

**MJE13003D-P**

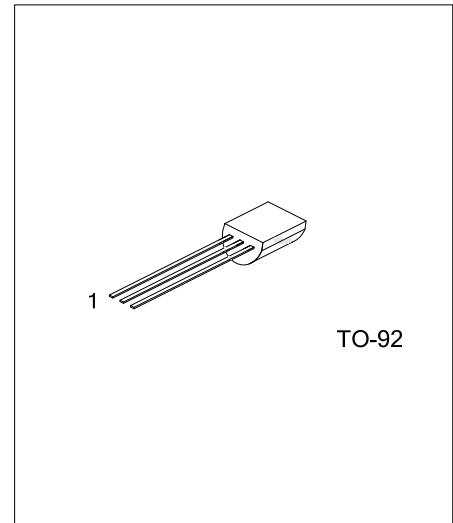
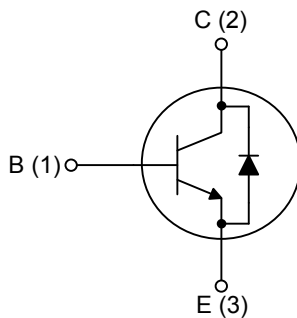
Preliminary

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

The UTC **MJE13003D-P** 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-P-x-T92-B	MJE13003DG-P-x-T92-B	TO-92	E	C	B	Tape Box
MJE13003DL-P-x-T92-K	MJE13003DG-P-x-T92-K	TO-92	E	C	B	Bulk
MJE13003DL-P-x-T92-R	MJE13003DG-P-x-T92-R	TO-92	E	C	B	Tape Reel

MJE13003L-P-x-T92-K (1) Packing Type (2) Package Type (3) Rank (4) Lead Free	(1) B: Tape Box, K: Bulk, R: Tape Reel (2) T92: TO-92 (3) x: refer to Classification of h_{FE1} (4) L: Lead Free, G: Halogen Free
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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 ($I_C=0$, $I_B=0.75A$, $t_P<10\mu S$)		V_{EBO}	9	V
Collector Current		I_C	1.5	A
Collector Peak Current ($t_P<5ms$)		I_{CM}	3	A
Base Current		I_B	0.75	A
Base Peak Current ($t_P<5ms$)		I_{BM}	1.5	A
Power Dissipation	$T_A=25^{\circ}C$	P_D	1.1	W
	$T_C=25^{\circ}C$		1.5	W
Junction Temperature		T_J	150	$^{\circ}C$
Storage Temperature		T_{STG}	-55 ~ +150	$^{\circ}C$

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)	$V_{CEO(SUS)}$	$I_C=10\text{mA}$, $I_B=0$	450			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_{FE1}	$I_C=0.4\text{A}$, $V_{CE}=5\text{V}$	14		57	
	h_{FE2}	$I_C=1\text{A}$, $V_{CE}=5\text{V}$	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

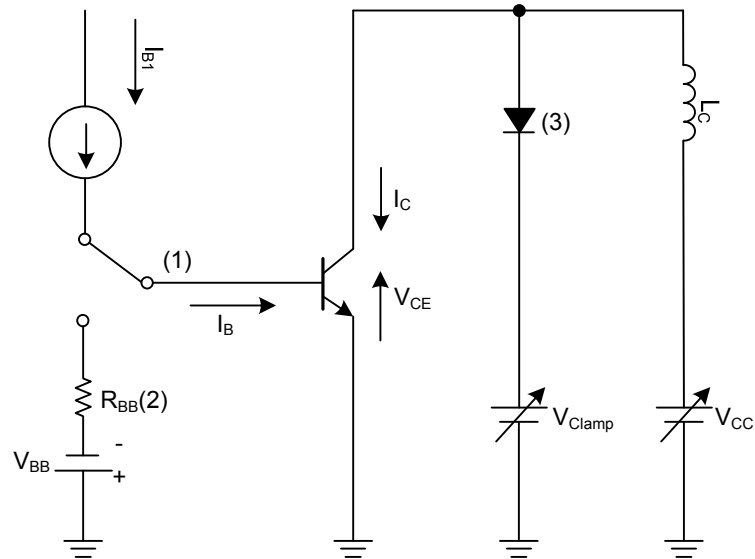
Note: Pulse Test: Pulse duration $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

■ **CLASSIFICATION OF h_{FE1}**

RANK	A	B	C	D	E	F	G	H
RANGE	14 ~ 22	21 ~ 27	26 ~ 32	31 ~ 37	36 ~ 42	41 ~ 47	46 ~ 52	51 ~ 57

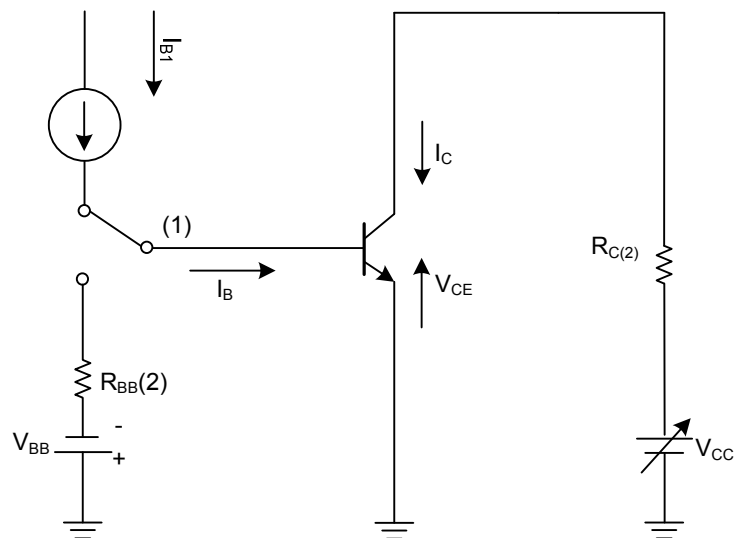
■ TEST CIRCUITS

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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