

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (MONOLITHIC DUAL TYPE)

# 2SC3381

LOW NOISE AUDIO AMPLIFIER APPLICATIONS

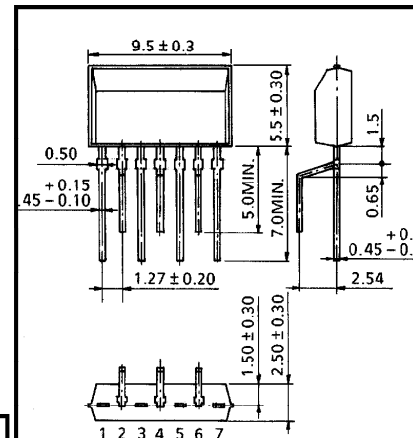
Unit in mm

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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