75mΩ, 650V, Super Junction N-Channel Power MOSFET SRC65R075BS

General Description

The Sanrise SRC65R075BS 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 SRC65R075BS break down voltage is 650V and it has a high rugged avalanche characteristics.

The SRC65R075BS is available in TO-263-2 , TO-220F, TO-220C and TO-247 packages.

Symbol

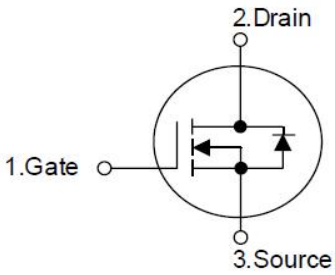


Figure 1 Symbol of SRC65R075BS

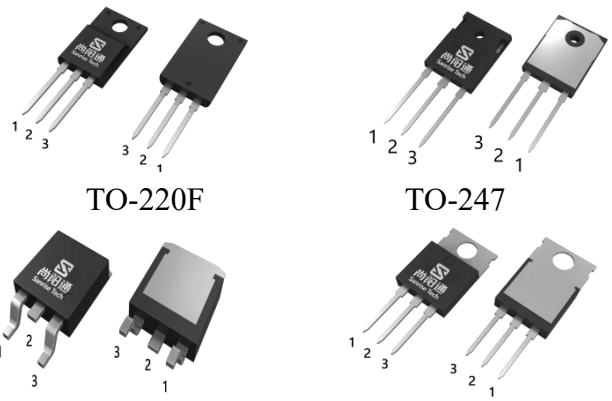
Features

- Ultra Low $R_{DS(ON)}$ = 75mΩ @ V_{GS} = 10V.
- Vds@Tjmax=700v
- Ultra Low Gate Charge, Qg=133nC typ.
- Fast switching capability
- Robust design with better EAS performance
- EMI Improved
- Non-automotive Qualified
- Ultra-fast body diode

Application

- Telecom Power
- EV Charger

Package Type



TO-220F TO-247

TO-263 TO-220C

Figure 2 Package Types of SRC65R075BS

Ordering Information

SRC65R075BS□□–□

Circuit Type

Package
T: TO-247
S2: TO-263-2
TF: TO-220F
TC: TO-220C

E: Lead Free
G: Green
Blank: Tube
TR: Tape & Reel

Package	Part Number	Marking ID	Packing Type
TO-247	SRC65R075BST-G	SRC65R075BSTG	Tube
TO-220F	SRC65R075BSTF-G	SRC65R075BSTFG	Tube
TO-263-2	SRC65R075BSS2TR-G	SRC65R075BSS2G	Tape & Reel
TO-220C	SRC65R075BSTC-G	SRC65R075BSTCG	Tube

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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
Continuous Drain Current	T_C=25ºC	I_D	44	A
	T_C=100ºC		27	
	T_C=125ºC		19	
Power Dissipation（Tc=25℃,TO-220F）		P_{tot}	34	W
Power Dissipation（Tc=25℃,TO-247,TO-220C,TO-263）		P_{tot}	328	W
Pulsed Drain Current (Note 2)		I_{DM}	132	A
Avalanche Energy, Single Pulse (Note 3)		E_{AS}	320	mJ
Avalanche Energy, Single Pulse (Note 4)		E_{AS}	1500	mJ
Avalanche Energy, Repetitive (Note 2)		E_{AR}	0.2	mJ
Avalanche Current, Repetitive (Note 2)		I_{AR}	4.0	A
Continuous Diode Forward Current		I_S	44	A
Diode Pulse Current		$I_{S.PULSE}$	132	A
MOSFET dv/dt Ruggedness, V_{DS}<=480V		dv/dt	120	V/ns
Reverse Diode dv/dt, V_{DS}<=480V, I_{SD}<=I_D		dv/dt	50	V/ns
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. Repetitive Rating: Pulse width limited by maximum junction temperature
3. I_{AS}=4.0A, V_{DD} = 60V, R_G = 25Ω, Starting T_J = 25°C.Finish goods test condition
4. I_{AS}=8.7A, V_{DD} = 60V, R_G = 25Ω, Starting T_J = 25°C.Typical Eas

Thermal characteristics

Parameter		Symbol	Min	Typ	Max	Unit
Thermal resistance, Junction-to-Case	TO-220F	R_{thJC}			3.6	ºC /W
	TO-220C				0.38	
	TO-247				0.38	
	TO-263				0.38	
Thermal resistance, Junction-to-Ambient	TO-220F	R_{thJA}			70	ºC /W
	TO-220C				59	
	TO-247				59	
	TO-263				59	

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}=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=1.0mA	3.5	4.5	5.5	V
Static Drain-Source On-Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=24A		60	75	mΩ
Gate Resistance		R_G	f=1MHz, Open Drain		2.0		Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}=400V, V_{GS}=0V, f=100kHz		2792		pF
Output Capacitance		C_{OSS}			78		pF
Effective output capacitance, energy related NOTE5		$C_{O(er)}$	V_{GS}=0V, V_{DS}=0…480V		110		pF
Effective output capacitance, time related NOTE6		$C_{O(tr)}$			751		
Turn-on Delay Time		$t_{d(on)}$	V_{DD}=400V, I_D=24A R_G=3Ω, V_{GS}=12V		50		ns
Rise Time		t_r			16		
Turn-off Delay Time		$t_{d(off)}$			69		
Fall Time		t_f			10		
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	V_{DD}=480V, I_D=24A V_{GS}=0 to 10V		24		nC
Gate to Drain Charge		Q_{gd}			85		
Gate Charge Total		Q_g			133		
Gate Plateau Voltage		$V_{plateau}$			7.0		V
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_{SD}=24A		0.86	1.1	V
Reverse Recovery Time		t_{rr}	V_R=400V, I_F=24A dI$_F$/dt=120A/us		190		ns
Reverse Recovery Charge		Q_{rr}			1.9		uC
Peak Reverse Recovery Current		I_{rrm}			18		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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