

Dual N-channel MOSFET

ELM51034EA-S

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

■General description

ELM51034EA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and operation with gate voltages as low as 2.5V and internal ESD protection.

■Features

- $V_{ds}=30V$
- $I_d=0.7A$
- $R_{ds(on)} = 450m\Omega$ ($V_{gs}=4.5V$)
- $R_{ds(on)} = 600m\Omega$ ($V_{gs}=2.5V$)
- ESD protected

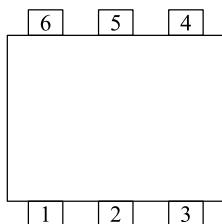
■Maximum absolute ratings

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

| Parameter | Symbol | Limit | Unit |
|--|-----------|-------------|-------------|
| Drain-source voltage | V_{ds} | 30 | V |
| Gate-source voltage | V_{gs} | ± 12 | V |
| Continuous drain current($T_j=150^{\circ}C$) | I_d | 0.7 | A |
| | | 0.4 | |
| Pulsed drain current | I_{dm} | 1.0 | A |
| Power dissipation | P_d | 0.27 | W |
| | | 0.16 | |
| Operating junction temperature | T_j | - 55 to 150 | $^{\circ}C$ |
| Storage temperature range | T_{stg} | - 55 to 150 | $^{\circ}C$ |

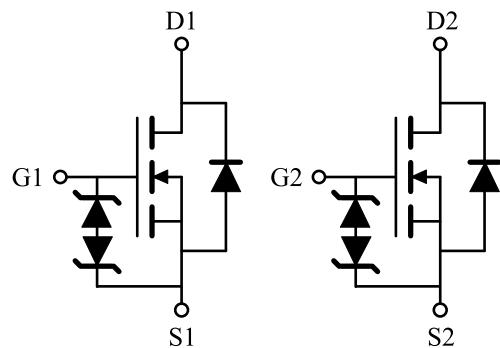
■Pin configuration

SOT-563(TOP VIEW)



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

■Circuit



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■Electrical characteristics

Ta=25°C. Unless otherwise noted.

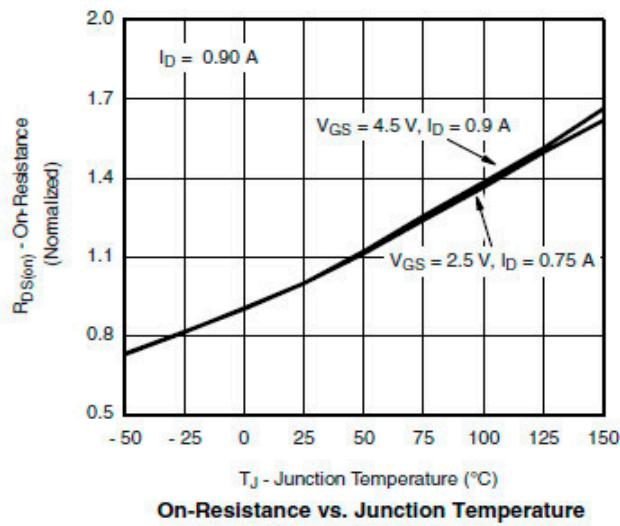
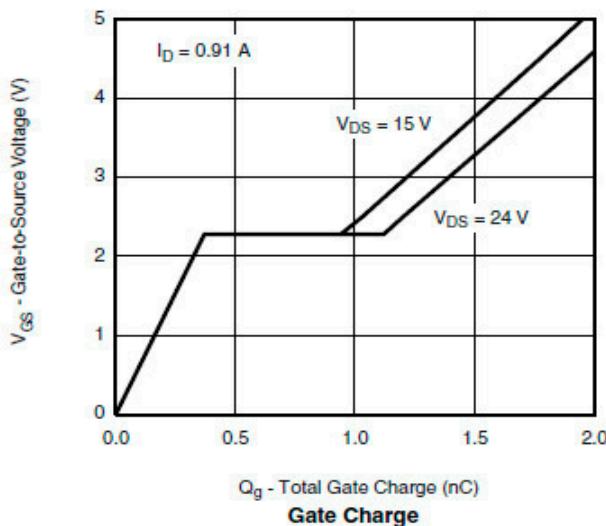
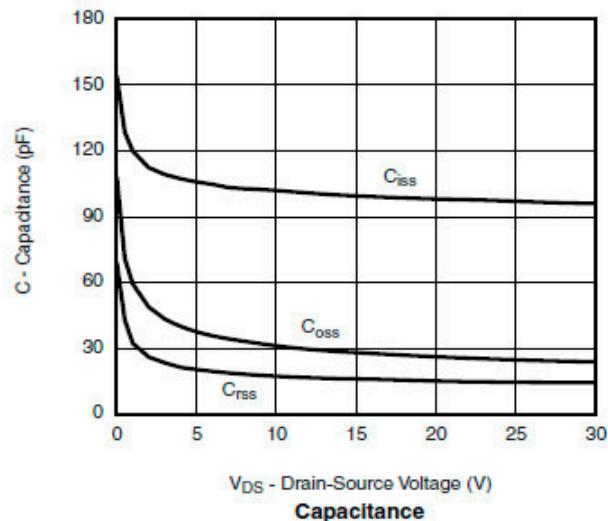
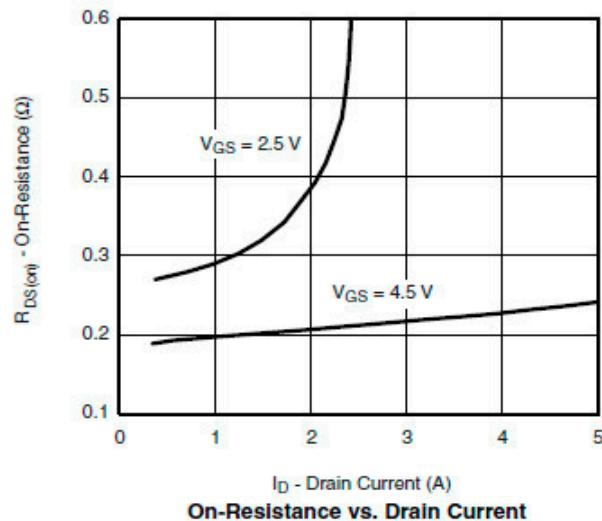
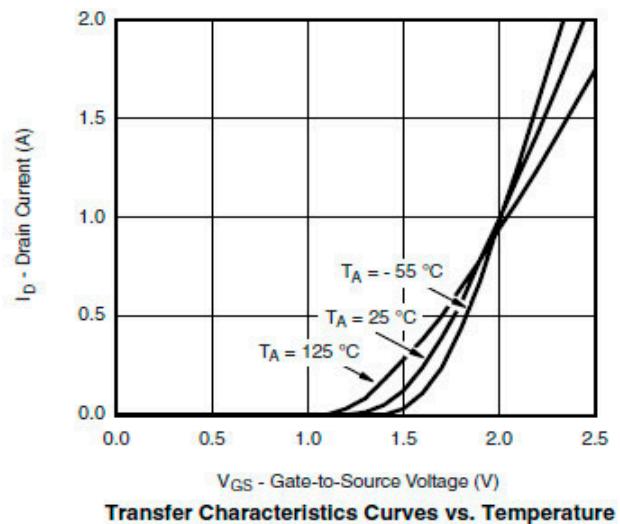
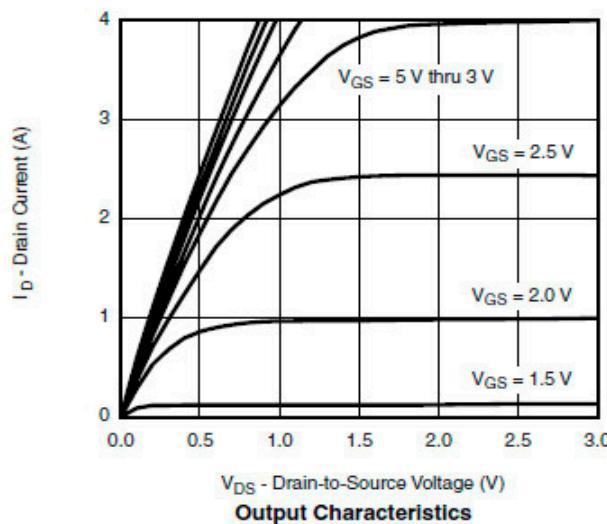
| Parameter | Symbol | Condition | | Min. | Typ. | Max. | Unit | |
|------------------------------------|---------|---|---------|------|------|------|------|--|
| STATIC PARAMETERS | | | | | | | | |
| Drain-source breakdown voltage | BVdss | Id=250μA, Vgs=0V | | 30 | | | V | |
| Zero gate voltage drain current | Idss | Vds=24V, Vgs=0V | Ta=85°C | | | 1 | μA | |
| | | | | | | 5 | | |
| Gate-source leakage current | Igss | Vds=0V, Vgs=±12V | | | | ±5 | mA | |
| Gate threshold voltage | Vgs(th) | Vds=Vgs, Id=250μA | | 0.5 | | 1.5 | V | |
| On state drain current | Id(on) | Vgs=4.5V, Vds≥5V | | 0.7 | | | A | |
| Static drain-source on-resistance | Rds(on) | Vgs=4.5V, Id=0.6A | | | 400 | 450 | mΩ | |
| | | Vgs=2.5V, Id=0.5A | | | 550 | 600 | | |
| Forward transconductance | Gfs | Vds=10V, Id=0.4A | | | 1 | | S | |
| Diode forward voltage | Vsd | Is=0.15A, Vgs=0V | | | 0.6 | 1.2 | V | |
| Max. body-diode continuous current | Is | | | | | 0.3 | A | |
| DYNAMIC PARAMETERS | | | | | | | | |
| Input capacitance | Ciss | Vgs=0V, Vds=15V, f=1MHz | | | 85 | | pF | |
| Output capacitance | Coss | | | | 25 | | pF | |
| Reverse transfer capacitance | Crss | | | | 15 | | pF | |
| SWITCHING PARAMETERS | | | | | | | | |
| Total gate charge | Qg | Vgs=4.5V, Vds=15V, Id=0.6A | | | 1.4 | 1.8 | nC | |
| Gate-source charge | Qgs | | | | 0.3 | | nC | |
| Gate-drain charge | Qgd | | | | 0.6 | | nC | |
| Turn-on delay time | td(on) | Vgs=4.5V, Vds=15V RL=20Ω, Id=0.5A Rgen=1.0Ω | | | 15 | 25 | ns | |
| Turn-on rise time | tr | | | | 25 | 45 | ns | |
| Turn-off delay time | td(off) | | | | 15 | 25 | ns | |
| Turn-off fall time | tf | | | | 10 | 20 | ns | |

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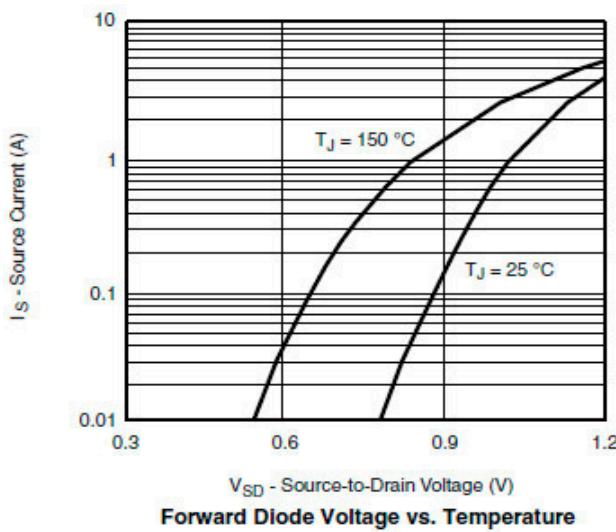
■ Typical electrical and thermal characteristics



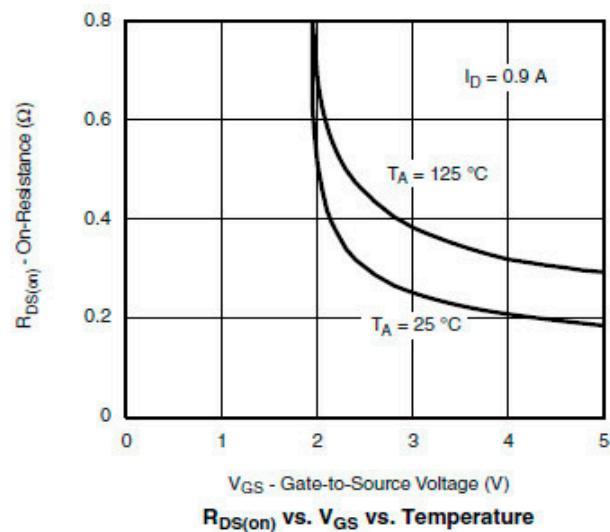
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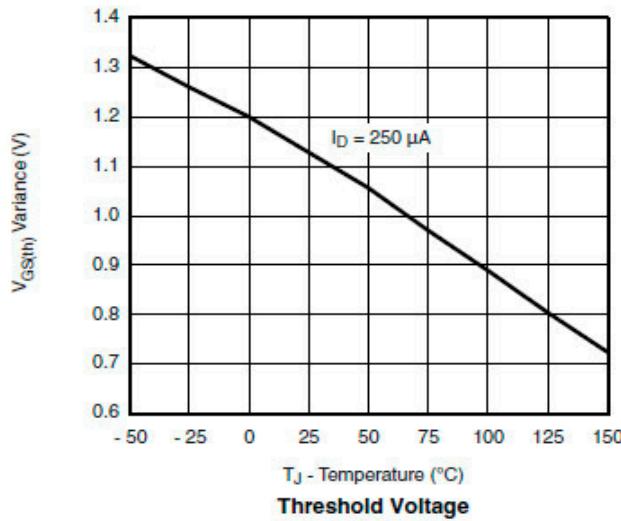
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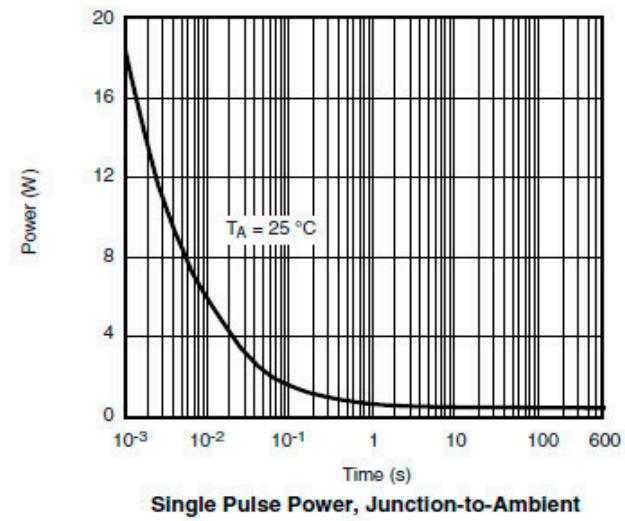
Forward Diode Voltage vs. Temperature
 V_{SD} - Source-to-Drain Voltage (V)



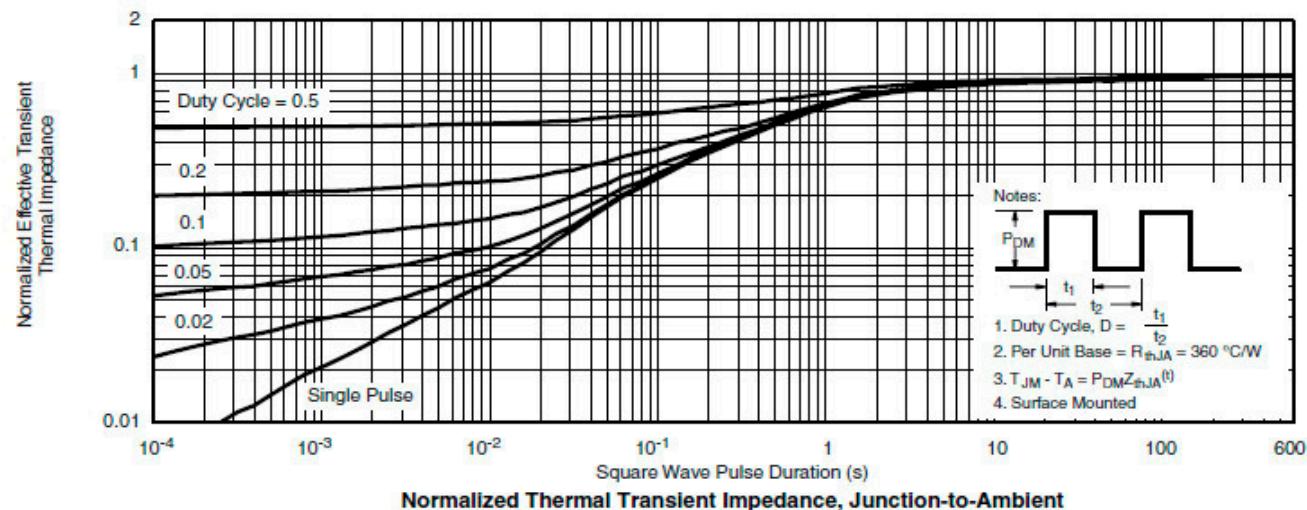
$R_{DS(on)}$ vs. V_{GS} vs. Temperature
 $R_{DS(on)}$ - On-Resistance (Ω)
 V_{GS} - Gate-to-Source Voltage (V)



Threshold Voltage
 $V_{GS(th)}$ - Variance (V)
 T_J - Temperature (°C)



Single Pulse Power, Junction-to-Ambient
Power (W)
Time (s)



Normalized Thermal Transient Impedance, Junction-to-Ambient

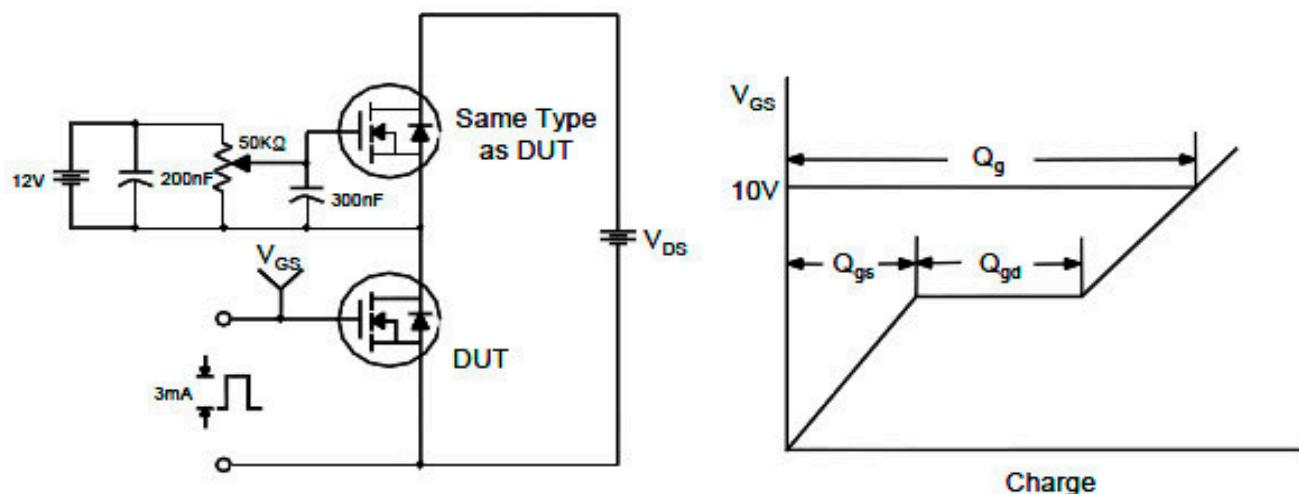
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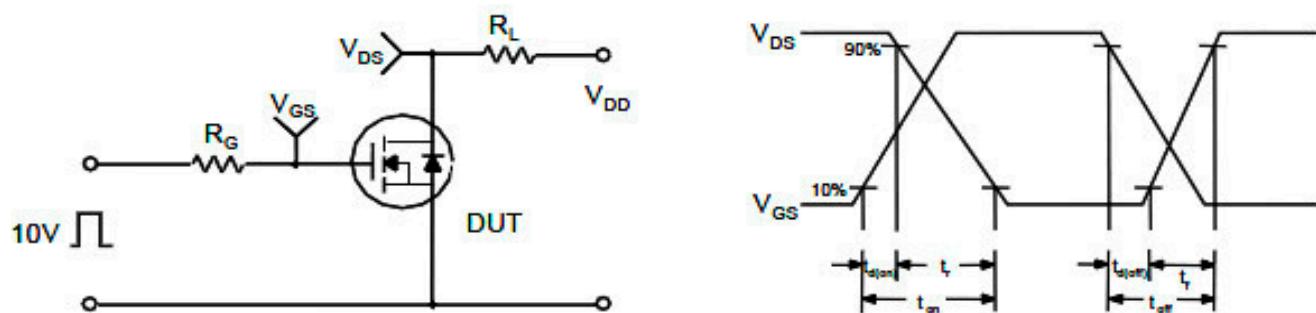
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

