9.0mΩ, 150V, N-Channel Power MOSFET SRT15N090H

General Description

The Sanrise SRT15N090H is a low voltage power MOSFET, fabricated using advanced split gate trench 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 synchronous rectification.

The SRT15N090H break down voltage is 150V and it has a high rugged avalanche characteristics.

The SRT15N090H is available in TO-220C and TO-263-2 and PDFN5*6 packages.

Features

- Ultra Low

$R_{DS(ON)\_TYP}$ = 7.3mΩ, TO-220C @V_{GS} = 10V.

$R_{DS(ON)\_TYP}$ = 7.2mΩ, TO-263-2@V_{GS} = 10V.

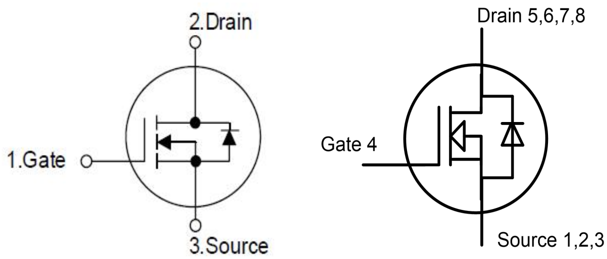
$R_{DS(ON)\_TYP}$ = 7.2mΩ, PDFN5*6 @V_{GS} = 10V.

- Ultra Low Gate Charge, Qg=32nC typ.
- Fast switching capability
- Robust design with better EAS performance
- EMI Improved
- Non-automotive Qualified

Application

- Server/Telecom
- High Power Supply
- Solar
- UPS

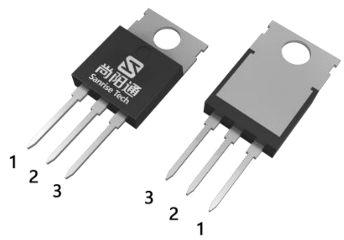
Symbol



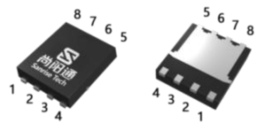
TO-220C,TO-263-2 PDFN5*6

Figure 1 Symbol of SRT15N090H

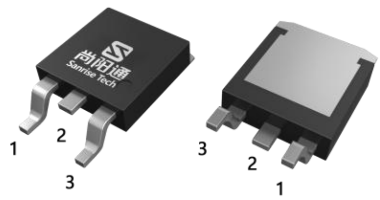
Package Type



TO-220C



PDFN5*6



TO-263-2

Figure 2 Package Type of SRT15N090H

Ordering Information

SRT15N090H□□-□

Circuit Type

Package
TC: TO-220C
S2: TO-263-2
D56: PDFN5*6

E: Lead Free
G: Green

Blank: Tube
TR: Tape & Reel

Package	Part Number	Marking ID	Packing Type
TO-220C	SRT15N090HTC-G	SRT15N090HTCG	Tube
TO-263-2	SRT15N090HS2TR-G	SRT15N090HS2G	Tape &Reel
PDFN5*6	SRT15N090HD56TR-G	SRT15N090HD56G	Tape & Reel

Absolute Maximum Ratings

Parameter		Symbol	Rating		Unit
Drain-Source Voltage		V_{DSS}	150		V
Gate-Source Voltage		V_{GSS}	±20		V
Continuous Drain Current,Package Limited	T_C=25ºC	I_D	TO-220C	105	A
			TO-263-2	105	
			PDFN56	105	
	T_C=100ºC		TO-220C	75	
			TO-263-2	75	
			PDFN56	75	
Continuous Drain Current,Silicon	T_C=25ºC		TO-220C	105	
			TO-263-2	105	
			PDFN56	105	
Pulsed Drain Current (Note 2)		I_{DM}	TO-220C	420	A
			TO-263-2	420	
			PDFN56	420	
Power Dissipation (T_C = 25°C)		P_D	214		W
Avalanche Destructive Energy, Single Pulse (Note 4)		E_{AS_Limit}	552		mJ
Avalanche Energy, Single Pulse (Note 3)		E_{AS}	81		mJ
Avalanche Energy, Repetitive (Note 2)		E_{AR}	0.1		mJ
Avalanche Current, Repetitive (Note 2)		I_{AR}	22		A
Continuous Diode Forward Current		I_S	105		A
Diode Pulse Current		$I_{S.PULSE}$	420		A
Operating Junction Temperature		T_J	175		ºC
Storage Temperature		T_{STG}	-55 to 175		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}= 18A, V_{DD}= 60V, R_G= 25Ω, Starting T_J= 25°C
4. I_{AS_Limit}= 47A, 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-220C	R_{thJC}			0.7	ºC/W
	TO-263-2				0.7	
	PDFN5*6				0.7	
Thermal Resistance，Junction-to-Ambient	TO-220C	R_{thJA}			62	
	TO-263-2				62	
	PDFN5*6				50	

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	150			V
Zero Gate Voltage Drain Current		I_{DSS}	V_{DS}=150V, 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=0.25mA	2.0	3.0	4.0	V
Static Drain-Source On-Resistance	TO-220C	$R_{DS(ON)}$	V_{GS}=10V, I_D=60A		7.3	9.0	mΩ
	TO-263-2				7.2	9.0	mΩ
	PDFN5*6				7.1	9.0	mΩ
Gate Resistance		R_G	f=1MHz, Open Drain		1.2		Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}=50V, V_{GS}=0V, f=1MHz		2.2		nF
Output Capacitance		C_{OSS}			1.5		nF
Reverse Transfer Capacitance		C_{RSS}			23		pF
Effective output capacitance, energy related NOTE5		$C_{O(er)}$	V_{GS}=0V, V_{DS}=0…90V		1.4		nF
Effective output capacitance, time related NOTE6		$C_{O(tr)}$			1.7		
Turn-on Delay Time		$t_{d(on)}$	V_{DD}=75V, I_D=60A R_G=1.6Ω, V_{GS}=10V		8		nS
Rise Time		t_r			4		
Turn-off Delay Time		$t_{d(off)}$			13		
Fall Time		t_f			4		
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	V_{DD}=75V, I_D=60A V_{GS}=0 to 10V		11.7		nC
Gate to Drain Charge		Q_{gd}			7.6		
Gate Charge Total		Q_g			32.0		
Gate Plateau Voltage		$V_{plateau}$			5.4		V
Gate Charge Total, sync FET		Q_g	V_{DD}=0.1V, V_{GS}=0 to 10V		26.9		nC
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_{SD}=60A		0.87	1.1	V
Reverse Recovery Time		t_{rr}	V_R=75V, I_F=60A dIF/dt=100A/us		28		nS
Reverse Recovery Charge		Q_{rr}			27		nC
Peak Reverse Recovery Current		I_{rrm}			1.9		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 90V

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 90 V

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IMPORTANT NOTICE

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