



STE70IE120

Monolithic Emitter Switched Bipolar Transistor ESBT[®] 1200 V - 70 A - 0.014 Ω Power Module

Target data

General features

| | | |
|--------------|-------|--------------|
| $V_{CS(ON)}$ | I_C | $R_{CS(ON)}$ |
| 1V | 70A | 0.014Ω |

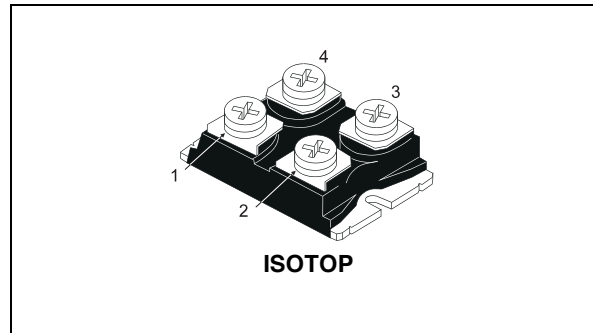
- High voltage / high current Cascode configuration
- Ultra low equivalent on resistance
- Very fast-switch, up to 150 kHz
- Ultra low C_{ISS}
- Low dynamic $V_{CS(ON)}$

Description

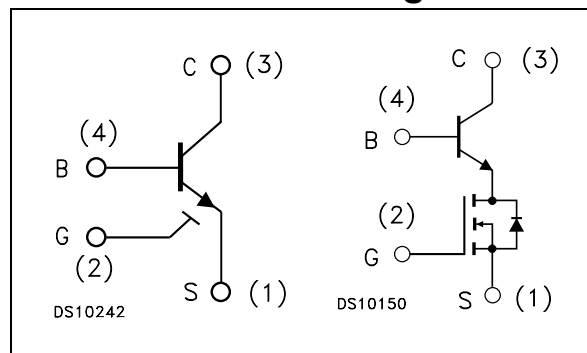
The STE70DE120 is manufactured in monolithic structure, to be used in industrial applications.

Applications

- Solar
- Welding



Internal schematic diagram



Order codes

| Part number | Marking | Package | Packaging |
|-------------|----------|---------|-----------|
| STE70IE120 | E70IE120 | ISOTOP | Tube |

1 Electrical ratings

Table 1. Absolute maximum ratings

| Symbol | Parameter | Value | Unit |
|--------------|--|------------|------------|
| $V_{CS(SS)}$ | Collector-source voltage ($V_{BS} = V_{GS} = 0V$) | 1200 | V |
| $V_{BS(OS)}$ | Base-source voltage ($I_C = 0, V_{GS} = 0V$) | 40 | V |
| $V_{SB(OS)}$ | Source-base voltage ($I_C = 0, V_{GS} = 0V$) | 12 | V |
| V_{GS} | Gate-source voltage | ± 20 | V |
| I_C | Collector current | 70 | A |
| I_{CM} | Collector peak current ($t_p < 5ms$) | 150 | A |
| I_B | Base current | 20 | A |
| I_{BM} | Base peak current ($t_p < 1ms$) | 70 | A |
| P_{tot} | Total dissipation at $T_C = 25^\circ C$ | TBD | W |
| T_{STG} | Storage temperature | -65 to 150 | $^\circ C$ |
| T_J | Maximum operating junction temperature | 150 | $^\circ C$ |
| V_{ISO} | Insulation withstand voltage (AC-RMS) from all four leads to external heatsink | 2500 | V |

1.1 Thermal data

Table 2. Thermal data

| Symbol | Parameter | Value | Unit |
|----------------|---|-------|--------------|
| $R_{thJ-case}$ | Thermal resistance junction-case (Max) | TBD | $^\circ C/W$ |
| R_{thc-h} | Thermal resistance case-heatsink with conductive grease applied (Max) | TBD | $^\circ C/W$ |

2 Electrical characteristics

Table 3. Electrical characteristics

($T_{Case} = 25^{\circ}C$, unless otherwise specified)

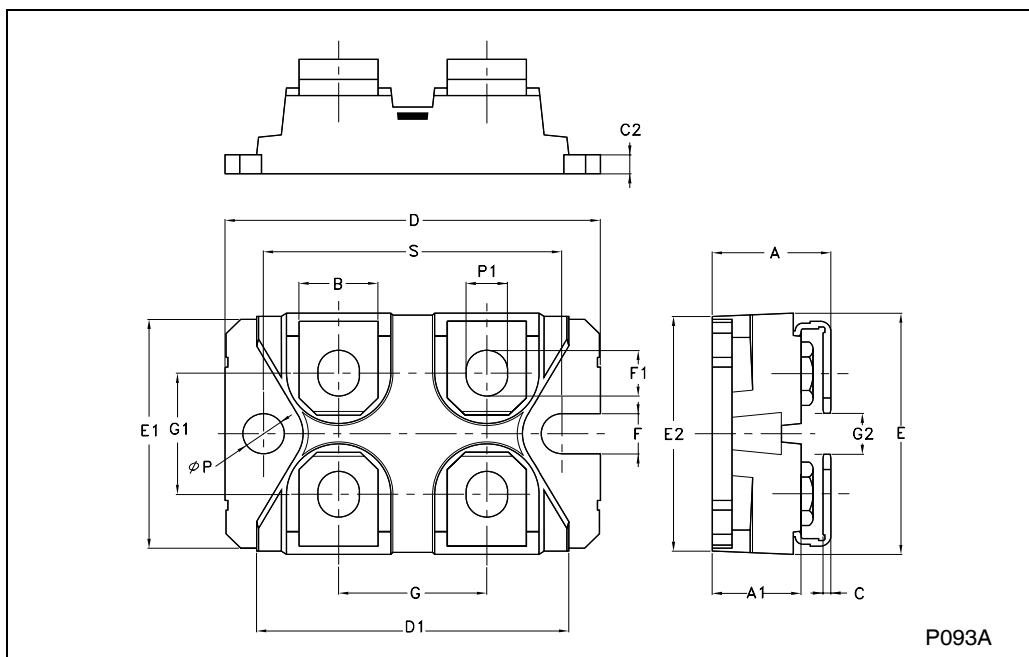
| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---------------|---|--|--------|------------|---------|---------|
| $I_{CS(SS)}$ | Collector-source current ($V_{BS} = V_{GS} = 0$) | $V_{CE} = 1200V$ | | | 100 | μA |
| $I_{BS(OS)}$ | Base-source current ($I_C = 0, V_{GS} = 0V$) | $V_{BS(OS)} = 40V$ | | | 10 | μA |
| $I_{SB(OS)}$ | Source-base current ($I_C = 0, V_{GS} = 0$) | $V_{SB(OS)} = 10V$ | | | 100 | μA |
| $I_{GS(OS)}$ | Gate-source leakage | $V_{GS} = \pm 20V$ | | | 500 | nA |
| $V_{CS(ON)}$ | Collector-source ON voltage | $V_{GS} = 10V \quad I_C = 70A \quad I_B = 14A$ $V_{GS} = 10V \quad I_C = 45A \quad I_B = 4.5A$ | | 1 1 | | V V |
| h_{FE} | DC current gain | $V_{GS} = 10V \quad V_{CS} = 1V \quad I_C = 70A$ $V_{GS} = 10V \quad V_{CS} = 1V \quad I_C = 45A$ | 3 6 | | 7 13 | |
| $V_{BS(ON)}$ | Base-emitter ON voltage | $V_{GS} = 10V \quad I_C = 70A \quad I_B = 14A$ $V_{GS} = 10V \quad I_C = 45A \quad I_B = 4.5A$ | | tbd tbd | | V V |
| $V_{GS(th)}$ | Gate threshold voltage | $V_{BS} = V_{GS} \quad I_B = 250\mu A$ | 3 | 3.7 | 4.5 | V |
| C_{iss} | Input Capacitance | $V_{CS} = 25V \quad f=1MHz$ $V_{GS} = V_{CB} = 0$ | | tbd | | pF |
| $Q_{GS(tot)}$ | Gate-source charge | $V_{CS} = 25V \quad V_{GS} = 10$ $V_{CB} = 0 \quad I_C = 70A$ | | tbd | | nC |

3 Package Mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

ISOTOP MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|-------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 11.8 | | 12.2 | 0.465 | | 0.480 |
| A1 | 8.9 | | 9.1 | 0.350 | | 0.358 |
| B | 7.8 | | 8.2 | 0.307 | | 0.322 |
| C | 0.75 | | 0.85 | 0.029 | | 0.033 |
| C2 | 1.95 | | 2.05 | 0.076 | | 0.080 |
| D | 37.8 | | 38.2 | 1.488 | | 1.503 |
| D1 | 31.5 | | 31.7 | 1.240 | | 1.248 |
| E | 25.15 | | 25.5 | 0.990 | | 1.003 |
| E1 | 23.85 | | 24.15 | 0.938 | | 0.950 |
| E2 | | 24.8 | | | 0.976 | |
| G | 14.9 | | 15.1 | 0.586 | | 0.594 |
| G1 | 12.6 | | 12.8 | 0.496 | | 0.503 |
| G2 | 3.5 | | 4.3 | 0.137 | | 1.169 |
| F | 4.1 | | 4.3 | 0.161 | | 0.169 |
| F1 | 4.6 | | 5 | 0.181 | | 0.196 |
| P | 4 | | 4.3 | 0.157 | | 0.169 |
| P1 | 4 | | 4.4 | 0.157 | | 0.173 |
| S | 30.1 | | 30.3 | 1.185 | | 1.193 |



4 Revision history

Table 4. Document revision history

| Date | Revision | Changes |
|-------------|----------|-----------------------|
| 04-May-2007 | 1 | Initial EDOCS release |

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