

High Voltage IGBT

IXSN 55N120A

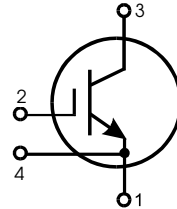
$$V_{CES} = 1200 \text{ V}$$

$$I_{C25} = 110 \text{ A}$$

$$V_{CE(sat)} = 4 \text{ V}$$

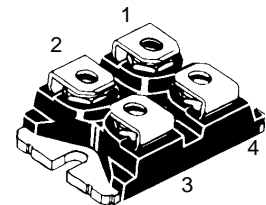
Short Circuit SOA Capability

Preliminary Data



| Symbol | Test Conditions | Maximum Ratings |
|------------------------------------|--|--------------------------------------|
| V_{CES} | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$ | 1200 V |
| V_{CGR} | $T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$ | 1200 A |
| V_{GES} | Continuous | ± 20 V |
| V_{GEM} | Transient | ± 30 V |
| I_{C25} | $T_C = 25^\circ\text{C}$ | 110 A |
| I_{C90} | $T_C = 90^\circ\text{C}$ | 55 A |
| I_{CM} | $T_C = 25^\circ\text{C}, 1 \text{ ms}$ | 160 A |
| SSOA (RBSOA) | $V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 22 \Omega$ Clamped inductive load, $L = 30 \mu\text{H}$ | $I_{CM} = 110$ @ $0.8 V_{CES}$ A |
| t_{SC} (SCSOA) | $V_{GE} = 15 \text{ V}, V_{CE} = 0.6 V_{CES}, T_J = 125^\circ\text{C}$ $R_G = 22 \Omega$, non-repetitive | 10 μs |
| P_C | $T_C = 25^\circ\text{C}$ IGBT | 500 W |
| V_{ISOL} | 50/60 Hz $t = 1 \text{ min}$ $I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$ | 2500 V~ 3000 V~ |
| T_J | | -55 ... +150 $^\circ\text{C}$ |
| T_{JM} | | 150 $^\circ\text{C}$ |
| T_{stg} | | -55 ... +150 $^\circ\text{C}$ |
| M_d | Mounting torque Terminal connection torque (M4) | 1.5/13 Nm/lb.in. 1.5/13 Nm/lb.in. |
| Weight | | 30 g |

miniBLOC, SOT-227 B



1 = Emitter ① 3 = Collector
2 = Gate 4 = Emitter ①

① Either Emitter terminal can be used as Main or Kelvin Emitter

Features

- International standard package miniBLOC
- Aluminium-nitride isolation
 - high power dissipation
- Isolation voltage 3000 V~
- UL registered E 153432
- Low $V_{CE(sat)}$
 - for minimum on-state conduction losses
- Low collector-to-case capacitance (<100 pF)
 - reduces RFI
- Low package inductance (< 10 nH)
 - easy to drive and to protect

Applications

- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies

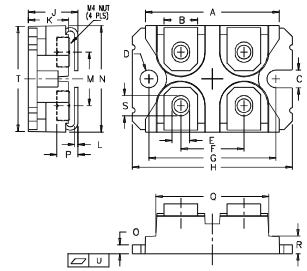
Advantages

- Space savings
- Easy to mount with 2 screws
- High power density

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|---------------|---|---|------|----------------|
| | | Min. | Typ. | Max. |
| BV_{CES} | $I_C = 6 \text{ mA}, V_{GE} = 0 \text{ V}$ | 1200 | | V |
| $V_{GE(th)}$ | $I_C = 8 \text{ mA}, V_{CE} = V_{GE}$ | 4 | | V |
| I_{CES} | $V_{CE} = 0.8 V_{CES}$ $V_{GE} = 0 \text{ V}$ | | | 1 mA 2.5 mA |
| I_{GES} | $V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$ | | | ± 200 nA |
| $V_{CE(sat)}$ | $I_C = I_{C90}, V_{GE} = 15 \text{ V}$ | | | 4 V |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|--|---|------|---------|
| | | Min. | Typ. | Max. |
| g_{fs} | $I_C = I_{C90}$; $V_{CE} = 10\text{ V}$ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | 32 | 45 | S |
| $I_{C(on)}$ | $V_{CE} = 10\text{ V}$, $V_{GE} = 15\text{ V}$ | | 340 | A |
| C_{ies} | $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$ | | 8000 | pF |
| C_{oes} | | | 590 | pF |
| C_{res} | | | 120 | pF |
| Q_g | $I_C = I_{C90}$; $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$ | | 300 | nC |
| Q_{ge} | | | 80 | nC |
| Q_{gc} | | | 140 | nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}$; $V_{GE} = 15\text{ V}$, $V_{CE} = 0.8 V_{CES}$, $R_G = 2.7\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 V_{CES}$, higher T_J or increased R_G | | 140 | ns |
| t_{ri} | | | 220 | ns |
| $t_{d(off)}$ | | | 400 | ns |
| t_{fi} | | | 700 | 1000 ns |
| E_{off} | | | 18 | mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}$; $V_{GE} = 15\text{ V}$, $V_{CE} = 0.8 V_{CES}$, $R_G = 2.7\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 V_{CES}$, higher T_J or increased R_G | | 140 | ns |
| t_{ri} | | | 250 | ns |
| $t_{d(off)}$ | | | 600 | ns |
| t_{si} | | | 900 | ns |
| t_c | | | 950 | ns |
| $E_{(on)}$ | | | 6 | mJ |
| E_{off} | | | 25 | mJ |
| R_{thJC} | | | 0.25 | K/W |
| R_{thCK} | | 0.05 | | K/W |

miniBLOC, SOT-227 B



M4 screws (4x) supplied

| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 31.50 | 31.88 | 1.240 | 1.255 |
| B | 7.80 | 8.20 | 0.307 | 0.323 |
| C | 4.09 | 4.29 | 0.161 | 0.169 |
| D | 4.09 | 4.29 | 0.161 | 0.169 |
| E | 4.09 | 4.29 | 0.161 | 0.169 |
| F | 14.91 | 15.11 | 0.587 | 0.595 |
| G | 30.12 | 30.30 | 1.186 | 1.193 |
| H | 38.00 | 38.23 | 1.496 | 1.505 |
| J | 11.68 | 12.22 | 0.460 | 0.481 |
| K | 8.92 | 9.60 | 0.351 | 0.378 |
| L | 0.76 | 0.84 | 0.030 | 0.033 |
| M | 12.60 | 12.85 | 0.496 | 0.506 |
| N | 25.15 | 25.42 | 0.990 | 1.001 |
| O | 1.98 | 2.13 | 0.078 | 0.084 |
| P | 4.95 | 5.97 | 0.195 | 0.235 |
| Q | 26.54 | 26.90 | 1.045 | 1.059 |
| R | 3.94 | 4.42 | 0.155 | 0.174 |
| S | 4.72 | 4.85 | 0.186 | 0.191 |
| T | 24.59 | 25.07 | 0.968 | 0.987 |
| U | -0.05 | 0.1 | -0.002 | 0.004 |