

Home Appliance

BLDC Motor Driver Solutions

LV 12V/ 24V : MCU **iU6392/ iU6393**

HV48V : **iU6399**

Home Appliance

12V/24V

- Household Fan
- Air Purifier
- Dehumidifier Fan
- Sweep Robot
- RO Water Purifier



Single Side PCBA

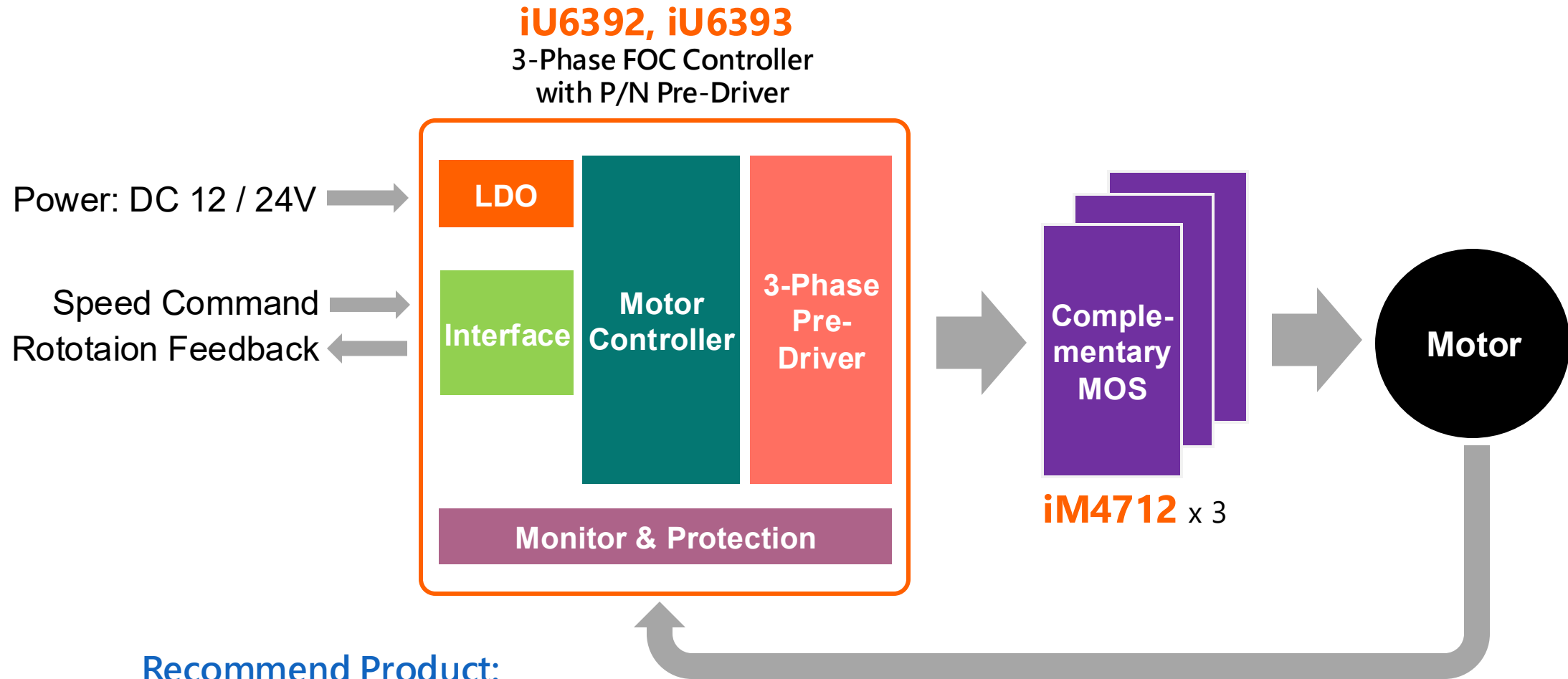


48V

- Indoor/Outdoor (IDU/ODU) Air Condition Fan
- Freezer Fans
- Bathroom Exhaust Fan
- High Speed Hair Dryer



Block Diagram of 12V/24V LV Solution

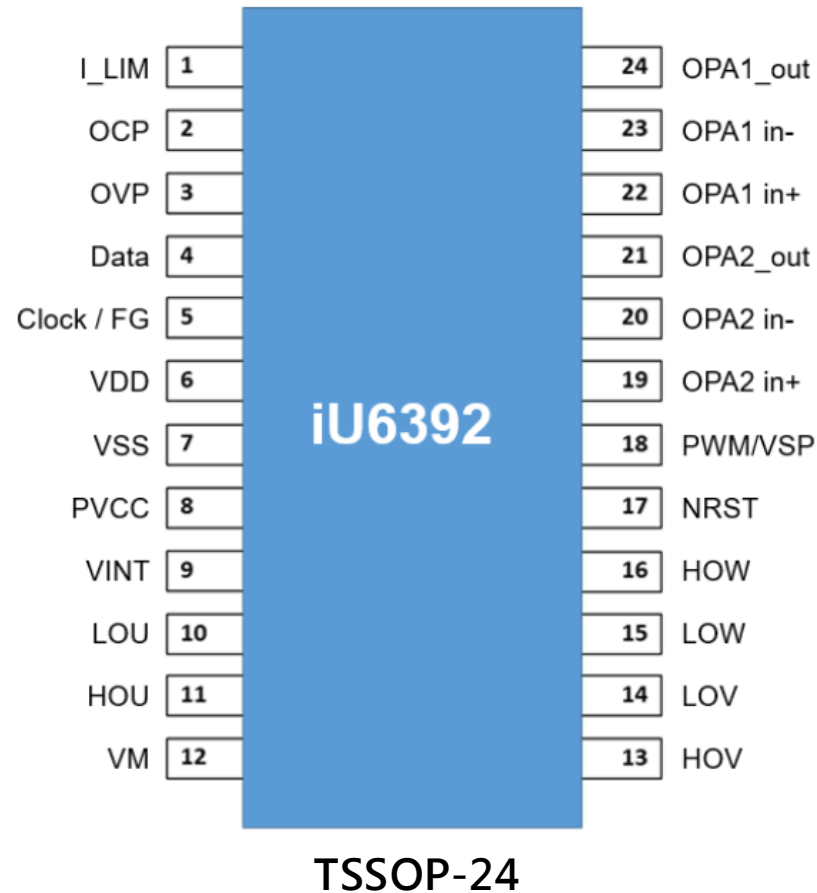


Recommend Product:

- **iU6392** x 1, TSSOP-24
- **iM4712** or other MOS product x 3 (depends on application required current)

iU6392

- **3-Phase FOC Controller with P/N Pre-Driver**
- **Operation Voltage 7V~32V (VM, FG)**
- **Embedded with**
 - ◆ 5V LDO
 - ◆ Current Amplifier x 2
 - ◆ 40V P/N Pre-Driver
- **Control Functions**
 - ◆ Support PWM duty / DC / Clock input
 - ◆ Adjustable PWM Frequency
 - ◆ Lead Angle
 - ◆ FG Output
 - ◆ Adjustable Start
- **Built-in Protection**
 - ◆ Over-Voltage
 - ◆ Over-Current
 - ◆ Over-Temperature
 - ◆ Auto Recovery



Pin No.	Function	Description
1	I_LIM	Average Current Detection
2	OCF	Over Current Protection
3	OVP	Over Voltage Protection
4	Data	Data Input
5	Clock / FG	Clock Input / FG
6	VDD	Self Logic 5V Power
7	VSS	Ground
8	PVCC	Power VCC Supply
9	VINT	7V Regulator Output for Pre-Driver
10	LOU	U-Phase, Low Side Gate Driver
11	HOU	U-Phase, High Side Gate Driver
12	VM	VDC Supply, HO Pull-Hi Voltage
13	HOV	V-Phase, High Side Gate Driver
14	LOV	V-Phase, Low Side Gate Driver
15	LOW	W-Phase, Low Side Gate Driver
16	HOW	W-Phase, High Side Gate Driver
17	NRST	External RESET
18	PWM/VSP	PWM/VSP
19	OPA2 in+	OPAMP2 Positive Input
20	OPA2 in-	OPAMP2 Negative Input
21	OPA2_out	OPAMP2 Output
22	OPA1 in+	OPAMP1 Positive Input
23	OPA1 in-	OPAMP1 Negative Input
24	OPA1_out	OPAM1 Output

iU6393

■ 3-Phase FOC Controller with P/N Pre-Driver

■ Operation Voltage 7V~32V

■ Embedded with

- ◆ 5V LDO
- ◆ Current Amplifier x 2
- ◆ 40V P/N Pre-Driver

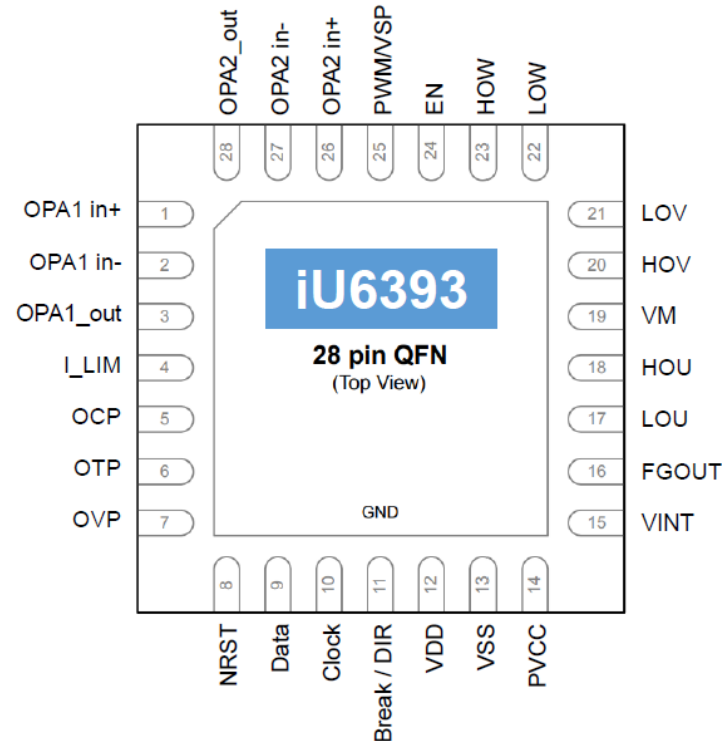
■ Low Power Stop Mode

■ Control Functions

- ◆ Support PWM duty / DC / Clock input
- ◆ Adjustable PWM Frequency
- ◆ Lead Angle
- ◆ FG Output
- ◆ Adjustable Start

■ Built-in Protection

- ◆ Over-Voltage
- ◆ Over-Temperature
- ◆ Over-Current
- ◆ Auto Recovery



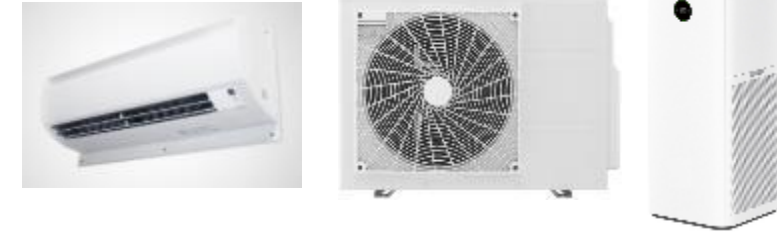
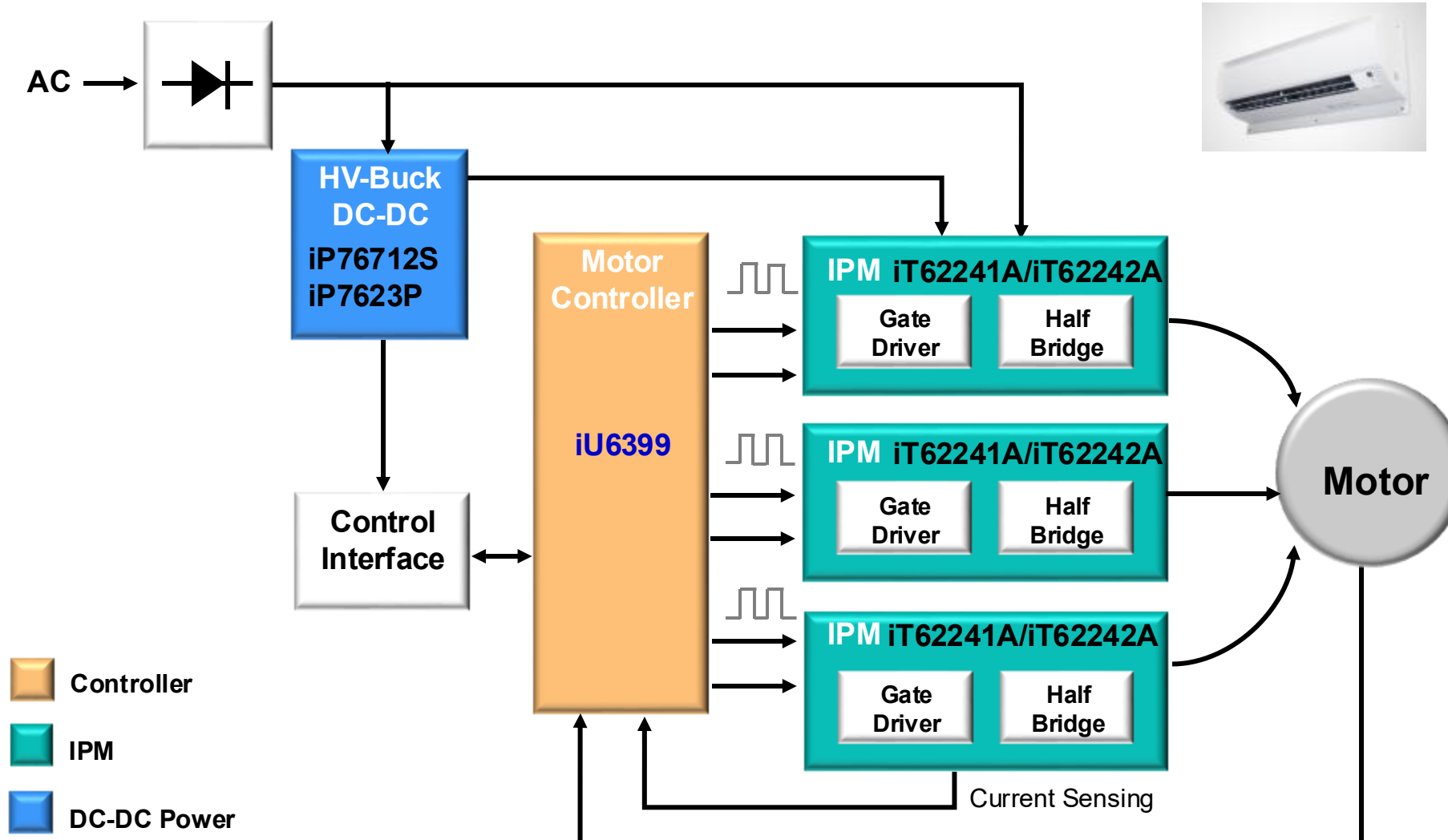
QFN-28 4x4

Pin No.	Symbol	Description
1	OPA1 in+	OPAMP1 Positive Input
2	OPA1 in-	OPAMP1 Negative Input
3	OPA1_out	OPAMP1 Output
4	I_LIM	Average Current Detection
5	OCP	Over Current Protection
6	OTP	Over Temperature Protection
7	OVP	Over Voltage Protection
8	NRST	External RESET
9	Data	Data Input
10	Clock	Clock Input
11	Break / DIR	Break / Direction
12	VDD	Self Logic 5V Power
13	VSS	Ground
14	PVCC	Power VCC Supply
15	VINT	7V Regulator Output for Pre-Driver
16	FGOUT	FG Output
17	LOU	U-Phase, Low Side Gate Driver
18	HOU	U-Phase, High Side Gate Driver
19	VM	VDC Supply, HO Pull-Hi Voltage
20	HOV	V-Phase, High Side Gate Driver
21	LOV	V-Phase, Low Side Gate Driver
22	LOW	W-Phase, Low Side Gate Driver
23	HOW	W-Phase, High Side Gate Driver
24	EN	Pre-Driver Enable
25	PWM/VSP	PWM/VSP
26	OPA2 in+	OPAMP2 Positive Input
27	OPA2 in-	OPAMP2 Negative Input
28	OPA2_out	OPAMP2 Output

iU6393 Superior Features

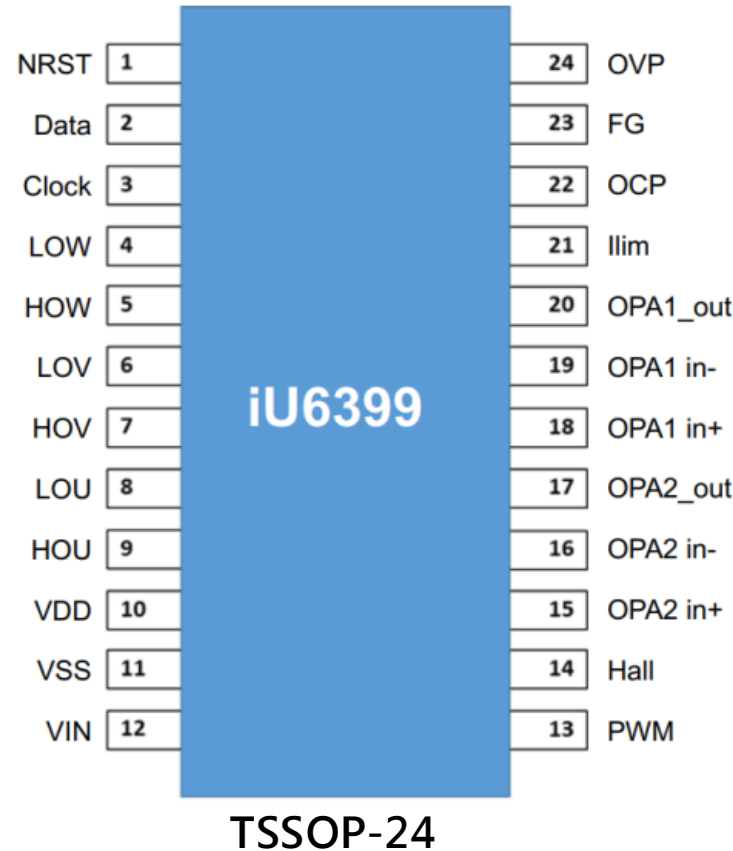
- **FOC control for high rotation speed**
(6 poles / 80,000 RPM or 12 poles / 40,000 RPM)
- **Built-in protection** for enhanced reliability
- **Adaptive algorithm FOC technology** for silent operation
- **Ease-of-use parameter modification platform**
- **4-wire programming** for flexible development
- **OTA updates** for seamless feature enhancements

Block Diagram of 48V HV Solution



iU6399

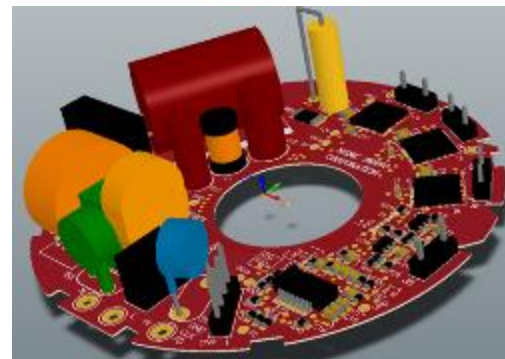
- **3-Phase FOC Controller with Regulator**
- **Operation Voltage 5.5V~24V**
- **Embedded with 5V LDO**
- **Integrated Current Amplifiers x 2**
- **Control Functions**
 - ◆ Support PWM duty / DC / Clock input
 - ◆ Adjustable PWM Frequency
 - ◆ Lead Angle
 - ◆ FG Output
 - ◆ Adjustable Start
- **Built-in Protection**
 - ◆ Over-Voltage
 - ◆ Over-Current
 - ◆ Current Limit
 - ◆ Auto Recovery



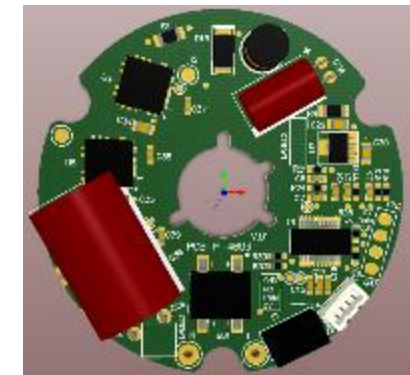
Pin No.	Function	Description
1	NRST	External RESET
2	Data	Data Input
3	Clock	Clock Input
4	LOW	PWM 3 Complementary Output
5	HOW	PWM 3 Output
6	LOV	PWM 2 Complementary Output
7	HOV	PWM 2 Output
8	LOU	PWM 1 Complementary Output
9	HOU	PWM 1 Output
10	VDD	Self Logic 5V Power
11	VSS	Ground
12	VIN	Power Input
13	PWM	PWM Input
14	Hall	Hall Input
15	OPA2 in+	OPAMP2 Positive Input
16	OPA2 in-	OPAMP2 Negative Input
17	OPA2_out	OPAMP2 Output
18	OPA1 in+	OPAMP1 Positive Input
19	OPA1 in-	OPAMP1 Negative Input
20	OPA1_out	OPAM1 Output
21	I_lim	Average Current Detection
22	OCP	Over Current Protection
23	FG	FG Output
24	OVP	Over Voltage Protection

iU6399 Superior Features

- Unique FOC control technology to implement **Silence Operation**
- Adaptive Algorithm FOC **automatically optimizes** efficiency under **different coil deviation**
- **Constant speed** under different fan loading
- Built-in Protection
- Ease to Use Parameter Modification Platform
- 4-Wire Programming



Solution for Commercial Refrigerator



Solution for High Speed Hair Dryer

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We look forward to building a successful partnership with you!



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