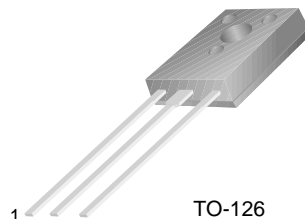


# MJE180/181/182

**Low Power Audio Amplifier**  
**Low Current High Speed Switching Applications**



TO-126  
1. Emitter 2. Collector 3. Base

## NPN Epitaxial Silicon Transistor

### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage : MJE180	60	V
	: MJE181	80	V
	: MJE182	100	V
$V_{CEO}$	Collector-Emitter Voltage : MJE180	40	V
	: MJE181	60	V
	: MJE182	80	V
$V_{EBO}$	Emitter-Base Voltage	7	V
$I_C$	Collector Current (DC)	3	A
$I_{CP}$	Collector Current (Pulse)	6	A
$I_B$	Base Current	1	A
$P_C$	Collector Dissipation ( $T_a=25^\circ\text{C}$ )	1.5	W
$P_C$	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	12.5	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 65 ~ 150	$^\circ\text{C}$

### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units	
$BV_{CEO}$	Collector -Emitter Breakdown Voltage	$I_C = 10\text{mA}, I_B = 0$	40		V	
	: MJE180					
	: MJE181					
$I_{CBO}$	Collector Cut-off Current : MJE180	$V_{CB} = 60\text{V}, I_B = 0$ $V_{CB} = 80\text{V}, I_E = 0$ $V_{CB} = 100\text{V}, I_E = 0$ $V_{CB} = 60\text{V}, I_E = 0 @ T_C = 150^\circ\text{C}$ $V_{CB} = 80\text{V}, I_E = 0 @ T_C = 150^\circ\text{C}$ $V_{CB} = 100\text{V}, I_E = 0 @ T_C = 150^\circ\text{C}$		0.1	$\mu\text{A}$	
	: MJE181				$\mu\text{A}$	
	: MJE182				$\mu\text{A}$	
	: MJE180				0.1	
	: MJE181				0.1	
	: MJE182				0.1	
$I_{EBO}$	Emitter Cut-off Current	$V_{BE} = 7\text{V}, I_C = 0$		0.1	$\mu\text{A}$	
$h_{FE}$	DC Current Gain	$V_{CE} = 1\text{V}, I_C = 100\text{mA}$	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			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 500\text{mA}, I_B = 50\text{mA}$		0.3	V	
		$I_C = 1.5\text{A}, I_B = 150\text{mA}$			0.9	V
		$I_C = 3\text{A}, I_B = 600\text{mA}$			1.7	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 1.5\text{A}, I_B = 150\text{mA}$		1.5	V	
		$I_C = 3\text{A}, I_B = 600\text{mA}$			2.0	V
$V_{BE(on)}$	Base-Emitter ON Voltage	$V_{CE} = 1\text{V}, I_C = 500\text{mA}$		1.2	V	
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 10\text{V}, I_C = 100\text{mA}$	50		MHz	
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{V}, I_E = 0, f = 0.1\text{MHz}$		30	pF	

# Typical Characteristics

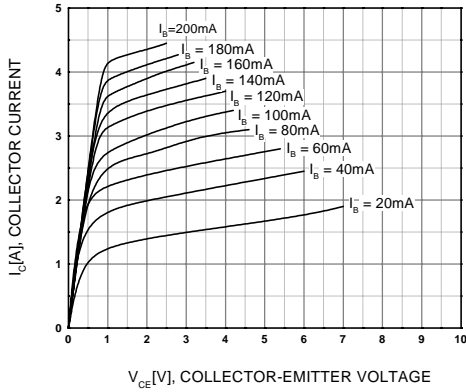


Figure 1. Static Characteristic

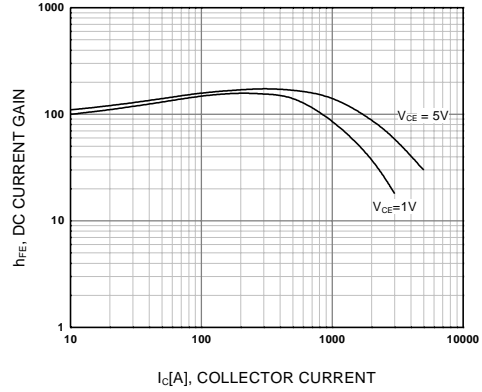


Figure 2. DC current Gain

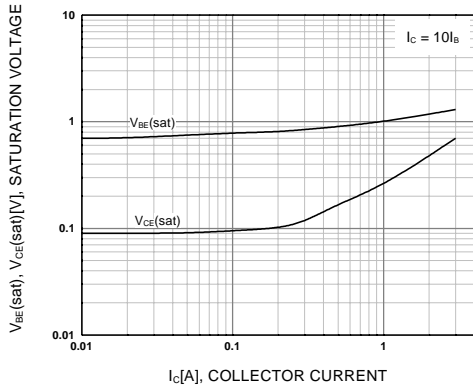


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

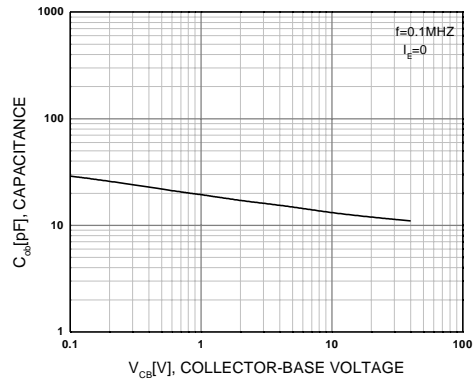


Figure 4. Collector Output Capacitance

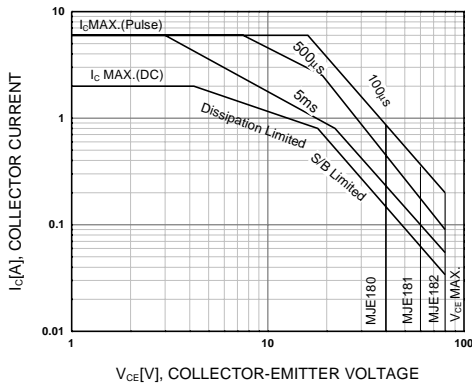


Figure 5. Safe Operating Area

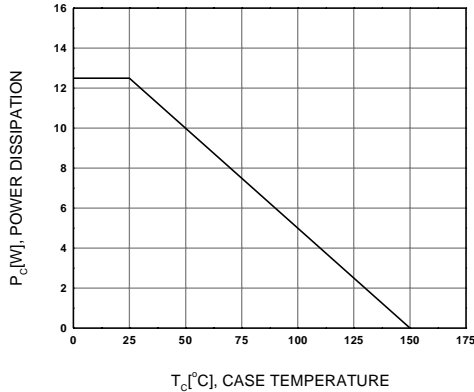
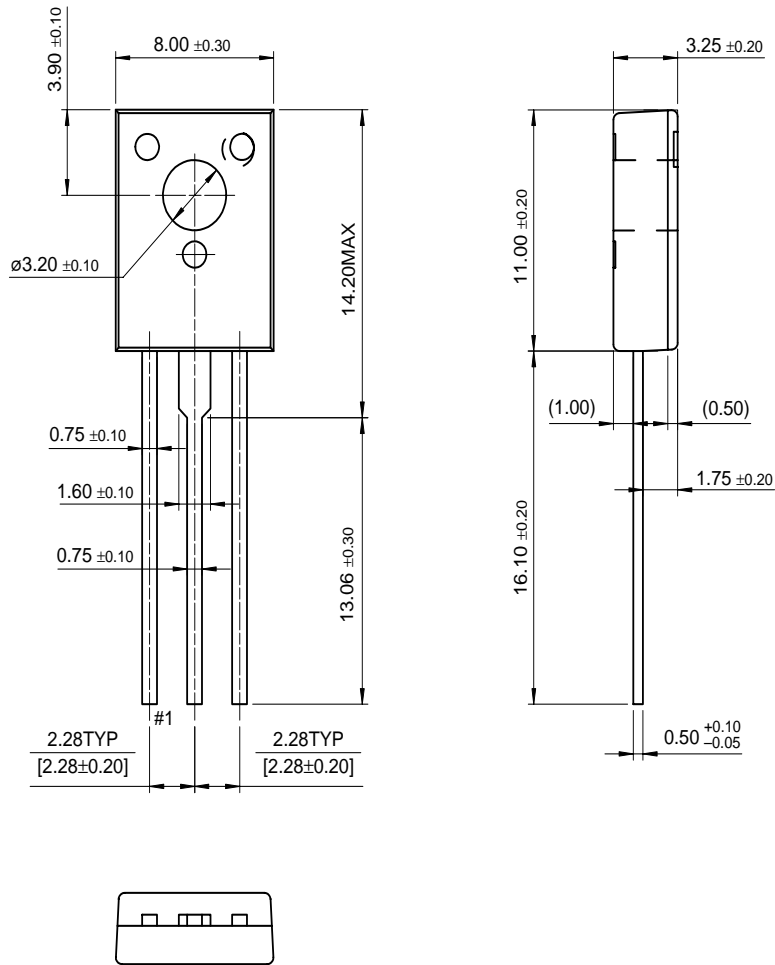


Figure 6. Power Derating

# Package Dimensions

## TO-126

MJE180/181/182



Dimensions in Millimeters

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DOME™	ISOPLANAR™	Quiet Series™	
E <sup>2</sup> CMOS™	MICROWIRE™	LILENT SWITCHER®	
EnSigna™	OPTOLOGIC™	SMART START™	
FACT™	OPTOPLANAR™	SuperSOT™-3	
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