

TOSHIBA TRANSISTOR SILICON PNP EPITAXIAL TYPE (MONOLITHIC DUAL TYPE)

# 2SA1349

LOW NOISE AUDIO AMPLIFIER APPLICATIONS

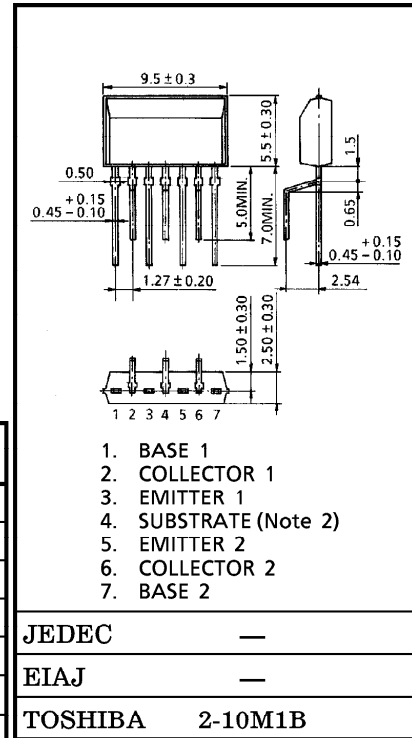
RECOMMENDED FOR CASCADE, CURRENT MIRROR CIRCUIT APPLICATIONS OF THE FIRST STAGES OF PRE, MAIN AMPLIFIERS

- 1 Chip Dual Type.
- Good Pair Characteristics.
- Low Noise :  $NF=3dB$  (Max.),  $R_g=10k\Omega$ ,  $V_{CE}=-6V$ ,  $I_C=-0.1mA$ ,  $f=1kHz$
- High Breakdown Voltage :  $V_{CEO}=-80V$  (Min.)
- Complementary to 2SC3381.

MAXIMUM RATINGS ( $T_a = 25^\circ C$ )

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	-80	V
Collector-Emitter Voltage	$V_{CEO}$	-80	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current	$I_C$	-100	mA
Base Current	$I_B$	-20	mA
Collector Power Dissipation	$P_C$	200×2	mW
Junction Temperature	$T_j$	125	°C
Storage Temperature Range	$T_{stg}$	-55~125	°C

Unit in mm



Weight : 0.37g

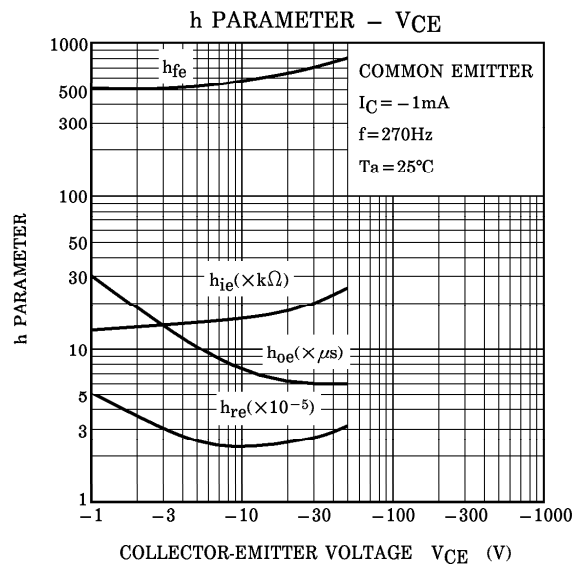
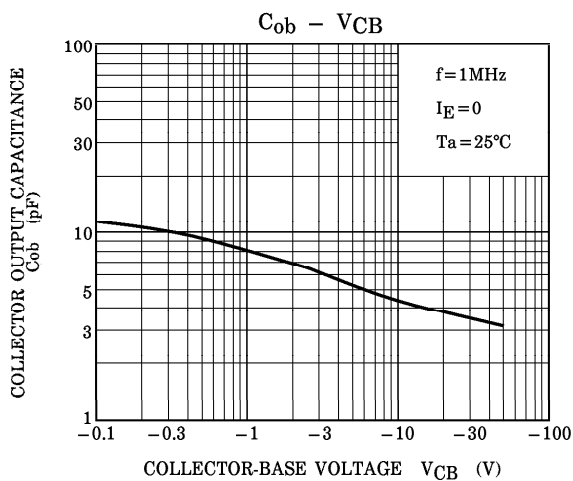
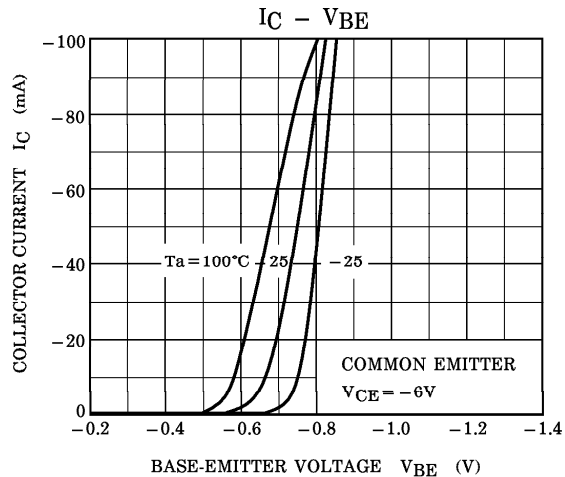
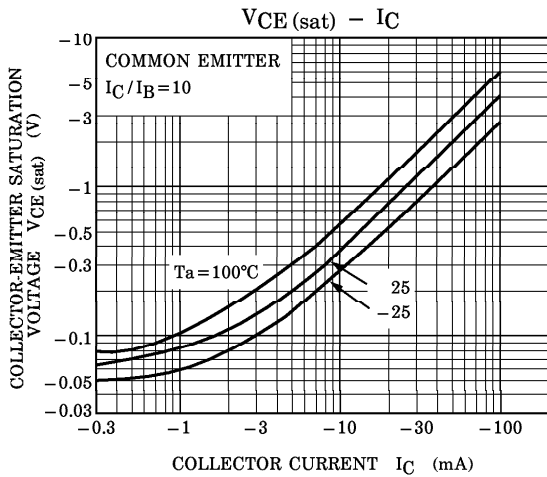
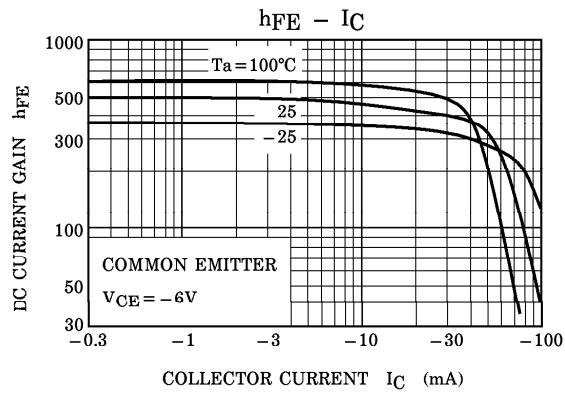
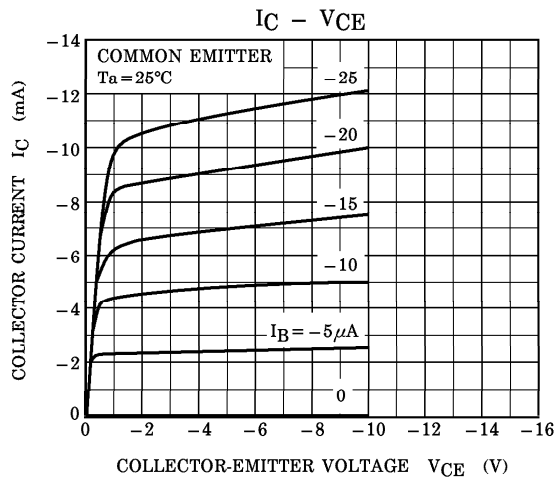
ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ C$ )

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = -80V, I_E = 0$	—	—	-0.1	$\mu A$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = -5V, I_C = 0$	—	—	-0.1	$\mu A$
DC Current Gain	$h_{FE}$ (Note 1)	$V_{CE} = -6V, I_C = -2mA$	200	—	700	
DC Current Gain Ratio	$h_{FE(S)} / h_{FE(L)}$	$V_{CE} = -6V, I_C = -2mA$	0.9	—	1.0	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -5mA, I_B = -0.5mA$	—	—	-0.3	V
Base-Emitter Voltage	$V_{BE}$	$V_{CE} = -6V, I_C = -2mA$	—	-0.6	—	V
Differential Base-Emitter Voltage	$ V_{BE1} - V_{BE2} $	$V_{CE} = -6V, I_C = -2mA$	0	—	10	mV
Collector Output Capacitance	$C_{ob}$	$V_{CB} = -10V, I_E = 0, f = 1MHz$	—	4.2	—	pF
Noise Figure	NF	$V_{CE} = -6V, I_C = -0.1mA$ $R_G = 10k\Omega, f = 1kHz$	0	—	3	dB

Note 1 :  $h_{FE}$  Classification GR : 200~400, BL : 350~700  
2 : Use the substrate lead with open.

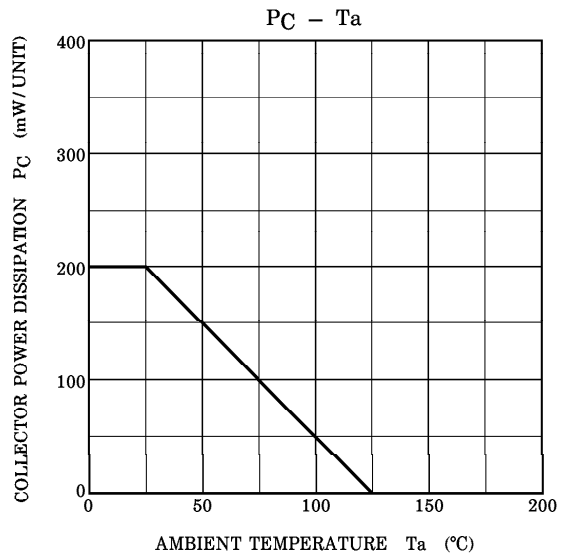
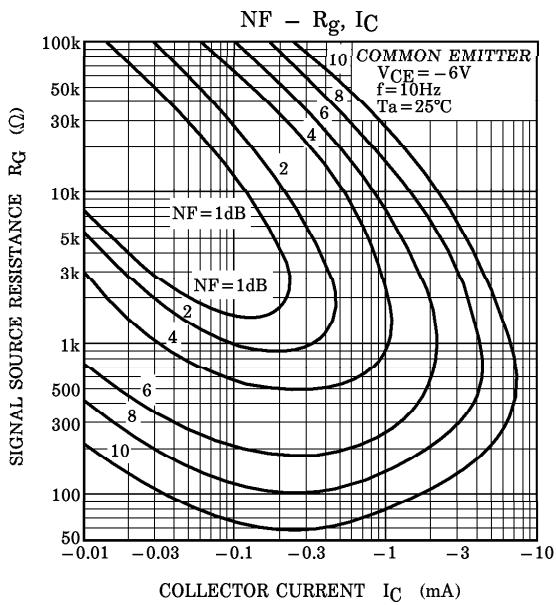
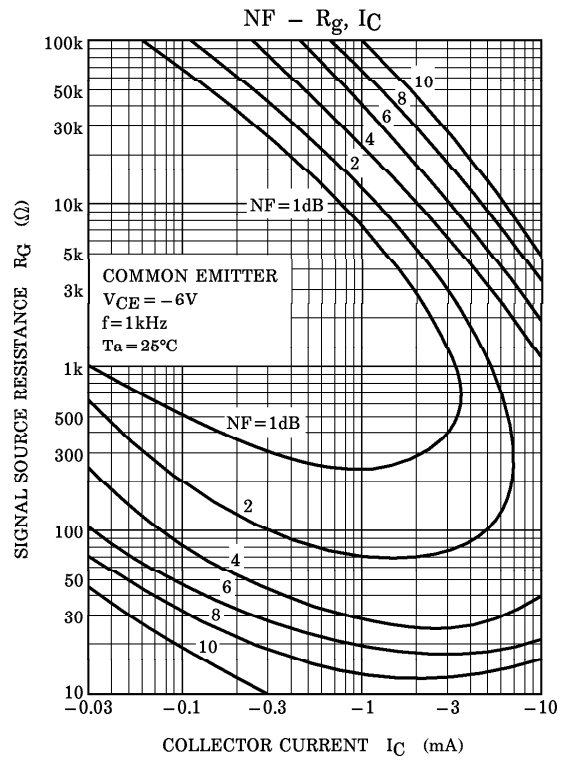
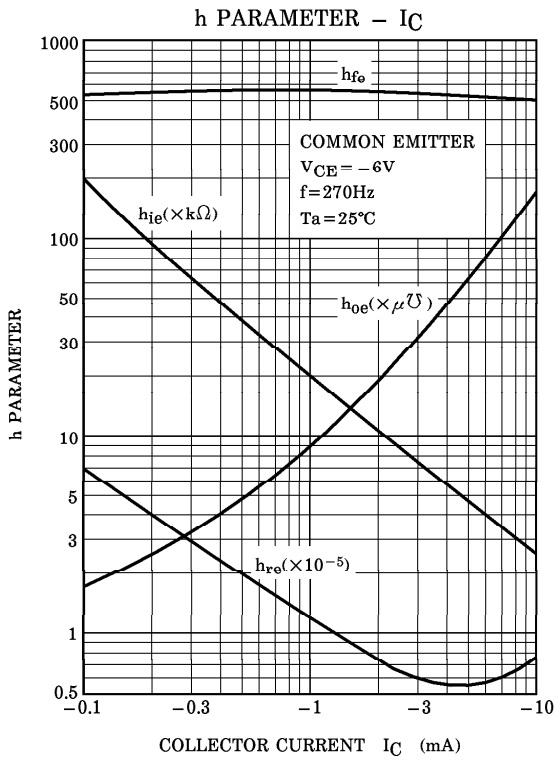
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TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (MONOLITHIC DUAL TYPE)

# 2SC3381

LOW NOISE AUDIO AMPLIFIER APPLICATIONS

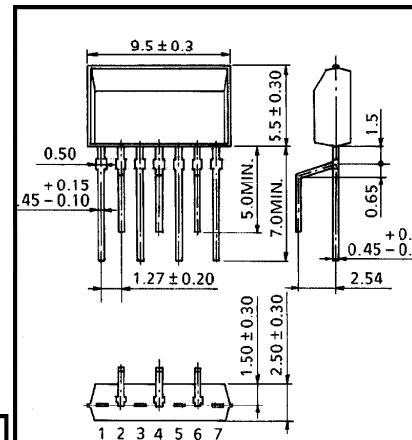
Unit in mm

RECOMMENDED FOR CASCODE, CURRENT MIRROR CIRCUIT APPLICATIONS OF THE FIRST STAGES OF PRE, MAIN AMPLIFIERS

- 1 Chip Dual Type.
- Good Pair Characteristics.
- Low Noise : NF=3dB (Max.), ( $V_{CE}=6V, I_C=0.1mA, R_G=10k\Omega, f=1kHz$ )
- High Breakdown Voltage :  $V_{CEO}=80V$  (Min.)
- Complementary to 2SA1349.

MAXIMUM RATINGS ( $T_a = 25^\circ C$ )

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	80	V
Collector-Emitter Voltage	$V_{CEO}$	80	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Collector Current	$I_C$	100	mA
Base Current	$I_B$	20	mA
Collector Power Dissipation	$P_C$	200×2	mW
Junction Temperature	$T_j$	125	°C
Storage Temperature Range	$T_{stg}$	-55~125	°C



1. BASE 1
  2. COLLECTOR 1
  3. EMITTER 1
  4. SUBSTRATE
  5. EMITTER 2
  6. COLLECTOR 2
  7. BASE 2
- (Use the substrate lead with open)

JEDEC	—
EIAJ	—
TOSHIBA	2-10M1B

Weight : 0.37g

ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ C$ )

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB}=80V, I_E=0$	—	—	0.1	$\mu A$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB}=5V, I_C=0$	—	—	0.1	$\mu A$
DC Current Gain	$h_{FE}$ (Note)	$V_{CE}=6V, I_C=2mA$	200	—	700	
DC Current Gain Ratio	$h_{FE}(S) / h_{FE}(L)$	$V_{CE}=6V, I_C=2mA$	0.9	—	1.0	
Collector-Emitter Saturation Voltage	$V_{CE}(sat)$	$I_C=10mA, I_B=1mA$	—	0.07	0.3	V
Base-Emitter Voltage	$V_{BE}$	$V_{CE}=6V, I_C=2mA$	—	0.63	—	V
Differential Base-Emitter Voltage	$ V_{BE1}-V_{BE2} $	$V_{CE}=6V, I_C=2mA$	0	—	10	mV
Collector Output Capacitance	$C_{ob}$	$V_{CB}=10V, I_E=0, f=1MHz$	—	3.6	—	pF
Noise Figure	NF	$V_{CE}=6V, I_C=0.1mA, R_G=10k\Omega, f=1kHz$	0	—	3	dB

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

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