



13002AH

Preliminary

NPN SILICON TRANSISTOR

NPN SILICON BIPOLAR TRANSISTORS FOR LOW FREQUENCY AMPLIFICATION

DESCRIPTION

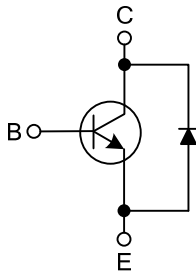
The UTC **13002AH** is a silicon NPN power switching transistor; it uses UTC's advanced technology to provide customers high collector-base breakdown voltage, low reverse leakage current and high reliability, etc.

The UTC **13002AH** 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

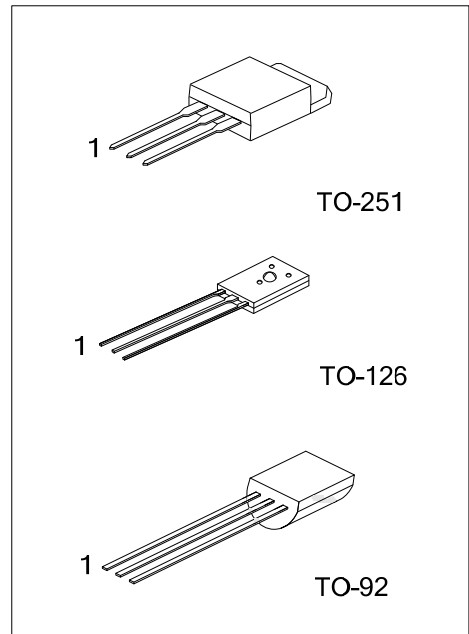


ORDERING INFORMATION

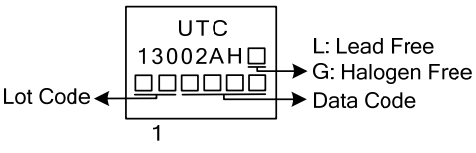
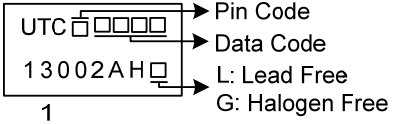
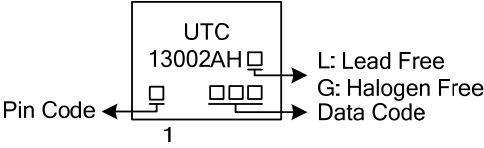
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
13002AHL-TM3-T	13002AHG-TM3-T	TO-251	B	C	E	Tube
13002AHL-T60-F-K	13002AHG-T60-F-K	TO-126	B	C	E	Bulk
13002AHL-T92-F-B	13002AHG-T92-F-B	TO-92	B	C	E	Tape Box
13002AHL-T92-F-K	13002AHG-T92-F-K	TO-92	B	C	E	Bulk

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

13002AHL-T60-F-B	(1)Packing Type (2)Pin Assignment (3)Package Type (4)Green Package	(1) T: Tube, B: Bluk, K: Bulk (2) refer to Pin Assignment (3) TM3: TO-251, T60: TO-126, T92: TO-92 (4) L: Lead Free, G: Halogen Free
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■ MARKING

PACKAGE	MARKING
TO-251	 Diagram showing the marking on a TO-251 package. The marking includes 'UTC', '13002AH', and a Lot Code (four digits). The Lot Code is labeled 'Lot Code' with an arrow. The marking also includes 'L: Lead Free', 'G: Halogen Free', and 'Data Code'.
TO-126	 Diagram showing the marking on a TO-126 package. The marking includes 'UTC', '13002AH', and a Pin Code (four digits). The Pin Code is labeled 'Pin Code' with an arrow. The marking also includes 'Data Code', 'L: Lead Free', and 'G: Halogen Free'.
TO-92	 Diagram showing the marking on a TO-92 package. The marking includes 'UTC', '13002AH', and a Pin Code (four digits). The Pin Code is labeled 'Pin Code' with an arrow. The marking also includes 'L: Lead Free', 'G: Halogen Free', and 'Data Code'.

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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		V_{CBO}	700	V
Collector-Emitter Voltage		V_{CEO}	450	V
Emitter-Base Voltage		V_{EBO}	9	V
Collector Current	Continuous	I_{C}	1.2	A
	Peak	I_{CM}	2.4	A
Power Dissipation ($T_{\text{C}}=25^{\circ}\text{C}$)	TO-251	P_{D}	10	W
	TO-126		20	W
	TO-92		0.8	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}	95	$^{\circ}\text{C/W}$
	TO-126		100	
	TO-92		150	
Junction to Case	TO-251	θ_{JC}	13	$^{\circ}\text{C/W}$
	TO-126		7.5	
	TO-92		112	

■ **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}	$I_{\text{C}}=1\text{mA}$	700			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_{\text{C}}=1\text{mA}$	450			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_{\text{E}}=1\text{mA}$	10			V
Collector Cut-Off Current	I_{CBO}	$V_{\text{CB}}=700\text{V}$, $I_{\text{E}}=0$			1	μA
Collector-Emitter Cut-Off Current	I_{CEO}	$V_{\text{CE}}=450\text{V}$, $I_{\text{B}}=0$			5	μA
Emitter-Base Cut-Off Current	I_{EBO}	$V_{\text{EB}}=9\text{V}$, $I_{\text{C}}=0$			1	μA
DC Current Gain (Note)	h_{FE}	$V_{\text{CE}}=5\text{V}$, $I_{\text{C}}=0.1\text{A}$	25		35	
Low current and high current $h_{\text{FE}2}$ $h_{\text{FE}1}$ ratio	$h_{\text{FE}1}/h_{\text{FE}2}$	$I_{\text{C}}=0.5\text{A}$, $I_{\text{B}}=0.1\text{A}$		0.2	0.8	
		$I_{\text{C}}=0.5\text{A}$, $I_{\text{B}}=0.1\text{A}$		0.9	1.5	
Collector-Emitter Saturation Voltage (Note)	$V_{\text{CE(SAT)}}$	$I_{\text{C}}=0.2\text{A}$, $I_{\text{B}}=40\text{mA}$			0.4	V
		$I_{\text{C}}=1.2\text{A}$, $I_{\text{B}}=500\text{mA}$			3.0	V
Base-Emitter Saturation Voltage (Note)	$V_{\text{BE(SAT)}}$	$I_{\text{C}}=0.2\text{A}$, $I_{\text{B}}=40\text{mA}$			1.0	V
		$I_{\text{C}}=1.2\text{A}$, $I_{\text{B}}=500\text{mA}$			1.2	V
Storage Time	t_{S}	UI9600, $I_{\text{C}}=100\text{mA}$	2.0		4.0	μs
Rise Time	t_{R}				1.0	μs
Fall Time	t_{F}				1.0	μs
Transition Frequency	f_{T}	$V_{\text{CE}}=10\text{V}$, $I_{\text{C}}=0.1\text{A}$, $f=1\text{MHz}$	5			MHz

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

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