Prisemi®

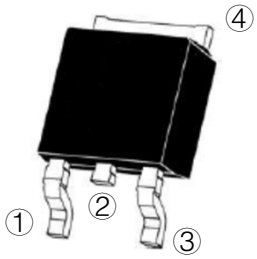
PNMDP03R11L

N-Channel MOSFET

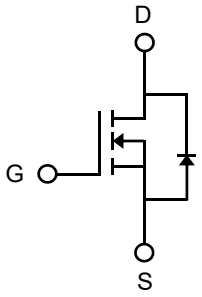
Description

The PNMDP03R11L uses trench technology to provide excellent $R_{DS(ON)}$ low gate charge. This device is suitable for power management and high efficiency applications at high switching frequencies applications.

MOSFET Product Summary		
V_{DS}(V)	$R_{DS(on)}$(mΩ)(Typ)	I_D(A)
30	6.5 @ V_{GS} = 10V	64
	10.8 @ V_{GS} = 4.5V	



TO-252 (Top View)



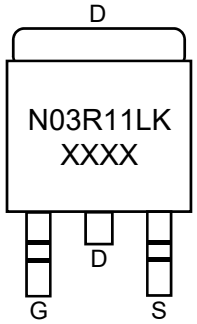
Circuit Diagram

Feature

- Fast Switching Capability
- Lead free product is acquired.
- Avalanche Energy Tested

Applications

- PWM applications
- Load Switch
- Power Management
- DC-DC Converters



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	64	A
	T_C=100℃		46	
Pulsed Drain Current[2]		I_{DM}	256	A
Total Power Dissipation[3]		P_D	44.6	W
Avalanche Current[4]		I_{AS}	19	A
Avalanche Energy[4]		E_{AS}	98	mJ
Thermal Resistance , Junction-to-Case[5]		$R_{\theta JC}$	2.8	℃/W
Thermal Resistance , Junction-to-Ambient[6]		$R_{\theta JA}$	35.9	℃/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 = 250μA	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} = ±20V,V_{DS} = 0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS},I_D = 250μA	1.0	1.5	2.3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} = 10V,I_D = 20A	-	6.5	8.0	mΩ
		V_{GS} = 4.5V,I_D = 20A	-	10.8	13	
Dynamic Characteristics[7)]						
Input Capacitance	C_{iss}	V_{DS} = 15V,V_{GS} = 0V, f = 1.0MHz	-	1230	-	pF
Output Capacitance	C_{oss}		-	150	-	
Reverse Transfer Capacitance	C_{rss}		-	128	-	
Switching Characteristics[7)]						
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = 15V, V_{GS} = 10V, I_D = 20A,R_G = 2Ω	-	5.9	-	ns
Turn-on Rise Time	t_r		-	21.3	-	
Turn-Off Delay Time	$t_{d(off)}$		-	21.4	-	
Turn-Off Fall Time	t_f		-	18.1	-	
Total Gate Charge	Q_g	V_{DS} = 15V, V_{GS} = 10V, I_D = 20A	-	24.2	-	nC
Gate-Source Charge	Q_{gs}		-	2.5	-	
Gate-Drain Charge	Q_{gd}		-	6.7	-	
Gate Resistance	R_g	f=1MHz , Open Drain	-	2.0	-	Ω
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V,I_S = 20A	-	0.8	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℃).
3. Pulse Test: Pulse Width ≤ 10μs, Duty Cycle ≤ 1%.
4. This single-pulse measurement was taken under the following condition [L=0.5mH,V_{GS}=10V,V_{DS}=30V]while it's value is limited by T_{J_Max}=150℃.
5. Device mounted on infinite heatsink.
6. Device mounted on FR4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
7. Guaranteed by design, not subject to production.

Typical Characteristics

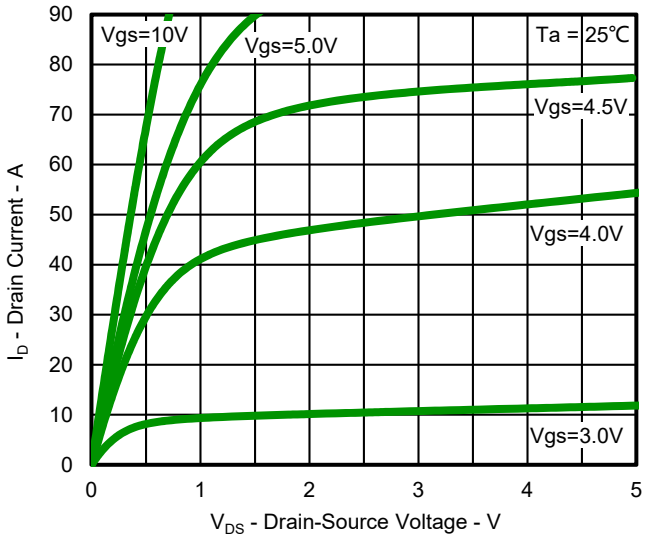


Fig.1 Output Characteristics

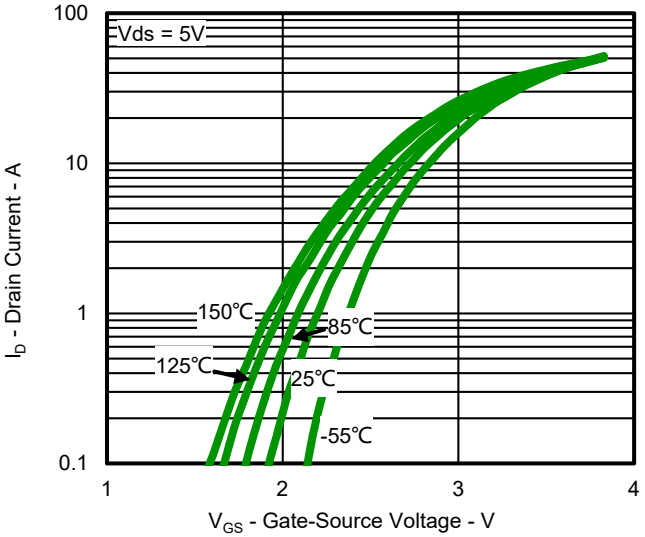


Fig.2 Typical Transfer Characteristic

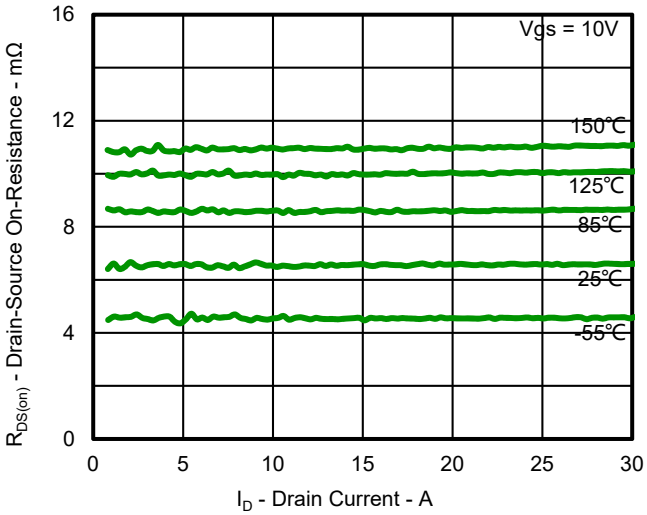


Fig.3 Typical On-Resistance vs Drain Current and Temperature

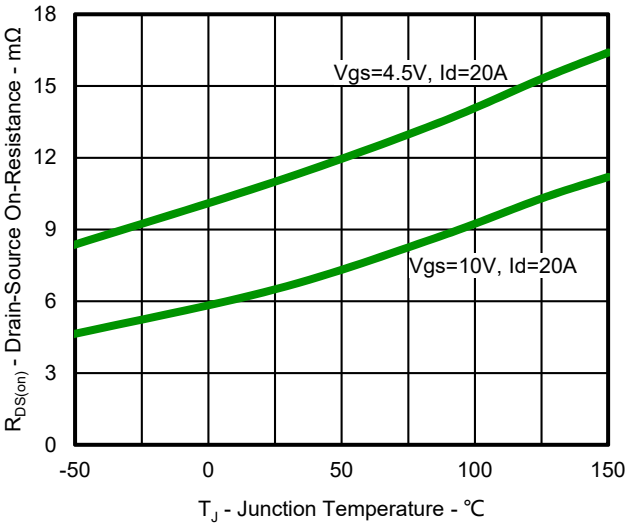


Fig.4 On-Resistance Variation with Temperature

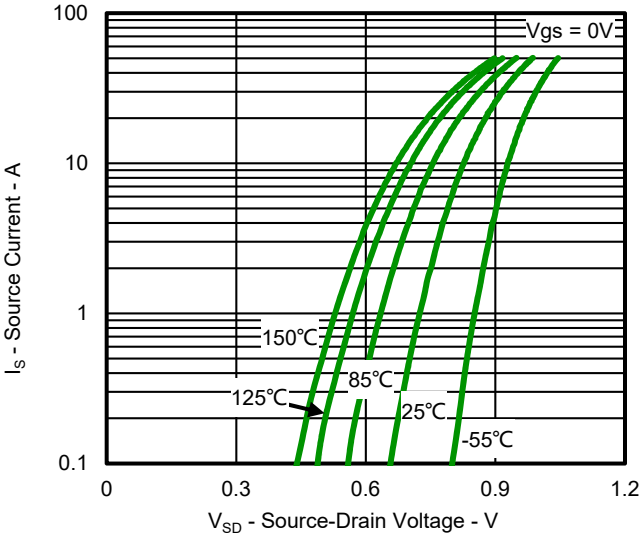


Fig.5 Diode Forward Voltage vs. Current

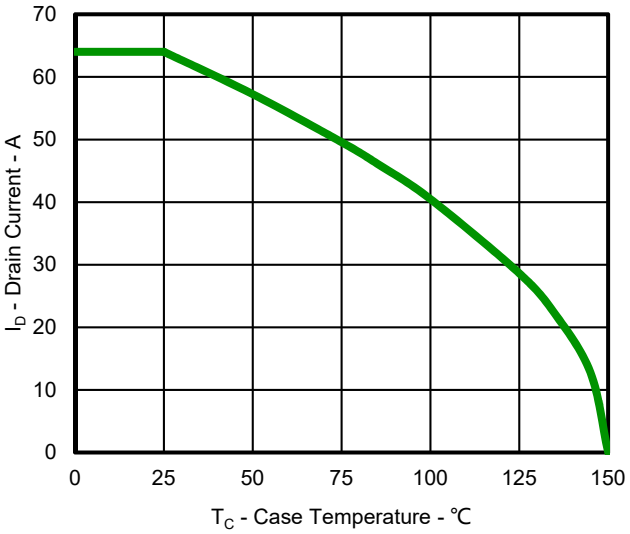


Fig.6 Maximum Drain Current vs. Case Temperature

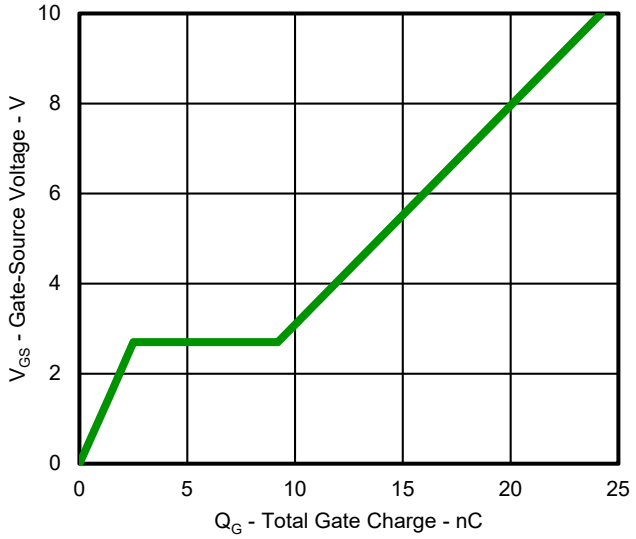


Fig.7 Gate Charge Characteristics

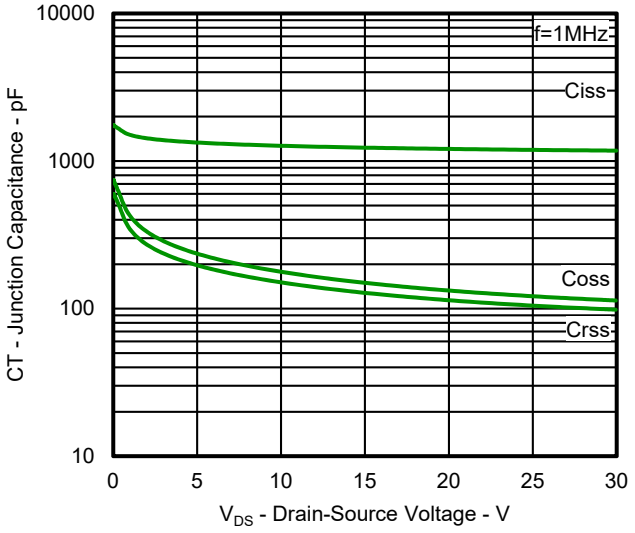


Fig.8 Typical Junction Capacitance

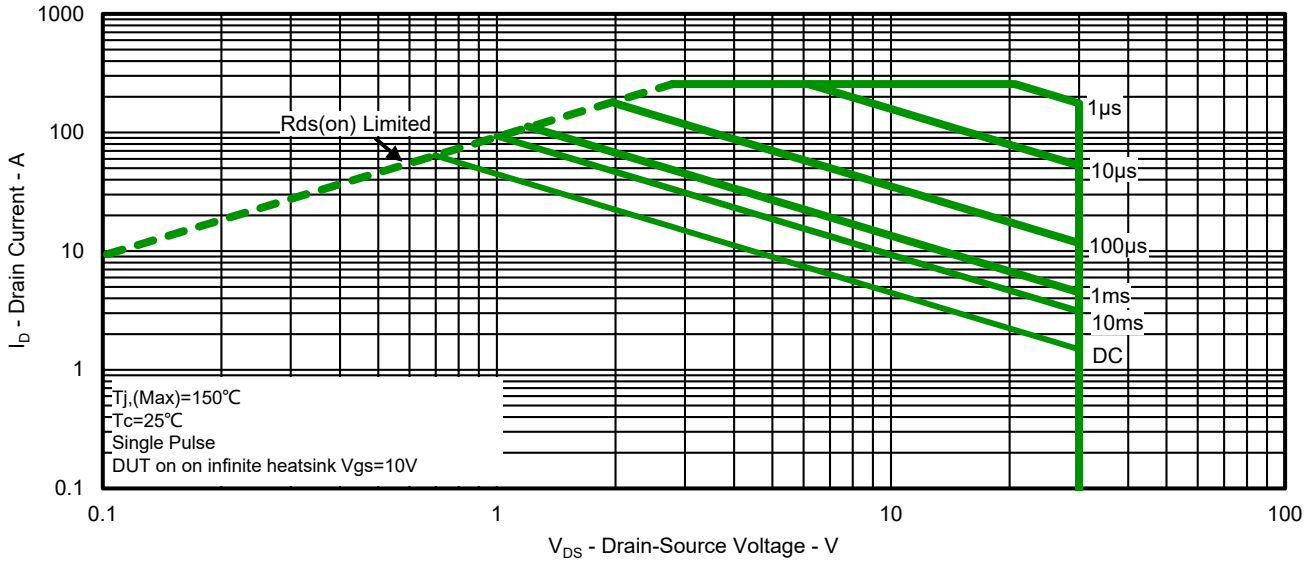


Fig.9 Safe Operation Area

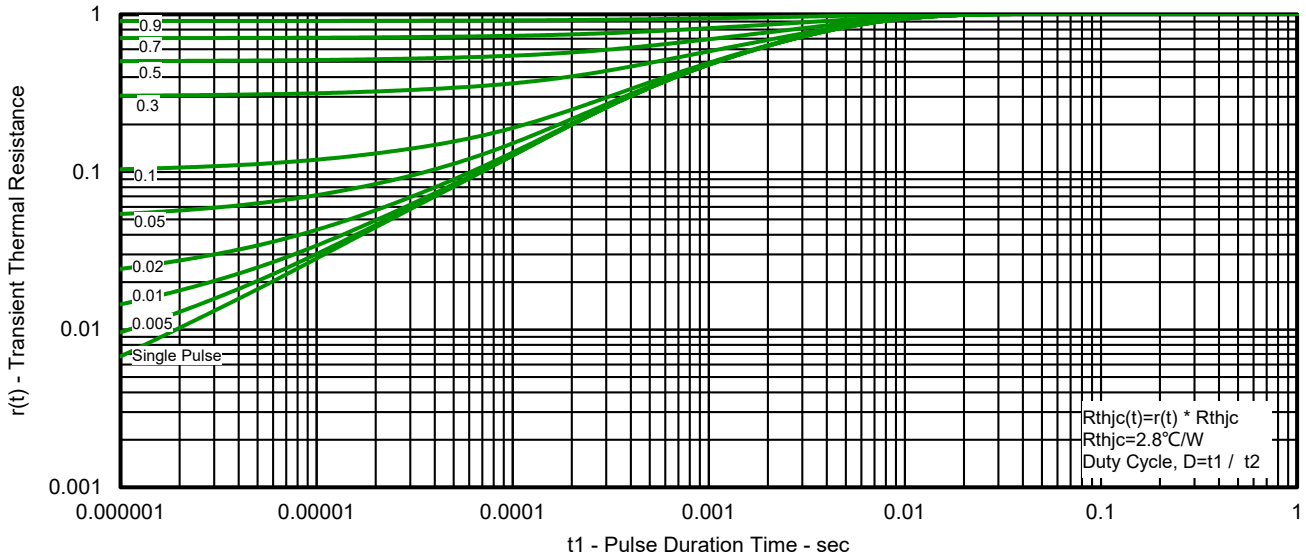
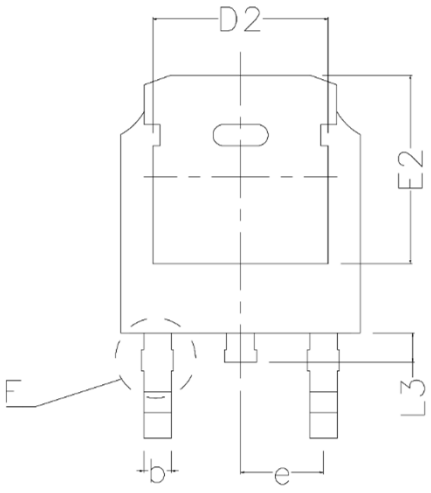
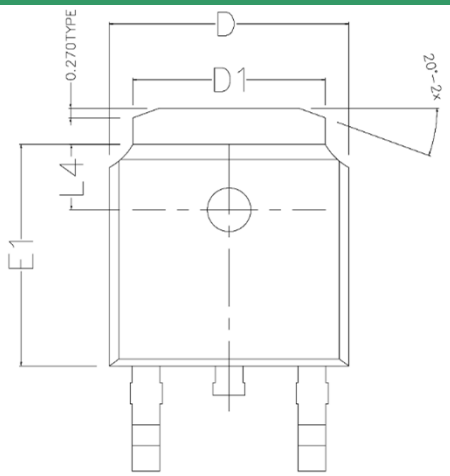


Fig.10 Transient Thermal Resistance

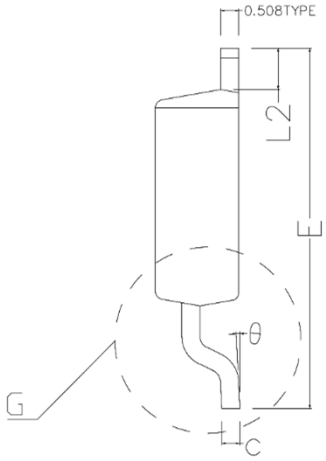
Product Dimension (TO-252)



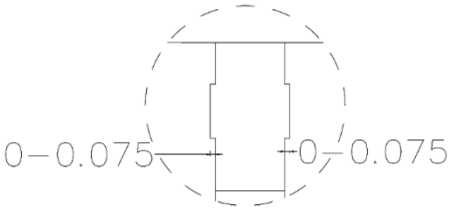
BOTTOM VIEW



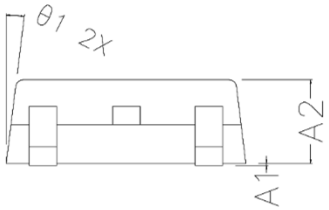
TOP VIEW



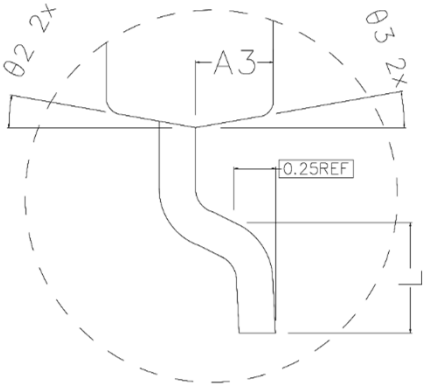
SIDE VIEW



DETAIL F



SIDE VIEW



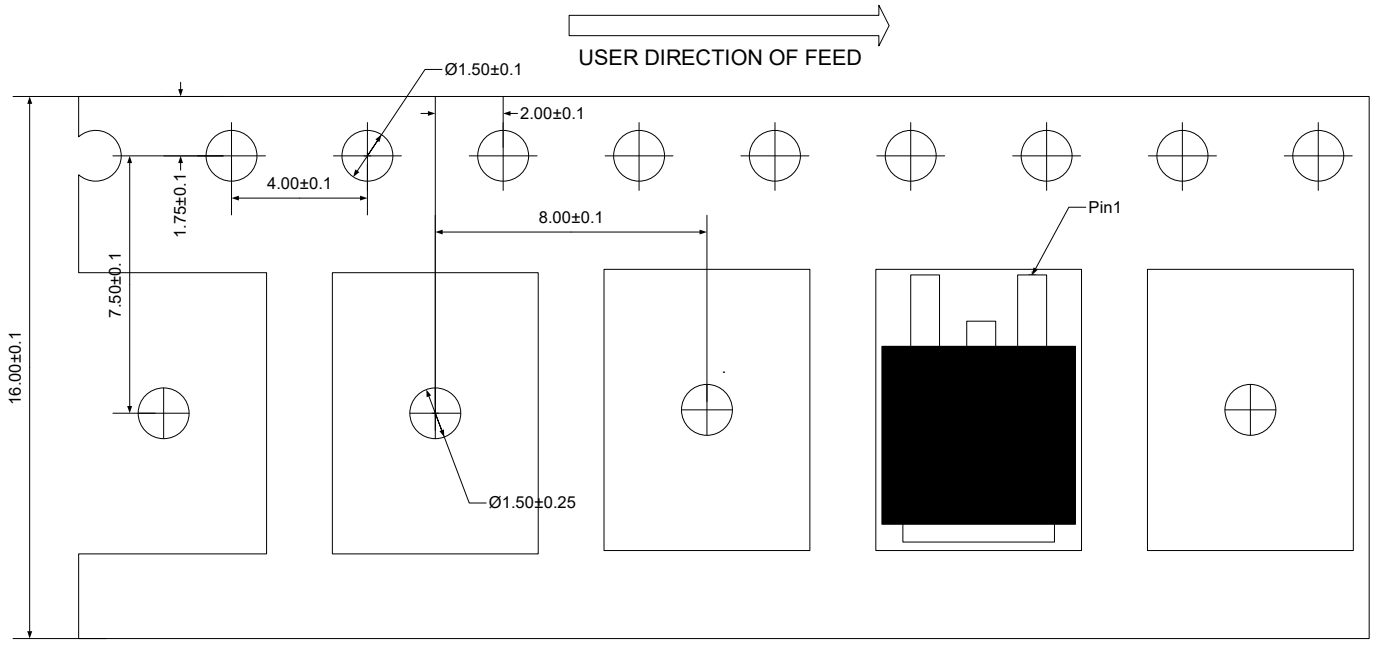
DETAIL G

Dim	Millimeters		Inches		Dim	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A1	0.03	0.13	0.001	0.005	E2	5.14 Ref.		0.202 Ref.	
A2	2.20	2.40	0.087	0.094	e	2.286 Typ.		0.090 Typ.	
A3	0.96	1.06	0.038	0.042	L	1.40	1.60	0.055	0.063
b	0.64	0.74	0.025	0.029	L2	1.00 Ref.		0.039 Ref.	
c	0.46	0.55	0.018	0.022	L3	0.80 Ref.		0.031 Ref.	
D	6.50	6.70	0.256	0.264	L4	1.80 Ref.		0.071 Ref.	
D1	5.334 Ref.		0.210 Ref.		θ	0°	8°	0°	8°
D2	4.83 Ref.		0.190 Ref.		θ1	7° Typ.		7° Typ.	
E	9.77	10.17	0.385	0.400	θ2	7° Typ.		7° Typ.	
E1	6.00	6.20	0.236	0.244	θ3	7° Typ.		7° Typ.	

Ordering Information

Package	Reel	Shipping
TO-252	13"	2500 / Tape & Reel

Load With Information



Unit:mm

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