IXYS

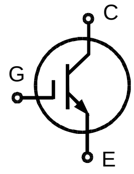
High Voltage IGBT

IXDA 20N120 AS

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

Short Circuit SOA Capability
Square RBSOA

Preliminary Data



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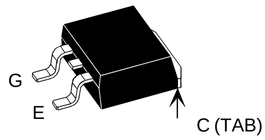

E = Emitter, G = Gate , C (TAB) = Collector

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		34	A
I_{C90}	T_C = 90°C		21	A
I_{CM}	T_C = 90°C, t_p = 1 ms		42	A
RBSOA	V_{GE} = ±15 V, T_J = 125°C, R_G = 68 Ω Clamped inductive load, L = 30 µH		I_{CM} = 35 $V_{CEK} < V_{CES}$	A
t_{SC} **(SCSOA)**	V_{GE} = ±15 V, V_{CE} = V_{CES}, T_J = 125°C R_G = 68 Ω, non repetitive		10	µs
P_C	T_C = 25°C	IGBT	200	W
T_J			-55 ... +150	°C
T_{stg}			-55 ... +150	°C
Weight			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
- Uninteruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies

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 = 0.6 mA, V_{CE} = V_{GE}		4.5		6.5	V
I_{CES}	V_{CE} = V_{CES}	T_J = 25°C T_J = 125°C		 0.8	0.8	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			2.8	3.4	V

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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		1000		pF
C_{oes}			150		pF
C_{res}			70		pF
Q_g	I_C = 20 A, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		70		nC
$t_{d(on)}$	**Inductive load, T_J = 125°C**		60		ns
t_r	I_C = 20 A, V_{GE} = ±15 V,		60		ns
$t_{d(off)}$	V_{CE} = 600 V, R_G = 68 Ω		400		ns
t_f			50		ns
E_{on}			3.5		mJ
E_{off}			2.1		mJ
R_{thJC}				0.63	K/W

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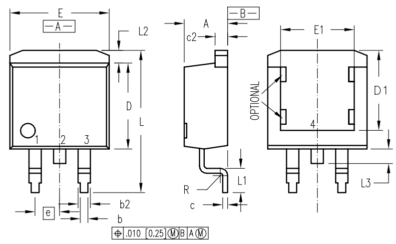

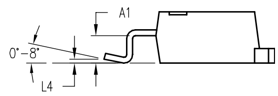

1. Gate
2. Collector
3. Emitter
4. Collector
   Botton Side

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.06	4.83	.160	.190
A1	2.03	2.79	.080	.110
b	0.51	0.99	.020	.039
b2	1.14	1.40	.045	.055
c	0.46	0.74	.018	.029
c2	1.14	1.40	.045	.055
D	8.64	9.65	.340	.380
D1	8.00	8.89	.315	.350
E	9.65	10.29	.380	.405
E1	6.22	8.13	.245	.320
e	2.54 BSC		.100 BSC	
L	14.61	15.88	.575	.625
L1	2.29	2.79	.090	.110
L2	1.02	1.40	.040	.055
L3	1.27	1.78	.050	.070
L4	0	0.20	0	.008
R	0.46	0.74	.018	.029

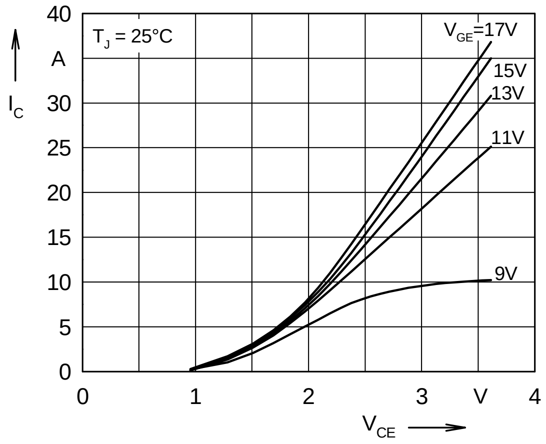

Fig. 1 Typ. output characteristics

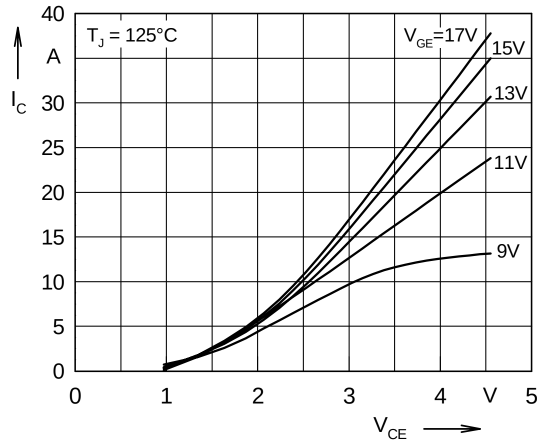

Fig. 2 Typ. output characteristics

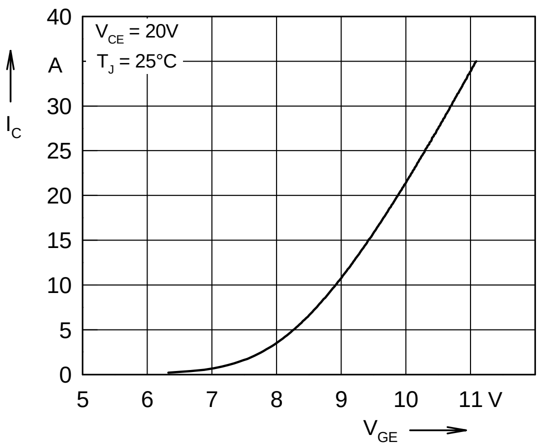

Fig. 3 Typ. transfer characteristics

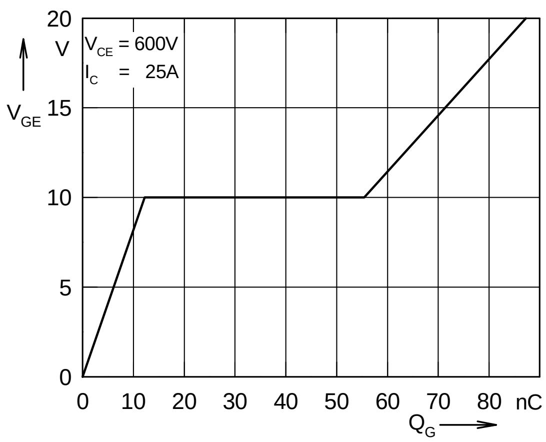

Fig. 4 Typ. turn on gate charge

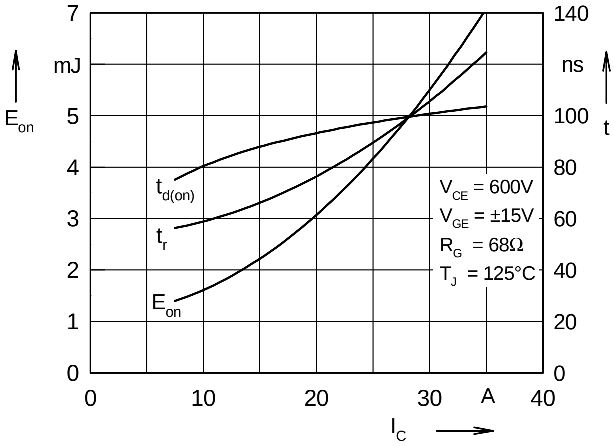

Fig. 5 Typ. turn on energy and switching times versus collector current

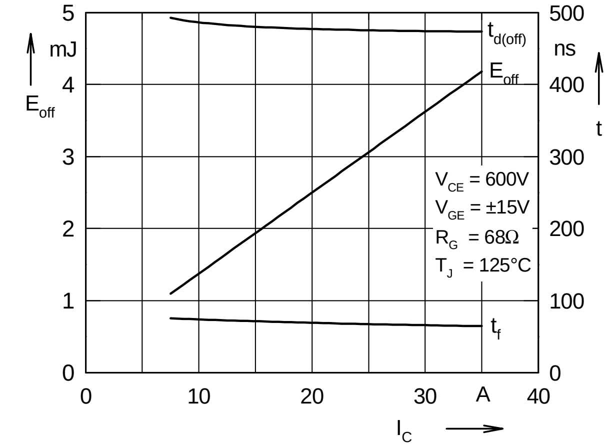

Fig. 6 Typ. turn off energy and switching times versus collector current

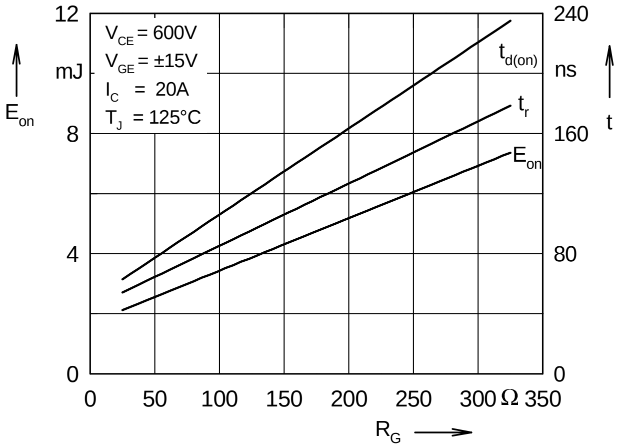

Fig. 7 Typ. turn on energy and switching times versus gate resistor

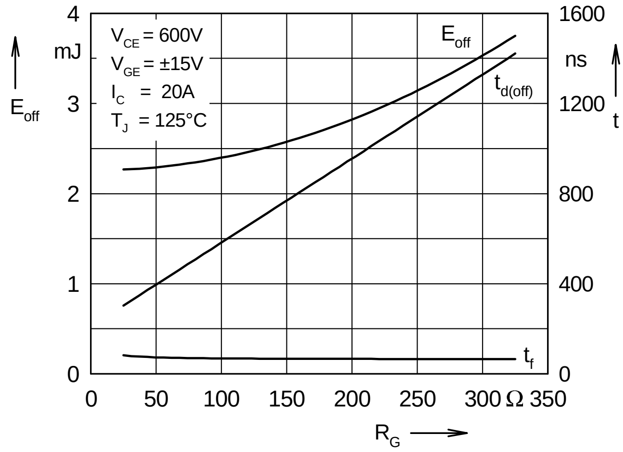

Fig. 8 Typ. turn off energy and switching times versus gate resistor

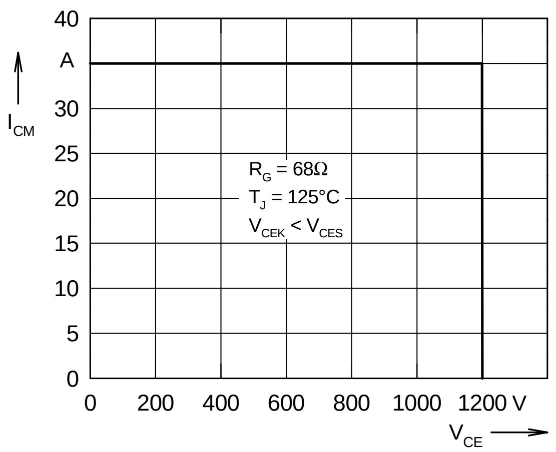

Fig. 9 Reverse biased safe operating area RBSOA

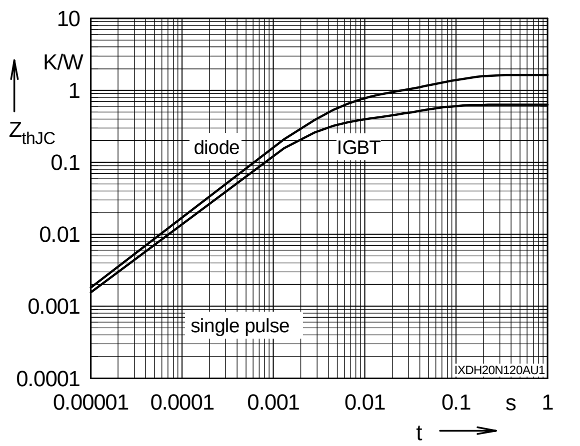

Fig. 10 Typ. transient thermal impedance