

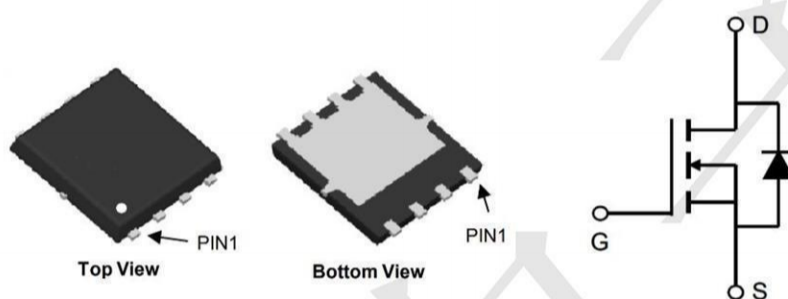
Features

- Advanced trench cell design
- Low Thermal Resistance
- Low Gate Charge

Application

- Motor/Body Load Control
- Load Switch
- PWM Application
- DC-DC converters and Off-line UPS

PDFN5X6-8L Pin Configuration



Absolute Maximum Ratings (at $T_a = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C = 25^\circ\text{C}$	85
		$T_C = 100^\circ\text{C}$	56
Peak Drain Current, Pulsed ¹⁾	I_{DM}	200	A
Avalanche Current	I_{AS}	53	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	140	mJ
Power Dissipation	P_{tot}	83	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Case ³⁾	$R_{\theta JC}$	1.5	$^\circ\text{C}/\text{W}$
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	55	$^\circ\text{C}/\text{W}$

Characteristics at Ta = 25°C unless otherwise specified

Parameter	Symbol	Min.	Type.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $I_D = 250\mu A$	BV_{DSS}	85			V
Drain-Source Leakage Current at $V_{DS} = 80 V$	I_{DSS}			1	μA
Gate Leakage Current at $V_{GS} = \pm 20 V$	I_{GSS}			± 100	nA
Gate-Source Threshold Voltage at $V_{DS} = V_{GS}, I_D = 250 \mu A$	$V_{GS(th)}$	2	3	4	V
Drain-Source On-State Resistance at $V_{GS} = 10 V, I_D = 30 A$	$R_{DS(on)}$		4.5	5	m Ω
DYNAMIC PARAMETERS					
Gate resistance at $V_{DS} = 0 V, f = 1 MHz$	R_g		1.35	2.1	Ω
Forward Transconductance at $V_{DS} = 5 V, I_D = 20 A$	g_{fs}		70		S
Input Capacitance at $V_{GS} = 0 V, V_{DS} = 40 V, f = 1 MHz$	C_{iss}		4194		pF
Output Capacitance at $V_{GS} = 0 V, V_{DS} = 40 V, f = 1 MHz$	C_{oss}		665		pF
Reverse Transfer Capacitance at $V_{GS} = 0 V, V_{DS} = 40 V, f = 1 MHz$	C_{rss}		31		pF
Gate charge total at $V_{DS} = 40 V, I_D = 20 A, V_{GS} = 10 V$	Q_g		36.5	51	nC
Gate to Source Charge at $V_{DS} = 40 V, I_D = 20 A, V_{GS} = 10 V$	Q_{gs}		11		nC
Gate to Drain Charge at $V_{DS} = 40 V, I_D = 20 A, V_{GS} = 10 V$	Q_{gd}		6		nC
Turn-On Delay Time at $V_{GS} = 10 V, V_{DS} = 40 V, R_L = 2 \Omega, R_g = 3 \Omega$	$t_{d(on)}$		11		nS
Turn-On Rise Time at $V_{GS} = 10 V, V_{DS} = 40 V, R_L = 2 \Omega, R_g = 3 \Omega$	t_r		5		nS
Turn-Off Delay Time at $V_{GS} = 10 V, V_{DS} = 40 V, R_L = 2 \Omega, R_g = 3 \Omega$	$t_{d(off)}$		25		nS
Turn-Off Fall Time at $V_{GS} = 10 V, V_{DS} = 40 V, R_L = 2 \Omega, R_g = 3 \Omega$	t_f		6		nS
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S = 1 A, V_{GS} = 0 V$	V_{SD}		0.71	1	V
Body Diode Reverse Recovery Time at $I_F = 20 A, di/dt = 500 A / \mu s$	t_{rr}		30		nS
Body Diode Reverse Recovery Charge at $I_F = 20 A, di/dt = 500 A / \mu s$	Q_{rr}		126		nC

Typical Characteristics

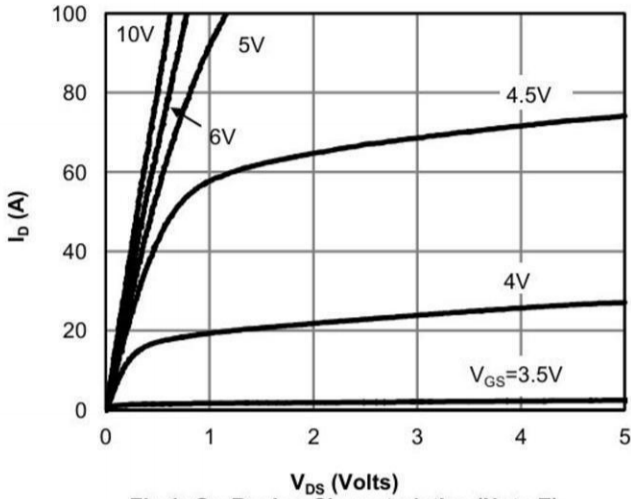


Fig 1: On-Region Characteristics (Note E)

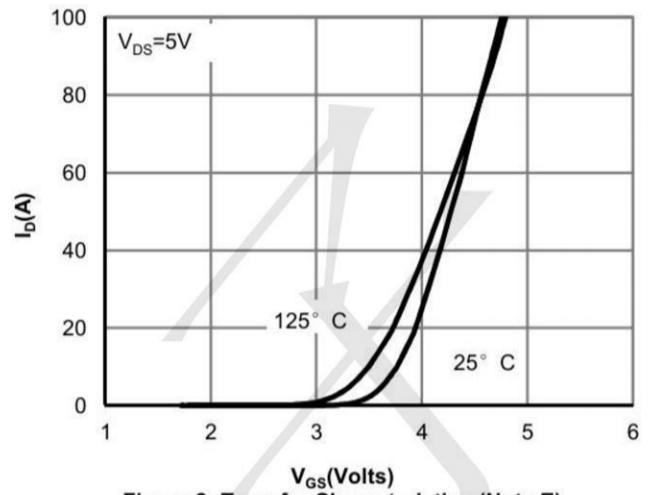


Figure 2: Transfer Characteristics (Note E)

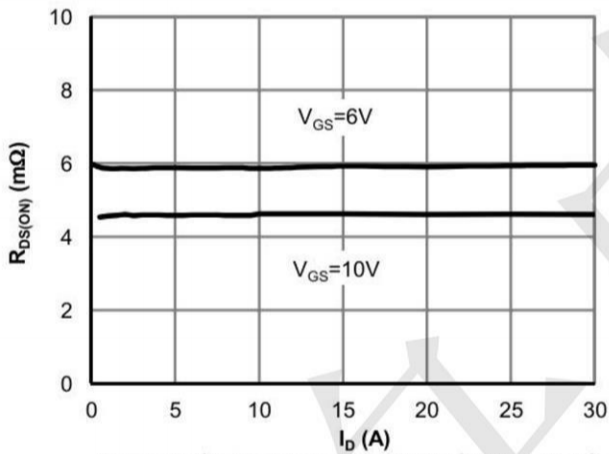


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

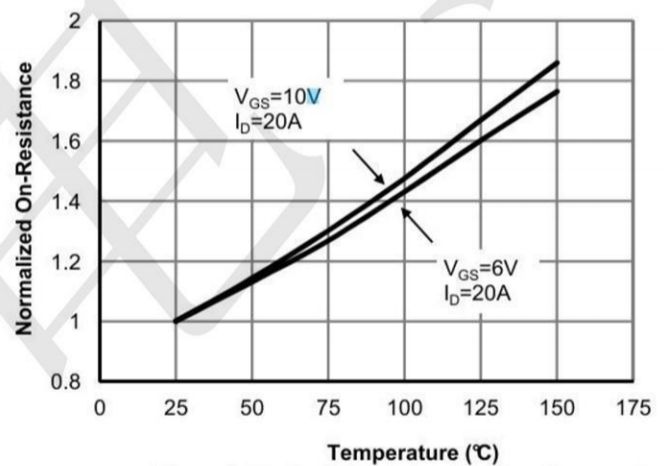


Figure 4: On-Resistance vs. Junction Temperature (Note E)

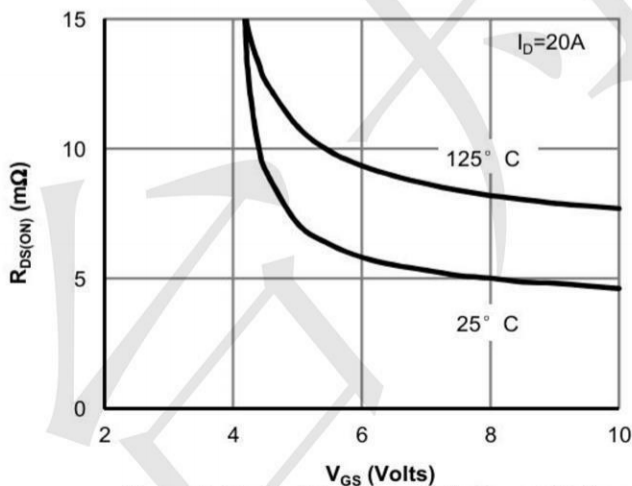


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

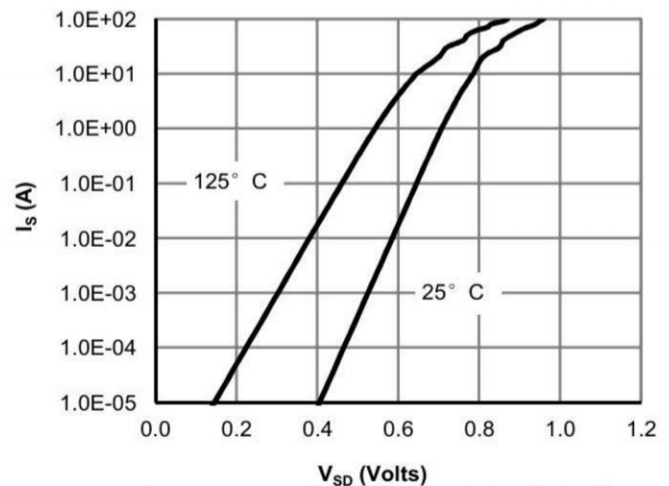


Figure 6: Body-Diode Characteristics (Note E)

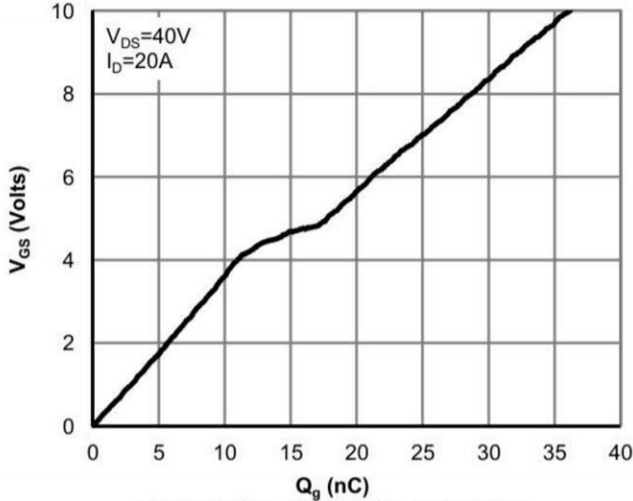


Figure 7: Gate-Charge Characteristics

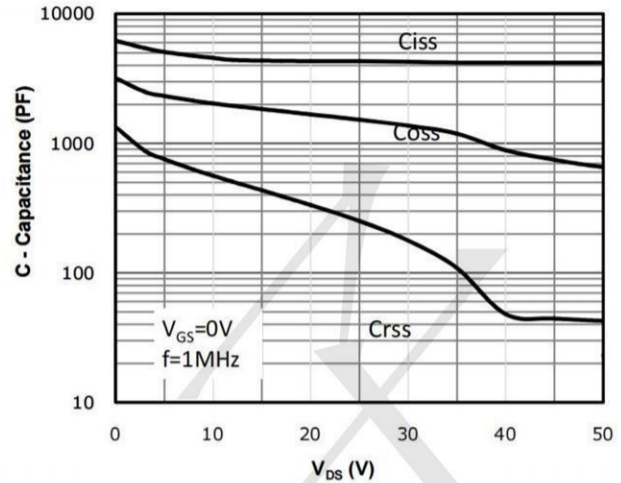


Figure 8: Capacitance Characteristics

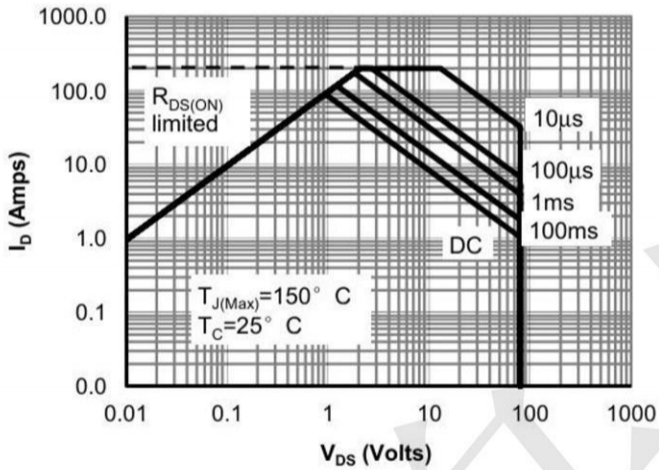


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

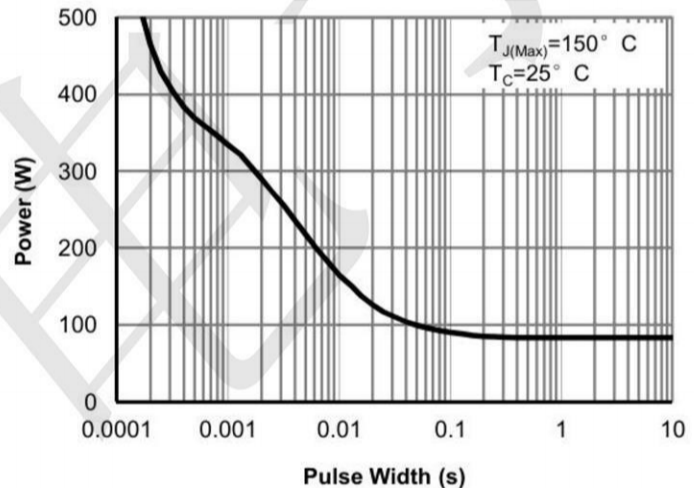


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

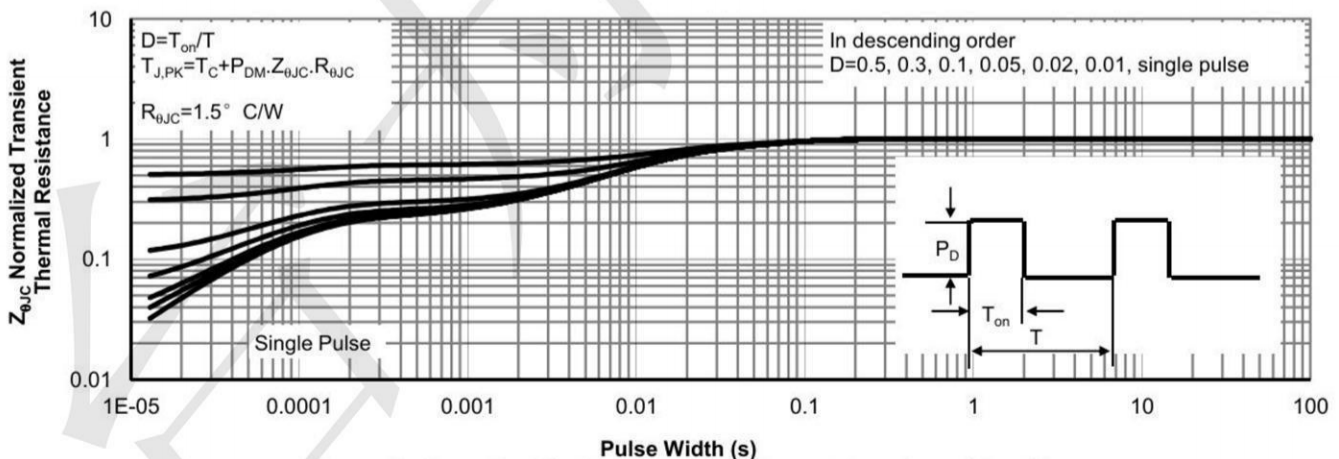


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

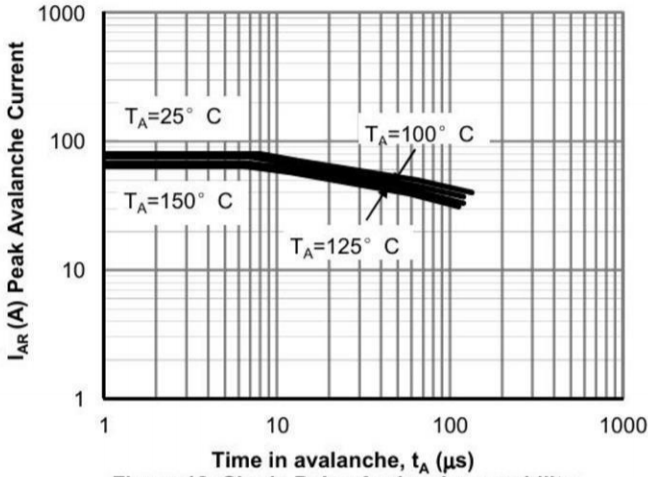


Figure 12: Single Pulse Avalanche capability (Note C)

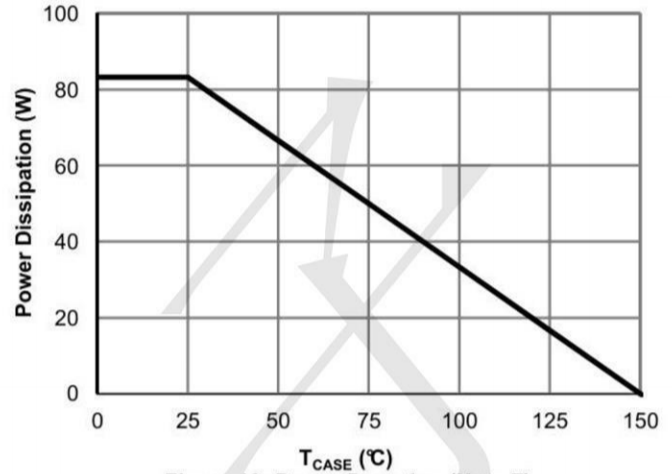


Figure 13: Power De-rating (Note F)

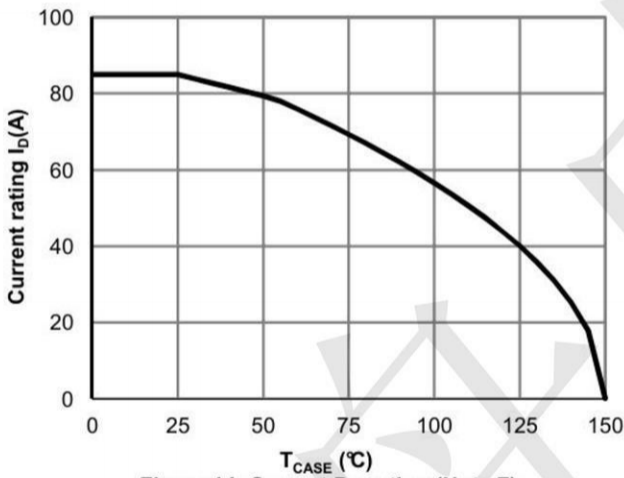


Figure 14: Current De-rating (Note F)

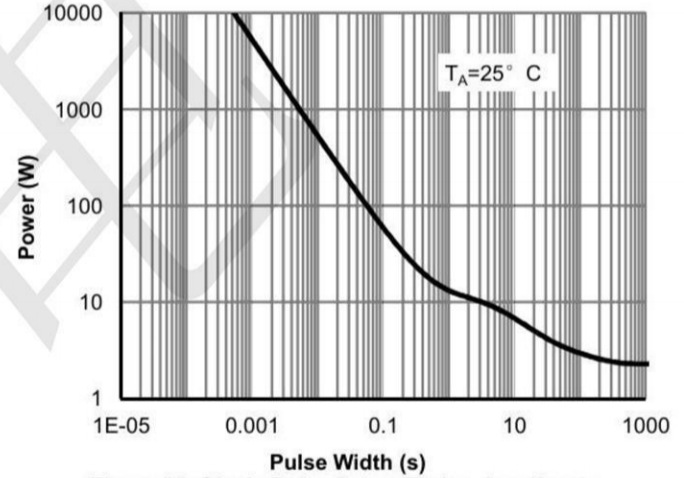


Figure 15: Single Pulse Power Rating Junction-to-Ambient (Note H)

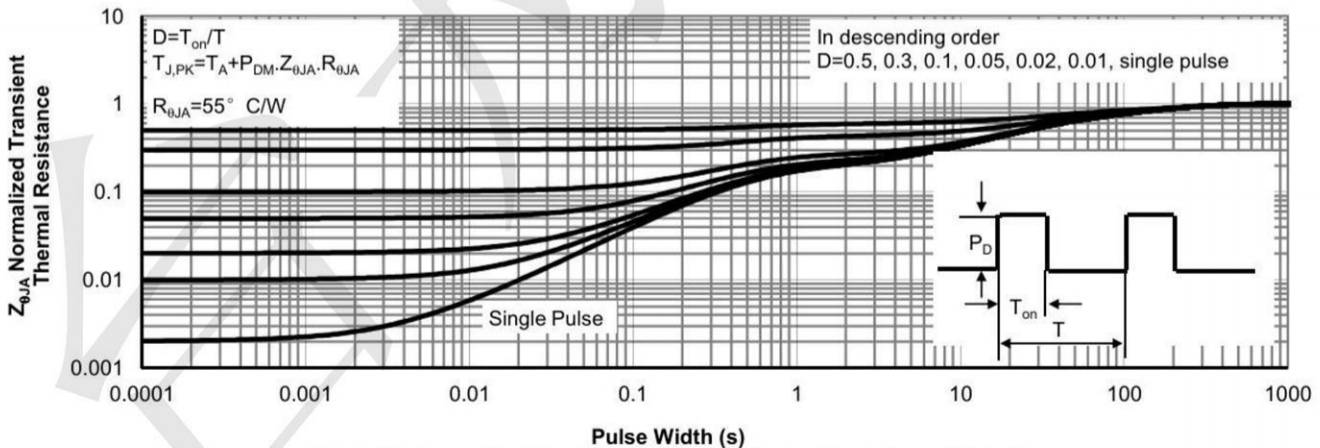
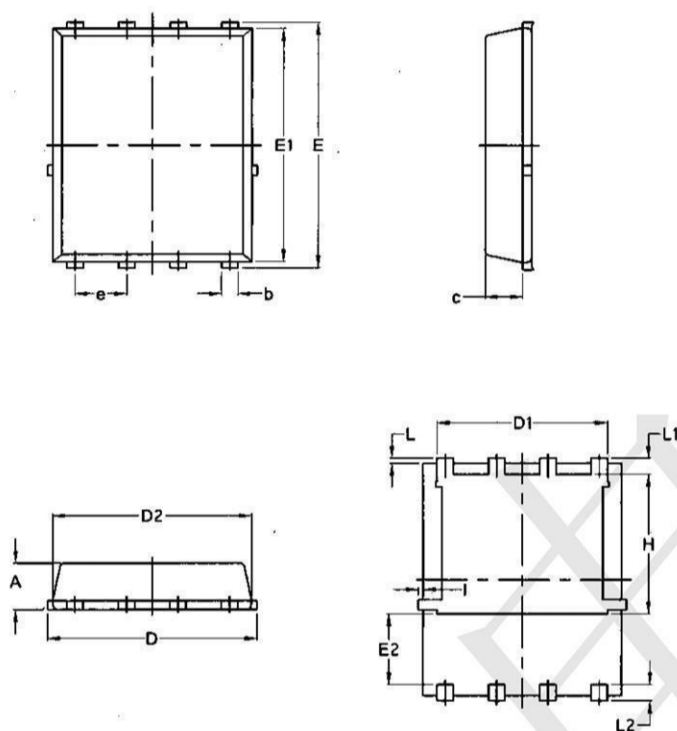


Figure 16: Normalized Maximum Transient Thermal Impedance (Note H)

Package Outline Dimensions PDFN5*6-8L



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070