

## General Description

The Sanrise SRC60R017FB 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 SRC60R017FB break down voltage is 600V and it has a high rugged avalanche characteristics. The SRC60R017FB is available in TO-247 package.

## Features

- Ultra Low  $R_{DS(ON)} = 17m\Omega @ V_{GS} = 10V$ .
- $V_{ds@T_{jmax}} = 650V$ .
- Ultra Low Gate Charge,  $Q_g = 290nC$  typ.
- Fast switching capability
- Robust design with better EAS performance
- EMI Improved
- Non-automotive Qualified
- Ultra-fast body diode

## Application

- Server / Telecom Power
- EV Charger

## Symbol

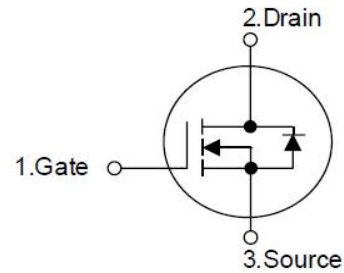
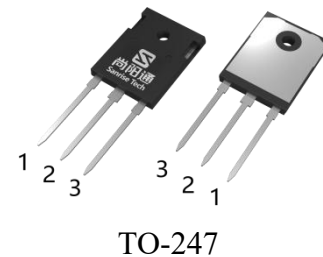


Figure 1 Symbol of SRC60R017FB

## Package Type



TO-247

Figure 2 Package Type of SRC60R017FB

## Ordering Information

SRC60R017FB□□-□		
Circuit Type	_____	E: Lead Free
Package	_____	G: Green
T: TO-247		Blank: Tube
		TR: Tape & Reel

Package	Part Number	Marking ID	Packing Type
TO-247	SRC60R017FBT-G	SRC60R017FBTG	Tube

## Absolute Maximum Ratings

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		$V_{DS}$	600	V
Gate-Source Voltage (static)		$V_{GSS}$	$\pm 20$	V
Gate-Source Voltage (dynamic), AC $f > 1\text{Hz}$		$V_{GSS}$	$\pm 30$	V
Power Dissipation ( $T_c=25^\circ\text{C}$ , TO-247 )		$P_{tot}$	657	W
Continuous Drain Current	$T_c=25^\circ\text{C}$	$I_D$	120	A
	$T_c=100^\circ\text{C}$		76	
	$T_c=125^\circ\text{C}$		54	
Pulsed Drain Current (Note 2)		$I_{DM}$	360	A
Avalanche Energy, Single Pulse (Note 3)		$E_{AS}$	600	mJ
Avalanche Energy, Single Pulse (Note 4)		$E_{AS}$	4380	mJ
Avalanche Energy, Repetitive (Note 2)		$E_{AR}$	0.6	mJ
Avalanche Current, Repetitive (Note 2)		$I_{AR}$	5.5	A
Continuous Diode Forward Current		$I_S$	120	A
Diode Pulse Current		$I_{S,PULSE}$	360	A
MOSFET $dv/dt$ Ruggedness, $V_{DS} \leq 480\text{V}$		$dv/dt$	80	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	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-55 to 150	$^\circ\text{C}$
Lead Temperature (Soldering, 10 sec)		$T_{LEAD}$	260	$^\circ\text{C}$

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.  $I_{AS} = 5.5\text{A}$ ,  $V_{DD} = 60\text{V}$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^\circ\text{C}$ . Finish goods test condition.
4.  $I_{AS} = 14.8\text{A}$ ,  $V_{DD} = 60\text{V}$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^\circ\text{C}$ . Typical Eas.

## Thermal characteristics

Parameter		Symbol	Min	Typ	Max	Unit
Thermal resistance, Junction-to-Case	TO-247	$R_{thJC}$			0.19	$^\circ\text{C} / \text{W}$
Thermal resistance, Junction-to-Ambient	TO-247	$R_{thJA}$			62	$^\circ\text{C} / \text{W}$

## 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 <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	600			V
Zero Gate Voltage Drain Current		I <sub>DSS</sub>	V <sub>DS</sub> =600V, V <sub>GS</sub> =0V			10	uA
Gate-Body Leakage Current	Forward	I <sub>GSSF</sub>	V <sub>GS</sub> =30V, V <sub>DS</sub> =0V			200	nA
	Reverse	I <sub>GSSR</sub>	V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V			-200	
Gate Threshold Voltage		V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =2.9mA	3.0	4.0	5.0	V
Static Drain-Source On-Resistance		R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A		15.1	17	mΩ
Gate Resistance		R <sub>G</sub>	f=1MHz, Open Drain		1.3		Ω
Dynamic Characteristics							
Input Capacitance		C <sub>ISS</sub>	V <sub>DS</sub> =400V,		13.7		nF
Output Capacitance		C <sub>OSS</sub>	V <sub>GS</sub> =0V, f=100KHz		222		pF
Effective output capacitance, energy related <sup>NOTE5</sup>		C <sub>O(er)</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0...480V		291		pF
Effective output capacitance, time related <sup>NOTE6</sup>		C <sub>O(tr)</sub>			237 9		
Turn-on Delay Time		t <sub>d(on)</sub>	V <sub>DD</sub> =400V, I <sub>D</sub> =60A R <sub>G</sub> =2Ω, V <sub>GS</sub> =12V		73.2		ns
Rise Time		t <sub>r</sub>			21.6		
Turn-off Delay Time		t <sub>d(off)</sub>			184		
Fall Time		t <sub>f</sub>			12.4		
Gate Charge Characteristics							
Gate to Source Charge		Q <sub>gs</sub>	V <sub>DD</sub> =400V, I <sub>D</sub> =60A V <sub>GS</sub> =0 to 10V		85		nC
Gate to Drain Charge		Q <sub>gd</sub>			90		
Gate Charge Total		Q <sub>g</sub>			290		
Gate Plateau Voltage		V <sub>plateau</sub>			6.5		V
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>SD</sub> =40A		0.85	1.1	V
Reverse Recovery Time		t <sub>rr</sub>	V <sub>R</sub> =400V, I <sub>F</sub> =50A dI <sub>F</sub> /dt=100A/us		195		ns
Reverse Recovery Charge		Q <sub>rr</sub>			1.8		uC
Peak Reverse Recovery Current		I <sub>rrm</sub>			15		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



Shenzhen Sanrise Technology Co., LTD.

<http://www.sanrise-tech.com>

#### **IMPORTANT NOTICE**

Shenzhen Sanrise Technology Co., LTD. reserves the right to make changes without further notice to any products or specifications herein. Shenzhen Sanrise Technology Co., LTD. does not assume any responsibility for use of any its products for any particular purpose, nor does Shenzhen Sanrise Technology Co., LTD. assume any liability arising out of the application or use of any its products or circuits. Shenzhen Sanrise Technology Co., LTD. does not convey any license under its patent rights or other rights nor the rights of others.

---

#### **Main Site:**

##### **- Headquarter**

Shenzhen Sanrise Technology Co., LTD.

A1206, Skyworth building, No. 008, gaoxinnan 1st Road,  
Gaoxin District, Yuehai street,, Nanshan District, ShenZhen,  
P.R.China

Tel: +86-755-22953335

Fax: +86-755-22916878

##### **- Shanghai Office**

Shenzhen Sanrise Technology Co., LTD.

Rm.401, Building B, No. 666, Zhangheng Road,  
Zhangjiang Hi-Tech Park, Shanghai, P.R.China

Tel: +86-21-68825918