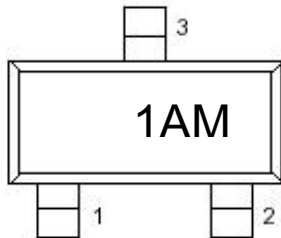


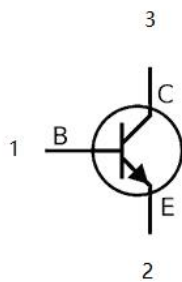
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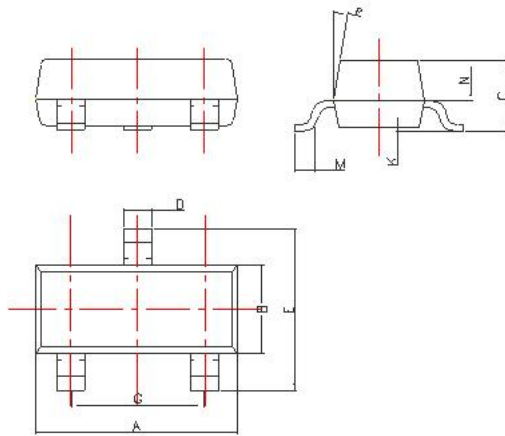
Marking: 1AM



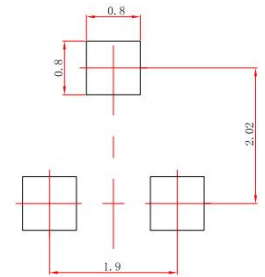
Top view



SOT-23 Dimension



DIM	Millimeters
A	2.85~3.04
B	1.30±0.10
C	1.00±0.10
D	0.45±0.05
E	2.25~2.55
G	1.90±0.1
K	0.00~0.10
M	0.20 min
N	0.60±0.10
P	7±2°

SOT-23
Suggested Layout

mm (± 0.05mm)

MAXIMUM RATINGS (Ta=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	V_{CEO}	40	Vdc
Collector-Base Voltage	V_{CBO}	60	Vdc
Emitter-Base Voltage	V_{EBO}	5	Vdc
Collector Current - Continuous	I_C	200	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (1) (Ta=25°C)	P_D	225	mW
Derate above 25°C		1.8	mW/°C
Thermal Resistance Junction to Ambient	R_{JA}	556	°C/W
Total Device Dissipation Alumina Substrate, (2) Ta=25°C	P_D	300	mW
Derate above 25°C		2.4	mW/°C
Thermal Resistance Junction to Ambient	R_{JA}	417	°C/W
Junction and Storage Temperature	$T_J,$ T_{stg}	150, -55~150	°C

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ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min	Type	Max	Unit
Collector Cutoff Current	I_{CEX}	$V_{CE}=30V_{dc}$, $V_{EB}=3.0V_{dc}$	--	--	50	nAdc
Base Cutoff Current	I_{BEX}	$V_{CE}=30V_{dc}$, $V_{EB}=3.0V_{dc}$	--	--	50	nAdc
Collector-Emitter Breakdown Voltage (3)	$V_{(BR)CEO}$	$I_C=1.0mA_{dc}$, $I_B=0$	40	--	--	Vdc
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=10\mu A_{dc}$, $I_E=0$	60	--	--	Vdc
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=10\mu A_{dc}$, $I_C=0$	5	--	--	Vdc
DC Current Gain	h_{FE}	$I_C=0.1mA_{dc}$, $V_{CE}=1.0V_{dc}$	40	--	--	--
		$I_C=1.0mA_{dc}$, $V_{CE}=1.0V_{dc}$	70	--	--	
		$I_C=10mA_{dc}$, $V_{CE}=1.0V_{dc}$	100	--	300	
		$I_C=50mA_{dc}$, $V_{CE}=1.0V_{dc}$	60	--	--	
		$I_C=100mA_{dc}$, $V_{CE}=1.0V_{dc}$	30	--	--	
Collector-Emitter Saturation Voltage (3)	$V_{CE(sat)}$	$I_C=10mA_{dc}$, $I_B=1.0mA_{dc}$	--	--	0.2	Vdc
		$I_C=50mA_{dc}$, $I_B=5.0mA_{dc}$	--	--	0.3	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=10mA_{dc}$, $I_B=1.0mA_{dc}$	0.65	--	0.85	Vdc
		$I_C=50mA_{dc}$, $I_B=5.0mA_{dc}$	--	--	0.95	
Current-Gain-Bandwidth Product	f_T	$I_C=10mA_{dc}$, $V_{CE}=20V_{dc}$, $f=100MHz$	300	--	--	MHz
Output Capacitance	C_{obo}	$V_{CB}=5.0V_{dc}$, $I_E=0$, $f=1.0MHz$	--	--	4.0	pF
Input Capacitance	C_{ibo}	$V_{EB}=0.5V_{dc}$, $I_C=0$, $f=1.0MHz$	--	--	8.0	pF
Input Impedance	h_{ie}	$V_{CE}=10V_{dc}$, $I_C=1.0mA_{dc}$, $f=1.0KHz$	1.0	--	10	k Ω
Voltage Feedback Ratio	h_{re}	$V_{CE}=10V_{dc}$, $I_C=1.0mA_{dc}$, $f=1.0KHz$	0.5	--	8.0	$\times 10^{-4}$
Small-Signal Current Gain	h_{fe}	$V_{CE}=10V_{dc}$, $I_C=1.0mA_{dc}$, $f=1.0KHz$	100	--	400	
Output Admittance	* h_{oe}	$V_{CE}=10V_{dc}$, $I_C=1.0mA_{dc}$, $f=1.0KHz$	1.0	--	40	$\mu mhos$
Noise Figure	NF	$V_{CE}=5.0V_{dc}$, $I_C=100\mu A_{dc}$, $f=1.0KHz$	--	--	5.0	dB
Delay Time	t_d	$V_{CC}=3.0V_{dc}$, $V_{BE}=-0.5V_{dc}$, $I_C=10mA_{dc}$, $I_{B1}=1.0mA_{dc}$	--	--	35	nS
Rise Time	t_r		--	--	35	
Storage Time	t_s	$V_{CC}=3.0V_{dc}$, $I_C=10mA_{dc}$, $I_{B1}=I_{B2}=1.0mA_{dc}$	--	--	200	nS
Fall Time	t_f		--	--	50	

1. FR-5=1.0x0.75x0.062in.

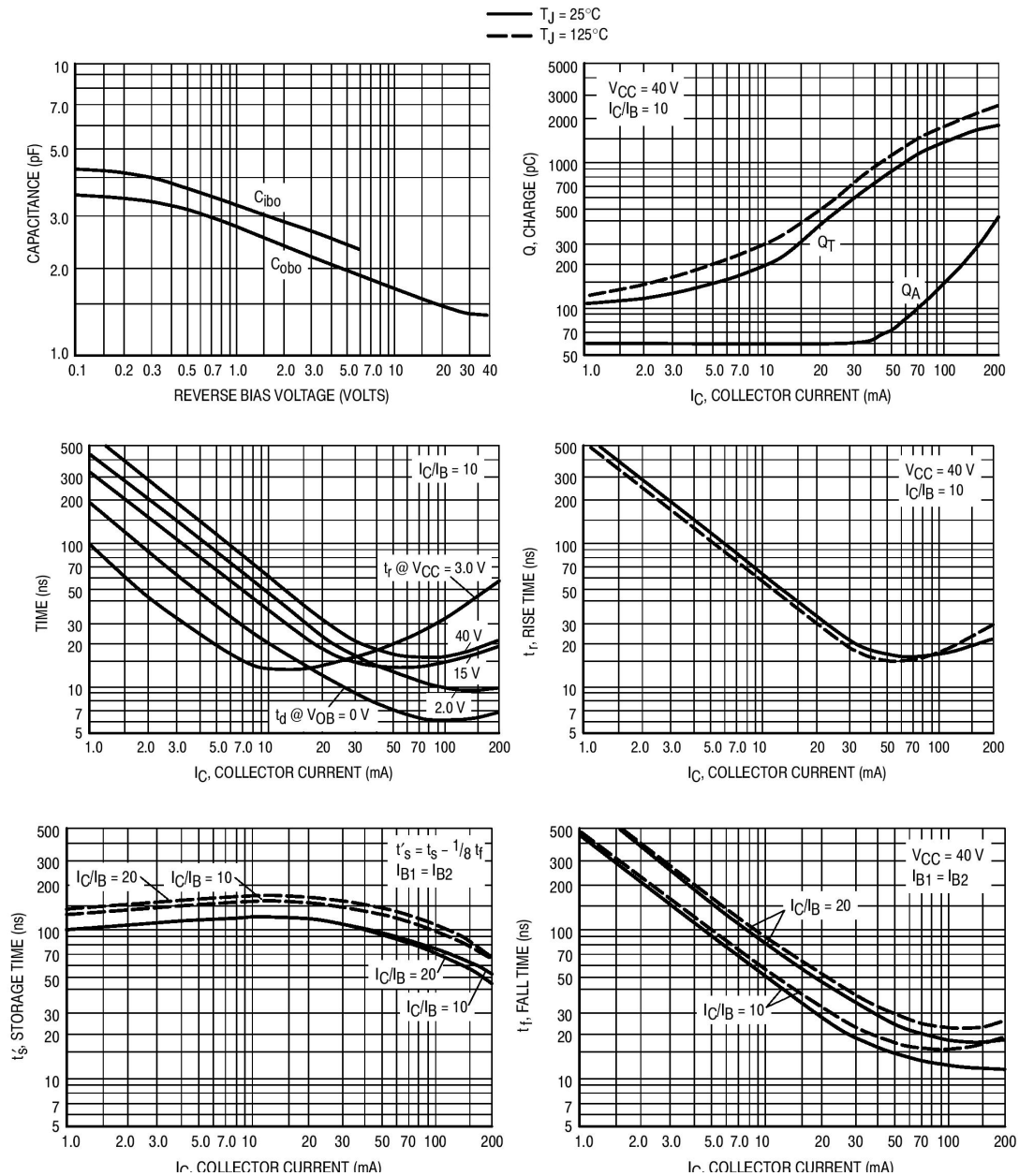
2. Alumina=0.4x0.3x0.024in, 99.5% alumina.

3. Pulse Width $\leq 300\mu S$; Duty Cycle $\leq 2.0\%$.

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Typical Characteristics

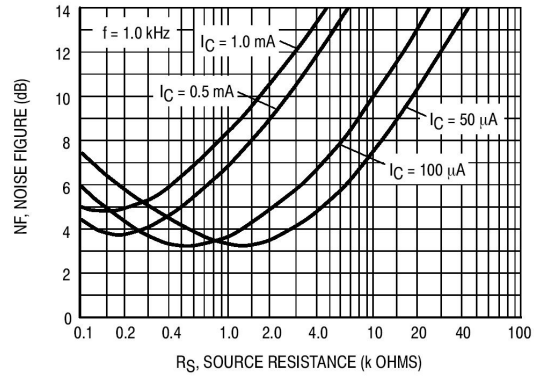
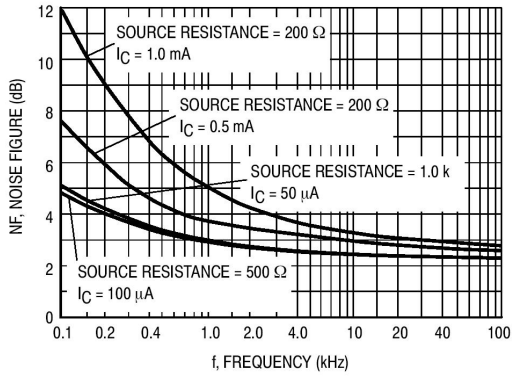


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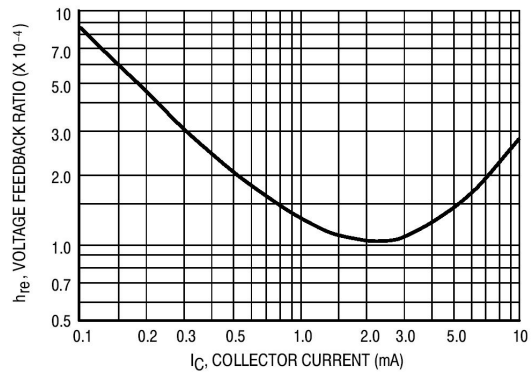
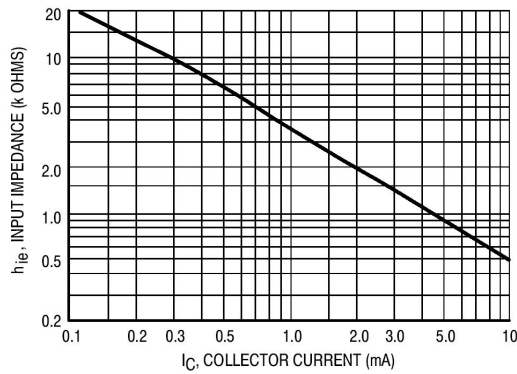
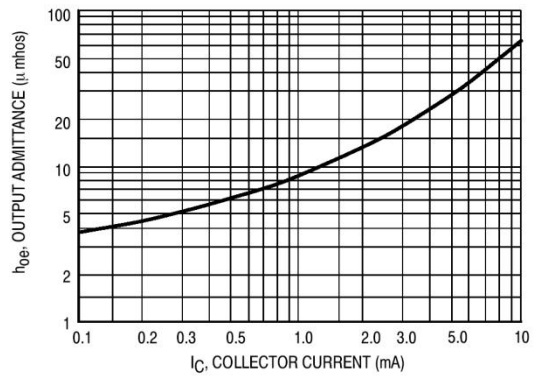
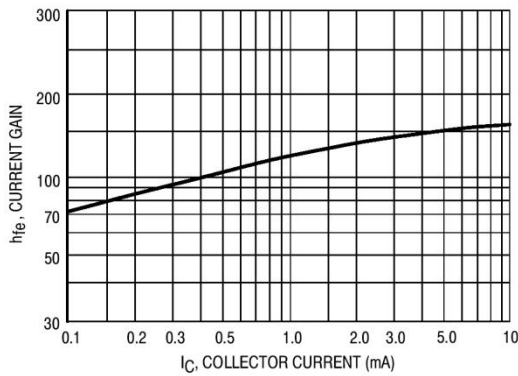
TYPICAL AUDIO SMALL-SIGNAL CHARACTERISTICS NOISE FIGURE VARIATIONS

($V_{CE} = 5.0$ Vdc, $T_A = 25^\circ\text{C}$, Bandwidth = 1.0 Hz)



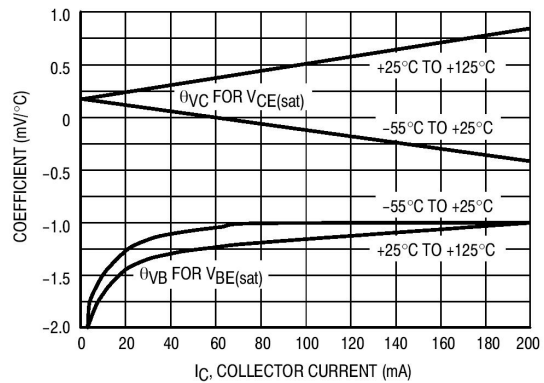
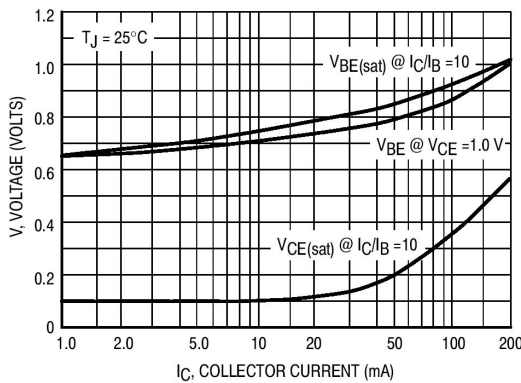
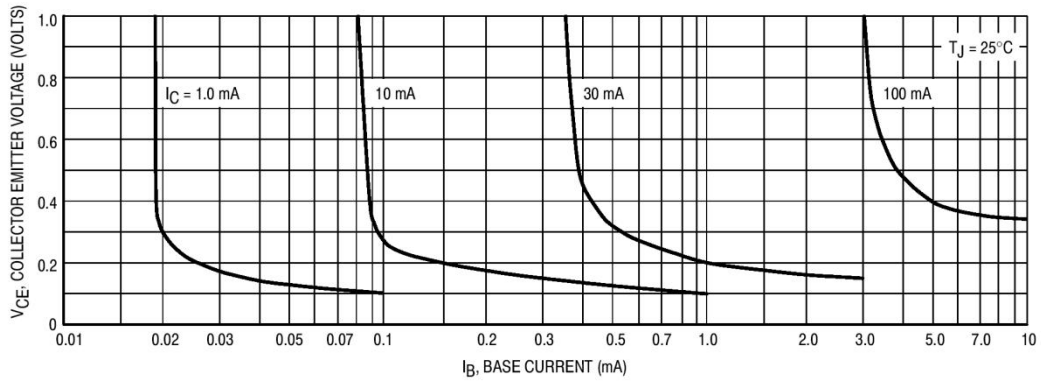
h PARAMETERS

($V_{CE} = 10$ Vdc, $f = 1.0$ kHz, $T_A = 25^\circ\text{C}$)

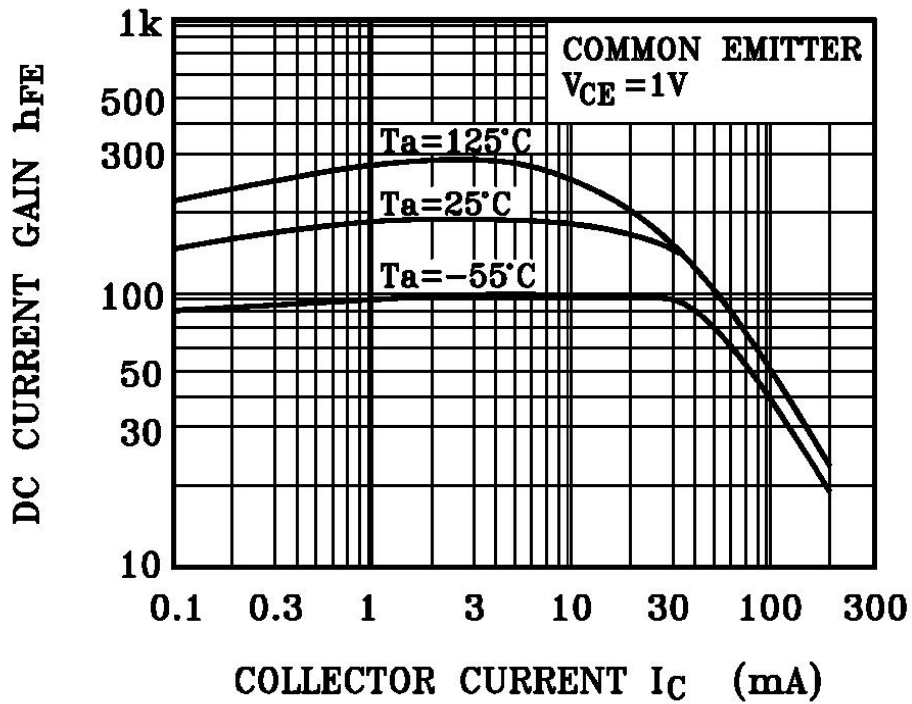


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$h_{FE} - I_C$



Note: Specifications are subject to change without notice. For more detail and update, please visit our website.