



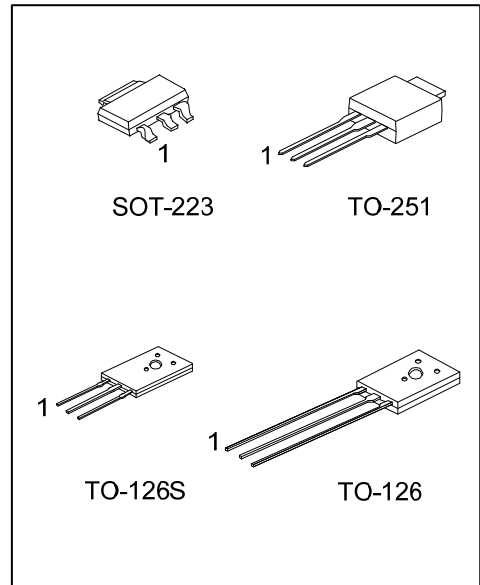
## BD139

## NPN SILICON TRANSISTOR

### NPN POWER TRANSISTORS

#### FEATURES

- \* High current (max.1.5A)
- \* Low voltage (max.80V)



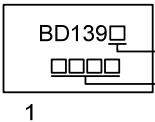
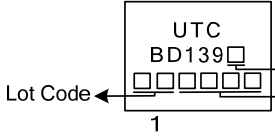
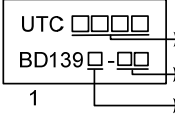
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
BD139L-xx-AA3-R	BD139G-xx-AA3-R	SOT-223	B	C	E	Tape Reel
BD139L-xx-TM3-T	BD139G-xx-TM3-T	TO-251	B	C	E	Tube
BD139L-xx-T60-K	BD139G-xx-T60-K	TO-126	E	C	B	Bulk
BD139L-xx-T6S-K	BD139G-xx-T6S-K	TO-126S	E	C	B	Bulk

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

<p>BD139G-xx-AA3-R</p>	<p>(1) R: Tape Reel, K: Bulk, T: Tube  (2) AA3: SOT-223, TM3: TO-251, T60: TO-126, T6S: TO-126S  (3) refer to <math>h_{FE}</math>  (4) G: Halogen Free and Lead Free, L: Lead Free</p>
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### MARKING

PACKAGE	MARKING
SOT-223	 <p>BD139□            □□□□            1</p> <p>L: Lead Free            G: Halogen F            Data Code</p>
TO-251	 <p>UTC            BD139□            □□□□□□            1</p> <p>Lot Code ←            L: Lead Free            G: Halogen Free            Data Code</p>
TO-126 TO-126C	 <p>UTC □□□□            BD139□-□□            1</p> <p>Data Code            Rank            L: Lead Free            G: Halogen Free</p>

■ ABSOLUTE MAXIMUM RATING

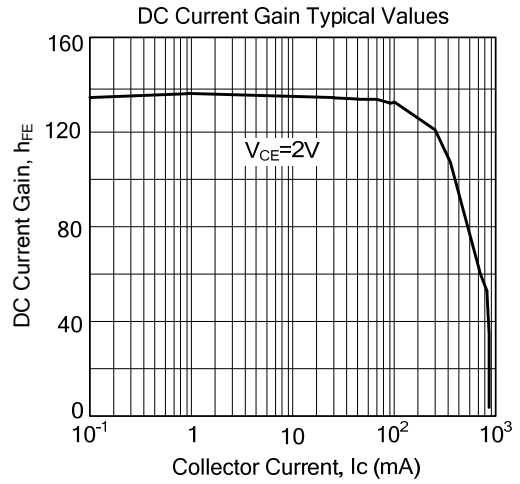
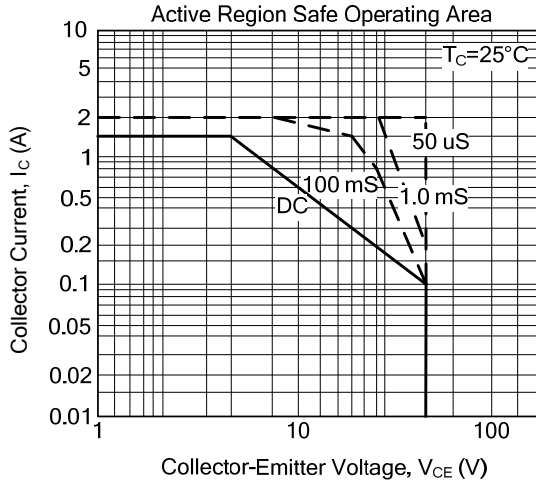
PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		$V_{CBO}$	100	V
Collector-Emitter Voltage		$V_{CEO}$	80	V
Emitter-Base Voltage		$V_{EBO}$	5	V
Collector Current (DC)		$I_C$	1.5	A
Peak Collector Current		$I_{CM}$	2	A
Peak Base Current		$I_{BM}$	1	A
Power Dissipation ( $T_A=25^\circ\text{C}$ )	SOT-223	$P_D$	0.8	W
	TO-126/ TO-126S		1.25	W
	TO-251		1.5	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Operating Temperature		$T_{OPR}$	-65 ~ +150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-65 ~ +150	$^\circ\text{C}$

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.

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

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector Cut-Off Current		$I_{CBO}$	$I_E=0, V_{CB}=30\text{V}$			100	nA
			$I_E=0, V_{CB}=30\text{V}, T_J=125^\circ\text{C}$			10	$\mu\text{A}$
Emitter Cut-Off Current		$I_{EBO}$	$I_C=0, V_{EB}=5\text{V}$			100	nA
DC Current Gain		$h_{FE}$	$V_{CE}=2\text{V}$ (See Fig.1)	$I_C=5\text{mA}$	40		
				$I_C=150\text{mA}$	63		250
				$I_C=500\text{mA}$	25		
DC Current Gain	BD139-10		$I_C=150\text{mA}, V_{CE}=2\text{V}$ (See Fig.1)		63		160
	BD139-16				100		250
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	$I_C=500\text{mA}, I_B=50\text{mA}$			0.5	V
Base-Emitter Voltage		$V_{BE}$	$I_C=500\text{mA}, V_{CE}=2\text{V}$			1	V
Transition Frequency		$f_T$	$I_C=500\text{mA}, V_{CE}=5\text{V}, f=100\text{MHz}$		190		MHz

## ■ TYPICAL CHARACTERISTICS



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