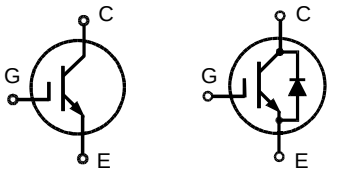
IXYS

High Voltage IGBT with optional Diode

Short Circuit SOA Capability
Square RBSOA

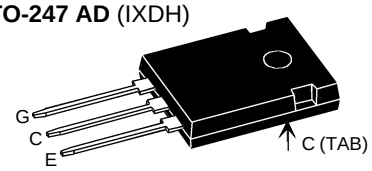
IXDH 30N120
IXDH 30N120 D1
IXDT 30N120
IXDT 30N120 D1

V_{CES} = 1200 V
I_{C25} = 60 A
$V_{CE(sat)\ typ}$ = 2.4 V

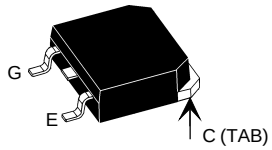


IXDH 30N120 IXDT 30N120 | IXDH 30N120 D1 IXDT 30N120 D1

TO-247 AD (IXDH)



TO--268 AA (IXDT)



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

Symbol	Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1200	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 20 kΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	60	A
I_{C90}	T_C = 90°C	38	A
I_{CM}	T_C = 90°C, t_p = 1 ms	76	A
RBSOA	V_{GE} = ±15 V, T_J = 125°C, R_G = 47 Ω Clamped inductive load, L = 30 µH	I_{CM} = 50 V_{CEK} < V_{CES}	A
t_{SC} (SCSOA)	V_{GE} = ±15 V, V_{CE} = V_{CES}, T_J = 125°C R_G = 47 Ω, non repetitive	10	µs
P_C	T_C = 25°C IGBT Diode	300 135	W W
T_J		-55 ... +150	°C
T_{stg}		-55 ... +150	°C
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
M_d	Mounting torque	1.1/10	Nm/lb.in.
Weight		6	g

Symbol	Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
$V_{(BR)CES}$	V_{GE} = 0 V	1200			V
$V_{GE(th)}$	I_C = 1 mA, V_{CE} = V_{GE}	4.5		6.5	V
I_{CES}	V_{CE} = V_{CES} T_J = 25°C T_J = 125°C		 2.5	1.5	mA mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V			± 500	nA
$V_{CE(sat)}$	I_C = 30 A, V_{GE} = 15 V		2.4	2.9	V

Features

- NPT IGBT technology
- low saturation voltage
- low switching losses
- square RBSOA, no latch up
- high short circuit capability
- positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- optional ultra fast diode
- International standard packages

Advantages

- Space savings
- High power density
- IXDT: surface mountable high power package

Typical Applications

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

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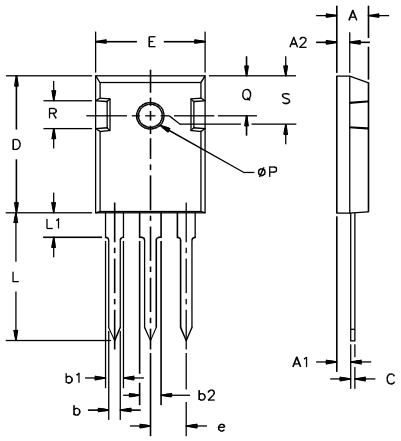
Symbol	Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		1650		pF
C_{oes}			250		pF
C_{res}			110		pF
Q_g	I_C = 30 A, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		120		nC
$t_{d(on)}$	**Inductive load, T_J = 125°C**		100		ns
t_r	I_C = 30 A, V_{GE} = ±15 V,		70		ns
$t_{d(off)}$	V_{CE} = 600 V, R_G = 47 Ω		500		ns
t_f			70		ns
E_{on}			4.6		mJ
E_{off}			3.4		mJ
R_{thJC}				0.42	K/W
R_{thCK}	Package with heatsink compound		0.25		K/W

Reverse Diode (FRED) [D1 version only]

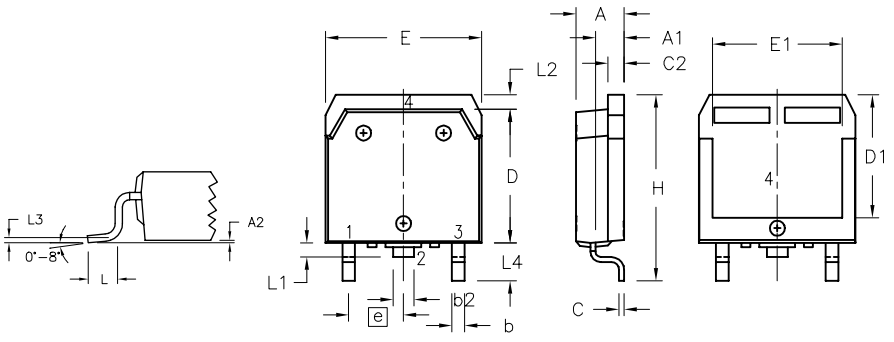
Symbol	Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_F	I_F = 30 A, V_{GE} = 0 V		2.5	2.7	V
	I_F = 30 A, V_{GE} = 0 V, T_J = 125°C		2.0		V
I_F	T_C = 25°C			60	A
	T_C = 90°C			35	A
I_{RM}	I_F = 30 A, -di_F/dt = 400 A/µs, V_R = 600 V		20		A
t_{rr}	V_{GE} = 0 V, T_J = 125°C		200		ns
t_{rr}	I_F = 1 A, -di_F/dt = 100 A/µs, V_R = 30 V, V_{GE} = 0 V		40		ns
R_{thJC}				1	K/W

TO-247 AD 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
∅P	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-268 AA Outline



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

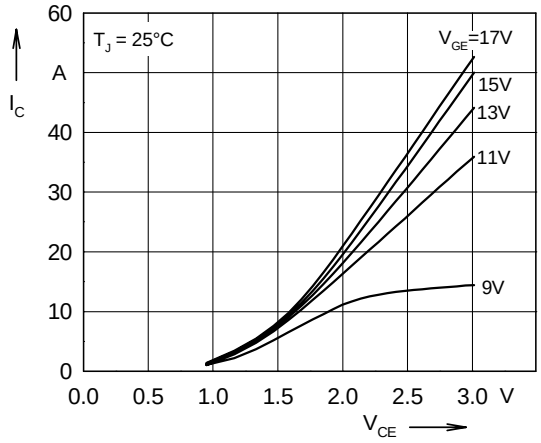


Fig. 1 Typ. output characteristics

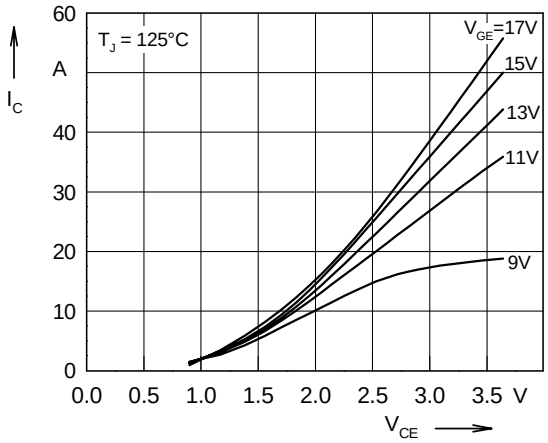


Fig. 2 Typ. output characteristics

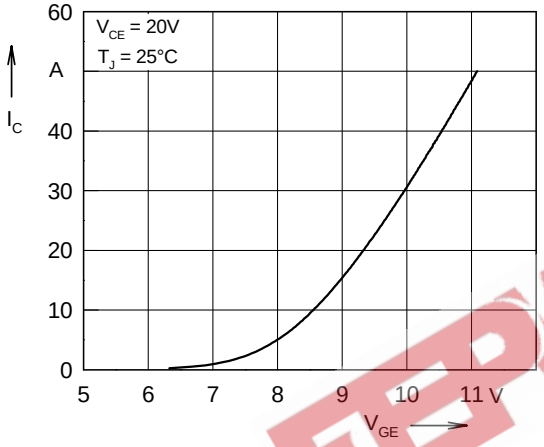


Fig. 3 Typ. transfer characteristics

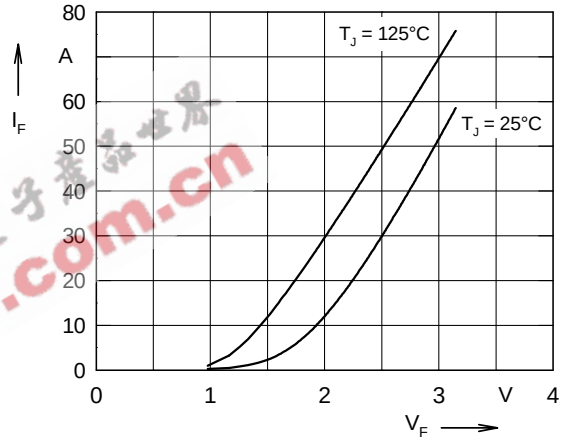


Fig. 4 Typ. forward characteristics of free wheeling diode

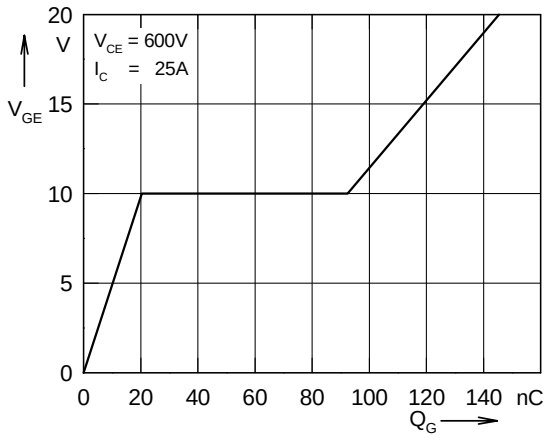


Fig. 5 Typ. turn on gate charge

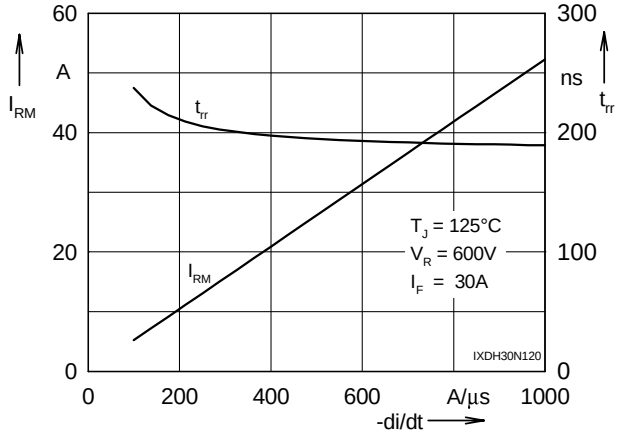


Fig. 6 Typ. turn off characteristics of free wheeling diode

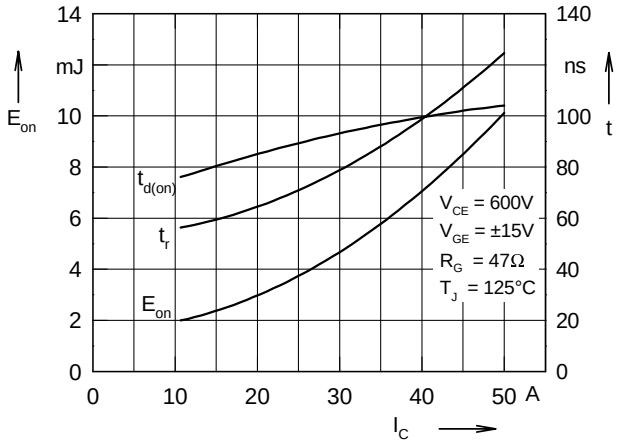


Fig. 7 Typ. turn on energy and switching times versus collector current

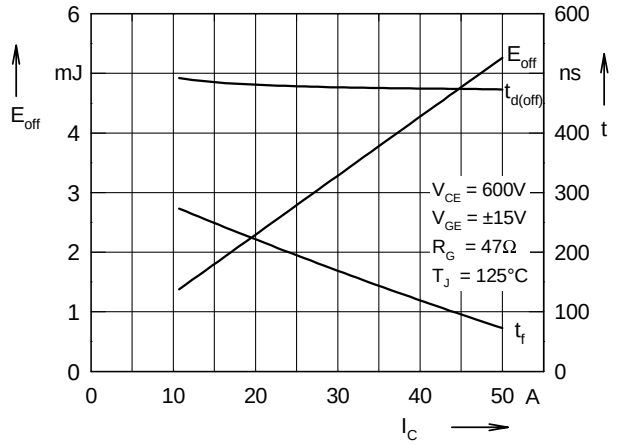


Fig. 8 Typ. turn off energy and switching times versus collector current

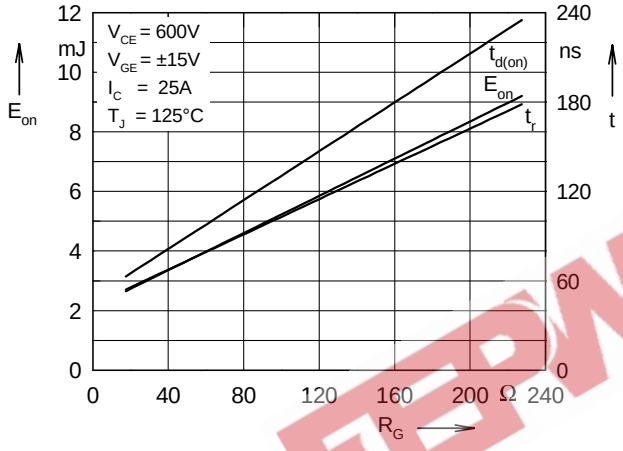


Fig. 9 Typ. turn on energy and switching times versus gate resistor

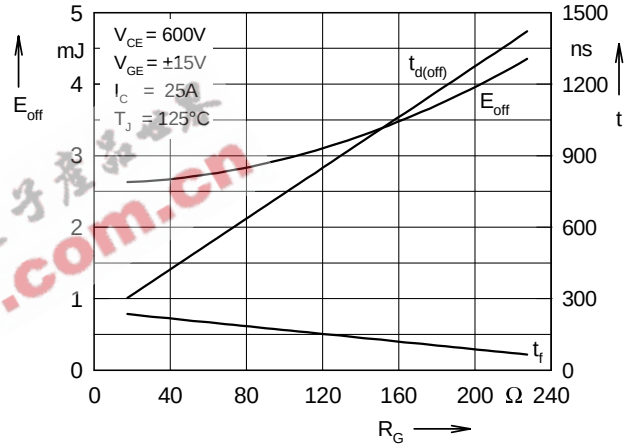


Fig.10 Typ. turn off energy and switching times versus gate resistor

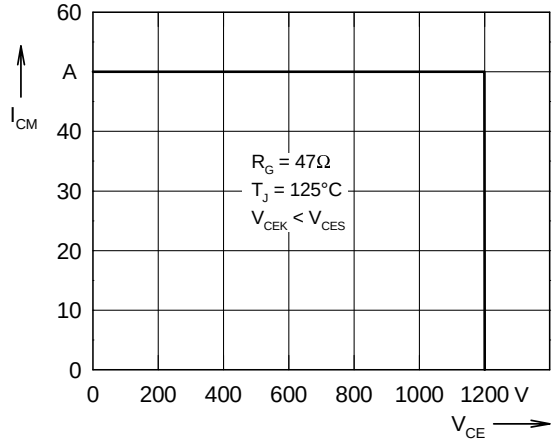


Fig. 11 Reverse biased safe operating area RBSOA

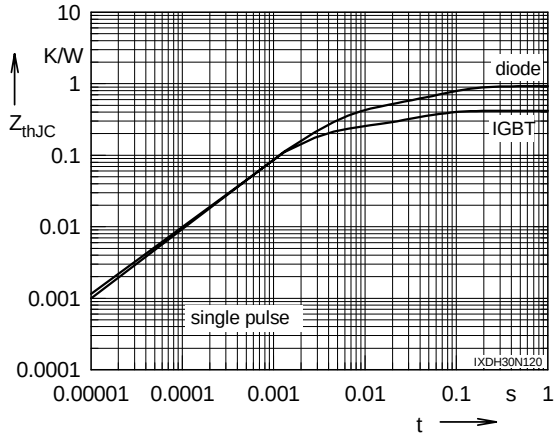


Fig. 12 Typ. transient thermal impedance