



## Description

The DMP3021SFVWQ-7 uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. This device is well suited for high current load applications.

## General Features

$V_{DS} = -30V, I_D = -32A$

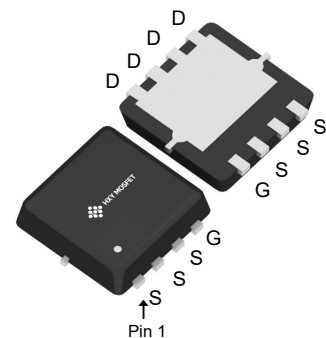
$R_{DS(ON)} < 12m\Omega @ V_{GS} = -10V$

$R_{DS(ON)} < 18m\Omega @ V_{GS} = -4.5V$

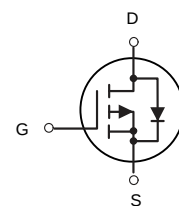
## Application

High side switch for full bridge converter

DC/DC converter for LCD display



DFN3X3-8L



P-Channel MOSFET

## Ordering Information

| Product ID     | Pack      | Brand      | Qty(PCS) |
|----------------|-----------|------------|----------|
| DMP3021SFVWQ-7 | DFN3X3-8L | HXY MOSFET | 5000     |

## Absolute Maximum Ratings@T<sub>J</sub>=25°C(unless otherwise specified)

| Symbol                               | Parameter                                                 | Rating     | Units |
|--------------------------------------|-----------------------------------------------------------|------------|-------|
| V <sub>DS</sub>                      | Drain-Source Voltage                                      | -30        | V     |
| V <sub>GS</sub>                      | Gate-Source Voltage                                       | ±20        | V     |
| I <sub>D</sub> @T <sub>A</sub> =25°C | Drain Current, V <sub>GS</sub> @ 10V                      | -32        | A     |
| I <sub>D</sub> @T <sub>A</sub> =70°C | Drain Current, V <sub>GS</sub> @ 10V                      | -9.8       | A     |
| I <sub>DM</sub>                      | Pulsed Drain Current <sup>1</sup>                         | -65        | A     |
| P <sub>D</sub> @T <sub>A</sub> =25°C | Total Power Dissipation                                   | 3.57       | W     |
| T <sub>STG</sub>                     | Storage Temperature Range                                 | -55 to 150 | °C    |
| T <sub>J</sub>                       | Operating Junction Temperature Range                      | -55 to 150 | °C    |
| R <sub>thj-c</sub>                   | Maximum Thermal Resistance, Junction-case                 | 6          | °C/W  |
| R <sub>thj-a</sub>                   | Maximum Thermal Resistance, Junction-ambient <sup>3</sup> | 35         | °C/W  |



**Electrical Characteristics@Tj=25°C(unless otherwise specified)**

| Symbol            | Parameter                                      | Test Conditions                                             | Min. | Typ.  | Max. | Units |
|-------------------|------------------------------------------------|-------------------------------------------------------------|------|-------|------|-------|
| BV <sub>DSS</sub> | Drain-Source Breakdown Voltage                 | V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA                 | -30  | -     | -    | V     |
| RDS(ON)           | Static Drain-Source On-Resistance <sup>2</sup> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A                 | -    | 10    | 12   | mΩ    |
|                   |                                                | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A                | -    | 14    | 18   | mΩ    |
| VGS(th)           | Gate Threshold Voltage                         | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA   | -1   | -1.95 | -2.5 | V     |
| g <sub>fs</sub>   | Forward Transconductance                       | V <sub>DS</sub> =-10V, I <sub>D</sub> =-6A                  | -    | 19    | -    | S     |
| IDSS              | Drain-Source Leakage Current                   | V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V                  | -    | -     | -30  | uA    |
| IGSS              | Gate-Source Leakage                            | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                  | -    | -     | ±100 | nA    |
| Q <sub>g</sub>    | Total Gate Charge                              | I <sub>D</sub> =-15A                                        | -    | 12.5  | 24   | nC    |
| Q <sub>gs</sub>   | Gate-Source Charge                             | V <sub>DS</sub> =-15V                                       | -    | 5.4   | -    | nC    |
| Q <sub>gd</sub>   | Gate-Drain ("Miller") Charge                   | V <sub>GS</sub> =-4.5V                                      | -    | 5     | -    | nC    |
| td(on)            | Turn-on Delay Time                             | V <sub>DS</sub> =-15V                                       | -    | 4.4   | -    | ns    |
| t <sub>r</sub>    | Rise Time                                      | I <sub>D</sub> =-15A                                        | -    | 11.2  | -    | ns    |
| td(off)           | Turn-off Delay Time                            | R <sub>G</sub> =3.3Ω                                        | -    | 34    | -    | ns    |
| t <sub>f</sub>    | Fall Time                                      | V <sub>GS</sub> =-10V                                       | -    | 18    | -    | ns    |
| C <sub>iss</sub>  | Input Capacitance                              | V <sub>GS</sub> =0V                                         | -    | 1345  | 2000 | pF    |
| C <sub>oss</sub>  | Output Capacitance                             | V <sub>DS</sub> =-15V<br>f=1.0MHz                           | -    | 194   | -    | pF    |
| C <sub>rss</sub>  | Reverse Transfer Capacitance                   |                                                             | -    | 158   | -    | pF    |
| trr               | Reverse Recovery Time                          | I <sub>S</sub> =-15A, V <sub>GS</sub> =0V,<br>dI/dt=100A/μs | -    | 12.4  | -    | ns    |
| Q <sub>rr</sub>   | Reverse Recovery Charge                        |                                                             | -    | 5     | -    | nC    |

**Notes:**

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test



## Typical Characteristics

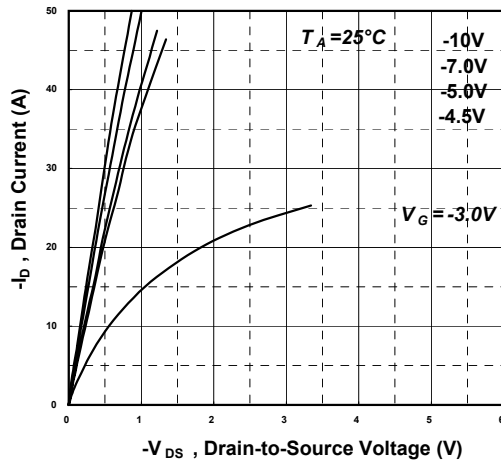


Fig 1. Typical Output Characteristics

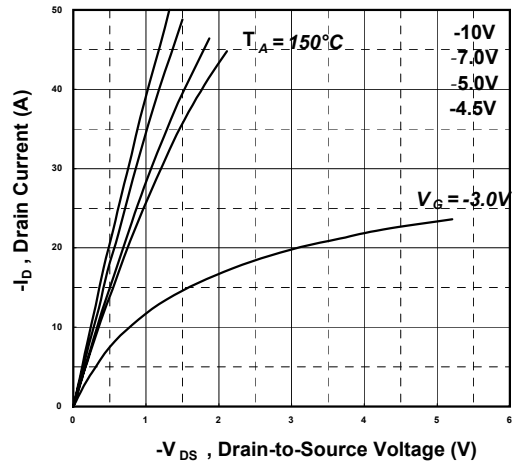


Fig 2. Typical Output Characteristics

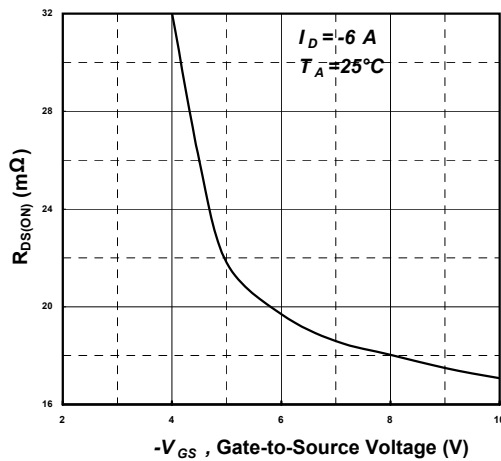


Fig 3. On-Resistance v.s. Gate Voltage

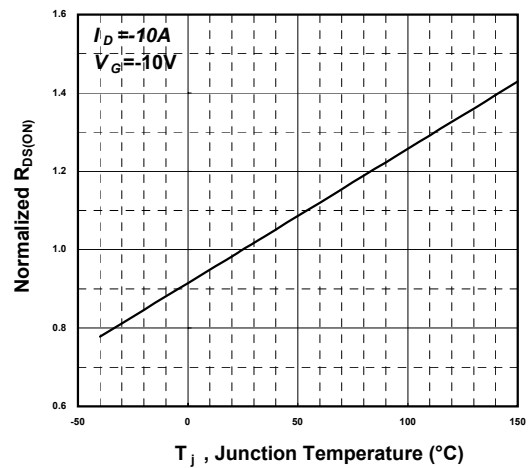


Fig 4. Normalized On-Resistance v.s. Junction Temperature

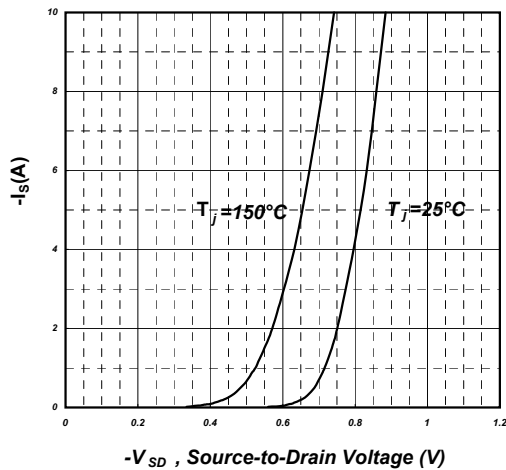


Fig 5. Forward Characteristic of Reverse Diode

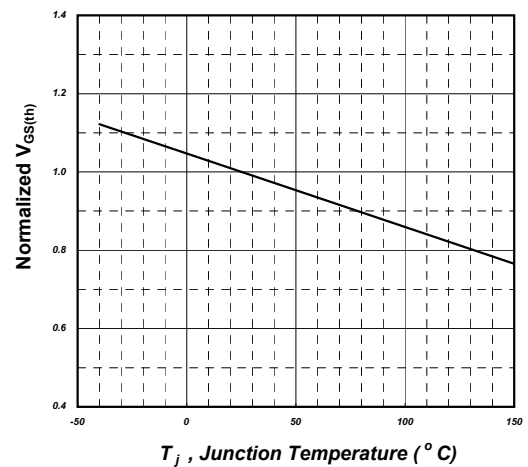


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

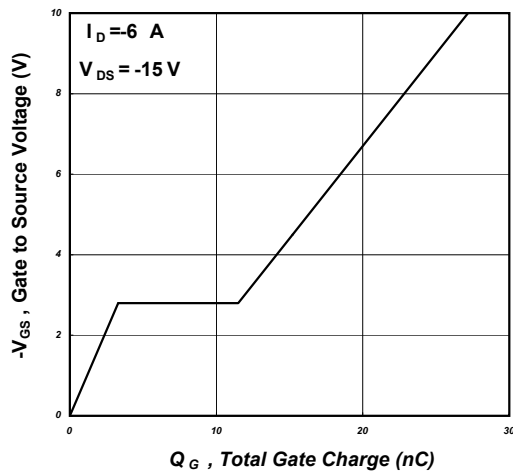


Fig 7. Gate Charge Characteristics

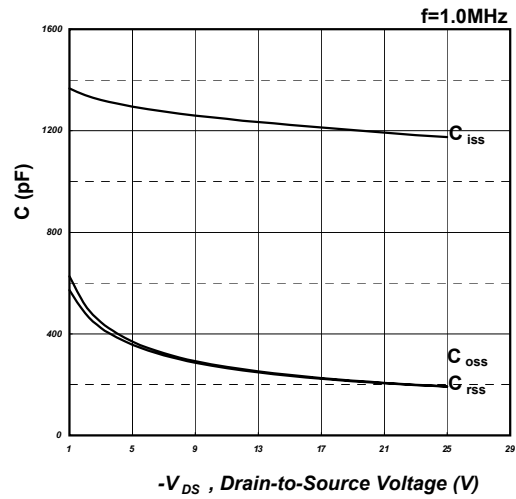


Fig 8. Typical Capacitance Characteristics

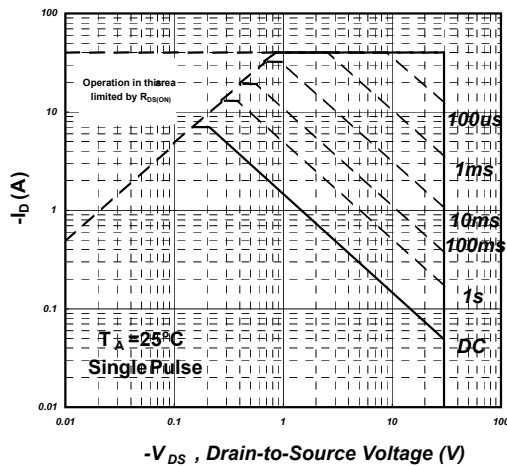


Fig 9. Maximum Safe Operating Area

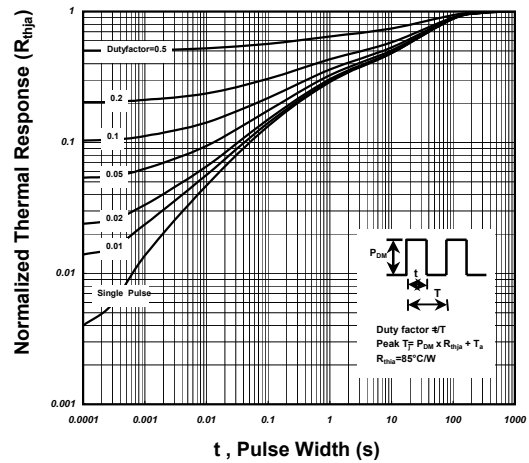


Fig 10. Effective Transient Thermal Impedance

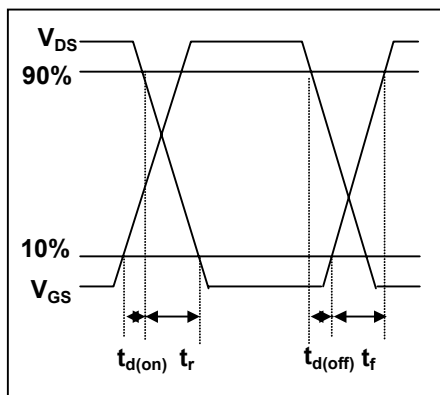


Fig 11. Switching Time Waveform

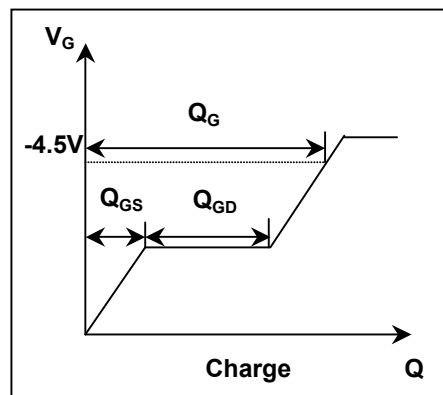
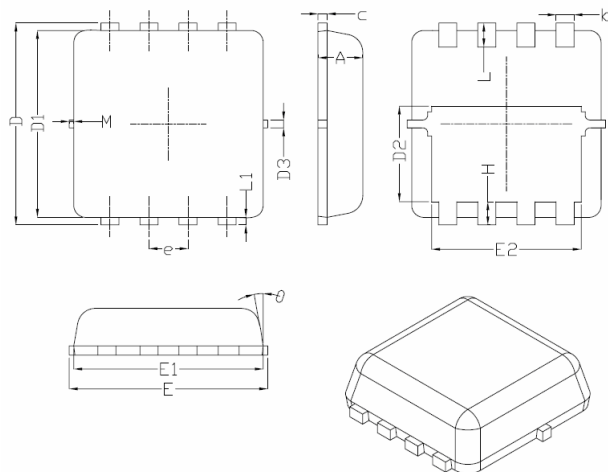


Fig 12. Gate Charge Waveform



## 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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