SESCRIPTION

BTA16 or BTB16 series triacs,
with high ability to withstand the shock loading of large current,
provide high dv/dt rate with strong resistance to electromagnetic interface.
With high commutation performances,
3 quadrants products especially recommended for use on inductive load.
Package: TO-220A、TO-220B、TO-220F、TO-263 (D^2PAK)

产品特征

双面台面玻璃钝化工艺；背面多层金属电极
具有较高的阻断电压和抗电流冲击能力；可以适应于直流和交流光藕触发电路

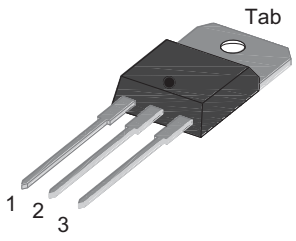
主要用途

自动化电气设备；开关电源；无功补偿；复合开关；交流电开关；
交流/直流电源变换；工业和家庭电加热器的温度控制；
大功率路灯；大功率捕鱼器；电机马达调速控制电路；
以及三相交流输入的高压电路、变频电路

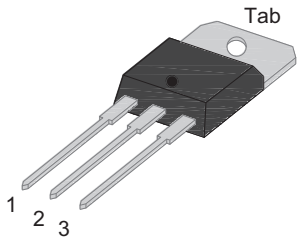
封装外形

TO-220A (绝缘型)，TO-220B (非绝缘型)，TO-220F (全塑封)，TO-263 (D^2PAK表面贴装)

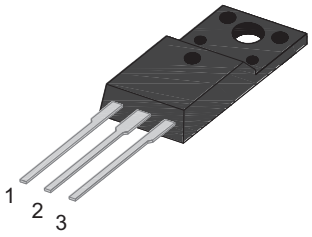
TO-220A



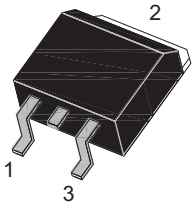
TO-220B



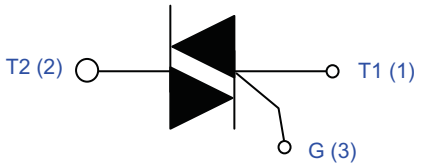
TO-220F



TO-263
D^2PAK



■ PINNING: Package

Pin 管脚排列	Symbol 对应极性	Description 极性名词	Description 极性含义	Pin Polarity Circuit Diagram 脚位与极性 电路符号表示
1	T1	Main terminal 1	第一阳极	
2	T2	Main terminal 2	第二阳极	
3	G	Gate	门-控制极	
4	Tab	----	散热片	

■ Product Model Reference & Naming【产品型号参考及型号命名】

16A	产品型号列表、种类区分、型号对照电压值				型号后缀 触发电流 Ⅰ-Ⅱ-Ⅲ
	600V	800V	1000V	1200V	
4Q TO-220A 绝缘型封装	BTA16-600B	BTA16-800B	BTA16-1000B	BTA16-1200B	B≤50mA
	BTA16-600C	BTA16-800C	BTA16-1000C	BTA16-1200C	C≤25mA
4Q TO-220B 非绝缘型封装	BTB16-600B	BTB16-800B	BTB16-1000B	BTB16-1200B	B≤50mA
	BTB16-600C	BTB16-800C	BTB16-1000C	BTB16-1200C	C≤25mA
3Q TO-220A Insulated 绝缘型封装	BTA16-600BW	BTA16-800BW	BTA16-1000BW	BTA16-1200BW	BW≤50mA
	BTA16-600CW	BTA16-800CW	BTA16-1000CW	BTA16-1200CW	CW≤35mA
	BTA16-600SW	BTA16-800SW	BTA16-1000SW	BTA16-1200SW	SW≤10mA
	BTA16-600TW	BTA16-800TW	BTA16-1000TW	BTA16-1200TW	TW≤5mA
3Q TO-220B No-Insulated 非绝缘型封装	BTB16-600BW	BTB16-800BW	BTB16-1000BW	BTB16-1200BW	BW≤50mA
	BTB16-600CW	BTB16-800CW	BTB16-1000CW	BTB16-1200CW	CW≤35mA
	BTB16-600SW	BTB16-800SW	BTB16-1000SW	BTB16-1200SW	SW≤10mA
	BTB16-600TW	BTB16-800TW	BTB16-1000TW	BTB16-1200TW	TW≤5mA
D^2PAK TO-263 片式表面贴装	T1650-600G	T1650-800G	T1650-1000G	T1650-1200G	50≤50mA
	T1635-600G	T1635-800G	T1635-1000G	T1635-1200G	35≤35mA
	T1610-600G	T1610-800G	T1610-1000G	T1610-1200G	10≤10mA
	T1605-600G	T1605-800G	T1605-1000G	T1605-1200G	05≤5mA
说明	常规品种	高压品种	未量产	特制高压品种	

Some models need to order in advance *部分型号需订制*

TO-220A、TO-220B 产品命名方式

H	BT	A	16	-	600	B	W
HAOHAI ELECTRONICS CO.,LTD.	BT: Bi-directional Triode 三端双向可控硅开关	A:绝缘型封装 Insulated B:不绝缘型封装 Non Insulated	06=6A (TO-220) 08=8A (TO-220) 12=12A (TO-220) 16=16A (TO-220) 24=25A (TO-220) 25=25A (RD-91) 26=25A (TOP3) 40=40A (RD-91) 41=40A (TOP3)		600=600V 800=800V 1000=1000V 1200=1200V	I_{GT} Ⅰ-Ⅱ-Ⅲ T≤5mA S≤10mA C≤35mA B≤50mA	3Q-TRIACs 无缓冲触发 三象限双向可控硅

TO-263 （D^2PAK） 产品命名方式

H	T	16	50	-	600	G
HAOHAI ELECTRONICS CO.,LTD.	T: Triode-TRIACs 三端双向可控硅开关	16A	I_{GT} Ⅰ-Ⅱ-Ⅲ 50≤50mA 35≤35mA 10≤10mA 05≤5mA		600=600V 800=800V 1000=1000V 1200=1200V	TO-263 or D^2PAK

■ABSOLUTE MAXIMUM RATINGs

SYMBOL	Signification in Symbol		Test Conditions	Value	Unit
$I_{T(RMS)}$	RMS On-state Current (full sine wave)	TO-220A	T_C=86℃	16	A
		TO-220B	T_C=107℃		
		TO-220F	T_C=90℃		
		TO-263	T_C=115℃		
I_{TSM}	Non Repetitive Surge Peak on-state Current		tp=10mS	160	
I_{GM}	Peak Gate Current			4	
I^2t	I^2t Value for Fusing Consideration		tp=10mS	128	A^2ses
dI/dt	Critical rate of rise of on-state current		I_G=2×I_{GT}	50	A/μs
V_{DRM}	Repetitive peak off-state Voltages	见型号对照列表	T_J=25℃	600~1200	V
V_{RRM}	Repetitive peak Reverse Voltages	见型号对照列表	T_J=25℃		
V_{DSM}	Non Repetitive Surge peak off-state Voltages		tp=10mS, T_j=25℃	V_{DRM}+100	
V_{RSM}	Non Repetitive peak Reverse Voltages		tp=10mS, T_j=25℃	V_{RRM}+100	
$P_{G(AV)}$	Average gate power dissipation			1	W
P_{GM}	Peak gate power			5	
T_j	Operating Junction Temperature Range			-40 ~ +125	℃
T_{stg}	Storage Junction Temperature Range			-40 ~ +150	

■ ELECTRICAL CHARACTERISTICS (T_j=25℃ unless otherwise specified) 三象限品种 (V_{DRM} / V_{RRM}: 600/800V)

SYMBOL 符号表示	Paramenter & Test Conditions 符号含义 及 参数测试条件说明	Quadrant		3 Quadrants				Unit 单位
				BW	CW	SW	TW	
I_{GT}	V_D=12V, R_L=33Ω	Ⅰ-Ⅱ-Ⅲ	Max.	50	30	10	5	mA
I_H	I_T=100mA	Ⅰ-Ⅱ-Ⅲ	Max.	60	40	25	15	
I_L	I_G=1.2 I_{GT}	Ⅰ-Ⅲ	Max.	70	50	25	15	
		Ⅱ	Max.	80	60	30	20	
dV/dt	V_D=2/3V_{DRM} gate open	T_j=125℃	Min.	1000	500	100	50	V/μs
(dI/dt)C	(dI/dt)c=1.7A/ms	T_j=125℃	Min.	14	8.5	6	5	
V_{GT}	V_D=12V, R_L=33Ω	Ⅰ-Ⅱ-Ⅲ	Max.	1.5				V
V_{GD}	V_D=V_{DRM}, R_L=3.3KΩ, T_j=125℃	Ⅰ-Ⅱ-Ⅲ	Min.	0.2				

■ ELECTRICAL CHARACTERISTICS (T_j=25℃ unless otherwise specified) 四象限品种 (V_{DRM} / V_{RRM}: 600/800V)

SYMBOL	Paramenter & Test Conditions	Quadrant		4 Quadrants		Unit
				B	C	
I_{GT}	V_D=12V, R_L=33Ω	Ⅰ-Ⅱ-Ⅲ	Max.	50	25	mA
		Ⅳ	Max.	70	50	
I_H	I_T=100mA		Max.	60	40	
I_L	I_G=1.2 I_{GT}	Ⅰ-Ⅲ	Max.	70	50	
		Ⅳ	Max.	100	80	
dV/dt	V_D=2/3V_{DRM} gate open	T_j=125℃	Min.	500	200	V/μs
(dI/dt)C	(dI/dt)c=1.7A/ms	T_j=125℃	Min.	8.5	5	
V_{GT}	V_D=12V, R_L=33Ω	ALL	Max.	1.5		V
V_{GD}	V_D=V_{DRM}, R_L=3.3KΩ, T_j=125℃	ALL	Min.	0.2		

■ ELECTRICAL CHARACTERISTICS (T_j=25℃ unless otherwise specified) 三象限品种 (V_{DRM} / V_{RRM}: 1200V)

SYMBOL	Paramenter & Test Conditions	Quadrant		3 Quadrants	Unit
I_{GT}	V_D=12V, R_L=33Ω	Ⅰ-Ⅱ-Ⅲ	Max.	50	mA
I_H	I_T=100mA	Ⅰ-Ⅱ-Ⅲ	Max.	60	
I_L	I_G=1.2 I_{GT}	Ⅰ-Ⅲ	Max.	70	
		Ⅱ	Max.	80	
dV/dt	V_D=2/3V_{DRM} gate open	T_j=125℃	Min.	1500	V/μs
(dI/dt)C	(dI/dt)c=1.7A/ms	T_j=125℃	Min.	14	
V_{GT}	V_D=12V, R_L=33Ω	Ⅰ-Ⅱ-Ⅲ	Max.	1.5	V
V_{GD}	V_D=V_{DRM}, R_L=3.3KΩ, T_j=125℃	Ⅰ-Ⅱ-Ⅲ	Min.	0.25	

■ STATIC CHARACTERISTICS

SYMBOL	Paramenter & Test Conditions		Value (MAX)			Unit
			-600V	-800V	-1200V	
V_{TM}	I_{TM}=22.5A, tp=380μs	T_j=25℃	1.55			V
I_{DRM}	V_D=V_{DRM}, V_R=V_{RRM}	T_j=25℃	5	5	10	μA
I_{RRM}		T_j=125℃	2	2	1	mA

■ THERMAL RESISTANCES

SYMBOL	Paramenter & Test Conditions	Package	Value	Unit
$R_{th(j-c)}$	junction to case (AC)	TO-220A	2.9	℃/W
		TO-220B	1.2	
		TO-220F	3.3	
		TO-263	0.85	

Electrical characteristics & Typical characteristics（电气特性与典型特征）

FIG.1: Maximum power dissipation versus RMS on-state current

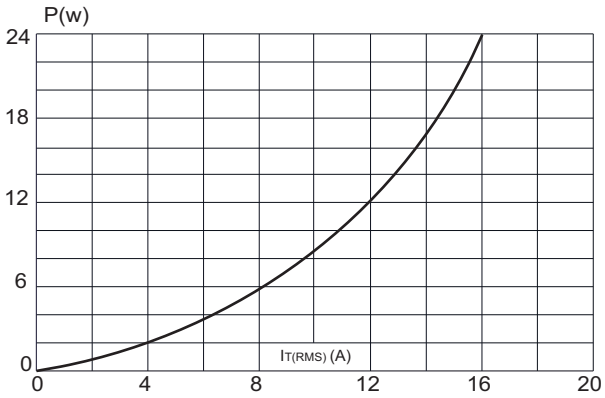


FIG.2: RMS on-state current versus case temperature

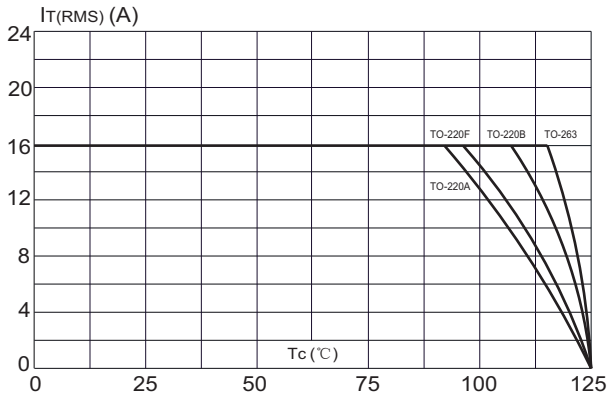


FIG.3: Surge peak on-state current versus number of cycles

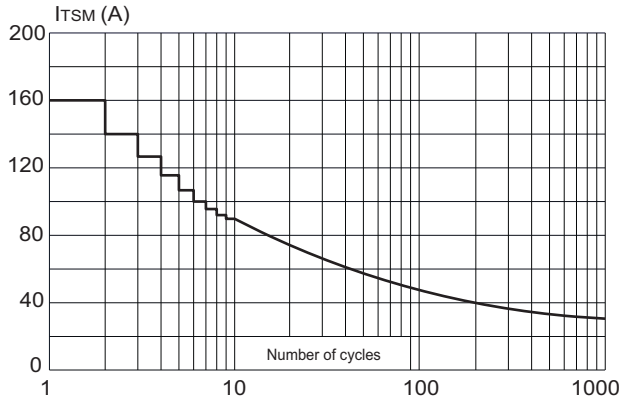


FIG.4: On-state characteristics (maximum values)

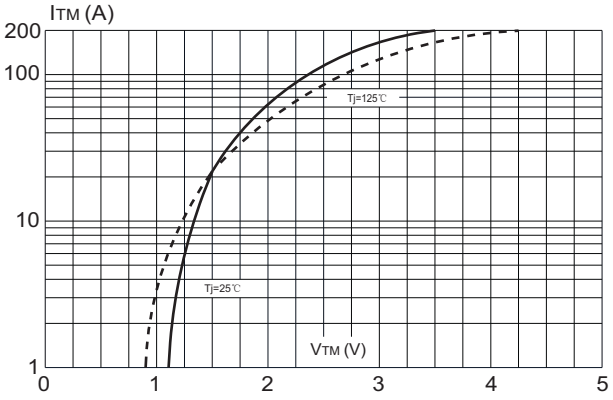


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponging value of I^2t (dI/dt<50A/μS)

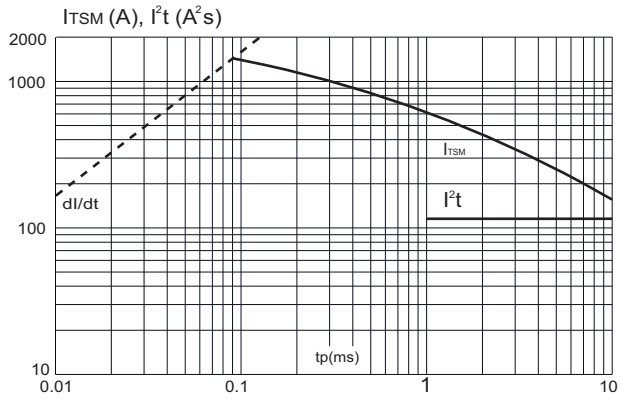
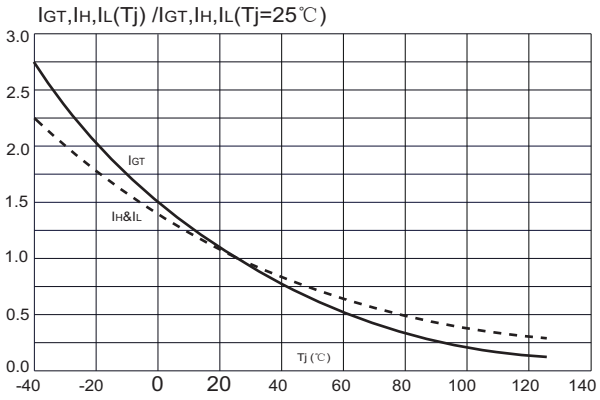
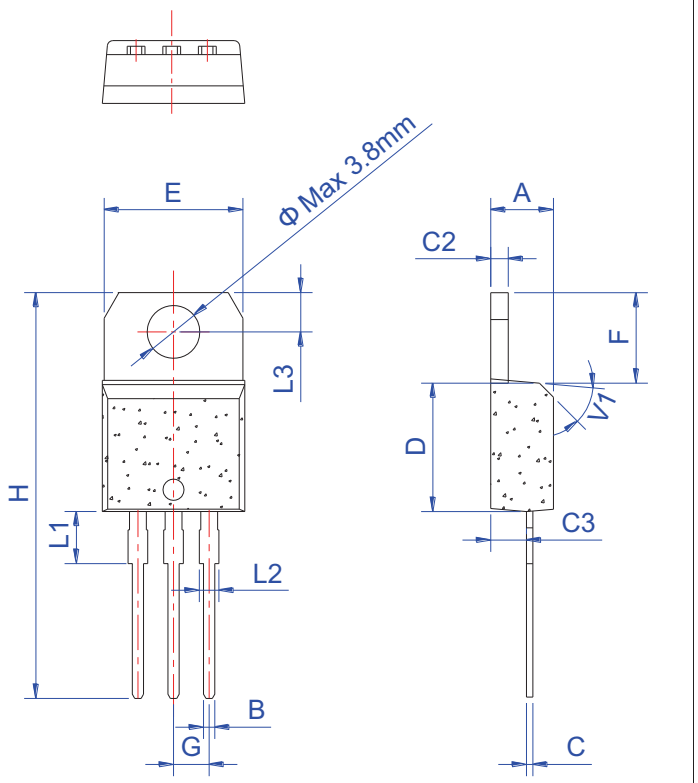


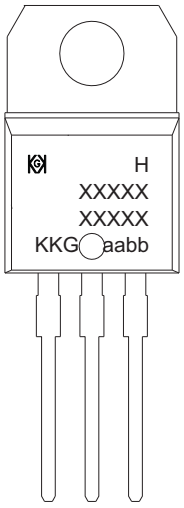
FIG.6: Relative variations of gate trigger current, holding current current and latching current versus junction temperature



TO-220A PACKAGE MECHANICAL DATA （mm & inch）封装尺寸数据（毫米与英寸对照）



REF	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	1.181
B	0.61	0.88	0.024	0.034
C	0.46	0.70	0.018	0.027
C2	1.21	1.32	0.048	0.052
C3	2.40	2.72	0.094	0.107
D	8.60	9.70	0.338	0.382
E	9.80	10.0	0.386	0.409
F	6.55	6.95	0.258	0.274
G	2.54 Typ.		0.1 Typ.	
H	28.0	29.8	11.0	11.7
L1	3.75 Typ.		0.147 Typ.	
L2	1.14	1.70	0.045	0.067
L3	2.65	2.95	0.104	0.116
V1	45° Typ.		45° Typ.	



打印标识
H: 浩海电子
XXXXXXXXXX: 器件型号
KKG: 注册商标
aa: 出厂年份
bb: 出厂自然周 (01~53)

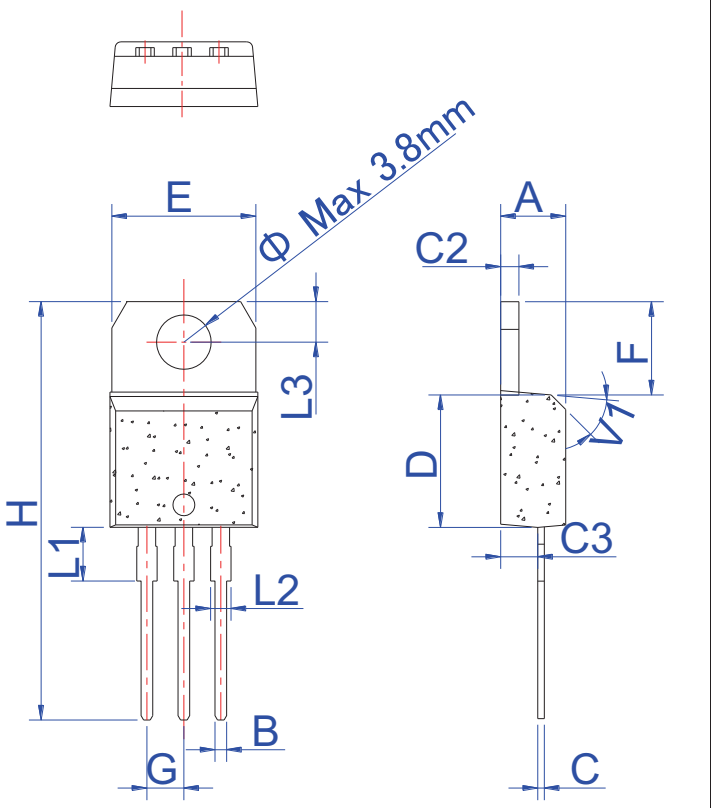
Marking
H: HAOHAI ELECTRONICS
XXXXXXXXXX: Part Number
KKG: Registered trademark
aa: Factory Year
bb: Factory natural Week (01~53)

包装规格

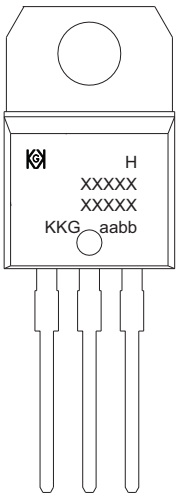
TO-220A: 条管装、纸盒装
每管50只
每盒1000只（1Kpcs）
每箱8000只（8Kpcs）

Packaging Specifications
TO-220A: Plastic tube
50Pcs/Tub
1000Pcs/BOX（1Kpcs）
8000Pcs/Cartons（8Kpcs）

TO-220B PACKAGE MECHANICAL DATA （mm & inch）封装尺寸数据（毫米与英寸对照）



REF	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	1.181
B	0.61	0.88	0.024	0.034
C	0.46	0.70	0.018	0.027
C2	1.21	1.32	0.048	0.052
C3	2.40	2.72	0.094	0.107
D	8.60	9.70	0.338	0.382
E	9.60	10.4	0.378	0.409
F	6.20	6.60	0.244	0.259
G	2.54 Typ.		0.1 Typ.	
H	28.0	29.8	11.0	11.7
L1	3.75 Typ.		0.147 Typ.	
L2	1.14	1.70	0.045	0.067
L3	2.65	2.95	0.104	0.116
V1	45° Typ.		45° Typ.	



打印标识
H: 浩海电子
XXXXXXXXXX: 器件型号
KKG: 注册商标
aa: 出厂年份
bb: 出厂自然周 (01~53)

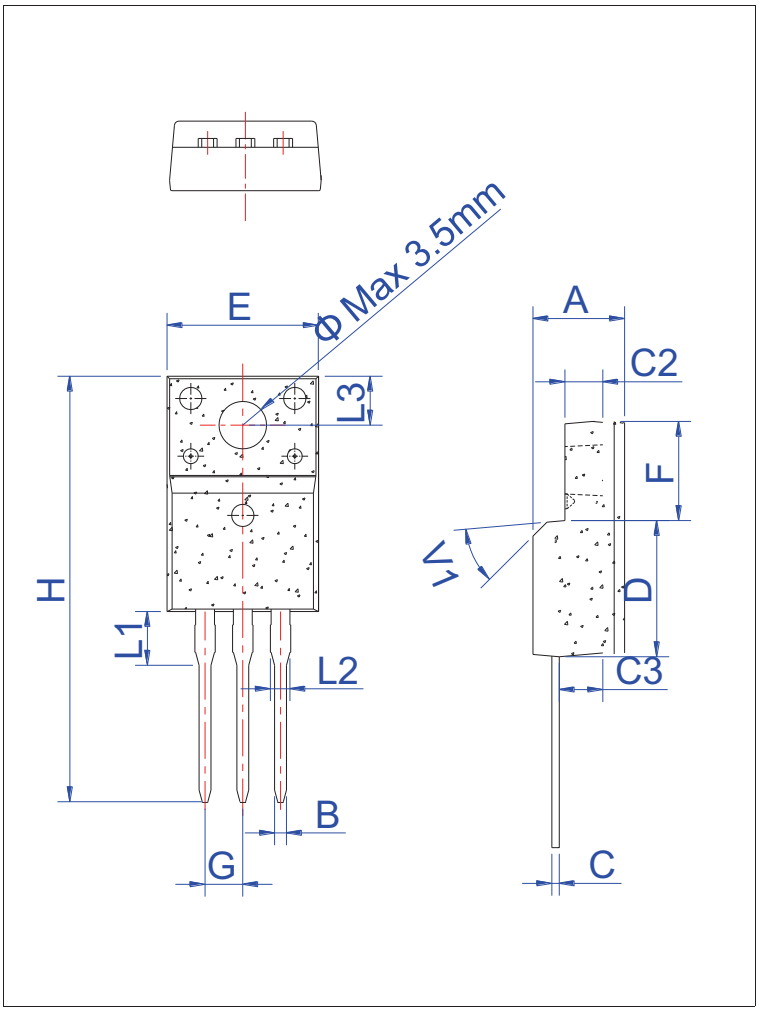
Marking
H: HAOHAI ELECTRONICS
XXXXXXXXXX: Part Number
KKG: Registered trademark
aa: Factory Year
bb: Factory natural Week (01~53)

包装规格

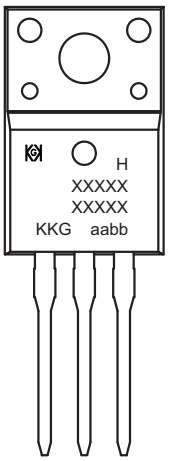
TO-220B: 条管装、纸盒装
每管50只
每盒1000只（1Kpcs）
每箱8000只（8Kpcs）

Packaging Specifications
TO-220B: Plastic tube
50Pcs/Tub
1000Pcs/BOX（1Kpcs）
8000Pcs/Cartons（8Kpcs）

TO-220F PACKAGE MECHANICAL DATA （mm & inch）封装尺寸数据（毫米与英寸对照）



REF	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.80	0.173	1.189
B	0.74	0.83	0.029	0.033
C	0.48	0.75	0.019	0.030
C2	2.40	2.70	0.094	0.106
C3	2.60	3.00	0.102	0.118
D	8.80	9.30	0.346	0.367
E	9.70	10.3	0.382	0.406
F	6.40	7.00	0.252	0.276
G	2.54 Typ.		0.1 Typ.	
H	28.0	29.8	11.0	11.7
L1	3.63 Typ.		0.143 Typ.	
L2	1.14	1.70	0.045	0.067
L3	3.30 Typ.		0.130 Typ.	
V1	45° Typ.		45° Typ.	



打印标识
H: 浩海电子
XXXXXXXXXX: 器件型号
KKG: 注册商标
aa: 出厂年份
bb: 出厂自然周 (01~53)

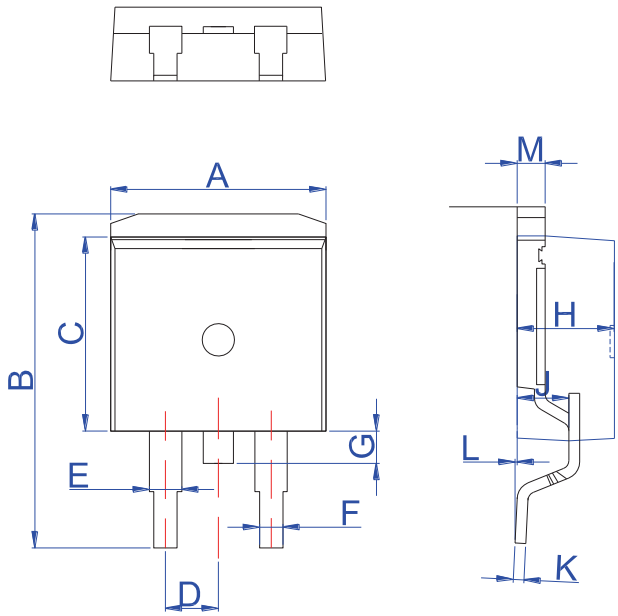
Marking
H: HAOHAI ELECTRONICS
XXXXXXXXXX: Part Number
KKG: Registered trademark
aa: Factory Year
bb: Factory natural Week (01~53)

包装规格

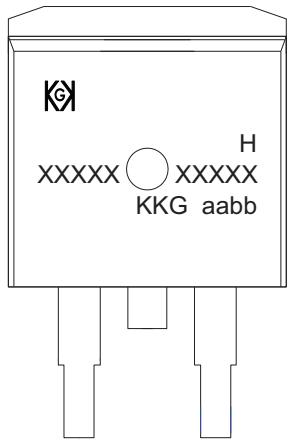
TO-220F: 条管装、纸盒装
每管50只
每盒1000只（1Kpcs）
每箱8000只（8Kpcs）

Packaging Specifications
TO-220F: Plastic tube
50Pcs/Tub
1000Pcs/BOX（1Kpcs）
8000Pcs/Cartons（8Kpcs）

TO-263 (D^2PAK) PACKAGE MECHANICAL DATA （mm & inch）封装尺寸数据（毫米与英寸对照）



REF	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	9.90	10.2	0.390	0.402
B	14.7	15.8	0.579	0.622
C	9.40	9.60	0.370	0.378
D	2.54 Typ.		0.100 Typ.	
E	1.20	1.40	0.047	0.055
F	0.75	0.85	0.029	0.033
G		1.75		0.069
H	4.40	4.70	0.173	0.185
J	2.30	2.70	0.091	0.106
K	0.38	0.55	0.015	0.022
L	0	0.10	0	0.010
M	1.25	1.35	0.049	0.053



打印标识
H: 浩海电子
XXXXXXXXXX: 器件型号
KKG: 注册商标
aa: 出厂年份
bb: 出厂自然周 (01~53)

Marking
H: HAOHAI ELECTRONICS
XXXXXXXXXX: Part Number
KKG: Registered trademark
aa: Factory Year
bb: Factory natural Week (01~53)

包装规格

TO-263: 条管装、纸盒装
每管50只
每盒1000只（1Kpcs）
每箱5000只（5Kpcs）

Packaging Specifications
TO-263: Plastic tube
50Pcs/Tub
1000Pcs/BOX（1Kpcs）
5000Pcs/Cartons（5Kpcs）

Manufacturers version information
2006-09-01， KKG ™ Product Data-1.0
2011-04-25， KKG ™ Product Data-1.1
2014-09-25， KKG ™ Product Data-1.2

深圳市浩海電子有限公司
SHENZHEN HAOHAI ELECTRONICS CO., LTD.

2 floor(whole floor), BAOXIN Building. 0 Lane on the 8th. Yufeng Garden.
82 District. BAOAN District, Shenzhen City, Guangdong Province, China.

公司电话 TEL: +86-755-29955080、29955081、29955082、29955083
总机八线 29955090、29955091、29955092、29955093

FAX: +86-755-27801767 E-mail: kkg@kkg.com.cn
产品主页: http://www.szhhe.com http://www.kkg.com.cn