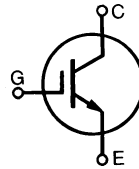


HiPerFAST™ IGBT

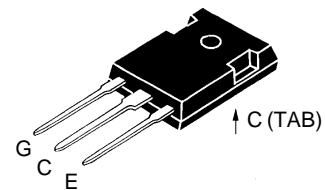
	V_{CES}	$I_{C(25)}$	$V_{CE(sat)}$	t_{fi}
IXGH24N50B	500 V	48 A	2.3 V	80 ns
IXGH24N60B	600 V	48 A	2.5 V	80 ns

Preliminary data



Symbol	Test Conditions	Maximum Ratings		
		24N50	24N60	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	500	600	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	500	600	V
V_{GES}	Continuous	± 20		V
V_{GEM}	Transient	± 30		V
I_{C25}	$T_C = 25^\circ\text{C}$	48		A
I_{C90}	$T_C = 90^\circ\text{C}$	24		A
I_{CM}	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	96		A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 22 \Omega$ Clamped inductive load, $L = 100 \mu\text{H}$	$I_{CM} = 48$ @ $0.8 V_{CES}$		A
P_C	$T_C = 25^\circ\text{C}$	150		W
T_J		-55 ... +150		$^\circ\text{C}$
T_{JM}		150		$^\circ\text{C}$
T_{stg}		-55 ... +150		$^\circ\text{C}$
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300		$^\circ\text{C}$
M_d	Mounting torque (M3)	1.13/10		Nm/lb.in.
Weight		6		g

TO-247 AD



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

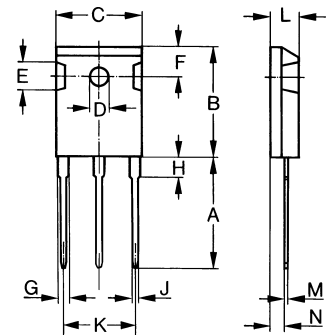
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies

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}	$I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$	24N50 500		V
		24N60 600		V
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	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 24N60		2.3 V 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, $t \leq 300\ \mu\text{s}$, 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	120 nC
Q_{ge}			11	15 nC
Q_{gc}			30	40 nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 10\ \Omega$ 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	200 ns
t_{fi}			80	150 ns
E_{off}			24N50B: 0.62 24N60B: 0.80	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 10\ \Omega$ 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: 0.9 24N60B: 1.4	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

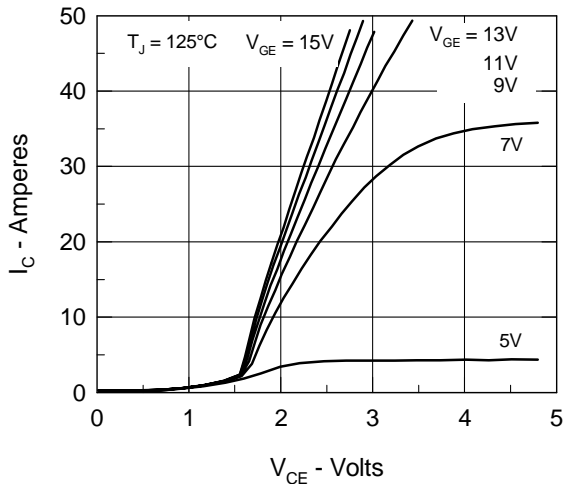


Fig. 1. Saturation Voltage Characteristics

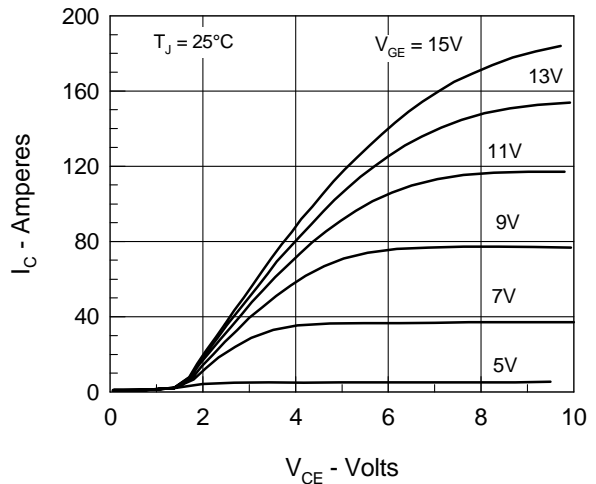


Fig. 2. Extended Output Characteristics

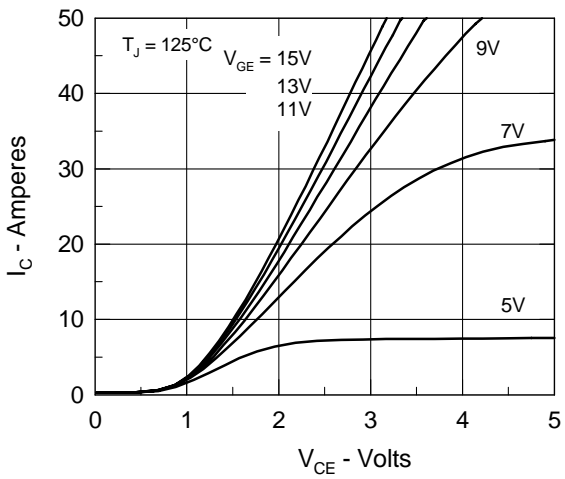


Fig. 3. Saturation Voltage Characteristics

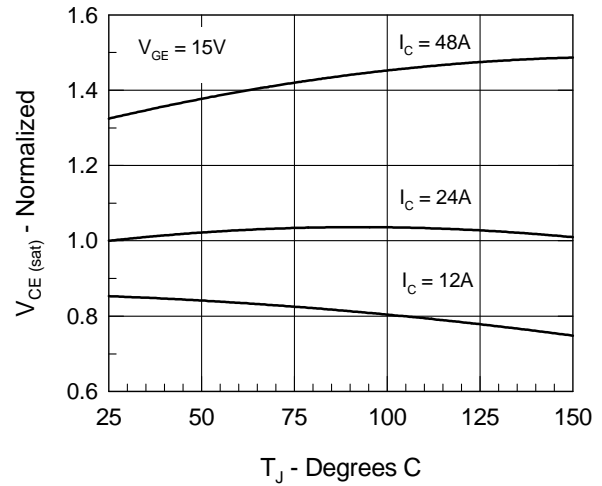


Fig. 4. Temperature Dependence of $V_{CE(sat)}$

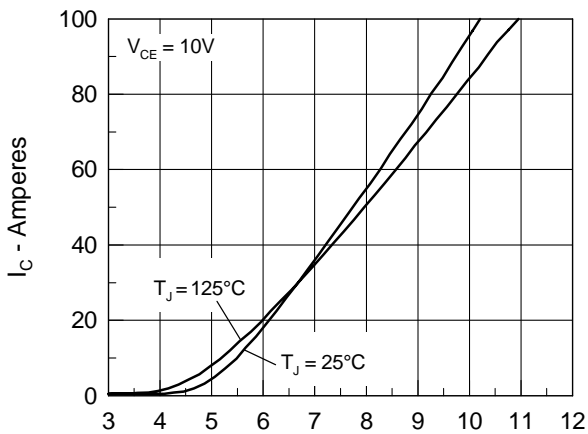


Fig. 5. Admittance Curves

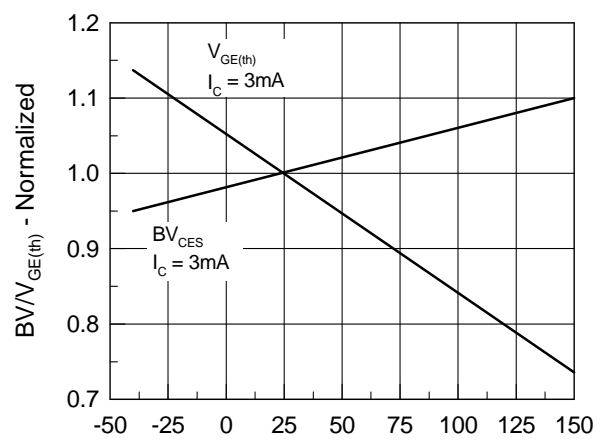


Fig. 6. Temperature Dependence of BV_{DSS} & $V_{GE(th)}$

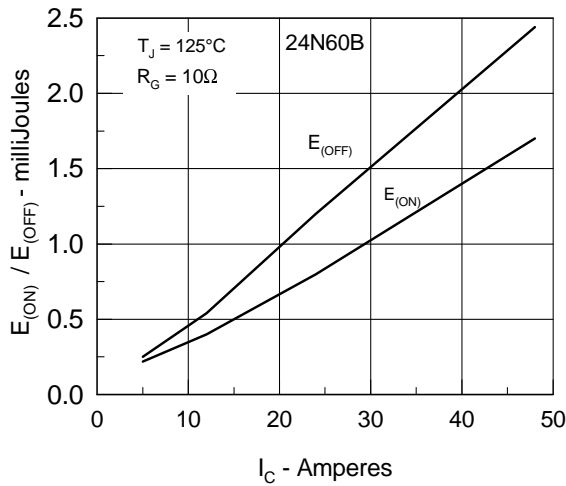


Fig. 7. Dependence of t_{fi} and E_{OFF} on I_C .

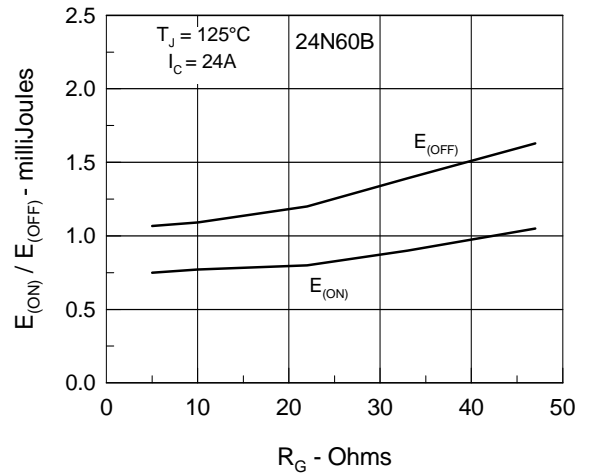


Fig. 8. Dependence of t_{fi} and E_{OFF} on R_G .

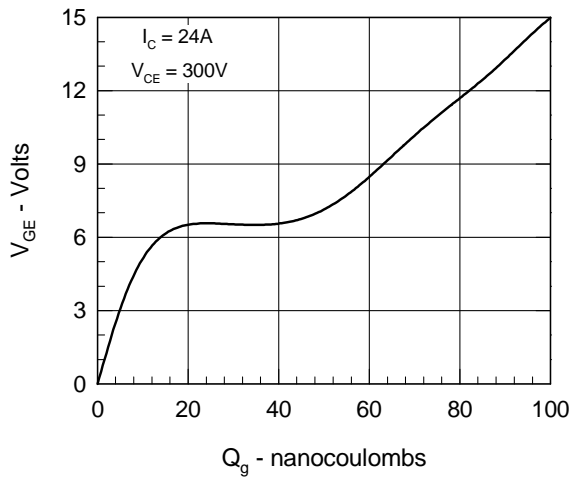


Fig. 9. Gate Charge

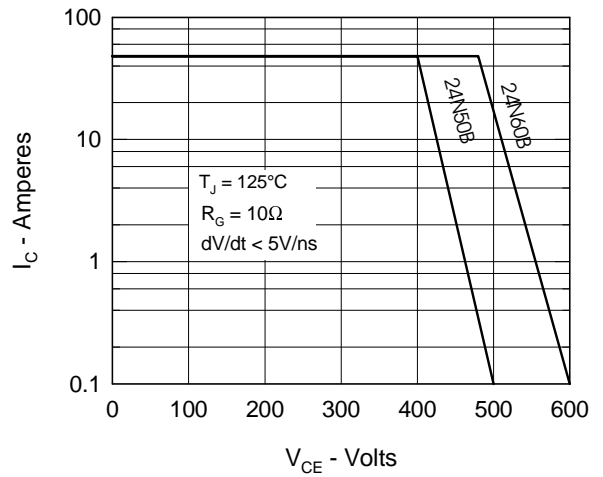


Fig. 10. Turn-off Safe Operating Area

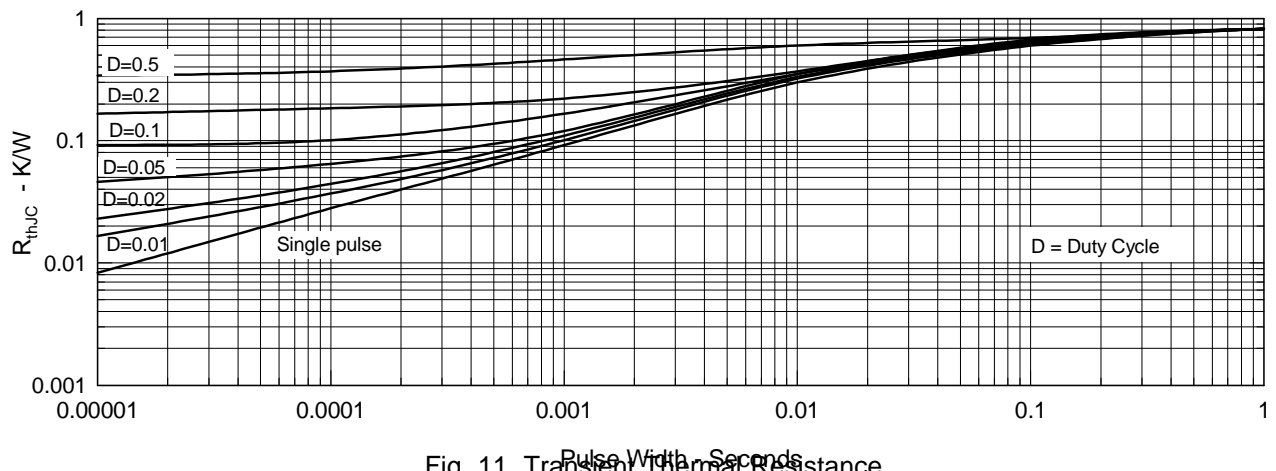


Fig. 11. Transient Thermal Resistance