



## 2SA1607/2SC4168

### High-Speed Switching Applications

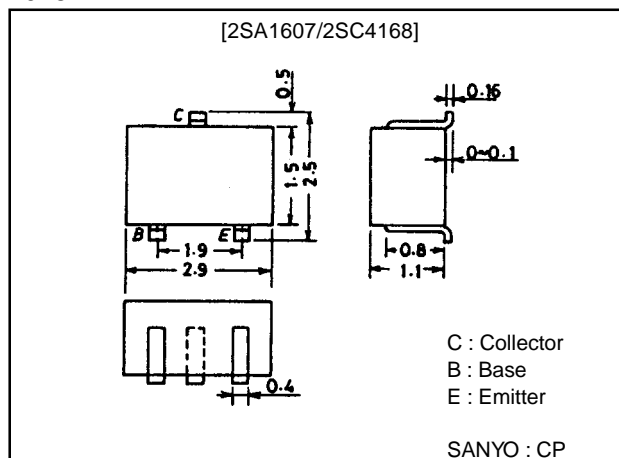
#### Features

- Fast switching speed.
- High gain-bandwidth product.
- Low saturation voltage.

#### Package Dimensions

unit:mm

2018A



(): 2SA1607

#### Specifications

##### Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-)40	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-)20	V
Emitter-to-Base Voltage	$V_{EBO}$		(-)5	V
Collector Current	$I_C$		(-)150	mA
Collector Current (Pulse)	$I_{CP}$		(-)300	mA
Base Current	$I_B$		(-)30	mA
Collector Dissipation	$P_C$		200	mW
Junction Temperature	$T_J$		150	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

##### Electrical Characteristics at Ta = 25°C

Parameter	Symbol	Conditions	Ratings		Unit	
			min	typ		max
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)30V, I_E=0$			(-)0.1	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4V, I_C=0$			(-)0.1	$\mu A$
DC Current Gain	$h_{FE}$	$V_{CE}=(-)1V, I_C=(-)10mA$	60*		270*	
					(180)	
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10V, I_C=(-)10mA$		700		MHz
				(400)		MHz

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**SANYO Electric Co., Ltd. Semiconductor Business Headquarters**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output Capacitance	$C_{ob}$	$V_{CB} = (-)10V, f = 1MHz$		(2.9)		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = (-)10mA, I_B = (-)1mA$		2.6		pF
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = (-)10mA, I_B = (-)1mA$		0.08	(-0.2)	V
				(-0.07)		V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10\mu A, I_E = 0$		0.72	(-1.0)	V
				(-0.75)		V
Collector-to-Base Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$				V
Collector-to-Base Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$				V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)10\mu A, I_C = 0$				V
Delay Time	$t_d$	See specified Test Circuit		(14)11	20	ns
Rise Time	$t_r$	See specified Test Circuit		(11)10	20	ns
Storage Time	$t_{stg}$	See specified Test Circuit		(80)70	180	ns
Fall Time	$t_f$	See specified Test Circuit		(16)15	25	ns

\* : The 2SA1607/2SC4168 are classified by 10mA  $h_{FE}$  as follows :

2SA1607	60	3	120	90	4	180			
2SC4168	60	3	120	90	4	180	135	5	270

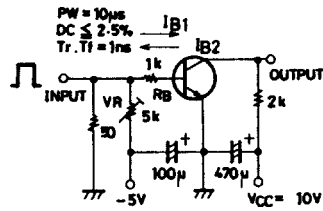
Marking 2SA1607 : YL

2SC4168 : GT

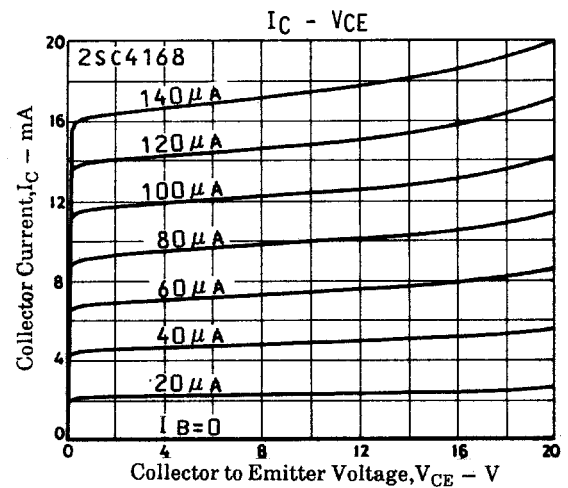
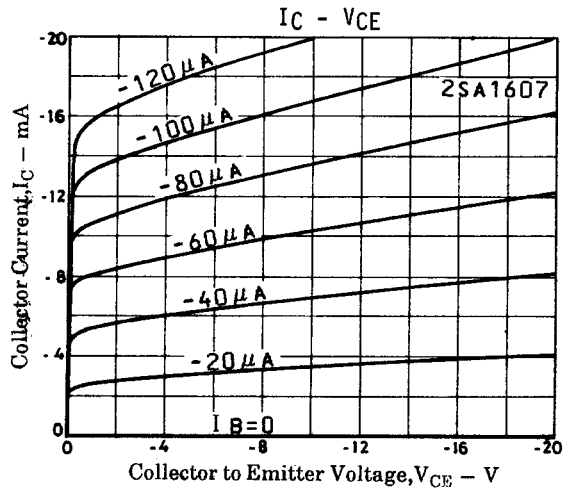
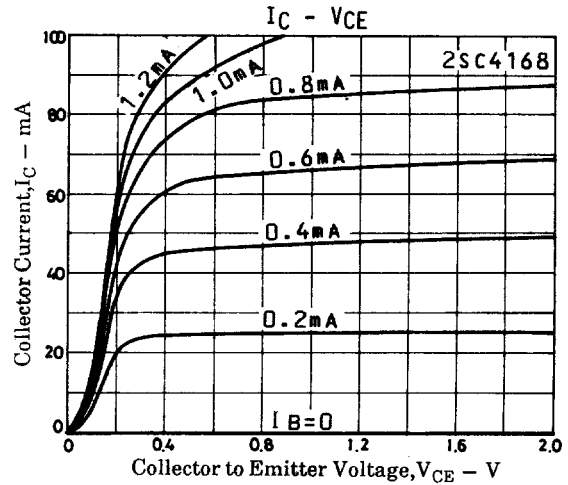
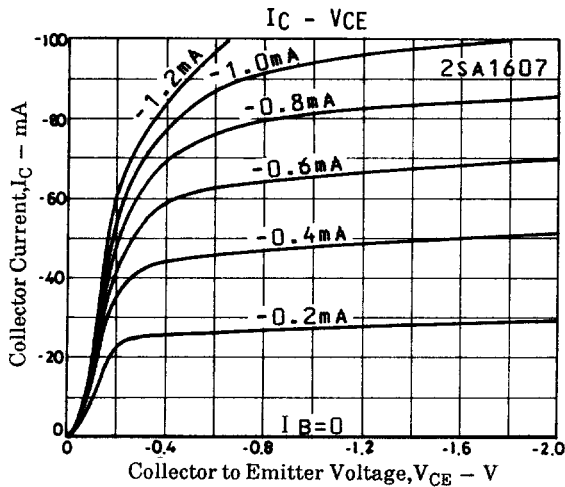
$h_{FE}$  rank 2SA1607 : 3, 4

2SC4168 : 3, 4, 5

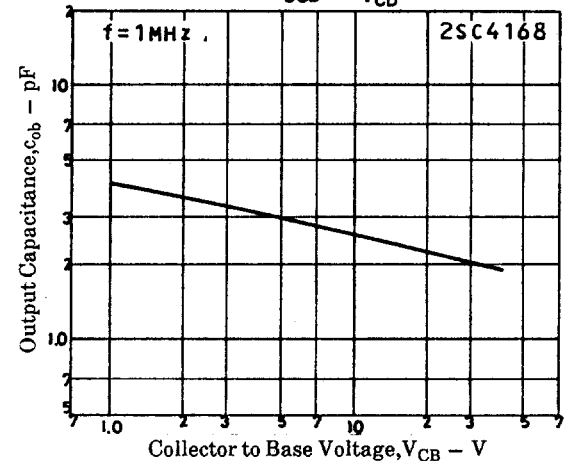
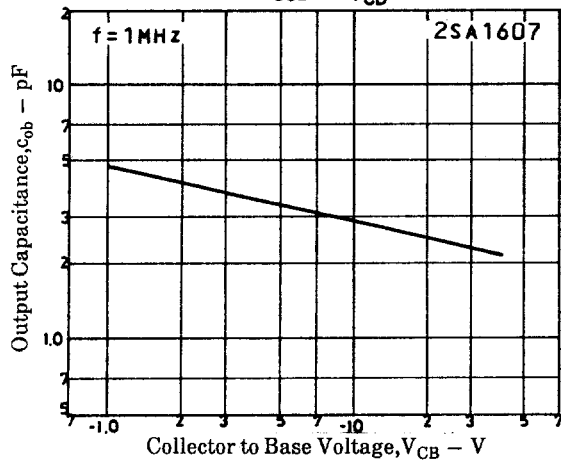
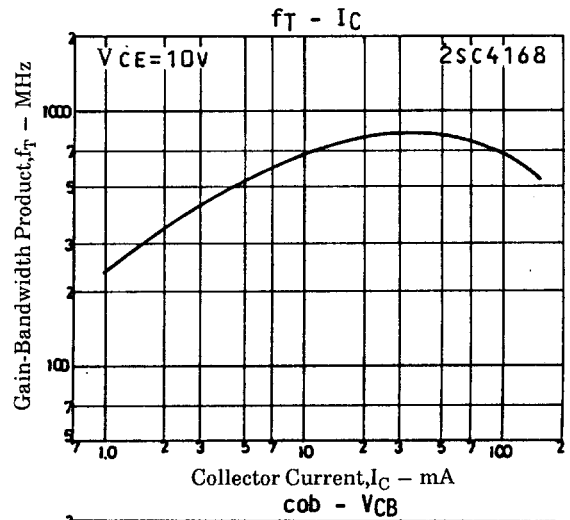
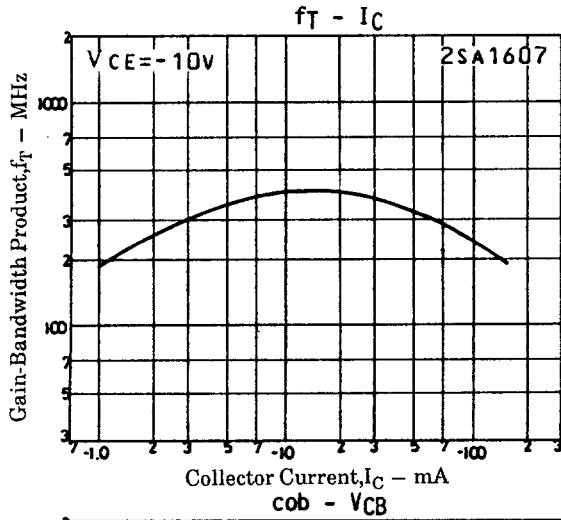
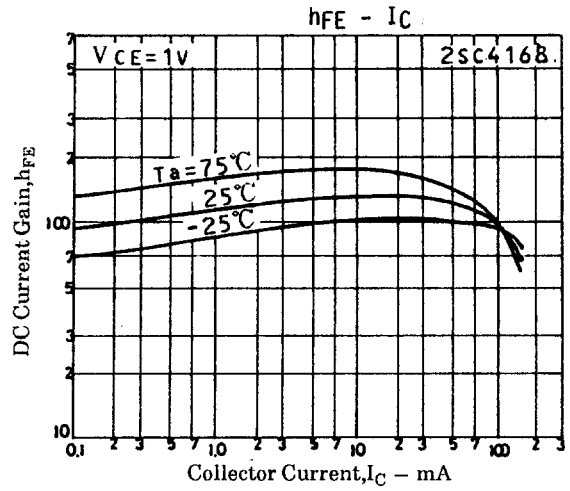
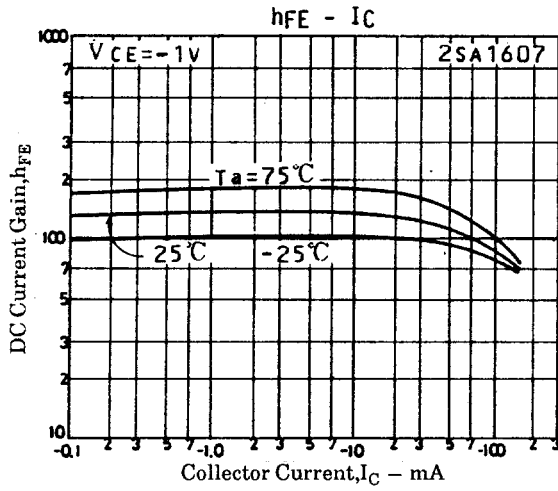
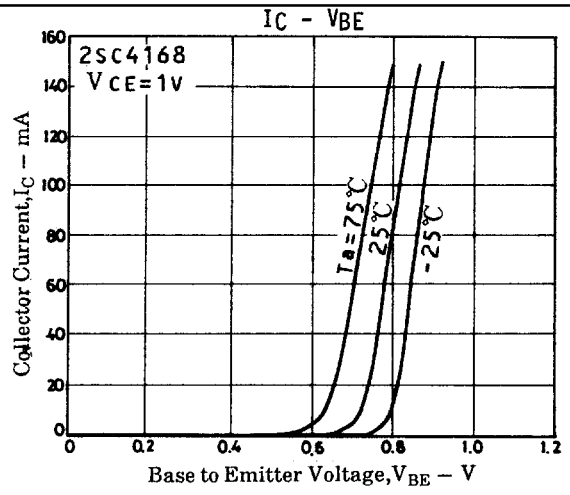
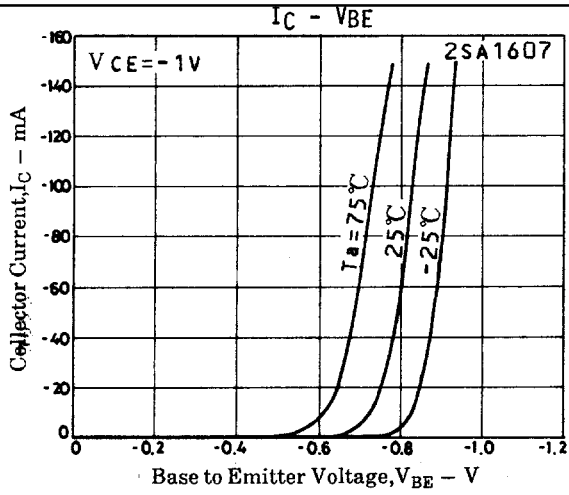
### Switching Time Test Circuit



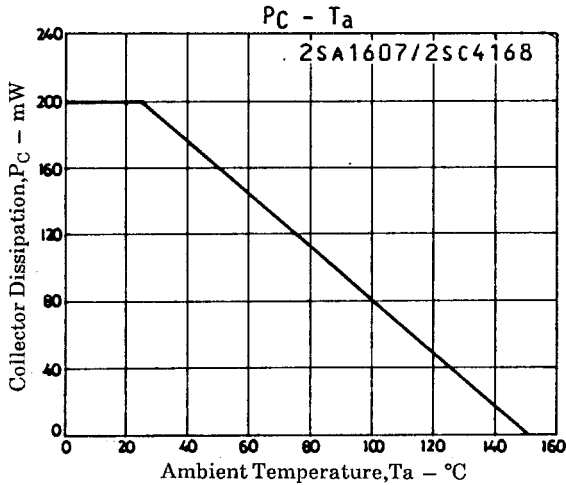
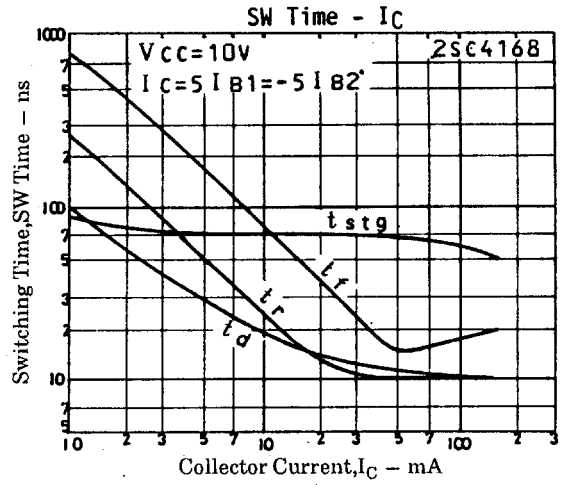
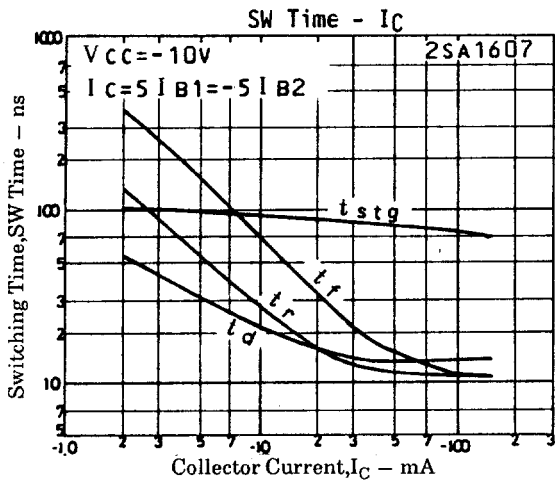
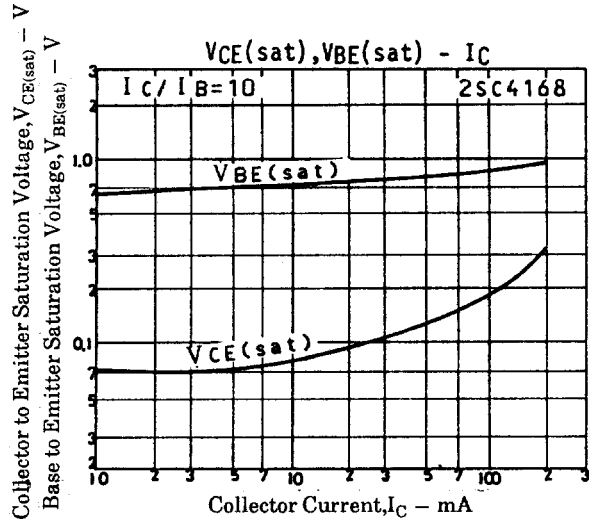
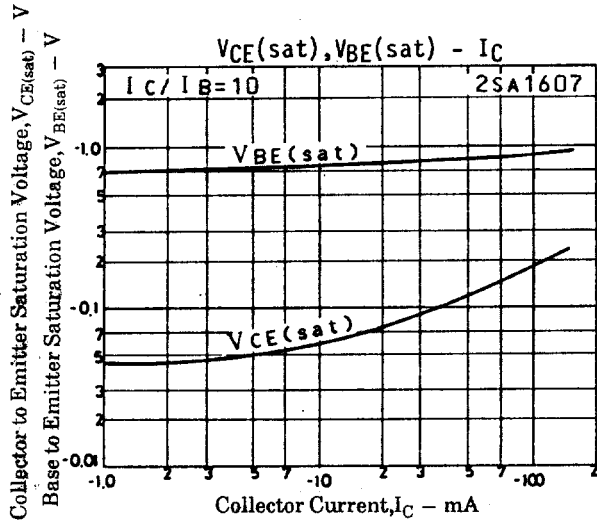
$5I_{B1} = -5I_{B2} = I_C = 50mA$   
 (For PNP, the polarity is reserved.)  
 Unit (resistance : Ω, capacitance : F)



# 2SA1607/2SC4168



# 2SA1607/2SC4168



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