STK5Q4U3XXJGEVB

STK5Q4U3xx Series Evaluation Board User's Manual

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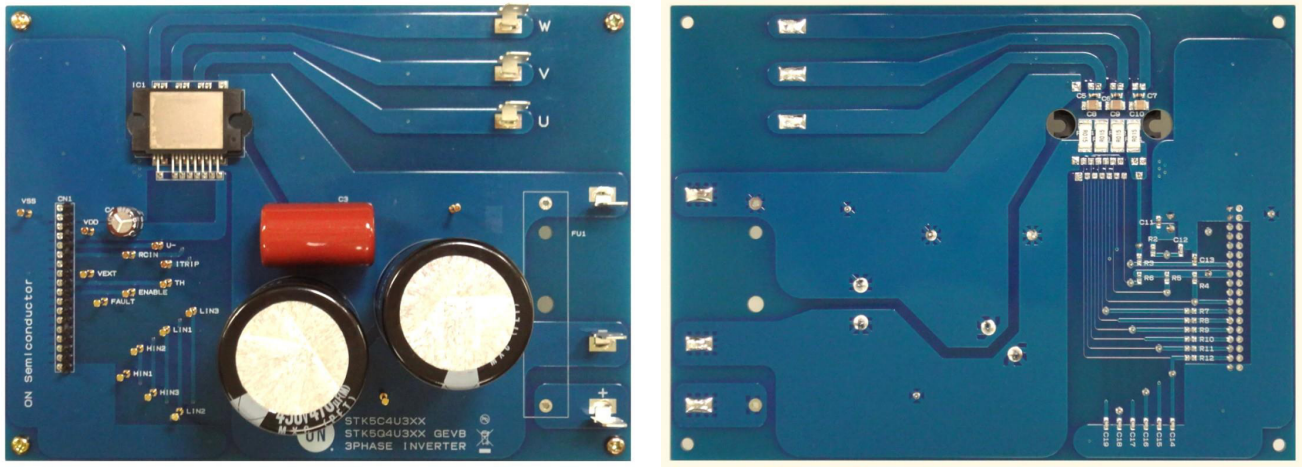
EVAL BOARD USER'S MANUAL

Introduction

By using this board, STK5Q4U3xx series (DIPS3) can be evaluated.

ONPN of EVAL Board	ONPN of IPM	I_O
STK5Q4U352JGEVB	STK5Q4U352J−E	8 A
STK5Q4U362JGEVB	STK5Q4U362J−E	10 A



Surface **Back Side**

Figure 1. Evaluation Board Photos

CIRCUIT DIAGRAM

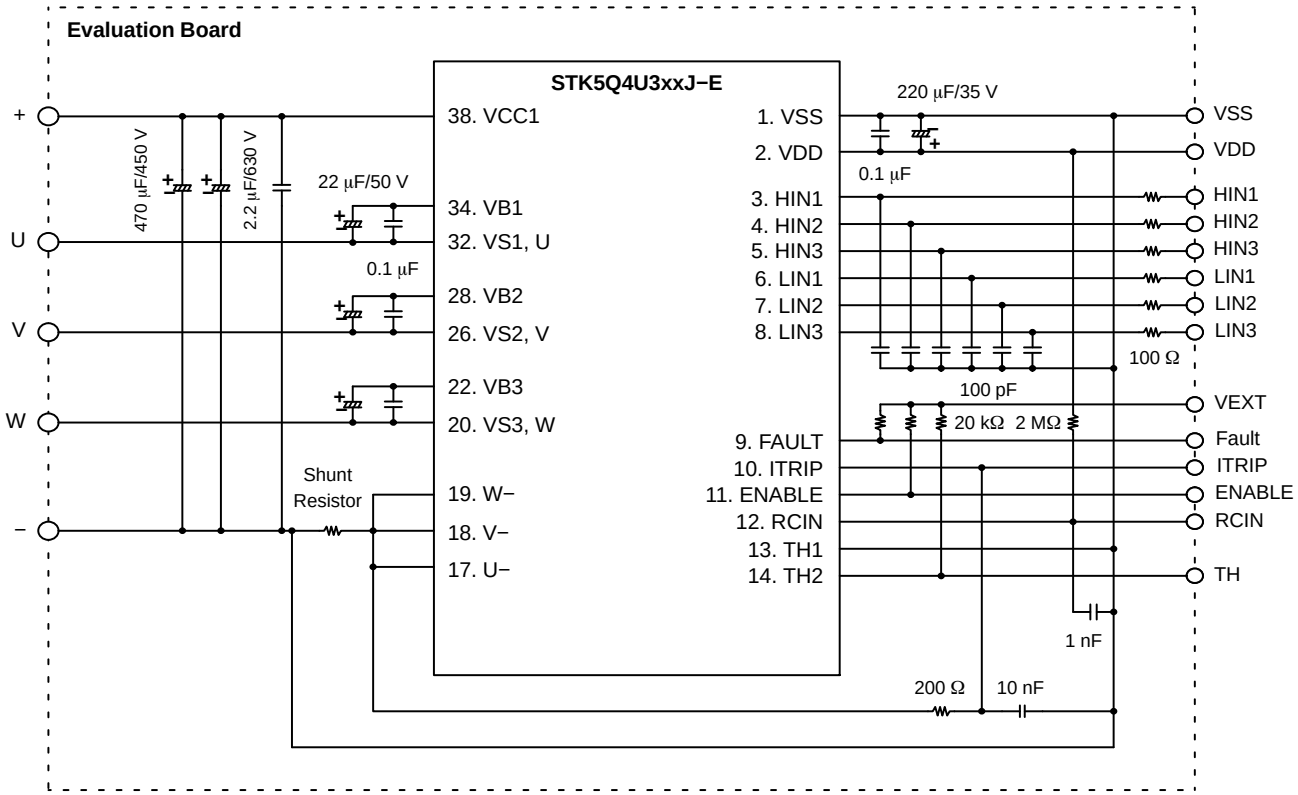


Figure 2. Circuit Diagram

PIN DESCRIPTION

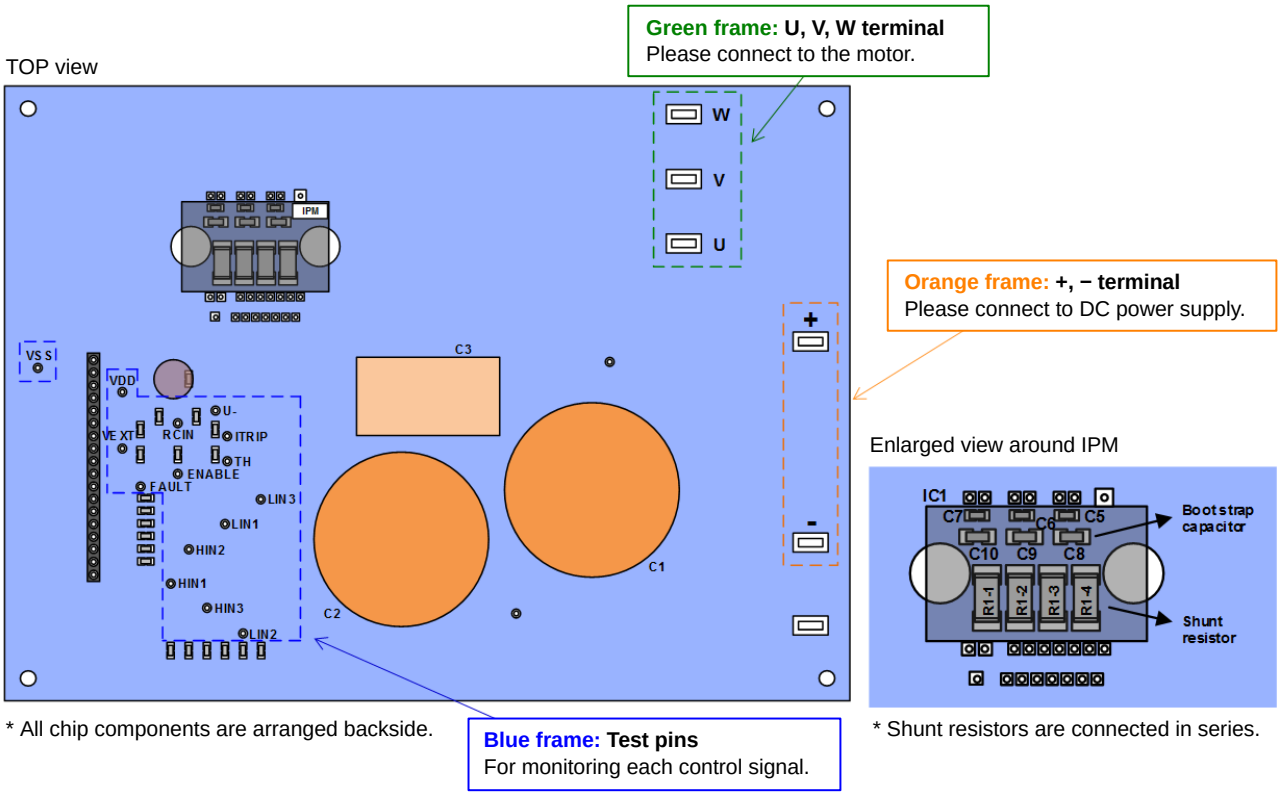


Figure 3. Pin Description − 1

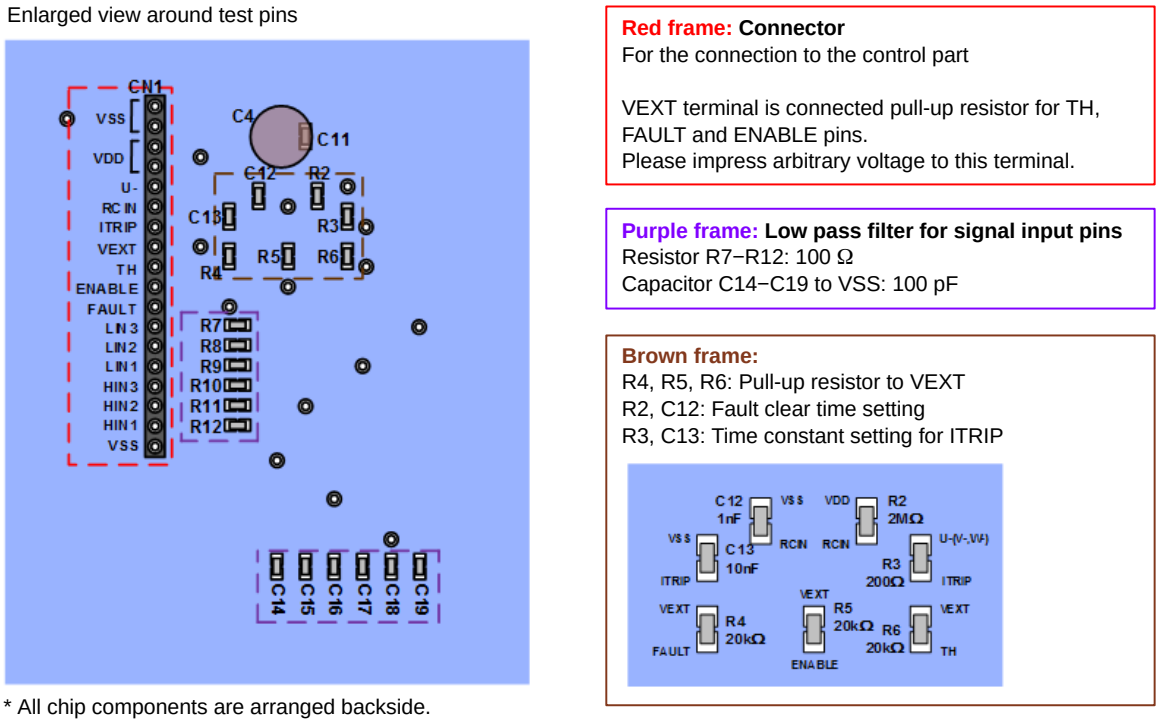


Figure 4. Pin Description − 2

OPERATION PROCEDURE

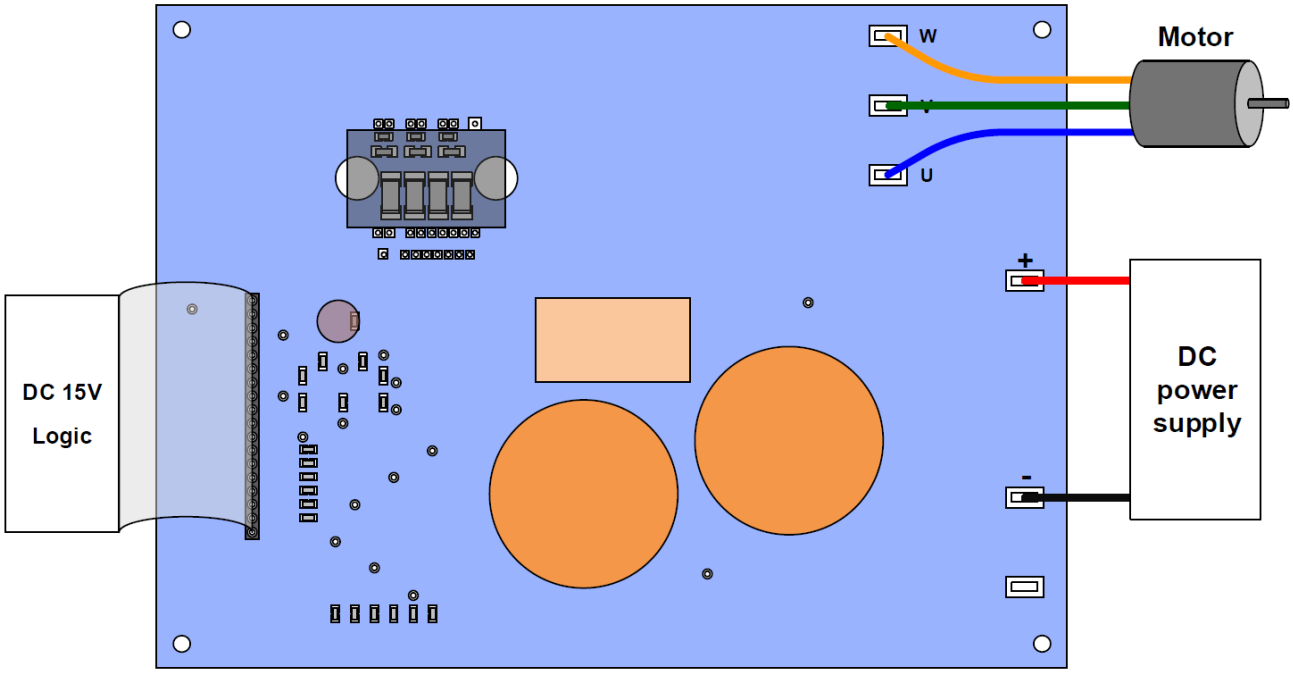


Figure 5. Connection Example

Step1: 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.
Step2: Please impress the power supply of DC15V.
Step3: Please perform a voltage setup according to specifications, and impress the power supply between the “+” and the “−” terminal.
Step4: 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)

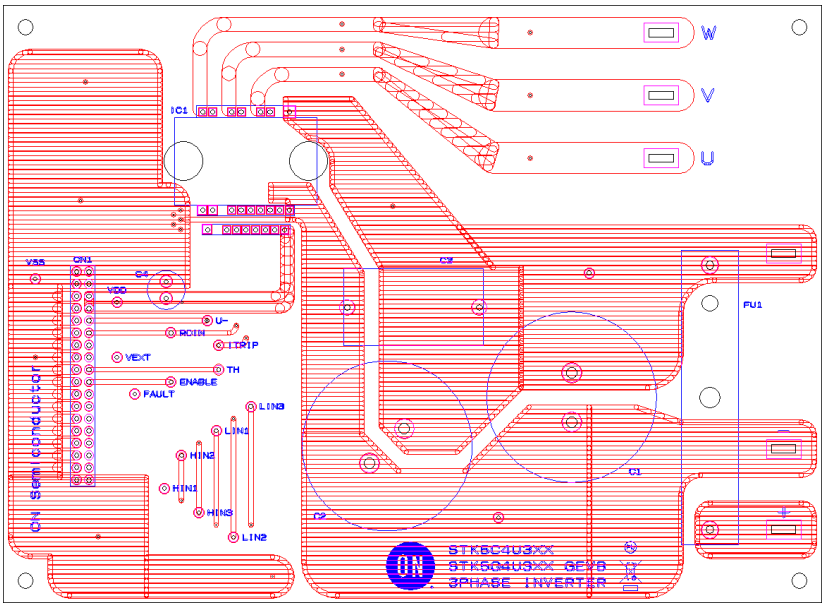


Figure 6. Surface

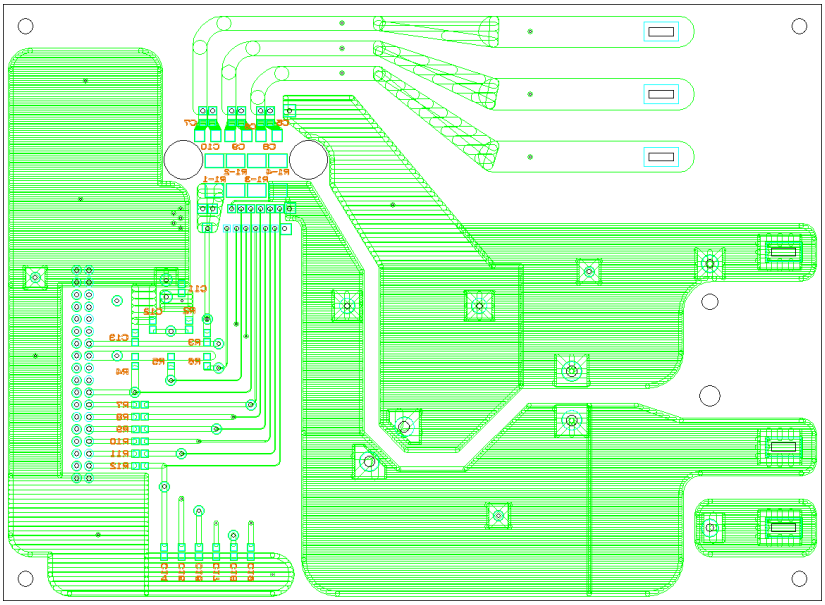


Figure 7. Back Side

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 μm

HEAT SINK MOUNTING

Table 1. 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 (See Figure 9) JIS B 1256
Heat Sink	Material: Copper or Aluminum Warpage (the surface that contacts IPM): −50~50 μm Screw holes must be countersunk. No contamination on the heat sink surface that contacts IPM.
Torque	Final tightening: 0.4~0.6 Nm Temporary tightening: 50~60% of final tightening
Grease	Silicone grease Thickness: 50 ~ 100 μm Uniformly apply silicone grease to whole back (see Figure 10)

Procedure for the Heat Sink Mounting

Step 1: Tighten the screws until the torque of temporary tightening while maintaining the balance of left((1)) and right((2)).
Step 2: Tighten them until the torque of final tightening.

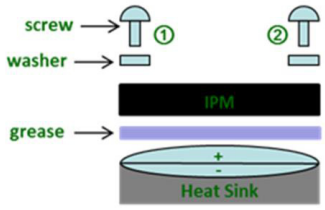


Figure 8. Mounting Composition

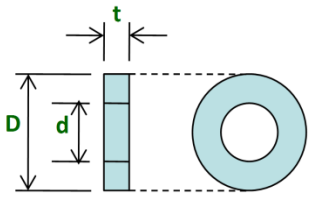


Figure 9. Size of Washer

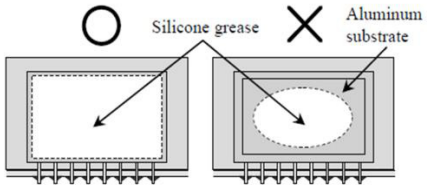


Figure 10. Grease Application

STK5Q4U3XXJGEVB

BILL OF MATERIALS

Table 2. BILL OF MATERIALS

Designator	Qty.	Description	Value	Tolerance	Footprint	Manufacturer	Part Number	Substitution Allowed
R1−1 − R1−4	4	Shunt Resistor	10 mΩ/2 W	±1%	SMD6432	SUSUMU	KRL3264E-C-R010-F (for 352)	Yes
			8 mΩ/2 W	±1%			KRL3264E-C-R008-F (for 362)	
R2	1	Setting Fault Clear Time/Resistor	2 MΩ/0.1 W	±1%	SMD1608	KOA	RK73H1JTTD2004F	Yes
R3	1	Setting Time Constant/Resistor	200 Ω/0.1 W	±1%	SMD1608	KOA	RK73H1JTTD2000F	Yes
R4 − R6	3	Fault, ENABLE, TH Pull-Up/Resistor	20 kΩ/0.1 W	±1%	SMD1608	KOA	RK73H1JTTD2002F	Yes
R7 − R12	6	Signal Input Low Pass Filter/Resistor	100 Ω/0.1 W	±1%	SMD1608	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%	SMD1608	MURATA	GRM188B31H104K	Yes
C8− C10	3	VBx − VSx/ Capacitor	22 μF/25 V	±20%	SMD3225	MURATA	GRM32ER71E226ME15	Yes
C12	1	Setting Fault Clear Time/Capacitor	1 nF/50 V	±5%	SMD1608	MURATA	GRM1882C1H102J	Yes
C13	1	Setting Time Constant/ Capacitor	10 nF/50 V	±10%	SMD1608	MURATA	GRM188B11H103K	Yes
C14 − C19	6	Signal Input Low Pass Filter/ Capacitor	100 pF/50 V	±5%	SMD1608	MURATA	GRM1882C1H101J	Yes
CN1	1	Header − 18 Pin			Through-Hole 2.52 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 for 3-Phase Motor Drive			DIP−38	ON Semiconductor	STK5Q4U3xxJ-E	No

*All Components are Pb-Free.

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