

**$V_{CEO} = -230\text{ V}$ ,  $I_C = -15\text{ A}$**   
**Silicon PNP Epitaxial Planar Transistor**  
**2SA2223**

**Description**

The 2SA2223 is a PNP transistor of  $-230\text{ V}$ ,  $-15\text{ A}$ . The product has constant  $h_{FE}$  characteristics in a wide current range, providing high-quality audio sounds.

**Features**

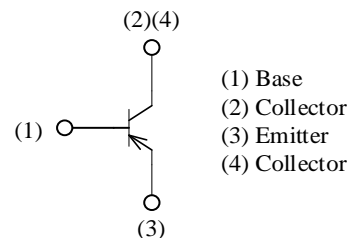
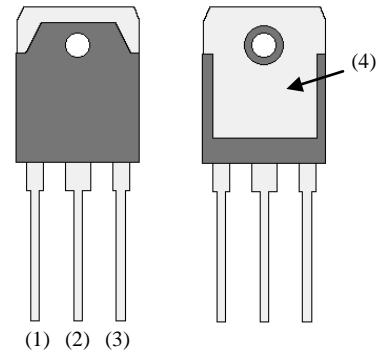
- Complementary to 2SC6145
- LAPT (Linear Amplifier Power Transistor)
- High Transition Frequency
- Bare Lead Frame: Pb-free (RoHS Compliant)
- $V_{CEO}$ ----- $-230\text{ V}$
- $I_C$ ----- $-15\text{ A}$
- $f_T$ ----- $35\text{ MHz}$
- $P_C$ ----- $160\text{ W}$

**Application**

- Audio Power Amplifier

**Package**

TO3P-3L



Not to scale

### Absolute Maximum Ratings

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

Parameter	Symbol	Conditions	Rating	Unit
Collector to Base Voltage	$V_{CBO}$		-230	V
Collector to Emitter Voltage	$V_{CEO}$		-230	V
Emitter to Base Voltage	$V_{EBO}$		-5	V
Collector Current	$I_C$		-15	A
Base Current	$I_B$		-4	A
Collector Power Dissipation	$P_C$	$T_C = 25\text{ }^\circ\text{C}$	160	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)	$R_{\theta JC}$		—	—	0.78	$^\circ\text{C}/\text{W}$
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	$I_{CBO}$	$V_{CB} = -230\text{ V}, I_E = 0\text{ A}$	—	—	-10	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = -5\text{ V}, I_C = 0\text{ A}$	—	—	-10	$\mu\text{A}$
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -25\text{ mA}$	-230	—	—	V
DC Current Gain	$h_{FE}$	$V_{CE} = -4\text{ V}, I_C = -5\text{ A}$	40	—	140	—
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -5\text{ A}, I_B = -0.5\text{ A}$	—	—	-0.5	V
Transition Frequency	$f_T$	$V_{CE} = -12\text{ V}, I_E = 2\text{ A}$	—	35	—	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	R	O	Y
$h_{FE}$	40 to 80	50 to 100	70 to 140

Rating and Characteristic Curves

Single Pulse

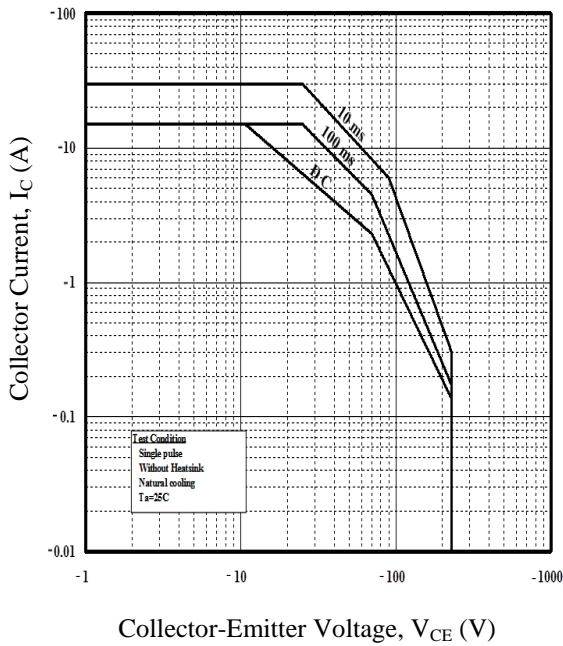


Figure 1. Safe Operating Area

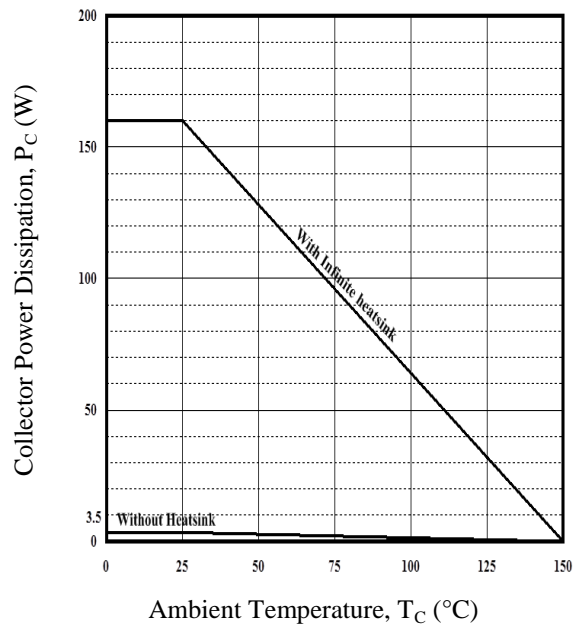


Figure 2. Power Dissipation vs. Ambient Temperature

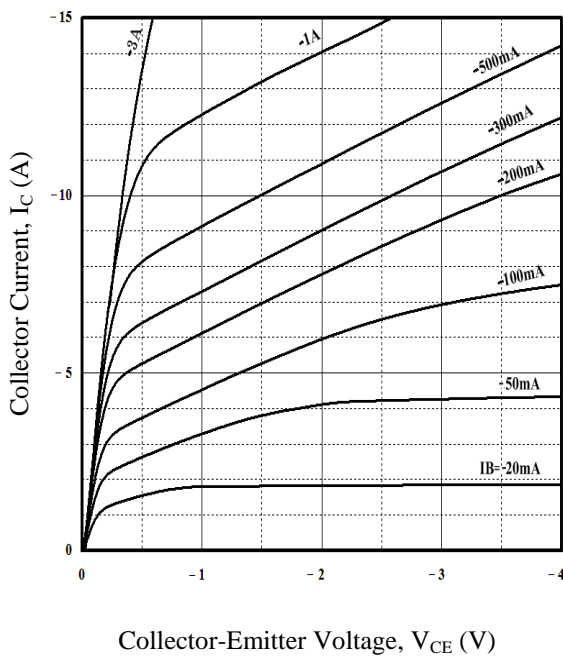


Figure 3. Collector Current vs. Collector-Emitter Voltage

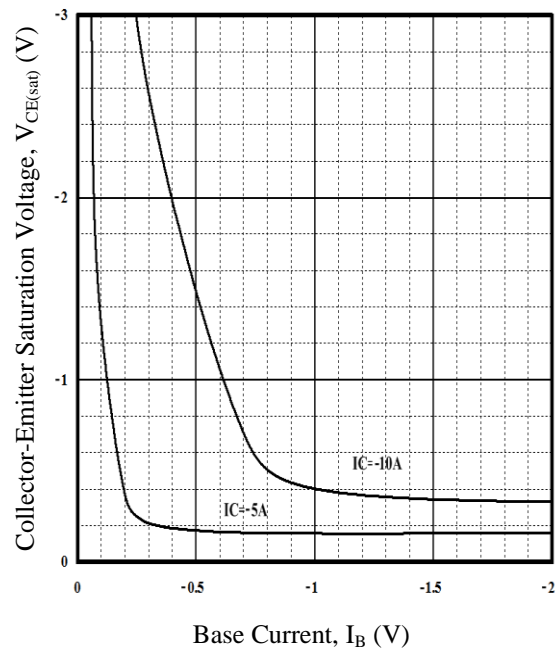


Figure 4. Collector-Emitter Saturation Voltage vs. Base Current

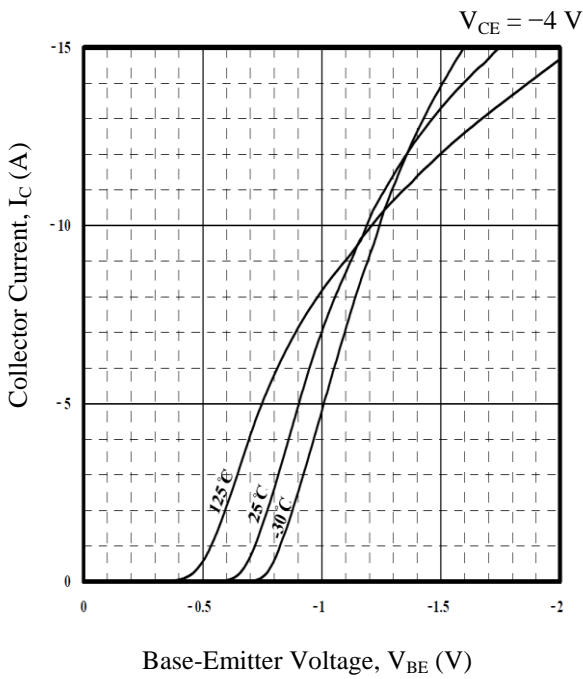


Figure 5. Collector Current vs. Base-Emitter Voltage

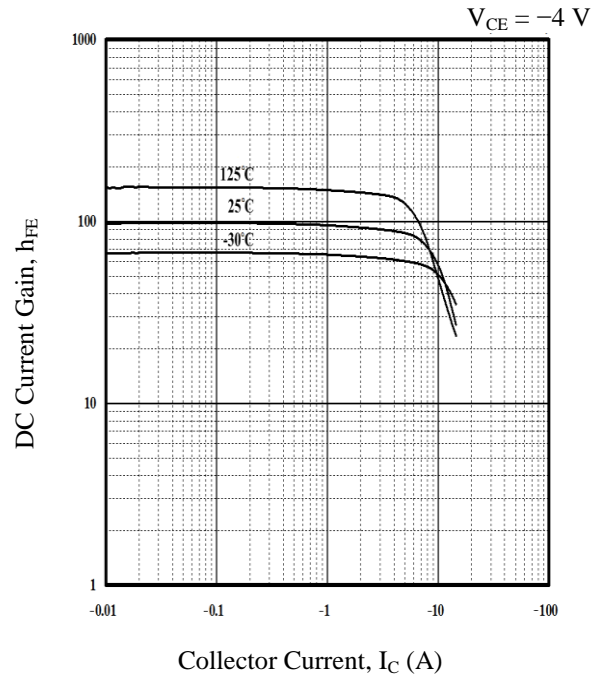


Figure 6. DC Current Gain vs. Collector Current

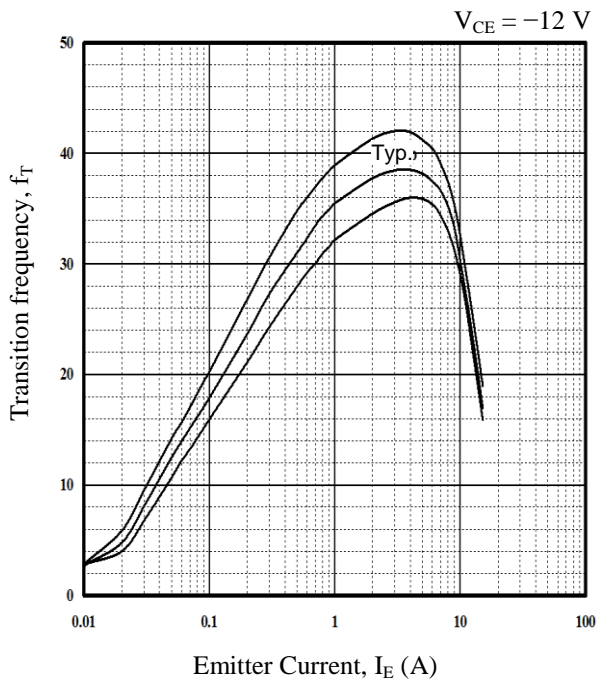


Figure 7. Transition Frequency vs. Emitter Current

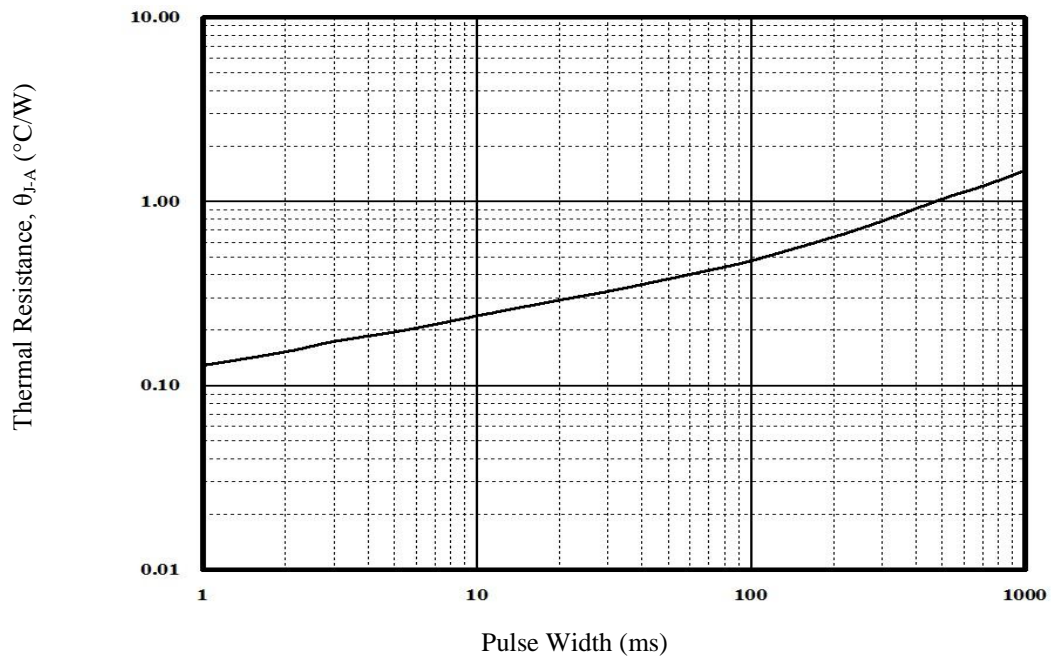
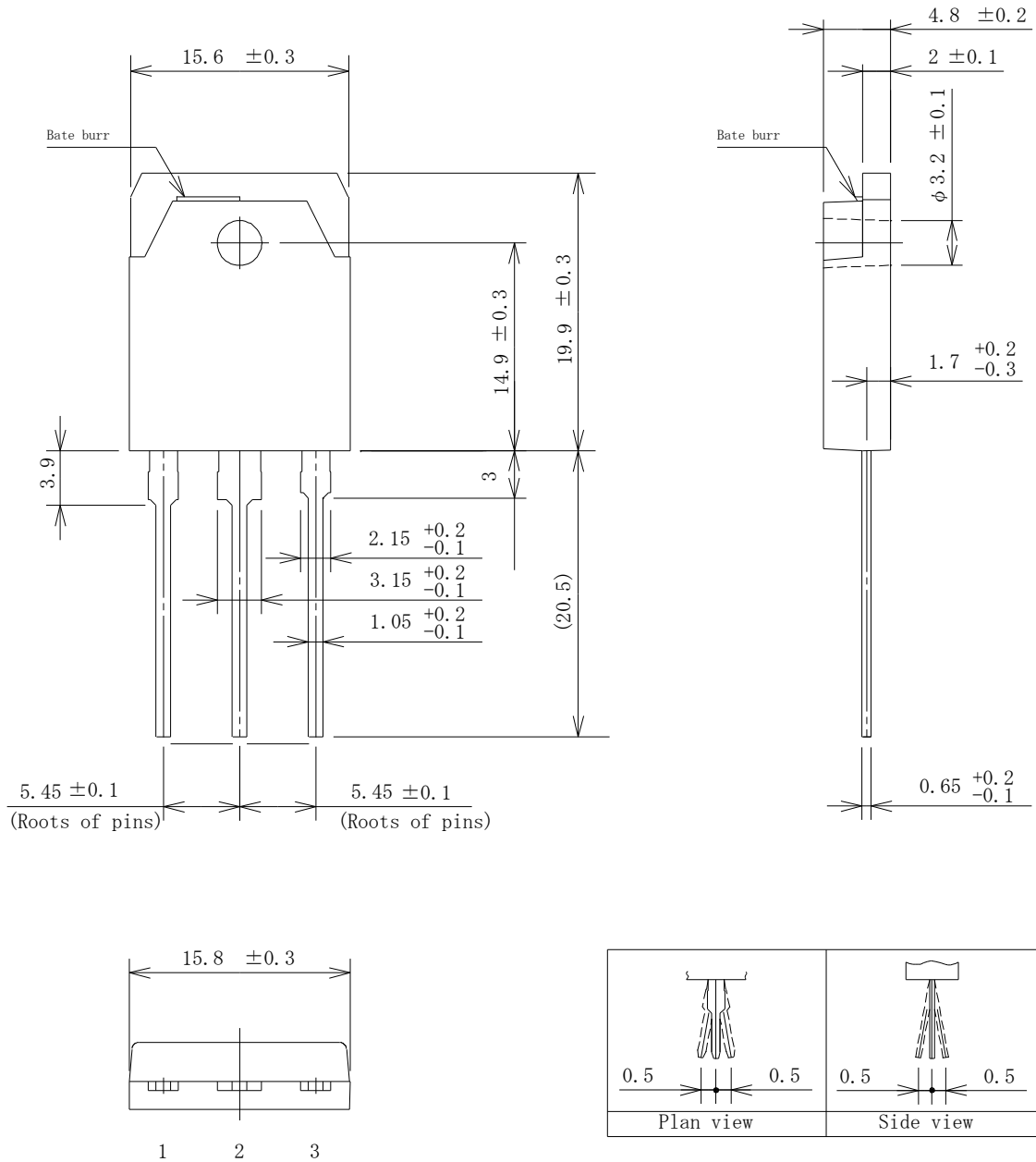


Figure 8. Transient Thermal Resistance

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

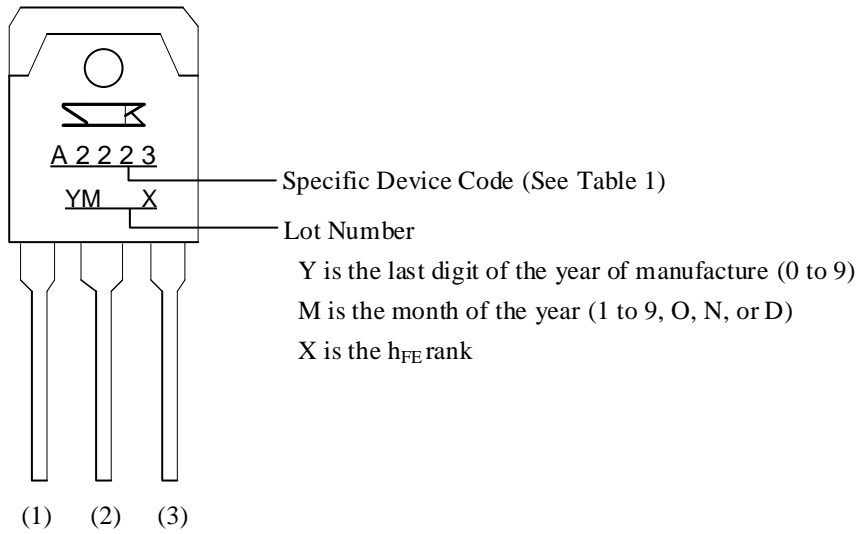


Table 1. Specific Device Code

Specific Device Code	Part Number
A2223	2SA2223

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