# 7mΩ, 100V, N-Channel Power MOSFET SRT10N070H

## General Description

The Sanrise SRT10N070H 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 SRT10N070H break down voltage is 100V and it has a high rugged avalanche characteristics.
The SRT10N070H is available in PDFN5*6 and TO-220C packages.

## Features

- Ultra Low
$R_{DS(ON)_TYP}$ = 5.7mΩ ,PDFN5*6 @$V_{GS}$ = 10V.
$R_{DS(ON)_TYP}$ = 6.3mΩ ,TO-220C @$V_{GS}$ = 10V.
- Ultra Low Gate Charge, Qg=32.1nC typ.
- Fast switching capability
- Robust design with better EAS performance
- Non-automotive Qualified

## Application

- Charger / Adapter
- Server/Telecom
- High Power Supply
- E-Tools

## Symbol

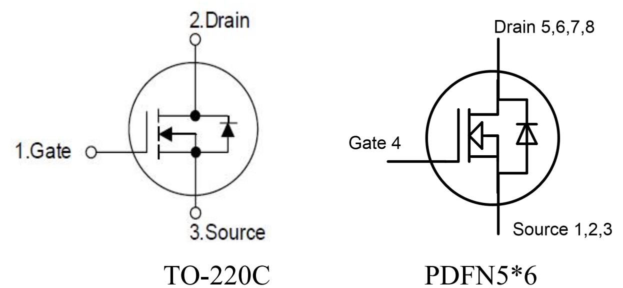



Figure 1 Symbol of SRT10N070H

## Package Type

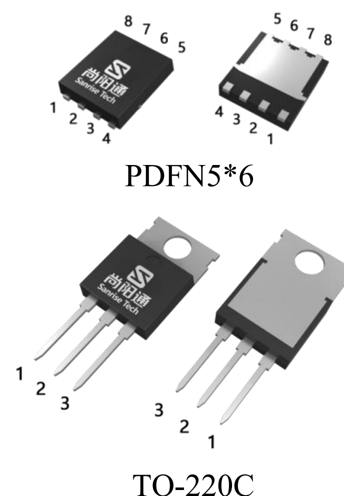
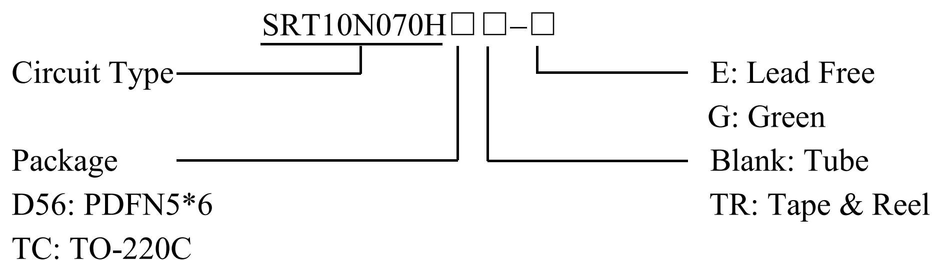



Figure 2 Package Type of SRT10N070H

## Ordering Information




| Package | Part Number | Marking ID | Packing Type |
|---|---|---|---|
| PDFN5*6 | SRT10N070HD56TR-G | SRT10N070HD56G | Tape & Reel |
| TO-220C | SRT10N070HTC-G | SRT10N070HTCG | Tube |

## Absolute Maximum Ratings

| Parameter | | Symbol | Rating | | Unit |
|---|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 100 | | V |
| Gate-Source Voltage | | $V_{GSS}$ | ±20 | | V |
| Continuous Drain Current | $T_C$=25°C | $I_D$ | PDFN5*6 | 84 | A |
| | | | TO-220C | 87 | |
| | $T_C$=100°C | | PDFN5*6 | 53 | |
| | | | TO-220C | 56 | |
| Pulsed Drain Current (Note 2) | | $I_{DM}$ | 336 | | A |
| Avalanche Energy, Single Pulse (Note 3) | | $E_{AS}$ | 36 | | mJ |
| Avalanche Destructive Energy, Single Pulse (Note 4) | | $E_{AS_Limit}$ | 306 | | mJ |
| Avalanche Energy, Repetitive (Note 2) | | $E_{AR}$ | 0.05 | | mJ |
| Avalanche Current, Repetitive (Note 2) | | $I_{AR}$ | 12 | | A |
| Continuous Diode Forward Current | | $I_S$ | 84 | | A |
| Diode Pulse Current | | $I_{S.PULSE}$ | 320 | | A |
| Max Power Dissipation | | $P_D$ | 96.1 | | W |
| Operating Junction Temperature | | $T_J$ | 150 | | °C |
| Storage Temperature | | $T_{STG}$ | -55 to 150 | | °C |
| Lead Temperature (Soldering, 10 sec) | | $T_{LEAD}$ | 260 | | °C |

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. $I_{AS}$= 12.0A, $V_{DD}$= 50V, $R_G$= 25Ω, Starting $T_J$= 25°C
4. $I_{AS_Limit}$= 35A, $V_{DD}$= 50V, $R_G$= 25Ω, Starting $T_J$= 25°C

## Thermal Resistance

| Parameter | | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Thermal Resistance，Junction-to-Case | PDFN5*6 | $R_{thJC}$ | | | 1.3 | °C/W |
| Thermal Resistance，Junction-to-Ambient | | $R_{thJA}$ | | | 50 | °C/W |
| Thermal Resistance，Junction-to-Case | TO-220C | $R_{thJC}$ | | | 1.1 | °C/W |
| Thermal Resistance，Junction-to-Ambient | | $R_{thJA}$ | | | 60 | °C/W |

## 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 | 100 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=100V, $V_{GS}$=0V | | | 1 | uA |
| Gate-Body Leakage Current, Forward | $I_{GSSF}$ | $V_{GS}$=20V, $V_{DS}$=0V | | | 100 | nA |
| Gate-Body Leakage Current, Reverse | $I_{GSSR}$ | $V_{GS}$=-20V, $V_{DS}$=0V | | | -100 | nA |
| 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, PDFN5*6 | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=14A | | 5.7 | 7.0 | mΩ |
| Static Drain-Source On-Resistance, TO-220C | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=14A | | 6.3 | 7.5 | mΩ |
| Gate Resistance | $R_G$ | f=1MHz, Open Drain | | 1.7 | | Ω |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | $C_{ISS}$ | $V_{DS}$=50V, $V_{GS}$=0V, f=1MHz | | 2.1 | | nF |
| Output Capacitance | $C_{OSS}$ | | | 720 | | pF |
| Reverse Transfer Capacitance | $C_{RSS}$ | | | 13 | | pF |
| Effective output capacitance, energy related NOTE5 | $C_{O(er)}$ | $V_{GS}$=0V, $V_{DS}$=0…80V | | 690 | | pF |
| Effective output capacitance, time related NOTE6 | $C_{O(tr)}$ | | | 920 | | pF |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$=50V, $I_D$=30A $R_G$=3.0Ω, $V_{GS}$=10V | | 10 | | nS |
| Rise Time | $t_r$ | | | 5 | | nS |
| Turn-off Delay Time | $t_{d(off)}$ | | | 22 | | nS |
| Fall Time | $t_f$ | | | 6 | | nS |
| Gate Charge Characteristics | | | | | | |
| Gate to Source Charge | $Q_{gs}$ | $V_{DD}$=50V, $I_D$=30A $V_{GS}$=0 to 10.0V | | 9.7 | | nC |
| Gate to Drain Charge | $Q_{gd}$ | | | 6.2 | | nC |
| Gate Charge Total | $Q_g$ | | | 32.1 | | nC |
| Gate Plateau Voltage | $V_{plateau}$ | | | 4.6 | | V |
| Gate Charge Total, sync FET | $Q_g$ | $V_{DD}$=0.1V, $V_{GS}$=0 to 10V | | 27.6 | | nC |
| Reverse Diode Characteristics | | | | | | |
| Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_{SD}$=30A | | 0.85 | 1.1 | V |
| Reverse Recovery Time | $t_{rr}$ | $V_R$=50V, $I_F$=30A $dI_F/dt$=100A/us | | 53 | | nS |
| Reverse Recovery Charge | $Q_{rr}$ | | | 93 | | nC |
| Peak Reverse Recovery Current | $I_{rrm}$ | | | 3.5 | | 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 80V

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 80 V

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