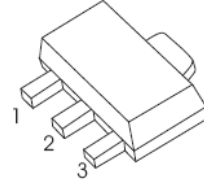
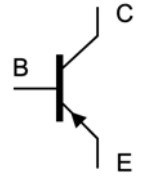


## Features

- NPN complements to GSBCX54, GSBCX55, GSBCX56
- Low voltage
- High current



SOT-89-3L



Schematic Diagram

## Applications

- Medium power general purposes
- Driver stages of audio amplifiers

1. BASE
2. COLLECTOR
3. EMITTER

## Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Collector-Base Voltage	GSBCX51	V <sub>CBO</sub>	-45	V
	GSBCX52		-60	
	GSBCX53		-100	
Collector- Emitter Voltage	GSBCX51	V <sub>CEO</sub>	-45	V
	GSBCX52		-60	
	GSBCX53		-80	
Emitter-Base Voltage		V <sub>EBO</sub>	-5	V
Collector Current		I <sub>C</sub>	-1	A
Peak Collector Current <sup>1</sup>		I <sub>CM</sub>	-1.5	A
Thermal Resistance from Junction to Ambient		R <sub>θJA</sub>	250	°C/W
Collector Power Dissipation		P <sub>C</sub>	500	mW
Junction Temperature Range		T <sub>J</sub>	-55 to +150	°C
Storage Temperature Range		T <sub>STG</sub>	-55 to +150	°C

Note:

1. Single pulse: t<sub>p</sub> ≤ 1 ms.

**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

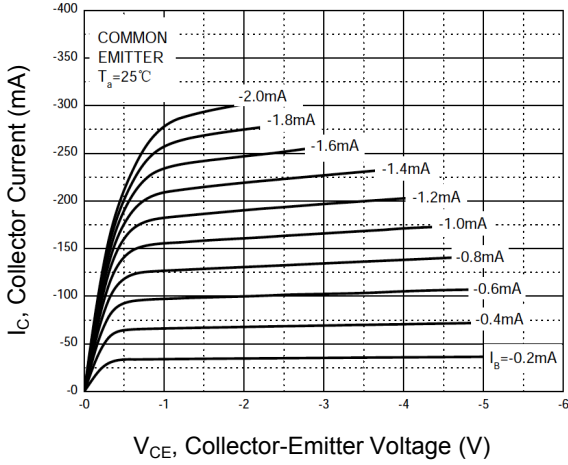
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=-100\mu\text{A}, I_E=0$	GSBCX51	-45	-	-	V
			GSBCX52	-60	-	-	
			GSBCX53	-100	-	-	
Collector-Emitter Breakdown Voltage <sup>2</sup>	$V_{(BR)CEO}$	$I_C=-10\text{mA}, I_B=0$	GSBCX51	-45	-	-	V
			GSBCX52	-60	-	-	
			GSBCX53	-80	-	-	
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=-100\mu\text{A}, I_C=0$	-5	-	-	V	
Collector Cut-Off Current	$I_{CBO}$	$V_{CB}=-30\text{V}, I_E=0$	-	-	-0.1	$\mu\text{A}$	
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB}=-5\text{V}, I_C=0$	-	-	-0.1	$\mu\text{A}$	
DC Current Gain <sup>2</sup>	$h_{FE(1)}$	$V_{CE}=-2\text{V}, I_C=-5\text{mA}$	63	-	-	-	
	$h_{FE(2)}$	$V_{CE}=-2\text{V}, I_C=-150\text{mA}$	63	-	250	-	
	$h_{FE(3)}$	$V_{CE}=-2\text{V}, I_C=-0.5\text{A}$	40	-	-	-	
Collector-Emitter Saturation Voltage <sup>2</sup>	$V_{CE(sat)}$	$I_C=-0.5\text{A}, I_B=-50\text{mA}$	-	-	-0.5	V	
Base -Emitter Voltage <sup>2</sup>	$V_{BE}$	$V_{CE}=-2\text{V}, I_C=-0.5\text{A}$	-	-	-1	V	
Transition Frequency	$f_T$	$V_{CE}=-5\text{V}, I_C=-10\text{mA}, f=100\text{MHz}$	-	50	-	MHz	

Note:  
2. Pulse Test

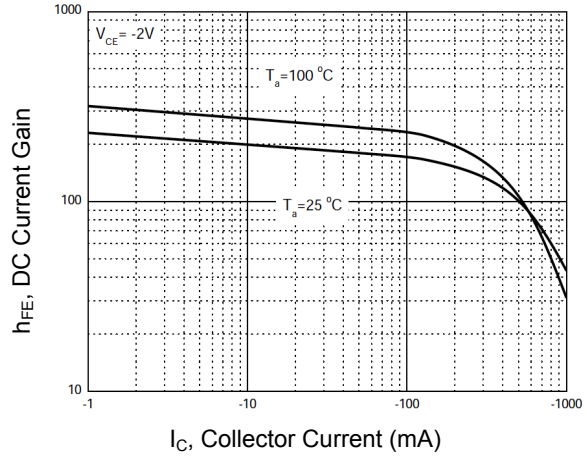
**Classification of  $h_{FE(2)}$**

<b>Rank</b>	GSBCX51	GSBCX51-10	GSBCX51-16
	GSBCX52	GSBCX52-10	GSBCX52-16
	GSBCX53	GSBCX53-10	GSBCX53-16
<b><math>h_{FE}</math> Range</b>	63 - 250	63 - 160	100 - 250

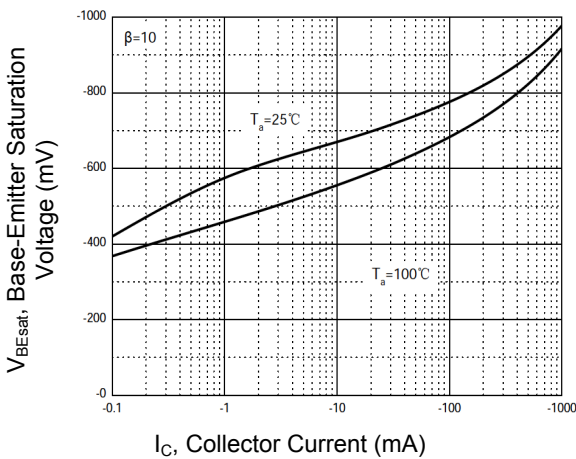
**Typical Electrical Characteristic Curves**



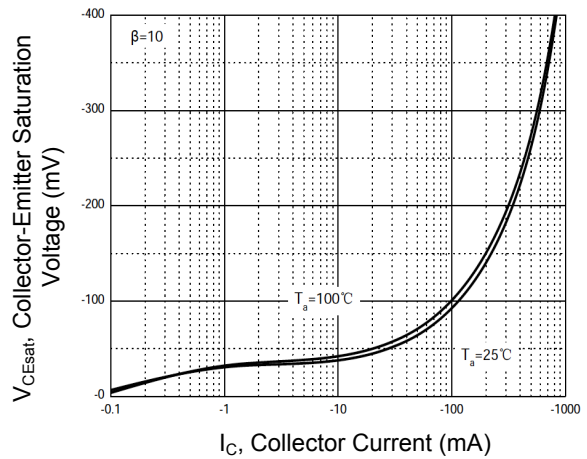
**Figure 1. Static Characteristics**



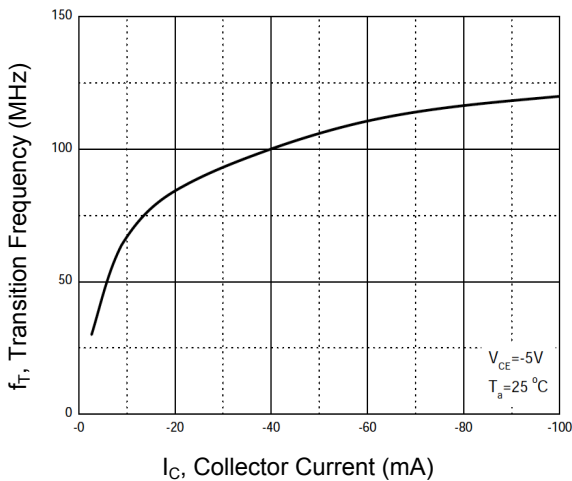
**Figure 2. DC Current Gain vs. Collector Current**



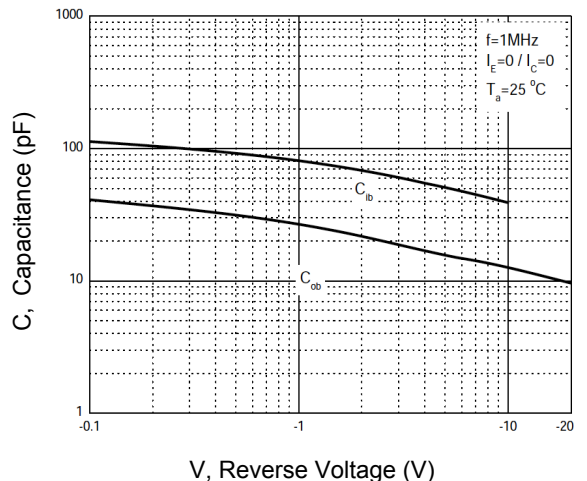
**Figure 3. Base-Emitter Saturation Voltage vs. Collector Current**



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



**Figure 5. Transition Frequency vs. Collector Current**



**Figure 6. Capacitance Characteristics**

**Typical Electrical Characteristic Curves**

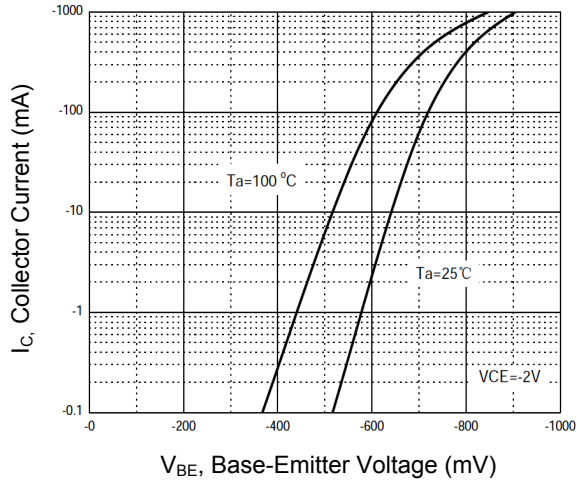


Figure 7. Collector Current vs. Base-Emitter Voltage

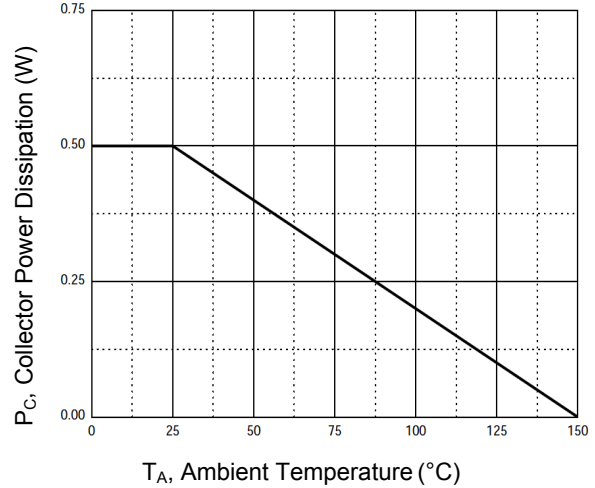
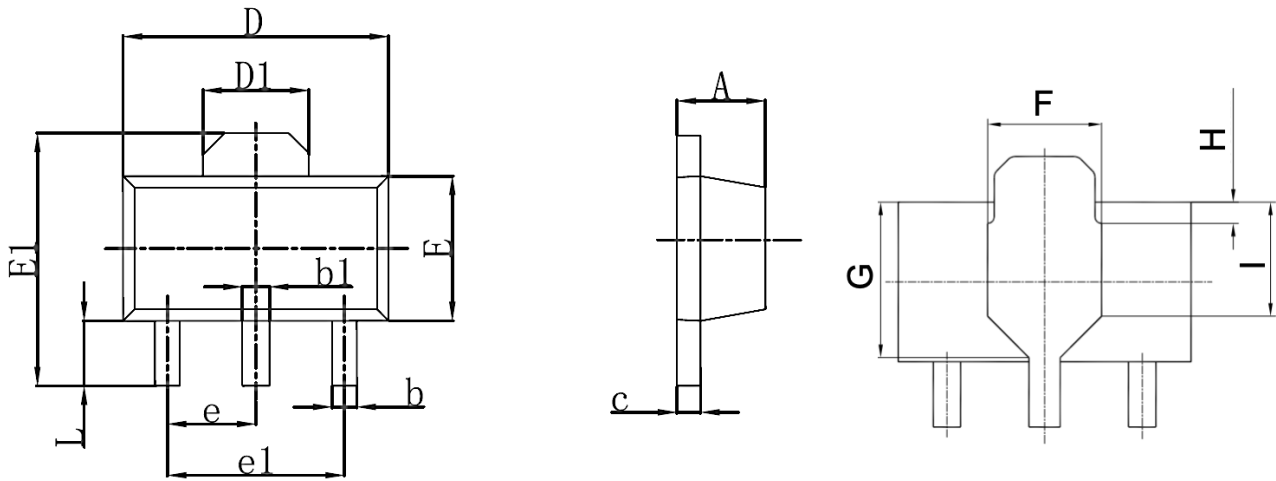


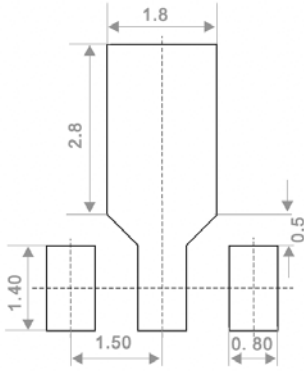
Figure 8. Power Dissipation vs. Ambient Temperature

**Package Outline Dimensions (SOT-89-3L)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047
F	1.750 REF.		0.069 REF.	
G	2.380 REF.		0.094 REF.	
H	0.320 REF.		0.013 REF.	
I	1.750 REF.		0.069 REF.	

**Recommended Pad Layout**



- Note:
1. Controlling dimension: in millimeters
  2. General tolerance:  $\pm 0.05\text{mm}$
  3. The pad layout is for reference purposes only

**Order Information**

Device	Package	Marking	Packaging	SPQ
GSBCX51	SOT-89-3L	AA	Tape & Reel	1,000pcs / Reel
GSBCX51-10	SOT-89-3L	AC	Tape & Reel	1,000pcs / Reel
GSBCX51-16	SOT-89-3L	AD	Tape & Reel	1,000pcs / Reel
GSBCX52	SOT-89-3L	AE	Tape & Reel	1,000pcs / Reel
GSBCX52-10	SOT-89-3L	AG	Tape & Reel	1,000pcs / Reel
GSBCX52-16	SOT-89-3L	AM	Tape & Reel	1,000pcs / Reel
GSBCX53	SOT-89-3L	AH	Tape & Reel	1,000pcs / Reel
GSBCX53-10	SOT-89-3L	AK	Tape & Reel	1,000pcs / Reel
GSBCX53-16	SOT-89-3L	AL	Tape & Reel	1,000pcs / Reel