

NPN Silicon Epitaxial Planar Transistor

MMST3904

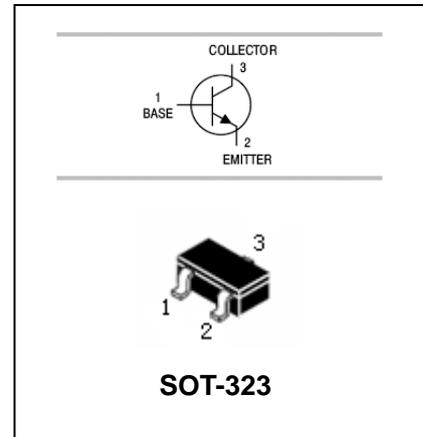
FEATURES

- Power dissipation.($P_C=0.2W$)
- Complements the MMST3906.



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 to +150	$^{\circ}C$

NPN Silicon Epitaxial Planar Transistor

MMST3904

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}	$V_{CB}=40V, I_E=0$		50	nA
Collector cut-off current	I_{CES}	$V_{CE}=30V, I_B=0$		50	nA
Emitter cut-off current	I_{EBO}	$V_{EB}=3V, I_C=0$		50	nA
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	$V_{CE(sat)}$	$I_C=10mA, I_B=1mA$ $I_C=50mA, I_B=5mA$		0.2 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}	$V_{CB}=10V, f=100kHz$		4	pF
Emitter input capacitance	C_{ib}	$V_{EB}=0.5V, f=100kHz$		8	pF
Noise figure	NF	$V_{CE}=5V, I_C=0.1mA,$ $f=1KHz, R_g=1K\Omega$		5	dB
Delay time	t_d	$V_{CC}=3V, V_{BE(OFF)}=0.5V,$ $I_C=10mA, I_{B1}=1mA$		35	nS
Rise time	t_r			35	nS
Storage time	t_s			200	nS
Fall time	t_f	$I_{B1}=-I_{B2}=1mA$		50	nS

NPN Silicon Epitaxial Planar Transistor

MMST3904

TYPICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

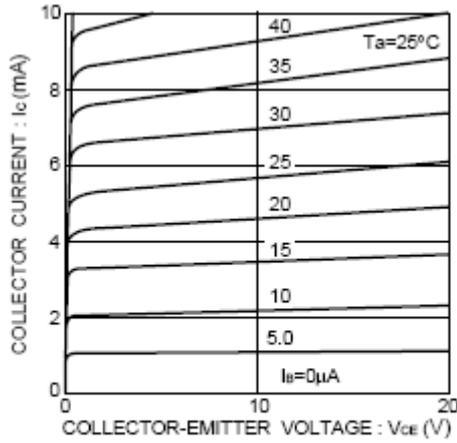


Fig.1 Grounded emitter output characteristics

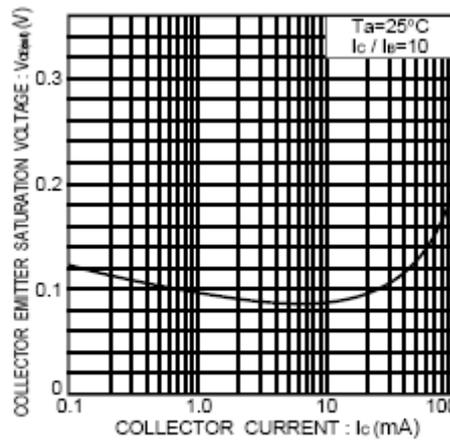


Fig.2 Collector-emitter saturation voltage vs. collector current

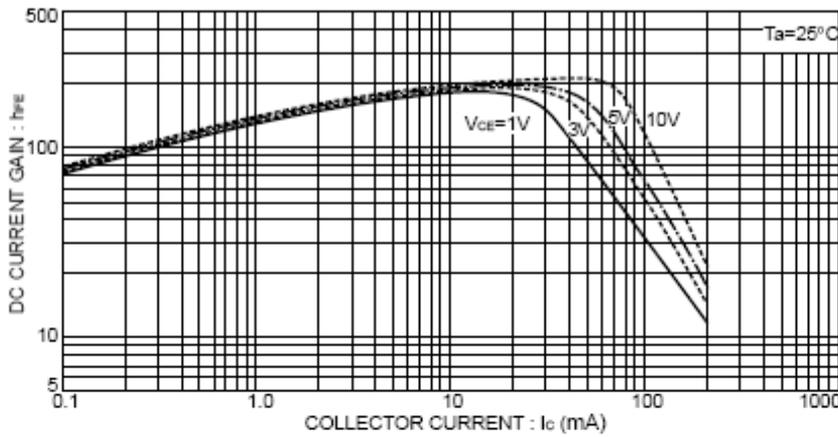


Fig.3 DC current gain vs. collector current (I)

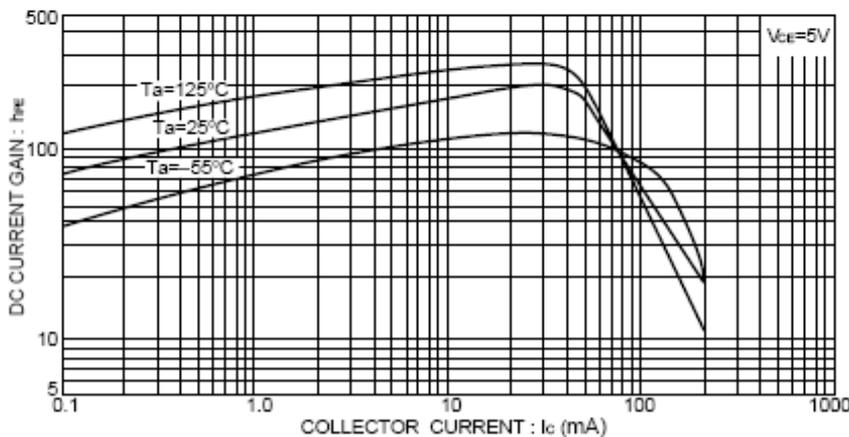


Fig.4 DC current gain vs. collector current (II)

NPN Silicon Epitaxial Planar Transistor

MMST3904

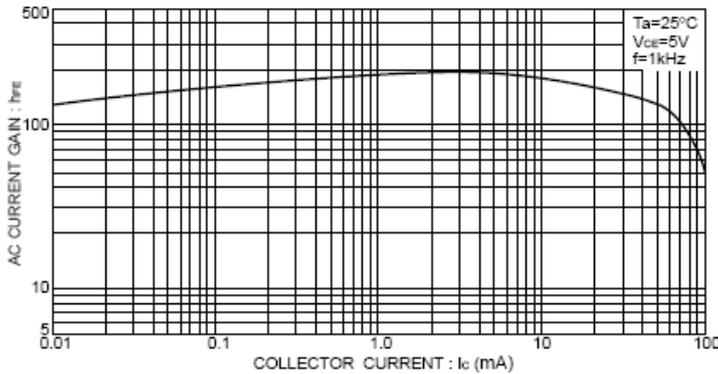


Fig.5 AC current gain vs. collector current

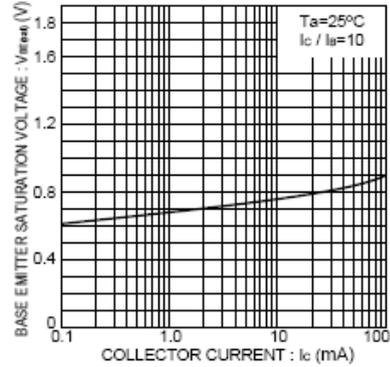


Fig.6 Base-emitter saturation voltage vs. collector current

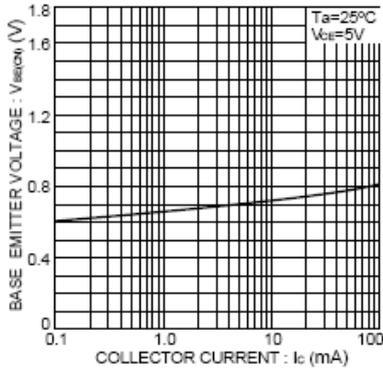


Fig.7 Grounded emitter propagation characteristics

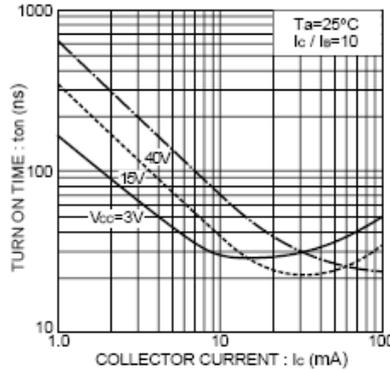


Fig.8 Turn-on time vs. collector current

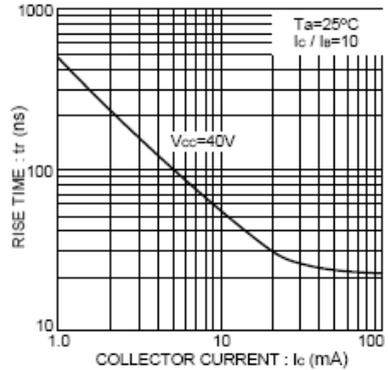


Fig.9 Rise time vs. collector current

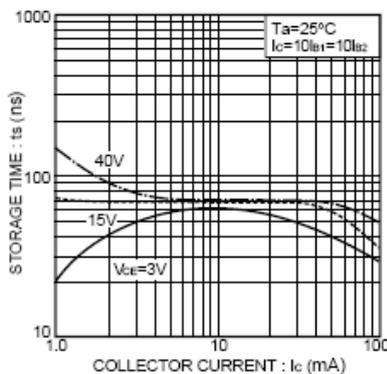


Fig.10 Storage time vs. collector current

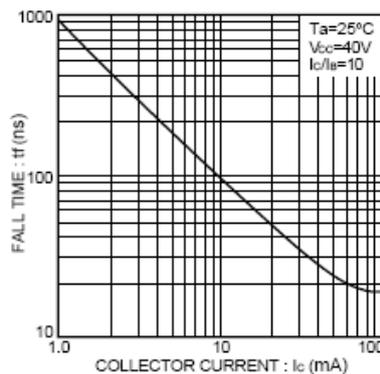


Fig.11 Fall time vs. collector current

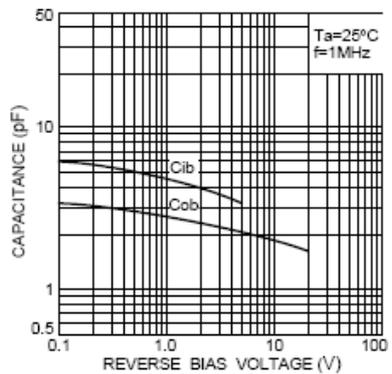


Fig.12 Input/output capacitance vs. voltage

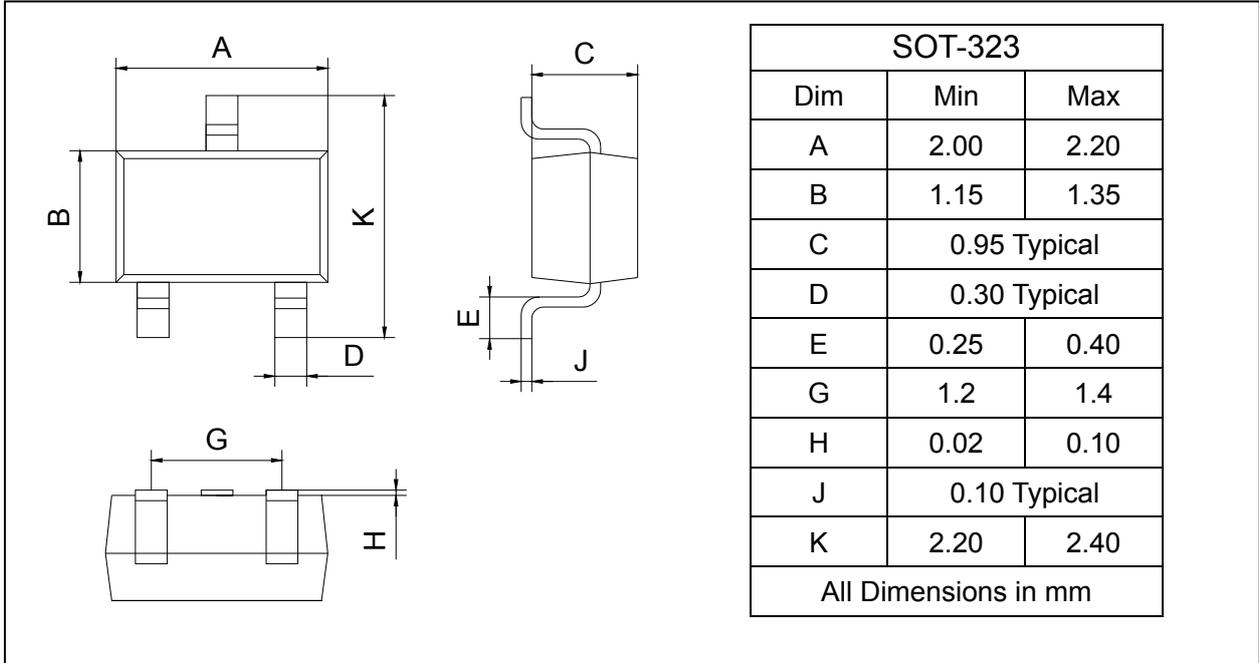
NPN Silicon Epitaxial Planar Transistor

MMST3904

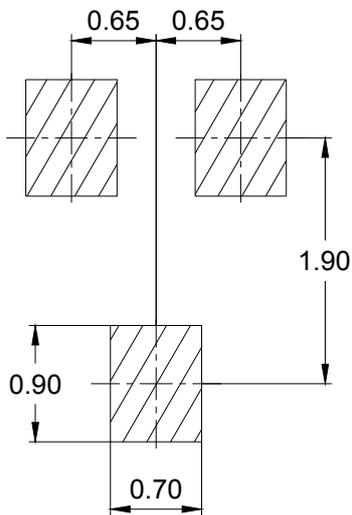
PACKAGE OUTLINE

Plastic surface mounted package

SOT-323



SOLDERING FOOTPRINT



Unit : mm

PACKAGE INFORMATION

Device	Package	Shipping
MMST3904	SOT-323	3000/Tape&Reel