



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

**SILICON PLANAR DARLINGTON  
TRANSISTORS**

The BDX42, BDX43 and BDX44 are silicon NPN planar Darlington transistors and are mounted in Jedec TO-126 plastic package. They are intended for use in industrial switching applications.

The complementary PNP types are the BDX45, BDX46 and BDX47 respectively.

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Ratings		Value	Unit	
$V_{CBO}$	Collector-Base Voltage	BDX42	60	V	
		BDX43	80		
		BDX44	90		
$V_{CER}$	Collector-Emitter Voltage	BDX42	45	V	
		BDX43	60		
		BDX44	80		
$V_{EBO}$	Emitter-Base Voltage	BDX42	5	V	
		BDX43			
		BDX44			
$I_C$	Collector Current	$I_C$	BDX42	1	A
			BDX43		
			BDX44		
		$I_{CM}$	BDX42	2	
			BDX43		
			BDX44		
$I_B$	Base Current	BDX42	0.1	A	
		BDX43			
		BDX44			
$P_T$	Power Dissipation	@ $T_C = 25^\circ$	BDX42	1.25	Watts
			BDX43		
			BDX44		
$T_J$	Junction Temperature	BDX42	150	°C	
		BDX43			
		BDX44			
$T_S$	Storage Temperature	BDX42	-65 to +150	°C	
		BDX43			
		BDX44			



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

**THERMAL CHARACTERISTICS**

Symbol	Ratings	Value	Unit	
$R_{thJ-a}$	Thermal Resistance, Junction to Ambient	BDX42	100	K/W
		BDX43		
		BDX44		
$R_{thJ-mb}$	Thermal Resistance, Junction to Mounting base	BDX42	10	K/W
		BDX43		
		BDX44		

**ELECTRICAL CHARACTERISTICS**

TC=25°C unless otherwise noted

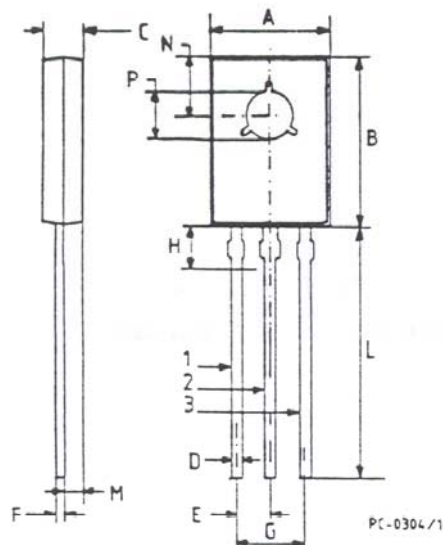
Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit	
$I_{CES}$	Collector cut-off current	$V_{BE} = 0 ; V_{CE} = 45V$	BDX42	-	-	10	$\mu A$
		$V_{BE} = 0 ; V_{CE} = 60V$	BDX43	-	-	10	
		$V_{BE} = 0 ; V_{CE} = 80V$	BDX44	-	-	10	
$I_{EBO}$	Emitter cut-off current	$I_C = 0 ; V_{EB} = 4V$	BDX42	-	-	10	$\mu A$
			BDX43	-	-	10	
			BDX44	-	-	10	
$V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*)	$I_C = 500 \text{ m A}, I_B = 0.5 \text{ mA}$	BDX42	-	-	1.3	V
			BDX43	-	-	1.3	
			BDX44	-	-	1.3	
		$I_C = 1.0 \text{ A}, I_B = 1.0 \text{ mA}$	BDX43	-	-	1.6	
			BDX42	-	-	1.6	
		$I_C = 1.0 \text{ A}, I_B = 4.0 \text{ mA}$	BDX44	-	-	1.6	
			BDX42	-	-	1.3	
			BDX43	-	-	1.3	
BDX44	-	-	1.3				
	$I_C = 1.0 \text{ A}, I_B = 1.0 \text{ mA}$ $T_j = 150^\circ C$	BDX43	-	-	1.8		
$I_C = 1.0 \text{ A}, I_B = 4.0 \text{ mA}$ $T_j = 150^\circ C$	BDX42	-	-	1.6			
	BDX44	-	-	1.6			
$V_{BE(SAT)}$	Base-Emitter saturation Voltage (*)	$I_C = 500 \text{ m A}, I_B = 0.5 \text{ mA}$	BDX42	-	-	1.9	V
			BDX43	-	-	1.9	
			BDX44	-	-	1.9	
		$I_C = 1.0 \text{ A}, I_B = 1.0 \text{ mA}$	BDX43	-	-	2.2	
			BDX42	-	-	2.2	
BDX44	-	-	2.2				
$h_{FE}$	DC Current Gain	$V_{CE} = 10 \text{ V}, I_C = 150 \text{ mA}$	BDX42	1000	-	-	-
			BDX43	1000	-	-	
			BDX44	1000	-	-	
		$V_{CE} = 10 \text{ V}, I_C = 500 \text{ mA}$	BDX42	2000	-	-	
			BDX43	2000	-	-	
			BDX44	2000	-	-	

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

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>BDX42</b>	-	10	-	-
			<b>BDX43</b>	-	10	-	
			<b>BDX44</b>	-	10	-	
$t_{on}$	Turn-on time	$I_C=500\text{ mA}$ , $I_{B(on)} = -I_{B(off)}=0.5\text{ mA}$	<b>BDX42</b>	-	400	-	ns
			<b>BDX43</b>	-	400	-	
			<b>BDX44</b>	-	400	-	
$t_{off}$	Turn-off time		<b>BDX42</b>	-	1500	-	ns
			<b>BDX43</b>	-	1500	-	
			<b>BDX44</b>	-	1500	-	
$t_{on}$	Turn-on time	$I_C=1\text{ A}$ , $I_{B(on)} = -I_{B(off)}=1.0\text{ mA}$	<b>BDX42</b>	-	400	-	ns
			<b>BDX43</b>	-	400	-	
			<b>BDX44</b>	-	400	-	
$t_{off}$	Turn-off time		<b>BDX42</b>	-	1500	-	ns
			<b>BDX43</b>	-	1500	-	
			<b>BDX44</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