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[IXYS Corporation](#)

[IXGH30N60BU1](#)

For any questions, you can email us directly:

sales@integrated-circuit.com

IXYS

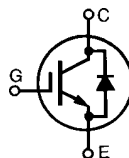
HiPerFAST™ IGBT with Diode

IXGH 30N60BU1

IXGT 30N60BU1

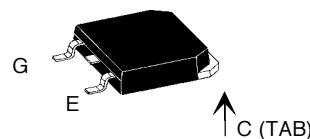
V_{CES} = 600 V
I_{C25} = 60 A
V_{CE(sat)} = 1.8 V
t_{fi} = 100 ns

Combi Pack

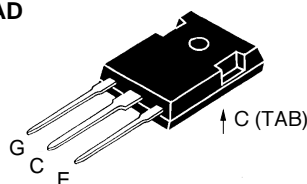


Symbol	Test Conditions	Maximum Ratings	
V _{CES}	T _J = 25°C to 150°C	600	V
V _{CGR}	T _J = 25°C to 150°C; R _{GE} = 1 MΩ	600	V
V _{GES}	Continuous	±20	V
V _{GEM}	Transient	±30	V
I _{C25}	T _C = 25°C	60	A
I _{C110}	T _C = 110°C	30	A
I _{CM}	T _C = 25°C, 1 ms	120	A
SSOA (RBSOA)	V _{GE} = 15 V, T _{VJ} = 125°C, R _G = 33 Ω Clamped inductive load, L = 100 μH	I _{CM} = 60 @ 0.8 V _{CES}	A
P _C	T _C = 25°C	200	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-268	4 g
		TO-247 AD	6 g

TO-268 (IXGT)



TO-247 AD



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

Features

- International standard packages JEDEC TO-247 SMD surface mountable and JEDEC TO-247 AD
- High frequency IGBT and antiparallel FRED in one package
- High current handling capability
- Newest 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

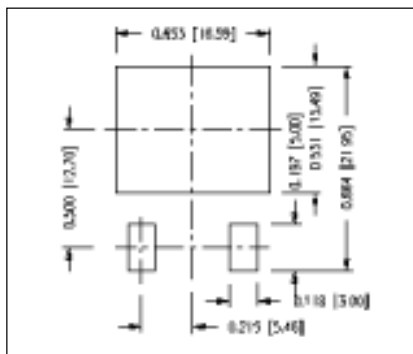
- Space savings (two devices in one package)
- High power density
- Optimized V_{CE(sat)} and switching speeds for medium frequency applications

Symbol	Test Conditions	Characteristic Values (T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
BV _{CES}	I _C = 750 μA, V _{GE} = 0 V BV _{CES} temperature coefficient	600	0.072	V %/K
V _{GE(th)}	I _C = 250 μA, V _{CE} = V _{GE} V _{GE(th)} temperature coefficient	2.5	-0.286	V %/K
I _{CES}	V _{CE} = 0.8 • V _{CES} T _J = 25°C V _{GE} = 0 V T _J = 150°C			500 μA 3 mA
I _{GES}	V _{CE} = 0 V, V _{GE} = ±20 V			±100 nA
V _{CE(sat)}	I _C = I _{C110} , V _{GE} = 15 V			1.8 V
V _{CE(sat)}	I _C = I _{C110} , V _{GE} = 15 V T _J = 150°C			2.0 V

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = I_{C110}$; $V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$		25	S
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$		2710	pF
C_{oes}			240	pF
C_{res}			50	pF
Q_g	$I_C = I_{C110}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		110	150 nC
Q_{ge}			22	35 nC
Q_{gc}			40	75 nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C110}$; $V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$; $R_G = R_{off} = 4.7\ \Omega$ 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}			30	ns
$t_{d(off)}$			130	220 ns
t_{fi}			100	190 ns
E_{off}			1.0	2.0 mJ
$t_{d(on)}$	Inductive load, $T_J = 150^\circ\text{C}$ $I_C = I_{C110}$; $V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$; $R_G = R_{off} = 4.7\ \Omega$ 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}			35	ns
E_{on}			1	mJ
$t_{d(off)}$			200	ns
t_{fi}			230	ns
E_{off}		2.5	mJ	
R_{thJC}				0.62 KW
R_{thCK}		0.25		KW

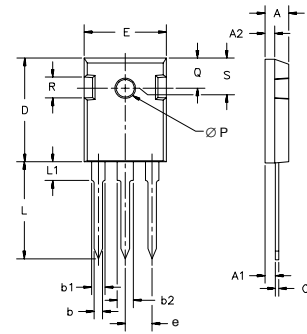
Reverse Diode (FRED)

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_F	$I_F = I_{C110}$; $V_{GE} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.6 V
I_{RM}	$I_F = I_{C110}$; $V_{GE} = 0\text{ V}$; $-di_F/dt = 240\text{ A}/\mu\text{s}$ $V_R = 360\text{ V}$		10	15 A
t_{rr}	$I_F = 1\text{ A}$; $-di/dt = 100\text{ A}/\mu\text{s}$; $V_R = 30\text{ V}$		35	50 ns
R_{thJC}				1 KW



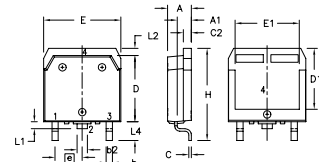
Min Recommended Footprint

TO-247 AD Outline



Dim.	Millimeter		Inches	
	Min.	Max.	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
L1		4.50		.177
ØP	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-247 AA (D³ PAK)



Dim.	Millimeter		Inches	
	Min.	Max.	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

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

Fig. 1. Saturation Voltage Characteristics

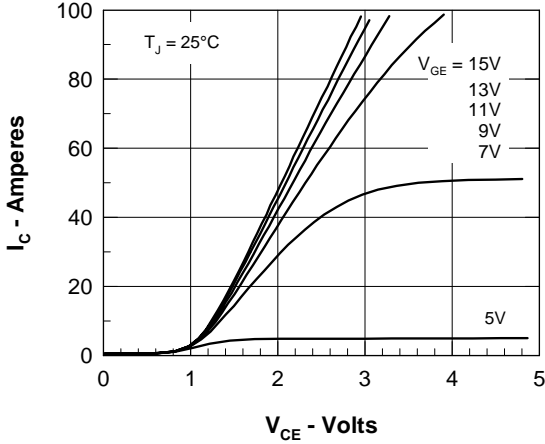


Fig. 2. Extended Output Characteristics

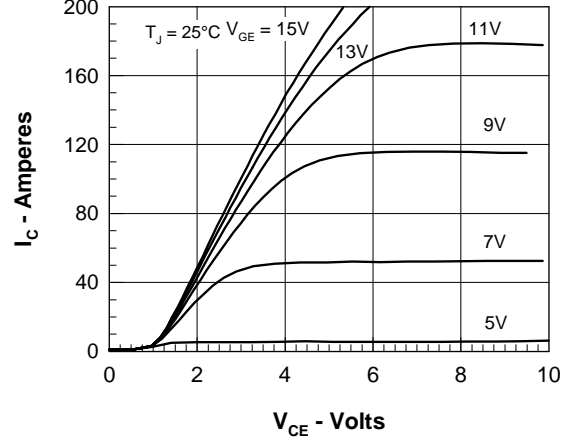


Fig. 3. Saturation Voltage Characteristics

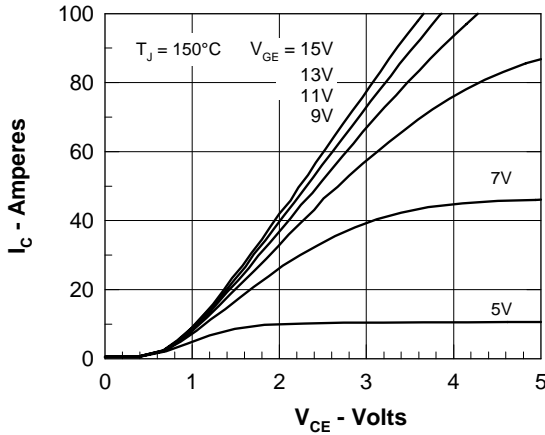


Fig. 4. Temperature Dependence of $V_{CE(sat)}$

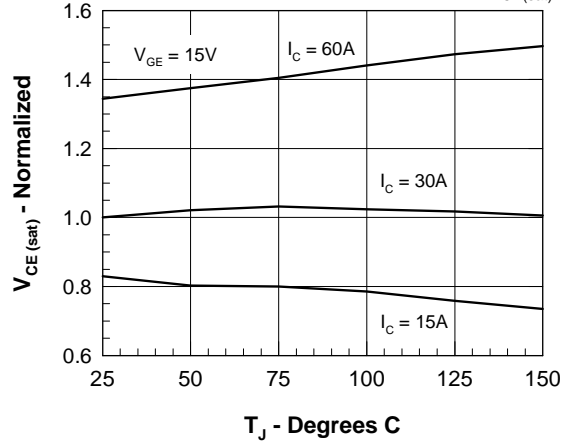


Fig. 5. Admittance Curves

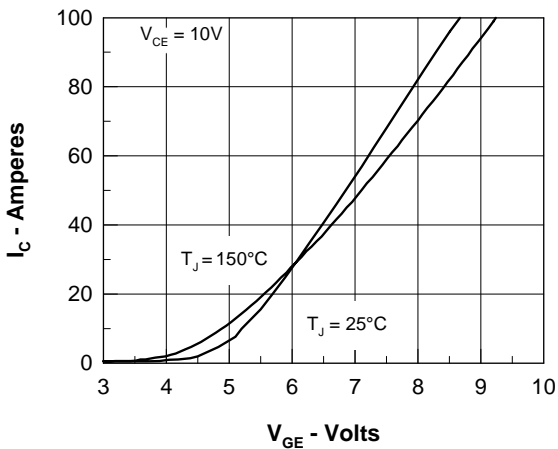


Fig. 6. Temperature Dependence of BV_{DSS} & $V_{GE(th)}$

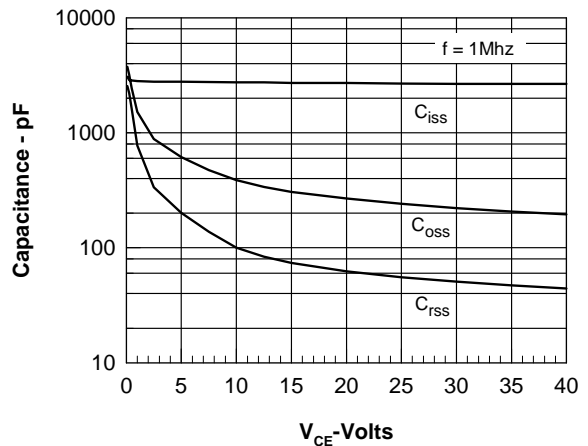


Fig. 7. Dependence of E_{OFF} and E_{ON} on I_C .

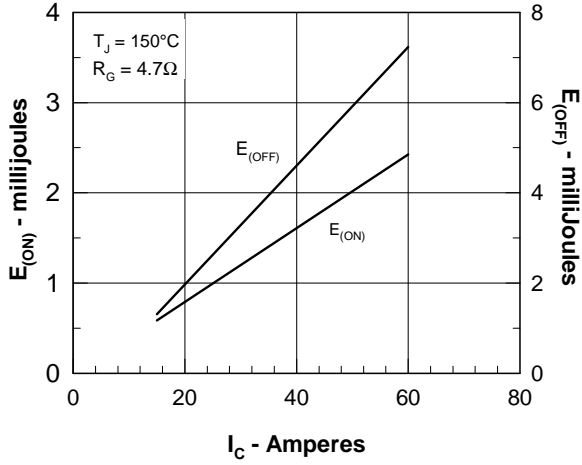


Fig. 8. Dependence of E_{OFF} on R_G .

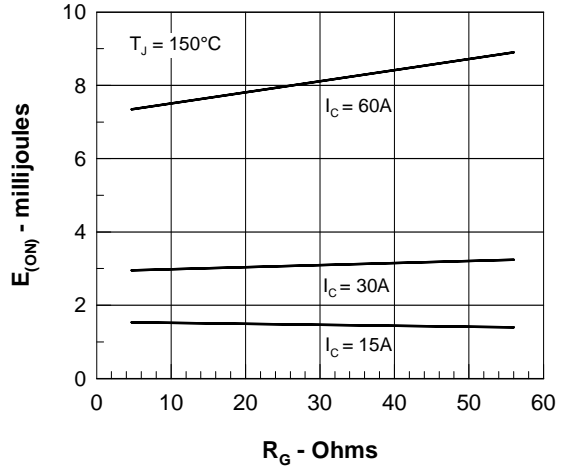


Fig. 9. Gate Charge

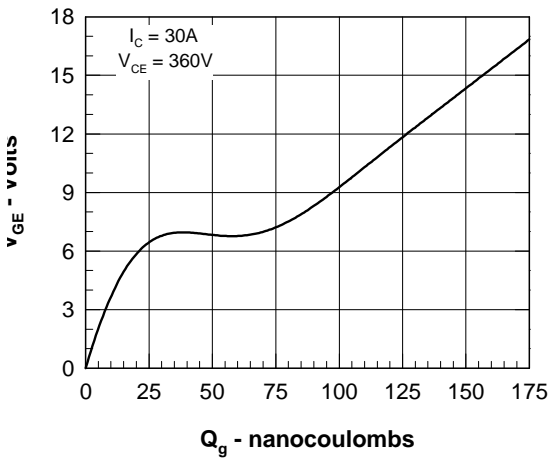


Fig. 10. Turn-off Safe Operating Area

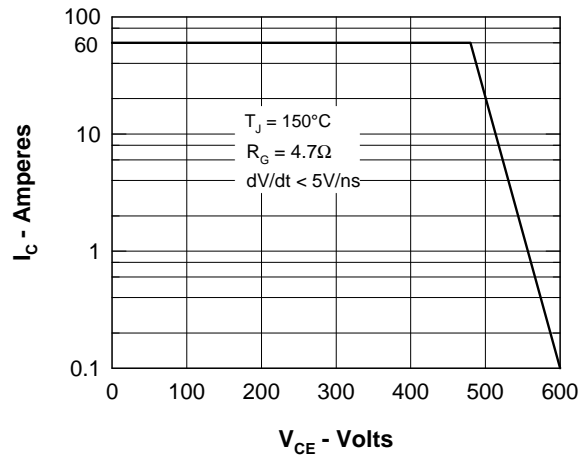
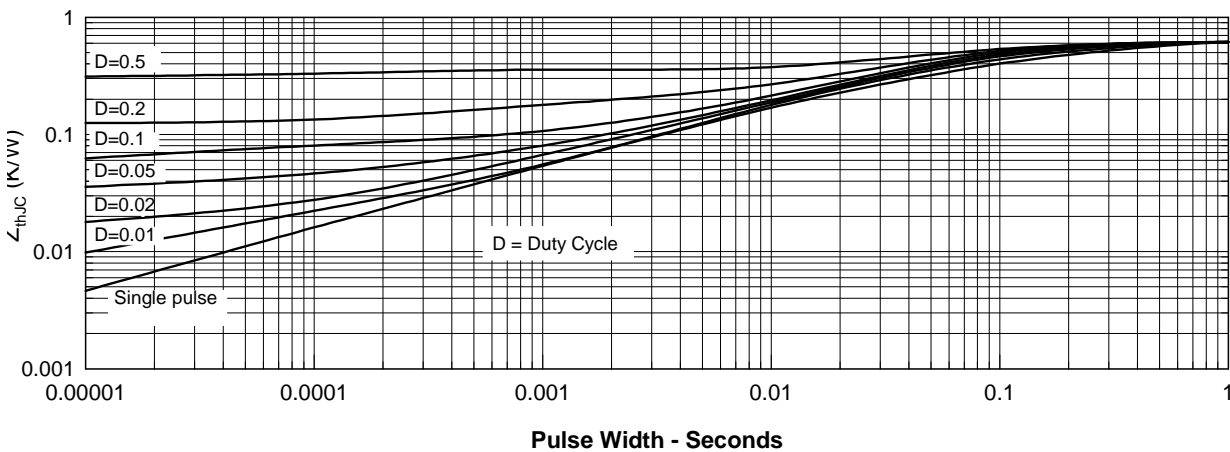


Fig. 11. IGBT Transient Thermal Resistance



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

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	6,306,728B1
4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	



IXGH 30N60BU1
IXGT 30N60BU1

Fig. 12. Forward current versus voltage drop.

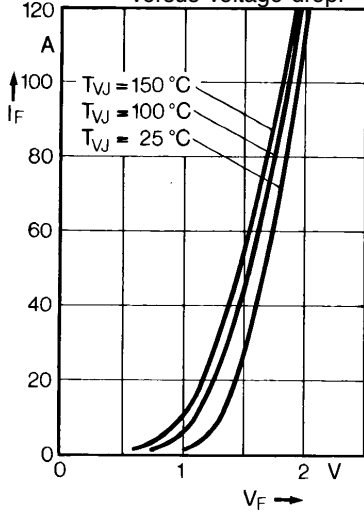


Fig. 13. Recovery charge versus $-di_F/dt$.

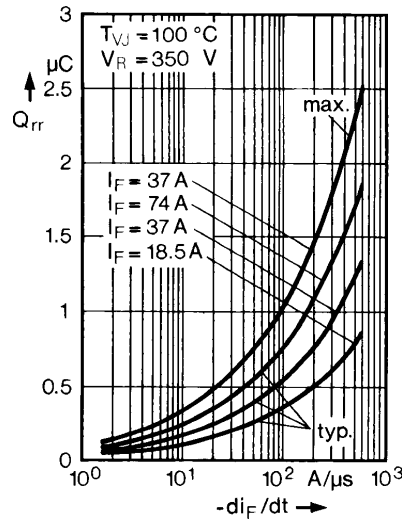


Fig. 14. Peak reverse current versus $-di_F/dt$.

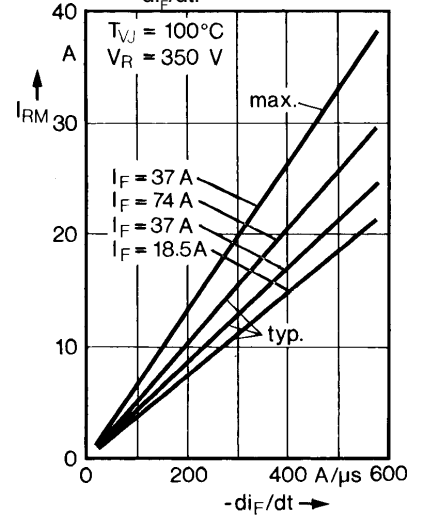


Fig. 15. Dynamic parameters versus junction temperature.

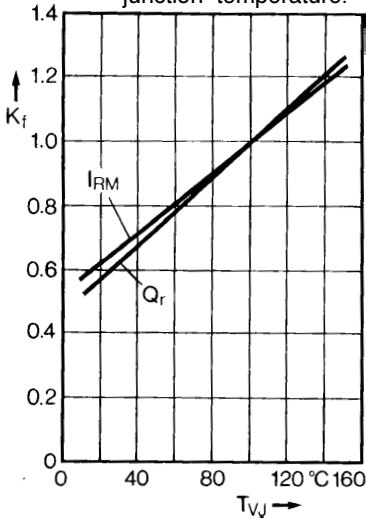


Fig. 16. Reverse recovery time vs $-di_F/dt$.

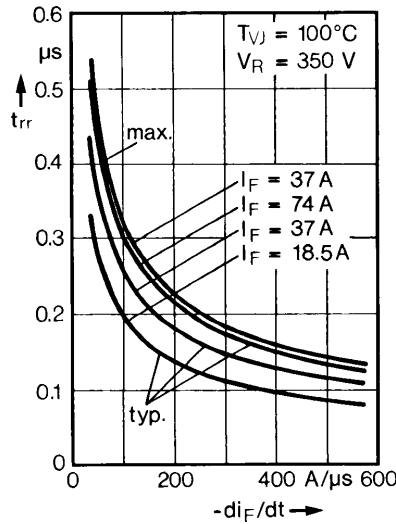


Fig. 17. Forward voltage recovery and time versus $-di_F/dt$.

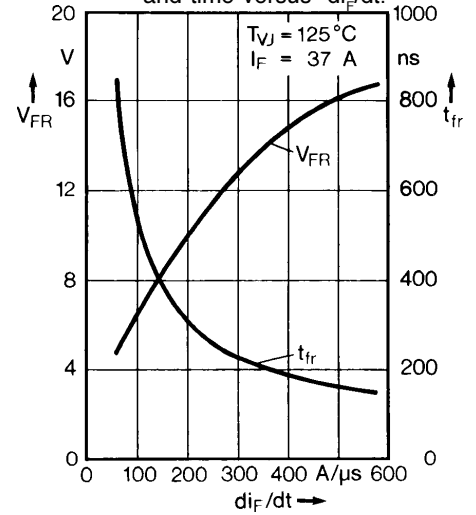


Fig. 18. Transient thermal resistance junction to case.

