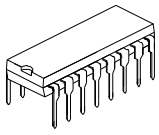
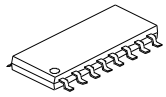
AM/FM RADIO RECEIVER

DESCRIPTION

The SA2003 is AM/FM radio IC (FM F/E+AM/FM IF) which is designed for AM/FM radios. Combining with the UTC7368 (Mono PW IC), a suitable AM/FM radio system is able to be constituted.



DIP-16-300-2.54



SOP-16-225-1.27

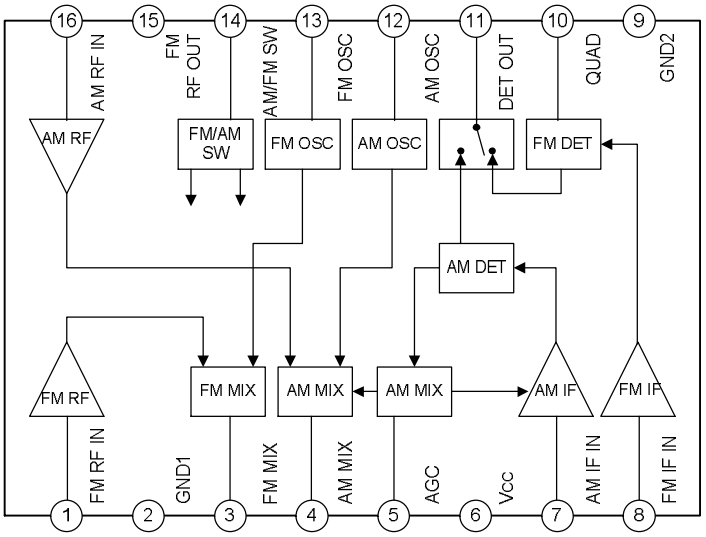
FEATURES

* FM IFT, AM IFT and FM detector coil are not needed.
* Pin compatible of TA8164P.
* Operating supply voltage range: V_{CC}(opr)=1.8~7V (T_a=25°C)

ORDERING INFORMATION

Device	Package
SA2003	DIP-16-300-2.54
SA2003S	SOP-16-225-1.27

BLOCK DIAGRAM



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

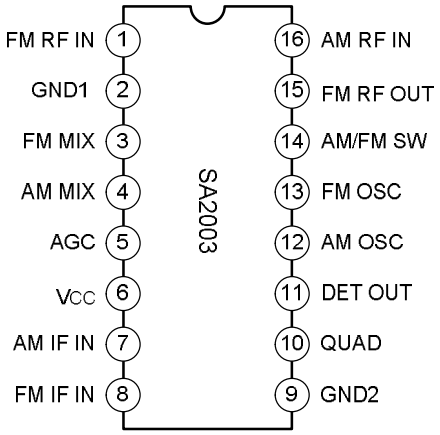
Characteristic		Symbol	Ratings	Unit
Supply Voltage		V_{CC}	8	V
Power Dissipation	DIP-16	PD (Note)	750	mW
	SOP-16		350	
Operating Temperature		T_{opr}	-25~75	°C
Storage Temperature		T_{stg}	-55~150	°C

NOTE: Derated above T_{amb}=25°C in the proportion of 6mW/°C for SA2003 and of 2.8 mW/°C for SA2002S.

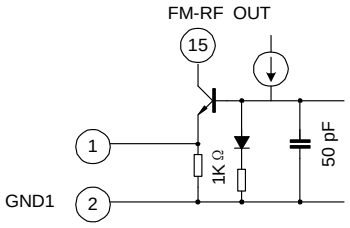
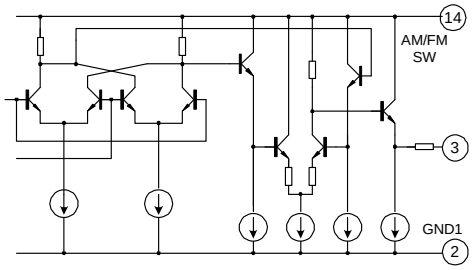
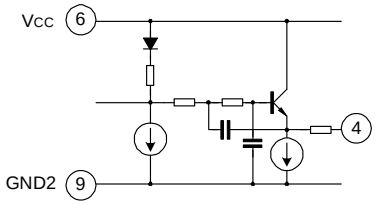
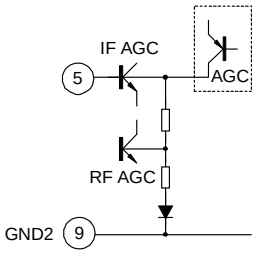
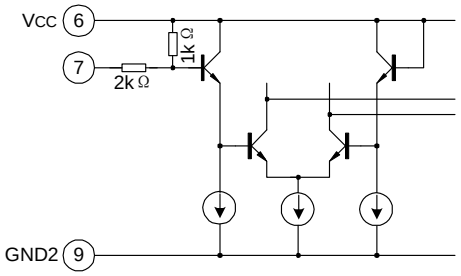
ELECTRICAL CHARACTERISTICS (Unless otherwise specified, T_a=25°C, V_{CC}=3 V, F/E : f=98 MHz, fm=1 kHz ; FM IF : f=10.7 MHz, Δf =±22.5 kHz, fm= 1kHz ;AM : f=1MHz, MOD=30%, fm=1kHz)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Supply Current		I_{CC} (FM)	FM mode, Vin=0	--	10.5	16.5	mA
		I_{CC} (AM)	AM mode, Vin=0	--	5.0	8.0	
F/E	Input Limiting Voltage	Vin(lim)	-3dB limiting point	--	12	--	dBμV EMF
	Quiescent Sensitivity	QS	S/N=40dB	--	12	--	dBμV EMF
	Local OSC Voltage	V_{OSC}	f_{OSC} =108 MHz	160	240	320	mVrms
	Local OSC Stop Voltage	V_{stop}(FM)	Vin=0	--	1.2	--	V
FM IF	Input Limiting Voltage	V_{in}(lim) IF	-3dB limiting point	42	47	52	dBμV EMF
	Recovered Output Voltage	V_{OD}	Vin = 80dBμV EMF	50	70	90	mVrms
	Signal to Noise Ratio	S/N	Vin = 80dBμV EMF	--	62	--	dB
	Total Harmonic Distortion	THD	Vin = 80dBμV EMF	--	0.4	--	%
	AM Rejection Ratio	AMR	Vin = 80dBμV EMF	--	33	--	dB
AM	Voltage Gain	GV	Vin = 27dBμV EMF	15	32	50	mVrms
	Recovered Output Voltage	V_{OD}	Vin = 60dBμV EMF	35	60	85	mVrms
	Signal to Noise Ratio	S/N	Vin = 60dBμV EMF	--	43	--	dB
	Total Harmonic Distortion	THD	Vin = 60dBμV EMF	--	1.0	--	%
	Local OSC Stop Voltage	V_{stop}(AM)	Vin=0		1.6	--	V

PIN CONFIGURATION

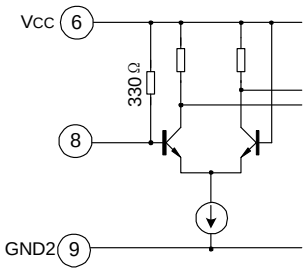
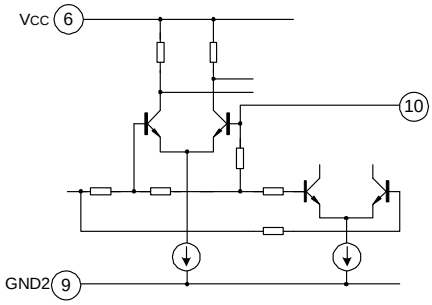
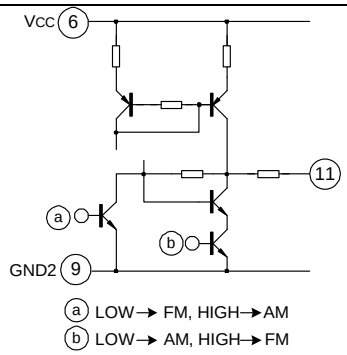
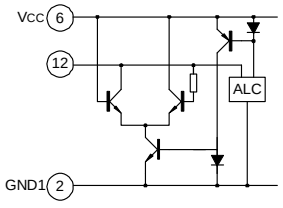
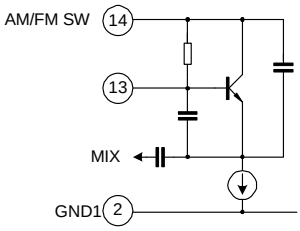


PIN DESCRIPTION TERMINAL VOLTAGE : Typical DC voltage at Ta=25°C,VCC=3V and no signal with Test Circuit 1

Pin No.	Symbol	Internal Circuit	Terminal Voltage (V)	
			AM	FM
1	FM RF IN		0	0.7
2	GND1	-	0	0
3	FM MIX		0.4	1.7
4	AM MIX		0.6	0
5	AGC		0	0
6	VCC	-	3.0	3.0
7	AM IF IN		3.0	3.0

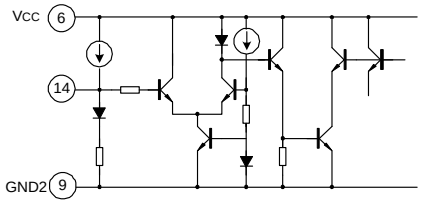
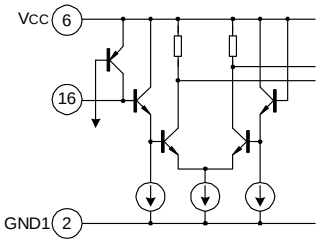
(TO be continued)

(Continued)

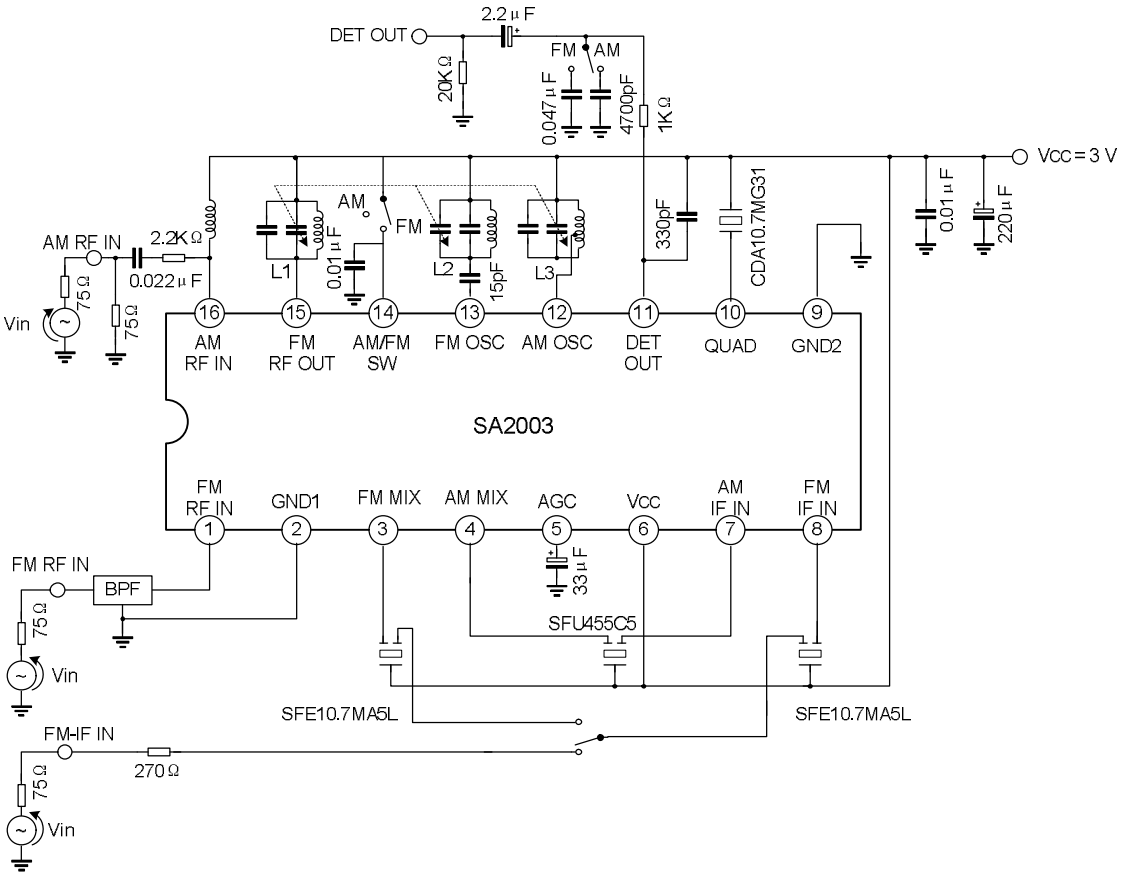
Pin No.	Symbol	Internal Circuit	Terminal Voltage (V)	
			AM	FM
8	FM IF IN		3.0	3.0
9	GND2	-	0	0
10	QUAD		2.5	2.2
11	DET OUT		1.4	1.1
12	AM OSC		3.0	3.0
13	FM OSC		0.9	3.0

(TO be continued)

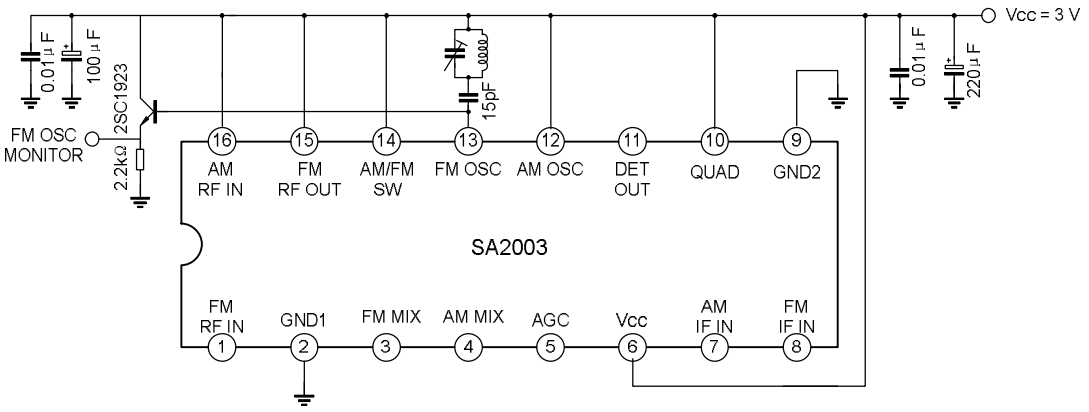
(Continued)

Pin No.	Symbol	Internal Circuit	Terminal Voltage (V)	
			AM	FM
14	AM/FM SW		0.9	3.0
15	FM RF OUT	Cf. PIN①	3.0	3.0
16	AM RF IN		3.0	3.0

TEST CIRCUIT 1



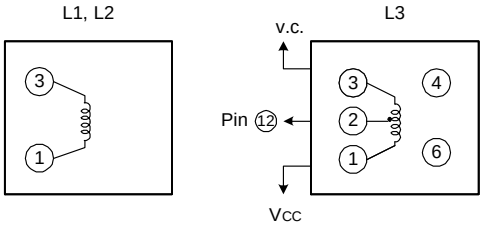
TEST CIRCUIT 2



COIL DATA

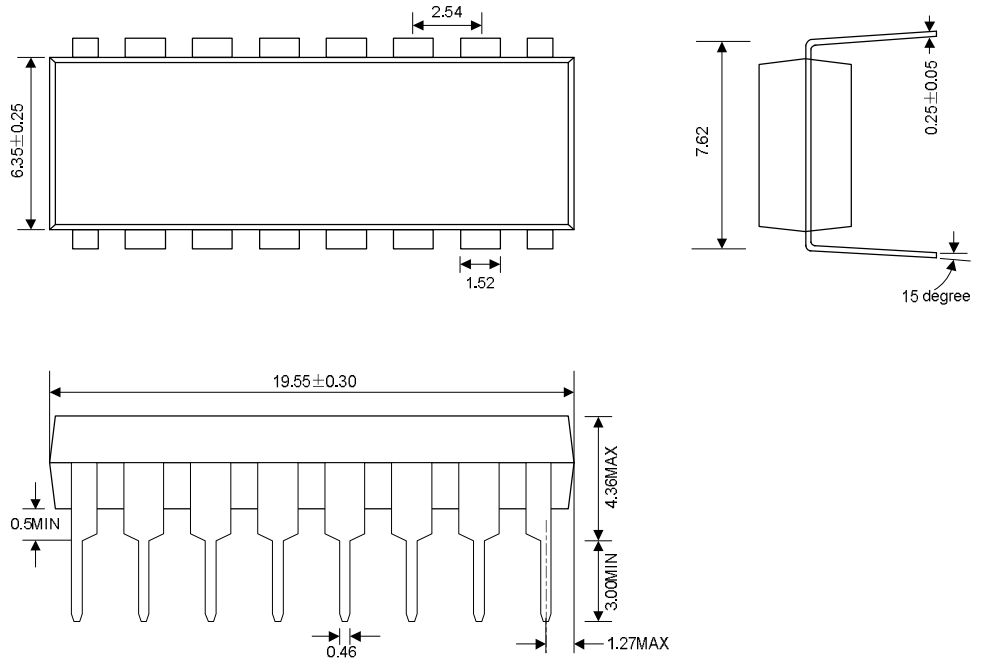
Coil No.	Test Freq.	L (μH)	Co (pF)	Qo	Turns					Wire(mm)	Reference
					1-2	2-3	1-3	1-4	4-6		
L1 FM RF	100MHz	--	--	100	--	--	--	$2\frac{1}{4}$	--	0.5 UEW	(s)0258-000-021
L2 FM OSC	100MHz	--	--	100	--	--	$1\frac{3}{4}$	--	--	0.5 UEW	(s)0258-000-020
L3 AM OSC	796kHz	268	--	125	14	86	--	--	--	0.06 UEW	(s)2157-2239-213A

(s): Sumida electric co., ltd.



PACKAGE OUTLINE

DIP-16-300-2.54 UNIT: mm



SOP-16-225-1.27 UNIT: mm