# Dual N-channel MOSFET

## ELM51026SA-S



## ■General description

ELM51026SA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and operation with gate voltages as low as 4.5V and internal ESD protection.

## ■Features

- Vds=60V
- Id=0.35A
- Rds(on) = 2.4Ω (Vgs=10V)
- Rds(on) = 3.0Ω (Vgs=4.5V)
- ESD protected : >2KV

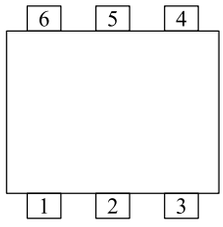
## ■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Drain-source voltage | | Vds | 60 | V |
| Gate-source voltage | | Vgs | ±20 | V |
| Continuous drain current(Tj=150°C) | Ta=25°C | Id | 0.35 | A |
| | Ta=70°C | | 0.23 | |
| Pulsed drain current | | Idm | 0.65 | A |
| Power dissipation | Tc=25°C | Pd | 0.25 | W |
| | Tc=70°C | | 0.15 | |
| Operating junction temperature | | Tj | - 55 to 150 | °C |
| Storage temperature range | | Tstg | - 55 to 150 | °C |

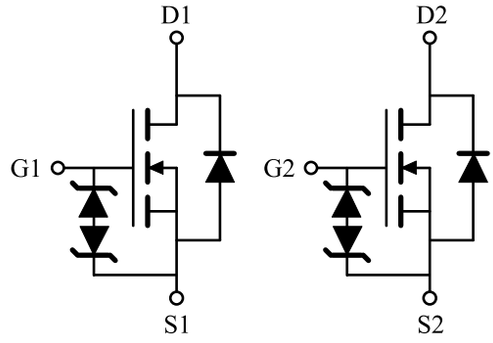
## ■Pin configuration

SOT-563(TOP VIEW)




| Pin No. | Pin name |
|---|---|
| 1 | SOURCE1 |
| 2 | GATE1 |
| 3 | DRAIN2 |
| 4 | SOURCE2 |
| 5 | GATE2 |
| 6 | DRAIN1 |

## ■Circuit

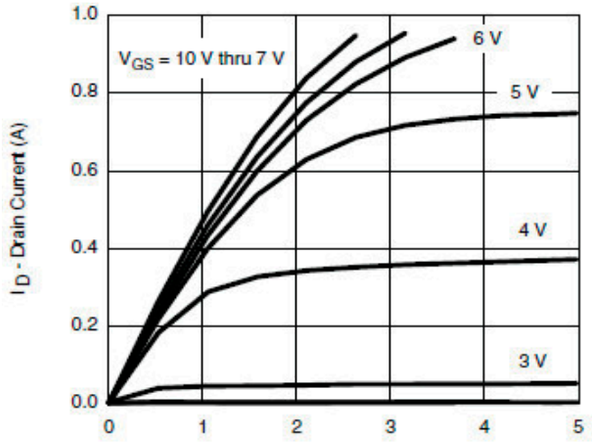


## ■Electrical characteristics

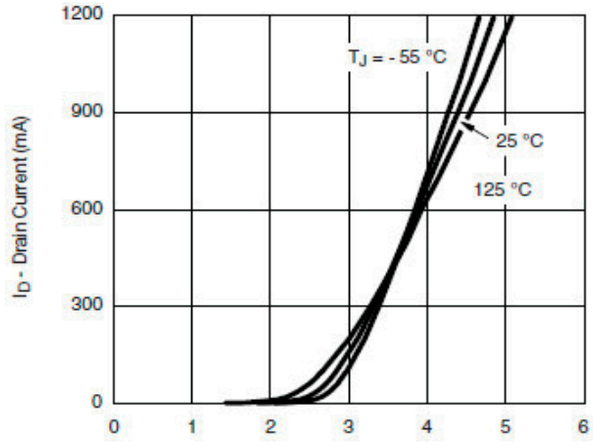
Ta=25°C. Unless otherwise noted.

| Parameter | Symbol | Condition | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| STATIC PARAMETERS | | | | | | | |
| Drain-source breakdown voltage | BVdss | Id=250μA, Vgs=0V | | 60 | | | V |
| Zero gate voltage drain current | Idss | Vds=60V, Vgs=0V | | | | 1 | μA |
| | | | Ta=85°C | | | 10 | |
| Gate-source leakage current | Igss | Vds=0V, Vgs=±20V | | | | 3 | μA |
| Gate threshold voltage | Vgs(th) | Vds=Vgs, Id=250μA | | 1.0 | | 2.0 | V |
| Static drain-source on-resistance | Rds(on) | Vgs=10V, Id=0.5A | | | 1.2 | 2.4 | Ω |
| | | Vgs=4.5V, Id=0.2A | | | 1.7 | 3.0 | |
| Forward transconductance | Gfs | Vds=10V, Id=0.2A | | | 0.2 | | S |
| Diode forward voltage | Vsd | Is=0.2A, Vgs=0V | | | 0.75 | 1.40 | V |
| Max. body-diode continuous current | Is | | | | | 0.25 | A |
| DYNAMIC PARAMETERS | | | | | | | |
| Input capacitance | Ciss | Vgs=0V, Vds=25V, f=1MHz | | | 30 | | pF |
| Output capacitance | Coss | | | | 8 | | pF |
| Reverse transfer capacitance | Crss | | | | 5 | | pF |
| SWITCHING PARAMETERS | | | | | | | |
| Total gate charge | Qg | Vgs=4.5V, Vds=10V, Id≡0.25A | | | 450 | | pC |
| Gate-source charge | Qgs | | | | 110 | | pC |
| Gate-drain charge | Qgd | | | | 150 | | pC |
| Turn-on delay time | td(on) | Vgs=10V, Vds=30V RL=150Ω, Id≡0.2A Rgen=10Ω | | | 4 | 10 | ns |
| Turn-on rise time | tr | | | | 5 | 15 | ns |
| Turn-off delay time | td(off) | | | | 12 | 20 | ns |
| Turn-off fall time | tf | | | | 10 | 20 | ns |

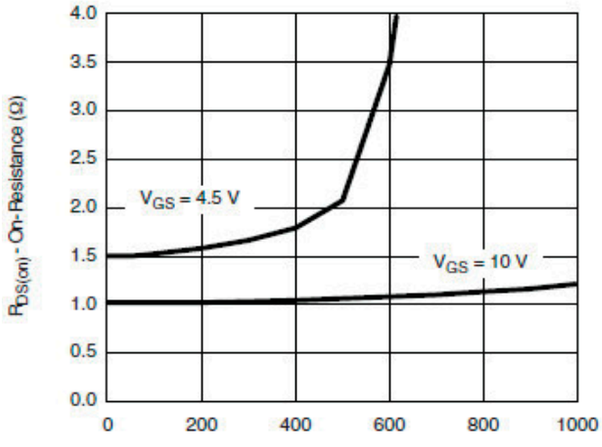
## ■Typical electrical and thermal characteristics



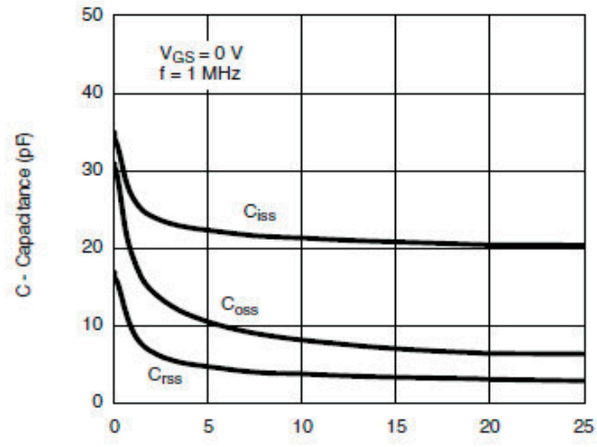

**Output Characteristics**



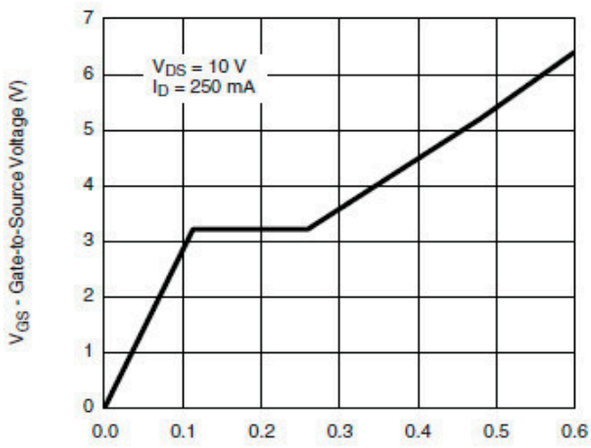

**Transfer Characteristics**



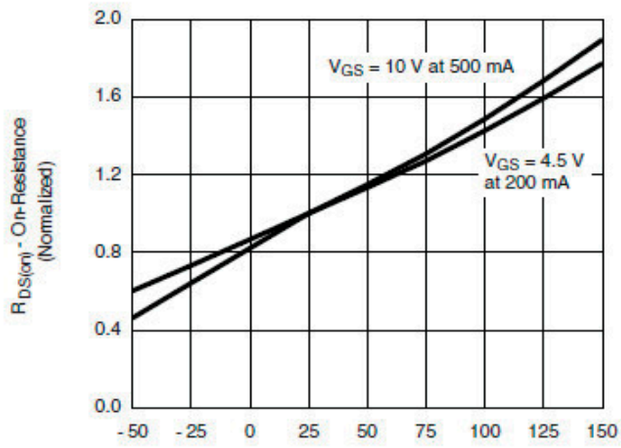

**On-Resistance vs. Drain Current**



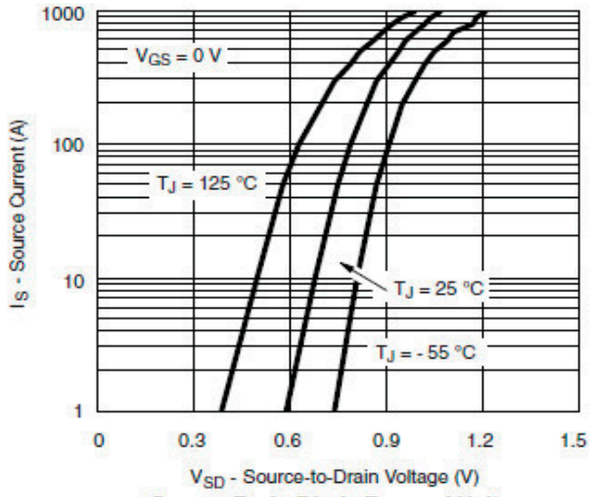

**Capacitance**



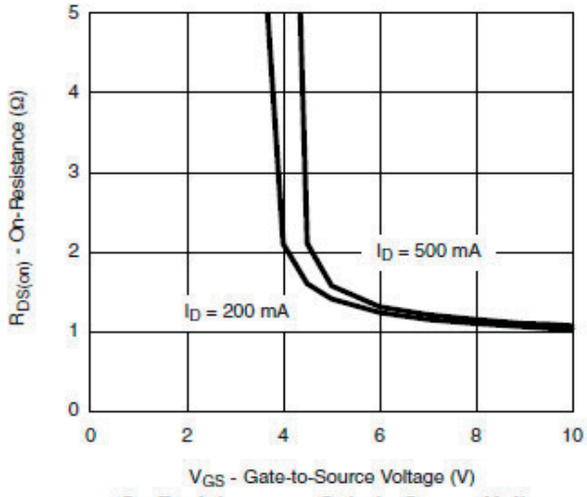

**Gate Charge**



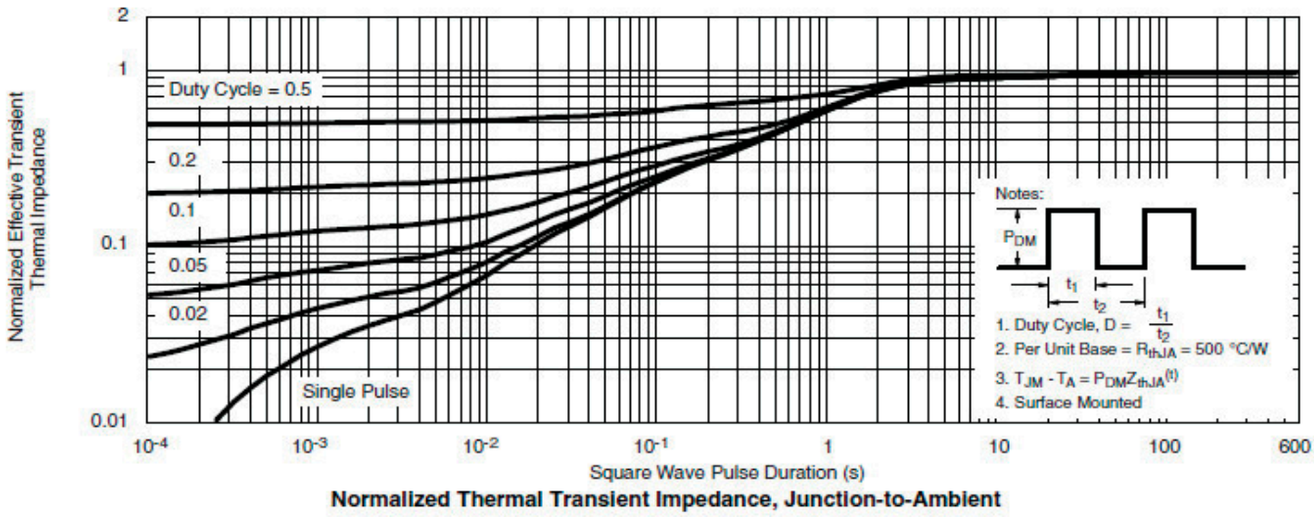

**On-Resistance vs. Junction Temperature**




**Source-Drain Diode Forward Voltage**



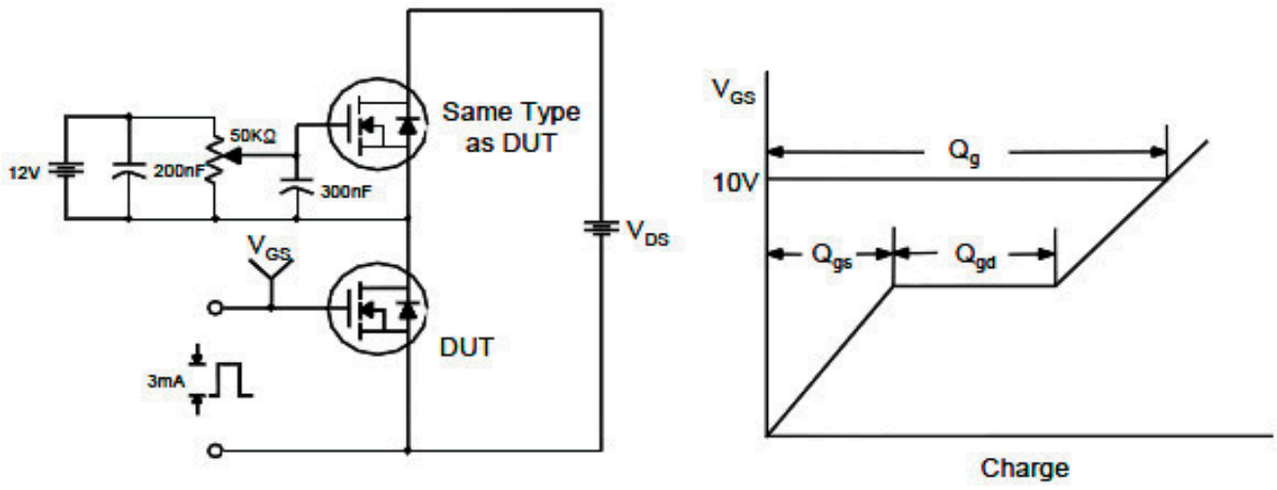

**On-Resistance vs. Gate-to-Source Voltage**



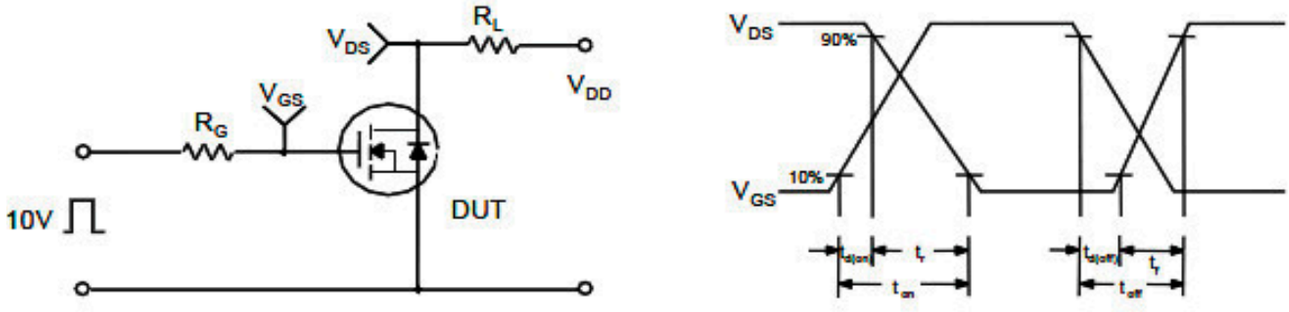

**Normalized Thermal Transient Impedance, Junction-to-Ambient**

## ■Test circuit and waveform

Gate Charge Test Circuit & Waveform




Resistive Switching Test Circuit & Waveforms




Unclamped Inductive Switching Test Circuit & Waveforms