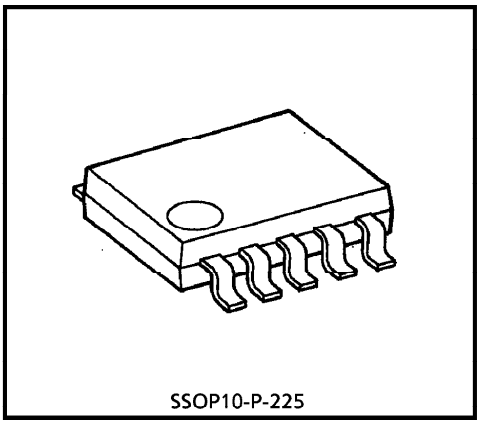
FM FRONT END IC

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.



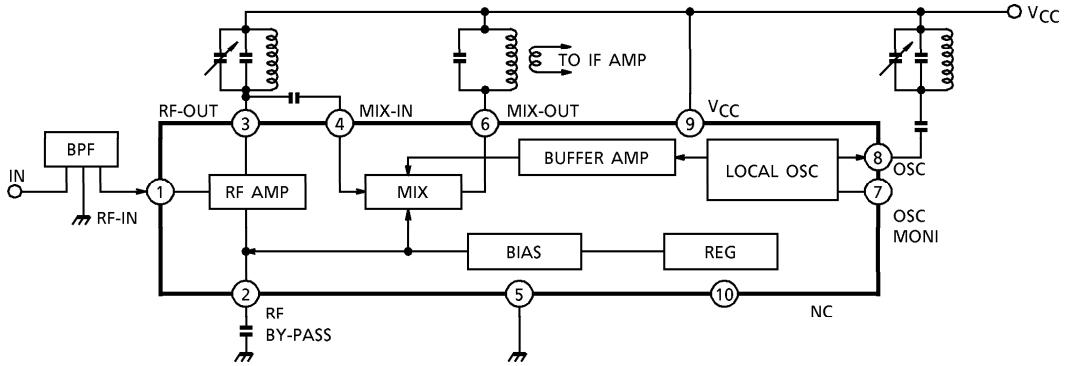
SSOP10-P-225

Weight : 0.10g (Typ.)

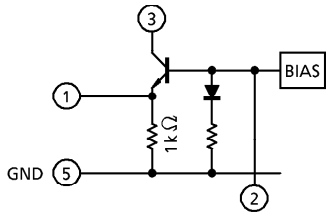
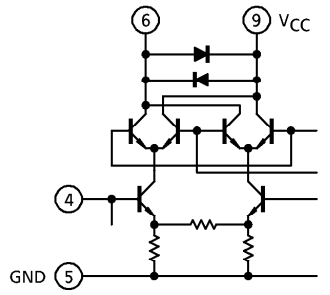
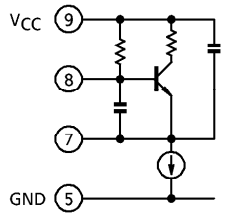
FEATURES

- Wide Supply Voltage Range : V_{CC} = 1.6~6.0V (Ta = 25°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 Clampping Diode for the Local Oscillator Output.

BLOCK DIAGRAM



EXPLANATION OF TERMINAL
(Terminal voltage is DC voltage at Ta = 25°C, V_{CC} = 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	V_{CC}	—	5.0
10	NC	—	—

MAXIMUM RATINGS (Ta = 25°C)

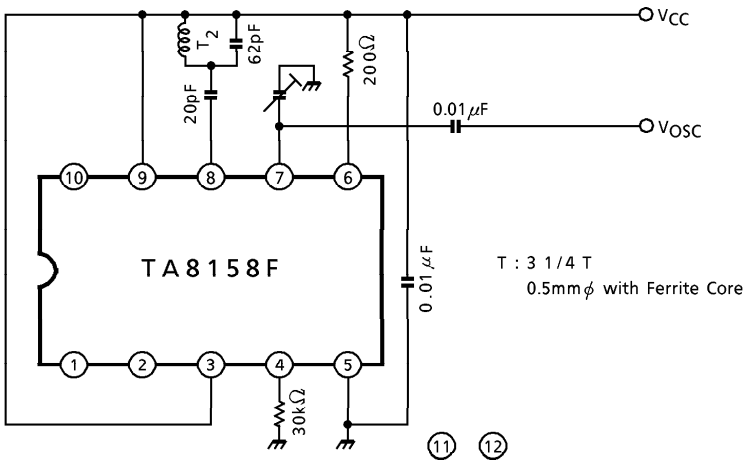
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	8	V
Power Dissipation	P_D (Note)	400	mW
Operating Temperature	T_{opr}	−25~75	°C
Storage Temperature	T_{stg}	−55~150	°C

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

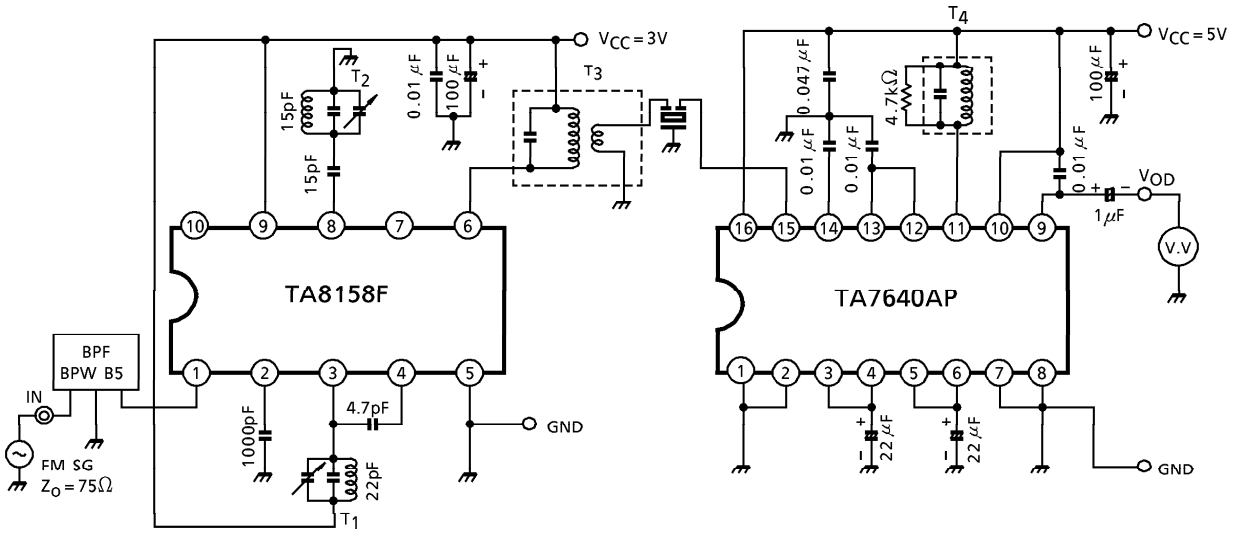
ELECTRICAL CHARACTERISTICS
Unless otherwise specified
(V_{CC} = 3V, f = 83MHz, f_m = 1kHz, Δf = 22.5kHz dev, Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		I_{CC}	2	V_{in} = 0	—	5.2	8.0	mA
−3dB Limiting Sensitivity		$V_{in\ (lim)}$	2	—	—	3.0	7.0	dBμV EMF
Quiescent Sensitivity		Q_S	2	—	—	11.0	—	dBμV EMF
Conversion Gain		G_C	—	—	—	31	—	dB
Local OSC Voltage		V_{OSC}	1	f_{OSC} = 60MHz	140	220	340	mV_{rms}
Pin① Impedance	Parallel Input Resistance	r_{ip1}	3	f = 83MHz	—	57	—	Ω
Pin③ Impedance	Parallel Output Resistance	r_{op3}	3		—	25	—	kΩ
	Parallel Output Capacitance	c_{op3}			—	2.0	—	pF
Pin④ Impedance	Parallel Input Resistance	r_{ip4}	3		—	2.7	—	kΩ
	Parallel Input Capacitance	c_{ip4}			—	3.3	—	pF
Pin⑥ Impedance	Parallel Output Resistance	r_{op6}	3	f = 10.7MHz	—	100	—	kΩ
	Parallel Output Capacitance	c_{op6}			—	4.8	—	pF
Local OSC Stop Voltage		V_{stop}	1	—	—	0.9	—	V

TEST CIRCUIT 1



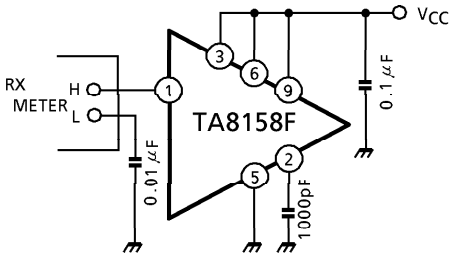
TEST CIRCUIT 2



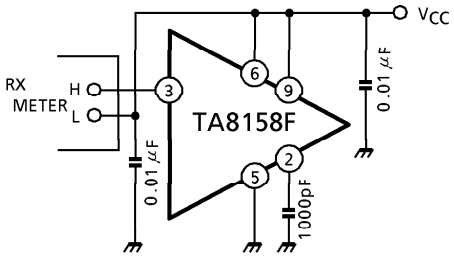
TEST CIRCUIT 3

Input, output impedance

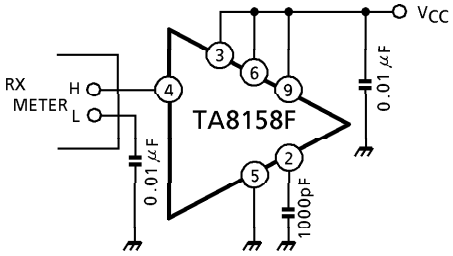
(1) r_{ip1}



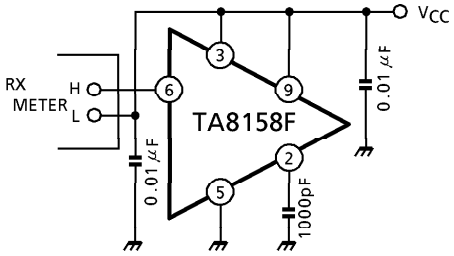
(2) r_{op3}, c_{op3}



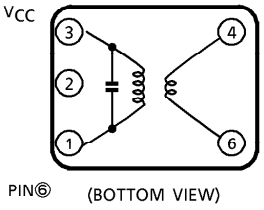
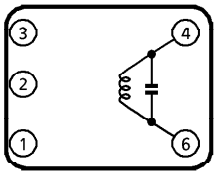
(3) r_{ip4}, c_{ip4}



(4) r_{op6}, c_{op6}



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

COIL	f_o	Q_o	TURNS	CAPACI-TANCE	
T_1 RF Coil	100MHz	100	0.5mmϕ 2 $\frac{1}{4}$ T Center Tap	15pF (External)	
T_2 OSC Coil	100MHz	100	0.5mmϕ 2 $\frac{1}{2}$ T	15pF (External)	
T_3 IFT Coil	10.7MHz	115	①-③ 12T ④-⑥ 1T Wire 0.12mmϕ UEW SUMIDA ELECTRIC Co., LTD. 5764 or Equivalent	75pF	
T_4 Quad Coil	10.7MHz	150	④-⑥ 14T Wire 0.12mmϕ UEW SUMIDA ELECTRIC Co., LTD. 44M-933A or Equivalent	47pF	

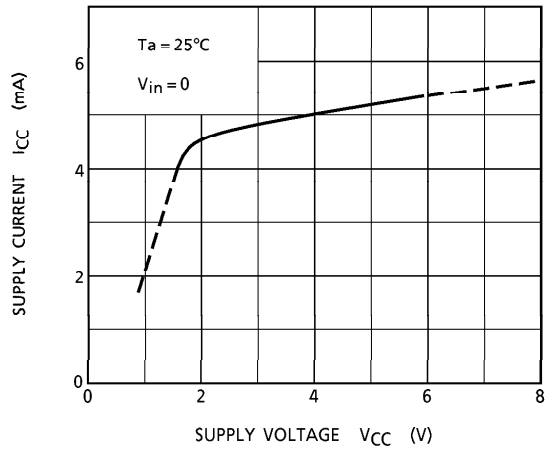
Band Pass Filter (BPF)

SOSHIN ELECTRIC Co., LTD. BPWB5

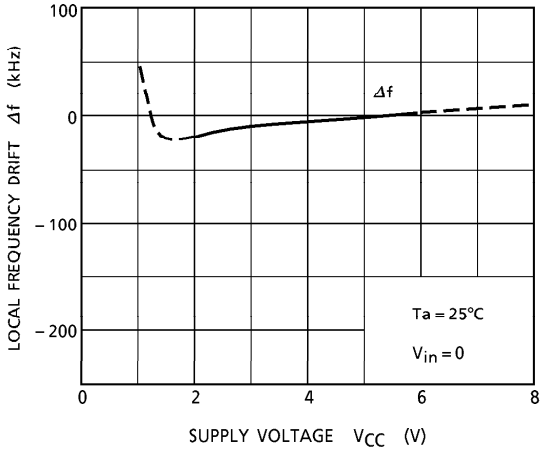
Tuning Capacitor

ALPS ELECTRIC Co., LTD. CB41EL933

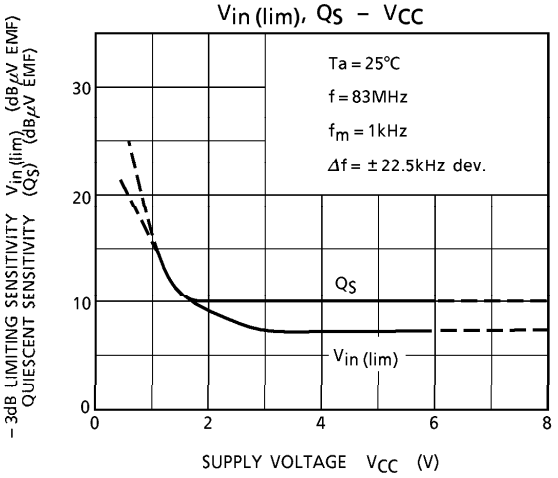
I_{CC} – V_{CC}



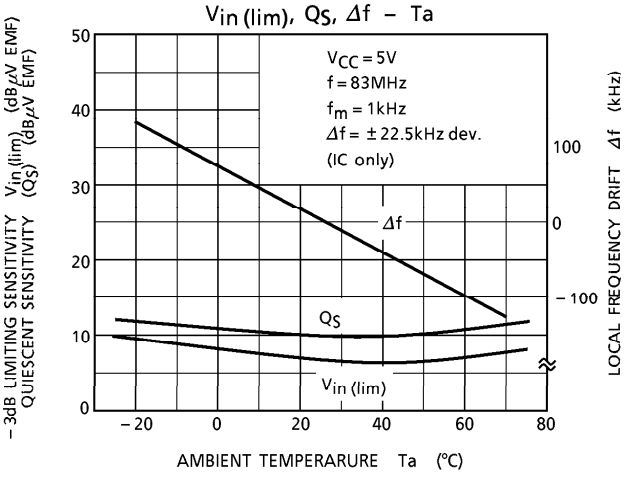
Δf – V_{CC}



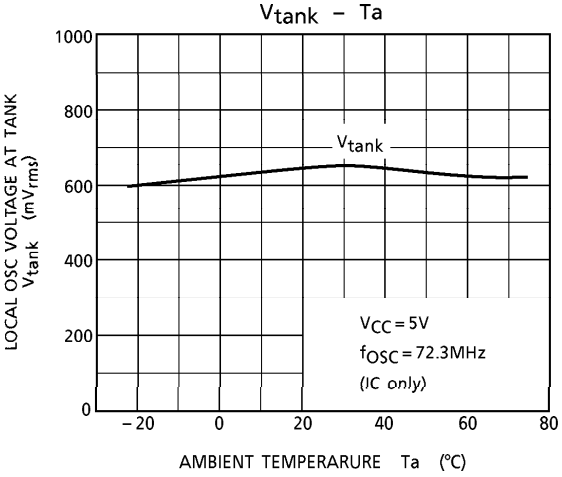
$V_{in\,(lim)}$, Q_S – V_{CC}



$V_{in\,(lim)}$, Q_S, Δf – Ta



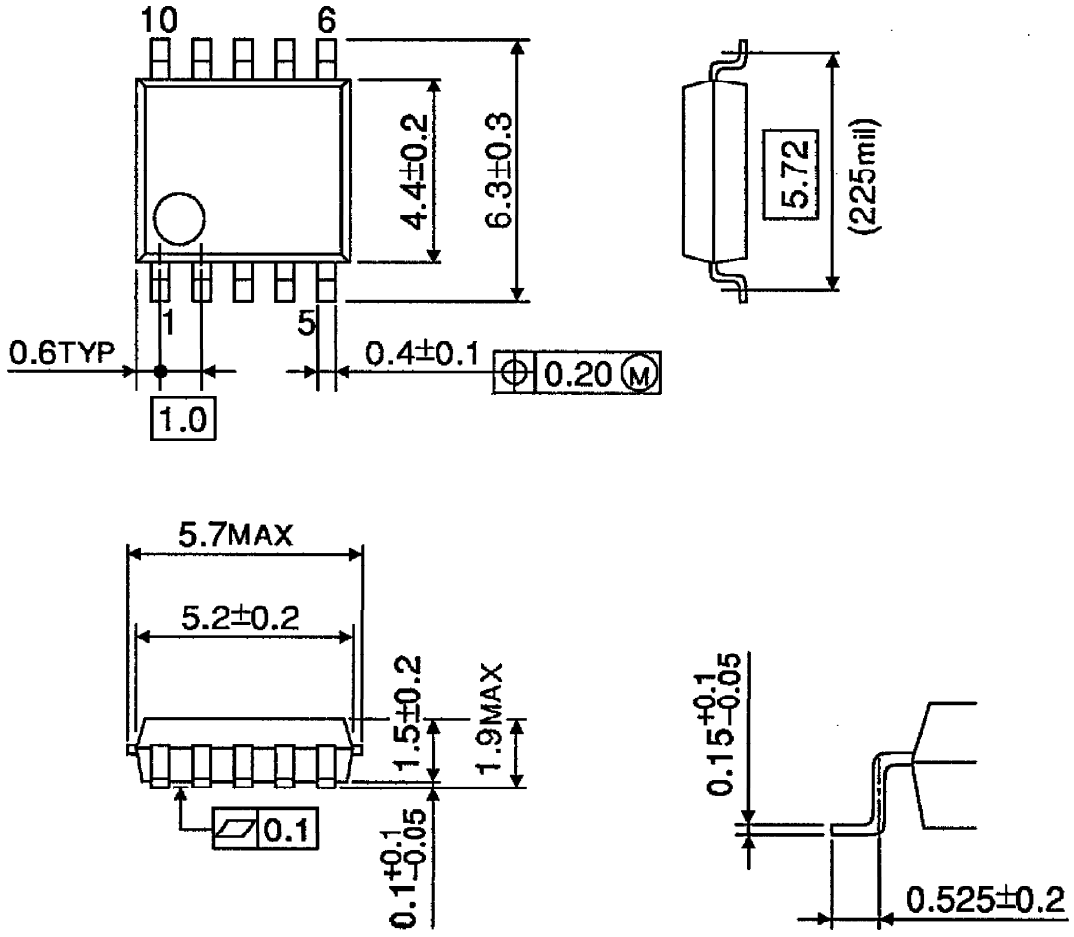
V_{tank} – Ta



OUTLINE DRAWING

SSOP10-P-225

Unit : mm



Weight : 0.10g (Typ.)