



## MJE13003-XS

## NPN SILICON TRANSISTOR

### NPN SILICON POWER TRANSISTOR

#### DESCRIPTION

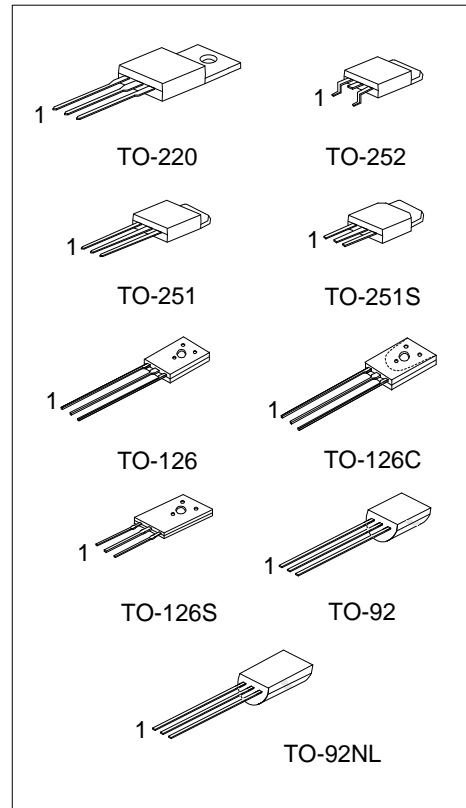
These devices are designed for high-voltage, high-speed power switching inductive circuits where fall time is critical. They are particularly suited for 115V and 220V applications in switch mode.

#### FEATURES

\* 700V blocking capability

#### APPLICATIONS

- \* Switching regulator's, inverters
- \* Motor controls
- \* Solenoid/relay drivers
- \* Deflection circuits



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen-Free		1	2	3	
MJE13003L-XS-TA3-T	MJE13003G-XS-TA3-T	TO-220	B	C	E	Tube
MJE13003L-XS-TM3-T	MJE13003G-XS-TM3-T	TO-251	B	C	E	Tube
MJE13003L-XS-TMS-T	MJE13003G-XS-TMS-T	TO-251S	B	C	E	Tube
MJE13003L-XS-TN3-R	MJE13003G-XS-TN3-R	TO-252	B	C	E	Tape Reel
MJE13003L-XS-T60-F-K	MJE13003G-XS-T60-F-K	TO-126	B	C	E	Bulk
MJE13003L-XS-T6C-A-K	MJE13003G-XS-T6C-A-K	TO-126C	E	C	B	Bulk
MJE13003L-XS-T6C-F-K	MJE13003G-XS-T6C-F-K	TO-126C	B	C	E	Bulk
MJE13003L-XS-T6S-F-K	MJE13003G-XS-T6S-F-K	TO-126S	B	C	E	Bulk
MJE13003L-XS-T92-A-B	MJE13003G-XS-T92-A-B	TO-92	E	C	B	Tape Box
MJE13003L-XS-T92-A-K	MJE13003G-XS-T92-A-K	TO-92	E	C	B	Bulk
MJE13003L-XS-T92-F-B	MJE13003G-XS-T92-F-B	TO-92	B	C	E	Tape Box
MJE13003L-XS-T92-F-K	MJE13003G-XS-T92-F-K	TO-92	B	C	E	Bulk
MJE13003L-XS-T9N-B	MJE13003G-XS-T9N-B	TO-92NL	E	C	B	Tape Box
MJE13003L-XS-T9N-K	MJE13003G-XS-T9N-K	TO-92NL	E	C	B	Bulk

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

<p>MJE13003G-XS-T60-F-K</p> <p>(1)Packing Type (2)Pin Assignment (3)Package Type (4)Green Package</p>	<p>(1) K: Bulk, B: Tape Box, R: Tape Reel, T: Tube (2) refer to Pin Assignment (3) TA3: TO-220, TM3: TO-251, TMS: TO-251S, TN3: TO-252, T60: TO-126, T6C:TO-126C, T6S: TO-126S, T92: TO-92, T9N: TO-92NL (4) G: Halogen Free and Lead Free, L: Lead Free</p>
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## NPN SILICON TRANSISTOR

### MARKING

TO-220 / TO-251 / TO-251S / TO-252	TO-126 / TO-126C / TO-126S
<p>UTC MJE13003 1</p> <p>Lot Code ←      → Date Code</p> <p>L: Lead Free G: Halogen Free</p>	<p>UTC 13003 1</p> <p>Lot Code ←      → Date Code</p> <p>Pin Code L: Lead Free G: Halogen Free</p>
TO-92	TO-92NL
<p>UTC MJE 13003 1</p> <p>Lot Code ←      → Date Code</p> <p>Pin Code L: Lead Free G: Halogen Free</p>	<p>UTC MJE13003 1</p> <p>Lot Code ←      → Date Code</p> <p>L: Lead Free G: Halogen Free</p>

### ■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT			
Collector-Emitter Voltage		V <sub>CEO(SUS)</sub>	400	V			
Collector-Base Voltage		V <sub>CBO</sub>	700	V			
Collector-Emitter Voltage (V <sub>BE</sub> =0)		V <sub>CES</sub>	700	V			
Emitter Base Voltage		V <sub>EBO</sub>	9	V			
Collector Current	Continuous	I <sub>C</sub>	1	A			
	Peak (1)	I <sub>CM</sub>	2	A			
Power Dissipation (Note 2)	T <sub>A</sub> =25°C	TO-126/TO-126C TO-126S	P <sub>D</sub>	1.4	W		
		TO-92/TO-92NL		1.1	W		
		TO-220		2	W		
		TO-251/TO-251S TO-252		1.56	W		
	T <sub>C</sub> =25°C	TO-126/TO-126C TO-126S		20	W		
		TO-92/TO-92NL		1.5	W		
		TO-220		40	W		
		TO-251/TO-251S TO-252		25	W		
		Junction Temperature		T <sub>J</sub>	+150	°C	
		Storage Temperature		T <sub>STG</sub>	-55 ~ +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.

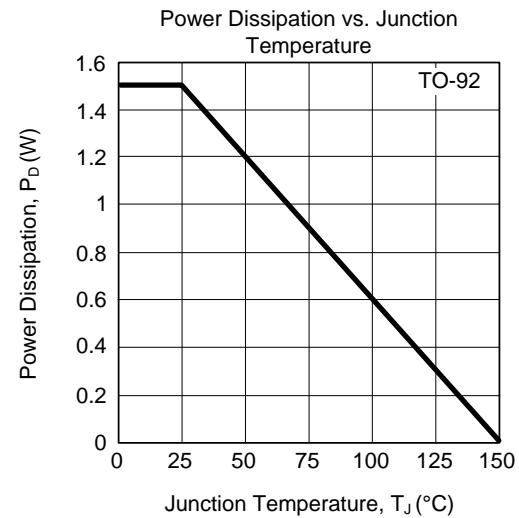
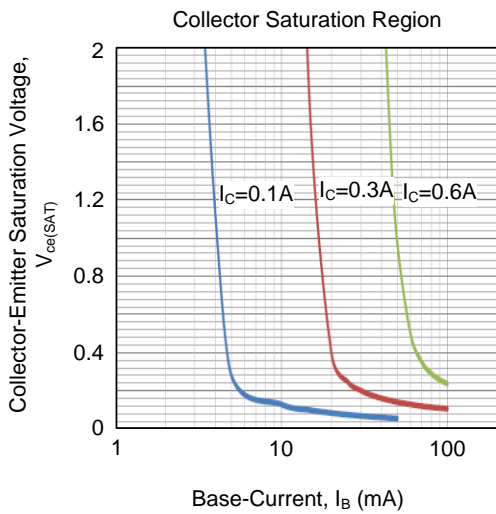
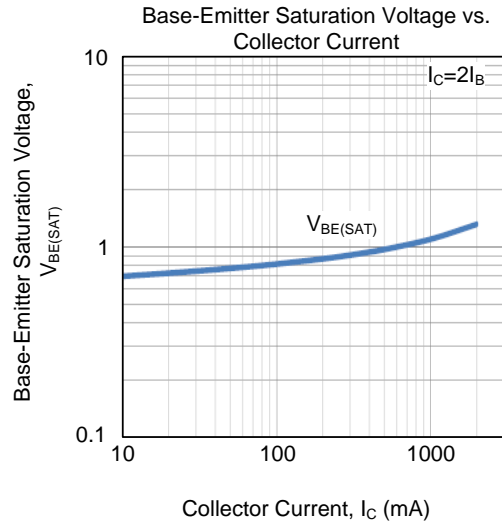
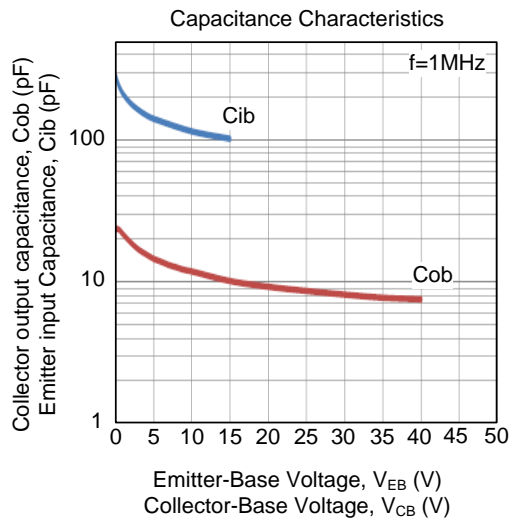
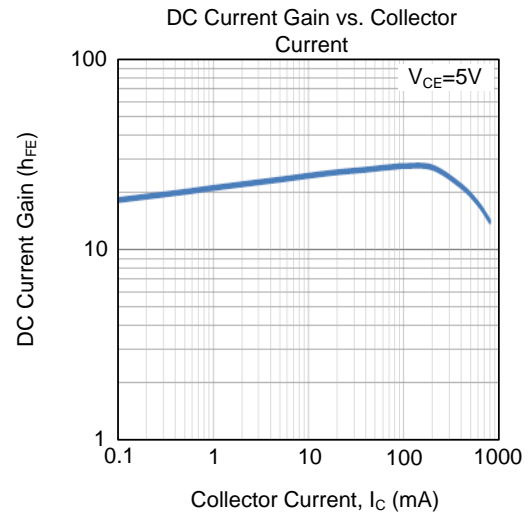
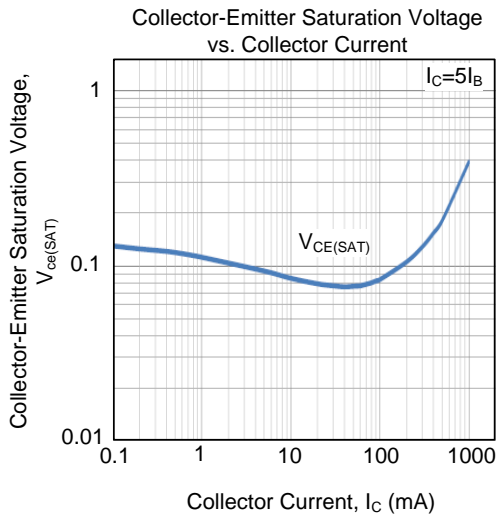
2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square pad.

### ■ ELECTRICAL CHARACTERISTICS (T<sub>C</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b> (Note)						
Collector-Emitter Sustaining Voltage	V <sub>CEO(SUS)</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =0	700			V
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =700V, I <sub>E</sub> =0			10	μA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =9.0V, I <sub>C</sub> =0			10	μA
<b>ON CHARACTERISTICS</b> (Note)						
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =200mA	15		30	
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	I <sub>C</sub> =500mA, I <sub>B</sub> =100mA			0.5	V
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	I <sub>C</sub> =500mA, I <sub>B</sub> =250mA			1.2	V
<b>DYNAMIC CHARACTERISTICS</b>						
Current-Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =0.1A, f=1MHz	5			MHz
Output Capacitance	C <sub>OB</sub>	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=0.1MHz		16		pF
<b>SWITCHING CHARACTERISTICS</b>						
Storage Time	t <sub>S</sub>	I <sub>C</sub> =0.25A	1.5		4.0	μs

Note: Pulse Test: P<sub>W</sub> = 300μs, Duty Cycle ≤ 2%.

## ■ TYPICAL CHARACTERISTICS



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