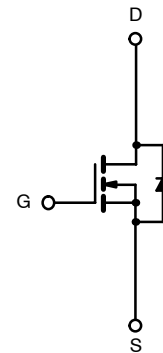
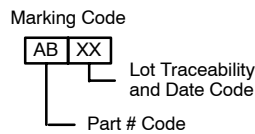
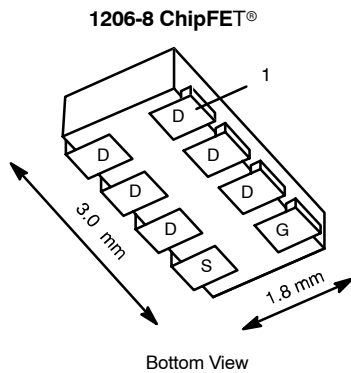




N-Channel 2.5-V (G-S) MOSFET

| PRODUCT SUMMARY | | |
|-----------------|---------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| 20 | 0.030 @ $V_{GS} = 4.5$ V | 7.2 |
| | 0.045 @ $V_{GS} = 2.5$ V | 5.9 |

TrenchFET®
Power MOSFETS
2.5-V Rated



Ordering Information: Si5404DC-T1

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | | |
|---|--------------------------|----------------|------------|--------------|------------------|
| Parameter | | Symbol | 5 secs | Steady State | Unit |
| Drain-Source Voltage | | V_{DS} | 20 | | V |
| Gate-Source Voltage | | V_{GS} | ± 12 | | |
| Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a | $T_A = 25^\circ\text{C}$ | I_D | 7.2 | 5.2 | A |
| | $T_A = 85^\circ\text{C}$ | | 5.2 | 3.8 | |
| Pulsed Drain Current | | I_{DM} | 20 | | |
| Continuous Source Current (Diode Conduction) ^a | | I_S | 2.1 | 1.1 | W |
| Maximum Power Dissipation ^a | $T_A = 25^\circ\text{C}$ | P_D | 2.5 | 1.3 | |
| | $T_A = 85^\circ\text{C}$ | | 1.3 | 0.7 | |
| Operating Junction and Storage Temperature Range | | T_J, T_{stg} | -55 to 150 | | $^\circ\text{C}$ |
| Soldering Recommendations (Peak Temperature) ^{b, c} | | | 260 | | |

| THERMAL RESISTANCE RATINGS | | | | | |
|--|----------------|------------|---------|---------|---------------------------|
| Parameter | | Symbol | Typical | Maximum | Unit |
| Maximum Junction-to-Ambient ^a | $t \leq 5$ sec | R_{thJA} | 40 | 50 | $^\circ\text{C}/\text{W}$ |
| | Steady State | | 80 | 95 | |
| Maximum Junction-to-Foot (Drain) | | R_{thJF} | 15 | 20 | |

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- See Reliability Manual for profile. The ChipFET is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection.
- Rework Conditions: manual soldering with a soldering iron is not recommended for leadless components.

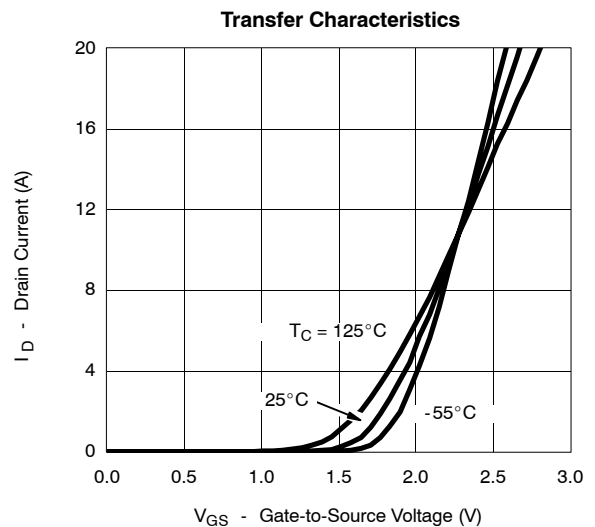
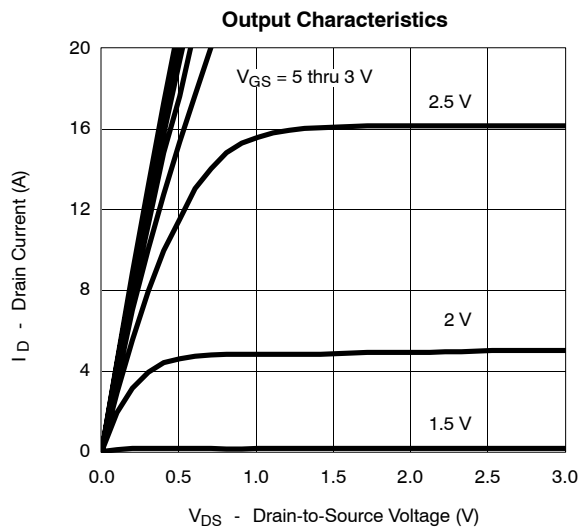
SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---------------------|---|-----|-------|-------|------|
| Static | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250 μA | 0.6 | | | V |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ± 12 V | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 20 V, V _{GS} = 0 V | | | 1 | μA |
| | | V _{DS} = 20 V, V _{GS} = 0 V, T _J = 85 °C | | | 5 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} ≥ 5 V, V _{GS} = 4.5 V | 20 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = 4.5 V, I _D = 5.2 A | | 0.025 | 0.030 | Ω |
| | | V _{GS} = 2.5 V, I _D = 4.3 A | | 0.038 | 0.045 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = 10 V, I _D = 5.2 A | | 20 | | S |
| Diode Forward Voltage ^a | V _{SD} | I _S = 1.1 A, V _{GS} = 0 V | | 0.8 | 1.2 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 5.2 A | | 12 | 18 | nC |
| Gate-Source Charge | Q _{gs} | | | 2.4 | | |
| Gate-Drain Charge | Q _{gd} | | | 3.2 | | |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = 10 V, R _L = 10 Ω I _D ≅ 1 A, V _{GEN} = 4.5 V, R _G = 6 Ω | | 20 | 30 | ns |
| Rise Time | t _r | | | 40 | 60 | |
| Turn-Off Delay Time | t _{d(off)} | | | 40 | 60 | |
| Fall Time | t _f | | | 15 | 23 | |
| Source-Drain Reverse Recovery Time | t _{rr} | I _F = 1.1 A, di/dt = 100 A/μs | | 30 | 60 | |

Notes

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

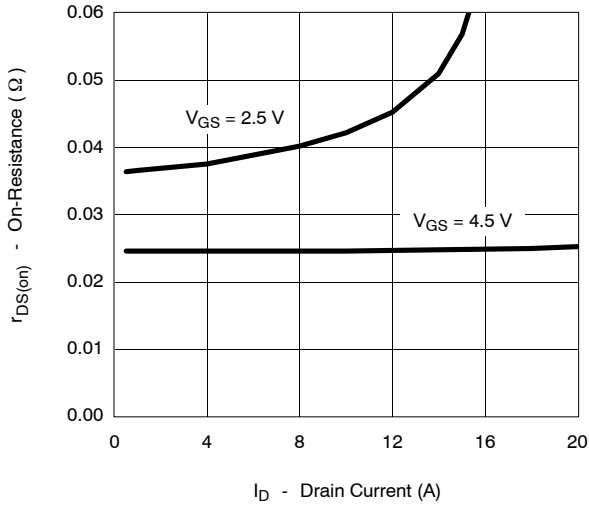
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



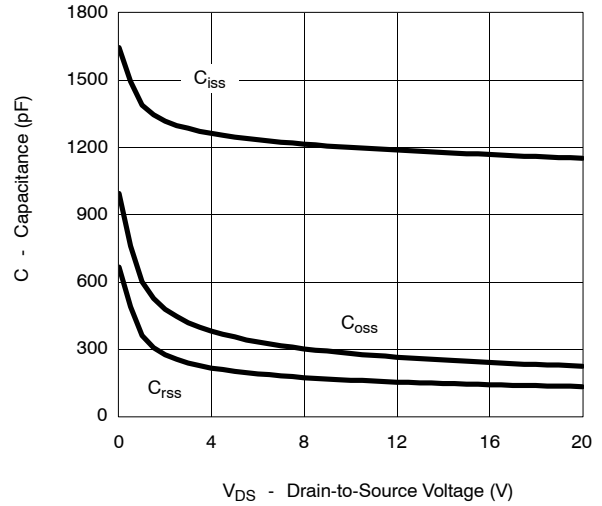


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

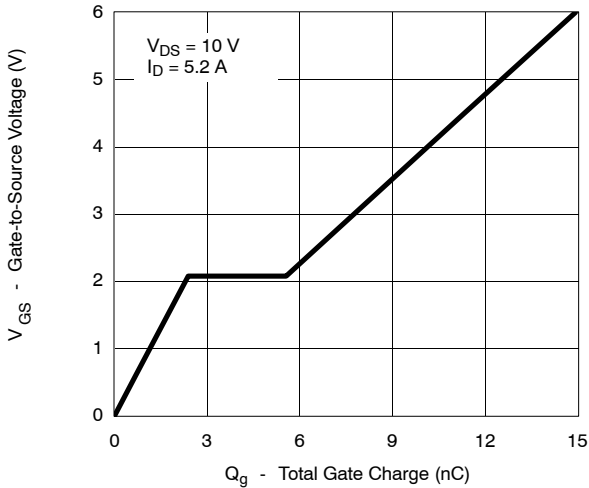
On-Resistance vs. Drain Current



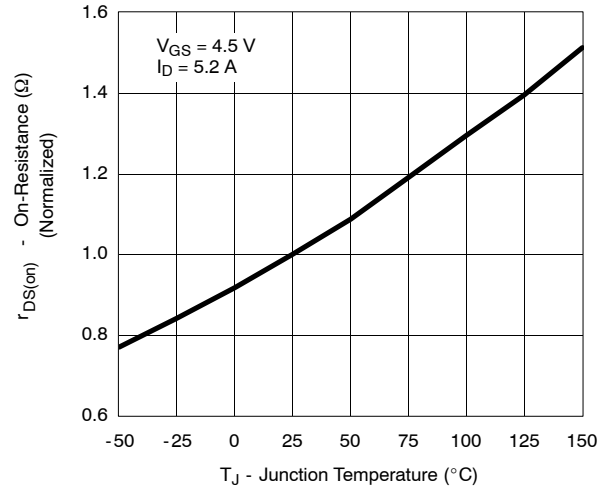
Capacitance



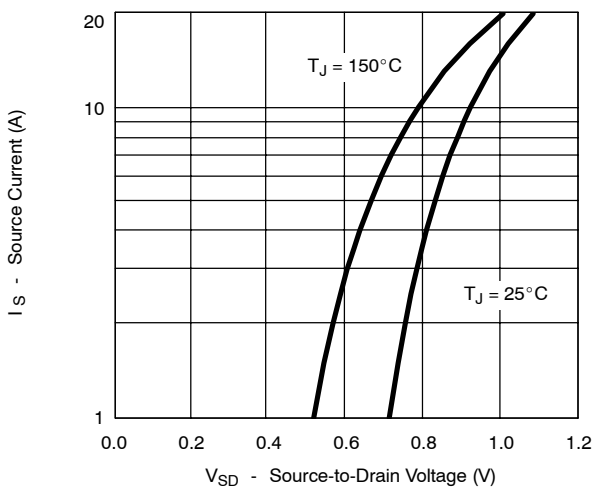
Gate Charge



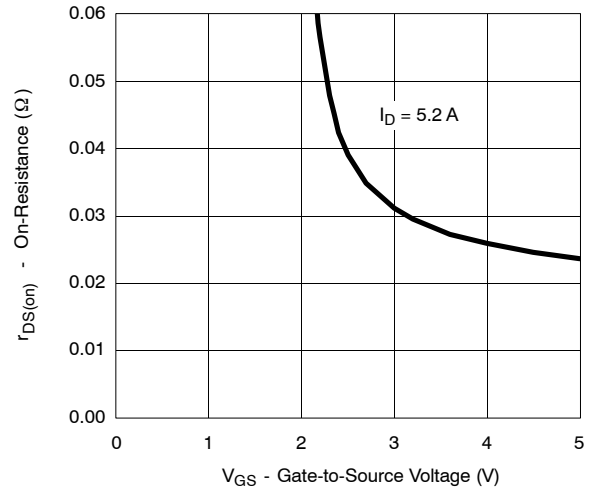
On-Resistance vs. Junction Temperature



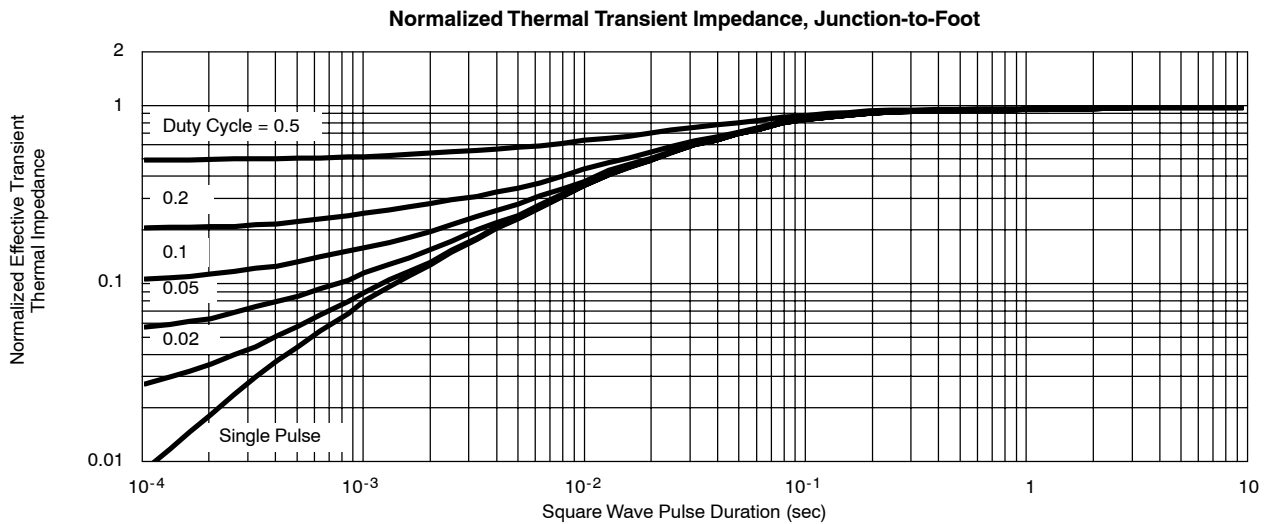
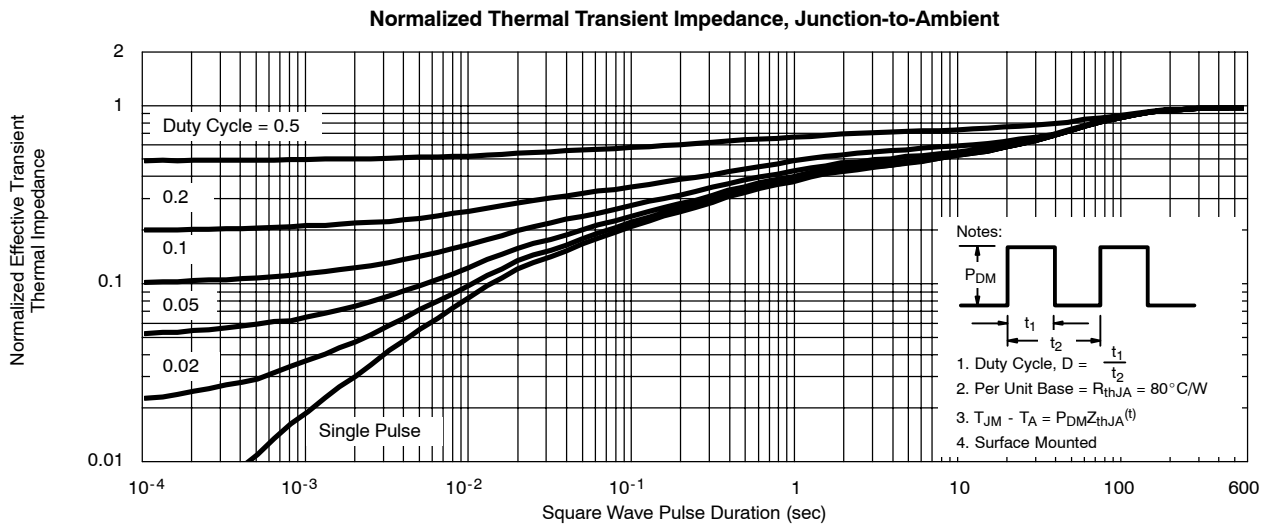
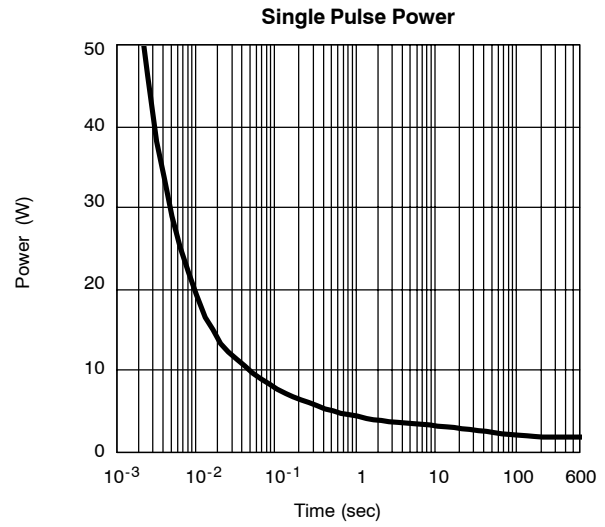
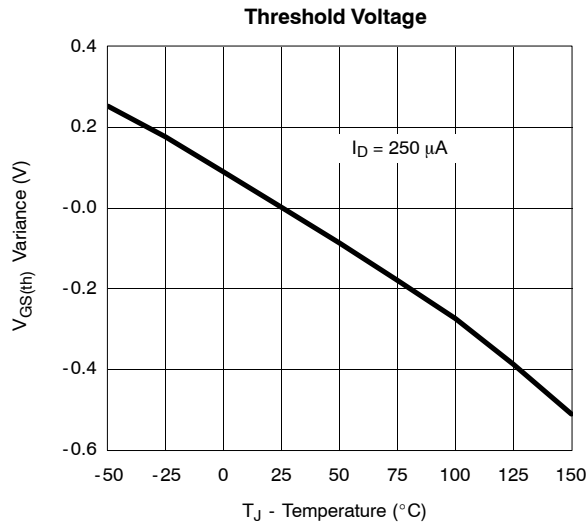
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





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