T-29-11





2029A

PNP Epitaxial Planar Silicon Transistor

Differential Amp Applications

€968C

Applications

. Differential amp, current mirror.

Features

- . Excellent in thermal equilibrium and suited for use in first-stage differential amp.
- . Low noise.
- . Matched pair capability.

Absolute Maximum Ratings at Ta=25°C	unit
Collector to Base Voltage V _{CBO} -55	- V
Collector to Emitter Voltage V _{CEO} -50	V
Emitter to Base Voltage V _{EBO} -5	V
Collector Current IC -150	mA
Peak Collector Current icp -300	mA
Collector Dissipation PC 1 unit 200	mW
Total Dissipation P _T 400	mW
Junction Temperature T ₄ 150	оС
Storage Temperature T _{stg} -55 to +150	°C

Electrical Characteristics at Ta=25°C

Collector Cutoff Current
Emitter Cutoff Current
DC Current Gain
DC Current Gain Ratio

$$\begin{array}{lll} & & & & & & & & & \\ I_{CBO} & & & & & & & & \\ I_{EBO} & & & & & & & & \\ h_{FE} & & & & & & & \\ h_{FE(small/large)} & & & & & & \\ V_{CE} = -6V, I_{C} = -1mA & & & & \\ \end{array}$$

min typ max unit
-0.1 uA
-0.1 uA
.100* 560*
0.85 0.98
Continued on next page.

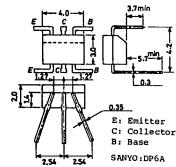
*: The 2SA1238 is classified by $h_{FE}(\text{small})$ as follows:

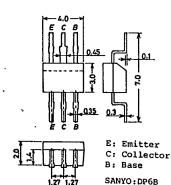
100 E	1 1	200	160	F	320	280	G	560

The 2SA1238 is provided with a surface mounted package.

Case Outline 2030A (unit:mm)

Case Outline 2029A (unit:mm)



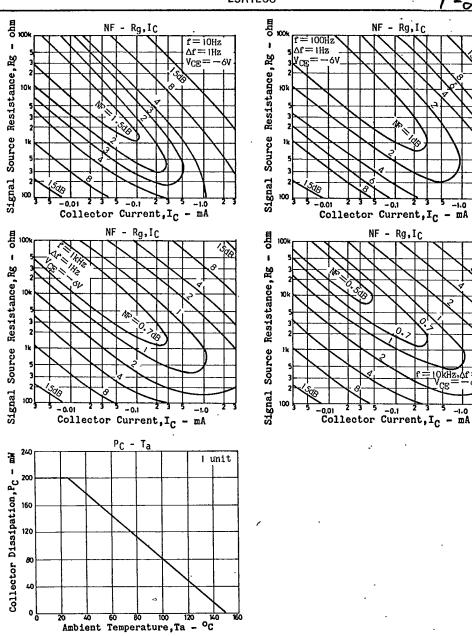


3207AT/1105MY,TS No.968-1/3

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		SA1238	T-29-11
Continued from preceding			min typ max unit
Base to Emitter Voltage Drop	VBE(large-small)	$V_{CE}=-6V, I_{C}=-1mA$	1.0 10 mV
Collector to Emitter Saturation Voltage	VCE(sat)	$I_{C}=-50mA$, $I_{B}=-5mA$	-0.5 V
Gain-Bandwidth Product Output Capacitance	f _T	V _{CE} =-6V, I _C =-1mA V _{CB} =-10V, f=1MHz I _C =-10uA, I _E =0	100 MHz
Collector to Base Breakdown Voltage	v _{ob} v _{(BR)CBO}	I _C =-10uA, I _E =0	5.0 pF -55 v
Collector to Emitter	V(BR)CEO	$I_{C}=-1$ mA, $R_{BE}=\infty$	-50 V
Breakdown Voltage Emitter to Base	V(BR)EBO	I _E =-10uA,I _C =0	-5 V
Breakdown Voltage Noise Level		V _{CC} =30V, I _C =1mA,	35 mV
Noise Peak Level	V _{NO(peak)}	V _{CC} =30V,I _C =1mA, Rg=56kohm,VG=77dB/1kHz V _{CC} =30V,I _C =1mA,	200 mV
Ic - V		Rg=56kohm, VG=77dB/1kHz	
1 -18 10 L		1 -100	V _{CE} =-6V
1/		₩ -80	
Collector Current, IC -4 -40 μ A -20 -40 μ A -20 -40 μ A -20 -40 μ A -20 -40 μ A -40		" - - - -	
$\frac{1}{2}$ $\frac{1}$		Current, IB	
2 -10 -40 μA			-
5 -6		Cur	
-20	μΑ	9 -20 mg -20	
S -2		m i	
0 - 1 - 1 - 20 - 25	-30 -35 -40 -45 6	0 -0.2 -0.4	
Collector to Emitter	Voltage, VCE -	V Base to Emitter	
₩ 250 ft - I	C V _{CE} = -6V	hFE .	- I _C
	CE	7	V _{CE} =-6V
.E→200		E4 5	
150 150 150	+	Gain, be	
ğ 130		E 100°C 25	
g 100		20 00 C 25	30.0
17			
ğ 50		υ w	
4 100		A 1	·
g 0 5 7 -1.0 2 3 5 7 -10	2 3 5 7_100 2	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	-10 2 3 5 -100 2 3
Collector Curre	nt,I _C - mA	Collector Cur	rent,I _C - mA
100 - Cob -		VCE(sat	
4 7 1 1 1	e = 1MHz	ati 2	Ic/I _B =10
י ווי ווי ווי ווי ווי ווי ווי ווי ווי ו		0.1-8	
0 3		es S	
g '		1 1 A 3	
ing 10		Voltage, VCE(sat)	++- - -
o 7		Ø 7 −0.1	
g 3		1 5 5 T	41111
Output Capacitance, cob		1 3 3	
ğ 1.0		CE(sat) Collector to Emitter Saturation Voltage, VCE(sat) Voltage,	
Collector to Base	2 3 5 7-10 Voltage, V _{CR} - V	Collector Curr	2 3 5 7 -100 2 rent. In mA
-			

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35E D



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.

