

STK5C4U3XXJGEVB

STK5C4U3xx Series Evaluation Board User's Manual



ON Semiconductor®

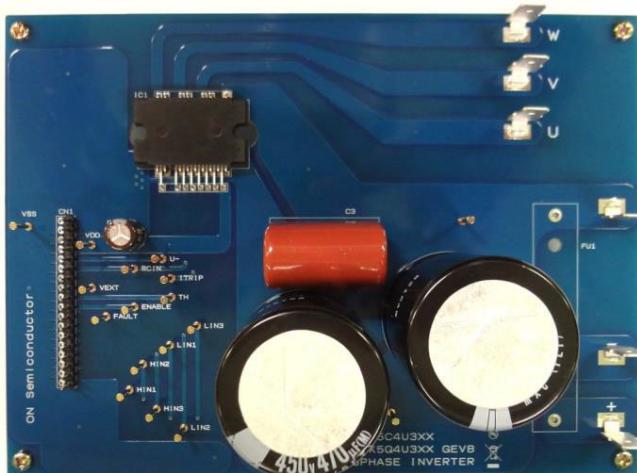
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Introduction

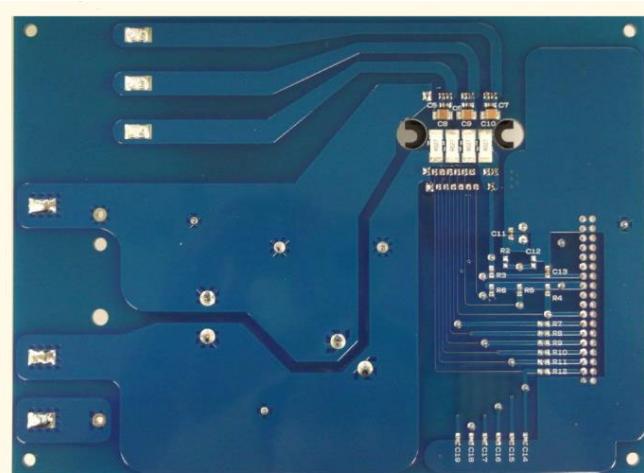
By using this board, STK5C4U3xx series (DIPS) can be evaluated.

EVAL BOARD USER'S MANUAL

ONPN of EVAL Board	ONPN of IPM	Io
STK5C4U332JGEVB	STK5C4U332J-E	3A



Surface



Back side

Figure 1. Evaluation Board Photos

CIRCUIT DIAGRAM

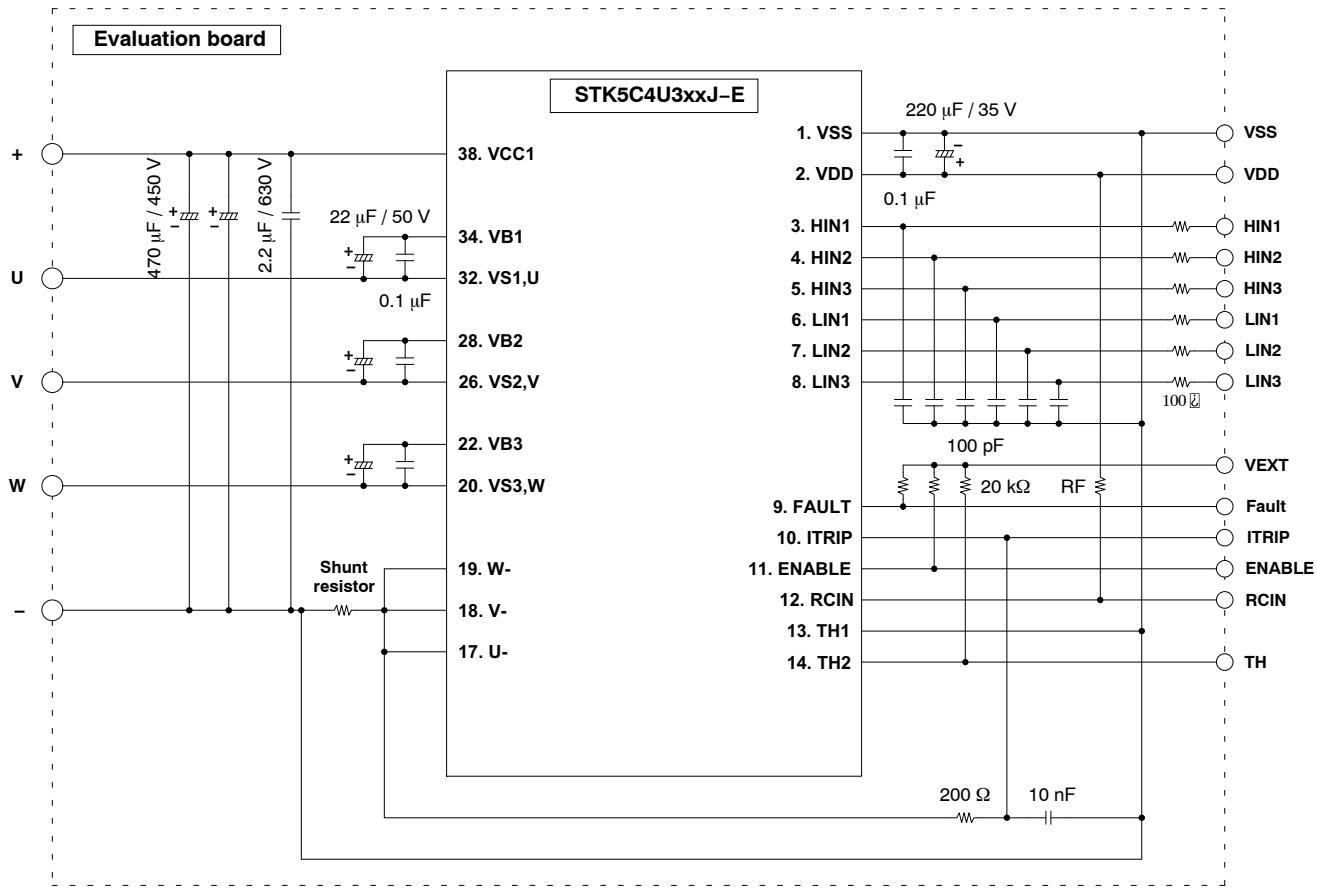


Figure 2. Circuit Diagram

STK5C4U3XXJGEVB

PIN DESCRIPTION

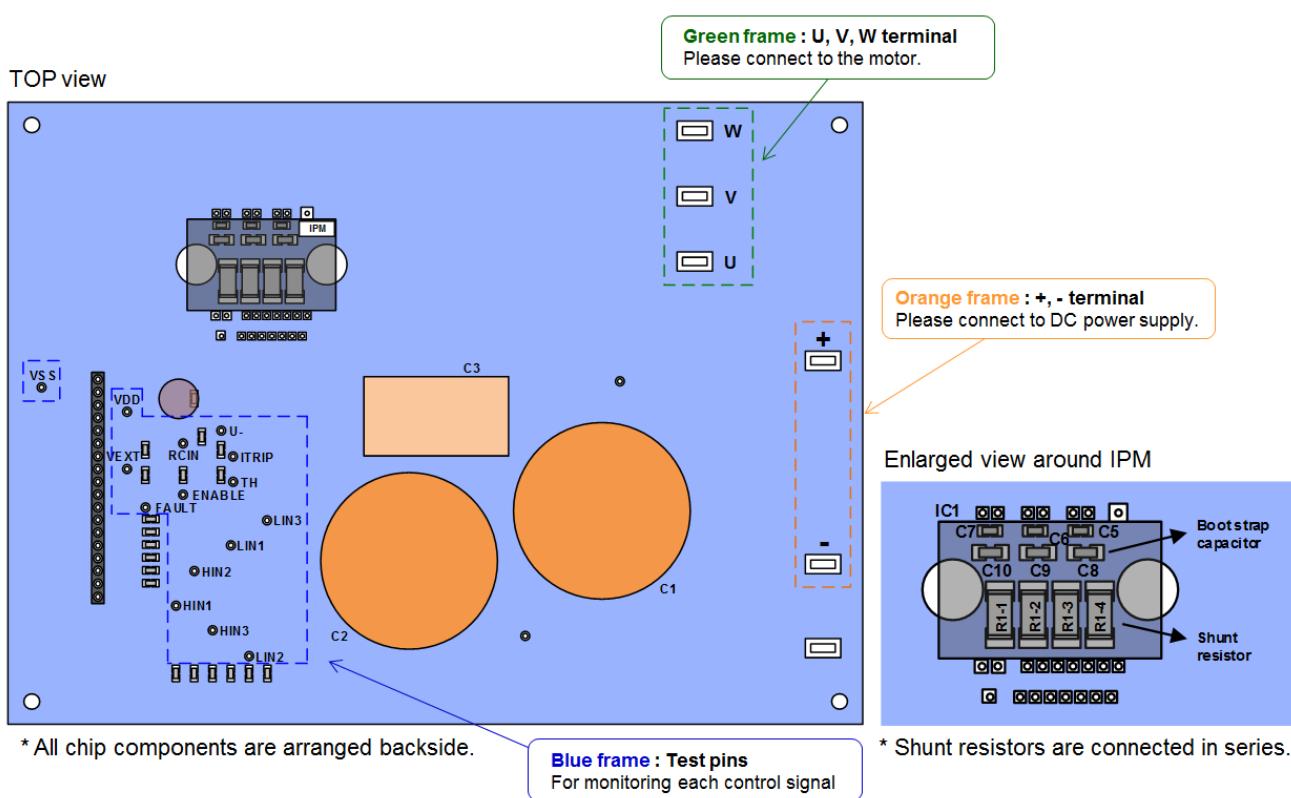


Figure 3. Pin Description 1

Enlarged view around test pins

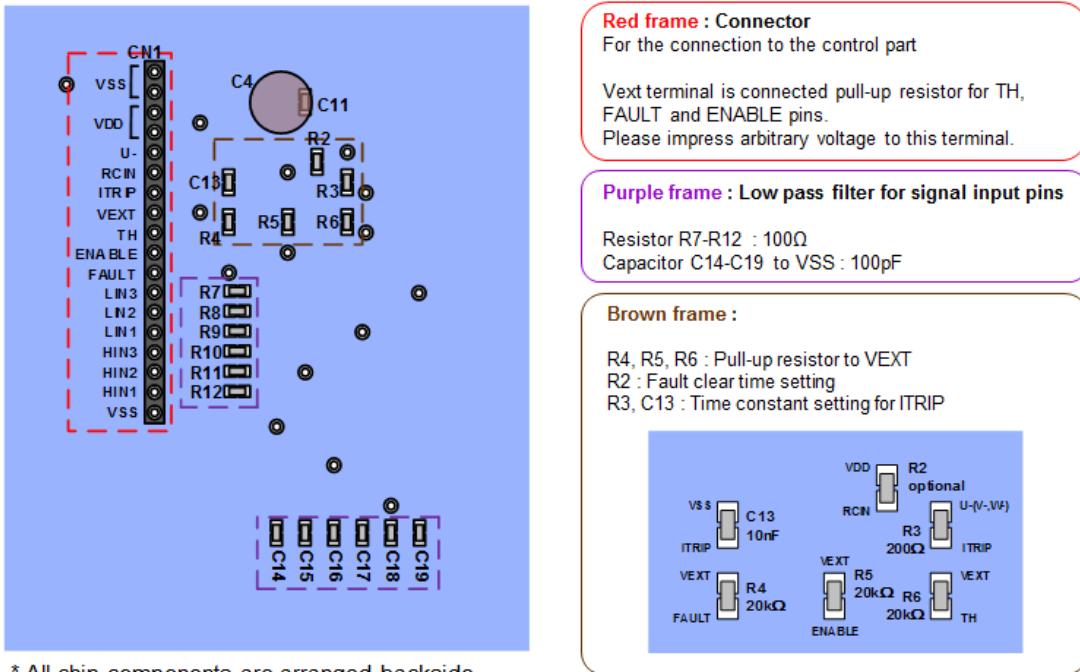
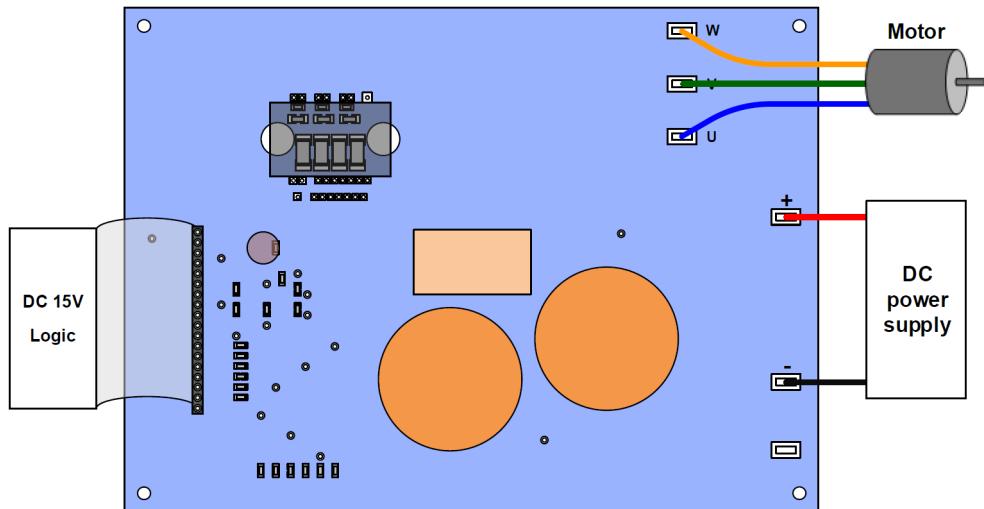


Figure 4. Pin Description 2

OPERATION PROCEDURE**Figure 5. Connection Example**

Step 1. Please connect IPM, each power supply, logic parts, and the motor to the evaluation board, and confirm that each power supply is OFF at this time.

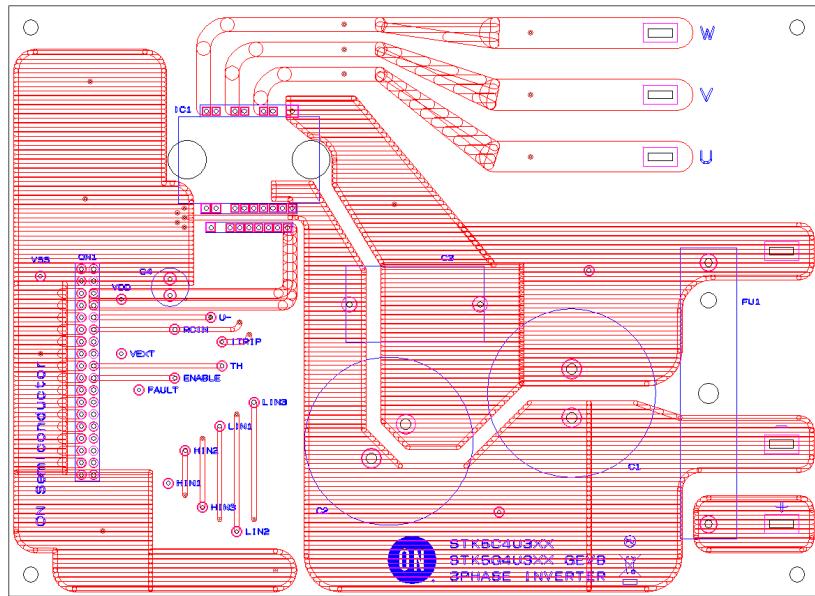
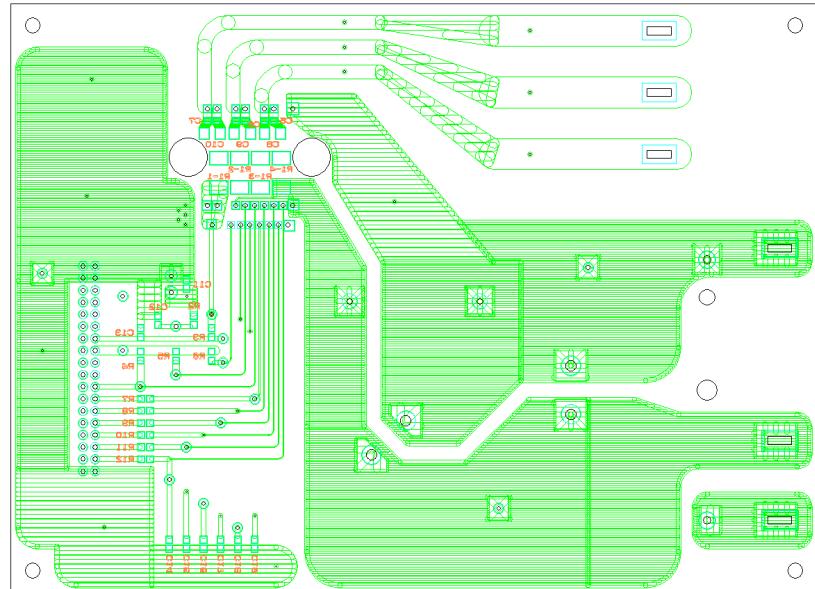
Step 2. Please impress the power supply of DC 15 V.

Step 3. Please perform a voltage setup according to specifications, and impress the power supply between the “+” and the “-” terminal.

Step 4. By inputting signal to the logic part, IPM control is started.

(Therefore, please set electric charge to the boot-strap capacitor of upper side to turn on lower side IGBT before running.)

NOTE: When turning off the power supply part and the logic part, please carry out in the reverse order to above steps.

LAYOUT (TOP VIEW)**Figure 6. Layout – Surface****Figure 7. Layout – Back Side**

Length: 124 mm

Side: 170 mm

Thickness: 1.6 mm

Rigid double-sided substrate (Material: FR-4)

Both sides resist coating

Copper foil thickness: 70 μ m

BILL OF MATERIALS

Table 1. BILL OF MATERIALS

Designator	Qty	Description	Value	Toler- ance	Footprint	Manufacturer	Manufacturer Part Number	Substi- tution Allowed
R1–1 – R1–4	4	Shunt resistor	27 mΩ / 2 W	±1%	SMD 6432	SUSUMU	KRL3264E-C-R027-F (for 332)	Yes
R2	1	Setting fault clear time / resistor	optional		SMD 1608			Yes
R3	1	Setting time constant / resistor	200 Ω / 0.1 W	±1%	SMD 1608	KOA	RK73H1JTTD2000F	Yes
R4 – R6	3	Fault, ENABLE, TH pull-up / resistor	20 kΩ / 0.1 W	±1%	SMD 1608	KOA	RK73H1JTTD2002F	Yes
R7 – R12	6	Signal input low pass filter / resistor	100 Ω / 0.1 W	±1%	SMD 1608	KOA	RK73H1JTTD1000F	Yes
C1, C2	2	Aluminum electrolytic capacitor, Plus – Minus	470 µF / 450 V	±20%	Through- hole	Rubycon	450MXC470MEFCSN35X50	Yes
C3	1	Film capacitor Plus – Minus, Snubber	2.2 µF / 630 V	±5%	Through- hole	PANASONIC	ECQE6225JT	Yes
C4	1	Aluminum electrolytic capacitor, VDD – VSS	220 µF / 35 V	±20%	Through- hole	Nippon Chemi-Con	EKMG350ELL221MHB5D	Yes
C5 – C7, C11	4	VBx – VSx, VDD – VSS / capacitor	0.1 µF / 50 V	±10%	SMD 1608	MURATA	GRM188B31H104K	Yes
C8 – C10	3	VBx – VSx / capacitor	22 µF / 25 V	±20%	SMD 3225	MURATA	GRM32ER71E226ME15	Yes
C13	1	Setting time constant / capacitor	10 nF / 50 V	±10%	SMD 1608	MURATA	GRM188B11H103K	Yes
C14 – C19	6	Signal input low pass filter / capacitor	100 pF / 50 V	±5%	SMD 1608	MURATA	GRM1882C1H101J	Yes
CN1	1	Header – 18 Pin			Through- hole 2.54 pitch	HIROSE ELECTRIC	A2-18PA-2.54DSA(71)	Yes
VSS, VDD, U–, RCIN, ITRIP, VEXT, TH, ENABLE, FAULT, HIN1–3, LIN1–3, +, –	17	Test Pins			Through- hole	Mac8	ST-1-3	Yes
U, V, W, +, –	5	Faston terminal (Tab)			Through- hole			Yes
IC1	1	Inverter IPM			DIP-38	ON Semiconductor	STK5C4U3xxJ-E	No

NOTE All Components are lead free.

HEAT SINK MOUNTING

Table 2. MOUNTING CONDITION

Item	Recommended Condition
Pitch	26.0 ± 0.1 mm (Please refer to Package Outline Diagram)
Screw	Diameter: M3 Bind machine screw, Truss machine screw, Pan machine screw
Washer	Plane washer Don't use spring washer. The size is $D = 7$ mm, $d = 3.2$ mm and $t = 0.5$ mm (Figure 9) JIS B 1256
Heat Sink	Material: copper or Aluminum Warpage (the surface that contacts IPM): $-50 \sim 50 \mu\text{m}$ Screw holes must be countersunk. No contamination on the heat sink surface that contacts IPM.
Torque	Final tightening: $0.4 \sim 0.6$ Nm Temporary tightening: $50 \sim 60\%$ of final tightening
Grease	Silicone grease Thickness: $50 \sim 100 \mu\text{m}$ Uniformly apply silicone grease to whole back. (Figure 10)

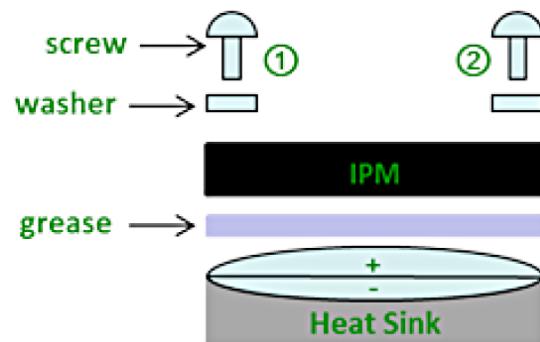


Figure 8. Mounting Composition

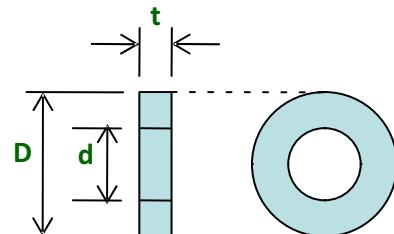


Figure 9. Size of Washer

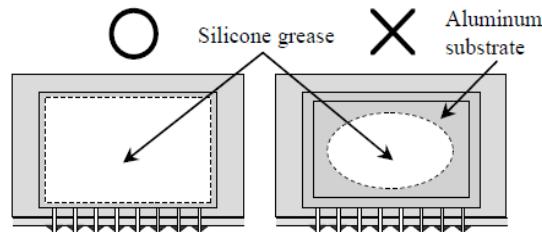


Figure 10. Grease Application

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