

**Descriptions**

Silicon PNP transistor in a SOT-89 Plastic Package

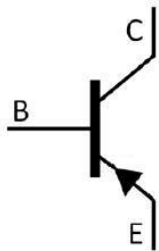
**Features**

- Low  $V_{CE(sat)}$
- Complements the 2SD1664
- Halogen-free product

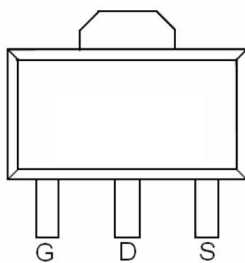
**Applications**

Medium power amplifier applications.

**Equivalent Circuit**



**Pinning**



SOT-89 top view

PIN1: Base    PIN 2: Collector    PIN 3: Emitter

**hFE Classifications & Marking**

h <sub>FE</sub> Classifications Symbol	P	Q	R
h <sub>FE</sub> Range	82~180	120~270	180~390
Marking	HBAP	HBAQ	HBAR

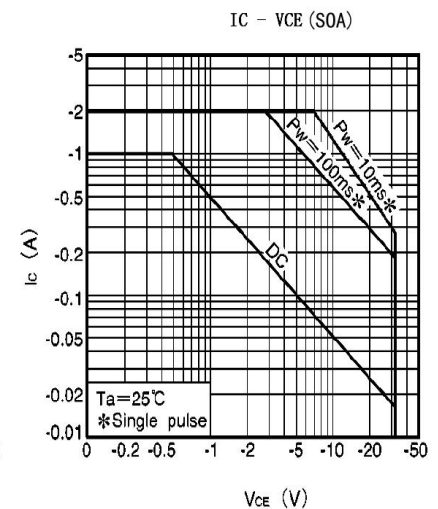
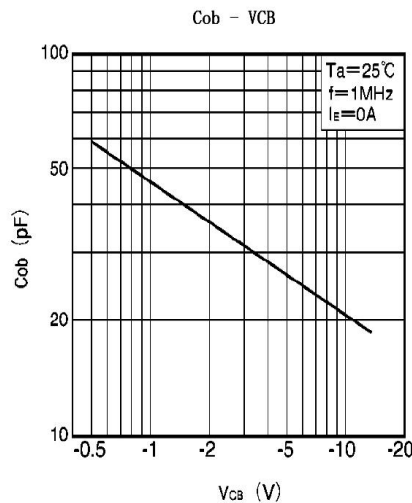
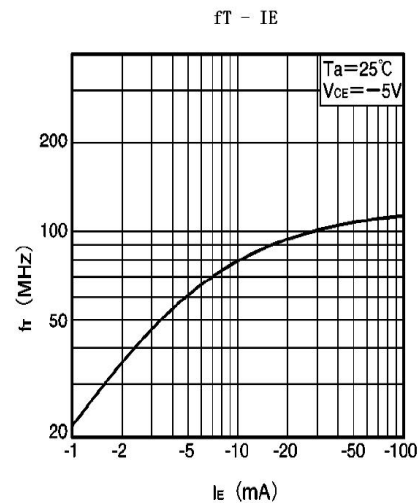
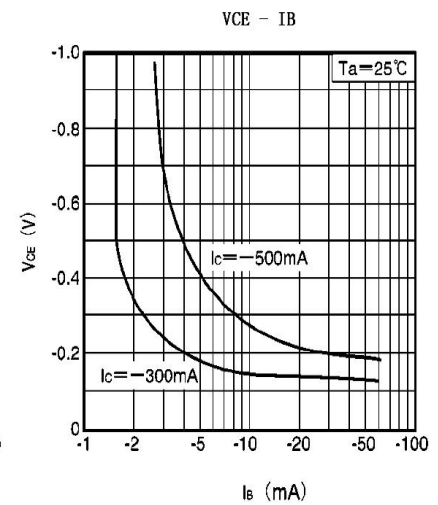
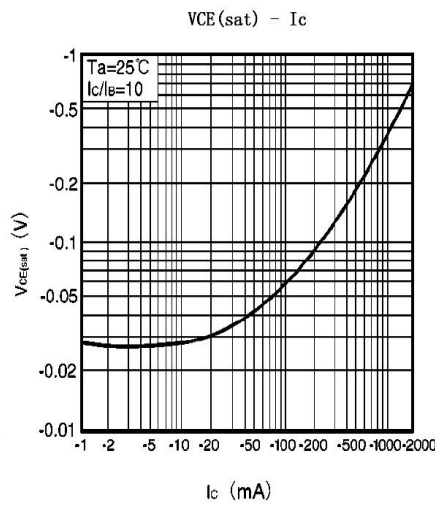
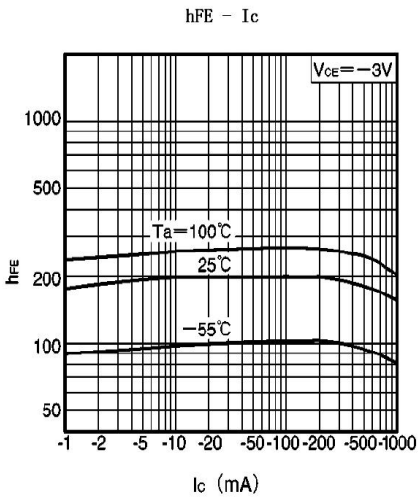
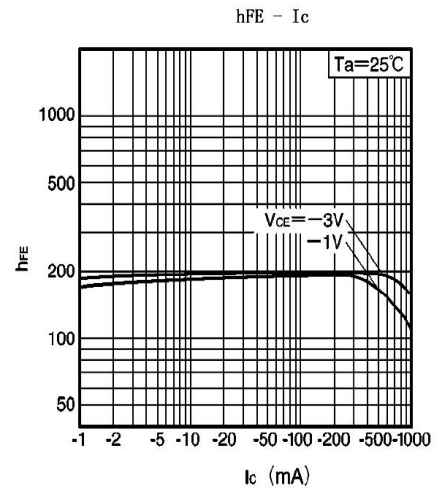
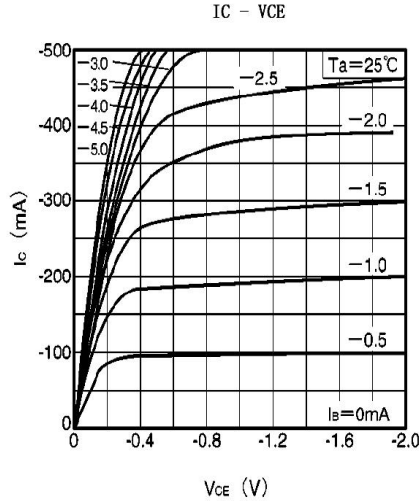
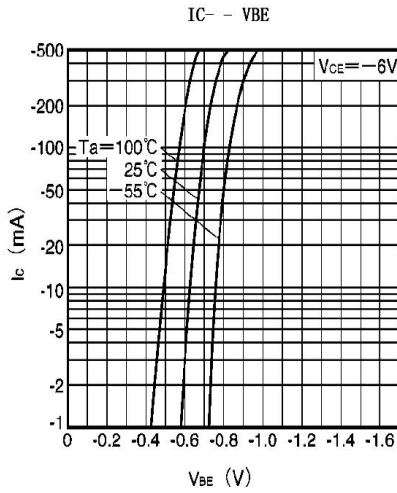
## Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Rating	Unit
Collector to Base Voltage	$V_{CBO}$	-40	V
Collector to Emitter Voltage	$V_{CEO}$	-32	V
Emitter to Base Voltage	$V_{EBO}$	-5.0	V
Collector Current-Continuous	$I_C$	-1.0	A
Collector Current-Continuous(Pulse)	$I_{CP}$	-2.0	A
Collector Power Dissipation	$P_C$	500	mW
Collector Power Dissipation	$P_C(T_C=25^\circ\text{C})$	2.0	W
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C

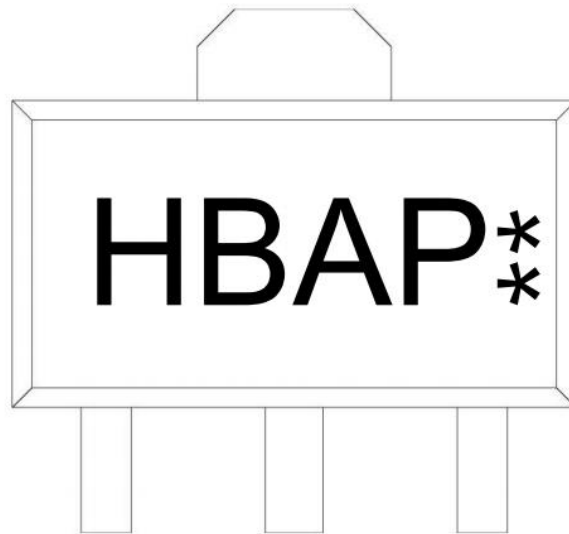
## Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector to Base Breakdown Voltage	$V_{CBO}$	$I_C=-50\mu\text{A}$ $I_B=0$	-40			V
Collector to Emitter Breakdown Voltage	$V_{CEO}$	$I_C=-1.0\text{mA}$ $I_B=0$	-32			V
Emitter to Base Breakdown Voltage	$V_{EBO}$	$I_E=-50\mu\text{A}$ $I_C=0$	-5.0			V
Collector Cut-Off Current	$I_{CBO}$	$V_{CB}=-20\text{V}$ $I_E=0$			-0.5	$\mu\text{A}$
Emitter Base Cut-Off Current	$I_{EBO}$	$V_{EB}=-4.0\text{V}$ $I_C=0$			-0.5	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=-3.0\text{V}$ $I_C=-0.1\text{A}$	82		390	
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-500\text{mA}$ $I_B=-50\text{mA}$		-0.2	-0.5	V
Transition Frequency	$f_T$	$V_{CE}=-5.0\text{V}$ $f=30\text{MHz}$ $I_E=50\text{mA}$		150		MHz
Collector Output Capacitance	$C_{ob}$	$V_{CB}=-10\text{V}$ $f=1.0\text{MHz}$ $I_E=0$		20	30	pF

Electrical Characteristic Curve



**Marking Instructions**



- ote:
- H: Company Code
- BA: Product Type
- P:  $h_{FE}$  Classifications Symbol
- \*\*:
- Lot No. Code, code change with Lot No

$h_{FE}$ Classifications Symbol	P	Q	R
$h_{FE}$ Range	82~180	120~270	180~390
Marking	HBAP	HBAQ	HBAR

**Packaging SPEC**

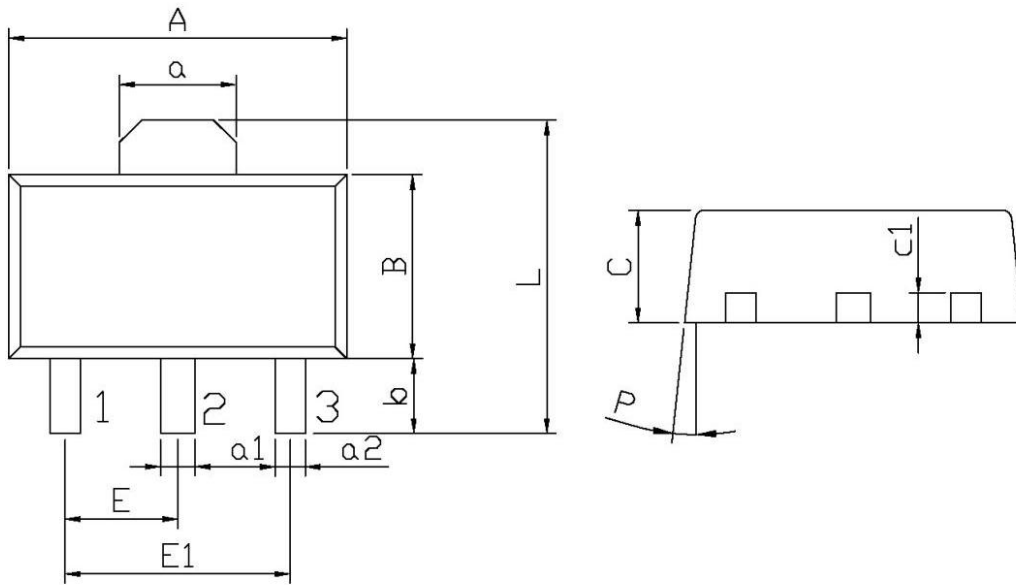
REEL INFORMATION

Package Type	Units					Dimension (unit: mm <sup>3</sup> )		
	Units/Reel	Reels/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Reel	Inner Box	Outer Box
SOT-89	1,000	7	7,000	8	56,000	7" x12	180x120x180	385x257x392

Package Outline Dimensions

SOT-89

单位: mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.4	4.7	a1	0.36	0.56
B	2.35	2.65	a2	0.30	0.50
L	3.878	4.478	C	1.40	1.70
a	1.45	1.65	c1	0.35	0.50
E	1.40	1.60	P	6°	
E1	2.80	3.20			
b	0.80	1.20			