



MJE13003D

Preliminary

NPN SILICON TRANSISTOR

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

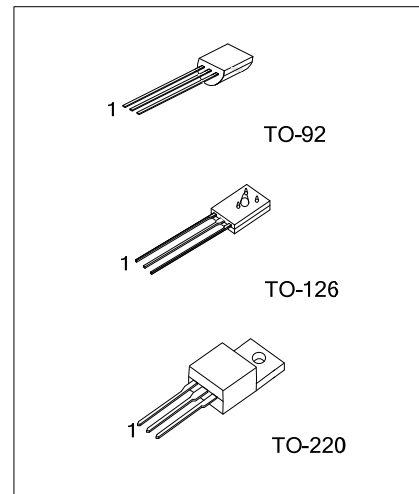
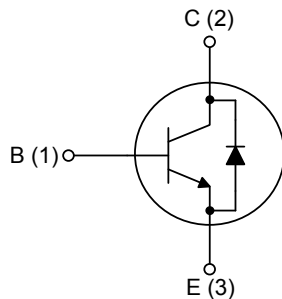
DESCRIPTION

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-T60-K	MJE13003DG-T60-K	TO-126	B	C	E	Bulk
MJE13003DL-T92-B	MJE13003DG-T92-B	TO-92	B	C	E	Tape Box
MJE13003DL-T92-K	MJE13003DG-T92-K	TO-92	B	C	E	Bulk
MJE13003DL-T92-R	MJE13003DG-T92-R	TO-92	B	C	E	Tape Reel
MJE13003DL-TA3-T	MJE13003DG-TA3-T	TO-220	B	C	E	Tube

<p>MJE13003DL-T60-K</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p>	<p>(1) B: Tape Box, K: Bulk, R: Tape Reel, T: Tube</p> <p>(2) T60: TO-126, T92: TO-92, TA3: TO-220</p> <p>(3) G: Halogen Free, L: Lead Free</p>
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■ 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	1.5	A
Collector Peak Current ($t_P<5\text{ms}$)	I_{CM}	3	A
Base Current	I_B	0.75	A
Base Peak Current ($t_P<5\text{ms}$)	I_{BM}	1.5	A
Power Dissipation ($T_C=25^\circ\text{C}$)	TO-126	40	W
	TO-92	30	
	TO-220	70	
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.

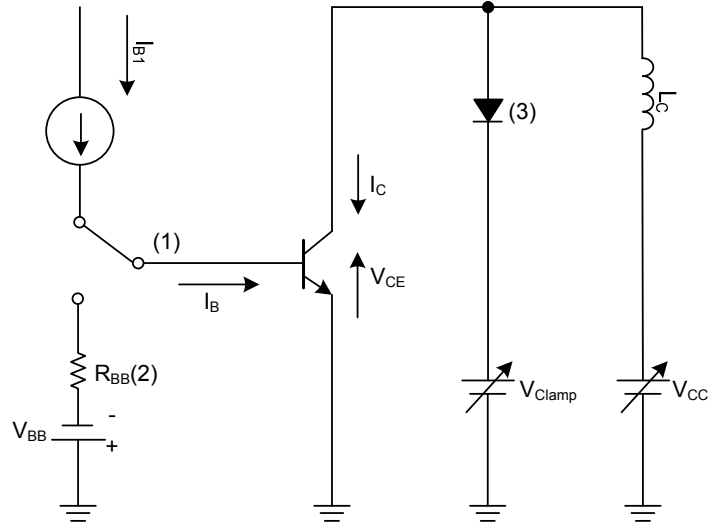
■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E=10\text{mA}, I_C=0$	9		18	V
Collector-Emitter Sustaining Voltage (Note)	$V_{CEO(SUS)}$	$I_C=10\text{mA}, I_B=0$	400			V
Collector Cut-Off Current	I_{CES}	$V_{CE}=700\text{V}, V_{BE}=0$			1	mA
Collector-Emitter Saturation Voltage (Note)	$V_{CE(SAT)}$	$I_C=0.5\text{A}, I_B=0.1\text{A}$			0.5	V
		$I_C=1\text{A}, I_B=0.25\text{A}$			1	V
		$I_C=1.5\text{A}, I_B=0.5\text{A}$			3	V
Base-Emitter Saturation Voltage (Note)	$V_{BE(SAT)}$	$I_C=0.5\text{A}, I_B=0.1\text{A}$			1	V
		$I_C=1\text{A}, I_B=0.25\text{A}$			1.2	V
DC Current Gain	h_{FE}	$I_C=0.5\text{A}, V_{CE}=5\text{V}$	8		51	
		$I_C=1\text{A}, V_{CE}=5\text{V}$	5		30	
Resistive Load	Rise Time	$V_{CC}=125\text{V}, I_C=1\text{A}, I_{B1}=0.2\text{A}, I_{B2}=-0.2\text{A}, t_P=25\mu\text{S}$			1	μS
	Storage Time				4	μS
	Fall Time				0.7	μS
Inductive Load Storage Time	t_S	$I_C=1\text{A}, I_{B1}=0.2\text{A}, V_{BE}=-5\text{V}, L=50\text{mH}, V_{CLAMP}=300\text{V}$		0.8		μS
Diode Forward Voltage	V_F	$I_F=0.5\text{A}$			1.5	V

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

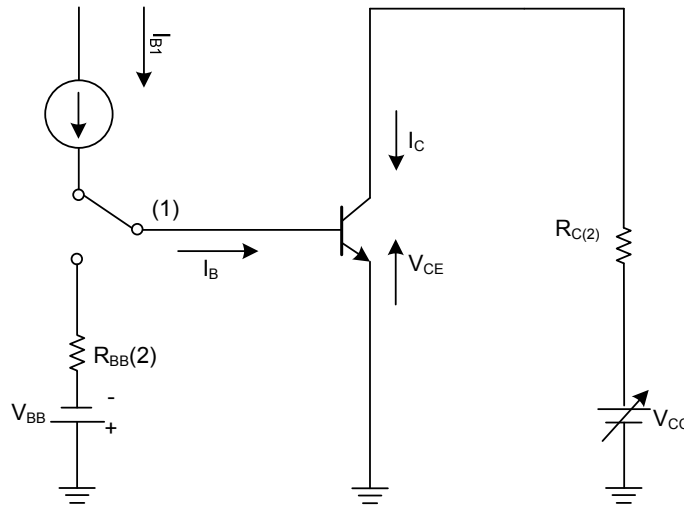
■ TEST CIRCUITS

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

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