



MJE13009D

NPN SILICON TRANSISTOR

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

■ DESCRIPTION

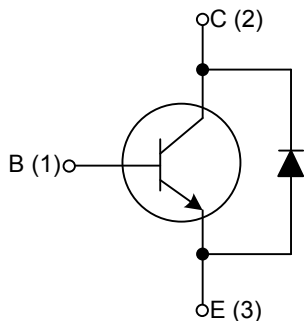
The UTC **MJE13009D** is a high voltage fast-switching NPN power transistor. It is characterized by high breakdown voltage, high current capability, high switching speed and high reliability.

The UTC **MJE13009D** is intended to be used in a energy-saving lights electronic ballast, high frequency switching power supplies, high frequency power transforms or common power amplifiers, etc.

■ FEATURES

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

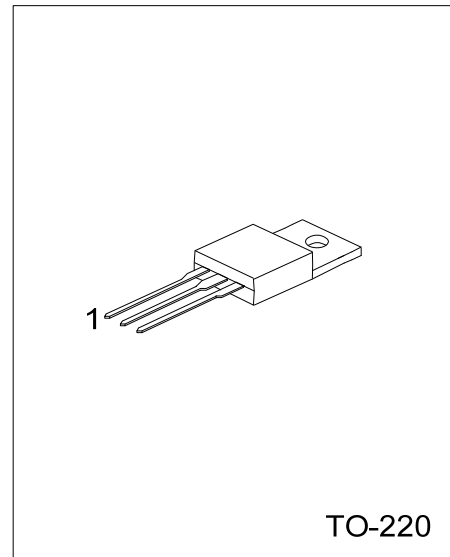
■ INTERNAL SCHEMATIC DIAGRAM



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free Plating	Halogen Free		1	2	3	
MJE13009DL-TA3-T	MJE13009DG-TA3-T	TO-220	B	C	E	Tube

<p>MJE13009DL-TA3-T</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Lead Plating 	<ul style="list-style-type: none"> (1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free, L: Lead Free Plating
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■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector- Emitter Voltage (V _{BE} = -1.5V)	V _{CEV}	700	V
Collector-Emitter Voltage (I _B = 0)	V _{CEO}	400	V
Emitter-Base Voltage	V _{EBO}	9	V
Collector Current	DC	I _C	12
	Pulse(Note 2)	I _{CM}	24
Base Current	DC	I _B	6
	Pulse(Note 2)	I _{BM}	12
Emitter Current	DC	I _E	18
	Pulse(Note 2)	I _{EM}	36
Total Power Dissipation	T _A =25°C	P _D	2
Linear Derating Factor Above			16
Total Power Dissipation	T _C =25°C	P _D	100
Linear Derating Factor Above			800
Operating Junction Temperature	T _J	-65 ~ +150	°C
Storage Temperature	T _{STG}	-65 ~ +150	°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	RATINGS	UNIT
Junction to Ambient	θ _{JA}	62.5	°C /W
Junction to Case	θ _{JC}	3.13	°C /W

■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

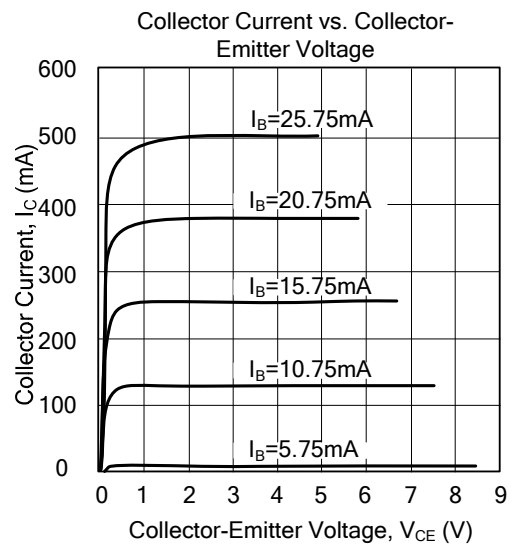
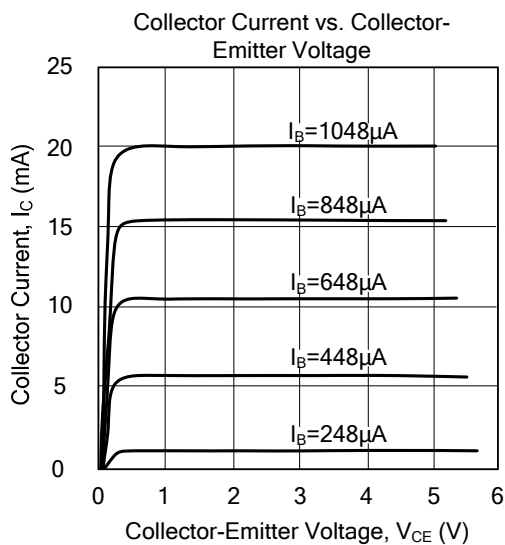
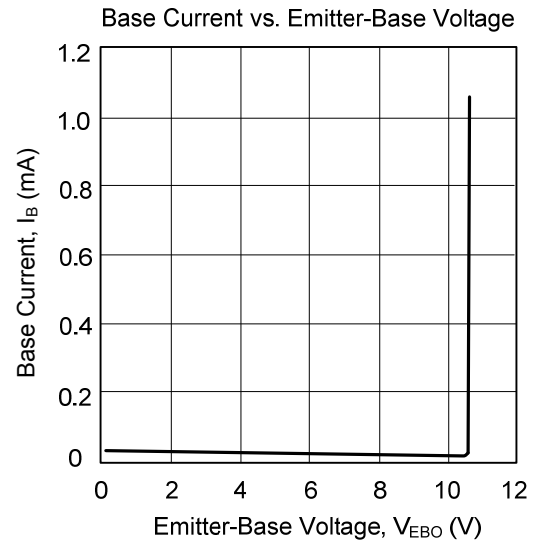
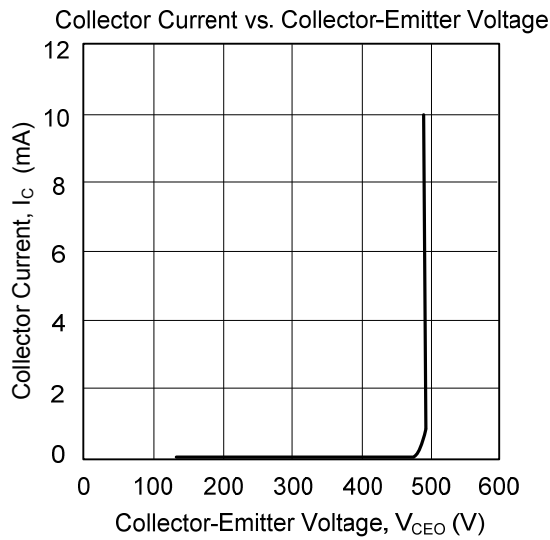
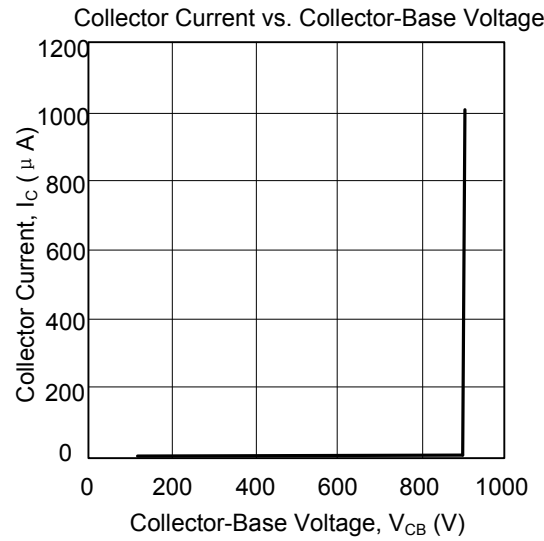
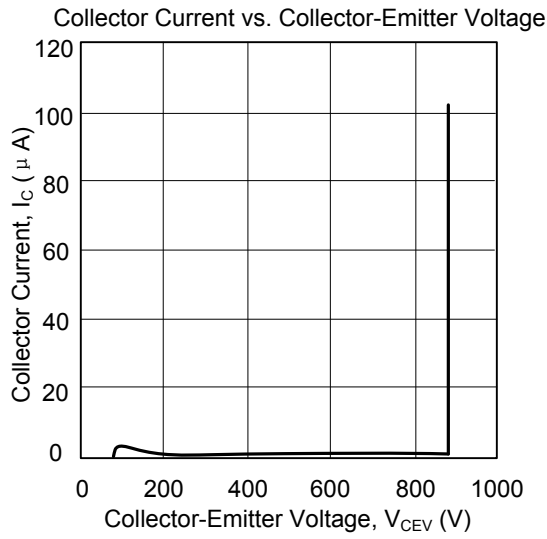
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS (Note)						
Collector-Emitter Sustaining Voltage	V _{CEO(SUS)}	I _C =10mA, I _B =0	400			V
Collect Cut-Off Current	I _{CEV}	V _{CEV} =Rated Value, V _{BE(OFF)} = -1.5V	T _C =100°C		1	mA
					5	mA
Emitter Cut-Off Current	I _{EBO}	V _{EB} =9V, I _C =0			1	mA
ON CHARACTERISTICS (Note)						
DC Current Gain	h _{FE}	V _{CE} =5V, I _C =5A	8		40	
		V _{CE} =5V, I _C =8A	6		30	
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	I _C =5A, I _B =1A			1	V
		I _C =8A, I _B =1.6A	T _C =100°C		1.5	V
					2	V
I _C =12A, I _B =3A			3	V		
Base -Emitter Saturation Voltage	V _{BE(SAT)}	I _C =5A, I _B =1A			1.2	V
		I _C =8A, I _B =1.6A	T _C =100°C		1.6	V
					1.5	V
ON CHARACTERISTICS (Note)						
Current Gain Bandwidth Product	f _T	V _{CE} =10V, I _C =500mA, f=1MHz	4			MHz
Output Capacitance	C _{OB}	V _{CB} =10V, I _C =0, f=0.1MHz		180		pF

■ SWITCHING CHARACTERISTICS

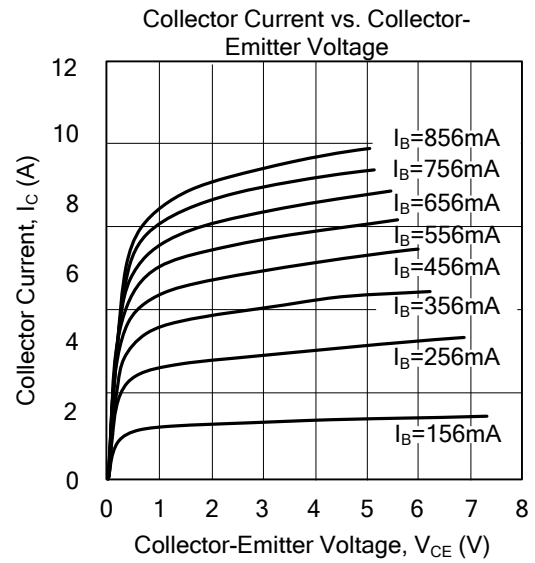
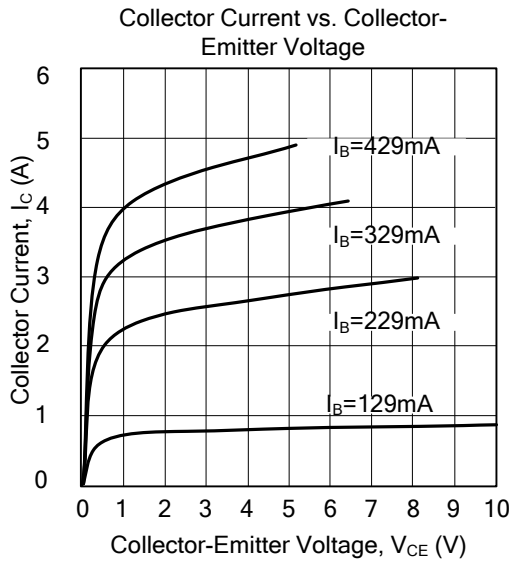
RESISTIVE LOAD						
Delay Time	t_D	$V_{CC}=125V, I_C=8A, I_{B1}=I_{B2}=1.6A,$ $t_P=25\mu s, \text{Duty Cycle}\leq 1\%$		0.06	0.1	μs
Rise Time	t_R			0.45	1	μs
Storage Time	t_S			1.3	3	μs
Fall Time	t_F			0.2	0.7	μs
INDUCTIVE LOAD, CLAMPED						
Voltage Storage Time	t_S	$I_C=8A, V_{CLAMP}=300V, I_{B1}=1.6A,$ $V_{BE(OFF)}=5V, T_C=100^\circ C$		0.92	2.3	μs
Crossover Time	t_C			0.12	0.7	μs

Note: Pulse Test: Pulse Width=300 μs , Duty Cycle=2%.

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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