New Jersey Semi-Conductor Products, Inc.

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## BD545, BD545A, BD545B, BD545C NPN SILICON POWER TRANSISTORS

- Designed for Complementary Use with the BD546 Series
- 85 W at 25°C Case Temperature
- 15 A Continuous Collector Current
- Customer-Specified Selections Available



SOT-93 PACKAGE

Pin 2 is in electrical contact with the mounting base.

### absolute maximum ratings at 25°C case temperature (unless otherwise noted)

RATING			VALUE	UNIT	
	BD545		40		
Collector-base voltage (I <sub>E</sub> = 0)	BD545A		60		
	BD545B	V <sub>CBO</sub>	80	V	
	BD545C		100		
	BD545		40		
Collector-emitter voltage (I <sub>B</sub> = 0) (see Note 1)	BD545A		60	v	
	BD545B	V <sub>CEO</sub>	80		
	BD545C		100		
Emitter-base voltage			5	v	
Continuous collector current			15	A	
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)			85	W	
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)			3.5	w	
Operating free air temperature range			-65 to +150	°Ĉ	
Operating junction temperature range			-65 to +150	°C	
Storage temperature range			-65 to +150	°C	
Lead temperature 3.2 mm from case for 10 seconds			260	°C	

NOTES: 1. These values apply when the base-emitter diode is open circuited.

2. Derate linearly to 150°C case temperature at the rate of 0.68 W/°C.

3. Derate linearly to 150°C free air temperature at the rate of 28 mW/°C.



NJ Semi-Conductors reserves the right to change test conditions, parameters limits and package dimensions without notice information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

# **Quality Semi-Conductors**

PARAMETER			TEST CONDITIONS			TYP	MAX	UNIT
V <sub>(BR)CEO</sub>	Collector-emitter breakdown voltage	I <sub>C</sub> = 30 mA (see Note 4)	l <sub>B</sub> = 0	BD545 BD545A BD545B BD545C	40 60 80 100			v
I <sub>CES</sub>	Collector-emitter cut-off current	$V_{CE} = 40 V$ $V_{CE} = 60 V$ $V_{CE} = 80 V$ $V_{CE} = 100 V$	$V_{BE} = 0$ $V_{BE} = 0$ $V_{BE} = 0$ $V_{BE} = 0$	BD545 BD545A BD545B BD545C			0.4 0.4 0.4 0.4	mA
I <sub>CEO</sub>	Collector cut-off current	V <sub>CE</sub> ≠ 30 V V <sub>CE</sub> ≠ 60 V	I <sub>B</sub> = 0 I <sub>B</sub> = 0	BD545/545A BD545B/545C			0.7 0.7	mA
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> = 5 V	I <sub>C</sub> = 0	······································			1	mA
h <sub>FE</sub>	Forward current transfer ratio	$V_{CE} = 4V$ $V_{CE} = 4V$ $V_{CE} = 4V$	$I_C = 1A$ $I_C = 5A$ $I_C = 10A$	(see Notes 4 and 5)	60 25 10			
$V_{\text{CE(sat)}}$	Collector-emitter saturation voltage	$I_{B} = 625 \text{ mA}$ $I_{B} = 2 \text{ A}$	I <sub>C</sub> = 5A I <sub>C</sub> = 10A	(see Notes 4 and 5)			0.8 1	v
V <sub>BE</sub>	Base-emitter voltage	V <sub>CE</sub> = 4V	I <sub>C</sub> = 10 A	(see Notes 4 and 5)			1.8	v
h <sub>fe</sub>	Small signal forward current transfer ratio	V <sub>CE</sub> = 10 V	I <sub>C</sub> = 0.5 A	f = 1 kHz	20			
h <sub>fe</sub>	Small signal forward current transfer ratio	V <sub>CE</sub> = 10 V	l <sub>C</sub> = 0.5 A	f = 1 MHz	3			

### electrical characteristics at 25°C case temperature

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NOTES: 4. These parameters must be measured using pulse techniques, t<sub>p</sub> = 300 µs, duty cycle ≤ 2%. 5. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

#### thermal characteristics

PARAMETER			TYP	MAX	UNIT
R <sub>eJC</sub>	Junction to case thermal resistance			1.47	°C/W
R <sub>eja</sub>	Junction to free air thermal resistance			35.7	°C/W

### resistive-load-switching characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS <sup>†</sup>			MIN	TYP	MAX	UNIT
t <sub>on</sub> Turn-on time	I <sub>C</sub> = 6 A	I <sub>B(on)</sub> = 0.6 A	I <sub>B(off)</sub> = -0.6 A		0.6		μs
t <sub>off</sub> Turn-off time	V <sub>BE(off)</sub> = -4 V	<b>R</b> L <b>= 5</b> Ω	t <sub>p</sub> = 20 µs, dc ⊵ 2%		1		μs

<sup>†</sup> Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.