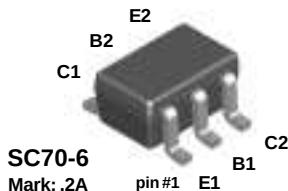


FFB3906

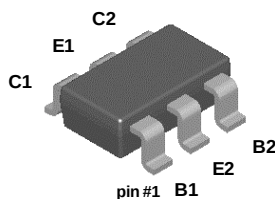


SC70-6

Mark: .2A

NOTE: The pinouts are symmetrical; pin 1 and pin 4 are interchangeable. Units inside the carrier can be of either orientation and will not affect the functionality of the device.

FMB3906

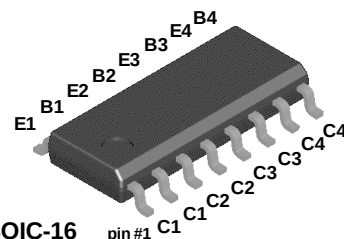


SuperSOT™-6

Mark: .2A

Dot denotes pin #1

MMPQ3906



SOIC-16

Mark: MMPQ3906

PNP Multi-Chip General Purpose Amplifier

This device is designed for general purpose amplifier and switching applications at collector currents of 10 μ A to 100 mA. Sourced from Process 66.

Absolute Maximum Ratings*

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

Symbol	Parameter	Value	Units
V_{CEO}	Collector-Emitter Voltage	40	V
V_{CBO}	Collector-Base Voltage	40	V
V_{EBO}	Emitter-Base Voltage	5.0	V
I_C	Collector Current - Continuous	200	mA
T_J, T_{stg}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
- 3) All voltages (V) and currents (A) are negative polarity for PNP transistors.

Thermal Characteristics

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

Symbol	Characteristic	Max			Units
		FFB3906	FMB3906	MMPQ3906	
P_D	Total Device Dissipation	300	700	1,000	mW
	Derate above 25°C	2.4	5.6	8.0	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	415	180		$^\circ\text{C/W}$
	Effective 4 Die Each Die			125 240	$^\circ\text{C/W}$ $^\circ\text{C/W}$

PNP Multi-Chip General Purpose Amplifier

(continued)

Electrical Characteristics

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 1.0\text{ mA}, I_B = 0$	40			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\text{ }\mu\text{A}, I_E = 0$	40			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\text{ }\mu\text{A}, I_C = 0$	5.0			V
I_{BL}	Base Cutoff Current	$V_{CE} = 30\text{ V}, V_{BE} = 3.0\text{ V}$			50	nA
I_{CEX}	Collector Cutoff Current	$V_{CE} = 30\text{ V}, V_{BE} = 3.0\text{ V}$			50	nA

ON CHARACTERISTICS

h_{FE}	DC Current Gain *	$I_C = 0.1\text{ mA}, V_{CE} = 1.0\text{ V}$ MMPQ3906 $I_C = 1.0\text{ mA}, V_{CE} = 1.0\text{ V}$ MMPQ3906 $I_C = 10\text{ mA}, V_{CE} = 1.0\text{ V}$ MMPQ3906 $I_C = 50\text{ mA}, V_{CE} = 1.0\text{ V}$ $I_C = 100\text{ mA}, V_{CE} = 1.0\text{ V}$	60 40 80 60 100 75 60 30		300	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10\text{ mA}, I_B = 1.0\text{ mA}$ $I_C = 50\text{ mA}, I_B = 5.0\text{ mA}$			0.25 0.4	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10\text{ mA}, I_B = 1.0\text{ mA}$ $I_C = 50\text{ mA}, I_B = 5.0\text{ mA}$	0.65		0.85 0.95	V V

SMALL SIGNAL CHARACTERISTICS (MMPQ3906 only)

f_T	Current Gain - Bandwidth Product	$I_C = 10\text{ mA}, V_{CE} = 20\text{ V}, f = 100\text{ MHz}$		200		MHz
C_{obo}	Output Capacitance	$V_{CB} = 5.0\text{ V}, I_E = 0, f = 140\text{ kHz}$		4.5		pF
C_{ibo}	Input Capacitance	$V_{EB} = 0.5\text{ V}, I_C = 0, f = 140\text{ kHz}$		10		pF

*Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$

NOTE: All voltages (V) and currents (A) are negative polarity for PNP transistors.

Spice Model

PNP (Is=1.41f Xti=3 Eg=1.11 Vaf=18.7 Bf=180.7 Ne=1.5 Ise=0 Ikf=80m Xtb=1.5 Br=4.977 Nc=2 Isc=0 Ikr=0 Rc=2.5 Cjc=9.728p Mjc=.5776 Vjc=.75 Fc=.5 Cje=8.063p Mje=.3677 Vje=.75 Tr=33.42n Tf=179.3p Itf=.4 Vtf=4 Xtf=6 Rb=10)

FFB3906 / FMB3906 / MMPQ3906

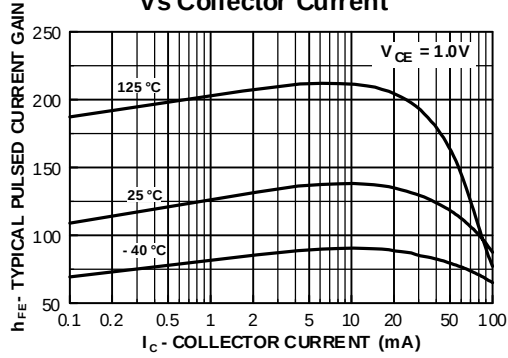
PNP Multi-Chip General Purpose Amplifier

(continued)

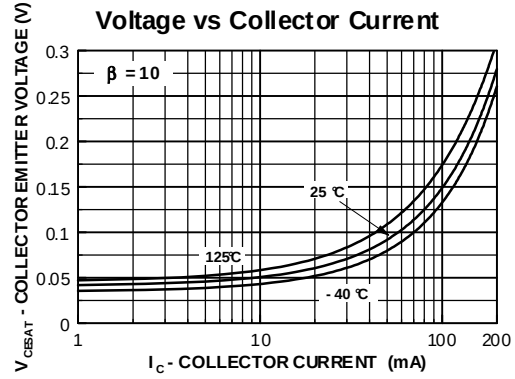
FFB3906 / FMB3906 / MMPQ3906

Typical Characteristics

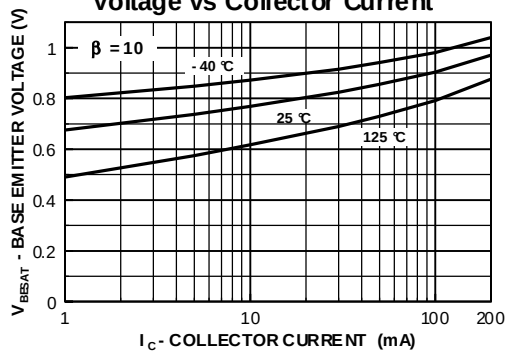
Typical Pulsed Current Gain
vs Collector Current



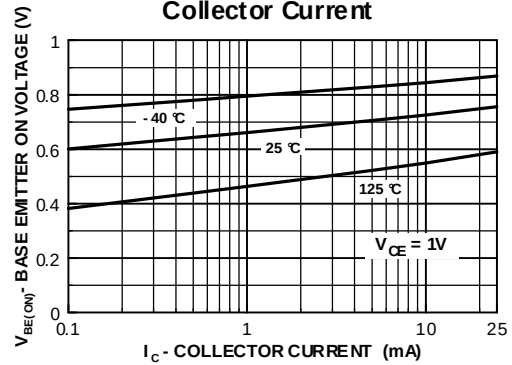
Collector-Emitter Saturation
Voltage vs Collector Current



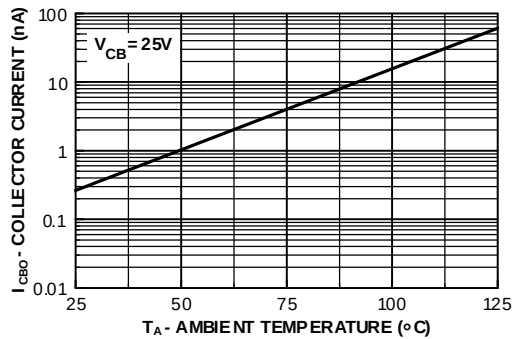
Base-Emitter Saturation
Voltage vs Collector Current



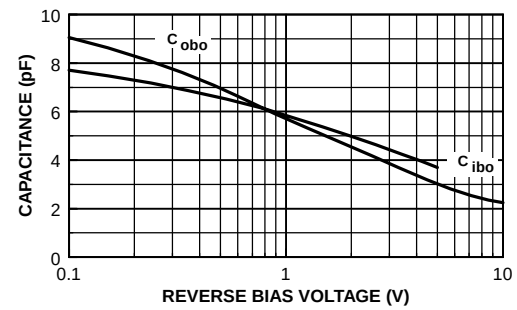
Base Emitter ON Voltage vs
Collector Current



Collector-Cutoff Current
vs Ambient Temperature



Common-Base Open Circuit
Input and Output Capacitance
vs Reverse Bias Voltage

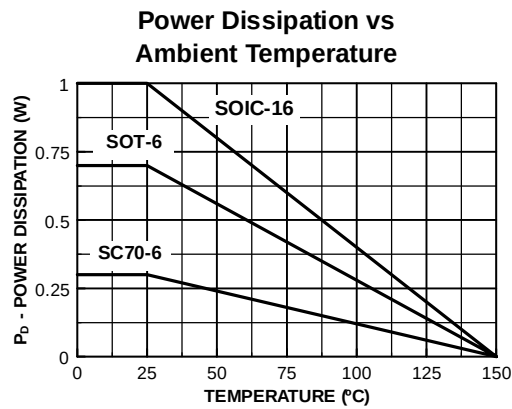
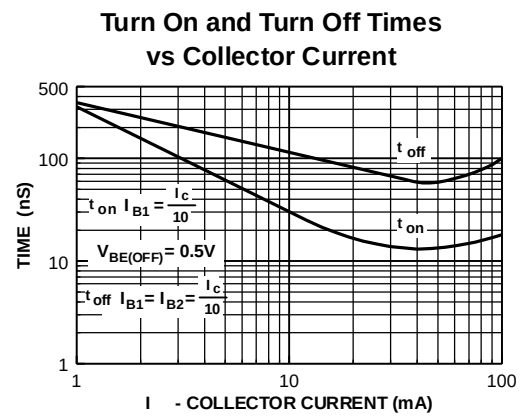
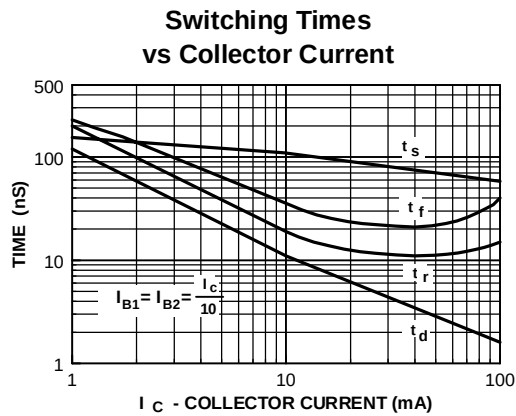
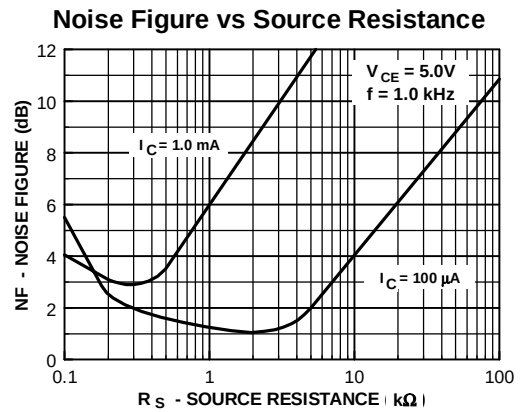
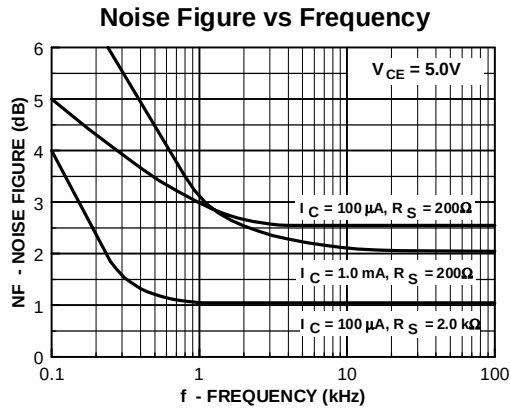


PNP Multi-Chip General Purpose Amplifier

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FFB3906 / FMB3906 / MMPQ3906

Typical Characteristics (continued)

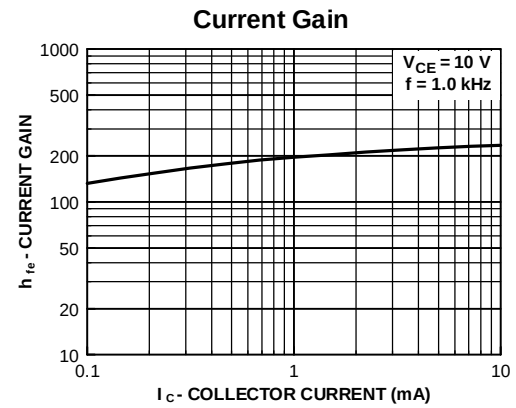
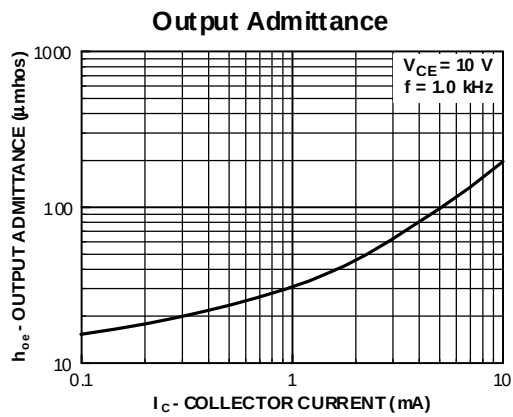
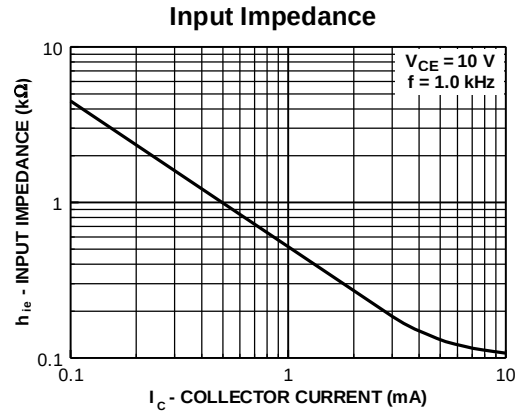
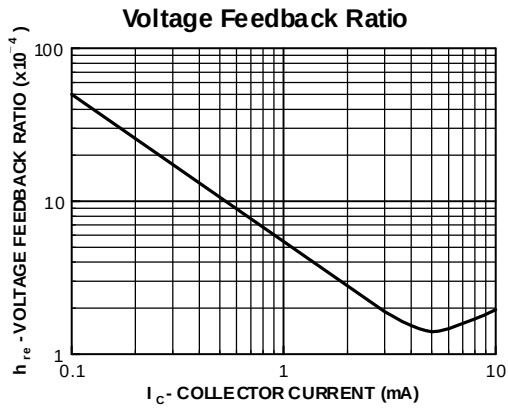


PNP Multi-Chip General Purpose Amplifier

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FFB3906 / FMB3906 / MMPQ3906

Typical Characteristics (continued)



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