

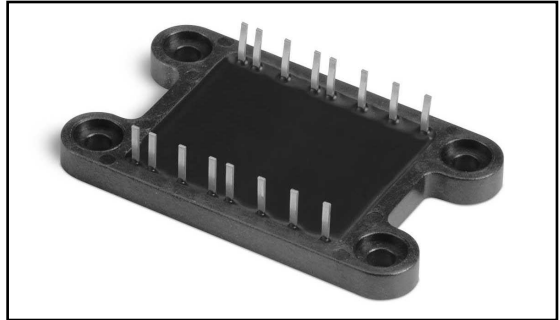
MODEL 7721 SERIES

H Bridge

Power Module

Drives DC motors, transformers and other loads. Paralleled ultrafast diodes included. Standard applications are off-line DC motor control and power conversion.

NEW PRODUCT



MODELS/RANGE

7721-1A

22A 500V IGBTs with 8A 600V ultrafast diodes

7721-2A

32A 600V IGBTs with 25A 600V hyperfast diodes

FEATURES AND BENEFITS

- Saves significant space and assembly time
- Modern design reduces heatsink cost
- Low cost
- Thin package (.200) easily fits between PCB and heatsink
- Internal temperature sensing for fastest possible response
- Replaces 8 each TO-220 or TO-247 discrete power semiconductors
- Custom designs accept any IGBTs or FETs up to size 5 with parallel diodes
- Custom module versions available for specific applications

Example: 3 phase motor drives & rectifier bridges, power servo amplifiers, solenoid drivers, solid state relays, audio amplifiers, and high-power DC/DC converters.

Specifications subject to change without notice.

ELECTRICAL CHARACTERISTICS (7721-1A)

| Parameter | Symbol | Conditions ¹ | Min. | Typ. | Max. | Units |
|---------------------------------|--------------|---|------|-------|-----------|---------------------------|
| Q1-Q4 IGBT | | | | | | |
| Continuous Collector Current | I_C | $T_C = 25^\circ\text{C}$ | | | 40 | A |
| | | $T_C = 100^\circ\text{C}$ | | | 22 | A |
| Pulsed Collector Current | I_{CM} | | | | 80 | A |
| Reverse Avalanche Energy | E_{AVR} | | | | 15 | mJ |
| Collector Leakage Current | I_{CES} | $V_{GE} = 0V, V_{CE} = 500V$ | | | 250 | μA |
| Saturation Voltage | $V_{CE(ON)}$ | $I_C = 22A, V_{GE} = 15V$ | | 2.4 | 3.0 | V |
| | | $I_C = 40A, V_{GE} = 15V$ | | 2.8 | | V |
| Gate Threshold Voltage | $V_{GE(TH)}$ | $V_{CE} = V_{GE}, I_C = 250\mu\text{A}$ | 3.0 | | 5.5 | V |
| Gate Leakage Current | I_{GES} | $V_{GE} = \pm 20V$ | | | ± 100 | nA |
| Total Gate Charge (turn on) | Q_g | $I_C = 22A, V_{CC} = 400V, V_{GE} = 15V$ | | 55 | 83 | nC |
| Gate Emitter Charge (turn on) | Q_{ge} | $I_C = 22A, V_{CC} = 400V, V_{GE} = 15V$ | | 11 | 17 | nC |
| Gate Collector Charge (turn on) | Q_{gc} | $I_C = 22A, V_{CC} = 400V, V_{GE} = 15V$ | | 19 | 29 | nC |
| Turn Off Delay Time | $t_{d(off)}$ | $I_C = 22A, V_{CC} = 400V, V_{GE} = 15V, R_G = 10\Omega$ w/tail | | 100 | 150 | ns |
| Fall Time | t_f | $I_C = 22A, V_{CC} = 400V, V_{GE} = 15V, R_G = 10\Omega$ w/tail | | 56 | 100 | ns |
| Total Switching Loss | E_{ts} | $I_C = 22A, V_{CC} = 400V, V_{GE} = 15V, R_G = 10\Omega$ w/tail | | .55 | .70 | mJ |
| Input Capacitance | C_{ies} | $V_{GE} = 0V, V_{CC} = 30V, f = 1\text{MHz}$ | | 1400 | | pF |
| Output Capacitance | C_{oes} | $V_{GE} = 0V, V_{CC} = 30V, f = 1\text{MHz}$ | | 250 | | pF |
| Reverse Transfer Capacitance | C_{res} | $V_{GE} = 0V, V_{CC} = 30V, f = 1\text{MHz}$ | | 42 | | pF |
| Junction Temperature | T_J | | | | 150 | $^\circ\text{C}$ |
| Thermal Resistance | R_{thjc} | | | | .94 | $^\circ\text{C}/\text{W}$ |
| D1-D4 Fred Diodes | | | | | | |
| Reverse Leakage Current | I_R | $V_R = 600V$ | | | 20 | μA |
| | | $V_R = .8 \times 600V, T_J = 125^\circ\text{C}$ | | | 1.5 | mA |
| Forward Voltage | V_F | $I_F = 8A$ | | | 1.5 | V |
| | | $I_F = 8A, T_J = 150^\circ\text{C}$ | | | 1.3 | V |
| Reverse Recovery Time | t_{rr} | $I_F = 1A, -di/dt = 50A/\mu\text{s}, V_R = 30V$ | | 35 | 50 | ns |
| Junction Temperature | T_J | | | | 150 | $^\circ\text{C}$ |
| Thermal Resistance | R_{thjc} | | | | 3.1 | $^\circ\text{C}/\text{W}$ |
| TH1 NTC Thermistor | | | | | | |
| Resistance | R_{25} | $I = 1\text{mA}$ | 22.5 | 25 | 27.5 | K Ω |
| Resistance Ratio | R_T/R_{25} | $t = 80^\circ\text{C}$ | | .126 | | |
| | | $t = 90^\circ\text{C}$ | | .0916 | | |
| | | $t = 100^\circ\text{C}$ | | .0679 | | |
| | | $t = 110^\circ\text{C}$ | | .0511 | | |
| Dissipation Constant | P_D | | | 1.0 | | mW/ $^\circ\text{C}$ |
| Thermal Time Constant | t | | | | 10 | sec |

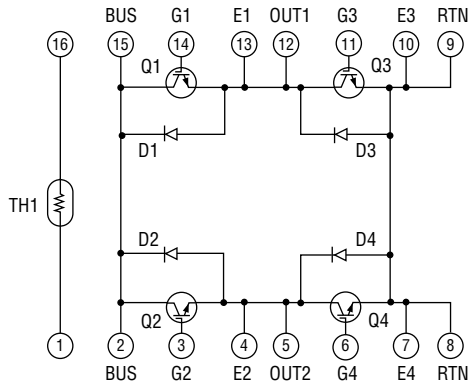
1 - TCase = 25°C unless otherwise specified.

ELECTRICAL CHARACTERISTICS (7721-2A)

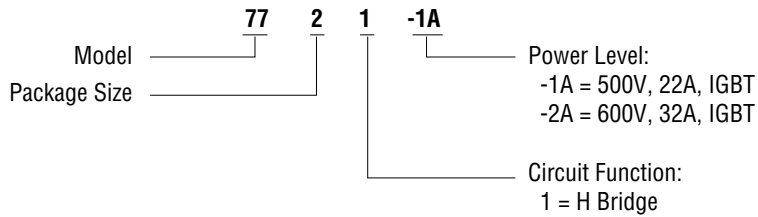
| Parameter | Symbol | Conditions ¹ | Min. | Typ. | Max. | Units |
|---------------------------------|--------------|--|------|---------------------------------|------------|---------------------------|
| Q1-Q4 IGBT | | | | | | |
| Continuous Collector Current | I_C | $T_C = 25^\circ\text{C}$ $T_C = 90^\circ\text{C}$ | | | 60 32 | A A |
| Pulsed Collector Current | I_{CM} | | | | 120 | A |
| Collector Leakage Current | I_{CES} | $V_{GE} = 0\text{V}, I_C = .8 \times 600\text{V}$ $V_{GE} = 0\text{V}, V_{CE} = .8 \times 600\text{V}, T_J = 125^\circ\text{C}$ | | | 200 1 | μA mA |
| Saturation Voltage | $V_{CE(ON)}$ | $I_C = 32\text{A}, V_{GE} = 15\text{V}$ | | | 2.5 | V |
| Gate Threshold Voltage | $V_{GE(TH)}$ | $V_{CE} = V_{GE}, I_C = 250\mu\text{A}$ | 2.5 | | 5.0 | V |
| Gate Leakage Current | I_{GES} | $V_{GE} = \pm 20\text{V}$ | | | ± 100 | nA |
| Total Gate Charge (turn on) | Q_g | $I_C = 32\text{A}, V_{CC} = 300\text{V}, V_{GE} = 15\text{V}$ | | 125 | 150 | nC |
| Gate Emitter Charge (turn on) | Q_{ge} | $I_C = 32\text{A}, V_{CC} = 300\text{V}, V_{GE} = 15\text{V}$ | | 23 | 35 | nC |
| Gate Collector Charge (turn on) | Q_{gc} | $I_C = 32\text{A}, V_{CC} = 300\text{V}, V_{GE} = 15\text{V}$ | | 50 | 75 | nC |
| Turn Off Delay Time | $t_{d(off)}$ | $I_C = 32\text{A}, V_{CC} = 400\text{V}, V_{GE} = 15\text{V}, R_G = 4.7\Omega$ | | 100 | 200 | ns |
| Fall Time | t_f | $I_C = 32\text{A}, V_{CC} = 400\text{V}, V_{GE} = 15\text{V}, R_G = 4.7\Omega$ | | 80 | 150 | ns |
| Total Switching Loss | E_{ts} | $I_C = 32\text{A}, V_{CC} = 400\text{V}, V_{GE} = 15\text{V}, R_G = 4.7\Omega$ | | .8 | 1.6 | mJ |
| Input Capacitance | C_{ies} | $V_{GE} = 0\text{V}, V_{CC} = 25\text{V}, f = 1\text{MHz}$ | | 2500 | | pF |
| Output Capacitance | C_{oes} | $V_{GE} = 0\text{V}, V_{CC} = 25\text{V}, f = 1\text{MHz}$ | | 230 | | pF |
| Reverse Transfer Capacitance | C_{res} | $V_{GE} = 0\text{V}, V_{CC} = 25\text{V}, f = 1\text{MHz}$ | | 70 | | pF |
| Junction Temperature | T_J | | | | 150 | $^\circ\text{C}$ |
| Thermal Resistance | R_{thjc} | | | | .60 | $^\circ\text{C}/\text{W}$ |
| D1-D4 Fred Diodes | | | | | | |
| Reverse Leakage Current | I_R | $V_R = 600\text{V}$ $V_R = .600\text{V}, T_J = 150^\circ\text{C}$ | | 1 .3 | 500 1.5 | μA mA |
| Forward Voltage | V_F | $I_F = 25\text{A}$ $I_F = 25\text{A}, T_J = 150^\circ\text{C}$ | | 1.5 1.3 | 2.8 2.5 | V V |
| Reverse Recovery Time | t_{rr} | $I_F = 1\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ | | 30 | 40 | ns |
| Junction Temperature | T_J | | | | 175 | $^\circ\text{C}$ |
| Thermal Resistance | R_{thjc} | | | | 1.2 | $^\circ\text{C}/\text{W}$ |
| TH1 NTC Thermistor | | | | | | |
| Resistance | R_{25} | $I = 1\text{mA}$ | 22.5 | 25 | 27.5 | K Ω |
| Resistance Ratio | R_T/R_{25} | $t = 80^\circ\text{C}$ $t = 90^\circ\text{C}$ $t = 100^\circ\text{C}$ $t = 110^\circ\text{C}$ | | .126 .0916 .0679 .0511 | | |
| Dissipation Constant | P_D | | | 1.0 | | mW/ $^\circ\text{C}$ |
| Thermal Time Constant | t | | | | 10 | sec |

1 - TCASE = 25°C unless otherwise specified.

SCHEMATIC



ORDERING INFORMATION



OUTLINE DIMENSIONS (Inch)

