



13003DW

Preliminary

NPN SILICON TRANSISTOR

NPN SILICON BIPOLAR TRANSISTORS FOR LOW FREQUENCY AMPLIFICATION

■ DESCRIPTION

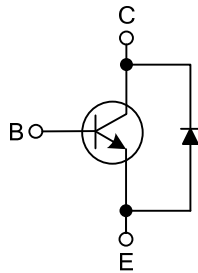
The UTC **13003DW** is a silicon NPN power switching transistor; it uses UTC's advanced technology to provide customers high collector-base breakdown voltage and high reliability, etc.

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

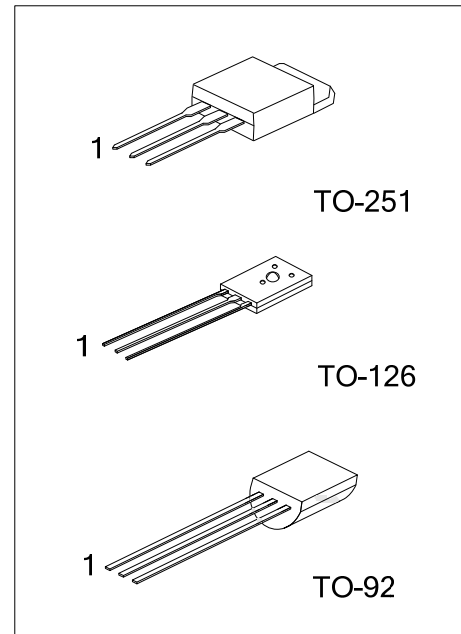


■ ORDERING INFORMATION

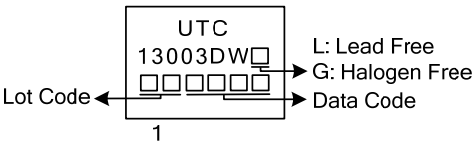
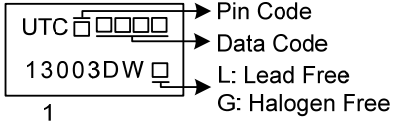
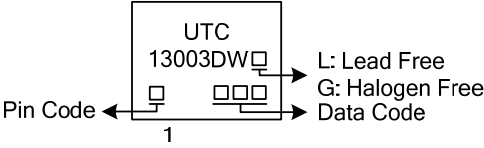
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
13003DWL-x-TM3-T	13003DWG-x-TM3-T	TO-251	B	C	E	Tube
13003DWL-x-T60-F-K	13003DWG-x-T60-F-K	TO-126	B	C	E	Bulk
13003DWL-x-T92-A-B	13003DWG-x-T92-A-B	TO-92	E	C	B	Tape Box
13003DWL-x-T92-A-K	13003DWG-x-T92-A-K	TO-92	E	C	B	Bulk

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

13003DWL-T60-F-B	(1)Packing Type (2)Pin Assignment (3)Package Type (4)Lead Free	(1) T: Tube, B: Bulk, 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	 Lot Code ← UTC 13003DW □ □ □ □ □ → Data Code 1 L: Lead Free G: Halogen Free
TO-126	 UTC □ □ □ □ → Pin Code Data Code 13003DW □ → L: Lead Free G: Halogen Free 1
TO-92	 Pin Code ← UTC 13003DW □ □ □ → L: Lead Free G: Halogen Free Data Code 1

■ 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}	$I_{\text{C}}=1\text{mA}$	350			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_{\text{C}}=10\text{mA}$	200			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_{\text{E}}=1\text{mA}$	9			V
Collector Cut-Off Current	I_{CBO}	$V_{\text{CB}}=350\text{V}$, $I_{\text{E}}=0$			0.1	mA
Collector-Emitter Cut-Off Current	I_{CEO}	$V_{\text{CE}}=200\text{V}$, $I_{\text{B}}=0$			0.1	mA
Emitter-Base Cut-Off Current	I_{EBO}	$V_{\text{EB}}=9\text{V}$, $I_{\text{C}}=0$			0.1	mA
DC Current Gain (Note 1)	h_{FE}	$I_{\text{C}}=0.5\text{A}$, $V_{\text{CE}}=5.0\text{V}$	15		30	
Low current and high current $h_{\text{FE}2}$ $h_{\text{FE}1}$ ratio	$h_{\text{FE}1}/h_{\text{FE}2}$	$h_{\text{FE}1}$: $V_{\text{CE}}=5\text{V}$, $I_{\text{C}}=50\text{mA}$	0.7	0.9		
		$h_{\text{FE}2}$: $V_{\text{CE}}=5\text{V}$, $I_{\text{C}}=0.5\text{A}$				
Collector-Emitter Saturation Voltage (Note)	$V_{\text{CE(SAT)}}$	$I_{\text{C}}=1.5\text{A}$, $I_{\text{B}}=0.5\text{A}$		0.21	1	V
Base-Emitter Saturation Voltage (Note)	$V_{\text{BE(SAT)}}$	$I_{\text{C}}=1.5\text{A}$, $I_{\text{B}}=0.5\text{A}$		1.1	1.5	V
Storage Time	t_{S}	UI9600, $I_{\text{C}}=0.1\text{A}$	2.5		4.5	μs
Rise Time	t_{R}				1	μs
Fall Time	t_{F}				1	μs
Transition Frequency	f_{T}	$I_{\text{C}}=0.2\text{A}$, $V_{\text{CE}}=10\text{V}$, $f=1\text{MHz}$	4			MHz
Diode Forward Voltage	V_{F}	$I_{\text{F}}=2\text{A}$			2.5	V

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

■ CLASSIFICATION OF h_{FE}

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

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