STK581U3C2DGEVB

STK581U3C2D-E Evaluation Board User's Manual

ON Semiconductor®

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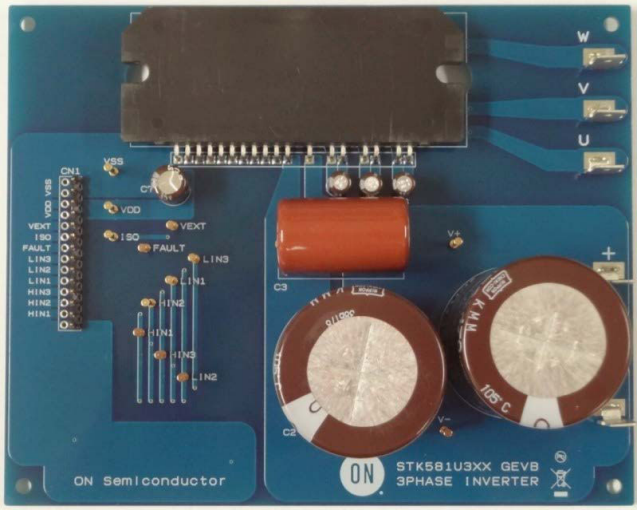
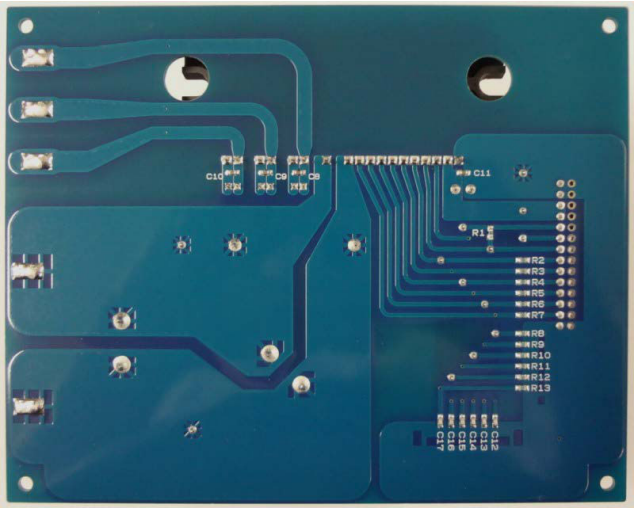
EVAL BOARD USER'S MANUAL

Introduction

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



Surface



Back side

Figure 1. Evaluation Board Photos

Table 1.

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

CIRCUIT DIAGRAM

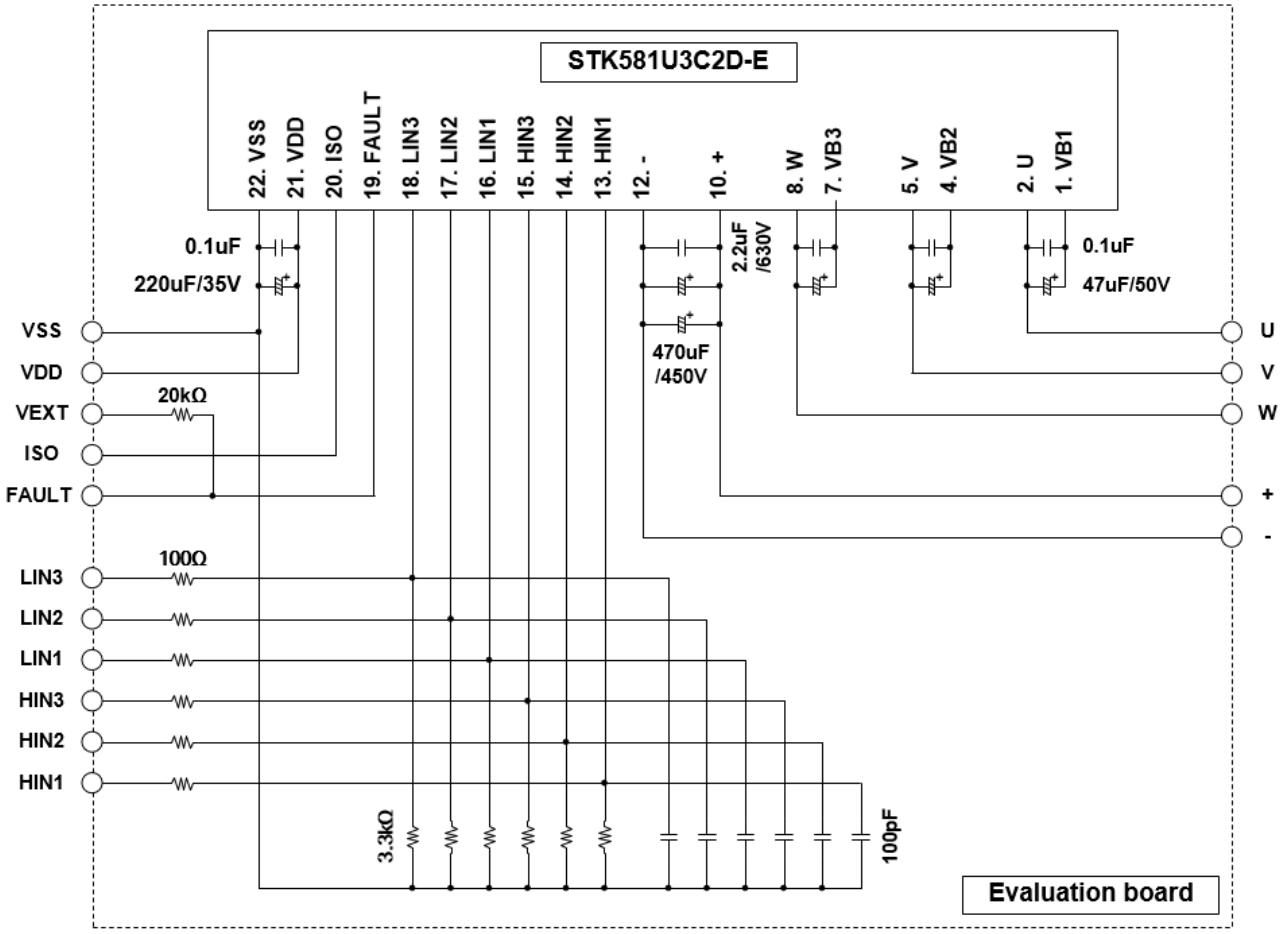


Figure 2. Circuit Diagram

PIN DESCRIPTION

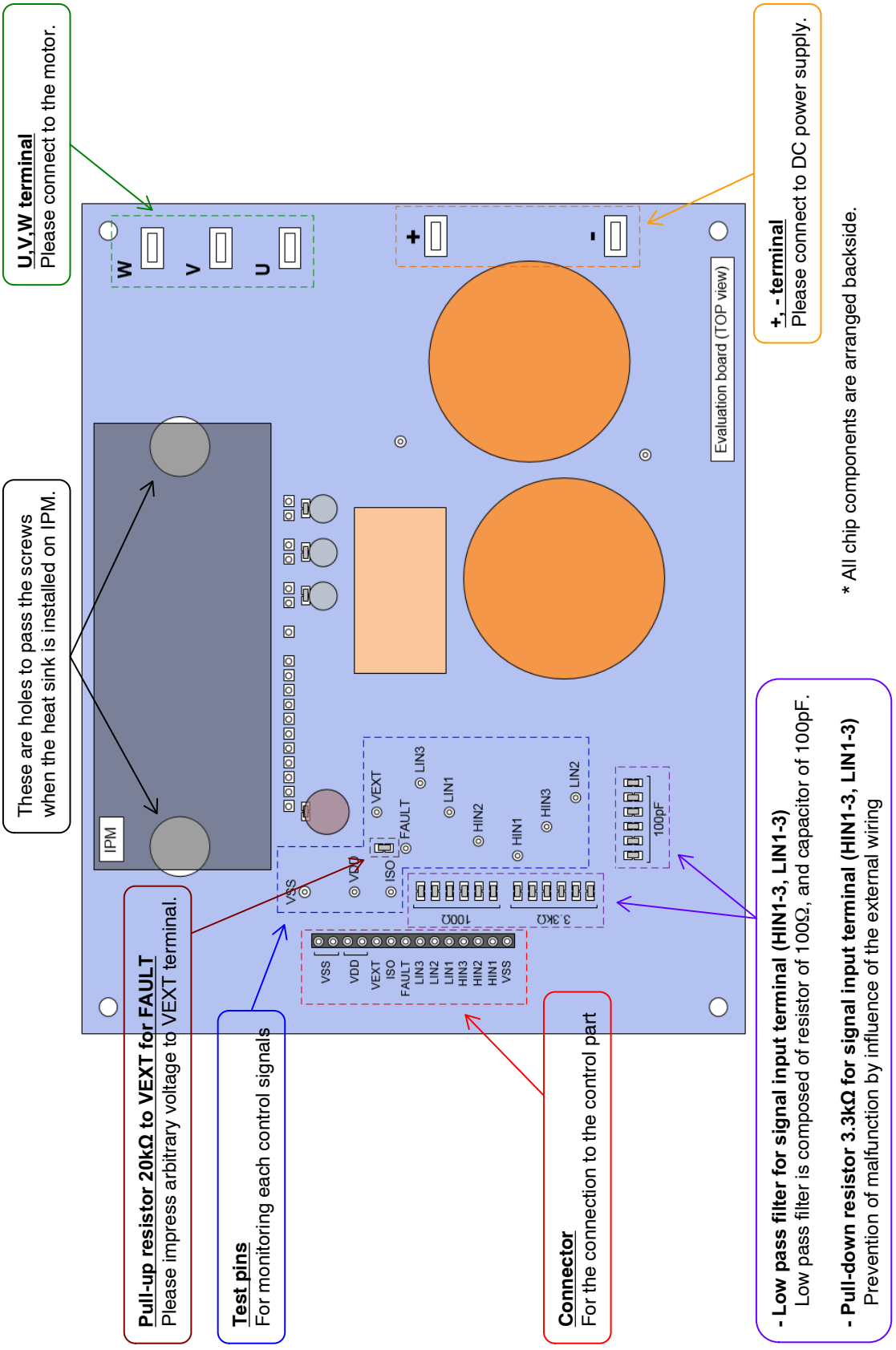


Figure 3. Description of Each Pin

OPERATION PROCEDURE

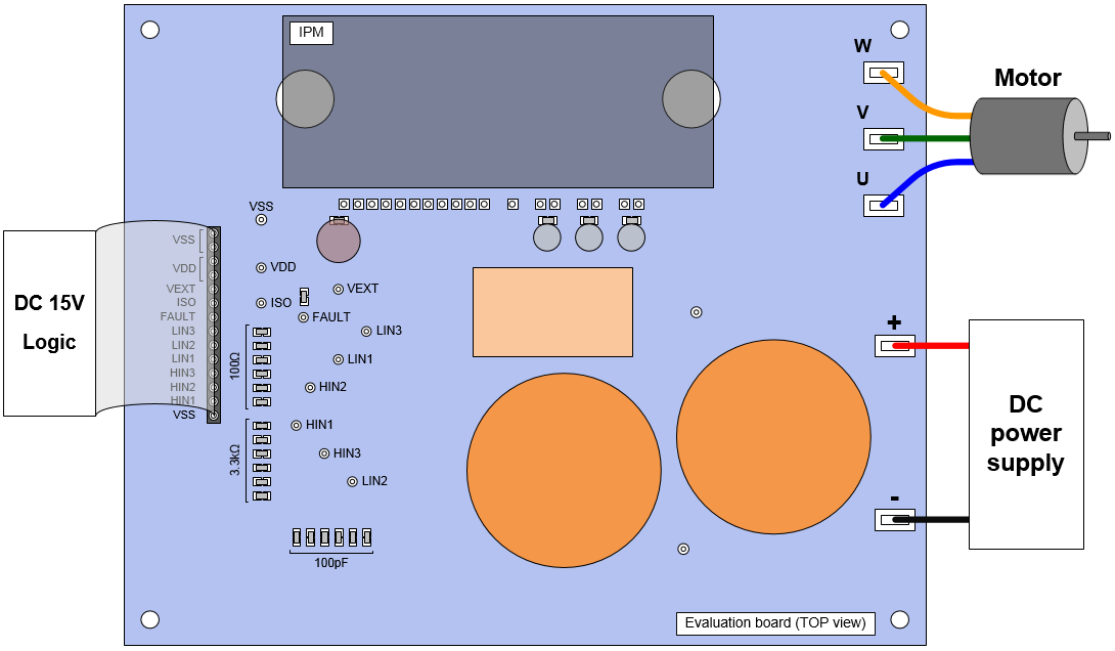


Figure 4.

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.

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 μm

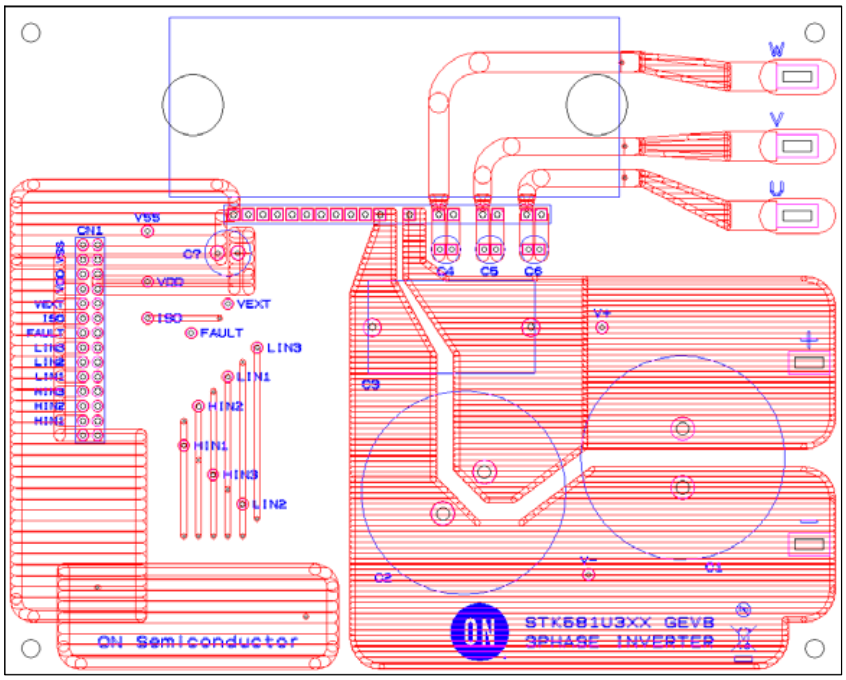


Figure 5. Layout (Top View) − Surface

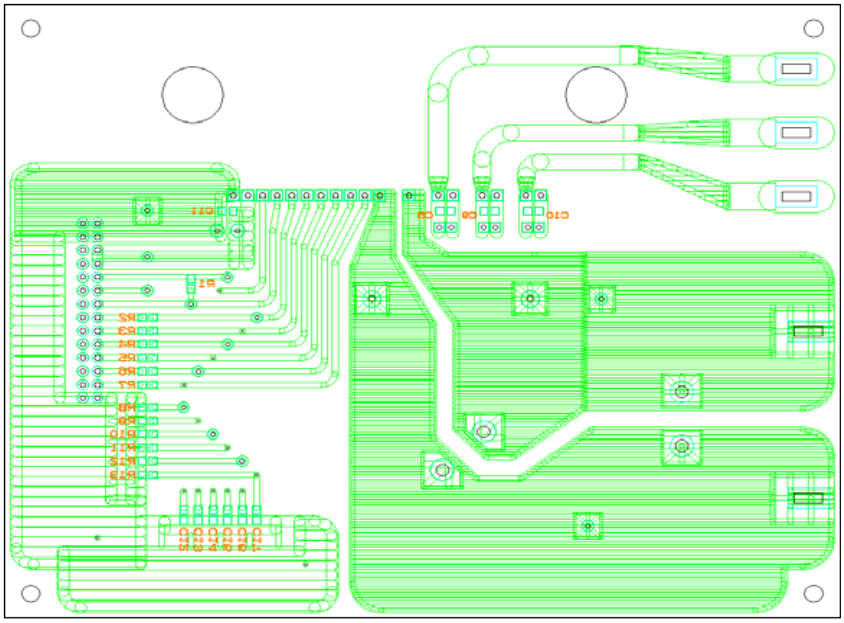


Figure 6. Layout (Top View) − Back Side

BILL OF MATERIALS

Table 2. EVALUATION BOARD BILL OF MATERIALS

Compon-ents	Symbol	SMD	DIP	Manufacturer	Part Number	Specification	Supplement	
Resistor	R1	1		KOA	RK73H1JTTD2002F	20 kΩ/ 0.1 W / ±1%	Chip (1608 size)	Fault pull−up
	R2 − R7	6		KOA	RK73H1JTTD1000F	100 Ω / 0.1 W / ±1%	Chip (1608 size)	Signal input low pass filter
	R8 − R13	6		KOA	RK73H1JTTD3301F	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)

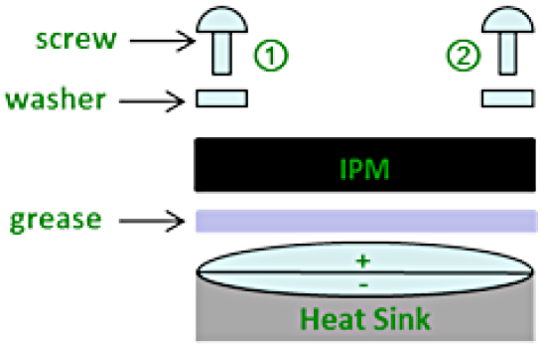


Figure 7. Mount HIC on a Heat Sink

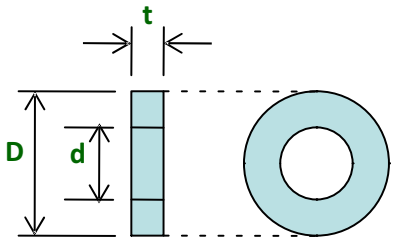


Figure 8. Size of Washer

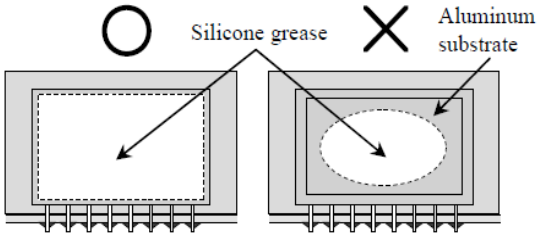


Figure 9. About Uniformly Application

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