Extreme Light Punch Through IGBT for 10-30kHz Switching

Symbol | Test Conditions | Maximum Ratings |
---|---|---|
$V_{CES}$ | $T_J = 25°C$ to $175°C$ | 600 V |
$V_{EGR}$ | $T_J = 25°C$ to $175°C$, $R_{GE} = 1M\Omega$ | 600 V |
$V_{GES}$ | Continuous | ±20 V |
$V_{GEM}$ | Transient | ±30 V |
$I_{CES}$ | $T_J = 25°C$ (Chip Capability) | 550 A |
$I_{LMS}$ | Leads Current Limit | 160 A |
$I_{C110}$ | $T_J = 110°C$ (Chip Capability) | 300 A |
$I_{CM}$ | $T_J = 25°C$, 1ms | 1140 A |
$I_A$ | $T_J = 25°C$ | 100 A |
$E_{AS}$ | $T_J = 25°C$ | 500 mJ |
$V_{SSOA}$ | $V_{GE} = 15V$, $T_J = 150°C$, $R_G = 1\Omega$ | $I_{CM} = 600 A$ |
$t_{sc}$ | Clamped Inductive Load | $V_{CE} \leq V_{CES}$ |
$t_{SCS0A}$ | $V_{GE} = 15V$, $V_{CE} = 360V$, $T_J = 150°C$ | 10 μs |
$P_C$ | Maximum Lead Temperature for Soldering | 2300 W |
$T_J$ | $T_J = 25°C$ | -55 ... +175 °C |
$T_{GAM}$ | | 175 °C |
$T_{stg}$ | $-55 ... +175°C$ | |
$T_L$ | Maximum Lead Temperature for Soldering | 300 °C |
$T_{SOLD}$ | 1.6 mm (0.062in.) from Case for 10s | 260 °C |
$M_d$ | Mounting Torque (TO-264) | 1.13/10 Nm/lb.in. |
$F_C$ | Mounting Force (PLUS247) | 20..120 /4.5..27 N/lb. |
Weight | TO-264 | 10 g |
| PLUS247 | 6 g |

Features

- Optimized for 10-30kHz Switching
- Square RBSOA
- International Standard Packages
- Avalanche Rated
- Short Circuit Capability
- High Current Handling Capability

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

- Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts
**Symbol Test Conditions**

(T<sub>J</sub> = 25°C Unless Otherwise Specified)

<table>
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<th>Characteristic Values</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
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</table>

**Notes:**

1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.
2. Switching times & energy losses may increase for higher V<sub>CE</sub>(clamp), T<sub>J</sub> or R<sub>G</sub>.

**ADVANCE TECHNICAL INFORMATION**

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.
Fig. 7. Transconductance

Fig. 8. Gate Charge

Fig. 9. Capacitance

Fig. 10. Reverse-Bias Safe Operating Area

Fig. 11. Maximum Transient Thermal Impedance

Fig. 12. Forward-Bias Safe Operating Area
Fig. 19. Inductive Turn-on Switching Times vs. Gate Resistance

- $t_{r1}$ - Nanoseconds
- $t_{d(on)}$ - Nanoseconds
- $T_J = 150^\circ C$, $V_{GE} = 15V$, $V_{CE} = 400V$
- $I_C = 100A$
- $I_C = 50A$

Fig. 20. Inductive Turn-on Switching Times vs. Collector Current

- $t_{r1}$ - Nanoseconds
- $t_{d(on)}$ - Nanoseconds
- $R_G = 1\Omega$, $V_{GE} = 15V$, $V_{CE} = 400V$
- $T_J = 25^\circ C$
- $T_J = 150^\circ C$

Fig. 21. Inductive Turn-on Switching Times vs. Junction Temperature

- $t_{r1}$ - Nanoseconds
- $t_{d(on)}$ - Nanoseconds
- $R_G = 1\Omega$, $V_{GE} = 15V$, $V_{CE} = 400V$
- $I_C = 100A$
- $I_C = 50A$