

HCG300FH120A2E1

1200V / 300A 62 mm with Cu Baseplate

Features

- V_{CEsat} with positive temperature coefficient
- High power density
- High creepage and clearance distances

Applications

- Inverter for motor drives AC and DC servo drives
- High power converters
- UPS systems
- Solar power



Table 1 Key Performance and Package Parameters

Type	V_{CES}	I_C	$V_{CE\ sat}$ ($T_J = 25^\circ C$, $I_C = 300A$, $V_{GE} = 15V$)	T_{vjmax}	Package
IGBT+RFD	1200V	300A	1.70V	175°C	62mm

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Table 2 Absolute Maximum ratings (Ta = 25 °C)

Parameter	Symbol	Conditions	Value	Unit
Collector emitter voltage	V_{CE}	$T_{vj} = 25^{\circ}C$	1200	V
Continuous DC collector current	I_{CDC}		300	A
Repetitive peak collector current	I_{CRM}	$T_p=1ms$	600	A
Continuous DC forward current	I_F		300	A
Repetitive peak forward current	I_{FRM}	$T_p=1ms$	600	A
Gate Source Voltage	V_{GE}	$T_{vj} = 25^{\circ}C$	± 20	V
Junction temperature	T_{vj}		-40 to +175	$^{\circ}C$
Storage temperature	T_{stg}		-40 to +125	$^{\circ}C$
Operating virtual junction temperature	T_{vjop}		-40 to +150	$^{\circ}C$

Table 3 Thermal Resistance

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
IGBT thermal resistance junction - case	R_{thJC}	Per IGBT	-	TBD	-	$^{\circ}C / W$
Diode thermal resistance junction - case	R_{thJC}	Per diode	-	TBD	-	$^{\circ}C / W$

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Table 4 Characteristics values

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit	
Collector emitter voltage	V _{(BR)CES}	V _{GE} = 0V	T _{vj} = 25°C	1200	-	-	V	
Collector-emitter saturation voltage	V _{CE(sat)}	V _{GE} = 15V, I _C = 300A	T _{vj} = 25°C	-	1.70	-	V	
		V _{GE} = 15V, I _C = 300A	T _{vj} = 150°C	-	2.10	-		
Diode forward voltage	V _F	V _{GE} = 0V, I _C = 300A	T _{vj} = 25°C	-	1.68	-	V	
		V _{GE} = 0V, I _C = 300A	T _{vj} = 150°C	-	1.75	-		
Gate-emitter threshold voltage	V _{GE(th)}	V _{CE} = V _{GE} , I _C = 10.4mA	T _{vj} = 25°C	-	5.80	-	V	
Zero gate voltage collector current	I _{CES}	V _{CE} = 1200V, V _{GE} = 0V	T _{vj} = 25°C	-	-	100	uA	
Gate-emitter leakage current	I _{GES}	V _{GE} = 20V, V _{CE} = 0V	T _{vj} = 25°C	-	-	100	nA	
Input capacitance	C _{ies}	V _{CE} = 25V, V _{GE} = 0 V, f = 100 kHz	T _{vj} = 25°C	-	TBD	-	nF	
Output capacitance	C _{oes}		T _{vj} = 25°C	-	TBD	-		
Reverse transfer capacitance	C _{res}		T _{vj} = 25°C	-	TBD	-		
Gate input resistance	R _G	f = 1MHz	T _{vj} = 25°C	-	TBD	-	Ω	
Gate charge	Q _g	V _{GE} = ±15 V V _{CE} = 600 V	T _{vj} = 25°C	-	TBD	-	μC	
Turn-on delay time (inductive load)	t _{d on}	V _{CE} = 600V, I _C = 300A, V _{GE} = ±15 V , R _{Gon} = 1.8Ω, R _{Goff} = 1.8Ω	T _{vj} = 25°C	-	200	-	ns	
Rise time (inductive load)	t _r		T _{vj} = 150°C	-	215	-		
			T _{vj} = 25°C	-	35	-		
			T _{vj} = 150°C	-	50	-		
			T _{vj} = 25°C	-	260	-		
Turn-off delay time (inductive load)	t _{d off}		T _{vj} = 150°C	-	300	-		
Fall time (inductive load)	t _f		T _{vj} = 25°C	-	160	-		
			T _{vj} = 150°C	-	280	-		
Turn-on switching loss	E _{on}		T _{vj} = 25°C	-	15.4	-	mJ	
			T _{vj} = 150°C	-	32.4	-		
Turn-off switching loss	E _{off}		T _{vj} = 25°C	-	22.0	-		
			T _{vj} = 150°C	-	30.6	-		
Total switching energy loss	E _{ts}		T _{vj} = 25°C	-	37.4	-		
			T _{vj} = 150°C	-	63.0	-		
Short circuit current	I _{SC}		V _{CE} = 800V, V _{GE} ≤ 15V , V _{CEmax} = V _{CES} - L _{sCE} *di/dt	T _P ≤ 6 us, T _{vj} =150°C	-	1100	-	A

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Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
Reverse recovery time	T _{rr}	V _{CE} = 600V, I _{CE} = 300A, V _{GE} = ±15 , R _{Gon} = 1.8Ω, R _{Goff} = 1.8Ω	T _{vj} = 25°C	-	265	-	ns
			T _{vj} =150°C	-	475	-	
Peak reverse recovery current	I _{RM}		T _{vj} = 25°C	-	240	-	A
			T _{vj} =150°C	-	210	-	
Reverse recovery charge	Q _{rr}		T _{vj} = 25°C	-	24.0	-	μC
			T _{vj} = 150°C	-	50.6	-	
Reverse recovery energy	E _{rec}		T _{vj} = 25°C	-	9.75	-	mJ
			T _{vj} = 150°C	-	19.7	-	

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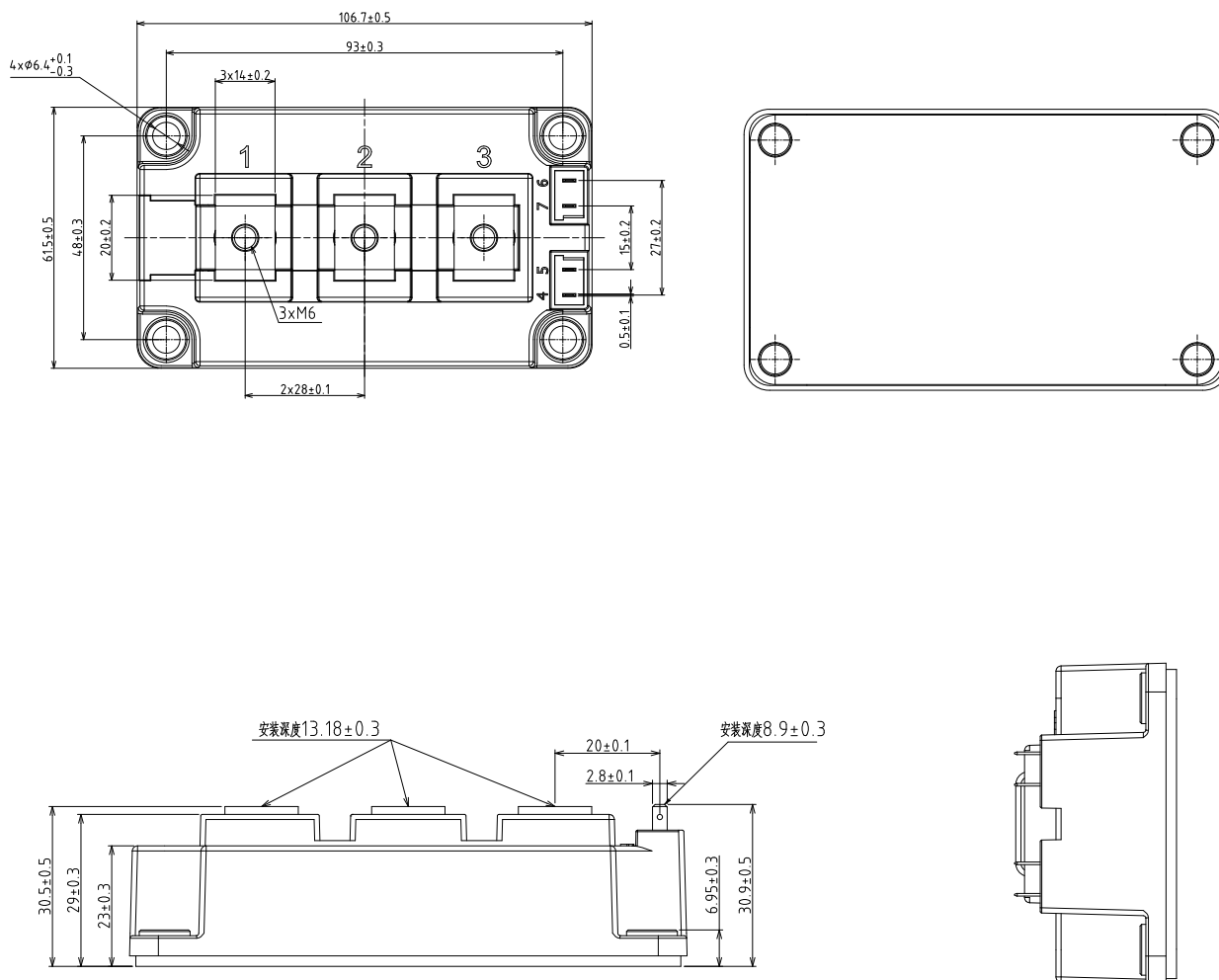
Table 5 Module

Parameter	Symbol	Value	Unit	Unit Conditions
Isolation test voltage	V _{ISOL}	4.0	kV	RMS, f = 50 Hz, t = 1min
Material of module baseplate		Cu+Ni		
Internal isolation		Improved Al ₂ O ₃ ceramic		Basic insulation
Mounting torque of screws to heat sink	Ms	3.0-6.0	N·m	M5
Mounting torque of screws to terminals	Mt	2.5-5.0	N·m	M6
Comparative tracking index	CTI	>175		

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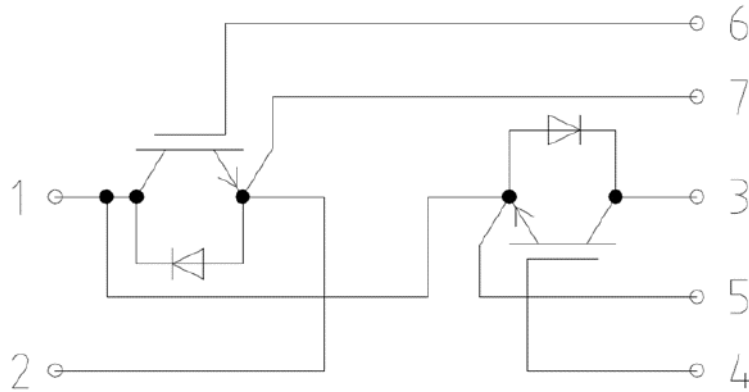
Package Outlines



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Circuit Diagram



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Revision History

Document Version	Description of Changes
RevX.0.1	Released

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