

0. Overview

This document explains how to use GD6112TRC3P-EVK-003, gate driver board(GD Board), to evaluate TRCDRIVE pack™ as a 3 phase traction inverter. The user must read the manual before starting the test. Also, there are few LEDs and terminals, which it is helpful for the user to monitor the board status and conduct the test. If the user would like to confirm the specification of the board, please refer to the user's guide

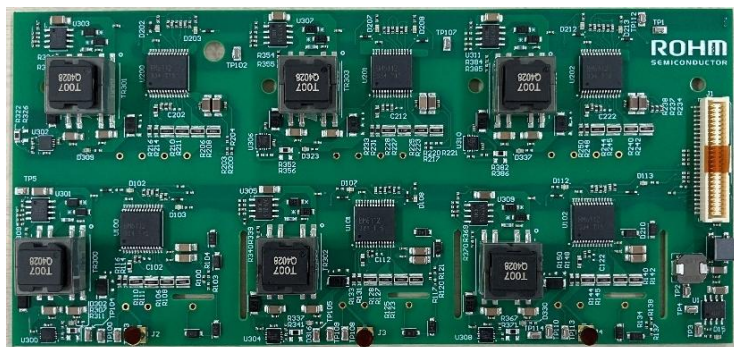


Figure 1. GD Board

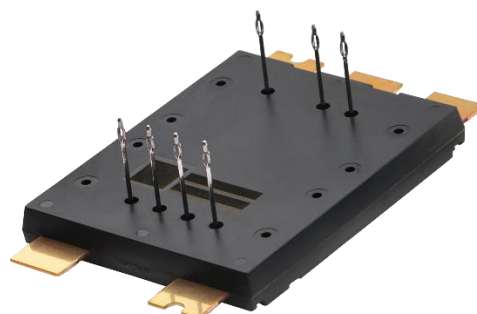


Figure 2. TRCDRIVE pack™



Figure 3. 3 phase Inverter EVK (assembled with KIT)

Table 1. SiC power module

Part Name	V _{bss} [V]	RDS(on) [mΩ]	Heat sink assembly	Module type	Reference Part No.
BST350T12P4PSAMPLE	1200	2.8	Ag Sinter	Small	REF68004

1. Pin assignment

1.1. Socket Pin and connector

Figure 4 shows GD Board pin position. The end user refers to the Table2, J1 pin assignment, to make the cable, which can provide the IO signal to the GD Board

J1 I/O Connector P/N: BM50B-SHLDS-G-TFT

J1 Cable Housing P/N: SHLDP-50V-S-1(B)

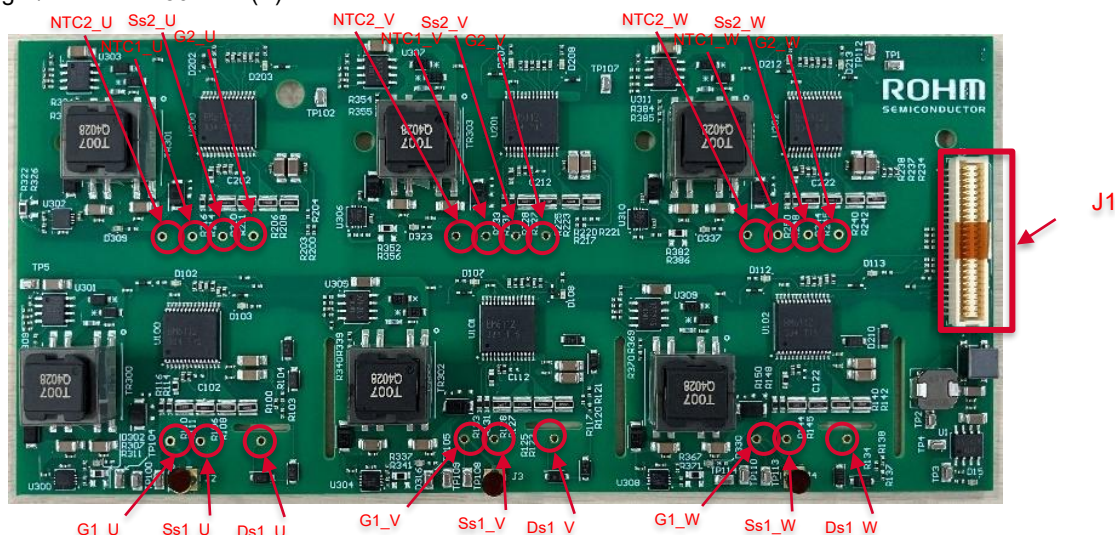


Figure 4. GD Board and press fit pin

Table 2. GD Board pressfit pin list

Pin Name	Details
G1_U	U High side Gate
Ss1_U	U High side Source Sense
Ds1_U	U High side Drain Sense
G2_U	U Low side Gate
Ss2_U	U Low side Source Sense
NTC1_U	U phase power module NTC
NTC2_U	U phase power module NTC
G1_V	V High side Gate
Ss1_V	V High side Source Sense
Ds1_V	V High side Drain Sense
G2_V	V Low side Gate
Ss2_V	V Low side Source Sense
NTC1_V	V phase power module NTC
NTC2_V	V phase power module NTC
G1_W	W High side Gate
Ss1_W	W High side Source Sense
Ds1_W	W High side Drain Sense
G2_W	W Low side Gate
Ss2_W	W Low side Source Sense
NTC1_W	W phase power module NTC
NTC2_W	W phase power module NTC

Table 3. J1 Pin assignment

Pin No.	Pin Name	I/O	details
1	N.C.	-	-
2	GND_IN	-	GND
3	N.C.	-	-
4	GND_IN	-	GND
5	N.C.	-	-
6	GND_IN	-	GND
7	N.C.	-	-
8	N.C.	-	-
9	N.C.	-	-
10	N.C.	-	-
11	TEMP_U	O	U phase Power Module contains build-in NTC, and GD Board provides temperature monitor function
12	GND_IN	-	GND
13	TEMP_V	O	V phase Power Module contains build-in NTC, and GD Board provides temperature monitor function
14	GND_IN	-	GND
15	TEMP_W	O	W phase Power Module contains build-in NTC, and GD Board provides temperature monitor function
16	GND_IN	-	GND
17	N.C.	-	-
18	N.C.	-	-
19	N.C.	-	-
20	N.C.	-	-
21	RDY_H	O	Abnormal signal pin(High side). Normal: "H", When Fault(UVLO or OSFB) : "L"
22	GND_IN	-	GND
23	RDY_L	O	Abnormal signal pin(Low side). Normal: "H", When Fault(UVLO or OSFB) : "L"
24	GND_IN	-	GND
25	FLT_H	O	Fault signal pin(High side). Normal: "Hi-Z", When fault: "L"
26	GND_IN	-	GND
27	FLT_L	O	Fault signal pin(Low side). Normal: "Hi-Z", When fault: "L"
28	GND_IN	-	GND
29	N.C.	-	-
30	N.C.	-	-
31	ENA	I	Enabling signal pin. When ENA is "H" level, output is enabled. When ENA is "L" level, output is disabled
32	GND_IN	-	GND
33	IN_WH	I	Input signal for W High side power module "H" Level : output(Gate Driver Voltage) is high "L" Level : output(Gate Driver Voltage) is low
34	GND_IN	-	GND
35	IN_WL	I	Input signal for W Low side power module "H" Level : output(Gate Driver Voltage) is high "L" Level : output(Gate Driver Voltage) is low
36	GND_IN	-	GND
37	IN_VH	I	Input signal for V High side power module "H" Level : output(Gate Driver Voltage) is high "L" Level : output(Gate Driver Voltage) is low
38	GND_IN	-	GND
39	IN_VL	I	Input signal for V Low side power module "H" Level : output(Gate Driver Voltage) is high "L" Level : output(Gate Driver Voltage) is low
40	GND_IN	-	GND
41	IN_UH	I	Input signal for U High side power module "H" Level : output(Gate Driver Voltage) is high "L" Level : output(Gate Driver Voltage) is low
42	GND_IN	-	GND

43	IN_UL	I	Input signal for U Low side power module “H” Level : output(Gate Driver Voltage) is high “L” Level : output(Gate Driver Voltage) is low
44	GND_IN	-	GND
45	+B	I	Power Supply Voltage
46	+B	I	Power Supply Voltage
47	+B	I	Power Supply Voltage
48	+B	I	Power Supply Voltage
49	+B	I	Power Supply Voltage
50	+B	I	Power Supply Voltage

1.2. Test pin and MMCX connector

This GD Board has 16 test pins and 3 MMCXs to monitor signals on the board. Table 4 shows the list of test pins. Please refer to figure 5 to identify the location of the pins and MMCX connector.

Table 4. test pin list

Category	Side	Designator	Description
Input voltage and signal	Primary	TP1	ENA
		TP2	VSUP
		TP3	+5V
		TP4, TP5	GND
UH	Primary	TP102	UH IN_PWM
	Secondary	TP100	UH VCC2
		TP103	UH Gate
		TP104	UH VEE2
		J2	UH Vgs MMCX
VH	Primary	TP107	VH IN_PWM
	Secondary	TP105	VH VCC2
		TP108	VH Gate
		TP109	VH VEE2
		J3	VH Vgs MMCX
WH	Primary	TP112	WH IN_PWM
	Secondary	TP110	WH VCC2
		TP113	WH Gate
		TP114	WH VEE2
		J4	WH Vgs MMCX

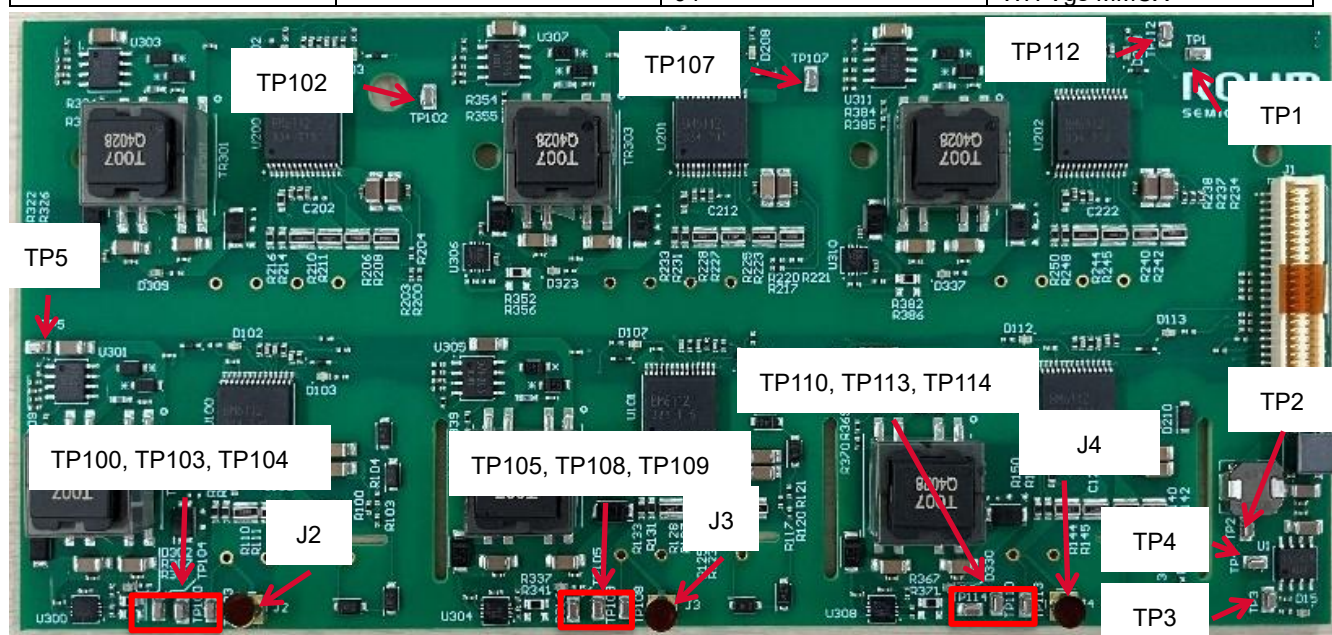


Figure 5. test Pin position

2. How to use

The following steps describe how to use GD Board. If the user did not follow these steps, the power module and GD Board could be broken possibly.

2.1. Power ON/OFF Sequence

Please be advised to follow the power on/off sequence described below. Otherwise, power module is likely to be damaged due to voltage overshoot

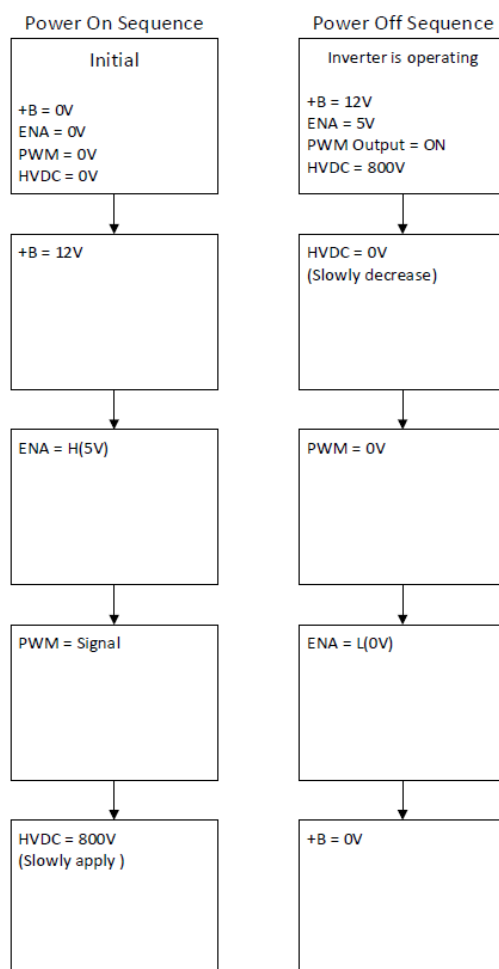


Figure 7. Power on and off sequence

2.2. LED

This GD Board has 19 LEDs as status indicators. Table 5 describes the functions of each LEDs and figure 8 shows the locations of the LEDs.

Table 5. LED list

Category	Side	Designator	Description
Auxiliary power	Primary	D15	ON: +5V is normal OFF: +5V is abnormal
UH	Primary	D102	ON: RDY error is triggered OFF: Normal
		D103	ON: FLT error is triggered OFF: Normal
	Secondary	D302	ON: +18V is normal OFF: +18V is abnormal
UL	Primary	D202	ON: RDY error is triggered OFF: Normal
		D203	ON: FLT error is triggered OFF: Normal
	Secondary	D309	ON: +18V is normal OFF: +18V is abnormal
VH	Primary	D107	ON: RDY error is triggered OFF: Normal
		D108	ON: FLT error is triggered OFF: Normal
	Secondary	D316	ON: +18V is normal OFF: +18V is abnormal
VL	Primary	D207	ON: RDY error is triggered OFF: Normal
		D208	ON: FLT error is triggered OFF: Normal
	Secondary	D323	ON: +18V is normal OFF: +18V is abnormal
WH	Primary	D112	ON: RDY error is triggered OFF: Normal
		D113	ON: FLT error is triggered OFF: Normal
	Secondary	D330	ON: +18V is normal OFF: +18V is abnormal
WL	Primary	D212	ON: RDY error is triggered OFF: Normal
		D213	ON: FLT error is triggered OFF: Normal
	Secondary	D337	ON: +18V is normal OFF: +18V is abnormal

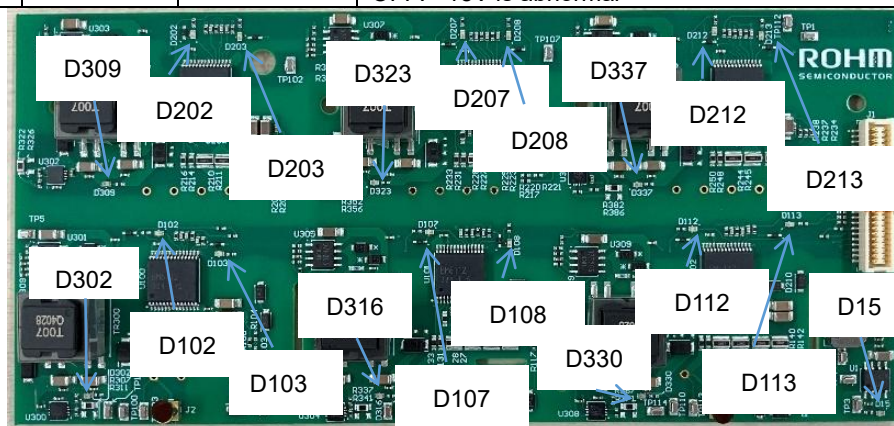


Figure 8. LED position

2.3. Gate Resistor

The switching speed can be adjusted by gate resistors. Gate resistors are already mounted, though the user can change the gate resistor by soldering. However, it is not guaranteed that the GD Board can drive the power module safely. Figure 8 shows the gate resistor on schematic circuit. Table 6 and 7 shows the list of gate resistors and the value. Figure 10 shows the position of the gate resistor.

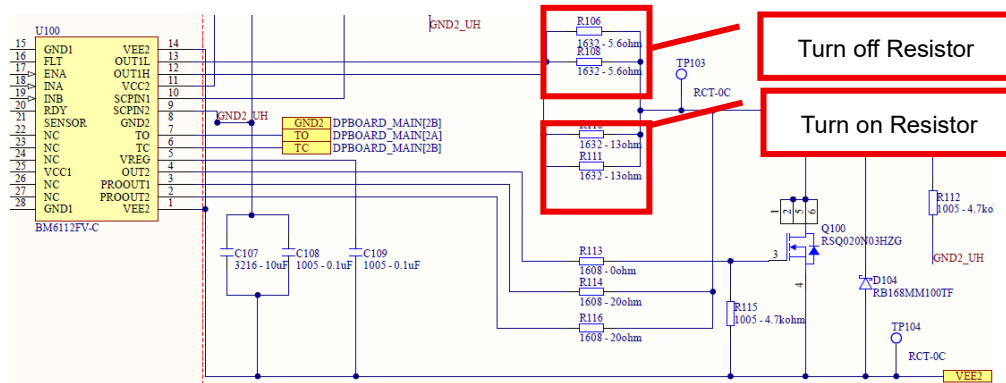


Figure 9. gate resistor on schematics

Table 6. gate resistor designator

	UH	UL	VH	VL	WH	WL
Turn on R	R110, R111	R210, R211	R127, R128	R227, R228	R144, R145	R244, R245
Turn off R	R106, R108	R206, R208	R123, R125	R223, R225	R140, R142	R240, R242

Table 7. default gate resistor value

	Default gate resistor	
	Turn on	Turn off
Package	LTR18(0612)	LTR18(0612)
Value(Ω)	13	5.6

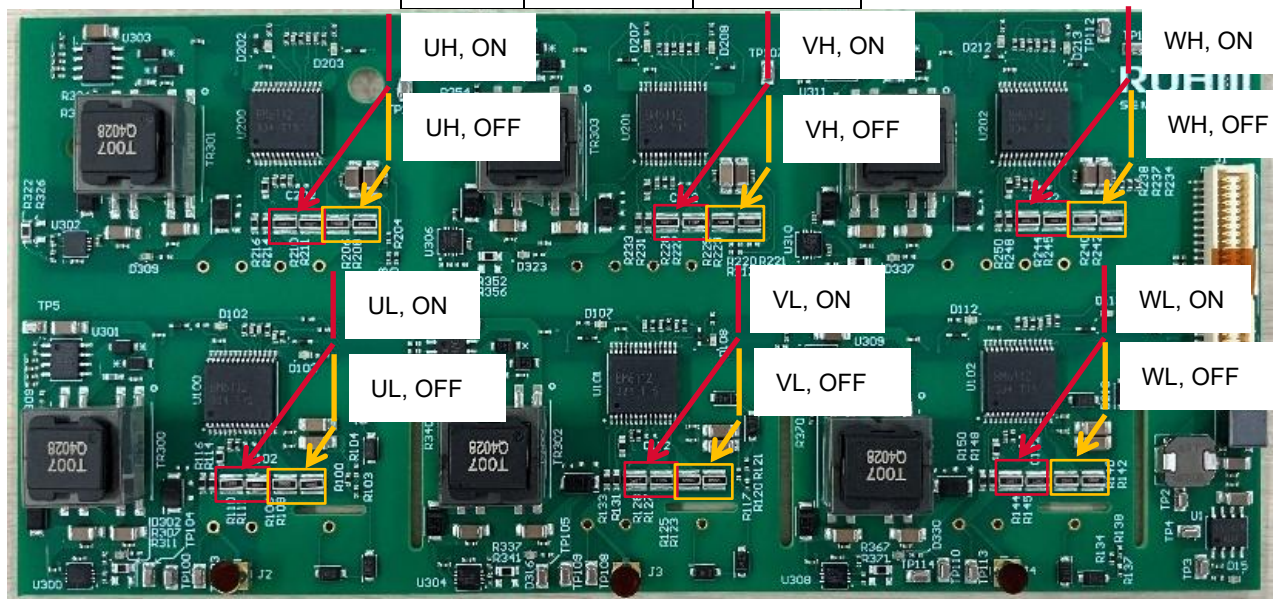


Figure 10. gate resistor position

3. Revision History

Revision	Date	Description of change
1	September 2025	Initial version

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