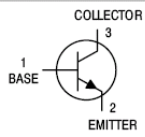
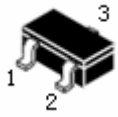
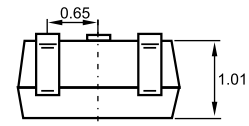
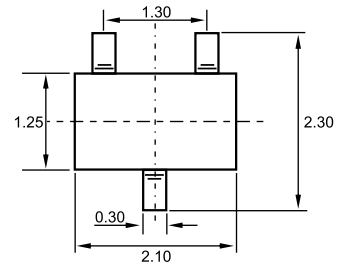


# MMST3904

NPN Silicon Epitaxial Planar Transistor



## SOT-323



Dimensions in inches and (millimeters)

## Features

- Power dissipation.( $P_C=0.2W$ )

## Applications

- Audio frequency general purpose amplifier.

## Ordering Information

Type No.	Marking	Package Code
MMST3904	K2N	SOT-323

MAXIMUM RATING @  $T_a=25^{\circ}C$  unless otherwise specified

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	60	V
$V_{CEO}$	Collector-Emitter Voltage	40	V
$V_{EBO}$	Emitter-Base Voltage	5	V
$I_C$	Collector Current -Continuous	200	mA
$P_C$	Collector Dissipation	200	mW
$T_j, T_{stg}$	Junction and Storage Temperature	-55~150	$^{\circ}C$

# MMST3904

NPN Silicon Epitaxial Planar Transistor

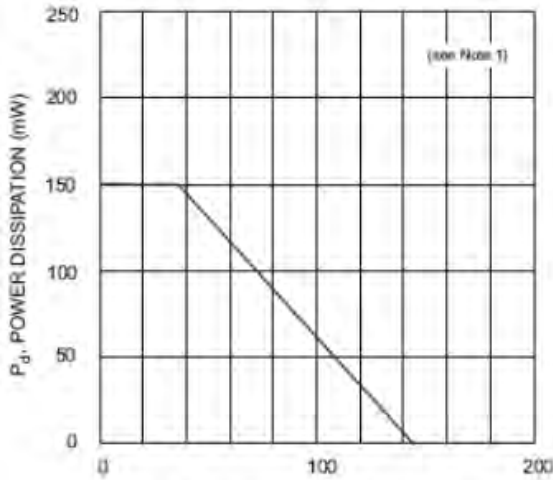


## ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

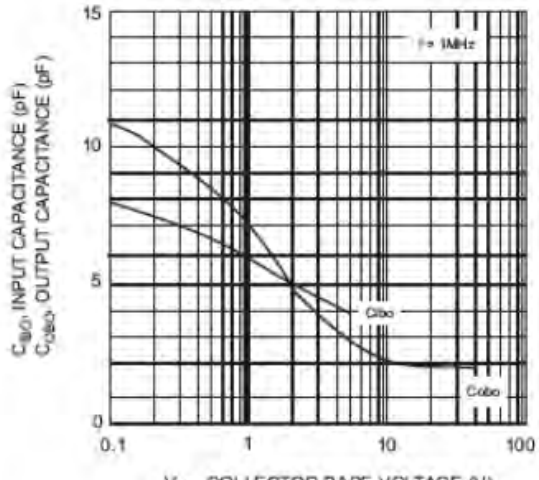
Parameter	Symbol	Test conditions	MIN	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	60		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1mA, I_B=0$	40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0$	5		V
Collector cut-off current	$I_{CBO}$	$V_{CB}=60V, I_E=0$		0.05	$\mu A$
Collector cut-off current	$I_{CEO}$	$V_{CE}=40V, I_B=0$		0.5	$\mu A$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=5V, I_C=0$		0.05	$\mu A$
DC current gain	$h_{FE}$	$V_{CE}=1V, I_C=0.1mA$	40	300	
		$V_{CE}=1V, I_C=1mA$	70		
		$V_{CE}=1V, I_C=10mA$	100		
		$V_{CE}=1V, I_C=50mA$	60		
		$V_{CE}=1V, I_C=100mA$	30		
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=10mA, I_B=1mA$ $I_C=50mA, I_B=5mA$		0.25 0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=10mA, I_B=1mA$ $I_C=50mA, I_B=5mA$	0.65	0.85 0.95	V
Transition frequency	$f_T$	$V_{CE}=20V, I_E=10mA$ $f=100MHz$	300		MHz
Collector output capacitance	$C_{ob}$	$V_{CB}=5V, I_E=0, f=1MHz$		4	pF
Noise figure	NF	$V_{CE}=5V, I_C=0.1mA,$ $f=1KHz, R_g=1K\Omega$		5	dB
Delay time	$t_d$	$V_{CC}=3V, V_{BE}=0.5V,$ $I_C=10mA, I_B=1mA$		35	nS
Rise time	$t_r$			35	nS
Storage time	$t_s$	$V_{CC}=3V, I_C=10mA,$ $I_{B1}=I_{B2}=1mA$		200	nS
Fall time	$t_f$			50	nS



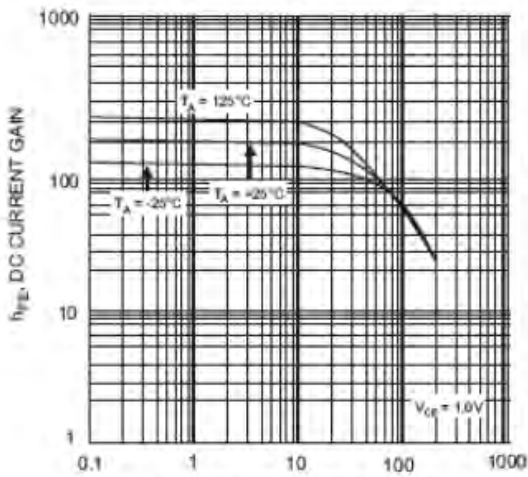
TYPICAL CHARACTERISTICS @  $T_a=25^\circ\text{C}$  unless otherwise specified



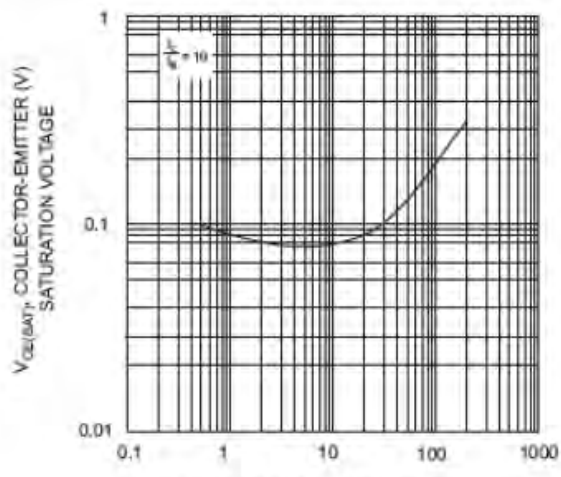
$T_a$ , AMBIENT TEMPERATURE ( $^\circ\text{C}$ )  
Fig. 1, Power Derating Curve



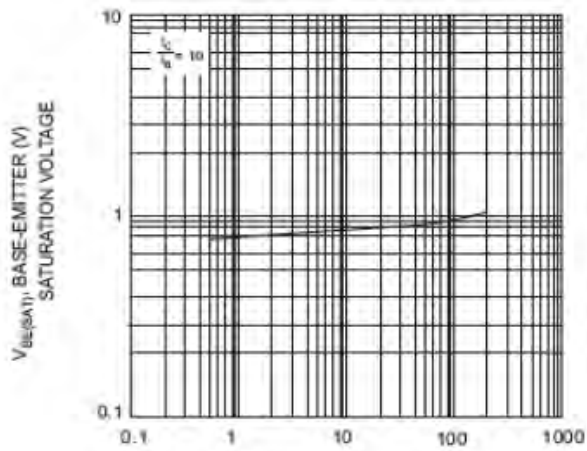
$V_{CB}$ , COLLECTOR-BASE VOLTAGE (V)  
Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage



$I_C$ , COLLECTOR CURRENT (mA)  
Fig. 3, Typical DC Current Gain vs. Collector Current



$I_C$ , COLLECTOR CURRENT (mA)  
Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current



$I_C$ , COLLECTOR CURRENT (mA)  
Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current

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