



BD136-138-140

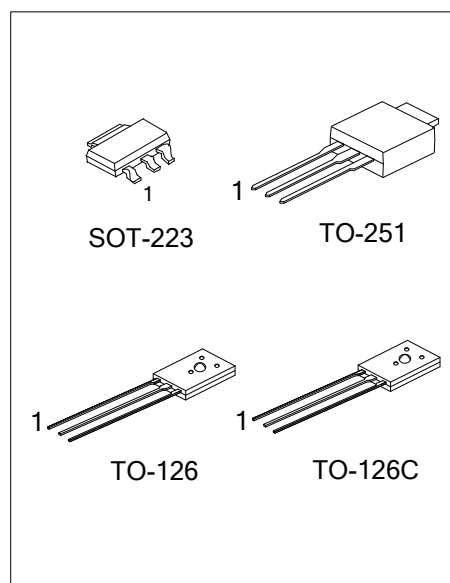
PNP EPITAXIAL SILICON TRANSISTOR

PNP SILICON TRANSISTOR

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.



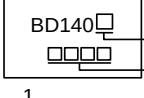
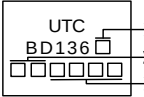
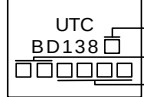
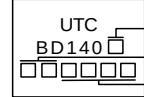
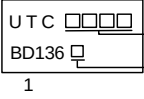
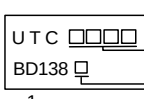
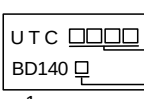
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
BD136L-xx-T60-K	BD136G-xx-T60-K	TO-126	E	C	B	Bulk
BD136L-xx-TM3-T	BD136G-xx-TM3-T	TO-251	B	C	E	Tube
BD138L-xx-AA3-R	BD138G-xx-AA3-R	SOT-223	B	C	E	Tape Reel
BD138L-xx-T60-K	BD138G-xx-T60-K	TO-126	E	C	B	Bulk
BD138L-xx-TM3-T	BD138G-xx-TM3-T	TO-251	B	C	E	Tube
BD140L-xx-AA3-R	BD140G-xx-AA3-R	SOT-223	B	C	E	Tape Reel
BD140L-xx-T60-K	BD140G-xx-T60-K	TO-126	E	C	B	Bulk
BD140L-xx-T6C-K	BD140G-xx-T6C-K	TO-126C	E	C	B	Bulk
BD140L-xx-TM3-T	BD140G-xx-TM3-T	TO-251	B	C	E	Tube

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

BD136G-xx-AA3-R	(1)Packing Type	(1) R: Tape Reel, K: Bulk, T: Tube
	(2)Package Type	(2) AA3: SOT-23, T60: TO-126, T6C: TO-126C, TM3: TO-251
	(3)Rank	(3) x: refer to Classification of h_{FE}
	(4)Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free

MARKING

PACKAGE	MARKING		
	BD136	BD138	BD140
SOT-223	-		
TO-251			
TO-126 TO-126C			

■ 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	A
Collector Peak Current			I _{CM}	-3	A
Base Current			I _B	-0.5	A
Power Dissipation	T _C ≤25°C	SOT-223	P _D	8	W
		TO-126/TO-126C		12.5	
		TO-251		15	
Junction Temperature			T _J	+150	°C
Storage Temperature			T _{STG}	-40 ~ +150	°C

Note: 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.

■ THERMAL DATA

PARAMETER			SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223		θ_{JA}	155	$^\circ\text{C/W}$
	TO-126/TO-126C			100	
	TO-251			83	
Junction to Case	SOT-223		θ_{JC}	15.5	$^\circ\text{C/W}$
	TO-126/TO-126C			10	
	TO-251			8.3	

Note: Transistor mounted on an FR4 printed circuit board.

■ 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			V
	BD140			-80			V
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	μA
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_{FE3}

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

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