

<For DTr1(NPN)>

| Parameter     | Value        |
|---------------|--------------|
| $V_{CC}$      | 50V          |
| $I_{C(MAX.)}$ | 100mA        |
| $R_1$         | 22k $\Omega$ |
| $R_2$         | 22k $\Omega$ |

<For DTr2(PNP)>

| Parameter     | Value        |
|---------------|--------------|
| $V_{CC}$      | -50V         |
| $I_{C(MAX.)}$ | -100mA       |
| $R_1$         | 22k $\Omega$ |
| $R_2$         | 22k $\Omega$ |

### ●Features

- 1)Both the DTA124E chip and DTC124E chip 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.

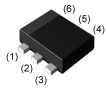
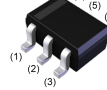
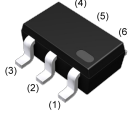
### ●Application

INVERTER, INTERFACE, DRIVER

### ●Packaging specifications

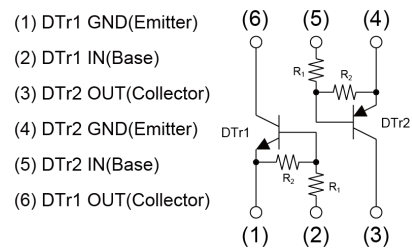
| Part No. | Package        | Package size | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit.(pcs) | Marking |
|----------|----------------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| EMD2     | SOT-563 (EMT6) | 1616         | T2R         | 180            | 8               | 8000                      | D2      |
| UMD2N    | SOT-363 (UMT6) | 2021         | TR          | 180            | 8               | 3000                      | D2      |
| IMD2A    | SOT-457 (SMT6) | 2928         | T108        | 180            | 8               | 3000                      | D2      |

### ●Outline

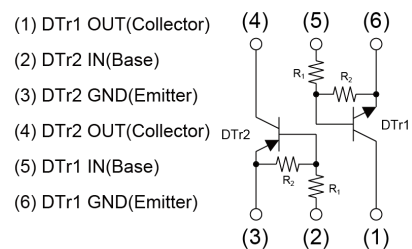
|                                                                                                                           |                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <p>SOT-563</p>  <p>EMD2<br/>(EMT6)</p>  | <p>SOT-363</p>  <p>UMD2N<br/>(UMT6)</p> |
| <p>SOT-457</p>  <p>IMD2A<br/>(SMT6)</p> |                                                                                                                            |

### ●Inner circuit

EMD2 / UMD2N



IMD2A



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

| Parameter                    |             | Symbol            | DTr1(NPN)   | DTr2(PNP) | Unit             |
|------------------------------|-------------|-------------------|-------------|-----------|------------------|
| Supply voltage               |             | $V_{CC}$          | 50          | -50       | V                |
| Input voltage                |             | $V_{IN}$          | -10 to 40   | -40 to 10 | V                |
| Output current               |             | $I_O$             | 30          | -30       | mA               |
| Collector current            |             | $I_{C(MAX)}^{*1}$ | 100         | -100      | mA               |
| Power dissipation            | EMD2/ UMD2N | $P_D^{*2*3}$      | 150         |           | mW/Total         |
|                              | IMD2A       | $P_D^{*2*4}$      | 300         |           |                  |
| Junction temperature         |             | $T_j$             | 150         |           | $^\circ\text{C}$ |
| Range of storage temperature |             | $T_{stg}$         | -55 to +150 |           | $^\circ\text{C}$ |

**● Electrical characteristics ( $T_a = 25^\circ\text{C}$ ) <For DTr1(NPN)>**

| Parameter            | Symbol       | Conditions                                           | Values |      |      | Unit          |
|----------------------|--------------|------------------------------------------------------|--------|------|------|---------------|
|                      |              |                                                      | Min.   | Typ. | Max. |               |
| Input voltage        | $V_{I(off)}$ | $V_{CC} = 5V, I_O = 100\mu\text{A}$                  | -      | -    | 0.5  | V             |
|                      | $V_{I(on)}$  | $V_O = 0.2V, I_O = 5\text{mA}$                       | 3.0    | -    | -    |               |
| Output voltage       | $V_{O(on)}$  | $I_O = 10\text{mA}, I_I = 0.5\text{mA}$              | -      | 100  | 300  | mV            |
| Input current        | $I_I$        | $V_I = 5V$                                           | -      | -    | 360  | $\mu\text{A}$ |
| Output current       | $I_{O(off)}$ | $V_{CC} = 50V, V_I = 0V$                             | -      | -    | 500  | nA            |
| DC current gain      | $G_I$        | $V_O = 5V, I_O = 5\text{mA}$                         | 56     | -    | -    | -             |
| Input resistance     | $R_1$        | -                                                    | 15.4   | 22   | 28.6 | k $\Omega$    |
| Resistance ratio     | $R_2/R_1$    | -                                                    | 0.8    | 1.0  | 1.2  | -             |
| Transition frequency | $f_T^{*1}$   | $V_{CE} = 10V, I_E = -5\text{mA}, f = 100\text{MHz}$ | -      | 250  | -    | MHz           |

**● Electrical characteristics ( $T_a = 25^\circ\text{C}$ ) <For DTr2(PNP)>**

| Parameter            | Symbol       | Conditions                                           | Values |      |      | Unit          |
|----------------------|--------------|------------------------------------------------------|--------|------|------|---------------|
|                      |              |                                                      | Min.   | Typ. | Max. |               |
| Input voltage        | $V_{I(off)}$ | $V_{CC} = -5V, I_O = -100\mu\text{A}$                | -      | -    | -0.5 | V             |
|                      | $V_{I(on)}$  | $V_O = -0.2V, I_O = -5\text{mA}$                     | -3.0   | -    | -    |               |
| Output voltage       | $V_{O(on)}$  | $I_O = -10\text{mA}, I_I = -0.5\text{mA}$            | -      | -100 | -300 | mV            |
| Input current        | $I_I$        | $V_I = -5V$                                          | -      | -    | -360 | $\mu\text{A}$ |
| Output current       | $I_{O(off)}$ | $V_{CC} = -50V, V_I = 0V$                            | -      | -    | -500 | nA            |
| DC current gain      | $G_I$        | $V_O = -5V, I_O = -5\text{mA}$                       | 56     | -    | -    | -             |
| Input resistance     | $R_1$        | -                                                    | 15.4   | 22   | 28.6 | k $\Omega$    |
| Resistance ratio     | $R_2/R_1$    | -                                                    | 0.8    | 1.0  | 1.2  | -             |
| 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.

\*3 120mW per element must not be exceeded.

\*4 200mW per element must not be exceeded.

● Electrical characteristic curves ( $T_a = 25^\circ\text{C}$ ) <For DTR1(NPN)>

Fig.1 Input Voltage vs. Output Current (ON Characteristics)

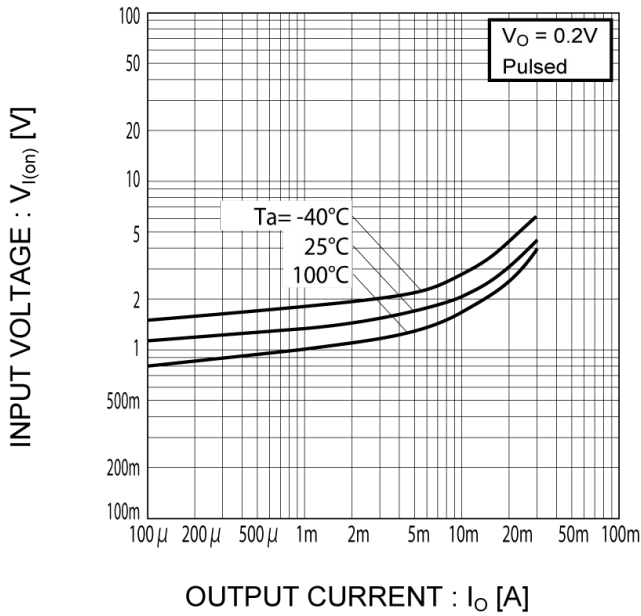


Fig.2 Output Current vs. Input Voltage (OFF Characteristics)

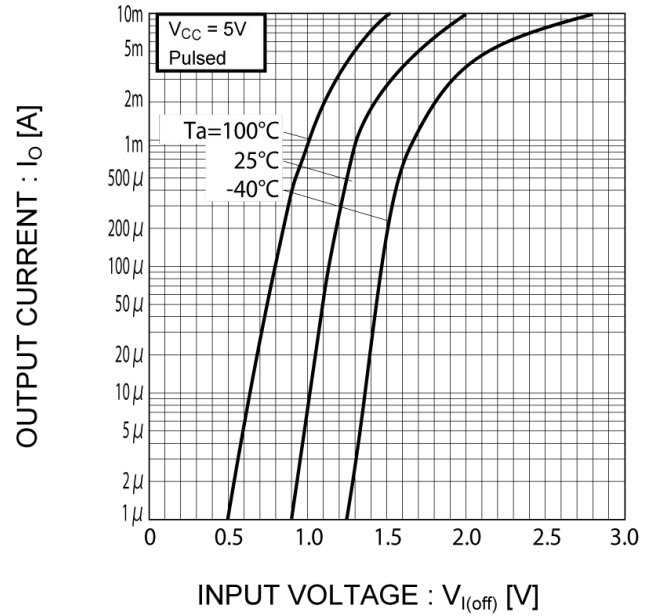


Fig.3 Output Current vs. Output Voltage

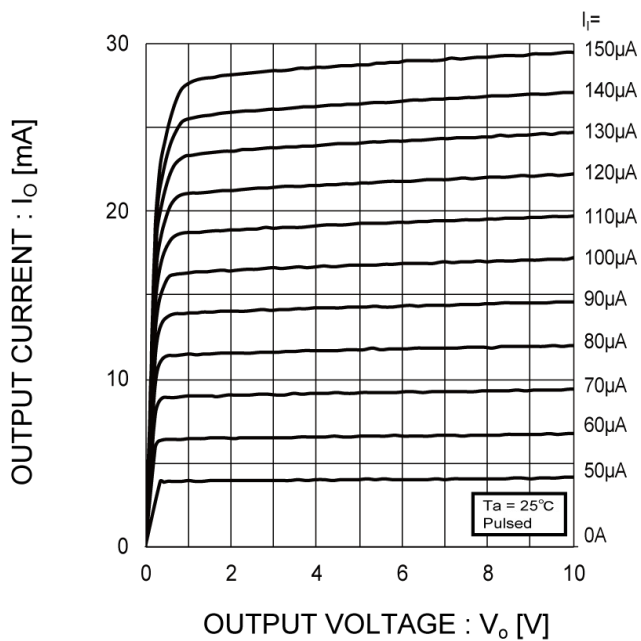
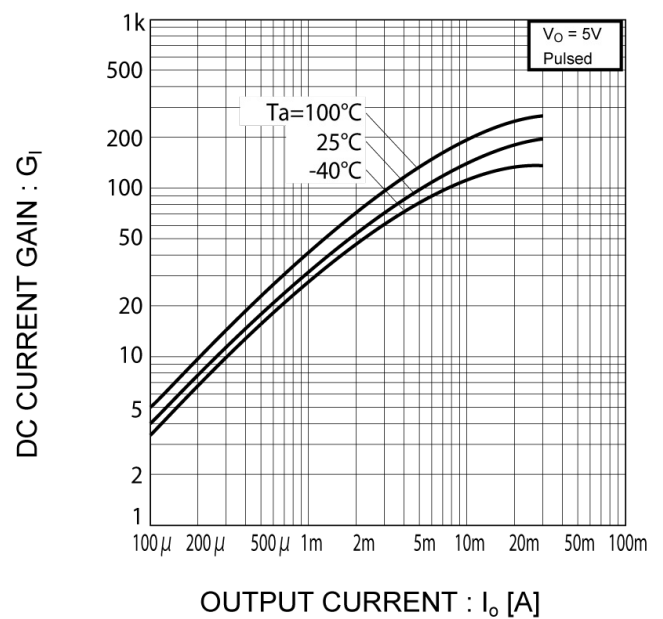
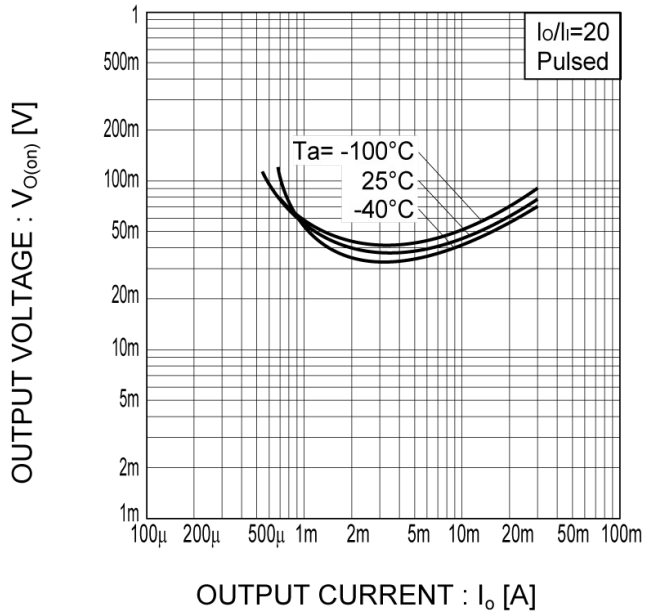


Fig.4 DC Current Gain vs. Output Current



● Electrical characteristic curves ( $T_a = 25^\circ\text{C}$ ) <For DTR1(NPN)>

Fig.5 Output Voltage vs. Output Current



● Electrical characteristic curves ( $T_a=25^\circ\text{C}$ ) <For DTr2(PNP)>

Fig.1 Input Voltage vs. Output Current (ON Characteristics)

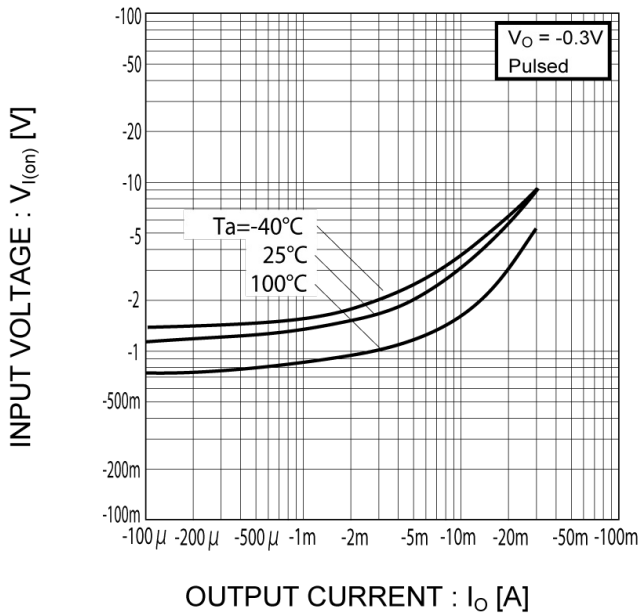


Fig.2 Output Current vs. Input Voltage (OFF Characteristics)

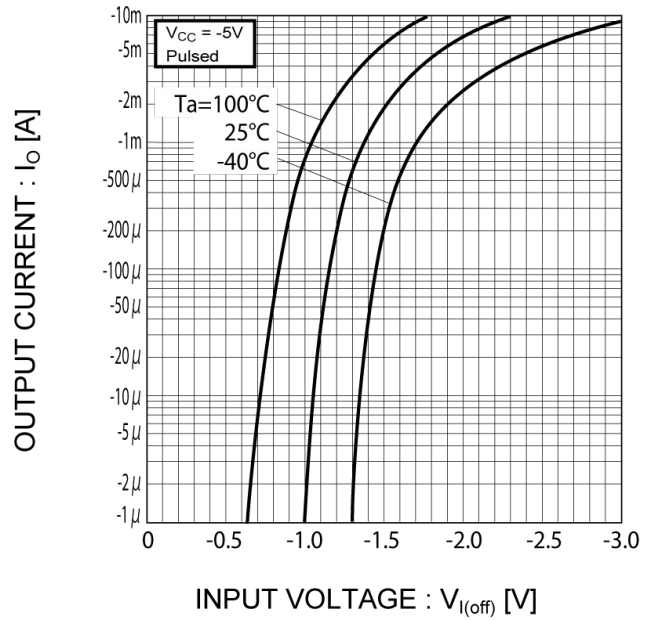


Fig.3 Output Current vs. Output Voltage

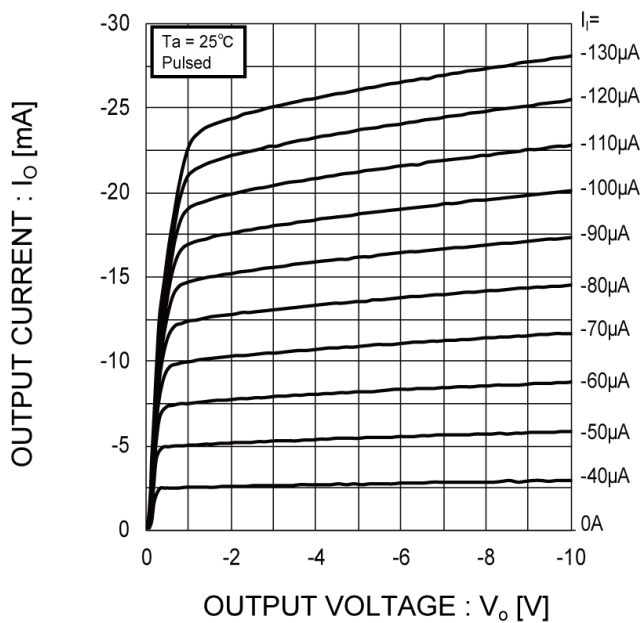
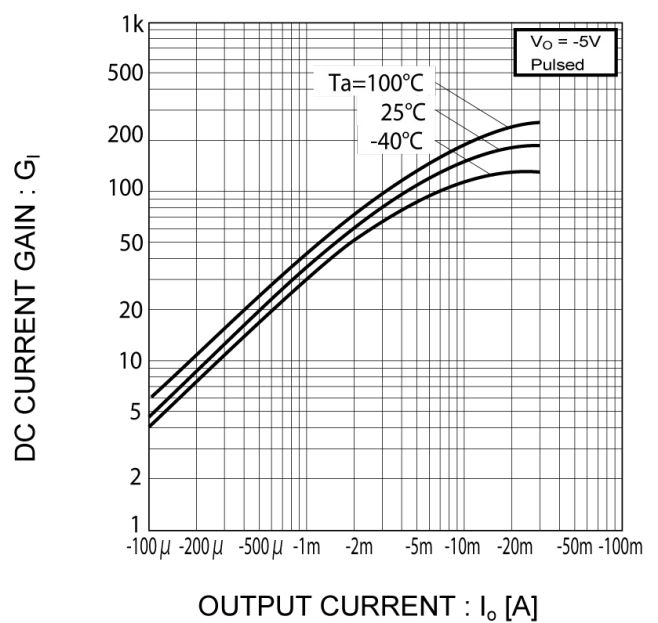
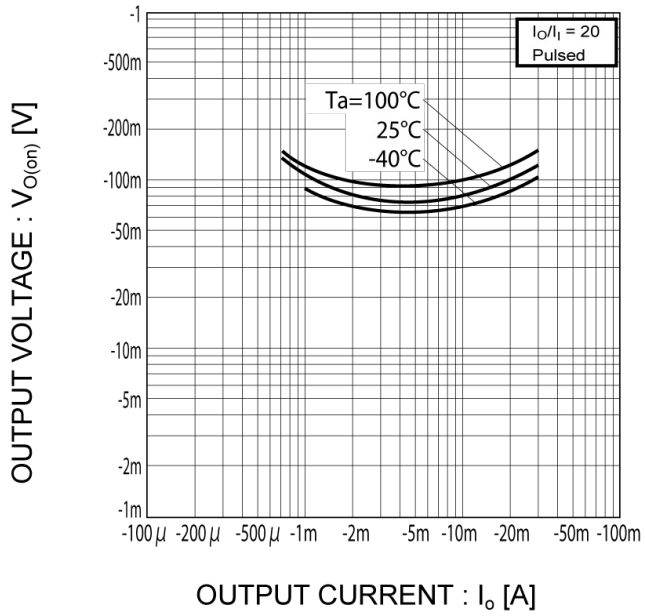


Fig.4 DC Current Gain vs. Output Current

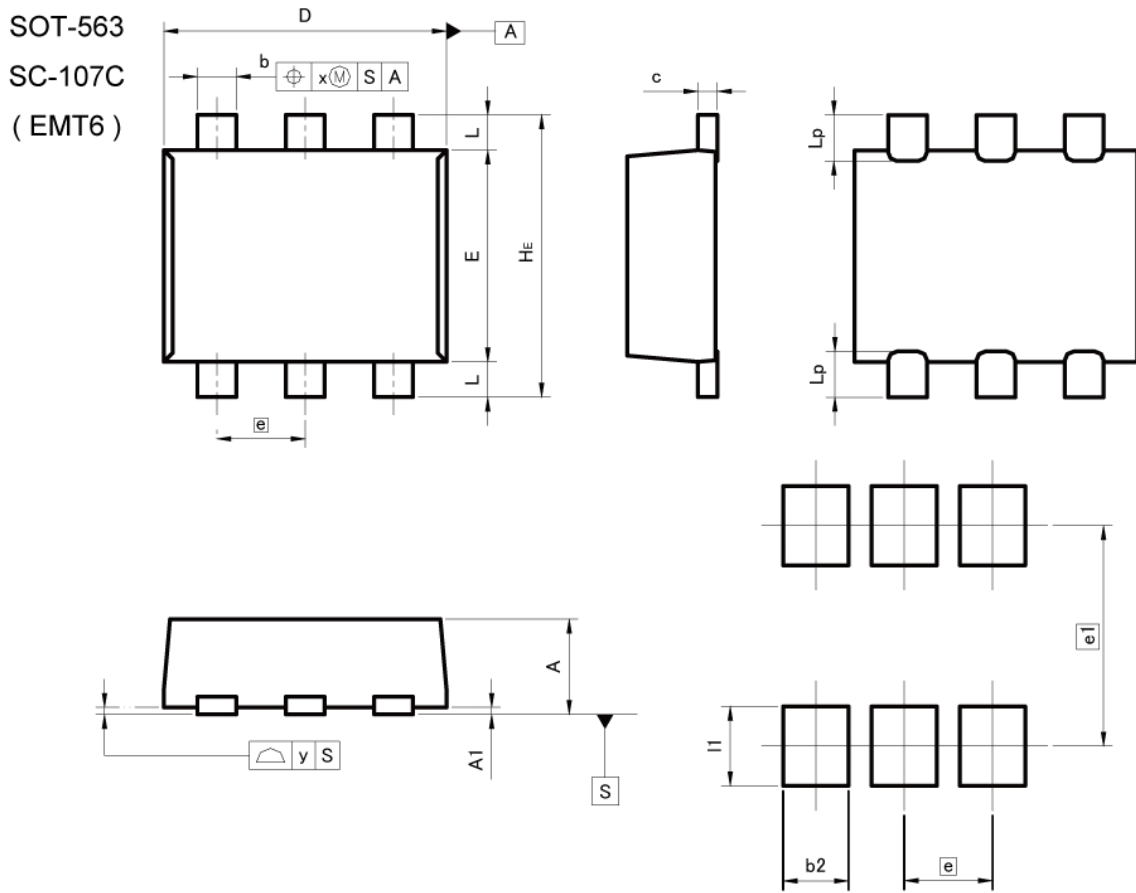


● Electrical characteristic curves ( $T_a=25^\circ\text{C}$ ) <For DTr2(PNP)>

Fig.5 Output Voltage vs. Output 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 |

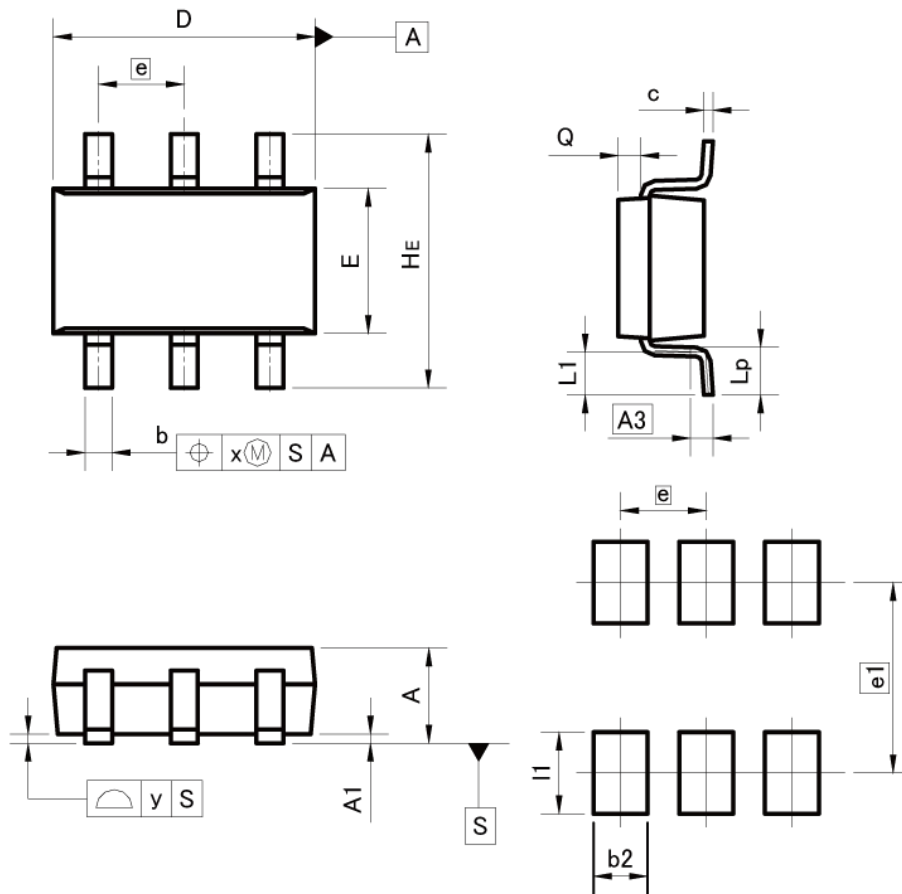
| DIM | MILIMETERS |      | INCHES |       |
|-----|------------|------|--------|-------|
|     | MIN        | MAX  | MIN    | MAX   |
| b2  | -          | 0.40 | -      | 0.016 |
| e1  | 1.55       |      | 0.061  |       |
| I1  | -          | 0.65 | -      | 0.026 |

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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  - Use of the Products in places subject to dew condensation
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- Please verify and confirm characteristics of the final or mounted products in using the Products.
- In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse. is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
- De-rate Power Dissipation (Pd) depending on Ambient temperature (Ta). When used in sealed area, confirm the actual ambient temperature.
- Confirm that operation temperature is within the specified range described in the product specification.
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- When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.
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  - [b] the temperature or humidity exceeds those recommended by ROHM
  - [c] the Products are exposed to direct sunshine or condensation
  - [d] the Products are exposed to high Electrostatic
2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.
3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

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[NSBC114YF3T5G](#) [NSBC123TF3T5G](#) [SMUN5235T1G](#) [SMUN5330DW1T1G](#) [SSVMUN5312DW1T2G](#) [RN1303\(TE85L,F\)](#)  
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