DACO

DAHF800G120SB2

IGBT Power Module
1200V / 800A

Preliminary

Features

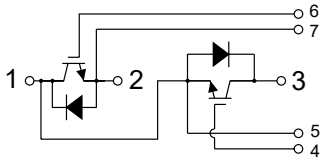
- 62mm Fast Switching / Trench Field Stop IGBT Technology
- Low Switching Losses
- Super Fast Diodes
- High Short Circuit Capability

Applications

- Welder / Power Supply
- UPS / Inverter
- Industrial Motor Drive

HDA-10662

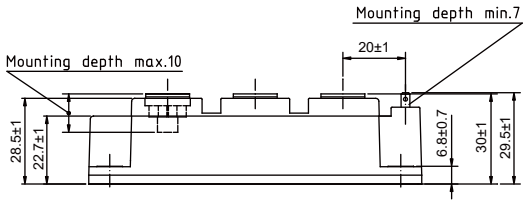
Circuit Diagram Headline

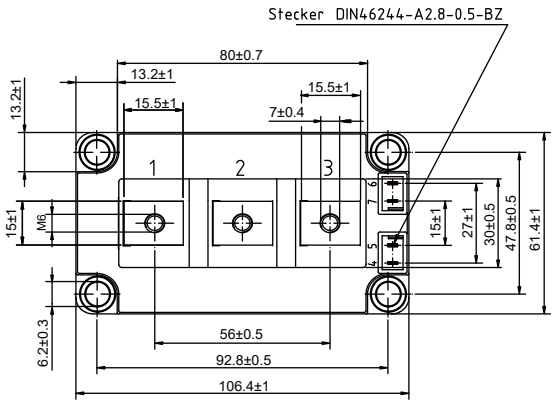


Maximum Ratings (T_C= 25℃)

Item		Symbol	Rated Value	Unit
Collector-Emitter Voltage	T_{VJ} = 25℃	V_{CES}	1200	V
Gate-Emitter Peak Voltage		V_{GES}	±20	V
Continuous DC Collector Current	Tc = 90℃ $T_{VJ\ max.}$ = 175℃	I_{CDC}	800	A
Repetitive Peak Collector Current	tp =1ms	I_{CRM}	1600	A
Total Power Dissipation		P_{tot}	3450	W
Isolation Voltage	RMS, f=50Hz, t=1min	V_{iso}	3000	V
Max. Junction Temperature		$T_{VJ\ max.}$	175	℃
Temperature Under Switching Conditions		$T_{VJ\ op}$	−40～+150	℃
Storage Temperature		T_{stg}	−40～+125	℃
Mounting Torque	Module Base to Heatsink (M6)		3～6	N.m
	Busbar to Terminal (M6)		2.5～5	

Package Outlines





Dimensions in mm (1 mm = 0.0394")

■ Electrical Characteristics

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$V_{CE\ sat}$	I_C =800A, V_{GE} =15V	T_{vj} =25℃		1.85	2.15	V
	I_C =800A, V_{GE} =15V	T_{vj} =125℃		2.15		
V_{GEth}	I_C =5.3mA, V_{CE} =V_{GE}, T_{vj} =25℃		4.8	5.3	5.8	V
Q_G	I_C =800A, V_{CE} =600V,V_{GE} =15V			2411		nC
R_{Gint}	T_{vj} =25°C			0.6		Ω
C_{ies}	f = 100KHz, T_{vj} =25℃, V_{CE} =25V, V_{GE} =0V			94.6		nF
C_{oes}	f = 100KHz, T_{vj} =25℃, V_{CE} =25V, V_{GE} =0V			2.73		nF
C_{res}	f = 100KHz, T_{vj} =25℃, V_{CE} =25V, V_{GE} =0V			0.472		nF
I_{CES}	V_{CE} =1200V, V_{GE} =0V, T_{vj} =25℃				5	mA
I_{GES}	V_{CE} =0V, V_{GE} =20V, T_{vj} =25℃				400	nA
$t_{d\ on}$	I_C =800A, V_{CE} =600V	T_{vj} =25℃		540		ns
	V_{GE} = ±15V	T_{vj} =125℃		552		
	$R_{G(on)}$ =2.2Ω, $R_{G(off)}$ =2.2Ω	T_{vj} =150℃		544		
t_r	I_C =800A, V_{CE} =600V	T_{vj} =25℃		144		ns
	V_{GE} = ±15V	T_{vj} =125℃		148		
	$R_{G(on)}$ =2.2Ω, $R_{G(off)}$ =2.2Ω	T_{vj} =150℃		164		
$t_{d\ off}$	I_C =800A, V_{CE} =600V	T_{vj} =25℃		388		ns
	V_{GE} = ±15V	T_{vj} =125℃		412		
	$R_{G(on)}$ =2.2Ω, $R_{G(off)}$ =2.2Ω	T_{vj} =150℃		426		
t_f	I_C =800A, V_{CE} =600V	T_{vj} =25℃		154		ns
	V_{GE} = ±15V	T_{vj} =125℃		180		
	$R_{G(on)}$ =2.2Ω, $R_{G(off)}$ =2.2Ω	T_{vj} =150℃		184		
E_{on}	I_C =800A, V_{CE} =600V	T_{vj} =25℃		15.2		mJ
	V_{GE} = ±15V	T_{vj} =125℃		22.1		
	$R_{G(on)}$ =2.2Ω, $R_{G(off)}$ =2.2Ω	T_{vj} =150℃		28		
E_{off}	I_C =800A, V_{CE} =600V	T_{vj} =25℃		52.8		mJ
	V_{GE} = ±15V	T_{vj} =125℃		57.8		
	$R_{G(on)}$ =2.2Ω, $R_{G(off)}$ =2.2Ω	T_{vj} =150℃		60		
I_{SC}	V_{GE} ≤15V, V_{CC} =800V V_{CEmax} =V_{CES} - L_{sCE} ·di/dt	t_P ≤8μs, T_{vj} =150℃		3000		A
R_{thJC}	per IGBT				0.043	℃/W
R_{thCH}	per IGBT			0.0251		℃/W

■ Diode Ratings & Characteristics

Characteristics	Symbol	Test Conditions	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	T_{vj} =25°C	1200	V
Continuous DC forward current	I_F		800	A
Repetitive peak forward current	I_{FRM}	t_P =1ms	1600	A
I^2t - value	I^2t	V_R =0V, t_P =10ms, T_{vj} =125°C	53000	A^2s
		V_R =0V, t_P =10ms, T_{vj} =175°C	41000	

Characteristics	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
Forward voltage	V_F	I_F =800A, V_{GE} =0V	T_{vj} =25°C		2.2	2.35	V
		I_F =800A, V_{GE} =0V	T_{vj} =125°C		1.9		
Peak reverse recovery current	I_{RRM}	I_F =800A, -di_F/dt =4800A/µs	T_{vj} =25°C		340		A
		V_R =600V	T_{vj} =125°C		520		
		V_{GE} = ±15V	T_{vj} =150°C		580		
Recovered charge	Qrr	I_F =800A, -di_F/dt =4800A/µs	T_{vj} =25°C		36110		nC
		V_R =600V	T_{vj} =125°C		83160		
		V_{GE} = ±15V	T_{vj} =150°C		99210		
Reverse recovery energy	Erec	I_F =800A, -di_F/dt =4800A/µs	T_{vj} =25°C		11.1		mJ
		V_R =600V	T_{vj} =125°C		24.2		
		V_{GE} = ±15V	T_{vj} =150°C		28.1		
Reverse Recovery Time	Trr	I_F =800A, -di_F/dt =4800A/µs, V_R =600V, V_{GE} = ±15V T_{vj}=25°C			202		ns
Thermal resistance, junction to case	R_{thJC}	per diode				0.0892	°C/W
Thermal resistance, case to heatsink	R_{thCH}	per diode			0.0333		°C/W
Temperature under switching conditions	$T_{vj\ op}$			-40		150	°C

■ Module Ratings & Characteristics

Characteristics	Symbol	Test Conditions	Value	Unit
Material of module baseplate			Cu	
Internal isolation		basic insulation (class 1, IEC 61140)	Al_2O_3	
Creepage distance		terminal to heatsink	29	mm
		terminal to terminal	23	
Clearance		terminal to heatsink	23	mm
		terminal to terminal	11	
Comperative tracking index	CTI		>400	

Typical Characteristics

Preliminary Data

Fig.1 Output characteristic IGBT,Inverter (typical)

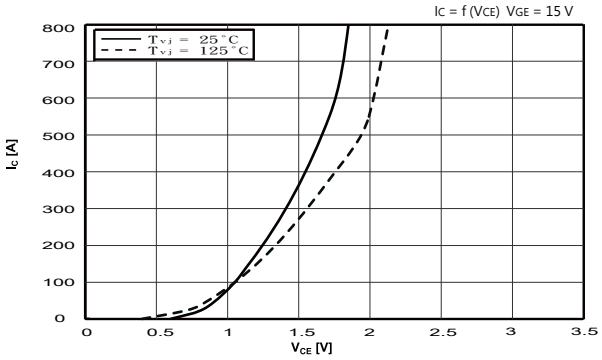


Fig.2 Output characteristic IGBT,Inverter (typical)

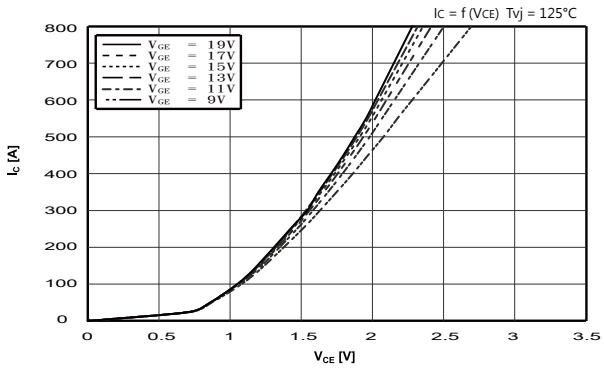


Fig.3 Transfer characteristic IGBT,Inverter (typical)

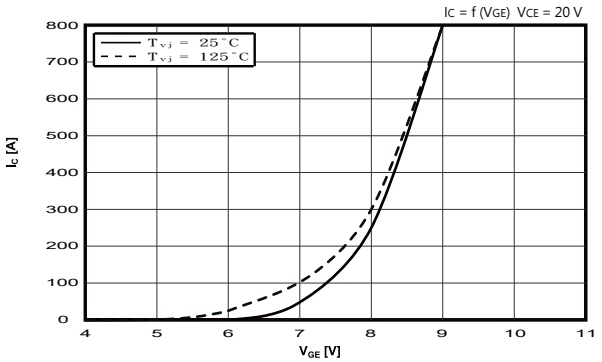


Fig.4 Switching losses IGBT,Inverter (typical)

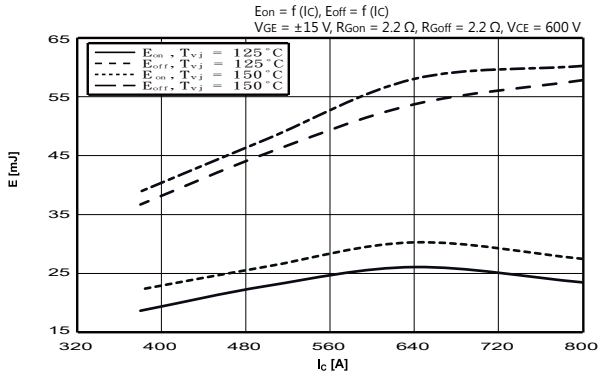


Fig.5 Switching losses IGBT,Inverter (typical)

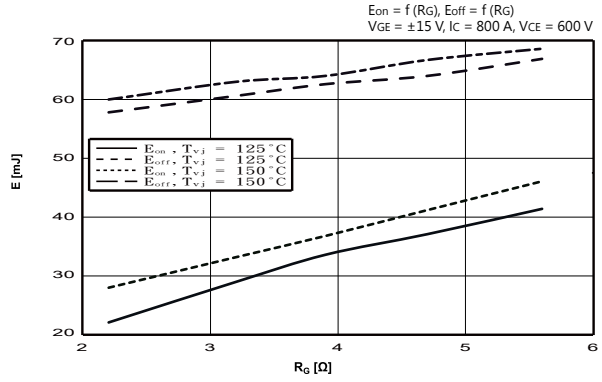


Fig.6 Transient thermal impedance IGBT,Inverter

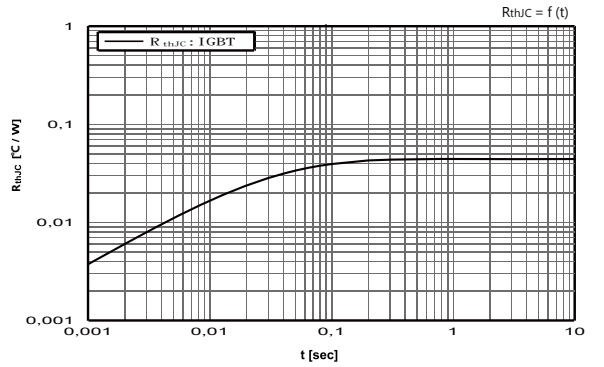


Fig.7 Reverse bias safe operating area IGBT,Inverter (RBSOA)

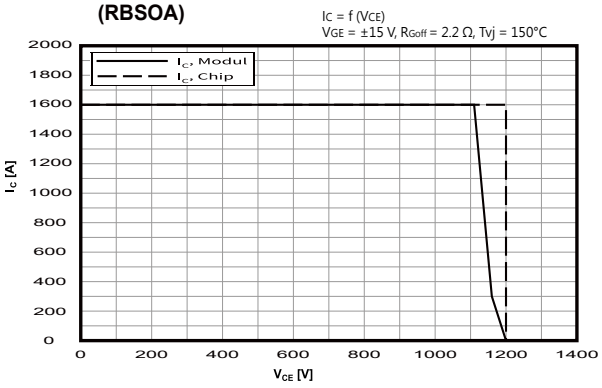
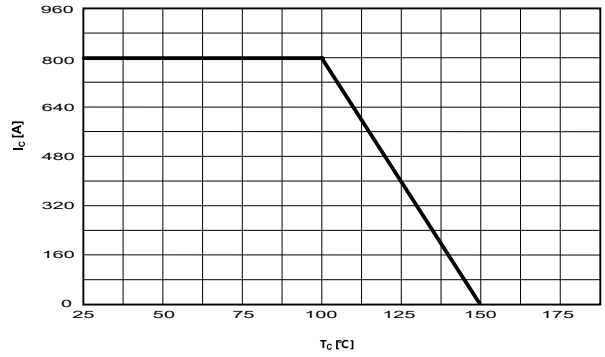


Fig.8 Output characteristic IGBT,Inverter (typical)



Typical Characteristics

Preliminary Data

Fig.9 Gate Charge Characteristics(typical)

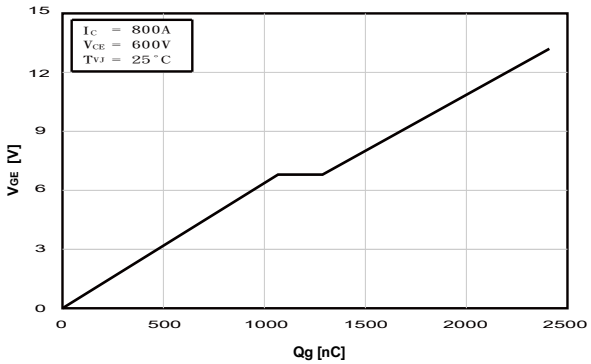


Fig.10 Forward characteristic of Diode, Inverter (typical)

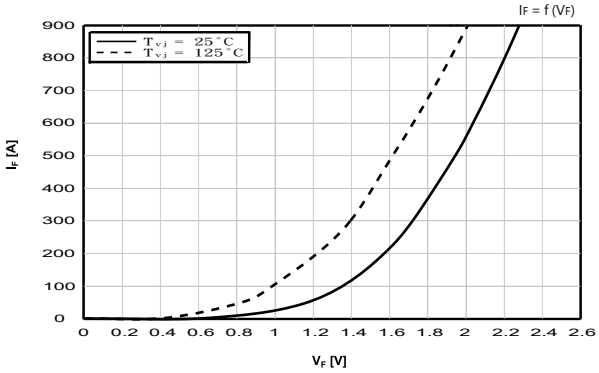


Fig.11 Switching losses Diode, Inverter (typical)

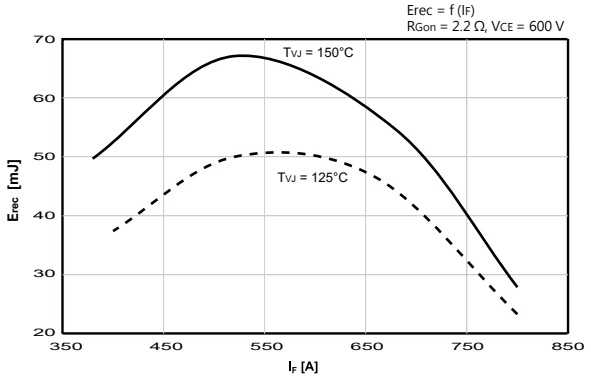


Fig.12 Switching losses Diode, Inverter (typical)

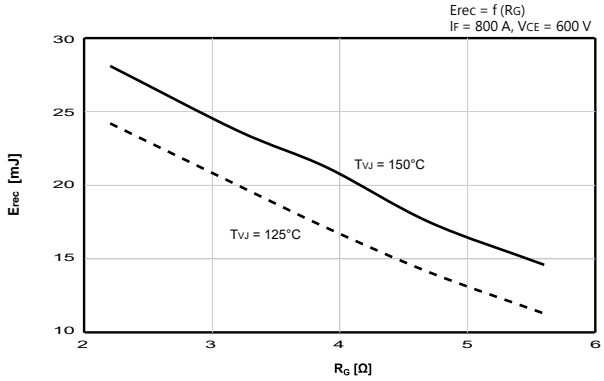
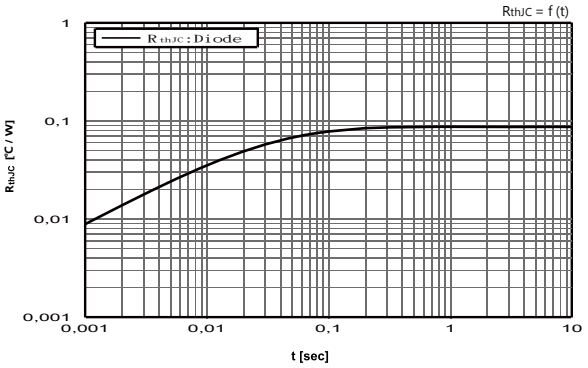


Fig.13 Transient thermal impedance Diode, Inverter



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