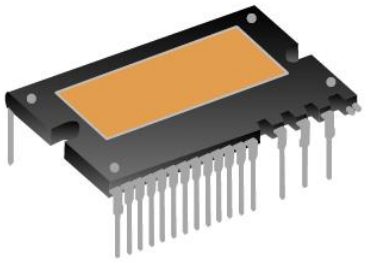
Description

CRM60GH15E4 are 3-phase Integrated Power Modules (IPM) designed for advanced appliance motor drive applications such as refrigerator compressor and pumps.

CRM60GH15E4 Integrated 6 low-loss IGBTs and FRDs, 3-phase full bridge drivers in a familiar package. The modules are optimized for low EMI characteristics.

Features

- 600V/15A three-phase inverter
- Works with 3.3V/5V MCU
- Integrated under-voltage protection
- Integrated high accurate short-circuit current protection
- Integrated >40μs fault duration time
- Integrated built-in temperature-sensing
- Integrated over temperature protection
- Integrated bootstrap diodes with current limiting resistor
- Isolation rating: 1500 Vrms/min



DIP-24B

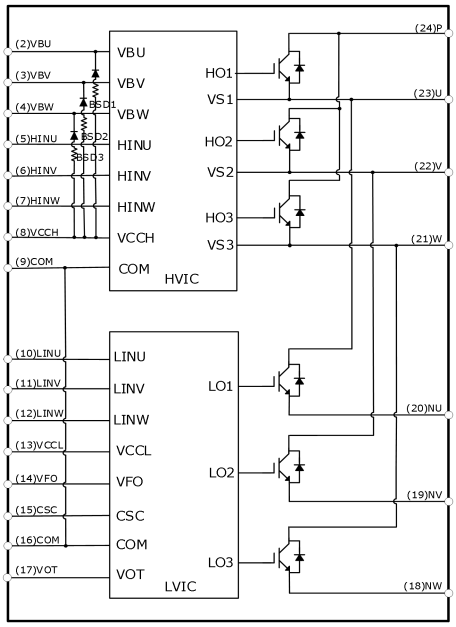
Applications

- Refrigerator compressor
- Air conditioning compressor
- Low-power inverters
- Pumps

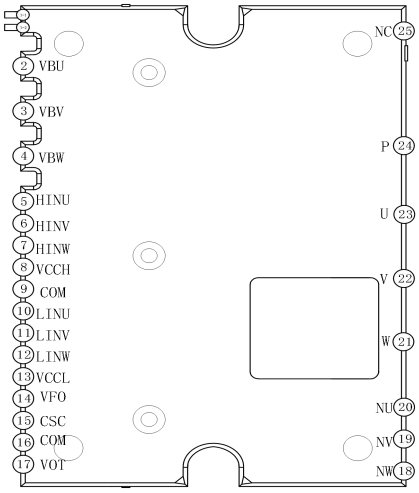
Package Marking and Ordering Information

Part #	Marking	Package	Packing Factory Code	Packing	Quantity	Green
CRM60GH15E4	CRM60GH15E4	DIP-24B	1	Tube	360EA	ROHS/HF
CRM60GH15E4	CRM60GH15E4	DIP-24B	6	Tube	300EA	ROHS/HF

Internal Electrical Schematic



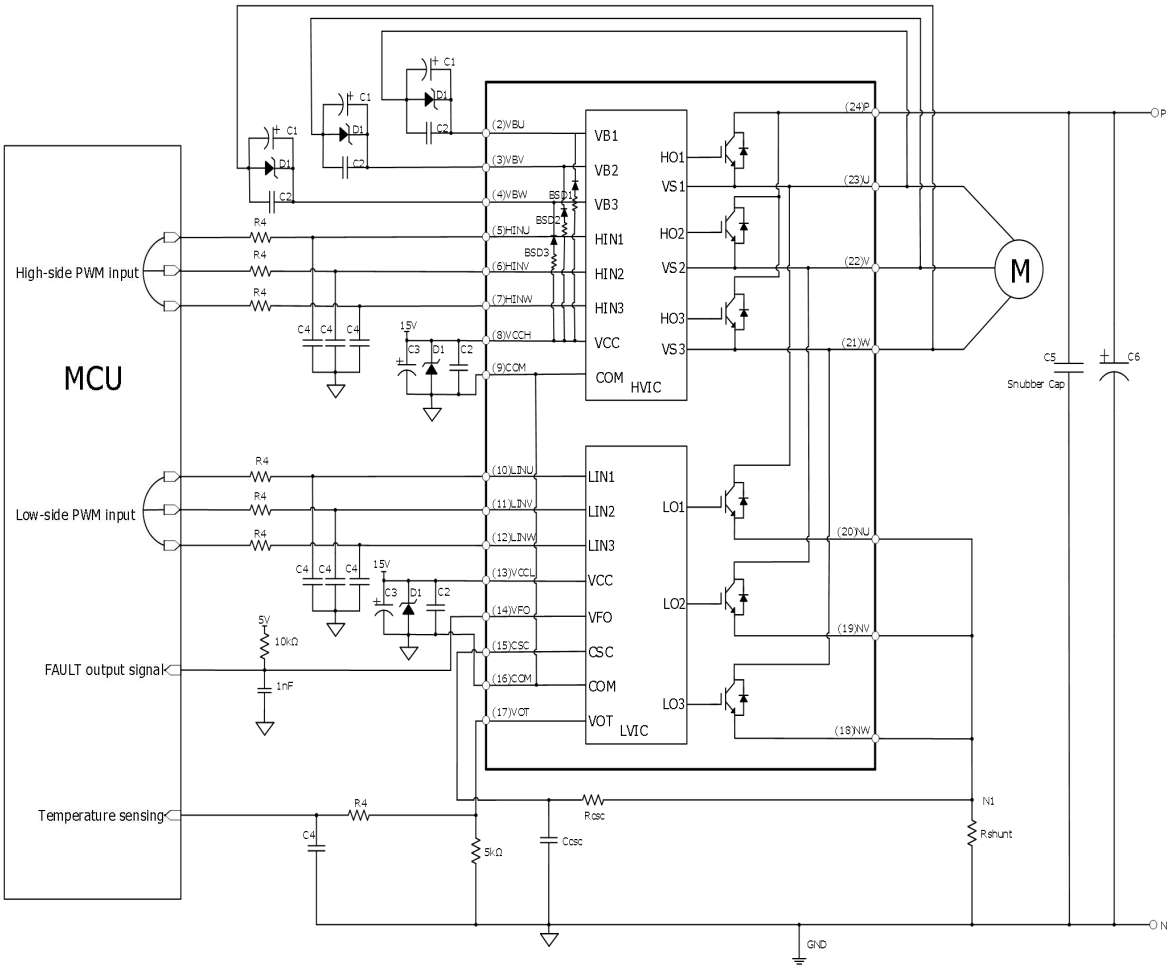
Module Pin-Out Description



Bottom view

Pin Number	Pin Name	Description
2	VBU	High Side Floating Supply Voltage U
3	VBV	High Side Floating Supply Voltage V
4	VBW	High Side Floating Supply Voltage W
5	HINU	Logic Input for High Side Gate Driver - Phase U
6	HINV	Logic Input for High Side Gate Driver - Phase V
7	HINW	Logic Input for High Side Gate Driver - Phase W
8	VCCH	High side IC supply voltage
9	COM	Logic Ground
10	LINU	Logic Input for Low Side Gate Driver - Phase U
11	LINV	Logic Input for Low Side Gate Driver - Phase V
12	LINW	Logic Input for Low Side Gate Driver - Phase W
13	VCCL	Low side IC supply voltage
14	VFO	Fault output / Temperature monitor
15	CSC	External capacitance, Short-current detection input
16	COM	Logic Ground
17	VOT	Output for Temperature Sensing
18	NW	Phase W Low Side Emitter
19	NV	Phase V Low Side Emitter
20	NU	Phase U Low Side Emitter
21	W	Output - Phase W, High Side Floating Supply Offset W
22	V	Output - Phase V, High Side Floating Supply Offset V
23	U	Output - Phase U, High Side Floating Supply Offset U
24	P	DC Bus Voltage Positive
25	NC	Not Connected

Application Circuit

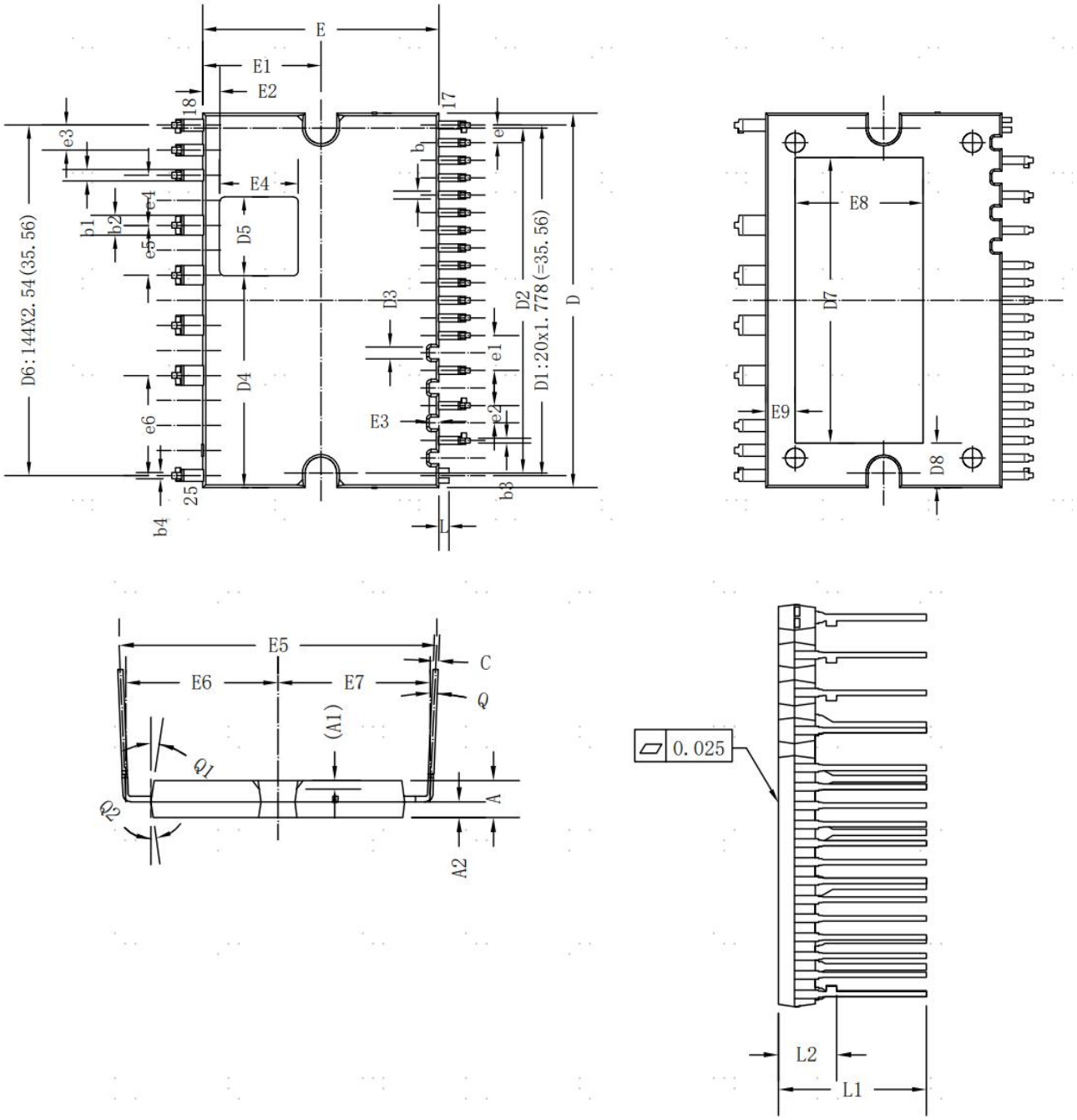


Remark:

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 5kΩ （typ.）pull-down resistor integrated in the IC input circuit. And adding RC filter circuit to the input will prevent the surge noise caused by incorrect input.
3. To prevent surge damage, it is recommended to add a high-frequency non-inductive flat capacitor (0.1μF to 0.22μF) 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 R_{CSC} and C_{CSC} of the protection circuit should be selected in the range of 1.5-2.0 μs.

Package Outline

DIP-24B **UNIT:mm**



SYMBOL	COMMON			SYMBOL	COMMON		
	Dimensions millimeter				Dimensions millimeter		
	Min	Nom	Max		Min	Nom	Max
A	3.400	3.500	3.600	(E3)	0.900	1.100	1.300
(A1)	0.400	0.500	0.600	E4	7.800	8.000	8.200
A2	1.450	1.500	1.550	E5	28.900	29.400	29.900
b	0.750	0.900	1.050	E6	13.900	14.400	14.900
b1	1.150	1.200	1.250	E7	13.900	14.400	14.900

b2	1.950	2.000	2.050	E8	12.500	13.000	13.500
b3	0.450	0.500	0.550	E9	2.600	3.000	3.400
b4	0.500	0.600	0.700	e	1.728	1.778	1.828
C	0.300	0.425	0.550	e1	3.506	3.556	3.606
D	37.500	38.000	38.500	e2	1.728	1.778	1.828
(D1)	35.510	35.560	35.610	e3	2.490	2.540	2.590
(D2)	34.850	35.000	35.150	e4	5.030	5.080	5.130
D3	1.100	1.200	1.300	e5	5.030	5.080	5.130
D4	21.300	21.500	21.700	e6	10.110	10.160	10.210
D5	7.800	8.000	8.200	L	0.900	1.000	1.100
D6	35.510	35.560	35.610	L1	13.500	14.000	14.500
D7	28.500	29.000	29.500	L2	5.200	5.500	5.800
D8	4.100	4.500	4.900	(Q)	0°	2.5°	5°
E	23.500	24.000	24.500	Q1	7°	9°	11°
E1	11.850	12.000	12.150	Q2	7°	9°	11°
E2	1.500	1.700	1.900				

Revision History

Revision	Date	Major changes
1.0	2022/5/6	Release of formal version
1.1	2023/2/3	Delete Bootstrap Diode Part
1.2	2023/11/29	Electrical Characteristic and POD
1.3	2024/3/28	RBS Change
1.4	2024/9/2	Update the thermal resistance value
1.5	2025/06/30	Update the Dimensions Limitation Specification

Disclaimer

Unless otherwise specified in the datasheet, the product is designed and qulified as a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability, such as automotive, aviation/aerospace and life-support devices or systems.

Any and all semicondutor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.

CRM(CQ) reserves the right to improve product design, function and reliability without notice.