

MOSFET Silicon N-Channel MOS



1. Applications

Single-ended flyback or two-transistor forward topologies.
PC power, PD Adaptor, LCD & PDP TV and LED lighting.

2. Features

Low drain-source on-resistance: $R_{DS(ON)} = 5.5\text{m}\Omega$ (typ.)
Easy to control Gate switching
Enhancement mode: $V_{th} = 2.4$ to 3.4 V

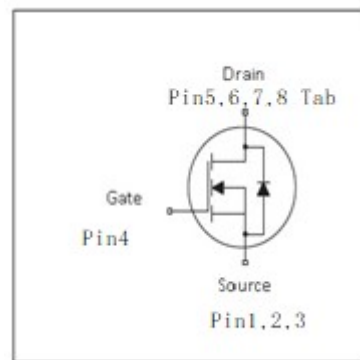
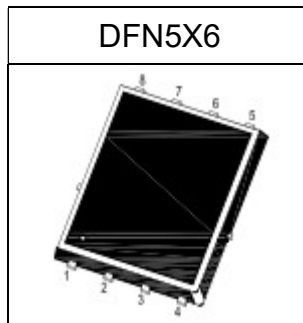


Table 1 Key Performance Parameters

| Parameter | Value | Unit |
|----------------------|-------|------------|
| $V_{DS} @ T_{j,max}$ | 100 | V |
| $R_{DS(on),max}$ | 6.3 | m Ω |
| $Q_{g,typ}$ | 60.7 | nC |
| $I_{D,pulse}$ | 396 | A |

3. Packaging and Internal Circuit

| Part Name | Package | Marking |
|-----------|---------|-----------|
| AUN063N10 | DFN5X6 | AUN063N10 |



1 Maximum ratings

at $T_j = 25^\circ\text{C}$, unless otherwise specified

Table 2 Maximum ratings

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|--|---------------|--------|------|------|------------------|--|
| | | Min. | Typ. | Max. | | |
| Continuous drain current ¹⁾ | I_D | | - | 123 | A | $T_C=25^\circ\text{C}$ |
| Pulsed drain current ²⁾ | $I_{D,pulse}$ | - | - | 396 | A | $T_C=25^\circ\text{C}$ |
| Avalanche energy, single pulse | E_{AS} | - | - | 240 | mJ | $T_C=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $I=31\text{A}$, $L=0.5\text{mH}$, $R_G=25\Omega$ |
| Avalanche current, single pulse | I_{AR} | - | - | 31 | A | $T_C=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $L=0.5\text{mH}$, $R_G=25\Omega$ |
| Gate source voltage (static) | V_{GS} | -20 | - | 20 | V | static; |
| Power dissipation | P_{tot} | - | - | 151 | W | $T_C=25^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 | - | 150 | $^\circ\text{C}$ | |
| Operating junction temperature | T_j | -55 | - | 150 | $^\circ\text{C}$ | |
| Transconductance | GFS | - | 51 | - | S | $V_{DS}=5\text{V}$ $I_{DS}=20\text{A}$ |

¹⁾ Limited by $T_{j,max}$. Maximum Duty Cycle $D = 0.50$

²⁾ Pulse width t_p limited by $T_{j,max}$

³⁾ Identical low side and high side switch with identical R_G

2 Thermal characteristics

Thermal characteristics

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|--|------------|--------|------|------|------|----------------------------------|
| | | Min. | Typ. | Max. | | |
| Thermal resistance, junction - case | R_{thJC} | - | - | 1.3 | °C/W | - |
| Thermal resistance, junction - ambient | R_{thJA} | - | - | 50 | °C/W | device on PCB, minimal footprint |

3 Electrical characteristics

at $T_j=25^\circ\text{C}$, unless otherwise specified

Table 4 Static characteristics

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|----------------------------------|---------------|--------|------|-----------|------------|---|
| | | Min. | Typ. | Max. | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 100 | - | - | V | $V_{GS}=0V, I_D=250\mu A$ |
| Gate threshold voltage | $V_{(GS)th}$ | 2.4 | | 3.4 | V | $V_{DS}=V_{GS}, I_D=250\mu A$ |
| Zero gate voltage drain current | I_{DSS} | - | - | 1 | μA | $V_{DS}=95V, V_{GS}=0V, T_j=25^\circ C$ |
| Gate-source leakage current | I_{GSS} | - | - | ± 100 | nA | $V_{GS}=\pm 20V, V_{DS}=0V$ |
| Drain-source on-state resistance | $R_{DS(on)}$ | - | 5.5 | 6.3 | m Ω | $V_{GS}=10V, I_D=20A, T_j=25^\circ C$ |
| Gate resistance (Intrinsic) | R_G | - | 1 | - | Ω | $f=1\text{MHz}$, open drain |

Table 5 Dynamic characteristics

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|------------------------------|--------------|--------|------|------|------|---|
| | | Min. | Typ. | Max. | | |
| Input capacitance | C_{iss} | - | 3680 | - | pF | $V_{GS}=0V, V_{DS}=50V, f=1\text{MHz}$ |
| Output capacitance | C_{oss} | - | 361 | - | pF | $V_{GS}=0V, V_{DS}=50V, f=1\text{MHz}$ |
| Reverse transfer capacitance | C_{rss} | - | 14.6 | - | pF | $V_{GS}=0V, V_{DS}=50V, f=1\text{MHz}$ |
| Turn-on delay time | $t_{d(on)}$ | - | 29 | - | ns | $V_{DD}=50V, V_{GS}=10V, I_D=20A, R_G=10\Omega$ |
| Rise time | t_r | - | 55 | - | ns | $V_{DD}=50V, V_{GS}=10V, I_D=20A, R_G=10\Omega$ |
| Turn-off delay time | $t_{d(off)}$ | - | 69 | - | ns | $V_{DD}=50V, V_{GS}=10V, I_D=20A, R_G=10\Omega$ |
| Fall time | t_f | - | 43 | - | ns | $V_{DD}=50V, V_{GS}=10V, I_D=20A, R_G=10\Omega$ |

Table 6 Gate charge characteristics

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|-----------------------|----------|--------|------|------|------|--|
| | | Min. | Typ. | Max. | | |
| Gate to source charge | Q_{gs} | - | 15.5 | - | nC | $V_{DD}=50V, I_D=20A, V_{GS}=0$ to 10V |
| Gate to drain charge | Q_{gd} | - | 17.6 | - | nC | $V_{DD}=50V, I_D=20A, V_{GS}=0$ to 10V |
| Gate charge total | Q_g | - | 60.7 | - | nC | $V_{DD}=50V, I_D=20A, V_{GS}=0$ to 10V |

Table 7 Reverse diode characteristics

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|-------------------------------|-----------|--------|------|------|------|--|
| | | Min. | Typ. | Max. | | |
| Diode forward voltage | V_{SD} | - | 0.7 | - | V | $V_{GS}=0V, I_F=1A, T_j=25^{\circ}C$ |
| Reverse recovery time | t_{rr} | - | 45 | - | ns | $V_R=30V, I_F=20A, di_F/dt=300A/\mu s$ |
| Reverse recovery charge | Q_{rr} | - | 212 | - | nC | $V_R=30V, I_F=20A, di_F/dt=300A/\mu s$ |
| Peak reverse recovery current | I_{rrm} | - | 8.4 | - | A | $V_R=30V, I_F=20A, di_F/dt=300A/\mu s$ |

4 Test Circuits

Table 8 Diode characteristics

| Test circuit for diode characteristics | Diode recovery waveform |
|--|-------------------------|
| | |

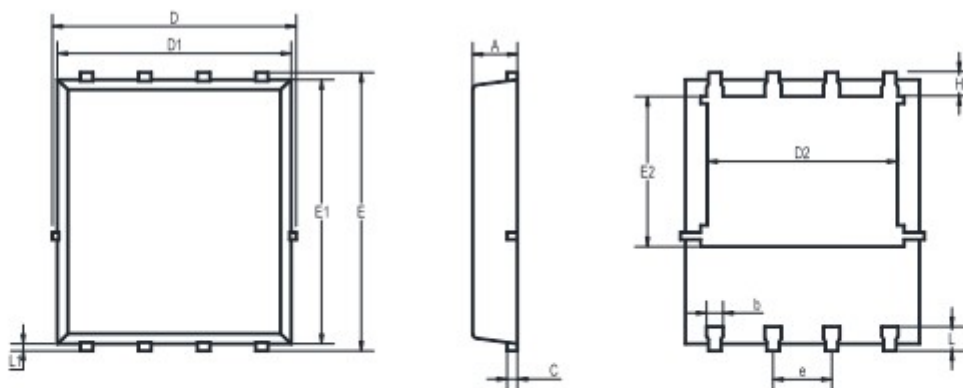
Table 9 Switching times

| Switching times test circuit for inductive load | Switching times waveform |
|---|--------------------------|
| | |

Table 10 Unclamped inductive load

| Unclamped inductive load test circuit | Unclamped inductive waveform |
|---------------------------------------|------------------------------|
| | |

5 Package Outlines



| UNIT | A | b | C | D | D1 | D2 | E | E1 | E2 | e | L | L1 | H |
|------|------|------|------|------|-----|------|------|-----|------|------|------|------|------|
| mm | 1.12 | 0.51 | 0.34 | 5.26 | 5.1 | 4.5 | 6.25 | 6 | 3.66 | 1.37 | 0.71 | 0.2 | 0.71 |
| | 0.9 | 0.33 | 0.11 | 4.7 | 4.7 | 3.56 | 5.75 | 5.6 | 3.18 | 1.17 | 0.35 | 0.06 | 0.35 |

Outline PG-DFN5X6

Revision History

| Revision | Date | Subjects (major changes since last revision) |
|----------|------------|--|
| 1.0 | 2021-12-02 | Preliminary version |