

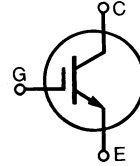
HiPerFAST™ IGBT

IXGH24N50B

IXGH24N60B

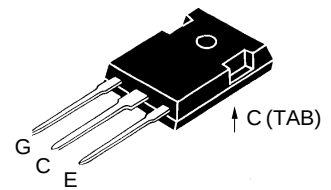
V_{CES}	$I_{C(25)}$	$V_{CE(sat)}$	t_{fi}
500 V	48 A	2.3 V	80 ns
600 V	48 A	2.5 V	80 ns

Preliminary data



Symbol	Test Conditions	Maximum Ratings		
		24N50	24N60	
V _{CES}	T _J = 25°C to 150°C	500	600	V
V _{CGR}	T _J = 25°C to 150°C; R _{GE} = 1 MΩ	500	600	V
V _{GES}	Continuous		±20	V
V _{GEM}	Transient		±30	V
I _{C25}	T _C = 25°C		48	A
I _{C90}	T _C = 90°C		24	A
I _{CM}	T _C = 25°C, 1 ms		96	A
SSOA (RBSOA)	V _{GE} = 15 V, T _{VJ} = 125°C, R _G = 22 Ω Clamped inductive load, L = 100 μH		I _{CM} = 48 @ 0.8 V _{CES}	A
P _C	T _C = 25°C		150	W
T _J		-55 ... +150		°C
T _{JM}			150	°C
T _{stg}		-55 ... +150		°C
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s			300	°C
M _d	Mounting torque (M3)		1.13/10	Nm/lb.in.
Weight			6	g

TO-247 AD



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

Features

- International standard packages JEDEC TO-247 AD
- High frequency IGBT
- High current handling capability
- 3rd generation HDMOS™ process
- MOS Gate turn-on - drive simplicity

Applications

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

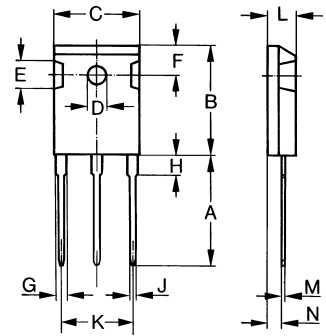
Advantages

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

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 250\text{ }\mu\text{A}$, $V_{GE} = 0\text{ V}$	24N50 500 24N60 600		V
$V_{GE(th)}$	$I_C = 250\text{ }\mu\text{A}$, $V_{CE} = V_{GE}$	2.5		5 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}	$V_{CE} = 0\text{ V}$, $V_{GE} = \pm 20\text{ V}$			$\pm 100\text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C90}$, $V_{GE} = 15\text{ V}$	24N50 2.3 24N60 2.5		V

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = I_{C90}, V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$	9	13	S
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$		1500	pF
C_{oes}			135	pF
C_{res}			40	pF
Q_g	$I_C = I_{C90}, V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		90	nC
Q_{ge}			11	nC
Q_{gc}			30	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{ V}$, $L = 100\text{ }\mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 10\text{ }\Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G		25	ns
t_{ri}			15	ns
E_{on}			0.6	mJ
$t_{d(off)}$			150	ns
t_{fi}			80	ns
E_{off}		24N50B 24N60B	0.62 0.80	mJ mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{ V}$, $L = 100\text{ }\mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 10\text{ }\Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G		25	ns
t_{ri}			15	ns
E_{on}			0.8	mJ
$t_{d(off)}$			250	ns
t_{fi}			100	ns
E_{off}		24N50B 24N60B	0.9 1.4	mJ mJ
R_{thJC}				0.83 K/W
R_{thCK}			0.25	K/W

TO-247 AD (IXGH) 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

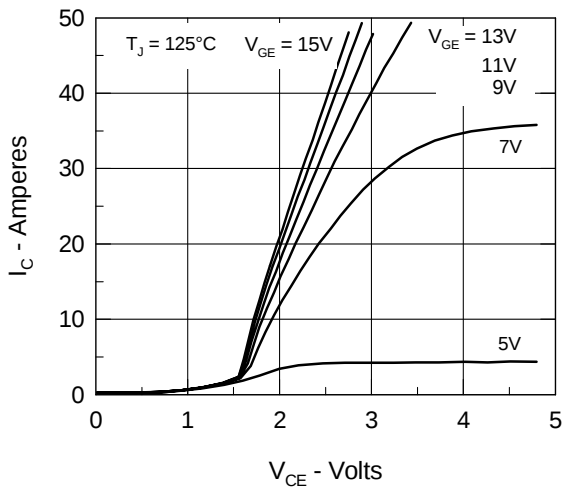


Fig. 1. Saturation Voltage Characteristics

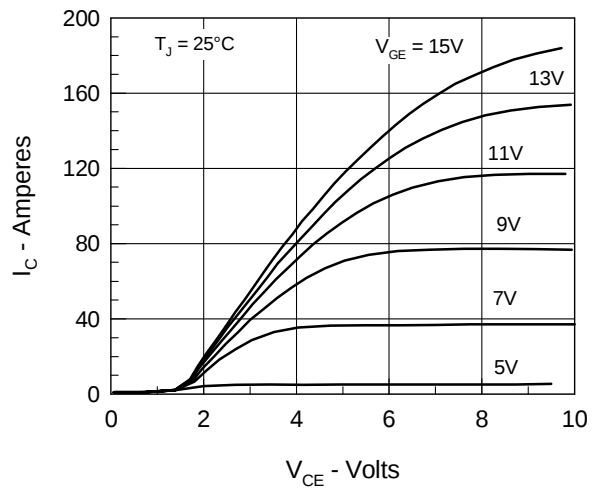


Fig. 2. Extended Output Characteristics

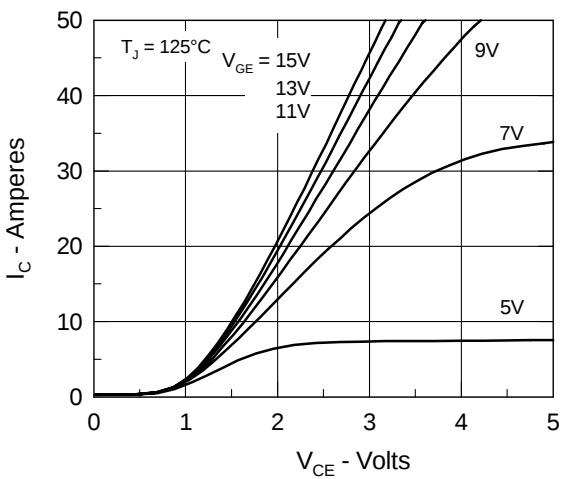


Fig. 3. Saturation Voltage Characteristics

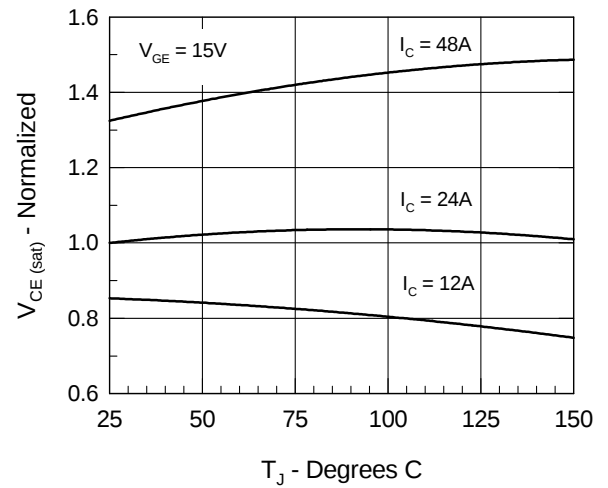
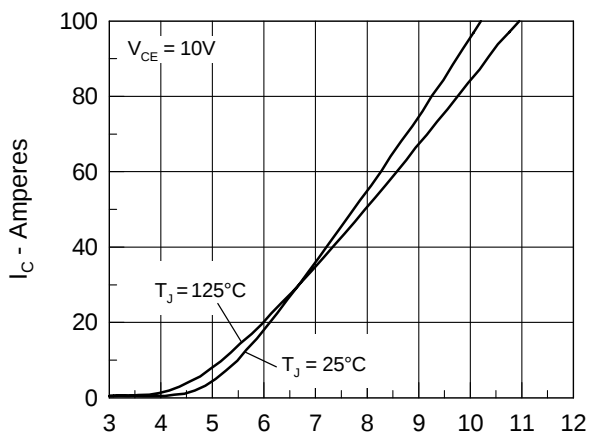
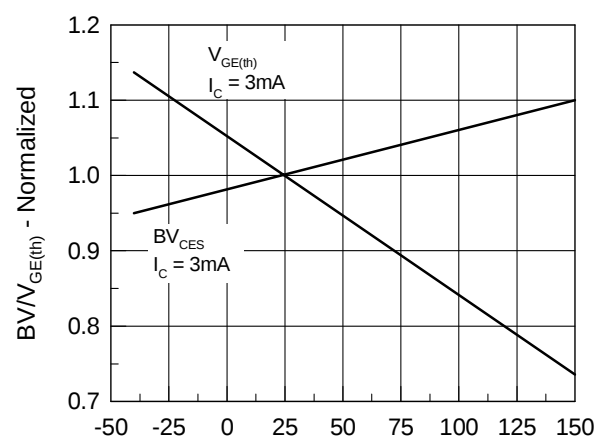

Fig. 4. Temperature Dependence of $V_{CE(sat)}$


Fig. 5. Admittance Curves


Fig. 6. Temperature Dependence of BV_{DSS} & $V_{GE(th)}$

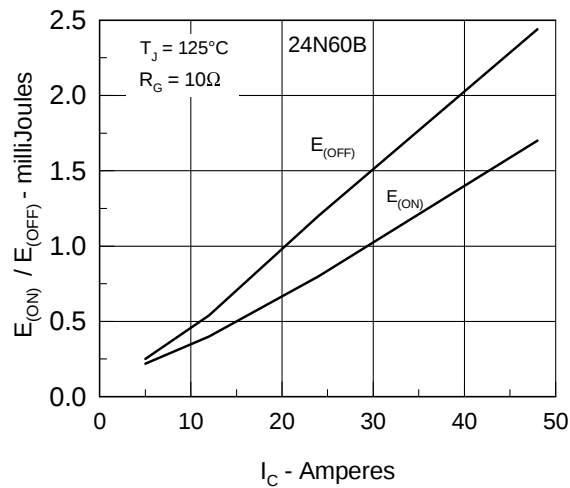


Fig. 7. Dependence of tfi and E_{OFF} on I_C .

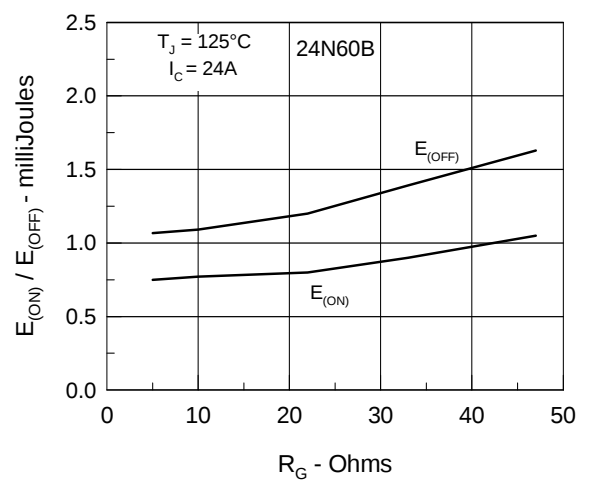


Fig. 8. Dependence of tfi and E_{OFF} on R_G .

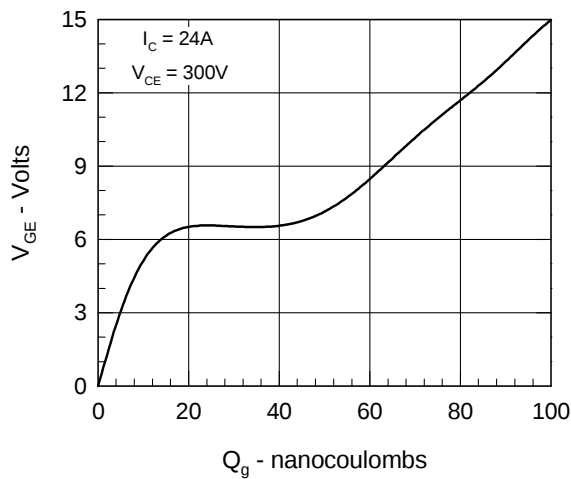


Fig. 9. Gate Charge

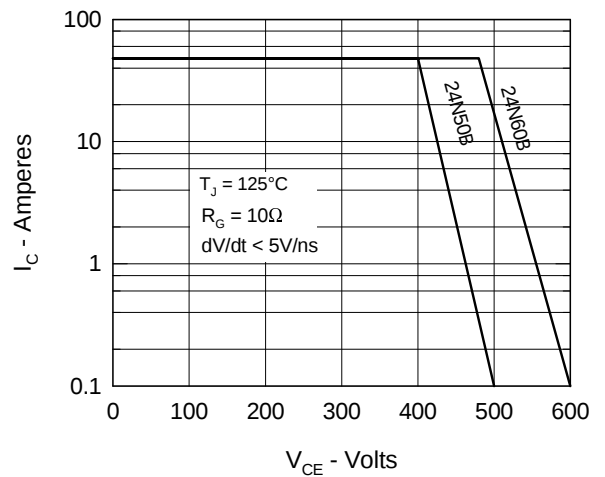


Fig. 10. Turn-off Safe Operating Area

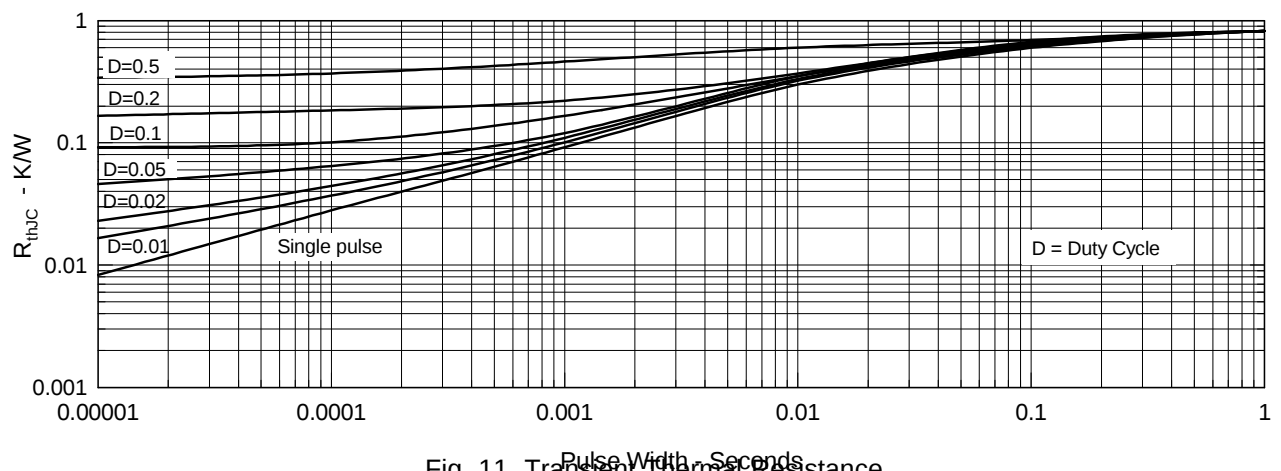


Fig. 11. Transient Thermal Resistance