

## Overview

The LA12 Magnetic Direct Current Sensors (MDCS™) use our proprietary magnetic material and hall element for magnetic detection of both direct current (DC) and alternating current (AC) as well as pulse current. The output voltage varies in proportion to the strength of the current measured.

## Applications

Typical applications include inverter-based home appliances (air conditioners), general purpose inverters, AC variable-speed drives and servo drives, industrial machinery, UPSs, and DC motor controls.

## Benefits

- Detection of DC, AC and pulse currents
- Limited fluctuations in output from changes in the power supply voltage and the ambient temperature
- Excellent linearity of the measured current and the converted power output
- Measured current and secondary output side are insulated
- Compact and lightweight
- RoHS compliant

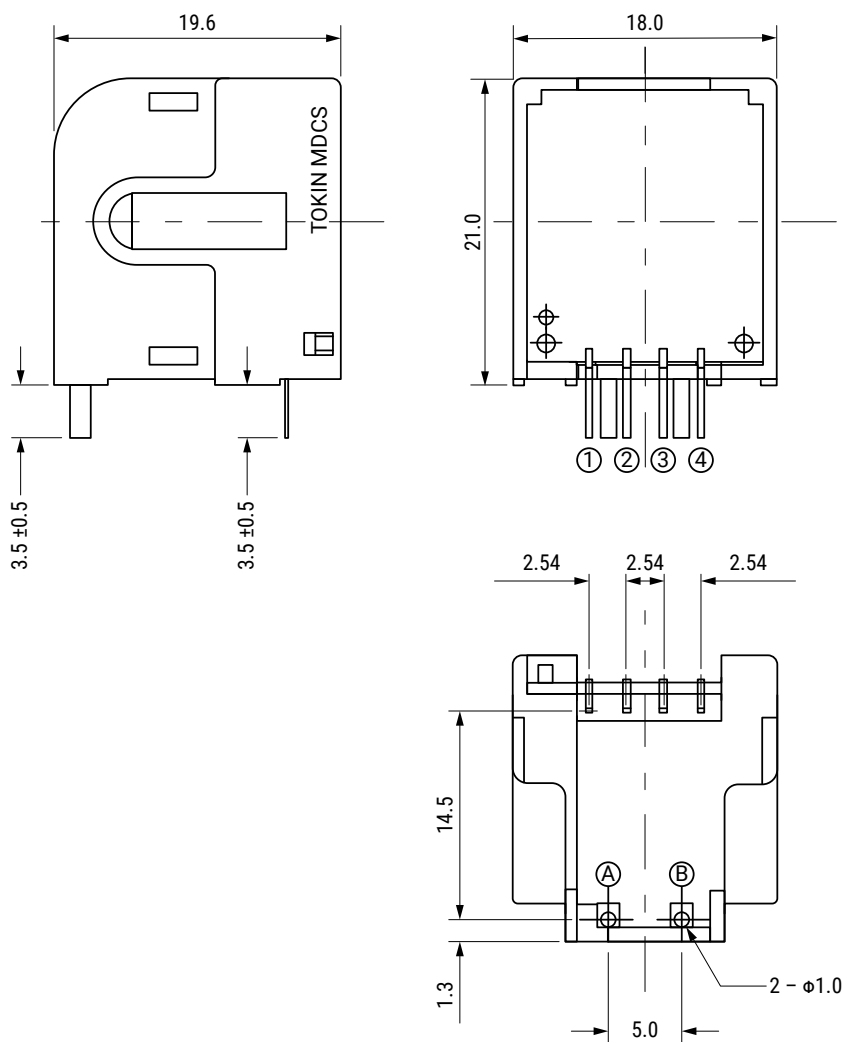


## Ordering Information

| LA12-  | 10                   | V21                |
|--------|----------------------|--------------------|
| Series | Rated Current AC (A) | Output Voltage (V) |
| LA12   | 10<br>48<br>50<br>60 | V21 = 2            |

## Dimensions in mm

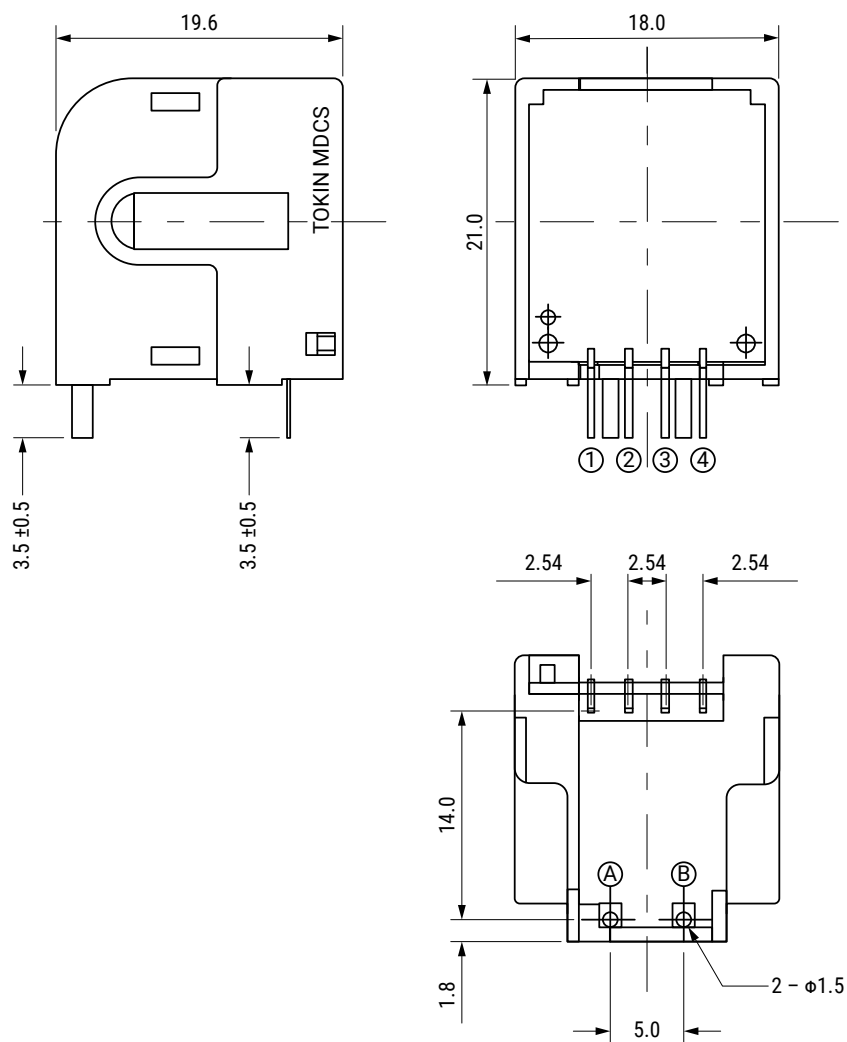
### LA12-10V21



| Pin Number | LA12                                  |
|------------|---------------------------------------|
| 1          | NC                                    |
| 2          | GND (Ground pin)                      |
| 3          | Vcc (+12 V)                           |
| 4          | V <sub>out</sub> (Output voltage pin) |
| A          | (Measured current ⊕ pin)              |
| B          | (Measured current Φ pin)              |

## Dimensions in mm (cont.)

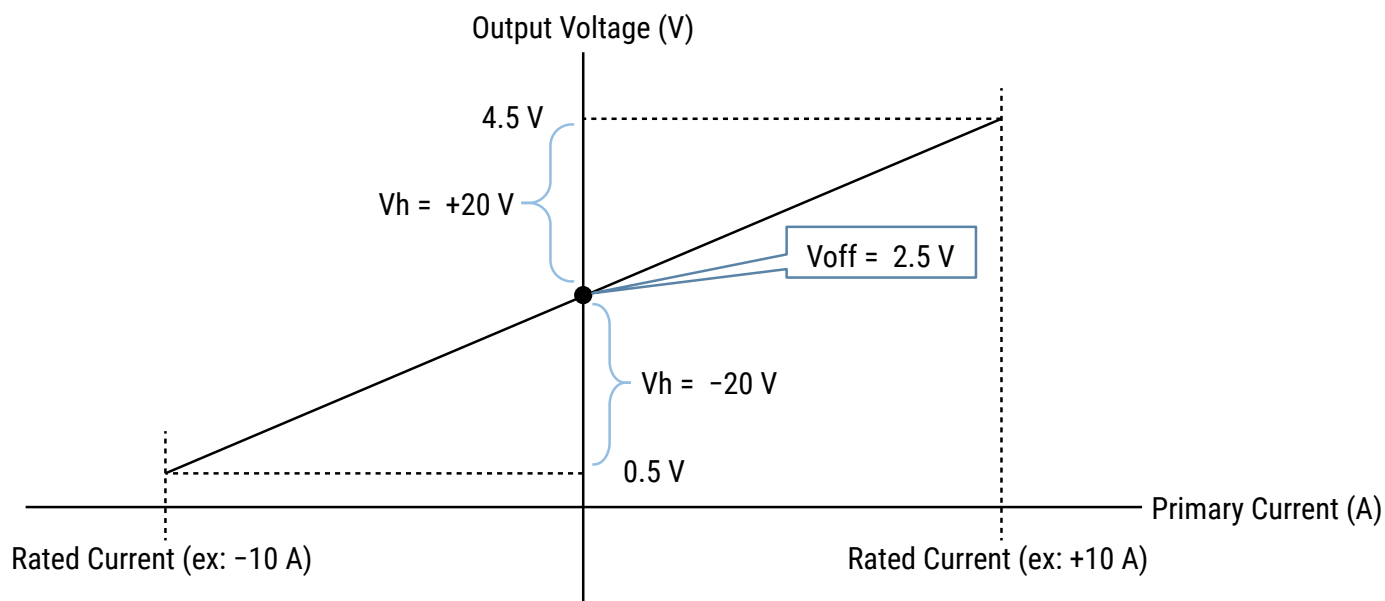
### LA12-48V21, LA12-50V21, & LA12-60V21



| Pin Number | LA12                                  |
|------------|---------------------------------------|
| 1          | NC                                    |
| 2          | GND (Ground pin)                      |
| 3          | Vcc (+12 V)                           |
| 4          | V <sub>out</sub> (Output voltage pin) |
| A          | (Measured current ⊕ pin)              |
| B          | (Measured current Φ pin)              |

## AC Output Characteristics

### Output Voltage Example LA12-10V21



## Environmental Compliance

All MDCS sensors are RoHS compliant.

## Specifications

| Item                         | Performance Characteristics                     |
|------------------------------|-------------------------------------------------|
| Rated Current                | 10 – 60 A                                       |
| Power Supply Voltage         | 12 V                                            |
| Consumption Current          | 40 mA Maximum                                   |
| Output Voltage               | 2,000 $\pm$ 0.06 V                              |
| Residual Voltage             | 2,500 $\pm$ 0.06 V                              |
| Hysteresis                   | 60 mV Maximum                                   |
| Pulse Response               | 20 $\mu$ s maximum ( $di/dt = 100$ AT/ $\mu$ s) |
| Linearity                    | -2 to 2                                         |
| Insulation Withstand Voltage | 2,000 VAC/1 minute                              |
| Insulation Resistance        | 500 VDC to 500 M $\Omega$                       |
| Operating Temperature Range  | -10°C to +75°C                                  |
| Storage Temperature Range    | -15°C to +80°C                                  |

**Table 1 – Ratings & Part Number Reference**

| Part Number | Rated Current (A) | Primary Side Windings (Turn) | Scope of Measurement       | Power Supply Voltage <sup>1</sup> (V) | Output Voltage <sup>2</sup> (V) | Residual Voltage <sup>3</sup> (V) | Insulation Withstand Voltage <sup>4</sup> | Insulation Resistance <sup>4</sup> | Weight (g) |
|-------------|-------------------|------------------------------|----------------------------|---------------------------------------|---------------------------------|-----------------------------------|-------------------------------------------|------------------------------------|------------|
| LA12-10V21  | 10                | 6                            | 0 to 100% of rated current | 12 ±5%                                | 2,000 ±0.06                     | 2,500 ±0.06                       | 2,000 VAC /1 minute                       | 500 VDC to 500 MΩ                  | 9.0        |
| LA12-48V21  | 48                | 2                            |                            |                                       |                                 |                                   |                                           |                                    | 7.8        |
| LA12-50V21  | 50                | 2                            |                            |                                       |                                 |                                   |                                           |                                    | 7.8        |
| LA12-60V21  | 60                | 1                            |                            |                                       |                                 |                                   |                                           |                                    | 7.4        |

<sup>1</sup> A power supply voltage variation 30 mV maximum

<sup>2</sup> At rated current and  $R_L = 10\text{ k}\Omega$ , temperature characteristics  $\pm 0.15\text{ }^\circ\text{C}$

<sup>3</sup> At 0A and  $R_L = 10\text{ k}\Omega$ , temperature characteristics  $\pm 4\text{ mV}/^\circ\text{C}$

<sup>4</sup> Between wire and terminals

## Soldering Process

### LA12-10V21, LA12-48V21, LA12-50V21 & LA12-60V21

|                  |                     |                   |
|------------------|---------------------|-------------------|
| Reflow Soldering | Heating temperature | 260°C             |
|                  | Heating time        | within 10 seconds |
| Iron Soldering   | Temperature of tip  | 350°C or lower    |
|                  | Worktime            | within 3 seconds  |

## Packaging

| Part Number | Packaging Type | Pieces per Box |
|-------------|----------------|----------------|
| LA12-10V21  | Tray           | 400            |
| LA12-48V21  |                |                |
| LA12-50V21  |                |                |
| LA12-60V21  |                |                |

## Handling Precautions

### Precautions for product storage

Current Sensors should be stored in normal working environments. While the sensors are quite robust in other environments, solderability will be degraded by exposure to high temperatures, high humidity, corrosive atmospheres, and long-term storage.

KEMET recommends that maximum storage temperature not exceed 80°C and atmospheres should be free of chlorine and sulfur-bearing compounds. Temperature fluctuations should be minimized to avoid condensation on the parts. Also, avoid storage near strong magnetic fields as this might magnetize the product and could cause its characteristics to change. Limit ambient magnetic fields to 50e or less.

For optimized solderability, Current Sensor's stock should be used preferably within 12 months of receipt.

### Before using magnetic direct current sensors

- Do NOT drop or apply any other mechanical stress as it may change the performance characteristics.
- Do NOT exceed 260°C for 10 seconds when soldering, this is the maximum heat resistance grade of these sensors. Use a low-corrosion type flux when soldering.
- Do NOT apply strong static electricity, as the circuit uses ICs, this could cause damage. Take static electricity precautions when handling.

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## Export Control

### For customers in Japan

For products that are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

### For customers outside Japan

Sensors should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destructive weapons (nuclear weapons, chemical or biological weapons, or missiles), or any other weapons.

## KEMET Electronics Corporation Sales Offices

For a complete list of our global sales offices, please visit [www.kemet.com/sales](http://www.kemet.com/sales).

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Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as the installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

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