



HGS100N10 N-CHANNEL MOSFET

FEATURES

- Low gate charge
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product

产品特性

- 低栅极电荷
- 开关速度快
- 产品全部经过雪崩测试
- 高抗 dv/dt 能力
- RoHS 产品

APPLICATIONS

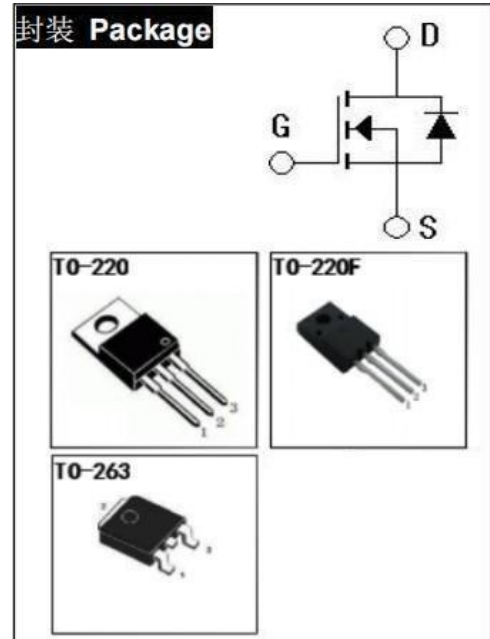
- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- LED power supplies

用途

- 高频开关电源
- 电子镇流器
- LED 电源

主要参数 MAIN CHARACTERISTICS

I_D		100 A
V_{DSS}		100 V
R_{dson} ($V_{gs}=10V$)	Typ	
	Max	12m Ω
Q_g -typ		25.7nC



产品型号信息 PRODUCT MESSAGE

型号 Model	印记 Marking	封装 Package
HGS100N10C	HGS100N10C	TO-220
HGS100N10D	HGS100N10D	TO-220F
HGS100N10S	HGS100N10S	TO-263



HGS100N10 N-CHANNEL MOSFET

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)			
Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^B	I_D	$T_C = 25^\circ\text{C}$	90
		$T_C = 100^\circ\text{C}$	76
Pulsed Drain Current ^A	I_{DM}	380	A
Avalanche Current ^A	I_{AS}	38	A
Single Pulse Avalanche Energy $L = 0.3\text{mH}$ ^A	E_{AS}	300	mJ
Power Dissipation ^C	P_D	$T_C = 25^\circ\text{C}$	230
		$T_C = 100^\circ\text{C}$	140
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Thermal Characteristics			
Parameter	Symbol	Maximum	Units
Maximum Junction-to-Case	Steady-State $R_{\theta JC}$	0.8	$^\circ\text{C/W}$
Maximum Junction-to-Ambient	Steady-State $R_{\theta JA}$	50	



Electrical Characteristics($T_J=25^{\circ}\text{C}$ unless otherwise noted)						
Symbol	Parameter	Conditions	Value			Units
			Min	Typ	Max	
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	100			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100\text{V}, V_{GS}=0\text{V}$	$T_J=25^{\circ}\text{C}$		1	μA
			$T_J=125^{\circ}\text{C}$		100	
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.1	1.6	2.4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}, I_D=30\text{A}$		6	7	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}, I_D=30\text{A}$		8	9	$\text{m}\Omega$
g_{FS}	Forward Transconductance	$V_{DS}=5\text{V}, I_D=20\text{A}$		80		S
V_{SD}	Diode Forward Voltage	$I_S=30\text{A}, V_{GS}=0\text{V}$			1	V
I_S	Maximum Body-Diode Continuous Current ^B				100	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}, V_{DS}=50\text{V}, f=1\text{MHz}$		3000		pF
C_{oss}	Output Capacitance			530		
C_{rss}	Reverse Transfer Capacitance			20		
R_g	Gate Resistance	$f=1\text{MHz}$		0.9		Ω
SWITCHING PARAMETERS						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=10\text{V}, V_{DS}=50\text{V}, I_D=20\text{A}$		25.7		nC
$Q_g(4.5\text{V})$	Gate Source Charge			13		
Q_{gs}	Gate Source Charge			4.3		
Q_{gd}	Gate Drain Charge			5.3		
Q_{oss}	Output Charge	$V_{GS}=0\text{V}, V_{DS}=50\text{V}$		34.2		
$t_{D(on)}$	Turn-On Delay Time	$V_{GS}=10\text{V}, V_{DS}=50\text{V}, I_D=20\text{A}, R_G=1.8\Omega$		33		ns
t_r	Turn-On Rise Time			4		
$t_{D(off)}$	Turn-Off Delay Time			55		
t_f	Turn-Off Fall Time			3.1		
t_{rr}	Body Diode Reverse Recovery Time	$I_r=20\text{A}, di/dt=100\text{A}/\mu\text{s}$		49		ns
Q_{rr}	Body Diode Reverse Recovery Charge			71		nC

A. Single pulse width limited by maximum junction temperature.

B. The maximum current rating is package limited.

C. The power dissipation P_D is based on $T_{J(MAX)}=175^{\circ}\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

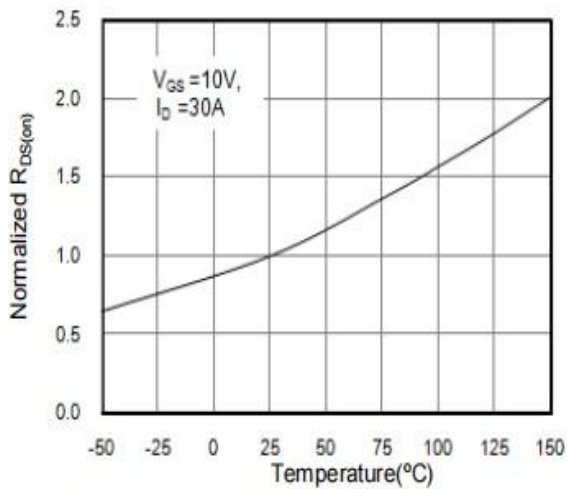


Figure 7: On-Resistance vs. Junction Temperature

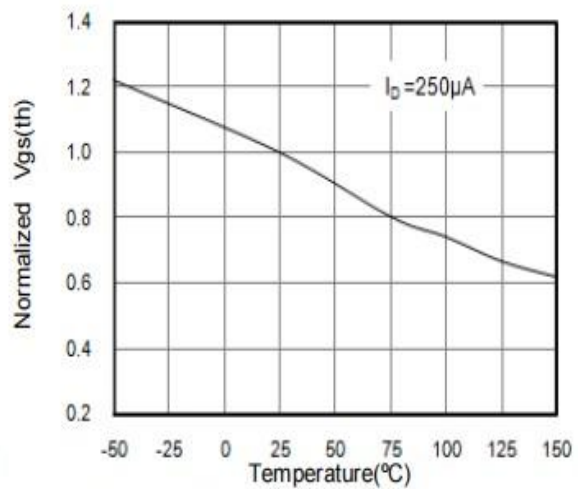


Figure 8: V_GS(th) vs. Junction Temperature

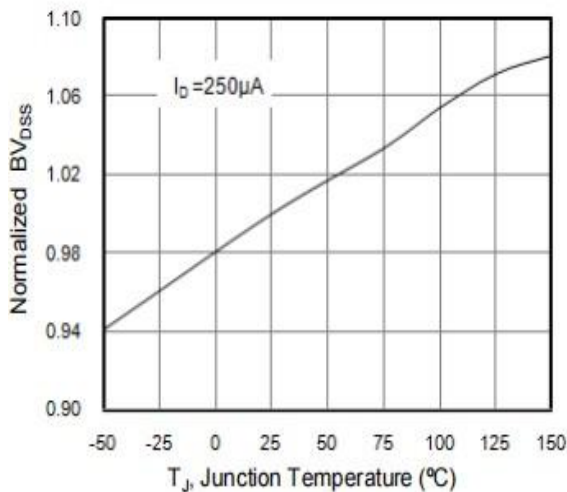


Figure 9: BV_DS(s) vs. Junction Temperature

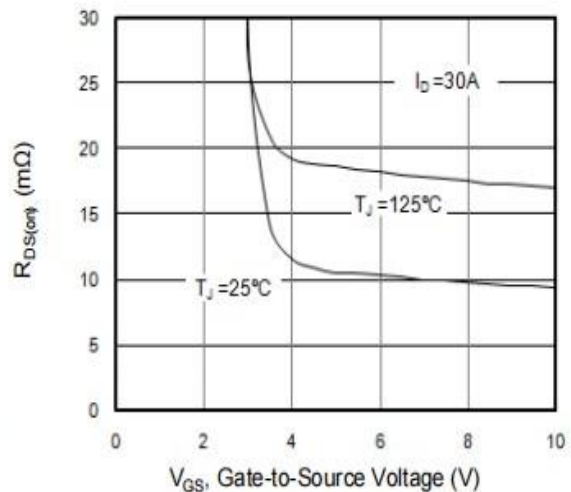


Figure 10: On-Resistance vs. Gate-Source Voltage

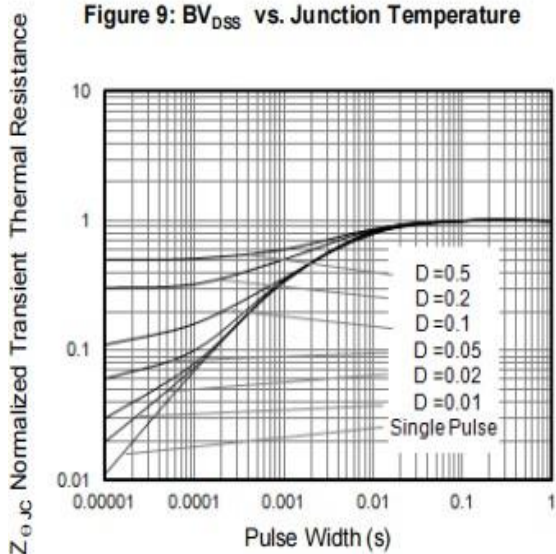


Figure 11: Normalized Transient Thermal Resistance

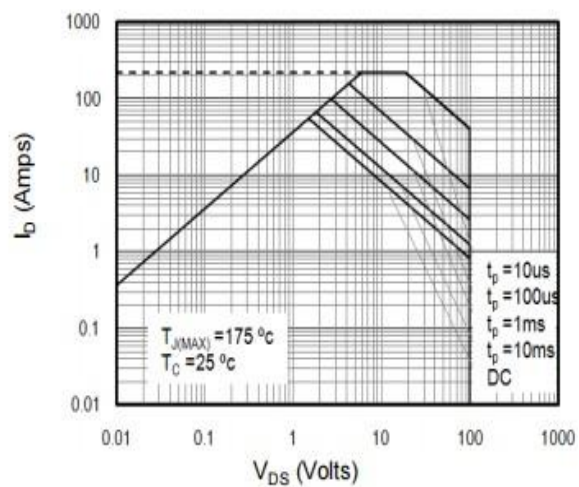


Figure 12: Safe Operating Area



Figure A: Gate Charge Test Circuit and Waveforms

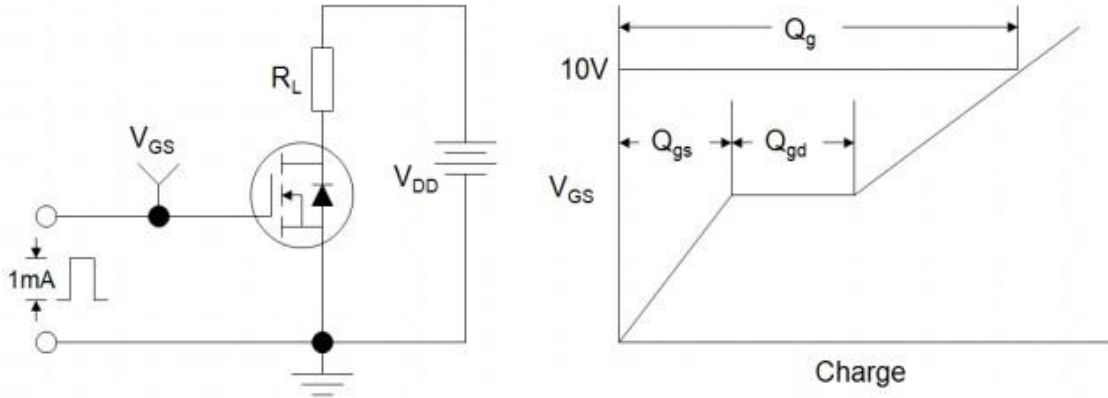


Figure B: Resistive Switching Test Circuit and Waveforms

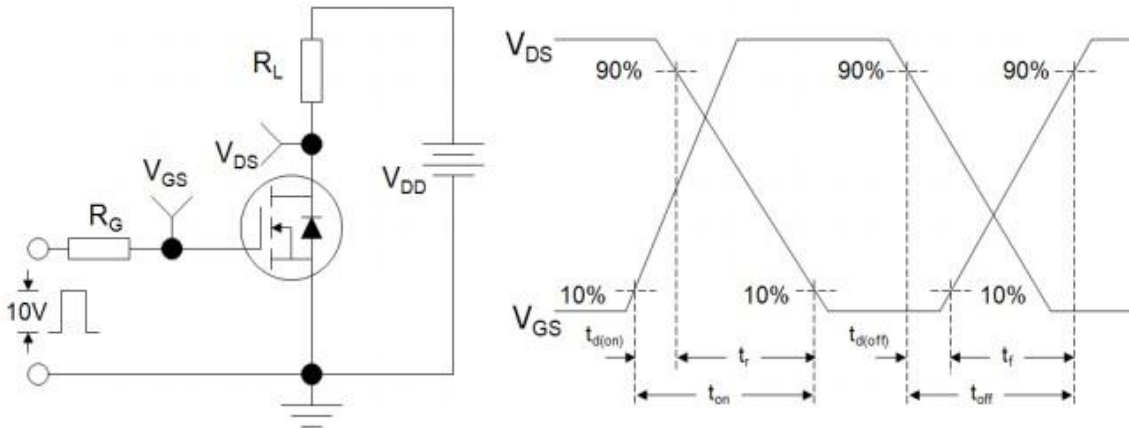
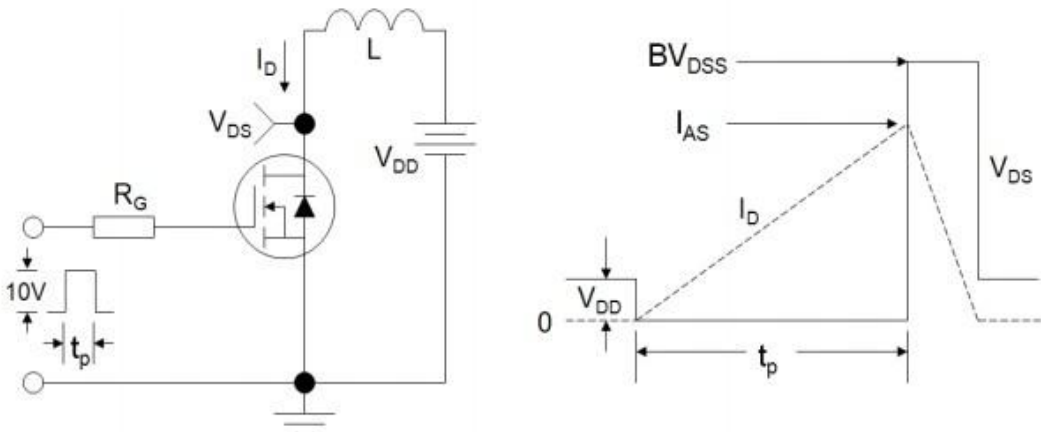


Figure C: Unclamped Inductive Switching (UIS) Test Circuit and Waveforms

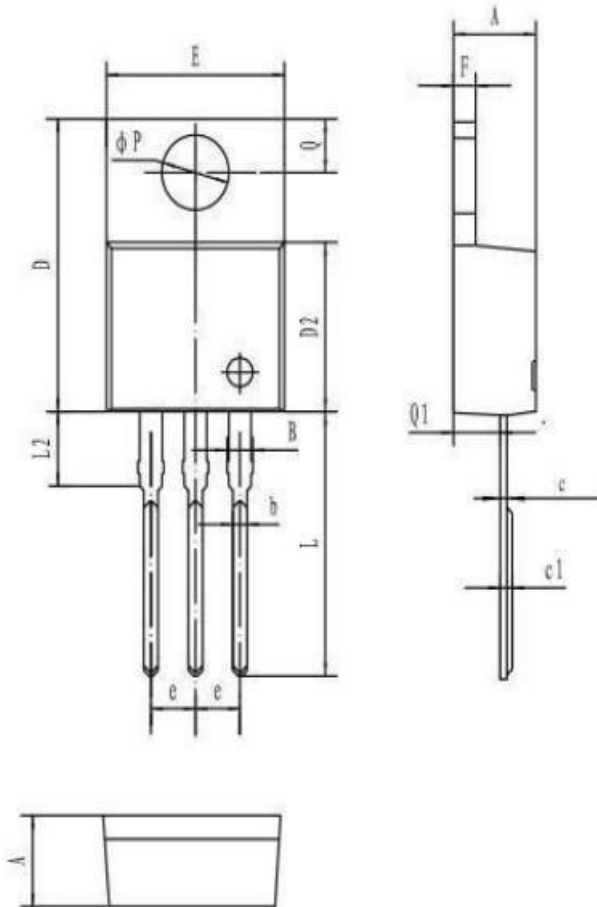




外形尺寸 PACKAGE MECHANICAL DATA

TO-220

单位 Unit : mm



符号 symbol	MIN	MAX
A	4.40	4.80
B	1.10	1.40
b	0.70	0.95
c	0.28	0.48
c1	0.32	0.52
D	14.45	16.00
D2	8.20	9.20
E	9.60	10.40
e	2.39	2.69
F	1.20	1.35
L	13.05	14.05
L2	3.70	3.90
Q	2.40	3.00
Q1	2.20	2.90
P	3.50	4.00



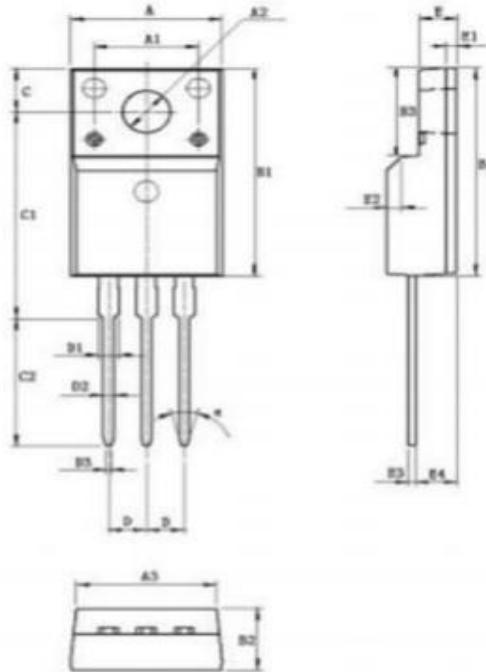
外形 寸 PACKAGE MECHANICAL DATA

TO-220F

单位 Unit : mm

Package Dimension

TO-220F



单位: mm

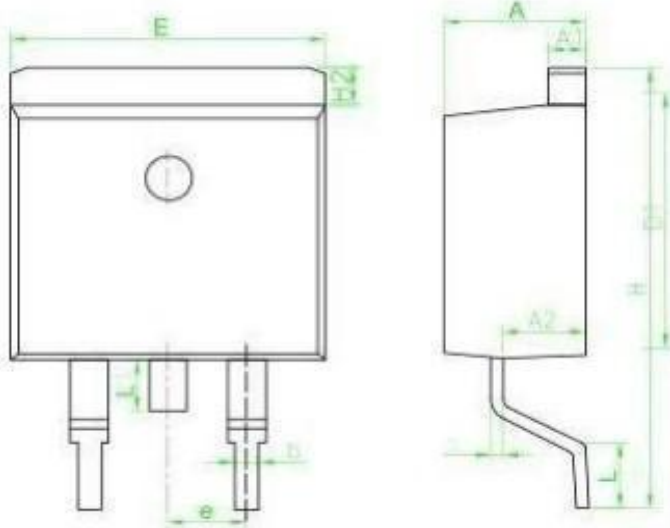
Symbol	Min	Max	Symbol	Min	Max
A	9.96	10.36	D	2.54	
A1	7.00		D1	1.15	1.35
A2	3.08	3.28	D2	0.70	0.90
A3	9.25	9.65	D3	0.28	0.48
B1	15.70	16.10	E	2.34	2.74
B2	4.50	4.90	E1	0.70	
B3	6.20	6.80	E2	1.0×45°	
C	3.20	3.40	E3	0.36	0.65
C1	15.20	16.00	E4	2.55	2.95
C2	9.75	10.15	a(度)	30°	



外形尺寸 PACKAGE MECHANICAL DATA

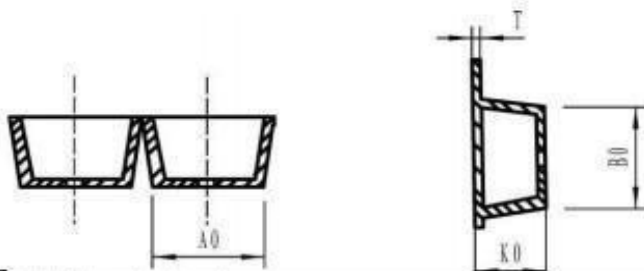
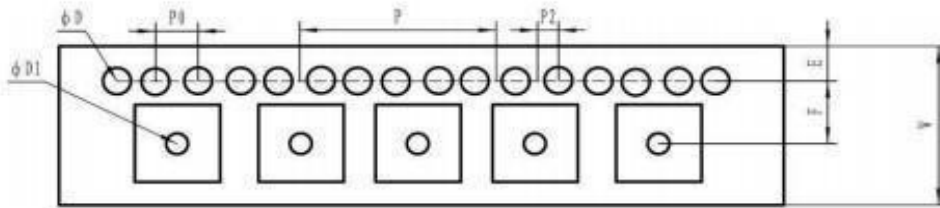
TO-263

单位 Unit : mm



SYMBOL	MM.	
	MIN	MAX
A	4.30	4.80
A1	1.12	1.42
A2	2.54	2.84
b	0.67	1.00
c	0.29	0.52
D1	8.40	9.00
E	9.80	10.46
e	2.54BSC	
H	14.00	16.00
H2	1.12	1.45
L	1.50	3.10
L1	1.45	1.70

编带 REEL



产品尺寸规格 (UNIT: mm)					
规格	V	A0	E	F	D
尺寸	24 ± 0.3	10.9 ± 0.2	1.75 ± 0.2	11.5 ± 0.2	1.5 ± 0.2 / -0.1
规格	D1	P0	P2	P	T
尺寸	1.5 ± 0.2 / -0.1	4 ± 0.2	2 ± 0.2	14 ± 0.2	0.35 ± 0.05
规格	K0	B0			
尺寸	4.9 ± 0.2	16.0 ± 0.2			



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