

## 30V Dual P-Channel Enhancement Mode MOSFET

### Description

The NP4805 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a load switch or in PWM applications.

### General Features

- ◆  $V_{DS} = -30V$ ,  $I_D = -8A$   
 $R_{DS(ON)}(Typ.) = 17.5m\Omega$  @  $V_{GS} = -4.5V$   
 $R_{DS(ON)}(Typ.) = 16.5m\Omega$  @  $V_{GS} = -10V$
- ◆ High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

### Application

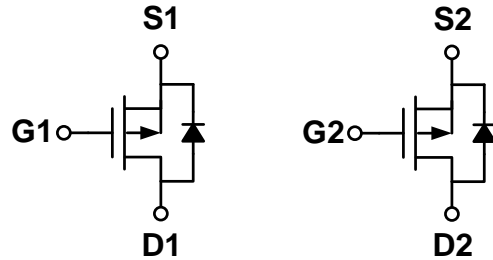
- ◆ PWM applications
- ◆ Load switch

### Package

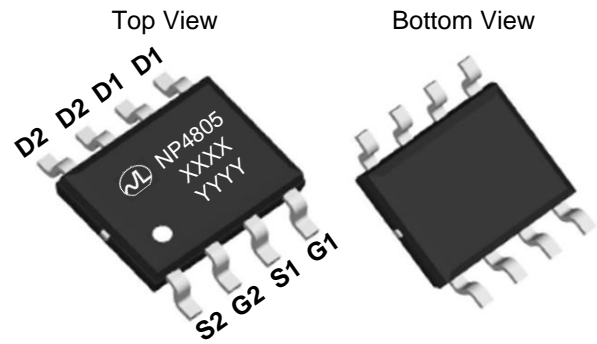
- ◆ SOP-8

*100% UIS TESTED!*  
*100%  $\Delta V_{ds}$  TESTED!*

### Schematic diagram



### Marking and pin assignment



XXXX—Wafer Information

YYYY—Quality Traceability Code.



### Ordering Information

| Part Number | Storage Temperature | Package | Devices Per Reel |
|-------------|---------------------|---------|------------------|
| NP4805SR-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                       | $V_{DS}$ | -30                | V    |   |
| Gate-source voltage                        | $V_{GS}$ | $\pm 20$           | V    |   |
| Drain Current-Continuous (Silicon Limited) | $I_D$    | $T_A = 25^\circ C$ | -8   | A |
|  |          | $T_A = 75^\circ C$ | -6   |   |
| Pulsed Drain Current (Package Limited)     | $I_{DM}$ | -32                | A    |   |
| Maximum power dissipation                  | $P_D$    | $T_A = 25^\circ C$ | 2    | W |
|  |          | $T_A = 75^\circ C$ | 1.3  |   |
| Operating junction Temperature range       | $T_j$    | -55—150            | °C   |   |

**Electrical Characteristics** (TA=25°C unless otherwise noted)

| Parameter                                     | Symbol       | Condition   | Min  | Typ  | Max       | Unit       |
|---|--------------|---|------|------|-----------|------------|
| <b>Static Characteristics</b>                 |              |   |      |      |           |            |
| Drain-source breakdown voltage                | $BV_{DSS}$   | $V_{GS}=0V, I_D=-250\mu A$  | -30  | -    | -         | V          |
| Zero gate voltage drain current               | $I_{DSS}$    | $V_{DS}=-30V, V_{GS}=0V$  | -    | -    | 1         | $\mu A$    |
|   |              | $T_J=85^\circ C$  | -    | -    | 30        |            |
| Gate Leakage Current                          | $I_{GSS}$    | $V_{DS}=0V, V_{GS}=\pm 20V$   | -    | -    | $\pm 100$ | nA         |
| Gate threshold voltage                        | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$                                      | -1.2 | -1.6 | -2.5      | V          |
| Drain-source on-state resistance <sup>1</sup> | $R_{DS(on)}$ | $V_{GS}=-10V, I_D=-8A$  | -    | 16.5 | 20        | m $\Omega$ |
|   |              | $V_{GS}=-4.5V, I_D=-7A$   | -    | 17.5 | 25        |            |
| On Status Drain Current                       | $I_{D(ON)}$  | $V_{DS}=-15V, V_{GS}=-10V$  | 8    | -    | -         | A          |
| <b>Diode Characteristics</b>                  |              |   |      |      |           |            |
| Diode Forward Voltage                         | $V_{SD}$     | $I_{SD}=-8A, V_{GS}=0V$   | -    | -0.8 | -1.3      | V          |
| Diode Continuous Forward Current              | $I_S$        |   | -    | -8   | -         | A          |
| Reverse Recovery Time                         | $t_{rr}$     | $I_F=-8A,$<br>$di/dt=-100A/\mu s$                                   | -    | 24   | -         | ns         |
| Reverse Recovery Charge                       | $Q_{rr}$     |   | -    | 16   | -         | nC         |
| <b>Dynamic Characteristics</b>                |              |   |      |      |           |            |
| Gate Resistance                               | $R_G$        | $V_{GS}=0V, V_{DS}=0V, f=1MHz$                                      | -    | 0.65 | -         | $\Omega$   |
| Input capacitance                             | $C_{ISS}$    | $V_{GS}=0V, V_{DS}=-15V$<br>$f=1.0MHz$                              | -    | 1360 | -         | pF         |
| Output capacitance                            | $C_{OSS}$    |   | -    | 250  | -         |            |
| Reverse transfer capacitance                  | $C_{RSS}$    |   | -    | 210  | -         |            |
| Turn-on delay time                            | $t_{D(ON)}$  | $V_{GS}=-10V, V_{DD}=-30V,$<br>$R_L=3\Omega, I_D=1A, R_G=2.5\Omega$ | -    | 9    | -         | ns         |
| Turn-on Rise time                             | $t_r$        |   | -    | 10   | -         |            |
| Turn-off delay time                           | $t_{D(OFF)}$ |   | -    | 50   | -         |            |
| Turn-off Fall time                            | $t_f$        |   | -    | 20   | -         |            |
| Total gate charge                             | $Q_g$        | $V_{GS}=-10V, I_D=-8A$<br>$V_{DS}=-15V$                             | -    | 31   | -         | nC         |
| Gate-source charge                            | $Q_{gs}$     |   | -    | 3    | -         |            |
| Gate-drain charge                             | $Q_{gd}$     |   | -    | 9    | -         |            |

**Thermal Characteristics**

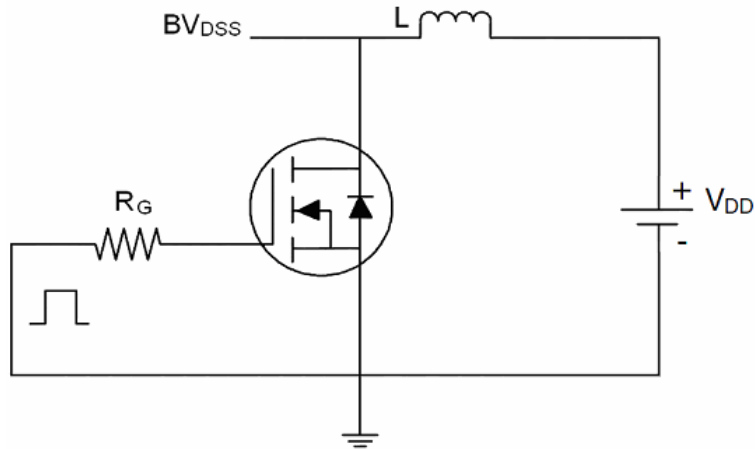
| Parameter                                | Symbol       | Typ | Max | Unit         |
|--|--------------|-----|-----|--------------|
| Maximum Junction-to-Ambient <sup>A</sup> | $\leq 10s$   | 33  | 40  | $^\circ C/W$ |
| Maximum Junction-to-Ambient <sup>A</sup> | Steady-State |     |     |              |
| Maximum Junction-to-Lead <sup>B</sup>    | Steady-State | 16  | 24  |              |

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

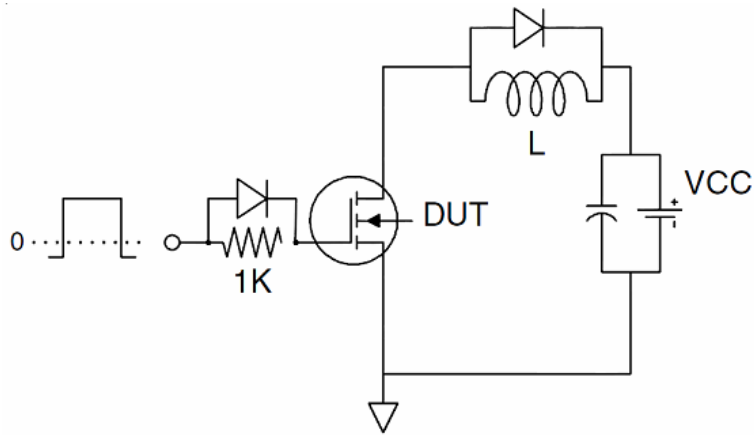
B: The  $R_{qJA}$  is the sum of the thermal impedance from junction to lead  $R_{qJL}$  and lead to ambient.

**Test Circuit:**

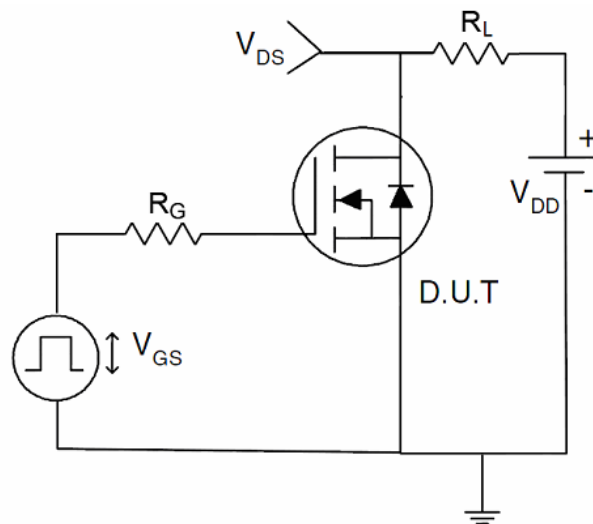
(1)、EAS Test Circuit



(2)、Gate Charge Test Circuit

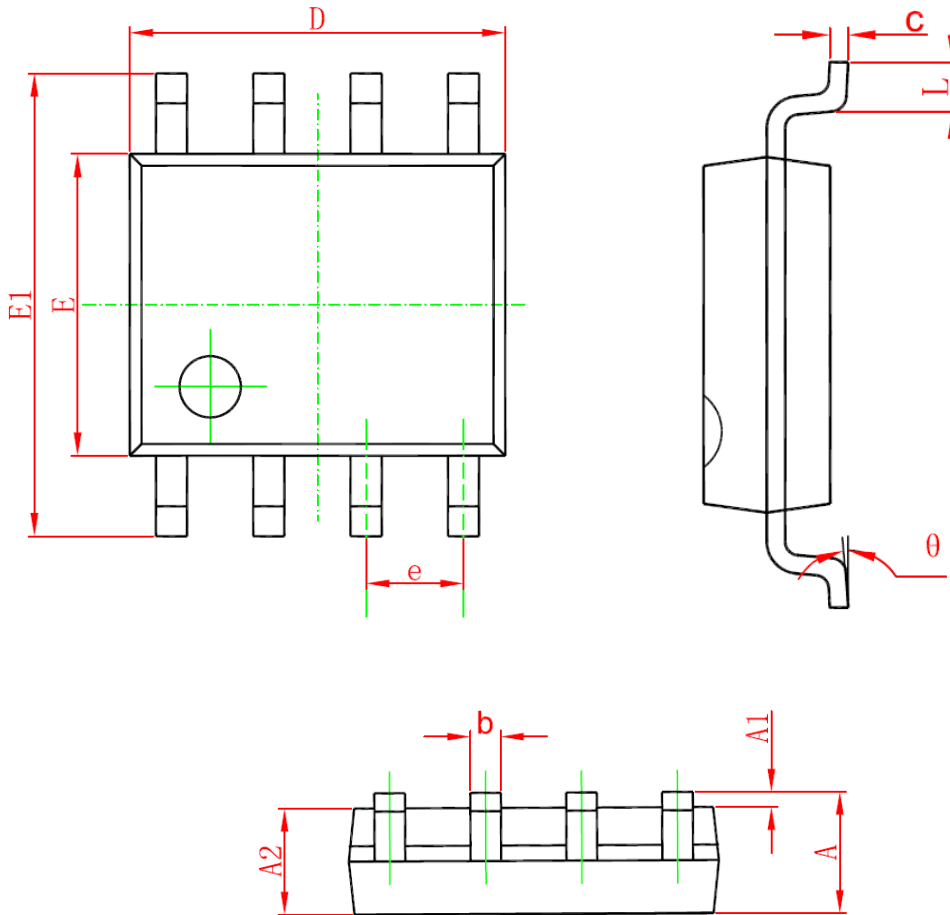


(3)、Switch Time Test Circuit



## Package Information

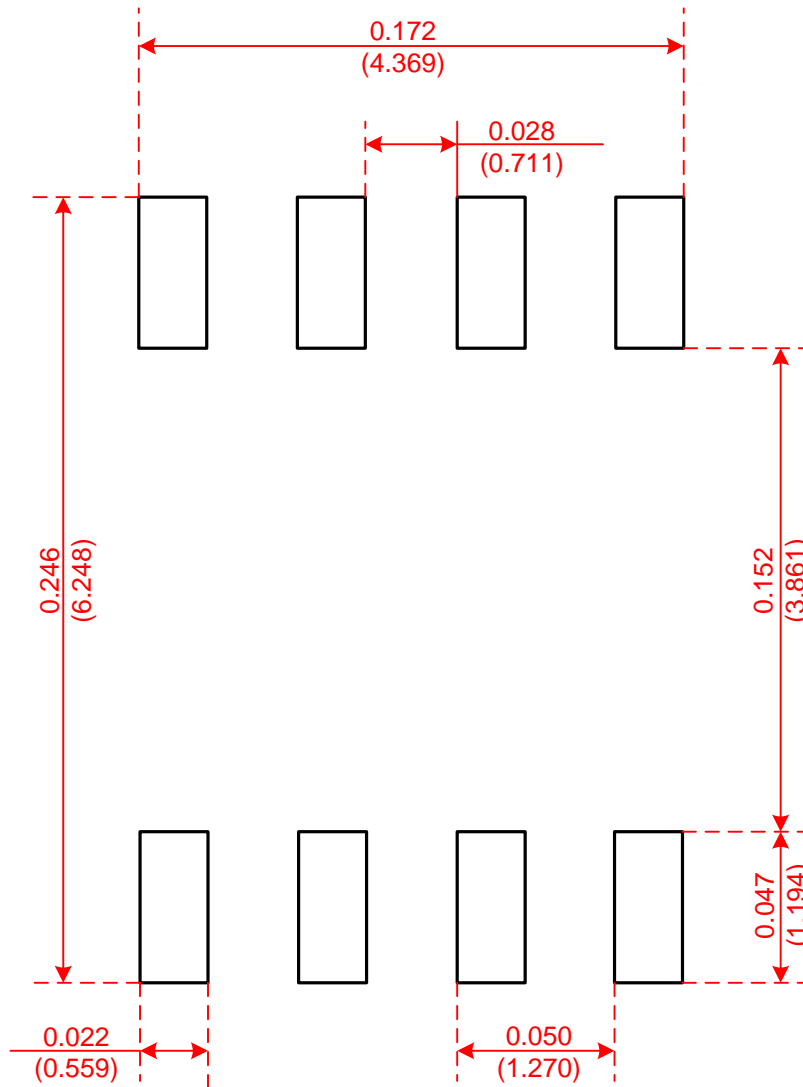
- SOP-8



| 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

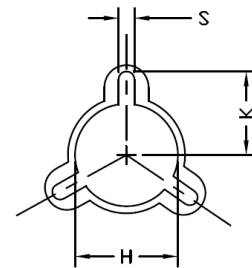
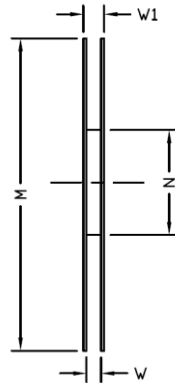
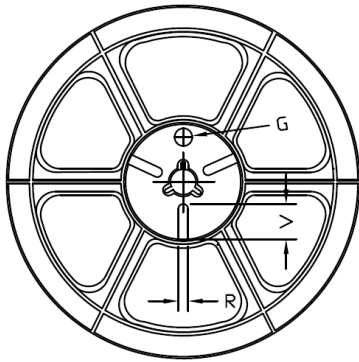
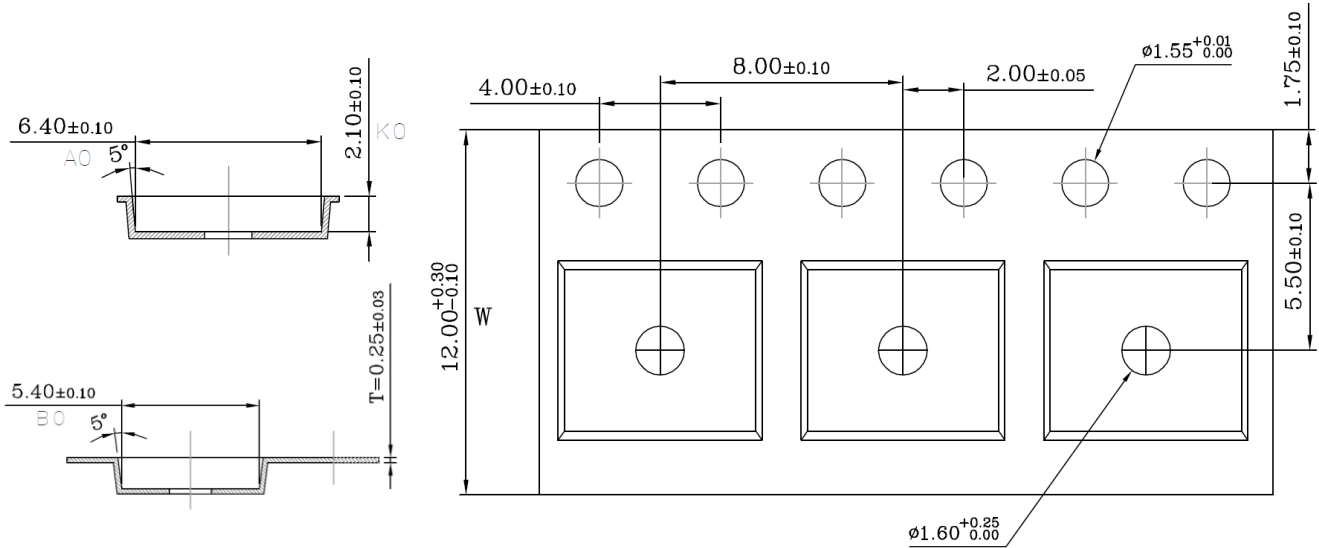
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Recommended Minimum Pads  
Dimensions in Inches/(mm)

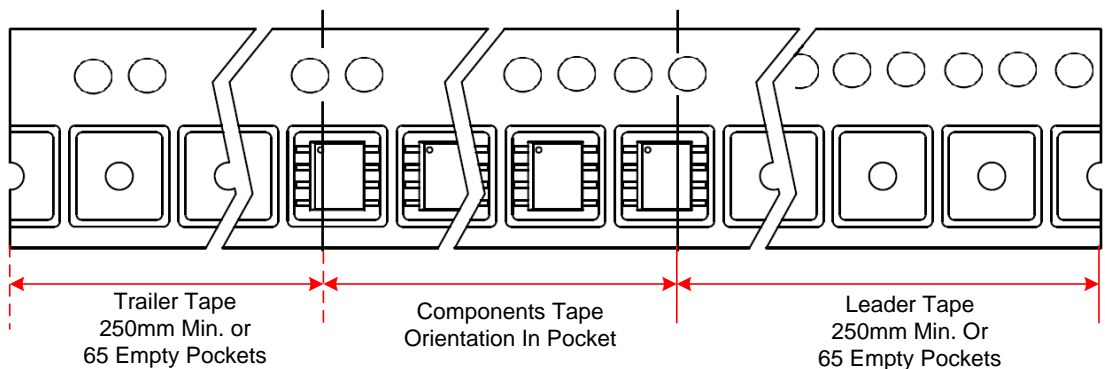
## Tape and Reel

- SOP-8



| Tape Size | Reel Size  | M                           | N                          | W                     | W1                    | H                         | K      | S                    | G | R | V |
|-----------|------------|-----------------------------|----------------------------|-----------------------|-----------------------|---------------------------|--------|----------------------|---|---|---|
| 12mm      | $\phi 330$ | $\phi 330.00$<br>$\pm 0.50$ | $\phi 97.00$<br>$\pm 0.30$ | $13.00$<br>$\pm 0.30$ | $17.40$<br>$\pm 1.00$ | $\phi 13.00$<br>$\pm 0.5$ | $10.6$ | $2.00$<br>$\pm 0.50$ | — | — | — |

Unit Per Reel:  
4000pcs



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