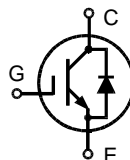


High Voltage BIMOSFET™ Monolithic Bipolar MOS Transistor

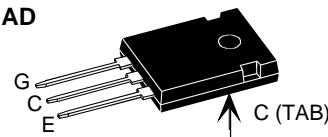
N-Channel, Enhancement Mode

IXBH 40N140
IXBH 40N160

$V_{CES} = 1400/1600\text{ V}$
 $I_{C25} = 33\text{ A}$
 $V_{CE(sat)} = 6.2\text{ V typ.}$
 $t_{fi} = 40\text{ ns}$



TO-247 AD



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

Symbol	Conditions	Maximum Ratings		
		40N140	40N160	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	1400	1600	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1\text{ M}\Omega$	1400	1600	V
V_{GES}	Continuous		± 20	V
V_{GEM}	Transient		± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$,		33	A
I_{C90}	$T_C = 90^\circ\text{C}$		20	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1 ms		40	A
SSOA (RBSOA)	$V_{GE} = 15\text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 22\ \Omega$, $V_{CE} = 0.8 \cdot V_{CES}$, Clamped inductive load, $L = 100\ \mu\text{H}$		$I_{CM} = 40$	A
P_C	$T_C = 25^\circ\text{C}$		350	W
T_J		-55 ... +150		$^\circ\text{C}$
T_{JM}			150	$^\circ\text{C}$
T_{stg}		-55 ... +150		$^\circ\text{C}$
T_L	1.6 mm (0.063 in) from case for 10 s		300	$^\circ\text{C}$
M_d	Mounting torque	1.15/10		Nm/lb.in.
Weight			6	g

Features

- International standard package JEDEC TO-247 AD
- High Voltage BIMOSFET™
 - replaces high voltage Darlingtons and series connected MOSFETs
 - lower effective $R_{DS(on)}$
- Monolithic construction
 - high blocking voltage capability
 - very fast turn-off characteristics
- MOS Gate turn-on
 - drive simplicity
- Intrinsic diode

Applications

- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- CRT deflection
- Lamp ballasts

Advantages

- Easy to mount with 1 screw (isolated mounting screw hole)
- Space savings
- High power density

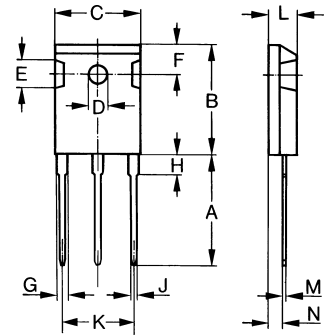
Symbol	Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)			
			min.	typ.	max.
BV_{CES}	$I_C = 1\text{ mA}$, $V_{GE} = 0\text{ V}$	40N140 40N160	1400 1600		V
$V_{GE(th)}$	$I_C = 2\text{ mA}$, $V_{CE} = V_{GE}$		4		8 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0\text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$			400 μA 3 mA
I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = \pm 20\text{ V}$				$\pm 500\text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C90}$, $V_{GE} = 15\text{ V}$	$T_J = 125^\circ\text{C}$		6.2	7.1 V 7.8 V

IXYS reserves the right to change limits, test conditions and dimensions.

Symbol	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}			220	pF
C _{res}			30	pF
Q _g	I _C = 20 A, V _{CE} = 600 V, V _{GE} = 15 V		130	nC
t _{d(on)}	Inductive load, T_J = 125°C I _C = I _{C90°} , V _{GE} = 15 V, L = 100 μH, V _{CE} = 960 V, R _G = 22 Ω		200	ns
t _{ri}			60	ns
t _{d(off)}			270	ns
t _{fi}			40	ns
R _{thJC}				0.35 K/W
R _{thCK}		0.25		K/W

Reverse Conduction **Characteristic Values**
(T_J = 25°C, unless otherwise specified)

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V _F	I _F = I _{C90°} , V _{GE} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %		2.5	5 V

TO-247 AD Outline


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

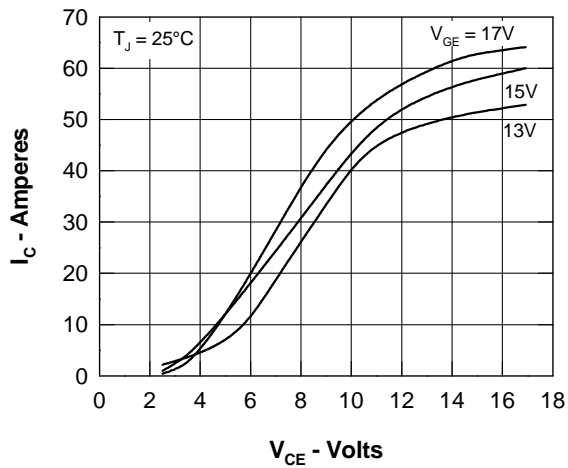


Fig. 1 Typ. Output Characteristics

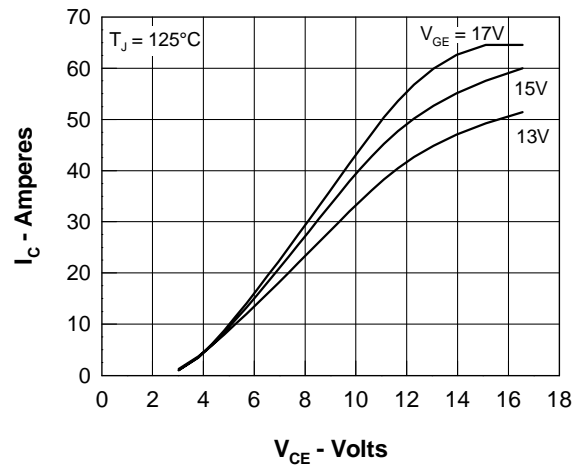


Fig. 2 Typ. Output Characteristics

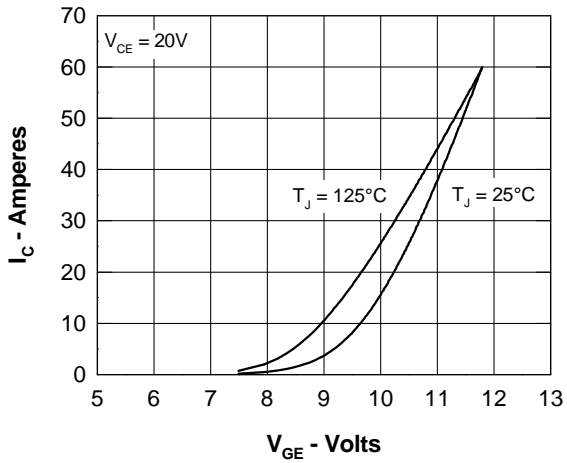


Fig. 3 Typ. Transfer Characteristics

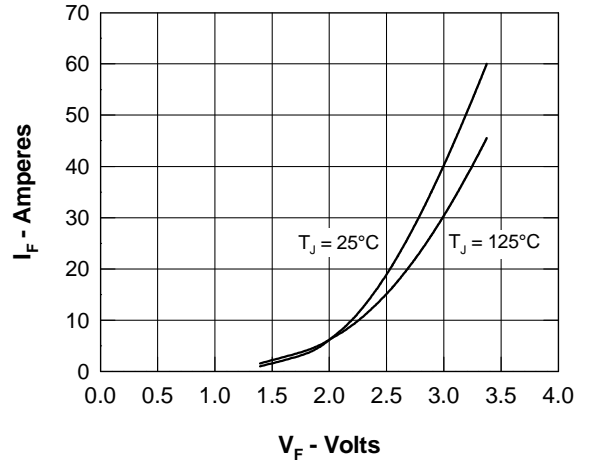


Fig. 4 Typ. Characteristics of Reverse Conduction

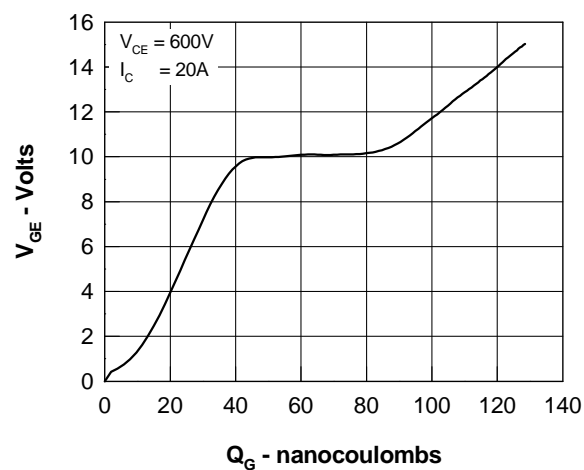


Fig. 5 Typ. Gate Charge characteristics

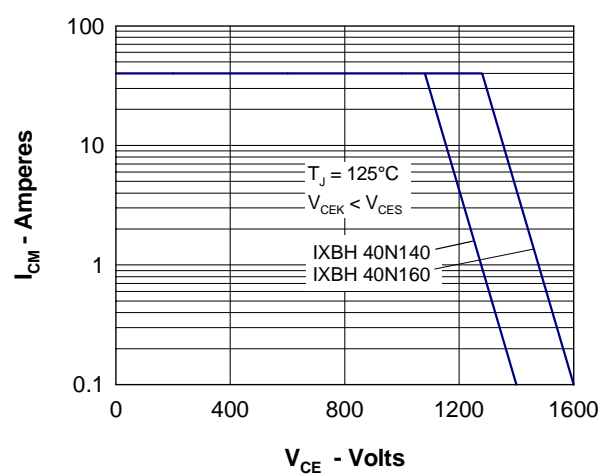


Fig. 6 Reverse Based Safe Operating Area RBSOA

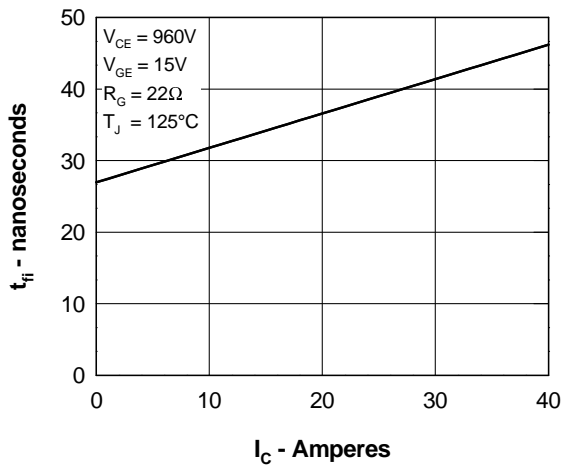


Fig. 7 Typ. Fall Time

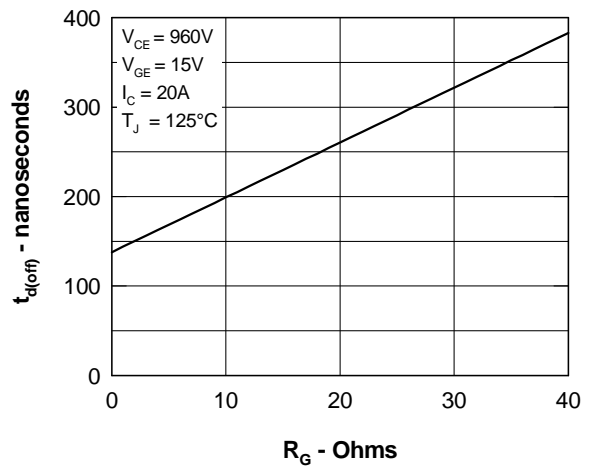


Fig. 8 Typ. Turn Off Delay Time

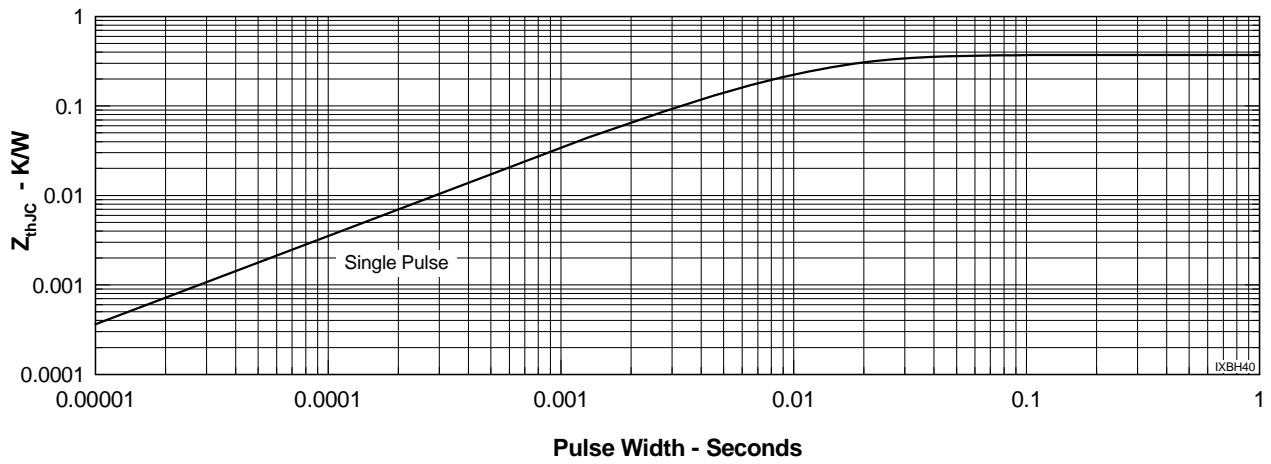


Fig. 9 Typ. Transient Thermal Impedance