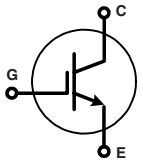
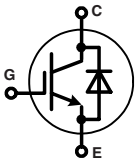
NPT³ IGBT

I_{C25} = 36 A
V_{CES} = 1200 V
$V_{CE(sat)\,typ}$ = 2.6 V

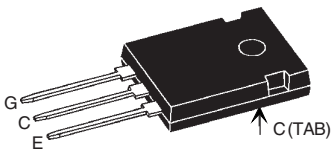


IXEH 25N120



IXEH 25N120D1

TO-247 AD



IGBT

Symbol	Conditions	Maximum Ratings	
V_{CES}	T_{VJ} = 25°C to 150°C	1200	V
V_{GES}		± 20	V
I_{C25}	T_C = 25°C	36	A
I_{C90}	T_C = 90°C	24	A
I_{CM}	V_{GE} = ±15 V; R_G = 68 Ω; T_{VJ} = 125°C	60	A
V_{CEK}	RBSOA, Clamped inductive load; L = 100 µH	V_{CES}	
t_{SC} (SCSOA)	V_{CE} = 900V; V_{GE} = ±15 V; R_G = 68 Ω; T_{VJ} = 125°C non-repetitive	10	µs
P_{tot}	T_C = 25°C	200	W

Symbol	Conditions	Characteristic Values (T_{VJ} = 25°C, unless otherwise specified) min.	typ.	max.	
$V_{CE(sat)}$	I_C = 25 A; V_{GE} = 15 V; T_{VJ} = 25°C		2.6	3.2	V
	T_{VJ} = 125°C		3.2		V
$V_{GE(th)}$	I_C = 0.6 mA; V_{GE} = V_{CE}	4.5		6.5	V
I_{CES}	V_{CE} = V_{CES}; V_{GE} = 0 V; T_{VJ} = 25°C			0.2	mA
	T_{VJ} = 125°C		0.2		mA
I_{GES}	V_{CE} = 0 V; V_{GE} = ± 20 V			200	nA
$t_{d(on)}$	Inductive load, T_{VJ} = 125°C		205		ns
t_r	V_{CE} = 600 V; I_C = 20 A		105		ns
$t_{d(off)}$	V_{GE} = ±15 V; R_G = 68 Ω		320		ns
t_f			175		ns
E_{on}			4.1		mJ
E_{off}			1.5		mJ
C_{ies}	V_{CE} = 25 V; V_{GE} = 0 V; f = 1 MHz		1.2		nF
Q_{Gon}	V_{CE} = 600 V; V_{GE} = 15 V; I_C = 20 A		100		nC
R_{thJC}				0.63	K/W

Features

- NPT³ IGBT
  - positive temperature coefficient of saturation voltage for easy paralleling
  - fast switching
  - short tail current for optimized performance in resonant circuits
- optional HiPerFRED™ diode
  - fast reverse recovery
  - low operating forward voltage
  - low leakage current
- TO-247 package
  - industry standard outline
  - epoxy meets UL 94V-0

Applications

- AC drives
- DC drives and choppers
- Uninteruptible power supplies (UPS)
- switched-mode and resonant-mode power supplies
- inductive heating, cookers

0549

Diode [D1 version only]

Symbol	Conditions	Maximum Ratings	
I_{F25}	T_C = 25°C	31	A
I_{F90}	T_C = 90°C	19	A

Symbol	Conditions	Characteristic Values min.	typ.	max.	
V_F	I_F = 25 A; T_{VJ} = 25°C		2.7	3.2	V
	T_{VJ} = 125°C		2.1		V
I_{RM}	I_F = 15 A; di_F/dt = -400 A/µs; T_{VJ} = 125°C		16		A
t_{rr}	V_R = 600 V; V_{GE} = 0 V		130		ns
R_{thJC}				1.6	K/W

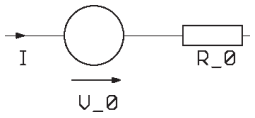
Component

Symbol	Conditions	Maximum Ratings	
T_{VJ}		-55...+150	°C
T_{stg}		-55...+150	°C
M_d	mounting torque	0.8...1.2	Nm

Symbol	Conditions	Characteristic Values min.	typ.	max.	
R_{thCH}	with heatsink compound		0.25		K/W
Weight			6		g

Equivalent Circuits for Simulation

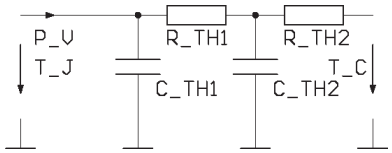
Conduction



IGBT (typ. at V_{GE} = 15 V; T_J = 125°C)
V_0 = 1.09 V; R_0 = 85 mΩ

Free Wheeling Diode (typ. at T_J = 125°C)
V_0 = 1.3 V; R_0 = 32 mΩ

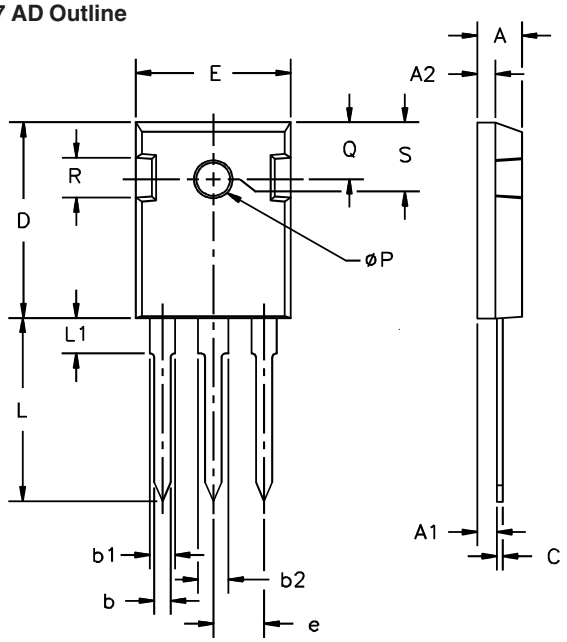
Thermal Response



IGBT (typ.)
C_{th1} = 0.004 J/K; R_{th1} = 0.335 K/W
C_{th2} = 0.133 J/K; R_{th2} = 0.295 K/W

Free Wheeling Diode (typ.)
C_{th1} = 0.004 J/K; R_{th1} = 1.076 K/W
C_{th2} = 0.078 J/K; R_{th2} = 0.524 K/W

TO-247 AD Outline



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
øP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

0549

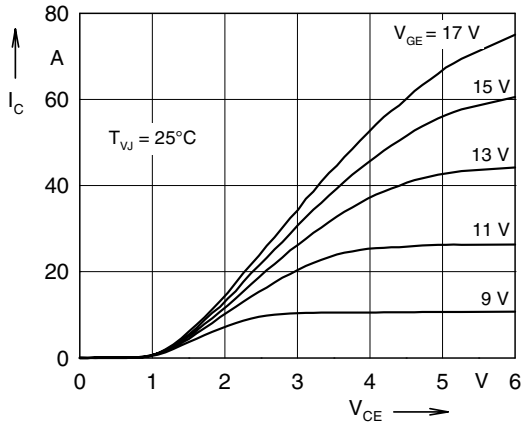


Fig. 1 Typ. output characteristics

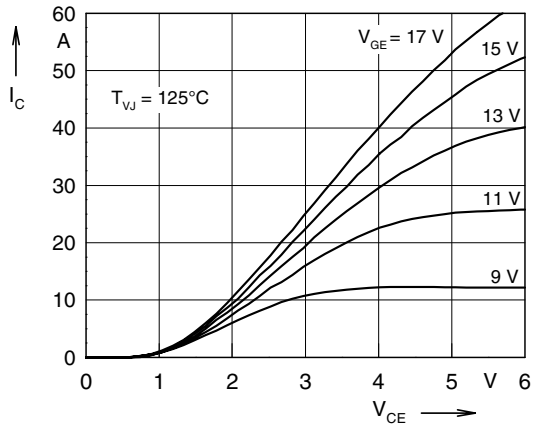


Fig. 2 Typ. output characteristics

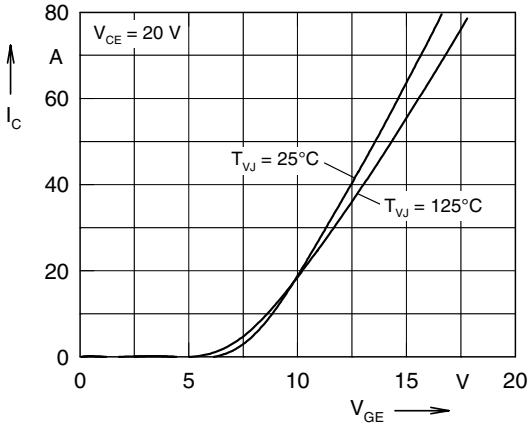


Fig. 3 Typ. transfer characteristics

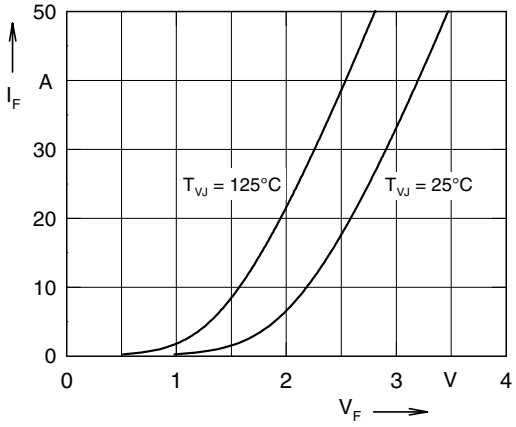


Fig. 4 Typ. forward characteristics of free wheeling diode

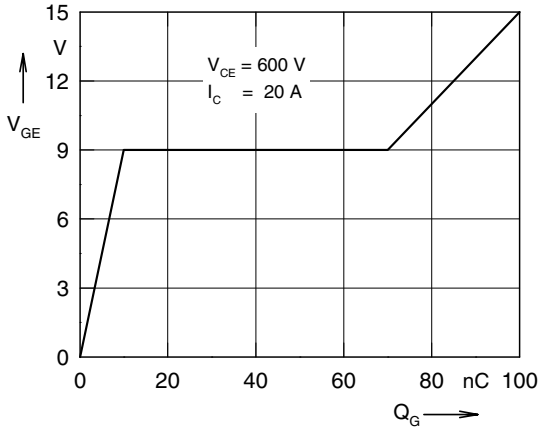


Fig. 5 Typ. turn on gate charge

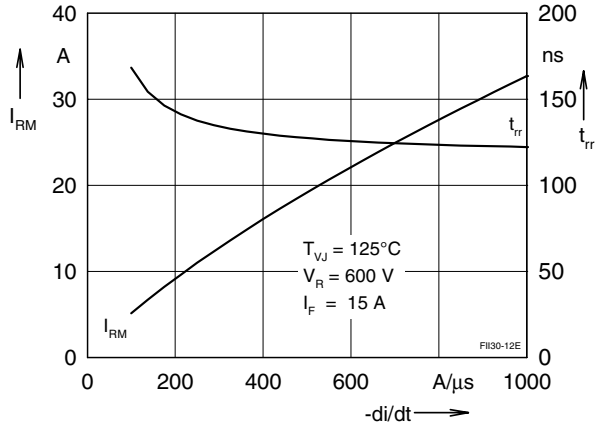


Fig. 6 Typ. turn off characteristics of free wheeling diode

0549

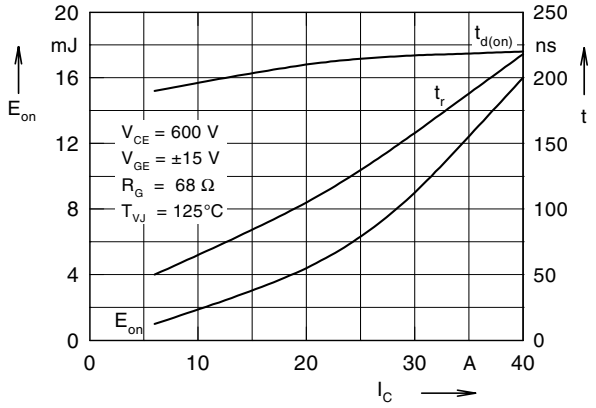


Fig. 7 Typ. turn on energy and switching times versus collector current

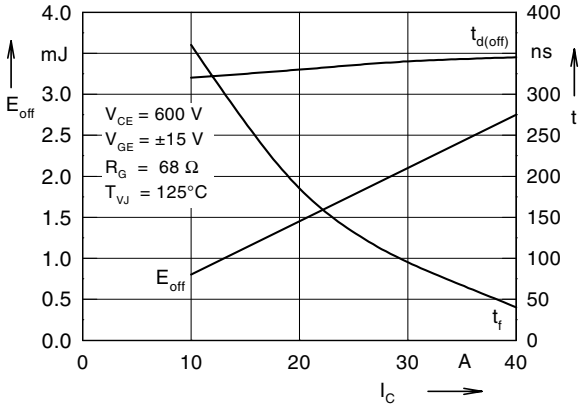


Fig. 8 Typ. turn off energy and switching times versus collector current

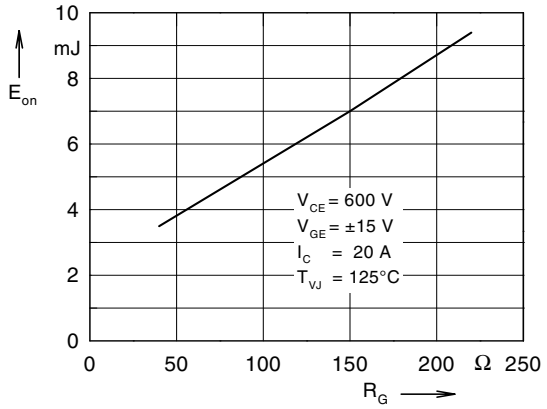


Fig. 9 Typ. turn on energy vs gate resistor

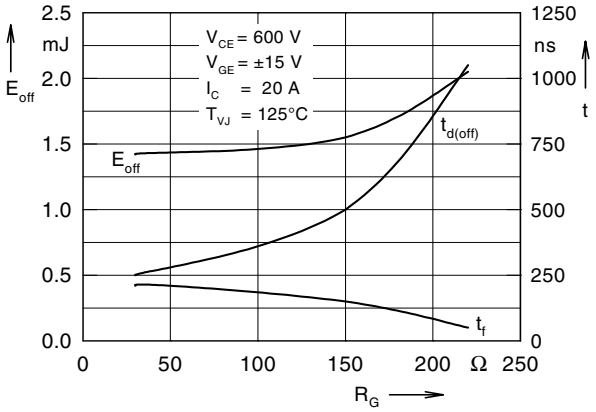


Fig.10 Typ. turn off energy and switching times versus gate resistor

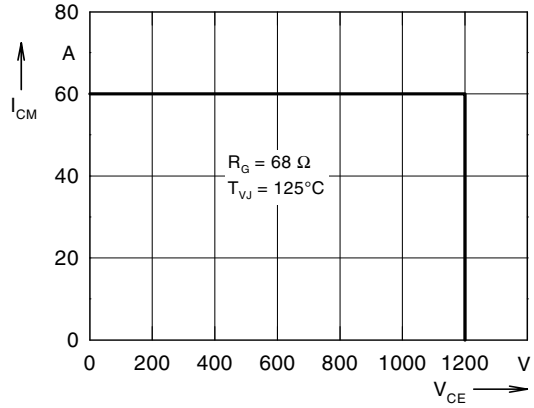


Fig. 11 Reverse biased safe operating area RBSOA

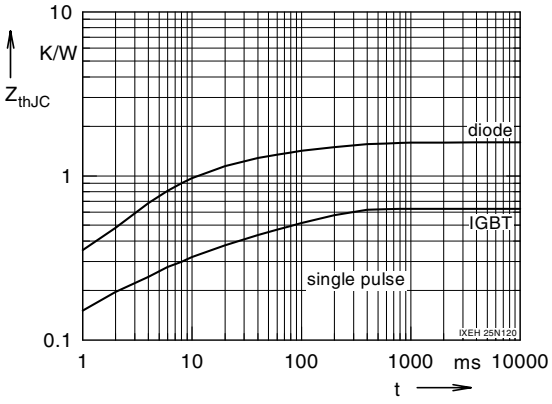


Fig. 12 Typ. transient thermal impedance

0549