



广东富信微信公众号　广东富信官网二维码　阿里巴巴店铺

广东富信科技股份有限公司

Guangdong Fuxin Technology Co., Ltd.

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股票代码:688662

半导体热电技术解决方案及应用产品提供商

FUXIN

广东富信科技股份有限公司

Guangdong Fuxin Technology Co., Ltd.

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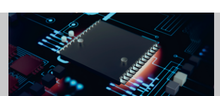
型号系列 Series of Products

- 单级制冷器件 Single Stage Modules 13
- 大功率制冷器件 High Power Modules 15
- 高温差制冷器件 High Temperature Difference Modules 15
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广东富信科技股份有限公司

半导体热电技术解决方案及应用产品提供商

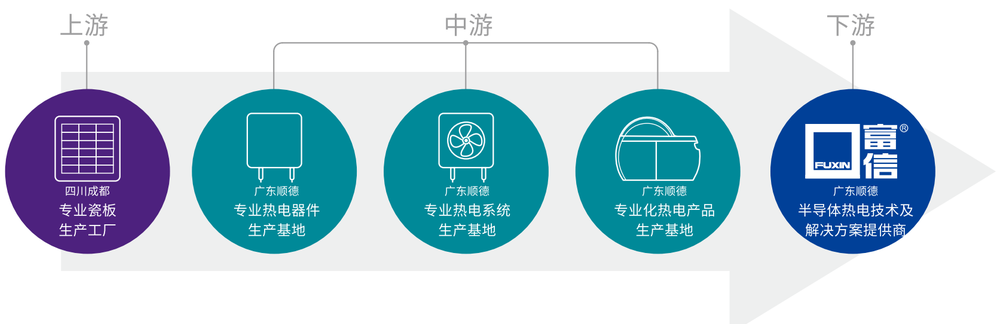
广东富信科技股份有限公司创建于2003年,是一家集研发、生产、销售、服务于一体的半导体热电技术高新企业。公司致力于半导体热电制冷技术(Thermoelectric Coolig)、半导体温差发电技术(Thermoelectric Power Generation)及其产品研发,是半导体热电产品制造基地。公司主营业务半导体热电器件、半导体热电系统、半导体热电整机应用(恒温酒柜、电子冰箱、冰淇淋机、恒温床垫、啤酒机、除湿器、冻奶器等产品)。2009年5月,公司研发中心被认定为广东省省级企业技术中心,2016年11月被认定为广东省半导体热电技术与应用工程技术研究中心,公司与武汉理工大学、河北科技大学等研究院所进行深度技术合作。

Guangdong Fuxin Technology Co., Ltd.

Thermoelectric Technology Solutions And Application Products Provider

Guangdong Fuxin Technology Co., Ltd. is a national high tech enterprise of thermoelectric technology which was established in 2003, integrating R&D, production, sales and service. The company devotes to Thermoelectric Cooling Technology (TEC), Thermoelectric Power Generation Technology (TEG), and product development. The main business of Fuxin is the manufacturer of thermoelectric components, thermoelectric systems and thermoelectric applications like wine coolers, refrigerators, ice cream makers, heating &cooling mattresses, beer coolers, dehumidifiers, milk coolers and etc. In May 2009, the company R&D center was identified as the provincial Enterprise Technology Center of Guangdong Province. And in November 2016, the company was identified as the Thermoelectric Technology and Applied Engineering Technology Research Center of Guangdong Province. The company has deeply technical cooperation with Research institutes in thermoelectric of Wuhan University of Technology and Hebei University of Science & Technology.

Thermoelectric Complete Industrial Chain
热电产业链





高新技术企业证书



ISO9001证书

Cooperation Case
合作案例



invitop
美的 Midea
GREE 格力
Canbo 康宝
XINGX 星星
Hangdi 航迪
ANGEL 安吉尔 高端净饮水专家
BlackShields 黑盾
flex LIVE SMARTER
KEMIN 诚于追取 科创未来
黑鲨科技 BLACK SHARK
SUNSEA 日海
威力 WEILI
艾斯伯格

以上排名不分先后

Thermoelectric Application Products

热电应用领域

新能源领域
New Energy

工业和环保领域
Industry and Environmental

汽车领域
Automotive

生物医疗领域
Biological Medical



通讯领域
Telecommunications

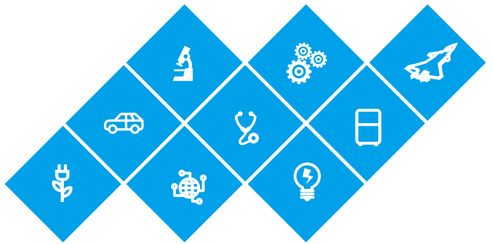
民用消费品领域
Consumer Electronics

空间军事领域
Aerospace & Defense

电子工业领域
Electronics Industry

Thermoelectric Application Products

热电应用产品



工业和环保领域
Industry and Environmental

应用产品：工业废热发电、垃圾焚烧热发电、汽车尾气发电等。

Application Products: Industrial Waste Heat Power Generation, Waste Incineration Heat Power Generation, Automobile Exhaust Power Generation etc.

汽车领域
Automotive

应用产品：车载冰箱、汽车冷暖座垫、汽车动力电池热管理、无人驾驶汽车传感器热管理、车用冷暖杯、冷藏包、冷暖包等。

Application Products：Car Refrigerator，Car Warm And Cold Seat Cushion，Car Power Battery Thermal Management，driverless Car Sensor Thermal Management，Car Warm And Cold Cup，Cooling Bag，Cold And Warm Bags etc.

新能源领域
New Energy

应用产品：热能表、太阳能热电、LNG冷能温差发电等。

Application Products: Thermal Energy Meter, Solar Thermal Power, LNG Cold Energy Temperature Difference Power Generation etc.

生物医疗领域
Biological Medical

应用产品：PCR仪器、恒温培养箱、医用冷藏箱、冷冻减肥仪、胰岛素冷藏盒、智能退热仪、植物培养箱等。

Application Products: PCR Instrument, Thermostatic Incubator, Medical Refrigerator, Frozen Weight Loss Instrument, Insulin Refrigerator, Intelligent Antipyretic Instrument, Plant Incubator etc.

通讯领域
Telecommunications

应用产品：数据中心、骨干网和城域网、接入网、5G网、激光发射器、光接收器、泵浦激光器等。

Application Products: Data Center, Backbone Network And Metropolitan Area Network, Access Network, 5G Network, Laser Transmitter, Optical Receiver, Pump Laser etc.

空间军事领域
Aerospace & Defense

应用产品：军用红外探测器冷却、空间光电子芯片的冷却、军用制水壶、军用调温服等。

Application Products：Military Infrared Detector Cooling，Space Photoelectronic Chip Cooling，Military Kettle，Military Temperature Control Clothing etc.

光电子领域
Electronics Industry

应用产品：高清摄像头控温、工业除湿机、红外成像仪、半导体空调、激光二极管、光电倍增管等

Application Products: HD Camera Temperature Control, Industrial Dehumidifier, Infrared Imager, Semiconductor Air Conditioner, Laser Diode, Photomultiplier Tube etc.

民用消费品领域
Consumer Electronics

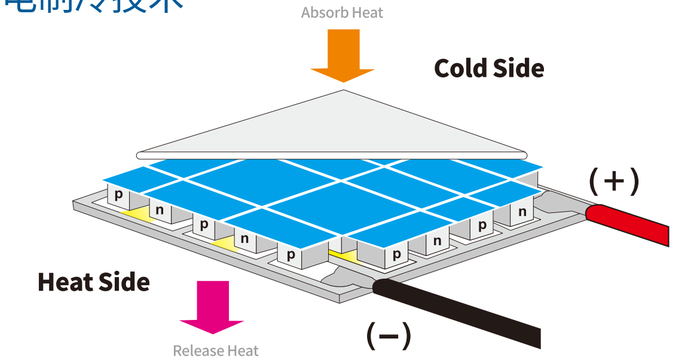
应用产品：
大家电：红酒柜、冰箱、冷热箱、雪茄柜等。
厨房小家电：冰淇淋机、酸奶机、母乳包、冻奶器、巧克力机等。
生活电器：冷暖床垫、除湿机、啤酒机、空调扇、化妆品冷藏箱、新风空调、冷热杯、恒温米柜、冷热饮水机、冷热净水器、暖脚套等。
个人护理电器：负离子电吹风、水离子电吹风、美容仪、冷热锤、激光冰点脱毛仪等。
娱乐电器：手机散热器等。

Application Products
Home Appliances：Wine Cooler，Minibar，Cooling And Heating Box，Cigar Humidor etc.
Kitchen Appliances：Ice Cream Maker，Yoghourt Maker，Breast Milk Box，Milk Cooler，Chocolate Cooler etc.
Life Appliances：Heating And Cooling Mattress，Dehumidifier，Beer Cooler，Air-Conditioning Fans，Cosmetic Cooler，Fresh Air Conditioner，Hot And Cold Cup，Constant Temperature Rice Cabinet，Water Dispenser，Water Purifier，Foot Warmer etc.
Personal Care Appliances：Negative Lon Hair Dryer，Water Lon Hair Dryer，Beauty Instrument，Hot And Cold Hammer，Laser Freezing Point Hair Removal Instrument etc.
Entertainment Appliances：Mobile Phone Radiator etc.



Thermoelectric Cooling Technology

热电制冷技术



Technology Introduction

技术简介

半导体热电制冷技术是利用半导体材料的珀耳帖效应(Peltier效应)实现制冷或加热的一种能量转换技术,广泛应用于光电子、电子工业、生物医疗、消费类家电等领域。热电制冷技术的核心部件为热电制冷器件(TEC) ,也称作热电制冷器或热电制冷芯片。如上图所示, 热电制冷器件通常是由若干对p、n型半导体热电偶串联而成。

当接上直流电源后, 热电制冷器件的一端会温度降低, 而另一端温 度会同时升高。借助热交换器等各种传热手段,使制冷器件的热端不断散热,则器件的冷端将不断从工作环境吸收热量。值得注意的是,此现象是完全可逆的,只要改变电流方向,就可以使热量向相反的方向转移。因此,在一个热电制冷器件上可同时实现制冷和加热两种功能。

Thermoelectric cooling is one kind of energy conversation technology which uses the Peltier Effect to cooling or heating, widely used in the fields of Iphotoelectron, industry, biology, medicine and home appliance.
The core component of the thermoelectric cooling is thermoelectric cooling modules (TEC), also called thermoelectric cooling chips. As shown above, TEC is usually composed by many pairs of p-n thermoelectric couples which are connected in series. Access a DC power supply for the TEC, there will be a temperature difference between both sides of TEC. It is noteworthy that this phenomenon is reversible. The cold and hot sides can be interchanged as long as change the direction of current flow. Therefore, TEC possesses two functions of cooling and heating at the same time.

Technology Advantages And Typical Application

技术特点及典型应用

与传统的机械制冷方式相比, 热电制冷技术不需要任何制冷剂, 是一种环境友好的固态制冷方式, 具有体积小、重量轻;无振动、无噪音;控温精确、可靠性高;可在任意角度下工作等优点, 甚至在某些应用领域, 热电技术是重要的技术解决方案之一。

Compared with the traditional mechanical refrigeration method, the thermoelectric cooling technology does not require any refrigerant. It is an environmentally friendly solid-state cooling system which has the advantages of small size and light weight; no vibration, low noise; precise temperature control and high reliability. Also it can work at any angles, and even in some applications, thermoelectric technology is one of the technical solutions.

主动型制冷
Active Cooling

热电制冷属于主动型制冷方式, 可将对象冷却至环境温度以下, 而这是普通散热器无法实现的。

Thermoelectric cooling is an active cooling method that cools the object below ambient temperature, which is not possible with conventional heat exchanger.

点对点制冷
Point Cooling

热电制冷结构小巧,可以实现很小空间或范围内的精确温度控制,甚至可以实现点制冷,这是其它制冷方式无法实现的。

The thermoelectric cooling structure is compact, enabling precise temperature control in a small space or range, and even point cooling, which is not possible with other cooling methods.

高可靠
High Reliability

热电制冷无任何运动部件,可靠性高,可长时间工作而无需维护,适用于安装后不易拆卸或需要较长使用寿命的系统。

Thermoelectric cooling doesn' t have any moving parts, with the advantage of high reliability, long-term work with less maintenance, suitable for systems that are not easy to disassemble after installation or require a long service life.

精准控温
Precise Temperature Control

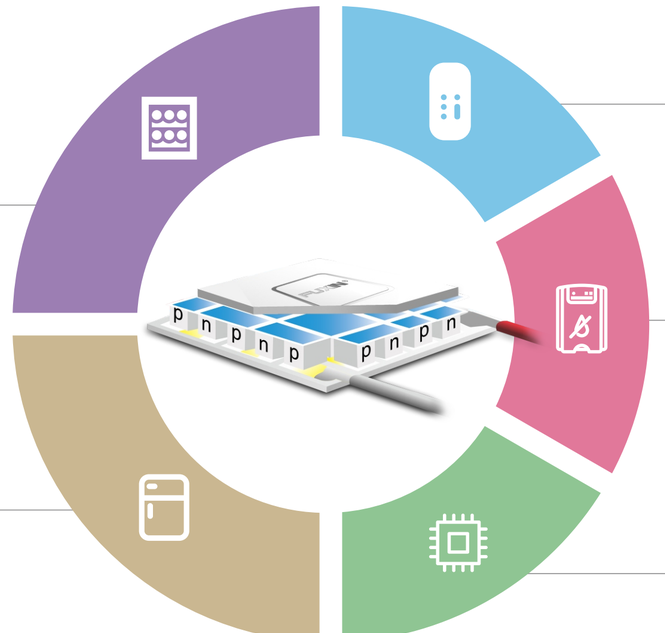
热电制冷属于直流供电,且冷量调节方便,通过调节输入电流的大小, 即可实现对冷量及温度的精确控制。

Thermoelectric cooling is a DC power supply, and the cooling capacity is convenient. By adjusting the input current, precise control of the cooling capacity and temperature can be achieved.

制冷&加热
Cooling & Heating

热电技术同时具有制冷和加热两种功能, 同一系统只要改变电流方向即可实现冷却和加热两种模式。

Thermoelectric technology has both cooling and heating functions. The same system can achieve both cooling and heating modes by changing the current direction.



深度制冷 Deep Refrigeration

应用案例:红外探测器/CCD
Application Case : Infrared Detector/CCD Cooling

湿度调节 Humidity Control

应用案例:除湿机
Application Case :Dehumidifier

精准控温 Precise Temperature Control

应用案例:光电子器件冷却
Application Case :Cooling Of Optoelectronic Devices

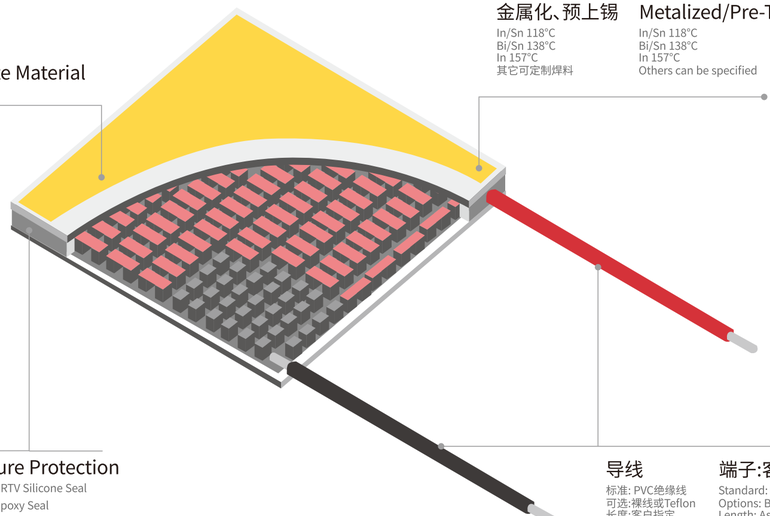
Vibration-Free Noise-Free无振动无噪声

应用案例:红酒柜
Application Case :Wine Cooler

Small 小巧轻便

应用案例:便携式冷藏箱
Application Case: Portable Refrigerator

Thermoelectric Cooling Modules
热电制冷器件外形特征



基板材料 Substrate Material
96%氧化铝 96% Alumina

防潮保护 Moisture Protection
标准: RTV硅胶密封
可选:环氧树脂密封
Standard: RTV Silicone Seal
Options: Epoxy Seal

基板金属化 Substrate Surface Metalized
铜、镍、金
Cu/Ni/Au

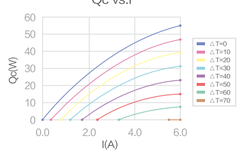
金属化、预上锡 Metalized/Pre-Tinned
In/Sn 118°C
Bi/Sn 138°C
In 157°C
其它可定制焊料
In/Sn 118°C
Bi/Sn 138°C
In 157°C
Others can be specified

导线
标准: PVC绝缘线
可选:裸线或Teflon
长度:客户指定
端子:客户指定

端子:客户指定
Standard: PVC
Options: Bare, Teflon
Length: As required/ specified
Terminals: As required/ specified

Performance Curve
热电制冷器件性能曲线

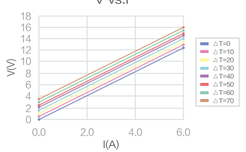
Qc vs.I



Qc–I：表示在热面温度一定时，不同温差下制冷功率与输入电流之间的对应关系。该曲线可以评价热电制冷器件是否有足够的制冷能力来满足应用需求。

Qc–I: It reflects the corresponding relationship between the cooling power and the input current under certain temperature on heat side. The curve can be used to evaluate whether the cooling function of the thermoelectric module is sufficient to meet the application requirements.

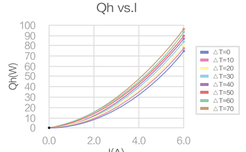
V vs.I



V–I：表示不同温差下，输入电压与输入电流之间的对应关系。当温差与电流确定后，该曲线可以帮助用户选择合适的电源。

V–I: It reflects the corresponding relationship between the input voltage and the input current under different temperature. When the temperature difference and current is confirmed, this curve can help the users to choose the right power supply.

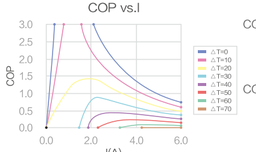
Qh vs.I



Qh–I：表示在热面温度一定时，不同温差下热面散热功率与输入电流之间的对应关系。Qh为Qc与输入电功率之和。

Qh–I: It reflects the corresponding relationship between the heat dispersing power and the input current under different temperature when the temperature of the heat surface is certain. Qh is the sum of Qc and input power.

COP vs.I



COP–I：表示不同温差下，COP系数与输入电流之间的对应关系。COP系数为制冷功率与输入电功率的比值。该曲线有助于用户确定制冷效率，从而实现制冷能力的最大化。

COP–I: It reflects the corresponding relationship between the COP coefficient and the input current under different temperature. COP coefficient reflects the ratio of cooling power to input power. The curve is helpful for users to determine the cooling efficiency and maximize cooling capacity.

Single-Stage Modules

单级制冷器件

能够满足大多数中、大功率制冷或加热场合应用，广泛应用于电子工业、科学仪器、医学和生物设备、消费类电器等领域。

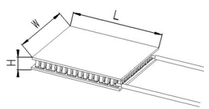
The single-stage modules are able to meet a wide range of various cooling and heating applications where a medium or large amount of heat is involved, and widely used in the fields of photoelectron, industry, biology, medicine and home appliance.



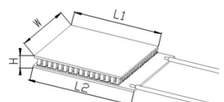
型号	Imax（A）	Umax（V）	△Tmax（℃）	Qcmax（W）	L×W×H
TEC1-00703	3.0	0.9	67	1.7	10*10*4.5mm
TEC1-01703	3.0	2.1	67	4.2	15*15*4.5mm
TEC1-03103	3.0	3.8	67	7.6	20*20*4.5mm
TEC1-03503	3.0	4.2	67	8.6	30*15*4.5mm
TEC1-04903	3.0	5.9	67	12.0	25*25*4.5mm
TEC1-06303	3.0	7.6	67	15.4	40*20*4.5mm
TEC1-07103	3.0	8.6	67	17.4	30*30*4.5mm
TEC1-12703	3.0	15.4	67	31.1	40*40*4.5mm
TEC1-19903	3.0	24.1	67	48.7	50*50*4.5mm
TEC1-00704	4.0	0.9	67	2.2	10*10*4.2mm
TEC1-01704	4.0	2.1	67	5.3	15*15*4.2mm
TEC1-03104	4.0	3.8	67	9.6	20*20*4.2mm
TEC1-03504	4.0	4.2	67	10.8	30*15*4.2mm
TEC1-04904	4.0	5.9	67	15.2	25*25*4.2mm
TEC1-06304	4.0	7.6	67	19.5	40*20*4.2mm
TEC1-07104	4.0	8.6	67	22.0	30*30*4.2mm
TEC1-12704	4.0	15.4	67	39.3	40*40*4.2mm
TEC1-19904	4.0	24.1	67	61.5	50*50*4.2mm
TEC1-00705	5.0	0.9	67	2.7	10*10*3.9mm
TEC1-01705	5.0	2.1	67	6.6	15*15*3.9mm
TEC1-03105	5.0	3.8	67	12.1	20*20*3.9mm
TEC1-03505	5.0	4.2	67	13.6	30*15*3.9mm
TEC1-04905	5.0	5.9	67	19.1	25*25*3.9mm
TEC1-06305	5.0	7.6	67	24.5	40*20*3.9mm
TEC1-07105	5.0	8.6	67	27.6	30*30*3.9mm
TEC1-12705	5.0	15.4	67	49.4	40*40*3.9mm
TEC1-19905	5.0	24.1	67	77.4	50*50*3.9mm

性能参数（基于热面27℃）
Based on the hot side temperature Th=27℃





常规结构
Normal Structure



门式结构
Gate-style Structure

型号	Imax（A）	Umax（V）	△Tmax（℃）	Qcmax（W）	L×W×H
TEC1-00706	6.0	0.9	67	3.0	10*10*3.8mm
TEC1-01706	6.0	2.1	67	7.4	15*15*3.8mm
TEC1-03106	6.0	3.8	67	13.4	20*20*3.8mm
TEC1-03506	6.0	4.2	67	15.2	30*15*3.8mm
TEC1-04906	6.0	5.9	67	21.2	25*25*3.8mm
TEC1-06306	6.0	7.6	67	27.3	40*20*3.8mm
TEC1-07106	6.0	8.6	67	30.8	30*30*3.8mm
TEC1-12706	6.0	15.4	67	55.0	40*40*3.8mm
TEC1-19906	6.0	24.1	67	86.2	50*50*3.8mm
TEC1-00707	7.0	0.9	67	3.7	10*10*3.7mm
TEC1-01707	7.0	2.1	67	8.9	15*15*3.7mm
TEC1-03107	7.0	3.8	67	16.2	20*20*3.7mm
TEC1-03507	7.0	4.2	67	18.3	30*15*3.7mm
TEC1-04907	7.0	5.9	67	25.6	25*25*3.7mm
TEC1-06307	7.0	7.6	67	32.9	40*20*3.7mm
TEC1-07107	7.0	8.6	67	37.0	30*30*3.7mm
TEC1-12707	7.0	15.4	67	66.3	40*40*3.7mm
TEC1-19907	7.0	24.1	67	103.8	50*50*3.7mm
TEC1-00708	8.0	0.9	67	4.2	10*10*3.6mm
TEC1-01708	8.0	2.1	67	10.1	15*15*3.6mm
TEC1-03108	8.0	3.8	67	18.5	20*20*3.6mm
TEC1-03508	8.0	4.2	67	20.9	30*15*3.6mm
TEC1-04908	8.0	5.9	67	29.2	25*25*3.6mm
TEC1-06308	8.0	7.6	67	37.6	40*20*3.6mm
TEC1-07108	8.0	8.6	67	42.4	30*30*3.6mm
TEC1-12708	8.0	15.4	67	75.8	40*40*3.6mm
TEC1-19908	8.0	24.1	67	118.7	50*50*3.6mm

性能参数（基于热面27℃）
Based on the hot side temperature Th=27℃



High Power Modules

大功率制冷器件

专为大制冷量应用而设计，采用超薄和高密度元件排列方式，在相同的基板尺寸下获得更大的制冷量。

The highpower modules are specifically designed to maximize cooling power. The high density integrating characteristic in the TEC enables higher cooling power to be achieved in same substrate sizes.

型号	Imax（A）	Umax（V）	△Tmax（℃）	Qcmax（W）	L×W×H
TEC1-12710	10.0	15.4	67	94.4	40*40*3.4mm
TEC1-19910	10.0	24.1	67	148.1	40*40*3.2mm
TEC1-12710	10.0	15.4	67	94.7	50*50*3.7mm
TEC1-12712	12.0	15.4	67	113.3	40*40*3.2mm
TEC1-19912	12.0	24.1	67	177.8	40*40*3.0mm
TEC1-12712	12.0	15.4	67	113.6	50*50*3.4mm
TEC1-12715	15.0	15.4	67	141.7	50*50*3.2mm
TEC1-12720	20.0	15.4	67	189.3	62*62*4.4mm
TEC1-12730	30.0	15.4	67	283.9	62*62*3.8mm



High Temperature Difference Modules

高温差制冷器件

专为高效热电制冷而设计，产品采用高性能热电材料及特殊的工艺技术，在相同条件下，具有更大的制冷深度和转化效率。

The high temperature difference modules have been specifically designed for high efficient thermoelectric cooling. The high performance materials and special techn-ologies enable lower cooling temperature and higher efficiency to be achieved in sa-me conditions.

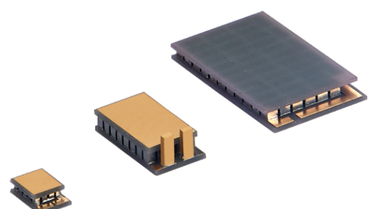
型号	Imax（A）	Umax（V）	△Tmax（℃）	Qcmax（W）	L×W×H
HPTEC1-07105	5.0	8.7	70	28.2	30*30*3.9mm
HPTEC1-12705	5.0	15.6	70	50.4	40*40*3.9mm
HPTEC1-19905	5.0	24.4	70	79.0	50*50*3.9mm
HPTEC1-07106	6.0	8.7	70	31.4	30*30*3.8mm
HPTEC1-12706	6.0	15.6	70	56.2	40*40*3.8mm
HPTEC1-19906	6.0	24.4	70	88.0	50*50*3.8mm
HPTEC1-07107	7.0	8.7	70	37.8	30*30*3.7mm
HPTEC1-12707	7.0	15.6	70	67.6	40*40*3.7mm
HPTEC1-19907	7.0	24.4	70	105.9	50*50*3.7mm

Miniature Modules

超微型制冷器件

面向光通讯特别是5G领域应用而开发的新一代产品,它采用高性能热电材料和先进的制作工艺,具有体积小,可靠性高等特点,典型应用于激光发射器、光接收器等光器件的精确温度控制。

The miniature modules is suitable for various cooling and heating applications where only a small amount of heat is involved. Typical application areas include laser diode Cooling, infrared devices, electrooptics, electronic equipments and other low power applic-ations.

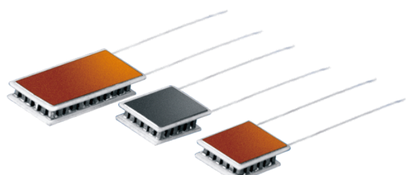


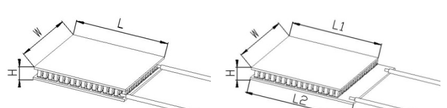
Miniature Modules

微型制冷器件

适用于各种小功率制冷或加热场合。典型应用于激光二极管、红外装置、光电、电子设备及其它小功率装置的冷却或加热。

The miniature modules is suitable for various cooling and heating applications where only a small amount of heat is involved. Typical application areas include laser diode cooling, infrared devices, electrooptics, electronic equipments and other low power applications.





型号	Imax（A）	Umax（V）	△Tmax（℃）	Qcmax（W）	L×W×H
TES1-007020	2.0	0.85	67	1.04	6*6*3.4mm
TES1-017020	2.0	2.06	67	2.53	9*9*3.4mm
TES1-031020	2.0	3.76	67	4.61	12*12*3.4mm
TES1-049020	2.0	5.94	67	7.28	15*15*3.4mm
TES1-063020	2.0	7.64	67	9.37	25*12.5*3.4mm
TES1-071020	2.0	8.61	67	10.55	18*18*3.4mm
TES1-127020	2.0	15.39	67	18.88	25*25*3.4mm
TES1-00702	2.0	0.9	67	1.0	8*8*4.4mm
TES1-01702	2.0	2.1	67	2.5	12*12*4.4mm
TES1-03102	2.0	3.8	67	4.6	15*15*4.4mm
TES1-04902	2.0	5.9	67	7.3	20*20*4.4mm
TES1-06302	2.0	7.6	67	9.4	30*15*4.4mm
TES1-07102	2.0	8.6	67	10.6	23*23*4.4mm
TES1-12702	2.0	15.4	67	18.9	30*30*4.4mm
TES1-24102	2.0	29.2	67	35.9	40*40*4.4mm
TES1-00703	3.0	0.9	67	1.6	8*8*3.8mm
TES1-01703	3.0	2.1	67	3.8	12*12*3.8mm
TES1-03103	3.0	3.8	67	6.9	15*15*3.8mm
TES1-04903	3.0	5.9	67	10.9	20*20*3.8mm
TES1-06303	3.0	7.6	67	14.1	30*15*3.8mm
TES1-07103	3.0	8.6	67	15.9	23*23*3.8mm
TES1-12703	3.0	15.4	67	28.4	30*30*3.8mm
TES1-24103	3.0	29.2	67	53.8	40*40*3.8mm
TES1-00704	4.0	0.9	67	2.1	8*8*3.4mm
TES1-01704	4.0	2.1	67	5.1	12*12*3.4mm
TES1-03104	4.0	3.8	67	9.2	15*15*3.4mm
TES1-04904	4.0	5.9	67	14.6	20*20*3.4mm
TES1-06304	4.0	7.6	67	18.8	30*15*3.4mm
TES1-07104	4.0	8.6	67	21.1	23*23*3.4mm
TES1-12704	4.0	15.4	67	37.8	30*30*3.4mm
TES1-24104	4.0	29.2	67	71.7	40*40*3.4mm

性能参数（基于热面27℃）
Based on the hot side temperature Th=27℃



典型应用
Typical Application

型号	Imax（A）	Umax（V）	△Tmax（℃）	Qcmax（W）	L_1×L_2×W×H
TES1-007020	2.0	0.85	67	1.04	4.2*4.2*1.7mm
TES1-008020	2.0	0.97	67	1.19	6.2*4.2*4.2*1.7mm
TES1-011020	2.0	1.33	67	1.64	6.2*4.2*1.7mm
TES1-017020	2.0	2.06	67	2.53	6.2*6.2*1.7mm
TES1-018020	2.0	2.18	67	2.68	8.2*6.2*6.2*1.7mm
TES1-023020	2.0	2.79	67	3.43	8.2*6.2*1.7mm
TES1-029020	2.0	3.51	67	4.32	10.2*6.2*1.7mm
TES1-031020	2.0	3.76	67	4.62	8.2*8.2*1.7mm
TES1-032020	2.0	3.88	67	4.77	10.2*8.2*8.2*1.7mm
TES1-035020	2.0	4.24	67	5.22	12.2*6.2*1.7mm
TES1-041020	2.0	4.97	67	6.17	14.2*6.2*1.7mm
TES1-049020	2.0	5.94	67	7.30	10.2*10.2*1.7mm
TES1-065020	2.0	7.88	67	9.69	12.2*11.2*1.7mm

性能参数（基于热面27℃）
Based on the hot side temperature Th=27℃

型号	Imax（A）	Umax（V）	△Tmax（℃）	Qcmax（W）	L_1×L_2×W×H
TES1-007008	0.8	0.85	67	0.42	3.4*3.4*2.3mm
TES1-011008	0.8	1.33	67	0.66	5.0*3.4*2.3mm
TES1-017008	0.8	2.06	67	1.03	5.0*5.0*2.3mm
TES1-031008	0.8	3.76	67	1.87	6.6*6.6*2.3mm
TES1-007012	1.2	0.85	67	0.63	4.2*4.2*2.3mm
TES1-008012	1.2	0.97	67	0.72	6.2*4.2*4.2*2.3mm
TES1-011012	1.2	1.33	67	0.98	6.2*4.2*2.3mm
TES1-017012	1.2	2.06	67	1.52	6.2*6.2*2.3mm
TES1-018012	1.2	2.18	67	1.61	8.2*6.2*6.2*2.3mm
TES1-023012	1.2	2.79	67	2.06	8.2*6.2*2.3mm
TES1-029012	1.2	3.51	67	2.59	10.2*6.2*2.3mm
TES1-031012	1.2	3.76	67	2.77	8.2*8.2*2.3mm
TES1-032012	1.2	3.88	67	2.86	10.2*8.2*8.2*2.3mm
TES1-035012	1.2	4.24	67	3.13	12.2*6.2*2.3mm
TES1-041012	1.2	4.97	67	3.67	14.2*6.2*2.3mm
TES1-049012	1.2	5.94	67	4.38	10.2*10.2*2.3mm
TES1-065012	1.2	7.88	67	5.81	12.2*11.2*2.3mm
TES1-007016	1.6	0.85	67	0.84	4.2*4.2*1.9mm
TES1-008016	1.6	0.97	67	0.95	6.2*4.2*4.2*1.9mm
TES1-011016	1.6	1.33	67	1.31	6.2*4.2*1.9mm
TES1-017016	1.6	2.06	67	2.03	6.2*6.2*1.9mm
TES1-018016	1.6	2.18	67	2.15	8.2*6.2*6.2*1.9mm
TES1-023016	1.6	2.79	67	2.74	8.2*6.2*1.9mm
TES1-029016	1.6	3.51	67	3.46	10.2*6.2*1.9mm
TES1-031016	1.6	3.76	67	3.70	8.2*8.2*1.9mm
TES1-032016	1.6	3.88	67	3.82	10.2*8.2*8.2*1.9mm
TES1-035016	1.6	4.24	67	4.17	12.2*6.2*1.9mm
TES1-041016	1.6	4.97	67	4.94	14.2*6.2*1.9mm
TES1-049016	1.6	5.94	67	5.84	10.2*10.2*1.9mm
TES1-065016	1.6	7.88	67	7.75	12.2*11.2*1.9mm

性能参数（基于热面27℃）
Based on the hot side temperature Th=27℃



Temperature- Cycle Modules

温度循环器件

专为冷热循环应用场合而设计，产品采用特殊的结构设计和工艺技术，在很大程度上承受冷热循环过程中产生的热应力，并保持较长的使用寿命。

The temperature-cycle modules have been specifically designed for cycling applications. Special structure design and technologies enable longer life to be achieved in the process of cold and hot cycle.

型号	Imax（A）	Umax（V）	△Tmax（℃）	Qcmax（W）	L×W×H
HRTEC1-07105	5.0	8.6	67	27.6	30*30*3.9mm
HRTEC1-12705	5.0	15.4	67	49.4	40*40*3.9mm
HRTEC1-19905	5.0	24.1	67	77.4	50*50*3.9mm
HRTEC1-07106	6.0	8.6	67	30.8	30*30*3.8mm
HRTEC1-12706	6.0	15.4	67	55.0	40*40*3.8mm
HRTEC1-19906	6.0	24.1	67	86.2	50*50*3.8mm
HRTEC1-07107	7.0	8.6	67	37.0	30*30*3.7mm
HRTEC1-12707	7.0	15.4	67	66.3	40*40*3.7mm
HRTEC1-19907	7.0	24.1	67	103.8	50*50*3.7mm

性能参数（基于热面27℃）
Based on the hot side temperature Th=27℃

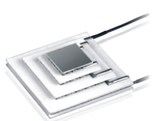
Multi-Stage Modules

多级制冷器件

专为大温差应用而设计，可产生100K以上温度差，不同层叠设计可满足不同深度的制冷需求。适用于中小制冷功率、深度制冷的场合。典型应用于CCD、IR- 检测和光电等领域。

The multi-stage modules are designed to provide significantly higher temperature difference. They are suitable for low temperature applications where a small or medium cooling power is required. Typical application areas include CCD arrays, IR detectors and photoelectric device.





Center-Hole Modules

单孔制冷器件

产品形状可根据客户的具体需求而设计，适用于小或中等制冷功率场合，典型应用于光电子、工业和科学仪器等领域。

The center hole modules are suitable for various cooling applications where a small or medium cooling power is required. Typical application areas include Optoelectronic, industrial and electrical equipments. Products can be customized.





Customized Modules

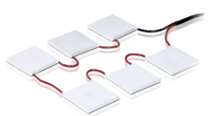
客户定制器件

在外形、尺寸、连接方式等方面完全符合客户特定需求的产品及技术解决方案。

The shape, size, wire, terminal and connection mode of the TEC can be customized.



定制导线端子TEC

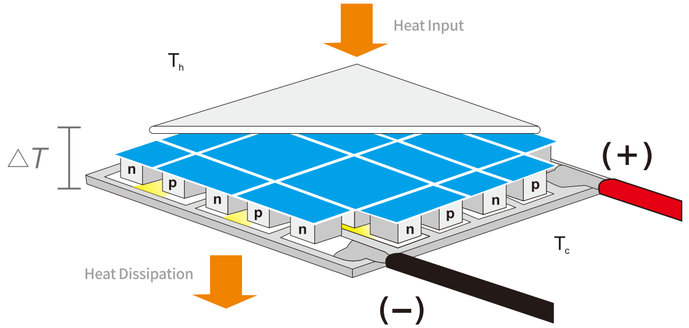


串并联TEC模组



Thermoelectric Generation Technology

温差发电技术



Technology Introduction

技术简介

温差发电技术是利用半导体材料的Seebeck效应将热能直接转换成电能的一种新能源技术，具有结构紧凑、无运动部件、性能可靠、免维护、工作时无噪声、低碳环保等特点，广泛应用于航空、军事、工业、汽车、新能源、民用家电等领域。

温差发电技术的核心部件为温差发电器件(TEG)，也称作温差发电芯片。如上图所示，温差发电器件通常由若干对p、n半导体电偶对串联而成。只要温差发电器件的热面有热量输入，在器件冷热两面之间建立起温度差，就会有源源不断的直流电发出。

Thermoelectric power generation is one kind of new energy technologies which uses the Seebeck effect to convert heat source into electricity directly.
It has the characteristics of compact structure, reliable performance, maintenance free, working without noise, lowcarbon and green, and widely used in the fields of space, military, industry, automobile, new energy and home appliance.
The core component of the thermoelectric power generation is thermoelectric power generator (TEG) , also called thermoelectric power generation chip.
As shown above, TEG is usually composed by some pairs of thermoelectric couples which are connected in series. As long as there is temperature difference between both sides of TEG, it will generate DC electricity continuously.

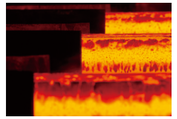
Applications

技术应用

Energy Recovery

能量回收

可以将低品位热能或废热直接转化成电能回收利用，是一种节能环保的新能源技术。
It can convert waste heat into electricity directly and is a kind of new energy technologies of energy conservation and environmental protection.



工业废热
Industrial Waste Heat



垃圾焚烧热
Waste Incineration Heat



汽车尾气废热
Car Exhalust Waste Heat



太阳能热
Solar Energy



地热
Geothermal Energy



LNG冷能
LNG Cold Energy

Independent Power Source

独立电源

可以将环境中的热能源源不断转换为电能，是低成本零维护的电源解决方案。
It can convert the heat in the surrounding environment into electricity continuously and which is low cost and zero maintenance Power solution.



RTG



燃气热水器
Gas Water Heater



燃气灶具
Intelligent Gas Cooker



烤炉
Oven



捕蚊器
Mosquito Trap

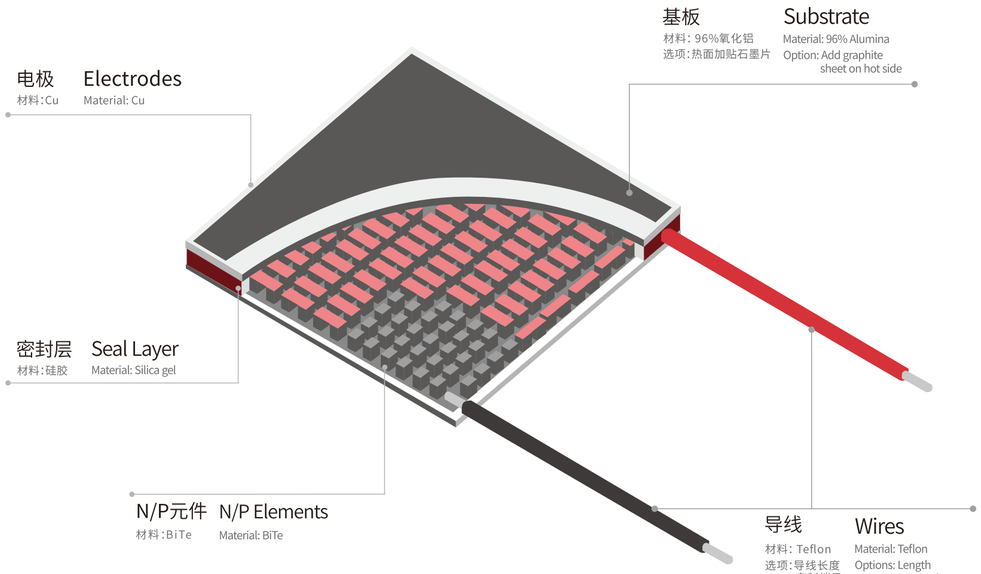


热能表
Thermal Energy Meter

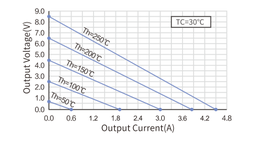


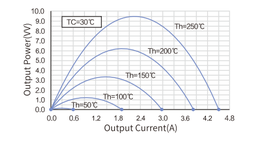
户外炊具
Outdoor Cooker

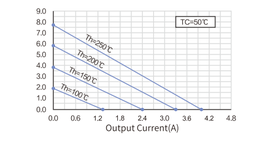
Thermoelectric Power Generator
温差发电器件外形特征

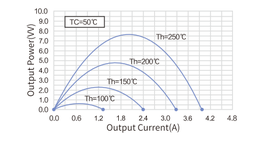


Performance Curve
温差发电器件性能曲线









在温差一定的情况下，V-I特性曲线可以看作是一条直线，直线的横截距表示短路电流，纵截距表示开路电压，斜率表示动态内阻。当温差发电器件的动态内阻与外负载相等时，可获得最大输出功率。此时，输出电压为开路电压的一半。

Under a certain temperature difference, V - I characteristic curve can be thought of as a straight line, and the horizontal intercept of the line is the short-circuit current, the vertical intercept is the open-circuit voltage, the slope is the dynamic resistance. It can obtain the maximum output power when the dynamic resistance and load are equal, here the output voltage is half of the open- circuit voltage.

Types and Performance Parameters
温差发电器件型号及性能参数

产品型号Types	TEG1-071-1.4-1.6-250		TEG1-128-1.0-1.2-250		TEG1-127-1.4-1.6-250		TEG1-242-1.0-1.2-250		TEG1-127-1.8-2.0-250		TEG1-199-1.4-1.6-250	
热面尺寸 Hot Side Size (mm × mm)	30mm×30mm		30mm×30mm		40mm×40mm		40mm×40mm		50mm×50mm		50mm×50mm	
冷面尺寸 Cold Side Size (mm × mm)	30mm×30mm		34mm×30mm		40mm×40mm		44mm×40mm		50mm×50mm		50mm×50mm	
高度 Height (mm)	3.8		3.4		3.8		3.4		4.2		3.8	
交流电阻 AC Resistance(Ω, 25℃)	0.6		1.6		1.0		3.0		0.8		1.6	
电输出特性Electrical Output Characteristics												
热面温度 Hot Side Temperature(℃)	250		250		250		250		250		250	
冷面温度 Cold Side Temperature(℃)	30	50	30	50	30	50	30	50	30	50	30	50
开路电压 Open Circuit Voltage (V)	4.6	4.2	8.1	7.5	8.2	7.5	15.2	14.0	8.2	7.6	12.8	11.7
动态内阻 Dynamic Resistance (Ω)	1.1	1.1	2.9	3.0	1.9	2.0	5.4	5.6	1.4	1.4	2.9	3.0
最大输出功率 Maximum Output Power (W)	5.0	4.1	5.7	4.7	9.0	7.3	10.6	8.7	12.1	10.0	14.0	11.3
热电转换效率 Conversion Efficiency (%)	5.6	4.9	5.5	4.8	5.6	4.9	5.5	4.8	5.7	5.0	5.6	4.9

※若以上产品不能满足您的需求，请与我司联系，我们非常乐意为您设计并提供特殊型号的温差发电组件及技术解决方案。

Notes: If the above products can not meet your needs, please contact with us. We are very pleased to provide you with special products and technology solutions.



Thermoelectric Systems
热电系统



Consumer Electronics
消费类 常规系统 Standard System

冰胆类系统 Standard Water Tank







型号	1.5A	04A	05D	06A	08H
电压	DC12V	DC12V	DC12V	DC12V	DC12V
功率	130W±10%	65W±10%	65W±8%	65W±10%	65W±10%
制冷能力(出水量)	≥1100mL/h	≥800mL/h	≥850mL/h	≥950mL/h	≥800mL/h
使用环境	25°C	25°C	25°C	25°C	25°C
尺寸	258x150x192.5mm	147x100x132.5mm	167x110x140mm	187x120x184mm	198.5x120x198mm
容量	1.5L	0.4L	0.5L	0.6L	0.8L

Consumer Electronics
消费类 常规系统 Standard System

冰箱、酒柜系统 Bar Fridge/Wine Cooler System






型号	7B1	TC2-1C-1	25A	30C
电压	DC 12.5V	DC 12.5V	DC 12.5V	DC 12.5V
功率	40W±8	130W±15	45W±5	45W±5
使用环境	25-32°C	25-32°C	25-32°C	25-32°C
尺寸	89x93x48mm	208x162x102mm	350x300x115mm	370x300x110mm





Consumer Electronics
消费类 常规系统 Standard System

啤酒机系统 Beer Cooler System





型号	5B	2C
电压	DC 12.5V	DC 12.5V
功率	45W±5	45W±5
使用环境	25-32°C	25-32°C
尺寸	160x127x92mm	135x105x55mm

Consumer Electronics
消费类 常规系统 Standard System

恒温箱系统(汽车冰箱) Constant Temperature System



型号	61A
电压	DC 12.5V
功率	40W±8W
使用环境	25-32°C
尺寸	120x100x46.5mm

Consumer Electronics
消费类 常规系统 Standard System

除湿系统 Dehumidification System



型号	45A
电压	DC 12.5V
功率	30W
使用环境	200ml/24h
尺寸	30°C,80%湿度

Consumer Electronics
消费类 高端系统 Highend System

冷暖床垫系统 Heating and Cooling Mattress System





型号	Z2B	Z4B
电压	DC 12.5V	DC 12.5V
功率	125W	120W
使用环境	25-32°C	25-32°C
尺寸	310x120x66mm	220x210x120mm



Industrial Cooling System
工业散热

铝型材检测仪系统
Detector System for Aluminum Profile Energy Conservation



型号	59A
电压	24(DC)
功率	250W±8
使用环境	25-32°C
尺寸	177x107x34mm



Telecommunications System
通讯行业

基站恒温系统
Communication Base Station Air Conditioning Systerm



型号	CMU-8S
电压	DC 12.5V
功率	55W±8
使用环境	25-32°C
尺寸	165x135x140mm



Automotive Industry System
汽车行业

汽车冰箱系统
Car Refrigerator System



型号	49A
电压	DC 12.5V
功率	40W±5
使用环境	30°C
尺寸	118x97x48mm



Medical Industry System
医疗行业

胰岛素盒系统
Insulin Box System



型号	67A
电压	DC 12.5V
功率	40W±3
使用环境	25-30°C
尺寸	102x92x27.6mm

Thermoelectric Application Products

富信热电应用产品



Wine Cooler
酒柜

Dehumidifier
除湿机





Hot And Cold Cup
冷热杯



Bar Fridge
小冰箱



Ice Cream Maker
冰淇淋机



Cosmetic Cooler
美妆镜柜

Heating And Cooling Mattress
冷暖床垫





Cooling Bag
车载冷藏包



Bar Fridge
小冰箱

Yoghurt Maker
酸奶机



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