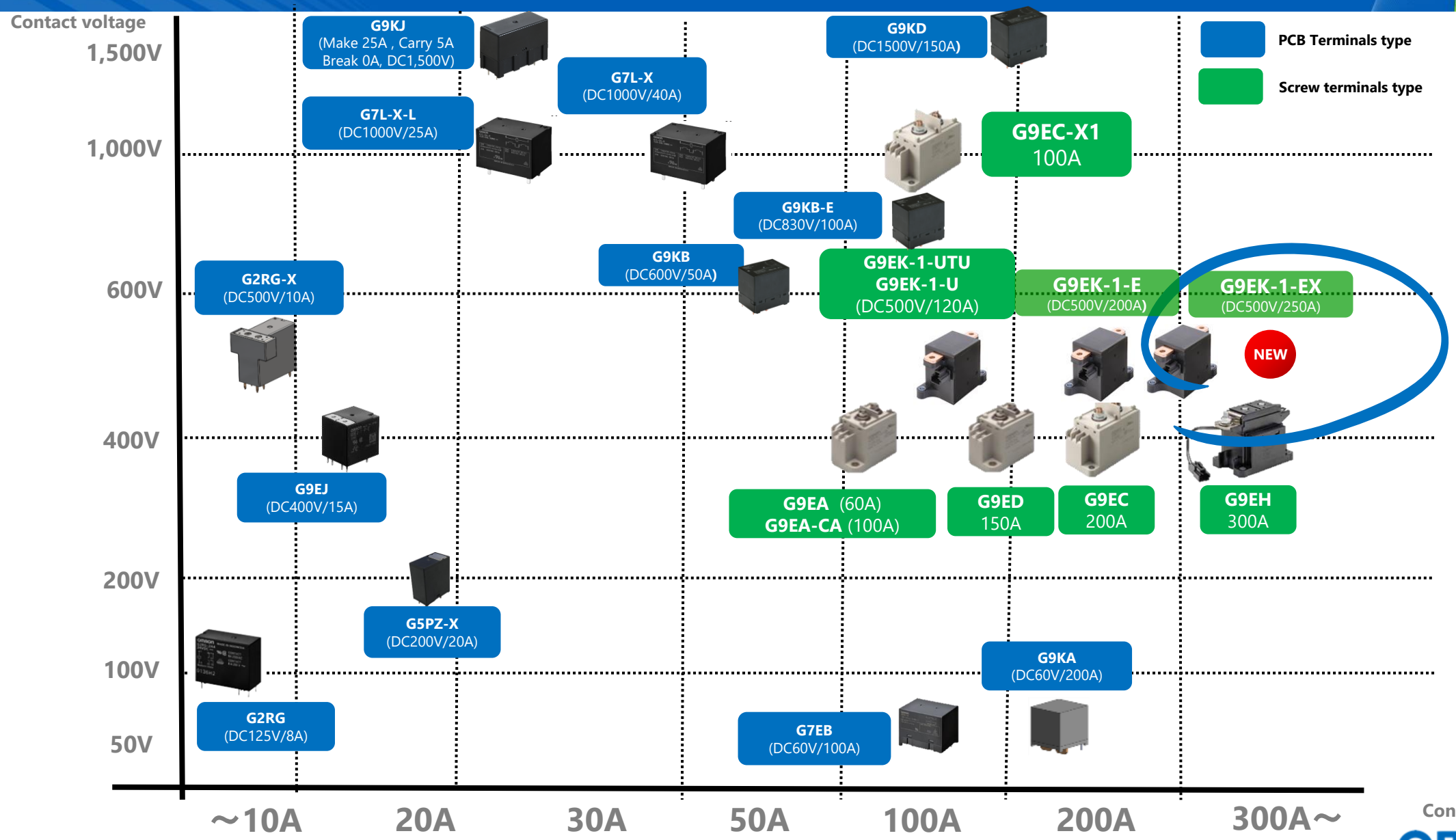
# New Product Information

# G9EK-1-EX

**Gasless High-capacity DC Power Relay**

# Updated Product Roadmap



# New Product Main Spec

●Contacts

| Item | G9EK-1-E | G9EK-1-EX |
|---|---|---|
| Rated load (resistive load) | 200 A at 500 VDC at 70°C at 50sq bus-bar | 250 A at 500 VDC at 70°C at 100sq bus-bar |
| Rated carry current | 200 A at 70°C at 50sq bus-bar | 250 A at 70°C at 100sq bus-bar |
| Maximum switching voltage | 500 VDC | 500 VDC |
| Maximum switching current | 200 A | 250 A |

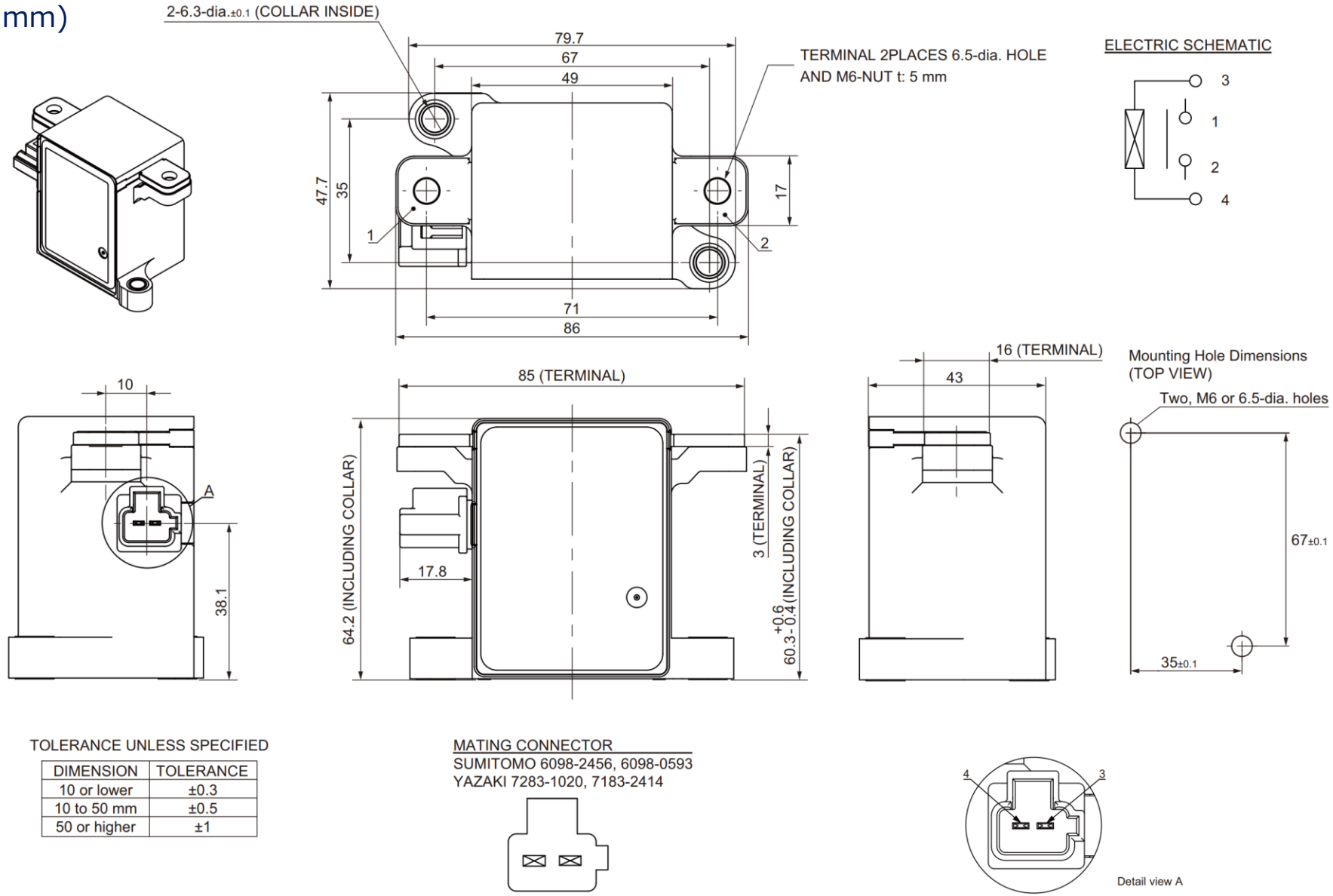
## Characteristics

| Item | Model | G9EK-1-E | G9EK-1-EX |
|---|---|---|---|
| Contact resistance *1 | | 15 mΩ max. | |
| Contact voltage drop | | 0.1 V max. (for a current of 200 A) | 0.125 V max. (for a current of 250 A) |
| Operate time | | 50 ms max. (Not including bounce time) | |
| Release time | | 30 ms max. (Not including bounce time) | |
| Insulation resistance *2 | Between coil and contacts | 1000 MΩ min. | |
| | Between contacts of the same polarity | 1000 MΩ min. | |
| Dielectric strength | Between coil and contacts | 2500 VAC 1 min | |
| | Between contacts of the same polarity | 2500 VAC 1 min | |
| Impulse withstand voltage *3 | | 4000 V | |
| Vibration resistance | Destruction | 33 Hz Acceleration: 45 $m/s^2$ | |
| | Malfunction | 10 to 500 Hz Acceleration: 45 $m/s^2$ | |
| Shock resistance | Destruction | 490 $m/s^2$ (pulse duration: 11 ms) | |
| | Malfunction (Energized) | 980 $m/s^2$ (pulse duration: 11 ms detection time: 10 μs) | |
| | Malfunction (De-energized) | 107.8 $m/s^2$ (pulse duration: 11 ms detection time: 10 μs) | |
| Mechanical endurance *4 | | 200,000 ops. min. | |
| Electrical endurance (Capacitive load) | | Inrush 140 A at 20 VDC (70000 operations min.) | |
| Electrical endurance (resistive load) *5 | | 200 A at 500 VDC (10 operations min.) | 250 A at 500 VDC (5 operations min.) |
| Short-time carry current | | Refer the IT Curve Graph | |
| Maximum interruption current *5 | | 1000 A at 400 VDC (1 operations min.) | |
| Ambient operating temperature | | -40 to 85°C (without freezing or condensation) | |
| Ambient operating humidity | | 5% to 85% | |
| Weight (Including accessories) | | Approx. 310 g | Approx. 340 g |

**Note:** Unless otherwise specified, the above values are the initial values at an ambient temperature of 23°C and ambient pressure of 1 atm.
*1. The contact resistance was measured with 1 A at 5 VDC using the voltage drop method.
*2. The insulation resistance was measured with a 1000-VDC megohmmeter.
*3. The impulse withstand voltage was measured with a JEC-212 (1981) standard impulse voltage waveform (1.2 x 50 μs).
*4. The mechanical endurance was measured at a switching frequency of 3,600 operations/hr.
*5. The switching performance and interruption performance were measured with varistor connected to absorb coil surge.

# New Product Main Spec

## Dimensions (Unit: mm)




TOLERANCE UNLESS SPECIFIED

| DIMENSION | TOLERANCE |
|---|---|
| 10 or lower | ±0.3 |
| 10 to 50 mm | ±0.5 |
| 50 or higher | ±1 |

MATING CONNECTOR

SUMITOMO 6098-2456, 6098-0593

YAZAKI 7283-1020, 7183-2414






Detail view A

# New Product Features & Benefits

## Features

- Added DC500V 250A specification to the G9EK series.
- Achieves high current and high voltage interruption performance of DC400V 1000A in a compact size.
- Achieves industry-leading * low power consumption and high short-circuit performance. This helps reduce overall system energy usage. *Based on OMRON investigation in October 2025.
- This is a multi-functional relay that has high short-circuit capabilities, which is essential for applications that carry large currents, such as batteries, as well as high vibration and shock resistance, which is effective for moving applications such as mobility.

## Benefits

- Interrupts large currents & high voltages of 1000 A, 400 VDC.
- Supports a 250A current rating (at 70℃) while maintaining the same compact size as the G9EK-1. (64.2 x 86 x 47.7 mm (H x W x L))
- Excellent short-circuit performance capable of withstanding large currents of up to 5,000A during abnormal conditions.
- High vibration and shock resistance makes it suitable for installation in mobility devices.
- Gas-less structure significantly reduces CO2 emissions during production.

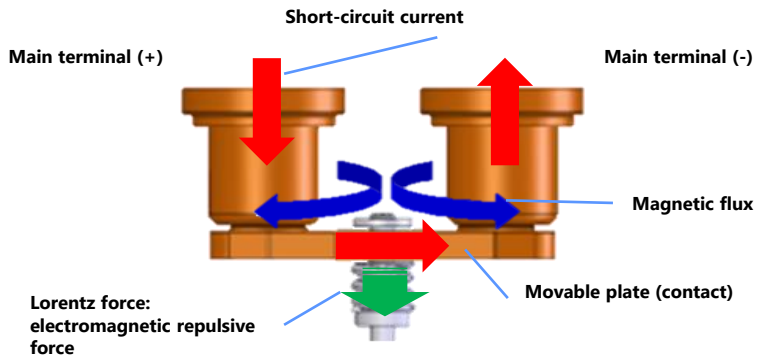
Contributing to carbon neutrality throughout the supply chain.

# New Product Features & Benefits

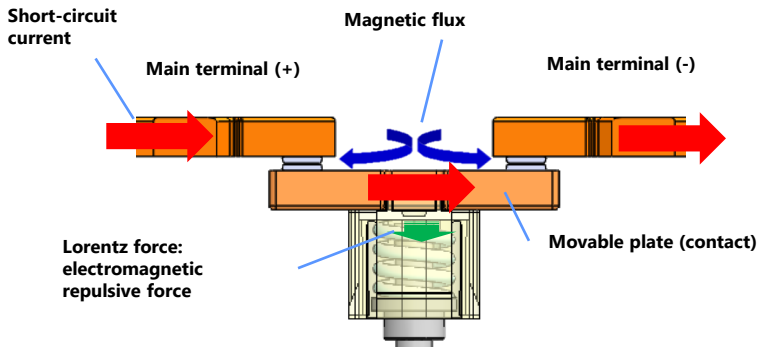
**<Low power consumption>** By optimizing the internal structure and electromagnet, the G9EK achieves industry-leading low power consumption for its class.

| Rated current | 60 A | 120 A | 250 A |
|---|---|---|---|
| Typical DC relay Power consumption | ~5 W | 6~7 W | 6~11 W |
| **G9EK-1-EX Power consumption** | **--** | **--** | **4W** |

**<Short-circuit resistance performance>** The gasless design enables a unique terminal structure that is less affected by electromagnetic repulsion during short-circuit events, even under currents of several thousand amperes.



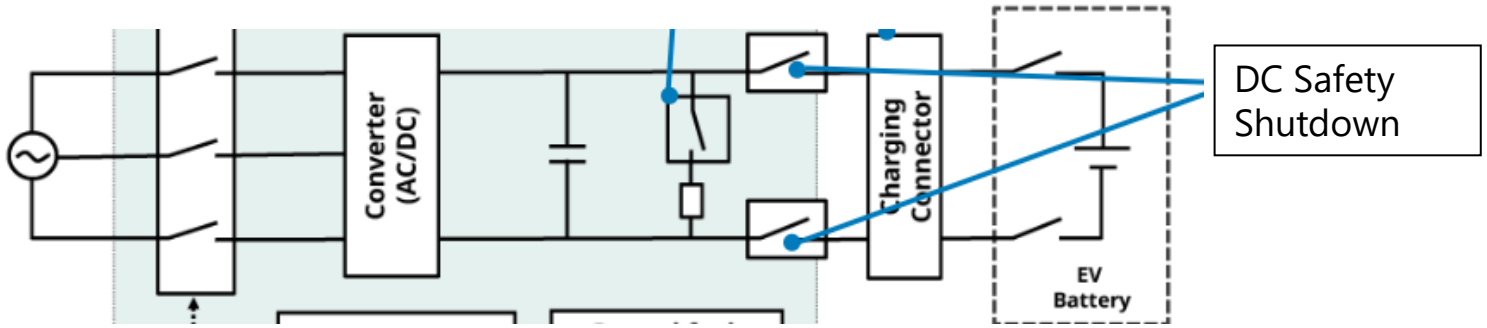

Conventional terminal structure



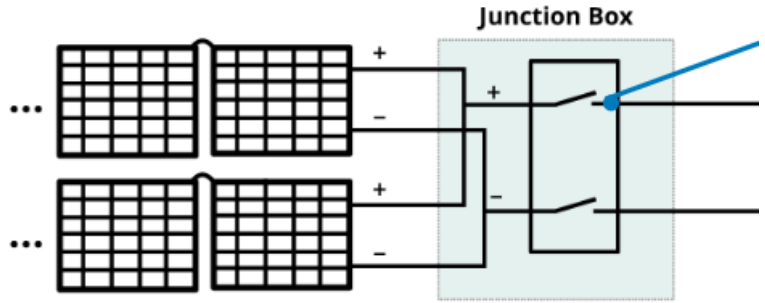

G9EK terminal structure

# Details of Target Application

DC Fast Charger



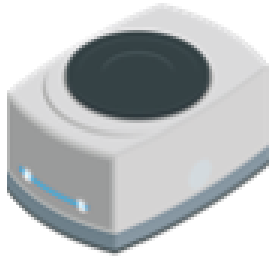

Rapid Shutdown


*This circuit block diagram conforms to NEC 2014.

PV Inverter (Commercial & Industrial)

AGV/AMR



# Thank You


OMRON