



GT300HF120T2NH

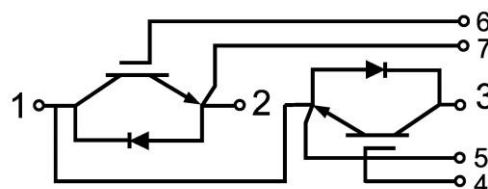
IGBT Module

Preliminary Data

Features:

- Field Stop Trench Gate IGBT
- Short Circuit Rated $>10\mu\text{s}$
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested($2\times I_c$)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Circuit Diagram



Applications:

- High Power Converters
- Motor Drives
- UPS Systems
- Wind Turbines

IGBT, Inverter

Maximum Rated Values ($T_c=25^\circ\text{C}$ unless otherwise specified)

V_{CES}	Collector-Emitter Blocking Voltage		1200	V
V_{GES}	Gate-Emitter Voltage		± 20	V
I_c	Continuous Collector Current	$T_c=100^\circ\text{C}$	300	A
		$T_c=25^\circ\text{C}$	434	A
I_{CM}	Peak Collector Current Repetitive	$t_p=1\text{ms}$	600	A
P_D	Maximum Power Dissipation (IGBT)	$T_c=25^\circ\text{C}, T_{Jmax}=175^\circ\text{C}$	1910	W



Electrical Characteristics of IGBT ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=11.5\text{mA}$, $V_{CE}=V_{GE}$	5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=300\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^{\circ}\text{C}$	2.20	2.60	V
			$T_J=125^{\circ}\text{C}$	2.85		V
			$T_J=175^{\circ}\text{C}$	3.15		V
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0\text{V}$, $V_{CE}=V_{CES}$, $T_J=25^{\circ}\text{C}$			1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^{\circ}\text{C}$			400	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		34.2		nF
C_{oes}	Output Capacitance			1.72		nF
C_{res}	Reverse Transfer Capacitance			0.35		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=300A,$ $R_G=1\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		159		ns
			$T_J=125^{\circ}C$		172		
			$T_J=175^{\circ}C$		178		
t_r	Rise Time		$T_J=25^{\circ}C$		38		ns
			$T_J=125^{\circ}C$		49		
			$T_J=175^{\circ}C$		54		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=600V, I_C=300A,$ $R_G=1\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		198		ns
			$T_J=125^{\circ}C$		225		
			$T_J=175^{\circ}C$		242		
t_f	Fall Time		$T_J=25^{\circ}C$		58		ns
			$T_J=125^{\circ}C$		133		
			$T_J=175^{\circ}C$		146		
E_{on}	Turn-on Switching Loss	$V_{CC}=600V, I_C=300A,$ $R_G=1\Omega, V_{GE}=\pm 15V,$ $di/dt=4444A/\mu s$ ($T_J=175^{\circ}C$) Inductive Load	$T_J=25^{\circ}C$		20		mJ
			$T_J=125^{\circ}C$		31		
			$T_J=175^{\circ}C$		40		



E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =300A, R _G =1Ω, V _{GE} =±15V, du/dt=4444V/μs (T _J =175°C) Inductive Load	T _J =25°C		12.5		mJ
			T _J =125°C		16.6		
			T _J =175°C		19.0		
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C		1770		nC
R _{G(int)}	Internal Gate Resistance		T _J =25°C		1.5		Ω
I _{sc}	V _{CC} =600V, V _{GE} =±15V, tp=10μs, T _J =150°C				1280		A
R _{θJC}	IGBT Thermal Resistance: Junction-to-Case (per IGBT)					0.079	°C/W

FWD, Inverter

Maximum Rated Values (T_C=25°C unless otherwise specified)

V _{RRM}	Repetitive Peak Reverse Voltage	T _J =25°C	1200	V
I _F	Diode Continuous Forward Current		300	A
I _{FM}	Peak Diode Current Repetitive	tp=1ms	600	A

Electrical Characteristics of Diode (T_C=25°C unless otherwise specified)

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V _{FM}	Forward Voltage	I _F =300A	T _J =25℃		1.80		V
			T _J =125℃		1.95		
			175℃		2.00		
t _{rr}	Reverse Recovery Time	I _F =300A, -diF/dt=2800A/μs(T _J =175℃), V _R =600V, V _{GE} =-15V	T _J =25℃		204		ns
			T _J =125℃		552		
			175℃		670		
I _{rr}	Peak Reverse Recovery Current		T _J =25℃		158		A
			T _J =125℃		162		
			175℃		190		
Q _{rr}	Reverse Recovery Charge		T _J =25℃		19.5		μC
			T _J =125℃		38.1		
			T _J =175℃		45.0		



E _{rec}	Reverse Recovery Energy	I _F =300A, -diF/dt=2800A/μs(T _J =175°C), V _R =600V, V _{GE} =-15V	T _J =25°C		5.5		mJ
			T _J =125°C		11.4		
			T _J =175°C		14.0		
R _{θJC}	Diode Thermal Resistance: Junction-to-Case (per Diode)					0.163	°C/W

Module

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	RMS, f=50Hz, 1minute	2500			V
T _J	Maximum Junction Temperature				175	°C
T _{JOP}	Maximum Operating Junction Temperature Range		-40		+150	°C
T _{stg}	Storage Temperature		-40		+125	°C
CTI	Comparative Tracking Index		200			
R _{θCS}	Case-to-Sink Thermally (Conductive Grease Applied)				0.03	°C/W
T	Power Terminals Screw:M6		3.0		5.0	N·m
T	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			300		g

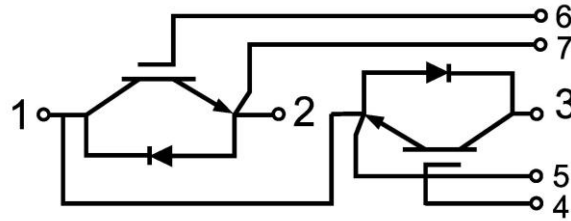
Ordering Information Table

Device code	G	T	300	HF	120	T2N	H
	①	②	③	④	⑤	⑥	⑦

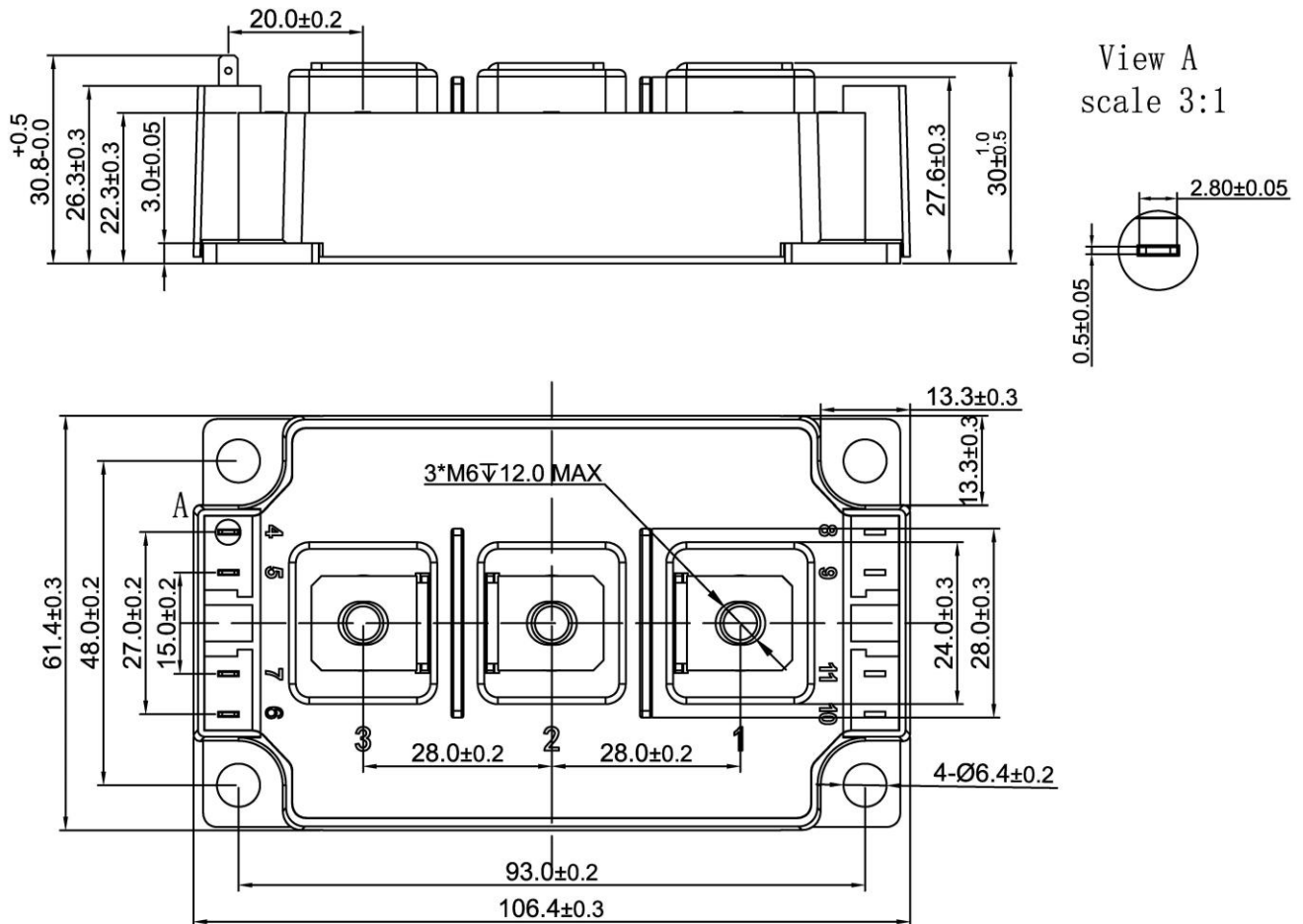
- ① - IGBT Module
- ② - Trench, Low Switching Losses IGBT
- ③ - Rated Current (300=300A)
- ④ - Circuit Configuration: HF (Half Bridge)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)



Internal Circuit:



Package Outline (Unit: mm):





Revision	Notes
01	Initial release

Announcement

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The released datasheet would be issued with “REV.” + “alphabet characters”.