

XI'AN IR-PERI



PRELIMINARY

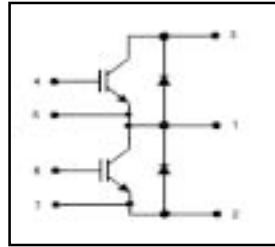
GA75TS120K

“ HALF-BRODGE ” IGBT INT-A -PAK

Short Circuit Rated
Ultra-Fast™ Speed IGBT

Features

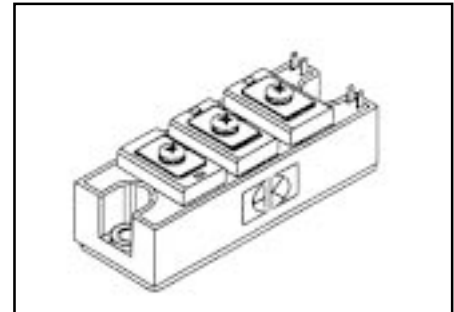
- Generation 5 IGBT NPT technology
- UltraFast optimized high operating frequencies 8-40 kHz in hard switching, >200 kHz in resonant mode.
- Very low conduction and switching losses
- HEXFRED™ antiparallel diodes with ultra-soft recovery
- Industry standard package
- UL recognition pending
- Short circuit rated 10 μs



$V_{CES}=1200V$
 $V_{CE(on) typ.}=2.5V$
@ $V_{GE}=15V, I_c=75A$

Benefits

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



Absolute Maximum Ratings

| | Parameter | Max. | Units |
|-------------------------|--|-------------|-------------|
| V_{CES} | Collector- to- Emitter Voltage | 1200 | V |
| $I_c @ T_c=25^{\circ}C$ | Continuous Collector Current | 100 | A |
| $I_c @ T_c=85^{\circ}C$ | Continuous Collector Current | 75 | |
| I_{CM} | Pulsed collector Current | 150 | |
| I_{LM} | Peak switching Current | 150 | |
| I_{FM} | Peak Diode Forward Current | 150 | |
| V_{GE} | Gate- to- Emitter Voltage | ± 20 | V |
| V_{ISOL} | RMS Isolation Voltage, Any Terminal To Case, t=1 min | 2500 | W |
| $P_D @ T_c=25^{\circ}C$ | Maximum Power Dissipation | 625 | |
| $P_D @ T_c=85^{\circ}C$ | Maximum Power Dissipation | 325 | |
| T_J | Operating Junction Temperature Range | -40 to +150 | $^{\circ}C$ |
| T_{STG} | Storage Temperature Range | -40 to +125 | |

Termal / Mechanical Characteristics

| | Parameter | Typ. | Max. | Units |
|-----------------|---|------|------|---------------|
| $R_{\theta JC}$ | Termal Resistance, Junction-to- Case- IGBT | - | 0.20 | $^{\circ}C/W$ |
| $R_{\theta JC}$ | Termal Resistance, Junction-to- Case- Diode | - | 0.35 | |
| $R_{\theta CS}$ | Termal Resistance, Csar-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 | 200 | - | g |

GA75TS120K



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 | — | 2.5 | — | | V _{GE} =15V, I _C =75A |
| | | — | 2.7 | — | | V _{GE} =15V, I _C =75A, T _J =125°C |
| V _{GE(th)} | Gate Threshold Voltage | 4.5 | — | 5.5 | | V _{CE} =6V, I _C =750μA |
| DV _{GE(th)DTJ} | Temperature Coeff. of Threshold Voltage | — | -11 | — | mV/°C | V _{CE} =V _{GE} , I _C =750μA |
| g _{fe} | Forward Transconductance | — | 107 | — | S | V _{CE} =25V, I _C =75A |
| I _{CES} | Collector - to - Emitter Leaking Current | — | — | 1.0 | mA | V _{GE} =0V, V _{CE} =1200V |
| | | — | — | 10 | | V _{GE} =0V, V _{CE} =1200V, T _J =125°C |
| V _{FM} | Diode Forward Voltage - Maximum | — | 2.0 | 2.5 | V | I _F =75A, V _{GE} =0V |
| | | — | 1.8 | — | | I _F =75A, V _{GE} =0V, T _J =125°C |
| I _{GES} | Gate - to - Emitter Leakage Current | — | — | 100 | 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) | — | 570 | 855 | nC | V _{CC} = 400V I _C =96A T _J =25°C |
| Q _{ge} | Gate - Emitter charge (turn - on) | — | 96 | 144 | | |
| Q _{gc} | Gate - Collector charge (turn - on) | — | 189 | 283 | | |
| T _{d(on)} | Turn - On Delay Time | — | 100 | — | nS | R _{G1} =15Ω , R _{G2} = 0Ω I _C = 75A V _{CC} =720V V _{GE} =± 15V |
| t _r | Rise Time | — | 100 | — | | |
| T _{d(off)} | Turn - Off Delay Time | — | 392 | — | | |
| t _f | Fall Time | — | 70 | — | | |
| E _{on} | Turn - On Switching Energy | — | 17 | — | mJ | |
| E _{off(1)} | Turn - Off Switching Energy | — | 9 | — | | |
| E _{ts(1)} | Total Switching Energy | — | 26 | 35 | | |
| C _{ies} | Input Capacitance | — | 12812 | — | pF | V _{GE} = 0V V _{CC} = 30V f=1MHZ |
| C _{oes} | Output Capacitance | — | 570 | — | | |
| C _{res} | Reverse Transfer Capacitance | — | 110 | — | | |
| t _{rr} | Diode Reverse Recovery Time | — | 174 | — | nS | I _C = 75A |
| I _{rr} | Diode Peak Reverse Current | — | 104 | — | A | R _{G1} =15Ω |
| Q _{rr} | Diode Recovery Charge | — | 7064 | — | nC | R _{G2} =0Ω |
| di(rec)M/dt | Diode Peak Rate of Fall of Recovery During t _b | — | 1400 | — | A/μs | V _{CC} =720V di/dt=1300A/μs |
| T _{sc} | Short circuit withstand time | 10 | — | — | μs | V _{CC} =720V, V _{GE} =± 15V Min. R _{G1} =15Ω, V _{CEP} =1100V |

Appendix:

Circuit configuration for Half bridge IGBT Modules

T----Half Bridge

H---Chopper High Side

L---Chopper Low Side

T*K---Common Anode Half Bridge

