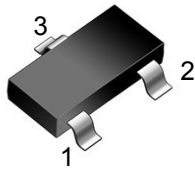
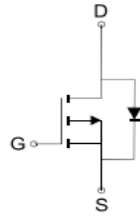


**SOT-23**



**MARKING:** 3407



P-Channel MOSFET

**Features**

Advanced trench process technology  
 High density cell design for Ultra Low On-Resistance  
 Halogen free and RoHS compliant

**Mechanical Data**

SOT-23 Small Outline Plastic Package  
 EpoxyUL:94V-0

**Summary of Packing Options**

| Package | Packing Description | Packing Quantity | Industry Standard |
|---------|---------------------|------------------|-------------------|
| SOT-23  | Tape/Reel,7" reel   | 3000             | EIA-481-1         |

**Maximum Ratings & Thermal Characteristics**

(Ratings at 25°C ambient temperature unless otherwise specified.)

| Symbol                            | Parameter   | Rating                         | Unit |
|-----------------------------------|---|--------------------------------|------|
| $V_{DS}$                          | Drain-Source Breakdown Voltage  | -30                            | V    |
| $V_{GS}$                          | Gate-Source Voltage   | ±20                            | V    |
| $T_J$                             | Maximum Junction Temperature  | 150                            | °C   |
| $T_{STG}$                         | Storage Temperature Range   | -50 to 155                     | °C   |
| $I_S$                             | Diode Continuous Forward Current                                      | $T_c=25^\circ\text{C}$<br>-4.1 | A    |
| <b>Mounted on Large Heat Sink</b> |   |                                |      |
| $I_{DM}$                          | Pulse Drain Current Tested  | $T_c=25^\circ\text{C}$<br>-15  | A    |
| $I_D$                             | Continuous Drain Current@GS=10V                                       | $T_c=25^\circ\text{C}$<br>-4.1 | A    |
| $P_D$                             | Maximum Power Dissipation   | $T_c=25^\circ\text{C}$<br>1.5  | W    |
| $R_{\theta JA}$                   | Thermal Resistance Junction-Ambient>(*1 in2 Pad of 2-oz Copper, Max.) | 82                             | °C/W |

**Electrical Characteristics**

(Ratings at 25°C ambient temperature unless otherwise specified).

| Symbol         | Parameter                        | Condition                      | Min  | Typ  | Max  | Unit |
|----------------|----------------------------------|--------------------------------|------|------|------|------|
| $BV_{(BR)DSS}$ | Drain-Source Breakdown Voltage   | $V_{GS}=0V, I_D=-250\mu A$     | -30  | --   | --   | V    |
| $I_{DSS}$      | Zero Gate Voltage Drain Current  | $V_{DS}=-30V, V_{GS}=0V$       | --   | --   | -1   | uA   |
| $I_{GSS}$      | Gate-Body Leakage Current        | $V_{GS}=\pm 20V, V_{DS}=0V$    | --   | --   | ±100 | nA   |
| $V_{GS(th)}$   | Gate Threshold Voltage           | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -1.0 | -1.5 | -2.5 | V    |
| $R_{DS(on)}$   | Drain-Source On-State Resistance | $V_{GS}=-10V, I_D=-4.1A$       | --   | 40   | 60   | mΩ   |
|                |                                  | $V_{GS}=-4.5V, I_D=-3.5A$      | --   | 55   | 90   | mΩ   |

## Electrical Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified).

| Symbol                                     | Parameter                    | Condition  | Min | Typ  | Max  | Unit |
|--|------------------------------|--|-----|------|------|------|
| <b>Dynamic Electrical Characteristics</b>  |                              |  |     |      |      |      |
| $C_{ISS}$                                  | Input Capacitance            | $V_{DS}=-15V, V_{GS}=0V, f=1MHz$                 | --  | 570  | --   | pF   |
| $C_{OSS}$                                  | Output Capacitance           |  | --  | 80   | --   | pF   |
| $C_{RSS}$                                  | Reverse Transfer Capacitance |  | --  | 70   | --   | pF   |
| <b>Switching Characteristics</b>           |                              |  |     |      |      |      |
| $Q_g$                                      | Total Gate Charge            | $V_{DS}=-15V, I_D=-4.2A, V_{GS}=-10V$            | --  | 11.5 | --   | nC   |
| $Q_{gs}$                                   | Gate Source Charge           |  | --  | 2.3  | --   | nC   |
| $Q_{gd}$                                   | Gate Drain Charge            |  | --  | 2.1  | --   | nC   |
| $t_{d(on)}$                                | Turn-on Delay Time           | $V_{DS}=-15V, I_D=-1A, V_{GS}=-10V, R_G=3\Omega$ | --  | 3.8  | --   | nS   |
| $t_r$                                      | Turn-on Rise Time            |  | --  | 17.5 | --   | nS   |
| $t_{d(off)}$                               | Turn-Off Delay Time          |  | --  | 18   | --   | nS   |
| $t_f$                                      | Turn-Off Fall Time           |  | --  | 21.8 | --   | nS   |
| <b>Source- Drain Diode Characteristics</b> |                              |  |     |      |      |      |
| $V_{SD}$                                   | Forward on voltage           | $T_j=25^\circ C, I_s=-4A,$                       | --  | --   | -1.2 | V    |

## Ratings and Characteristic Curves

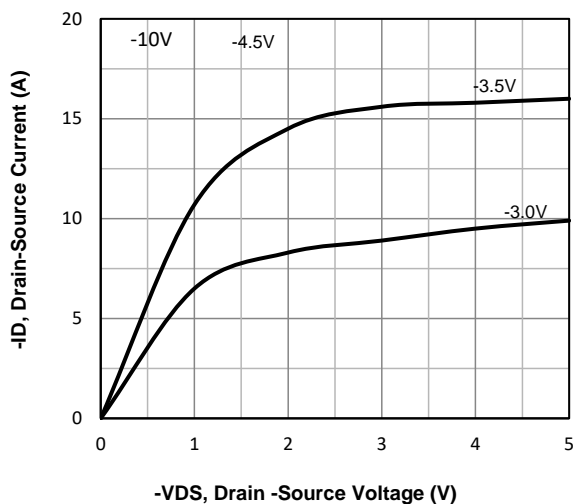


Fig1. Typical Output Characteristics

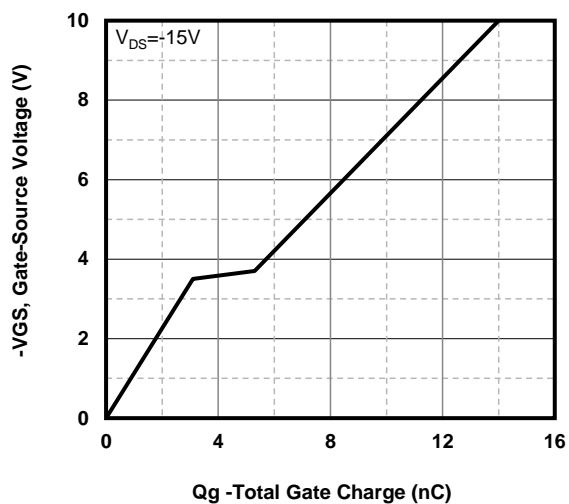
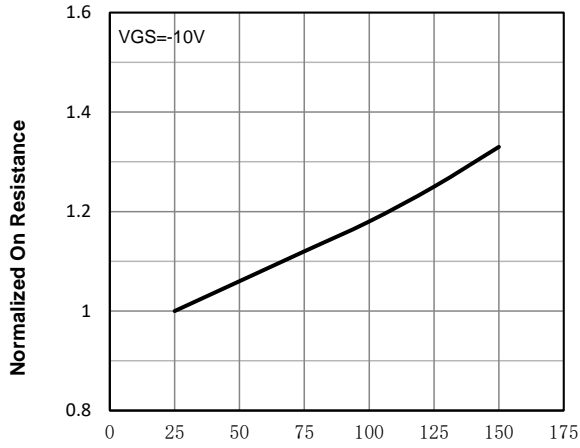
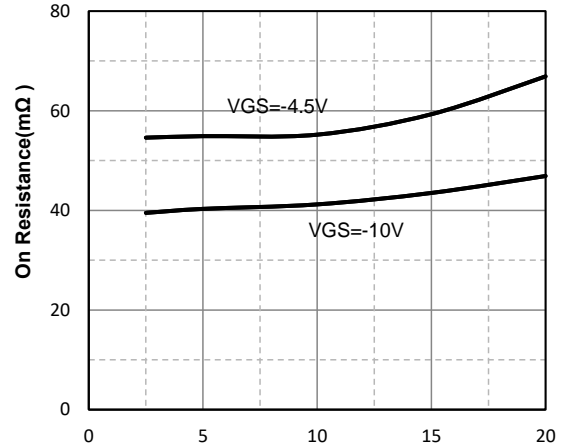


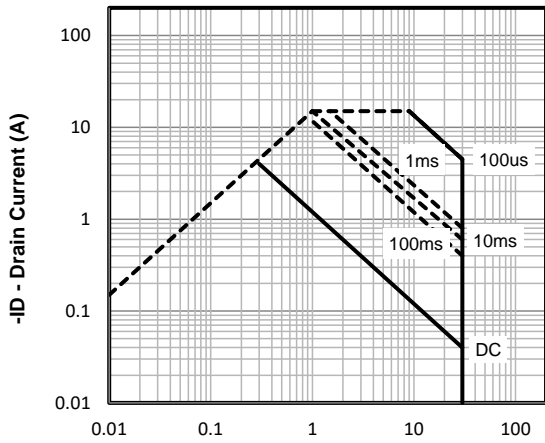
Fig2. Typical Gate Charge Vs. Gate-Source Voltage



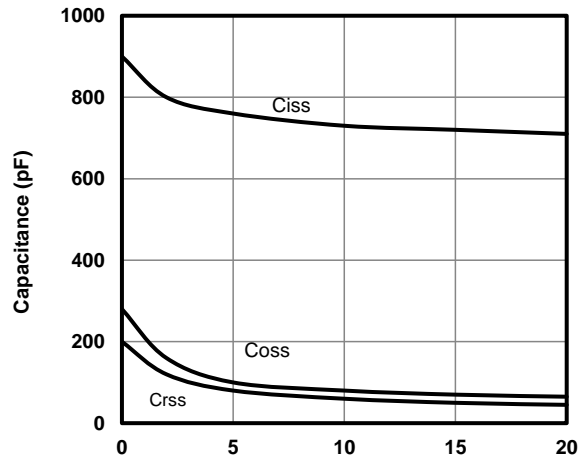
T<sub>j</sub> - Junction Temperature (°C)  
Fig3. Normalized On-Resistance Vs.



ID, Drain-Source Current (A)  
Fig4. On-Resistance Vs. Drain-Source Current

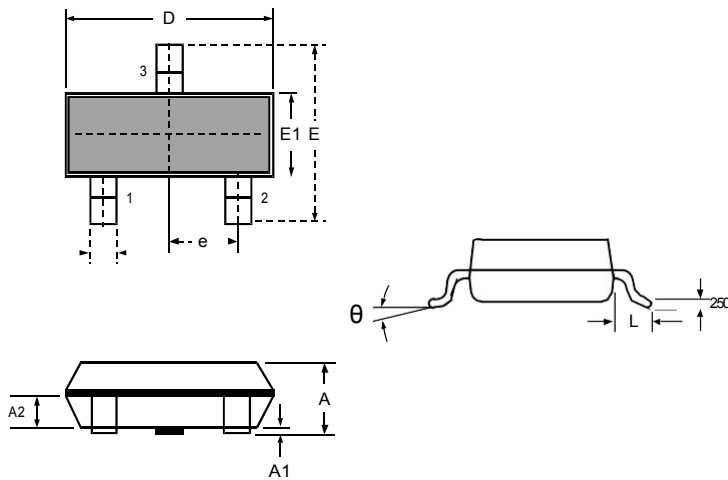


-VDS, Drain -Source Voltage (V)  
Fig5. Maximum Safe Operating Area



-VDS, Drain-Source Voltage (V)  
Fig6 Typical Capacitance Vs. Drain-Source

### Package Outline Dimensions: SOT-23



#### DIMENSIONS

| SYMBOL | MILLIMETER |       | INCHES    |       |
|--------|------------|-------|-----------|-------|
|        | MIN        | MAX   | MIN       | MAX   |
| A      | 0.900      | 1.150 | 0.035     | 0.045 |
| A1     | 0.000      | 0.100 | 0.000     | 0.004 |
| A2     | 0.900      | 1.050 | 0.035     | 0.041 |
| D      | 2.800      | 3.000 | 0.110     | 0.118 |
| b      | 0.300      | 0.500 | 0.012     | 0.020 |
| E      | 2.250      | 2.550 | 0.089     | 0.100 |
| E1     | 1.200      | 1.400 | 0.047     | 0.055 |
| e      | 0.950 BSC  |       | 0.037 BSC |       |
| L      | 0.300      | 0.500 | 0.012     | 0.020 |
| θ      | 0          | 8°    | 0         | 8°    |