



**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

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**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	
		$I_E=0, V_{CB}=30\text{ V}, T_i=150^\circ\text{C}$	BD675/A	-	-	2	
		$I_E=0, V_{CB}=40\text{ V}, T_i=150^\circ\text{C}$	BD677/A	-	-	2	
		$I_E=0, V_{CB}=50\text{ V}, T_i=150^\circ\text{C}$	BD679/A	-	-	2	
		$I_E=0, V_{CB}=60\text{ V}, T_i=150^\circ\text{C}$	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	$-V_{CE}=50\text{ V}, t_P=20\text{ms, non rep., without heatsink}$	0,8	-	-	A	

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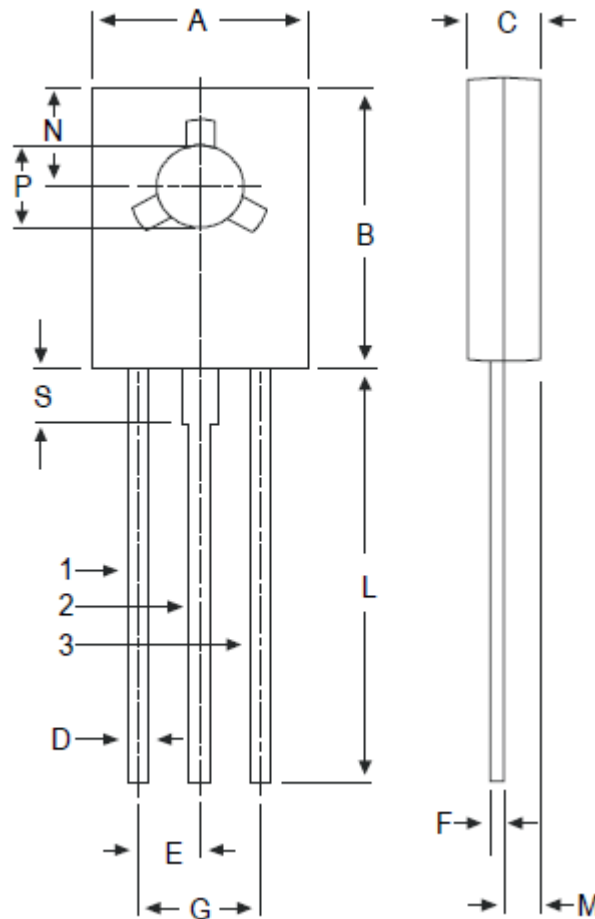
Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit
$t_{on}$	Turn-on time	$-I_{con} = 1,5A, -I_{bon} = I_{boff} = 6mA,$	-	0,3	1.5	$\mu s$
$t_{off}$	Turn-off time		-	1,5	5	

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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