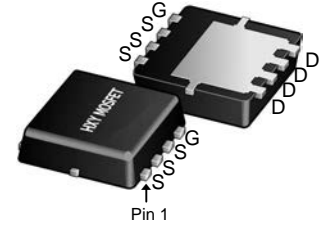


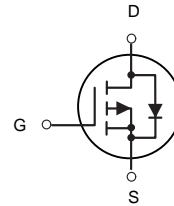


### Description

The DMP3013SFV uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



DFN3X3-8L  
(PowerDI3333-8)



P-Channel MOSFET

### General Features

$V_{DS} = -30V$   $I_D = -55A$

$R_{DS(ON)} < 11m\Omega$  @  $V_{GS} = -10V$

### Application

Battery protection

Load switch

Uninterruptible power supply

### Package Marking and Ordering Information

| Product ID | Pack                     | Brand      | Qty(PCS) |
|------------|--------------------------|------------|----------|
| DMP3013SFV | DFN3X3-8L(PowerDI3333-8) | HXY MOSFET | 5000     |

### Absolute Maximum Ratings ( $T_C = 25^\circ C$ unless otherwise noted)

| Symbol                    | Parameter                                     | Rating     | Units |
|---------------------------|---|------------|-------|
| V <sub>DS</sub>           | Drain-Source Voltage                          | -30        | V     |
| V <sub>GS</sub>           | Gate-Source Voltage                           | ± 20       | V     |
| $I_D @ T_C = 25^\circ C$  | Continuous Drain Current, $V_{GS} @ 10V^1$    | -55        | A     |
| $I_D @ T_C = 100^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$    | -23        | A     |
| IDM                       | Pulsed Drain Current <sup>2</sup>             | -140       | A     |
| EAS                       | Single Pulse Avalanche Energy <sup>3</sup>    | 78.8       | mJ    |
| $P_D @ T_C = 25^\circ C$  | Total Power Dissipation <sup>4</sup>          | 21.5       | W     |
| TSTG                      | Storage Temperature Range                     | -55 to 150 | °C    |
| T <sub>J</sub>            | Operating Junction Temperature Range          | -55 to 150 | °C    |
| R <sub>θJC</sub>          | Thermal Resistance Junction-Case <sup>1</sup> | 5.8        | °C/W  |



### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

| Symbol               | Parameter   | Test Condition  | Min. | Typ. | Max. | Units |
|----------------------|---|---|------|------|------|-------|
| V <sub>(BR)DSS</sub> | Drain-Source Breakdown Voltage                            | V <sub>GS</sub> =0V, I <sub>D</sub> = -250μA  | -30  | -    | -    | V     |
| I <sub>DSS</sub>     | Zero Gate Voltage Drain Current                           | V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V,   | -    | -    | -1   | μA    |
| I <sub>GSS</sub>     | Gate to Body Leakage Current                              | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V  | -    | -    | ±100 | nA    |
| V <sub>GS(th)</sub>  | Gate Threshold Voltage                                    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                     | -1.0 | -1.5 | -2.5 | V     |
| R <sub>DS(on)</sub>  | Static Drain-Source on-Resistance<br><small>note3</small> | V <sub>GS</sub> = -10V, I <sub>D</sub> = -12A   | -    | 8.5  | 11   | mΩ    |
|                      |   | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -8A   | -    | 13   | 18   |       |
| C <sub>iss</sub>     | Input Capacitance   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                     | -    | 2800 | -    | pF    |
| C <sub>oss</sub>     | Output Capacitance  |   | -    | 346  | -    | pF    |
| C <sub>rss</sub>     | Reverse Transfer Capacitance                              |   | -    | 319  | -    | pF    |
| Q <sub>g</sub>       | Total Gate Charge   | V <sub>DS</sub> = -15V, I <sub>D</sub> = -20A,<br>V <sub>GS</sub> = -10V                        | -    | 30   | -    | nC    |
| Q <sub>gs</sub>      | Gate-Source Charge  |   | -    | 5.3  | -    | nC    |
| Q <sub>gd</sub>      | Gate-Drain("Miller") Charge                               |   | -    | 7.6  | -    | nC    |
| t <sub>d(on)</sub>   | Turn-on Delay Time  | V <sub>DD</sub> = -15V, I <sub>D</sub> = -20A,<br>V <sub>GS</sub> =-10V, R <sub>GEN</sub> =2.5Ω | -    | 14   | -    | ns    |
| t <sub>r</sub>       | Turn-on Rise Time   |   | -    | 20   | -    | ns    |
| t <sub>d(off)</sub>  | Turn-off Delay Time                                       |   | -    | 95   | -    | ns    |
| t <sub>f</sub>       | Turn-off Fall Time  |   | -    | 65   | -    | ns    |
| I <sub>S</sub>       | Maximum Continuous Drain to Source Diode Forward Current  |   | -    | -    | -55  | A     |
| I <sub>SM</sub>      | Maximum Pulsed Drain to Source Diode Forward Current      |   | -    | -    | -140 | A     |
| V <sub>SD</sub>      | Drain to Source Diode Forward Voltage                     | V <sub>GS</sub> = 0V, I <sub>S</sub> = -35A   | -    | -0.8 | -1.2 | V     |

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

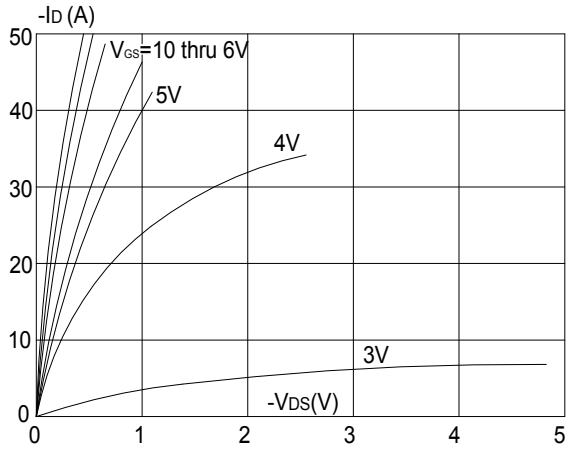
2. EAS condition: T<sub>J</sub>= 25°C, V<sub>DD</sub>= -20V, V<sub>G</sub>= -10V, L= 0.5mH, R<sub>G</sub>= 25 Ω, I<sub>AS</sub>= -17A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

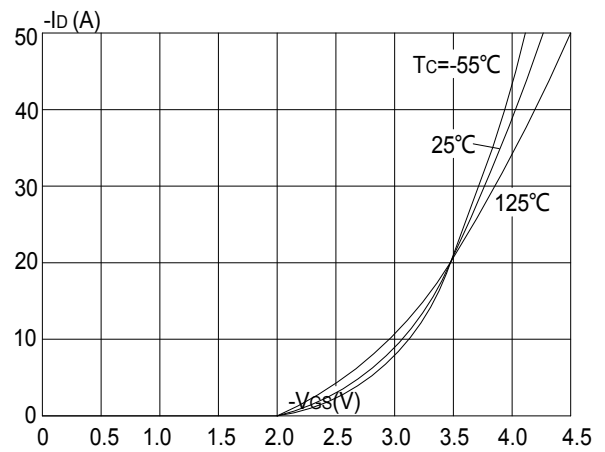


## Typical Performance Characteristics

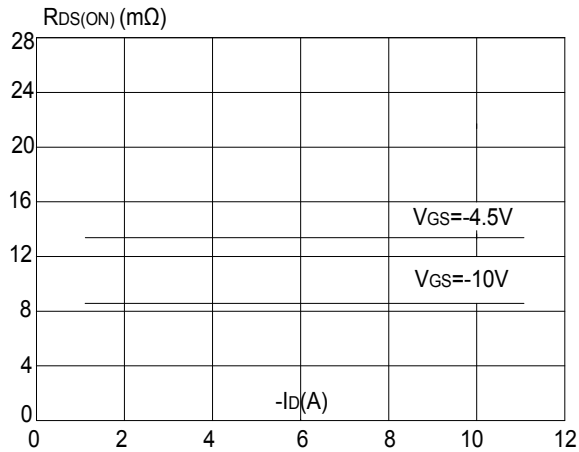
**Figure 1: Output Characteristics**



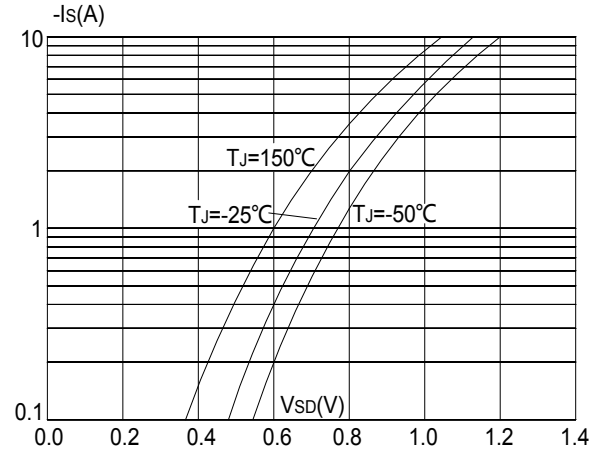
**Figure 2: Typical Transfer Characteristics**



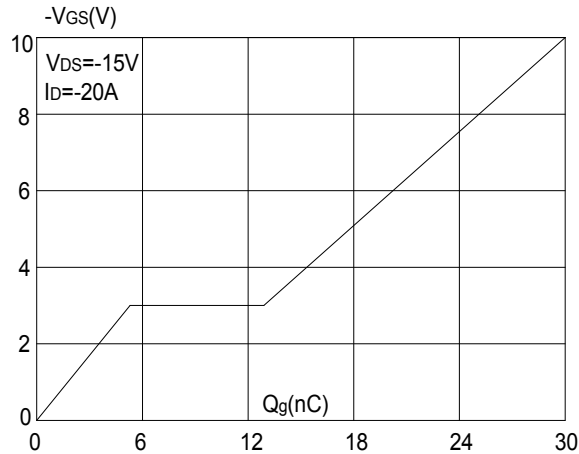
**Figure 3: On-resistance vs. Drain Current**



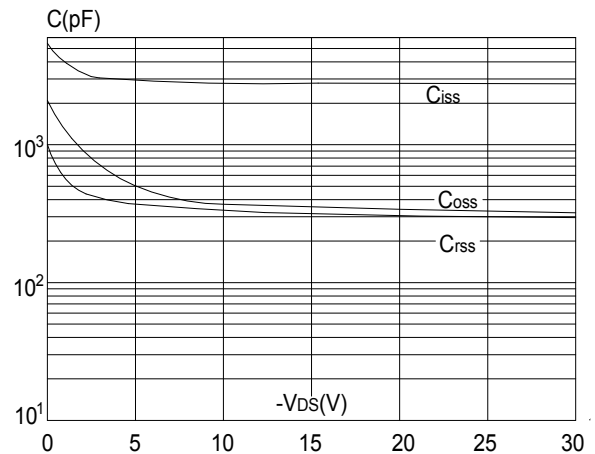
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

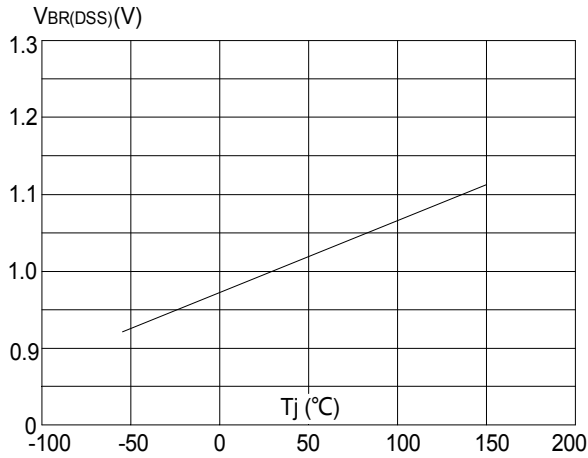


**Figure 6: Capacitance Characteristics**

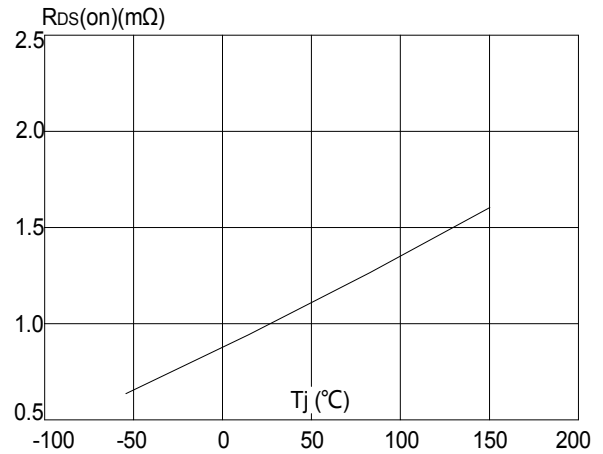




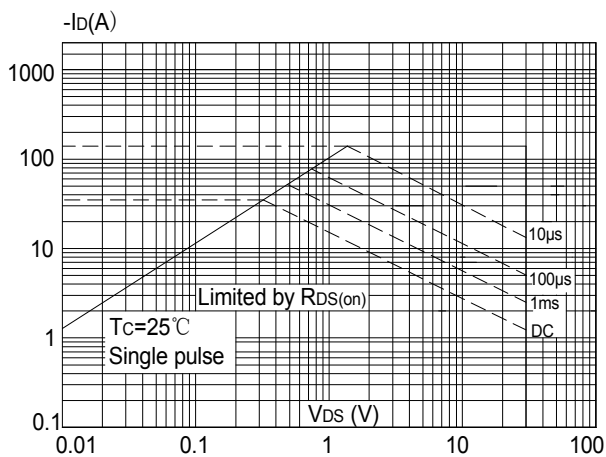
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



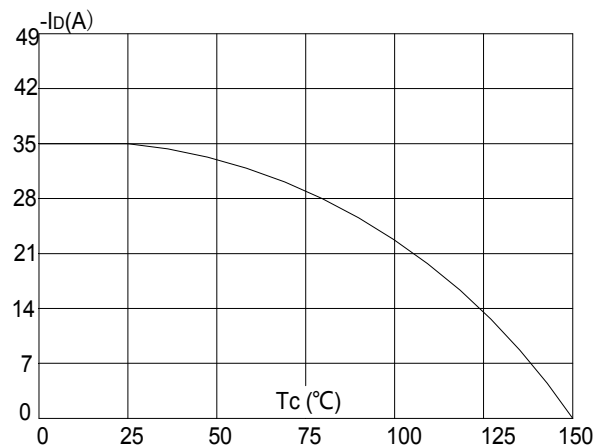
**Figure 8:** Normalized on Resistance vs. Junction Temperature



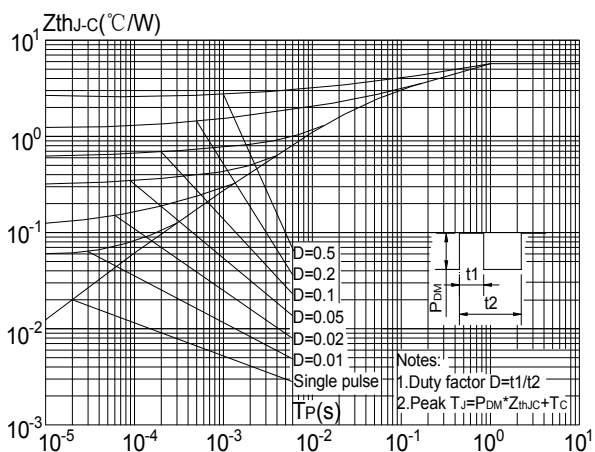
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

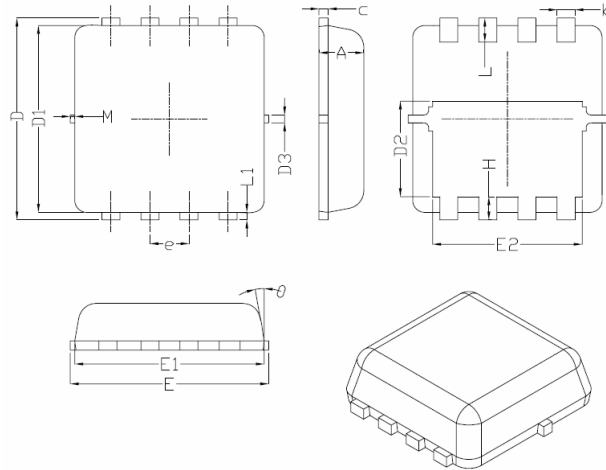


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case





### DFN3X3-8L(PowerDI3333-8) Package Information



| Symbol | Dimensions In Millimeters |      |      |
|--------|---------------------------|------|------|
|        | Min.                      | Nom. | Max. |
| A      | 0.70                      | 0.75 | 0.80 |
| b      | 0.25                      | 0.30 | 0.35 |
| c      | 0.10                      | 0.15 | 0.25 |
| D      | 3.25                      | 3.35 | 3.45 |
| D1     | 3.00                      | 3.10 | 3.20 |
| D2     | 1.48                      | 1.58 | 1.68 |
| D3     | -                         | 0.13 | -    |
| E      | 3.20                      | 3.30 | 3.40 |
| E1     | 3.00                      | 3.15 | 3.20 |
| E2     | 2.39                      | 2.49 | 2.59 |
| e      | 0.65BSC                   |      |      |
| H      | 0.30                      | 0.39 | 0.50 |
| L      | 0.30                      | 0.40 | 0.50 |
| L1     | -                         | 0.13 | -    |
| M      | *                         | *    | 0.15 |
| θ      |                           | 10°  | 12°  |



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