UNISONIC TECHNOLOGIES CO., LTD

13003DE   Preliminary   *NPN SILICON TRANSISTOR*

SILICON TRIPLE DIFFUSION NPN BIPOLAR TRANSISTORS
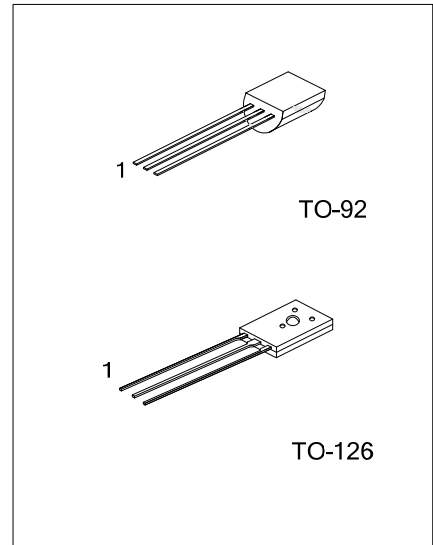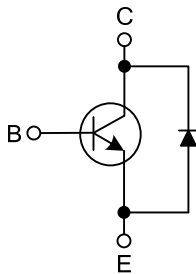

TO-92

TO-126

■ 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
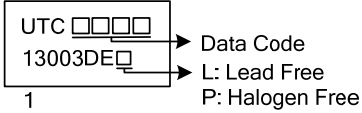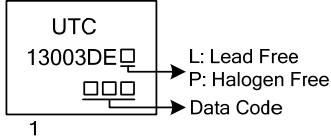
■ EQUIVALENT CIRCUIT

■ ORDERING INFORMATION

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

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

13003DEL-x-T60-K

(1)Packing Type
(2)Package Type
(3)Rank
(4)Lead Free

(1) B: Bluk, K: Bulk

(2) T60: TO-126, T92: TO-92

(3) x: refer to Classification of h_{FE}

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

■ **MARKING INFORMATION**

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

■ **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	0.75	0.9		
		h_{FE2}: V_{CE}=5V, I_C=0.2A				
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

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