

**2SA1969**

## High-Frequency Medium-Output Amplifier, Medium-Current Ultrahigh-Speed Switching Applications

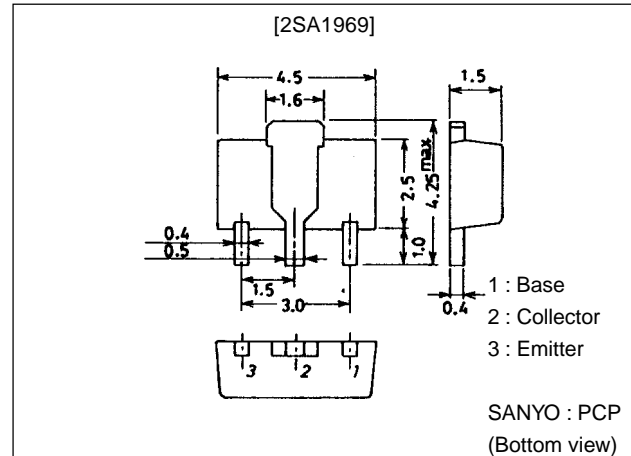
### Features

- High  $f_T$  ( $f_T=1.7\text{GHz}$  typ).
- Large current capacity ( $I_C=-400\text{mA}$ ).

### Package Dimensions

unit:mm

2038A



### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CBO}$		-10	V
Collector-to-Emitter Voltage	$V_{CEO}$		-10	V
Emitter-to-Base Voltage	$V_{EBO}$		-2	V
Collector Current	$I_C$		-400	mA
Collector Current (Pulse)	$I_{CP}$		-800	mA
Collector Dissipation	$P_C$	Mounted on ceramic board (250mm <sup>2</sup> ×0.8mm)	1.3	W
Junction Temperature	$T_J$		150	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=-10\text{V}, I_E=0$			-1.0	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=-1\text{V}, I_C=0$			-10	$\mu\text{A}$
DC Current Gain	$h_{FE1}$	$V_{CE}=-5\text{V}, I_C=-50\text{mA}$	20		120	
	$h_{FE2}$	$V_{CE}=-5\text{V}, I_C=-400\text{mA}$	5			
Gain-Bandwidth Product	$f_T$	$V_{CE}=-5\text{V}, I_C=-100\text{mA}$		1.7		GHz
Output Capacitance	$C_{ob}$	$V_{CB}=-10\text{V}, f=1\text{MHz}$		4.7	7.0	pF
Reverse Transfer Capacitance	$C_{re}$	$V_{CB}=-10\text{V}, f=1\text{MHz}$		3.9		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-200\text{mA}, I_B=-20\text{mA}$	-0.4		-1.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=-200\text{mA}, I_B=-20\text{mA}$	-0.9		-1.2	V

Marking : AQ

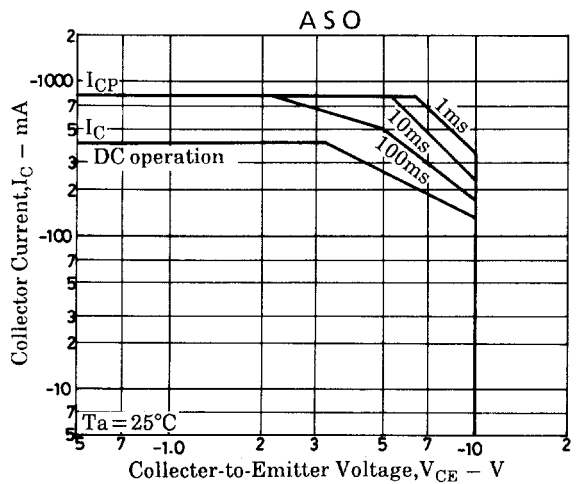
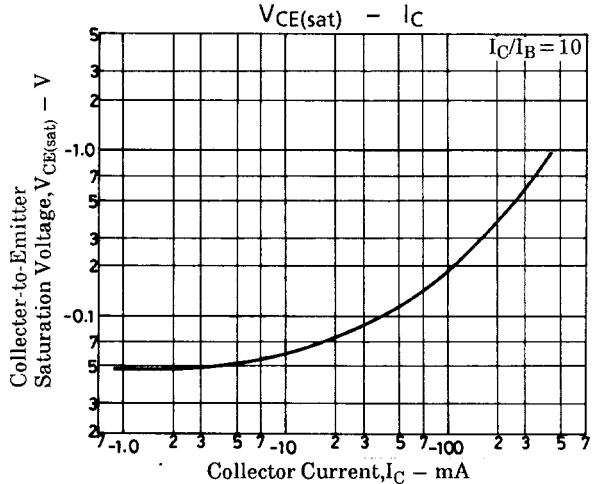
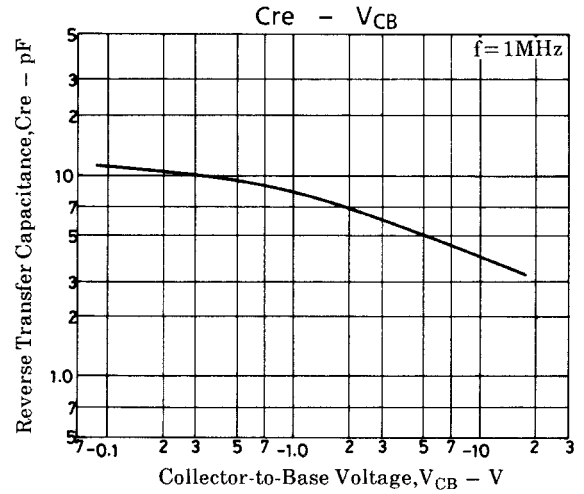
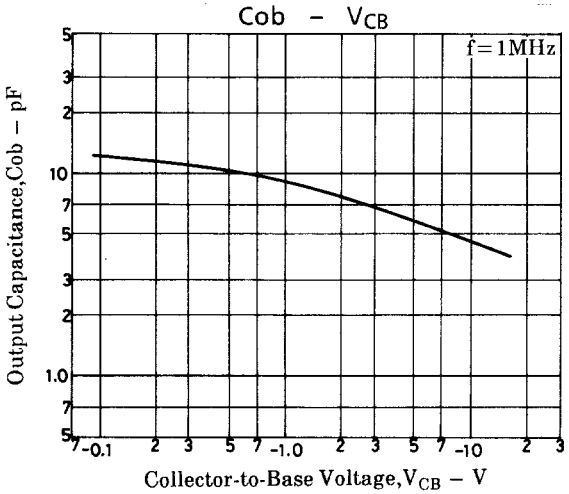
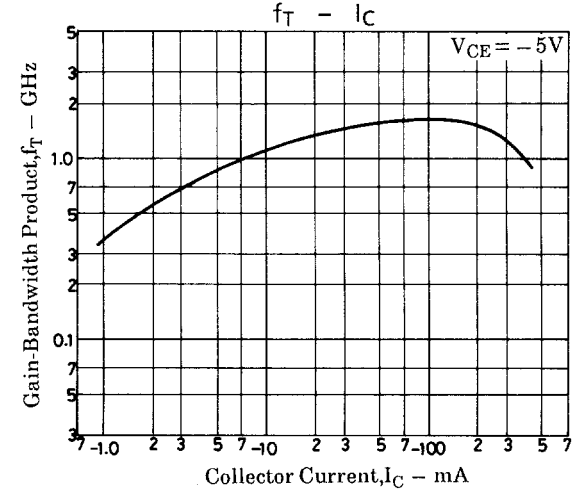
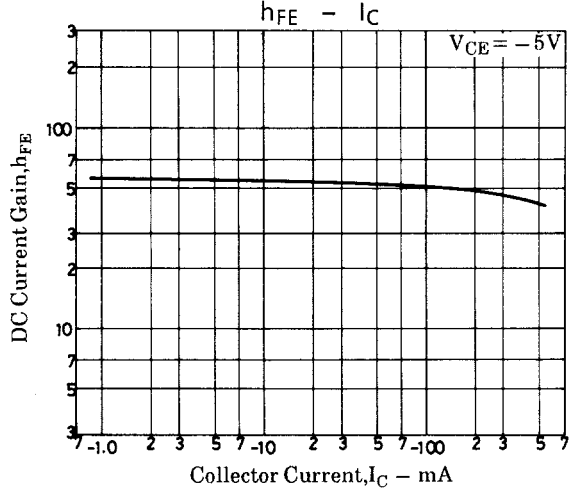
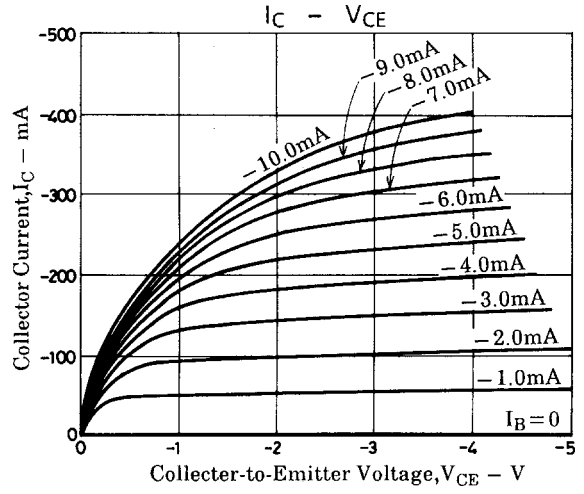
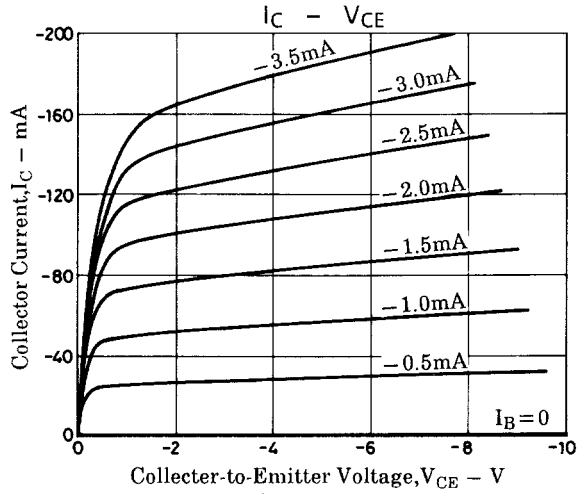
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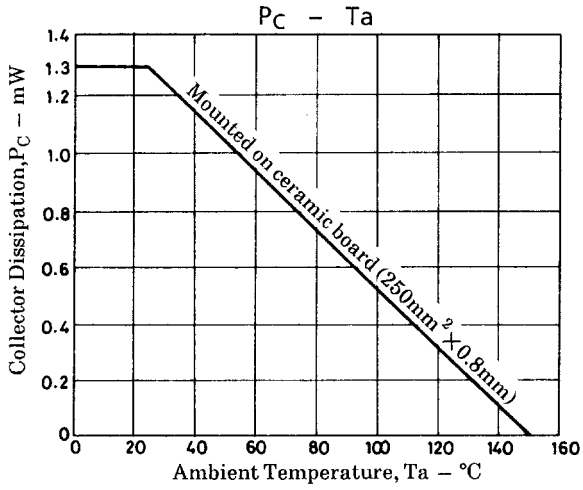
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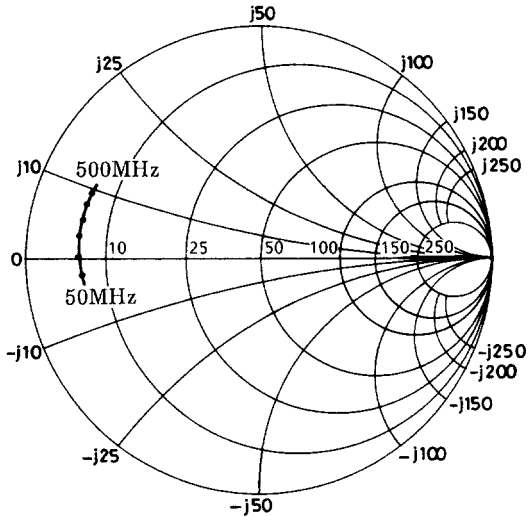


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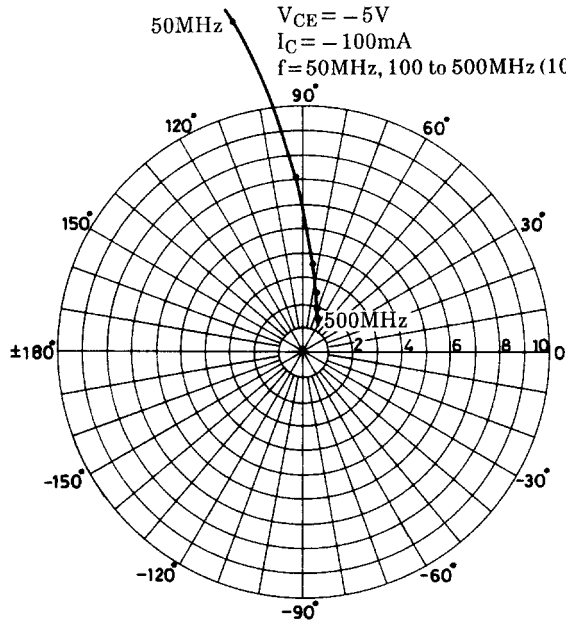
2SA1969 S11e

$V_{CE} = -5V$   
 $I_C = -100mA$   
 $f = 50MHz, 100 \text{ to } 500MHz (100MHz \text{ step})$



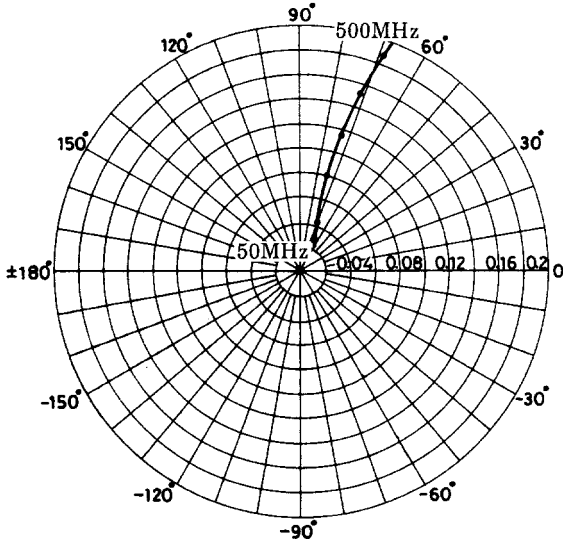
2SA1969 S21e

$V_{CE} = -5V$   
 $I_C = -100mA$   
 $f = 50MHz, 100 \text{ to } 500MHz (100MHz \text{ step})$



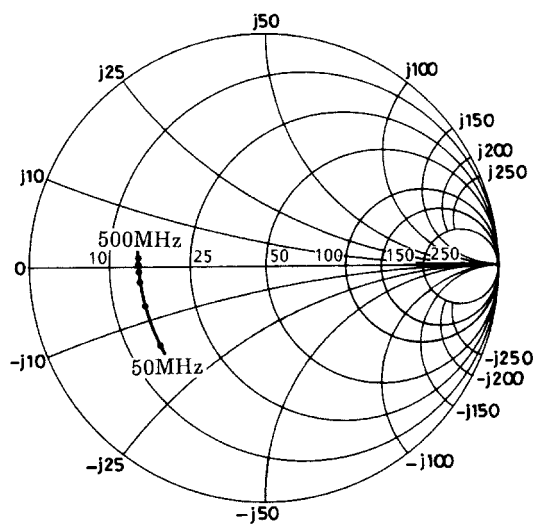
2SA1969 S12e

$V_{CE} = -5V$   
 $I_C = -100mA$   
 $f = 50MHz, 100 \text{ to } 500MHz (100MHz \text{ step})$



2SA1969 S22e

$V_{CE} = -5V$   
 $I_C = -100mA$   
 $f = 50MHz, 100 \text{ to } 500MHz (100MHz \text{ step})$



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### S Parameter (Common emitter)

$$V_{CE} = -5V, I_C = -100mA, Z_0 = 50\Omega$$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
50	0.758	-174.7	13.652	102.0	0.025	63.4	0.565	-143.6
100	0.770	179.3	7.077	92.4	0.042	70.7	0.548	-162.0
200	0.774	172.7	3.601	83.4	0.080	74.0	0.543	-173.2
300	0.771	167.3	2.449	77.1	0.116	73.1	0.542	-178.0
400	0.769	162.3	1.888	71.6	0.152	71.0	0.544	178.8
500	0.765	157.9	1.562	66.5	0.187	68.7	0.544	176.3

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