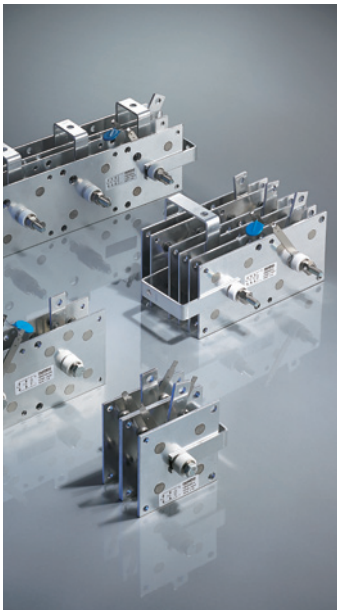
Short From Catalogue

HUAJING
华晶整流器

POWER
SEMICONDUCTOR DEVICES
电力半导体器件

HUAJING RECTIFIER CO.,LTD.
华晶整流器有限公司
www.china-huajing.com



HUAJING

- Since 1992 -

企业简介

作为国内专业的电力半导体器件及硅整流成套设备生产企业之一，华晶自成立之初，秉承以产品质量为根本，以市场需求为导向，以为客户创造价值为己任的精神，致力于为全球客户提供高品质的电力半导体产品。

公司不断加大设备投入力度，引进先进的生产检测设备，将现代科技融入企业技术生产经营全过程，把从市场、设计、制造、管理、售前、售后服务的整个生产经营过程视为一个整体，努力提高企业核心竞争力。公司在上海、江苏、宁波等地拥有多条自动化生产线，专业生产各类双极型晶体管、可控硅、场效应管等各类大、中、小功率半导体器件。针对电力半导体元件适应现代产业技术发展的高度可靠性要求，华晶不断追求半导体部件的高性能化，凭借雄厚的科技力量和先进的检测设备和国际化生产管理体制，使产品的整体工艺达到世界先进水平，并以此推动相关产业的发展。

公司主要产品有：单双向可控硅、电源管理器件、平板式器件、螺旋式器件、功率半导体模块、桥式整流器、固态继电器、智能模块、电焊机组件、电子电力器材用散热器、整流装置、开关电源、充电机等。公司通过ISO9001:2000 质量管理体系认证；产品均获得全国工业生产许可，并通过 CE 认证。

华晶秉承“为用户服务、对用户负责、让用户满意”的服务宗旨，为各行业用户提供优质的产品、完善的服务。目前公司已在全国各大、中城市建立起完善的售后服务网络，我们在保证为客户提供高品质产品的同时，致力为客户提供尽心尽力、尽善尽美的服务。

面队经济全球化、知识化、信息化的挑战，华晶人与时俱进、开拓创新，不断推进企业的规模化、科技化建设，努力做大做强。热忱期待与海内外的用户一起进一步发展技术合作、科技研发、共创双赢、共同成长！

INTRODUCTION

Since its establishment, Huajing, as one of the professional manufacturers of power semiconductor devices and rectifier equipments in China, has been devoted to provide high quality power semiconductor products for customers in the world by carrying forward the spirit of product quality as the base, market demand as the guide and creating value for customers as our responsibility.

The company has unceasingly enhanced investment in equipment, introduced advanced production and inspection equipment and integrated modern technology into the whole process of production and management in the company, making all efforts to improve core competitive force of the enterprise by regarding marketing, design, manufacturing, management, before-sale and after-sale service as a whole. To meet the requirements of development of modern industrial technology to high reliability of power semiconductor components, Huajing is continuously developing high performance semiconductor components to make the overall technology of products reach the world advanced level and push forward the development of relevant industries through our strong technological force, advanced inspection equipment and internationalized production and management systems.

Our main products include: Capsule type device, Stud type device, Power module, Bridge rectifier, Solid state relay, Intelligent module, Heatsink, Welding machine device, Rectifier equipments, Switch power supply, Battery charger etc. We have been issued the national production license for industrial products and certified to CE.
HUAJING adhering to the “service for the users, responsible for the users, and customer satisfaction” service purposes, for various industries provide quality products, perfect service. The company has built a perfect after-sale service network in the country, we guarantee to provide customers with high-quality products and perfection services.

Faced with the challenges of economic globalization, intellectualization and informationization, the pioneering and enterprising Huajing personnel are advancing with times and continuously promoting scale and technology construction of the enterprise, striving to make it bigger and stronger. Warmly welcome users from home and abroad to further develop technical cooperation and scientific research and development with us for creating mutual benefits and growing up together!



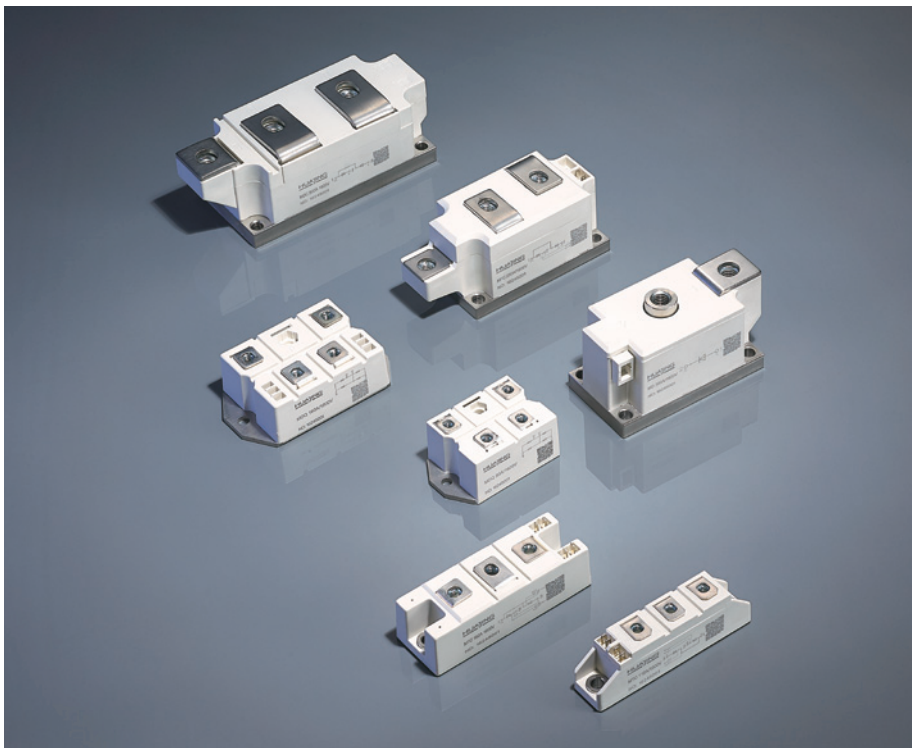


Twenty - seven years of ingenuity, Achieve the quality of the road

二十七年匠心，成就华晶品质之路

华晶——一个专注于电力半导体领域的资深企业，孜孜以求、致力成为行业领先的电力半导体器件制造企业。以前瞻特立的稳健笃行，不断契合客户需求，以高效、快速的响应能力提供专业化的服务支持，为客户提供最具性价比的电力半导体器件和解决方案。

HUAJING - a senior company specializing in the field of power semiconductor, has been striving to become the leading manufacturer of power semiconductor devices. To prospectie tenet's relentlessly resourceful, fit the needs of customers, in an efficient and rapid response capability to provide professional service support, to provide customers with the most cost-effective power semiconductor devices and solutions.



Supply the global users with a high-performance power semiconductor devices

为全球用户提供高性能的电力半导体器件

电力半导体器件主要用于电力电子设备的整流、稳压、开关、混频等，具有应用范围广等特点，被广泛应用于计算机、工业控制、汽车电子、网络通信、消费电子与轨道交通、医疗器械、智能电网、新能源领域 (光伏和风力发电、电动汽车) 及航空与军事等各个领域。

Power semiconductor device is mainly used for power electronics rectifier, regulator, switch, mixing, etc., has many characteristics, such as wide application range, is widely used in computer, industrial control, automotive electronics, network communications, consumer electronics and rail transportation, medical equipment, smart grid, new energy (solar and wind power, the electric car) as well as aviation and military fields.

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普通整流管 Rectifier Diode

特点

- 扩散结构
- 平板型陶瓷管封装、双面冷却

典型应用

- 大功率变流器
- 焊接设备
- 电机控制和驱动、充电设备

Feature

- Full diffusion process
- Capsule type ceramic package. Double sided cooling

Typical Application

- High power transmission
- Welding equipment
- Motor control and drive. Battery charger

Type	V_{RRM}	$I_{F(AV)}$ T_{HS} 55°C	I_{RRM}	V_{FM}/I_{FM} 25°C	$R_{TH(j-hs)}$	Tjm	安装力 M
	V	A	mA	V/A	°C/W	°C	KN
ZP100A	100-5000	100	16	1.2/300	0.090	150	3.3-5.5
ZP200A	100-5000	200	16	1.2/600	0.090	150	3.3-5.5
ZP300A	100-5000	300	30	1.2/900	0.065	150	5.3-10
ZP400A	100-5000	400	40	1.2/1200	0.040	150	10-20
ZP500A	100-5000	500	40	1.2/1500	0.040	150	10-20
ZP600A	100-5000	600	40	1.2/1800	0.040	150	10-20
ZP800A	100-5000	800	80	2.2/2400	0.022	150	19-26
ZP1000A	100-5000	1000	80	2.0/3000	0.022	150	19-26
ZP1200A	100-5000	1200	120	2.2/3000	0.020	150	21-30
ZP1500A	100-5000	1500	130	2.0/3000	0.020	150	21-30
ZP2000A	100-5000	2000	140	2.2/4000	0.016	150	30-40
ZP2500A	100-5000	2500	150	2.2/5000	0.011	150	35-47
ZP3000A	100-5000	3000	160	2.0/5000	0.010	150	40-50
ZP3500A	100-5000	3500	200	2.0/5000	0.090	150	60-75
ZP4000A	100-5000	4000	230	2.0/5000	0.009	150	70-95
ZP5000A	100-5000	5000	250	2.25/5000	0.080	150	70-95

焊接二极管 Welding Diode

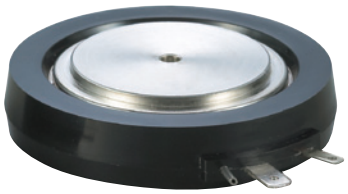
特点

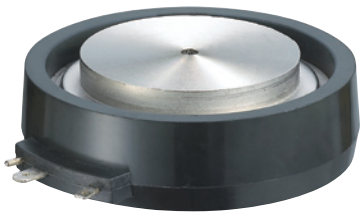
- 专为中高频焊接设备和大电流整流器设计。
- 经过验证的高可靠性焊接元件，极低的通态电压和非常低的热电阻。

Feature

- Designed for medium frequency welding equipment and optimized for high current rectifiers.
- Proven high reliability in welding equipment with very low on-state voltage and very low thermal resistance.

Type	V_{RRM}	$I_{F(AV)}$ T_{HS} 55°C	I_{RRM}	V_{FO} Tjmax	R_F Tjmax		R thjc	安装力 M
	V	A	mA	V/A		°C	K/KW	KN
ZP7100A	200-400	7100	20	0.70	0.090	170	6.0	22
ZP12000A	200-400	12000	60	0.75	0.065	170	3.9	35
ZP13500A	200-400	13500	80	0.758	0.040	170	3.9	35





普通晶闸管 Phase Control Thyristor

特点

- 全扩散工艺，平板型陶瓷管封装
- 中心放大门极结构，双面冷却

典型应用

- 大功率变流器
- 交直流电机控制
- 交直流开关、相控整流
- 有源和无源逆变

Feature

- Full diffusion process, capsule type ceramic package
- Amplifying gates, Double sided cooling

Typical Application

- High power transmission
- DC and AC motor control, Controlled rectifier
- AC DC switch, phase-controlled rectifying
- Active and reactive inversion

Type	V_{DRM} V_{RRM}	$I_{T(AV)}$ T_{HS} 55°C	I_{TSM} 10ms	dv/dt	di/dt	I_{DRM} I_{RRM}	I_{GT}	V_{GT}	I_H	V_{TM}/I_{TM}	$R_{TH(j-hs)}$	Tjm	安装力 M
							25°C						
	V	A	KA	V/μS	A/μS	mA	mA	V	mA	V/A	°C/W	°C	KN
KP100A	100-6500	100	2.5	300	100	30	35-250	0.8-2.0	20-150	2.4/600	0.065	125	5.3-10
KP200A	100-6500	200	2.5	300	100	30	35-250	0.8-2.0	20-150	2.4/600	0.065	125	5.3-10
KP300A	100-6500	300	3.8	500	100	30	35-250	0.8-2.5	20-200	2.2/900	0.055	125	5.3-10
KP400A	100-6500	400	5	500	100	40	35-250	0.8-2.5	20-200	2.4/1200	0.040	125	10-20
KP500A	100-6500	500	6.4	800	100	50	35-250	0.8-2.5	20-250	2.4/1500	0.035	125	15-20
KP600A	100-6500	600	6.4	800	100	40	35-300	0.8-2.5	20-250	1.8/1800	0.035	125	10-20
KP800A	100-6500	800	10	1000	100	50	40-300	0.8-3.0	20-250	2.2/2400	0.032	125	15-20
KP1000A	100-6500	1000	13	1000	150	80	40-300	0.8-3.0	20-300	2.4/3000	0.022	125	21-30
KP1200A	100-6500	1200	15	1000	200	120	40-300	0.8-3.0	20-300	2.4/3000	0.020	125	21-30
KP1500A	100-6500	1500	20	1000	200	120	40-300	0.8-3.0	20-300	2.4/3000	0.017	125	27-34
KP1800A	100-6500	1800	22.5	1000	200	160	40-300	0.8-3.0	20-300	2.4/4000	0.016	125	30-40
KP2000A	100-6500	2000	25	1000	250	200	40-300	0.8-3.0	20-300	2.4/4000	0.011	125	35-47
KP2500A	100-6500	2500	31	1000	250	200	40-300	0.8-3.0	20-300	2.4/5000	0.011	125	35-47
KP3000A	100-6500	3000	38	1000	250	200	40-300	0.8-3.0	20-300	2.2/5000	0.011	125	35-47
KP3500A	100-6500	3500	44	1000	250	250	40-300	0.8-3.0	20-300	2.4/5000	0.01	125	70-85
KP4000A	100-6500	4000	44	1000	250	250	40-300	0.8-3.0	20-300	2.4/5000	0.01	125	70-85
KP5000A	100-6500	5000	44	1000	250	250	40-300	0.8-3.0	20-300	2.4/5000	0.01	125	70-85

说明

■ I_{GT}、V_{GT}、I_H 为 25℃测试值，除非另作说明，参数表中其它参数皆为在 Tjm 下的测试值

■ $I^2t=I^2_{TSM}\times tw/2$: tw= 正弦半波电流底宽。在 50Hz 下，$I^2t=0.005I2_{TSM}(A^2S)$

■ 当使用在电流为 60Hz 情况下：$I_{TSM}(8.3ms)=I_{TSM}(10ms)\times 1.066$, Tj=Tjm

$I^2t(8.3ms)=I^2t(10ms)\times 0.943$, Tj=Tjm

■ 门极引线：白色或无色　阴极引线 (需要时): 红色

Note:

■ I_{GT}, V_{GT}, I_H are test values under 25℃. Unless otherwise specified, other parameters in the parameter table are test values under Tjm.

■ $I^2t=I^2_{TSM}\times tw/2$: tw=bottom width of half-sinusoid current. Under 50Hz, $I^2t=0.005I^2_{TSM}(A^2S)$.

■ When working under the current of 60Hz: $I_{TSM}(8.3ms)=I_{TSM}(10ms)\times 1.066$, Tj=Tjm.

$I^2t(8.3ms)=I^2t(10ms)\times 0.943$, Tj=Tjm.

■ Gate lead: white or colorless, cathode lead (if necessary): Red

雪崩整流管 Avalanche Diode

特点

- 全扩散工艺，平板型陶瓷管封装
- 中心放大门极结构
- 双面冷却，大电流

典型应用

- 大功率变流器
- 交直流电机控制，交直流开关
- 相控整流
- 有源和无源逆变

Feature

- Full diffusion process, capsule type ceramic package
- Amplifying gate structure at the center
- Double-sided cooling, High current

Typical Application

- High power converter
- AC & DC motor control, AC& DC switch
- Phase-controlled rectifying
- Active and reactive inversion

Type	V_{RRM}	$I_{F(AV)}$ T_{HS} 55°C	I_{RRM}	V_{FM}/I_{FM} 25°C	$R_{TH(j-hs)}$	Tjm	安装力 M
	V	A	mA	V/A	°C/W	°C	KN
ZB200A	100-5000	200	16	1.8/600	0.090	150	3.3-5.5
ZB300A	100-5000	300	30	1.8/900	0.065	150	5.3-10
ZB400A	100-5000	400	40	1.8/1200	0.040	150	10-20
ZB500A	100-5000	500	40	1.8/1500	0.040	150	10-20

快速整流管 Fast recovery diode

Type	V_{RRM}	$I_{F(AV)}$ T_{HS}55°C	trr 100°C	Qrr	I_{FSM} 10ms	I_{RRM}	V_{FM}/I_{FM} 25°C	$R_{TH(j-hs)}$	Tjm	安装力 M
	V	A	μS	μC	KA	mA	V/A	°C/W	°C	KN
ZK200A	100-5000	200	2	70	2.7	16	2.2/600	0.090	150	3.3-5.5
ZK300A	100-5000	300	3	100	4.1	30	2.4/900	0.065	150	5.3-10
ZK400A	100-5000	400	3	100	5.4	40	2.4/1200	0.040	150	10-20
ZK500A	100-5000	500	3	120	8	40	2.4/1800	0.033	150	10-20
ZK800A	100-5000	800	3	130	10	40	2.6/2400	0.033	150	10-20
ZK1000A	100-5000	1000	4	150	13	50	2.6/3000	0.030	150	15-20
ZK1500A	100-5000	1500	4	250	20	80	2.8/3000	0.020	150	19-26
ZK2000A	100-5000	2000	6	400	30	120	3.0/5000	0.016	150	27-34
ZK3000A	100-5000	3000	6	700	40	200	3.0/5000	0.016	150	35-47

说明

■ I_{GT}、V_{GT}、I_H 为 25℃测试值，除非另作说明，参数表中其它参数皆为在 Tjm 下的测试值

■ $I^2t=I^2_{TSM}\times tw/2$: tw= 正弦半波电流底宽。在 50Hz 下，$I^2t=0.005I2_{TSM}(A^2S)$

■ 当使用在电流为 60Hz 情况下：$I_{TSM}(8.3ms)=I_{TSM}(10ms)\times 1.066$, Tj=Tjm

$I^2t(8.3ms)=I^2t(10ms)\times 0.943$, Tj=Tjm

■ 门极引线：白色或无色　阴极引线 (需要时): 红色

Note:

■ I_{GT}, V_{GT}, I_H are test values under 25℃. Unless otherwise specified, other parameters in the parameter table are test values under Tjm.

■ $I^2t=I^2_{TSM}\times tw/2$: tw=bottom width of half-sinusoid current. Under 50Hz, $I^2t=0.005I^2_{TSM}(A^2S)$.

■ When working under the current of 60Hz: $I_{TSM}(8.3ms)=I_{TSM}(10ms)\times 1.066$, Tj=Tjm.

$I^2t(8.3ms)=I^2t(10ms)\times 0.943$, Tj=Tjm.

■ Gate lead: white or colorless, cathode lead (if necessary): Red

快速晶闸管 Fast Turn-off Thyhristor

特点

- 全扩散工艺，平板型陶瓷管封装
- 分布式放大门极结构
- 优良的动态特性
- 低开关损耗，双面冷却
- 快速开关性能

典型应用

- 逆变器、斩波器、感应加热
- 各种类型的强迫换流器

Feature

- Full diffusion process, capsule type ceramic package
- Distributed extension to amplify the gate structure
- Excellent dynamic characteristic
- Low switching loss, Double-sided cooling
- Fast switching performance

Typical Application

- Inverter, Chopper, Inductor
- Various types of forced converter

Type	V_{DRM} V_{RRM}	$I_{T(AV)}$ T_{HS} 55°C	Tq 100°C	I_{DRM} I_{RRM}	I_{GT}	V_{GT}	I_H	V_{TM}/I_{TM}	R_{TH} (j-hs)	Tjm	安装力 M
					25°C						
	V	A	μS	mA	mA	V	mA	V/A	°C/W	°C	KN
KK200A	600-2500	200	16-35	30	40-250	0.9-2.5	20-400	2.9/600	0.065	115	5.3-10
KK300A	600-2500	300	16-35	30	40-250	0.9-2.5	20-400	2.8/900	0.055	115	5.3-10
KK400A	600-2500	400	16-35	40	40-250	0.9-2.5	20-400	2.8/1200	0.040	115	10-20
KK500A	600-2500	500	16-35	50	40-250	0.9-2.5	20-400	3.15/1500	0.035	115	15-20
KK600A	600-2500	600	16-35	50	40-300	0.9-3.0	20-400	3.15/1800	0.032	115	15-20
KK800A	600-2500	800	16-35	60	40-300	0.9-3.0	20-400	3.15/2400	0.030	115	18-25
KK1000A	600-2500	1000	16-35	80	40-300	0.9-3.0	20-500	3.15/3000	0.024	115	19-26
KK1200A	600-2500	1200	16-35	100	40-300	0.9-3.0	20-500	3.15/3000	0.022	115	21-30
KK1500A	600-2500	1500	16-35	120	40-300	0.9-3.5	20-500	3.15/3000	0.020	115	21-30
KK1800A	600-2500	1800	16-35	120	40-400	0.9-3.5	20-800	3.15/4000	0.017	115	27-34
KK2000A	600-2500	2000	40-80	160	40-400	0.9-4.5	20-1000	3.15/4000	0.016	115	30-40
KK2500A	600-2500	2500	40-80	200	40-450	0.9-4.5	20-1000	3.15/5000	0.011	115	35-47
KK3000A	600-2500	3000	40-80	250	40-450	0.9-4.5	20-1000	3.15/5000	0.009	115	45-55

说明

■ I_{GT}、V_{GT}、I_H 为 25℃测试值，除非另作说明，参数表中其它参数皆为在 Tjm 下的测试值

■ $I^2t=I^2_{TSM}\times tw/2$: tw= 正弦半波电流底宽。在 50Hz 下，$I^2t=0.005I2_{TSM}(A^2S)$

■ 当使用在电流为 60Hz 情况下：$I_{TSM}(8.3ms)=I_{TSM}(10ms)\times 1.066$, Tj=Tjm

$I^2t(8.3ms)=I^2t(10ms)\times 0.943$, Tj=Tjm

■ 门极引线：白色或无色　阴极引线 (需要时): 红色

Note:

■ I_{GT}, V_{GT}, I_H are test values under 25℃. Unless otherwise specified, other parameters in the parameter table are test values under Tjm.

■ $I^2t=I^2_{TSM}\times tw/2$: tw=bottom width of half-sinusoid current. Under 50Hz, $I^2t=0.005I^2_{TSM}(A^2S)$.

■ When working under the current of 60Hz: $I_{TSM}(8.3ms)=I_{TSM}(10ms)\times 1.066$, Tj=Tjm.

$I^2t(8.3ms)=I^2t(10ms)\times 0.943$, Tj=Tjm.

■ Gate lead: white or colorless, cathode lead (if necessary): Red

高频晶闸管 (KA/KG) High Frequency Thyristor

特点

- 全扩散工艺，分布式扩展放大门极结构
- 开关损耗低，优良的动态特性
- 优良的高频性能，适用频率 2.5-10KHz
- 平板型陶瓷管封装，双面冷却

典型应用

- 逆变器、电焊机
- 斩波器、感应器
- 各种类型的强迫换流器

Feature

- Full diffusion process, Distributed extension to amplify the gate structure
- Low switching loss, Excellent dynamic characteristic
- Excellent high frequency performances, applicable frequency 2.5-10KHz
- Capsule type ceramic package, Double-sided cooling

Typical application

- Inverter, Electric welder
- Chopper, Inductor
- Various types of forced converter

Type	V_{DRM} V_{RRM}	$I_{T(AV)}$	Itf/f	Tq	I_{TSM}	I_{DRM} I_{RRM}	I_{GT}	V_{GT}	I_H	V_{TM}/I_{TM}	R_{TH} (j-hs)	Tjm	安装力 M
		T_{HS} 55°C		100°C	10ms		25°C						
	V	A	A/KHz	μS	KA	mA	mA	V	mA	V/A	°C/W	°C	KN
KG200A	800-2500	200	200/6	10-16	2.4	30	30-200	0.8-2.5	20-250	3.2/600	0.055	115	5.3-10
KG300A	800-2500	300	300/6	10-16	3.6	40	30-250	0.8-3.0	20-400	3.2/900	0.035	115	10-20
KG400A	800-2500	400	300/10	10-16	4.8	40	30-250	0.8-3.0	20-400	3.2/1200	0.035	115	10-20
KG500A	800-2500	500	500/6	10-16	6	50	30-250	0.8-3.0	20-400	3.2/1500	0.032	115	15-20
KG600A	800-2500	600	600/6	12-18	7.2	60	30-250	0.8-3.0	20-400	3.2/1800	0.030	115	18-25
KG800A	800-2500	800	800/6	12-18	9.6	80	30-250	0.8-3.0	20-400	3.2/2400	0.024	115	19-25
KG1000A	800-2500	1000	1000/6	12-18	12	100	30-300	0.8-3.0	20-400	3.2/3000	0.022	115	21-30
KG1200A	800-2500	1200	800/8	15-20	14	100	30-300	0.8-3.0	20-400	3.2/3000	0.022	115	21-30

双向晶闸管 Bi-directional Thyristor

Type	V_{DRM} V_{RRM}	$I_{T(AV)}$ T_{HS} 55°C	I_{TSM} 10ms	I_{DRM} I_{RRM}	I_{GT}	V_{GT}	I_H	V_{TM}/I_{TM}	R_{TH} (j-hs)	Tjm	安装力 M
					25°C						
	V	A	KA	mA	mA	V	mA	V/A	°C/W	°C	KN
KS200A	100-2000	200	1.7	20	20-200	0.8-2.5	20-200	2.4/300	0.120	125	3.3-5.5
KS300A	100-2000	300	2.5	30	20-200	0.8-2.5	20-200	2.4/500	0.065	125	5.3-10
KS500A	100-2000	500	4	40	20-300	0.8-3.0	20-300	2.4/700	0.040	125	10-20
KS600A	100-2000	600	4.2	40	20-300	0.8-3.0	20-300	2.4/900	0.035	125	10-20
KS800A	100-2000	800	6.8	50	20-350	0.8-3.5	20-400	2.4/1200	0.030	125	15-20

俄罗斯型 Russian Type

特点

- 陶瓷绝缘子密封金属外壳封装，双面冷却
- 放大门极，优化后通态损耗低
- 适用于串联及并联，Q_{RR} 和 V_{TM} 偏差小

典型应用

- 直流电机控制
- 可控整流器、交流控制器
- 交流电机用“软”启动器
- 高电压 SM 驱动至 30MW

Feature

- Hermetic metal case with ceramic insulator. Capsule packages for double-sided cooling.
- Amplifying gates. Optimized for low on-state losse.
- Suitable for series and parallel connections, narrow Q_{RR} and V_{TM} deflection.

Typical application

- DC motor control.
- Controlled rectifier, AC controller.
- “Soft” starters for AC motor.
- High voltage SM-drives up to 30 MW.

Type	V_{DRM} (V_{RRM})	Irr (I_{DRM})	$I_{T(AV)}$ (Tc°C)	I_{TSM} 10ms	V_{TM}/I_{TM}	V_{GT}	I_{GT}	dv/dt	di/dt	Tjmax	Rth(j-c)	Weight
	V	mA	A	kA	V/A	V	mA	V/mks	A/mks	°C/W	°C/W	kg
T123-200	400-6500	150.0	200(95)	4.00	1.90/628	2.5	≤ 200	≥ 500	30	125	0.08	0.070
T123-250	400-6500	150.0	250(92)	4.50	1.75/785	2.5	≤ 200	≥ 500	30	125	0.08	0.070
T123-320	400-6500	150.0	320(90)	5.00	1.75/1005	2.5	≤ 200	≥ 500	30	125	0.075	0.070
T133-400	400-6500	30.0	400(93)	8.00	1.75/1256	2.5	≤ 200	≥ 500	100	125	0.045	0.100
T133-500	400-6500	50.0	500(120)	10.00	1.50/1570	2.5	≤ 250	≥ 500	100	150	0.035	0.100
T133-630	400-6500	50.0	630(120)	12.00	1.45/1980	2.5	≤ 250	≥ 500	100	150	0.035	0.100
T143-400	400-6500	50.0	400(96)	9.00	2.15/1256	2.5	≤ 300	≥ 1000	250	125	0.034	0.240
T143-500	400-6500	30.0	500(94)	11.00	1.80/1570	2.5	≤ 250	≥ 1000	250	125	0.034	0.240
T143-630	400-6500	30.0	630(93)	13.00	1.65/1978	2.5	≤ 250	≥ 1000	250	125	0.03	0.240
T143-800	400-6500	30.0	800(85)	14.00	1.75/2512	2.5	≤ 250	≥ 1000	250	125	0.03	0.240
T143-1000	400-6500	70.0	1000(100)	19.00	1.50/3140	2.5	≤ 250	≥ 1000	250	150	0.028	0.240
T153-630	400-6500	50.0	630(93)	15.00	2.10/1978	2.5	≤ 250	≥ 1000	250	125	0.024	0.500
T153-800	400-6500	50.0	800(90)	20.00	1.90/2512	2.5	≤ 250	≥ 1000	250	125	0.024	0.500
T153-1600	400-6500	100.0	1600(100)	30.00	1.50/5024	2.5	≤ 200	≥ 1000	250	140	0.016	0.500
T153-2000	400-6500	100.0	2000(95)	36.00	1.45/6280	2.5	≤ 200	≥ 1000	250	140	0.016	0.500
T253-500	400-6500	150.0	530(80)	10.00	2.40/1570	2.5	≤ 250	≥ 1000	250	120	0.026	0.550
T253-800	400-6500	70.0	800(91)	17.00	2.10/2500	2.5	≤ 250	≥ 1000	250	125	0.020	0.550
T253-1000	400-6500	70.0	1000(88)	22.00	1.80/3140	2.5	≤ 250	≥ 1000	250	125	0.020	0.550
T253-1250	400-6500	70.0	1250(92)	28.000	1.60/3925	2.5	≤ 250	≥ 1000	250	125	0.018	0.550
T173-2000	400-6500	200.0	2000(90)	49.00	1.65/6280	2.5	≤ 250	≥ 1000	250	125	0.011	1.200
T173-2500	400-6500	100.0	2700(85)	52.00	1.70/7850	2.5	≤ 250	≥ 1000	250	125	0.010	1.200
T173-3200	400-6500	200.0	3360(95)	60.00	1.50/10050	2.5	≤ 250	≥ 1000	250	140	0.010	1.200
T173-4000	400-6500	200.0	4000(85)	62.00	1.50/12560	2.5	≤ 250	≥ 1000	250	140	0.010	1.200

普通整流管 Standard Rectifier Diode

特点

- 全封闭陶瓷 - 金属螺柱型结构，符合 JB/T8949.2-1999 标准
- 承受高浪涌电流能力，螺栓为阴极或阳极的正向或反向结构

典型应用

- 直流电机控制，直流电源控制
- 交流开关及温度控制，同步电机励磁

Feature

- Hermetic ceramics-metal stud structure. Conform to national standard JB/T8949.2-1999
- Capacity of supporting high surge current, Stud cathode and stud anode version

Typical Application

- DC motor controls, Controls DC power supplie
- AC switch and thermal control, Synchronous motor excitation

Type	$I_{F(AV)}$	$I_{F(RMS)}$	V_{FM}	V_{RRM}	I_{RRM}	R(jc)	Tj	Weight
	A	A	V	V	mA	°C/W	°C	g
ZP5A	5	7.9	≤ 1.0	100~5000	≤ 2	≤ 4.0	-40~150	10
ZP10A	10	16	≤ 1.0	100~5000	≤ 2	≤ 2.5	-40~150	25
ZP20A	20	31	≤ 1.1	100~5000	≤ 6	≤ 1.4	-40~150	27
ZP30A	30	47	≤ 1.1	100~5000	≤ 6	≤ 1.0	-40~150	110
ZP50A	50	79	≤ 1.2	100~5000	≤ 12	≤ 0.6	-40~150	140
ZP100A	100	160	≤ 1.3	100~5000	≤ 12	≤ 0.3	-40~150	205
ZP200A	200	310	≤ 1.4	100~5000	≤ 12	≤ 0.2	-40~150	325
ZP300A	300	470	≤ 1.5	100~5000	≤ 15	≤ 0.11	-40~150	470
ZP500A	500	630	≤ 1.8	100~5000	≤ 15	≤ 0.068	-40~150	925

普通晶闸管 Phase Control Thyristor

特点

- 全封闭陶瓷 - 金属螺柱型结构
- 承受高浪涌电流能力

典型应用

- 直流电机控制，直流电源控制，交流开关及温度控制，同步电机励磁

Feature

- Hermetic ceramics-metal stud structure
- Capacity of supporting high surge current

Typical Application

- DC motor control, Control DC power supplie, AC switch and thermal control, Synchronous motor excitation

Type	$I_{T(AV)}$	$I_{F(RMS)}$	V_{TM}	V_{RRM}	I_{DRM}	I_{GT}	V_{GT}	I_H	dv/dt	di/dt	Tj	Rjc	Weight
	A	A	V	V	mA	mA	V	mA	V/μS	A/μS	°C/W	°C	g
KP5A	5	8	≤ 2.0	100~3000	≤ 8.0	5~45	≤ 2.5	5~45	≥ 500	-	-40~+125	≤ 3.0	12
KP10A	10	16	≤ 2.0	100~3000	≤ 8.0	5~45	≤ 2.5	5~45	≥ 500	-	-40~+125	≤ 2.5	27
KP20A	20	32	≤ 2.0	100~3000	≤ 8.0	5~45	≤ 2.5	5~45	≥ 500	-	-40~+125	≤ 1.0	29
KP30A	30	48	≤ 2.0	100~3000	≤ 10	5~50	≤ 2.5	5~50	≥ 800	≥ 50	-40~+125	≤ 0.5	112
KP50A	50	80	≤ 2.4	100~3000	≤ 10	5~150	≤ 2.5	5~150	≥ 800	≥ 50	-40~+125	≤ 0.14	142
KP100A	100	160	≤ 2.4	100~3000	≤ 10	5~200	≤ 2.5	5~200	≥ 800	≥ 50	-40~+125	≤ 0.11	207
KP200A	200	320	≤ 2.6	100~3000	≤ 10	5~200	≤ 2.5	5~200	≥ 800	≥ 100	-40~+125	≤ 0.11	327
KP300A	300	480	≤ 2.6	100~3000	≤ 30	5~200	≤ 2.5	5~200	≥ 800	≥ 100	-40~+125	≤ 0.08	472
KP500A	500	800	≤ 2.6	100~2000	≤ 30	5~200	≤ 2.5	5~200	≥ 800	≥ 100	-40~+125	≤ 0.04	927

旋转整流管 Rotation Rectifier

特点

- 可在较大离心力作用下工作

典型应用

- 使用于旋转励磁发电机 (电动机)

Feature

- It can be worked under greater centrifugal force

Applications

- Special used for rotation excitation dynamotor (electromotor)

Type	$I_{F(AV)}$@Tc		V_{RRM}	I_{RRM}	I_{RRM}@Tjm& 10ms	V_{TM}@I_{TM} 25°C		αn		Rjc	M±10%	Tjm
								Normal	Instantaneous			
	A	°C	V	mA	KA	V	A	g	g	°C/W	N.m	°C
ZX50	50	85	500-3000	8	1.3	1.3	160	1250	2500	0.7	8	150
ZX100	100	85	500-3000	10	2.6	1.5	320	1250	2500	0.35	12	150
ZX200	200	85	800-3000	14	3	1.6	640	1250	2500	0.2	16	150
ZX300	300	85	800-3000	21	4.5	1.6	900	5000	5500	0.11	16	150
ZX400	400	85	800-3000	30	6	1.6	1200	5000	5500	0.09	16	150
ZX500	500	85	800-3000	35	7.5	1.6	1500	5000	5500	0.068	16	150
ZX600	600	85	800-3000	45	10	1.6	1800	5000	5500	0.07	16	150
ZX860	860	85	800-3000	60	13	1.6	1800	5000	7500	0.065	16	150
ZX1000	1000	85	800-3000	70	20	1.6	3000	5100	8000	0.08	16	150

双向晶闸管 Bi-directional Thyristor (Triac)

特点

- 全密封陶瓷 - 金属螺柱型结构
- 全封闭玻璃 - 金属螺柱型结构
- 符合 GB4193-1986 部分标准，IEC 国际电工委员会标准

典型应用

- 直流电机控制，直流电源控制
- 交流开关及温度控制、同步电机励磁

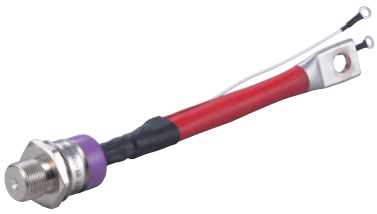
Feature

- Hermetic ceramics-metal stud structure
- Hermetic glass-metal stud structure
- Conform to national standard GB4193-1986,
  Conform to IEC international electrical committee standard

Typical Application

- DC motor control, Control DC power supplie
- AC switch and thermal control, Synchronous motor excitation

Type	$I_{T(RMS)}$	V_{TM}	V_{RRM}	I_{RRM}	I_{GT}	I_H	V_{GT}	dv/dt	(dv/dt)c	Tj	Rjc	Weight
	V	V	mA	mA	mA	mA	V	V/μS	V/μS	°C/W	°C	g
KS5A	5	≤ 2.6	100~2000	≤ 30	≤ 350	≤ 250	≤ 3.5	≥ 500	≥ 50	-40~+125	≤ 0.11	10
KS10A	10	≤ 2.6	100~2000	≤ 30	≤ 350	≤ 250	≤ 3.5	≥ 500	≥ 50	-40~+125	≤ 0.11	25
KS20A	20	≤ 2.6	100~2000	≤ 30	≤ 350	≤ 250	≤ 3.5	≥ 500	≥ 50	-40~+125	≤ 0.11	27
KS30A	30	≤ 2.6	100~2000	≤ 30	≤ 350	≤ 250	≤ 3.5	≥ 500	≥ 50	-40~+125	≤ 0.11	110
KS50A	50	≤ 2.6	100~2000	≤ 30	≤ 350	≤ 250	≤ 3.5	≥ 500	≥ 50	-40~+125	≤ 0.11	130
KS100A	100	≤ 2.6	100~2000	≤ 30	≤ 350	≤ 250	≤ 3.5	≥ 500	≥ 100	-40~+125	≤ 0.11	165
KS200A	200	≤ 2.6	100~2000	≤ 30	≤ 350	≤ 250	≤ 3.5	≥ 500	≥ 100	-40~+125	≤ 0.11	335



俄罗斯型 Russian Type

特点

- 玻璃绝缘子密封金属外壳，国际标准外壳
- M5，M6，M8，M10，M12，M20，M24 螺柱
- 高 V_{DRM}，V_{RRM} 数值，通态损耗低

典型应用

- 可控和半控整流器
- 直流电机控制，交流控制器（如温度控制）

Feature

- Hermetic metal case with glass insulator. International standard case.
- Threaded studs M5, M6, M8, M10, M12, M20 and M24. High values V_{DRM},V_{RRM}
- Low losses on-state.

Typical application

- Controlled and half-controlled rectifier.
- DC motor control, AC controller (e.g. for temperature control).

Type	V_{DRM} V_{RRM}	I_{DRM} I_{RRM}	I_{TRMS} (Tc°C)	I_{TSM} 20ms	I^2t	V_{TM}/I_{TM}	V_T (V_{TO})	r_T	di_T/dt cirt	du_D/dt com	V_{GT}	I_{GT}	Tj max	Rth (j-c)	Md	Weight
	V	mA	A	kA	$A^2 \cdot 10^3$	V/A	V	mΩ	A/μs	A/μs	V	V	°C	°C/W	Nm	kg
TC112-10	100-1200	3.0	10(85)	0.07	49	1.85/14	1.20	46	50	2.2-25	3.0	100	125	2.50	0.9-1.1	0.006
TC112-16	100-1200	3.0	16(85)	0.10	100	1.85/22	1.20	29	50	2.2-25	3.0	100	125	1.55	0.9-1.1	0.006
TC112-20	100-1200	3.5	20(85)	0.12	144	1.85/28	1.10	27	50	2.5-50	3.5	150	125	1.30	1.5-1.7	0.011
TC112-25	100-1200	3.5	25(85)	0.20	400	1.80/35	1.10	21	50	2.5-50	3.5	150	125	0.90	1.5-1.7	0.011
TC122-40	100-1200	5.0	40(85)	0.25	625	1.85/56	1.00	15	63	2.5-50	4.0	200	125	0.65	5.0-6.2	0.023
TC132-50	100-1200	5.0	50(85)	0.45	2025	1.80/70	1.00	12	63	2.5-50	4.0	200	125	0.52	5.0-6.2	0.023
TC132-63	100-1200	7.0	63(85)	0.48	2300	1.80/89	0.90	10	63	2.5-50	5.0	200	125	0.44	9.0-11	0.050
TC132-80	100-1200	7.0	80(85)	0.58	3360	1.80/113	0.90	8	63	2.5-50	5.0	200	125	0.34	9.0-11	0.050
TC151-100	300-1600	10	100(85)	1.0	10.0	1.85/140	1.50	3.50	6.3	6.3-100	3	300	125	0.22	10-20	0.110
TC151-125	300-1600	10	125(85)	1.2	14.4	1.74/180	1.15	3.50	6.3	6.3-100	3	300	125	0.22	10-20	0.110
TC151-160	300-1600	10	160(85)	1.4	19.6	1.55/225	1.10	2.00	6.3	6.3-100	3	300	140	0.19	10-20	0.110
TC251-100	300-1600	10	100(85)	1.0	10.0	1.85/140	1.50	3.50	25	6.3-100	3	300	125	0.22	10-20	0.110
TC251-125	300-1600	10	125(85)	1.2	14.4	1.74/180	1.15	3.50	25	6.3-100	3	300	125	0.22	10-20	0.110
TC251-160	300-1600	10	160(85)	1.4	19.6	1.55/225	1.10	2.00	25	6.3-100	3	300	125	0.19	10-20	0.110
TC161-160	300-1600	15	160(85)	1.8	32.4	1.75/225	1.20	2.60	6.3	6.3-100	4	300	125	0.14	20-30	0.175
TC161-200	300-1600	15	200(85)	2.0	40.0	1.60/280	1.00	2.25	6.3	6.3-100	4	300	125	0.14	20-30	0.175
TC261-160	300-1600	15	160(85)	2.0	32.4	1.70/225	1.15	2.74	25	6.3-100	4	300	125	0.14	20-30	0.175
TC261-200	300-1600	15	200(85)	2.0	40.0	1.60/280	1.00	2.25	25	6.3-100	4	300	125	0.14	20-30	0.175
TC171-250	300-1600	25	250(85)	3.0	90.0	1.70/350	1.00	2.00	6.3	6.3-100	4	300	125	0.10	25-35	0.325
TC171-320	300-1600	25	320(85)	3.3	99.0	1.50/450	0.86	1.50	6.3	6.3-100	4	300	125	0.10	25-35	0.325
TC271-250	300-1600	25	250(85)	3.0	90.0	1.65/350	1.00	1.98	25	6.3-100	4	300	125	0.10	25-35	0.325
TC271-320	300-1600	25	320(85)	3.3	99.0	1.50/450	0.86	1.50	25	6.3-100	4	300	125	0.10	25-35	0.325

快速晶闸管 (TBK, KK) Fast switching thyristors (TBK, KK)

Type	V_{DRM} V_{RRM}	I_{DRM} I_{RRM}	$I_{T(AV)}$ (Tc°C)	I_{TRMS}	I_{TSM} 10ms	I^2t	V_{TM}/I_{TM}	V_T (V_{TO})	r_T	di_T/dt cirt	du_D/dt com	V_{GT}	I_{GT}	Tj max	Rth (j-c)	Md	tq
	V	mA	A	A	kA	$A^2 \cdot 10^3$	V/A	V	mΩ	A/μs	A/μs	V	V	°C	°C/W	Nm	μs
TBH351-80	600-1200	50	100(85)	157	2.0	25	2.40/314	1.20	2.40	800	1000	2.5	250	125	0.160	20-30	12.5,16,20
TBH361-150	600-1200	50	100(85)	157	2.5	31	2.40/314	1.40	2.40	800	1000	2.5	250	125	0.160	20-30	12.5,16,20
TBH371-250	600-1200	50	160(85)	250	4.0	80	2.70/502	1.40	1.20	1000	1000	2.5	300	125	0.090	25-35	10,12.5,16
TBH371-320	600-1800	40	200(85)	314	6.0	180	2.60/628	1.35	1.20	1000	1000	2.5	300	125	0.090	25-35	25,32,40,50

俄罗斯型 Russian Type

特点

- 玻璃绝缘子密封金属外壳，国际标准外壳
- M5，M6，M8，M10，M12，M20，M24 螺柱
- 高 V_{DRM}，V_{RRM} 数值，通态损耗低（尤其 T271-320）

典型应用

- 可控和半控整流器，直流电机控制，交流控制器（如温度控制）

Feature

- Hermetic metal case with glass insulator. International standard case.
- Threaded studs M5, M6, M8, M10, M12, M20 and M24. High values V_{DRM},V_{RRM}
- Low losses on-state(especially T271-320).

Typical application

- Controlled and half-controlled rectifier, DC motor control, AC controller (e.g. for temperature control).

Type	V_{RRM}	I_{RRM}	$I_{T(AV)}$(Tc°C)	I_{FSM} 10ms	V_{FM}/I_{FM}	Tj max	Rth(j-c)	Weight
	V	mA	A	kA	V/A	°C	°C/W	kg
D112-10	100-1600	3	10(150)	0.25	1.35/31	150	2.70	0.006
D112-16	100-1600	3	16(150)	0.27	1.35/50	150	2.00	0.006
D112-25	100-1600	3	25(150)	0.34	1.35/78	150	1.25	0.006
D122-32	100-1600	5	32(150)	0.46	1.35/100	150	1.00	0.012
D122-40	100-1600	5	40(150)	0.55	1.35/125	150	0.80	0.012
D132-50	100-1600	6	50(150)	1.20	1.35/137	150	0.60	0.027
D132-63	100-1600	6	63(150)	1.40	1.35/198	150	0.50	0.027
D132-80	100-1600	6	80(150)	1.50	1.35/250	150	0.40	0.027
D141-100	300-3500	20	100(135)	2.20	1.35/314	190	0.40	0.090
D141-100X	300-3500	20	100(135)	2.00	3.35/314	190	0.40	0.090
D151-125	300-3500	20	125(140)	3.00	1.35/392	190	0.30	0.165
D151-160	300-3500	20	160(140)	4.50	1.35/502	190	0.24	0.165
D161-200	300-3500	40	200(145)	5.50	1.35/628	190	0.15	0.265
D161-200X	300-3500	40	200(125)	5.50	1.35/628	190	0.15	0.265
D161-250	300-3500	40	250(140)	6.40	1.35/785	190	0.15	0.265
D161-250X	300-3500	40	250(140)	6.40	1.45/785	190	0.14	0.265
D161-320	300-3500	40	320(130)	7.50	1.35/1005	190	0.15	0.265
D161-320X	300-3500	40	320(130)	7.50	1.50/1005	190	0.13	0.265
D171-400	300-3500	50	400(145)	14.00	1.45/1256	190	0.035	0.265

Type	V_{DRM} (V_{RRM})	Irr (I_{DRM})	$I_{T(AV)}$ (Tc°C)	I_{TSM} 10ms	V_{TM}/I_{TM}	V_{GT}	I_{GT}	dv/dt	di/dt	Tj max	Rth(j-c)	Weight
	V	mA	A	kA	V/A	V	mA	V/mks	A/mks	°C	°C/W	kg
T112-10	100-1200	2.5	10(85)	0.15	1.85/31	2.5	40	50-1000	125	125	1.80	0.006
T112-16	100-1200	3	16(85)	0.20	1.65/50	2.5	40	50-1000	125	125	1.50	0.006
T122-20	100-1200	3	20(85)	0.30	1.75/63	2.5	60	50-1000	125	125	0.90	0.011
T122-25	100-1200	3	25(85)	0.35	1.75/78	2.5	60	50-1000	125	125	0.80	0.011
T122-32	100-1200	6	32(85)	0.45	1.80/100	2.5	60	50-1000	125	125	0.75	0.011
T132-40	100-1600	6	40(85)	0.75	1.75/125	3.0	100	50-1000	125	125	0.62	0.023
T132-50	100-1600	6	50(85)	0.80	1.75/160	3.0	100	50-1000	125	125	0.50	0.023
T132-63	100-1600	6	63(85)	1.25	1.60/200	3.0	100	50-1000	125	125	0.45	0.023
T142-63	100-1600	6	63(87)	1.30	1.75/200	3.0	150	50-1000	125	125	0.35	0.048
T142-80	100-1600	6	80(85)	1.50	1.65/250	3.0	150	50-1000	125	125	0.30	0.048
T151-100	300-1800	15.0	100(90)	2.00	1.80/314	3.5	200	200-1000	160	140	0.30	0.150
T161-125	300-2500	15.0	125(90)	2.50	1.75/392	3.5	200	200-1000	125	125	0.15	0.240
T161-160	300-2500	15.0	160(87)	4.00	1.70/502	3.5	200	200-1000	125	125	0.15	0.240
T161-200	300-2500	15.0	200(87)	5.00	1.60/628	3.5	200	200-1000	160	125	0.13	0.240
T171-200	300-3500	30.0	200(90)	5.00	1.75/628	3.5	200	200-1000	125	125	0.10	0.440
T171-250	300-3500	30.0	250(85)	6.00	1.75/785	3.5	200	200-1000	125	125	0.10	0.440
T171-320	300-3500	30.0	320(87)	8.50	160/1005	3.5	200	200-1000	320	125	0.085	0.440






普通晶闸管模块 Thyristor Module

特点

- 芯片与底板电气绝缘，2500V 交流电压
- 国际标准封装；全压接结构，优良的温度特性和功率循环能力
- 350A 以下模块皆为强迫风冷，400A 以上模块，风冷、水冷选用

典型应用

- 交直流电机控制，各种整流电源
- 工业加热控制，调光，无触点开关
- 电机软起动，静止无功补尝
- 电焊机，变频器，UPS 电源，电池充放电

Feature

- Chips are electrically insulated from bottom plate
- Package in compliance with international standard. Pressure type,excellent temperature characteristics and power cycling capability
- 350A below modules are forced air cooling;
  400A above modules can be selected by air cooling or water cooling

Typical application

- AC,DC motor control, Different kind of rectifying power supply
- Industrial heating and control, Light adjustment, Non-contact switch
- Motor softstarter, Static reactive power compensation
- Welding equipment, Frequency transformer, UPS, Battery charging and discharging

MTC, MTX, MTK, MTA, HSKKT, HMCC

Type	$I_{T(AV)}$	V_{DRM} V_{RRM}	V_{TM}@I_{TM}		I_{DRM} I_{RRM}	I_{GT}	V_{GT}	I_H	dv/dt	di/dt	I_{TSM}	Rjc	Tjm	Viso
	A	V	V	A	mA	mA	V	mA	V/μs	A/μs	Ax10^3	°C/W	°C	V(AC)
MTx25A	25	500-2500	1.30	80	8	100	2.5	100	800	50	0.55	0.950	135	2500
MTx55A	55	500-2500	1.35	170	8	100	2.5	100	800	50	1.25	0.530	135	2500
MTx90A	90	500-2500	1.40	270	15	100	2.5	100	800	100	2.00	0.280	135	2500
MTx110A	110	500-2500	1.42	330	20	100	2.5	100	800	100	2.40	0.250	135	2500
MTx130A	130	500-2500	1.45	410	25	150	2.5	100	800	100	3.80	0.200	135	2500
MTx160A	160	500-2500	1.48	480	25	150	2.5	200	800	100	5.40	0.170	135	2500
MTx200A	200	500-2500	1.50	600	30	180	2.5	200	800	100	7.20	0.140	135	2500
MTx250A	250	500-2500	1.55	750	30	180	2.5	200	800	100	8.50	0.120	135	2500
MTx300A	300	500-2500	1.60	900	40	180	2.5	200	800	100	9.30	0.100	135	2500
MTx350A	350	500-2500	1.65	1050	40	180	2.5	200	1000	100	11.0	0.090	135	2500
MTx500A	500	500-2500	1.70	1600	40	200	3.0	200	1000	100	16.0	0.065	135	2500
MTx600A	600	500-2500	1.90	1800	40	200	3.0	200	1000	100	13.0	0.073	135	2500
MTx800A	800	500-2500	1.95	2400	40	200	3.0	200	1000	100	16.0	0.054	135	2500
MTx1000A	1000	500-2500	1.95	3000	40	200	3.0	200	1000	100	16.0	0.054	135	2500

单管晶闸管模块 Single Thyristor Modules(MT,HSKET,HTZ)

Type	V_{DRM} V_{RRM}	$I_{T(AV)}$ T_{HS} 55°C	I_{TSM} 10ms	dv/dt	di/dt	I_{DRM} I_{RRM}	I_{GT}	V_{GT}	I_H	V_{TM}/I_{TM}	R_{TH} (j-hs)	Tjm	Viso	安装力 M
							25°C							
	V	A	KA	V/μS	A/μS	mA	mA	V	mA	V/A	°C/W	°C	V(AC)	KN
MT400A	100-6500	400	5	500	100	40	35-250	0.8-2.5	20-200	2.4/1200	0.040	125	2500	10-20
MT500A	100-6500	500	6.4	800	100	50	35-250	0.8-2.5	20-250	2.4/1500	0.035	125	2500	15-20
MT800A	100-6500	800	10	1000	100	50	40-300	0.8-3.0	20-250	2.2/2400	0.032	125	2500	15-20
MT1000A	100-6500	1000	13	1000	150	80	40-300	0.8-3.0	20-300	2.4/3000	0.022	125	2500	21-30

普通晶闸管 / 整流管混合模块 Thyristor / Diode Module

特点

- 芯片与底板电气绝缘，2500V 交流电压
- 国际标准封装；全压接结构，优良的温度特性和功率循环能力
- 350A 以下模块皆为强迫风冷，400A 以上模块，风冷、水冷选用

典型应用

- 交直流电机控制，各种整流电源，电机软起动，静止无功补尝
- 工业加热控制，调光，无触点开关
- 电焊机，变频器，UPS 电源，电池充放电

Feature

- Chips are electrically insulated from bottom plate, 2500V AC voltage
- Package in compliance with international standard. Pressure type,excellent temperature characteristics and power cycling capability
- 350A below modules are forced air cooling; 400A above modules can be selected by air cooling or water cooling

Typical application

- AC,DC motor control, Different kind of rectifying power supply, Motor softstarter, Static reactive power compensation
- Industrial heating and control, Light adjustment, Non-contact switch
- Welding equipment, Frequency transformer, UPS, Battery charging and discharging

MFC, MFA, MFK, MFX, HSKKH

Type	$I_{T(AV)}$	V_{DRM} V_{RRM}	$V_{TM}V_{FM}$	@I_{TM}@I_{FM}	I_{DRM} I_{RRM}	I_{GT}	V_{GT}	I_H	dv/dt	di/dt	I_{TSM} I_{FSM}	Rjc	Tjm	Viso
	A	V	V	A	mA	mA	V	mA	V/μs	A/μs	Ax10^3	°C/W	°C	V(AC)
MFX25A	25	500-2500	1.30	80	8	100	2.5	100	800	50	0.55	0.950	125	2500
MFX55A	55	500-2500	1.40	170	8	100	2.5	100	800	50	1.25	0.530	125	2500
MFX90A	90	500-2500	1.42	270	15	100	2.5	100	800	100	2.00	0.280	125	2500
MFX110A	110	500-2500	1.45	330	20	100	2.5	100	800	100	2.40	0.250	125	2500
MFX130A	130	500-2500	1.50	410	20	150	2.5	100	800	100	3.80	0.200	125	2500
MFX160A	160	500-2500	1.52	480	25	150	2.5	200	800	100	5.40	0.170	125	2500
MFX200A	200	500-2500	1.55	600	30	180	2.5	200	800	100	7.20	0.140	125	2500
MFX250A	250	500-2500	1.67	750	40	180	2.5	200	800	100	8.50	0.120	125	2500
MFX300A	300	500-2500	1.70	900	30	180	2.5	200	800	100	9.30	0.100	125	2500
MFX350A	350	500-2500	1.75	1050	40	180	2.5	200	1000	100	11.0	0.090	125	2500
MFX500A	500	500-2500	1.80	1500	50	200	3.0	200	1000	100	16.0	0.065	125	2500
MFX600A*	600	500-2500	1.90	1800	40	200	3.0	200	1000	100	13.0	0.073	125	2500
MFX800A*	800	500-2500	1.95	2400	40	200	3.0	200	1000	100	16.0	0.054	125	2500
MFx1000A	1000	500-2500	1.95	3000	40	200	3.0	200	1000	100	16.0	0.054	125	2500

MDC, MDK, MDA, MDX, MD, HSKKD, HMCD

Type	$I_{F(AV)}$	V_{RRM}	V_{FM} @I_{FM}		I_{RRM}	$I_{F(RMS)}$	I_{FSM}	Rjc	Tjm	Viso
	A	V	V	A	mA	A	Ax10^3	°C/W	°C	V(AC)
MDX25A	25	500-2500	1.30	80	8	41	0.65	1.300	150	2500
MDX55A	55	500-2500	1.45	170	8	86	1.30	0.700	150	2500
MDX90A	90	500-2500	1.33	270	8	141	2.30	0.470	150	2500
MDX110A	110	500-2500	1.35	330	8	173	2.60	0.350	150	2500
MDX130A	130	500-2500	1.38	410	12	212	3.90	0.310	150	2500
MDX160A	160	500-2500	1.38	480	12	251	6.00	0.230	150	2500
MDX200A	200	500-2500	1.38	600	12	314	8.00	0.210	150	2500
MDX250A	250	500-2500	1.43	750	20	393	11.0	0.140	150	2500
MDX300A	300	500-2500	1.45	900	20	471	12.5	0.130	150	2500
MDX350A	350	500-2500	1.50	1050	30	550	15.0	0.110	150	2500
MDX500A	500	500-2500	1.55	1500	40	785	21.0	0.090	150	2500
MDX600A*	600	500-2500	1.65	1800	40	942	15.0	0.110	150	2500
MDX800A*	800	500-2500	1.70	2400	40	1256	18.0	0.080	150	2500
MDX1000A	1000	500-2500	1.80	2500	45	1256	19.0	0.090	150	2500

非绝缘型晶闸管 / 整流管混合模块 Thyristor/Diode Module(Non-isolated type)

特点

- 非绝缘，底板为公共电极
- 国际标准封装、全压接结构，优良的温度特性和功率循环能力
- 最高工作结温达 150℃
- 高浪涌电流，低正向压降

典型应用

- 电焊机电源、各种 DC 电源
- 变频器

Feature

- Non-insulating module, bottom plate is common electrode
- Packaged as per international standard. Complete pressure connection structure, with excellent temperature characteristics and power cycling capacity
- Maximum junction temperature up to 150℃
- High surge current, Low forward voltage drop

Typical application

- Electric welder power supply, Various DC power supply
- Frequency transformer

MFG, MFY

Type	$I_{T(AV)}$ $I_{F(AV)}$	V_{DRM} V_{RRM}	V_{TM} V_{FM}	@I_{TM} @I_{FM}	I_{DRM} I_{RRM}	I_{GT}	V_{GT}	I_H	dv/dt	di/dt	I_{TSM}	Rjc	Tjm
	A	V	V	A	mA	mA	V	mA	V/μs	A/μs	Ax10^3	°C/w	°C
MFG100	100	500-2500	1.20	300	12	100	2.5	100	800	100	3.20	0.250	125
MFG150	150	500-2500	1.30	450	12	100	2.5	100	800	100	5.10	0.160	125
MFG200	200	500-2500	1.40	600	20	150	2.5	100	800	100	6.50	0.130	125
MFG250	250	500-2500	1.50	750	20	150	2.5	100	800	100	8.50	0.100	125
MFG300	300	500-2500	1.60	900	25	150	2.5	100	800	100	9.60	0.080	125

MTG, MTY

Type	$I_{T(AV)}$	V_{DRM} V_{RRM}	V_{TM}@I_{TM}		I_{DRM} I_{RRM}	I_{GT}	V_{GT}	I_H	dv/dt	di/dt	I_{TSM}	Rjc	Tjm
	A	V	V	A	mA	mA	V	mA	V/μs	A/μs	Ax10^3	°C/W	°C
MTG100	100	500-2500	1.20	300	12	100	2.5	≤ 100	800	100	3.20	0.250	125
MTG150	150	500-2500	1.30	450	12	100	2.5	≤ 200	800	100	5.10	0.160	125
MTG200	200	500-2500	1.40	600	20	150	2.5	≤ 200	800	100	6.50	0.130	125
MTG250	250	500-2500	1.50	750	20	150	2.5	≤ 200	800	100	8.50	0.100	125
MTG300	300	500-2500	1.60	900	25	150	2.5	≤ 200	800	100	9.60	0.080	125

MDG, MDY(非绝缘型整流管模块) MDG, MDY (non-insulating rectifier module)

Type	$I_{T(AV)}$	V_{RRM}	V_{FM}@I_{FM}		I_{RRM}	$I_{F(RMS)}$	I_{FSM}	Rjc	Tjm
	A	V	V	A	mA	A	Ax10^3	°C/W	°C
MDG100	100	500-2500	1.20	300	12	157	3.90	0.380	150
MDG150	150	500-2500	1.30	450	12	236	5.80	0.240	150
MDG200	200	500-2500	1.40	600	20	314	8.00	0.200	150
MDG250	250	500-2500	1.50	750	20	393	9.80	0.150	150
MDG300	300	500-2500	1.60	900	25	471	11.50	0.130	150

注：1、型号栏中 MTX 表示 MTG、MTY 中的任一种；
2、型号栏中 MDX 表示 MDG、MDY 中的任一种。

Note: 1. MTX in the type column indicates any kind of MTG or MTY.
2. MDX in the type column indicates any kind of MDG or MDY.

单相 / 三相整流桥模块 Single/Three Phases Rectifier Bridge Module

特点

- 芯片与底板电气绝缘，2500V 交流电压
- 国际标准封装，焊接结构，优良的温度特性和功率循环能力
- 最高工作结温达 150℃，正向压降小

典型应用

- 仪器设备的直流电源，PWM 变频器的输入整流电源
- 直流电机励磁电源，开关电源的输入整流
- 软启动电容充电，电气拖动和辅助电流
- 逆变焊机，电流充电直流电源

Feature

- The chips are electrically insulated from bottom plate, 2500V AC voltage
- Packaged as per international standard, Welded structure, with excellent temperature characteristics and power cycling capacity
- Maximum junction temperature up to 150, Low forward voltage drop

Typical application

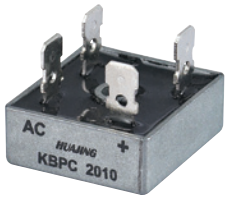
- DC power supply of appliance and device, Input rectifying power supply of PWM frequency transformer
- Excitation source for DC motor, Input rectifying of switching power supply
- Charging of soft starting capacitor, Electric towage and auxiliary current
- Inversion welder, Current charging DC power supply

MDQ

Type	Io @ Tc		V_{RRM}	V_{FM} @ I_{FM}		I_{RRM}	$I_{F(AV)}$	$I_{F(RMS)}$	I_{FSM}	Rjc	Tjm	Viso
	A	°C	V	V	A	mA	A	A	$Ax10^3$	°C/W	°C	V(AC)
MDQ50	50	100	600-2000	1.20	75	8	25	60	0.75	0.55	150	2500
MDQ75	75	100	600-2000	1.20	100	8	38	70	1.00	0.32	150	2500
MDQ100	100	100	600-2000	1.30	120	10	50	86	1.50	0.24	150	2500
MDQ150	150	100	600-2000	1.30	150	10	75	106	2.50	0.15	150	2500
MDQ200	200	100	600-2000	1.47	180	10	75	106	2.50	0.15	150	2500
MDQ300	300	100	600-2000	1.47	200	10	75	106	2.50	0.15	150	2500
MDQ400	400	100	600-2000	1.47	220	10	75	106	2.50	0.15	150	2500
MDQ500	500	100	600-2000	1.47	240	10	75	106	2.50	0.15	150	2500

MDS

Type	Io @ Tc		V_{RRM}	V_{FM} @ I_{FM}		I_{RRM}	$I_{F(AV)}$	$I_{F(RMS)}$	I_{FSM}	Rjc	Tjm	Viso
	A	°C	V	V	A	mA	A	A	$Ax10^3$	°C/W	°C	V(AC)
MDS50	50	100	600-2000	1.20	50	8	17	39	0.75	0.55	150	2500
MDS75	75	100	600-2000	1.20	75	8	25	47	1.00	0.32	150	2500
MDS100	100	100	600-2000	1.30	100	10	33	51	1.50	0.24	150	2500
MDS150	150	100	600-2000	1.30	150	10	50	71	2.50	0.15	150	2500
MDS200	200	100	600-2000	1.50	180	10	50	71	2.50	0.15	150	2500
MDS300	300	100	600-2000	1.50	200	10	50	71	2.50	0.15	150	2500
MDS400	400	100	600-2000	1.50	220	10	50	71	2.50	0.15	150	2500
MDS500	500	100	600-2000	1.50	240	10	50	71	2.50	0.15	150	2500



桥式整流器 Bridge Rectifier

特点

- 电流：5-300A，电压：100-1600V
- 小型通用尺寸“真空 + 充氢保护”焊接技术、玻璃钝化二极管芯片

典型应用

- 整流电源、工业自动化控制、数控机械、遥控系统

Features

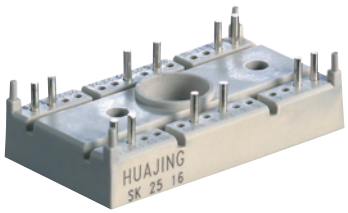
- Current:5-300A, Voltage:100-1600V
- All models feature the same compact dimensions to provide auniform mounting pitch. Glass passivated diode chip

Typical Applications

- Eliminator supply, Industrial automatic control, Numierial-controlled machinery, Telecontrol system

Type	V_{FM}	V_{RRM}	I_{RRM}	Viso	Tj	Weight
	V	V	mA	V	°C	g
KBPC 5A-35A	≤ 1.30	100-1600V	5	2500V	-40~150	29
QL5A-40A	≤ 1.30	100-1600V	5	2500V	-40~150	35
QL5A-40A	≤ 1.30	100-1600V	5	2500V	-40~150	47
QL20A-100A	≤ 1.40	100-1600V	7	2500V	-40~150	315
QL150A-300A	≤ 1.50	100-1600V	10	2500V	-40~150	1200
SQL50A-100A	≤ 1.40	100-1600V	7	2500V	-40~150	315
SQL4 150A-300A	≤ 1.50	100-1600V	10	2500V	-40~150	1200
SKBPC 15-35A	≤ 1.30	100-1600V	5	2500V	-40~150	29
SQL 5A-50A	≤ 1.40	100-1600V	7	2500V	-40~150	47

单相半控整流桥 Half Controlled Single Phase Rectifier Bridge



特点

- DCB 陶瓷底板封装，绝缘电压可达 3600V
- 钝化平面芯片 、1/4” 快速打开终端

典型应用

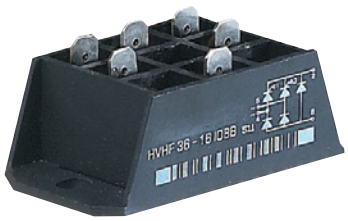
- DC 功率设备、DC 电机控制

Feature

- Package with DCB ceramic base plate. Isolation voltage 3600V~
- Planar passivated chips. 1/4” fast-on terminals

Typical Applications

- Supply for DC power equipment. DC motor control



HSK

Type	V_{RRM} V_{DRM}	I_D@T_S	T_S	I_{TSM} I_{FSM} @Tjmax	$V_{T(TO)}$ @Tjmax	$r_{T(TO)}$ @Tjmax	Rth(j-s) per chip	Tj	Case
	V	A	°C	A	V	mΩ	K/W	°C	
HSK50B06UF	600	46	80	400	0.8	11	0.45	-40~+150	2
HSK50B	800-1600	51	80	270	0.8	13	1.7	-40~+150	2
HSK55B06F	600	54	80	440	0.9	16	1.2	-40~+150	2
HSK55B12F	1200	57	80	550	1.2	22	0.9	-40~+150	2

HVHF

Type	V_{RRM}	V_{VRMS}	I_{DAVM}	@TH	@Tc	I_{FSM} 10ms Tvj45°C	V_{TO}	r_T (mohms)	Tvjm	Rth_{JC} perchip	Rth_{JH} perchip	Ckt Diag	Package style	Status
	V	V	A	°C	°C	A	V		°C	K/W	K/W			
HVHF15	1400	440	15	85	-	190	1.00	40	125	2.40	3.00	VHF	FO-F-A	Active Part
HVHF36	1400	440	36	85	-	320	0.85	13	125	1.15	1.55	VHF	FO-F-A	Active Part
HVHF28	1400	440	28	85	-	300	0.90	15	125	1.40	2.00	VHF	FO-F-A	Active Part
HVHF25	800	250	32	-	85	200	0.85	27	125	1.30	1.80	VHF	ECO-PAC1	Active Part

快速晶闸管 / 整流管模块 Fast Turn-off Thyristor/Fast Rectifier Diode Module

特点

- 芯片与底板绝缘，国际标准封装
- 压接结构，优良的温度特性和功率循环能力
- 200A 以下模块皆为强迫风冷 ，300A 以上模块，既可选用风冷，也可选用水冷
- 安装简单，维修方便

典型应用

- 逆变器
- 感应加热
- 斩波器

Feature

- Chips are electrically insulated from bottom plate
- Seal in compliance with international standard
- Pressure type,excellent temperature characteristics and power cycling capability
- 200A below modules are forced air cooling,
  300A above modules can be selected by air cooling or water cooling
- Simple installation, convenient maintenance

Typical application

- Inverter
- Induction heating
- Wave chopper

V_{RRM} = 600V, 1200V $I_{F(AV)}$ = 75A~400A AV_{ISO} = 2500V (RMS)

Type	V_{RRM}	$I_{F(AV)}$@T_C T_C=85°C	$I_{F(RMS)}$ Tj=150°C	I_{FRM} f=20KHZ T_C=85°C	I_{FSM} 10ms 45°C	V_{FM}@$I_{F(AV)}$ Tj=25°C		t_{rr} Typ 45°C	Rthjc	P_D max	Viso
	V	A	A	A	A	V	A	μs	K/W	W	V(AC)
MZC(K)75TA60	600	2×75	2×110	2×56	2×1100	1.2	75	107	0.60	200	2500
MZC(K)100TA60	600	2×100	2×145	2×77	2×1500	1.3	100	107	0.50	250	2500
MZC(K)150TS60	600	2×150	2×215	2×112	2×2300	1.4	150	140	0.35	350	2500
MZC(K)200TS60	600	2×200	2×300	2×168	2×3100	1.6	200	137	0.20	416	2500
MZC(K)300TS60	600	2×300	2×450	2×224	2×4700	1.6	300	170	0.18	690	2500
MZC(K)400TS60	600	2×400	2×600	2×336	2×6200	1.6	400	200	0.18	690	2500
MZC(K)75TS120	1200	2×75	2×105	2×55	2×1000	2.3	75	150	0.35	350	2500
MZC(K)100TS120	1200	2×100	2×145	2×86	2×1300	2.1	100	149	0.30	416	2500
MZC(K)150TS120	1200	2×150	2×215	2×140	2×2000	2.3	150	188	0.20	625	2500
MZC(K)200TS120	1200	2×200	2×300	2×172	2×2700	2.2	200	181	0.18	625	2500
MZC(K)300TS120	1200	2×300	2×425	2×226	2×4000	2.4	300	231	0.10	1250	2500
MZC(K)400TS120	1200	2×400	2×600	2×312	2×5400	2.3	400	240	0.10	1250	2500

单管整流管模块 Single Diode Modules

Type	V_{DRM} V_{RRM}	$I_{T(AV)}$ T_{HS} 55°C	I_{TSM} 10ms	dv/dt	di/dt	I_{DRM} I_{RRM}	I_{GT}	V_{GT}	I_H	V_{TM}/I_{TM}	Rth (j-hs)	Tjm	Viso	安装力 M
							25°C							
	V	A	KA	V/μS	A/μS	mA	mA	V	mA	V/A	°C/W	°C	V(AC)	KN
MD400A	100-6500	400	5	500	100	40	35-250	0.8-2.5	20-200	2.4/1200	0.040	135	2500	10-20
MD500A	100-6500	500	6.4	800	100	50	35-250	0.8-2.5	20-250	2.4/1500	0.035	135	2500	15-20
MD800A	100-6500	800	10	1000	100	50	40-300	0.8-3.0	20-250	2.2/2400	0.032	135	2500	20-25
MD1000A	100-6500	1000	13	1000	150	80	40-300	0.8-3.0	20-300	2.4/3000	0.022	135	2500	21-30

三相二极管 & 晶闸管 Three Phase Diode & Thyristor

特点

- 该模块的设计非常紧凑。二极管模块，晶闸管集成为一体。
- 该模块也是孤立型电极端子和安装基座之间。可以把这个模块和另一个一起在同一个鳍。

典型应用

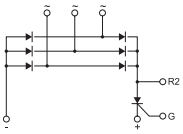
- 逆变交流或直流电机控制
- 稳压电源
- 开关电源

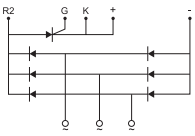
Feature

- This module is designed very compactly. Because diode module and thyristor are put together.
- This module is also isolated type between electorode terminal and mounting base.
  So you can put this module and other one together in a same fin.

Typical application

- Inverter for AC or DC motor control
- Current stabilized power supply
- Switching power supply





Type	V_{RRM} V_{DRM}	V_{RSM}	$I_{T(AV)}$	I_{TSM}	I^2t	di/dt	Viso	Tj	Tstg	I_{DRM} I_{RRM}	V_{TM}	I_{GT}	V_{GT}	dv/dt	Rth (j-c)	Rth (c-f)
	V	V	A	A	A^2s	A/μs	V(AC)	°C	°C	mA	V	mA	V	V/μs	°C/W	°C/W
HDFA50BA80	800	960	50	730/800	2660	150	2500	-40~+135	-40~+125	50	1.10	70	3	500	0.80	0.10
HDFA50BA160	1600	1700	50	730/800	2660	150	2500	-40~+135	-40~+125	50	1.10	70	3	500	0.80	0.10
HDFA75BA80	800	960	75	910/1000	4150	150	2500	-40~+135	-40~+125	60	1.20	70	3	500	0.40	0.10
HDFA75BA160	1600	1700	75	910/1000	4150	150	2500	-40~+135	-40~+125	60	1.20	70	3	500	0.40	0.10
HDFA100BA80	800	960	100	1186/1300	7030	150	2500	-40~+135	-40~+125	70	1.20	70	3	500	0.236	0.10
HDFA100BA160	1600	1700	100	1186/1300	7030	150	2500	-40~+135	-40~+125	70	1.20	70	3	500	0.36	0.10
HDFA150AA80	800	960	150	1460/1600	10670	150	2500	-40~+135	-40~+125	80	1.35	70	3	500	0.21	0.007
HDFA150AA160	1600	1700	150	1460/1600	10670	150	2500	-40~+135	-40~+125	80	1.35	70	3	500	0.21	0.07
HDFA200AA80	800	960	200	1850/2000	17000	200	2500	-40~+135	-40~+125	100	1.45	100	3	500	0.18	0.18
HDFA200AA160	1600	1700	200	1850/2000	17000	200	2500	-40~+135	-40~+125	100	1.45	100	3	500	-	0.18

快恢复二极管 (FRD) 模块 Fast Recovery Diode (FRD) Module

肖特基二极管模块 MBRP、MUR Schottky diode module MBRP, MUP

Type	$I_{F(AV)}$	V_{RRM}	I_{FSM}	V_F	Tj	E_{AS}	I_{RM}	Ls	Ct
	A	V	A	V	°C	MJ	mA	nH	pF
M**200	200	35-45	25.000	0.45	-55~150	180	10	4.0	10.300
M**300	300	35-45	26.000	0.50	-55~150	180	15	4.5	10.300
M**400	400	35-45	29.000	0.52	-55~150	180	20	5.0	10.300

HMD 二极管 HMD PV Diode Module

特点

- 芯片与底板电气绝缘，2500V 交流电压
- 采用进口玻璃钝化芯片焊接，优良的温度特性进口和功率循环能力
- 体积小，重量轻

典型应用

- 太阳能电池阵列组合器

Feature

- Chip and backplane electrical insulation, 2500V AC voltage
- Imported glass passivated chip welding, excellent temperature characteristics of the import and power cycling capability
- Small size, light weight

Typical application

- Solar Array Combiner

Type	$I_{F(AV)}$	V_{RRM}	V_{FM} @I_{FM}		I_{RRM}	$I_{F(RMS)}$	I_{FSM}	Rjc	Tjm	Viso
	A	V	V	A	mA	A	Ax10^3	°C/W	°C	V(AC)
HMD25A	25	500-2500	0.70	80	8	41	0.65	1.300	150	2500
HMD55A	55	500-2500	0.70	170	8	86	1.30	0.700	150	2500
HMD90A	90	500-2500	0.70	270	8	141	2.30	0.470	150	2500
HMD110A	110	500-2500	0.70	330	8	173	2.60	0.350	150	2500
HMD130A	130	500-2500	0.70	410	12	212	3.90	0.310	150	2500
HMD160A	160	500-2500	0.70	480	12	251	6.00	0.230	150	2500
HMD200A	200	500-2500	0.70	600	12	314	8.00	0.210	150	2500
HMD250A	250	500-2500	0.70	750	20	393	11.0	0.140	150	2500
HMD300A	300	500-2500	0.70	900	20	471	12.5	0.130	150	2500
HMD350A	350	500-2500	0.70	1050	30	550	15.0	0.110	150	2500
HMD500A	500	500-2500	0.70	1500	40	785	21.0	0.090	150	2500
HMD600A	600	500-2500	0.70	1800	40	942	15.0	0.110	150	2500
HMD800A	800	500-2500	0.70	2400	40	1256	18.0	0.080	150	2500

HMDK 二极管 HMDK PV Diode Module

Type	$I_{F(AV)}$	V_{RRM}	V_{FM} @I_{FM}		I_{RRM}	$I_{F(RMS)}$	I_{FSM}	Rjc	Tjm	Viso
	A	V	V	A	mA	A	Ax10^3	°C/W	°C	V(AC)
HMDK25A	25	500-2500	0.70	80	8	41	0.65	1.300	150	2500
HMDK55A	55	500-2500	0.70	170	8	86	1.30	0.700	150	2500
HMDK90A	90	500-2500	0.70	270	8	141	2.30	0.470	150	2500
HMDK110A	110	500-2500	0.70	330	8	173	2.60	0.350	150	2500
HMDK130A	130	500-2500	0.70	410	12	212	3.90	0.310	150	2500
HMDK160A	160	500-2500	0.70	480	12	251	6.00	0.230	150	2500
HMDK200A	200	500-2500	0.70	600	12	314	8.00	0.210	150	2500
HMDK250A	250	500-2500	0.70	750	20	393	11.0	0.140	150	2500
HMDK300A	300	500-2500	0.70	900	20	471	12.5	0.130	150	2500
HMDK350A	350	500-2500	0.70	1050	30	550	15.0	0.110	150	2500
HMDK500A	500	500-2500	0.70	1500	40	785	21.0	0.090	150	2500
HMDK600A	600	500-2500	0.70	1800	40	942	15.0	0.110	150	2500
HMDK800A	800	500-2500	0.70	2400	40	1256	18.0	0.080	150	2500

HGJM 二极管 HGJM PV Diode Module

特点

- 芯片与底板电气绝缘，2500V 交流电压
- 采用进口玻璃钝化芯片焊接，优良的温度特性进口和功率循环能力
- 体积小，重量轻

典型应用

- 太阳能电池阵列组合器

Feature

- Chip and backplane electrical insulation, 2500V AC voltage
- Imported glass passivated chip welding, excellent temperature characteristics of the import and power cycling capability
- Small size, light weight

Typical application

- Solar array combiner

Type	Io@Tc		V_{RRM}	V_{FM}@I_{FM}		I_{RRM}	$I_{F(AV)}$	$I_{F(RMS)}$	I_{FSM}	Rjc	Tjm	Viso
	A	°C	V	V	A	mA	A	A	$Ax10^3$	°C/W	°C	VA.C
HGJM50	50	100	600-2000	0.60	75	8	25	60	0.75	0.55	150	2500
HGJM75	75	100	600-2000	0.70	110	8	38	70	1.00	0.32	150	2500
HGJM100	100	100	600-2000	0.80	150	10	50	86	1.50	0.24	150	2500
HGJM150	150	100	600-2000	0.80	230	10	60	90	2.50	0.15	150	2500
HGJM200	200	100	600-2000	0.90	230	10	60	90	2.50	0.15	150	2500
HGJM300	300	100	600-2000	0.90	230	10	70	95	2.50	0.15	150	2500
HGJM400	400	100	600-2000	1.0	230	10	75	106	2.50	0.15	150	2500
HGJM500	500	100	600-2000	1.0	230	10	75	106	2.50	0.15	150	2500

IGBT 模块 IGBT Module

特点

- IGBT 是由 MOSFET 和双极型晶体管复合而成的一种器件，其输入极为 MOSFET，输出极为 PNP 晶体管，它融和了这两种器件的优点。
- 具有 MOSFET 器件驱动功率小和开关速度快的优点。
- 具有双极型器件饱和压降低而容量大的优点，其频率特性介于 MOSFET 与功率晶体管之间，可正常工作于几十 kHz 频率范围内。

Feature

- IGBT is a MOSFET and bipolar transistor made of a composite device, the input is extremely MOSFET, the output is extremely PNP transistor, which integration of these two devices are the advantage of.
- With a small power MOSFET device driver and switching speed advantage.
- With a bipolar device saturation pressure lowering of the advantageof large capacity, it frequency response range and power MOSFET transistor, and is available to work on dozen of kHz frequency range.

模块型号命名 Module type naming

HFGM	XXX	x	x	xxx	x
模块种类 Module type	电流值 Current value	内部连线方式 Internal connection type	封装形式 Package form	电压量 Voltage	类型 Type

电流值：指集中电极直流 (连续) 电流

内部连线方式：T: 桥臂连接；L: 低端连接；H: 高端连接；D: 单管结构 封装形式：A:A-A-pak　S:Int-A-pak　D:Dual-Int-A-pak

电压量：集电极发射极电压值为 : 电压量 ×10(V)

类型：U 型：超快速型　K: 具有短路能力的超快速 (NPT)

Current value: It indicates the collector DC (continuous) current.

Internal connection type: T: bridge arm; L: low end connection; H: high end connection; D: single-tube structure

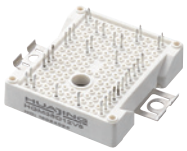
Package form: A: A-A-pak; S: Int-A-pak; D: Dual-Int-A-pak

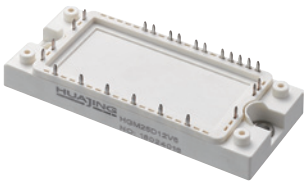
Voltage: The voltage value at the collector and emitter is: voltage × 10(V)

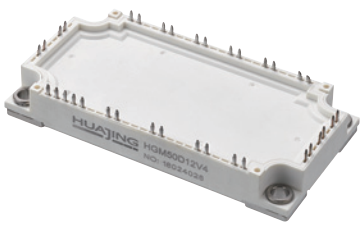
Type: U type: super fast type; K type: super fast type provided with short circuit function (NPT)

零件名称 Part Name	V_{CES}	Ic@Tc		$V_{CE(ON)}$	I_{CP}	IGBT	封装形式 Package
	V	A@25°C	A@°C	V	A	Type	
HFGM25D06V1	600	50	25/50	1.5	100	PT	V4
HFGM50D06V1	600	70	50/70	1.8	120	PT	V4
HFGM75D06V1	600	100	75/70	1.9	140	PT	V1
HFGM100D06V1	600	130	100/70	2.2	200	PT	V1
HFGM150D06V1	600	200	150/70	1.9	350	PT	V1
HFGM200D06V2	600	260	200/70	2.2	400	PT	V2
HFGM75D06AV1	600	100	75/80	1.5	140	Trench	V1
HFGM100D06AV1	600	130	100/80	1.5	200	Trench	V1
HFGM150D06AV1	600	210	150/80	1.5	350	Trench	V1
HFGM200D06AV1	600	260	200/80	1.5	400	Trench	V1
HFGM200D06AV2	600	260	200/80	1.5	400	Trench	V2
HFGM300D06AV3	600	360	300/80	1.5	600	Trench	V3
HFGM400D06AV3	600	450	400/80	1.5	800	Trench	V3
HFGM75D12SV1	1200	100	75/80	2.8	200	NPT	V1
HFGM100D12SV1	1200	130	100/70	3.2	200	NPT	V1
HFGM150D12SV3	1200	200	150/70	2.8	350	NPT	V3
HFGM200D12SV3	1200	260	200/70	3.2	400	NPT	V3
HFGM100D12AV1	1200	130	100/80	1.7	200	Trench	V1
HFGM150D12AV3	1200	200	150/80	1.7	350	Trench	V3
HFGM200D12AV3	1200	260	200/80	1.7	400	Trench	V3
HFGM300D12AV3	1200	360	300/80	1.7	600	Trench	V3

配件 Accessories







HDH10~120A 单相固态继电器 HDH10~120A Single Phase SSR

HDH 是允许 10~120Amps 的电力线继电器，额定电压 280-480VAC

特点

- 高性能 / 低损耗电路设计
- 2500Vrms 光隔离
- “零压”型及调相“随机开关”型
- 高压（1200Vpk）型可用于 480Vrms
- 控制输入 LED 指示器
- 控制电压范围：4-16Vdc，3-32Vdc 或 90-280Vac

HDH are power line relays allowing 10~120 Amps. switching power, with Voltage ratings from 280 to 480VAC.

Features

- High performance / low cost circuit design
- 2500 Vrms optical isolation
- Both “Zero Voltage” & phase controllable “Random Switching” versions
- High voltage (1200 Vpk)versions for 480 Vrms service
- LED-indication for control input
- Control voltage range: 4 to 16 Vdc,3 to 32 Vdc or 90 to 280Vac

选型指南 Selection Guide

电压 Voltage	控制电压 Control voltage	额定工作电流 Rated operational current			
		10 Amp	15 Amp	25 Amp	40 Amp
280VAC Zero Voltage	4 to 16 Vdc	HDH1028ZD1	HDH1528ZD1	HDH2528ZD1	HDH4028ZD1
	3 to 32 Vdc	HDH1028ZD3	HDH1528ZD3	HDH2528ZD3	HDH4028ZD3
	90 to 280 Vac	HDH1028ZA4	HDH1528ZA4	HDH2528ZA4	HDH4028ZA4
480VAC Zero Voltage	4 to 16 Vdc	HDH1048ZD1	HDH1548ZD1	HDH2548ZD1	HDH4048ZD1
	3 to 32 Vdc	HDH1048ZD3	HDH1548ZD3	HDH2548ZD3	HDH4048ZD3
	90 to 280 Vac	HDH1048ZA4	HDH1548ZA4	HDH2548ZA4	HDH4048ZA4

电压 Voltage	控制电压 Control voltage	额定工作电流 Rated operational current			
		60 Amp	80 Amp	100 Amp	120 Amp
280VAC Zero Voltage	4 to 16 Vdc	HDH6028RD1	HDH8028RD1	HDH10028RD1	HDH12028RD1
	3 to 32 Vdc	HDH6028RD3	HDH8028RD3	HDH10028RD3	HDH12028RD3
	90 to 280 Vac	HDH6028RA4	HDH8028RA4	HDH10028RA4	HDH12028RA4
480VAC Zero Voltage	4 to 16 Vdc	HDH6048RD1	HDH8048RD1	HDH10048RD1	HDH12048RD1
	3 to 32 Vdc	HDH6048RD3	HDH8048RD3	HDH10048RD3	HDH12048RD3
	90 to 280 Vac	HDH6048RA4	HDH8048RA4	HDH10048RA4	HDH12048RA4

HDH 10-150A 单相固态继电器 HDH 10 to 150A Single Phase SSR

选型指南 Selection Guide

电压 Voltage	控制电压 Control voltage	额定工作电流 Rated operational current			
		10 Amp	25 Amp	40 Amp	60 Amp
280VAC Zero Voltage	4 to 16 Vdc	HDH1028ZD1B	HDH2528ZD1B	HDH4028ZD1B	HDH6028ZD1B
	3 to 32 Vdc	HDH1028ZD3B	HDH2528ZD3B	HDH4028ZD3B	HDH6028ZD3B
280VAC Random Switching	4 to 16 Vdc	HDH1028RD1B	HDH2528RD1B	HDH4028RD1B	HDH6028RD1B
	3 to 32 Vdc	HDH1028RD3B	HDH2528RD3B	HDH4028RD3B	HDH6028RD3B
480VAC Zero Voltage	4 to 16 Vdc	HDH1048ZD1B	HDH2548ZD1B	HDH4048ZD1B	HDH6048ZD1B
	3 to 32 Vdc	HDH1048ZD3B	HDH2548ZD3B	HDH4048ZD3B	HDH6048ZD3B
480VAC Random Switching	4 to 16 Vdc	HDH1048RD1B	HDH2548RD1B	HDH4048RD1B	HDH6048RD1B
	3 to 32 Vdc	HDH1048RD3B	HDH2548RD3B	HDH4048RD3B	HDH6048RD3B

电压 Voltage	控制电压 Control voltage	额定工作电流 Rated operational current			
		80 Amp	100 Amp	120 Amp	150 Amp
280VAC Zero Voltage	4 to 16 Vdc	HDH8028ZD1B	HDH10028ZD1B	HDH12028ZD1B	HDH15028ZD1B
	3 to 32 Vdc	HDH8028ZD3B	HDH10028ZD3B	HDH12028ZD3B	HDH15028ZD3B
280VAC Random Switching	4 to 16 Vdc	HDH8028RD1B	HDH10028RD1B	HDH12028RD1B	HDH15028RD1B
	3 to 32 Vdc	HDH8028RD3B	HDH10028RD3B	HDH12028RD3B	HDH15028RD3B
480VAC Zero Voltage	4 to 16 Vdc	HDH8048ZD1B	HDH10048ZD1B	HDH12048ZD1B	HDH15048ZD1B
	3 to 32 Vdc	HDH8048ZD3B	HDH10048ZD3B	HDH12048ZD3B	HDH15048ZD3B
480VAC Random Switching	4 to 16 Vdc	HDH8048RD1B	HDH10048RD1B	HDH12048RD1B	HDH15048RD1B
	3 to 32 Vdc	HDH8048RD3B	HDH10048RD3B	HDH12048RD3B	HDH15048RD3B

GPH10~100A 新功率固态继电器 GPH10~100A New Power SSR

特点

- 额定工作电流：10A, 20A, 40A, 60A, 80A, 100A
- 额定工作电压：480V
- 输入电压范围：3-32Vdc
- 功能：操作显示灯，内置压敏电阻

Features

- Rated operational current: 10A, 20A, 40A, 60A, 80A, 100A
- Rated operational voltage: 480V
- Input voltage range: 3 to 32 Vdc
- Function: operation indicator, built-in varistor

选型指南 Selection Guide

电压 Voltage	控制电压 Control voltage	额定工作电流 Rated operational current			
		10Amp	20Amp	40Amp	60Amp
480VAC Zero Voltage	4 to 16 Vdc	GPH1048ZD1	GPH2048ZD1	GPH4048ZD1	GPH6048ZD1
	3 to 32 Vdc	GPH1048ZD3	GPH2048ZD3	GPH4048ZD3	GPH6048ZD3
	90 to 280 Vac	GPH1048ZA4	GPH2048ZA4	GPH4048ZA4	GPH6048ZA4
480VAC Random Switching	4 to 16 Vdc	GPH1048RD1	GPH2048RD1	GPH4048RD1	GPH6048RD1
	3 to 32 Vdc	GPH1048RD3	GPH2048RD3	GPH4048RD3	GPH6048RD3
	90 to 280 Vac	GPH1048RA4	GPH2048RA4	GPH4048RA4	GPH6048RA4

HDH200~1000A 单相固态继电器 HDH200~1000A Single Phase SSR

HDH 是允许 200~1000Amps 的电力线继电器，额定电压 280-480VAC

特点

- 额定工作电流：200-350Amps
- 额定工作电压：280V 或 480V
- 输入电压范围：4-16Vdc，3-32Vdc 或 90-280Vac
- 4000Vrms 光隔离 (输入 / 输出)
- “零压”型及调相“随机开关”型
- 控制输入 LED 指示器

HDH are power line relays allowing 200~1000 Amps. Switching power, with voltage ratings from 280 to 480VAC.

Features

- Rated operational current: 200A~350Amps
- Rated operational voltage: 280V or 480V
- Input voltage range: 4 to 16 Vdc, 3 to 32 Vdc or 90 to 280 Vac
- 4000 Vrms optical isolation. (input/output)
- Both “Zero Voltage” & phase controllable “Random Switching” versions
- LED-indication for control input

选型指南 Selection Guide

电压 Voltage	控制电压 Control voltage	额定工作电流 Rated operational current			
		200 Amp	250 Amp	300 Amp	400 Amp
280VAC Zero Voltage	4 to 16 Vdc	HDH20028ZD1	HDH25028ZD1	HDH30028ZD1	HDH40028ZD1
	3 to 32 Vdc	HDH20028ZD3	HDH25028ZD3	HDH30028ZD3	HDH40028ZD3
	90 to 280 Vac	HDH20028ZA4	HDH25028ZA4	HDH30028ZA4	HDH40028ZA4
280VAC Random Switching	4 to 16 Vdc	HDH20028RD1	HDH25028RD1	HDH30028RD1	HDH40028RD1
	3 to 32 Vdc	HDH20028RD3	HDH25028RD3	HDH30028RD3	HDH40028RD3
	90 to 280 Vac	HDH20028RA4	HDH25028RA4	HDH30028RA4	HDH40028RA4
480VAC Zero Voltage	4 to 16 Vdc	HDH20048ZD1	HDH25048ZD1	HDH30048ZD1	HDH40048ZD1
	3 to 32 Vdc	HDH20048ZD3	HDH25048ZD3	HDH30048ZD3	HDH40048ZD3
	90 to 280 Vac	HDH20048ZA4	HDH25048ZA4	HDH30048ZA4	HDH40048ZA4
480VAC Random Switching	4 to 16 Vdc	HDH20048RD1	HDH25048RD1	HDH30048RD1	HDH40048RD1
	3 to 32 Vdc	HDH20048RD3	HDH25048RD3	HDH30048RD3	HDH40048RD3
	90 to 280 Vac	HDH20048RA4	HDH25048RA4	HDH30048RA4	HDH40048RA4

电压 Voltage	控制电压 Control voltage	额定工作电流 Rated operational current			
		500 Amp	800 Amp	1000 Amp	
280VAC Zero Voltage	4 to 16 Vdc	HDH50028ZD1	HDH80028ZD1	HDH100028ZD1	
	3 to 32 Vdc	HDH50028ZD3	HDH80028ZD3	HDH100028ZD3	
	90 to 280 Vac	HDH50028ZA4	HDH80028ZA4	HDH100028ZA4	
280VAC Random Switching	4 to 16 Vdc	HDH45028RD1	HDH80028RD1	HDH100028RD1	
	3 to 32 Vdc	HDH45028RD3	HDH80028RD3	HDH100028RD3	
	90 to 280 Vac	HDH45028RA4	HDH80028RA4	HDH100028RA4	
480VAC Zero Voltage	4 to 16 Vdc	HDH45048ZD1	HDH80048ZD1	HDH100048ZD1	
	3 to 32 Vdc	HDH45048ZD3	HDH80048ZD3	HDH100048ZD3	
	90 to 280 Vac	HDH45048ZA4	HDH80048ZA4	HDH100048ZA4	
480VAC Random Switching	4 to 16 Vdc	HDH45048RD1	HDH80048RD1	HDH100048RD1	
	3 to 32 Vdc	HDH45048RD3	HDH80048RD3	HDH100048RD3	
	90 to 280 Vac	HDH45048RA4	HDH80048RA4	HDH100048RA4	

HTH10~300A 三相固态继电器 HTH10~300A Three Phase SSR

HTH 系列三相固态继电器用于三相负载，单向可控硅输出。采用两个可控硅混合动力技术，提供高效热量管理，并提高循环使用寿命。

特点

- 额定工作电流：3×10，3×15，3×25，3×40，3×60，3×80，3×100，3×120Amps
- 高压 (1400Vpk) 型可用于 530Vrms；2500Vrms 光隔离 (输入 / 输出)
- “零压”型及调相“随机开关”型
- 输入电压范围：4-16Vdc，3-32Vdc 或 90-280Vac
- 控制输入 LED 指示器

HTH series three phase solid state relays is used three phase loads, SCR output. It is dual SCR power hybrid technology provides efficient thermal management for greatly increased cyclic life.

Features

- Rated operational current 3 × 10, 3 × 15, 3 × 25, 3 × 40, 3 × 60, 3 × 80, 3 × 100 and 3 × 120 Amps.
- Hight voltage (1400 Vpk) versions for 530 Vrms service.
  2500 Vrms optical isolation. (input/output)
- Both “Zero Voltage” & phase controllable “Random Switching” versions.
- Input voltage range 4 to 16 Vdc, 3 to 32 Vdc, 90 to 280Vac.
- LED-indication for control input.

选型指南 Selection Guide

电压 Voltage	控制电压 Control voltage	额定工作电流 Rated operational current				
		10 Amp	25 Amp	40 Amp	60 Amp	80 Amp
480 VAC Zero Voltage	4 to 16 Vdc	HTH1048ZD1	HTH2548ZD1	HTH4048ZD1	HTH6048ZD1	HTH8048ZD1
	3 to 32 Vdc	HTH1048ZD3	HTH2548ZD3	HTH4048ZD3	HTH6048ZD3	HTH8048ZD3
	90 to 280 Vac	HTH1048ZA4	HTH2548ZA4	HTH4048ZA4	HTH6048ZA4	HTH8048ZA4
530 VAC Zero Voltage	4 to 16 Vdc	HTH1053ZD1	HTH2553ZD1	HTH4053ZD1	HTH6053ZD1	HTH8053ZD1
	3 to 32 Vdc	HTH1053ZD3	HTH2553ZD3	HTH4053ZD3	HTH6053ZD3	HTH8053ZD3
	90 to 280 Vac	HTH1053ZA4	HTH2553ZA4	HTH4053ZA4	HTH6053ZA4	HTH8053ZA4
480VAC Random	4 to 16 Vdc	HTH1048RD1	HTH2548RD1	HTH4048RD1	HTH6048RD1	HTH8048RD1
	3 to 32 Vdc	HTH1048RD3	HTH2548RD3	HTH4048RD3	HTH6048RD3	HTH8048RD3
	90 to 280 Vac	HTH1048RA4	HTH2548RA4	HTH4048RA4	HTH6048RA4	HTH8048RA4
530VAC Random	4 to 16 Vdc	HTH1053RD1	HTH2553RD1	HTH4053RD1	HTH6053RD1	HTH8053RD1
	3 to 32 Vdc	HTH1053RD3	HTH2553RD3	HTH4053RD3	HTH6053RD3	HTH8053RD3
	90 to 280 Vac	HTH1053RA4	HTH2553RA4	HTH4053RA4	HTH6053RA4	HTH8053RA4

电压 Voltage	控制电压 Control voltage	额定工作电流 Rated operational current				
		100 Amp	120 Amp	150 Amp	200 Amp	300 Amp
480 VAC Zero Voltage	4 to 16 Vdc	HTH10048ZD1	HTH12048ZD1	HTH15048ZD1	HTH20048ZD1	HTH30048ZD1
	3 to 32 Vdc	HTH10048ZD3	HTH12048ZD3	HTH15048ZD3	HTH20048ZD3	HTH30048ZD3
	90 to 280 Vac	HTH10048ZA4	HTH12048ZA4	HTH15048ZA4	HTH20048ZA4	HTH30048ZA4
530 VAC Zero Voltage	4 to 16 Vdc	HTH10053ZD1	HTH12053ZD1	HTH15053ZD1	HTH20053ZD1	HTH30053ZD1
	3 to 32 Vdc	HTH10053ZD3	HTH12053ZD3	HTH15053ZD3	HTH20053ZD3	HTH30053ZD3
	90 to 280 Vac	HTH10053ZA4	HTH12053ZA4	HTH15053ZA4	HTH20053ZA4	HTH30053ZA4
480VAC Random	4 to 16 Vdc	HTH10048RD1	HTH12048RD1	HTH15048RD1	HTH20048RD1	HTH30048RD1
	3 to 32 Vdc	HTH10048RD3	HTH12048RD3	HTH15048RD3	HTH20048RD3	HTH30048RD3
	90 to 280 Vac	HTH10048RA4	HTH12048RA4	HTH15048RA4	HTH20048RA4	HTH30048RA4
530VAC Random	4 to 16 Vdc	HTH10053RD1	HTH12053RD1	HTH15053RD1	HTH20053RD1	HTH30053RD1
	3 to 32 Vdc	HTH10053RD3	HTH12053RD3	HTH15053RD3	HTH20053RD3	HTH30053RD3
	90 to 280 Vac	HTH10053RA4	HTH12053RA4	HTH15053RA4	HTH20053RA4	HTH30053RA4

GV/GI(MSA/MSD) 系列三相移相单片整流模块

GV/GI(MSA/MSD) Series Three Phase Single Chip Rectifier Module With Phase Shift

特点

该产品是一种多功能模块，包括晶闸管电路，单片控制移相触发电路，信号感应电路和可控制负载电压的调压电路。由于其内置线性控制电路，它具有精度高和性能稳定等特点。可广泛适用于感性和阻性负载，如直流电机，电分析，温度监控，调光，直流电压等等。

- 额定电流：50~500A
- 额定电压：40~440V
- 环境温度：-30~+40°C

Feature

It is a kind of multifunctional module consisting of thyristor power circuit, single-chip control phase shift triggering circuit, signal sensing circuit and voltage adjustable circuit, which can adjust and control load voltage, As it has built-in linear control circuit, it features high accuracy and stable performance.Widely applicable for inductive and resistive loads such as DC motor, electroanalysis, temperature monitoring, light adjusting, DC voltage and so on.

- Rated current: 50~500A
- Rated voltage: 40~440V
- Ambient temperature: -30~+40°C

主要技术参数 Main technial specification

功能 Function	输入电压范围 Input voltage range	电源 Power supply	控制电压 Control voltage	控制电流 Control current	手动电位计电阻 Resistance of manual potentiomete	冷却 Cooling	输出电压 Output voltage
	Arms	mA	VDC	mA	KΩ	m/s	VDC
晶闸管三相整流及调压 Thyristor three phase rectifying and voltage adjusting	40~440V	12V/400	0-5	4-20	10	风冷散热器 风速≥ 6 air cooling heatsink, wind speed ≥ 6	0-513
晶闸管三相交流移相调压（缺相，过热和过流保护） Thyristor three phase AC phase shift voltage adjusting, phase-lacking overheat and over current protection	40~440V	12V/400	0-5	4-20	10		0-513

主电路参数 Parameters of main circuit

额定电流 Nominal current	最高工作电压 Max.working current	可控硅截止电压 Interdiction voltage of SCR	频率 Frequency	断态电压临界上升率 Dv/dt	通态电流临界上升率 Di/dt	断路漏电电流（最高） Breaking leakage current(Max.)	导通压降（最高） Making voltage drop(Max.)	绝缘电压（端子 / 底板） Insulating voltage (terminal/soleplate)
Arms	Arms	Vpk	Hz	V/sec	A/sec	mA rms	V rms	V rms
50	3x50	1200	50/60	500	100	≤ 8	1.6	≥ 2500
70	3x70	1200	50/60	500	100	≤ 10	1.6	≤ 2500
120	3x120	1200	50/60	500	100	≤ 10	1.8	≤ 2500
200	3x200	1200	50/60	500	100	≤ 10	1.8	≤ 2500
250	3x250	1200	50/60	500	100	≤ 15	1.8	≤ 2500
350	3x350	1200	50/60	500	100	≤ 15	1.8	≤ 2500
500	3x500	1200	50/60	500	100	≤ 20	1.8	≤ 2500

GVDR 系列单相调压整流模块
GVDR Series Single Phase Voltage Adjustable Rectifier Module

特点

该产品是一种多功能模块，包括晶闸管电路，单片控制移相触发电路，信号感应电路和可控制负载电压的调压电路。由于其内置线性控制电路，它具有精度高和性能稳定等特点。可广泛适用于感性和阻性负载，如直流电机，电分析，温度监控，调光，直流电压等等。

- 额定电流：50-500A
- 额定电压：220V, 380V
- 环境温度：-30~+40°C
- 储存温度：-25~+55°C

Feature

It is a kind of multifunctional module consisting of thyristor power circuit, single-chip control phase shift triggering circuit, signal sensing circuit and voltage adjustable circuit, which can adjust and control load voltage, As it has built-in linear control circuit, it features high accuracy and stable performance. Widely applicable for inductive and resistive loads such as DC motor, electroanalysis,temperature monitoring, light adjusting, DC voltage and so on.

- Rated current: 50~500A
- Rated voltage: 220V, 380V
- Ambient temperature: -30~+40°C
- Storage temperature: -25~+55°C

主要技术参数 Main technial specifications

功能 Function	输入电压范围 Input voltage range	输出正波和负波不对称性 Dissymmetry of output plus and minus wave	信号控制电压 Controlling signal voltage	控制电流 Control current	手动电位计电阻 Resistance of manual potentiomete
			VDC	mA	KΩ
单相晶闸管调压整流 Single phase thyristor voltage rectifying	220±20% 380±20%	2%	0-5	4-20	10
单相晶闸管交流调压 Single phase thyristor type AC voltage adjustment rectifying	220±20% 380±20% 440±20%	2%	0-5	4-20	10

冷却：风冷散热器，风速≥ 6
Cooling: air cooling heatsink, wind speed ≥ 6

主电路参数 Parameters of main circuit

额定电流 Nominal current	可控硅截止电压 Interdiction voltage of SCR	断路漏电电流 (最高) Breaking leakage current(Max.)	导通压降 (最高) Making voltage drop(Max.)	绝缘电压 (端子 / 底板) Insulating voltage (terminal/soleplate)	重量 Weight
Arms	Vpk	mA rms	V rms	V rms	kg
50	800-1200	≤ 8	1.6	≥ 2500	0.425
70	800-1200	≤ 10	1.6	≥ 2500	0.425
100	800-1200	≤ 10	1.6	≥ 2500	0.425
120	800-1200	≤ 10	1.8	≥ 2500	0.425
200	800-1200	≤ 10	1.8	≥ 2500	0.425
250	800-1200	≤ 15	1.8	≥ 2500	2.2
350	800-1200	≤ 15	1.8	≥ 2500	2.2
500	800-1200	≤ 20	1.8	≥ 2500	2.2

HJTCW-32ZK1(2) 系列触发板 HJTCW-32ZK1(2) Trigger Board

特点

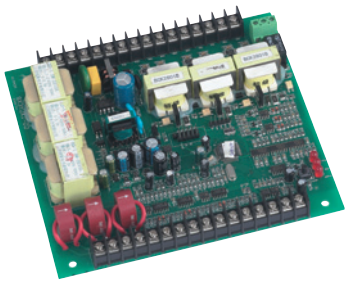
- 工作电源：AC220V 50Hz±5%
- 工作环境：环境温度 40；湿度 85(无露珠)；无强磁场；无强烈振动。
- 输入信号：4~20mA 线性电流 (0~10mA, 0~10V, 1~5V 订货时需说明)；
- 输出能力：驱动可控硅 (触发脉冲 3V/200mA, 50μS)。

Feature

- Working power supply: AC220V 50Hz±5%
- Working environment: ambient temperature 40; humidity 85 (without dew)
  without strong magnetic field; without strong vibration
- Input signal: 4-20mA linear current (0-10mA, 0-10V, 1-5V, please give indications when ordering goods)
- Output capacity: Drive SCR (trigger pulse 3V/200mA, 50μS)

功能 Function	常规功能 Normal functions	电流限幅功能 Current limit function	过流保护功能 Over current protection function	开路保护功能 Open circuit protection function
0	有 Yes	无 No	无 No	无 No
1	有 Yes	有 Yes	有 Yes	无 No
2	有 Yes	有 Yes	有 Yes	有 Yes

HJTCW-32ZK2 系列触发板 HJTCW-32ZK2 Series Trigger Board



特点

- 工作电源：AC220V 50Hz±5%
- 工作环境：环境温度 40；湿度 85(无露珠)；无强磁场；无强烈振动。
- 输入信号：4~20mA 线性电流 (0~10mA, 0~10V, 1~5V 订货时需说明)；
- 输出能力：驱动可控硅 (触发脉冲 3V/200mA, 50μS)。

Feature

- Working power supply: AC220V 50Hz±5%
- Working environment: ambient temperature 40; humidity 85 (without dew)
  without strong magnetic field; without strong vibration
- Input signal: 4-20mA linear current (0-10mA, 0-10V, 1-5V, please give indications when ordering goods)
- Output capacity: Drive SCR (trigger pulse 3V/200mA, 50μS)

使用方法：

1、自动输出：将“公共 - 自动”端子短接时，可从“输入信号 + 、-”端子输入 4~20mA 信号来控制触发器输出的大小；
2、手动输出：将“公共 - 自动”端子短接时，可通过“手动调节 (1K 电位器)”来调节触发器输出的大小；
3、电流限幅：使用电流限幅功能时，对于 TCW-32 ZK Y1，需将主回路中电流互感器信号引入“A1-A2”端；对于 TCW-32 ZK Y3，需将三相主回路中电流互感器信号分别引入“A1-A2, A3-A4, A5-A6”端。并外接“电流限幅 (1K 电位器)”，通过电位器调节电流限幅值的大小。为了不影响主控表的调节输出，在使用电流限幅功能时，一般将电流限幅设定在负载的额定电流附近；另外，为了可靠地使用过流保护功能，也需将电流限幅值设定在负载的额定电流附近。

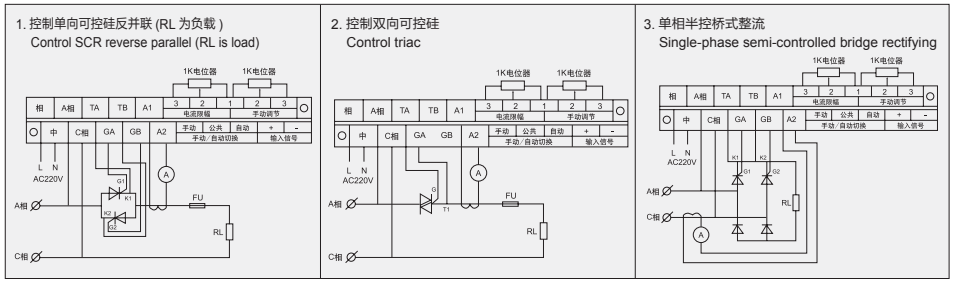
Use method:

1. Automatic output: When the "common-automatic" terminal is short-circuited, the trigger output volume can be controlled through inputting 4-20mA signal from the "input signal +, -" terminal.
2. Manual output: When the "common-automatic" terminal is short-circuited, the trigger output volume can be controlled through the "manual adjustment (1K potentiometer)".
3. Current limit: When the current limit function is used, for TCW-32 ZK Y1, the current transformer signals in the main circuit shall be introduced to the "A1-A2" terminal; for TCW-32 ZK Y3, the current transformer signals in the three-phase main circuit shall be respectively introduced to "A1-A2, A3-A4, A5-A6" terminals. And connect with the "current limit (1K potentiometer)" externally to adjust the current limit value through the potentiometer. In order not to influence the adjustment and output of the main control meter, when the current limit function is used, the current limit value is generally set near the rated current of load. In addition, to reliably use the over current protection function, it is also necessary to set the current limit value near the rated current of load.

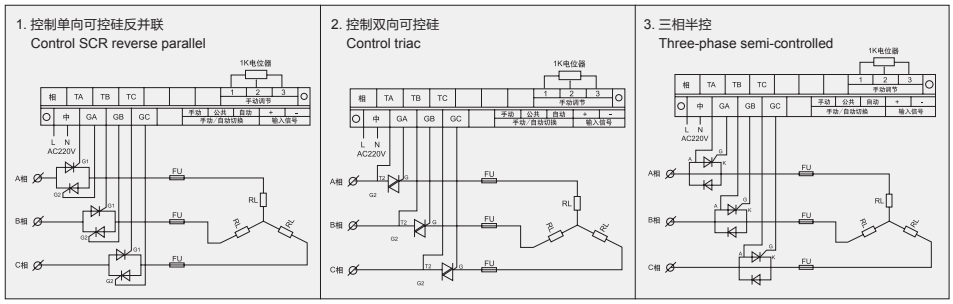
参考接线图 Reference wiring diagram

以 HJTCW-32ZK1 系列触发器为例，HJTCW-32ZK2 系列接线方法雷同。
Taking HJTCW-32ZK1 series triggers as the example, the wiring method of HJTCW-32ZK2 series is similar)

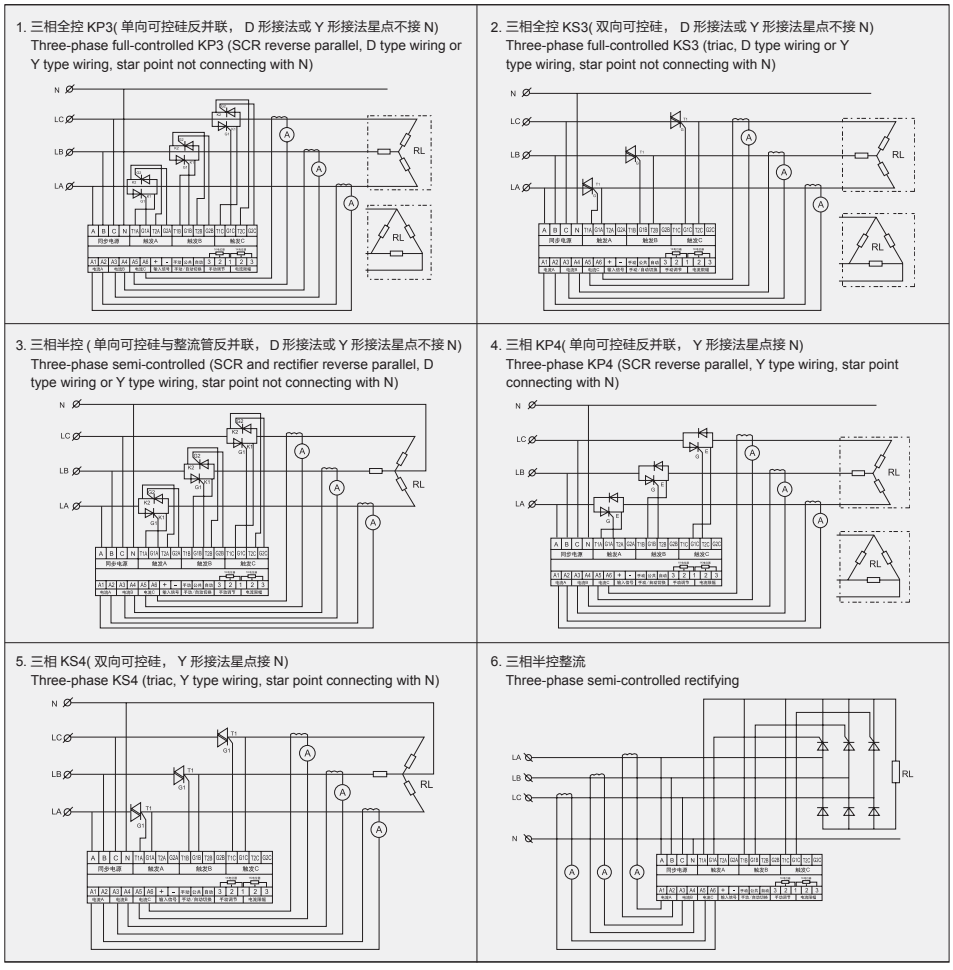
(一)HJTCW-32 ZK1 Y1 接线图 HJTCW-32 ZK1 Y1 wiring diagram



(二)HJTCW-32 ZK1 L3 接线图 HJTCW-32 ZK1 L3 wiring diagram



(三)HJTCW-32 ZK1 Y3 接线图 HJTCW-32 ZK1 Y3 Wiring Diagram



HR1~7KW 电机正反转固态继电器 HR 1~7KW Motor Reversing SSR

特点

- 工作电压高达 530VAC rms
- 高性能 / 低损耗电路设计
- 内置互锁功能，交直流电压控制
- LED 方位指示器
- 绝缘体：磁簧继电器或光耦合器（输入输出）2500VAC rms
- 电压控制范围：10-30Vdc 或 115Vac
- 本系列采用两个可控硅混合动力技术，提供高效热量管理，并提高循环使用寿命。

Features

- Operational voltage: Up to 530VAC rms
- High performance/low cost circuit design
- Built-in interlock function, AC or DC control voltage
- LED indication for direction
- Insulation: Reed relay or opt coupler(input-output) 2500VAC rms
- Control voltage range: 10~30 Vdc or 115 Vac
- This series with Dual SCR Power Hybrid technology provide highly efficient thermal management for greatly increased cyclic life

输入参数 Input parameters

名称 Name	控制电压 Control voltage	
输入电压 Input voltage Us(V)	DC4~30V	
输入电流 Input current Is(mA)	8~18	
接通电压 Turn-on voltage Uon(V)	4-30V	
关断电压 Turn-off voltage Uoff(V)	3.5	5
接通时间 Turn-on time ton(ms)	≤ 10	

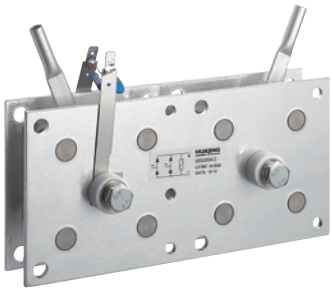
输出参数 Output parameters

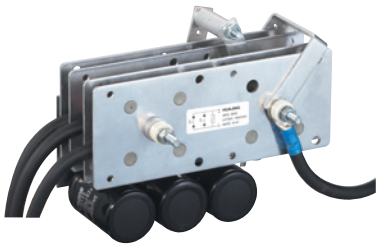
名称 Name	AC220 档 level	AC220 档 level
输出电压 Output voltage Ue(V)	AC20~280V	AC20~280V
额定输出电流 Rated output current 10-50A/phase Ie(A)	10~50A/ 每相 phase	
输出电压降 Output voltage drop Ur(V)	≤ 1.8	
输出漏电流 Output leakage current Ido(Ma)	≤ 10	≤ 15
瞬态电压 Transient voltage Up(A)	600	
绝缘电阻 Insulation resistance Ri(MW)	≥ 100	
介质耐压 Dielectric withstanding voltage (V)	2000	
工作温度 Working temperature	-20˚C~+70˚C	

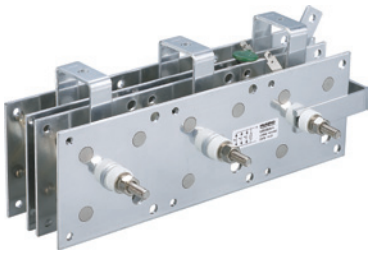
选型指南 Selection Guide

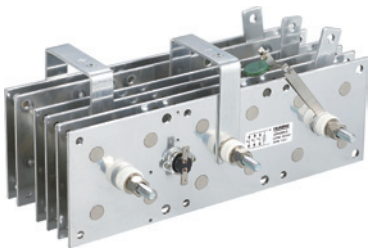
电压 Voltage	控制电压 Control voltage	负载功率 Load power			
		1kW	3kW	5kW	7kW
480 VACrms	10 to 30 Vdc	HR1048DD	HR3048DD	HR5048DD	HR7048DD
		HR1048TD	HR3048TD	HR5048TD	HR7048TD
	115 Vac	HR1048DA	HR3048DA	HR5048DA	HR7048DA
		HR1048TA	HR3048TA	HR5048TA	HR7048TA
530 VACrms	10 to 30 Vdc	HR1053DD	HR3053DD	HR5053DD	HR7053DD
		HR1053TD	HR3053TD	HR5053TD	HR7053TD
	115 Vac	HR1053DA	HR3053DA	HR5053DA	HR7053DA
		HR1053TA	HR3053TA	HR5053TA	HR7053TA

气体保护电焊机组件 Welding Machine Device









特点

- 低成本
- 正向压降低、高电流能力和导电包
- 真空气体保护焊工艺、散热器及过电压保护装置

典型应用

- 二氧化碳气体保护焊机
- 直流电源、整流电路

Feature

- Low cost
- Low forward voltage drop. High current capability & conductive package
- Vacuum thydrogen gas filled protection solder technology. Device with hentsink & over-voltage protection

Application

- Co_2 gas filled protection weld machine
- DC power supplies. Rectificate circuit

型号 Type	正向峰值电流 Peak forward current	正向峰值电压 Peak forward voltage	反向重复峰值电流 Repetitive peak current	反向重复峰值电压 Repetitive peak voltage	绝缘电压 Insulation voltage	工作结温 Temperature rise
	A	V	mA	V	V	°C
UQD100A	100	≤ 600	≤ 3	≤ 1.2	2500	≤ 100
UQD150A	150	≤ 600	≤ 4	≤ 1.2	2500	≤ 100
UQD200A	200	≤ 600	≤ 5	≤ 1.3	2500	≤ 100
UQD250A	250	≤ 600	≤ 5	≤ 1.3	2500	≤ 100
UQD300A	300	≤ 600	≤ 6	≤ 1.3	2500	≤ 100
UQD400A	400	≤ 600	≤ 6	≤ 1.4	2500	≤ 100
UQD500A	500	≤ 600	≤ 7	≤ 1.4	2500	≤ 100
UQD600A	600	≤ 600	≤ 7	≤ 1.4	2500	≤ 100

型号 Type	正向峰值电流 Peak forward current	正向峰值电压 Peak forward voltage	反向重复峰值电流 Repetitive peak current	反向重复峰值电压 Repetitive peak voltage	绝缘电压 Insulation voltage	工作结温 Temperature rise
	A	V	mA	V	V	°C
UQS100A	100	≤ 600	≤ 3.5	≤ 1.30	2500	≤ 100
UQS150A	150	≤ 600	≤ 4.0	≤ 1.30	2500	≤ 100
UQS200A	200	≤ 600	≤ 5.5	≤ 1.35	2500	≤ 100
UQS250A	250	≤ 600	≤ 6.0	≤ 1.35	2500	≤ 100
UQS300A	300	≤ 600	≤ 6.5	≤ 1.35	2500	≤ 100
UQS400A	400	≤ 600	≤ 8.0	≤ 1.40	2500	≤ 100
UQS500A	500	≤ 600	≤ 10.0	≤ 1.40	2500	≤ 100
UQS600A	600	≤ 600	≤ 10.0	≤ 1.45	2500	≤ 100

功率半导体夹子 (平板式专用) Power Semiconductors Clamp box

特点

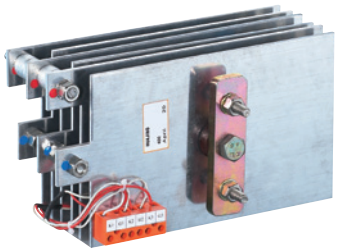
功率半导体夹子是一种主要用于固定平板式器件的外壳。其主要部分是压力板，弹簧组件，螺母和垫圈的压力模具，绝缘盘。

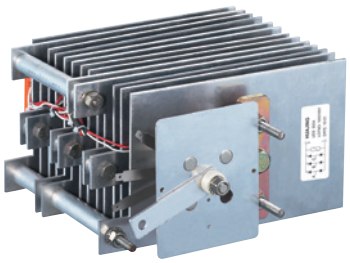
Feature

This clamp is a so-called pre-stressed unit. Its main parts are the pressure plate, the spring assembly, the pressure die with nut and washer, and an insulation disk. The spring assembly is pre-stressed as per the type marking and is fixed by the central nut.

型号 Type	器件数量 Number of devices	器件外壳 Outlines of devices	Rth(c-p) (°C/W)	Rth(p-hs) (°C/W)
MP25-200A	1	KT19aT KT25aT	0.095	0.012
MP33-500A	1	KT33CT	0.090	0.010

三相全控桥 Three-phase Full-controlled Bridge





用途

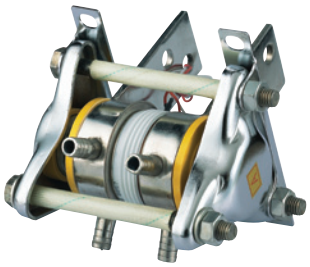
把交流电整流成可调的直流电，广泛用于直接电机调整 、电机励磁 、调压电源、直流电源、电解、电镀、电焊机等行业。

Application

It can rectify AC to adjustable DC, and applied in the adjustment and excitation of electric machine, voltage regulating source, DC stagnancy power supply, electroanalysis, electroplating, electric welding machine etc.

型号 Model	直输电流 DC output current	直输电压 DC output voltage	通态 (正向) 峰值电压 Peak on-state voltage (forward)	一字形外形尺寸 Shaped outline dimensions (一 - type)	品字形外形尺寸 Shaped outline dimensions (品 -type)	暂载率负载 Duty cycle	散热片数量 Heatsink quantity
	A	V	V	(L×W×H mm)	(L×W×H mm)		
UTS500	500	300~1200	≤ 1.8	490×180×235	330×180×426	60% 电焊机上 60% On the electric welder	9
UFS500	500	300~1200	≤ 1.8	490×180×235	330×180×426		9
UTS630	630	300~1200	≤ 1.8	490×190×235	330×190×426		9
UFS630	630	300~1200	≤ 1.8	490×190×235	330×190×426		9
UTS1000	1000	300~1200	≤ 1.8	490×225×235	330×225×426		9
UFS1000	1000	300~1200	≤ 1.8	490×225×235	330×225×426		9
UTS1250	1250	300~1200	≤ 1.8	490×280×235	330×280×426		9
UFS1250	1250	300~1200	≤ 1.8	490×280×235	330×280×426		9

SS 系列水冷散热器 SS Series Water Cooling Heatsink



特点

- 可与 SS14，SS15 系列兼容
- 散热器内高效热传导水冷设计
- 超低热阻，高散热能力
- 多重安装结构

典型应用

- 超大功率平板器件
- 大功率整流器，大功率感应加热设备

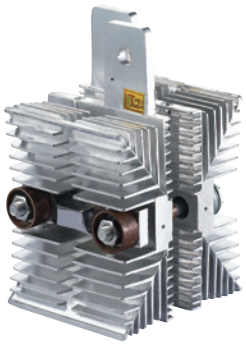
Feature

- Compatible with SS14,SS15 Serie
- High efficiency heat transfer water cooling design inside the heatsink
- Ultralow low thermal resistance, high heatsinking capability
- Manifold mounting structure

Application

- UHP capsule device
- High-power eliminator supply, High-power induction heating supply

SF 系列风冷散热器 SF Series Air Cooling Heatsink



特点

- 可与 SF12，SF13，SF14，SF15，SF16，SF17 系列兼容
- 散热器内高效热传导风冷设计
- 超低热阻，高散热能力，多重安装结构

典型应用

- 超大功率平板器件
- 大功率整流器，大功率感应加热设备

Feature

- Compatible with SF12, SF13, SF14, SF15, SF16, SF17, Series
- High efficiency heat transfer Air cooling design inside the heatsink
- Ultralow low thermal resistance, high heatsinking capability, Manifold mounting structures

Application

- UHP capsule devices
- High-power eliminator supply, High-power induction heating supply

模块专用风冷散热器 Heatsink for Module

典型应用

- 交直流电机控制
- 各种整流电源，工业加热控制
- 调光，无触点开关，电机软起动
- 静态无功补偿，焊机，传感器
- 不间断电源，电池充放电

Typical application

- AC/DC motor control
- Various of Rectifier supply, Industrial heating control
- Light change, No-contact switching, Soft startup of motor
- Quiescent reactive compensation, Welding machine, Transducer
- UPS power supply, Charging and discharging of battery

KMF 数字式直流传动装置 Digital DC Transmission Device

特征
- 英国“欧陆十六位微机控制器”，中央处理器 CPU 进行数据采集运算
- US232/US422 串口网络可构成先进的过程控制
- 精度≤ 0.2%
- 标准软件模块可组态控制，精确的速度转距控制

应用
- 直流电机调速

Feature
- “Britain” Eurotherm drives and Asia sixteen way microcomputer controller, CPU adoptd data-collection operation
- US232/US422 serial network will form advanced process control
- Precision ≤0.2%
- Standard software module may be controlled through configuration, Exact speed transition control

Application
- DC motor speed control

ZBA(ZBF), KBA(KBF) 一般工业用硅整流装置
ZBA(ZBF), KBA(KBF) General Industrial Silicon Rectifying Device

特征
- 模拟控制器，恒流 / 恒压功能
- 闭环控制，智能 PI 调节，精度≤ 3%
- 软起动功能

应用
- 照明、直流操作
- 汽车发动机点火，船用电源，直流电机试验

Feature
- Analog controller, Function of constant current and constant voltage
- Closed loop control, Intelligent PI adjustment, Precision ≤3%
- Soft start function

Application
- Lighting and DC operation
- Ignition of automobile motor, Ship used power, DC motor test

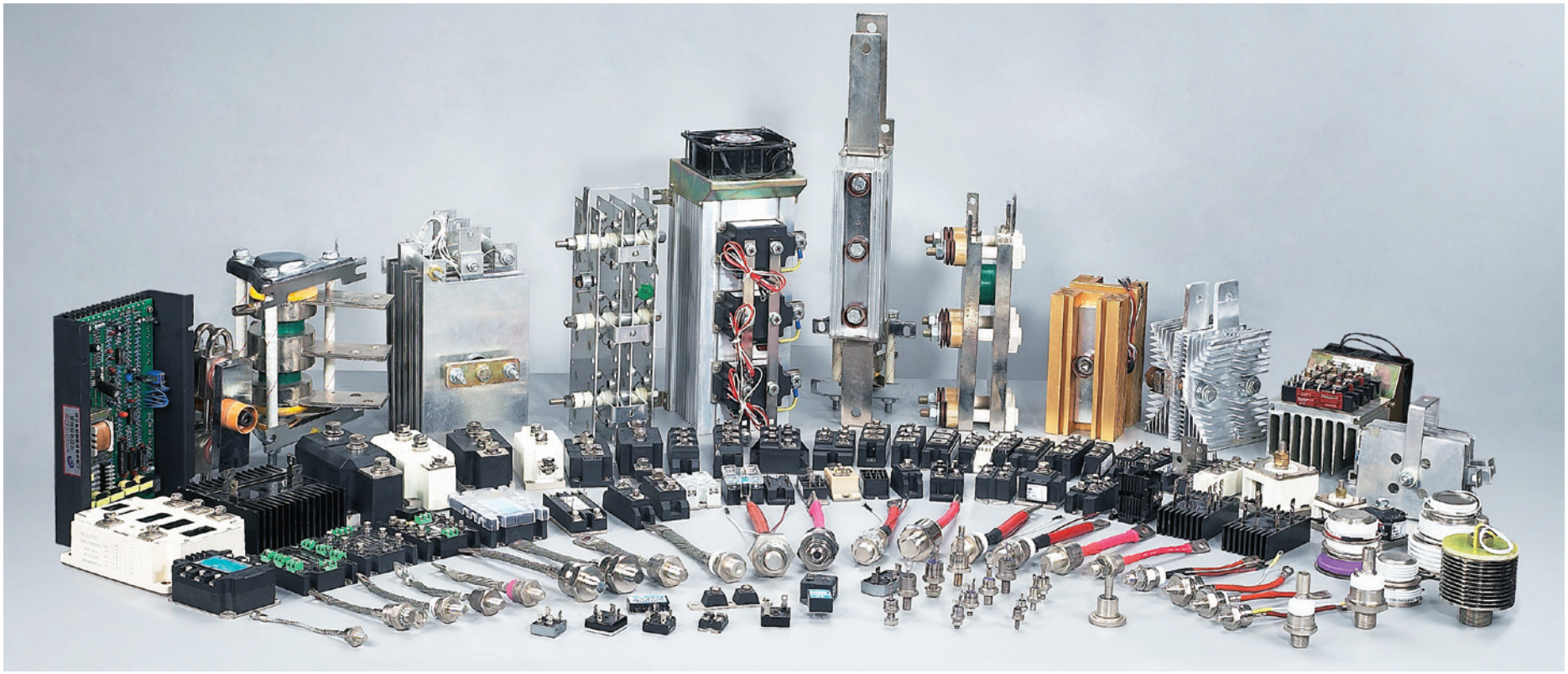
KDF, KHF(KHS) 电镀电化用硅整流装置
KDF, KHF(KHS) Rectifying Device for Electroplating

特征
- 模拟控制器，稳压 / 稳流功能，闭环控制
- 智能 PI 调节，精度≤ 3%，周期换向
- 美国集成数字式控制系统，软启动、慢停止功能

应用
- 工业电镀、阴极氧化
- 污水处理、直流电源、电解、石墨炉加热

Feature
- Analog controller, Function of voltage stabilizing and steady slow, Closed loop control
- Intelligent PI adjust, Precision ≤ 3%, Preiodically switching
- American integration digital control system, Function of soft startup and slow stop

Application
- Industrial electroplate, Cathode oxidation
- Disposal of sewage, DC power supply, Electrolysis, Graphite furnace heat up



符号及术语 Symbols

符号	表述意义
B_2	单相桥
B_6	三相桥
di/dt	通态电流临界上升率
dv/dt	断态电压临界上升率
I^2t	电流平方时间积
Id	直流输出电流
I_{DRM}	断态重复峰值电流
$I_{F(AV)}$	正向平均电流
I_{FM}	正向输出电流
$I_{F(RMS)}$	正向电流有效值
I_{FSM}	一周波正向不重复浪涌电流
I_G	门极电流
I_{GD}	门极不重复电流
I_{GT}	门极触发电流
I_H	维持电流
I_{RRM}	反向重复峰值电流
$I_{T(AV)}$	通态平均电流

符号	表述意义
$I_{T(RMS)}$	通态电流有效值
I_{TM}	通态峰值电流
I_{TSM}	一周波通态不重复浪涌电流
Qrr	反向恢复电荷
r_T	通态斜率电阻
r_F	正向斜率电阻
Rth	热阻抗
Rth(c-hs)	热阻抗 (壳至散热器)
Rth(h-a)	热阻抗 (用热器至环境)
Rth(j-c)	热阻抗 (结至壳)
V_{STG}	贮存温度
$V_{CE(ON)}$	集电极 – 发射极通态电压
V_{CES}	集电极 – 发射极电压
R_{TO}	通态斜率电阻
T_C	壳温 (模块为铜底板温度)
tdoff	关断贮存时间
tdon	开通延迟时间

符号	表述意义
tf	下降时间
M	紧固力矩
P_D	最大损耗功率
P_{GAV}	门极平均功率
Qg	栅极总电荷
Qgc	栅极 – 发射极电荷
Qgc	栅极 – 集电极电荷
Rth(j-hs)	热阻抗 (结至散热器)
Ta	环境温度
T_{HS}	散热器温度
Tj	结温
Tjm	最高额定结温
td	延迟时间
tp	脉冲宽度
tq	关断时间
tr	上升时间
trr	反向恢复时间

符号	表述意义
V_{DRM}	断态重复峰值电压
V_{DSM}	断态不重复峰值电压
V_{FM}	正向平均电压 (全动态测试)
V_G	门极电压
V_{GT}	门极触发电压
V_{GD}	门极不触发电压
Viso	绝缘电压
V_{RRM}	反向重复峰值电压
V_{FO}	正向门槛电压
V_{TO}	通态门槛电压
V_{RGM}	门极反向峰值电压
V_{RSM}	反向不重复峰值电压
V_{TM}	通态峰值电压
W_1	单相交流开关
W_3	三相交流开关
Wt	重量

符号	表述意义
V_{CE}	栅极 - 发射极电压
$V_{CE(TH)}$	栅极阀值电压
di/d	通态电流临界上升率
dvdt	断态电压临界上升率
Eoff	关断能量损耗
Eon	开通能量损耗
I_C	集电极直流 (连续) 电流
I_{CES}	集电极 - 发射极截止电流
I_{CM}	集电极峰值电流
Cies	输入电容
Coes	输出电容
C_{RES}	反向传输电容
L_{GES}	栅极 - 发射极漏电流
I_L	擎住电流
Irr	二极管反向恢复峰值电流

HUAJING

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