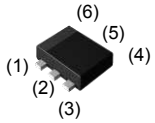
# EMH25

**NPN 100mA 50V Complex Digital Transistors (Bias Resistor Built-in Transistors)** Datasheet

| Parameter | Tr1 and Tr2 |
|---|---|
| $V_{CC}$ | 50V |
| $I_{C(MAX.)}$ | 100mA |
| $R_1$ | 4.7kΩ |
| $R_2$ | 47kΩ |

## ●Outline

EMT6

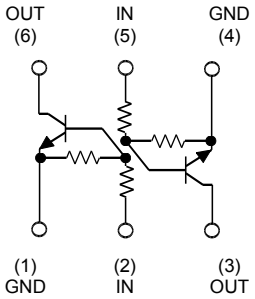



EMH25
(SC-107C)

## ●Features

1) Built-In Biasing Resistors.
2) Two DTC143Z chips in one package.
3) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit).
4) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of completely eliminating parasitic effects.
5) Only the on/off conditions need to be set for operation, making the circuit design easy.
6) Lead Free/RoHS Compliant.

## ●Inner circuit




## ●Application

Inverter circuit, Interface circuit, Driver circuit

## ●Packaging specifications

| Part No. | Package | Package size (mm) | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit (pcs) | Marking |
|---|---|---|---|---|---|---|---|
| EMH25 | EMT6 | 1616 | T2R | 180 | 8 | 8,000 | H25 |

## ●Absolute maximum ratings (Ta = 25°C)

<For Tr1 and Tr2 in common>

| Parameter | Symbol | Values | Unit |
|---|---|---|---|
| Supply voltage | $V_{CC}$ | 50 | V |
| Input voltage | $V_{IN}$ | −5 to +30 | V |
| Output current | $I_O$ | 100 | mA |
| Collector current | $I_{C(MAX.)}$ *1 | 100 | mA |
| Power dissipation | $P_D$ *2 | 150 (Total) *3 | mW |
| Junction temperature | $T_j$ | 150 | °C |
| Range of storage temperature | $T_{stg}$ | −55 to +150 | °C |

## ●Electrical characteristics(Ta = 25°C)

<For Tr1 and Tr2 in common>

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Input voltage | $V_{I(off)}$ | $V_{CC}$ = 5V, $I_O$ = 100μA | - | - | 0.5 | V |
| | $V_{I(on)}$ | $V_O$ = 0.3V, $I_O$ = 5mA | 1.3 | - | - | |
| Output voltage | $V_{O(on)}$ | $I_O$ / $I_I$ = 5mA / 0.25mA | - | 0.1 | 0.3 | V |
| Input current | $I_I$ | $V_I$ = 5V | - | - | 1.8 | mA |
| Output current | $I_{O(off)}$ | $V_{CC}$ = 50V, $V_I$ = 0V | - | - | 0.5 | μA |
| DC current gain | $G_I$ | $V_O$ = 5V, $I_O$ = 10mA | 80 | - | - | - |
| Input resistance | $R_1$ | - | 3.29 | 4.7 | 6.11 | kΩ |
| Resistance ratio | $R_2/R_1$ | - | 8 | 10 | 12 | - |
| Transition frequency | $f_T$ *1 | $V_{CE}$ = 10V, $I_E$ = −5mA, f = 100MHz | - | 250 | - | MHz |

*1 Characteristics of built-in transistor

*2 Each terminal mounted on a reference footprint

*3 120mW per element must not be exceeded.

## ●**Electrical characteristic curves**(Ta = 25°C)

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

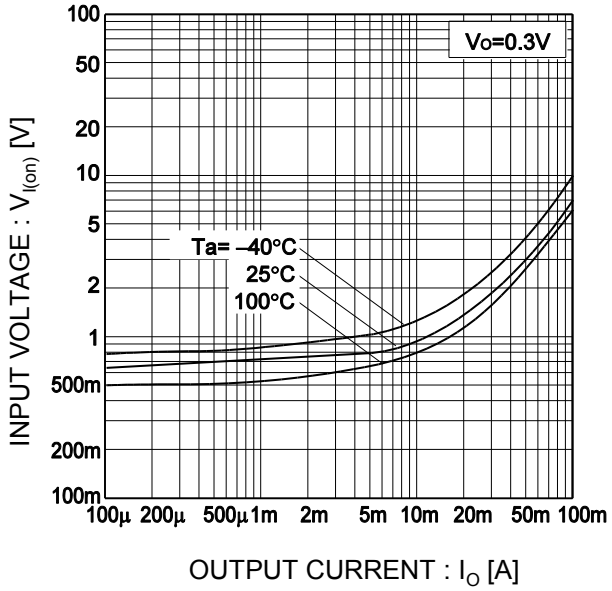



Fig.2 Output current vs. input voltage (OFF characteristics)

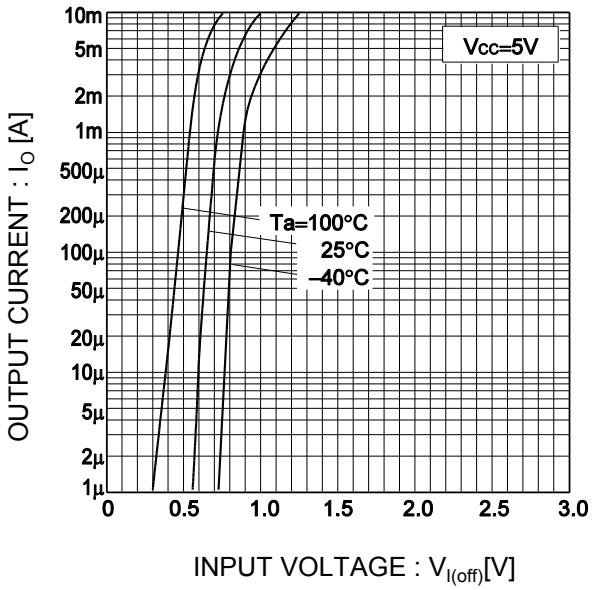



Fig.3 Output current vs. output voltage

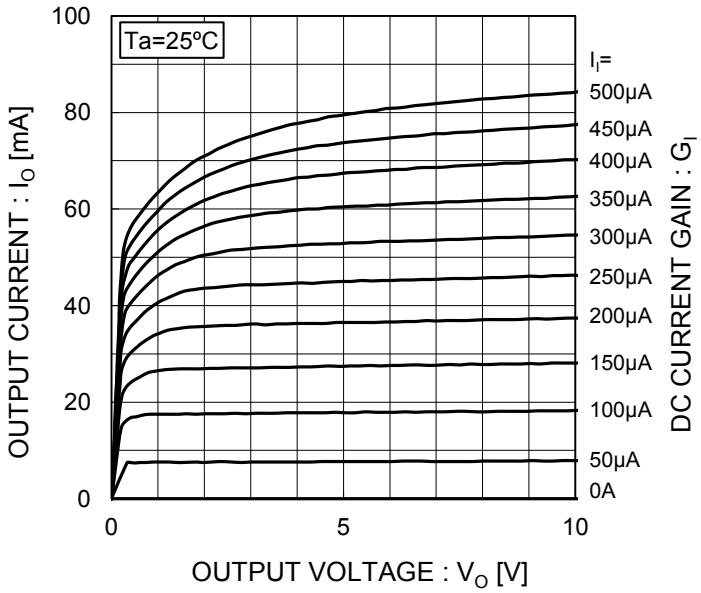
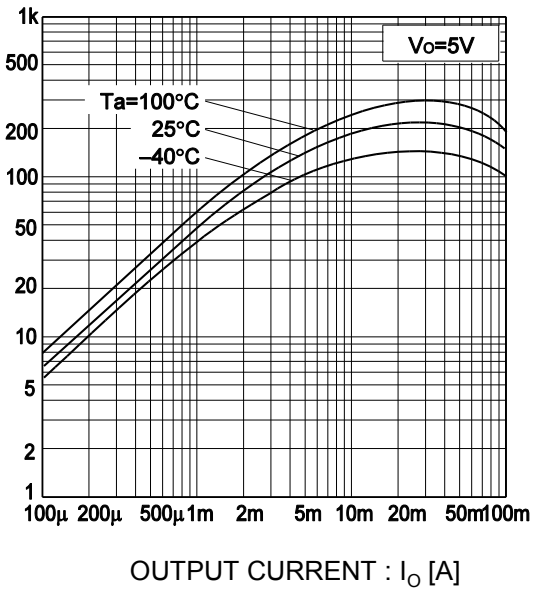
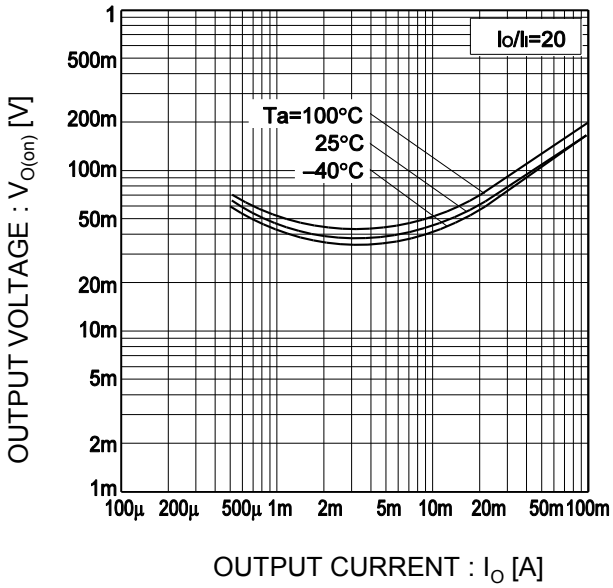



Fig.4 DC current gain vs. output current



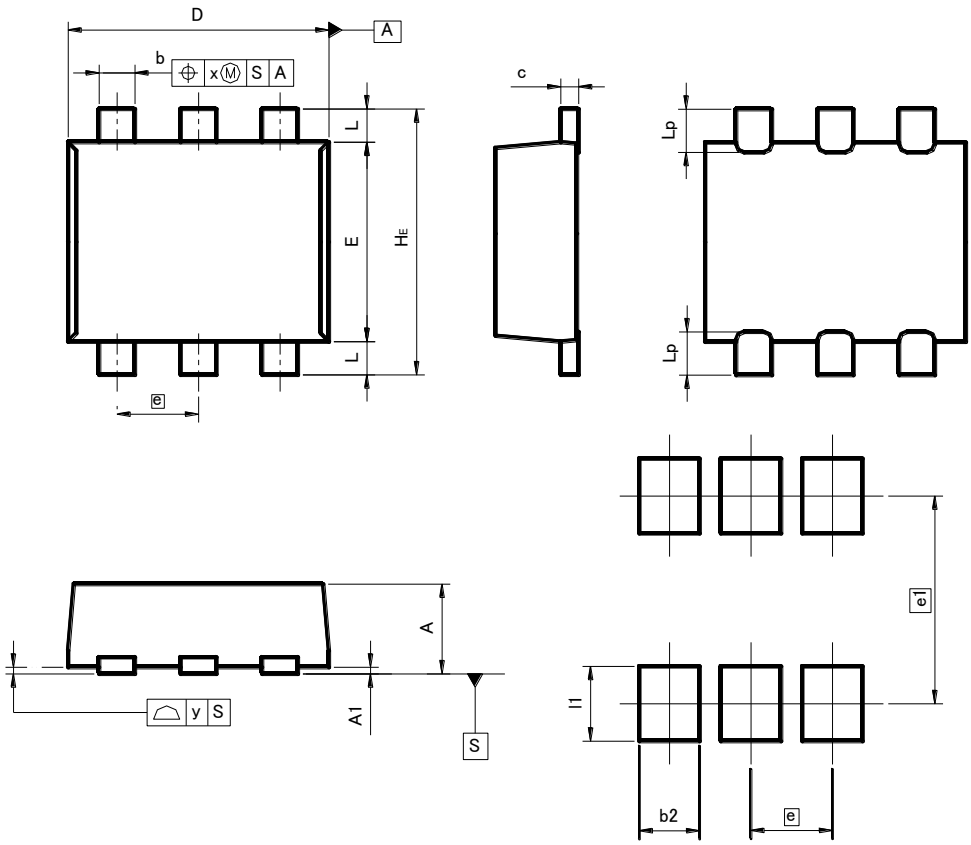
## ●Electrical characteristic curves(Ta = 25°C)

Fig.5 Output voltage vs. output current



●**Dimensions** (Unit : mm)

**EMT6**




**Patterm of terminal position areas**

| DIM | MILIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A1 | 0.00 | 0.10 | 0 | 0.004 |
| A | 0.45 | 0.55 | 0.018 | 0.022 |
| b | 0.17 | 0.27 | 0.007 | 0.011 |
| c | 0.08 | 0.18 | 0.003 | 0.007 |
| D | 1.50 | 1.70 | 0.059 | 0.067 |
| E | 1.10 | 1.30 | 0.043 | 0.051 |
| e | 0.50 | | 0.02 | |
| HE | 1.50 | 1.70 | 0.059 | 0.067 |
| L | 0.10 | 0.30 | 0.004 | 0.012 |
| Lp | – | 0.35 | – | 0.014 |
| x | – | 0.10 | – | 0.004 |
| y | – | 0.10 | – | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| e1 | 1.25 | | 0.049 | |
| b2 | – | 0.37 | – | 0.015 |
| l1 | – | 0.45 | – | 0.018 |

Dimension in mm/inches

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