



## TUL1203

## NPN SILICON TRANSISTOR

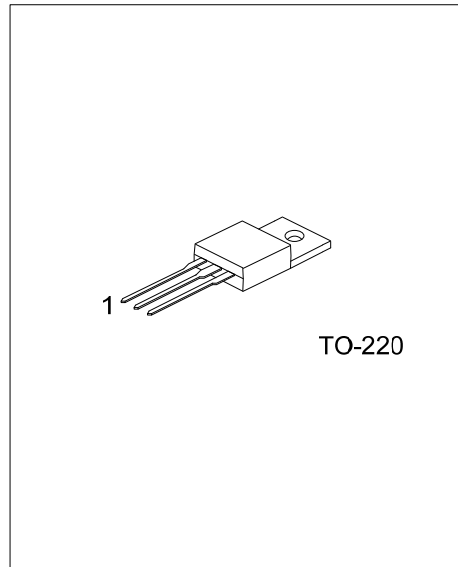
### HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

#### DESCRIPTION

The **TUL1203** is manufactured by using high voltage Planar technology for high voltage capability and high switching speeds.

#### FEATURES

- \*  $BV_{CES}$  Up To 1400V.
- \* Better Distribution Of Dynamic Parameters And Lot To Lot Spread
- \* High Switching Speed



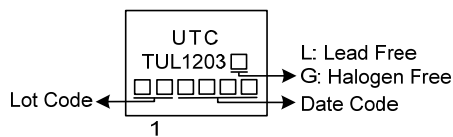
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free Plating	Halogen-Free		1	2	3	
TUL1203L-TA3-T	TUL1203G-TA3-T	TO-220	B	C	E	Tube

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

<p>TUL1203G-TA3-T</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) T: Tube</li> <li>(2) TA3: TO-220</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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#### MARKING



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage ( $I_E = 0$ )	$V_{CBO}$	1400	V
Collector-Emitter Voltage ( $V_{BE} = 0$ )	$V_{CES}$	1400	V
Collector-Emitter Voltage ( $I_B = 0$ )	$V_{CEO}$	550	V
Emitter-Base Voltage ( $I_C = 0$ )	$V_{EBO}$	12	V
Collector Current	$I_C$	5	A
Collector Peak Current ( $t_p < 5$ ms)	$I_{CM}$	8	A
Base Current	$I_B$	2	A
Base Peak Current ( $t_p < 5$ ms)	$I_{BM}$	4	A
Power Dissipation ( $T_C = 25^\circ\text{C}$ )	$P_D$	100	W
Junction Temperature	$T_J$	+150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-65 ~ +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.

### ■ THERMAL DATA

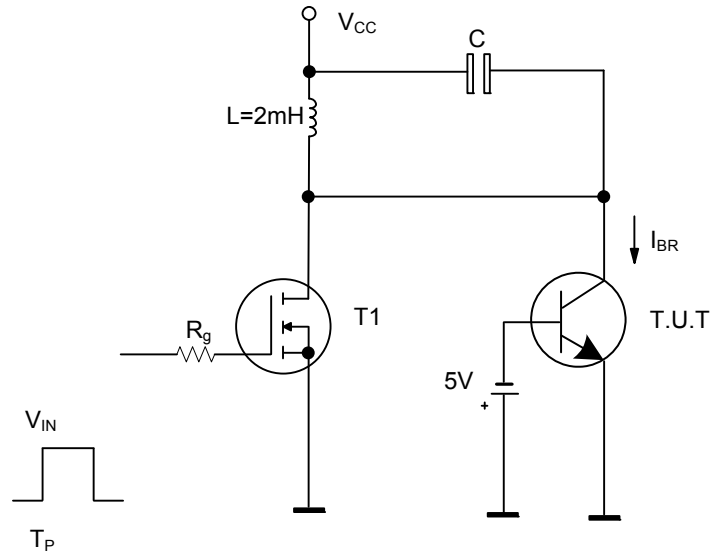
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	$\theta_{JC}$	1.25	$^\circ\text{C}/\text{W}$

### ■ ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise specified)

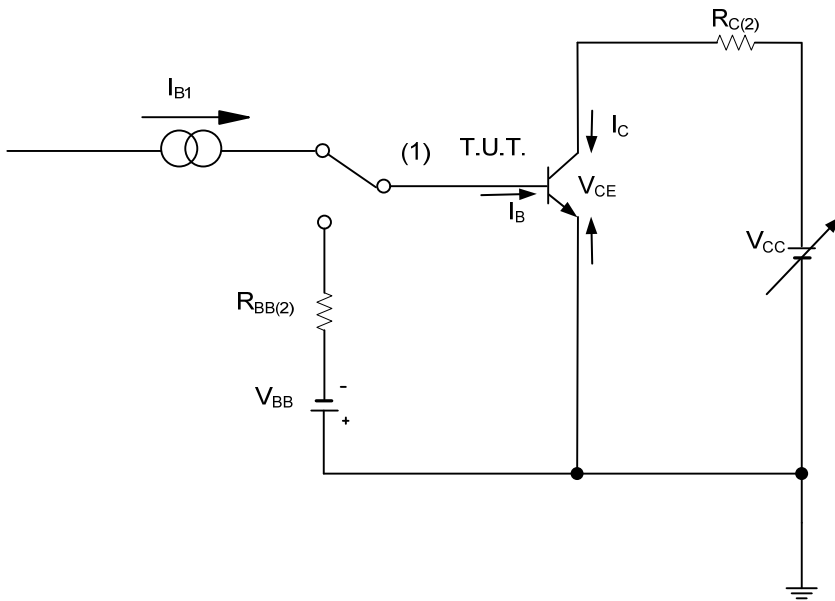
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Collector Cut-off Current ( $V_{BE} = 0$ )	$I_{CES}$	$V_{CE}=1400\text{V}$			100	$\mu\text{A}$	
Emitter Cut-off Current ( $I_B = 0$ )	$I_{EBO}$	$V_{EB}=12\text{V}$			100	$\mu\text{A}$	
Collector-Emitter Sustaining Voltage ( $I_B = 0$ ) (Note)	$V_{CEO(SUS)}$	$I_C=100\text{mA}$	550			V	
Collector-Emitter Saturation Voltage (Note)	$V_{CE(SAT)}$	$I_C=1\text{A}, I_B=200\text{mA}$			0.5	V	
		$I_C=2\text{A}, I_B=400\text{mA}$			0.7	V	
		$I_C=3\text{A}, I_B=1\text{A}$			1.5	V	
Base-Emitter Saturation Voltage (Note)	$V_{BE(SAT)}$	$I_C=2\text{A}, I_B=400\text{mA}$			1.5	V	
		$I_C=3\text{A}, I_B=1\text{A}$			1.5	V	
DC Current Gain (Note)	$h_{FE}$	$I_C=1\text{mA}, V_{CE}=5\text{V}$	10				
		$I_C=10\text{mA}, V_{CE}=5\text{V}$	10				
		$I_C=0.8\text{A}, V_{CE}=3\text{V}$	14		32		
		$I_C=2\text{A}, V_{CE}=5\text{V}$	9		28		
Resistive Load	Storage Time	$t_s$	$I_C=2\text{A}, V_{CC}=150\text{V}$		2.5	3.0	$\mu\text{s}$
	Fall Time	$t_f$	$I_{B1}=0.4\text{A}, I_{B2}=-0.8\text{A}, T_p=30\mu\text{s}$		0.2	0.3	$\mu\text{s}$
Avalanche Energy	$E_{AR}$	$L=2\text{mH}, C=1.8\text{nF}$ $I_{BR}\leq 2.5\text{A}, 25^\circ\text{C} < T_C < 125^\circ\text{C}$	6			mJ	

Note: Pulse Test: Pulse width = 300 $\mu\text{s}$ , Duty cycle $\leq$ 1.5%

■ TEST CIRCUITS

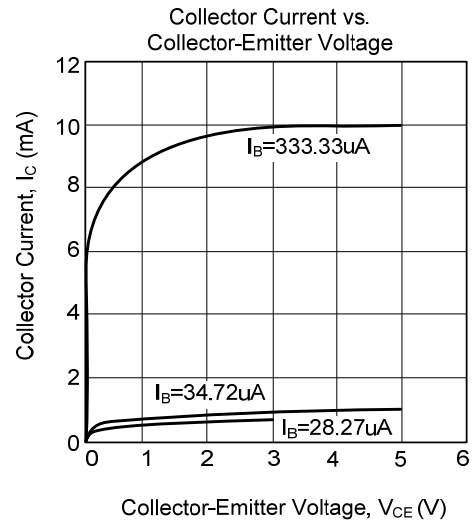
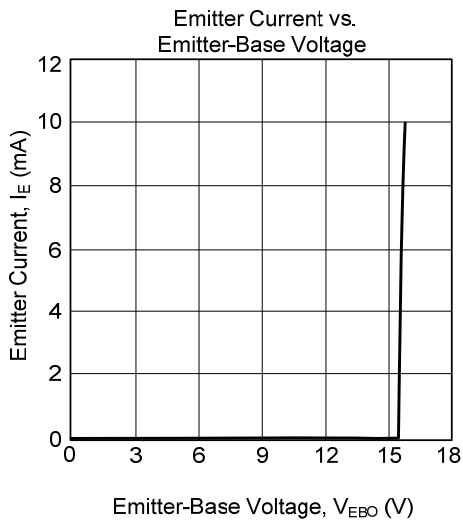
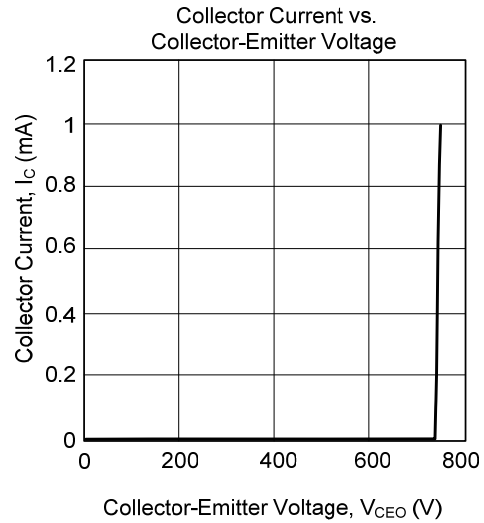
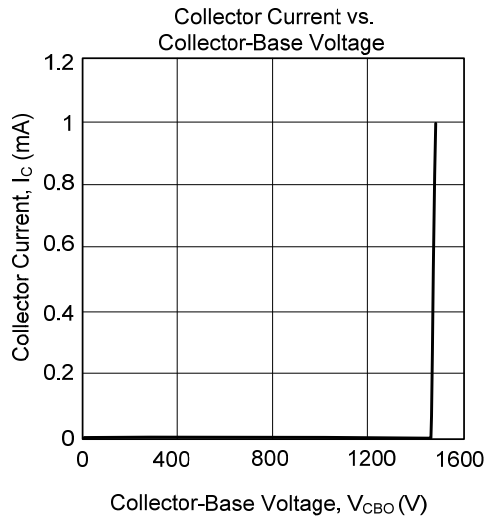


Energy Rating Test Circuit



Resistive Load Switching Test Circuit

### ■ TYPICAL CHARACTERISTICS



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