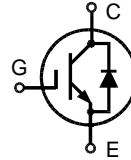


High Voltage BIMOSFET™ Monolithic Bipolar MOS Transistor

IXBJ 40N140
IXBJ 40N160

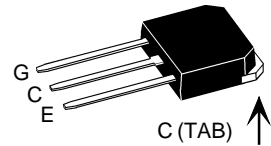
$V_{CES} = 1400/1600\text{ V}$
 $I_{C25} = 33\text{ A}$
 $V_{CE(sat)} = 7.1\text{ V}$
 $t_{fi} = 40\text{ ns}$

N-Channel, Enhancement Mode



Symbol	Test Conditions	Maximum Ratings		
		40N140	40N160	
V_{CES}	$T_J = 25^\circ\text{C}$ to 150°C	1400	1600	V
V_{CGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1\text{ MW}$	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)	$V_{GE} = 15\text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 22\ \Omega$; $V_{CE} = 0.8 V_{CES}$ Clamped inductive load, $L = 100\text{ mH}$		$I_{CM} = 40$	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

TO-268



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

Features

- Leaded TO-268 package
- High Voltage BIMOSFET™
 - replaces high voltage Darlington's and series connected MOSFET's
 - 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

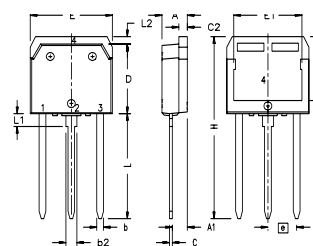
- Space savings
- High power density

Symbol	Test 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}	$V_{CE} = 0\text{ V}$, $V_{GE} = \pm 20\text{ V}$			$\pm 500\text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C90}$, $V_{GE} = 15\text{ V}$		6.2	7.1 V 7.8 V
		$T_J = 125^\circ\text{C}$		

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	min.	typ.	max.
V _F	I _F = I _{C90} , V _{GE} = 0 V, Pulse test, t ≤ 300 ms, duty cycle d ≤ 2 %		2.5	5 V

Leaded TO-268


All metal area are solder plated
1 - gate
2 - drain (collector)
3 - source (emitter)
4 - drain (collector)

Dim.	Inches		Millimeters	
	Min	Max	Min	Max
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	.040	.065
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	1.365	1.395	34.67	35.43
L	.780	.800	19.81	20.32
L1	.079	.091	2.00	2.30
L2	.039	.045	1.00	1.15

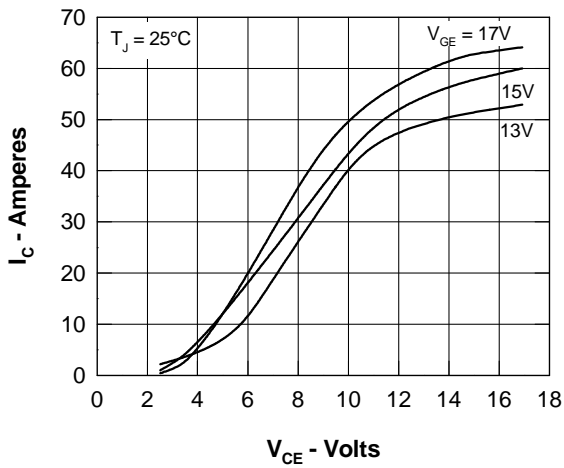


Fig. 1 Output Characteristics

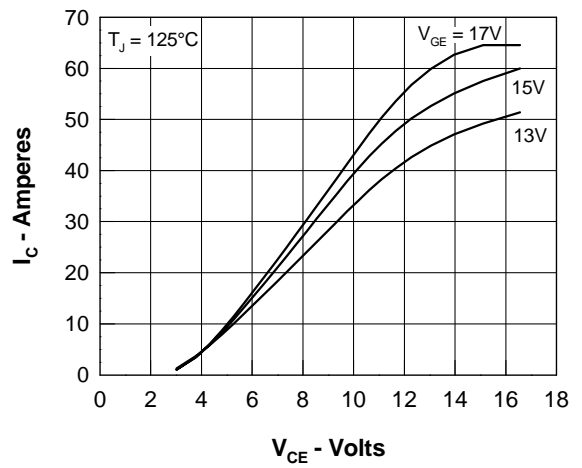


Fig. 2 High Temperature Output Characteristics

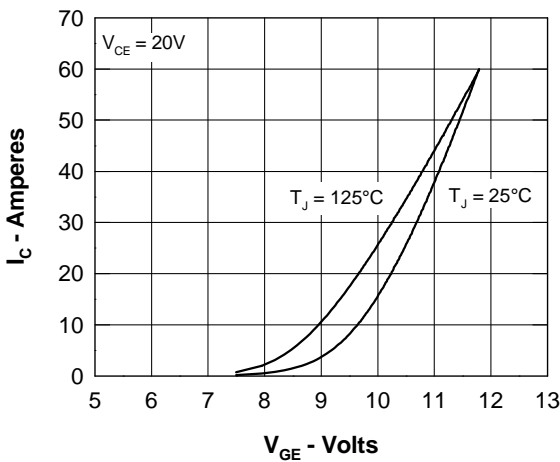


Fig. 3 Transfer Characteristics

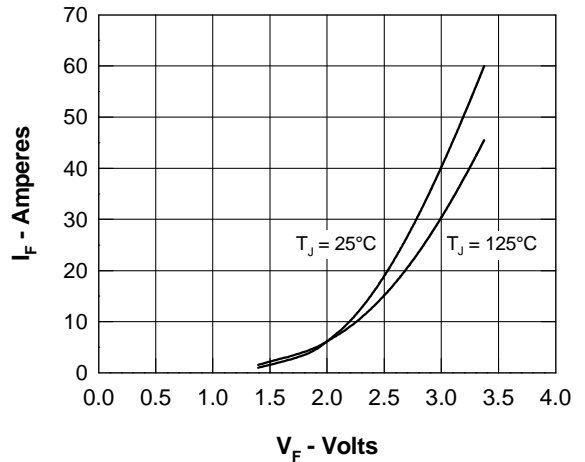


Fig. 4 Forward voltage drop of the Intrinsic Diode

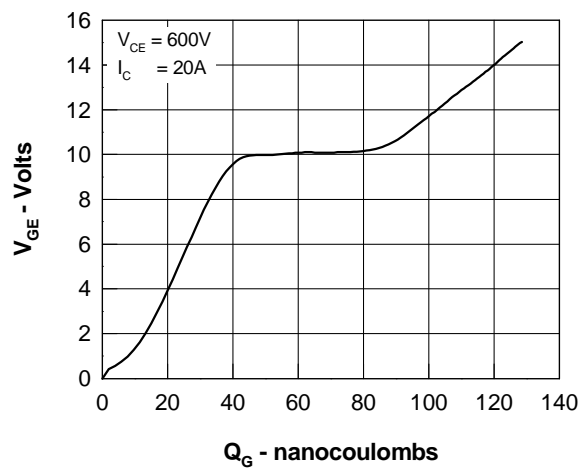


Fig. 5 Gate Charge Characteristics

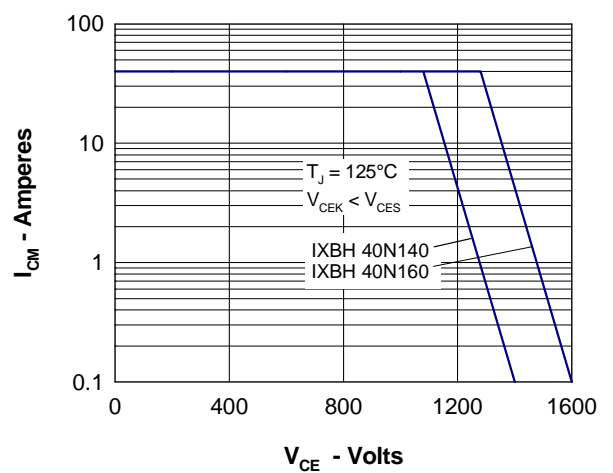


Fig. 6 Reverse Based Safe Operating Area

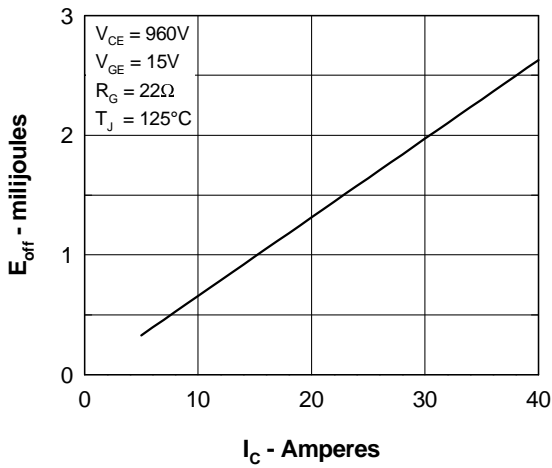


Fig. 7 Turn off Energy vs. Collector Current

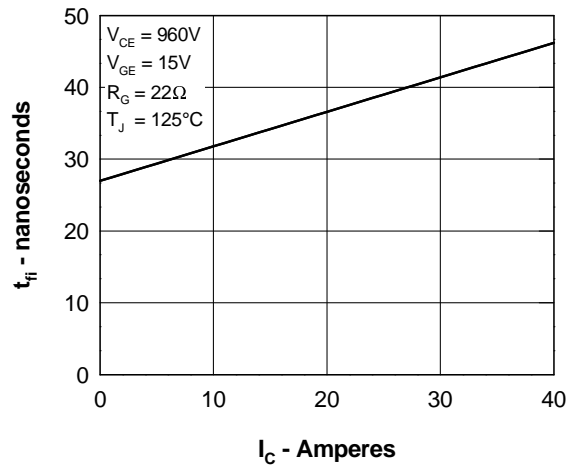


Fig. 8 Collector Current Fall Time

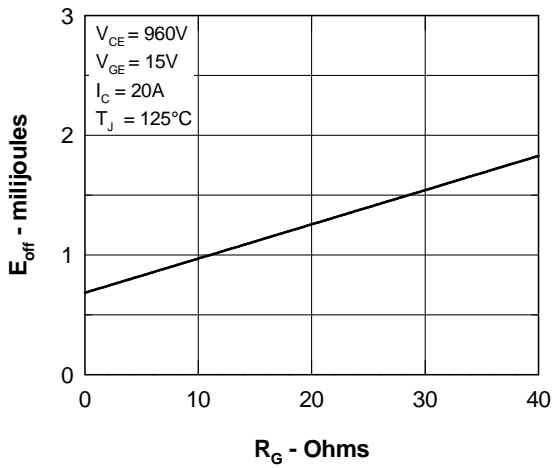


Fig. 9 Turn-off Energy vs. Gate Resistance

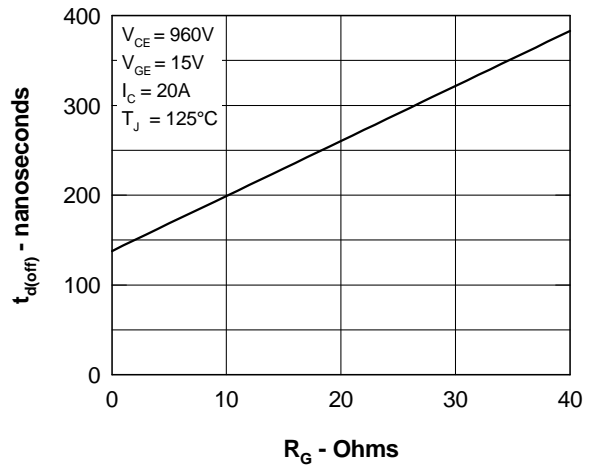


Fig.10 Turn Off Delay Time vs. Gate Resistance

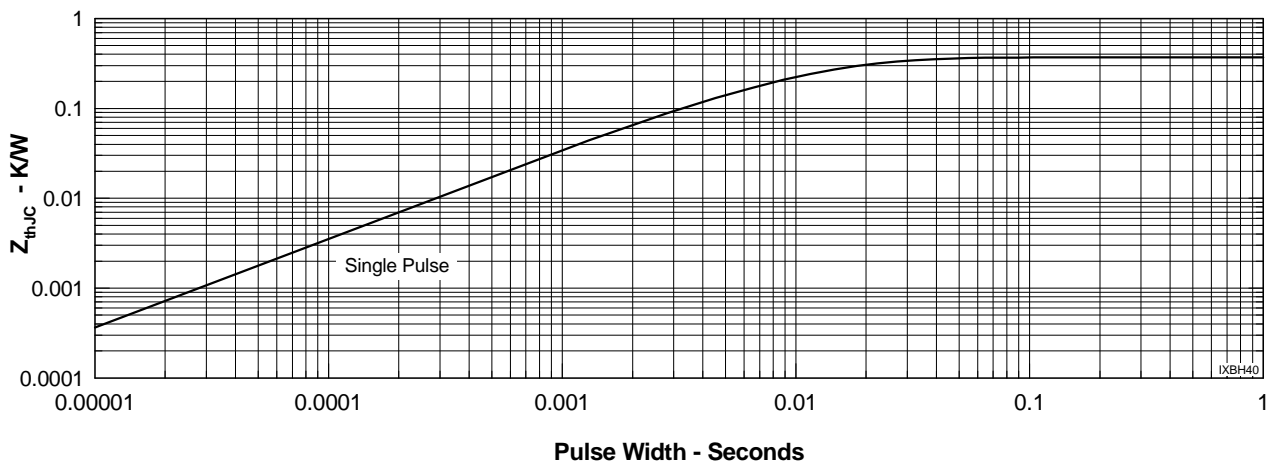


Fig.11 Transient Thermal Impedance