



JCS12N65EI

主要参数MAIN CHARACTERISTICS

ID	12A
VDSS	650V
Rdson-max (Vgs=10V)	0.9Ω
Qg-Typ	30nC

用途

- 高频开关电源
- 电子镇流器
- LED 电源

APPLICATIONS

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

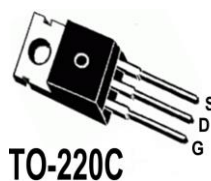
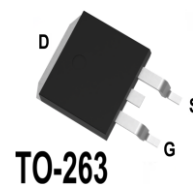
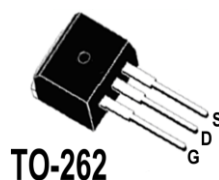
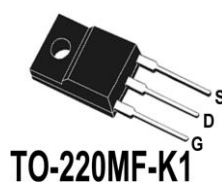
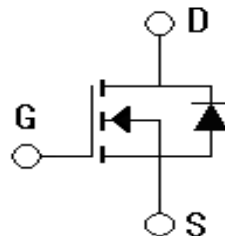
产品特性

- 低栅极电荷
- 低 C_{rss} (典型值 15.4pF)
- 开关速度快
- 产品全部经过雪崩测试
- 高抗 dv/dt 能力
- RoHS 产品

FEATURES

- Low gate charge
- Low C_{rss} (typical 15.4pF)
- 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		
JCS12N65FEI-F1-B	JCS12N65FEI-F1-BR	N/A	N/A	JCS12N65F	TO-220MF-K1
JCS12N65FEI-F2-B	JCS12N65FEI-F2-BR	N/A	N/A	JCS12N65F	TO-220MF-K2
JCS12N65BEI-B-B	JCS12N65BEI-B-BR	N/A	N/A	JCS12N65B	TO-262
JCS12N65SEI-S-B	JCS12N65SEI-S-BR	JCS12N65SEI-S-A	JCS12N65SEI-S-AR	JCS12N65S	TO-263
JCS12N65CEI-C-B	JCS12N65CEI-C-BR	N/A	N/A	JCS12N65C	TO-220C



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
		JCS12N65 BEI/SEI/CEI	JCS12N65FEI K1/K2	
最高漏极-源极直流电压 Drain-Source Voltage	V_{DS}	650		V
连续漏极电流 Drain Current-continuous	I_D $T=25^\circ\text{C}$ $T=100^\circ\text{C}$	12	12*	A
		7.6	7.6*	A
最大脉冲漏极电流 (注 1) Drain Current - pulse (note 1)	I_{DM}	48	48*	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}	770		mJ
雪崩电流 (注 1) Avalanche Current (note 1)	I_{AS}	12		A
重复雪崩能量 (注 1) Repetitive Avalanche Current (note 1)	E_{AR}	15.6		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	4.5		V/ns
最大电压变化速率 MOSFET dv/dt ruggedness		50		V/ns
耗散功率 Power Dissipation	P_D $T_c=25^\circ\text{C}$ -Derate above 25°C	250	51	W
		2	0.4	W/ $^\circ\text{C}$
最高结温及存储温度 Operating and Storage Temperature Range	T_J, T_{STG}	150; $-55 \sim +150$		$^\circ\text{C}$
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 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
关态特性 Off - Characteristics						
漏-源击穿电压 Drain-Source Voltage	BV_{DSS}	$I_D=250\ \mu A$, $V_{GS}=0V$	650	—	—	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 $25^\circ C$	—	0.65	—	V/ $^\circ C$
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=650V$, $V_{GS}=0V$, $T_C=25^\circ C$	—	—	1	μA
		$V_{DS}=520V$, $V_{GS}=0V$, $T_C=125^\circ C$	—	—	100	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	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D=250\ \mu A$	2.5	—	5	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$, $I_D=6.0A$ $25^\circ C$	—	0.73	0.9	Ω
正向跨导 Forward Transconductance	g_{fs}	$V_{DS}=40V$, $I_D=6.0A$ (note 4)	—	5.7	—	S
动态特性 Dynamic Characteristics						
栅极电阻 Gate resistance	R_g	$F=1.0MHz$ open drain	1.5	2.9	4.0	Ω
输入电容 Input capacitance	C_{iss}	$V_{DS}=25V$, $V_{GS}=0V$, $f=1.0MHz$	600	1130	1660	pF
输出电容 Output capacitance	C_{oss}		60	168	258	pF
反向传输电容 Reverse transfer capacitance	C_{rss}		2.0	15.4	25	pF





电特性ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	t _d (on)	V _{DD} =325V, I _D =12A, R _G =25Ω (note 4, 5)	—	30.7	50	ns
上升时间 Turn-On rise time	t _r		—	75.5	160	ns
延迟时间 Turn-Off delay time	t _d (off)		—	88	130	ns
下降时间 Turn-Off Fall time	t _f		—	54.4	80	ns
栅极电荷总量 Total Gate Charge	Q _g	V _{DS} =520V ,	—	30	75	nC
栅—源电荷 Gate-Source charge	Q _{gs}	I _D =12A	—	7	15	nC
栅—漏电荷 Gate-Drain charge	Q _{gd}	V _{GS} =10V (note 4, 5)	—	22	35	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		—	—	12	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}		—	—	48	A
正向压降 Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =12A	—	—	1.40	V
反向恢复时间 Reverse recovery time	t _{rr}	V _{GS} =0V, I _S =12A dI _F /dt=100A/ μ s	—	453	950	ns
反向恢复电荷 Reverse recovery charge	Q _{rr}	(note 4)	—	3	8	μ C

热特性THERMAL CHARACTERISTIC

项目 Parameter	符号 Symbol	JCS12N65 BEI/SEI/CEI	JCS12N65FEI K1/K2	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.5	2.45	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	62.5	$^{\circ}C/W$

注释:

- 1: 脉冲宽度由最高结温限制
- 2: $L=10mH, I_{AS}=12A, V_{DD}=50V, R_G=25\Omega$, 起始结温
 $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 12A, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}$, 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 $\leq 2\%$

Notes:

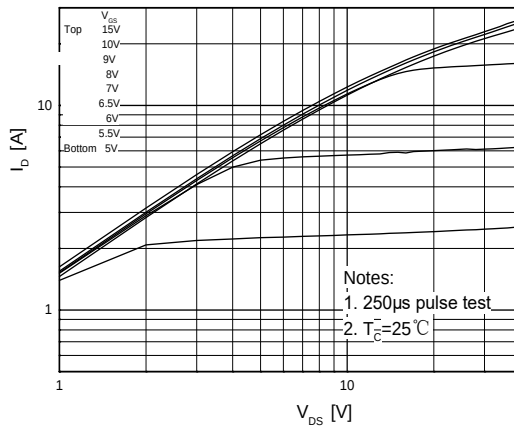
- 1: Pulse width limited by maximum junction temperature
- 2: $L=10mH, I_{AS}=12A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 12A, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$



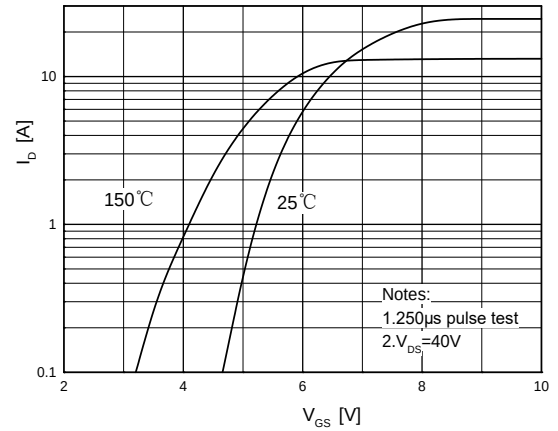


特征曲线ELECTRICAL CHARACTERISTICS (curves)

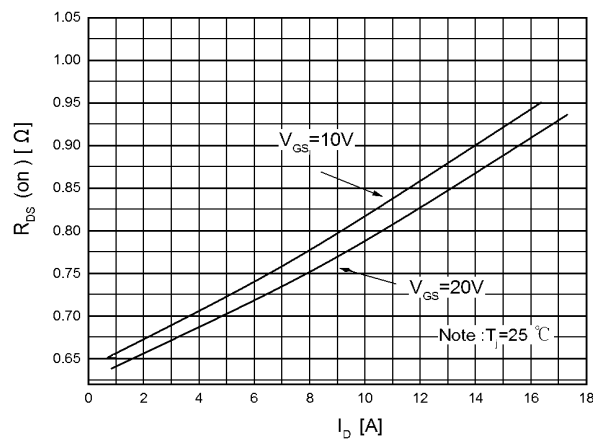
On-Region Characteristics



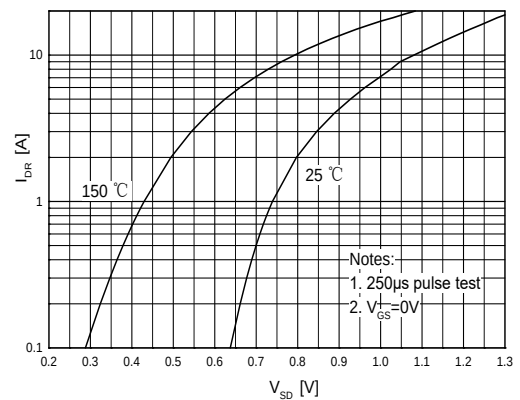
Transfer Characteristics



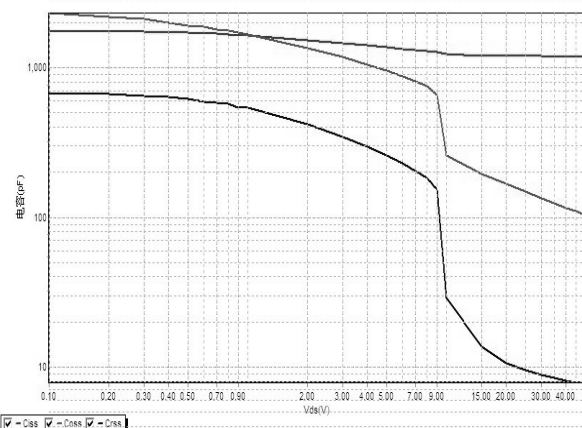
On-Resistance Variation vs. Drain Current and Gate Voltage



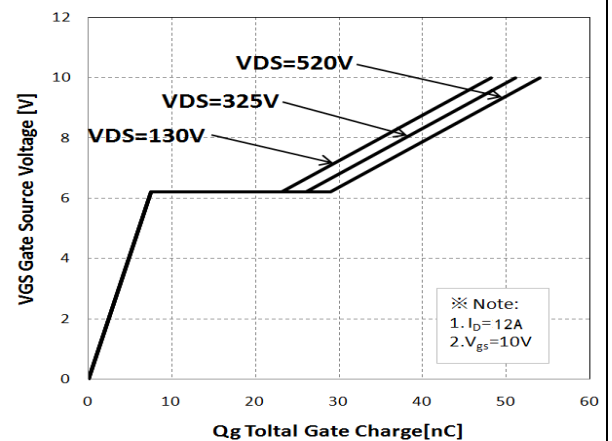
Body Diode Forward Voltage Variation vs. Source Current and



Capacitance Characteristics

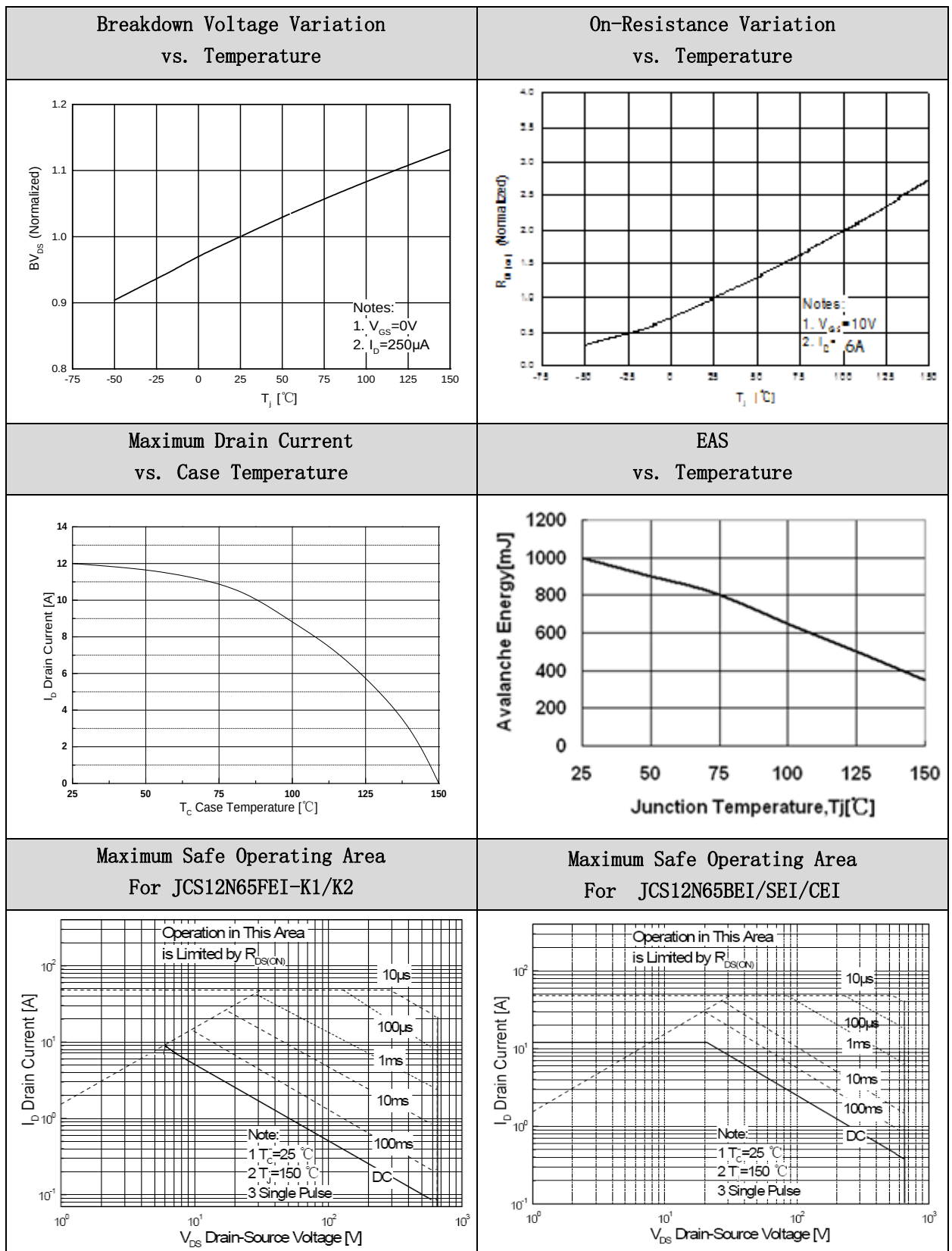


Gate Charge Characteristics



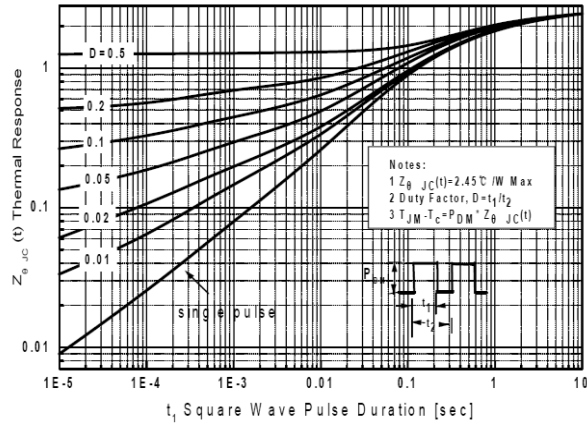
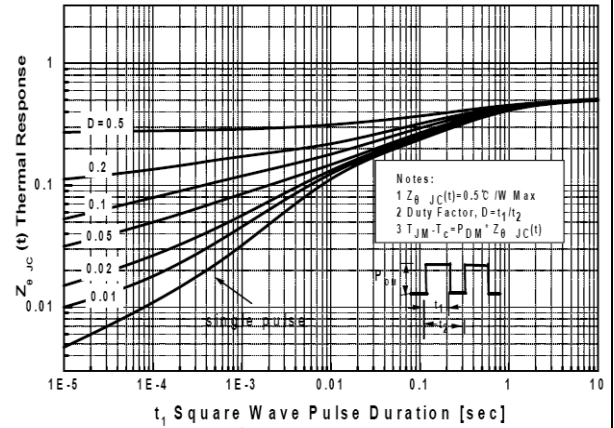


特征曲线ELECTRICAL CHARACTERISTICS (curves)





特征曲线ELECTRICAL CHARACTERISTICS (curves)

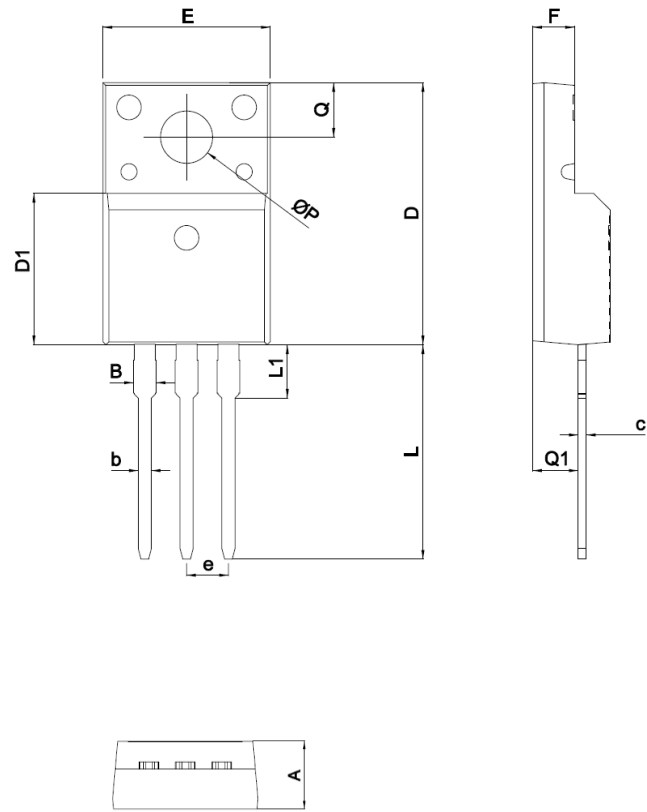
Transient Thermal Response Curve
For JCS12N65FEI-K1/K2Transient Thermal Response Curve
For JCS12N65BEI/SEI/CEI



外形尺寸 PACKAGE MECHANICAL DATA

TO-220MF-K1

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

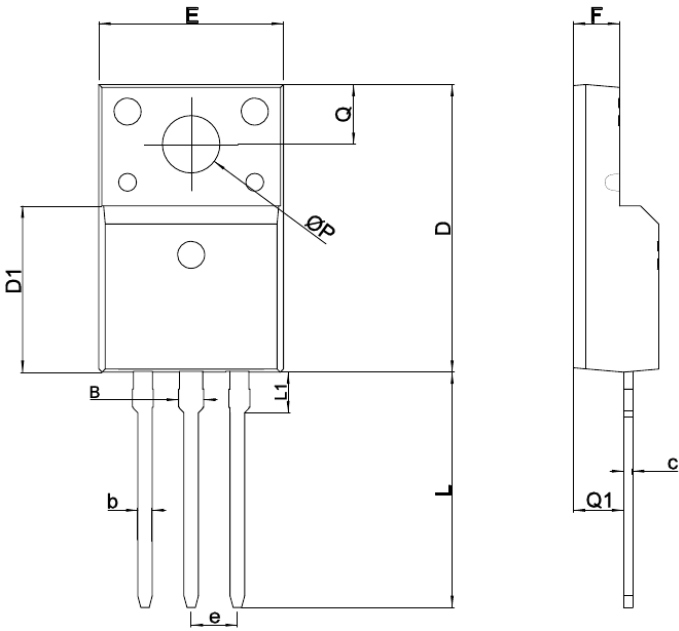




外形尺寸 PACKAGE MECHANICAL DATA

TO-220MF-K2

单位 Unit: mm



SYMBOL	mm	
	MIN	MAX
A	4.5	4.9
B		1.27
b	0.59	0.79
c	0.45	0.60
D	15.67	16.07
D1	8.97	9.37
e	2.54TYPE	
E	9.96	10.36
F	2.34	2.74
L	12.65	13.35
L1	1.80	2.20
Q	3.2	3.4
Q1	2.56	2.96
ΦP	3.08	3.28

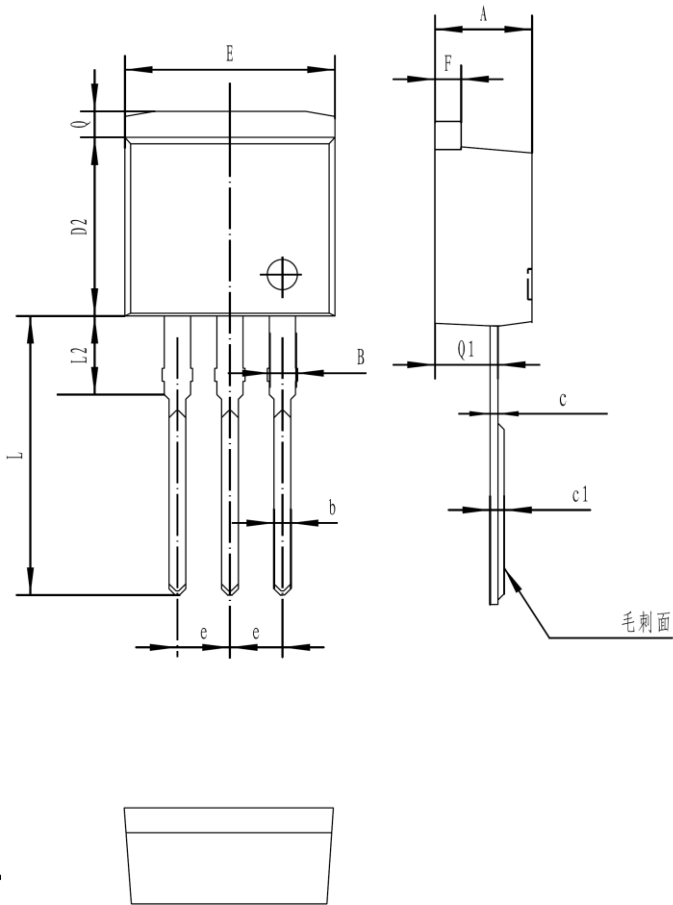




外形尺寸 PACKAGE MECHANICAL DATA

T0-262

单位 Unit: mm



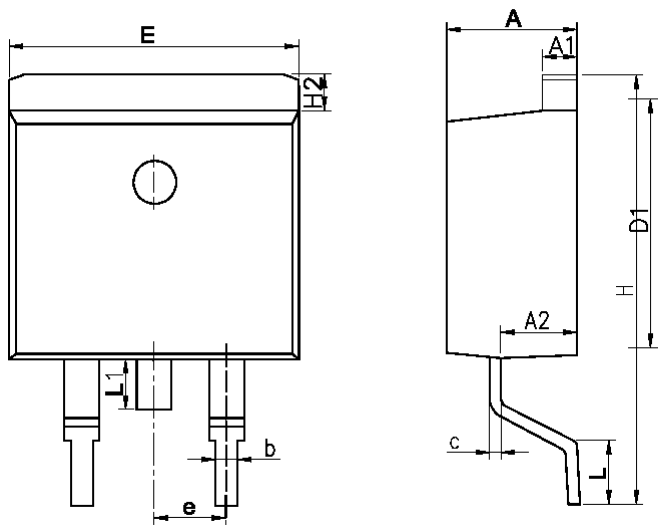
符号 symbol	MIN	MAX
A	4.40	4.90
B	1.10	1.40
b	0.70	0.95
c	0.30	0.60
c1	0.33	0.63
D2	8.20	9.20
E	9.60	10.50
e	2.39	2.69
F	1.20	1.35
L	13.11	14.61
L2	3.55	4.05
Q	1.10	1.40
Q1	2.65	2.85





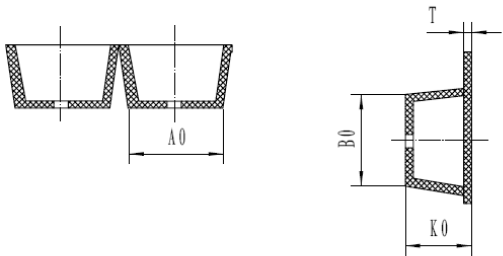
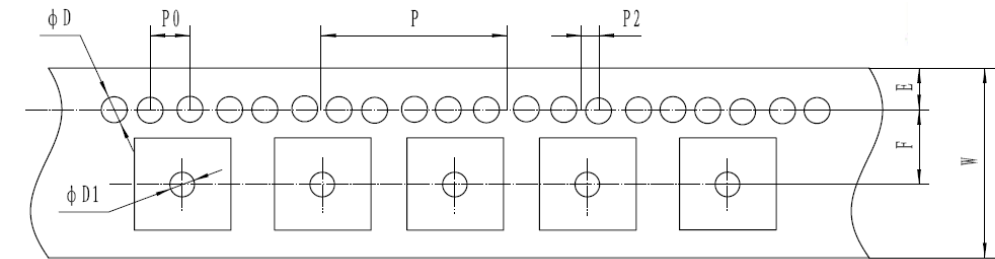
T0-263

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

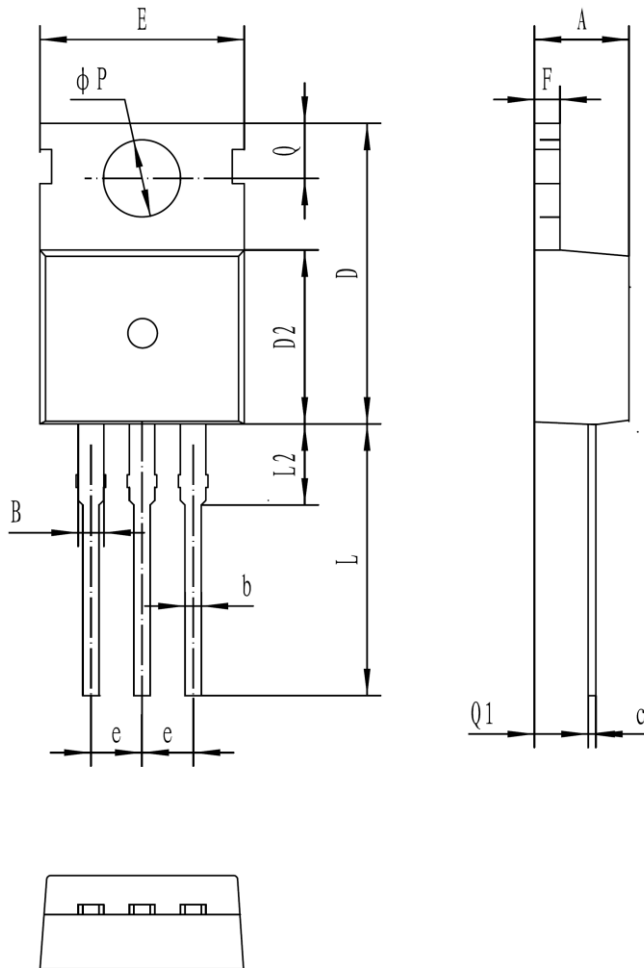


产品尺寸规格 (UNIT:mm)				
规格 W	A0	E	F	D
尺寸 24 ± 0.3	10.9 ± 0.1	1.75 ± 0.1	11.5 ± 0.1	1.5 +0.1/-0
规格 D1	P0	P2	P	T
尺寸 1.5 +0.1/-0	4 ± 0.1	2 ± 0.1	16 ± 0.1	0.35 ± 0.05
规格 K0	B0			
尺寸 4.9 ± 0.1	16.0 ± 0.1			



T0-220C

单位 Unit: mm



符号 symbol	MIN	MAX
A	4.30	4.70
B	1.22	1.47
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





注意事项

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3. 在电路设计时请不要超过器件的绝对最大额定值，否则会影响整机的可靠性。
4. 本说明书如有版本变更不另外告知。

NOTE

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2. We strongly recommend customers check carefully on the trademark when buying our product, if there is any question, please don' t be hesitate to contact us.
3. Please do not exceed the absolute maximum ratings of the device when circuit designing.
4. Jilin Sino-microelectronics co., Ltd reserves the right to make changes in this. specification sheet and is subject to change without prior notice.

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