



# 2SA1769/2SC4613

## 160V/700mA Switching Applications

### Applications

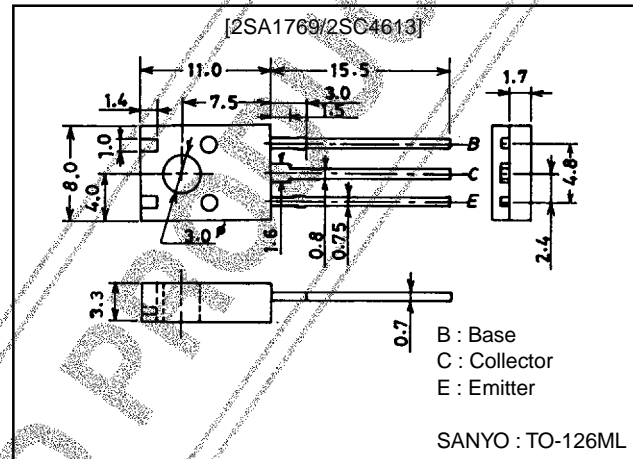
- Color TV audio output, conveter, inverter.

### Features

- Adoption of MBIT processes.
- High breakdown voltage and large current capacity.
- Fast switching speed.

### Package Dimensions

unit:mm  
2042A



( ) : 2SA1769

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CBO}$		(-)180	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-)160	V
Emitter-to-Base Voltage	$V_{EBO}$		(-)6	V
Collector Current	$I_C$		(-)0.7	A
Collector Current (Pulse)	$I_{CP}$		(-)1.5	A
Collector Dissipation	$P_C$	$T_C=25^\circ\text{C}$	1.5	W
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	$I_{CBO}$	$V_{CB}=(-)120\text{V}, I_E=0$			(-)0.1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0$			(-)0.1	$\mu\text{A}$
DC Current Gain	$\beta_{FE1}$	$V_{CE}=(-)5\text{V}, I_C=(-)100\text{mA}$	100*		400*	
	$\beta_{FE2}$	$V_{CE}=(-)5\text{V}, I_C=(-)10\text{mA}$	90			
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10\text{V}, I_C=(-)50\text{mA}$		120		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)250\text{mA}, I_B=(-)25\text{mA}$		0.12	0.4	V
				(-)0.2	(-)0.5	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)250\text{mA}, I_B=(-)25\text{mA}$	(-)0.85		(-)1.2	V

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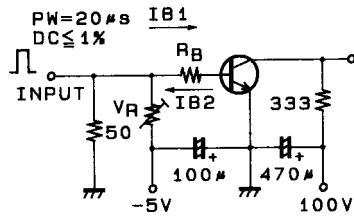
# 2SA1769/2SC4613

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10\mu A, I_E = 0$	(-)180			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$	(-)160			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)10\mu A, I_C = 0$	6			V
Output Capacitance	$C_{ob}$	$V_{CB} = (-)10V, f = 1MHz$		8 (11)		pF
Turn-ON Time	$t_{on}$	See specified Test Circuit		(60)50		ns
Storage Time	$t_{stg}$	See specified Test Circuit		(900)		ns
Fall Time	$t_f$	See specified Test Circuit		1000 (60)60		ns

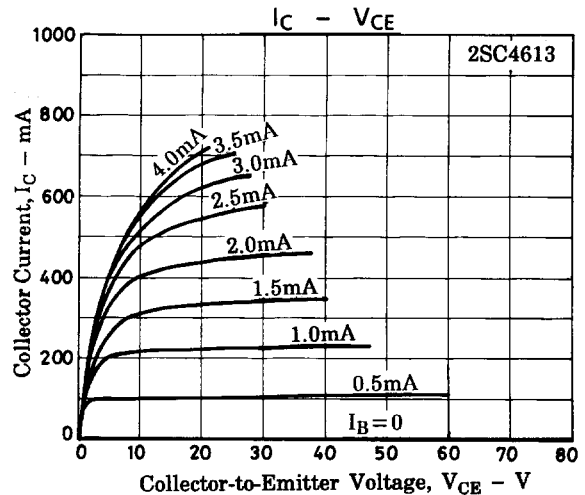
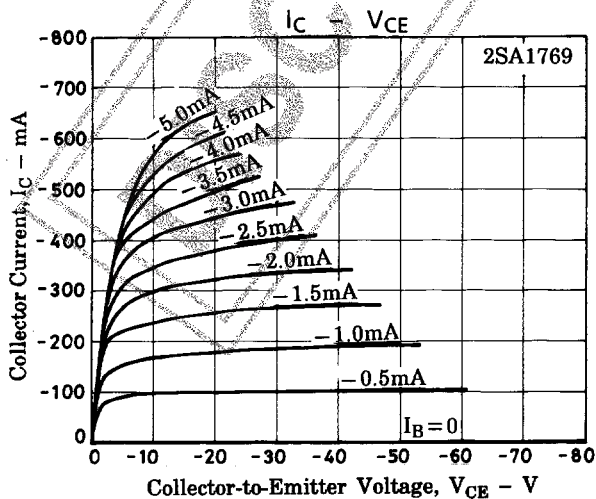
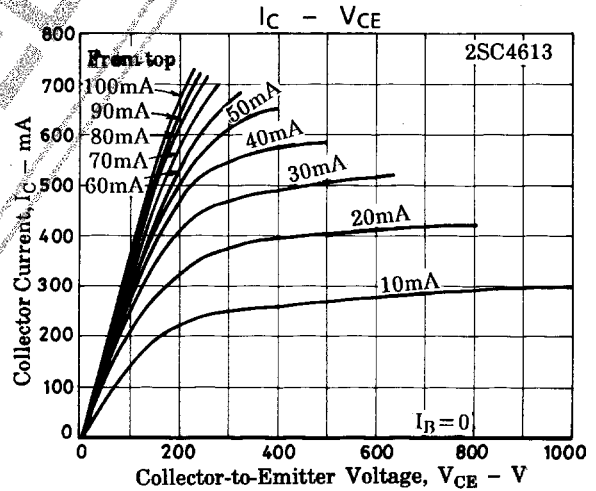
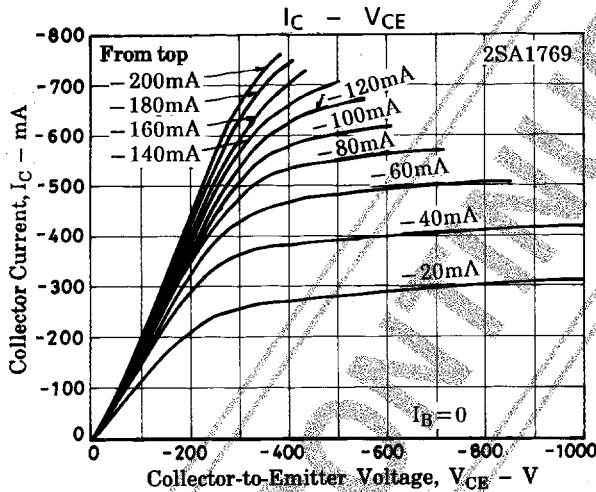
\* The 2SA1769/2SC4613 are classified by 100mA  $h_{FE}$  as follows :

100 R	200	140 S	280	200 T	400
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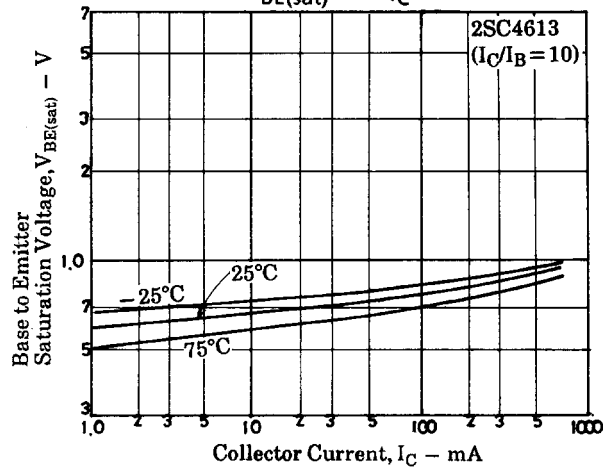
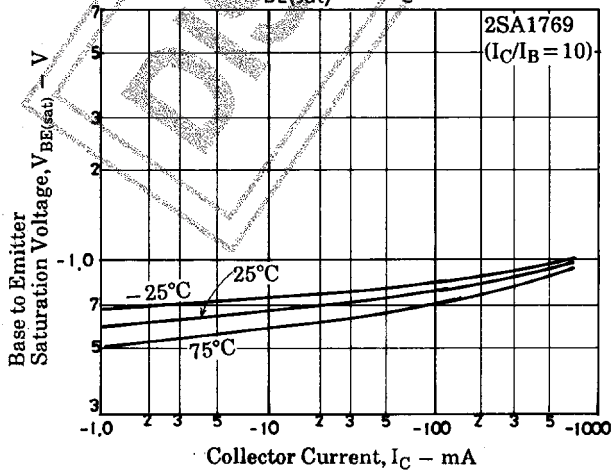
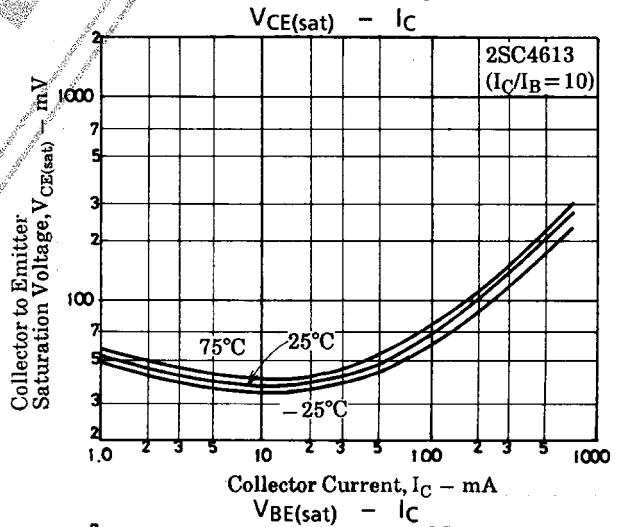
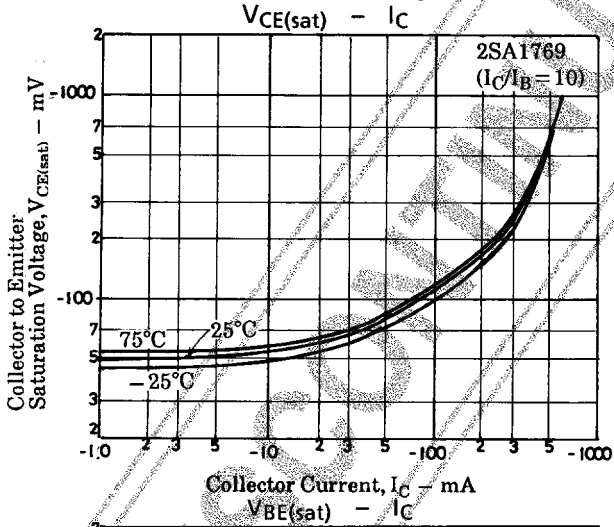
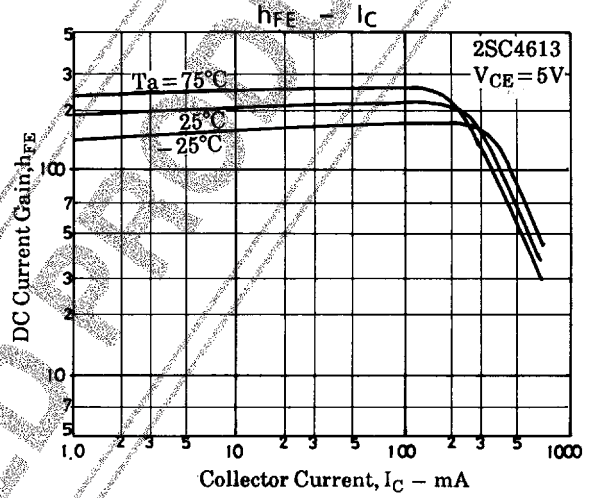
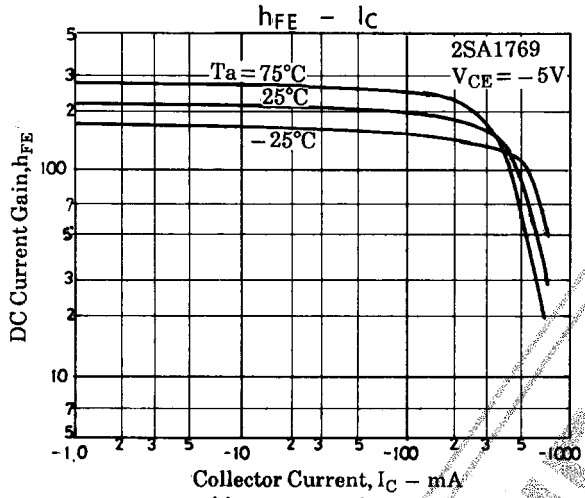
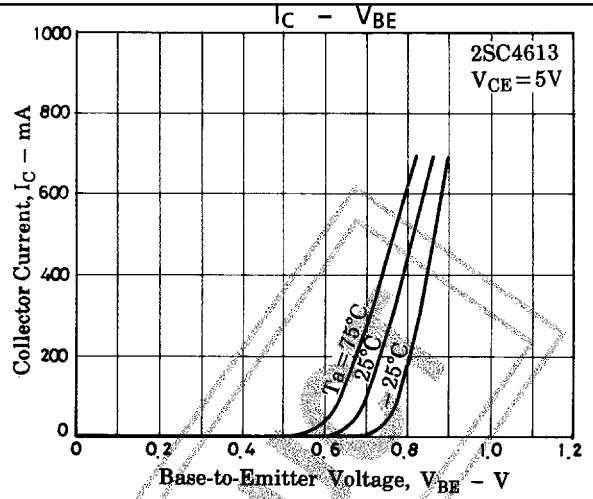
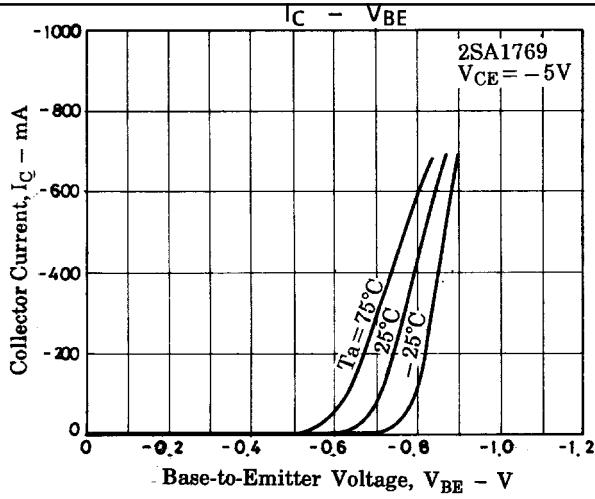
## Switching Time Test Circuit



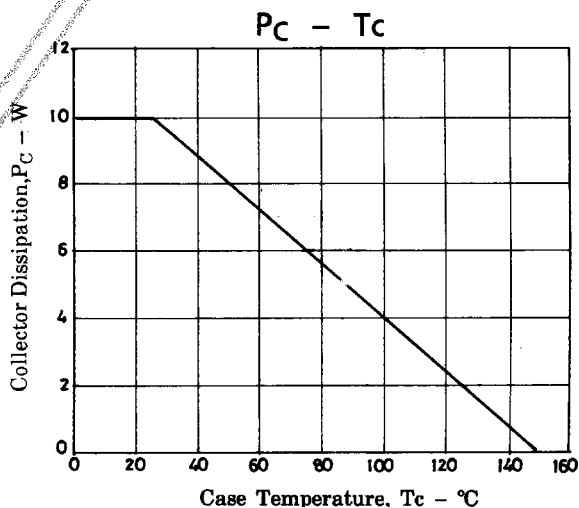
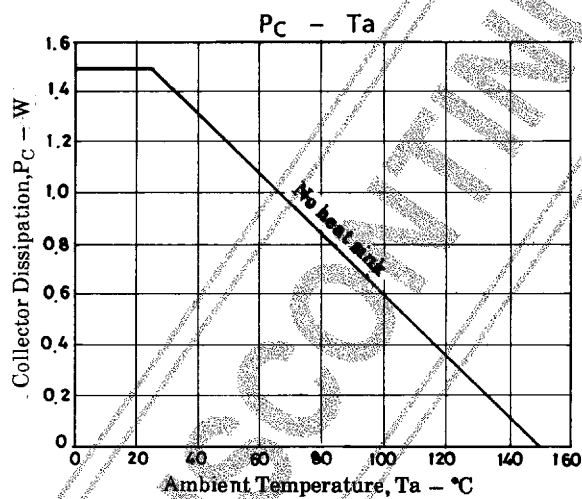
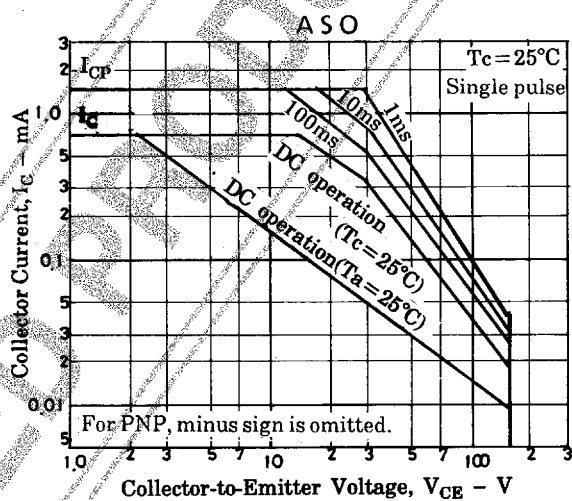
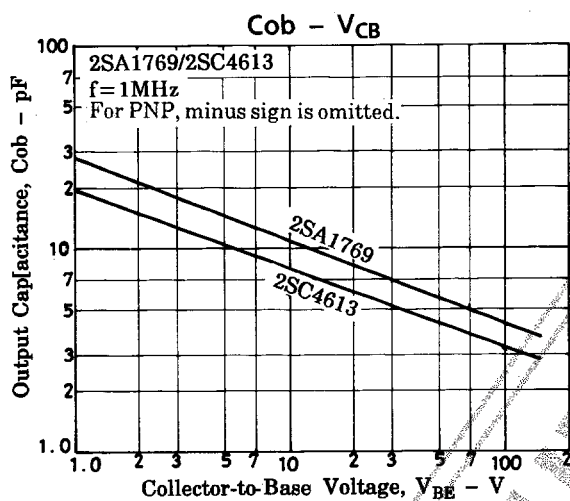
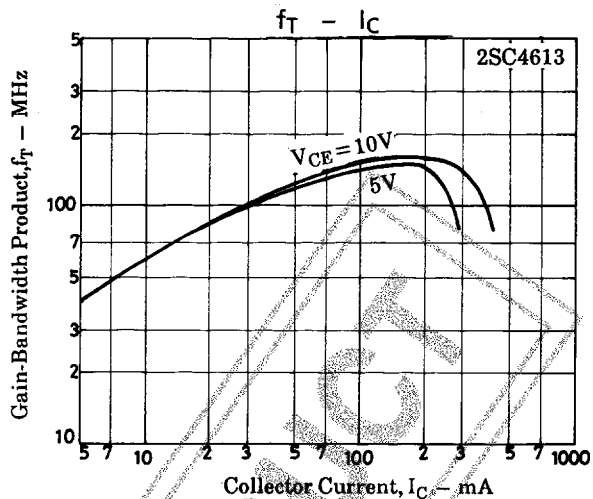
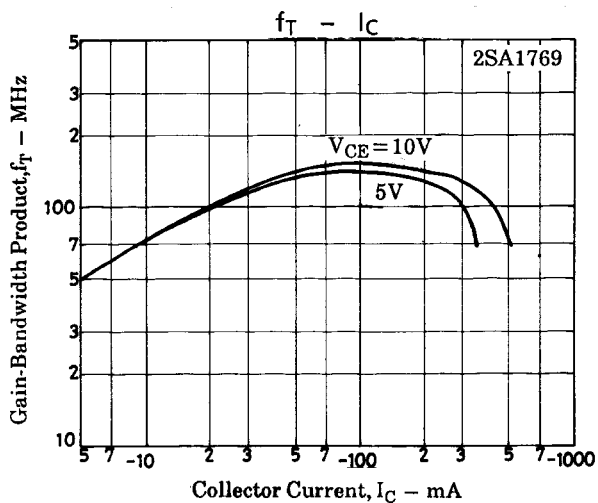
$20I_{B1} = -20I_{B2} = I_C = 300mA$   
 (For PNP, the polarity is reversed).  
 Unit (resistance :  $\Omega$ , capacitance : F)



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