

| Parameter | Value |
|-----------|--------------|
| V_{CE0} | 50V |
| I_C | 100mA |
| R_1 | 10k Ω |

●Features

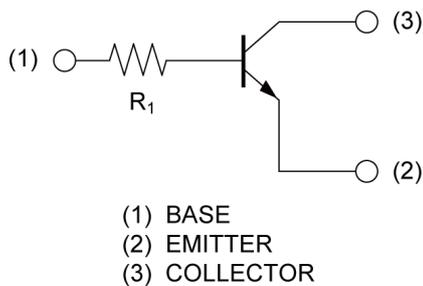
- 1) Built-In Biasing Resistor
- 2) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit) .
- 3) Only the on/off conditions need to be set for operation, making the circuit design easy.
- 4) Complementary PNP Types: DTA114T series

●Application

INVERTER, INTERFACE, DRIVER

●Inner circuit

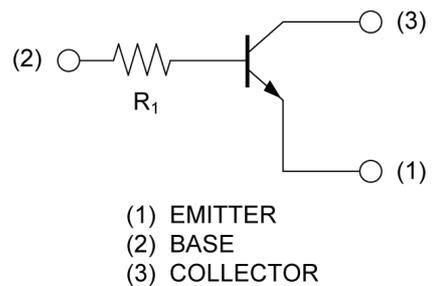
DTC114TM/ DTC114TEB/ DTC114TUB



●Outline

| | |
|--|---|
| <p>SOT-723</p> <p>DTC114TM (VMT3)</p> | <p>SOT-416FL</p> <p>DTC114TEB (EMT3F)</p> |
| <p>SOT-416</p> <p>DTC114TE (EMT3)</p> | <p>SOT-323FL</p> <p>DTC114TUB (UMT3F)</p> |
| <p>SOT-323</p> <p>DTC114TUA (UMT3)</p> | <p>SOT-346</p> <p>DTC114TKA (SMT3)</p> |

DTC114TE/ DTC114TUA/ DTC114TKA



●Packaging specifications

| Part No. | Package | Package size | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit.(pcs) | Marking |
|-----------|-----------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| DTC114TM | SOT-723 | 1212 | T2L | 180 | 8 | 8000 | 04 |
| DTC114TEB | SOT-416FL | 1616 | TL | 180 | 8 | 3000 | 04 |
| DTC114TE | SOT-416 | 1616 | TL | 180 | 8 | 3000 | 04 |
| DTC114TUB | SOT-323FL | 2021 | TL | 180 | 8 | 3000 | 04 |
| DTC114TUA | SOT-323 | 2021 | T106 | 180 | 8 | 3000 | 04 |
| DTC114TKA | SOT-346 | 2928 | T146 | 180 | 8 | 3000 | 04 |

● **Absolute maximum ratings** ($T_a = 25^\circ\text{C}$)

| Parameter | | Symbol | Values | Unit |
|------------------------------|-----------|---------------------|-------------|------------------|
| Collector-base voltage | | V_{CBO} | 50 | V |
| Collector-emitter voltage | | V_{CEO} | 50 | V |
| Emitter-base voltage | | V_{EBO} | 5 | V |
| Collector current | | I_{C} | 100 | mA |
| Power dissipation | DTC114TM | P_{D}^{*1} | 150 | mW |
| | DTC114TEB | | 150 | |
| | DTC114TE | | 150 | |
| | DTC114TUB | | 200 | |
| | DTC114TUA | | 200 | |
| | DTC114TKA | | 200 | |
| Junction temperature | | T_{j} | 150 | $^\circ\text{C}$ |
| Range of storage temperature | | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

● **Electrical characteristics** ($T_a = 25^\circ\text{C}$)

| Parameter | Symbol | Conditions | Values | | | Unit |
|--------------------------------------|----------------------|---|--------|------|------|------------|
| | | | Min. | Typ. | Max. | |
| Collector-base breakdown voltage | BV_{CBO} | $I_{\text{C}} = 50\mu\text{A}$ | 50 | - | - | V |
| Collector-emitter breakdown voltage | BV_{CEO} | $I_{\text{C}} = 1\text{mA}$ | 50 | - | - | V |
| Emitter-base breakdown voltage | BV_{EBO} | $I_{\text{E}} = 50\mu\text{A}$ | 5 | - | - | V |
| Collector cut-off current | I_{CBO} | $V_{\text{CB}} = 50\text{V}$ | - | - | 500 | nA |
| Emitter cut-off current | I_{EBO} | $V_{\text{EB}} = 4\text{V}$ | - | - | 500 | nA |
| Collector-emitter saturation voltage | $V_{\text{CE(sat)}}$ | $I_{\text{C}} = 10\text{mA}, I_{\text{B}} = 1\text{mA}$ | - | - | 300 | mV |
| DC current gain | h_{FE} | $V_{\text{CE}} = 5\text{V}, I_{\text{C}} = 1\text{mA}$ | 100 | 250 | 600 | - |
| Input resistance | R_{i} | - | 7 | 10 | 13 | k Ω |
| Transition frequency | f_{T}^{*2} | $V_{\text{CE}} = 10\text{V}, I_{\text{E}} = -5\text{mA}, f = 100\text{MHz}$ | - | 250 | - | MHz |

*1 Each terminal mounted on a reference land.

*2 Characteristics of built-in transistor

●Electrical characteristic curves(Ta=25°C)

Fig.1 Grounded emitter propagation characteristics

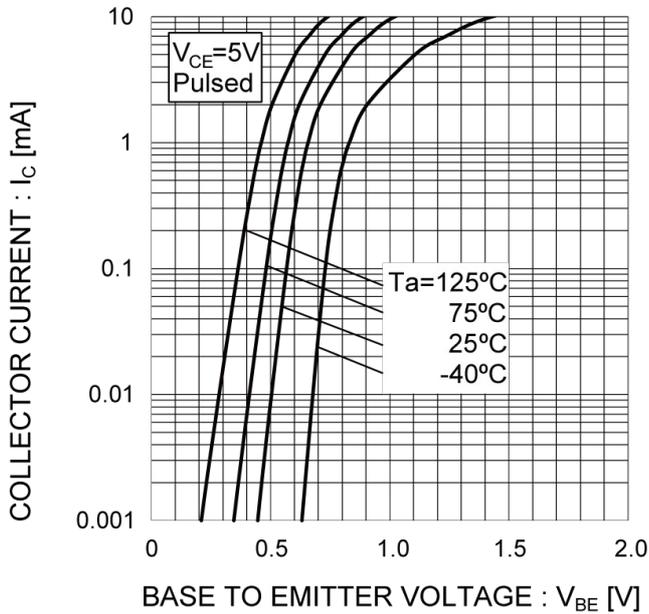


Fig.2 Typical Output Characteristics

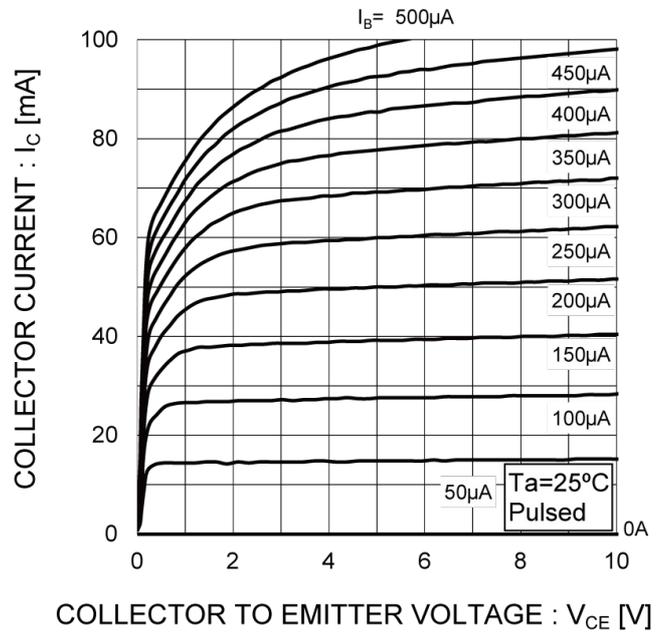


Fig.3 DC Current Gain vs. Collector Current

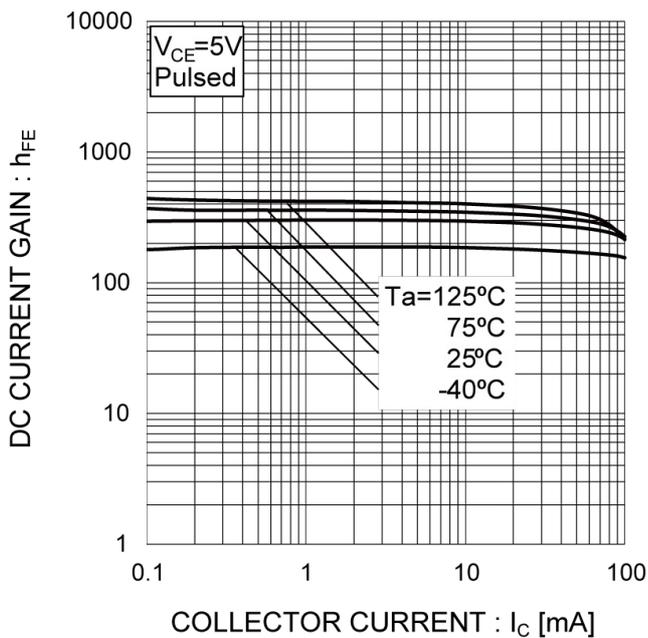
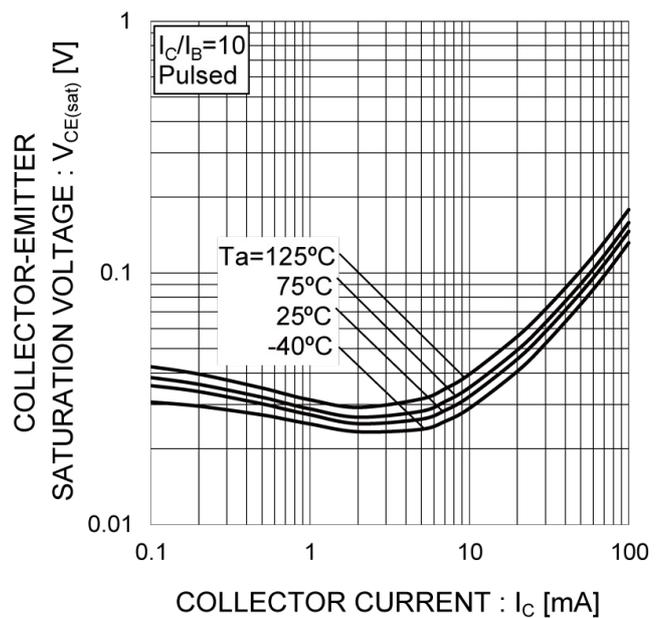
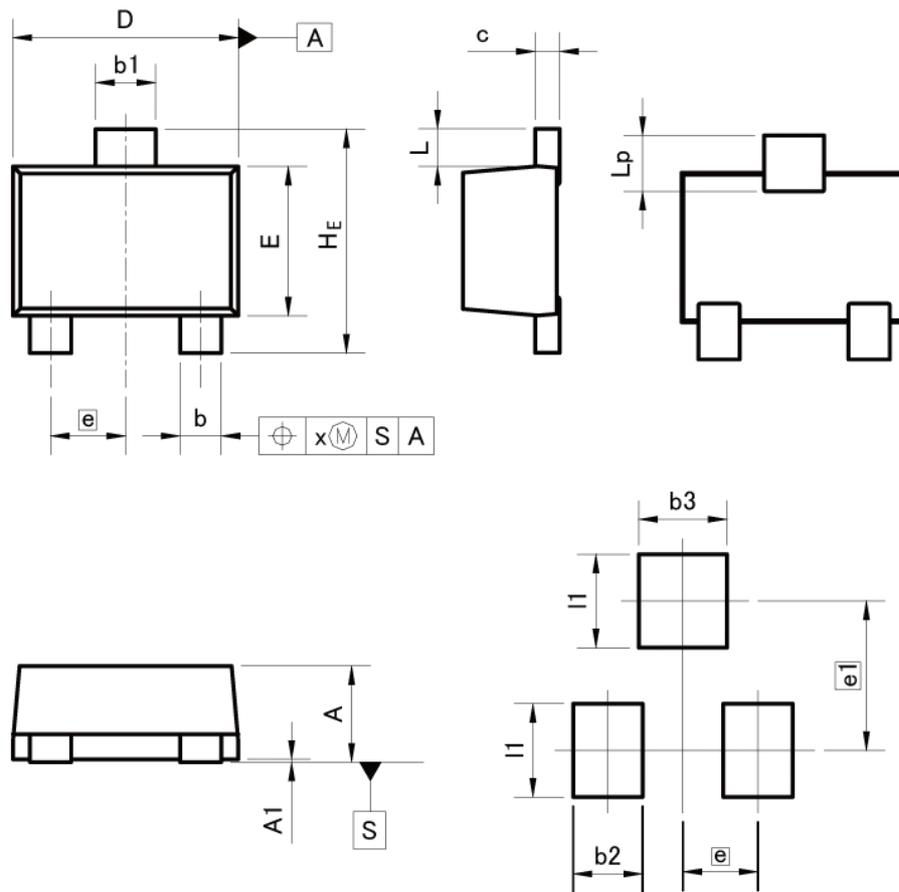


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current



●Dimensions

SOT-723
SC-105AA
(VMT3)



Pattern of terminal position areas
[Not a pattern of soldering pads]

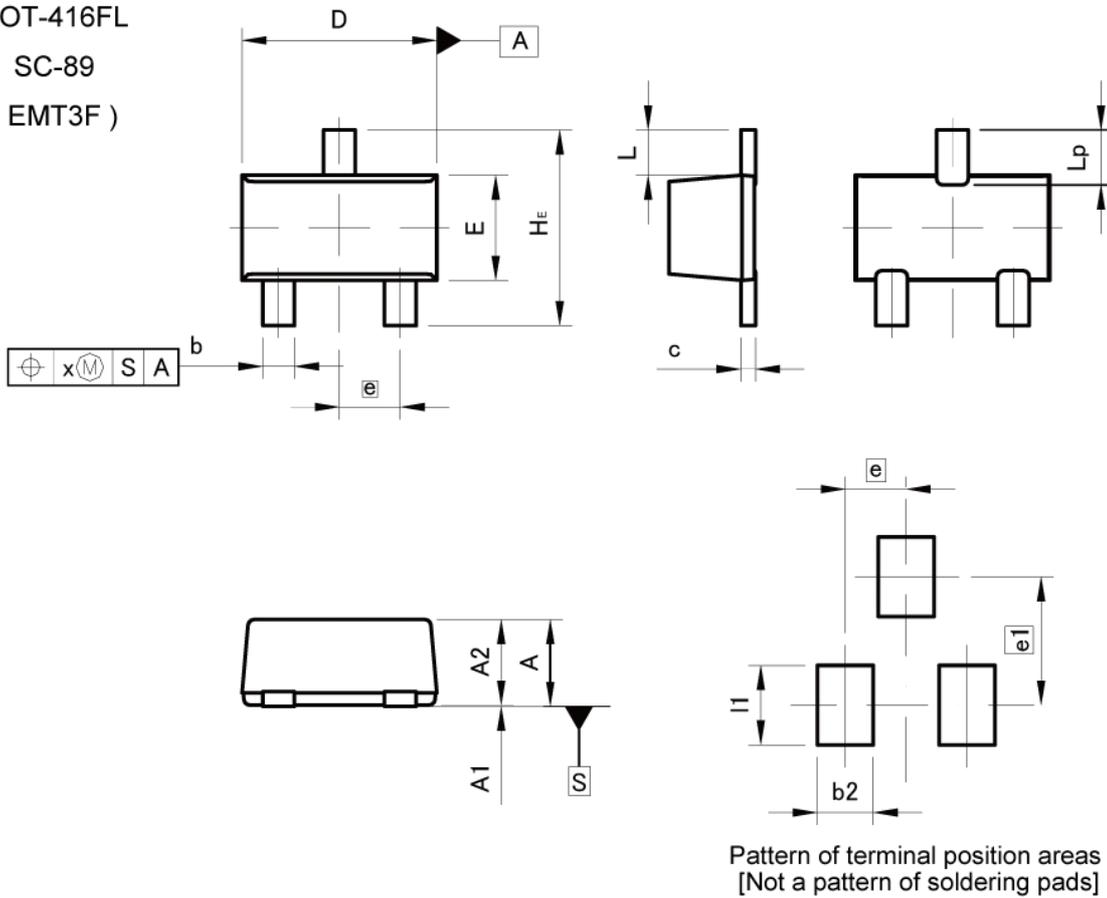
| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.45 | 0.55 | 0.018 | 0.022 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| b | 0.17 | 0.27 | 0.007 | 0.011 |
| b1 | 0.27 | 0.37 | 0.011 | 0.015 |
| c | 0.08 | 0.18 | 0.003 | 0.007 |
| D | 1.10 | 1.30 | 0.043 | 0.051 |
| E | 0.70 | 0.90 | 0.028 | 0.035 |
| e | 0.40 | | 0.02 | |
| HE | 1.10 | 1.30 | 0.043 | 0.051 |
| L | 0.10 | 0.30 | 0.004 | 0.012 |
| Lp | 0.20 | 0.40 | 0.008 | 0.016 |
| x | - | 0.10 | - | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| b2 | - | 0.37 | - | 0.015 |
| b3 | - | 0.47 | - | 0.019 |
| e1 | 0.80 | | 0.031 | |
| I1 | - | 0.50 | - | 0.020 |

Dimension in mm/inches

●Dimensions

SOT-416FL
SC-89
(EMT3F)



Pattern of terminal position areas
[Not a pattern of soldering pads]

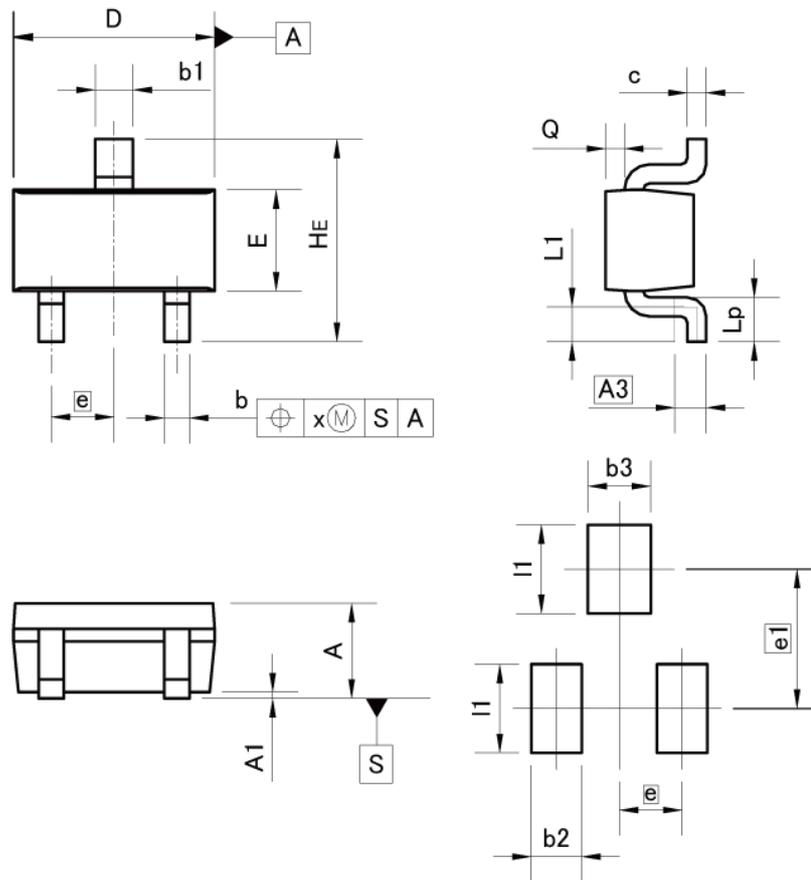
| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.65 | 0.85 | 0.026 | 0.033 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A2 | 0.60 | 0.80 | 0.024 | 0.031 |
| b | 0.21 | 0.36 | 0.008 | 0.014 |
| c | 0.08 | 0.18 | 0.003 | 0.007 |
| D | 1.50 | 1.70 | 0.059 | 0.067 |
| E | 0.76 | 0.96 | 0.030 | 0.038 |
| e | 0.50 | | 0.020 | |
| HE | 1.50 | 1.70 | 0.059 | 0.067 |
| L | 0.37 | | 0.015 | |
| Lp | 0.35 | 0.55 | 0.014 | 0.022 |
| x | - | 0.10 | - | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| b2 | - | 0.46 | - | 0.018 |
| e1 | - | 1.05 | - | 0.041 |
| l1 | - | 0.65 | - | 0.026 |

Dimension in mm/inches

●Dimensions

SOT-416
SC-75A
(EMT3)



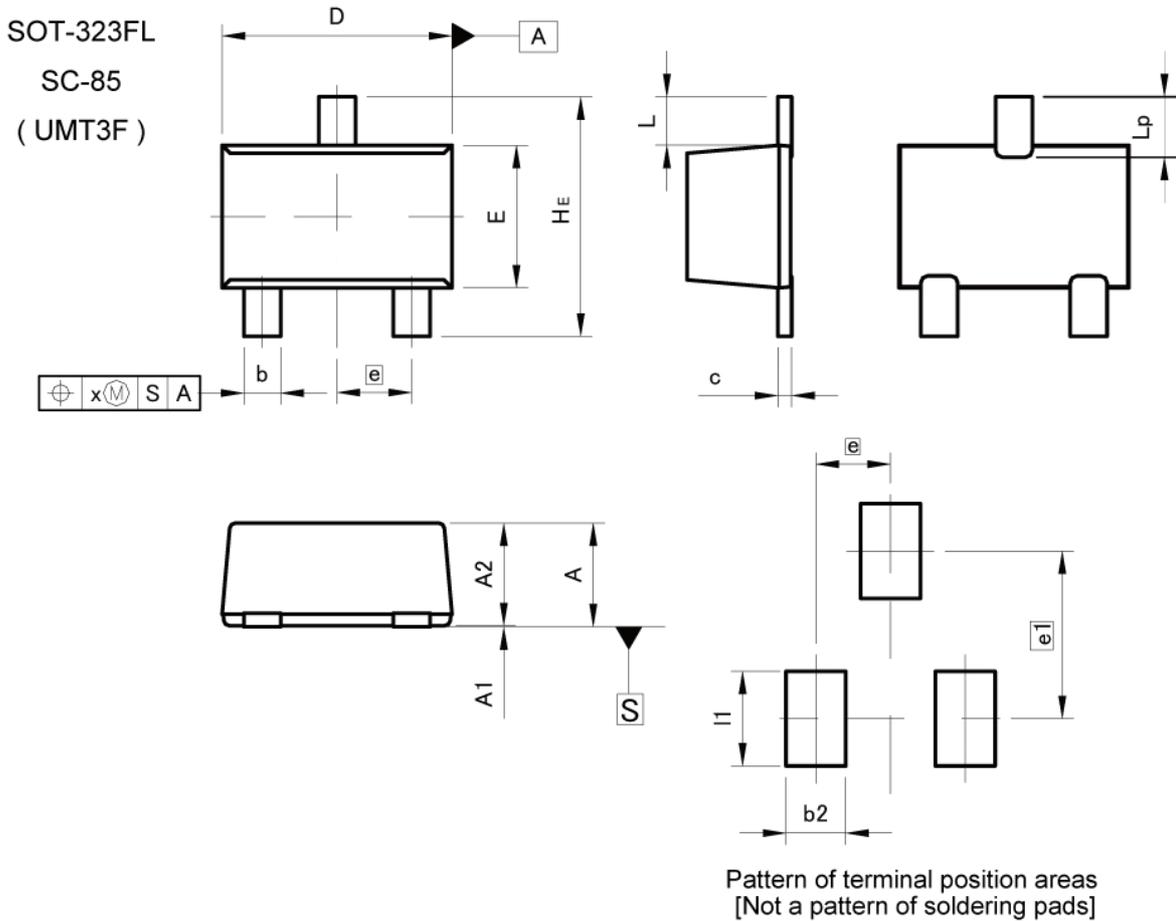
Pattern of terminal position areas
[Not a pattern of soldering pads]

| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.60 | 0.80 | 0.024 | 0.031 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A3 | 0.25 | | 0.010 | |
| b | 0.15 | 0.30 | 0.006 | 0.012 |
| b1 | 0.25 | 0.40 | 0.010 | 0.016 |
| c | 0.10 | 0.20 | 0.004 | 0.008 |
| D | 1.50 | 1.70 | 0.059 | 0.067 |
| E | 0.70 | 0.90 | 0.028 | 0.035 |
| e | 0.50 | | 0.020 | |
| HE | 1.40 | 1.80 | 0.055 | 0.071 |
| L1 | 0.10 | - | 0.004 | - |
| Lp | 0.15 | - | 0.006 | - |
| Q | 0.05 | 0.25 | 0.002 | 0.010 |
| x | - | 0.10 | - | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| b2 | - | 0.40 | - | 0.016 |
| b3 | - | 0.50 | - | 0.020 |
| e1 | 1.10 | | 0.043 | |
| l1 | - | 0.70 | - | 0.028 |

Dimension in mm/inches

●Dimensions

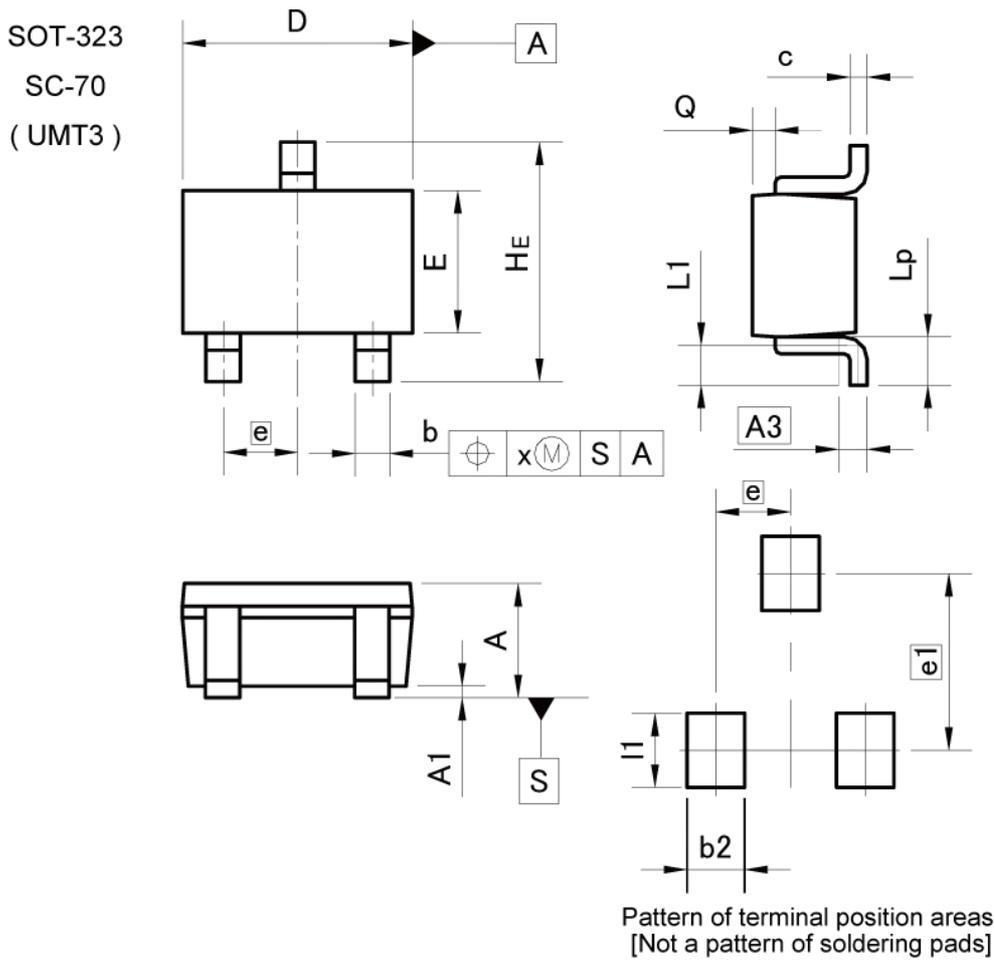


| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.85 | 1.05 | 0.033 | 0.041 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A2 | 0.80 | 1.00 | 0.031 | 0.039 |
| b | 0.27 | 0.42 | 0.011 | 0.017 |
| c | 0.08 | 0.18 | 0.003 | 0.007 |
| D | 1.90 | 2.10 | 0.075 | 0.083 |
| E | 1.15 | 1.35 | 0.045 | 0.053 |
| e | 0.65 | | 0.026 | |
| HE | 2.00 | 2.20 | 0.079 | 0.087 |
| L | 0.425 | | 0.017 | |
| Lp | 0.43 | 0.63 | 0.017 | 0.025 |
| x | - | 0.10 | - | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| b2 | - | 0.52 | - | 0.020 |
| e1 | 1.47 | | 0.058 | |
| l1 | - | 0.83 | - | 0.033 |

Dimension in mm/inches

●Dimensions

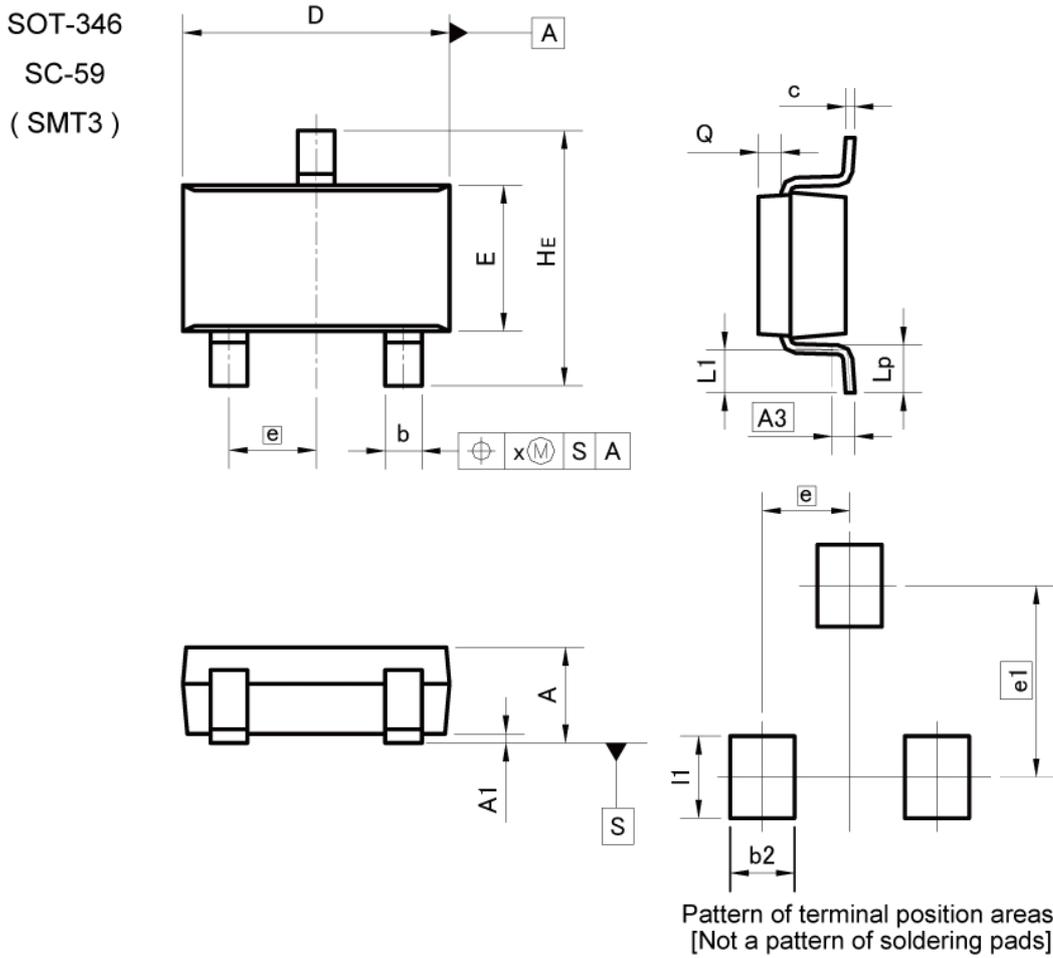


| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.80 | 1.00 | 0.031 | 0.039 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A3 | 0.25 | | 0.010 | |
| b | 0.25 | 0.40 | 0.010 | 0.016 |
| c | 0.10 | 0.20 | 0.004 | 0.008 |
| D | 1.90 | 2.10 | 0.075 | 0.083 |
| E | 1.15 | 1.35 | 0.045 | 0.053 |
| e | 0.65 | | 0.026 | |
| HE | 2.00 | 2.20 | 0.079 | 0.087 |
| L1 | 0.10 | 0.40 | 0.004 | 0.016 |
| Lp | 0.25 | 0.55 | 0.010 | 0.022 |
| Q | 0.10 | 0.30 | 0.004 | 0.012 |
| x | - | 0.10 | - | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| b2 | - | 0.50 | - | 0.020 |
| e1 | 1.55 | | 0.061 | |
| l1 | - | 0.65 | - | 0.026 |

Dimension in mm/inches

●Dimensions



| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.00 | 1.30 | 0.039 | 0.051 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A3 | 0.25 | | 0.010 | |
| b | 0.35 | 0.50 | 0.014 | 0.020 |
| c | 0.09 | 0.25 | 0.004 | 0.010 |
| D | 2.80 | 3.00 | 0.110 | 0.118 |
| E | 1.50 | 1.80 | 0.059 | 0.071 |
| e | 0.95 | | 0.037 | |
| HE | 2.60 | 3.00 | 0.102 | 0.118 |
| L1 | 0.30 | 0.60 | 0.012 | 0.024 |
| Lp | 0.40 | 0.70 | 0.016 | 0.028 |
| Q | 0.20 | 0.30 | 0.008 | 0.012 |
| x | - | 0.10 | - | 0.004 |
| y | - | 0.10 | - | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| b2 | - | 0.60 | - | 0.024 |
| e1 | 2.10 | | 0.083 | |
| I1 | - | 0.90 | - | 0.035 |

Dimension in mm/inches

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|-----------|-----------|------------|-----------|
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| CLASS IV | | CLASS III | |

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 - Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
 - Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
 - Sealing or coating our Products with resin or other coating materials
 - Use of our Products without cleaning residue of flux (even if you use no-clean type fluxes, cleaning residue of flux is recommended); or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
 - Use of the Products in places subject to dew condensation
- The Products are not subject to radiation-proof design.
- Please verify and confirm characteristics of the final or mounted products in using the Products.
- In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse. is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
- De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.
- Confirm that operation temperature is within the specified range described in the product specification.
- ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

Precaution for Mounting / Circuit board design

- When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.
- In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

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1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
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 - [b] the temperature or humidity exceeds those recommended by ROHM
 - [c] the Products are exposed to direct sunshine or condensation
 - [d] the Products are exposed to high Electrostatic
2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.
3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

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