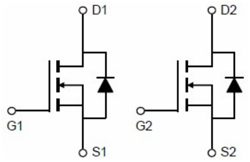
**DATA SHEET**

# AP6800

## N-Channel Power MOSFET

## Description

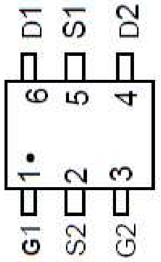
The AP6800 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge .This device is suitable for use as a load switch or in PWM applications.



Schematic diagram

## General Features

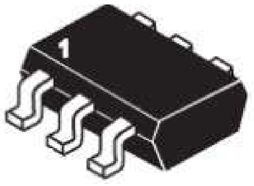
- $V_{DS}$ = 30V,$I_D$ = 5.8A
  $R_{DS(ON)}$ < 32mΩ @ $V_{GS}$=4.5V
  $R_{DS(ON)}$ <28mΩ @ $V_{GS}$=10V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package



Marking and pin Assignment

## Application

- Battery protection
- Load switch
- Power management



SOT23-6L top view

## Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|---|---|---|---|---|---|
| AP30 | AP6800 | SOT23-6 | | | |

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

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±12 | V |
| Drain Current-Continuous | $I_D$ | 5.8 | A |
| Drain Current-Pulsed (Note 1) | $I_{DM}$ | 20 | A |
| Maximum Power Dissipation | $P_D$ | 1.2 | W |
| Operating Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 To 150 | ℃ |

## Thermal Characteristic

| | | | |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 104 | ℃/W |

## Electrical Characteristics ($T_A$=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 | 30 | 33 | - | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=30V,$V_{GS}$=0V | - | - | 1 | μA |

| | | | | | | |
|---|---|---|---|---|---|---|
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±12V,$V_{DS}$=0V | - | - | ±100 | nA |
| **On Characteristics** (Note 3) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 0.7 | 1.0 | 1.5 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=5.8A | - | 22 | 28 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=4A | - | 26 | 30 | mΩ |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=5V,$I_D$=3.5A | - | 10 | - | S |
| **Dynamic Characteristics** (Note4) | | | | | | |
| Input Capacitance | $C_{lss}$ | $V_{DS}$=15V,$V_{GS}$=0V,<br>F=1.0MHz | - | 823 | - | PF |
| Output Capacitance | $C_{oss}$ | | - | 99 | - | PF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 77 | - | PF |
| **Switching Characteristics** (Note 4) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DS}$ =15V, $R_L$=4.2Ω<br>$V_{GS}$=10V,$R_{GEN}$=3Ω | - | 3.3 | - | nS |
| Turn-on Rise Time | $t_r$ | | - | 4.8 | - | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 26.5 | - | nS |
| Turn-Off Fall Time | $t_f$ | | - | 10.5 | - | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$=15V,$I_D$=3.5A,<br>$V_{GS}$=10V | - | 4.0 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 0.75 | - | nC |
| Gate-Drain Charge | $Q_{gd}$ | | - | 0.65 | - | nC |
| **Drain-Source Diode Characteristics** | | | | | | |
| Diode Forward Voltage (Note 3) | $V_{SD}$ | $V_{GS}$=0V,$I_S$=3.5A | - | 0.8 | 1.2 | V |
| Diode Forward Current (Note 2) | $I_S$ | | - | - | 3.5 | A |

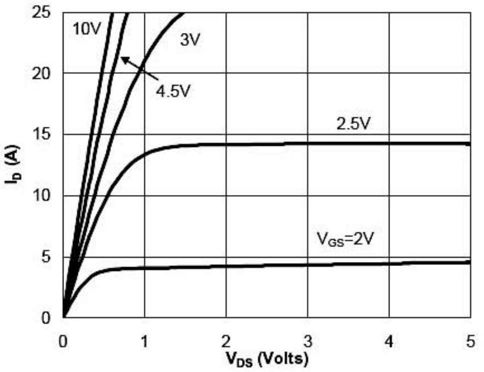
## Notes:

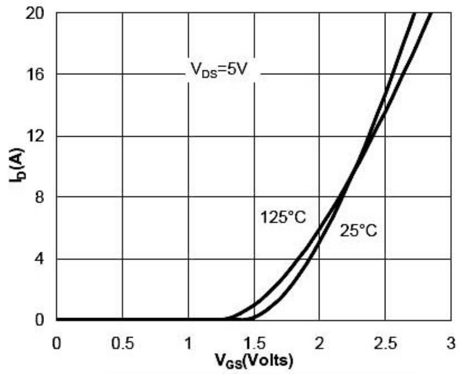
**1.** Repetitive Rating: Pulse width limited by maximum junction temperature.
**2.** Surface Mounted on FR4 Board, t ≤ 10 sec.
**3.** Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
**4.** Guaranteed by design, not subject to production

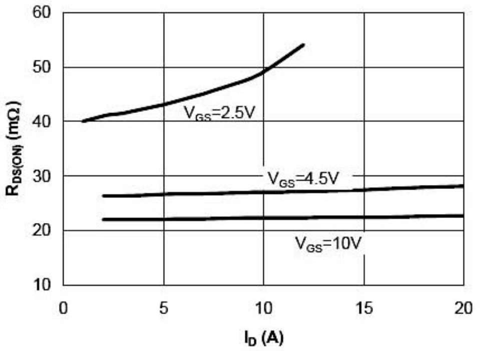
# AP6800

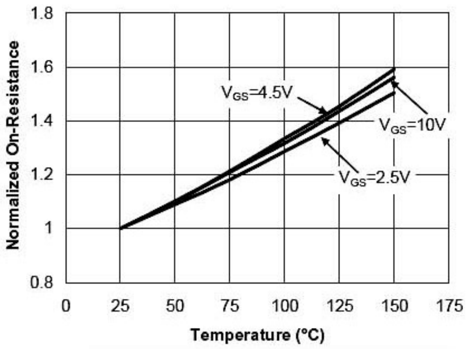
## N-Channel Power MOSFET

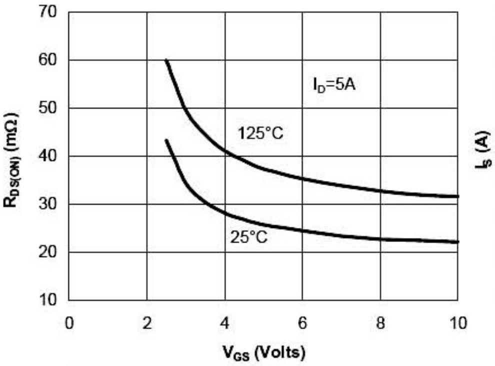
### Electrical Characteristic Curve

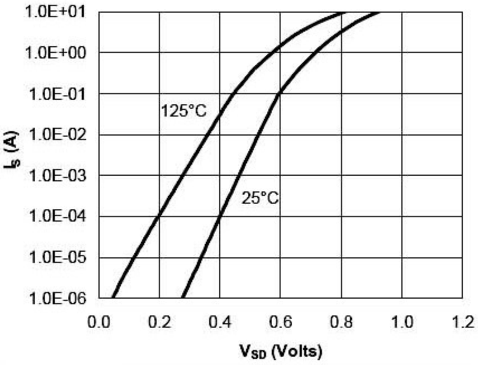


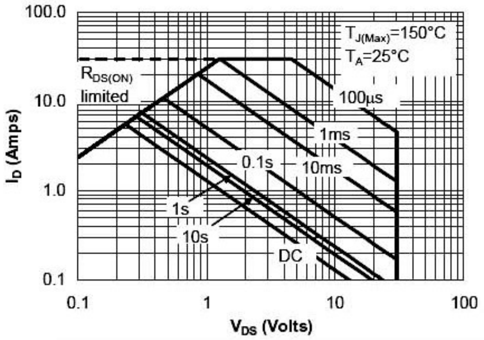


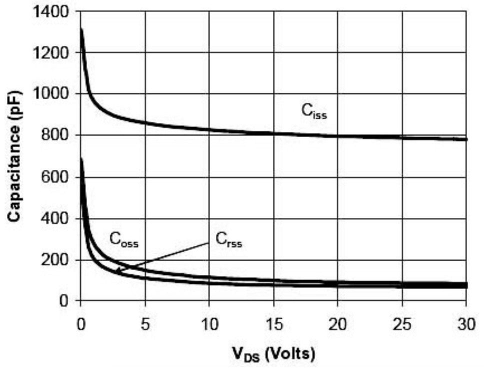




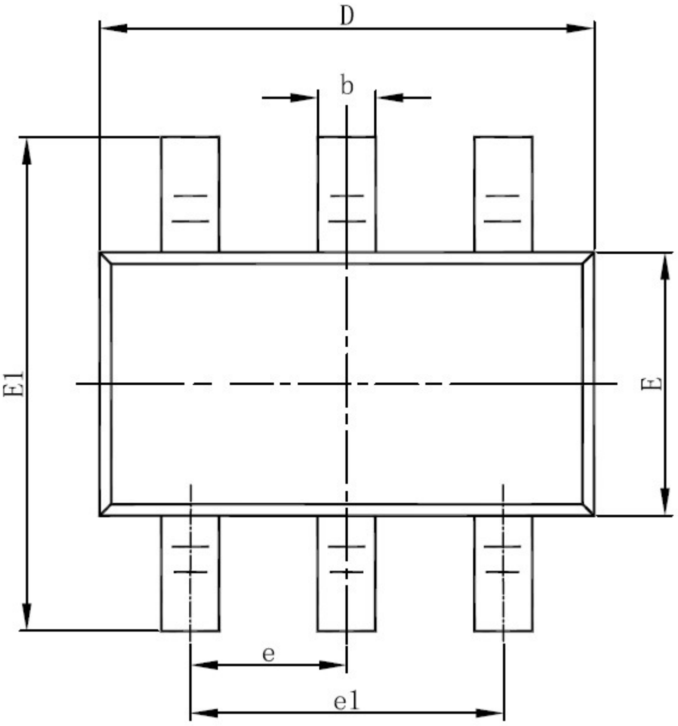


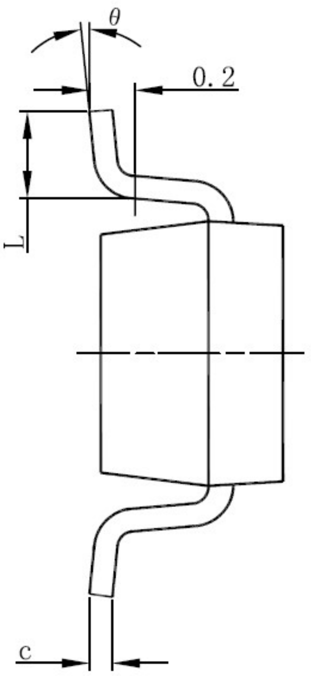


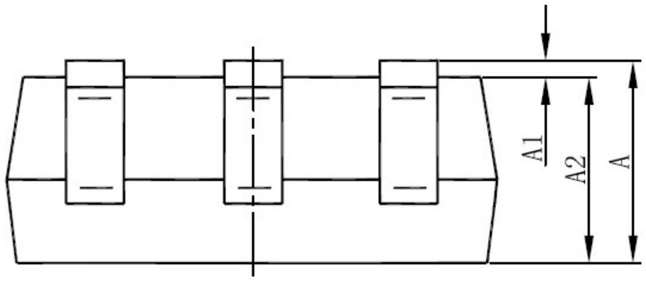




## SOT23-6L Package Information







| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |