

XI'AN IR-PERI



Company

PRELIMINARY

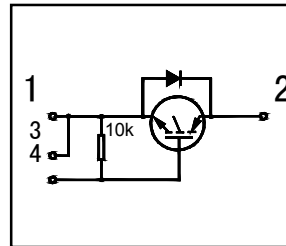
GA300DD60U

“ SINGLE SWITCH ” IGBT DOUBLE INT-A -PAK

Ultra-Fast™ Speed IGBT

Features

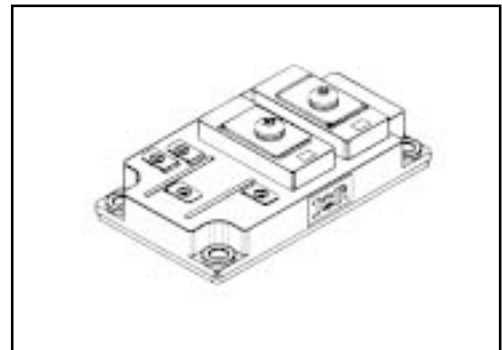
- Generation 4 IGBT technology
- UltraFast optimized high operating frequencies 8-40 kHz in hard switching, >200 kHz in resonant mode.
- Very low conduction and switching losses
- HEXFRED™ antiparallel diodes with ultra-soft recovery
- Industry standard package
- UL recognition pending



$V_{CES}=600V$
 $V_{CE(on) \text{ typ.}}=1.8V$
 @ $V_{GE}=15V, I_c=300A$

Benefits

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



Absolute Maximum Ratings

	Parameter	Max.	Units
V_{CES}	Collector-to- Emitter Voltage	600	V
$I_c @ T_c=25^\circ C$	Continuous Collector Current	350	A
$I_c @ T_c=85^\circ C$	Continuous Collector Current	300	
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	± 20	V
V_{ISOL}	RMS Isolation Voltage, Any Terminal To Case, $t=1 \text{ min}$	2500	
$P_D @ T_c=25^\circ C$	Maximum Power Dissipation	780	W
$P_D @ T_c=85^\circ C$	Maximum Power Dissipation	410	
T_J	Operating Junction Temperature Range	-40 to +150	$^\circ C$
T_{STG}	Storage Temperature Range	-40 to +125	

Thermal / Mechanical Characteristics

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to- Case- IGBT	-	0.16	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance, Junction-to- Case- Diode	-	0.40	
$R_{\theta CS}$	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

GA300DD60U



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

	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)CES}	Collector-to-Emitter Breakdown Voltage	600	—	—	V	V _{GE} =0V, I _C =8mA
V _{CE(ON)}	Collector-to-Emitter Voltage	—	1.8	2.2		V _{GE} =15V, I _C =300A
		—	1.8	—		V _{GE} =15V, I _C =300A, T _J =125°C
V _{GE(th)}	Gate Threshold Voltage	4.5	—	5.5		I _C =2.5mA, V _{CE} =6.0V
DV _{GE(th)DT_J}	Temperature Coeff. of Threshold Voltage	—	-11	—	mV/°C	V _{CE} =6.0V, I _C =2.5mA
g _{fe}	Forward Transconductance	—	360	—	S	V _{CE} =25V, I _C =300A
I _{CES}	Collector - to - Emitter Leaking Current	—	—	4.0	mA	V _{GE} =0V, V _{CE} =600V
		—	—	40		V _{GE} =0V, V _{CE} =600V, T _J =125°C
V _{FM}	Diode Forward Voltage - Maximum	—	2.5	2.8	V	I _F =300A, V _{GE} =0V
		—	2.5	—		I _F =300A, 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)	—	1913	2869	nC	V _{CC} = 300V V _{GE} =15V I _C =300A T _J =25°C
Q _{ge}	Gate - Emitter charge (turn - on)	—	275	416		
Q _{gc}	Gate - Collector charge (turn - on)	—	631	946		
T _{d(on)}	Turn - On Delay Time	—	1056	—	nS	R _{G1} = 15Ω , R _{G2} = 0Ω I _C = 300A V _{CC} = 300V V _{GE} =± 15V
t _r	Rise Time	—	750	—		
T _{d(off)}	Turn - Off Delay Time	—	636	—		
t _f	Fall Time	—	260	—		
E _{on}	Turn - On Switching Energy	—	15	—	mJ	
E _{off(1)}	Turn - Off Switching Energy	—	85	—		
E _{ts(1)}	Total Switching Energy	—	90	250		
C _{ies}	Input Capacitance	—	27710	—	pF	V _{GE} = 0V V _{CC} = 30V f = 1MHZ
C _{oes}	Output Capacitance	—	4880	—		
C _{res}	Reverse Transfer Capacitance	—	960	—		
t _{rr}	Diode Reverse Recovery Time	—	280	—	nS	I _C = 300A
I _{rr}	Diode Peak Reverse Current	—	105	—	A	R _{G1} =15Ω
Q _{rr}	Diode Recovery Charge	—	6313	—	nC	R _{G2} =0Ω
di(rec)M/dt	Diode Peak Rate of Fall of Recovery During t _b	—	532	—	A/μs	V _{CC} =300V di/dt=600A/μs

Notes:

The thermistor has an average rate of 7mW/°C between 20°C and 125°C.