

TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

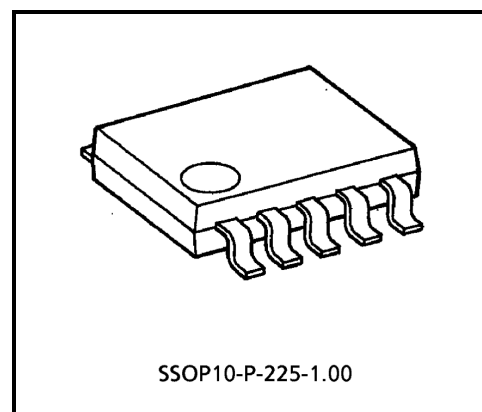
TA8158F

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.

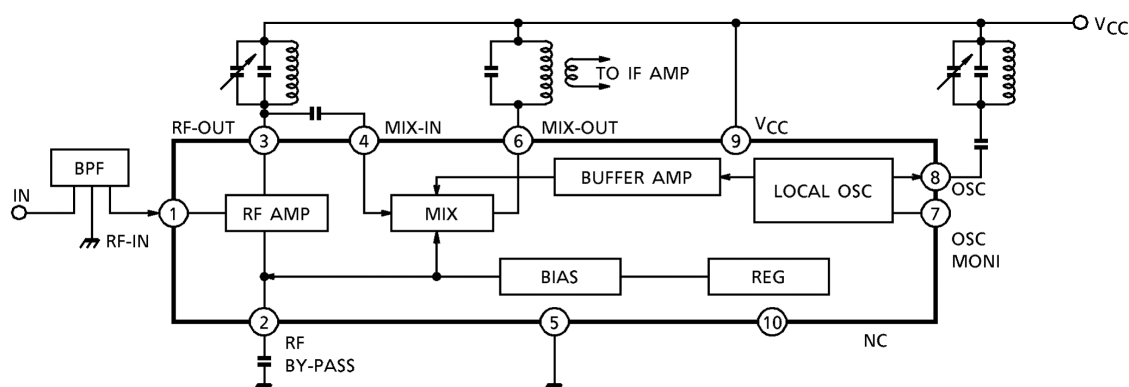
Features

- 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.



Weight: 0.10g (typ.)

Block Diagram



Explanation Of Terminal

(terminal voltage is DC voltage at $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$, 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, pin(4)	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.

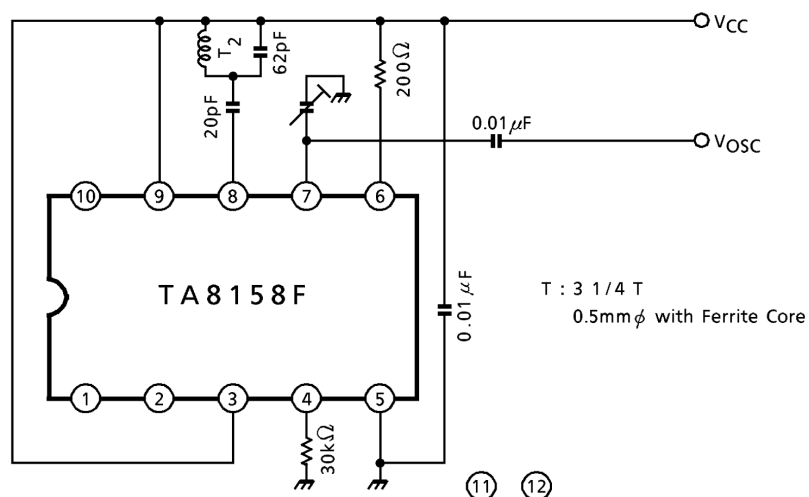
Electrical Characteristics

Unless Otherwise Specified

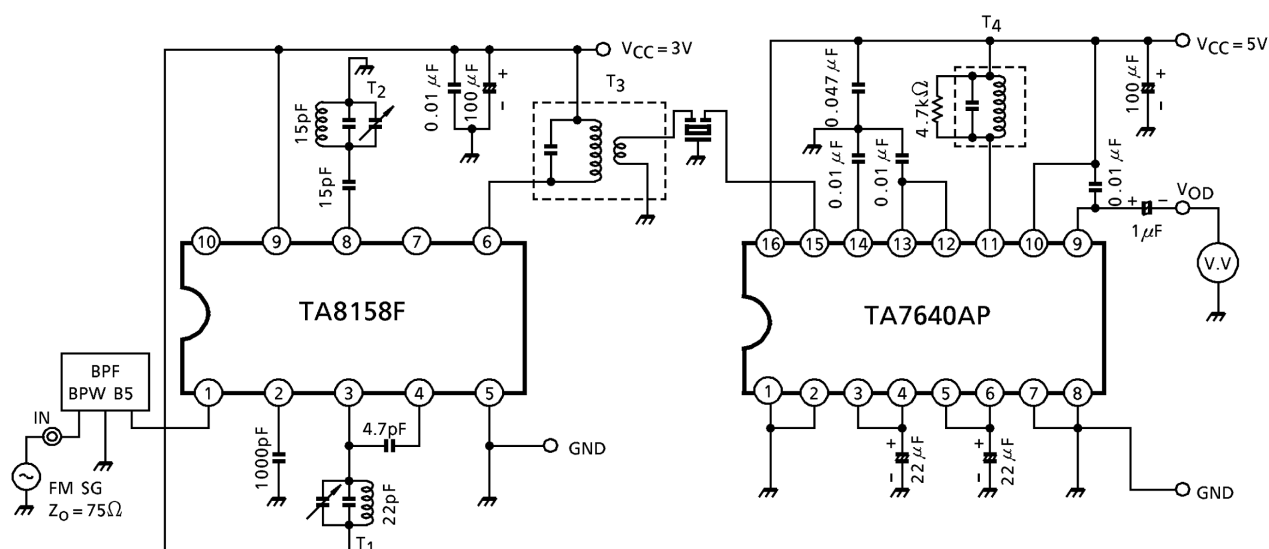
(V_{CC} = 3V, f = 83MHz, f_m = 1kHz, Δf = 22.5kHz dev, Ta = 25°C)

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}
Pin(1) impedance	Parallel input resistance	r _{ip1}	3	f = 83MHz	—	57	—	Ω
Pin(3) impedance	Parallel output resistance	r _{op3}	3		—	25	—	kΩ
	Parallel output capacitance	C _{op3}			—	2.0	—	pF
Pin(4) impedance	Parallel input resistance	r _{ip4}	3		—	2.7	—	kΩ
	Parallel input capacitance	C _{ip4}			—	3.3	—	pF
Pin(6) 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

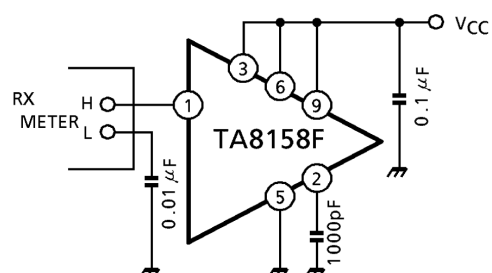
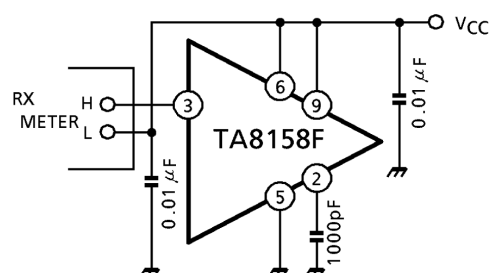
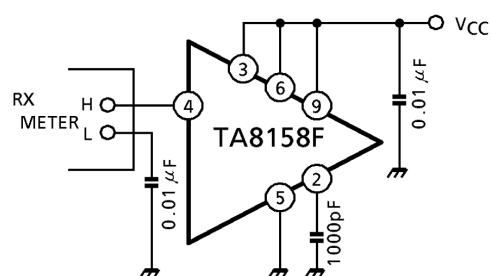
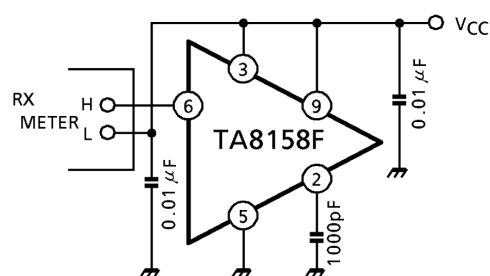


Test Circuit 2

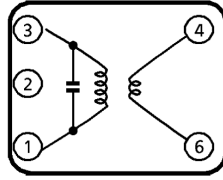
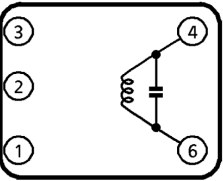


Test Circuit 3

Input, output impedance

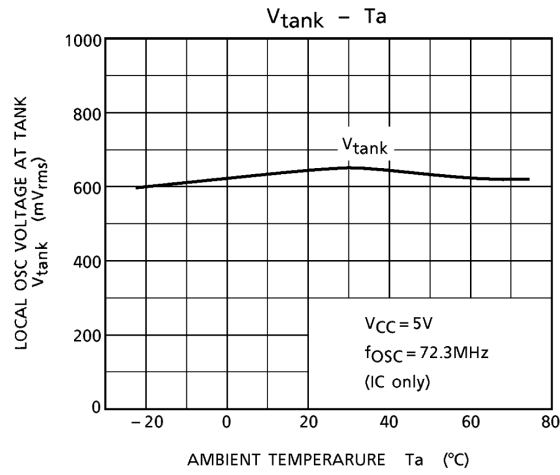
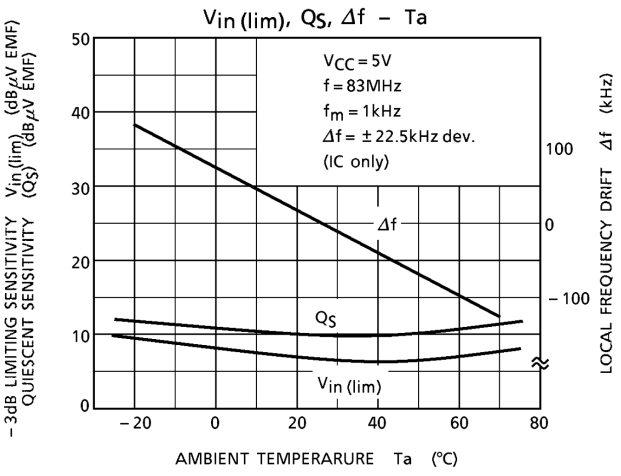
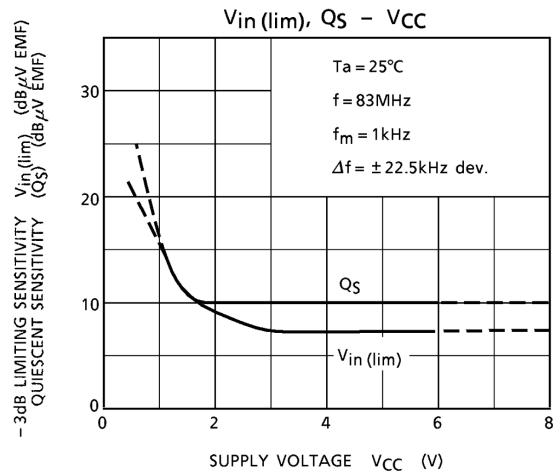
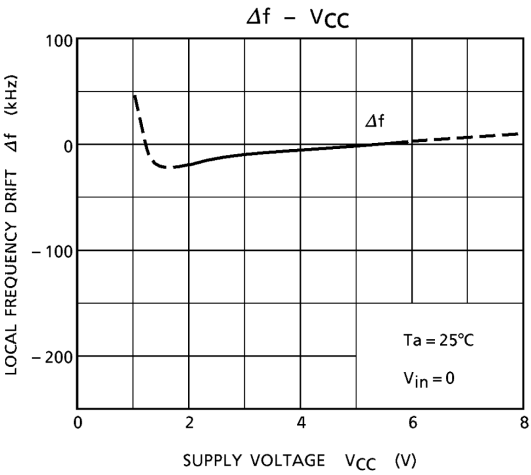
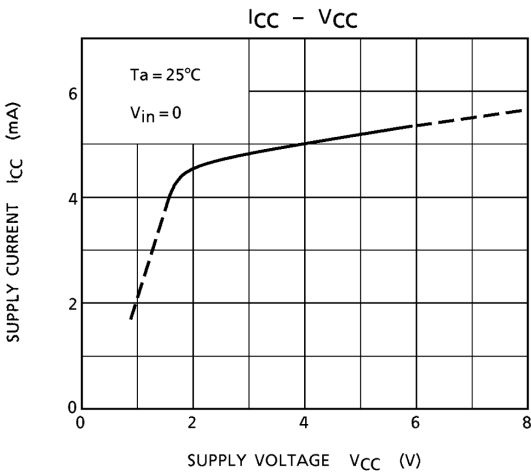
(1) r_{ip1} (2) r_{op3} , c_{op3} (3) r_{ip4} , c_{ip4} (4) r_{op6} , c_{op6} 

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 ⁴	15pF (external)	 FERRITE CORE
T ₂ OSC coil	100MHz	100	0.5mmφ 2 $\frac{1}{2}$ T	15pF (external)	 FERRITE CORE
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	 PIN⑥ (BOTTOM VIEW)
T ₄ 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

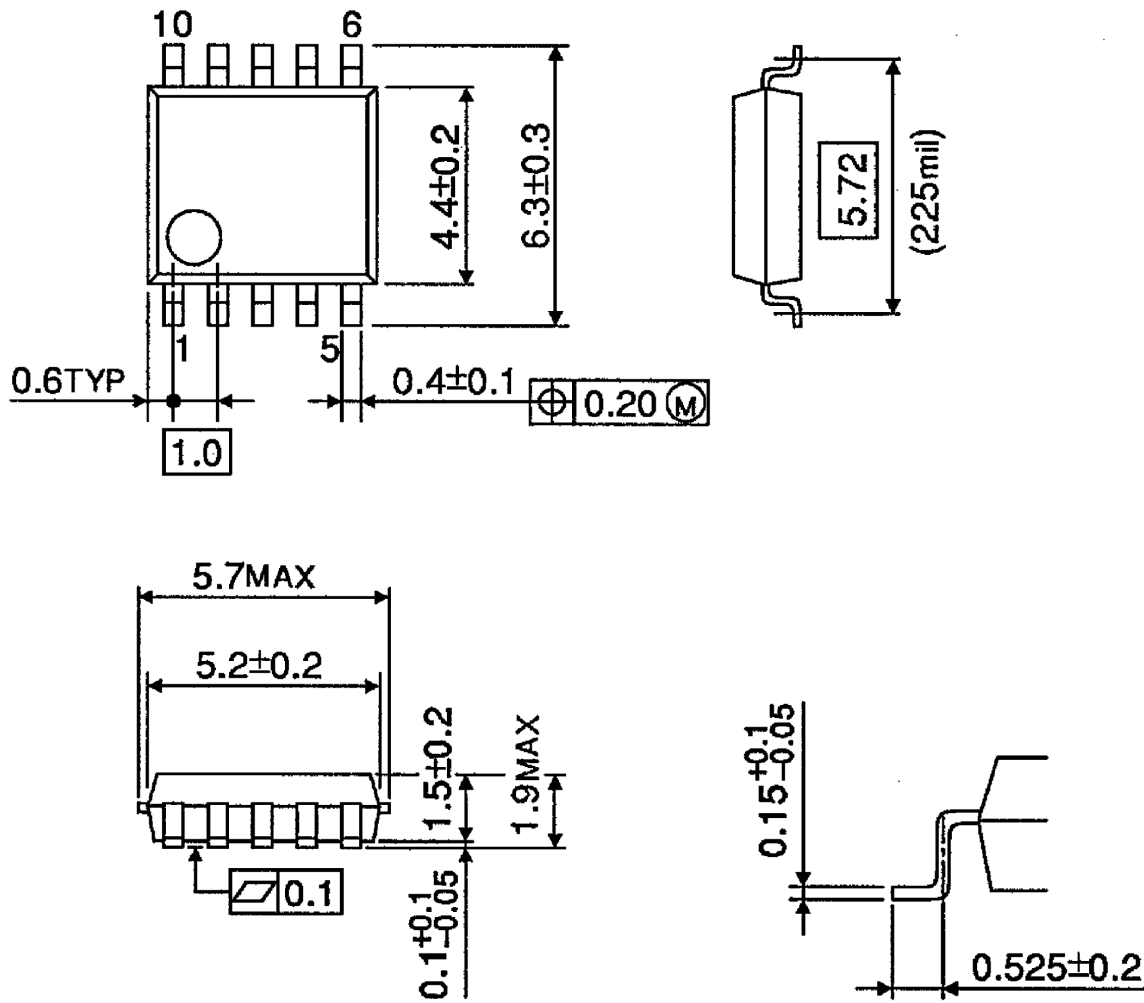
Tuning capacitor
ALPS ELECTRIC Co., LTD. CB41EL933



Package Dimensions

SSOP10-P-225-1.00

Unit : mm



Weight: 0.10g (typ.)

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000707EBA

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