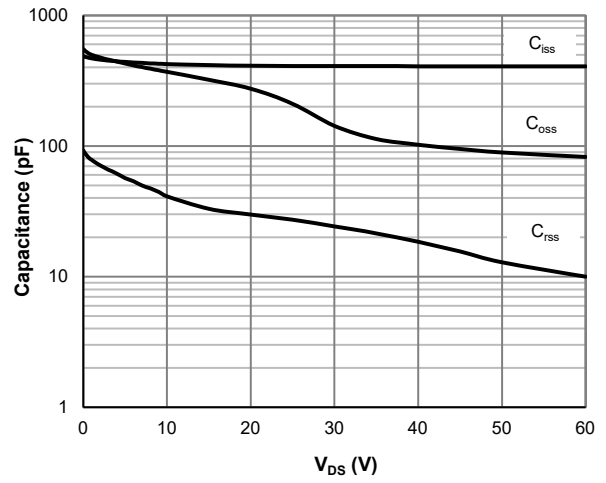


Figure 8: Capacitance Characteristics

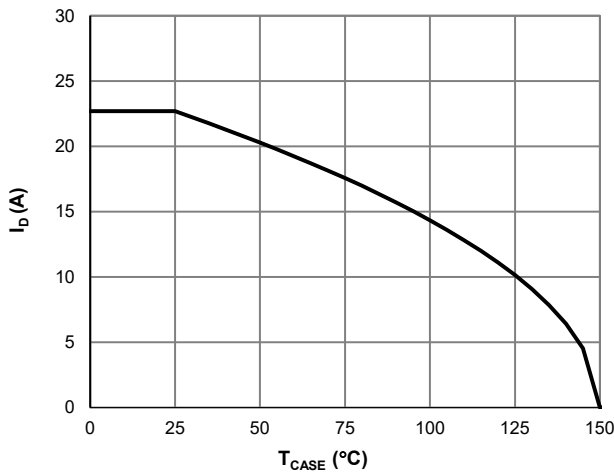


Figure 9: Current De-rating

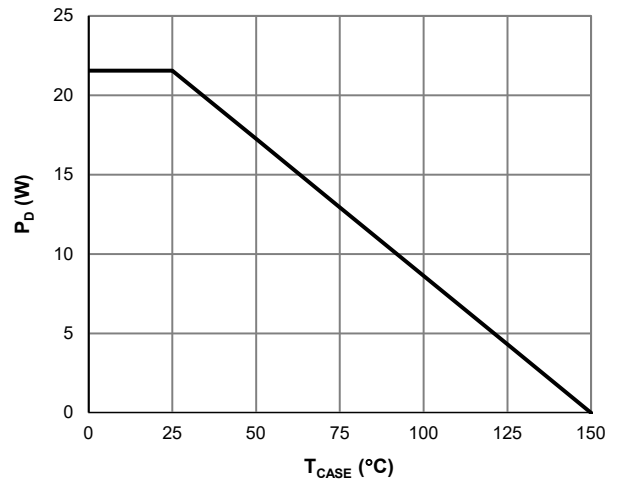


Figure 10: Power De-rating

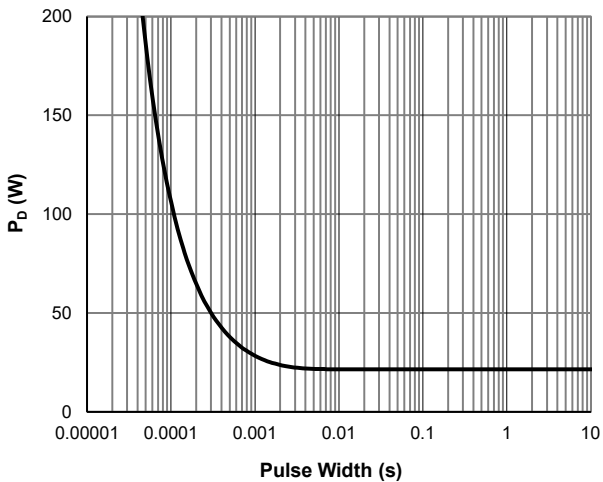


Figure 11: Single Pulse Power Rating, Junction-to-Case

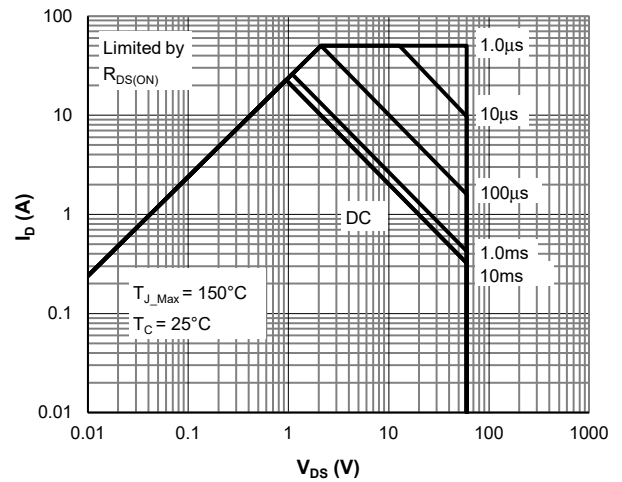


Figure 12: Maximum Safe Operating Area



Typical Electrical & Thermal Characteristics

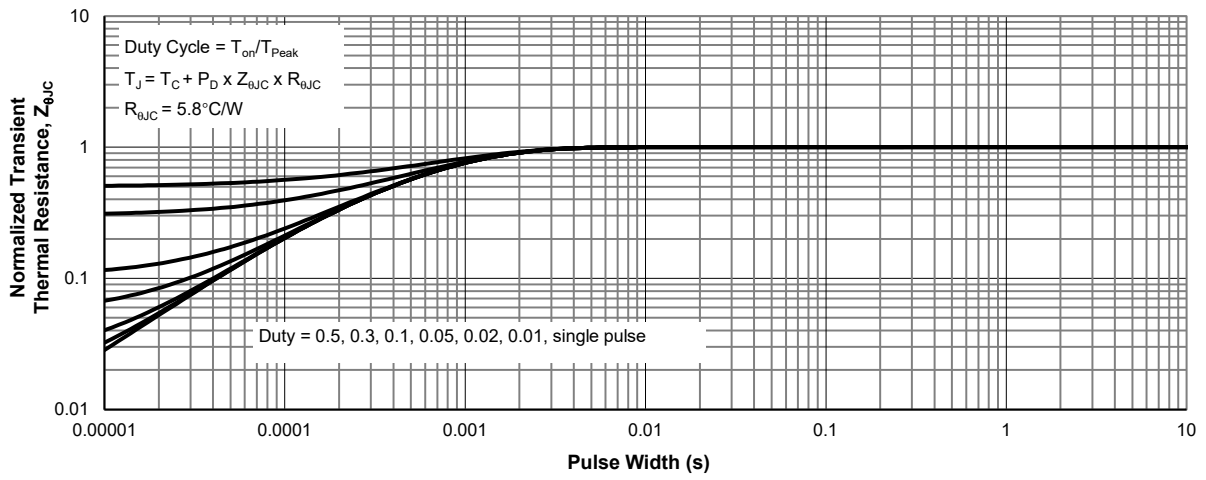
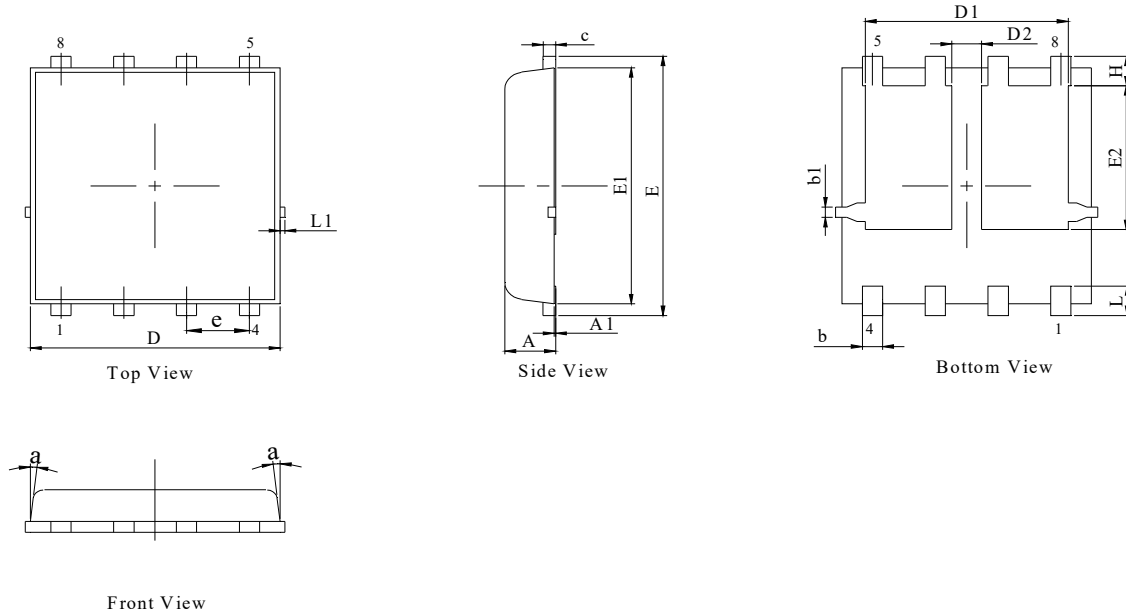
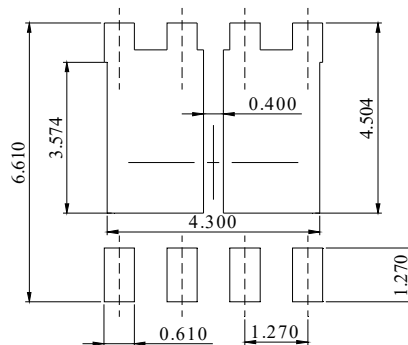


Figure 13: Normalized Maximum Transient Thermal Impedance

PDFN5x6-8L-D Package Information
Package Outline

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. ALL DIMNESIONS IN MILLIMETER (ANNGL E IN DEGREE).
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0.00	-	0.10
b	0.31	0.41	0.51
b1	0.15	0.25	0.35
c	0.23	-	0.33
D	4.95	5.05	5.15
D1	4.00	4.10	4.20
D2	0.50	0.60	0.70
E	6.05	6.15	6.25
E1	5.50	5.60	5.70
E2	3.31	3.41	3.51
e	1.27BSC		
H	0.60	0.70	0.80
L	0.50	0.70	0.80
L1	-	-	0.125
a	-	-	12°

Recommended Soldering Footprint


DIMENSIONS: MILLIMETERS