

MJE172**PNP EPITAXIAL SILICON TRANSISTOR**

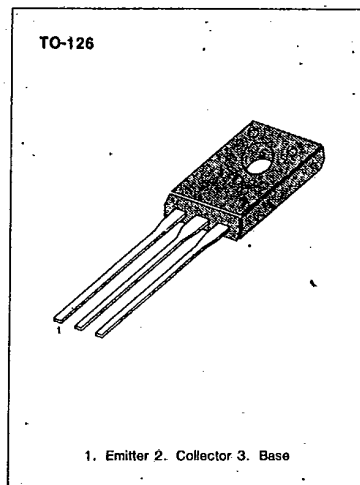
T-33-17

**LOW FREQUENCY AMPLIFIER
LOW CURRENT, HIGH SPEED
SWITCHING APPLICATION**

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CB0}	-100	V
Collector-Emitter Voltage	V_{CE0}	-80	V
Emitter-Base Voltage	V_{EB0}	-7	V
Base Current	I_b	-1	A
Collector Current (DC)	I_c	-3	A
Collector Current (Pulse)	I_c	-6	A
Collector Dissipation ($T_a=25^\circ\text{C}$)	P_c	1.5	W
Derate above 25°C		0.012	W/ $^\circ\text{C}$
Collector Dissipation ($T_c=25^\circ\text{C}$)	P_c	12.5	W
Derate above 25°C		0.1	W/ $^\circ\text{C}$
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65~150	$^\circ\text{C}$

* Refer to MJE170 for graphs

**ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)**

Characteristic	Symbol	Test Condition	Min	Max	Unit
Collector-Emitter Sustaining Voltage	$V_{CE(sus)}$	$I_c=-10\text{mA}, I_b=0$	-80		V
Collector Cutoff Current	I_{CB0}	$V_{CB}=-100\text{V}, I_E=0$		-0.1	μA
Emitter Cutoff Current	I_{EB0}	$V_{CB}=-100\text{V}, I_E=0, T_c=150^\circ\text{C}$		-0.1	mA
DC Current Gain	h_{FE}	$V_{EB}=-7\text{V}, I_c=0$		-0.1	μA
		$V_{CE}=-1\text{V}, I_c=-100\text{mA}$	50	250	
		$V_{CE}=-1\text{V}, I_c=-500\text{mA}$	30		
		$V_{CE}=-1\text{V}, I_c=-1.5\text{A}$	12		
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	$I_c=-500\text{mA}, I_b=-50\text{mA}$		-0.3	V
		$I_c=-1.5\text{A}, I_b=-150\text{mA}$		-0.9	V
		$I_c=-3.0\text{A}, I_b=-600\text{mA}$		-1.7	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_c=-1.5\text{A}, I_b=-150\text{mA}$		-1.5	V
		$I_c=-3.0\text{A}, I_b=-600\text{mA}$		-2.0	V
Base-Emitter On Voltage	$V_{BE(on)}$	$V_{CE}=-1\text{V}, I_c=-500\text{mA}$		-1.2	V
Current Gain Bandwidth Product	f_T	$V_{CE}=-10\text{V}, I_c=-100\text{mA}, f=10\text{MHz}$	50		MHz
Collector Output Capacitance	C_{ob}	$V_{CB}=-10\text{V}, I_E=0, f=0.1\text{MHz}$		50	pF

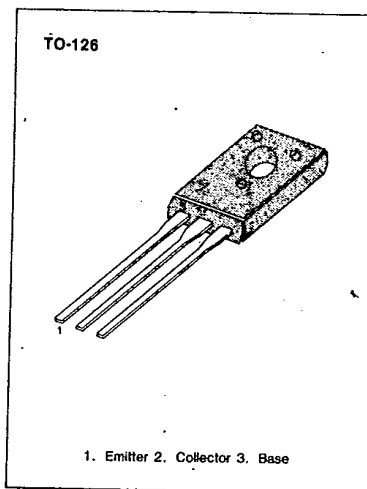
MJE180/181/182**NPN EPITAXIAL SILICON TRANSISTOR**

T-33-07

DESIGNED FOR LOW POWER AUDIO
AMPLIFIER AND LOW CURRENT
HIGH SPEED SWITCHING APPLICATIONS

ABSOLUTE MAXIMUM RATINGS (T_a = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage: MJE180	V _{CB0}	80	V
: MJE181		80	V
: MJE182		100	V
Collector-Emitter Voltage	V _{CEO}	40	V
: MJE180		60	V
: MJE181		80	V
Emitter-Base Voltage	V _{EB0}	7	V
Collector Current (DC)	I _C	3	A
Collector Current (Pulse)	I _C	6	A
Base Current (DC)	I _B	1	A
Collector Dissipation (T _a = 25°C)	P _C	1.5	W
Collector Dissipation (T _C = 25°C)	P _C	12.5	W
Junction Temperature	T _J	150	°C
Storage Temperature	T _{stg}	-65~150	°C



3

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

Characteristic	Symbol	Test Condition	Min	Max	Unit
Collector Emitter Sustaining Voltage	V _{CEO(sus)}	I _C = 10mA, I _B = 0	40		V
: MJE180			60		V
: MJE181			80		V
Collector Cutoff Current	I _{CB0}	V _{CB} = 60V, I _B = 0		0.1	μA
: MJE180		V _{CB} = 80V, I _E = 0		0.1	μA
: MJE181		V _{CB} = 100V, I _E = 0		0.1	μA
: MJE182		V _{CB} = 60V, I _E = 0, T _C = 150°C		0.1	μA
: MJE180		V _{CB} = 80V, I _E = 0, T _C = 150°C		0.1	μA
: MJE181		V _{CB} = 100V, I _E = 0, T _C = 150°C		0.1	μA
Emitter Cutoff Current	I _{EB0}	V _{BE} = 7V, I _C = 0		0.1	μA
DC Current Gain	h _{FE}	V _{CE} = 1V, I _C = 100mA	50	250	
		V _{CE} = 1V, I _C = 500mA	30		
		V _{CE} = 1V, I _C = 1.5A	12		
Collector Emitter Saturation Voltage	V _{CE(sat)}	I _C = 500mA, I _B = 50mA		0.3	V
		I _C = 1.5A, I _B = 150mA		0.9	V
		I _C = 3A, I _B = 600mA		1.7	V
Base Emitter Saturation Voltage	V _{BE(sat)}	I _C = 1.5A, I _B = 150mA		1.5	V
		I _C = 3A, I _B = 600mA		2.0	V
		V _{CE} = 1V, I _C = 500mA		1.2	V
Base Emitter On Voltage	V _{BE(on)}	V _{CE} = 10V, I _C = 100mA, f = 10MHz	50		MHz
Current Gain-Bandwidth Product	f _T	V _{CE} = 10V, I _C = 100mA, f = 0.1MHz		30	pF
Output Capacitance	C _{ob}	V _{CB} = 10V, I _E = 0, f = 0.1MHz			

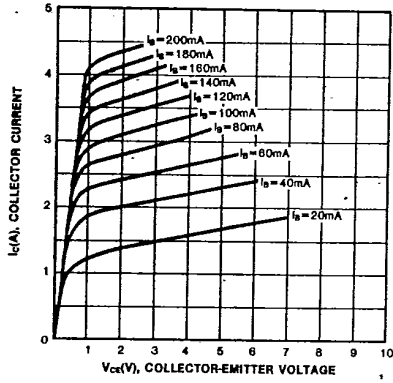


MJE180/181/182

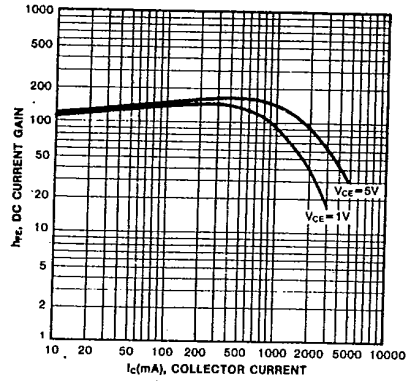
NPN EPITAXIAL SILICON TRANSISTOR

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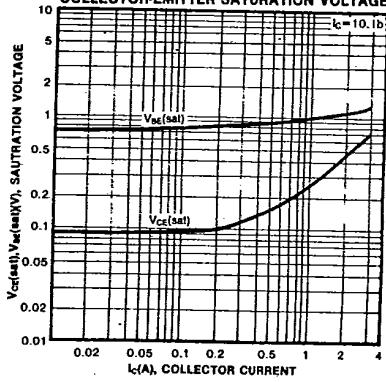
STATIC CHARACTERISTIC



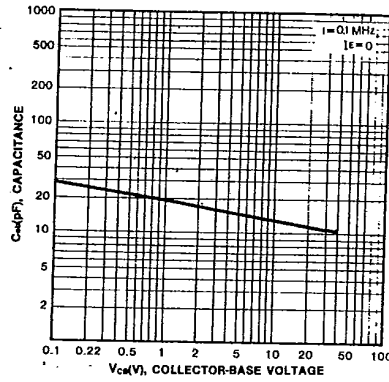
DC CURRENT GAIN



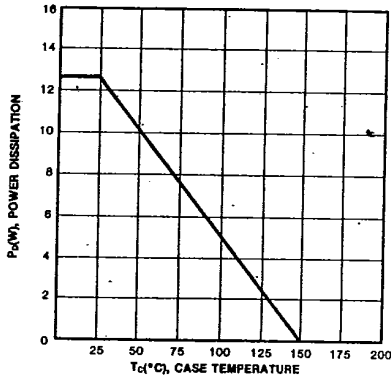
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE



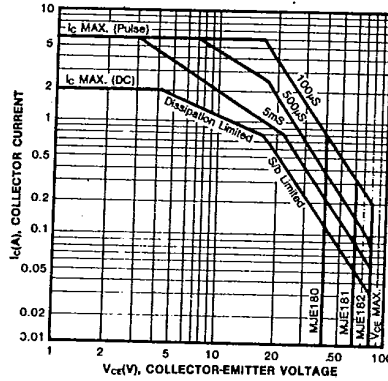
COLLECTOR OUTPUT CAPACITANCE



POWER DERATING



SAFE OPERATING AREA



MJE200**NPN EPITAXIAL SILICON TRANSISTOR**

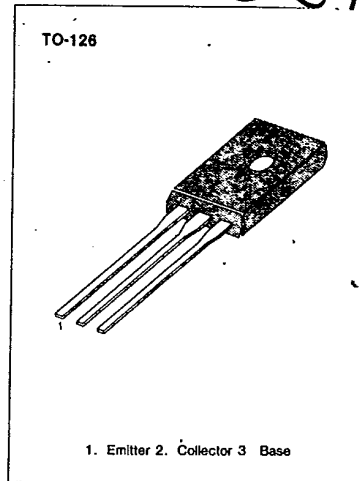
COLLECTOR-EMITTER SUSTAINING VOLTAGE
LOW COLLECTOR-EMITTER SATURATION
VOLTAGE

HIGH CURRENT GAIN-BANDWIDTH
PRODUCT-MIN $f_T=65\text{MHz}$ @ $I_C=100\text{mA}$

Complementary to MJE210

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CB0}	40	V
Collector-Emitter Voltage	V_{CE0}	25	V
Emitter-Base Voltage	V_{EB0}	8	V
Collector Current	I_C	5	A
Collector Dissipation	P_C	15	W
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65~150	$^\circ\text{C}$



3

ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)

Characteristic	Symbol	Test Condition	Min	Max	Unit
Collector Emitter Sustaining Voltage	$V_{CE0(sus)}$	$I_C=10\text{mA}, I_B=0$	25		V
Collector Cutoff Current	I_{CBO}	$V_{CB}=40\text{V}, I_E=0$		100	nA
Emitter Cutoff Current	I_{EBO}	$V_{CB}=40\text{V}, I_E=0, T_J=125^\circ\text{C}$		100	μA
DC Current Gain	h_{FE}	$V_{BE}=8\text{V}, I_C=0$	70	100	nA
		$V_{CE}=1\text{V}, I_C=500\text{mA}$	45	180	
		$V_{CE}=1\text{V}, I_C=2\text{A}$	10		
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{CE}=2\text{V}, I_C=5\text{A}$		0.3	V
		$I_C=500\text{mA}, I_B=50\text{mA}$		0.75	V
		$I_C=2\text{A}, I_B=200\text{mA}$		1.8	V
		$I_C=5\text{A}, I_B=1\text{A}$		2.5	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=5\text{A}, I_B=1\text{A}$		1.6	V
Base-Emitter On Voltage	$V_{BE(on)}$	$V_{CE}=1\text{V}, I_C=2\text{A}$		1.6	V
Current Gain-Bandwidth Product	f_T	$V_{CE}=10\text{V}, I_C=100\text{mA}, f=10\text{MHz}$	65		MHz
Output Capacitance	C_{ob}	$V_{CB}=10\text{V}, I_E=0, f=0.1\text{MHz}$		80	pF

MJE200

NPN EPITAXIAL SILICON TRANSISTOR

T-33-07

