

## Plastic-Encapsulate Transistors

DUAL TRANSISTOR (NPN+PNP)

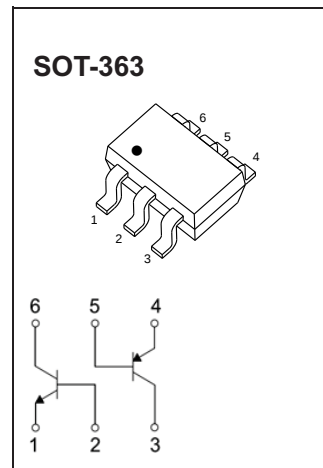
### FEATURES

- Epitaxial Planar Die Construction
- Ideal for low Power Amplification and Switching
- One 5551(NPN), one 5401(PNP)

MRKING:KNM

MAXIMUM RATINGS NPN 5551 ( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

| Symbol          | Parameter                               | Value   | Units                       |
|-----------------|-----------------------------------------|---------|-----------------------------|
| $V_{CBO}$       | Collector- Base Voltage                 | 180     | V                           |
| $V_{CEO}$       | Collector-Emitter Voltage               | 160     | V                           |
| $V_{EBO}$       | Emitter-Base Voltage                    | 6       | V                           |
| $I_C$           | Collector Current -Continuous           | 0.2     | A                           |
| $P_C$           | Collector Power Dissipation             | 0.2     | W                           |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 625     | $^{\circ}\text{C}/\text{W}$ |
| $T_J$           | Junction Temperature                    | 150     | $^{\circ}\text{C}$          |
| $T_{stg}$       | Storage Temperature                     | -55-150 | $^{\circ}\text{C}$          |



ELECTRICAL CHARACTERISTICS NPN 5551 ( $T_a=25^{\circ}\text{C}$  unless otherwise specified)

| Parameter                            | Symbol        | Test conditions                                                                  | Min | Typ | Max  | Unit          |
|--------------------------------------|---------------|----------------------------------------------------------------------------------|-----|-----|------|---------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C=100\mu\text{A}, I_E=0$                                                      | 180 |     |      | V             |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C=1\text{mA}, I_B=0$                                                          | 160 |     |      | V             |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E=10\mu\text{A}, I_C=0$                                                       | 6   |     |      | V             |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB}=120\text{V}, I_E=0$                                                      |     |     | 0.05 | $\mu\text{A}$ |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB}=4\text{V}, I_C=0$                                                        |     |     | 0.05 | $\mu\text{A}$ |
| DC current gain                      | $h_{FE1}$     | $V_{CE}=5\text{V}, I_C=1\text{mA}$                                               | 80  |     |      |               |
|                                      | $h_{FE2}$     | $V_{CE}=5\text{V}, I_C=10\text{mA}$                                              | 100 |     | 300  |               |
|                                      | $h_{FE3}$     | $V_{CE}=5\text{V}, I_C=50\text{mA}$                                              | 30  |     |      |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=10\text{mA}, I_B=1\text{mA}$                                                |     |     | 0.15 | V             |
|                                      |               | $I_C=50\text{mA}, I_B=5\text{mA}$                                                |     |     | 0.2  | V             |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C=10\text{mA}, I_B=1\text{mA}$                                                |     |     | 1    | V             |
|                                      |               | $I_C=50\text{mA}, I_B=5\text{mA}$                                                |     |     | 1    | V             |
| Output Capacitance                   | $C_{obo}$     | $V_{CB}=10\text{V}, f=1.0\text{MHz}, I_E=0$                                      |     |     | 6.0  | pF            |
| Current Gain-Bandwidth Product       | $f_T$         | $V_{CE}=10\text{V}, I_C=10\text{mA}, f=100\text{MHz}$                            | 100 |     | 300  | MHz           |
| Noise Figure                         | NF            | $V_{CE}=5.0\text{V}, I_C=200\mu\text{A}, R_S=1.0\text{k}\Omega, f=1.0\text{kHz}$ |     |     | 8.0  | dB            |

### MAXIMUM RATINGS PNP 5401 (T<sub>a</sub>=25°C unless otherwise noted)

| Symbol           | Parameter                               | Value   | Units |
|------------------|-----------------------------------------|---------|-------|
| V <sub>CBO</sub> | Collector- Base Voltage                 | -160    | V     |
| V <sub>CEO</sub> | Collector-Emitter Voltage               | -150    | V     |
| V <sub>EBO</sub> | Emitter-Base Voltage                    | -5      | V     |
| I <sub>C</sub>   | Collector Current -Continuous           | -0.2    | A     |
| P <sub>C</sub>   | Collector Power Dissipation             | 0.2     | W     |
| R <sub>θJA</sub> | Thermal Resistance, Junction to Ambient | 625     | °C/W  |
| T <sub>J</sub>   | Junction Temperature                    | 150     | °C    |
| T <sub>stg</sub> | Storage Temperature                     | -55-150 | °C    |

### ELECTRICAL CHARACTERISTICS PNP 5401 (T<sub>a</sub>=25°C unless otherwise specified)

| Parameter                            | Symbol               | Test conditions                                                                   | Min  | Typ | Max  | Unit |
|--------------------------------------|----------------------|-----------------------------------------------------------------------------------|------|-----|------|------|
| Collector-base breakdown voltage     | V <sub>(BR)CBO</sub> | I <sub>C</sub> =-100μA, I <sub>E</sub> =0                                         | -160 |     |      | V    |
| Collector-emitter breakdown voltage  | V <sub>(BR)CEO</sub> | I <sub>C</sub> =-1mA, I <sub>B</sub> =0                                           | -150 |     |      | V    |
| Emitter-base breakdown voltage       | V <sub>(BR)EBO</sub> | I <sub>E</sub> =-10μA, I <sub>C</sub> =0                                          | -5   |     |      | V    |
| Collector cut-off current            | I <sub>CBO</sub>     | V <sub>CB</sub> =-120V, I <sub>E</sub> =0                                         |      |     | -50  | nA   |
| Emitter cut-off current              | I <sub>EBO</sub>     | V <sub>EB</sub> =-3V, I <sub>C</sub> =0                                           |      |     | -50  | nA   |
| DC current gain                      | h <sub>FE1</sub>     | V <sub>CE</sub> =-5V, I <sub>C</sub> =-1mA                                        | 50   |     |      |      |
|                                      | h <sub>FE2</sub>     | V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA                                       | 100  |     | 300  |      |
|                                      | h <sub>FE3</sub>     | V <sub>CE</sub> =-5V, I <sub>C</sub> =-50mA                                       | 50   |     |      |      |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> =-10mA, I <sub>B</sub> =-1mA                                       |      |     | -0.2 | V    |
|                                      |                      | I <sub>C</sub> =-50mA, I <sub>B</sub> =-5mA                                       |      |     | -0.5 | V    |
| Base-emitter saturation voltage      | V <sub>BE(sat)</sub> | I <sub>C</sub> =-10mA, I <sub>B</sub> =-1mA                                       |      |     | -1   | V    |
|                                      |                      | I <sub>C</sub> =-50mA, I <sub>B</sub> =-5mA                                       |      |     | -1   | V    |
| Output Capacitance                   | C <sub>obo</sub>     | V <sub>CB</sub> =-10V, f = 1.0MHz, I <sub>E</sub> = 0                             |      |     | 6.0  | pF   |
| Current Gain-Bandwidth Product       | f <sub>T</sub>       | V <sub>CE</sub> =-10V, I <sub>C</sub> =-10mA, f = 100MHz                          | 100  |     | 300  | MHz  |
| Noise Figure                         | NF                   | V <sub>CE</sub> =-5.0V, I <sub>C</sub> =-200μA, R <sub>S</sub> = 10 Ω, f = 1.0kHz |      |     | 8.0  | dB   |