

# 2SC2734

Silicon NPN Epitaxial

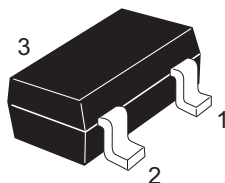
REJ03G0705-0200  
(Previous ADE-208-1074)  
Rev.2.00  
Aug.10.2005

## Application

- UHF frequency converter
- Local oscillator, wide band amplifier

## Outline

RENESAS Package code: PLSP0003ZB-A  
(Package name: MPAK)



1. Emitter  
2. Base  
3. Collector

Note: Marking is "GC".

## Absolute Maximum Ratings

(Ta = 25°C)

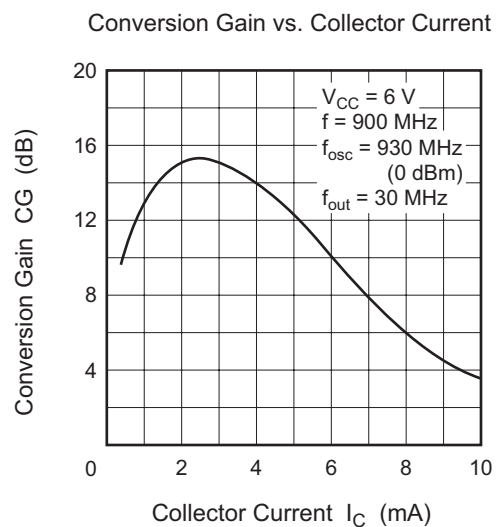
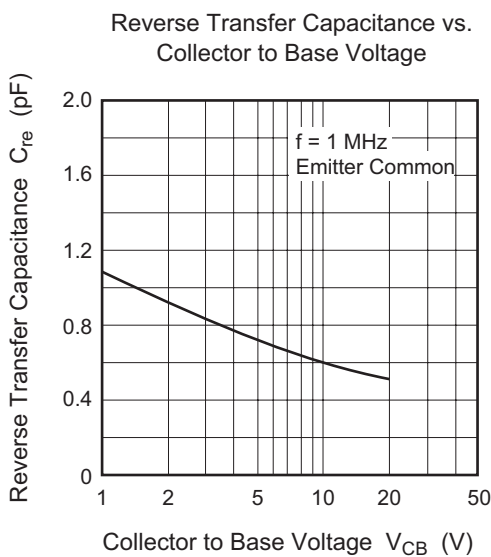
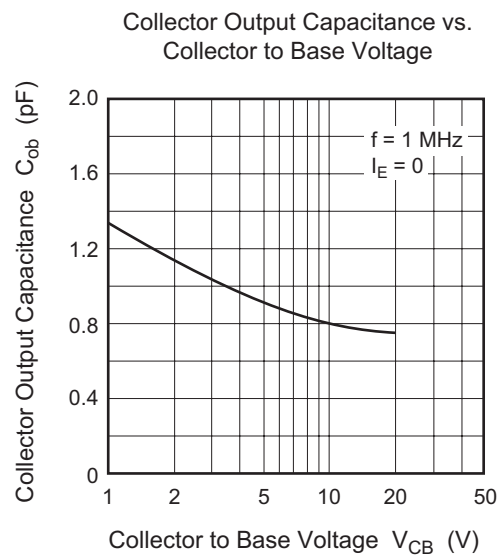
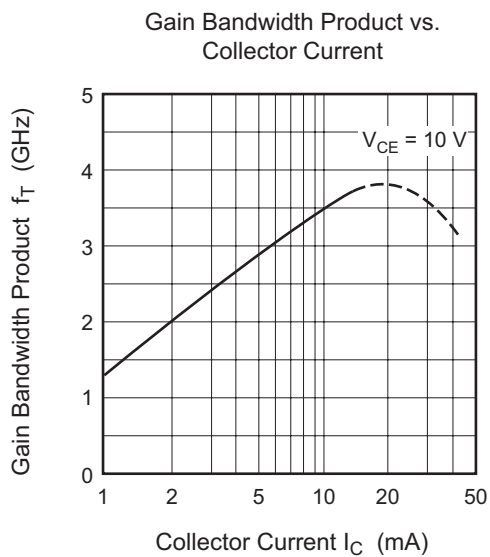
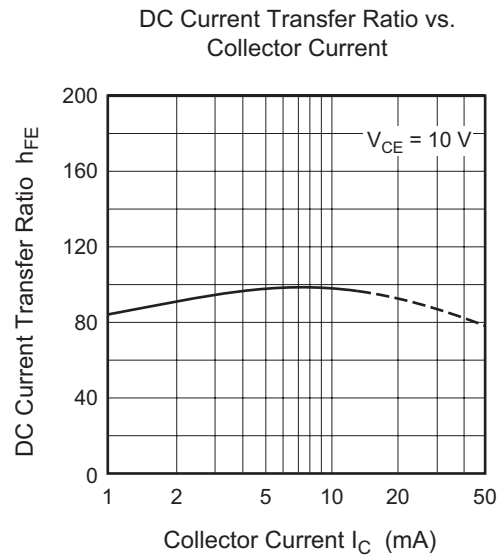
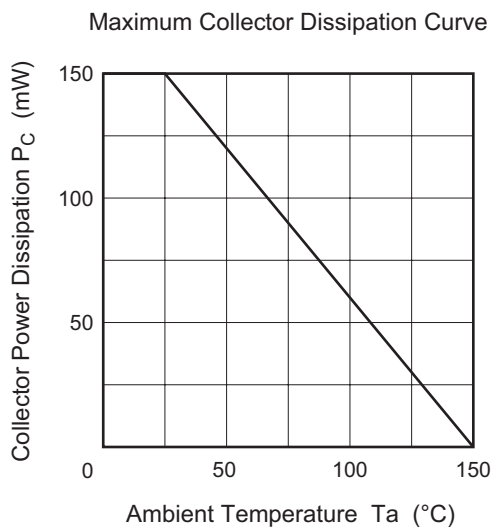
| Item                         | Symbol    | Ratings     | Unit |
|------------------------------|-----------|-------------|------|
| Collector to base voltage    | $V_{CBO}$ | 20          | V    |
| Collector to emitter voltage | $V_{CEO}$ | 11          | V    |
| Emitter to base voltage      | $V_{EBO}$ | 3           | V    |
| Collector current            | $I_C$     | 50          | mA   |
| Collector power dissipation  | $P_C$     | 150         | mW   |
| Junction temperature         | $T_j$     | 150         | °C   |
| Storage temperature          | $T_{stg}$ | -55 to +150 | °C   |

## Electrical Characteristics

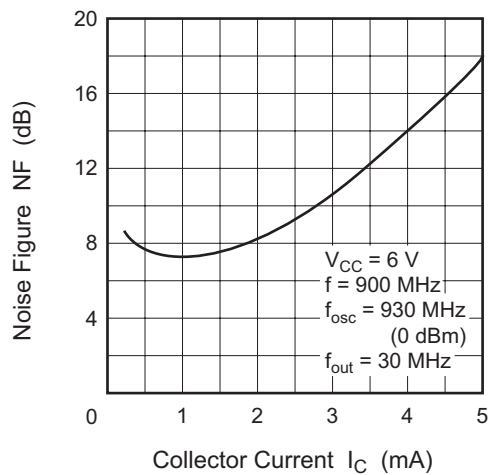
(Ta = 25°C)

| Item                                    | Symbol        | Min | Typ | Max | Unit    | Test conditions                                                                                          |
|-----------------------------------------|---------------|-----|-----|-----|---------|----------------------------------------------------------------------------------------------------------|
| Collector to base breakdown voltage     | $V_{(BR)CBO}$ | 20  | —   | —   | V       | $I_C = 10\ \mu A, I_E = 0$                                                                               |
| Collector to emitter breakdown voltage  | $V_{(BR)CEO}$ | 11  | —   | —   | V       | $I_C = 1\ mA, R_{BE} = \infty$                                                                           |
| Emitter to base breakdown voltage       | $V_{(BR)EBO}$ | 3   | —   | —   | V       | $I_E = 10\ \mu A, I_C = 0$                                                                               |
| Collector cutoff current                | $I_{CBO}$     | —   | —   | 0.5 | $\mu A$ | $V_{CB} = 10\ V, I_E = 0$                                                                                |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | —   | —   | 0.7 | V       | $I_C = 10\ mA, I_B = 5\ mA$                                                                              |
| DC current transfer ratio               | $h_{FE}$      | 20  | 90  | 200 |         | $V_{CE} = 10\ V, I_C = 5\ mA$                                                                            |
| Gain bandwidth product                  | $f_T$         | 1.4 | 3.5 | —   | GHz     | $V_{CE} = 10\ V, I_C = 10\ mA$                                                                           |
| Collector output capacitance            | $C_{ob}$      | —   | 0.9 | 1.5 | pF      | $V_{CB} = 10\ V, I_E = 0, f = 1\ MHz$                                                                    |
| Conversion gain                         | CG            | —   | 15  | —   | dB      | $V_{CC} = 6\ V, I_C = 2\ mA,$<br>$f = 900\ MHz,$<br>$f_{OSC} = 930\ MHz\ (0dBm),$<br>$f_{out} = 30\ MHz$ |
| Noise figure                            | NF            | —   | 9   | —   | dB      | $V_{CC} = 6\ V, I_C = 2\ mA,$<br>$f = 900\ MHz,$<br>$f_{OSC} = 930\ MHz\ (0dBm),$<br>$f_{out} = 30\ MHz$ |
| Oscillating output voltage              | $V_{OSC}$     | —   | 140 | —   | mV      | $V_{CC} = 6\ V, I_C = 5\ mA,$<br>$f = 930\ MHz$                                                          |

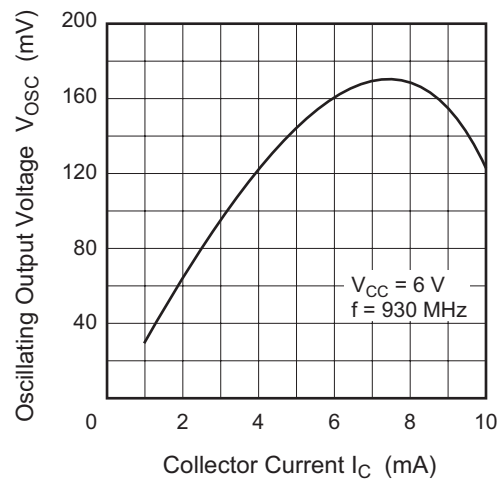
## Main Characteristics



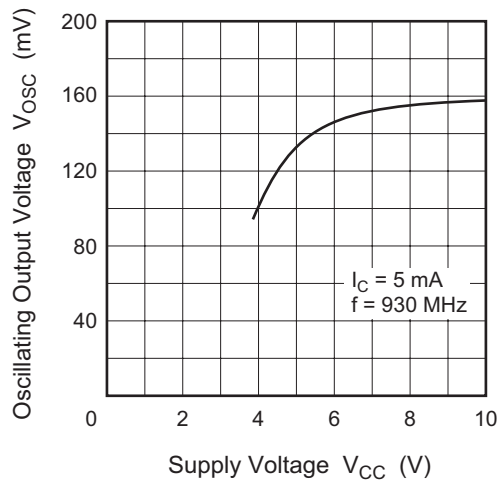
Noise Figure vs. Collector Current



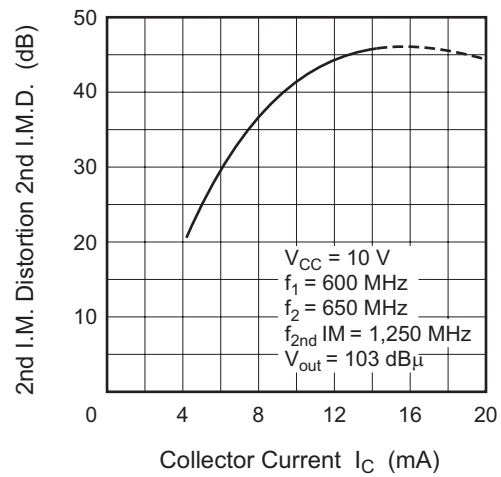
Oscillating Output Voltage vs. Collector Current



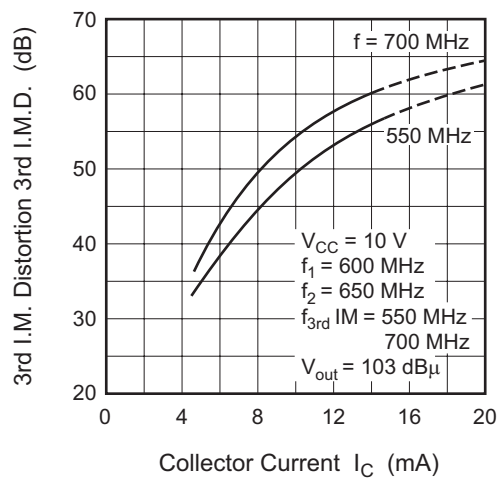
Oscillating Output Voltage vs. Supply Voltage



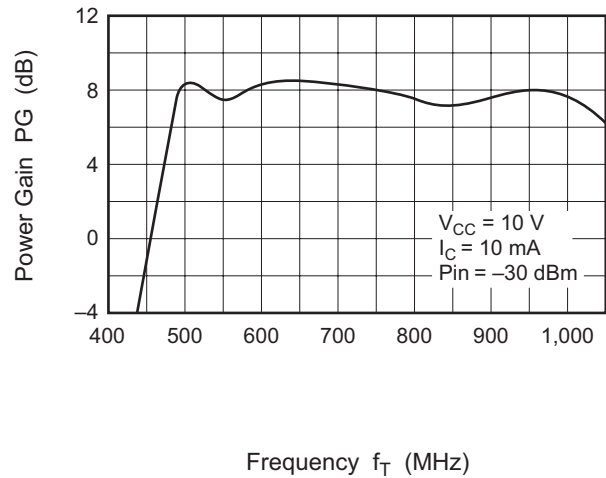
2nd I.M. Distortion vs. Collector Current



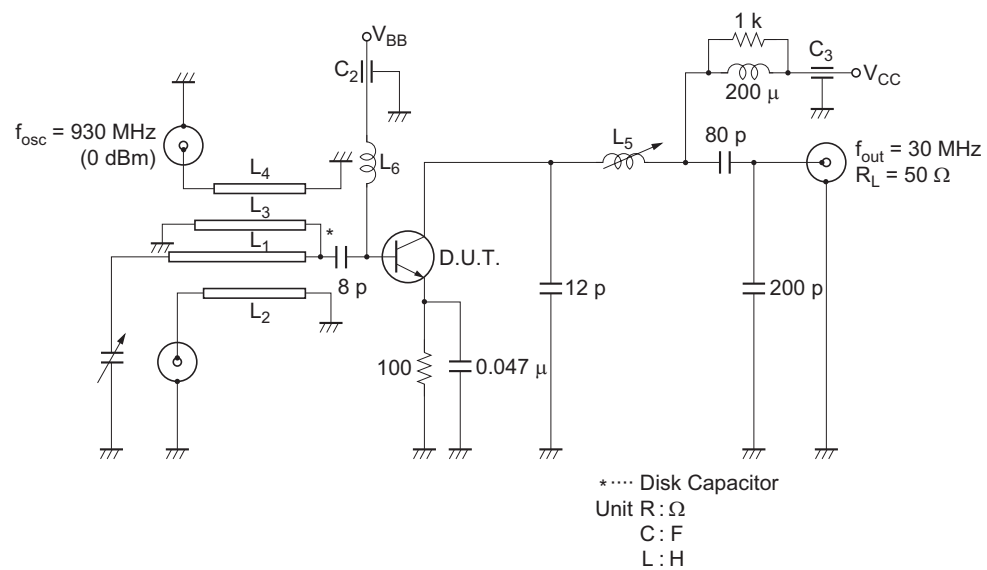
3rd I.M. Distortion vs. Collector Current



Power Gain vs. Frequency



Conversion Gain, Noise Figure Test Circuit

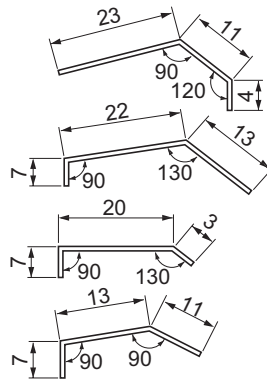


L<sub>1</sub> :  $\phi$ 1 mm Enameled Copper wire

L<sub>2</sub> :  $\phi$ 1 mm Enameled Copper wire

L<sub>3</sub> :  $\phi$ 1 mm Enameled Copper wire

L<sub>4</sub> :  $\phi$ 1 mm Enameled Copper wire



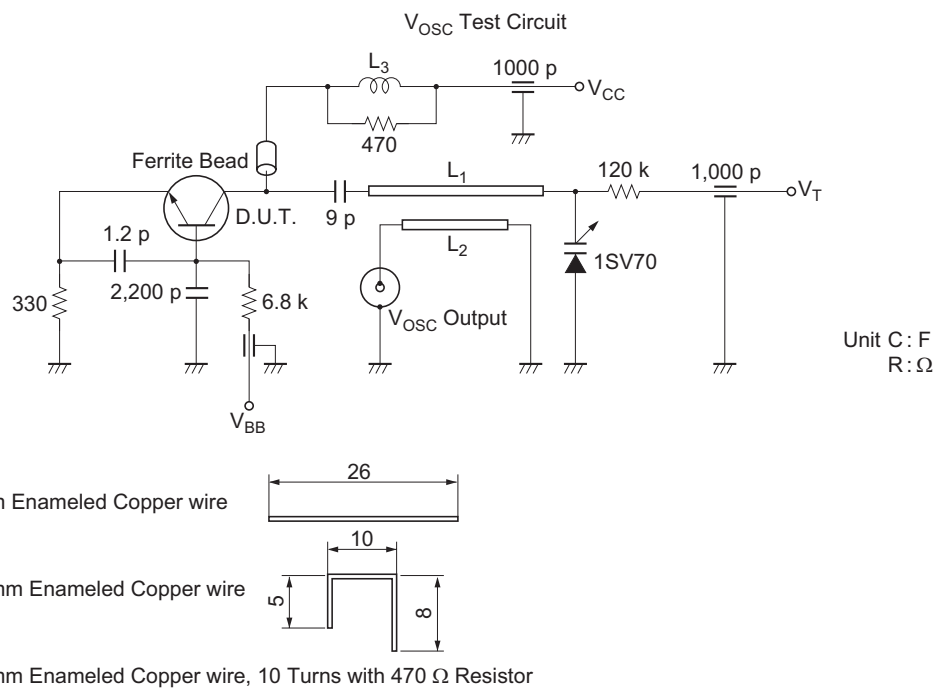
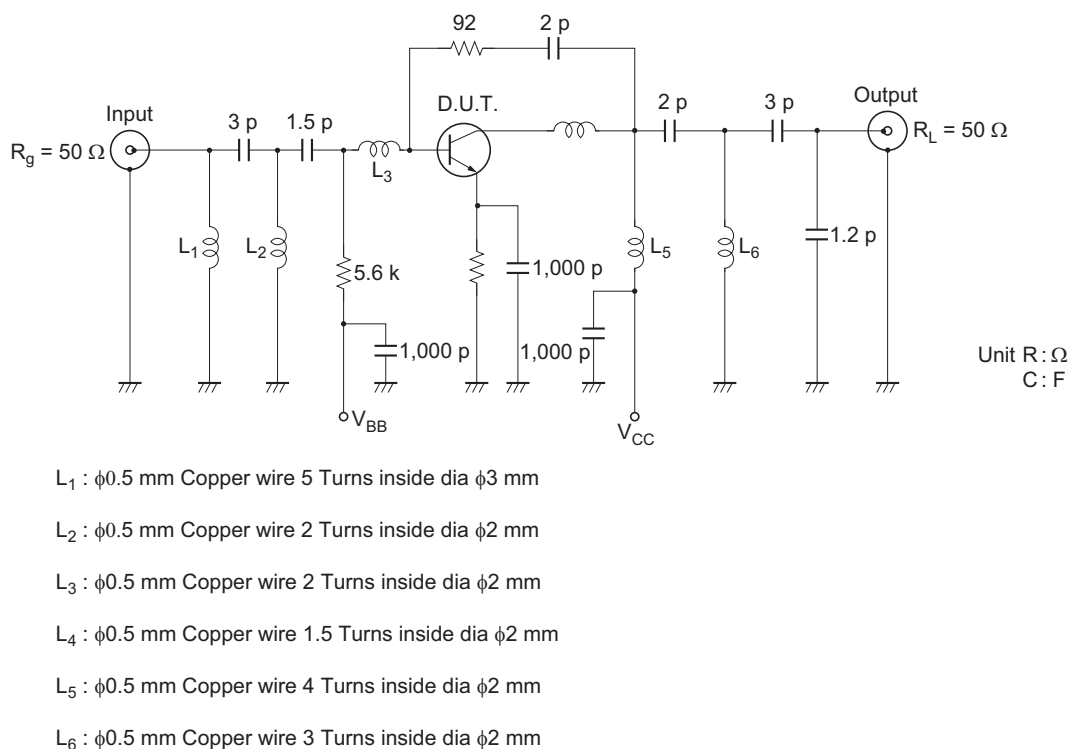
Unit : mm

L<sub>5</sub> : Bobbin  $\phi$ 5 mm inside dia,  $\phi$ 0.2 mm 20 Turns Enameled Copper wire

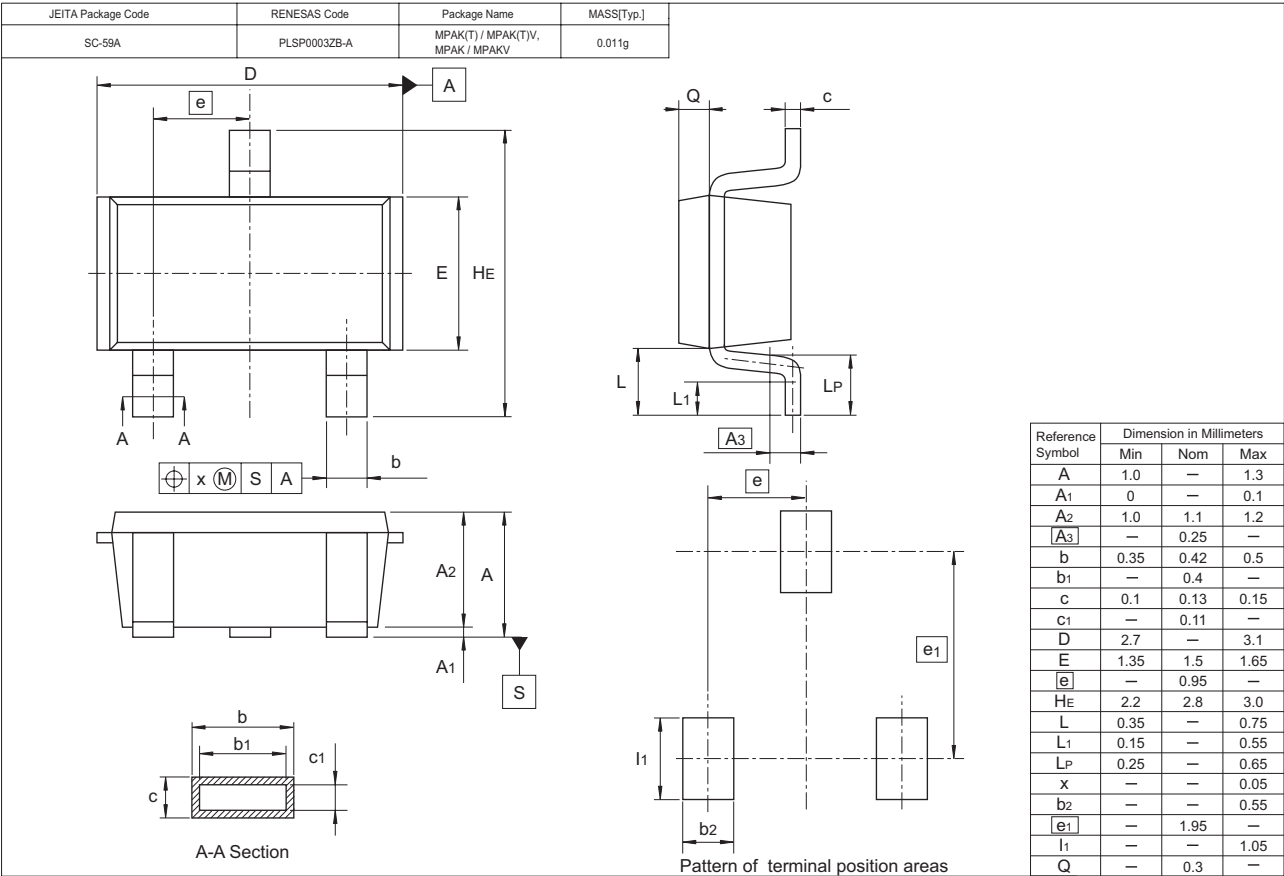
L<sub>6</sub> :  $\phi$ 0.5 mm Enameled Copper wire 1 Turn inside dia  $\phi$ 6 mm

C<sub>1</sub> : 20 pF max. Air Trimmer Condenser

C<sub>2</sub>, C<sub>3</sub> : 1000 pF Air Core Capacitor

Circuit Example-UHF Wide Bandwidth Amplifier ( $f = 500\text{ MHz to }950\text{ MHz}$ )

Package Dimensions



Ordering Information

| Part Name    | Quantity | Shipping Container                |
|--------------|----------|-----------------------------------|
| 2SC2734GTL-E | 3000     | φ 178 mm Reel, 8 mm Emboss Taping |

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