

G300HF120TK-G2 300A 1200V

FEATURES

- High short circuit capability, self limiting short circuit current
- IGBT CHIP(Trench+ Field Stop technology)
- $V_{CE(sat)}$ with positive temperature coefficient
- Fast switching and short tail current, Low switching losses
- Free wheeling diodes with fast and soft reverse recovery

APPLICATIONS

- High frequency switching application
- Medical applications
- Motion/servo control
- UPS systems



G2 Series Module

ABSOLUTE MAXIMUM RATINGS

$T_c=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Values	Unit
IGBT				
V_{CES}	Collector - Emitter Voltage	$T_{vj}=25^{\circ}\text{C}$	1250	V
V_{GES}	Gate - Emitter Voltage		± 30	V
I_c	DC Collector Current	$T_c=25^{\circ}\text{C}$	450	A
		$T_c=80^{\circ}\text{C}$	300	A
I_{CM}	Repetitive Peak Collector Current	$t_p=1\text{ms}$	600	A
P_{tot}	Power Dissipation Per IGBT		2083	W
Diode				
V_{RRM}	Repetitive Reverse Voltage	$T_{vj}=25^{\circ}\text{C}$	1250	V
$I_{F(AV)}$	Average Forward Current	$T_c=25^{\circ}\text{C}$	450	A
		$T_c=80^{\circ}\text{C}$	300	A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ms}$	400	A

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ELECTRICAL AND THERMAL CHARACTERISTICS $T_C=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
IGBT						
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	$V_{CE}=V_{GE}, I_C=2.0\text{mA}$	5.0		6.8	V
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	$I_C=300\text{A}, V_{GE}=15\text{V}, T_{vj}=25^{\circ}\text{C}$		1.9	2.2	V
		$I_C=300\text{A}, V_{GE}=15\text{V}, T_{vj}=125^{\circ}\text{C}$		2.1		V
I_{CES}	Collector Leakage Current	$V_{CE}=1250\text{V}, V_{GE}=0\text{V}, T_{vj}=25^{\circ}\text{C}$			1	mA
		$V_{CE}=1250\text{V}, V_{GE}=0\text{V}, T_{vj}=125^{\circ}\text{C}$			5	mA
R_{gint}	Integrated Gate Resistor	Per switch		5		Ω
I_{GES}	Gate Leakage Current	$V_{CE}=0\text{V}, V_{GE}\pm 15\text{V}, T_{vj}=125^{\circ}\text{C}$	-500		500	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		12.6		nF
C_{res}	Reverse Transfer Capacitance			0.43		nF
$t_{d(on)}$	Turn - on Delay Time	$V_{CC}=600\text{V}, I_C=300\text{A}, R_G=1.1\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_{vj}=25^{\circ}\text{C}$	450		ns
			$T_{vj}=125^{\circ}\text{C}$	470		ns
t_r	Rise Time	$V_{CC}=600\text{V}, I_C=300\text{A}, R_G=1.1\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_{vj}=25^{\circ}\text{C}$	39		ns
			$T_{vj}=125^{\circ}\text{C}$	42		ns
$t_{d(off)}$	Turn - off Delay Time	$V_{CC}=600\text{V}, I_C=300\text{A}, R_G=1.1\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_{vj}=25^{\circ}\text{C}$	320		ns
			$T_{vj}=125^{\circ}\text{C}$	340		ns
t_f	Fall Time	$V_{CC}=600\text{V}, I_C=300\text{A}, R_G=1.1\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_{vj}=25^{\circ}\text{C}$	140		ns
			$T_{vj}=125^{\circ}\text{C}$	150		ns
E_{on}	Turn - on Energy	$V_{CC}=600\text{V}, I_C=300\text{A}, R_G=1.1\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_{vj}=25^{\circ}\text{C}$	7.7		mJ
			$T_{vj}=125^{\circ}\text{C}$	14.5		mJ
E_{off}	Turn - off Energy	$V_{CC}=600\text{V}, I_C=300\text{A}, R_G=1.1\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_{vj}=25^{\circ}\text{C}$	26.3		mJ
			$T_{vj}=125^{\circ}\text{C}$	33.5		mJ
I_{sc}	Short Circuit Current	$t_{psc}\leq 10\mu\text{s}, V_{GE}=15\text{V}$ $T_{vj}=125^{\circ}\text{C}, V_{CC}=900\text{V}$		1200		A
R_{thJC}	Junction-to-Case Thermal Resistance (Per IGBT)				0.07	K /W
Diode						
V_F	Forward Voltage	$I_F=300\text{A}, V_{GE}=0\text{V}, T_{vj}=25^{\circ}\text{C}$		1.8	2.3	V
		$I_F=300\text{A}, V_{GE}=0\text{V}, T_{vj}=125^{\circ}\text{C}$		1.8		V
Q_{rr}	Reversed Charge	$I_F=300\text{A}, V_R=600\text{V}$		40		μC
I_{RRM}	Max. Reverse Recovery Current	$di_F/dt=-2360\text{A}/\mu\text{s}$		250		A
E_{rec}	Reverse Recovery Energy	$T_{vj}=125^{\circ}\text{C}$		18.5		mJ
R_{thJCD}	Junction-to-Case Thermal Resistance (Per Diode)				0.12	K /W

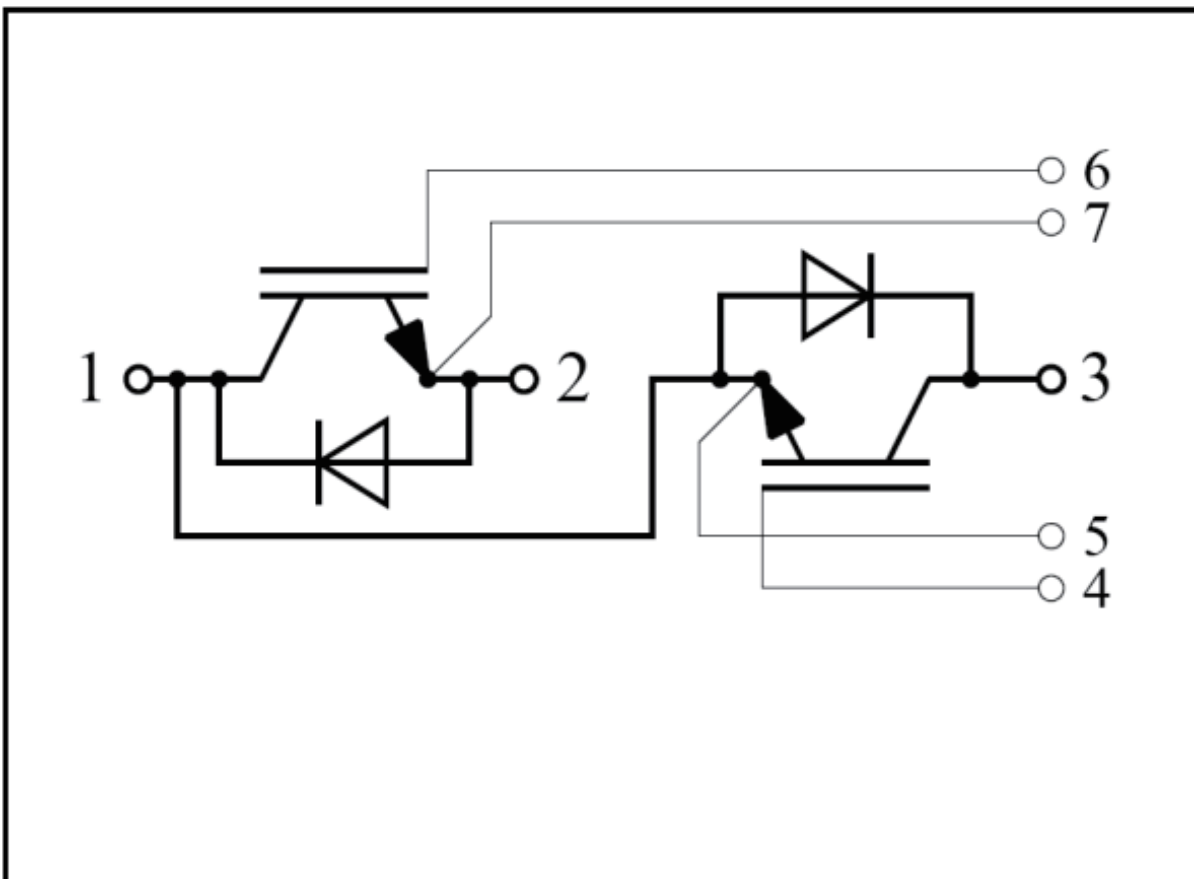
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MODULE CHARACTERISTICS

T_c=25°C unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
T _{Vj max}	Max. Junction Temperature				175	°C
T _{Vj op}	Operating Temperature		-40		150	°C
T _{stg}	Storage Temperature		-40		125	°C
V _{isol}	Insulation Test Voltage	AC, t=1min	3000			V
Torque	To-Sink	Recommended (M6)	3		5	N·m
Torque	To-Terminal	Recommended (M5)	2.5		5	N·m
Weight				302		g

CIRCUIT DIAGRAM



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PACKAGE OUTLINE