

| Parameter     | Value        |
|---------------|--------------|
| $V_{CC}$      | 50V          |
| $I_{C(MAX.)}$ | 100mA        |
| $R_1$         | 10k $\Omega$ |
| $R_2$         | 47k $\Omega$ |

### ●Features

- 1) Built-In Biasing Resistors,  $R_1 = 10k\Omega$ ,  $R_2 = 47k\Omega$ .
- 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: DTA114Y series

### ●Application

INVERTER, INTERFACE, DRIVER

### ●Inner circuit

DTC114YM/ DTC114YEB/ DTC114YUB

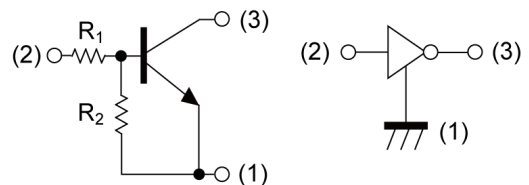


(1) IN (BASE)  
 (2) GND (EMITTER)  
 (3) OUT (COLLECTOR)

### ●Outline

|                                    |                                       |
|------------------------------------|---------------------------------------|
| SOT-723<br><br>DTC114YM<br>(VMT3)  | SOT-416FL<br><br>DTC114YEB<br>(EMT3F) |
| SOT-416<br><br>DTC114YE<br>(EMT3)  | SOT-323FL<br><br>DTC114YUB<br>(UMT3F) |
| SOT-323<br><br>DTC114YUA<br>(UMT3) | SOT-346<br><br>DTC114YKA<br>(SMT3)    |

DTC114YE/ DTC114YUA/ DTC114YKA



(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 |
|-----------|-----------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| DTC114YM  | SOT-723   | 1212         | T2L         | 180            | 8               | 8000                      | 64      |
| DTC114YEB | SOT-416FL | 1616         | TL          | 180            | 8               | 3000                      | 64      |
| DTC114YE  | SOT-416   | 1616         | TL          | 180            | 8               | 3000                      | 64      |
| DTC114YUB | SOT-323FL | 2021         | TL          | 180            | 8               | 3000                      | 64      |
| DTC114YUA | SOT-323   | 2021         | T106        | 180            | 8               | 3000                      | 64      |
| DTC114YKA | SOT-346   | 2928         | T146        | 180            | 8               | 3000                      | 64      |

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

| Parameter                    |           | Symbol            | Values      | Unit             |
|------------------------------|-----------|-------------------|-------------|------------------|
| Supply voltage               |           | $V_{CC}$          | 50          | V                |
| Input voltage                |           | $V_{IN}$          | -6 to 40    | V                |
| Output current               |           | $I_O$             | 70          | mA               |
| Collector current            |           | $I_{C(MAX)}^{*1}$ | 100         | mA               |
| Power dissipation            | DTC114YM  | $P_D^{*2}$        | 150         | mW               |
|                              | DTC114YEB |                   | 150         |                  |
|                              | DTC114YE  |                   | 150         |                  |
|                              | DTC114YUB |                   | 200         |                  |
|                              | DTC114YUA |                   | 200         |                  |
|                              | DTC114YKA |                   | 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        | $V_{I(off)}$ | $V_{CC} = 5V, I_O = 100\mu\text{A}$                  | -      | -    | 0.3  | V             |
|                      | $V_{I(on)}$  | $V_O = 0.3V, I_O = 1\text{mA}$                       | 1.4    | -    | -    |               |
| Output voltage       | $V_{O(on)}$  | $I_O = 5\text{mA}, I_I = 0.25\text{mA}$              | -      | 100  | 300  | mV            |
| Input current        | $I_I$        | $V_I = 5V$   | -      | -    | 880  | $\mu\text{A}$ |
| 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     | $R_1$        | -  | 7      | 10   | 13   | k $\Omega$    |
| Resistance ratio     | $R_2/R_1$    | -  | 3.7    | 4.7  | 5.7  | -             |
| 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<sub>a</sub> =25°C)

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

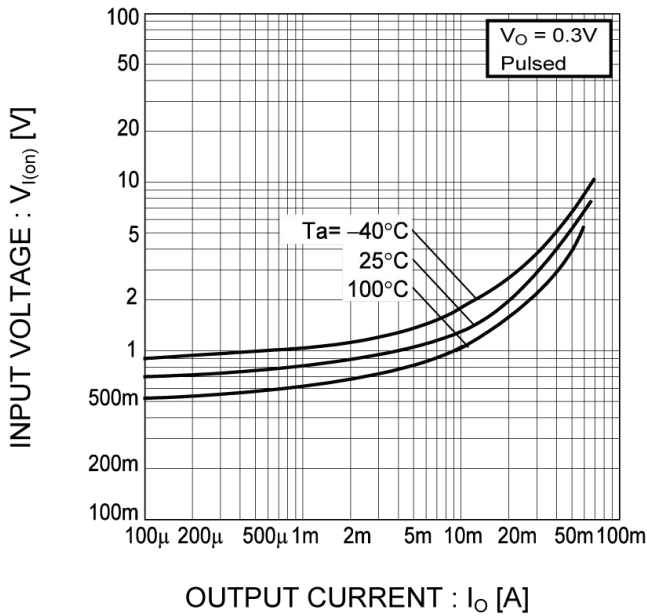


Fig.2 Output current vs. input voltage (OFF characteristics)

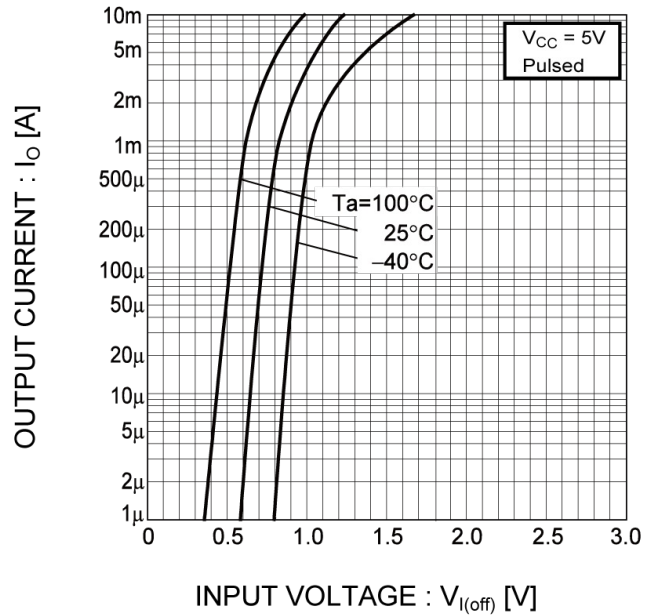


Fig.3 Output current vs. output voltage

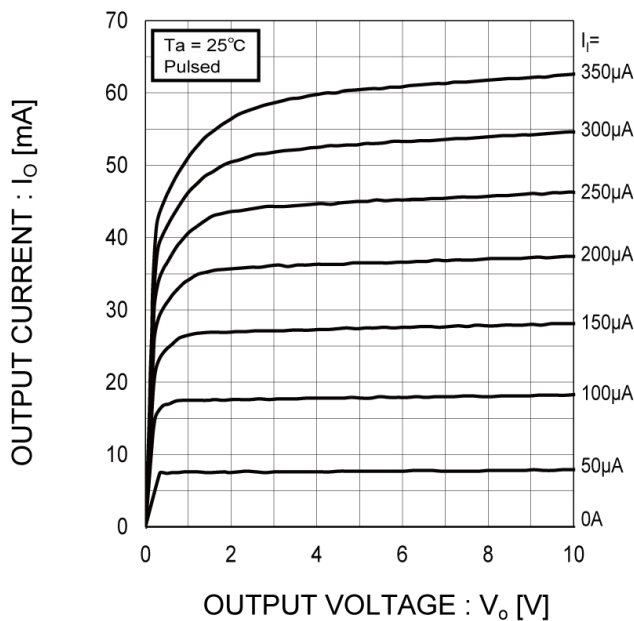
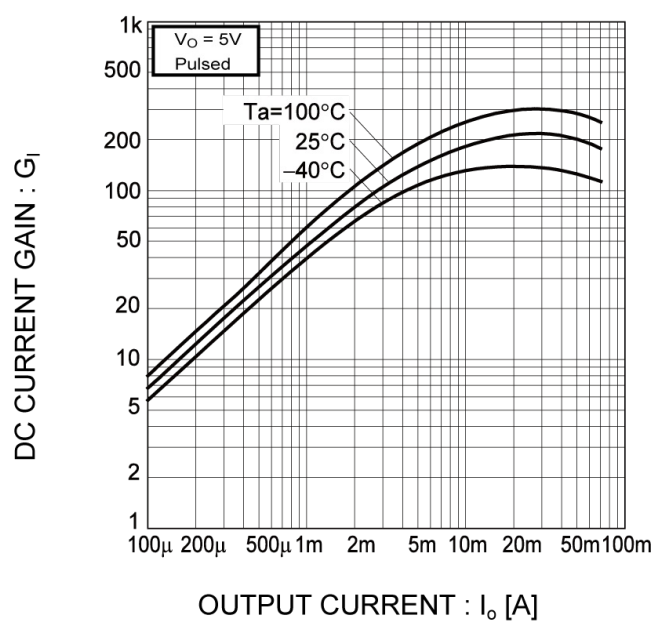
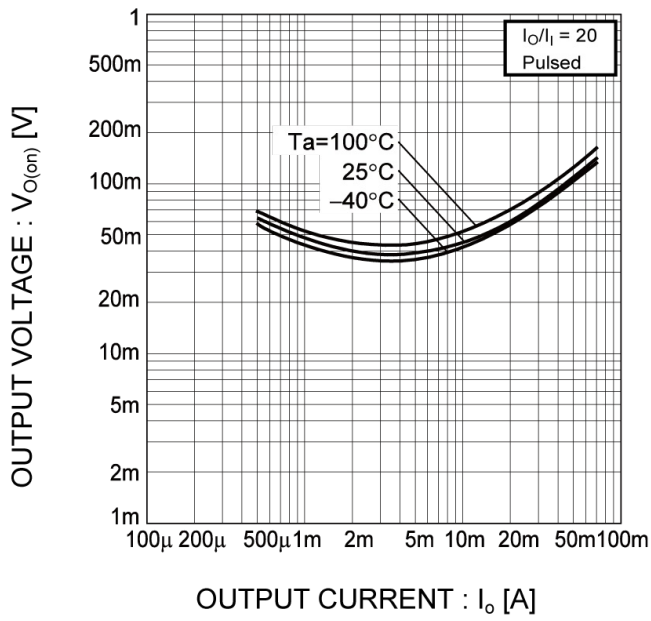


Fig.4 DC current gain vs. output current



● 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 )



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   | 0.43       |      | 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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## DTC114YE - Web Page

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|                             |          |
|-----------------------------|----------|
| Part Number                 | DTC114YE |
| Package                     | EMT3     |
| Unit Quantity               | 3000     |
| Minimum Package Quantity    | 3000     |
| Packing Type                | Taping   |
| Constitution Materials List | inquiry  |
| RoHS                        | Yes      |