



BD136-138-140

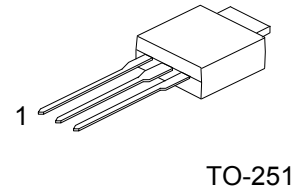
PNP EPITAXIAL SILICON TRANSISTOR

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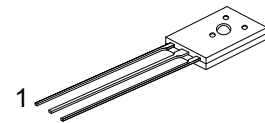
DESCRIPTION

The UTC **BD136/BD138/BD140** are silicon epitaxial planer PNP transistor, designed for use as audio amplifiers and drivers utilizing complementary or quasi complementary circuits.

The complementary NPN types are the BD135/BD137/ BD139.



TO-251



TO-126

ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
BD136L-x-T60-K	BD136G-x-T60-K	TO-126	E	C	B	Bulk
BD138L-x-T60-K	BD138G-x-T60-K	TO-126	E	C	B	Bulk
BD140L-x-T60-K	BD140G-x-T60-K	TO-126	E	C	B	Bulk
BD136L-x-TM3-T	BD136G-x-TM3-T	TO-251	B	C	E	Tube
BD138L-x-TM3-T	BD138G-x-TM3-T	TO-251	B	C	E	Tube
BD140L-x-TM3-T	BD140G-x-TM3-T	TO-251	B	C	E	Tube

Note: Pin Assignment: E: Emitter C: Collector B: Base

BD136L-x-T60-K	(1) Packing Type (2) Package Type (3) Rank (4) Lead Free	(1) K: Bulk, T: Tube (2) T60: TO-126, TM3: TO-251 (3) x: refer to Classification of h_{FE} (4) G: Halogen Free, L: Lead Free
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■ ABSOLUTE MAXIMUM RATING

PARAMETER			SYMBOL	RATINGS	UNIT
Collector-Base Voltage		BD136	V_{CBO}	-45	V
		BD138		-60	
		BD140		-80	
Collector-Emitter Voltage		BD136	V_{CEO}	-45	V
		BD138		-60	
		BD140		-80	
Emitter-Base Voltage			V_{EBO}	-5	V
Collector Current			I_C	-1.5	V
Collector Peak Current			I_{CM}	-3	A
Base Current			I_B	-0.5	A
Power Dissipation	$T_C \leq 25^{\circ}C$	TO-126	P_D	12.5	W
		TO-251		15	
Junction Temperature			T_J	150	$^{\circ}C$
Storage Temperature			T_{STG}	-40 ~ +150	$^{\circ}C$

Note 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. The device is guaranteed to meet performance specification within $0^\circ\text{C} \sim 70^\circ\text{C}$ operating temperature range and assured by design from $-20^\circ\text{C} \sim 85^\circ\text{C}$.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-126	θ_{JA}	100	$^\circ\text{C/W}$
	TO-251		83	
Junction to Case	TO-126	θ_{JC}	10	$^\circ\text{C/W}$
	TO-251		8.3	

■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Emitter Sustaining Voltage	BD136	$V_{CEO(SUS)}$	$I_C = -30\text{mA}$, $I_B = 0$ (Note)	-45			V
	BD138			-60			
	BD140			-80			
Collector Cut-off Current		I_{CBO}	$V_{CB} = -30\text{V}$, $I_E = 0$			-0.1	μA
			$V_{CB} = -30\text{V}$, $I_E = 0$, $T_C = 125^\circ\text{C}$			-10	
Emitter Cut-off Current		I_{EBO}	$V_{EB} = -5\text{V}$, $I_C = 0$			-10	μA
DC Current Gain		h_{FE1}	$V_{CE} = -2\text{V}$, $I_C = -5\text{mA}$	25			
		h_{FE2}	$V_{CE} = -2\text{V}$, $I_C = -0.5\text{A}$	25			
		h_{FE3}	$V_{CE} = -2\text{V}$, $I_C = -150\text{mA}$	40		250	
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	$I_C = -0.5\text{A}$, $I_B = -0.05\text{A}$ (Note)			-0.5	V
Base-Emitter Voltage		V_{BE}	$I_C = -0.5\text{A}$, $V_{CE} = -2\text{V}$ (Note)			-1	V

Note: Pulsed: Pulse duration $\leq 300\mu\text{s}$, duty cycle 1.5 %

■ CLASSIFICATION OF h_{FE}

RANK	6	10	16
RANGE	40~100	63~160	100~250

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