

TOSHIBA TRANSISTOR SILICON PNP EPITAXIAL TYPE (PCT PROCESS)

# 2SA970

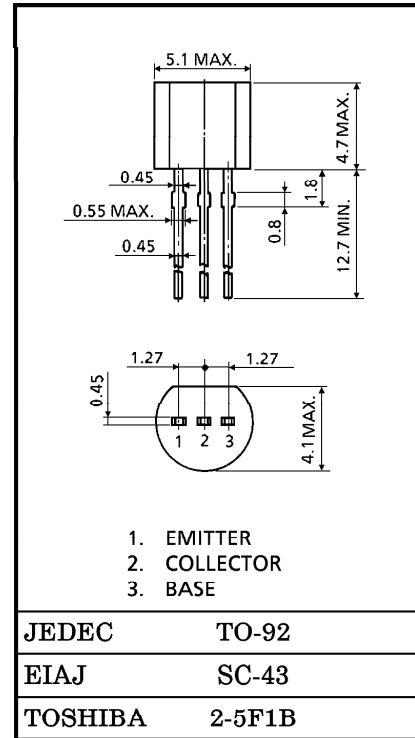
LOW NOISE AUDIO AMPLIFIER APPLICATIONS

Unit in mm

- Low Noise  
: NF=3dB (Typ.)  $R_G=100\Omega$ ,  $V_{CE}=-6V$ ,  $I_C=-100\mu A$ ,  $f=1kHz$   
: NF=0.5dB (Typ.)  $R_G=1k\Omega$ ,  $V_{CE}=-6V$ ,  $I_C=-100\mu A$ ,  $f=1kHz$
- High DC Current Gain :  $h_{FE}=200\sim 700$
- High Breakdown Voltage :  $V_{CEO}=-120V$
- Low Pulse Noise. Low 1/f Noise

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	-120	V
Collector-Emitter Voltage	$V_{CEO}$	-120	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current	$I_C$	-100	mA
Base Current	$I_B$	-20	mA
Collector Power Dissipation	$P_C$	300	mW
Junction Temperature	$T_j$	125	°C
Storage Temperature Range	$T_{stg}$	-55~125	°C



Weight : 0.21g

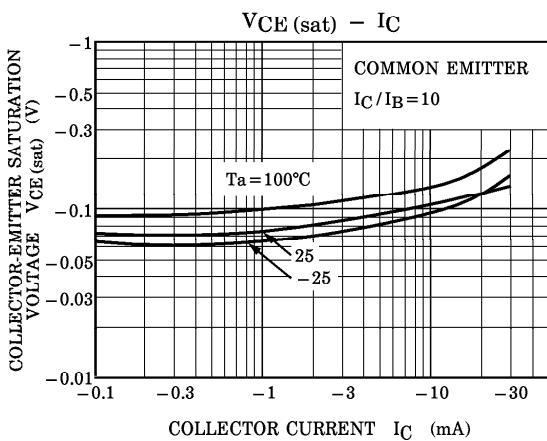
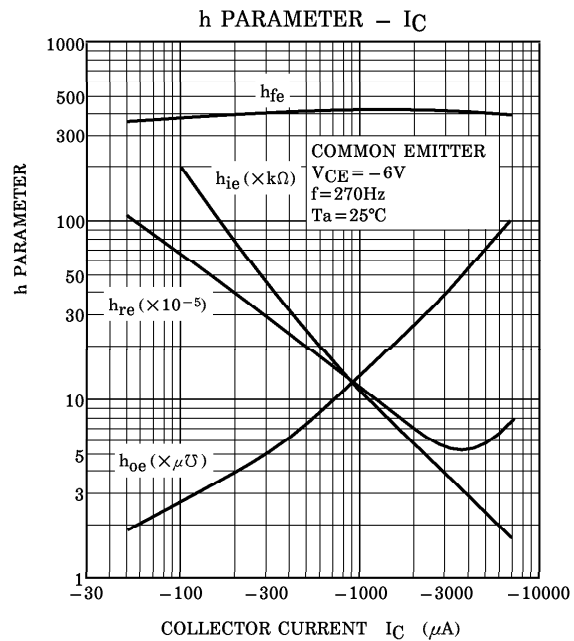
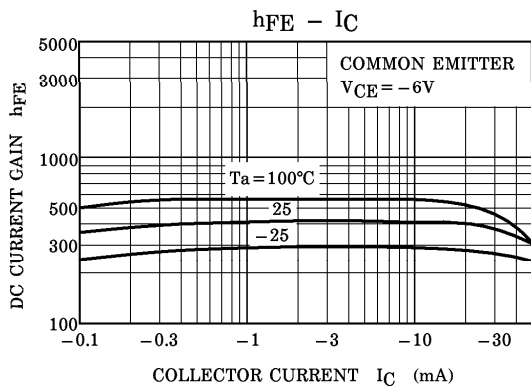
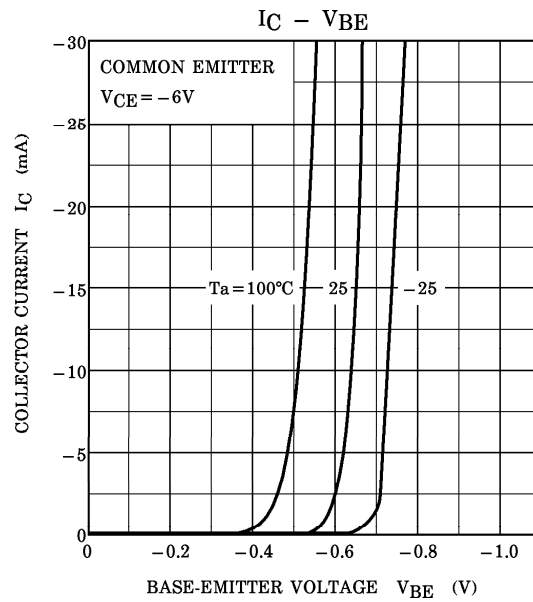
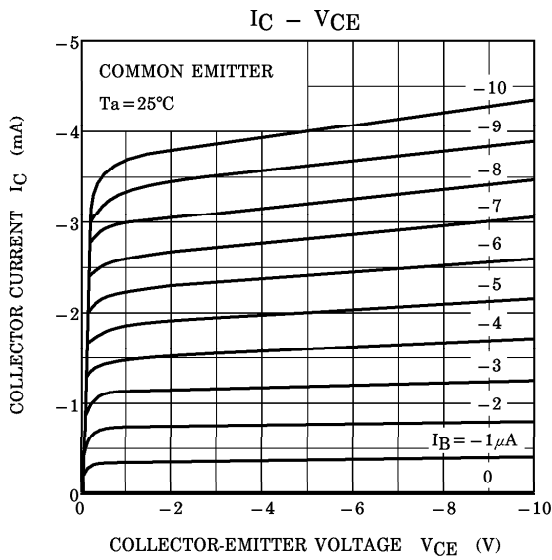
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB}=-120V$ , $I_E=0$	—	—	-0.1	$\mu A$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB}=-5V$ , $I_C=0$	—	—	-0.1	$\mu A$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=-1mA$ , $I_B=0$	-120	—	—	V
DC Current Gain	$h_{FE}$ (Note)	$V_{CE}=-6V$ , $I_C=-2mA$	200	—	700	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-10mA$ , $I_B=-1mA$	—	—	-0.3	V
Base-Emitter Voltage	$V_{BE}$	$V_{CE}=-6V$ , $I_C=-2mA$	—	0.65	—	V
Transition Frequency	$f_T$	$V_{CE}=-6V$ , $I_C=-1mA$	—	100	—	MHz
Collector Output Capacitance	$C_{ob}$	$V_{CB}=-10V$ , $I_E=0$ , $f=1MHz$	—	4.0	—	pF
Noise Figure	NF	$V_{CE}=-6V$ , $I_C=-0.1mA$ , $f=10Hz$ , $R_G=10k\Omega$	—	—	6	dB
		$V_{CE}=-6V$ , $I_C=-0.1mA$ , $f=1kHz$ , $R_G=10k\Omega$	—	—	2	
		$V_{CE}=-6V$ , $I_C=-0.1mA$ , $f=1kHz$ , $R_G=100\Omega$	—	3	—	

Note :  $h_{FE}$  Classification GR : 200~400, BL : 350~700

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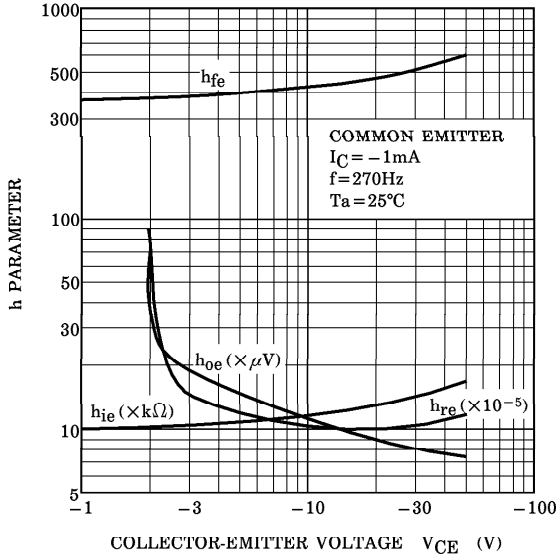
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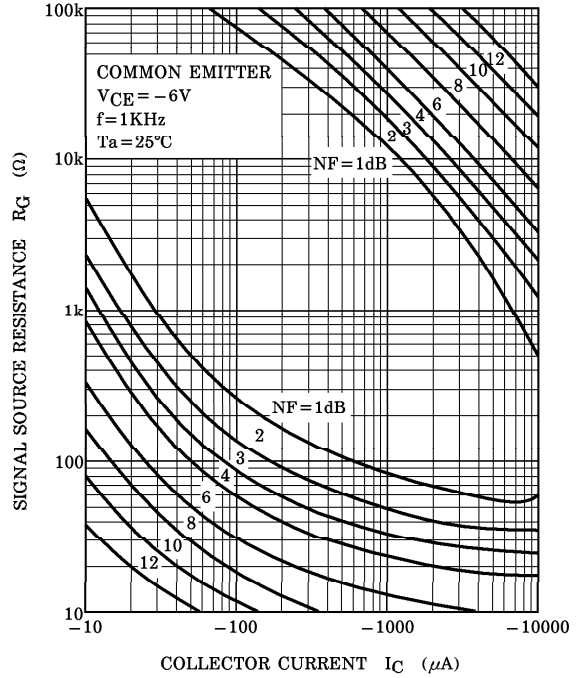
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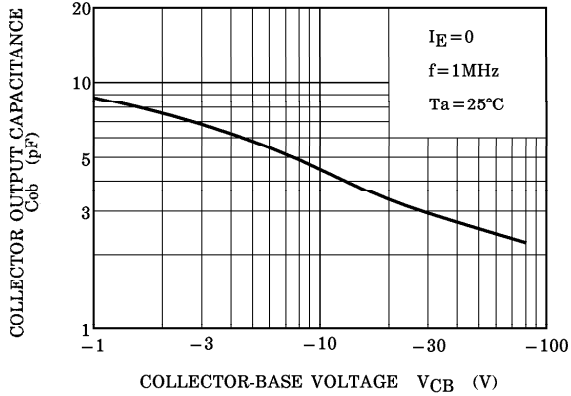
h PARAMETER - V<sub>CE</sub>



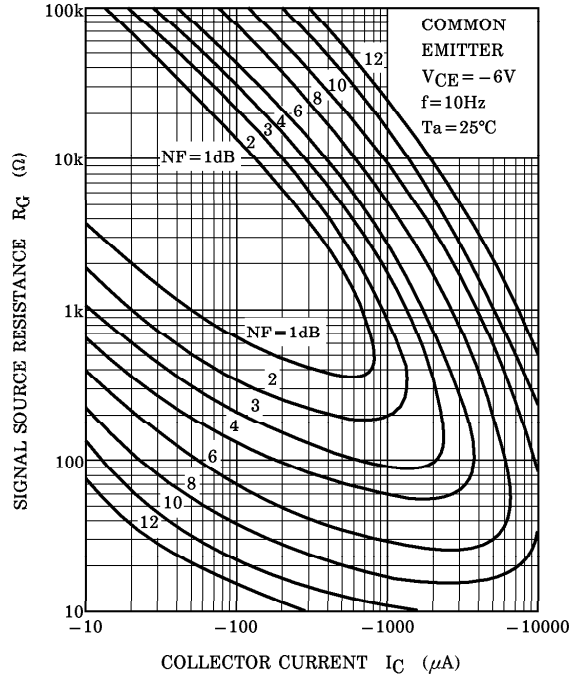
NF - R<sub>G</sub>, I<sub>C</sub>



C<sub>ob</sub> - V<sub>CB</sub>



NF - R<sub>G</sub>, I<sub>C</sub>



P<sub>C</sub> - T<sub>a</sub>

