BD644 – 646 – 648 – 650 – 652

SILICON DARLINGTON POWER TRANSISTORS

PNP 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.
NPN complements are BD643, BD645, BD647, BD649 and BD651
Compliance to RoHS.

ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit
$-V_{CBO}$	Collector-Base Voltage	BD644	45	V
		BD646	60	
		BD648	80	
		BD650	100	
		BD652	120	
$-V_{CEO}$	Collector-Emitter Voltage	BD644	45	V
		BD646	60	
		BD648	80	
		BD650	100	
		BD652	120	
$-V_{EBO}$	Emitter-Base Voltage	BD644	5	V
		BD646		
		BD648		
		BD650		
		BD652		
$-I_C$	Collector Current	BD644	8	A
		BD646		
		BD648		
		BD650		
		BD652		
$-I_{CM}$	Collector Peak Current	BD644	12	A
		BD646		
		BD648		
		BD650		
		BD652		

BD644 – 646 – 648 – 650 – 652

ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings			Value	Unit
$-I_B$	Base Current		BD644	150	mA
			BD646		
			BD648		
			BD650		
			BD652		
P_T	Power Dissipation	@ T_{mb} < 25°	BD644	62.5	Watts
			BD646		
			BD648		
			BD650		
			BD652		
T_J	Junction *Temperature*		BD644	150	℃
			BD646		
			BD648		
			BD650		
			BD652		
T_s	*Storage Temperature range*		BD644	-65 to +150	
			BD646		
			BD648		
			BD650		
			BD652		

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	70	K/W

BD644 – 646 – 648 – 650 – 652

ELECTRICAL CHARACTERISTICS

TC=25℃ 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	BD644	-	-	0.1	mA
			BD646				
			BD648				
			BD650				
			BD652				
		$-I_E$=0,$-V_{CB}$ =1/2 - V_{CBO}MAX, T_J=150℃	BD644	-	-	1	mA
			BD646				
			BD648				
			BD650				
			BD652				
$-I_{CEO}$	Collector Cutoff Current	$-I_E$=0, $-V_{CE}$ =1/2 - V_{CEO}MAX	BD644	-	-	0.2	mA
			BD646				
			BD648				
			BD650				
			BD652				
$-I_{EBO}$	Emitter Cutoff Current	$-V_{EB}$=5 V, $-I_C$=0	BD644	-	-	5.0	mA
			BD646				
			BD648				
			BD650				
			BD652				
$-V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*)	$-I_C$=4 A, $-I_B$=16 mA	BD644	-	-	2	V
		$-I_C$=3 A, $-I_B$=12 mA	BD646	-	-	2	
			BD648				
			BD650				
			BD652				
		$-I_C$=5 A, $-I_B$=50 mA	BD644	-	-	2.5	
			BD646				
			BD648				
			BD650				
			BD652				
$-V_{BE(SAT)}$	Base-Emitter Saturation Voltage (*)	$-I_C$=5 A, $-I_B$=50 mA	BD644	-	-	3	V
			BD646				
			BD648				
			BD650				
			BD652				

BD644 – 646 – 648 – 650 – 652

ELECTRICAL CHARACTERISTICS

TC=25℃ unless otherwise noted

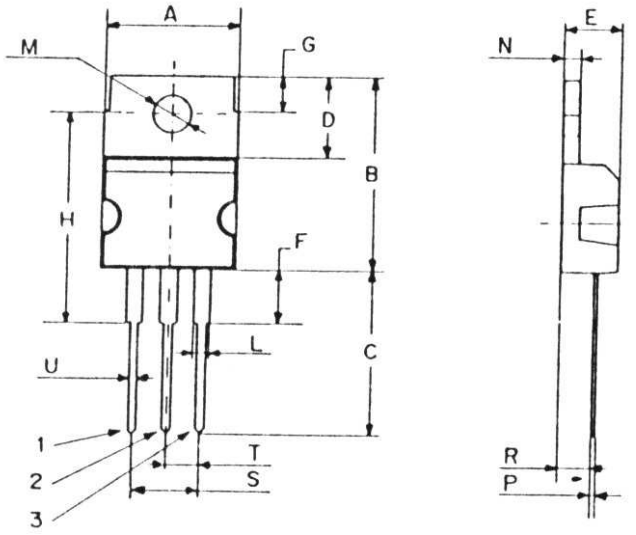
Symbol	Ratings			Min	Typ	Max	Unit
$-V_{BE}$	Base-Emitter Voltage (*)	$-I_C$=4 A, $-V_{CE}$=3 V	BD644	-	-	2.5	V
		$-I_C$=3 A, $-V_{CE}$=3 V	BD646	-	-	2.5	
			BD648				
			BD650				
			BD652				
h_{FE}	DC Current Gain (*)	$-V_{CE}$=3.0 V $-I_C$=0.5 A	BD644	-	2700	-	-
			BD646				
			BD648				
			BD650				
			BD652				
		$-V_{CE}$=3.0 V, $-I_C$=4 A	BD644	750	-	-	
		$-V_{CE}$=3.0 V, $-I_C$=3 A	BD646	750	-	-	
			BD648				
			BD650				
			BD652				
		$-V_{CE}$=3.0 V, $-I_C$=8 A	BD644	-	200	-	
			BD646				
			BD648				
			BD650				
			BD652				
h_{fe}	Small Signal Current Gain	$-V_{CE}$=3.0 V, $-I_C$=4 A f=1MHz	BD644	10	-	-	
		$-V_{CE}$=3.0 V $-I_C$=3 A, f=1MHz	BD646	10	-	-	
			BD648				
			BD650				
			BD652				
t_{on}	turn-on time	$-I_C$=3 A $-I_{Bon}$= I_{Boff}=12 mA	All types	-	1	-	µs
t_{off}	turn-off time			-	5	-	

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

BD644 – 646 – 648 – 650 – 652

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
Package	Collector

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