

## General Description

The MY15P03C 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.

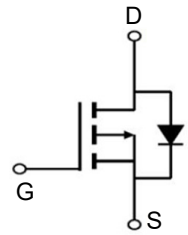
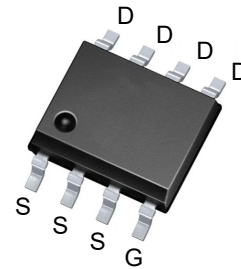


## Features

|                             |     |           |
|-----------------------------|-----|-----------|
| $V_{DSS}$                   | -30 | V         |
| $I_D$                       | -15 | A         |
| $P_D(T_A=25^\circ\text{C})$ | 2.5 | W         |
| $R_{DS(ON)}(at V_{GS}=10V)$ | <13 | $m\Omega$ |

## Application

- Battery protection
- Load switch
- Uninterruptible power supply



## Package Marking and Ordering Information

| Product ID | Pack  | Marking | Qty(PCS) |
|------------|-------|---------|----------|
| MY15P03C   | SOP-8 | 013DP   | 3000     |

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

| Symbol                     | Parameter   | Rating     | Units              |
|----------------------------|---|------------|--------------------|
| $V_{DS}$                   | Drain-Source Voltage                                      | -30        | V                  |
| $V_{GS}$                   | Gate-Source Voltage                                       | $\pm 20$   | V                  |
| $I_D@T_A=25^\circ\text{C}$ | Drain Current <sup>3</sup> , $V_{GS}$ @ 10V               | -15        | A                  |
| $I_D@T_A=70^\circ\text{C}$ | Drain Current <sup>3</sup> , $V_{GS}$ @ 10V               | -11        | A                  |
| $I_{DM}$                   | Pulsed Drain Current <sup>1</sup>                         | -40        | A                  |
| $P_D@T_A=25^\circ\text{C}$ | Total Power Dissipation                                   | 2.5        | W                  |
| $T_{STG}$                  | Storage Temperature Range                                 | -55 to 150 | $^\circ\text{C}$   |
| $T_J$                      | Operating Junction Temperature Range                      | -55 to 150 | $^\circ\text{C}$   |
| $R_{thj-a}$                | Maximum Thermal Resistance, Junction-ambient <sup>3</sup> | 50         | $^\circ\text{C/W}$ |

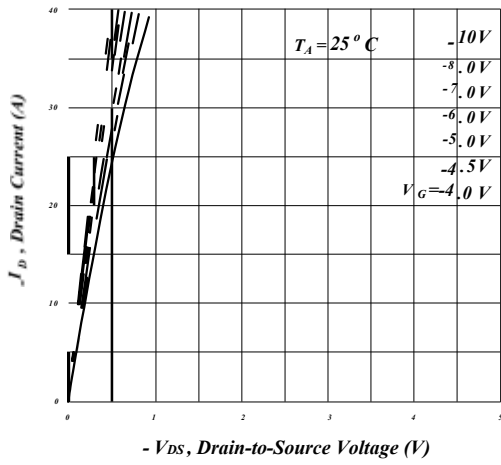
**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

| 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     |
| R <sub>DS(ON)</sub> | Static Drain-Source On-Resistance <sup>2</sup> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-10A                 | -    | -    | 13   | mΩ    |
|                     |  | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A                 | -    | -    | 20   | mΩ    |
| V <sub>GS(th)</sub> | Gate Threshold Voltage                         | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA   | -1   | -    | -3   | V     |
| g <sub>fs</sub>     | Forward Transconductance                       | V <sub>DS</sub> =-10V, I <sub>D</sub> =-10A                 | -    | 22   | -    | S     |
| I <sub>DSS</sub>    | Drain-Source Leakage Current                   | V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V                  | -    | -    | -10  | uA    |
| I <sub>GSS</sub>    | 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> =-6A   | -    | 28   | 45   | nC    |
| Q <sub>gs</sub>     | Gate-Source Charge                             | V <sub>DS</sub> =-15V                                       | -    | 7    | -    | nC    |
| Q <sub>gd</sub>     | Gate-Drain ("Miller") Charge                   | V <sub>GS</sub> =-4.5V                                      | -    | 11   | -    | nC    |
| t <sub>d(on)</sub>  | Turn-on Delay Time                             | V <sub>DS</sub> =-15V                                       | -    | 13   | -    | ns    |
| t <sub>r</sub>      | Rise Time                                      | I <sub>D</sub> =-1A   | -    | 10   | -    | ns    |
| t <sub>d(off)</sub> | Turn-off Delay Time                            | R <sub>G</sub> =3.3 Ω                                       | -    | 80   | -    | ns    |
| t <sub>f</sub>      | Fall Time                                      | V <sub>GS</sub> =-10V                                       | -    | 37   | -    | ns    |
| C <sub>iss</sub>    | Input Capacitance                              |   | -    | 2940 | 4700 | pF    |
| C <sub>oss</sub>    | Output Capacitance                             | V <sub>GS</sub> =0V V <sub>DS</sub> =-15V f=1.0MHz          | -    | 290  | -    | pF    |
| C <sub>rss</sub>    | Reverse Transfer Capacitance                   |   | -    | 210  | -    | pF    |
| R <sub>g</sub>      | Gate Resistance                                | f=1.0MHz  | -    | 6.2  | 12.4 | Ω     |
| V <sub>SD</sub>     | Forward On Voltage <sup>2</sup>                | I <sub>S</sub> =-2.1A, V <sub>GS</sub> =0V                  | -    | -    | -1.2 | V     |
| t <sub>rr</sub>     | Reverse Recovery Time                          | I <sub>S</sub> =-10A, V <sub>GS</sub> =0V,<br>dI/dt=100A/μs | -    | 19   | -    | ns    |
| Q <sub>rr</sub>     | Reverse Recovery Charge                        |   | -    | 6    | -    | nC    |

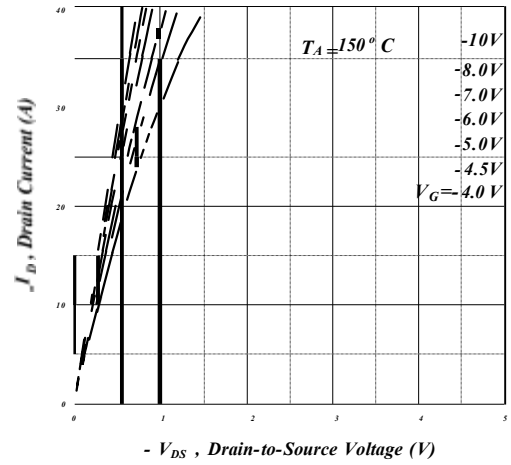
Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board, t ≤ 10s ; 125 °C/W when mounted on Min. copper pad.

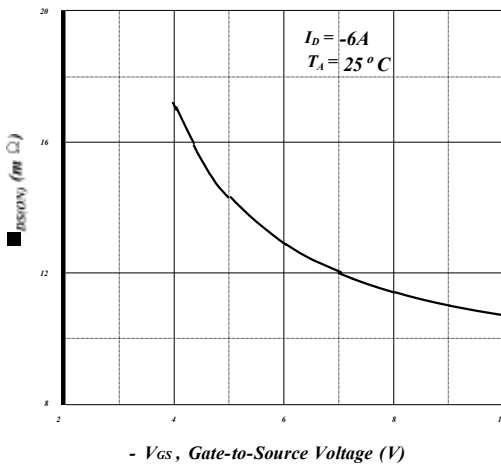
**Typical Electrical and Thermal Characteristics**



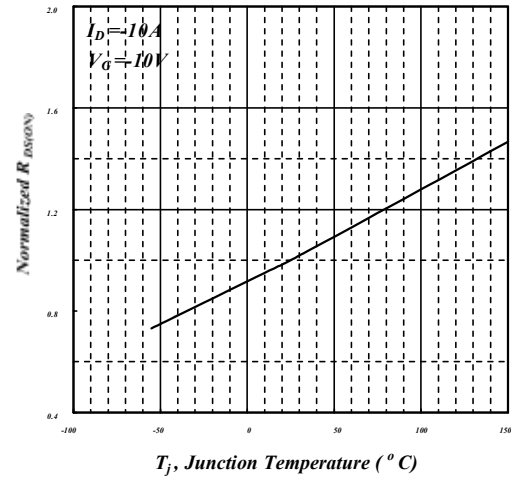
**Fig 1. Typical Output Characteristics**



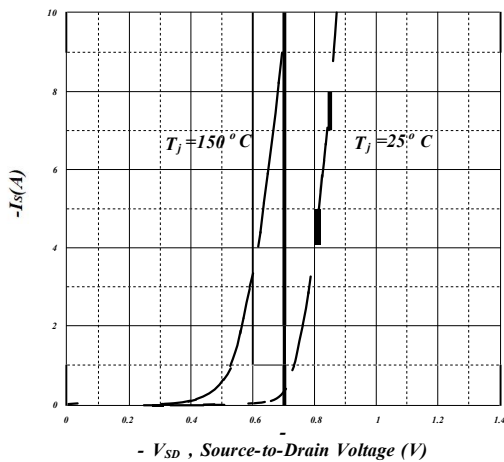
**Fig 2. Typical Output Characteristics**



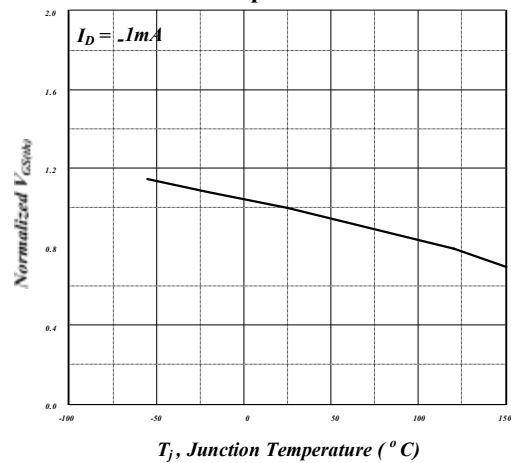
**Fig 3. On-Resistance v.s. Gate Voltage**



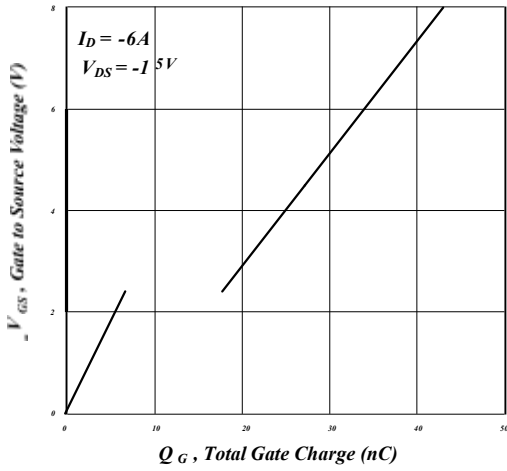
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



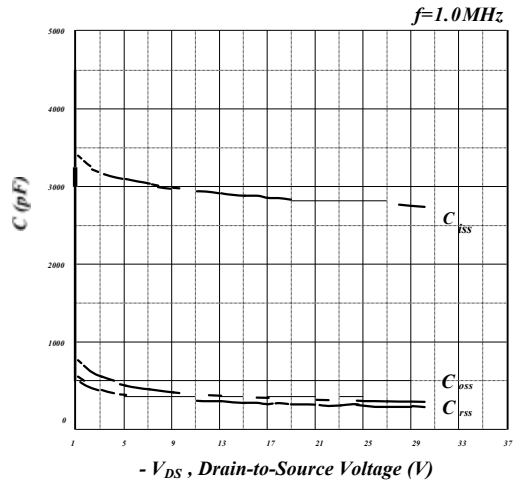
**Reverse Diode**



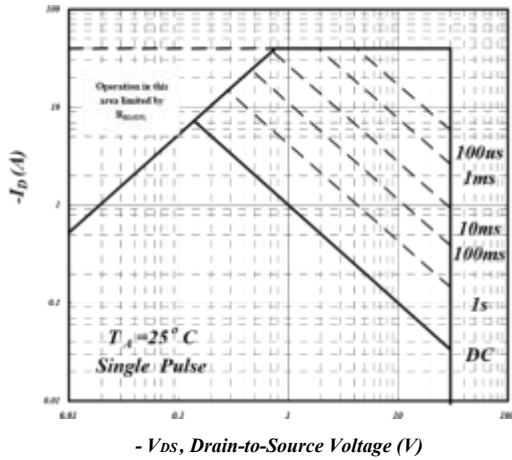
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



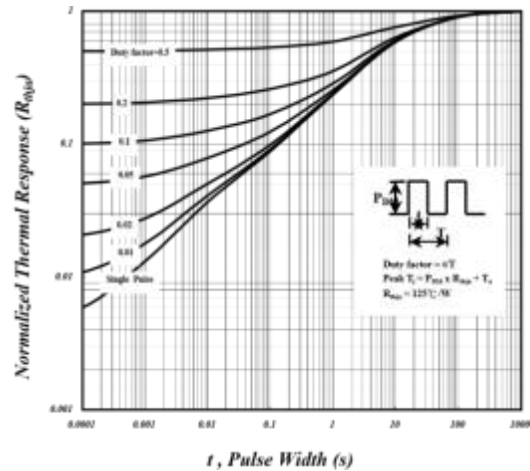
**Fig 7. Gate Charge Characteristics**



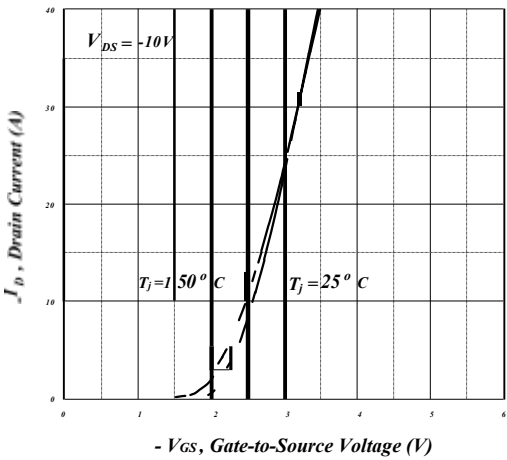
**Fig 8. Typical Capacitance Characteristics**



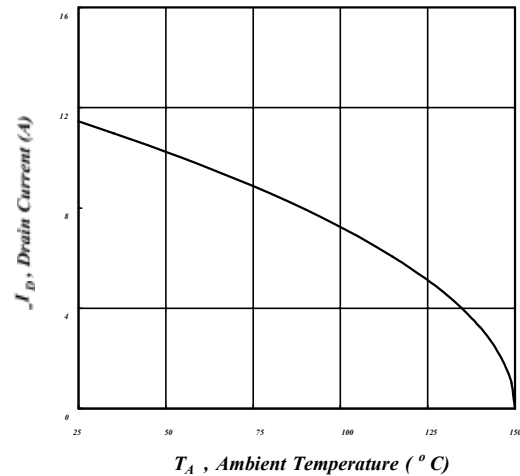
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Transfer Characteristics**



**Fig 12. Drain Current v.s. Ambient Temperature**

# MY15P03C

## -30V P-Channel Enhancement Mode MOSFET

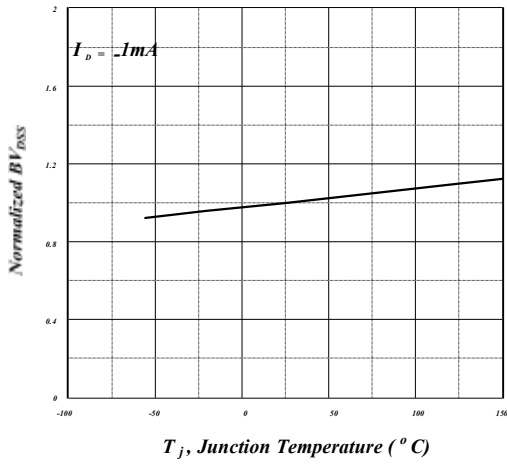


Fig 13. Normalized  $BV_{DSS}$  v.s. Junction Temperature

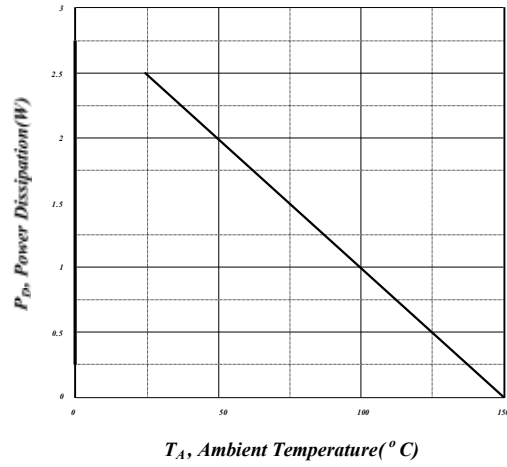


Fig 14. Total Power Dissipation

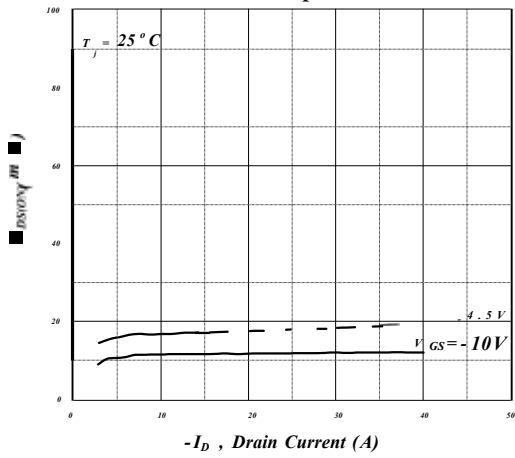
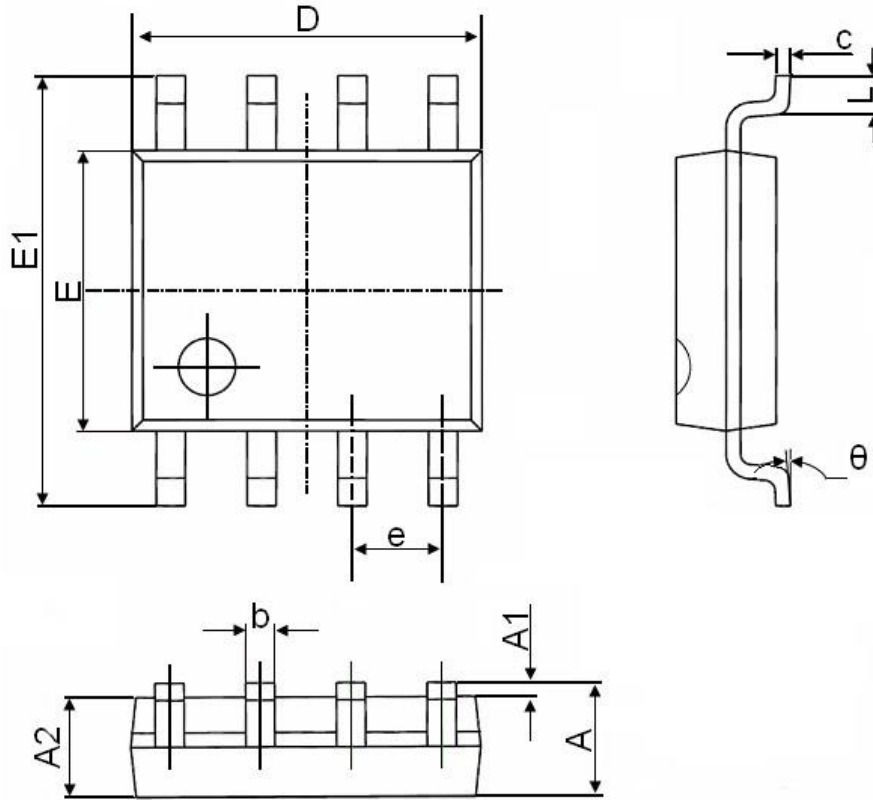


Fig 15. Typ. Drain-Source on State Resistance

**Package Mechanical Data-SOP-8**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.350                     | 1.750 | 0.053                | 0.069 |
| A1     | 0.100                     | 0.250 | 0.004                | 0.010 |
| A2     | 1.350                     | 1.550 | 0.053                | 0.061 |
| b      | 0.330                     | 0.510 | 0.013                | 0.020 |
| c      | 0.170                     | 0.250 | 0.006                | 0.010 |
| D      | 4.700                     | 5.100 | 0.185                | 0.200 |
| E      | 3.800                     | 4.000 | 0.150                | 0.157 |
| E1     | 5.800                     | 6.200 | 0.228                | 0.244 |
| e      | 1.270(BSC)                |       | 0.050(BSC)           |       |
| L      | 0.400                     | 1.270 | 0.016                | 0.050 |