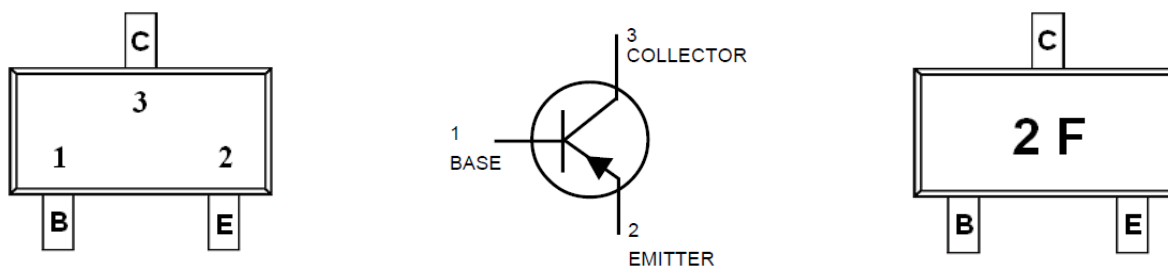




Features

- This device is designed for general purpose amplifier and switching applications

Pin Description (SOT-23)



Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFT2907AT1S23RG	2F	SOT-23	Tape & Reel	3000 EA

Absolute Maximum Ratings (T_A=25°C Unless otherwise noted)

Symbol	Parameter	Value	Unit
V _{CEO}	Collector-Emitter Voltage	-60	V
V _{CBO}	Collector-Base Voltage	-60	V
V _{EBO}	Emitter-Base Voltage	-5.0	V
I _C	Collector Current - Continuous	-600	mA
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Notes :

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics (T_A=25°C Unless otherwise noted)

Symbol	Parameter	Max.	Unit
P _D	Total Device Dissipation FR-5 Board, (1) T _A = 25°C	225	mW
	Derate above 25°C	1.8	mW/°C
R _{θJA}	Thermal Resistance, Junction to Ambient	556	°C/W
P _D	Total Device Dissipation Alumina Substrate, (2) T _A = 25°C	300	mW
	Derate above 25°C	2.4	mW/°C
R _{θJA}	Thermal Resistance, Junction to Ambient	417	°C/W

Notes :

- 1) FR-5 = 1.0 x 0.75 x 0.062 in.
- 2) Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.
- 3) Pulse Test: Pulse Width < 300 μs, Duty Cycle < 2.0%.



Electrical Characteristics ($T_A=25^\circ\text{C}$ Unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Max.	Unit
Off Characteristics					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage *	$I_C = -10\text{mA}, I_B = 0$	-60		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = -10\mu\text{A}, I_E = 0$	-40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = -10\mu\text{A}, I_C = 0$	-5.0		V
I_{BL}	Base Cutoff Current	$V_{CE} = -30\text{V}, V_{EB} = -0.5\text{V}$		-50	nA
I_{CEX}	Collector Cutoff Current	$V_{CE} = -30\text{V}, V_{EB} = -0.5\text{V}, T_A = 125^\circ\text{C}$		-50	nA
I_{CBO}	Collector Cutoff Current	$V_{CB} = -50\text{V}, I_E = 0$		-0.01	uA
		$V_{CB} = -50\text{V}, I_E = 0$		10	
On Characteristics *					
h_{FE}	DC Current Gain	$I_C = -0.1\text{mA}, V_{CE} = -10\text{V}$	75		
		$I_C = -1.0\text{mA}, V_{CE} = -10\text{V}$	100		
		$I_C = -10\text{mA}, V_{CE} = -10\text{V}$	100		
		$I_C = -150\text{mA}, V_{CE} = -10\text{V}$	100	300	
		$I_C = -500\text{mA}, V_{CE} = -10\text{V}$	50		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = -150\text{mA}, I_B = -15\text{mA}$		-0.4	V
		$I_C = -500\text{mA}, I_B = -50\text{mA}$		-1.6	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = -150\text{mA}, I_B = -15\text{mA}$		-1.3	V
		$I_C = -500\text{mA}, I_B = -50\text{mA}$		-2.6	
Small Signal Characteristics					
f_T	Current Gain - Bandwidth Product	$I_C = -50\text{mA}, V_{CE} = -20\text{V}, f = 100\text{MHz}$	200		MHz
C_{obo}	Output Capacitance	$V_{CB} = -10\text{V}, I_E = 0, f = 1.0\text{MHz}$		8	pF
C_{ibo}	Input Capacitance	$V_{EB} = -2.0\text{V}, I_C = 0, f = 1.0\text{MHz}$		30	pF
Switching Characteristics					
t_{on}	Turn-On Time	$V_{CC} = -30\text{V}, I_C = -150\text{mA}, I_{B1} = -15\text{mA}$		45	ns
t_d	Delay Time			10	
t_r	Rise Time			40	
t_{off}	Turn-Off Time	$V_{CC} = -6.0\text{V}, I_C = -150\text{mA}, I_{B1} = I_{B2} = -15\text{mA}$		100	ns
t_s	Storage Time			80	
t_f	Fall Time			30	

- Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$
- f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

Test Circuits

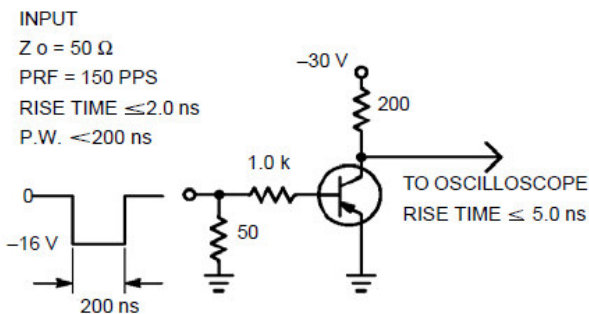


Figure 1. Delay and Rise Time Test Circuit

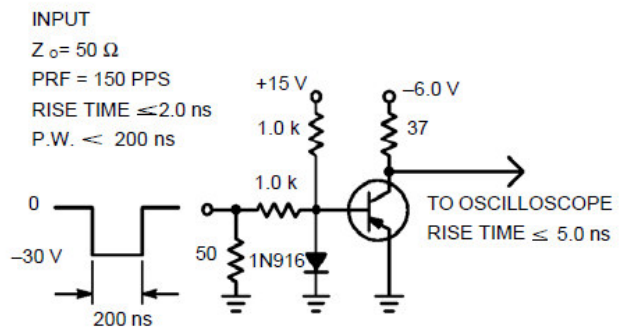


Figure 2. Storage and Fall Time Test Circuit



Typical Characteristics (TRANSIENT)

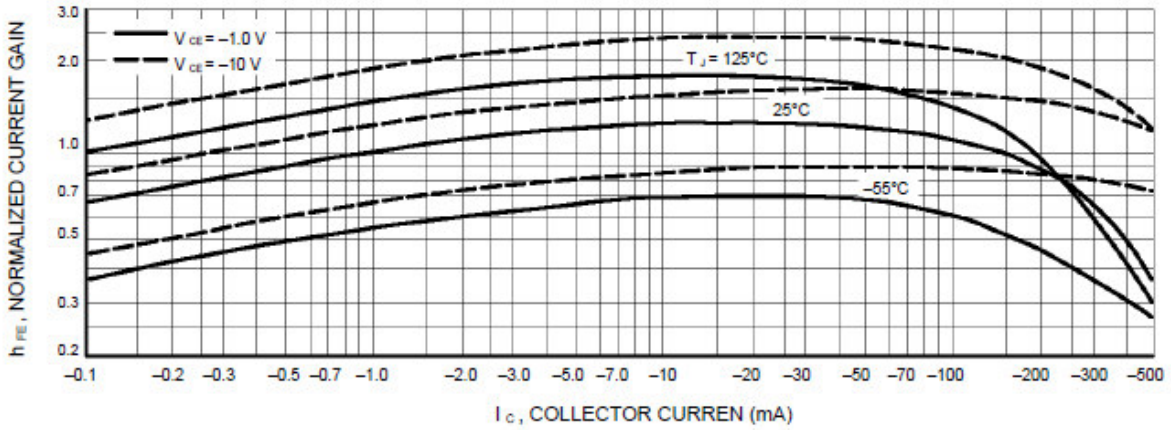


Figure 3. DC Current Gain

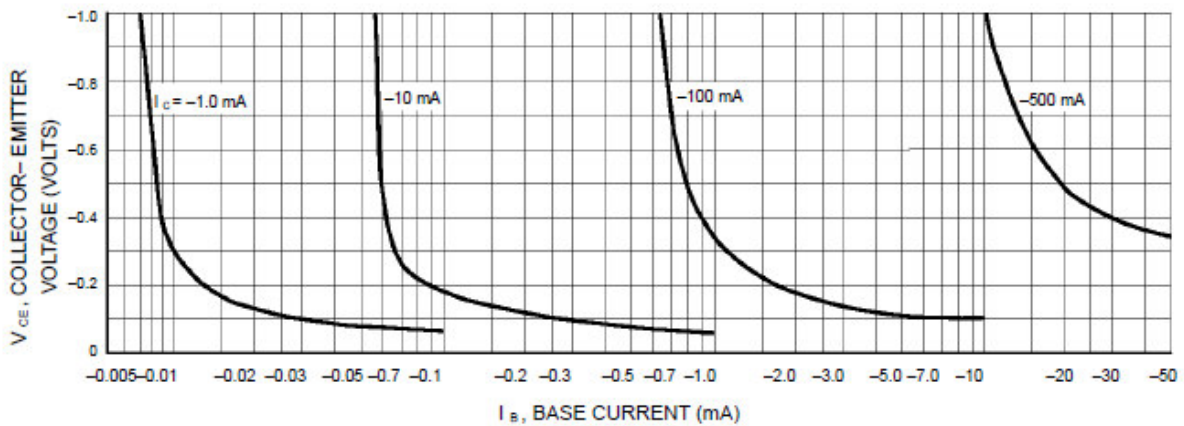


Figure 4. Collector Saturation Region

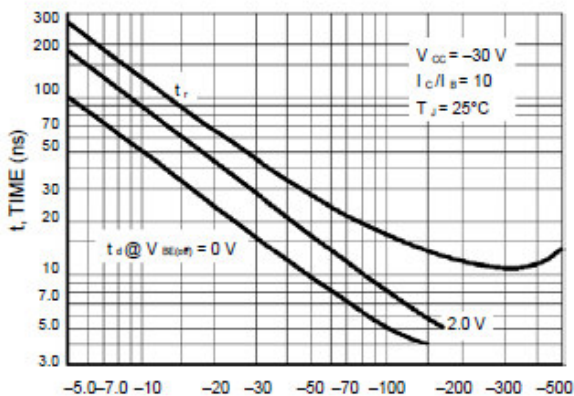


Figure 5. Turn-On Time

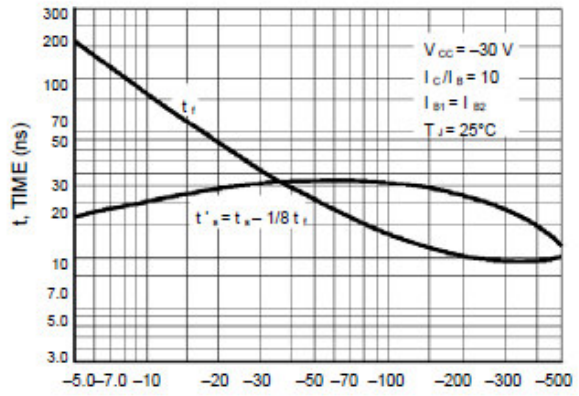


Figure 6. Turn-Off Time



Typical Characteristics (AUDIO SMALL-SIGNAL)

$V_{CE} = 10 \text{ Vdc}, T_A = 25^\circ\text{C}$

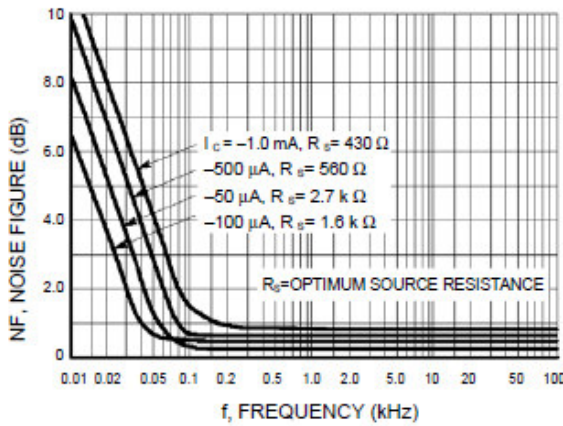


Figure 7. Frequency Effects

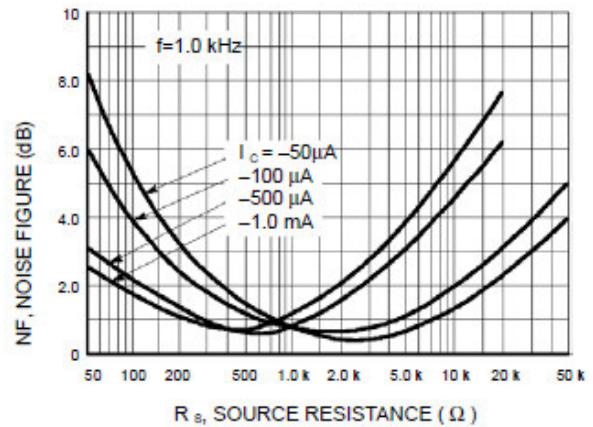


Figure 8. Source Resistance Effects

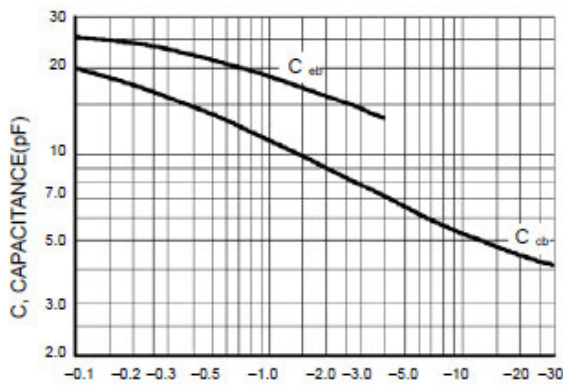


Figure 9. Capacitances

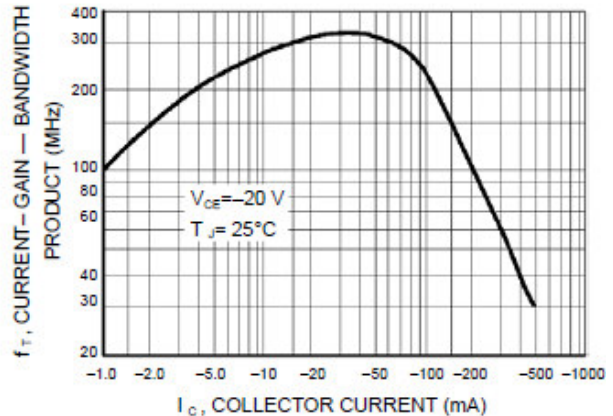


Figure 10. Current-Gain — Bandwidth Product

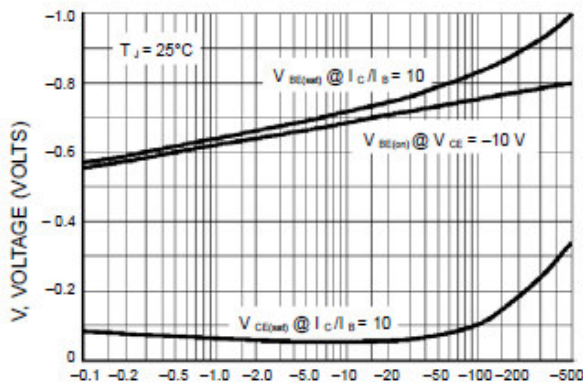


Figure 11. "On" Voltage

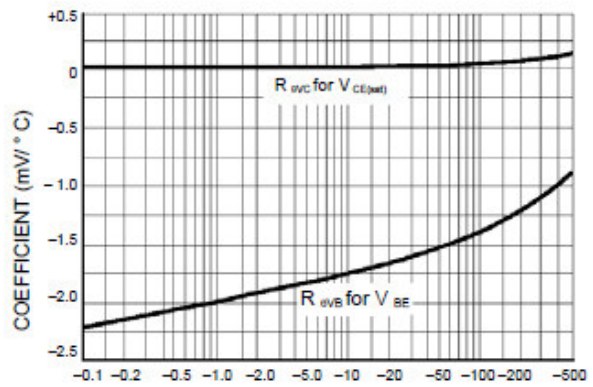
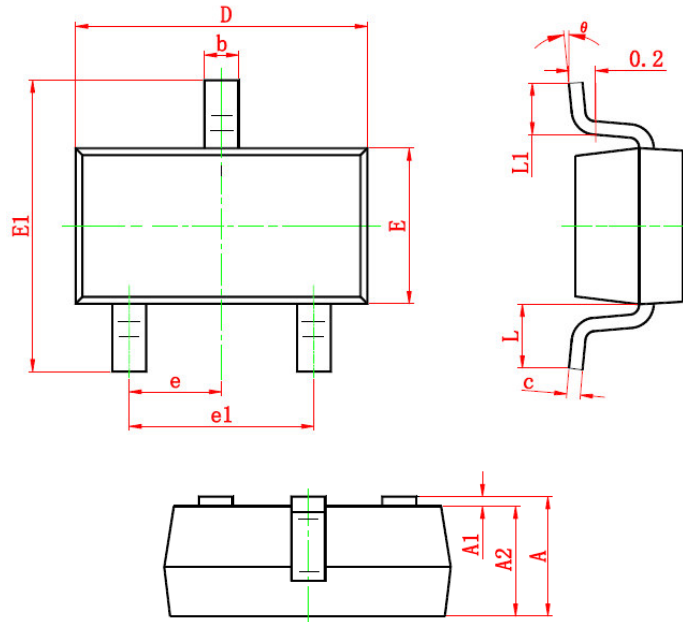


Figure 12. Temperature Coefficients



Package Information (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.100	0.035	0.039
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
theta	0°	8°	0°	6°

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