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Product Termination Notification



Product Group: SIL/Wed Jun 14, 2023/PTN-SIL-031-2023-REV-0

Conversion to Copper (Cu) Wire – SQ4850EY

For further information, please contact your regional Vishay office.

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Description of Change: The affected part number listed in this notification will be converted to a Copper wire material set. The new ordering code is SQ4850CEY-T1_GE3, which has the exact same product performance and fit as SQ4850EY. There will be no change to the wafer fab or assembly location (Note: parts with _BE3 suffix will be consolidated to single assembly location in China). There will be no changes to the parameters on the datasheet (reference: SQ4850CEY Doc #62018 Rev.B).

Classification of Change: Standardization of materials

Expected Influence on Quality/Reliability/Performance: None

Part Numbers/Series/Families Affected: SQ4850EY-T1_GE3, SQ4850EY-T1_BE3,

Vishay Brand(S): Vishay Siliconix

Time Schedule:

Last Time Buy Date: Mon Dec 18, 2023

Last Time Ship Date: Mon Jun 17, 2024

Sample Availability: Qualified samples of replacement product are available on request

Product Identification: SQ4850CEY-T1_GE3

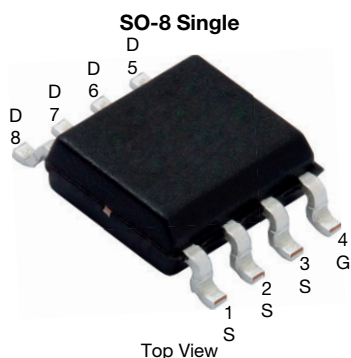
Qualification Data: AEC Q101 qualification data of replacement product is available. Qualification PPAP is available now

This PTN is considered approved, without further notification, unless we receive specific customer concerns before Mon Dec 18, 2023 or as specified by contract.

Issued By: Vishay Siliconix, business-americas@vishay.com



Automotive N-Channel 60 V (D-S) 175 °C MOSFET

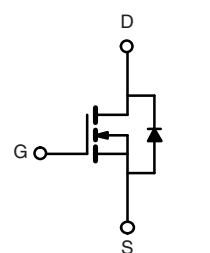


FEATURES

- TrenchFET® power MOSFET
- 100 % R_g and UIS tested
- AEC-Q101 qualified
- Material categorization:
for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE



N-Channel MOSFET

PRODUCT SUMMARY

| | |
|---|--------|
| V_{DS} (V) | 60 |
| $R_{DS(on)}$ (Ω) at $V_{GS} = 10$ V | 0.022 |
| $R_{DS(on)}$ (Ω) at $V_{GS} = 4.5$ V | 0.031 |
| I_D (A) | 12 |
| Configuration | Single |

ORDERING INFORMATION

| | |
|---------------------------------|---|
| Package | SO-8 |
| Lead (Pb)-free and halogen-free | SQ4850CEY (for detailed order number please see www.vishay.com/doc?79771) |

ABSOLUTE MAXIMUM RATINGS ($T_C = 25$ °C, unless otherwise noted)

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|----------------|----------------|------|
| Drain-source voltage | V_{DS} | 60 | V |
| Gate-source voltage | V_{GS} | ± 20 | |
| Continuous drain current | I_D | $T_C = 25$ °C | 12 |
| | | $T_C = 125$ °C | 6.9 |
| Continuous source current (diode conduction) | I_S | 6.2 | A |
| Pulsed drain current ^a | I_{DM} | 48 | |
| Single pulse avalanche current | I_{AS} | 23 | |
| Single pulse avalanche energy | E_{AS} | 26 | mJ |
| Maximum power dissipation | P_D | $T_C = 25$ °C | 6.8 |
| | | $T_C = 125$ °C | 2.2 |
| Operating junction and storage temperature range | T_J, T_{stg} | -55 to +175 | °C |

THERMAL RESISTANCE RATINGS

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--------------------------|------------|-------|------|
| Junction-to-ambient | R_{thJA} | 85 | °C/W |
| Junction-to-foot (Drain) | R_{thJF} | 22 | |

Notes

- Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 2 %
- When mounted on 1" square PCB (FR4 material)



| SPECIFICATIONS ($T_C = 25\text{ }^\circ\text{C}$, unless otherwise noted) | | | | | | | |
|---|---------------|--|---|------|-----------|-------|---------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT | |
| Static | | | | | | | |
| Drain-source breakdown voltage | V_{DS} | $V_{GS} = 0, I_D = 250\text{ }\mu\text{A}$ | 60 | - | - | V | |
| Gate-source threshold voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$ | 1.5 | 2 | 2.5 | | |
| Gate-source leakage | I_{GSS} | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$ | - | - | ± 100 | nA | |
| Zero gate voltage drain current | I_{DSS} | $V_{GS} = 0\text{ V}$ | $V_{DS} = 60\text{ V}$ | - | - | 1 | μA |
| | | $V_{GS} = 0\text{ V}$ | $V_{DS} = 60\text{ V}, T_J = 125\text{ }^\circ\text{C}$ | - | - | 50 | |
| | | $V_{GS} = 0\text{ V}$ | $V_{DS} = 60\text{ V}, T_J = 175\text{ }^\circ\text{C}$ | - | - | 150 | |
| On-state drain current ^a | $I_{D(on)}$ | $V_{GS} = 10\text{ V}$ | $V_{DS} \geq 5\text{ V}$ | 30 | - | - | A |
| Drain-source on-state resistance ^a | $R_{DS(on)}$ | $V_{GS} = 10\text{ V}$ | $I_D = 6\text{ A}$ | - | 0.018 | 0.022 | Ω |
| | | $V_{GS} = 10\text{ V}$ | $I_D = 6\text{ A}, T_J = 125\text{ }^\circ\text{C}$ | - | - | 0.037 | |
| | | $V_{GS} = 10\text{ V}$ | $I_D = 6\text{ A}, T_J = 175\text{ }^\circ\text{C}$ | - | - | 0.047 | |
| | | $V_{GS} = 4.5\text{ V}$ | $I_D = 5\text{ A}$ | - | 0.025 | 0.031 | |
| Forward transconductance ^b | g_{fs} | $V_{DS} = 15\text{ V}, I_D = 6\text{ A}$ | | - | 21 | - | S |
| Dynamic ^b | | | | | | | |
| Input capacitance | C_{iss} | $V_{GS} = 0\text{ V}$ | $V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | - | 1100 | 1250 | pF |
| Output capacitance | C_{oss} | | | - | 171 | 235 | |
| Reverse transfer capacitance | C_{rss} | | | - | 77 | 95 | |
| Total gate charge ^c | Q_g | $V_{GS} = 10\text{ V}$ | $V_{DS} = 30\text{ V}, I_D = 6\text{ A}$ | - | 22.3 | 30 | nC |
| Gate-source charge ^c | Q_{gs} | | | - | 4.1 | - | |
| Gate-drain charge ^c | Q_{gd} | | | - | 5.1 | - | |
| Gate resistance | R_g | $f = 1\text{ MHz}$ | | 0.2 | 0.41 | 2.1 | Ω |
| Turn-on delay time ^c | $t_{d(on)}$ | $V_{DD} = 30\text{ V}, R_L = 30\text{ }\Omega$ $I_D \cong 1\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$ | | - | 10 | 11 | ns |
| Rise time ^c | t_r | | | - | 4 | 14 | |
| Turn-off delay time ^c | $t_{d(off)}$ | | | - | 23 | 35 | |
| Fall time ^c | t_f | | | - | 11 | 14 | |
| Source-Drain Diode Ratings and Characteristics ^b | | | | | | | |
| Pulsed current ^a | I_{SM} | | | - | - | 48 | A |
| Forward voltage | V_{SD} | $I_F = 1.7\text{ A}, V_{GS} = 0\text{ V}$ | | - | 0.73 | 1.2 | V |
| Body diode reverse recovery time | t_{rr} | $I_F = 2.8\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$ | | - | 20 | 40 | ns |
| Body diode reverse recovery charge | Q_{rr} | | | - | 19 | 38 | nC |
| Reverse recovery fall time | t_a | | | - | 15 | - | ns |
| Reverse recovery rise time | t_b | | | - | 5 | - | |
| Body diode peak reverse recovery current | $I_{RM(REC)}$ | | | - | -2 | - | A |

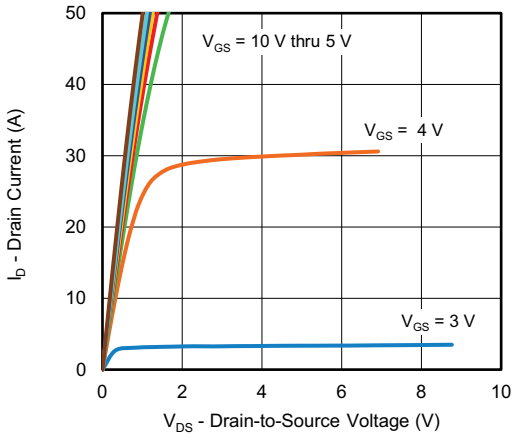
Notes

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing
c. Independent of operating temperature

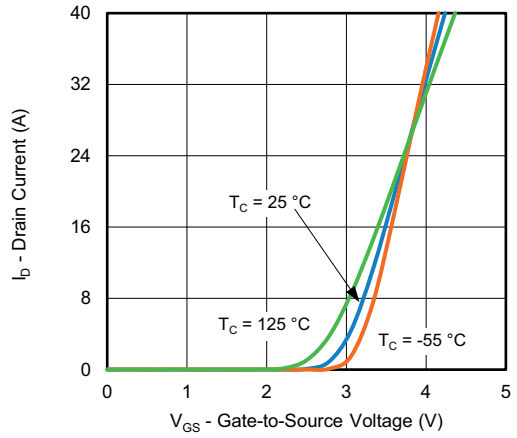
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



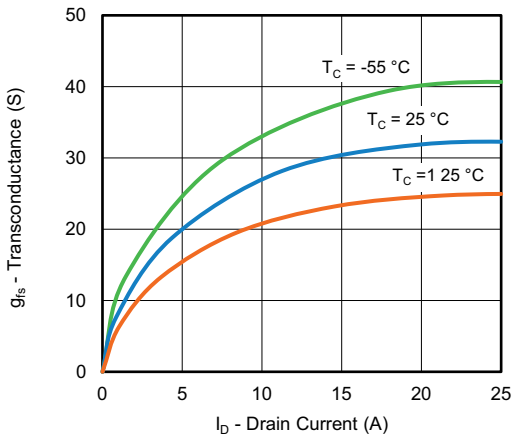
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



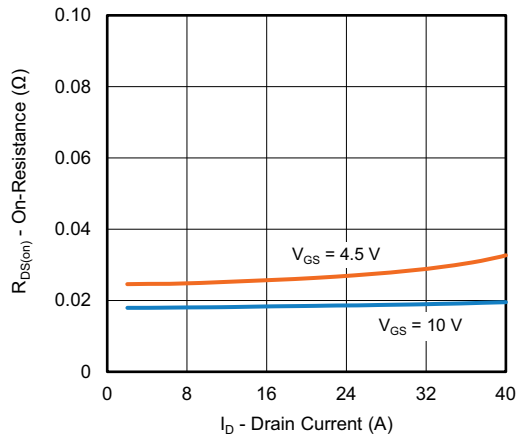
Output Characteristics



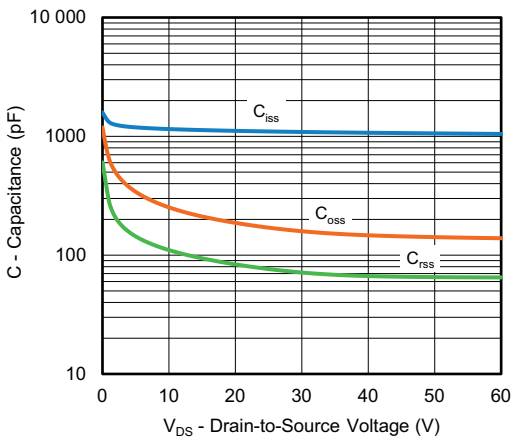
Transfer Characteristics



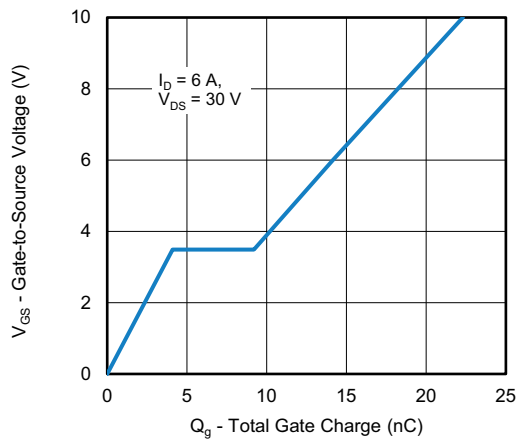
Transconductance



On-Resistance vs. Drain Current



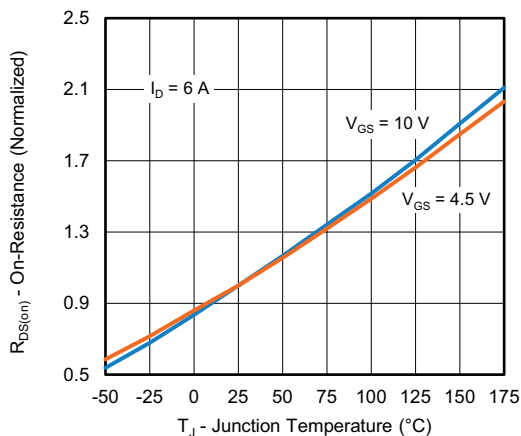
Capacitance



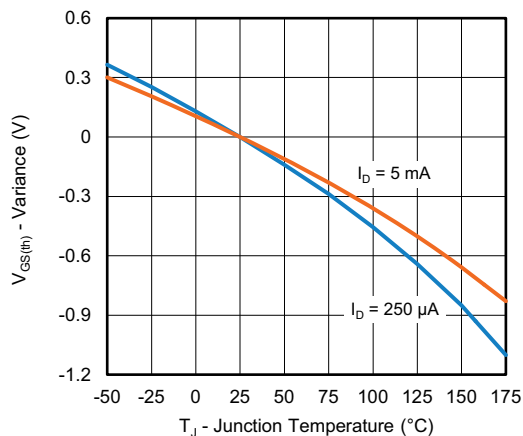
Gate Charge



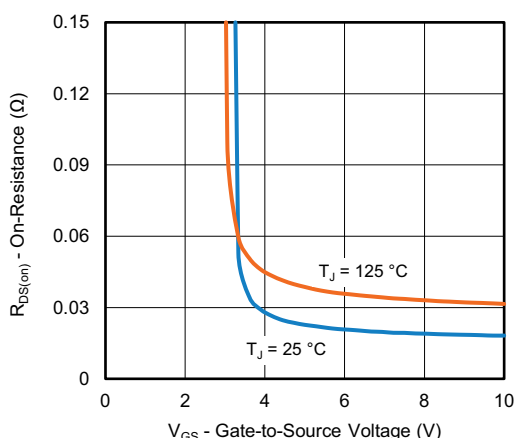
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



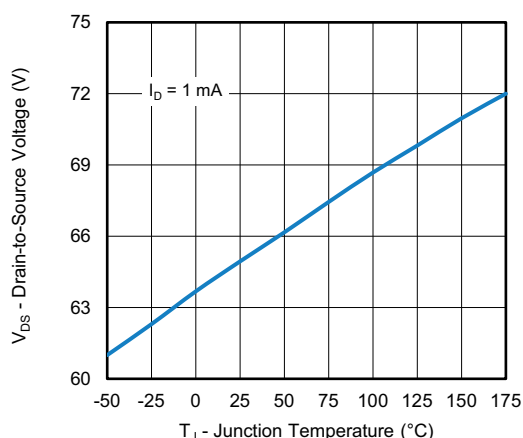
On-Resistance vs. Junction Temperature



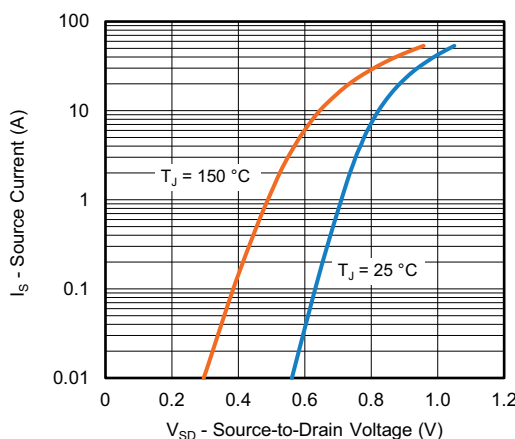
Threshold Voltage



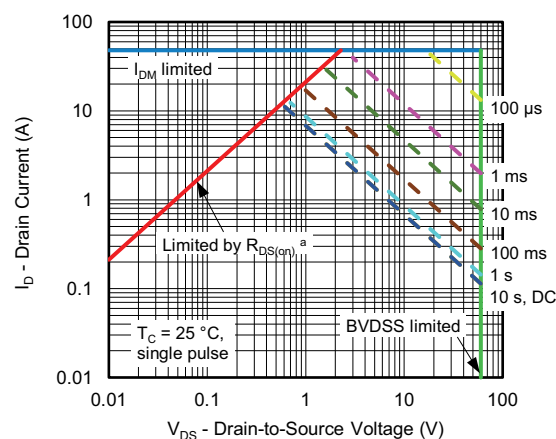
On-Resistance vs. Gate-to-Source Voltage



Drain Source Breakdown vs. Junction Temperature



Source Drain Diode Forward Voltage



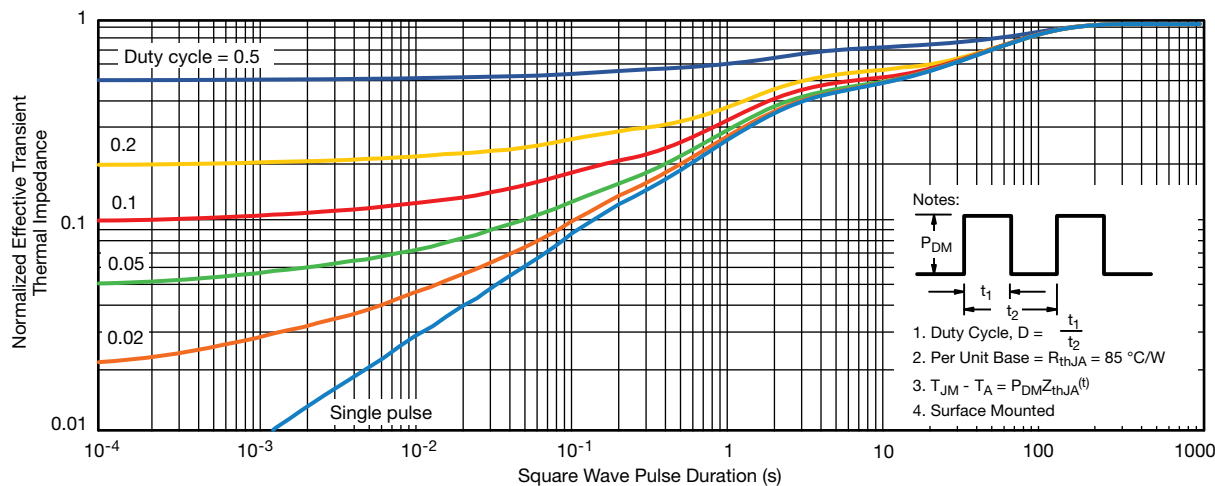
Safe Operating Area

Note

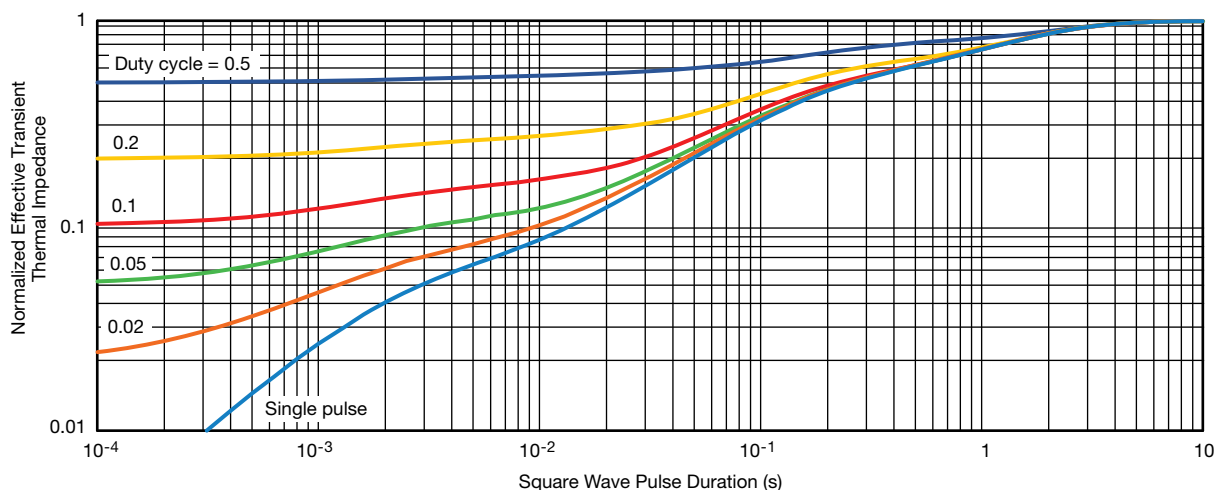
a. $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified



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



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction-to-Ambient ($25\text{ }^\circ\text{C}$)
 - Normalized Transient Thermal Impedance Junction-to-Foot ($25\text{ }^\circ\text{C}$)
 are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?62018.