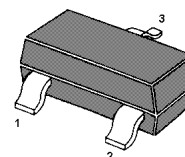


PNP Silicon Epitaxial Planar Transistor

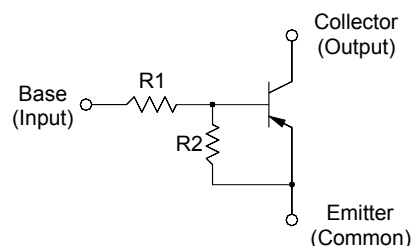
for switching and interface circuit and drive circuit applications

Resistor Values

| Type | R1 (K) | R2 (K) |
|----------|--------|--------|
| MMUN2111 | 10 | 10 |
| MMUN2112 | 22 | 22 |
| MMUN2113 | 47 | 47 |
| MMUN2114 | 10 | 47 |
| MMUN2115 | 10 | ∞ |
| MMUN2116 | 4.7 | ∞ |
| MMUN2130 | 1 | 1 |
| MMUN2131 | 2.2 | 2.2 |
| MMUN2132 | 4.7 | 4.7 |
| MMUN2133 | 4.7 | 47 |
| MMUN2134 | 22 | 47 |



1.Base 2.Emitter 3.Collector
SOT-23 Plastic Package



Absolute Maximum Ratings ($T_a = 25\text{ }^\circ\text{C}$)

| Parameter | Symbol | Value | Unit |
|---------------------------|------------|---------------|------------------|
| Collector Base Voltage | $-V_{CBO}$ | 50 | V |
| Collector Emitter Voltage | $-V_{CEO}$ | 50 | V |
| Collector Current | $-I_C$ | 100 | mA |
| Total Power Dissipation | P_{tot} | 200 | mW |
| Junction Temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_s | - 55 to + 150 | $^\circ\text{C}$ |



Characteristics at $T_a = 25\text{ }^\circ\text{C}$

| Parameter | Symbol | Min. | Max. | Unit | |
|---|----------------|--------------|------|------|----|
| DC Current Gain at $-V_{CE} = 10\text{ V}$, $-I_C = 5\text{ mA}$ | MMUN2111 | h_{FE} | 35 | - | - |
| | MMUN2112 | h_{FE} | 60 | - | - |
| | MMUN2113 | h_{FE} | 80 | - | - |
| | MMUN2114 | h_{FE} | 80 | - | - |
| | MMUN2115 | h_{FE} | 160 | - | - |
| | MMUN2116 | h_{FE} | 160 | - | - |
| | MMUN2130 | h_{FE} | 3 | - | - |
| | MMUN2131 | h_{FE} | 8 | - | - |
| | MMUN2132 | h_{FE} | 15 | - | - |
| | MMUN2133 | h_{FE} | 80 | - | - |
| MMUN2134 | h_{FE} | 80 | - | - | |
| Collector Base Cutoff Current at $-V_{CB} = 50\text{ V}$ | $-I_{CBO}$ | - | 100 | nA | |
| Collector Emitter Cutoff Current at $-V_{CE} = 50\text{ V}$ | $-I_{CEO}$ | - | 500 | nA | |
| Emitter Base Cutoff Current at $-V_{EB} = 6\text{ V}$ | MMUN2111 | $-I_{EBO}$ | - | 0.5 | mA |
| | MMUN2112 | $-I_{EBO}$ | - | 0.2 | mA |
| | MMUN2113 | $-I_{EBO}$ | - | 0.1 | mA |
| | MMUN2114 | $-I_{EBO}$ | - | 0.2 | mA |
| | MMUN2115 | $-I_{EBO}$ | - | 0.9 | mA |
| | MMUN2116 | $-I_{EBO}$ | - | 1.9 | mA |
| | MMUN2130 | $-I_{EBO}$ | - | 4.3 | mA |
| | MMUN2131 | $-I_{EBO}$ | - | 2.3 | mA |
| | MMUN2132 | $-I_{EBO}$ | - | 1.5 | mA |
| | MMUN2133 | $-I_{EBO}$ | - | 0.18 | mA |
| MMUN2134 | $-I_{EBO}$ | - | 0.13 | mA | |
| Collector Base Breakdown Voltage at $-I_C = 10\text{ }\mu\text{A}$ | $-V_{(BR)CBO}$ | 50 | - | V | |
| Collector Emitter Breakdown Voltage at $-I_C = 2\text{ mA}$ | $-V_{(BR)CEO}$ | 50 | - | V | |
| Collector Emitter Saturation Voltage at $-I_C = 10\text{ mA}$, $-I_B = 0.3\text{ mA}$ at $-I_C = 10\text{ mA}$, $-I_B = 5\text{ mA}$ at $-I_C = 10\text{ mA}$, $-I_B = 1\text{ mA}$ | | $-V_{CEsat}$ | - | 0.25 | V |
| | MMUN2130 | $-V_{CEsat}$ | - | 0.25 | V |
| | MMUN2131 | $-V_{CEsat}$ | - | 0.25 | V |
| | MMUN2115 | $-V_{CEsat}$ | - | 0.25 | V |
| | MMUN2116 | $-V_{CEsat}$ | - | 0.25 | V |
| | MMUN2132 | $-V_{CEsat}$ | - | 0.25 | V |
| | MMUN2133 | $-V_{CEsat}$ | - | 0.25 | V |
| | MMUN2134 | $-V_{CEsat}$ | - | 0.25 | V |

Characteristics at $T_a = 25\text{ }^\circ\text{C}$

| Parameter | Symbol | Min. | Max. | Unit | |
|--|----------------------------|-----------|-------|------------|------------|
| Output Voltage (on) at $-V_{CC} = 5\text{ V}$, $-V_B = 2.5\text{ V}$, $R_L = 1\text{ K}\Omega$ | MMUN2111 | $-V_{OL}$ | - | 0.2 | V |
| | MMUN2112 | $-V_{OL}$ | - | 0.2 | V |
| | MMUN2114 | $-V_{OL}$ | - | 0.2 | V |
| | MMUN2115 | $-V_{OL}$ | - | 0.2 | V |
| | MMUN2116 | $-V_{OL}$ | - | 0.2 | V |
| | MMUN2130 | $-V_{OL}$ | - | 0.2 | V |
| | MMUN2131 | $-V_{OL}$ | - | 0.2 | V |
| | MMUN2132 | $-V_{OL}$ | - | 0.2 | V |
| | MMUN2133 | $-V_{OL}$ | - | 0.2 | V |
| | MMUN2134 | $-V_{OL}$ | - | 0.2 | V |
| | MMUN2113 | $-V_{OL}$ | - | 0.2 | V |
| Output Voltage (off) at $-V_{CC} = 5\text{ V}$, $-V_B = 0.5\text{ V}$, $R_L = 1\text{ K}\Omega$ at $-V_{CC} = 5\text{ V}$, $-V_B = 0.05\text{ V}$, $R_L = 1\text{ K}\Omega$ at $-V_{CC} = 5\text{ V}$, $-V_B = 0.25\text{ V}$, $R_L = 1\text{ K}\Omega$ | MMUN2130 | $-V_{OH}$ | 4.9 | - | V |
| | MMUN2115 | $-V_{OH}$ | 4.9 | - | V |
| | MMUN2116 | $-V_{OH}$ | 4.9 | - | V |
| | MMUN2131 | $-V_{OH}$ | 4.9 | - | V |
| | MMUN2132 | $-V_{OH}$ | 4.9 | - | V |
| Input Resistor | MMUN2111 | R1 | 7 | 13 | K Ω |
| | MMUN2112 | R1 | 15.4 | 28.6 | K Ω |
| | MMUN2113 | R1 | 32.9 | 61.1 | K Ω |
| | MMUN2114 | R1 | 7 | 13 | K Ω |
| | MMUN2115 | R1 | 7 | 13 | K Ω |
| | MMUN2116 | R1 | 3.3 | 6.1 | K Ω |
| | MMUN2130 | R1 | 0.7 | 1.3 | K Ω |
| | MMUN2131 | R1 | 1.5 | 2.9 | K Ω |
| | MMUN2132 | R1 | 3.3 | 6.1 | K Ω |
| | MMUN2133 | R1 | 3.3 | 6.1 | K Ω |
| MMUN2134 | R1 | 15.4 | 28.6 | K Ω | |
| Resistor Ratio | MMUN2111/MMUN2112/MMUN2113 | R1/R2 | 0.8 | 1.2 | - |
| | MMUN2114 | R1/R2 | 0.17 | 0.25 | - |
| | MMUN2115/MMUN2116 | R1/R2 | - | - | - |
| | MMUN2130/MMUN2131/MMUN2132 | R1/R2 | 0.8 | 1.2 | - |
| | MMUN2133 | R1/R2 | 0.055 | 0.185 | - |



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SOT-23



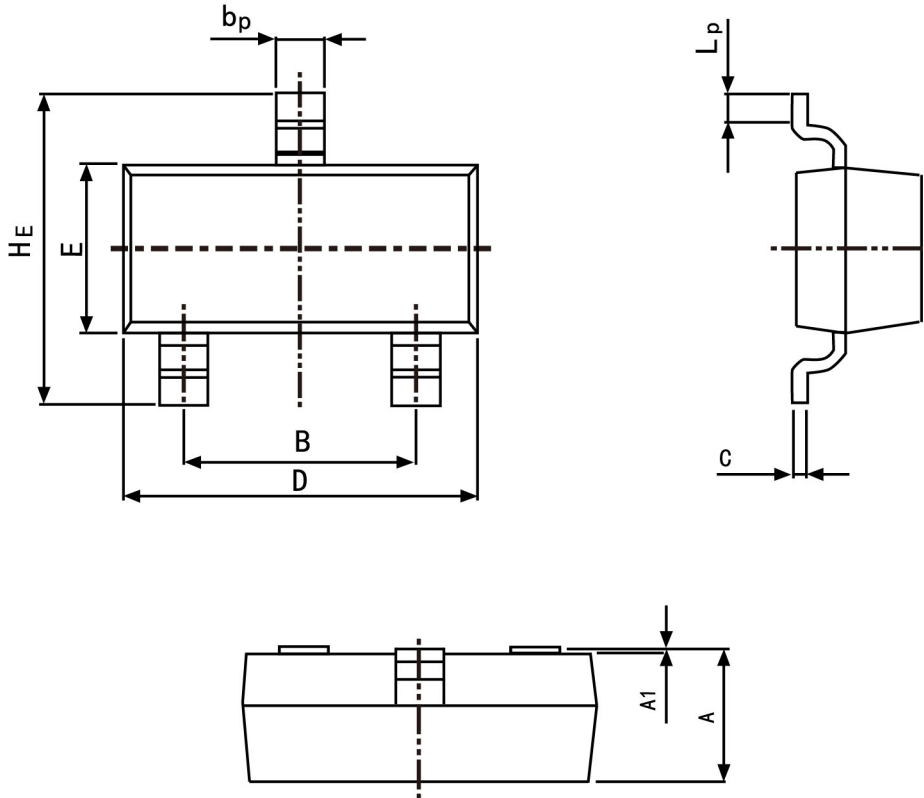
MMUN2111-MMUN2134

www.china-base.com.hk

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



| Symbol | Dimension in Millimeters | |
|--------|--------------------------|-------|
| | Min | Max |
| A | 0.95 | 1.40 |
| B | 1.78 | 2.04 |
| b_p | 0.35 | 0.50 |
| C | 0.08 | 0.19 |
| D | 2.70 | 3.10 |
| E | 1.20 | 1.65 |
| HE | 2.20 | 3.00 |
| A1 | 0.100 | 0.013 |
| Lp | 0.20 | 0.50 |