

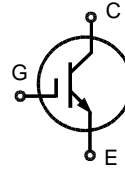
# High Voltage IGBT

## IXDA 20N120 AS

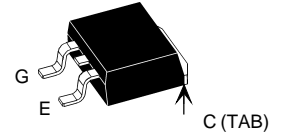
$V_{CES} = 1200\text{ V}$   
 $I_{C25} = 34\text{ A}$   
 $V_{CE(sat) typ} = 2.8\text{ V}$

### Short Circuit SOA Capability Square RBSOA

Preliminary Data



TO-263 AB



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

Symbol	Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	1200	V
$V_{CGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GE} = 20\text{ k}\Omega$	1200	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$	34	A
$I_{C90}$	$T_C = 90^\circ\text{C}$	21	A
$I_{CM}$	$T_C = 90^\circ\text{C}$ , $t_p = 1\text{ ms}$	42	A
<b>RBSOA</b>	$V_{GE} = \pm 15\text{ V}$ , $T_J = 125^\circ\text{C}$ , $R_G = 68\ \Omega$ Clamped inductive load, $L = 30\ \mu\text{H}$	$I_{CM} = 35$ $V_{CEK} < V_{CES}$	A
<b><math>t_{SC}</math> (SCSOA)</b>	$V_{GE} = \pm 15\text{ V}$ , $V_{CE} = V_{CES}$ , $T_J = 125^\circ\text{C}$ $R_G = 68\ \Omega$ , non repetitive	10	$\mu\text{s}$
$P_C$	$T_C = 25^\circ\text{C}$ IGBT	200	W
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
<b>Weight</b>		2	g

### Features

- NPT IGBT technology
- high switching speed
- low tail current
- no latch up
- short circuit capability
- positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- International standard package

### Advantages

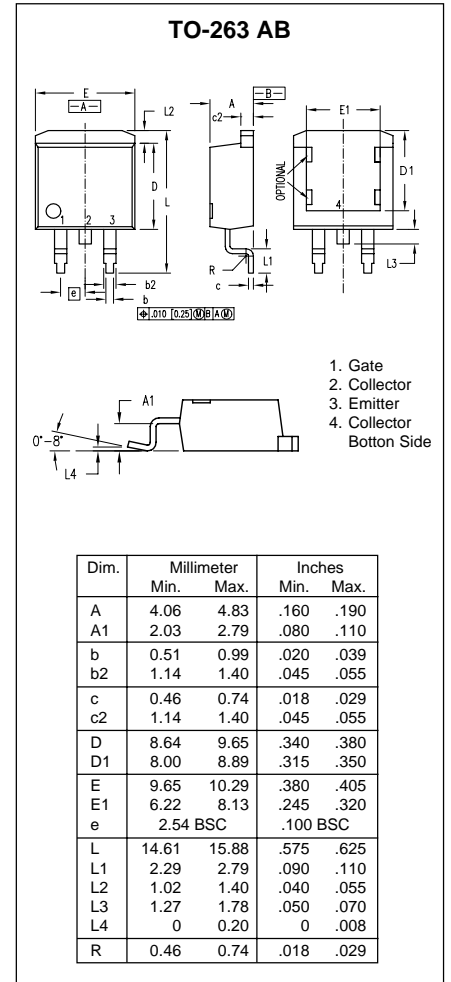
- Space savings
- High power density

### 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.
$V_{(BR)CES}$	$V_{GE} = 0\text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 0.6\text{ mA}$ , $V_{CE} = V_{GE}$	4.5		6.5 V
$I_{CES}$	$V_{CE} = V_{CES}$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		0.8	0.8 mA mA
$I_{GES}$	$V_{CE} = 0\text{ V}$ , $V_{GE} = \pm 20\text{ V}$			$\pm 500\text{ nA}$
$V_{CE(sat)}$	$I_C = 20\text{ A}$ , $V_{GE} = 15\text{ V}$		2.8	3.4 V

Symbol	Conditions	Characteristic Values		
		(T <sub>J</sub> = 25°C, unless otherwise specified)		
		min.	typ.	max.
C <sub>ies</sub>	V <sub>CE</sub> = 25 V, V <sub>GE</sub> = 0 V, f = 1 MHz		1000	pF
C <sub>oes</sub>			150	pF
C <sub>res</sub>			70	pF
Q <sub>g</sub>	I <sub>C</sub> = 20 A, V <sub>GE</sub> = 15 V, V <sub>CE</sub> = 0.5 V <sub>CES</sub>		70	nC
t <sub>d(on)</sub>	<b>Inductive load, T<sub>J</sub> = 125°C</b> I <sub>C</sub> = 20 A, V <sub>GE</sub> = ±15 V, V <sub>CE</sub> = 600 V, R <sub>G</sub> = 68 Ω		60	ns
t <sub>r</sub>			60	ns
t <sub>d(off)</sub>			400	ns
t <sub>f</sub>			50	ns
E <sub>on</sub>			3.5	mJ
E <sub>off</sub>		2.1	mJ	
R <sub>thJC</sub>				0.63 K/W



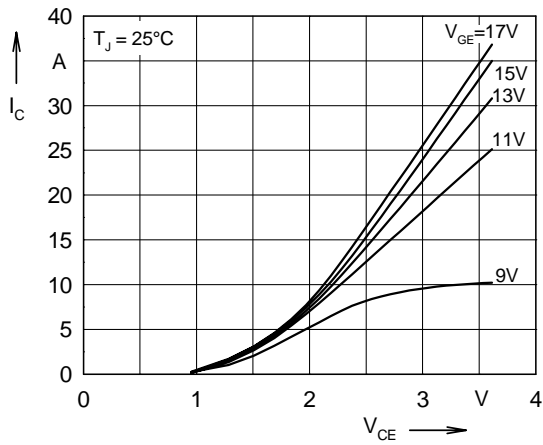


Fig. 1 Typ. output characteristics

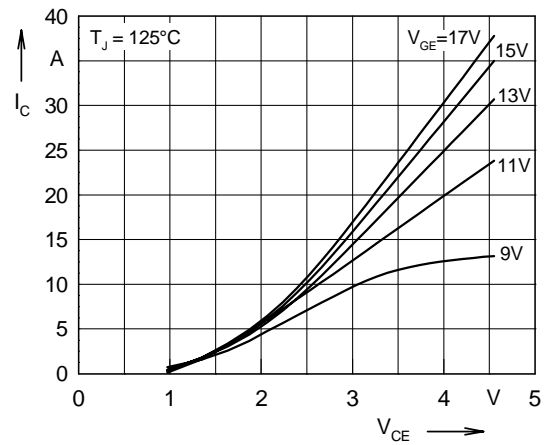


Fig. 2 Typ. output characteristics

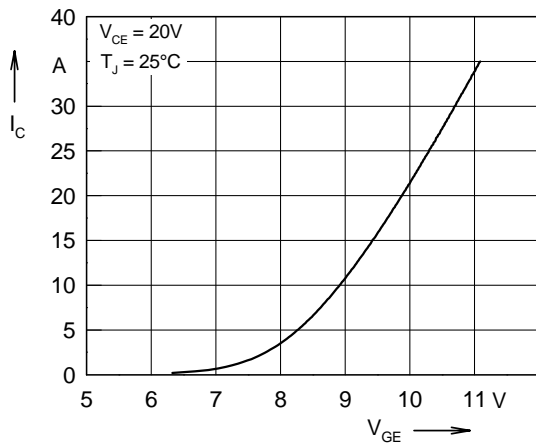


Fig. 3 Typ. transfer characteristics

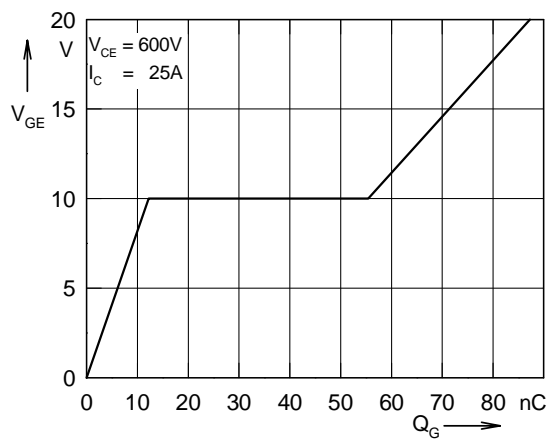


Fig. 4 Typ. turn on gate charge

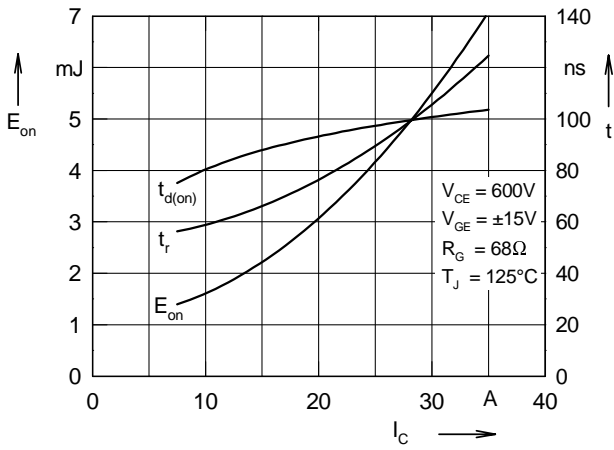


Fig. 5 Typ. turn on energy and switching times versus collector current

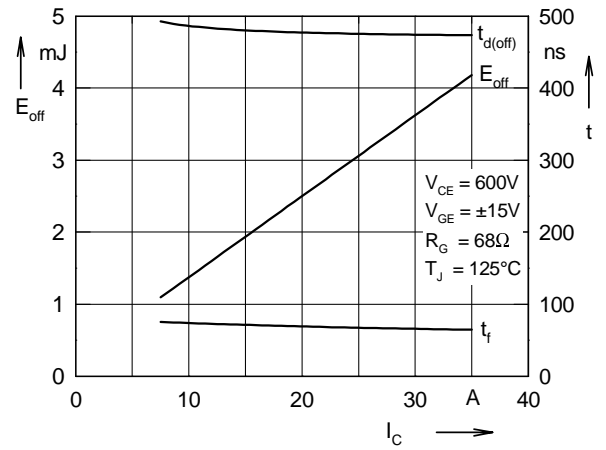


Fig. 6 Typ. turn off energy and switching times versus collector current

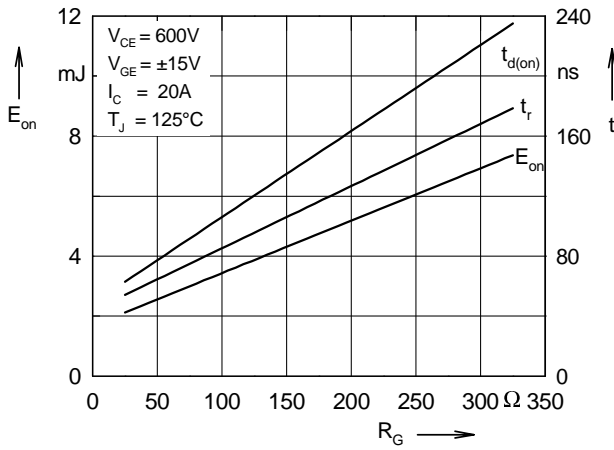


Fig. 7 Typ. turn on energy and switching times versus gate resistor

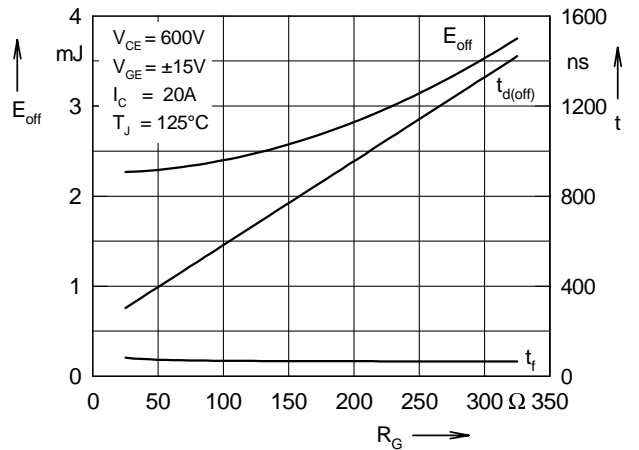


Fig. 8 Typ. turn off energy and switching times versus gate resistor

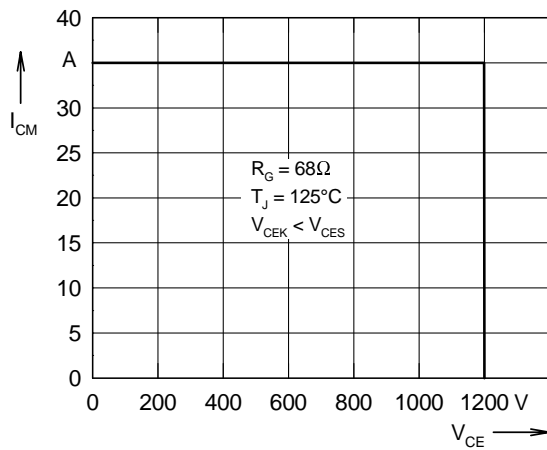


Fig. 9 Reverse biased safe operating area RBSOA

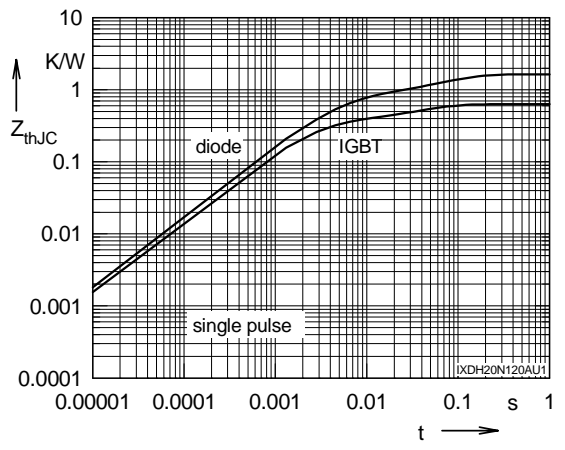


Fig. 10 Typ. transient thermal impedance