

Description

The PNM723T201E0L uses split gate 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.

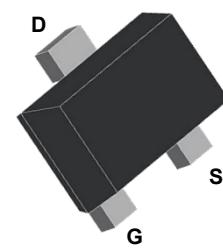
| MOSFET Product Summary | | | |
|------------------------|----------------------------|----------|--|
| $V_{DS}(V)$ | $R_{DS(on)}(m\Omega)(Typ)$ | $I_D(A)$ | |
| 20 | 120 @ $V_{GS} = 4.5V$ | 1.2 | |
| | 148 @ $V_{GS} = 2.5V$ | | |
| ESD | HBM | | |
| | Pass 3.5kV | | |

Feature

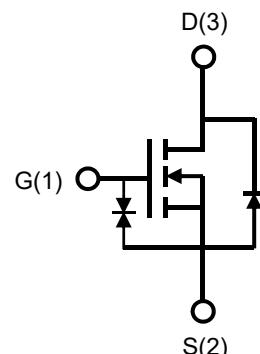
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Applications

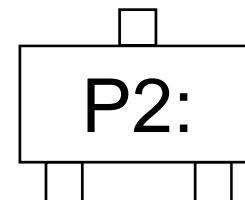
- PWM applications
- Load switch
- Power management
- DC-DC Converters
- Wireless Chargers



**SOT-723
(Top View)**



Circuit Diagram



Marking (Top View)

Absolute maximum rating@25°C

| Rating | Symbol | Value | Units |
|--|------------------|----------|-------|
| Drain-Source Voltage | V_{DS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ± 10 | V |
| Drain Current-Continuous ¹⁾ | $T_C=25^\circ C$ | 1.2 | A |
| | | 0.8 | |
| Pulsed Drain Current ²⁾ | I_{DM} | 4.0 | A |
| Total Power Dissipation ³⁾ | P_D | 0.5 | W |
| Thermal Resistance , Junction-to-Case ⁴⁾ | $R_{\theta JC}$ | 22.5 | °C/W |
| Thermal Resistance , Junction-to-Ambient ⁴⁾ | $R_{\theta JA}$ | 100 | °C/W |
| Junction and Storage Temperature Range | T_J, T_{STG} | -55~+150 | °C |

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

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|--------------|--|------|--------|----------|---------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS} = 0V, I_D = 250\mu A$ | 20 | - | - | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 20V, V_{GS} = 0V$ | - | - | 1.0 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS} = \pm 10V, V_{DS} = 0V$ | - | - | ± 10 | μA |
| On Characteristics | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 0.45 | 0.76 | 0.9 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS} = 4.5V, I_D = 0.65A$ | - | 120 | 200 | mΩ |
| | | $V_{GS} = 2.5V, I_D = 0.45A$ | - | 148 | 250 | |
| | | $V_{GS} = 1.8V, I_D = 0.25A$ | - | 200 | 350 | |
| Dynamic Characteristics⁵⁾ | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz$ | - | 16 | - | pF |
| Output Capacitance | C_{oss} | | - | 15.6 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 4.1 | - | |
| Switching Characteristics⁵⁾ | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DS} = 6V, V_{GS} = 4.5V, R_G = 50\Omega, R_L = 12\Omega, I_D = 0.5A$ | - | 121.4 | - | ns |
| Turn-on Rise Time | t_r | | - | 322.7 | - | |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 1086.7 | - | |
| Turn-Off Fall Time | t_f | | - | 910.7 | - | |
| Total Gate Charge | Q_g | $V_{DS} = 10V, V_{GS} = 4.5V, I_D = 0.5A$ | - | 0.8 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 0.2 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 0.3 | - | |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage | V_{SD} | $V_{GS} = 0V, I_S = 0.1A$ | - | 0.76 | 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. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
5. Guaranteed by design, not subject to production.

Typical Characteristics

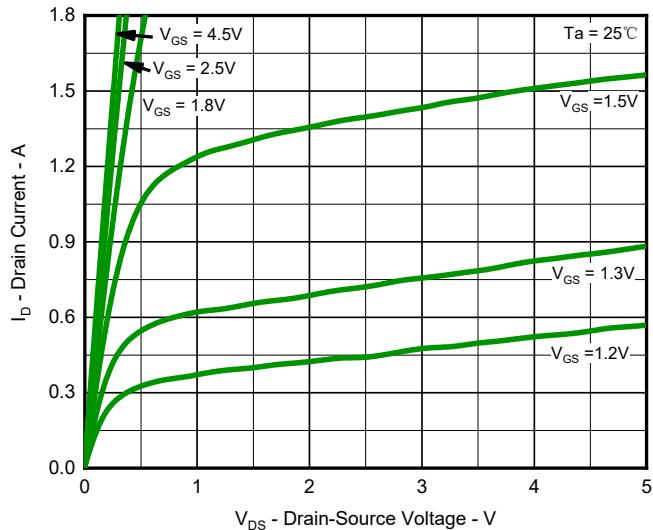


Fig.1 Output Characteristics

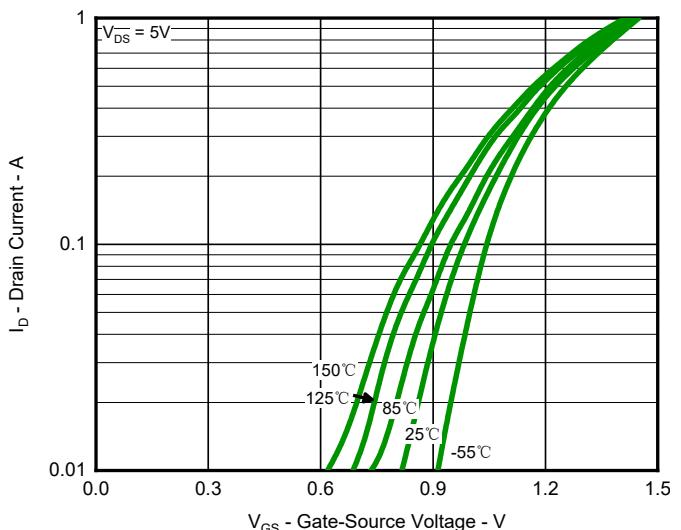


Fig.2 Typical Transfer Characteristic

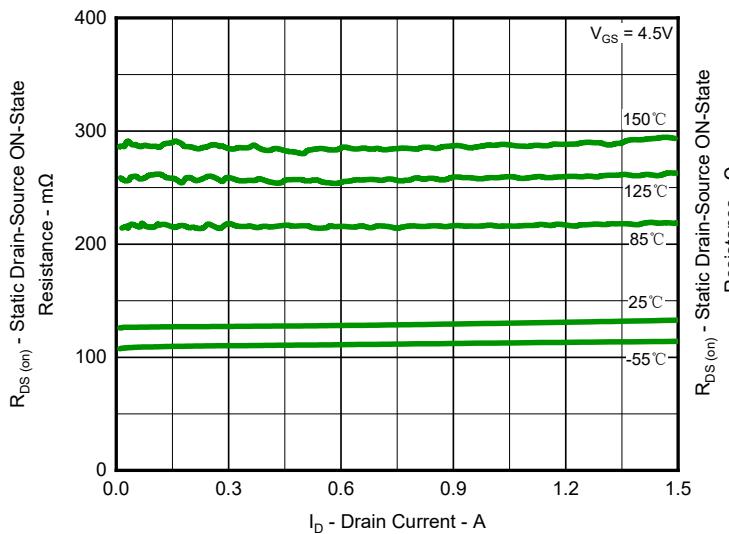


Fig.3 Typical On-Resistance vs. Drain Current and Temperature

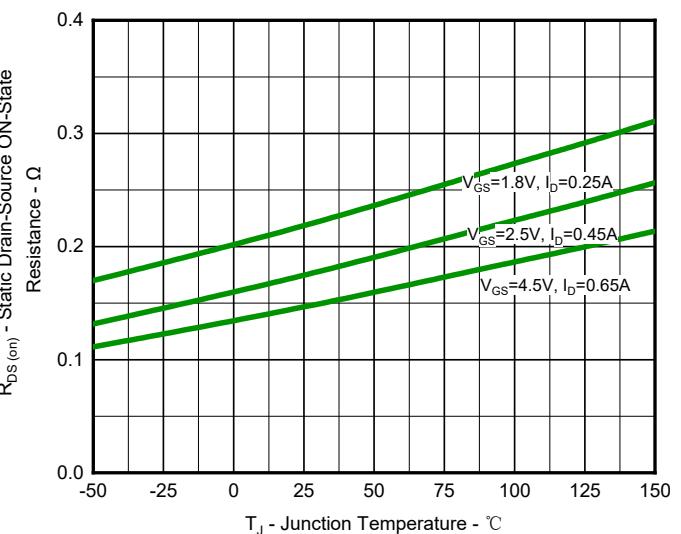


Fig.4 On-Resistance Variation with Temperature

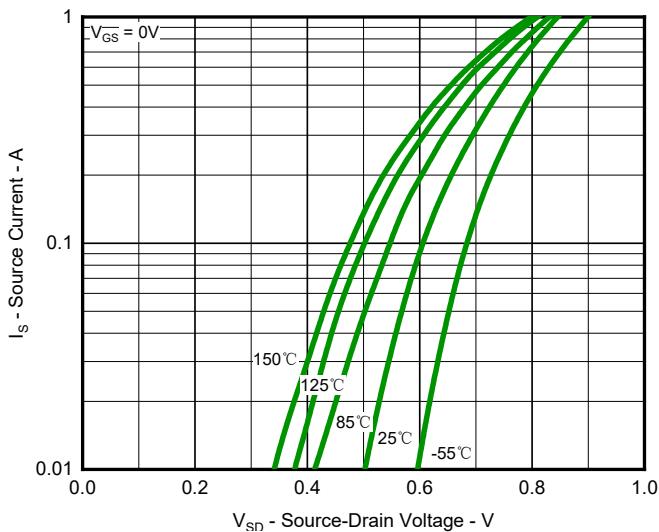


Fig.5 Diode Forward Voltage vs. Current

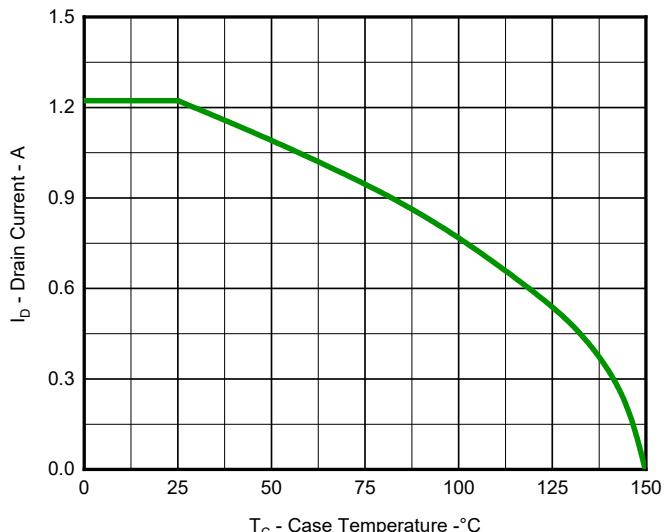


Fig.6 Maximum Drain Current vs. Case Temperature

N-Channel MOSFET

PNM723T201E0L

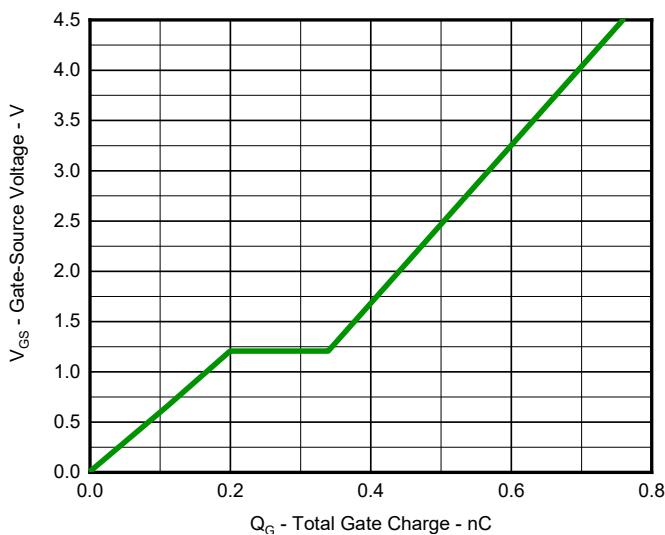


Fig.7 Gate Charge Characteristics

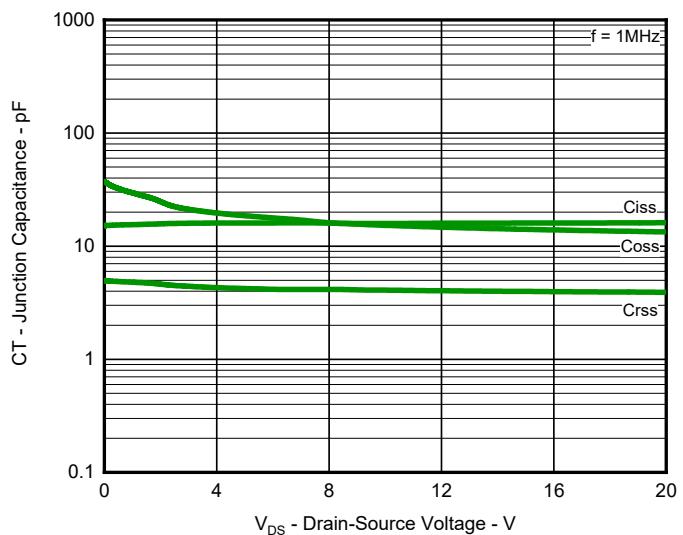


Fig.8 Typical Junction Capacitance

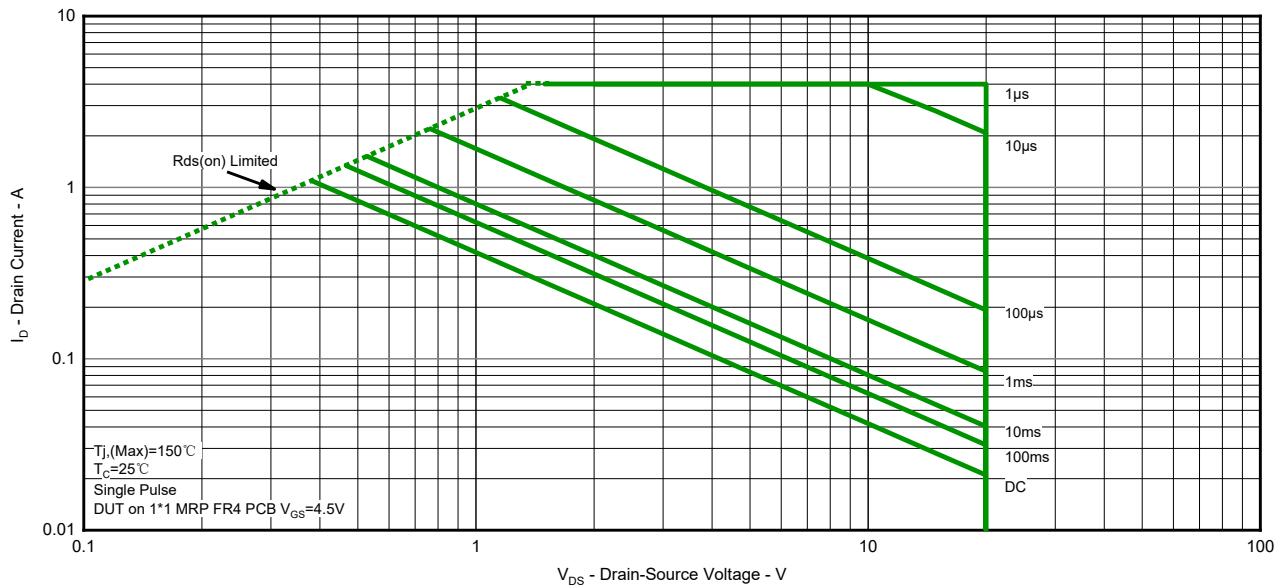


Fig.9 Safe Operation Area

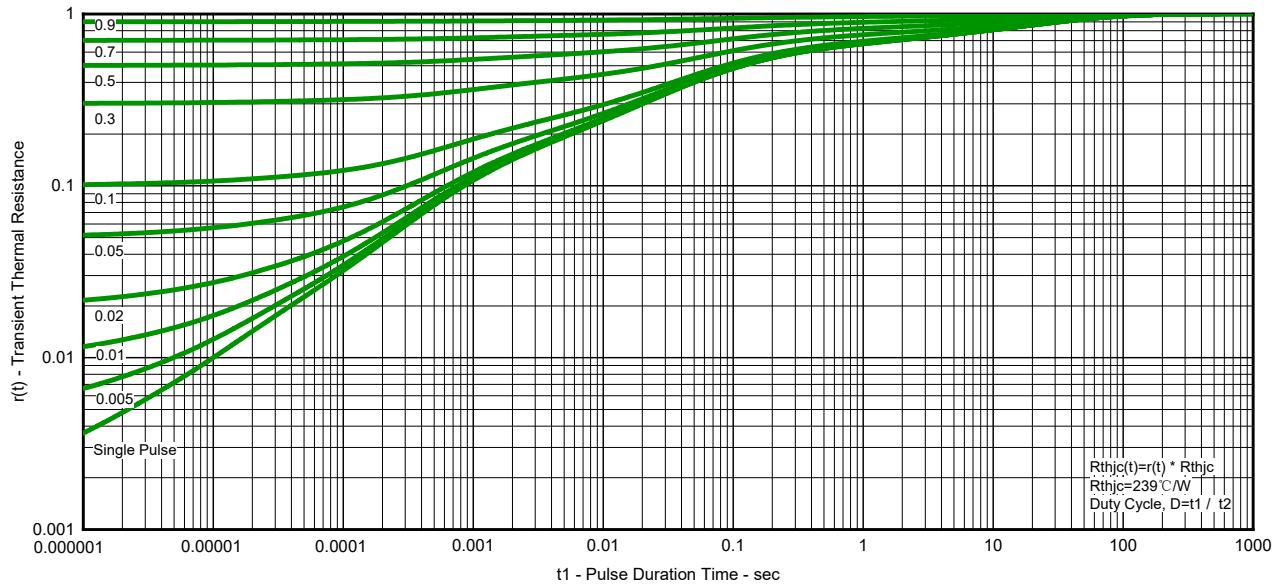
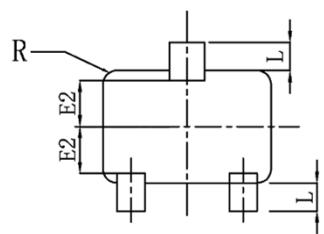
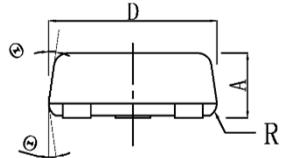
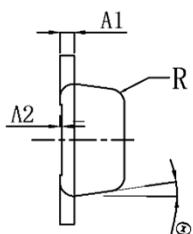
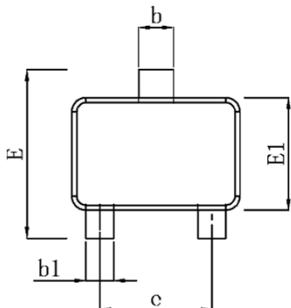


Fig.10 Transient Thermal Resistance

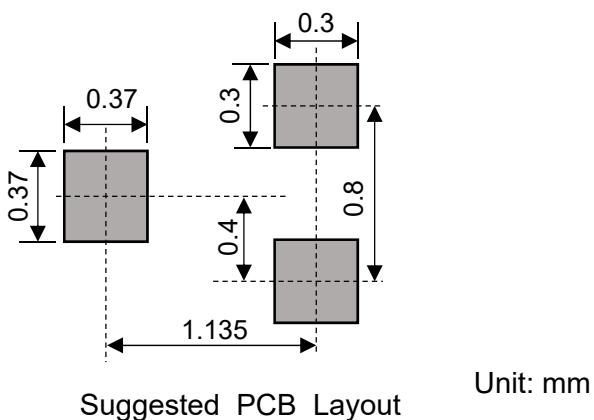
N-Channel MOSFET

PNM723T201E0L

Product Dimension (SOT-723)



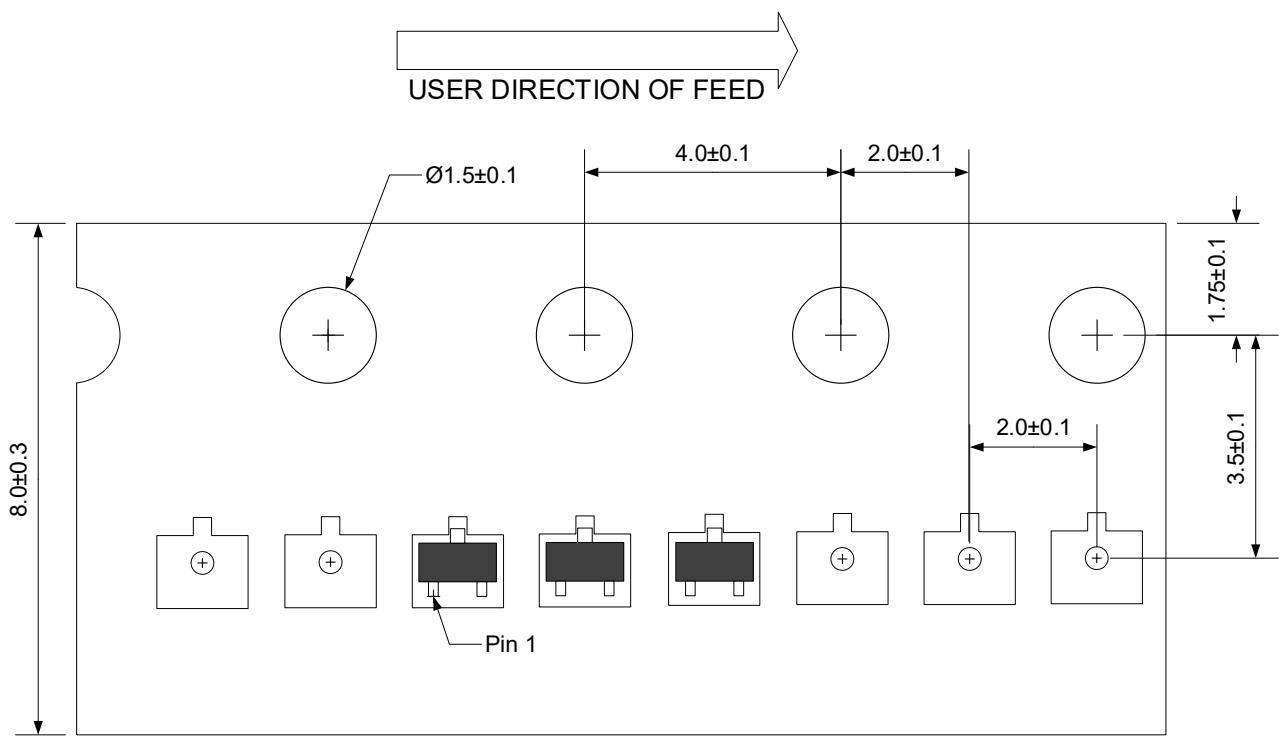
| Dim | Millimeters | | Inches | |
|-----|-------------|-------|------------|-------|
| | Min | Max | Min | Max |
| A1 | 0.075 | 0.125 | 0.003 | 0.005 |
| A2 | 0.00 | 0.05 | 0.000 | 0.002 |
| A | 0.43 | 0.49 | 0.017 | 0.019 |
| b | 0.22 | 0.28 | 0.009 | 0.011 |
| b1 | 0.15 | 0.25 | 0.006 | 0.010 |
| L | 0.15 | 0.25 | 0.006 | 0.010 |
| D | 1.15 | 1.25 | 0.045 | 0.049 |
| E | 1.15 | 1.25 | 0.045 | 0.049 |
| E1 | 0.75 | 0.85 | 0.030 | 0.033 |
| E2 | 0.33 Ref. | | 0.013 Ref. | |
| e | 0.80 Ref. | | 0.031 Ref. | |
| R | 0.10 Ref. | | 0.004 Ref. | |
| R1 | 0.16 Ref. | | 0.006 Ref. | |
| θ | 6° | 10° | 6° | 10° |



Ordering information

| Device | Package | Reel | Shipping |
|---------------|---------|------|---------------------|
| PNM723T201E0L | SOT-723 | 7" | 10000 / Tape & Reel |

Load with information



Unit:mm

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