



**THE DATASHEET OF  
FMMT3904TA**



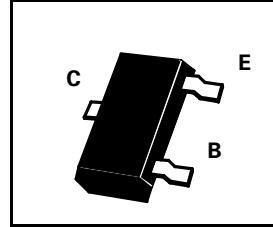
**SOT23 NPN SILICON PLANAR  
SWITCHING TRANSISTORS**

ISSUE 2 – SEPTEMBER 94

**FMMT3903  
FMMT3904**

COMPLIMENTARY TYPES – FMMT3903 - FMMT3905  
FMMT3904 - FMMT3906

PARTMARKING DETAIL – FMMT3903 - 1W  
FMMT3904 - 1A



**ABSOLUTE MAXIMUM RATINGS.**

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	60	V
CollectorEmitter Voltage	$V_{CEO}$	40	V
EmitterBase Voltage	$V_{EBO}$	6	V
Continuous Collector Current	$I_C$	200	mA
Power Dissipation at $T_{amb}=25^{\circ}C$	$P_{tot}$	330	mW
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^{\circ}C$

**ELECTRICAL CHARACTERISTICS (at  $T_{amb} = 25^{\circ}C$  unless otherwise stated).**

PARAMETER	SYMBOL	FMMT3903		FMMT3904		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Collector Base Breakdown Voltage	$V_{(BR)CBO}$	60		60		V	$I_C=10\mu A, I_E=0$
CollectorEmitter Breakdown Voltage	$V_{(BR)CEO}$	40		40		V	$I_C=1mA, I_B=0^*$
EmitterBase Breakdown Voltage	$V_{(BR)EBO}$	6		6		V	$I_E=10\mu A, I_C=0$
CollectorEmitter CutOff Current	$I_{CEX}$		50		50	nA	$V_{CE}=30V, V_{BE(off)}=3V$
Base CutOff Current	$I_{BEX}$		50		50	nA	$V_{CE}=30V, V_{EB(off)}=3V$
Static Forward Current Transfer Ratio	$h_{FE}$	20 35 50 30 15	150	40 70 100 60 30	300		$I_C=0.1mA, V_{CE}=1V^*$ $I_C=1mA, V_{CE}=1V^*$ $I_C=10mA, V_{CE}=1V^*$ $I_C=50mA, V_{CE}=1V^*$ $I_C=100mA, V_{CE}=1V^*$
CollectorEmitter Saturation Voltage	$V_{CE(sat)}$		0.2 0.3		0.2 0.3	V	$I_C=10mA, I_B=1mA^*$ $I_C=50mA, I_B=5mA^*$
BaseEmitter Saturation Voltage	$V_{BE(sat)}$	0.65	0.85 0.95	0.65	0.85 0.95	V	$I_C=10mA, I_B=1mA^*$ $I_C=50mA, I_B=5mA^*$
Transition Frequency	$f_T$	250		300		MHz	$I_C=10mA, V_{CE}=20V$ $f=100MHz$
Output Capacitance	$C_{obo}$		4		4	pF	$V_{CB}=5V, I_E=0, f=100KHz$
Input Capacitance	$C_{ibo}$		8		8	pF	$V_{BE}=0.5V, I_C=0, f=100KHz$



# FMMT3903 FMMT3904

## SWITCHING CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	FMMT3903		FMMT3904		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Noise Figure	N		6		5	dB	$V_{CE}=5\text{V}$ , $I_C=200\mu\text{A}$ , $R_g=2\text{K}\Omega$ $f=30\text{Hz}$ to $15\text{KHz}$ at -3dB points
Delay Time	$t_d$		35		35	ns	$V_{CC}=3\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=1\text{mA}$ $V_{BE(off)}=0.5\text{V}$ (See Figure1)
Rise Time	$t_r$		35		35	ns	
Storage Time	$t_s$		175		200	ns	$V_{CC}=3\text{V}$ , $I_C=10\text{mA}$ $I_{B1}=I_{B2}=1\text{mA}$ (See Figure2)
Fall Time	$t_f$		50		50	ns	

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$



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