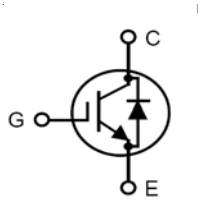
IXYS

High Voltage BiMOSFET™ Monolithic Bipolar MOS Transistor

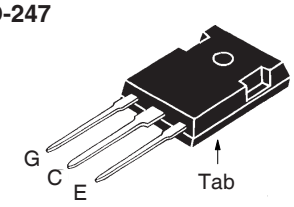
IXBH9N160G

N-Channel, Enhancement Mode
MOSFET Transistor



V_{CES} = 1600V
I_{C25} = 9A
$V_{CE(sat)}$ ≤ 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°C to 150°C	1600	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	1600	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	9	A
I_{C90}	T_C = 90°C	5	A
I_{CM}	T_C = 25°C, 1ms	10	A
SSOA (RBSOA)	V_{GE} = 10V, T_{VJ} = 125°C, R_G = 27Ω Clamped Inductive Load	I_{CM} = 12 1280	A V
P_C	T_C = 25°C	100	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°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	1.13/10	Nm/lb.in.
Weight		6	g

Symbol (T_J = 25°C, Unless Otherwise Specified)	Test Conditions	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	1600			V
$V_{GE(th)}$	I_C = 500μA, V_{CE} = V_{GE}	3.5		5.5	V
I_{CES}	V_{CE} = 0.8 • V_{CES}, V_{GE} = 0V			100	μA
	T_J = 125°C		100		μA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±500	nA
$V_{CE(sat)}$	I_C = 5A, V_{GE} = 15V, Note 1		4.9	7.0	V
	T_J = 125°C		5.6		V

Features

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

Reverse Diode

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

Notes:

1. Pulse test, t ≤ 300µs, duty cycle, d ≤ 2%.
2. Switching times & energy losses may increase for higher V_{CE}(clamp), T_J or R_G.

Fig. 1. Output Characteristics @ T_J = 25°C

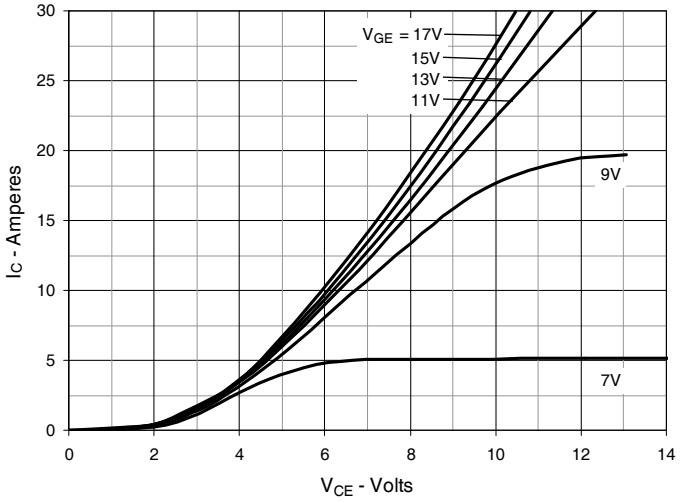


Fig. 2. Output Characteristics @ T_J = 125°C

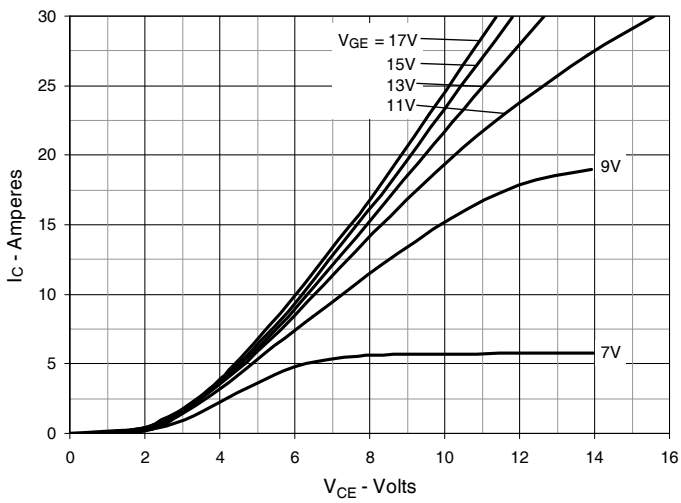


Fig. 3. Transfer Characteristics

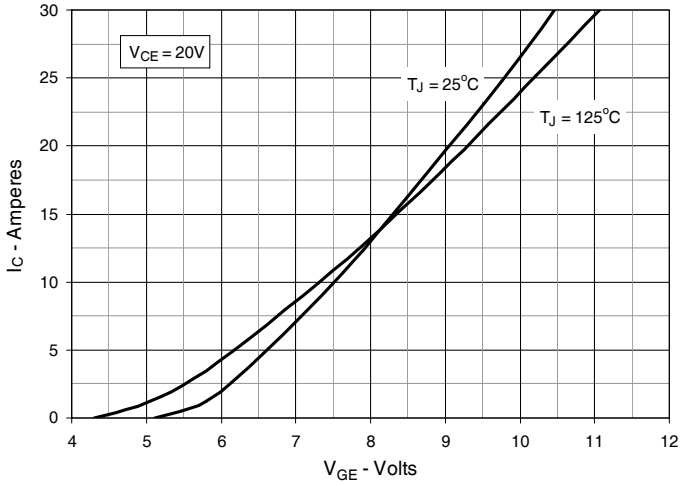


Fig. 4. Forward Voltage Drop of Intrinsic Diode

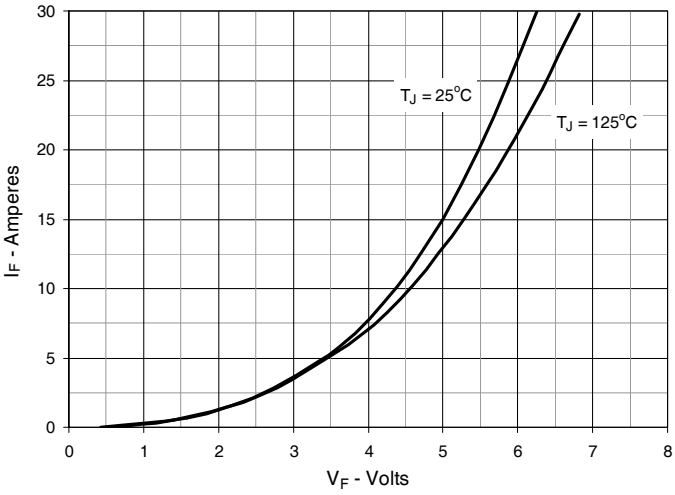


Fig. 5. Gate Charge

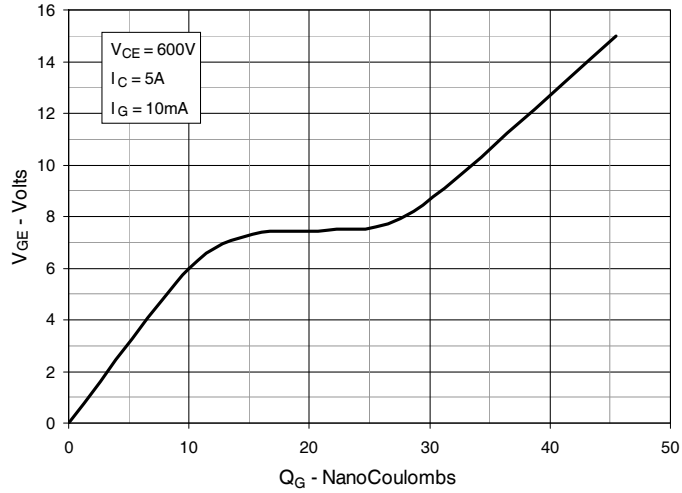


Fig. 6. Reverse-Bias Safe Operating Area

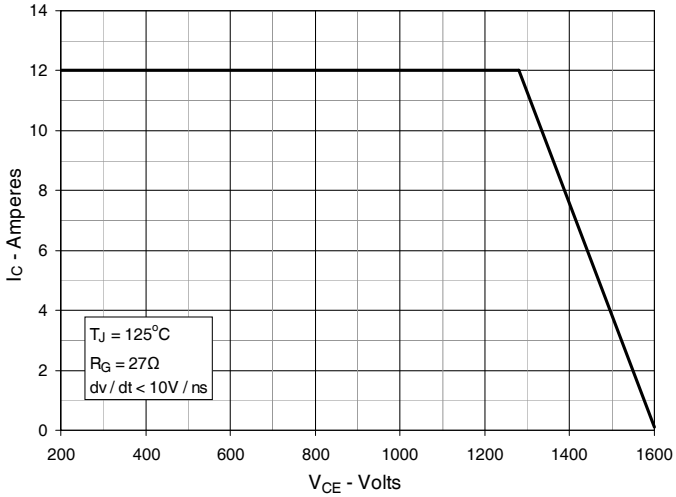


Fig. 7. Inductive Switching Fall Time

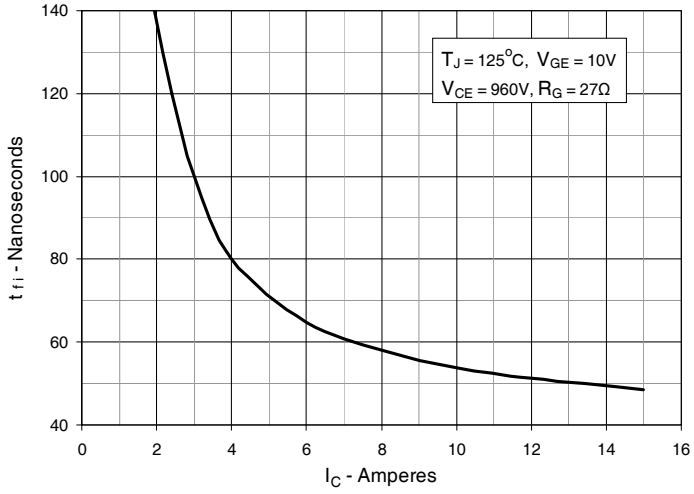


Fig. 8. Inductive Turn-off Delay Time

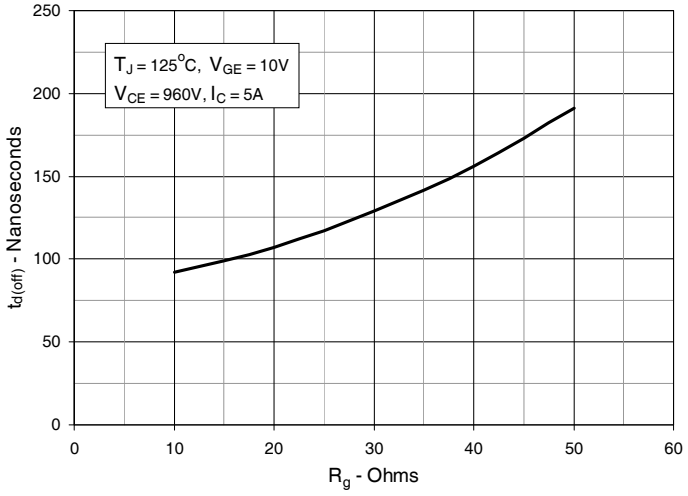
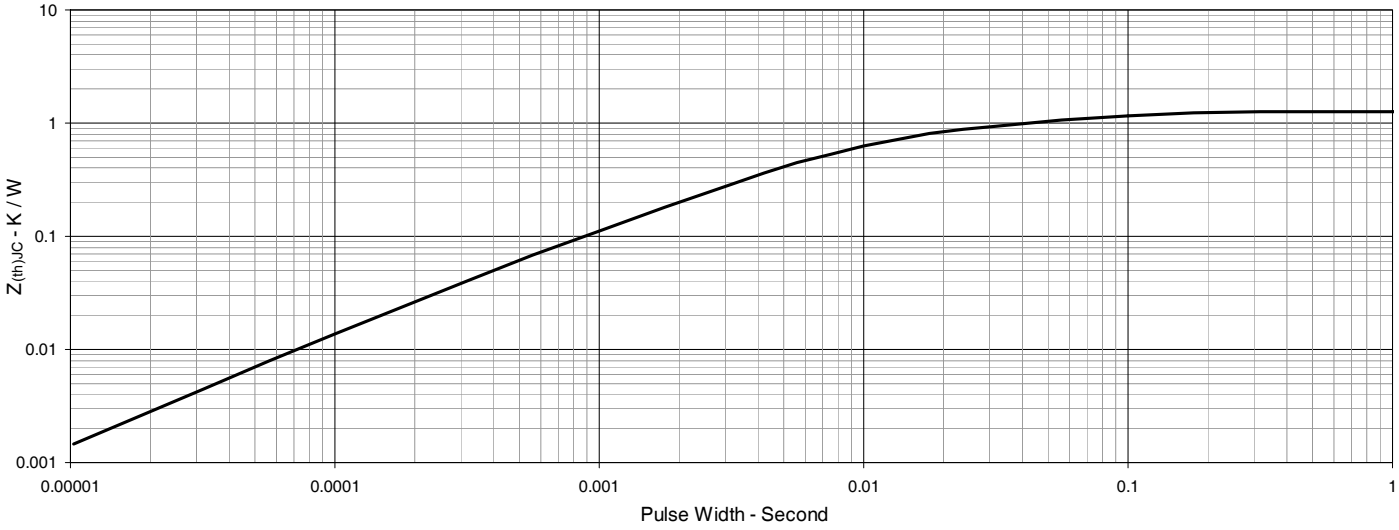
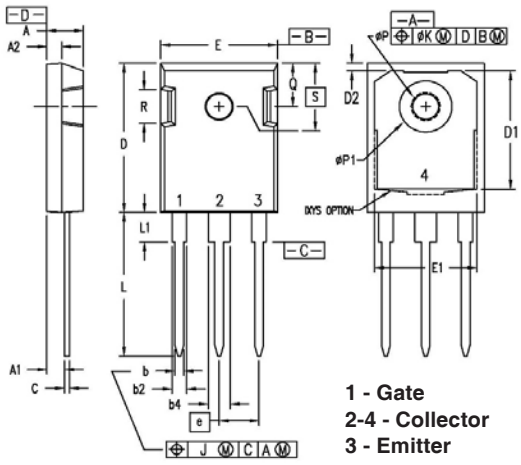


Fig. 9. Maximum Transient Thermal Impedance



TO-247 OUTLINE



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b2	.075	.087	1.91	2.20
b4	.115	.126	2.92	3.20
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
D1	.650	.690	16.51	17.53
D2	.035	.050	0.89	1.27
E	.620	.635	15.75	16.13
E1	.545	.565	13.84	14.35
e	.215 BSC		5.45 BSC	
J	--	.010	--	0.25
K	--	.025	--	0.64
L	.780	.810	19.81	20.57
L1	.150	.170	3.81	4.32
øP	.140	.144	3.55	3.65
øP1	.275	.290	6.99	7.37
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.242 BSC		6.15 BSC	

NOTE: This drawing will meet all dimensions requirement of JEDEC outlines TO-247 AD (R-PSIP-F3)