



MJE13005D

Preliminary

NPN SILICON TRANSISTOR

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

DESCRIPTION

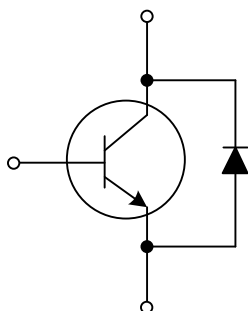
The UTC **MJE13005D** is a high voltage fast-switching NPN power transistor. It is characterized by high breakdown voltage, high current capability, high switching speed and high reliability.

The UTC **MJE13005D** is intended to be used in energy-saving light, electronic ballast, high frequency switching power supply, high frequency power transform or common power amplifier, etc.

FEATURES

- * High Breakdown Voltage
- * High Current Capability
- * High Switching Speed
- * High Reliability
- * RoHS-Compliant Product

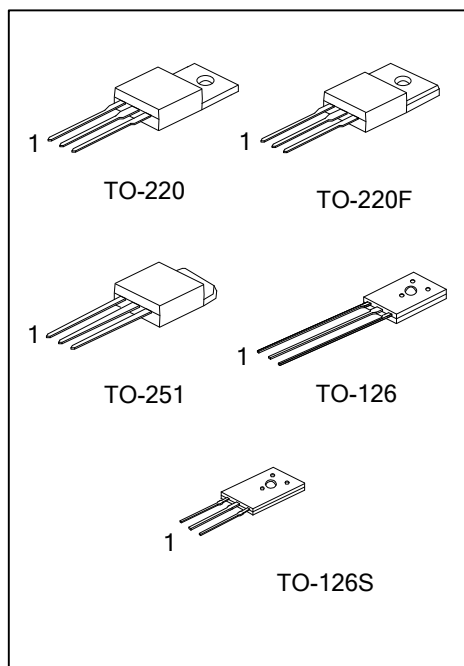
INTERNAL SCHEMATIC DIAGRAM



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
MJE13005DL-x-TA3-T	MJE13005DG-x-TA3-T	TO-220	B	C	E	Tube
MJE13005DL-x-TF3-T	MJE13005DG-x-TF3-T	TO-220F	B	C	E	Tube
MJE13005DL-x-TM3-T	MJE13005DG-x-TM3-T	TO-251	B	C	E	Tube
MJE13005DL-x-T60-K	MJE13005DG-x-T60-K	TO-126	B	C	E	Bulk
MJE13005DL-x-T6S-K	MJE13005DG-x-T6S-K	TO-126S	B	C	E	Bulk

<p>MJE13005DL-x-TA3-T</p>	<p>(1) T: Tube, K: Bulk (2) TA3: TO-220, TF3: TO-220F, TM3: TO-251 (3) T60: TO-126, T6S: TO-126S (3) x: refer to Classification of h_{FE1} (4) L: Lead Free, G: Halogen Free</p>
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■ ABSOLUTE MAXIMUM RATING ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATING	UNIT
Collector- Emitter Voltage ($V_{BE}=0$)		V_{CES}	700	V
Collector-Emitter Voltage ($I_B=0$)		V_{CEO}	400	V
Emitter-Base Voltage		V_{EBO}	9	V
Collector Current	DC	I_C	4	A
	Pulse	I_{CP}	8	A
Base Current	DC	I_B	2	A
	Pulse	I_{BP}	4	A
Power Dissipation	TO-220/TO-220F	P_D	75	W
	TO-251		50	
	TO-126/TO-126S		45	
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

Notes: 1. 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.

2. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle < 10%.

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^\circ\text{C/W}$
	TO-251		110	
	TO-126/TO-126S		89	
Junction to Case	TO-220/TO-220F	θ_{JC}	1.67	$^\circ\text{C/W}$
	TO-251		2.5	
	TO-126/TO-126S		2.78	

■ ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Emitter Breakdown Voltage		BV_{CEO}	$I_C=10\text{mA}, I_B=0$	400			V
Collector -Base Breakdown Voltage		BV_{CBO}	$I_C=1\text{mA}, I_B=0$	700			V
Emitter-Base Breakdown Voltage		BV_{EBO}	$I_E=1\text{mA}, I_C=0$	9			V
Collect Cut-off Current		I_{CBO}	$V_{CB}=700\text{V}, I_E=0$			100	μA
Collect Cut-off Current		I_{CEO}	$V_{CE}=400\text{V}, I_B=0$			50	μA
Emitter Cut-off Current		I_{EBO}	$V_{EB}=9\text{V}, I_C=0$			10	μA
DC Current Gain		h_{FE1}	$V_{CE}=5\text{V}, I_C=500\text{mA}$	15		50	
		h_{FE2}	$V_{CE}=5\text{V}, I_C=2\text{A}$	5			
Collector-Emitter Saturation Voltage		V_{CE}	$I_C=1\text{A}, I_B=0.2\text{A}$			0.5	V
			$I_C=2\text{A}, I_B=0.5\text{A}$			0.6	
			$I_C=4\text{A}, I_B=1\text{A}$			1	
			$I_C=2\text{A}, I_B=0.5\text{A}, T_C=100^\circ\text{C}$			1	
Base-Emitter Saturation Voltage		$V_{BE(SAT)}$	$I_C=2\text{A}, I_B=0.5\text{A}$			1.6	V
Resistive Load	Fall Time	t_F	$V_{CC}=24\text{V}, I_C=2\text{A}, I_{B1}=-I_{B2}=0.4\text{A}$			0.7	μs
	Storage Time	t_S				4	μs
Current Gain Bandwidth Product		f_T	$V_{CE}=10\text{V}, I_C=0.5\text{A}$	4			MHz
Diode Forward Voltage		V_F	$I_F=1\text{A}$			1.5	V

■ CLASSIFICATION OF h_{FE1}

RANK	A	B	C	D	E
RANGE	15 ~ 20	20 ~ 25	25 ~ 30	30 ~ 40	40 ~ 50

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