

# STK581U3C2DGEVB

## STK581U3C2D-E Evaluation Board User's Manual



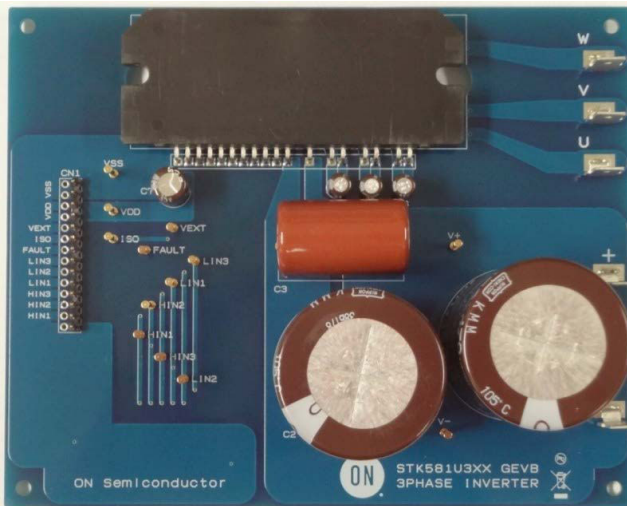
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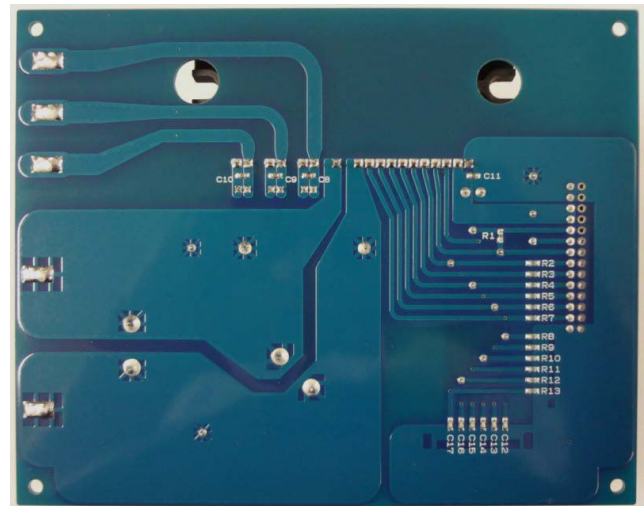
### Introduction

By using this board, STK581U3C2D-E (SIP3 / 1 shunt) can be evaluated.

### EVAL BOARD USER'S MANUAL



Surface



Back side

Figure 1. Evaluation Board Photos

Table 1.

ONPN of Evaluation Board	ONPN of IPM	Io
STK581U3C2DGEVB	STK581U3C2D-E	30 A

# STK581U3C2DGEVB

## CIRCUIT DIAGRAM

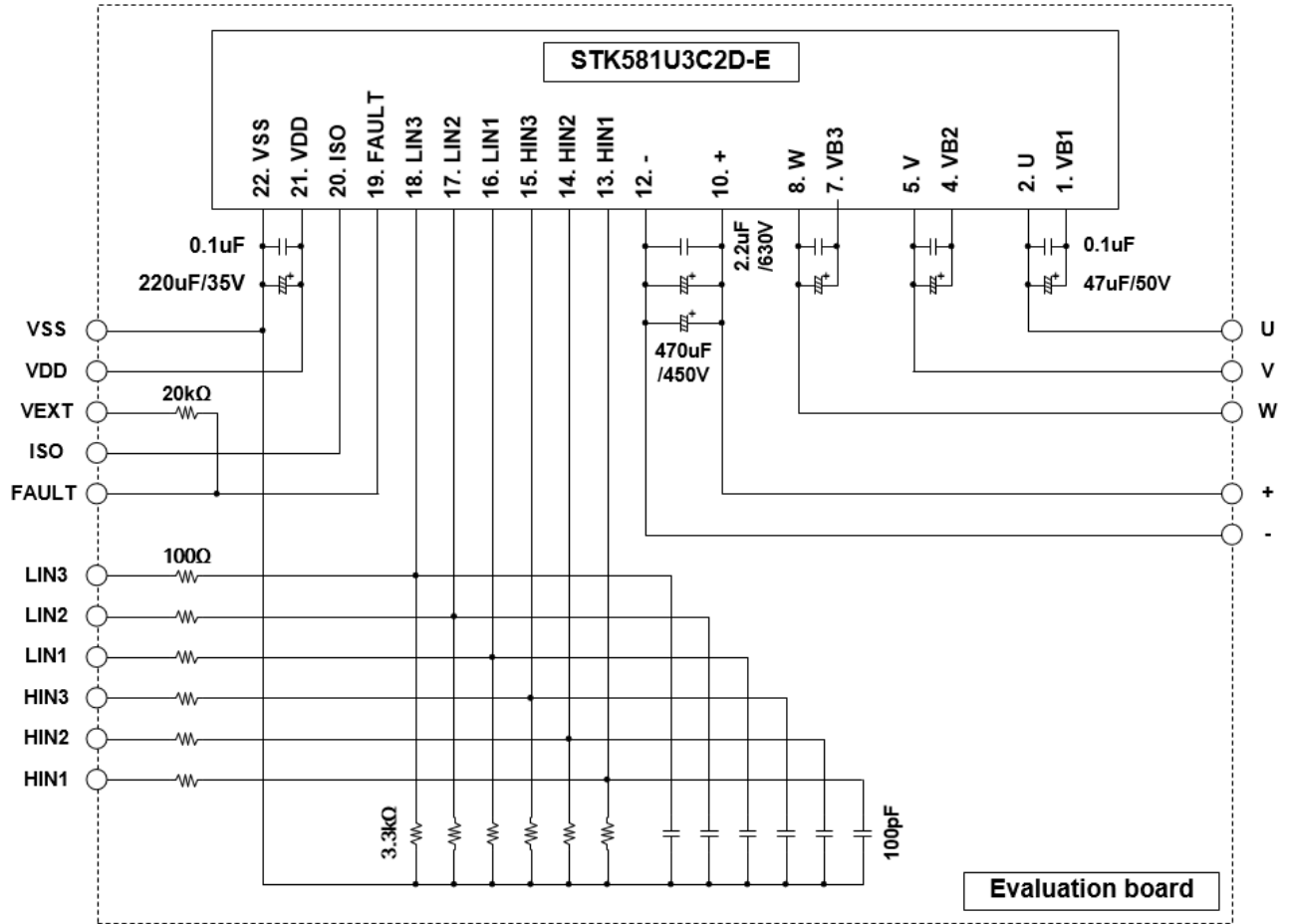


Figure 2. Circuit Diagram

# STK581U3C2DGEVB

## PIN DESCRIPTION

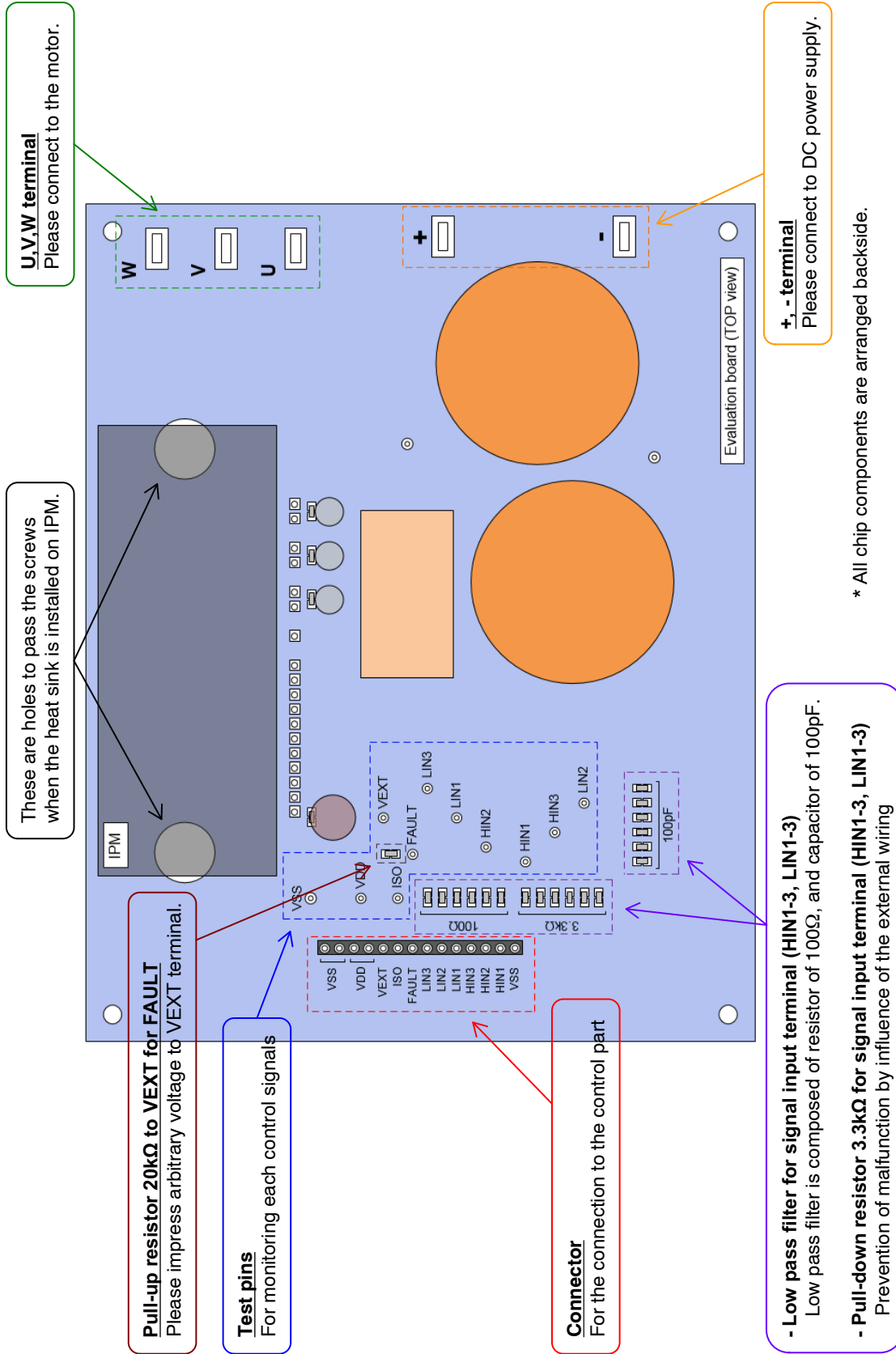


Figure 3. Description of Each Pin

# STK581U3C2DGEVB

## OPERATION PROCEDURE

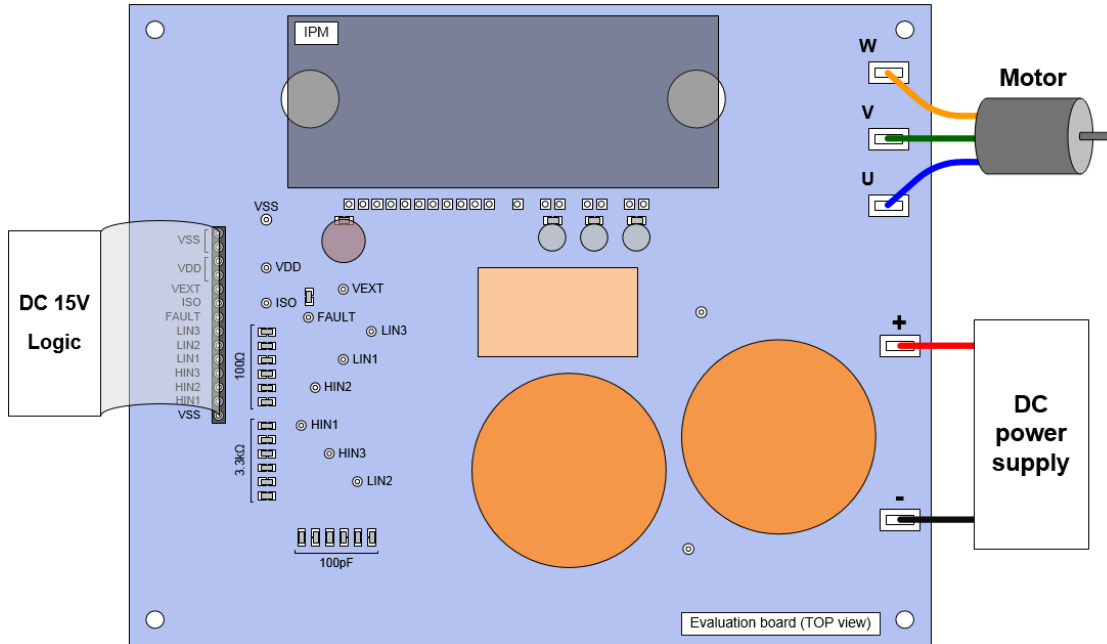


Figure 4.

**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.

# STK581U3C2DGEVB

## LAYOUT

Length: 116 mm  
Side: 145 mm  
Thickness: 1.6 mm

Rigid double-sided substrate (Material: FR-4)  
Both sides resist coating  
Copper foil thickness: 70  $\mu\text{m}$

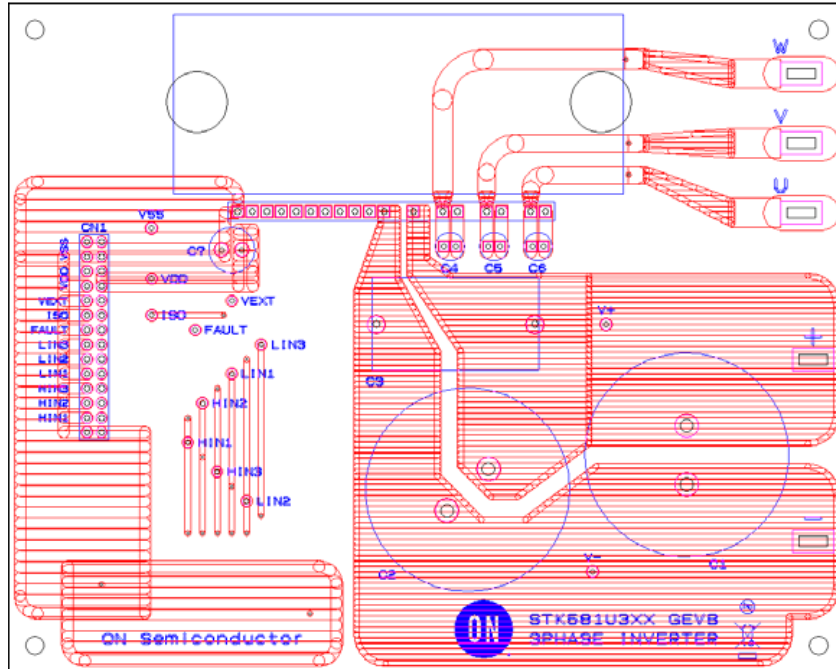


Figure 5. Layout (Top View) – Surface

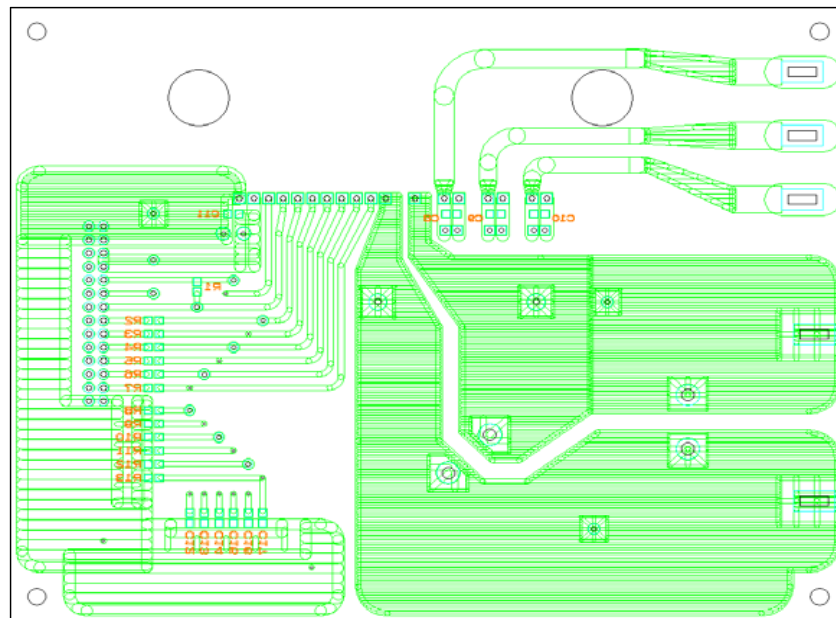


Figure 6. Layout (Top View) – Back Side

# STK581U3C2DGEVB

## BILL OF MATERIALS

**Table 2. EVALUATION BOARD BILL OF MATERIALS**

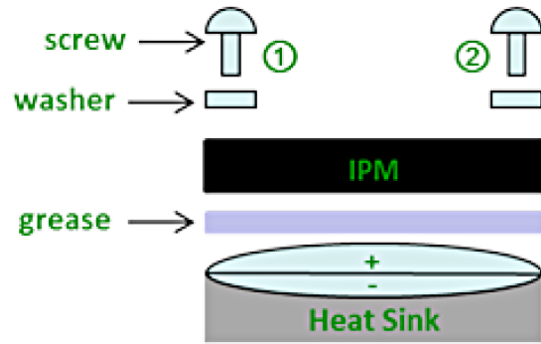
Components	Symbol	SMD	DIP	Manufacturer	Part Number	Specification	Supplement	
Resistor	R1	1		KOA	RK73H1JTDD2002F	20 kΩ / 0.1 W / ±1%	Chip (1608 size)	Fault pull-up
	R2 - R7	6		KOA	RK73H1JTDD1000F	100 Ω / 0.1 W / ±1%	Chip (1608 size)	Signal input low pass filter
	R8 - R13	6		KOA	RK73H1JTDD3301F	3.3 kΩ / 0.1 W / ±1%	Chip (1608 size)	Signal input pull-down
Capacitor	C1, C2		2	Nippon Chemi-Con	EKMM451VSN471MA50S	470 μF / 450 V / ±20%	Aluminum electrolytic capacitor	Plus-Minus
	C3		1	PANASONIC	ECQE6225JT	2.2 μF / 630 V / ±5%	Film capacitor	Plus-Minus, Snubber
	C4-C6		3	Nippon Chemi-Con	EKMG350ELL470ME11D	47 μF / 35 V / ±20%	Aluminum electrolytic capacitor	VBx - VSx
	C7		1	Nippon Chemi-Con	EKMG350ELL221MHB5D	220 μF / 35 V / ±20%	Aluminum electrolytic capacitor	VDD-VSS
	C8 - C11	4		MURATA	GRM188B31H104K	0.1 μF / 50 V / ±10%	Chip (1608 size)	VBx - Vsx, VDD-VSS
	C12 - C17	6		MURATA	GRM1882C1H101J	100 pF / 50 V / ±5%	Chip (1608 size)	Signal input low pass filter
Connector	CN1		1	HIROSE ELECTRIC	A2-14PA-2.54DSA(71)	14 pin / 2.54 pitch		
Pin (S)	VSS, VDD, VEXT, ISO, FAULT, HIN1-3, LIN1-3, V+, V-		13	Mac8	ST-1-3			
Pin (L)	U, V, W, +, -		5				Faston terminal (Tab)	
IC	IC1		1	ON Semiconductor	STK581U3C2D-E	SIP3 / 1shunt		
	Total	23	27					

**Heat Sink Mounting**

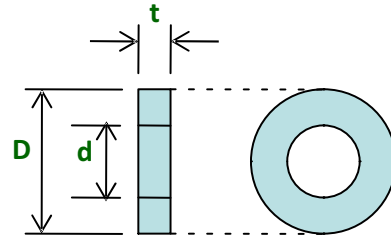
NOTE: When mounting the heat sink on IPM, first, tighten the screws roughly by temporary maintaining the balance of left and right. Next, tighten both screws gradually alternately until the end.

**Table 3.**

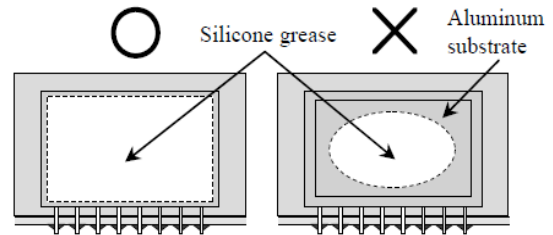
Item	Recommended Condition
Pitch	70.0 ± 0.1 mm (Please refer to Package Outline Diagram)
Screw	Diameter: M4 Bind machine screw, Truss machine screw, Pan machine screw
Washer	Plane washer The size is D = 9 mm, d = 4.2 mm and t = 0.8 mm (Figure 8) JIS B 1256
Heat Sink	Material: copper or Aluminum Warpage (the surface that contacts IPM): -50 ~ 100 μm Screw holes must be countersunk. No contamination on the heat sink surface that contacts IPM.
Torque	Final tightening: 0.79 ~ 1.17 Nm Temporary tightening: 20 ~ 30% of final tightening
Grease	Silicon grease Thickness: 100 ~ 200 μm Uniformly apply silicon grease to whole back. (Figure 9)



**Figure 7. Mount HIC on a Heat Sink**



**Figure 8. Size of Washer**



**Figure 9. About Uniformly Application**

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