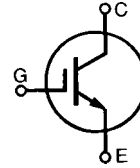


High Speed IGBT

IXSH/IXST 30N60B
IXSH/IXST 30N60C

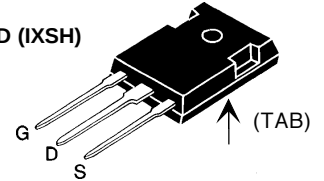
Short Circuit SOA Capability



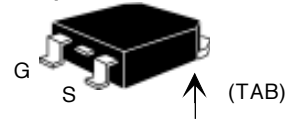
V_{CES}	I_{CES}	t_{fi}
600 V	2.0 V	140 ns
600 V	2.5 V	70 ns

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C}$ to 150°C	600	V
V_{CGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1\text{ M}\Omega$	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	55	A
I_{C90}	$T_C = 90^\circ\text{C}$	30	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1 ms	110	A
SSOA (RBSOA)	$V_{GE} = 15\text{ V}$, $T_J = 125^\circ\text{C}$, $R_G = 2.7\ \Omega$ Clamped inductive load, $V_{CC} = 0.8 V_{CES}$	$I_{CM} = 60$ @ $0.8 V_{CES}$	A
t_{SC} (SCSOA)	$V_{GE} = 15\text{ V}$, $V_{CE} = 360\text{ V}$, $T_J = 125^\circ\text{C}$ $R_G = 33\ \Omega$, non repetitive	10	μs
P_C	$T_C = 25^\circ\text{C}$	200	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
M_d	Mounting torque	(TO-247)	1.13/10 Nm/lb.in.
Weight		TO-247	6 g
		TO-268	4 g
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$

TO-247 AD (IXSH)



TO-268 (D3) (IXST)



G = Gate
S = Source

TAB = Drain

Features

- International standard packages
- Short Circuit SOA capability
- High frequency IGBT
- New generation HDMOS™ process

Applications

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

Advantages

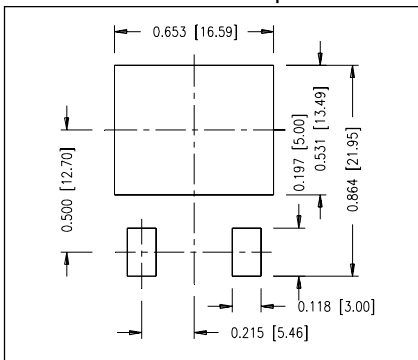
- Easy to mount with 1 screw (isolated mounting screw hole)
- Surface mountable, high power case style
- Reduce assembly time and cost
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 250\ \mu\text{A}$, $V_{GE} = 0\text{ V}$	600		V
$V_{GE(th)}$	$I_C = 2.5\text{ mA}$, $V_{CE} = V_{GE}$	4		V
I_{CES}	$V_{CE} = 0.8 V_{CES}$, $T_J = 25^\circ\text{C}$ $V_{GE} = 0\text{ V}$, $T_J = 125^\circ\text{C}$			100 μA 1 mA
I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = \pm 20\text{ V}$			$\pm 100\text{ nA}$
$V_{CE(sat)}$	$V_{GE} = 15\text{ V}$; $I_C = I_{C90}$	30N60B 30N60C		2.0 V 2.5 V

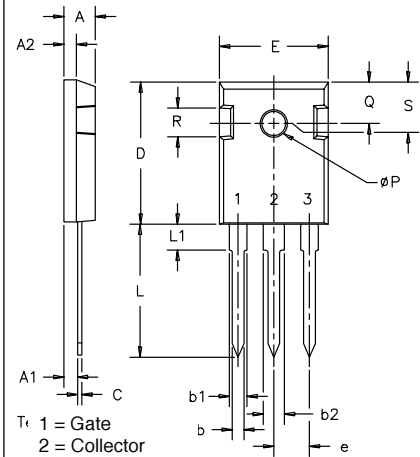
Symbol	Test Conditions	Characteristic Values (T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	I _C = I _{C90} ; V _{CE} = 10 V, Pulse test, t ≤ 300 μs, duty cycle ≤ 2 %	10		S
C_{ies}	V _{CE} = 25 V, V _{GE} = 0 V, f = 1 MHz		3100	pF
C_{oes}			240	pF
C_{res}			30	pF
Q_g	I _C = I _{C90} , V _{GE} = 15 V, V _{CE} = 0.5 V _{CES}		100	nC
Q_{ge}			30	nC
Q_{gc}			38	nC
t_{d(on)}	Inductive load, T _J = 25°C		30	ns
t_{ri}			30	ns
t_{d(off)}		I _C = I _{C90} , V _{GE} = 15 V V _{CE} = 0.8 V _{CES} , R _G = 4.7 Ω	30N60B 150 30N60C 90	270 ns 150 ns
t_{fi}		Note 1	30N60B 140 30N60C 70	270 ns 120 ns
E_{off}			30N60B 1.5 30N60C 0.7	2.5 mJ 1.2 mJ
t_{d(on)}	Inductive load, T _J = 125°C		35	ns
t_{ri}			35	ns
E_{on}		I _C = I _{C90} , V _{GE} = 15 V V _{CE} = 0.8 V _{CES} , R _G = 4.7 Ω	0.5	mJ
t_{d(off)}		Note 1	30N60B 270 30N60C 150	ns ns
t_{fi}			30N60B 250 30N60C 140	ns ns
E_{off}			30N60B 2.5 30N60C 1.2	mJ mJ
R_{thJC}	(TO-247)			0.62 K/W
R_{thCK}			0.25	K/W

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

Min Recommended Footprint

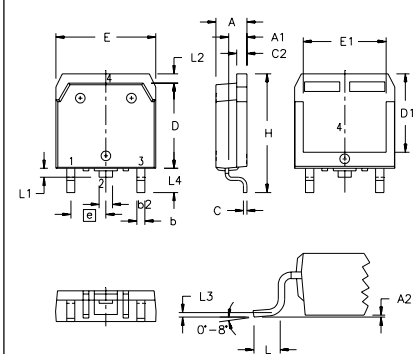


TO-247 AD Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.209	4.7	5.3
A1	.087	.102	2.2	2.54
A2	.059	.098	2.2	2.6
b	.040	.055	1.0	1.4
b1	.065	.084	1.65	2.13
b2	.113	.123	2.87	3.12
C	.016	.031	.4	.8
D	.819	.845	20.80	21.46
E	.610	.640	15.75	16.26
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1		.177		4.50
ØP	.140	.144	3.55	3.65
Q	.212	.244	5.4	6.2
R	.170	.216	4.32	5.49
S	.242 BSC		6.15 BSC	

TO-268 Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

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
 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

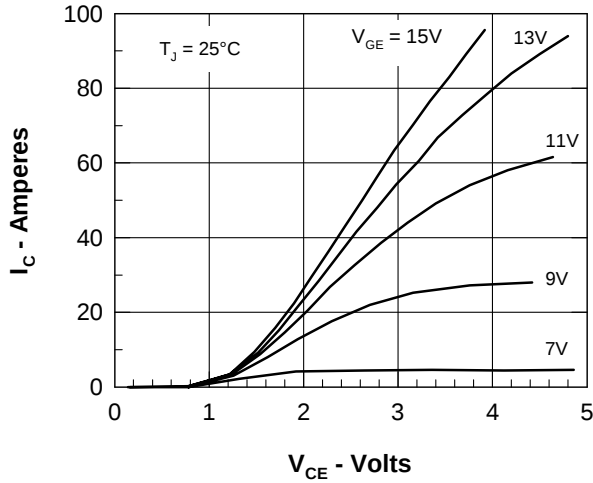
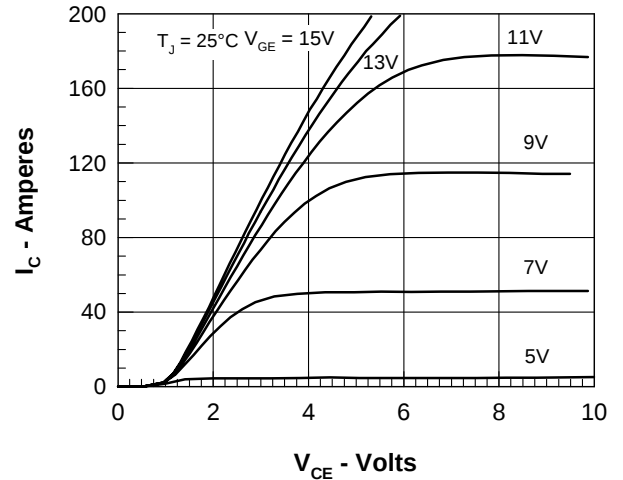
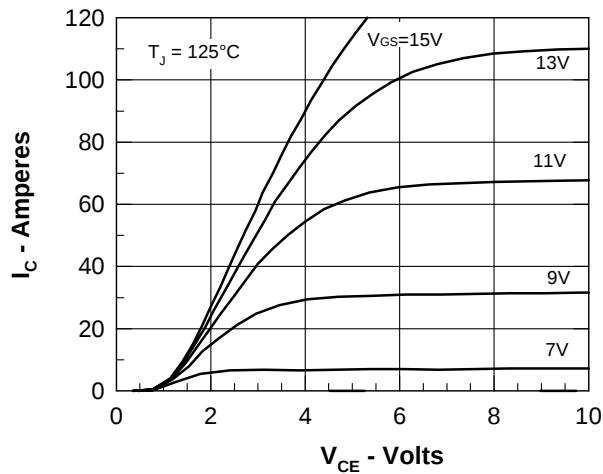
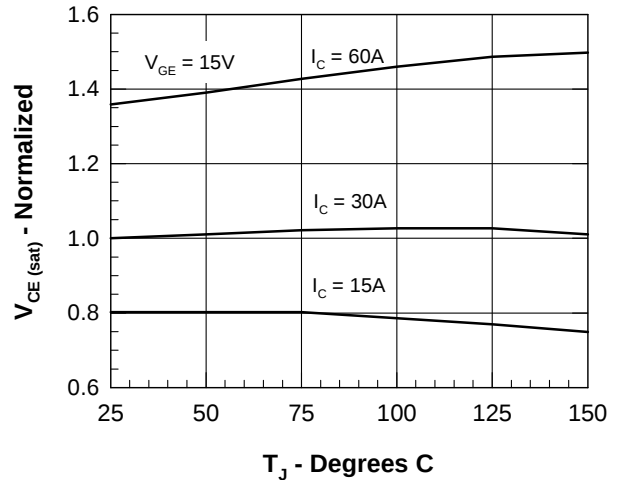
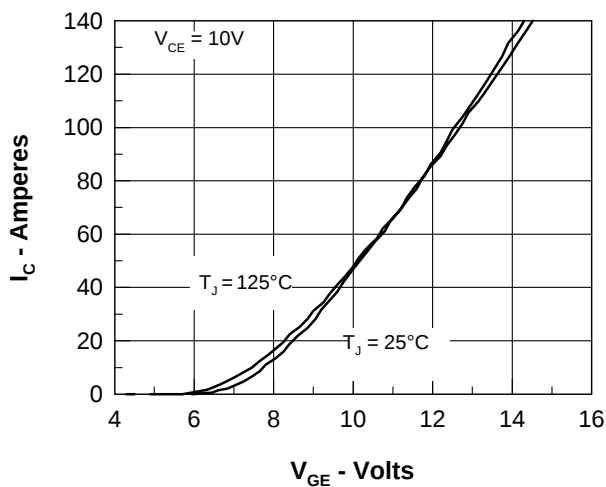
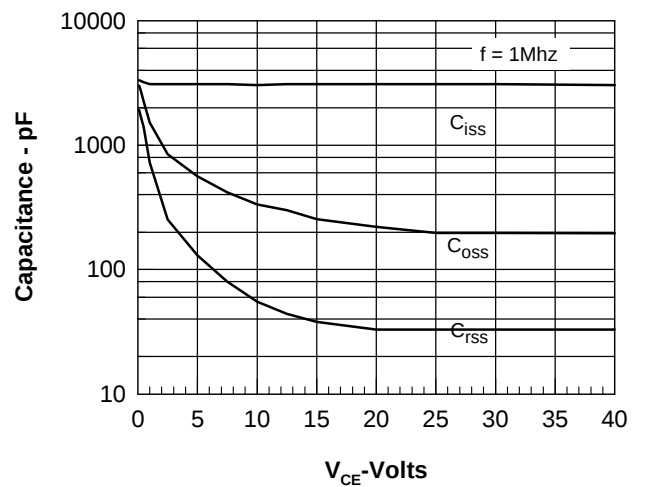
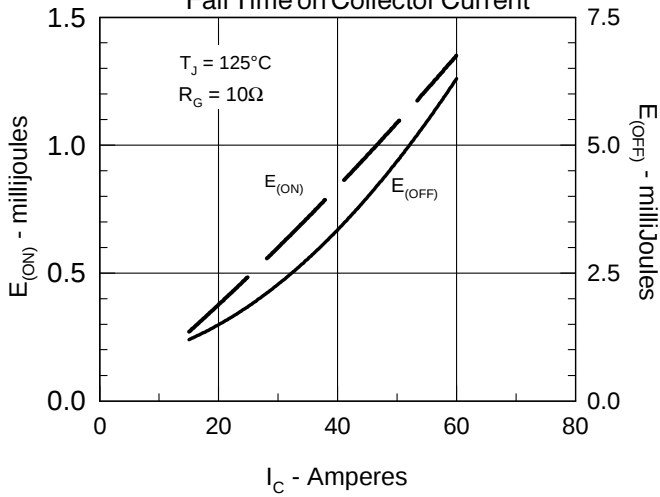
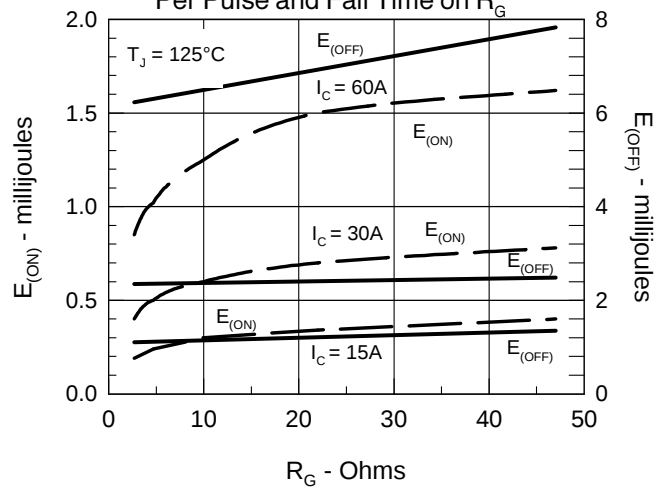
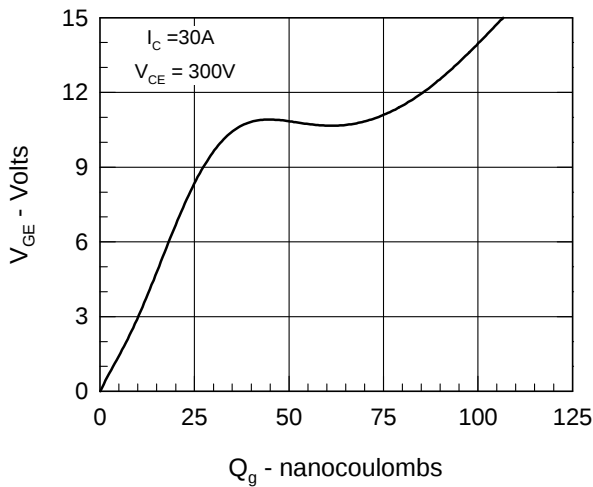
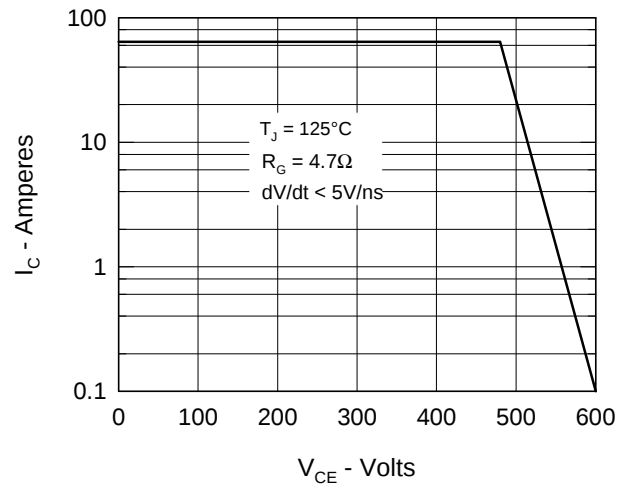
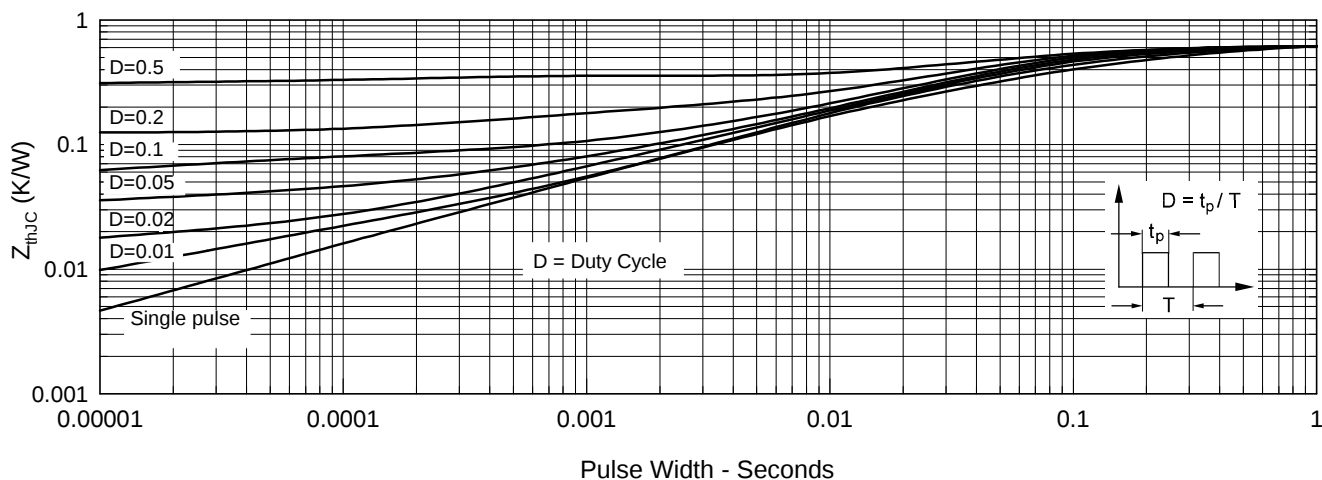
Fig.1 Saturation Characteristics

Fig.2 Output Characteristics

Fig.3 Collector-Emitter Voltage vs. Gate-Emitter Voltage

Fig.4 Temperature Dependence of Output Saturation Voltage

Fig.5 Input Admittance

Fig.6 Temperature Dependence of Breakdown and Threshold Voltage


Fig.7 Turn-Off Energy per Pulse and Fall Time on Collector Current

Fig.8 Dependence of Turn-Off Energy Per Pulse and Fall Time on R_G

Fig.9 Gate Charge Characteristic Curve

Fig.10 Turn-Off Safe Operating Area

Fig.11 Transient Thermal Impedance


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