800mΩ, 650V, Super Junction N-Channel Power MOSFET SRC65R800

General Description

The Sanrise SRC65R800 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 SRC65R800 break down voltage is 650V and it has a high rugged avalanche characteristic.

The SRC65R800 is available in TO-220F, TO-252 packages.

Symbol

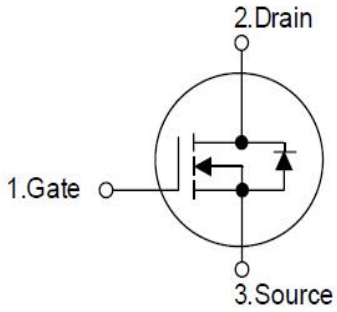
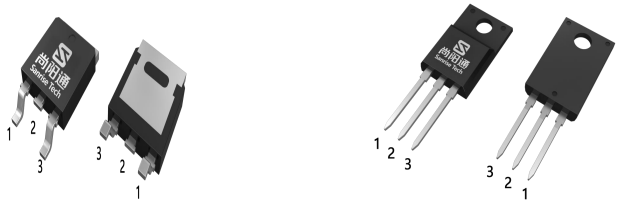


Figure 1 Symbol of SRC65R800

Features

- Ultra Low $R_{DS(ON)}$ = 800mΩ @ V_{GS} = 10V.
- Ultra Low Gate Charge, Qg=6.2nC typ.
- Intrinsic Fast-Recovery Body Diode
- Fast switching capability
- Robust design with better EAS performance
- Non-automotive Qualified

Package Type



TO-252 TO-220F

Figure 2 Package Types of SRC65R800

Application

- LED lighting
- Quick Charger

Ordering Information

SRC65R800□□–□

Circuit Type

Package

TF: TO-220F

D: TO-252

E: Lead Free

G: Green

Blank: Tube

TR: Tape & Reel

Package	Part Number	Marking ID	Packing Type
TO-220F	SRC65R800TF-G	SRC65R800TFG	Tube
TO-252	SRC65R800DTR-G	SRC65R800DG	Tape & Reel

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Absolute Maximum Ratings

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	3.9	A
			2.5	
	T_C=125ºC		1.8	
Power Dissipation（Tc=25℃,TO-220F）		P_{tot}	20	W
Power Dissipation（Tc=25℃,TO-252）		P_{tot}	29	W
Pulsed Drain Current (Note 2)		I_{DM}	11.7	A
Avalanche Energy, Single Pulse (Note 3)		E_{AS}	80	mJ
Avalanche Energy, Repetitive (Note 2)		E_{AR}	0.1	mJ
Avalanche Current, Repetitive (Note 2)		I_{AR}	0.2	A
Continuous Diode Forward Current		I_S	3.9	A
Diode Pulse Current		$I_{S.PULSE}$	11.7	A
MOSFET dv/dt Ruggedness, V_{DS}<=480V		dv/dt	15	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} = 3.0A, 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}			6.0	ºC /W
	TO-252				4.2	
Thermal resistance, Junction-to-Ambient	TO-220F	R_{thJA}			80	ºC /W
	TO-252				62	

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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			1	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=0.8mA	2.5	3.5	4.5	V
Static Drain-Source On-Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=1.5A		0.67	0.8	Ω
Gate Resistance		R_G	f=1MHz, Open Drain		6.0		Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}=50V, V_{GS}=0V, f=1MHz		293		pF
Output Capacitance		C_{OSS}			15		pF
Reverse Transfer Capacitance		C_{RSS}			0.4		
Effective output capacitance, energy related NOTE5		$C_{O(er)}$	V_{GS}=0V, V_{DS}=0…400V		8.8		pF
Effective output capacitance, time related NOTE6		$C_{O(tr)}$			55.6		
Turn-on Delay Time		$t_{d(on)}$	V_{DD}=400V, I_D=1.6A R_G=10Ω, V_{GS}=10V		6		ns
Rise Time		t_r			5		
Turn-off Delay Time		$t_{d(off)}$			40		
Fall Time		t_f			13		
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	V_{DD}=480V, I_D=1.5A V_{GS}=0 to 10V		1.5		nC
Gate to Drain Charge		Q_{gd}			2.2		
Gate Charge Total		Q_g			6.2		
Gate Plateau Voltage		$V_{plateau}$			5.0		V
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_{SD}=1.5A		0.82	1.1	V
Reverse Recovery Time		t_{rr}	V_R=100V, I_F=1.5A dI$_F$/dt=100A/us		110		ns
Reverse Recovery Charge		Q_{rr}			0.45		uC
Peak Reverse Recovery Current		I_{rrm}			8.2		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 400V

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 400 V

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