



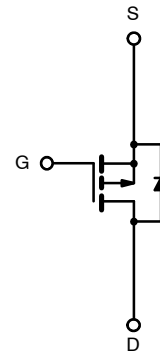
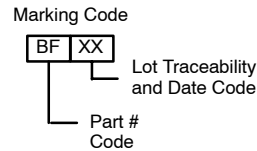
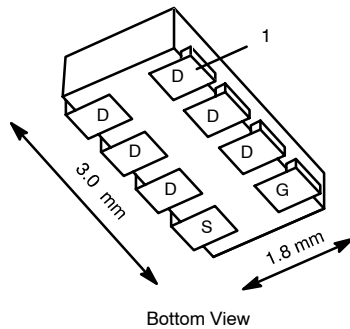
## P-Channel 12-V (D-S) MOSFET

## PRODUCT SUMMARY

| $V_{DS}$ (V) | $r_{DS(on)}$ ( $\Omega$ ) | $I_D$ (A) |
|--------------|---------------------------|-----------|
| -12          | 0.031 @ $V_{GS} = -4.5$ V | -7.6      |
|              | 0.041 @ $V_{GS} = -2.5$ V | -6.6      |
|              | 0.054 @ $V_{GS} = -1.8$ V | -5.8      |

**TrenchFET<sup>®</sup>**  
Power MOSFETs  
1.8-V Rated

1206-8 ChipFET™



P-Channel MOSFET

Ordering Information: Si5475DC-T1

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)

| Parameter                                                      |                       | Symbol                            | 5 secs     | Steady State | Unit |
|----------------------------------------------------------------|-----------------------|-----------------------------------|------------|--------------|------|
| Drain-Source Voltage                                           |                       | V <sub>DS</sub>                   | -12        |              | V    |
| Gate-Source Voltage                                            |                       | V <sub>GS</sub>                   | ± 8        |              |      |
| Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a</sup> | T <sub>A</sub> = 25°C | I <sub>D</sub>                    | -7.6       | -5.5         | A    |
|                                                                | T <sub>A</sub> = 85°C |                                   | -3.5       | -3.9         |      |
| Pulsed Drain Current                                           |                       | I <sub>DM</sub>                   | ± 20       |              |      |
| Continuous Source Current <sup>a</sup>                         |                       | I <sub>S</sub>                    | -2.1       | -1.1         |      |
| Maximum Power Dissipation <sup>a</sup>                         | T <sub>A</sub> = 25°C | P <sub>D</sub>                    | 2.5        | 1.3          | W    |
|                                                                | T <sub>A</sub> = 85°C |                                   | 1.3        | 0.7          |      |
| Operating Junction and Storage Temperature Range               |                       | T <sub>J</sub> , T <sub>stg</sub> | -55 to 150 |              | °C   |
| Soldering Recommendations (Peak Temperature) <sup>b, c</sup>   |                       |                                   | 260        |              |      |

## THERMAL RESISTANCE RATINGS

| Parameter                                |                | Symbol     | Typical | Maximum | Unit               |
|------------------------------------------|----------------|------------|---------|---------|--------------------|
| Maximum Junction-to-Ambient <sup>a</sup> | $t \leq 5$ sec | $R_{thJA}$ | 40      | 50      | $^\circ\text{C/W}$ |
|                                          | 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.

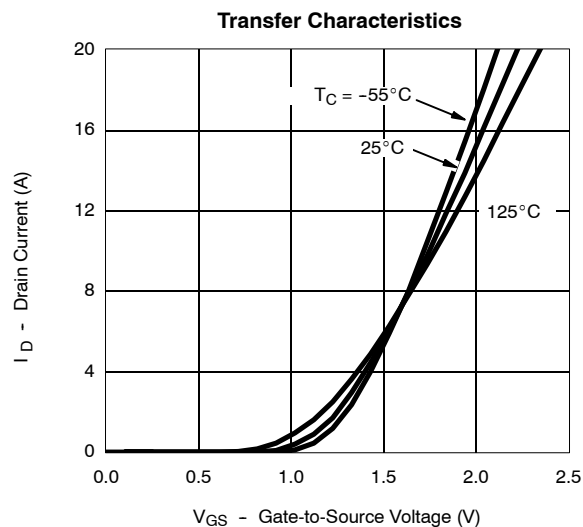
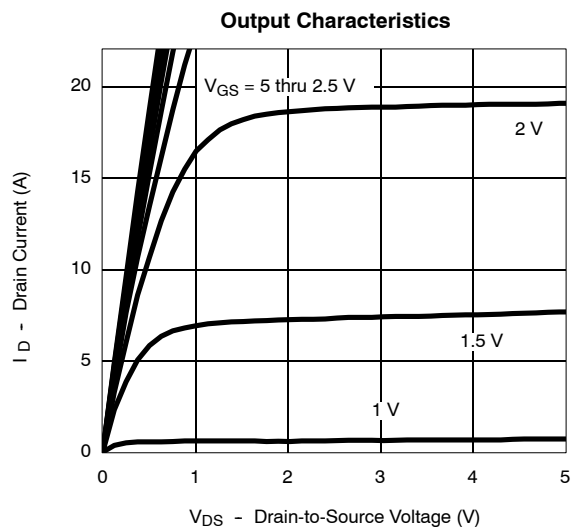
**SPECIFICATIONS ( $T_J = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

| Parameter                                     | Symbol       | Test Condition                                                                                                                      | Min   | Typ   | Max       | Unit          |
|-----------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-----------|---------------|
| <b>Static</b>                                 |              |                                                                                                                                     |       |       |           |               |
| Gate Threshold Voltage                        | $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = -1\text{ mA}$                                                                                            | -0.45 |       |           | V             |
| Gate-Body Leakage                             | $I_{GSS}$    | $V_{DS} = 0\text{ V}$ , $V_{GS} = \pm 8\text{ V}$                                                                                   |       |       | $\pm 100$ | nA            |
| Zero Gate Voltage Drain Current               | $I_{DSS}$    | $V_{DS} = -9.6\text{ V}$ , $V_{GS} = 0\text{ V}$                                                                                    |       |       | -1        | $\mu\text{A}$ |
|                                               |              | $V_{DS} = -9.6\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 85^\circ\text{C}$                                                         |       |       | -5        |               |
| On-State Drain Current <sup>a</sup>           | $I_{D(on)}$  | $V_{DS} \leq -5\text{ V}$ , $V_{GS} = -4.5\text{ V}$                                                                                | -20   |       |           | A             |
| Drain-Source On-State Resistance <sup>a</sup> | $r_{DS(on)}$ | $V_{GS} = -4.5\text{ V}$ , $I_D = -5.5\text{ A}$                                                                                    |       | 0.027 | 0.031     | $\Omega$      |
|                                               |              | $V_{GS} = -2.5\text{ V}$ , $I_D = -4.8\text{ A}$                                                                                    |       | 0.035 | 0.041     |               |
|                                               |              | $V_{GS} = -1.8\text{ V}$ , $I_D = -2\text{ A}$                                                                                      |       | 0.045 | 0.054     |               |
| Forward Transconductance <sup>a</sup>         | $g_{fs}$     | $V_{DS} = -5\text{ V}$ , $I_D = -5.2\text{ A}$                                                                                      |       | 19    |           | S             |
| Diode Forward Voltage <sup>a</sup>            | $V_{SD}$     | $I_S = -1.1\text{ A}$ , $V_{GS} = 0\text{ V}$                                                                                       |       | -0.7  | -1.2      | V             |
| <b>Dynamic<sup>b</sup></b>                    |              |                                                                                                                                     |       |       |           |               |
| Total Gate Charge                             | $Q_g$        | $V_{DS} = -6\text{ V}$ , $V_{GS} = -4.5\text{ V}$ , $I_D = -5.5\text{ A}$                                                           |       | 19    | 29        | nC            |
| Gate-Source Charge                            | $Q_{gs}$     |                                                                                                                                     |       | 3.9   |           |               |
| Gate-Drain Charge                             | $Q_{gd}$     |                                                                                                                                     |       | 3.6   |           |               |
| Turn-On Delay Time                            | $t_{d(on)}$  | $V_{DD} = -6\text{ V}$ , $R_L = 6\text{ }\Omega$<br>$I_D \approx -1\text{ A}$ , $V_{GEN} = -4.5\text{ V}$ , $R_G = 6\text{ }\Omega$ |       | 15    | 25        | ns            |
| Rise Time                                     | $t_r$        |                                                                                                                                     |       | 20    | 30        |               |
| Turn-Off Delay Time                           | $t_{d(off)}$ |                                                                                                                                     |       | 122   | 180       |               |
| Fall Time                                     | $t_f$        |                                                                                                                                     |       | 80    | 120       |               |
| Source-Drain Reverse Recovery Time            | $t_{rr}$     | $I_F = -1.1\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$                                                                          |       | 40    | 60        |               |

## Notes

a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .

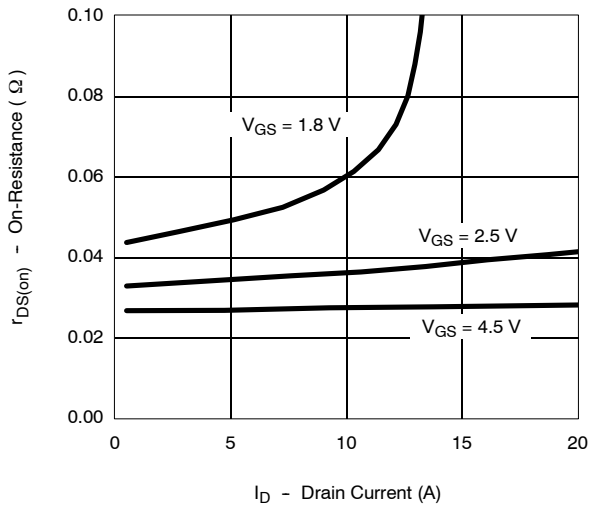
b. Guaranteed by design, not subject to production testing.

**TYPICAL CHARACTERISTICS ( $25^\circ\text{C}$  UNLESS NOTED)**

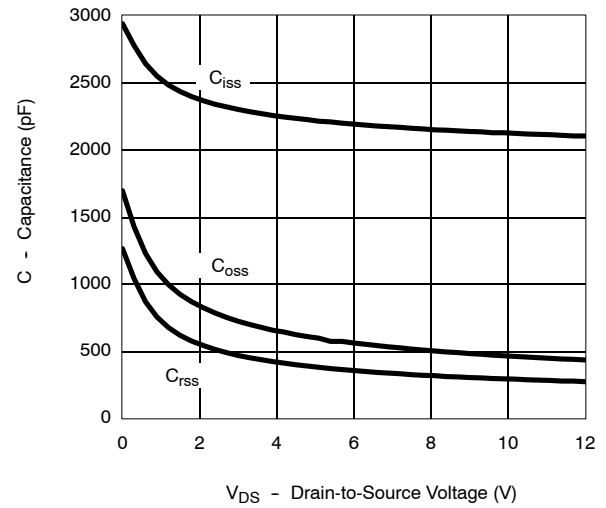


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

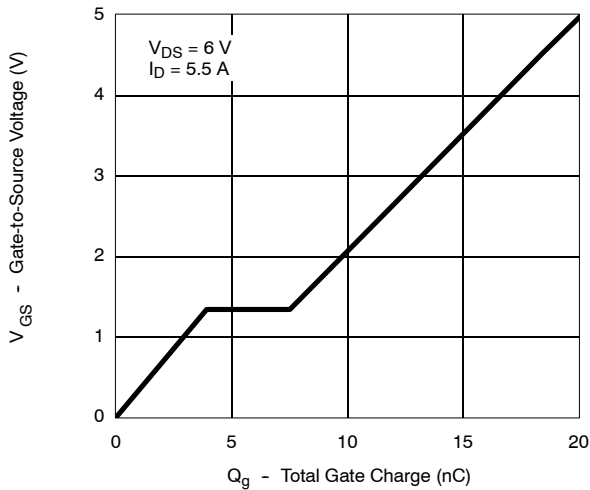
**On-Resistance vs. Drain Current**



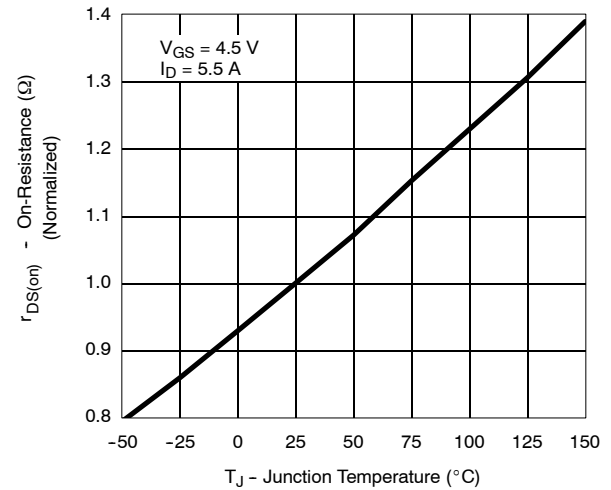
**Capacitance**



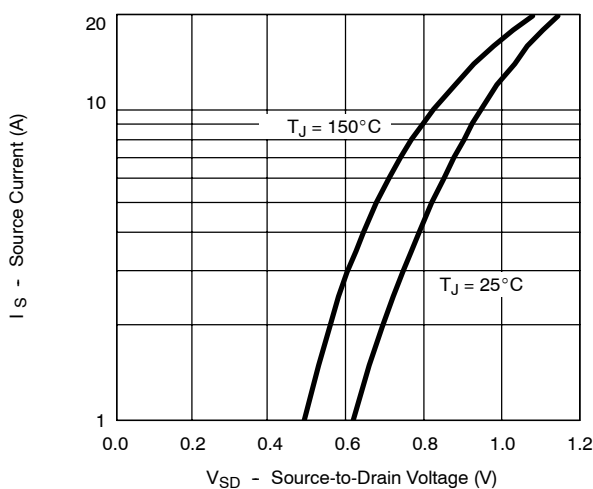
**Gate Charge**



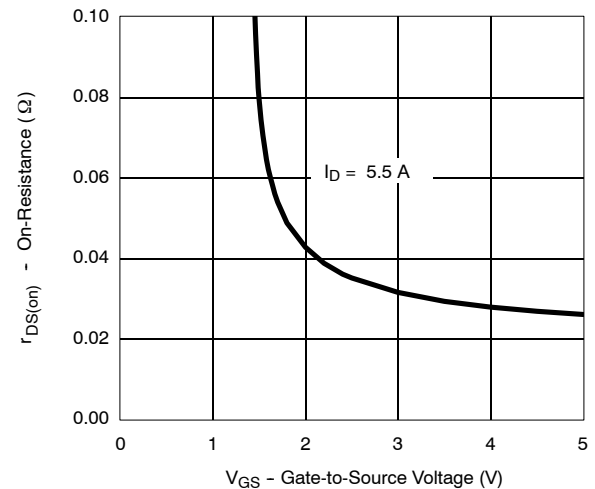
**On-Resistance vs. Junction Temperature**



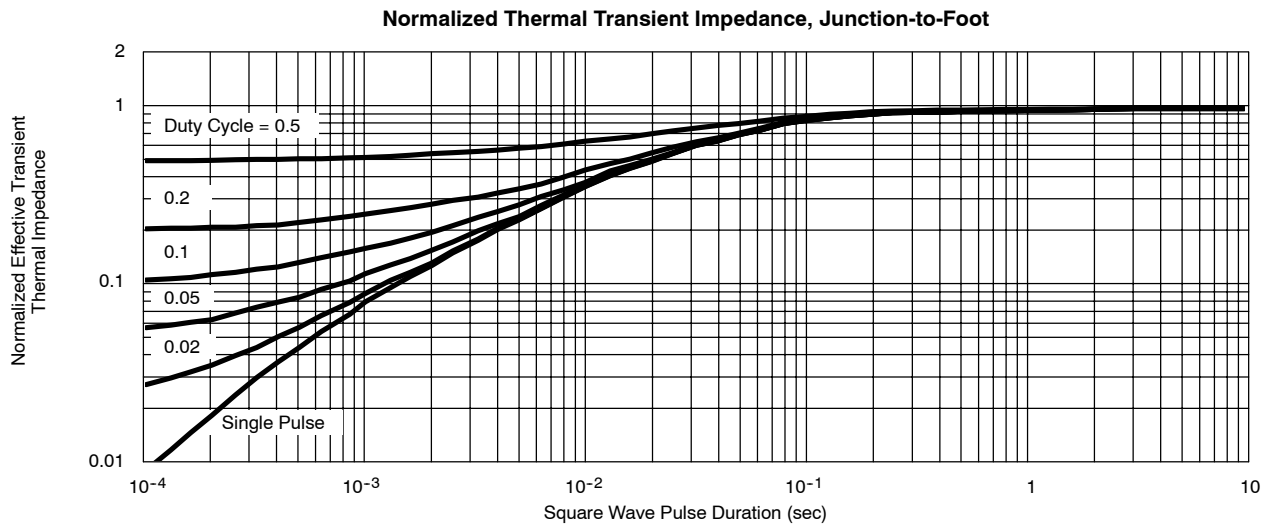
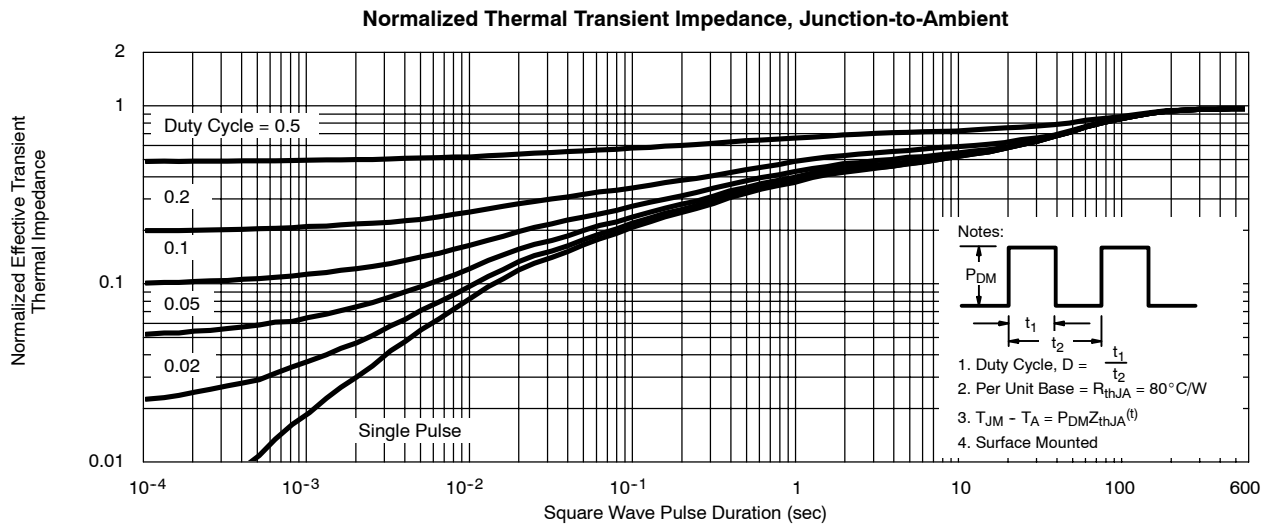
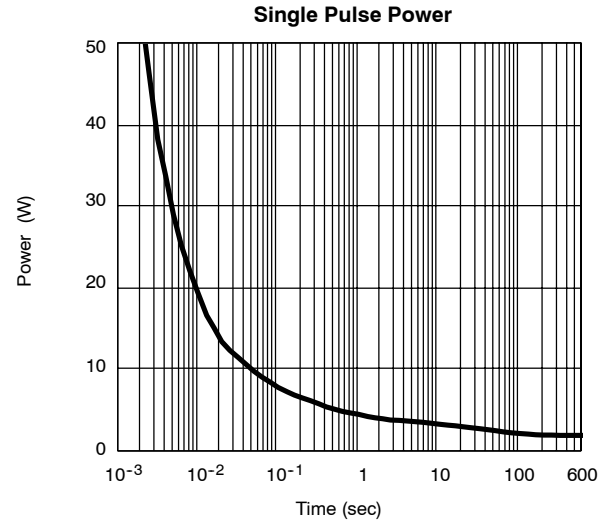
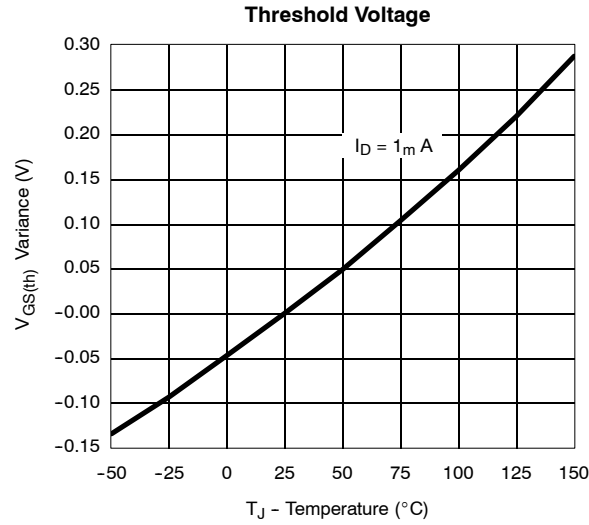
**Source-Drain Diode Forward Voltage**



**On-Resistance vs. Gate-to-Source Voltage**



**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**





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