PNP General-Purpose Amplifier

FMBM5401



TSOT23 6-Lead
CASE 419AG

Description

This device has matched dies in SUPERSOT™-6.

ABSOLUTE MAXIMUM RATINGS

(T_A = 25 °C unless otherwise noted.) (Notes 1, 2)

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	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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

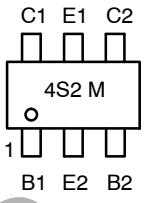
THERMAL CHARACTERISTICS

(T_A = 25 °C unless otherwise noted.) (Note 3)

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

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

MARKING DIAGRAM



4S2 = Specific Device Code
M = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
FMBM5401	TSOT23 6-Lead (Pb-Free, Halide Free)	3,000 / Tape & Reel

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted.)

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

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

4. Pulse test: Pulse width ≤ 300 μs, duty cycle ≤ 2%

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TYPICAL PERFORMANCE CHARACTERISTICS

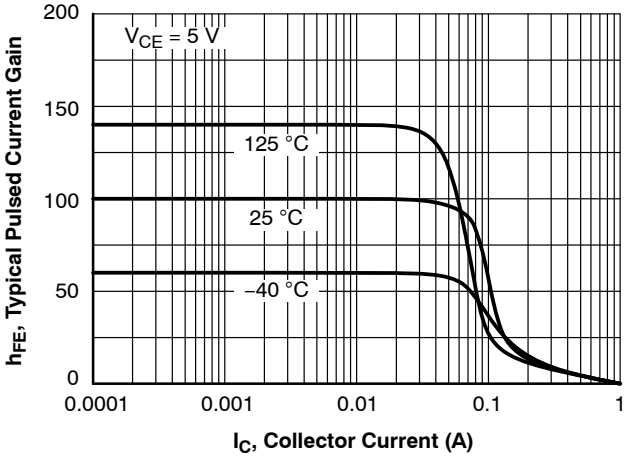


Figure 1. Typical Pulsed Current Gain vs. Collector Current

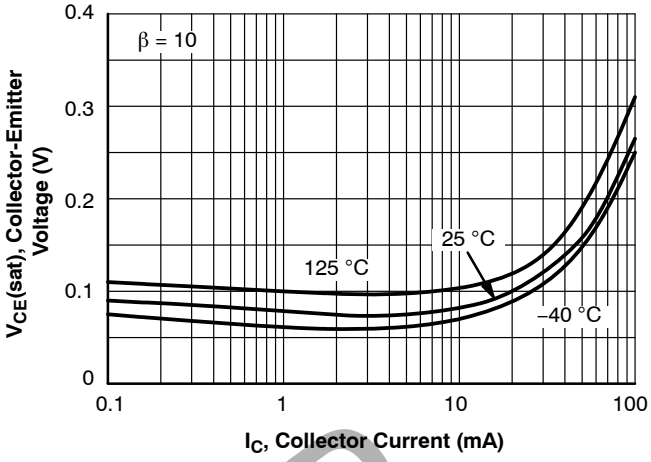


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

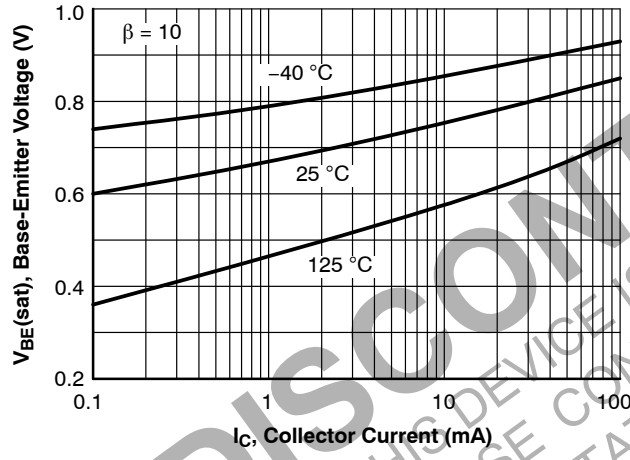


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

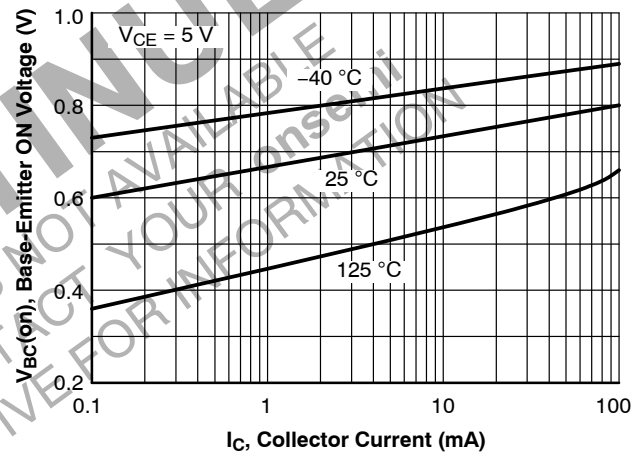


Figure 4. Base-Emitter On Voltage vs. Collector Current

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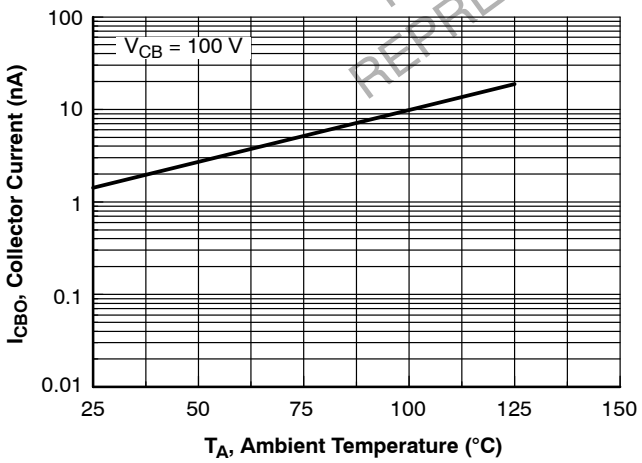


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

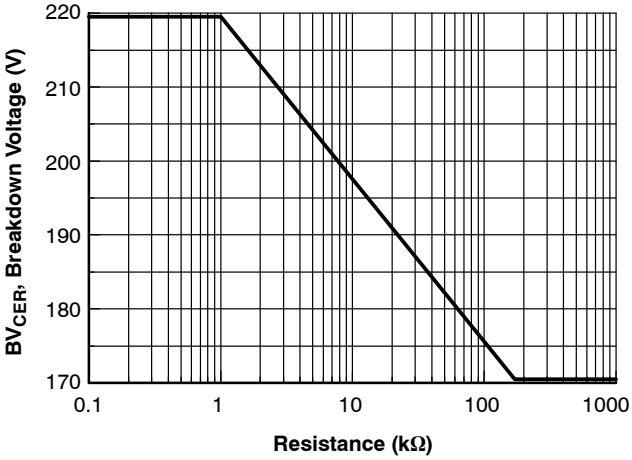


Figure 6. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

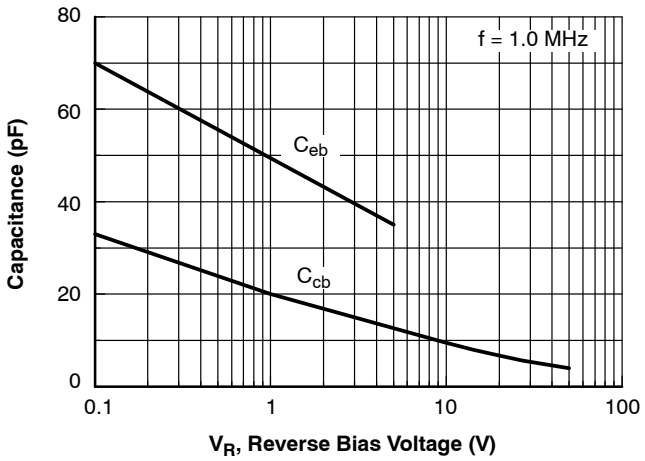


Figure 7. Input and Output Capacitance vs. Reverse Voltage

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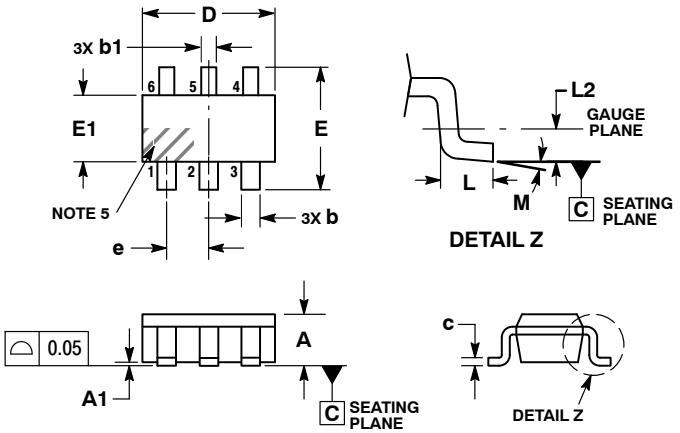
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SCALE 2:1

TSOT23 6−Lead
CASE 419AG−01
ISSUE O

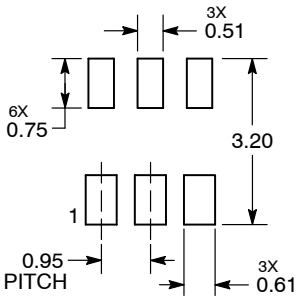
DATE 01 FEB 2010



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.15 PER SIDE. DIMENSIONS D AND E1 ARE DETERMINED AT DATUM H.
5. PIN ONE INDICATOR MUST BE LOCATED IN THE INDICATED ZONE.

	MILLIMETERS		
DIM	**MIN**	**NOM**	**MAX**
A	0.75	0.82	0.90
A1	−−−	−−−	0.10
b	0.40	0.45	0.50
b1	0.30	0.35	0.40
c	0.08	0.14	0.20
D	2.80	2.90	3.00
E	2.60	2.80	3.00
E1	1.50	1.60	1.70
e		0.95 BSC	
L	0.30	0.45	0.60
L2		0.25 BSC	
M	0°	–	8°

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

GENERIC MARKING DIAGRAMS*



IC

XXX = Specific Device Code
A = Assembly Location
Y = Year
W = Work Week
▪ = Pb−Free Package

STANDARD

XXX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present.

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