General Purpose Transistor (–50V, –0.15A)

2SA1037AK / 2SA1576A / 2SA1774 / 2SA2029 / 2SA933AS

●Features

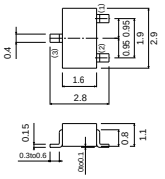
1) Excellent h_{FE} linearity.
2) Complements the 2SC2412K / 2SC4081 / 2SC4617 / 2SC5658 / 2SC1740S.

●Structure

Epitaxial planar type.
PNP silicon transistor

●External dimensions (Units : mm)

2SA1037AK



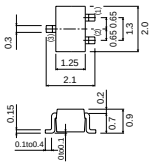
Each lead has same dimensions

ROHM : SMT3
EIAJ : SC-59

(1) Emitter
(2) Base
(3) Collector

Abbreviated symbol : F ∗

2SA1576A



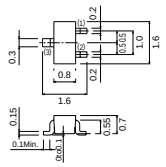
Each lead has same dimensions

ROHM : UMT3
EIAJ : SC-70

(1) Emitter
(2) Base
(3) Collector

Abbreviated symbol : F ∗

2SA1774

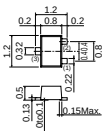


ROHM : EMT3
EIAJ : SC-75A

(1) Emitter
(2) Base
(3) Collecto

Abbreviated symbol : F ∗

2SA2029

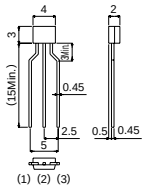


ROHM : VMT3
EIAJ :

(1) Base
(2) Emitter
(3) Collector

Abbreviated symbol : F ∗

2SA933AS



Taping specifications

ROHM : SPT
EIAJ : SC-72

(1) Emitter
(2) Collector
(3) Base

∗ Denotes h_{FE}

●**Absolute maximum ratings** (Ta=25°C)

Parameter		Symbol	Limits	Unit
Collector-base voltage		V_{CBO}	–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	P_C	0.2	W
	2SA2029, 2SA1774		0.15	
	2SA933AS		0.3	
Junction temperature		Tj	150	˚C
Storage temperature		Tstg	–55~+150	˚C

●**Electrical characteristics** (Ta=25°C)

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

●**Packaging specifications and h_{FE}**

Type	h_{FE}	Package	Taping				
		Code	T146	T106	TL	T2L	TP
		Basic ordering unit (pieces)	3000	3000	3000	8000	5000
2SA2029	QRS		–	–	–	○	–
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

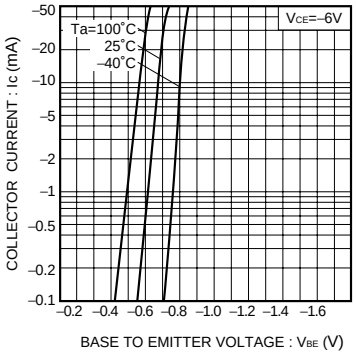


Fig.1 Grounded emitter propagation characteristics

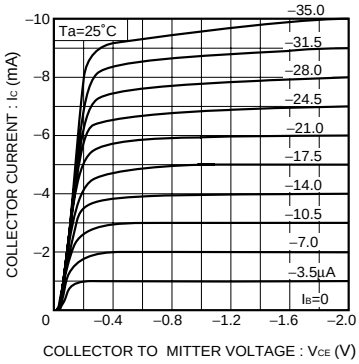


Fig.2 Grounded emitter output characteristics (I)

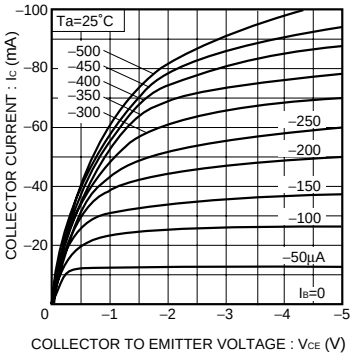


Fig.3 Grounded emitter output characteristics (II)

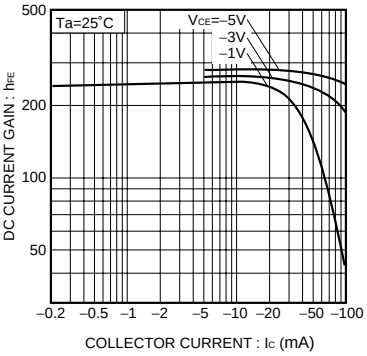


Fig.4 DC current gain vs. collector current (I)

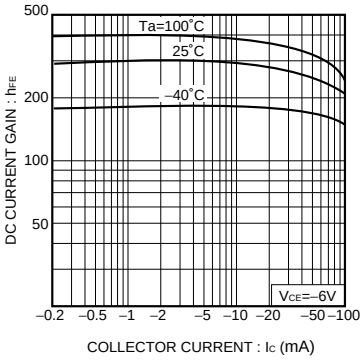


Fig.5 DC current gain vs. collector current (II)

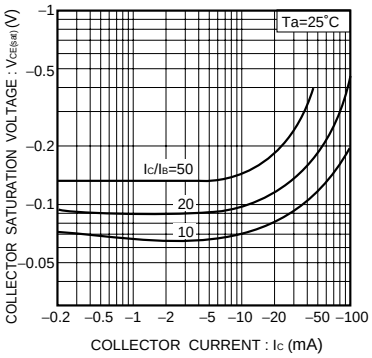


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

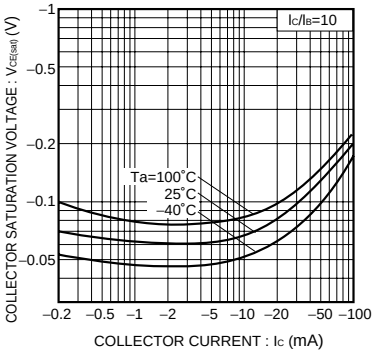


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

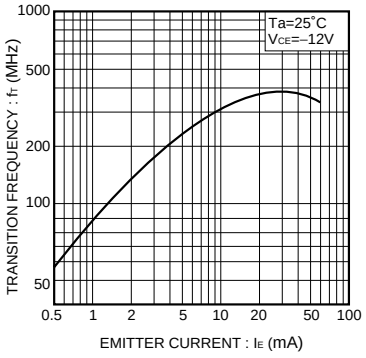


Fig.8 Gain bandwidth product vs. emitter current

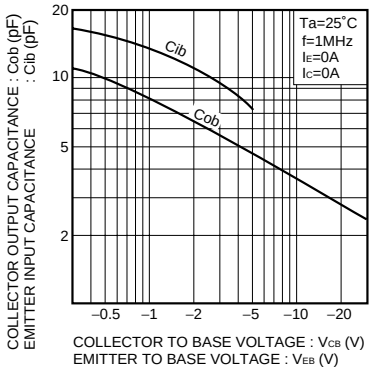


Fig.9 Collector output capacitance vs. collector-base voltage
Emitter inputcapacitance vs. emitter-base voltage