



100V 7.6mΩ N-Ch Power MOSFET

Features

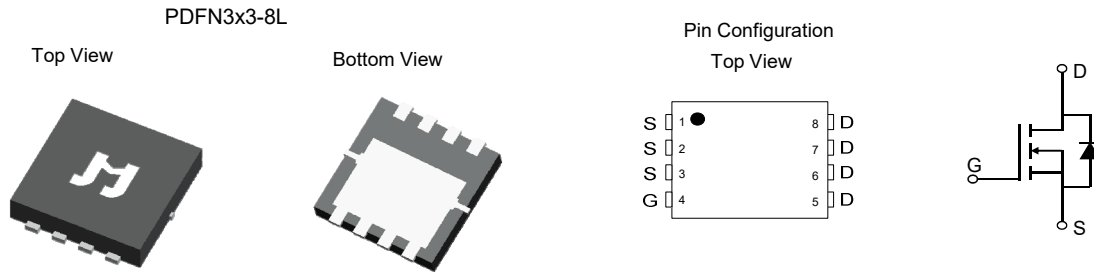
- Ultra-low ON-resistance, $R_{DS(ON)}$
- Low Gate Charge, Q_g
- 100% UIS and R_g Tested
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

Product Summary

Parameter	Value	Unit
V_{DS}	100	V
$V_{GS(th_Typ)}$	1.7	V
I_D (@ $V_{GS} = 10V$) ⁽¹⁾	67	A
$R_{DS(ON_Typ)}$ (@ $V_{GS} = 10V$)	7.6	mΩ
$R_{DS(ON_Typ)}$ (@ $V_{GS} = 4.5V$)	9.7	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

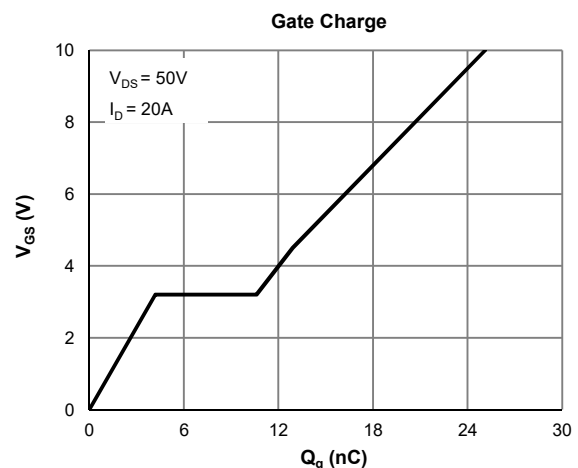
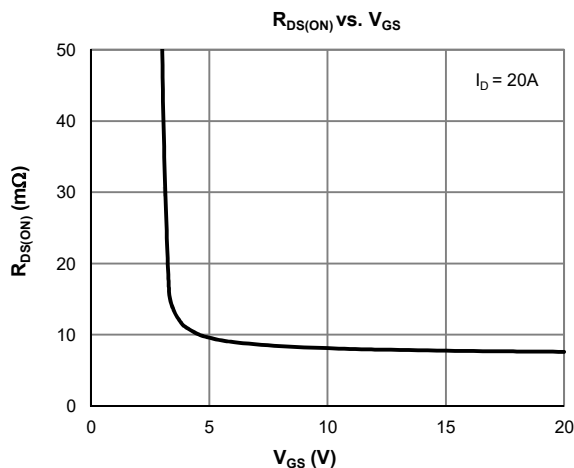


Ordering Information

Device	Package	# of Pins	Marking	MSL	T _J (°C)	Media	Quantity (pcs)
JMSL1009AU-13	PDFN3x3-8L	8	SL1009A	1	-55 to 150	13-inch Reel	3000

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	100	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current ⁽¹⁾	I_D	T _C = 25°C	67
		T _C = 100°C	43
Pulsed Drain Current ⁽²⁾	I_{DM}	244	A
Avalanche Current ⁽³⁾	I_{AS}	24	A
Avalanche Energy ⁽³⁾	E_{AS}	86	mJ
Power Dissipation ⁽⁴⁾	P_D	T _C = 25°C	74
		T _C = 100°C	29.4
Junction & Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C





Electrical Characteristics (@ T_J = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	I _D = 250μA, V _{GS} = 0V	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 80V, V _{GS} = 0V T _J = 55°C			1.0 5.0	μA
Gate-Body Leakage Current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.2	1.7	2.5	V
Static Drain-Source ON-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 20A		7.6	8.8	mΩ
	R _{DS(ON)}	V _{GS} = 4.5V, I _D = 15A		9.7	11.8	mΩ
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 10A		127		S
Diode Forward Voltage	V _{SD}	I _S = 1A, V _{GS} = 0V		0.68	1.0	V
Diode Continuous Current	I _S	T _C = 25°C			74	A

DYNAMIC PARAMETERS ⁽⁵⁾

Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 50V, f = 1MHz		1314		pF
Output Capacitance	C _{oss}			548		pF
Reverse Transfer Capacitance	C _{rss}			26		pF
Gate Resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz		1.6		Ω

SWITCHING PARAMETERS ⁽⁵⁾

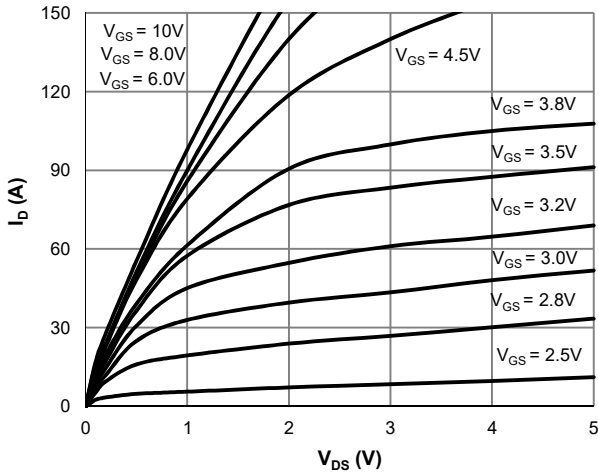
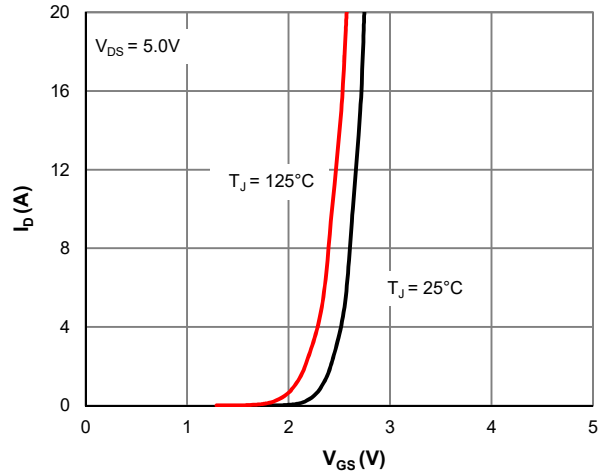
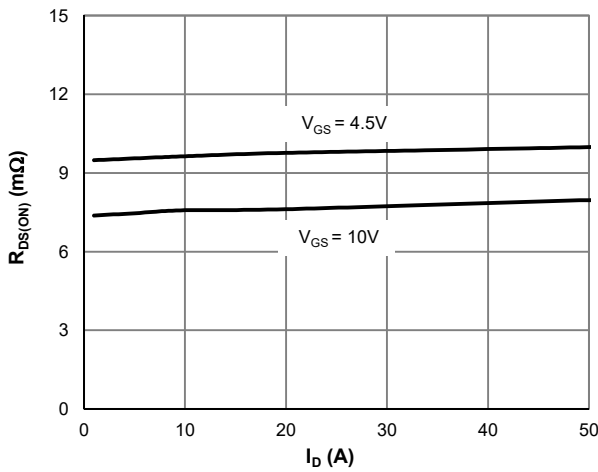
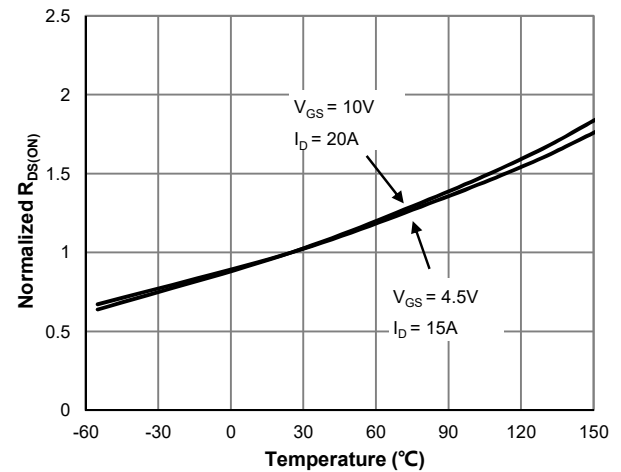
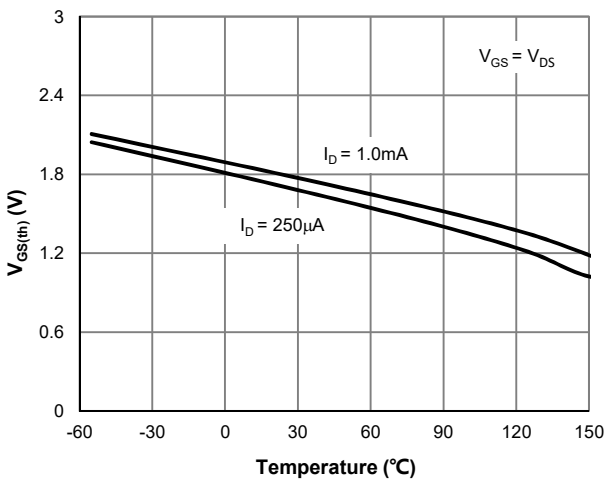
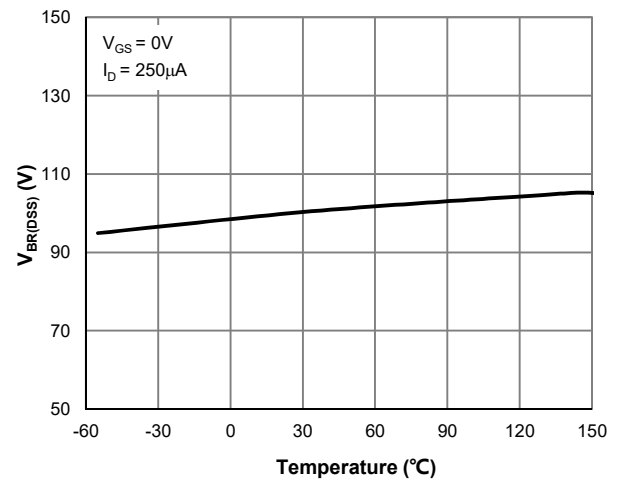
Total Gate Charge (@ V _{GS} = 10V)	Q _g	V _{GS} = 0 to 10V V _{DS} = 50V, I _D = 20A		25		nC
Total Gate Charge (@ V _{GS} = 4.5V)	Q _g			12.9		nC
Gate Source Charge	Q _{gs}			4.2		nC
Gate Drain Charge	Q _{gd}			6.3		nC
Turn-On DelayTime	t _{D(on)}	V _{GS} = 10V, V _{DS} = 50V R _L = 2.5Ω, R _{GEN} = 6Ω		10.6		ns
Turn-On Rise Time	t _r			53		ns
Turn-Off DelayTime	t _{D(off)}			34		ns
Turn-Off Fall Time	t _f			108		ns
Body Diode Reverse Recovery Time	t _{rr}		I _F = 20A, dI _F /dt = 100A/μS		55	
Body Diode Reverse Recovery Charge	Q _{rr}	I _F = 20A, dI _F /dt = 100A/μS		39		nC

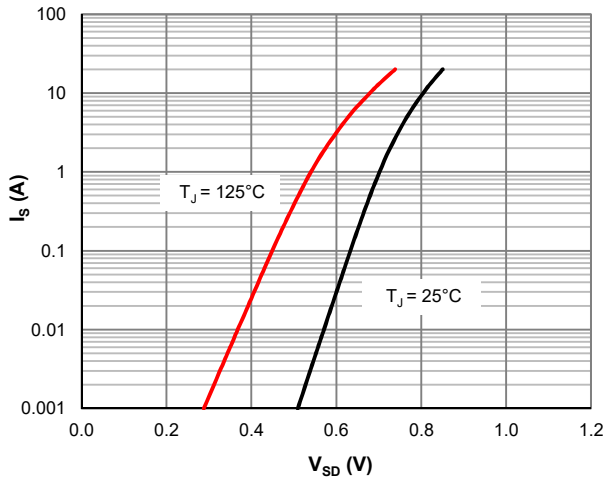
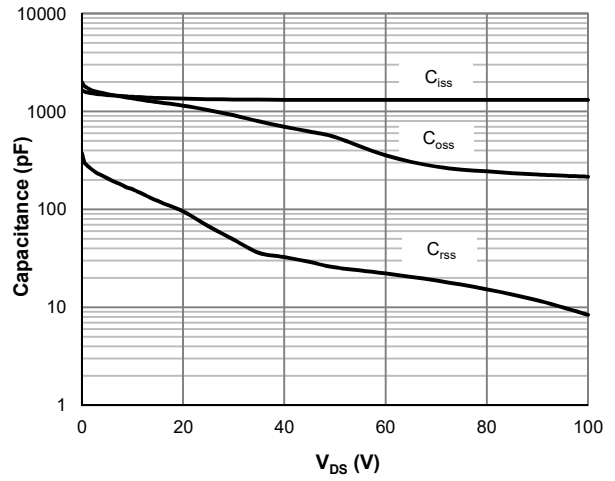
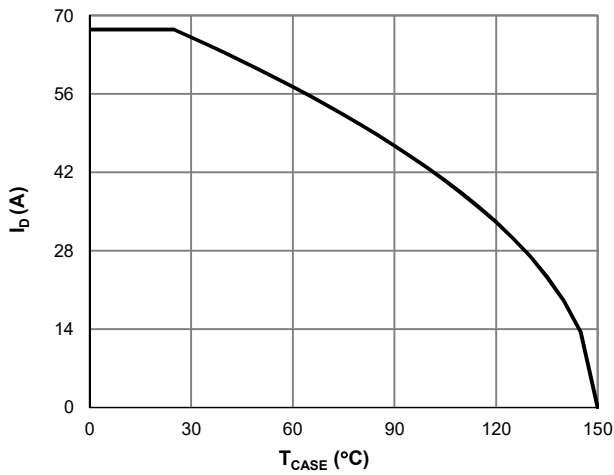
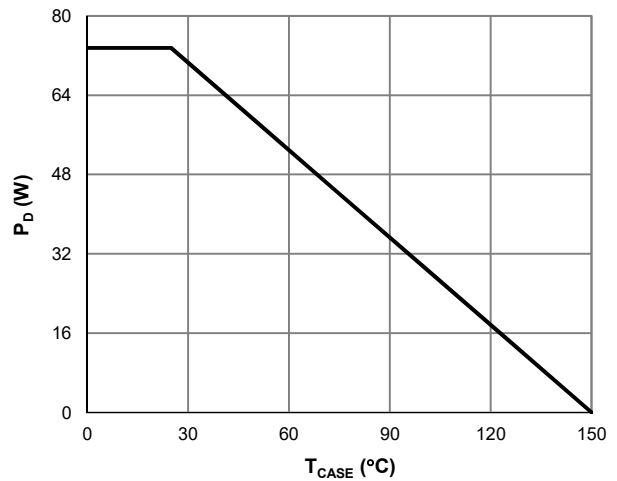
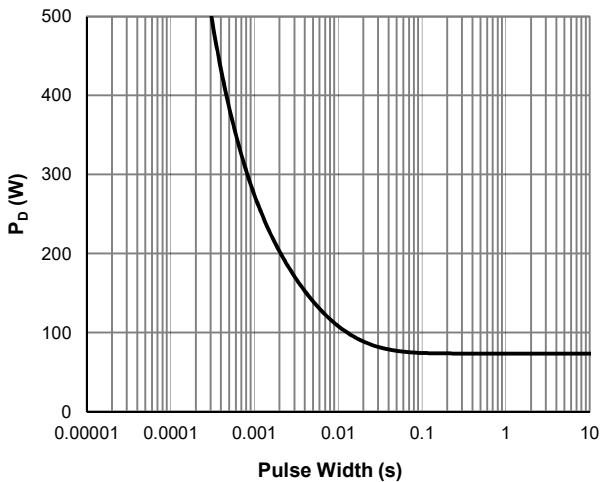
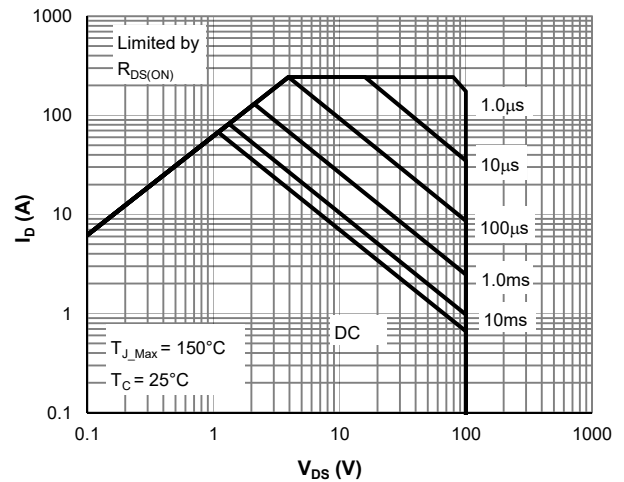
Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	R _{θJA}	54	65	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	1.7	2.0	°C/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°C.
3. This single-pulse measurement was taken under the following condition [L = 300μH, V_{GS} = 10V, V_{DS} = 50V] while its value is limited by T_{J,Max} = 150°C.
4. The power dissipation P_D is based on T_{J,Max} = 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

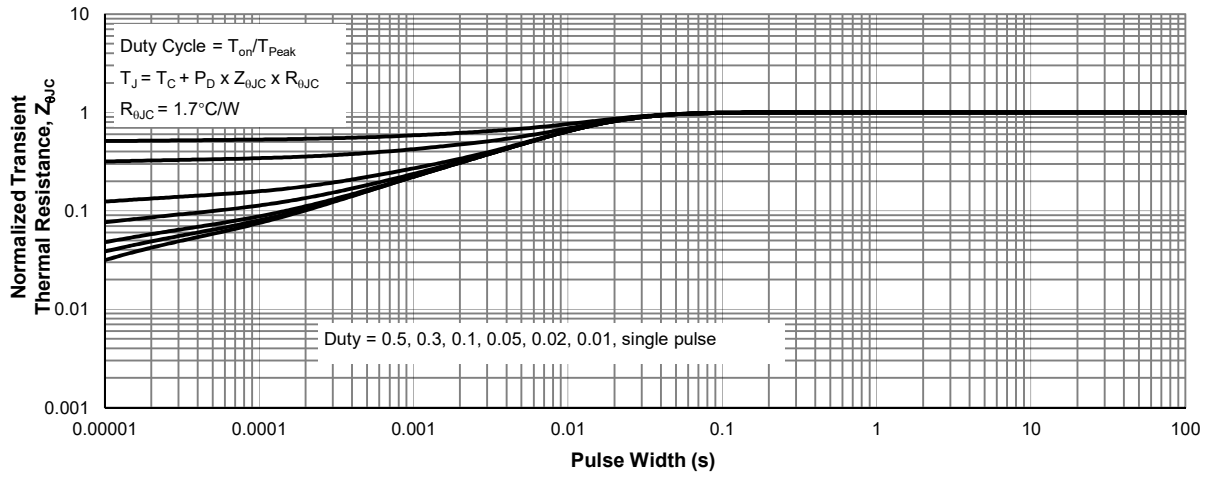
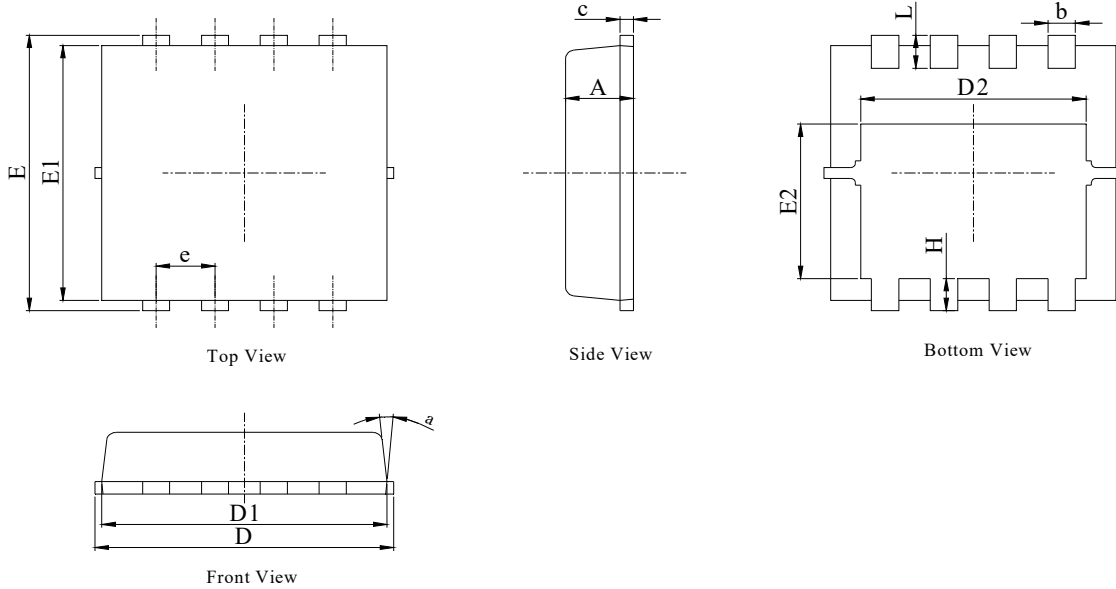
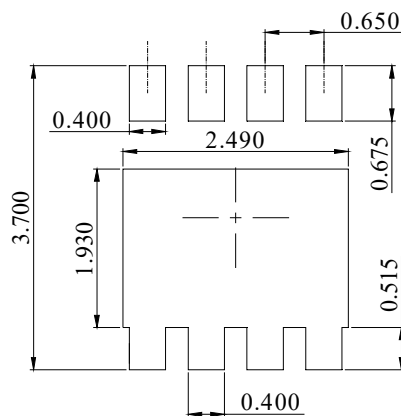


Figure 13: Normalized Maximum Transient Thermal Impedance

PDFN3x3-8L Package Information
Package Outline

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. ALL DIMNESIONS 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	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.20	0.25
D	3.00	3.15	3.25
D1	2.95	3.05	3.15
D2	2.39	2.49	2.59
E	3.20	3.30	3.40
E1	2.95	3.05	3.15
E2	1.70	1.80	1.90
e	0.65 BSC		
H	0.30	0.40	0.50
L	0.25	0.40	0.50
a	---	---	15°

Recommended Soldering Footprint


DIMENSIONS: MILLIMETERS