

## N Channel Enhancement Mode Power MOSFET

### GENERAL DESCRIPTION

The product utilizes the advanced planar processing techniques to achieve the highcell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

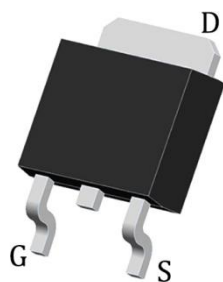
### FEATURES

- 500V/8A,  $R_{DS(ON)} = 0.75\Omega @ V_{GS} = 10V$  (Typical)
- Fast switching and reverse body recovery
- Excellent package for good heat dissipation

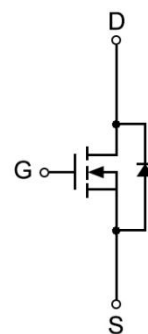
### APPLICATIONS

- Lighting
- High efficiency switch mode power supplies

### PIN DESCRIPTION



TO-252



N-Channel MOSFET

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Absolute Maximum Ratings( $T_c=25^{\circ}\text{C}$  Unless Otherwise Noted)

| Symbol          | Parameter                                        | Limit                     | Unit                 |
|-----------------|--------------------------------------------------|---------------------------|----------------------|
| $V_{DS}$        | Drain-Source Voltage                             | 500                       | V                    |
| $V_{GS}$        | Gate-Source Voltage                              | $\pm 30$                  | V                    |
| $I_D$           | Continuous Drain Current                         | $T_c=25^{\circ}\text{C}$  | A                    |
|                 |                                                  | $T_c=100^{\circ}\text{C}$ |                      |
| $I_{DM}$        | Pulsed Drain Current                             | 30                        | A                    |
| $P_D$           | Maximum Power Dissipation                        | 80                        | W                    |
| $T_J, T_{STG}$  | Operating Junction and Storage Temperature Range | $-55+150$                 | $^{\circ}\text{C}$   |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case              | 1.56                      | $^{\circ}\text{C/W}$ |

Electrical Characteristics( $T_c=25^{\circ}\text{C}$  Unless Otherwise Noted)

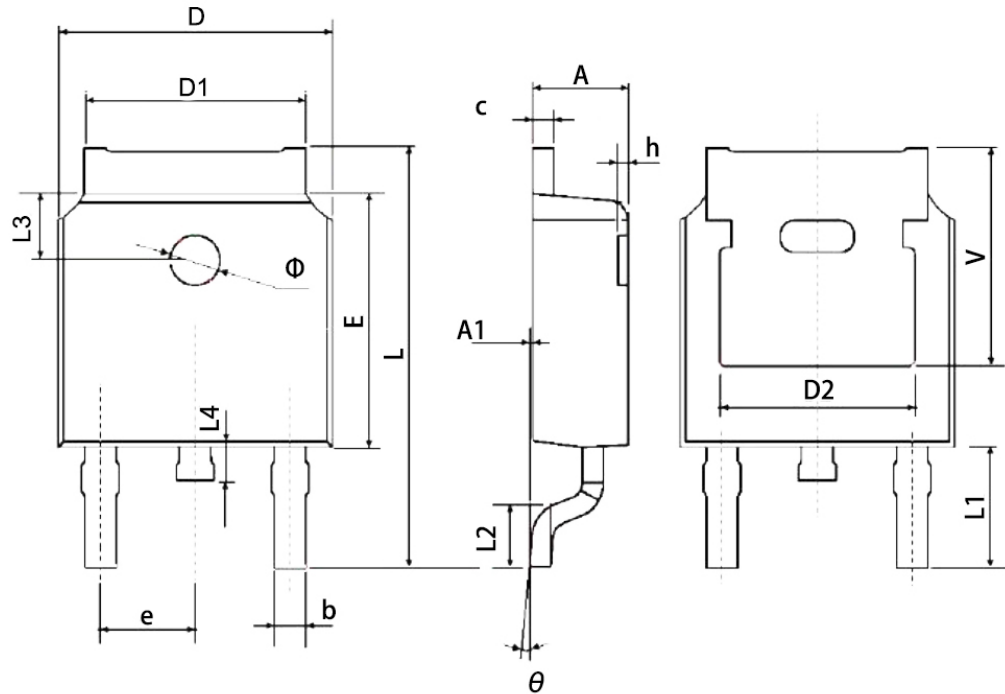
| Symbol                        | Parameter                        | Conditions                       | Min | Typ  | Max       | Unit     |
|-------------------------------|----------------------------------|----------------------------------|-----|------|-----------|----------|
| <b>Static Characteristics</b> |                                  |                                  |     |      |           |          |
| $BV_{DSS}$                    | Drain-Source Breakdown Voltage   | $V_{GS}=0V, I_{DS}=250\mu A$     | 500 |      |           | V        |
| $I_{DSS}$                     | Zero Gate Voltage Drain Current  | $V_{DS}=500V, V_{GS}=0V$         |     |      | 1         | $\mu A$  |
| $I_{GSS}$                     | Gate-Body Leakage Current        | $V_{GS}=\pm 30V, V_{DS}=0V$      |     |      | $\pm 100$ | nA       |
| $V_{GS(th)}$                  | Gate Threshold Voltage           | $V_{DS}=V_{GS}, I_{DS}=250\mu A$ | 2.0 |      | 4.0       | V        |
| $R_{DS(ON)}$                  | Drain-Source On-state Resistance | $V_{GS}=10V, I_{DS}=4A$          |     | 0.75 | 0.85      | $\Omega$ |

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## Electrical Characteristics(Ta=25°C Unless Otherwise Noted)

| Symbol                                    | Parameter                    | Conditions                                                                                   | Min | Typ  | Max | Unit |
|-------------------------------------------|------------------------------|----------------------------------------------------------------------------------------------|-----|------|-----|------|
| <b>Drain-Source Diode Characteristics</b> |                              |                                                                                              |     |      |     |      |
| V <sub>SD</sub>                           | Diode Forward Voltage        | V <sub>GS</sub> =0V, I <sub>SD</sub> =4A                                                     |     |      | 1.4 | V    |
| T <sub>rr</sub>                           | Reverse Recovery Time        | I <sub>SD</sub> =8A                                                                          |     | 390  |     | ns   |
| Q <sub>rr</sub>                           | Reverse Recovery Charge      | di/dt=100A/us                                                                                |     | 2.6  |     | nC   |
| <b>Dynamic Characteristics</b>            |                              |                                                                                              |     |      |     |      |
| T <sub>d(on)</sub>                        | Turn-on Delay Time           | V <sub>DS</sub> =250V,<br>R <sub>G</sub> =25Ω,<br>I <sub>DS</sub> =8A, V <sub>GS</sub> =10V, |     | 16   |     | ns   |
| T <sub>r</sub>                            | Turn-on Rise Time            |                                                                                              |     | 12   |     |      |
| T <sub>d(off)</sub>                       | Turn-off Delay Time          |                                                                                              |     | 58   |     |      |
| T <sub>f</sub>                            | Turn-off Fall Time           |                                                                                              |     | 26   |     |      |
| C <sub>iss</sub>                          | Input Capacitance            | V <sub>GS</sub> =0V,<br>V <sub>DS</sub> =25V,<br>f=1.0MHz                                    |     | 795  |     | pF   |
| C <sub>oss</sub>                          | Output Capacitance           |                                                                                              |     | 68   |     |      |
| C <sub>rss</sub>                          | Reverse Transfer Capacitance |                                                                                              |     | 8.1  |     |      |
| Q <sub>g</sub>                            | Total Gate Charge            | V <sub>DS</sub> =400V, I <sub>D</sub> =8A,<br>V <sub>GS</sub> =10V                           |     | 15.5 |     | nC   |
| Q <sub>gs</sub>                           | Gate-Source Charge           |                                                                                              |     | 4.6  |     |      |
| Q <sub>gd</sub>                           | Gate-Drain Charge            |                                                                                              |     | 4.1  |     |      |

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| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 2.200                     | 2.400  | 0.087                | 0.094 |
| A1     | 0.000                     | 0.127  | 0.000                | 0.005 |
| b      | 0.660                     | 0.860  | 0.026                | 0.034 |
| c      | 0.460                     | 0.580  | 0.018                | 0.023 |
| D      | 6.500                     | 6.700  | 0.256                | 0.264 |
| D1     | 5.100                     | 5.460  | 0.201                | 0.215 |
| D2     | 0.483 TYP.                |        |                      |       |
| E      | 6.000                     | 6.200  | 0.236                | 0.244 |
| e      | 2.186                     | 2.386  | 0.086                | 0.094 |
| L      | 9.800                     | 10.400 | 0.386                | 0.409 |
| L1     | 2.900 TYP.                |        | 0.114 TYP.           |       |
| L2     | 1.400                     | 1.700  | 0.055                | 0.067 |
| L3     | 1.600 TYP.                |        | 0.063 TYP            |       |
| L4     | 0.600                     | 1.000  | 0.024                | 0.039 |
| Φ      | 1.100                     | 1.300  | 0.043                | 0.051 |
| θ      | 0°                        | 8°     | 0°                   | 8°    |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| V      | 5.350 TYP.                |        | 0.211TYP.            |       |