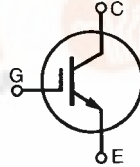




HiPerFAST™ IGBT

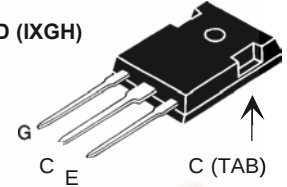
IXGH 50N60B
IXGK 50N60B
IXGT 50N60B
IXGJ 50N60B

$V_{CES} = 600 \text{ V}$
 $I_{C25} = 75 \text{ A}$
 $V_{CE(sat)} = 2.3 \text{ V}$
 $t_{fi(typ)} = 120 \text{ ns}$

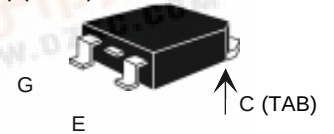


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	75	A
I_{C90}	$T_C = 90^\circ\text{C}$	50	A
I_{CM}	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	200	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 10 \Omega$ Clamped inductive load	$I_{CM} = 100$ @ $0.8 V_{CES}$	A
P_C	$T_C = 25^\circ\text{C}$	300	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
M_d	Mounting torque	TO-247AD TO-264	1.13/10 Nm/lb.in. 0.9/6 Nm/lb.in.
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$
Weight	TO-247	6	g
	TO-264	10	g
	TO-268	4	g

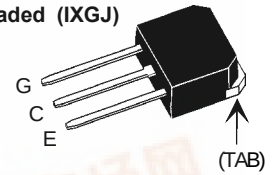
TO-247 AD (IXGH)



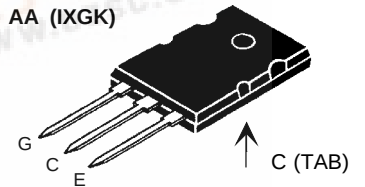
TO-268 (D3) (IXGT)



TO-268 Leaded (IXGJ)



TO-264 AA (IXGK)



G = Gate
E = Emitter
D = Drain
TAB = Collector

Features

- International standard packages
- High frequency IGBT
- Latest generation HDMOS™ process
- High current handling capability
- MOS Gate turn-on - drive simplicity

Applications

- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies

Advantages

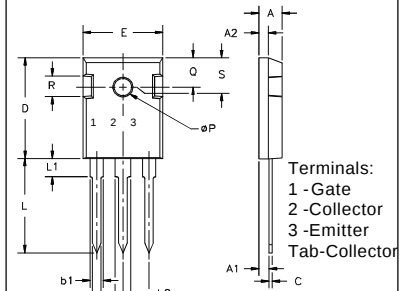
- Easy to mount with 1 screw (insulated mounting screw hole)
- Switching speed for high frequency applications
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$	600		V
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	2.5		5.0 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 \text{ V}$		$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	200 μA 1 mA
I_{GES}	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
	$I_C = I_{C90}, V_{GE} = 15 \text{ V}$			2.3 V



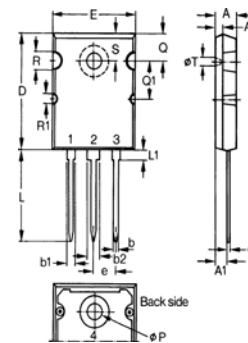
Symbol	Test Conditions	Characteristic Values (T _j = 25°C, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	I _C = I _{C90} ; V _{CE} = 10 V, Pulse test, t ≤ 300 μs, duty cycle ≤ 2 %	25	42	S
C_{ies}	V _{CE} = 25 V, V _{GE} = 0 V, f = 1 MHz		4100	pF
C_{oes}			310	pF
C_{res}			95	pF
Q_G	I _C = I _{C90} , V _{GE} = 15 V, V _{CE} = 0.5 V _{CES}		160	nC
Q_{GE}			30	nC
Q_{GC}			55	nC
t_{d(on)}	Inductive load, T _j = 25°C I _C = I _{C90} , V _{GE} = 15 V V _{CE} = 0.8 • V _{CES} , R _G = R _{off} = 2.7 Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8 • V _{CES} , higher T _j or increased R _G		50	ns
t_{ri}			50	ns
t_{d(off)}			150	ns
t_{fi}			120	ns
E_{off}			3.0	4.5 mJ
t_{d(on)}	Inductive load, T _j = 125°C I _C = I _{C90} , V _{GE} = 15 V V _{CE} = 0.8 • V _{CES} , R _G = R _{off} = 2.7 Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8 • V _{CES} , higher T _j or increased R _G		50	ns
t_{ri}			50	ns
E_{on}			3	mJ
t_{d(off)}			200	ns
t_{fi}			250	ns
E_{off}			4.2	mJ
R_{thJC}	TO-247 & TO-268 leaded packages TO-264 package		0.42	KW
R_{thCK}			0.25 0.15	KW KW

TO-247 AD (IXGH) Outline



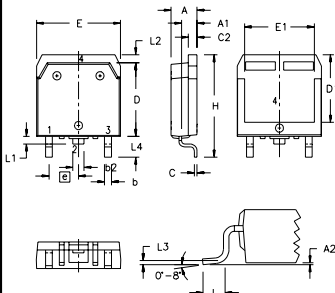
Dim.	Millimeter Min. Max.	Inches Min. Max.
A	4.7 5.3	.185 .209
A ₁	2.2 2.54	.087 .102
A ₂	2.2 2.6	.059 .098
b	1.0 1.4	.040 .055
b ₁	1.65 2.13	.065 .084
b ₂	2.87 3.12	.113 .123
C	.4 .8	.016 .031
D	20.80 21.46	.819 .845
E	15.75 16.26	.610 .640
e	5.20 5.72	0.205 0.225
L	19.81 20.32	.780 .800
L ₁	4.50	.177
∅P	3.55 3.65	.140 .144
Q	5.89 6.40	0.232 0.252
R	4.32 5.49	.170 .216
S	6.15 BSC	.242 BSC

TO-264 AA (IXGK) Outline



Dim.	Millimeter Min. Max.	Inches Min. Max.
A	4.82 5.13	.190 .202
A ₁	2.54 2.89	.100 .114
A ₂	2.00 2.10	.079 .083
b	1.12 1.42	.044 .056
b ₁	2.39 2.69	.094 .106
b ₂	2.90 3.09	.114 .122
c	0.53 0.83	.021 .033
D	25.91 26.16	1.020 1.030
E	19.81 19.96	.780 .786
e	5.46 BSC	.215 BSC
J	0.00 0.25	.000 .010
K	0.00 0.25	.000 .010
L	20.32 20.83	.800 .820
L ₁	2.29 2.59	.090 .102
P	3.17 3.66	.125 .144
Q	6.07 6.27	.239 .247
Q ₁	8.38 8.69	.330 .342
R	3.81 4.32	.150 .170
R ₁	1.78 2.29	.070 .090
S	6.04 6.30	.238 .248
T	1.57 1.83	.062 .072

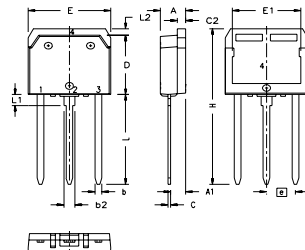
TO-268 (IXGT) Outline



SYM	INCHES MIN. MAX.	MILLIMETERS MIN. MAX.
A	.193 .201	4.90 5.10
A ₁	.106 .114	2.70 2.90
A ₂	.001 .010	0.02 0.25
b	.045 .057	1.15 1.45
b ₂	.075 .083	1.90 2.10
C	.016 .026	0.40 0.65
C ₂	.057 .063	1.45 1.60
D	.543 .551	13.80 14.00
D ₁	.488 .500	12.40 12.70
E	.624 .632	15.85 16.05
E ₁	.524 .535	13.30 13.60
e	.215 BSC	5.45 BSC
H	.736 .752	18.70 19.10
L	.094 .106	2.40 2.70
L ₁	.047 .055	1.20 1.40
L ₂	.039 .045	1.00 1.15
L ₃	.010 BSC	0.25 BSC
L ₄	.150 .161	3.80 4.10

Terminals:
1 - Gate
2 - Collector

TO-268 (IXGJ) Leaded Outline



SYM	INCHES MIN. MAX.	MILLIMETERS MIN. MAX.
A	.193 .201	4.90 5.10
A ₁	.106 .114	2.70 2.90
b	.045 .057	1.15 1.45
b ₂	.075 .083	1.90 2.10
C	.016 .026	0.40 0.65
C ₂	.057 .063	1.45 1.60
D	.543 .551	13.80 14.00
D ₁	.488 .500	12.40 12.70
E	.624 .632	15.85 16.05
E ₁	.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
L ₁	.079 .091	2.00 2.30
L ₂	.039 .045	1.00 1.15

NOTE: ALL METAL AREA ARE SOLDER PLATED.

- 1 - GATE
- 2 - DRAIN (COLLECTOR)
- 3 - SOURCE (EMITTER)
- 4 - DRAIN (COLLECTOR)

Figure 1. Saturation Voltage Characteristics

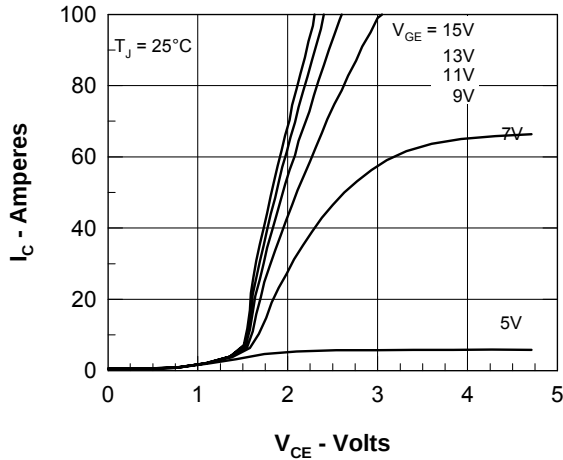


Figure 2. Extended Output Characteristics

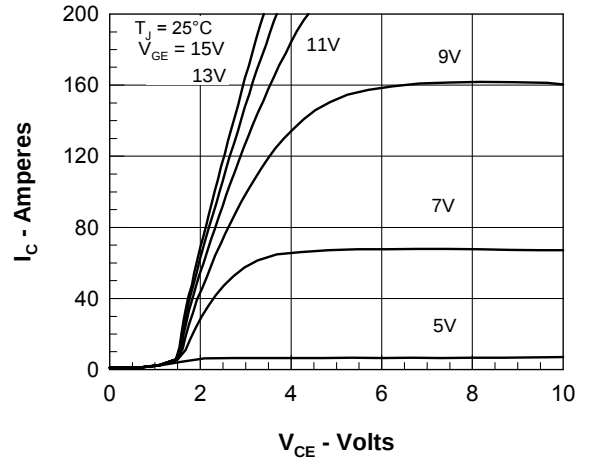


Figure 3. Saturation Voltage Characteristics

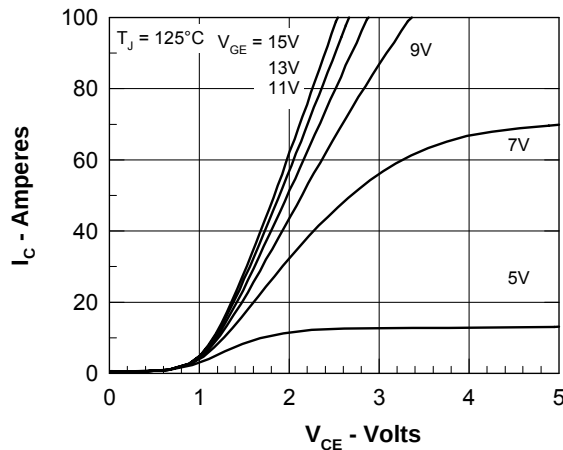


Figure 4. Temperature Dependence of $V_{CE(sat)}$

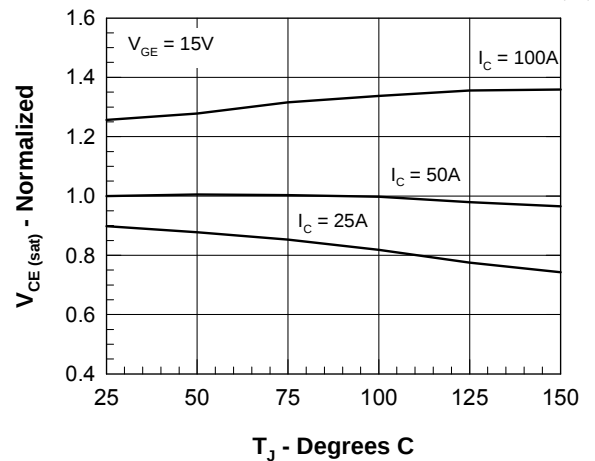


Figure 5. Admittance Curves

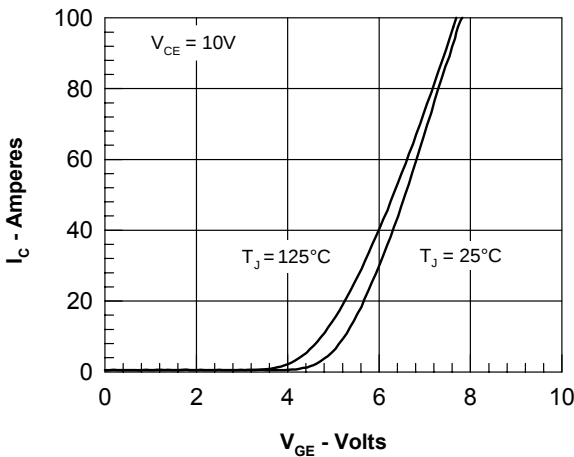


Figure 6. Capacitance Curves

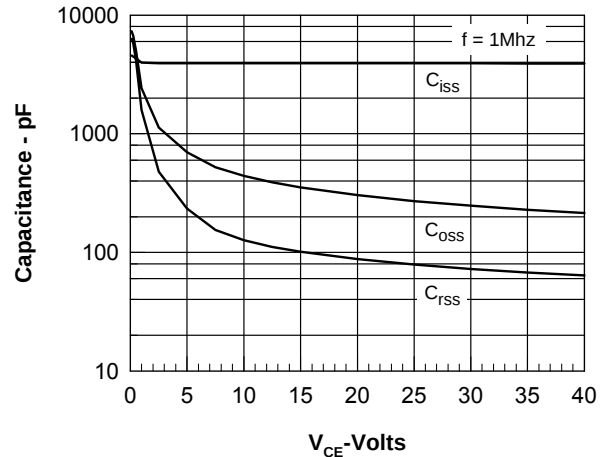


Figure 7. Dependence of E_{ON} and E_{OFF} on I_C

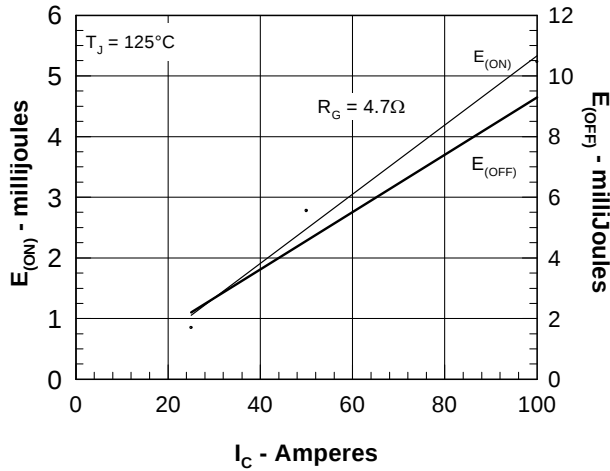


Figure 8. Dependence of E_{ON} and E_{OFF} on R_G

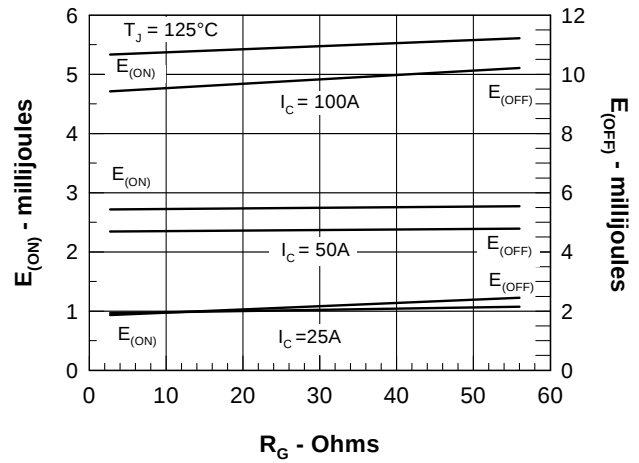


Figure 9. Gate Charge

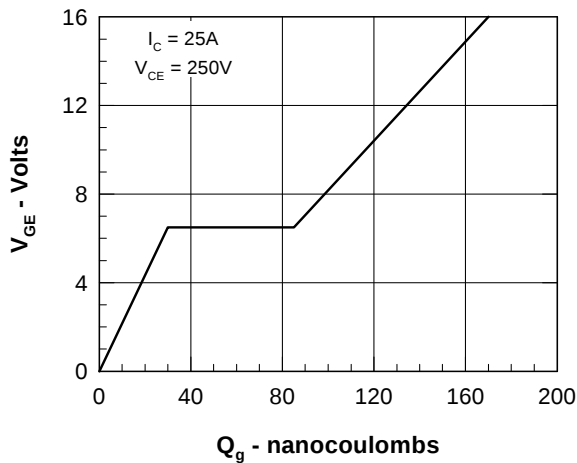


Figure 10. Turn-off Safe Operating Area

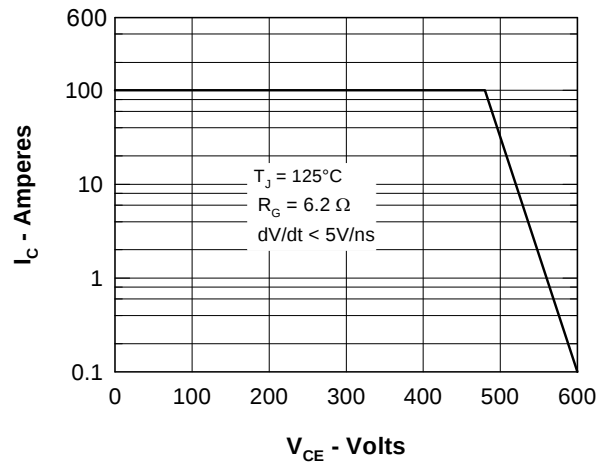


Figure 11. IGBT Transient Thermal Resistance

