

**MJE13005-XS****NPN SILICON TRANSISTOR****NPN SILICON POWER TRANSISTORS****DESCRIPTION**

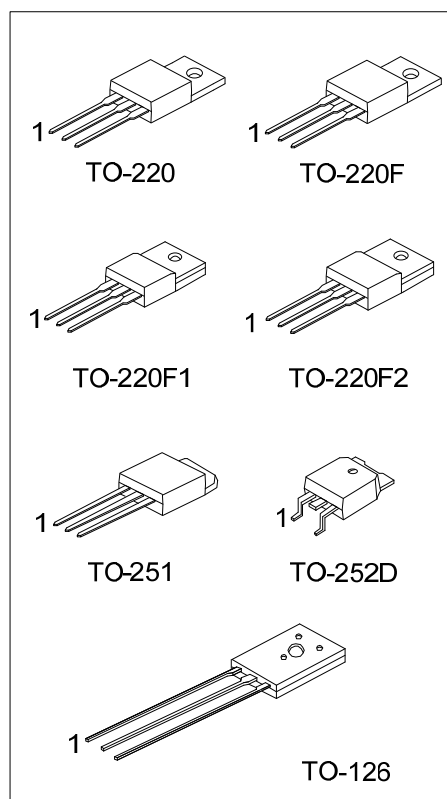
These devices are designed for high-voltage, high-speed power switching inductive circuits where fall time is critical. They are particularly suited for 115 and 220 V SWITCHMODE.

FEATURES

- * $V_{CEQ(SUS)} = 400V$
- * Inductive switching matrix 2 to 4 Amp, 25 and 100°C
 $t_c @ 3A, 100^\circ C$ is 180 ns (Typ.)
- * 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	
MJE13005L-XS-TA3-T	MJE13005G-XS-TA3-T	TO-220	B	C	E	Tube
MJE13005L-XS-TF1-T	MJE13005G-XS-TF1-T	TO-220F1	B	C	E	Tube
MJE13005L-XS-TF2-T	MJE13005G-XS-TF2-T	TO-220F2	B	C	E	Tube
MJE13005L-XS-TF3-T	MJE13005G-XS-TF3-T	TO-220F	B	C	E	Tube
MJE13005L-XS-TM3-T	MJE13005G-XS-TM3-T	TO-251	B	C	E	Tube
MJE13005L-XS-TND-R	MJE13005G-XS-TND-R	TO-252D	B	C	E	Tape Reel
MJE13005L-XS-T60-K	MJE13005G-XS-T60-K	TO-126	B	C	E	Bulk

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

MJE13005G-XS-TA3-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel, K: Bulk (2) TA3: TO-220, TF1: TO-220F1, TF2: TO-220F2 TF3: TO-220F, TND: TO-252D, T60: TO-126 (3) G: Halogen Free and Lead Free, L: Lead Free
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MJE13005-XS

NPN SILICON TRANSISTOR

■ MARKING

TO-220 / TO-220F / TO-220F1 TO-220F2 / TO-251 / TO-252D	TO-126
UTC MJE13005 Lot Code 1 Date Code L: Lead Free G: Halogen Free	UTC 13005 Lot Code 1 Date Code L: Lead Free G: Halogen Free

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		$V_{CEO(SUS)}$	400	V
Collector-Emitter Voltage ($V_{BE}=0$)		V_{CES}	700	V
Collector-Base Voltage		V_{CBO}	700	V
Emitter Base Voltage		V_{EBO}	9	V
Collector Current	Continuous	I_C	4	A
	Peak (1)	I_{CM}	8	A
Base Current	Continuous	I_B	2	A
	Peak (1)	I_{BM}	4	A
Emitter Current	Continuous	I_E	6	A
	Peak (1)	I_{EM}	12	A
Power Dissipation at $T_C=25^{\circ}\text{C}$	TO-220F/TO-220F1 TO-220F2/TO-126	P_D	40	W
	TO-220		75	W
	TO-251/TO-252D		50	W
Derate above 25°C	TO-220F/TO-220F1 TO-220F2/TO-126		320	mW/ $^{\circ}\text{C}$
	TO-220		600	mW/ $^{\circ}\text{C}$
	TO-251/TO-252D		400	mW/ $^{\circ}\text{C}$
Operating and Storage Junction Temperature		T_J, T_{STG}	-65 ~ +150	$^{\circ}\text{C}$

Note: 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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F TO-220F1/TO-220F2	θ_{JA}	62.5	$^{\circ}\text{C/W}$
	TO-252D		80	$^{\circ}\text{C/W}$
Junction to Case	TO-220F/TO-220F1 TO-126	θ_{JC}	3.125	$^{\circ}\text{C/W}$
	TO-220		1.67	$^{\circ}\text{C/W}$
	TO-251/TO-252D		2.5	$^{\circ}\text{C/W}$

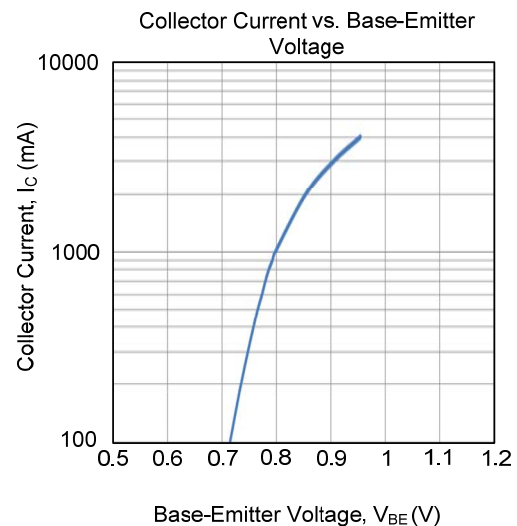
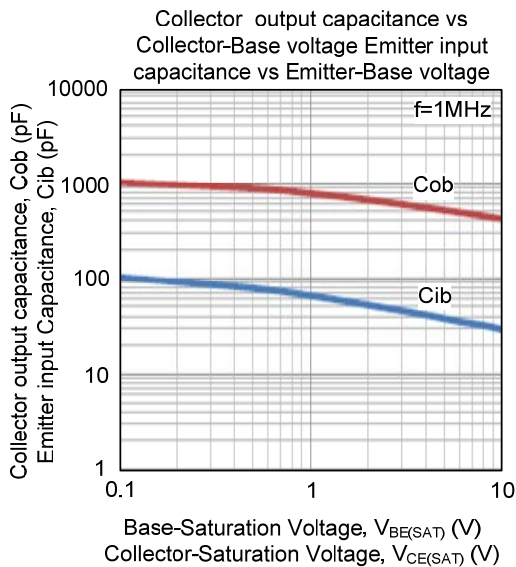
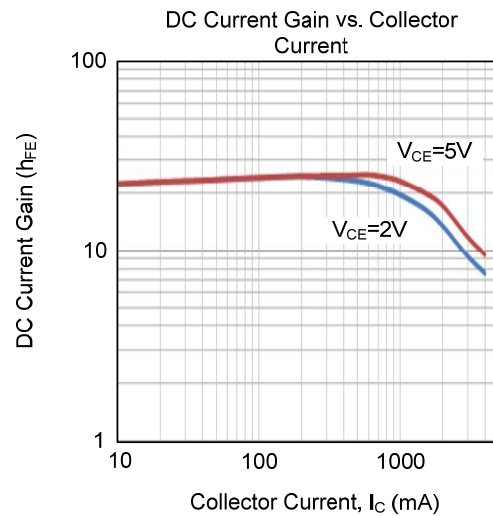
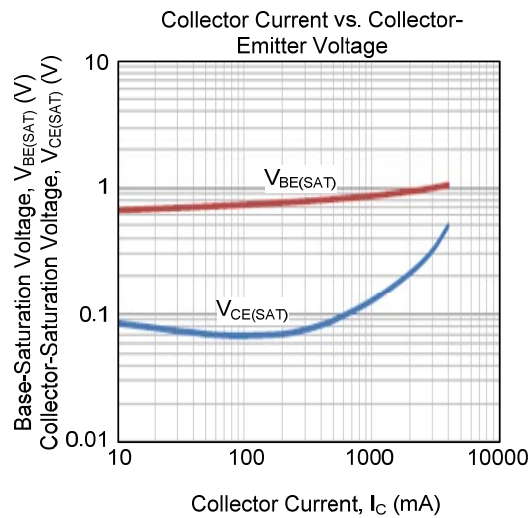
■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS (Note 1)						
Collector-Emitter Sustaining Voltage	V _{CEO(SUS)}	I _C =10mA , I _B =0	400			V
Collector Cutoff Current	I _{CBO}	V _{CBO} =Rated Value, V _{BE(OFF)} =1.5V			1	mA
		V _{CBO} =Rated Value, V _{BE(OFF)} =1.5V, T _C =100°C			5	
Emitter Cutoff Current	I _{EBO}	V _{EB} =9V, I _C =0			1	mA
SECOND BREAKDOWN						
Second Breakdown Collector Current with bass forward biased	I _{S/B}				See Fig. 11	
Clamped Inductive SOA with Base Reverse Biased	RBSOA				See Fig. 12	
ON CHARACTERISTICS (Note 1)						
DC Current Gain	h _{FE1}	I _C =0.5A, V _{CE} =5V	15		35	
	h _{FE2}	I _C =1A, V _{CE} =5V	10		35	
	h _{FE3}	I _C =2A, V _{CE} =5V	8		30	
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	I _C =1A, I _B =0.2A			0.5	V
		I _C =2A, I _B =0.5A			0.6	V
		I _C =4A, I _B =1A			1	V
		I _C =2A, I _B =0.5A, T _a =100°C			1	V
Base-Emitter Saturation Voltage	V _{BE (SAT)}	I _C =1A, I _B =0.2A			1.2	V
		I _C =2A, I _B =0.5A			1.6	V
		I _C =2A, I _B =0.5A, T _C =100°C			1.5	V
DYNAMIC CHARACTERISTICS						
Current-Gain-Bandwidth Product	f _T	I _C =500mA, V _{CE} =10V, f=1MHz	4			MHz
Output Capacitance	C _{OB}	V _{CB} =10V, I _E =0, f=0.1MHz		30		pF
SWITCHING CHARACTERISTICS						
Resistive Load (Table 1)						
Delay Time	t _D	V _{CC} =125V, I _C =2A, I _{B1} =I _{B2} =0.4A, t _p =25μs, Duty Cycle≤1%		0.025	0.1	μs
Rise Time	t _R			0.3	0.7	μs
Storage Time	t _S			1.7	4	μs
Fall Time	t _F			0.4	0.9	μs

Notes: 1. Pulse Test: Pulse Width=5ms, Duty Cycle≤10%

2. Pulse Test: P_W=300μs, Duty Cycle≤2%

TYPICAL CHARACTERISTICS



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