

General Description

The Sanrise SRT03N020L uses advanced split gate trench technology. It has extremely low on resistance, low gate charge and fast switching time. This device is ideal for Motor driver, BMS, DC-DC converter and power management.

The SRT03N020L break down voltage is 30V and it has a high rugged avalanche characteristic. The SRT03N020L is available in PDFN3.3*3.3 and PDFN5*6 packages.

Features

- Ultra Low
 $R_{DS(ON_TYP)} = 2.1m\Omega$,PDFN3.3*3.3@ $V_{GS} = 10V$.
 $R_{DS(ON_TYP)} = 1.5m\Omega$,PDFN5*6@ $V_{GS} = 10V$.
- Ultra Low Gate Charge, $Q_g=38.6nC$ typ.
- Fast switching capability
- Robust design with better EAS performance
- Non-automotive Qualified

Application

- Server / Telecom
- High Power Supply, such as DCDC converter
- Motor Driver, such as E-Tools
- BMS

Ordering Information

	SRT03N020L□□-□	
Circuit Type		E: Lead Free
Package		G: Green
D33: PDFN3.3*3.3		Blank: Tube
D56: PDFN5*6		TR: Tape & Reel

Package	Part Number	Marking ID	Packing Type
PDFN3.3*3.3	SRT03N020LD33TR-G	03N020LD33G	Tape & Reel
PDFN5*6	SRT03N020LD56TR-G	SRT03N020LD56G	Tape & Reel

Symbol

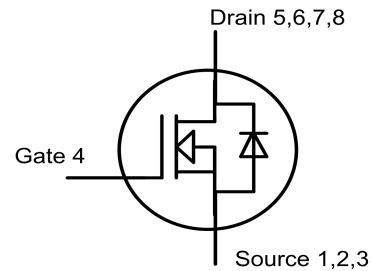


Figure 1 Symbol of SRT03N020L

Package Type

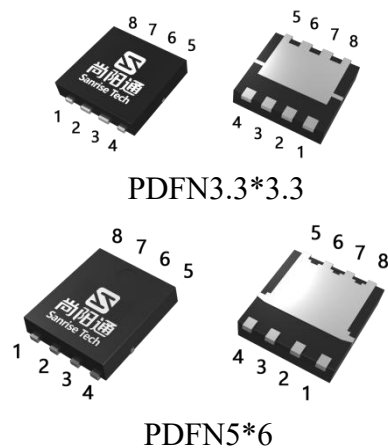


Figure 2 Package Types of SRT03N020L

Absolute Maximum Ratings

Parameter		Symbol	Rating		Unit
Drain-Source Voltage		V_{DSS}	30		V
Gate-Source Voltage		V_{GSS}	±20		V
Continuous Drain Current, Package Limited	$T_C=25^{\circ}C$	I_D	PDFN3*3	80	A
	$T_C=25^{\circ}C$		PDFN5*6	80	
	$T_C=100^{\circ}C$		PDFN3*3	69	
	$T_C=100^{\circ}C$		PDFN5*6	73	
Continuous Drain Current, Silicon	$T_C=25^{\circ}C$	I_D	PDFN3*3	110	A
	$T_C=25^{\circ}C$		PDFN5*6	125	
Pulsed Drain Current (Note 2)		I_{DM}	PDFN3*3	240	A
			PDFN5*6	240	
Power Dissipation ($T_C = 25^{\circ}C$)		P_D	90		W
Avalanche Destructive Energy, Single Pulse (Note 4)		E_{AS_Limit}	324		mJ
Avalanche Energy, Single Pulse (Note 3)		E_{AS}	56		mJ
Avalanche Current, Repetitive (Note 2)		I_{AR}	20.0		A
Operating Junction Temperature		T_J	150		$^{\circ}C$
Storage Temperature		T_{STG}	-55 to 150		$^{\circ}C$
Lead Temperature (Soldering, 10 sec)		T_{LEAD}	260		$^{\circ}C$

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
- $I_{AS} = 13.0A$, $V_{DD} = 15V$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}C$
- $I_{AS_Limit} = 30.0A$, $V_{DD} = 15V$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}C$

Thermal Characteristics

Parameter		Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	PDFN3.3*3.3	R_{thJC}			1.85	$^{\circ}C/W$
Thermal Resistance, Junction-to-Case	PDFN5*6	R_{thJC}			1.85	$^{\circ}C/W$

2.0mΩ, 30V, N-Channel Power MOSFET
SRT03N020L
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_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current		I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
			$V_{DS}=24V, V_{GS}=0V, T_J=55^\circ C$			10	μA
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		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=0.25mA$	1.2	1.7	2.1	V
Static Drain-Source On-Resistance	PDFN3*3	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=20A$		2.9	3.8	mΩ
	PDFN5*6				2.3	3.2	
Static Drain-Source On-Resistance	PDFN3*3	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$		2.1	2.6	mΩ
	PDFN5*6				1.5	2.0	
Gate Resistance		R_G	f=1MHz, Open Drain		1.8		Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		2.9		nF
Output Capacitance		C_{OSS}			640		pF
Reverse Transfer Capacitance		C_{RSS}			144		pF
Turn-on Delay Time		$t_{d(on)}$	$V_{DD}=15V, I_D=20A, R_G=1.6\Omega, V_{GS}=10V$		11		ns
Rise Time		t_r			8		
Turn-off Delay Time		$t_{d(off)}$			46		
Fall Time		t_f			8		
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	$V_{DD}=15V, I_D=20A, V_{GS}=0 \text{ to } 10V$		5.3		nC
Gate to Drain Charge		Q_{gd}			5.0		
Gate Charge Total		Q_g			38.6		
Gate Plateau Voltage		$V_{plateau}$			2.8		V
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	$V_{GS}=0V, I_{SD}=20A$		0.79	1.1	V
Reverse Recovery Time		t_{rr}	$V_R=15V, I_F=20A$		25		ns
Reverse Recovery Charge		Q_{rr}	$dI_F/dt=100A/\mu s$		50		nC



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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

Sanrise Technology Limited Company
Rm.401, Building B, No. 666, Zhangheng Road,
Zhangjiang Hi-Tech Park, Shanghai, P.R.China
Tel: +86-21-68825918