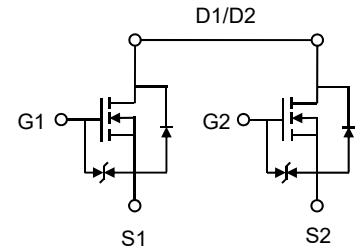


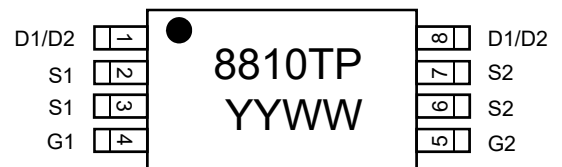
## Description

The PDNM8TP20V7E uses advanced trench technology to provide excellent  $R_{DS(on)}$ , low gate charge. This device is suitable for use as a load switch or in PWM applications.

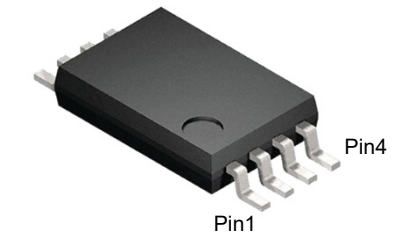
MOSFET Product Summary		
$V_{DS}(V)$	$R_{DS(on)}(m\Omega)$	$I_D(A)$
20	13 @ $V_{GS} = 10V$	7.0
	13.8 @ $V_{GS} = 4.5V$	
	14.2 @ $V_{GS} = 3.8V$	
	15.4 @ $V_{GS} = 2.5V$	



**Circuit Diagram**



**Marking (Top View)**



**TSSOP-8**

## Feature

- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

## Applications

- PWM application
- Load switch
- Power management
- DC-DC Converters
- Wireless Chargers

## Absolute maximum rating@25°C

Rating	Symbol	Value	Units
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Drain Current-Continuous <sup>1)</sup>	$I_D$	$T_C=25^\circ C$	7.0
		$T_C=100^\circ C$	4.2
Pulsed Drain Current <sup>2)</sup>	$I_{DM}$	30	A
Total Power Dissipation <sup>3)</sup>	$P_D$	1.1	W
Avalanche Current <sup>4)</sup>	$I_{AS}$	24	A
Avalanche Energy <sup>4)</sup>	$E_{AS}$	29	mJ
Thermal Resistance , Junction-case <sup>5)</sup>	$R_{\theta JC}$	20.7	$^\circ C/W$
Thermal Resistance Junction-to-Ambient <sup>5)</sup>	$R_{\theta JA}$	85	$^\circ C/W$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ C$

## Electrical characteristics per line@25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 20V, V_{GS} = 0V$	-	-	1.0	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 4.5V, V_{DS} = 0V$	-	-	$\pm 1.0$	$\mu A$
		$V_{GS} = \pm 4.5V, V_{DS} = 0V$	-	-	$\pm 10$	
<b>On Characteristics</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.45	-	0.9	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 3A$	-	13	17	m $\Omega$
		$V_{GS} = 4.5V, I_D = 3A$	-	13.8	19	
		$V_{GS} = 3.8V, I_D = 3A$	-	14.2	21	
		$V_{GS} = 2.5V, I_D = 3A$	-	15.4	23	
<b>Dynamic Characteristics<sup>6)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz$	-	872	-	pF
Output Capacitance	$C_{oss}$		-	104	-	
Reverse Transfer Capacitance	$C_{rss}$		-	68	-	
<b>Switching Characteristics<sup>6)</sup></b>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS} = 10V, V_{GS} = 5V, R_G = 3\Omega, R_L = 1.35\Omega$	-	1.0	-	ns
Turn-on Rise Time	$t_r$		-	2.1	-	
Turn-Off Delay Time	$t_{d(off)}$		-	8.2	-	
Turn-Off Fall Time	$t_f$		-	5.2	-	
Total Gate Charge	$Q_g$	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 7A$	-	7.9	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.6	-	
Gate-Drain Charge	$Q_{gd}$		-	1.4	-	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	-	4.3	-	$\Omega$
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0V, I_S = 1A$	-	-	1.2	V

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. Repetitive Rating: Pulse width limited by maximum junction temperature ( $T_{J,Max}=150^\circ C$ ).
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. This single-pulse measurement was taken under the following condition ( $L=100\mu H, V_{GS}=4.5V, V_{DS}=20V$ ) while its value is limited by  $T_{J,Max}=150^\circ C$ .
5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
6. Guaranteed by design, not subject to production.

Typical Characteristics

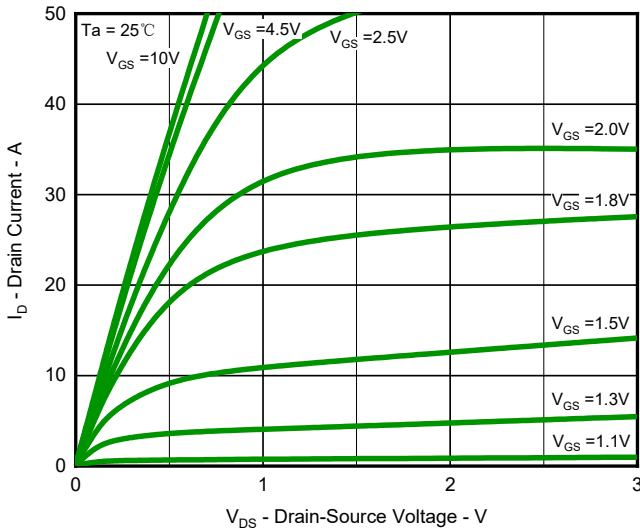


Fig.1 Output Characteristics

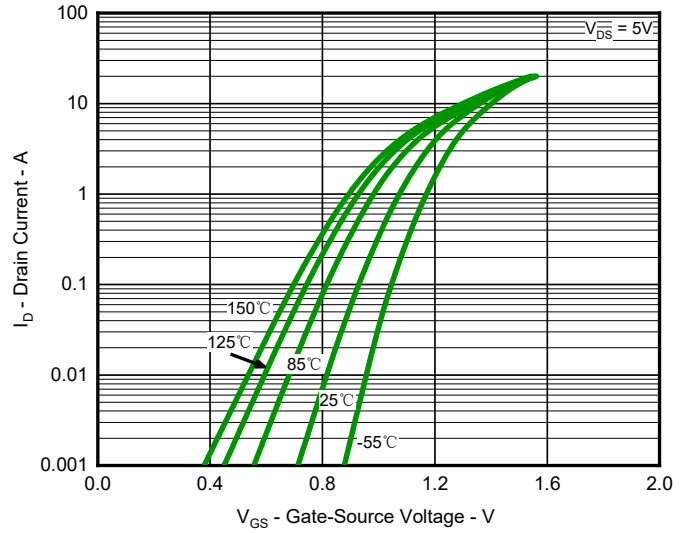


Fig.2 Typical Transfer Characteristic

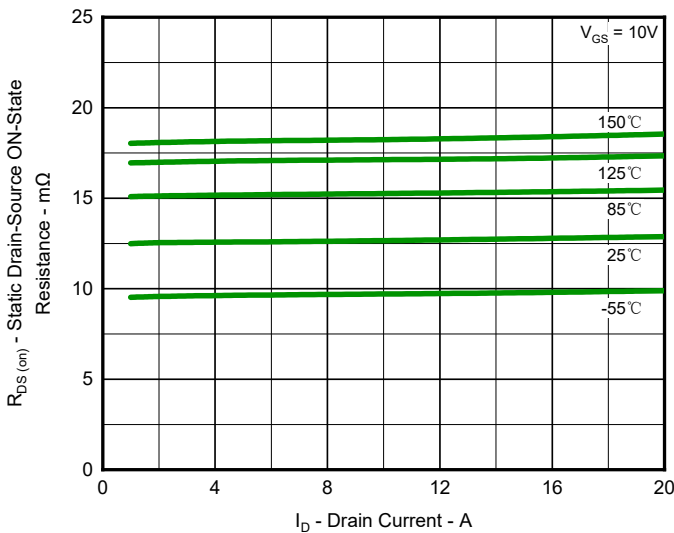


Fig.3 Typical On-Resistance vs Drain Current and Temperature

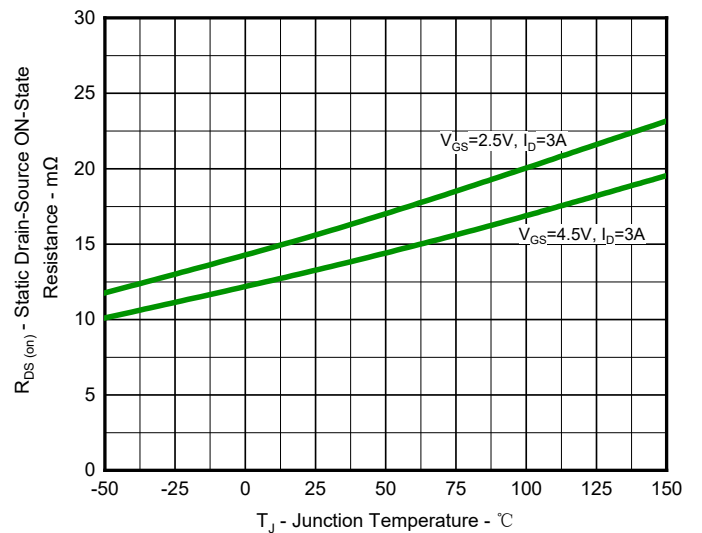


Fig.4 On-Resistance Variation with Temperature

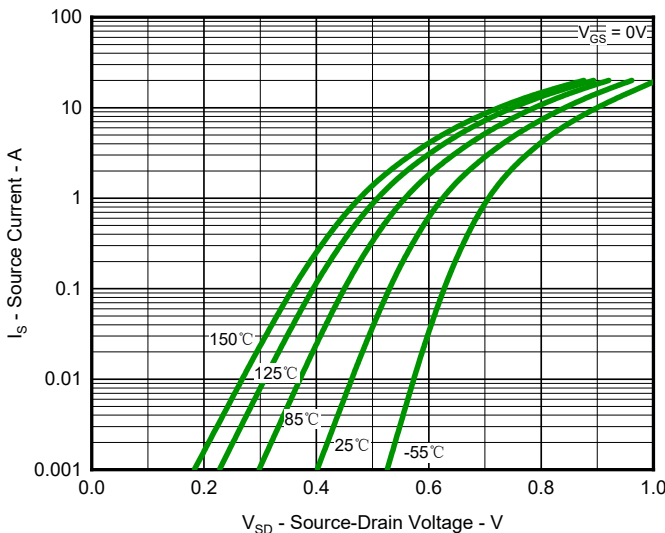


Fig.5 Diode Forward Voltage vs. Current

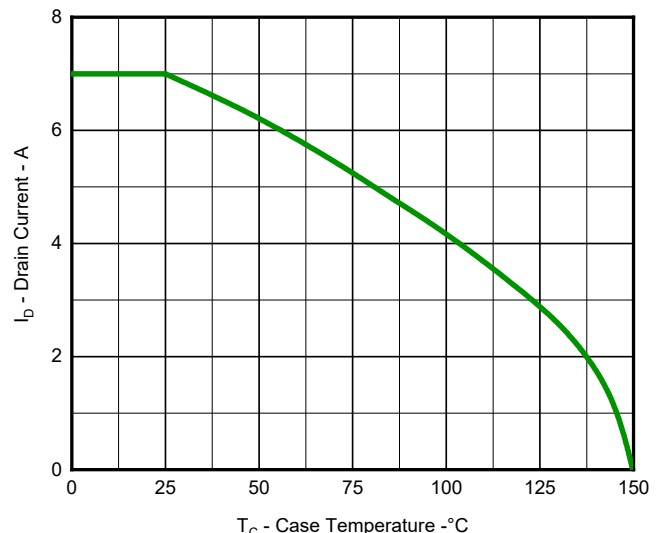


Fig.6 Maximum Drain Current vs. Case Temperature

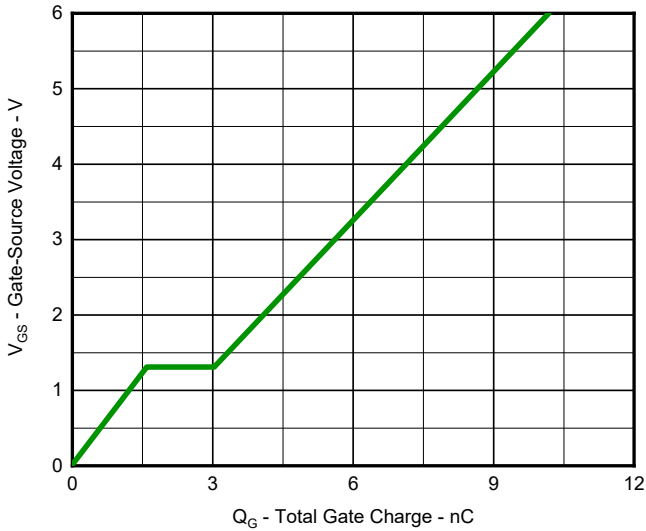


Fig.7 Gate Charge Characteristics

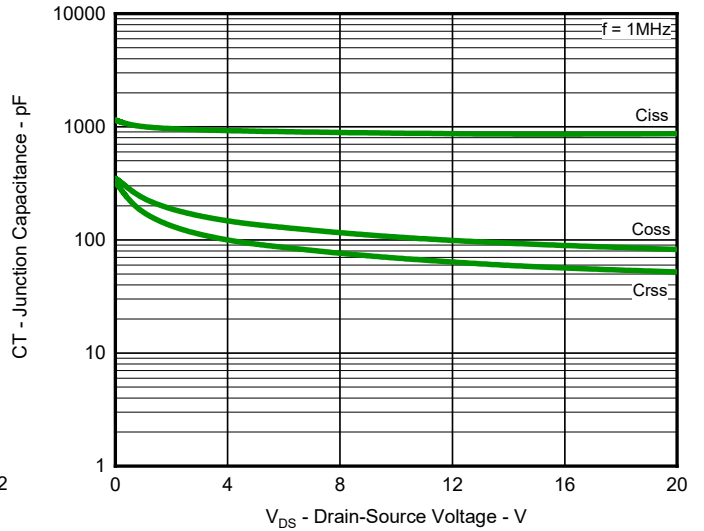


Fig.8 Typical Junction Capacitance

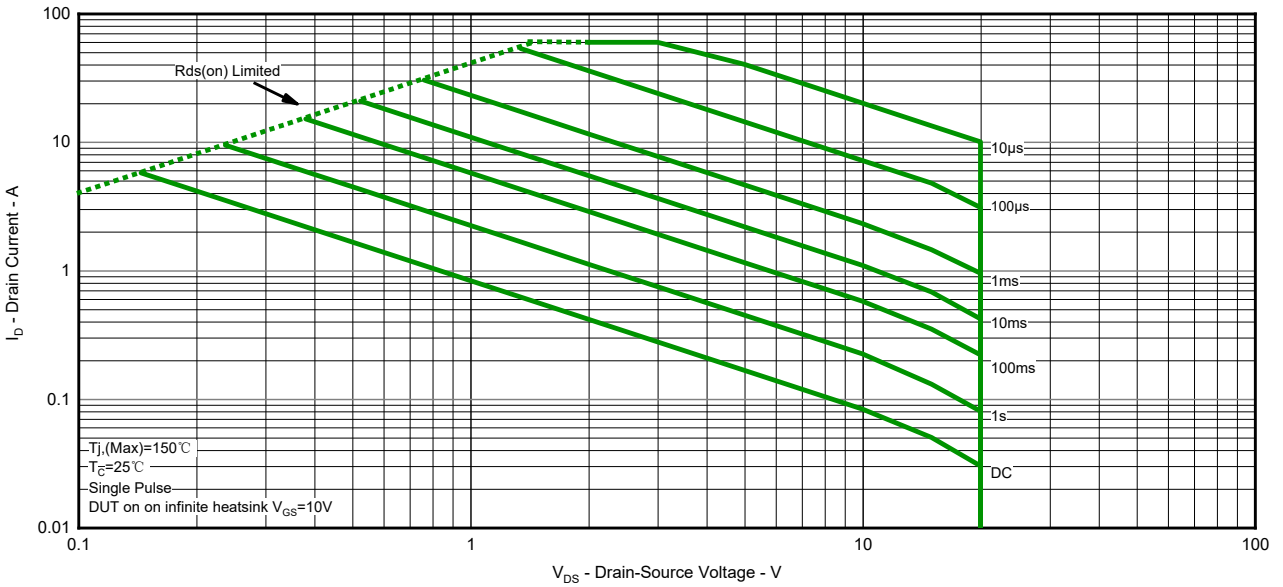


Fig.9 Safe Operation Area

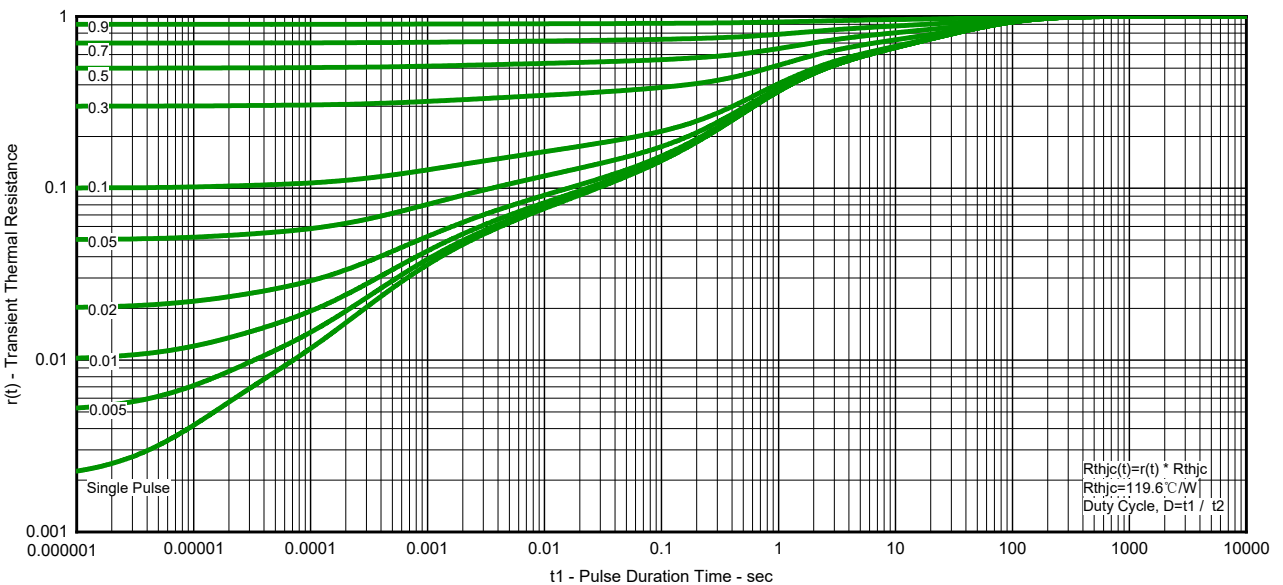
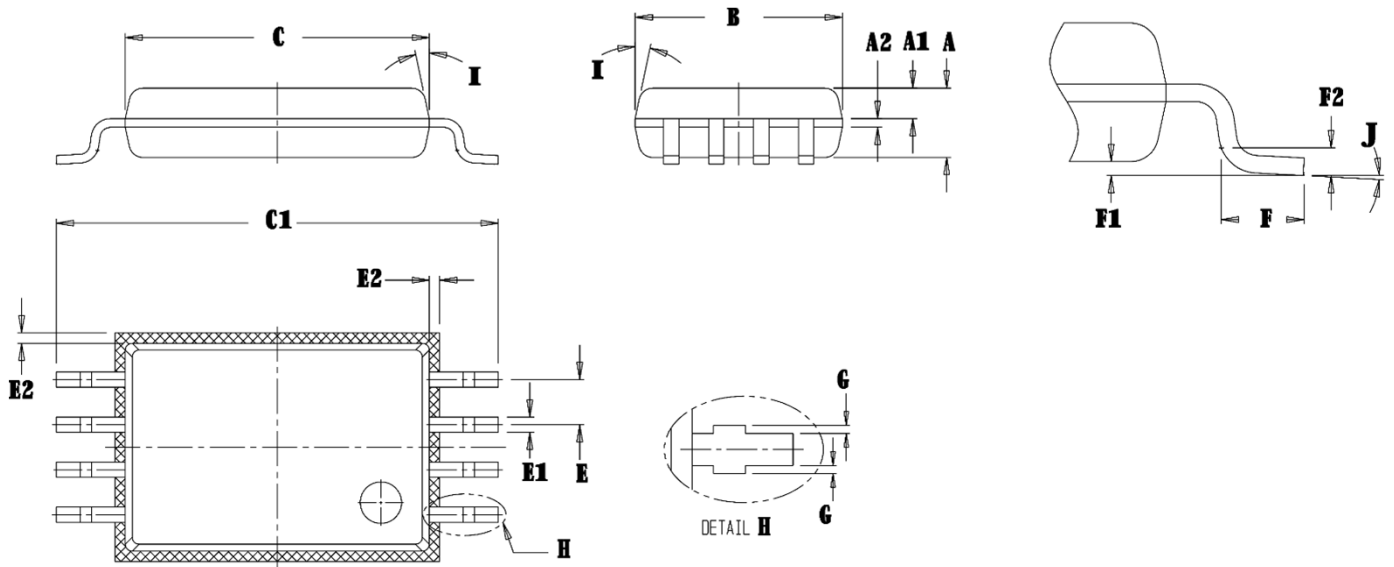


Fig.10 Transient Thermal Resistance

## Product Dimension (TSSOP-8)

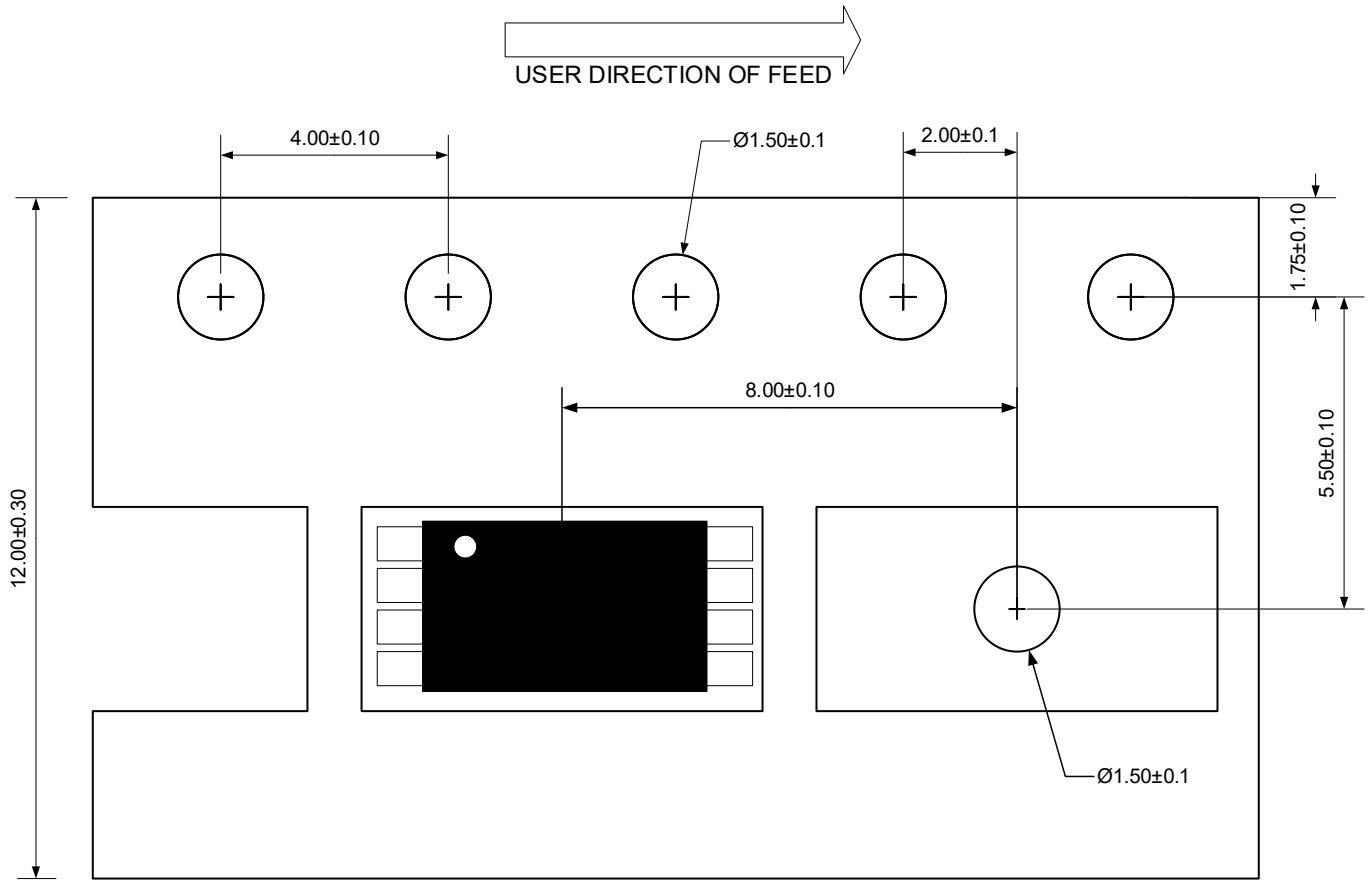


Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	0.95	1.05	0.037	0.041
A1	0.39	0.49	0.015	0.019
A2	0.127 Typ.		0.005 Typ.	
B	2.95	3.05	0.116	0.120
C	4.35	4.45	0.171	0.175
C1	6.30	6.50	0.248	0.256
E	0.65 Typ.		0.026 Typ.	
E1	0.195	0.245	0.008	0.010
E2	0.12 Typ.		0.005 Typ.	
F	0.50	0.70	0.020	0.028
F1	0.00	0.10	0.000	0.004
F2	0.20 Typ.		0.008 Typ.	
G	0.075 Typ.		0.003 Typ.	
I	10°	14°	10°	14°
J	0°	6°	0°	6°

## Ordering Information


Device	Package	Reel	Shipping
PDNM8TP20V7E	TSSOP-8	13"	3000 / Tape & Reel

Load with Information



Unit:mm


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