



MJE13003D

NPN SILICON TRANSISTOR

**HIGH VOLTAGE
FAST-SWITCHING NPN
POWER TRANSISTOR**

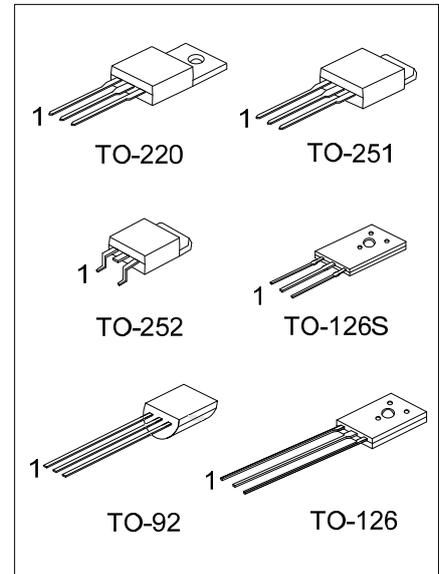
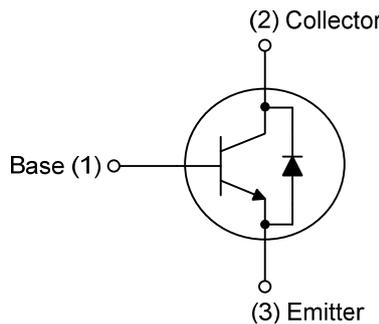
■ **DESCRIPTION**

The UTC **MJE13003D** is a NPN Power Transistor. It is intended to be used in applications requiring medium voltage capability and high switching speeds.

■ **FEATURES**

- * Fast-Switching And High Voltage Capability
- * Dynamic Parameters With Low Spread
- * High Reliability
- * Integrated Antiparallel Collector-Emitter Diode

■ **INTERNAL SCHEMATIC DIAGRAM**



■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
MJE13003DL-x-T60-K	MJE13003DG-x-T60-K	TO-126	B	C	E	Bulk
MJE13003DL-x-T6S-K	MJE13003DG-x-T6S-K	TO-126S	B	C	E	Bulk
MJE13003DL-x-TA3-T	MJE13003DG-x-TA3-T	TO-220	B	C	E	Tube
MJE13003DL-x-TM3-T	MJE13003DG-x-TM3-T	TO-251	B	C	E	Tube
MJE13003DL-x-TN3-R	MJE13003DG-x-TN3-R	TO-252	B	C	E	Tape Reel
MJE13003DL-x-T92-B	MJE13003DG-x-T92-B	TO-92	B	C	E	Tape Box
MJE13003DL-x-T92-K	MJE13003DG-x-T92-K	TO-92	B	C	E	Bulk
MJE13003DL-x-T92-A-B	MJE13003DG-x-T92-A-B	TO-92	E	C	B	Tape Box
MJE13003DL-x-T92-A-K	MJE13003DG-x-T92-A-K	TO-92	E	C	B	Bulk

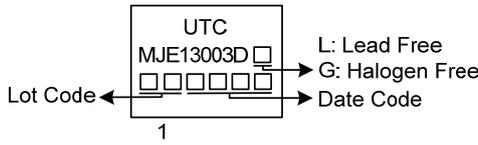
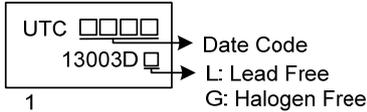
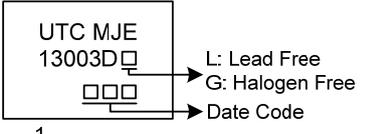
Note: Pin Assignment: B: Base C: Collector E: Emitter

<p>MJE13003DG-x-T92-A-B</p>	<p>(1) T: Tube, B: Tape Box, K: Bulk, R: Tape Reel (2) refer to Pin Assignment (for TO-92) (3) TA3: TO-220, TM3: TO-251, TN3: TO-252, T6S: TO-126S, T60: TO-126, T92: TO-92 (4) refer to Classification of h_{FE1} (5) G: Halogen Free and Lead Free, L: Lead Free</p>
-----------------------------	--

MJE13003D

NPN SILICON TRANSISTOR

MARKING

PACKAGE	MARKING
TO-220 / TO-251 / TO-252	 <p> UTC MJE13003D Lot Code Date Code 1 L: Lead Free G: Halogen Free </p>
TO-126 / TO-126S	 <p> UTC Date Code 13003D 1 L: Lead Free G: Halogen Free </p>
TO-92	 <p> UTC MJE 13003D Date Code 1 L: Lead Free G: Halogen Free </p>

■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT	
Collector- Emitter Voltage ($V_{BE}=0$)		V_{CES}	700	V	
Collector-Emitter Voltage ($I_B=0$)		V_{CEO}	400	V	
Emitter-Base Voltage ($I_C=0, I_B=0.75\text{A}, t_p < 10\mu\text{s}$)		V_{EBO}	9	V	
Collector Current		I_C	1.3	A	
Collector Peak Current ($t_p < 5\text{ms}$)		I_{CM}	2.6	A	
Power Dissipation	$T_A=25^\circ\text{C}$	TO-220	P_D	2	W
		TO-251/TO-252		1.25	W
		TO-126/TO-126S		1	W
		TO-92		0.78	W
	$T_C=25^\circ\text{C}$	TO-220		40	W
		TO-251/TO-252		25	W
		TO-126/TO-126S		12.5	W
		TO-92		1.5	W
Junction Temperature		T_J	150	$^\circ\text{C}$	
Storage Temperature		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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	$^\circ\text{C/W}$
	TO-251		100	$^\circ\text{C/W}$
	TO-126/TO-126S		122	$^\circ\text{C/W}$
	TO-92		160	$^\circ\text{C/W}$
Junction to Case	TO-220	θ_{JC}	3.125	$^\circ\text{C/W}$
	TO-251		5	$^\circ\text{C/W}$
	TO-126/TO-126S		10	$^\circ\text{C/W}$
	TO-92		80	$^\circ\text{C/W}$

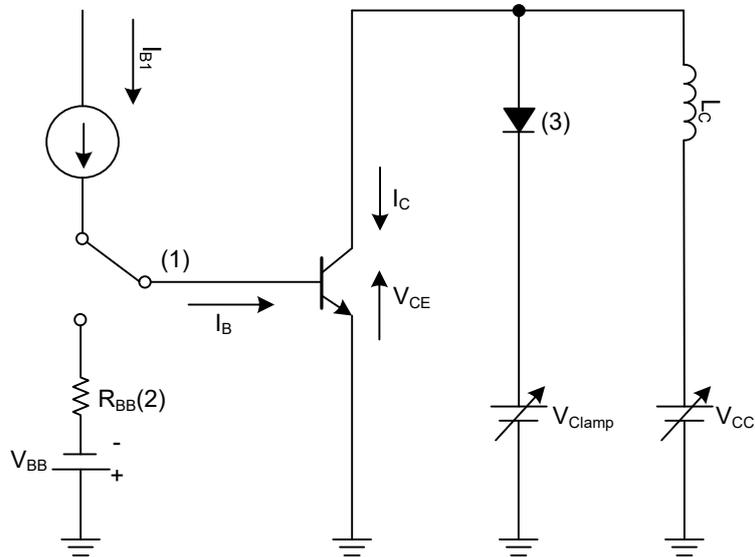
■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Emitter-Base Breakdown Voltage		BV_{EBO}	$I_E=1\text{mA}, I_C=0$	9			V
Collector-Emitter Sustaining Voltage (Note)		$V_{CEO(SUS)}$	$I_C=10\text{mA}, I_B=0$	400			V
Collector Cut-Off Current		I_{CBO}	$V_{CB}=700\text{V}, I_E=0$			1	μA
Collector Cut-Off Current		I_{CEO}	$V_{CE}=400\text{V}, I_B=0$			1	μA
Emitter Cutoff Current		I_{EBO}	$V_{EB}=9.0\text{V}, I_C=0$			1	μA
Collector-Emitter Saturation Voltage (Note)		$V_{CE(SAT)}$	$I_C=0.5\text{A}, I_B=0.1\text{A}$			0.8	V
Base-Emitter Saturation Voltage (Note)		$V_{BE(SAT)}$	$I_C=0.5\text{A}, I_B=0.1\text{A}$			1.5	V
DC Current Gain		h_{FE1}	$I_C=0.2\text{A}, V_{CE}=5.0\text{V}$	15		30	
		h_{FE2}	$I_C=5\text{mA}, V_{CE}=5.0\text{V}$	10			
Resistive Load	Storage Time	t_s	$V_{CC}=125\text{V}, I_C=0.1\text{A}, I_{B1}=10\text{mA}, I_{B2}=-10\text{mA}, t_p=25\mu\text{s}$	2		3	μs
Diode Forward Voltage		V_F	$I_F=0.5\text{A}$			1.5	V

Note: Pulse Test: Pulse duration $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

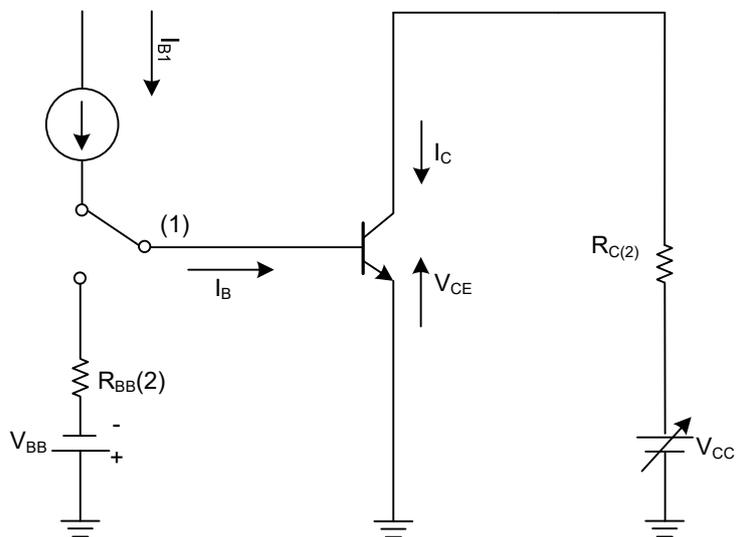
■ TEST CIRCUITS

Inductive Load Switching Test Circuit



- Notes: 1. Fast Electronic Switch
 2. Non-Inductive Resistor
 3. Fast Recovery Rectifier

Resistive Load Switching Test Circuit



- Notes: 1. Fast Electronic Switch
 2. Non-Inductive Resistor

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.