

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

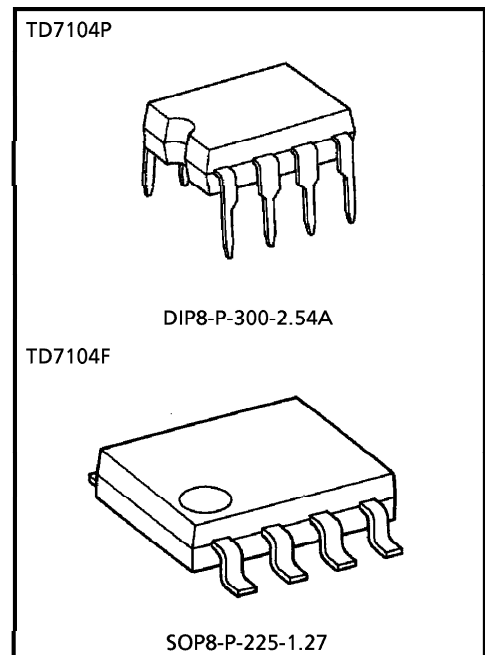
TD7104P, TD7104F

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.

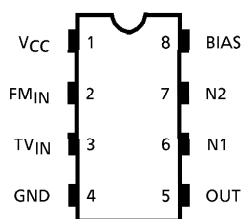
FEATURES

- Maximum operating frequency 1GHz.
(at 1/8 dividing 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

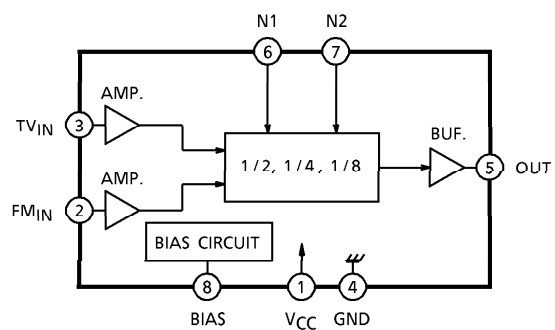


Weight
DIP8-P-300-2.54A : 0.45g (Typ.)
SOP8-P-225-1.27 : 0.76g (Typ.)

PIN CONNECTION



BLOCK DIAGRAM



980508EBA2

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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)

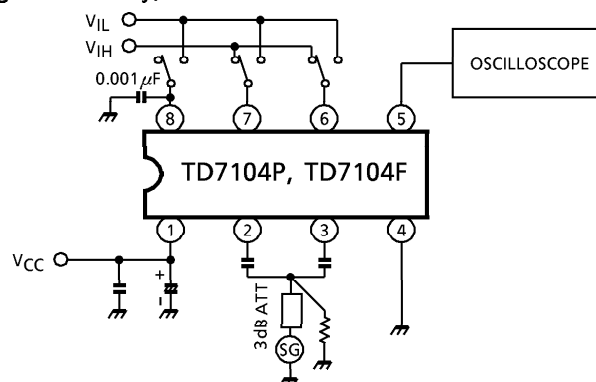
CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Supply Voltage	V _{CC}	6.5	V
Power Dissipation	P _D	450 (200) (*)	mW
Input Voltage	V _{in}	-0.3~V _{CC} +0.3	V
Operating Temperature	T _{opr}	-30~75	°C
Storage Temperature	T _{stg}	-55~150	°C

(*) Flat Package

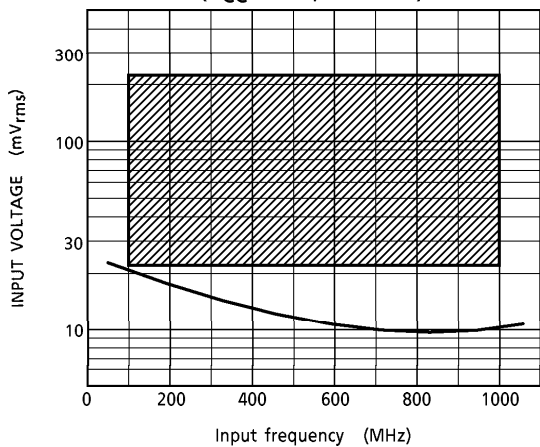
ELECTRICAL CHARACTERISTICS (Unless otherwise specified, V_{CC} = 3.0~6.0V, Ta = -30~75°C)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	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	
	V _{IN3}		FM _{IN} f _{IN} = 100~400MHz	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	

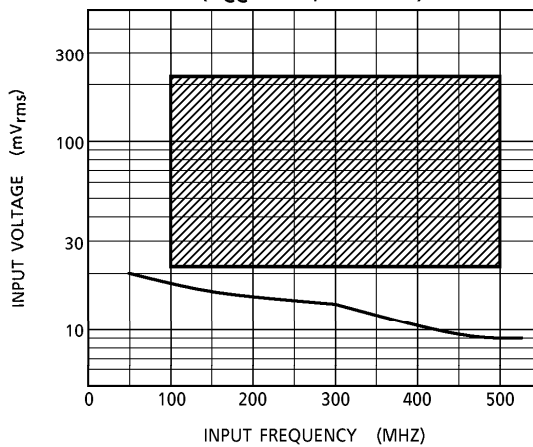
TEST CIRCUIT 1 (Input voltage sensitivity)



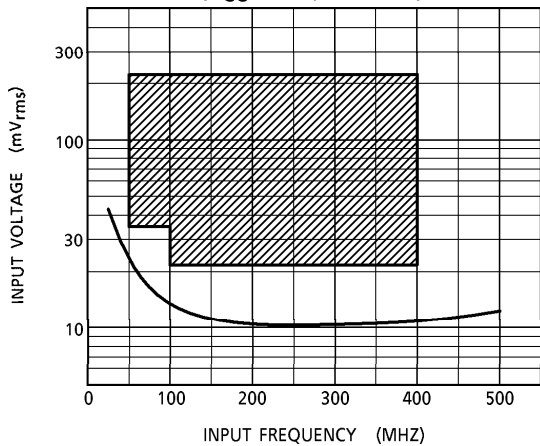
1/8 MODE INPUT VOLTAGE SENSITIVITY
($V_{CC} = 5.0V, T_a = 25^\circ C$)



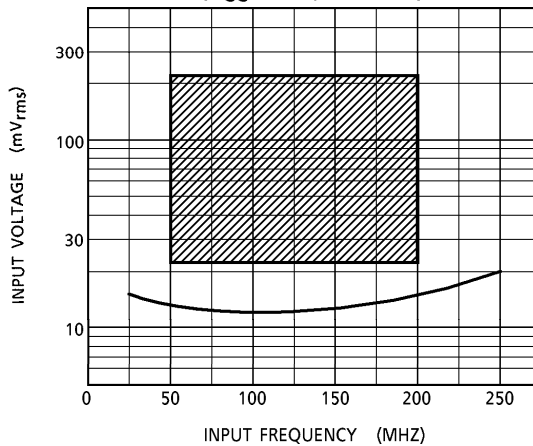
1/4 MODE INPUT VOLTAGE SENSITIVITY
($V_{CC} = 5.0V, T_a = 25^\circ C$)




1/2 MODE INPUT VOLTAGE SENSITIVITY
($V_{CC} = 5.0V, T_a = 25^\circ C$)



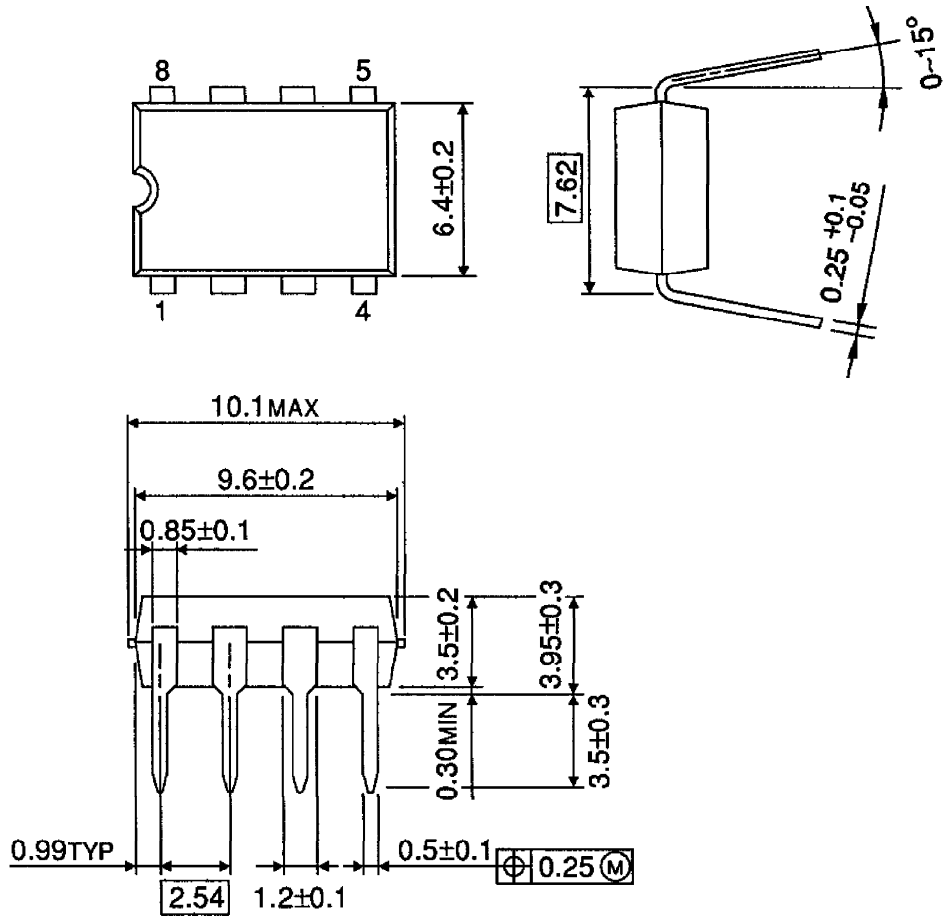
1/1 MODE INPUT VOLTAGE SENSITIVITY
($V_{CC} = 5.0V, T_a = 25^\circ C$)



(Note)  Operating range ($V_{CC} = 3.0\sim 6.0V, T_a = -30\sim 75^\circ C$)

OUTLINE DRAWING
DIP8-P-300-2.54A

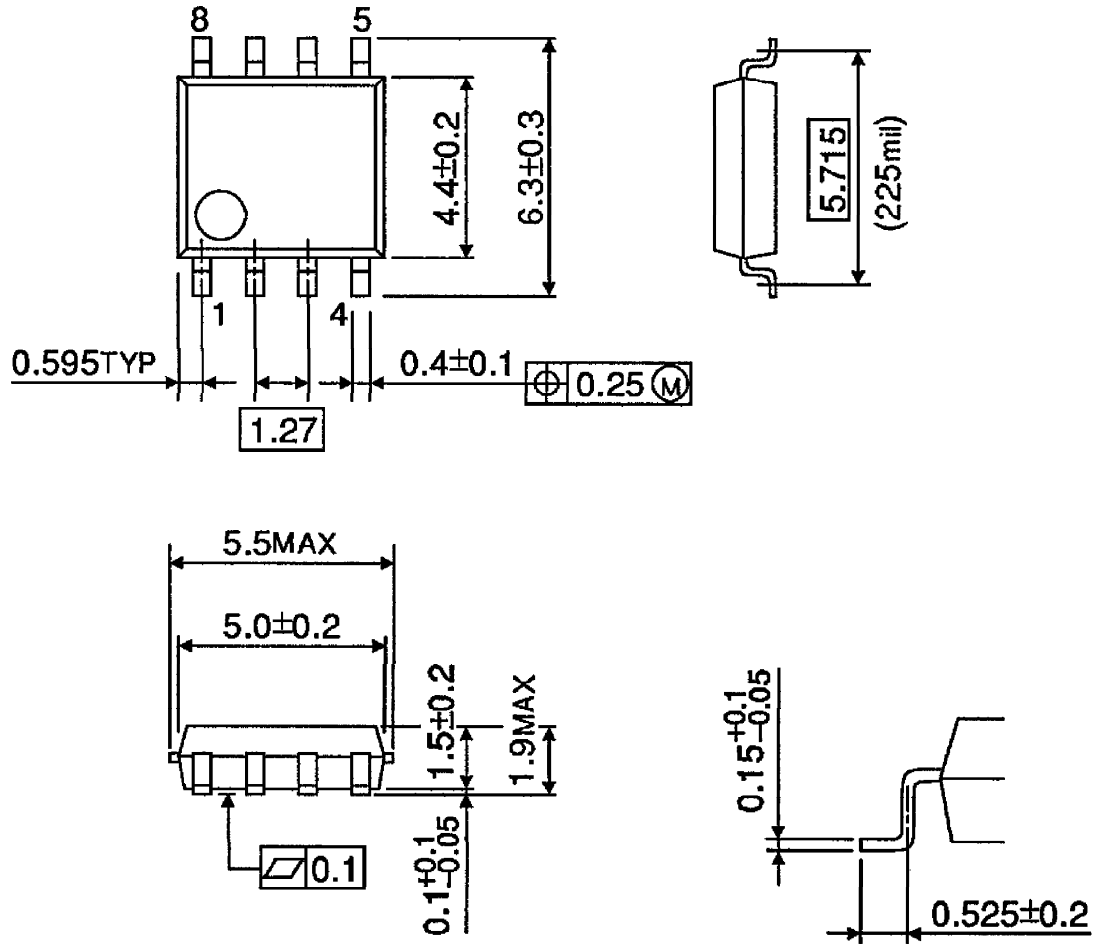
Unit : mm



Weight : 0.45g (Typ.)

OUTLINE DRAWING
SOP8-P-225-1.27

Unit : mm



Weight : 0.76g (Typ.)