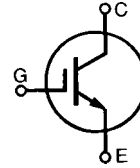


High Speed IGBT

IXSH/IXST 30N60B
IXSH/IXST 30N60C

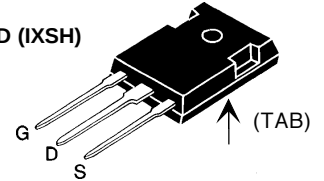
Short Circuit SOA Capability



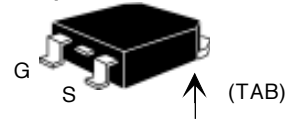
V_{CES}	I_{CES}	t_{fi}
600 V	2.0 V	140 ns
600 V	2.5 V	70 ns

Symbol	Test Conditions	Maximum Ratings	
V _{CES}	T _J = 25°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	55	A
I _{C90}	T _C = 90°C	30	A
I _{CM}	T _C = 25°C, 1 ms	110	A
SSOA (RBSOA)	V _{GE} = 15 V, T _J = 125°C, R _G = 2.7 Ω Clamped inductive load, V _{CC} = 0.8 V _{CES}	I _{CM} = 60 @ 0.8 V _{CES}	A
t _{SC} (SCSOA)	V _{GE} = 15 V, V _{CE} = 360 V, T _J = 125°C R _G = 33 Ω, non repetitive	10	μs
P _C	T _C = 25°C	200	W
T _J		-55 ... +150	°C
T _{JM}		150	°C
T _{stg}		-55 ... +150	°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	°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

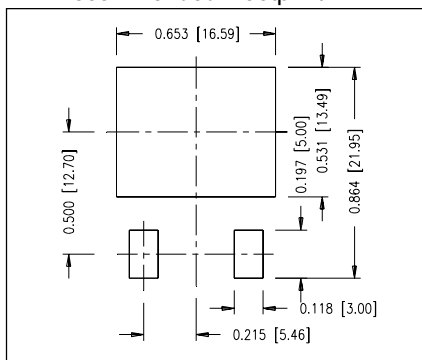
- Easy to mount with 1 screw (isolated mounting screw hole)
- Surface mountable, high power case style
- Reduce assembly time and cost
- High power density

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}	$V_{CE} = 0.8 V_{CES}$, $V_{GE} = 0\text{ V}$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$			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}			3100	pF	
C_{oes}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		240	pF	
C_{res}			30	pF	
Q_g			100	nC	
Q_{ge}	I_C = I_{C90}, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		30	nC	
Q_{gc}			38	nC	
t_{d(on)}			30	ns	
t_{ri}	Inductive load, T_J = 25°C		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 30N60C	150 90	270 150 ns	
t_{fi}	Note 1	30N60B 30N60C	140 70	270 120 ns	
E_{off}		30N60B 30N60C	1.5 0.7	2.5 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 30N60C	270 150	ns ns	
t_{fi}		30N60B 30N60C	250 140	ns	
E_{off}		30N60B 30N60C	2.5 1.2	mJ mJ	
R_{thJC}				0.62 K/W	
R_{thCK}	(TO-247)		0.25	K/W	

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

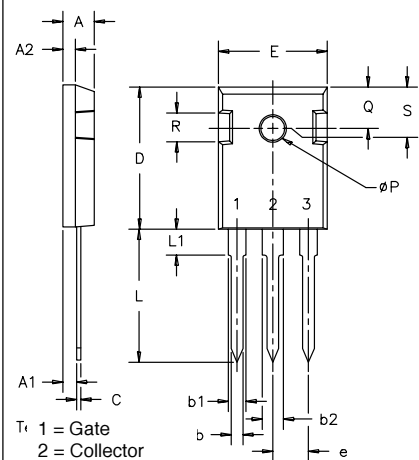
Min Recommended Footprint



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

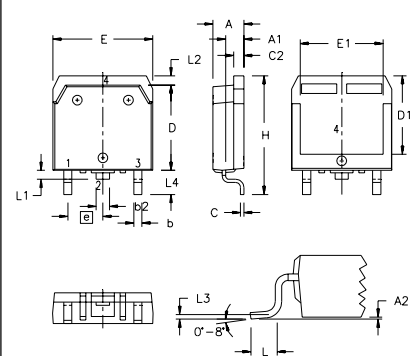
TO-247 AD Outline



Tab = Collector

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.209	4.7	5.3
A ₁	.087	.102	2.2	2.54
A ₂	.059	.098	2.2	2.6
b	.040	.055	1.0	1.4
b ₁	.065	.084	1.65	2.13
b ₂	.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
L ₁		.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	.011	0.25 BSC	
L4	.150	.161	3.80	4.10

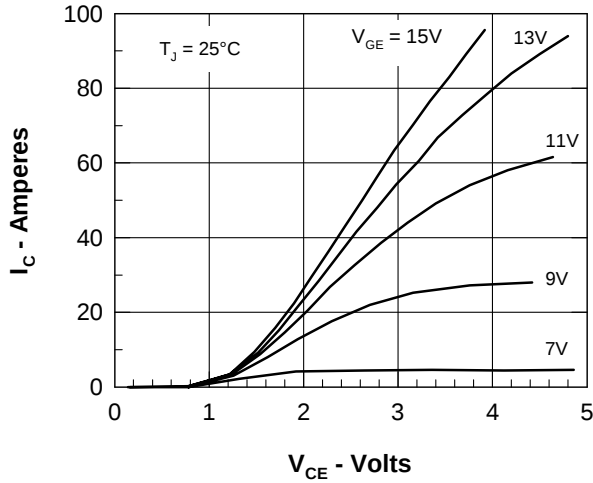
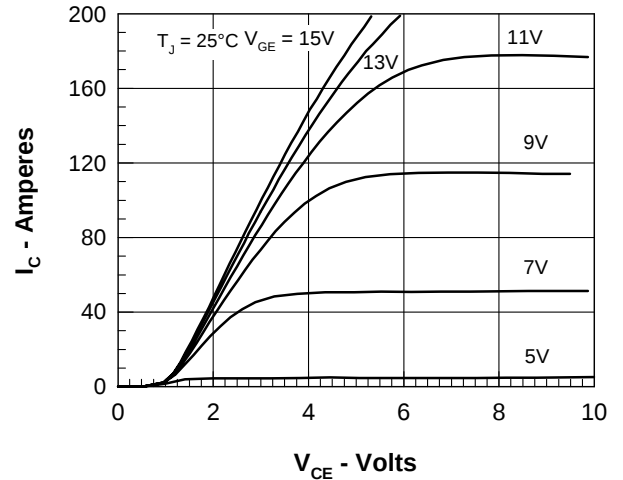
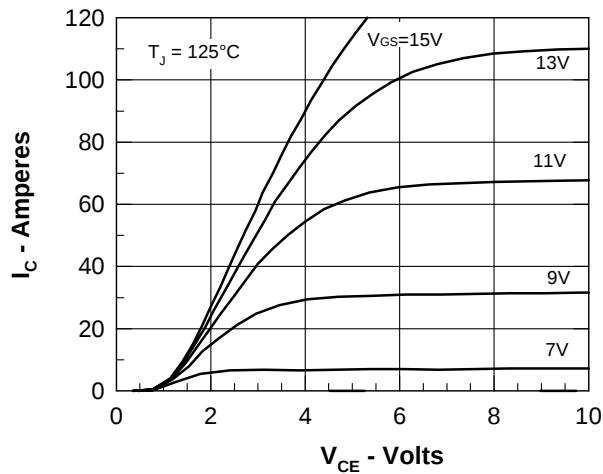
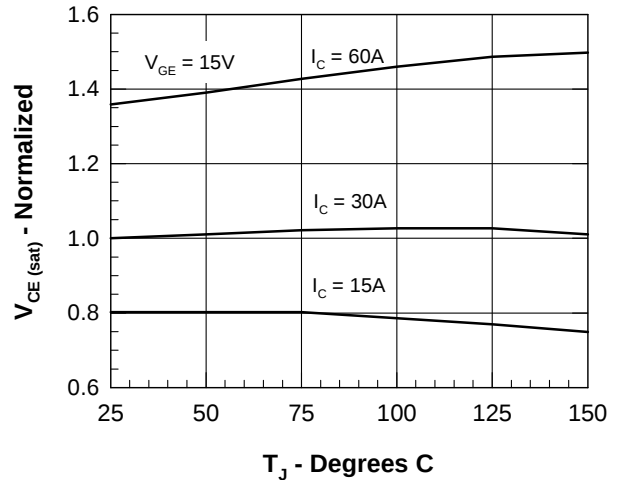
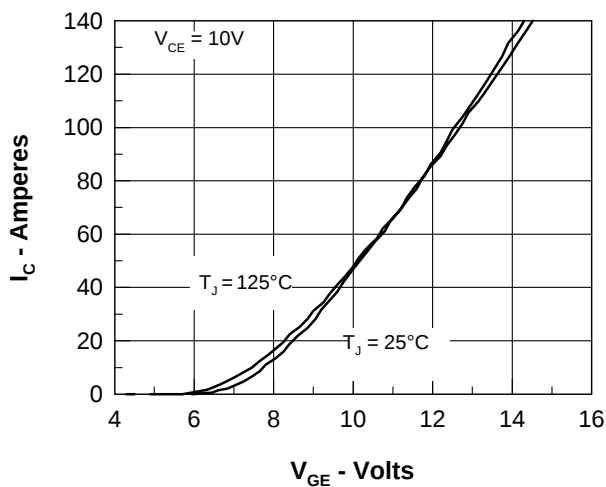
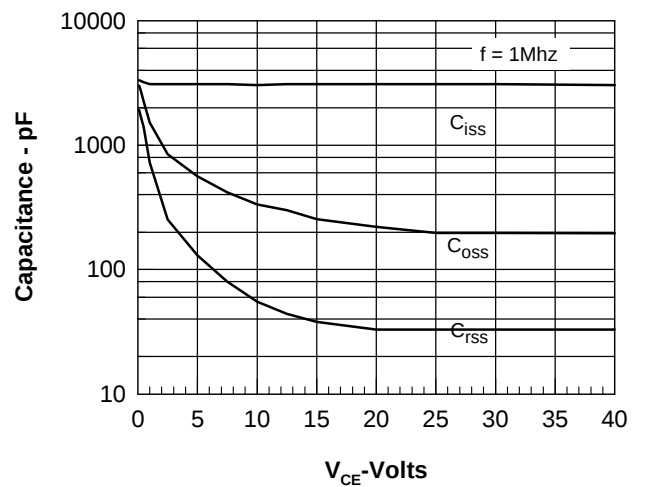
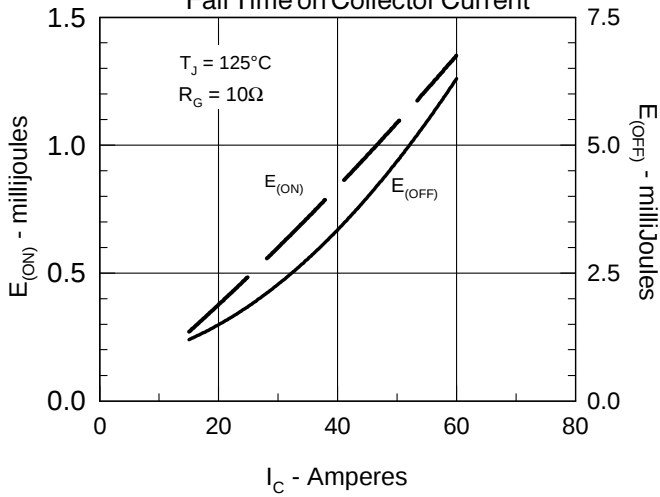
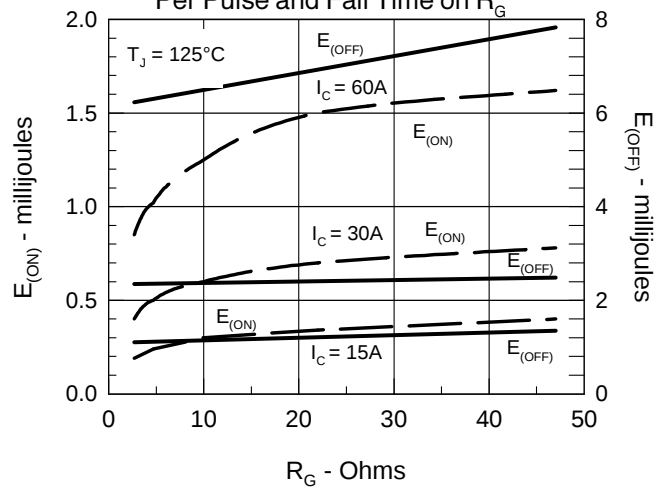
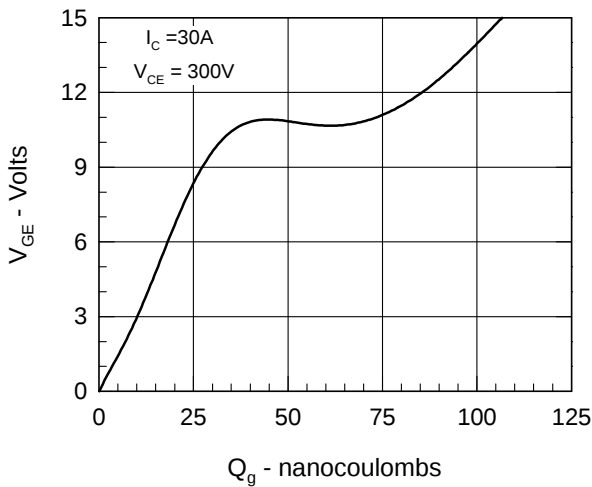
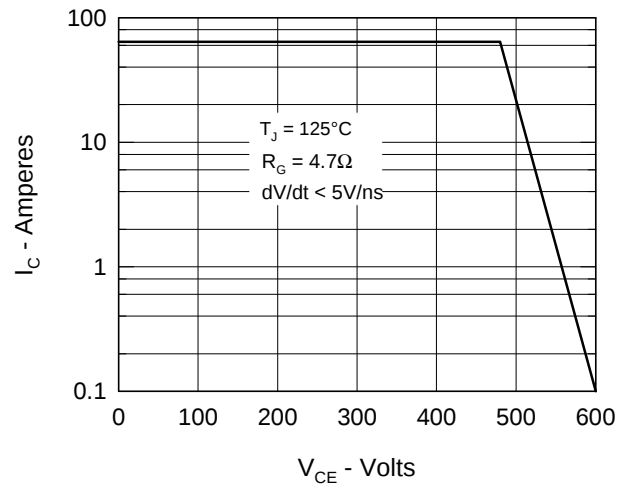
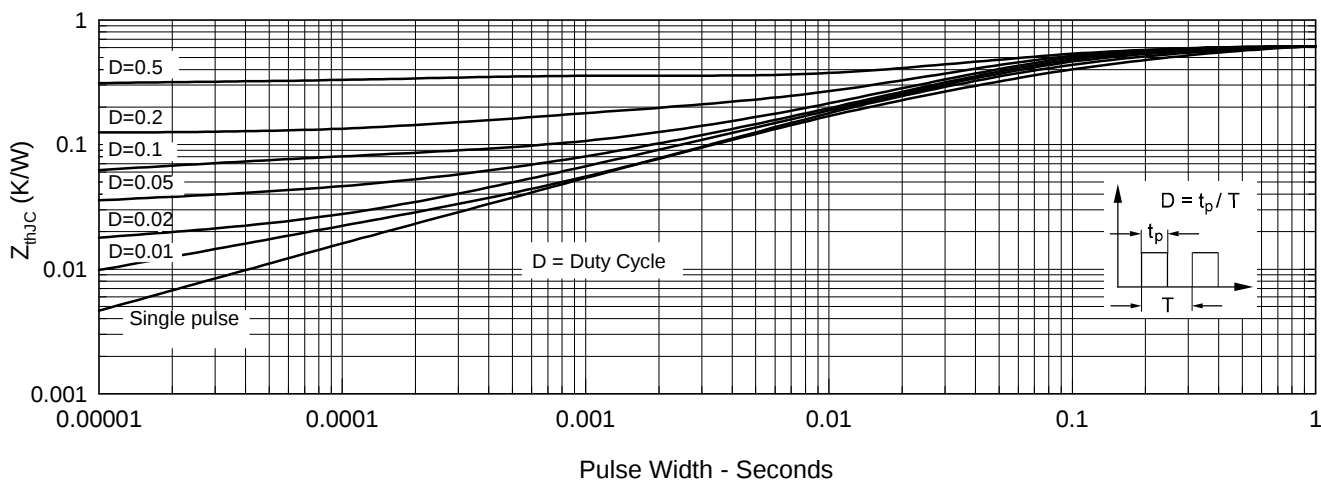
Fig.1 Saturation Characteristics

Fig.2 Output Characteristics

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