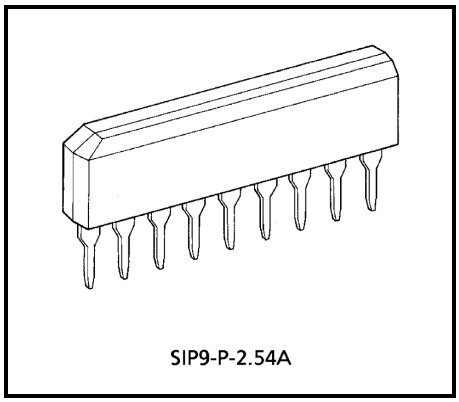
TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA7358PG

FM Front−End

The TA7358PG is designed for a FM front−end application, which is suitable to a portable radio or a radio cassette.
Comparing with conventional types, supply voltage dependence, overload characteristics and spuious radiation characteristics are improved.

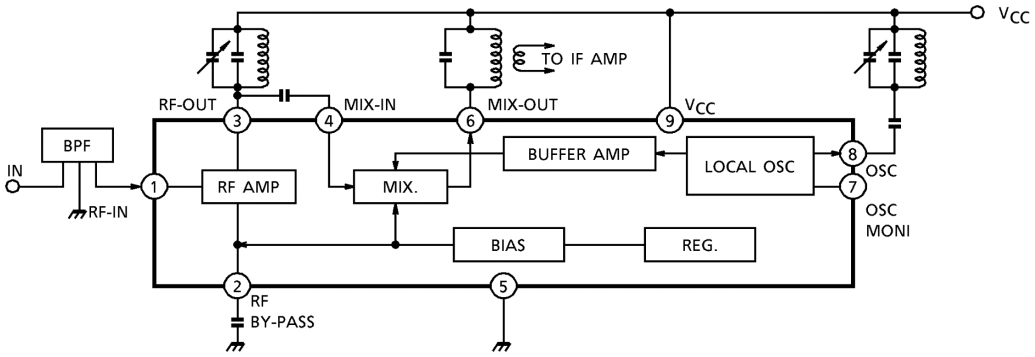


Weight: 0.92g (typ.)

Features

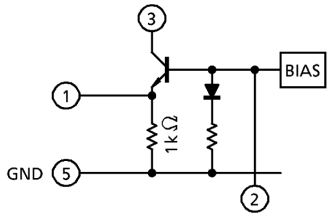
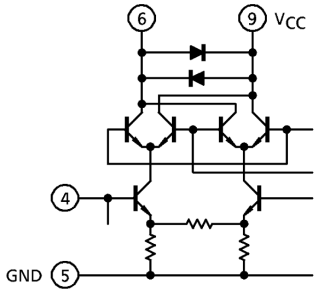
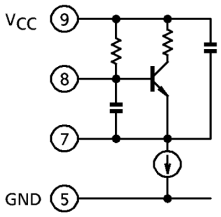
- Wide supply voltage range : V_{CC} = 1.6~6.0V
- Excellent supply voltage dependence of local oscillator
  : Oscillation stop V_{CC} = 0.9V (typ.)
- Improved inter−modulation characteristics by double balanced type mixer circuit.
- Low spurious radiation.
- Build−in clampping diode for the local oscillator output.

Block Diagam



Explanation Of Terminals

(terminal voltage is DC voltage at Ta = 25°C, V_{CC} = 5V, and no signal)

Pin No.	Symbol	Internal	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

Absolute Maximum Ratings (Ta = 25°C)

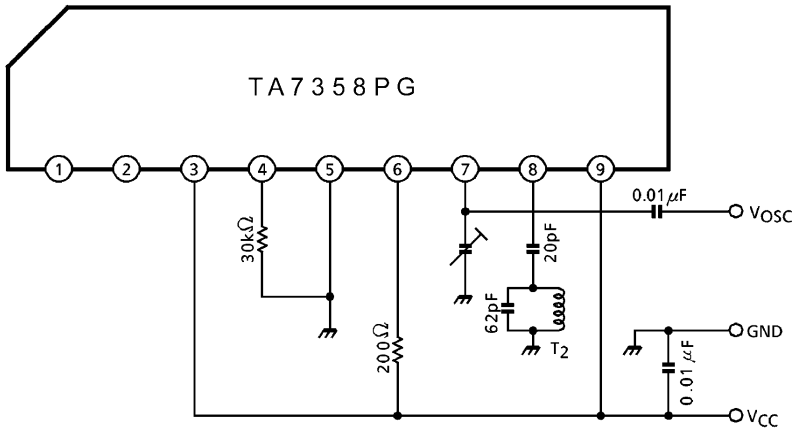
Characteristic	Symbol	Rating	Unit
Supply voltage	V_{CC}	8	V
Power dissipation	P_D (Note)	500	mW
Operating temperature	T_{opr}	−25~75	°C
Storage temperature	T_{stg}	−55~150	°C

(Note) Derated above 25°C in the proportion of 4mW / °C.

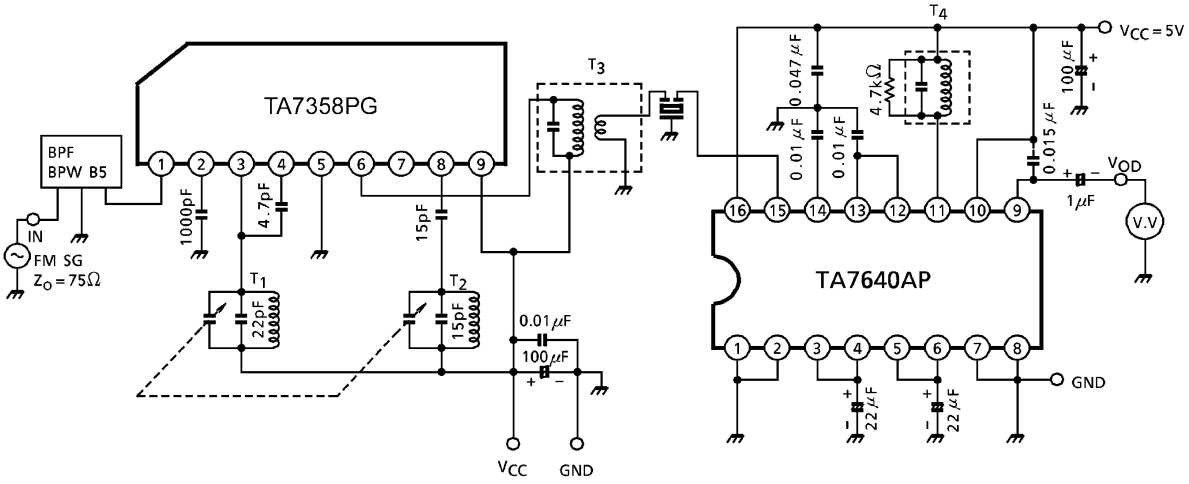
Electrical Characteristics (V_{CC} = 3V, f = 83MHz, f_m = 1kHz, Δ_f = ±22.5kHz, Ta = 25°C)

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		Vin (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	150	230	350	mV_{rms}
Pin(1) impedance	Parallel input resistance	$r_{ip}1$	3	f = 83MHz	—	57	—	Ω
Pin(3) impedance	Parallel output resistance	$r_{op}3$	3		—	25	—	kΩ
	Parallel output capacitance	$c_{op}3$			—	2.0	—	pF
Pin(4) impedance	Parallel input resistance	$r_{ip}4$	3		—	2.7	—	kΩ
	Parallel input capacitance	$c_{ip}4$			—	3.3	—	pF
Pin(6) impedance	Parallel output resistance	$r_{op}6$	3	f = 10.7MHz	—	100	—	kΩ
	Parallel output capacitance	$c_{op}6$			—	4.8	—	pF
Local OSC stop voltage		V_{stop}	1	—	—	0.9	1.3	V

Test Circuit 1



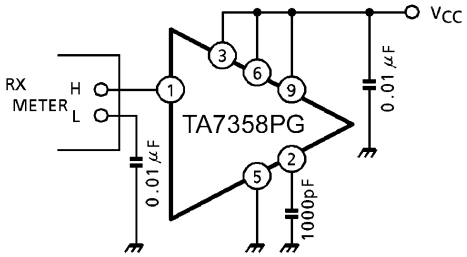
Test Circuit 2



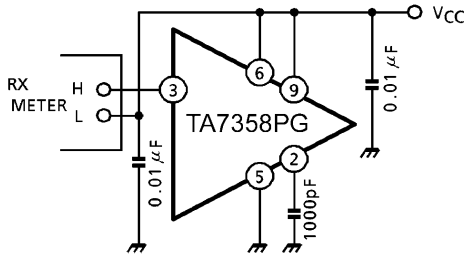
Test Circuit 3

Input,output impedance

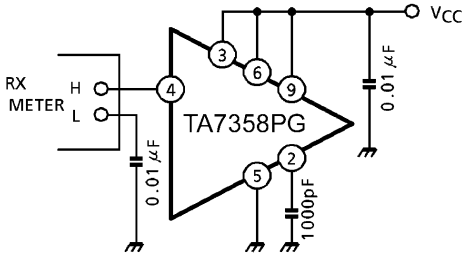
(1) r_{ip1}



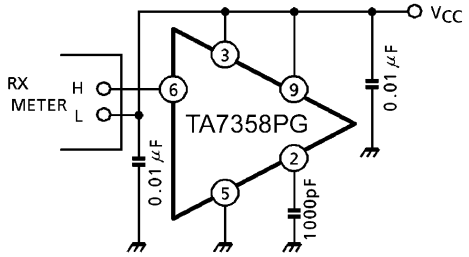
(2) r_{op3}, c_{op3}



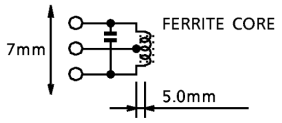
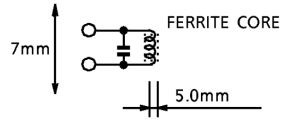
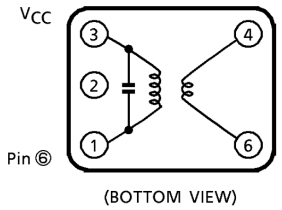
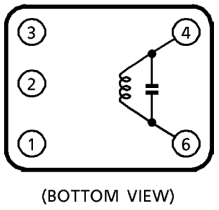
(3) r_{ip4}, c_{ip4}



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

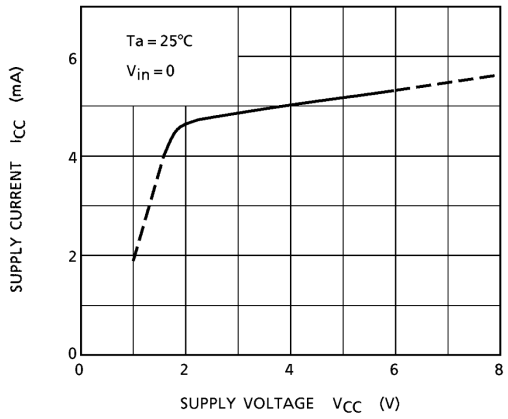


Test Circuit Coil Data (japan band for 76.0MHz to 108.0MHz)

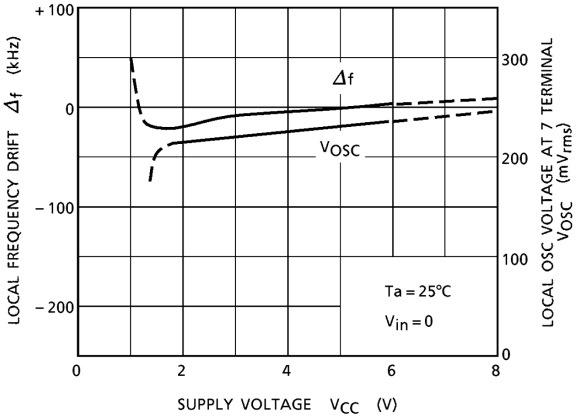
Coil	f_o	Q_o	Turns	Capacitance	
T_1 RF coil	100MHz	100	0.7mmϕ 2 $\frac{1}{4}$ T Center tap (japan band)	15pF (external)	
T_2 OSC coil	100MHz	100	0.7mmϕ 2 $\frac{1}{2}$ T (japan band)	15pF (external)	
T_3 IFT	10.7MHz	115	(1)–(3) 12T (4)–(6) 1T Wire 0.12mmϕ UEW Sumida electric Co., LTD. 5764 or equivalent	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. BPW85
Tuning capacitor
Alps electric CO., LTD. CB41EL933

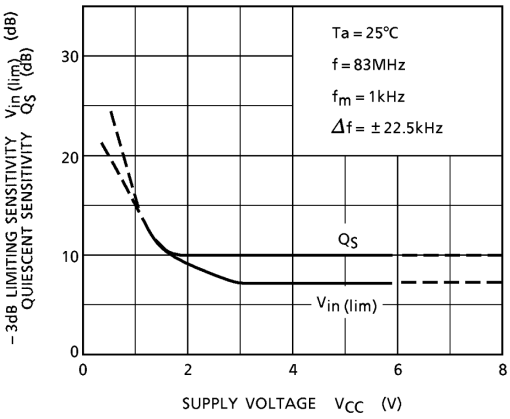
I_{CC} – V_{CC}



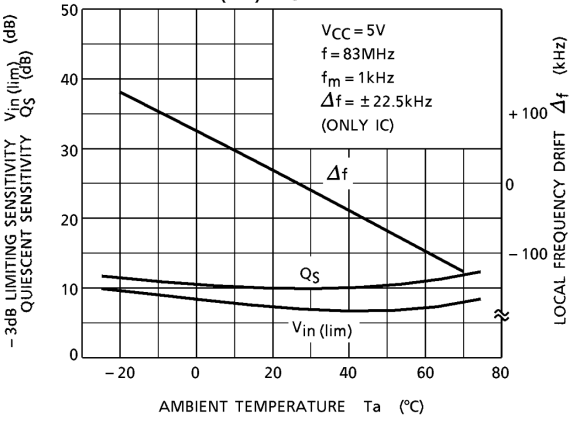
Δf, V_{OSC} – V_{CC}



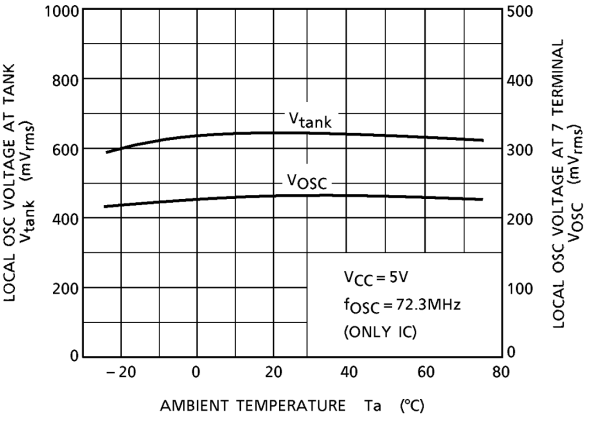
$V_{in\,(lim)}$, Q_S – V_{CC}



$V_{in\,(lim)}$, Q_S, Δf – Ta

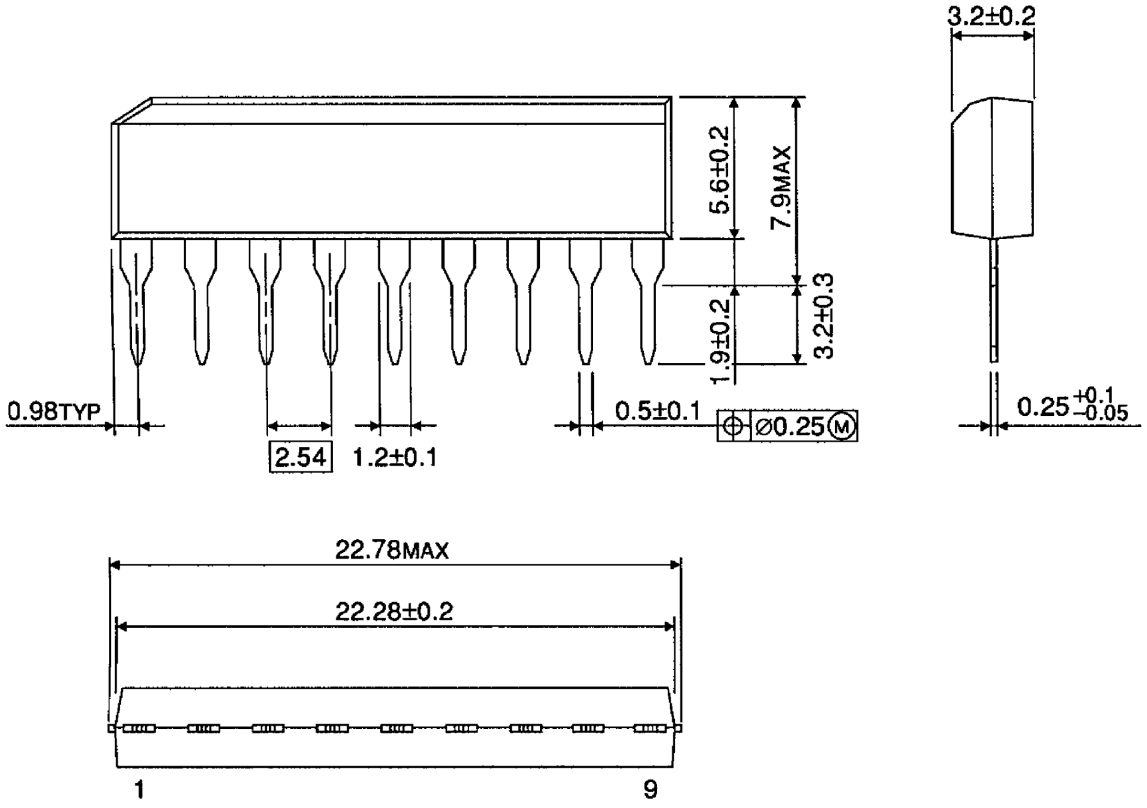


V_{tank}, V_{OSC} – Ta



Package Dimensions

SIP9-P-2.54A Unit : mm



Weight : 0.92g (typ.)

RESTRICTIONS ON PRODUCT USE

060116EBA

- The information contained herein is subject to change without notice. 021023_D
- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
  In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc. 021023_A
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk. 021023_B
- The products described in this document shall not be used or embedded to any downstream products of which manufacture, use and/or sale are prohibited under any applicable laws and regulations. 060106_Q
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others. 021023_C
- The products described in this document are subject to the foreign exchange and foreign trade laws. 021023_E

About solderability, following conditions were confirmed

- Solderability

  (1) Use of Sn-37Pb solder Bath
  - solder bath temperature = 230°C
  - dipping time = 5 seconds
  - the number of times = once
  - use of R-type flux

  (2) Use of Sn-3.0Ag-0.5Cu solder Bath
  - solder bath temperature = 245°C
  - dipping time = 5 seconds
  - the number of times = once
  - use of R-type flux