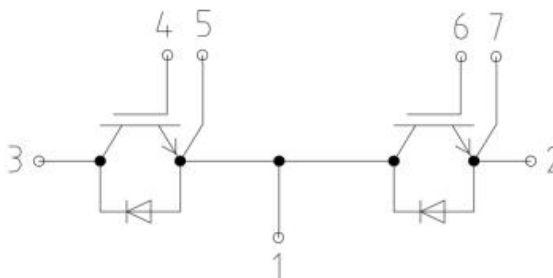


Product Summary

Product Type	V_{CES}	I_c	$V_{CE(sat)}$	Package
ATGM600N120HBAMP	1200V	600A	1.65V	62mm



Features

- Low losses 1200V IGBT half bridge module
- Low inductive design
- $T_{jmax} = 150^{\circ}\text{C}$
- 62mm half bridge module

Typical Applications

- Motor drive
- Servo drive
- UPS / Solar
- Energy storage system

Maximum Ratings (IGBT, $T_j=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}		1200	V
Gate-Emitter Voltage	V_{GES}		$\pm 20\text{V}$	V
DC Continuous Collector Current	I_c	$T_c = 100^{\circ}\text{C}$	600	A
Pulse Collector Current	I_{CM}	$t_p = 1\text{ms}$	1200	A
Maximum Power Dissipation	P_D	$T_c = 25^{\circ}\text{C}, T_j = 150^{\circ}\text{C}$	2650	W
junction temperature	T_j		-40 to 150	$^{\circ}\text{C}$
Storage temperature	T_{stg}		-40 to 150	$^{\circ}\text{C}$

Maximum Ratings (Freewheeling diode, $T_j = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Peak Repetitive Revers Voltage	V_{RRM}		1200	V
Diode forward Current	I_F	$T_C = 100^\circ\text{C}$	600	A
Repetitive peak forward Current	I_{FRM}	$t_p = 1\text{ms}$	1200	A
unction temperature	T_j		-40 to 150	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to 150	$^\circ\text{C}$

Module information

Parameter	Conditions	Value	Unit
Isolation Voltage	RMS, $f = 50\text{Hz}$, $t = 1\text{min}$	4	KV
module isolation		AL_2O_3	
CTI		>200	
Stray Inductance Module		20	nH
Module lead resistance, terminals – chip	$T_C = 25^\circ\text{C}$	0.5	$\text{m}\Omega$
Mounting torque for module mounting	M5, M6	3 to 5	Nm
Weight		310	g

IGBT Electrical characteristics ($T_j = 25^\circ\text{C}$ unless otherwise specified, chip)

Parameter	Symbol	conditions		Min	Typ	Max	Unit	
Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _C =600A, V _{GE} =15V	T _J =25 °C		1.65	2.0	V	
			T _J =150 °C		2.05		V	
Gate-Emitter threshold Voltage	V _{GE(th)}	I _C =4mA, V _{CE} =V _{GE}		5.0	5.7	6.6	V	
Gate charge	Q _G	V _{GE} = -15V to +15V			4.5		uC	
Internal gate resistor	R _{Gint}	f=1M,V _{pp} =1V	T _J =25 °C		0.7		Ω	
Input Capacitance	C _{ies}	V _{CE} =25V, V _{GE} =0V	T _J =25 °C		75		nF	
Reverse transfer Capacitance	C _{res}	f =100kHz			0.6		nF	
Collector- Emitter Cut off Current	I _{CES}	V _{CE} =1200V, V _{GE} =0V	T _J =25 °C			1	mA	
Gate-Emitter Leakage Current	I _{GES}	V _{CE} =20V, V _{GE} =0V	T _J =25 °C			500	nA	
Turn-on delay time	t _{d(on)}	V _{CE} =600V I _C = 600A V _{GE} =+15V/-15V R _G =1.5Ω Inductive load	T _J =25 °C		150		ns	
			T _J =150 °C		160		ns	
Rise time	t _r		T _J =25 °C		68		ns	
			T _J =150 °C		76		ns	
Turn-off delay time	t _{d(off)}		T _J =25 °C		470		ns	
			T _J =150 °C		525		ns	
Fall time	t _f		T _J =25 °C		135		ns	
			T _J =150 °C		240		ns	
Turn-on power dissipation	E _{on}		T _J =25 °C		43		mJ	
			T _J =150 °C		76		mJ	
Turn-off power dissipation	E _{off}		T _J =25 °C		61		mJ	
			T _J =150 °C		81		mJ	

Short Circuit	I_{SC}	$V_{GE}=15V, V_{CC}=800V, t_p<10\mu s,$ $T_j=150^{\circ}C$		2000		A
Thermal Resistance, Junction to Case (per IGBT)	$R_{th(j-c)}$				0.055	$^{\circ}C/W$
Thermal Resistance, Junction to heatsink (per IGBT)	$R_{th(j-h)}$			0.04		$^{\circ}C/W$

Freewheeling Diode Electrical characteristics (T_j =25°C unless otherwise specified, chip)

Item	Symbol	Condition		Min.	Typ.	Max.	Unit	
Diode Forward Voltage	V _F	I _F =600A, V _{GE} =0V	T _J =25 °C		1.6	2.0	V	
			T _J =150 °C		1.55		V	
Peak reverse recovery Current	I _{rr}	V _{rr} =600V, I _F =600A	T _J =25 °C		600		A	
			T _J =150 °C		635		A	
Recovered charge	Q _{rr}		T _J =25 °C		110		uC	
			T _J =150 °C		162		uC	
Reverse recovered energy	E _{rr}		T _J =25 °C		41		mJ	
			T _J =150 °C		55		mJ	
Thermal Resistance, Junction to Case (per Diode)	R _{th(j-c)}					0.08	°C/W	
Thermal Resistance, Junction to heatsink (per Diode)	R _{th(j-h)}				0.05		°C/W	

Characteristics Curve:

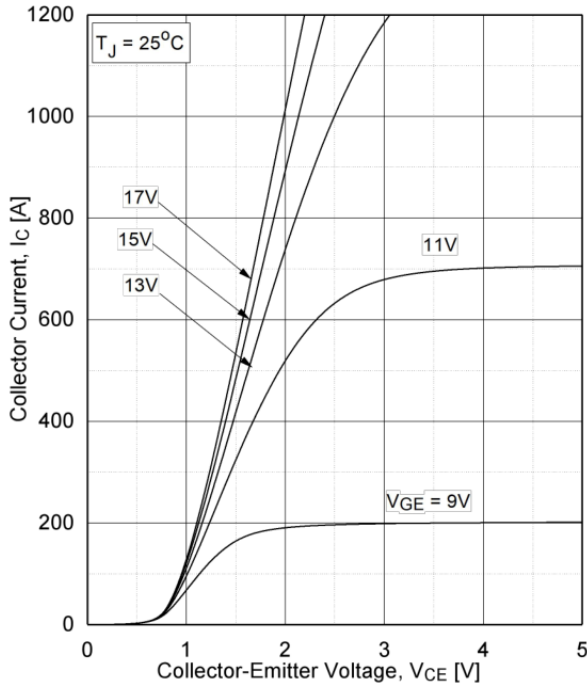


Fig1: Typical output characteristics@25°C

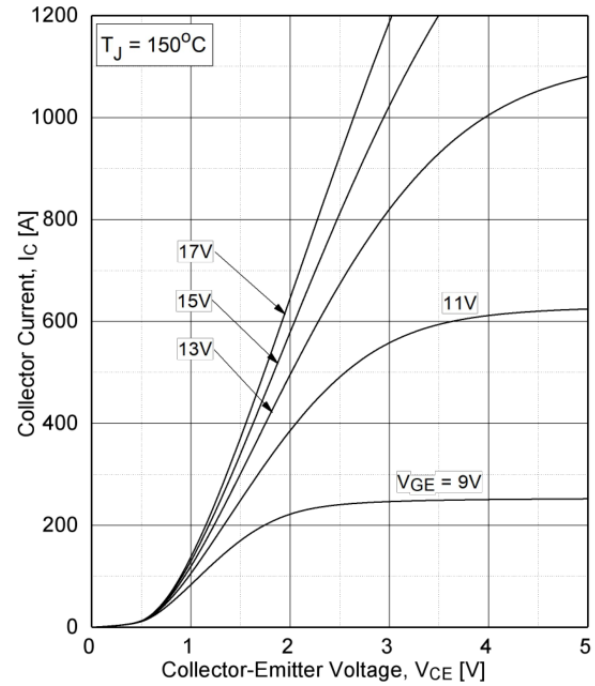


Fig2: Typical output characteristics@150°C

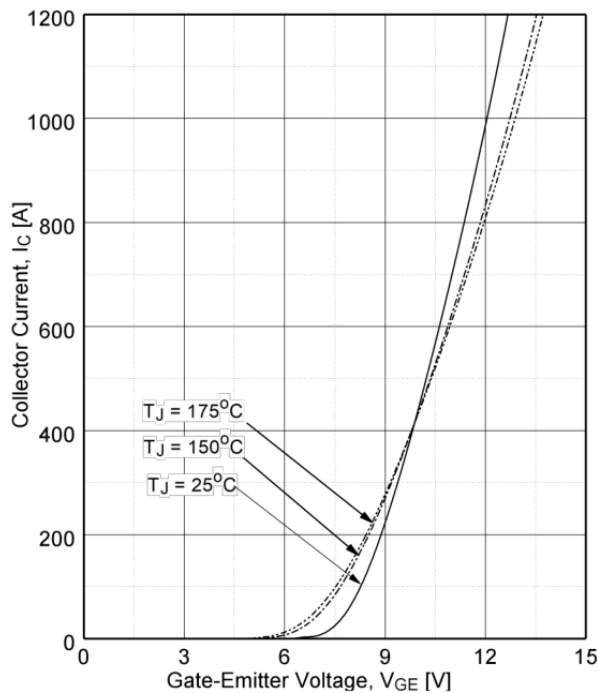


Fig3: IGBT Transfer characteristic

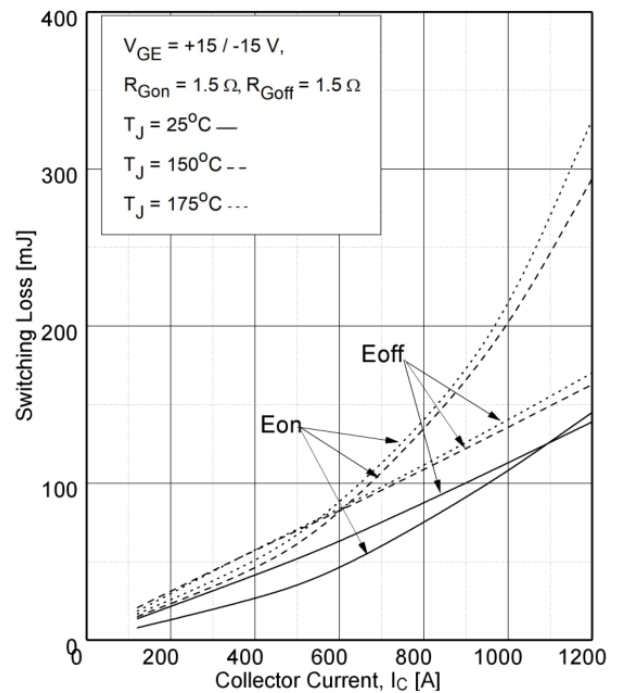


Fig4: IGBT Typical switching loss as Ic

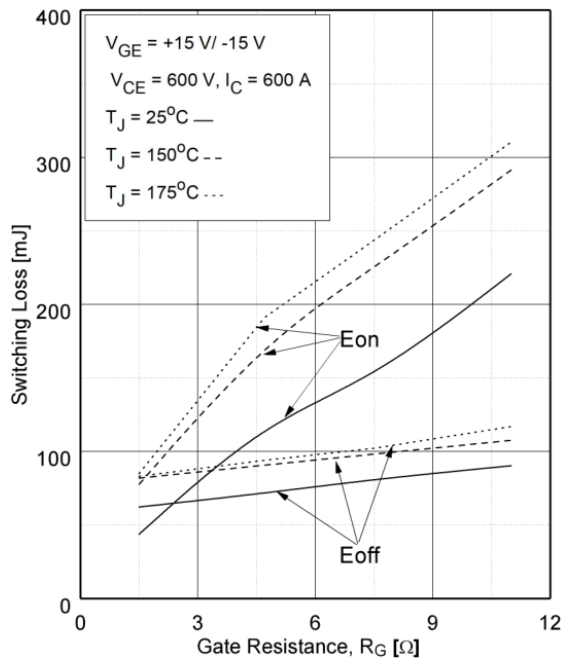


Fig5: Typical switching loss as Rg

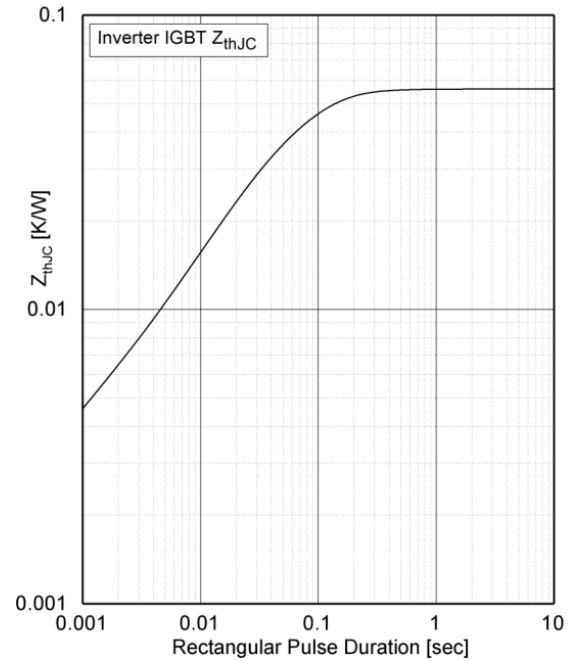


Fig6: IGBT Thermal Impedance

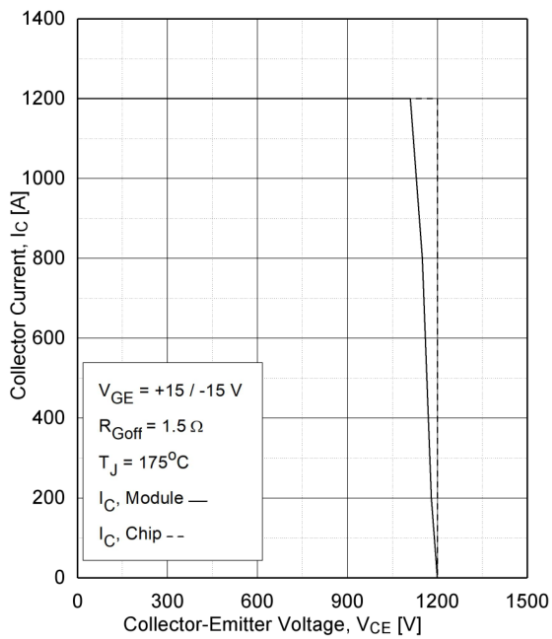


Fig7: Reverse Bias Safe Operation Area

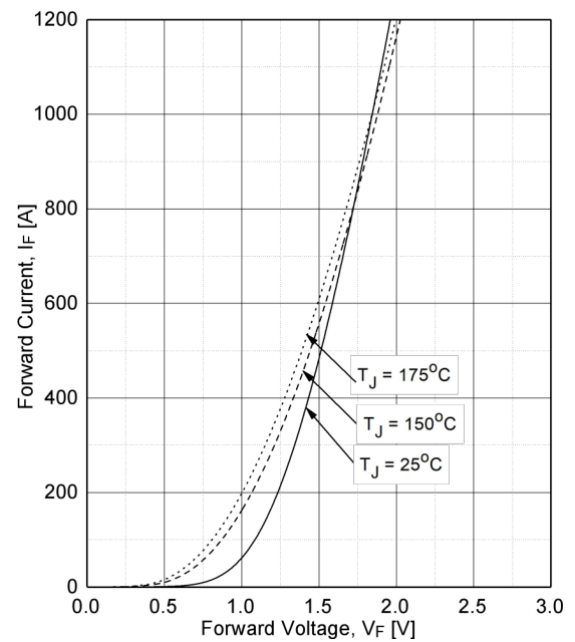
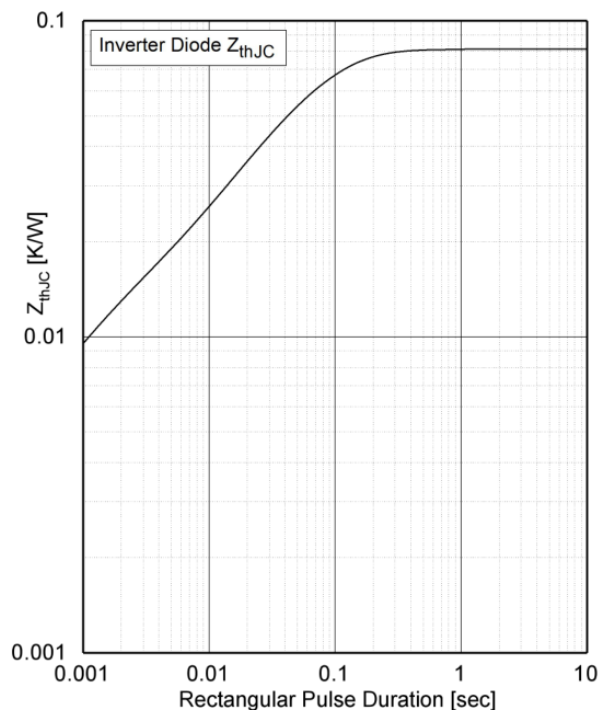
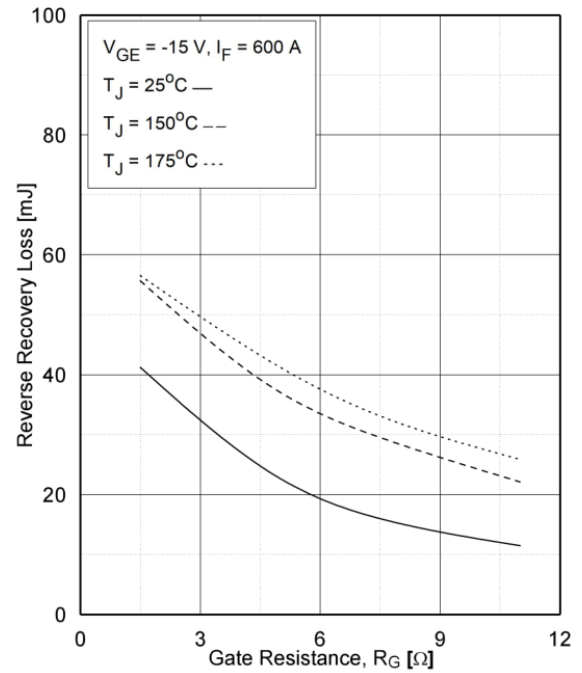
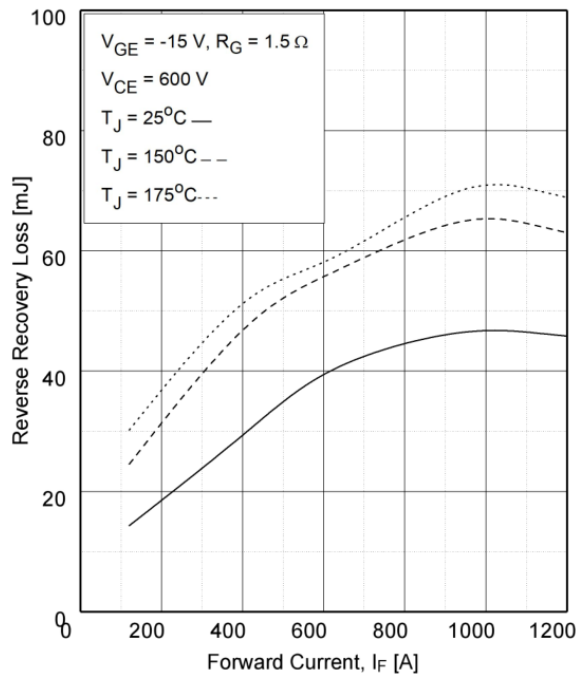


Fig8: Forward Characteristics of Diode



Package Information:

62mm module

