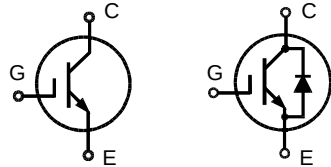


High Voltage IGBT with optional Diode

IXDP 20N60 B
IXDP 20N60 BD1

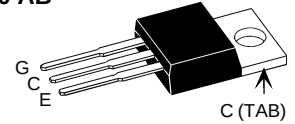
$V_{CES} = 600 \text{ V}$
 $I_{C25} = 32 \text{ A}$
 $V_{CE(sat) \text{ typ}} = 2.2 \text{ V}$

High Speed,
Low Saturation Voltage



IXDP 20N60B IXDP 20N60B D1

TO-220 AB



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

Symbol	Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 20 \text{ k}\Omega$	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	32	A
I_{C90}	$T_C = 90^\circ\text{C}$	20	A
I_{CM}	$T_C = 90^\circ\text{C}, t_p = 1 \text{ ms}$	40	A
RBSOA	$V_{GE} = \pm 15 \text{ V}, T_J = 125^\circ\text{C}, R_G = 22 \Omega$ Clamped inductive load, $L = 30 \mu\text{H}$	$I_{CM} = 60$ $V_{CEK} < V_{CES}$	A
t_{SC} (SCSOA)	$V_{GE} = \pm 15 \text{ V}, V_{CE} = 600 \text{ V}, T_J = 125^\circ\text{C}$ $R_G = 22 \Omega$, non repetitive	10	μs
P_C	$T_C = 25^\circ\text{C}$	IGBT Diode	140 50 W W
T_J		-55 ... +150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$
M_d	Mounting torque	0.4 - 0.6	Nm
Weight		2	g

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

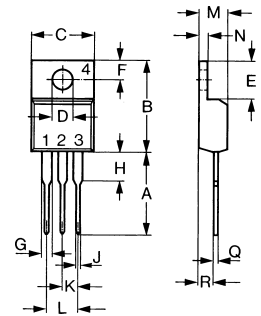
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies

Symbol	Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$V_{(BR)CES}$	$V_{GE} = 0 \text{ V}$	600		V
$V_{GE(th)}$	$I_C = 0.4 \text{ mA}, V_{CE} = V_{GE}$	3		5 V
I_{CES}	$V_{CE} = V_{CES}$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		0.7	0.1 mA mA
I_{GES}	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 500 \text{ nA}$
$V_{CE(sat)}$	$I_C = 20 \text{ A}, V_{GE} = 15 \text{ V}$		2.2	2.8 V

Symbol	Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
C_{ies}	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$		800	pF
C_{oes}			85	pF
C_{res}			50	pF
Q_g	$I_C = 20\text{ A}, V_{GE} = 15\text{ V}, V_{CE} = 480\text{ V}$		70	nC
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 20\text{ A}, V_{GE} = \pm 15\text{ V},$ $V_{CE} = 300\text{ V}, R_G = 22\ \Omega$		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}	Package with heatsink compound	0.5		0.9 K/W
R_{thCH}				K/W

Reverse Diode (FRED) [D1 version only]

Symbol	Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_F	$I_F = 20\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 20\text{ A}, V_{GE} = 0\text{ V}, T_J = 125^\circ\text{C}$	2.1	2.4	V
I_F	$T_C = 25^\circ\text{C}$ $T_C = 90^\circ\text{C}$		25	A
I_{RM}	$I_F = 10\text{ A}, -di_F/dt = 400\text{ A}/\mu\text{s}, V_R = 300\text{ V}$	11		A
t_{rr}	$V_{GE} = 0\text{ V}, T_J = 125^\circ\text{C}$	80		ns
t_{rr}	$I_F = 1\text{ A}, -di_F/dt = 100\text{ A}/\mu\text{s}, V_R = 30\text{ V}, V_{GE} = 0\text{ V}$	40		ns
R_{thJC}			2.5	K/W

TO-220 AB Outline


Dim.	Millimeter		Inches	
	Min.	Max.	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

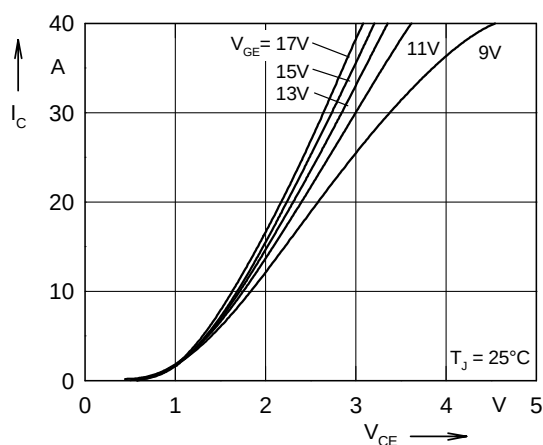


Fig. 1 Typ. output characteristics

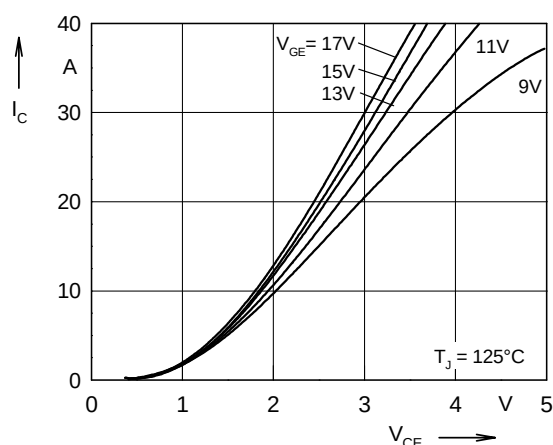


Fig. 2 Typ. output characteristics

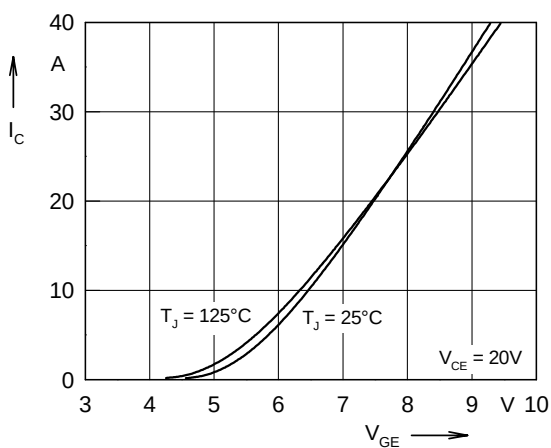


Fig. 3 Typ. transfer characteristics

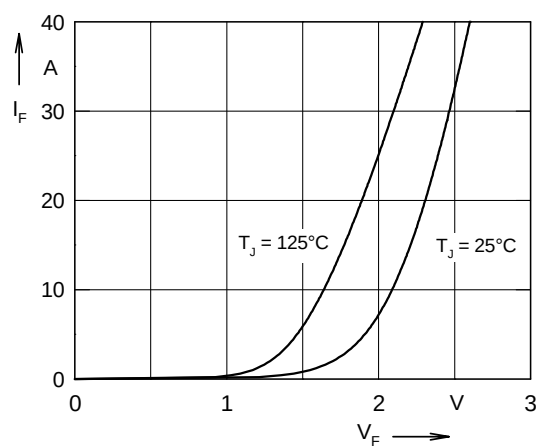


Fig. 4 Typ. forward characteristics of free wheeling diode

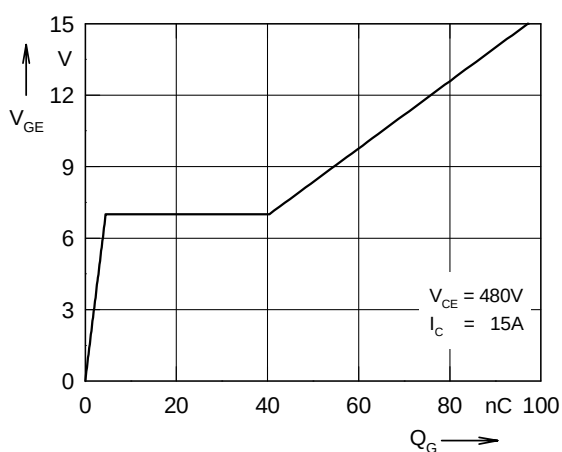


Fig. 5 Typ. turn on gate charge

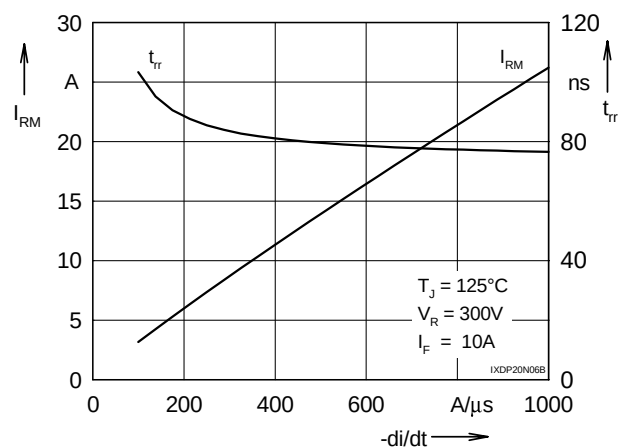


Fig. 6 Typ. turn off characteristics of free wheeling diode

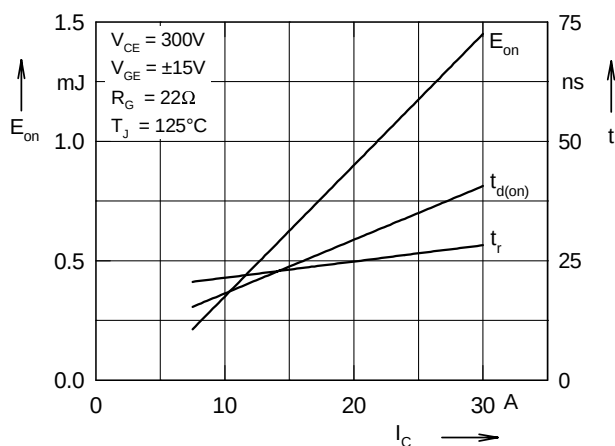


Fig. 7 Typ. turn on energy and switching times versus collector current

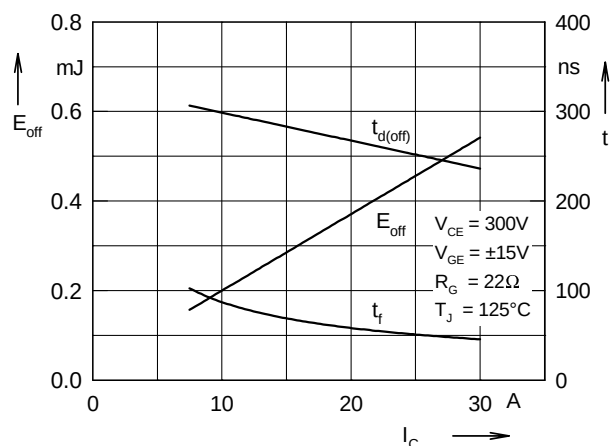


Fig. 8 Typ. turn off energy and switching times versus collector current

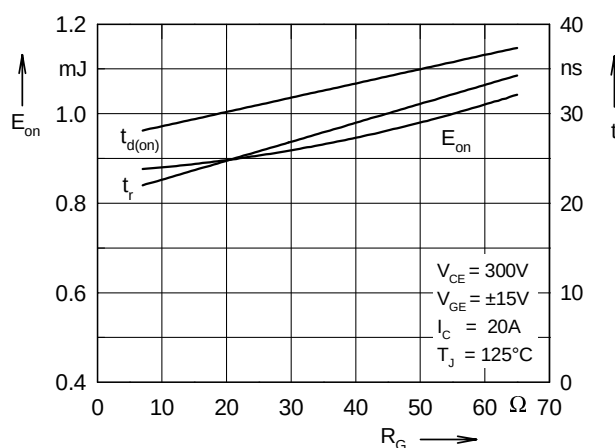


Fig. 9 Typ. turn on energy and switching times versus gate resistor

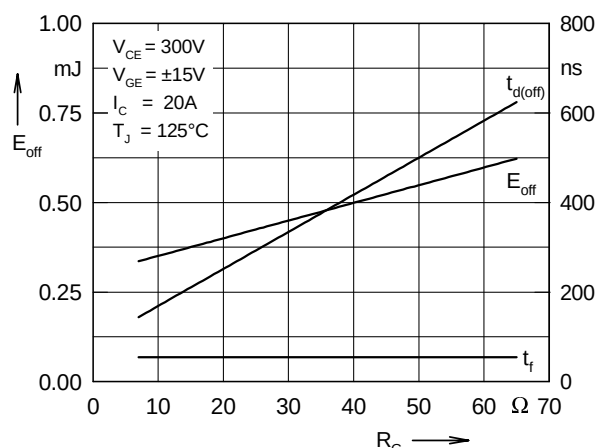


Fig. 10 Typ. turn off energy and switching times versus gate resistor

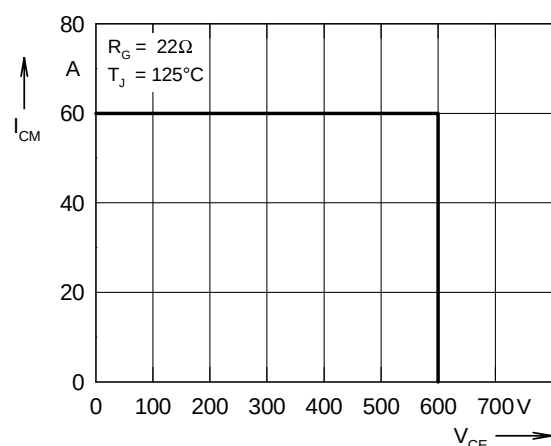


Fig. 11 Reverse biased safe operating area RBSOA

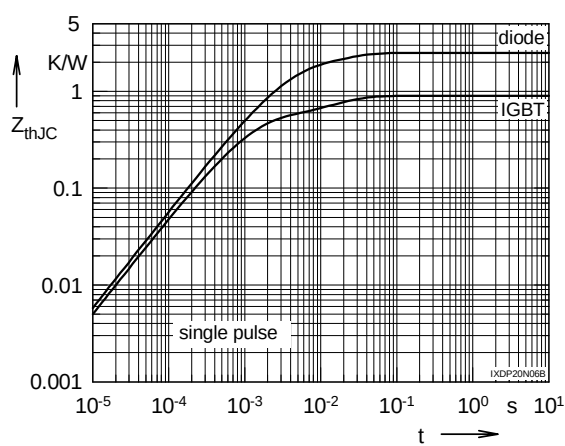


Fig. 12 Typ. transient thermal impedance