

DESCRIPTION

The X020 Series SCR series provide high dv/dt rate with strong resistance to electromagnetic interface.

They are especially recommended for use on residual current circuit breaker, straight hair, igniter etc.

■ 产品特点: 先进的玻璃钝化芯片工艺, 具有灵敏的控制极触发电流, 通态压降小, 高灵敏触发电单向可控硅。

■ 主要用途: 广泛应用于点火器、负离子发生器、雾化器、镇流器、漏电保护器; 各种万能开关器、小型马达控制器、彩灯控制器
漏电保护器、灯具继电器激励器、逻辑集成电路驱动、大功率可控硅门极驱动、摩托车点火器等线路功率控制。

■ 代替型号: X02--系列、MCR22系列、CR02AM系列、CR03AM系列、2P4M、2P6M、2S4M、2S6M、X00602MA、TN22系列、P0111DA、P0118MA、P0111DN、P0111MN、P0115MN、P0130系列、EC103D1、EC103D1W、MCR08BT1

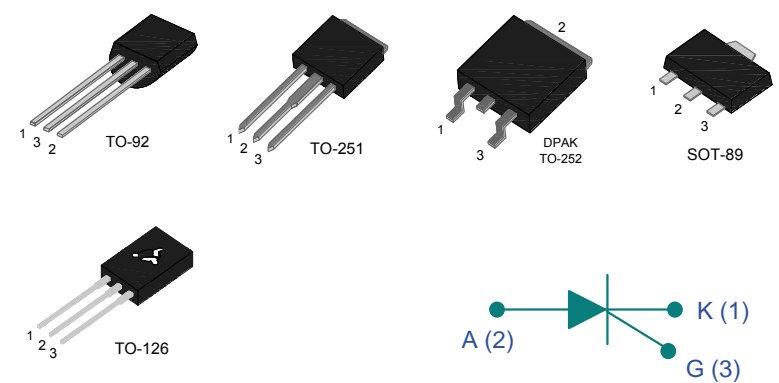
Product Model Reference & Naming 【产品型号参考及型号命名】

2A (Amperes)	产品型号列表、封装区分、型号对照电压值						I _{GT}
	封装标识	600V	800V	900V	1000V	1200V	
TO-92	A	X0202MA	X0202NA	X0202QA	X0202RA	X0202TA	02 ≤0.2mA ≤200μA ①
TO-126	T	X0202MT	X0202NT	X0202QT	X0202RT	X0202TT	
TO-251	U	X0202MU	X0202NU	X0202QU	X0202RU	X0202TU	
TO-252	S	X0202MS	X0202NS	X0202QS	X0202RS	X0202TS	
SOT-89	M	X0202MM	X0202NM	X0202QM	X0202RM	X0202TM	
Remarks (说明)		标准品种	高压品种	特制高压	特制高压	特制高压	

PINNING: Insulated Package

3-Leads Plastic Packaging

Pin in Symbol and Description				Pin Polarity & Graphic symbol 脚位与极性 电路符号表示
1	K	Cathode	阴极	
2	A	Anode	阳极	
3	G	Gate	控制极	
4		Tab	散热片	



H	X	02	02	M	A
↓	↓	↓	↓	↓	↓
厂商	品种表示	电流表示	触发电流表示	电压表示	封装表示
HAOHAI ELECTRONICS CO.,LTD.	Bipolar-Thyristor SCR 单向可控硅	2A	I _{GT} ≤0.2mA ≤200μA 具体分段 ①	M: 600V N: 800V Q: 900V R: 1000V T: 1200V	A: TO-92 T: TO-126 U: TO-251 S: TO-252 M: SOT-89

I_{GT} Class 触发电流分段 ①

Item	A	B	C	D	E	F	G	H	J	K	Unit
I _{GT}	1~5	5~10	10~30	30~60	40~100	50~200	1~30	20~80	30~100	40~200	μA

■ ABSOLUTE RATINGS (Limiting Values) 【额定值参数】

SYMBOL	Parameter & Test Conditions		Value	Unit
$I_{T(RMS)}$	On-State RMS Current	TO-92 ($T_C=63^\circ\text{C}$) TO-126 ($T_C=80^\circ\text{C}$) TO-251 ($T_C=90^\circ\text{C}$) TO-252 ($T_C=90^\circ\text{C}$) SOT-89 ($T_C=75^\circ\text{C}$)	2	A
I_{TSM}	Non repetitive surge peak on-state current	$T_J=25^\circ\text{C}$, $t_p=10\text{mS}$	20	
I_{GM}	Forward Peak Gate Current	$T_J=110^\circ\text{C}$, $t_p=20\mu\text{S}$	0.2	
I^2t	I^2t for fusing	$t=10\text{mS}$	2	A^2ses
di/dt	Critical rate of rise of on-state current		50	$\text{A}/\mu\text{s}$
P_{GM}	Forward Peak Gate Power	$t_p=20\mu\text{S}$, $T_J=110^\circ\text{C}$	0.5	W
$P_{G(AV)}$	Forward Average Gate Power	$T_J=110^\circ\text{C}$	0.1	
V_{DRM} V_{RRM}	Peak Repetitive Off-State Voltage Repetitive peak reverse voltage	见参考特性对应说明 ($T_J=25^\circ\text{C}$) See Reference Feature Description 以常规电压600V出货。高压需订制	600~1200	V
T_J	Operating Junction Temperature Range		-40~+110	$^\circ\text{C}$
T_{stg}	Storage junction temperature range		-40~+150	
T_L	Maximum Lead Temperature for Soldering Purposes 1/8, from Case for 10 Seconds		260	

■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ Unless Otherwise Noted)

SYMBOL	Parameter & Test Conditions		Min	Typ	Max	Unit
I_{GT}	$V_D=12\text{V}$, $R_L=33\Omega$	$T_J=25^\circ\text{C}$	--	50	200	μA
I_H	Holding Current	$I_T=50\text{mA}$ (0.05A)	--	--	5	mA
I_L	Latching Current	$I_G = 1.2 I_{GT}$	--	--	6	
V_{GT}	Gate Trigger Voltage	$V_D=12\text{V}$, $R_L=33\Omega$	--	0.6	0.8	V
V_{GD}	Gate Non-Trigger Voltage	$V_D=V_{DRM}$, $T_J=110^\circ\text{C}$	0.2	--	--	
V_{TM}	Peak Forward On-State Voltage	$I_{TM}=4\text{A}$, $t_p=380\mu\text{S}$, $T_J=25^\circ\text{C}$	--	--	1.5	
I_{DRM} I_{RRM}	Peak Reverse Blocking Current ($V_D=V_{DRM}$, $V_R=V_{RRM}$)	$T_J=25^\circ\text{C}$	--	--	5	μA
		$T_J=110^\circ\text{C}$	--	--	100	
dv/dt	$V_D=2/3V_{DRM}$, $R_{GK}=1\text{K}\Omega$, $T_J=110^\circ\text{C}$		10	--	--	$\text{V}/\mu\text{s}$

■ THERMAL CHARACTERISTICS

SYMBOL	Parameter & Test Conditions		Min	Typ	Max	Unit
$R_{th(j-c)}$	Thermal Resistance Junction-to-Case	TO-92	--	--	10	$^\circ\text{C}/\text{W}$
		TO-126	--	--	7.0	
		TO-251	--	--	6.5	
		TO-252	--	--	6.5	
		SOT-89	--	--	8.3	

Electrical characteristics & Typical characteristics

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

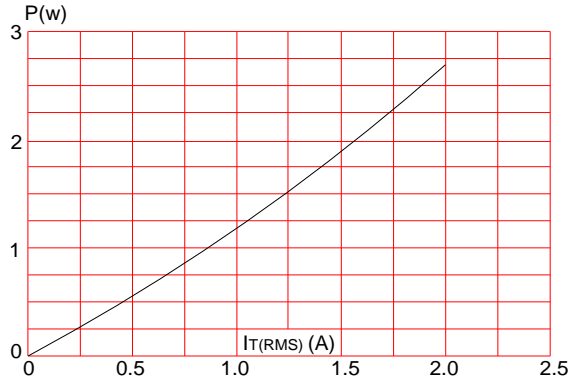


FIG.2: RMS on-state current versus case temperature

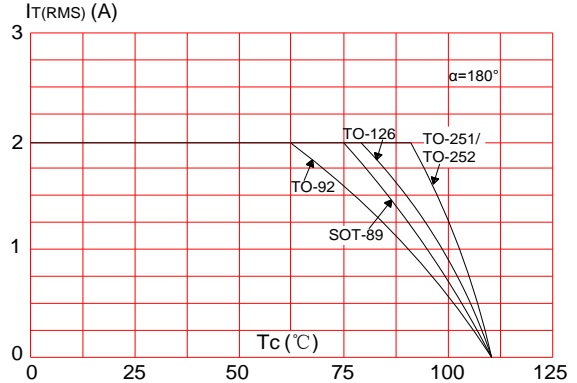


FIG.3: Surge peak on-state current versus number of cycles

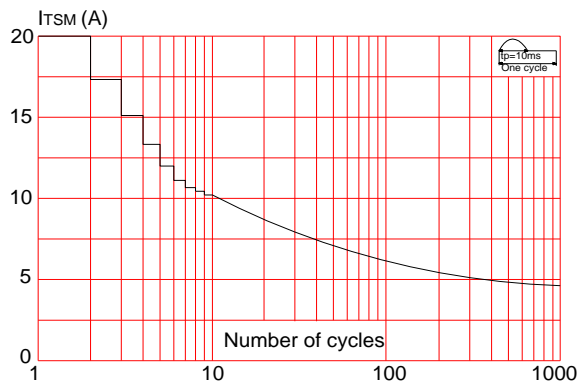


FIG.4: On-state characteristics (maximum values)

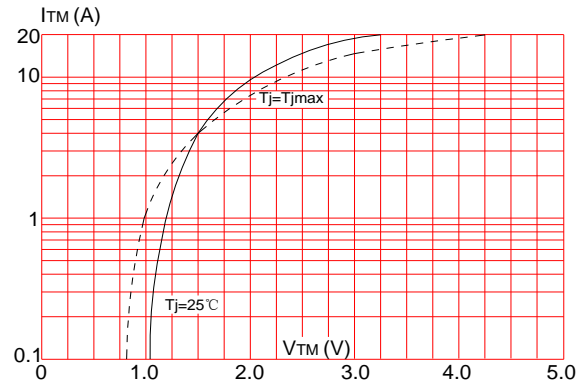


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10\text{ms}$, and corresponding value of I^2t ($di/dt < 50\text{A}/\mu\text{s}$)

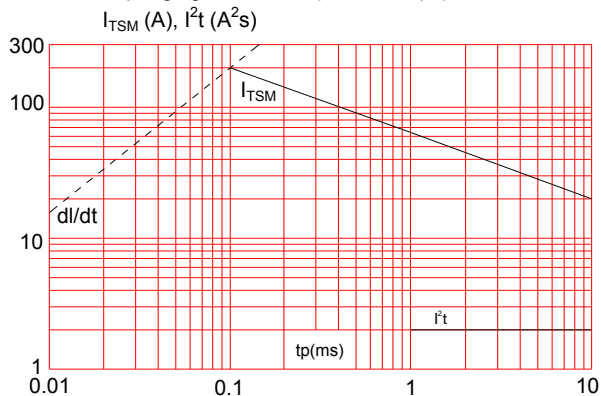
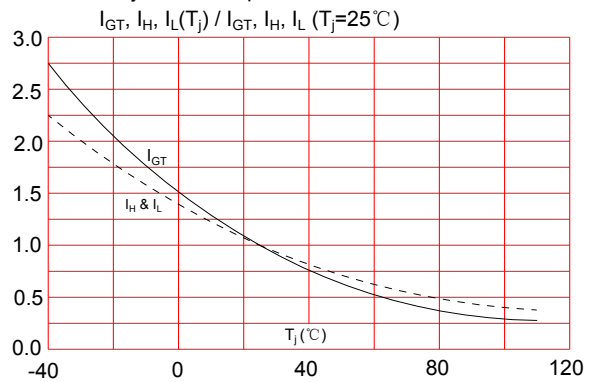


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature



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

打印标识

REF	Dimensions				Marking
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A	4.45	5.20	0.175	0.205	<p>H: HAOHAI XXXXXXXX: Part Number KKG: Registered trademark aa: Year bb: Week (01-53) LOGO in The upper left corner mark</p>
B	4.32	5.33	0.170	0.210	
C	3.18	4.19	0.125	0.165	
D	0.407	0.533	0.016	0.021	
E	0.60	0.80	0.024	0.031	
F	1.10 Typ.		0.043 Typ.		
G	1.27 Typ.		0.050 Typ.		
H	2.30 Typ.		0.091 Typ.		
J	0.36	0.50	0.014	0.020	
K	12.70	15.0	0.500	0.591	
N	2.04	2.66	0.080	0.105	
P	1.86	2.06	0.073	0.081	
V	--	4.30	--	0.169	

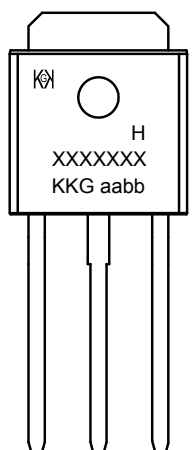
REF	Dimensions				Marking
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A	7.40	7.80	0.291	0.307	<p>H: HAOHAI XXXXXXXX: Part Number KKG: Registered trademark aa: Year bb: Week (01-53) LOGO in The upper left corner mark</p>
B	10.6	11.2	0.417	0.441	
C	15.3	16.3	0.602	0.642	
D	3.90	4.10	0.154	0.161	
E	1.17	1.47	0.046	0.058	
F	0.66	0.86	0.026	0.034	
G	2.29 Typ.		0.090 Typ.		
H	2.50	2.90	0.098	0.114	
J	1.10	1.50	0.043	0.059	
K	0.45	0.60	0.018	0.024	

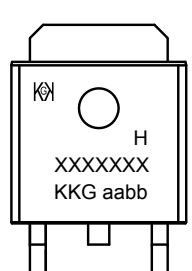
■ Packaging Specifications (包装数量、包装规格、装箱规格、包装尺寸数据)

REF.	TO-92			TO-126		
	Bag	BOX	Carton	Bag	BOX	Carton
QTY	1,000 Pcs	10,000 Pcs	100,000 Pcs	500 Pcs	5,000 Pcs	50,000 Pcs

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

打印标识

REF	Dimensions				Marking
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A	2.20	2.40	0.086	0.095	 <p>H: HAOHAI XXXXXXX: Part Number KKG: Registered trademark aa: Year bb: Week (01~53) LOGO in The upper left corner mark</p>
A2	0.90	1.20	0.035	0.047	
B	0.55	0.65	0.022	0.026	
B2	5.10	5.40	0.200	0.213	
B3	0.76	0.85	0.030	0.033	
C	0.45	0.62	0.018	0.024	
C2	0.48	0.62	0.019	0.024	
D	6.00	6.20	0.236	0.244	
E	6.40	6.70	0.252	0.264	
G	2.30 Typ.		0.091 Typ.		
H	16.0	17.0	0.630	0.669	
L	8.90	9.40	0.350	0.370	
L1	1.80	1.90	0.071	0.075	
L2	1.37	1.50	0.054	0.059	
V1	4° Typ.		4° Typ.		

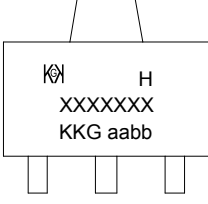
REF	Dimensions				Marking
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A	2.20	2.40	0.086	0.095	 <p>H: HAOHAI XXXXXXX: Part Number KKG: Registered trademark aa: Year bb: Week (01~53) LOGO in The upper left corner mark</p>
A2	0.03	0.23	0.001	0.009	
B	0.55	0.65	0.022	0.026	
B2	5.10	5.40	0.200	0.213	
C	0.45	0.62	0.018	0.024	
C2	0.48	0.62	0.019	0.024	
D	6.00	6.20	0.236	0.244	
E	6.40	6.70	0.252	0.264	
G	4.40	4.70	0.173	0.185	
H	9.35	10.6	0.368	0.417	
L1	1.30	1.70	0.051	0.067	
L2	1.37	1.50	0.054	0.059	
V1	4° Typ.		4° Typ.		
V2	0°	8°	0°	8°	

■ Packaging Specifications

REF.	TO-251			TO-252		
	Tube	BOX	Carton	Reel	BOX	Carton
QTY	80 Pcs	4,000 Pcs	24,000 Pcs	2,500 Pcs	5,000 Pcs	40,000 Pcs

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

打印标识

REF	Dimensions				Marking
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A	1.40	1.60	0.055	0.063	 <p>H: HAOHAI XXXXXXX: Part Number KKG: Registered trademark aa: Year bb: Week (01~53) LOGO in The upper left corner mark</p>
B	0.35	0.52	0.014	0.020	
C	0.35	0.46	0.014	0.018	
D	4.30	4.70	0.169	0.185	
D1	1.50	1.70	0.059	0.067	
D2	1.30	1.50	0.051	0.059	
E	2.30	2.70	0.091	0.106	
E1	2.20 Typ.		0.087 Typ.		
E2	0.52 Typ		0.020 Typ.		
e	1.50 Typ		0.059 Typ.		
e1	3.00 Typ		0.118 Typ.		
F	5° Typ.		5° Typ.		
H	3.94	4.00	0.155	0.157	
L	0.80	1.20	0.031	0.047	

SOT-89

■ Packaging Specifications

REF.	SOT-89		
	Reel	BOX	Carton
QTY	1,000 Pcs	10,000 Pcs	40,000 Pcs

Manufacturers version information

2005-03-20, KKG™ Product Data-1.0

2010-04-01, KKG™ Product Data-1.1

2015-08-13, KKG™ Product Data-1.2



经中华人民共和国工商行政管理总局商标局批准

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