



## Description

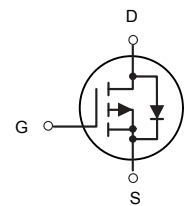
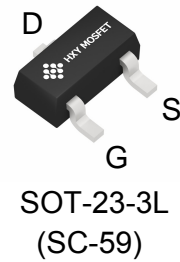
The DMP3030SN uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

## General Features

$V_{DS} = -30V, I_D = -4.1A$   
 $R_{DS(ON)} < 55m\Omega @ V_{GS}=10V$

## Application

High power and current handing capability  
Lead free product is acquired  
Surface mount package  
PWM applications  
Load switch  
Power management



P-Channel MOSFET

## Ordering Information

| Product ID | Pack             | Brand      | Qty(PCS) |
|------------|------------------|------------|----------|
| DMP3030SN  | SOT-23-3L(SC-59) | HXY MOSFET | 3000     |

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

| Symbol          | Parameter  | Limit      | Unit          |
|-----------------|--|------------|---------------|
| $V_{DS}$        | Drain-Source Voltage                             | -30        | V             |
| $V_{GS}$        | Gate-Source Voltage                              | $\pm 20$   | V             |
| $I_D$           | Drain Current-Continuous                         | -4.1       | A             |
| $I_{DM}$        | Drain Current-Pulsed (Note 1)                    | -13        | A             |
| $P_D$           | Maximum Power Dissipation                        | 1.32       | W             |
| $T_J, T_{STG}$  | Operating Junction and Storage Temperature Range | -55 To 150 | $^{\circ}C$   |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient (Note 2) | 125        | $^{\circ}C/W$ |



**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

| Symbol                              | Parameter                                      | Conditions  | Min. | Typ.  | Max. | Unit  |
|-------------------------------------|--|---|------|-------|------|-------|
| BV <sub>DSS</sub>                   | Drain-Source Breakdown Voltage                 | V <sub>GS</sub> =0V , I <sub>D</sub> =-250uA  | -30  | ---   | ---  | V     |
| ΔBV <sub>DSS</sub> /ΔT <sub>J</sub> | BVDSS Temperature Coefficient                  | Reference to 25°C , I <sub>D</sub> =-1mA  | ---  | -0.02 | ---  | V/°C  |
| R <sub>DS(ON)</sub>                 | Static Drain-Source On-Resistance <sup>2</sup> | V <sub>GS</sub> =-10V , I <sub>D</sub> =-3A   | ---  | 42    | 55   | mΩ    |
|                                     |  | V <sub>GS</sub> =-4.5V , I <sub>D</sub> =-1.5A  | ---  | 90    | 98   |       |
| V <sub>GS(th)</sub>                 | Gate Threshold Voltage                         | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA                                   | -1.2 | -1.5  | -2.5 | V     |
| ΔV <sub>GS(th)</sub>                | V <sub>GS(th)</sub> Temperature Coefficient    |   | ---  | 4.32  | ---  | mV/°C |
| I <sub>DSS</sub>                    | Drain-Source Leakage Current                   | V <sub>DS</sub> =-24V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C                          | ---  | ---   | -1   | uA    |
|                                     |  | V <sub>DS</sub> =-24V , V <sub>GS</sub> =0V , T <sub>J</sub> =55°C                          | ---  | ---   | -5   |       |
| I <sub>GSS</sub>                    | Gate-Source Leakage Current                    | V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V   | ---  | ---   | ±100 | nA    |
| g <sub>fs</sub>                     | Forward Transconductance                       | V <sub>DS</sub> =-5V , I <sub>D</sub> =-3A  | ---  | 4.8   | ---  | S     |
| R <sub>g</sub>                      | Gate Resistance                                | V <sub>DS</sub> =0V , V <sub>GS</sub> =0V , f=1MHz  | ---  | 24    | 48   | Ω     |
| Q <sub>g</sub>                      | Total Gate Charge (-4.5V)                      | V <sub>DS</sub> =-20V , V <sub>GS</sub> =-4.5V , I <sub>D</sub> =-3A                        | ---  | 5.22  | 7.3  | nC    |
| Q <sub>gs</sub>                     | Gate-Source Charge                             |   | ---  | 1.25  | 1.8  |       |
| Q <sub>gd</sub>                     | Gate-Drain Charge                              |   | ---  | 2.3   | 3.2  |       |
| T <sub>d(on)</sub>                  | Turn-On Delay Time                             | V <sub>DD</sub> =-15V , V <sub>GS</sub> =-10V , R <sub>G</sub> =3.3Ω<br>I <sub>D</sub> =-1A | ---  | 18.4  | 37   | ns    |
| T <sub>r</sub>                      | Rise Time                                      |   | ---  | 11.4  | 21   |       |
| T <sub>d(off)</sub>                 | Turn-Off Delay Time                            |   | ---  | 39.4  | 79   |       |
| T <sub>f</sub>                      | Fall Time                                      |   | ---  | 5.2   | 10.4 |       |
| C <sub>iss</sub>                    | Input Capacitance                              | V <sub>DS</sub> =-15V , V <sub>GS</sub> =0V , f=1MHz  | ---  | 463   | 650  | pF    |
| C <sub>oss</sub>                    | Output Capacitance                             |   | ---  | 82    | 115  |       |
| C <sub>riss</sub>                   | Reverse Transfer Capacitance                   |   | ---  | 68    | 95   |       |
| I <sub>S</sub>                      | Continuous Source Current <sup>1,4</sup>       | V <sub>G</sub> =V <sub>D</sub> =0V , Force Current  | ---  | ---   | -3.2 | A     |
| I <sub>SM</sub>                     | Pulsed Source Current <sup>2,4</sup>           |   | ---  | ---   | -13  | A     |
| V <sub>SD</sub>                     | Diode Forward Voltage <sup>2</sup>             | V <sub>GS</sub> =0V , I <sub>S</sub> =-1A , T <sub>J</sub> =25°C                            | ---  | ---   | -1   | V     |

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.



### Typical Characteristics

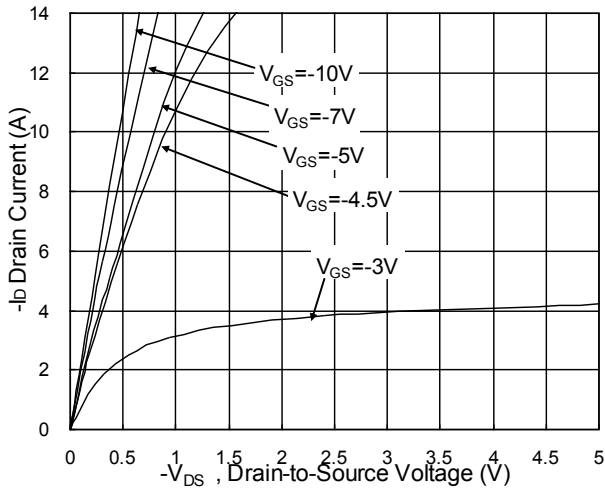


Fig.1 Typical Output Characteristics

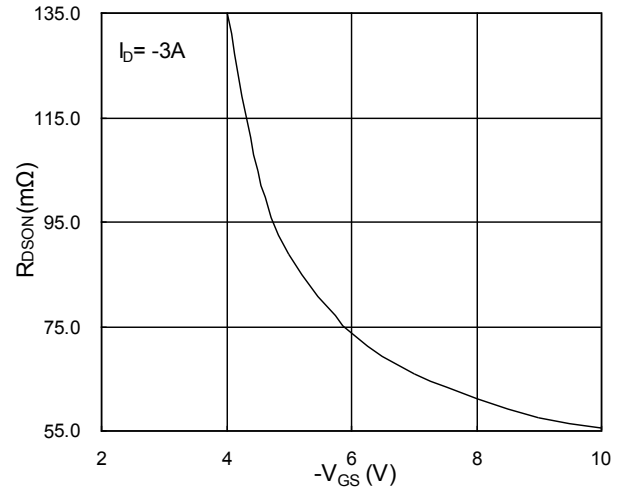


Fig.2 On-Resistance vs. G-S Voltage

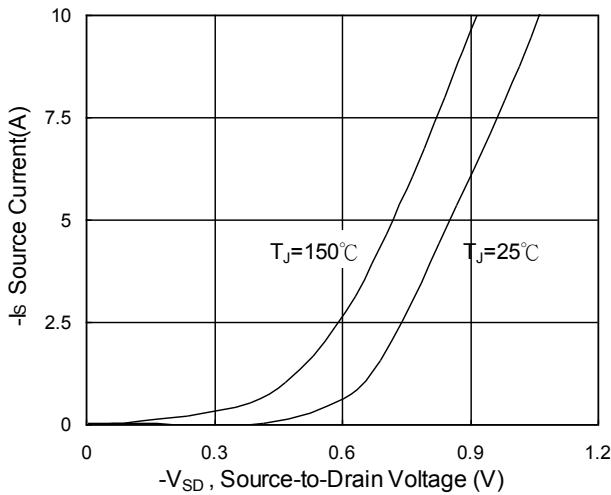


Fig.3 Source Drain Forward Characteristics

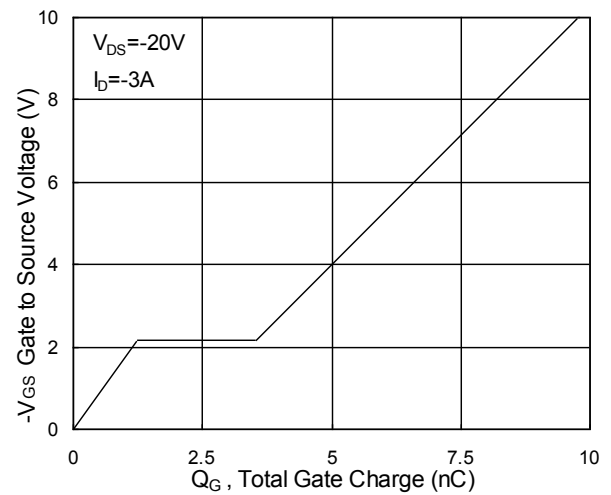


Fig.4 Gate-Charge Characteristics

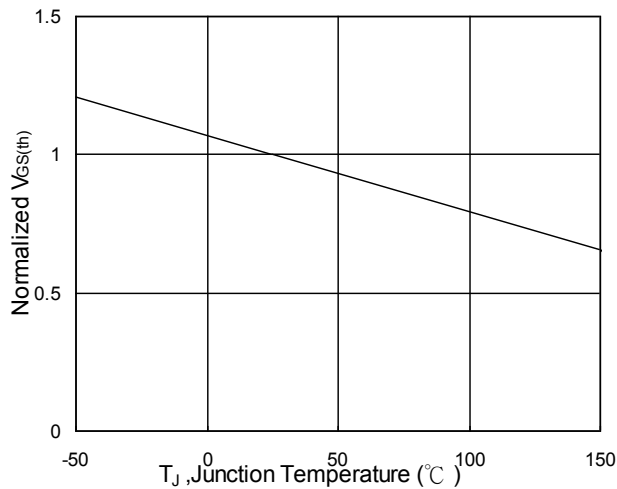


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

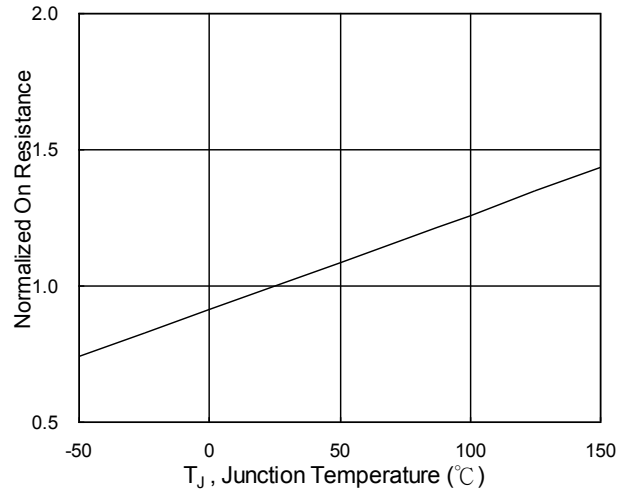


Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$



Fig.7 Capacitance

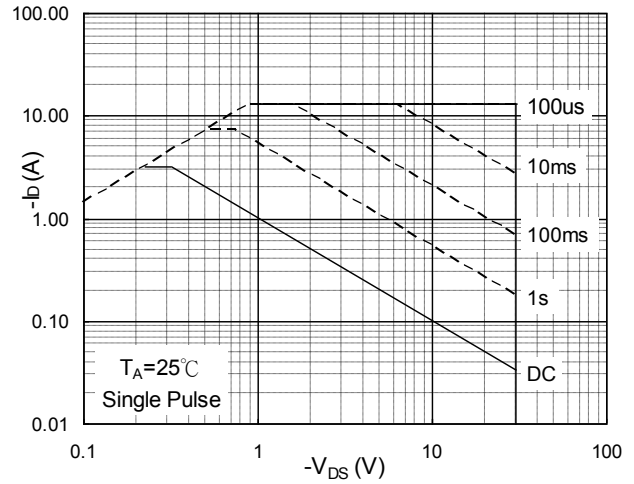


Fig.8 Safe Operating Area

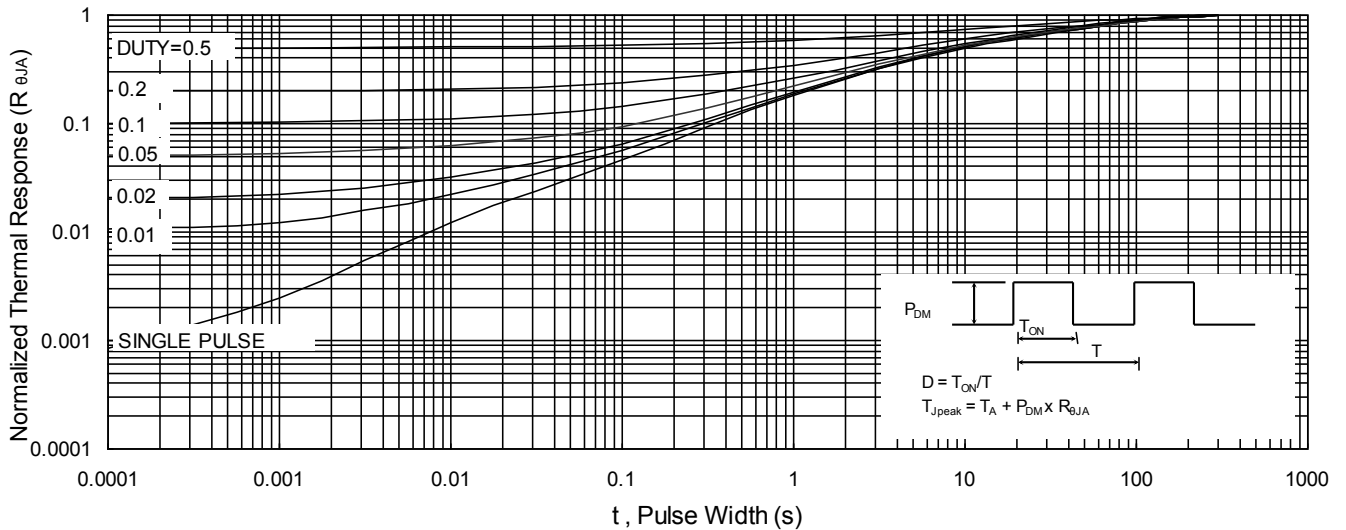


Fig.9 Normalized Maximum Transient Thermal Impedance



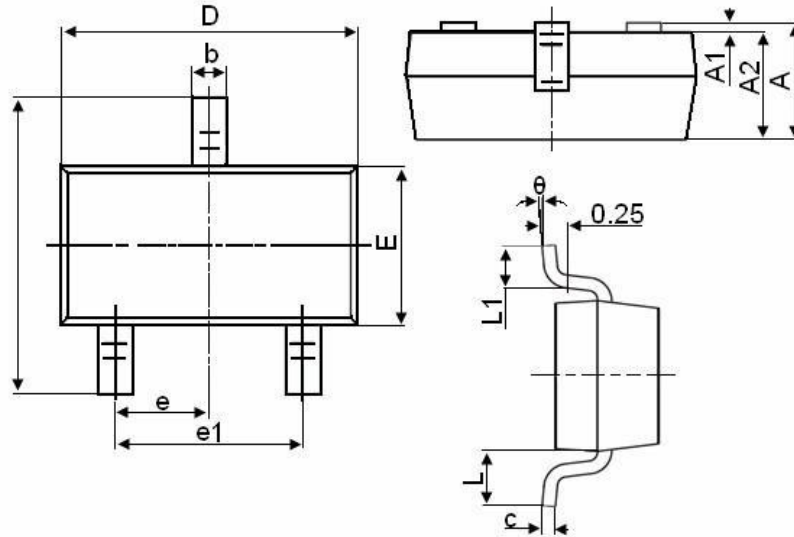
Fig.10 Switching Time Waveform



Fig.11 Gate Charge Waveform



**SOT-23-3L(SC-59) Package Information**



| Symbol   | Dimensions in Millimeters |       |
|----------|---------------------------|-------|
|          | MIN.                      | MAX.  |
| A        | 1.050                     | 1.250 |
| A1       | 0.000                     | 0.100 |
| A2       | 1.050                     | 1.150 |
| b        | 0.300                     | 0.500 |
| c        | 0.100                     | 0.200 |
| D        | 2.800                     | 3.000 |
| E        | 1.500                     | 1.700 |
| E1       | 2.650                     | 2.950 |
| e        | 0.950TYP                  |       |
| e1       | 1.800                     | 2.000 |
| L        | 0.550REF                  |       |
| L1       | 0.300                     | 0.600 |
| $\theta$ | 0°                        | 8°    |



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