

# General purpose (dual digital transistors)

## EMH9 / UMH9N / IMH9A

### ●Features

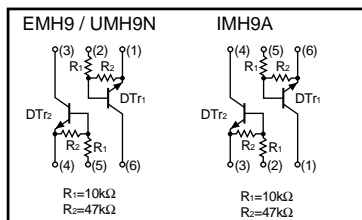
- 1) Two DTC114Ys chips in a EMT or UMT or SMT package.
- 2) Mounting possible with EMT3 or UMT3 or SMT3 automatic mounting machines.
- 3) Transistor elements are independent, eliminating interference.
- 4) Mounting cost and area can be cut in half.

### ●Structure

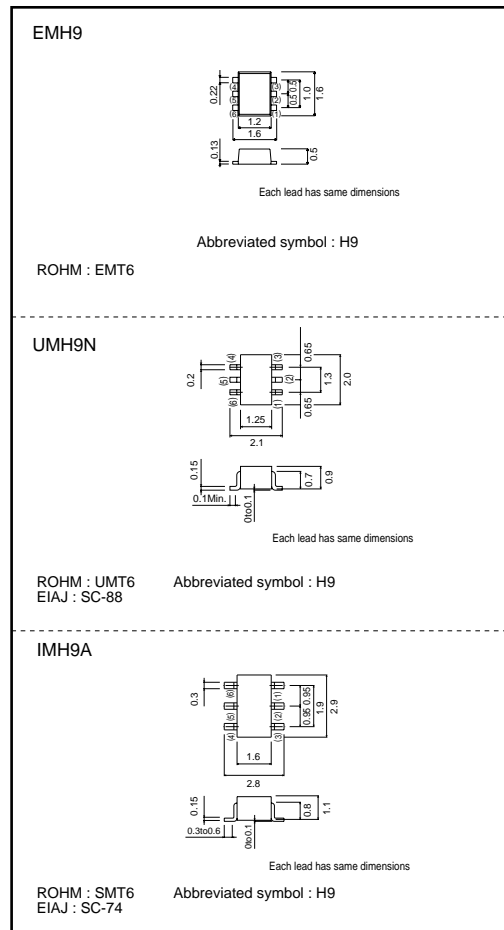
Epitaxial planar type  
NPN silicon transistor  
(Built-in resistor type)

The following characteristics apply to both DT<sub>1</sub> and DT<sub>2</sub>.

### ●Equivalent circuit



### ●External dimensions (Unit : mm)



### ●Packaging specifications

| Type  | Package                      | Taping |      |      |
|-------|------------------------------|--------|------|------|
|       | Code                         | T2R    | TN   | T110 |
|       | Basic ordering unit (pieces) | 8000   | 3000 | 3000 |
| EMH9  |                              | ○      | —    | —    |
| UMH9N |                              | —      | ○    | —    |
| IMH9A |                              | —      | —    | ○    |

Transistors

●Absolute maximum ratings (Ta = 25°C)

| Parameter            | Symbol                | Limits      | Unit        |    |    |
|----------------------|-----------------------|-------------|-------------|----|----|
| Supply voltage       | V <sub>CC</sub>       | 50          | V           |    |    |
| Input voltage        | V <sub>IN</sub>       | 40          | V           |    |    |
|                      |                       | -6          |             |    |    |
| Output current       | I <sub>o</sub>        | 70          | mA          |    |    |
|                      | I <sub>c (Max.)</sub> | 100         |             |    |    |
| Power dissipation    | EMH9, UMH9N           | Pd          | 150 (TOTAL) | mW | *1 |
|                      | IMH9A                 |             | 300 (TOTAL) |    |    |
| Junction temperature | T <sub>j</sub>        | 150         | °C          |    |    |
| Storage temperature  | T <sub>stg</sub>      | -55 to +150 | °C          |    |    |

\*1 120mW per element must not be exceeded.  
 \*2 200mW per element must not be exceeded.

●Electrical characteristics (Ta = 25°C)

| Parameter            | Symbol                         | Min. | Typ. | Max. | Unit | Conditions   |
|----------------------|--------------------------------|------|------|------|------|--|
| Input voltage        | V <sub>I (off)</sub>           | -    | -    | 0.3  | V    | V <sub>CC</sub> =5V, I <sub>o</sub> =100μA             |
|                      | V <sub>I (on)</sub>            | 1.4  | -    | -    |      | V <sub>o</sub> =0.3V, I <sub>o</sub> =1mA              |
| Output voltage       | V <sub>O (on)</sub>            | -    | 0.1  | 0.3  | V    | I <sub>o</sub> /I <sub>i</sub> =5mA/0.25mA             |
| Input current        | I <sub>i</sub>                 | -    | -    | 0.88 | mA   | V <sub>I</sub> =5V                                     |
| Output current       | I <sub>O (off)</sub>           | -    | -    | 0.5  | μA   | V <sub>CC</sub> =50V, V <sub>I</sub> =0V               |
| DC current gain      | G <sub>i</sub>                 | 68   | -    | -    | -    | V <sub>o</sub> =5V, I <sub>o</sub> =5mA                |
| Transition frequency | f <sub>T</sub>                 | -    | 250  | -    | MHz  | V <sub>CE</sub> =10V, I <sub>E</sub> =-5mA, f=100MHz * |
| Input resistance     | R <sub>1</sub>                 | 7    | 10   | 13   | kΩ   | -  |
| Resistance ratio     | R <sub>2</sub> /R <sub>1</sub> | 3.7  | 4.7  | 5.7  | -    | -  |

\* Transition frequency of the device

●Electrical characteristic curves

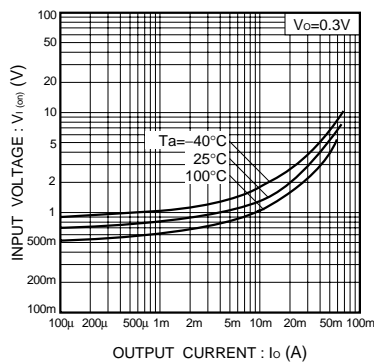


Fig.1 Input voltage vs. output current (ON characteristics)

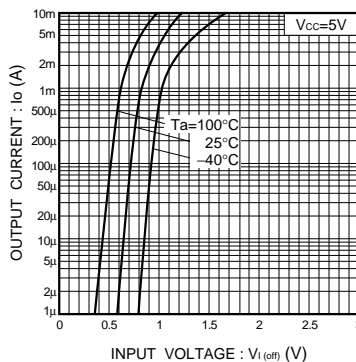


Fig.2 Output current vs. input voltage (OFF characteristics)

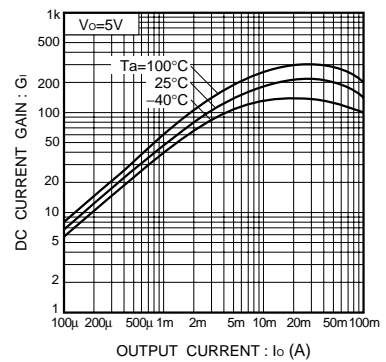


Fig.3 DC current gain vs. output current

Transistors

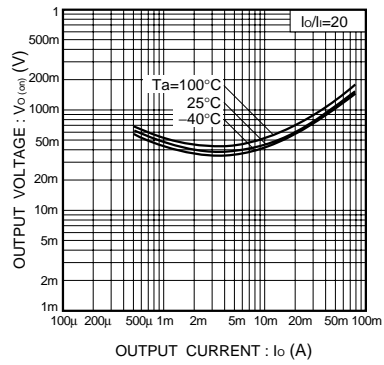


Fig.4 Output voltage vs. output current

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