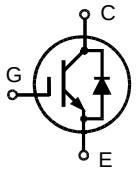
IXYS

IGBT with optional Diode

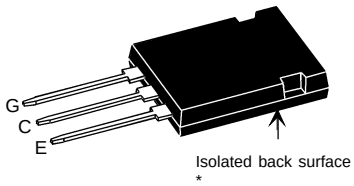
IXDR 35N60 BD1

V_{CES} = 600 V
I_{C25} = 38 A
$V_{CE(sat)\,typ}$ = 2.2 V

High Speed,
Low Saturation Voltage



ISOPLUS 247™



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

* Patent pending

Symbol	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} = 20 kΩ	600	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	38	A
I_{C90}	T_C = 90°C	24	A
I_{CM}	T_C = 90°C, t_p =1 ms	48	A
RBSOA	V_{GE}= ±15 V, T_J = 125°C, R_G = 10 Ω Clamped inductive load, L = 30 µH	I_{CM} = 110 V_{CEK} < V_{CES}	A
t_{SC} **(SCSOA)**	V_{GE}= ±15 V, V_{CE} = 600 V, T_J = 125°C R_G = 10 Ω, non repetitive	10	µs
P_C	T_C = 25°C IGBT Diode	125 50	W W
T_J		-55 ... +150	°C
T_{stg}		-55 ... +150	°C
V_{ISOL}	50/60 Hz RMS; I_{ISOL} ≤ 1 mA	2500	V~
F_C	mounting force with clip	20...120	N
Weight	typical	6	g

Symbol	Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
$V_{(BR)CES}$	V_{GE} = 0 V		600			V
$V_{GE(th)}$	I_C = 0.7 mA, V_{CE} = V_{GE}		3		5	V
I_{CES}	V_{CE} = V_{CES}	T_J = 25°C T_J = 125°C		 1	0.1	mA mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ± 20 V				± 500	nA
$V_{CE(sat)}$	I_C = 35 A, V_{GE} = 15 V			2.2	2.7	V

Features

- NPT IGBT technology
- low switching losses
- low tail current
- no latch up
- short circuit capability
- positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- optional ultra fast diode
- Epoxy meets UL 94V-0
- Isolated and UL registered E153432

Advantages

- DCB Isolated mounting tab
- Meets TO-247AD package Outline
- Package for clip or spring mounting
- Space savings
- High power density

Typical Applications

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

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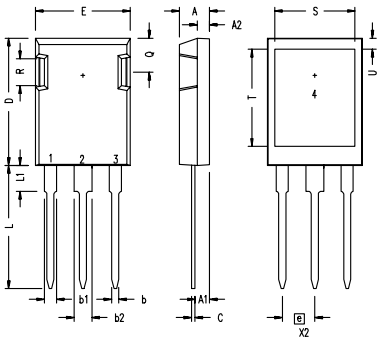
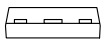
Symbol	Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		1600		pF
C_{oes}			150		pF
C_{res}			90		pF
Q_g	I_C = 35 A, V_{GE} = 15 V, V_{CE} = 480V		140		nC
$t_{d(on)}$	**Inductive load, T_J = 125°C** I_C = 35 A, V_{GE} = ±15 V, V_{CE} = 300 V, R_G = 10 Ω		30		ns
t_r			45		ns
$t_{d(off)}$			320		ns
t_f			70		ns
E_{on}			1.6		mJ
E_{off}			0.8		mJ
R_{thJC}				1	K/W
R_{thCH}	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 = 35 A, V_{GE} = 0 V		2.1	2.3	V
	I_F = 35 A, V_{GE} = 0 V, T_J = 125°C		1.6		V
I_F	T_C = 25°C			35	A
	T_C = 90°C			18	A
I_{RM}	I_F = 15 A, -di_F/dt = 400 A/µs, V_R = 300 V		13		A
t_{rr}	V_{GE} = 0 V, T_J = 125°C		90		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}				2.3	K/W

ISOPLUS 247 OUTLINE





1 Gate, 2 Drain (Collector)
3 Source (Emitter)
4 no connection

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.83	5.21	.190	.205
A_1	2.29	2.54	.090	.100
A_2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b_1	1.91	2.13	.075	.084
b_2	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190
S	13.21	13.72	.520	.540
T	15.75	16.26	.620	.640
U	1.65	3.03	.065	.080

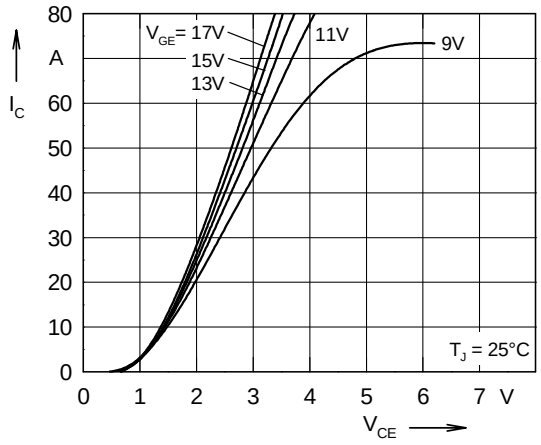


Fig. 1 Typ. output characteristics

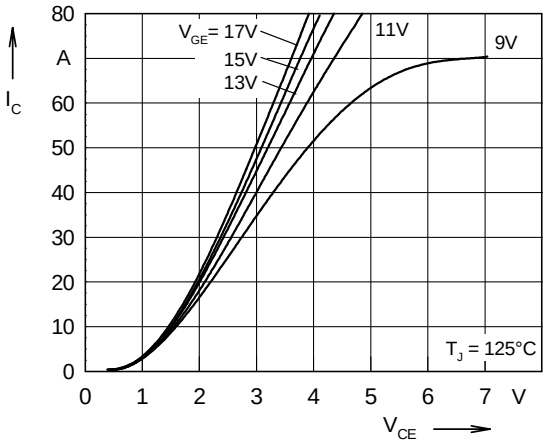


Fig. 2 Typ. output characteristics

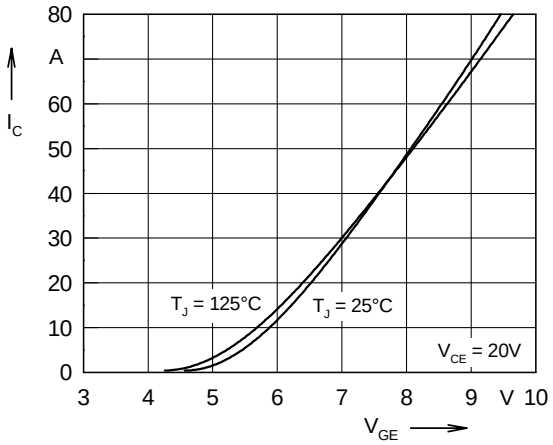


Fig. 3 Typ. transfer characteristics

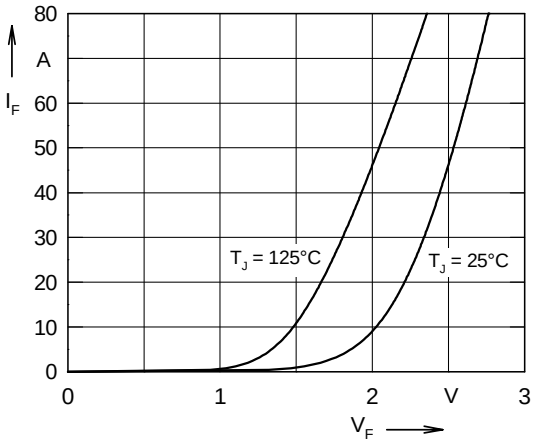


Fig. 4 Typ. forward characteristics of free wheeling diode

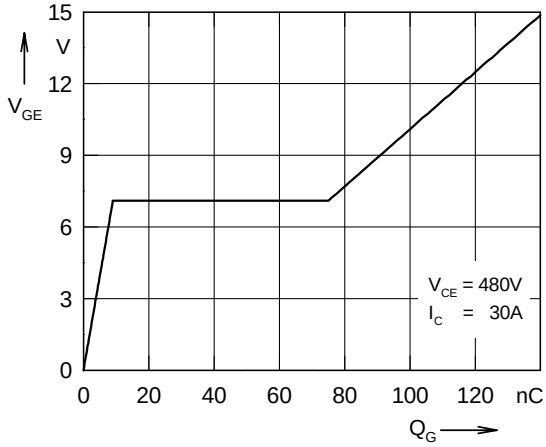


Fig. 5 Typ. turn on gate charge

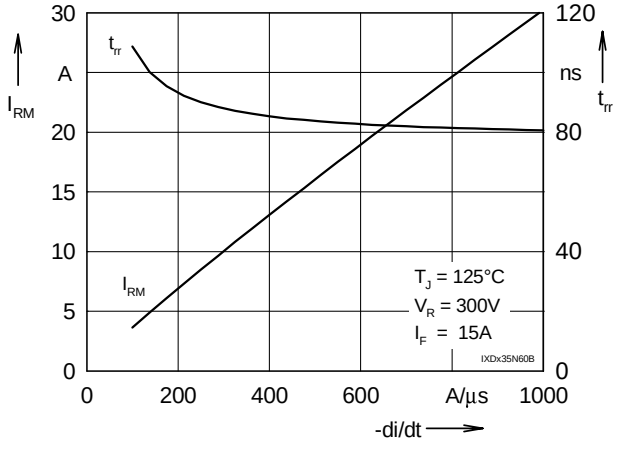


Fig. 6 Typ. turn off characteristics of free wheeling diode

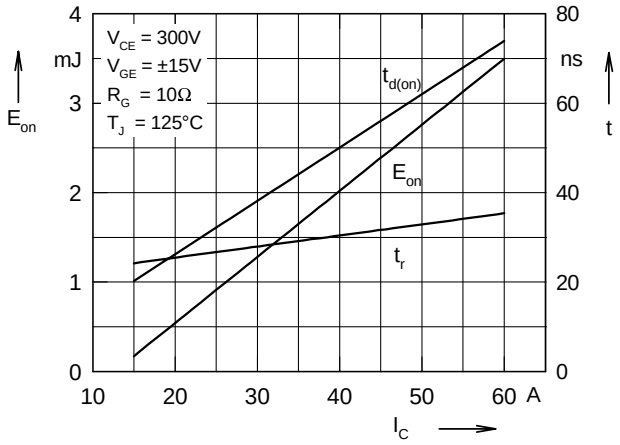


Fig. 7 Typ. turn on energy and switching times versus collector current

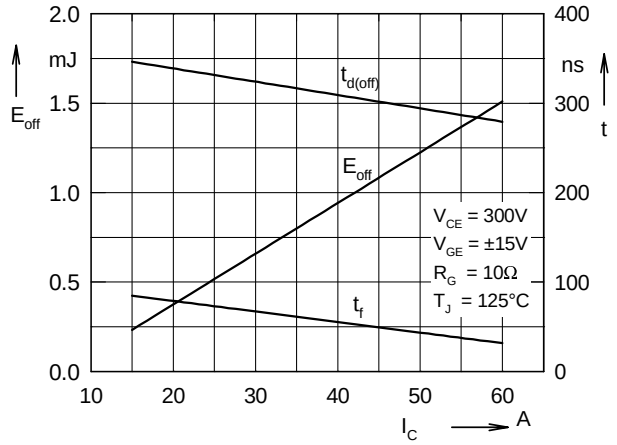


Fig. 8 Typ. turn off energy and switching times versus collector current

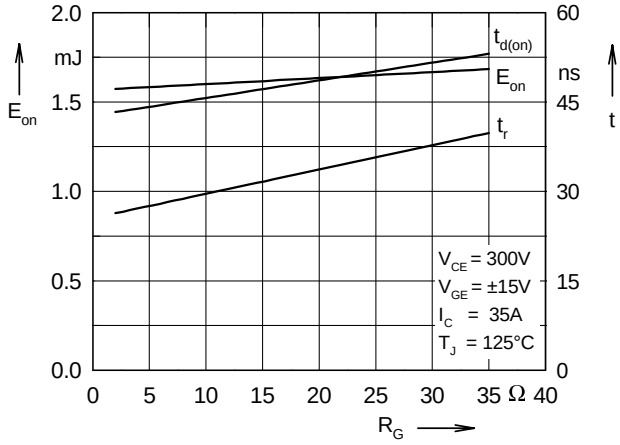


Fig. 9 Typ. turn on energy and switching times versus gate resistor

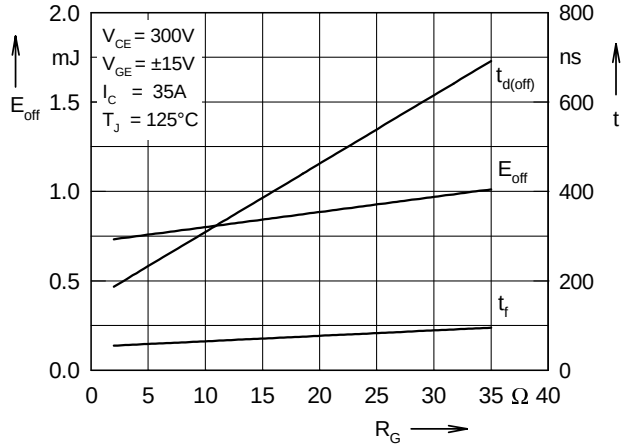


Fig.10 Typ. turn off energy and switching times versus gate resistor

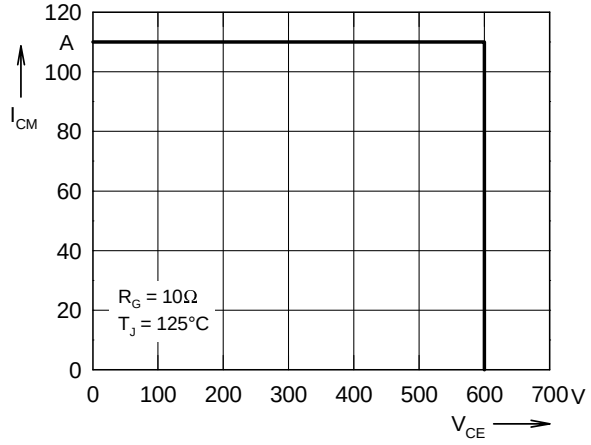


Fig. 11 Reverse biased safe operating area RBSOA

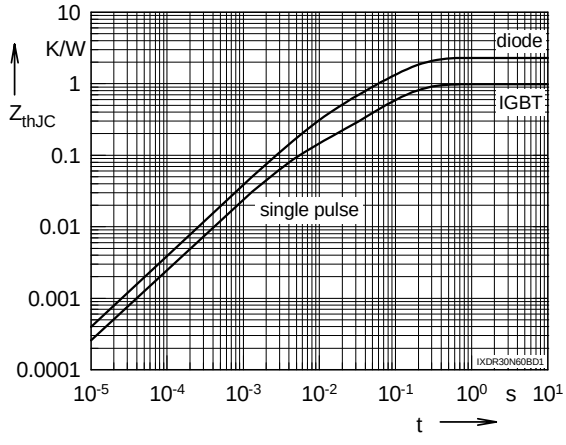


Fig. 12 Typ. transient thermal impedance