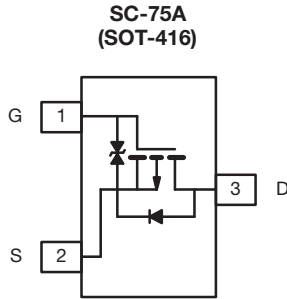


N-Channel 1.5 V (G-S) MOSFET



RoHS
COMPLIANT
HALOGEN
FREE

FEATURES

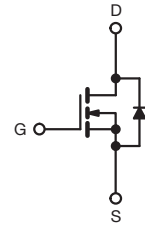
- TrenchFET® power MOSFETs: 1.5 V rated
- Low-side switching
- Low on-resistance: 5 W
- Low threshold: 0.9 V (typ.)
- Fast switching speed: 35 ns
- Enhance power dissipation and lower R_{thJC}
- 2000 V ESD protection
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

BENEFITS

- Ease in driving switches
- Low offset (Error) voltage
- Low-voltage operation
- High-speed circuits
- Low battery voltage operation

APPLICATIONS

- Drivers: relays, solenoids, lamps, hammers, displays, memories
- Battery operated systems
- Power supply converter circuits
- Load/power switching cell phones, pagers



N-Channel MOSFET

Marking Code: G

| PRODUCT SUMMARY | |
|--|--------|
| V_{DS} (V) | 20 |
| $R_{DS(on)}$ max. (Ω) at $V_{GS} = 4.5$ V | 5 |
| $R_{DS(on)}$ max. (Ω) at $V_{GS} = 2.5$ V | 7 |
| $R_{DS(on)}$ max. (Ω) at $V_{GS} = 1.8$ V | 9 |
| $R_{DS(on)}$ max. (Ω) at $V_{GS} = 1.5$ V | 10 |
| Q_g typ. (nC) | 750 |
| I_D (A) | 200 |
| Configuration | Single |

| ORDERING INFORMATION | |
|---------------------------------|----------------|
| Package | SC-75A |
| Lead (Pb)-free and halogen-free | Si1032R-T1-GE3 |

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted) | | | | | | | |
|---|----------------|--------------------------|--------------|----------------------|--------------|------------------|----|
| PARAMETER | SYMBOL | SI1032R | | SI1032X ^b | | UNIT | |
| | | 5 s | STEADY STATE | 5 s | STEADY STATE | | |
| Drain-source voltage | V_{DS} | 20 | | | | V | |
| Gate-source voltage | V_{GS} | ± 6 | | | | | |
| Continuous drain current ($T_J = 150^\circ\text{C}$) ^a | I_D | $T_A = 25^\circ\text{C}$ | 200 | 140 | 210 | 200 | mA |
| | | $T_A = 85^\circ\text{C}$ | 110 | 100 | 150 | 140 | |
| Pulsed drain current ^a | I_{DM} | 500 | | 600 | | | |
| Continuous source current (diode conduction) ^a | I_S | 250 | 200 | 300 | 240 | | |
| Maximum power dissipation ^a for SC-75 | P_D | $T_A = 25^\circ\text{C}$ | 280 | 250 | 340 | 300 | mW |
| | | $T_A = 85^\circ\text{C}$ | 145 | 130 | 170 | 150 | |
| Operating junction and storage temperature range | T_J, T_{stg} | - 55 to 150 | | | | $^\circ\text{C}$ | |
| Gate-source ESD rating (HBM, method 3015) | ESD | 2000 | | | | V | |

Note

- a. Surface mounted on FR4 board
 b. Si1032X, product End of Life November - 2024



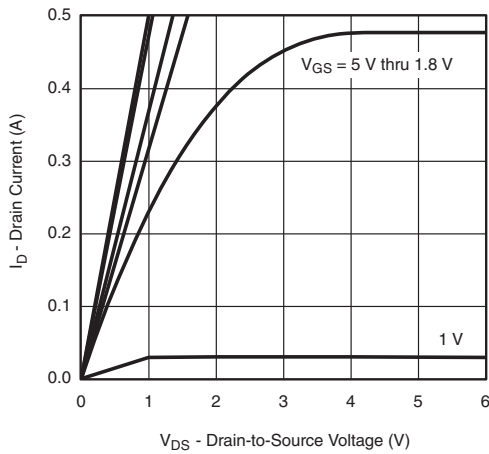
| SPECIFICATIONS (T _A = 25 °C, unless otherwise noted) | | | | | | |
|---|---------------------|---|------|-------|-------|------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
| Static | | | | | | |
| Gate threshold voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250 μA | 0.40 | 0.7 | 1.2 | V |
| Gate-body leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ± 2.8 V | - | ± 0.5 | ± 1.0 | μA |
| | | V _{DS} = 0 V, V _{GS} = ± 4.5 V | - | ± 1.0 | ± 3.0 | |
| Zero gate voltage drain current | I _{DSS} | V _{DS} = 20 V, V _{GS} = 0 V | - | - | 1 | |
| | | V _{DS} = 20 V, V _{GS} = 0 V, T _J = 55 °C | - | - | 10 | |
| On-state drain current ^a | I _{D(on)} | V _{DS} = 5 V, V _{GS} = 4.5 V | 250 | - | - | mA |
| Drain-source on-state resistance ^a | R _{DS(on)} | V _{GS} = 4.5 V, I _D = 200 mA | - | - | 5 | Ω |
| | | V _{GS} = 2.5 V, I _D = 175 mA | - | - | 7 | |
| | | V _{GS} = 1.8 V, I _D = 150 mA | - | - | 9 | |
| | | V _{GS} = 1.5 V, I _D = 40 mA | - | - | 10 | |
| Forward transconductance ^a | g _{fs} | V _{DS} = 10 V, I _D = 200 mA | - | 0.5 | - | S |
| Diode forward voltage ^a | V _{SD} | I _S = 150 mA, V _{GS} = 0 V | - | - | 1.2 | V |
| Dynamic ^b | | | | | | |
| Total gate charge | Q _g | V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 250 mA | - | 750 | - | pC |
| Gate-source charge | Q _{gs} | | - | 75 | - | |
| Gate-drain charge | Q _{gd} | | - | 225 | - | |
| Turn-on delay time | t _{d(on)} | V _{DD} = 10 V, R _L = 47 Ω I _D ≅ 200 mA, V _{GEN} = 4.5 V, R _g = 10 Ω | - | - | 50 | ns |
| Rise time | t _r | | - | - | 25 | |
| Turn-off delay time | t _{d(off)} | | - | - | 50 | |
| Fall time | t _f | | - | - | 25 | |

Notes

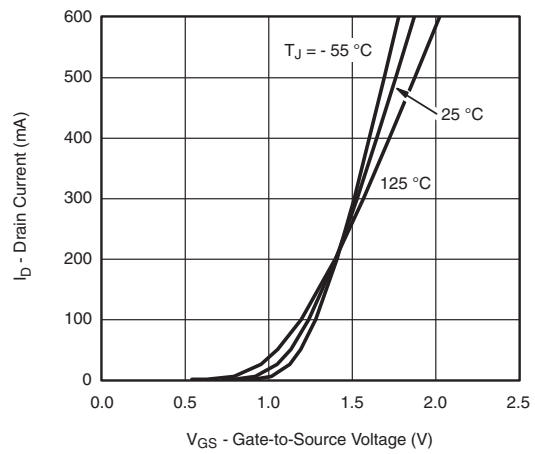
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- b. Guaranteed by design, not subject to production testing

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

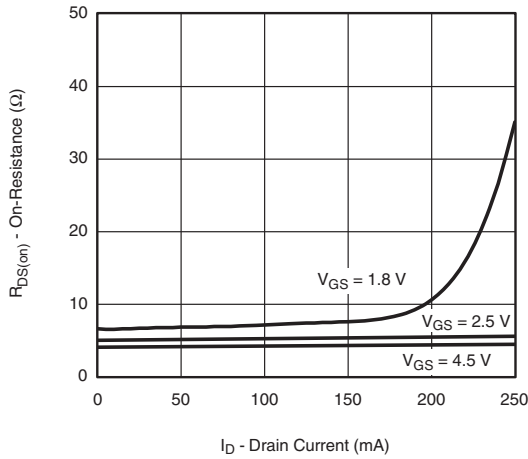
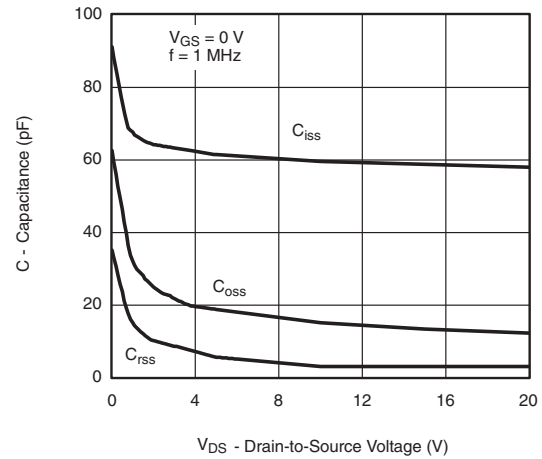
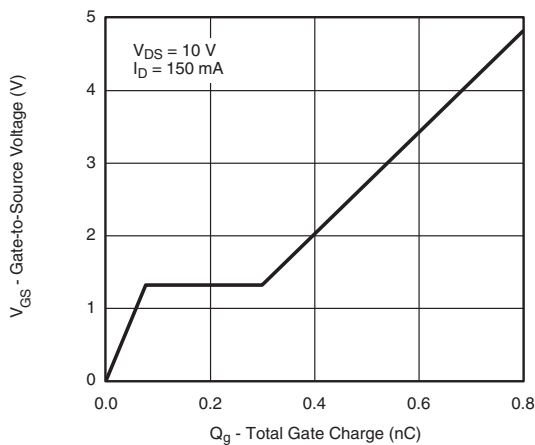
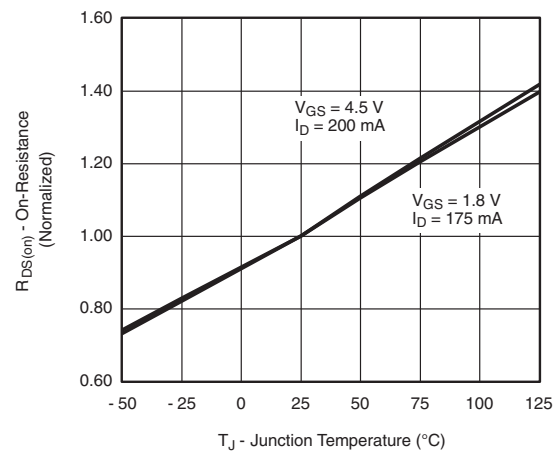
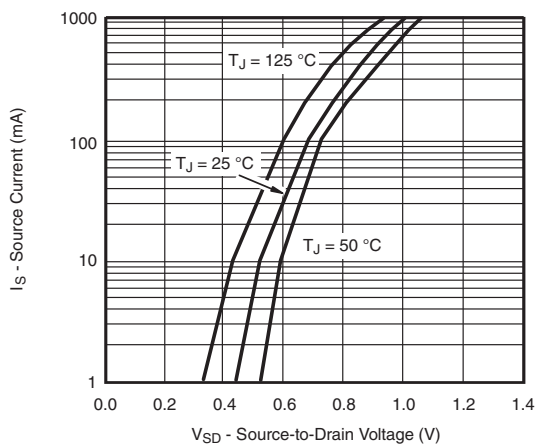
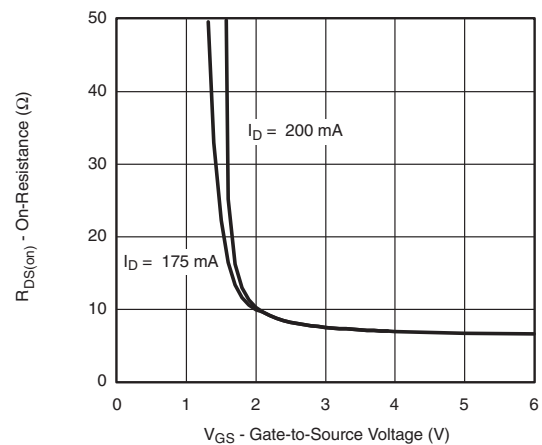
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



Output Characteristics

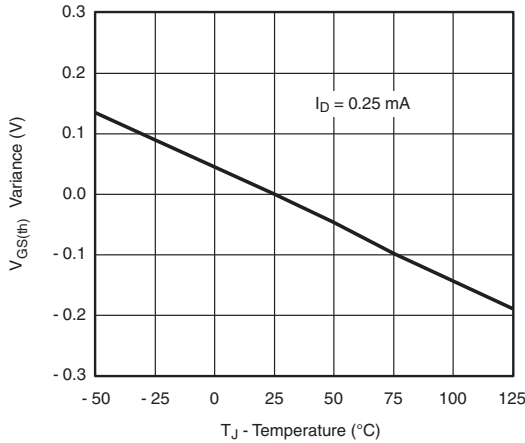


Transfer Characteristics

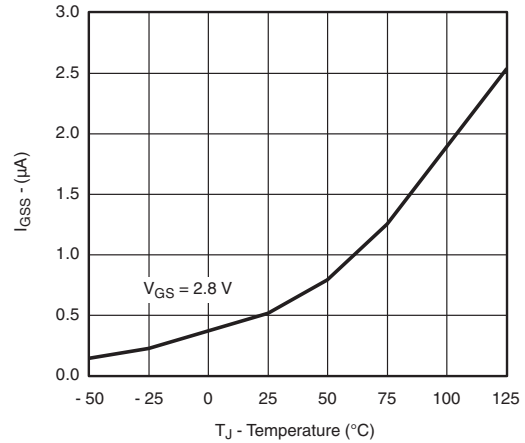
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)

On-Resistance vs. Drain Current

Capacitance

Gate Charge

On-Resistance vs. Gate-to-Source Voltage

Surge-Drain Diode Forward Voltage

On-Resistance vs. Gate-to-Source Voltage



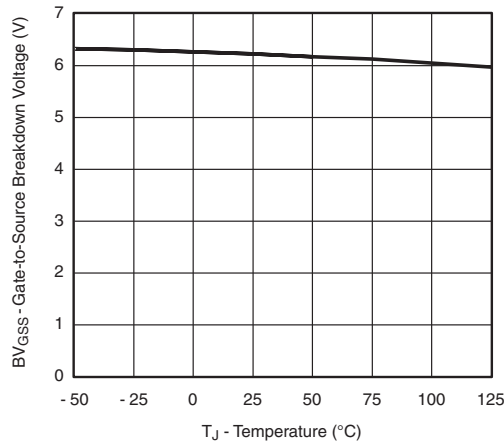
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



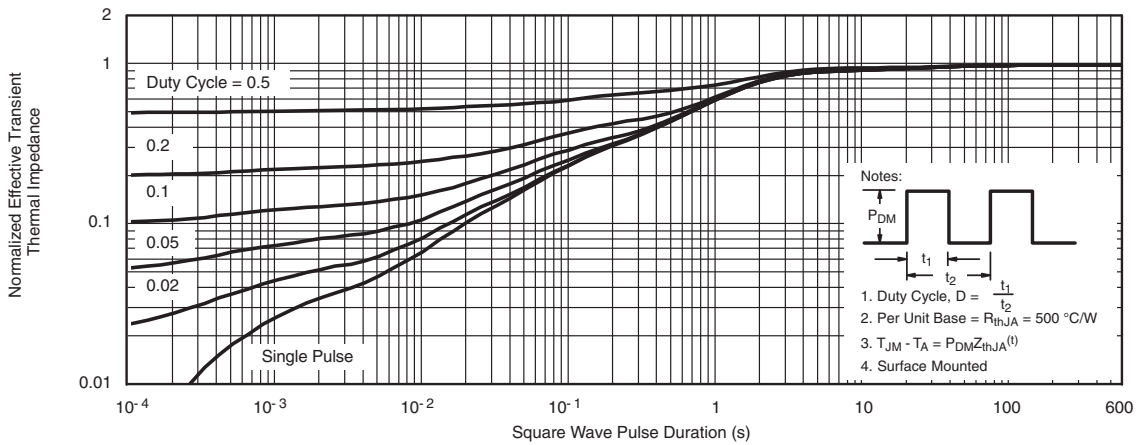
Threshold Voltage Variance vs. Temperature



IGSS vs. Temperature



BV_{GSS} vs. Temperature



Normalized Thermal Transient Impedance, Junction-to-Ambient (SC-75A, Si1032R Only)

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SC-75A: 3 Leads



DWG: 5868

Notes

Dimensions in millimeters will govern.

- 1. Dimension D does not include mold flash, protrusions or gate burrs. Mold flash protrusions or gate burrs shall not exceed 0.10 mm per end. Dimension E1 does not include Interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.10 mm per side.
- 2. Dimensions D and E1 are determined at the outmost extremes of the plastic body exclusive of mold flash, tie bar burrs, gate burrs and interlead flash, but including any mismatch between the top and bottom of the plastic body.
- 3. Datums A, B and D to be determined 0.10 mm from the lead tip.
- 4. Terminal positions are shown for reference only.
- 5. These dimensions apply to the flat section of the lead between 0.08 mm and 0.15 mm from the lead tip.

| DIMENSIONS | TOLERANCES |
|------------|------------|
| aaa | 0.10 |
| bbb | 0.10 |
| ccc | 0.10 |
| ddd | 0.10 |

| DIM. | MILLIMETERS | | | NOTE |
|------|-------------|-------|------|------|
| | MIN. | NOM. | MAX. | |
| A | - | - | 0.80 | |
| A1 | 0.00 | - | 0.10 | |
| A2 | 0.65 | 0.70 | 0.80 | |
| B1 | 0.19 | - | 0.24 | 5 |
| b1 | 0.17 | - | 0.21 | |
| c | 0.13 | - | 0.15 | 5 |
| c1 | 0.10 | - | 0.12 | 5 |
| D | 1.48 | 1.575 | 1.68 | 1, 2 |
| E | 1.50 | 1.60 | 1.70 | |
| E1 | 0.66 | 0.76 | 0.86 | 1, 2 |
| e1 | 0.50 BSC | | | |
| e2 | 1.00 BSC | | | |
| e3 | 0.50 BSC | | | |
| L | 0.15 | 0.205 | 0.30 | |
| L1 | 0.40 ref. | | | |
| L2 | 0.15 BSC | | | |
| q | 0° | - | 8° | |
| q1 | 4° | - | 10° | |

RECOMMENDED MINIMUM PADS FOR SC-75A: 3-Lead



Recommended Minimum Pads
Dimensions in Inches/(mm)

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