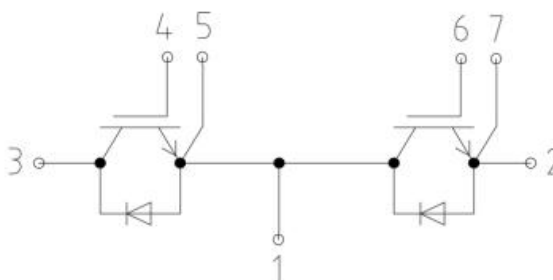


Product Summary

Product Type	V_{CES}	I_c	$V_{CE(sat)}$	Package
ATGM450N120HBAMP	1200V	450A	1.60V	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	$T_c = 100^{\circ}\text{C}$	450	A
Pulse Collector Current	I_{CM}	$t_p = 1\text{ms}$	900	A
Maximum Power Dissipation	P_D	$T_c = 25^{\circ}\text{C}, T_j = 150^{\circ}\text{C}$	2300	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	$T_C = 100^\circ\text{C}$	450	A
Repetitive peak forward Current	I_{FRM}	$t_p = 1\text{ms}$	900	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	$T_C = 25^\circ\text{C}$	0.7	m Ω
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 =450A, V _{GE} =15V	T _J =25 °C		1.60	2.0	V	
			T _J =150 °C		2.00		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			3.7		uC	
Internal gate resistor	R _{Gint}	f=1M,V _{pp} =1V	T _J =25 °C		0.8		Ω	
Input Capacitance	C _{ies}	V _{CE} =25V, V _{GE} =0V f =100kHz	T _J =25 °C		75		nF	
Reverse transfer Capacitance	C _{res}				1.3		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 = 450A V _{GE} =+15V/-15V R _G =1Ω Inductive load	T _J =25 °C		120		ns	
			T _J =150 °C		130		ns	
Rise time	t _r		T _J =25 °C		50		ns	
			T _J =150 °C		60		ns	
Turn-off delay time	t _{d(off)}		T _J =25 °C		400		ns	
			T _J =150 °C		450		ns	
Fall time	t _f		T _J =25 °C		140		ns	
			T _J =150 °C		220		ns	
Turn-on power dissipation	E _{on}		T _J =25 °C		11		mJ	
			T _J =150 °C		18.5		mJ	
Turn-off power dissipation	E _{off}		T _J =25 °C		40		mJ	
			T _J =150 °C		50.5		mJ	

Short Circuit	I_{SC}	$V_{GE}=15V, V_{CC}=800V, t_p<10\mu s, T_j=150^{\circ}C$		1900		A
Thermal Resistance, Junction to Case (per IGBT)	$R_{th(j-c)}$				0.065	$^{\circ}C/W$
Thermal Resistance, Junction to heatsink (per IGBT)	$R_{th(j-h)}$			0.03		$^{\circ}C/W$

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

Item	Symbol	Condition		Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_F	$I_F=450A, V_{GE}=0V$	$T_j=25^{\circ}C$		2.05	2.4	V
			$T_j=150^{\circ}C$		1.95		V
Peak reverse recovery Current	I_{rr}	$V_{rr}=600V, I_F=450A$	$T_j=25^{\circ}C$		490		A
			$T_j=150^{\circ}C$		540		A
Recovered charge	Q_{rr}		$T_j=25^{\circ}C$		40		μC
			$T_j=150^{\circ}C$		71		μC
Reverse recovered energy	E_{rr}		$T_j=25^{\circ}C$		22.5		mJ
			$T_j=150^{\circ}C$		32.5		mJ
Thermal Resistance, Junction to Case (per Diode)	$R_{th(j-c)}$					0.11	$^{\circ}C/W$
Thermal Resistance, Junction to heatsink (per Diode)	$R_{th(j-h)}$				0.06		$^{\circ}C/W$

Characteristics Curve:

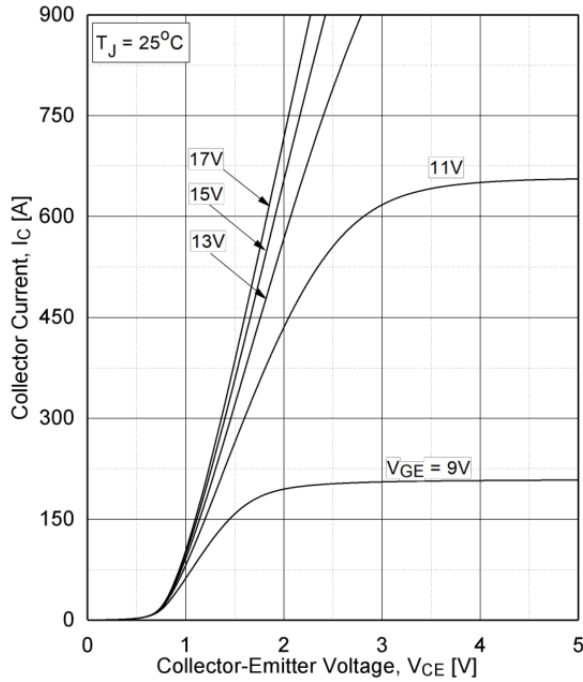


Fig1: Typical output characteristics@25°C

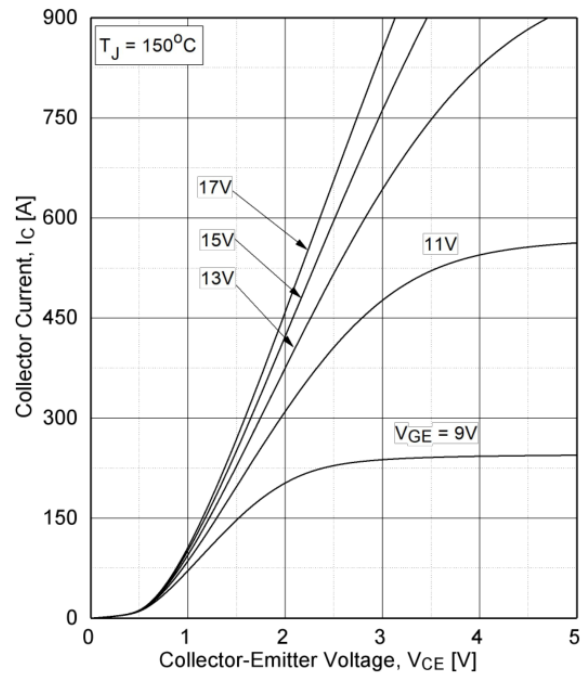


Fig2: Typical output characteristics@150°C

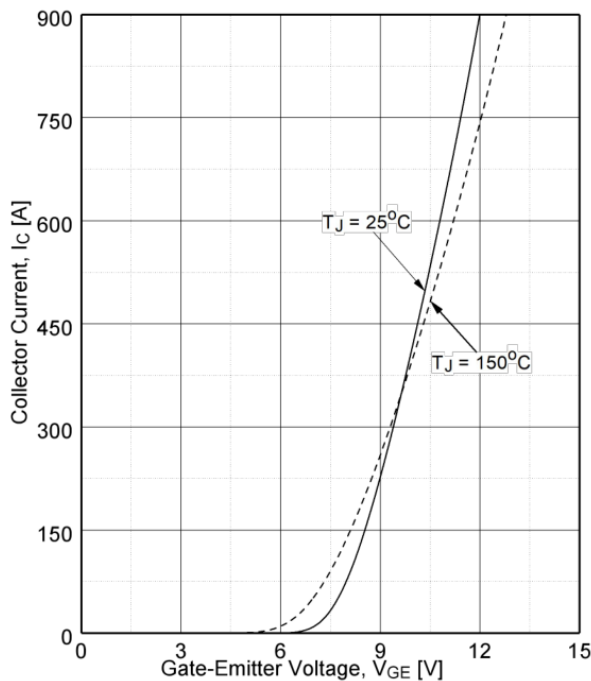


Fig3: IGBT Transfer characteristic

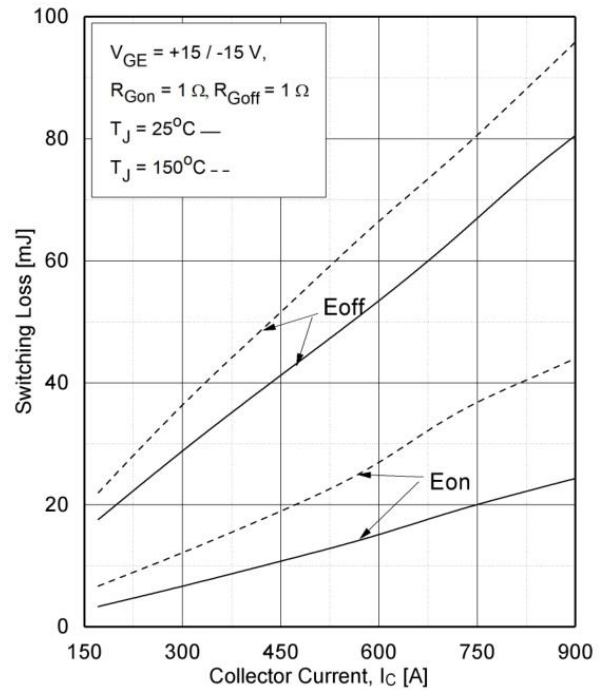
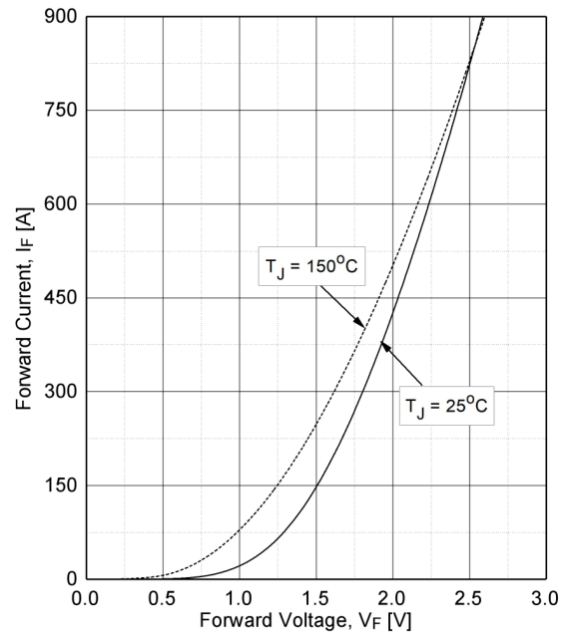
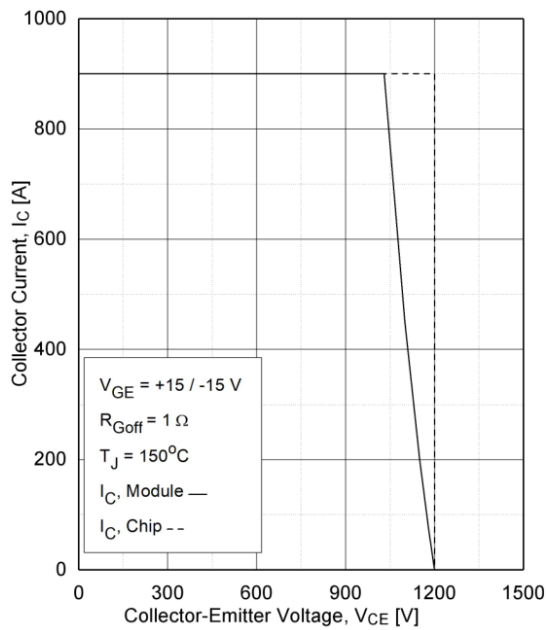
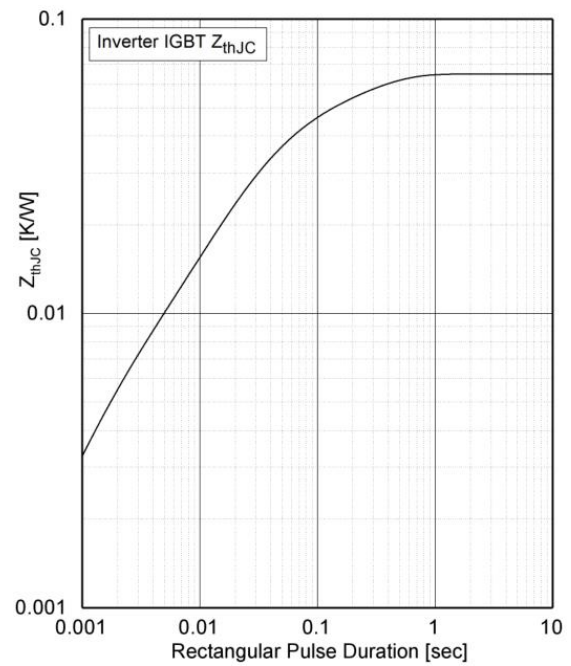
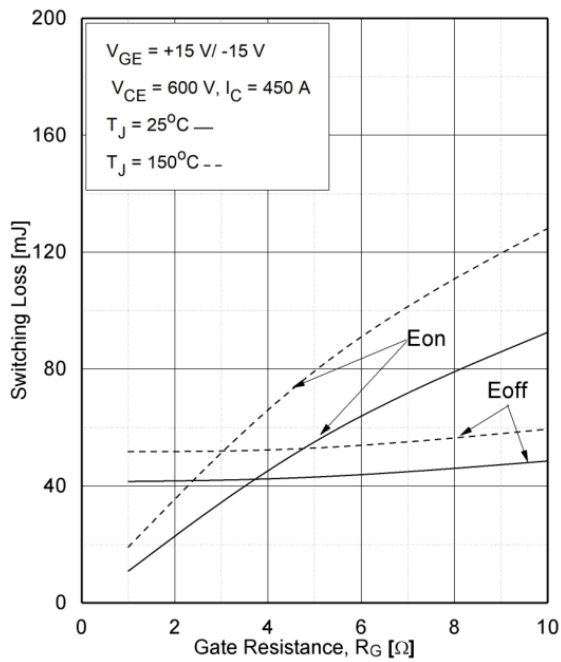
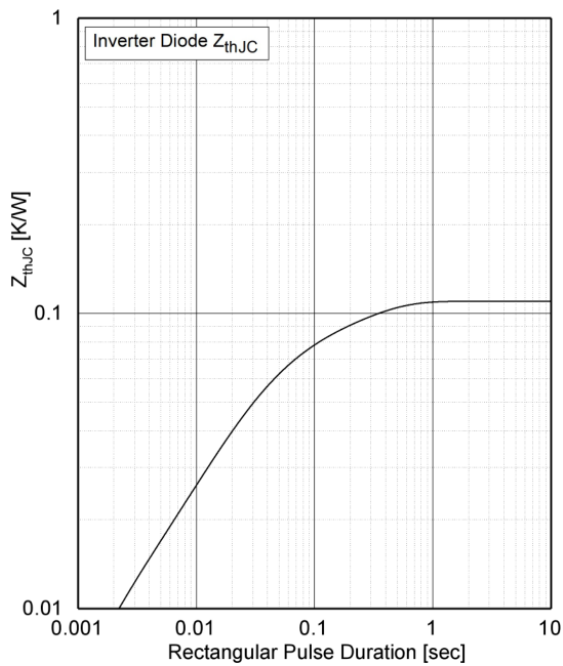
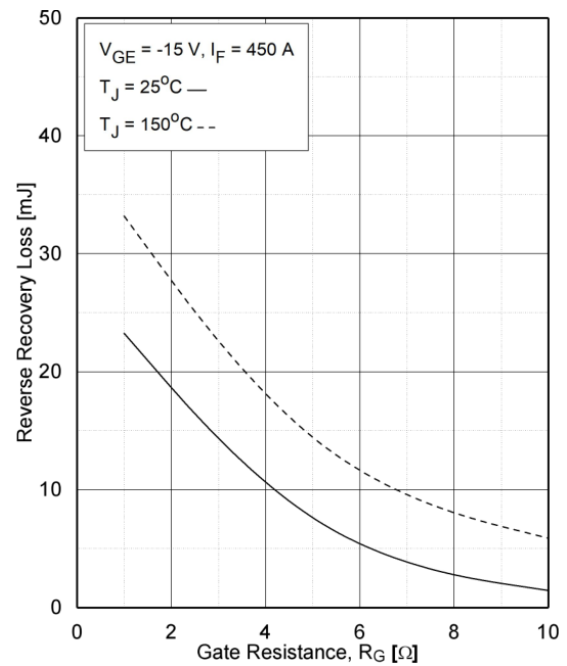
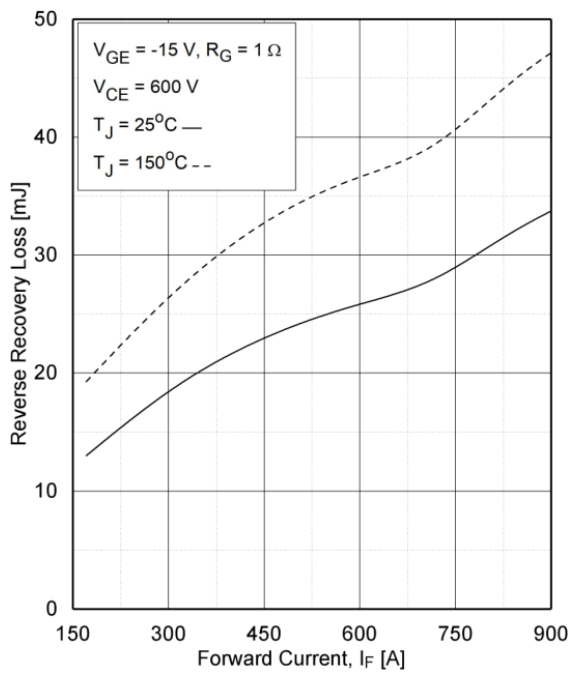


Fig4: IGBT Typical switching loss as Ic





Package Information:

62mm module

