# AT025SN060MTA

N-Channel Enhancement Mode MOSFET

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---|---|---|
| 60V | 40mΩ@10V | 25A |
| | 50mΩ@4.5V | |

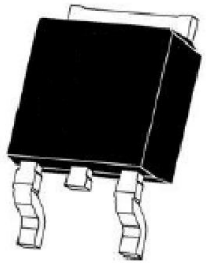
## Feature

- Fast Switching
- Low Gate Charge and Rdson

## Application

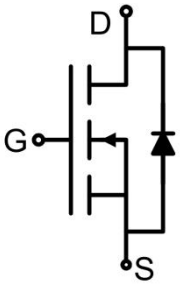
- DC-DC Converter
- Power switching application

## Package

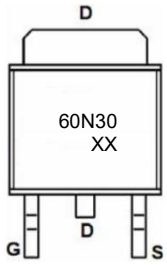


**TO-252AB**

## Circuit diagram




## Marking



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## Absolute maximum ratings ($T_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 60 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continuous Drain Current ($T_C$=25℃) | $I_D$ | 25 | A |
| Continuous Drain Current ($T_C$=100℃) | $I_D$ | 17 | A |
| Pulsed Drain Current | $I_{DM}$ | 100 | A |
| Single Pulse Avalanche Energy[1)] | $E_{AS}$ | 25 | mJ |
| Power Dissipation ($T_C$=25℃) | $P_D$ | 40 | W |
| Thermal Resistance Junction to Case | $R_{\theta JC}$ | 3.1 | ℃/W |
| Operating Junction Temperature | $T_J$ | -55 ~ +150 | ℃ |
| Storage Temperature Range | $T_{STG}$ | -55 ~ +150 | ℃ |

## Electrical characteristics ($T_A$=25℃ unless otherwise noted)

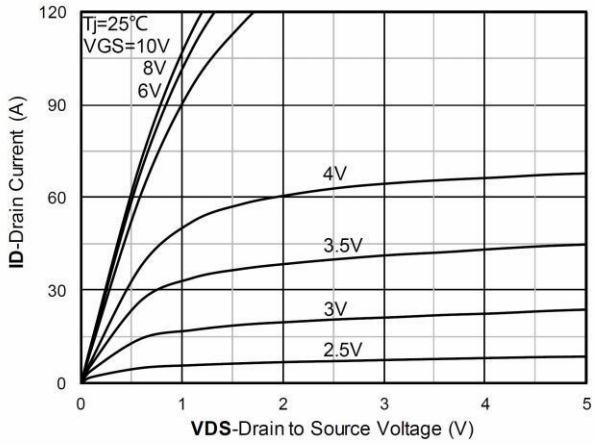
| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$ =0V, $I_D$ =250μA | 60 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =48V, $V_{GS}$ =0V, $T_J$ =25℃ | | | 1 | μA |
| Gate-body leakage current | $I_{GSS}$ | $V_{DS}$ =0V, $V_{GS}$ =±20V | | | ±100 | nA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | 1 | 1.6 | 2.5 | V |
| Drain-source on-resistance | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ =10A | | 30 | 40 | mΩ |
| | | $V_{GS}$ =4.5V, $I_D$ =5A | | 40 | 50 | |
| **Dynamic characteristics[2)]** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =15V, $V_{GS}$ =0V, f =1MHz | | 1180 | | pF |
| Output Capacitance | $C_{oss}$ | | | 60 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 45 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ =30V, $V_{GS}$ =10V, $I_D$ =45A | | 14 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 2.9 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 5.2 | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DS}$ =30V, $V_{GS}$ =10V, $I_D$ =2A $R_G$ =3Ω | | 5 | | nS |
| Turn-on rise time | $t_r$ | | | 15 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 24 | | |
| Turn-off fall time | $t_f$ | | | 2.3 | | |
| **Source-Drain Diode characteristics** | | | | | | |
| Diode Forward Current | $I_S$ | | | | 25 | A |
| Diode Forward voltage | $V_{SD}$ | $V_{GS}$ =0V, $I_S$ =1A,$T_J$ =25℃ | | | 1.2 | V |
| Reverse recover time | $T_{rr}$ | $I_S$ =10A, di/dt =100A/us $T_J$ =25℃ | | 21 | | nS |
| Reverse recovery charge | $Q_{rr}$ | | | 19 | | nC |

Notes:

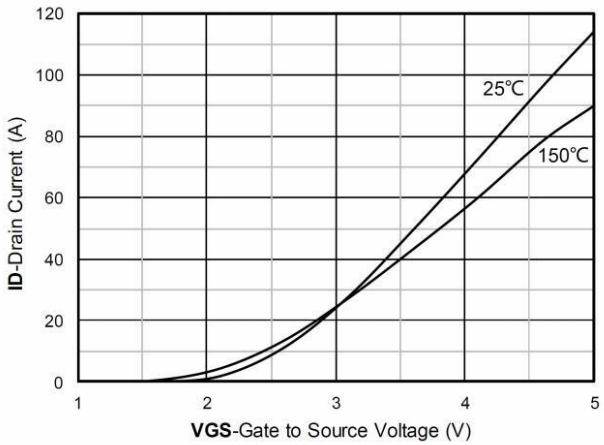
1) The EAS test condition is $V_{DD}$ = 30V, $V_{GS}$=10V, L=0.5mH,$R_G$ = 25Ω.

2) Guaranteed by design, not subject to production testing.

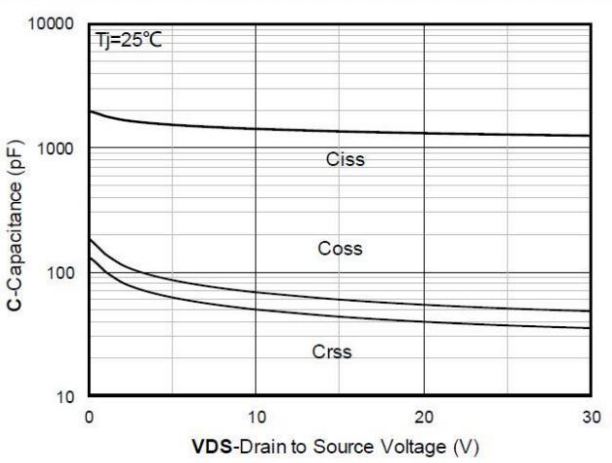
## Typical Characteristics



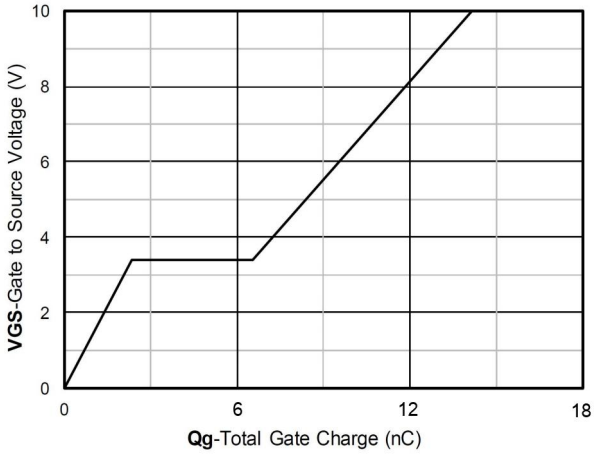

Output Characteristics



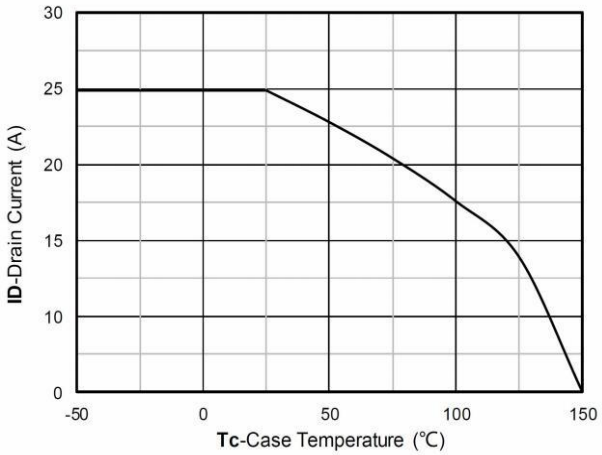

Transfer Characteristics



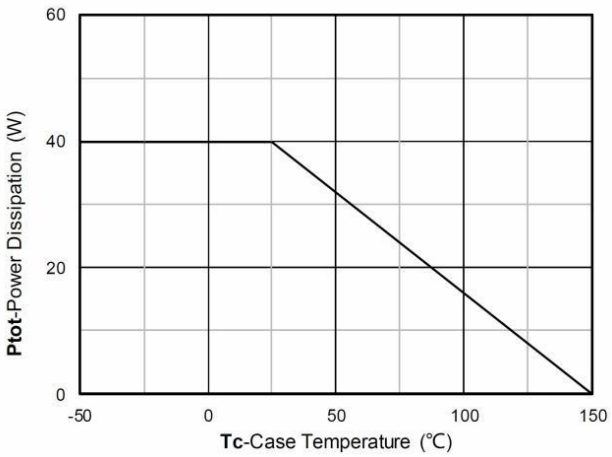

Capacitance Characteristics




Gate Charge

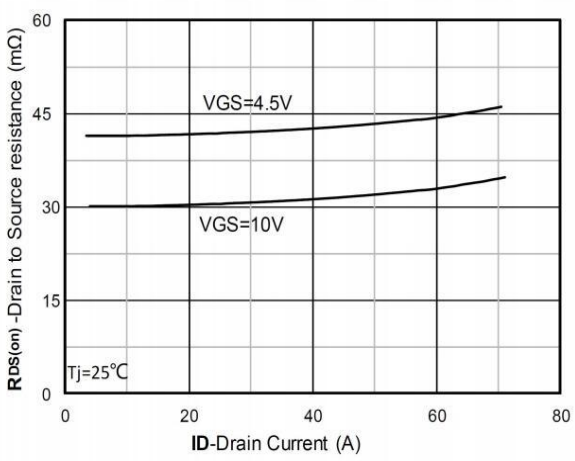



Current dissipation

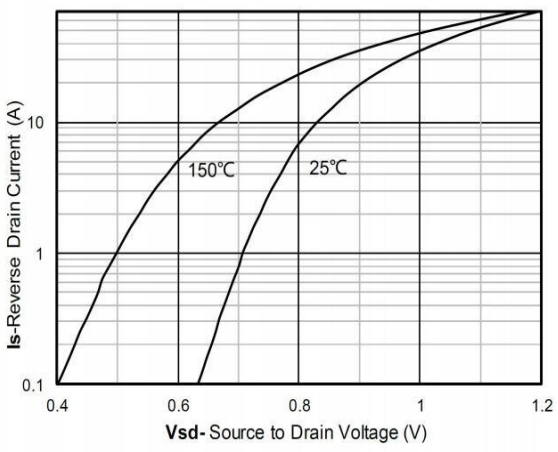



Power dissipation

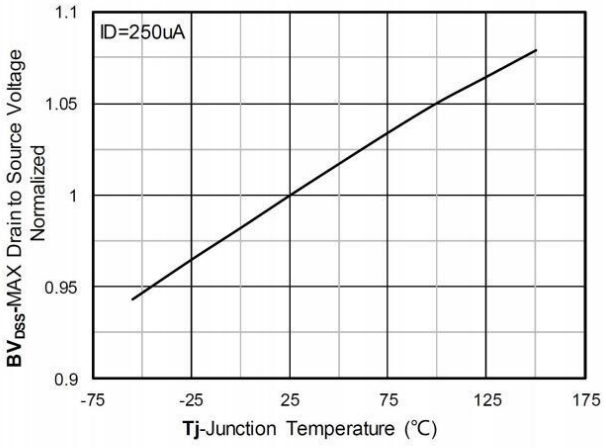
## Typical Characteristics



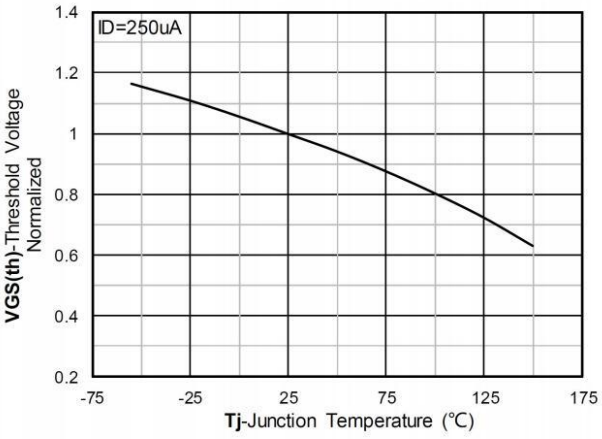

RDS(on) VS Drain Current



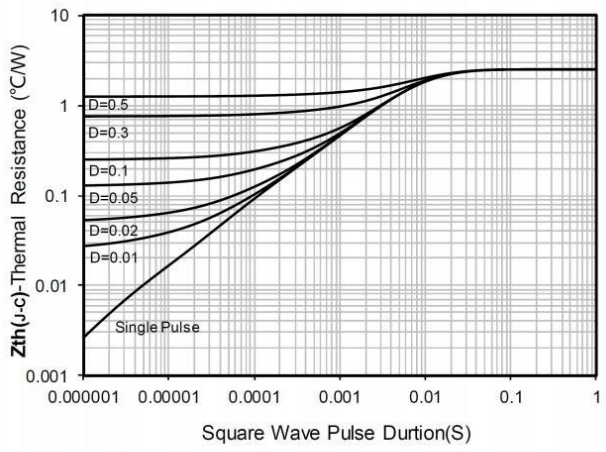

Forward characteristics of reverse diode



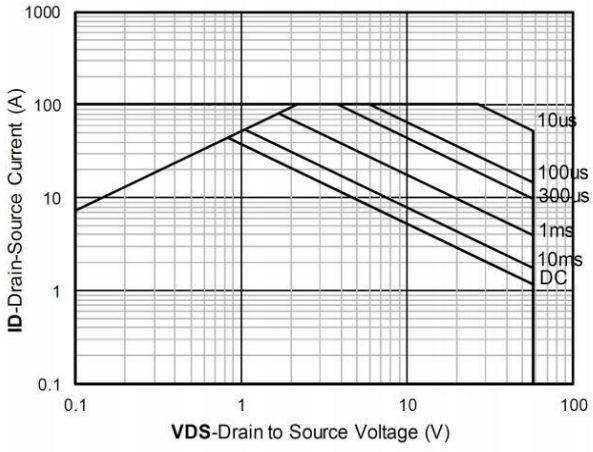

Normalized breakdown voltage




Normalized Threshold voltage

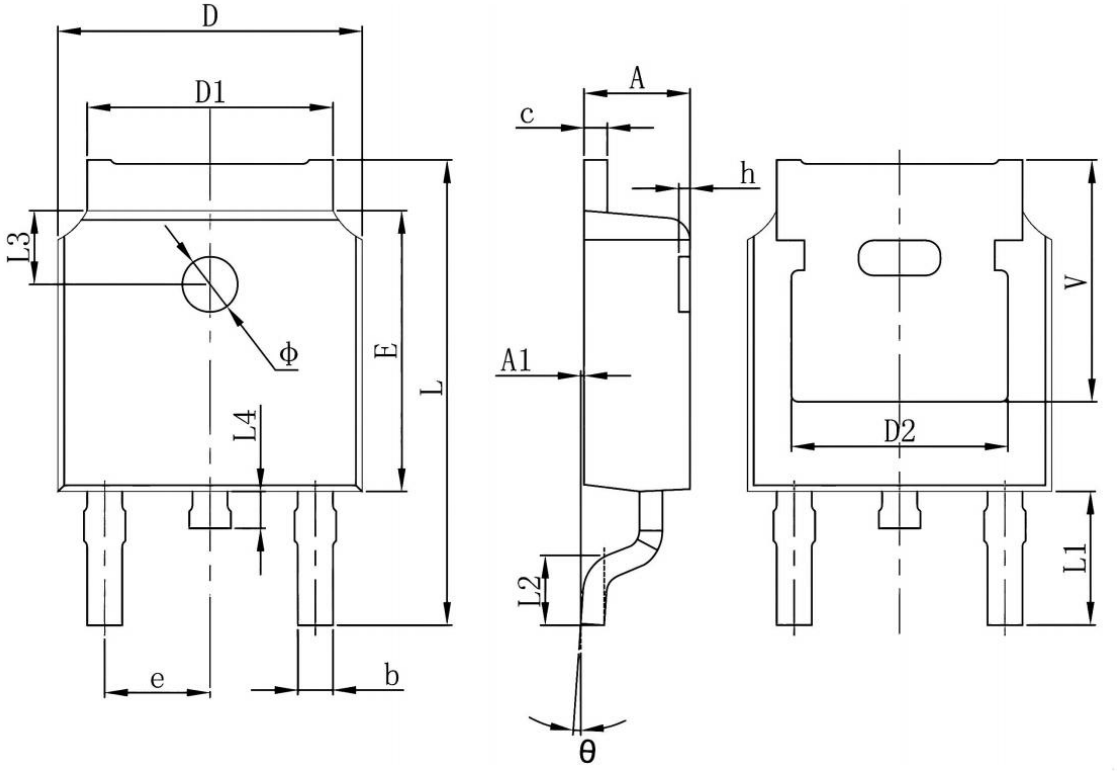



Maximum Transient Thermal Impedance




Safe Operation Area

## TO-252AB Package Information




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| b | 0.660 | 0.860 | 0.026 | 0.034 |
| c | 0.460 | 0.580 | 0.018 | 0.023 |
| D | 6.500 | 6.700 | 0.256 | 0.264 |
| D1 | 5.100 | 5.460 | 0.201 | 0.215 |
| D2 | 4.830 REF. | | 0.190 REF. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.800 | 10.400 | 0.386 | 0.409 |
| L1 | 2.900 REF. | | 0.114 REF. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 REF. | | 0.063 REF. | |
| L4 | 0.600 | 1.000 | 0.024 | 0.039 |
| Φ | 1.100 | 1.300 | 0.043 | 0.051 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| V | 5.350 REF. | | 0.211 REF. | |