

40V Dual N-Channel Enhancement Mode MOSFET

Description

The PECN4884 uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge.

This device is suitable for high side switch in SMPS and general purpose applications.

General Features

- ◆ $V_{DS} = 40V, I_D = 7A$
 $R_{DS(ON)} = 19m\Omega$ (typical) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 22m\Omega$ (typical) @ $V_{GS} = 4.5V$
- ◆ Excellent gate charge x $R_{DS(ON)}$ product(FOM)
- ◆ Very low on-resistance $R_{DS(ON)}$
- ◆ 150 °C operating temperature
- ◆ Pb-free lead plating
- ◆ 100% UIS tested

Application

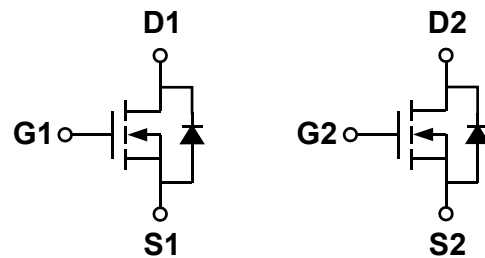
- ◆ DC/DC Converter
- ◆ Ideal for high-frequency switching and synchronous rectification

Package

- ◆ SOP-8

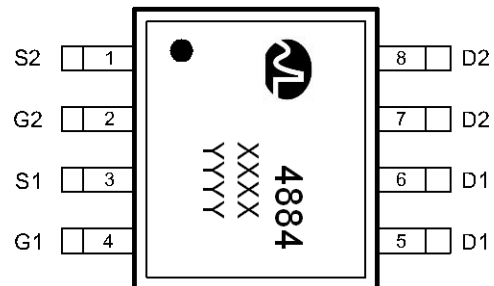
100% UIS TESTED!
100% ΔV_{ds} TESTED!

Schematic diagram



Marking and pin assignment

SOP-8
(TOP VIEW)



Note: XXXX is the date code , YYYY is the Quality Code



Ordering Information

| Part Number | Storage Temperature | Package | Devices Per Reel |
|--------------|---------------------|---------|------------------|
| PECN4884SR-G | -55°C to +150°C | SOP-8 | 4000 |

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

| parameter | symbol | limit | unit | |
|--|----------|--------------------|------|---|
| Drain-source voltage | V_{DS} | 40 | V | |
| Gate-source voltage | V_{GS} | ± 20 | V | |
| Drain Current-Continuous (Silicon Limited) | I_D | $T_A = 25^\circ C$ | 7 | A |
| | | $T_A = 75^\circ C$ | 5 | |
| Pulsed Drain Current (Package Limited) | I_{DM} | 28 | A | |
| Single pulse avalanche energy | E_{AS} | 25 | mJ | |
| Maximum power dissipation | P_D | $T_A = 25^\circ C$ | 3 | W |
| | | $T_A = 75^\circ C$ | 2.1 | |

| | | | |
|--------------------------------------|----------------|---------|----|
| Operating junction Temperature range | T _j | -55—150 | °C |
|--------------------------------------|----------------|---------|----|

Electrical Characteristics (TA=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 | 40 | - | - | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =40V, 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 | 1.2 | 1.9 | 2.5 | V |
| Drain-source on-state resistance | R _{DS(ON)} | V _{GS} =10V, I _D =7A | - | 19 | 22 | mΩ |
| | | V _{GS} =4.5V, I _D =6A | - | 22 | 21 | |
| Forward transconductance | g _{fs} | V _{DS} =5V, I _D =7A | - | 50 | - | S |
| Dynamic Characteristics | | | | | | |
| IPECNut capacitance | C _{ISS} | V _{DS} =20V, V _{GS} =0V f=1.0MHz | - | 1500 | - | pF |
| Output capacitance | C _{OSS} | | - | 215 | - | |
| Reverse transfer capacitance | C _{RSS} | | - | 135 | - | |
| Gate resistance | R _g | V _{GS} =0V, V _{DS} =0V, f=1.0MHz | - | 3.5 | - | Ω |
| Switching Characteristics | | | | | | |
| Turn-on delay time | t _{D(ON)} | V _{DS} =20V V _{GS} =10V R _L =2Ω R _{GEN} =3Ω | - | 6.4 | - | ns |
| Rise time | t _r | | - | 17.2 | - | |
| Turn-off delay time | t _{D(OFF)} | | - | 29.6 | - | |
| Fall time | t _f | | - | 16.8 | - | |
| Total gate charge | Q _g | V _{DS} =20V, I _D =7A V _{GS} =10V | - | 27.2 | - | nC |
| Gate-source charge | Q _{gs} | | - | 4.5 | - | |
| Gate-drain charge | Q _{gd} | | - | 6.4 | - | |

Thermal Characteristics

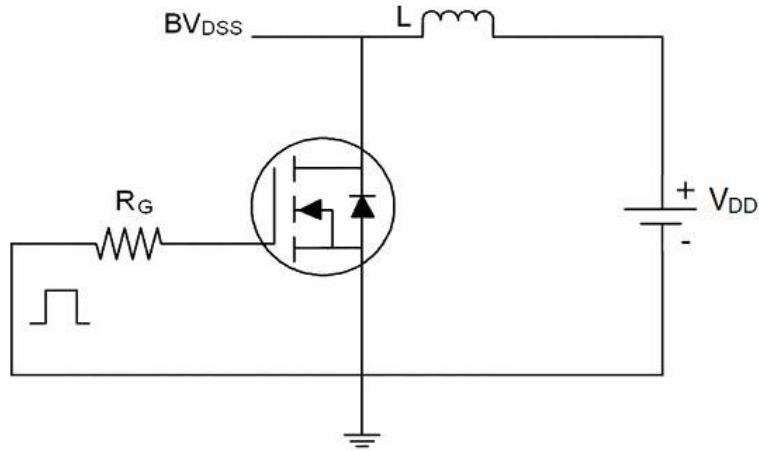
| Parameter | Symbol | Typ | Max | Unit |
|--|------------------|--------------|-----|------|
| Maximum Junction-to-Ambient ^A | R _{θJA} | 33 | 40 | °C/W |
| Maximum Junction-to-Ambient ^A | | Steady-State | 59 | |
| Maximum Junction-to-Lead ^B | R _{θJC} | 16 | 24 | |

A: The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application device depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

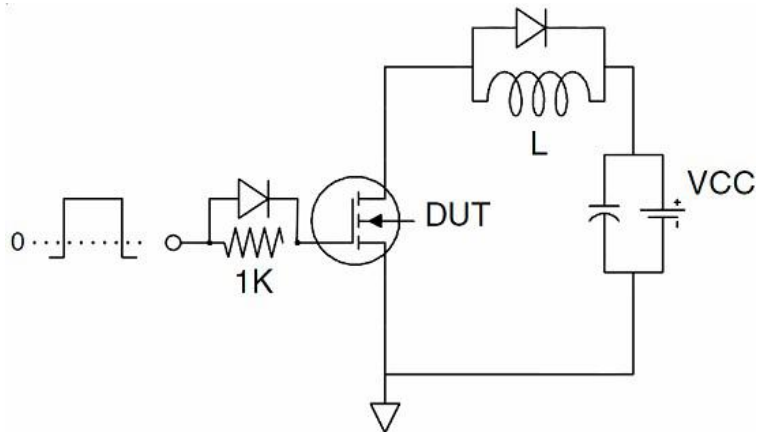
B: The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJC} and lead to ambient.

Test Circuit:

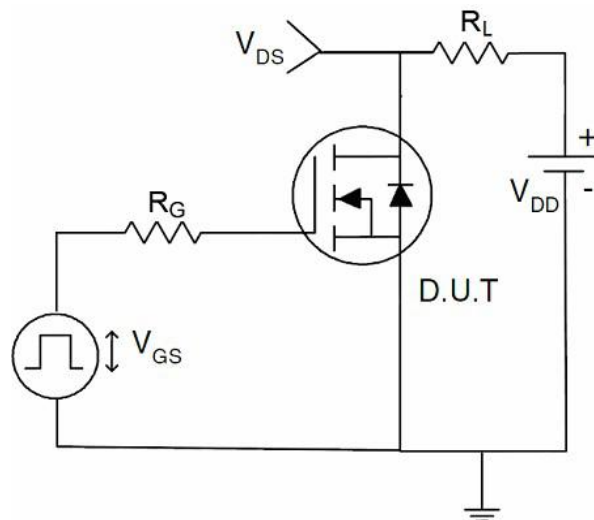
1 、 EAS Test Circuit



2 、 Gate Charge Test Circuit

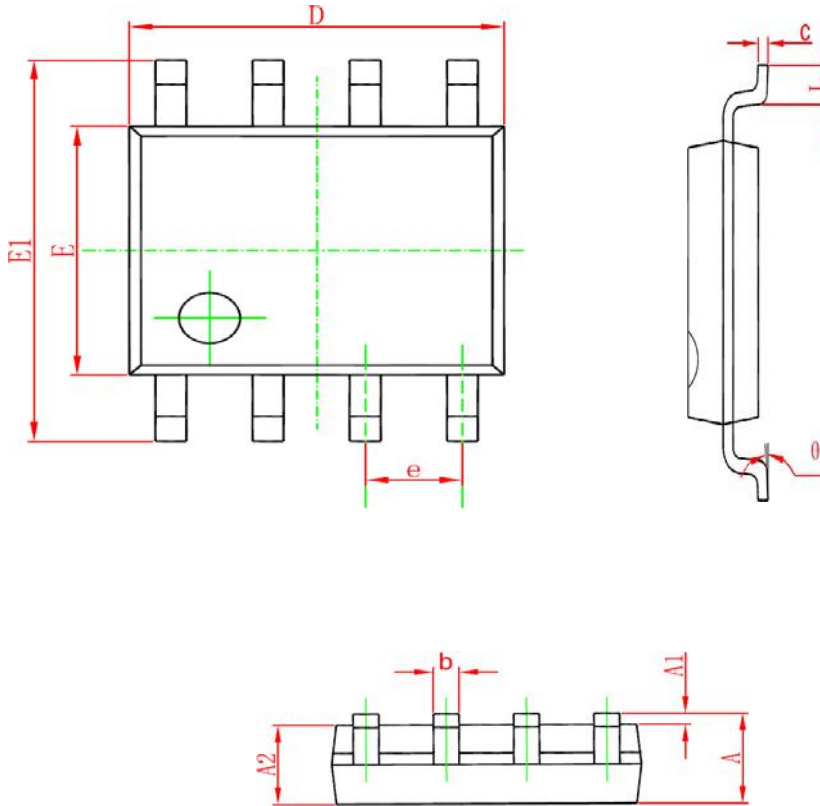


3 、 Switch Time Test Circuit



Package Information

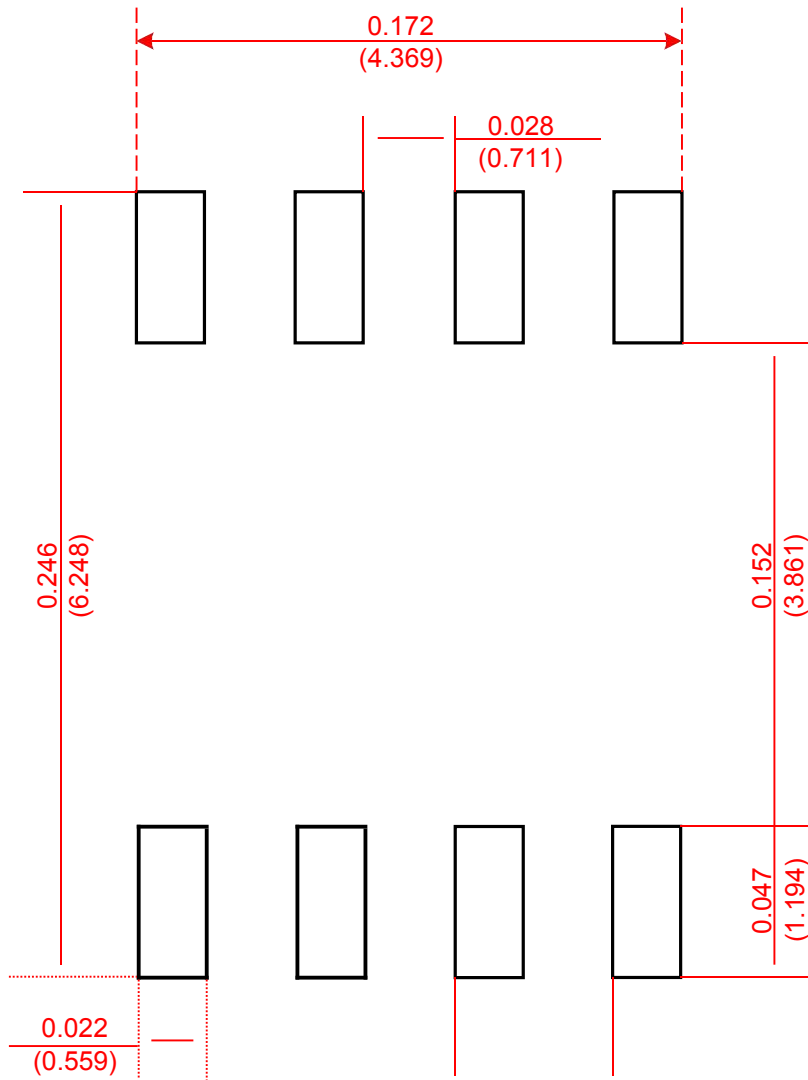
- SOP-8



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.100 | 0.250 | 0.004 | 0.010 |
| A2 | 1.350 | 1.550 | 0.053 | 0.061 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.170 | 0.250 | 0.006 | 0.010 |
| D | 4.700 | 5.100 | 0.185 | 0.200 |
| E | 3.800 | 4.000 | 0.150 | 0.157 |
| E1 | 5.800 | 6.200 | 0.228 | 0.244 |
| e | 1.270 (BSC) | | 0.050 (BSC) | |
| L | 0.400 | 1.270 | 0.016 | 0.050 |
| θ | 0° | 8° | 0° | 8° |

Recommended Minimum Pads

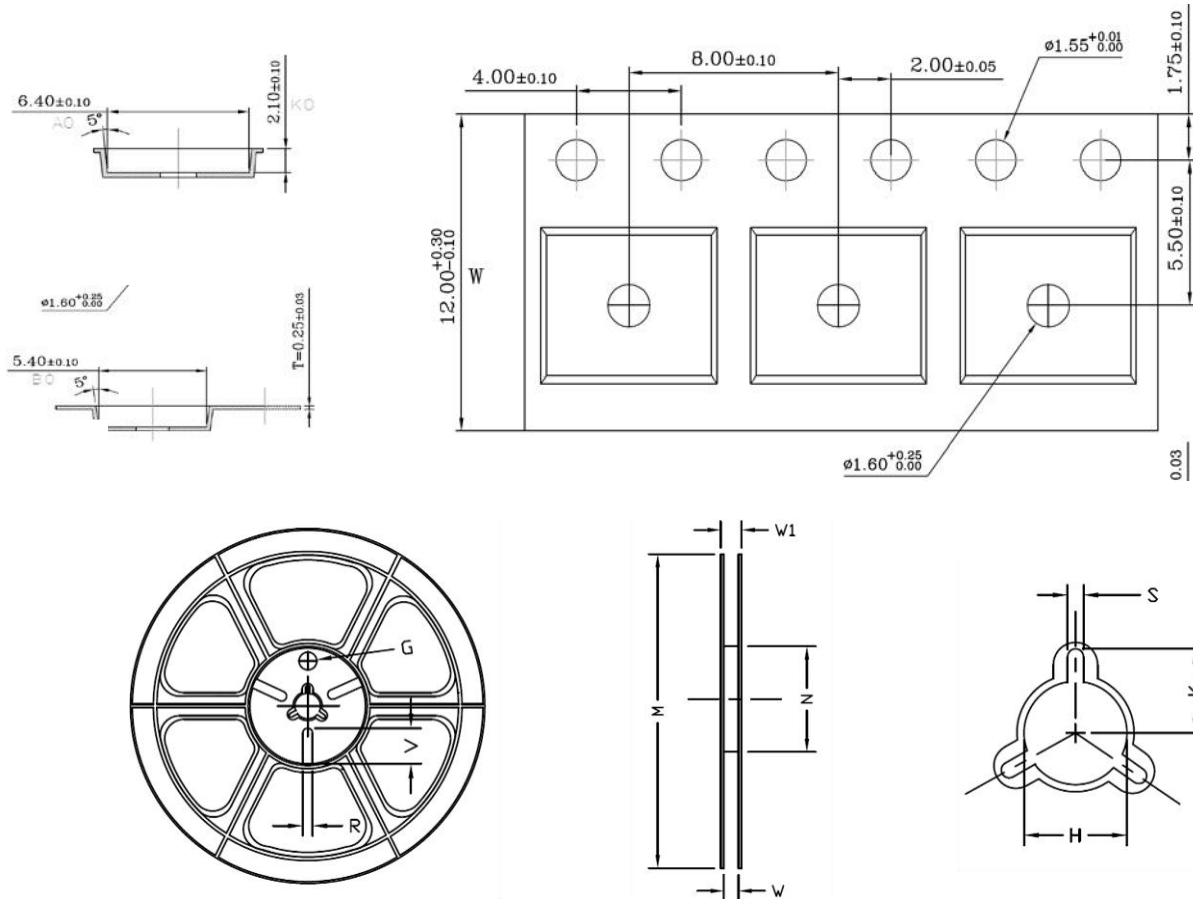
- SOP-8



Recommended Minimum Pads
Dimensions in Inches/(mm)

Tape and Reel

- SOP-8



| Tape Size | Reel Size | M | N | W | W1 | H | K | S | G | R | V |
|-----------|-----------|------------------|-----------------|----------------|----------------|----------------|------|---------------|---|---|---|
| 12mm | Φ330 | Φ330.00 ±0.50 | Φ97.00 ±0.30 | 13.00 ±0.30 | 17.40 ±1.00 | Φ13.00 ±0.5 | 10.6 | 2.00 ±0.50 | — | — | — |

