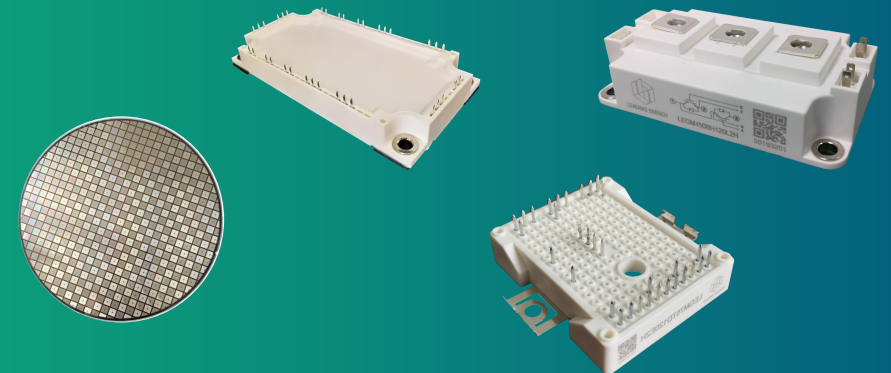


Expert in Power Semiconductors



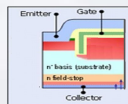
Semiconductor

Our Through Mount Block device connects with power MOSFETs and IGBTs to provide a complete power switching solution. It is designed to be used in a variety of applications, including power supplies, motor drives, and industrial automation.



CATALOG

01



Introduction to Industrial Capability of Leading Energy

02



Introduction to IGBT Chips and Module Products

03

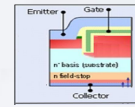


Introduction to Plans and Products of Frequency Converter



CATALOG

01



Introduction to Industrial Capability of Leading energy

02



Introduction to IGBT Chips and Module Products

03



Introduction to Plans and Products of Frequency Converter



Power semiconductors are the core components that convert and control the power consumption of electrical equipment during operation;

01

Industrial Products Market

Electric vehicles, rail transit, industrial frequency converters, UPS power supply, photovoltaic power generation, wind power generation, smart grid, 5G communication, servo control, energy storage, etc.



Our current market positioning

02

Military Products Market

Radar, communication command, aircraft, ship electrical equipment, high-energy weapons, satellites, spacecraft, rockets, missiles, various military power sources, etc.



03

Consumer Market

Induction cookers, air conditioners, refrigerators, washing machines, televisions, microwaves, etc.





Some direct industry customers

Frequency conversion & Servo control & Electric drive system



White goods



Inverter power supply & Wind solar energy storage inverter & Charging station



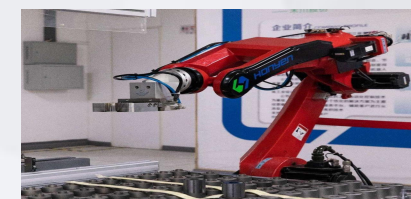
Electric welding machine



UPS & SVG & Induction heating



Some indirect industry customers





The provider of current industry value for customers

Core industrial chain links are independent and controllable

- Stable supply chain, stable production capacity, and stable quality;
- Continuous cost optimization;
- Performance specialization and product customization;

Full range of products and one-stop product solutions

- Silicon based IGBT chip+silicon carbide based MOSFET chip (under development);
- IGBT module+IGBT single tube+IPM (to be released);
- Power devices+application plans;

Customer empowerment of application plan products

- Cost-effective application solutions;
- Ensure performance, cost and quality, and provide "worry-free" industrial support;

Strict product testing and perfect quality control system

- Ensure stable product quality and excellent application characteristics;



A trusted long-term partner for customers

The core technology chain is independent and controllable, providing customers with continuous product support

- Continuous product upgrades and iterations;
- Product performance specialization;
- Product specifications customization;

With a strong ability to integrate resources

- Our industrial resource capability;
- Our capital resource capability;
- Our human resource capability;
- Our policy resource capability;

Excellent corporate culture and diligent industrial attitude

- A reverence for product quality and customer experience;
- Pragmatic cognition and continuous exploration of industrial regularity;
- The concept of sharing and win-win outcomes through helping teams and partners succeed;
- A down-to-earth and diligent work style;



Leading Energy (Beijing) Electronic Technology Co., Ltd.

(referred to as: **LEADING-ENERGY**) is a national high-tech enterprise focusing on the research and development, production and sales of power semiconductor chips and devices. It was established in **Beijing** on July 8, 2014, with a registered capital of 27.78 million yuan. Its products cover IGBT chips, IGBT high-power modules and discrete devices, and it is making efforts in the field of silicon carbide power devices. What's more, the company has independent intellectual property rights with all its products, and holds a number of invention patents.

R&D Center, East China Sales&Support Center:

Located in **Nanjing, Jiangsu Province**, the technology research and development team brings together outstanding foreign experts and senior technical talents in the industry, with excellent performance and many years of industry experience in the field of power semiconductors.

Closed Test Production Base:

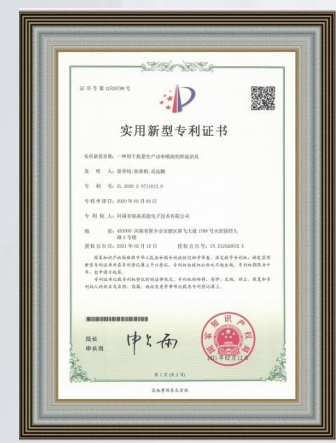
Henan Leading Energy Electronic Technology Co., Ltd. is located in **Xinxiang, Henan Province**, covering an area of 2500 square meters. It is a production base for devices packaging and testing. With self-built laboratories, it boasts a complete range of testing and experimental platforms.

South China Sales&Technical Support Center:

Located in **Shenzhen, Guangdong Province**









The technical research and development team is composed of senior experts from well-known enterprises such as International Rectifiers, TSMC, MACMIC, SGNEC, ON Semiconductor, and Jianghuai Automobile.

General Manager Founder

Chinese, Master of Engineering from Huazhong University of Science and Technology, former executive of Datang Telecom, senior business expert at Teradyne Company in the United States, with over 17 years of experience in the semiconductor industry. He is an industry expert in the power semiconductor industry and has a deep understanding of the power semiconductor industry ecology and laws. He has a large number of talents and industrial resources, and has successful entrepreneurial experience before.

Chief Scientist Founder

American, Doctor, with 40 years of experience in power semiconductor technology, former CTO of SEMICOA Company in the United States, core technical expert of chip research and development and process technology of IR company, technical director and general manager of No. 2, 3 chip production line of IR company, with rich experience in product development and chip production line management, and a large number of invention patents.

Chief Technology Officer Corporate Shareholder

Chinese, Master of Electronics, previously serving as the head of core technology of MACMIC (listed company) and Yangzhou Hongyang, and presiding over the research and development of a number of IGBT chips which were later mass-produced, with experience in packaging and line construction, and rich industrial resources.

Chip Process Director Corporate Shareholder

Chinese, Master of Electronics from Peking University, Head of the chip process Integration Department of Shougang -NEC, with advanced learning experience in Japanese enterprises, rich process experience and scientific research achievements, senior quality control and systematic management experience of Japanese semiconductor enterprises.

Application Technologist (1)

Chinese, with a Master's degree in Mechanical and Electrical Science, and over 15 years of experience in the development of application technology solutions. Previously serving as the R&D leader and technical director in three well-known inverter companies, a senior expert in frequency conversion control solutions and power electronic component applications.

Application Technologist (2)

Chinese, bachelor, master, doctor of mechanical and electronic engineering and postdoctor of optical engineering from National University of Defense Technology. Previously participating in the eight military 863 special projects, one project funded by the National Natural Science Foundation, and two provincial-level scientific research projects. Mainly engaging in precision electromechanical system measurement and control, target detection and signal processing, and research and application of advanced sensing and perception mechanisms.

Quality Management Director

Chinese, majoring in mechanical design, manufacturing, and automation engineering, with about 10 years of quality work experience in automobile making and semiconductor industries. Responsible for quality management in three well-known listed companies before and after, with in-depth knowledge and practical experience in quality management systems, third-party audits, manufacturing, and quality control.

Packaging Technology Director

Chinese, Bachelor of Engineering in Optoelectronic Information Engineering, with 11 years of experience in semiconductor packaging. Previously working in three listed semiconductor companies, i.e. serving as the core technology leader of Semiconductor Engineering Center of ATX, an expert in new product research and development technology of ON Semiconductor, and the manager of Engineering Department of Knowles.

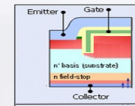
Industrial Resources and Technology Consultant

Chinese, Doctor of Fudan University. Previously working in Shanghai SIM-BCD and ASMC, responsible for research and development of product technology; Former chief of Integrated First Division of Huahong, chief expert of 1700~6500V IGBT chip manufacturing process of National 02 special project; Former Deputy Director of Research and Development Department of TSMC (China) Co., LTD., member of ISPSD TPC (Technical Committee) of International Power Semiconductor Forum, and president of Shanghai High Voltage Branch.



CATALOG

01



**Introduction to Industrial
Capability of Leading Energy**

02



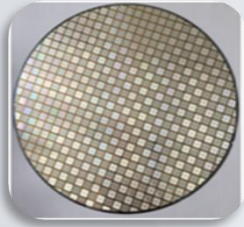
**Introduction to IGBT Chips and
Devices**

03



**Introduction to Plans and
Products of Frequency Converter**

Chip Products



- Technology**: Trench & Field Stop (Trench grating/field termination) process;
- Benchmarking products**: Chip performance benchmarking Infineon T series 4th generation products;

Product specifications

700V	15A ~ 200A
1200V	15A ~ 225A
1700V	100A ~ 200A

Module Products



Product specifications

650V~750V	100A~ 150A
1200V	15A ~ 800A
1700V	100A ~ 200A

- **Performance characteristics**: fast switching speed, low saturation voltage, low trailing current, strong short-circuit bearing capacity
- **Product categories**: K(slow), H (fast), S (super fast)
- **Application areas**: frequency converters, servo motor control, welding machines, SVG, wind energy systems, UPS, and other fields
- **Application replacement**: able to completely replace Infineon products



Product	I_c (A) @100°C	V_{ces} (V)	$V_{ce(sat)}$ (V)	E_{off} (mJ)	Disc specifications (mm)	Typical application directions
LEGW15T120HA1	15	1200	1.85	0.81	200	Frequency converter, servo motor control, electric vehicle
LEGW25T120HA1	25	1200	1.85	1.5	200	Frequency converter, servo motor control, electric vehicle
LEGW35T120HA1	35	1200	1.85	1.9	200	Frequency converter, servo motor control, electric vehicle
LEGW50T120HA1	50	1200	1.85	3.1	200	Frequency converter, servo motor control, electric vehicle
LEGW50T120SA1	50	1200	2.05	2.6	200	High frequency chip version, suitable for welding machines, induction heating, etc.
XMGW75T120HA1	75	1200	1.85	4.1	200	Frequency converter, servo motor control, UPS
XMGW75T120SA1	75	1200	2.05	3.9	200	High frequency chip version, suitable for welding machines, induction heating, etc.
XMGW100T120HA1	100	1200	1.70	7.8	200	Frequency converter, servo motor control, UPS, wind power generation, SVG
XMGW100T120SA1	100	1200	2.05	5.2	200	High frequency chip version, suitable for welding machines, induction heating, etc.
XMGW150T120HA1T	150	1200	1.85	10.5	300	Frequency converter, servo motor control, electric vehicle
XMGW200T120HA1	225	1200	1.70	20.3	200	UPS, motor control and drive, wind energy system, SVG
XMGW200T120SA1	225	1200	2.05	11.7	200	High-frequency chip version, induction heating, servo motor control
XMGW50T75HA1T	50	700	1.55	1.7	200	Energy storage, UPS, Electric vehicle, PV inverter, SVG
XMGW75T75HA1T	75	700	1.55	2.6	200	Energy storage, UPS, Electric vehicle, PV inverter, SVG
XMGW100T75HA1	100	700	1.55	3.5	200	Energy storage, UPS, Electric vehicle, PV inverter, SVG
XMGW150T75HA1E	150	700	1.55	5.3	200	Energy storage, UPS, Electric vehicle, PV inverter, SVG
XMGW225T75HA1E	225	700	1.55	7.9	200	Energy storage, UPS, Electric vehicle, PV inverter, SVG

Tj= 25 °C, unless otherwise specified

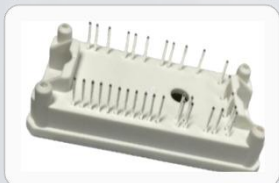
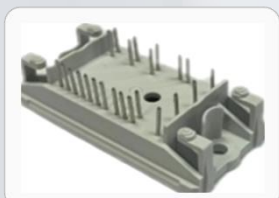


E1/E2 series products: benchmarking Infineon Easy series



Models of LEADING-ENERGY	Models of Infineon	Typical Applications
LEGM15BE120E1HZ	FP15R12W1T4	Frequency converter and servo motor control
LEGM35TD120E1HZ	FS35R12W1T4	
LEGM25BE120E2HZ	FP25R12W2T4	
LEGM35BE120E2HZ	FP35R12W2T4	
LEGM50TD120E2HZ	Customization	
LEGM75TD120E2H	FS75R12W1T4	Energy storage
LEGM100BC70E2H (Welding)	F3L100R07W2E3_B11 (Crimping)	

E4/E5 series products: (benchmarking Vincotech products)



Models of LEADING-ENERGY	Models of Vincotech	Typical Applications
LEGM15BE120E4HZ	V23990-P540-A01-PM	Frequency converter
LEGM25BE120E5HZ	10-F112PMA25M7-P589A79	
LEGM35BE120E5HZ	10-F112PMA35M7-P589A79	

E3 series products: customized models



Models of LEADING-ENERGY	Models of Infineon	Typical Applications
LEGM15TD120E3HZ	None	Frequency converter and servo motor control
LEGM25TD120E3HZ	None	
LEGM35TD120E3HZ	None	
LEGM50TD120E3HZ	None	

L1 series products: benchmarking Infineon 2-unit 34mm series



Models of LEADING-ENERGY	Models of Infineon	Typical Applications
LEGM50BH120L1SZ	FF50R12RT4	Electric welding machine
LEGM75BH120L1SZ	FF75R12RT4	
LEGM100BH120L1SZ	FF100R12RT4	
LEGM75BH120L1H	FF75R12RT4	Frequency converter, servo motor control and UPS
LEGM100BH120L1H	FF100R12RT4	
LEGM150BH120L1H	FF150R12RT4	
LEGM150CL120L1H	DF150R12RT4	Chopped wave speed regulating
LEGM100CH120L1H	FD100R12RT4	
LEGM150CH120L1H	FD150R12RT4	
LEGM100BH70L1H	GD100HFT60C1S (Star)	Inverter power supply, UPS



L2 series products: benchmarking Infineon 2-unit 62mm series



Models of LEADING-ENERGY	Models of Infineon	Typical Applications
LEGM150BH120L2H1	FF150R12KT3G	Frequency converter, servo motor control and UPS
LEGM200BH120L2H1	FF200R12KT4	
LEGM300BH120L2H1	FF300R12KT4	
LEGM450BH120L2H1	FF450R12KT4	
LEGM200BA120L2H1	FF200R12KT3_E	SVG and Chopped wave speed regulating
LEGM300BA120L2H1	FF300R12KE4-E	
LEGM200CL120L2H1	DF200R12KE3	Chopped wave speed regulating
LEGM300CL120L2H1	DF300R12KE3	
LEGM450CL120L2H1	DF400R12KE3	
LEGM200CH120L2H1	FD200R12KE3	
LEGM300CH120L2H1	FD300R12KE3	
LEGM450CH120L2H1	FD400R12KE3	

L4 series products: benchmarking Infineon Econo PIM2/Pack2



Models of LEADING-ENERGY	Models of Infineon	Typical Applications
LEGM25BF120L4HZ	FP25R12KT3	Frequency converter and servo motor control
LEGM35BE120L4HZ	FP35R12KT4	
LEGM40BF120L4HZ	FP40R12KT3	
LEGM50BE120L4HZ	FP50R12KT4	
LEGM75BE120L4H	FP75R12N2T4	
LEGM50TD120L4HZ	FS50R12KT3	
LEGM75TD120L4H	FS75R12KT3	

L3 series products: customized models



Models of LEADING-ENERGY	Models of Infineon	Typical Applications
LEGM200BT120L3H	Customization	SVG
LEGM300BT120L3H	Customization	

L5 series products: benchmarking Infineon Econo PIM3/Pack3



Models of LEADING-ENERGY	Models of Infineon	Typical Applications
LEGM40BF120L5HZ	FP40R12KT3G	Frequency converter and servo motor control
LEGM50BE120L5HZ	FP50R12KT4G	
LEGM50BF120L5HZ	FP50R12KT3	
LEGM75BF120L5H	FP75R12KT3	
LEGM75BE120L5H	FP75R12KT4	
LEGM100BE120L5H	FP100R12KT4	
LEGM100TD120L5H	FS100R12KT3/ FS100R12KT4G	
LEGM150BE120L5H	FP150R12KT4	Electric tools
LEGM150TD120L5H	FS150R12KT3/ FS150R12KT4	
LEGM200TD120L5H	GD200FFX120C6SA(Star)	
LEGM50TF120L5H	Customization	

L4 series products: benchmarking Infineon Econo DUAL™ 3



Models of LEADING-ENERGY	Models of Infineon	Typical Applications
LEGM200BH120L6H	FF200R12ME4	Frequency converter, wind energy system and UPS
LEGM300BH120L6H	FF300R12ME4	
LEGM450BH120L6H	FF450R12ME4	
LEGM600BH120L6H	FF600R12ME4	

D3 series products:



Models of LEADING-ENERGY	Models of benchmarking products	Typical Applications
LEGM100CW120D3H	MMG100J120UZ6TN (MACMIC)	Frequency converter and servo motor control
LEGM100CU120D3S	LGM100SG120S1F1 (LUXIN)	Welding machine

L7 series products: benchmarking Infineon 1-unit 62mm



Models of LEADING-ENERGY	Models of Infineon	Typical Applications
LEGM600CU120L7H	FZ600R12KE4	UPS, Motor control and drive
LEGM800CU120L7H	FZ800R12KE3	



Comparison of performance between self-developed chips, domestic products, and mainstream chips of the same specifications: Taking 1200V 100A H series chips as an example

Dynamic Condition Tj=150°C			
	LEADING-ENERGY	Representative foreign brands	Representative domestic brands
I _{SC}	350A	600A	1000A
E _{on}	4.5mJ	4.2mJ	5.8mJ
E _{off}	11.2mJ	12.1mJ	13.2mJ
I _{CRM}	300A	200A	200A

Short-circuit current capability: Self-produced chips are nearly twice as good as imported chips and twice as good as domestic similar chips;

Turn-off current capability: The self-developed chip has a performance of 3 times the nominal current, and it is 50% better than that of competitors;

Switching loss: The advantage of switch-off loss is obvious, and the overall switching loss is better than that of competitors;

★ Compared with imported and domestically produced chips of the same specification, IGBT chips of the same series, such as 1200V 15A 25A 35A 50A 150A 225A, have the same electrical performance and application characteristics.

More efficient

Comprehensive energy saving of about 5%~18%;



Higher reliability

Anti-overload impact capacity increased by about 50%;



Lower system costs

Significantly reducing additional costs such as overall system cooling and protection;

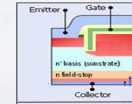
LEADING-ENERGY has been developing in the field of power semiconductors for nearly 10 years, focusing on core technology research and industrialization capabilities. At present, we have obtained bulk orders from over **50 customers** in China, among which we have established cooperative relationships with many industry-leading enterprises or are currently introducing products.





CATALOG

01



**Introduction to Industrial
Capability of Leading Energy**

02



**Introduction to IGBT Chips
and Module Products**

03



**Introduction to Plans and
Products of Frequency Converter**

Analysis of current situation and pain points

- *Industrial control market demand continues to expand.
- *Cost pressure is increasing.
- ***The production process of a single-tube low-cost frequency converter is complicated and there are potential safety hazards.**

A new 'module product plan' has emerged

- *The new frequency converter **module machine plan** has comprehensive functions, and the manufacturer ensures the performance and quality, and the future iteration upgrade.
- ***The cost of this plan is comparable to that of a single tube machine**, which not only simplifies the production process, but also reduces potential safety hazards and improves product reliability.



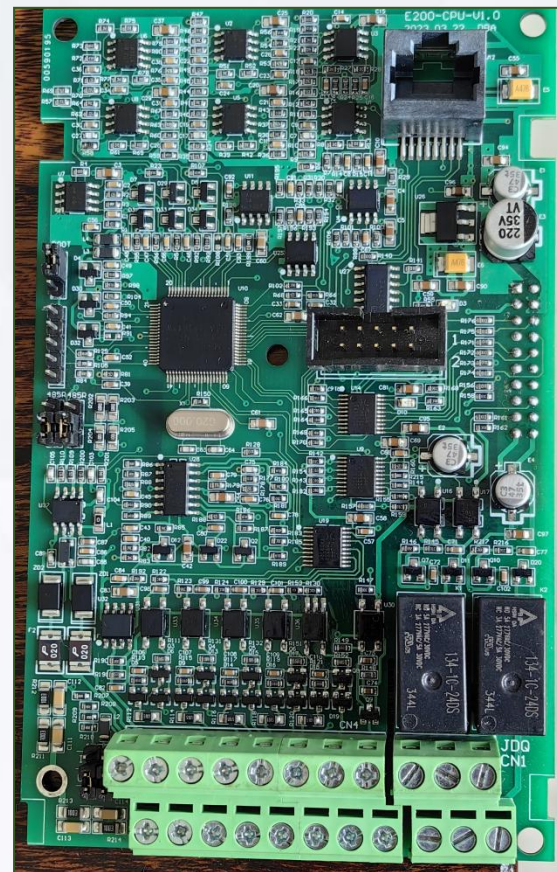
Provide external wiring terminals that users often need



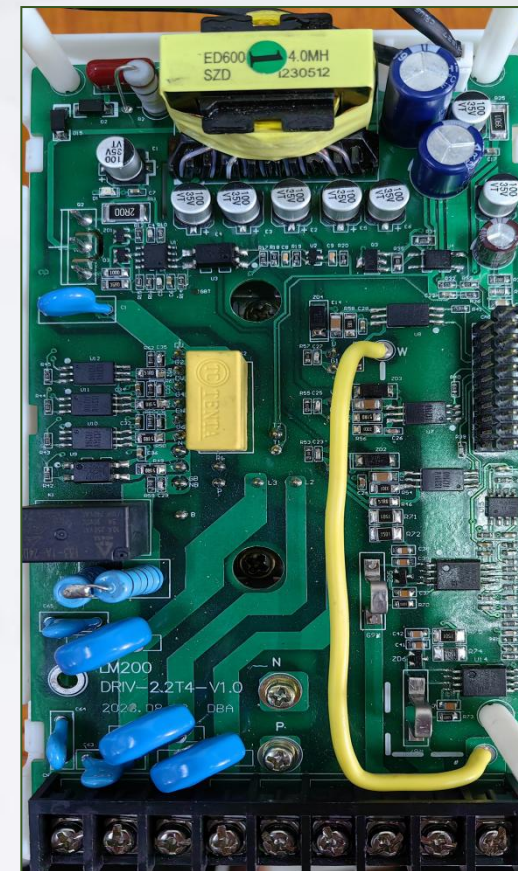
Digital input terminals	Providing 5 digital input terminal DI1—DI5
Analog input terminals	Providing 1 analog input terminal AI1
Digital output terminals	Providing 1 digital output terminal DO1
Analog output terminals	Providing 1 analog output terminal AO1
Relay output terminals	Providing 2 relay output terminals
485 communication terminals	Providing1 485 communication terminal
24V power output terminals	Supporting 200mA current output
External keyboard terminals	External keyboard can be connected



Appearance of Functional Board



Main control board



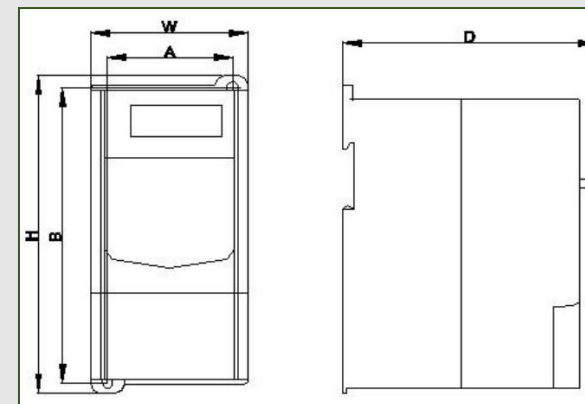
Power driver board



Appearance and Size of Products



Legend



Model of frequency converter	External dimension (mm)		
	W	D	H
LM200-0R7T4	88.5	125	163
LM200-1R5T4	88.5	125	163
LM200-2R2T4	88.5	125	163

Cost Accounting

Batch (≥ 1000 sets) machine material cost (including tax) accounting:

Machine model	Material cost	Remarks
$\leq 1.5\text{KW}$	No more than 215 yuan	Excluding production labor costs
2KW	No more than 225 yuan	Excluding production labor costs



Thank you for listening, looking forward to cooperation

Leading Energy (Beijing) Electronic Technology Co., Ltd.

Company website: www.leadingenergy-tec.com

Tel: 86-10-62322232

Email: peter_huang@semicoast.com