<M F T>

RT8H062E

WATCH DOG TIMER

DESCRIPTION

RT8H062E is a semiconductor integrated circuit which is designed for System Reset to detect +3.3V、+5V power supply. This MFT keeps the operation of micro computer watching. The system circuit current at normal state is low consumption type of 0.6mA(Typical).

FEATURES

- Miniaturization of a set
- Watch Dog Timer
- Variable power on reset voltage
- Low consumption type：0.6mA（Typ,VCC=3.3V）
- Wide range of power supply：VCC（MAX）=10V
- Open collector output

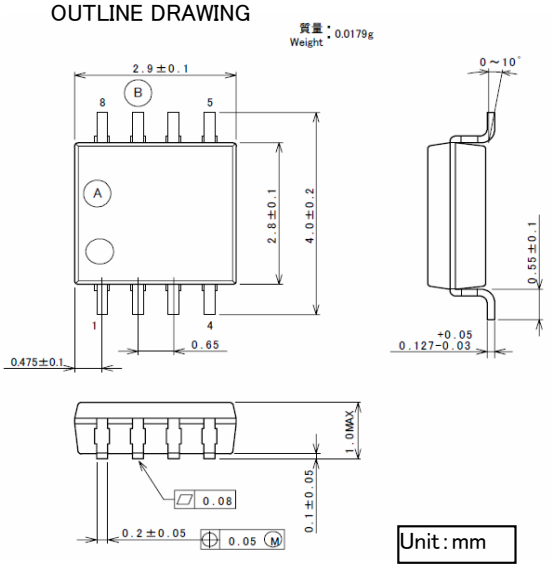
APPLICATION

- Microcomputer Systems

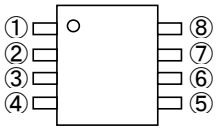
RECOMMENDED OPERATING CONDITIONS

- Supply voltage：3.3V、5V

OUTLINE DRAWING

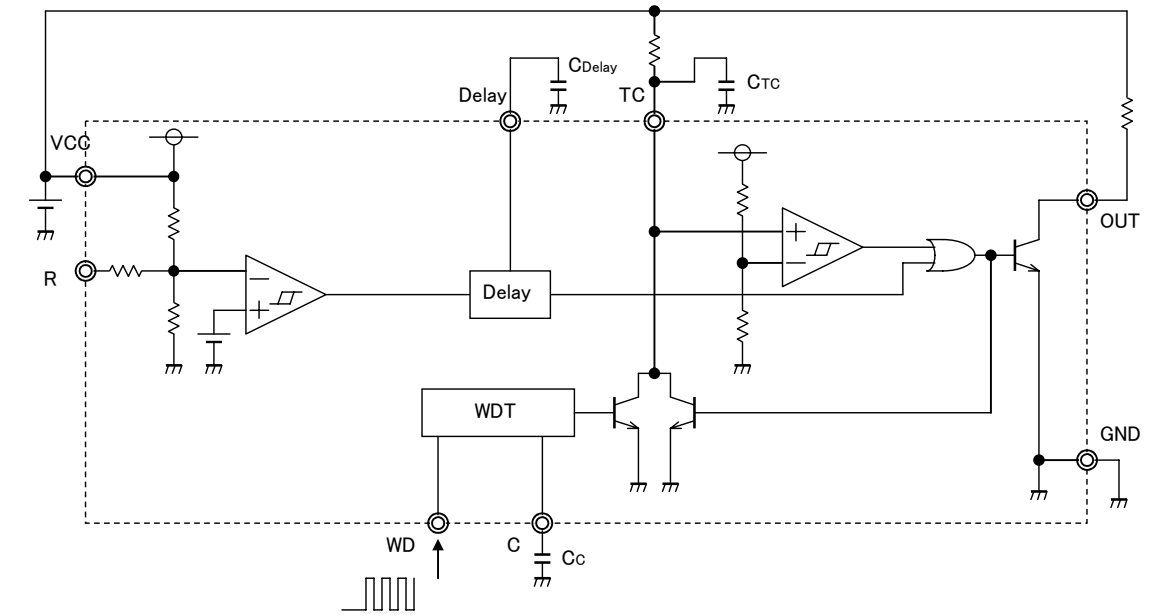


PIN CONFIGURATION



①Delay	⑧VCC
②WD	⑦TC
③GND	⑥OUT
④R	⑤C

BLOCK DIAGLAM OF MFT , APPLICATION CIRCUIT EXAMPLES



TERMINAL FUNCTION

Terminal No.	Symbol	Function
Undecided	VCC	Suply voltage terminal
	R	To change vcc detective voltage terminal
	WD	Watch dog input terminal
	C	To set abnormal high section of watch dog input terminal
	TC	To set watch dog time terminal
	Delay	To set power on reset time. Connection capacity terminal
	OUT	If input abnormal watch dog signal, then it output reset signal.
	GND	Grand teerminal

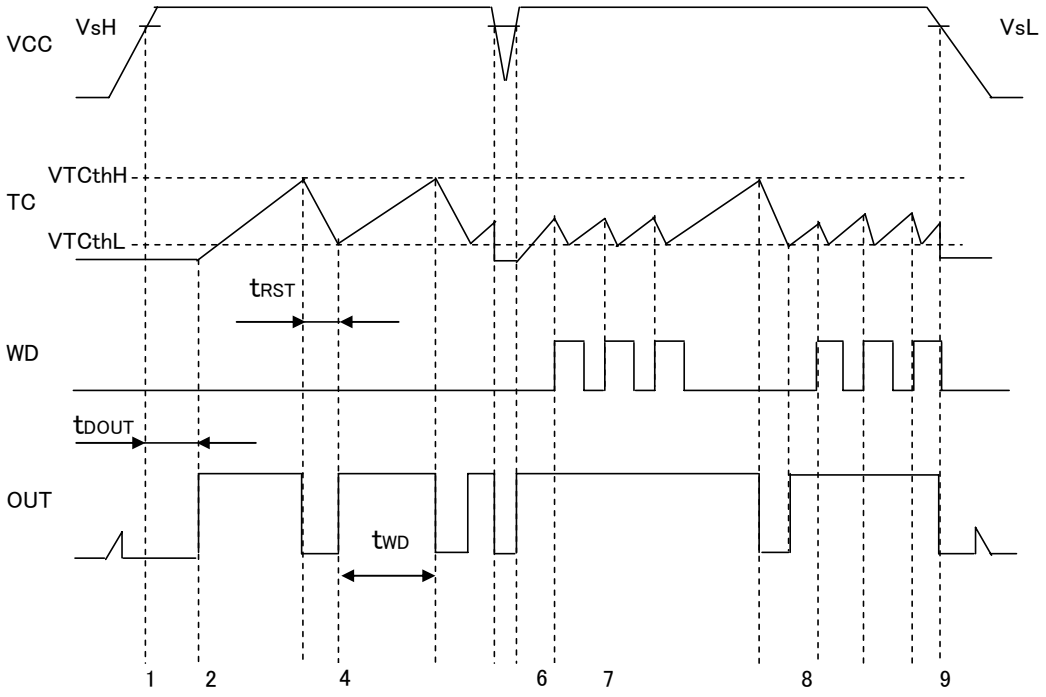
ABSOLUTE MAXIMUM RATINGS (Ta＝25℃)

Symbol	Parameter	Ratings	Unit
VCC	Supply voltage	10	V
VIN	Input voltage(WD,C,TC,Delay)	−0.3～VCC	V
IOUT	Output current(OUT)	10	mA
Pd	Internal power dissipation	200	mW
Topr	Operating temperature	−20～+75	℃
Tstg	Storage temperature	−40～+150	℃

ELECTRICAL CHARACTERISTIC (Ta=25℃,VCC=3.3V unless otherwise noted.)

Symbol	Parameter	Test conditions	Designed value			Unit
			Min	Typ	Max	
ICC	Circuit current		360	600	840	uA
VsH	VCC detective voltage at High	OUT=VCC−100kΩ、OUT:L→H	2.73	2.87	3.01	V
VsL	VCC detective voltage at Low	OUT=VCC−100kΩ、OUT:H→L	2.62	2.76	2.90	V
VWDth	Threshold voltage of WD	C:L→H		1.3		V
IWD	WD input current	WD=3V	80	160	320	uA
IC	Output current C	WD=3V、C=0.3V		20		uA
VTCthH	Threshold voltage of TC HIGH	OUT=VCC−100kΩ、OUT:H→L		1.5		V
VTCthL	Threshold voltage of TC LOW	OUT=VCC−100kΩ、OUT:L→H		1.1		V
VDth	Threshold voltage of Delay	OUT=VCC−100kΩ、OUT:L→H		1.2		V
IDelay	Charge current of Delay	Delay=0V		5		uA
VOsat1	OUT saturation voltage1	VCC=1.2V、I=1mA		0.12	0.50	V
VOsat2	OUT saturation voltage2	VCC=3V、TC=3V、I=1mA		0.10	0.50	V

TIMING DIAGRAM



NOTES

1. The VCC rises up to detective voltage(VsH), then reset is released.
2. OUT terminal(Open collector) generate High signal, after tDOUT time decided from capacity at Delay terminal.
   Charge of TC begins.
   t_{DOUT}[s]≒Cdelay[F]×1.2[V]÷5E-6[A]
3. This MFT watch WD signal from when TC rises up from VTCthL to VTCthH. If no signal input WD, OUT terminal generate Low signal.
   t_{WD}[s]≒0.236×C_{TC}[F]×R[Ω]
4. When TC falls to VTCthL, OUT terminal generate High signal.
   t_{RST}[s]≒100×C_{TC}[F]
5. Due to the power failure etc, VCC falls to VsL, OUT terminal generate Low signal.
6. VCC rises up to VsH, OUT terminal generate High signal (if no Cdelay capacity).
7. If normal clock signal is entered in twd time, TC terminal is decharged. And if TC terminal falls to VTCthL, TC begins chaerge.
8. If no signal is entered in twd time, OUT terminal generate Low signal.
9. When VCC falls to VsL, OUT terminal generate Low signal.

*About C terminal

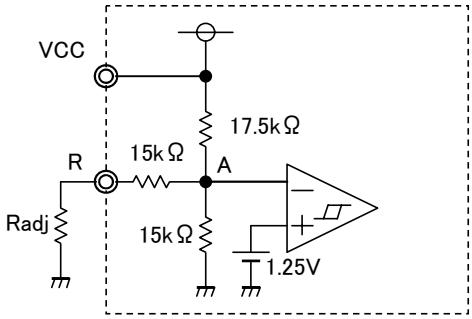
Please connect capacity C terminal-GND terminal always. This capacity is always necessary for detected edge of WD signal
And, for detected abnormal state of WD's high fixation, This capacity can detect normal time of WD's high fixation.

twdh[s]≒30000×Cc[F]

When High signal is entered in WD terminal, twdh[s] or more, TC terminal begins charge, and begin operate 3. .

About VCC detective voltage (R terminal)

VCC detective voltage	At Open	At 3.3kΩ pull down
VsH	2.87V	4.15V
VsL	2.76V	3.98V

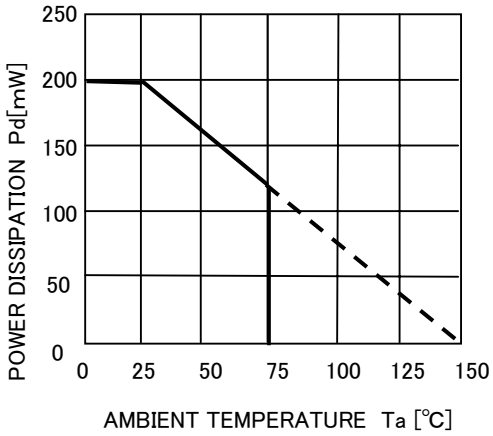


If change Radj, VCC detective voltage is variable.

VsH≒(1+17.5k/Combined resistance between point A～GND)×1.32V

VsL≒1+17.5k/Combined resistance between point A～GND)×1.25V

THERMAL DERATING



ISAHAYA ELECTRONICS CORPORATION

6-41 Tsukuba, Isahaya, Nagasaki, 854-0065 Japan

Keep safety first in your circuit designs!

·ISAHAYA Electronics Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (1) placement of substitutive, auxiliary, (2) use of non-farmable material or (3) prevention against any malfunction or mishap.

Notes regarding these materials

·These materials are intended as a reference to our customers in the selection of the ISAHAYA products best suited to the customer's application; they don't convey any license under any intellectual property rights, or any other rights, belonging ISAHAYA or third party.

·ISAHAYA Electronics Corporation assumes no responsibility for any damage, or infringement of any third party's rights, originating in the use of any product data, diagrams, charts or circuit application examples contained in these materials.

·All information contained in these materials, including product data, diagrams and charts, represent information on products at the time of publication of these materials, and are subject to change by ISAHAYA Electronics Corporation without notice due to product improvements or other reasons. It is therefore recommended that customers contact ISAHAYA Electronics Corporation or an authorized ISAHAYA products distributor for the latest product information before purchasing product listed herein.

·ISAHAYA Electronics Corporation products are not designed or manufactured for use in a device or system that is used under circumstances in which human life is potentially at stake. Please contact ISAHAYA electronics corporation or an authorized ISAHAYA products distributor when considering the use of a product contained herein for any specific purposes, such as apparatus or systems for transportation, vehicular, medical, aerospace, nuclear, or undersea repeater use.

·The prior written approval of ISAHAYA Electronics Corporation is necessary to reprint or reproduce in whole or in part these materials.

·If these products or technologies are subject to the Japanese export control restrictions, they must be exported under a license from the Japanese government and cannot be imported into a country other than the approved destination. Any diversion or re-export contrary to the export control laws and regulations of Japan and/or the country of destination is prohibited.

·Please contact ISAHAYA Electronics Corporation or authorized ISAHAYA products distributor for further details on these materials or the products contained therein.