



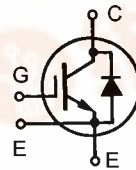
High Voltage IGBT with Diode

IXDN 50N120AU1

$V_{CES} = 1200\text{ V}$
 $I_{C25} = 70\text{ A}$
 $V_{CE(sat)} = 2.5\text{ V}$

Short Circuit SOA Capability

Preliminary Data

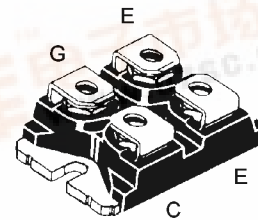


| Symbol | Test Conditions | Maximum Ratings |
|------------------------------------|---|--|
| V_{CES} | $T_J = 25^\circ\text{C}$ to 150°C | 1200 V |
| V_{CGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1\text{ M}\Omega$ | 1200 V |
| V_{GES} | Continuous | ± 20 V |
| V_{GEM} | Transient | ± 30 V |
| I_{C25} | $T_C = 25^\circ\text{C}$ | 70 A |
| I_{C90} | $T_C = 90^\circ\text{C}$ | 44 A |
| I_{CM} | $T_C = 25^\circ\text{C}$, 1 ms | 140 A |
| SSOA (RBSOA) | $V_{GE} = 15\text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 22\ \Omega$ Clamped inductive load, $L = 30\ \mu\text{H}$ | $I_{CM} = 100$ A @ V_{CES} |
| t_{SC} (SCSOA) | $V_{GE} = 15\text{ V}$, $V_{CE} = V_{CES}$, $T_J = 125^\circ\text{C}$ $R_G = 22\ \Omega$, non repetitive | 10 μs |
| P_C | $T_C = 25^\circ\text{C}$ | IGBT 350 W |
| P_D | | Diode 165 W |
| V_{ISOL} | 50/60 Hz $I_{ISOL} \leq 1\text{ mA}$ | $t = 1\text{ min}$ 2500 V~ $t = 1\text{ s}$ 3000 V~ |
| T_J | | -40 ... +150 $^\circ\text{C}$ |
| T_{JM} | | 150 $^\circ\text{C}$ |
| T_{stg} | | -40 ... +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



E153432



E = Emitter *, C = Collector
G = Gate, E = Emitter *

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

Features

- Square RBSOA
- International standard package miniBLOC
- Isolation voltage 3000 V~
- Low $V_{CE(sat)}$
 - for minimum on-state conduction losses
- Fast Recovery Epitaxial Diode
 - short t_{tr} and I_{RM}
- Low collector-to-case capacitance (< 50 pF)
 - reduced RFI
- Low package inductance (< 10 nH)
 - easy to drive and to protect

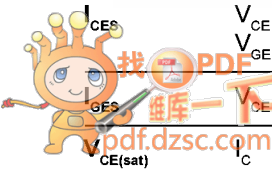
Applications

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

Advantages

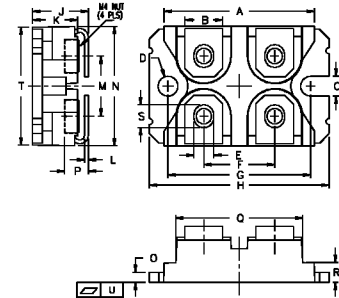
- Space savings
- Easy to mount with 2 screws
- High power density

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|---------------|--|---|------|----------------------------|
| | | min. | typ. | max. |
| BV_{CES} | $I_C = 5\text{ mA}$, $V_{GE} = 0\text{ V}$ | 1200 | | V |
| $V_{GE(th)}$ | $I_C = 4\text{ mA}$, $V_{CE} = V_{GE}$ | 4 | 5.5 | V |
| $V_{CE(sat)}$ | $V_{CE} = 0.8 \cdot V_{CES}$, $T_J = 25^\circ\text{C}$ $V_{GE} = 0\text{ V}$, $T_J = 125^\circ\text{C}$ | | | 500 μA 17 mA |
| | $V_{CE} = 0\text{ V}$, $V_{GE} = \pm 20\text{ V}$ | | | ± 500 nA |
| | $I_C = 50$, $V_{GE} = 15\text{ V}$ | 2.5 | 3 | V |



| Symbol | Test Conditions | Characteristic Values | | |
|---------------------|---|---|------|----------|
| | | (T _J = 25°C, unless otherwise specified) | | |
| | | min. | typ. | max. |
| C _{ies} | V _{CE} = 25 V, V _{GE} = 0 V, f = 1 MHz | | 3300 | pF |
| C _{oes} | | | 500 | pF |
| C _{res} | | | 220 | pF |
| Q _g | I _C = 50 A, V _{GE} = 15 V, V _{CE} = 0.5 V _{CES} | | 240 | nC |
| Q _{ge} | | | TBD | nC |
| Q _{gc} | | | TBD | nC |
| t _{d(on)} | Inductive load, T_J = 125°C I _C = 50 A, V _{GE} = 15 V, V _{CE} = 600 V, R _{on/off} = 22 Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8 • V _{CES} , higher T _J or increased R _G | | 45 | 100 ns |
| t _{ri} | | | 60 | 100 ns |
| t _{d(off)} | | | 380 | 500 ns |
| t _{fi} | | | 70 | 100 ns |
| E _{on} | | | TBD | mJ |
| E _{off} | | | 4.5 | mJ |
| R _{thJC} | | | | 0.35 K/W |
| R _{thCK} | | 0.1 | | K/W |

| Symbol | Test Conditions | Characteristic Values | | |
|-------------------|--|---|------|----------|
| | | (T _J = 25°C, unless otherwise specified) | | |
| | | min. | typ. | max. |
| V _F | I _F = 50 A, V _{GE} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 % | | | 2.1 V |
| I _{RM} | I _F = 50 A, V _{GE} = 0 V, -di _F /dt = 200 A/μs V _R = 600 V T _J = 100°C | | 25 | 30 A |
| t _{rr} | I _F = 50 A, V _{GE} = 0 V, -di _F /dt = 200 A/μs V _R = 600 V T _J = 100°C | | 250 | ns |
| | I _F = 1 A; -di/dt = 200 A/μs; V _R = 30 V T _J = 25°C | | 40 | 60 ns |
| R _{thJC} | | | | 0.75 K/W |

miniBLOC, SOT-227 B


M4 screws (4x) supplied

| Dim. | Millimeter | | Inches | |
|------|------------|------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 31.5 | 31.7 | 1.241 | 1.249 |
| B | 7.8 | 8.2 | 0.307 | 0.323 |
| C | 4.0 | - | 0.158 | - |
| D | 4.1 | 4.3 | 0.162 | 0.169 |
| E | 4.1 | 4.3 | 0.162 | 0.169 |
| F | 14.9 | 15.1 | 0.587 | 0.595 |
| G | 30.1 | 30.3 | 1.186 | 1.193 |
| H | 38.0 | 38.2 | 1.497 | 1.505 |
| J | 11.8 | 12.2 | 0.465 | 0.481 |
| K | 8.9 | 9.7 | 0.351 | 0.382 |
| L | 0.75 | 0.85 | 0.030 | 0.033 |
| M | 12.6 | 12.8 | 0.496 | 0.504 |
| N | 25.2 | 25.4 | 0.993 | 1.001 |
| O | 1.95 | 2.05 | 0.077 | 0.081 |
| P | - | 5.0 | - | 0.197 |