

MICRO-NPC1/I TYPE

3 LEVEL NPC1 IGBT DRIVER

Excellent Plug & Play solution!!

PART CODE: 220221043

DIRECT MOUNT ON 3-LEVEL IGBT

Features

- 1W Compact Dual channel driver
- Switching frequency up to 20 KHz
- $\pm 6A$ gate current, +15V/-10V
- Drive up to 1200V IGBT Module
- Electrical Interface
- Fiber Optical Optional
- Integrated short-circuit soft shutdown
- Gate clamping
- Less than 1 μs delay time
- Less aging effect due to ASIC
- Primary/Sec. under voltage lockout
- Vce monitoring for short circuit current
- Superior EMI-EMC
- Inbuilt Deadband Control
- Basic active Clamping against OV protection

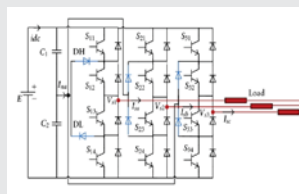
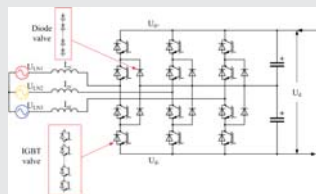
Benefits

- On board isolated DC-DC converter - No need of separate SMPS.
- Interface for 13V...15 V logic level - Direct compatible with any Controller.
- Common fault feedback signal to interface with controller - Avoid Extra component.
- Field configurable blocking time - Flexibility in your hand, use any make IGBT !!
- Safe isolation to IEC 61800-5-1, IEC-60664-1 & En50178, protection class II
- User Selectable Rg

Application



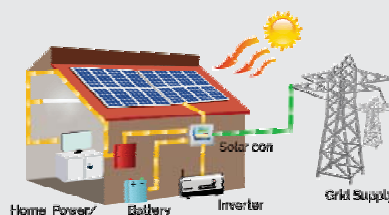
DRIVES



CONVERTER - INVERTER



UPS



SOLAR INVERTER



STATCOM / VAR COMPENSATION

Recommended Operating condition

Power Supply & Monitoring	MIN	TYP	MAX
1. Supply Voltage Vcc to GND	: 14.5	15	16 V
2. Supply Current Icc (Without Load)	: 200 mA (@10KHz PWM I/P)		
3. Under Voltage Primary, Set Fault	: 11.3	12.0	12.7 V
Clear Fault	: 11.9	12.6	13.3 V
Secondary, Set Fault	: 11.5	12.0	12.5 V
Clear Fault	: 12.1	12.6	13.1 V

Logical Inputs & Outputs

1. Input Bias Current	: 190 μ A
2. Interface Logic level	: 13 V 15.0 V logic level
3. Turn-on threshold	: 12 V
4. Turn off threshold	: 10.7 V
5. SOx output, failure Condition	: 0.7 V Max., I(SOx) < 20 mA total

Short-Circuit Protection

1. Vce-monitoring threshold	: 9.3 V (Internally Fix)
Trip adjustment D1, D9, D19, D27 (5.1V, 1W Zener)	: 3.8V
2. Factory Set response time	: 4.5 μ Sec (C3,C4,C11,C12: 150pF)
3. Minimum response time	: 4.5 μ Sec
4. Available blocking time (R17,R43)	: 9 μ Sec (Factory Set)
5. Minimum blocking time	: 9 μ Sec (OE)
6. Maximum blocking time	: 130 mSec

Timing Characteristic (Input to Output of Driver board under No-Load)

1. Turn-on delay $t_{d(on)}$: 900 nS, Max.
2. Turn-off delay $t_{d(off)}$: 900 nS, Max.

Protection Available on driver board

1. Primary/Secondary Under voltage monitoring & error feedback.
2. Power supply reverse polarity.
3. Soft Shut down, For IGBT Over Voltage.
4. Vce monitoring for short circuit current.
5. Schmitt trigger at the Input stage, highly susceptible to noise.
6. IGBT Gate clamping.
7. Basic active clamping (BAC) for Over Voltage protection.

Electrical Isolation

Test voltage (50 Hz/1 sec)	
1. Primary to secondary side	: 4.0 KV
2. Secondary to secondary side	: 4.0 KV

This gate driver is suited for HiPot testing. Nevertheless, it is strongly recommended to limit the testing time to 1s slots. Excessive HiPot testing at voltages much higher than 850V_{AC(eff)} may lead to insulation degradation. No degradation has been observed over 1 min. testing at 2500V_{AC(eff)}. Each driver core production sample shipped has undergone 100% testing at the given value or higher for 1s.

Output Voltage / Current / Power

1. Turn-on voltage, V _{Ghx}	: 15.0 V, any load condition
2. Turn-off voltage, V _{GLx}	: -9.9 V, No load
3. Turn-off voltage, V _{CLx}	: -8.0 V @ 1 W
4. Gate Peak Current I _{out}	: \pm 6 Amp
5. Internal Gate resistance	: 0.5 Ω
6. External Gate resistance	: Minimum 2.5 Ω , < 25kHz
7. Switching frequency F	: 50 KHz
8. Output Power	: 1.0 W, T _{amb} < 85 °C : 1.2 W, T _{amb} < 70 °C : 0.35W, T _{amb} < 105 °C

Part used on Plug & play driver : 2SC0106T2A1-12 from Power Integration (02 Qty/Board)

Environmental

Working temperature	: -40 to 105 °C
Storage temperature	: -40 to 90 °C

Driving Capability

: INFINEON / SEMIKRON
SEMIx205MLI07E4, SEMIX305MLI07E4, SEMIX405MLI07E4, F3L300R07PE4, F3L200R07PE4


Interfacing with Control Circuit

1. Electrical
ERROR (JP1) : Low to High / High to Low (Site selectable)

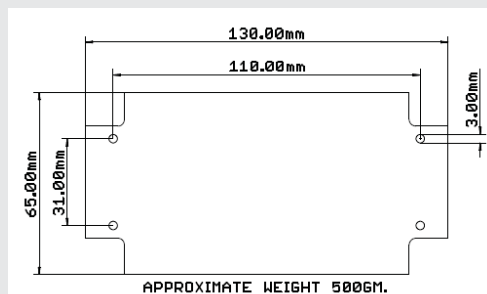
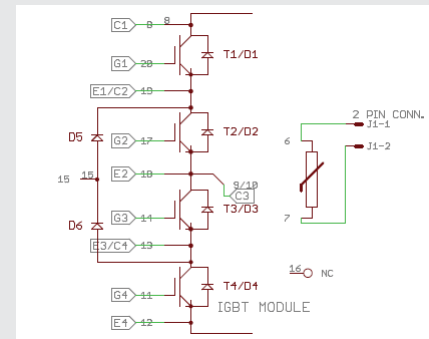
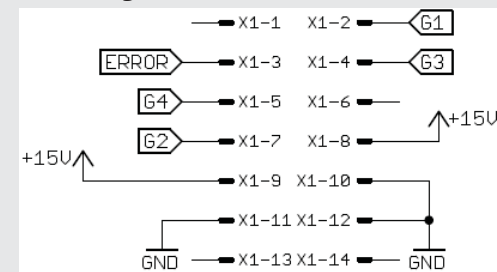
LED Indication

Power ON: Green (Normally ON, Off during Power supply fault)
ERROR_T, ERROR_B : RED (ON during UV / De-sat / IGBT Fault)
PWM_T1, PWM_T2, PWM_T3, PWM_T4: For Pulse Output Indication

ORDERING CODE - 220221043

MICRO NPC1 / I TYPE	Description	Specify X from Table
	1W, 6A, 50KHz 1200V CLASS IGBT DRIVER 14-PIN FRC Electrical Interface	
	Default Gate Resistor	
	RG ON: 5E, RG OFF: 10E	

Interfacing with Control Circuit



MECHANICAL DIMENSION: DIRECT MOUNTING ON IGBT