



MJE13009D

NPN SILICON TRANSISTOR

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

DESCRIPTION

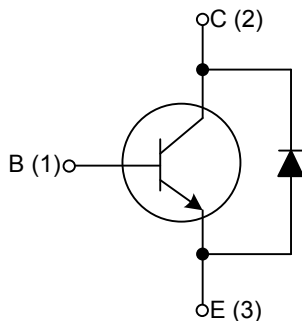
The UTC **MJE13009D** is a high voltage fast-switching NPN power transistor. It is characterized by high breakdown voltage, high current capability, high switching speed and high reliability.

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

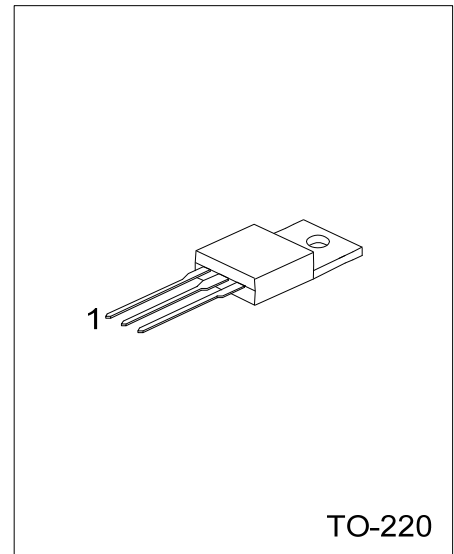
INTERNAL SCHEMATIC DIAGRAM



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

MJE13009DL-TA3-T (1) Packing Type (2) Package Type (3) Lead Plating	(1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free, L: Lead Free Plating
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■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ\text{C}$)

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	A
	Pulse(Note 2)	I_{CM}	24	A
Base Current	DC	I_B	6	A
	Pulse(Note 2)	I_{BM}	12	A
Emitter Current	DC	I_E	18	A
	Pulse(Note 2)	I_{EM}	36	A
Total Power Dissipation	$T_A = 25^{\circ}C$	P_D	2	W
Linear Derating Factor Above			16	mW/ $^{\circ}C$
Total Power Dissipation	$T_C = 25^{\circ}C$	P_D	100	W
Linear Derating Factor Above			800	mW/ $^{\circ}C$
Operating Junction Temperature		T_J	-65 ~ +150	$^{\circ}C$
Storage Temperature		T_{STG}	-65 ~ +150	$^{\circ}C$

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	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	3.13	$^\circ\text{C}/\text{W}$

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

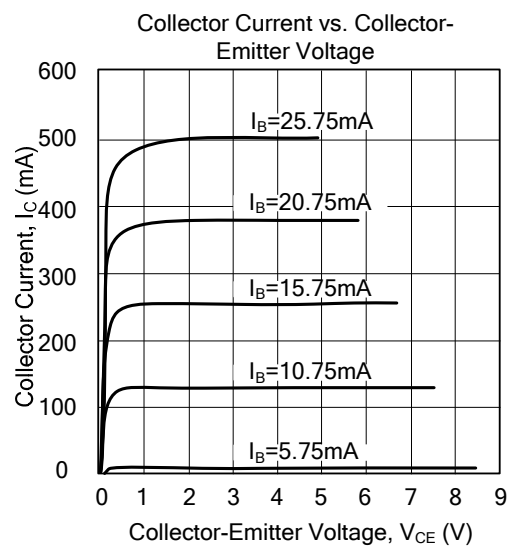
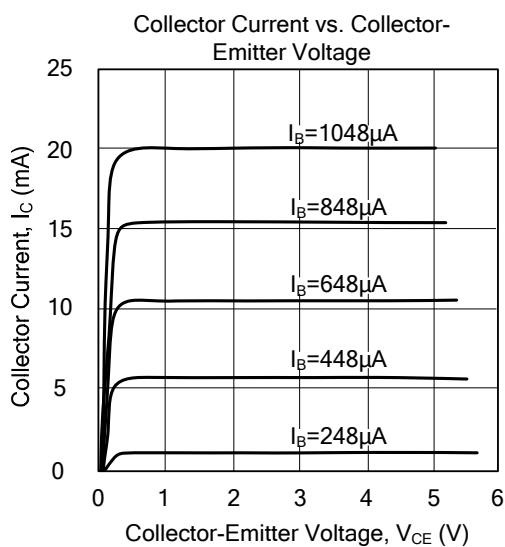
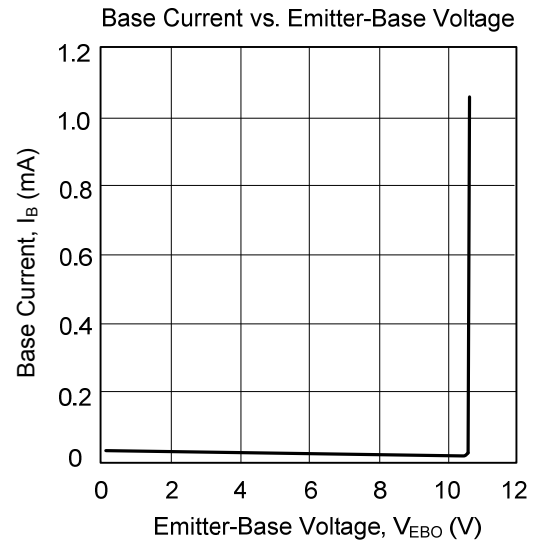
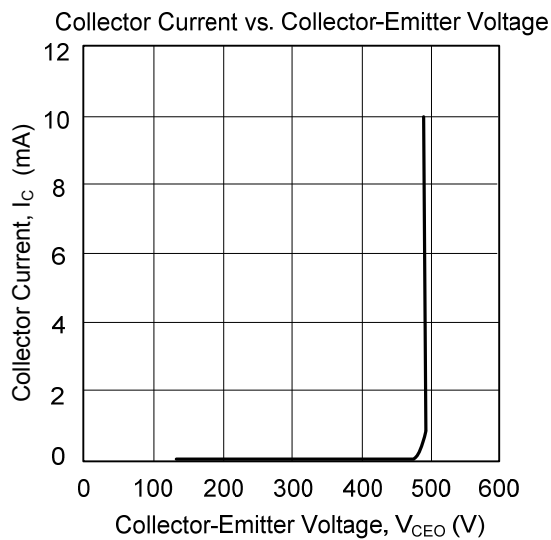
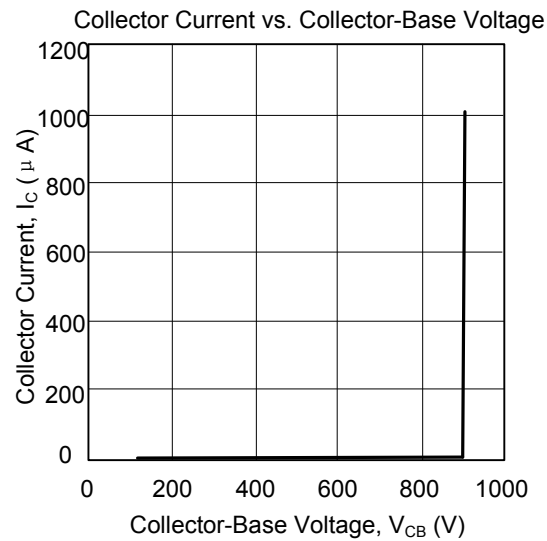
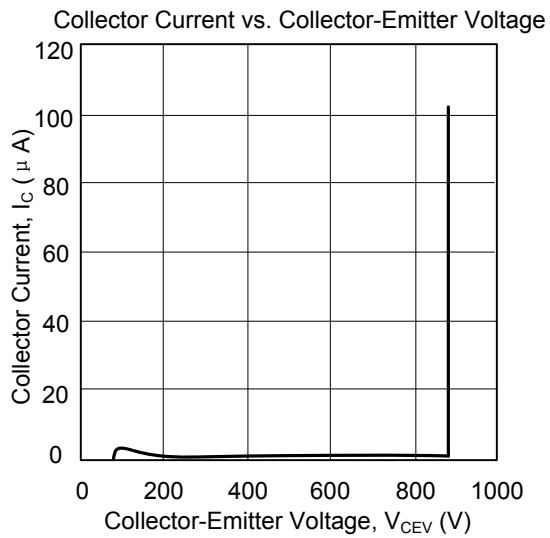
PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS (Note)							
Collector-Emitter Sustaining Voltage	V _{CEO(SUS)}	I _C =10mA, I _B =0		400			V
Collect Cut-Off Current	I _{CEV}	V _{CEV} =Rated Value, V _{BE(OFF)} = -1.5V	T _C =100°C			1	mA
Emitter Cut-Off Current	I _{EBO}	V _{EB} =9V, I _C =0				5	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				1.5	V
			T _C =100°C				2
		I _C =12A, I _B =3A					3
Base -Emitter Saturation Voltage	V _{BE(SAT)}	I _C =5A, I _B =1A				1.2	V
		I _C =8A, I _B =1.6A				1.6	V
			T _C =100°C				1.5
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

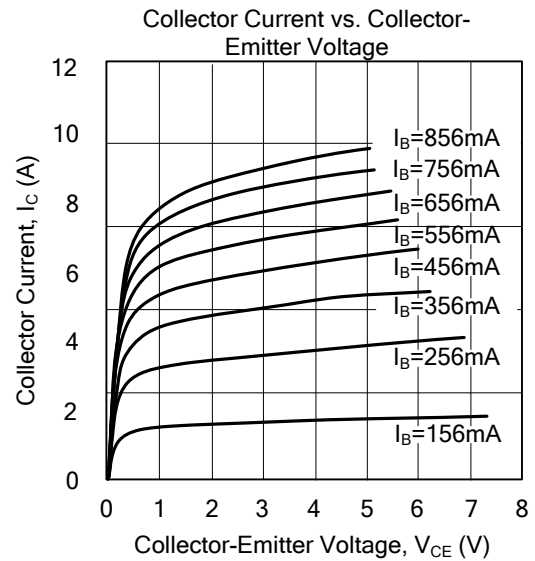
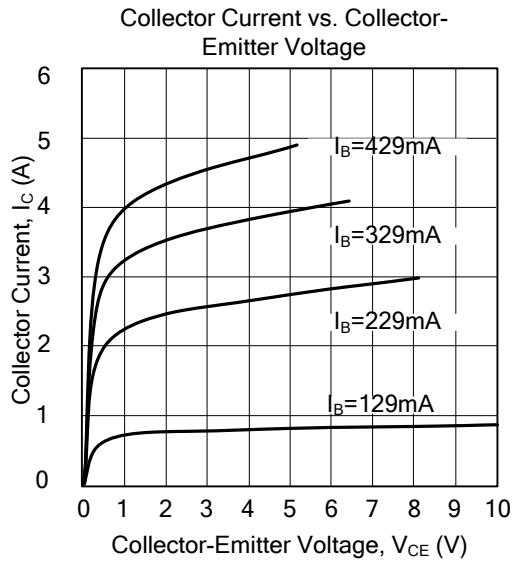
RESISTIVE LOAD						
Delay Time	t_D	$V_{CC}=125V, I_C=8A, I_{B1}=I_{B2}=1.6A,$ $t_P=25\mu s, \text{Duty Cycle}\leq 1\%$		0.06	0.1	μs
Rise Time	t_R			0.45	1	μs
Storage Time	t_S			1.3	3	μs
Fall Time	t_F			0.2	0.7	μs
INDUCTIVE LOAD, CLAMPED						
Voltage Storage Time	t_S	$I_C=8A, V_{CLAMP}=300V, I_{B1}=1.6A,$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

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

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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