



**PNP BDX45 – BDX46 – BDX47**  
**NPN BDX42 – BDX43– BDX44**

## SILICON PLANAR DARLINGTON TRANSISTORS

The BDX45, BDX46 and BDX47 are silicon PNP planar Darlington transistors and are mounted in Jedec TO-126 plastic package. They are intended for use in industrial switching applications.

The complementary NPN types are the BDX42, BDX43 and BDX44 respectively.

### ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit	
- V <sub>CBO</sub>	Collector-Base Voltage	BDX45	60	V	
		BDX46	80		
		BDX47	90		
- V <sub>CER</sub>	Collector-Emitter Voltage	BDX45	45	V	
		BDX46	60		
		BDX47	80		
- V <sub>EBO</sub>	Emitter-Base Voltage	BDX45	5	V	
		BDX46			
		BDX47			
- I <sub>C</sub>	Collector Current	- I <sub>C</sub>	BDX45	1	A
			BDX46		
			BDX47		
		- I <sub>CM</sub>	BDX45	2	
			BDX46		
			BDX47		
- I <sub>B</sub>	Base Current	BDX45	0.1	A	
		BDX46			
		BDX47			
P <sub>T</sub>	Power Dissipation	@ T <sub>C</sub> = 25°	BDX45	1.25	Watts
			BDX46		
			BDX47		
T <sub>J</sub>	Junction Temperature	BDX45	150	°C	
		BDX46			
		BDX47			
T <sub>S</sub>	Storage Temperature	BDX45	-65 to +150		
		BDX46			
		BDX47			



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**THERMAL CHARACTERISTICS**

Symbol	Ratings	Value	Unit	
$R_{thJ-a}$	Thermal Resistance, Junction to Ambient	BDX45	100	K/W
		BDX46		
		BDX47		
$R_{thJ-mb}$	Thermal Resistance, Junction to Mounting base	BDX45	10	
		BDX46		
		BDX47		

**ELECTRICAL CHARACTERISTICS**

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit	
- $I_{CES}$	Collector cut-off current	$V_{BE} = 0 ; -V_{CE} = 45V$	BDX45	-	-	10	$\mu A$
		$V_{BE} = 0 ; -V_{CE} = 60V$	BDX46	-	-	10	
		$V_{BE} = 0 ; -V_{CE} = 80V$	BDX47	-	-	10	
- $I_{EBO}$	Emitter cut-off current	$I_C = 0 ; V_{EB} = 4V$	BDX45	-	-	10	$\mu A$
			BDX46	-	-	10	
			BDX47	-	-	10	

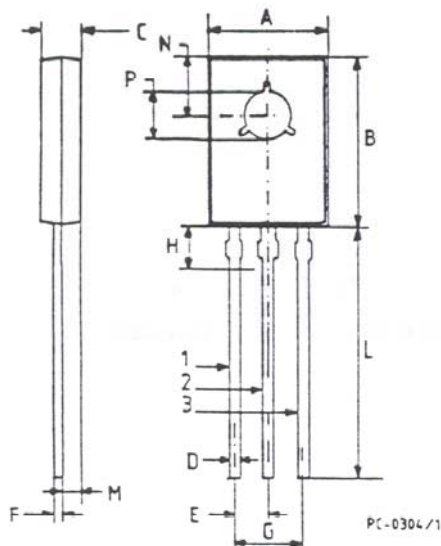
- $V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*)	$-I_C=500 \text{ mA}, -I_B=0.5 \text{ mA}$	BDX45	-	-	1.3	V
			BDX46	-	-	1.3	
			BDX47	-	-	1.3	
		$-I_C=1.0 \text{ A}, -I_B=1.0 \text{ mA}$	BDX46	-	-	1.6	
			BDX45	-	-	1.6	
			BDX47	-	-	1.6	
		$-I_C=1.0 \text{ A}, -I_B=4.0 \text{ mA}$	BDX45	-	-	1.3	
			BDX46	-	-	1.3	
			BDX47	-	-	1.3	
		$-I_C=1.0 \text{ A}, -I_B=1.0 \text{ mA}$ $T_j=150 \text{ }^\circ\text{C}$	BDX46	-	-	1.8	
			BDX45	-	-	1.6	
			BDX47	-	-	1.6	
- $V_{BE(SAT)}$	Base-Emitter saturation Voltage (*)	$-I_C=500 \text{ mA}, -I_B=0.5 \text{ mA}$	BDX45	-	-	1.9	V
			BDX46	-	-	1.9	
			BDX47	-	-	1.9	
		$-I_C=1.0 \text{ A}, -I_B=1.0 \text{ mA}$	BDX46	-	-	2.2	
			BDX45	-	-	2.2	
			BDX47	-	-	2.2	
$h_{FE}$	DC Current Gain	$-V_{CE}=10.0 \text{ V}, -I_C=150 \text{ mA}$	BDX45	1000	-	-	-
			BDX46	1000	-	-	
			BDX47	1000	-	-	
		$-V_{CE}=10.0 \text{ V}, -I_C=500 \text{ mA}$	BDX45	2000	-	-	
			BDX46	2000	-	-	
			BDX47	2000	-	-	

**PNP BDX45 – BDX46 – BDX47  
NPN BDX42 – BDX43– BDX44**

Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit	
$h_{fe}$	Small Signal Current Gain	$-V_{CE}=5.0\text{ V}, -I_C=500\text{ mA}, f=35\text{ MHz}$	<b>BDX45</b>	-	10	-	-
			<b>BDX46</b>	-	10	-	
			<b>BDX47</b>	-	10	-	
$t_{on}$	Turn-on time	$-I_C=500\text{ mA}, -I_{B(on)}=I_{B(off)}=0.5\text{ mA}$	<b>BDX45</b>	-	400	-	ns
			<b>BDX46</b>	-	400	-	
			<b>BDX47</b>	-	400	-	
$t_{off}$	Turn-off time		<b>BDX45</b>	-	1500	-	
			<b>BDX46</b>	-	1500	-	
			<b>BDX47</b>	-	1500	-	
$t_{on}$	Turn-on time	$-I_C=1\text{ A}, -I_{B(on)}=I_{B(off)}=1.0\text{ mA}$	<b>BDX45</b>	-	400	-	ns
			<b>BDX46</b>	-	400	-	
			<b>BDX47</b>	-	400	-	
$t_{off}$	Turn-off time		<b>BDX45</b>	-	1500	-	
			<b>BDX46</b>	-	1500	-	
			<b>BDX47</b>	-	1500	-	

**MECHANICAL DATA CASE TO-126**

	DIMENSIONS			
	mm		inches	
	min	max	min	max
A	7.4	7.8	0.295	0.307
B	10.5	10.8	0.413	0.425
C	2.4	2.7	0.094	0.106
D	0.7	0.9	0.027	0.035
E	2.2 typ.		0.087 typ.	
F	0.49	0.75	0.019	0.029
G	4.4 typ.		0.173 typ.	
H	2.54 typ.		0.100 typ.	
L	15.7 typ.		0.618 typ.	
M	1.2 typ.		0.047 typ.	
N	3.8 typ.		0.149 typ.	
P	3.0	3.2	0.118	0.126



Pin 1 :	Emitter
Pin 2 :	Collector
Case :	Base