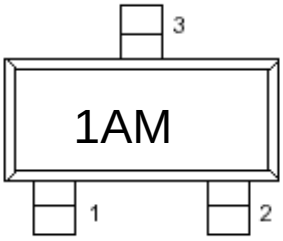
Kingtronics®

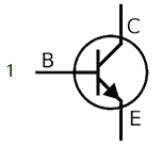
CDS3904-ME

SWITCHING TRANSISTOR

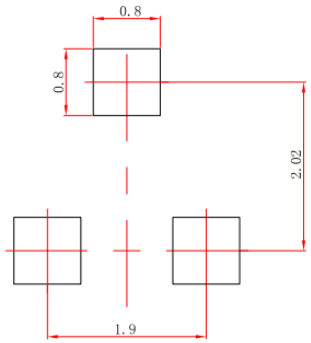
Marking:1AM



Top view



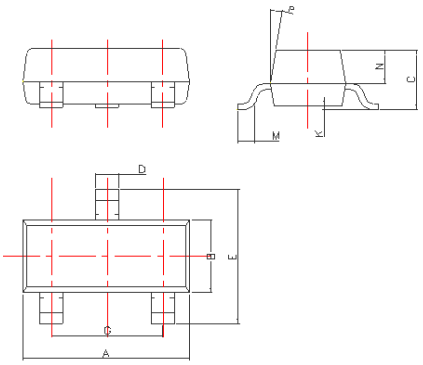
Suggested Layout



(±0.05mm)

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°

MAXIMUM RATINGS (Ta=25℃)

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) (T_A=25℃)	P_D	225	mW
Derate above 25℃		1.8	mW/℃
Thermal Resistance Junction to Ambient	R_{JA}	556	℃/W
Total Device Dissipation Alumina Substrate, (2) T_A=25℃	P_D	300	mW
Derate above 25℃		2.4	mW/℃
Thermal Resistance Junction to Ambient	R_{JA}	417	℃/W
Junction and Storage Temperature	T_J, T_{stg}	150, -55~150	℃

ELECTRICAL CHARACTERISTICS (TA=25℃ unless otherwise noted)

Characteristic	Symbol	Test Condition	Min	Type	Max	Unit
Collector Cutoff Current	I_{CEX}	V_{CE}=30Vdc, V_{EB}=3.0Vdc	--	--	50	nAdc
Base Cutoff Current	I_{BEX}	V_{CE}=30Vdc, V_{EB}=3.0Vdc	--	--	50	nAdc

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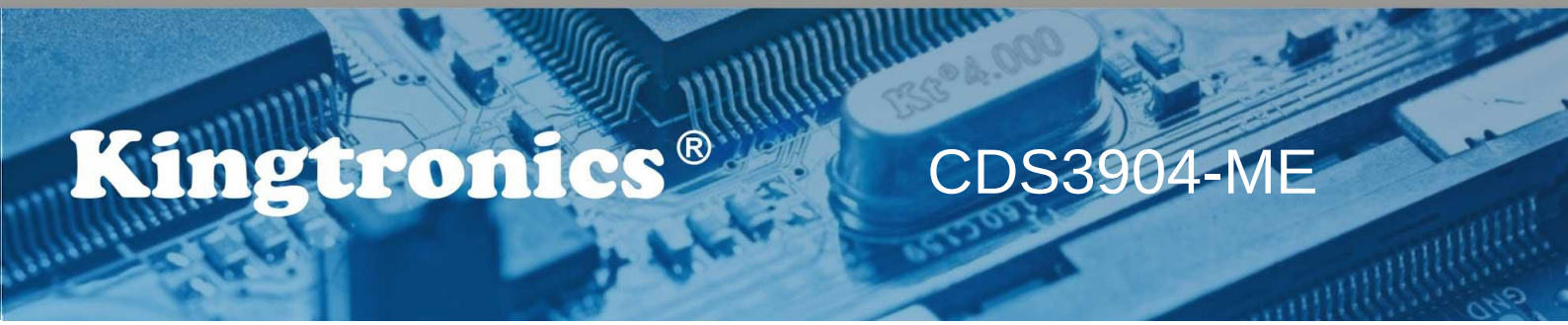

Collector-Emitter Breakdown Voltage (3)	$V_{(BR)CEO}$	I_C=1.0mAdc, I_B=0	40	--	--	Vdc
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=10μAdc, I_E=0	60	--	--	Vdc
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=10μAdc, I_C=0	5	--	--	Vdc
DC Current Gain	h_{FE}	I_C=0.1mAdc, V_{CE}=1.0Vdc	40	--	--	--
		I_C=1.0mAdc, V_{CE}=1.0Vdc	70	--	--	
		I_C=10mAdc, V_{CE}=1.0Vdc	100	--	300	
		I_C=50mAdc, V_{CE}=1.0Vdc	60	--	--	
		I_C=100mAdc, V_{CE}=1.0Vdc	30	--	--	
Collector-Emitter Saturation Voltage (3)	$V_{CE\ (sat)}$	I_C=10mAdc, I_B=1.0mAdc	--	--	0.2	Vdc
		I_C=50mAdc, I_B=5.0mAdc	--	--	0.3	
Base-Emitter Saturation Voltage	$V_{BE\ (sat)}$	I_C=10mAdc, I_B=1.0mAdc	0.65	--	0.85	Vdc
		I_C=50mAdc, I_B=5.0mAdc	--	--	0.95	
Current-Gain-Bandwidth Product	f_T	I_C=10mAdc, V_{CE}=20Vdc, f=100MHz	300	--	--	MHz
Output Capacitance	C_{obo}	V_{CB}=5.0Vdc, I_E=0, f=1.0MHz	--	--	4.0	pF
Input Capacitance	C_{ibo}	V_{EB}=0.5Vdc, I_C=0, f=1.0MHz	--	--	8.0	pF
Input Impedance	h_{ie}	V_{CE}=10Vdc, I_C=1.0mAdc, f=1.0KHz	1.0	--	10	kΩ
Voltage Feedback Ratio	h_{re}	V_{CE}=10Vdc, I_C=1.0mAdc, f=1.0KHz	0.5	--	8.0	$x10^{-4}$
Small-Signal Current Gain	h_{fe}	V_{CE}=10Vdc, I_C=1.0mAdc, f=1.0KHz	100	--	400	
Output Admittance	$*h_{oe}$	V_{CE}=10Vdc, I_C=1.0mAdc, f=1.0KHz	1.0	--	40	μmhos
Noise Figure	NF	V_{CE}=5.0Vdc I_C=100 μ Adc, f=1.0KHz	--	--	5.0	dB
Delay Time	t_d	V_{CC}=3.0Vdc, V_{BE}=-0.5Vdc, I_C=10mAdc, I_{B1}=1.0mAdc	--	--	35	nS
Rise Time	t_r		--	--	35	
Storage Time	t_s	V_{CC}=3.0Vdc, I_C=10mAdc, I_{B1}=I_{B2}=1.0mAdc	--	--	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 ≤300μS; Duty Cycle ≤2.0%.

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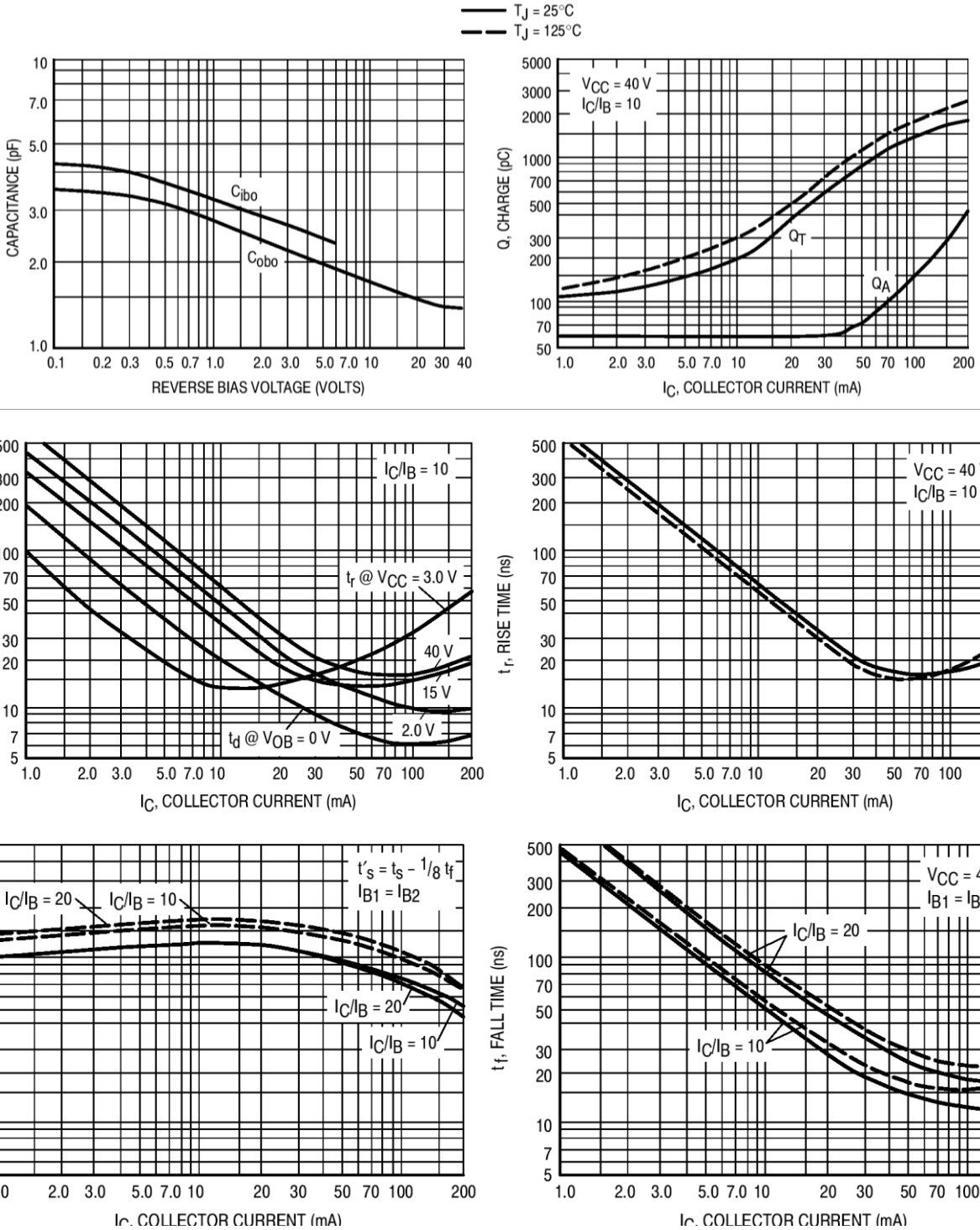
Typical Performance Characteristics



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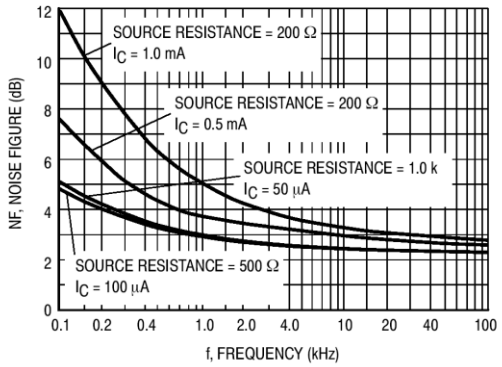
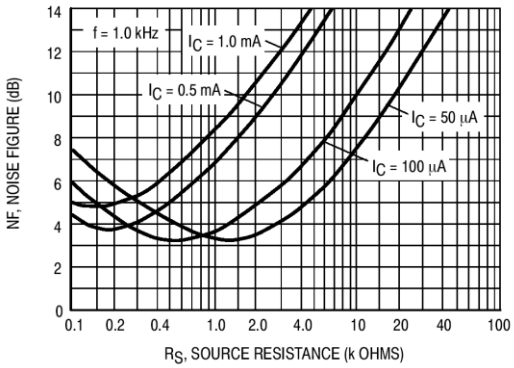
TYPICAL AUDIO SMALL–SIGNAL CHARACTERISTICS
NOISE FIGURE VARIATIONS

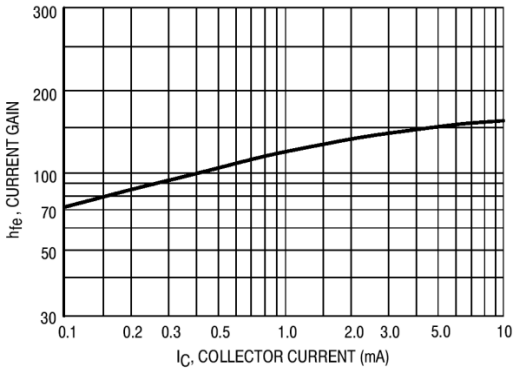
(V_{CE} = 5.0 Vdc, T_A = 25°C, Bandwidth = 1.0 Hz)

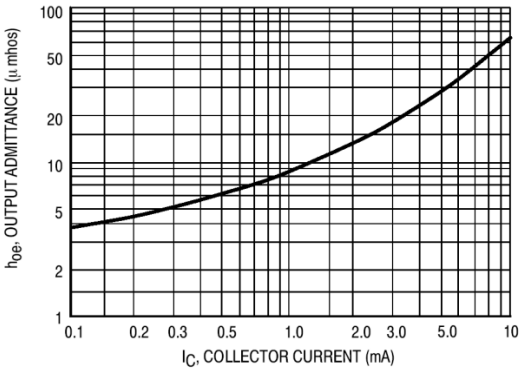


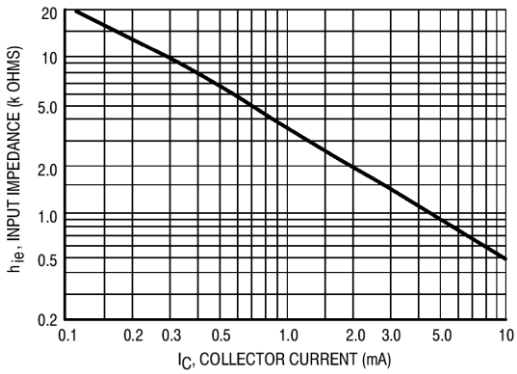


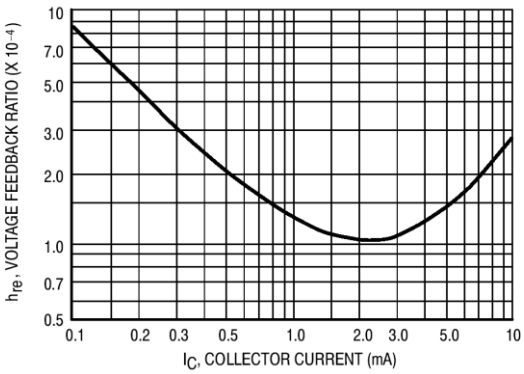
h PARAMETERS

(V_{CE} = 10 Vdc, f = 1.0 kHz, T_A = 25°C)









Note: Specifications are subject to change without notice.