

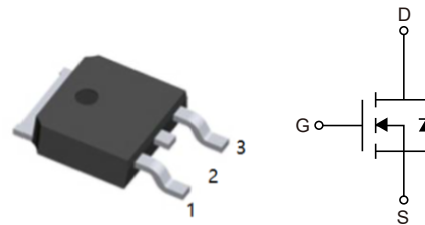
## 1.Features

- $V_{DS(V)}=100V$
- $I_D=90A$
- $R_{DS(ON)}<6.8m\Omega(V_{GS}=10V)$
- Excellent gate charge x  $R_{DS(ON)}$  product (FOM)
- Very low on-resistance  $R_{DS(ON)}$
- 175 °C operating temperature
- Ideal for high-frequency switching and synchronous rectification

## 2.Pinning information

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1   | G      | GATE        |
| 2   | D      | DRAIN       |
| 3   | S      | SOURCE      |

TO-252(DPAK)  
top view



## 3.Absolute Maximum Ratings $T_J=25^{\circ}C$

| Parameter                          | Symbol         | Conditions                 | Value      | Units       |
|------------------------------------|----------------|----------------------------|------------|-------------|
| Continuous drain current           | $I_D$          | $T_C=25^{\circ}C^{(2)}$    | 90         | A           |
|                                    |                | $T_C=100^{\circ}C$         | 72         | A           |
| Pulsed drain current <sup>2)</sup> | $I_{D,pulse}$  | $T_C=25^{\circ}C$          | 360        | A           |
| Avalanche current, single pulse    | $E_{AS}$       | $I_D=90A, R_{GS}=25\Omega$ | 130        | mJ          |
| Gate source voltage                | $V_{GS}$       |                            | $\pm 20$   | V           |
| Power dissipation                  | $P_{tot}$      | $T_C=25^{\circ}C$          | 150        | W           |
| Storage temperature                | $T_J, T_{STG}$ |                            | -55 to 175 | $^{\circ}C$ |
| IEC cimatic category; DIN IEC 68-1 |                |                            | 55/175/56  |             |



#### 4. Electrical Characteristic ( $T_J=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter                              | Symbol        | Conditions                                                 | Min | Typ  | Max  | Units      |
|----------------------------------------|---------------|------------------------------------------------------------|-----|------|------|------------|
| Thermal resistance, junction -case     | $R_{thJC}$    |                                                            |     |      | 1    | K/W        |
| Thermal resistance, junction - ambient | $R_{thJA}$    | minimal footprint                                          |     |      | 62   | K/W        |
|                                        |               | 6 cm <sup>2</sup> cooling area <sup>3)</sup>               |     |      | 40   | K/W        |
| Drain-source breakdown voltage         | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=1mA$                                       | 100 |      |      | V          |
| Gate threshold voltage                 | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=90\mu A$                               | 2   | 2.7  | 3.5  | V          |
| Zero gate voltage drain current        | $I_{DSS}$     | $V_{DS}=100V, V_{GS}=0V, T_J=25^{\circ}\text{C}$           |     | 0.1  | 1    | $\mu A$    |
|                                        |               | $V_{DS}=100V, V_{GS}=0V, T_J=125^{\circ}\text{C}$          |     | 10   | 100  | $\mu A$    |
| Gate-source leakage current            | $I_{GSS}$     | $V_{GS}=20V, V_{DS}=0V$                                    |     | 1    | 100  | nA         |
| Drain-source on-state resistance       | $R_{DS(ON)}$  | $V_{GS}=10V, I_D=90A$                                      |     | 5.7  | 6.8  | m $\Omega$ |
|                                        |               | $V_{GS}=6V, I_D=45A$                                       |     | 7.1  | 12.3 | m $\Omega$ |
| Gate resistance                        | $R_G$         |                                                            |     | 1.6  |      | $\Omega$   |
| Transconductance                       | $g_{FS}$      | $ V_{DS} >2 I_D R_{DS(ON)max}, I_D=90A$                    | 54  | 107  |      | S          |
| Input capacitance                      | $C_{iss}$     | $V_{GS}=0V, V_{DS}=50V, f=1MHz$                            |     | 3690 | 4910 | pF         |
| Output capacitance                     | $C_{oss}$     |                                                            |     | 646  |      | pF         |
| Reverse transfer capacitance           | $C_{rss}$     |                                                            |     | 25   |      | pF         |
| Turn-on delay time                     | $t_{D(on)}$   | $V_{DD}=50V, V_{GS}=10V$<br>$I_D=80A, R_{G,ext}=3.6\Omega$ |     | 19   |      | ns         |
| Rise time                              | $t_r$         |                                                            |     | 37   |      | ns         |
| Turn-off delay time                    | $t_{D(off)}$  |                                                            |     | 37   |      | ns         |
| Fall time                              | $t_f$         |                                                            |     | 9    |      | ns         |
| Gate to source charge                  | $Q_{gs}$      | $V_{DD}=15V, I_D=30A$<br>$V_{GS}=0 \text{ to } 4.5V$       |     | 18   |      | nC         |
| Gate to drain charge                   | $Q_{gd}$      |                                                            |     | 10   |      | nC         |
| Switching charge                       | $Q_{SW}$      |                                                            |     | 17   |      | nC         |
| Gate charge total                      | $Q_g$         |                                                            |     | 51   | 68   | nC         |
| Gate plateau voltage                   | $V_{plateau}$ |                                                            |     | 4.9  |      | V          |



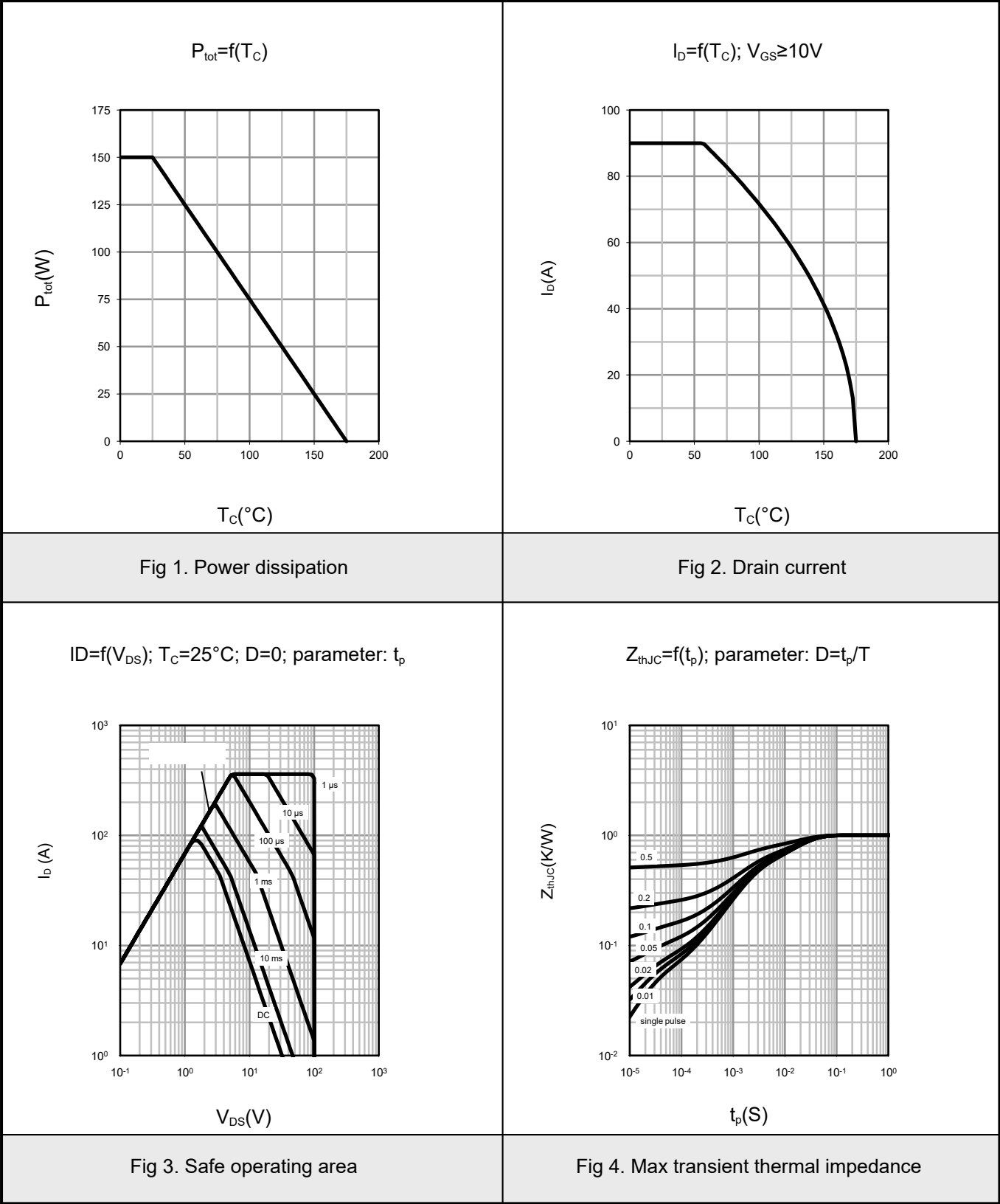
|                                  |               |                                        |  |     |     |    |
|----------------------------------|---------------|----------------------------------------|--|-----|-----|----|
| Output charge                    | $Q_{oss}$     | $V_{DD}=50V, V_{GS}=0V$                |  | 68  | 91  | nC |
| Diode continuous forward current | $I_S$         | $T_C=25^{\circ}C$                      |  |     | 90  | A  |
| Diode pulse current              | $I_{S,pulse}$ |                                        |  |     | 360 | A  |
| Diode forward voltage            | $V_{SD}$      | $V_{GS}=0V, I_F=90A, T_J=25^{\circ}C$  |  | 1   | 1.2 | V  |
| Reverse recovery time            | $t_{rr}$      | $V_R=15V, I_F=80A, di_F/dt=100A/\mu s$ |  | 73  |     | ns |
| Reverse recovery charge          | $Q_{rr}$      |                                        |  | 139 |     | nC |

Notes:

6) See figure 16 for gate charge parameter definition.

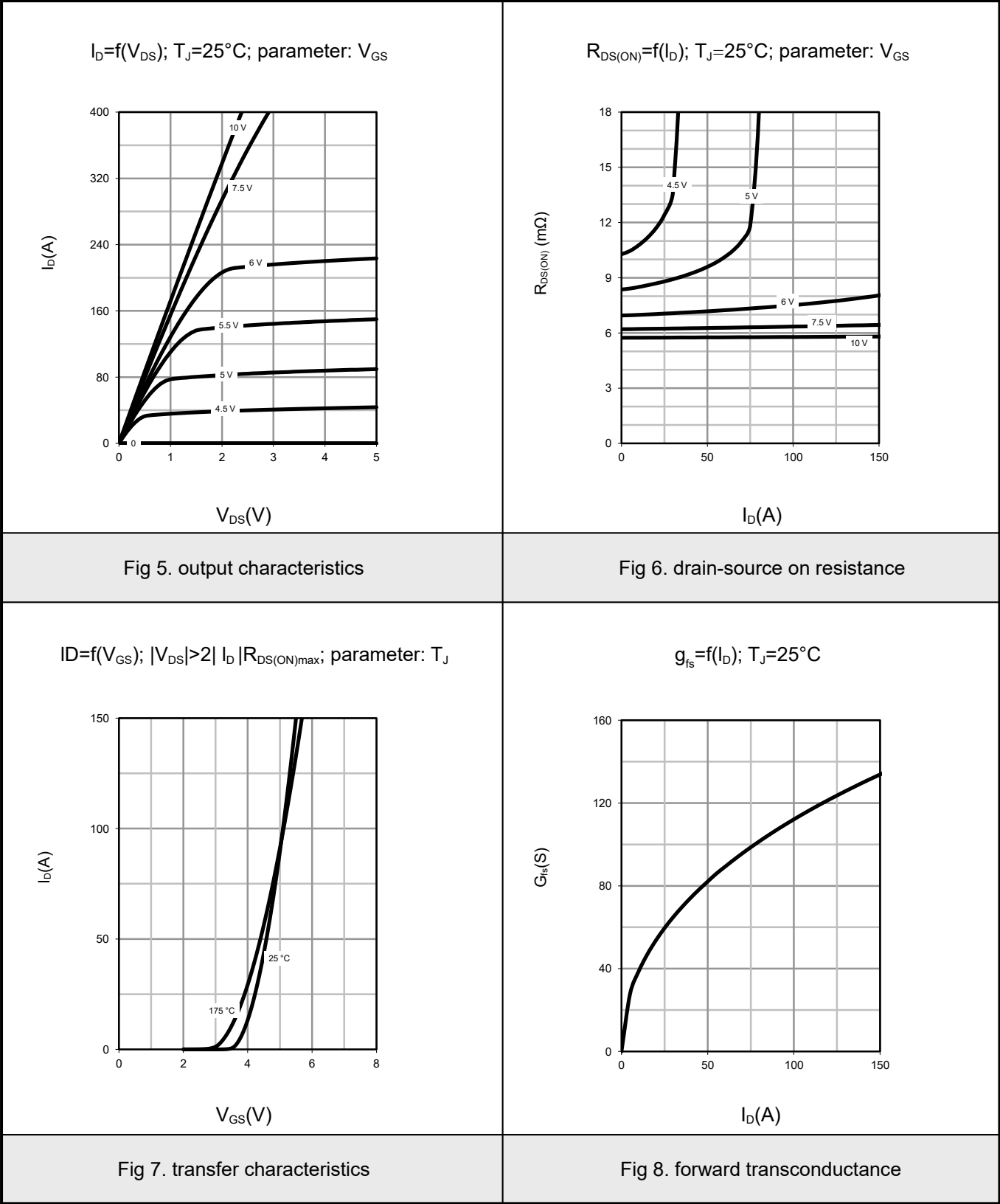


5.1Typical characteristic



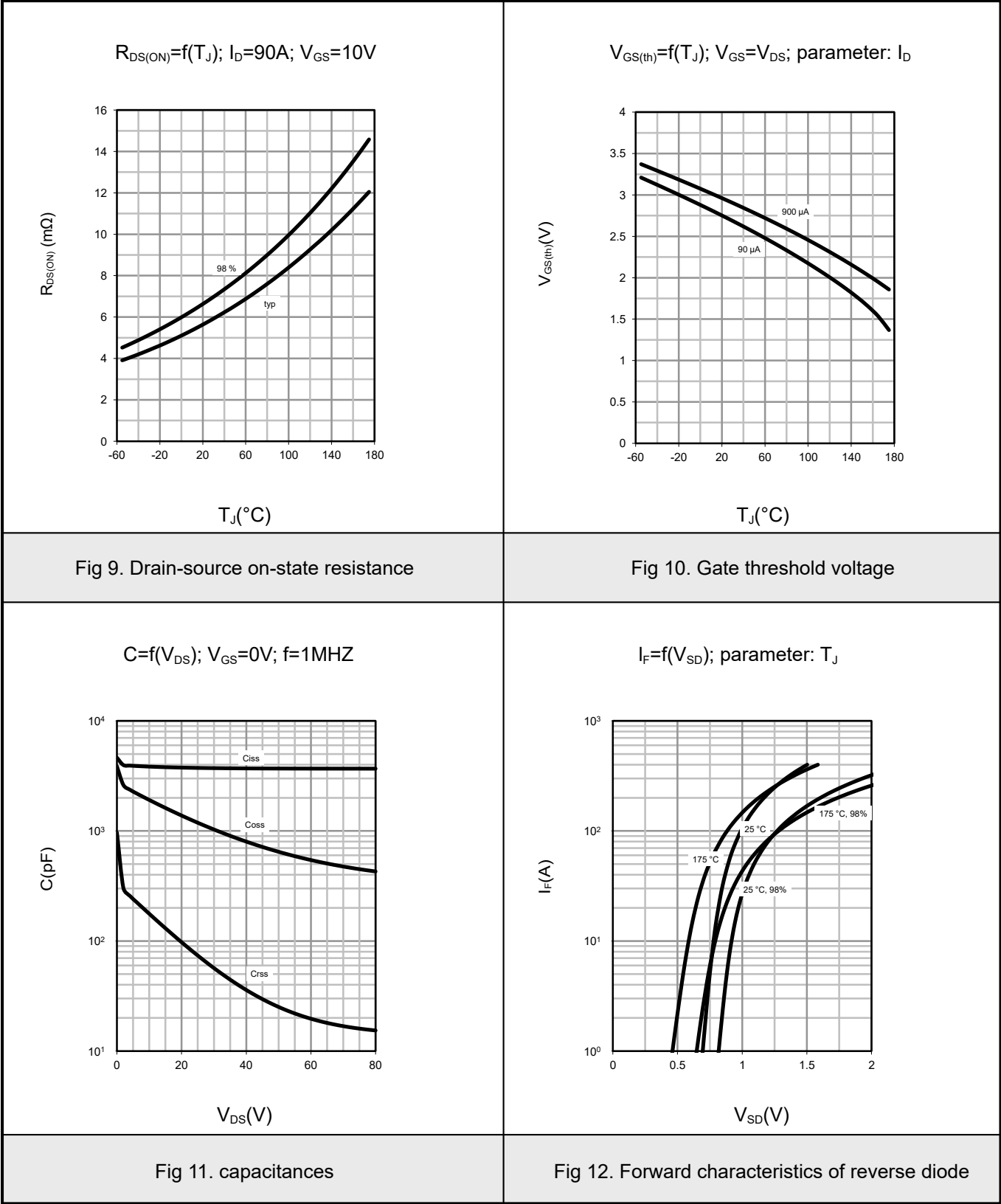


5.2Typical characteristic



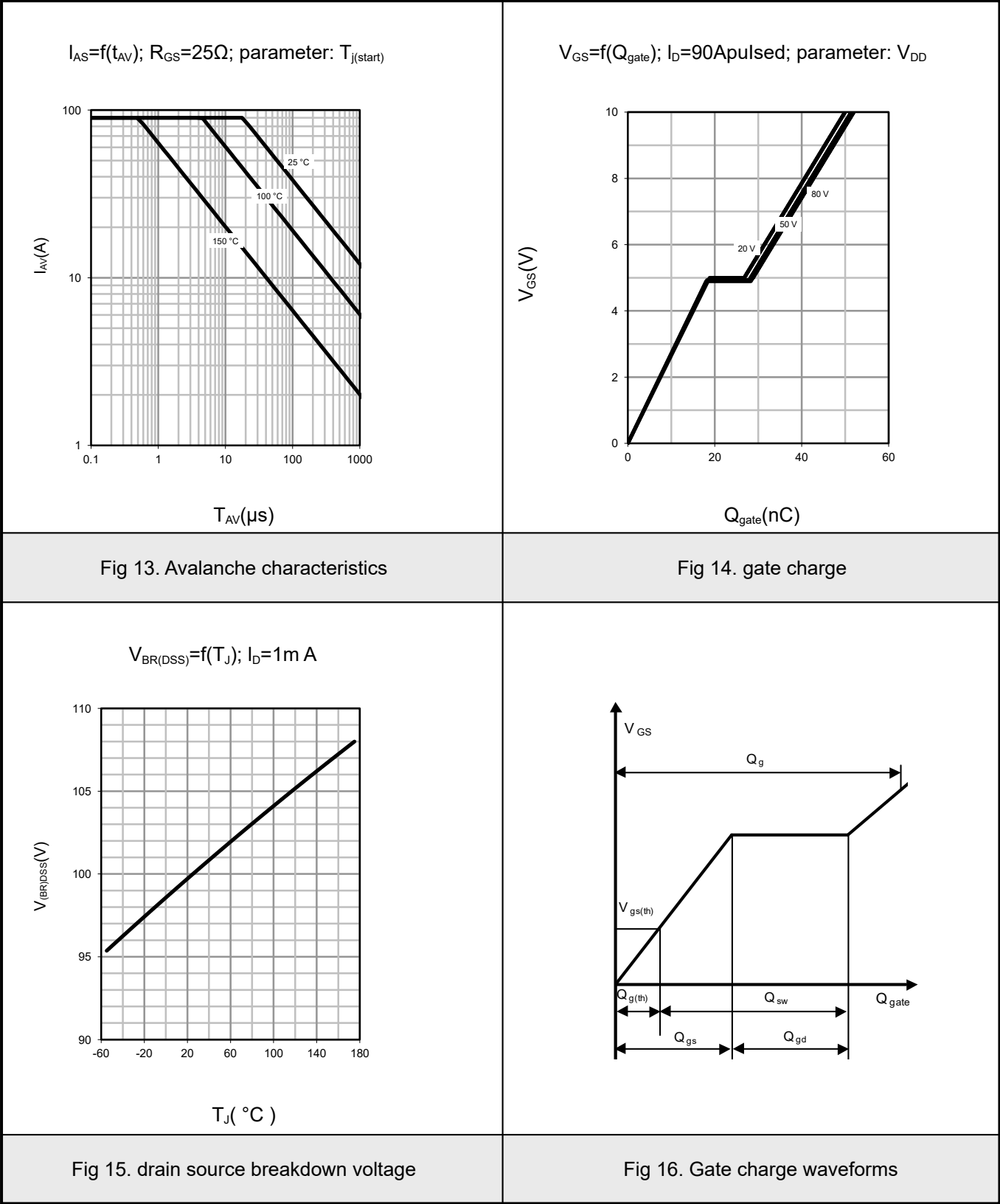


5.3Typical characteristic



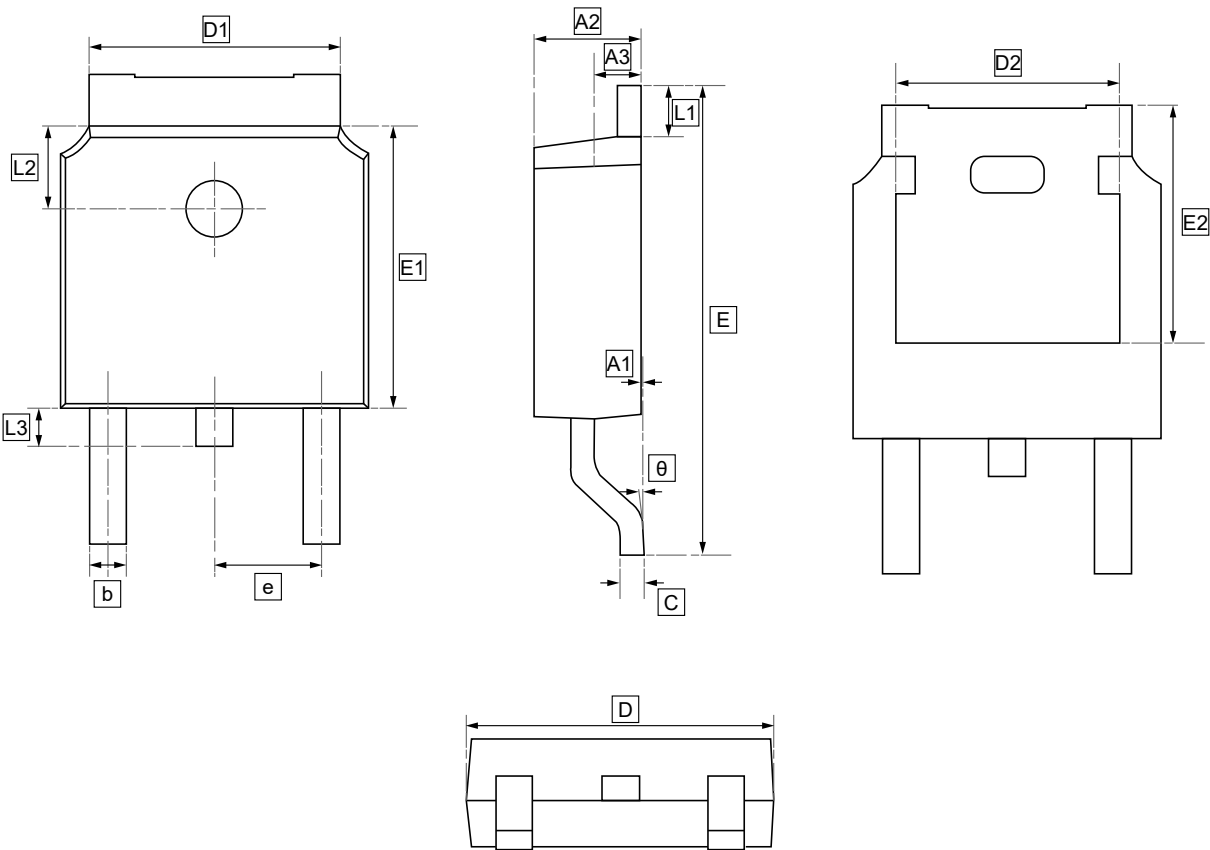


5.4Typical characteristic





6.TO-252 Package Outline Dimensions

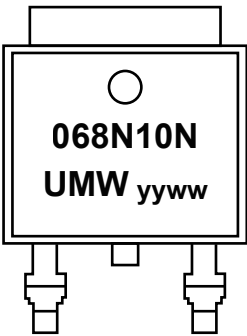


DIMENSIONS (mm are the original dimensions)

| Symbol | A1   | A2   | A3   | b    | c    | D    | D1   | D2   | E     | E1   | E2   | e            | L1   | L2   | L3   | θ    |
|--------|------|------|------|------|------|------|------|------|-------|------|------|--------------|------|------|------|------|
| Min    | 0.00 | 2.18 | 0.90 | 0.65 | 0.46 | 6.35 | 4.95 | 4.32 | 9.40  | 5.97 | 5.21 | 2.286<br>BSC | 0.89 | 1.70 | 0.60 | 0.00 |
| Max    | 0.13 | 2.39 | 1.10 | 0.85 | 0.61 | 6.73 | 5.46 | 4.90 | 10.41 | 6.22 | 5.38 |              | 1.27 | 1.90 | 1.00 | 8.00 |



7.Ordering information



yy: Year Code  
ww: Week Code

| Order Code       | Package | Base QTY | Delivery Mode |
|------------------|---------|----------|---------------|
| UMW IPD068N10N3G | TO-252  | 2500     | Tape and reel |



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