



2003A

PNP Epitaxial Planar Silicon Transistor

T-29-15

## Very Low-Noise Amp Applications

©371D

The 2SA929, 930 are transistors for very low noise AF amp. They are especially suited for use in the first stage of equalizer amp. in high-grade stereo sets. It is possible to form a complementary pair with NPN type 2SC1570.

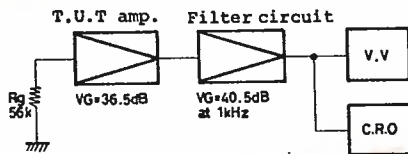
Absolute Maximum Ratings at $T_a=25^\circ\text{C}$		2SA929	2SA930	unit
Collector to Base Voltage	$V_{CB0}$	-55	-40	V
Collector to Emitter Voltage	$V_{CE0}$	-50	-35	V
Emitter to Base Voltage	$V_{EB0}$		-5	V
Collector Current	$I_C$		-50	mA
Collector Dissipation	$P_C$		200	mW
Junction Temperature	$T_j$		125	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +125		$^\circ\text{C}$

Electrical Characteristics at $T_a=25^\circ\text{C}$			min	typ	max	unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=-30\text{V}, I_E=0$			-0.1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=-4\text{V}, I_C=0$			-0.1	$\mu\text{A}$
Collector to Base Breakdown Voltage	$V_{(BR)CB0}$	$I_C=-10\mu\text{A}, I_E=0$	2SA929	-55		V
			2SA930	-40		V
Collector to Emitter Breakdown Voltage	$V_{(BR)CE0}$	$I_C=-1\text{mA}, R_{BE}=\infty$	2SA929	-50		V
			2SA930	-35		V
Emitter to Base Breakdown Voltage	$V_{(BR)EB0}$	$I_E=-10\mu\text{A}, I_C=0$		-5		V
DC Current Gain	$h_{FE}$	$V_{CE}=-6\text{V}, I_C=-1\text{mA}$		160*	960*	
Gain-Bandwidth Product	$f_T$	$V_{CE}=-6\text{V}, I_C=-1\text{mA}$		80		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=-6\text{V}, f=1\text{MHz}$		5		pF
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-50\text{mA}, I_E=-5\text{mA}$			-0.5	V
Output Noise Voltage	$V_{NO}$	$V_{CC}=-30\text{V}, I_C=-1\text{mA}, R_g=56\text{k}\Omega, V_G=77\text{dB}(1\text{kHz})$			35	mV
	$V_{NO(peak)}$	Same as above			200	mV

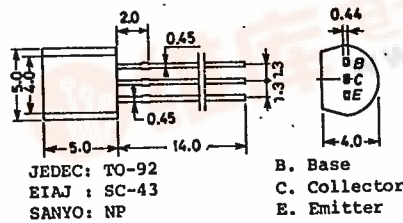
\* The 2SA929, 930 are classified as follows according to  $h_{FE}$  at 1mA.

160	F	320	280	G	560	480	H	960
-----	---	-----	-----	---	-----	-----	---	-----

### Noise Test Circuit

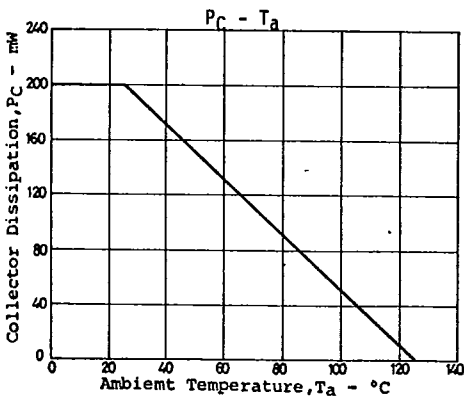
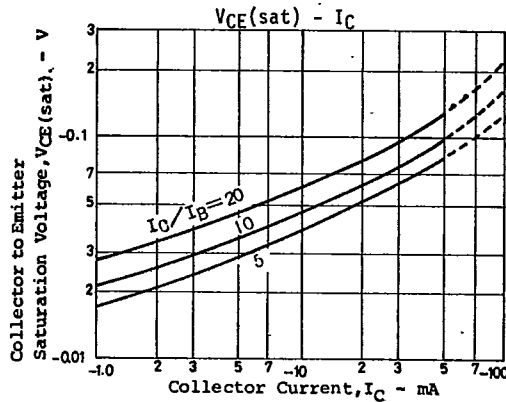
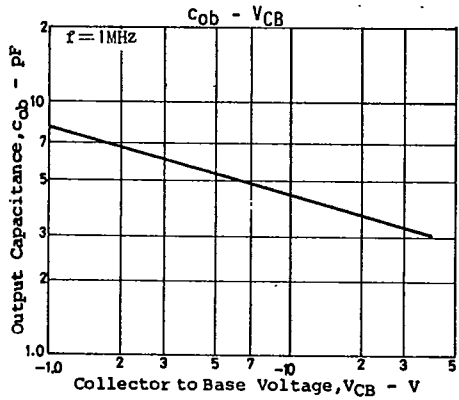
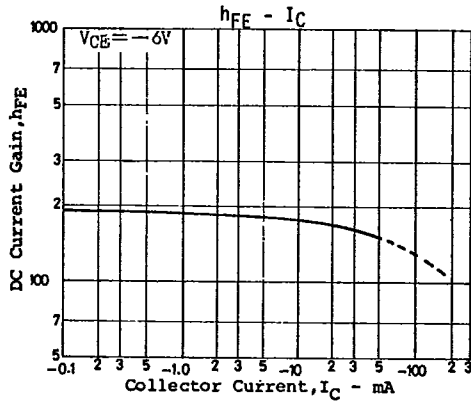
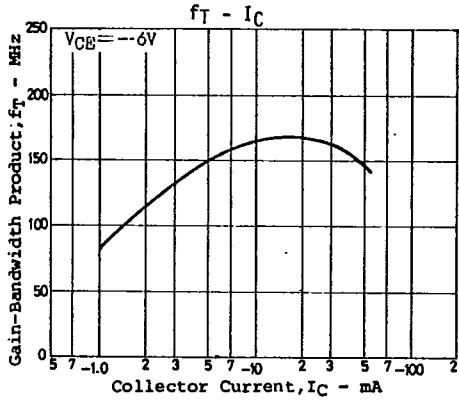
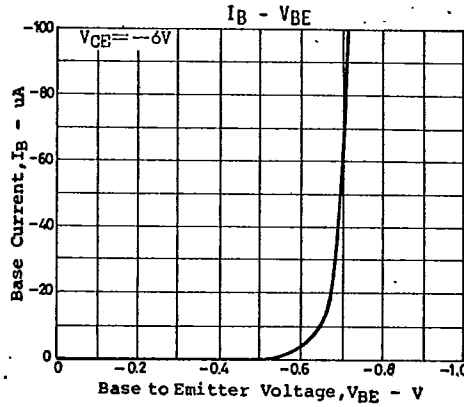
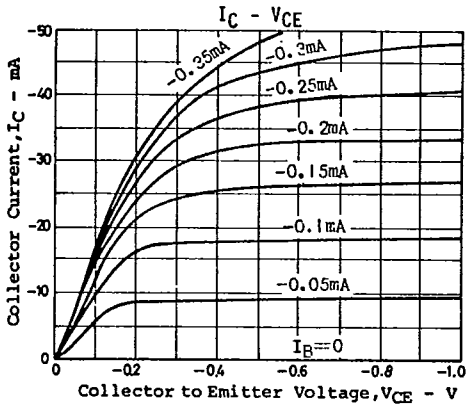


### Case Outline 2003A (unit:mm)

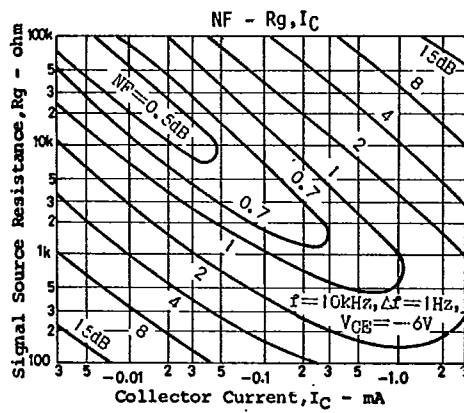
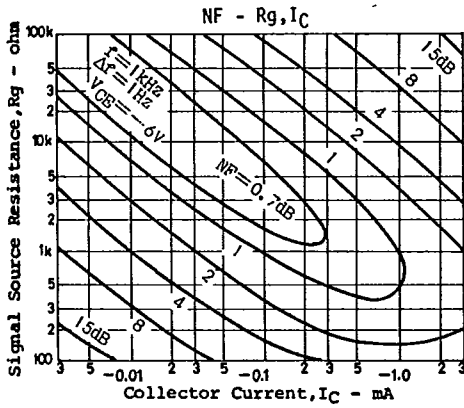
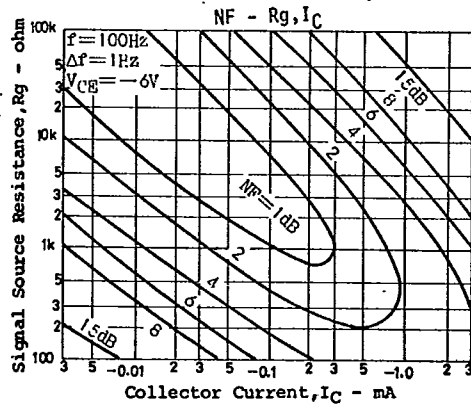
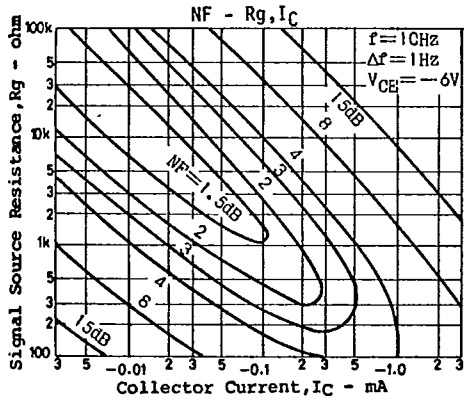


2SA929,930

T-29-15



T-29-15

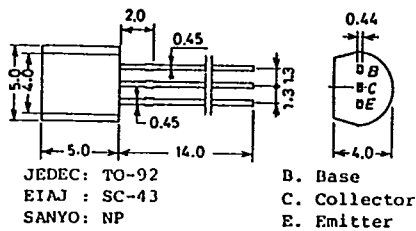


T-91-20

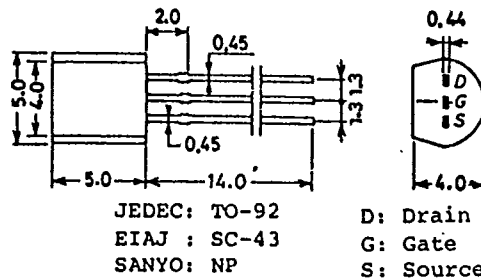
### CASE OUTLINES OF LEAD FORMED SMALL SIGNAL TRANSISTORS

- All of Sanyo lead formed small signal transistor case outlines are illustrated below.
- All dimensions are in mm, and dimensions which are not followed by min. or max. are represented by typical values.
- No marking is indicated.

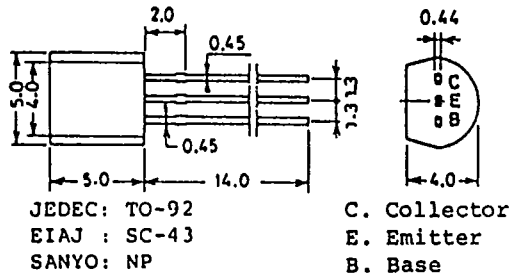
Case Outline-[2003A] unit: mm



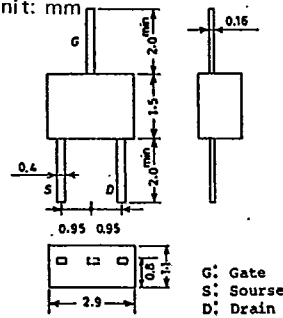
Case Outline-[2019A] unit: mm



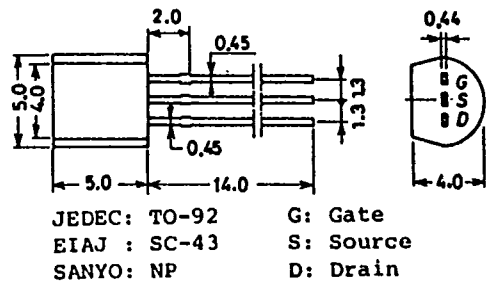
Case Outline-[2004A] unit: mm



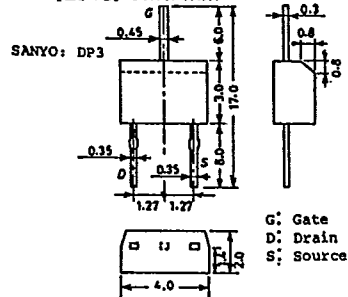
Case Outline-[2025] unit: mm



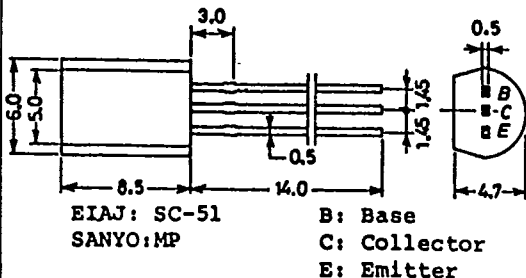
Case Outline-[2005A] unit: mm



Case Outline-[2026] unit: mm



Case Outline-[2006A] unit: mm



Case Outline-[2027A] unit: mm

