# Single N-channel MOSFET

## ELM51480A-S

## ■General description

ELM51480A-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate threshold voltage.

## ■Features

- Vds=100V
- Id=2.3A
- Rds(on) = 285mΩ (Vgs=10V)
- Rds(on) = 295mΩ (Vgs=4.5V)

## ■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

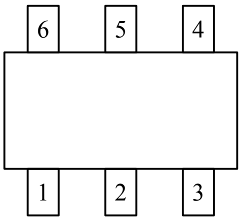
| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Drain-source voltage | | Vds | 100 | V |
| Gate-source voltage | | Vgs | ±20 | V |
| Continuous drain current(Tj=150°C) | Ta=25°C | Id | 2.3 | A |
| | Ta=70°C | | 1.8 | |
| Pulsed drain current | | Idm | 7 | A |
| Power dissipation | Tc=25°C | Pd | 1.5 | W |
| | Tc=70°C | | 1.0 | |
| Operating junction temperature | | Tj | 150 | °C |
| Storage temperature range | | Tstg | - 55 to 150 | °C |

## ■Thermal characteristics

| Parameter | Symbol | Typ. | Max. | Unit |
|---|---|---|---|---|
| Thermal resistance junction-to-ambient | Rθja | | 120 | °C/W |

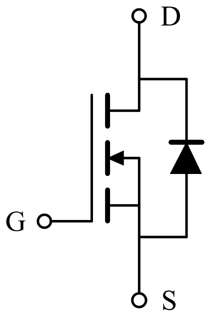
## ■Pin configuration

SC-70-6(TOP VIEW)



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

## ■Circuit

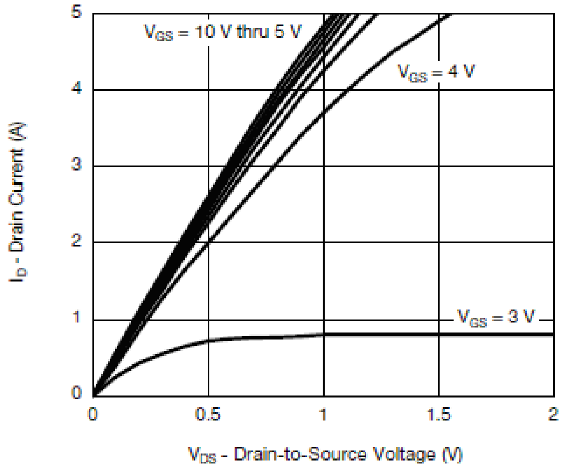


## ■Electrical characteristics

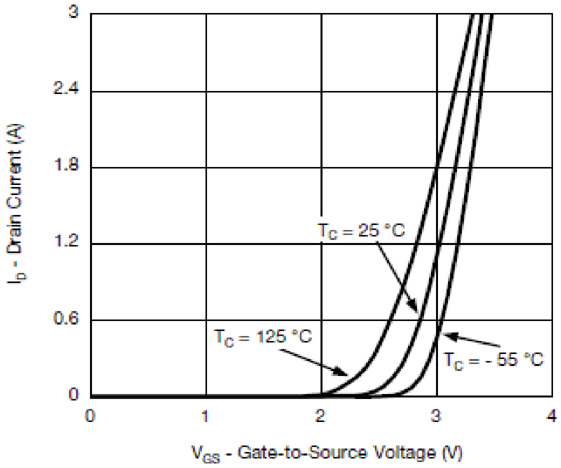
Ta=25°C. Unless otherwise noted.

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| STATIC PARAMETERS | | | | | | |
| Drain-source breakdown voltage | BVdss | Id=250μA, Vgs=0V | 100 | | | V |
| Zero gate voltage drain current | Idss | Vds=80V, Vgs=0V | | | 1 | μA |
| | | Ta=85°C | | | 10 | |
| Gate-body leakage current | Igss | Vds=0V, Vgs=±20V | | | ±100 | nA |
| Gate threshold voltage | Vgs(th) | Vds=Vgs, Id=250μA | 1.0 | | 2.0 | V |
| On state drain current | Id(on) | Vgs=4.5V, Vds≥5V | 5 | | | A |
| Static drain-source on-resistance | Rds(on) | Vgs=10V, Id=2.3A | | 265 | 285 | mΩ |
| | | Vgs=4.5V, Id=1.8A | | 275 | 295 | |
| Forward transconductance | Gfs | Vds=20V, Id=1.5A | | 2 | | S |
| Diode forward voltage | Vsd | Is=1.3A, Vgs=0V | | 0.85 | 1.20 | V |
| Max. body-diode continuous current | Is | | | | 1.3 | A |
| DYNAMIC PARAMETERS | | | | | | |
| Input capacitance | Ciss | Vgs=0V, Vds=50V, f=1MHz | | 200 | | pF |
| Output capacitance | Coss | | | 22 | | pF |
| Reverse transfer capacitance | Crss | | | 13 | | pF |
| SWITCHING PARAMETERS | | | | | | |
| Total gate charge | Qg | Vgs=4.5V, Vds=50V<br>Id≡1.6A | | 2.80 | 5.80 | nC |
| Gate-source charge | Qgs | | | 0.75 | | nC |
| Gate-drain charge | Qgd | | | 1.40 | | nC |
| Turn-on delay time | td(on) | Vgs=4.5V, Vds=50V<br>RL=39Ω, Id≡1.3A<br>Rgen=1.0Ω | | 25 | 50 | ns |
| Turn-on rise time | tr | | | 20 | 50 | ns |
| Turn-off delay time | td(off) | | | 15 | 30 | ns |
| Turn-off fall time | tf | | | 10 | 25 | ns |

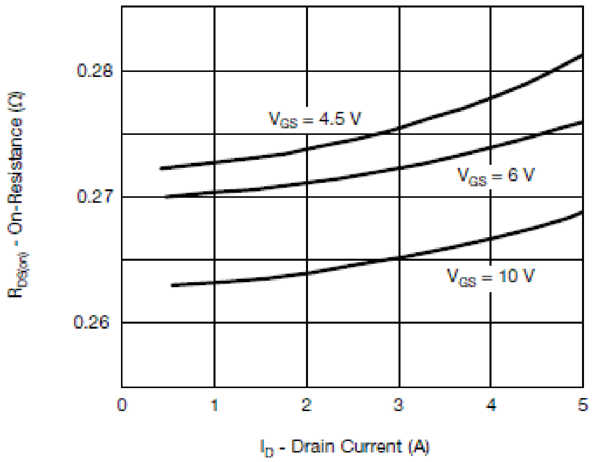
## ■Typical electrical and thermal characteristics



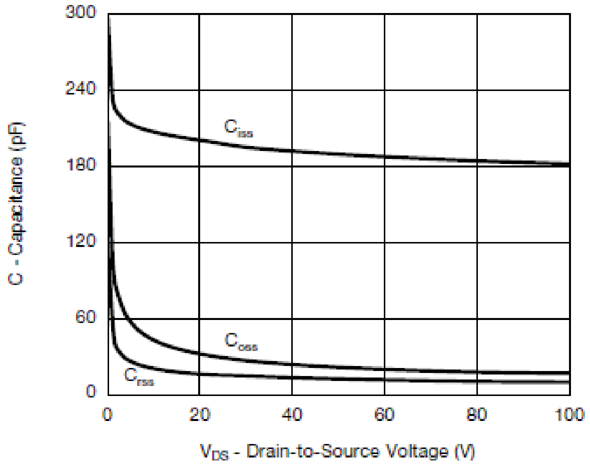
**Output Characteristics**



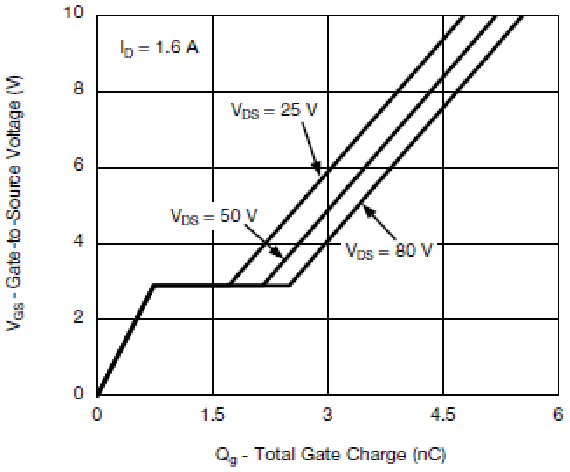
**Transfer Characteristics**



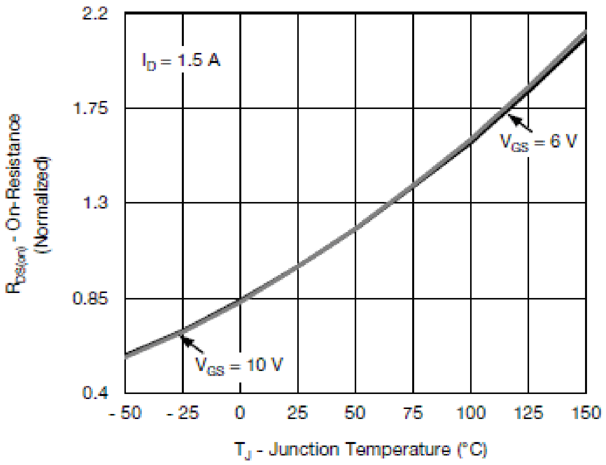
**On-Resistance vs. Drain Current and Gate Voltage**



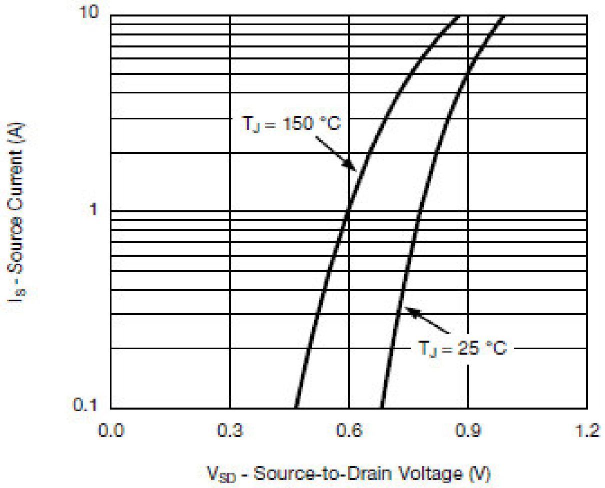
**Capacitance**



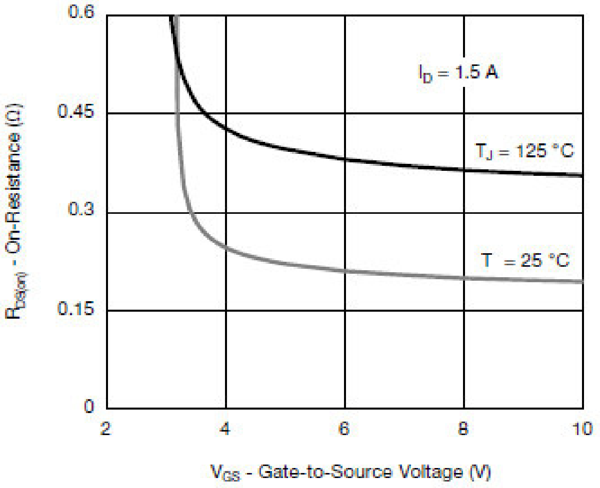
**Gate Charge**



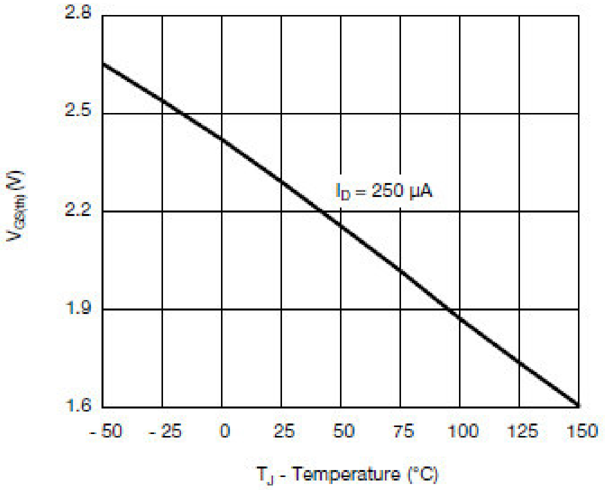
**On-Resistance vs. Junction Temperature**



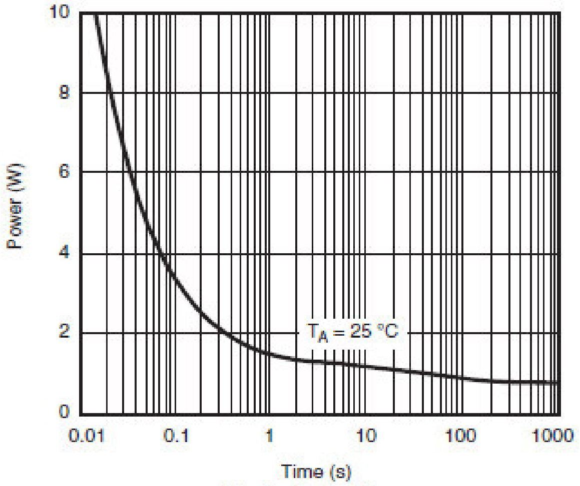
**Source-Drain Diode Forward Voltage**



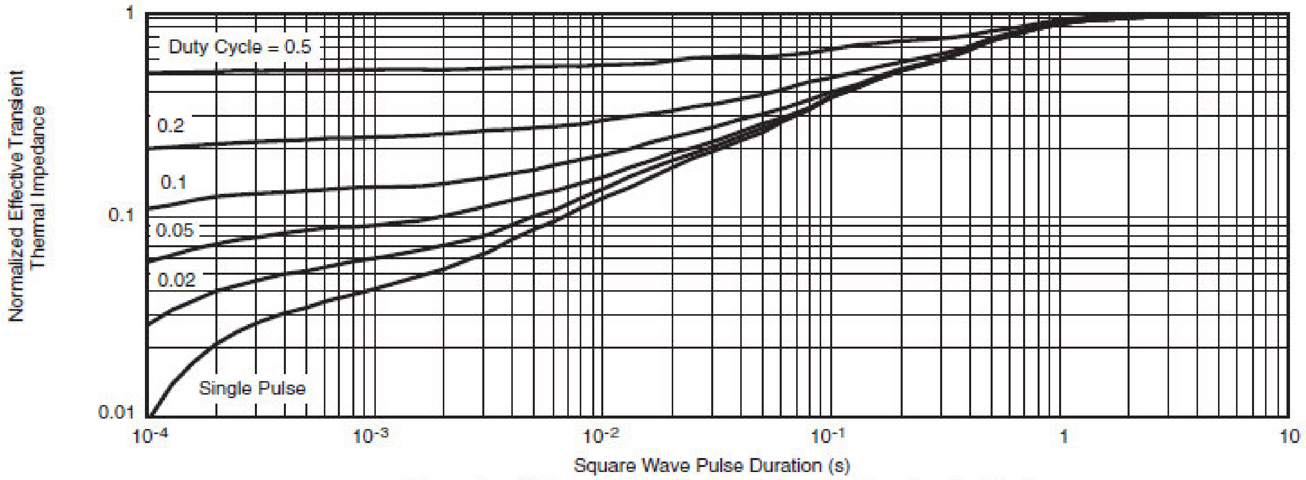
**On-Resistance vs. Gate-to-Source Voltage**



**Threshold Voltage**



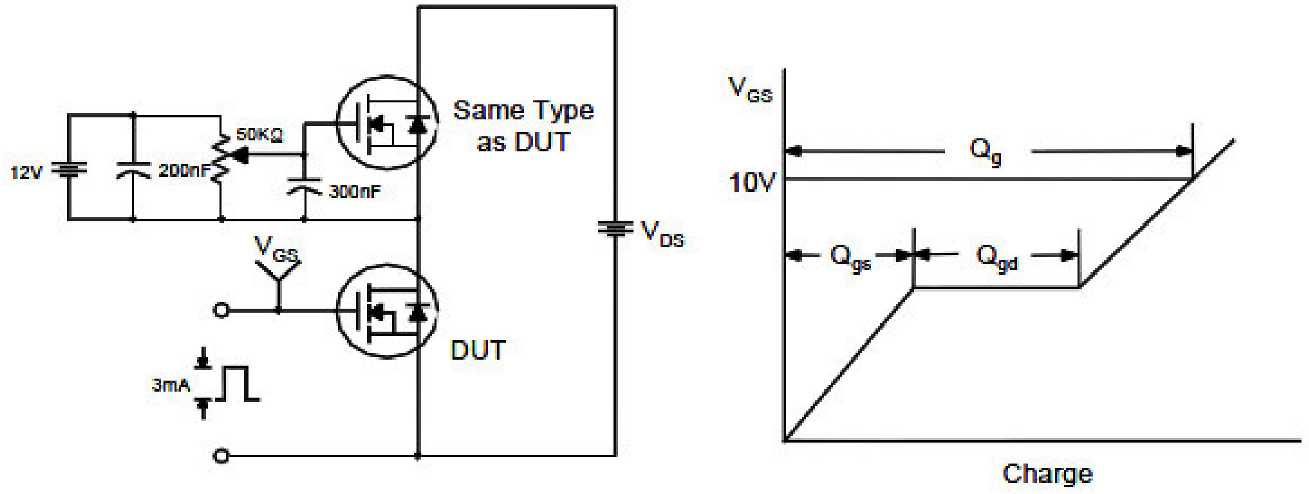
**Single Pulse Power**



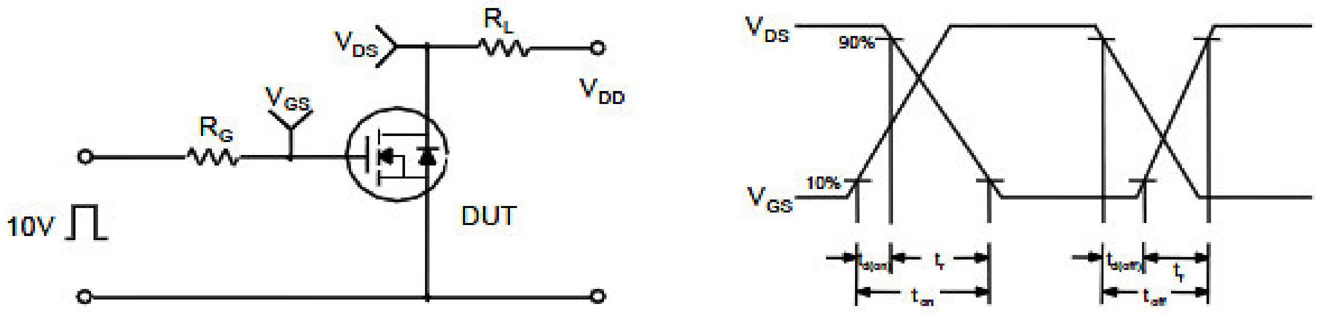
**Normalized Thermal Transient Impedance, Junction-to-Foot**

## ■Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms