

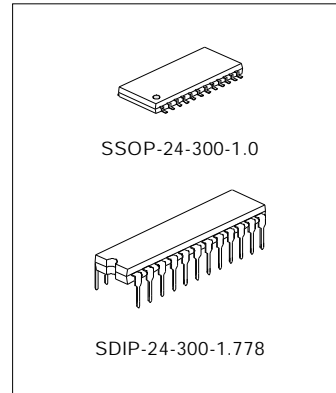
4.5V AM/FM +MPX TUNER IC(FOR DIGITAL TUNING SYSTEM)

DESCRIPTIONS

The SA1823 is the AM/FM/MPX IC, which is designed for DTS Radios.

FEATURES

- * AM+FM+MPX
- * Built-in Circuit for FM Stereo Detector VCO
- * AM/FM IF count buffer for IF Counter
- * Built-in FM stereo indicator
- * Built-in AM OSC buffer



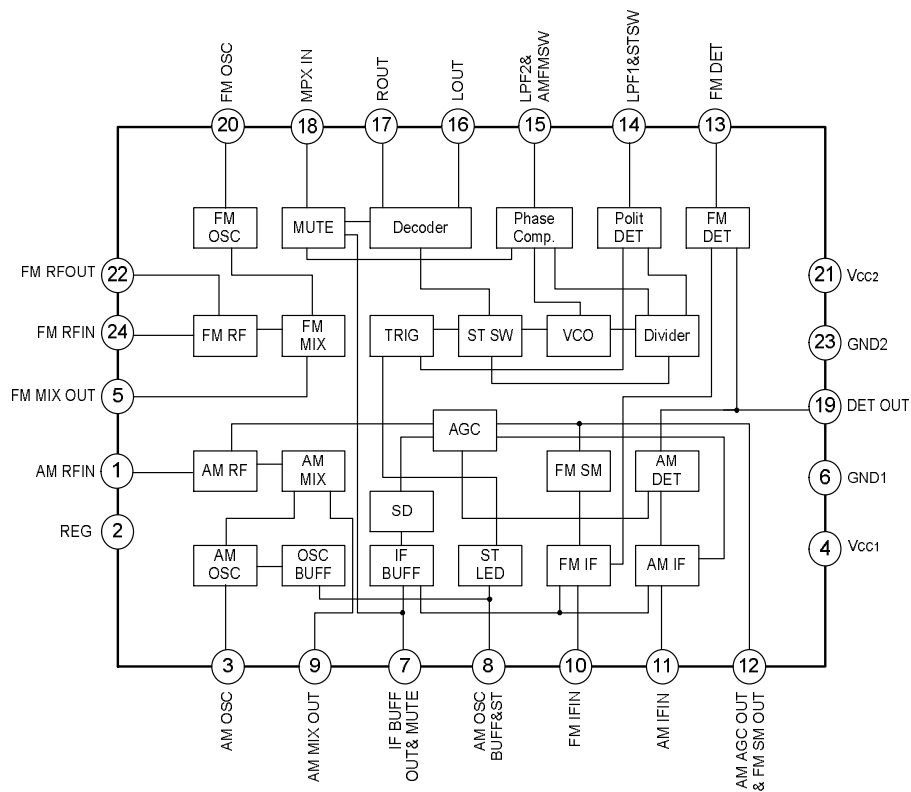
APPLICATIONS

- * Radio
- * Recorder

ORDERING INFORMATION

Device	Package
SA1823	SDIP-24-300-1.778
SA1823S	SSOP-24-300-1.0

BLOCK DIAGRAM



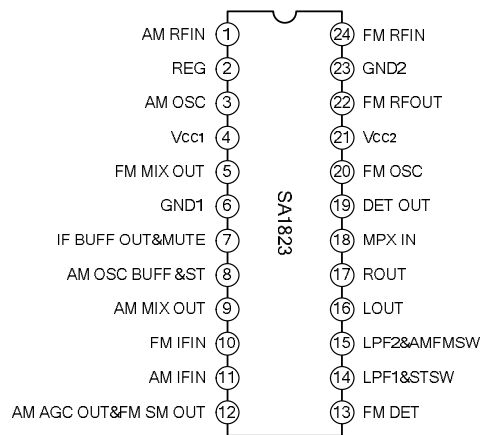
ABSOLUTE MAXIMUM RATING (T_{amb}=25°C)

Characteristics	Symbol	Rating	Unit
Supply Voltage	V _{CCmax}	7.0	V
LED Current	I _{LED}	20	mA
Power Dissipation	P _{dmax}	300	mW
Operating Temperature	T _{opr}	-20~+70	°C
Storage Temperature	T _{stg}	-40~+125	°C
Recommended Supply Voltage	V _{CC}	4.5	V
Operation Supply Voltage Range	V _{CCop}	1.8 ~ 6.0	V

ELECTRICAL CHARACTERISTICS (Unless otherwise specified, T_{amb}=25°C, V_{CC}=4.5V)

Characteristics	Symbol	Test condition	Min.	Typ.	Max.	Unit
<i>Quiescent supply current</i>						
FM-mode Quiescent Current	I _{cc(FM)}	No input	10.0	15.0	20.0	mA
AM-mode Quiescent Current	I _{cc(AM)}	No input	6.5	7.6	14.5	mA
<i>FM Front-End Characteristics (f_c=98MHz, f_m=1kHz, 22.5kHz dev)</i>						
Local Oscillator Voltage	V _{OSC}	f _{osc} =108.7MHz, with FET buffer gain=0dB		100		mVrms
Input Limiting Voltage	-3dB L.S	Referenced to V _{IN} =60dBμV EMF, a 3dB down input	--	12	--	dBμV EMF
<i>FM IF Characteristics (Monaural) (f_c=10.7MHz, f_m=1kHz, 75kHz dev)</i>						
Demodulation Output	V _O	V _{IN} =100dBμV	135	180	240	mVrms
Input Limiting Voltage	-3dB L.S.	Referenced to V _{IN} =100dB dBμV, 75kHz dev, a 3 dB down input	31	38	45	dBμV
Total Harmonic Distortion (Mono)	THD	V _{IN} =100dBμV	--	0.5	1.5	%
Signal To Noise Ratio	S/N	V _{IN} =100dBμV	63	72	--	dB
IF Count Output Sensitivity	IF buff on	IF count buffer on	35	45	55	dBμV
IF Count Buffer Output Amplitude	V _{IFbuff}	Test from pin7 for V _{IN} =100dB, no modulation	120	180	260	mVrms
<i>FM IF Characteristics (Stereo) (f_c=10.7MHz, f_m=1kHz, L+R=90%, pilot=10%)</i>						
Separation	SEP	V _{IN} =100dBμV	25	40	--	dB
Stereo LED Sensitivity	ST-ON	V _{IN} =100dBμV, the pilot modulation	2.5	3.5	7.2	%
Total Harmonic Distortion	THD	V _{IN} =100dBμV	--	0.5	1.7	%
<i>AM Characteristics (f_c=1MHz, f_m=1kHz, 30%)</i>						
Detector Output	V _O (1)	V _{IN} =23dBμV	17	30	53	mVrms
	V _O (2)	V _{IN} =80dBμV	50	75	120	mVrms
Signal-To-Noise Ratio	S/N (1)	V _{IN} =23dBμV	15	20	--	dB
	S/N (2)	V _{IN} =80dBμV	47	53	--	dB
Total Harmonic Distortion	THD	V _{IN} =80dBμV	--	0.5	1.5	%
OSC Buffer Output	V _{OSC} buff	Test from pin8 for no input	80	100	160	mVrms
IF Count Buffer On Level	IF buff on	IF count buffer on	15	25	35	dBμV
IF Count Buffer Output	V _{IF} buff	Test from pin7 for V _{IN} =80 dBμV, no modulation	110	180	240	mVrms

PIN CONFIGURATIONS



PIN DESCRIPTIONS

Pin no.	Pin name	Description
1	AM RFIN	Connect the AM antenna coil between this pin and pin2 (Reg)
2	REG	Reference Voltage
3	AM OSC	Connect the AM oscillator coil between this pin and pin4 (VCC1)
4	Vcc1	AM/FM-IF/MPX block Vcc
5	FM MIX OUT	Rout=270Ω
6	GND1	AM/FM-IF/MPX block GND
7	IF Buff OUT & Mute	IF buffer output & mute switch
8	AM OSC Buff & ST	AM-oscillator buffer output & Stereo indicator
9	AM MIX OUT	Connect the AM mixer coil between this pin and pin4 (VCC1)
10	FM IFIN	Rin=330Ω
11	AM IFIN	Rin=2kΩ
12	AM AGC OUT& FM SM OUT	AM AGC output&FM SM output
13	FM DET	Connect ceramic discriminator between this pin and ground.
14	LPF1&STSW	LPF for pilot detector & STSW
15	LPF2&AMFMSW	LPF for phase comparator & AMFMSW
16	LOUT	Output of L channel
17	ROUT	Output of R channel
18	MPX IN	RIN=50kΩ
19	DET OUT	Output of AM/FM DET Output impedance AM: Rout=50kΩ FM: Rout=500Ω

(To be continued)

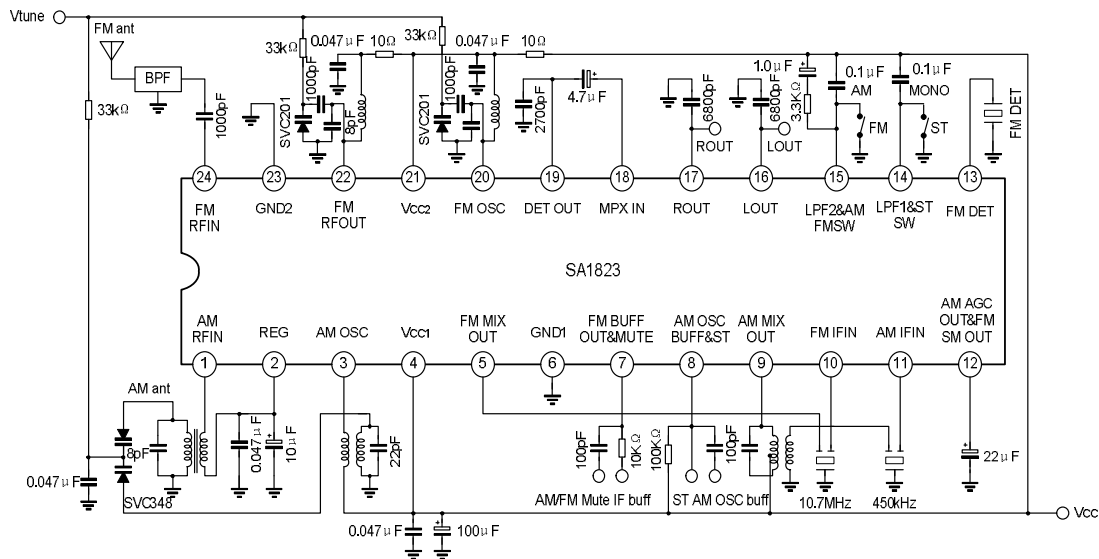
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Pin no.	Pin name	Description
20	FM OSC	Connect the FM oscillator coil between this pin and pin21 (Vcc2)
21	Vcc2	FM-FE block Vcc
22	FM RF OUT	Connect the FM-RF coil between this pin and pin21 (Vcc2)
23	GND2	FM-FE block ground
24	FM RF IN	Connect the FM-RF coil between this pin and pin21 (Vcc2) Rin =1.8KΩ

FUNCTION DESCRIPTION

1. FM: RF amplifier, mixer, oscillator, IF amplifier, detector, signal meter, IF count buffer output
 2. AM: RF amplifier, mixer, oscillator (with ALC), oscillator buffer output, IF amplifier, detector, AGC, IF count buffer output
 3. MPX: PLL stereo decoder, stereo indicator, VCO on chip, forced monaural, Audio mute
 4. FM/AM switch and MONO/ST switch
- PIN14 is connected to ground -->monaural mode
 PIN14 is open --> stereo mode
 PIN15 is connected to ground -->AM mode
 PIN15 is open --> FM mode

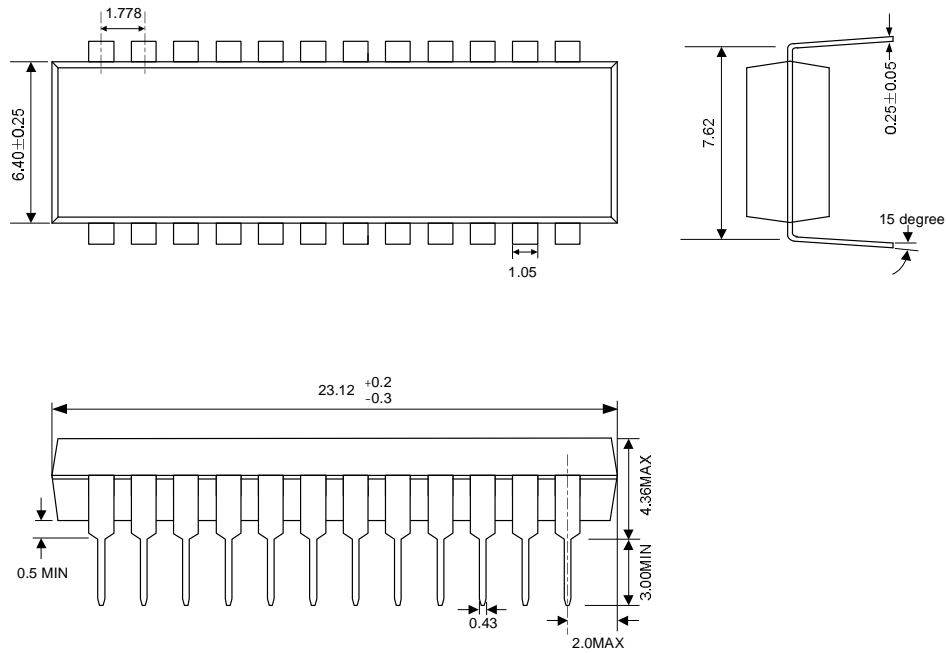
TEST CIRCUIT



PACKAGE OUTLINE

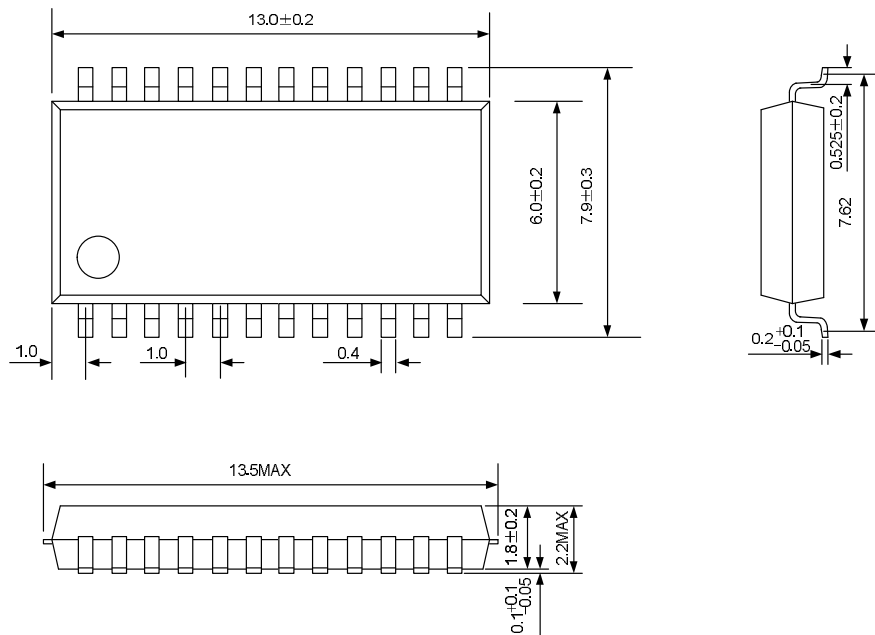
SDIP-24-300-1.778

UNIT: mm



SSOP-24-300-1.0

UNIT: mm



ATTACH

Revision History

Data	REV	Description	Page
2005.07.13	1.0	Original	
2005.08.23	1.1	Add the package of "SSOP-24-300-1.0"	
2005.08.29	1.2	Modify the "TEST CIRCUIT" and "TYPICAL APPLICATION CIRCUIT"	