

Linear Systems High Voltage Super-Beta Monolithic Dual NPN

The LS302 is a monolithic pair of high voltage Super-Beta NPN transistors mounted in a single SOT-23 package. The monolithic dual chip design reduces parasitics and gives better performance while ensuring extremely tight matching.

The 6 Pin SOT-23 provides ease of manufacturing, and a lower cost assembly option.

(See Packaging Information).

LS302 Features:

- Very high gain
- Tight matching
- Low Output Capacitance

FEATURES

| | |
|-------------------------|-------------------------------------|
| HIGH GAIN | $h_{FE} \geq 1000$ @ 1 μ A TYP. |
| LOW OUTPUT CAPACITANCE | $C_{OBO} \leq 2.0$ pF |
| TIGHT V_{BE} MATCHING | $ V_{BE1} - V_{BE2} = 0.2$ mV TYP. |
| HIGH f_t | 100MHZ |

ABSOLUTE MAXIMUM RATINGS ¹ @ 25°C (unless otherwise noted)

Maximum Temperatures

| | |
|--------------------------------|-----------------|
| Storage Temperature | -65°C to +200°C |
| Operating Junction Temperature | -55°C to +150°C |

Maximum Power Dissipation

| | |
|---|----------|
| Continuous Power Dissipation (One side) | 250mW |
| Continuous Power Dissipation (Both sides) | 500mW |
| Linear Derating factor (One side) | 2.3mW/°C |
| Linear Derating factor (Both sides) | 4.3mW/°C |

Maximum Currents

| | |
|-------------------|-----|
| Collector Current | 5mA |
|-------------------|-----|

MATCHING CHARACTERISTICS @ 25°C (unless otherwise stated)

| SYMBOL | CHARACTERISTIC | MIN | TYP | MAX | UNITS | CONDITIONS |
|---|---|-----|-----|-----|------------------|---|
| $ V_{BE1} - V_{BE2} $ | Base Emitter Voltage Differential | -- | 0.2 | 1 | mV | $I_C = 10\mu A, V_{CE} = 5V$ |
| $\Delta (V_{BE1} - V_{BE2}) / \Delta T$ | Base Emitter Voltage Differential Change with Temperature | -- | 1 | 5 | $\mu V/^\circ C$ | $I_C = 10\mu A, V_{CE} = 5V$ $T_A = -55^\circ C$ to $+125^\circ C$ |
| $ I_{B1} - I_{B2} $ | Base Current Differential | -- | 1 | 5 | nA | $I_C = 10\mu A, V_{CE} = 5V$ |
| h_{FE1} / h_{FE2} | DC Current Gain Differential | -- | 5 | -- | % | $I_C = 10\mu A, V_{CE} = 5V$ |

ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

| SYMBOL | CHARACTERISTICS | MIN. | TYP. | MAX. | UNITS | CONDITIONS |
|---------------|--|------|------|------|-------|--|
| BV_{CBO} | Collector to Base Voltage | 35 | -- | -- | V | $I_C = 10\mu A, I_E = 0$ |
| BV_{CEO} | Collector to Emitter Voltage | 35 | -- | -- | V | $I_C = 10\mu A, I_B = 0$ |
| BV_{EBO} | Emitter-Base Breakdown Voltage | 6.2 | -- | -- | V | $I_E = 10\mu A, I_C = 0^2$ |
| BV_{CCO} | Collector to Collector Voltage | 100 | -- | -- | V | $I_C = 10\mu A, I_E = 0$ |
| h_{FE} | DC Current Gain | -- | 1000 | -- | | $I_C = 1\mu A, V_{CE} = 5V$ |
| | | 1000 | -- | -- | | $I_C = 10\mu A, V_{CE} = 5V$ |
| | | -- | 1000 | -- | | $I_C = 500\mu A, V_{CE} = 5V$ |
| $V_{CE(SAT)}$ | Collector Saturation Voltage | -- | -- | 0.5 | V | $I_C = 1mA, I_B = 0.1mA$ |
| I_{EBO} | Emitter Cutoff Current | -- | -- | 0.2 | pA | $I_C = 0, V_{EB} = 3V$ |
| I_{CBO} | Collector Cutoff Current | -- | -- | 100 | pA | $I_E = 0, V_{CB} = 10V$ |
| C_{OBO} | Output Capacitance | -- | -- | 2 | pF | $I_E = 0, V_{EB} = 1V$ |
| C_{C1C2} | Collector to Collector Capacitance | -- | -- | 2 | pF | $V_{CC} = 0V$ |
| I_{C1C2} | Collector to Collector Leakage Current | -- | -- | 0.5 | nA | $V_{CC} = \pm 80V$ |
| f_T | Current Gain Bandwidth Product | 100 | -- | -- | MHZ | $I_C = 200\mu A, V_{CE} = 5V$ |
| NF | Narrow Band Noise Figure | -- | -- | 3 | dB | $I_C = 10\mu A, V_{CE} = 3V, BW=200Hz, R_G= 10K\Omega, f = 1KHz$ |

Notes:

- Absolute Maximum ratings are limiting values above which serviceability may be impaired
- The reverse base-to-emitter voltage must never exceed 6.2 volts; the reverse base-to-emitter current must never exceed 10 μ A.

Available Packages:

LS302 in SOT-23
LS302 available as bare die

Please contact Micross for full package and die dimensions:

Email: chipcomponents@micross.com
Web: www.micross.com/distribution.aspx

