

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.

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

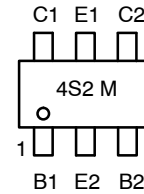
THERMAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
P _D	Total Power Dissipation	700	mW
R _{θJA}	Thermal Resistance, Junction to Ambient, Total	180	°C/W

- Device mounted on a 1 in² 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.

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted.)

Symbol	Parameter	Test Conditions	Min	Max	Unit
BV_{CEO}	Collector-Emitter Breakdown Voltage (Note 4)	$I_C = -1.0\text{ mA}$, $I_B = 0$	-150	-	V
BV_{CBO}	Collector-Base Breakdown Voltage	$I_C = -100\text{ }\mu\text{A}$, $I_E = 0$	-160	-	V
BV_{EBO}	Emitter-Base Breakdown Voltage	$I_E = -10\text{ }\mu\text{A}$, $I_C = 0$	-5.0	-	V
I_{CBO}	Collector Cut-Off Current	$V_{CB} = -120\text{ V}$, $I_E = 0$	-	-50	nA
		$V_{CB} = -120\text{ V}$, $I_E = 0$, $T_A = 100\text{ }^{\circ}\text{C}$	-	-50	μA
I_{EBO}	Emitter Cut-Off Current	$V_{EB} = -3.0\text{ V}$, $I_C = 0$	-	-50	nA
h_{FE1}	DC Current Gain (Note 4)	$V_{CE} = -5\text{ V}$, $I_C = -1\text{ mA}$	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 (Note 4)	$V_{CE} = -5\text{ V}$, $I_C = -10\text{ mA}$	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 (Note 4)	$V_{CE} = -5\text{ V}$, $I_C = -50\text{ mA}$	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 (Note 4)	$I_C = -10\text{ mA}$, $I_B = -1\text{ mA}$	-	-0.2	V
		$I_C = -50\text{ mA}$, $I_B = -5\text{ mA}$	-	-0.5	
$V_{BE}(\text{sat})$	Base-Emitter Saturation Voltage (Note 4)	$I_C = -10\text{ mA}$, $I_B = -1\text{ mA}$	-	-1	V
		$I_C = -50\text{ mA}$, $I_B = -5\text{ mA}$	-	-1	
$V_{BE}(\text{on})$	Base-Emitter On Voltage (Note 4)	$V_{CE} = -5\text{ V}$, $I_C = -10\text{ mA}$	-	-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	$V_{CE} = -5.0\text{ V}$, $I_C = -250\text{ }\mu\text{A}$, $R_S = 1.0\text{ k}\Omega$, $f = 10\text{ Hz to }15.7\text{ kHz}$	-	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 $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

TYPICAL PERFORMANCE CHARACTERISTICS

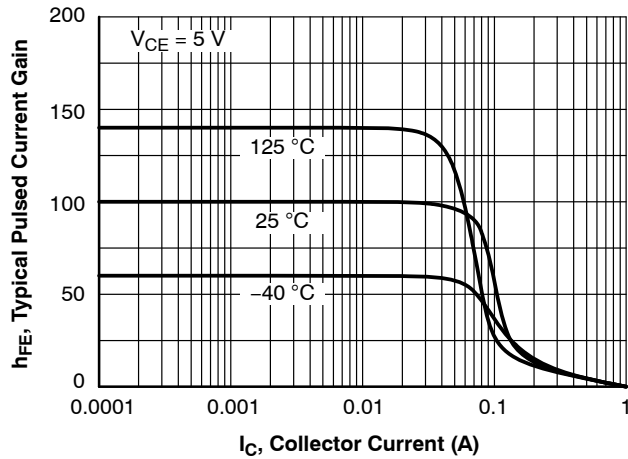


Figure 1. Typical Pulsed Current Gain vs. Collector Current

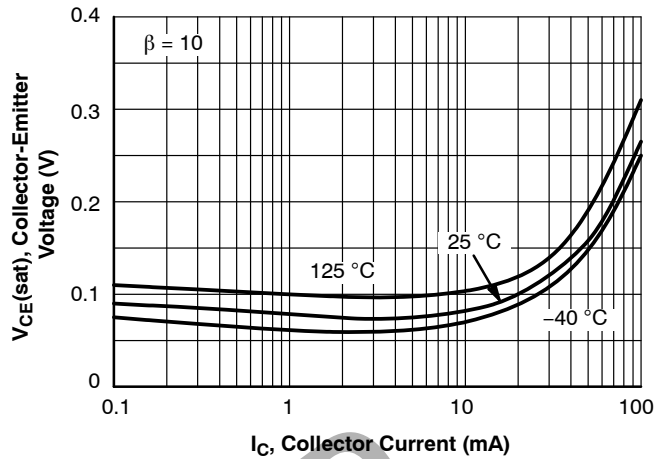


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

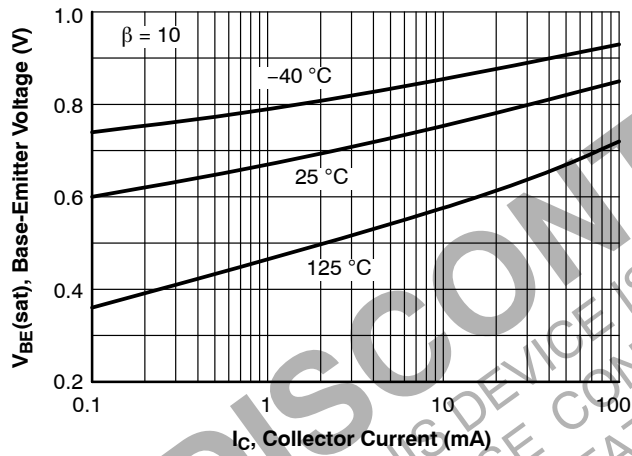


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

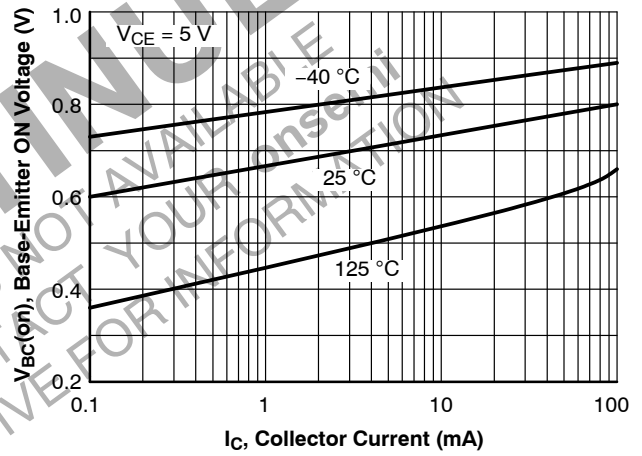


Figure 4. Base-Emitter On Voltage vs. Collector Current

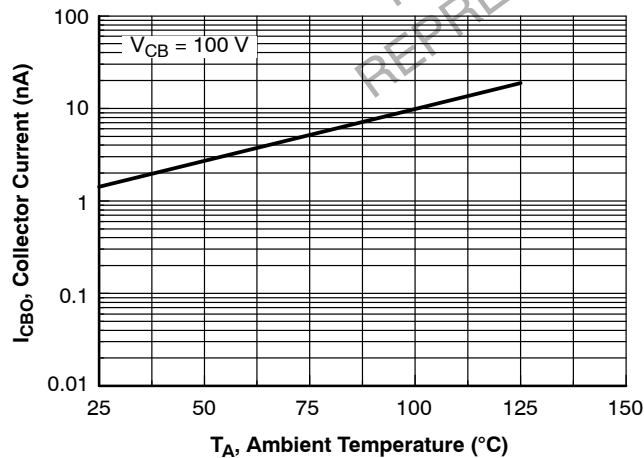


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

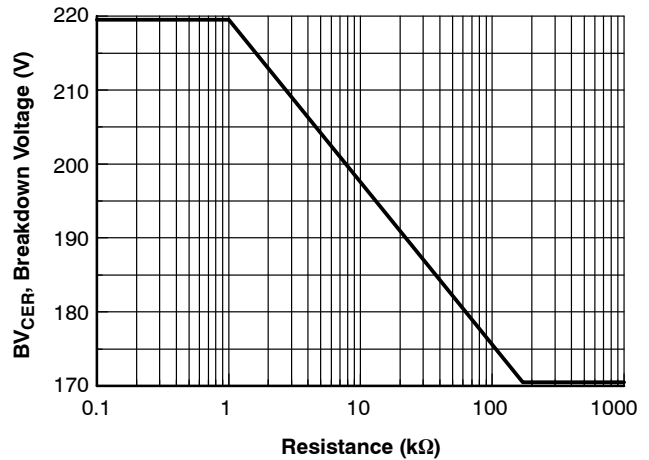


Figure 6. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

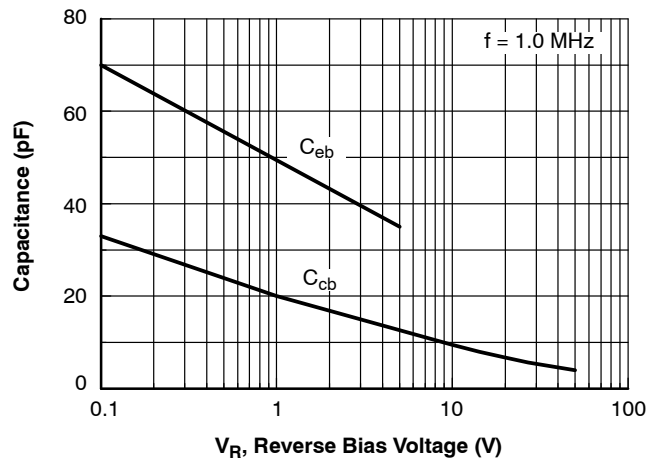
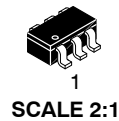
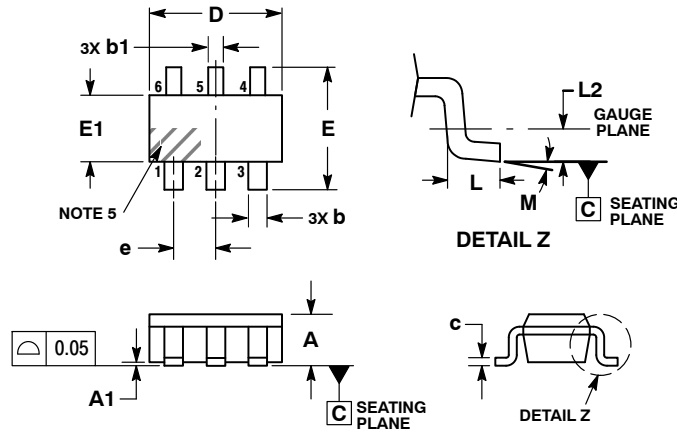


Figure 7. Input and Output Capacitance vs. Reverse Voltage

DISCONTINUED
THIS DEVICE IS NOT AVAILABLE
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION


TSOT23 6-Lead
CASE 419AG-01
ISSUE O

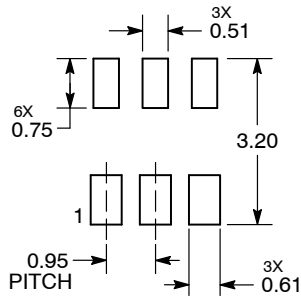
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NOTES:

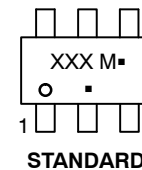
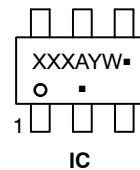
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, 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***


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

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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