

General Description

The Sanrise SRT15N050H 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 SRT15N050H break down voltage is 150V and it has a high rugged avalanche characteristics. The SRT15N050H is available in TO-220C and TO-263-2 and TO-247 and TOLL packages.

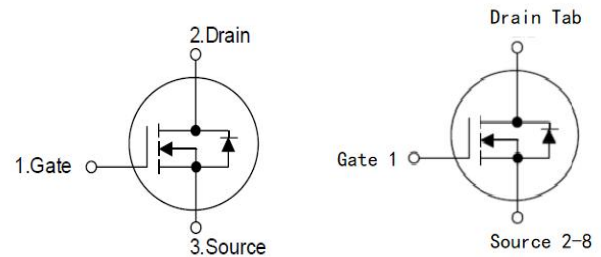
Features

- Ultra Low
 $R_{DS(ON_TYP)} = 3.9m\Omega$, TO-220C @ $V_{GS} = 10V$.
 $R_{DS(ON_TYP)} = 3.8m\Omega$, TO-263-2@ $V_{GS} = 10V$.
 $R_{DS(ON_TYP)} = 3.9m\Omega$, TO-247 @ $V_{GS} = 10V$.
 $R_{DS(ON_TYP)} = 2.9m\Omega$, TOLL @ $V_{GS} = 10V$.
- Ultra Low Gate Charge, $Q_g=107nC$ typ.
- Fast switching capability
- Robust design with better EAS performance
- EMI Improved
- Non-automotive Qualified

Application

- Server/Telecom
- High Power Supply
- E-Tools
- BMS

Symbol

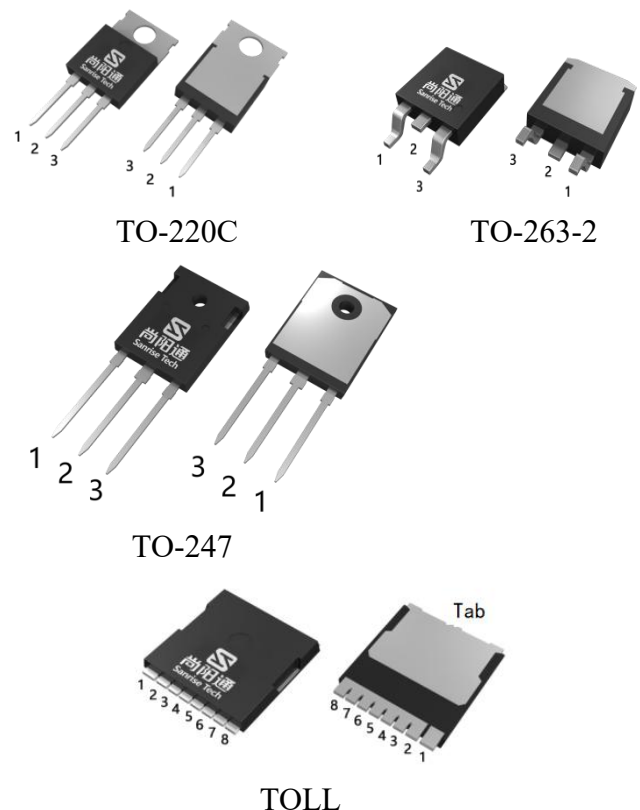


TO-263-2/TO-220C/TO-247

TOLL

Figure 1 Symbol of SRT15N050H

Package Type



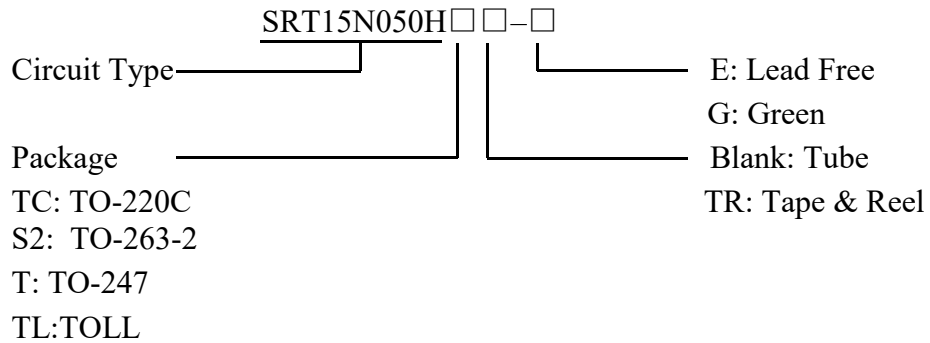
TO-220C

TO-263-2

TO-247

TOLL

Figure 2 Package Type of SRT15N050H

Ordering Information


Package	Part Number	Marking ID	Packing Type
TO-220C	SRT15N050HTC-E	SRT15N050HTCE	Tube
TO-263-2	SRT15N050HS2TR-E	SRT15N050HS2E	Tape & Reel
TO-247	SRT15N050HT-G	SRT15N050HTG	Tube
TOLL	SRT15N050HTLTR-G	SRT15N050HTLG	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	$T_C=25^{\circ}\text{C}$	I_D	TO-220C	120	A
			TO-263-2	120	
			TO-247	120	
			TOLL	200	
	$T_C=100^{\circ}\text{C}$		TO-220C	120	
			TO-263-2	120	
			TO-247	120	
			TOLL	180	
Continuous Drain Current, Silicon	$T_C=25^{\circ}\text{C}$	TO-220C	169		
		TO-263-2	169		
		TO-247	169		
		TOLL	200		
Pulsed Drain Current (Note 2)		I_{DM}	TO-220C	480	A
			TO-263-2	480	
			TO-247	480	
			TOLL	800	
Power Dissipation ($T_C = 25^{\circ}\text{C}$)		P_D	319		W
Avalanche Destructive Energy, Single Pulse (Note 4)		E_{AS_Limit}	900		mJ
Avalanche Energy, Single Pulse (Note 3)		E_{AS}	183		mJ
Avalanche Energy, Repetitive (Note 2)		E_{AR}	0.4		mJ
Avalanche Current, Repetitive (Note 2)		I_{AR}	40.0		A
Continuous Diode Forward Current		I_S	120		A
Diode Pulse Current		$I_{S,PULSE}$	360		A
Operating Junction Temperature		T_J	175		$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55 to 175		$^{\circ}\text{C}$
Lead Temperature (Soldering, 10 sec)		T_{LEAD}	260		$^{\circ}\text{C}$

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
- $I_{AS} = 27\text{A}$, $V_{DD} = 75\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$
- $I_{AS_Limit} = 60\text{A}$, $V_{DD} = 75\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

5.0mΩ, 150V, N-Channel Power MOSFET**SRT15N050H****Thermal Resistance**

Parameter		Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	TO-220C	R_{thJC}			0.47	°C/W
	TO-263-2				0.47	
	TO-247				0.47	
	TOLL				0.40	
Thermal Resistance, Junction-to-Ambient		R_{thJA}			62	

5.0mΩ, 150V, N-Channel Power MOSFET
SRT15N050H
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}	$V_{GS}=0V, I_D=250\mu A$	150			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=150V, V_{GS}=0V$			1	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	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=0.25mA$	2.0	3.0	4.0	V
Static Drain-Source On-Resistance	TO-220C	$R_{DS(ON)}, V_{GS}=10V, I_D=60A$		3.9	5.0	$m\Omega$
	TO-263-2			3.8	4.9	$m\Omega$
	TO-247			3.9	5.0	$m\Omega$
	TOLL			2.9	3.8	$m\Omega$
Gate Resistance	R_G	$f=1MHz, \text{Open Drain}$		1.0		Ω
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$		7.1		nF
Output Capacitance	C_{OSS}			2.4		nF
Reverse Transfer Capacitance	C_{RSS}			78		pF
Effective output capacitance, energy related <small>NOTE5</small>	$C_{O(er)}$	$V_{GS}=0V, V_{DS}=0\dots 90V$		2.3		nF
Effective output capacitance, time related <small>NOTE6</small>	$C_{O(tr)}$			2.8		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=75V, I_D=60A, R_G=1.6\Omega, V_{GS}=10V$		21		Ns
Rise Time	t_r			6		
Turn-off Delay Time	$t_{d(off)}$			27		
Fall Time	t_f			5		
Gate Charge Characteristics						
Gate to Source Charge	Q_{gs}	$V_{DD}=75V, I_D=60A, V_{GS}=0 \text{ to } 10V$		32.8		nC
Gate to Drain Charge	Q_{gd}			24.8		
Gate Charge Total	Q_g			107		
Gate Plateau Voltage	$V_{plateau}$			4.6		V
Gate Charge Total, sync FET	Q_g	$V_{DD}=0.1V, V_{GS}=0 \text{ to } 10V$		89.7		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}	$V_R=75V, I_F=60A, dI_F/dt=100A/\mu s$		52		ns
Reverse Recovery Charge	Q_{rr}			86		nC
Peak Reverse Recovery Current	I_{rrm}			3.3		A

Note:

- $C_{O(er)}$ is a fixed capacitance that gives the same stored energy as C_{OSS} while V_{DS} is rising from 0 to 60V
- $C_{O(tr)}$ is a fixed capacitance that gives the same charging time as C_{OSS} while V_{DS} is rising from 0 to 60 V



Sanrise Technology Limited Company

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