
2SD1609, 2SD1610

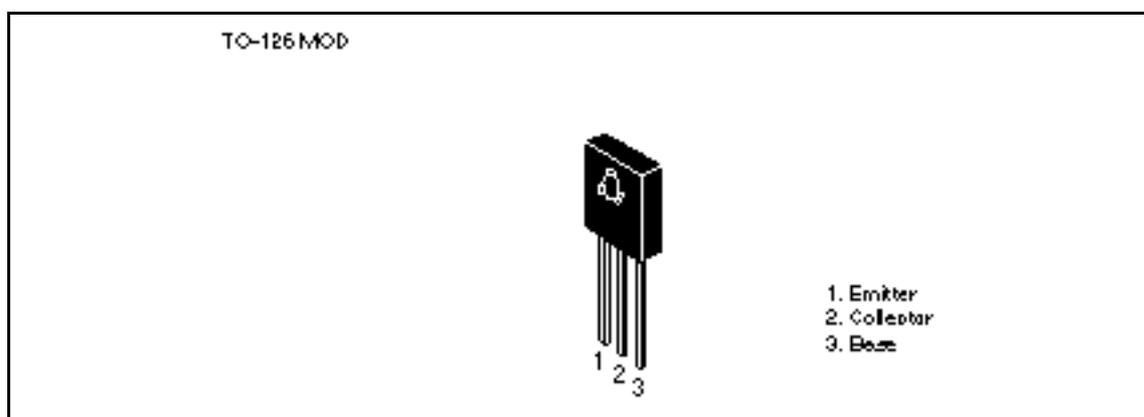
Silicon NPN Epitaxial

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Application

Low frequency high voltage amplifier complementary pair with 2SB1109 and 2SB1110

Outline



Absolute Maximum Ratings (Ta = 25°C)

| Item | Symbol | Ratings | | Unit |
|------------------------------|-----------|-------------|-------------|------|
| | | 2SD1609 | 2SD1610 | |
| Collector to base voltage | V_{CBO} | 160 | 200 | V |
| Collector to emitter voltage | V_{CEO} | 160 | 200 | V |
| Emitter to base voltage | V_{EBO} | 5 | 5 | V |
| Collector current | I_C | 100 | 100 | mA |
| Collector power dissipation | P_C | 1.25 | 1.25 | W |
| Junction temperature | T_j | 150 | 150 | °C |
| Storage temperature | T_{stg} | -45 to +150 | -45 to +150 | °C |

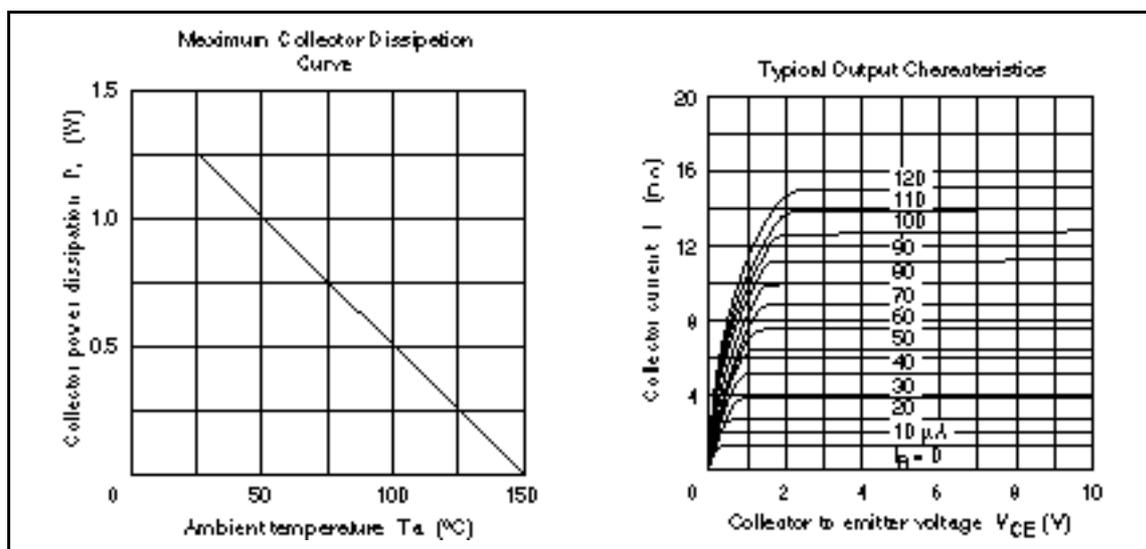
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Electrical Characteristics (Ta = 25°C)

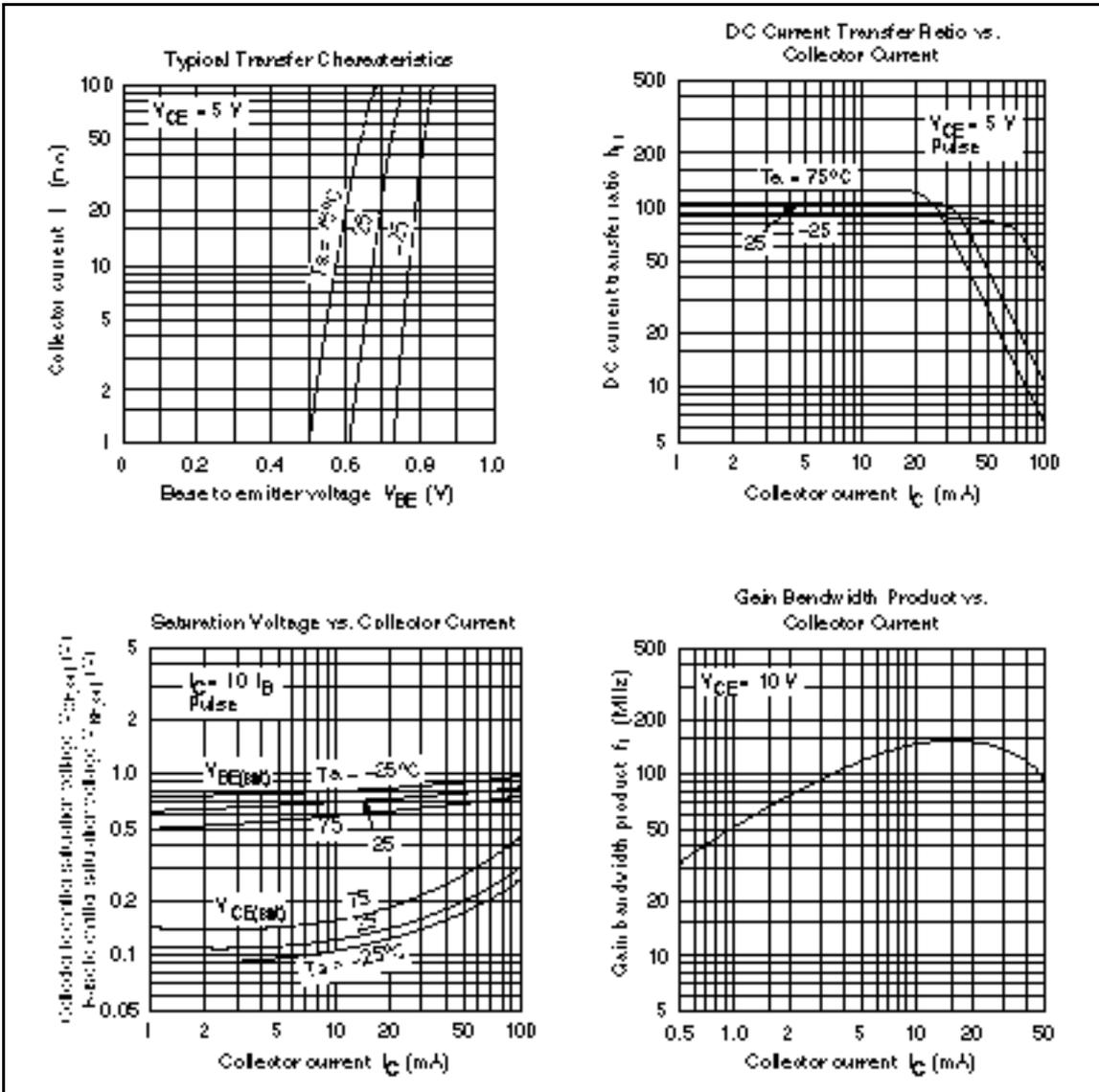
| Item | Symbol | 2SD1609 | | | 2SD1610 | | | Unit | Test conditions |
|---|----------------|---------|-----|-----|---------|-----|-----|---------|--|
| | | Min | Typ | Max | Min | Typ | Max | | |
| Collector to base breakdown voltage | $V_{(BR)CBO}$ | 160 | — | — | 200 | — | — | V | $I_C = 10 \mu A, I_E = 0$ |
| Collector to emitter breakdown voltage | $V_{(BR)CEO}$ | 160 | — | — | 200 | — | — | V | $I_C = 1 \text{ mA}, R_{BE} =$ |
| Emitter to base breakdown voltage | $V_{(BR)EBO}$ | 5 | — | — | 5 | — | — | V | $I_E = 10 \mu A, I_C = 0$ |
| Collector cutoff current | I_{CBO} | — | — | 10 | — | — | — | μA | $V_{CB} = 140 \text{ V}, I_E = 0$ |
| | | — | — | — | — | — | 10 | | $V_{CB} = 160 \text{ V}, I_E = 0$ |
| DC current transfer ratio | h_{FE1}^{*1} | 60 | — | 320 | 60 | — | 320 | V | $V_{CE} = 5 \text{ V}, I_C = 10 \text{ mA}$ |
| | h_{FE2} | 30 | — | — | 30 | — | — | | $V_{CE} = 5 \text{ V}, I_C = 1 \text{ mA}$ |
| Base to emitter voltage | V_{BE} | — | — | 1.5 | — | — | 1.5 | V | $V_{CE} = 5 \text{ V}, I_C = 10 \text{ mA}$ |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | — | — | 2 | — | — | 2 | V | $I_C = 30 \text{ mA}, I_B = 3 \text{ mA}$ |
| Gain bandwidth product | f_T | — | 140 | — | — | 140 | — | MHz | $V_{CE} = 5 \text{ V}, I_C = 10 \text{ mA}$ |
| Collector output capacitance | C_{ob} | — | 3.8 | — | — | 3.8 | — | pF | $V_{CB} = 10 \text{ V}, I_E = 0,$ $f = 1 \text{ MHz}$ |

Note: 1. The 2SD1609 and 2SD1610 are grouped by h_{FE1} as follows.

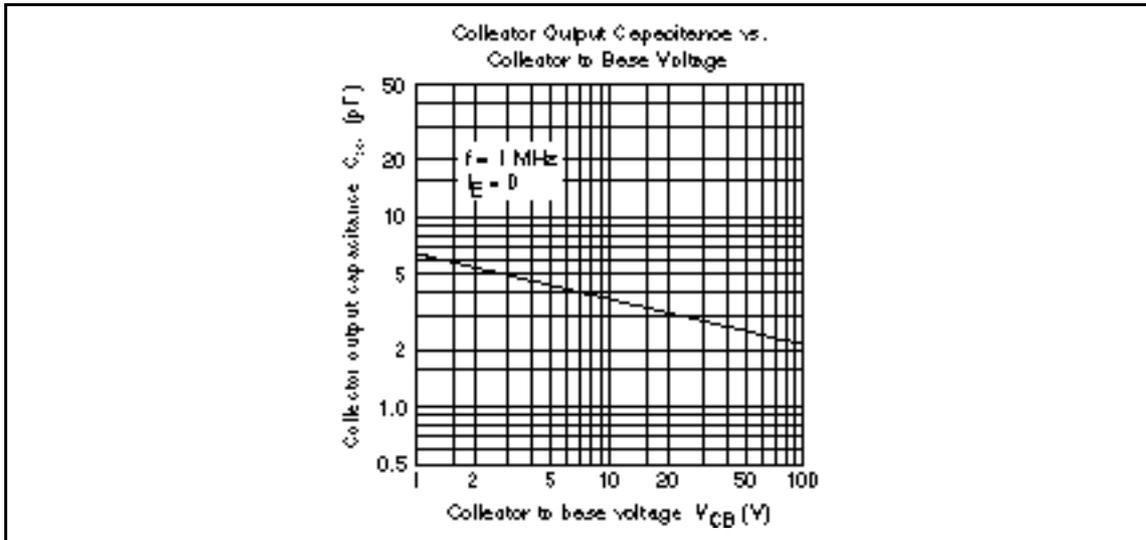
| B | C | D |
|-----------|------------|------------|
| 60 to 120 | 100 to 200 | 160 to 320 |



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