



13003DW

Preliminary

NPN SILICON TRANSISTOR

NPN SILICON BIPOLAR TRANSISTORS FOR LOW FREQUENCY AMPLIFICATION

DESCRIPTION

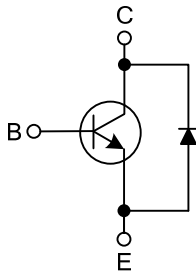
The UTC **13003DW** is a silicon NPN power switching transistor; it uses UTC's advanced technology to provide customers high collector-base breakdown voltage and high reliability, etc.

The UTC **13003DW** is suitable for electronic ballast power switch circuit and low voltage electronic energy-saving light.

FEATURES

- * High collector-base breakdown voltage
- * High reliability

EQUIVALENT CIRCUIT

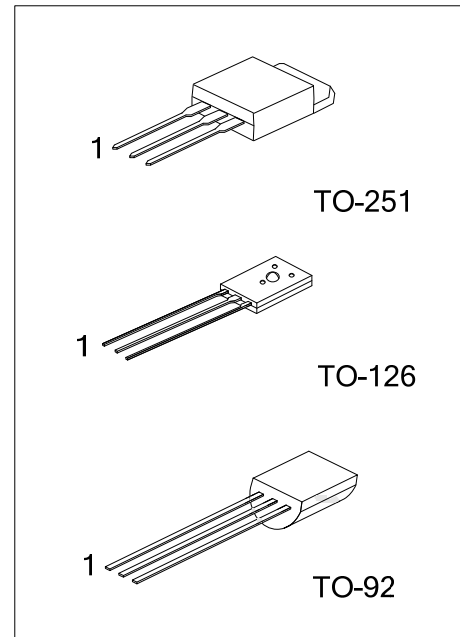


ORDERING INFORMATION

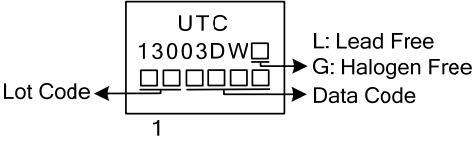
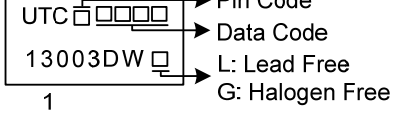
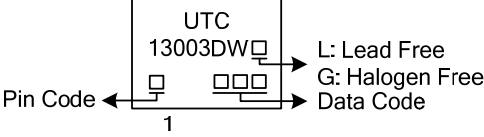
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
13003DWL-x-TM3-T	13003DWG-x-TM3-T	TO-251	B	C	E	Tube
13003DWL-x-T60-F-K	13003DWG-x-T60-F-K	TO-126	B	C	E	Bulk
13003DWL-x-T92-A-B	13003DWG-x-T92-A-B	TO-92	E	C	B	Tape Box
13003DWL-x-T92-A-K	13003DWG-x-T92-A-K	TO-92	E	C	B	Bulk

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

<p>13003DWL-T60-F-B</p>	<p>(1) T: Tube, B: Bulk, 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

PACKAGE	MARKING
TO-251	 <p>Diagram showing marking on a TO-251 package. The marking includes 'UTC' and '13003DW' followed by a small square. Below this is a row of five small squares. An arrow labeled 'Lot Code' points to the first square. To the right, an arrow labeled 'Data Code' points to the last square. Below the row of squares is the number '1'. To the right of the package, text indicates 'L: Lead Free' and 'G: Halogen Free'.</p>
TO-126	 <p>Diagram showing marking on a TO-126 package. The marking includes 'UTC' followed by a small square, then a row of four small squares. Below this is '13003DW' followed by a small square. An arrow labeled 'Pin Code' points to the first square of the row. An arrow labeled 'Data Code' points to the last square of the row. Below the row of squares is the number '1'. To the right of the package, text indicates 'L: Lead Free' and 'G: Halogen Free'.</p>
TO-92	 <p>Diagram showing marking on a TO-92 package. The marking includes 'UTC' and '13003DW' followed by a small square. Below this is a row of three small squares. An arrow labeled 'Pin Code' points to the first square. An arrow labeled 'Data Code' points to the last square. Below the row of squares is the number '1'. To the right of the package, text indicates 'L: Lead Free', 'G: Halogen Free', and 'Data Code'.</p>

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

PARAMETER	SYMBOL	RATINGS	UNIT	
Collector-Base Voltage	V_{CBO}	350	V	
Collector-Emitter Voltage	V_{CEO}	200	V	
Emitter-Base Voltage	V_{EBO}	9	V	
Continuous Collector Current	I_C	2	A	
Power Dissipation	P_D	$T_A=25^\circ\text{C}$	1	W
		$T_C=25^\circ\text{C}$	35	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}	$I_C=1\text{mA}$	350			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C=10\text{mA}$	200			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E=1\text{mA}$	9			V
Collector Cut-Off Current	I_{CBO}	$V_{CB}=350\text{V}, I_E=0$			0.1	mA
Collector-Emitter Cut-Off Current	I_{CEO}	$V_{CE}=200\text{V}, I_B=0$			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}	$I_C=0.5\text{A}, V_{CE}=5.0\text{V}$	15		30	
Low current and high current h_{FE2} h_{FE1} ratio	h_{FE1}/h_{FE2}	$h_{FE1}: V_{CE}=5\text{V}, I_C=50\text{mA}$	0.7	0.9		
		$h_{FE2}: V_{CE}=5\text{V}, I_C=0.5\text{A}$				
Collector-Emitter Saturation Voltage (Note)	$V_{CE(SAT)}$	$I_C=1.5\text{A}, I_B=0.5\text{A}$		0.21	1	V
Base-Emitter Saturation Voltage (Note)	$V_{BE(SAT)}$	$I_C=1.5\text{A}, I_B=0.5\text{A}$		1.1	1.5	V
Storage Time	t_s	UI9600, $I_C=0.1\text{A}$	2.5		4.5	μs
Rise Time	t_R				1	μs
Fall Time	t_F				1	μs
Transition Frequency	f_T	$I_C=0.2\text{A}, V_{CE}=10\text{V}, f=1\text{MHz}$	4			MHz
Diode Forward Voltage	V_F	$I_F=2\text{A}$			2.5	V

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

■ CLASSIFICATION OF h_{FE}

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

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