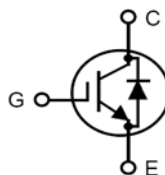


High Voltage BiMOSFET™ IXBH9N160G

Monolithic Bipolar MOS Transistor

N-Channel, Enhancement Mode
MOSFET Transistor



$$V_{CES} = 1600V$$

$$I_{C25} = 9A$$

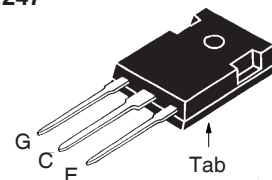
$$V_{CE(sat)} \leq 7.0V$$

$$t_{fi(typ)} = 70ns$$

| Symbol | Test Conditions | Maximum Ratings | |
|-------------------------------|--------------------------------------------------------------------------------------|-----------------------|------------|
| V_{CES} | $T_J = 25^\circ C$ to $150^\circ C$ | 1600 | V |
| V_{CGR} | $T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$ | 1600 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ C$ | 9 | A |
| I_{C90} | $T_C = 90^\circ C$ | 5 | A |
| I_{CM} | $T_C = 25^\circ C$, 1ms | 10 | A |
| SSOA (RBSOA) | $V_{GE} = 10V$, $T_{VJ} = 125^\circ C$, $R_G = 27\Omega$ Clamped Inductive Load | $I_{CM} = 12$ 1280 | A V |
| P_C | $T_C = 25^\circ C$ | 100 | W |
| T_J | | -55 ... +150 | $^\circ C$ |
| T_{JM} | | 150 | $^\circ C$ |
| T_{stg} | | -55 ... +150 | $^\circ C$ |
| T_L | Maximum Lead Temperature for Soldering | 300 | $^\circ C$ |
| T_{SOLD} | 1.6 mm (0.062in.) from Case for 10s | 260 | $^\circ C$ |
| M_d | Mounting Torque | 1.13/10 | Nm/lb.in. |
| Weight | | 6 | g |

| Symbol | Test Conditions ($T_J = 25^\circ C$, Unless Otherwise Specified) | Characteristic Values | | |
|---------------|-----------------------------------------------------------------------|-----------------------|------------|--------------------|
| | | Min. | Typ. | Max. |
| BV_{CES} | $I_C = 250\mu A$, $V_{GE} = 0V$ | 1600 | | V |
| $V_{GE(th)}$ | $I_C = 500\mu A$, $V_{CE} = V_{GE}$ | 3.5 | | 5.5 V |
| I_{CES} | $V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0V$ $T_J = 125^\circ C$ | | 100 | μA μA |
| I_{GES} | $V_{CE} = 0V$, $V_{GE} = \pm 20V$ | | | ± 500 nA |
| $V_{CE(sat)}$ | $I_C = 5A$, $V_{GE} = 15V$, Note 1 $T_J = 125^\circ C$ | | 4.9 5.6 | V V |

TO-247



G = Gate C = Collector
E = Emitter Tab = Collector

Features

- High Voltage Package
 - Replaces High Voltage Darlington's and Series Connected MOSFETs
 - Lower Effective $R_{DS(on)}$
- MOS Gate turn-on
 - Drive Simplicity
 - MOSFET Compatible for 10V turn on Gate Voltage
- Monolithic construction
 - High Blocking Voltage Capability
 - Very Fast turn-off Characteristics
- International Standard Package
 - Reverse Conducting Capability

Advantages

- Low Gate Drive Requirement
- High Power Density

Applications

- Flyback Converters
- DC Choppers
- Uninterruptible Power Supplies (UPS)
- Switched-Mode & Resonant-Mode Power Supplies
- CRT Deflection
- Lamp Ballasts

| Symbol Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified) | | Characteristic Values | | |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|-------------------------|
| | | Min. | Typ. | Max. |
| C_{ies} C_{oes} C_{res} | $V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$ | | 550 | pF |
| | | | 36 | pF |
| | | | 5 | pF |
| $Q_{g(on)}$ | $I_C = 5\text{A}, V_{GE} = 10\text{V}, V_{CE} = 600\text{V}$ | | 34 | nC |
| $t_{d(on)}$ t_{ri} $t_{d(off)}$ t_{fi} | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 5\text{A}, V_{GE} = 10\text{V}$ $V_{CE} = 960\text{V}, R_G = 27\Omega$ Note 2 | | 140 | ns |
| | | | 200 | ns |
| | | | 120 | ns |
| | | | 70 | ns |
| R_{thJC} | | | | 1.25 $^\circ\text{C/W}$ |
| R_{thCS} | | 0.21 | | $^\circ\text{C/W}$ |

Reverse Diode

| Symbol Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | | Characteristic Value | | |
|------------------------------------------------------------------------------------|------------------------------------------------------|----------------------|------|-------|
| | | Min. | Typ. | Max. |
| V_F | $I_F = 5\text{A}, V_{GE} = 0\text{V}, \text{Note 1}$ | | 3.6 | 5.0 V |

Notes:

1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.
2. Switching times & energy losses may increase for higher $V_{CE}(\text{clamp})$, T_J or R_G .

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

| | | | | | | | | | | |
|----------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|
| IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: | 4,835,592 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665 | 6,404,065 B1 | 6,683,344 | 6,727,585 | 7,005,734 B2 | 7,157,338B2 |
| | 4,860,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343 | 6,710,405 B2 | 6,759,692 | 7,063,975 B2 | |
| | 4,881,106 | 5,034,796 | 5,187,117 | 5,486,715 | 6,306,728 B1 | 6,583,505 | 6,710,463 | 6,771,478 B2 | 7,071,537 | |

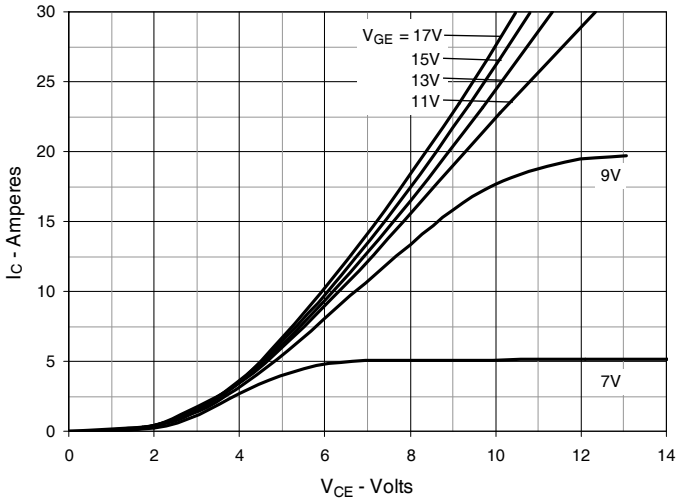
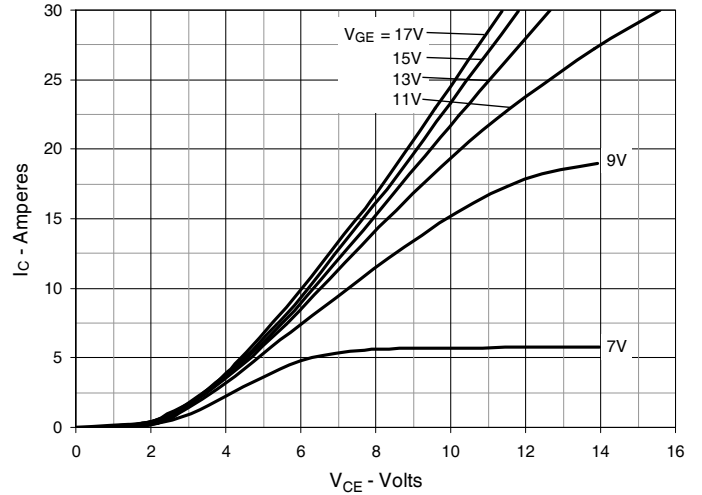
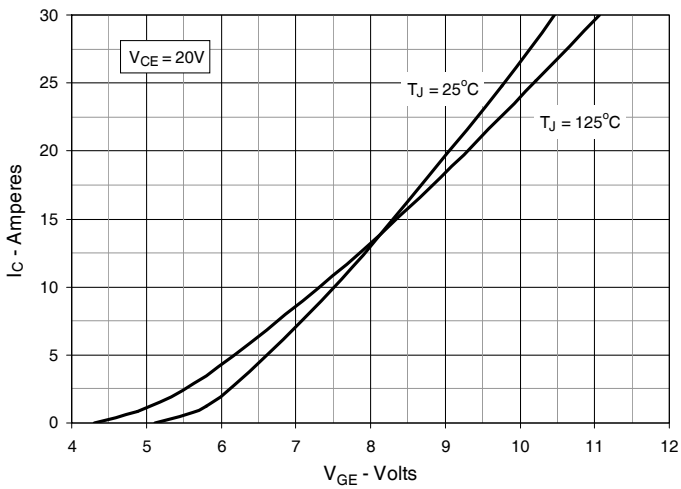
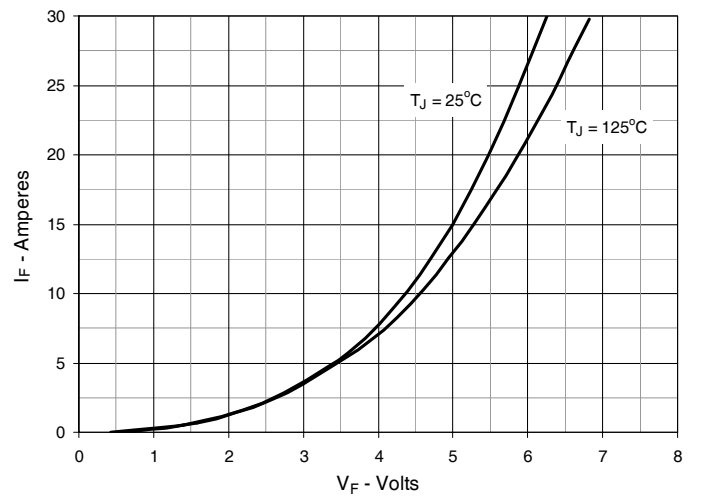
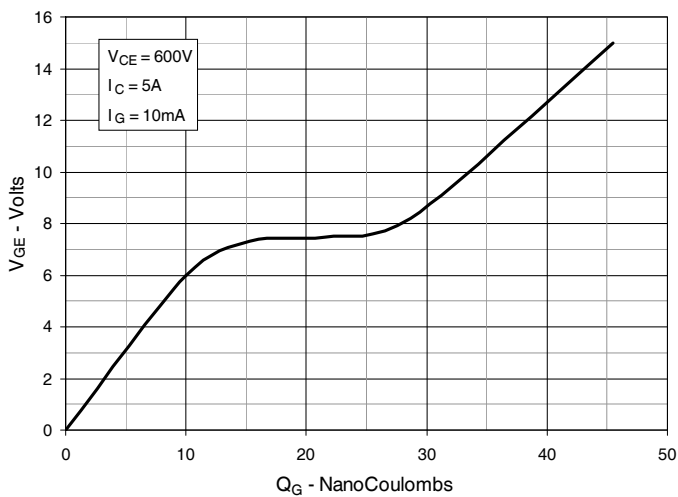
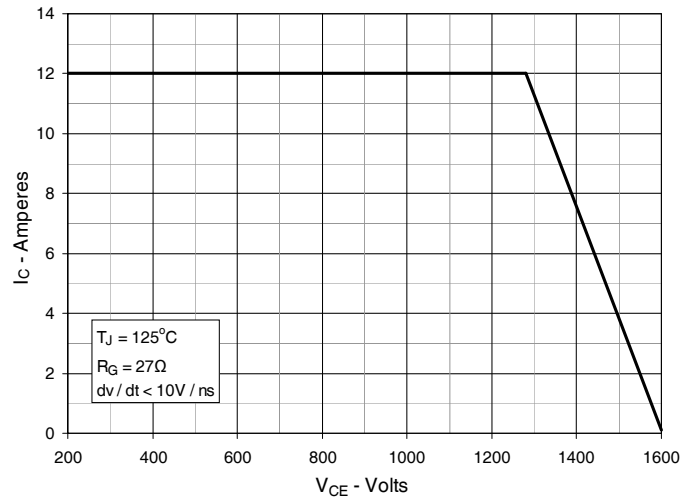
Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

Fig. 2. Output Characteristics @ $T_J = 125^\circ\text{C}$

Fig. 3. Transfer Characteristics

Fig. 4. Forward Voltage Drop of Intrinsic Diode

Fig. 5. Gate Charge

Fig. 6. Reverse-Bias Safe Operating Area


Fig. 7. Inductive Switching Fall Time

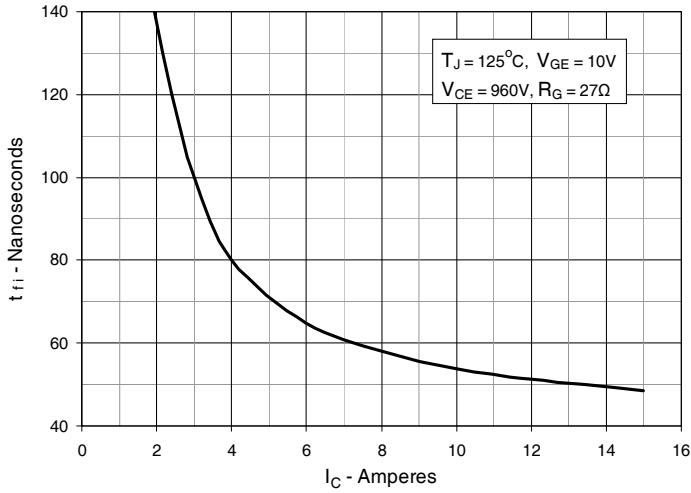


Fig. 8. Inductive Turn-off Delay Time

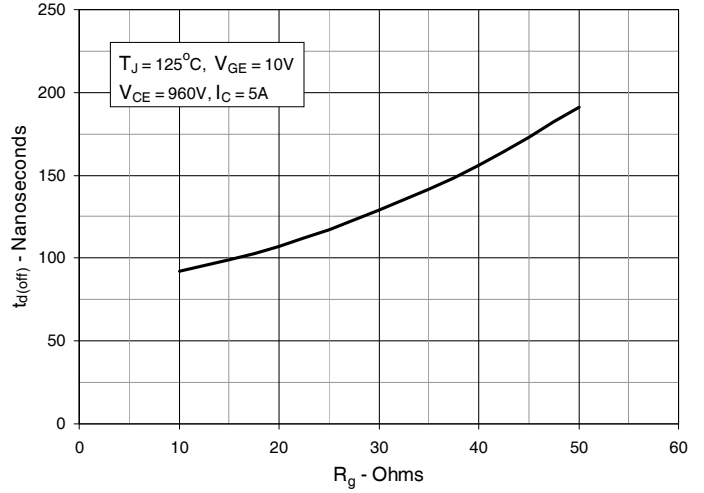
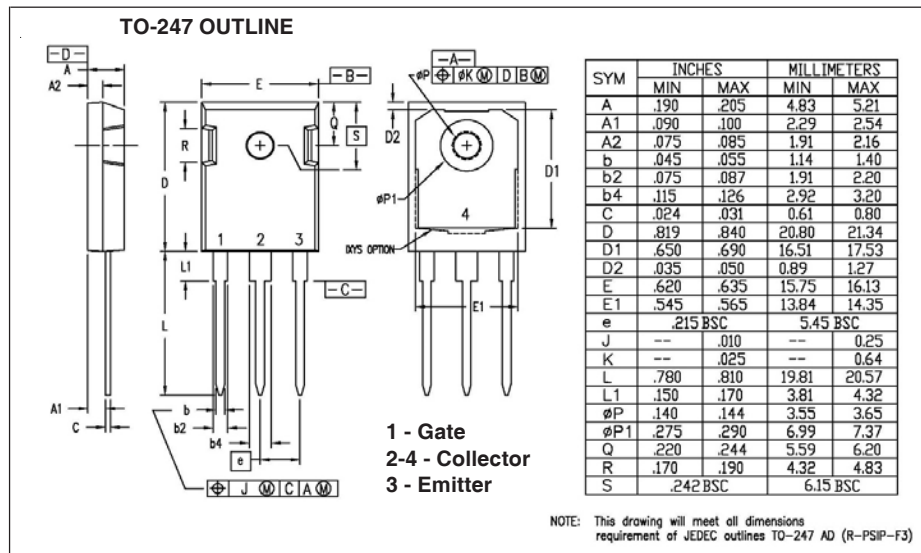
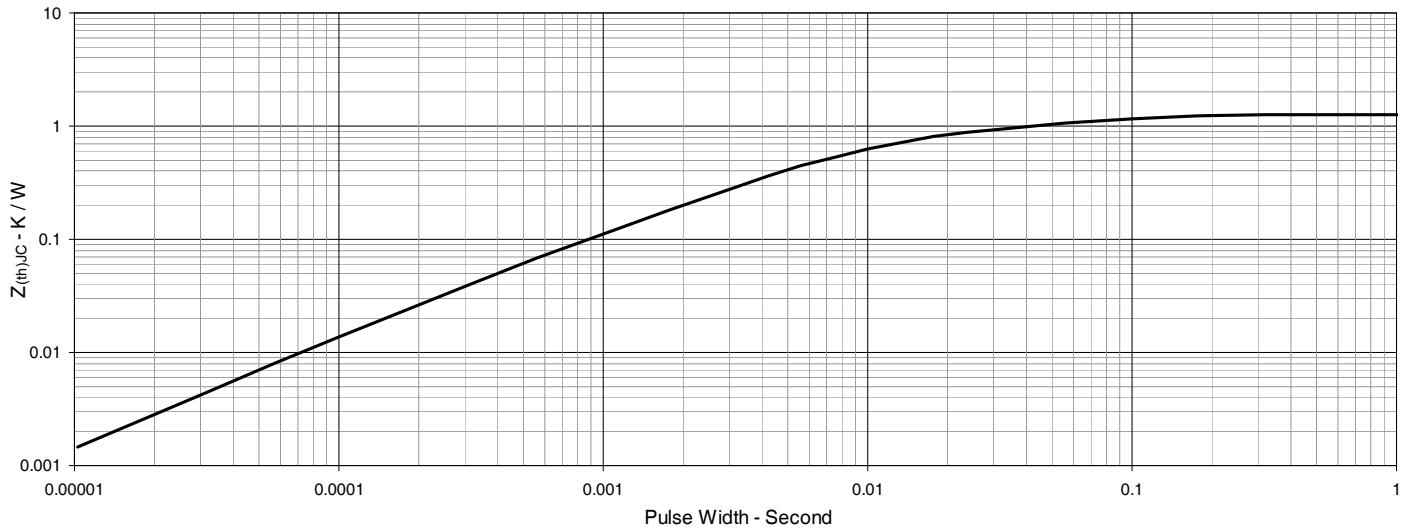


Fig. 9. Maximum Transient Thermal Impedance





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