

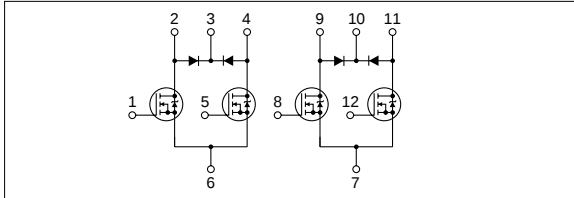
## Absolute maximum ratings

(Ta=25°C)

| Symbol                | Ratings                                                                                                                         | Unit |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------|------|
| V <sub>DSS</sub>      | 60                                                                                                                              | V    |
| V <sub>GSS</sub>      | ±10                                                                                                                             | V    |
| I <sub>D</sub>        | ±5                                                                                                                              | A    |
| I <sub>D(pulse)</sub> | ±10 (PW≤1ms)                                                                                                                    | A    |
| E <sub>AS</sub> *     | 2                                                                                                                               | mJ   |
| I <sub>F</sub>        | 5 (PW≤0.5ms, Du≤25%)                                                                                                            | A    |
| I <sub>FSM</sub>      | 10 (PW≤10ms, Single pulse)                                                                                                      | A    |
| V <sub>R</sub>        | 120                                                                                                                             | V    |
| P <sub>T</sub>        | 5 (Ta=25°C, with all circuits operating, without heatsink)<br>35 (Tc=25°C, with all circuits operating, with infinite heatsink) | W    |
| θ <sub>J-a</sub>      | 25 (Junction-Air, Ta=25°C, with all circuits operating)                                                                         | °C/W |
| θ <sub>J-c</sub>      | 3.57 (Junction-Case, Tc=25°C, with all circuits operating)                                                                      | °C/W |
| V <sub>ISO</sub>      | 1000 (Between fin and lead pin, AC)                                                                                             | Vrms |
| T <sub>ch</sub>       | 150                                                                                                                             | °C   |
| T <sub>stg</sub>      | -40 to +150                                                                                                                     | °C   |

\*: V<sub>DD</sub>=20V, L=1mH, I<sub>D</sub>=1.7A, unclamped, see Fig. E on page 15.

## Equivalent circuit diagram



## Electrical characteristics

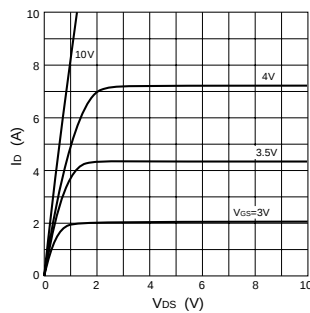
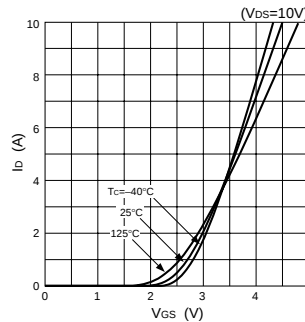
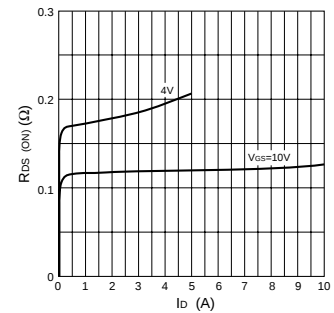
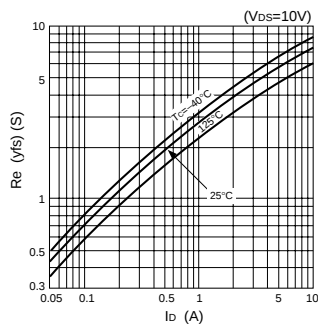
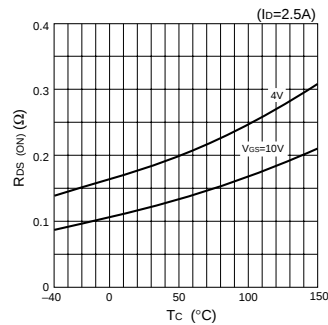
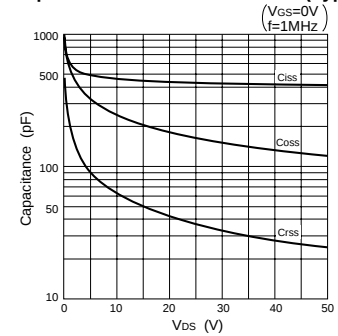
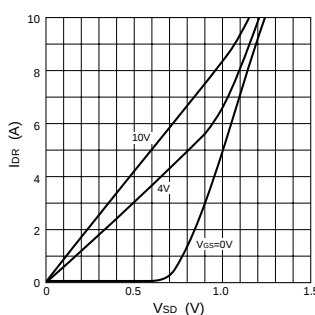
(Ta=25°C)

| Symbol               | Specification |      |      | Unit | Conditions                                                                            |
|----------------------|---------------|------|------|------|---------------------------------------------------------------------------------------|
|                      | min           | typ  | max  |      |                                                                                       |
| V <sub>(BR)DSS</sub> | 60            |      |      | V    | I <sub>D</sub> =250μA, V <sub>GS</sub> =0V                                            |
| I <sub>GSS</sub>     |               |      | ±500 | nA   | V <sub>GS</sub> =±10V                                                                 |
| I <sub>DSS</sub>     |               |      | 250  | μA   | V <sub>DS</sub> =60V, V <sub>GS</sub> =0V                                             |
| V <sub>TH</sub>      | 1.0           |      | 2.0  | V    | V <sub>DS</sub> =10V, I <sub>D</sub> =250μA                                           |
| R <sub>e(yfs)</sub>  | 3.1           | 4.6  |      | S    | V <sub>DS</sub> =10V, I <sub>D</sub> =5A                                              |
| R <sub>DS(ON)</sub>  |               | 0.17 | 0.22 | Ω    | V <sub>GS</sub> =10V, I <sub>D</sub> =2.5A                                            |
|                      |               | 0.25 | 0.30 | Ω    | V <sub>GS</sub> =4V, I <sub>D</sub> =2.5A                                             |
| C <sub>iss</sub>     |               | 400  |      | pF   | V <sub>DS</sub> =25V, f=1.0MHz, V <sub>GS</sub> =0V                                   |
| C <sub>oss</sub>     |               | 160  |      | pF   | V <sub>DS</sub> =25V, f=1.0MHz, V <sub>GS</sub> =0V                                   |
| ton                  |               | 80   |      | ns   | I <sub>D</sub> =5A, V <sub>DD</sub> ÷30V, V <sub>GS</sub> =5V, see Fig. 3 on page 16. |
| toff                 |               | 50   |      | ns   | I <sub>D</sub> =5A, V <sub>DD</sub> ÷30V, V <sub>GS</sub> =5V, see Fig. 3 on page 16. |
| V <sub>SD</sub>      |               | 1.1  | 1.5  | V    | I <sub>SD</sub> =5A, V <sub>GS</sub> =0V                                              |
| t <sub>rr</sub>      |               | 150  |      | ns   | I <sub>SD</sub> =±100mA                                                               |

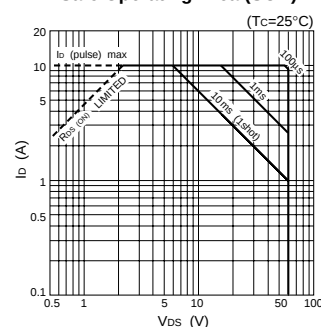
## Diode for flyback voltage absorption

| Symbol          | Specification |     |     | Unit | Conditions             |
|-----------------|---------------|-----|-----|------|------------------------|
|                 | min           | typ | max |      |                        |
| V <sub>R</sub>  | 120           |     |     | V    | I <sub>R</sub> =10μA   |
| V <sub>F</sub>  |               | 1.0 | 1.2 | V    | I <sub>F</sub> =1A     |
| I <sub>R</sub>  |               |     | 10  | μA   | V <sub>R</sub> =120V   |
| t <sub>rr</sub> |               | 100 |     | ns   | I <sub>F</sub> =±100mA |

## Characteristic curves

I<sub>D</sub>-V<sub>DS</sub> Characteristics (Typical)I<sub>D</sub>-V<sub>GS</sub> Characteristics (Typical)R<sub>DS(ON)</sub>-I<sub>D</sub> Characteristics (Typical)R<sub>e(yfs)</sub>-I<sub>D</sub> Characteristics (Typical)R<sub>DS(ON)</sub>-T<sub>C</sub> Characteristics (Typical)Capacitance-V<sub>DS</sub> Characteristics (Typical)I<sub>DR</sub>-V<sub>SD</sub> Characteristics (Typical)

Safe Operating Area (SOA)

P<sub>T</sub>-T<sub>a</sub> Characteristics