April 1990
Edition 2.0

FUJITSU

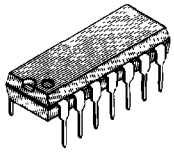
DATA SHEET

MB4517
TELEPHONE TONE RINGER

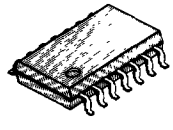
TELEPHONE TONE RINGER

The Fujitsu MB4517, fabricated in Bipolar technology, is a telephone tone ringer integrated circuit. The MB4517 is intended as a replacement for the mechanical bell.

- Selectable 4-kind of ringing tone by external switches
- Ringing start current is controlled by an external resistor
- Provides a tone signal that shifts between two predeterminded frequencies at 8 Hz or 16 Hz.
- Direct drive for piezoelectric transducers
- Low supply voltage



PLASTIC PACKAGE
DIP-14P-M02



PLASTIC PACKAGE
FPT-14P-M01

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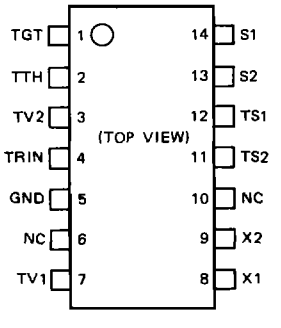
ABSOLUTE MAXIMUM RATINGS (See Note) $T_A = 25°C$

Rating	Symbol	Value	Unit
Supply Voltage	V_{TR}	20	V
Supply Current	I_{TR}	7	mA
Operating Temperature	T_A	−30 ~ +60	°C
Storage Temperature	T_{STG}	−55 ~ +125	°C

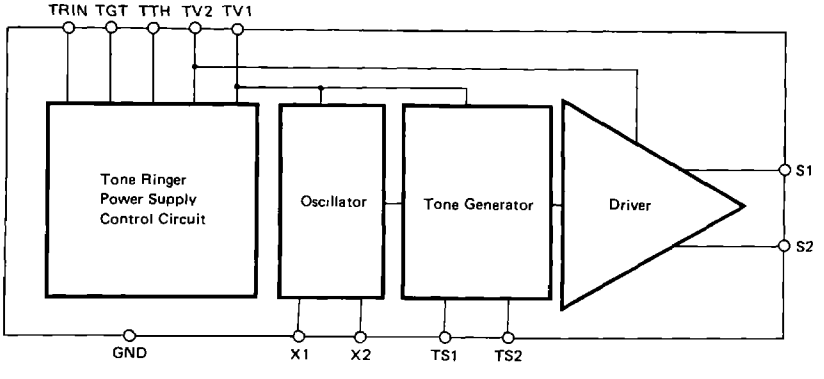
NOTE: Permanent device damage may occur if ABSOLUTE MAXIMUM RATINGS are exceeded. Functional operation should be restricted to the conditions as detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

PIN ASSIGNMENT



This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields. However, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high impedance circuit.

Fig. 1 – MB4517 BLOCK DIAGRAM



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ELECTRICAL CHARACTERISTICS

$T_A = 25°C$

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	
Ringing Start Current	I_{TR}	Load 56nF	1.5	2.5	3.5	mA
Output Voltage	V_T	Load 56nF, I_{TR} = 5mA	18	21	–	dBV

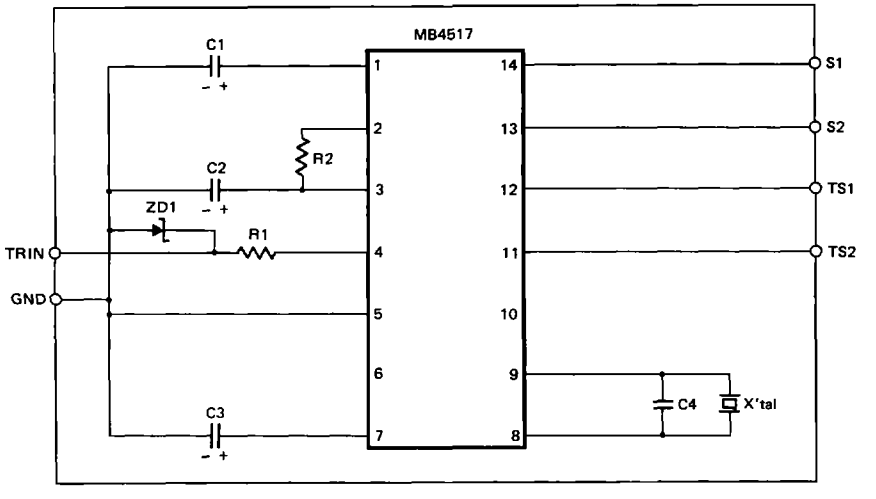
TONE RINGER TONE

	Condition	TS1	TS2	Tone Frequency	Rate
F1	Load 56nF I_{TR} = 5mA	Open	Open	1024Hz, 819Hz	8Hz
F2		Close	Open	1024Hz, 819Hz	16Hz
F3		Open	Close	1024Hz, 1365Hz	8Hz
F4		Close	Close	1024Hz	–

PIN DESCRIPTIONS

Pin No.	Pin Name	Descriptions
1	TGT	Tone ringer control pin. This input controls tone ringer circuit and this pin is normally connected to ground through a capacitor.
2	TTH	Tone ringer control pin. A resistor is connected between this pin and TV2 pin. Ringing start is controlled by the resistor.
3	TV2	Power supply input for tone ringer circuit. This pin is connected to ground through a capacitor.
4	TRIN	Tone ringer input pin.
5	GND	Ground. This pin is connected to negative output of the diode bridge.
6, 10	NC	No connection.
7	TV1	Power supply input for tone ringer circuit. This pin is connected to ground through a capacitor.
8	X1	Tone ringer output pins. A ceramic piezoelectric buzzer is connected between S1 pin and S2 pin.
9	X2	
11	TS2	*Tone select inputs.* 4-kind of tone are selected by combination of these input level such as open or ground.
12	TS1	
13	S2	The 32 kHz crystal connection pins. A crystal (32.768kHz) is connected between X1 pin and X2 pin for tone ringer circuit and clock generator.
14	S1	

Fig. 2 – TEST CIRCUIT



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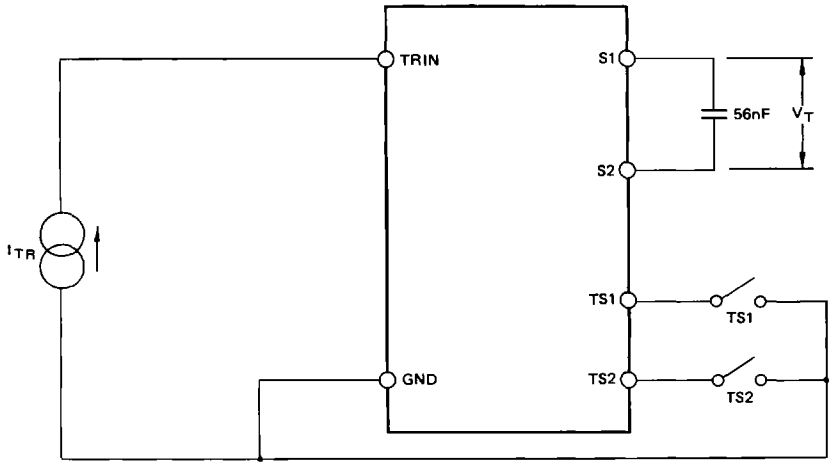
PARTS LIST

Symbol	Description	Value
R1	Resistor	270Ω, 1/16W or more
R2	Resistor	100kΩ, 1/16W or more
C1	Capacitor	1.0μF, 35V, ±10%
C2	Capacitor	22.0μF, 35V, ±10%
C3	Capacitor	2.2μF, 35V, ±10%
C4	Capacitor	82pF, 3V, ±5V
ZD1	Zener Diode	1Z27 ST06-27 or equivalent
X'tal	Crystal	Oscillator Frequency 32.768kHz

Fig. 3 – TEST SETUP

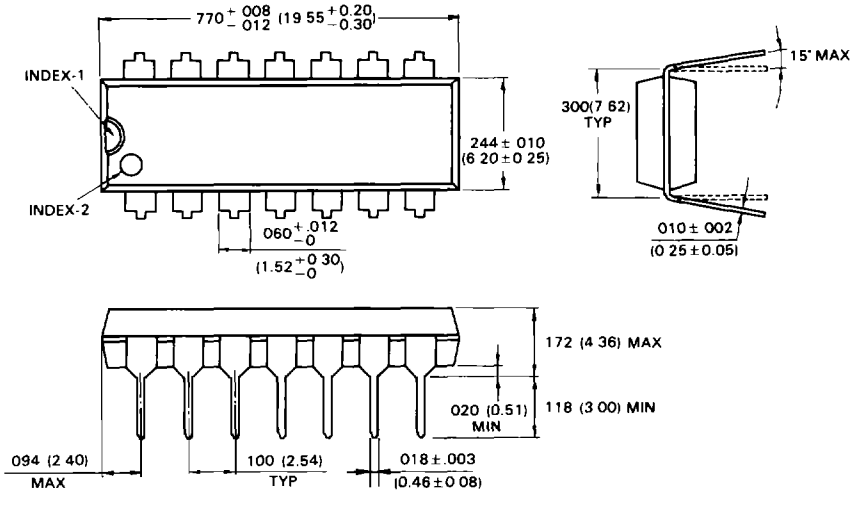


TS1	TS2	Tone Frequency	Rate
Open	Open	1024Hz, 819Hz	8Hz
Close	Open	1024Hz, 819Hz	16Hz
Open	Close	1024Hz, 1365Hz	8Hz
Close	Close	1024Hz	–

PACKAGE DIMENSIONS

14-LEAD PLASTIC DUAL IN-LINE PACKAGE

(Case No. : DIP-14P-M02)



Dimensions in
inches (millimeters)

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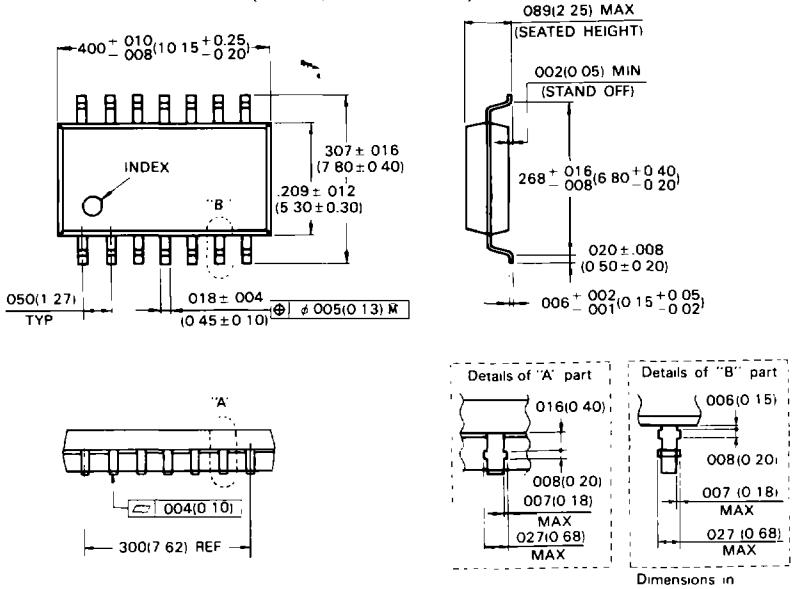
PACKAGE DIMENSIONS (continued)

14-LEAD PLASTIC FLAT PACKAGE

(Case No. : FPT-14P-M01)



Dimensions in inches (millimeters)

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