

100V P-Channel Enhancement Mode MOSFET

Description

The PECN2P10MR uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and high density cell Design for ultra low on- resistance. This device is suitable for use as a load switch or in PWM applications.

General Features

- ◆ $V_{DS} = -100V$, $I_D = -2A$
 $R_{DS(ON)}(Typ.) = 255m\Omega$ @ $V_{GS} = -10V$
 $R_{DS(ON)}(Typ.) = 280m\Omega$ @ $V_{GS} = -4.5V$
- ◆ High switching speed
- ◆ Improved dv/dt capability
- ◆ Low Gate Charge
- ◆ Low reverse transfer capacitance
- ◆ Lead free in compliance with EU RoHS 2.0

Application

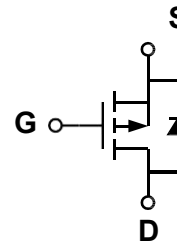
- ◆ PWM applications
- ◆ Load switch

Package

- ◆ SOT-23-3L



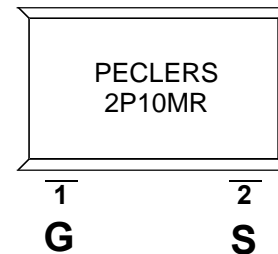
Schematic diagram



Marking and pin assignment

SOT-23-3L
(TOP VIEW)

D
3



Ordering Information

| Part Number | Storage Temperature | Package | Devices Per Reel |
|-------------|---------------------|-----------|------------------|
| PECN2P10MR | -55°C to +150°C | SOT-23-3L | 3000 |

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| parameter | symbol | limit | unit | |
|--|----------|--------------------|------|---|
| Drain-source voltage | V_{DS} | -100 | V | |
| Gate-source voltage | V_{GS} | ±20 | V | |
| Continuous Drain Current | I_D | $T_A = 25^\circ C$ | -2 | A |
| | | $T_A = 70^\circ C$ | -1.5 | |
| Pulsed Drain Current ^C | I_{DM} | -8 | A | |
| Maximum power dissipation ^B | P_D | $T_A = 25^\circ C$ | 1.4 | W |
| | | $T_A = 70^\circ C$ | 0.9 | |
| Operating junction Temperature range | T_j | -55—150 | °C | |

Thermal Characteristics

| Parameter | Symbol | Typ | Max | Unit |
|--|------------------|-----|-----|------|
| Maximum Junction-to-Ambient ^A | R _{θJA} | 70 | 90 | °C/W |
| Maximum Junction-to-Ambient ^{A D} | | 100 | 125 | |
| Maximum Junction-to-Lead ^B | R _{θJL} | 63 | 80 | |

A. The value of R_{θJA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B. The power dissipation P_D is based on T_{J(MAX)}=150°C, using ≤ 10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.

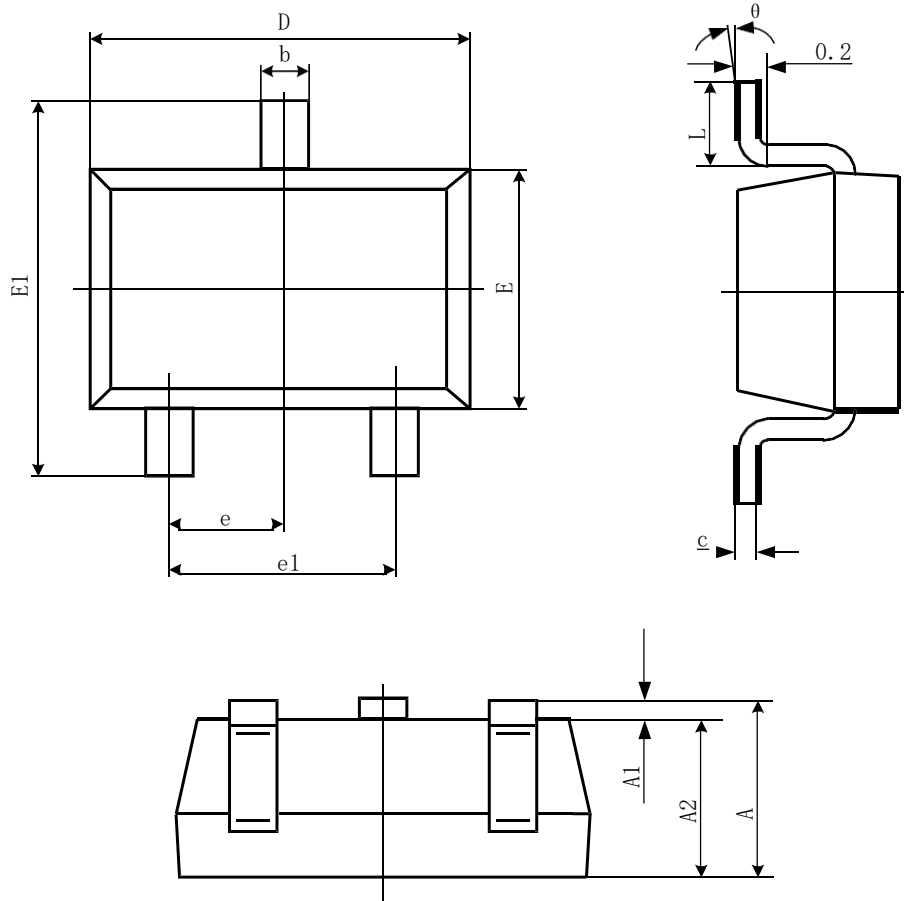
D. The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

Electrical Characteristics (T_A=25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---------------------|--|------|-------|------|------|
| OFF Characteristics | | | | | | |
| Drain-source breakdown voltage | BV _{DSS} | V _{GS} =0V, I _D =-250μA | -100 | - | - | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =-100V, V _{GS} =0V | - | - | 1 | μA |
| Gate-body leakage | I _{GSS} | V _{DS} =0V, V _{GS} =±20V | - | - | ±100 | nA |
| ON Characteristics | | | | | | |
| Gate threshold voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =-250μA | -1.0 | -2.0 | -3.0 | V |
| Drain-source on-state resistance | R _{DS(ON)} | V _{GS} =-10V, I _D =-2A | - | 255 | 325 | mΩ |
| | | V _{GS} =-4.5V, I _D =-1A | | 280 | 350 | |
| Dynamic Characteristics | | | | | | |
| Input capacitance | C _{ISS} | V _{DS} =-50V, V _{GS} =0V f=1.0MHz | - | 900 | - | pF |
| Output capacitance | C _{OSS} | | - | 50 | - | |
| Reverse transfer capacitance | C _{RSS} | | - | 41 | - | |
| Switching Characteristics | | | | | | |
| Turn-on delay time | t _{D(ON)} | V _{DD} =-50V R _L =33 ohm V _{GS} =-10V R _G =6.2ohm | - | 7.1 | - | ns |
| Rise time | t _r | | - | 47 | - | |
| Turn-off delay time | t _{D(OFF)} | | - | 38 | - | |
| Fall time | t _f | | - | 41 | - | |
| Total gate charge | Q _g | V _{DS} =-50V I _D =-2A V _{GS} =-10V | - | 16 | - | nC |
| Gate-source charge | Q _{gs} | | - | 3.5 | - | |
| Gate-drain charge | Q _{gd} | | - | 2.8 | - | |
| DRAIN-SOURCE DIODE CHARACTERISTICS | | | | | | |
| Diode forward voltage | V _{SD} | V _{GS} =0V, I _S =-1A | - | -0.82 | -1.2 | V |

Package Information

- SOT-23-3L



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |