



13003DF

Preliminary

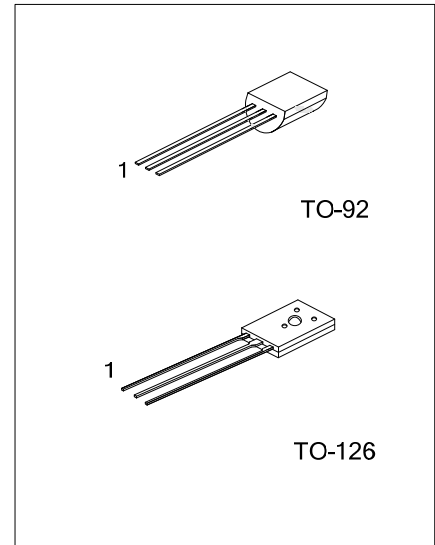
NPN SILICON TRANSISTOR

NPN SILICON BIPOLAR TRANSISTORS FOR LOW FREQUENCY AMPLIFICATION

DESCRIPTION

The UTC **13003DF** 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.

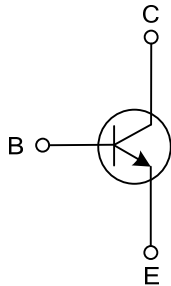
The UTC **13003DF** is suitable for electronic ballast power switch circuit and the compact electronic energy-saving light.



FEATURES

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

EQUIVALENT CIRCUIT



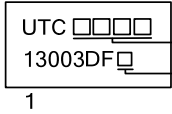
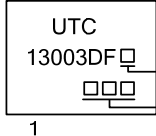
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
13003DFL-xx-T60-K	13003DFG-xx-T60-K	TO-126	B	C	E	Bulk
13003DFL-xx-T92-B	13003DFG-xx-T92-B	TO-92	E	C	B	Tape Box
13003DFL-xx-T92-K	13003DFG-xx-T92-K	TO-92	E	C	B	Bulk

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

13003DFL-xx-T60-K	(1)Packing Type (2)Package Type (3)Rank (4)Lead Free	(1) B: Bulk, K: Bulk (2) T60: TO-126, T92: TO-92 (3) xx: refer to Classification of h_{FE} vs. t_s (4) L: Lead Free, G: Halogen Free
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■ MARKING INFORMATION

PACKAGE	MARKING
TO-126	 1 UTC □□□□ → Data Code 13003DF □ → L: Lead Free P: Halogen Free
TO-92	 1 UTC 13003DF □ → L: Lead Free P: Halogen Free □□□ → Data Code

■ 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}	1.5	A
Power Dissipation	P_{D}	$T_A=25^{\circ}\text{C}$ 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}	$I_{\text{C}}=0.1\text{mA}$	600			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_{\text{C}}=1\text{mA}$	400			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_{\text{E}}=0.1\text{mA}$	9			V
Collector Cut-Off Current	I_{CBO}	$V_{\text{CB}}=600\text{V}$, $I_{\text{E}}=0$			0.1	mA
Collector-Emitter Cut-Off Current	I_{CEO}	$V_{\text{CE}}=400\text{V}$, $I_{\text{B}}=0$			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}	$V_{\text{CE}}=5\text{V}$, $I_{\text{C}}=0.2\text{A}$	15		30	
Low current and high current $h_{\text{FE}2}$ $h_{\text{FE}1}$ ratio	$h_{\text{FE}1}/h_{\text{FE}2}$	$h_{\text{FE}1}$: $V_{\text{CE}}=5\text{V}$, $I_{\text{C}}=5\text{mA}$	0.75	0.9		
		$h_{\text{FE}2}$: $V_{\text{CE}}=5\text{V}$, $I_{\text{C}}=0.2\text{A}$				
Collector-Emitter Saturation Voltage (Note)	$V_{\text{CE(SAT)}}$	$I_{\text{C}}=1\text{A}$, $I_{\text{B}}=0.25\text{A}$		0.3	0.9	V
Base-Emitter Saturation Voltage (Note)	$V_{\text{BE(SAT)}}$	$I_{\text{C}}=1\text{A}$, $I_{\text{B}}=0.25\text{A}$		0.9	1.2	V
Storage Time	t_{S}	UI9600, $I_{\text{C}}=0.1\text{A}$	3		5	μs
Rise Time	t_{R}				1	μs
Fall Time	t_{F}				1	μs
Transition Frequency	f_{T}	$I_{\text{C}}=0.1\text{A}$, $V_{\text{CE}}=10\text{V}$, $f=1\text{MHz}$	5			MHz

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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