

# General Purpose Transistor (-50V, -0.15A)

## 2SA1037AK / 2SA1576A / 2SA1774 / 2SA933AS

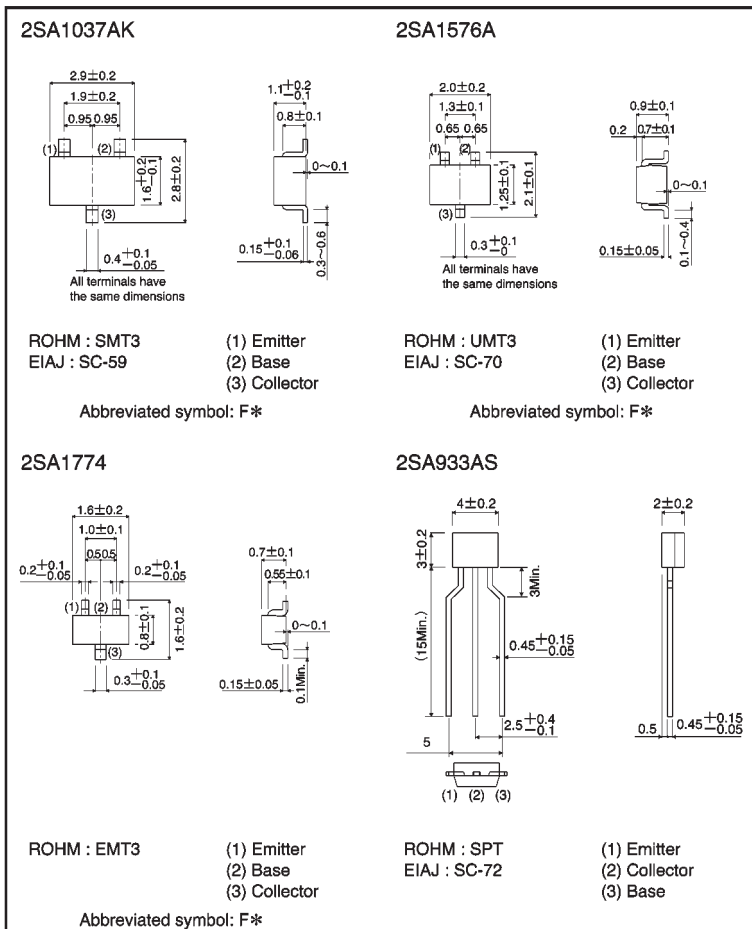
●Features

- 1) Excellent  $h_{FE}$  linearity.
- 2) Complements the 2SC2412K / 2SC4081 / 2SC4617 / 2SC1740S.

●Structure

Epitaxial planar type  
PNP silicon transistor

●External dimensions (Units: mm)



\* Denotes  $h_{FE}$

● Absolute maximum ratings ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CB0}$	-60	V
Collector-emitter voltage	$V_{CEO}$	-50	V
Emitter-base voltage	$V_{EBO}$	-6	V
Collector current	$I_c$	-0.15	A (DC)
Collector power dissipation	2SA1037AK, 2SA1576A	0.2	W
	2SA1774	0.15	
	2SA933AS	0.3	
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55~+150	$^\circ\text{C}$

● Electrical characteristics ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CB0}$	-60	—	—	V	$I_c = -50 \mu\text{A}$
Collector-emitter breakdown voltage	$BV_{CEO}$	-50	—	—	V	$I_c = -1\text{mA}$
Emitter-base breakdown voltage	$BV_{EBO}$	-6	—	—	V	$I_E = -50 \mu\text{A}$
Collector cutoff current	$I_{CBO}$	—	—	-0.1	$\mu\text{A}$	$V_{CB} = -60\text{V}$
Emitter cutoff current	$I_{EBO}$	—	—	-0.1	$\mu\text{A}$	$V_{EB} = -6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	-0.5	V	$I_c/I_B = -50\text{mA}/-5\text{mA}$
DC current transfer ratio	$h_{FE}$	120	—	560	—	$V_{CE} = -6\text{V}$ , $I_c = -1\text{mA}$
Transition frequency	$f_r$	—	140	—	MHz	$V_{CE} = -12\text{V}$ , $I_E = 2\text{mA}$ , $f = 30\text{MHz}$
Output capacitance	$C_{ob}$	—	4.0	5.0	pF	$V_{CB} = -12\text{V}$ , $I_E = 0\text{A}$ , $f = 1\text{MHz}$

● Packaging specifications and  $h_{FE}$ 

Type	$h_{FE}$	Package	Taping			
		Code	T146	T106	TL	TP
		Basic ordering unit (pieces)	3000	3000	3000	5000
2SA1037AK	QRS	○	—	—	—	
2SA1576A	QRS	—	○	—	—	
2SA1774	QRS	—	—	○	—	
2SA933AS	QRS	—	—	—	○	

$h_{FE}$  values are classified as follows:

Item	Q	R	S
$h_{FE}$	120~270	180~390	270~560

●Electrical characteristic curves

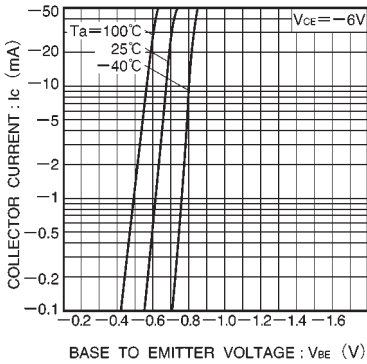


Fig.1 Grounded emitter propagation characteristics

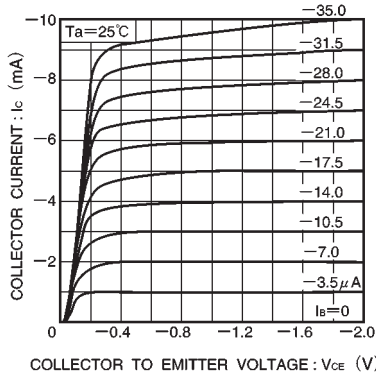


Fig.2 Grounded emitter output characteristics ( I )

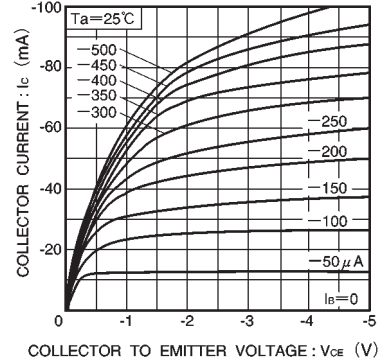


Fig.3 Grounded emitter output characteristics ( II )

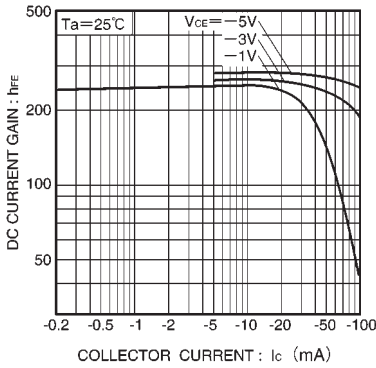


Fig.4 DC current gain vs. collector current ( I )

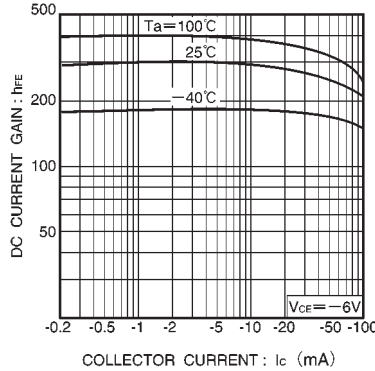


Fig.5 DC current gain vs. collector current ( II )

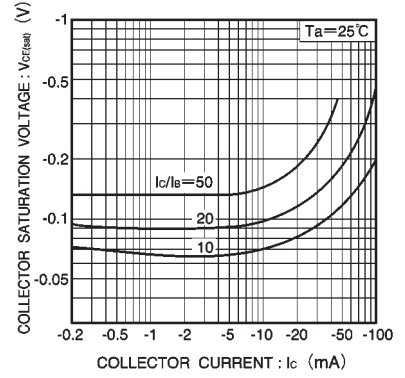


Fig.6 Collector-emitter saturation voltage vs. collector current ( I )

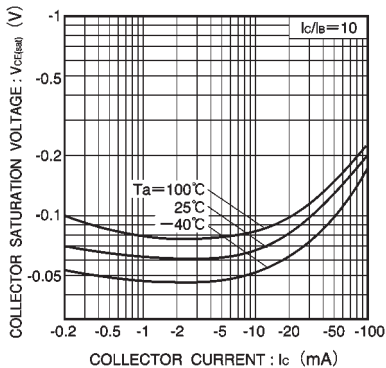


Fig.7 Collector-emitter saturation voltage vs. collector current ( II )

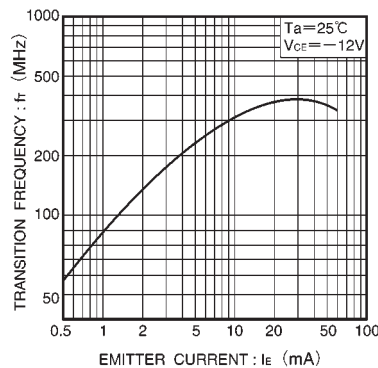


Fig.8 Gain bandwidth product vs. emitter current

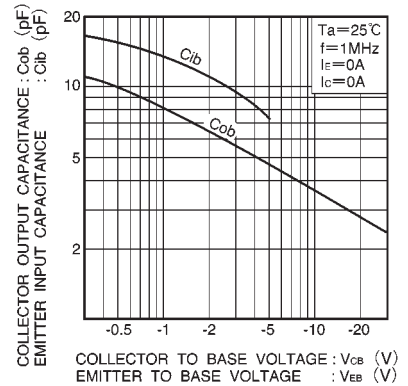


Fig.9 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage