

# RD3ST24

## Standby Control IC

REJ03D0521-0200  
Rev.2.00  
Mar 01, 2006

### Description

RD3ST24 is including the standby control circuit for a microcomputer in 8 pin packages.

When  $\overline{\text{MSTB}}$  input "Low", SWOUT output "Low",  $\overline{\text{STBYOUT}}$  output become "High" and cancels standby condition.

And  $\overline{\text{RESOUT}}$  output becomes "High" after it passed period ( $t1^*$ ) when it is stable the oscillation that was set up with RC bill outside and cancel the reset condition of a microcomputer.

Also when  $\overline{\text{MSTB}}$  input "Low",  $\overline{\text{RESOUT}}$  output becomes "Low" and makes reset condition.

After the delay time ( $t2$ ) of prescription passed subsequently, SWOUT output "High"  $\overline{\text{STBYOUT}}$  output becomes "Low" and makes a microcomputer standby condition.

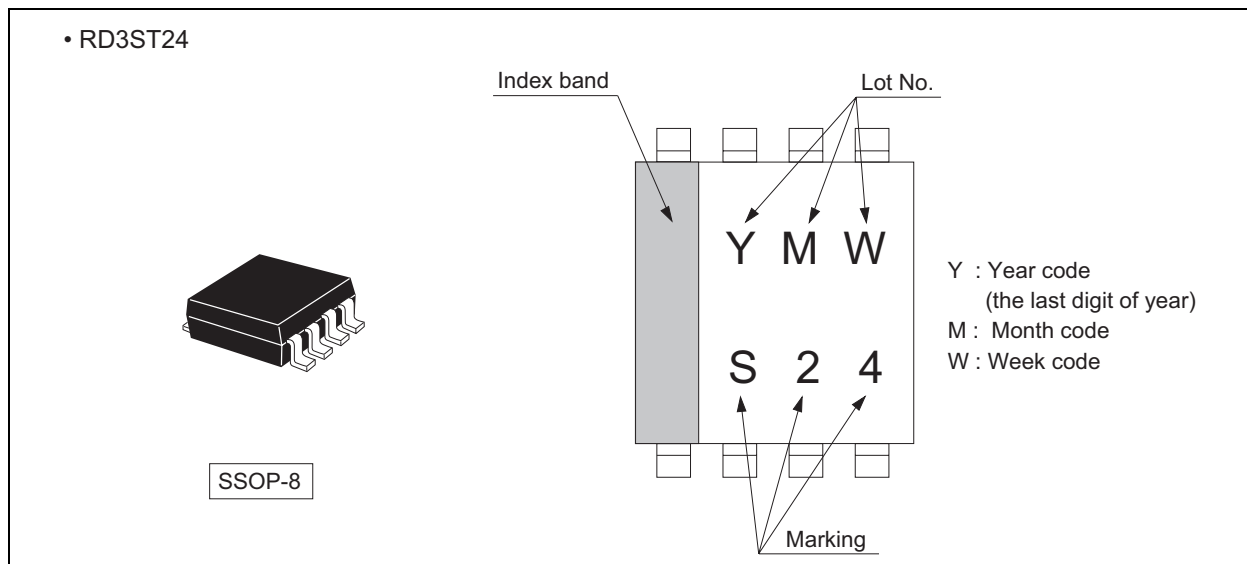
\*:  $t1 = K \cdot RC$  (K is coefficient: Reference of application data)

### Features

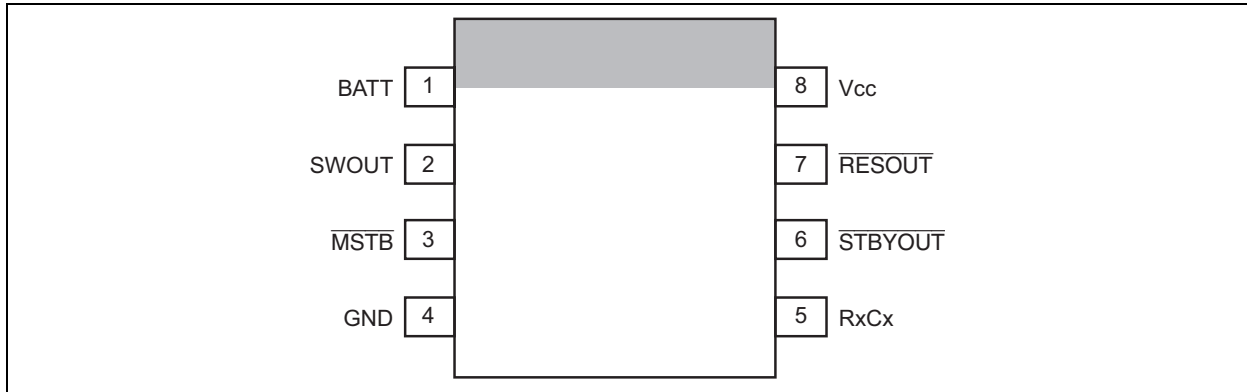
- Supply voltage range: 2.3 to 5.5 V
- Temperature range: -40 to +85°C
- Output current:  $\pm 6\text{mA}$  (@ $V_{CC}=3.0\text{V}$ ),  $\pm 12\text{mA}$  (@ $V_{CC}=4.5\text{V}$ )
- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
RD3ST24USE	SSOP-8 pin	PVSP0008KA-A (TTP-8DBV)	US	E (3,000 pcs/reel)

### Outline and Article Indication



## Pin Arrangement



## Pin Description

Symbol	Pin Name
BATT	The battery power supply
SWOUT	Output for Power MOS FET control
$\overline{\text{MSTB}}$	Manual standby Input
GND	Ground
RxCx	Terminal for external resistance and capacitance
STBYOUT	Standby Output
$\overline{\text{RESOUT}}$	Reset Output
Vcc	Power supply

## Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Test Conditions
Supply voltage range	$V_{CC}$	-0.5 to 7.0	V	
Input voltage range <sup>*1</sup>	$V_I$	-0.5 to $V_{CC} + 0.5$	V	
Output voltage range <sup>*1, 2</sup>	$V_O$	-0.5 to $V_{CC} + 0.5$	V	Output: H or L
		-0.5 to 7.0		$V_{CC}$ : OFF
Input clamp current	$I_{IK}$	$\pm 20$	mA	$V_I < 0$
Output clamp current	$I_{OK}$	$\pm 50$	mA	$V_O < 0$ or $V_O > V_{CC}$
Continuous output current	$I_O$	$\pm 25$	mA	$V_O = 0$ to $V_{CC}$
Continuous current through $V_{CC}$ or GND	$I_{CC}$ or $I_{GND}$	$\pm 50$	mA	
Maximum power dissipation at $T_a = 25^\circ\text{C}$ (in still air) <sup>*3</sup>	$P_T$	200	mW	
Storage temperature	$T_{stg}$	-65 to 150	$^\circ\text{C}$	

Notes: The absolute maximum ratings are values, which must not individually be exceeded, and furthermore no two of which may be realized at the same time.

1. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
2. This value is limited to 6.0 V maximum.
3. The maximum package power dissipation was calculated using a junction temperature of  $150^\circ\text{C}$ .

## Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit	Conditions
Supply voltage range	$V_{CC}$ , BATT	2.3	—	5.5	V	
Input voltage range	$V_I$	0.0	—	$V_{CC}$	V	
Output voltage range	$V_O$	0.0	—	5.5	V	
Output current	$I_{OH}$	—	—	-6	mA	$V_{CC} = 3.0\text{ V to }3.6\text{ V}$
		—	—	-12		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$
	$I_{OL}$	—	—	6		$V_{CC} = 3.0\text{ V to }3.6\text{ V}$
		—	—	12		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$
External resistance	$R_X$	1.0	—	—	k $\Omega$	
External capacitance	$C_X$	—	Unlimited	—	F	
Operating free-air temperature	$T_a$	-40	—	85	$^\circ\text{C}$	

## Electrical Characteristic

Ta = -40 to 85°C

Item	Symbol	V <sub>CC</sub> (V)	BATT (V)	Min	Typ	Max	Unit	Test condition
Input voltage	V <sub>IH</sub>	2.5±0.2		0.7×V <sub>CC</sub>	—	—	V	
		3.3±0.3		0.7×V <sub>CC</sub>	—	—		
		5.0±0.5		0.7×V <sub>CC</sub>	—	—		
	V <sub>IL</sub>	2.5±0.2		—	—	0.3×V <sub>CC</sub>	V	
		3.3±0.3		—	—	0.3×V <sub>CC</sub>		
		5.0±0.5		—	—	0.3×V <sub>CC</sub>		
Output voltage	V <sub>OH</sub>	3.0	3.0	2.9	—	—	V	I <sub>OH</sub> =-100μA
				2.48	—	—		I <sub>OH</sub> =-6mA
		4.5	4.5	4.4	—	—		I <sub>OH</sub> =-100μA
				3.8	—	—		I <sub>OH</sub> =-12mA
	V <sub>OL</sub>	3.0	3.0	—	—	0.1	V	I <sub>OL</sub> =100μA
				—	—	0.44		I <sub>OL</sub> =6mA
		4.5	4.5	—	—	0.1		I <sub>OL</sub> =100μA
				—	—	0.55		I <sub>OL</sub> =12mA
Input current	I <sub>IN</sub>	5.5	5.5	—	—	±10	μA	V <sub>IN</sub> =0V or V <sub>CC</sub> , R <sub>X</sub> C <sub>X</sub> =GND
Output leakage current	I <sub>OFF</sub>	0	0	—	—	±10	μA	V <sub>O</sub> =5.5V, R <sub>X</sub> C <sub>X</sub> =GND (RESOUT, STBYOUT, SWOUT)
Quiescent supply current	I <sub>CC</sub>	5.5	5.5	—	—	±10	μA	V <sub>IN</sub> =0V or V <sub>CC</sub> , R <sub>X</sub> C <sub>X</sub> =GND
	I <sub>CC</sub> (BATT)	5.5	5.5	—	—	±10	μA	
	0	5.5	—	—	—	±10	μA	

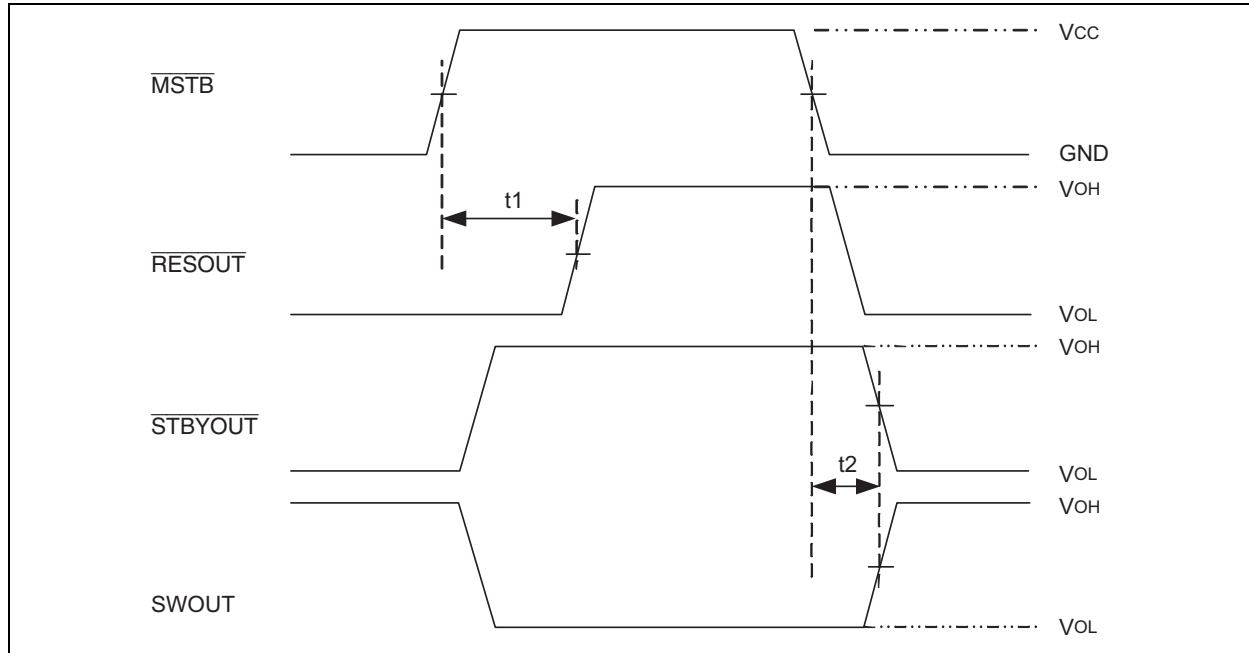
## Switching Characteristics

Ta = -40 to 85°C

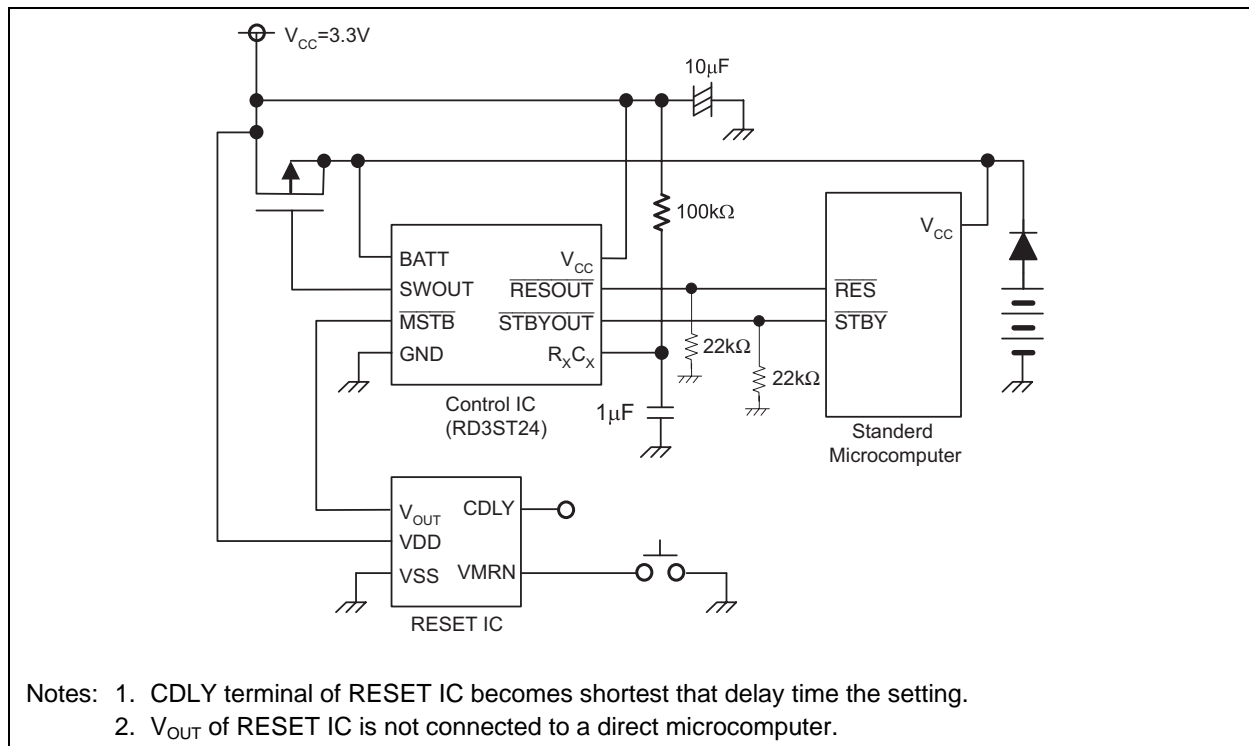
Item	Symbol	V <sub>CC</sub> (V) *1	BATT (V)	Min	Typ	Max	Unit	Test condition
Propagation delay time	t1	3.3	3.3	80	95	110	μs	R <sub>X</sub> =10kΩ, C <sub>X</sub> =0.01μF
				0.8	0.95	1.1	ms	R <sub>X</sub> =10kΩ, C <sub>X</sub> =0.1μF
				80	95	110	ms	R <sub>X</sub> =100kΩ, C <sub>X</sub> =1.0μF
		5.0	5.0	80	95	110	μs	R <sub>X</sub> =10kΩ, C <sub>X</sub> =0.01μF
				0.8	0.95	1.1	ms	R <sub>X</sub> =10kΩ, C <sub>X</sub> =0.1μF
				80	95	110	ms	R <sub>X</sub> =100kΩ, C <sub>X</sub> =1.0μF
	t2	3.3	3.3	125	—	250	ns	
		5.0	5.0	70	—	160	ns	

Note: 1. Ta = 25°C

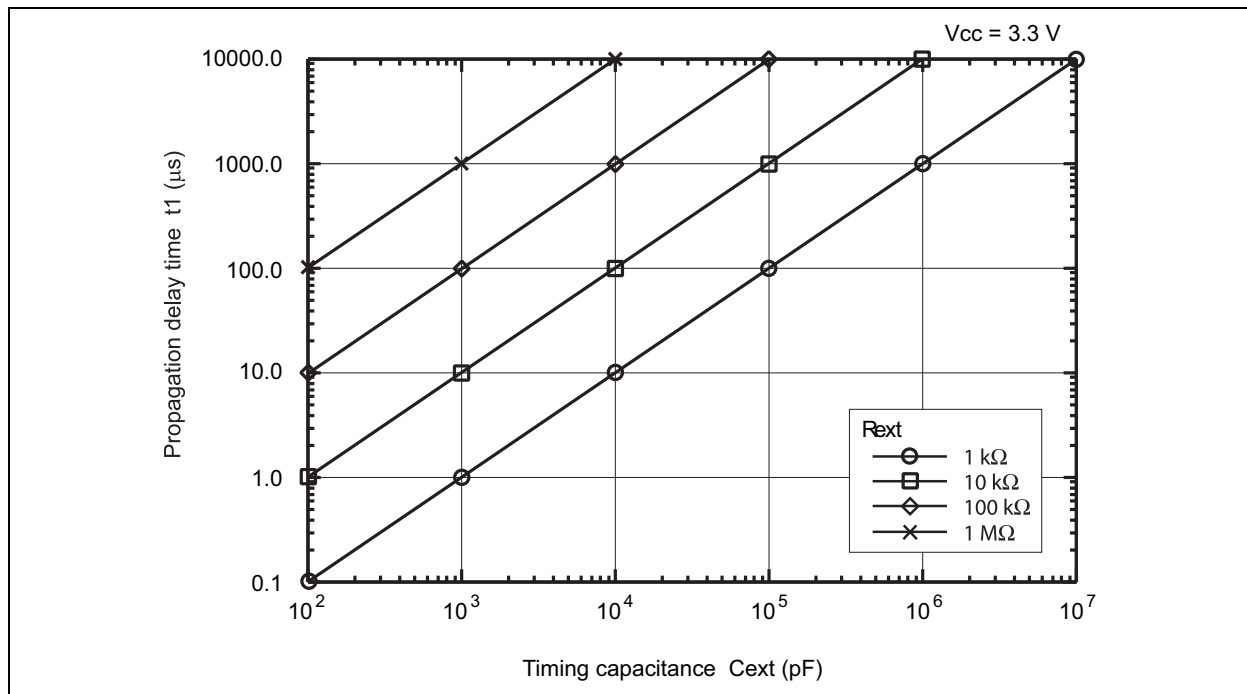
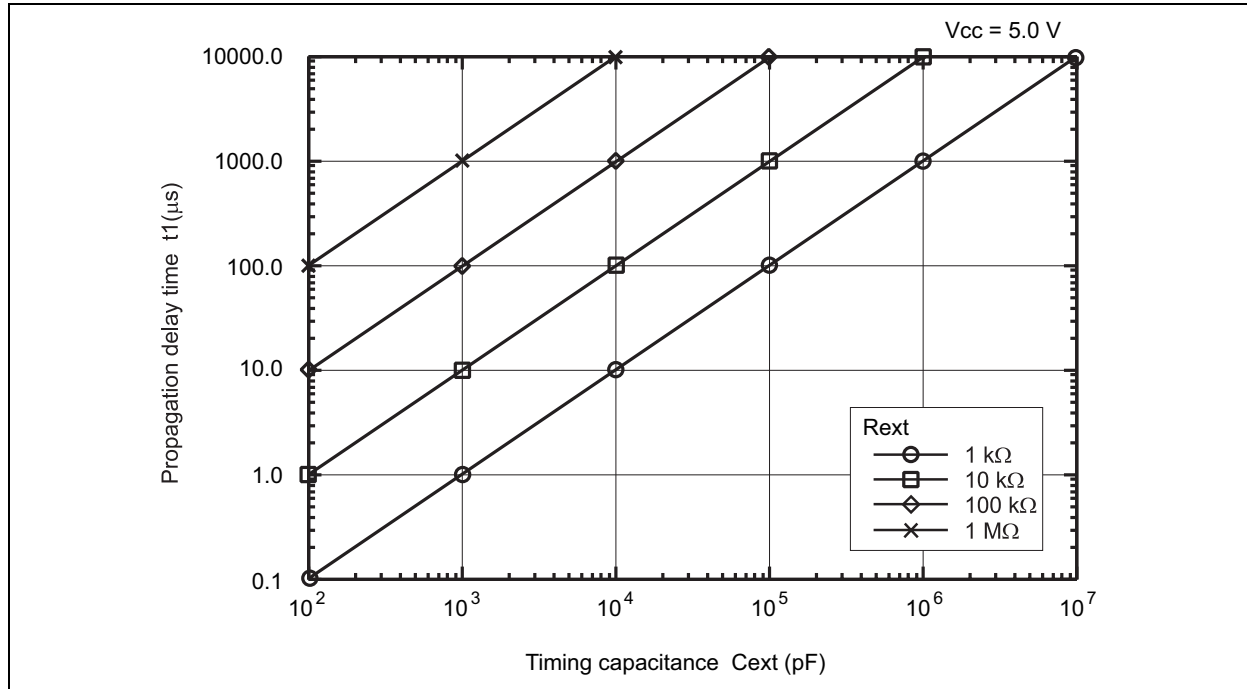
## Timing Diagram

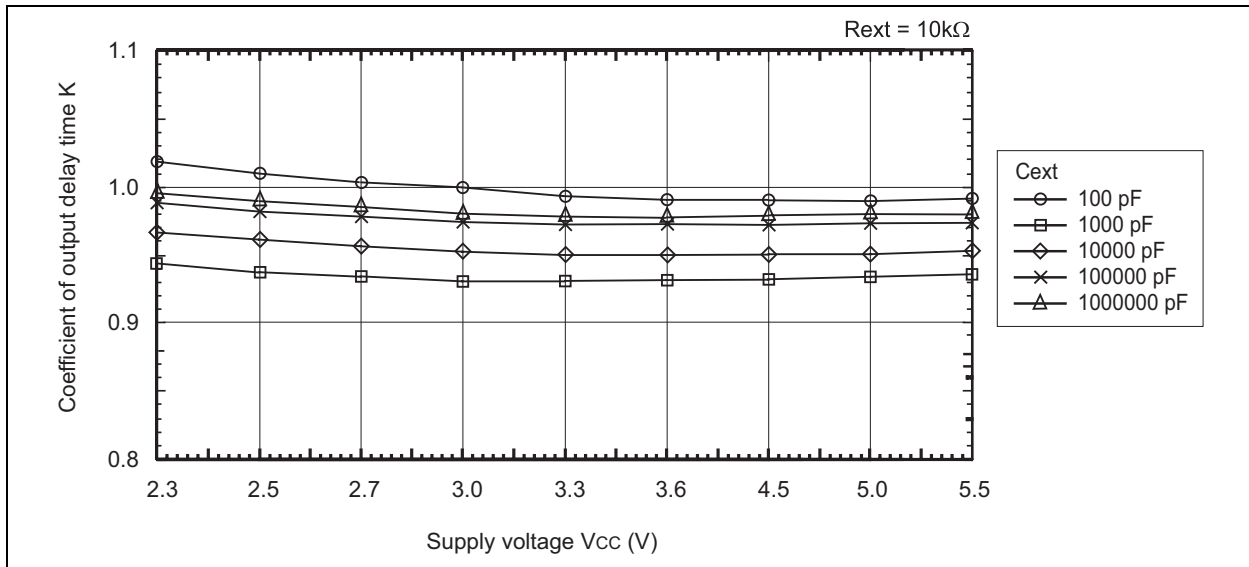
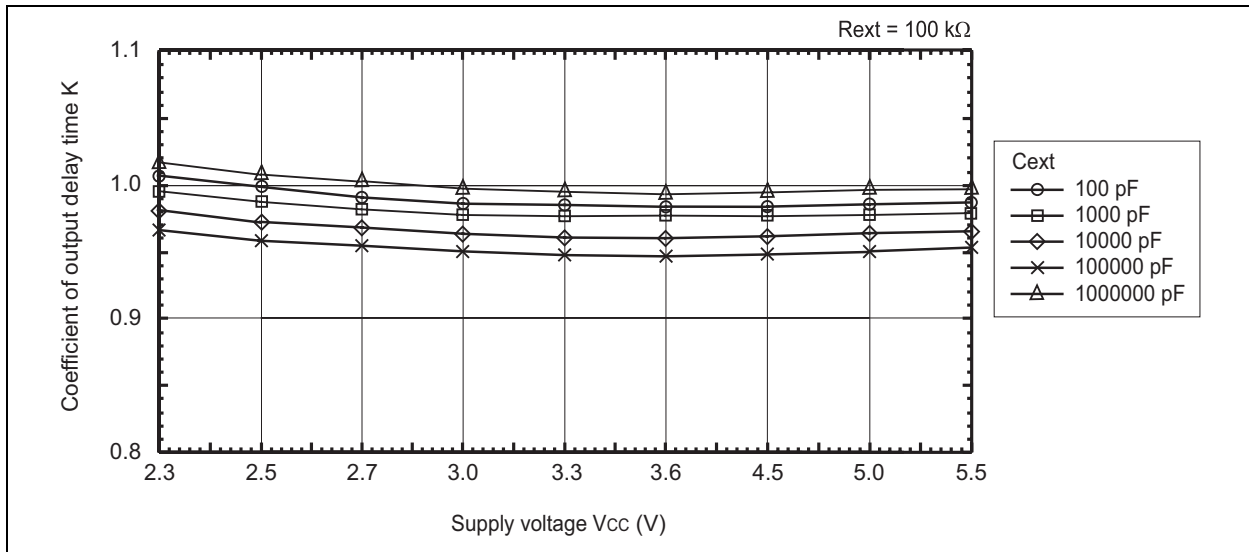


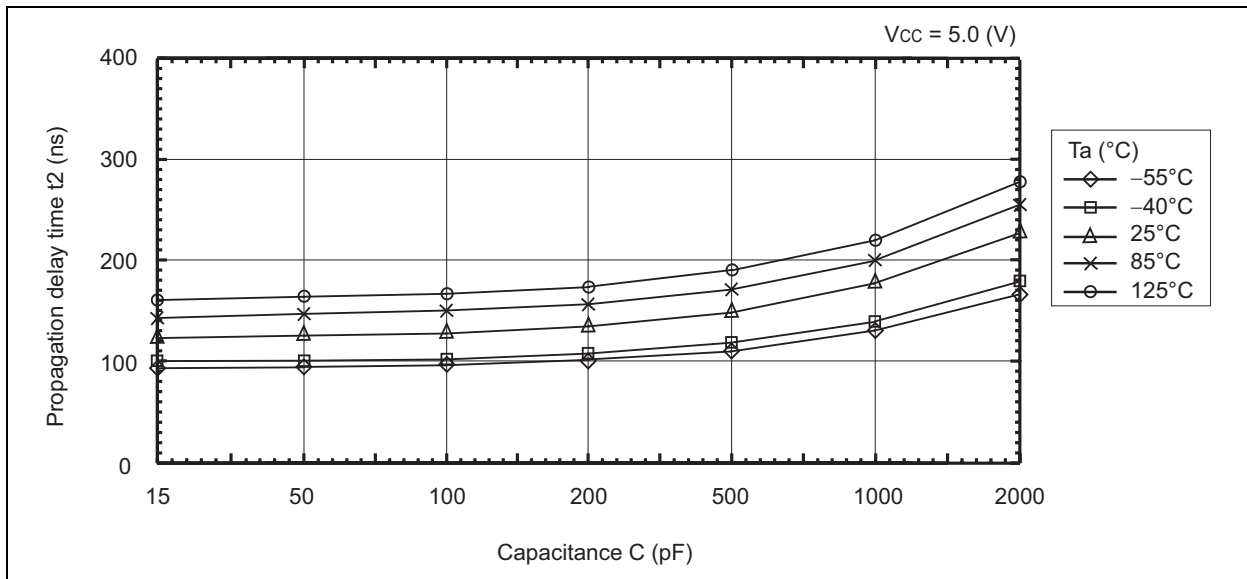
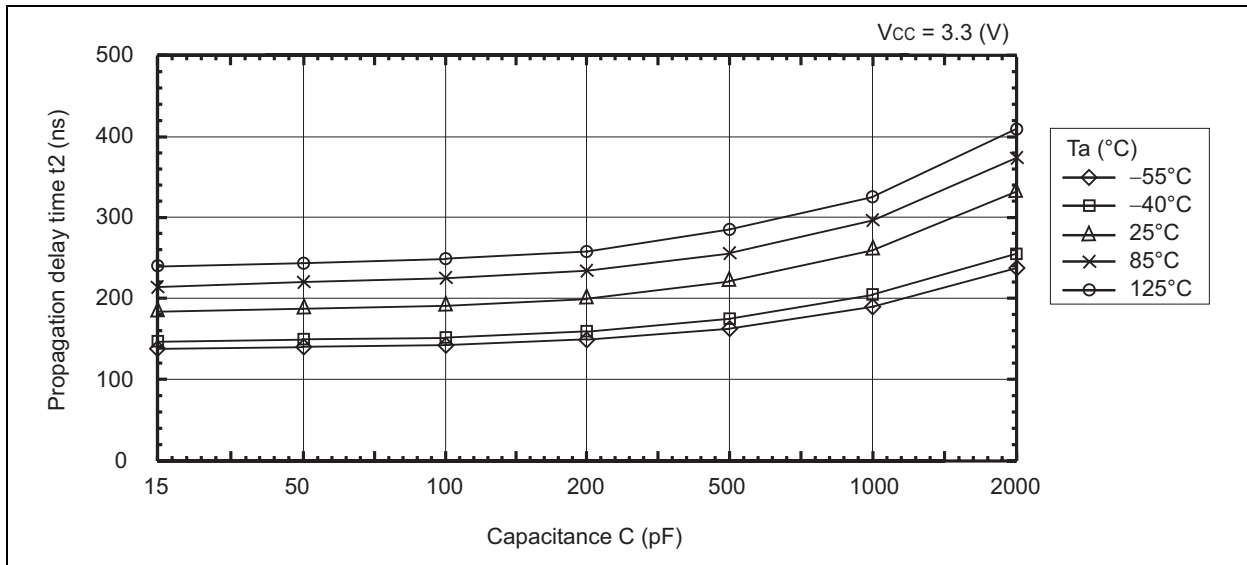
## Application Circuit



## Application Data



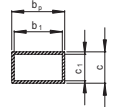
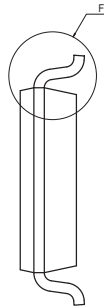
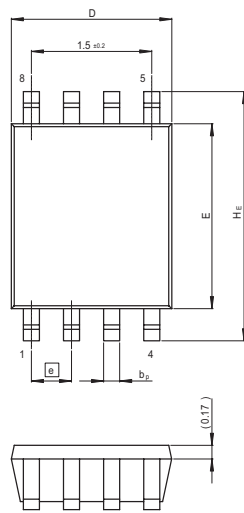




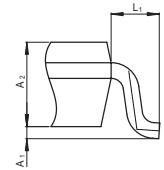


Package Dimensions

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-VSSOP8-2.3x2-0.50	PVSP0008KA-A	TTP-8DB/TTP-8DBV	0.010g



Terminal cross section



Detail F

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	1.8	2.0	2.2
E	2.2	2.3	2.4
A <sub>2</sub>	0.6	0.7	0.8
A <sub>1</sub>	0	—	0.1
A	—	—	—
b <sub>P</sub>	0.15	0.22	0.3
b <sub>1</sub>	—	0.20	—
c	0.08	0.13	0.23
c <sub>1</sub>	—	0.11	—
θ	—	—	—
H <sub>E</sub>	2.8	3.1	3.4
Ⓜ	—	(0.5)	—
x	—	—	—
y	—	—	—
Z	—	—	—
L	—	—	—
L <sub>1</sub>	—	(0.4)	—

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