



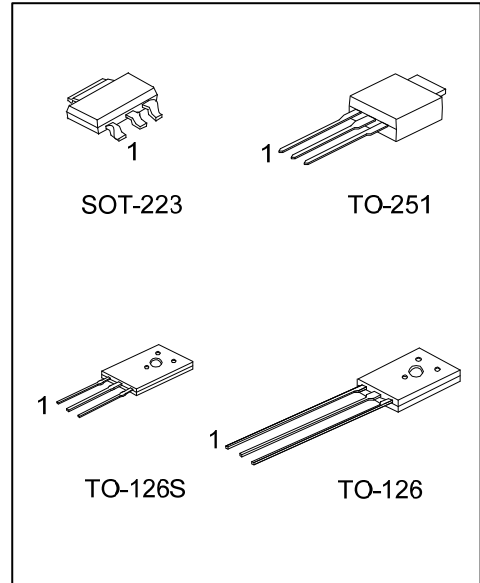
BD139

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

BD139G-xx-AA3-R (1) Packing Type (2) Package Type (3) Rank (4) Green Package	(1) R: Tape Reel, K: Bulk, T: Tube (2) AA3: SOT-223, TM3: TO-251, T60: TO-126, T6S: TO-126S (3) refer to h_{FE} (4) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

PACKAGE	MARKING
SOT-223	BD139□ □□□□ 1 L: Lead Free G: Halogen Free Date Code
TO-251	UTC BD139□ □□□□□□ Lot Code 1 L: Lead Free G: Halogen Free Date Code
TO-126 TO-126C	UTC □□□□ BD139□-□□ 1 L: Lead Free G: Halogen Free Date Code Rank

■ 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.

■ THERMAL DATA

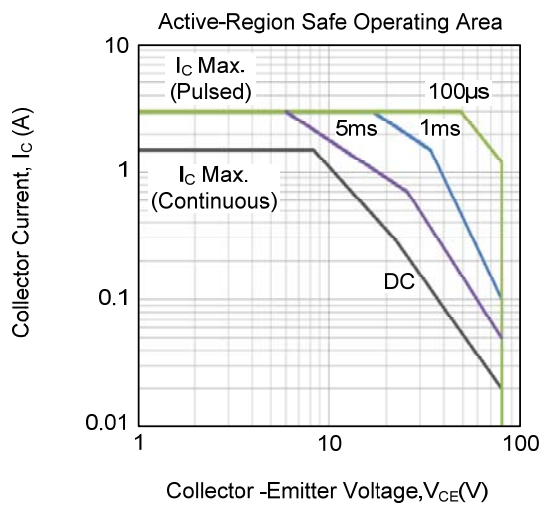
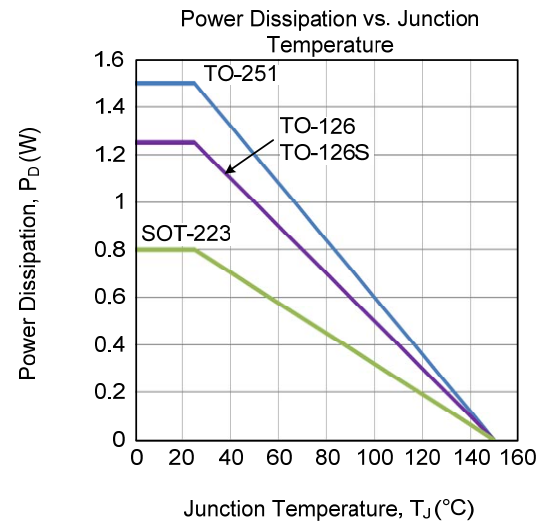
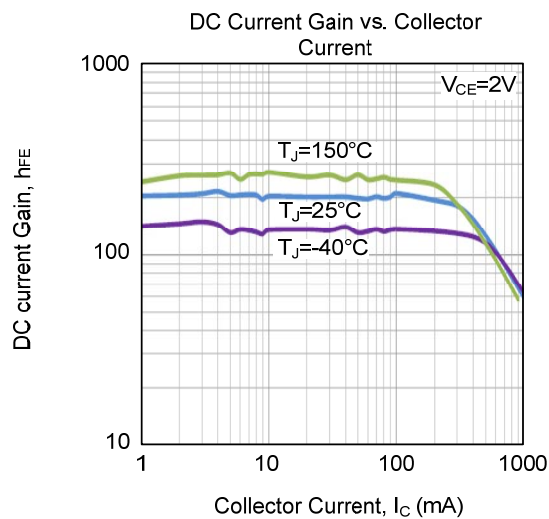
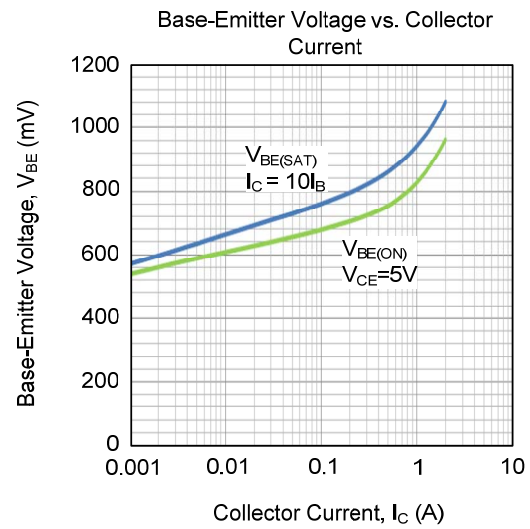
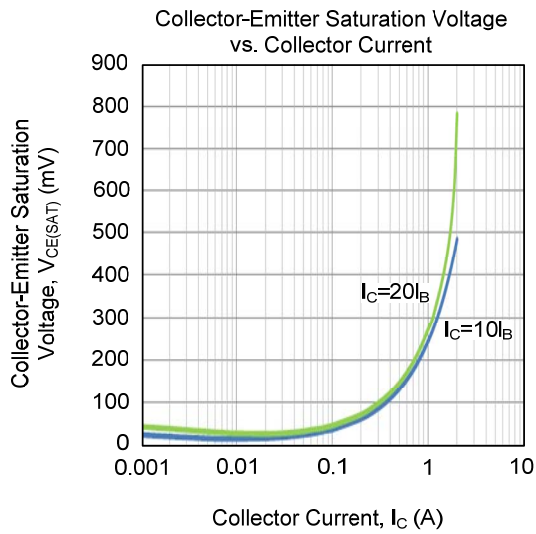
PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	SOT-223	θ_{JA}	156	$^\circ\text{C/W}$
	TO-126/TO-126S		100	$^\circ\text{C/W}$
	TO-251		83.3	$^\circ\text{C/W}$
Junction to Case	SOT-223	θ_{JC}	16	$^\circ\text{C/W}$
	TO-126/TO-126S		10	$^\circ\text{C/W}$
	TO-251		8.33	$^\circ\text{C/W}$

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ 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	μA
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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