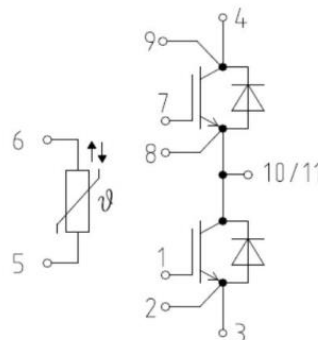


Product Summary

Product Type	V _{CES}	I _c	V _{CE(sat)}	Package
ATGM800N120HBAMW	1200V	800A	1.60V	EcoDual 3



Features

- Positive temperature coefficient for easy paralleling
- Low losses 1200V IGBT half bridge module
- Low inductive design
- T_{jmax} = 150°C
- Short circuit rated

Typical Applications

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

Maximum Ratings (IGBT, T_j=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V _{CES}		1200	V
Gate-Emitter Voltage	V _{GES}		±20V	V
DC Continuous Collector Current	I _c	T _c = 100°C	800	A
Pulse Collector Current	I _{CM}	t _p = 1ms	1600	A
Maximum Power Dissipation	P _D	T _c = 25°C, T _j = 150°C	3565	W
junction temperature	T _j		-40 to 150	°C
Storage temperature	T _{stg}		-40 to 150	°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	$T_C = 100^\circ\text{C}$	800	A
Repetitive peak forward Current	I_{FRM}	$t_p = 1\text{ms}$	1600	A
junction 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, $f = 50\text{Hz}$, $t = 1\text{min}$	3.4	KV
Isolation material		Al_2O_3	
CTI		>200	
Stray Inductance Module		20	nH
Module lead resistance, terminals – chip	$T_C = 25^\circ\text{C}$	0.8	m Ω
Mounting torque for module mounting	M5, M6	3 to 5	Nm
Weight		345	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	$V_{CE(sat)}$	$I_C=800A$, $V_{GE}=15V$	$T_j=25\text{ }^{\circ}C$		1.6	2.0	V
			$T_j=150\text{ }^{\circ}C$		1.95		V
Gate-Emitter threshold Voltage	$V_{GE(th)}$	$I_C=10mA$, $V_{CE}=V_{GE}$		5.0	5.7	6.6	V
Gate charge	Q_G	$V_{GE}=-15V$ to $+15V$			5.4		μC
Internal gate resistor	R_{Gint}	$f=1M$, $V_{pp}=1V$	$T_j=25\text{ }^{\circ}C$		0.8		Ω
Input Capacitance	C_{ies}	$V_{CE}=25V$, $V_{GE}=0V$	$T_j=25\text{ }^{\circ}C$		94		nF
Reverse transfer Capacitance	C_{res}	$f=100kHz$			0.82		nF
Collector- Emitter Cut off Current	I_{CES}	$V_{CE}=1200V$, $V_{GE}=0V$	$T_j=25\text{ }^{\circ}C$			1	mA
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=20V$, $V_{GE}=0V$	$T_j=25\text{ }^{\circ}C$			500	nA
Turn-on delay time	$t_{d(on)}$	$V_{CE}=600V$ $I_C=800A$ $V_{GE}=+15V/-15V$ $R_G=1.0\Omega$ Inductive load	$T_j=25\text{ }^{\circ}C$		180		ns
			$T_j=150\text{ }^{\circ}C$		180		ns
Rise time	t_r		$T_j=25\text{ }^{\circ}C$		110		ns
			$T_j=150\text{ }^{\circ}C$		110		ns
Turn-off delay time	$t_{d(off)}$		$T_j=25\text{ }^{\circ}C$		520		ns
			$T_j=150\text{ }^{\circ}C$		535		ns
Fall time	t_f		$T_j=25\text{ }^{\circ}C$		185		ns
			$T_j=150\text{ }^{\circ}C$		295		ns
Turn-on power dissipation	E_{on}		$T_j=25\text{ }^{\circ}C$		45.5		mJ
			$T_j=150\text{ }^{\circ}C$		81.5		mJ
Turn-off power dissipation	E_{off}		$T_j=25\text{ }^{\circ}C$		88		mJ
			$T_j=150\text{ }^{\circ}C$		112		mJ
Short Circuit	I_{SC}	$V_{GE}=15V$, $V_{CC}=800V$, $t_p<10\mu s$, $T_j=150^{\circ}C$			2900		A

Thermal Resistance, Junction to Case (per IGBT)	$R_{th(j-c)}$			0.038		°C/W
Thermal Resistance, Junction to heatsink (per IGBT)	$R_{th(j-h)}$			0.03		°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	$I_F = 800A$, $V_{GE} = 0V$	$T_j = 25\text{ °C}$	1.75	2.00	V
			$T_j = 150\text{ °C}$	1.80		V
Peak reverse recovery Current	I_{rr}	$V_{rr} = 600V$, $I_F = 800A$	$T_j = 25\text{ °C}$	470		A
			$T_j = 150\text{ °C}$	512		A
Recovered charge	Q_{rr}		$T_j = 25\text{ °C}$	75.5		uC
			$T_j = 150\text{ °C}$	138		uC
Reverse recovered energy	E_{rr}		$T_j = 25\text{ °C}$	34.5		mJ
			$T_j = 150\text{ °C}$	55.6		mJ
Thermal Resistance, Junction to Case (per Diode)	$R_{th(j-c)}$			0.065		°C/W
Thermal Resistance, Junction to heatsink (per Diode)	$R_{th(j-h)}$			0.05		°C/W

NTC Electrical characteristics (T_j =25°C unless otherwise specified)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Rated resistance	R_{25}	$T_c = 25\text{ °C}$		5		k Ω
Deviation of R_{100}	$\Delta R/R$	$R_{100} = 493\text{ Ω}$ $T_{NTC} = 100\text{ °C}$	-5		5	%
Power dissipation	P_{25}	$T_c = 25\text{ °C}$			20	mW
B-value	$B_{25/50}$	$R_2 = R_{25} \exp [B_{25/50} (1/T_2 - 1/(298.15\text{ K}))]$		3375		

Characteristics Curve:

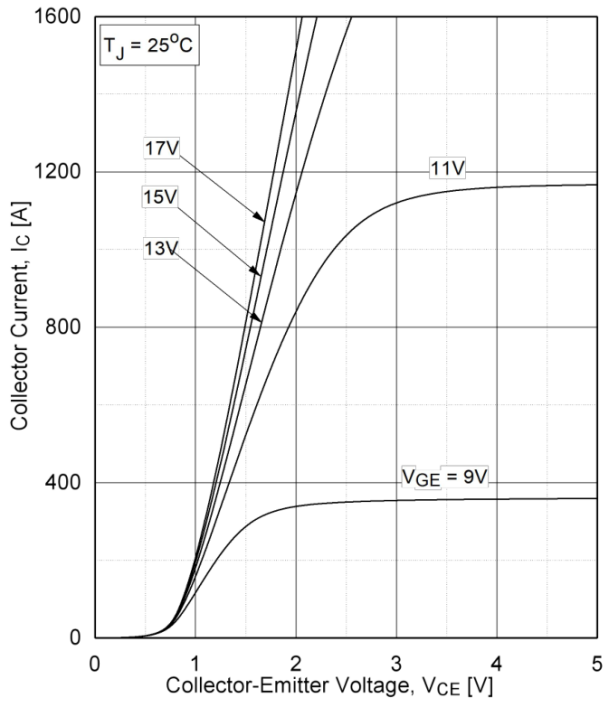


Fig1: Typical output characteristics@25°C

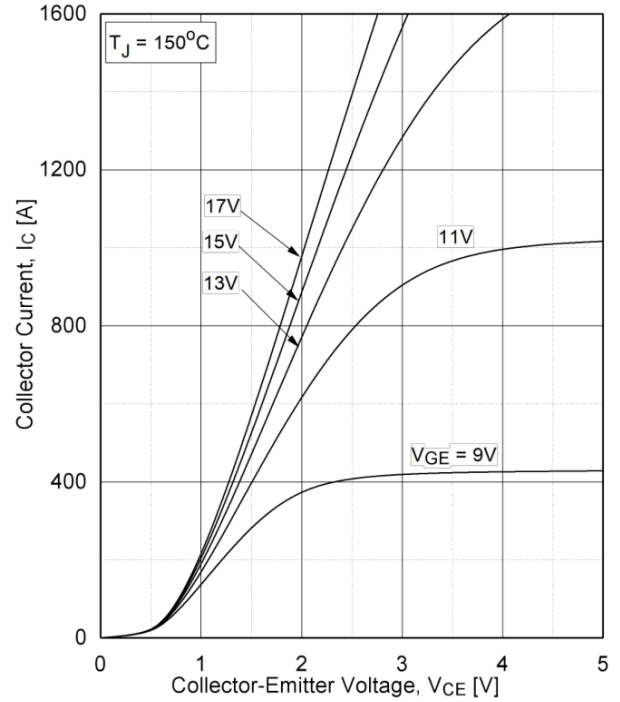


Fig2: Typical output characteristics@150°C

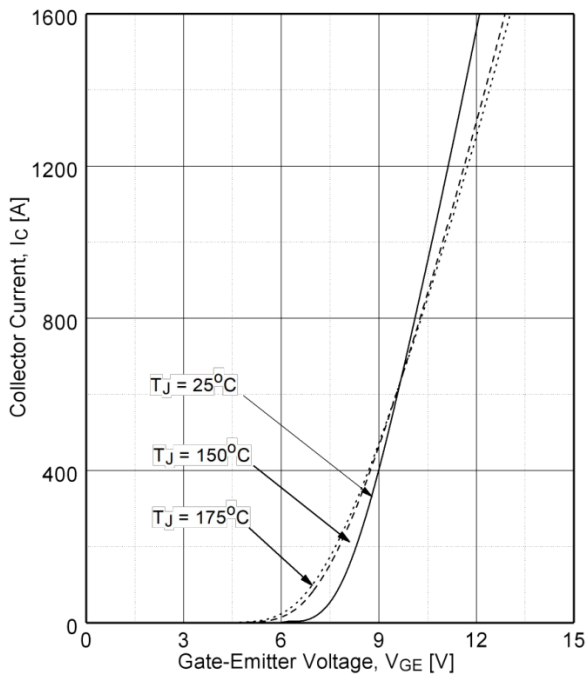


Fig3: IGBT Transfer characteristic

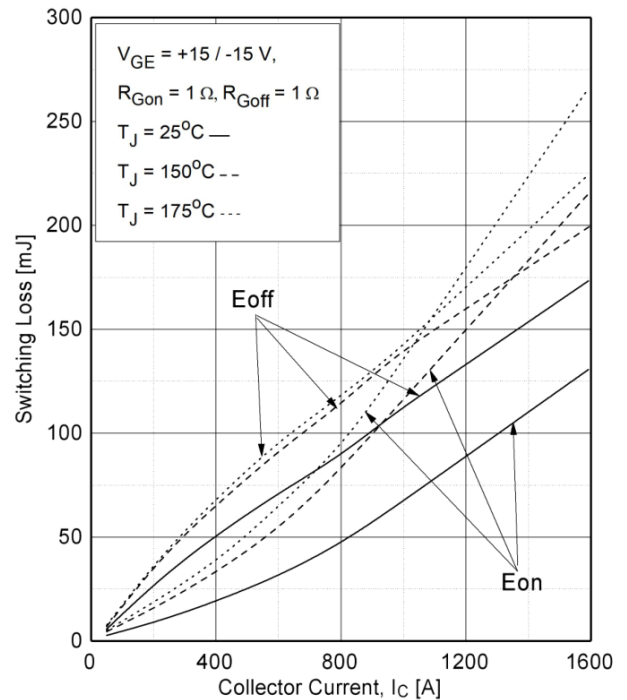
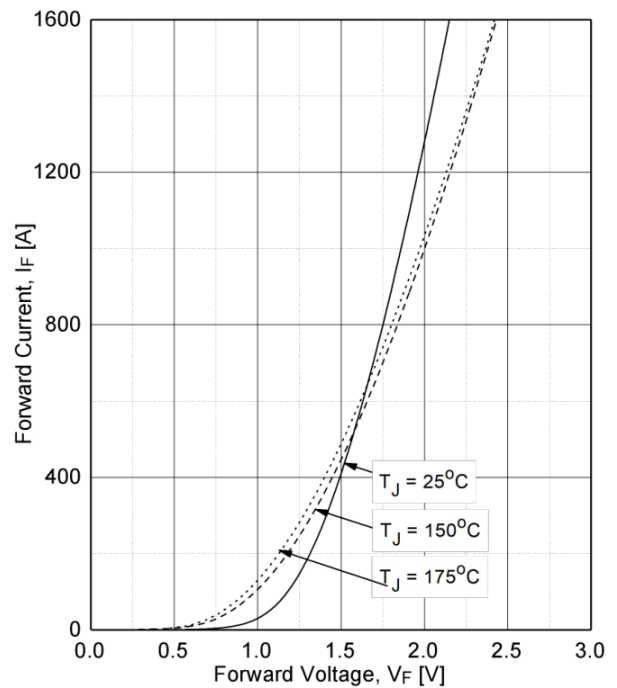
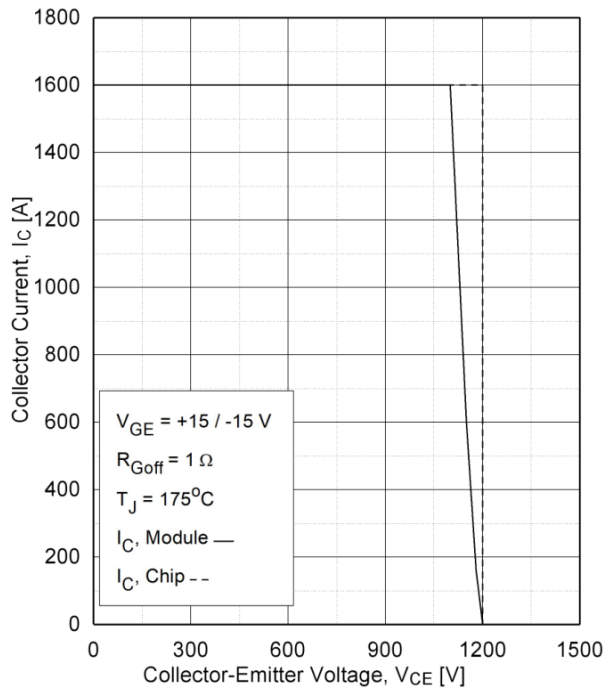
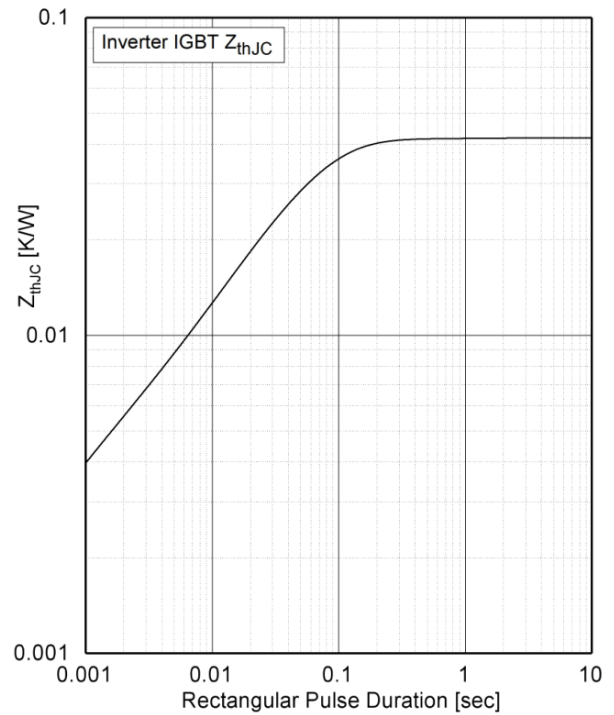
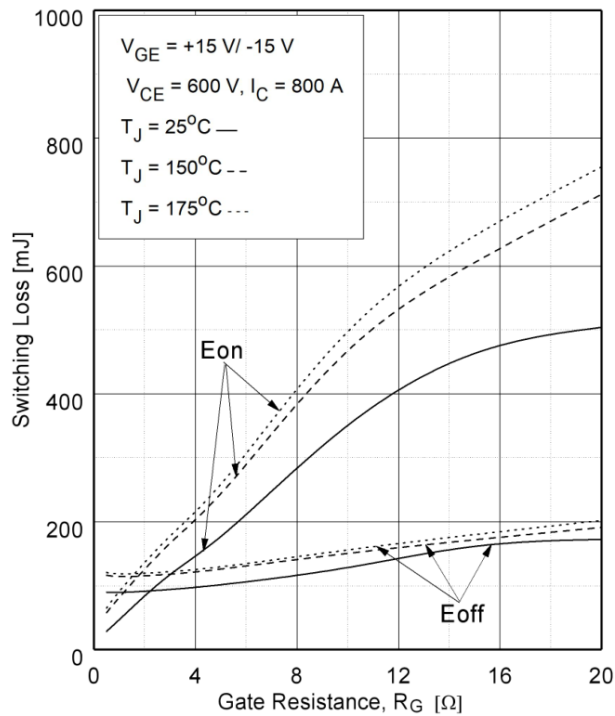


Fig4: IGBT Typical switching loss as Ic



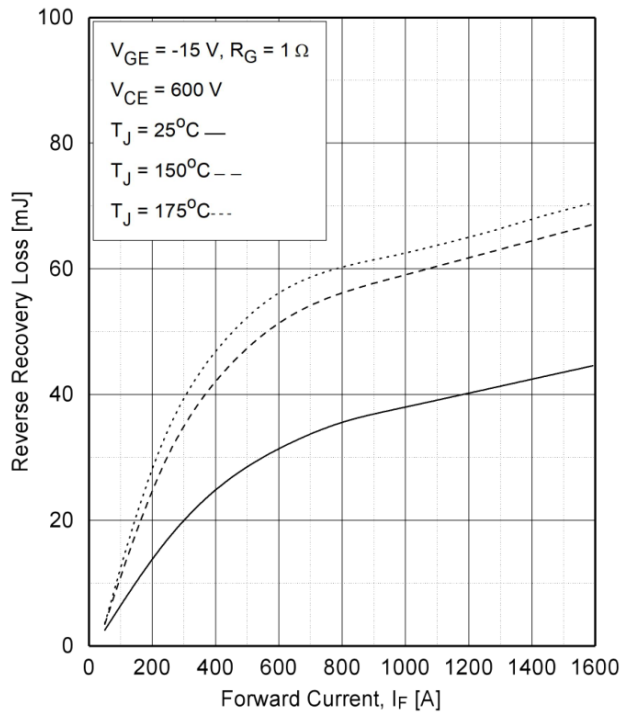


Fig9: Diode Switching loss as I_F

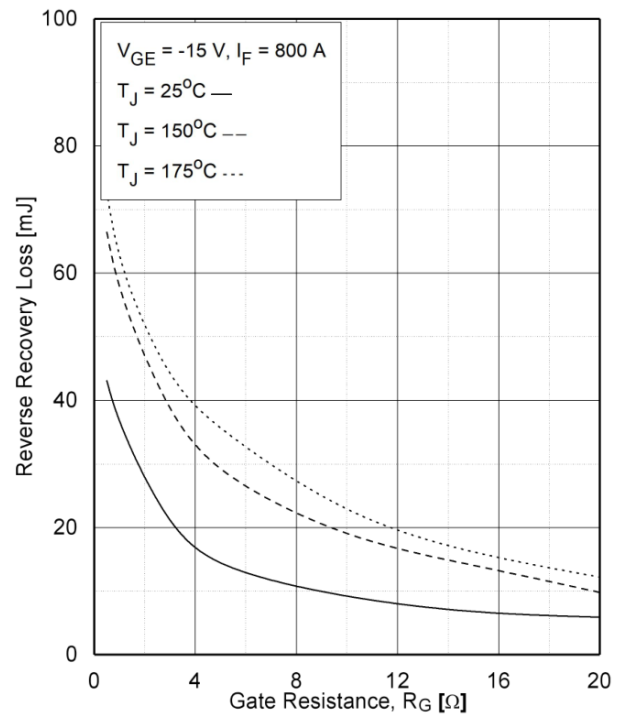


Fig10: Diode switching loss as R_g

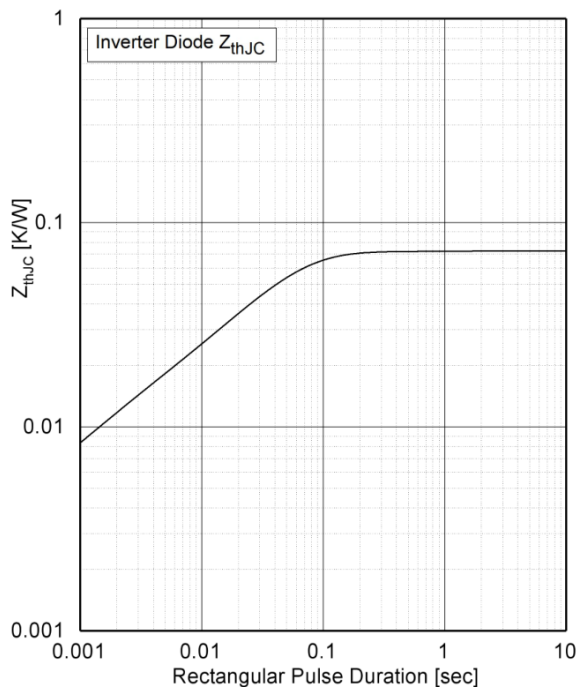


Fig11: Diode Thermal Impedance

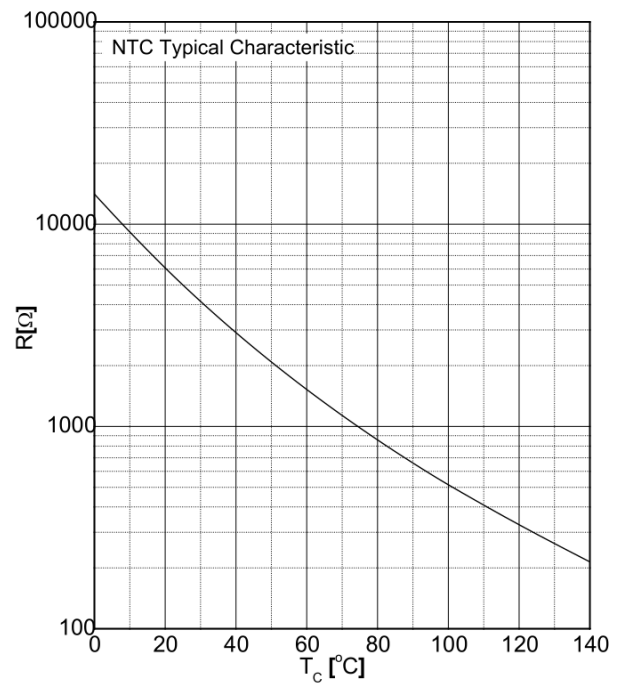
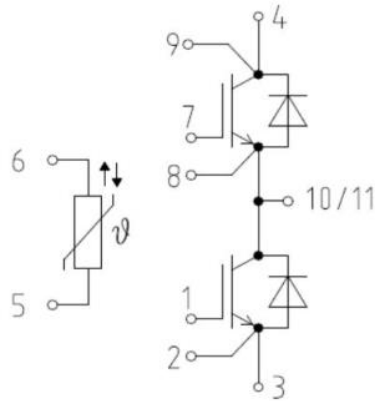


Fig12: NTC Characteristics

Package Information:

EcoDual 3 module



Dimensions in Millimeters

