2.8mΩ, 100V, N-Channel Power MOSFET SRT10N030H

General Description

The Sanrise SRT10N030H is a low voltage power MOSFET, fabricated using advanced split gate trench technology. The resulting device has extremely low on resistance, low Qg charge and fast switching time, making it especially suitable for applications which require superior power density and synchronous rectification.

The SRT10N030H break down voltage is 100V and it has a high rugged avalanche characteristics.

The SRT10N030H is available in TO-263-2 and TO-220C packages.

Symbol

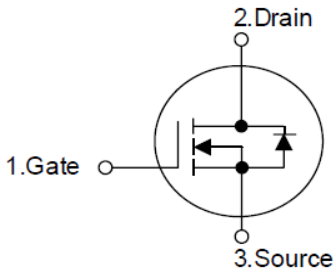


Figure 1 Symbol of SRT10N030H

Features

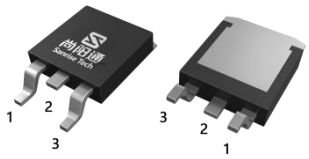
- Ultra Low

$R_{DS(ON)\_TYP}$ = 2.8mΩ ,TO-263-2 @V_{GS} = 10V.

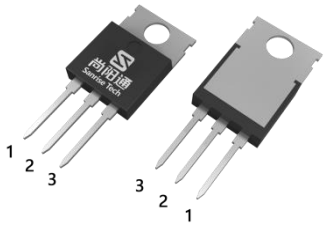
$R_{DS(ON)\_TYP}$ = 2.8mΩ ,TO-220C @V_{GS} = 10V.

- Ultra Low Qg, Qg=140nC typ.
- Fast switching capability
- Robust design with better EAS performance
- EMI Improved
- Non-automotive Qualified

Package Type



TO-263



TO-220C

Figure 2 Package Type of SRT10N030H

Application

- Server/Telecom
- Motor Driver
- High Power Supply
- BMS

Ordering Information

SRT10N030H□□–□

Circuit Type

Package

S2: TO-263-2

TC: TO-220C

E: Lead Free

GL: Green

Blank: Tube

TR: Tape & Reel

Package	Part Number	Marking ID	Packing Type
	Green	Green	
TO-263-2	SRT10N030HS2TR-GL	SRT10N030HS2GL	Tape & Reel
TO-220C	SRT10N030HTC-GL	SRT10N030HTCGL	Tube

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Absolute Maximum Ratings

Parameter		Symbol	Rating		Unit
Drain-Source Voltage		V_{DSS}	100		V
Gate-Source Voltage		V_{GSS}	±20		V
Continuous Drain Current, Package Limited	T_C=25ºC	I_D	TO-263-2	176	A
			TO-220C	176	
	T_C=100ºC		TO-263-2	117	
			TO-220C	117	
Continuous Drain Current, Silicon	T_C=25ºC		TO-263-2	186	
			TO-220C	186	
Pulsed Drain Current (Note 2)		I_{DM}	TO-263-2	704	A
			TO-220C	704	
Max Power Dissipation		P_D	208		W
Avalanche Destructive Energy, Single Pulse (Note 4)		E_{AS_Limit}	1764		mJ
Avalanche Energy, Single Pulse (Note 3)		E_{AS}	225		mJ
Continuous Diode Forward Current		I_S	176		A
Diode Pulse Current		$I_{S.PULSE}$	704		A
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}= 30.0A, V_{DD}= 50V, R_G= 25Ω, Starting T_J= 25°C
4. I_{AS_Limit}= 84A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C

Thermal Resistance

Parameter		Symbol	Min	Typ	Max	Unit
Thermal Resistance， Junction-to-Case	TO-263-2	R_{thJC}			0.6	ºC/W
	TO-220C				0.6	
Thermal Resistance， Junction-to-Ambient	TO-263-2	R_{thJA}			40	
	TO-220C				40	

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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	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
	Reverse	I_{GSSR}	V_{GS}=-20V, V_{DS}=0V			-100	
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	2.2	3.0	3.8	V
Static Drain-Source On-Resistance	TO-263-2	$R_{DS(ON)}$	V_{GS}=10V, I_D=90A		2.8	3.3	mΩ
	TO-220C				2.8	3.3	mΩ
Gate Resistance		R_G	f=1MHz, Open Drain		2.2		Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}=50V, V_{GS}=0V, f=1MHz		10		nF
Output Capacitance		C_{OSS}			1200		pF
Reverse Transfer Capacitance		C_{RSS}			40		pF
Turn-on Delay Time		$t_{d(on)}$	V_{DD}=50V, I_D=90A R_G=3Ω, V_{GS}=10V		42		ns
Rise Time		t_r			68		
Turn-off Delay Time		$t_{d(off)}$			95		
Fall Time		t_f			43		
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	VDD=50V, ID=90A VGS=0 to 10V		54		nC
Gate to Drain Charge		Q_{gd}			51		
Gate Charge Total		Q_g			140		
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_{SD}=90A		0.9	1.4	V
Reverse Recovery Time		t_{rr}	V_R=50V, I_F=90A dI$_F$/dt=100A/us		92		ns
Reverse Recovery Charge		Q_{rr}			260		nC
Peak Reverse Recovery Current		I_{rrm}			5.0		A

2.8mΩ, 100V, N-Channel Power MOSFET **SRT10N030H**

Typical Performance Characteristics

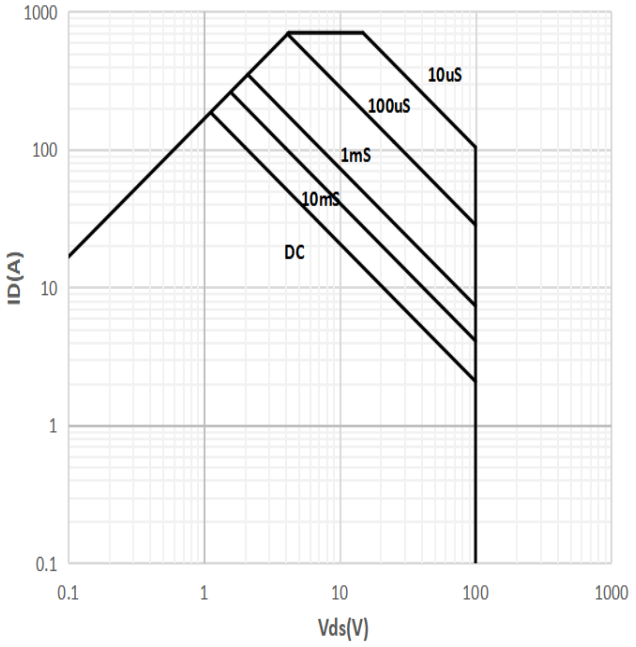
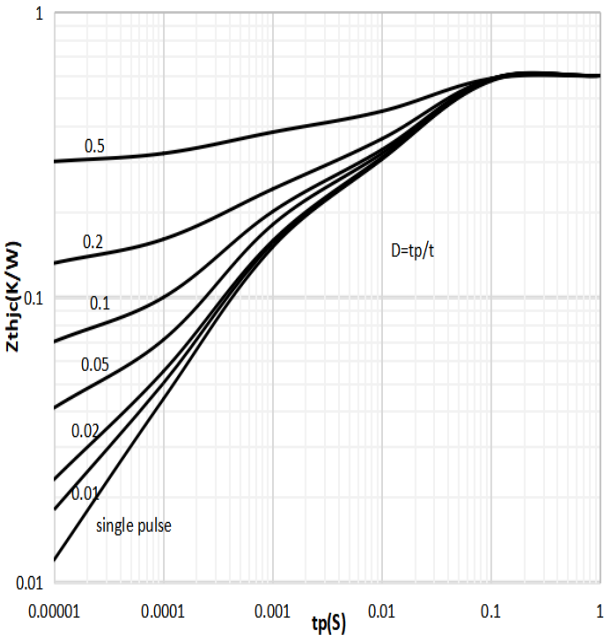
Figure 1: Max. Forward Safe Operating Area	Figure 2: Max. Transient Thermal Impedance
	
I_D=f(V_{DS}); Tc=25℃; V_{GS}＞7.0V; parameter t_p	Z($_{thJC}$)=f(t_p);parameter:D=t_p/T

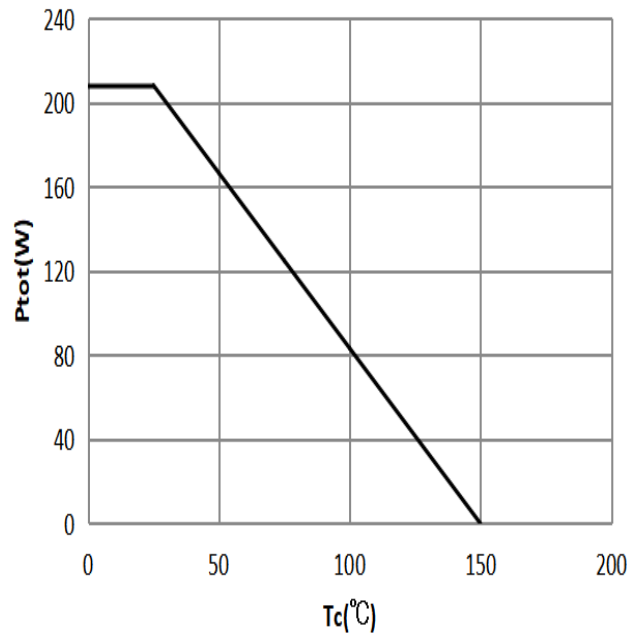
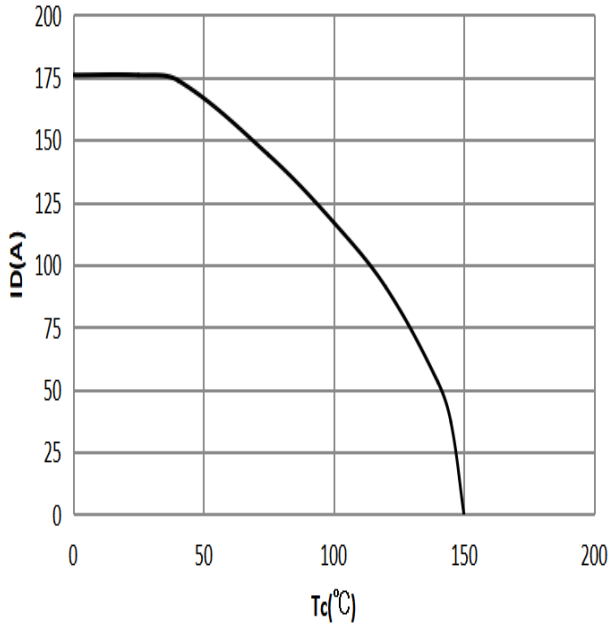
Figure 3: Power Dissipation	Figure 4:Drain Current vs. Temperature
	
Ptot=f(T_C)	I_D = f(T_J); V_{GS}>=10V

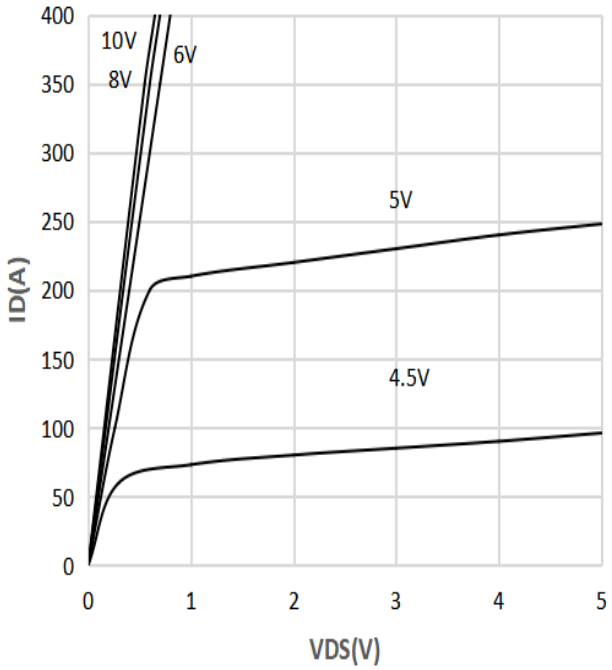
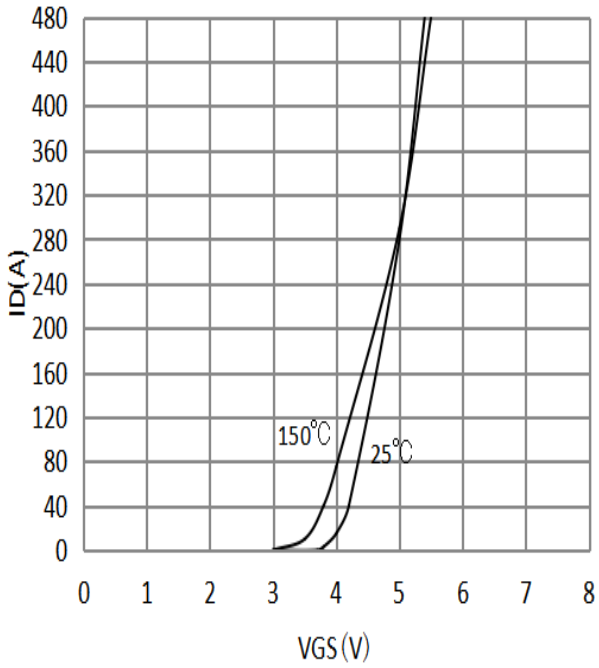
Figure 5: Typ. Output Characteristics	Figure 6: Typ. Transfer Characteristics
	
$I_D=f(V_{DS})$;Tj=25ºC; parameter:V_{GS}	$I_D = f(V_{GS})$; $\|V_{DS}\| > 2\|I_D\|R_{DS(on)max}$

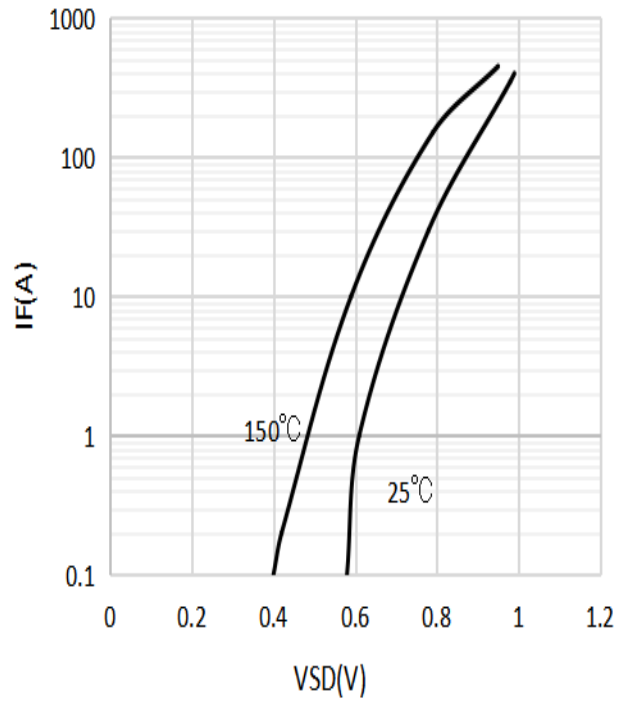
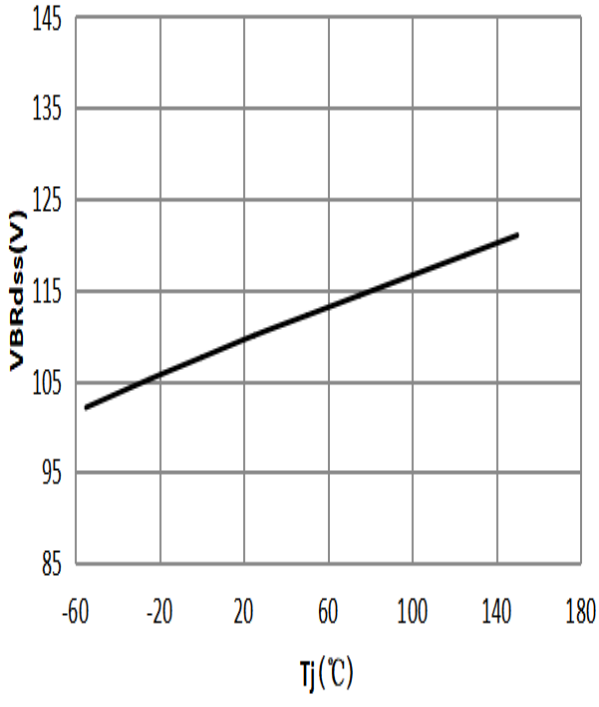
Figure 7: Forward Characteristics of Reverse Diode	Figure 8: Drain-Source Breakdown Voltage
	
$I_F=f(V_{SD})$; parameter: T_j	$V_{BR(DSS)}=f(T_j)$; I_D=5mA

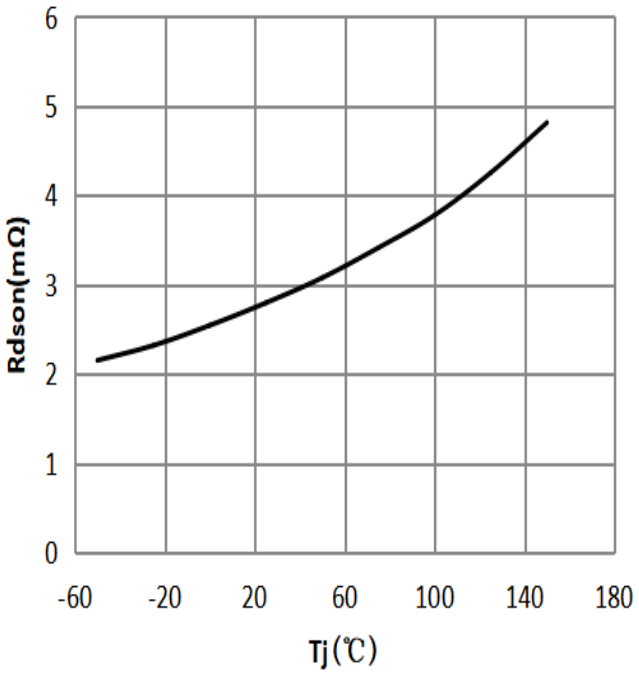
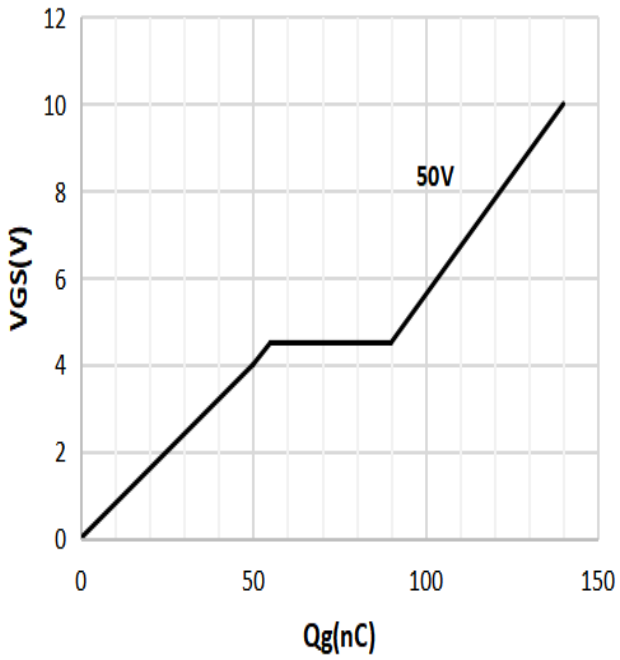
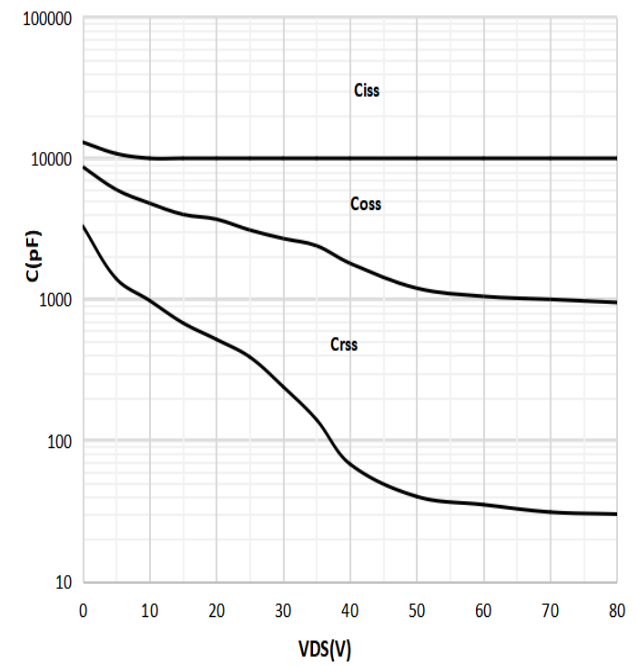
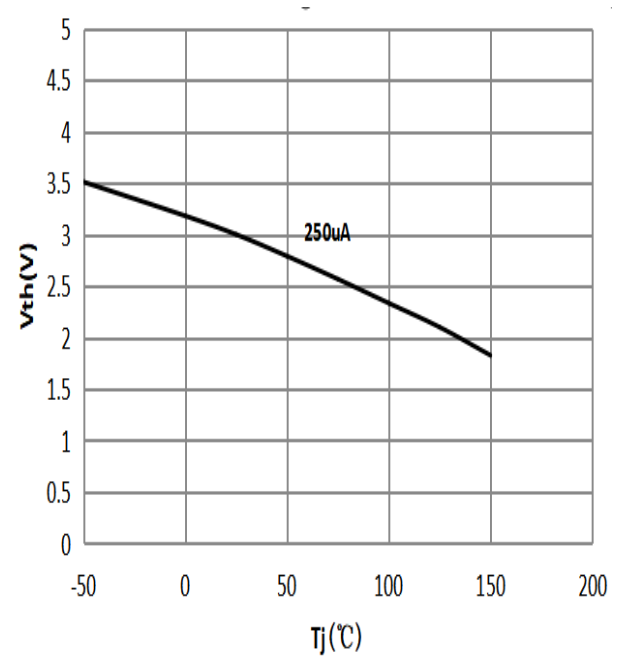
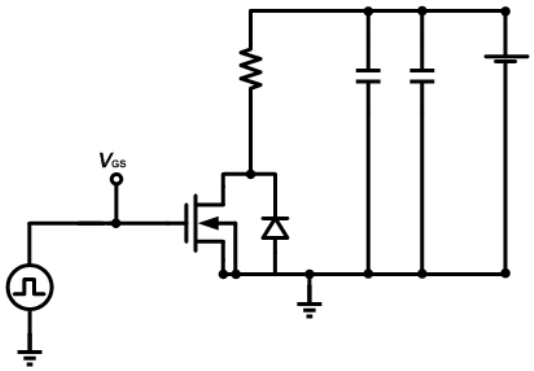
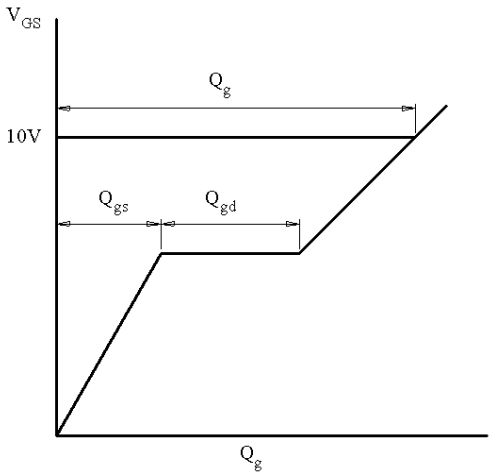
Figure 9: Typ. Drain-Source On-State Resistance	Figure 10: Typ. Gate Charge
	
$R_{DS(ON)}=f(T_j)$; I_D=100A; V_{GS}=10V	$V_{GS}= f(Q_{gate})$, I_D=100A pulsed

Figure 11: Typ. Capacitances	Figure 12: Typ. Gate threshold voltage
	
C=f(V_{DS}); V_{GS}=0; f=1MHz	$V_{GS}= f(T_j)$, $V_{GS}= V_{DS}$

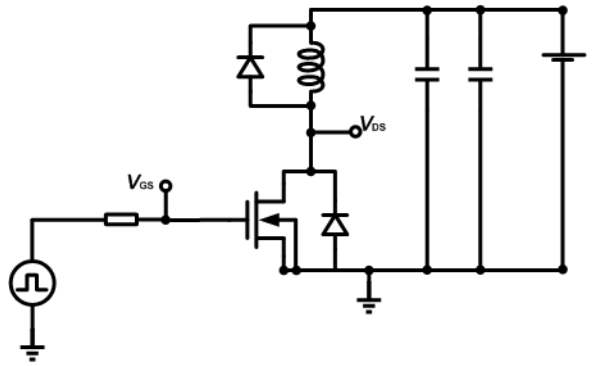
Test Circuits

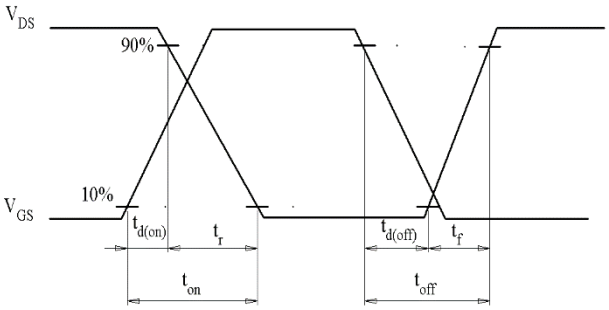
1. Gate Charge Test Circuit & Waveform



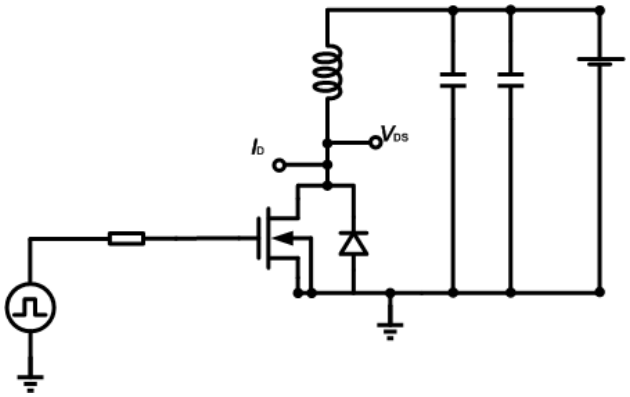


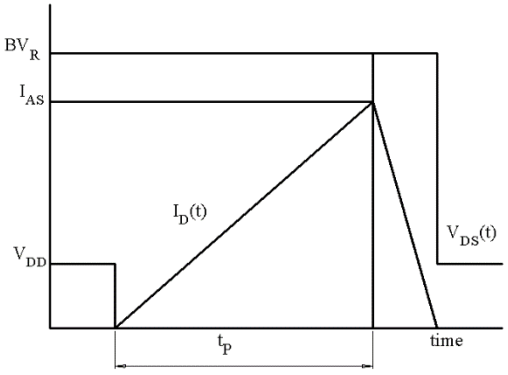
2. Switch Time Test Circuit



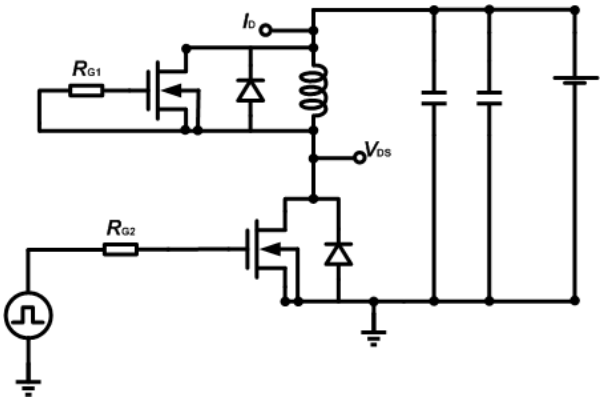


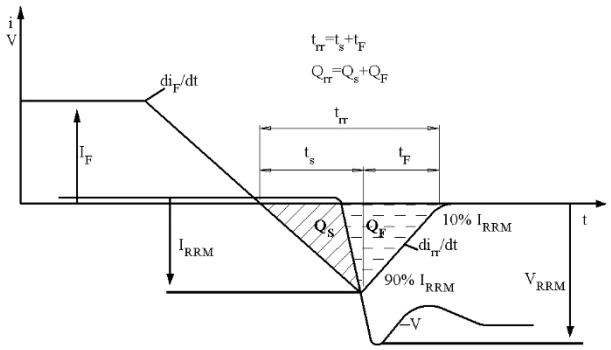
3. Unclamped Inductive Switching Test Circuit & Waveforms





4. Test Circuit and Waveform for Diode Characteristics

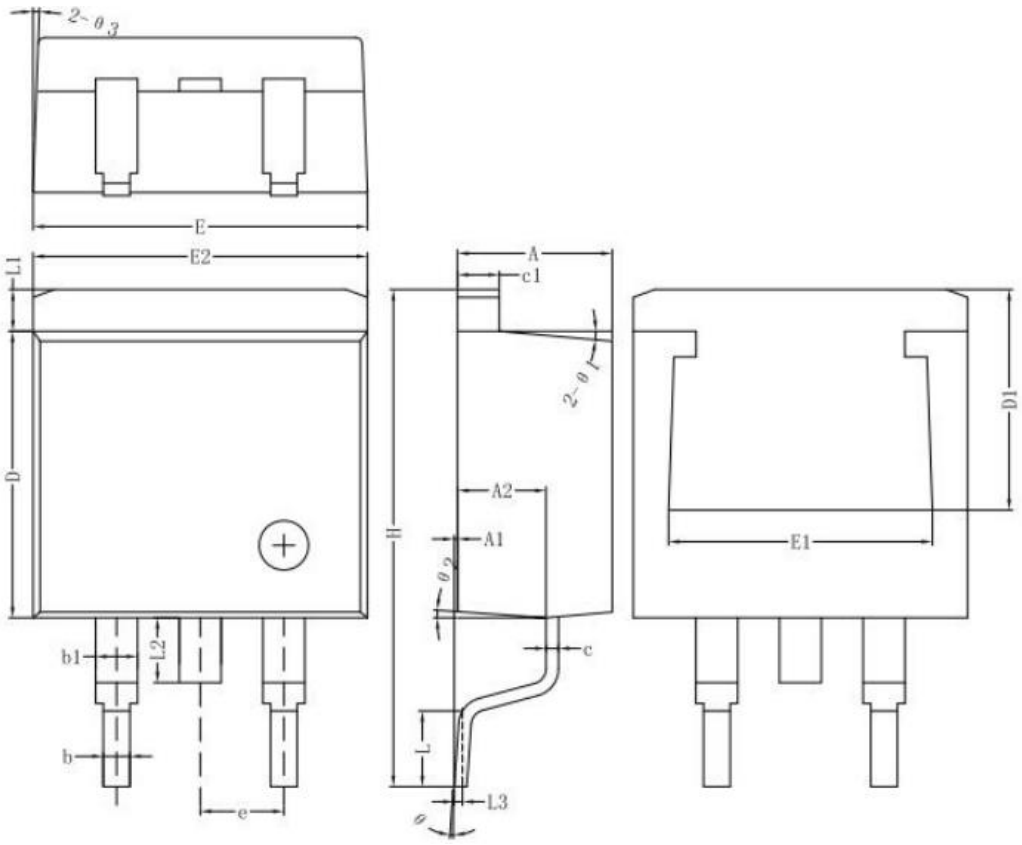




2.8mΩ, 100V, N-Channel Power MOSFET **SRT10N030H**

Mechanical Dimensions

TO-263-2 **Unit: mm**

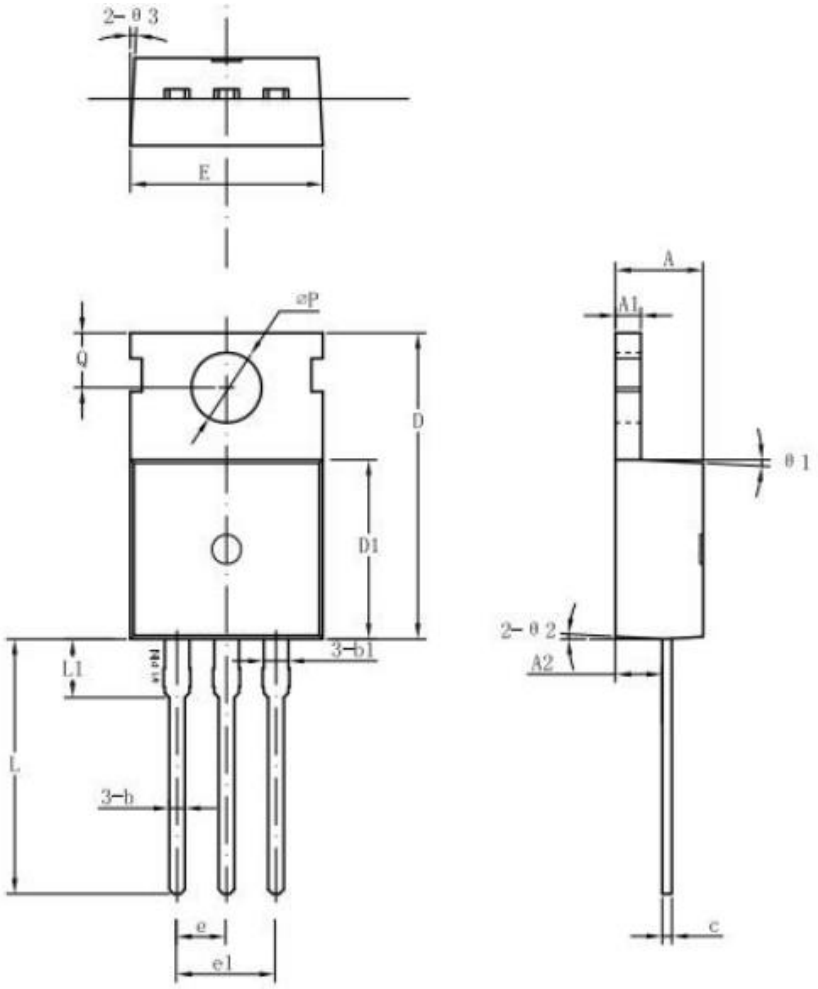


Symbol	Dimensions (mm)			Symbol	Dimensions (mm)		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.55	4.70	4.85	E2	9.98	10.08	10.18
A1	0.00	0.10	0.25	e	–	2.54	–
A2	2.59	2.69	2.89	H	14.70	15.10	15.50
b	0.71	0.81	0.96	L	2.00	2.30	2.70
b1	–	1.27	–	L1	1.17	1.27	1.40
c	0.36	0.38	0.61	L2	–	–	2.20
c1	1.17	1.27	1.37	L3	–	0.25BSC	–
D	8.55	8.70	8.85	Θ	0°	–	8°
D1	–	7.20	–	Θ1	–	5°	–
E	10.01	10.16	10.31	Θ2	–	4°	–
E1	–	7.8	–	Θ3	–	4°	–

2.8mΩ, 100V, N-Channel Power MOSFET SRT10N030H

Mechanical Dimensions

TO-220C **Unit: mm**



Symbol	Dimensions (mm)			Symbol	Dimensions (mm)		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.30	4.50	4.70	e	-	2.54	-
A1	1.25	1.30	1.40	e1	-	5.08	-
A2	2.20	2.40	2.60	L	12.60	13.08	13.60
b	0.70	0.80	0.95	L1	-	3.00	-
b1	-	1.27	-	ΦP	3.50	3.60	3.80
c	0.40	0.50	0.65	Q	2.60	2.80	3.00
D	15.20	15.70	16.20	Θ1	-	3°	-
D1	9.00	9.20	9.40	Θ2	-	3°	-
E	9.70	10.00	10.10	Θ3	-	3°	-

2.8mΩ, 100V, N-Channel Power MOSFET SRT10N030H

Sanrise Technology Limited Company

http://www.sanrise-tech.com

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