

Description

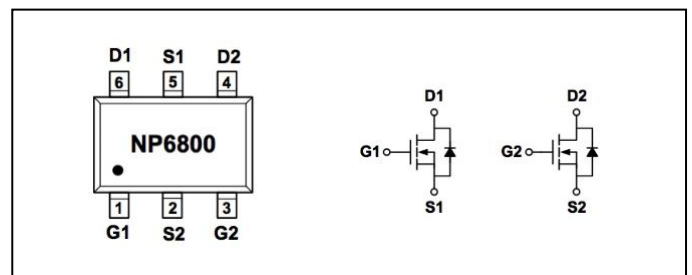
The HSW6800 is the high cell density trenched N-ch MOSFETs, which provides excellent R_{DS(ON)} and efficiency for most of the small power switching and load switch applications.

The HSW6800 meet the RoHS and Green Product requirement with full function reliability approved.

- Green Device Available
- Super Low Gate Charge
- Excellent C_{dv/dt} effect decline
- Advanced high cell density Trench technology

Product Summary

| | | |
|-------------------------|----|----|
| V _{DS} | 30 | V |
| R _{DS(ON),max} | 45 | mΩ |
| I _D | 4 | A |

SOT23-6L Pin Configuration

Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|--------------------------------------|---|------------|-------|
| V _{DS} | Drain-Source Voltage | 30 | V |
| V _{GS} | Gate-Source Voltage | ±12 | V |
| I _D @T _A =25°C | Continuous Drain Current, V _{GS} @ 4.5V ₁ | 4 | A |
| I _D @T _A =70°C | Continuous Drain Current, V _{GS} @ 4.5V ₁ | 3 | A |
| I _{DM} | Pulsed Drain Current ₂ | 16 | A |
| P _D @T _A =25°C | Total Power Dissipation ₃ | 1.4 | W |
| T _{STG} | Storage Temperature Range | -55 to 150 | °C |
| T _J | Operating Junction Temperature Range | -55 to 150 | °C |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|------------------|--|------|------|------|
| R _{θJA} | Thermal Resistance Junction-ambient ¹ | --- | 90 | °C/W |

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|--|---|------|-------|------|-------|
| B _V DSS | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250uA | 30 | --- | --- | V |
| ΔB _V DSS/ΔT _J | BVDSS Temperature Coefficient | Reference to 25°C, I _D =1mA | --- | 0.029 | --- | V/°C |
| R _{DS(ON)} | Static Drain-Source On-Resistance ² | V _{GS} =4.5V, I _D =4A | --- | 32 | 45 | mΩ |
| | | V _{GS} =2.5V, I _D =3A | --- | 45 | 60 | |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250uA | 0.6 | 0.9 | 1.3 | V |
| ΔV _{GS(th)} | V _{GS(th)} Temperature Coefficient | | --- | -2.82 | --- | mV/°C |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =24V, V _{GS} =0V, T _J =25°C | --- | --- | 1 | uA |
| | | V _{DS} =24V, V _{GS} =0V, T _J =55°C | --- | --- | 5 | |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±12V, V _{DS} =0V | --- | --- | ±100 | nA |
| g _{fs} | Forward Transconductance | V _{DS} =5V, I _D =2A | --- | 5 | --- | S |
| Q _g | Total Gate Charge (4.5V) | V _{DS} =15V, V _{GS} =4.5V, I _D =4A | --- | 9.5 | --- | nC |
| Q _{gs} | Gate-Source Charge | | --- | 1.6 | --- | |
| Q _{gd} | Gate-Drain Charge | | --- | 3 | --- | |
| T _{d(on)} | Turn-On Delay Time | V _{DD} =15V, V _{GS} =4.5V, R _G =3.3Ω I _D =3A | --- | 3.2 | --- | ns |
| T _r | Rise Time | | --- | 4.9 | --- | |
| T _{d(off)} | Turn-Off Delay Time | | --- | 22 | --- | |
| T _f | Fall Time | | --- | 4 | --- | |
| C _{iss} | Input Capacitance | V _{DS} =15V, V _{GS} =0V, f=1MHz | --- | 880 | --- | pF |
| C _{oss} | Output Capacitance | | --- | 99 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 73 | --- | |

Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|--|---|------|------|------|------|
| I _S | Continuous Source Current ^{1,4} | V _G =V _D =0V, Force Current | --- | --- | 4 | A |
| I _{SM} | Pulsed Source Current ^{2,4} | | --- | --- | 16 | A |
| V _{SD} | Diode Forward Voltage ² | V _{GS} =0V, I _S =1A, T _J =25°C | --- | --- | 1.2 | V |

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%

3.The power dissipation is limited by 150°C junction temperature

4.The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.



Dual N-CH Fast Switching MOSFETs

Typical Characteristics

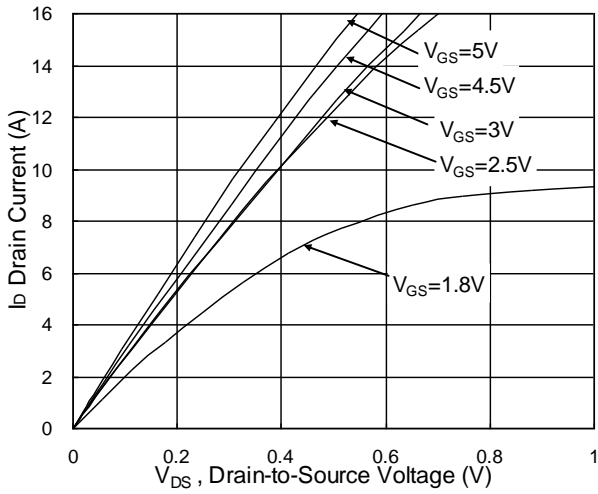


Fig.1 Typical Output Characteristics

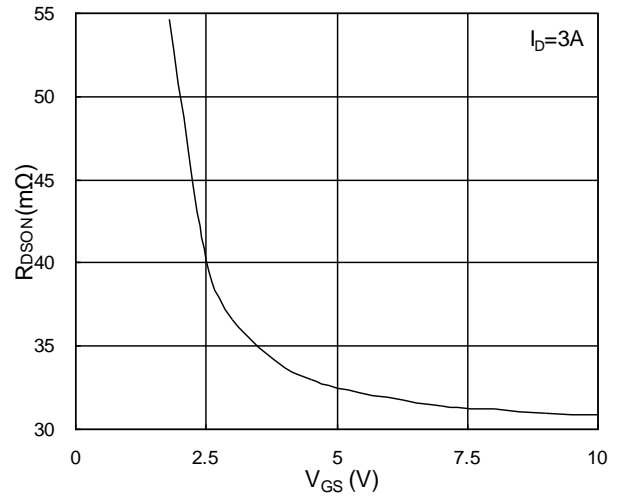


Fig.2 On-Resistance vs. Gate-Source

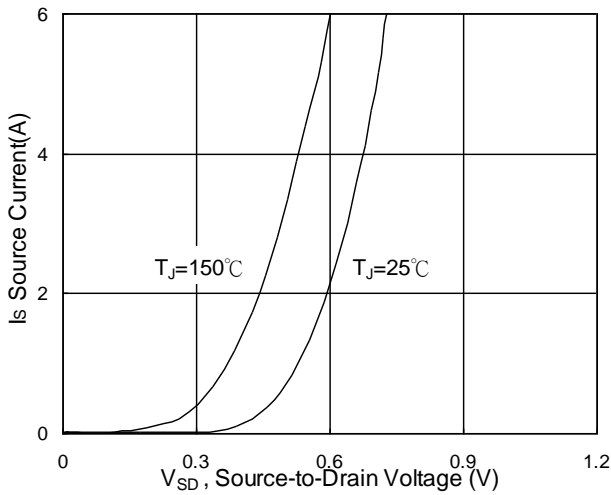


Fig.3 Forward Characteristics Of Reverse

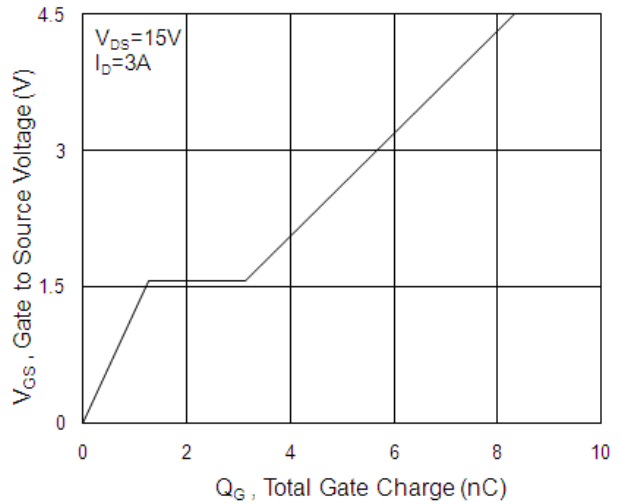


Fig.4 Gate-Charge Characteristics

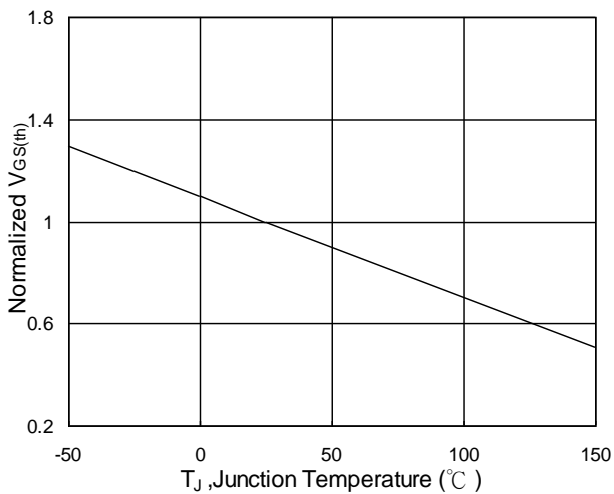


Fig.5 Normalized V_{GS(th)} vs. T_J

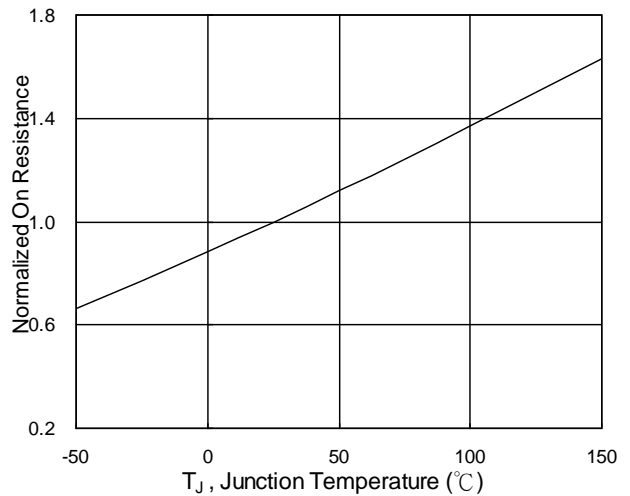


Fig.6 Normalized R_{DS(on)} vs. T_J



Dual N-CH Fast Switching MOSFETs

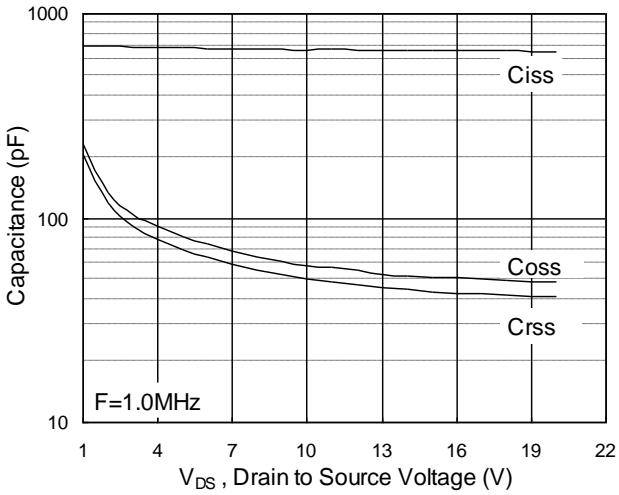


Fig.7 Capacitance

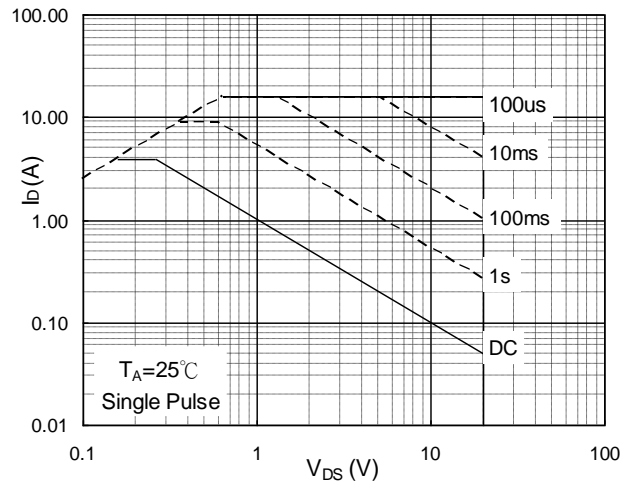


Fig.8 Safe Operating Area

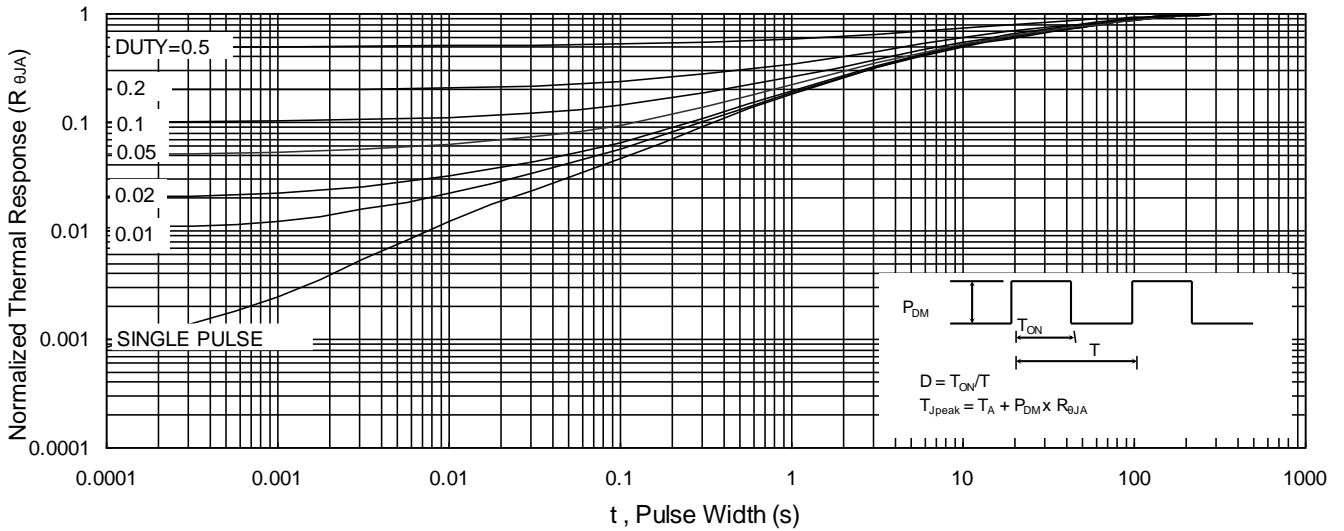


Fig.9 Normalized Maximum Transient Thermal Impedance

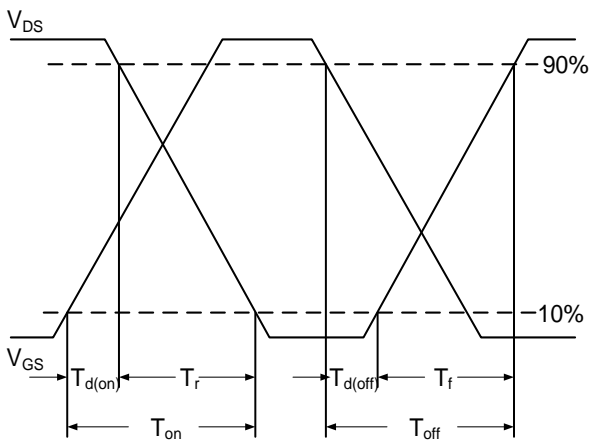


Fig.10 Switching Time Waveform

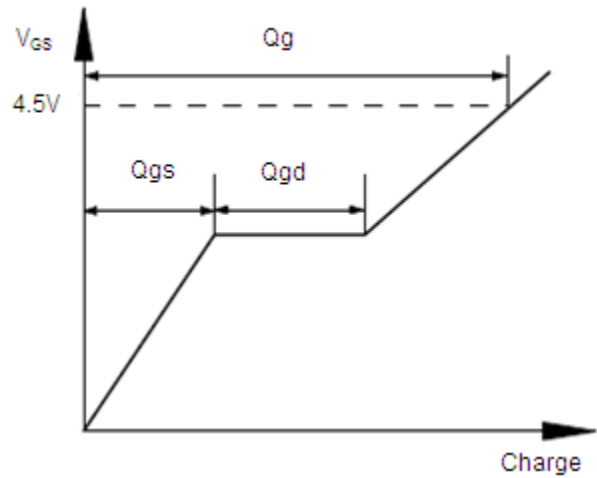
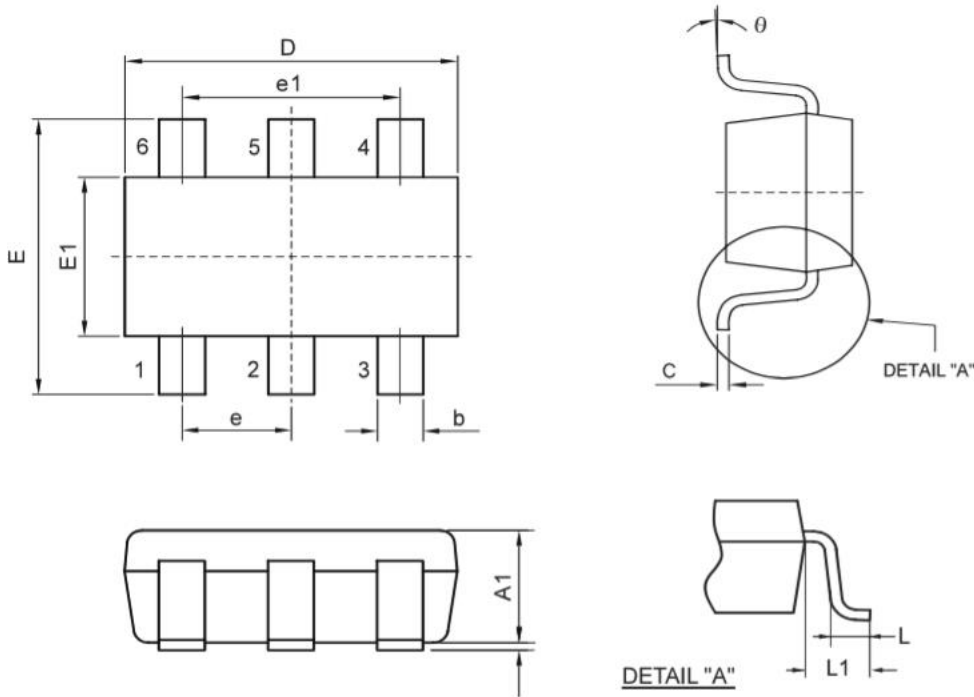


Fig.11 Gate Charge Waveform



SOT23-6L Package Outline Dimensions



| SYMBOLS | MILLIMETERS | | INCHES | |
|---------|-------------|-------|------------|-------|
| | MIN | MAX | MIN | MAX |
| D | 2.692 | 3.099 | 0.106 | 0.122 |
| E | 2.591 | 3.000 | 0.102 | 0.118 |
| E1 | 1.397 | 1.803 | 0.055 | 0.071 |
| e | 0.950 REF. | | 0.037 REF. | |
| e1 | 1.900 REF. | | 0.075 REF. | |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| C | 0.080 | 0.200 | 0.003 | 0.008 |
| A | 0.000 | 0.100 | 0.000 | 0.004 |
| A1 | 0.700 | 1.200 | 0.028 | 0.048 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| L1 | 0.600 REF. | | 0.023 REF. | |
| θ | 0° | 9° | 0° | 9° |

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