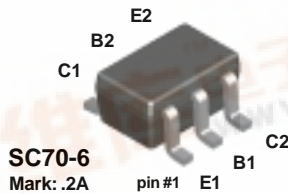




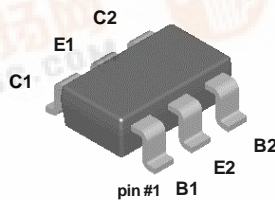
FFB3906



SC70-6
Mark: .2A

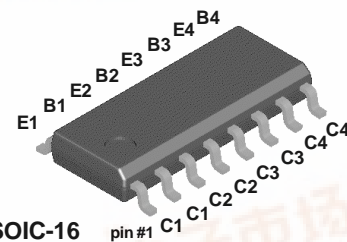
NOTE: The pinouts are symmetrical; pin 1 and pin 4 are interchangeable. Units inside the carrier can be of either orientation and will not affect the functionality of the device.

FMB3906



SuperSOT™-6
Mark: .2A

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.

Thermal Characteristics

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

Symbol	Characteristic	Max			Units
		FFB3904	FMB3904	MMPQ3904	
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 Effective 4 Die Each Die	415	180	125	$^\circ\text{C}/\text{W}$
				240	$^\circ\text{C}/\text{W}$
					$^\circ\text{C}/\text{W}$

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
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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 *	$I_C = 0.1\text{ mA}, V_{CE} = 1.0\text{ V}$ $I_C = 1.0\text{ mA}, V_{CE} = 1.0\text{ V}$ $I_C = 10\text{ mA}, V_{CE} = 1.0\text{ V}$ $I_C = 50\text{ mA}, V_{CE} = 1.0\text{ V}$ $I_C = 100\text{ mA}, V_{CE} = 1.0\text{ V}$	60 80 100 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

f_T	Current Gain - Bandwidth Product	$I_C = 10\text{ mA}, V_{CE} = 20\text{ V},$ $f = 100\text{ MHz}$		450		MHz
C_{obo}	Output Capacitance	$V_{CB} = 5.0\text{ V}, I_E = 0,$ $f = 100\text{ kHz}$		3.0		pF
C_{ibo}	Input Capacitance	$V_{EB} = 0.5\text{ V}, I_C = 0,$ $f = 100\text{ kHz}$		8.0		pF
NF	Noise Figure (except MMPQ3906)	$I_C = 100\text{ }\mu\text{A}, V_{CE} = 5.0\text{ V},$ $R_S = 1.0\text{ k}\Omega, f = 10\text{ Hz to }15.7\text{ kHz}$		2.5		dB

SWITCHING CHARACTERISTICS

t_d	Delay Time	$V_{CC} = 3.0\text{ V}, V_{BE} = 0.5\text{ V},$		15		ns
t_r	Rise Time	$I_C = 10\text{ mA}, I_{B1} = 1.0\text{ mA}$		20		ns
t_s	Storage Time	$V_{CC} = 3.0\text{ V}, I_C = 10\text{ mA}$		110		ns
t_f	Fall Time	$I_{B1} = I_{B2} = 1.0\text{ mA}$		40		ns

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

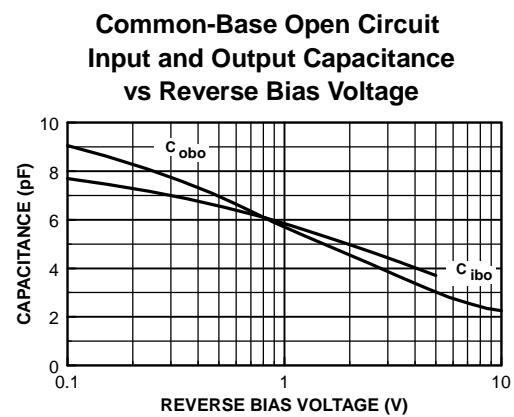
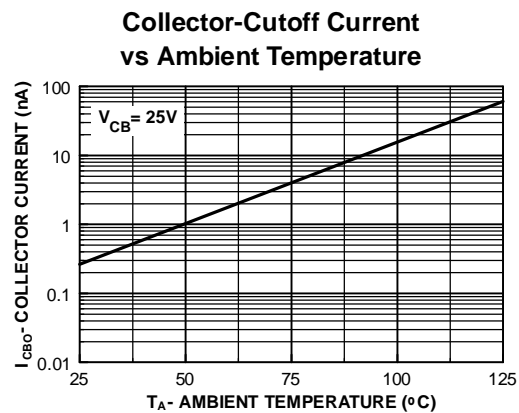
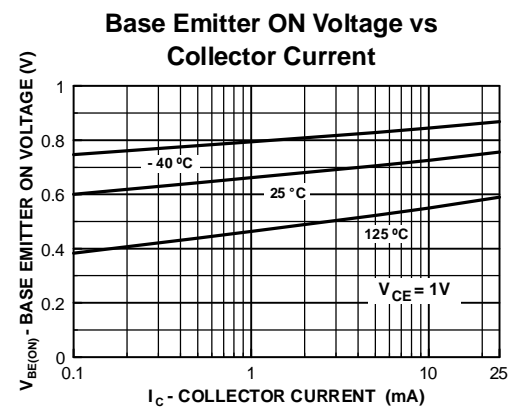
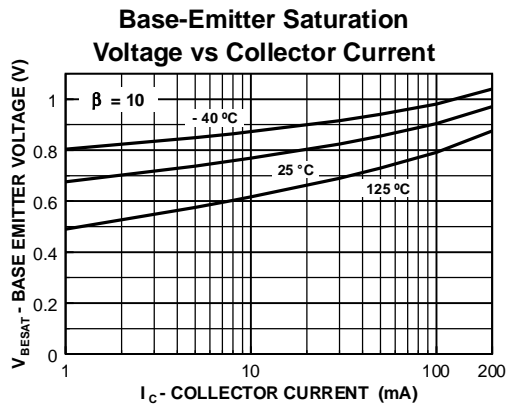
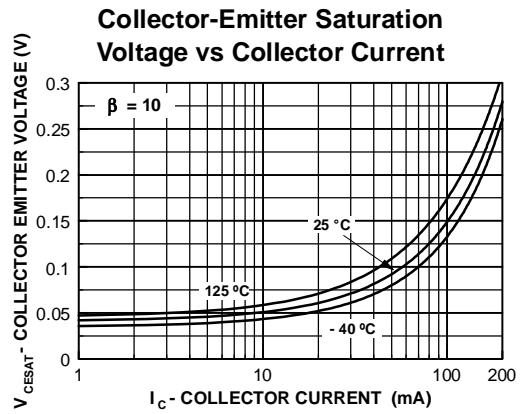
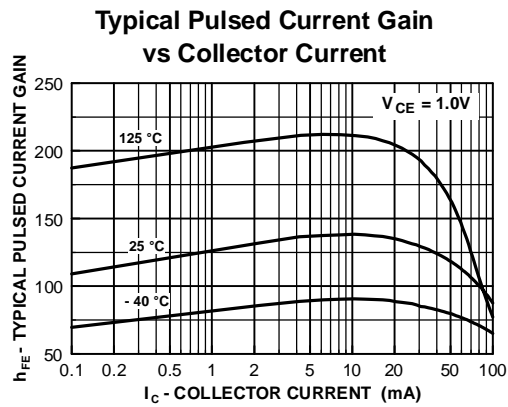
PNP (Is=1.41f Xti=3 Eg=1.11 Vaf=18.7 Bf=180.7 Ne=1.5 Ise=0 Ikf=80m Xtb=1.5 Br=4.977 Nc=2 Isc=0 Ikr=0 Rc=2.5 Cjc=9.728p Mjc=.5776 Vjc=.75 Fc=.5 Cje=8.063p Mje=.3677 Vje=.75 Tr=33.42n Tf=179.3p Itf=.4 Vtf=4 Xtf=6 Rb=10)

PNP Multi-Chip General Purpose Amplifier

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FFB3906 / FMB3906 / MMPQ3906

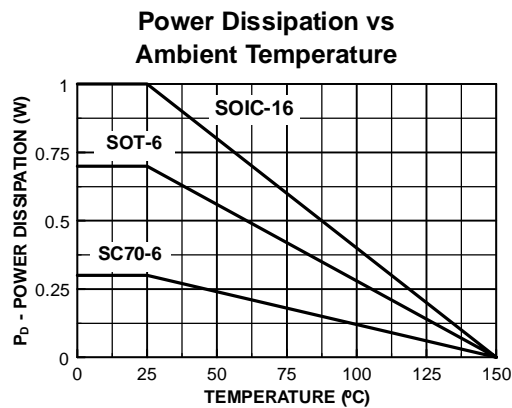
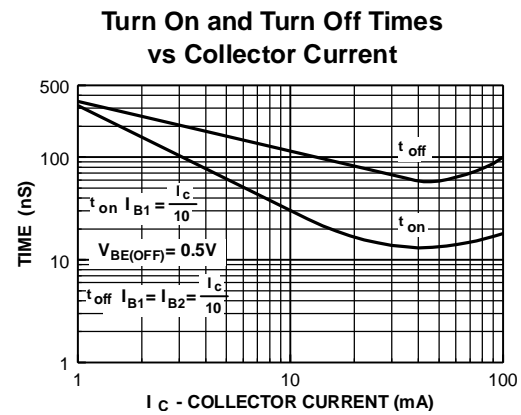
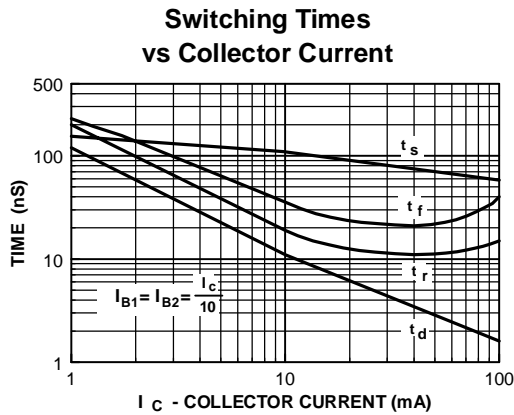
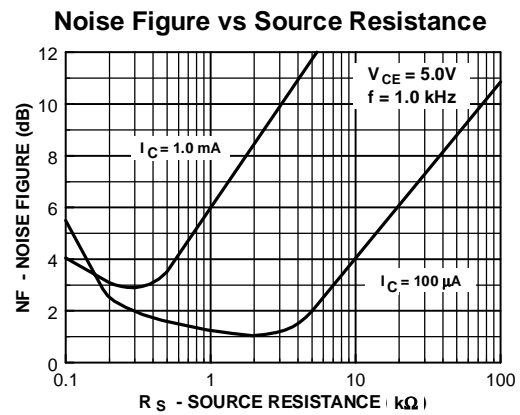
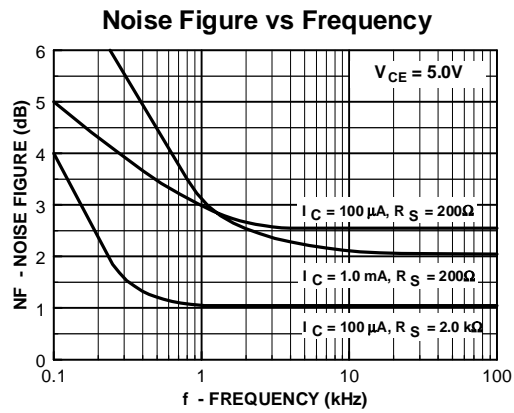
Typical Characteristics



PNP Multi-Chip General Purpose Amplifier

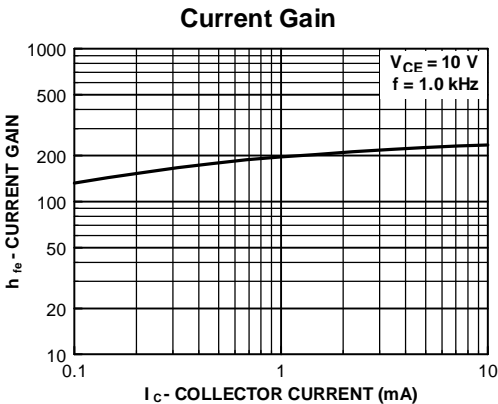
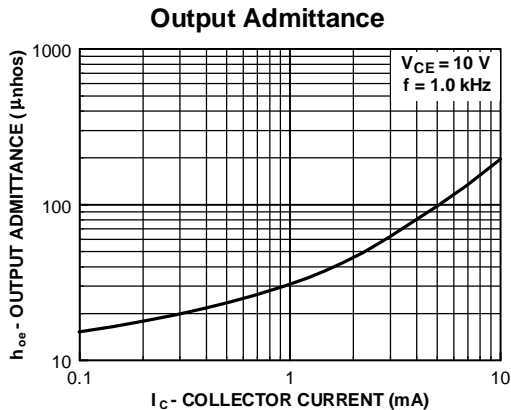
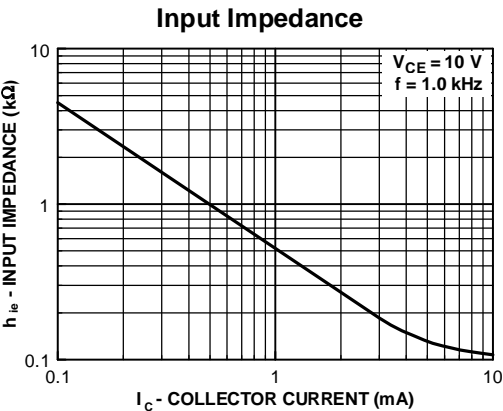
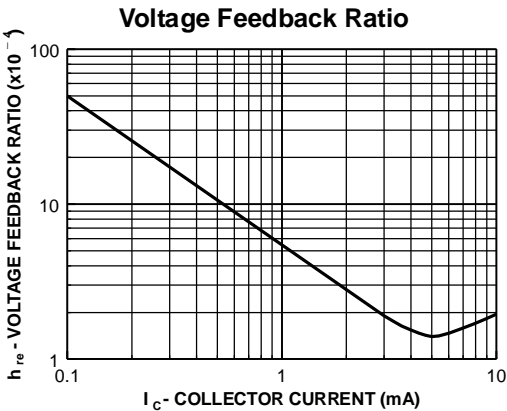
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Typical Characteristics (continued)



PNP Multi-Chip General Purpose Amplifier
(continued)

Typical Characteristics (continued)



FFB3906 / FMB3906 / MMPQ3906

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FACT Quiet Series™	Quiet Series™	
FAST®	SuperSOT™-3	
FASTr™	SuperSOT™-6	
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