Prisemi®

PNMDP30V100A

N-Channel MOSFET

Description

The PNMDP30V100A 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.
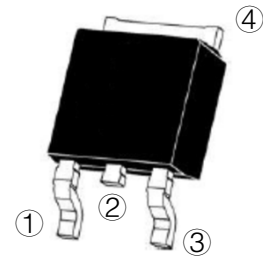
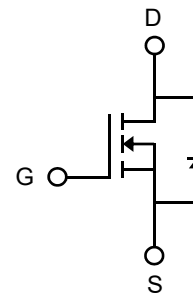| MOSFET Product Summary		
V_{DS}(V)	$R_{DS(on)}$(mΩ)	I_D(A)
30	3.2@ V_{GS} = 10V	85.5
	4.4@ V_{GS} = 4.5V	

Feature

➢ High Power and current handing capability

➢ Lead free product is acquired
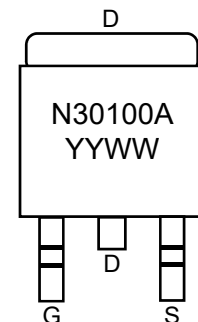
➢ Surface Mount Package

Applications

➢ PWM applications

➢ Load switch

➢ Power management

➢ DC-DC Converters

➢ Wireless Chargers

TO-252 (Top View)

Circuit Diagram

N30100A
YYWW

Marking (Top View)

Absolute maximum rating@25℃

Rating		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous[1]	T_C=25℃	I_D	85.5	A
	T_C=100℃		54	
Pulsed Drain Current[2]		I_{DM}	340	A
Total Power Dissipation[3]		P_D	43	W
Avalanche Current[4]		I_{AS}	62	A
Avalanche Energy[4]		E_{AS}	194	mJ
Thermal Resistance , Junction-case[5]		$R_{\theta JC}$	8.8	℃/W
Thermal Resistance Junction-to-Ambient[5]		$R_{\theta JA}$	42	℃/W
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	℃

Electrical characteristics per line@25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$	-	-	1.0	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.5	2.4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 20A$	-	3.2	4.5	mΩ
		$V_{GS} = 4.5V, I_D = 15A$	-	4.4	7.0	
Dynamic Characteristics[6]						
Input Capacitance	C_{Iss}	$V_{DS} = 15V, V_{GS} = 0V,$ $f = 1.0MHz$	-	3067	-	pF
Output Capacitance	C_{oss}		-	364	-	
Reverse Transfer Capacitance	C_{rss}		-	293	-	
Switching Characteristics[6]						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS} = 15V, V_{GS} = 10V,$ $R_G = 10\Omega, I_D = 20A$	-	10.7	-	ns
Turn-on Rise Time	t_r		-	34	-	
Turn-Off Delay Time	$t_{d(off)}$		-	107	-	
Turn-Off Fall Time	t_f		-	59	-	
Total Gate Charge	Q_g	$V_{DS} = 15V, V_{GS} = 10V,$ $I_D = 20A$	-	60	-	nC
Gate-Source Charge	Q_{gs}		-	8.2	-	
Gate-Drain Charge	Q_{gd}		-	10.1	-	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	-	2.33	-	Ω
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 2A$	-	0.7	1.3	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℃).
3. Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.
4. This single-pulse measurement was taken under the following condition (L=100uH,V_{GS}=10V,V_{DS}=50V)while it's value is limited by T_{J_Max}=150℃.
5. Device mounted on infinite heatsink.
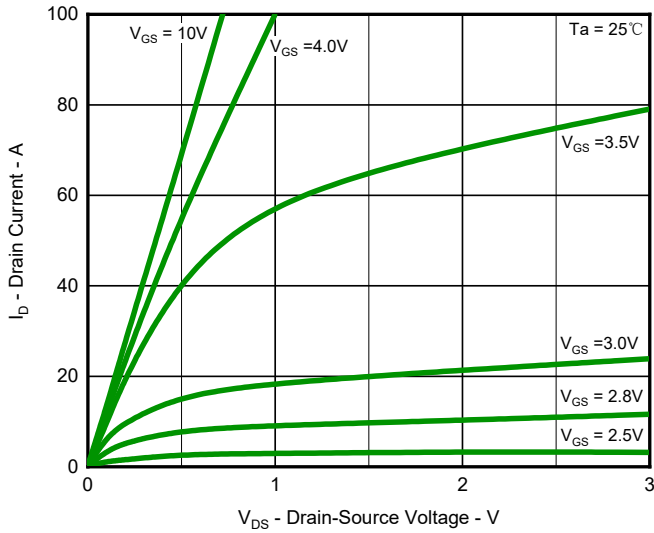6. Guaranteed by design, not subject to production.

Typical Characteristics
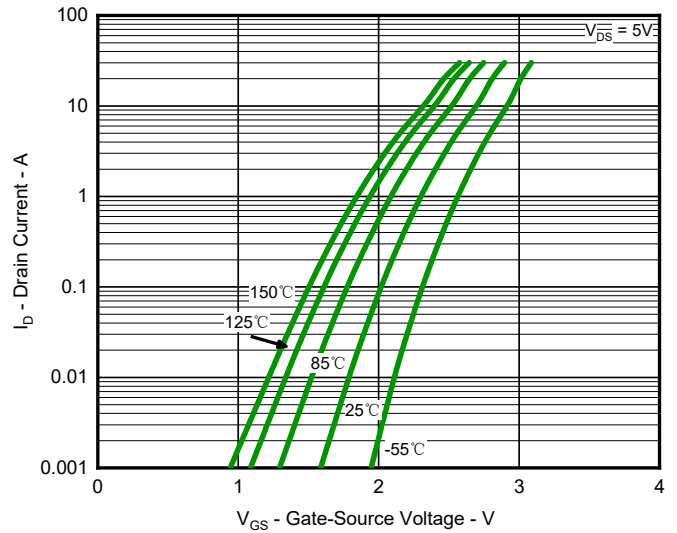

Fig.1 Output Characteristics

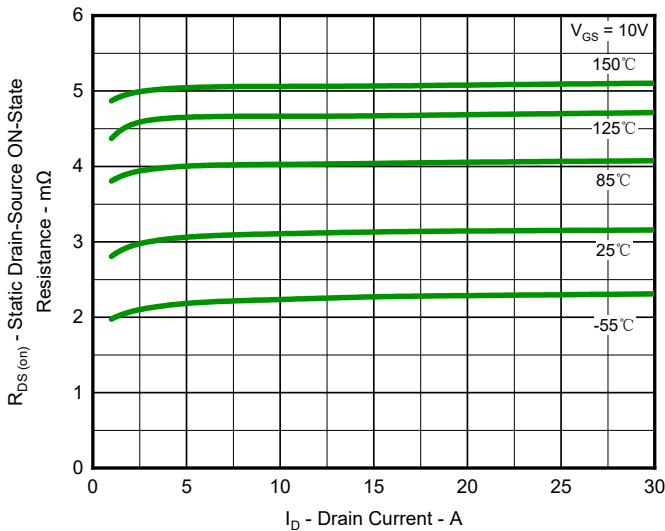**Fig.2 Typical Transfer Characteristic**

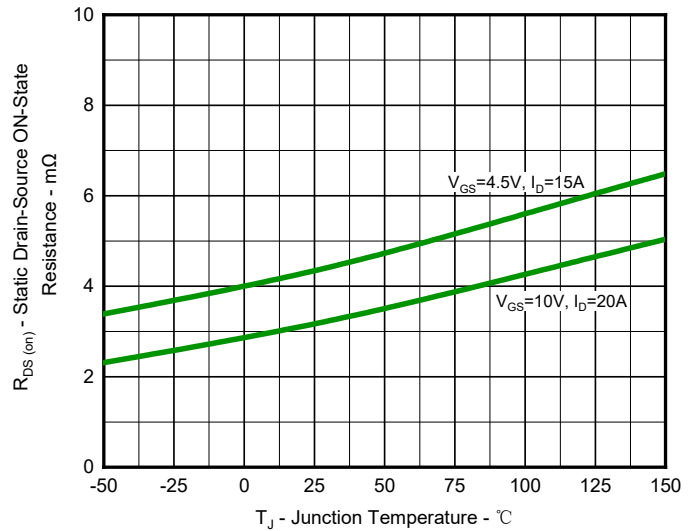**Fig.3 Typical On-Resistance vs Drain Current and Temperature**
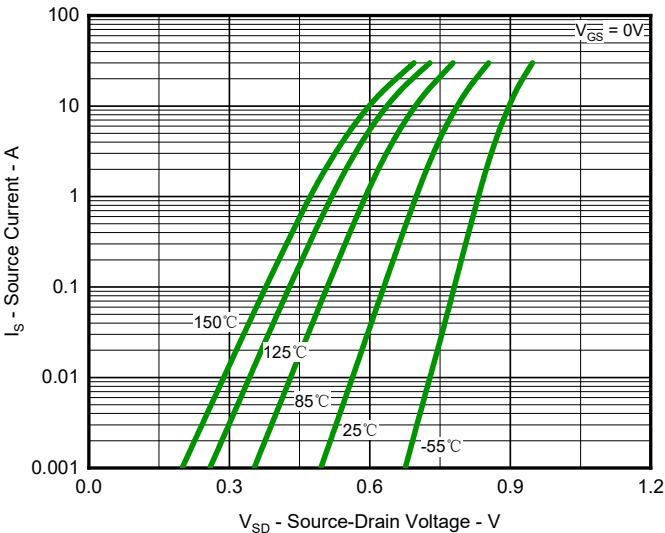

Fig.4 On-Resistance Variation with Temperature

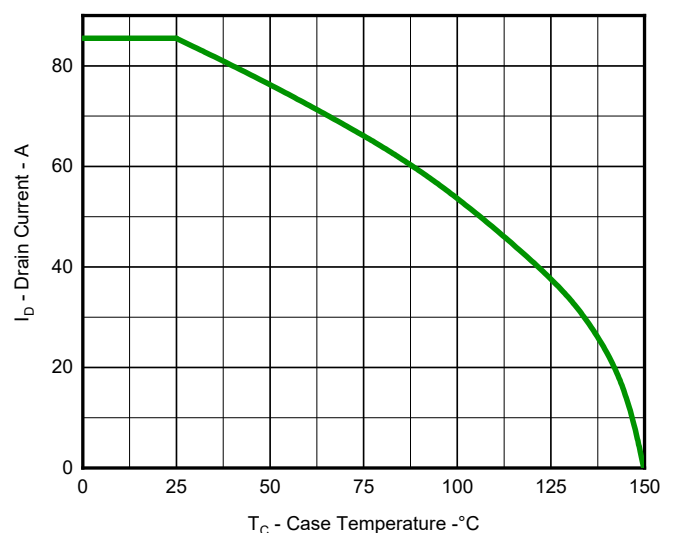

Fig.5 Diode Forward Voltage vs. Current

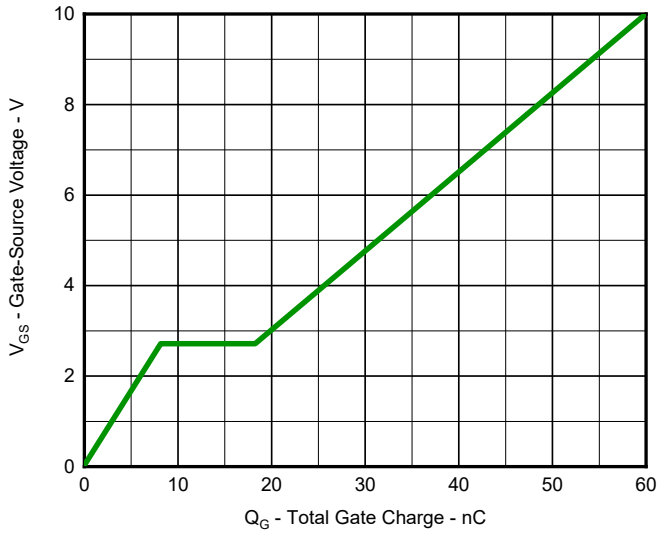**Fig.6 Maximun Drain Current vs. Case Temperature**
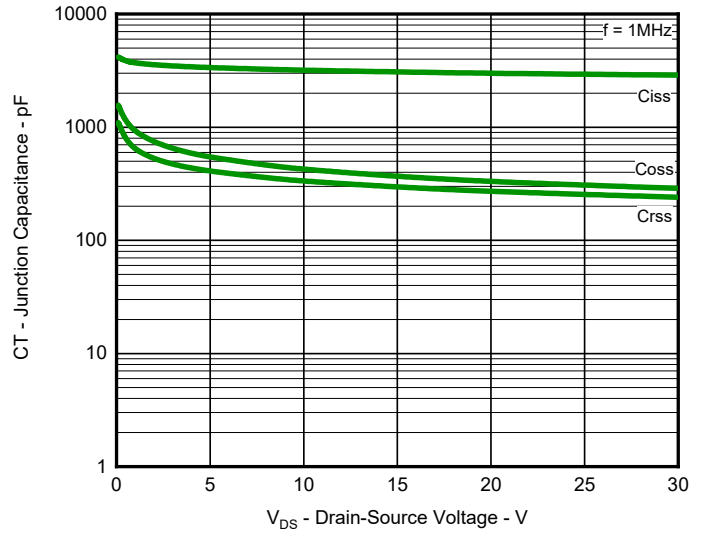
Fig.7 Gate Charge Characteristics

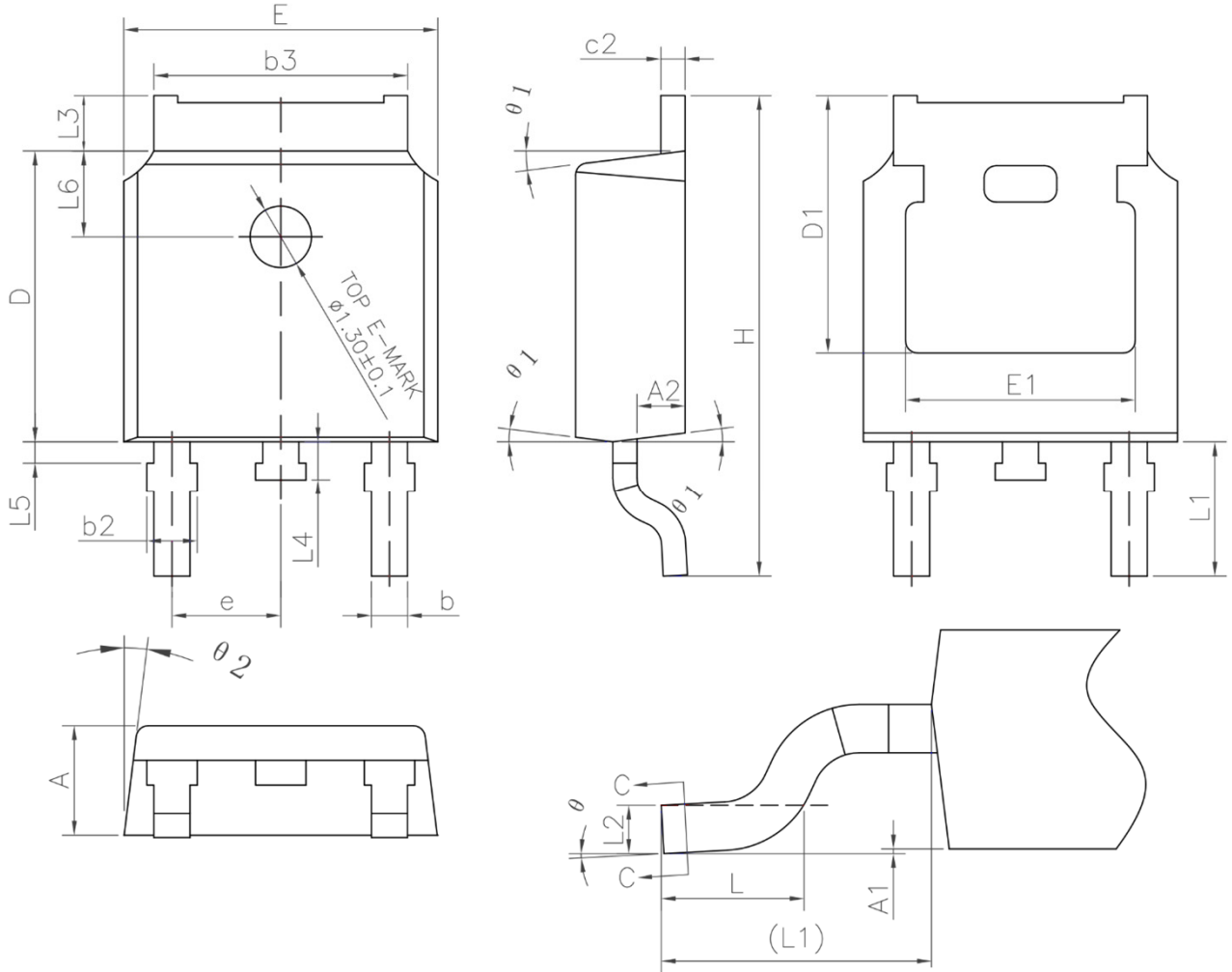**Fig.8 Typical Junction Capacitance**
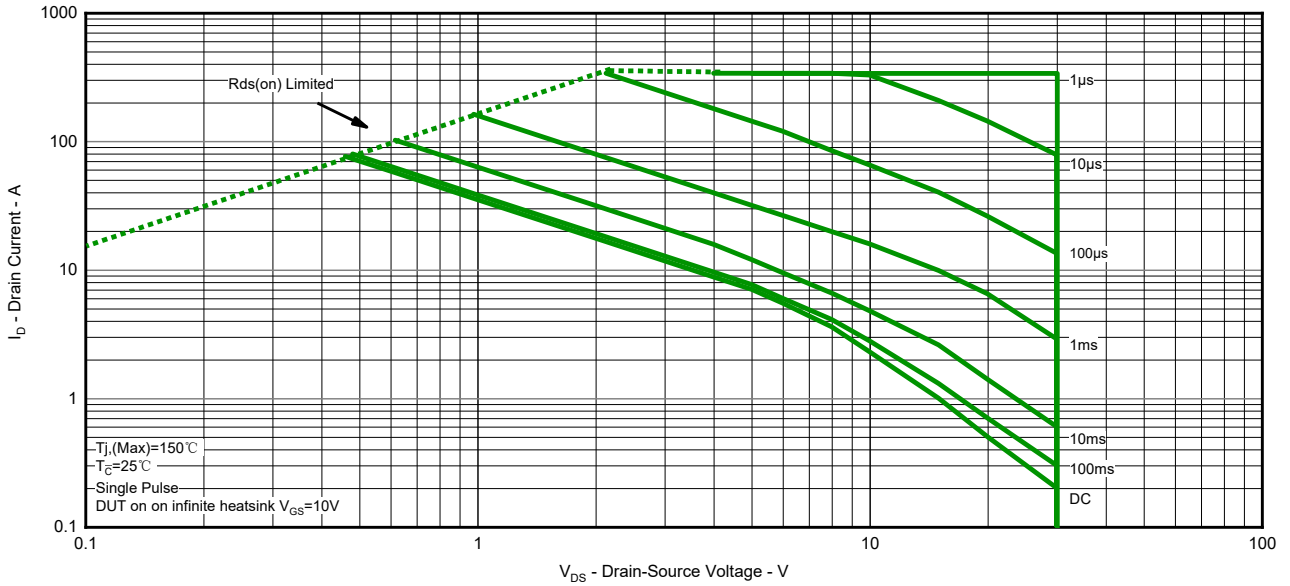
Fig.9 Safe Operation Area
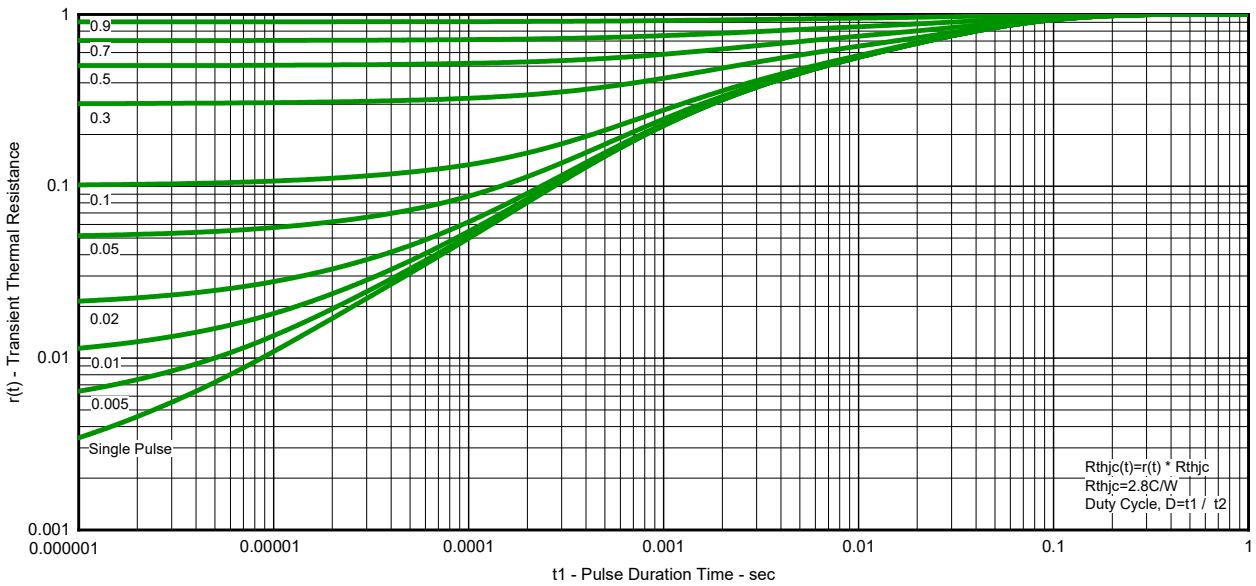
Fig.10 Transient Thermal Resistance

Product Dimension (TO-252)

Dim	Millimeters		Inches		Dim	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	2.20	2.38	0.087	0.094	e	2.186	2.386	0.086	0.094
A1	0.00	0.10	0.000	0.004	H	9.80	10.40	0.386	0.409
A2	0.90	1.10	0.035	0.043	L	1.40	1.70	0.055	0.067
b	0.72	0.82	0.028	0.032	L1	2.90 Ref.		0.114 Ref.	
b2	0.72	0.90	0.028	0.035	L2	0.508 BSC.		0.020 BSC.	
b3	5.13	5.46	0.202	0.215	L3	0.90	1.25	0.035	0.049
c	0.47	0.60	0.019	0.024	L4	0.60	1.00	0.024	0.039
c2	0.47	0.60	0.019	0.024	L5	0.15	0.75	0.006	0.030
D	6.00	6.20	0.236	0.244	L6	1.80 Ref.		0.071 Ref.	
D1	5.25	-	0.207	-	θ	0°	8°	0°	8°
E	6.50	6.70	0.256	0.264	θ1	5°	9°	5°	9°
E1	4.70	-	0.185	-	θ2	5°	9°	5°	9°

Ordering Information

Device	Package	Reel	Shipping
PNMDP30V100A	To-252(Pb-Free)	13"	2500 / Tape & Reel

Load With Information

USER DIRECTION OF FEED

Ø1.50±0.1

2.00±0.1

4.00±0.1

8.00±0.1

1.75±0.1

7.50±0.1

16.00±0.1

Ø1.50±0.25

Pin1
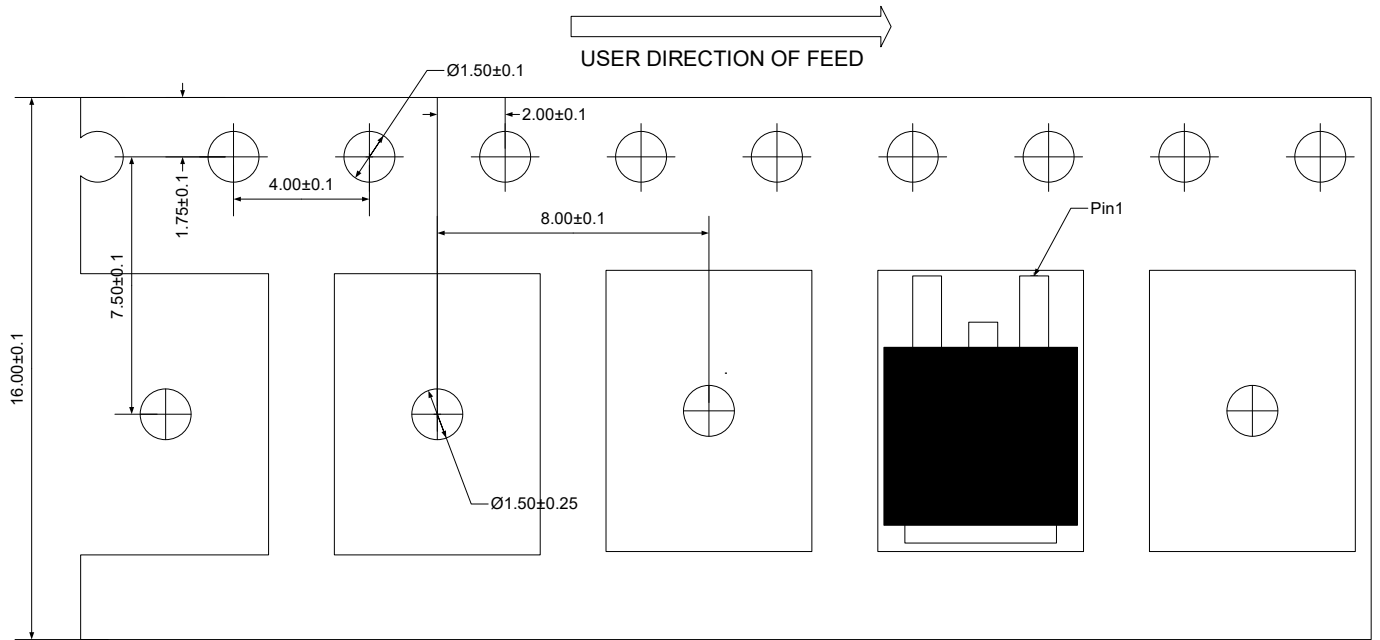
Unit:mm

IMPORTANT NOTICE