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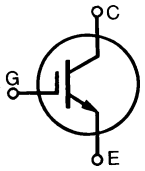
IXYS

HiPerFAST™ IGBT

IXGH 20N60B
IXGT 20N60B

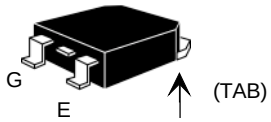
V_{CES} = 600 V
I_{C25} = 40 A
$V_{CE(sat)typ}$ = 1.7 V
$t_{fi(typ)}$ = 100 ns

Preliminary data sheet

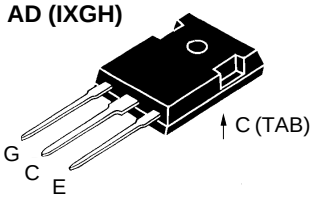


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	600	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	600	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	40	A
I_{C90}	T_C = 90°C	20	A
I_{CM}	T_C = 25°C, 1 ms	80	A
SSOA (RBSOA)	V_{GE}= 15 V, T_{VJ} = 125°C, R_G = 22 Ω Clamped inductive load, L = 100 μH	I_{CM} = 40 @ 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 and Tab temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
M_d	Mounting torque, TO-247 AD	1.13/10	Nm/lb.in.
Weight	TO-247	6	g
	TO-268	4	g

TO-268 (D3) (IXGT)



TO-247 AD (IXGH)



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

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Features
- International standard packages JEDEC TO-268 surface mountable and JEDEC TO-247 AD
- High current handling capability
- Latest 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
- Space savings (two devices in one package)
- High power density
- Suitable for surface mounting
- Switching speed for high frequency applications
- Easy to mount with 1 screw,TO-247 (isolated mounting screw hole)

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0 V		600			V
$V_{GE(th)}$	I_C = 250 μA, V_{CE} = V_{GE}		2.5		5.0	V
I_{CES}	V_{CE} = 0.8 • V_{CES}	T_J = 25°C			200	μA
	V_{GE} = 0 V	T_J = 125°C			1	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15 V			1.7	2.0	V

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

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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 %	9	17		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		1500		pF
C_{oes}			175		pF
C_{res}			40		pF
Q_g	$I_C = I_{C90}$, V_{GE} = 15 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°C**		15		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V, L = 100 µH,		35		ns
E_{on}	V_{CE} = 0.8 V_{CES}, $R_G = R_{off}$ = 10 Ω		0.15		mJ
$t_{d(off)}$			150	200	ns
t_{fi}			100	150	ns
E_{off}	Note 1		0.7	1.0	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		15		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V, L = 100 µH		35		ns
E_{on}	V_{CE} = 0.8 V_{CES}, $R_G = R_{off}$ = 10 Ω		0.15		mJ
$t_{d(off)}$			220		ns
t_{fi}			140		ns
E_{off}	Note 1		1.2		mJ
R_{thJC}				0.83	K/W
R_{thCK}			0.25		K/W

Note 1: Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G

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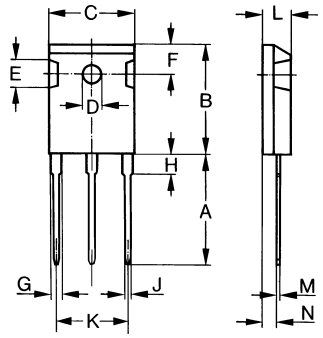
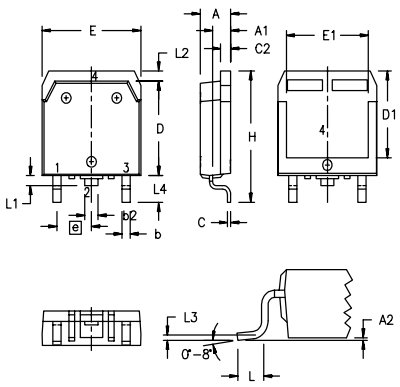
TO-247 AD (IXGH) Outline



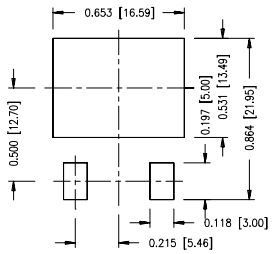
Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M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

TO-268AA (D^3 PAK)



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.9	5.1	.193	.201
A_1	2.7	2.9	.106	.114
A_2	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b_2	1.9	2.1	.75	.83
C	.4	.65	.016	.026
D	13.80	14.00	.543	.551
E	15.85	16.05	.624	.632
E_1	13.3	13.6	.524	.535
e	5.45 BSC		.215 BSC	
H	18.70	19.10	.736	.752
L	2.40	2.70	.094	.106
L1	1.20	1.40	.047	.055
L2	1.00	1.15	.039	.045
L3	0.25 BSC		.010 BSC	
L4	3.80	4.10	.150	.161

Min. Recommended Footprint



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IXYS MOSFETS and IGBTs are covered by one or more of the following U.S. patents:
4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

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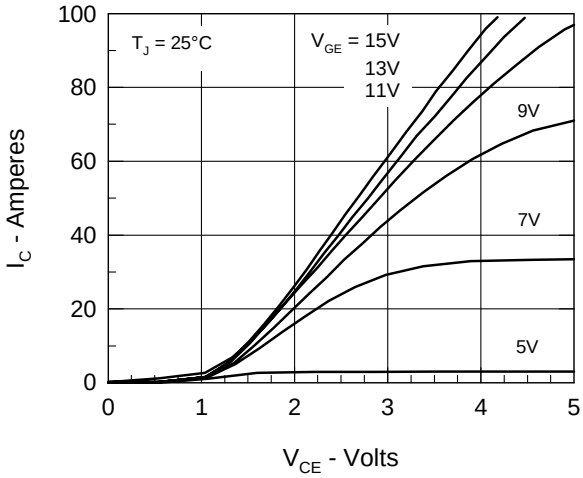

Fig. 1. Output Characteristics

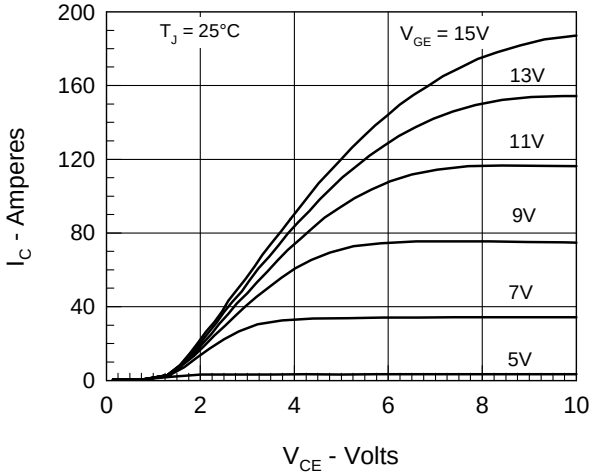

Fig. 2. Extended Output Characteristics

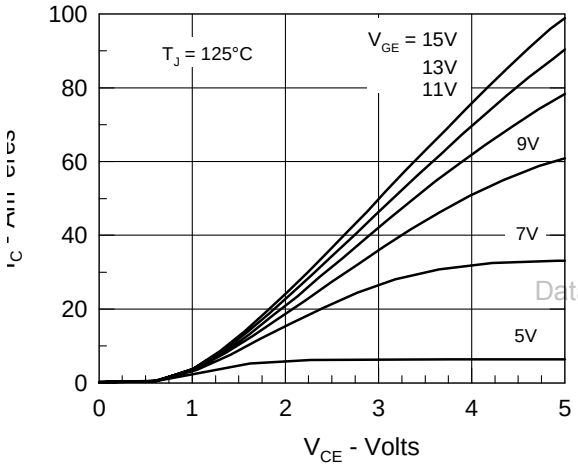

Fig. 3. High Temperature Output Characteristics

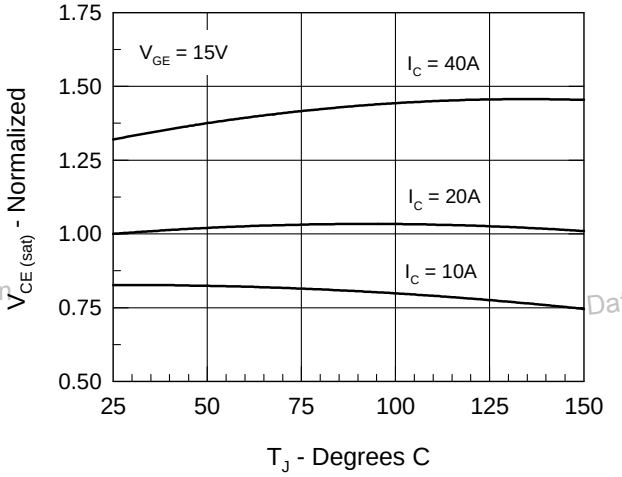

Fig. 4. Temperature Dependence of $V_{CE(sat)}$

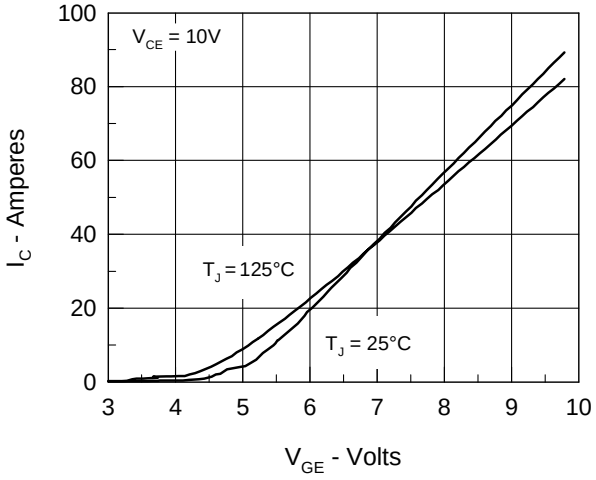

Fig. 5. Admittance Curves

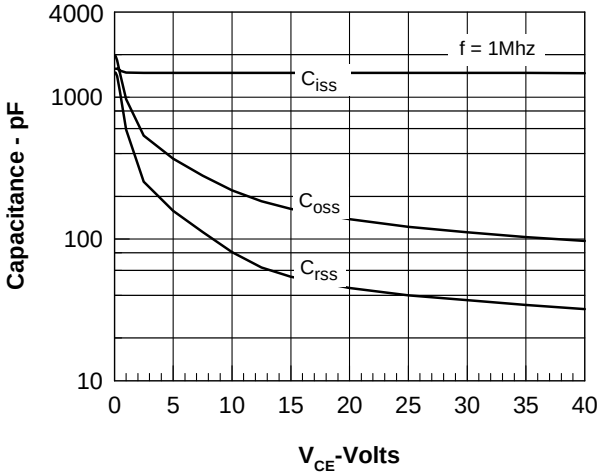

Fig. 6. Capacitance Curves

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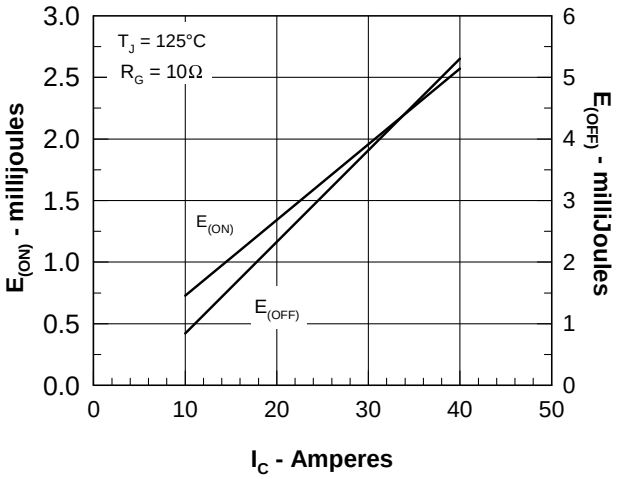

Fig. 7. Dependence of E_{ON} and E_{OFF} on I_C.

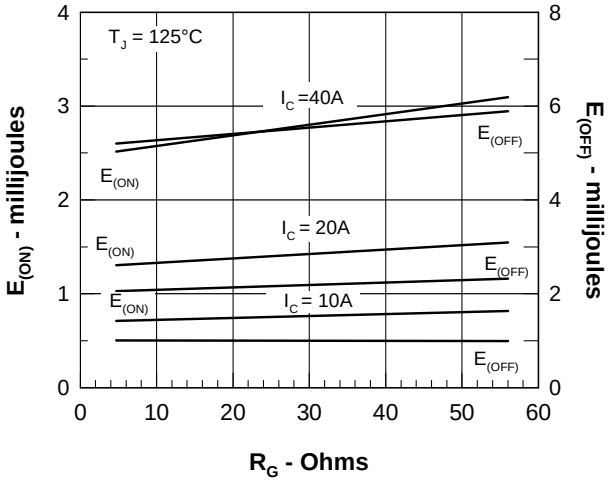

Fig. 8. Dependence of E_{ON} and E_{OFF} on R_G.

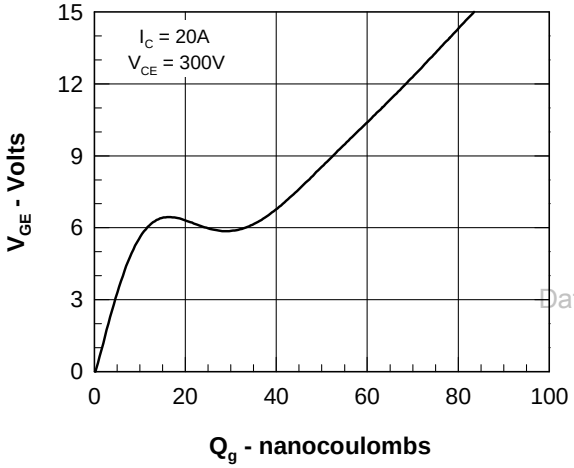

Fig. 9. Gate Charge

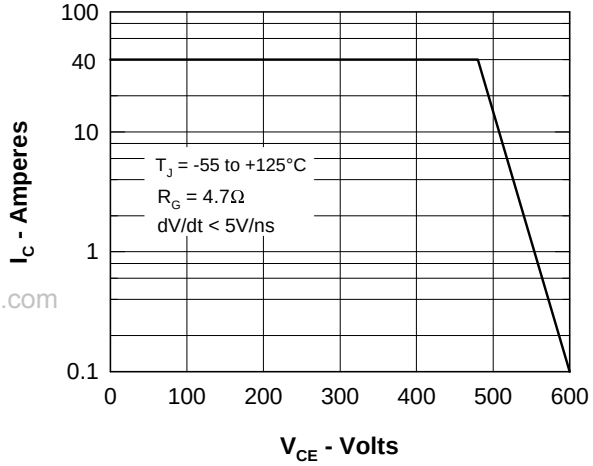

Fig. 10. Turn-off Safe Operating Area

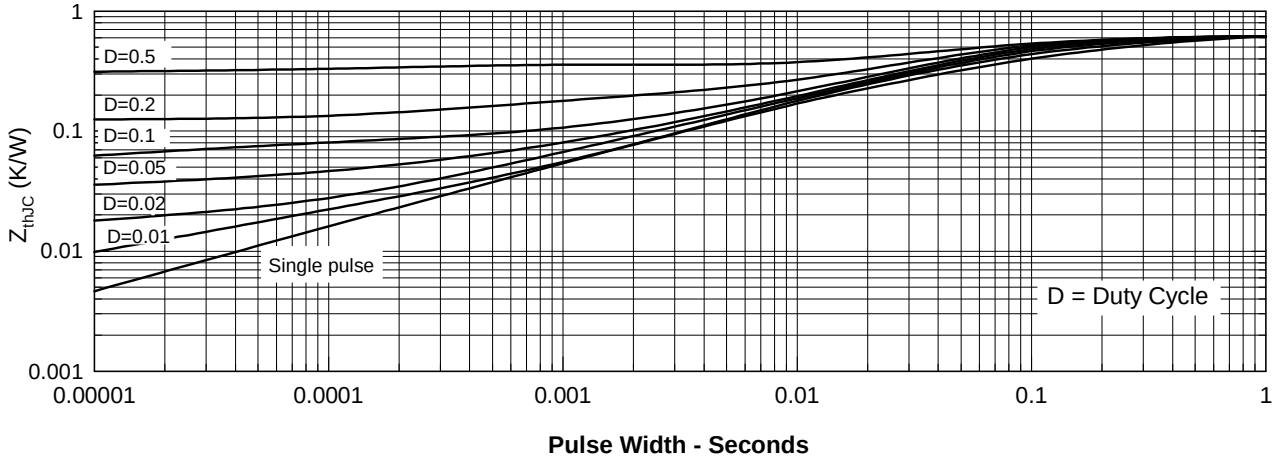

Fig. 11. IGBT Transient Thermal Resistance Junction-to-Case

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