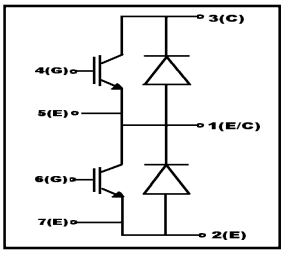
XI'AN IR-PERI Company

PRELIMINARY

GA300TD120ST

" HALF-BRODGE" IGBT DOUBLE INT-A -PAK

Features



V_{CES}=1200V

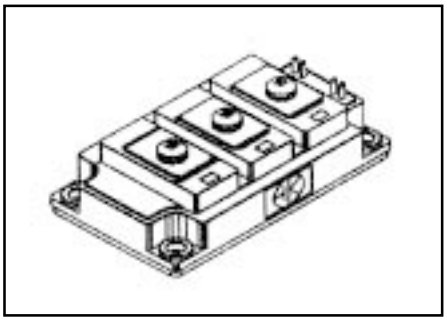
$V_{CE(on)\ typ.}$=1.9V

@V_{GE}=15V,I_C=300A

- Highly rugged SPT+ IGBT technology
- Low saturation voltage
- Very low conduction and switching losses
- Vce(sat) with positive temperature coefficient
- HEXFRED ™ antiparallel diodes with ultra-soft recovery
- Industry standard package
- High short circuit capability

Benefits

- Increased operating efficiency
- Direct mounting to heatsink
- Performance optimized for power conversion: UPS, SMPS, Mortor Control
- Lower EMI, requries less snubbing



Absolute Maximum Ratings

	Parameter	Max.	Units
V_{CES}	Collector- to- Emitter Voltage	1200	V
I_C @ Tc=25°	CContinuous Collector Current	300	
I_C @ Tc=85°	CContinuous Collector Current	200	
I_{CM}	Pulsed collector Current	600	A
I_{LM}	Peak switching Current	600	
I_{FM}	Peak Diode Forward Current	600	
V_{GE}	Gate- to- Emitter Voltage	± 20	V
V_{ISOL}	RMS Isolation Voltage, Any Terminal To Case, t =1 min	3000	
P_D @ T_C =25°C	Maximum Power Dissipation	1400	W
P_D @ T_C =85°C	Maximum Power Dissipation	730	
T_J	Operating Junction Temperature Range	-40 to +150	°C
T_{STG}	Storage Temperature Range	-40 to +125	

Termal / Mechanical Characteristics

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Termal Resistance, Junction-to- Case- IBGT	-	0.12	°C/W
$R_{\theta JC}$	Termal Resistance, Junction-to- Case- Diode	-	0.20	
$R_{\theta CS}$	Termal Resistance, Csar-to- Sink- Module	0.1	-	
	Mouting Torque, Case-to-Heatsink	-	4.0	N.m
	Mouting Torque, Case-to-Terminal 1,2 & 3	-	3.0	
	Weight of Module	400	-	g

Electrical Characteristics @ T_J=25°C(unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)CES}$	Collector-to-Emitter Breakdown Voltage	1200	—	—	V	V_{GE}=0V, I_C=1mA
$V_{CE(ON)}$	Collector-to-Emitter Voltage	—	1.9	—		V_{GE}=15V, I_C=300A
		—	2.1	—		V_{GE}=15V, I_C=300A,T_J=125°C
$V_{GE(th)}$	Gate Threshold Voltage	5.0	—	7.0I		C=6mA
$DV_{GE(th)}DT_J$	Temperature Coeff. of Threshold Voltage	—		—	mV/°C	V_{CE}=V_{GE}, I_C=2.5mA
g_{fe}	Forward Ttansconductance	—		—	S	V_{CE}=25V, I_C=300A
I_{CES}	Collector - to - Emitter Leaking Current	—	—	1mA		V_{GE}=0V, V_{CE}=1200V
		—	—	3mA		V_{GE}=0V, V_{CE}=1200V, T_J=125°C
V_{FM}	Diode Forward Voltage - Maximum	—	2.2	2.5	V	I_F=300A , V_{GE}=0V
		—	2.0	—		I_F=200A , V_{GE}=0V ,T_J=125°C
I_{GES}	Gate - to - Emitter Leakage Current	—	—	500	nA	V_{GE}=± 20V

Dynamic Characteristics - T_J=125°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
Q_g	Total gate charge (turn - on)	—	1660	2490	nC	V_{CC}= 400V V_{GE}=15V
Q_{ge}	Gate - Emitter charge (turn - on)	—	280	420		I_C=300A
Q_{gc}	Gate - Collector charge (turn - on)	—	550	825		T_J =25°C
$T_{d(on)}$	Turn - On Delay Time	—	230	—	nS	R_G =6.8 Ω
t_r	Rise Time	—	60	—		I_C = 300A
$T_{d(off)}$	Turn - Off Delay Time	—	539	—		V_{CC}= 600V
t_f	Fall Time	—	80	—		V_{GE}=± 15V
E_{on}	Turn - On Switching Energy	—	38	—	mJ	
$E_{off(1)}$	Turn - Off Switching Energy	—	33	—		
$E_{ts(1)}$	Total Switching Energy	—	71			
C_{ies}	Input Capacitance	—	23	—	nf	V_{GE} = 0V
C_{oes}	Output Capacitance	—	1.65	—		V_{CC} = 25V
C_{res}	Reverse Transfer Capacitance	—	1.1	—		*f* =1MHZ
t_{rr}	Diode Reverse Recovery Time	—	196	—	nS	I_C = 200A
I_{rr}	Diode Peak Reverse Current	—	131	—	A	R_{G1}=15Ω
Q_{rr}	Diode Recovery Charge	—	12833	—	nC	R_{G2}=0Ω
di(rec)M/dt	Diode Peak Rate of Fall of Recovery During t_b	—	1740	—	A/μs	V_{CC}=720V di/dt=1294A/μs
T_{sc}	Short circuit withstand time	10	—	—	μs	V_{CC}=720V, V_{GE}=± 15V Min. R_{G1}=15Ω, V_{CEP}=1100V