XI'AN IR-PERI Company

PRELIMINARY

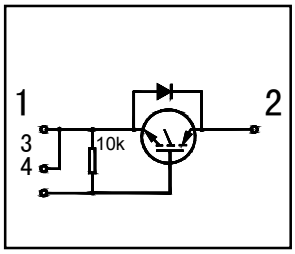
GA400DD60U

" SINGLE SWITCH" IGBT DOUBLE INT-A -PAK

Ultra-Fast™ Speed IGBT

Features

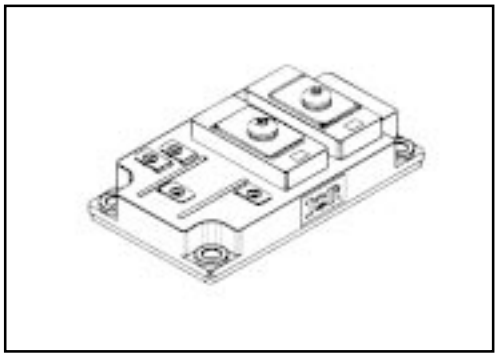
- Generation 4 IGBT technology
- UltraFast optimized high operating frequencies 8-40 kHz in hard switching, >200 kHz in resonant mode.
- Very low conduction and switching losses
- HEXFRED ™ antiparallel diodes with ultra-soft recovery
- Industry standard package
- UL recongnition pending



V_{CES}=600V

$V_{CE(on)\ typ.}$=1.7V

@V_{GE}=15V,I_C=400A



Benefits

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

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{CES}	Collector- to- Emitter Voltage	600	V
I_C @ Tc=25°C	Continuous Collector Current	480	A
I_C @ Tc=85°C	Continuous Collector Current	400	
I_{CM}	Pulsed collector Current	800	
I_{LM}	Peak switching Current	800	
I_{FM}	Peak Diode Forward Current	800	
V_{GE}	Gate- to- Emitter Voltage	± 20	V
V_{ISOL}	RMS Isolation Voltage, Any Terminal To Case, t =1 min	2500	
P_D @ T_C =25°C	Maximum Power Dissipation	1250	W
P_D @ T_C =85°C	Maximum Power Dissipation	650	
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	-	0.10	°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	600	—	—	V	V_{GE}=0V, I_C=5mA
$V_{CE(ON)}$	Collector-to-Emitter Voltage	—	1.7	2.4		V_{GE}=15V, I_C=400A
		—	1.8	—		V_{GE}=15V, I_C=400A,T_J=125°C
$V_{GE(th)}$	Gate Threshold Voltage	4.5	—	5.5		I_C=5mA,V_{CE}=6.0V
$DV_{GE(th)}DT_J$	Temperature Coeff. of Threshold Voltage	—	-11	—	mV/°C	V_{CE}=6.0V, I_C=5mA
g_{fe}	Forward Ttansconductance	—	481	—	S	V_{CE}=25V, I_C=400A
I_{CES}	Collector - to - Emitter Leaking Current	—	—	2.0	mA	V_{GE}=0V, V_{CE}=600V
		—	—	20		V_{GE}=0V, V_{CE}=600V, T_J=125°C
V_{FM}	Diode Forward Voltage - Maximum	—	2.6	2.9	V	I_F=400A , V_{GE}=0V
		—	2.5	—		I_F=400A , V_{GE}=0V ,T_J=125°C
I_{GES}	Gate - to - Emitter Leakage Current	—	—	1000	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)	—	1806	2709	nC	V_{CC}= 400V V_{GE}=15V
Q_{ge}	Gate - Emitter charge (turn - on)	—	251	376		I_C=270A
Q_{gc}	Gate - Collector charge (turn - on)	—	612	918		T_J =25°C
$T_{d(on)}$	Turn - On Delay Time	—	1033	—	nS	R_{G1} =15Ω , R_{G2} = 0Ω
t_r	Rise Time	—	335	—		I_C = 400A
$T_{d(off)}$	Turn - Off Delay Time	—	688	—		V_{CC}= 360V
t_f	Fall Time	—	225	—		V_{GE}=± 15V
E_{on}	Turn - On Switching Energy	—	26	—	mJ	
$E_{off(1)}$	Turn - Off Switching Energy	—	48	—		
$E_{ts(1)}$	Total Switching Energy	—	74	89		
C_{ies}	Input Capacitance	—	40136	—	pF	V_{GE} = 0V
C_{oes}	Output Capacitance	—	2509	—		V_{CC} = 30V
C_{res}	Reverse Transfer Capacitance	—	522	—		*f* =1MHZ
t_{rr}	Diode Reverse Recovery Time	—	232	—	nS	I_C = 400A
I_{rr}	Diode Peak Reverse Current	—	141	—	A	R_{G1}=15Ω
Q_{rr}	Diode Recovery Charge	—	16292	—	nC	R_{G2}=0Ω
di(rec)M/dt	Diode Peak Rate of Fall of Recovery During t_b	—	1641	—	A/μs	V_{CC}=360V di/dt=1300A/μs

Notes:

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