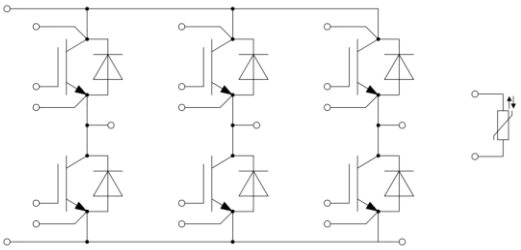
Product Summary

Product Type	V_{CES}	I_c	$V_{CE(sat)}$	Package
ATGM550N75SPAEP	750V	550A	1.48V	EV Pack



Features

- Low conduction loss
- Low switching loss
- Short circuit capability
- Untra fast & soft recovery anti-parallel diode
- Cu plate module package

Typica Applications

- Motor drive
- Inverter
- Energy storage system
- EV Motor drive

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

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}		750	V
Gate-Emitter Voltage	V_{GES}		±20V	V
DC Continuous Collector Current	I_C	T_C =100°C	550	A
Pulse Collector Current	I_{CM}	t_p =1ms	1100	A
Maximum Power Dissipation	P_D	T_C =25°C, T_j =150°C	1000	W
junction temperature	T_j		-40 to 150	°C
Storage temperature	T_{stg}		-40 to 125	°C

Maximum Ratings (Freewheeling diode, Tj =25°C unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Peak Repetitive Revers Voltage	V_{RRM}		750	V
Diode forward Current	I_F	T_C =100°C	550	A
Repetitive peak forward Current	I_{FRM}	t_p =1ms	1100	A
junction temperature	T_j		-40 to 150	°C
Storage temperature	T_{stg}		-40 to 125	°C

Module information

Parameter	Conditions	Value	Unit
Isolation Voltage	RMS, f = 50Hz, t =1.2sec	4500	V
	RMS, f = 50Hz, t =1min	2500	V
Stray Inductance		30	nH
module baseplate		Cu	
CTI		>200	
DBC material		Al_2O_3	
Mounting torque for module mounting	M5/M6	3 to 6	Nm
Weight		485	g

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

Parameter	Symbol	conditions		Min	Typ	Max	Unit
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=550A, V_{GE}=15V	T_j=25 °C		1.48	2.1	V
			T_j=150 °C		1.70		V
Gate-Emitter threshold Voltage	$V_{GE(th)}$	I_C =6mA, V_{CE} =V_{GE}		5.0	5.7	6.5	V
Gate charge	Q_G	V_{GE} = -15V to +15V			3640		nC
Internal gate resistor	R_G				1.65		Ω
Collector- Emitter Cut off Current	I_{CES}	V_{CE} =750V, 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
Input capacitance	C_{ies}	f=1MHz, V_{CE}=25V, V_{GE}=0V			81.6		nF
Reverse transfer capacitance	C_{res}				0.72		nF
Turn-on delay time	$t_{d(on)}$	V_{CE} =350V I_C = 550A V_{GE} =+15V/-8V R_G =1.5Ω Inductive load	T_j=25 °C		0.06		us
			T_j=150 °C		0.06		us
Rise time	t_r		T_j=25 °C		0.13		us
			T_j=150 °C		0.14		us
Turn-off delay time	$t_{d(off)}$		T_j=25 °C		1.18		us
			T_j=150 °C		1.26		us
Fall time	t_f		T_j=25 °C		0.16		us
			T_j=150 °C		0.21		us
Turn-on power dissipation	E_{on}		T_j=25 °C		0.1		mJ
			T_j=150 °C		2.1		mJ
Turn-off power dissipation	E_{off}		T_j=25 °C		47.1		mJ
			T_j=150 °C		51.8		mJ

Short circuit current	I_{SC}	V_{GE} = 15 V,V_{CC} = 350 V t_P = 5 µs, T_{vj} = 150°C			5400	A
Thermal resistance, junction-cooling fluid	R_{thJF}				0.15	K/W

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

Item	Symbol	Condition		Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_F	I_F =550A, V_{GE} =0V	T_j=25 °C		1.44	2.0	V
			T_j=150 °C		1.46		V
Peak reverse recovery Current	I_{rr}	I_F = 550A, V_R = 350V V_{GE} = -15V , -di_F/dt = 2720 A/µs $R_{G(on)}$ = 1.5Ω (Tvj = 150°C)	T_j=25 °C		262		A
			T_j=150 °C		312		A
Recovered charge	Q_{rr}		T_j=25 °C		34.6		uC
			T_j=150 °C		50.4		uC
Reverse recovered energy	E_{rr}		T_j=25 °C		9.43		mJ
			T_j=125 °C		14		mJ
Thermal resistance, junction-cooling fluid	R_{thJF}					0.3	°C/W

NTC characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Rated Resistance	R_{25}	T_c=25 °C		5.0		KΩ
Deviation for R100	△R/R	T_c=25 °C, R_{100}=493Ω	-5		5	%
Power dissipation	P_{25}	T_c=25 °C		20		mW
B value	$B_{25/50}$	Calculated from resistance value at 25°C and 50°C		3375		K

Characteristics Curve:

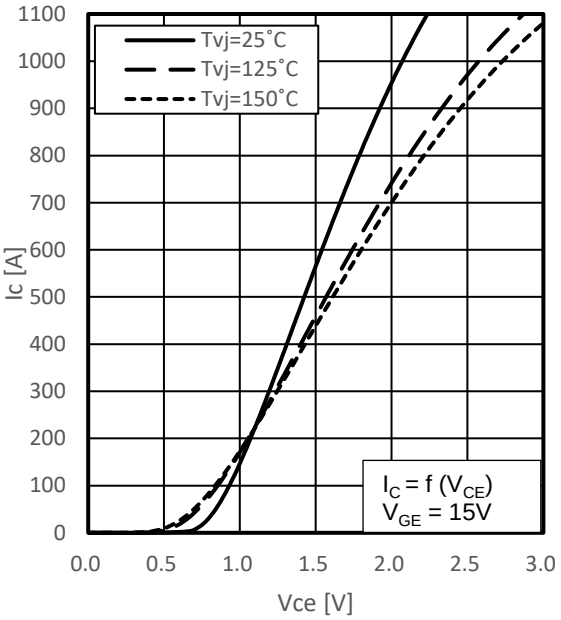


Fig1: Typical output characteristics,

I_C vs V_{CE} vs Temperature

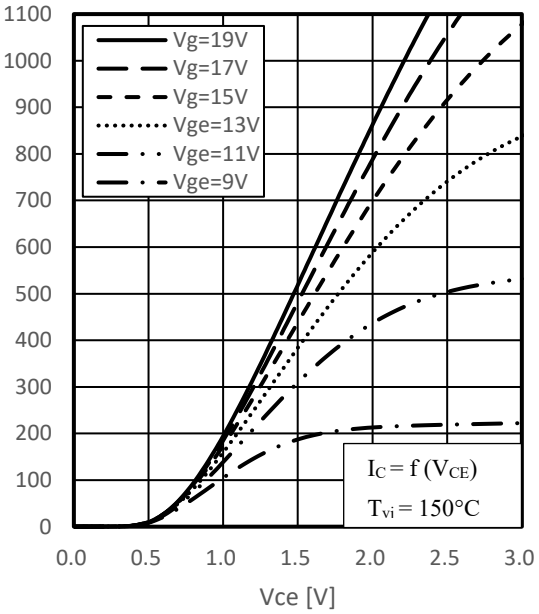


Fig2: Typical output characteristics,

I_C vs V_{CE} vs Gate voltage

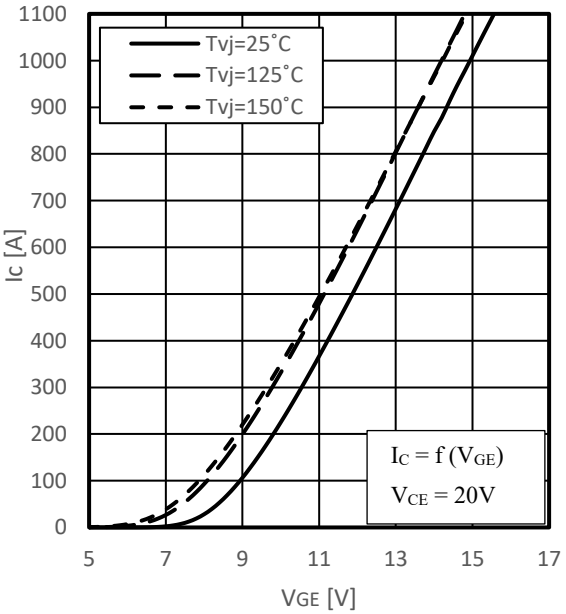


Fig3: Transfer characteristic

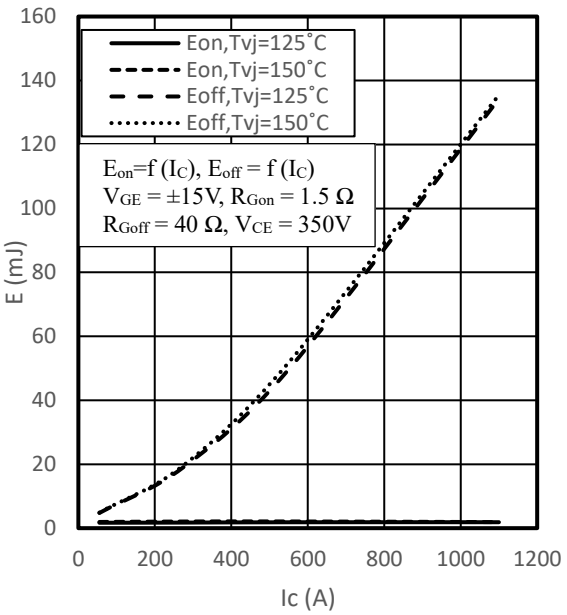


Fig4: Typical switching loss as Tj, IGBT

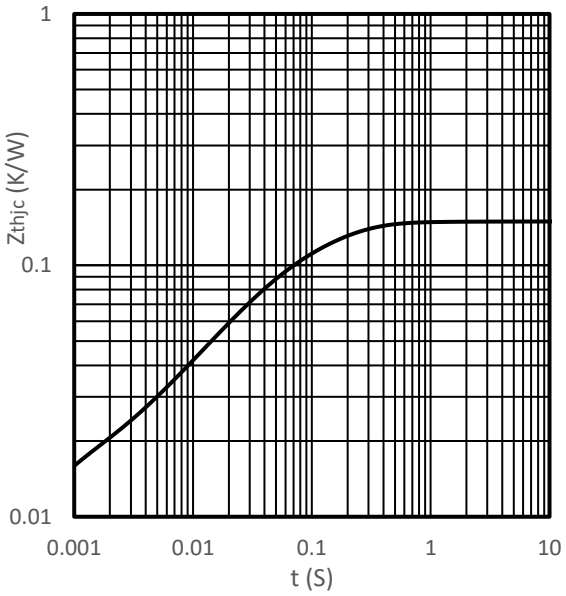


Fig 5: Typical thermal impedance, IGBT

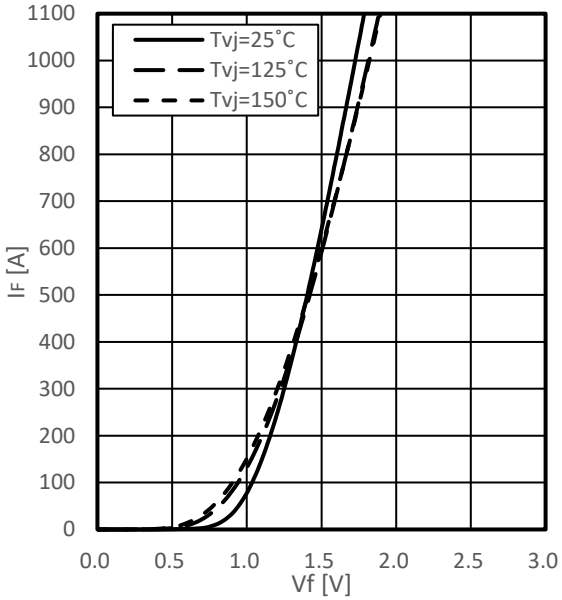


Fig 6: Forward characterization, Diode

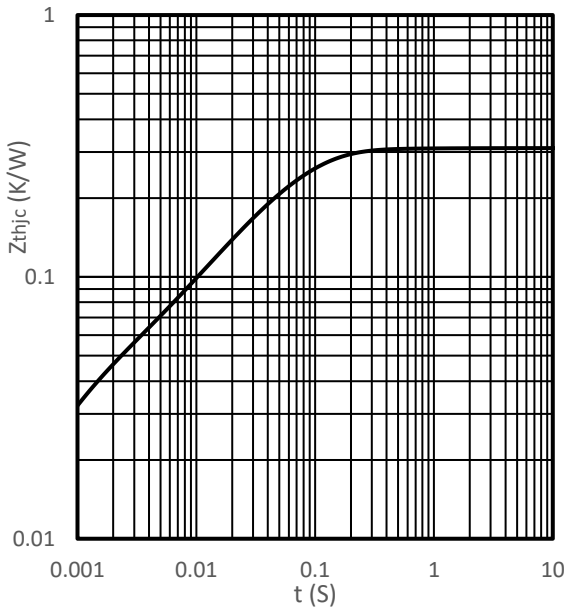


Fig 7: Typical thermal impedance, Diode

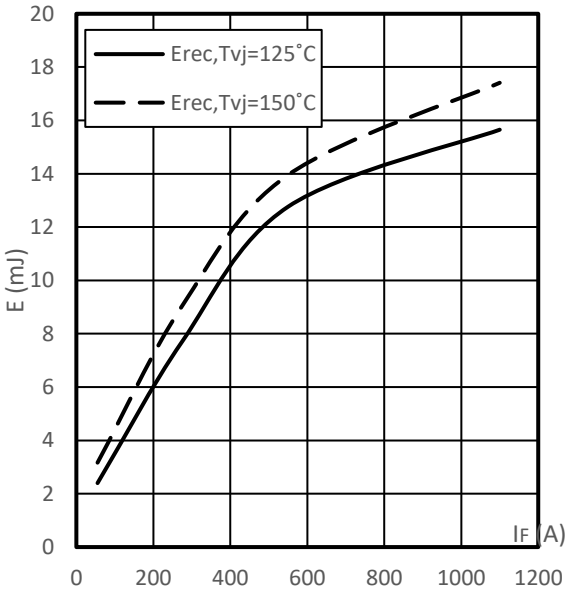


Fig 8: Switching loss, Diode

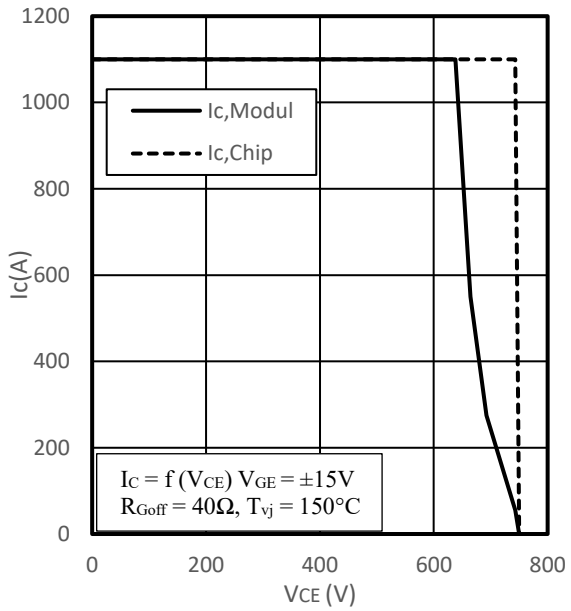


Fig 9: Reverse bias safe operating area IGBT RBSOA

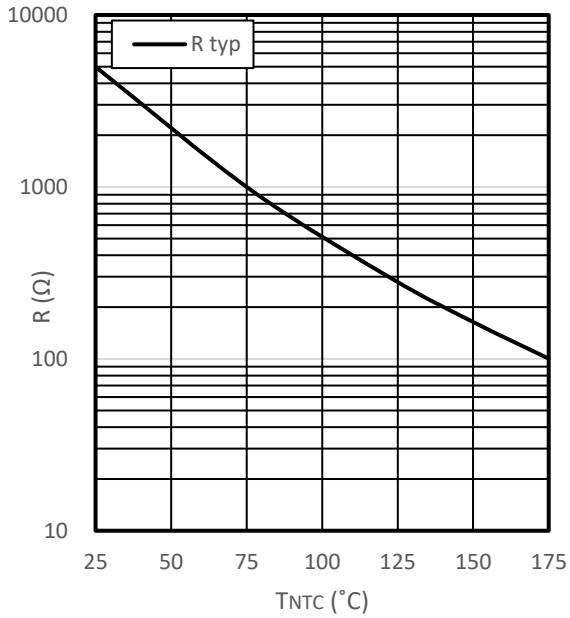


Fig 10: NTC-Thermistor-temperature characteristic

Package Information: EV Pack