# 20V N-Channel Enhancement Mode MOSFET

## Description

The PECN2060G uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge.It can be used in a wide variety of applications.

## General Features

- $V_{DS}$ =20V $I_D$ =60A
  $R_{DS(ON)}$(Typ.)=4.8mΩ @$V_{GS}$=4.5V
  $R_{DS(ON)}$(Typ.)=6.2mΩ @$V_{GS}$=2.5V
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high $E_{AS}$
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

## Application

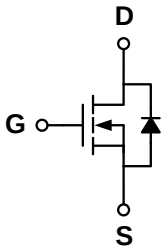
- Automotive applications
- Hard switched and high frequency circuits
- Uninterruptible power supply

## Package

- TO-252-2L

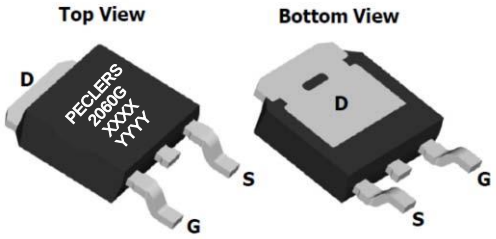
*100% UIS TESTED!*
*100% ΔVds TESTED!*

## Schematic diagram




## Marking and pin assignment

**TO-252-2L**
（Top View）




PECN2060G—Product Name
XXXX—Wafer Lot No.
YYYY—Quality Code

## Ordering Information

| Part Number | Storage Temperature | Package | Devices Per Reel |
|---|---|---|---|
| PECN2060G | -55°C to +150°C | TO-252-2L | 2500 |

## Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

| parameter | | symbol | limit | unit |
|---|---|---|---|---|
| Drain-source voltage | | $V_{DS}$ | 20 | V |
| Gate-source voltage | | $V_{GS}$ | ±12 | V |
| Continuous Drain Current | TC=25°C | $I_D$ | 60 | A |
| | TC=100°C | | 42 | |
| Pulsed Drain Current | | $I_{DP}$ | 210 | A |
| Avalanche energy( L=0.5mH) (note1) | | $E_{AS}$ | 200 | mJ |
| Maximum power dissipation | TC=25°C | $P_D$ | 60 | W |
| Operating junction Temperature range | | Tj | -55—150 | ℃ |

## Electrical Characteristics (TA=25℃ unless otherwise noted)

| Parameter | Symbol | Condition | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | | |
| Drain-source breakdown voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=250μA | | 20 | - | - | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$=20V, $V_{GS}$=0V | $T_J$=25°C | - | - | 1 | μA |
| | | | $T_J$=85°C | - | - | 5 | |
| Gate Leakage Current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±12V | | - | - | ±100 | nA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | | 0.5 | 0.75 | 1.2 | V |
| Drain-source on-state resistance[1] | $R_{DS(ON)}$ | $V_{GS}$=4.5V, $I_D$=60A | | - | 4.8 | 6 | mΩ |
| | | $V_{GS}$=2.5V, $I_D$=40A | | - | 6.2 | 9 | |
| On Status Drain Current | $I_{D(ON)}$ | $V_{DS}$=20V, $V_{GS}$=4.5V | | 60 | - | - | A |
| Gate resistance | $R_G$ | | | | 1.2 | | Ω |
| **Diode Characteristics** | | | | | | | |
| Diode Continuous Forward Current | $I_S$ | | | - | - | 12 | A |
| Reverse Recovery Time | $t_{rr}$ | $I_F$=20A, dI/dt=20A/us | | - | 25 | - | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | | - | 24 | - | nC |
| **Dynamic Characteristics[2]** | | | | | | | |
| Input capacitance | $C_{ISS}$ | $V_{GS}$=0V ,$V_{DS}$=10V f=1.0MHz | | - | 2700 | - | pF |
| Output capacitance | $C_{OSS}$ | | | - | 355 | - | |
| Reverse transfer capacitance | $C_{RSS}$ | | | - | 322 | - | |
| Turn-on delay time | $t_{D(ON)}$ | $V_{GS}$=4.5V, $V_{DD}$=10V, $I_D$=2A | | - | 6.5 | - | ns |
| Turn-on Rise time | tr | | | - | 17 | - | |
| Turn-off delay time | $t_{D(OFF)}$ | | | - | 29.5 | - | |
| Turn-off Fall time | tf | | | - | 17 | - | |
| Total gate charge | $Q_g$ | $V_{GS}$=10V,$I_D$=60A $V_{DS}$=10V | | - | 67 | | nC |
| Gate-source charge | $Q_{gs}$ | | | | 5.2 | | |
| Gate-drain charge | $Q_{gd}$ | | | - | 8.2 | - | |
| **Drain-Source Diode Characteristics** | | | | | | | |
| Diode forward voltage | $V_{SD}$ | $I_{SD}$=10A,$V_{GS}$=0V | | - | 0.8 | 1.2 | V |

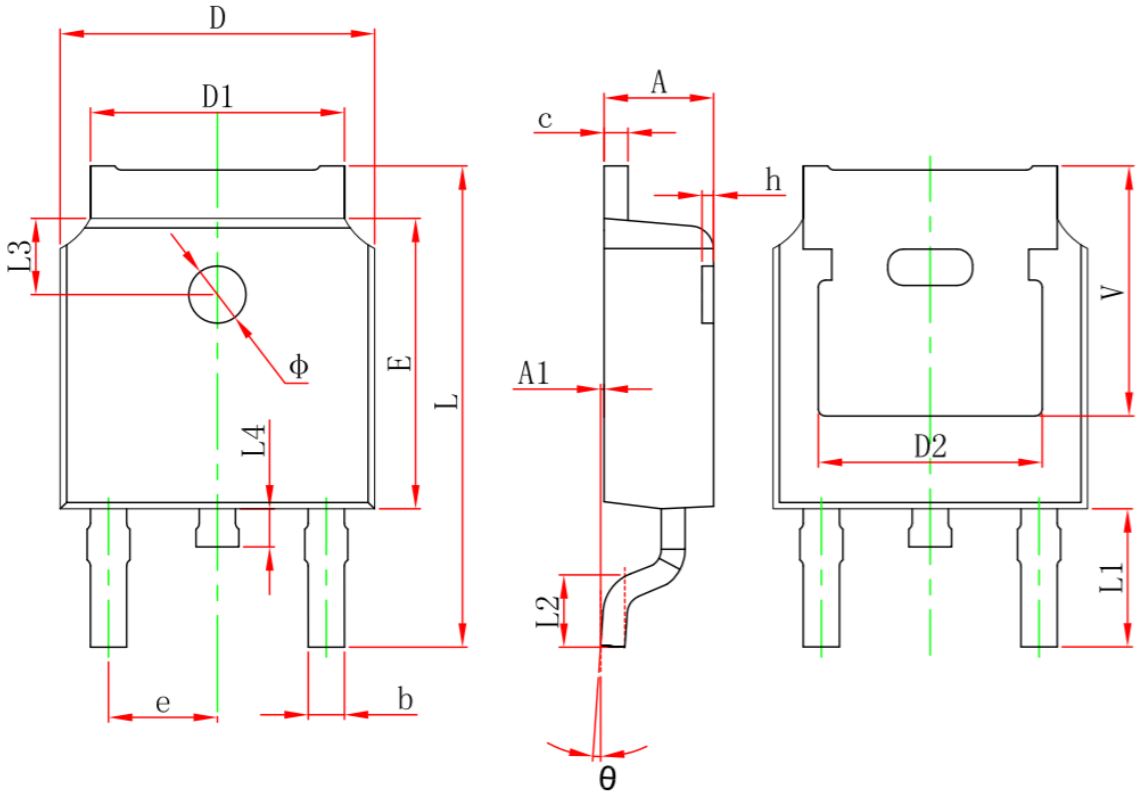
Note: 1：Eas test：VDD=10V，RG=25ohm，L=500uH

2：Pulse test; pulse width ≦ 300ns, duty cycle ≦ 2%.

3：Guaranteed by design, not subject to production testing.

## Package Information

- **TO-252-2L**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| b | 0.660 | 0.860 | 0.026 | 0.034 |
| c | 0.460 | 0.580 | 0.018 | 0.023 |
| D | 6.500 | 6.700 | 0.256 | 0.264 |
| D1 | 5.100 | 5.460 | 0.201 | 0.215 |
| D2 | 4.830 REF. | | 0.190 REF. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.800 | 10.400 | 0.386 | 0.409 |
| L1 | 2.900 REF. | | 0.114 REF. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 REF. | | 0.063 REF. | |
| L4 | 0.600 | 1.000 | 0.024 | 0.039 |
| Φ | 1.100 | 1.300 | 0.043 | 0.051 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| V | 5.350 REF. | | 0.211 REF. | |