



2SA1607/2SC4168

High-Speed Switching Applications

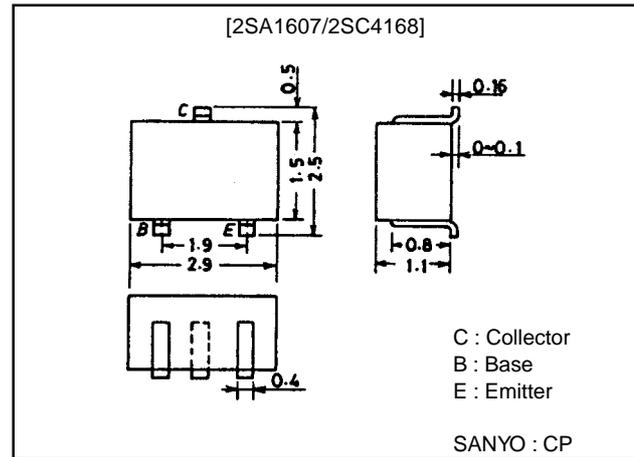
Features

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

Package Dimensions

unit:mm

2018A



() : 2SA1607

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

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	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Electrical Characteristics at $T_a = 25^\circ\text{C}$

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

Continued on next page.

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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
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = (-)10mA, I_B = (-)1mA$		0.08	(-0.2)	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = (-)10mA, I_B = (-)1mA$		(-0.07)		V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = (-)10mA, I_B = (-)1mA$		0.72	(-1.0)	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10\mu A, I_E = 0$		(-40)		V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$		(-20)		V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)10\mu A, I_C = 0$		(-5)		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

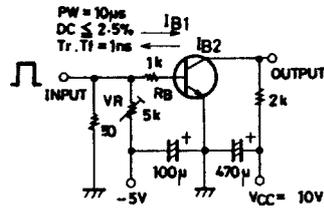
Marking 2SA1607 : YL

2SC4168 : GT

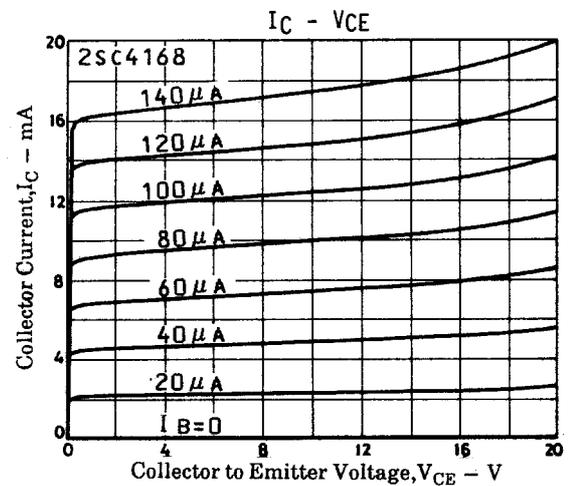
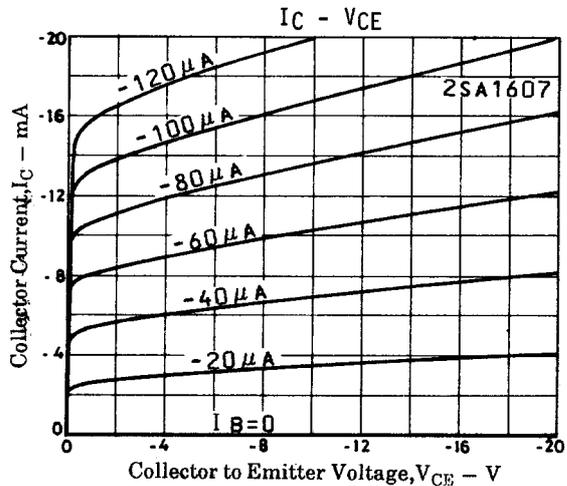
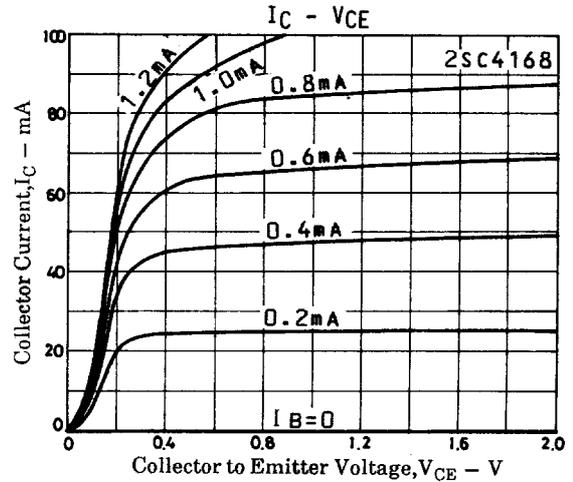
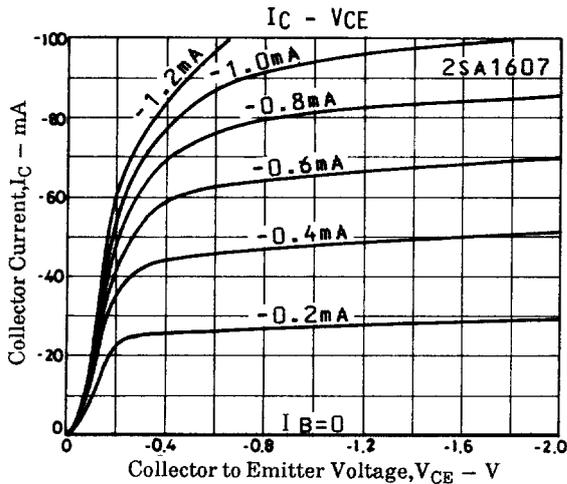
h_{FE} rank 2SA1607 : 3, 4

2SC4168 : 3, 4, 5

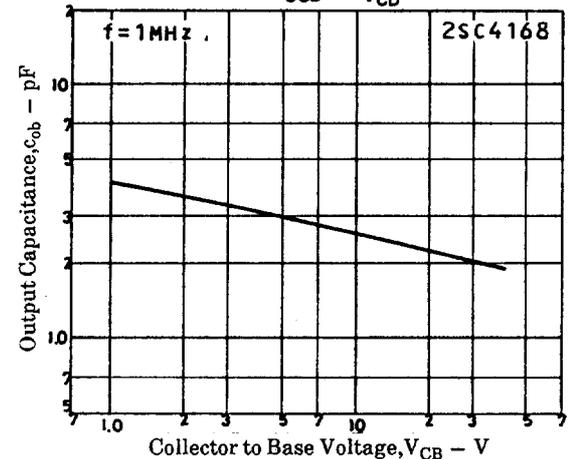
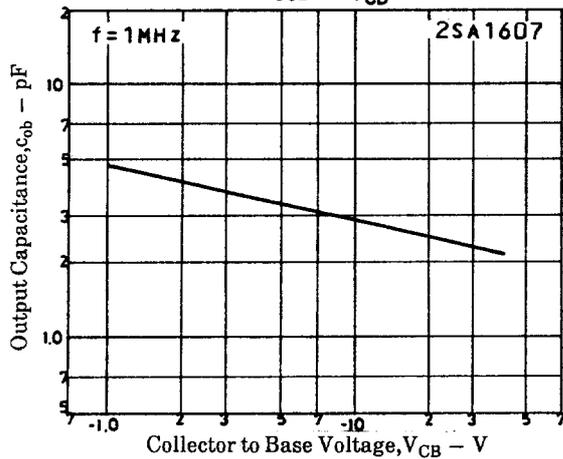
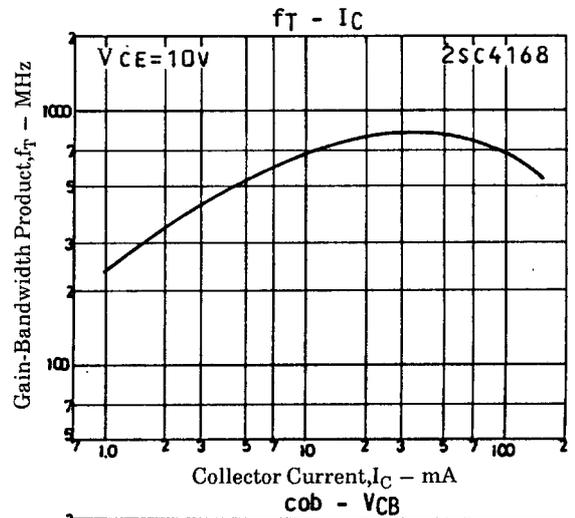
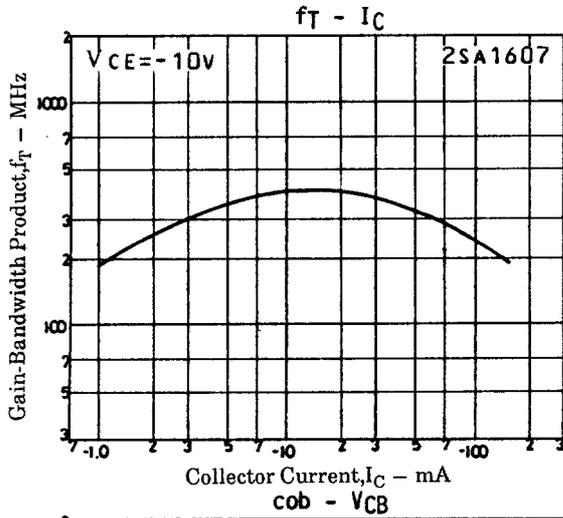
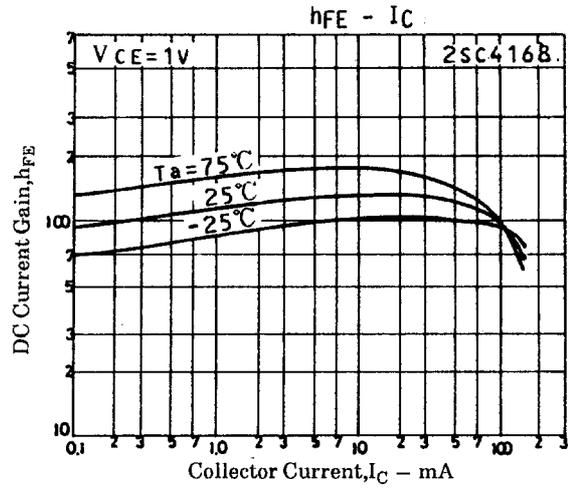
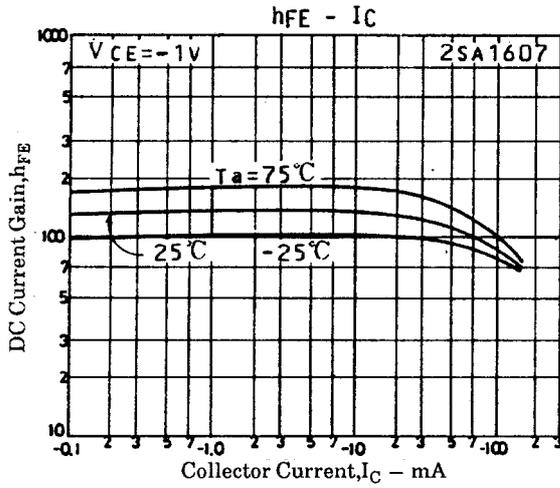
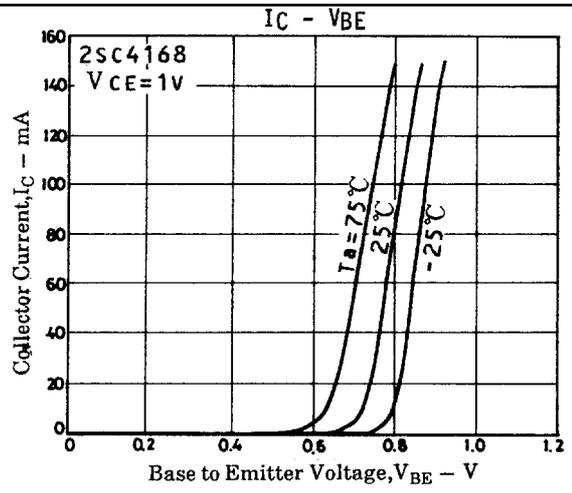
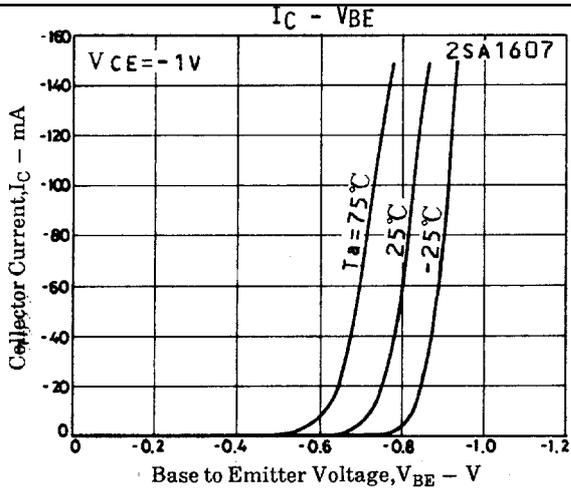
Switching Time Test Circuit



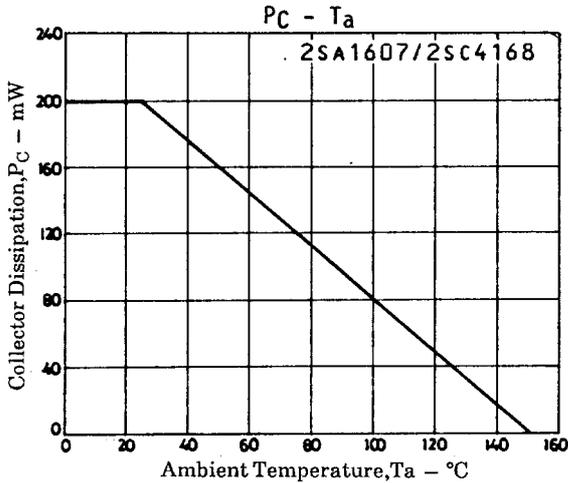
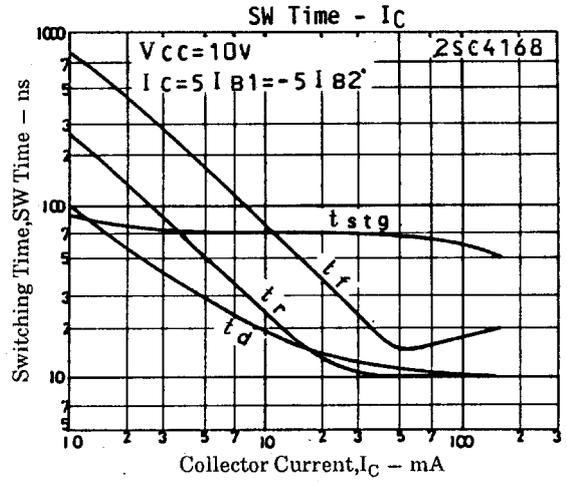
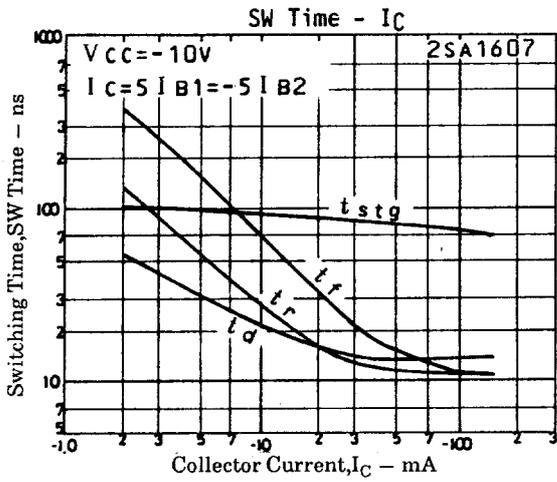
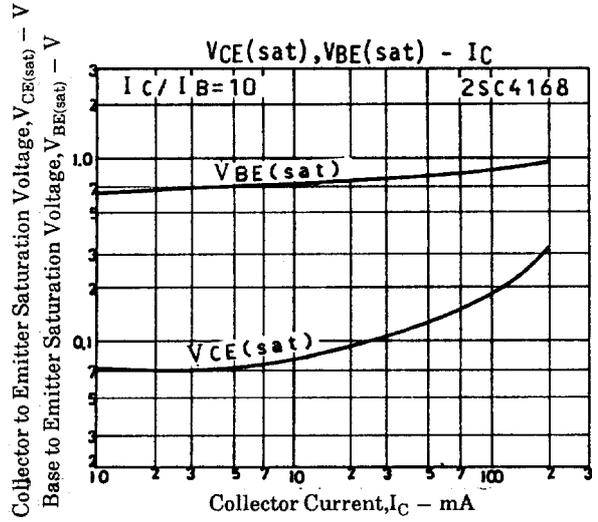
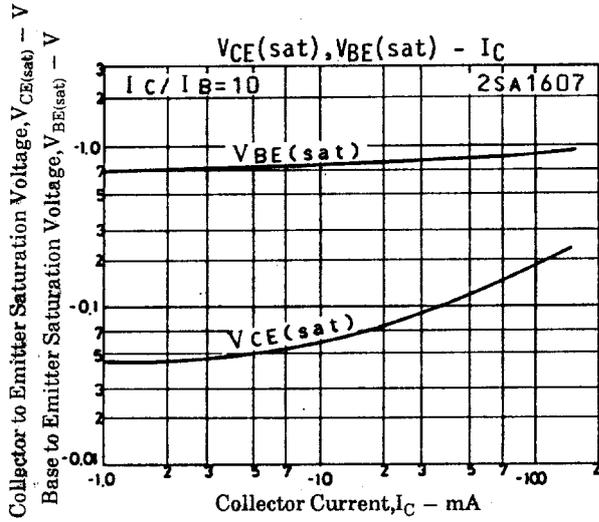
$5I_{B1} = -5I_{B2} = I_C = 50mA$
 (For PNP, the polarity is reserved.)
 Unit (resistance : Ω , capacitance : F)



2SA1607/2SC4168



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