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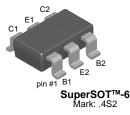


**ON Semiconductor®** 

# FMBM5401 PNP General-Purpose Amplifier

# Description

This device has matched dies in SuperSOT-6.



# **Ordering Information**

| Part Number | Marking | Package | Packing Method |
|-------------|---------|---------|----------------|
| FMBM5401    | 4S2     | SSOT 6L | Tape and Reel  |

### Absolute Maximum Ratings(1),(2)

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^{\circ}$ C unless otherwise noted.

| Symbol                            | Parameter  | Value       | Unit |
|-----------------------------------|--|-------------|------|
| V <sub>CEO</sub>                  | Collector-Emitter Voltage                        | -150        | V    |
| V <sub>CBO</sub>                  | Collector-Base Voltage                           | -160        | V    |
| V <sub>EBO</sub>                  | Emitter-Base Voltage                             | -5.0        | V    |
| Ι <sub>C</sub>                    | Collector Current - Continuous                   | -600        | mA   |
| T <sub>J</sub> , T <sub>STG</sub> | Operating and Storage Junction Temperature Range | -55 to +150 | °C   |

### Notes:

- 1. These ratings are based on a maximum junction temperature of 150°C.
- 2. These are steady-state limits. ON Semiconductor should be consulted on applications involving pulsed or lowduty-cycle operations.

# Thermal Characteristics<sup>(3)</sup>

Values are at  $T_A = 25^{\circ}C$  unless otherwise noted.

| Symbol                | Parameter                                      | Value | Unit |
|-----------------------|--|-------|------|
| PD                    | Total Power Dissipation                        | 700   | mW   |
| $R_{	extsf{	heta}JA}$ | Thermal Resistance, Junction-to-Ambient, Total | 180   | °C/W |

### Note:

3. Device mounted on a 1 in 2 pad of 2 oz copper.

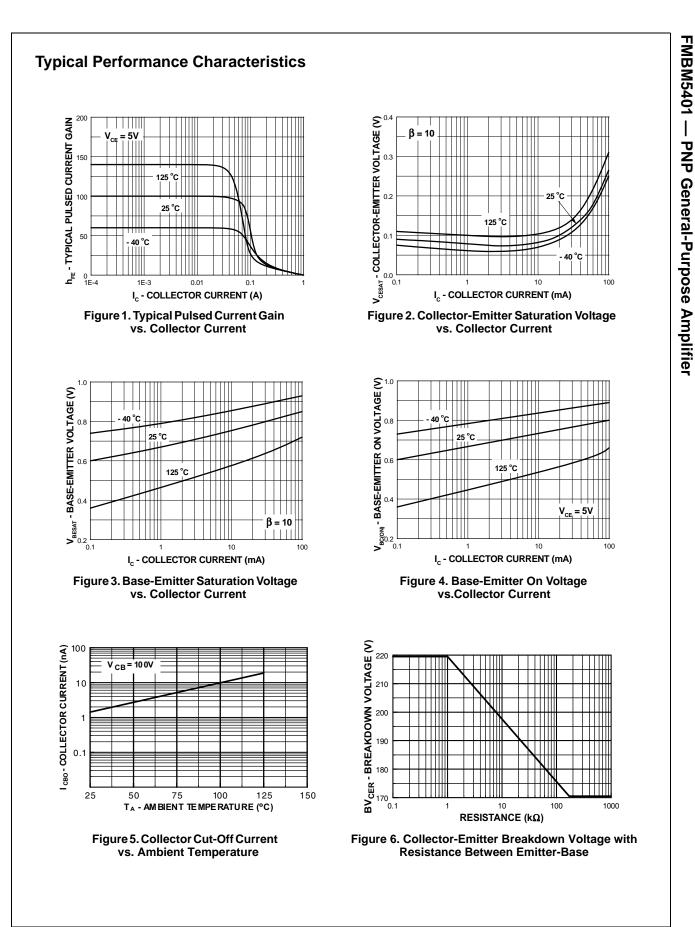
# **Electrical Characteristics**

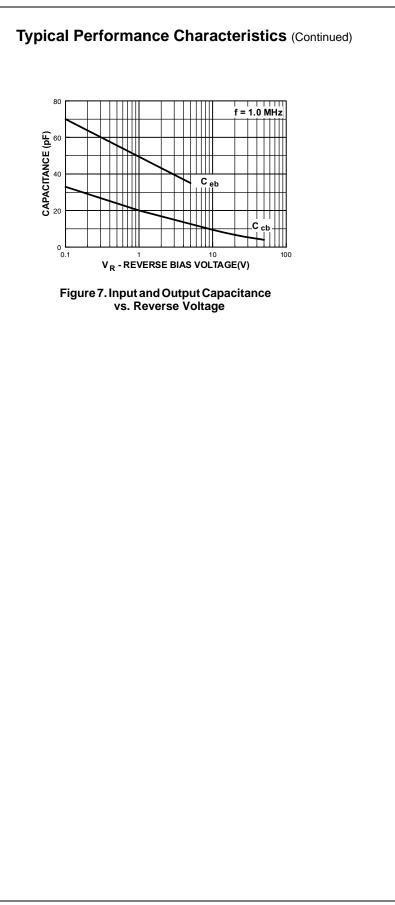
Values are at  $T_A = 25^{\circ}C$  unless otherwise noted.

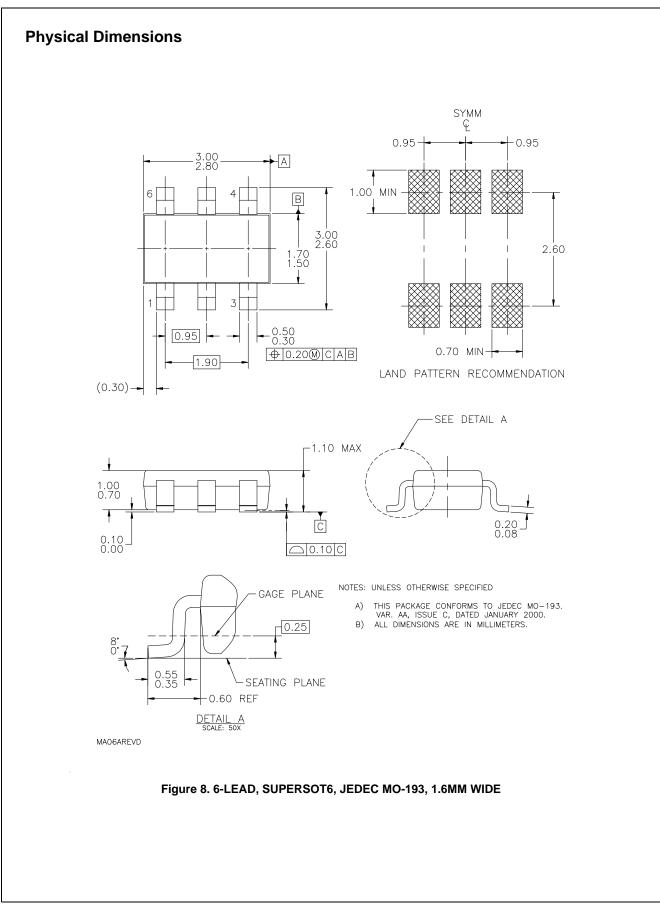
| Symbol                | Parameter  | Conditions  | Min. | Max. | Unit |
|-----------------------|--|---|------|------|------|
| BV <sub>CEO</sub>     | Collector-Emitter Breakdown Voltage <sup>(4)</sup>             | $I_{\rm C} = -1.0 \text{ mA}, I_{\rm B} = 0$  | -150 |      | V    |
| BV <sub>CBO</sub>     | Collector-Base Breakdown Voltage                               | $I_{C} = -100 \ \mu A, \ I_{E} = 0$   | -160 |      | V    |
| $BV_{EBO}$            | Emitter-Base Breakdown Voltage                                 | $I_{E} = -10 \ \mu A, \ I_{C} = 0$  | -5.0 |      | V    |
| I <sub>CBO</sub>      | Collector Cut-Off Current                                      | V <sub>CB</sub> = -120 V, I <sub>E</sub> = 0  |      | -50  | nA   |
|                       |  | $V_{CB} = -120 \text{ V}, \text{ I}_{E} = 0, \text{ T}_{A} = 100^{\circ}\text{C}$                 |      | -50  | μΑ   |
| I <sub>EBO</sub>      | Emitter Cut-Off Current  | $V_{EB} = -3.0 \text{ V}, I_{C} = 0$  |      | -50  | nA   |
| h <sub>FE1</sub>      | DC Current Gain <sup>(4)</sup>                                 | $V_{CE} = -5 \text{ V}, \text{ I}_{C} = -1 \text{ mA}$  | 50   |      |      |
| DIVID1                | Variation Ratio of h <sub>FE1</sub><br>Between Die 1 and Die 2 | h <sub>FE1</sub> (Die1) / h <sub>FE1</sub> (Die2)   | 0.9  | 1.1  |      |
| h <sub>FE2</sub>      | DC Current Gain <sup>(4)</sup>                                 | $V_{CE} = -5 \text{ V}, \text{ I}_{C} = -10 \text{ mA}$   | 60   | 240  |      |
| DIVID2                | Variation Ratio of h <sub>FE2</sub><br>Between Die 1 and Die 2 | h <sub>FE2</sub> (Die1) / h <sub>FE2</sub> (Die2)   | 0.95 | 1.05 |      |
| h <sub>FE3</sub>      | DC Current Gain <sup>(4)</sup>                                 | $V_{CE} = -5 \text{ V}, \text{ I}_{C} = -50 \text{ mA}$   | 50   |      |      |
| DIVID3                | Variation Ratio of h <sub>FE3</sub><br>Between Die 1 and Die 2 | h <sub>FE3</sub> (Die1) / h <sub>FE3</sub> (Die2)   | 0.9  | 1.1  |      |
| V <sub>CE</sub> (sat) | Collector-Emitter Saturation Voltage <sup>(4)</sup>            | I <sub>C</sub> = -10 mA, I <sub>B</sub> = -1 mA   |      | -0.2 | V    |
|                       |  | I <sub>C</sub> = -50 mA, I <sub>B</sub> = -5 mA   |      | -0.5 |      |
| V <sub>BE</sub> (sat) | Base-Emitter Saturation Voltage <sup>(4)</sup>                 | I <sub>C</sub> = -10 mA, I <sub>B</sub> = -1 mA   |      | -1   | V    |
|                       | Base-Emilier Saluration Voltage                                | I <sub>C</sub> = -50 mA, I <sub>B</sub> = -5 mA   |      | -1   |      |
| V <sub>BE</sub> (on)  | Base-Emitter On Voltage <sup>(4)</sup>                         | $V_{CE} = -5 \text{ V}, \text{ I}_{C} = -10 \text{ mA}$   |      | -1   | V    |
| DEL                   | Difference of V <sub>BE</sub> (on)<br>Between Die1 and Die 2   | V <sub>BE</sub> (on)(Die1) - V <sub>BE</sub> (on)(Die2)   | -8   | 8    | mV   |
| f <sub>T</sub>        | Current Gain Bandwidth Product                                 | $V_{CE} = -10 \text{ V}, \text{ I}_{C} = -10 \text{ mA},$<br>f = 100 MHz                          | 100  | 300  | MHz  |
| C <sub>ob</sub>       | Output Capacitance   | V <sub>CB</sub> = -10 V, I <sub>E</sub> = 0, f = 1 MHz  |      | 6.0  | pF   |
| NF                    | Noise Figure   | $V_{CE}$ = -5.0 V, I <sub>C</sub> = -250 μA,<br>R <sub>S</sub> = 1.0 kΩ,<br>f = 10 Hz to 15.7 kHz |      | 8.0  | dB   |

### Note:

4. Pulse test: Pulse width  $\leq$  300 ms, duty cycle  $\leq$  2%







FMBM5401 — PNP General-Purpose Amplifier

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