

Single P-channel MOSFET

ELM34417AA-N

General description

ELM34417AA-N uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

Features

- $V_{ds} = -30V$
- $I_d = -6A$
- $R_{ds(on)} < 45m\Omega$ ($V_{gs} = -10V$)
- $R_{ds(on)} < 75m\Omega$ ($V_{gs} = -4.5V$)

Maximum absolute ratings

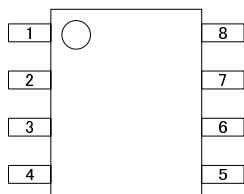
| Parameter | Symbol | Limit | Unit | Note | |
|--|----------------|--------------------|------------|------|--|
| Drain-source voltage | V_{ds} | -30 | V | | |
| Gate-source voltage | V_{gs} | ± 20 | V | | |
| Continuous drain current | I_d | $T_a = 25^\circ C$ | -6 | A | |
| | | $T_a = 70^\circ C$ | -5 | | |
| Pulsed drain current | I_{dm} | -30 | A | 3 | |
| Power dissipation | P_d | $T_a = 25^\circ C$ | 2.5 | W | |
| | | $T_a = 70^\circ C$ | 1.3 | | |
| Junction and storage temperature range | T_j, T_{stg} | -55 to 150 | $^\circ C$ | | |

Thermal characteristics

| Parameter | | Symbol | Typ. | Max. | Unit | Note |
|-----------------------------|--------------|----------------|------|------|--------------|------|
| Maximum junction-to-case | Steady-state | $R\theta_{jc}$ | | 25 | $^\circ C/W$ | |
| Maximum junction-to-ambient | Steady-state | $R\theta_{ja}$ | | 50 | $^\circ C/W$ | |

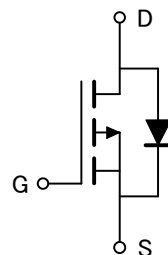
Pin configuration

SOP-8 (TOP VIEW)



| Pin No. | Pin name |
|---------|----------|
| 1 | SOURCE |
| 2 | SOURCE |
| 3 | SOURCE |
| 4 | GATE |
| 5 | DRAIN |
| 6 | DRAIN |
| 7 | DRAIN |
| 8 | DRAIN |

Circuit



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Electrical characteristics

T_a=25°C

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit | Note |
|------------------------------------|---------------------|--|------|------|------|------|------|
| STATIC PARAMETERS | | | | | | | |
| Drain-source breakdown voltage | BV _{dss} | I _d =-250 μA, V _{gs} =0V | -30 | | | V | |
| Zero gate voltage drain current | I _{dss} | V _{ds} =-24V, V _{gs} =0V | | | -1 | μA | |
| | | V _{ds} =-20V, V _{gs} =0V, T _j =125°C | | | -10 | | |
| Gate-body leakage current | I _{gss} | V _{ds} =0V, V _{gs} =±20V | | | ±100 | nA | |
| Gate threshold voltage | V _{gs(th)} | V _{ds} =V _{gs} , I _d =-250 μA | -0.9 | -1.5 | -3.0 | V | |
| On state drain current | I _{d(on)} | V _{gs} =-10V, V _{ds} =-5V | -30 | | | A | 1 |
| Static drain-source on-resistance | R _{ds(on)} | V _{gs} =-10V, I _d =-6A | | 37 | 45 | mΩ | 1 |
| | | V _{gs} =-4.5V, I _d =-5A | | 60 | 75 | mΩ | |
| Forward transconductance | G _{fs} | V _{ds} =-10V, I _d =-6A | | 16 | | S | 1 |
| Diode forward voltage | V _{sd} | I _s =-1A, V _{gs} =0V | | | -1.2 | V | 1 |
| Max. body-diode continuous current | I _s | | | | -2.1 | A | |
| Pulsed body-diode current | I _{sm} | | | | -4 | A | 3 |
| DYNAMIC PARAMETERS | | | | | | | |
| Input capacitance | C _{iss} | V _{gs} =0V, V _{ds} =-15V, f=1MHz | | 530 | | pF | |
| Output capacitance | C _{oss} | | | | 135 | | pF |
| Reverse transfer capacitance | C _{rss} | | | | 70 | | pF |
| SWITCHING PARAMETERS | | | | | | | |
| Total gate charge | Q _g | V _{gs} =-10V, V _{ds} =-15V I _d =-6A | | 10.0 | 14.0 | nC | 2 |
| Gate-source charge | Q _{gs} | | | 2.2 | | nC | 2 |
| Gate-drain charge | Q _{gd} | | | 2.0 | | nC | 2 |
| Turn-on delay time | t _{d(on)} | V _{gs} =-10V, V _{ds} =-15V I _d ≈ -1A, R _l =1 Ω, R _{gen} =6 Ω | | 5.7 | | ns | 2 |
| Turn-on rise time | t _r | | | 10.0 | | ns | 2 |
| Turn-off delay time | t _{d(off)} | | | 18.0 | | ns | 2 |
| Turn-off fall time | t _f | | | 5.0 | | ns | 2 |
| Body diode reverse recovery time | t _{rr} | I _f =-5A, dI/dt=100A/μs | | 15.5 | | ns | |
| Body diode reverse recovery charge | Q _{rr} | I _f =-5A, dI/dt=100A/μs | | 7.9 | | nC | |

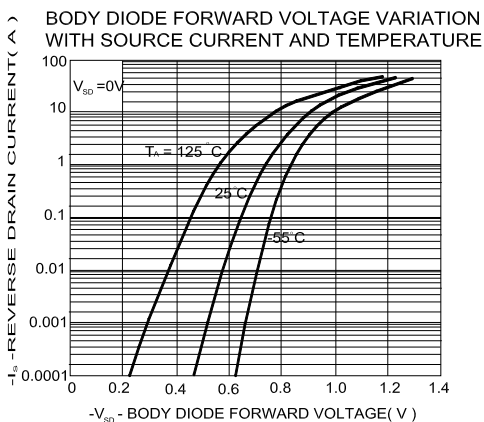
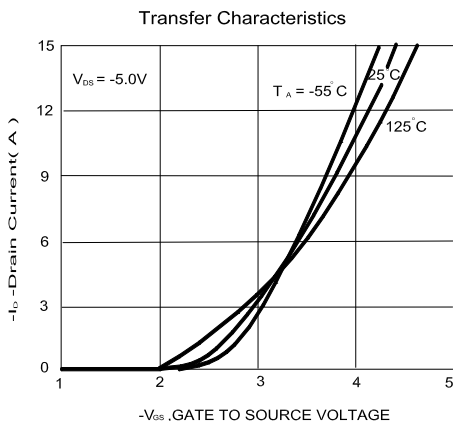
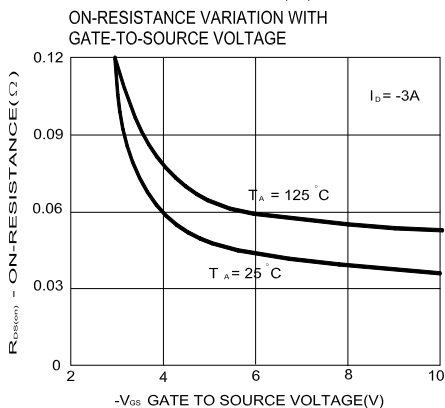
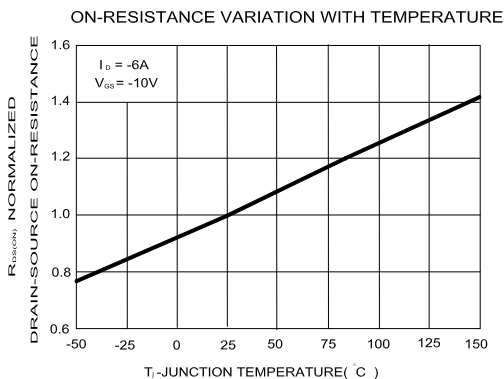
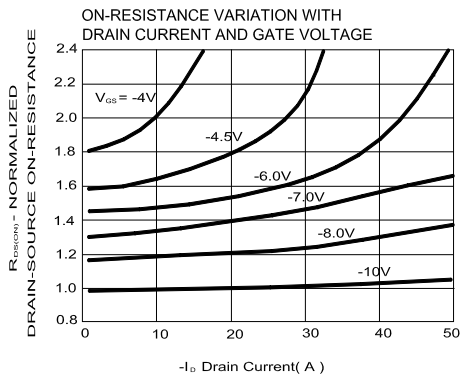
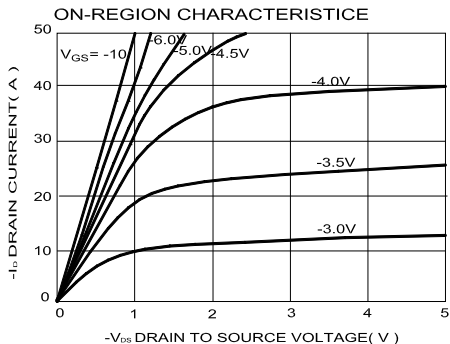
NOTE :

1. Pulsed width ≤ 300 μsec and Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.
4. Duty cycle ≤ 1%.

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Typical electrical and thermal characteristics



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