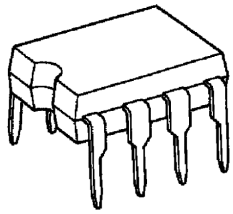
TOSHIBA Bipolar Digital Integrated Circuit Silicon Monolithic

TD7104P,TD7104F

ECL Prescaler For Digital Synthesized Tuner

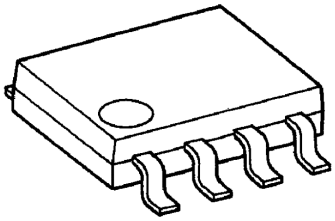
TD7104P,TD7104F are general−purpose fixed dividing prescaler developed for digital tuning system of PLL frequency synthesizer type, and can operate up to 1GHz.

TD7104P



DIP8-P-300-2.54A

TD7104F



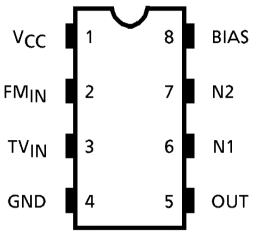
SOP8-P-225-1.27

Weight
DIP8−P−300−2.54A: 0.45g (typ.)
SOP8−P−225−1.27: 0.76g (typ.)

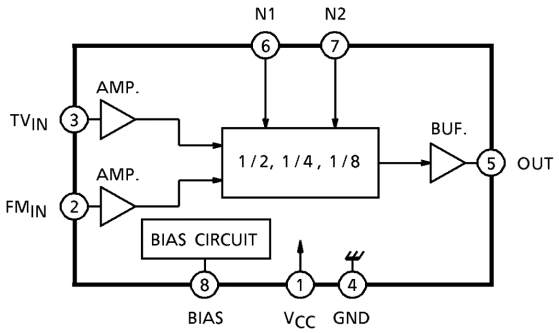
Features

- Maximum operating frequency 1GHz.
  (at 1 / 8 dividign mode)
- Dividing ratios of 1 / 8, 1 / 4, and 1 / 2 are provided.
- Independent TV and FM inputs are provided.
  In FM mode, this IC can function as a buffer amplifier (1 / 1 dividing).
- The built−in input amplifier contributes to realizing high input voltage sensitivity.
- built−in stand−by circuit

Pin Connection



Block Diagram



Pin Function

Pin No.	Symbol	Pin Name	Function And Description	Remarks
1	V_{CC}	Power supply terminal	Applies voltage of V_{CC} = 3.0 to 5.5V	—
2	FM_{IN}	FM local OSC. signal input terminal	Inputs local oscillation signal in FM band. f_{IN} = 50 to 200MHz, FM_{IN} input signal is output by 1 / 1 dividing (buffer amplifier).	Built−in input Amp. provided
3	TV_{IN}	TV local OSC. signal input terminal	Inputs local oscillation signal in TV band. F_{IN} = 50M to 1.0GHz, TV_{IN} input signal is output by 1 / 8, 1 / 4, or 1 / 2 dividing, which is controlled with N1 and N2 input.	Built−in input Amp. provided
4	GND	Ground terminal	Grounds.	—
5	Out	Dividing signal output terminal	Outputs dividing signal.	—
6	N1	Dividing ratio selecting control terminal	These inputs control the selection of a dividing ratio among 1 / 1, 1 / 2, 1 / 4, and 1 / 8. FM_{IN} terminal is selected at N1 = N2 = "L" level (1 / 1 dividing). The truth table is shown below.	—
7	N2			
8	BIAS	BIAS terminal	Connects capacitors on bias circuit. Change this pin into low, the IC is turned stand−by mode.	—

Truth Table

Receiving Band	Input Terminal	Operating Frequency Range	Dividing Ratio	N1	N2
FM	FM_{IN}	50M~200MHz	÷1	0	0
TV	TV_{IN}	50M~400MHz	÷2	1	0
		100M~500MHz	÷4	0	1
		100M~1.0GHz	÷8	1	1

Maximum Ratings (Ta = 25°C)

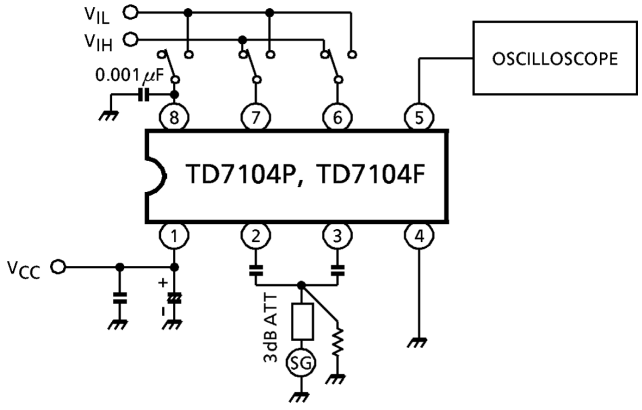
Characteristic	Symbol	Rating	Unit
Power supply voltage	V_{CC}	6.5	V
Power dissipation	P_D	450 (200) (*)	mW
Input voltage	V_{in}	−0.3~V_{CC} + 0.3	V
Operating temperature	T_{opr}	−30~75	°C
Storage temperature	T_{stg}	−55~150	°C

(*) Flat package

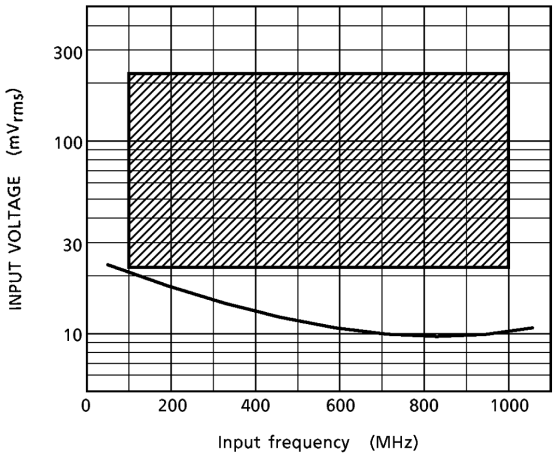
Electrical Characteristics (unless otherwise specified, V_{CC} = 3.0~6.0V, Ta = −30~75°C)

Characteristic		Symbol	Test Cir−cuit	Test Condition		Min.	Typ.	Max.	Unit
Power supply voltage		V_{CC}	—	—		3.0	~	6.0	V
Operating supply current		I_{CC1}	—	V_{CC} = 5.0V, ÷8, ÷4		—	14	20	mA
		I_{CC2}	—	V_{CC} = 5.0V, ÷2		—	11	18	
		I_{CC3}	—	V_{CC} = 5.0V, FM mode		—	7	13	
Stand−by current		I_{CS}	—	V_{CC} = 5.0V, BIAS = GND		—	30	70	μA
Operating frequency range		f_{IN1}	1	÷8, TV_{IN}		100	—	1000	MHz
		f_{IN2}		÷4, TV_{IN}		100	—	500	
		f_{IN3}		÷2, TV_{IN}		50	—	400	
		f_{IN4}		FM mode, FM_{IN}		50	—	200	
Input voltage range		V_{IN1}	1	TV_{IN} (÷8, ÷4)		22.0	—	220	mV_{rms}
		V_{IN2}		TV_{IN} (÷2)	f_{IN} = 50~100MHz	35.0	—	220	
					f_{IN} = 100~400MHz	22.0	—	220	
		V_{IN3}		FM_{IN}		22.0	—	220	
Output amplitude		V_{OUT}	1	Out, C_L = 3pF		0.4	0.5	—	V_{p-p}
Input voltage	"H" level	V_{IH}	—	N1, N2, BIAS		2.5	—	V_{CC}	V
	"L" level	V_{IL}	—	N1, N2, BIAS		0	—	0.8	
Input current	"H" level	I_{IH}	—	N1, N2, BIAS, V_{CC} = 5.0V V_{IH} = 4.0V		—	—	100	μA
	"L" level	I_{IL}	—	N1, N2, BIAS, V_{CC} = 5.0V V_{IL} = 1.0V		—	—	10	

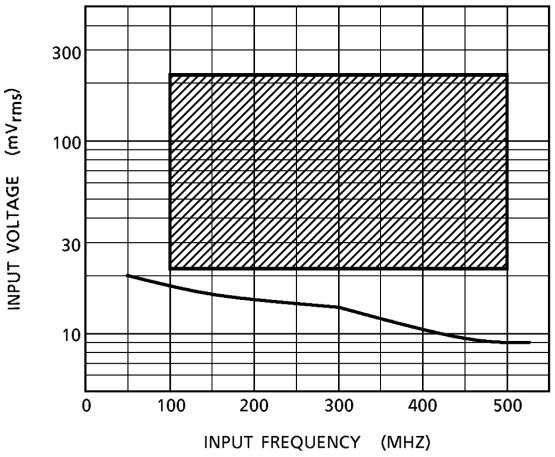
Test Circuit 1 (input voltage sensitivity)



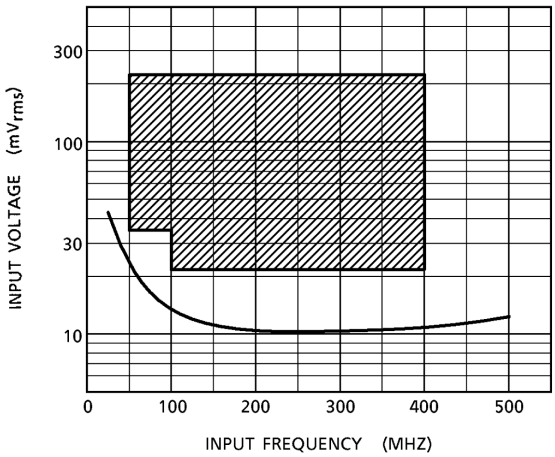
1/8 MODE INPUT VOLTAGE SENSITIVITY
(V_{CC} = 5.0V, Ta = 25°C)



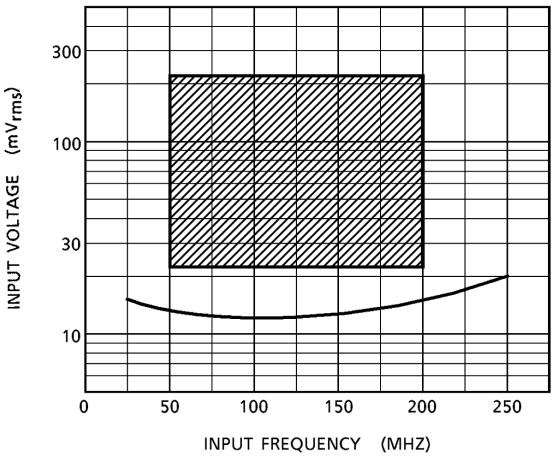
1/4 MODE INPUT VOLTAGE SENSITIVITY
(V_{CC} = 5.0V, Ta = 25°C)



1/2 MODE INPUT VOLTAGE SENSITIVITY
(V_{CC} = 5.0V, Ta = 25°C)



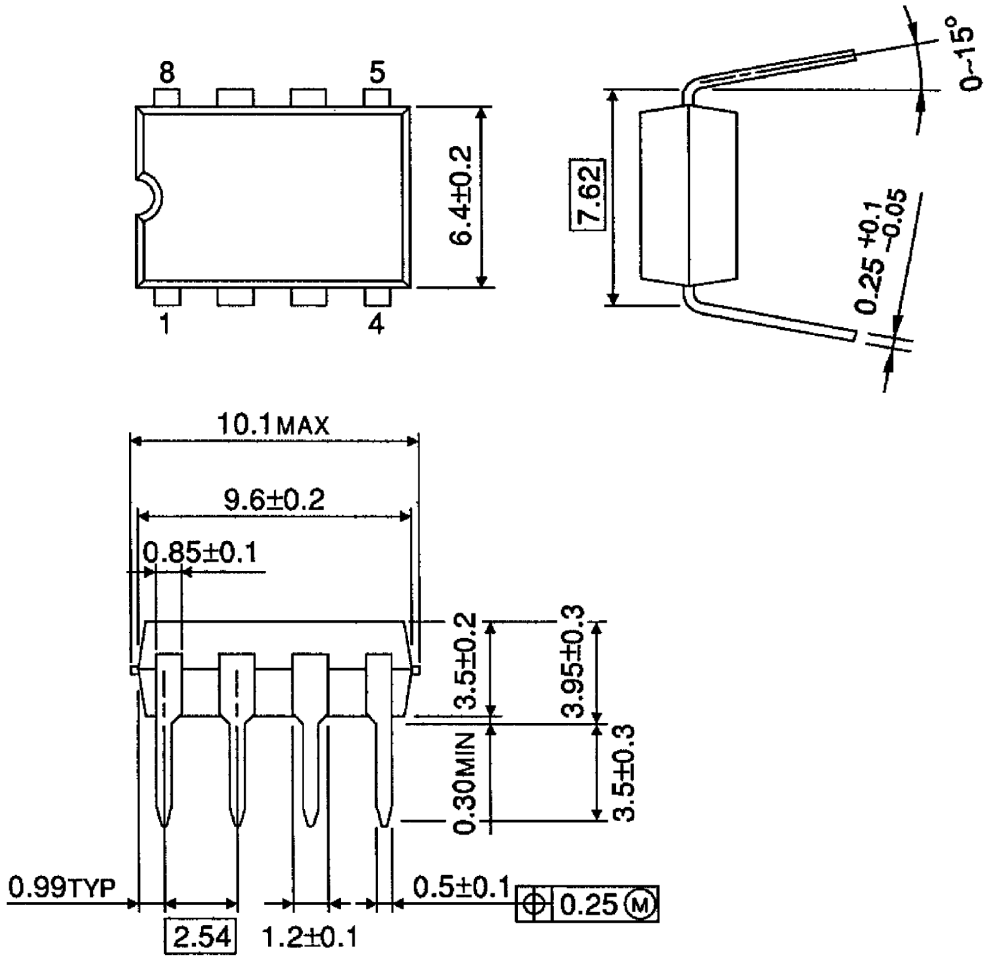
1/1 MODE INPUT VOLTAGE SENSITIVITY
(V_{CC} = 5.0V, Ta = 25°C)



(Note) ▨ Operating range (V_{CC} = 3.0~6.0V, Ta = −30~75°C)

Package Dimensions

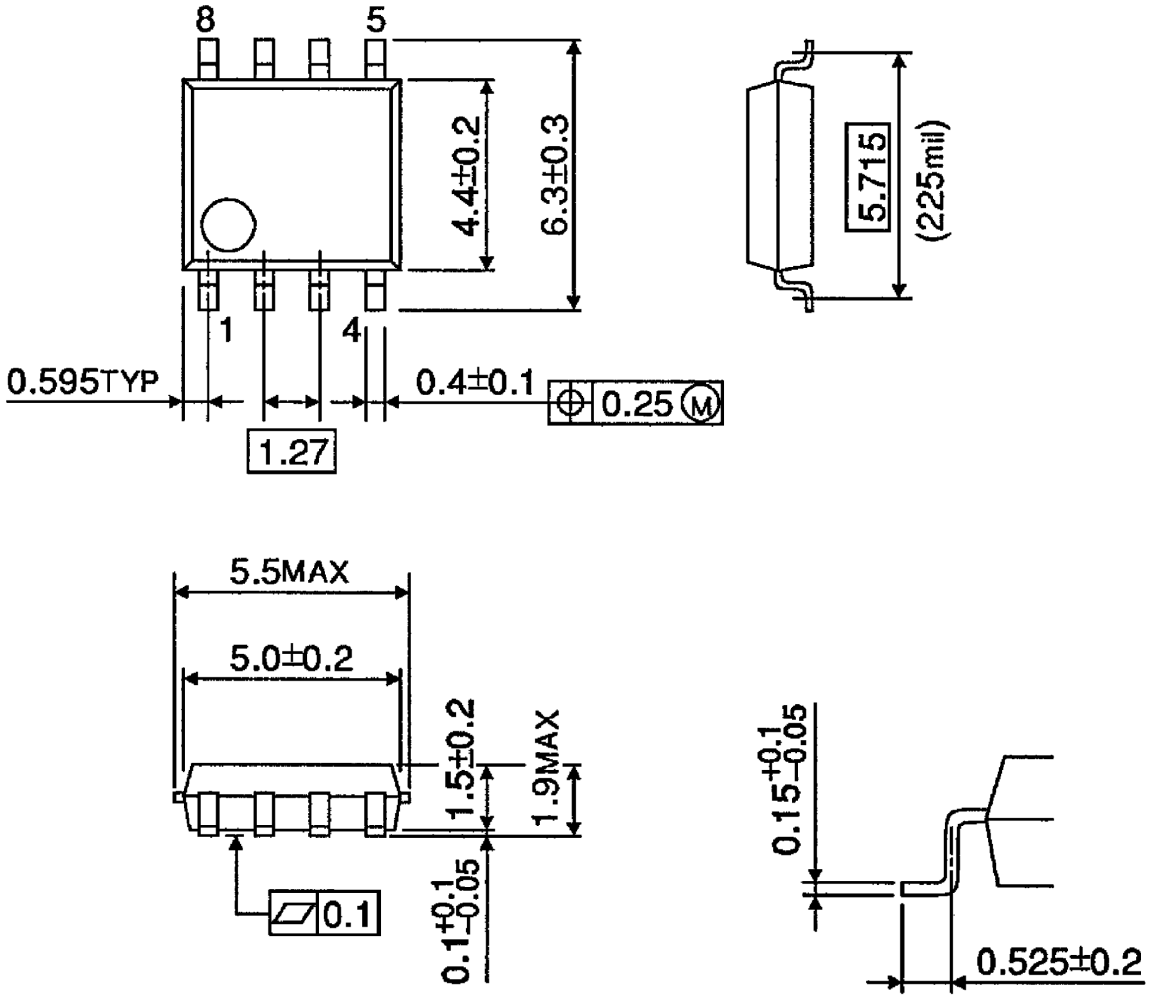
DIP8-P-300-2.54A Unit : mm



Weight: 0.45g (typ.)

Package Dimensions

SOP8-P-225-1.27 Unit : mm



Weight: 0.76g (typ.)

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