



JCS12N65EI

主要参数 MAIN CHARACTERISTICS

I_D	12A
V_{DSS}	650V
$R_{dson-max}$ ($V_{GS}=10V$)	0.9 Ω
Q_g-Typ	30nC

用途

- 高频开关电源
- 电子镇流器
- LED 电源

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

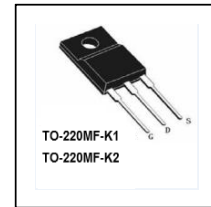
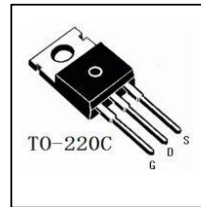
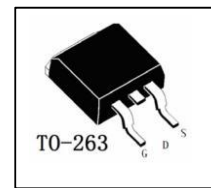
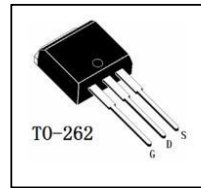
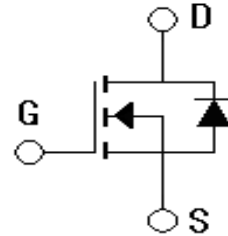
APPLICATIONS

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

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 B/S/CEI	JCS12N65FEI K1/K2	
最高漏极-源极直流电压 Drain-Source Voltage	V_{DSS}	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_{GSS}	± 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
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~+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	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$I_D=250\mu A$, referenced to 25°C	-	0.65	-	V/°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°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	0.8	2.9	6.5	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	$t_{d(on)}$	$V_{DD}=325V, I_D=12A, R_G=25\Omega$ (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	$V_{DS}=520V,$ $I_D=12A$ $V_{GS}=10V$ (note 4, 5)	-	54	75	nC
栅-源电荷 Gate-Source charge	Q_{gs}		-	7	15	nC
栅-漏电荷 Gate-Drain charge	Q_{gd}		-	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}	$V_{GS}=0V, I_S=12A$ $di/dt=100A/\mu s$ (note 4)	-	453	950	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	3	8	μC

热特性 THERMAL CHARACTERISTIC

项目 Parameter	符号 Symbol	JCS12N65 B/S/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:

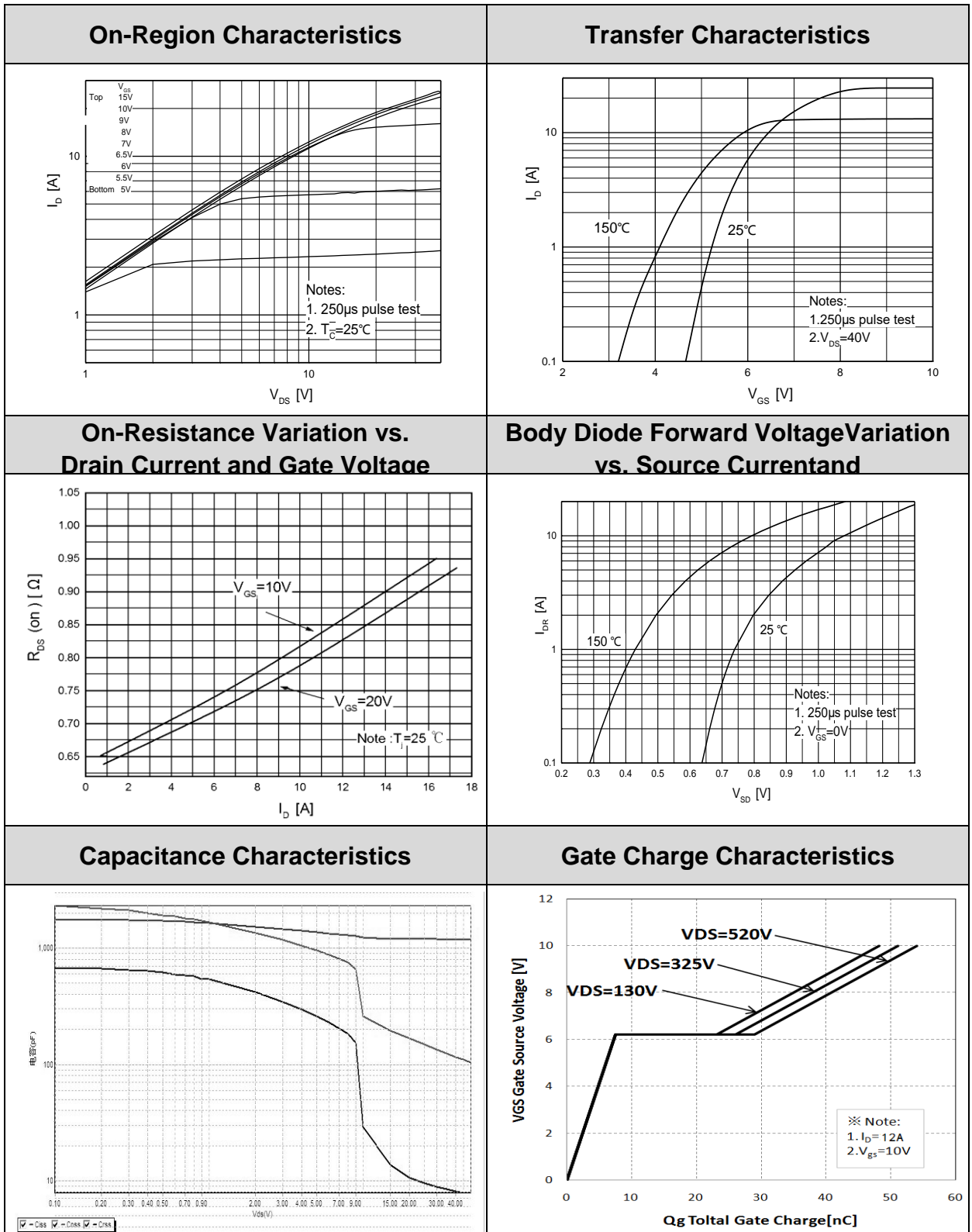
- 1: 脉冲宽度由最高结温限制
- 2: $L=10mH, I_{AS}=12A, V_{DD}=50V, R_G=25\Omega$, 起始结温 $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 12A, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}$, 起始结温 $T_J=25^{\circ}C$
- 4: 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 2\%$
- 5: 基本与工作温度无关

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 Cycles $\leq 2\%$
- 5: Essentially independent of operating temperature

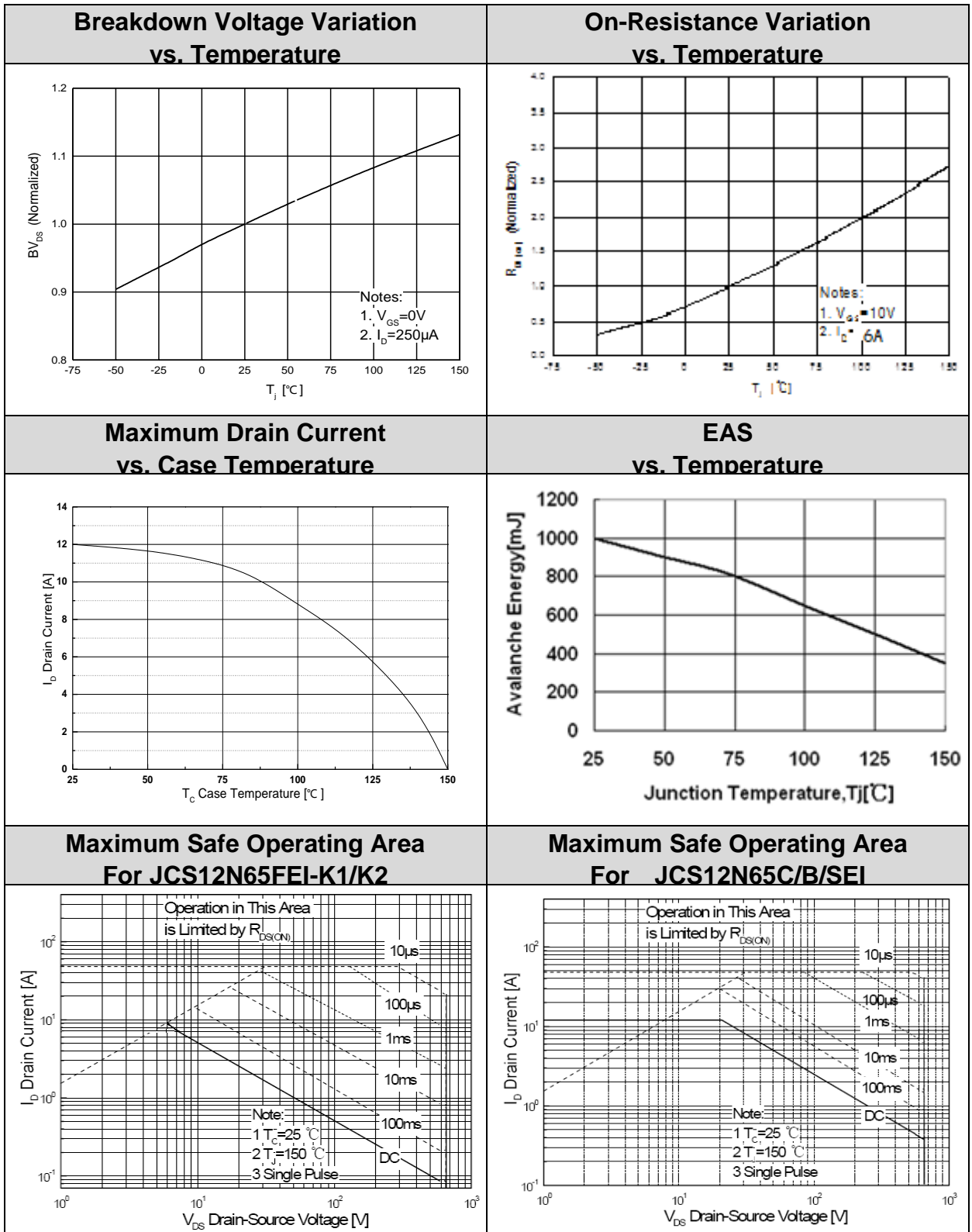


特征曲线ELECTRICAL CHARACTERISTICS (curves)



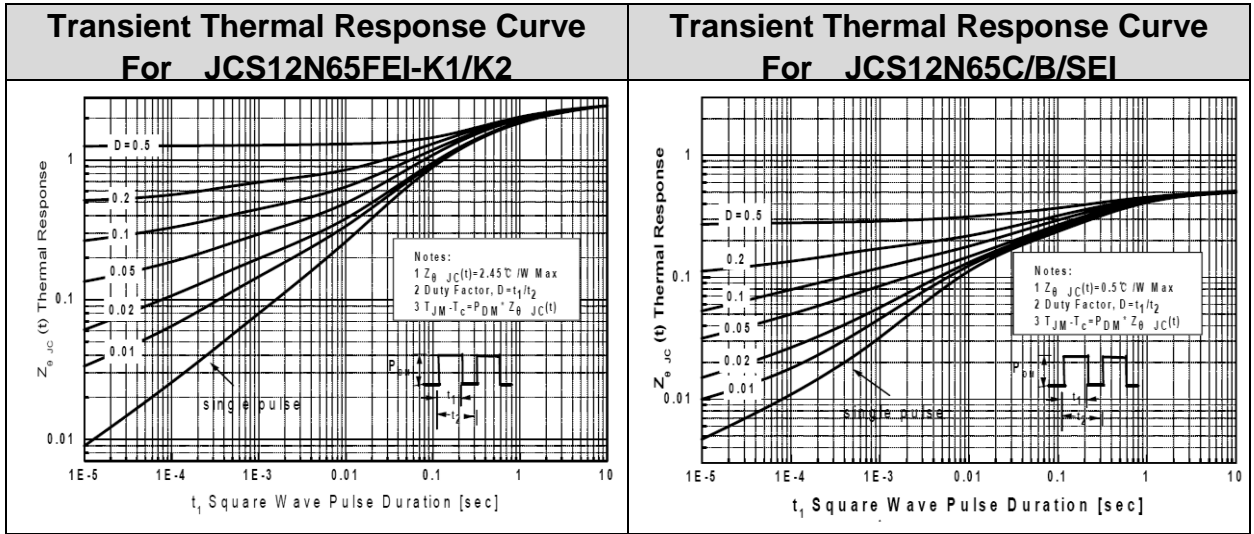


特征曲线ELECTRICAL CHARACTERISTICS (curves)





特征曲线ELECTRICAL CHARACTERISTICS (curves)

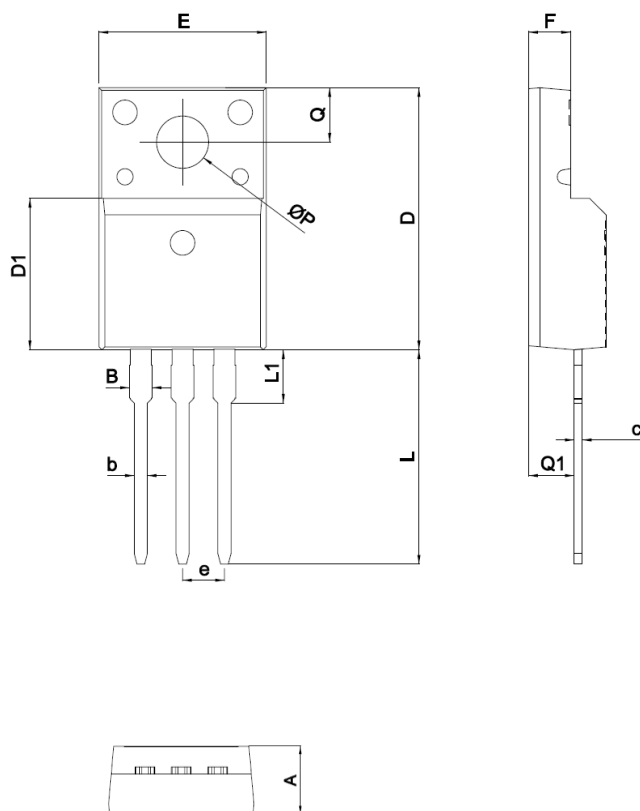




外形尺寸 PACKAGE MECHANICAL DATA

TO-220MF-K1

单位 Unit: mm



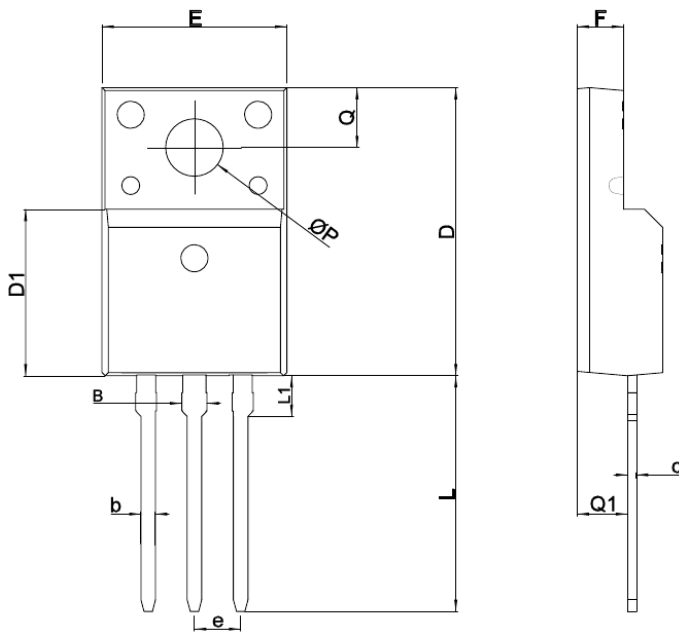
SYMBOL	mm	
	MIN	MAX
A	4.5	4.9
B	1.22	1.47
b	0.7	0.9
c	0.45	0.60
D	15.6	16.1
D1	9.0	9.3
e	2.54TYPE	
E	9.9	10.4
F	2.3	2.8
L	12.6	13.3
L1	3.1	3.4
Q	3.2	3.4
Q1	2.6	2.9
ΦP	3.0	3.5



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

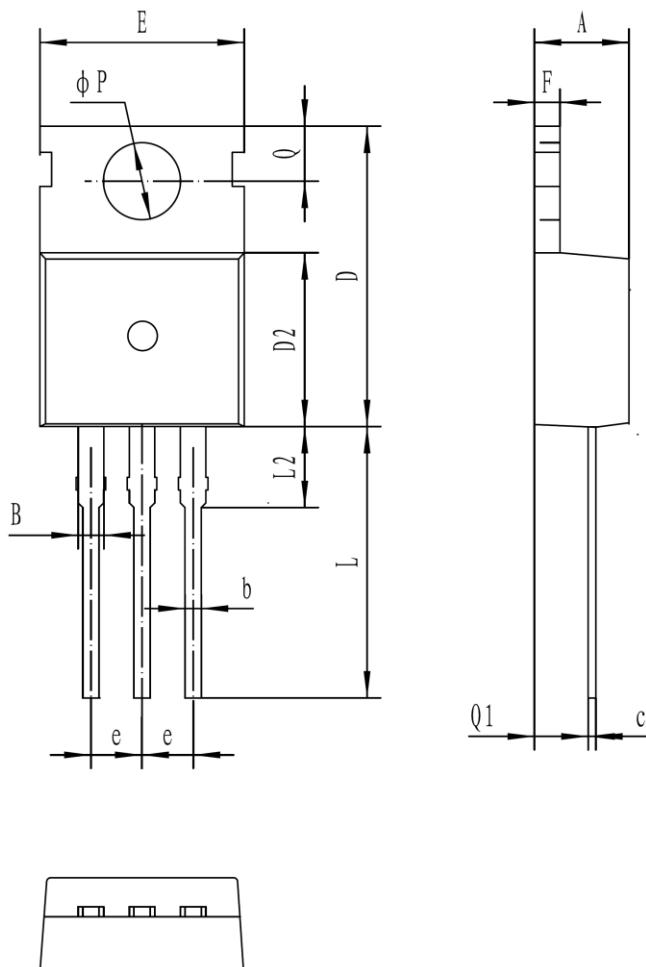




外形尺寸 PACKAGE MECHANICAL DATA

TO-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

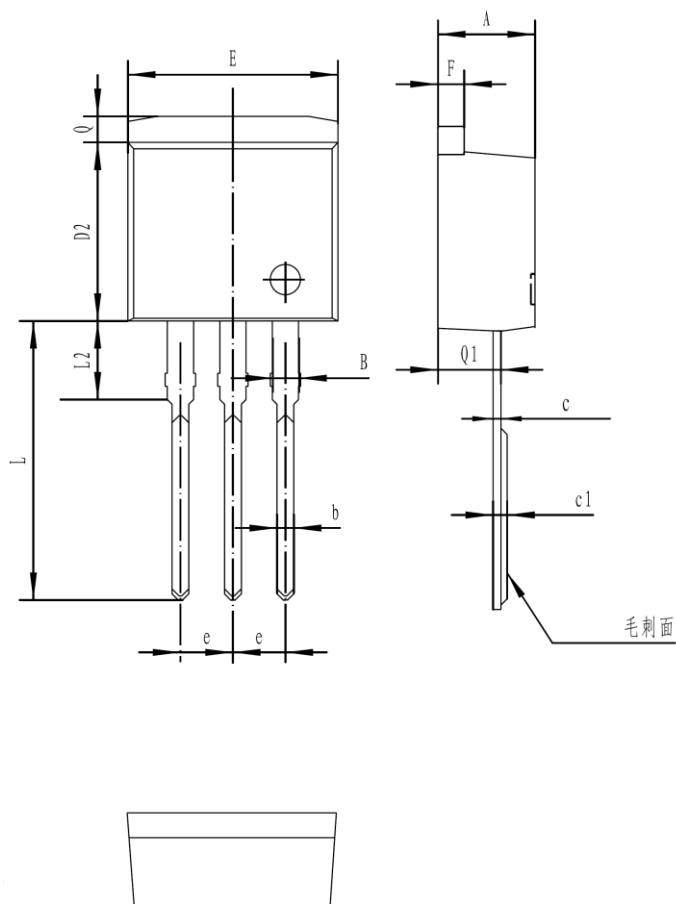




外形尺寸 PACKAGE MECHANICAL DATA

TO-262

单位 Unit: mm



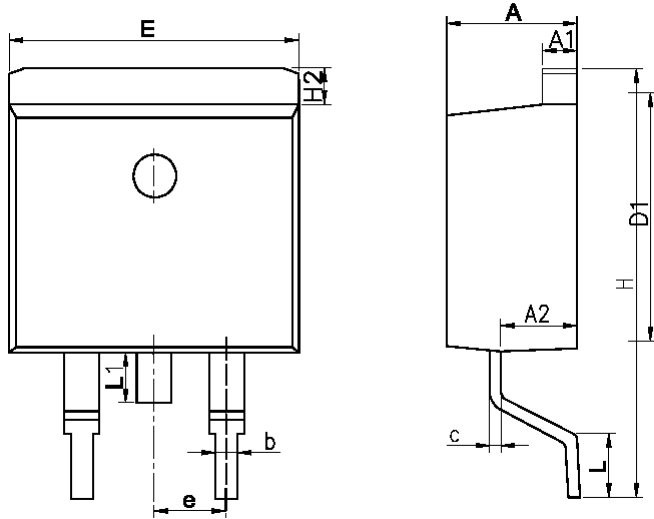
符号 symbol	MIN	MAX
A	4.40	4.90
B	1.10	1.40
b	0.70	0.95
c	0.30	0.60
c1	0.33	0.63
D2	8.20	9.20
E	9.60	10.50
e	2.39	2.69
F	1.20	1.35
L	13.11	14.61
L2	3.55	4.05
Q	1.10	1.40
Q1	2.65	2.85



外形尺寸 PACKAGE MECHANICAL DATA

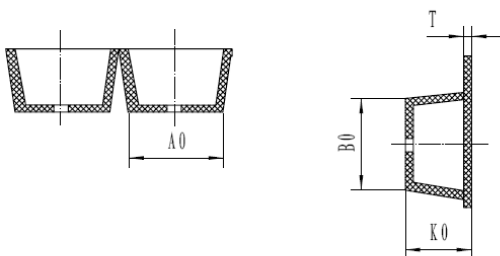
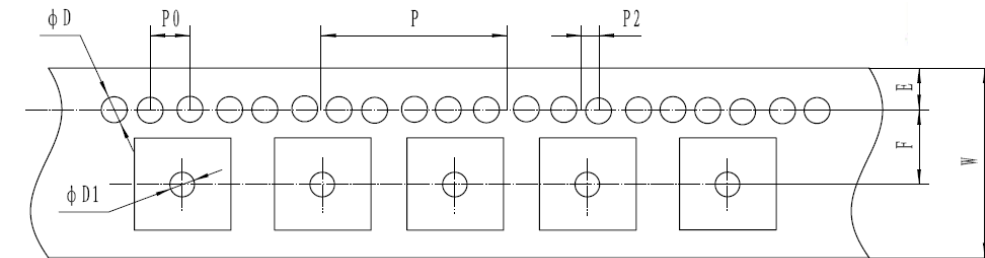
TO-263

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	0.28	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			



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联系方式

吉林华微电子股份有限公司

公司地址：吉林省吉林市深圳街 99 号

邮编：132013

总机：86-432-64678411

传真：86-432-64665812

网址：www.hwdz.com.cn

CONTACT

JILIN SINO-MICROELECTRONICS CO., LTD.

ADD: No.99 Shenzhen Street, Jilin City, Jilin Province, China.

Post Code: 132013

Tel: 86-432-64678411

Fax: 86-432-64665812

Web Site: www.hwdz.com.cn

