

| Parameter | DTr1 and DTr2 |
|-----------|---------------|
| $V_{CEO}$ | 50V           |
| $I_C$     | 100mA         |
| $R_1$     | 10k $\Omega$  |

### ●Features

- 1)Two DTC114T chips in a EMT or UMT or SMT package.
- 2)Mounting possible with EMT3 or UMT3 or SMT3 automatic mounting machines.
- 3)Transistor elements are independent, eliminating interference.
- 4)Mounting cost and area can be cut in half.

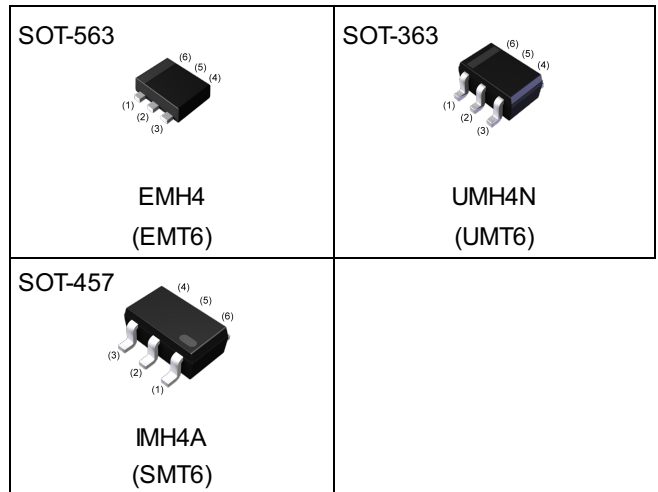
### ●Application

INVERTER, INTERFACE, DRIVER

### ●Packaging specifications

| Part No. | Package        | Package size | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit.(pcs) | Marking |
|----------|----------------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| EMH4     | SOT-563 (EMT6) | 1616         | T2R         | 180            | 8               | 8000                      | H4      |
| UMH4N    | SOT-363 (UMT6) | 2021         | TN          | 180            | 8               | 3000                      | H4      |
| IMH4A    | SOT-457 (SMT6) | 2928         | T110        | 180            | 8               | 3000                      | H4      |

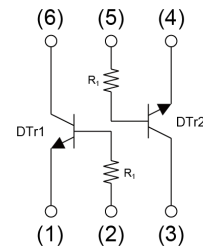
### ●Outline



### ●Inner circuit

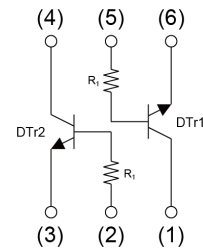
#### EMH4 / UMH4N

- (1) DTr1 Emitter
- (2) DTr1 Base
- (3) DTr2 Collector
- (4) DTr2 Emitter
- (5) DTr2 Base
- (6) DTr1 Collector



#### IMH4A

- (1) DTr1 Collector
- (2) DTr2 Base
- (3) DTr2 Emitter
- (4) DTr2 Collector
- (5) DTr1 Base
- (6) DTr1 Emitter



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

<For DTr1 and DTr2 in common>

| Parameter                    |       | Symbol                | Values      | Unit             |
|------------------------------|-------|-----------------------|-------------|------------------|
| Collector-base voltage       |       | $V_{\text{CBO}}$      | 50          | V                |
| Collector-emitter voltage    |       | $V_{\text{CEO}}$      | 50          | V                |
| Emitter-base voltage         |       | $V_{\text{EBO}}$      | 5           | V                |
| Collector current            |       | $I_{\text{C}}$        | 100         | mA               |
| Power dissipation            | EMH4  | $P_{\text{D}}^{*1*2}$ | 150         | mW/Total         |
|                              | UMH4N | $P_{\text{D}}^{*1*2}$ | 150         |                  |
|                              | IMH4A | $P_{\text{D}}^{*1*3}$ | 300         |                  |
| Junction temperature         |       | $T_{\text{j}}$        | 150         | $^\circ\text{C}$ |
| Range of storage temperature |       | $T_{\text{stg}}$      | -55 to +150 | $^\circ\text{C}$ |

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

<For DTr1 and DTr2 in common>

| Parameter                            | Symbol               | Conditions  | Values |      |      | Unit       |
|--------------------------------------|----------------------|---|--------|------|------|------------|
|                                      |                      |   | Min.   | Typ. | Max. |            |
| Collector-base breakdown voltage     | $BV_{\text{CBO}}$    | $I_{\text{C}} = 50\mu\text{A}$  | 50     | -    | -    | V          |
| Collector-emitter breakdown voltage  | $BV_{\text{CEO}}$    | $I_{\text{C}} = 1\text{mA}$   | 50     | -    | -    | V          |
| Emitter-base breakdown voltage       | $BV_{\text{EBO}}$    | $I_{\text{E}} = 50\mu\text{A}$  | 5      | -    | -    | V          |
| Collector cut-off current            | $I_{\text{CBO}}$     | $V_{\text{CB}} = 50\text{V}$  | -      | -    | 500  | nA         |
| Emitter cut-off current              | $I_{\text{EBO}}$     | $V_{\text{EB}} = 4\text{V}$   | -      | -    | 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                      | $h_{\text{FE}}$      | $V_{\text{CE}} = 5\text{V}, I_{\text{C}} = 1\text{mA}$                      | 100    | 250  | 600  | -          |
| Input resistance                     | $R_1$                | -   | 7      | 10   | 13   | k $\Omega$ |
| Transition frequency                 | $f_{\text{T}}^{*4}$  | $V_{\text{CE}} = 10\text{V}, I_{\text{E}} = -5\text{mA}, f = 100\text{MHz}$ | -      | 250  | -    | MHz        |

\*1 Each terminal mounted on a reference land.

\*2 120mW per element must not be exceeded.

\*3 200mW per element must not be exceeded.

\*4 Characteristics of built-in transistor.

● **Electrical characteristic curves** ( $T_a = 25^\circ\text{C}$ )  
 <For DTr1 and DTr2 in common>

Fig.1 Grounded Emitter Propagation Characteristics

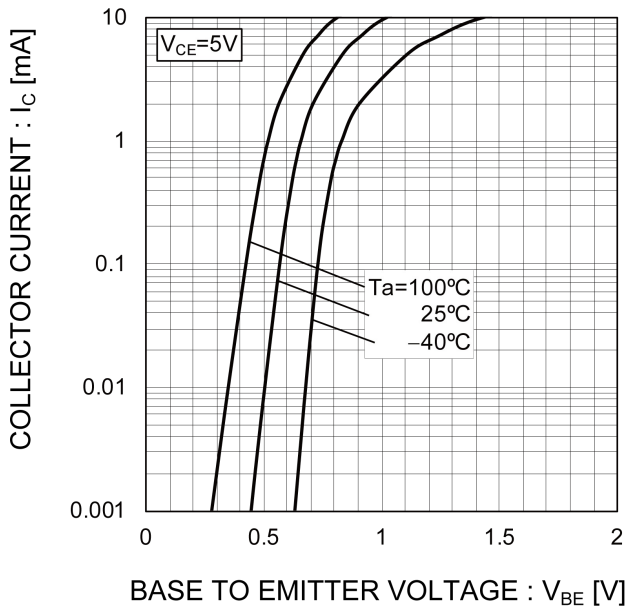


Fig.2 Grounded Emitter Output Characteristics

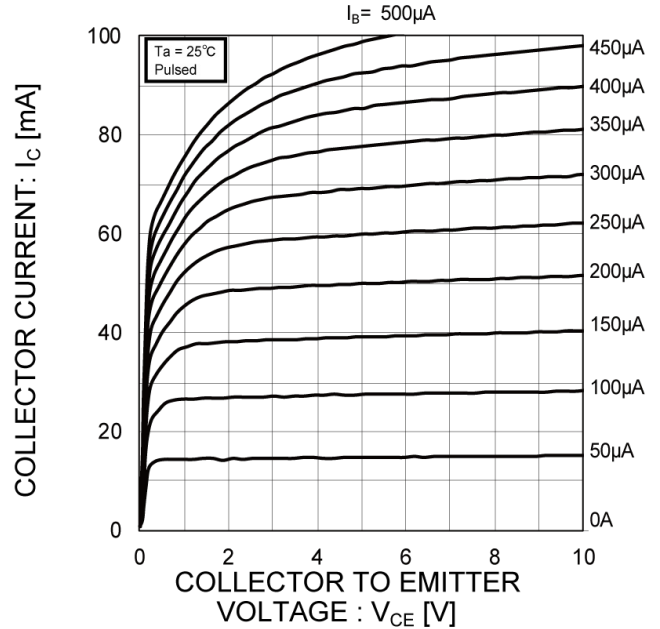


Fig.3 DC Current Gain vs. Collector Current

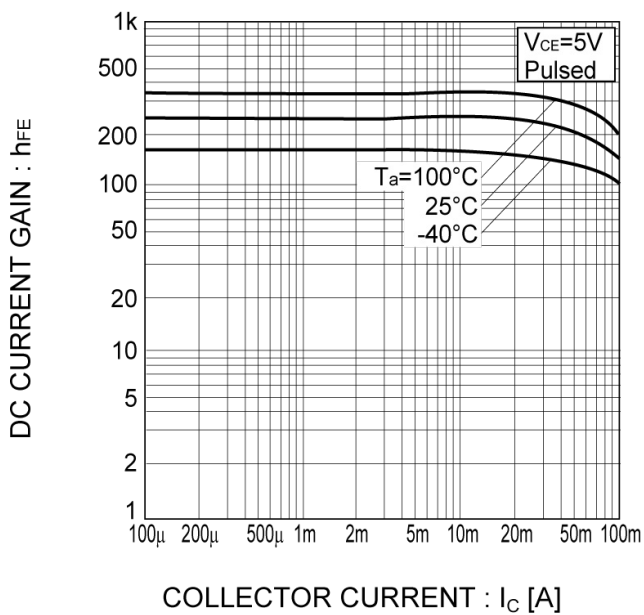
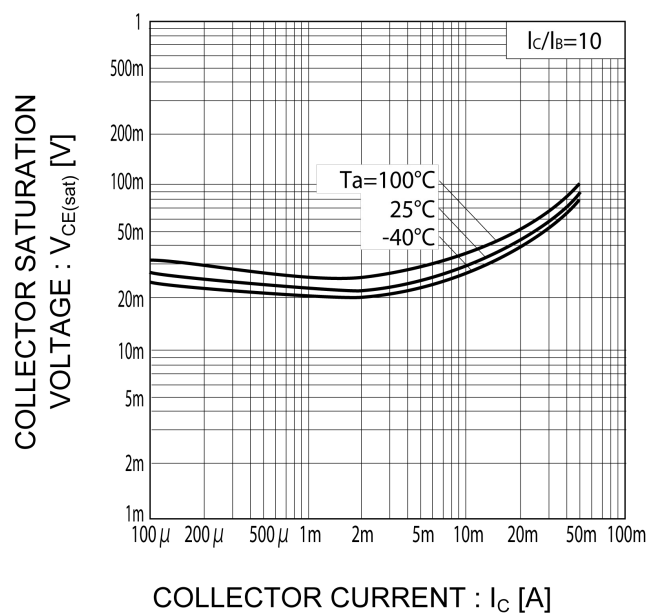
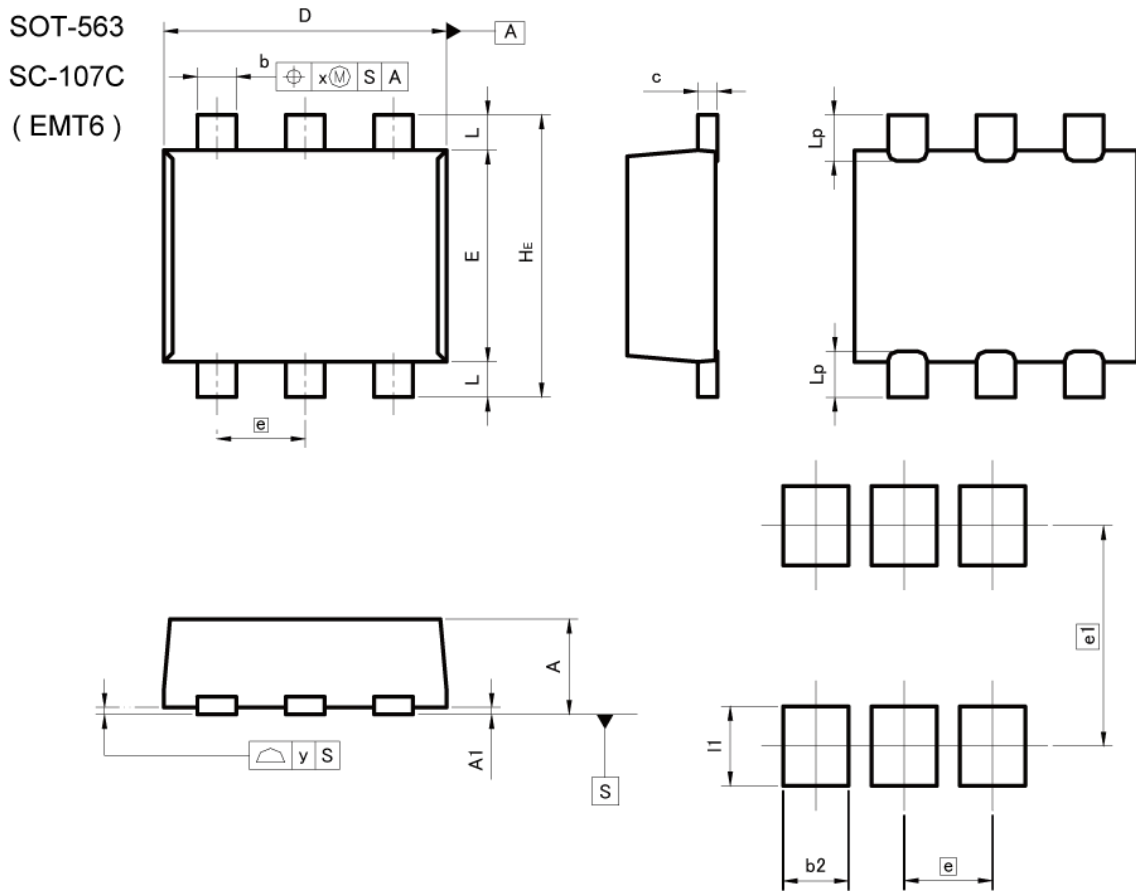


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current



●Dimensions



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 |
| 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       |      | 0.020  |       |
| 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   |
| b2  | -          | 0.37 | -      | 0.015 |
| e1  | 1.25       |      | 0.049  |       |
| I1  | -          | 0.45 | -      | 0.018 |

Dimension in mm/inches

●Dimensions



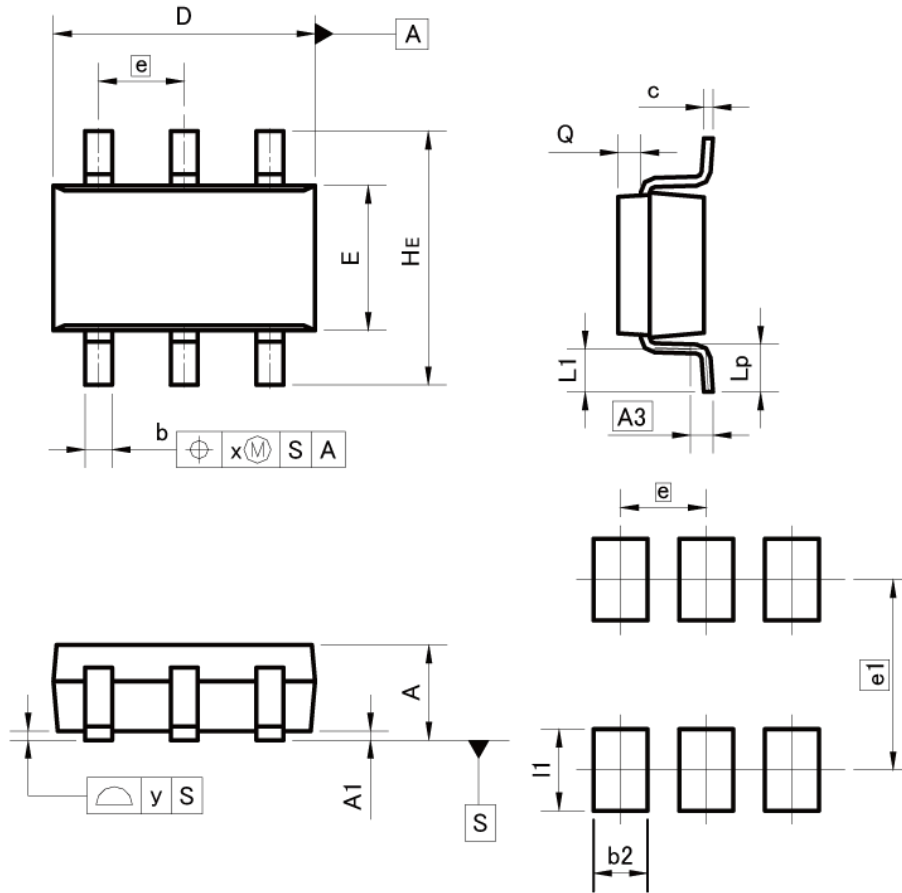
| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| A   | 0.80       | 1.00 | 0.031  | 0.039 |
| A1  | 0.00       | 0.10 | 0.000  | 0.004 |
| A3  | 0.25       |      | 0.010  |       |
| b   | 0.15       | 0.30 | 0.006  | 0.012 |
| 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  | 0.20       | 0.50 | 0.008  | 0.020 |
| Lp  | 0.25       | 0.55 | 0.010  | 0.022 |
| Q   | 0.10       | 0.30 | 0.004  | 0.012 |
| x   | -          | 0.10 | -      | 0.004 |
| y   | -          | 0.10 | -      | 0.004 |

| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| b2  | -          | 0.40 | -      | 0.016 |
| e1  | 1.55       |      | 0.061  |       |
| l1  | -          | 0.65 | -      | 0.026 |

Dimension in mm/inches

●Dimensions

SOT-457  
SC-74  
(SMT6)



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   | 0.25       | 0.40 | 0.010  | 0.016 |
| 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   | -          | 0.20 | -      | 0.008 |
| 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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