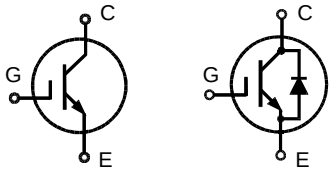
IXYS

High Voltage IGBT with optional Diode

IXDP 20N60 B
IXDP 20N60 BD1

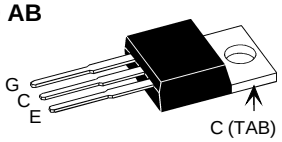
V_{CES} = 600 V
I_{C25} = 32 A
$V_{CE(sat)\ typ}$ = 2.2 V

High Speed,
Low Saturation Voltage



IXDP 20N60B IXDP 20N60B D1

TO-220 AB



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

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	32	A
I_{C90}	T_C = 90°C	20	A
I_{CM}	T_C = 90°C, t_p =1 ms	40	A
RBSOA	V_{GE} = ±15 V, T_J = 125°C, R_G = 22 Ω Clamped inductive load, L = 30 µH	I_{CM} = 60 V_{CEK} < V_{CES}	A
t_{SC} **(SCSOA)**	V_{GE} = ±15 V, V_{CE} = 600 V, T_J = 125°C R_G = 22 Ω, non repetitive	10	µs
P_C	T_C = 25°C IGBT Diode	140 50	W W
T_J		-55 ... +150	°C
T_{stg}		-40 ... +150	°C
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
M_d	Mounting torque	0.4 - 0.6	Nm
Weight		2	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 = 0.4 mA, V_{CE} = V_{GE}	3		5	V
I_{CES}	V_{CE} = V_{CES} T_J = 25°C T_J = 125°C		 0.7	0.1	mA mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ± 20 V			± 500	nA
$V_{CE(sat)}$	I_C = 20 A, V_{GE} = 15 V		2.2	2.8	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
- International standard package

Advantages

- Space savings
- High power density

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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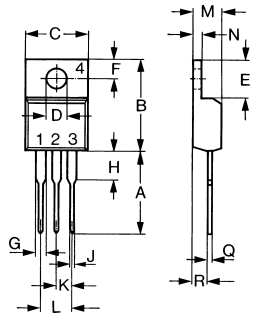
Symbol	Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		800		pF
C_{oes}			85		pF
C_{res}			50		pF
Q_g	I_C = 20 A, V_{GE} = 15 V, V_{CE} = 480 V		70		nC
$t_{d(on)}$	**Inductive load, T_J = 125°C** I_C = 20 A, V_{GE} = ±15 V, V_{CE} = 300 V, R_G = 22 Ω		25		ns
t_r			30		ns
$t_{d(off)}$			260		ns
t_f			55		ns
E_{on}			0.9		mJ
E_{off}			0.4		mJ
R_{thJC}				0.9	K/W
R_{thCH}	Package with heatsink compound	0.5			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 = 20 A, V_{GE} = 0 V		2.1	2.4	V
	I_F = 20 A, V_{GE} = 0 V, T_J = 125°C		1.6		V
I_F	T_C = 25°C			25	A
	T_C = 90°C			15	A
I_{RM}	I_F = 10 A, -di_F/dt = 400 A/µs, V_R = 300 V		11		A
t_{rr}	V_{GE} = 0 V, T_J = 125°C		80		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}				2.5	K/W

TO-220 AB Outline



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	12.70	13.97	0.500	0.550
B	14.73	16.00	0.580	0.630
C	9.91	10.66	0.390	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	0.230	0.270
F	2.54	3.18	0.100	0.125
G	1.15	1.65	0.045	0.065
H	2.79	5.84	0.110	0.230
J	0.64	1.01	0.025	0.040
K	2.54	BSC	0.100	BSC
M	4.32	4.82	0.170	0.190
N	1.14	1.39	0.045	0.055
Q	0.35	0.56	0.014	0.022
R	2.29	2.79	0.090	0.110

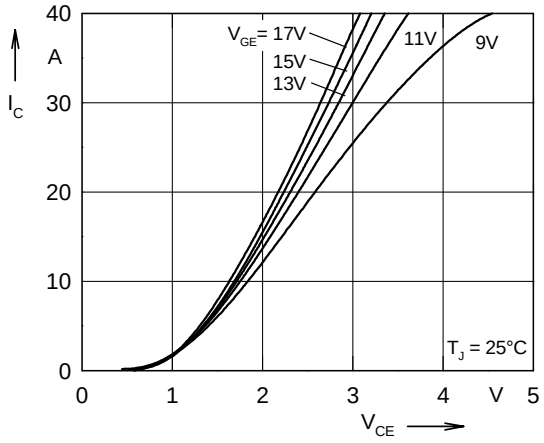


Fig. 1 Typ. output characteristics

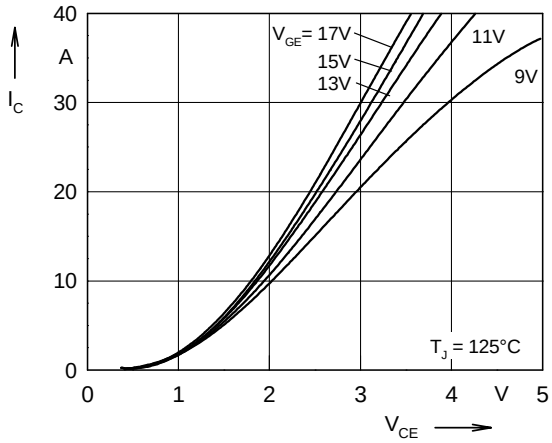


Fig. 2 Typ. output characteristics

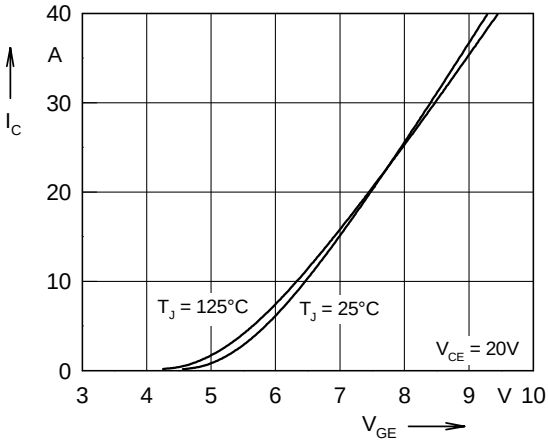


Fig. 3 Typ. transfer characteristics

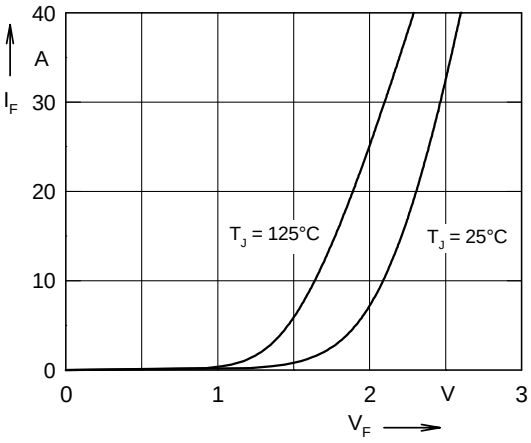


Fig. 4 Typ. forward characteristics of free wheeling diode

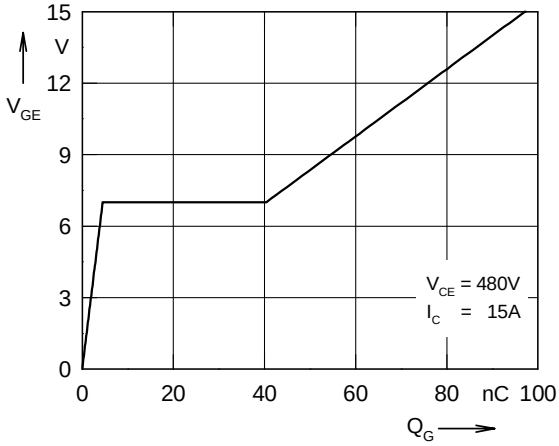


Fig. 5 Typ. turn on gate charge

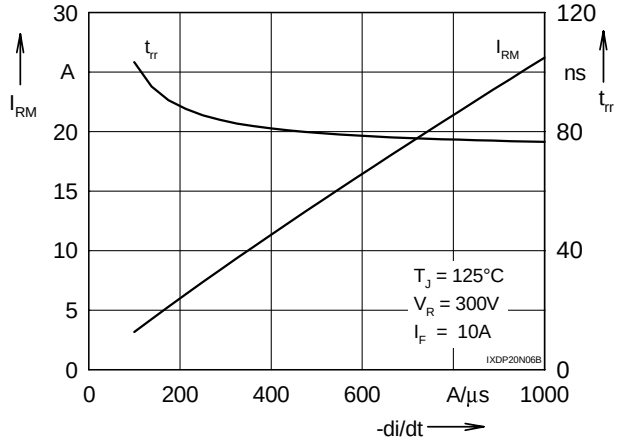


Fig. 6 Typ. turn off characteristics of free wheeling diode

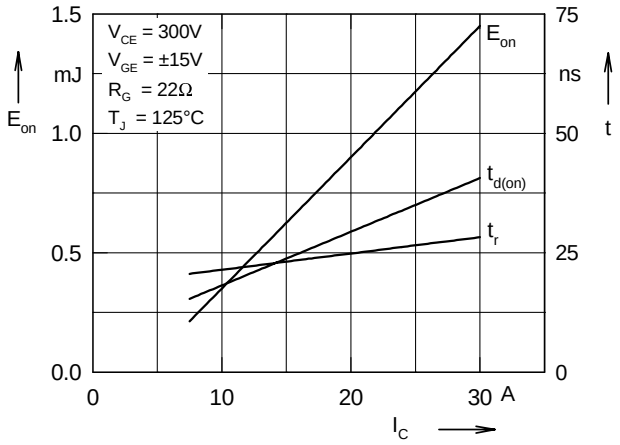


Fig. 7 Typ. turn on energy and switching times versus collector current

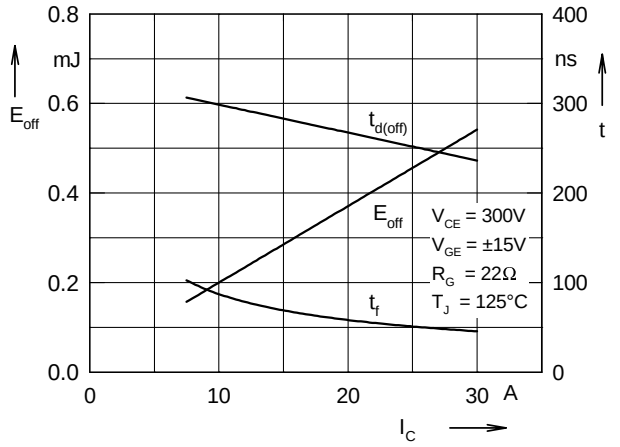


Fig. 8 Typ. turn off energy and switching times versus collector current

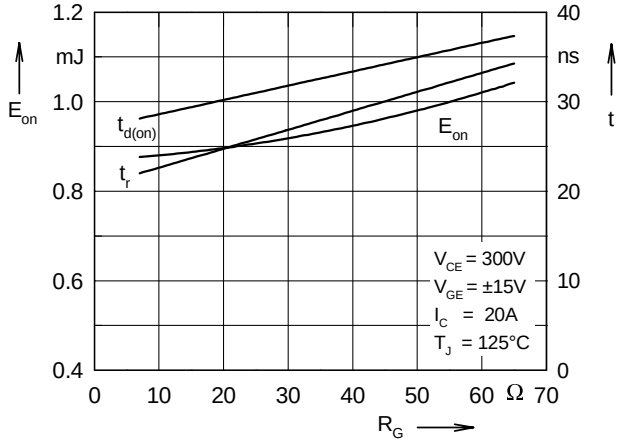


Fig. 9 Typ. turn on energy and switching times versus gate resistor

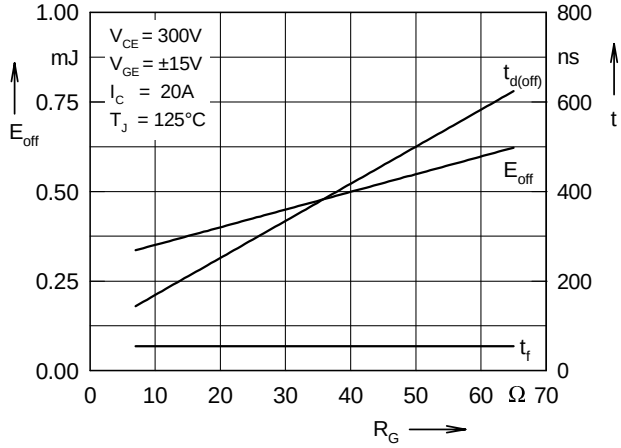


Fig.10 Typ. turn off energy and switching times versus gate resistor

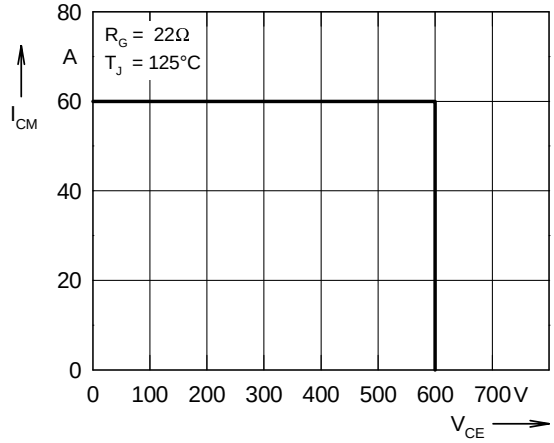


Fig. 11 Reverse biased safe operating area RBSOA

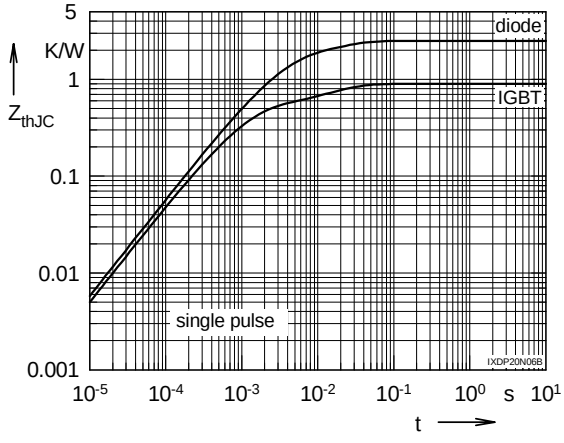


Fig. 12 Typ. transient thermal impedance

Mouser Electronics

Authorized Distributor

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IXYS:

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