



## NPN BD683 – BD683A

### SILICON DARLINGTON POWER TRANSISTORS

The BD683 and BD683A are NPN epitaxial-base transistors in monolithic Darlington circuit for audio and video applications.

They are mounted in Jedec TO-126 plastic package.

PNP complements are BD684 and BD684A.

Compliance to RoHS

#### ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings	Value	Unit
$V_{CEO}$	Collector-Emitter Voltage	120	V
$V_{CBO}$	Collector-Base Voltage	120	V
$V_{EBO}$	Emitter-Base Voltage	5	V
$I_C$	Collector Current	$I_C$	4
		$I_{CM}$	6
$I_{BM}$	Base current peak value	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 BD683 – BD683A

### ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit
$I_{CBO}$	Collector cut-off current	$I_E=0, V_{CB}= 120\text{ V}$	-	-	0,2	mA
		$I_E=0, V_{CB}= 120\text{V}, T_j= 150^\circ\text{C}$	-	-	2	
$I_{CEO}$	Collector cut-off current	$I_B=0, V_{CE}= 1/2V_{CEOMAX}$	-	-	0,5	mA
$I_{EBO}$	Emitter cut-offcurrent	$I_C=0, V_{EB}=5\text{ V}$	-	-	5	mA
$V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*)	$I_C=1.5\text{ A}, I_B=30\text{ mA}$ BD683	-	-	2,5	V
		$I_C=2\text{ A}, I_B=40\text{ mA}$ BD683A	-	-	2,8	
$h_{FE}$	DC Current Gain (*)	$V_{CE}=3\text{ V}, I_C=1.5\text{ A}$ BD683	750	-	-	-
		$V_{CE}=3\text{ V}, I_C=2\text{ A}$ BD683A				
$V_{BE}$	Base-Emitter Voltage (*)	$V_{CE}=3\text{ V}, I_C=1.5\text{ A}$ BD683	-	-	2,5	V
		$V_{CE}=3\text{ V}, I_C=2\text{ A}$ BD683A				
$h_{fe}$	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	$V_{CE}=50\text{ V}, t_p= 20\text{ms}, \text{non rep. without heatsink}$	0,8	-	-	A
$t_{on}$	Turn-on time	$I_{con}= 1.5\text{A}, -I_{bon}= I_{boff}= 6\text{mA}$	-	0,8	2	$\mu\text{s}$
$t_{off}$	Turn-off time	$V_{CC}=30\text{V}$	-	4,5	8	

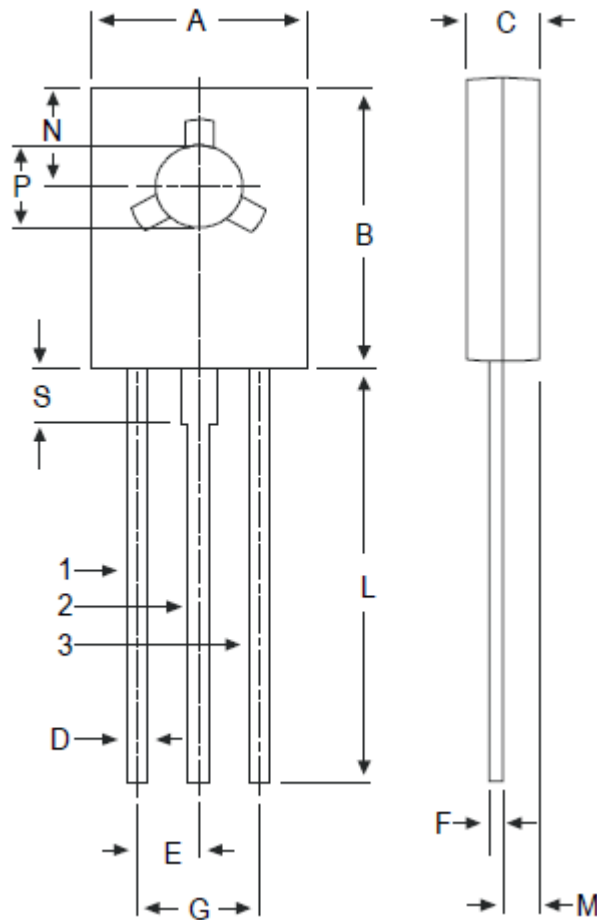
(\*) Measured under pulse conditions : $t_p < 300\mu\text{s}, \delta < 2\%$ .

## NPN BD683 – BD683A

### 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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