HGS140N10 N-CHANNEL MOSFET

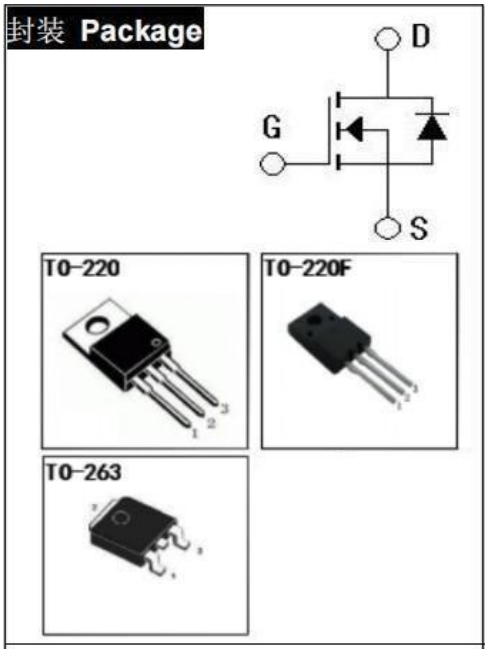
FEATURES

- 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

封装 Package



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		140 A
V_{DSS}		100 V
Rdson (Vgs=10V)	Typ	
	Max	4.5mΩ
Qg-typ		98nC

产品型号信息 PRODUCT MESSAGE

型 号 Model	印 记 Marking	封 装 Package
HGS140N10C	HGS140N10C	TO-220
HGS140N10D	HGS140N10D	TO-220F
HGS140N10S	HGS140N10S	TO-263

Absolute Maximum Ratings at T_j= 25°C unless otherwise noted				
Parameter		**Symbol**	**Value**	**Unit**
Drain-Source Voltage (V_{GS} = 0V)		V_{DSS}	100	V
Continuous Drain Current T_C = 25°C	(note1)	I_D	140	A
Continuous Drain Current T_C = 100°C	(note1)		100	A
Pulsed Drain Current	(note2)	I_{DM}	450	A
Gate Source Voltage		V_{GSS}	±20	V
Single Pulse Avalanche Energy	(note3)	E_{AS}	480	mJ
Power Dissipation T_C = 25°C	(note4)	P_D	198	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~175	°C

Thermal Characteristics				
Parameter		**Symbol**	**Value**	**Unit**
Thermal Resistance, Junction-to-Case	(note1)	$R_{\theta JC}$	0.42	°C/W
Thermal Resistance, Junction-to-Ambient	(note1)	$R_{\theta JA}$	62	

Typical Characteristics T_J = 25°C, unless otherwise noted

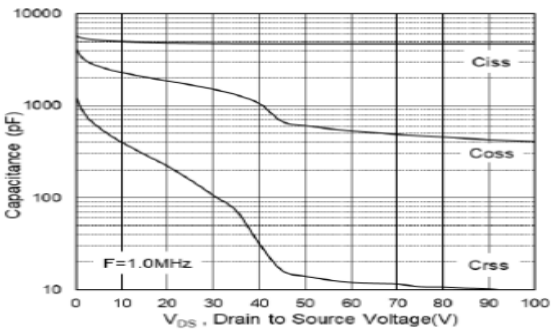


Fig.7 Capacitance

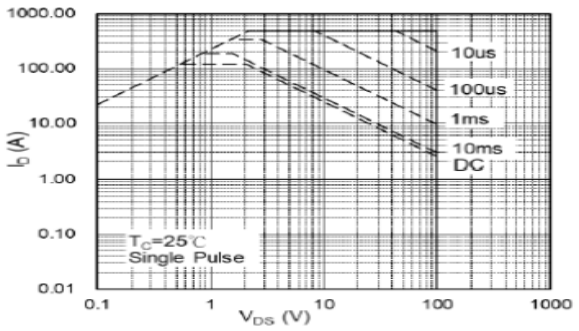


Fig.8 Safe Operating Area

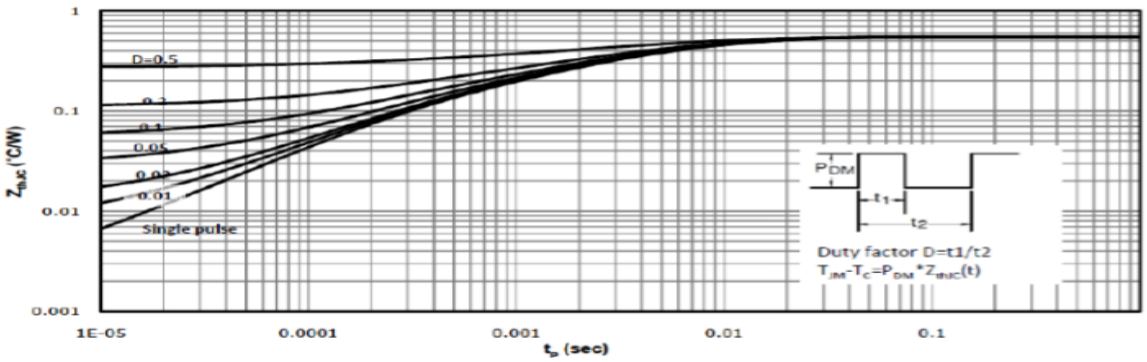


Fig.9 Normalized Maximum Transient Thermal Impedance

Electrical Characteristics T_j= 25ºC unless otherwise specified

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V, T_J = 25ºC	--	--	1	uA
		V_{DS} = 100V, V_{GS} = 0V, T_J = 55ºC	--	--	5	uA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	--	4	V
Drain-Source On-Resistance (note2)	$R_{DS(on)}$	V_{GS} = 10V, I_D = 60A	--	4.2	4.5	mΩ
		V_{GS} = 10V, I_D = 2A	--	3.9	4.3	
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1.0MHz	--	5987	--	pF
Output Capacitance	C_{oss}		--	768	--	
Reverse Transfer Capacitance	C_{rss}		--	13	--	
Total Gate Charge （10V）	Q_g	V_{DS} = 48V, I_D = 20A, V_{GS} = 10V	--	98	--	nC
Gate-Source Charge	Q_{gs}		--	19	--	
Gate-Drain Charge	Q_{gd}		--	27	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = 30V, I_D = 30A V_{GS} = 10V,R_G = 3Ω	--	31	--	ns
Turn-on Rise Time	t_r		--	9	--	
Turn-off Delay Time	$t_{d(off)}$		--	85	--	
Turn-off Fall Time	t_f		--	23	--	
Body Diode Characteristics						
Source-Drain Current(Body Diode)	I_{SD}		--	--	140	A
Pulsed Source-Drain Current(Body Diode)	I_{SDM}		--	--	450	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 1A, V_{GS} = 0V	--	--	1.3	V
Reverse Recovery Time	t_{rr}	T_J = 25ºC , I_F = 30A di_F/dt = 100A/μs	--	95	--	ns
Reverse Recovery Charge	Q_{rr}		--	265	--	nC

Notes

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width≦300us , duty cycle≦2%
3. The E_{AS} data shows Max. rating . The test condition is V_{DD} =50V,V_{GS} =10V,L=1mH
4. The power dissipation is limited by 175℃ junction temperature
5. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics T_J = 25ºC, unless otherwise noted

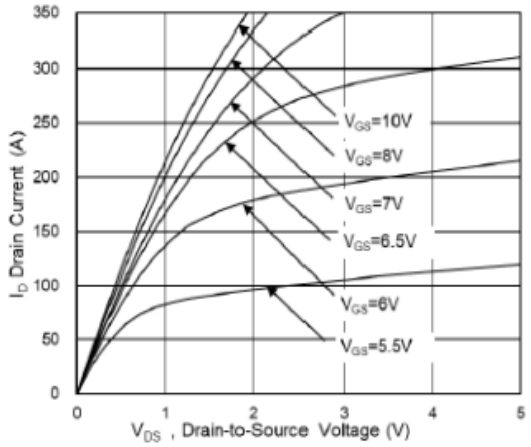


Fig.1 Typical Output Characteristics

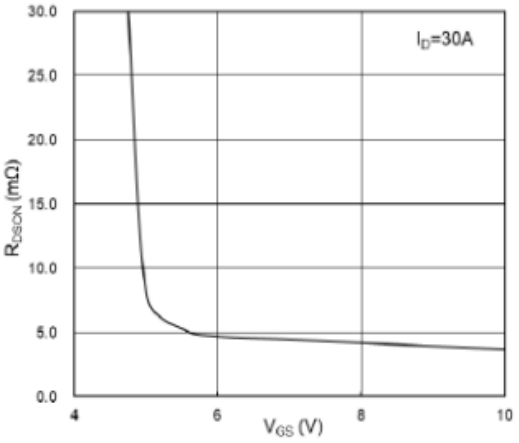


Fig.2 On-Resistance v.s Gate-Source

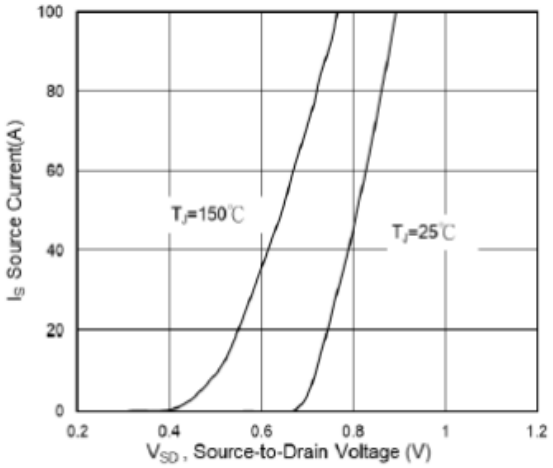


Fig.3 Forward Characteristics of Reverse

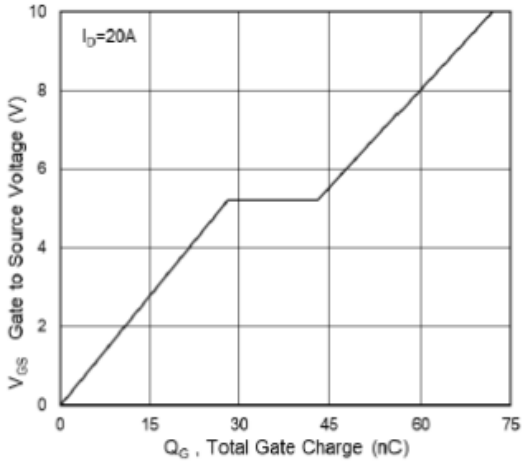


Fig.4 Gate-Charge Characteristics

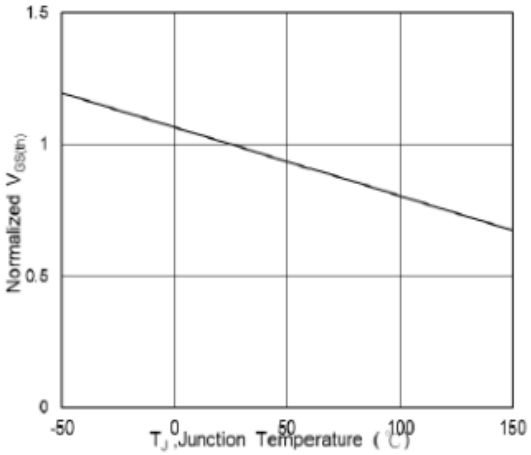


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

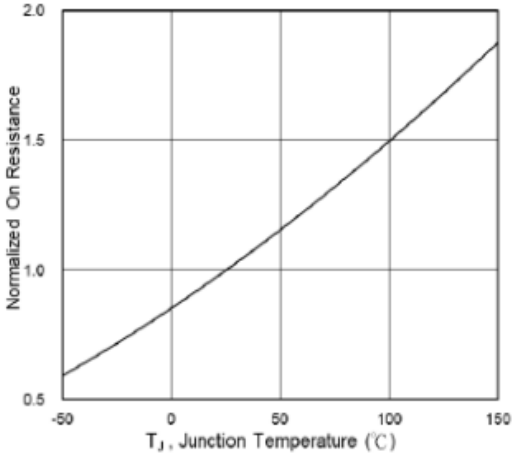


Fig.6 Normalized R_{DSON} vs. T_J

Figure A：Gate Charge Test Circuit and Waveform

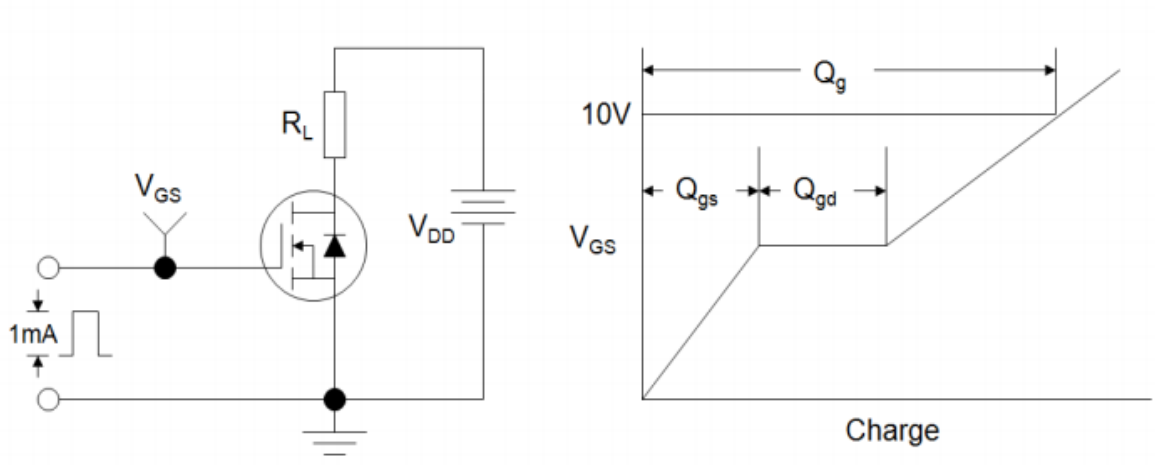


Figure B：Resistive Switching Test Circuit and Waveform

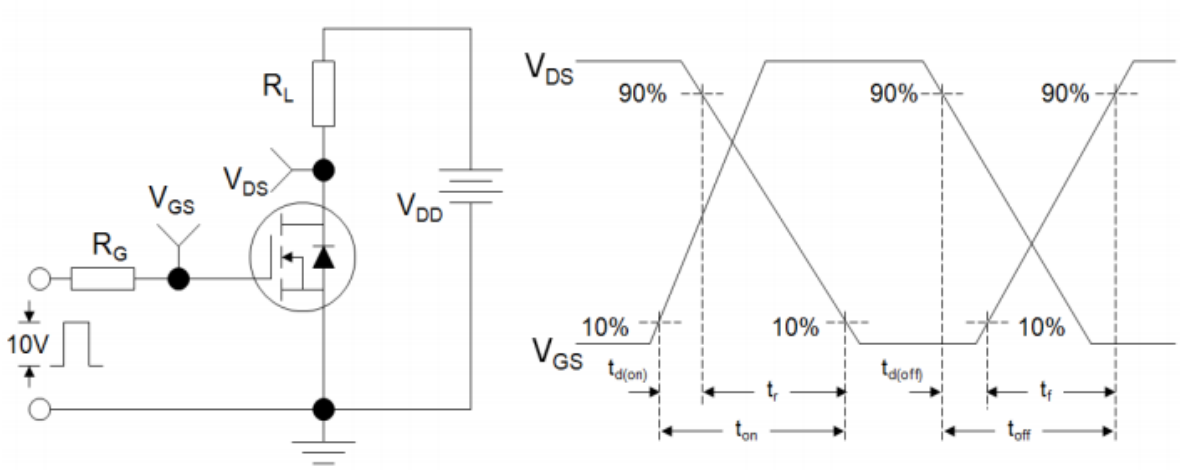
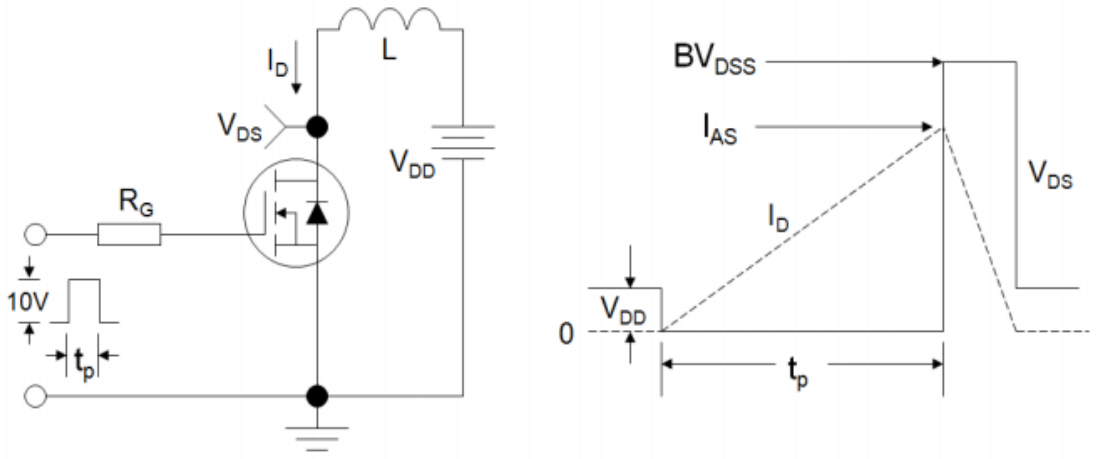


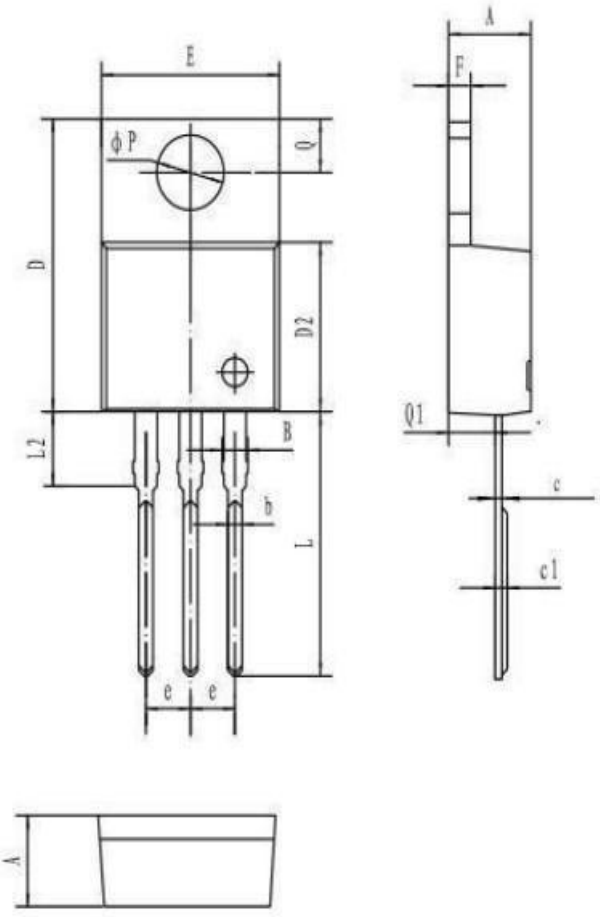
Figure C：Unclamped Inductive Switching Test Circuit and Waveform



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

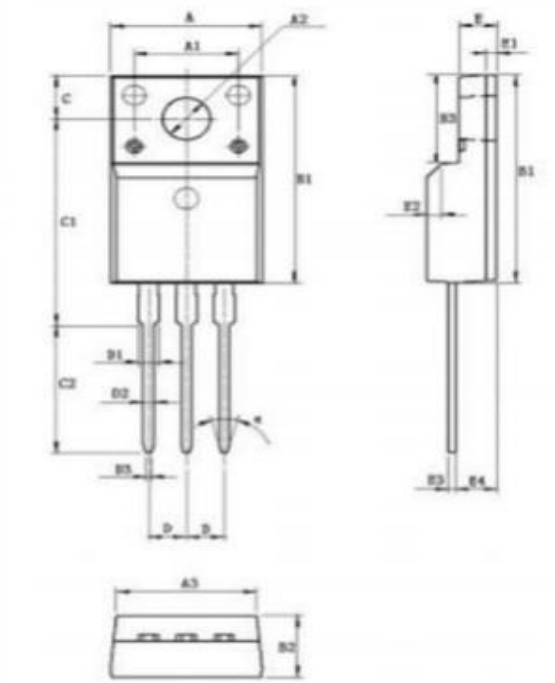
外形 寸 PACKAGE MECHANICAL DATA

TO-220F

单位 Unit ： mm

Package Dimension

TO-220F



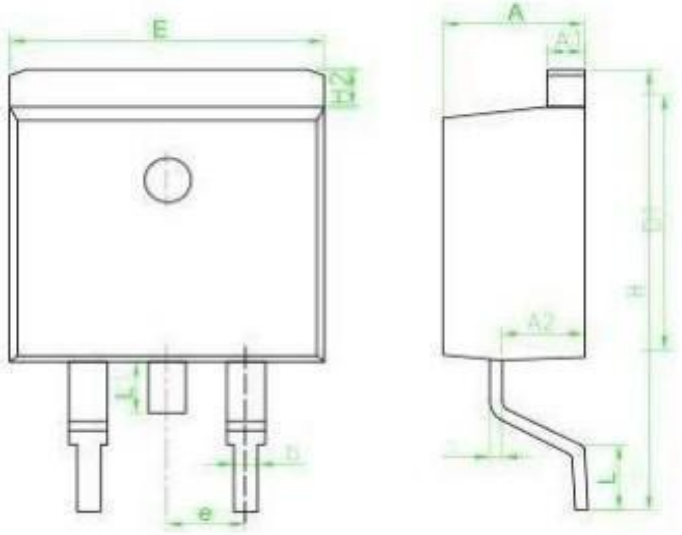
单位：mm

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**

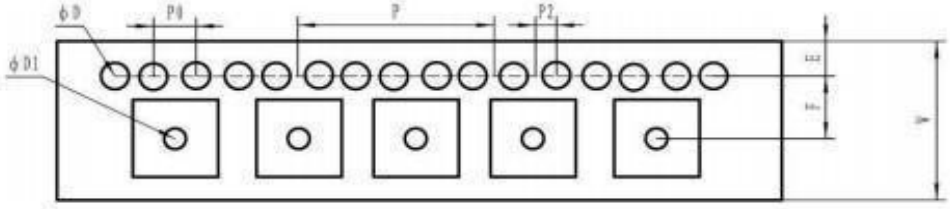
TO-263

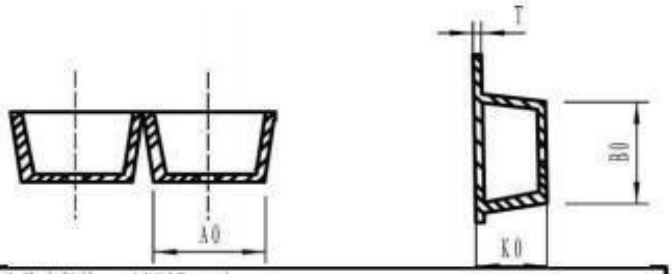
单位 Unit：mm



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	W	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	16±0.2	0.35±0.05
规格	K0	B0			
尺寸	4.9±0.2	16.0±0.2			

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4.本说明书如有版本变更不另外告知

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3. Please do not exceed the absolute maximum ratings of the device when circuit designing.
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