330mΩ, 650V, Super Junction N-Channel Power MOSFET SRC65R330B

General Description

The Sanrise SRC65R330B 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 SRC65R330B break down voltage is 650V and it has a high rugged avalanche characteristics. The SRC65R330B is available in TO-220F , TO-220C and TO-252 packages.

Features

- Ultra Low $R_{DS(ON)}$ = 330mΩ @ V_{GS} = 10V.
- Ultra Low Gate Charge, Qg=25.8nC typ.
- Intrinsic Fast-Recovery Body Diode
- Fast switching capability
- Robust design with better EAS performance
- Non-automotive Qualified
- Ultra-fast body diode

Application

- PC Power
- Server / Telecom
- High Performance LED Lighting Power

Symbol

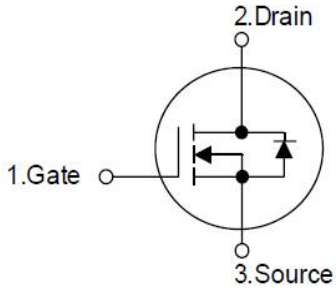
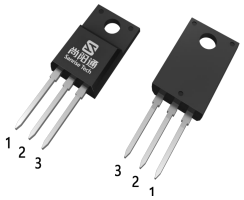
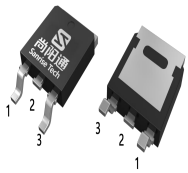


Figure 1 Symbol of SRC65R330B

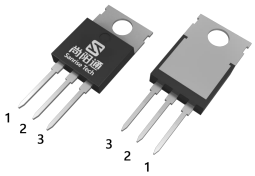
Package Type



TO-220F



TO-252



TO-220C

Figure 2 Package Types of SRC65R330B

Ordering Information

SRC65R330B□□–□

Circuit Type

Package
TF: TO-220F
TC: TO-220C
D: TO-252

E: Lead Free
G: Green

Blank: Tube
TR: Tape & Reel

Package	Part Number	Marking ID	Packing Type
TO-220F	SRC65R330BTF-G	SRC65R330BTFG	Tube
TO-220C	SRC65R330BTC-G	SRC65R330BTCG	Tube
TO-252	SRC65R330BDTR-G	SRC65R330BDG	Tape & Reel

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Absolute Maximum Ratings

Parameter		Symbol	Rating	Unit
Drain-Source Voltage (Note2)		V_{DSS}	650	V
Gate-Source Voltage		V_{GSS}	±30	V
Gate-Source Voltage,AC(f>1 Hz)		V_{GSS}	±30	V
Continuous Drain Current	T_C=25ºC	I_D	12.0	A
	T_C=100ºC		7.6	
	T_C=125ºC		5.4	
Power Dissipation（Tc=25℃,TO-252,TO-220C）		P_{tot}	86	W
Power Dissipation（Tc=25℃,TO-220F）		P_{tot}	32	W
Pulsed Drain Current (Note 3)		I_{DM}	36	A
Avalanche Energy, Single Pulse (Note 4)		E_{AS}	185	mJ
Avalanche Energy, Repetitive (Note 3)		E_{AR}	0.2	mJ
Avalanche Current, Repetitive (Note 3)		I_{AR}	3.5	A
Continuous Diode Forward Current		I_S	12.0	A
Diode Pulse Current		$I_{S.PULSE}$	35	A
Operating Junction Temperature		T_J	150	ºC
Storage Temperature		T_{STG}	-55 to 150	ºC
Lead Temperature (Soldering, 10 sec)		T_{LEAD}	260	ºC

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. For voltage spike during switching.
3. Repetitive Rating: Pulse width limited by maximum junction temperature
4. I_{AS} = 2A, V_{DD} = 60V, R_G = 25Ω, Starting T_J = 25°C

Thermal Resistance

Parameter		Symbol	Min	Typ	Max	Unit
Thermal resistance, Junction-to-Case	TO-220F	R_{thJC}			3.85	ºC /W
	TO-252				1.44	
	TO-220C				1.44	
Thermal resistance, Junction-to-Ambient	TO-220F	R_{thJA}			70	ºC /W
	TO-252				62	
	TO-220C				62	

Electrical Characteristics

T_J = 25℃, unless otherwise specified.

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250uA	650			V
Zero Gate Voltage Drain Current		I_{DSS}	V_{DS}=650V, V_{GS}=0V			10	uA
Gate-Body Leakage Current	Forward	I_{GSSF}	V_{GS}=30V, V_{DS}=0V			100	nA
	Reverse	I_{GSSR}	V_{GS}=-30V, V_{DS}=0V			-100	
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	3.0	4.0	5.0	V
Static Drain-Source On-Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=5.0A		250	330	mΩ
Gate Resistance		R_G	f=1MHz, Open Drain		2.0		Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}=50V, V_{GS}=0V, f=1MHz		1140		pF
Output Capacitance		C_{OSS}			74		
Reverse Transfer Capacitance		C_{RSS}			15		
Effective output capacitance, energy related NOTE5		$C_{O(er)}$	V_{GS}=0V, V_{DS}=0…480V		47.0		pF
Effective output capacitance, time related NOTE6		$C_{O(tr)}$			201		
Turn-on Delay Time		$t_{d(on)}$	V_{DD}=400V, I_D=5.5A R_G=10Ω, V_{GS}=10V		12		ns
Rise Time		t_r			20		
Turn-off Delay Time		$t_{d(off)}$			24		
Fall Time		t_f			50		
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	V_{DD}=480V, I_D=5.5A V_{GS}=0 to 10V		7.4		nC
Gate to Drain Charge		Q_{gd}			8.2		
Gate Charge Total		Q_g			25.8		
Gate Plateau Voltage		$V_{plateau}$			5.4		V
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_{SD}=5.5A		0.84	1.1	V
Reverse Recovery Time		t_{rr}	V_R=400V, I_F=5.5A dI$_F$/dt=100A/us		93		ns
Reverse Recovery Charge		Q_{rr}			0.33		uC
Peak Reverse Recovery Current		I_{rrm}			7.1		A

Note:

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

6. $C_{O(tr)}$ 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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Sanrise Technology Limited Company

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