

## General Description

The Sanrise SRC60R140B 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 SRC60R140B break down voltage is 600V and it has a high rugged avalanche characteristics. The SRC60R140B is available in TO-220F, TO-220C, TO-263-2 and TO-247 packages.

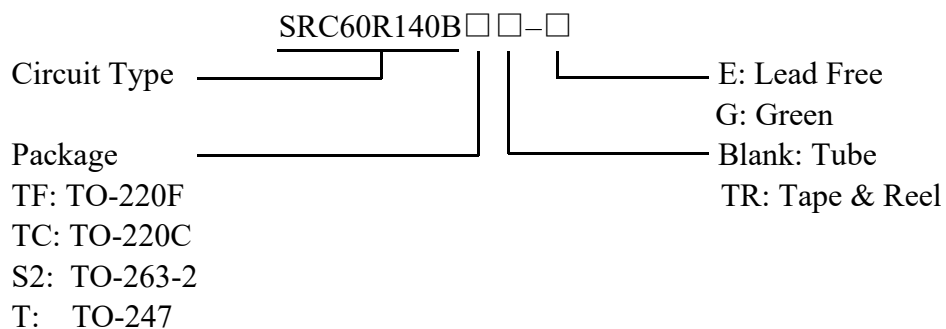
## Features

- Ultra Low  $R_{DS(ON)} = 140m\Omega @ V_{GS} = 10V$ .
- Ultra Low Gate Charge,  $Q_g = 40.4nC$  typ.
- Intrinsic Fast-Recovery Body Diode
- Fast switching capability
- Robust design with better EAS performance
- Non-automotive Qualified

## Application

- AC/DC Power Supply
- PC Power
- Sever / Telecom
- Solar Inverter

## Ordering Information



## Symbol

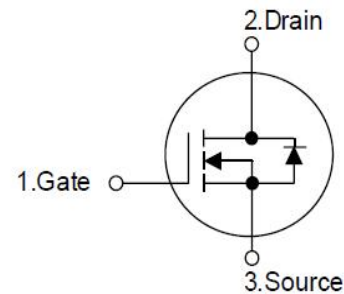


Figure 1 Symbol of SRC60R140B

## Package Type

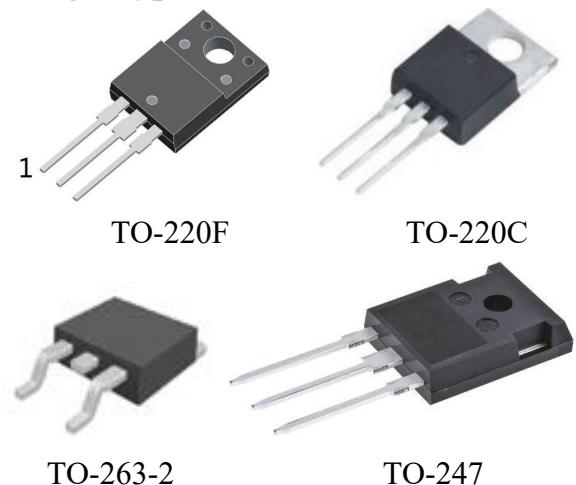


Figure 2 Package Types of SRC60R140B

Package	Part Number	Marking ID	Packing Type
TO-220F	SRC60R140BTF-E	SRC60R140BTFE	Tube
TO-220C	SRC60R140BTC-E	SRC60R140BTCE	Tube
TO-263-2	SRC60R140BS2TR-E	SRC60R140BS2E	Tape & Reel
TO-247	SRC60R140BT-G	SRC60R140BTG	Tube

**Absolute Maximum Ratings**<sup>Note 1</sup>

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		$V_{DSS}$	600	V
Gate-Source Voltage(static)		$V_{GSS}$	±30	V
Gate-Source Voltage(dynamic),AC( $f>1\text{Hz}$ )		$V_{GSS}$	±30	
Continuous Drain Current	$T_C=25^\circ\text{C}$	$I_D$	25.0	A
	$T_C=100^\circ\text{C}$		15.8	
	$T_C=125^\circ\text{C}$		11.2	
Power Dissipation (TO-220C,TO-247,TO-263-2)		$P_{tot}$	178.6	W
Power Dissipation (TO-220F)		$P_{tot}$	34.7	W
Pulsed Drain Current (Note 2)		$I_{DM}$	76	A
Avalanche Energy, Single Pulse (Note 3)		$E_{AS}$	510	mJ
Avalanche Energy, Repetitive (Note 2)		$E_{AR}$	0.7	mJ
Avalanche Current, Repetitive (Note 2)		$I_{AR}$	3.6	A
Continuous Diode Forward Current		$I_S$	25.0	A
Diode Pulse Current		$I_{S,PULSE}$	76	A
MOSFET dv/dt Ruggedness, $V_{DS}\leq 480\text{V}$		dv/dt	50	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:

- 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.
- Repetitive Rating: Pulse width limited by maximum junction temperature
- $I_{AS} = 3.6\text{A}$ ,  $V_{DD} = 60\text{V}$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^\circ\text{C}$

**Thermal characteristics**

Parameter		Symbol	Min	Typ	Max	Unit
Thermal resistance, Junction-to-Case	TO-220F	$R_{thJC}$			3.6	°C /W
	TO-247				0.7	
	TO-220C				0.7	
	TO-263-2				0.7	
Thermal resistance, Junction-to-Ambient	TO-220F	$R_{thJA}$			80	°C /W
	TO-247				62	
	TO-220C				62	
	TO-263-2				62	

**Electrical Characteristics**

 T<sub>J</sub> = 25 °C, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
<b>Statistic Characteristics</b>							
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			100	nA
	Reverse	I <sub>GSSR</sub>	V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V			-1.0	uA
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2.3	3.3	4.3	V	
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =13.0A		126	140	mΩ	
Gate Resistance	R <sub>G</sub>	f=1MHz, Open Drain		1.7		Ω	
<b>Dynamic Characteristics</b>							
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz		1650		pF	
Output Capacitance	C <sub>OSS</sub>			129.6			
Reverse Transfer Capacitance	C <sub>RSS</sub>			10.1			
Effective output capacitance, energy related <sup>NOTE5</sup>	C <sub>O(er)</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0...480V		76.8		pF	
Effective output capacitance, time related <sup>NOTE6</sup>	C <sub>O(tr)</sub>			281			
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =400V, I <sub>D</sub> =13.0A R <sub>G</sub> =3.4Ω, V <sub>GS</sub> =10V		11		ns	
Rise Time	t <sub>r</sub>			10			
Turn-off Delay Time	t <sub>d(off)</sub>			76			
Fall Time	t <sub>f</sub>			8			
<b>Gate Charge Characteristics</b>							
Gate to Source Charge	Q <sub>gs</sub>	V <sub>DD</sub> =480V, I <sub>D</sub> =13.0A V <sub>GS</sub> =0 to 10V		10.8		nC	
Gate to Drain Charge	Q <sub>gd</sub>			13.9			
Gate Charge Total	Q <sub>g</sub>			40.4			
Gate Plateau Voltage	V <sub>plateau</sub>			5.4		V	
<b>Reverse Diode Characteristics</b>							
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>SD</sub> =13.0A		0.90	1.1	V	
Reverse Recovery Time	t <sub>rr</sub>	V <sub>R</sub> =400V, I <sub>F</sub> =13.0A dI <sub>F</sub> /dt=100.0A/us		124		ns	
Reverse Recovery Charge	Q <sub>rr</sub>			0.59		uC	
Peak Reverse Recovery Current	I <sub>rrm</sub>			9.5		A	

Note:

 5. C<sub>O(er)</sub> is a fixed capacitance that gives the same stored energy as C<sub>OSS</sub> while V<sub>DS</sub> is rising from 0 to 480V

 6. C<sub>O(tr)</sub> is a fixed capacitance that gives the same charging time as C<sub>OSS</sub> while V<sub>DS</sub> is rising from 0 to 480V



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