

SANYO**SANYO Semiconductors****DATA SHEET**

PNP/NPN Epitaxial Planar Silicon Transistors

2SA1591/2SC4133**Switching Applications
(with Bias Resistance)****Applications**

- Switching circuit, inverter circuit, interface circuit, driver circuit

Features

- On-chip bias resistance ($R_1=4.7k\Omega$, $R_2=47k\Omega$)
- Small-sized package (SPA)

(): 2SA1591

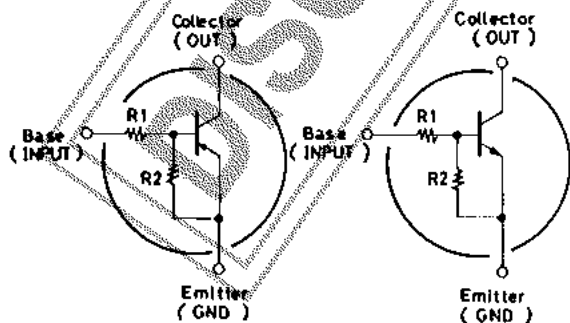
Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

			unit
Collector to Base Voltage	V_{CB0}	(-)50	V
Collector to Emitter Voltage	V_{CE0}	(-)50	V
Emitter to Base Voltage	V_{EB0}	(-)6	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 at $T_a=25^\circ\text{C}$

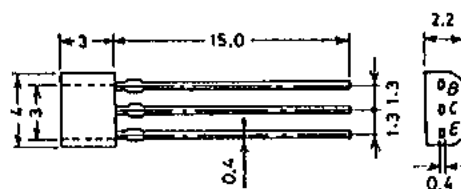
		min	typ	max	unit
Collector Cutoff Current	I_{CBO} $V_{CB}=(-)40\text{V}, I_E=0$		(-)0.1		μA
Collector Cutoff Current	I_{CEO} $V_{CE}=(-)40\text{V}, I_B=0$		(-)0.5		μA
Emitter Cutoff Current	I_{EBO} $V_{EB}=(-)5\text{V}, I_C=0$	(-)74	(-)97	(-)138	μA
DC Current Gain	h_{FE} $V_{CE}=(-)5\text{V}, I_C=(-)5\text{mA}$	70			
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
C-E Saturation Voltage	$V_{CE(sat)}$ $I_C=(-)10\text{mA}, I_B=(-)0.5\text{mA}$		(-)0.1	(-)0.3	V
C-B Breakdown Voltage	$V_{(BR)CBO}$ $I_C=(-)10\mu\text{A}, I_E=0$	(-)50			V
C-E Breakdown Voltage	$V_{(BR)CEO}$ $I_C=(-)100\mu\text{A}, R_{BE}=\infty$	(-)50			V

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Electrical Connection

2SA1591(PNP)

2SC4133(NPN)

**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
Input OFF-State Voltage	$V_{I(off)}$	$V_{CE}=(-)5V, I_C=(-)100\mu A$	(-)0.5	(-)0.6	(-)0.8	V
Input ON-State Voltage	$V_{I(on)}$	$V_{CE}=(-)0.2V, I_C(-)5mA$	(-)0.7	(-)0.85	(-)1.3	V
Input Resistance	R_1		3.3	4.7	6.1	k Ω
Resistance Ratio	R_1/R_2		0.09	0.1	0.11	

