



MJE13009D

NPN SILICON TRANSISTOR

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

■ DESCRIPTION

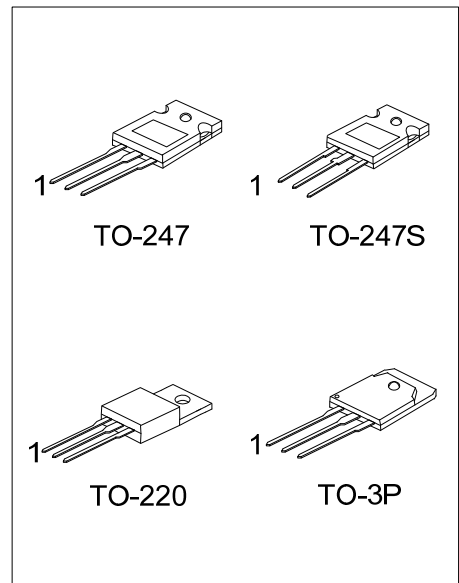
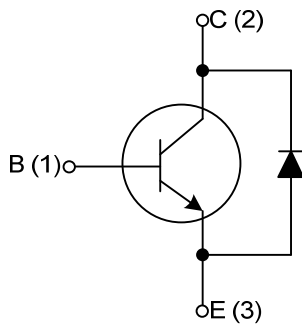
The UTC **MJE13009D** is a high voltage fast-switching NPN power transistor. It is characterized by high breakdown voltage, high current capability, high switching speed and high reliability.

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



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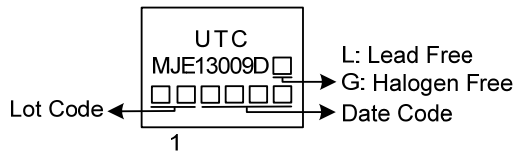
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
MJE13009DL-TA3-T	MJE13009DG-TA3-T	TO-220	B	C	E	Tube
MJE13009DL-T3P-T	MJE13009DG-T3P-T	TO-3P	B	C	E	Tube
MJE13009DL-T47-T	MJE13009DG-T47-T	TO-247	B	C	E	Tube
MJE13009DL-T47S-T	MJE13009DG-T47S-T	TO-247S	B	C	E	Tube

Note: Pin Assignment: B: Base C: Collector E: Emitter

<p>MJE13009DG-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) T: Tube (2) TA3: TO-220, T3P: TO-3P, T47: TO-247, T47S: TO-247S (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise specified)

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°C	TO-220	2	W
		TO-3P	5.8	W
		TO-247/TO-247S	4.2	W
Linear Derating Factor Above	T _A =25°C	TO-220	16	mW/°C
		TO-3P	46.4	mW/°C
		TO-247/TO-247S	33.6	mW/°C
Total Power Dissipation	T _C =25°C	TO-220	100	W
		TO-3P	210	W
		TO-247/TO-247S	200	W
Linear Derating Factor Above	T _C =25°C	TO-220	800	mW/°C
		TO-3P	1680	mW/°C
		TO-247/TO-247S	1600	mW/°C
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

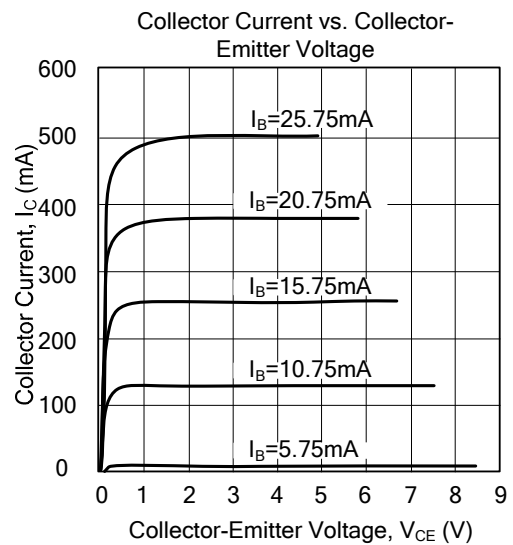
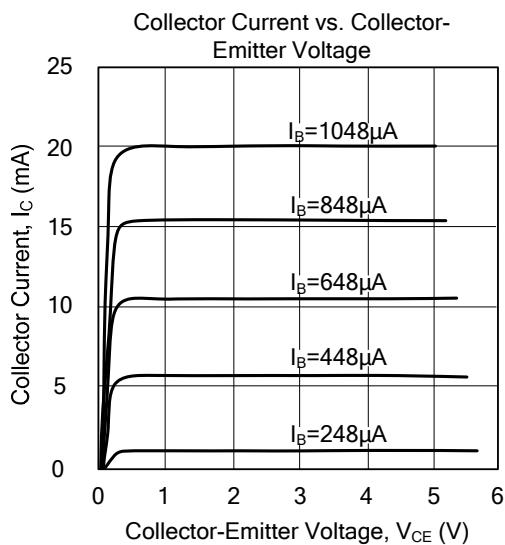
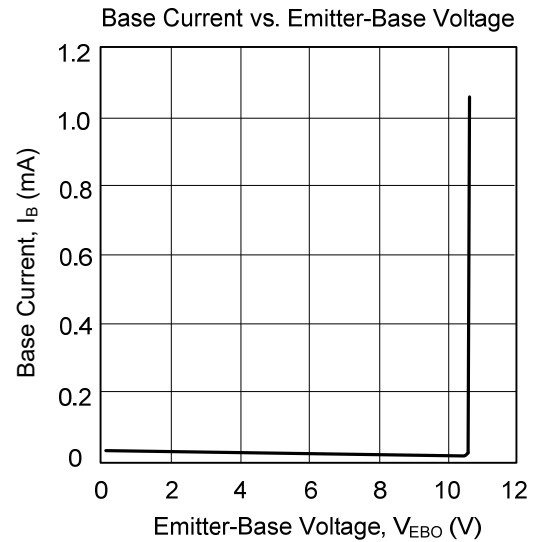
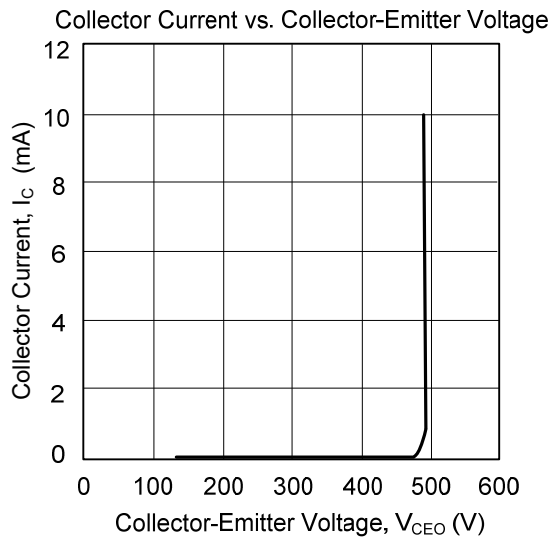
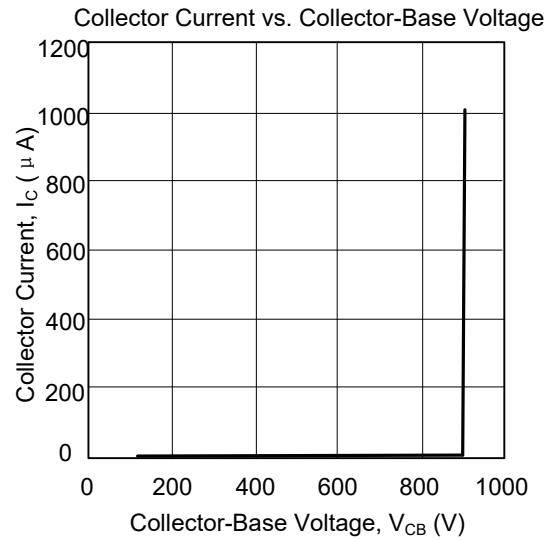
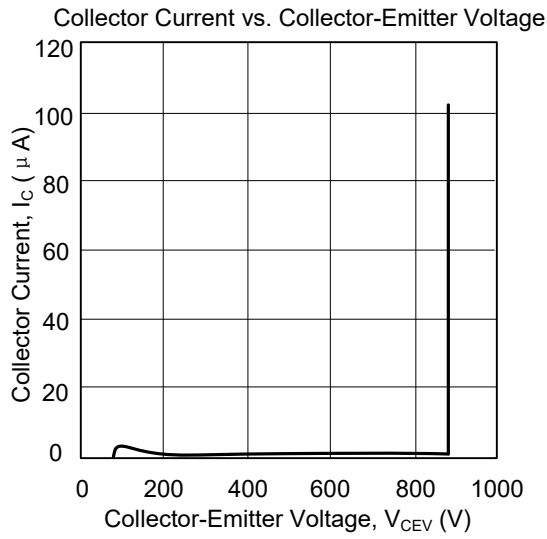
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ _{JA}	62.5	°C/W
	TO-3P		21	°C/W
	TO-247/TO-247S		30	°C/W
Junction to Case	TO-220	θ _{JC}	1.25	°C/W
	TO-3P		0.6	°C/W
	TO-247/TO-247S		0.625	°C/W

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

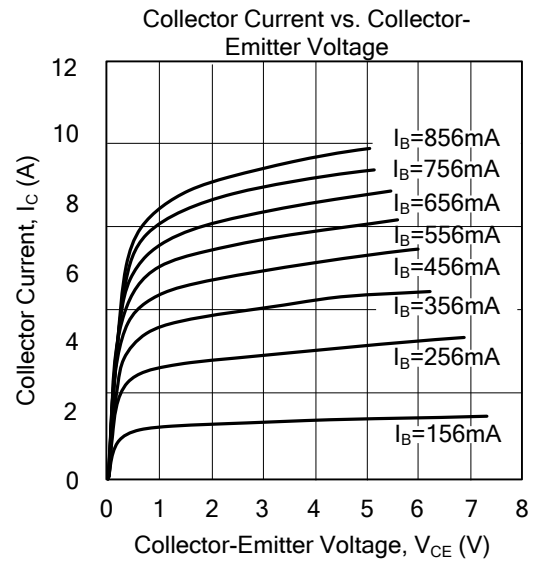
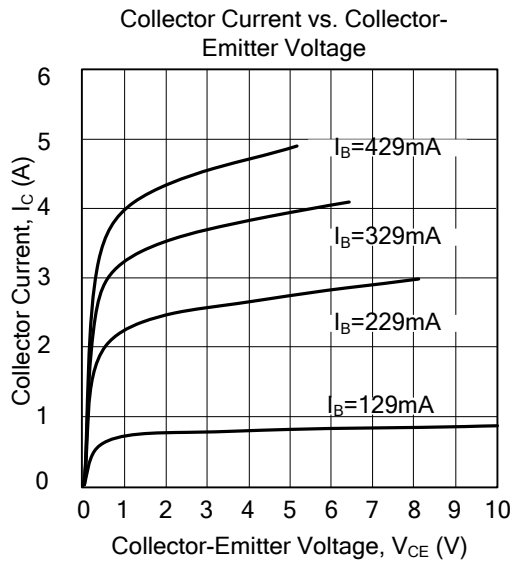
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS (Note)						
Collector-Emitter Sustaining Voltage	V _{CEO(SUS)}	I _C =10mA, I _B =0	400			V
Collect Cut-Off Current	I _{CEV}	V _{CEV} =Rated Value, V _{BE(OFF)} = -1.5V T _C =100°C			1	mA
					5	mA
Emitter Cut-Off Current	I _{EBO}	V _{EB} =9V, I _C =0			1	mA
Diode Forward Voltage	V _F	I _F =1A			1.5	V
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
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
RESISTIVE LOAD						
Delay Time	t _d	V _{CC} =125V, I _C =8A, I _{B1} =I _{B2} =1.6A, t _P =25μs, Duty Cycle≤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°C		0.12	0.7	μs

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

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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