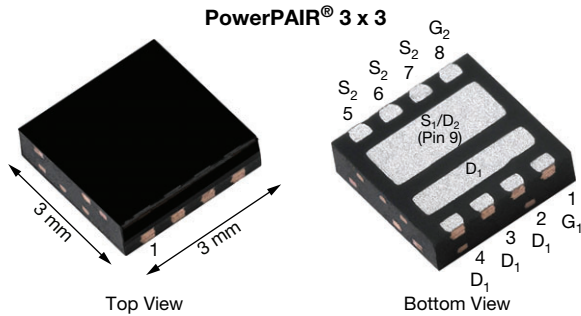


Dual N-Channel 30 V (D-S) MOSFET



FEATURES

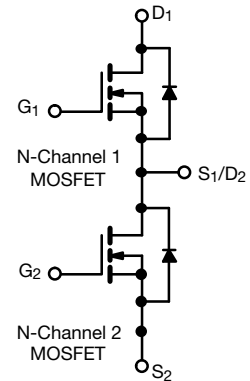
- TrenchFET® Gen IV power MOSFET
- High side and low side MOSFETs form optimized combination for 50 % duty cycle
- Optimized $R_{DS} - Q_g$ and $R_{DS} - Q_{gd}$ FOM elevates efficiency for high frequency switching
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Synchronous buck
- DC/DC conversion
- Half bridge
- POL



| PRODUCT SUMMARY | |
|--|---------|
| MOSFET CHANNEL-1 AND CHANNEL-2 | |
| V_{DS} (V) | 30 |
| $R_{DS(on)}$ max. (Ω) at $V_{GS} = 10$ V | 0.00712 |
| $R_{DS(on)}$ max. (Ω) at $V_{GS} = 4.5$ V | 0.01019 |
| Q_g typ. (nC) | 5.7 |
| I_D (A) ^{a, d} | 30 |
| Configuration | Dual |

| ORDERING INFORMATION | |
|---------------------------------|-----------------|
| Package | PowerPAIR 3 x 3 |
| Lead (Pb)-free and halogen-free | SiZ348DT-T1-GE3 |

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted) | | | |
|---|-------------------------|---------------|----------------------|
| PARAMETER | CHANNEL-1 AND CHANNEL-2 | | |
| | SYMBOL | LIMIT | UNIT |
| Drain-source voltage | V_{DS} | 30 | V |
| Gate-source voltage | V_{GS} | +20 / -16 | |
| Continuous drain current ($T_J = 150$ °C) | I_D | $T_C = 25$ °C | 30 ^a |
| | | $T_C = 70$ °C | 30 ^a |
| | | $T_A = 25$ °C | 18 ^{b, c} |
| | | $T_A = 70$ °C | 14.4 ^{b, c} |
| Pulsed drain current ($t = 100$ μ s) | I_{DM} | 100 | A |
| Continuous source current (MOSFET diode conduction) | I_S | $T_C = 25$ °C | |
| | | $T_A = 25$ °C | 3.1 ^{b, c} |
| Single pulse avalanche current | I_{AS} | 10 | mJ |
| Single pulse avalanche energy | E_{AS} | 5 | |
| Maximum power dissipation | P_D | $T_C = 25$ °C | 16.7 |
| | | $T_C = 70$ °C | 10.7 |
| | | $T_A = 25$ °C | 3.7 ^{b, c} |
| | | $T_A = 70$ °C | 2.4 ^{b, c} |
| Operating junction and storage temperature range | T_J, T_{stg} | -55 to +150 | °C |
| Soldering recommendations (peak temperature) | | 260 | |

Notes

- Package limited
- Surface mounted on 1" x 1" FR4 board
- $t = 10$ s
- $T_C = 25$ °C



| THERMAL RESISTANCE RATINGS | | | | | | |
|---|---------------|-------------------------|---------|---------|------|--|
| PARAMETER | | CHANNEL-1 AND CHANNEL-2 | | | | |
| | | SYMBOL | TYPICAL | MAXIMUM | UNIT | |
| Maximum junction-to-ambient ^{a, b} | $t \leq 10$ s | R_{thJA} | 27 | 34 | °C/W | |
| Maximum junction-to-case (drain) | Steady state | R_{thJC} | 6 | 7.5 | | |

Notes

- a. Surface mounted on 1" x 1" FR4 board
- b. Maximum under steady state conditions is 69 °C/W

| SPECIFICATIONS ($T_J = 25$ °C, unless otherwise noted) | | | | | | |
|---|-------------------------|--|-------------|---------|-----------|----------|
| PARAMETER | CHANNEL-1 AND CHANNEL-2 | | | | | |
| | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
| Static | | | | | | |
| Drain-source breakdown voltage | V_{DS} | $V_{GS} = 0$ V, $I_D = 250$ μ A | 30 | - | - | V |
| Gate-source threshold voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 250$ μ A | 1 | - | 2.4 | |
| Gate-source leakage | I_{GSS} | $V_{DS} = 0$ V, $V_{GS} = +20$ V / -16 V | - | - | ± 100 | nA |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = 30$ V, $V_{GS} = 0$ V | - | - | 1 | μ A |
| | | $V_{DS} = 30$ V, $V_{GS} = 0$ V, $T_J = 55$ °C | - | - | 5 | |
| On-state drain current ^a | $I_{D(on)}$ | $V_{DS} \geq 5$ V, $V_{GS} = 10$ V | 40 | - | - | A |
| Drain-source on-state resistance ^a | $R_{DS(on)}$ | $V_{GS} = 10$ V, $I_D = 15$ A | - | 0.00593 | 0.00712 | Ω |
| | | $V_{GS} = 4.5$ V, $I_D = 10$ A | - | 0.00849 | 0.01019 | |
| Forward transconductance ^a | g_{fs} | $V_{DS} = 10$ V, $I_D = 15$ A | - | 46 | - | S |
| Dynamic ^b | | | | | | |
| Input capacitance | C_{iss} | $V_{DS} = 15$ V, $V_{GS} = 0$ V, $f = 1$ MHz | - | 820 | - | pF |
| Output capacitance | C_{oss} | | - | 370 | - | |
| Reverse transfer capacitance | C_{rss} | | - | 40 | - | |
| C_{rss}/C_{iss} ratio | | | - | 0.049 | 0.098 | |
| Total gate charge | Q_g | $V_{DS} = 15$ V, $V_{GS} = 10$ V, $I_D = 18$ A | - | 12.1 | 18.2 | nC |
| Gate-source charge | Q_{gs} | $V_{DS} = 15$ V, $V_{GS} = 4.5$ V, $I_D = 18$ A | - | 5.7 | 7.5 | |
| Gate-drain charge | Q_{gd} | | - | 2.6 | - | |
| Gate resistance | R_g | | $f = 1$ MHz | 0.2 | 0.8 | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD} = 15$ V, $R_L = 1.04$ Ω , $I_D \cong 14.4$ A, $V_{GEN} = 10$ V, $R_g = 1$ Ω | - | 10 | 20 | ns |
| Rise time | t_r | | - | 25 | 50 | |
| Turn-off delay time | $t_{d(off)}$ | | - | 10 | 20 | |
| Fall time | t_f | | - | 10 | 20 | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD} = 15$ V, $R_L = 1.04$ Ω , $I_D \cong 14.4$ A, $V_{GEN} = 4.5$ V, $R_g = 1$ Ω | - | 15 | 30 | |
| Rise time | t_r | | - | 50 | 75 | |
| Turn-off delay time | $t_{d(off)}$ | | - | 10 | 20 | |
| Fall time | t_f | | - | 20 | 40 | |



| SPECIFICATIONS (T _J = 25 °C, unless otherwise noted) | | | | | | |
|---|-------------------------|--|------|------|------|------|
| PARAMETER | CHANNEL-1 AND CHANNEL-2 | | | | | |
| | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
| Drain-source Body Diode Characteristics | | | | | | |
| Continuous source-drain diode current | I _S | T _C = 25°C | - | - | 30 | A |
| Pulse diode forward current | I _{SM} | | - | - | 100 | |
| Body diode voltage | V _{SD} | I _S = 15.2 A, V _{GS} = 0 V | - | 0.85 | 1.2 | V |
| Body diode reverse recovery time | t _{rr} | I _F = 15.2 A, di/dt = 100 A/μs, T _J = 25 °C | - | 31 | 48 | ns |
| Body diode reverse recovery charge | Q _{rr} | | - | 26 | 40 | nC |
| Reverse recovery fall time | t _a | | - | 17 | - | ns |
| Reverse recovery rise time | t _b | | - | 14 | - | |

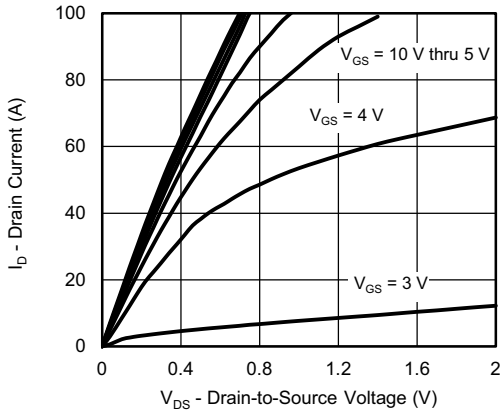
Notes

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

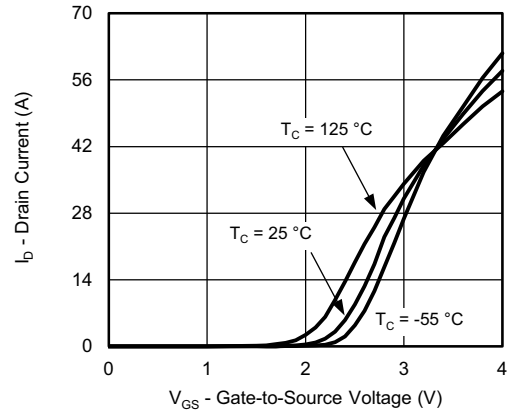
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



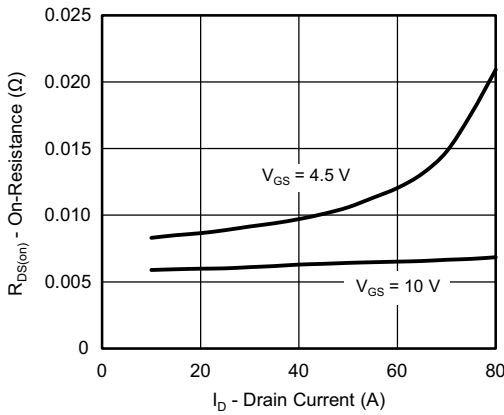
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



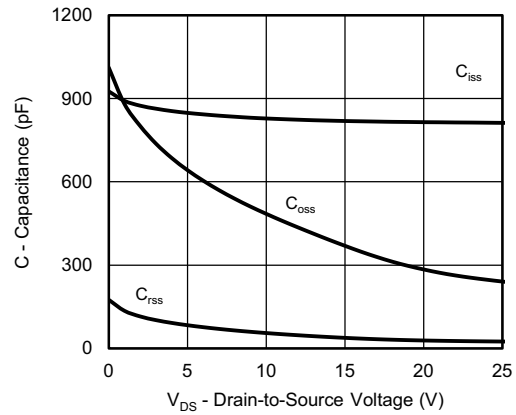
Output Characteristics



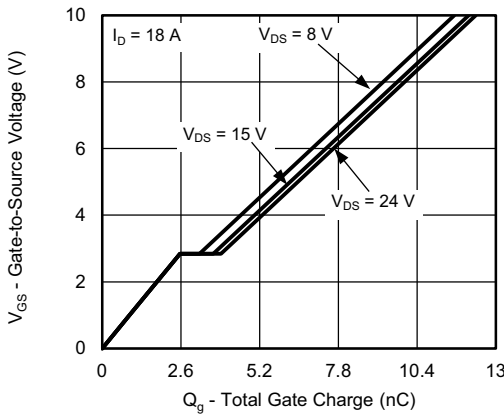
Transfer Characteristics



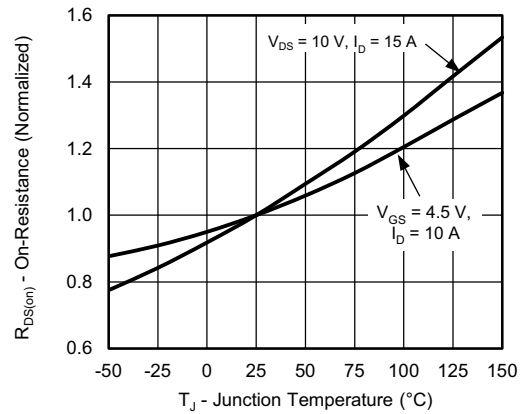
On-Resistance vs. Drain Current and Gate



Capacitance



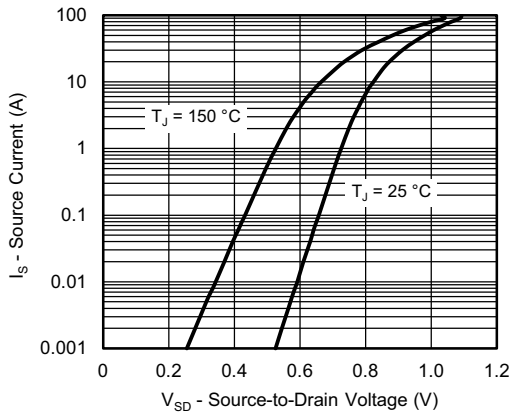
Gate Charge



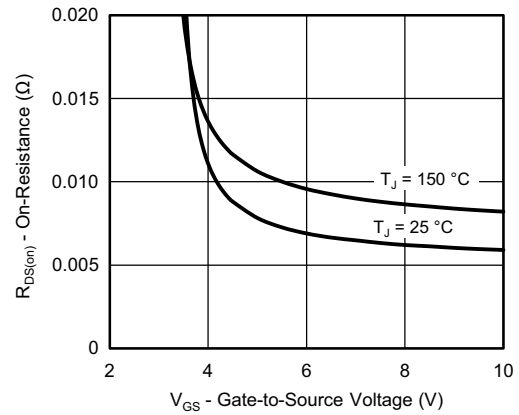
On-Resistance vs. Junction Temperature



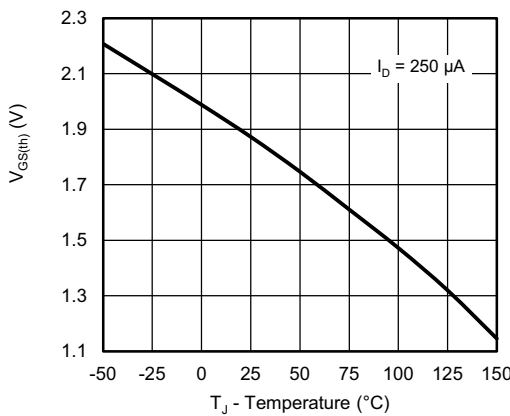
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



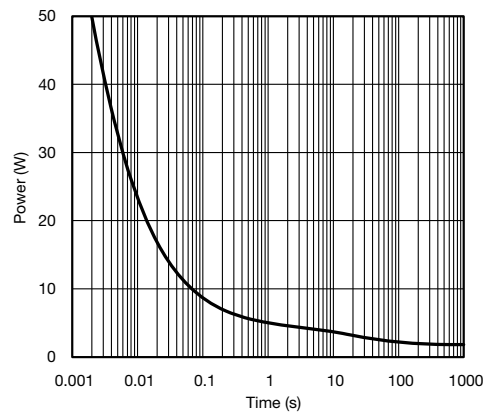
Source-Drain Diode Forward Voltage



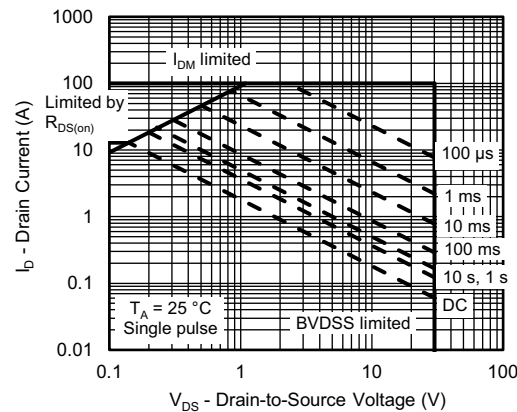
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power

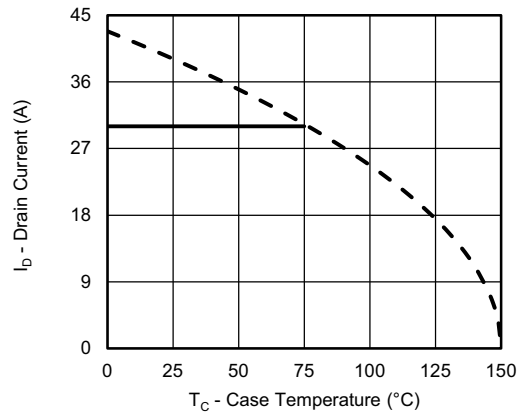


Safe Operating Area, Junction-to-Ambient

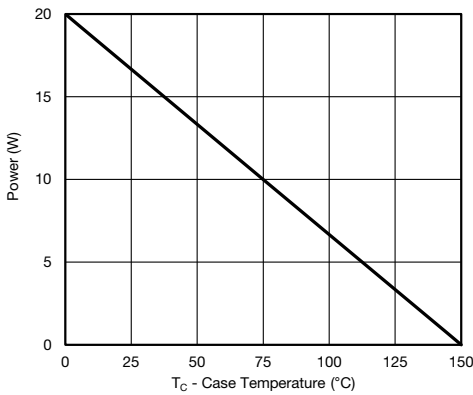
(1) $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified



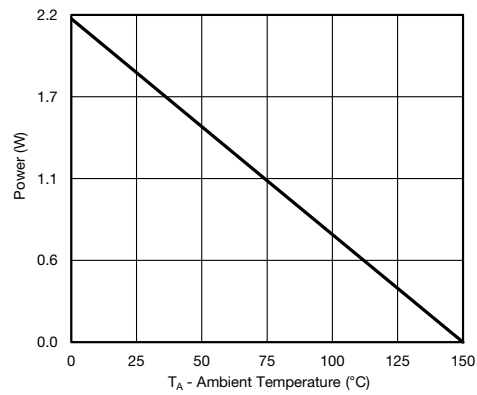
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating ^a



Power, Junction-to-Case

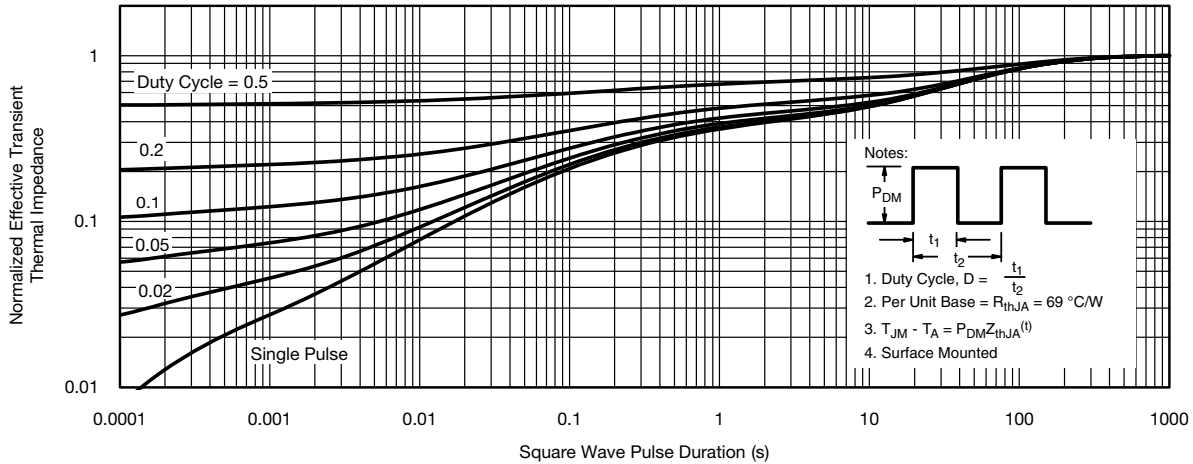


Power, Junction-to-Ambient

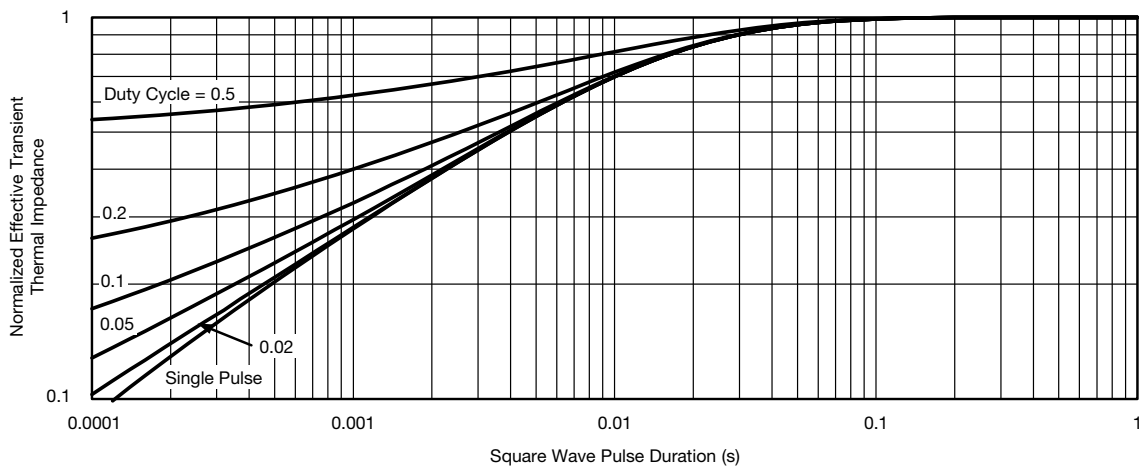
Note

- a. The power dissipation P_D is based on T_J max. = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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