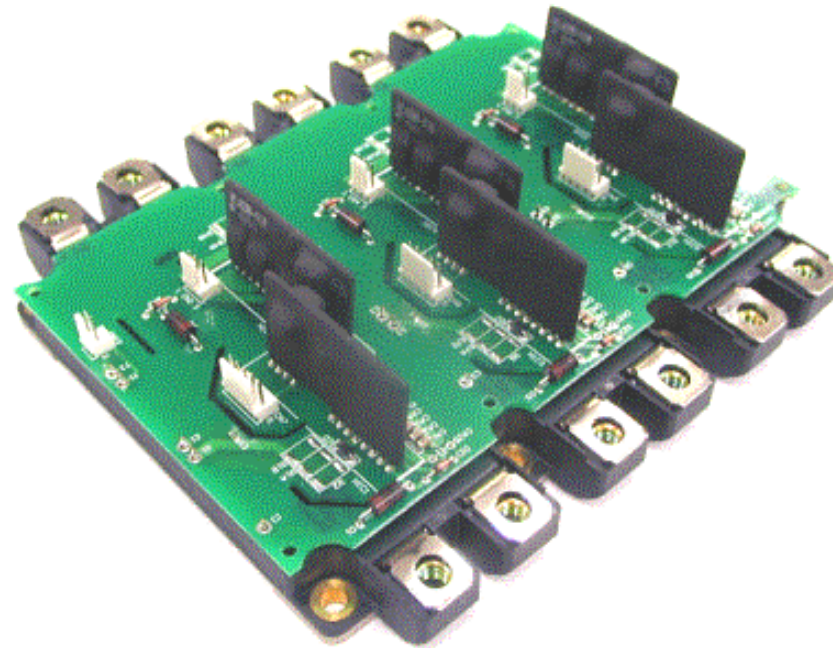




# **IGBT Gate Drive Unit “VLA525-01R” Installation Manual**

(Tentative)

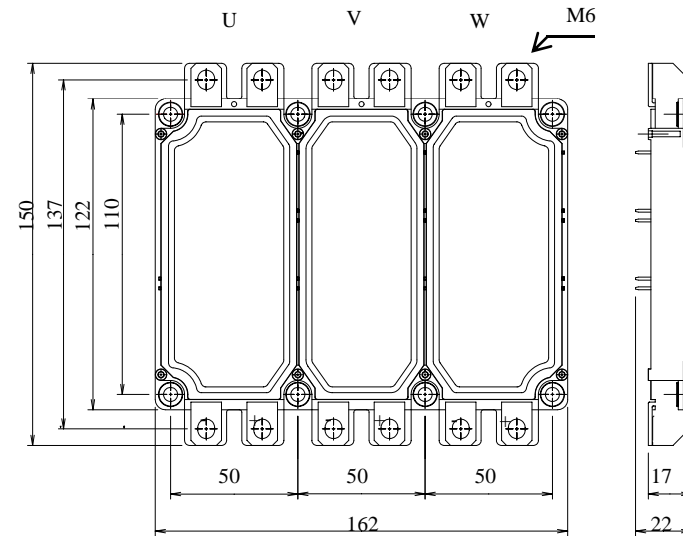


1.Applicable Fuji IGBT-module

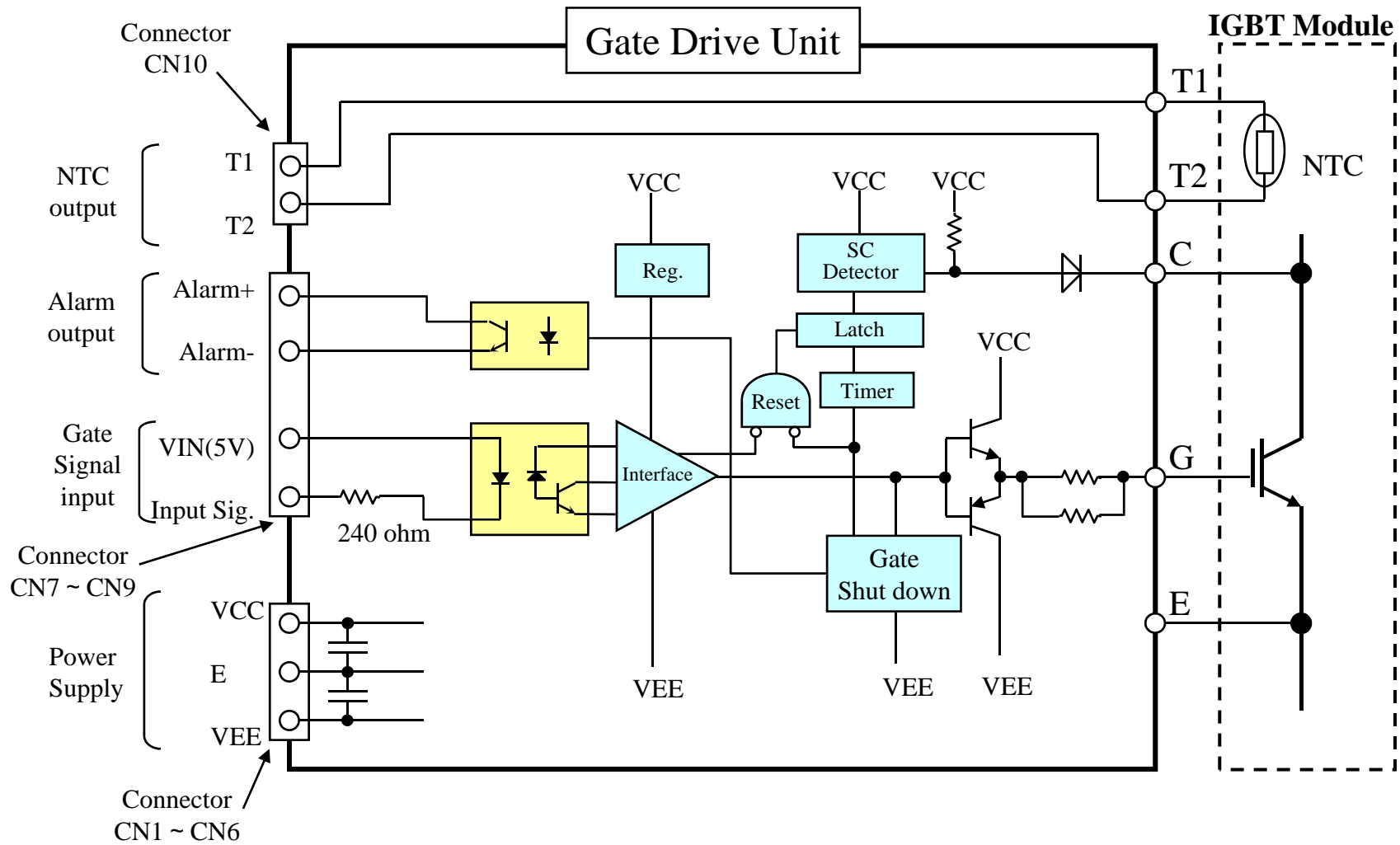
VCES(V)	IC(A)	Type	Package
1200	225	6MBI225U4-120	6 in 1 package
1200	300	6MBI300U4-120	
1200	450	6MBI450U4-120	
1700	225	6MBI225U4-170	
1700	300	6MBI300U4-170	
1700	450	6MBI450U4-170	



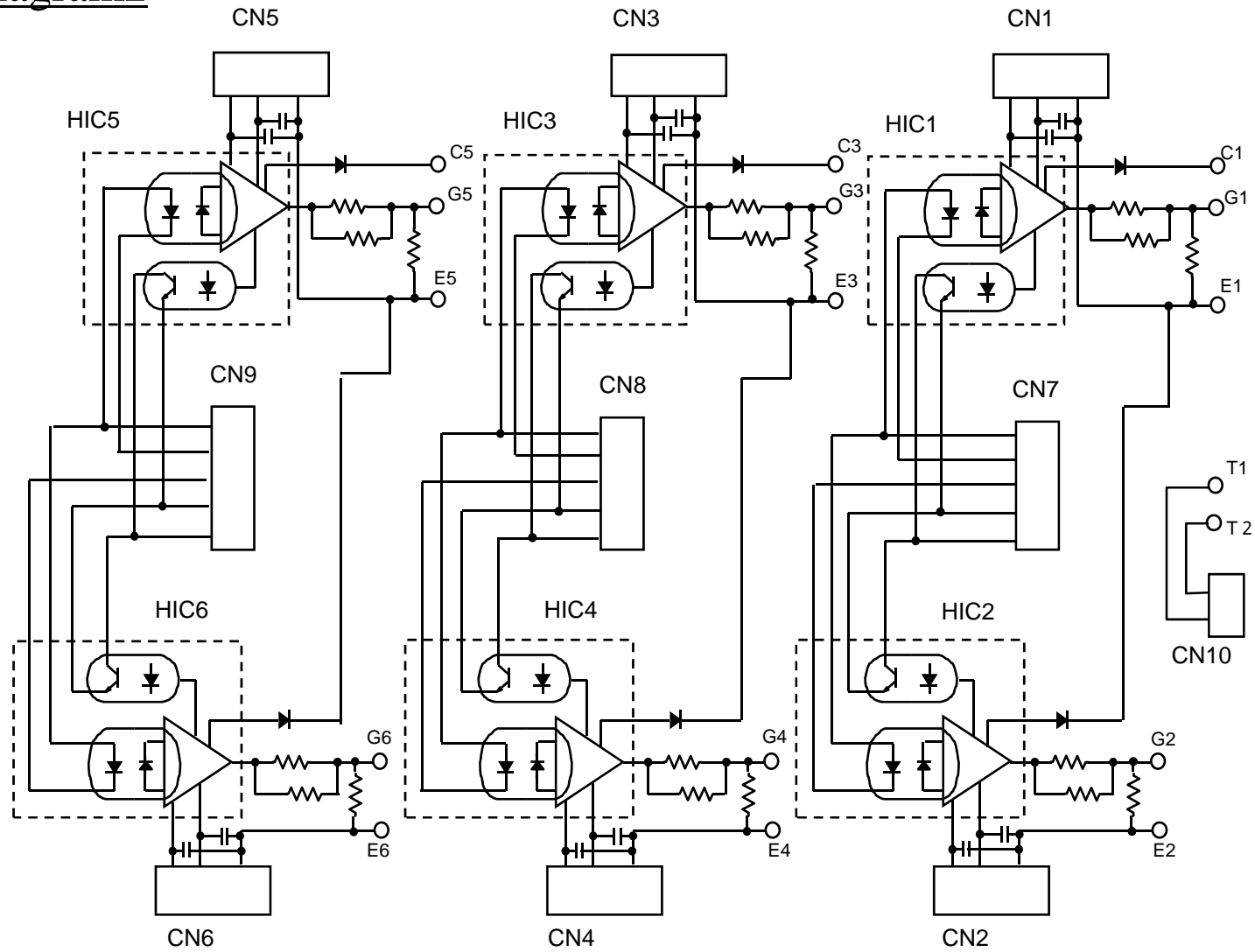
6MBI450U4-120



2.Block Diagram1



### 3. Block Diagram2



## 4. Specifications (Tentative)

### Maximum ratings (unless otherwise noted, Ta=25C)

Symbol	Parameter	Conditions	Ratings	Unit
VCCEE	Supply voltage	Applied between VCC –VEE	31	V
I <sub>IH</sub>	Input signal current	-	20	mA
I <sub>OHP</sub>	Gate peak current	Pulse width 2us	-5	A
I <sub>IOLP</sub>			5	A
I <sub>alm</sub>	Alarm output current	-	10	mA
f <sub>c</sub>	Switching frequency	-	15	kHz
V <sub>iso</sub>	Isolation voltage	AC50/60Hz,1min Applied between Primary and Secondary	4000	V <sub>rms</sub>
T <sub>opr</sub>	Operating temperature	No condensation allowable	-20 ~ 85	deg C
T <sub>stg</sub>	Storage temperature	No condensation allowable	-25 ~ 100	deg C

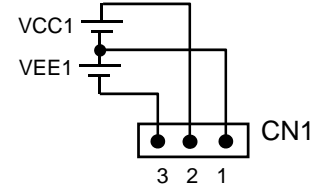
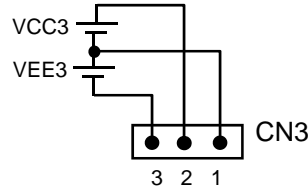
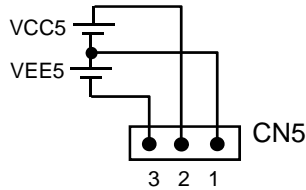
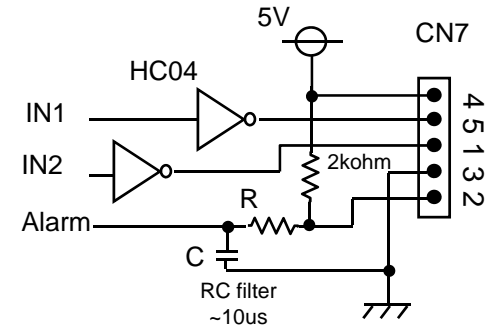
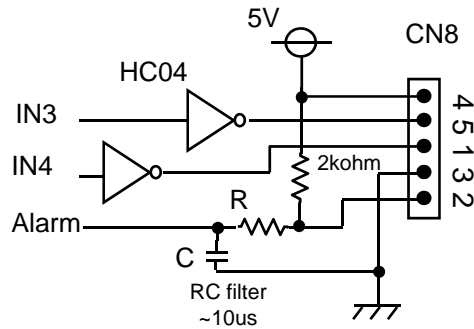
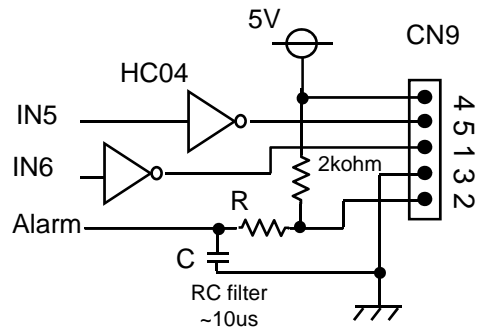
### Electrical Characteristics ( unless otherwise noted, Ta=25C, VCC=15V,VEE=-10V )

Symbol	Parameter	Conditions	Limits			Unit
			Min	Typ	Max	
t <sub>PLH</sub>	"L-H" propagation time	Measurement point is output of driver	-	-	1.3	us
t <sub>PHL</sub>	"H-L" propagation time	Measurement point is output of driver	-	-	1.3	us
V <sub>SC</sub>	SC detect threshold voltage	-	VCC-9	VCC-8	VCC-7	V
t <sub>alm</sub>	Alarm output time	-	1	1.4	2	ms
t <sub>dalm</sub>	Alarm delay time	-	-	-	10	us
R <sub>g</sub>	Gate resistance	-	-	1.1	-	ohm

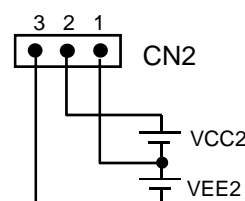
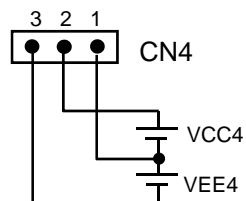
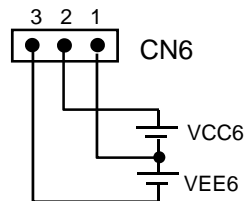
### Recommended operating conditions

Symbol	Parameter	Conditions	Ratings			Unit
			Min	Typ	Max	
VCC	Supply voltage	-	14.5	15	17	V
VEE		-	-6	-8	-12	V
V <sub>IN</sub>	Pull-up voltage for input signal	-	4.75	5	5.25	V
I <sub>IH</sub>	Input signal current	-	10	13	16	mA
T <sub>opr</sub>	Operating temperature	No condensation allowable	-20	-	85	deg C

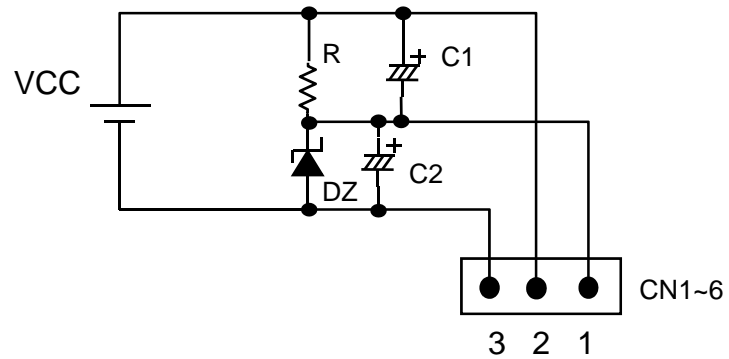
## 5. Input signal & Gate power supply connection



**VCC,VEE : Isolated Power Supplies**

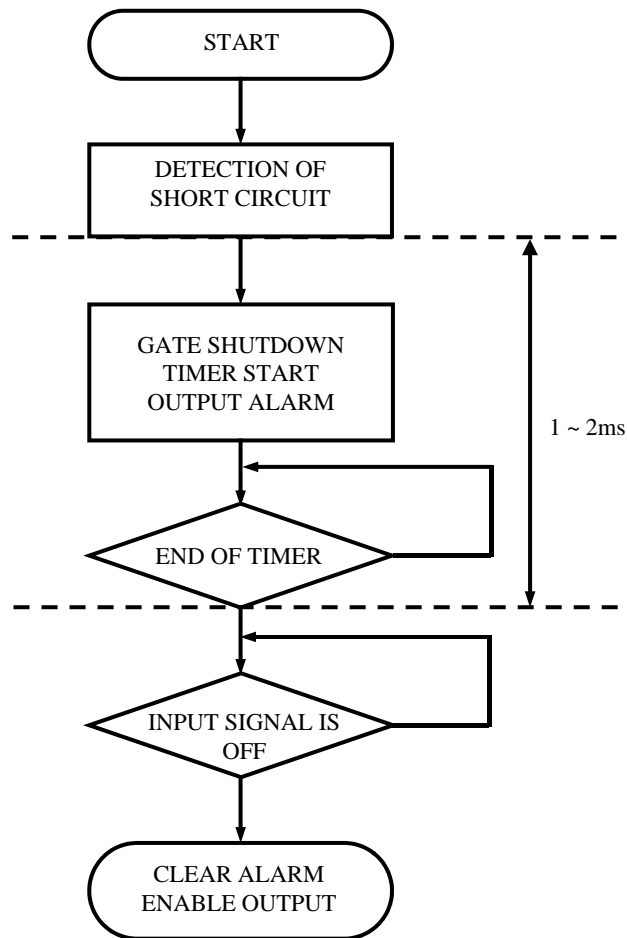


## 6. Application example of single power supply for gate drive



VCC = 24V (Isolated Power Supply) → Ex. VLA106-15242 (ISAHAYA ELECTRONICS)  
R = 3.3kohm  
DZ = 8.2V  
C1,2 = 100uF,50V (low impedance)

## 7. Operation flow on detecting short circuit

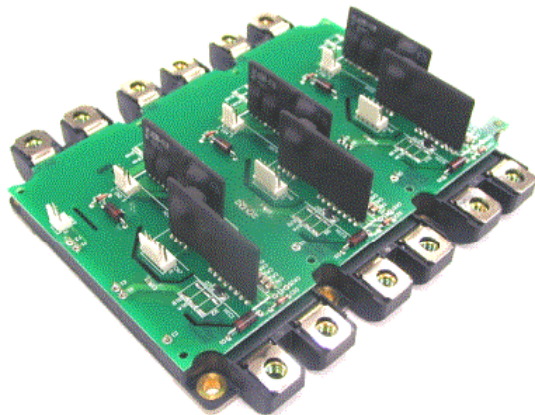


(1) In case the gate voltage is “H” and the collector voltage is high, the gate driver will recognize the circuit as short circuit and immediately reduce the gate voltage. (Slow shut down) Besides, put out an alarm sign which inform that protection circuit is operating.

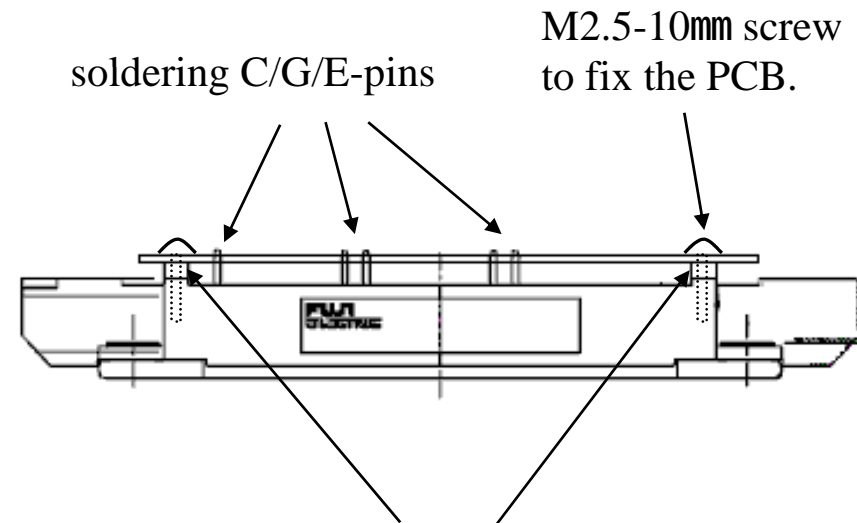
(2) The protection circuit return to ordinary condition if input sign is OFF when the predetermined time (1~2ms) passed. ( OFF period is needed more than 40us.)



## 8.The installation of the PCB on IGBT module



Gate Drive Unit VLA525-01R  
mounted on Fuji 6MBI450U4-120



Spacer(2.5 ~ 3.0mm length)  
to avoid overheating the PCB.

9.Details of connectors (1)

CN5	
Pin N.o.	Signal
1	Emitter15
2	VCC15
3	VEE15

CN3	
Pin N.o.	Signal
1	Emitter3
2	VCC3
3	VEE3

CN1	
Pin N.o.	Signal
1	Emitter1
2	VCC1
3	VEE1

CN9	
Pin N.o.	Signal
1	IN6
2	Alarm+U
3	Alarm-U
4	VIN(5V)
5	IN5

CN8	
Pin N.o.	Signal
1	IN4
2	Alarm+V
3	Alarm-V
4	VIN(5V)
5	IN3

CN7	
Pin N.o.	Signal
1	IN2
2	Alarm+W
3	Alarm-W
4	VIN(5V)
5	IN1

CN6	
Pin N.o.	Signal
1	Emitter6
2	VCC6
3	VEE6

CN4	
Pin N.o.	Signal
1	Emitter4
2	VCC4
3	VEE4

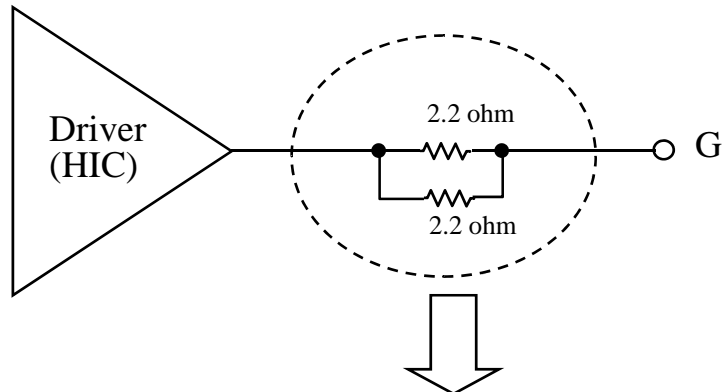
CN2	
Pin N.o.	Signal
1	Emitter2
2	VCC2
3	VEE2

CN10	
Pin N.o.	Signal
1	T1
2	T2

## 10.Details of connectors (2)

Connector	Header	Housing	Terminal	Maker
CN1~6	5045-03A	5051-03	5159	molex
CN7~9	5045-05A	5051-05	5159	molex
CN10	5045-02A	5051-02	5159	molex

## 11.About gate resistor



Total resistance value is 1.1 ohm

Gate resistance value is 1.1 ohm at the time of shipment.  
Please order by the following type name if other resistance value is needed.

Type name	Resistance value
VLA525-01R	➔ 1.1 ohm
VLA525-2R3	➔ 2.35 ohm
VLA525-3R4	➔ 3.4 ohm
VLA525-5R0	➔ 5 ohm