

## COMPLEMENTARY SILICON POWER TRANSISTORS

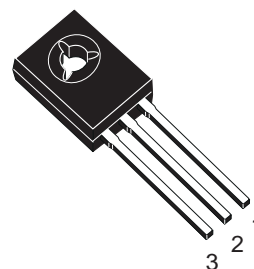
- STMicroelectronics PREFERRED SALESTYPE
- COMPLEMENTARY PNP - NPN DEVICES

### DESCRIPTION

The BD433, BD435, and BD437 are silicon epitaxial-base NPN power transistors in Jedec SOT-32 plastic package, intended for use in medium power linear and switching applications.

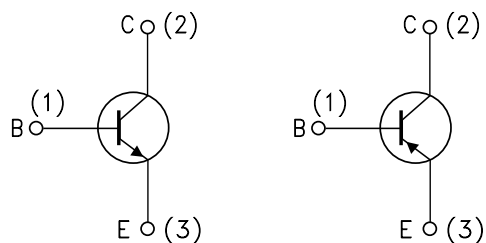
The BD433 is especially suitable for use in car-radio output stages.

The complementary PNP types are BD434, BD436, and BD438 respectively.



**SOT-32**

### INTERNAL SCHEMATIC DIAGRAM



SC06960

SC08810

### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value				Unit
		NPN	BD433	BD435	BD437	
	PNP	BD434	BD436	BD438		
V <sub>CBO</sub>	Collector-Base Voltage (I <sub>E</sub> = 0)		22	32	45	V
V <sub>CES</sub>	Collector-Emitter Voltage (V <sub>BE</sub> = 0)		22	32	45	V
V <sub>CEO</sub>	Collector-Emitter Voltage (I <sub>B</sub> = 0)		22	32	45	V
V <sub>EBO</sub>	Emitter-Base Voltage (I <sub>C</sub> = 0)		5			V
I <sub>C</sub>	Collector Current		4			A
I <sub>CM</sub>	Collector Peak Current (t ≤ 10 ms)		7			A
I <sub>B</sub>	Base Current		1			A
P <sub>tot</sub>	Total Dissipation at T <sub>c</sub> ≤ 25 °C		36			W
T <sub>stg</sub>	Storage Temperature		-65 to 150			°C
T <sub>j</sub>	Max. Operating Junction Temperature		150			°C

For PNP types voltage and current values are negative.

**BD433 BD434 BD435 BD436 BD437 BD438****THERMAL DATA**

R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	3.5	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-ambient	Max	100	°C/W

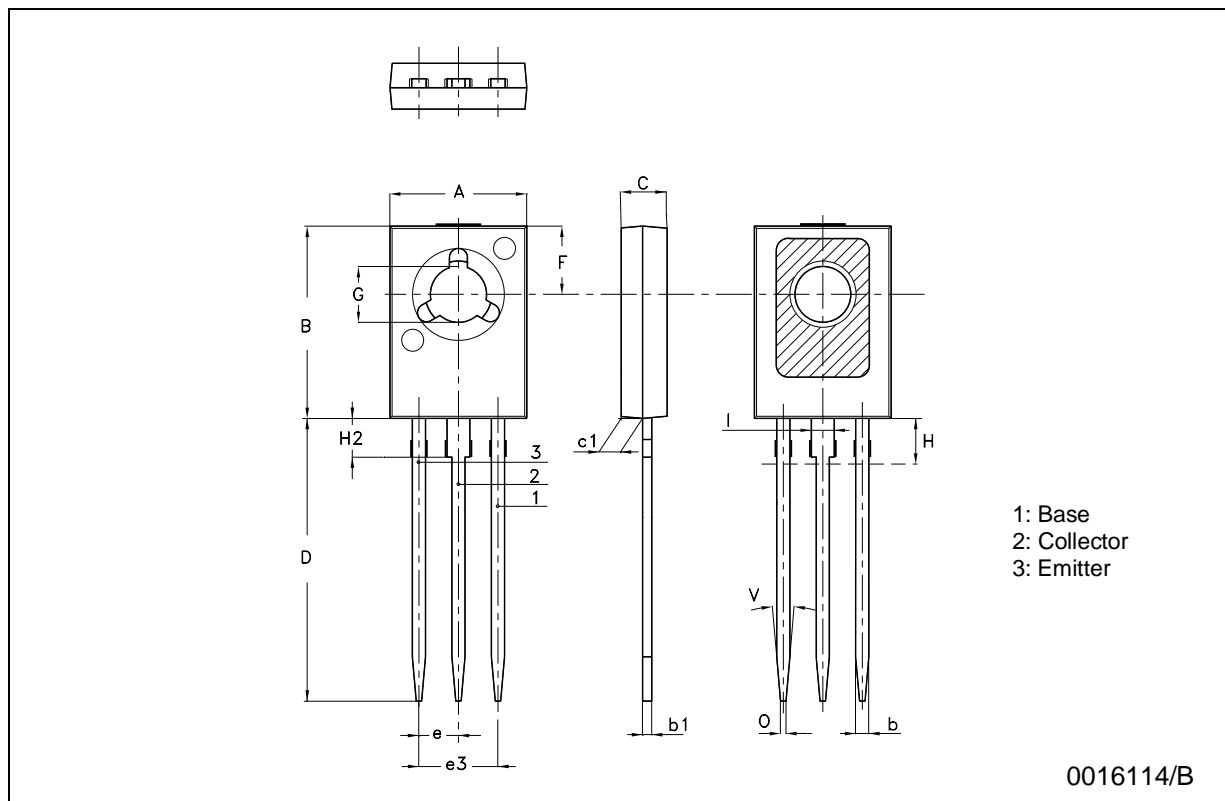
**ELECTRICAL CHARACTERISTICS** (T<sub>case</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	for <b>BD433/434</b> for <b>BD435/436</b> for <b>BD437/438</b>	V <sub>CB</sub> = 22 V V <sub>CB</sub> = 32 V V <sub>CB</sub> = 45 V			100 100 100	μA μA μA
I <sub>CES</sub>	Collector Cut-off Current (V <sub>BE</sub> = 0)	for <b>BD433/434</b> for <b>BD435/436</b> for <b>BD437/438</b>	V <sub>CE</sub> = 22 V V <sub>CE</sub> = 32 V V <sub>CE</sub> = 45 V			100 100 100	μA μA μA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V				1	mA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 100 mA	for <b>BD433/434</b> for <b>BD435/436</b> for <b>BD437/438</b>	22 32 45			V V V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 2 A	I <sub>B</sub> = 0.2 A for <b>BD433/434</b> for <b>BD435/436</b> for <b>BD437/438</b>		0.2 0.2 0.2	0.5 0.5 0.6	V V V
V <sub>BE*</sub>	Base-Emitter Voltage	I <sub>C</sub> = 10 mA I <sub>C</sub> = 2 A	V <sub>CE</sub> = 5 V V <sub>CE</sub> = 1 V for <b>BD433/434</b> for <b>BD435/436</b> for <b>BD437/438</b>		0.58	1.1 1.1 1.2	V V V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 10 mA  I <sub>C</sub> = 500 mA I <sub>C</sub> = 2 A	V <sub>CE</sub> = 5 V for <b>BD433/434</b> for <b>BD435/436</b> for <b>BD437/438</b>  V <sub>CE</sub> = 1 V V <sub>CE</sub> = 1 V for <b>BD433/434</b> for <b>BD435/436</b> for <b>BD437/438</b>	40 40 30 85  50 50 40	130 130 130 140		
h <sub>FE1</sub> /h <sub>FE2*</sub>	Matched Pair	I <sub>C</sub> = 500 mA	V <sub>CE</sub> = 1 V			1.4	
f <sub>T</sub>	Transition frequency	I <sub>C</sub> = 250 mA	V <sub>CE</sub> = 1 V	3			MHz

\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

## SOT-32 (TO-126) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		10.8	0.413		0.425
b	0.7		0.9	0.028		0.035
b1	0.40		0.65	0.015		0.025
C	2.4		2.7	0.094		0.106
c1	1.0		1.3	0.039		0.051
D	15.4		16.0	0.606		0.630
e		2.2			0.087	
e3		4.4			0.173	
F		3.8			0.150	
G	3		3.2	0.118		0.126
H			2.54			0.100
H2		2.15			0.084	
I		1.27			0.05	
O		0.3			0.011	
V		10°			10°	



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