

### Description

CRM60GK06E3 are 3-phase Integrated Power Modules (IPM) designed for advanced appliance motor drive applications such as fan, water pump, refrigerator, etc.

CRM60GK06E3 Integrated 6 low-loss IGBTs and FRDs, 3-phase half bridge high voltage gate drivers in a familiar package. The modules are optimized for low EMI characteristics.

CRM60GK06E3 internal integration of undervoltage, short circuit and other protection functions, providing excellent protection and a wide range of safe working area. Since each phase has an independent negative DC terminal, its current can be detected separately.

### Features

- 600V/6A three-phase inverter
- Works with 3.3V/5V MCU
- Built-in high voltage gate drive circuit
- Integrated over temperature protection
- Integrated under-voltage protection
- Integrated high accurate over-current protection
- Integrated enable shut down function
- Integrated double high interlock function
- Integrated bootstrap functionality
- Three independent negative DC terminals are used for inverter current detection
- Isolation rating: 1500 Vrms/min



DIP-25A

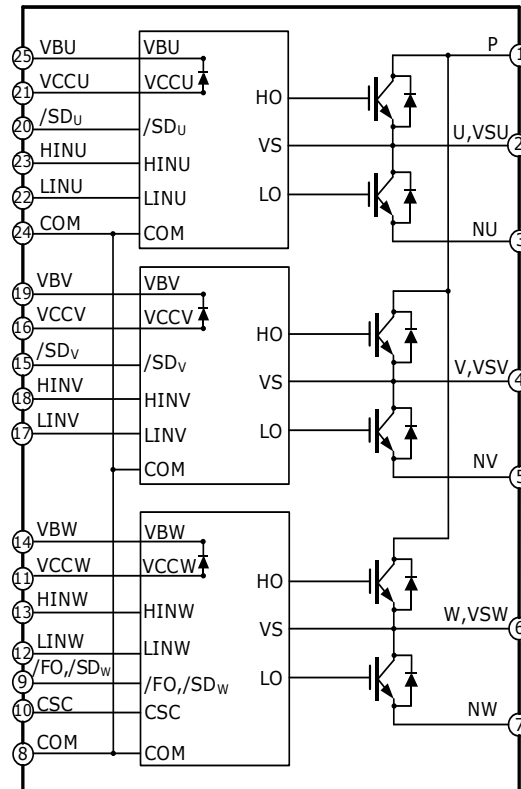
### Applications

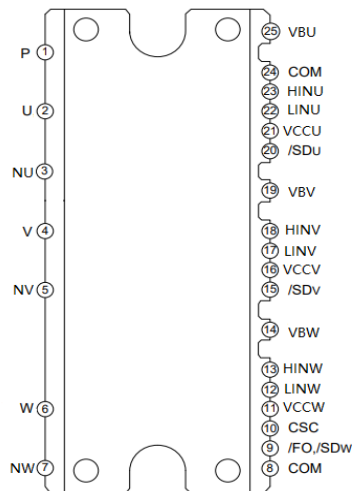
- Freezer compressor
- Pumps

### Package Marking and Ordering Information

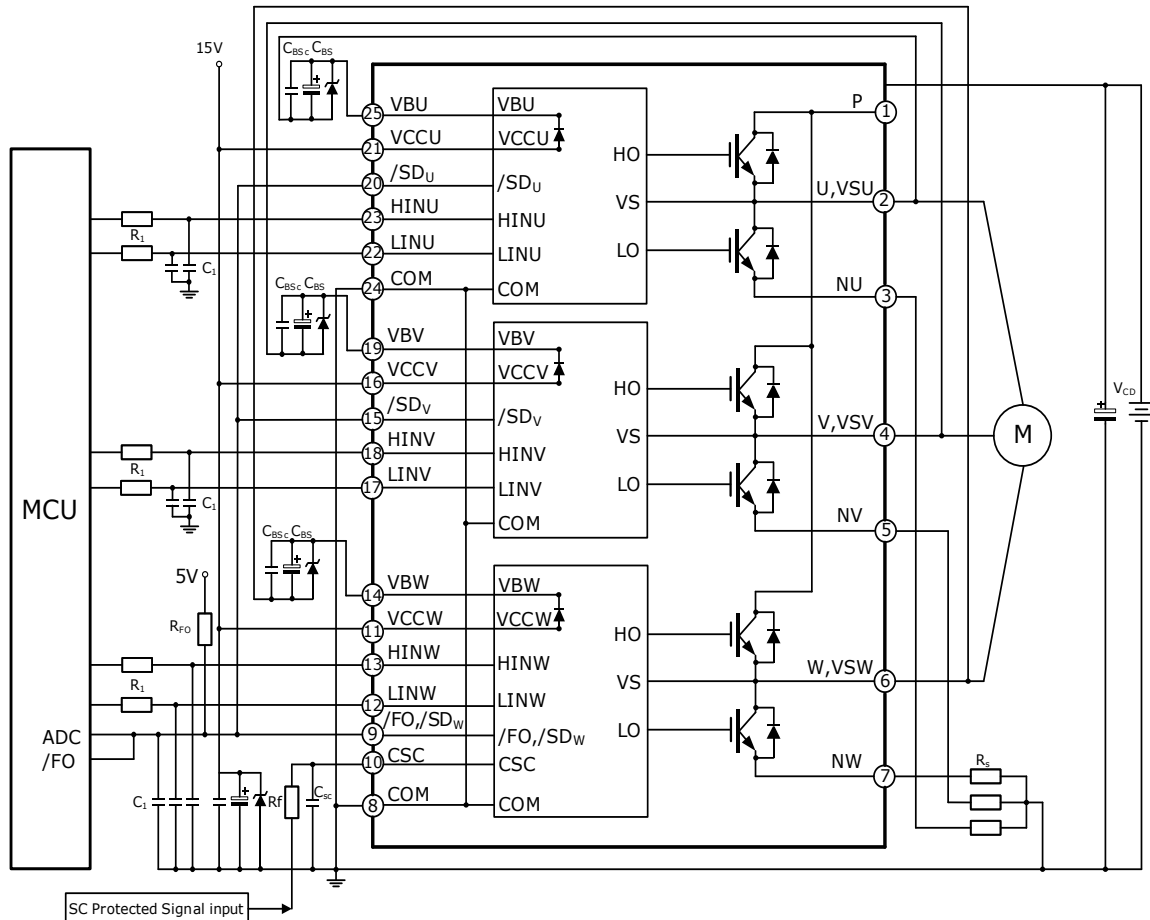
Part #	Marking	Package	Packing	Quantity	VTS
CRM60GK06E3	CRM60GK06E3	DIP-25A	Tube	308	-

### Internal Electrical Schematic



**Module Pin-Out Description**

**Top view**

Pin Number	Pin Name	Description
1	P	DC Bus Voltage Positive
2	U	Output - Phase U, High Side Floating Supply Offset U
3	NU	Phase U Low Side Source
4	V	Output - Phase V, High Side Floating Supply Offset V
5	NV	Phase V Low Side Source
6	W	Output - Phase W, High Side Floating Supply Offset W
7	NW	Phase W Low Side Source
8	COM	Logic Ground
9	/FO,/SD <sub>W</sub>	Fault output /W phase shut down
10	CSC	External capacitance, Over current shutdown input
11	VCCW	W phase IC supply voltage
12	LINW	Logic Input for Low Side Gate Driver - Phase W
13	HINW	Logic Input for High Side Gate Driver - Phase W
14	VBW	High Side Floating Supply Voltage W
15	/SD <sub>V</sub>	V phase shut down
16	VCCV	V phase IC supply voltage
17	LINV	Logic Input for Low Side Gate Driver - Phase V
18	HINV	Logic Input for High Side Gate Driver - Phase V
19	VBV	High Side Floating Supply Voltage V
20	/SD <sub>U</sub>	U phase shut down
21	VCCU	U phase IC supply voltage
22	LINU	Logic Input for Low Side Gate Driver - Phase U
23	HINU	Logic Input for High Side Gate Driver - Phase U
24	COM	Logic Ground
25	VBU	High Side Floating Supply Voltage U

**Application Circuit**

**Remark:**

- 1、 To prevent malfunction, the wiring of each input should be as short as possible.
- 2、 Input drive is High-Active type. There is a 20kΩ (typ.) pull-down resistor integrated in the IC input circuit. And adding RC filter circuit to the input will prevent the surgenoise caused by incorrect input.
- 3、 To prevent surge damage, it is recommended to add a high-frequency non-inductive flat capacitor (0.1uF to 0.22uF) between P and N. The cable connection of the capacitor should be as short as possible.
- 4、 The line between the current detection resistor and the IPM should be as short as possible, otherwise the large surge voltage generated by the connecting inductor may cause damage.
- 5、 All capacitors should be mounted as close to the terminals of the IPM as possible.
- 6、 FO output is open drain type. It should be pulled up to the positive side of 5V power supply by a resistor of about 10kΩ.
- 7、 The time constant Rf and Cf of the protection circuit should be selected in the range of 1.5-2.0 μs.

Package Outline

DIP-25A

UNIT:mm

