



13003DH

Preliminary

NPN SILICON TRANSISTOR

NPN SILICON BIPOLAR TRANSISTORS FOR LOW FREQUENCY AMPLIFICATION

DESCRIPTION

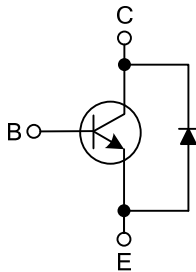
The UTC **13003DH** is a silicon NPN power switching transistor; it uses UTC's advanced technology to provide customers high collector-base breakdown voltage, low reverse leakage current and high reliability, etc.

The UTC **13003DH** 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

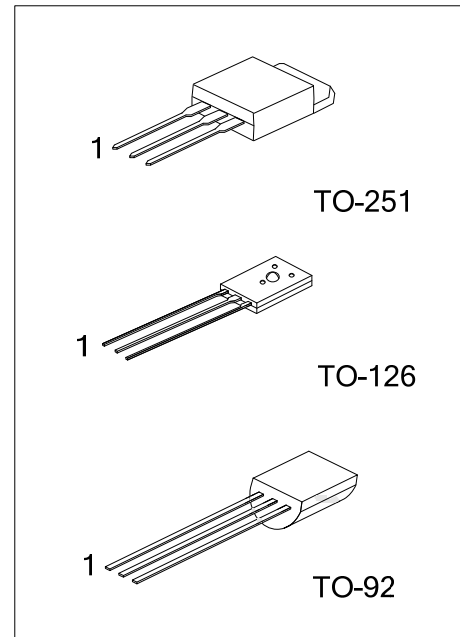


ORDERING INFORMATION

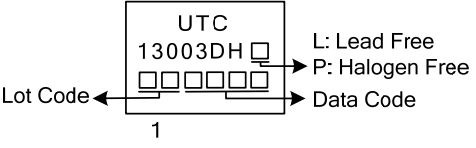
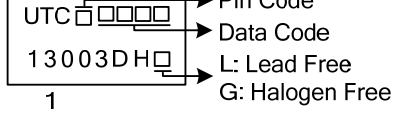
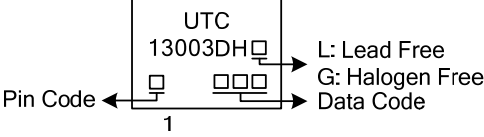
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
13003DHL-x-TM3-T	13003DHG-x-TM3-T	TO-251	B	C	E	Tube
13003DHL-x-T60-F-K	13003DHG-x-T60-F-K	TO-126	B	C	E	Bulk
13003DHL-x-T92-A-B	13003DHG-x-T92-A-B	TO-92	E	C	B	Tape Box
13003DHL-x-T92-A-K	13003DHG-x-T92-A-K	TO-92	E	C	B	Bulk

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

<p>13003DHL-T60-F-B</p> <p>(1)Packing Type</p> <p>(2)Pin Assignment</p> <p>(3)Package Type</p> <p>(4)Lead Free</p>	<p>(1) T: Tube, B: Bluk, K: Bulk</p> <p>(2) refer to Pin Assignment</p> <p>(3) TM3: TO-251, T60: TO-126, T92: TO-92</p> <p>(4) L: Lead Free, G: Halogen Free</p>
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MARKING INFORMATION

PACKAGE	MARKING
TO-251	 <p>Diagram showing marking on a TO-251 package. The marking includes 'UTC', '13003DH', and a lot code '□□□□□□'. Arrows indicate: Lot Code (left), Data Code (right), L: Lead Free (top right), and P: Halogen Free (middle right). A '1' is shown below the marking.</p>
TO-126	 <p>Diagram showing marking on a TO-126 package. The marking includes 'UTC', '13003DH', and a pin code '□□□□'. Arrows indicate: Pin Code (top right), Data Code (middle right), L: Lead Free (bottom right), and G: Halogen Free (bottom right). A '1' is shown below the marking.</p>
TO-92	 <p>Diagram showing marking on a TO-92 package. The marking includes 'UTC', '13003DH', and a pin code '□□□'. Arrows indicate: Pin Code (left), Data Code (right), L: Lead Free (top right), and G: Halogen Free (middle right). A '1' is shown below the marking.</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		V_{CBO}	600	V
Collector-Emitter Voltage		V_{CEO}	400	V
Emitter-Base Voltage		V_{EBO}	9	V
Continuous Collector Current		I_C	1.8	A
Power Dissipation	$T_A=25^\circ\text{C}$	P_D	1.25	W
	$T_C=25^\circ\text{C}$		50	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.

■ 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}	$I_C=0.1\text{mA}$	600			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C=1\text{mA}$	400			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E=0.1\text{mA}$	9			V
Collector Cut-Off Current	I_{CBO}	$V_{CB}=600\text{V}, I_E=0$			0.1	mA
Collector-Emitter Cut-Off Current	I_{CEO}	$V_{CE}=400\text{V}, I_B=0$			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 1)	h_{FE}	$I_C=0.2\text{A}, V_{CE}=5.0\text{V}$	15		30	
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	0.9		
		$h_{FE2}: V_{CE}=5\text{V}, I_C=0.2\text{A}$				
Collector-Emitter Saturation Voltage (Note)	$V_{CE(SAT)}$	$I_C=1\text{A}, I_B=0.25\text{A}$		0.30	0.8	V
Base-Emitter Saturation Voltage (Note)	$V_{BE(SAT)}$	$I_C=1\text{A}, I_B=0.25\text{A}$		0.9	1.2	V
Storage Time	t_s	UI9600, $I_C=0.1\text{A}$	3		5	μs
Rise Time	t_R				1	μs
Fall Time	t_F				1	μs
Transition Frequency	f_T	$I_C=0.1\text{A}, V_{CE}=10\text{V}, f=1\text{MHz}$	5			MHz
Diode Forward Voltage	V_F	$I_F=1.5\text{A}$			2.5	V

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

■ CLASSIFICATION OF h_{FE}

RANK	A	B	C
RANGE	15 ~ 20	20 ~ 25	25 ~ 30

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