

Non Punch Through (NPT) IGBT

Description

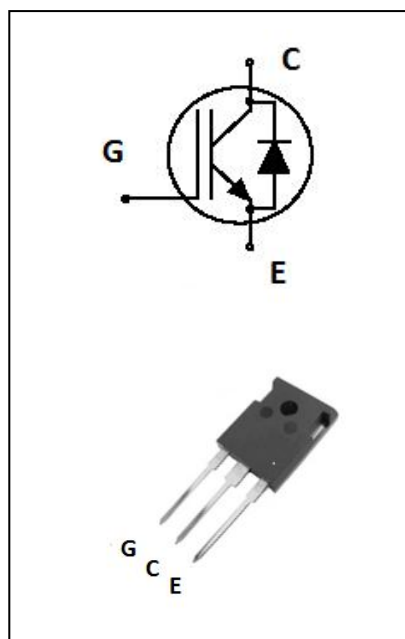
The ZG40N120 is use advanced non punch through(NPT) technology ,the 1200V NPT IGBT offers superior conduction and switching performances.

General Features

- 1200V Breakdown Voltage
- Low saturation voltage: $V_{CE(sat),typ}=2.12V$
@ $I_C=40A$ and $T_C=25^{\circ}C$
- NPT Technology,Positive temperature coefficient

Application

- Solar Converters
- Welding Converters
- UPS



Electrical Characteristics @ $T_c=25^{\circ}C$ (unless otherwise specified)

a) Limited Parameters:

| Symbol | Parameter | Value | Units |
|-----------|---|-------------|-------------|
| V_{CES} | Collector-Emitter Voltage | 1200 | V |
| V_{GES} | Gate-Emitter Voltage | +/-20 | V |
| I_C | Collector Current | 80 | A |
| | Collector Current @ $T_c=100^{\circ}C$ | 40 | A |
| I_{CM} | Pulsed Collector Current | 120 | A |
| I_F | Diode Continuous Forward Current @ $T_c=100^{\circ}C$ | 40 | A |
| I_{FM} | Diode Maximum Forward Current | 120 | A |
| P_D | Total Dissipation at $T_a=25^{\circ}C$ | 550 | W |
| | Total Dissipation at @ $T_c=100^{\circ}C$ | 450 | |
| T_j | Operating Junction and Storage Temperature Range | -40 to +150 | $^{\circ}C$ |
| T_L | Max Temperature For Soldering | 300 | $^{\circ}C$ |



b) Electrical Parameters:

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|---------------|--------------------------------------|---|---------------|------|------|---------|
| V_{CES} | Collector-Emitter Voltage | $V_{GE}=0V, I_{CE}=250\mu A$ | 1200 | | | V |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $V_{GE}=15V, I_C=40A$ | | 2.12 | 2.5 | V |
| $V_{GE(th)}$ | Gated Threshold Voltage | $V_{CE}=V_{GE}, I_C=1mA$ | 4.5 | 5.2 | 5.8 | V |
| I_{CES} | Collector-Emitter Leakage Current | $V_{GE}=0V, V_{CE}=1200V$ | | | 25 | μA |
| $I_{GES(F)}$ | Gate to Emitter Forward Leakage | $V_{GE}=+20V,$ | | | 250 | nA |
| $I_{GES(R)}$ | Gate to Emitter Reverse Leakage | $V_{GE}=-20V,$ | | | -250 | nA |
| C_{ies} | Input Capacitance | $V_{GE}=0V,$ $V_{CE}=25V,$ $f=1.0MHz$ | | 1680 | | pF |
| C_{oes} | Output Capacitance | | | 260 | | pF |
| C_{res} | Reverse Transfer Capacitance | | | 120 | | pF |
| Q_g | Total Gate Charge | | $V_{CE}=400V$ | | 210 | |
| Q_{ge} | Gate to Emitter Charge | $I_C=40A$ | | 34 | | nC |
| Q_{gc} | Gate to Collector Charge | $V_{GE}=15V$ | | 105 | | nC |

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|--------------|---------------------|--|-----|-----|-----|------|
| $t_{d(on)}$ | Turn-on Delay Time | $V_{CE}=600V, I_C=40A$ $V_{GE}=15V, R_G=10\Omega$ | | 290 | | nS |
| t_r | Rise Time | | | 63 | | nS |
| $t_{d(off)}$ | Turn-off Delay Time | | | 270 | | nS |
| t_f | Fall Time | | | 285 | | nS |

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|----------|----------------------------------|--|-----|-----|-----|------|
| I_F | Diode Continuous Forward Current | $TC=100^\circ C$ | 40 | | | A |
| I_{FM} | Diode Maximum Forward Current | $TC=100^\circ C$ | 120 | | | A |
| V_F | Diode Forward Voltage | $I_F=40A$ | | 2.7 | 3.4 | V |
| t_{rr} | Diode reverse recovery time | $I_F=1A, V_R=30V,$ $di/dt=200A/\mu s$ | | 55 | | ns |

| Symbol | Parameter | Typ | MAX | Units |
|-----------------|---|-----|-----|--------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction to case for IGBT | -- | 0.6 | $^\circ C/W$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | -- | 40 | $^\circ C/W$ |

