

HCG100FS120E1B

$V_{CES}=1200V$, $I_C (nom) =100A$

Features

- Low inductive design
- Low V_{cesat} with high junction temperature
- Fast & soft reverse recovery anti-parallel FWD
- Low Switching Losses

Benefits

- Higher System Efficiency
- Reduce cooling requirements
- Increased power density
- Enabling higher frequency

Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- Uninterruptible power supply

Absolute Maximum Ratings

$T_C=25^{\circ}C$ unless otherwise noted

IGBT-inverter

| Symbol | Parameter | Value | Unit |
|-----------|---|----------|------|
| V_{CES} | Collector-Emitter Voltage | 1200 | V |
| V_{GES} | Gate - Emitter Voltage | ± 20 | V |
| I_C | Collector Current @ $T_C = 25^{\circ}C$, $T_{vj} = 150^{\circ}C$ | 100 | A |
| I_{CM} | Pulsed Collector Current $t_p = 1ms$ | 200 | A |

Diodeinverter

| Symbol | Parameter | Value | Unit |
|-----------|---|-------|------|
| V_{RRM} | Repetitive Peak Reverse Voltage | 1200 | V |
| I_F | Diode Continuous Forward Current | 100 | A |
| I_{FM} | Diode Maximum Forward Current $t_p = 1ms$ | 200 | A |

Package



IGBT-inverter Characteristics $T_c = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Min. | Typ. | Max. | Unit | Test Conditions |
|---------------|---|------|-------|------|------------------|---|
| $V_{CE(sat)}$ | Collector to Emitter Saturation Voltage | | 1.70 | 2.15 | V | $I_c=100\text{A}, V_{GE}=15\text{V}, T_j=25^\circ\text{C}$ |
| | | | 1.95 | | | $I_c=100\text{A}, V_{GE}=15\text{V}, T_j=125^\circ\text{C}$ |
| | | | 2.0 | | | $I_c=100\text{A}, V_{GE}=15\text{V}, T_j=150^\circ\text{C}$ |
| $V_{GE(th)}$ | Gate-Emitter Threshold Voltage | 5.2 | 6.0 | 6.8 | V | $I_c=2.4\text{mA}, V_{CE}=V_{GE}, T_j=25^\circ\text{C}$ |
| I_{CES} | Collector Cut-Off Current | | | 1.0 | mA | $V_{CE}=V_{CES}, V_{GE}=0\text{V}, T_j=25^\circ\text{C}$ |
| I_{GES} | Gate-Emitter Leakage Current | | | 400 | nA | $V_{GE}=V_{GES}, V_{CE}=0\text{V}, T_j=25^\circ\text{C}$ |
| E_{On} | Turn-On Switching Energy | -- | 5.90 | -- | mJ | $V_{CC}=600\text{V}, I_c=100\text{A}, R_G=2.2\Omega, V_{GE}=\pm 15\text{V}, T_j=25^\circ\text{C}$ |
| E_{Off} | Turn Off Switching Energy | -- | 6.05 | -- | | |
| $t_{d(on)}$ | Turn-on Delay Time | -- | 170 | -- | ns | |
| t_r | Turn-on Rise Time | -- | 32 | -- | | |
| $t_{d(off)}$ | Turn-off Delay Time | -- | 360 | -- | | |
| t_f | Turn-off Fall Time | -- | 86 | -- | | |
| I_{sc} | SC Data | | 500 | | A | |
| R_{thJC} | Thermal resistance, junction to case | | 0.293 | | K/W | <i>per IGBT</i> |
| R_{thCH} | Thermal resistance, case to heatsink | | 0.190 | | K/W | <i>per IGBT</i> |
| $T_{vj op}$ | Temperature under switching conditions | -40 | | 150 | $^\circ\text{C}$ | |

Diode-inverter Characteristics $T_c = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Min. | Typ. | Max. | Unit | Test Conditions |
|-------------|--|------|-------|------|------------------|---|
| V_F | Diode Forward Voltage | | 1.70 | 2.15 | V | $I_c=100\text{A}, V_{GE}=0\text{V}, T_j=25^\circ\text{C}$ |
| | | | 1.65 | | | $I_F=100\text{A}, V_{GE}=0\text{V}, T_j=125^\circ\text{C}$ |
| | | | 1.65 | | | $I_F=100\text{A}, V_{GE}=0\text{V}, T_j=150^\circ\text{C}$ |
| Q_r | Recovered Charge | -- | 9.0 | -- | μC | $V_R=600\text{V}, I_F=100\text{A}, -di/dt=2500\text{A}/\mu\text{s}, V_{GE}=-15\text{V}, T_j=25^\circ\text{C}$ |
| I_{RM} | Peak Reverse Recovery Current | -- | 110 | -- | A | |
| E_{rec} | Reverse Recovery Energy | -- | 3.32 | -- | mJ | |
| R_{thJC} | Thermal resistance, junction to case | | 0.505 | | K/W | <i>per DIODE</i> |
| R_{thCH} | Thermal resistance, case to heatsink | | 0.327 | | K/W | <i>per DIODE</i> |
| $T_{vj op}$ | Temperature under switching conditions | -40 | | 150 | $^\circ\text{C}$ | |

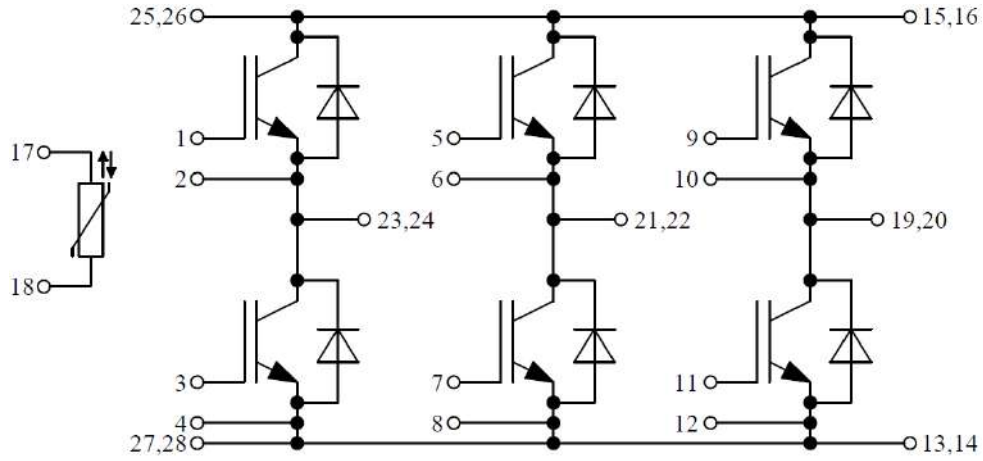
NTC-Thermistor Characteristics

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------|------------------|---|------|------|------|------------------|
| R_{25} | Rated Resistance | $T_{NTC}=25^{\circ}\text{C}$ | | 5.0 | | $\text{k}\Omega$ |
| $B_{25/50}$ | B-value | $R_2=R_{25\text{exp}}[B_{25/50}(1/T_2-1/(298,15\text{K}))]$ | | 3380 | | K |
| $B_{25/80}$ | B-value | $R_2=R_{25\text{exp}}[B_{25/80}(1/T_2-1/(298,15\text{K}))]$ | | 3435 | | K |

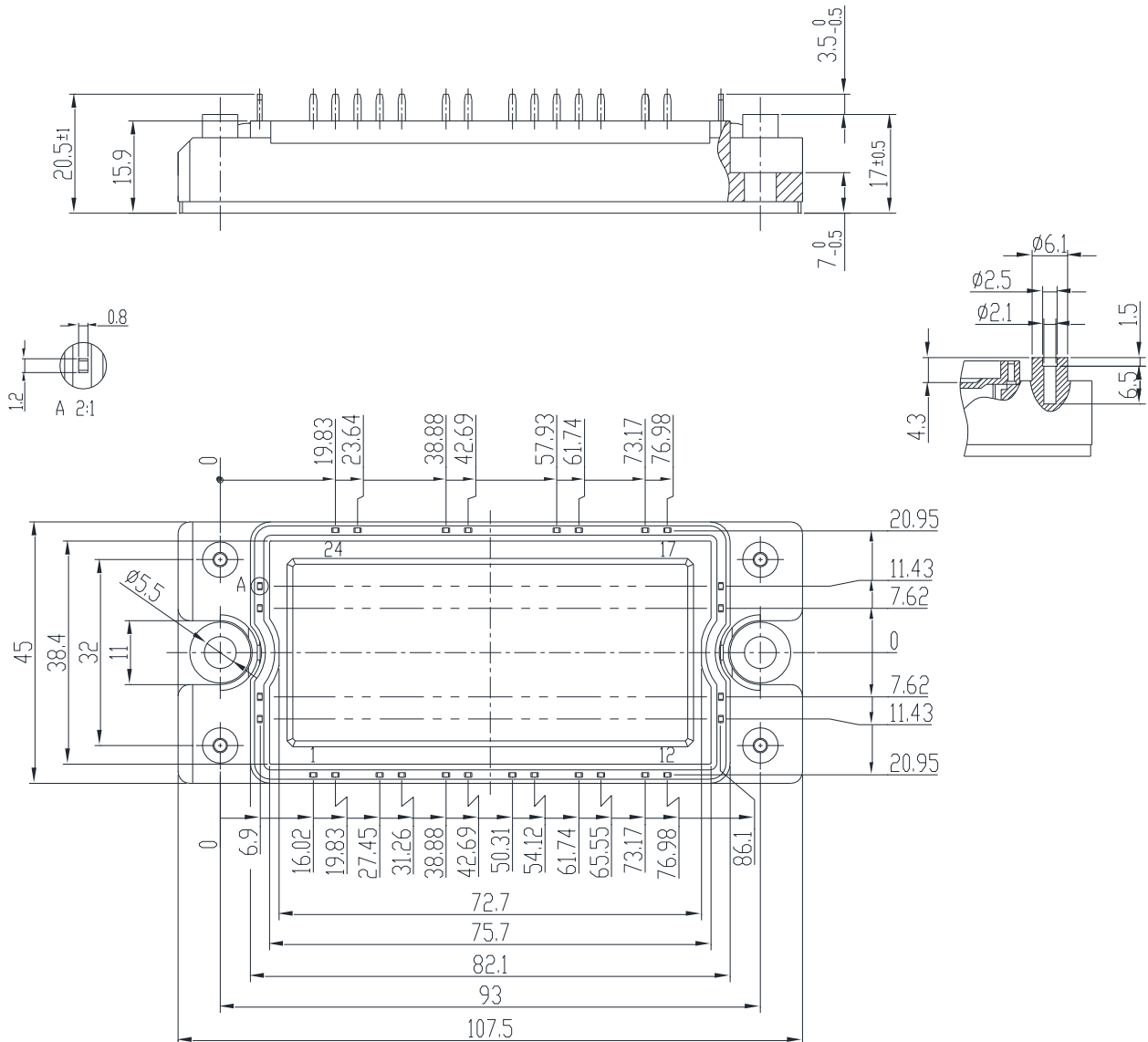
Package

| Symbol | Parameter | Test Conditions | Values | Unit |
|--------------------|-------------------------------------|--|---------|--------------------|
| V_{ISOL} | Isolation test voltage | RMS, $f=50\text{Hz}$, $t=1\text{min}$ | 2.5 | kV |
| d_{Creep} | Creepage distance | | 10.0 | mm |
| d_{Clear} | Clearance | | 7.5 | mm |
| CTI | Comparative tracking index | | > 200 | |
| L_{sCE} | Stray inductance module | | 60 | nH |
| T_{stg} | Storage temperature | | -40~125 | $^{\circ}\text{C}$ |
| M | Mounting torque for module mounting | M5, Screw | 3~6 | Nm |
| G | Weight | | 300 | g |

Circuit diagram



Package Dimensions Dimensions in Millimeters



Revision History

| Document Version | Description of Changes |
|------------------|------------------------|
| RevX.0.1 | Released |
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