

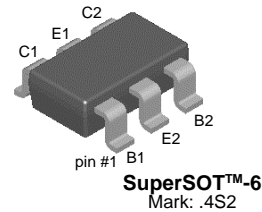


ON Semiconductor®

# 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<sup>(1),(2)</sup>

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  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{CEO}$	Collector-Emitter Voltage	-150	V
$V_{CBO}$	Collector-Base Voltage	-160	V
$V_{EBO}$	Emitter-Base Voltage	-5.0	V
$I_C$	Collector Current - Continuous	-600	mA
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

### Notes:

1. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
2. These are steady-state limits. ON Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

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

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

Symbol	Parameter	Value	Unit
$P_D$	Total Power Dissipation	700	mW
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient, Total	180	$^\circ\text{C}/\text{W}$

### Note:

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

## Electrical Characteristics

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

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

**Note:**

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

## Typical Performance Characteristics

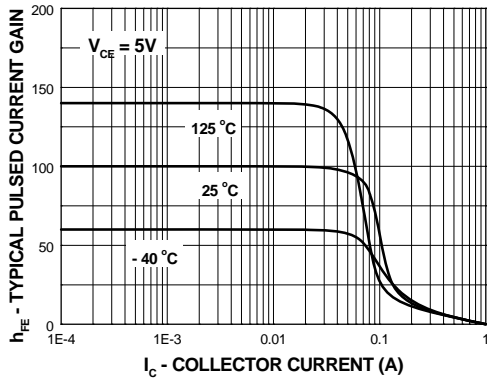


Figure 1. Typical Pulsed Current Gain vs. Collector Current

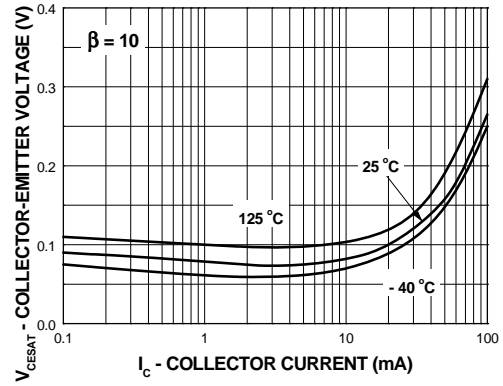


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

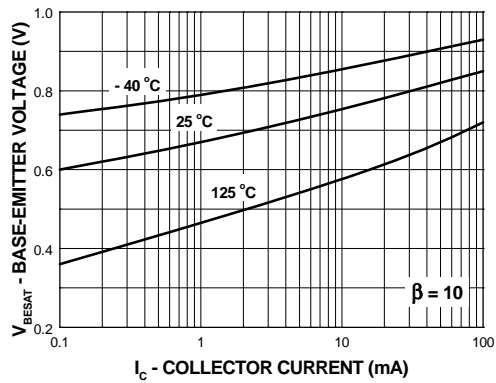


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

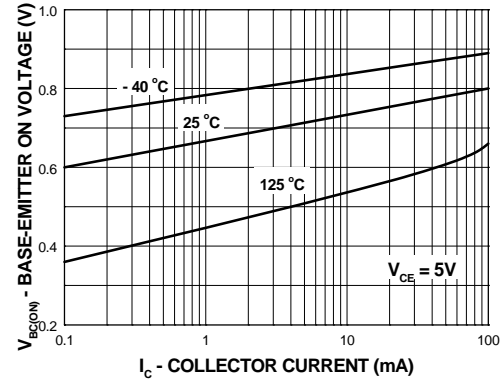


Figure 4. Base-Emitter On Voltage vs. Collector Current

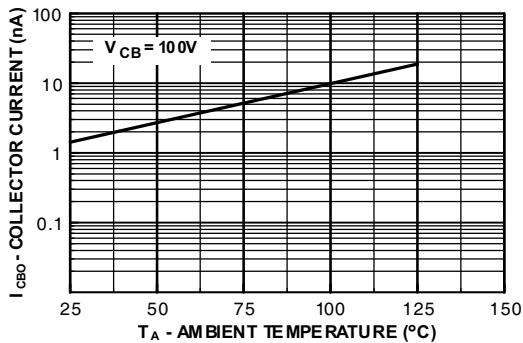


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

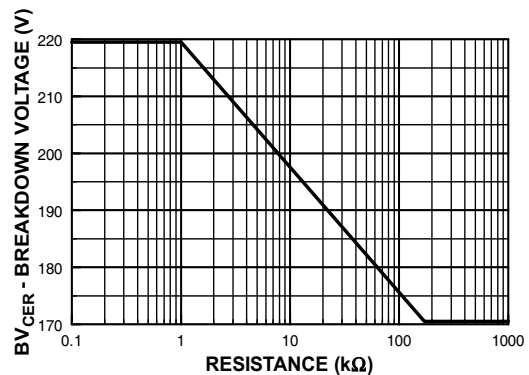


Figure 6. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

Typical Performance Characteristics (Continued)

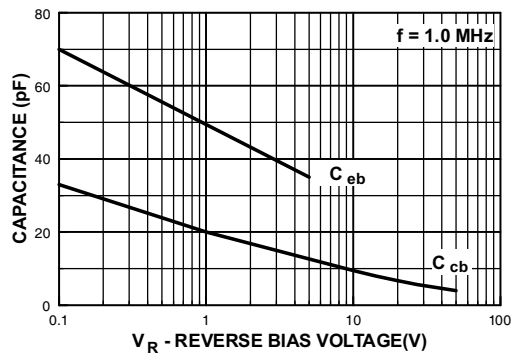
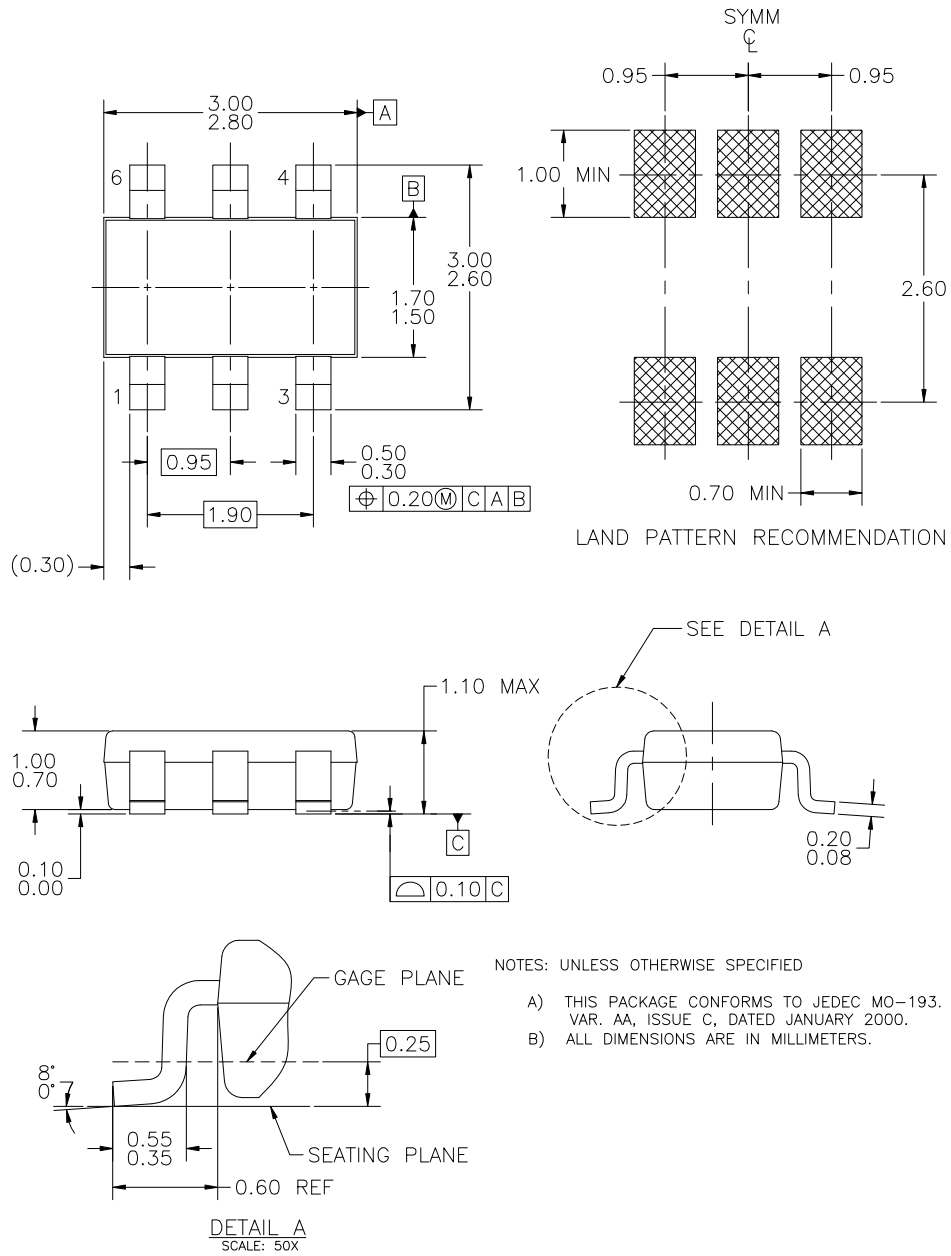



Figure 7. Input and Output Capacitance vs. Reverse Voltage

**Physical Dimensions**



**Figure 8. 6-LEAD, SUPERSOT6, JEDEC MO-193, 1.6MM WIDE**

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