

**Silicon NPN transistor epitaxial type**  
**C5901**

**[ Applications ]**

DC to DC conversion, MOSFET gate driving  
Motor control, Power switching, Automotive applications

**[ Feature ]**

Very low collector saturation voltage  $V_{CE(sat)} = 280\text{mV}$  (Max.) at  $I_C = 1\text{A}$ ,  $I_B = 100\text{mA}$   
PNP complementary pair with A5901

**[ Absolute maximum ratings (Ta=25°C) ]**

Characteristic	Symbol	Maximum ratings	Unit
Collector-base voltage	VCBO	80	V
Collector-emitter voltage	VCEO	60	V
Emitter-base voltage	VEBO	5	V
Collector current (DC)	IC	1	A
Collector current (Pulse) *	ICP	2	A
Base current (DC)	IB	0.3	A
Base current (Pulse) *	IBP	1	A
Junction temperature	Tj	150	C
Storage temperature	Tstg	-55 to 150	C

\* Pulse<1ms

**[ Electrical characteristics (Ta=25°C) ]**

Characteristic	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BVCBO	80	-	-	V	$I_C = 100\mu\text{A}$ , $I_E = 0\text{A}$
Collector-emitter breakdown voltage	BVCEO	60	-	-	V	$I_C = 10\text{mA}$ , $I_B = 0\text{A}$
Emitter-base breakdown voltage	BVEBO	5	-	-	V	$I_E = 100\mu\text{A}$ , $I_C = 0\text{A}$
Collector cut-off current	ICBO	-	-	100	nA	$V_{CB} = 60\text{V}$ , $I_E = 0\text{A}$
Collector cut-off current	ICES	-	-	100	nA	$V_{CES} = 60\text{V}$
Emitter cut-off current	IEBO	-	-	100	nA	$V_{EB} = 5\text{V}$ , $I_C = 0\text{A}$
DC current gain 1	hFE 1	200	-	-	-	$V_{CE} = 5\text{V}$ , $I_C = 1\text{mA}$
DC current gain 2	hFE 2	200	-	-	-	$V_{CE} = 5\text{V}$ , $I_C = 500\text{mA}$
DC current gain 3	hFE 3	100	-	-	-	$V_{CE} = 5\text{V}$ , $I_C = 1\text{A}$
Collector-emitter saturation voltage 1	$V_{CE(sat)1}$	-	-	115	mV	$I_C = 100\text{mA}$ , $I_B = 1\text{mA}$
Collector-emitter saturation voltage 2	$V_{CE(sat)2}$	-	-	150	mV	$I_C = 500\text{mA}$ , $I_B = 50\text{mA}$
Collector-emitter saturation voltage 3	$V_{CE(sat)3}$	-	-	280	mV	$I_C = 1\text{A}$ , $I_B = 100\text{mA}$
Base-emitter saturation voltage	$V_{BE(sat)}$	-	-	1.1	V	$I_C = 1\text{A}$ , $I_B = 50\text{mA}$
Base-emitter on voltage	$V_{BE(on)}$	-	-	0.9	V	$V_{CE} = 5\text{V}$ , $I_C = 1\text{A}$
Transition frequency	fT	150	-	-	MHz	$V_{CE} = 10\text{V}$ , $I_E = -50\text{mA}$
Collector output capacitance	Cob	-	-	10	pF	$V_{CB} = 10\text{V}$ , $f = 1\text{MHz}$ , $I_E = 0\text{A}$
Delay time	td	-	12	-	ns	$V_{CC} = 40\text{V}$ , $I_C = 500\text{mA}$ $I_{B1} = -I_{B2} = 25\text{mA}$
Rise time	tr	-	78	-	ns	
Turn on time	ton	-	90	-	ns	
Storage time	tstg	-	340	-	ns	
Fall time	tf	-	160	-	ns	
Turn off time	toff	-	500	-	ns	

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 IC - VBE(on)  
at VCE= 5V, Ta= 25C

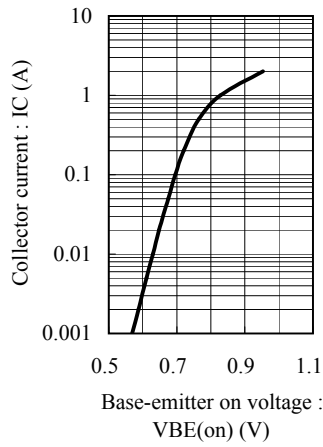


Fig.2 hFE - IC  
at VCE= 5V, Ta= 25C

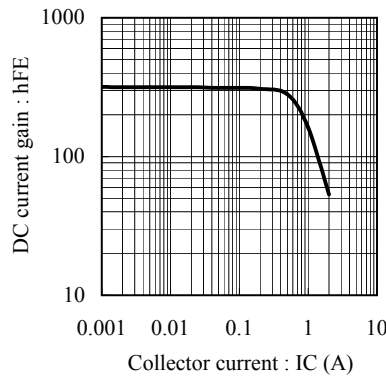


Fig.3 VCE(sat) - IC  
at IC/IB= 10, Ta= 25C

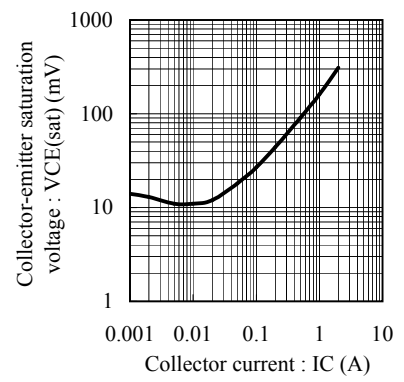


Fig.4 VCE(sat) - IC  
at IC/IB=100, Ta= 25C

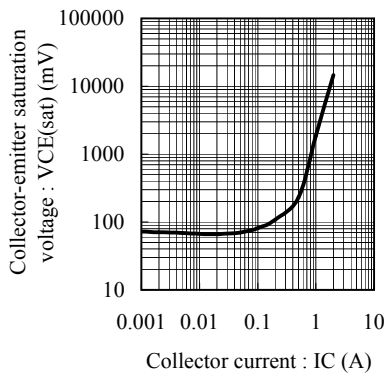


Fig.5 VBE(sat) - IC  
at IC/IB= 20, Ta= 25C

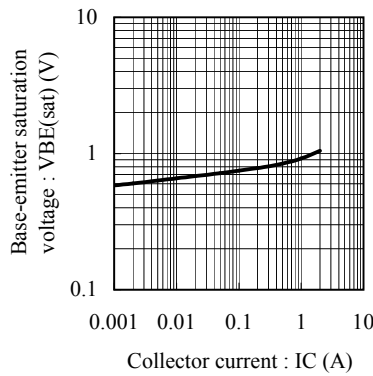


Fig.6 fT - IE  
at VCE= 10V, Ta= 25C

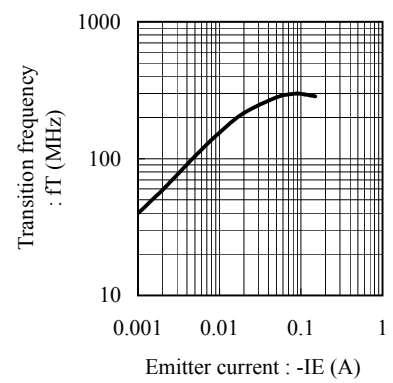


Fig.7 Cob - VCB  
at f= 1MHz, Ta= 25C

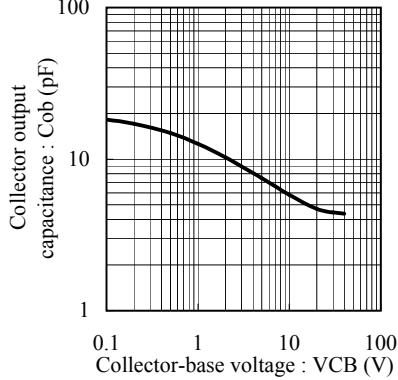


Fig.8 Cib - VEB  
at f= 1MHz, Ta= 25C

