

$V_{CEO} = -150\text{ V}$ ,  $I_C = -10\text{ A}$   
Silicon PNP Epitaxial Planar Transistor  
**2SA1186**

**Description**

The 2SA1186 is a PNP transistor of  $-150\text{ V}$ ,  $-10\text{ A}$ . The product has constant  $h_{FE}$  characteristics in a wide current range, providing high-quality audio sounds.

**Features**

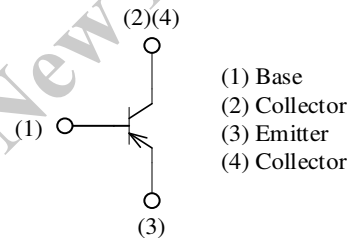
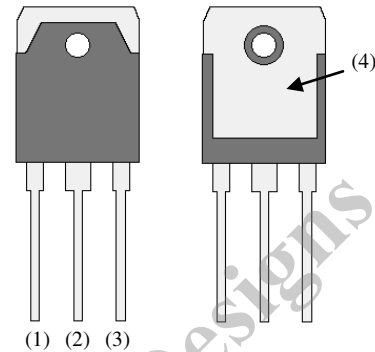
- Complementary to 2SC2837
  - LAPT (Linear Amplifier Power Transistor)
  - High Transition Frequency
  - Bare Lead Frame: Pb-free (RoHS Compliant)
- $V_{CEO}$ ----- $-150\text{ V}$   
•  $I_C$ ----- $-10\text{ A}$   
•  $f_T$ ----- $60\text{ MHz}$   
•  $P_C$ ----- $100\text{ W}$

**Application**

- Audio Power Amplifier

**Package**

TO3P-3L



Not to scale

Not Recommended for New Designs

### Absolute Maximum Ratings

Unless otherwise specified,  $T_A = 25\text{ }^\circ\text{C}$ .

Parameter	Symbol	Conditions	Rating	Unit
Collector to Base Voltage	$V_{CBO}$		-150	V
Collector to Emitter Voltage	$V_{CEO}$		-150	V
Emitter to Base Voltage	$V_{EBO}$		-5	V
Collector Current	$I_C$		-10	A
Base Current	$I_B$		-2	A
Collector Power Dissipation	$P_C$	$T_C = 25\text{ }^\circ\text{C}$	100	W
Operating Junction Temperature	$T_J$		150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$		-55 to 150	$^\circ\text{C}$

### Thermal Characteristics

Unless otherwise specified,  $T_A = 25\text{ }^\circ\text{C}$ .

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Thermal Resistance (Junction to Case)	$R_{\theta JC}$		—	—	1.25	$^\circ\text{C}/\text{W}$
Thermal Resistance (Junction to Ambient)	$R_{\theta JA}$		—	—	35.7	$^\circ\text{C}/\text{W}$

### Electrical Characteristics

Unless otherwise specified,  $T_A = 25\text{ }^\circ\text{C}$ .

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = -150\text{ V}, I_E = 0\text{ A}$	—	—	-100	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = -5\text{ V}, I_C = 0\text{ A}$	—	—	-100	$\mu\text{A}$
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -25\text{ mA}$	-150	—	—	V
DC Current Gain	$h_{FE}$	$V_{CE} = -4\text{ V}, I_C = -3\text{ A}$	50	—	180	—
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -5\text{ A}, I_B = -0.5\text{ A}$	—	—	-2.0	V
Transition Frequency	$f_T$	$V_{CE} = -12\text{ V}, I_E = 1\text{ A}$	—	60	—	MHz
Collector Output Capacitance	$C_{OB}$	$V_{CB} = -80\text{ V}, I_E = 0\text{ A},$ $f = 1\text{ MHz}$	—	110	—	pF

### $h_{FE}$ Rank

For the marking area of the rank, see the Marking Diagram.

Rank	O	P	Y
$h_{FE}$	50 to 100	70 to 140	90 to 180

Rating and Characteristic Curves

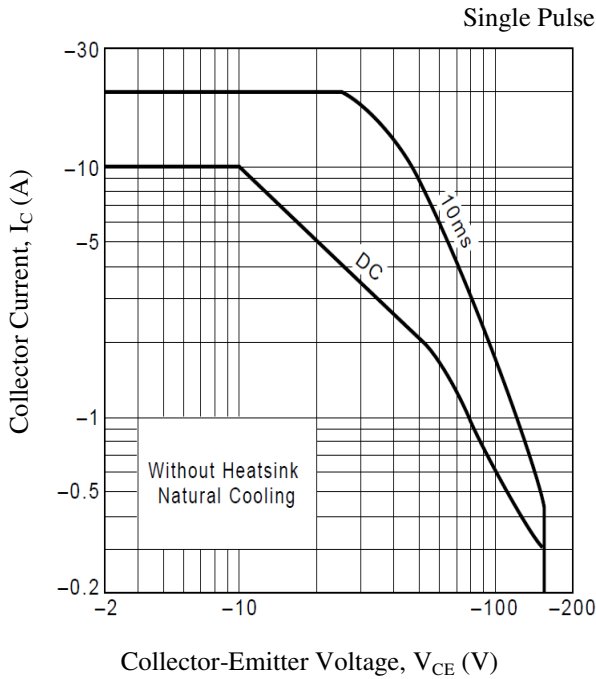


Figure 1. Safe Operating Area

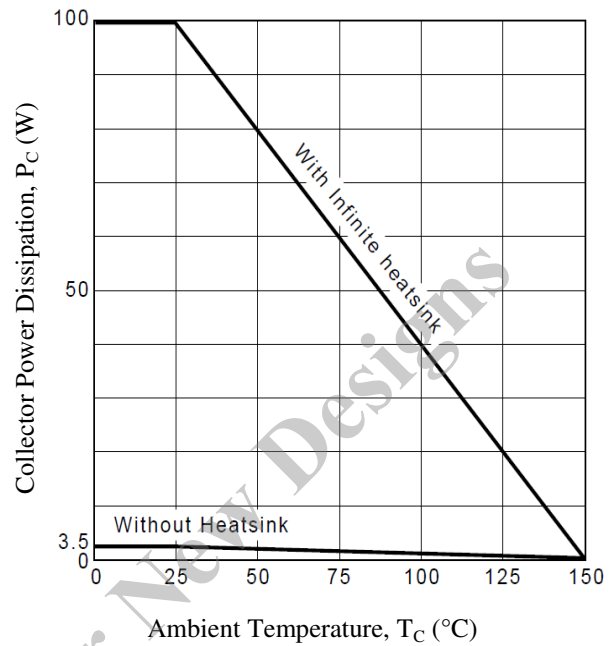


Figure 2. Power Dissipation vs. Ambient Temperature

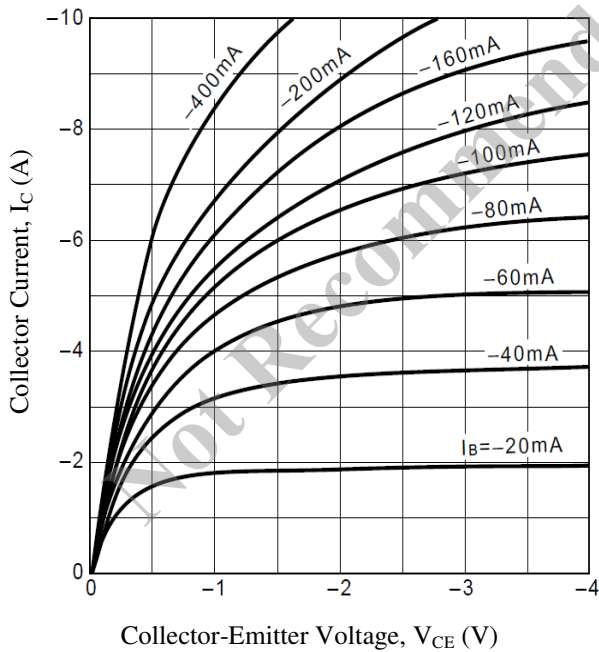


Figure 3. Collector Current vs. Collector-Emitter Voltage

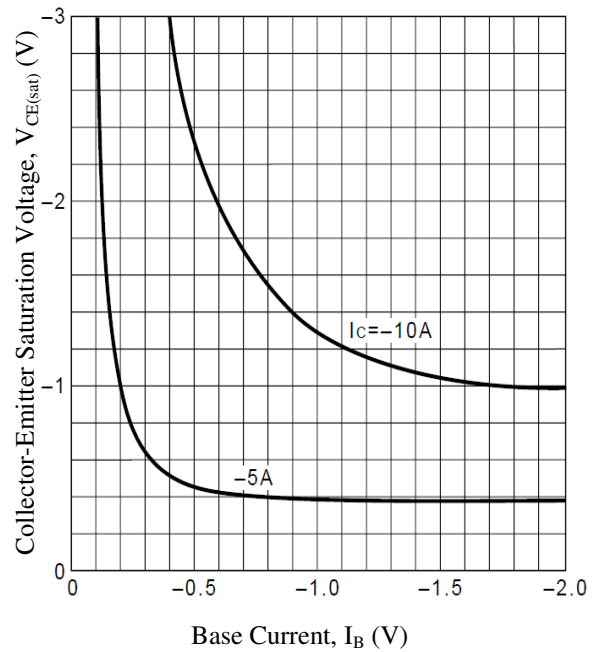


Figure 4. Collector-Emitter Saturation Voltage vs. Base Current

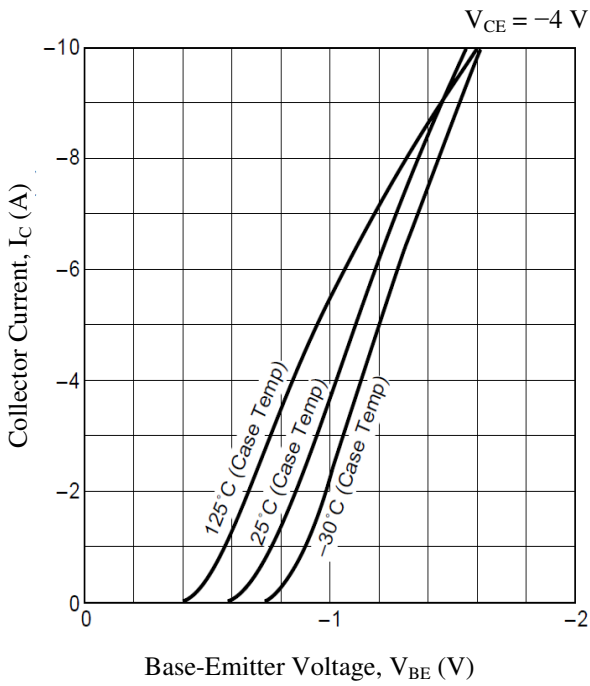


Figure 5. Collector Current vs. Base-Emitter Voltage

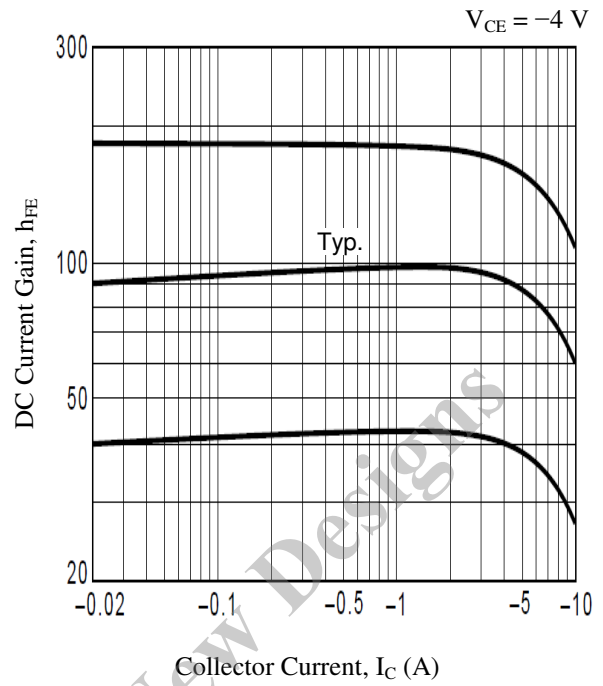


Figure 6. DC Current Gain Variation vs. Collector Current

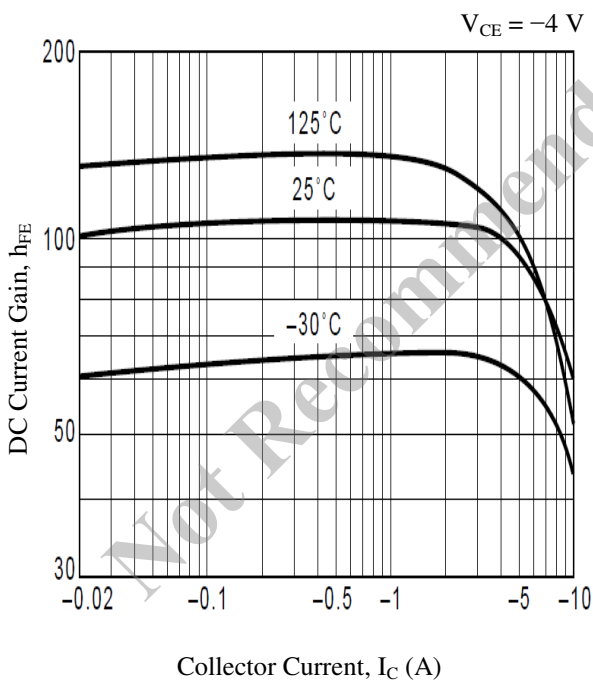


Figure 7. DC Current Gain vs. Collector Current

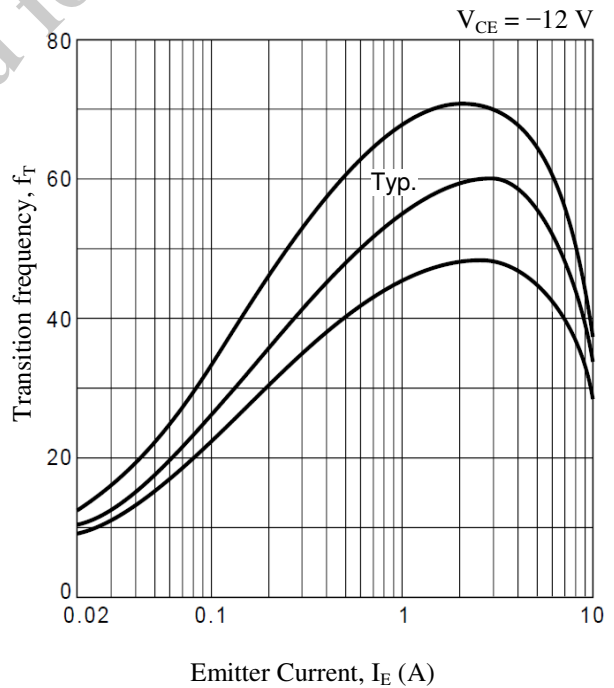


Figure 8. Transition Frequency vs. Emitter Current

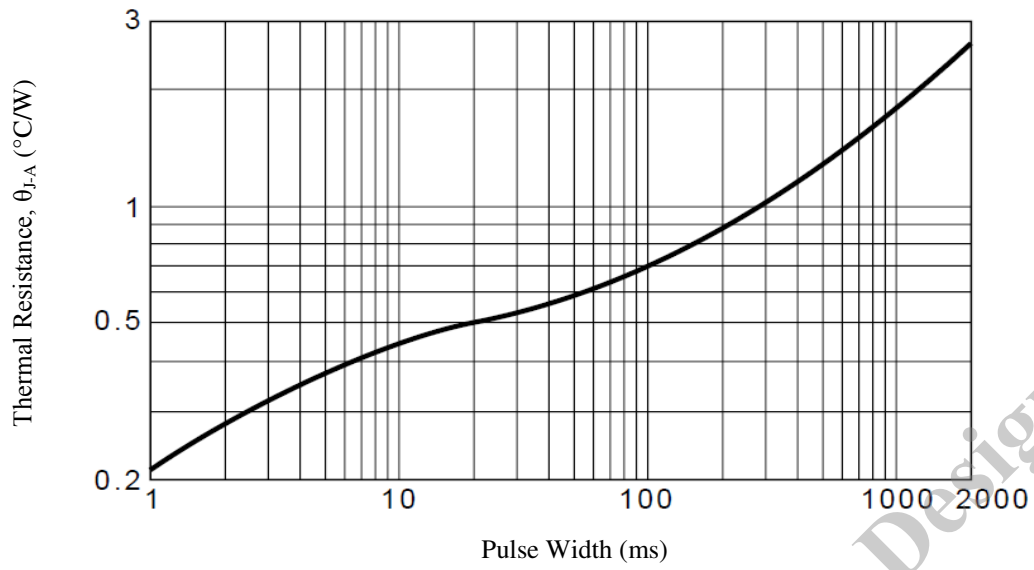
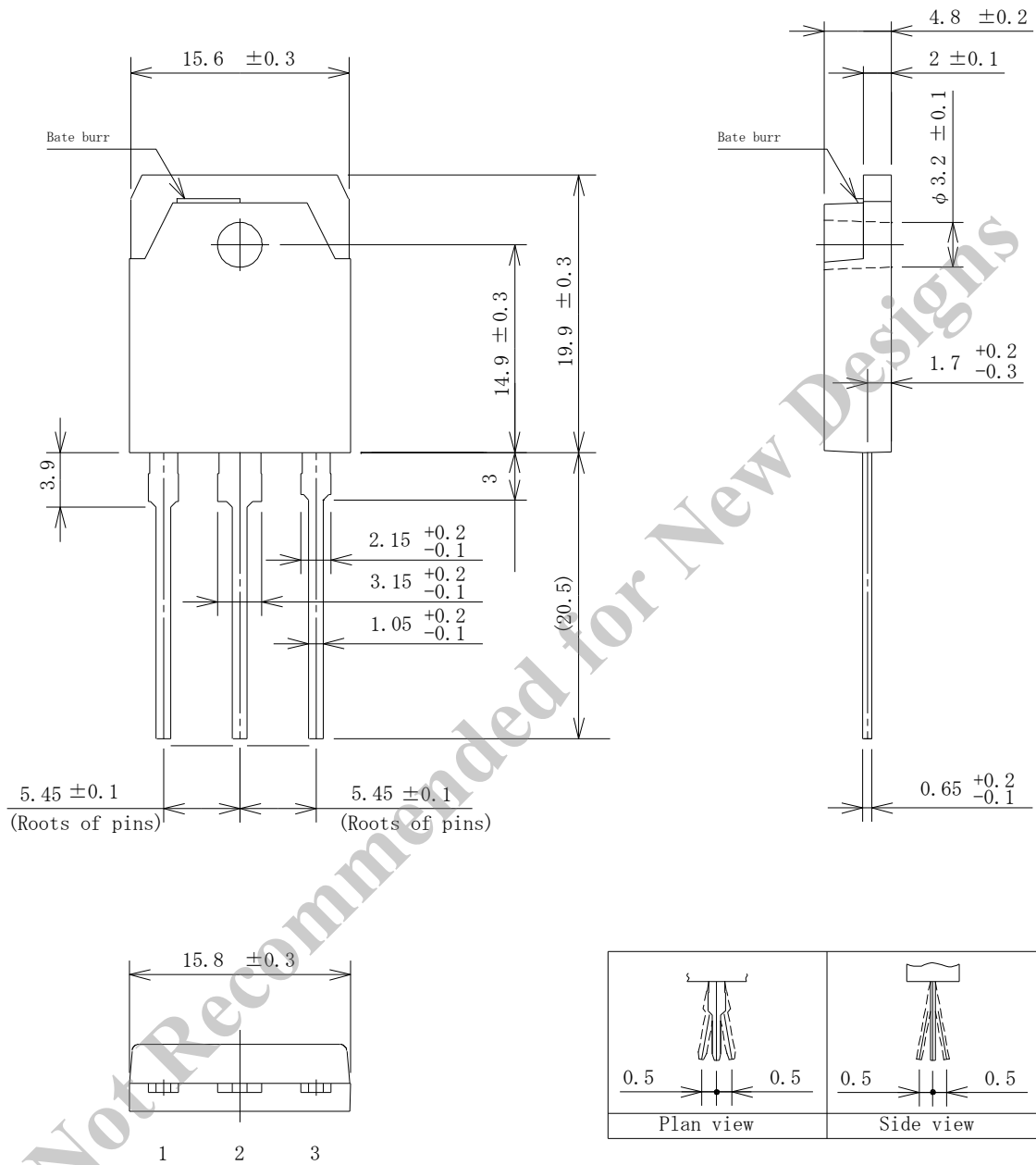


Figure 9. Transient Thermal Resistance

Not Recommended for New Designs

Physical Dimensions

● TO3P-3L



NOTES:

- Gate burr: 0.3 mm (max.)
- All dimensions in millimeters
- Bare lead frame: Pb-free (RoHS compliant)
- When soldering the product, be sure to minimize the working time within the following limits:
 

$260 \pm 5 \text{ }^\circ\text{C}$	$10 \pm 1 \text{ s, 2 times (flow)}$
$380 \pm 10 \text{ }^\circ\text{C}$	$3.5 \pm 0.5 \text{ s, 1 time (soldering iron)}$
- Soldering should be at a distance of at least 1.5 mm from the body of the product.
- The recommended screw torque for TO3P: 0.686 N·m to 0.882 N·m (7 kgf·cm to 9 kgf·cm)

Marking Diagram

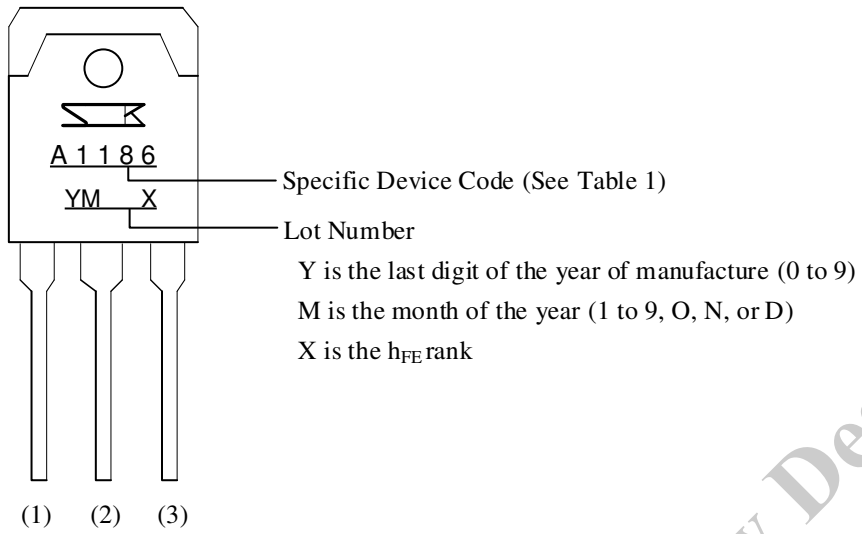


Table 1. Specific Device Code

Specific Device Code	Part Number
A1186	2SA1186

Not Recommended for New Designs

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