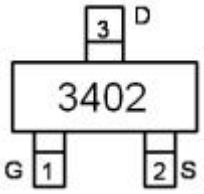
# SSF3402

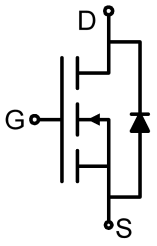
## Main Product Characteristics:

| | |
|---|---|
| $V_{DSS}$ | 30V |
| $R_{DS}$(on) | 26mΩ(typ.) |
| $I_D$ | 5A |


SOT-23




Marking and Pin Assignments




Schematic Diagram

## Features and Benefits

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150℃ operating temperature

## Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

## Absolute Max Rating:

| Symbol | Parameter | Max. | Units |
|---|---|---|---|
| $I_D$ @ $T_C$ = 25°C | Continuous Drain Current, $V_{GS}$ @ 10V① | 5 | A |
| $I_{DM}$ | Pulsed Drain Current② | 20 | |
| $P_D$ @$T_C$ = 25°C | Power Dissipation③ | 1.38 | W |
| $V_{DS}$ | Drain-Source Voltage | 30 | V |
| $V_{GS}$ | Gate-to-Source Voltage | ± 20 | V |
| $T_J$ $T_{STG}$ | Operating Junction and Storage Temperature Range | -55 to +150 | °C |

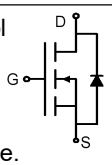
## Thermal Resistance

| Symbol | Characterizes | Typ. | Max. | Units |
|---|---|---|---|---|
| $R_{\theta JA}$ | Junction-to-Ambient④ | — | 90 | ℃/W |

## Electrical Characterizes @$T_A$=25℃unless otherwise specified

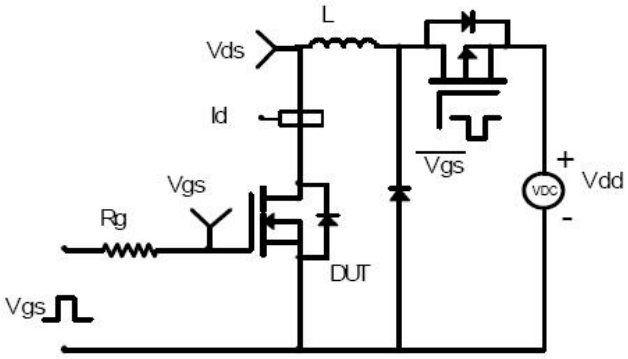
| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-to-Source breakdown voltage | 30 | — | — | V | $V_{GS}$ = 0V, $I_D$ = 250μA |
| $R_{DS(on)}$ | Static Drain-to-Source on-resistance | — | 45 | 48 | mΩ | $V_{GS}$=4.5V, $I_D$=4A |
| | | — | 26 | 30 | mΩ | $V_{GS}$=10V, $I_D$=5A |
| $V_{GS(th)}$ | Gate threshold voltage | 1 | — | 2.5 | V | $V_{DS}$ = $V_{GS}$, $I_D$ =250μA |
| $I_{DSS}$ | Drain-to-Source leakage current | — | — | 1 | μA | $V_{DS}$=30V,$V_{GS}$=0V |
| $I_{GSS}$ | Gate-Body Leakage Current | — | — | ±100 | nA | $V_{GS}$=±20V,$V_{DS}$=0V |
| $Q_g$ | Total gate charge | — | 8.5 | — | nC | $V_{DS}$=16V,$I_D$=5A,$V_{GS}$=4.5V |
| $Q_{gs}$ | Gate-to-Source charge | — | 1.5 | — | | |
| $Q_{gd}$ | Gate-to-Drain("Miller") charge | — | 3.2 | — | | |
| $t_{d(on)}$ | Turn-on delay time | — | 6 | — | ns | $V_{DS}$=15V, $I_D$=5A, $V_{GS}$=10V, $R_{GEN}$=3.3Ω,$R_L$=3Ω |
| $t_r$ | Rise time | — | 20 | — | | |
| $t_{d(off)}$ | Turn-Off delay time | — | 20 | — | | |
| $t_f$ | Fall time | — | 3 | — | | |
| $C_{iss}$ | Input capacitance | — | 660 | — | pF | $V_{DS}$=25V,$V_{GS}$=0V, f=1.0MHz |
| $C_{oss}$ | Output capacitance | — | 90 | — | | |
| $C_{rss}$ | Reverse transfer capacitance | — | 70 | — | | |

## Source-Drain Ratings and Characteristics

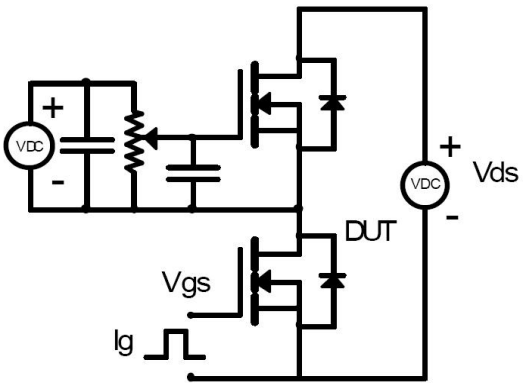
| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current (Body Diode) | — | — | 5 | A | MOSFET symbol showing the integral reverse p-n junction diode.   |
| $I_{SM}$ | Pulsed Source Current (Body Diode) | — | — | 20 | A | |
| $V_{SD}$ | Diode Forward Voltage | — | — | 1.2 | V | $V_{GS}$=0V,$I_S$=1.2A |

## Test Circuits and Waveforms

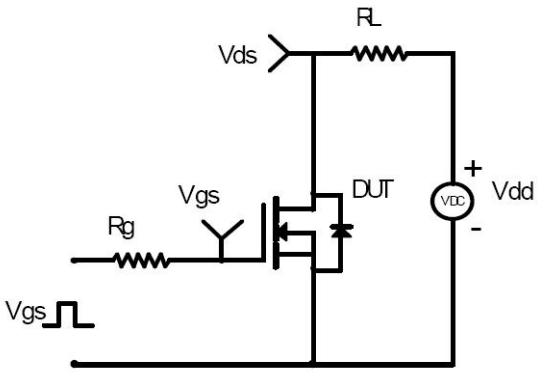
**EAS Test Circuit:**



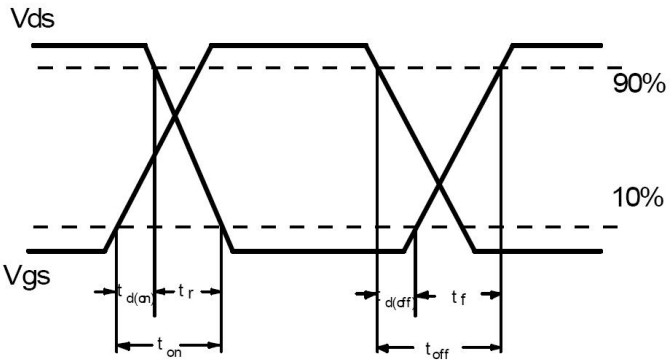

**Gate Charge Test Circuit:**




**Switching Time Test Circuit:**




**Switching Waveforms:**




## Notes:

①Calculated continuous current based on maximum allowable junction temperature.

②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

④The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25 ℃

## Typical Electrical and Thermal Characteristics

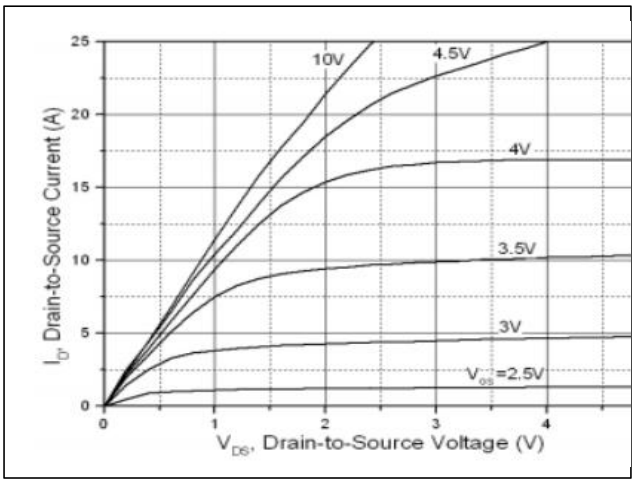



Figure1. Typical Output Characteristics

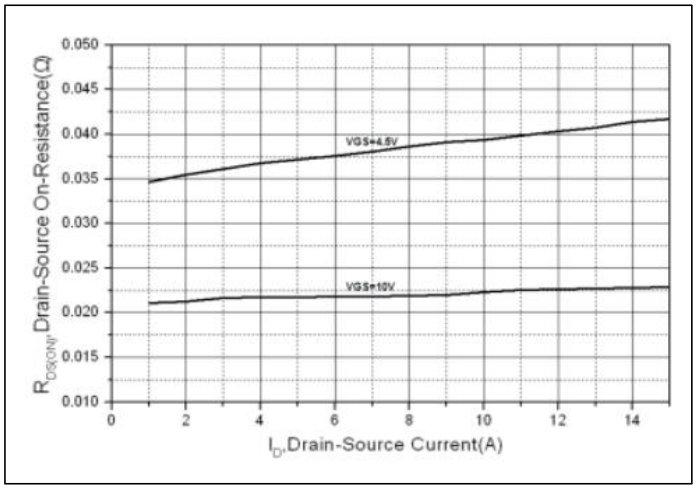



Figure2.Typical On-Resistance vs. Drain Current and Gate Voltage

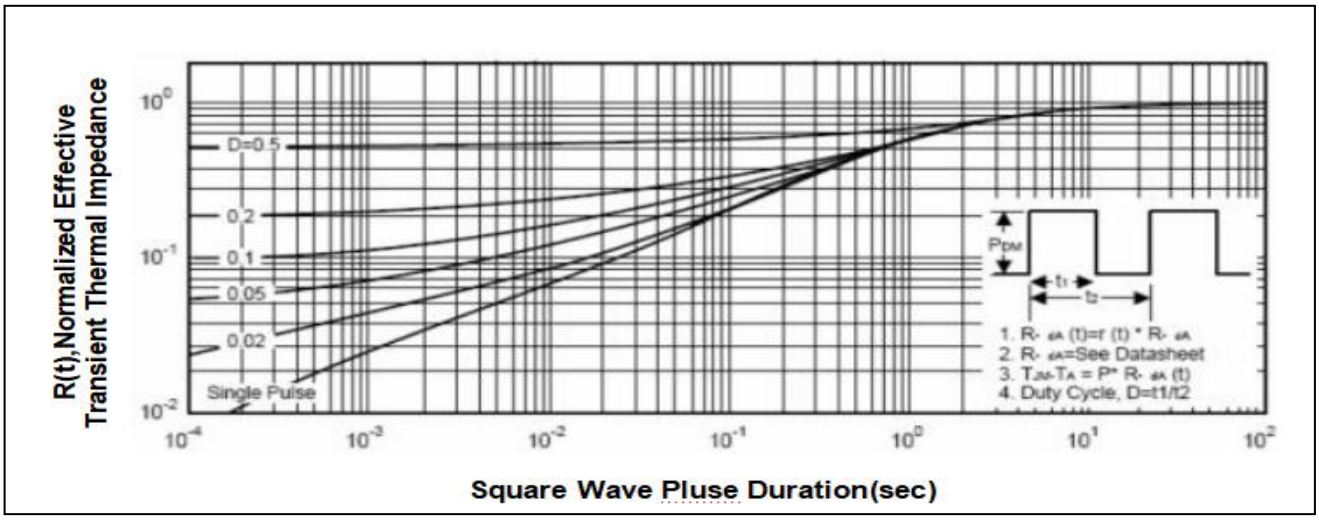
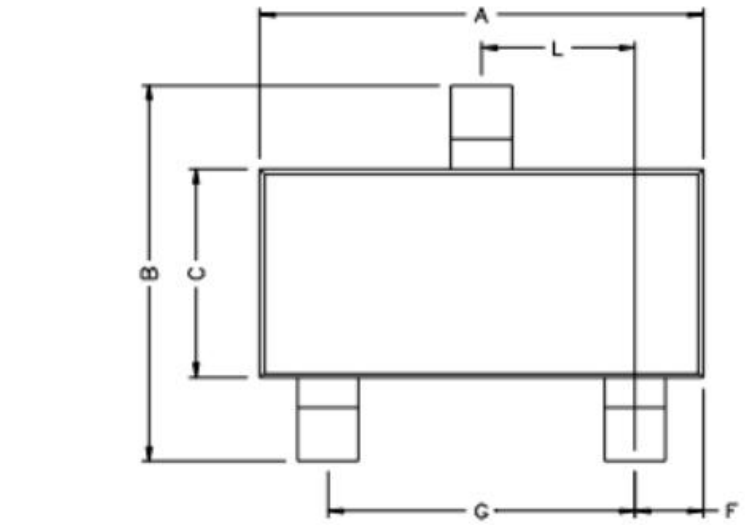
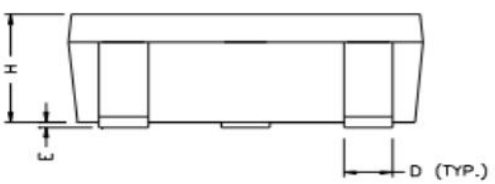


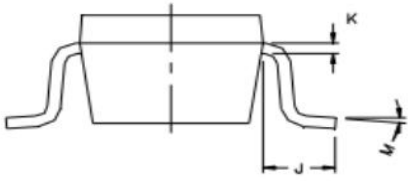

Figure3.Normalized Maximum Transient Thermal Impedance

## Mechanical Data：

**SOT-23 Package Outline(Unit:mm)**




| REF. | Millimeter | | REF. | Millimete | |
|---|---|---|---|---|---|
| | Min. | Max. | | Min. | Max. |
| A | 2.80 | 3.00 | G | 1.80 | 2.00 |
| B | 2.30 | 2.50 | H | 0.90 | 1.1 |
| C | 1.20 | 1.40 | K | 0.10 | 0.20 |
| D | 0.30 | 0.50 | J | 0.35 | 0.70 |
| E | 0 | 0.10 | L | 0.92 | 0.98 |
| F | 0.45 | 0.55 | M | 0° | 10° |

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