

## COMPLEMENTARY SILICON POWER TRANSISTORS

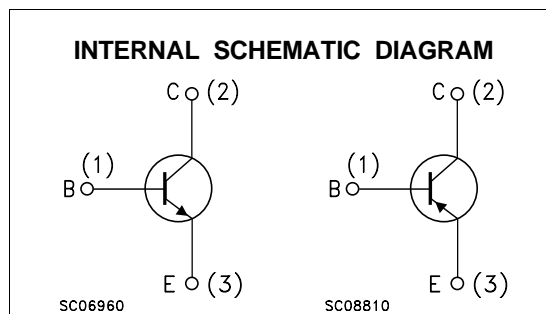
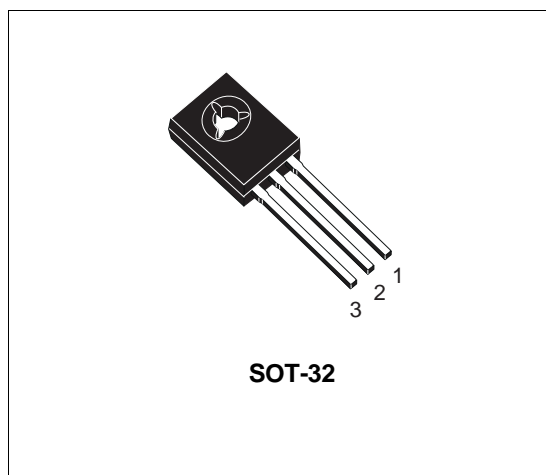
- STMicroelectronics PREFERRED SALESTYPE
- COMPLEMENTARY PNP - NPN DEVICES

### 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.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value				Unit
		NPN	BD433	BD435	BD437	
		PNP	BD434	BD436	BD438	
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )		22	32	45	V
$V_{CES}$	Collector-Emitter Voltage ( $V_{BE} = 0$ )		22	32	45	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )		22	32	45	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )		5			V
$I_C$	Collector Current		4			A
$I_{CM}$	Collector Peak Current ( $t \leq 10$ ms)		7			A
$I_B$	Base Current		1			A
$P_{tot}$	Total Dissipation at $T_c \leq 25$ °C		36			W
$T_{stg}$	Storage Temperature		-65 to 150			°C
$T_j$	Max. Operating Junction Temperature		150			°C

For PNP types voltage and current values are negative.

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

$R_{thj-case}$	Thermal Resistance Junction-case	Max	3.5	$^{\circ}C/W$
$R_{thj-amb}$	Thermal Resistance Junction-ambient	Max	100	$^{\circ}C/W$

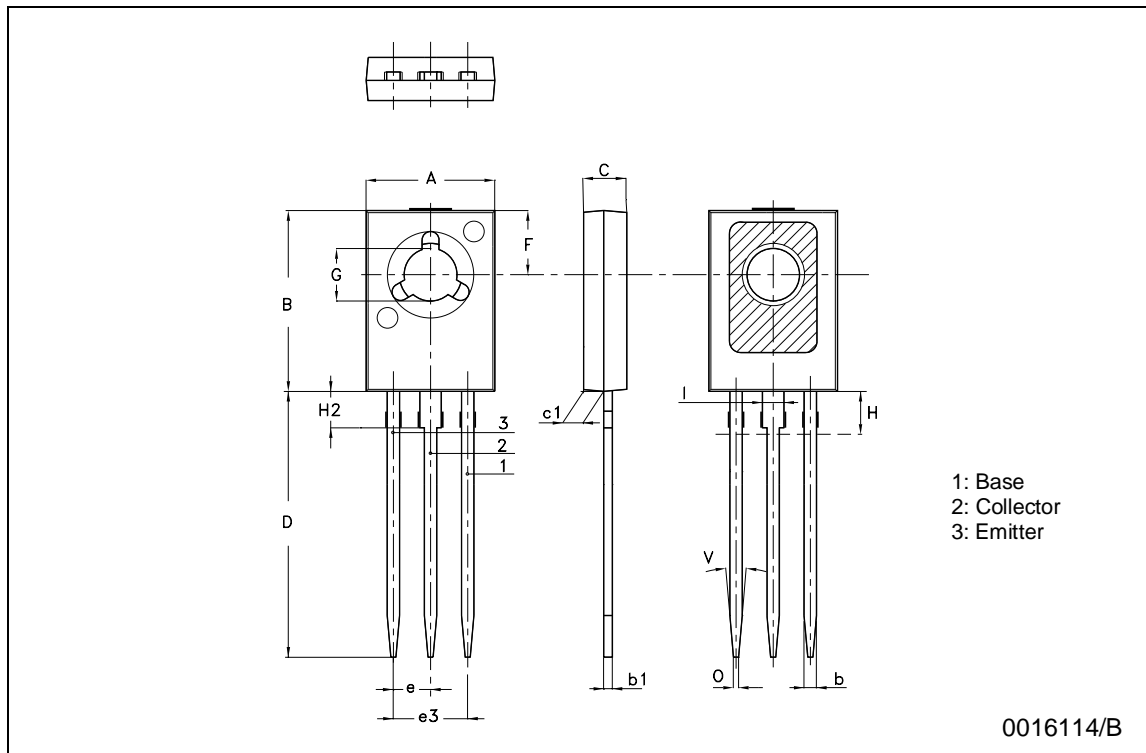
**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25^{\circ}C$  unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut-off Current ( $I_E = 0$ )	for <b>BD433/434</b> $V_{CB} = 22 V$ for <b>BD435/436</b> $V_{CB} = 32 V$ for <b>BD437/438</b> $V_{CB} = 45 V$			100 100 100	$\mu A$ $\mu A$ $\mu A$
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	for <b>BD433/434</b> $V_{CE} = 22 V$ for <b>BD435/436</b> $V_{CE} = 32 V$ for <b>BD437/438</b> $V_{CE} = 45 V$			100 100 100	$\mu A$ $\mu A$ $\mu A$
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 5 V$			1	mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 100 mA$ for <b>BD433/434</b> $I_C = 100 mA$ for <b>BD435/436</b> $I_C = 100 mA$ for <b>BD437/438</b>	22 32 45			V V V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 2 A$ $I_B = 0.2 A$ 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
$V_{BE*}$	Base-Emitter Voltage	$I_C = 10 mA$ $V_{CE} = 5 V$ $I_C = 2 A$ $V_{CE} = 1 V$ 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
$h_{FE*}$	DC Current Gain	$I_C = 10 mA$ $V_{CE} = 5 V$ for <b>BD433/434</b> for <b>BD435/436</b> for <b>BD437/438</b> $I_C = 500 mA$ $V_{CE} = 1 V$ $I_C = 2 A$ $V_{CE} = 1 V$ 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		
$h_{FE1}/h_{FE2*}$	Matched Pair	$I_C = 500 mA$ $V_{CE} = 1 V$			1.4	
$f_T$	Transition frequency	$I_C = 250 mA$ $V_{CE} = 1 V$	3			MHz

\* Pulsed: Pulse duration = 300  $\mu s$ , 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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