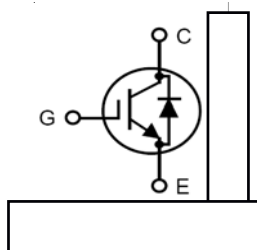


# High Voltage BiMOSFET™ IXBH9N160G

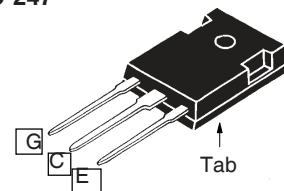
## Monolithic Bipolar MOS Transistor

N-Channel, Enhancement Mode  
MOSFET Transistor



$V_{CES} = 1600V$   
 $I_{C25} = 9A$   
 $V_{CE(sat)} \leq 7.0V$   
 $t_{fi(typ)} = 70ns$

TO-247



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

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	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	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
<b>SSOA</b> <b>(RBSOA)</b>	$V_{GE} = 10V$ , $T_{VJ} = 125^\circ C$ , $R_G = 27\Omega$ 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.
<b>Weight</b>		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	$\mu A$ $\mu A$
$I_{GES}$	$V_{CE} = 0V$ , $V_{GE} = \pm 20V$			$\pm 500$ nA
$V_{CE(sat)}$	$I_C = 5A$ , $V_{GE} = 15V$ , Note 1 $T_J = 125^\circ C$		4.9 5.6	V V

### Features

- High Voltage Package
  - Replaces High Voltage Darlington's and Series Connected MOSFETs
  - Lower Effective  $R_{DSON}$
- 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
$t_{d(on)}$ $t_{ri}$ $t_{d(off)}$ $t_{fi}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = 5\text{A}, V_{GE} = 10\text{V}$ $V_{CE} = 960\text{V}, R_G = 27\Omega$ Note 2		140	ns
			200	ns
			120	ns
			70	ns
$R_{thJC}$				1.25 °C/W
$R_{thCS}$		0.21		°C/W

**Reverse Diode**

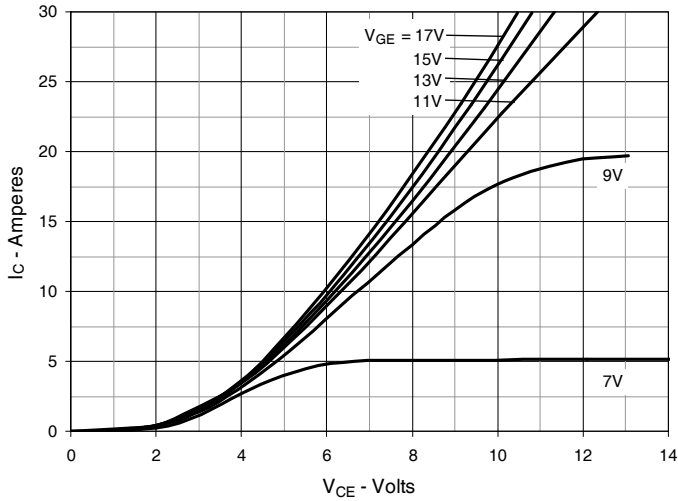
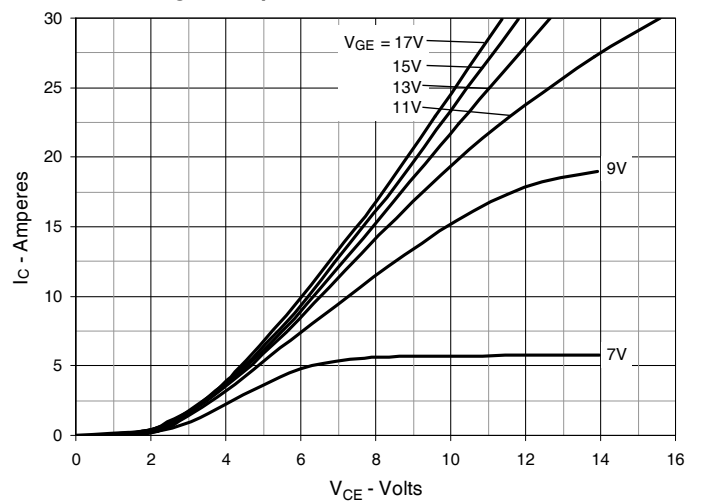
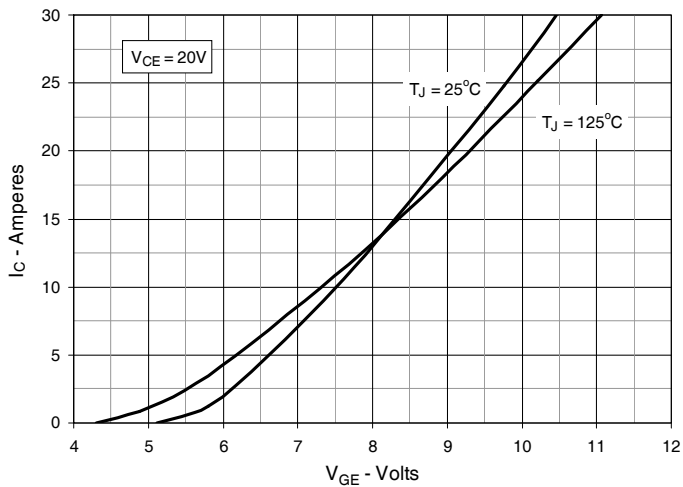
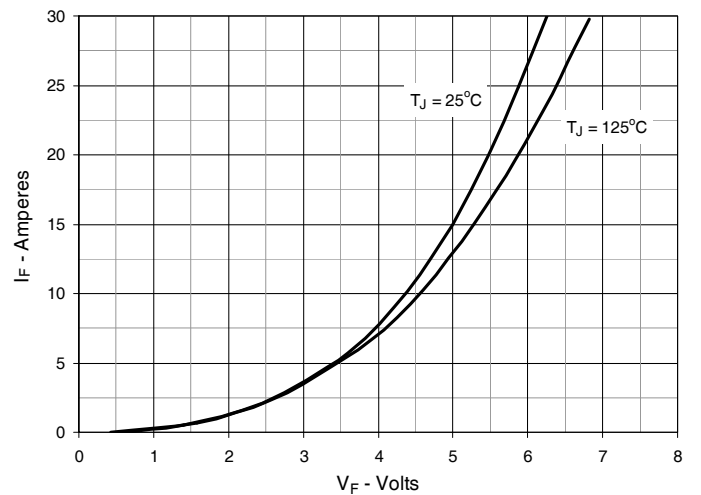
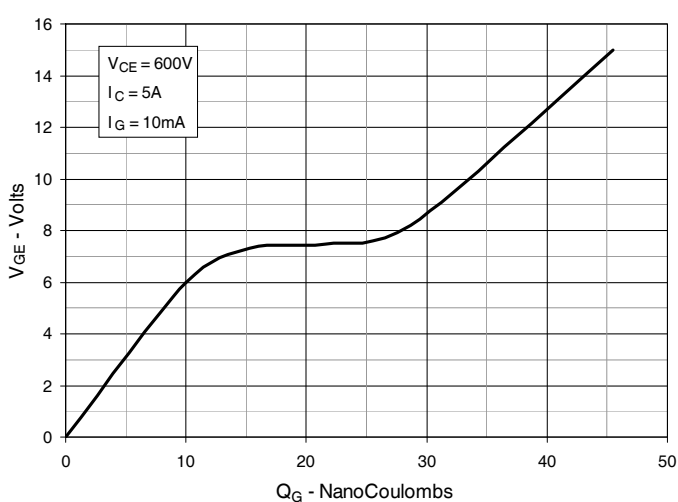
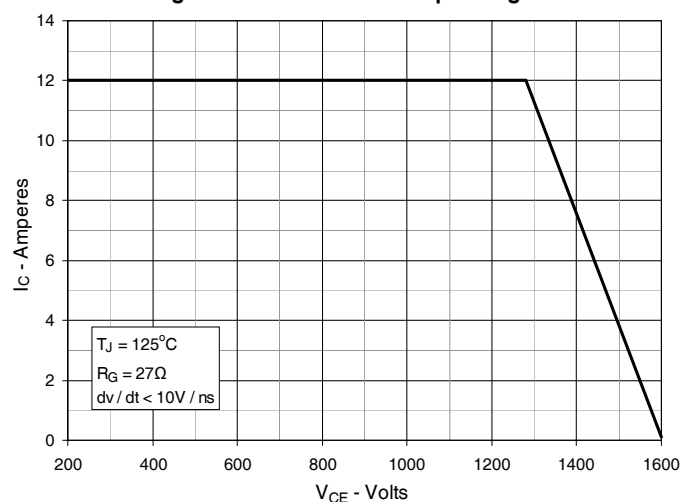
Symbol Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)		Characteristic Value		
		Min.	Typ.	Max.
$V_F$	$I_F = 5\text{A}, V_{GE} = 0\text{V}, \text{Note 1}$		3.6	5.0 V

**Notes:**

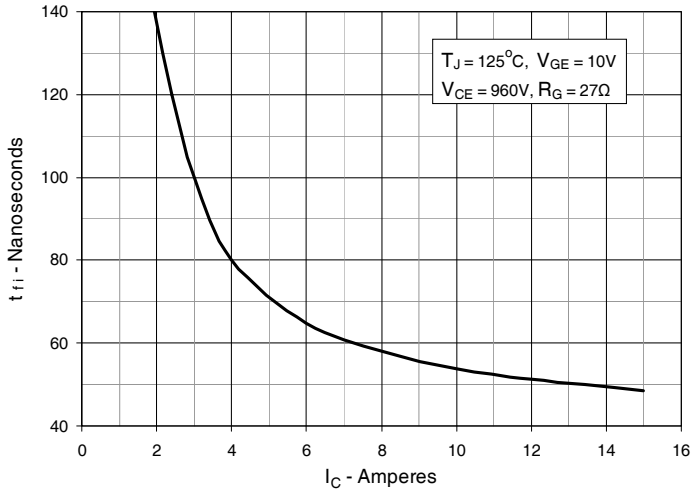
1. Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .
2. Switching times & energy losses may increase for higher  $V_{CE}(\text{clamp})$ ,  $T_J$  or  $R_G$ .

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

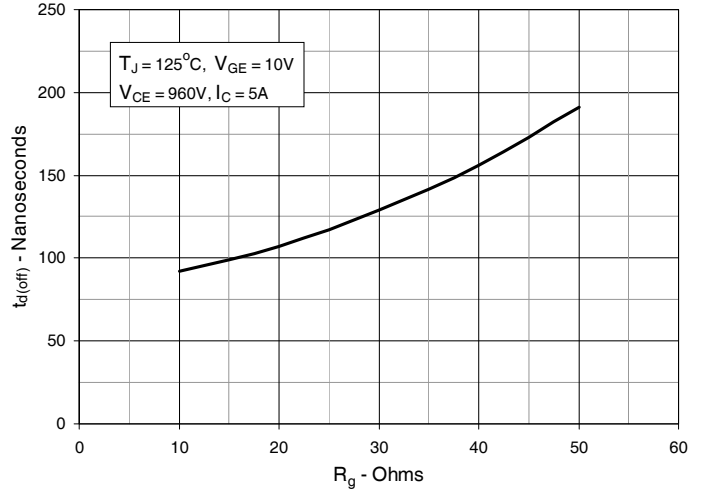
IXYS MOSFETs and IGBTs are covered	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
by one or more of the following U.S. patents:	4,860,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
	4,881,106	5,034,796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


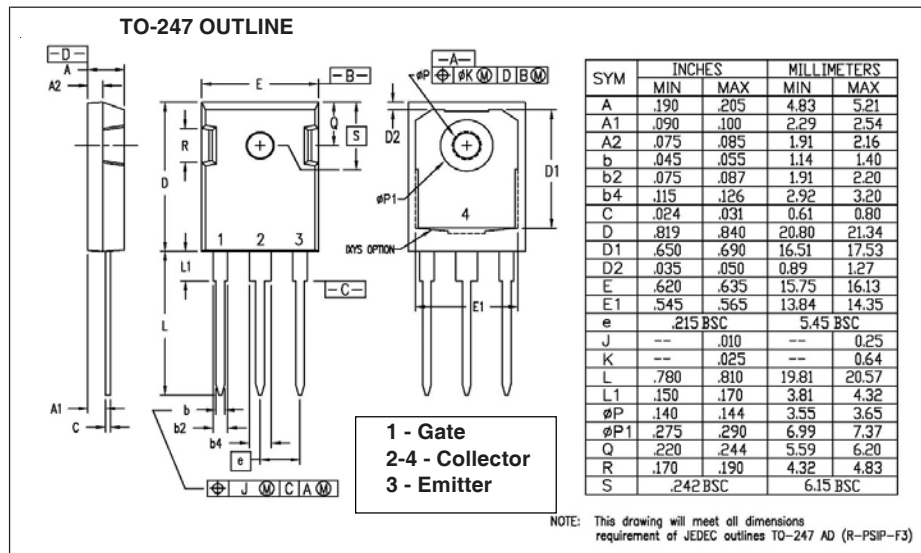
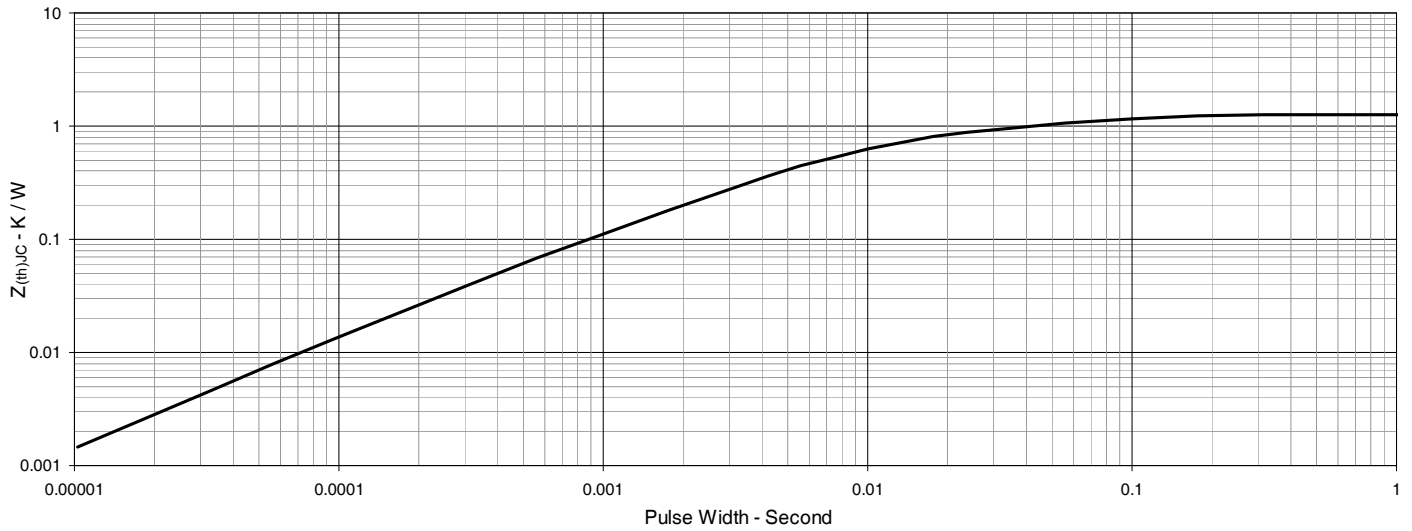
**Fig. 7. Inductive Switching Fall Time**



**Fig. 8. Inductive Turn-off Delay Time**



**Fig. 9. Maximum Transient Thermal Impedance**





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