



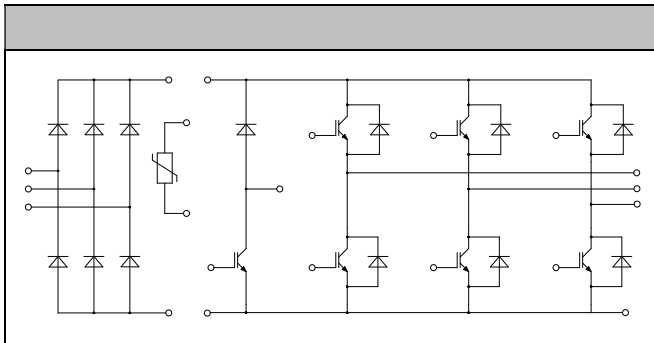
MG50P12E2



120V
50A



- **MicroDives**
- **AC and DC servo drive amplifier**
- **UPS (Uninterruptible Power Supplies)**



- **Low switching losses**
- **Low $V_{CE(sat)}$ with positive temperature coefficient**
- **Including fast & soft recovery anti-parallel FWD**
- **Low inductance case**
- **High short-circuit capability (10s)**
- **Maximum junction temperature 175°C**

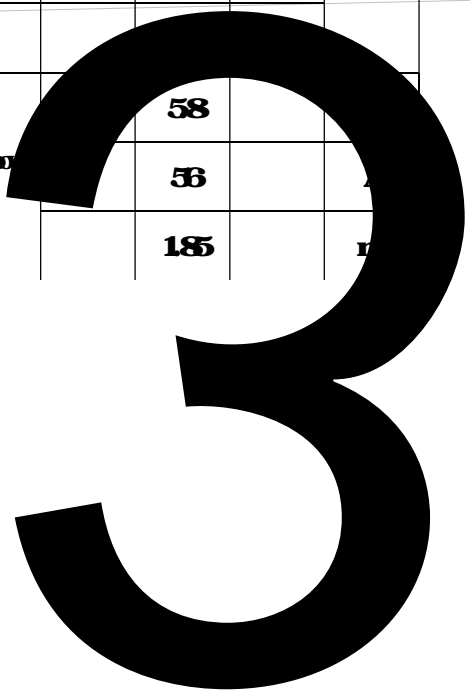
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| Collector-Emitter Voltage | V_{CES} | $V_{CE=0V, I_C=1mA, T_J=25^\circ C$ | 120 | V |
| Continuous Collector Current | I_C | $T_C=100^\circ C, T_{Jmax}=175^\circ C$ | 50 | A |
| Repetitive Peak Collector Current | I_{RM} | $t_p=1ms$ | 100 | A |
| Gate-Emitter Voltage | V_{GES} | $T_J=25^\circ C$ | ± 20 | V |
| Total Power Dissipation | P_{tot} | $T_C=25^\circ C$ $T_{Jmax}=175^\circ C$ | 288 | W |

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| Gate-emitter Threshold Voltage | $V_{GE(th)}$ | $V_{GE}=V_{CE}, I_C=1.7mA, T_J=25C$ | 52 | 58 | 64 | V | |
| Collector-Emitter Cut-off Current | I_{CES} | $V_{CE}=120V, V_{GE}=0V, T_J=25C$ | | | 10 | nA | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=50A, V_{GE}=15V, T_J=25C$ | | 190 | 230 | V | |
| | | $I_C=50A, V_{GE}=15V, T_J=125C$ | | 220 | | | |
| | | $I_C=50A, V_{GE}=15V, T_J=150C$ | | 230 | | | |
| Gate Charge | Q_g | | | 035 | | μC | |
| Input Capacitance | C_{is} | $V_{CE}=25V, V_{GE}=0V$ | | 260 | | rF | |
| Reverse Transfer Capacitance | C_{res} | $f=1MHz, T_J=25C$ | | 010 | | rF | |
| Gate-Emitter leakage current | I_{GES} | $V_{CE}=0V, V_{GE}=20V, T_J=25C$ | | | 40 | nA | |
| Turn-on Delay/line | t_{on} | $I_C=50A$ $V_{CE}=60V$ $V_{GE}=\pm 15V$ $R_{\theta}=15$ $T_J=25C$ | | 168 | | ns | |
| Rise time | t_r | | | 31 | | ns | |
| Turn-off Delay/line | t_{off} | | | 30 | | ns | |
| Fall time | t_f | | | 78 | | ns | |
| Energy Dissipation During Turn-on/line | E_{on} | | | 542 | | nJ | |
| Energy Dissipation During Turn-off/line | E_{off} | | | 415 | | nJ | |
| Turn-on Delay/line | t_{on} | | $I_C=50A$ $V_{CE}=60V$ $V_{GE}=\pm 15V$ $R_{\theta}=15$ $T_J=125C$ | | 175 | | ns |
| Rise time | t_r | | | | 42 | | ns |
| Turn-off Delay/line | t_{off} | | | | 46 | | ns |
| Fall time | t_f | | | | 148 | | ns |
| Energy Dissipation During Turn-on/line | E_{on} | | | 726 | | nJ | |
| Energy Dissipation During Turn-off/line | E_{off} | | | 580 | | nJ | |
| SCData | I_C | $T_p=10s, V_{CE}=15V, T_J=150C,$ $V_{CE}=90V, V_{CEM}=120V$ | | 220 | | A | |



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| Repetitive Peak Reverse Voltage | V_{RM} | T_J=25°C | 120 | V |
| Continuous DC Forward Current | I_F | | 50 | A |
| Repetitive Peak Forward Current | I_{RM} | t_F=1ms | 100 | A |
| R_{θJC} | R_θ | V_F=0, t_F=10ms, T_J=125°C | 500 | As |
| | | V_F=0, t_F=10ms, T_J=150°C | 400 | |

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| Forward Voltage | V_F | I_F=50A, T_J=25°C | 210 | 250 | V |
| | | I_F=50A, T_J=125°C | 215 | | |
| | | I_F=50A, T_J=150°C | | | |
| Recovered Charge | Q_R | I_F=50A | 58 | | |
| Peak Reverse Recovery Current | I_R | V_R=600V, C_{ES}=60nF, dI_F=150A/μs | 50 | | |
| Reverse Recovery Energy | E_{rec} | T_J=25°C | 185 | | |



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|--|-----------|-------------------------------|----------------------------|----------|
| Collector-Emitter Voltage | V_{CES} | $V_{CE}=0V, I_C=1mA, T_j=25C$ | 120 | V |
| Continuous Collector Current | I_C | $T_C=100C, T_{jmax}=175C$ | 35 | A |
| Repetitive Peak Collector Current | I_{CRM} | $t_p=1ms$ | 70 | A |
| Gate-Emitter Voltage | V_{GES} | $T_j=25C$ | ± 20 | V |
| Total Power Dissipation | P_{tot} | $T_C=25C$ $T_{jmax}=175C$ | 227 | W |

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|---|---------------|--|-----------|------------|------------|---------------------------|-----------|
| Gate-emitter Threshold Voltage | $V_{GE(th)}$ | $V_{CE}=V_{CE}, I_C=14mA, T_j=25C$ | 52 | 58 | 64 | V | |
| Collector-Emitter Cut-off Current | I_{CES} | $V_{CE}=120V, V_{GE}=0V, T_j=25C$ | | | 10 | nA | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=35A, V_{CE}=15V, T_j=25C$ | | 185 | 225 | V | |
| | | $I_C=35A, V_{CE}=15V, T_j=125C$ | | 215 | | | |
| | | $I_C=35A, V_{CE}=15V, T_j=150C$ | | 225 | | | |
| Gate Charge | Q_g | | | 027 | | μC | |
| Input Capacitance | C_{in} | $V_{CE}=25V, V_{GE}=0V$ $f=1MHz, T_j=25C$ | | 200 | | nF | |
| Reverse Transfer Capacitance | C_{tr} | | | 007 | | nF | |
| Gate-Emitter leakage current | I_{GES} | $V_{CE}=0V, V_{GE}=20V, T_j=25C$ | | | 40 | nA | |
| Turn-on Delay/line | t_{on} | $I_C=35A$ $V_{CE}=60V$ $V_{GE}=\pm 15V$ $R_g=12$ $T_j=25C$ | | 25 | | ns | |
| Rise time | t_r | | | 13 | | ns | |
| Turn-off Delay/line | t_{off} | | | 21 | | ns | |
| Fall time | t_f | | | 115 | | ns | |
| Energy Dissipation During Turn-on | E_{on} | | | | 190 | | nJ |
| Energy Dissipation During Turn-off | E_{off} | | | | 200 | | nJ |





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| Repetitive Peak Reverse Voltage | V_{RRM} | $T_J=25^{\circ}\text{C}$ | 160 | V |
| Average Output Current 50kHz, sine wave | $I_{(AV)}$ | $T_C=100^{\circ}\text{C}$ | 6 | A |
| Minimum RMS Current at Rectifier Output | I_{RSM} | $T_C=100^{\circ}\text{C}$ | 110 | A |
| Surge Forward Current | I_{SM} | $V_F=0, t_F=10\text{ms}, T_J=45^{\circ}\text{C}$ | 80 | A |
| ft value | f_t | $V_F=0, t_F=10\text{ns}, T_J=45^{\circ}\text{C}$ | 360 | As |

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| Diode Forward Voltage | V_F | $I_F=50\text{A}, T_J=125^{\circ}\text{C}$ | 10 | V |
| Reverse Current | I_R | $T_J=125^{\circ}\text{C}, V_R=160\text{V}$ | 15 | nA |

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| Rated Resistance | R_{θ} | | 50 | kΩ |
| Deviation of R10 | RR | $T_C=100^{\circ}\text{C}, R_{\theta}=483^{\circ}\text{C}$ | -5 | 5 % |
| Power Dissipation | P_{θ} | | | 200 nW |
| B value | B_{50} | $R_{\theta} = R_{\theta} \exp\{P_{\theta 50} (1/T_{\theta} - 1/298.15)\}$ | 375 | K |



MG50P12E2

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| V_{ce} | t=1ms | 50Hz | 250 | | V |
| T_{junction} | | | | 15 | °C |
| T_{storage} | | | | 15 | |
| T_{leg} | | | -40 | 125 | °C |

