BD643 – 645 – 647 – 649 – 651

SILICON DARLINGTON POWER TRANSISTORS

NPN epitaxial-base transistors in a monolithic Dalrington circuit and housed in a TO-220 enveloppe.
They are intended for output stages in audio equipment, general amplifiers, and analogue switching application.
PNP complements are BD644, BD646, BD648, BD650 and BD652
Compliance to RoHS.

ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit
V_{CBO}	Collector-Base Voltage	BD643	60	V
		BD645	80	
		BD647	100	
		BD649	120	
		BD651	140	
V_{CEO}	Collector-Emitter Voltage	BD643	45	V
		BD645	60	
		BD647	80	
		BD649	100	
		BD651	120	
V_{EBO}	Emitter-Base Voltage	BD643	5	V
		BD645		
		BD647		
		BD649		
		BD651		
I_C	Collector Current	BD643	8	A
		BD645		
		BD647		
		BD649		
		BD651		
I_{CM}	Collector Peak Current	BD643	12	A
		BD645		
		BD647		
		BD649		
		BD651		

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ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings			Value	Unit
I_B	Base Current		BD643	300	mA
			BD645		
			BD647		
			BD649		
			BD651		
P_T	Power Dissipation	@ T_{mb} < 25°	BD643	62.5	Watts
			BD645		
			BD647		
			BD649		
			BD651		
T_J	Junction Temperature		BD643	150	°C
			BD645		
			BD647		
			BD649		
			BD651		
T_S	Storage Temperature range		BD643	-65 to +150	
			BD645		
			BD647		
			BD649		
			BD651		

Limiting values in accordance with the Absolute Maximum System (IEC 134)

THERMAL CHARACTERISTICS

Symbol	Ratings	Value	Unit
R_{thJ-MB}	From junction to mounting base	2	K/W
R_{thJ-A}	From junction to ambient in free air	62.5	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 Cutoff Current	I_E=0,V_{CB} =V_{CEO}Max	BD643	-	-	0.2	mA
			BD645				
			BD647				
			BD649				
			BD651				
		I_E=0,V_{CB} =1/2 V_{CBO}Max T_J=150°C	BD643	-	-	2	mA
			BD645				
			BD647				
			BD649				
			BD651				
I_{CEO}	Collector Cutoff Current	I_E=0, V_{CE} =1/2 V_{CEO}Max	BD643	-	-	0.5	mA
			BD645				
			BD647				
			BD649				
			BD651				
I_{EBO}	Emitter Cutoff Current	V_{EB}=5 V, I_C=0	BD643	-	-	5.0	mA
			BD645				
			BD647				
			BD649				
			BD651				
V_{CEO}	Collector-Emitter Breakdown Voltage	I_C=30 mA, I_B= 0	BD643	45	-	-	V
			BD645	60	-	-	
			BD647	80	-	-	
			BD649	100	-	-	
			BD651	120	-	-	
$V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*)	I_C=4 A, I_B=16 mA	BD643	-	-	2	V
		I_C=3 A, I_B=12 mA	BD645	-	-	2	
			BD647				
			BD649				
			BD651				
		I_C=5 A, I_B=50 mA	BD643	-	-	2.5	
			BD645				
			BD647				
			BD649				
			BD651				
$V_{BE(SAT)}$	Base-Emitter Saturation Voltage (*)	I_C=12 A, I_B=50 mA	BD643	-	-	3	V
			BD645				
			BD647				
			BD649				
			BD651				

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ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)		Min	Typ	Max	Unit
V_{BE}	Base-Emitter Voltage (*)	I_C=4 A, V_{CE}=3 V	BD643	-	-	2.5	V
		I_C=3 A, V_{CE}=3 V	BD645	-	-	2.5	
			BD647				
			BD649				
			BD651				
h_{FE}	DC Current Gain (*)	V_{CE}=3.0 V, I_C=0.5 A	BD643	-	1900	-	-
			BD645				
			BD647				
			BD649				
			BD651				
		V_{CE}=3.0 V, I_C=4 A	BD643	750	-	-	
		V_{CE}=3.0 V, I_C=3 A	BD645	750	-	-	
			BD647				
			BD649				
			BD651				
		V_{CE}=3.0 V, I_C=8 A	BD643	-	1800	-	
			BD645				
			BD647				
			BD649				
			BD651				
h_{fe}	Small Signal Current Gain	V_{CE}=3.0 V, I_C=4 A f=1MHz	BD643	10	-	-	-
		V_{CE}=3.0 V, I_C=3 A f=1MHz	BD645	10	-	-	
			BD647	10	-	-	
			BD649	10	-	-	
			BD651	10	-	-	

(*) Pulse Width ≈ 300 μs, Duty Cycle ∠ 2.0%

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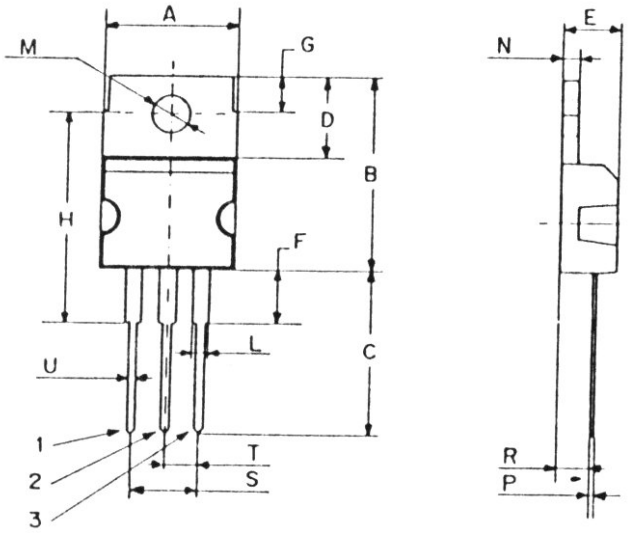
MECHANICAL DATA CASE TO-220

DIMENSIONS (mm)		
	Min.	Max.
A	9,90	10,30
B	15,65	15,90
C	13,20	13,40
D	6,45	6,65
E	4,30	4,50
F	2,70	3,15
G	2,60	3,00
H	15,75	17.15
L	1,15	1,40
M	3,50	3,70
N	-	1,37
P	0,46	0,55
R	2,50	2,70
S	4,98	5,08
T	2.49	2.54
U	0,70	0,90



Pin 1 :	Base
Pin 2 :	Collector
Pin 3 :	Emitter
Case :	Collector

Revised September 2012