

$V_{CEO} = -180\text{ V}$, $I_C = -15\text{ A}$
Silicon PNP Epitaxial Planar Transistor
2SA1386A

Description

The 2SA1386A is a PNP transistor of -180 V , -15 A . The product has constant h_{FE} characteristics in a wide current range, providing high-quality audio sounds.

Features

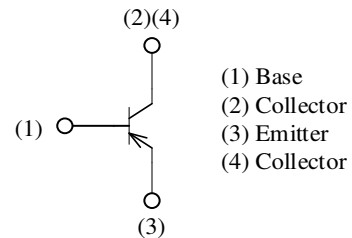
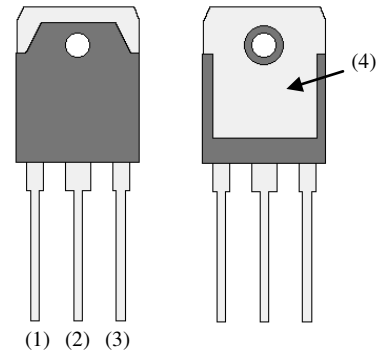
- Complementary to 2SC3519A
- LAPT (Linear Amplifier Power Transistor)
- High Transition Frequency
- Bare Lead Frame: Pb-free (RoHS Compliant)
- V_{CEO} ----- -180 V
- I_C ----- -15 A
- f_T ----- 40 MHz
- P_C ----- 130 W

Application

- Audio Power Amplifier

Package

TO3P-3L



Not to scale

2SA1386A

Absolute Maximum Ratings

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

Parameter	Symbol	Conditions	Rating	Unit
Collector to Base Voltage	V_{CBO}		-180	V
Collector to Emitter Voltage	V_{CEO}		-180	V
Emitter to Base Voltage	V_{EBO}		-5	V
Collector Current	I_C		-15	A
Base Current	I_B		-4	A
Collector Power Dissipation	P_C	$T_C = 25\text{ }^\circ\text{C}$	130	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)	$R_{\theta JC}$		—	—	0.96	$^\circ\text{C}/\text{W}$
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}	$V_{CB} = -180\text{ V}, I_E = 0\text{ A}$	—	—	-100	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = -5\text{ V}, I_C = 0\text{ A}$	—	—	-100	μA
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -25\text{ mA}$	-180	—	—	V
DC Current Gain	h_{FE}	$V_{CE} = -4\text{ V}, I_C = -5\text{ A}$	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	$V_{CE} = -12\text{ V}, I_E = 2\text{ A}$	—	40	—	MHz
Collector Output Capacitance	C_{OB}	$V_{CB} = -10\text{ V}, I_E = 0\text{ A},$ $f = 1\text{ MHz}$	—	500	—	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

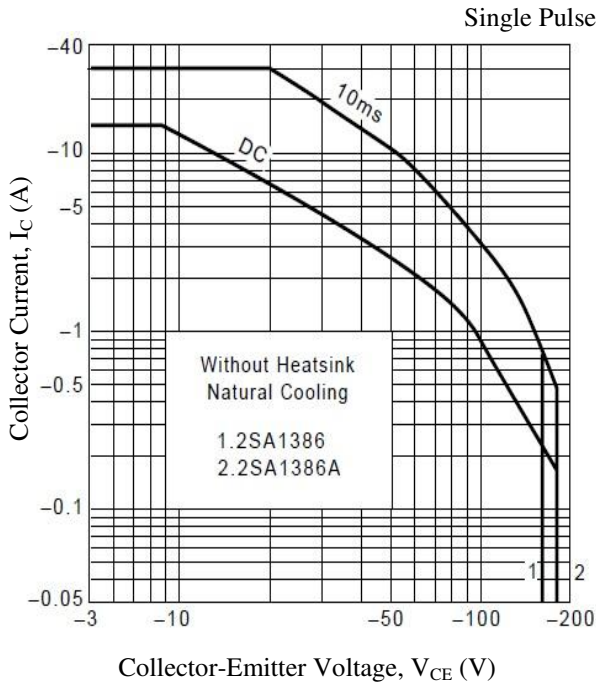


Figure 1. Safe Operating Area

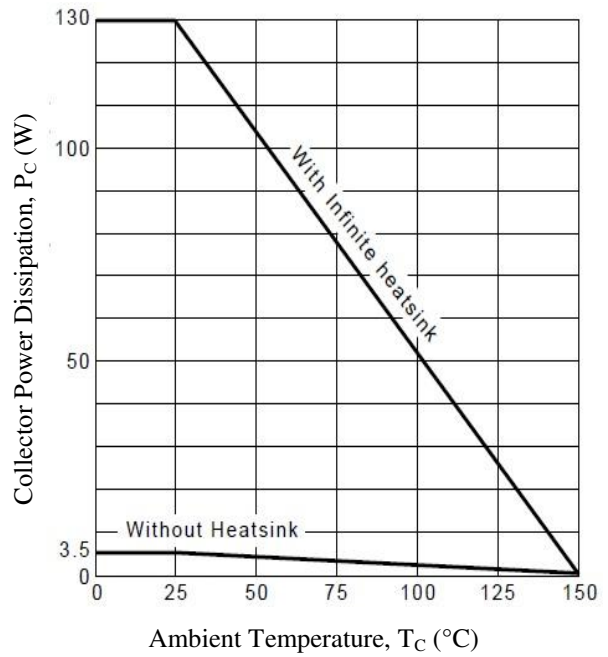


Figure 2. Power Dissipation vs. Ambient Temperature

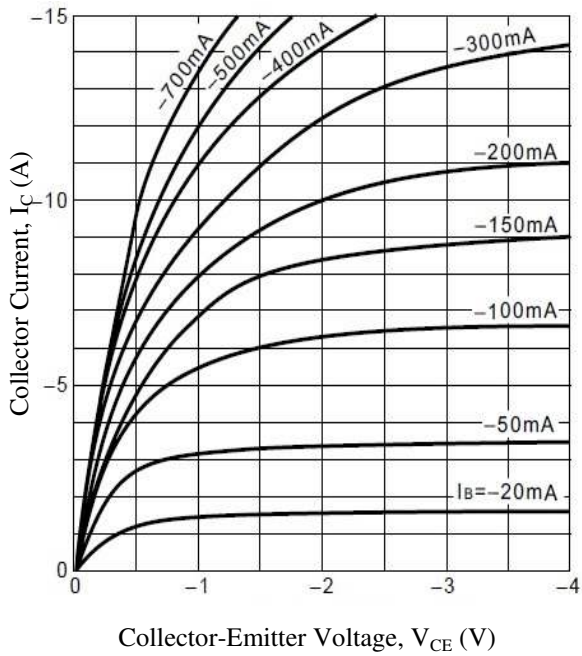


Figure 3. Collector Current vs. Collector-Emitter Voltage

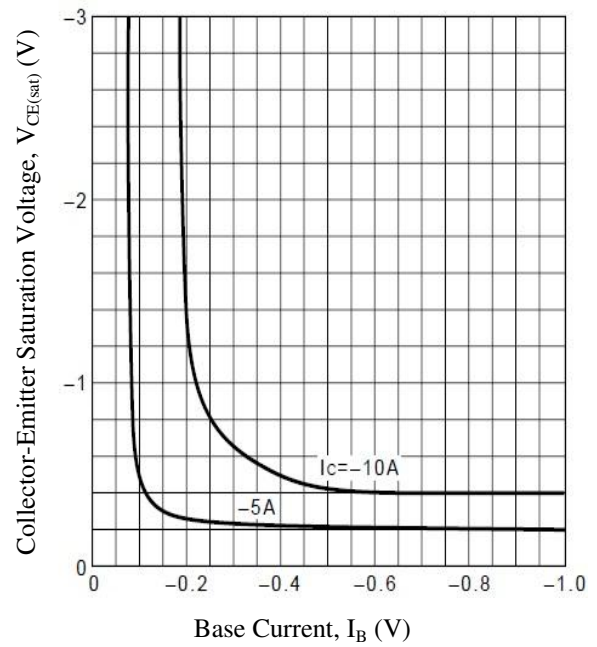


Figure 4. Collector-Emitter Saturation Voltage vs. Base Current

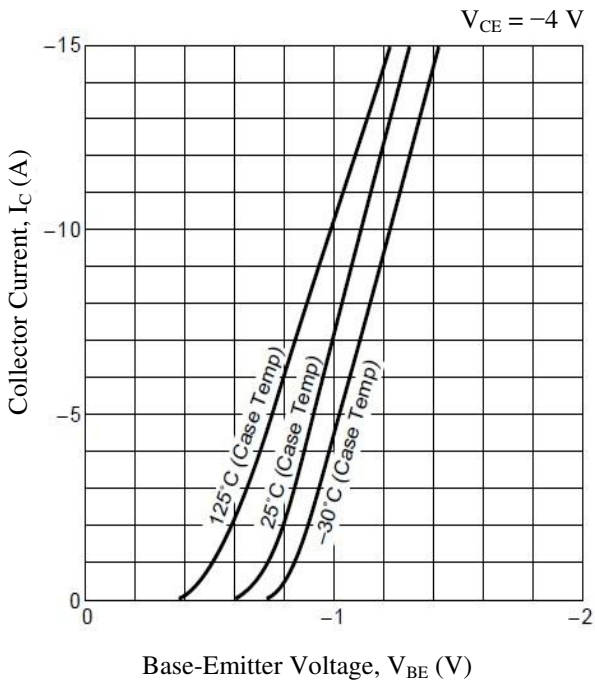


Figure 5. Collector Current vs. Base-Emitter Voltage

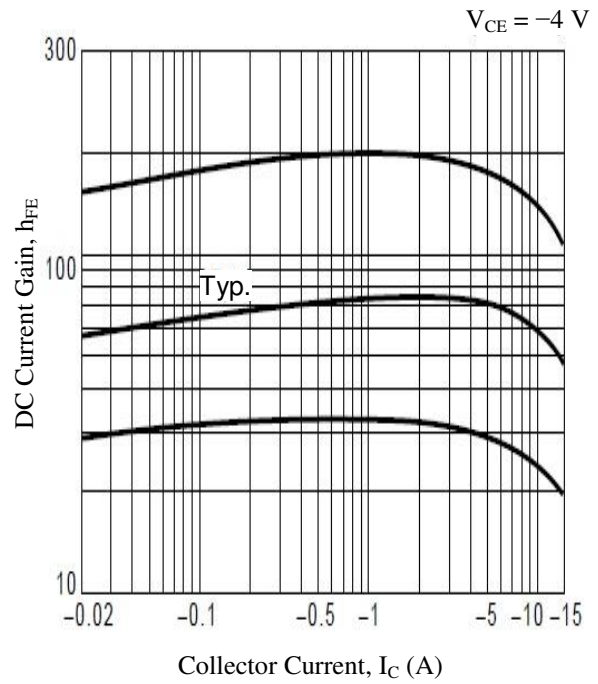


Figure 6. DC Current Gain Variation vs. Collector Current

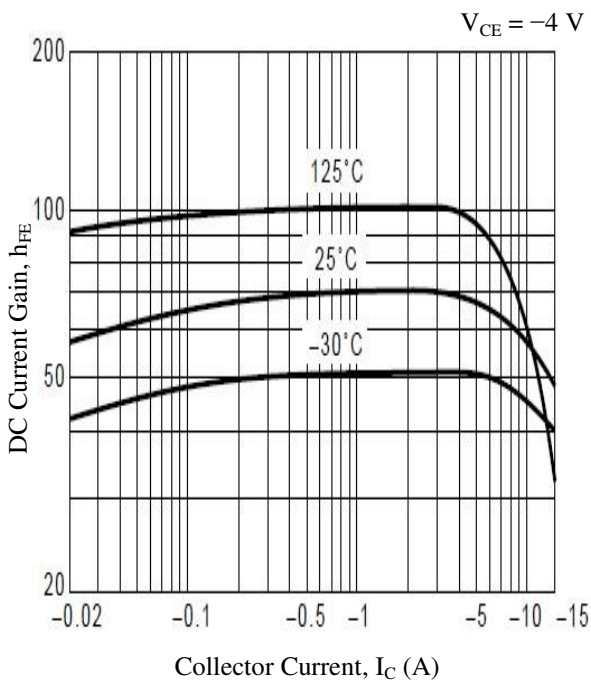


Figure 7. DC Current Gain vs. Collector Current

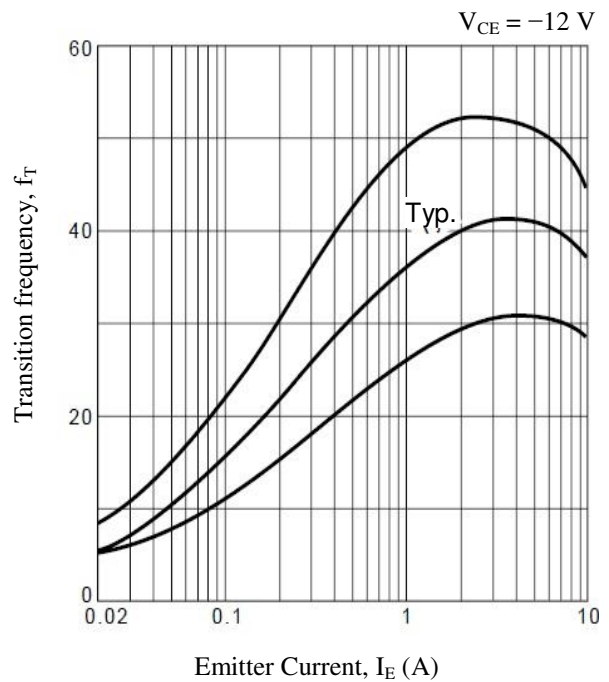


Figure 8. Transition Frequency vs. Emitter Current

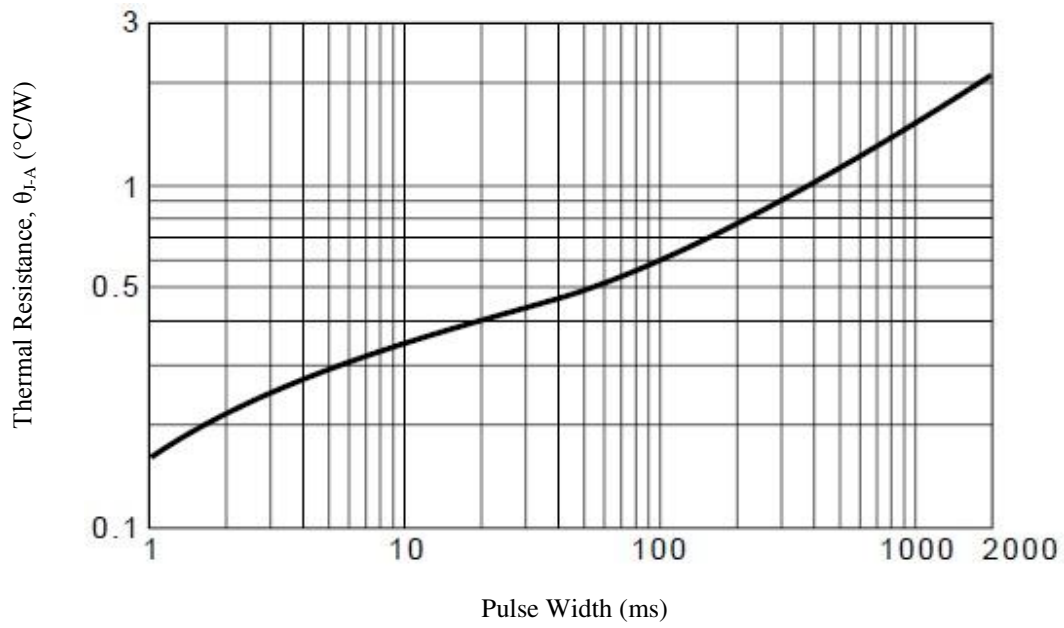
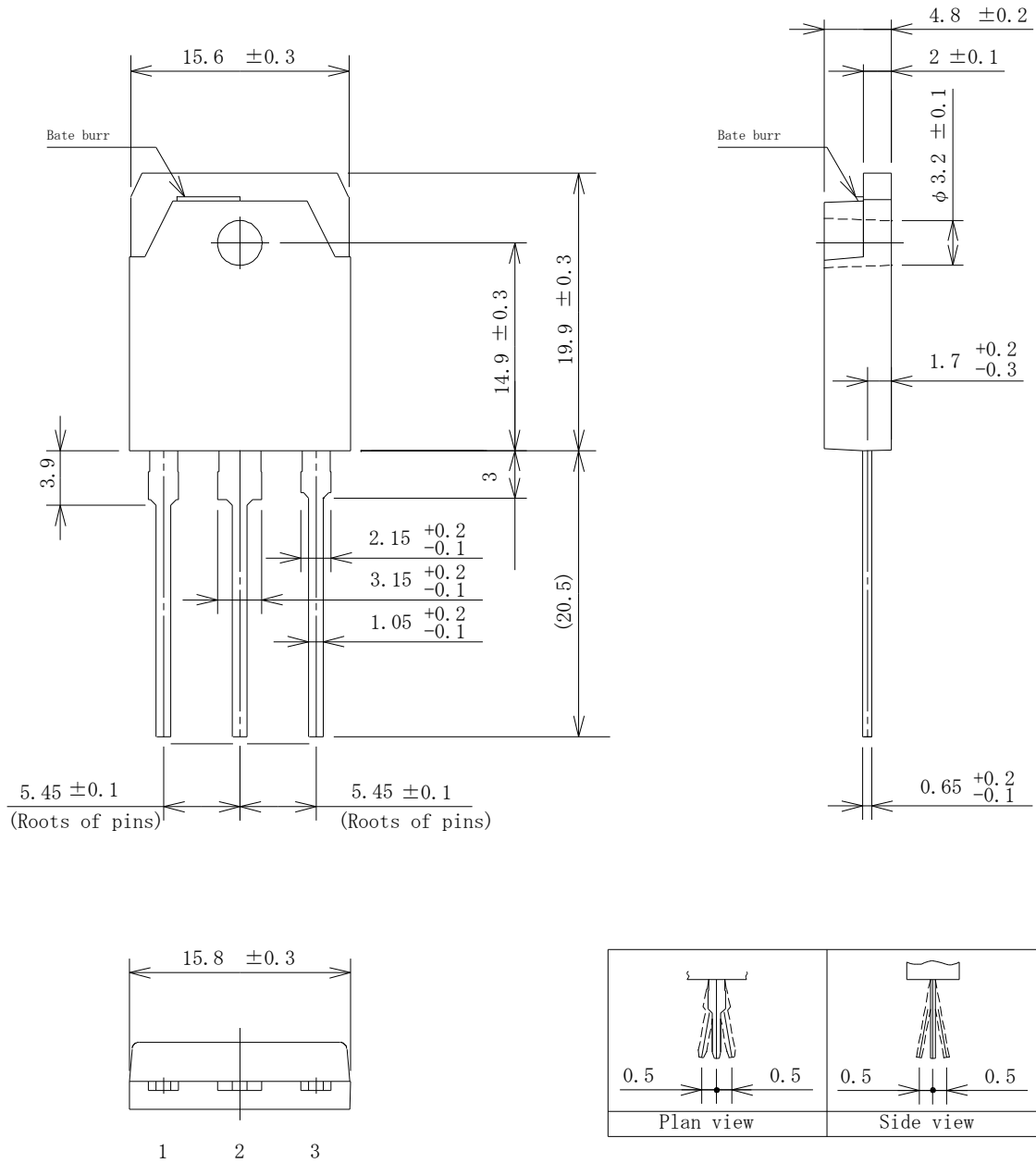


Figure 9. Transient Thermal Resistance

2SA1386A

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

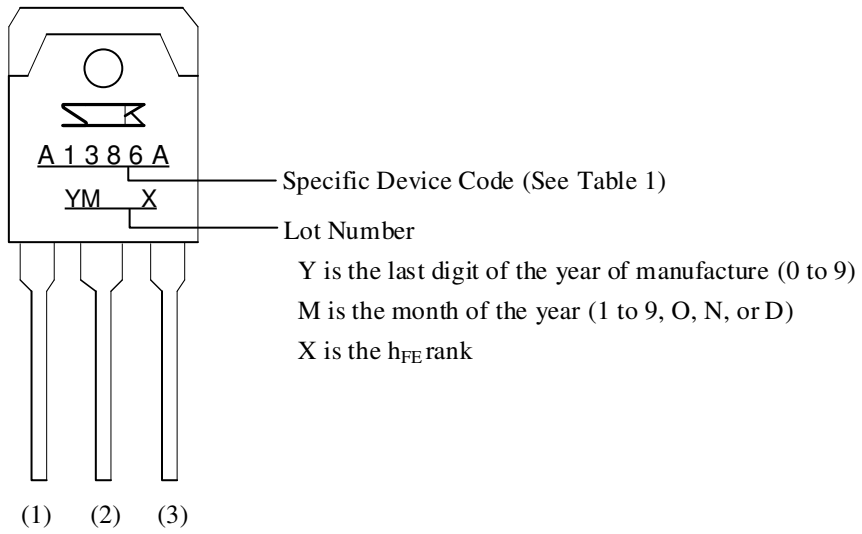


Table 1. Specific Device Code

Specific Device Code	Part Number
A1386A	2SA1386A

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DSGN-CEZ-16003