Innosense

Current Sensors Guidebook

for Motor Controllers

V2025.02

Innosense

About Innosense

Innosense is a professional current sensor, position sensor company, focusing on R&D, manufacturing, sales and service of system sensor solutions. Our goal is to provide the best sensor solutions for automotive, photovoltaic, energy storage and industrial automation industries.

The core team members all come from key positions in the world's leading sensor companies with more than 10 years' experience in the industry. Our core technology is protected by independent and original global intellectual property rights, enabling us to offer original and exclusive solutions to our customers. Founded in Shanghai in 2021, the company has opened an innovative R&D center in France with the aim of becoming a world-class technology company.

Innosense has successfully launched new products answering to challenges of automotive industry on current measurement and position sensing. Innosense's current sensor solutions offer several advantages over existing market sensors.

Certifications

IATF16949 Certification

ISO45001 Certification

ISO14001 Certification

ISO9001 Certificate

Applications

Automotive

Solar/ Wind Energy

Energy Storage Systems

Industrial Automation

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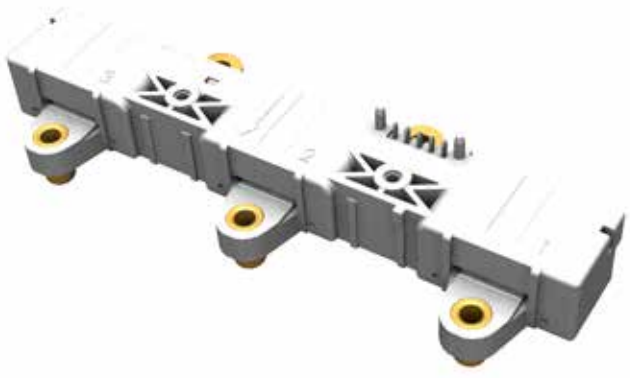
Product Profile

M3A



(The picture is for reference only, please refer to the actual product.)

Introduction:

Three-phase open-loop Hall principle current sensor, perfectly matched HP Drive_Long tap IGBT module, suitable for motor controller three-phase current sensing, matching with 800V system applications.

Apply to:

- HPD_LONG TAP

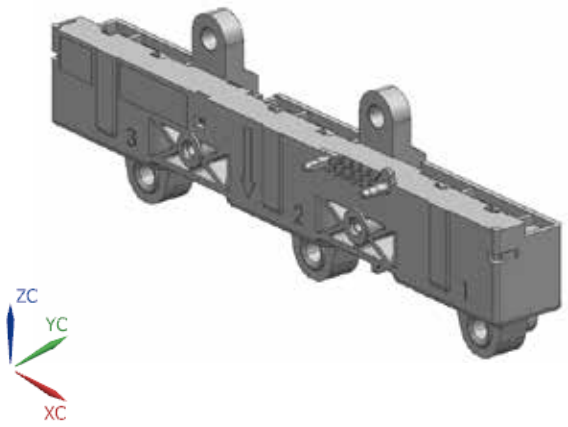
Parameters:

- Current Measurement Range: ±1200 A
- Response Time: 2 μs
- Zero Offset: 10 mV
- Operating Temperature: -40°C ~ 125°C
- Global Error at Room Temperature: 1%
- Global Error at Full Temperature: 3%
- Frequency Bandwidt: DC to 40 kHz
- Applicable system voltage: 800 V

Features:

- Two/three-phase sensing is optional
- Wide range of current sensing
- Matching 800V system applications

Dimensions(mm):

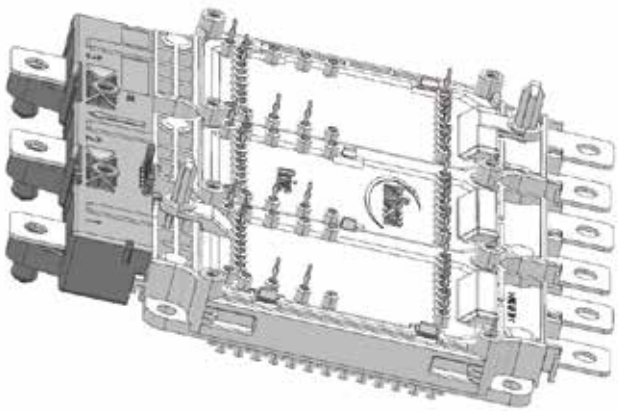


	M3A	M3D
XC	125.9	112.9
YC	15.9	18.9
ZC	18.9	15.9

IGBT Application:

(The pictures are for illustration only. Please refer to the actual installation for accuracy)

HP Drive LONG TAP



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M3B

（The picture is for reference only, please refer to the actual product.）

Introduction：

Three-phase open-loop Hall principle current sensor, perfectly matched HPD_Short Tap IGBT, suitable for motor controller three-phase current sensing, compatible with 800V system applications.

Apply to：

- HPD_SHORT TAP

Parameters：

- Current Measurement Range: ±1200 A
- Response Time: 2 μs
- Zero Offset: 10 mV
- Operating Temperature: -40°C to 125°C
- Global Error at Room Temperature: 1%
- Global Error at Full Temperature: 3%
- Frequency Bandwidth: DC to 40 kHz
- Applicable system voltage: 800 V

Features：

- Perfectly matched to HPD_Short Tap IGBT
- Two/three - phase sensing is optional
- Wide range of current sensing
- Matching 800V system applications

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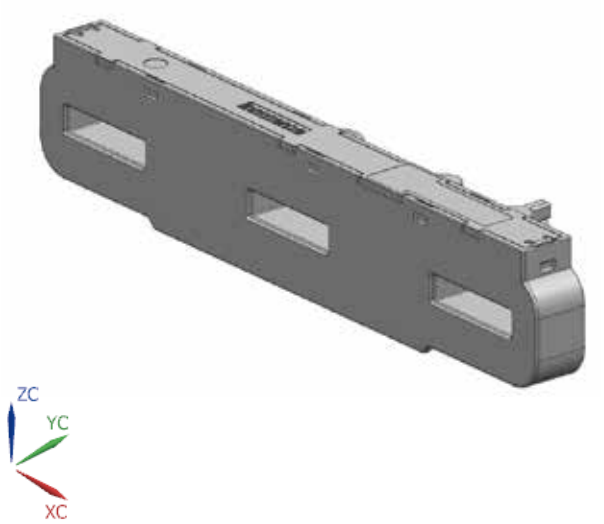
Dimensions(mm):

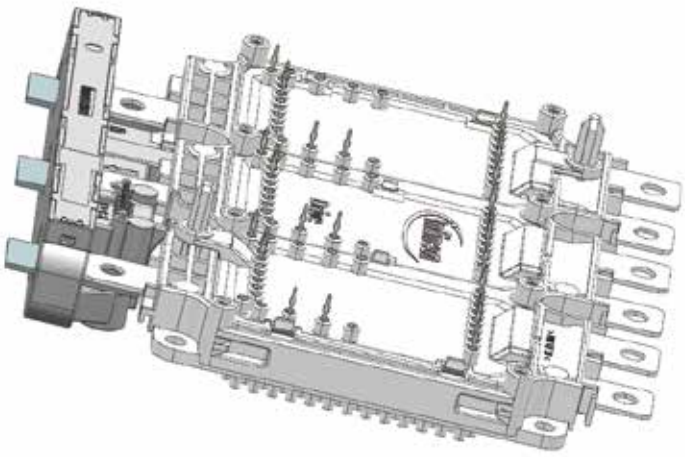


	M3B	M3E
XC	127.8	114.8
YC	10.4	10.4
ZC	24.4	24.4

IGBT Application:

(The pictures are for illustration only. Please refer to the actual installation for accuracy)

HP Drive SHORT TAP



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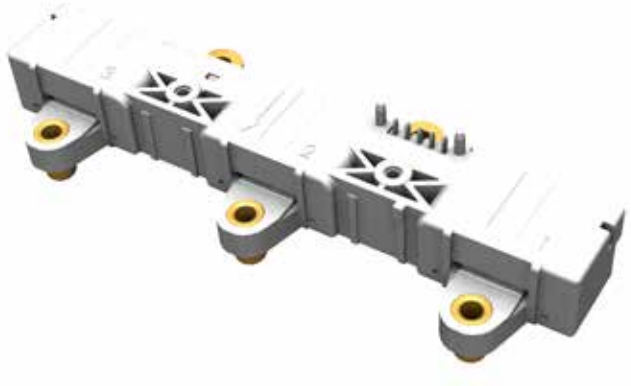
M3D



(The picture is for reference only, please refer to the actual product.)

Introduction:

Three-phase open-loop Hall principle current sensor, perfectly matched HPD_Mini long Tap IGBT, suitable for Motor controller three-phase current sensing, matched with 800V system application.

Apply to:

- HPD_Mini_LONG TAP

Parameters:

- Current Measurement Range: ±1200 A
- Response Time: 2 μs
- Zero Offset: 10 mV
- Operating Temperature: -40°C to 125°C
- Global Error at Room Temperature: 1%
- Global Error at Full Temperature: 3%
- Frequency Bandwidth: DC to 40 kHz
- Applicable system voltage: 800 V

Feature:

- Perfectly matched to HPD_Long Tap IGBT
- Two/three-phase sensing is optional
- Wide range of current sensing
- Matching 800V system applications

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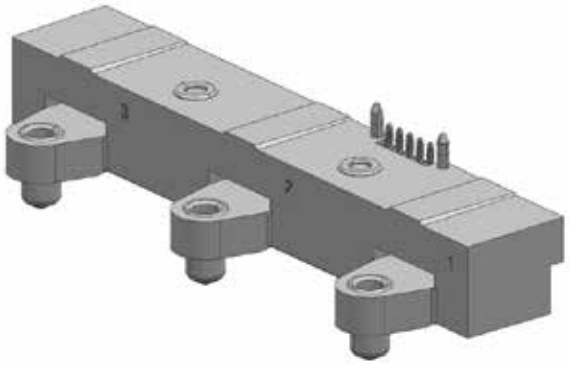
Dimensions(mm):

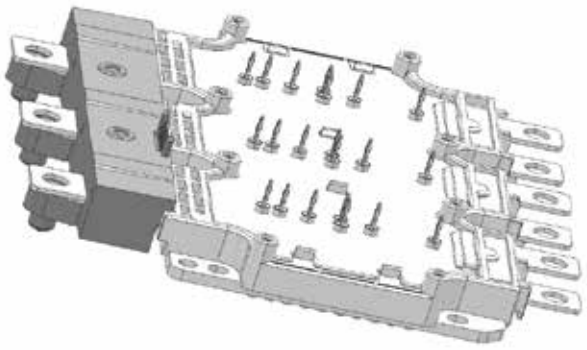


	M3D	M3A
XC	112.9	125.9
YC	18.9	15.9
ZC	15.9	18.9

IGBT Application:

(The pictures are for illustration only. Please refer to the actual installation for accuracy.)

HP Drive Mini_ LONG TAP



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M3E

(The picture is for reference only, please refer to the actual product.)

Introduction:

Three-phase open-loop Hall principle current sensor, perfectly matchedHPD_Mini short Tap IGBT, suitable for Motor Controller three-phase current sensing, matched with 800V system application.

Apply to:

- HPD_Mini_SHORT TAP

Parameters:

- Current Measurement Range: ±1200 A
- Response Time: 2 μs
- Zero Offset: 10 mV
- Operating Temperature: -40°C to 125°C
- Global Error at Room Temperature: 1%
- Global Error at Full Temperature: 3%
- Frequency Bandwidth: DC to 40 kHz
- Applicable system voltage: 800 V

Feature:

- Perfectly matched to HPD_Long Tap IGBT
- Two/three-phase sensing is optional
- Wide range of current sensing
- Matching 800V system applications

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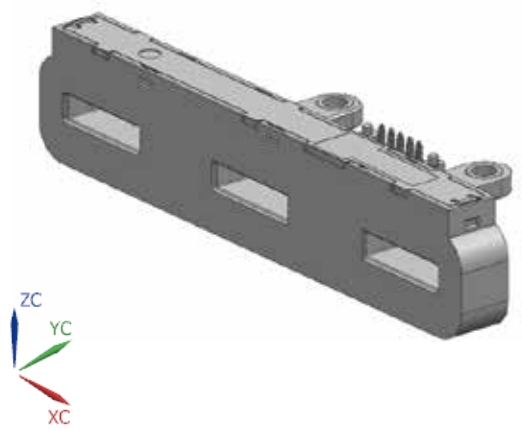
Dimensions(mm):

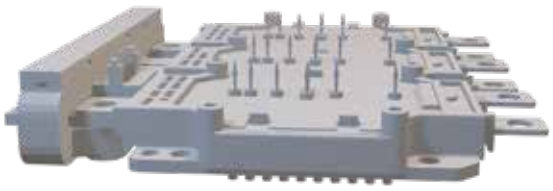


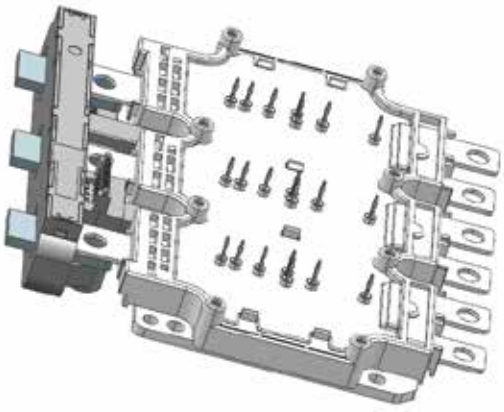
	M3E	M3B
XC	114.8	127.8
YC	10.4	10.4
ZC	24.4	24.4

IGBT Application:

(The pictures are for illustration only. Please refer to the actual installation for accuracy.)

HP Drive Mini_SHORT TAP





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MBA

（The picture is for reference only, please refer to the actual product.）

Introduction：

The MBA current sensor is a highly compact device designed for use in new energy vehicles. It measures both AC and DC currents and can be applied in several ways, including the sensing of three-phase AC currents in motors within the electric drive system, DC/DC booster current sensing and monitoring the DC currents involved in charging and discharging battery packs.

Apply to：

- DCM1000
- HPD_SHORT TAP（& Mini）
- Customized BOOSTER with special shape

Parameters：

- Current Measurement Range: ±1200 A
- Response Time: 2 μs
- Zero Offset: 10mV
- Operating Temperature: -40°C to 125°C
- Global Error at Room Temperature: 1%
- Global Error at Full Temperature: 3%
- Frequency Bandwidth: DC to 40 kHz
- Applicable system voltage: 800 V

Features：

- High accuracy and wide environmental compatibility
- Extremely compact design
- Easy and flexible installation
- The input end can be customized and the output end can be tailored with a wiring harness

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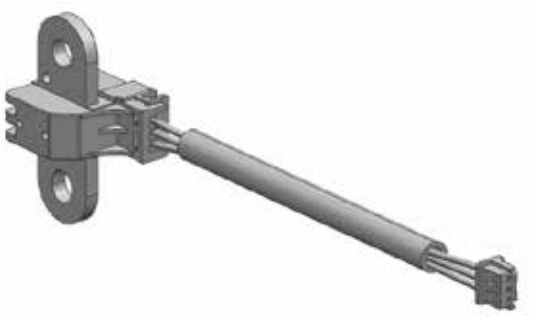
Outline Dimensions (mm) :

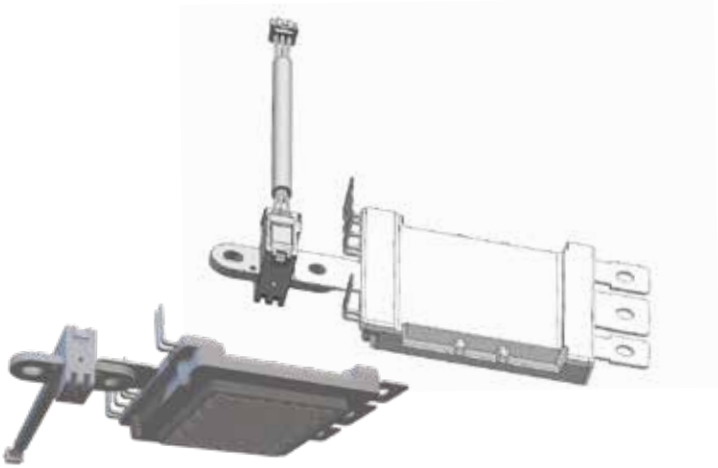


XC	17.4 (not include wiring harness)
YC	20.6
ZC	40

IGBT Application :

(The pictures are for illustration only. Please refer to the actual installation for accuracy.)

DCM1000



HP Drive SHORT TAP

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MPC

(The picture is for reference only, please refer to the actual product.)

Introduction:

MPC current sensor is based on the single-phase open-loop Hall principle. It is installed on a PCB and is used in scenarios where customer copper bars are parallel to the PCB. It is suitable for AC/DC current sensing applications such as DC Link and motor controller, and is compatible with 800V system applications.

Apply to:

- DCM1000
- HPD_LONG TAP
- HPD_SHORT TAP
- HPD_Mini_LONG TAP
- HPD_Mini_SHORT TAP

Parameters:

- Current Measurement Range: ±1200 A
- Response Time: 2 μs
- Zero Offset: 10 mV
- Operating Temperature: -40°C to 125°C
- Global Error at Room Temperature: 1%
- Global Error at Full Temperature 3%
- Frequency Bandwidth: DC to 40 kHz
- Applicable system voltage: 800 V

Features:

- Flexible matching of multiple IGBTs
- Compact in size
- Wide range of current sensing
- Matching 800V system applications

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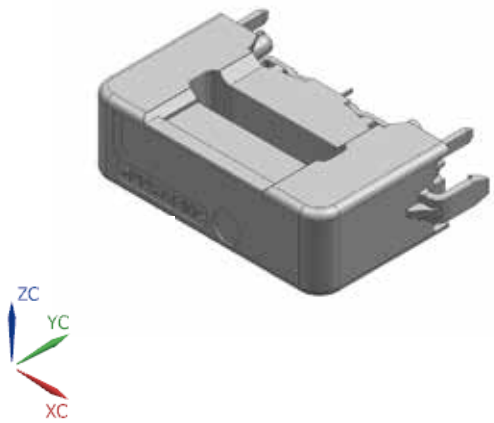
Dimensions(mm):

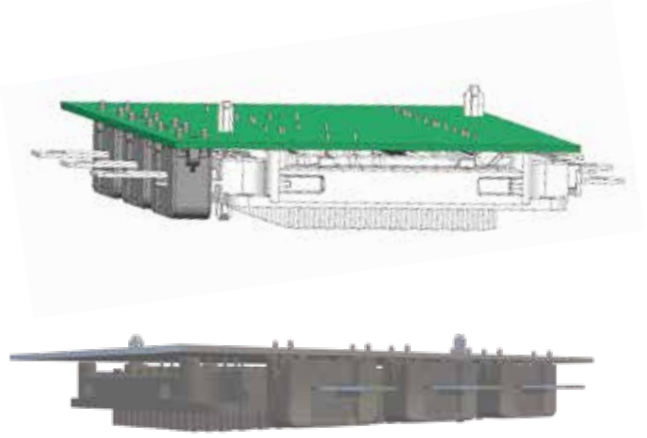


XC	34.2
YC	18.9
ZC	10.9

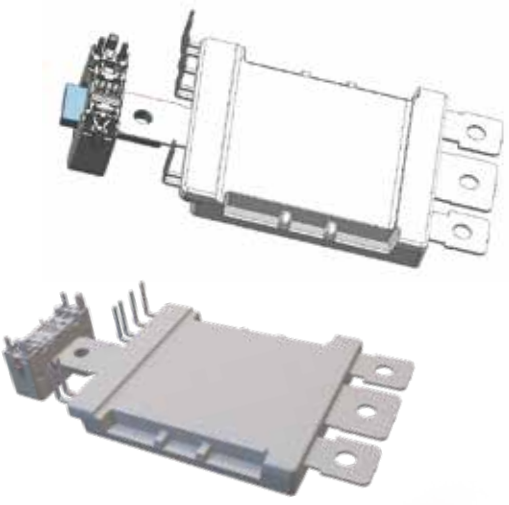
IGBT Application:

(The pictures are for illustration only. Please refer to the actual installation for accuracy.)

HP Drive LONG TAP



DCM1000



MPE

(The picture is for reference only, please refer to the actual product.)

Introduction:

With its ultra-thin design, MPE effectively saves customers' vertical installation space. There are two versions available: single-chip and dual-chip. The dual-chip version adopts leading dual Hall chip technology, greatly improving its ability to resist external magnetic field interference. The chips in the dual chip version not only work independently, but also diagnose each other, providing strong support for the functional safety design of the client. MPE is widely used in various AC/DC current sensing scenarios such as DC Link and motor controller, and can perfectly adapt to 400V and 800V system applications to meet diverse needs.

IGBT Application:

- TPAK

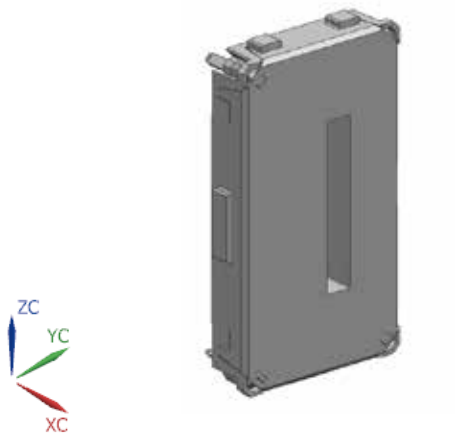
Parameters:

- Current Measurement Range: ±1200 A
- Response Time: 2 μs
- Zero Offset: 10 mV
- Operating Temperature: -40°C to 125°C
- Global Error at Room Temperature: 1%
- Global Error at Full Temperature: 3%
- Frequency Bandwidth: DC to 40 kHz
- Applicable system voltage: 400 V, 800 V

Features:

- Ultra thin product design, saving vertical space
- Single/dual-chip versions are available for selection
- Resist external magnetic field interference
- Independent output, mutual diagnosis
- Matching 400V and 800V system applications

Dimensions (mm) :

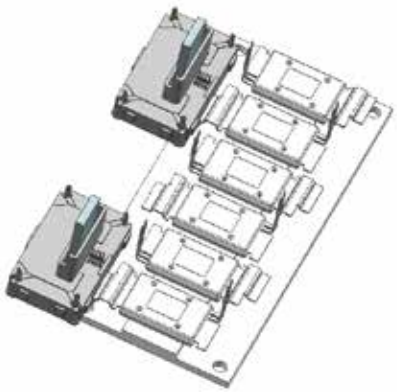


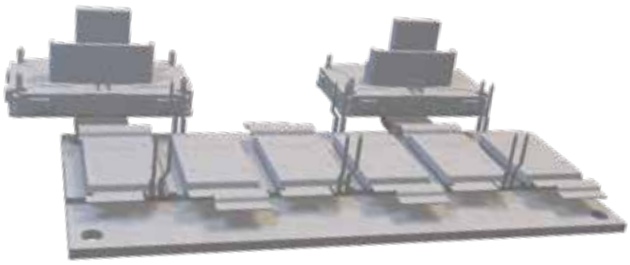
XC	7
YC	27
ZC	48

Intsallation:

(The pictures are for illustration only. Please refer to the actual installation for accuracy.)

TPAK





MPB

（The picture is for reference only, please refer to the actual product.）

Introduction：

Mounted on PCB , MPB current sensor is used in scenarios where the customer's copper bar is perpendicular to the PCB. It is suitable for AC/DC current sensing such as DC Link and motor controller, and is compatible with 400V system applications.

IGBT Application：

- HP1

Parameters：

- Current Measurement Range: ±900 A
- Response Time: 2 μs
- Zero Offset: 10 mV
- Operating Temperature: -40°C to 125°C
- Global Error at Room Temperature: 1%
- Global Error at Full Temperature: 3%
- Frequency Bandwidth: DC to 40 kHz
- Applicable system voltage: 400 V
-

Features：

- Compact in size
- Matching 400V system applications

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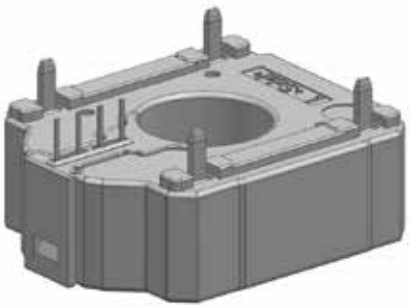
Dimensions (mm) :

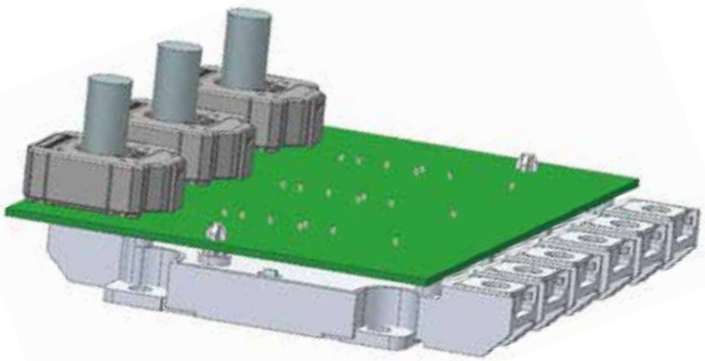


XC	27.7
YC	32.7
ZC	10.9

Installation :

(The pictures are for illustration only. Please refer to the actual installation for accuracy.)

HP 1



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M1A

(The picture is for reference only, please refer to the actual product.)

Introduction：

M1A current sensor is suitable for measuring both AC and DC currents in xEV applications. It can effectively sense the three-phase AC currents of the motor within the electric drive system of these vehicles. Additionally, it is capable of measuring DC currents during the charging and discharging of battery packs.

IGBT Application：

- DCM1000
- Customized BOOSTER with special shape

Parameters：

- Current Measurement Range: ±1200 A
- Response Time: 2 μs
- Zero Offset: 10 mV
- Operating Temperature: -40°C to 125°C
- Global Error at Room Temperature: 1%
- Global Error at Full Temperature: 3%
- Frequency Bandwidth: DCto 40 kHz
- Applicable system voltage: 800 V

Features：

- Copper bar installation method
- Flexible installation position
- Wide range of current sensing
- Matching 800V system applications

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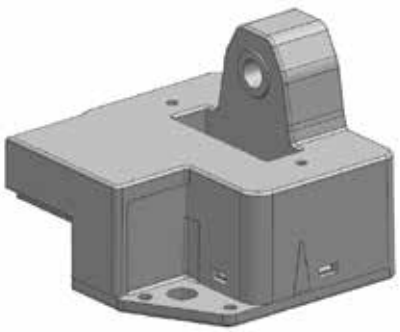
Dimensions (mm) :

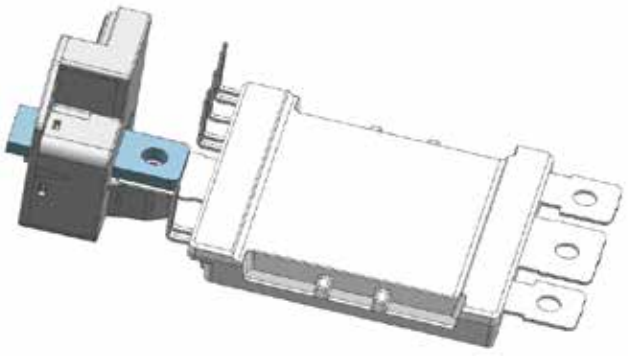


XC	39.5
YC	25.9
ZC	18.3

Installation:

(The pictures are for illustration only. Please refer to the actual installation for accuracy.)

DCM1000



M1A is also suitable for customized BOOSTER with special shape

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Applications

IGBT Module List

IGBT Category	IGBT Sketch	Suitable Products
DCM1000		MBA、M1A、MPC
HP1		MPB
HPD_LONG TAP		M3A、MPC
HPD_SHORT TAP		M3B、MPC、MBA
HPD_MINI_LONG TAP		M3D、MPC
HPD_MINI_SHORT TAP		M3E、MPC、MBA
MINI_PAK		M3C
TPAK		MPA、MPE

Notes

- MPC, MBA, MPB, M1A are suitable for various power modules
- Products can be customized accordingly

Other applications and products

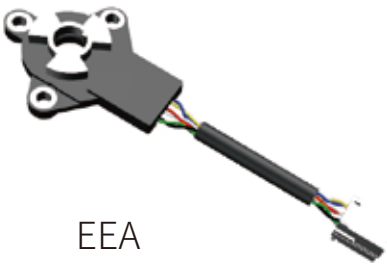
Current Sensors（for battery packs）

BB Series

B1 Series

Shunt+Hall Series

Position Sensors（for motors）



EEA

EEB

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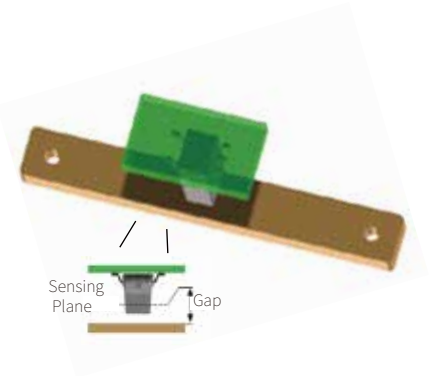
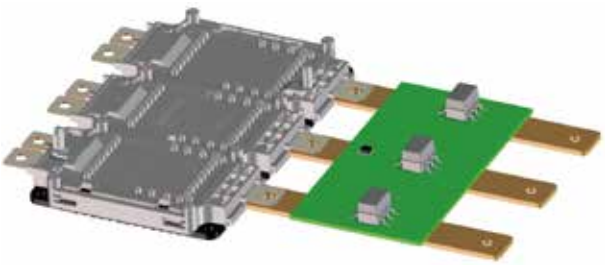
Innovative

New VMI Current Sensor：

(VMI=Variable Magneto Inductor)



- Original global intellectual property rights
- Best in class accuracy with very low offset
- Non-intrusive and coreless measurement
- Easy mechanical and electronic integration
- OCD & Safety ISO 26262 compliance
- 800V compliance



More new products, please stay tuned.

V2025.02

Innosense Electronics

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