

| Parameter | Value |
|---------------|--------------|
| V_{CC} | -50V |
| $I_{C(MAX.)}$ | -100mA |
| R_1 | 22k Ω |
| R_2 | 22k Ω |

●Features

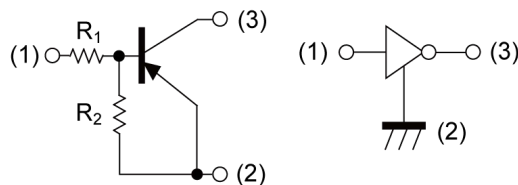
- 1) Built-In Biasing Resistors, $R_1 = R_2 = 22k\Omega$
- 2) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit) .
- 3) Only the on/off conditions need to be set for operation, making the circuit design easy.
- 4) Complementary NPN Types: DTC124E series

●Application

INVERTER, INTERFACE, DRIVER

●Inner circuit

DTA124EM/ DTA124EEB/ DTA124EUB

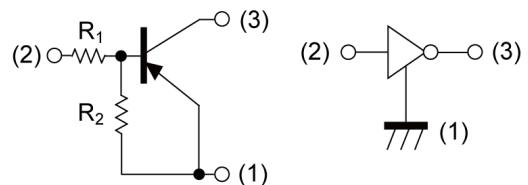


(1) IN (BASE)
 (2) GND (+) (EMITTER)
 (3) OUT (COLLECTOR)

●Outline

| | |
|------------------------------------|---------------------------------------|
| SOT-723 DTA124EM (VMT3) | SOT-416FL DTA124EEB (EMT3F) |
| SOT-416 DTA124EE (EMT3) | SOT-323FL DTA124EUB (UMT3F) |
| SOT-323 DTA124EU3 (UMT3) | SOT-346 DTA124EKA (SMT3) |

DTA124EE/ DTA124EU3/ DTA124EKA



(1) GND (+) (EMITTER)
 (2) IN (BASE)
 (3) OUT (COLLECTOR)

●Packaging specifications

| Part No. | Package | Package size | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit.(pcs) | Marking |
|-----------|-----------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| DTA124EM | SOT-723 | 1212 | T2L | 180 | 8 | 3000 | 15 |
| DTA124EEB | SOT-416FL | 1616 | TL | 180 | 8 | 3000 | 15 |
| DTA124EE | SOT-416 | 1616 | TL | 180 | 8 | 3000 | 15 |
| DTA124EUB | SOT-323FL | 2021 | TL | 180 | 8 | 3000 | 15 |
| DTA124EU3 | SOT-323 | 2021 | T106 | 180 | 8 | 3000 | 15 |
| DTA124EKA | SOT-346 | 2928 | T146 | 180 | 8 | 3000 | 15 |

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

| Parameter | | Symbol | Values | Unit |
|------------------------------|-----------|-------------------|-------------|------------------|
| Supply voltage | | V_{CC} | -50 | V |
| Input voltage | | V_{IN} | -40 to 10 | V |
| Output current | | I_O | -30 | mA |
| Collector current | | $I_{C(MAX)}^{*1}$ | -100 | mA |
| Power dissipation | DTA124EM | P_D^{*2} | 150 | mW |
| | DTA124EEB | | 150 | |
| | DTA124EE | | 150 | |
| | DTA124EUB | | 200 | |
| | DTA124EU3 | | 200 | |
| | DTA124EKA | | 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. | |
| Input voltage | $V_{I(off)}$ | $V_{CC} = -5V, I_O = -100\mu\text{A}$ | - | - | -0.5 | V |
| | $V_{I(on)}$ | $V_O = -0.2V, I_O = -5\text{mA}$ | -3.0 | - | - | |
| Output voltage | $V_{O(on)}$ | $I_O = -10\text{mA}, I_I = -0.5\text{mA}$ | - | -100 | -300 | mV |
| Input current | I_I | $V_I = -5V$ | - | - | -360 | μA |
| Output current | $I_{O(off)}$ | $V_{CC} = -50V, V_I = 0V$ | - | - | -500 | nA |
| DC current gain | G_I | $V_O = -5V, I_O = -5\text{mA}$ | 56 | - | - | - |
| Input resistance | R_I | - | 15.4 | 22 | 28.6 | k Ω |
| Resistance ratio | R_2/R_1 | - | 0.8 | 1.0 | 1.2 | - |
| Transition frequency | f_T^{*1} | $V_{CE} = -10V, I_E = 5\text{mA}, f = 100\text{MHz}$ | - | 250 | - | MHz |

*1 Characteristics of built-in transistor

*2 Each terminal mounted on a reference land.

● Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

Fig.1 Input voltage vs. output current (ON characteristics)

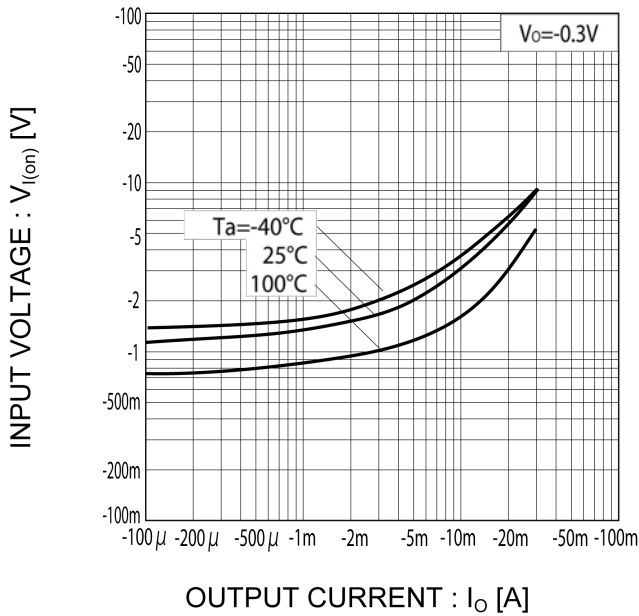


Fig.2 Output current vs. input voltage (OFF characteristics)

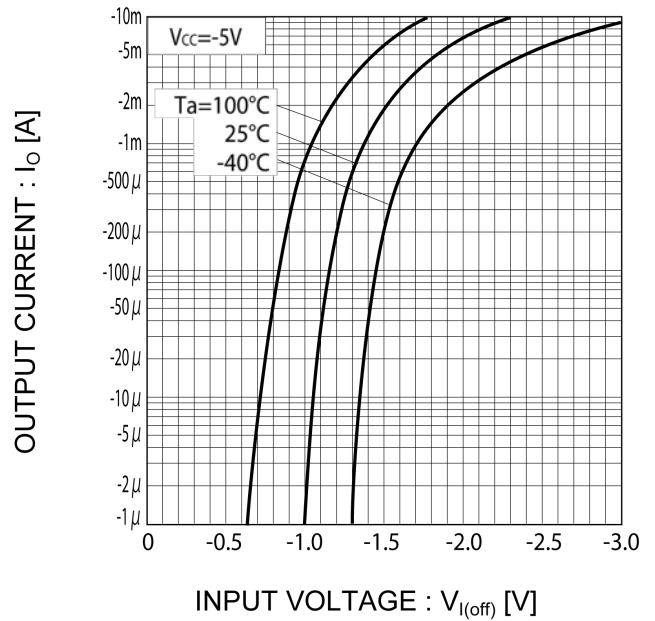


Fig.3 Output current vs. output voltage

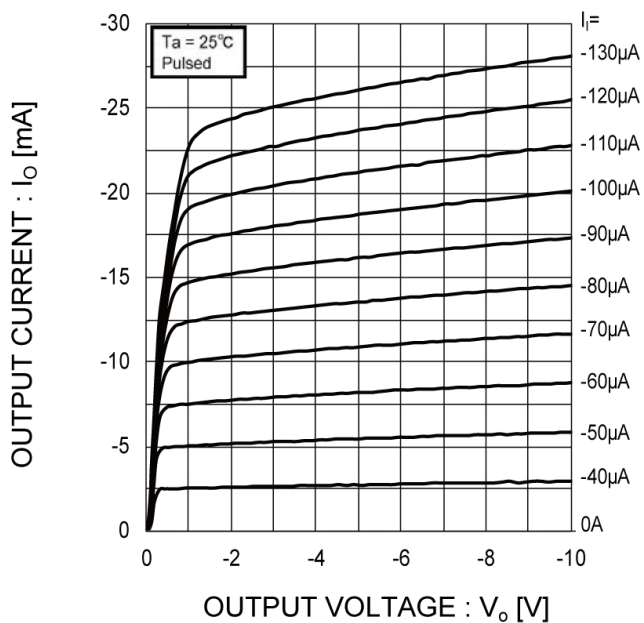
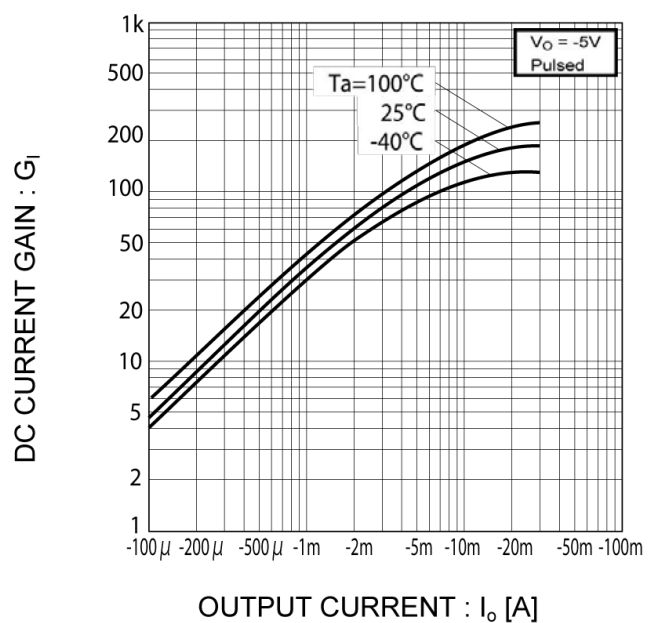
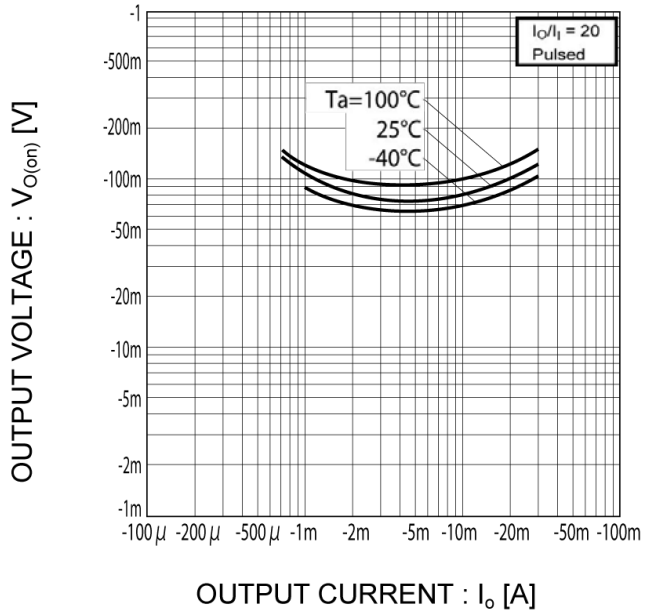


Fig.4 DC current gain vs. output current



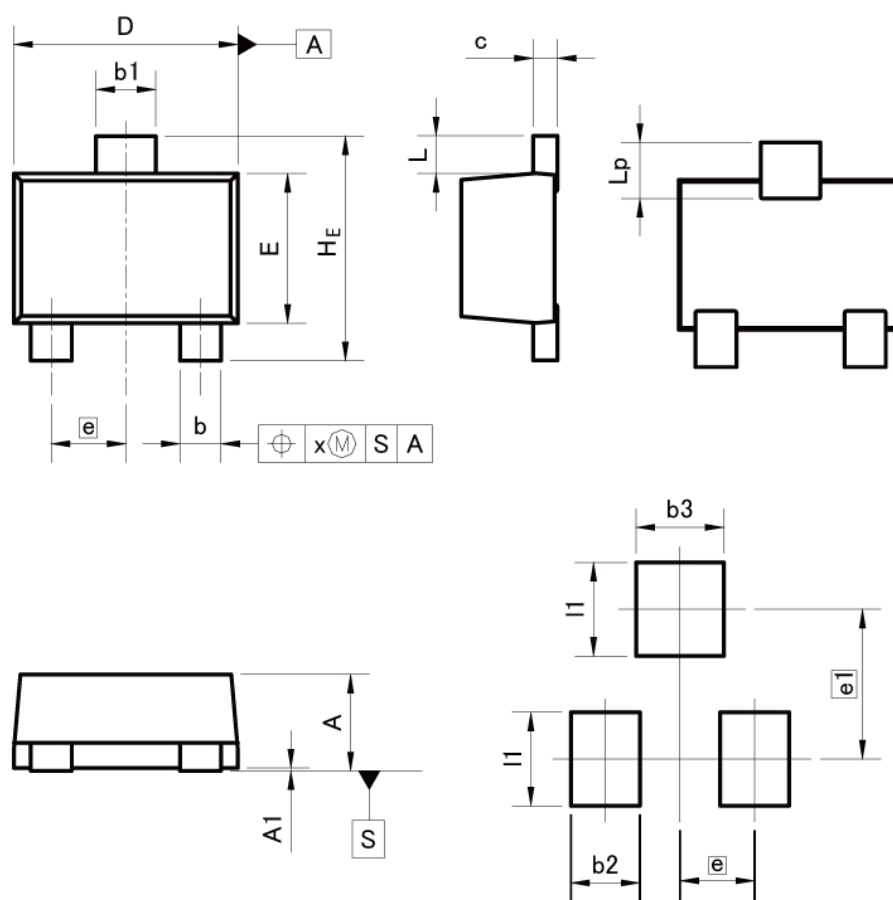
● Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

Fig.5 Output voltage vs. output current



●Dimensions

SOT-723
SC-105AA
(VMT3)



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

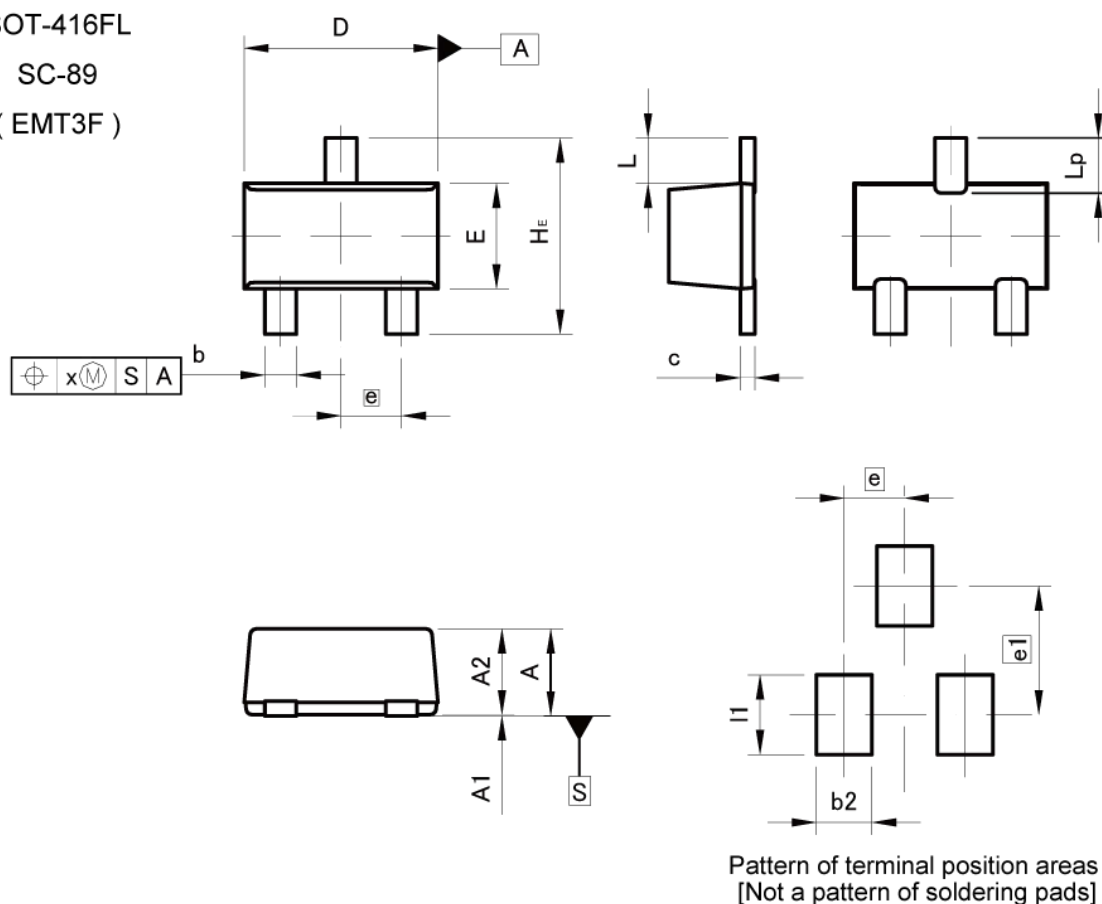
| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.45 | 0.55 | 0.018 | 0.022 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| b | 0.17 | 0.27 | 0.007 | 0.011 |
| b1 | 0.27 | 0.37 | 0.011 | 0.015 |
| c | 0.08 | 0.18 | 0.003 | 0.007 |
| D | 1.10 | 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 | |
| l1 | - | 0.50 | - | 0.020 |

Dimension in mm/inches

●Dimensions

SOT-416FL
SC-89
(EMT3F)



| 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

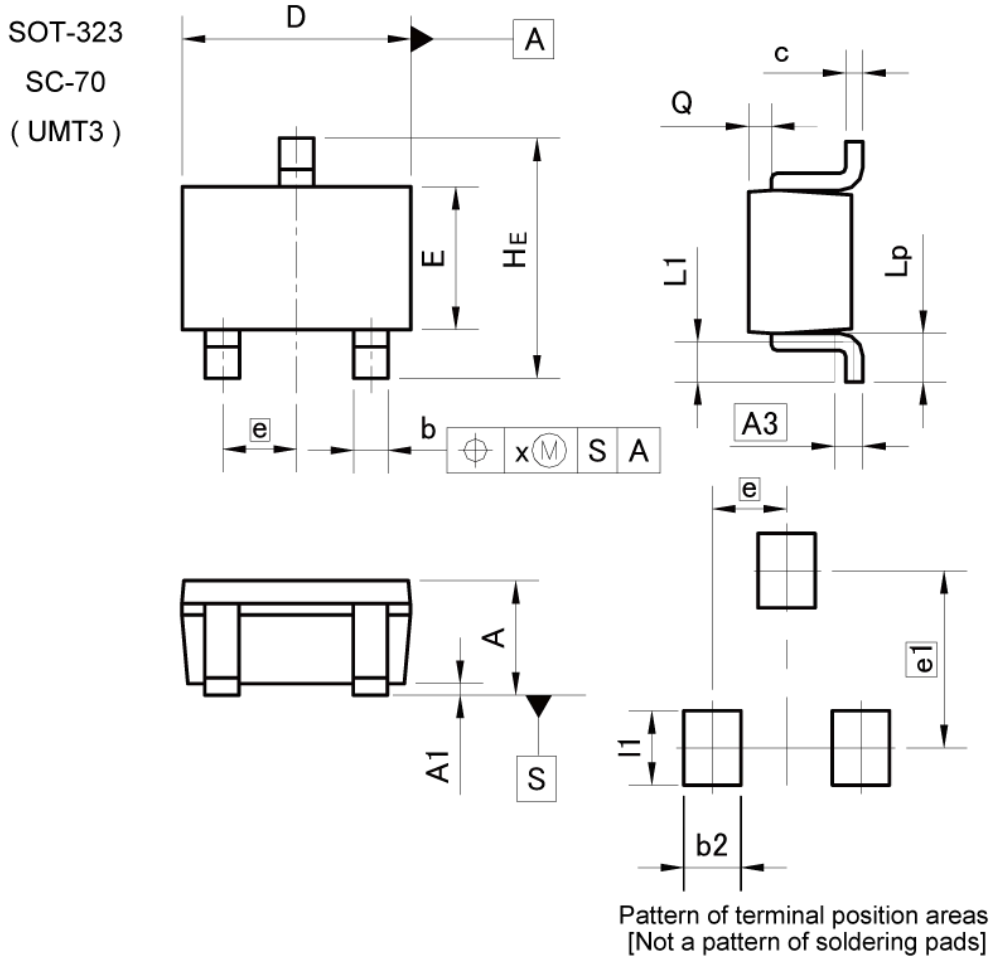


| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.85 | 1.05 | 0.033 | 0.041 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A2 | 0.80 | 1.00 | 0.031 | 0.039 |
| b | 0.27 | 0.42 | 0.011 | 0.017 |
| c | 0.08 | 0.18 | 0.003 | 0.007 |
| D | 1.90 | 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 | 0.43 | | 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 | |
| I1 | - | 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 | 0.004 |
| A3 | 0.25 | | 0.01 | |
| b | 0.25 | 0.40 | 0.01 | 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 | | 0.03 | |
| HE | 2.00 | 2.20 | 0.079 | 0.087 |
| L1 | 0.20 | 0.50 | 0.008 | 0.02 |
| Lp | 0.25 | 0.55 | 0.01 | 0.022 |
| Q | 0.10 | 0.30 | 0.004 | 0.012 |
| x | - | 0.10 | - | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| e1 | 1.55 | | 0.06 | |
| b2 | - | 0.50 | - | 0.02 |
| l1 | - | 0.65 | - | 0.026 |

Dimension in mm/inches

●Dimensions

SOT-346
SC-59
(SMT3)



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

| 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 | |
| l1 | - | 0.90 | - | 0.035 |

Dimension in mm/inches

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|-----------|-----------|------------|-----------|
| CLASS III | CLASS III | CLASS II b | 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.

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- 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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 - [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
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[TP](#) [DTC123TM3T5G](#) [DTA114ECA-TP](#) [DTA113EM3T5G](#) [DCX115EK-7-F](#) [DTC113EM3T5G](#) [NSVMUN5135DW1T1G](#)
[NSVMUN2237T1G](#) [NSVDTC143ZM3T5G](#) [SMUN5335DW1T2G](#) [SMUN5216DW1T1G](#)