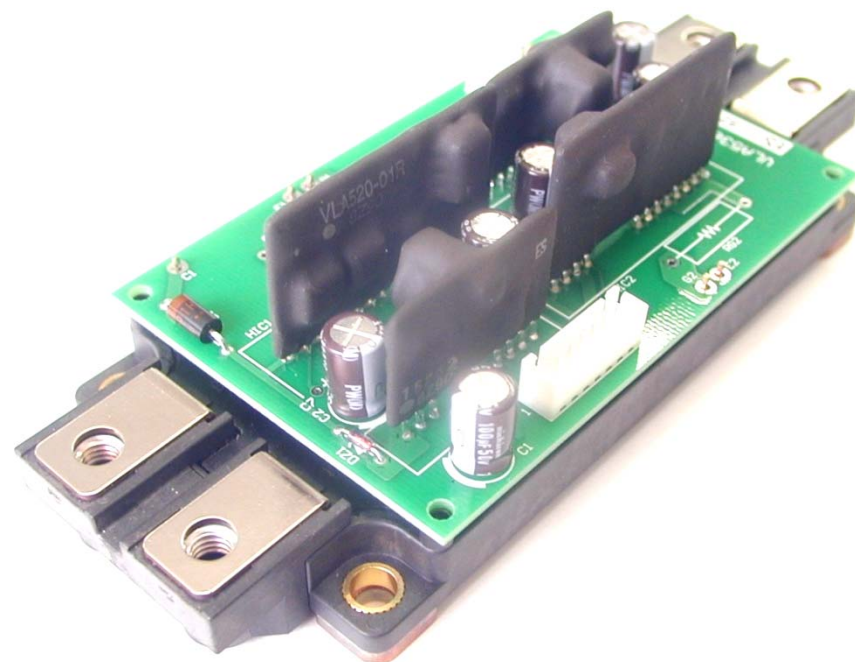


# IGBT Gate Drive Unit VLA536-01R



Apr.07,'09



**FEATURE**

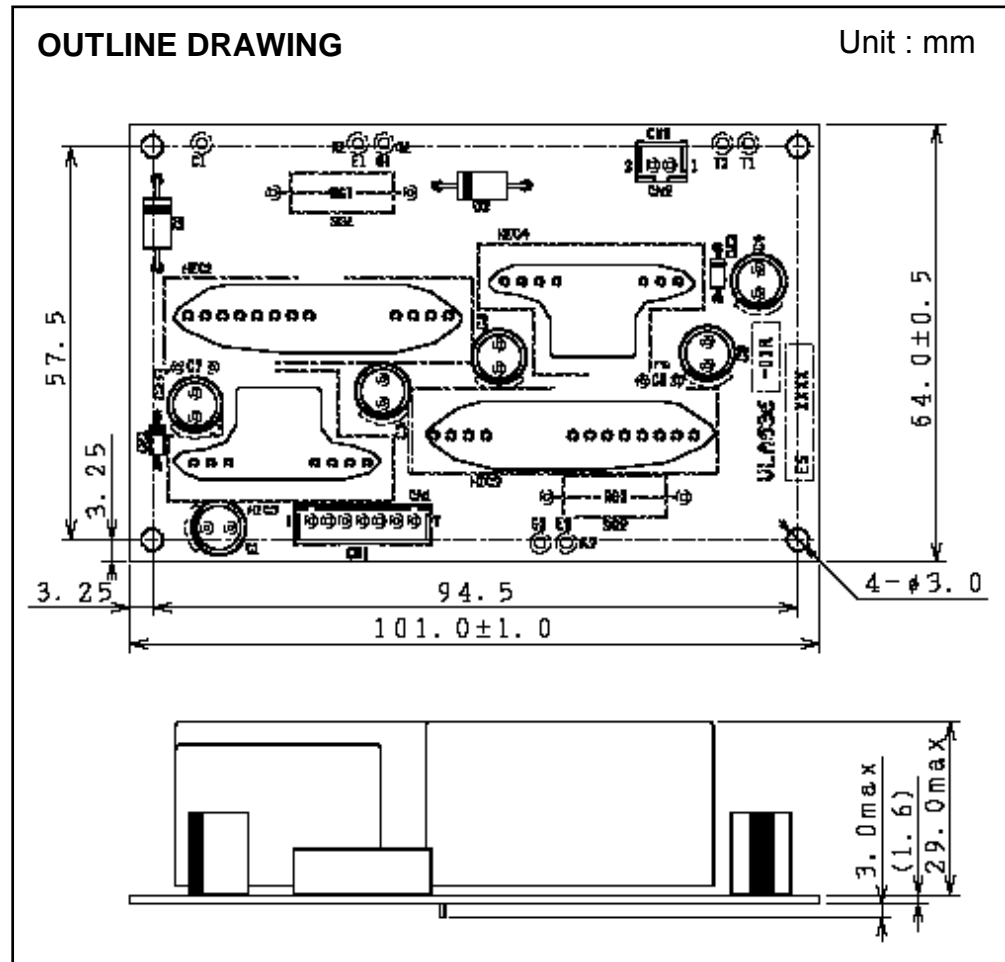
- >Possible to mount on the IGBT package (2 in 1 package)
- >Built in the isolated DC-DC converter for gate drive
- >Built in short circuit protection
- >Electrical isolation voltage is 2500Vrms (for 1 minute)
- >Two way power supply system for drivers and input signal (VD=15V , VIN=5V)
- >CMOS compatible input interface

**RECOMMENDED IGBT MODULES**

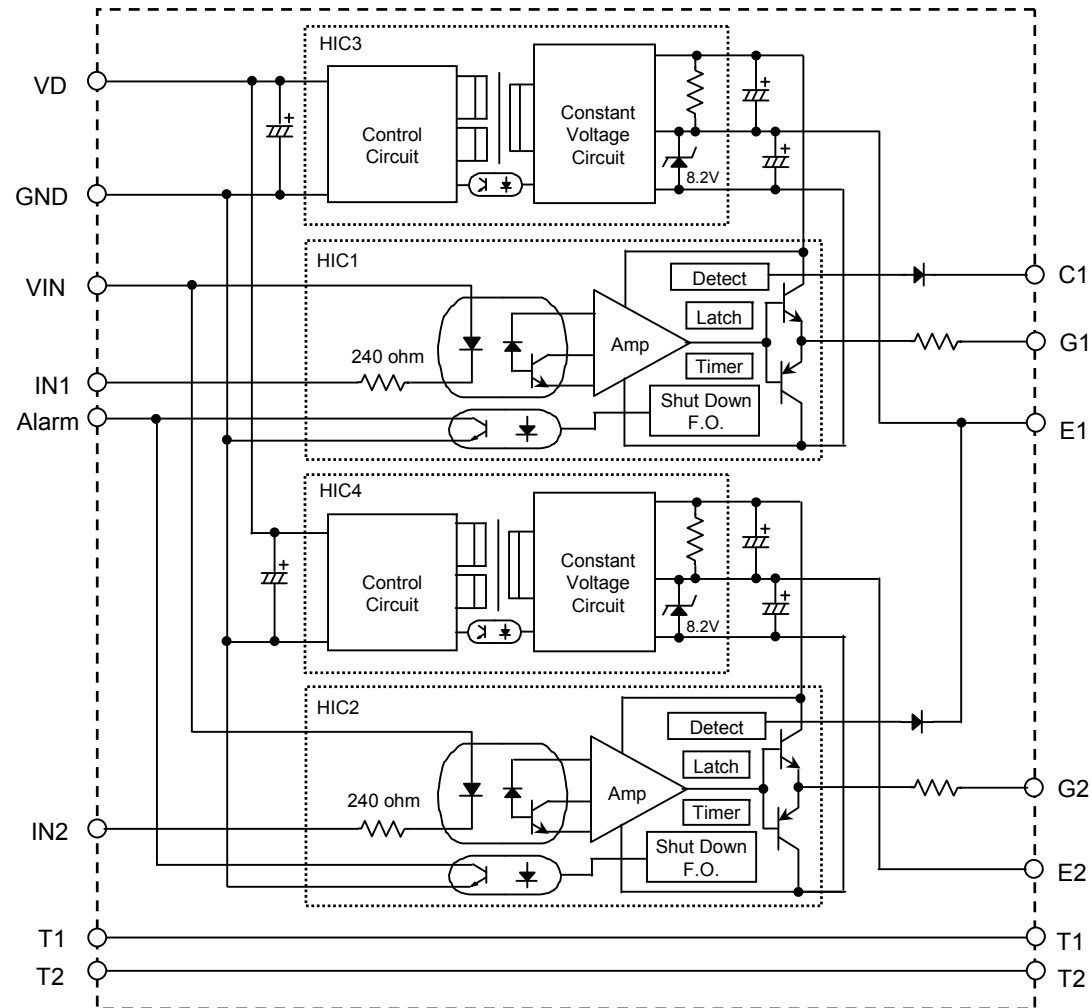
MITSUBISHI NX series IGBT modules

VCES = 600V series ~ 400A class

VCES = 1200V series ~ 450A class



**BLOCK DIAGRAM**



**MAXIMUM RATINGS** (unless otherwise noted, Ta=25C)

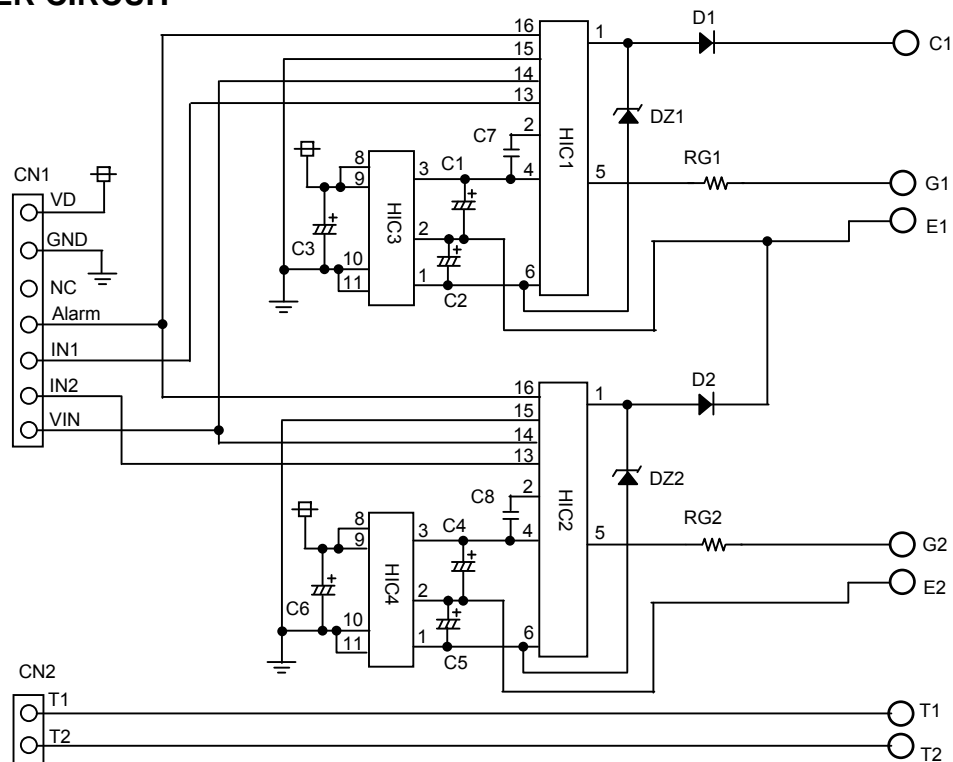
Symbol	Parameter	Conditions	Ratings	Unit
VD	Supply voltage	DC	18	V
VI	Input signal voltage	Applied between VIN - IN1,2 50% Duty cycle, Pulse width 1ms	-1 ~ +7	V
IOHP	Gate peak current	Pulse width 2us	-5	A
IOLP			5	A
Viso	Isolation voltage	Sine wave voltage 60Hz, for 1min	2500	Vrms
Topr	Operating temperature	No condensation allowable	-20 ~ 70	deg C
Tstg	Storage temperature	No condensation allowable	-25 ~ 85	deg C
Ialm	Alarm pin output sink current	-	10	mA
Valm	Alarm pin voltage	Between Alarm – GND pin	50	V
Idrive	Gate drive current	Gate average current (Per one circuit)	83	mA

**ELECTRICAL CHARACTERISTICS** ( unless otherwise noted, Ta=25C, VD=15V )

Symbol	Parameter	Conditions	Limits			Unit
			Min	Typ	Max	
VD	Supply voltage	Recommended range	12	15	18	V
VIN	Pull-up voltage on input side	Recommended range	4.75	5	5.25	V
IIH	Input signal current	Recommended range	10	13	16	mA
f	Switching frequency	Recommended range	-	-	20	kHz
RG	Gate resistance	Recommended range	2	-	-	Ω
Ialm	Alarm output current	Recommended range	-	-	5	mA
VOH	Plus bias voltage	-	14.5	16.0	17.5	V
VOL	Minus bias voltage	-	-9.0	-8.0	-7.0	V
tPLH	“L-H” propagation time	IIH = 13mA	0.2	0.45	0.8	us
tPHL	“H-L” propagation time	IIH = 13mA	0.2	0.4	0.7	us
t_timer	Timer	Between start and clear (under input signal “OFF”)	1	1.4	2	ms
tdalm	Alarm delay time	Ialm=2.5mA	-	6.5	10	us
VSC	SC detect collector voltage	IGBT collector voltage	15	-	-	V



### INNER CIRCUIT



CN1	
PinN.o.	Pin name
1	VD
2	GND
3	NC
4	Alarm
5	IN1
6	IN2
7	VIN

CN2	
Pin N.o.	Pin name
1	T1
2	T2

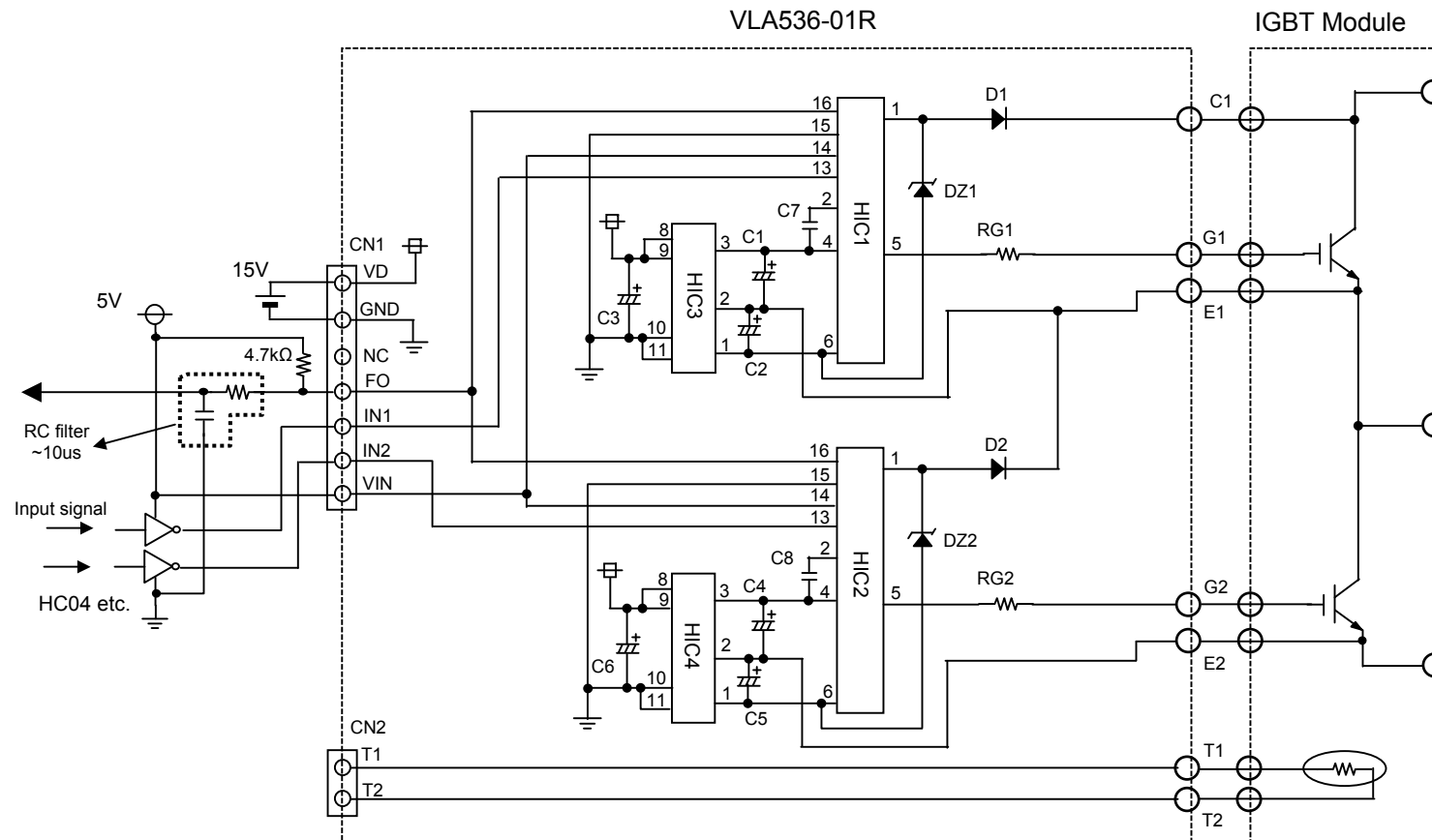
Parts list ( Reference )

HIC1,2	VLA520-01R	ISAHAYA
HIC3,4	VLA106-15252	ISAHAYA
DZ1,2	30V, 500mW	
D1,2	RP1H	SanKen
C1 ~ 6	100uF, 50V	Low impedance
C7,8	10pF ~ 50pF , 50V	TDK FK28 type
RG1,2	3W class	
CN1	B7B-XH-A	JST
CN2	B2B-XH-A	JST

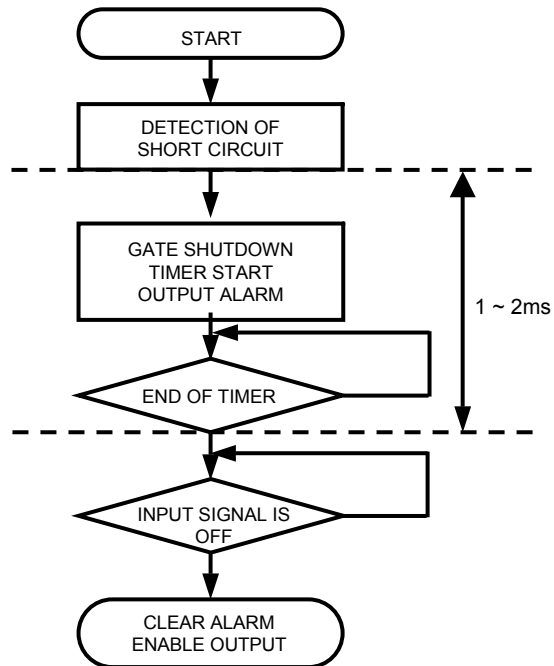
\*1) Gate Resistor is not installed at the time of shipment.  
Please solder the chosen resistor.

\*2) C7,8 is not installed at the time of shipment.  
Please solder the chosen condenser if needed.  
(Rough guide 10 ~ 50pF , 50V, ceramic)

APPLICATION EXAMPLE

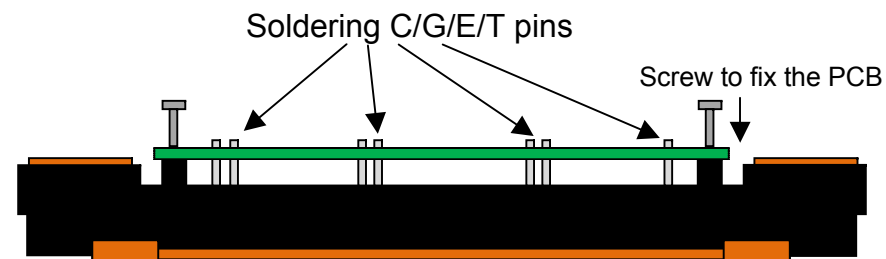


## OPERATION FLOW ON DETECTING SHORT CIRCUIT



- (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.)

## INSTALLATION OF THE PCB ON IGBT MODULE



**Keep safety first in your circuit designs!**

·ISAHAYA Electronics Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (1) placement of substitutive, auxiliary circuits, (2) use of non-flammable material or (3) prevention against any malfunction or mishap.

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