

DESCRIPTION

Highly sensitive triggering levels, the HBT169 Series SCRs is suitable for all applications, where the available gate current is limited, such as capacitive discharge ignitions, motor control in kitchen aids, overvoltage crowbar protection in low power supplies....

- **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:** MCR22-8可代替: MCR22-6、MCR22-4、MCR22-3、MCR22-2; MCR100-6、MCR100-8、BT169、CR03系列

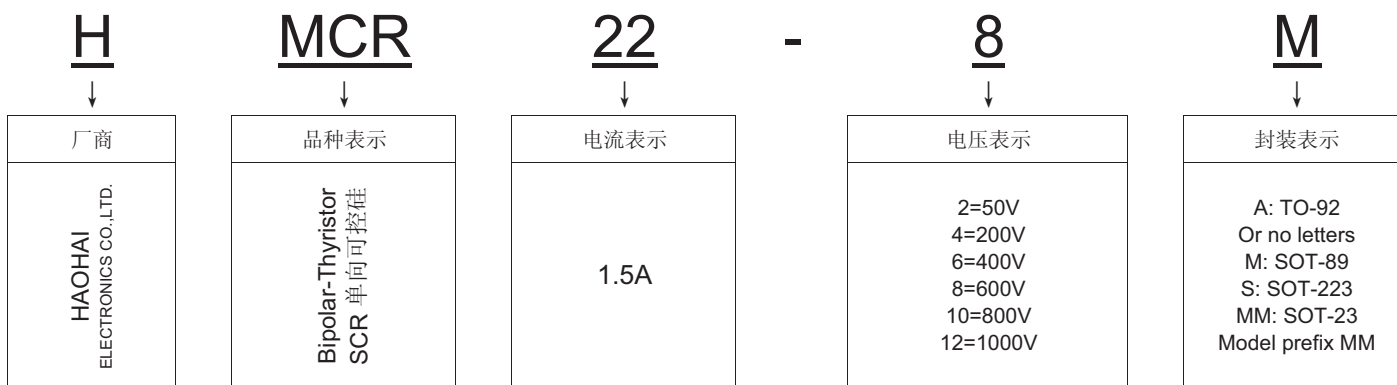
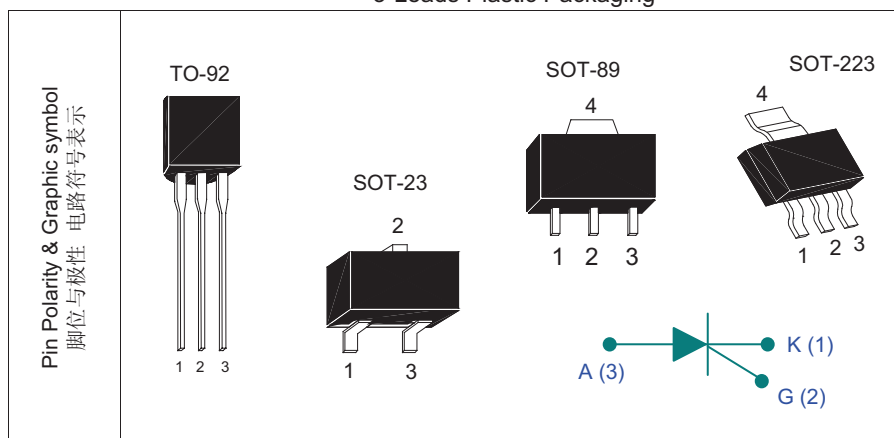
Product Model Reference & Naming【产品型号参考及型号命名】

1A (Amperes)	产品型号列表、封装区分、型号对照电压值						I _{GT}
	封装标识	200V	400V	600V	800V	1000V	
TO-92	A	MCR22-4	MCR22-6	MCR22-8	MCR22-10	MCR22-12	≤200μA ① I _{GT} Class
SOT-23	MM	MMCR22-4	MMCR22-6	MMCR22-8	MMCR22-10	MMCR22-12	
SOT-89	M	MCR22-4M	MCR22-6M	MCR22-8M	MCR22-10M	MCR22-12M	
SOT-223	S	MCR22-4S	MCR22-6S	MCR22-8S	MCR22-10S	MCR22-12S	
Remarks (说明)		低压品种	标准品种	高压品种	高压品种	特制高压	

PINNING: Insulated Package

Pin in Symbol and Description			
1	K	Cathode	阴极
2	G	Gate	控制极
3	A	Anode	阳极
4		Tab	散热片

3-Leads Plastic Packaging



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	1~10	10~20	30~45	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	All Conduction Angles	1.5	A
I_{TSM}	Peak Non-Repetitive Surge Current	$T_J=25^{\circ}C$, 1/2 Cycle, Sine Wave, 60 Hz	15	
I_{GM}	Forward Peak Gate Current	$T_A=25^{\circ}C$, Pulse Width $\leq 1.0\mu s$	0.2	
I^2t	I^2t for fusing	$t=8.3mS$	0.9	A ² ses
P_{GM}	Forward Peak Gate Power	Pulse Width $\leq 1\mu s$, $T_A=25^{\circ}C$	0.5	W
$P_{G(AV)}$	Forward Average Gate Power	$t=8.3mS$, $T_A=25^{\circ}C$	0.1	
V_{DRM} V_{RRM}	Peak Repetitive Off-State Voltage ($R_{GK}=1K\Omega$, $T_J=110^{\circ}C$, Sine Wave, 50-60 Hz, Gate Open)	见参考特性对应说明 See Reference Feature Description	200~1000	V
V_{RGM}	Reverse Peak Gate Voltage	Pulse Width $\leq 1.0\mu s$, $T_A=25^{\circ}C$	5.0	
T_J	Operating Junction Temperature Range		-40~+110	°C
T_{stg}	Storage Temperature Range		-40~+150	
T_L	Maximum Lead Temperature for Soldering Purposes 1/8, from Case for 10 Seconds		260	

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

SYMBOL	Parameter & Test Conditions		Min	Typ	Max	Unit
I_{GT}	Gate Trigger Current $V_D=6V$, $R_L=100\Omega$	$T_C=25^{\circ}C$ $T_C=-40^{\circ}C$	-- --	30 --	200 500	μA
I_H	Holding Current ($V_{AK}=12V$, Gate Open)	$T_C=25^{\circ}C$ $T_C=-40^{\circ}C$	-- --	2.0 --	5.0 100	mA
V_{GT}	Gate Trigger Voltage $V_{AK}=7V$, $R_L=100\Omega$	$T_C=25^{\circ}C$ $T_C=-40^{\circ}C$	-- --	-- --	0.8 1.2	V
V_{GD}	Gate Non-Trigger Voltage	$V_{AK}=12V$, $R_L=100\Omega$, $T_J=110^{\circ}C$	0.1	--	--	
V_{TM}	Peak Forward On-State Voltage	$I_{TM}=1A$, $tp=380\mu s$, $T_J=25^{\circ}C$	--	1.2	1.7	
I_{DRM} I_{RRM}	Peak Reverse Blocking Current ($V_R=V_{RRM}$, $R_{GK}=1K\Omega$)	$T_J=25^{\circ}C$ $T_J=110^{\circ}C$	-- --	-- --	10 200	μA

■ DYNAMIC CHARACTERISTICS

SYMBOL	Parameter & Test Conditions	Min	Typ	Max	Unit
dv/dt	$V_D=67\%V_{DRM}$, $R_{GK}=1K\Omega$, $T_J=110^{\circ}C$	--	25	--	V/ μs

■ THERMAL CHARACTERISTICS

SYMBOL	Parameter & Test Conditions		Min	Typ	Max	Unit
$R_{th(j-c)}$	Thermal Resistance, Junction to Case	TO-92	--	--	50	°C/W
$R_{th(j-a)}$	Thermal Resistance, Junction to Ambient	TO-92	--	--	160	°C/W

(1) Pulse Width = 1.0ms, Duty Cycle 1%. (2) R_{GK} Current not included in measurement.

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

FIG.1: Maximum power dissipation versus RMS on-state current(full cycle)



FIG.2: RMS on-state current versus case temperature(full cycle)

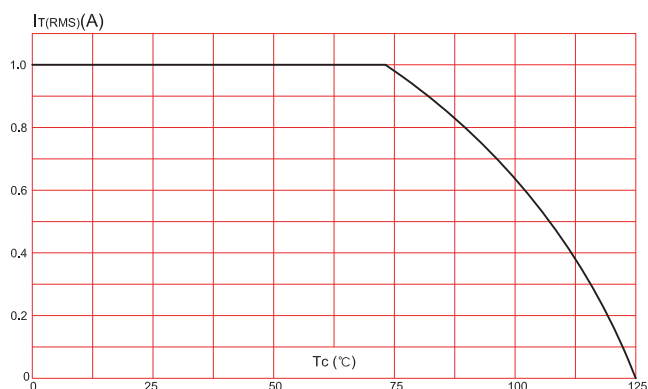


FIG.3: On-state characteristics (maximum values).

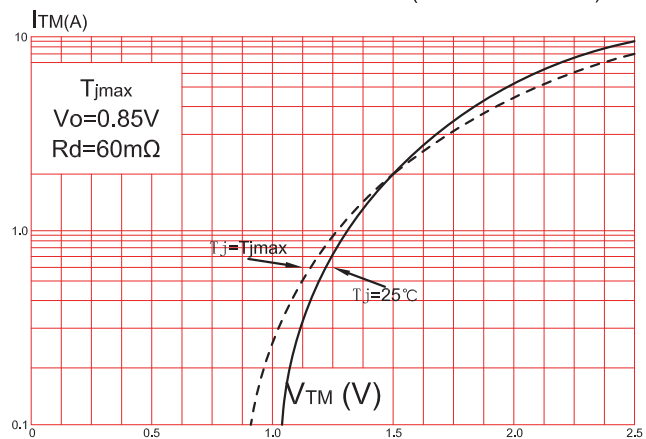


FIG.4: Surge peak on-state current versus number of cycles.

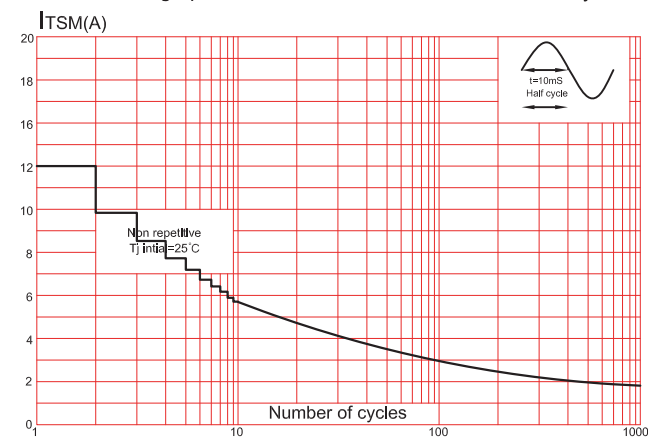


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10\text{ms}$, and corresponding value of I^2t .

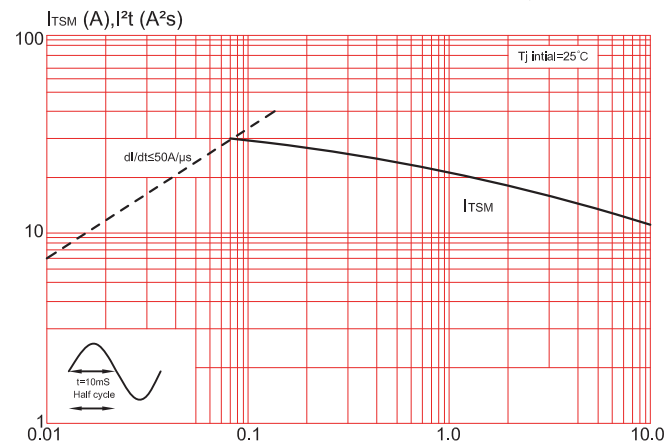
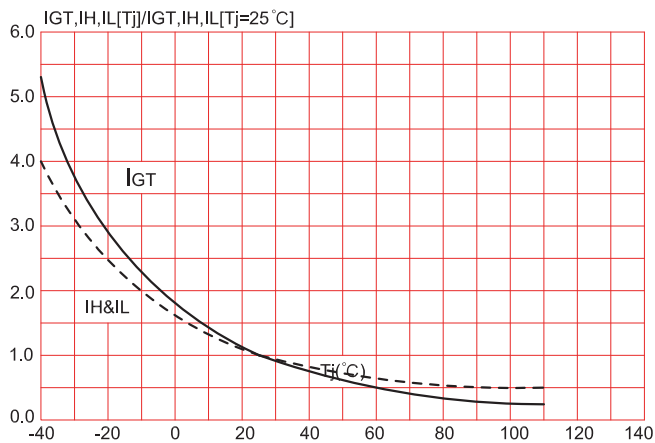


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature (typical values)



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

打印标识

REF	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.45	5.20	0.175	0.205
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
G	1.15	1.39	0.045	0.055
H	2.42	2.66	0.095	0.105
J	0.39	0.50	0.015	0.020
K	12.70		0.500	
N	2.04	2.66	0.080	0.105
P		2.54		0.100
V	3.43		0.135	

TO-92 (TO-226AA)
Package Code: A

Marking

XXX: Part Number
KKG: Registered trademark
AAA: Chip Code
LOGO in
The upper left corner mark
XXX 产品型号
KKG: 注册商标
AAA: 芯片代码
左上角为公司LOGO

REF	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0	0.100	0	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

SOT-23-3L
Package Code: MM

Marking

XXX: Part Number
KKG: Registered trademark
LOGO in
The upper left corner mark
XXX 产品型号
KKG: 注册商标
左上角为公司LOGO

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

REF.	TO-92 (TO-226AA)			SOT-23-3L		
	Bag	BOX	Carton	Reel	BOX	Carton
QTY	1,000 Pcs	10,000 Pcs	100,000 Pcs	3,000 Pcs	45,000 Pcs	180,000 Pcs
Size	--	245×176×97mm	520×370×270mm	7"	220×220×200mm	440×440×230mm
G.W.	197 g	2132 g	22314 g	113 g	1932 g	8639 g

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

打印标识

	REF	Dimensions				
		Millimeters		Inches		
		Min.	Max.	Min.	Max.	
		A	4.40	4.60	0.173	0.181
		B	2.40	2.60	0.094	0.102
C	1.40	1.60	0.055	0.063		
D	0.37	0.57	0.015	0.022		
E	0.32	0.52	0.013	0.020		
F	1.50	1.83	0.059	0.072		
G	1.50 BSC		0.059 BSC			
H	3.00 BSC		0.118 BSC			
J	0.30	0.50	0.012	0.020		
K	0.80	--	0.031	--		
L	--	4.25	--	0.167		

SOT-89
Package Code: M

Marking	
XXX: Part Number KKG: Registered trademark LOGO in The upper left corner mark	
XXX: 产品型号 KKG: 注册商标 左上角为公司LOGO	

	REF	Dimensions				
		Millimeters		Inches		
		Min.	Max.	Min.	Max.	
		A	1.50	1.80	0.059	0.071
		A1	0.01	0.10	0.001	0.004
B	2.90	3.10	0.114	0.122		
B1	0.60	0.80	0.024	0.031		
C	0.22	0.32	0.009	0.013		
D	6.30	6.70	0.248	0.264		
E	3.30	3.70	0.130	0.146		
F	4.60 TYP.		0.181 TYP.			
F1	2.30 TYP.		0.091 TYP.			
G	0.70	1.10	0.028	0.043		
H	1.50	2.00	0.059	0.079		
J	6.70	7.30	0.264	0.287		
K	0.90 TYP.		0.035 TYP.			

SOT-223
Package Code: S

Marking	
H: HAOHAI XXXXXX: Part Number KKG: Registered trademark LOGO in The upper left corner mark	
XXXXXX: 产品型号 KKG: 注册商标 左上角为公司LOGO	

■ Packaging Specifications

REF.	SOT-89			SOT-223		
	Reel	BOX	Carton	Reel	BOX	Carton
QTY	1,000 Pcs	10,000 Pcs	40,000 Pcs	2,500 Pcs	5,000 Pcs	40,000 Pcs
Size	7"	210×210×220mm	460×450×240mm	13"	336×336×46mm	440×440×600mm
G.W.	158 g	1723 g	7.8 Kg	647.5 g	1471.5 g	

Manufacturers version information
2005-03-20, KKG™ Product Data-1.0
2012-04-01, KKG™ Product Data-1.1
2014-08-10, 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
KKG 图案、字母、均为我公司正式注册商标，仿冒、盗用均属侵权，违法必究！
WARN, Letters, patterns, are officially registered my trademark counterfeiting, theft are all violations, violators will be held liable !

深圳市浩海电子有限公司
SHENZHEN HAOHAI ELECTRONICS CO., LTD.

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>