



**Si7370DP**  
Vishay Siliconix

**N-Channel 60-V (D-S) MOSFET**

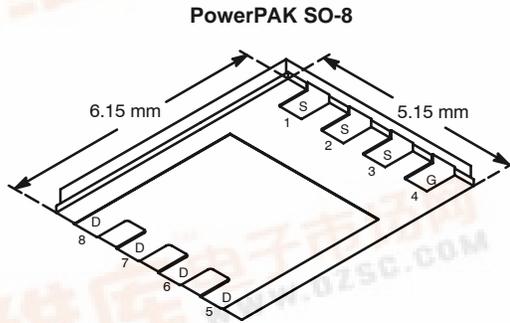
| PRODUCT SUMMARY     |                                |                    |
|---------------------|--------------------------------|--------------------|
| V <sub>DS</sub> (V) | r <sub>DS(on)</sub> (Ω)        | I <sub>D</sub> (A) |
| 60                  | 0.011 @ V <sub>GS</sub> = 10 V | 15.8               |
|                     | 0.013 @ V <sub>GS</sub> = 6 V  | 14.5               |

**FEATURES**

- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile
- PWM Optimized for Fast Switching
- 100% R<sub>G</sub> Tested

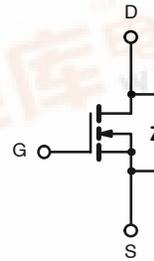
**APPLICATIONS**

- Primary Side Switch for 24-V DC/DC Applications
- Secondary Synchronous Rectifier



Bottom View

Ordering Information: Si7370DP-T1  
Si7370DP-T1—E3 (Lead (Pb)-Free)



N-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED) |                                   |                        |              |      |
|--|-----------------------------------|------------------------|--------------|------|
| Parameter  | Symbol                            | 10 secs                | Steady State | Unit |
| Drain-Source Voltage   | V <sub>DS</sub>                   | 60                     |              | V    |
| Gate-Source Voltage  | V <sub>GS</sub>                   | ± 20                   |              |      |
| Continuous Drain Current (T <sub>J</sub> = 150 °C) <sup>a</sup>          | I <sub>D</sub>                    | T <sub>A</sub> = 25 °C | 15.8         | 9.6  |
|  |                                   | T <sub>A</sub> = 70 °C | 12.6         | 7.7  |
| Continuous Source Current  | I <sub>S</sub>                    | 4.7                    | 1.7          | A    |
| Pulsed Drain Current   | I <sub>DM</sub>                   | 50                     |              |      |
| Avalanche Current  | I <sub>AS</sub>                   | 50                     |              |      |
| Single Avalanche Energy  | E <sub>AS</sub>                   | 125                    |              | mJ   |
| Maximum Power Dissipation  | P <sub>D</sub>                    | T <sub>A</sub> = 25 °C | 5.2          | 1.9  |
|  |                                   | T <sub>A</sub> = 70 °C | 3.3          | 1.25 |
| Operating Junction and Storage Temperature Range                         | T <sub>J</sub> , T <sub>stg</sub> | -55 to 150             |              | °C   |

| THERMAL RESISTANCE RATINGS               |                   |              |         |      |
|--|-------------------|--------------|---------|------|
| Parameter                                | Symbol            | Typical      | Maximum | Unit |
| Maximum Junction-to-Ambient <sup>a</sup> | R <sub>thJA</sub> | t ≤ 10 sec   | 19      | 24   |
|  |                   | Steady State | 52      | 65   |
| Maximum Junction-to-Case (Drain)         | R <sub>thJC</sub> | 1.5          | 1.8     | °C/W |

Notes:  
a. Surface Mounted on 1" x 1" FR4 Board.

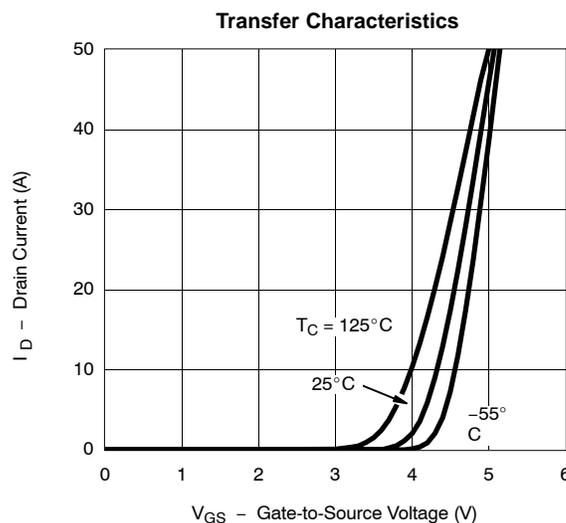
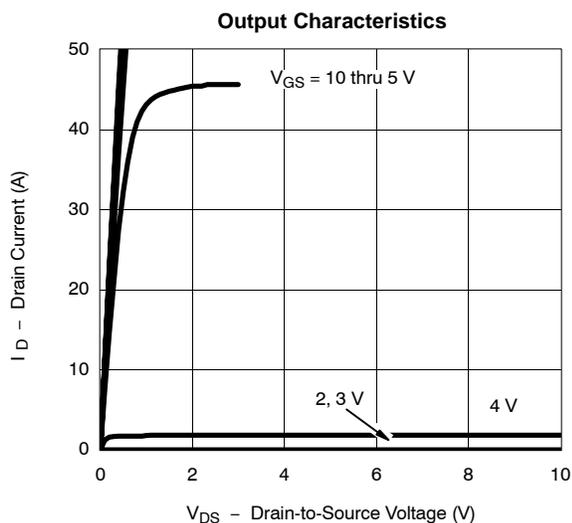


| <b>SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)</b> |                     |  |     |        |       |      |
|--|---------------------|--|-----|--------|-------|------|
| Parameter  | Symbol              | Test Condition   | Min | Typ    | Max   | Unit |
| <b>Static</b>  |                     |  |     |        |       |      |
| Gate Threshold Voltage   | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA  | 2.0 |        | 4.0   | V    |
| Gate-Body Leakage  | I <sub>GSS</sub>    | V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V  |     |        | ± 100 | nA   |
| Zero Gate Voltage Drain Current                                      | I <sub>DSS</sub>    | V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V  |     |        | 1     | μA   |
|  |                     | V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C  |     |        | 5     |      |
| On-State Drain Current <sup>a</sup>                                  | I <sub>D(on)</sub>  | V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V  | 50  |        |       | A    |
| Drain-Source On-State Resistance <sup>a</sup>                        | r <sub>DS(on)</sub> | V <sub>GS</sub> = 10 V, I <sub>D</sub> = 12 A  |     | 0.009  | 0.011 | Ω    |
|  |                     | V <sub>GS</sub> = 6.0 V, I <sub>D</sub> = 10 A   |     | 0.0105 | 0.013 |      |
| Forward Transconductance <sup>a</sup>                                | g <sub>fs</sub>     | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 10 A  |     | 50     |       | S    |
| Diode Forward Voltage <sup>a</sup>                                   | V <sub>SD</sub>     | I <sub>S</sub> = 3.0 A, V <sub>GS</sub> = 0 V  |     | 0.75   | 1.2   | V    |
| <b>Dynamic<sup>b</sup></b>   |                     |  |     |        |       |      |
| Total Gate Charge  | Q <sub>g</sub>      | V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 12 A  |     | 46     | 57    | nC   |
| Gate-Source Charge   | Q <sub>gs</sub>     |  |     | 11.5   |       |      |
| Gate-Drain Charge  | Q <sub>gd</sub>     |  |     | 11.5   |       |      |
| Gate Resistance  | R <sub>g</sub>      |  | 0.2 | 0.85   | 1.2   | Ω    |
| Turn-On Delay Time   | t <sub>d(on)</sub>  | V <sub>DD</sub> = 30 V, R <sub>L</sub> = 30 Ω<br>I <sub>D</sub> ≅ 1.0 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 6 Ω |     | 16     | 25    | ns   |
| Rise Time  | t <sub>r</sub>      |  |     | 12     | 18    |      |
| Turn-Off Delay Time  | t <sub>d(off)</sub> |  |     | 50     | 75    |      |
| Fall Time  | t <sub>f</sub>      |  |     | 30     | 45    |      |
| Source-Drain Reverse Recovery Time                                   | t <sub>rr</sub>     | I <sub>F</sub> = 3.0 A, di/dt = 100 A/μs   |     | 40     | 60    |      |

Notes

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

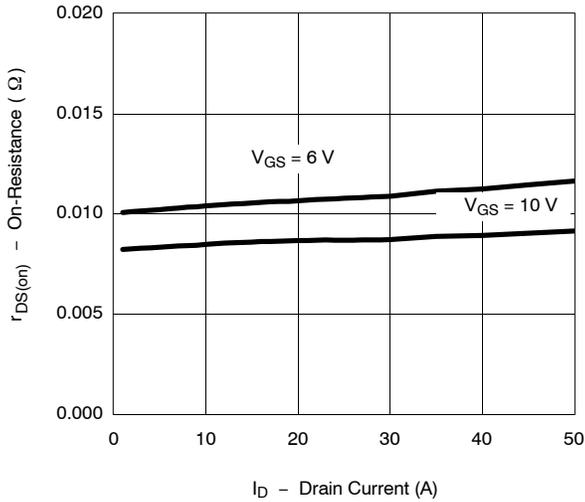
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



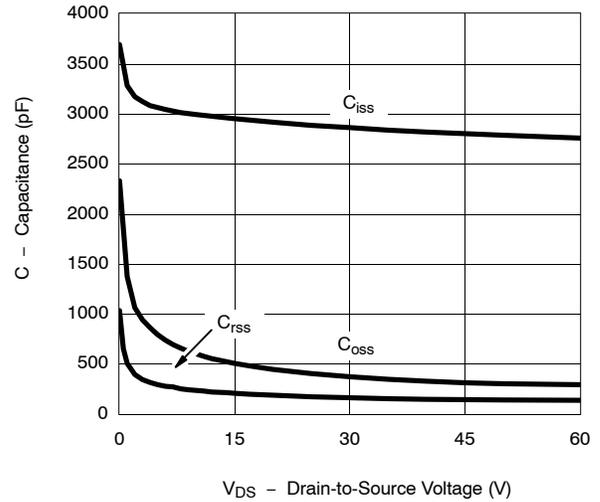


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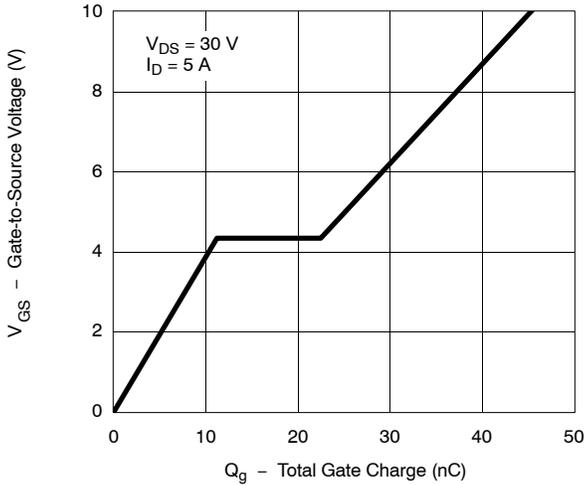
**On-Resistance vs. Drain Current**



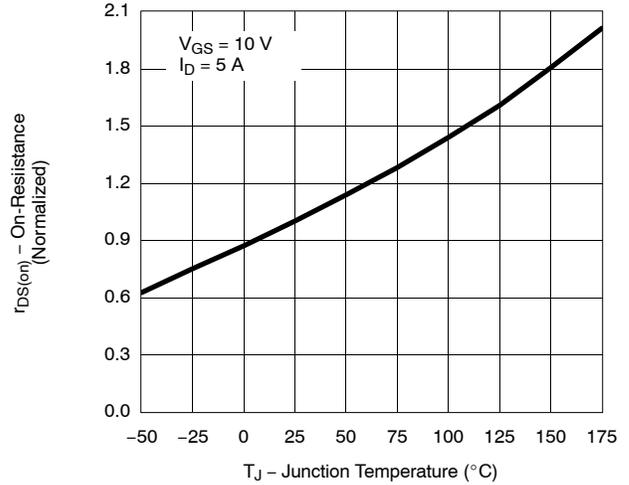
**Capacitance**



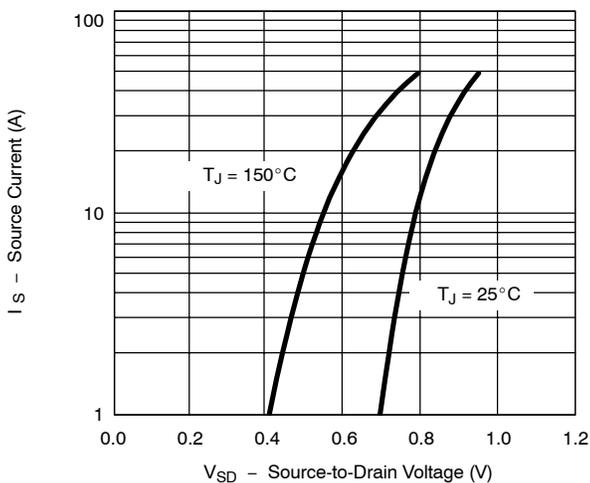
**Gate Charge**



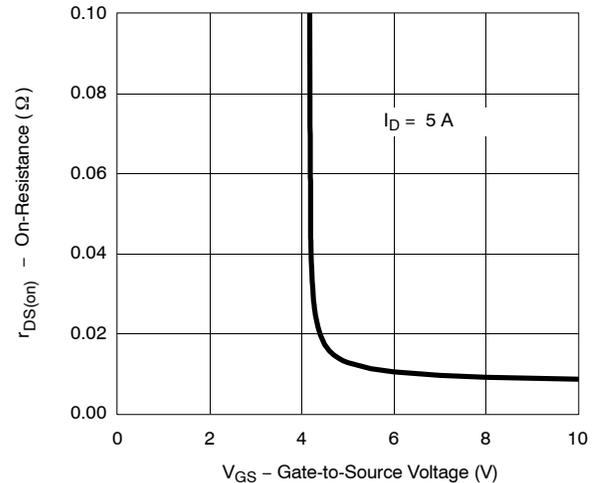
**On-Resistance vs. Junction Temperature**



**Source-Drain Diode Forward Voltage**

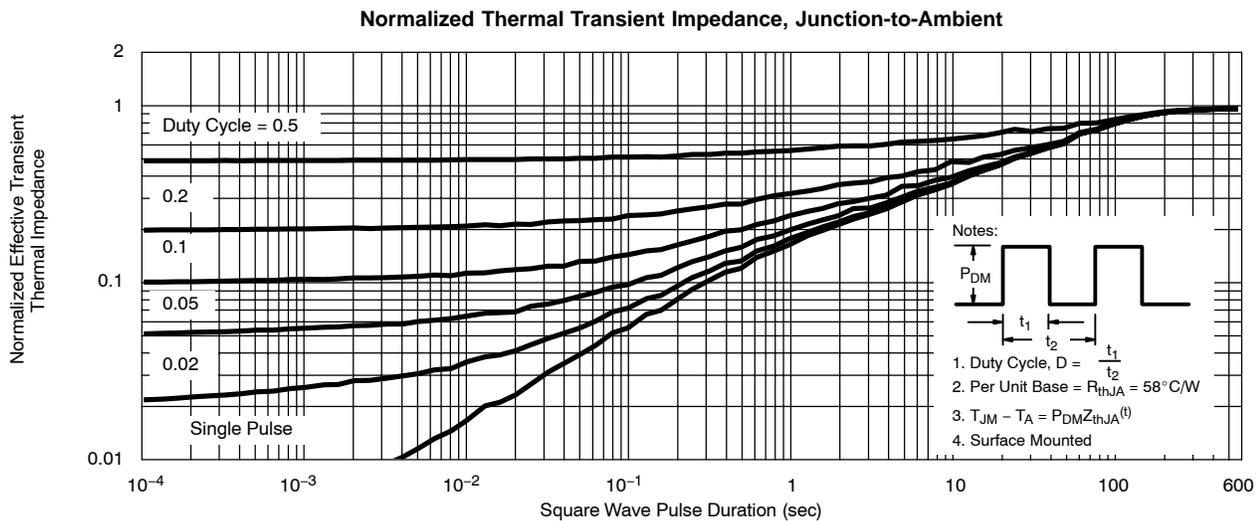
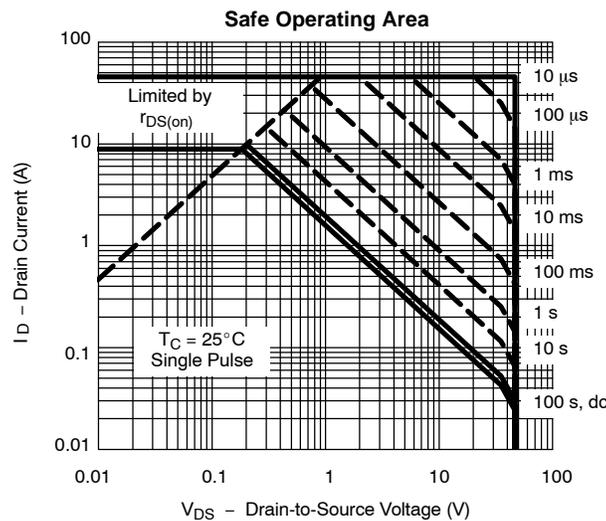
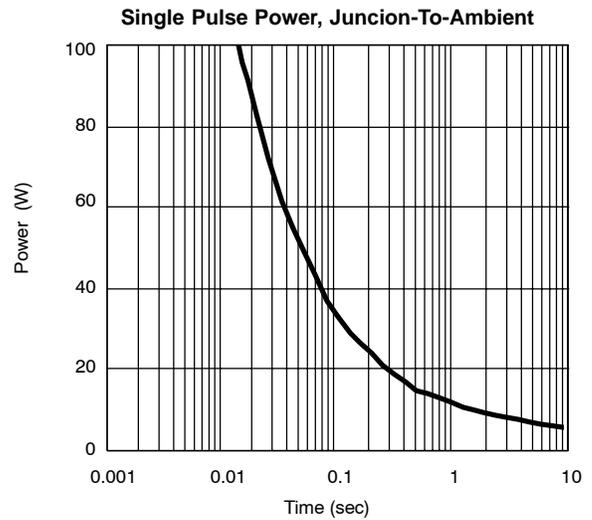
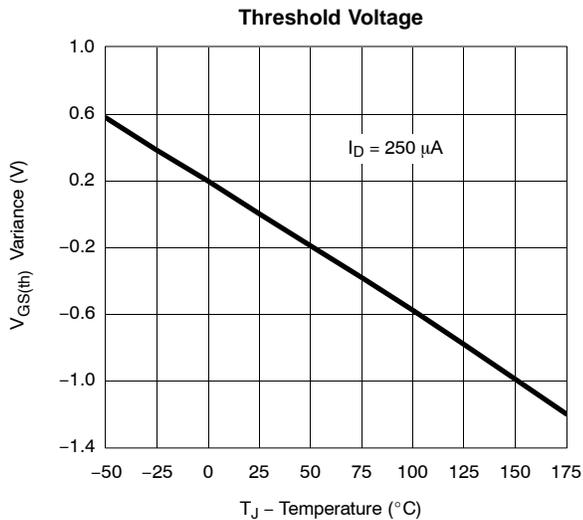


**On-Resistance vs. Gate-to-Source Voltage**





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





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

