



NPN BD675 - BD677 - BD679 - BD681
NPN BD675A - BD677A - BD679A - BD681A

SILICON DARLINGTON POWER TRANSISTORS

The BD675/A-BD677/A-BD679/A-BD681/A are NPN transistors mounted in Jedec TO-126 plastic package.

They are epitaxial-base transistors in monolithic Darlington circuit for audio and video applications.

PNP complements are BD676/A - BD678/A - BD680/A - BD682/A

Compliance to RoHS.

ABSOLUTE MAXIMUM RATINGS

| Symbol | Ratings | Value | Unit | |
|-----------|---------------------------|-------------------------------|-------------|------------------|
| V_{CEO} | Collector-Emitter Voltage | BD675/A | 45 | V |
| | | BD677/A | 60 | |
| | | BD679/A | 80 | |
| | | BD681/A | 100 | |
| V_{CBO} | Collector-Base Voltage | BD675/A | 45 | V |
| | | BD677/A | 60 | |
| | | BD679/A | 80 | |
| | | BD681/A | 100 | |
| V_{EBO} | Emitter-Base Voltage | 5 | V | |
| I_C | Collector Current | I_C | 4 | A |
| | | I_{CM} | 6 | |
| I_B | Base current (peak value) | I_{BM} | 0.1 | A |
| P_T | Total power Dissipation | @ $T_{mb} = 25^\circ\text{C}$ | 40 | W |
| T_J | Junction Temperature | | 150 | $^\circ\text{C}$ |
| T_{Stg} | Storage Temperature | | -65 to +150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Symbol | Ratings | Value | Unit |
|--------------|---|-------|------|
| R_{thJ-mb} | Thermal Resistance, Junction to mounting base | 3.12 | K/W |
| R_{thJ-a} | Thermal Resistance, Junction to ambient in free air | 100 | K/W |

**NPN BD675 - BD677 - BD679 - BD681
NPN BD675A - BD677A - BD679A - BD681A**
ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

| Symbol | Ratings | Test Condition(s) | Min | Typ | Max | Unit | |
|----------------|--------------------------------------|--|---------|------|-----|------|----|
| I_{CBO} | Collector cut-off current | $I_E=0, V_{CB}=60\text{ V}$ | BD675/A | - | - | 0,2 | mA |
| | | $I_E=0, V_{CB}=80\text{ V}$ | BD677/A | - | - | 0,2 | |
| | | $I_E=0, V_{CB}=100\text{ V}$ | BD679/A | - | - | 0,2 | |
| | | $I_E=0, V_{CB}=120\text{ V}$ | BD681/A | - | - | 0,2 | |
| | | $I_E=0, V_{CB}=30\text{ V}, T_j=150^\circ\text{C}$ | BD675/A | - | - | 2 | |
| | | $I_E=0, V_{CB}=40\text{ V}, T_j=150^\circ\text{C}$ | BD677/A | - | - | 2 | |
| | | $I_E=0, V_{CB}=50\text{ V}, T_j=150^\circ\text{C}$ | BD679/A | - | - | 2 | |
| | | $I_E=0, V_{CB}=60\text{ V}, T_j=150^\circ\text{C}$ | BD681/A | - | - | 2 | |
| I_{CEO} | Collector cut-off current | $I_B=0, V_{CE}=\frac{1}{2}V_{CEOMAX}$ | BD675/A | - | - | 0,5 | mA |
| | | $I_B=0, V_{CE}=\frac{1}{2}V_{CEOMAX}$ | BD677/A | - | - | 0,5 | |
| | | $I_B=0, V_{CE}=\frac{1}{2}V_{CEOMAX}$ | BD679/A | - | - | 0,5 | |
| | | $I_B=0, V_{CE}=\frac{1}{2}V_{CEOMAX}$ | BD681/A | - | - | 0,5 | |
| I_{EBO} | Emitter cut-off current | $I_C=0, -V_{EB}=5\text{ V}$ | - | - | 5 | mA | |
| $V_{CEO(SUS)}$ | Collector-Emitter sustaining Voltage | $I_B=0, I_C=50\text{ mA}$ | BD675/A | 45 | - | - | V |
| | | | BD677/A | 60 | - | - | |
| | | | BD679/A | 80 | - | - | |
| | | | BD681/A | 100 | - | - | |
| $V_{CE(SAT)}$ | Collector-Emitter saturation Voltage | BD675, BD677, BD679, BD681 $I_C=1,5\text{ A}, I_B=30\text{ mA}$ | - | - | 2,5 | V | |
| | | BD675A, BD677A, BD679A, BD681A $I_C=2\text{ A}, I_B=40\text{ mA}$ | - | - | 2,8 | | |
| h_{FE} | DC Current Gain | BD675, BD677, BD679, BD681 $V_{CE}=3\text{ V}, I_C=500\text{ mA}$ | - | 2200 | - | | |
| | | BD675, BD677, BD679, BD681 $V_{CE}=3\text{ V}, I_C=1,5\text{ A}$ | 750 | - | - | | |
| | | BD675, BD677, BD679, BD681 $V_{CE}=3\text{ V}, I_C=4\text{ A}$ | - | 1500 | - | | |
| | | BD675A, BD677A, BD679A, BD681A $V_{CE}=3\text{ V}, I_C=2\text{ A}$ | 750 | - | - | | |
| V_{BE} | Base-Emitter Voltage(1&2) | BD675, BD677, BD679, BD681 $V_{CE}=3\text{ V}, I_C=1,5\text{ A}$ | - | - | 2,5 | V | |
| | | BD675A, BD677A, BD679A, BD681A $V_{CE}=3\text{ V}, I_C=2\text{ A}$ | - | - | 2,5 | | |
| h_{fe} | Small signal current gain | $V_{CE}=3\text{ V}, I_C=1,5\text{ A}, f=1\text{ MHz}$ | 10 | - | - | | |
| f_{hfe} | Ut-off frequency | $V_{CE}=3\text{ V}, I_C=1,5\text{ A}$ | - | 60 | - | kHz | |
| V_F | Diode forward voltage | $I_F=1,5\text{ A}$ | - | 1,5 | - | V | |
| $I_{(SB)}$ | Second-breakdown collector current | $-V_{CE}=50\text{ V}, t_P=20\text{ms}, \text{non rep.}, \text{without heatsink}$ | 0,8 | - | - | A | |

**NPN BD675 - BD677 - BD679 - BD681
NPN BD675A - BD677A - BD679A - BD681A**

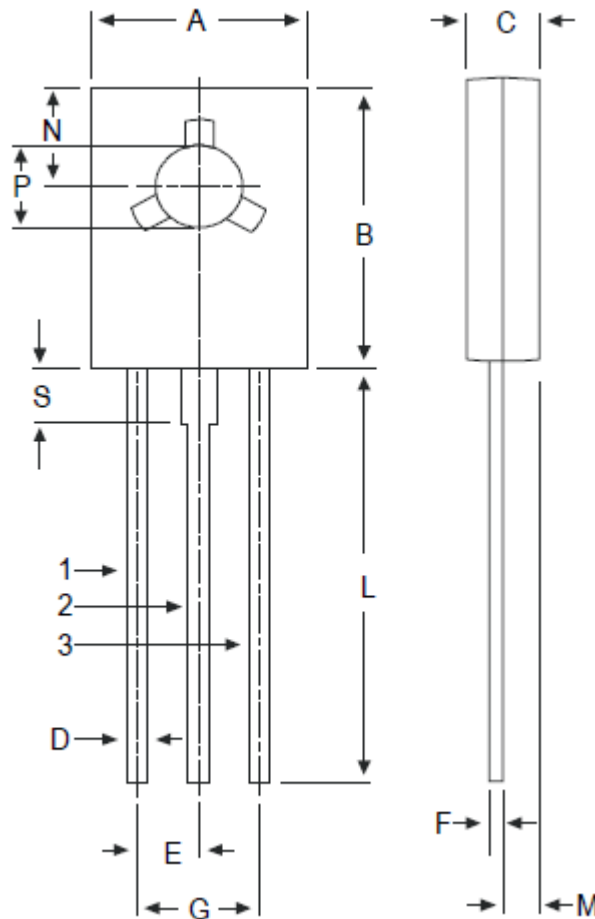
| Symbol | Ratings | Test Condition(s) | Min | Typ | Max | Unit |
|-----------|---------------|---|-----|-----|-----|---------|
| t_{on} | Turn-on time | $-I_{con} = 1,5A, -I_{bon} = I_{boff} = 6mA,$ | - | 0,3 | 1.5 | μs |
| t_{off} | Turn-off time | | - | 1,5 | 5 | |

1. Measured under pulse conditions : $t_p < 300\mu s, \square < 2\%$.
2. V_{BE} decreases by about 3,6 mV/K with increasing temperature.

MECHANICAL DATA CASE TO-126

| | DIMENSIONS | |
|---|------------|------|
| | min | max |
| A | 7.4 | 7.8 |
| B | 10.5 | 10.8 |
| C | 2.4 | 2.7 |
| D | 0.7 | 0.9 |
| E | 2.25 typ. | |
| F | 0.49 | 0.75 |
| G | 4.4 typ. | |
| L | 15.7 typ. | |
| M | 1.27 typ. | |
| N | 3.75 typ. | |
| P | 3.0 | 3.2 |
| S | 2.54 typ. | |

| | |
|---------|-----------|
| Pin 1 : | Emitter |
| Pin 2 : | Collector |
| Pin 3 : | Base |



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