

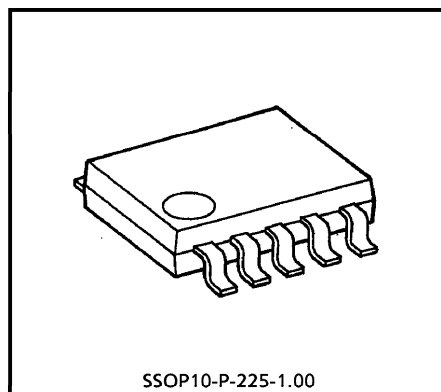
# TA8158F

## FM FRONT END IC

The TA8158F is low operation voltage FM FRONT END IC for the portable equipments which is suitable for the headphone stereo radios and radio cassette players.

### FEATURES

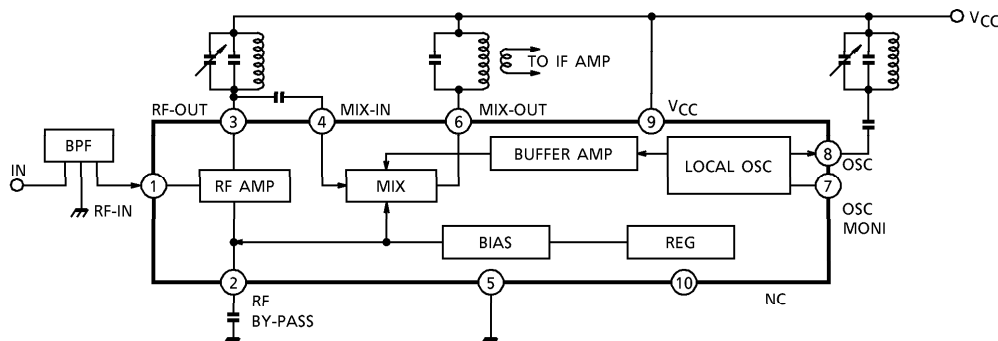
- Wide Supply Voltage Range :  $V_{CC} = 1.6 \sim 6.0V$  ( $T_a = 25^\circ C$ )
- Excellent Supply Voltage Dependence of Local Oscillator : Oscillation Stop  $V_{CC} = 0.9V$  (Typ.)
- Improved Inter-Modulation Characteristics by Double Balanced Type Mixer Circuit.
- Built-in Clamping Diode for the Local Oscillator Output.



SSOP10-P-225-1.00

Weight : 0.10g (Typ.)

### BLOCK DIAGRAM



961001EBA2

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**EXPLANATION OF TERMINAL**

(Terminal voltage is DC voltage at Ta = 25°C, VCC = 5V, and no signal)

PIN No.	SYMBOL	INTERNAL CIRCUIT	TERMINAL VOLTAGE (V)
1	FM-RF IN		0.8
2	BY PASS		1.5
3	FM-RF OUT		5.0
4	MIX IN		1.5
5	GND	—	0
6	MIX OUT	cf, pin④	5.0
7	OSC MONITOR		4.3
8	OSC		5.0
9	VCC	—	5.0
10	NC	—	—

## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	8	V
Power Dissipation	P <sub>D</sub> (Note)	400	mW
Operating Temperature	T <sub>opr</sub>	-25~75	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

(Note) Derated above Ta = 25°C in the proportion of 3.2mW/°C.

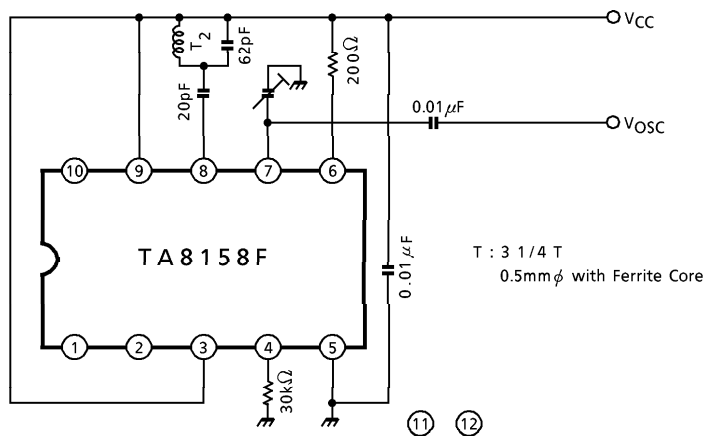
## ELECTRICAL CHARACTERISTICS

Unless otherwise specified

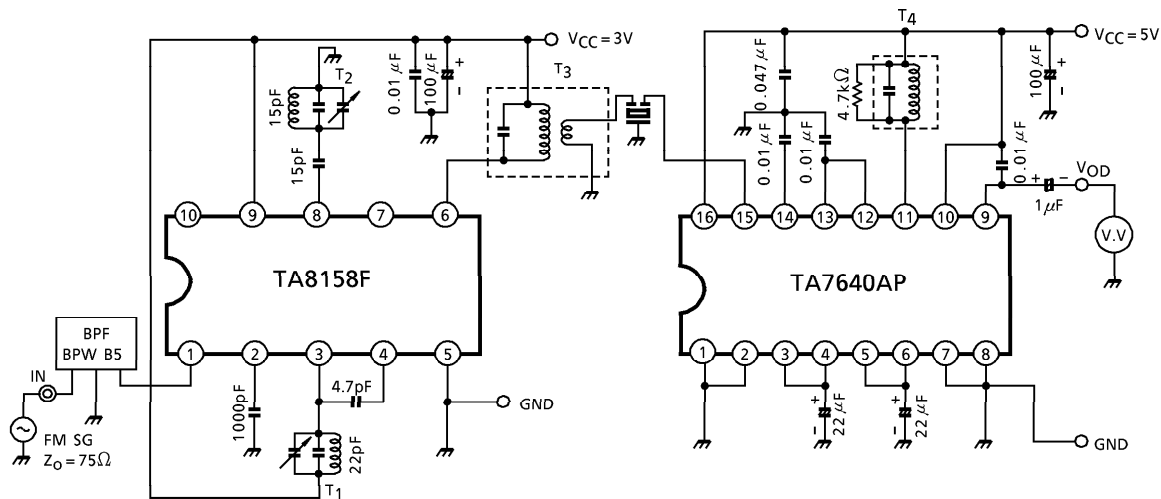
(V<sub>CC</sub> = 3V, f = 83MHz, f<sub>m</sub> = 1kHz, Δf = 22.5kHz dev, Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		I <sub>CC</sub>	2	V <sub>in</sub> = 0	—	5.2	8.0	mA
-3dB Limiting Sensitivity		V <sub>in</sub> (lim)	2	—	—	3.0	7.0	dB $\mu$ V EMF
Quiescent Sensitivity		Q <sub>S</sub>	2	—	—	11.0	—	dB $\mu$ V EMF
Conversion Gain		G <sub>C</sub>	—	—	—	31	—	dB
Local OSC Voltage		V <sub>OSC</sub>	1	f <sub>OSC</sub> = 60MHz	140	220	340	mV <sub>rms</sub>
Pin① Impedance	Parallel Input Resistance	r <sub>ip1</sub>	3	f = 83MHz	—	57	—	$\Omega$
Pin③ Impedance	Parallel Output Resistance	r <sub>op3</sub>	3		—	25	—	k $\Omega$
	Parallel Output Capacitance	c <sub>op3</sub>			—	2.0	—	pF
Pin④ Impedance	Parallel Input Resistance	r <sub>ip4</sub>	3		—	2.7	—	k $\Omega$
	Parallel Input Capacitance	c <sub>ip4</sub>			—	3.3	—	pF
Pin⑥ Impedance	Parallel Output Resistance	r <sub>op6</sub>	3		f = 10.7MHz	—	100	—
	Parallel Output Capacitance	c <sub>op6</sub>		—		4.8	—	pF
Local OSC Stop Voltage		V <sub>stop</sub>	1	—	—	0.9	—	V

TEST CIRCUIT 1



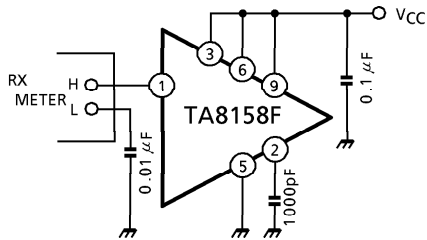
TEST CIRCUIT 2



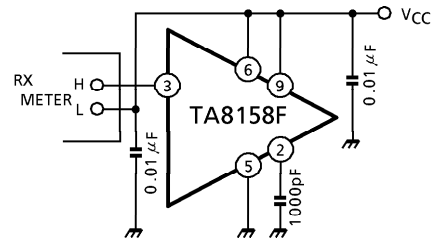
**TEST CIRCUIT 3**

Input, output impedance

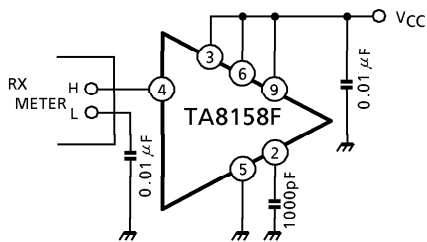
(1)  $r_{ip1}$



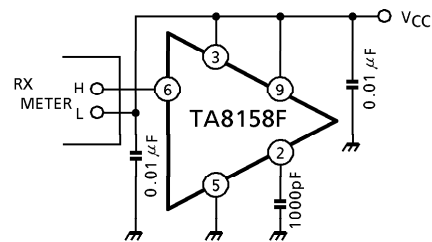
(2)  $r_{op3}, C_{op3}$



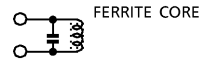

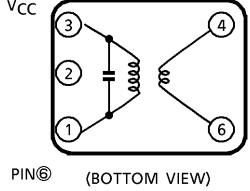
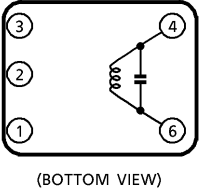
(3)  $r_{ip4}, C_{ip4}$



(4)  $r_{op6}, C_{op6}$



**TEXT CIRCUIT COIL DATA** (Japan band for 76.0MHz to 108.0MHz)

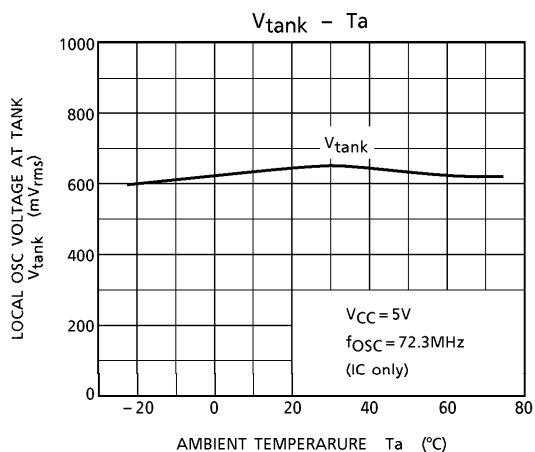
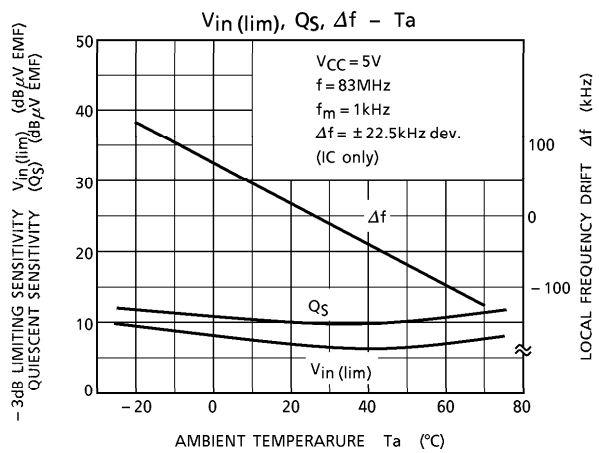
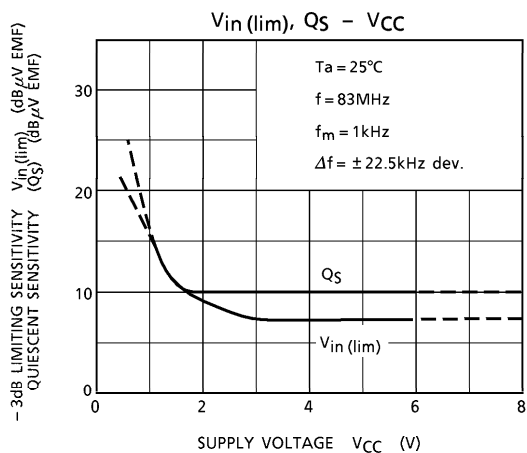
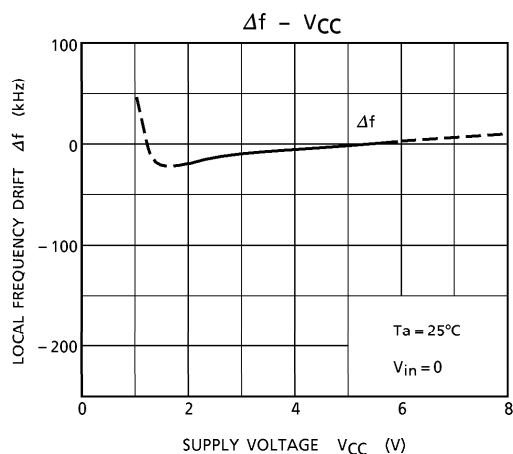
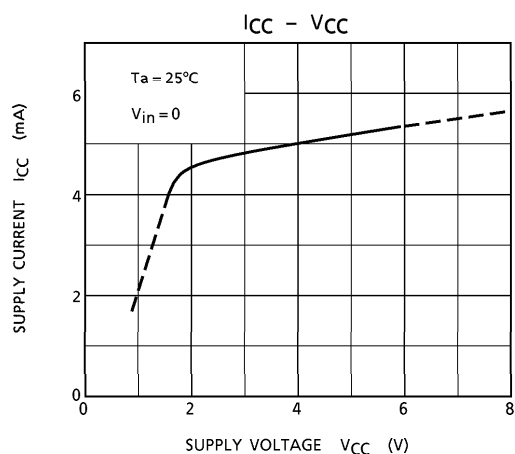
COIL	f <sub>o</sub>	Q <sub>o</sub>	TURNS	CAPACITANCE	
T <sub>1</sub> RF Coil	100MHz	100	0.5mmϕ 2 $\frac{1}{4}$ T Center Tap	15pF (External)	 FERRITE CORE
T <sub>2</sub> OSC Coil	100MHz	100	0.5mmϕ 2 $\frac{1}{2}$ T	15pF (External)	 FERRITE CORE
T <sub>3</sub> IFT Coil	10.7MHz	115	①-③ 12T ④-⑥ 1T Wire 0.12mmϕ UEW SUMIDA ELECTRIC Co., LTD. 5764 or Equivalent	75pF	 VCC PINⓄ (BOTTOM VIEW)
T <sub>4</sub> Quad Coil	10.7MHz	150	④-⑥ 14T Wire 0.12mmϕ UEW SUMIDA ELECTRIC Co., LTD. 44M-933A or Equivalent	47pF	 (BOTTOM VIEW)

Band Pass Filter (BPF)

SOSHIN ELECTRIC Co., LTD. BPWB5

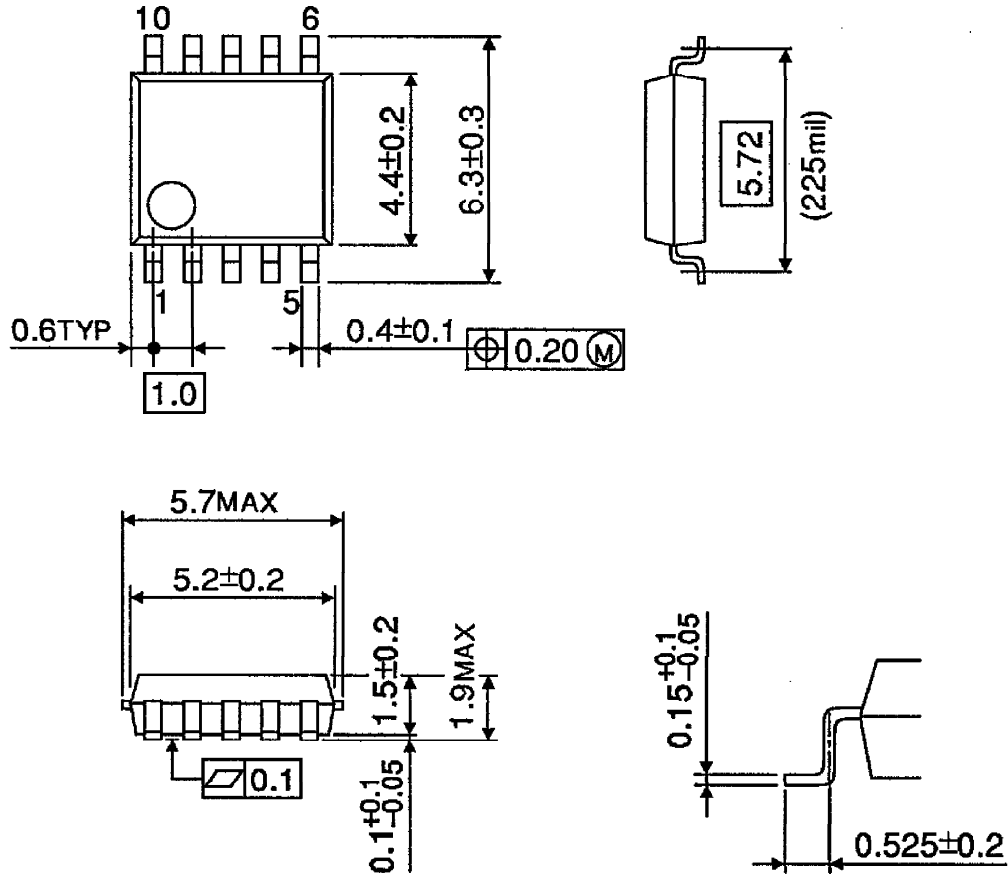
Tuning Capacitor

ALPS ELECTRIC Co., LTD. CB41EL933



OUTLINE DRAWING  
SSOP10-P-225-1.00

Unit : mm



Weight : 0.10g (Typ.)