

Single P-channel MOSFET

ELM34423AA-N

<http://www.elm-tech.com>

■ General description

ELM34423AA-N uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance. Internal ESD protection is included.

■ Features

- $V_{ds} = -30V$
- $I_d = -8A$
- $R_{ds(on)} < 20\Omega$ ($V_{gs} = -10V$)
- $R_{ds(on)} < 35\Omega$ ($V_{gs} = -4.5V$)
- ESD protected

■ Maximum absolute ratings

$T_a = 25^\circ C$. Unless otherwise noted.

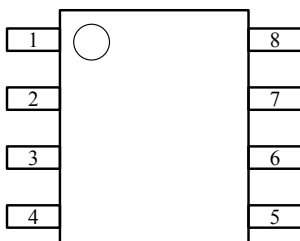
| Parameter | Symbol | Limit | Unit | Note | |
|--|----------------|--------------------|------------|------|---|
| Drain-source voltage | V_{ds} | -30 | V | | |
| Gate-source voltage | V_{gs} | ± 20 | V | | |
| Continuous drain current | I_d | $T_a = 25^\circ C$ | -8.0 | A | 5 |
| | | $T_a = 70^\circ C$ | -6.5 | | |
| Pulsed drain current | I_{dm} | -50 | A | 3, 5 | |
| Avalanche current | I_{as} | -30 | A | | |
| Avalanche energy | E_{as} | 46 | mJ | | |
| Power dissipation | P_d | $T_c = 25^\circ C$ | 2.0 | W | |
| | | $T_c = 70^\circ C$ | 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-ambient | $R_{\theta ja}$ | | 60 | $^\circ C/W$ | |

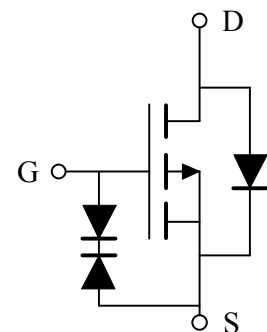
■ Pin configuration

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

Ta=25°C. Unless otherwise noted.

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit | Note |
|------------------------------------|---------|---------------------------------------|------|------|------|------|------|
| STATIC PARAMETERS | | | | | | | |
| Drain-source breakdown voltage | BVdss | Id=-250μA, Vgs=0V | -30 | | | V | |
| Zero gate voltage drain current | Idss | Vds=-24V, Vgs=0V | | | -1 | μA | |
| | | Vds=-20V, Vgs=0V, Ta=70°C | | | -10 | | |
| Gate-body leakage current | Igss | Vds=0V, Vgs=±16V | | | ±30 | nA | |
| Gate threshold voltage | Vgs(th) | Vds=Vgs, Id=-250μA | -1.0 | -1.6 | -3.0 | V | |
| On-state drain current | Id(on) | Vds=-5V, Vgs=-10V | -50 | | | A | 1 |
| Static drain-source on-resistance | Rds(on) | Vgs=-10V, Id=-8A | | 17 | 20 | mΩ | 1 |
| | | Vgs=-4.5V, Id=-7A | | 27 | 35 | | |
| Forward transconductance | Gfs | Vds=-10V, Id=-8A | | 22 | | S | 1 |
| Diode forward voltage | Vsd | If=-8A, Vgs=0V | | | -1.2 | V | 1 |
| Max. body-diode continuous current | Is | | | | -8 | A | |
| DYNAMIC PARAMETERS | | | | | | | |
| Input capacitance | Ciss | | | 1500 | | pF | |
| Output capacitance | Coss | Vgs=0V, Vds=-15V, f=1MHz | | 293 | | pF | |
| Reverse transfer capacitance | Crss | | | 207 | | pF | |
| Gate resistance | Rg | Vgs=0V, Vds=0V, f=1MHz | | 3.1 | | Ω | |
| SWITCHING PARAMETERS | | | | | | | |
| Total gate charge | Qg | Vgs=-10V, Vds=-15V Id=-8A | | 30 | | nC | 2 |
| Gate-source charge | Qgs | | | 5 | | nC | 2 |
| Gate-drain charge | Qgd | | | 8 | | nC | 2 |
| Turn-on delay time | td(on) | Vgs=-10V, Vds=-15V Id=-8A, Rgen=6Ω | | 20 | | ns | 2 |
| Turn-on rise time | tr | | | 12 | | ns | 2 |
| Turn-off delay time | td(off) | | | 48 | | ns | 2 |
| Turn-off fall time | tf | | | 22 | | ns | 2 |
| Reverse recovery time | trr | If=-8A, dIf/dt=100A/μs | | 18 | | ns | |
| Reverse recovery charge | Qrr | | | 7 | | nC | |

NOTE :

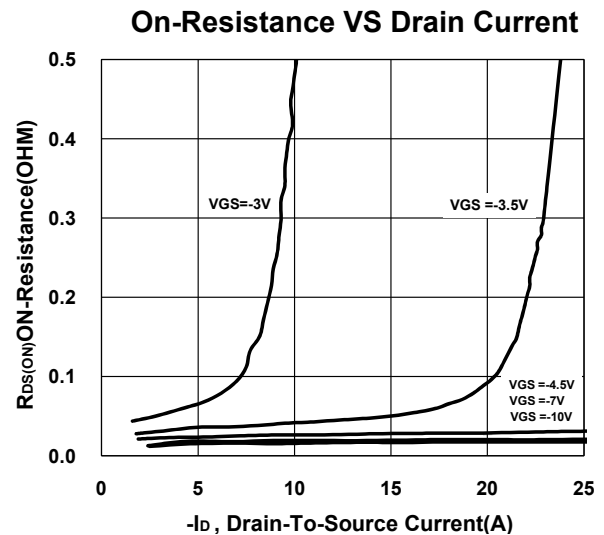
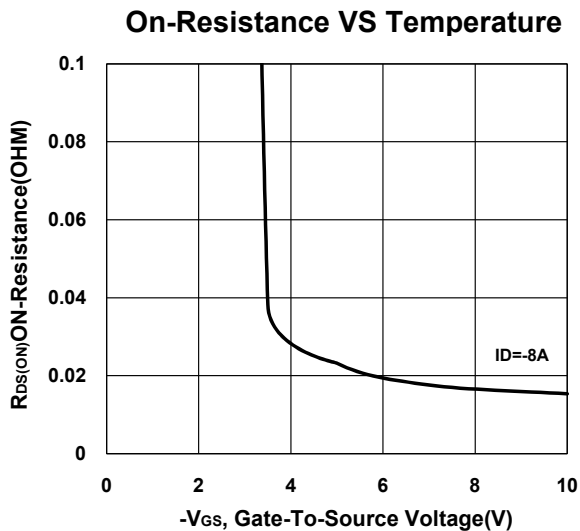
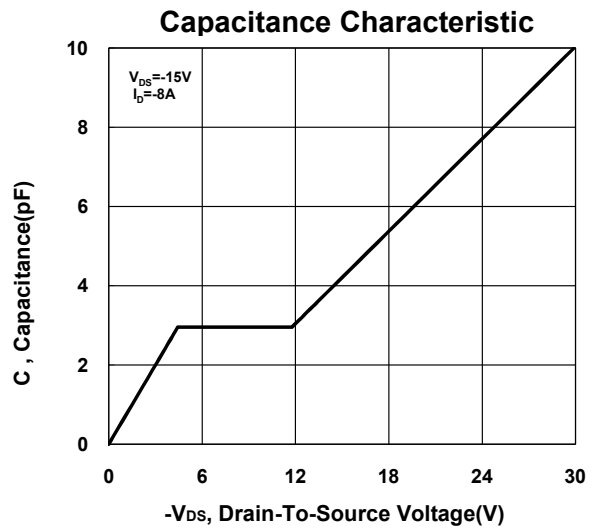
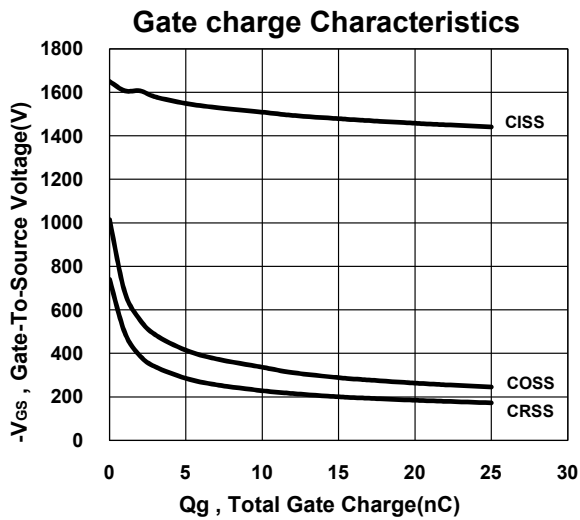
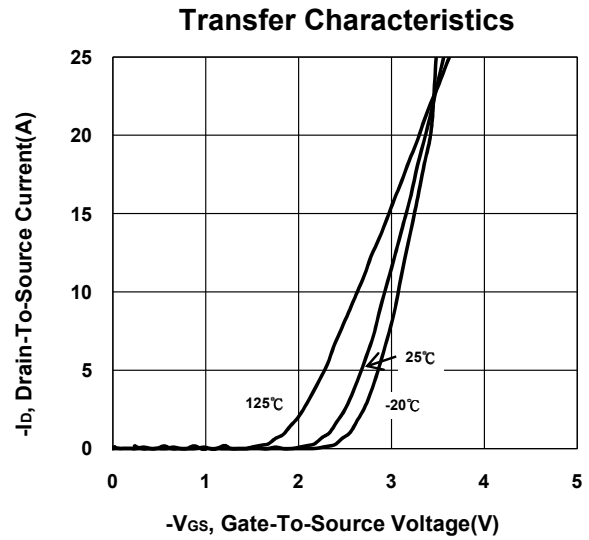
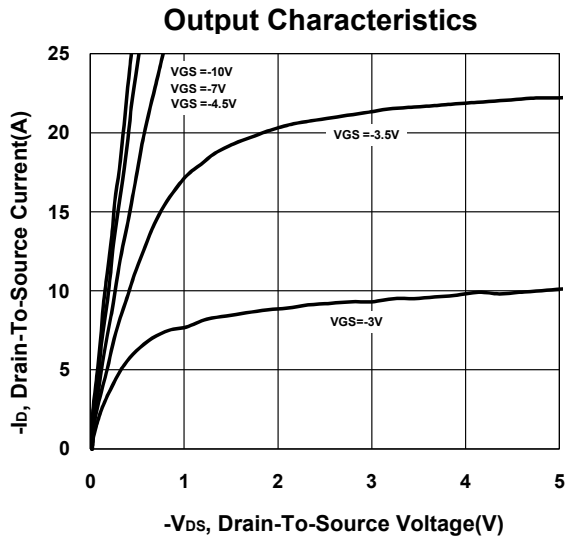
1. Pulsed width ≤ 300μsec and Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.
4. Duty cycle ≤ 1%.
5. Limited only by maximum temperature allowed.

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■ Typical electrical and thermal characteristics

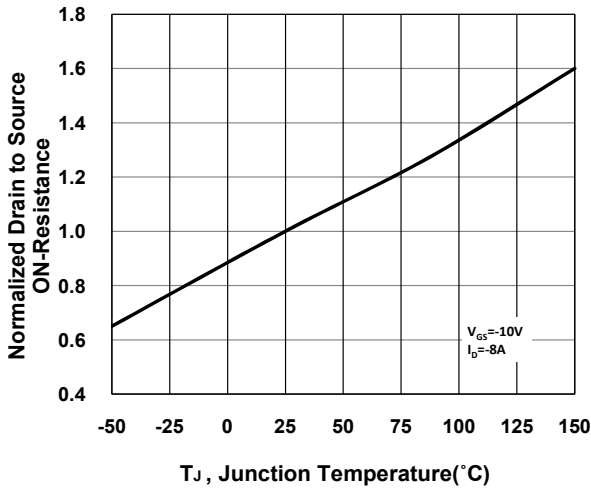


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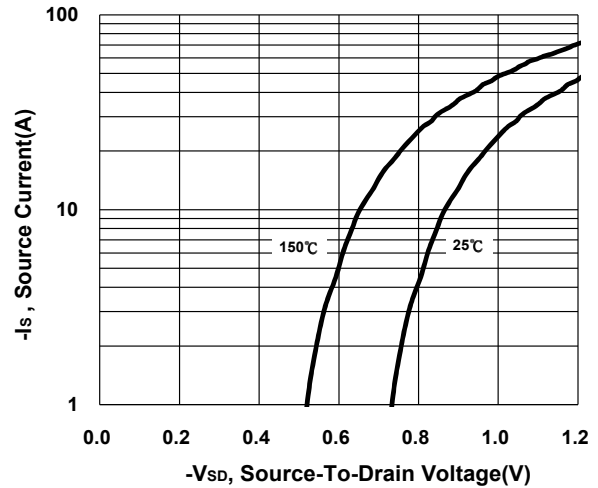
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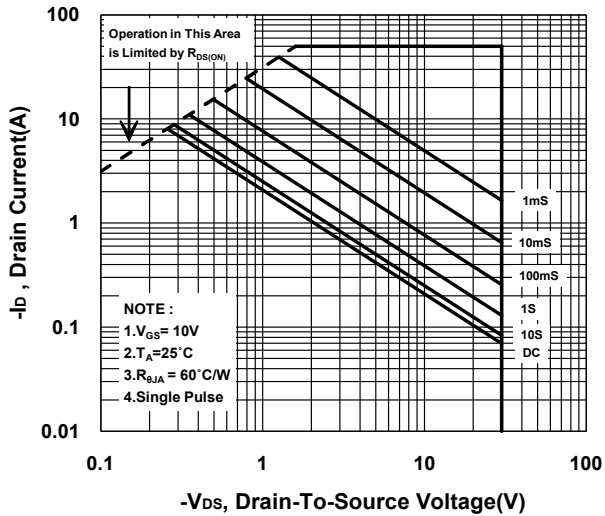
On-Resistance VS Gate-To-Source



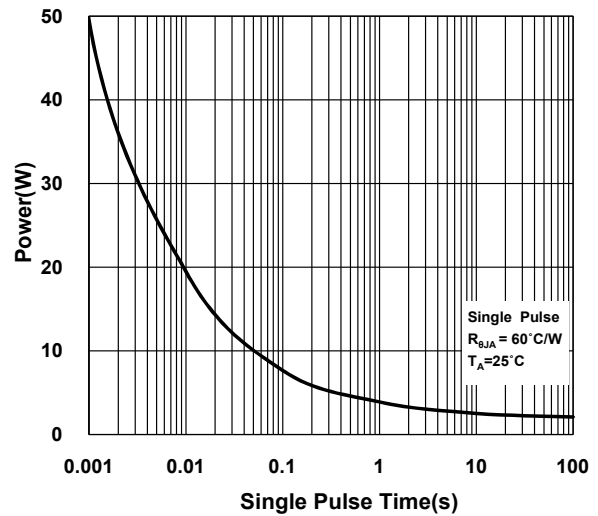
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

