

(SMALL-SIGNAL TRANSISTOR)
2SA1928
DUAL TRANSISTOR
FOR LOW NOISE DIFFERENTIAL AMPLIFY APPLICATION
SILICON PNP EPITAXIAL TYPE

DESCRIPTION

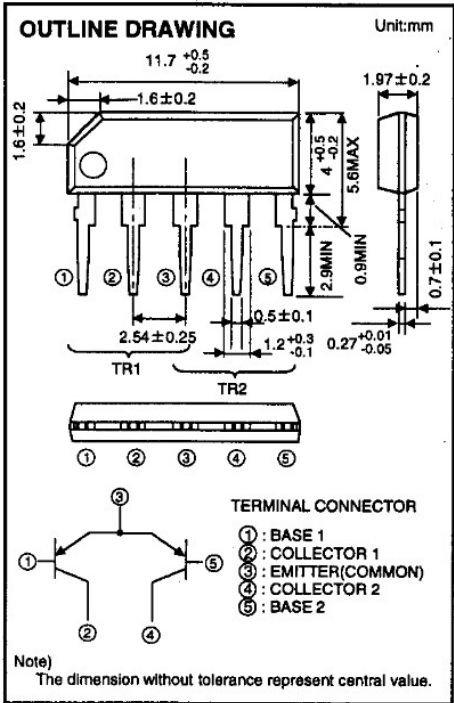
2SA1928 is a silicon PNP epitaxial type transistor. It is designed for low noise differential amplify application.

FEATURE

- High V_{CEO} V_{CEO}=-100V
- Low noise NF=0.5dB typ NV=100mV typ
- High h_{FE} h_{FE}=250 to 800
- Good two elements characteristics
 h_{FE1}/h_{FE2}=0.98 typ
 |V_{BE1}-V_{BE2}| =1mV typ

APPLICATION

For Low noise differential amplify application.



MAXIMUM RATINGS (Ta=25°C)

Symbol	Parameter	Ratings	Unit
V _{CAO}	Collector to Base voltage	-100	V
V _{EBO}	Emitter to Base voltage	-5	V
V _{CEO}	Collector to Emitter voltage	-100	V
I _c	Collector current	-50	mA
P _c	Collector dissipation (Ta=25°C)	200	mW/unit
P _T	Total dissipation (Ta=25°C)	400	mW
T _j	Junction temperature	+125	°C
T _{stg}	Storage temperature	-55 to +125	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
V _{(BR)CEO}	C to E break down voltage	I _C =-100 μA, R _{BE} =∞	-100			V
I _{CBO}	Collector cut off current	V _{CB} =-70V, I _E =0			-0.1	μA
I _{EBO}	Emitter cut off current	V _{EB} =-2V, I _C =0			-0.1	μA
I _{CER}	Collector cut off current	V _{CE} =-100V, R _{BE} =100k Ω			-10	μA
h _{FE} *	DC forward current gain	V _{CE} =-6V, I _C =-1mA	250		800	—
V _{CE(sat)}	C to E saturation voltage	I _C =-10mA, I _B =-1mA			-0.6	V
V _{BE1} -V _{BE2}	B-E voltage differential	V _{CE} =-6V, I _C =-1mA		1	10	mV
h _{FE1} /h _{FE2}	DC forward current gain ratio	V _{CE} =-6V, I _C =-1mA	0.8	0.98	1.0	—
f _r	Gain band width product	V _{CE} =-6V, I _E =1mA		150		MHz
C _{ob}	Collector output capacitance	V _{CB} =-6V, I _E =0, f=1MHz		2.5		pF
NF	Noise figure	V _{CE} =-6V, I _E =0.1mA, f=1kHz, R _G =10k Ω		0.5		dB
NV	Low frequency broadband noise voltage	V _{CE} =-10V, I _E =1mA, R _G =100k Ω, Gv=80dB (Refer to test circuit)	effective value	100		mV
NVM			peaked value	0.5		V

* : It shows h_{FE} (element 1) classification in right table.

Item	F	G
h _{FE}	250 to 500	400 to 800

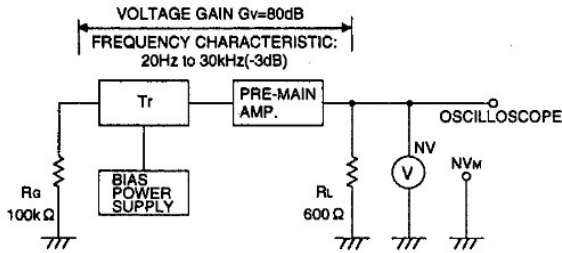
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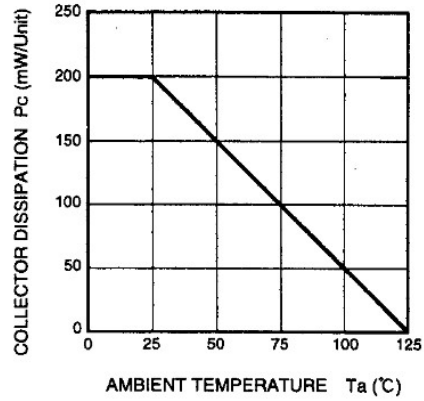
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**LOW FREQUENCY WIDE BAND NOISE
VOLTAGE TEST CIRCUIT**

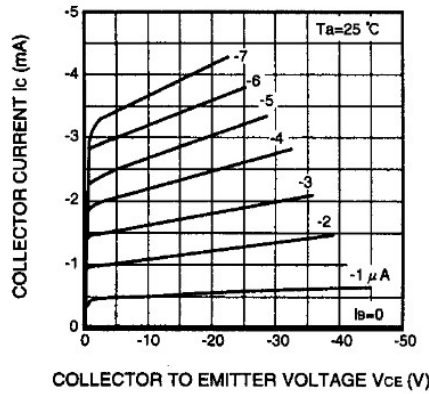


TYPICAL CHARACTERISTICS

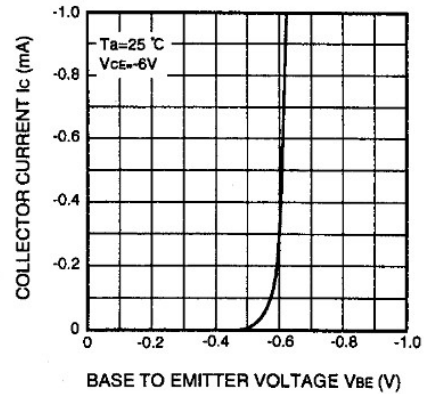
**COLLECTOR DISSIPATION
VS. AMBIENT TEMPERATURE**



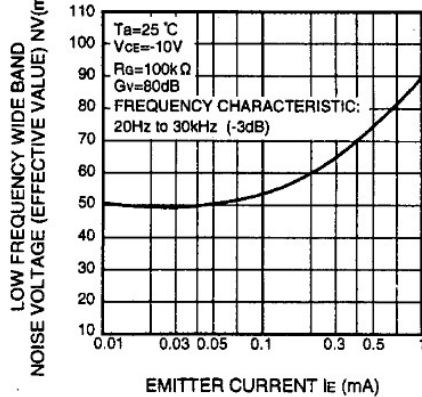
COMMON EMITTER OUTPUT



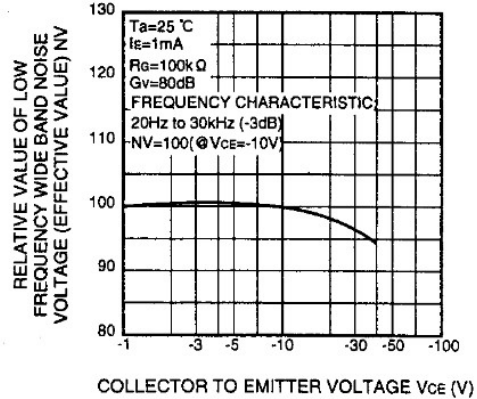
COMMON EMITTER TRANSFER



**LOW FREQUENCY WIDE BAND NOISE VOLTAGE
(EFFECTIVE VALUE) VS. EMITTER CURRENT**



**LOW FREQUENCY WIDE BAND NOISE
VOLTAGE (EFFECTIVE VALUE) VS.
COLLECTOR TO EMITTER VOLTAGE**

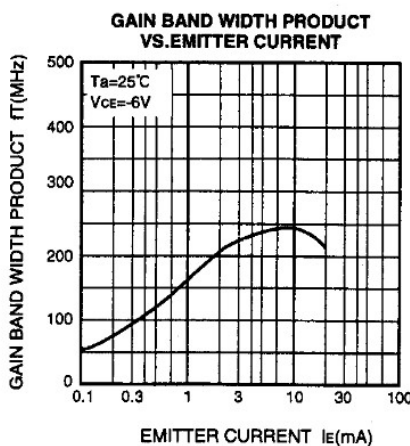
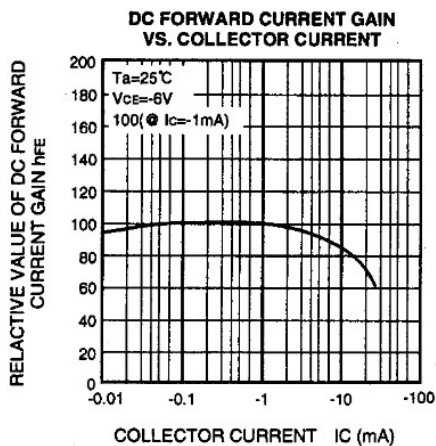
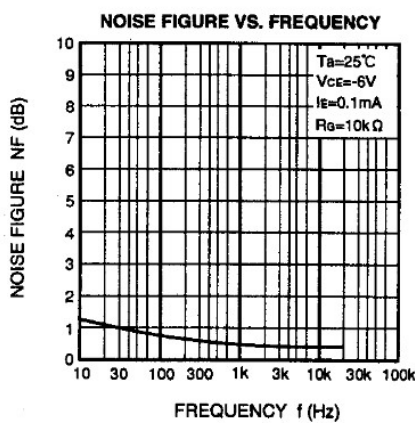
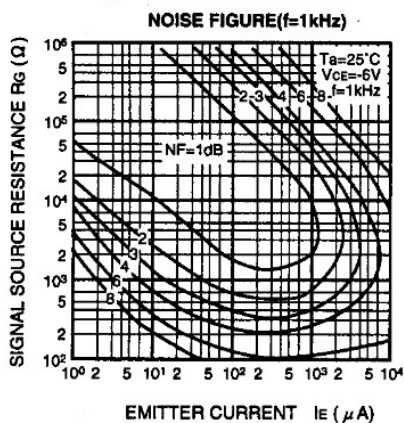
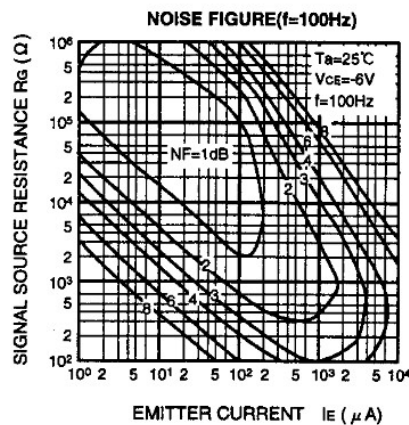
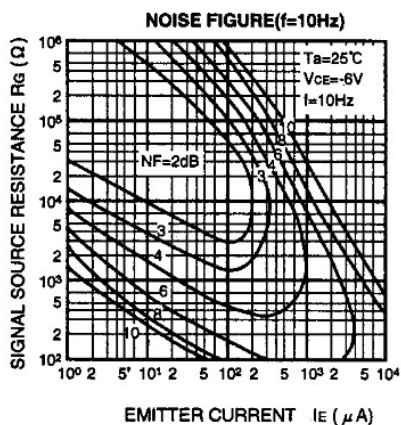


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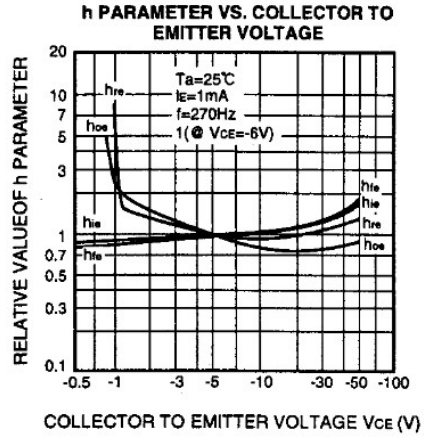
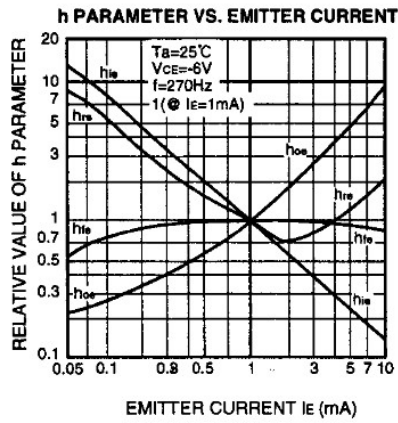


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COMMON EMITTER h PARAMETER (TYPICAL VALUE)

Symbol	Parameter	Test conditions	Limits	Unit
h_{ie}	Closed loop small signal input impedance	$T_a=25^\circ\text{C}$ $V_{CE}=-6\text{V}$ $I_E=1\text{mA}$ $f=270\text{Hz}$	14	$\text{k}\Omega$
h_{re}	Open loop small signal reverse voltage amplification factor		0.08	$\times 10^{-3}$
h_{fe}	Closed loop small signal forward current amplification factor		500	—
h_{oe}	Open loop small signal output admittance		19	μS

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6-41, TSUKUBA, ISAHAYA, NAGASAKI, 854-0065, JAPAN

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