

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| 100V          | 70mΩ@10V        | 6A    |

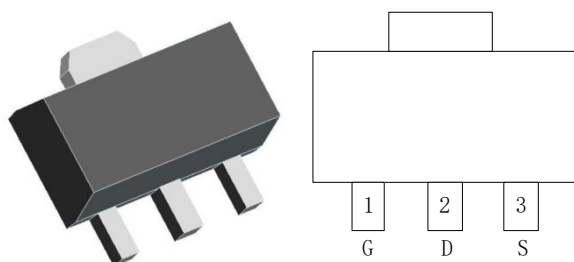
## Feature

- High power and current handling capability
- Surface mount package

## Application

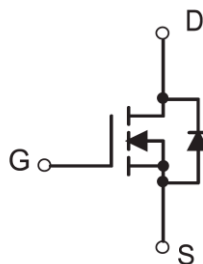
- DC-DC Converters
- Power management functions

## Package

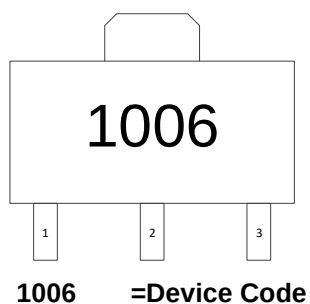


SOT-89-3L

## Circuit diagram



## Marking



**Absolute maximum ratings (Ta=25°C unless otherwise noted)**

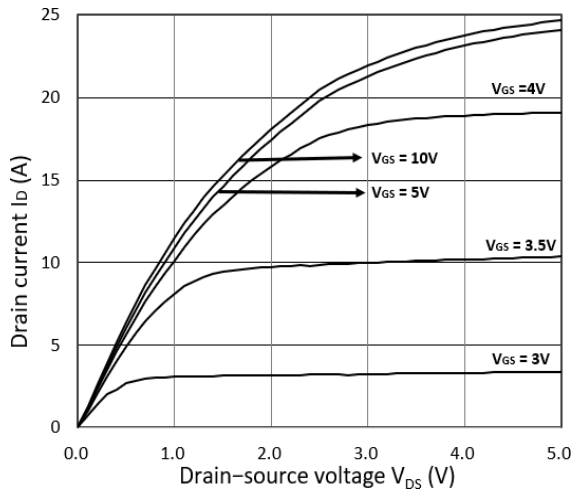
| Parameter                                           |                        | Symbol          | Limit      | Unit               |
|-----------------------------------------------------|------------------------|-----------------|------------|--------------------|
| Drain-Source Voltage                                |                        | $V_{DS}$        | 100        | V                  |
| Gate-Source Voltage                                 |                        | $V_{GS}$        | $\pm 20$   | V                  |
| Drain Current-Continuous                            |                        | $I_D$           | 6          | A                  |
| Pulsed Drain Current                                |                        | $I_{DM}$        | 24         | A                  |
| Maximum Power Dissipation                           | $T_A=25^\circ\text{C}$ | $P_D$           | 1.5        | W                  |
|                                                     | $T_C=25^\circ\text{C}$ |                 | 4.0        |                    |
| Thermal Resistance,Junction-to-Ambient <sup>1</sup> |                        | $R_{\theta JA}$ | 83         | $^\circ\text{C/W}$ |
| Thermal Resistance,Junction-to-Case <sup>1</sup>    |                        | $R_{\theta JC}$ | 31         |                    |
| Operating Junction and Storage Temperature Range    |                        | $T_J, T_{STG}$  | -55 To 175 | $^\circ\text{C}$   |

**Electrical characteristics (Ta=25°C, unless otherwise noted)**

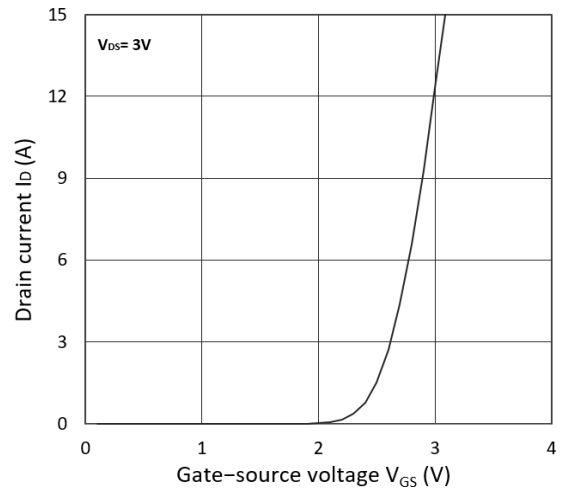
| Parameter                          | Symbol            | Condition                              | Min | Typ  | Max  | Unit |
|------------------------------------|-------------------|----------------------------------------|-----|------|------|------|
| Static Characteristics             |                   |                                        |     |      |      |      |
| Drain-Source Breakdown Voltage     | BV <sub>DSS</sub> | VGS=0V ID=250μA                        | 100 | 110  | -    | V    |
| Zero Gate Voltage Drain Current    | I <sub>DSS</sub>  | VDS=100V,VGS=0V                        | -   | -    | 1    | μA   |
| Gate-Body Leakage Current          | I <sub>GSS</sub>  | VGS=±20V,VDS=0V                        | -   | -    | ±100 | nA   |
| Gate Threshold Voltage             | VGS(th)           | VDS=VGS,ID=250μA                       | 1.2 | 1.8  | 2.5  | V    |
| Drain-Source On-State Resistance   | RDS(on)           | VGS=10V, ID=5A                         | -   | 70   | 100  | mΩ   |
|                                    |                   | VGS=4.5V, ID=3A                        | -   | 85   | 120  |      |
| Dynamic Characteristics            |                   |                                        |     |      |      |      |
| Input Capacitance                  | Ciss              | VDS = 15V, VGS =0V,<br>f =1MHz         | -   | 1100 | -    | PF   |
| Output Capacitance                 | Coss              |                                        | -   | 55   | -    |      |
| Reverse Transfer Capacitance       | Crss              |                                        | -   | 40   | -    |      |
| Switching Characteristics          |                   |                                        |     |      |      |      |
| Turn-on Delay Time                 | td(on)            | VGS =10V, VDD =50V,<br>RG = 3Ω, ID= 5A | -   | 3.9  | -    | nS   |
| Turn-on Rise Time                  | tr                |                                        | -   | 26   | -    |      |
| Turn-Off Delay Time                | td(off)           |                                        | -   | 16.2 | -    |      |
| Turn-Off Fall Time                 | tf                |                                        | -   | 8.9  | -    |      |
| Total Gate Charge                  | Qg                | VGS = 10V,VDS = 50V, ID=5A             | -   | 12   | -    | nC   |
| Gate-Source Charge                 | Qgs               |                                        | -   | 2.9  | -    |      |
| Gate-Drain Charge                  | Qgd               |                                        | -   | 1.8  | -    |      |
| Drain-Source Diode Characteristics |                   |                                        |     |      |      |      |
| Diode Forward Voltage              | VSD               | VGS=0V,IS=1A                           | -   | -    | 1.2  | V    |
| Diode Forward Current              | Is                |                                        | -   | -    | 6    | A    |



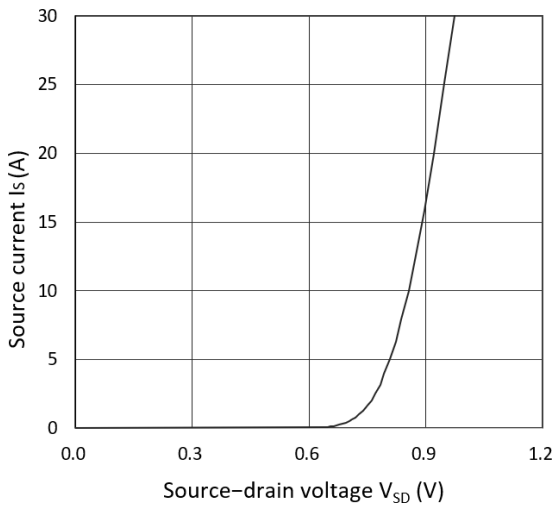
## Typical Characteristics



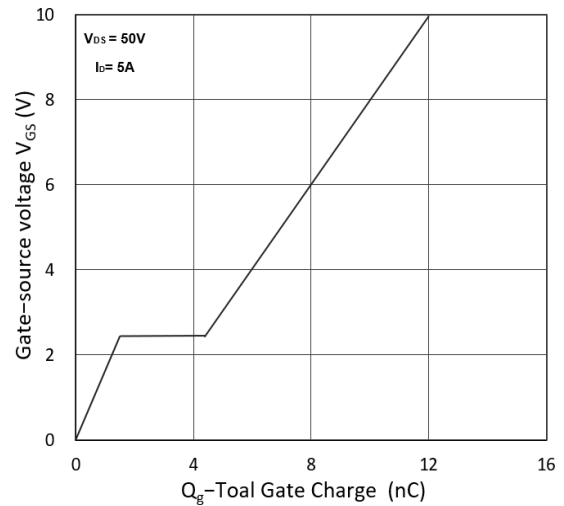
Output Characteristics



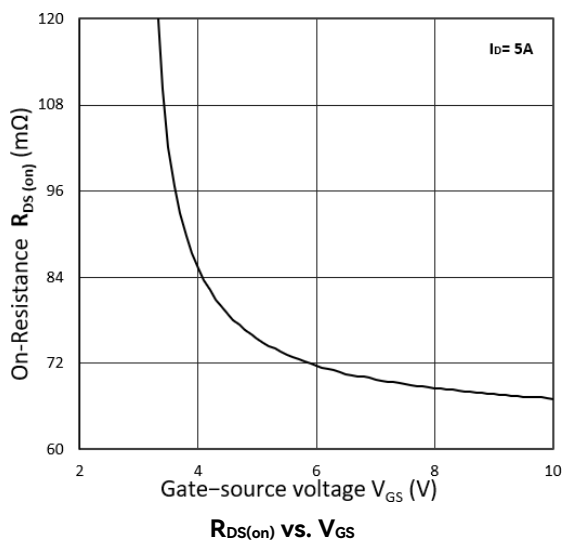
Transfer Characteristics



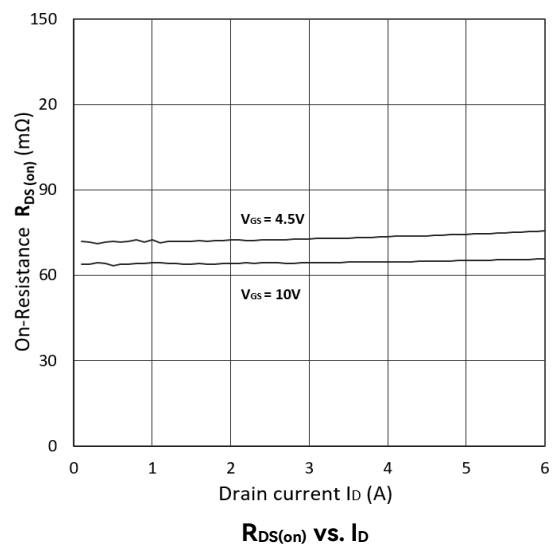
Forward Characteristics of Reverse



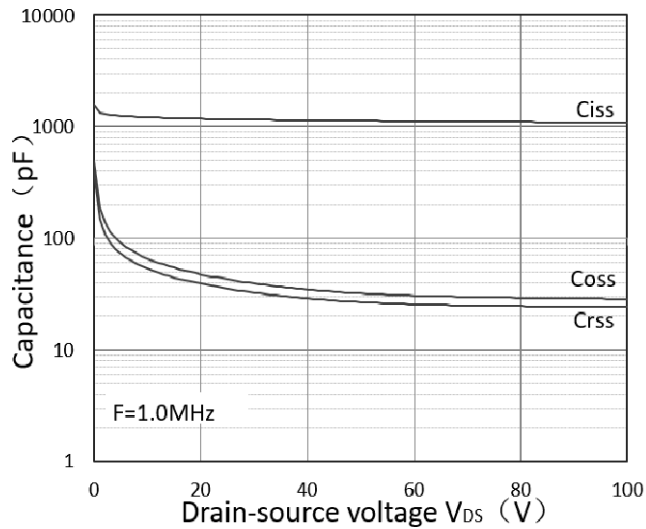
Gate Charge Characteristics



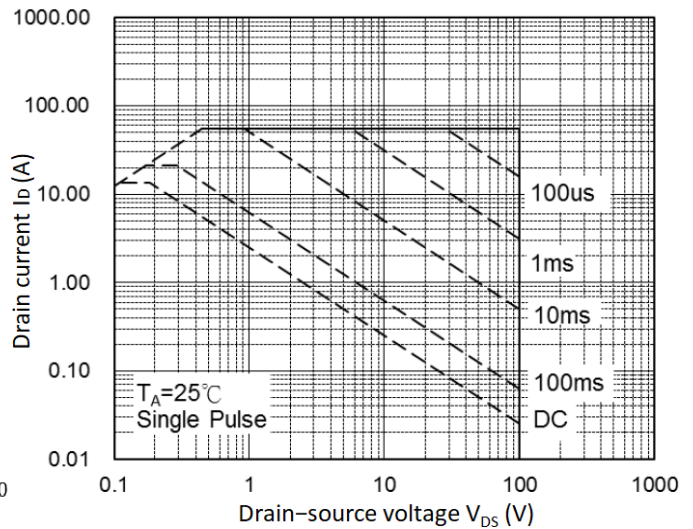
$R_{DS(on)}$  vs.  $V_{GS}$



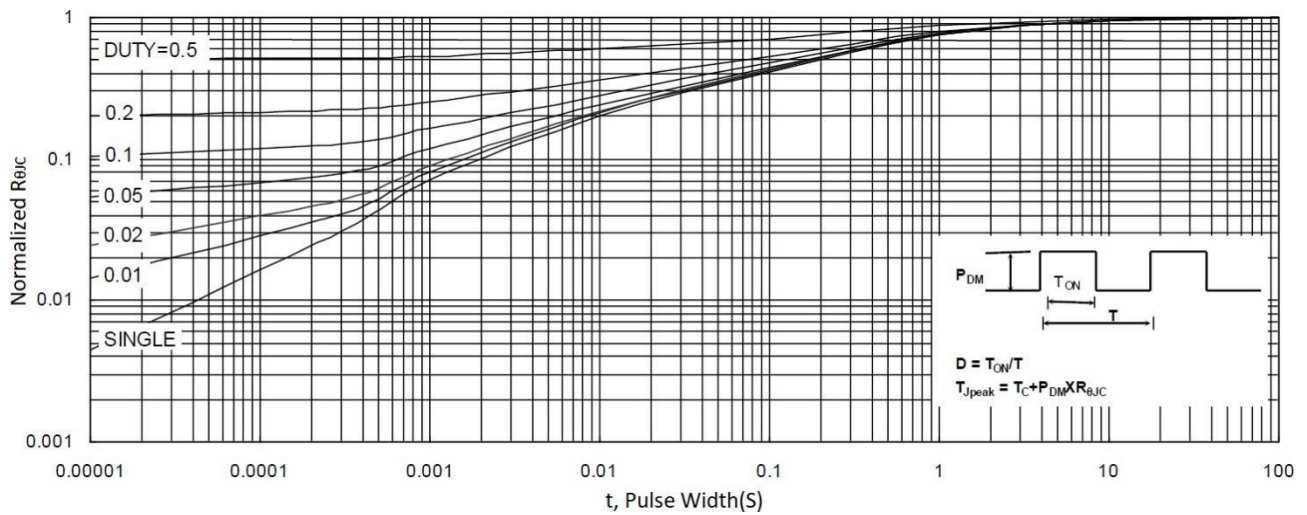
$R_{DS(on)}$  vs.  $I_D$



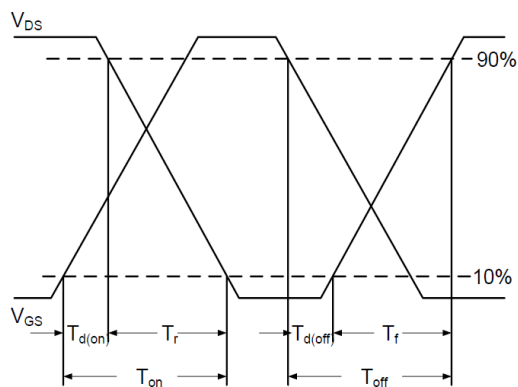
Capacitance Characteristics



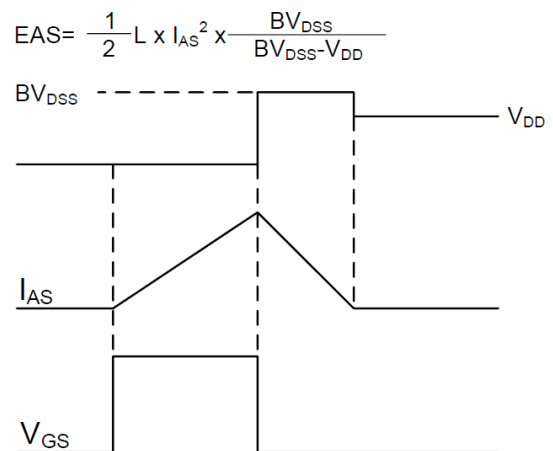
Safe Operating Area



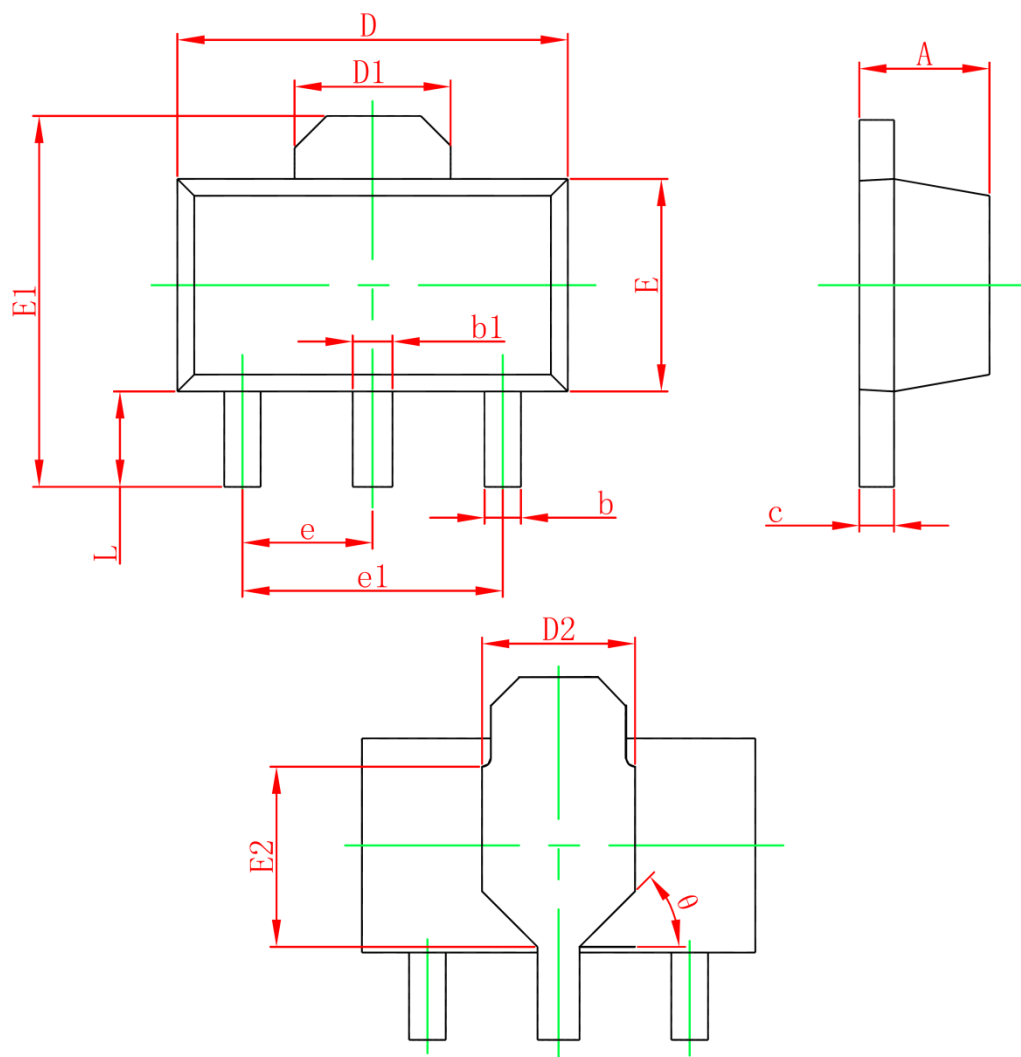
Normalized Maximum Transient Thermal Impedance



Switching Time Waveform



Unclamped Inductive Switching Waveform



| Symbol | Dimensions In Millimeters |       |
|--------|---------------------------|-------|
|        | Min.                      | Max.  |
| A      | 1.400                     | 1.600 |
| b      | 0.320                     | 0.520 |
| b1     | 0.400                     | 0.580 |
| c      | 0.350                     | 0.440 |
| D      | 4.400                     | 4.600 |
| D1     | 1.550 REF.                |       |
| D2     | 1.750 REF.                |       |
| E      | 2.300                     | 2.600 |
| E1     | 3.940                     | 4.250 |
| E2     | 1.900 REF.                |       |
| e      | 1.500 TYP.                |       |
| e1     | 3.000 TYP.                |       |
| L      | 0.900                     | 1.200 |
| θ      | 45°                       |       |