



# 150V 27mΩ N-Ch Power MOSFET

## Features

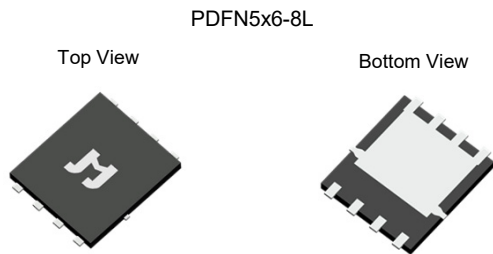
- Low ON-resistance,  $R_{DS(ON)}$
- Low Gate Charge,  $Q_g$
- 100% UIS and  $R_g$  Tested
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

## Product Summary

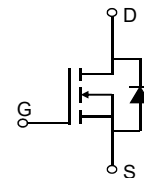
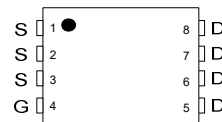
Parameter	Value	Unit
$V_{DS}$	150	V
$V_{GS(th\_Typ)}$	3.3	V
$I_D$ (@ $V_{GS} = 10V$ ) <sup>(1)</sup>	28	A
$R_{DS(ON\_Typ)}$ (@ $V_{GS} = 10V$ )	27	mΩ

## Applications

- Power Management in Telecom., Industrial Automation, CE
- Current Switching in DC/DC & AC/DC (SR) Sub-systems
- Motor Driving in Power Tool, E-vehicle, Robotics



Pin Configuration  
Top View

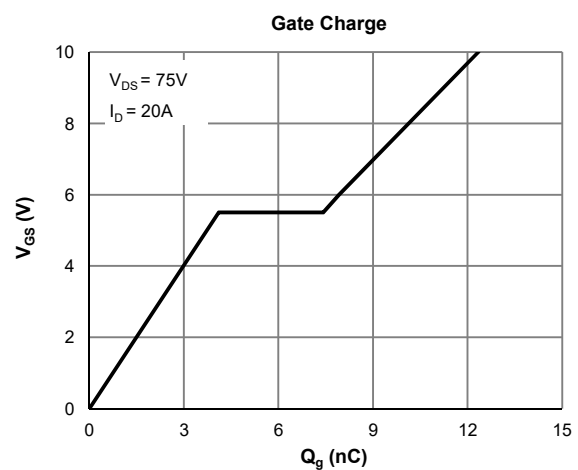
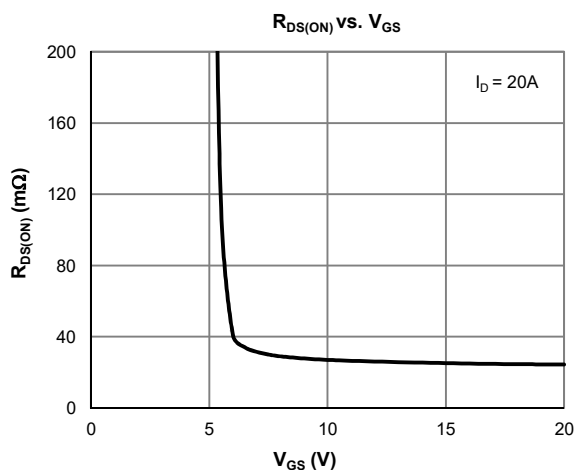


## Ordering Information

Device	Package	# of Pins	Marking	MSL	$T_J$ (°C)	Media	Quantity (pcs)
JMSH1535AG	PDFN5x6-8L	8	SH1535A	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	$V_{DS}$	150	V
Gate-to-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current <sup>(1)</sup>	$I_D$	$T_C = 25^\circ C$	28
		$T_C = 100^\circ C$	18
Pulsed Drain Current <sup>(2)</sup>	$I_{DM}$	132	A
Avalanche Current <sup>(3)</sup>	$I_{AS}$	31	A
Avalanche Energy <sup>(3)</sup>	$E_{AS}$	48	mJ
Power Dissipation <sup>(4)</sup>	$P_D$	$T_C = 25^\circ C$	63
		$T_C = 100^\circ C$	25
Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C



**Electrical Characteristics** (@ T<sub>J</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>STATIC PARAMETERS</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	150			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 120V, V <sub>GS</sub> = 0V			1.0	μA
					5.0	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2.5	3.3	4.5	V
Static Drain-Source ON-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A		27	35	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 20A		54		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 1A, V <sub>GS</sub> = 0V		0.68	1.0	V
Diode Continuous Current	I <sub>S</sub>	T <sub>C</sub> = 25°C			63	A

**DYNAMIC PARAMETERS** <sup>(5)</sup>

Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 75V, f = 1MHz		760		pF
Output Capacitance	C <sub>oss</sub>			113		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			23		pF
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz		0.36		Ω

**SWITCHING PARAMETERS** <sup>(5)</sup>

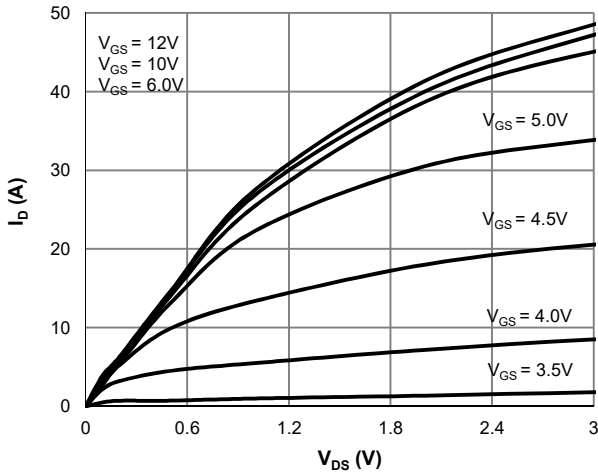
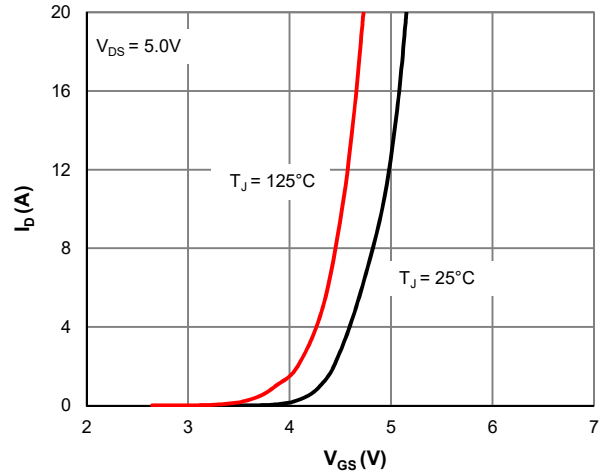
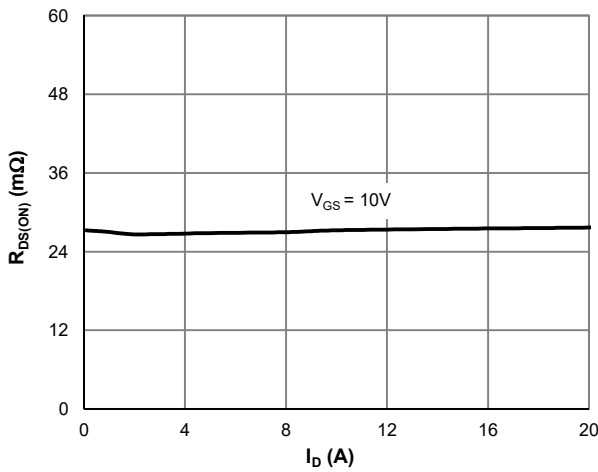
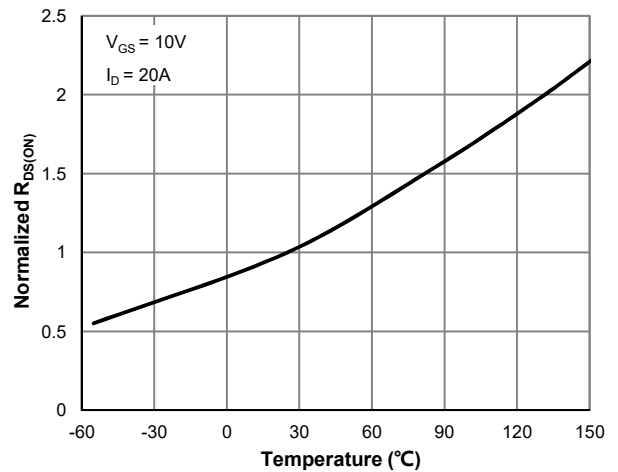
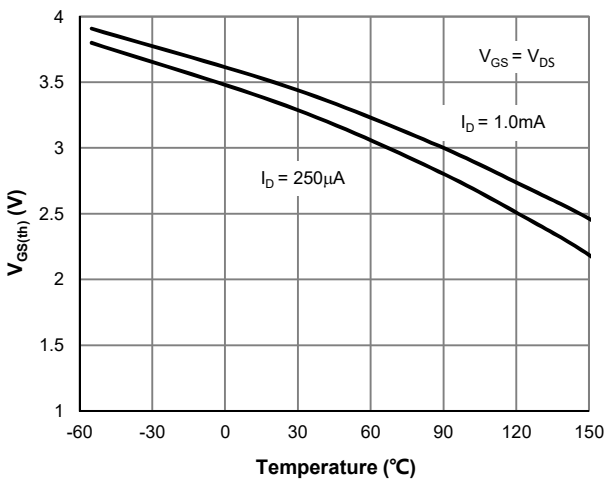
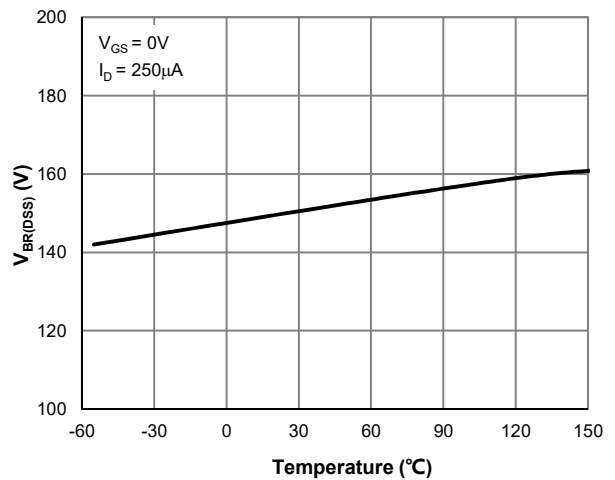
Total Gate Charge (@ V <sub>GS</sub> = 10V)	Q <sub>g</sub>	V <sub>GS</sub> = 0 to 10V V <sub>DS</sub> = 75V, I <sub>D</sub> = 20A		12.3		nC
Total Gate Charge (@ V <sub>GS</sub> = 6.0V)	Q <sub>g</sub>			7.9		nC
Gate Source Charge	Q <sub>gs</sub>			4.4		nC
Gate Drain Charge	Q <sub>gd</sub>			3.6		nC
Turn-On DelayTime	t <sub>D(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 75V R <sub>L</sub> = 3.8Ω, R <sub>GEN</sub> = 6Ω		10.7		ns
Turn-On Rise Time	t <sub>r</sub>			65		ns
Turn-Off DelayTime	t <sub>D(off)</sub>			15.9		ns
Turn-Off Fall Time	t <sub>f</sub>			52		ns
Body Diode Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = 20A, dI <sub>F</sub> /dt = 100A/μS		73	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> = 20A, dI <sub>F</sub> /dt = 100A/μS		116		nC

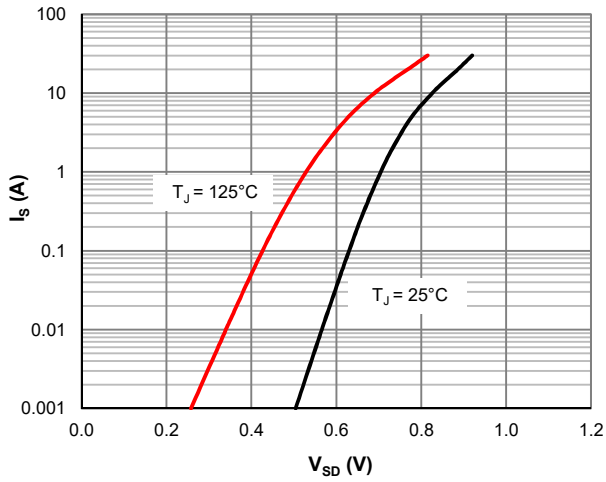
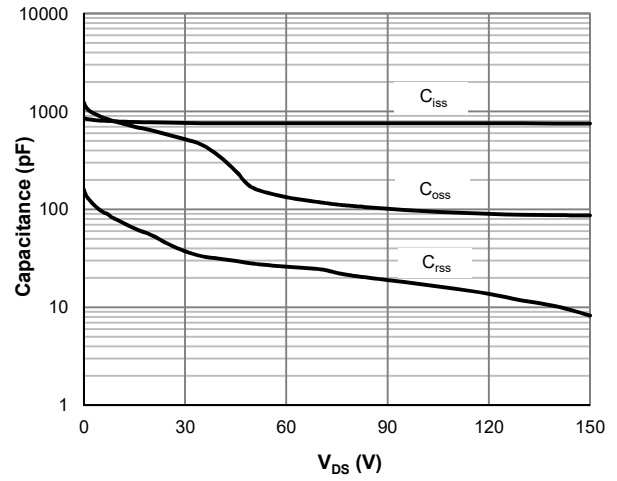
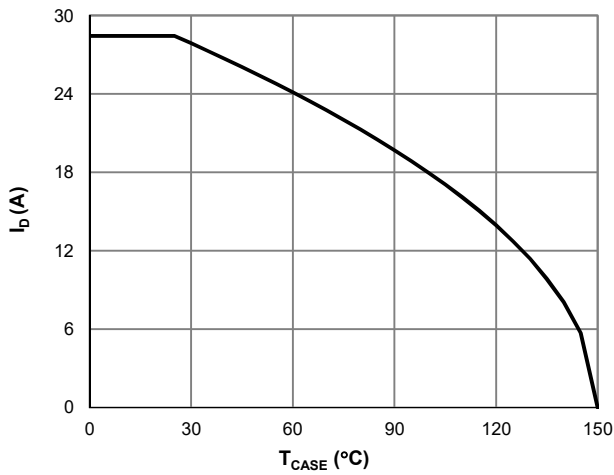
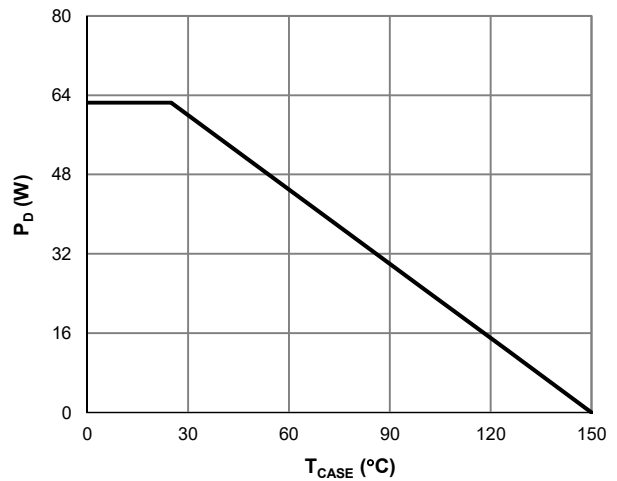
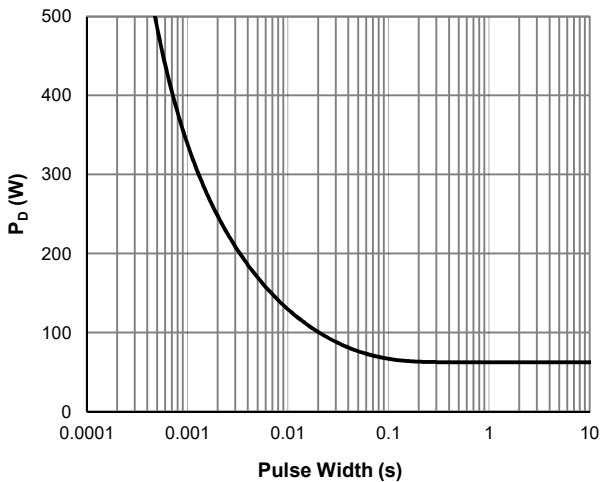
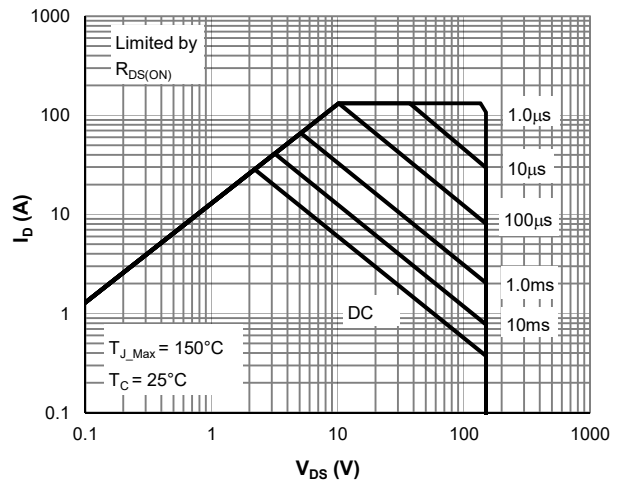
**Thermal Performance**

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	55	66	°C/W
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	2.0	2.4	°C/W

**Notes:**

1. Computed continuous current assumes the condition of T<sub>J,Max</sub> while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T<sub>J,Max</sub> = 150°C.
3. This single-pulse measurement was taken under the following condition [L = 100μH, V<sub>GS</sub> = 10V, V<sub>DS</sub> = 75V] while its value is limited by T<sub>J,Max</sub> = 150°C.
4. The power dissipation P<sub>D</sub> is based on T<sub>J,Max</sub> = 150°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

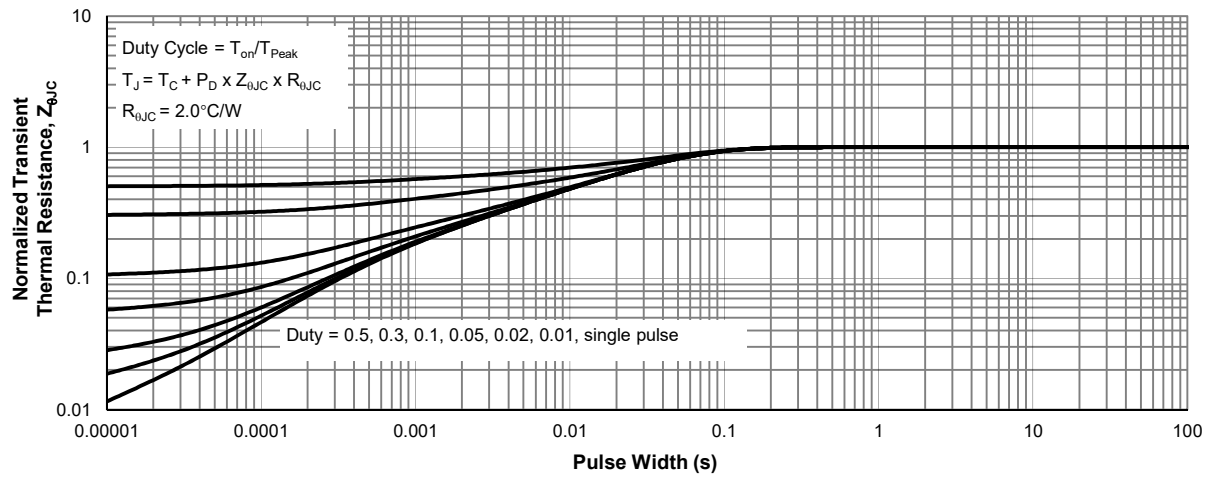
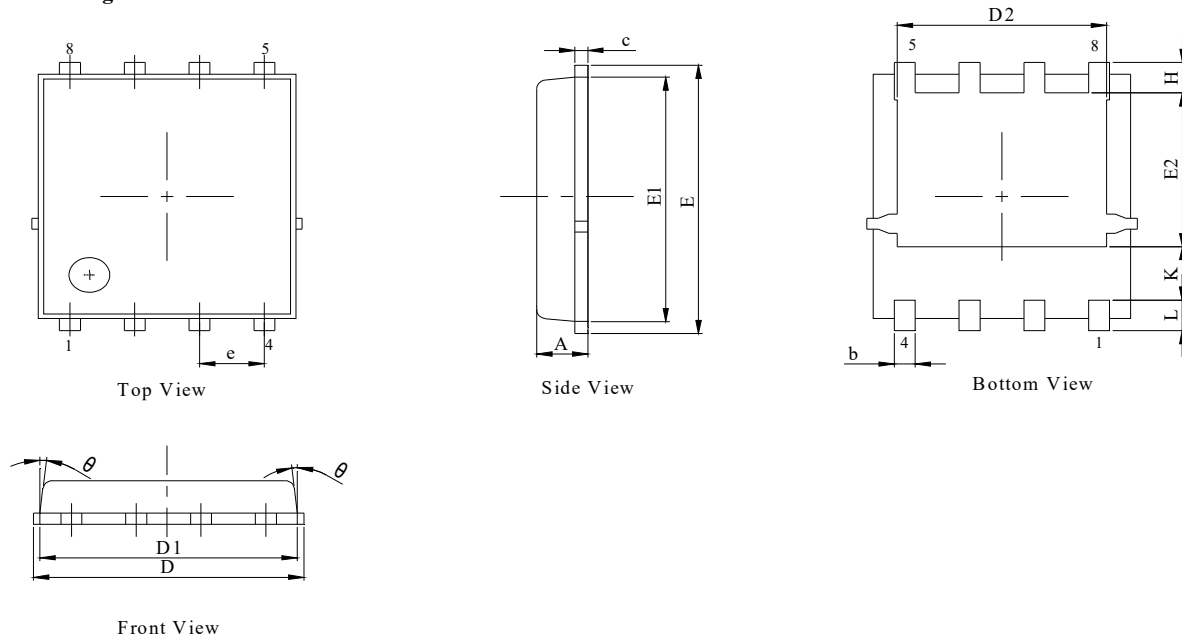
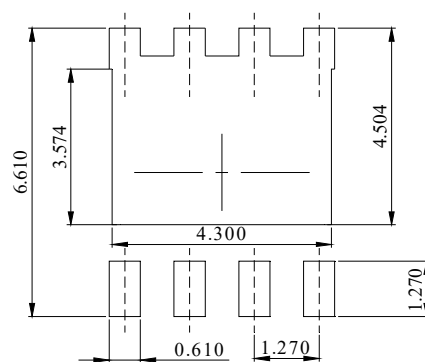


Figure 13: Normalized Maximum Transient Thermal Impedance

**PDFN5x6-8L Package Information**
**Package Outline**

**NOTES:**

1. Dimension and tolerance per ASME Y14.5M, 1994.
2. All dimensions in millimeter (angle 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
b	0.31	0.41	0.51
c	0.20	0.25	0.30
D	5.00	5.20	5.40
D1	4.95	5.05	5.15
D2	4.00	4.10	4.20
E	6.05	6.15	6.25
E1	5.50	5.60	5.70
E2	3.42	3.53	3.63
e	1.27BSC		
H	0.60	0.70	0.80
L	0.50	0.70	0.80
K	1.23 REF		
$\theta$	-	-	10°

**Recommended Soldering Footprint**


DIMENSIONS: MILLIMETERS