

| Parameter | Value |
|---------------|--------------|
| V_{CC} | 50V |
| $I_{C(MAX.)}$ | 100mA |
| R_1 | 47k Ω |
| R_2 | 47k Ω |

●Features

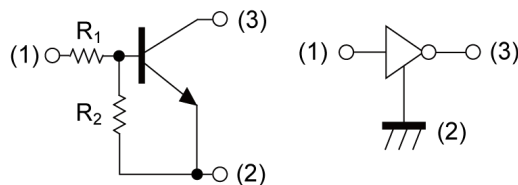
- 1) Built-In Biasing Resistors, $R_1 = R_2 = 47k\Omega$
- 2) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit) .
- 3) Only the on/off conditions need to be set for operation, making the circuit design easy.
- 4) Complementary PNP Types: DTA144E series

●Application

INVERTER, INTERFACE, DRIVER

●Inner circuit

DTC144EM/ DTC144EEB/ DTC144EUB

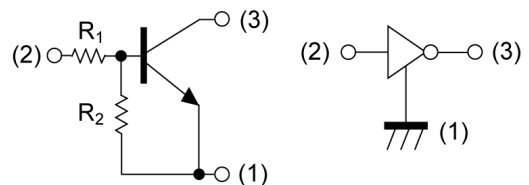


(1) IN (BASE)
 (2) GND (EMITTER)
 (3) OUT (COLLECTOR)

●Outline

| | |
|------------------------------------|---------------------------------------|
| SOT-723 DTC144EM (VMT3) | SOT-416FL DTC144EEB (EMT3F) |
| SOT-416 DTC144EE (EMT3) | SOT-323FL DTC144EUB (UMT3F) |
| SOT-323 DTC144EU3 (UMT3) | SOT-346 DTC144EKA (SMT3) |

DTC144EE/ DTC144EU3/ DTC144EKA



(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 |
|-----------|-----------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| DTC144EM | SOT-723 | 1212 | T2L | 180 | 8 | 8000 | 26 |
| DTC144EEB | SOT-416FL | 1616 | TL | 180 | 8 | 3000 | 26 |
| DTC144EE | SOT-416 | 1616 | TL | 180 | 8 | 3000 | 26 |
| DTC144EUB | SOT-323FL | 2021 | TL | 180 | 8 | 3000 | 26 |
| DTC144EU3 | SOT-323 | 2021 | T106 | 180 | 8 | 3000 | 26 |
| DTC144EKA | SOT-346 | 2928 | T146 | 180 | 8 | 3000 | 26 |

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

| Parameter | | Symbol | Values | Unit |
|------------------------------|-----------|-------------------|-------------|------------------|
| Supply voltage | | V_{CC} | 50 | V |
| Input voltage | | V_{IN} | -10 to 40 | V |
| Output current | | I_O | 30 | mA |
| Collector current | | $I_{C(MAX)}^{*1}$ | 100 | mA |
| Power dissipation | DTC144EM | P_D^{*2} | 150 | mW |
| | DTC144EEB | | 150 | |
| | DTC144EE | | 150 | |
| | DTC144EUB | | 200 | |
| | DTC144EU3 | | 200 | |
| | DTC144EKA | | 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 |
| | $V_{I(on)}$ | $V_O = 0.3V, I_O = 2\text{mA}$ | 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 | $V_I = 5V$ | - | - | 180 | μA |
| Output current | $I_{O(off)}$ | $V_{CC} = 50V, V_I = 0V$ | - | - | 500 | nA |
| DC current gain | G_I | $V_O = 5V, I_O = 5\text{mA}$ | 68 | - | - | - |
| Input resistance | R_1 | - | 32.9 | 47 | 61.1 | 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

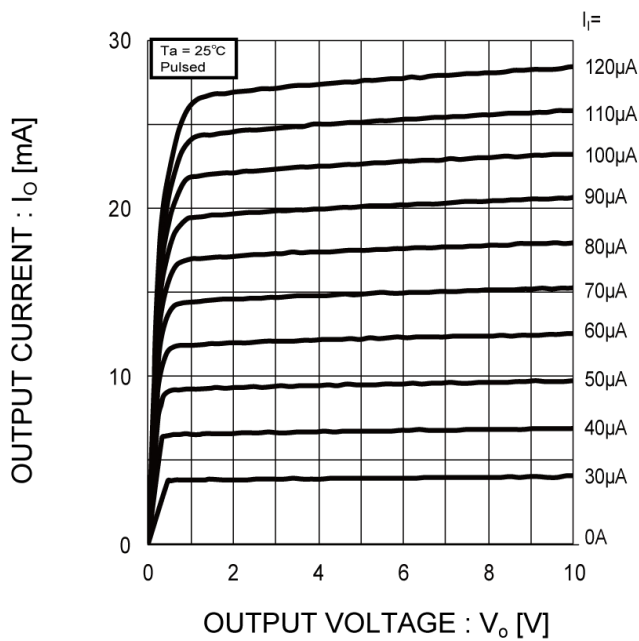
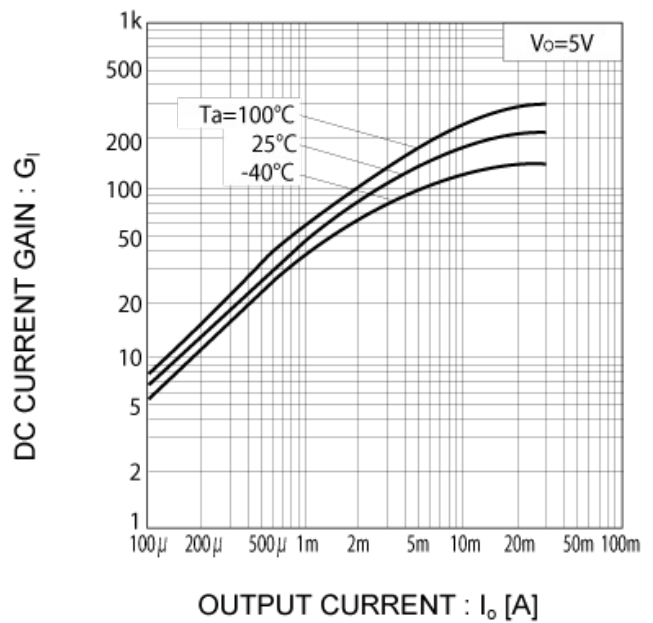
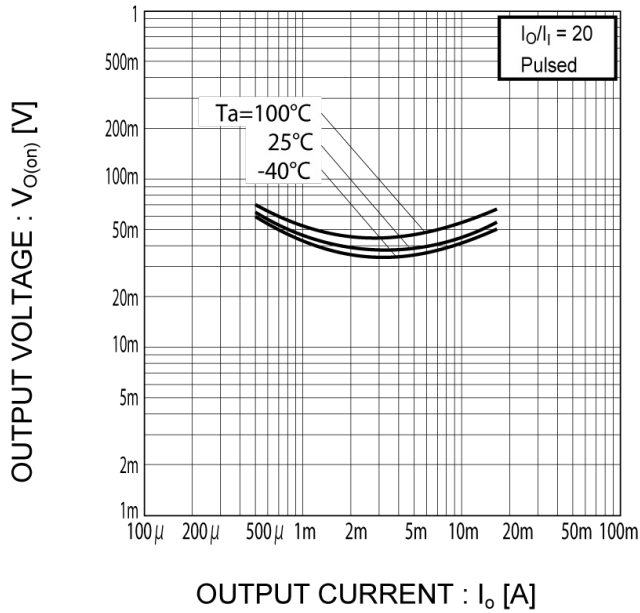


Fig.4 DC current gain vs. output current



● 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 | |
| I1 | - | 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 | |
| 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 | 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



| 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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|-----------|-----------|------------|-----------|
| CLASS III | CLASS III | CLASS II b | CLASS III |
| CLASS IV | | CLASS III | |

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 - Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
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 - Use of the Products in places subject to dew condensation
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- Confirm that operation temperature is within the specified range described in the product specification.
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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.
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DTC144EU3 - Web Page

[Distribution Inventory](#)

| | |
|-----------------------------|-----------|
| Part Number | DTC144EU3 |
| Package | UMT3 |
| Unit Quantity | 3000 |
| Minimum Package Quantity | 3000 |
| Packing Type | Taping |
| Constitution Materials List | inquiry |
| RoHS | Yes |