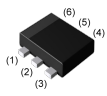
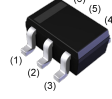
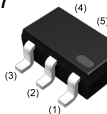


| Parameter | Tr1 and Tr2 |
|-----------|-------------|
| V_{CEO} | 50V |
| I_C | 150mA |

●Features

- 1) Two 2SC2412K chips in a EMT, UMT or SMT package.
- 2) Mounting possible with EMT3, UMT3 or SMT3 automatic mounting machines.
- 3) Transistor elements are independent, eliminating interference.
- 4) Mounting cost and area can be cut in half.

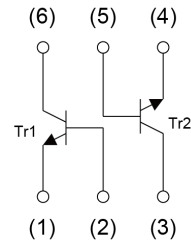
●Outline

| | |
|--|--|
| <p>SOT-563</p>  <p>EMX1 (EMT6)</p> | <p>SOT-363</p>  <p>UMX1N (UMT6)</p> |
| <p>SOT-457</p>  <p>IMX1 (SMT6)</p> | |

●Inner circuit

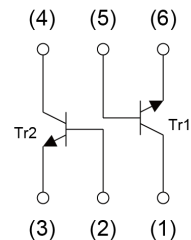
EMX1 / UMX1N

- (1) Tr1 Emitter
- (2) Tr1 Base
- (3) Tr2 Collector
- (4) Tr2 Emitter
- (5) Tr2 Base
- (6) Tr1 Collector



IMX1

- (1) Tr1 Collector
- (2) Tr2 Base
- (3) Tr2 Emitter
- (4) Tr2 Collector
- (5) Tr1 Base
- (6) Tr1 Emitter



●Application

GENERAL PURPOSE SMALL SIGNAL AMPLIFIER

●Packaging specifications

| Part No. | Package | Package size | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit.(pcs) | Marking |
|----------|-------------------|--------------|-------------|----------------|-----------------|---------------------------|---------|
| EMX1 | SOT-563 (EMT6) | 1616 | T2R | 180 | 8 | 8000 | X1 |
| UMX1N | SOT-363 (UMT6) | 2021 | TN | 180 | 8 | 3000 | X1 |
| IMX1 | SOT-457 (SMT6) | 2928 | T110 | 180 | 8 | 3000 | X1 |

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

<For Tr1 and Tr2 in common>

| Parameter | | Symbol | Values | Unit |
|------------------------------|-------------|--------------|-------------|------------------|
| Collector-base voltage | | V_{CBO} | 60 | V |
| Collector-emitter voltage | | V_{CEO} | 50 | V |
| Emitter-base voltage | | V_{EBO} | 7 | V |
| Collector current | | I_C | 150 | mA |
| Power dissipation | EMX1/ UMX1N | P_D^{*1*2} | 150 | mW/Total |
| | IMX1 | P_D^{*1*3} | 300 | mW/Total |
| 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 Tr1 and Tr2 in common>

| Parameter | Symbol | Conditions | Values | | | Unit |
|--------------------------------------|---------------|---|--------|------|------|------|
| | | | Min. | Typ. | Max. | |
| Collector-base breakdown voltage | BV_{CBO} | $I_C = 50\mu\text{A}$ | 60 | - | - | V |
| Collector-emitter breakdown voltage | BV_{CEO} | $I_C = 1\text{mA}$ | 50 | - | - | V |
| Emitter-base breakdown voltage | BV_{EBO} | $I_E = 50\mu\text{A}$ | 7 | - | - | V |
| Collector cut-off current | I_{CBO} | $V_{CB} = 60\text{V}$ | - | - | 100 | nA |
| Emitter cut-off current | I_{EBO} | $V_{EB} = 7\text{V}$ | - | - | 100 | nA |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 50\text{mA}, I_B = 5\text{mA}$ | - | - | 400 | mV |
| DC current gain | h_{FE} | $V_{CE} = 6\text{V}, I_C = 1\text{mA}$ | 120 | - | 560 | - |
| Transition frequency | f_T | $V_{CE} = 12\text{V}, I_E = -2\text{mA}, f = 100\text{MHz}$ | - | 180 | - | MHz |
| Output capacitance | C_{ob} | $V_{CB} = 12\text{V}, I_E = 0\text{A}, f = 1\text{MHz}$ | - | 2.0 | 3.5 | pF |

*1 Each terminal mounted on a reference land.

*2 120mW per element must not be exceeded.

*3 200mW per element must not be exceeded.

● Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

<For Tr1 and Tr2 in common>

Fig.1 Ground Emitter Propagation Characteristics

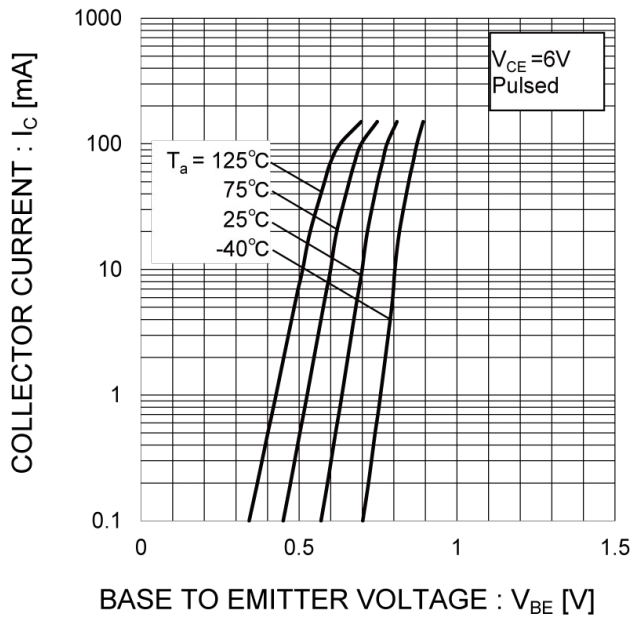


Fig.2 Grounded Emitter Output Characteristics

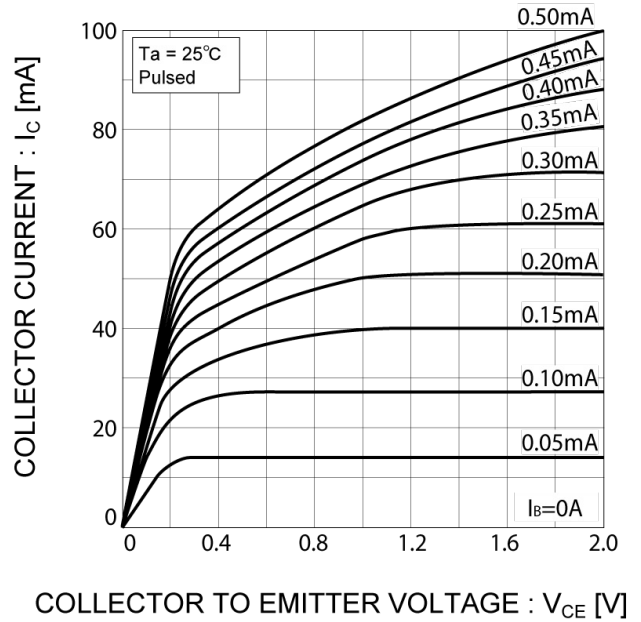


Fig.3 DC Current Gain vs. Collector Current (I)

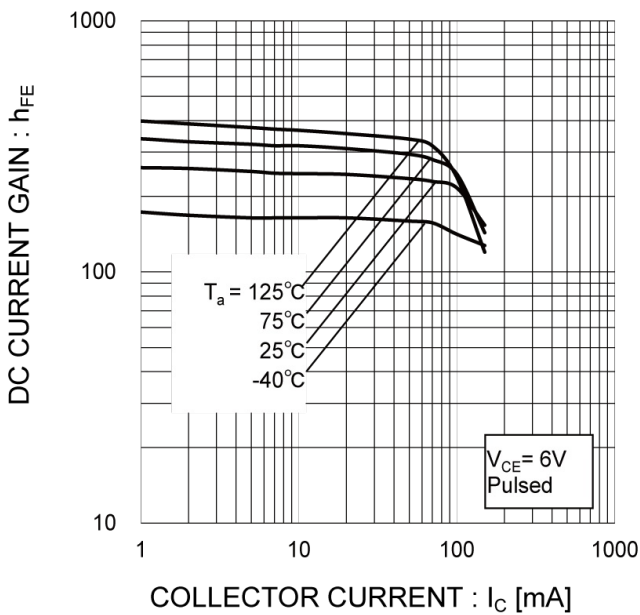
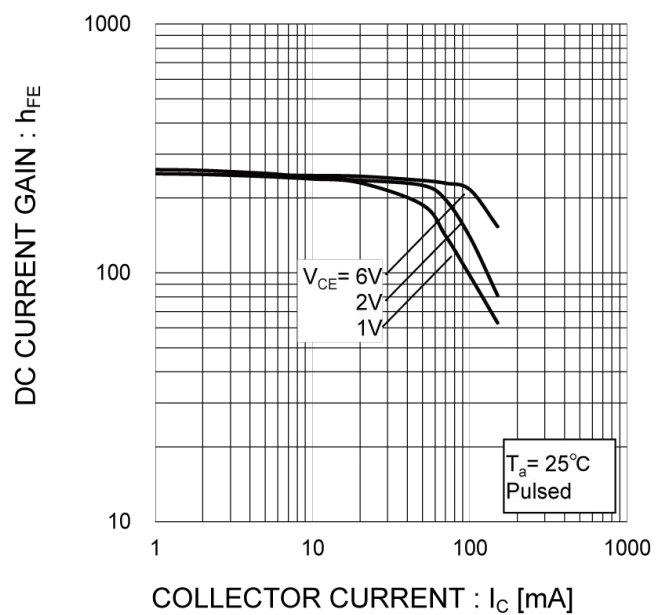


Fig.4 DC Current Gain vs. Collector Current (II)



● Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

<For Tr1 and Tr2 in common>

Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current(I)

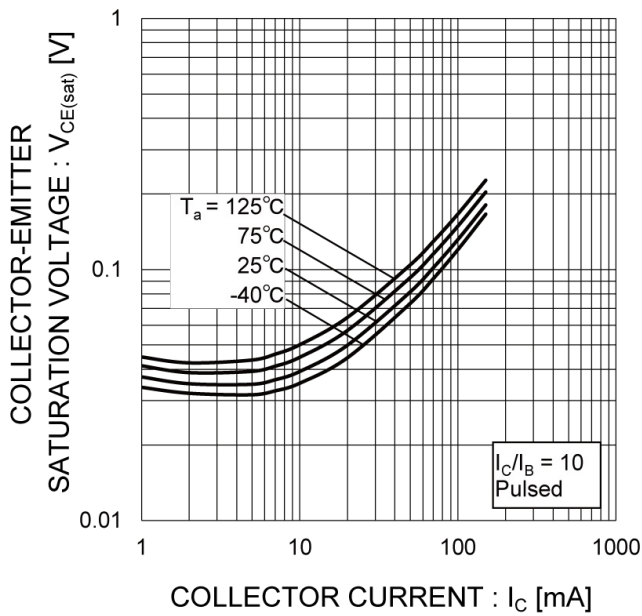


Fig.6 Collector-Emitter Saturation Voltage vs. Collector Current(II)

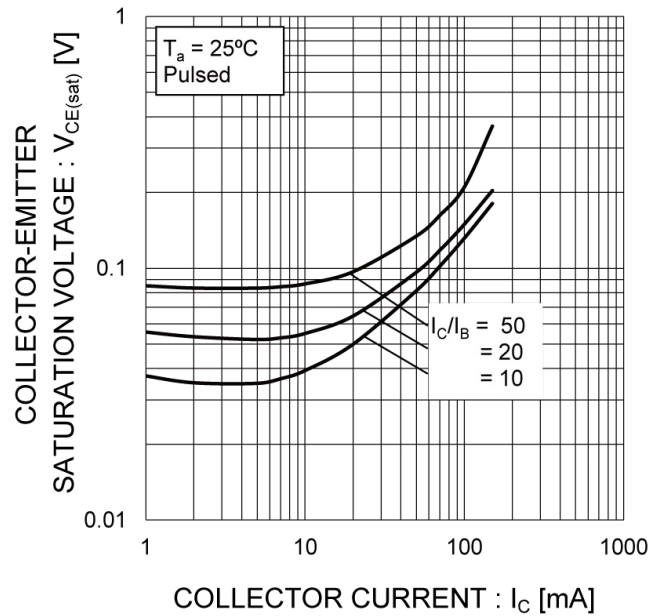


Fig.7 Base-Emitter Saturation Voltage vs. Collector Current (I)

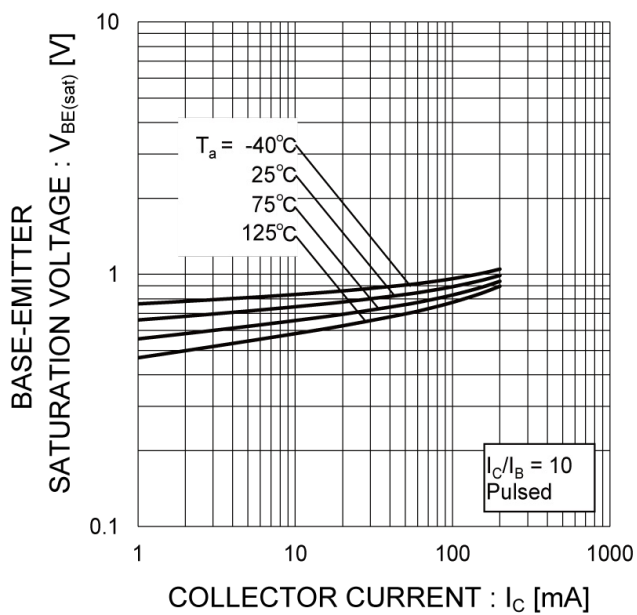
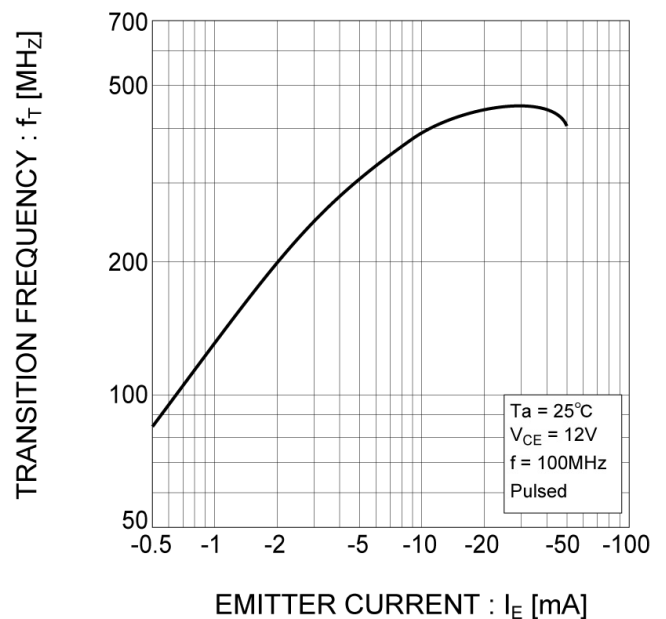


Fig.8 Gain Bandwidth Product vs. Emitter Current



● Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

<For Tr1 and Tr2 in common>

Fig.9 Collector Output Capacitance vs. Collector-Base Voltage
Emitter Input Capacitance vs. Emitter-Base Voltage

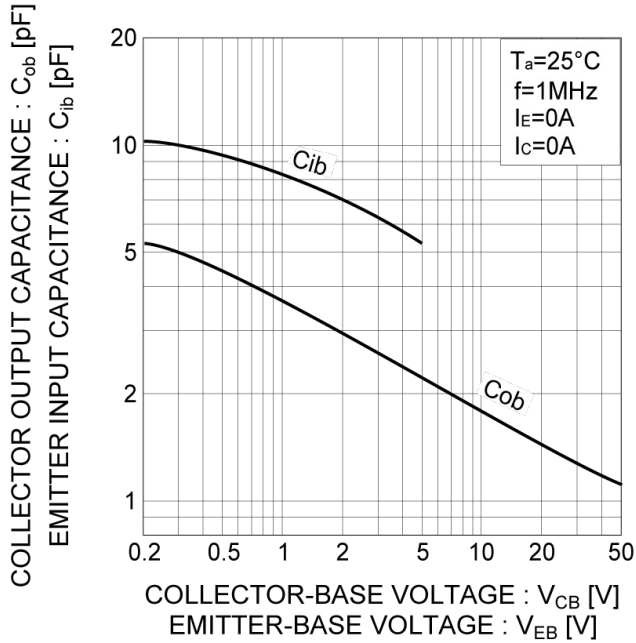


Fig.10 Safe Operating Area

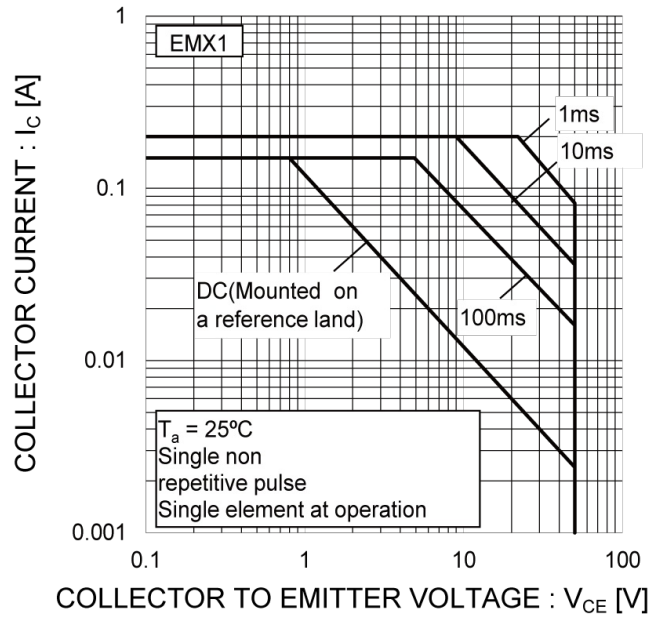


Fig.11 Safe Operating Area

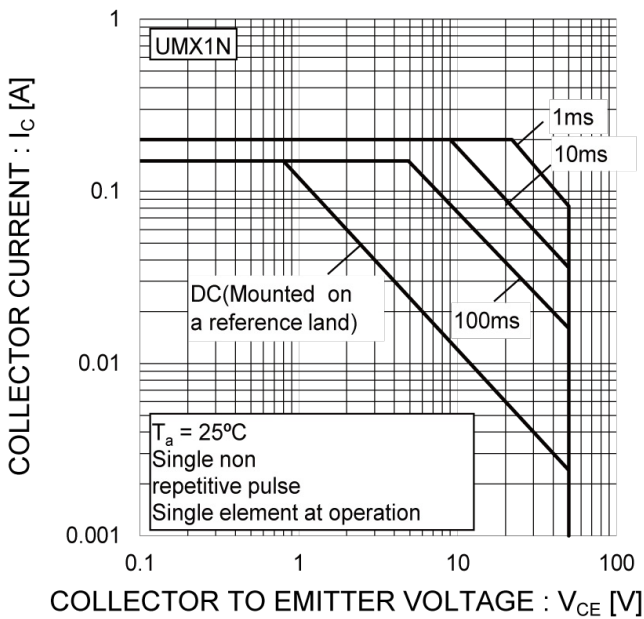
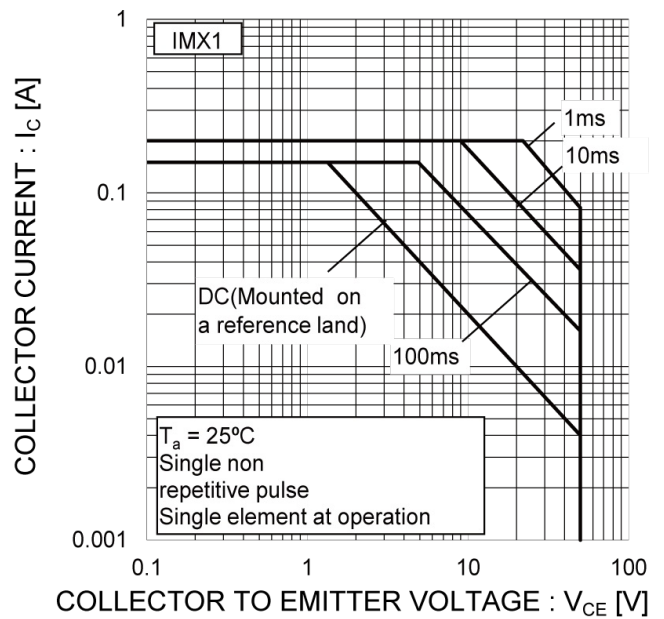
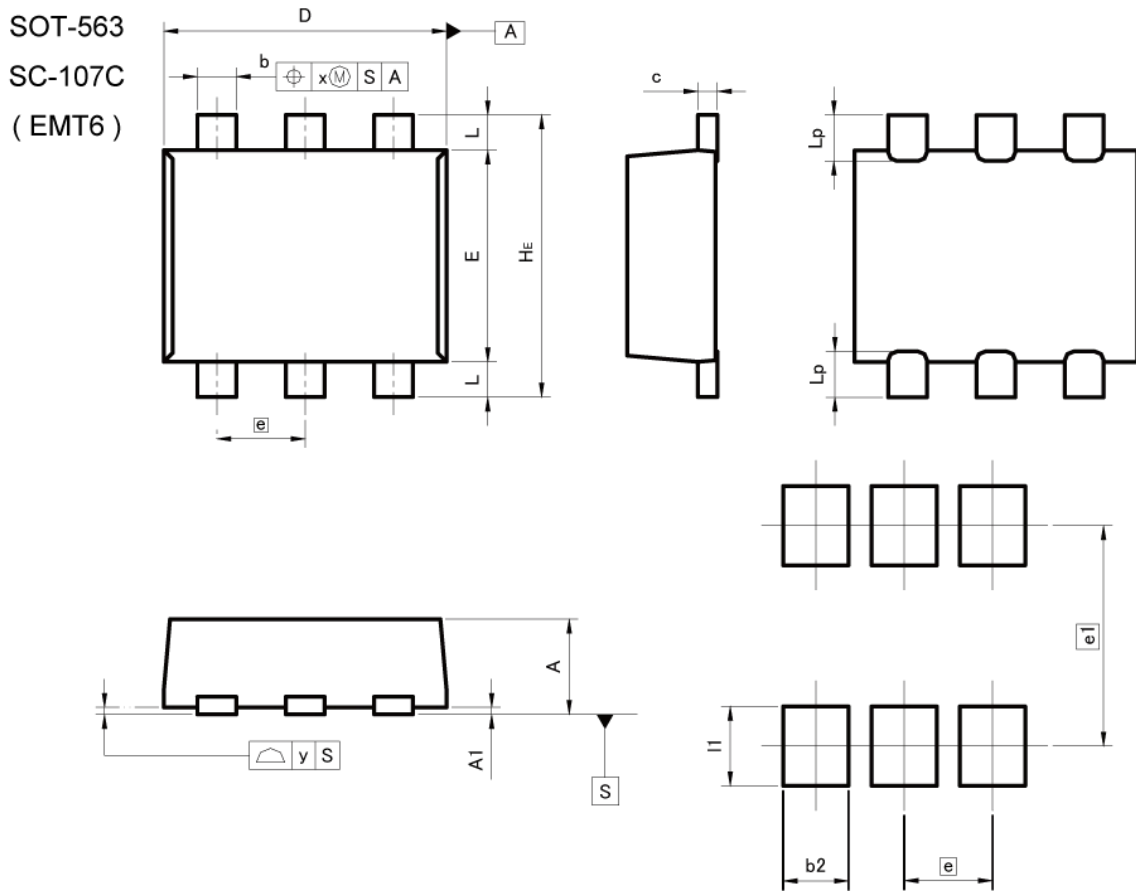


Fig.12 Safe Operating Area



●Dimensions



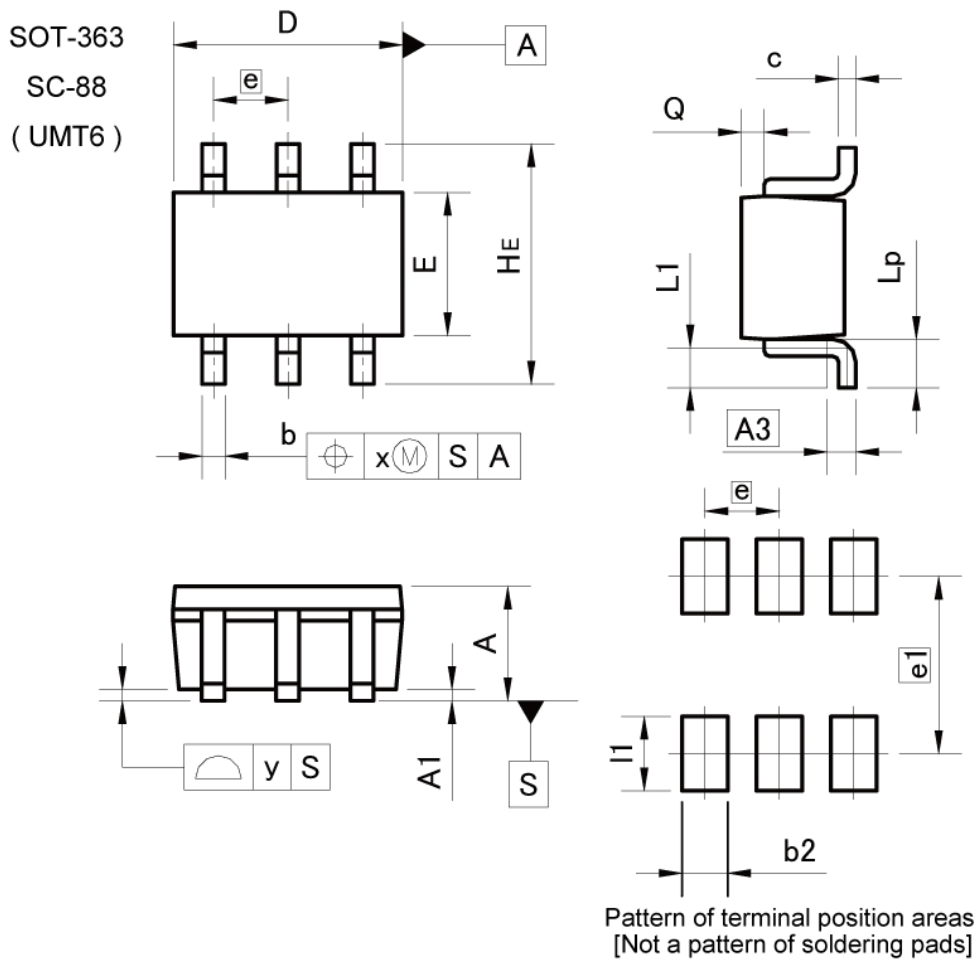
Pattern of terminal position areas
[Not a pattern of soldering pads]

| 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



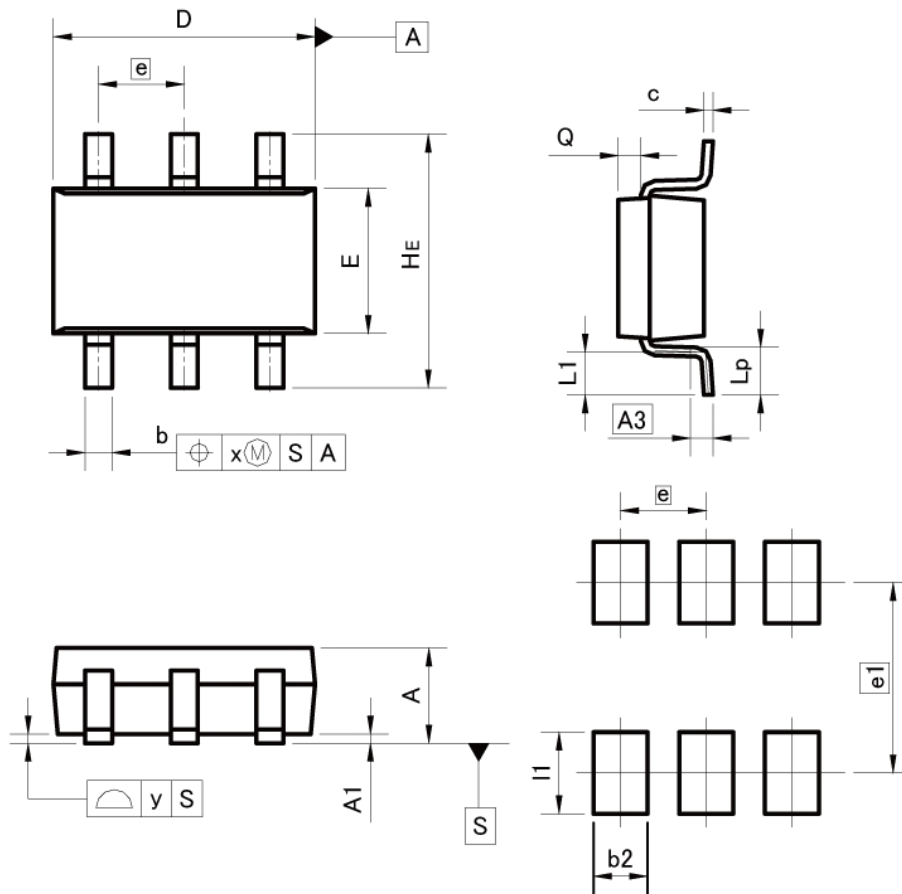
| DIM | MILIMETERS | | INCHES | |
|-----|------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.80 | 1.00 | 0.031 | 0.039 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A3 | 0.25 | | 0.010 | |
| b | 0.15 | 0.30 | 0.006 | 0.012 |
| c | 0.10 | 0.20 | 0.004 | 0.008 |
| D | 1.90 | 2.10 | 0.075 | 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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UMX1N - Web Page

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| | |
|-----------------------------|---------|
| Part Number | UMX1N |
| Package | UMT6 |
| Unit Quantity | 3000 |
| Minimum Package Quantity | 3000 |
| Packing Type | Taping |
| Constitution Materials List | inquiry |
| RoHS | Yes |