

General Description

The Sanrise SRC65R032FBS is a high voltage power MOSFET, fabricated using advanced super junction technology. The resulting device has extremely low on resistance, low gate charge and fast switching time, making it especially suitable for applications which require superior power density and outstanding efficiency.

The SRC65R032FBS break down voltage is 650V and it has a high rugged avalanche characteristics.

The SRC65R032FBS is available in TO-247 package.

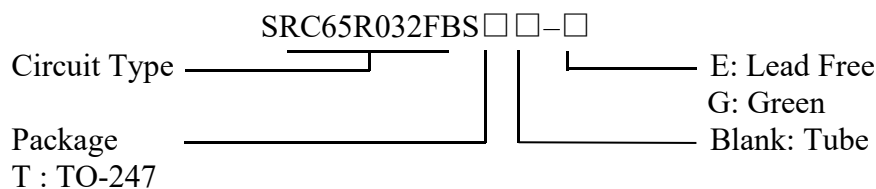
Features

- Ultra Low $R_{DS(ON)} = 32m\Omega @ V_{GS} = 10V$.
- $V_{ds@Tjmax} = 700v$.
- Ultra Low Gate Charge, $Q_g = 152nC$ typ.
- Fast switching capability
- Robust design with better EAS performance
- Optimized switching process
- Non-automotive Qualified
- Ultra-fast body diode

Application

- EV Charger
- High Performance PS

Ordering Information



Symbol

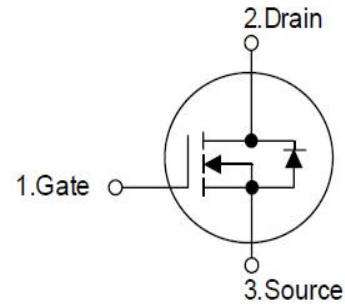


Figure 1 Symbol of SRC65R032FBS

Package Type

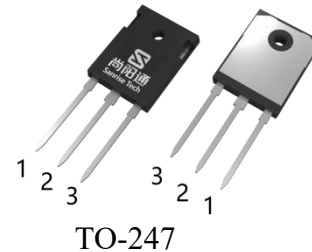


Figure 2 Package Type of SRC65R032FBS

| Package | Part Number | Marking ID | Packing Type |
|---------|-----------------|----------------|--------------|
| TO-247 | SRC65R032FBST-G | SRC65R032FBSTG | Tube |

Absolute Maximum Ratings^{Note 1}

| Parameter | | Symbol | Rating | Unit |
|--|-------------------------|---------------|------------|------|
| Drain-Source Voltage | | V_{DSS} | 650 | V |
| Gate-Source Voltage (static) | | V_{GSS} | ±20 | V |
| Gate-Source Voltage (dynamic), AC ($f > 1$ Hz) | | V_{GSS} | ±30 | V |
| Power Dissipation($T_C=25^\circ\text{C}$, TO-247) | | P_{tot} | 500 | W |
| Continuous Drain Current | $T_C=25^\circ\text{C}$ | I_D | 82 | A |
| | $T_C=100^\circ\text{C}$ | | 52 | |
| | $T_C=125^\circ\text{C}$ | | 37 | |
| Pulsed Drain Current (Note 2) | | I_{DM} | 246 | A |
| Avalanche Energy, Single Pulse (Note 3) | | E_{AS} | 303 | mJ |
| Avalanche Energy, Single Pulse (Note 4) | | E_{AS} | 4860 | mJ |
| Avalanche Energy, Repetitive (Note 2) | | E_{AR} | 0.3 | mJ |
| Avalanche Current, Repetitive (Note 2) | | I_{AR} | 3 | A |
| Continuous Diode Forward Current | | I_S | 82 | A |
| Diode Pulse Current | | $I_{S,PULSE}$ | 246 | A |
| MOSFET dv/dt Ruggedness, $V_{DS} \leq 480\text{V}$ | | dv/dt | 120 | V/ns |
| Reverse Diode dv/dt, $V_{DS} \leq 480\text{V}$, $I_{SD} \leq I_D$ | | dv/dt | 50 | V/ns |
| Operating Junction Temperature | | T_J | 150 | °C |
| Storage Temperature | | T_{STG} | -55 to 150 | °C |
| Lead Temperature (Soldering, 10 sec) | | T_{LEAD} | 260 | °C |

Note:

1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. $I_{AS}=3.0\text{A}$, $V_{DD}=60\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$. Finish goods test condition.
4. $I_{AS}=12\text{A}$, $V_{DD}=60\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$. Typical Eas.

Thermal Resistance

| Parameter (TO247-package) | Symbol | Min | Typ | Max | Unit |
|---|------------|-----|-----|------|------|
| Thermal Resistance, Junction-to-Case | R_{thJC} | - | | 0.25 | °C/W |
| Thermal Resistance, Junction-to-Ambient | R_{thJA} | - | | 60 | |

Electrical Characteristics

$T_j = 25^\circ\text{C}$, unless otherwise specified.

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit | |
|---|---------------|---|-----|-----|------|---------|---------|
| Statistic Characteristics | | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 650 | | | V | |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=650V, V_{GS}=0V$ | | | 20 | μA | |
| Gate-Body Leakage Current | Forward | $I_{GSSF}, V_{GS}=20V, V_{DS}=0V$ | | | 100 | nA | |
| | Reverse | $I_{GSSR}, V_{GS}=-20V, V_{DS}=0V$ | | | -100 | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 3.5 | 4.7 | 5.5 | V | |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=34A$ | | 26 | 32 | mΩ | |
| Gate Resistance | R_G | f=1MHz, Open Drain | | 1.4 | | Ω | |
| Dynamic Characteristics | | | | | | | |
| Input Capacitance | C_{ISS} | $V_{DS}=400V, V_{GS}=0V,$ f=100KHz | | 6.8 | | nF | |
| Output Capacitance | C_{OSS} | | | | 164 | | pF |
| Effective output capacitance, energy related ^{NOTE5} | $C_{O(er)}$ | $V_{GS}=0V,$ $V_{DS}=0\dots 480V$ | | 227 | | pF | |
| Effective output capacitance, time related ^{NOTE6} | $C_{O(tr)}$ | | | | 1067 | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}=400V, I_D=34A$ $R_G=2\Omega, V_{GS}=12V$ | | 44 | | ns | |
| Rise Time | t_r | | | | 13 | | |
| Turn-off Delay Time | $t_{d(off)}$ | | | | 121 | | |
| Fall Time | t_f | | | | 5 | | |
| Gate Charge Characteristics | | | | | | | |
| Gate to Source Charge | Q_{gs} | $V_{DD}=400V, I_D=34A$ $V_{GS}=0$ to 10V | | 53 | | nC | |
| Gate to Drain Charge | Q_{gd} | | | | 69 | | |
| Gate Charge Total | Q_g | | | | 152 | | |
| Gate Plateau Voltage | $V_{plateau}$ | | | | 7.6 | | V |
| Reverse Diode Characteristics | | | | | | | |
| Drain-Source Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_{SD}=34A$ | | 0.9 | 1.1 | V | |
| Reverse Recovery Time | t_{rr} | $V_R=400V, I_F=34A$ $dI_F/dt=100A/\mu s$ | | 200 | | ns | |
| Reverse Recovery Charge | Q_{rr} | | | | 2.4 | | μC |
| Peak Reverse Recovery Current | I_{rrm} | | | | 20.8 | | A |

Note:

- $C_{O(er)}$ is a fixed capacitance that gives the same stored energy as C_{OSS} while V_{DS} is rising from 0 to 480V
- $C_{O(tr)}$ is a fixed capacitance that gives the same charging time as C_{OSS} while V_{DS} is rising from 0 to 480 V



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