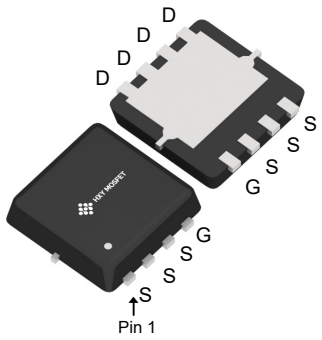
# DMP3018SFVQ-13

P-Channel Enhancement Mode MOSFET

## Description

The DMP3018SFVQ-13 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.

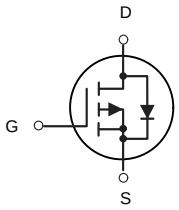



DFN3X3-8L

## General Features

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

$R_{DS(ON)}$ < 11mΩ @ $V_{GS}$=-10V




P-Channel MOSFET

## Application

Battery protection

Load switch

Uninterruptible power supply

## Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|---|---|---|---|
| DMP3018SFVQ-13 | DFN3X3-8L | HXY MOSFET | 5000 |

## Absolute Maximum Ratings ($T_C$=25℃unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| VDS | Drain-Source Voltage | -30 | V |
| VGS | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_C$=25℃ | Continuous Drain Current, $V_{GS}$ @ 10V[1] | -55 | A |
| $I_D$@$T_C$=100℃ | Continuous Drain Current, $V_{GS}$ @ 10V[1] | -23 | A |
| IDM | Pulsed Drain Current[2] | -140 | A |
| EAS | Single Pulse Avalanche Energy[3] | 78.8 | mJ |
| $P_D$@$T_C$=25℃ | Total Power Dissipation[4] | 21.5 | W |
| TSTG | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |
| $R_{\theta}JC$ | Thermal Resistance Junction-Case[1] | 5.8 | ℃/W |

## Electrical Characteristics ($T_J$=25℃ unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| **Off Characteristic** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V,$I_D$= -250μA | -30 | - | - | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$ = -30V, $V_{GS}$ = 0V, | - | - | -1 | μA |
| $I_{GSS}$ | Gate to Body Leakage Current | $V_{DS}$ =0V, $V_{GS}$ = ±20V | - | - | ±100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$= $V_{GS}$, $I_D$= -250μA | -1.0 | -1.5 | -2.5 | V |
| $R_{DS(on)}$ | Static Drain-Source on-Resistance note3 | $V_{GS}$ =-10V, $I_D$ =-12A | - | 8.5 | 11 | mΩ |
| | | $V_{GS}$ =-4.5V, $I_D$ =-8A | - | 13 | 18 | |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$ = -15V, $V_{GS}$ = 0V, f = 1.0MHz | - | 2800 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 346 | - | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 319 | - | pF |
| $Q_g$ | Total Gate Charge | $V_{DS}$= -15V, $I_D$ = -20A, $V_{GS}$ = -10V | - | 30 | - | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 5.3 | - | nC |
| $Q_{gd}$ | Gate-Drain(“Miller”) Charge | | - | 7.6 | - | nC |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD}$ = -15V, $I_D$ = -20A, $V_{GS}$=-10V, $R_{GEN}$=2.5Ω | - | 14 | - | ns |
| $t_r$ | Turn-on Rise Time | | - | 20 | - | ns |
| $t_{d(off)}$ | Turn-off Delay Time | | - | 95 | - | ns |
| $t_f$ | Turn-off Fall Time | | - | 65 | - | ns |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| $I_S$ | Maximum Continuous Drain to Source Diode Forward Current | | - | - | -55 | A |
| $I_{SM}$ | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | -140 | A |
| $V_{SD}$ | Drain to Source Diode Forward Voltage | $V_{GS}$ = 0V, $I_S$ = -35A | - | -0.8 | -1.2 | V |

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

2. EAS condition: $T_J$= 25℃, VDD= -20V, VG= -10V, L= 0.5mH, RG= 25Ω, IAS= -17A

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

## Typical Performance Characteristics

**Figure1:** Output Characteristics

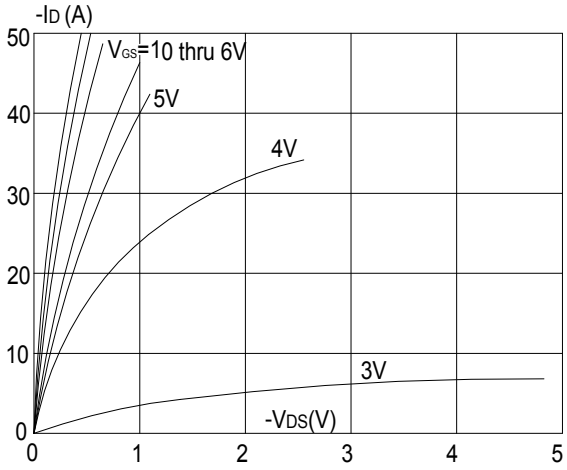



**Figure 2:** Typical Transfer Characteristics

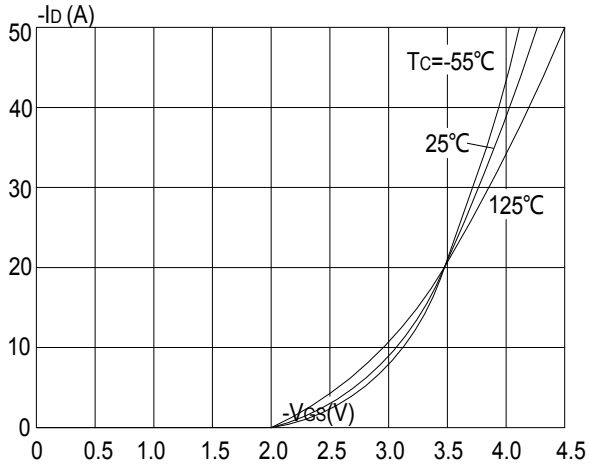



**Figure 3:**On-resistance vs. Drain Current

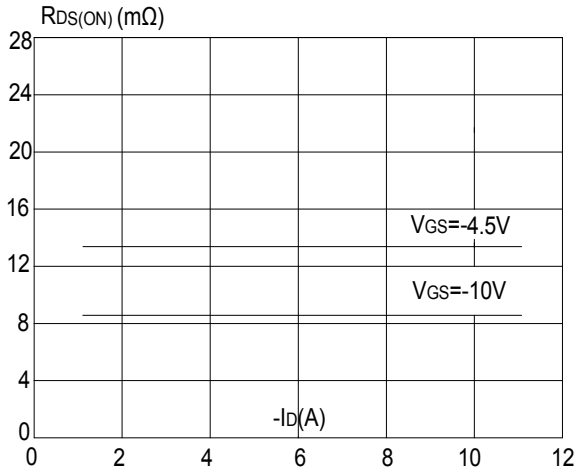



**Figure 4**: Body Diode Characteristics

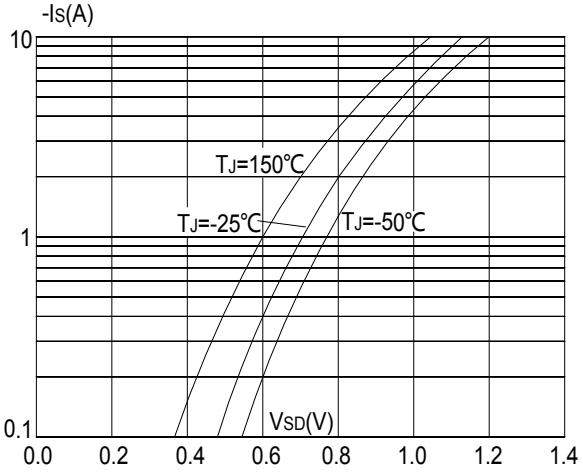



**Figure 5:** Gate Charge Characteristics

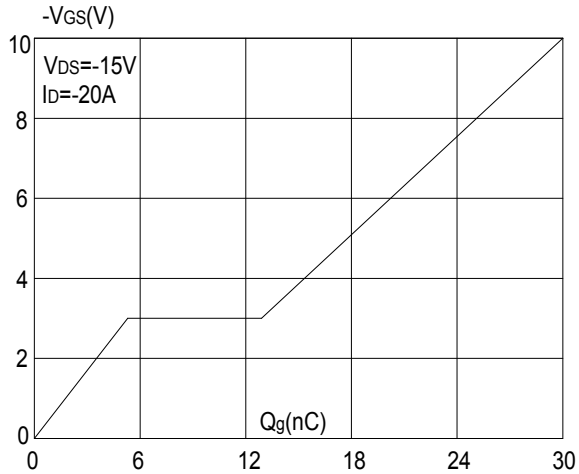



**Figure 6:** Capacitance Characteristics

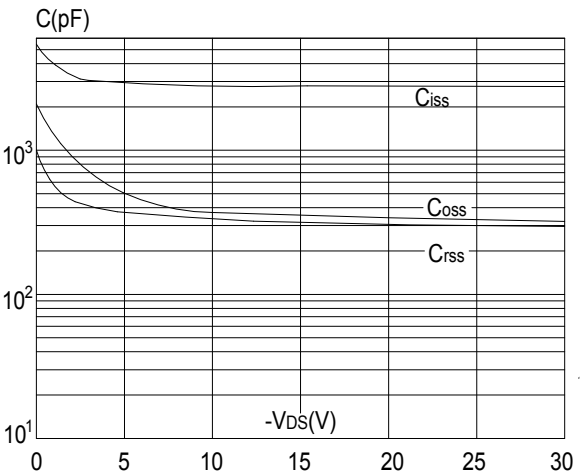


**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature

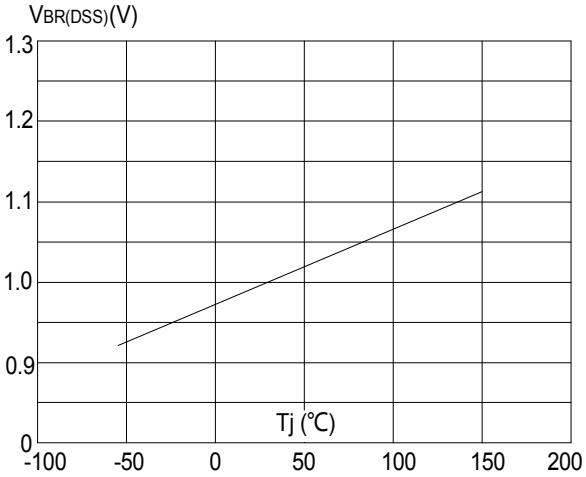



**Figure 8:** Normalized on Resistance vs. Junction Temperature

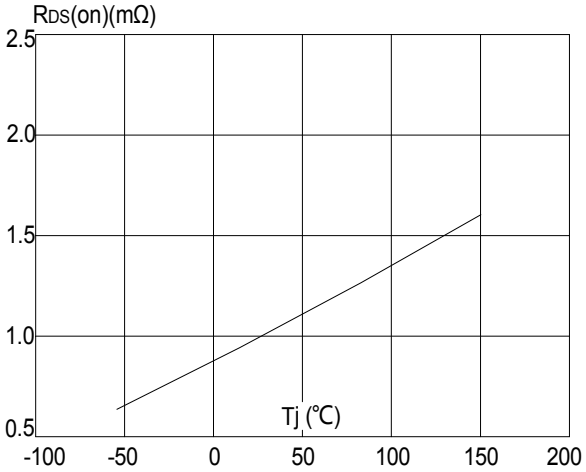



**Figure 9:** Maximum Safe Operating Area

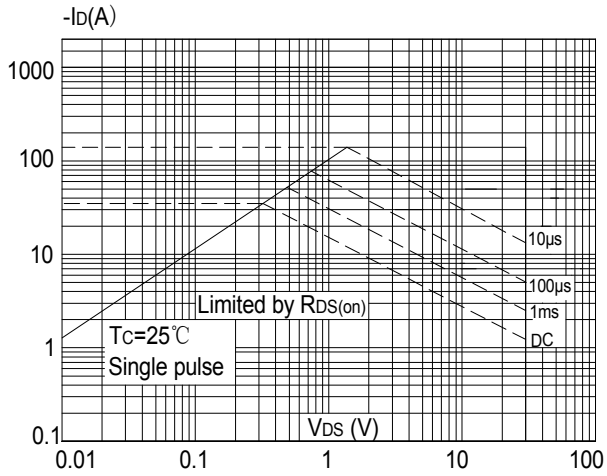



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

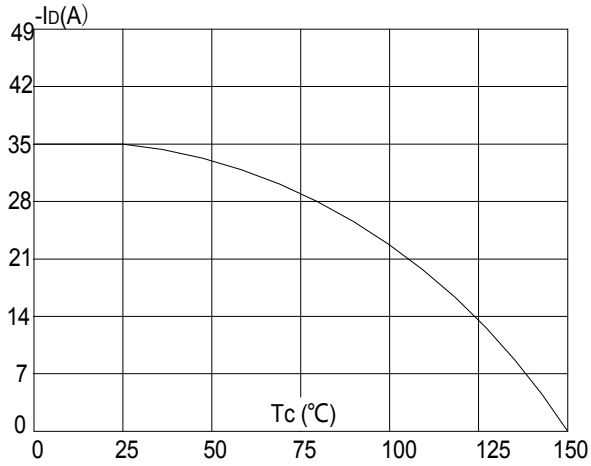
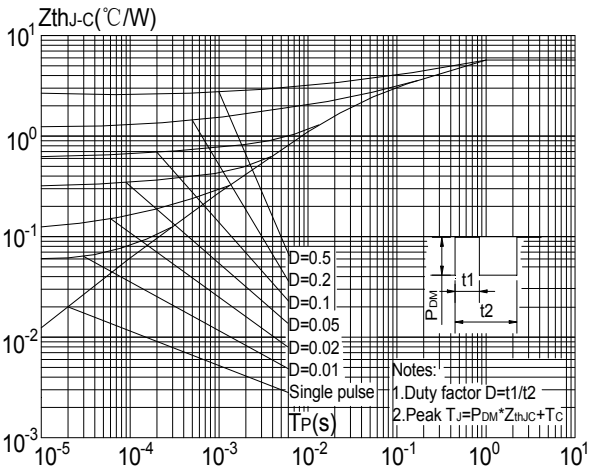
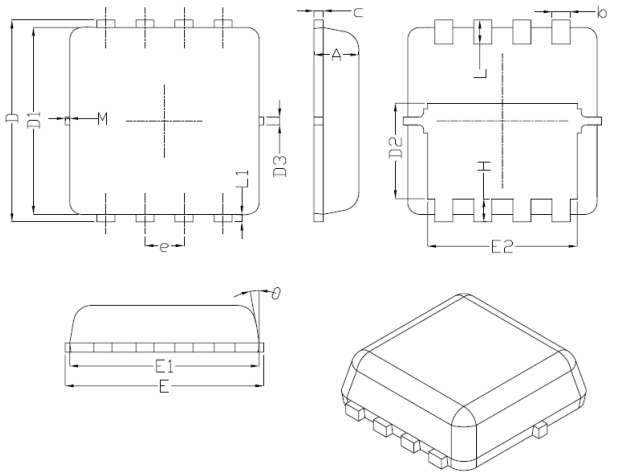



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



## DFN3X3-8L 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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