

## C-FAP Product Summary

### ● Basic operation of the C-FAP device

The C-FAP high-speed protector is a device for circuit protection using MOSFET. The C-FAP protector placed in series with the system to monitor the line current. If the current exceeds the set level, The C-FAP device protects sensitive electronic equipment by providing an effective barrier against excessive and destructive voltages and currents during surges.

When the line current exceeds the C-FAP device's trigger current ( $I_{\text{trigger}}$ ), the C-FAP device operates at about  $1\ \mu\text{m}$ . After operating, the C-FAP device limits line current to values below  $1\text{mA}$  and blocks voltages, including surges, up to the rated limit.

After a surge, the C-FAP automatically resets when the voltage across the C-FAP device drops below  $V_{\text{reset}}$ . C-FAP devices automatically reset on lines with no DC bias or DC bias below  $V_{\text{reset}}$  (signal lines with no power, etc.).

If the line has a normal DC bias above  $V_{\text{reset}}$ , the voltage across the C-FAP device may not drop below  $V_{\text{reset}}$  after a surge. Special care must be taken in such cases to guarantee resetting of the C-FAP device. Software monitoring can be used to achieve the above.

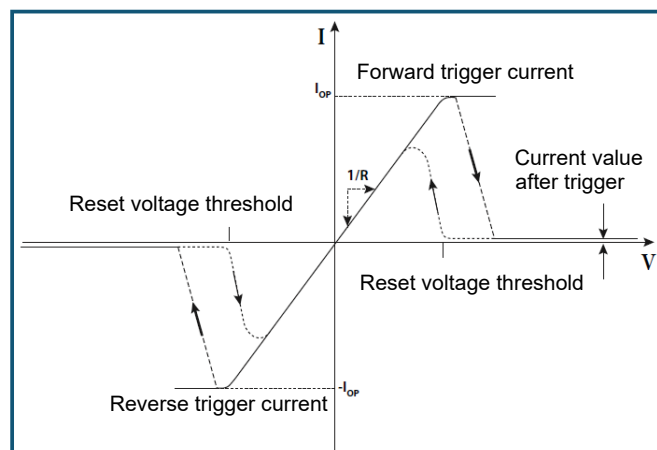
### ● Major features

- The C-FAP devices are used in series with the line.
- The C-FAP device triggers on the rising edge of the current.
- The C-FAP devices can block voltages up to  $850\text{V}$ . Allows easy coordination with overvoltage protection components.
- The C-FAP offers excellent protection below  $1\ \mu\text{m}$ .
- The C-FAP is reset by voltage.
- The C-FAP has extremely low capacitance.

### ● Main advantages

- High speed performance
- The C-FAP blocks voltage and current.
- Extremely low pass energy  $100\text{nJ}$
- It will self-reset in the line without DC bias.
- Small DFN package
- The C-FAP-PL & PK series is triggered by voltage.
- Minimum board area
- Ultra-thin package

V-I curve of C-FAP



## ● Selection of C-FAP and overvoltage protection device

### Step 1: Check current

- You check the peak operating current and maximum operating temperature of your system.
- You determine the C-FAP derating value by using the derating curve from the C-FAP device datasheet 「Trigger current and temperature」 .

### Step 2: Selecting overvoltage protection

- Select an overvoltage protection device with a DC breakdown voltage higher than the normal system voltage and expected AC power crossings. The selected device shall be capable of carrying the required lightning surge current.

### Step 3: Selection of C-FAP devices

- You select a C-FAP device with a maximum impulse voltage ( $V_{imp}$ ) higher than the clamp voltage or the maximum impulse breakover voltage of the selected overvoltage protection device.

The selected C-FAP device should have a minimum  $I_{trigger}$  greater than the peak value of the maximum operating current of the temperature-compensated system.

### Step 4 : Others

In many applications the circuit being protected will provide enough current to trigger the C-FAP. If the circuit being protected has high impedance, place a small avalanche diode to ground and a small signal diode for clamping to the power circuit after the C-FAP device. This ensures C-FAP triggering and prevents interface voltages from rising to dangerous levels.