

XI'AN IR-PERI



Company

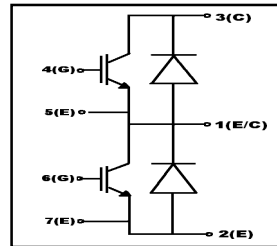
PRELIMINARY

GA300TD120ST

“ HALF-BRODGE” IGBT DOUBLE INT-A -PAK

### Features

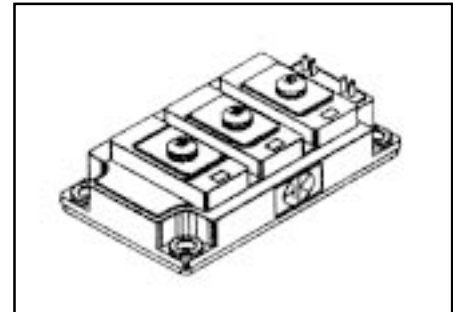
- Highly rugged SPT+ IGBT technology
- Low saturation voltage
- Very low conduction and switching losses
- Vce(sat) with positive temperature coefficient
- HEXFRED™ antiparallel diodes with ultra-soft recovery
- Industry standard package
- High short circuit capability



$V_{CES}=1200V$   
 $V_{CE(on) \text{ typ.}}=2.5V$   
 @ $V_{GE}=15V, I_c=300A$

### Benefits

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



### Absolute Maximum Ratings

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

### Thermal / Mechanical Characteristics

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

# GA300TD120ST



## Electrical Characteristics @ T<sub>J</sub>=25°C(unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)CES</sub>	Collector-to-Emitter Breakdown Voltage	1200	—	—	V	V <sub>GE</sub> =0V, I <sub>c</sub> =1mA
V <sub>CE(ON)</sub>	Collector-to-Emitter Voltage	—	1.9	—		V <sub>GE</sub> =15V, I <sub>c</sub> =300A
		—	2.1	—		V <sub>GE</sub> =15V, I <sub>c</sub> =300A, T <sub>J</sub> =125°C
V <sub>GE(th)</sub>	Gate Threshold Voltage	5.0	—	7.0I		c=6mA
DV <sub>GE(th)DTJ</sub>	Temperature Coeff. of Threshold Voltage	—	—	—	mV/°C	V <sub>CE</sub> =V <sub>GE</sub> , I <sub>c</sub> =2.5mA
g <sub>fe</sub>	Forward Ttansconductance	—	—	—	S	V <sub>CE</sub> =25V, I <sub>c</sub> =300A
I <sub>CES</sub>	Collector - to - Emitter Leaking Current	—	—	1mA		V <sub>GE</sub> =0V, V <sub>CE</sub> =1200V
		—	—	3mA		V <sub>GE</sub> =0V, V <sub>CE</sub> =1200V, T <sub>J</sub> =125°C
V <sub>FM</sub>	Diode Forward Voltage - Maximum	—	2.2	2.5	V	I <sub>F</sub> =300A , V <sub>GE</sub> =0V
		—	2.0	—		I <sub>F</sub> =200A , V <sub>GE</sub> =0V , T <sub>J</sub> =125°C
I <sub>GES</sub>	Gate - to - Emitter Leakage Current	—	—	500	nA	V <sub>GE</sub> =± 20V

## Dynamic Characteristics - T<sub>J</sub>=125°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
Q <sub>g</sub>	Total gate charge ( turn - on )	—	1660	2490	nC	V <sub>CC</sub> = 400V V <sub>GE</sub> =15V I <sub>c</sub> =300A T <sub>J</sub> =25°C
Q <sub>ge</sub>	Gate - Emitter charge ( turn - on )	—	280	420		
Q <sub>gc</sub>	Gate - Collector charge ( turn - on )	—	550	825		
T <sub>d(on)</sub>	Turn - On Delay Time	—	230	—	nS	R <sub>G</sub> =6.8 Ω I <sub>c</sub> = 300A V <sub>CC</sub> = 600V V <sub>GE</sub> =± 15V
t <sub>r</sub>	Rise Time	—	60	—		
T <sub>d(off)</sub>	Turn - Off Delay Time	—	539	—		
t <sub>f</sub>	Fall Time	—	80	—		
E <sub>on</sub>	Turn - On Switching Energy	—	38	—	mJ	
E <sub>off(1)</sub>	Turn - Off Switching Energy	—	33	—		
E <sub>ts(1)</sub>	Total Switching Energy	—	71	—		
C <sub>ies</sub>	Input Capacitance	—	23	—	nf	V <sub>GE</sub> = 0V V <sub>CC</sub> = 25V f=1MHZ
C <sub>oes</sub>	Output Capacitance	—	1.65	—		
C <sub>res</sub>	Reverse Transfer Capacitance	—	1.1	—		
t <sub>rr</sub>	Diode Reverse Recovery Time	—	196	—	nS	I <sub>c</sub> = 200A
I <sub>rr</sub>	Diode Peak Reverse Current	—	131	—	A	R <sub>G1</sub> =15Ω
Q <sub>rr</sub>	Diode Recovery Charge	—	12833	—	nC	R <sub>G2</sub> =0Ω
di(rec)M/dt	Diode Peak Rate of Fall of Recovery During t <sub>b</sub>	—	1740	—	A/μs	V <sub>CC</sub> =720V di/dt=1294A/μs
T <sub>sc</sub>	Short circuit withstand time	10	—	—	μs	V <sub>CC</sub> =720V, V <sub>GE</sub> =± 15V Min. R <sub>G1</sub> =15Ω, V <sub>CEP</sub> =1100V