

Silicon PNP transistor epitaxial type AP940

[Applications]

Switching and low frequency signal amplifier

[Feature]

MMBT4403 Compatible electrical characteristics

High level collector current $I_C = -600\text{mA}$

DC current gain certified at high collector current $hFE \geq 20$ at $I_C = -500\text{mA}$

Suitable for small package with shrunked chip size

[Absolute maximum ratings (Ta=25C)]

Characteristic	Symbol	Maximum ratings	Unit
Collector-base voltage	VCBO	-40	V
Collector-emitter voltage	VCEO	-40	V
Emitter-base voltage	VEBO	-5	V
Collector current	IC	-600	mA
Junction temperature	Tj	150	C
Storage temperature	Tstg	-55 to 150	C

[Electrical characteristics (Ta=25C)]

Characteristic	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BVCBO	-40	-	-	V	$I_C = -100\mu\text{A}$, $I_E = 0\text{A}$
Collector-emitter breakdown voltage	BVCEO	-40	-	-	V	$I_C = -1\text{mA}$, $I_B = 0\text{A}$
Emitter-base breakdown voltage	BVEBO	-5	-	-	V	$I_E = -100\mu\text{A}$, $I_C = 0\text{A}$
Collector cut-off current	ICEX	-	-	-100	nA	$V_{CE} = -35\text{V}$, $V_{EB} = -0.4\text{V}$
Emitter cut-off current	IEBO	-	-	-100	nA	$V_{EB} = -5\text{V}$, $I_C = 0\text{A}$
DC current gain 1	hFE 1	30	-	-	-	$V_{CE} = -1\text{V}$, $I_C = -0.1\text{mA}$
DC current gain 2	hFE 2	60	-	-	-	$V_{CE} = -1\text{V}$, $I_C = -1\text{mA}$
DC current gain 3	hFE 3	100	-	-	-	$V_{CE} = -1\text{V}$, $I_C = -10\text{mA}$
DC current gain 4	hFE 4	100	-	300	-	$V_{CE} = -2\text{V}$, $I_C = -150\text{mA}^*$
DC current gain 5	hFE 5	20	-	-	-	$V_{CE} = -2\text{V}$, $I_C = -500\text{mA}^*$
Collector-emitter saturation voltage 1	$V_{CE(sat)1}$	-	-	-0.4	V	$I_C = -150\text{mA}$, $I_B = -15\text{mA}^*$
Collector-emitter saturation voltage 2	$V_{CE(sat)2}$	-	-	-0.75	V	$I_C = -500\text{mA}$, $I_B = -50\text{mA}^*$
Base-emitter saturation voltage 1	$V_{BE(sat)1}$	-0.75	-	-0.95	V	$I_C = -150\text{mA}$, $I_B = -15\text{mA}^*$
Base-emitter saturation voltage 2	$V_{BE(sat)2}$	-	-	-1.3	V	$I_C = -500\text{mA}$, $I_B = -50\text{mA}^*$
Transition frequency	f T	200	-	-	MHz	$V_{CE} = -10\text{V}$, $I_E = 20\text{mA}$
Collector output capacitance	Cob	-	-	8.5	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$
Collector input capacitance	Cib	-	-	30	pF	$V_{EB} = -0.5\text{V}$, $f = 1\text{MHz}$
Delay time	td	-	-	15	ns	$V_{CC} = -30\text{V}$, $V_{BE} = 2\text{V}$
Rise time	tr	-	-	20	ns	$I_C = -150\text{mA}$, $I_B = -15\text{mA}$
Storage time	tstg	-	-	225	ns	$V_{CC} = -30\text{V}$, $I_C = -150\text{mA}$
Fall time	tf	-	-	30	ns	$I_{B1} = -I_{B2} = -15\text{mA}$

*pulse test

Notice 1) These are measured data of transistors assembled by PHENITEC SEMICONDUCTOR Corp. and are for reference only.

Notice 2) The contents described herein are subject to change without notice.

Fig.1 hFE - IC
at VCE= -1V, Ta= 25C

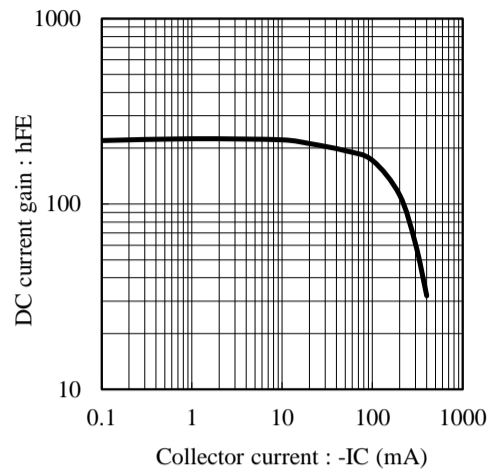


Fig.2 hFE - IC
at VCE= -2V, Ta= 25C

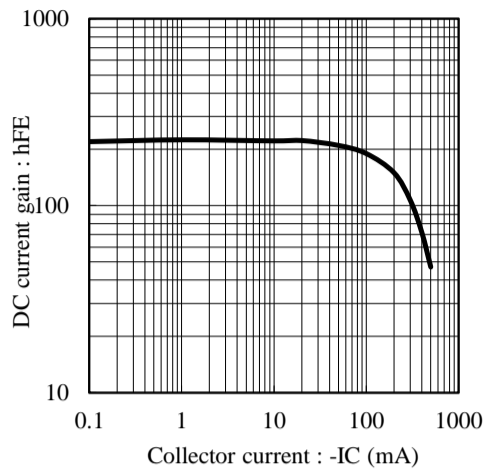


Fig.3 VCE(sat) - IC
at IC/IB= 10, Ta= 25C

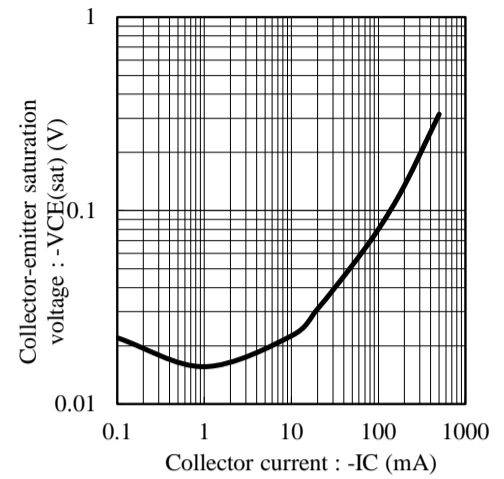


Fig.4 VBE(sat) - IC
at IC/IB= 10, Ta= 25C

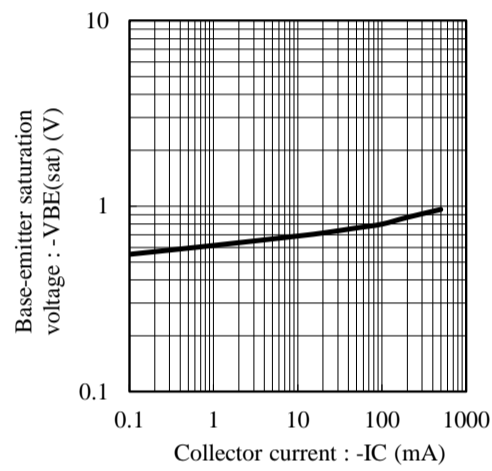


Fig.5 fT - IE
at VCE= -20V, Ta= 25C

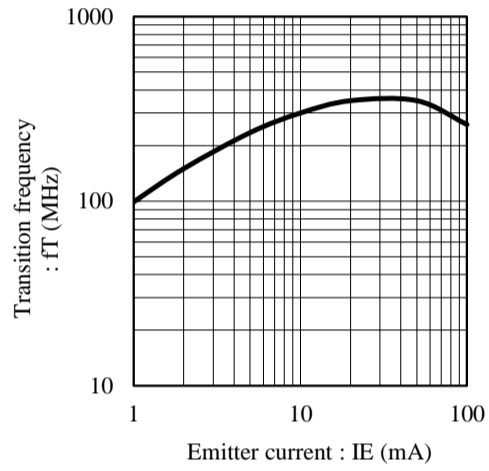


Fig.6 Cob - VCB
at f= 1MHz, Ta= 25C

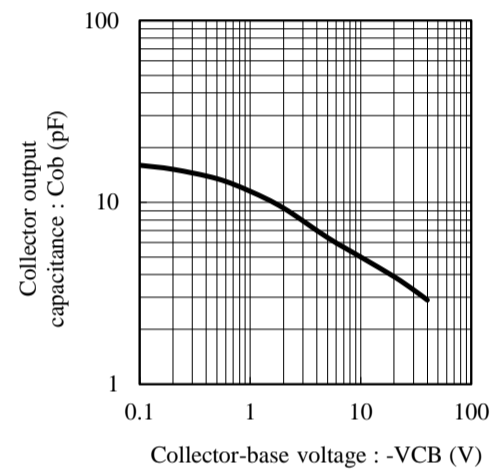


Fig.7 Cib - VEB
at f= 1MHz, Ta= 25C

