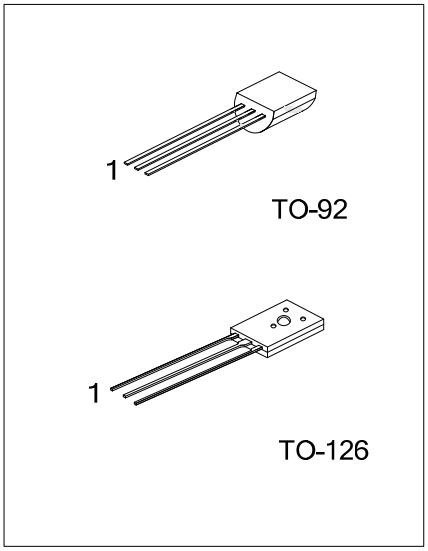
SILICON TRIPLE DIFFUSION NPN BIPOLAR TRANSISTORS



■ DESCRIPTION

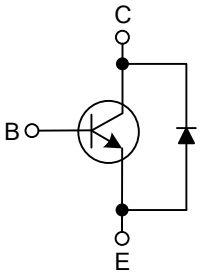
The UTC **13003DE** is a silicon NPN power switching transistor; it uses UTC's advanced technology to provide customers high collector-base breakdown voltage, low reverse leakage current and high reliability, etc.

The UTC **13003DE** is suitable for electronic ballasts and the general power switch circuit, etc.

■ FEATURES

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

■ EQUIVALENT CIRCUIT



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
13003DEL-x-T60-F-K	13003DEG-x-T60-F-K	TO-126	B	C	E	Bulk
13003DEL-x-T92-A-B	13003DEG-x-T92-A-B	TO-92	E	C	B	Tape Box
13003DEL-x-T92-A-K	13003DEG-x-T92-A-K	TO-92	E	C	B	Bulk

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

13003DEL-T60-F-B

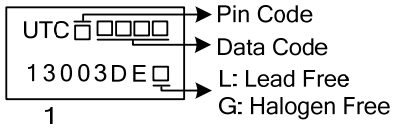
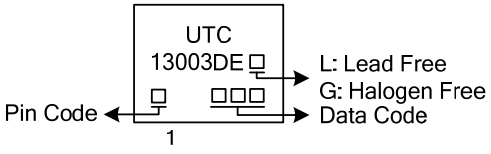
(1)Packing Type — (1) B: Bluk, K: Bulk

(2)Pin Assignment — (2) refer to Pin Assignment

(3)Package Type — (3) T60: TO-126, T92: TO-92

(4)Lead Free — (4) L: Lead Free, G: Halogen Free

■ MARKING

TO-126	TO-92
	

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°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	1.3	A
Power Dissipation	P_D	0.8	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55~+150	°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	θ_{JA}	156	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A =25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	BV_{CBO}	I_C=0.1mA	600			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	I_C=1mA	400			V
Emitter-Base Breakdown Voltage	BV_{EBO}	I_E=0.1mA	9			V
Collector Cut-Off Current	I_{CBO}	V_{CB}=600V, I_E=0			0.1	mA
Collector-Emitter Cut-Off Current	I_{CEO}	V_{CE}=400V, I_B=0			0.1	mA
Emitter-Base Cut-Off Current	I_{EBO}	V_{EB}=9V, I_C=0			0.1	mA
DC Current Gain (Note 1)	h_{FE}	I_C=0.2A, V_{CE}=5.0V	15		30	
Low current and high current h_{FE2} h_{FE1} ratio	h_{FE1}/ h_{FE2}	h_{FE1}: V_{CE}=5V, I_C=5mA h_{FE2}: V_{CE}=5V, I_C=0.2A	0.75	0.9		
Collector-Emitter Saturation Voltage (Note)	$V_{CE(SAT)}$	I_C=0.5A, I_B=0.1A		0.22	0.8	V
Base-Emitter Saturation Voltage (Note)	$V_{BE(SAT)}$	I_C=0.5A, I_B=0.1A		1	1.5	V
Storage Time	t_S	UI9600, I_C=0.1A	2		4	μs
Rise Time	t_R				1	μs
Fall Time	t_F				1	μs
Transition Frequency	f_T	I_C=0.2A, V_{CE}=10V, f=1MHz	5			MHz
Diode Forward Voltage	V_F	I_F=1A			1.5	V

Note: Pulse test, pulse width tp≤300μs, Duty cycle≤2%

■ CLASSIFICATION OF h_{FE}

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