



CS684 TO3

PNP SILICON DARLINGTON POWER TRANSISTORS

PNP epitaxial-base transistors in monolithic Darlington circuit for audio and video applications.
 They are mounted in Jedec TO-3 metal package.
 CS684 is the BD684 in TO3 package.
 Compliance to RoHS.

ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings	Value	Unit
$-V_{CEO}$	Collector-Emitter Voltage	140	V
$-V_{CBO}$	Collector-Base Voltage	140	V
$-V_{EBO}$	Emitter-Base Voltage	5	V
$-I_C$	Collector Current	$-I_C$	4
		$-I_{CM}$	6
$-I_B$	Base current (peak value)	$-I_{BM}$	0.1
P_T	Total power Dissipation	@ $T_{mb} = 25^\circ\text{C}$	65
T_J	Junction Temperature		150
T_{Stg}	Storage Temperature		-65 to +150
			Watts
			$^\circ\text{C}$
			$^\circ\text{C}$

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

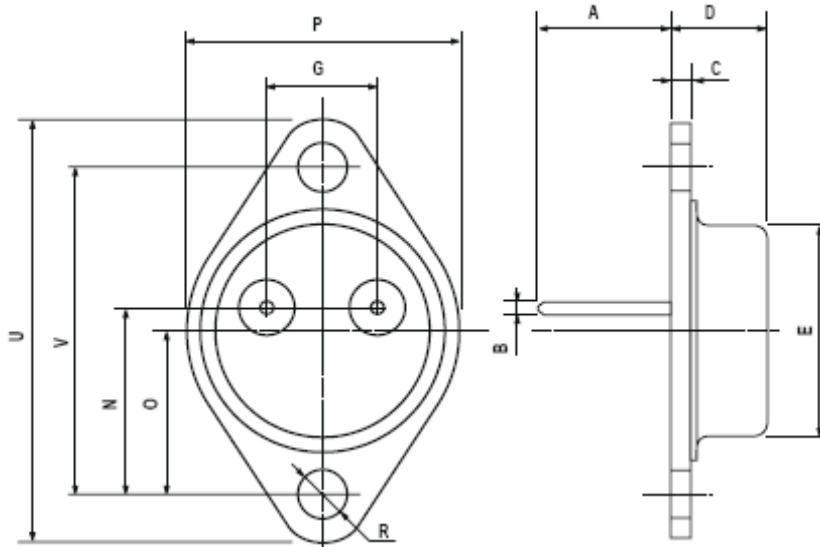
Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit
$-I_{CBO}$	Collector cut-off current	$I_E=0, -V_{CB}=-V_{CEOMAX}=140\text{ V}$	-	-	0,2	mA
		$I_E=0, -V_{CB}=-1/2V_{CBOMAX}=70\text{ V}$ $T_j=150^\circ\text{C}$	-	-	1	
$-I_{CEO}$	Collector cut-off current	$I_B=0, -V_{CE}=-1/2V_{CEOMAX}=70\text{ V}$	-	-	0,2	mA
$-I_{EBO}$	Emitter cut-off current	$I_C=0, -V_{EB}=5\text{ V}$	-	-	5	mA
$-V_{CE(SAT)}$	Collector-Emitter saturation Voltage	$-I_C=1.5\text{ A}, -I_B=6\text{ mA}$	-	-	2	V
h_{FE}	DC Current Gain	$-V_{CE}=3\text{ V}, -I_C=500\text{ mA}$	-	2000	-	
		$-V_{CE}=3\text{ V}, -I_C=1,5\text{ A}$	750	-	-	
		$-V_{CE}=3\text{ V}, -I_C=4\text{ A}$	-	750	-	
$-V_{BE}$	Base-Emitter Voltage(1&2)	$-V_{CE}=3\text{ V}, -I_C=1,5\text{ A}$	-	-	2,5	V
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	μs
t_{off}	Turn-off time	$V_{CC}=30\text{V}$	-	4,5	8	

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

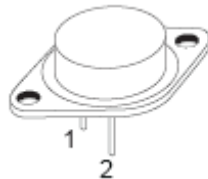
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MECHANICAL DATA CASE TO-3

DIMENSIONS (mm)		
	min	max
A	11	13.10
B	0.97	1.15
C	1.5	1.65
D	8.32	8.92
F	19	20
G	10.70	11.1
N	16.50	17.20
P	25	26
R	4	4.09
U	38.50	39.30
V	30	30.30



Pin 1 :	Base
Pin 2 :	Emitter
Case :	Collector



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