



SANYO Semiconductors

# DATA SHEET

## 2SA1348/2SC3402

PNP/NPN Epitaxial Planar Silicon Transistors  
**Switching Applications**  
**(with Bias Resistance)**

### Applications

Switching circuit, inverter, interface circuit, driver

### Features

- Built-in bias resistor ( $R_1=10k\Omega$ ,  $R_2=10k\Omega$ ).
- Small-sized package (SPA).

( ): 2SA1348

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

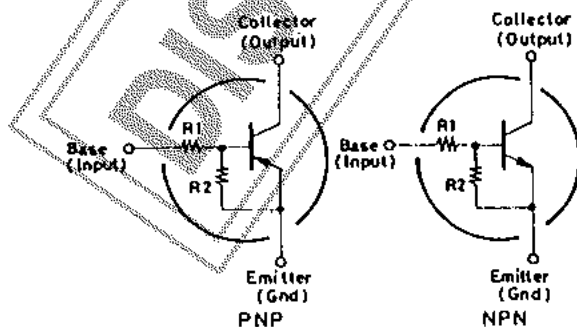
			unit
Collector to Base Voltage	$V_{CB0}$	(-)50	V
Collector to Emitter Voltage	$V_{CE0}$	(-)50	V
Emitter to Base Voltage	$V_{EB0}$	(-)10	V
Collector Current	$I_C$	(-)100	mA
Collector Current(Pulse)	$I_{CP}$	(-)200	mA
Collector Dissipation	$P_C$	300	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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

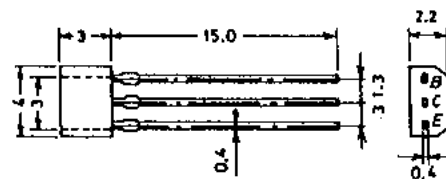
			min	typ	max	unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)40\text{V}, I_E=0$			(-)0.1	$\mu\text{A}$
Collector Cutoff Current	$I_{CEO}$	$V_{CE}=(-)40\text{V}, I_B=0$			(-)0.5	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)5\text{V}, I_C=0$	(-)170	(-)250	(-)330	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=(-)5\text{V}, I_C=(-)10\text{mA}$	50			
Gain-bandwidth product	$f_T$	$V_{CE}=(-)10\text{V}, I_C=(-)5\text{mA}$		250 (200)		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10\text{V}, f=1\text{MHz}$		3.7 (5.5)		pF
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)10\text{mA}, I_B=(-)0.5\text{mA}$	(-)0.1	(-)0.3		V

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### Electrical Connection



### Case Outline 2033 (unit: mm)



B: Base  
 C: Collector  
 E: Emitter  
 SANYO: SPA

Specifications and information herein are subject to change without notice.

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			min	typ	max	unit
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10\mu A, I_E = 0$	(-)50			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)100\mu A, R_{BE} = \infty$	(-)50			V
Input Off Voltage	$V_{I(off)}$	$V_{CE} = (-)5V, I_C = (-)100\mu A$	(-)0.8	(-)1.1	(-)1.5	V
Input On Voltage	$V_{I(on)}$	$V_{CE} = (-)0.2V, I_C = (-)10mA$	(-)1.0	(-)2.0	(-)4.0	V
Input Resistance	$R_1$		7.0	10	13	k $\Omega$
Input Resistance Ratio	$R_1/R_2$		0.9	1.0	1.1	

■ Sample Application Circuit

