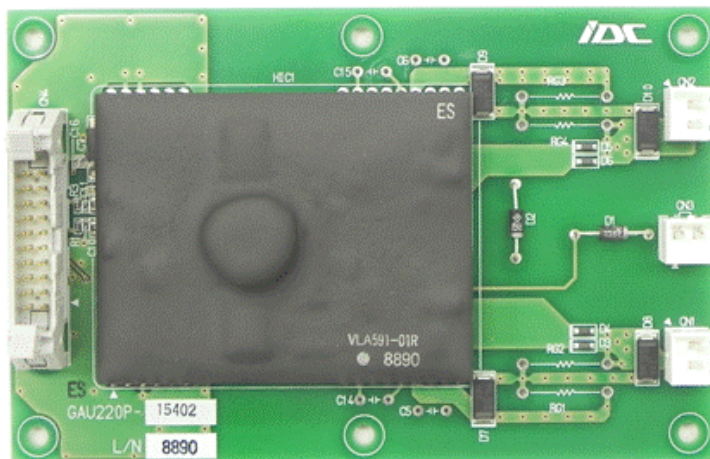


GAU220P-15402 Universal Gate Drive Prototype Board

Preliminary



Size : 80 x 125 mm (Image photo)

Core Gate Driver : VLA591-01R (Built in DCDC converter)

Features

- >Built in dual channel core gate driver (VLA591-01R)
- >Built in the isolated DC-DC converter for gate drive
- >Output peak current is +/-20A(max)
- >Electrical isolation voltage is 4000Vrms(for 1 minute)
- >Built in short circuit protection with soft shut down
- >One way power supply system for drivers and input signal (VD=15V)
- >Adjustable fall time on activity of short circuit protection

Targeted IGBT Modules

VCES:600/650V series ~ 600A class

VCES:1200V series ~ 1400A class

VCES:1700V series ~ 1800A class

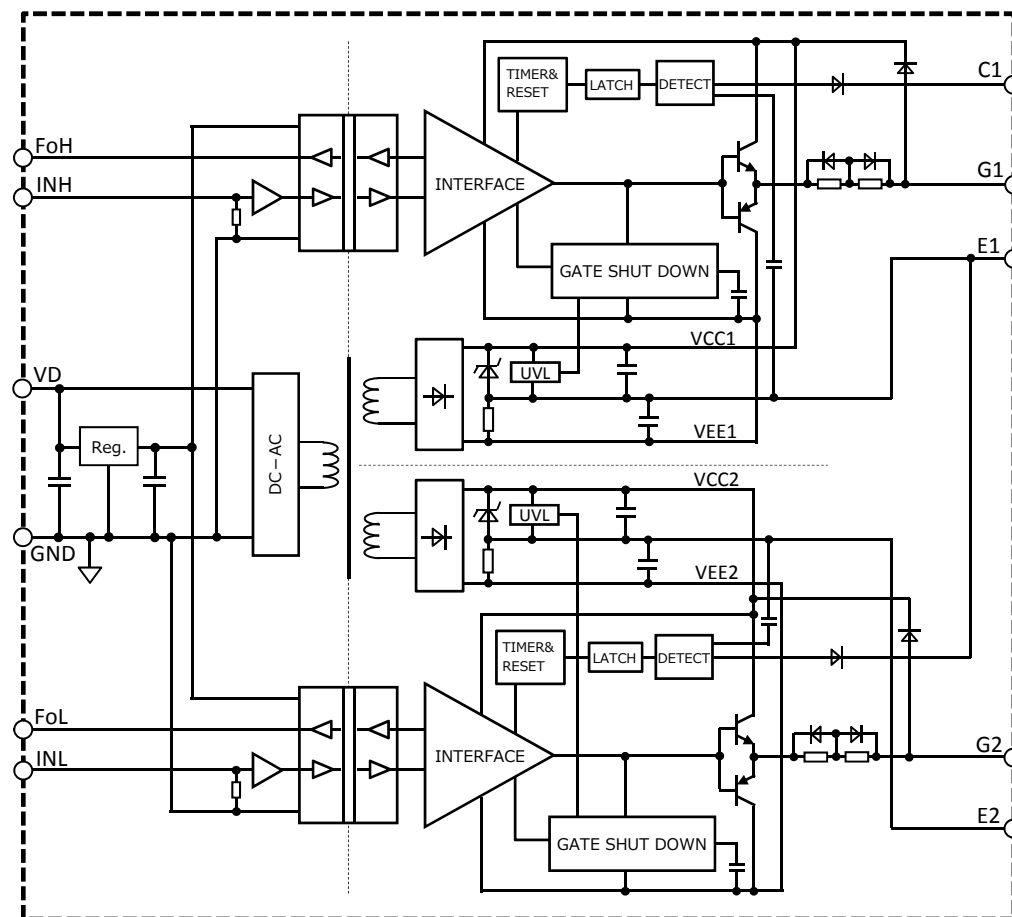


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Block diagram

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Maximum ratings (unless otherwise noted, Ta=25 degC)

Symbol	Item	Conditions	Ratings	Unit
VD	Supply voltage	DC	-1 ~ 16.5	V
VI	Input signal voltage	Applied between GND - INH,INL	19	V
I_Fo	Fo output current	Sink and source current of Fo terminal	+/-10	mA
IOHP	Output peak current	Pulse width 3us	-20	A
IOLP			20	A
Viso	Isolation voltage between primary and secondary	Sine wave voltage 60Hz, for 1min	4000	Vrms
Topr	Operating temperature	No condensation allowable	-40 ~ 85	deg C
Tstg	Storage temperature	No condensation allowable	-40 ~ 90	deg C
Idrive	Gate drive current	Gate average current (Per one circuit)	100	mA
VCN3	CN3 voltage	Terminal voltage of CN3	1700	V
VDC_Link	Main circuit voltage	The voltage between P and N	1200	V

Electrical characteristics (unless otherwise noted, Ta=25 degC, VD=15V, f=3kHz)

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
VD	Supply voltage	Recommended range	14.5	15	15.5	V
f	Switching frequency	Recommended range It is limited by gate average current (max:100mA/1circuit)	-	-	20	kHz
RG	Gate resistance	Recommended range	0.5	-	-	ohm
VI	Input signal voltage	Recommended range	4.5	-	15.5	V
I_Fo	Fo output current	Recommended range	-4	-	4	mA
VI_H	Input signal high threshold	-	1.8	2.1	2.4	V
VI_L	Input signal low threshold	-	0.9	1.2	1.5	V
VOH	Plus bias output voltage	Input "H"(High active)	13.5	15.2	16.5	V
VOL	Minus bias output voltage	Input "L"	-6	-8	-11	V
tPLH	"L-H" propagation time	RG=1.5Ω, f=3kHz, C_load:0.33uF	-	0.29	-	us
tPHL	"H-L" propagation time	RG=1.5Ω, f=3kHz, C_load:0.33uF	-	0.15	-	us
ttimer	Timer	Between start and cancel of protection (Under input signal is off state)	1	-	2	ms
UVLO+_VCC	Under voltage lock out	VCC voltage (Operation start)	-	12.6	-	V
UVLO-_VCC	Under voltage lock out	VCC voltage (Operation stop)	-	11.7	-	V
VSC	SC detect voltage	Collector voltage of IGBT	15	-	-	V

Preliminary

Calculation for gate drive current (gate average current)

This product has isolated DCDC converter built in for gate drive.
 The maximum output average current is 100mA per one channel.
 This current means maximum gate average current.
 When you decide the switching frequency,
 please check the gate average current by next formula.

$$I_{drive} = (Q1 + |Q2|) \times f \times N \quad \leftarrow \text{It must be less than 100mA}$$

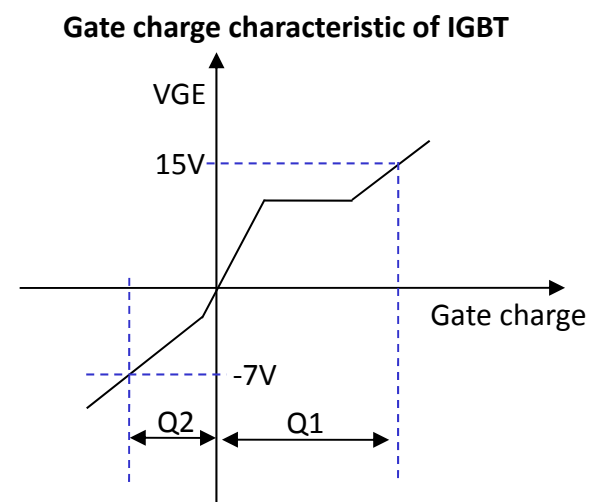
I_{drive} : Gate average current

$Q1$: Gate charge at +15V (Read from data sheet of IGBT)

$Q2$: Gate charge at -7V (Read from data sheet of IGBT)

f : Switching frequency of IGBT

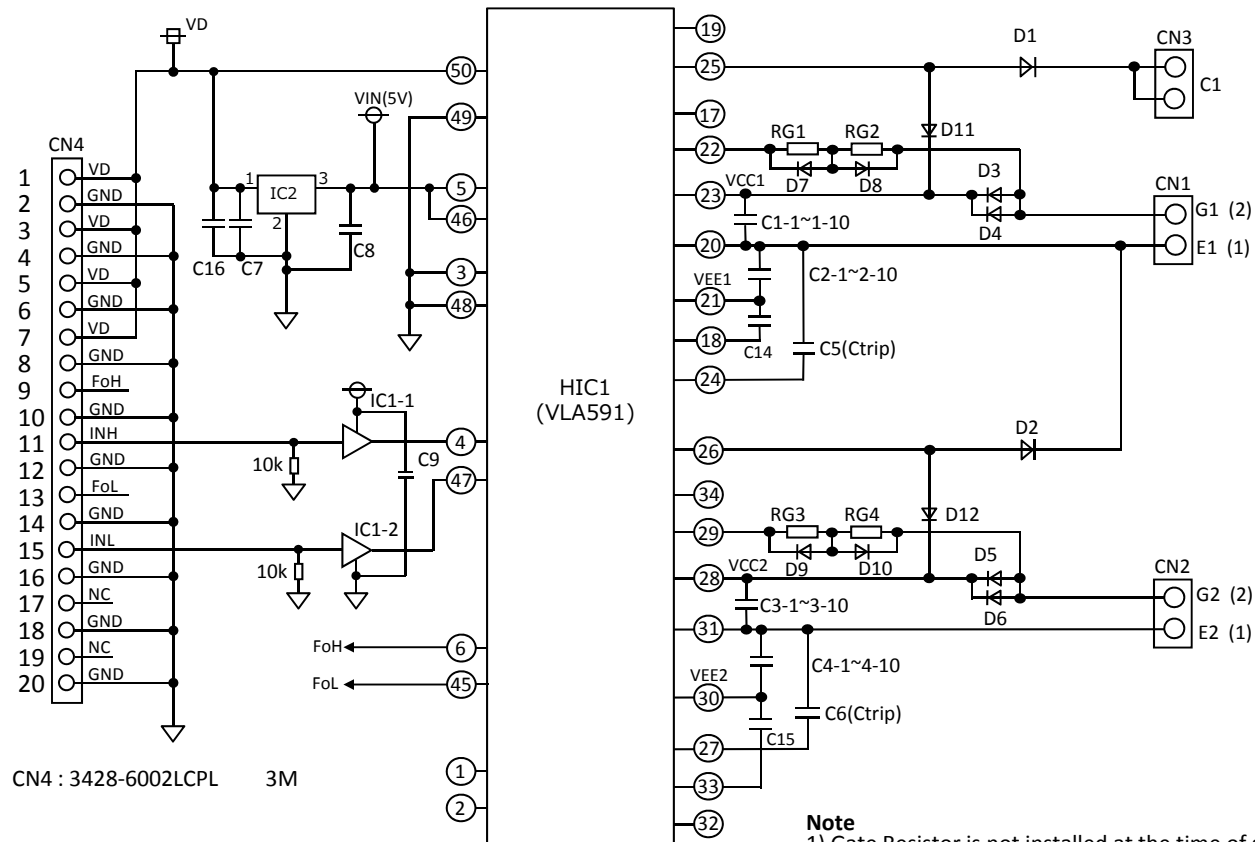
N : Parallel number



Circuit diagram

Preliminary

CN1	
Pin N.o.	Pin name
1	VD
2	GND
3	VD
4	GND
5	VD
6	GND
7	VD
8	GND
9	FoH
10	GND
11	INH
12	GND
13	FoL
14	GND
15	INL
16	GND
17	NC
18	GND
19	NC
20	GND

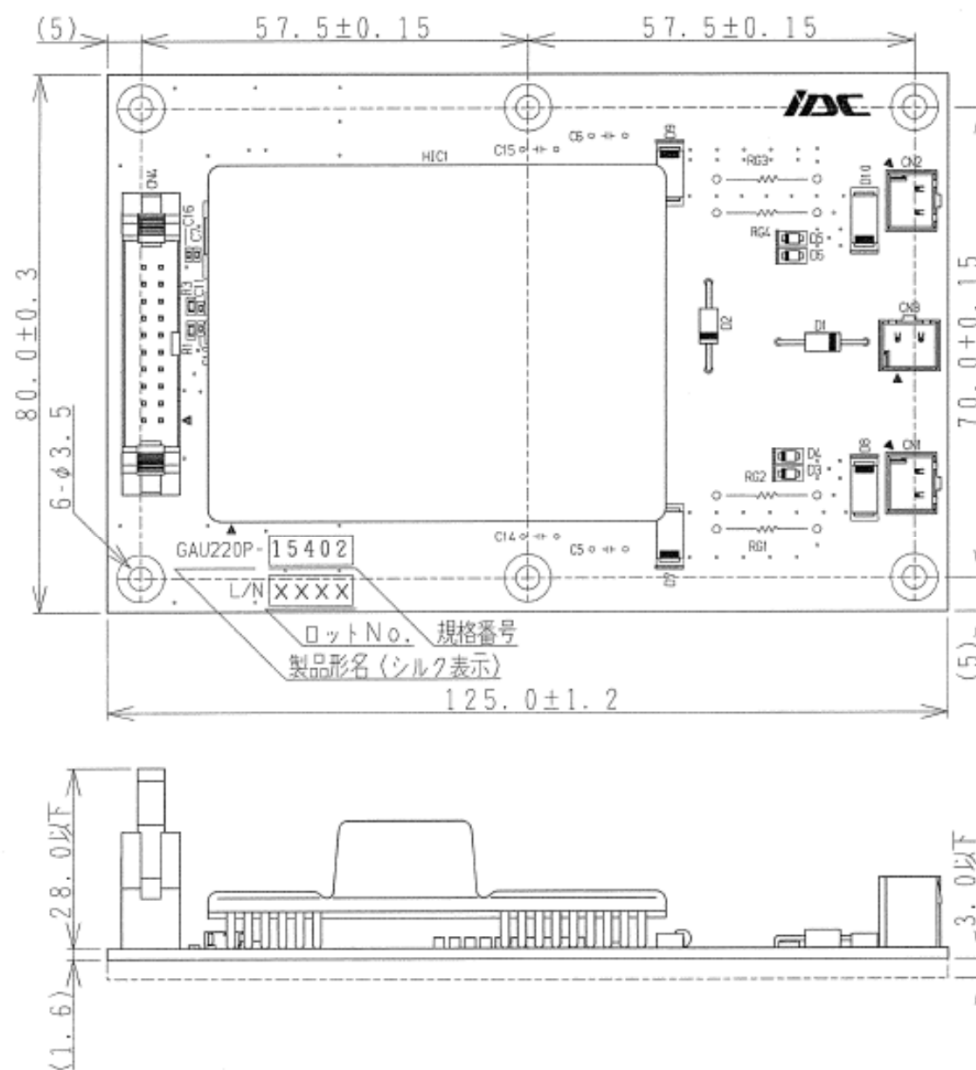
**Note**

- 1) Gate Resistor is not installed at the time of shipment. Please solder the chosen resistor.
- 2) C5,6 is not installed at the time of shipment. It isn't be needed basically. But if needed, please solder the chosen condenser. 50V, ceramic, ~ 47pF (rough guide)
- 3) C14,15 is not be needed anytime but a special case.



Outline & Size

Preliminary



Keep safety first in your circuit designs!

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