

**13003BS**

Preliminary

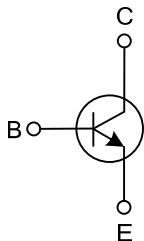
NPN SILICON TRANSISTOR**NPN SILICON BIPOLAR
TRANSISTORS FOR LOW
FREQUENCY AMPLIFICATION****DESCRIPTION**

The UTC **13003BS** is a silicon NPN power switching transistor; it uses UTC's advanced technology to provide customers high collector-base breakdown voltage, low reverse leakage current and high reliability, etc.

The UTC **13003BS** is suitable for electronic ballast power switch circuit and the compact electronic energy-saving light.

FEATURES

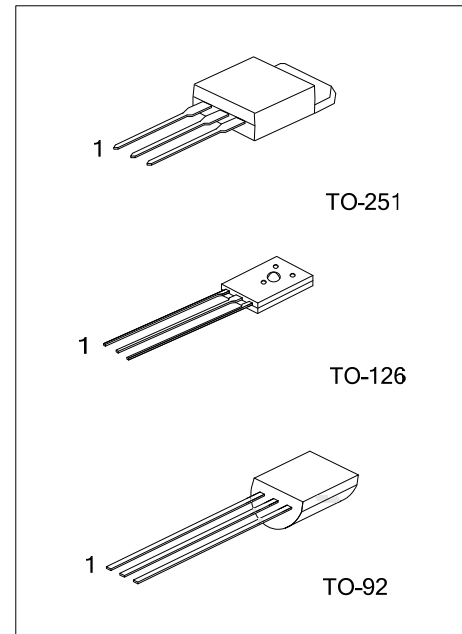
- * High collector-base breakdown voltage
- * Low reverse leakage current
- * High reliability

EQUIVALENT CIRCUIT**ORDERING INFORMATION**

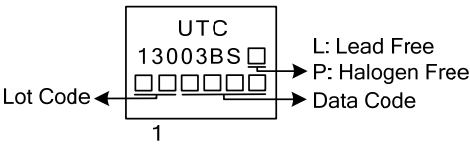
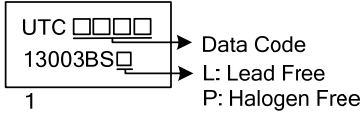
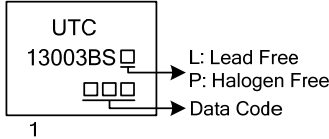
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
13003BSL-TM3-T	13003BSG-TM3-T	TO-251	B	C	E	Tube
13003BSL-T60-K	13003BSG-T60-K	TO-126	B	C	E	Bulk
13003BSL-T92-B	13003BSG-T92-B	TO-92	B	C	E	Tape Box
13003BSL-T92-K	13003BSG-T92-K	TO-92	B	C	E	Bulk

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

13003BSL-TM3-T	(1)Packing Type (2)Package Type (3)Lead Free	(1) T: Tube, B: Bluk, K: Bulk (2) TM3: TO-251, T60: TO-126, T92: TO-92 (3) L: Lead Free, G: Halogen Free
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■ MARKING INFORMATION

PACKAGE	MARKING
TO-251	 Diagram showing marking on a TO-251 package. The marking includes 'UTC', '13003BS', and a lot code (four digits). Arrows indicate: 'L: Lead Free' and 'P: Halogen Free' for the '13003BS' part, and 'Data Code' for the lot code. A '1' is shown below the lot code.
TO-126	 Diagram showing marking on a TO-126 package. The marking includes 'UTC', '13003BS', and a data code (three digits). Arrows indicate: 'Data Code' for the data code, 'L: Lead Free' and 'P: Halogen Free' for the '13003BS' part. A '1' is shown below the data code.
TO-92	 Diagram showing marking on a TO-92 package. The marking includes 'UTC', '13003BS', and a data code (three digits). Arrows indicate: 'L: Lead Free' and 'P: Halogen Free' for the '13003BS' part, and 'Data Code' for the data code. A '1' is shown below the data code.

■ **ABSOLUTE MAXIMUM RATINGS** ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		V_{CBO}	800	V
Collector-Emitter Voltage		V_{CEO}	450	V
Emitter-Base Voltage		V_{EBO}	9	V
Collector Current	Continuous	I_C	2	A
	Peak	I_{CM}	4	A
Base Current	Continuous	I_B	1	A
	Peak	I_{BM}	2	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	TO-251	P_D	10	W
	TO-126		20	W
	TO-92		1	W
Junction Temperature		T_J	150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55~+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	TO-251	θ_{JA}	90	$^{\circ}\text{C/W}$
	TO-126		100	
	TO-92		150	
Junction to Case	TO-251	θ_{JC}	12.5	$^{\circ}\text{C/W}$
	TO-126		7.5	
	TO-92		100	

■ **ELECTRICAL CHARACTERISTICS** ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	BV_{CBO}	$I_C=1\text{mA}$, $I_E=0$	800			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C=1\text{mA}$, $I_B=0$	450			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E=1\text{mA}$, $I_C=0$	9			V
Collector Cut-Off Current	I_{CBO}	$V_{CB}=800\text{V}$, $I_E=0$			0.1	mA
Collector-Emitter Cut-Off Current	I_{CEO}	$V_{CE}=450\text{V}$, $I_B=0$			0.1	mA
Emitter-Base Cut-Off Current	I_{EBO}	$V_{EB}=9\text{V}$, $I_C=0$			0.1	mA
DC Current Gain (Note)	h_{FE}	$V_{CE}=5\text{V}$, $I_C=0.2\text{mA}$	20		35	
Low current and high current h_{FE2} h_{FE1} ratio	h_{FE1}/h_{FE2}	h_{FE1} : $V_{CE}=5\text{V}$, $I_C=5\text{mA}$	0.75			
		h_{FE2} : $V_{CE}=5\text{V}$, $I_C=0.2\text{A}$				
Collector-Emitter Saturation Voltage (Note)	$V_{CE(SAT)}$	$I_C=0.5\text{A}$, $I_B=0.1\text{A}$			0.8	V
Base-Emitter Saturation Voltage (Note)	$V_{BE(SAT)}$	$I_C=0.5\text{A}$, $I_B=0.1\text{A}$			1.5	V
Storage Time	t_S	UI9600, $I_C=0.25\text{A}$	2		5	μs
Rise Time	t_R				2	μs
Fall Time	t_F				2	μs
Transition Frequency	f_T	$V_{CE}=10\text{V}$, $I_C=0.1\text{A}$, $f=1\text{MHz}$	5			MHz

Note: Pulse test, pulse width $t_p \leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

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