# 60V Dual N-Channel Enhancement Mode MOSFET

## Description

The NP4822SR 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

- $V_{DS}$ =60V,$I_D$ =9A
  $R_{DS(ON)}$=11.5mΩ (typical) @ $V_{GS}$=10V
  $R_{DS(ON)}$=15mΩ (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

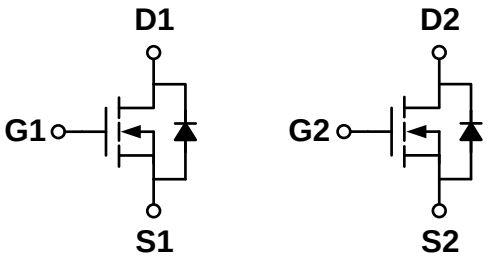
## Application

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

## Package

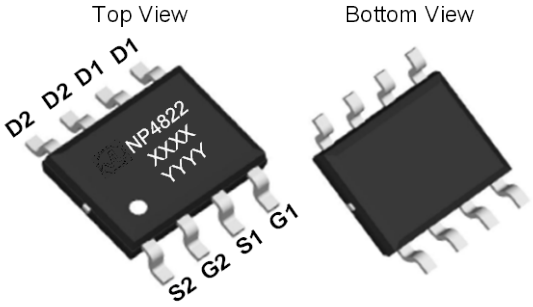
- SOP-8

## Schematic diagram




## Marking and pin assignment

SOP-8




XXXX—Wafer Information

YYYY—Quality Code

## Ordering Information

| Part Number | Storage Temperature | Package | Devices Per Reel |
|---|---|---|---|
| NP4822SR-G | -55°C to +150°C | SOP-8 | 4000 |

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

| parameter | | symbol | limit | unit |
|---|---|---|---|---|
| Drain-source voltage | | $V_{DS}$ | 60 | V |
| Gate-source voltage | | $V_{GS}$ | ±20 | V |
| Drain Current-Continuous (Silicon Limited) | $T_A$=25°C | $I_D$ | 9 | A |
| | $T_A$=75°C | | 7 | |
| Pulsed Drain Current (Package Limited) | | $I_{DM}$ | 32 | A |
| Single pulse avalanche energy (L=0.5mH) | | $E_{AS}$ | 150 | mJ |
| Maximum power dissipation | $T_A$=25°C | $P_D$ | 2 | W |
| | $T_A$=75°C | | 1.3 | |
| Operating junction Temperature range | | Tj | -55—150 | ℃ |

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

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **OFF Characteristics** | | | | | | |
| Drain-source breakdown voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=250μA | 60 | - | - | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$=60V, $V_{GS}$=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 | 1.8 | 2.5 | V |
| Drain-source on-state resistance | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=9A | - | 11.5 | 17 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=6A | - | 15 | 20 | |
| Forward transconductance | gfs | $V_{DS}$=5V, $I_D$=8A | 18 | - | - | S |
| **Dynamic Characteristics** | | | | | | |
| Input capacitance | $C_{ISS}$ | $V_{DS}$=30V ,$V_{GS}$=0V f=1.0MHz | - | 1100 | - | pF |
| Output capacitance | $C_{OSS}$ | | - | 292 | - | |
| Reverse transfer capacitance | $C_{RSS}$ | | - | 23 | - | |
| Gate resistance | Rg | f=1.0MHz | - | 1.85 | 5 | Ω |
| **Switching Characteristics** | | | | | | |
| Turn-on delay time | $t_{D(ON)}$ | $V_{DS}$=30V $V_{GS}$=10V $R_L$=1Ω $R_{GEN}$=3Ω | - | 7 | - | ns |
| Rise time | tr | | - | 5.5 | - | |
| Turn-off delay time | $t_{D(OFF)}$ | | - | 29 | - | |
| Fall time | tf | | - | 4.5 | - | |
| Total gate charge | Qg | $V_{DS}$=30V,$I_D$=9A $V_{GS}$=10V | - | 20 | - | nC |
| Gate-source charge | Qgs | | - | 3.6 | - | |
| Gate-drain charge | Qgd | | - | 3.4 | - | |

## Thermal Characteristics

| Parameter | | Symbol | Typ | Max | Unit |
|---|---|---|---|---|---|
| Maximum Junction-to-Ambient[A] | ≤ 10s | $R_{θJA}$ | 33 | 40 | ℃/W |
| Maximum Junction-to-Ambient[A] | Steady-State | | 59 | 75 | |
| Maximum Junction-to-Lead[B] | Steady-State | $R_{θJC}$ | 16 | 24 | |

A:The value of R qJA is measured with the device mounted on 1in 2 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. The current rating is based on the t ≤ 10s thermal resistance rating.

B: The R qJA is the sum of the thermal impedence from junction to lead R qJL and lead to ambient.

## Typical Performance Characteristics

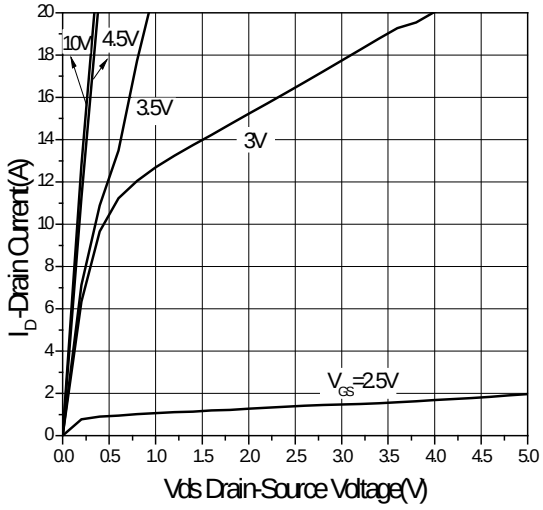



**Fig1 Output Characteristics**

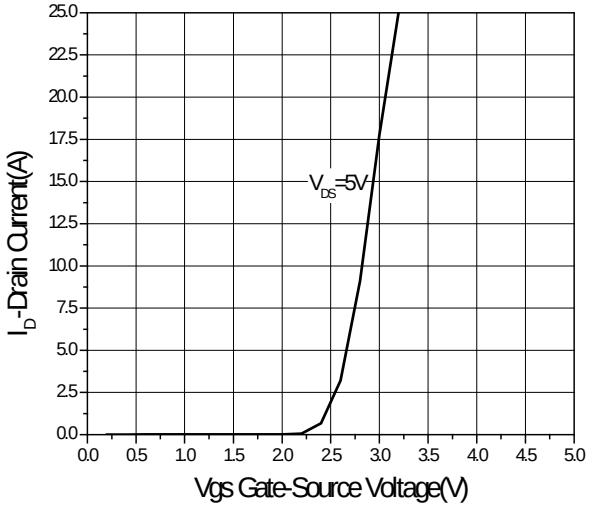



**Fig2 Transfer Characteristics**

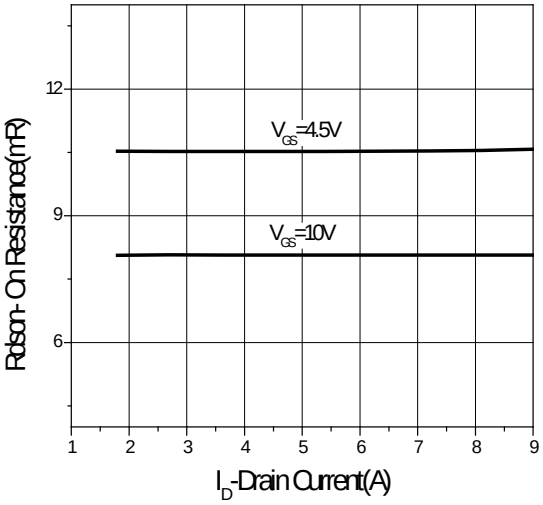



**Fig3 Rdson-Drain current**

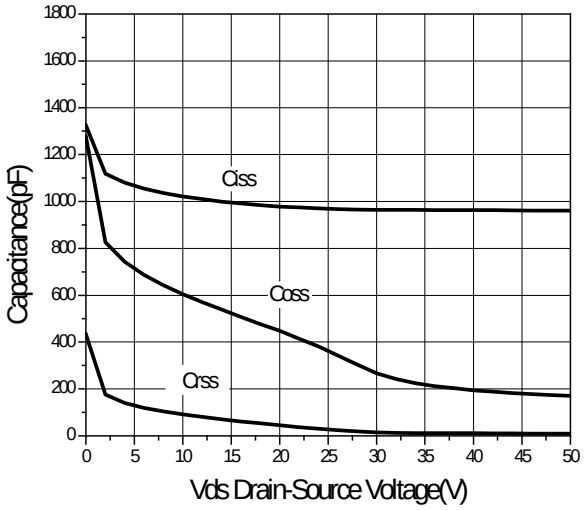



**Fig4 Capacitance vs Vds**

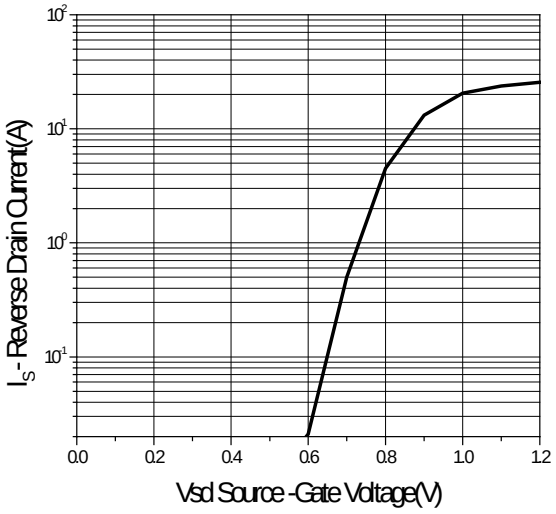



**Fig5 Source-Drain Diode Forward**

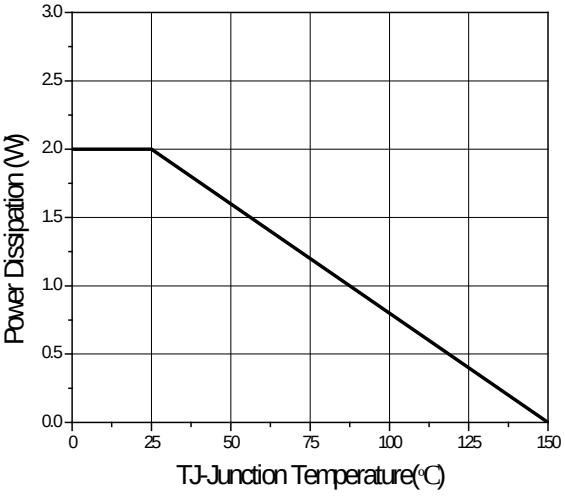



**Fig6 Power De-rating**

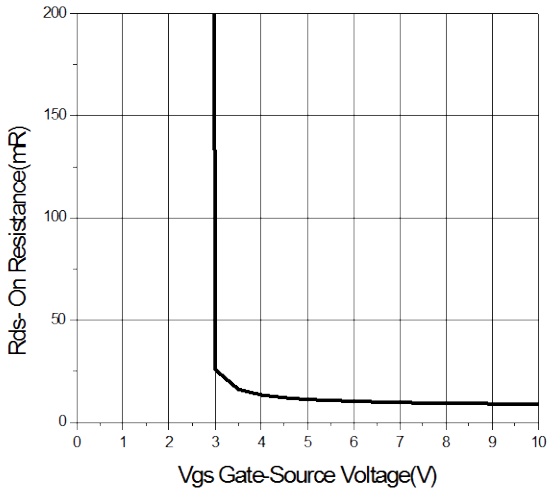



Fig7 Rdson-Gate Drain voltage

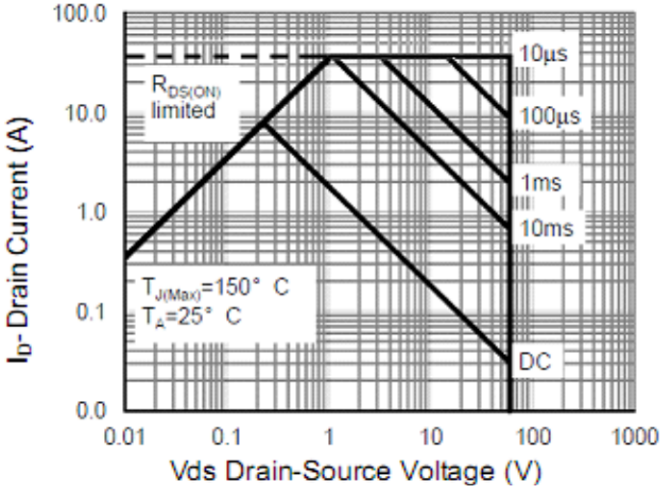



Fig8 Safe Operation Area

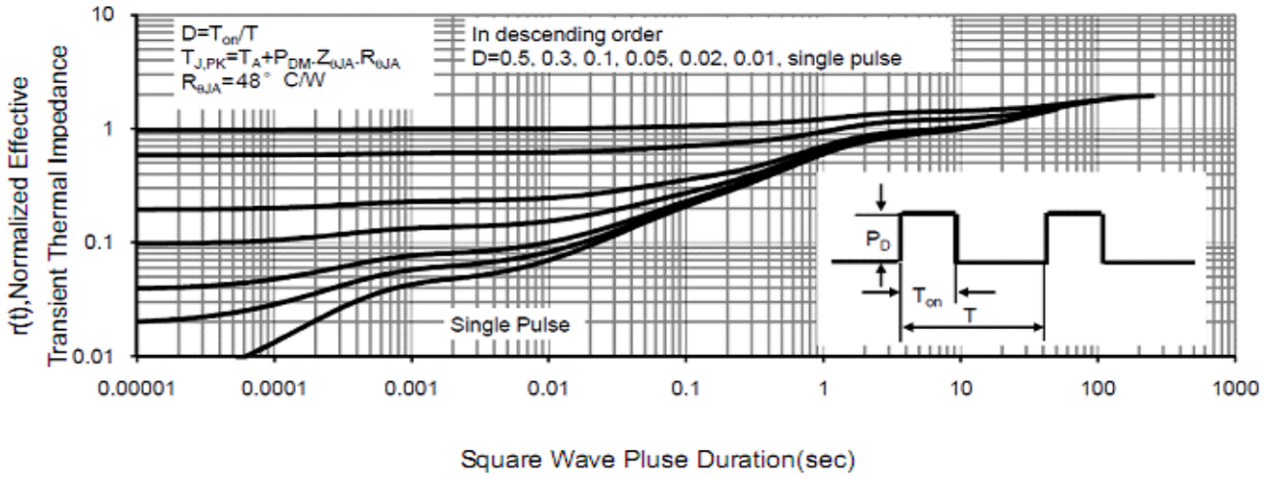
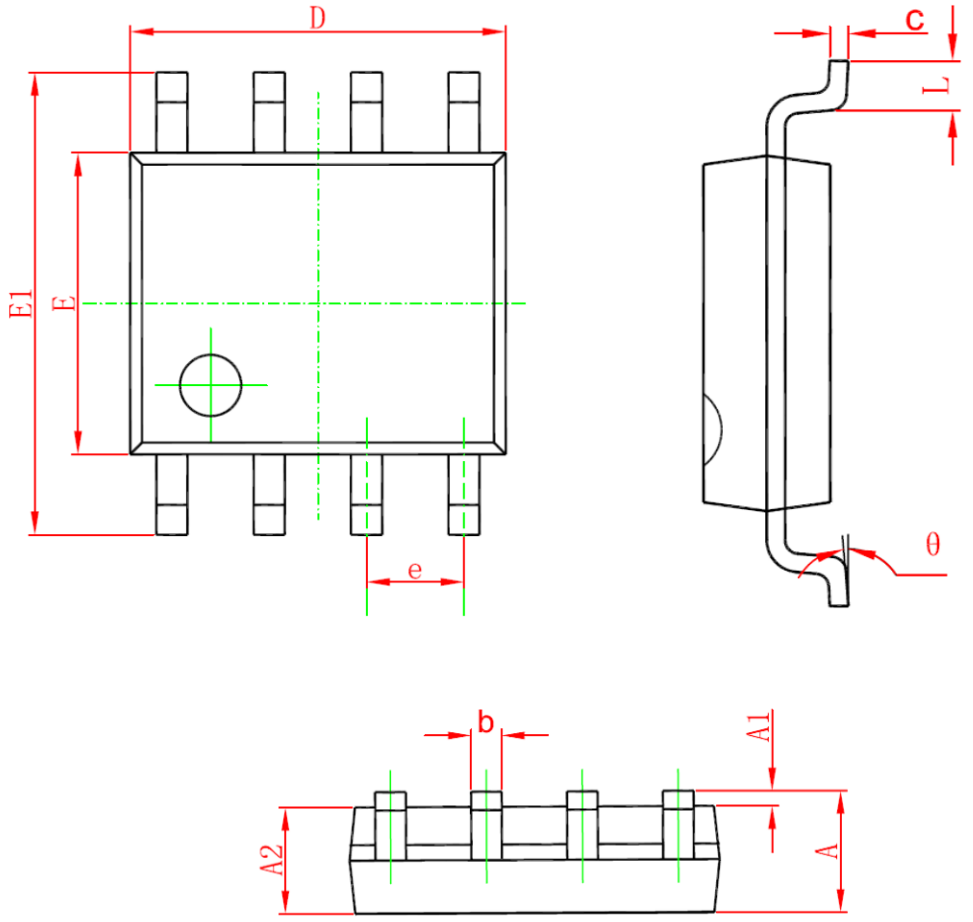



Fig9 Normalized maximum Transient Thremal Impedance

## Package Information

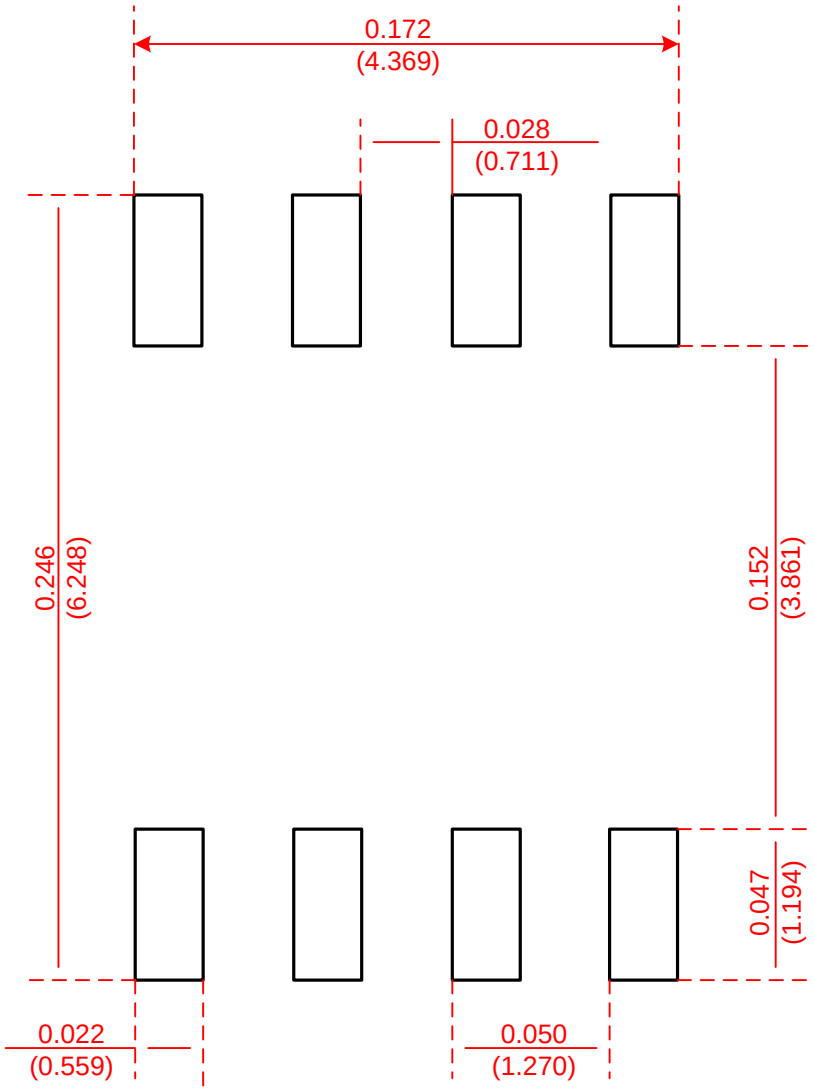
- **SOP-8**




| 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)**