



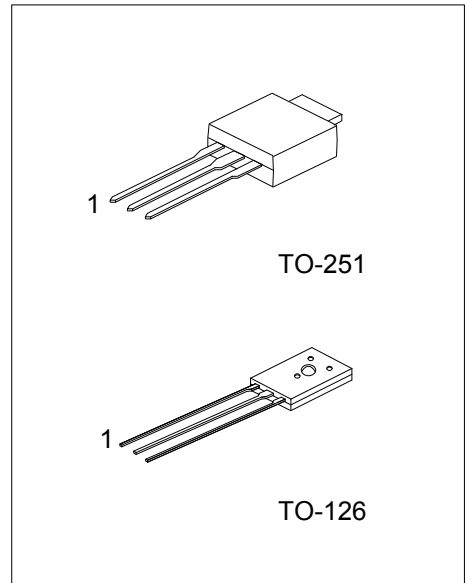
## BD139

## NPN SILICON TRANSISTOR

### NPN POWER TRANSISTORS

#### ■ FEATURES

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



Lead-free: BD139L  
Halogen-free: BD139G

#### ■ ORDERING INFORMATION

Ordering Number			Package	Pin Assignment			Packing
Normal	Lead Free	Halogen Free		1	2	3	
BD139-T60-K	BD139L-T60-K	BD139G-T60-K	TO-126	E	C	B	Bulk
BD139-TM3-T	BD139L-TM3-T	BD139G-TM3-T	TO-251	B	C	E	Tube

<p>BD139L-T60-B</p> <p>(1)Packing Type (2)Package Type (3)Lead Plating</p>	<p>(1) B: Bulk, T: Tube (2) T60: TO-126, TM3: TO-251 (3) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p>
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### ■ ABSOLUTE MAXIMUM RATING

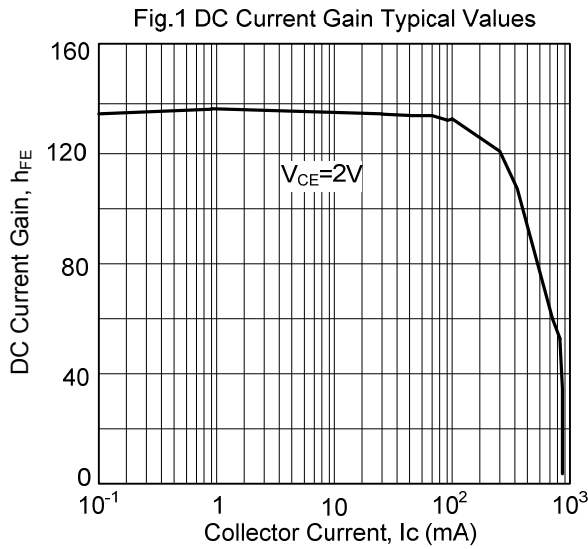
PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		$V_{CBO}$	100	V
Collector-Emitter Voltage		$V_{CEO}$	80	V
Emitter-Base Voltage		$V_{EBO}$	5	V
Collector Current (DC)		$I_C$	1.5	A
Peak Collector Current		$I_{CM}$	2	A
Peak Base Current		$I_{BM}$	1	A
Power Dissipation ( $T_a=25^\circ\text{C}$ )	TO-126	$P_D$	1.25	W
	TO-251		1	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			$I_C=150\text{mA}, V_{CE}=2\text{V}$ (See Fig.1)				
BD139-10		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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