# RAM ENTERPRISE

**THE POWER SOLUTIONS**


## MICRO CHOPPER

### CHOPPER IGBT DRIVER (1 CH REDUNDANT)

**PART CODE: 220221056**

**Excellent Plug & Play solution!!**

## Features

- 2x1W Compact Chopper driver
- Switching frequency up to 50 KHz
- ±6A gate current, +15V/-10V
- Drive up to 1200V IGBT Module
- Electrical Interface - 14 Pin molex
- Reliable & rugged design
- Integrated short-circuit soft shutdown
- Gate clamping
- Less aging effect due to ASIC
- Primary/Sec. under voltage lockout
- Vce monitoring for short circuit current
- Superior EMI-EMC
- 105 °C Operational temperature suitable for Traction
- Basic active clamping for over voltage protection (Optional)

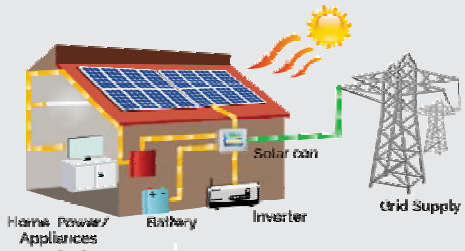
## Benefits

- On board isolated DC-DC converter - No need of separate SMPS.
- Interface for 12V...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

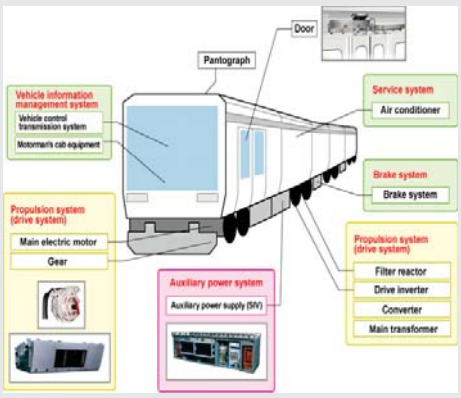
UPS


DRIVES




SOLAR INVERTER

MEDICAL-X RAY




POWER SUPPLY FOR RAILWAY

RAM ENTERPRISE
THE POWER SOLUTIONS
An ISO 9001:2015 COMPANY

## Technical Specification

# THE POWER SOLUTIONS

**Recommended Operating condition**

| Power Supply & Monitoring | MIN | TYP | MAX | |
|---|---|---|---|---|
| 1. Supply Voltage Vcc to GND | : 14.5 | 15 | 15.5 | V |
| 2. Supply Current Icc (Without Load): | 35 mA (@20KHz PWM I/P) | | | |
| 3. Under Voltage Primary, Set Fault | : 13.0 | 13.8 | 14.1 | V |
| Clear Fault | : 14.2 | 14.5 | 15.0 | 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 µA |
| 2. Interface Logic level | : 12 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** : Diode sense method

| | |
|---|---|
| 1. Vce-monitoring threshold | : 9.3 V (Internally Fix) |
| 2. Factory Set response time | : 4.5 µSec (C6,C7: 150pF) |
| 3. Minimum response time | : 4.5 µSec |
| 4. Available blocking time (R35) | : 49 mSec (User Selectable 100K) |
| 5. Minimum blocking time (R35) | : 9 µSec (0E) |

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

| | |
|---|---|
| 1. Turn-on delay $t_{d(on)}$ | : 1 uS, Max. |
| 2. Turn-off delay $t_{d(off)}$ | : 1.2 uS, Max. |

For detail timing information of driver core, refer part specific datasheet.

**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.

**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, $V_{GHx}$ | : 15.2 V, any load condition |
| 2. Turn-off voltage, $V_{GLx}$ | : -9.8 V, No load |
| 3. Turn-off voltage, $V_{GLx}$ | : -8.0 V @ 1 W |
| 4. Gate Peak Current $I_{out}$ | : ±6 Amp |
| 5. Internal Gate resistance | : 0.5 Ω |
| 6. External Gate resistance | : Minimum 2.5 Ω, <25kHz |
| | : Minimum 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

**Environmental**

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

**Driving Capability : ANY MAKE**

All usual IGBT modules up to 450 A /1200 V or 600A/600V.
Driving power depends on switching frequency so in case of any doubt during selection process pl. contact us.

**Interfacing with Control Circuit**

ERROR : High (Normal) to Low (Error) (J3 SHORT - (2-3))
Low (Normal) to High (Error) (J3 SHORT - (1-2))
Open collector output (Optional).
EXTRST : 5 µSec high to low Pulse/
Do ground if function not used in circuit.

**LED Indication**

Power ON: Green (Normally ON, Off during Power supply fault)
ERROR : RED (ON during Under Voltage / DESAT/ IGBT Fault)

## ORDERING CODE - 220221056

| MICRO CHOPPER | Description Specify ✘ from Table |
|---|---|
| 220221056 | 1W, 6A, 50KHz 1200V CLASS IGBT DRIVER |
| | Optional function available upon request. |
| | Default Gate Resistor: RGOFF :10E, RGON: 10E |

**Interfacing with Control Circuit**

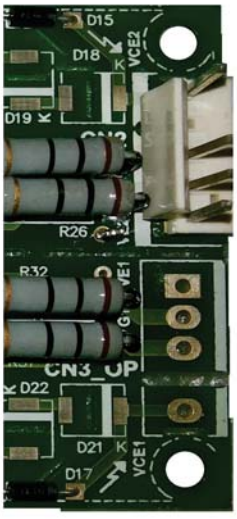
**14-PIN MOLEX Pin Detail:**

| | | | |
|---|---|---|---|
| 2 | PWM(I/N) | 3 | ERROR |
| 8,9 | +15V | 4 | EXTERNAL RESET |
| 10,11 | GND | 1,5,6,7,12,13,14 | N.C |

**Mechanical Dimension:**

PCB : 124 X 66 Mounting Hole : 115 X 57
Enclosure : Open Frame Weight : 0.3 Kg

**Driver Secondary Connection with IGBT:-**




CN2

5 - C2 (HIGH VOLTAGE F/B)

2,3 - G2 (IGBT CONTROL PIN)

1 - E2 (IGBT CONTROL PIN)


sales@ramenterprise.co.in
www.ramenterprise.co.in