



JCS4AN120A

主要参数 MAIN CHARACTERISTICS

ID	4A
VDSS	1200 V
Rdson-max (@Vgs=10V))	4.0Ω
Qg-typ	39nC

用途

- 高频开关电源
- 电子镇流器
- UPS 电源

产品特性

- 低栅极电荷
- 低 C_{RSS} (典型值 98pF)
- 开关速度快
- 产品全部经过雪崩测试
- 高抗 dv/dt 能力
- RoHS 产品

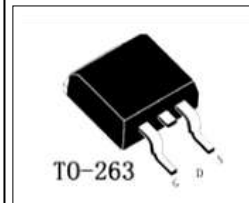
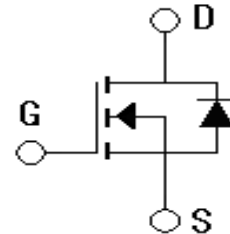
APPLICATIONS

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

FEATURES

- Low gate charge
- Low C_{RSS} (typical 98pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product

封装 Package



订货信息 ORDER MESSAGE

订 货 型 号 Order codes				印 记 Marking	封 装 Package
有卤-条管 Halogen-Tube	无卤-条管 Halogen-Free-Tube	有卤-编带 Halogen-Reel	无卤-编带 Halogen-Free-Reel		
JCS4AN120FA-F-B	JCS4AN120FA-F-BR	N/A	N/A	JCS4AN120FA	TO-220MF
JCS4AN120CA-C-B	JCS4AN120CA-C-BR	N/A	N/A	JCS4AN120CA	TO-220C
N/A	JCS4AN120SA-S-BR	N/A	JCS4AN120SA-S-AR	JCS4AN120SA	TO-263

绝对最大额定值 ABSOLUTE RATINGS ($T_c=25^{\circ}\text{C}$)

项 目 Parameter	符 号 Symbol	数 值 Value		单 位 Unit
		JCS4AN120FA	JCS4AN120SA/CA	
最高漏极-源极直流电压 Drain-Source Voltage	V_{DSS}	1200		V
连续漏极电流 Drain Current -continuous	I_{D} $T=25^{\circ}\text{C}$ $T=100^{\circ}\text{C}$	4*		A
		2.4*		A
最大脉冲漏极电流 (注 1) Drain Current -pulse (note 1)	I_{DM}	16*		A
最高栅源电压 Gate-Source Voltage	V_{GS}	± 30		V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	E_{AS}	83		mJ
雪崩电流 (注 1) Avalanche Current (note 1)	I_{AR}	4		A
重复雪崩能量 (注1) Repetitive Avalanche Current (note 1)	E_{AR}	11		mJ
二极管反向恢复最大电压变化速率 (注3) Peak Diode Recovery dv/dt (note 3)	dv/dt	5		V/ns
耗散功率 Power Dissipation	P_{D} $T_c=25^{\circ}\text{C}$ -Derate above 25°C	48	286	W
		0.4	2.3	
最高结温及存储温度 Operating and Storage Temperature Range	$T_{\text{J}}, T_{\text{STG}}$	$-55 \sim +150$		$^{\circ}\text{C}$
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_{L}	300		$^{\circ}\text{C}$

*漏极电流由最高结温限制

*Drain current limited by maximum junction temperature





电特性 ELECTRICAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单 位 Units
关态特性 Off –Characteristics						
漏—源击穿电压 Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	1200	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	$I_D=250\mu A$, referenced to 25°C	-	0.5	-	V/°C
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=1200V, V_{GS}=0V, T_C=25^\circ C$	-	-	10	μA
		$V_{DS}=1200V, T_C=125^\circ C$	-	-	300	μA
正向栅极体漏电流 Gate-body leakage current, forward	I_{GSSF}	$V_{DS}=0V, V_{GS}=30V$	-	-	100	nA
反向栅极体漏电流 Gate-body leakage current, reverse	I_{GSSR}	$V_{DS}=0V, V_{GS}=-30V$	-	-	-100	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	3.0	-	5.0	V
正向跨导 Forward Transconductance	g_{fs}	$V_{DS} = 30V, I_D=2$ (note 4)	-	4.2	-	S
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2A$	-	2.9	4	Ω
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{iss}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	833	1250	pF
输出电容 Output capacitance	C_{oss}		-	150	225	pF
反向传输电容 Reverse transfer capacitance	C_{rss}		-	98	147	pF





电特性 ELECTRICAL CHARACTERISTICS

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单位 Units
开关特性 Switching –Characteristics						
延迟时间 Turn-On delay time	$t_d(\text{on})$	$V_{DD}=600V$	-	29	43.5	ns
上升时间 Turn-On rise time	t_r	$I_D=4A$	-	55	82.5	ns
延迟时间 Turn-Off delay time	$t_d(\text{off})$	$V_{GS}=10V$	-	94	141	ns
下降时间 Turn-Off Fall time	t_f	$R_G=25\Omega$	-	88	132	ns
栅极电荷总量 Total Gate Charge	Q_g	$V_{DS}=960V$,	-	39	58.5	nC
栅—源电荷 Gate-Source charge	Q_{gs}	$I_D=4A$	-	6	9	nC
栅—漏电荷 Gate-Drain charge	Q_{gd}	$V_{GS}=10V$ (note 4, 5)	-	25	37.5	nC
漏—源二极管特性及最大额定值 Drain-Source Diode Characteristics and Maximum Ratings						
正向最大连续电流 Maximum Continuous Drain-Source Diode Forward Current		I_S	-	-	4	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	16	A
正向导通压降 Forward on voltage	V_{SD}	$V_{GS}=0V, I_S=4A$	-		1.6	V
反向恢复时间 Reverse recovery time	t_{rr}	$V_{GS}=0V, I_S=4A,$		595		ns
反向恢复电荷 Reverse recovery charge	Q_{rr}	$dI_F/dt=100A/\mu s$ (note 4)		4.9		μC

热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大值 Value		单 位 Unit
		JCS4AN120FA	JCS4AN120SA/CA	
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	2.6	0.35	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	40	$^{\circ}C/W$

注:

- 1: 脉冲宽度由最高结温限制
- 2: $L=10mH, I_{AS}=4.0A, V_{DD}=50V, R_G=25\Omega$, 起始结温 $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 4A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, 起始结温 $T_J=25^{\circ}C$
- 4: 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 2\%$
- 5: 基本与工作温度无关

Notes:

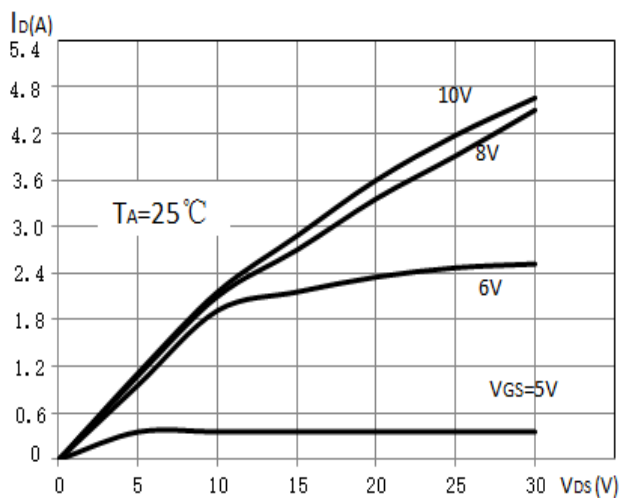
- 1: Pulse width limited by maximum junction temperature
- 2: $L=10mH, I_{AS}=4.0A, V_{DD}=50V, R_G=25\Omega, R_{GS}=25\Omega$, Starting $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 4A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$
- 5: Essentially independent of operating temperature



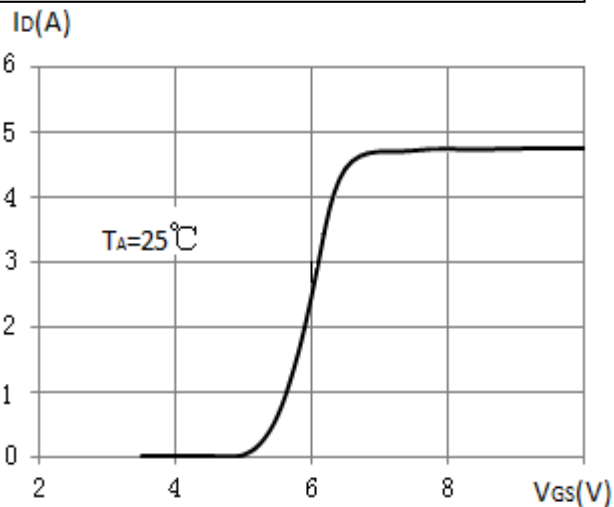


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

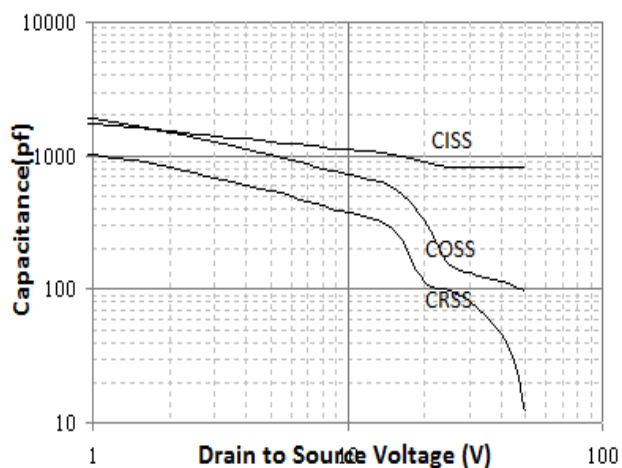
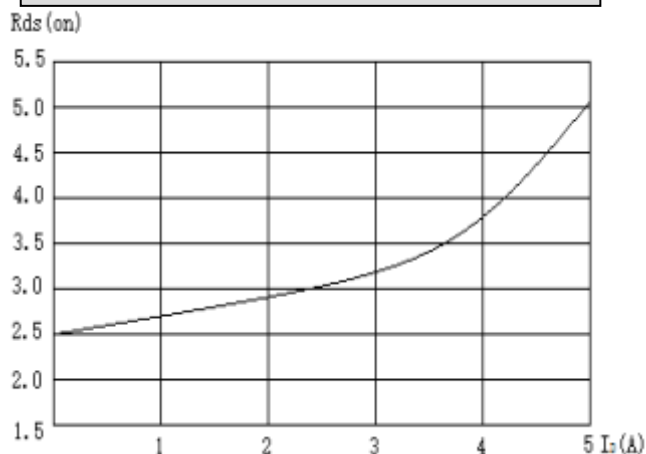
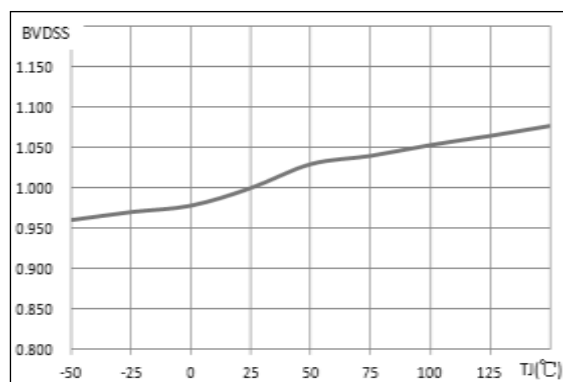
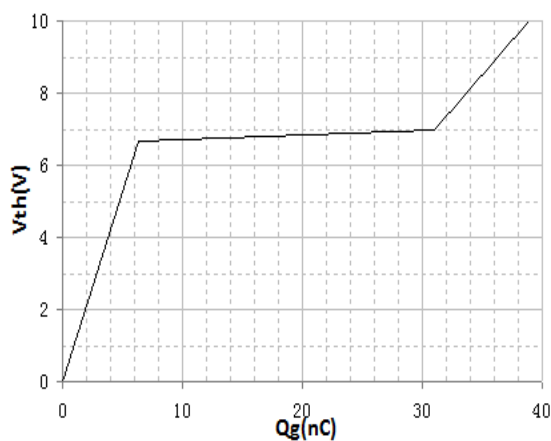
Output characteristics



Transfer characteristics



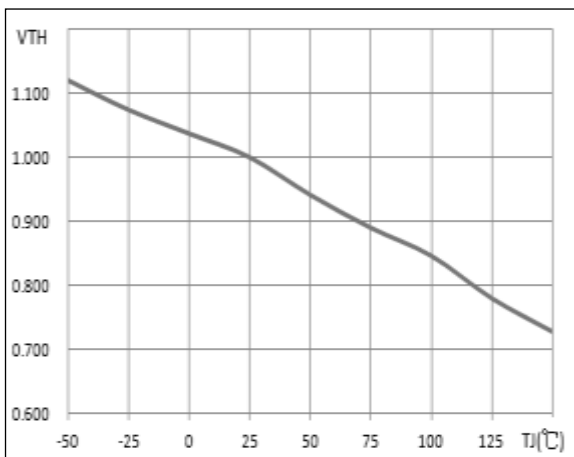
Capacitance Characteristics

On-Resistance Variation vs. I_D Normalized BV_{DSS} vs. temperatureGate charge vs. V_{GS} 

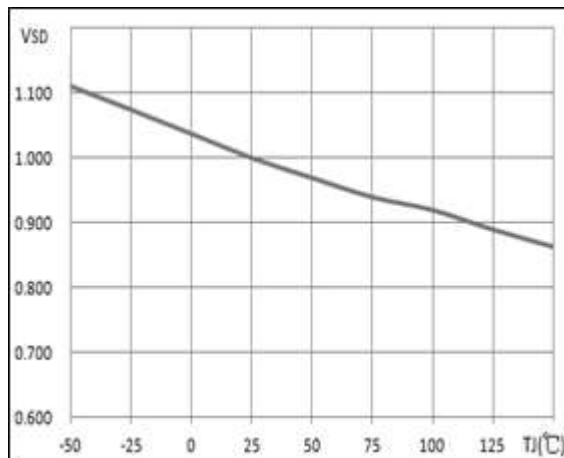


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

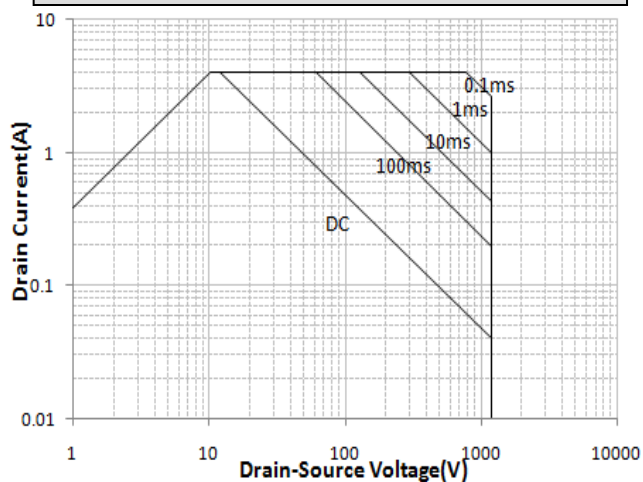
Normalized VTH vs. temperature



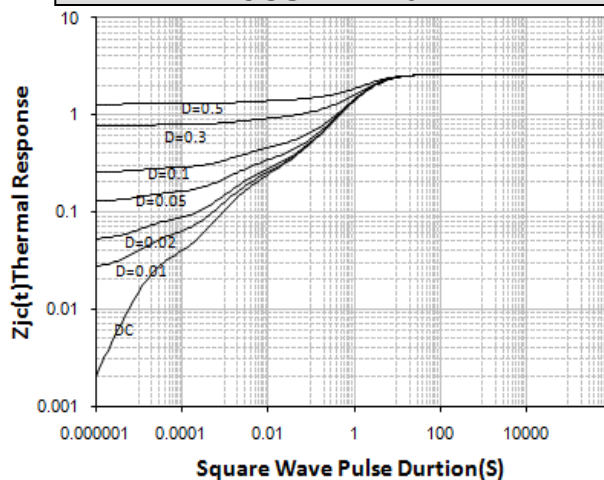
Normalized VSD vs. temperature



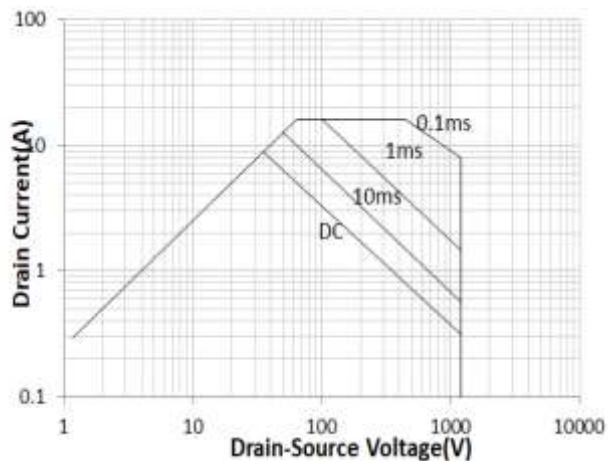
Maximum Safe Operating Area for JCS4AN120FA



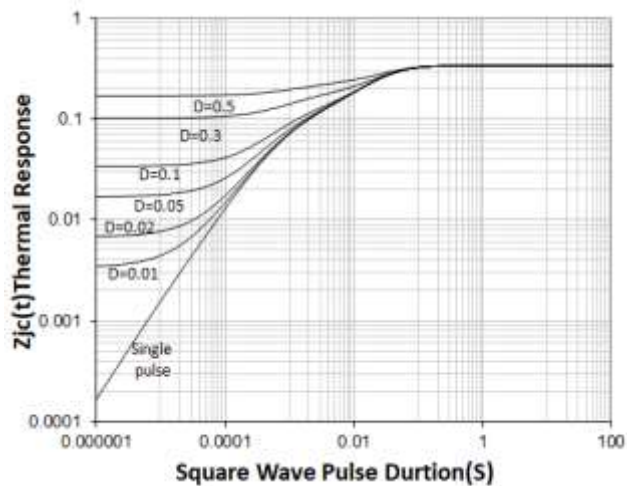
Thermal impedance for JCS4AN120FA



Maximum Safe Operating Area for JCS4AN120SA/CA



Thermal impedance for JCS4AN120SA/CA

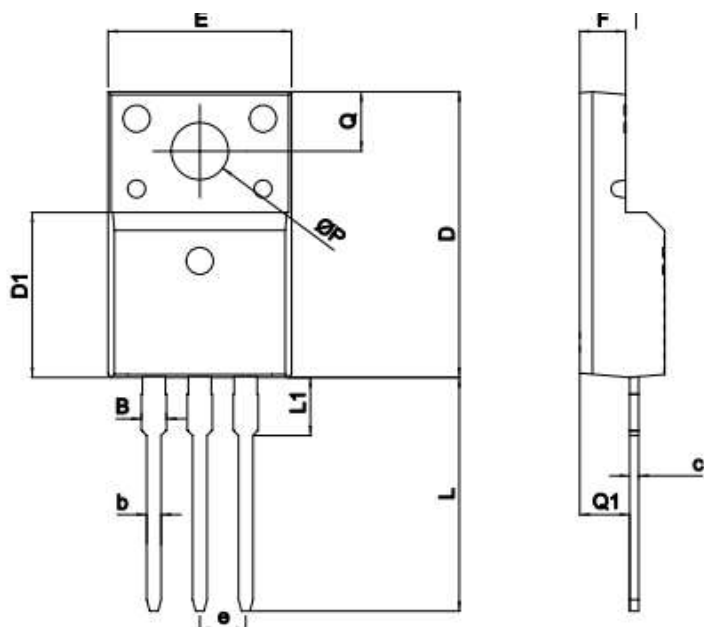




外形尺寸 PACKAGE MECHANICAL DATA

TO-220MF

单位 Unit: mm

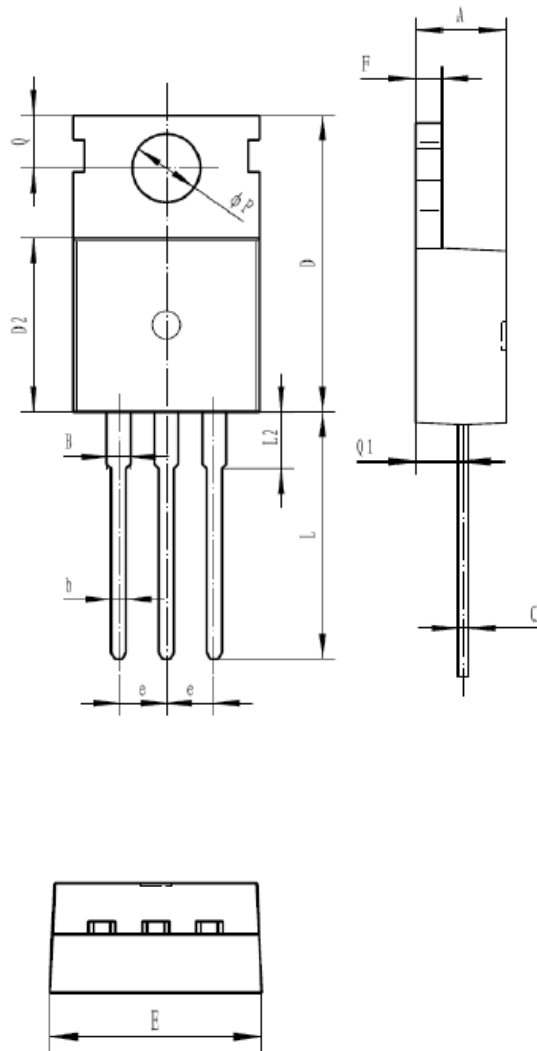


SYMBOL	mm	
	MIN	MAX
A	4.5	4.9
B	1.22	1.47
b	0.7	0.9
c	0.45	0.60
D	15.6	16.1
D1	9.0	9.3
e	2.54TYPE	
E	9.9	10.4
F	2.3	2.8
L	12.6	13.3
L1	3.1	3.4
Q	3.2	3.4
Q1	2.6	2.9
ΦP	3.0	3.5





TO-220C

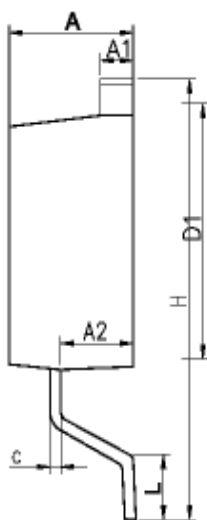
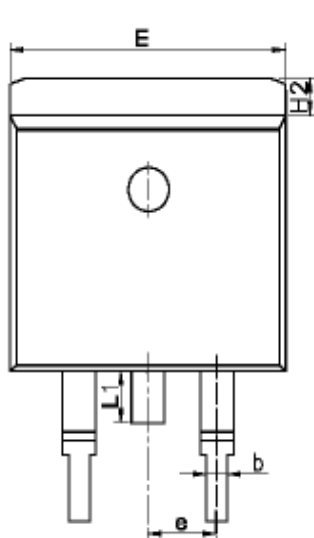


符号 symbol	MIN	MAX
A	4.30	4.70
B	1.22	1.40
b	0.70	0.95
c	0.40	0.65
D	15.20	16.20
D2	9.00	9.40
E	9.70	10.10
e	2.39	2.69
F	1.25	1.40
L	12.60	13.60
L2	2.80	3.20
Q	2.60	3.00
Q1	2.20	2.60
P	3.50	3.80



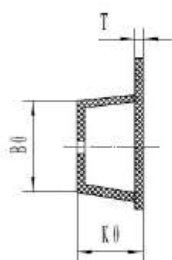
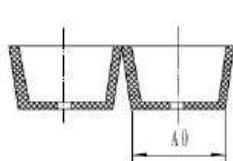
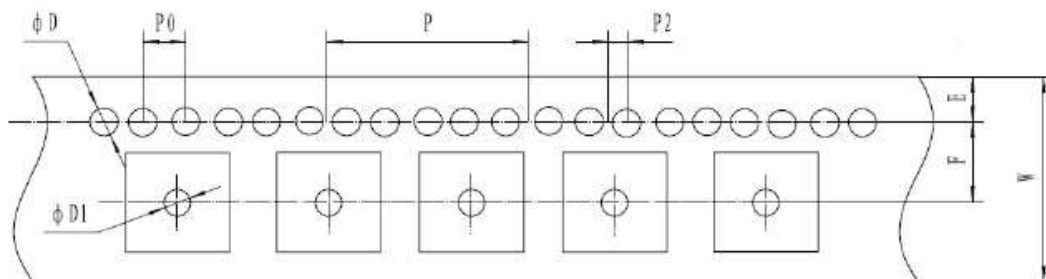
外形尺寸 PACKAGE MECHANICAL DATA

TO-263



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 ±0.1	1.75 ±0.1	31.5 ±0.1	1.5 +0.1/-0
规格 D1	P0	P2	P	T
尺寸 1.5 +0.1/-0	4 ±0.1	3 ±0.1	16 ±0.1	0.35 ±0.05
规格 K0	B0			
尺寸 4.9 ±0.1	16.0 ±0.1			



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