

## SOT-363 Plastic-Encapsulate Transistors

### MMDT5451 DUAL TRANSISTOR (NPN+PNP)

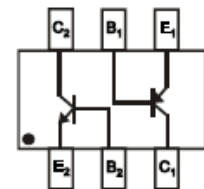
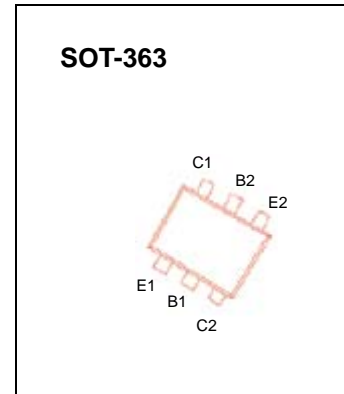
#### FEATURES

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

#### MRKING:KNM

#### MAXIMUM RATINGS NPN 5551 (T<sub>a</sub>=25°C unless otherwise noted)

| Symbol           | Parameter                               | Value   | Units |
|------------------|---|---------|-------|
| V <sub>CB0</sub> | Collector- Base Voltage                 | 180     | V     |
| V <sub>CEO</sub> | Collector-Emitter Voltage               | 160     | V     |
| V <sub>EBO</sub> | Emitter-Base Voltage                    | 6       | 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    |



E1, B1, C1 = PNP 5401  
E2, B2, C2 = NPN 5551

#### ELECTRICAL CHARACTERISTICS NPN 5551 (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   | 180 |     |      | V    |
| Collector-emitter breakdown voltage  | V <sub>(BR)CEO</sub> | I <sub>C</sub> =1mA, I <sub>B</sub> =0   | 160 |     |      | V    |
| Emitter-base breakdown voltage       | V <sub>(BR)EBO</sub> | I <sub>E</sub> =10μA, I <sub>C</sub> =0  | 6   |     |      | V    |
| Collector cut-off current            | I <sub>CBO</sub>     | V <sub>CB</sub> =120V, I <sub>E</sub> =0   |     |     | 0.05 | μA   |
| Emitter cut-off current              | I <sub>EBO</sub>     | V <sub>EB</sub> =4V, I <sub>C</sub> =0   |     |     | 0.05 | μA   |
| DC current gain                      | h <sub>FE1</sub>     | V <sub>CE</sub> =5V, I <sub>C</sub> =1mA   | 80  |     |      |      |
|                                      | 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  | 30  |     |      |      |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> =10mA, I <sub>B</sub> =1mA  |     |     | 0.15 | V    |
|                                      |                      | I <sub>C</sub> =50mA, I <sub>B</sub> =5mA  |     |     | 0.2  | 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> = 1.0kΩ, f = 1.0kHz |     |     | 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,<br>R <sub>S</sub> = 10 Ω, f = 1.0kHz |      |     | 8.0  | dB   |