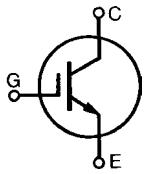
HiPerFAST™ IGBT
Lightspeed™ Series

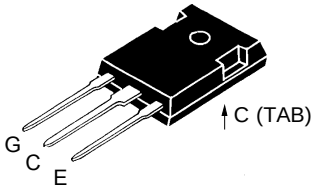
IXGH 12N90C
IXGX 12N90C

V_{CES} = 900 V
I_{C25} = 24 A
$V_{CES(sat)}$ = 3.0 V
$t_{fi(typ)}$ = 70 ns

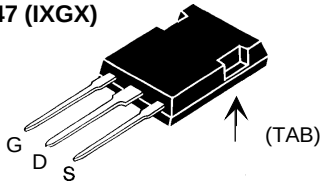


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	900	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	900	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	24	A
I_{C90}	T_C = 90°C	12	A
I_{CM}	T_C = 25°C, 1 ms	48	A
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 125°C, R_G = 33 Ω Clamped inductive load	I_{CM} = 24 @ 0.8 V_{CES}	A
P_C	T_C = 25°C	100	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
M_d	Mounting torque with screw M3 Mounting torque with screw M3.5	0.45/4 0.55/5	Nm/lb.in. Nm/lb.in.
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
Weight		6	g

TO-247 (IXGH)



PLUS 247 (IXGX)



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

Features

- Very high frequency IGBT
- New generation HDMOS™ process
- International standard package
- High peak current handling capability

Applications

- PFC circuit
- AC motor speed control
- DC servo and robot drives
- Switch-mode and resonant-mode power supplies
- High power audio amplifiers

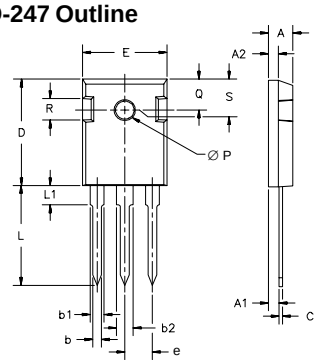
Advantages

- Fast switching speed
- High power density

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
BV_{CES}	I_C = 250 μA, V_{GE} = 0 V		900			V
$V_{GE(th)}$	I_C = 250 μA, V_{GE} = V_{GE}		2.5		5.0	V
I_{CES}	V_{CE} = V_{CES}	T_J = 25°C			100	μA
	V_{GE} = 0 V	T_J = 125°C			1.5	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = I_{CE90}, V_{GE} = 15 V				3.0	V

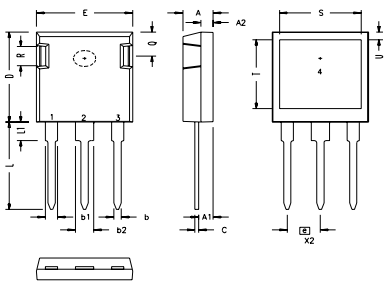
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	$I_C = I_{C90}$; V_{CE} = 10 V, Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %	5	10		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		780		pF
C_{oes}			60		pF
C_{res}			15		pF
Q_g	$I_C = I_{C90}$, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		33		nC
Q_{ge}			10		nC
Q_{gc}			12		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		20		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V		20		ns
$t_{d(off)}$	V_{CE} = 0.8 • V_{CES}, $R_G = R_{off}$ = 22 Ω		135	200	ns
t_{fi}	Remarks: Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G		70	180	ns
E_{off}			0.32	0.70	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		20		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V		20		ns
E_{on}	V_{CE} = 0.8 • V_{CES}, $R_G = R_{off}$ = 22 Ω		0.15		mJ
$t_{d(off)}$	Remarks: Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G		200		ns
t_{fi}			150		ns
E_{off}			0.70		mJ
R_{thJC}				1.25	K/W
R_{thCK}	TO-247		0.25		K/W
	PLUS 247		0.15		K/W

TO-247 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
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	

PLUS 247 Outline



SYM	INCHES MIN	MAX	MILLIMETERS MIN	MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

1 – GATE
2 – DRAIN (COLLECTOR)
3 – SOURCE (EMITTER)
4 – NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

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

Fig. 1. Saturation Voltage Characteristics @ 25°C

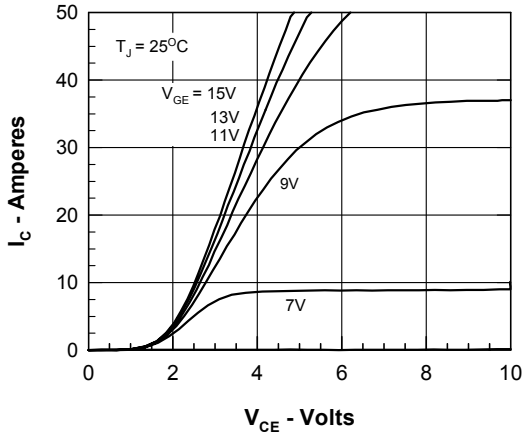


Fig. 2. Extended Output Characteristics

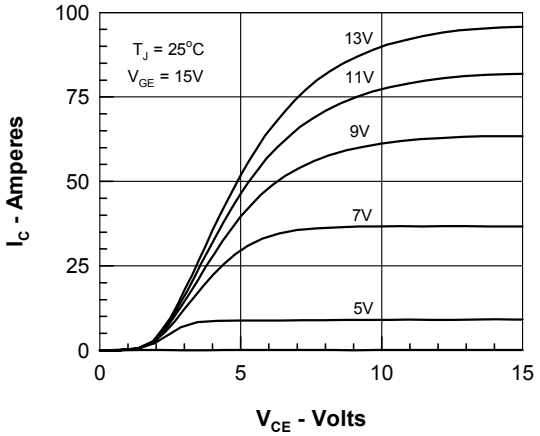


Fig. 3. Saturation Voltage Characteristics @ 125°C

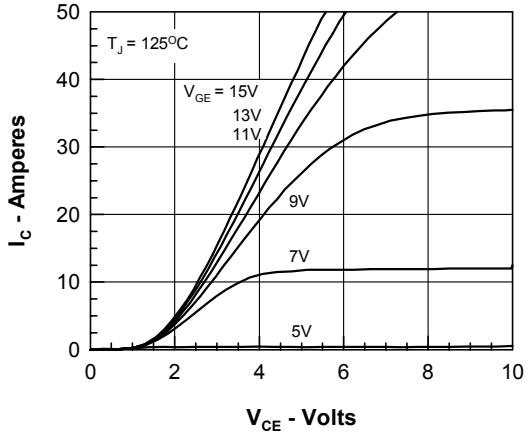


Fig. 4. Temperature Dependence of $V_{CE(SAT)}$

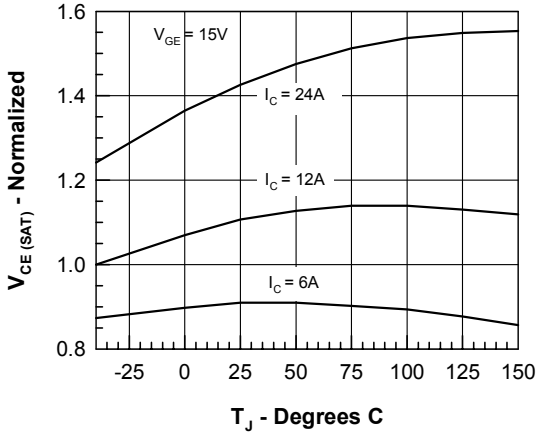


Fig. 5. Admittance Curves

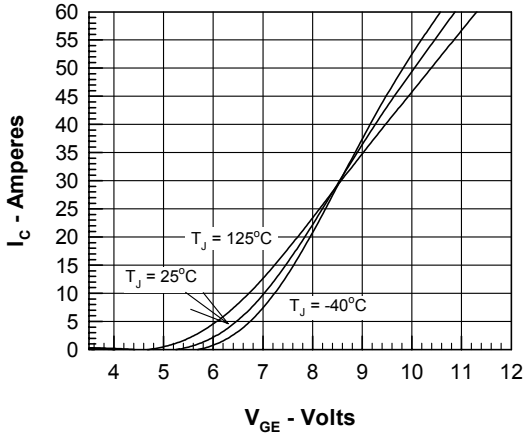


Fig. 6. Capacitance Curves