

# General purpose (dual digital transistors)

## EMD2 / UMD2N / IMD2A

### ●Features

- 1) Both the DTA124E chip and DTC124E chip in a EMT or UMT or SMT package.
- 2) Mounting possible with EMT6 or UMT6 or SMT6 automatic mounting machines.
- 3) Transistor elements are independent, eliminating interference.
- 4) Mounting cost and area can be cut in half.

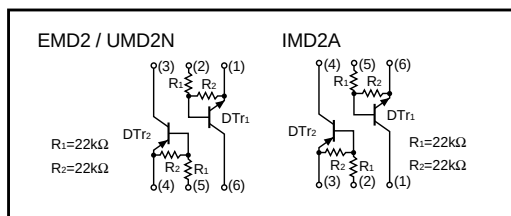
### ●Structure

Epitaxial planar type

NPN / PNP silicon transistor (Built-in resistor type)

The following characteristics apply to both the DTr1 and DTr2, however, the “—” sign on DTr2 values for the PNP type have been omitted.

### ●Equivalent circuit

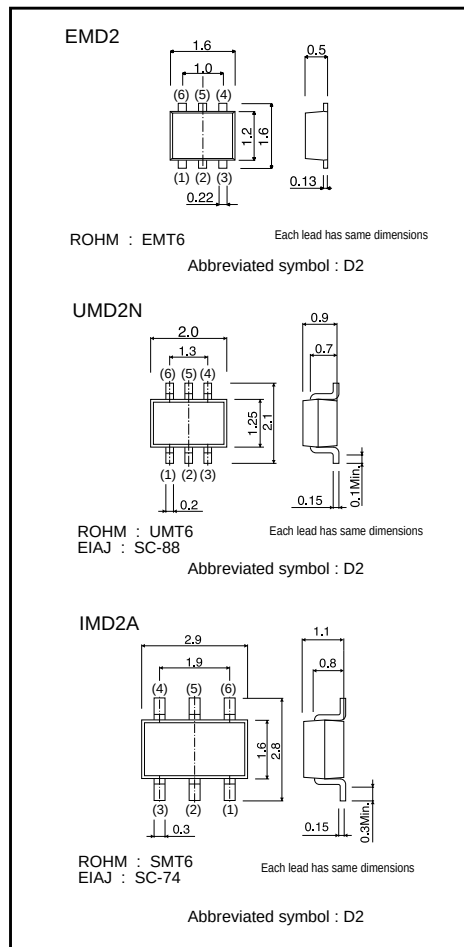


### ●Absolute maximum ratings (Ta = 25°C)

| Parameter            | Symbol       | Limits            | Unit  |
|----------------------|--------------|-------------------|-------|
| Supply voltage       | $V_{CC}$     | 50                | V     |
| Input voltage        | $V_{IN}$     | 40<br>-10         | V     |
| Output current       | $I_O$        | 30                | mA    |
|                      | $I_C (Max.)$ | 100               |       |
| Power dissipation    | EMD2, UMD2N  | $P_d$ 150 (TOTAL) | mW *1 |
|                      | IMD2A        | 300 (TOTAL)       | mW *2 |
| Junction temperature | $T_j$        | 150               | °C    |
| Storage temperature  | $T_{stg}$    | -55 to +150       | °C    |

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

### ●Dimensions (Unit : mm)



Transistors

●Electrical characteristics (Ta = 25°C)

| Parameter            | Symbol       | Min. | Typ. | Max. | Unit      | Conditions                         |
|----------------------|--------------|------|------|------|-----------|------------------------------------|
| Input voltage        | $V_{I(off)}$ | —    | —    | 0.5  | V         | $V_{CC}=5V, I_o=100\mu A$          |
|                      | $V_{I(on)}$  | 3    | —    | —    |           | $V_o=0.2V, I_o=5mA$                |
| Output voltage       | $V_{O(on)}$  | —    | 0.1  | 0.3  | V         | $I_o=10mA, I_i=0.5mA$              |
| Input current        | $I_i$        | —    | —    | 0.36 | mA        | $V_i=5V$                           |
| Output current       | $I_{O(off)}$ | —    | —    | 0.5  | $\mu A$   | $V_{CC}=50V, V_i=0V$               |
| DC current gain      | $G_i$        | 56   | —    | —    | —         | $V_o=5V, I_o=5mA$                  |
| Transition frequency | $f_T$        | —    | 250  | —    | MHz       | $V_{CE}=10V, I_E=-5mA, f=100MHz$ * |
| Input resistance     | $R_i$        | 15.4 | 22   | 28.6 | $k\Omega$ | —                                  |
| Resistance ratio     | $R_2/R_1$    | 0.8  | 1    | 1.2  | —         | —                                  |

\* Transition frequency of the device

●Packaging specifications

| Type  | Package                      | Taping |      |      |
|-------|------------------------------|--------|------|------|
|       | Code                         | T2R    | TR   | T108 |
|       | Basic ordering unit (pieces) | 8000   | 3000 | 3000 |
| EMD2  | ○                            | —      | —    | —    |
| UMD2N | —                            | ○      | —    | —    |
| IMD2A | —                            | —      | —    | ○    |

●Electrical characteristic curves

DT1 (NPN)

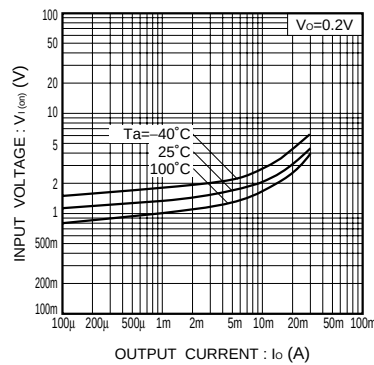


Fig.1 Input voltage vs. output current (ON characteristics)

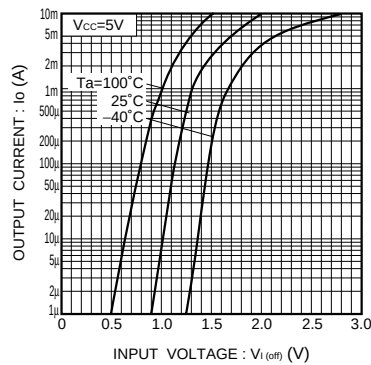


Fig.2 Output current vs. input voltage (OFF characteristics)

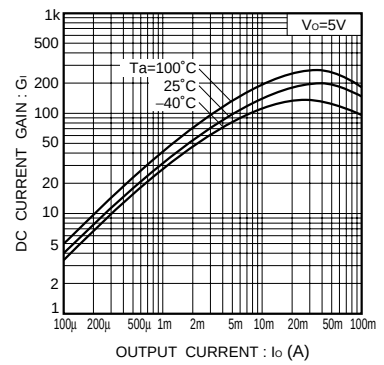


Fig.3 DC current gain vs. output current

Transistors

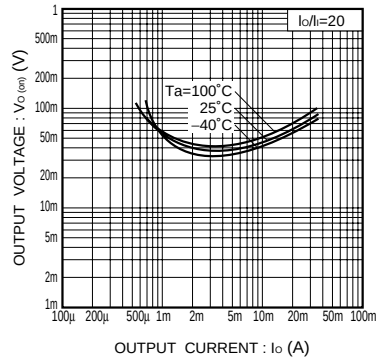


Fig.4 Output voltage vs. output current

DT<sub>2</sub> (PNP)

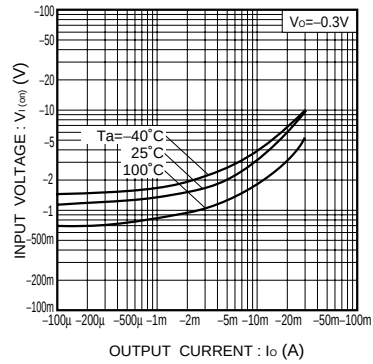


Fig.5 Input voltage vs. output current (ON characteristics)

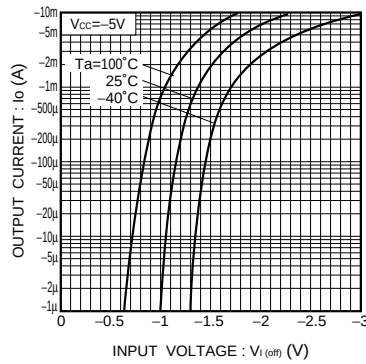


Fig.6 Output current vs. input voltage (OFF characteristics)

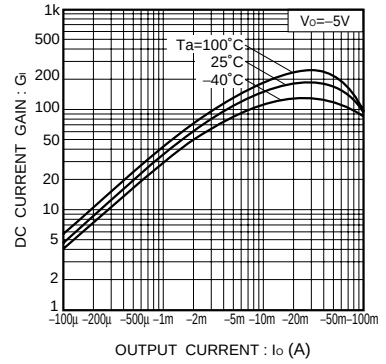


Fig.7 DC current gain vs. output current

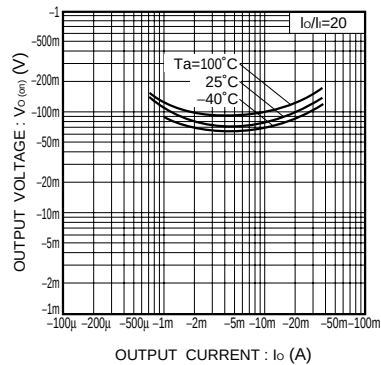


Fig.8 Output voltage vs. output current

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