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Electronic Components

Buyer's Guide - January 2022

Outlook 2022

In pursuit of better technologies

High market demand for electronics is fueling manufacturing and product initiatives, especially in China as it aims for greater technological capacity.

From anticipations of market recovery, the year that was turned out to be another one fraught with challenges. Already impacted by the continuing trade war and shutdowns due to the pandemic, supply chains have experienced a few more mishaps and missteps. There were the Suez Canal blockage in the early part of 2021 and the consequence of manufacturers' initial underestimation of demand that led to the knee-jerk response to stockpile. The ensuing shortage is not limited to components but extends to shipping containers stranded at ports of origin or destination or what Reuters called "containergeddon." All this combined has caused a far-reaching ripple effect to this day with no end in sight in the near term.

Against this backdrop, China has been strongly focused on its electronics manufacturing industry, aiming to boost the country's value proposition against the rise of alternative locations in Asia such as Vietnam, Malaysia, Thailand and India. The government has set out an ambitious project to turn the country into a "manufacturing powerhouse" and "network powerhouse" by 2025 as part of the 14th Five-Year Plan.

"By the end of the 14th Five-Year Plan period (2021-25), China will have built the world's largest and most extensive stand-alone 5G network and basically achieved full network coverage in urban and rural areas," says Wang Zhiqin, deputy head of government think tank China Academy of Information and Communications Technology. As for Huawei's 5G

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APPLICATION WATCH

LiFePO₄ batteries lead Li-ion category in renewable energy market

Environmental concerns have accelerated the development of renewable energy sources and corresponding storage solutions. Harnessing energy from the sun and wind is a viable alternative now, and the popular technology for storage and conversion to usable power is also green, Li-ion batteries.

Up to 300GW solar power systems will be installed worldwide by 2025, with total capacity reaching as high as 1,900GW, according to



BloombergNEF. Wind power, expected to have 70GW in place annually, will have an aggregate capacity of 1,000GW in the same year.

In China, the same upward trend is happening. Wind and solar sources delivered respectively 5.7 percent and 3.1 percent of total power in 2019, [continued on page 106](#)

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Listing of key sections including editorial articles.

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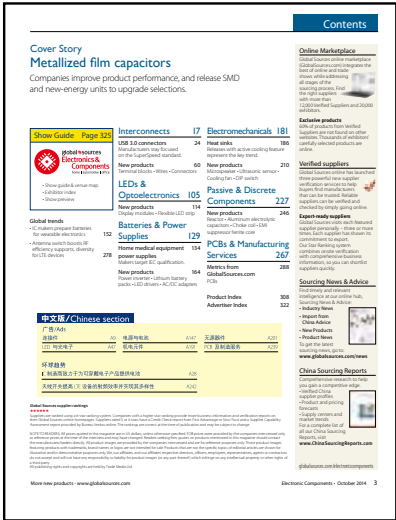
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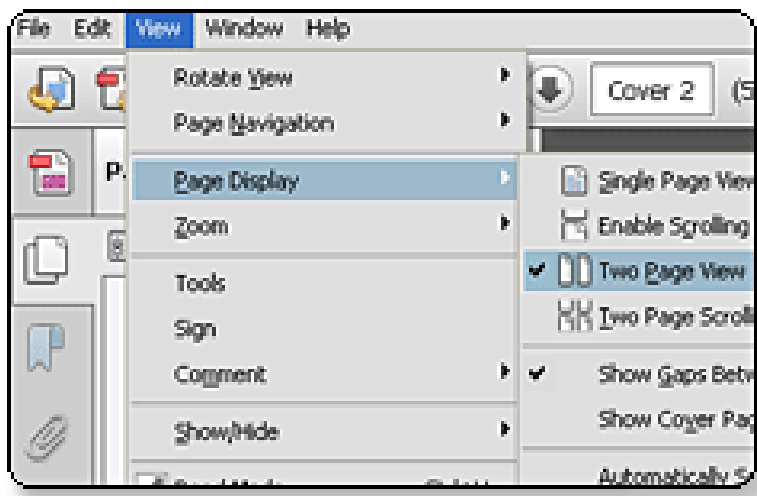


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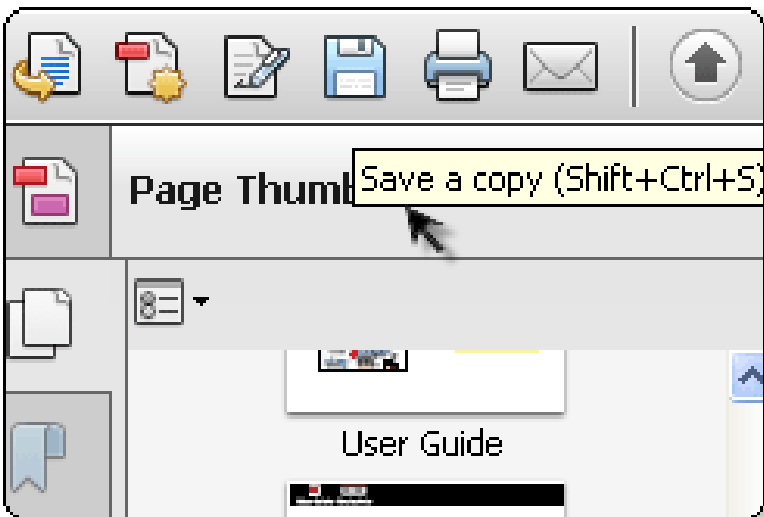
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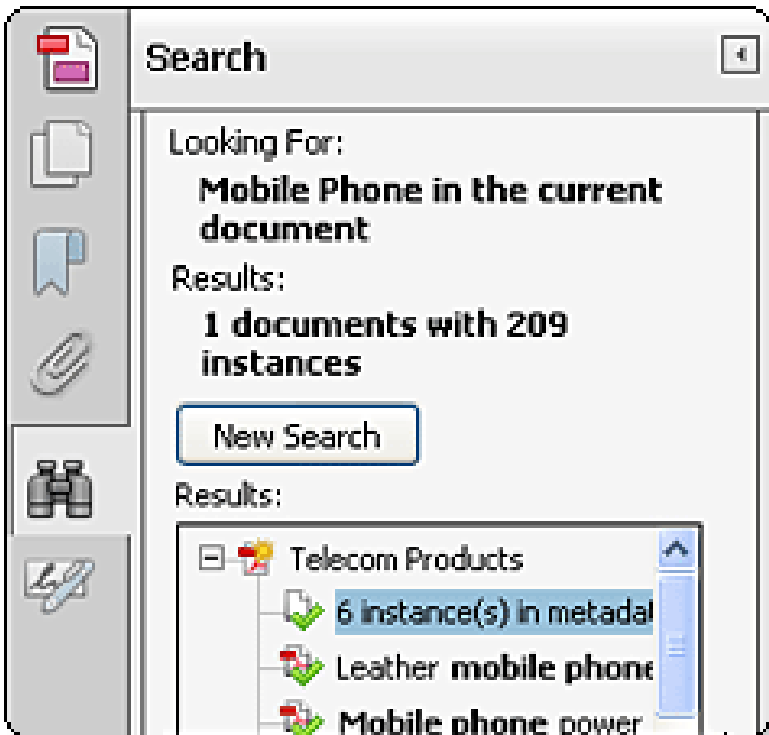
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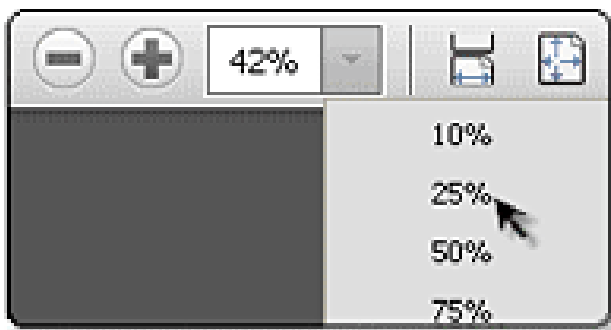
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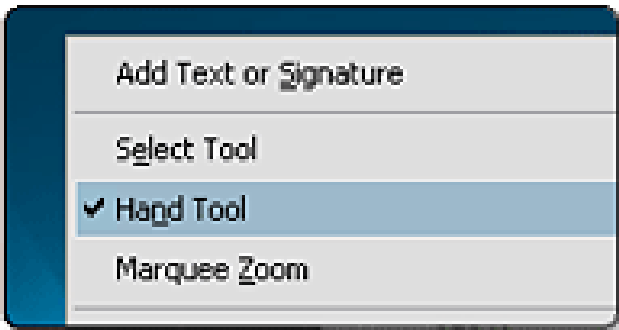


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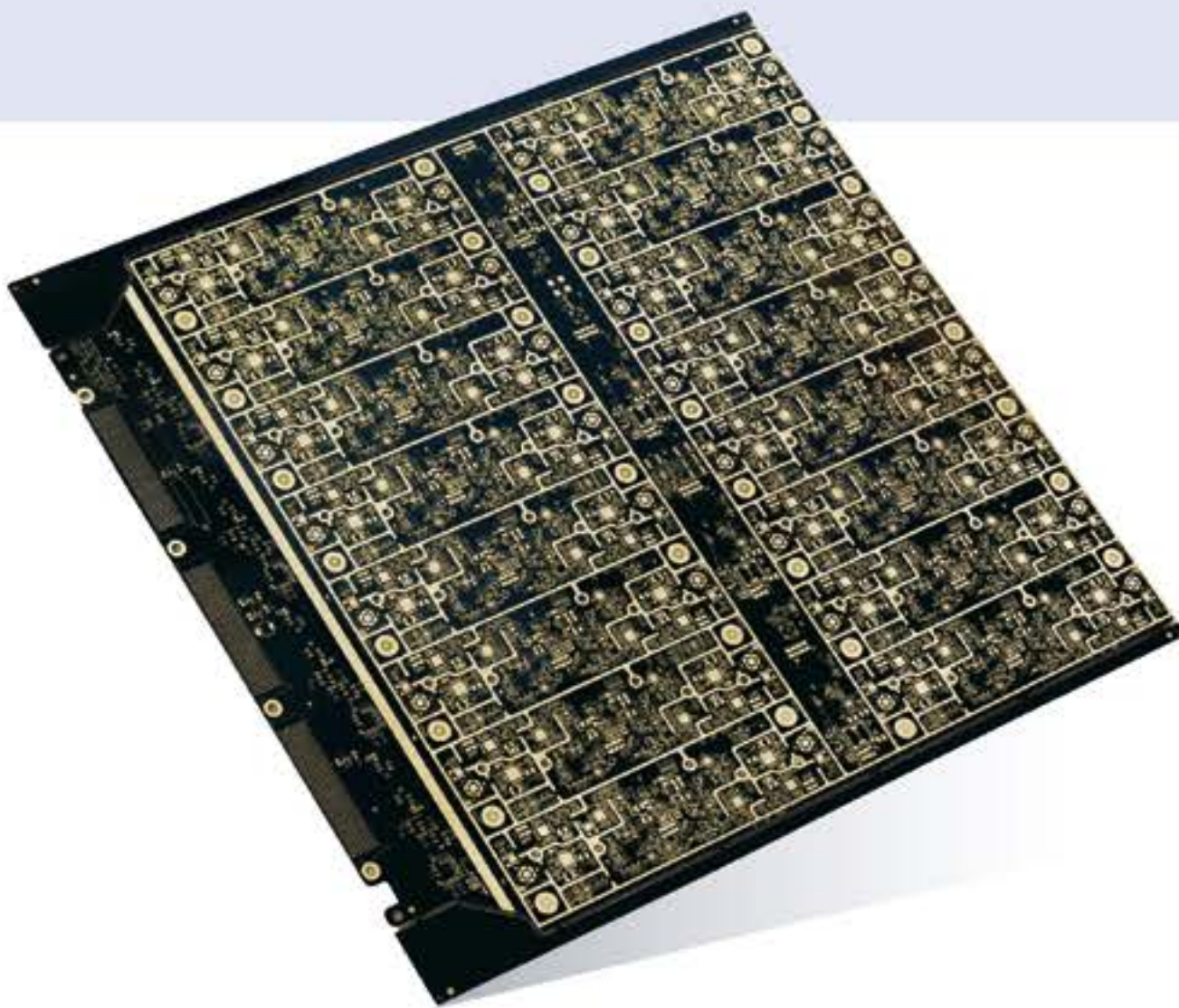
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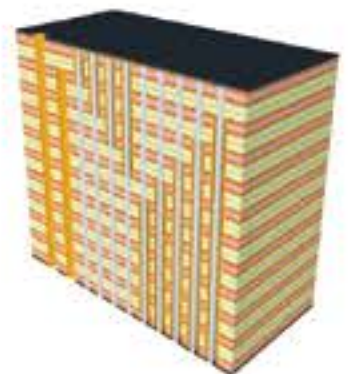
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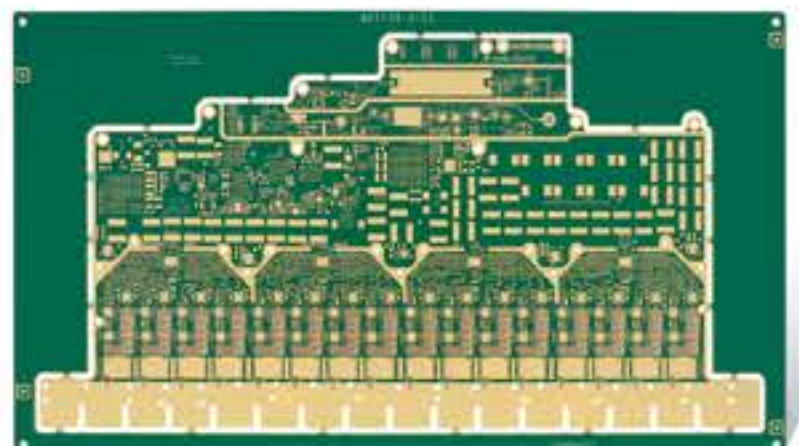
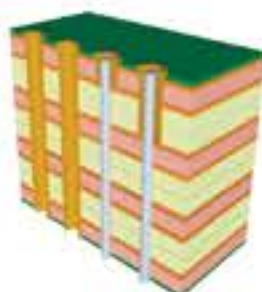
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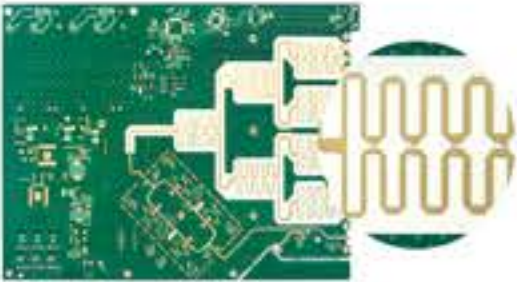

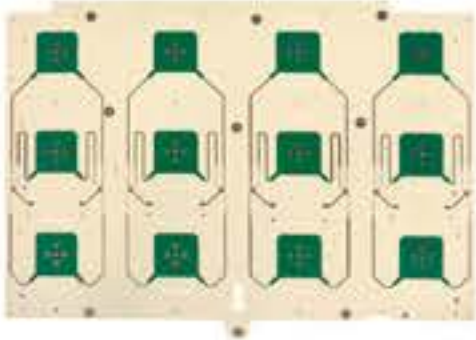
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In pursuit of better technologies

« [continued from cover](#)

applications, they have been deployed in more than 20 industries, including manufacturing, and have been enabling more intelligent, efficient and safer production, according to the company's carrier business group president Ding Yun.

With digital infrastructure being set up, the shift to smart manufacturing, which has become the focal point for increasing efficiency and product

quality amid rising labor costs and intensifying market competition in recent years, will pick up pace. There has been a steady stream of technology and machine upgrades that also included the adoption of industrial robots.

The Chinese government, in fact, has been encouraging this together with the Internet of Things (IoT). In 2018, the China Information Technology Industry Federation issued a guidance document, formulating the industrial internet and security and core product innovation platforms to promote smart manufacturing. A mobile IoT industry innovation center was set up, which offers support to enterprises on AI, industrial internet and NB-IoT technology and industry development.

Higher market goals

Market preference for high-end electronic components, which come from just a few industry players, and outsized demand have resulted in a supply shortage, which began in 2018.

To strengthen the components

sector and boost its market penetration, China embarked on a three-year plan, announced by the Ministry of Industry and Information Technology at the beginning of 2021. This includes a sales target of \$325.1 billion to be realized with fresh efforts to "cultivate a batch of internationally competitive local electronic components companies, with at least 15 of them having a revenue of over 10 billion yuan each by 2023," according to *China Daily*.

The initiative will facilitate the release of construction permits and financing, and provide assistance to meet required international standards, according to a report from *Nikkei Asia*. This extends to foreign companies who set up research and production facilities in China.

Material technologies

Hand in hand with further miniaturization across product categories, adoption of better materials to realize higher component performance is underway.

GaN has been hailed as the next enabling technology that will usher

in more efficient but smaller power devices such as transistors. It outdoes conventional semiconductor material silicon, which has reached the limit in terms of heat and electrical transfer vis à vis transistor size. This means silicon transistors can no longer be shrunk further without impact on their performance.

GaN versions, on the other hand, benefit from the material's wide bandgap or capability of conducting at elevated voltages over time and allowing current to pass faster for better processing speed. As such, they are more efficient and produce less heat, with the latter property allowing components to be mounted tighter. Using them results in smaller but still robust devices, attracting attention in the power supply industry. However, adoption is still at its infancy. In China, manufacturers such as Xiaomi, Baseus, Elecjet, J. Zao, Ilano and McDodo have only been releasing GaN AC/DC adapters since 2020.

[continued on page 24 »](#)



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In pursuit of better technologies

« [continued from page 22](#)

SiC, a nontoxic ceramic that can tolerate higher electric fields and will not fail even at elevated voltages, is another base material. Its breakdown voltage is five to 10 times higher than that of silicon, which is about 600V. This makes SiC components suitable in thermally demanding applications. Industry analysts are predicting such products will gradually replace not only



Photo by Magnus Enger on Unsplash

silicon-based rectifiers but also Schottky and PIN diodes in the future. However, only a few suppliers in China are currently engaged in the development and production of SiC-based power devices. With greater market uptake and once technology threshold is hurdled, more are expected to venture into this category in the coming years.

There is also a shift to SiC and GaN in MOSFETs. As production of SiC variants increases, the price gap with silicon-based types is narrowing and boosting market uptake. Earlier projections point to the former taking the lead in sales of discrete SiC power devices beginning 2021, while their GaN counterparts are not far behind.

MOSFETs in general have rebounded significantly, with the recovery from 2020 attributed to computing and consumer electronics applications, according to Yole Développement. In coming years, this momentum will get an additional push from the automotive industry, particularly the electric vehicle segment. In view of

such a market opportunity, Chinese MOSFET suppliers have been investing in R&D to complement their silicon-based selections with SiC and GaN as well as super-silicon variants. This is to achieve higher frequency and output power and lower power dissipation.

In crystal oscillators, especially for high-density applications demanding tiny but heat-resistant components, ceramic is also expected to replace metal as primary material. With a metal lid, ceramic packages offer a hermetically seam-sealed housing, ensuring a stable atmosphere against environmental changes for the crystal's optimum functioning. Chinese manufacturers aim to catch up with industry leaders in turning out as small as 1008 SMD crystal oscillators in these packages for wearable devices, smartphones and medical devices.

Looking for material alternatives

The industry's dependence on rare-earth magnets is a cause for concern

as their component materials pose a supply risk.

Rare-earth elements (REE) are not easy to obtain, involving complex extraction and processing methods with significant impact on the environment.

Producers have been researching substitute materials and other REEs that can be more easily sourced. The end-goal is to reserve precious rare earths for applications that really need them, which include electric (EVs) and hybrid vehicles (HEVs), and wind turbines, or avoid them altogether.

Rare-earth iron-nitrides (REFeN) and rare-earth iron-carbides (REFeC) are some of the potential alternatives currently under development. These are considered fourth-generation rare-earth magnets after SmCo₅, Sm₂Co₁₇ and NdFeB. REFeN magnets have higher Curie temperature, lower temperature coefficient and better corrosion resistance than their NdFeB counterparts.

[continued on page 26 »](#)

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Outlook 2022

In pursuit of better technologies

» continued from page 24

Semicon industry buildup

China's key electronic information industry hub, the region around the Pearl River Delta officially designated the Greater Bay Area, is also its largest semiconductor production base, with key sites in Shenzhen, Guangzhou, Zhuhai, and the special administrative regions of Hong Kong and Macau.

Since the Semiconductor Industry

Alliance was established in Guangzhou in 2018, several production bases have sprung up. One is Shenzhen's Pingshan district, which now has at least 50 semiconductor enterprises. In the Pingshan High Tech Zone, which has a total area of 5.09sqkm, eight third-generation companies form a comprehensive supply chain of materials, equipment, design, fabrication, package and testing. As many as 40 suppliers, meanwhile, are based in the Hengqin district of Zhuhai.

The Greater Bay Area initiative also included encouraging cooperation among research institutes, universities and domestic manufacturers. This led to the establishment of the National Semiconductor Research Innovation Center in Macau in 2019.

Companies based in the region include major wafer suppliers such as SMIC, Guangzhou CanSemi and Tsinghua Unigroup, and key manufacturers of other semiconductor materials, including Capchem and Huate Gas. □

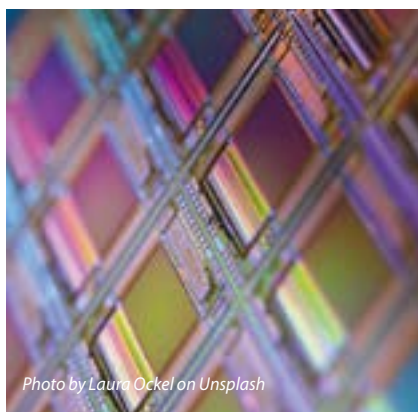


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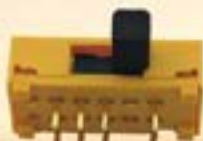
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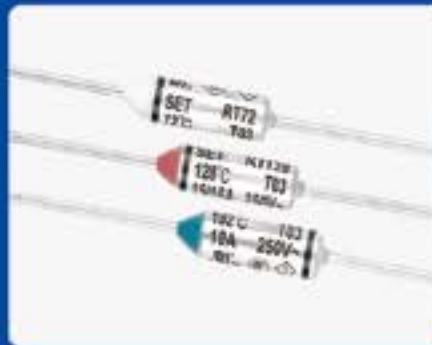


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Sourcing Center: Zhejiang relays

Zhejiang advances manufacturing sector through digitalization

One of China's economic powerhouses, Zhejiang is boosting its stature with development projects based on the 14th Five-Year Plan.

China's third-richest province, Zhejiang is home to various industries, including electromechanical components, and is on its way to transforming this economic base in accordance with the 14th Five-Year Plan. This coastal powerhouse aims to achieve smart manufacturing, initially listing 36 industrial clusters for the project.

Based on a report by the Cyberspace Administration of China released in 2021, Zhejiang topped the industrial

digitalization index in 2020, according to *Science and Technology Daily*.

The province has also introduced a service system that will help small and medium-sized enterprises (SMEs), of which there are many, with digital transformation, as reported by *Xinhua Net* in November 2021. It was set up by the School of Management of Zhejiang University and digital transformation service provider Inclusion.

In addition to this, SMEs in Zhejiang

are expected to benefit from the Beijing Stock Exchange, which has a special mandate to serve companies that pursue innovation. As reported by Zhejiang's official website, the province has 470 national-level "little giants" or what the Ministry of Industry and Information Technology calls SMEs with "outstanding innovation abilities, cutting-edge core technologies, and a considerable market share for niche products."

The national government,

meanwhile, picked Zhejiang as the pilot zone for China's "Common Prosperity," an undertaking meant to reduce inequality, according to a *Bloomberg* article. The goal covers urbanization, with 75 percent as the target by 2025 from 72 percent in 2020. This will entail infrastructure building, with investment from the state. The plan also includes a call for donation from businesses. It is important to

[continued on page 30 »](#)

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Sourcing Center

Zhejiang advances manufacturing sector through digitalization

» [continued from page 28](#)

note that the province has at least 10 multibillionaires, which *Bloomberg* estimates to have “a combined net worth of \$236 billion.”

As it stands, Zhejiang has already a lot under its belt, being also among China’s top exporting regions. In 2020, its export value reached \$166.03 million, third to Fujian and Guangdong, according to Zhiyan Consulting.



More than 30 percent of China’s manufacturers of relays are in Zhejiang.

Attracting more

In the manufacturing sector for relays, the province is home to more than 30 percent of homegrown suppliers. Most of these companies are operating on a small or medium scale in Ningbo and Yueqing.

This pool is anticipated to continue growing, as Zhejiang’s comprehensive industrial chain has been attracting new investment in recent years.

A new entrant is major relays company Hongfa, which spent \$190 million for the construction of a facility in an area of 271,469sqm at the Zhoushan Ocean Industry Park. The scheduled start of mass production was in 2021. The factory has an annual capacity of 4.8 million relays for the new energy market and 120 million units for industrial applications, and is anticipated to rake in up to \$335 million in sales annually.

Relays that can be sourced from Zhejiang-based suppliers include power, industrial, automotive and signal types widely used in the communications, home appliances,

automotive, industrial control, power, space and aviation fields.

While the majority of these companies focus on entry-level and midrange products, large manufacturers will put greater emphasis on the midrange and high-end markets. This is because 5G communication and new energy vehicles are the forecast hot applications in the coming years and will drive R&D toward small size, and high voltage, reliability and stability.

For key materials and components such as coils, cores, springs and bolts, Chinese suppliers turn mainly to domestic providers. They source inputs from foreign companies only when required.

Costs rose in 2021, resulting in a 5 to 10 percent price increase. Manufacturers interviewed by *Global Sources Electronic Components* could not rule out the possibility this trend will continue in 2022.

China relays

A major production hub for relays, China owns over 50 percent of the

global market, according to estimates by industrial consultants Puhua Policy.

Despite the pandemic, the country’s relay industry saw a 5 percent YoY increase in 2020, realizing \$4.27 billion, according to AskCI. Export value, however, suffered a slight drop with \$1.277 billion compared to \$1.28 billion in 2019 as reported by Zhiyan Consulting.

In the next one or two years, the worldwide market will grow by 5 percent. China will possibly have a higher rate, according to companies interviewed, based on continued output expansion activities to meet demand in the EV, home appliances and industrial control sectors. The transition to smart manufacturing is expected to contribute to this trend as well.

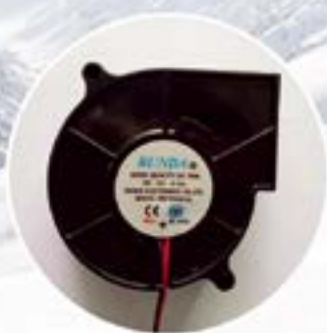
There are an estimated 500 manufacturers of relays in China. In addition to Hongfa, the major players include Sanyou, Huigang, Ningbo Forward and Tianbo.

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Key export products: Relays
Export ratio: 50%
Main export markets: Europe, North America, Asia



Model: Fb-T73-DC12V-G-S
MOQ: 2,000 units
Delivery: 15 days
Description: Relay; 125, 250VAC rated voltage; 10, 15A rated current; CE, CQC, UL

CONTACT SUPPLIER

Ningbo Yod Electronic Technology Co. Ltd ★★★★★
Year established: 2014
Head office location: Ningbo, Zhejiang
Key export products: Relays
Annual export sales: \$3.85 million
Export ratio: 70%
Main export markets: Europe, North America, Asia



Model: 660-12V-1U Open Mold-0
MOQ: 500 units
Delivery: 7 days
Description: Automotive relay; miniature, 4P; 12V, 25A; 20.5x15.5x22.5mm; PCB board, insert mount variants available

CONTACT SUPPLIER

Yueqing Cherry Electric Technical Co. Ltd ★★★★★
Year established: 2010
Head office location: Yueqing, Zhejiang
Key export products: Relays
Annual export sales: \$2.8 million
Export ratio: 50%
Main export markets: Europe, North America, Asia



Model: 3UA59;1-25A
MOQ: 100 units
Delivery: 7 days
Description: Thermal relay; 660 or 1,100V rated insulation voltage; 0.1 to 630A main circuit current; CE, RoHS

CONTACT SUPPLIER

Zhejiang Aokai Electric Co. Ltd ★★★★★
Year established: 2008
Head office location: Yueqing, Zhejiang
Key export products: Relays
Annual export sales: \$2.03 million
Export ratio: 45%
Main export markets: Europe, North America, Asia



Model: ANR200-1K-48V
MOQ: 1 unit
Delivery: 7 days
Description: Relay; for agricultural vehicles; 12, 24, 36, 48V coil rated voltage; 200A main circuit rated current; 4 to 10W coil consumption; 20,000 operations electrical life span, 300,000 operations mechanical life span; IP50

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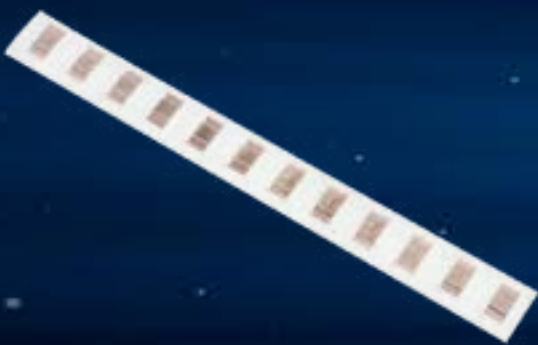
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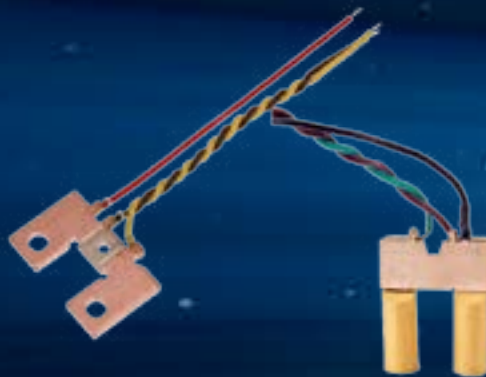
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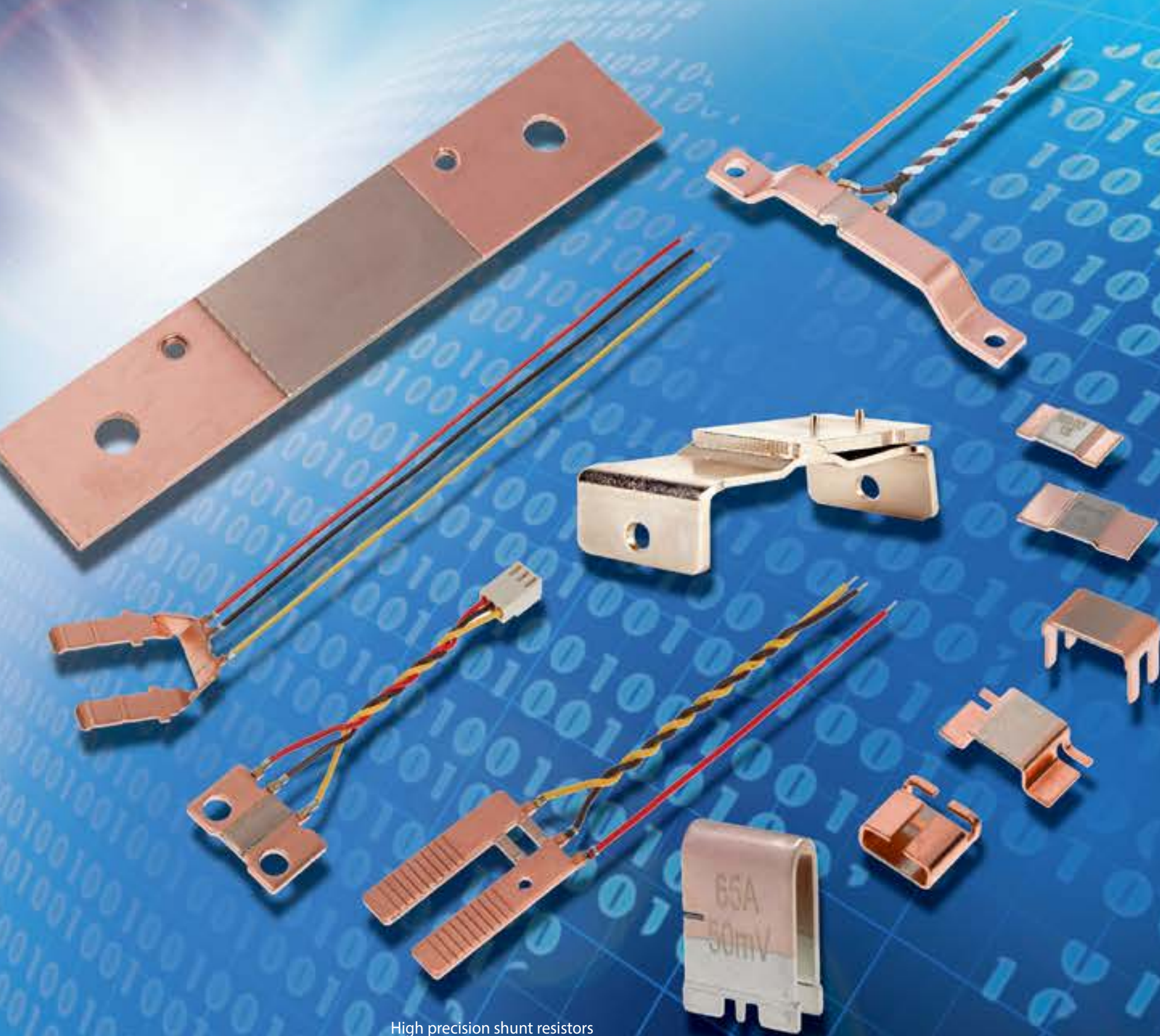
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High frequency transformer



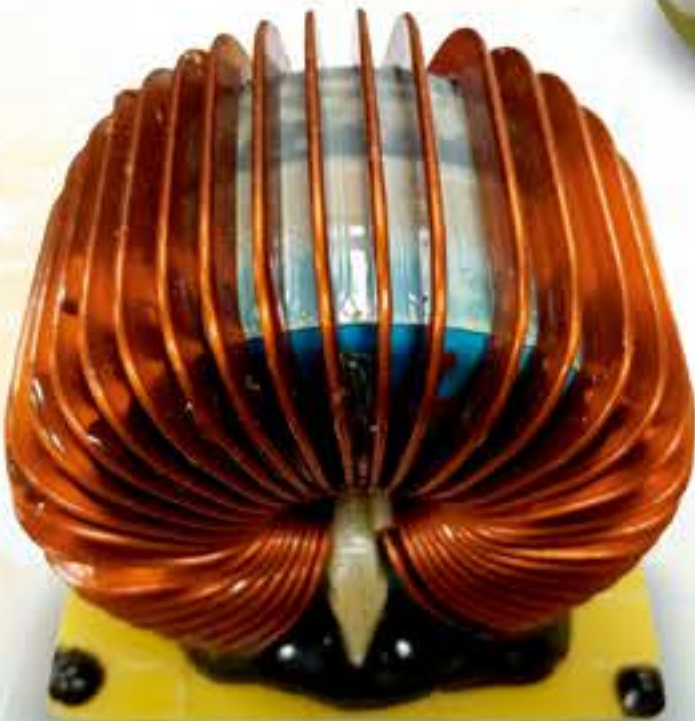
Three-phase reactor



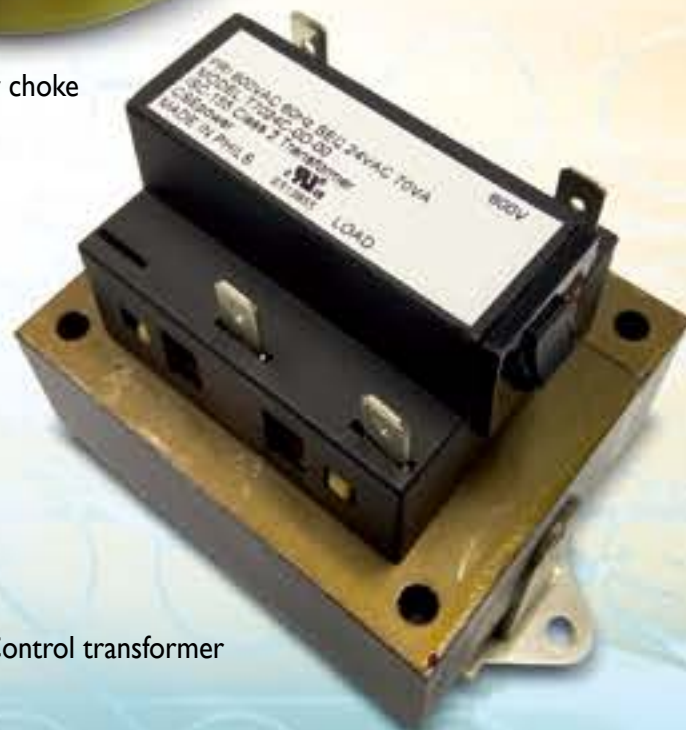
Toroidal transformer



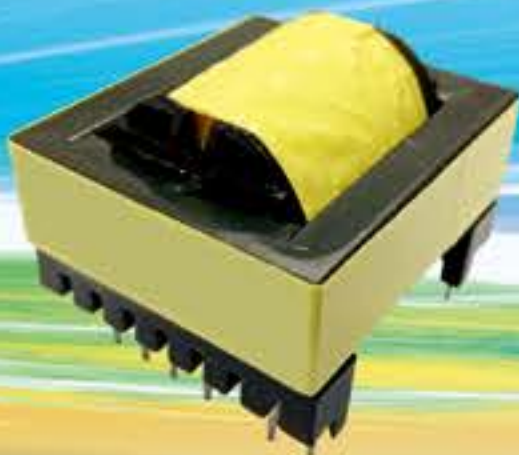
High frequency choke



Edge winding choke



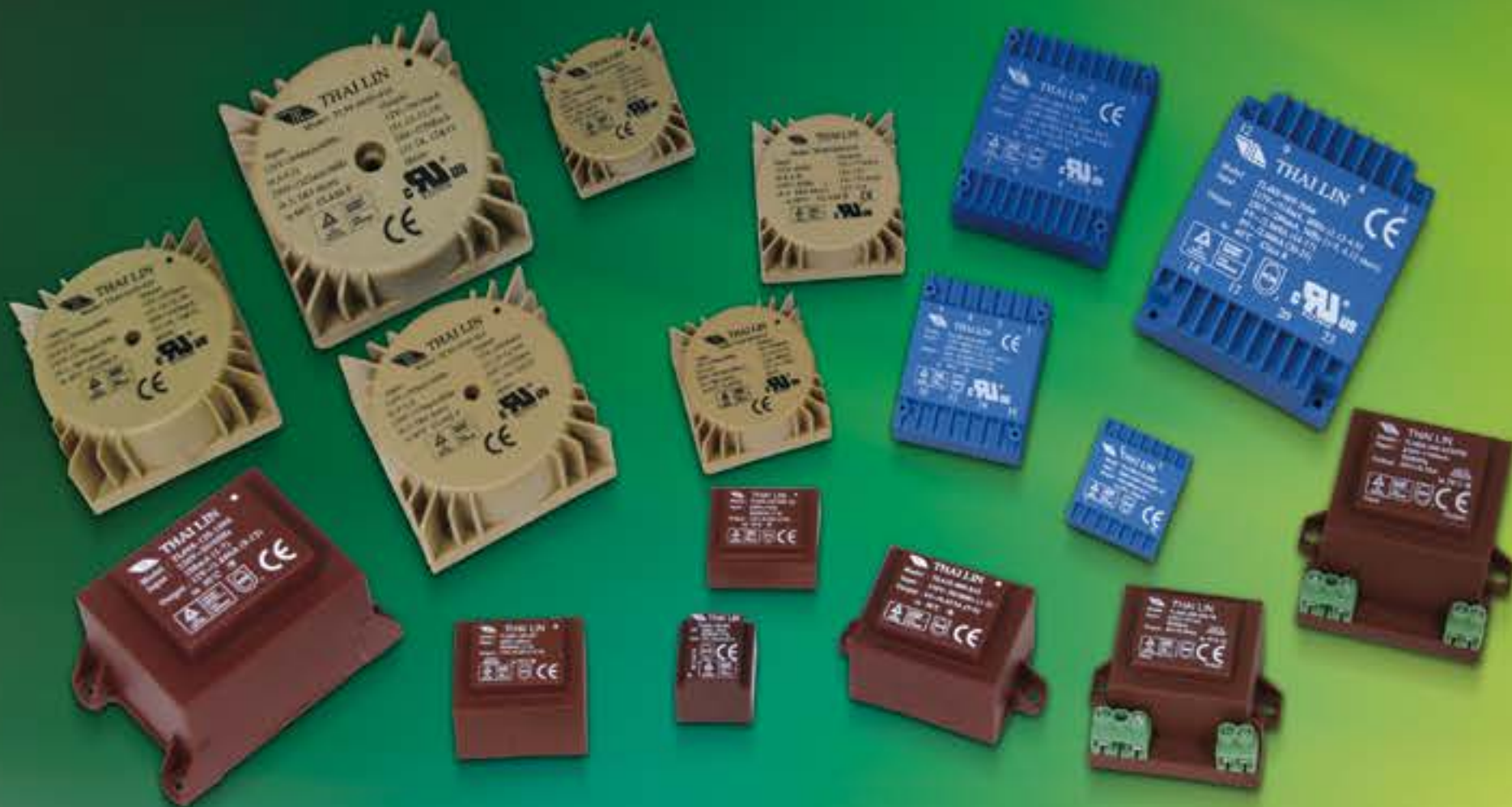
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High frequency transformer



Three-phase transformer



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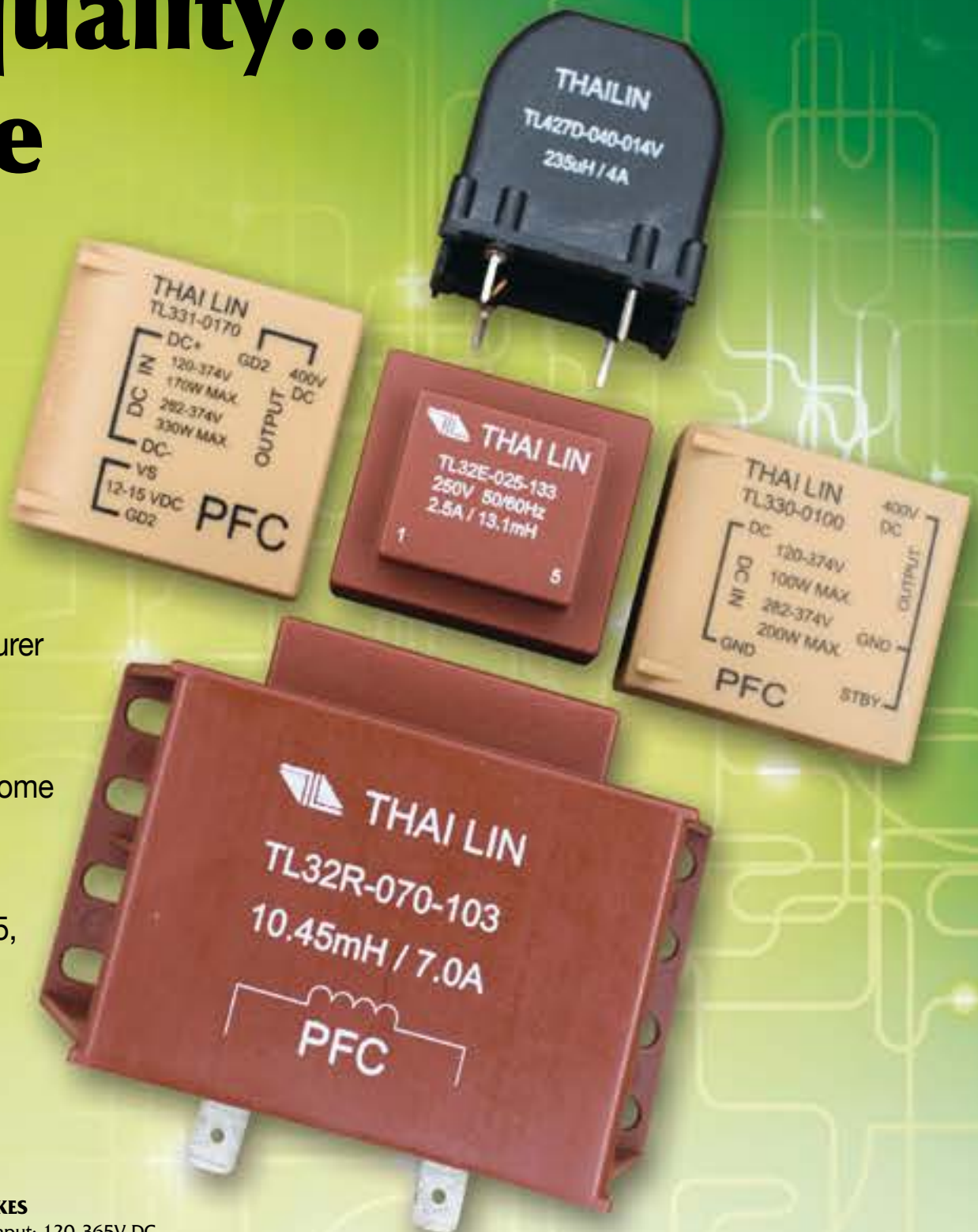
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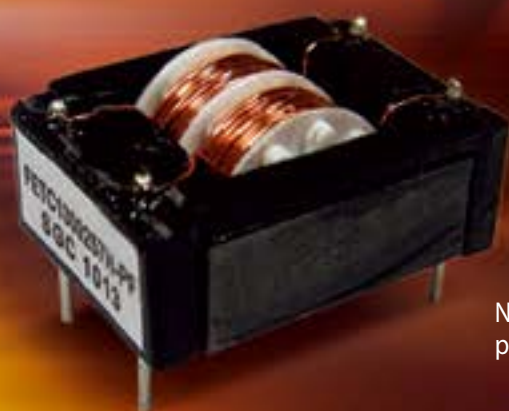


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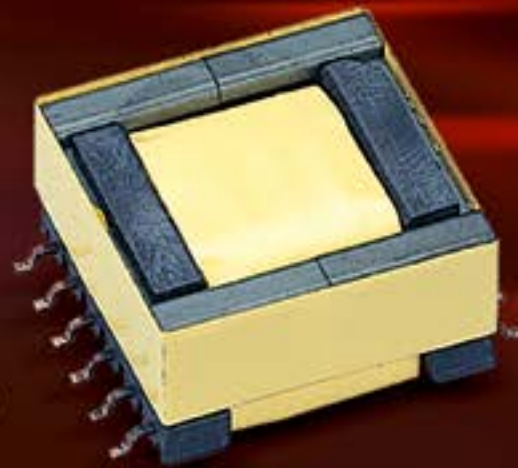
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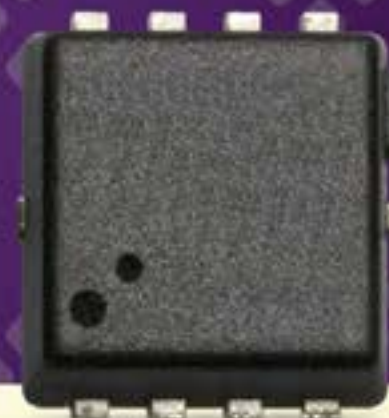
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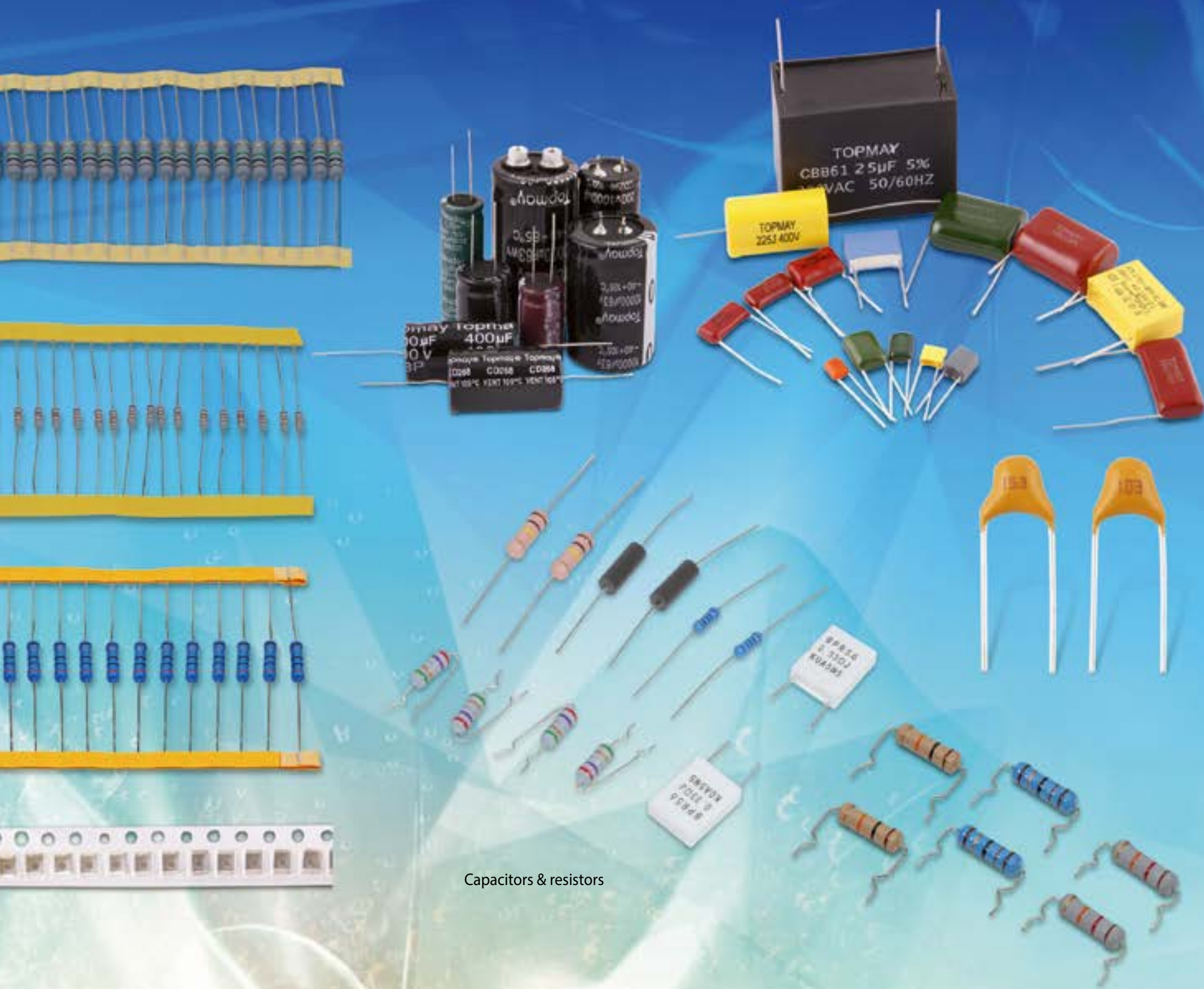
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Protecting your intellectual property when sourcing from China

IP protection is vital. Registering your ownership is how you ensure that you can reap the benefits of the designs, brands, breakthroughs and other intellectual property you've spent so much time, money and effort on creating.

And if your product crosses borders, it's not enough just to register your IP in your home jurisdiction and consider it done. Each territory is different – and in an ideal world, you'd take the time to register your IP in each and every one of them around the world. In practice, the priority has to be staking your claim where your product is sold and where it's made.

In this article, we'll look at how to do that when you're sourcing from China.

Register your IP rights in China – early

Don't rely on the IP protection that you already have in your home jurisdiction or destination markets for your products. As soon as you are thinking about manufacturing or otherwise doing business in China, you need to be registering your IP there with the relevant bodies. They won't provide ironclad protection, but if you don't register in China, you'll have no protection there against other people using your hard-earned intellectual property.

Have China-specific contracts

It should – but sadly doesn't – go without saying that you must have a contract with any company you're working with in China.

A common contract used in China for IP protection is an NNN (Non-Use, Non-Disclosure and Non-Circumvention) Agreement. This is like an NDA (Non-Disclosure Agreement) only more so, prohibiting not just the sharing of confidential information or other protected elements but also stopping, say, a manufacturer from using your mold designs for their own-brand products. And the non-circumvention clauses head off, as far as possible, any skirting around the written rules.

Dan Harris has an in-depth explainer about NNNs on the China Law Blog,

covering why NNNs work in China while NDAs don't, and how to draft them properly. That being said, you should retain the services of a legal professional for this, one who's familiar with Chinese IP rights and has created similar contracts before.

PRC authorities do not enforce judgments from foreign courts, so the contract should state that disputes will be resolved in China. This makes the contract enforceable in China. Note that in a bilingual contract the Chinese text always prevails, so ensure the accuracy of the translation, if you don't read Chinese yourself.

Be vigilant

Once your IP is registered, no one is going to be keeping an eye out for infringements if you don't.

"It's recommended that you work with a lawyer that's familiar with IP law in China to help you protect your IP and perform takedowns if needed," says US-Australian design firm Metafuro. "Using search engines to search for IP infringement is a great starting point and cost-efficient. You're able to use Google to search for your trademark or similar words as well as images that are related to your product or service."

Register your IP with Chinese customs

The General Administration of Customs can halt goods leaving China that are suspected of infringing IP rights and seize them if they are found to be doing so. Customs officers can do this ex officio – that is, they spot something they suspect of being a knockoff and investigate the shipment on their own initiative – or by request, when an IP rights owner reports an infringing shipment. In the latter case, the customs officials won't investigate but they can detain the reported goods while the IP owner takes legal action.

For either of these to happen, though, you need to register your IP with the IPR Enforcement Office of the Department of Policy & Legal Affairs, under the General Administration of Customs. □

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Gallery View: Stamped metal parts

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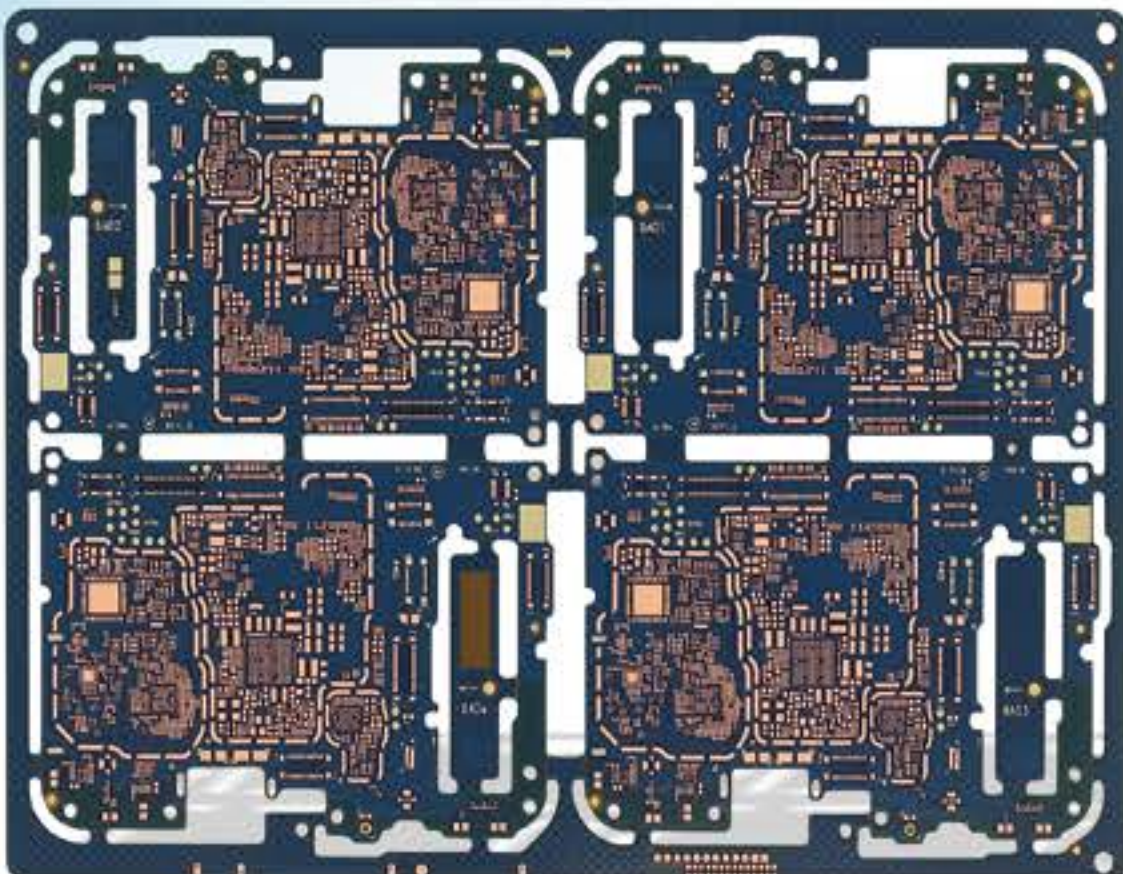
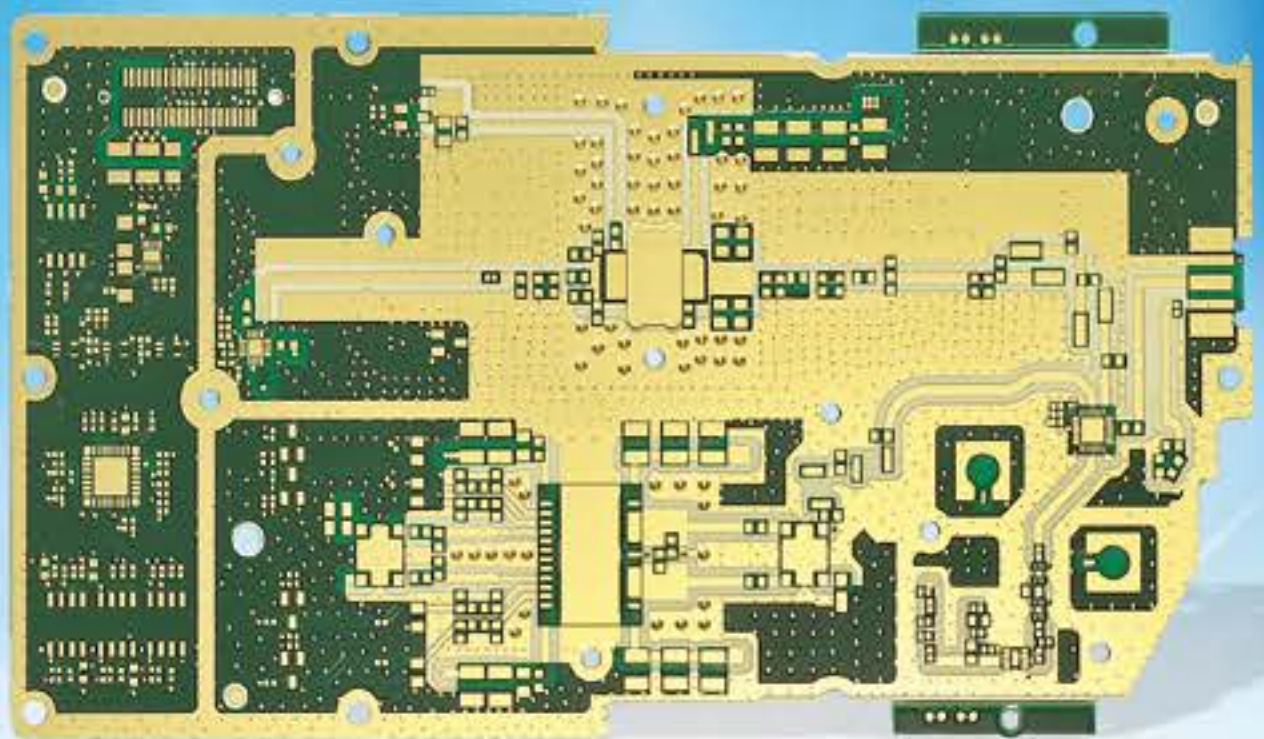
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Annual PCB production capacity covers an area of over 60 million square feet

Six-layer immersion gold high frequency hybrid lam PCB

- Material: rogers
- Layer count: six
- Finishing thickness: 2.4mm
- Surface finished: immersion gold
- Minimum trace width/ space: inner of 0.15mm/0.15mm; outer of 0.15mm/0.173mm
- Minimum hole size: 0.3mm for mechanical drilling
- Applications: network communication (5G communication base station)



Eight-layer immersion gold and OSP HDI PCB

- Material: FR-4
- Layer count: eight
- Finishing thickness: 0.70mm
- Surface finished: immersion gold and OSP
- Trace width/ trace space: inner of 0.05mm/0.05mm; outer of 0.0mm5/0.05mm
- Minimum hole size: 0.2mm for mechanical drilling
- Laser drilling: 0.1mm
- Applications: consumer electronics (smart phone)

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- Multi-type products: high-end multi-layer PCB, HDI high-density interconnect board, FPC flexible board, R-FPC hard and soft combination board, special substrate
- Three manufacturing factories in Jiangxi, Dongguan and Meizhou; six PCB business groups; over 6,000 employees
- Obtained national 'High-tech Enterprise' and 'Shenzhen Famous Brand' titles, among others
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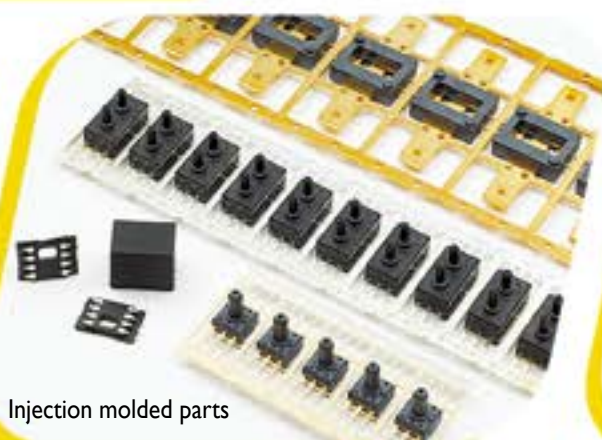
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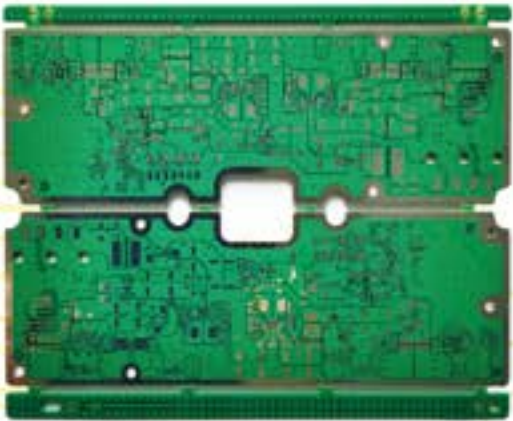
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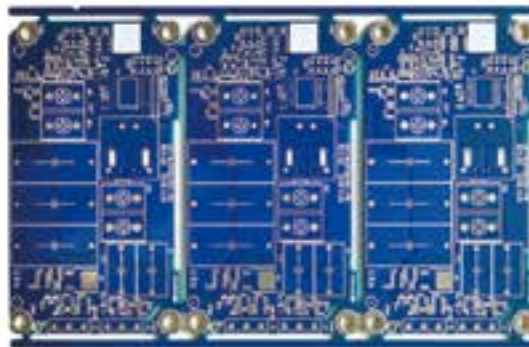
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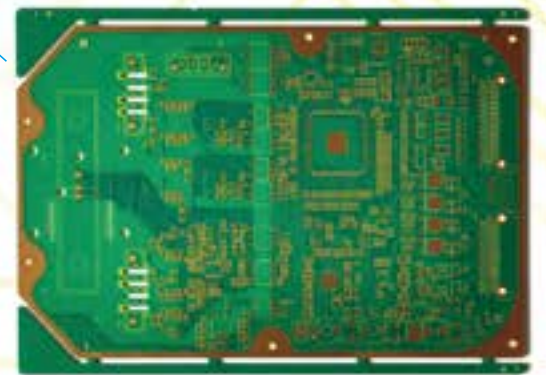
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Emphasis on equipment to handle any metal stamping requirement

Metal stamping includes tooling, stamping, inner inspection, deburring and cleaning, final inspection and packaging. For these processes, hydraulic punching, drilling, planing and grinding machines are among the key equipment. Some manufacturers also use CNC milling machines and machine tool centers.

In the Chinese mainland, machinery upgrades remain a priority as companies further improve their production techniques and efficiency to boost their capability to handle custom shape, size and tolerance requirements at relatively low costs. Huateng Metal Products (Dongguan) Co. Ltd has introduced advanced CNC machines from Japan, Germany and the Taiwan region and will continue to source

production and test equipment overseas in the next two years.

Spurring these improvements is the steady rise in demand. In a report published by *Market Reports World*, the global market for metal stamping was \$143.94 billion in 2020 and is anticipated to reach \$169.93 billion by 2027 at 2.4 percent CAGR from 2021.

Widely made stamped metal parts by Chinese companies are made of copper, brass, bronze, aluminum, steel, stainless steel and zinc and are polished, plated, sandblasted, powder-coated, anodized or hot-dip galvanized. These are used in the consumer electronics, communications, automotive, medical and industrial sectors.

High-speed precision stamping

Dongguan Kinggold Industry Co. Ltd

★★★★★

The KG07-396G from Dongguan Kinggold is made of aluminum, brass, copper, zinc, bronze, stainless steel or steel using high-speed precision stamping, progressive die stamping, CNC deep drawing or die-casting. Options in finishes include polishing, plating, sandblasting, powder coating, anodizing and hot-dip galvanizing.

The supplier requires a minimum order of 1,000 pieces. Delivery takes 15 days.

CONTACT SUPPLIER



Brass & copper

Dongguan Kinggold Industry Co. Ltd

★★★★★

Dongguan Kinggold's KGIJ0285 model is a stamped brass and copper part with a clean finish.

A minimum order of 1,000 pieces is for delivery within seven days.

CONTACT SUPPLIER



±0.01mm tolerance

HLC Metal Parts Ltd

★★★★★

From HLC, the HLC-041201-MSP is a stamped brass, phosphor bronze, stainless steel or low carbon steel part with ±0.01mm tolerance. This undergoes burr removal, cleaning and polishing.

An order of at least 2,000 pieces is required. Lead time is 15 days.

CONTACT SUPPLIER



Steel, other alloys

HLC Metal Parts Ltd

★★★★★

Made of steel or other alloys, the HLC-0617-1-SP stamped part from HLC is manufactured in production facilities compliant with ISO/TS 16949:2009 and IATF 16949:2016 requirements.

The 2,000-piece minimum order has a 15-day lead time.

CONTACT SUPPLIER



Electropolished spring steel

Huateng Metal Products (Dongguan) Co. Ltd

★★★★★

This RoHS-compliant stamped part from Huateng, the HYVW0624, is made of spring steel and has an electropolished finish.

The minimum order quantity is negotiable. Delivery is within 10 days.

CONTACT SUPPLIER



Electropolished stainless steel

Huateng Metal Products (Dongguan) Co. Ltd

★★★★★

This stamped part from Huateng, the HYVW0615, is made of electropolished stainless steel and meets RoHS requirements.

The minimum order quantity is negotiable and the lead time 10 days.

CONTACT SUPPLIER



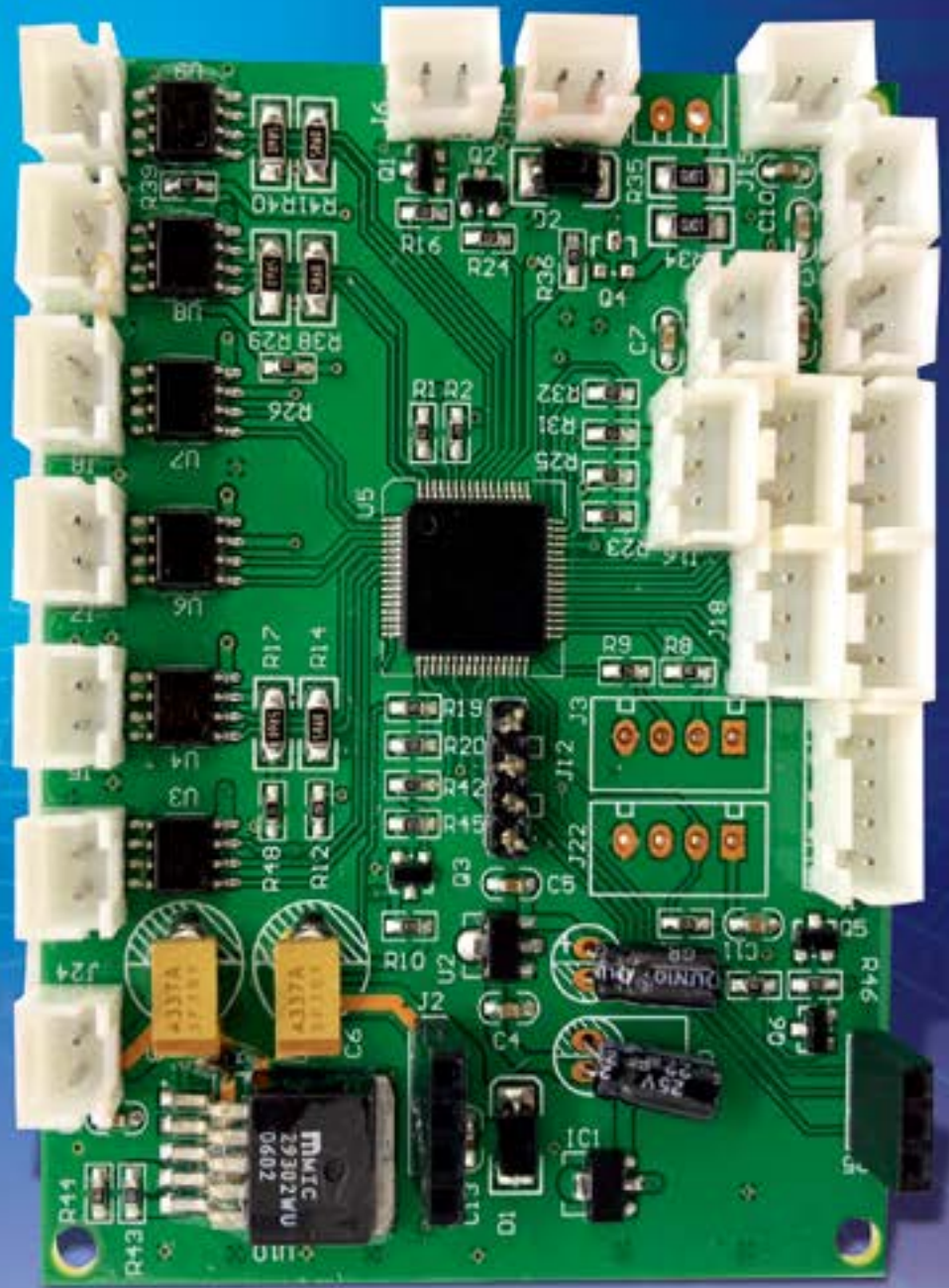
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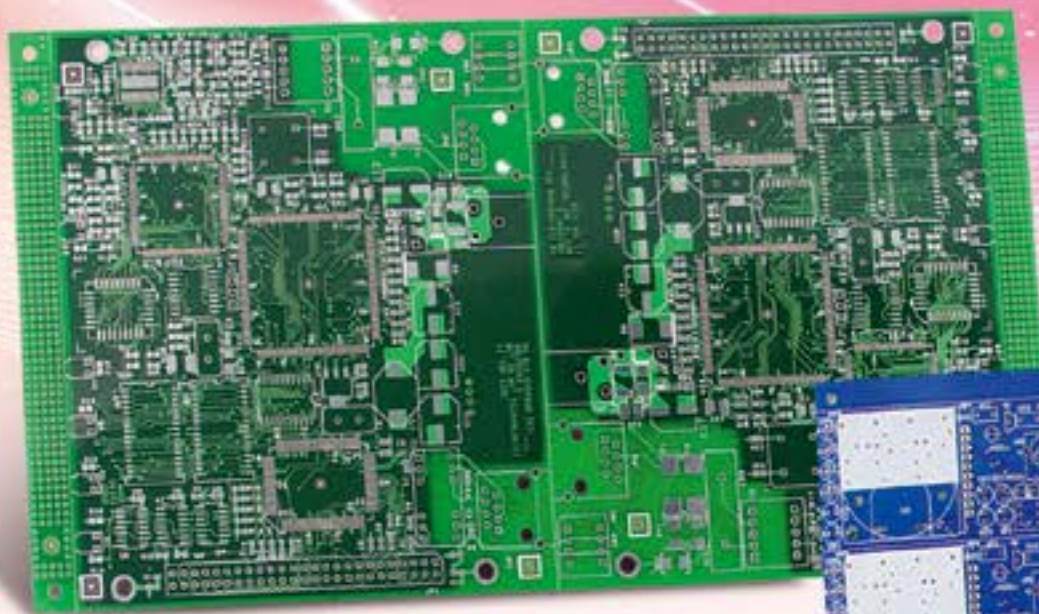
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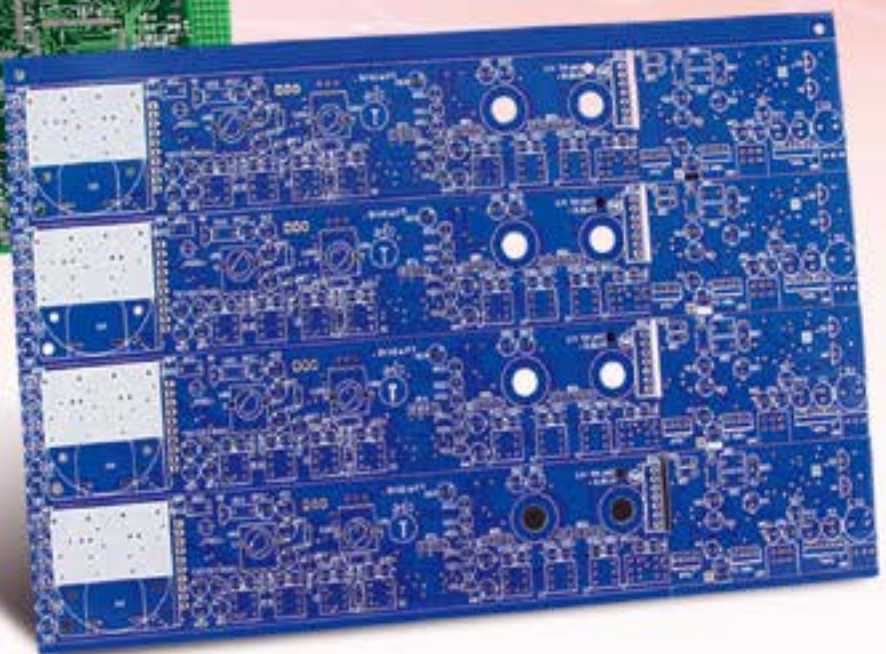


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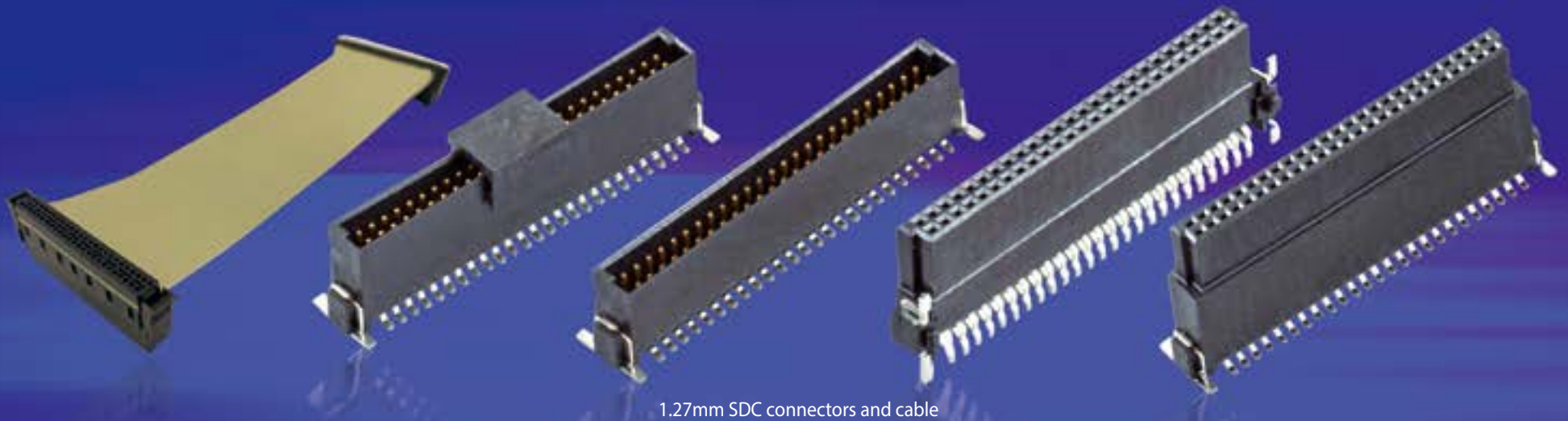
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Various wire harnesses



Various wire harnesses



Various wire harnesses



Various wire harnesses



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Product details	
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MOQ	1,000 units
Lead time	5 to 12 days
Supplier profile	
Export markets	Asia, Australasia, North, Central & South America, Europe, Middle East, Africa
Annual sales	\$90 million to \$95 million
Certifications	ISO 9001, 14001, 13485, IATF 16949, SA 8000, QC 080000

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Dongguan Xieao Industrial Co. Ltd
★★★★☆



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Product details	
Model	XA-PDSC23001
MOQ	5,000 units
Lead time	10 to 30 days
Supplier profile	
Year established	2015
Export markets	Asia, Australasia, North, Central & South America, Europe, Middle East, Africa
Export products	Cable assemblies
Annual sales	\$600,000 to \$700,000

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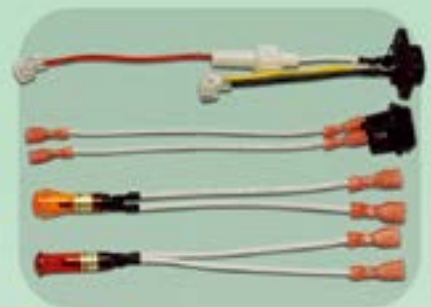
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Cable assemblies

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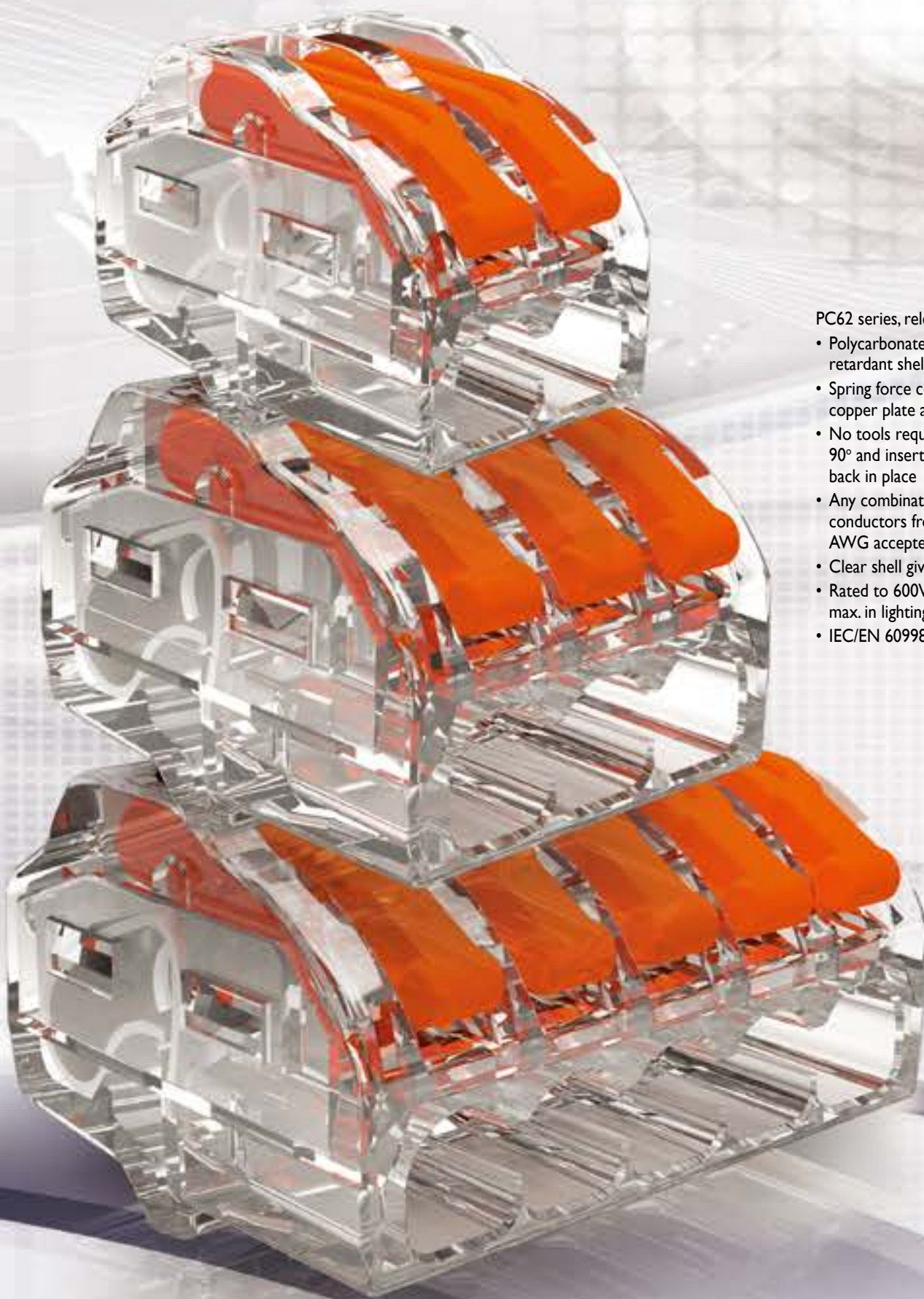
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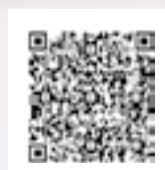
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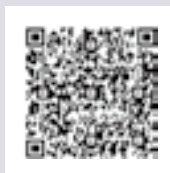
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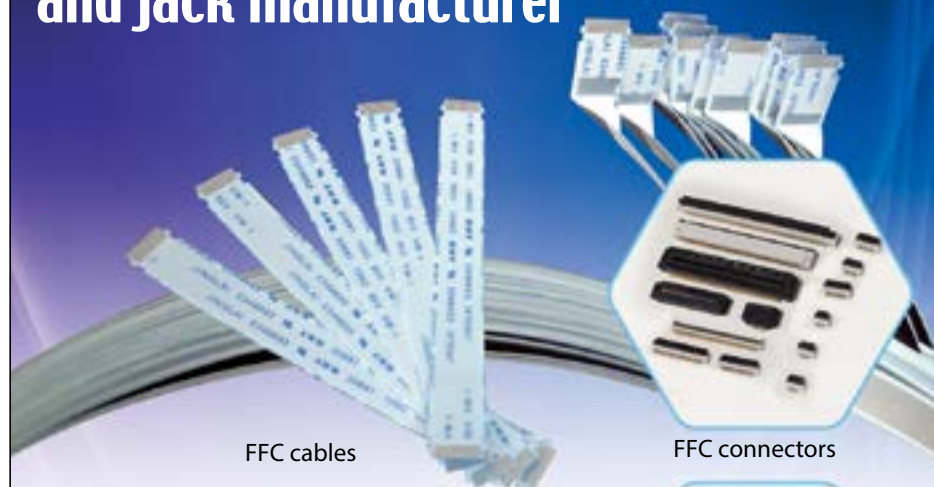
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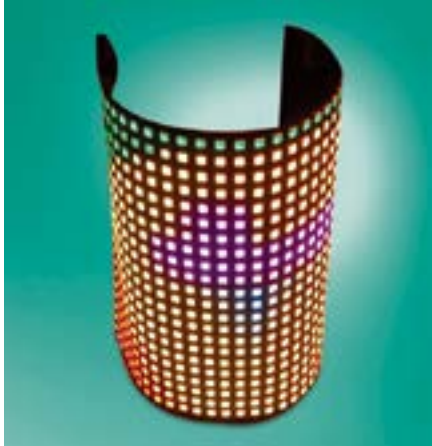
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Gallery View: Flexible LED strips

100

Convenience of remote control via app, voice and motion is expected to drive demand for smart strip lighting.

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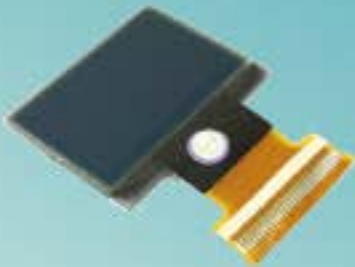
MTF156FD02A-V1
 • Size: 15.6"
 • Resolution: 1920 x 1200
 • Interface: EDP



MTF133EA0T
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 • Resolution: 1920 x 1080



MTP070GG-13B
 • Size: 7"
 • Resolution: 800 x 480



MTC3029FA
 • Resolution: 128 x 64 dots
 • Outline dimensions: 34.0 x 27.0mm



MTF055HD08A-V1
 • AMOLED MIPI interface
 • Size: 5.5"
 • Resolution: 1280 x 720



MTF0397SWI-07
 • Size: 3.97"
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MTF03400AR39A + CTP
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 • Interface: MIPI 3 lane



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Flexible LED strips move toward smart territory

From ambient to functional lighting, flexible LED strips fill spaces where bulbs cannot fit. In today's homes, where connectivity spells convenience, the smart technology trend has spilled over into this product category.

Eyeing uptake in this market, manufacturers in China are developing more smart products, in addition to the continuing pursuit of greater brightness, stability and reliability. Some companies have introduced products that can be used with the Smart Life or Tuya app, enabling voice control as well.

LEDs, with those integrating the latter forming the bulk of shipments. The SMD LEDs used typically come in sizes of 5050, 3528, 2835, 0603, 0805 and 1210. They are placed 18 or 24 units per 30cm or 15, 24 or 30 units per 50cm or as specified. The options by color temperature are 3,500, 6,500 and 7,500K and by rated voltage 12 and 24V. There are indoor and outdoor designs, with the latter in choices of IP65, IP67 and IP68 ratings.

The majority of Chinese companies secure product safety approvals such as CE and RoHS.

Mainstream flexible LED strips from Chinese suppliers have DIP or SMD

LEDs, PCBs and adhesives are sourced domestically.

5050 SMD LEDs, 1,000 lumens

Seven Lights Technology Co. Ltd

Per meter, Seven Lights' 5050 Flexible LED Strip has 60 LEDs, 1,000-lumen luminous flux and 14.4W rating. For indoor use, this 12VDC unit has a 120-degree beam angle, more than 80 CRI and 3,000 to 3,500K color temperature.

The order quantity is negotiable. Lead time is seven days.

CONTACT SUPPLIER



2835 SMD LEDs, IP65 rating

Seven Lights Technology Co. Ltd

The 2835 Flexible LED Strip, with 60 LEDs per meter, has 12VDC input voltage and 10W rating. Suitable for outdoor installation, this IP65-rated unit from Seven Lights has a 120-degree beam angle, more than 80 CRI, and 660nm red and 460nm blue wavelengths.

The negotiable order quantity is delivered within seven days.

CONTACT SUPPLIER



5050 SMD LEDs, motion sensor

Shenzhen JMK Technology Co. Ltd

★★★★☆

The SMD-2835 model from Shenzhen JMK is a flexible LED strip with 72 5050 SMD LEDs, and optional motion sensor and manual operation mode. This 150cm-long 4.5V product has 20 to 22-lumen luminous flux and an IP65 rating. It meets CE and RoHS requirements.

A minimum order of 10 meters is required. Lead time is 15 days.

CONTACT SUPPLIER



5050 SMD LEDs, 16 million colors

Shenzhen JMK Technology Co. Ltd

★★★★☆

Available in lengths of 12, 15, 18 and 24m, the 5050-RGB flexible LED strip from Shenzhen JMK has 16 million colors, 29 dynamic modes and an IP65 water resistance. The rated voltage is 3 or 5V.

The supplier requires an order of at least 10 meters. Delivery is within 15 days.

CONTACT SUPPLIER



2835 SMD LEDs, IP65 or IP68

Zhongshan Golden Sun Optoelectronics Technology Co. Ltd

★★★★☆

From Zhongshan Golden Sun, the JYL-2835-60LED flexible LED strip uses 60 LEDs per meter, each with an 8-lumen luminous flux. Power rating per meter is 14.4W. This 12VDC unit comes in white and warm-white variants, with an IP65 or IP68 water resistance. An order of at least 250m is required. Delivery is within 10 days

CONTACT SUPPLIER



5630 SMD LEDs, 30 to 32 lumens

Zhongshan Golden Sun Optoelectronics Technology Co. Ltd

★★★★☆

Zhongshan Golden Sun offers the JYL-5630-60LED flexible LED strip with a 30 to 32-lumen luminous flux and an IP65 or IP68 water resistance. A meter of this warm or warm-white unit has 60 5630 SMD LEDs and 12W power rating. The minimum order requirement is 250m and the lead time 10 days.

CONTACT SUPPLIER



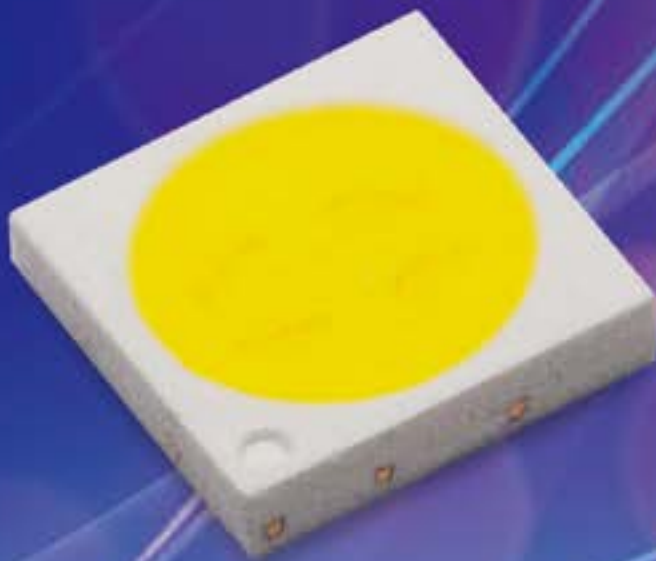
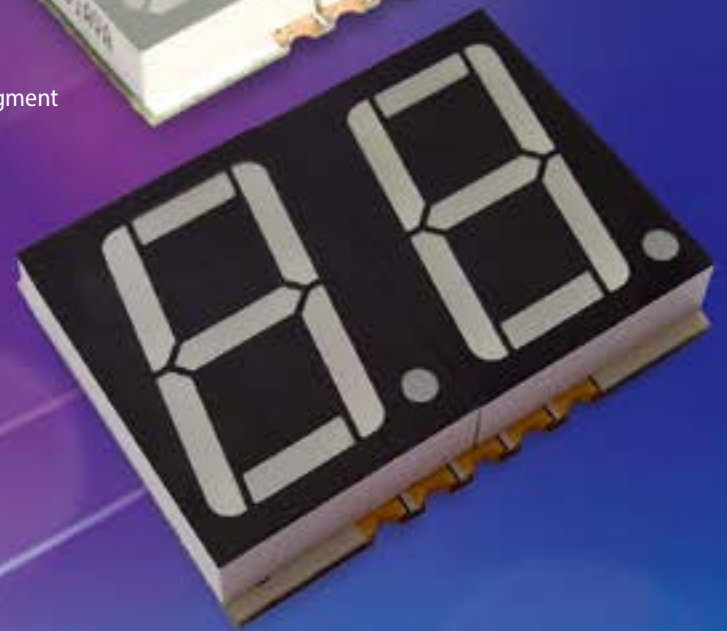
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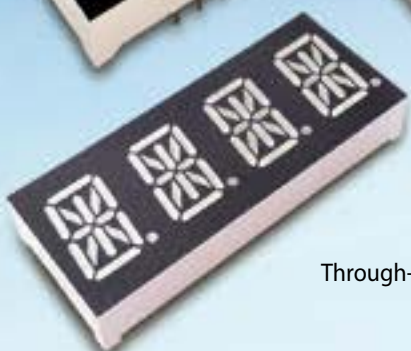
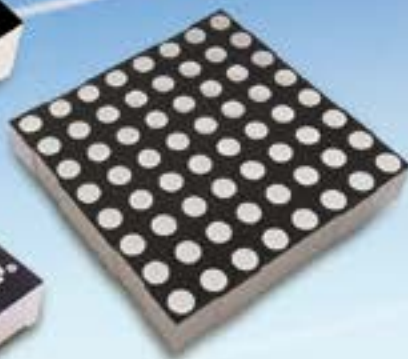
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Application Watch: Renewable energy cover

LiFePO₄ batteries lead Li-ion category as the energy storage of choice for solar and wind power systems.

Analyst's Choice 110

- 22kW 2xType 2 EV charging station
- 2,200mAh Li-ion battery pack

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Application Watch: Renewable Energy

LiFePO₄ batteries lead Li-ion category in renewable energy

« [continued from cover](#) to *Tencent News*. By 2025, their combined share will be between 25 and 30 percent as the country endeavors to reduce its coal consumption.

The bearing on global energy storage is significant, as demonstrated in Wood Mackenzie’s forecast for 2021. “Global energy storage deployments will nearly triple year-on-year, reaching 12GW/28GWh this year and close to the 1TWh mark by 2030. While global lithium-ion battery manufacturing capacity will double in the next two years,” writes Le Xu in an article posted in October 2021 on the research and consultancy group’s website.

LiFePO₄ batteries, in particular, are going to benefit from this energy storage market and the increasing sales of electric vehicles. Globally, this category, including portable and

China suppliers at a glance						
Company	Supplier ranking	Year established	Head office location	Main product lines	Total annual sales (\$mn)	Total annual exports (\$mn)
Mica Power Co. Ltd	★★★★☆	2009	Dongguan, Guangdong	Li-ion batteries	20	14
Shenzhen FBTech Co. Ltd	★★★★☆	1999	Shenzhen, Guangdong	Li-ion batteries	•	•
Shenzhen Vcell Power Technology Co. Ltd	★★★★☆	2001	Shenzhen, Guangdong	Li-ion batteries	•	•
TOPA Technology Ltd	★★★★☆	2008	Shenzhen, Guangdong	Li-ion batteries	•	•

stationary types, reached \$5.6 billion in 2020 and will rise to \$9.9 billion by 2030 at 5.9 percent CAGR from 2021 to 2030, according to Allied Research.

Compared to other Li-ion batteries, lithium iron phosphate units have advantages of improved discharge and charge efficiency, long life span and high safety in terms of thermal and chemical stability. They remain cool in high-temperature environments and are nonflammable, in addition to being nontoxic. For these features and low cost, they are regarded as the preferable option for renewable energy applications.

On account of this industry outlook, LFP battery suppliers in China are expanding their production further. Mica Power Co. Ltd, which invested in new automatic production and test equipment, boosted its output by 25 percent in 2021 and is planning to raise it anew by 10 to 15 percent in the months ahead.

There are hundreds of Li-ion battery manufacturers in China. Most can offer products for the renewable energy market and for these companies, the application accounts for 10 to 40 percent of shipments. Some also offer Li-polymer, lead-acid and NiMH types.

The majority of these suppliers are exporters, allocating 20 percent to as much as 80 percent of their output for overseas. Germany, the UK, Italy, France and the US are some of these key destinations.

Li-ion battery factories in China are found mainly in Shenzhen, Dongguan, Zhongshan and Xiamen, while there are also companies in Suzhou, Changzhou and Ningbo.

Competition is intense in this product category, complicated further by the presence of a number of foreign-invested companies operating on

[continued on page 108 »](#)

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Michael Michelini,
Global from Asia

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Battery charger



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120W switch power supply

Application Watch

LiFePO₄ batteries lead Li-ion category in renewable energy

« continued from page 106

a bigger scale than the majority of domestic enterprises.

LFP batteries dominate

For the renewable energy market, the mainstream selections of Li-ion batteries in China are mostly based on

the lithium iron phosphate chemistry. Typical LiFePO₄ cells offered have a rated voltage of 3.2V, energy density of up to 180Wh/kg and a life span of about 3,000 cycles.

For a broader market reach, customization of cells and battery packs according to intended application is widely accommodated.

Many Chinese suppliers follow international quality standards such as CE, IEC and UL, and RoHS environmental regulations.

Key inputs used in the production of Li-ion batteries include cathode and anode materials, electrolyte, separators and cases. These are sourced domestically or from overseas when required.

Material and component costs rose slightly in 2021, leading to higher battery prices. Most manufacturers raised their quotes by 5 to 10 percent.

Companies interviewed by *Global Sources Electronic Components* are predicting that cost and price stability may just be possible in the coming months.

■ [Gallery view, page 110](#)



Mica's model LFP25150 is a 25.6V, 150Ah lithium iron phosphate battery with 3.84kWh energy capacity.

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22kW 2xType 2 EV charging station

Xiamen Biyate Imp. and Exp. Co. Ltd

★★★★★



The IOCAP06C-22 from Xiamen Biyate is a three-phase EV charging station with 400V±20 percent input and output voltage and 32A output current. It has less than 5W standby power, with 22kW output power from each Type 2 socket. The unit, with an IP54-rated metal housing, measures 350x1,400x200mm and weighs 30kg.

2,200mAh Li-ion battery pack

Guangzhou World Power Co. Ltd

★★★★☆



Available in 42x42x70mm or buyer-specified dimensions, the DTP18650-3S1P rechargeable Li-ion battery pack from Guangzhou World has 2,200mAh capacity, 11.1 to 12.6V voltage and more than 500-cycle life span. It comes in 3S1P configuration and uses 18650 cells. This unit has 0 to 45 C charge and -20 to 60 C discharge operating temperatures.

Product details	
Model	IOCAP06C-22
MOQ	5 units
Lead time	30 to 40 days
Certifications:	CE
Supplier profile	
Year established	1999
Export markets	Asia, Australasia, North, Central & South America, Europe, Middle East, Africa
Annual sales	\$9 million to \$10 million

CONTACT SUPPLIER

Product details	
Model	DTP18650-3S1P
MOQ	100 sets
Lead time	10 to 25 days
Supplier profile	
Year established	2020
Export markets	US, Germany, Japan, Canada, UK, France
Export products	Batteries
Certifications	ISO 9001:2000

CONTACT SUPPLIER

Application Watch: Renewable Energy

GALLERY VIEW

A selection of LiFePO₄ batteries from China

150Ah LiFePO₄ battery

Mica Power Co. Ltd

★★★★☆

A 25.6V, 150Ah LiFePO₄ battery, the LFP25150 from Mica has 3.84kWh energy capacity, 30mA maximum charge and discharge current, and 0 to 60 C charge and -20 to 60 C discharge operating temperatures. The supplier requires a minimum order of 10 units. Delivery is within 20 days.

CONTACT SUPPLIER

200Ah LiFePO₄ battery

Shenzhen FBTech Co. Ltd

★★★★☆

Shenzhen FBTech's 12.8V, 200Ah LiFePO₄ battery has a life span exceeding 2,000 cycles. It meets UL and CE standards.

An order of at least one unit is required. Delivery is within 20 days.

CONTACT SUPPLIER

50Ah LiFePO₄ battery

Shenzhen Vcell Power Technology Co. Ltd

★★★★☆

The VP-LF12-50-8686 from Shenzhen Vcell is a 50Ah LiFePO₄ battery with 12V nominal and 10V discharge cut-off voltages, and 0.5C maximum charge and 1C maximum continuous discharge current. This CE-approved unit, weighing 6.5g, has 5 to 45 C charge and -20 to 60 C discharge operating temperatures. The minimum order of 10 units is delivered within seven days.

CONTACT SUPPLIER

12,500mAh-rated LiFePO₄ battery

TOPA Technology Ltd

★★★★☆

TOPA markets the IFR42120 3.2V 12.5Ah LiFePO₄ battery, which has 3.2V rated voltage and 12,500mAh rated capacity.

The 50-unit minimum order has a seven-day lead time.

CONTACT SUPPLIER



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★★★☆☆☆	✓	✓	
★★☆☆☆☆	✓	✓	

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ELECTROMECHANICALS

CIRCUIT & HEAT PROTECTION COMPONENTS

CNC machined heatsinks

Dongguan Foxron Precision Metal Parts Co. Ltd	57	www.globalsources.com/foxron.co	★★★★★★
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Cooling fans

Dongguan RUNDA Cooling Fan Co. Ltd	30	www.globalsources.com/szrunnda.co	★★★★☆
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Electronic circuit breakers

Shanghai Sovin Electrical Tech Co. Ltd	16	www.globalsources.com/sovin.co	★★★★★★
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Thermal interface materials

Xiamen Set Electronics Co. Ltd	27	www.globalsources.com/set.co	★★★★☆
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MAGNETS

Alnico magnets

Xiamen Yuxiang Imp. & Exp. Co. Ltd	33	www.globalsources.com/yuxiang.co	★★★★☆
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MOTORS & MECHANISMS

DC motors

Hennkwell Ind. Co. Ltd	29	www.globalsources.com/hennkwell.co	★★★★☆
Jinlong Machinery & Electronic Co. Ltd	14-15	www.globalsources.com/kotl.co	★★★★★★
Kennex Electronics (Dongguan) Ltd	22	www.globalsources.com/kennex.co	★★★★☆
Shenzhen Kinmore Motor Co. Ltd	20-21	www.globalsources.com/kinmore.co	★★★★★★

Linear motors

Jinlong Machinery & Electronic Co. Ltd	14-15	www.globalsources.com/kotl.co	★★★★★★
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Micro motors

Jinlong Machinery & Electronic Co. Ltd	14-15	www.globalsources.com/kotl.co	★★★★★★
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RELAYS & KEYBOARDS

Electromechanical relays

Zhejiang HKE Relay Co. Ltd	18-19	www.globalsources.com/cnhke.co	★★★★☆
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Linear solenoids

Shenzhen ZRC Technology Co. Ltd	33	www.globalsources.com/zrc.co	★★★☆☆
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SENSORS & TRANSDUCERS

Fluid level sensors

Dongguan City Hangseng Sensor Co. Ltd	28	www.globalsources.com/hangsengsensor.co	★★★★☆
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SWITCHES

Illuminated pushbutton switches

Kaihua Electronics Co. Ltd	23	www.globalsources.com/kailh.co	★★★★☆
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Keyboard switches

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Keylock switches

Jack Dart Enterprise Co. Ltd	31	www.globalsources.com/jackdart.co	★★★★☆
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Membrane switches

Nanjing Zhongshan Membrane Switch Co. Ltd	31	www.globalsources.com/zsbm.co	★★★★☆
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Micro/miniature switches

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Pushbutton switches

Honyone Electrical Co. Ltd	24	www.globalsources.com/honyone.co	★★★★☆
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Rocker/paddle switches

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Toggle switches

Canal Components Inc.	33	www.globalsources.com/canal.co	★★★★☆
Tele Long Enterprise Co. Ltd	78-79	www.globalsources.com/telelong.co	★★★★☆

Waterproof tactile switches

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PASSIVE & DISCRETE COMPONENTS

CAPACITORS

Aluminum electrolytic capacitors

Supertech Electronic Co. Ltd	47	www.globalsources.com/supertech.co	★★★★☆
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Film capacitors

Aid Electronics Corp.	42	www.globalsources.com/aid.co	★★★★☆
HK Film Capacitor Ltd	46	www.globalsources.com/hkfc.co	★★★★☆
Shenzhen Topmay Electronic Co. Ltd	48	www.globalsources.com/topmay-computer.co	★★★★☆

Polypropylene capacitors

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COILS

Solenoid coils

Summit Elec-Tech Co. Ltd	44	www.globalsources.com/summit88.co	★★★★☆
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Crystal oscillators

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SPK Electronics Co. Ltd	51	www.globalsources.com/spk.co	★★★★☆

INDUCTORS

High current power inductors

Thai Lin Radio Coil Mfy Ltd	C-4,40-41	www.globalsources.com/thailin.co	★★★★★
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Power inductors

ABC Taiwan Electronics Corp.	49	www.globalsources.com/abc.co	★★★★★
Thai Lin Radio Coil Mfy Ltd	C-4,40-41	www.globalsources.com/thailin.co	★★★★★

RESISTORS

Chip resistors

Digi-Key Electronics	C-1,4	n.a.	★★★★★
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Metal-film resistors

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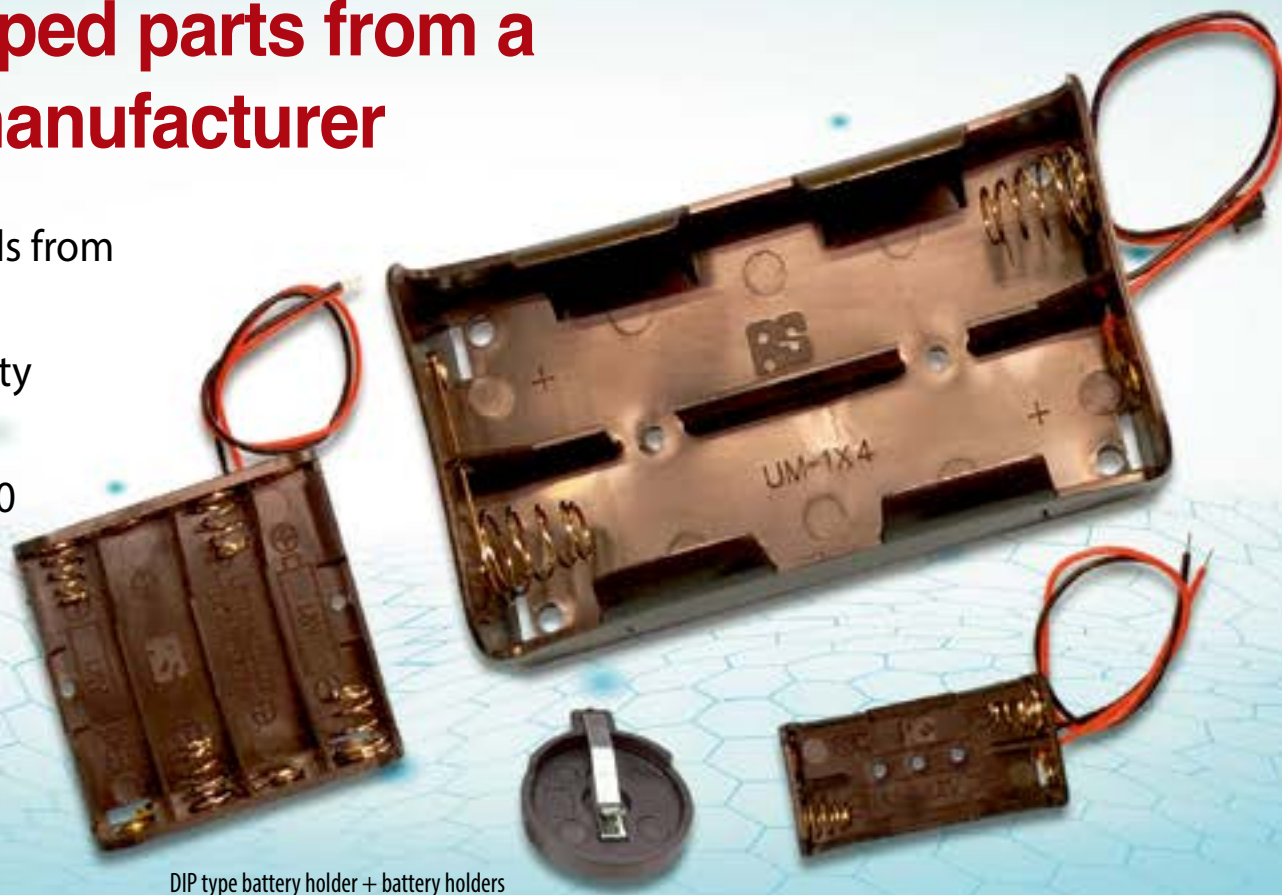
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Control transformers			
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Power transformers			
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Showwell Group Co. Ltd	43	www.globalsources.com/showwell.co	★★★★☆
Reactors			
Chuan Shun Electric Industrial Co. Ltd	38-39	www.globalsources.com/cse-power.co	★★★★☆
Toroidal transformers			
Chuan Shun Electric Industrial Co. Ltd	38-39	www.globalsources.com/cse-power.co	★★★★☆
Keen Ocean Industrial Ltd	34	www.globalsources.com/kocean.co	★★★★☆
Thai Lin Radio Coil Mfy Ltd	C-4,40-41	www.globalsources.com/thailin.co	★★★★★
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Winning Team International Limited	45	www.globalsources.com/winningteam.co	★★★★☆
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Heatact Super Conductive Heat-Tech Co. Ltd	52	www.globalsources.com/heatact.co	★★★★☆
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Chang Way Industries Co. Ltd	59	www.globalsources.com/changway.co	★★★★☆
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Win Industry Company	64	www.globalsources.com/win.co	★★★★★
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Dongguan Foxron Precision Metal Parts Co. Ltd	57	www.globalsources.com/foxron.co	★★★★★
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Chief Tech Rubber Industrial Co. Ltd	69	www.globalsources.com/chieftechrubber.co	★★★☆☆
Win Industry Company	64	www.globalsources.com/win.co	★★★★★
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Chang Way Industries Co. Ltd	59	www.globalsources.com/changway.co	★★★★☆
Sun Strong Metal Manufacturing Ltd	68	www.globalsources.com/sunstron.co	★★★★☆
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Guangzhou Auto Spring Co. Ltd	66	www.globalsources.com/autospg.co	★★★★★
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Finest PCB Assemble Limited	58	www.globalsources.com/finestpcba.co	★★★★☆
Grand Bond Electronics Ltd	60	www.globalsources.com/grandbondpcba.co	★★★★☆
Jiangxi Zhihao Electronic Technology Co. Ltd	54-55	www.globalsources.com/jxzhpcb.co	★★★★★
Poe Precision Electronics Co. Ltd	65	www.globalsources.com/poeprecision.co	★★★★☆
Shenzhen Shinelong Electronics Industrial Co. Ltd	56	www.globalsources.com/seic.co	★★★★☆
Shenzhen Vipsten Electronic Co. Ltd	C-3	www.globalsources.com/vipsten.co	★★★★★
Syhogy (Xiamen) Tech Co. Ltd	63	www.globalsources.com/syhogy.co	★★★★☆
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Grand Bond Electronics Ltd	60	www.globalsources.com/grandbondpcba.co	★★★★☆
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Rigid-flex PCBs			
Sunshine Global Circuits Co. Ltd	6-7	www.globalsources.com/ssct.co	★★★★★
PROCESSING & MANUFACTURING SERVICES			
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Win Industry Company	64	www.globalsources.com/win.co	★★★★★
PCB design services			
Finenet Electronic Circuit Ltd	67	www.globalsources.com/finenet.co	★★★★☆
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CABLES & ASSEMBLIES			
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Hou Ta Electric Cords & Plugs Co. Ltd	85	www.globalsources.com/houtaht.co	★★★★☆
Zhejiang Shuangyang Group Co. Ltd	80-81	www.globalsources.com/chinasy.co	★★★★★
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Dongguan Fuxin Electronics Co. Ltd	88-89	www.globalsources.com/fuxin.co	★★★★★
CAT 8 cable assemblies			
Dongguan Fuxin Electronics Co. Ltd	88-89	www.globalsources.com/fuxin.co	★★★★★
D/D-sub cable assemblies			
Premier Cable Co. Ltd	82-83	www.globalsources.com/premier.co	★★★★★
DSL splitters			
Dongguan Fuxin Electronics Co. Ltd	88-89	www.globalsources.com/fuxin.co	★★★★★
Flat cables			
Dongguan City Jinglai Electronic Co. Ltd	95	www.globalsources.com/victorlands.co	★★★☆☆
Morethanall Co. Ltd	93	www.globalsources.com/morethanall.co	★★★☆☆
IDC cable assemblies			
Unicorn Electronics Components Co. Ltd	92	www.globalsources.com/unicorne.co	★★★☆☆
RF cable assemblies			
EnterTec Technology Inc	2	www.globalsources.com/entertec.co	★★★★★
USB-C cable assemblies			
Ningbo Mainning Electronics Co. Ltd	92	www.globalsources.com/mainning.co	★★★☆☆
Waterproof cable assemblies			
EnterTec Technology Inc	2	www.globalsources.com/entertec.co	★★★★★
CONNECTORS			
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Tele Long Enterprise Co. Ltd	78-79	www.globalsources.com/telelong.co	★★★★☆
Board to board connectors			
Dongguan Lianda Precision Products Co. Ltd	94	www.globalsources.com/szconnector.co	★★★☆☆
Unicorn Electronics Components Co. Ltd	92	www.globalsources.com/unicorne.co	★★★☆☆
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FPC connectors			
Ariba Technology Co. Ltd	94	www.globalsources.com/ariba.co	★★★☆☆
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Shenzhen MUP Industrial Co. Ltd	120	www.globalsources.com/mupconnector.co	★★★★☆
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Comfortable Electronic Co. Ltd	75,117	www.globalsources.com/comf.co	★★★★★
Dongguan Rayconn Electronics Co. Ltd	93	www.globalsources.com/rayconnplus.co	★★★★☆
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Xiamen Ocular Optics Co. Ltd	9	www.globalsources.com/xmzhxi.co	★★★★★
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Palm Technology (Taiwan) Co. Ltd	99	www.globalsources.com/palmtech.co	★★★★★
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Helms-Man Industrial Co. Ltd	107	www.globalsources.com/helmsman.co	★★★★★
Xelite Electronics Co. Ltd	108	www.globalsources.com/xelitepower.co	★★★★☆
AC/DC switching adapters			
Jodeway Electron Co. Ltd	111	www.globalsources.com/jodeway.co	★★★★☆
Xiamen Xunheng Electronics Tech. Co. Ltd	104-105	www.globalsources.com/xun-heng.co	★★★★☆
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Shenzhen Hailei New Energy Co. Ltd	8	www.globalsources.com/batteryhailei.co	★★★★★
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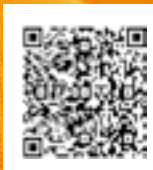
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Our units last longer and boast higher capacities than the industry average

The featured lithium button-cell batteries are perfect for powering a variety of devices, including 3-D glasses and remote controls. And since they boast higher capacities and longer life spans than many other units on the market, they are better for the environment as well. Our CR2032 cells, for instance, have a capacity of 245mAh – that's up to 5 percent higher than similar CR2032 cells from Japan.

Each item is manufactured at our 9,000m² ISO 9001:2015- and ISO 14001:2015-certified factory, where we turn out up to 25 million units monthly. Plus, our products meet UL 1642, UN 38.3, CE, JISC 8515 and IEC standards, as well as comply with RoHS Directive, Directive 2013/56/EU and REACH requirements. We are also an authorized distributor of Toshiba batteries.

To ensure quality, we conduct evaluations using precision equipment from the US, Switzerland and Taiwan region. For more information regarding our batteries and to place an order, contact us now.

Battery type	Capacity
CR2016	90mAh
CR2025	165mAh
CR2032	245mAh
CR2430	300mAh
CR2450	620mAh

**Power Glory Battery Tech. (HK) Co. Ltd**

Rm A, 13/F, Hoi Bun Industrial Building, 6 Wing Yip St, Kwun Tong, Kowloon, Hong Kong SAR, China

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E-mail: sales@omnergy.com.hk

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Chinese mainland factory:

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Lithium button-cell batteries



We are an authorized Toshiba battery distributor

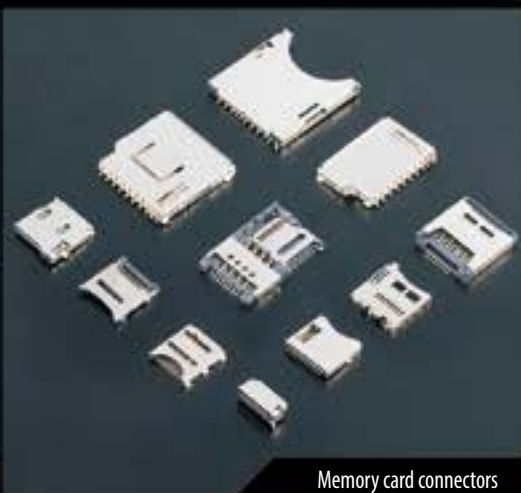


Various primary lithium batteries

Four production bases cover 50,000m² with 800 employees and over 120 R&D engineers



Smart card connectors



Memory card connectors



SIM card connectors



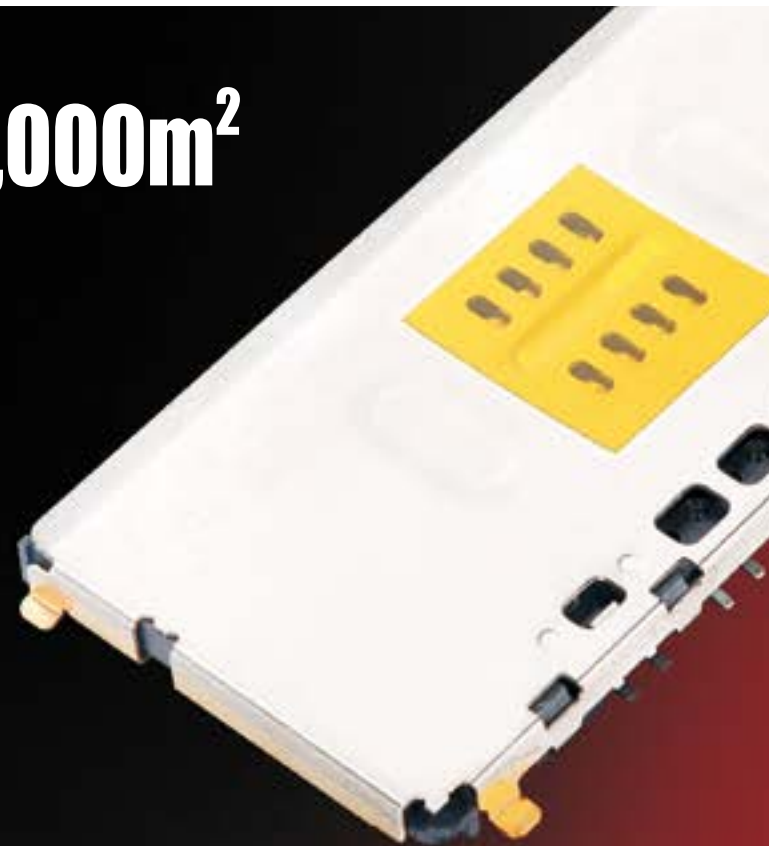
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- 18 years of R&D and manufacturing experience in the connector industry
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MUP Shenzhen MUP Industrial Co. Ltd

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- Contract manufacturing service available

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Pulse & drive transformers

- Rated voltage: up to 1000V
- Operating frequency: 60 kHz max.
- Ignition current up to 3A
- Voltage time integral: 1500V μ s max.
- Dielectric strength: 4000Vrms
- Insulation class: class B (130°C)
- Vacuum potting
- Ambient temperature (ta): -25°C ~ +70°C
- Storage temperature: -40°C ~ +85°C

Ignition transformers

- All materials are under insulation class B (130°C)
- Dielectric strength: 4000Vrms
- Ambient temperature: +70°C
- Output voltage: 2x \geq 20kV p-p.
- No-load operation up to 30 sec.
- Terminals: PCB mounting and faston tab 2.8x0.8mm
- Potted under vacuum.
- Operating frequency: approx. 20 kHz.
- Spark gap: 4~8 mm

Current sensors for charging Plug-in electric vehicles

- AC level II (208V/240V)
- For 13A, 16A, 25A, 32A, 40A circuit
- Single phase/three phase
- Dielectric strength: 4000Vrms
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- Vacuum potting