

030N100TA / 030N100TB

100V N-Channel Super Trench Power MOSFET



康 比 電 子
HORNBY ELECTRONIC

Description

030N100T is uses Super Trench technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g . This device is ideal for high-frequency switching and synchronous rectification.

General Features

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- Pb-free lead plating

MAIN CHARACTERISTICS

ID	180A
VDSS	100v
$R_{DS(ON)Typ}$ (at VGS=10V) TO-220	2.7m Ω
$R_{DS(ON)Typ}$ (at VGS=10V) TO-263	2.5m Ω

Application

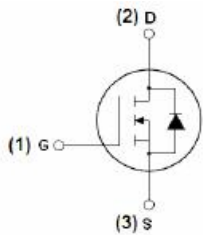
- Motor control and drive
- Battery management
- UPS (Uninterruptible Power Supplies)



030N100TA



030N100TB



Absolute maximum ratings

Symbol	Parameter		030N100TA	030N100TB	Unit
V _{DSS}	Drain-source voltage		100		V
V _{GSS}	Gate-Source Voltage		± 20		V
I _D	Drain Current -continuous(TC=25℃)		180		A
	Drain Current -continuous(TC=100℃)		138		
I _{DM}	Drain Current-Pulsed		720		A
P _D	Power Dissipation	Tc=25℃	250		W
E _{AS}	Single pulsed avalanche energy (Note5)		950		mJ

Thermal Characteristics

Symbol	Parameter	030N100TA	030N100TB	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note2)	0.5		$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62		$^{\circ}C/W$

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Electrical Characteristics T_c=25°C unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max	Unit
Off Characteristics						
BV _{DSS}	Drain Source breakdown voltage	V _{GS} =0V, I _D =250uA, T _J =25°C	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V, V _{GS} =0V	-	-	1	uA
I _{GSS}	Gate-to-Source Forward Leakage	V _{GS} =±20V, V _{DS} =0V	-	-	±200	nA

On Characteristics (Note 3)

V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2		4	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =90A	TO-220	-	2.7	3 mΩ
			TO-263	-	2.5	3 mΩ
G _{FS}	Forward Transconductance	V _{DS} =5V, I _D =90A	-	197	-	S

Dynamic Characteristics (Note 4)

C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, F=1MHz	-	13200	-	pF
C _{oss}	Output Capacitance		-	1080	-	pF
C _{rss}	Reverse Transfer Capacitance		-	48	-	pF

SWITCHING Characteristics (Note 4)

T _{D(on)}	Turn-on Delay Time	V _{DD} =50V, I _D =50A, R _G =3Ω, V _{GS} =10V	-	35	-	ns
T _r	Turn-on Rise Time		-	108	-	ns
T _{D(off)}	Turn-off Delay Time		-	84	-	ns
T _f	Turn-off Fall Time		-	107	-	ns
Q _g	Total Gate Charge	V _{DS} =50V, I _D =90A, V _{GS} =10V	-	175	-	nC
Q _{gs}	Gate Source Charge		-	65	-	nC
Q _{gd}	Gate Drain Charge		-	40	-	nC

Drain-Source Diode Characteristics and Maximum Ratings

V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =90A	-	-	1.2	V
T _{rr}	Reverse Recovery Time	T _J =25°C, V _R =50V, I _F =90A, di/dt=100A/uS (Note3)	-	96	-	ns
Q _{rr}	Reverse Recovery Charge		-	310	-	uC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Surface Mounted on FR4 Board, t≤10 sec.
3. Pulse test: Pulse Width ≤300uS, Duty Cycle≤2%
4. Guaranteed by design, not subject to production
5. EAS condition: T_J=25°C, V_{DD}=50V, V_G=10V, L=1mH, R_g=25Ω

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Fig 1: Output Characteristics

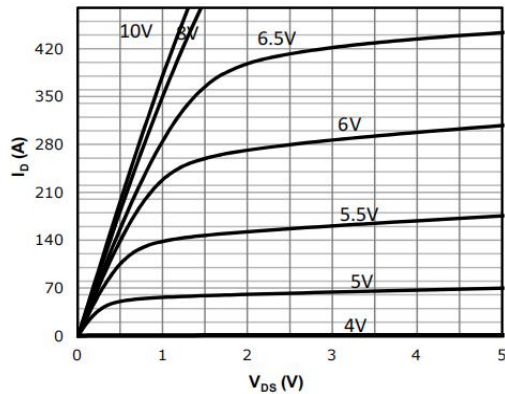


Fig 2: Transfer Characteristics

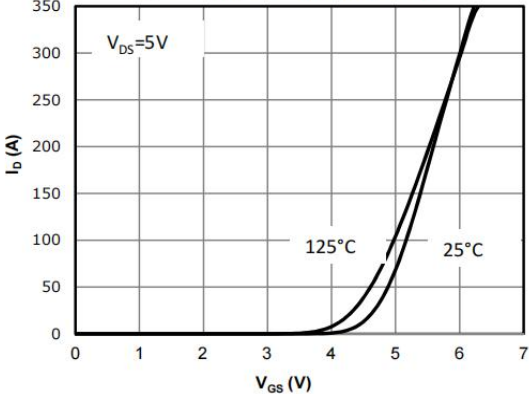


Fig 3: Rds(on) vs Drain Current and Gate Voltage

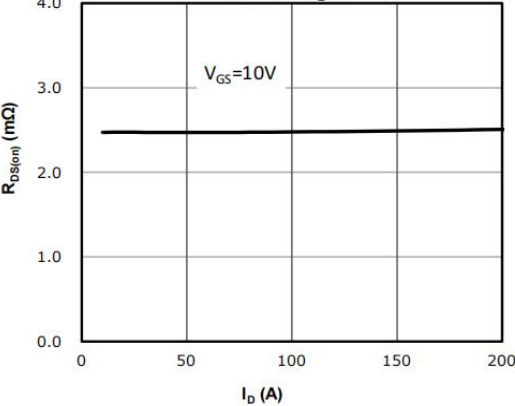


Fig 4: Rds(on) vs Gate Voltage

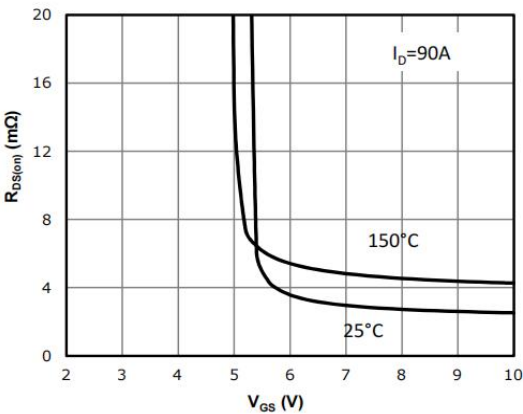


Fig 5: Rds(on) vs. Temperature

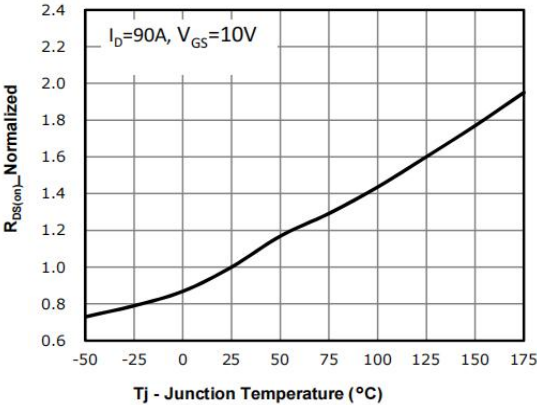
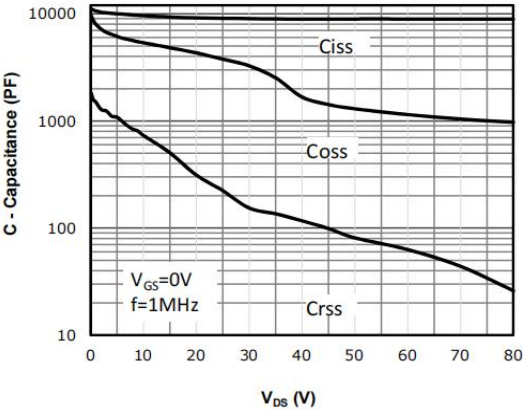
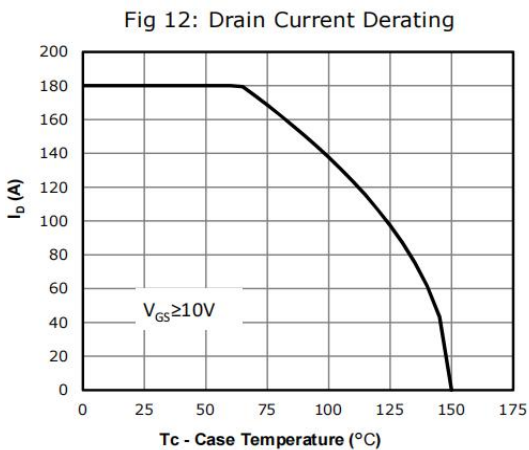
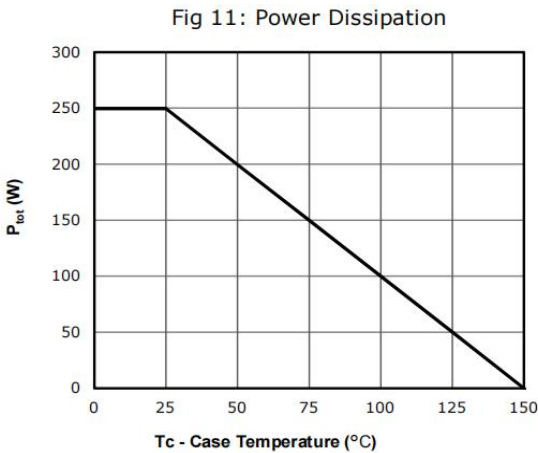
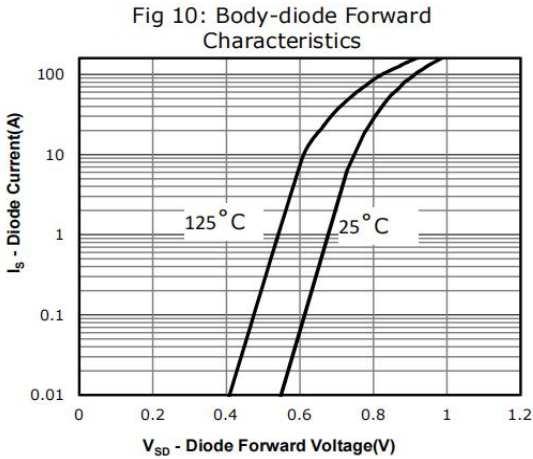
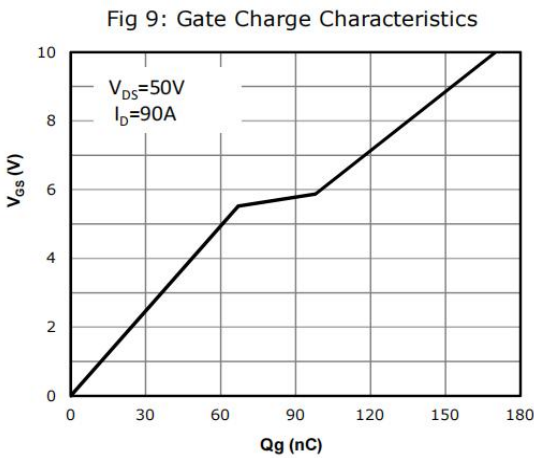
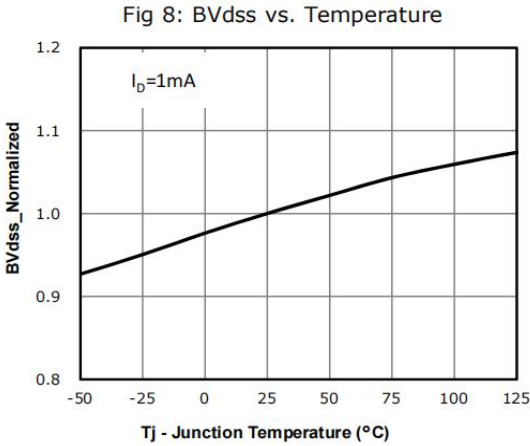
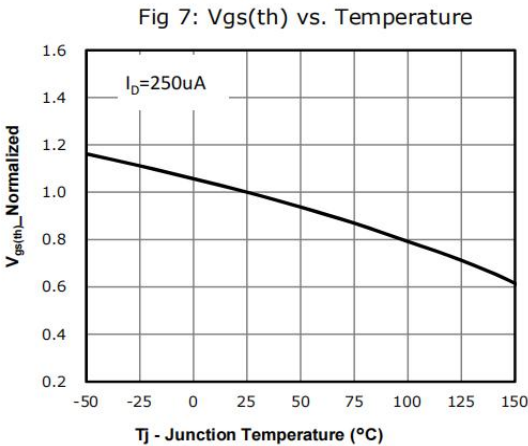


Fig 6: Capacitance Characteristics



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Fig 13: Safe Operating Area

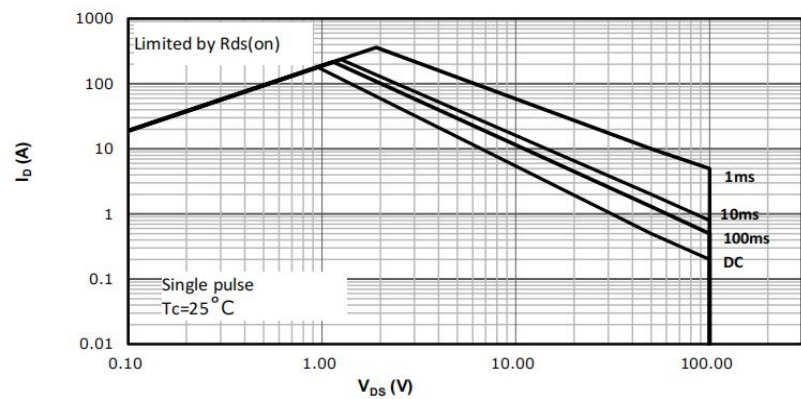
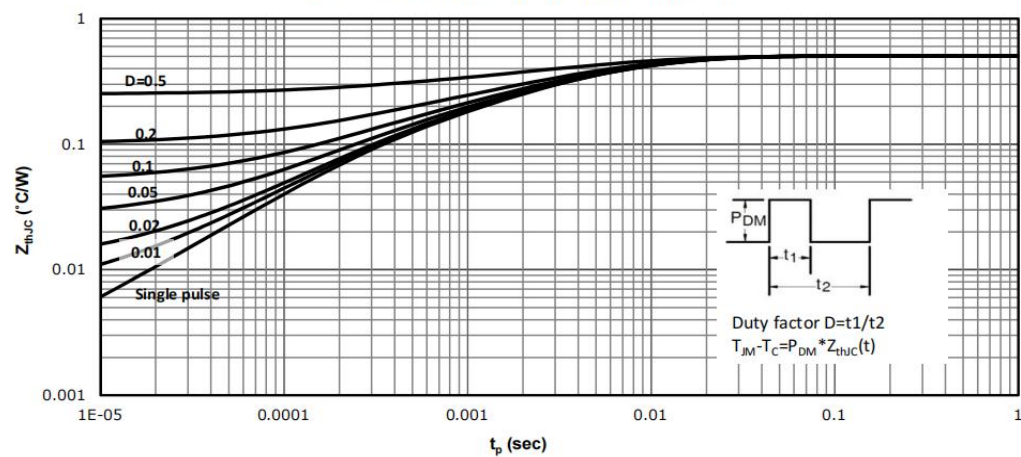


Fig 14: Max. Transient Thermal Impedance

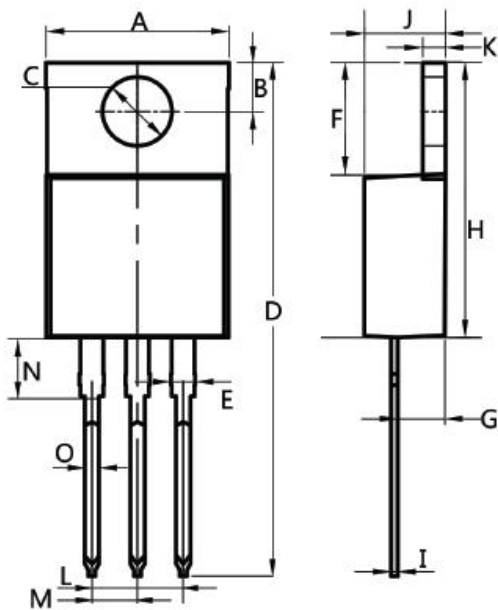


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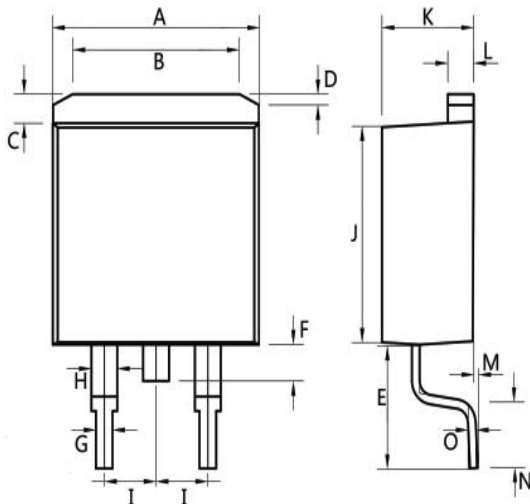
Package Outline

T0-220 封装尺寸 (Package size)



Dim	Min	Max
A	10	10.4
B	2.5	3
C	3.5	4
D	28	30
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15	16
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
L	Typ 5.08	
M	Typ 2.54	
N	3.1	3.5
O	0.7	0.9
P	10	10.4

T0-263 封装尺寸 (Package size)



Dim	Min	Max
A	10	10.5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5	6
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	TYP 2.54	
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45