To our customers,

## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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RENESAS

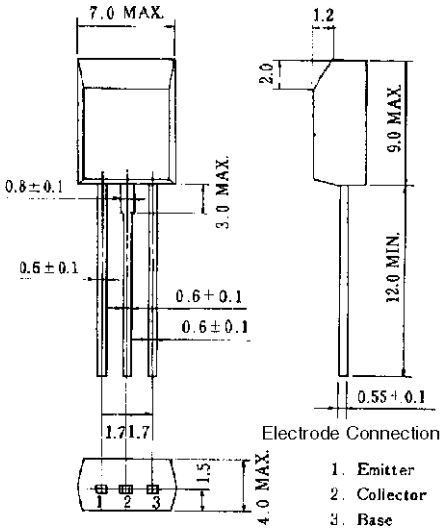
# SILICON TRANSISTOR
# 2SC2721

## NPN SILICON EPITAXIAL TRANSISTOR
## FOR HIGH-FREQUENCY AMPLIFIERS AND MID-SPEED SWITCHING

### FEATURES

- Complementary transistor with 2SA1154
- High $P_T$ in small dimension and high voltage
  $P_T$ = 1 W, $V_{CEO}$ = 60 V

### PACKAGE DRAWING (UNIT: mm)




### ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Collector to base voltage | $V_{CBO}$ | 60 | V |
| Collector to emitter voltage | $V_{CEO}$ | 60 | V |
| Emitter to base voltage | $V_{EBO}$ | 5.0 | V |
| Collector current (DC) | $I_{C(DC)}$ | 0.7 | A |
| Collector current (pulse) | $I_{C(pulse)}$* | 1.0 | A |
| Total power dissipation | $P_T$ | 1 | W |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature | $T_{stg}$ | −55 to +150 | °C |

* PW ≤ 10 ms, duty cycle ≤ 50%

### ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|
| Collector cutoff current | $I_{CBO}$ | $V_{CB}$ = 60 V, $I_E$ = 0 | | | 100 | nA |
| Emitter cutoff current | $I_{EBO}$ | $V_{EB}$ = 5.0 V, $I_C$ = 0 | | | 100 | nA |
| DC current gain | $h_{FE1}$ | $V_{CE}$ = 1.0 V, $I_C$ = 0.1 A * | 90 | 200 | 400 | |
| DC current gain | $h_{FE2}$ | $V_{CE}$ = 1.0 V, $I_C$ = 0.5 A * | 50 | 150 | | |
| DC base voltage | $V_{BE}$ | $V_{CE}$ = 6.0 V, $I_C$ = 10 mA | 600 | 635 | 700 | mV |
| Collector saturation voltage | $V_{CE(sat)}$ | $I_C$ = 0.5 A, $I_B$ = 50 mA * | | 0.12 | 0.35 | V |
| Base saturation voltage | $V_{BE(sat)}$ | $I_C$ = 0.5 A, $I_B$ = 50 mA * | | 0.90 | 1.2 | V |
| Output capacitance | $C_{ob}$ | $V_{CB}$ = 6.0 V, $I_E$ = 0, f = 1.0 MHz | | 13 | | pF |
| Gain bandwidth product | $f_T$ | $V_{CE}$ = 6.0 V, $I_E$ = −10 mA | | 110 | | MHz |
| Turn-on time | $t_{on}$ | Refer to the test circuit. | | 60 | | ns |
| Storage temperature | $t_{stg}$ | | | 600 | | ns |
| Turn-off time | $t_{off}$ | | | 650 | | ns |

* Pulse test PW ≤ 350 μs, duty cycle ≤ 2% per pulsed

### $h_{FE}$ CLASSIFICATION

| Marking | MA | LA | KA |
|---|---|---|---|
| $h_{FE1}$ | 90 to 180 | 135 to 270 | 200 to 400 |

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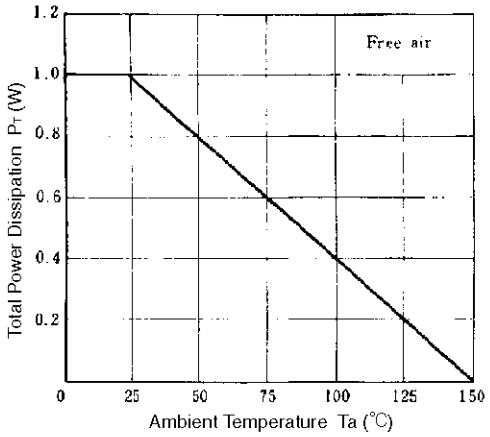
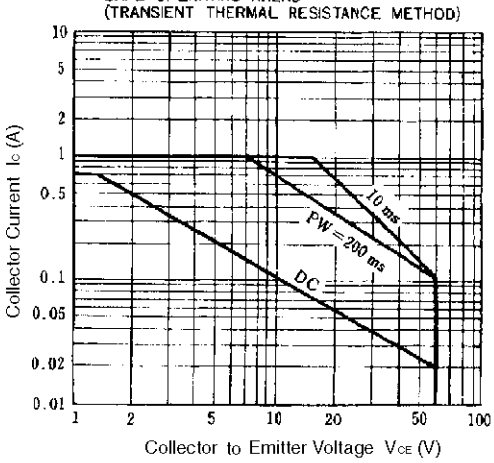
Printed in Japan

## TYPICAL CHARACTERISTICS (Ta = 25°C)

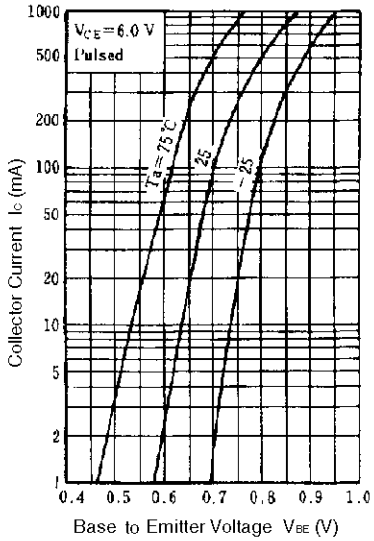
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



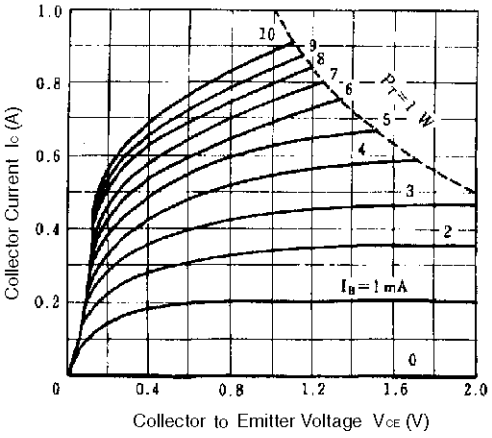

SAFE OPERATING AREAS (TRANSIENT THERMAL RESISTANCE METHOD)



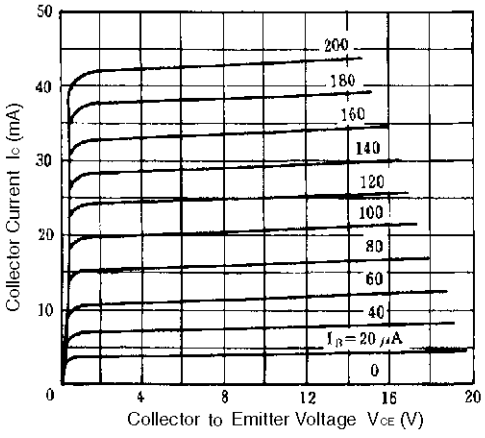

COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



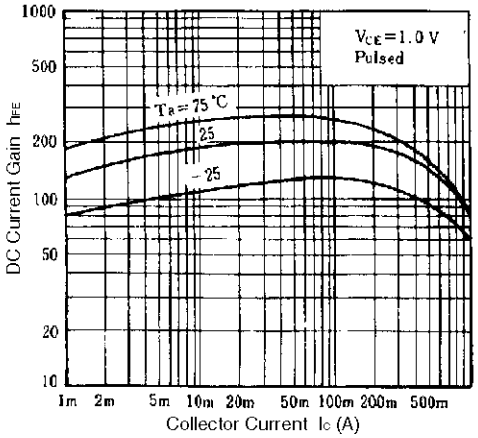

COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



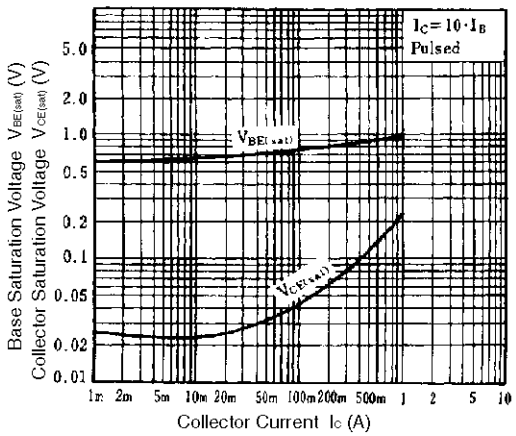

COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



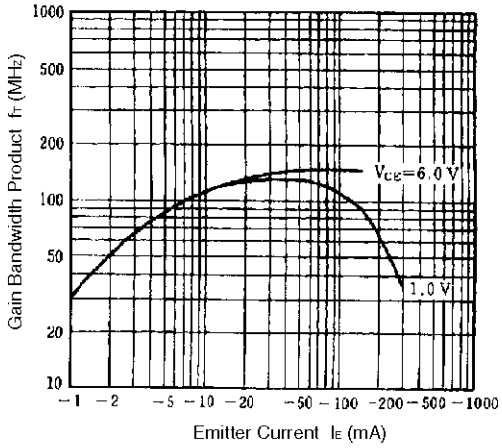

DC CURRENT GAIN vs. COLLECTOR CURRENT



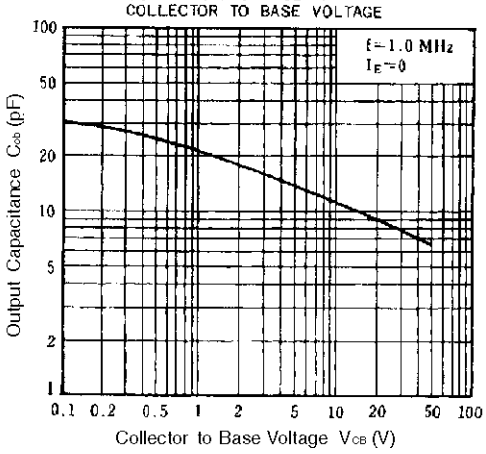
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



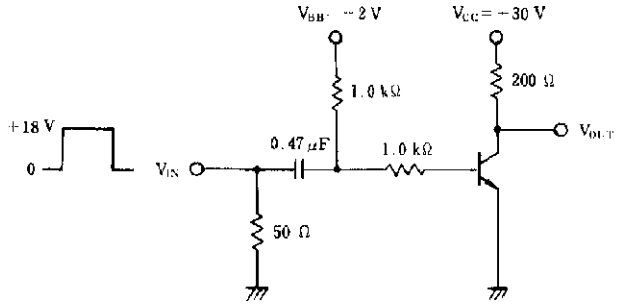

GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT




OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE

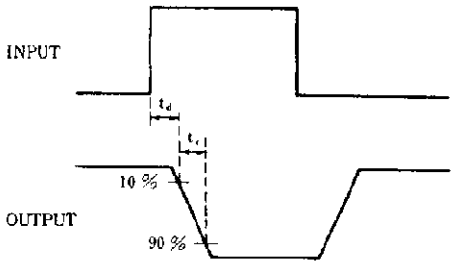


## SWITCHING TIME TEST CIRCUIT



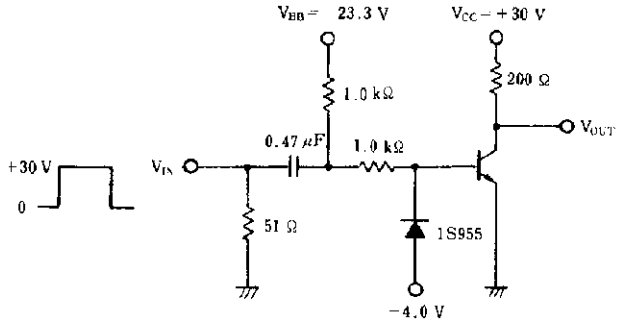

$t_r$ < 2.0 ns
PW = 1.0 μs
DC = 2 %

$t_{on}$ Switching Circuit



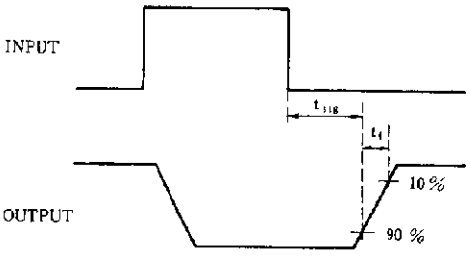

$t_{on} = t_d + t_r$

VOLTAGE WAVEFORMS




$t_r \leqslant 2.0$ ns
PW = 1.0 μs
DC = 2 %

$t_{off}$ Switching Circuit




$t_{off} = t_{stg} + t_f$

VOLTAGE WAVEFORMS

**[MEMO]**

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