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Old Company Name in Catalogs and Other Documents

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April 1st, 2010
Renesas Electronics Corporation

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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•RC (K is coefficient: Reference of application data)

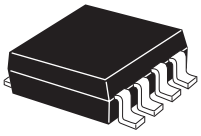
Features

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

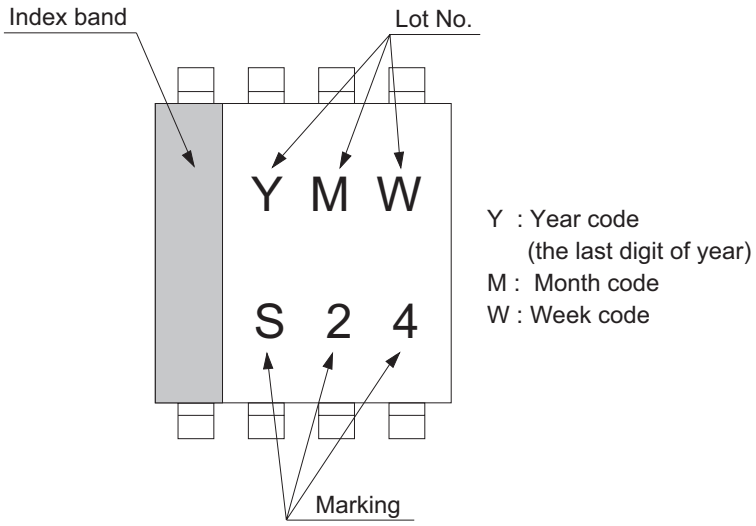
Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
RD3ST24USE	SSOP-8 pin	PVSP0008KA–A (TTP-8DBV)	US	E (3,000 pcs/reel)

Outline and Article Indication

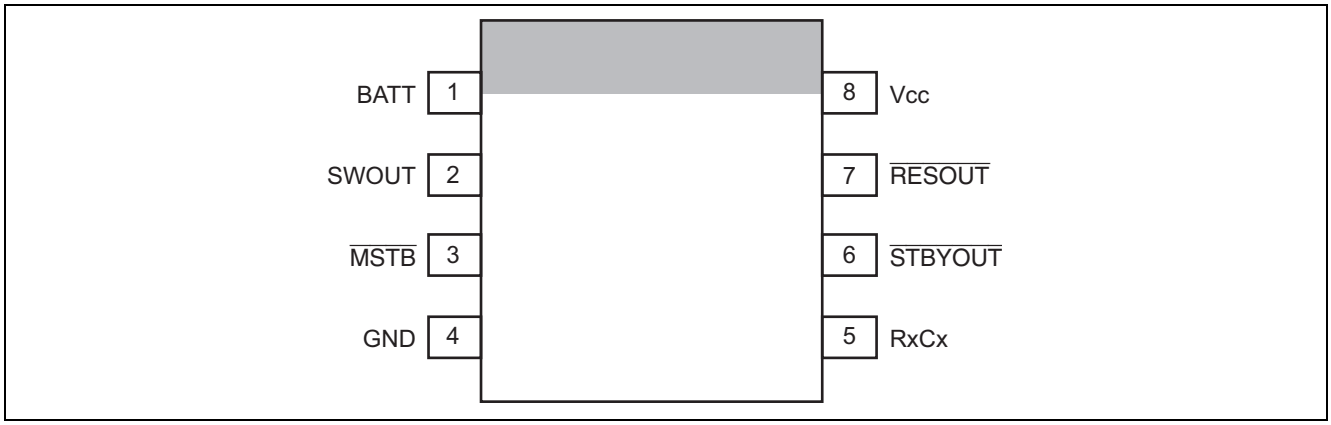
• RD3ST24



SSOP-8



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
R_xC_x	Terminal for external resistance and capacitance
$\overline{\text{STBYOUT}}$	Standby Output
$\overline{\text{RESOUT}}$	Reset Output
V_{CC}	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 *[1]	V_I	–0.5 to V_{CC} + 0.5	V	
Output voltage range *[1, 2]	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}	±20	mA	V_I < 0
Output clamp current	I_{OK}	±50	mA	V_O < 0 or V_O > V_{CC}
Continuous output current	I_O	±25	mA	V_O = 0 to V_{CC}
Continuous current through V_{CC} or GND	I_{CC} or I_{GND}	±50	mA	
Maximum power dissipation at Ta = 25°C (in still air) *[3]	P_T	200	mW	
Storage temperature	Tstg	–65 to 150	°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°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 V to 3.6 V
		—	—	–12		V_{CC} = 4.5 V to 5.5 V
	I_{OL}	—	—	6		V_{CC} = 3.0 V to 3.6 V
		—	—	12		V_{CC} = 4.5 V to 5.5 V
External resistance	R_X	1.0	—	—	kΩ	
External capacitance	C_X	—	Unlimited	—	F	
Operating free-air temperature	Ta	–40	—	85	°C	

Electrical Characteristic

Ta = –40 to 85°C

Item	Symbol	V_{CC} (V)	BATT (V)	Min	Typ	Max	Unit	Test condition
Input voltage	V_{IH}	2.5±0.2		0.7×V_{CC}	—	—	V	
		3.3±0.3		0.7×V_{CC}	—	—		
		5.0±0.5		0.7×V_{CC}	—	—		
	V_{IL}	2.5±0.2		—	—	0.3×V_{CC}	V	
		3.3±0.3		—	—	0.3×V_{CC}		
		5.0±0.5		—	—	0.3×V_{CC}		
Output voltage	V_{OH}	3.0	3.0	2.9	—	—	V	I_{OH}=–100µA
				2.48	—	—		I_{OH}=–6mA
		4.5	4.5	4.4	—	—		I_{OH}=–100µA
				3.8	—	—		I_{OH}=–12mA
	V_{OL}	3.0	3.0	—	—	0.1	V	I_{OL}=100µA
				—	—	0.44		I_{OL}=6mA
		4.5	4.5	—	—	0.1		I_{OL}=100µA
				—	—	0.55		I_{OL}=12mA
Input current	I_{IN}	5.5	5.5	—	—	±10	µA	V_{IN}=0V or V_{CC}, R_XC_X=GND
Output leakage current	I_{OFF}	0	0	—	—	±10	µA	V_O=5.5V, R_XC_X=GND ($\overline{\text{RESOUT}}$, $\overline{\text{STBYOUT}}$, SWOUT)
Quiescent supply current	I_{CC}	5.5	5.5	—	—	±10	µA	V_{IN}=0V or V_{CC}, R_XC_X=GND
	$I_{CC\ (BATT)}$	5.5	5.5	—	—	±10	uA	
		0	5.5	—	—	±10	uA	

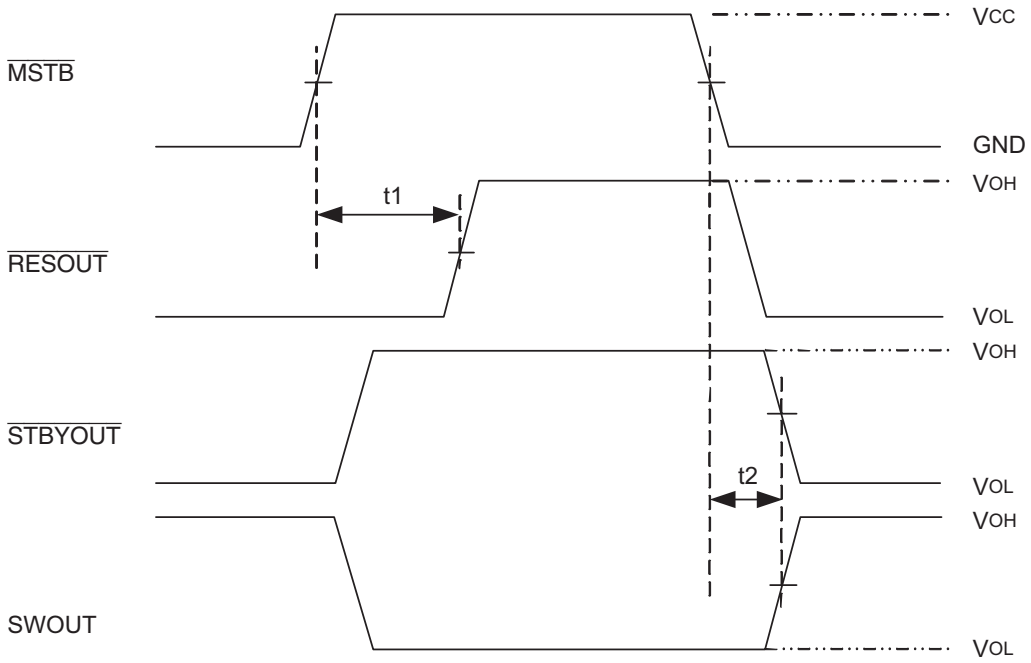
Switching Characteristics

Ta = –40 to 85°C

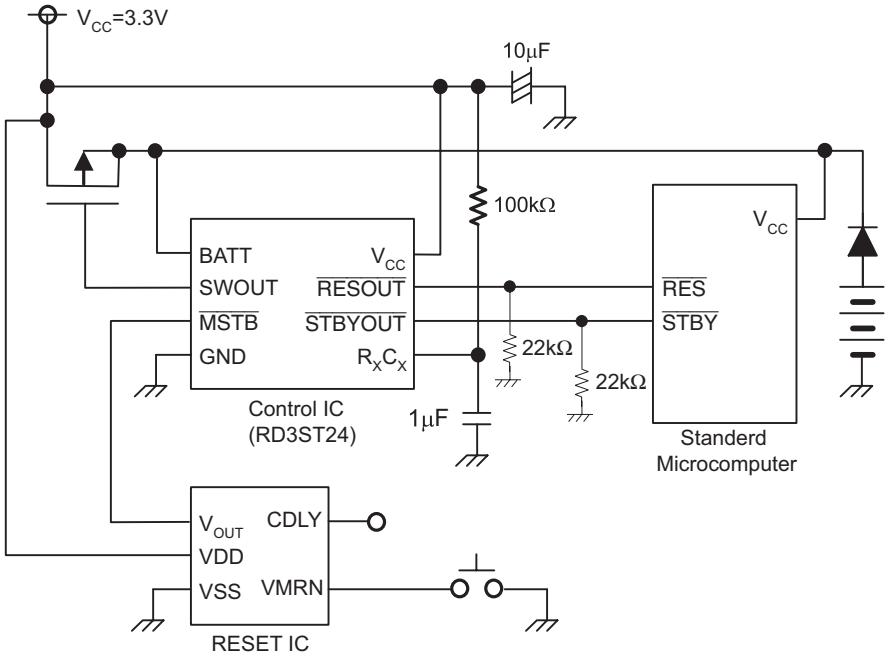
Item	Symbol	V_{CC} (V) *[1]	BATT (V)	Min	Typ	Max	Unit	Test condition
Propagation delay time	t1	3.3	3.3	80	95	110	µs	R_X=10kΩ, C_X=0.01µF
				0.8	0.95	1.1	ms	R_X=10kΩ, C_X=0.1µF
				80	95	110	ms	R_X=100kΩ, C_X=1.0µF
		5.0	5.0	80	95	110	µs	R_X=10kΩ, C_X=0.01µF
				0.8	0.95	1.1	ms	R_X=10kΩ, C_X=0.1µF
				80	95	110	ms	R_X=100kΩ, C_X=1.0µF
	t2	3.3	3.3	125	—	250	ns	
		5.0	5.0	70	—	160	ns	

Note: 1. Ta = 25°C

Timing Diagram

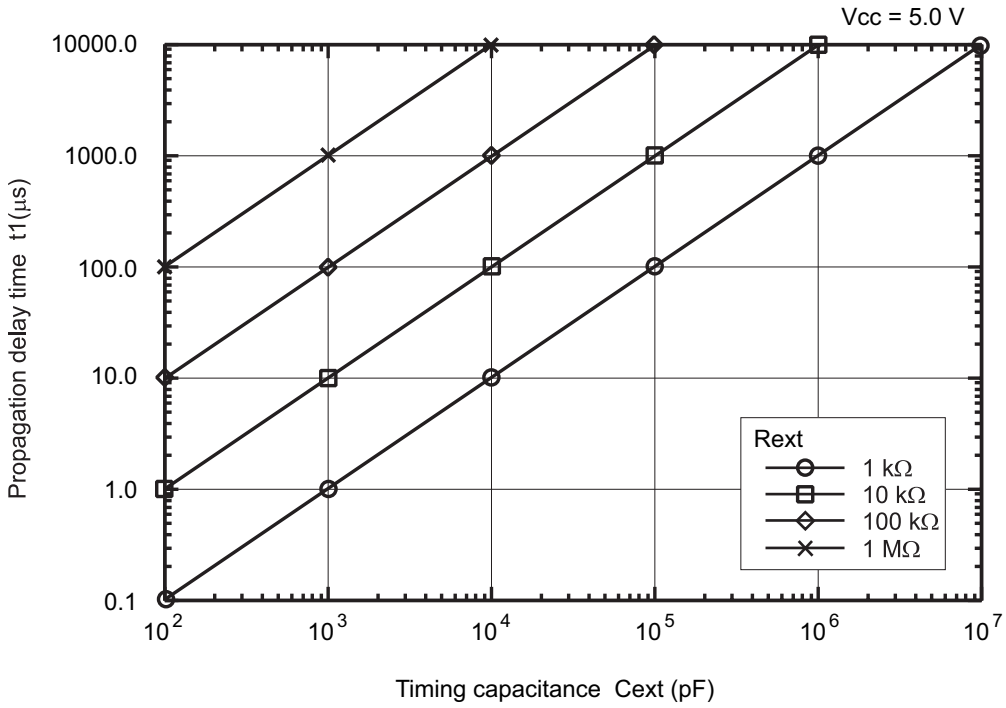


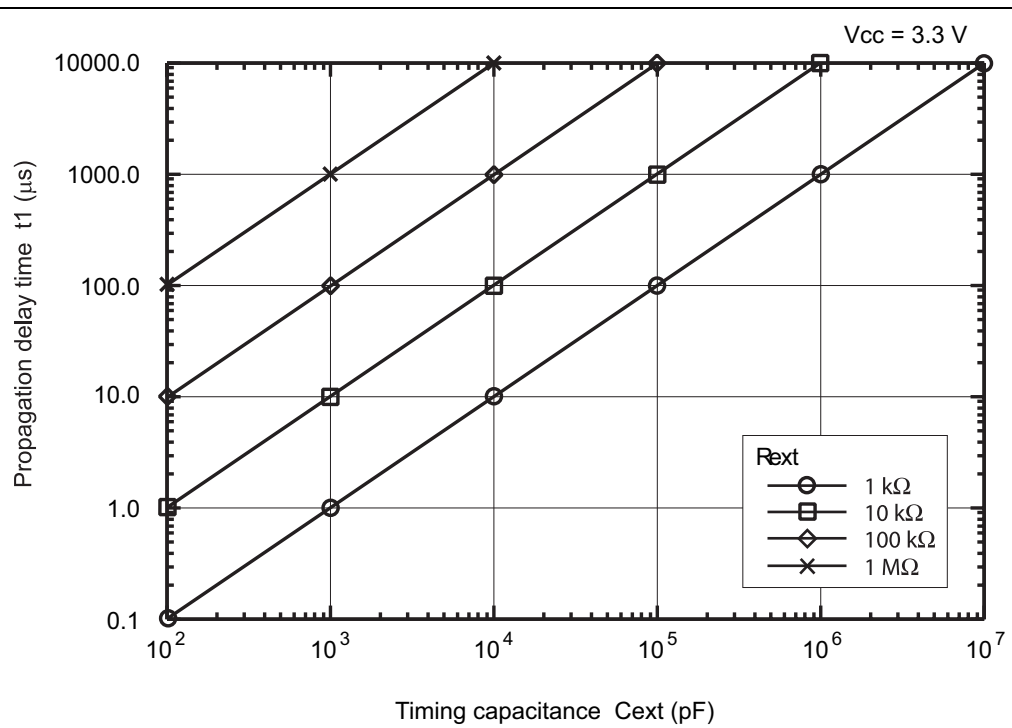
Application Circuit

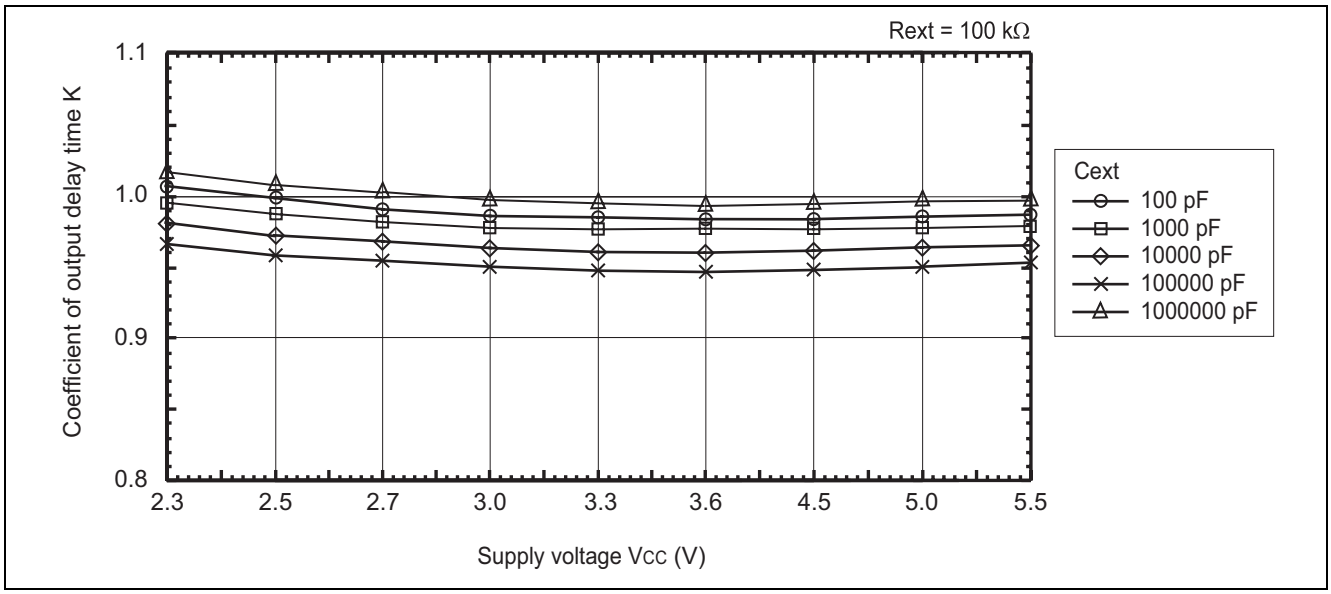


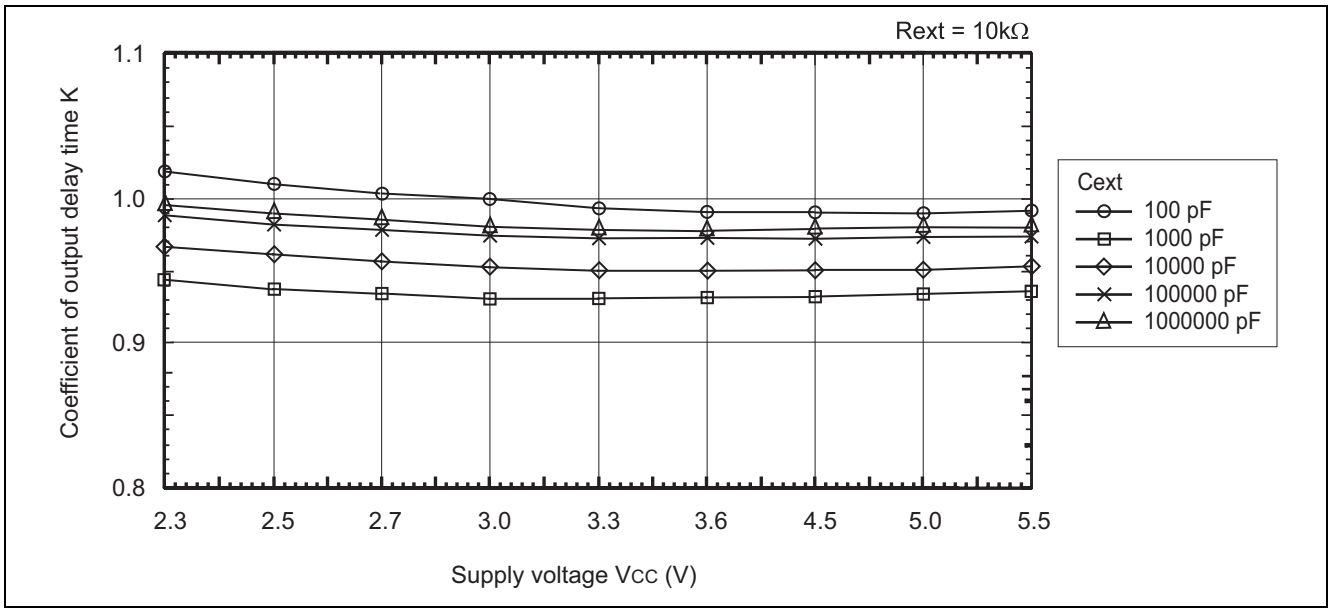
Notes: 1. CDLY terminal of RESET IC becomes shortest that delay time the setting.
2. V_{OUT} of RESET IC is not connected to a direct microcomputer.

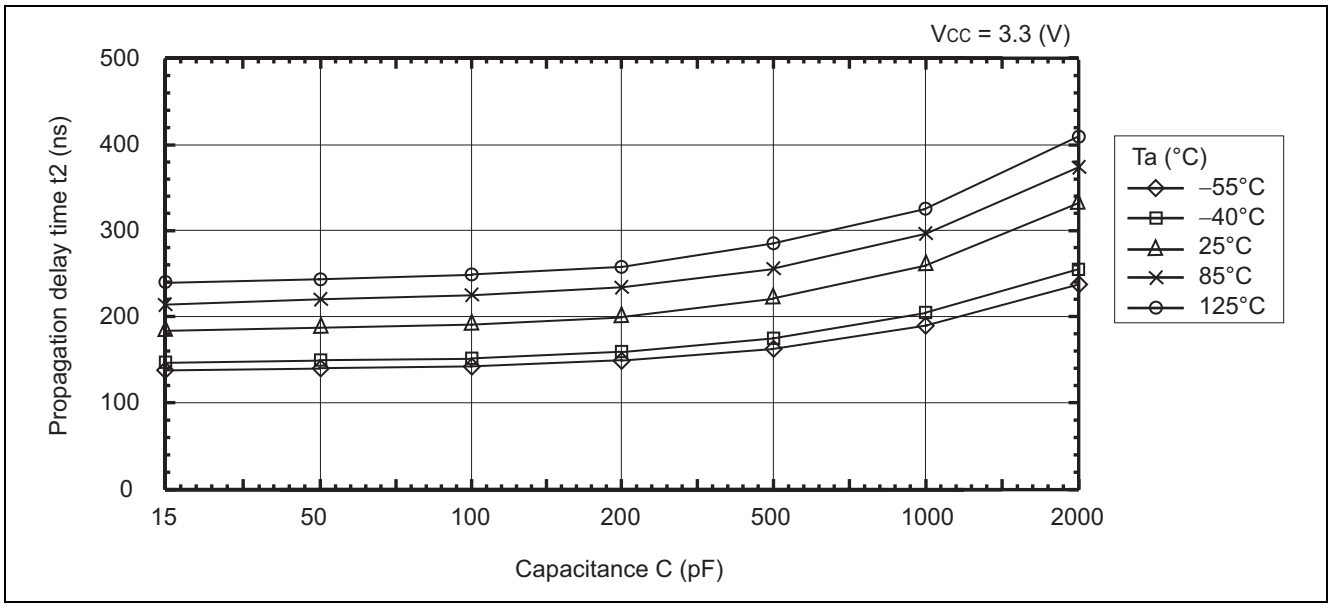
Application Data

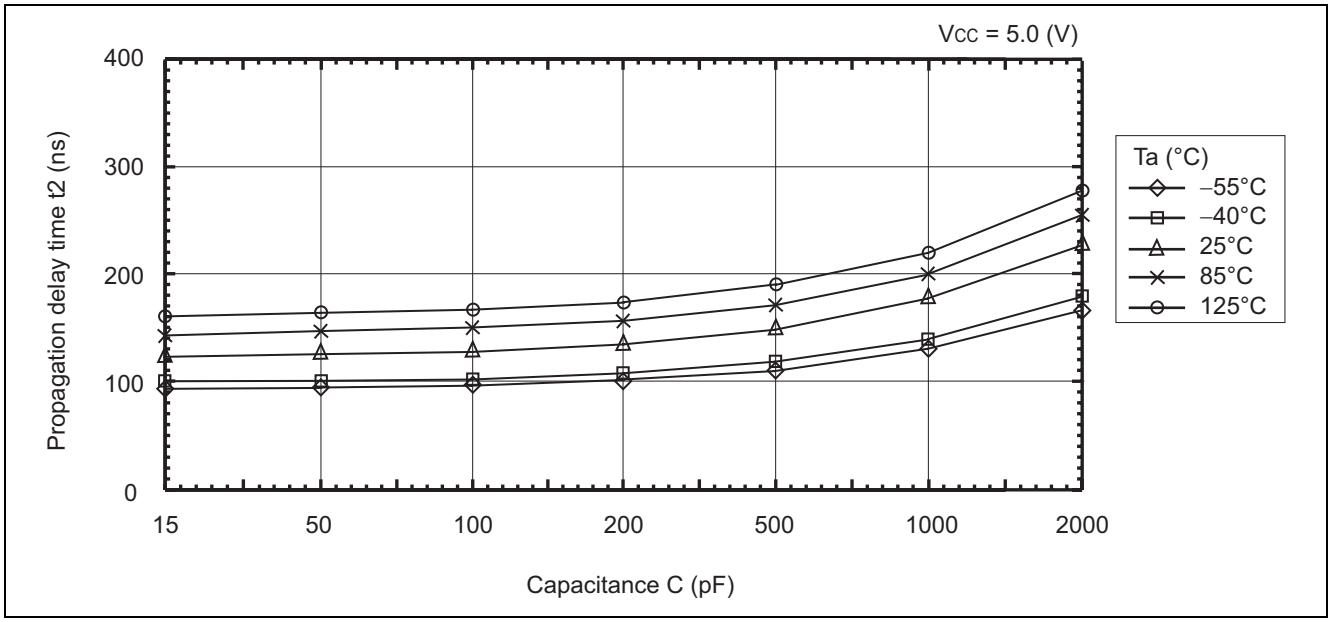





Rext = 100 kΩ
Coefficient of output delay time K
1.1
1.0
0.9
0.8
2.3
2.5
2.7
3.0
3.3
3.6
4.5
5.0
5.5
Supply voltage Vcc (V)
Cext
100 pF
1000 pF
10000 pF
100000 pF
1000000 pF

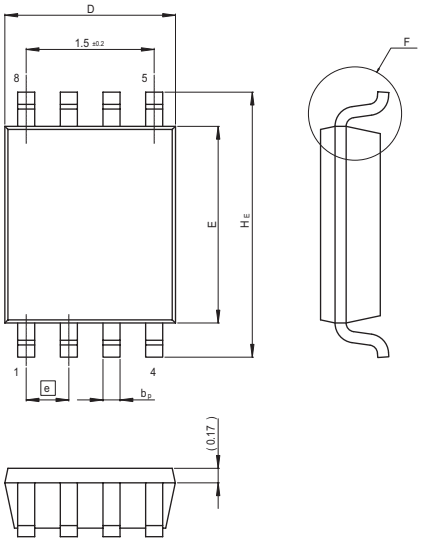

Rext = 10kΩ
Coefficient of output delay time K
1.1
1.0
0.9
0.8
2.3
2.5
2.7
3.0
3.3
3.6
4.5
5.0
5.5
Supply voltage Vcc (V)
Cext
100 pF
1000 pF
10000 pF
100000 pF
1000000 pF

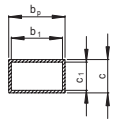

Vcc = 3.3 (V)
Propagation delay time t2 (ns)
500
400
300
200
100
0
15
50
100
200
500
1000
2000
Capacitance C (pF)
Ta (°C)
–55°C
–40°C
25°C
85°C
125°C


Vcc = 5.0 (V)
Propagation delay time t2 (ns)
400
300
200
100
0
15
50
100
200
500
1000
2000
Capacitance C (pF)
Ta (°C)
–55°C
–40°C
25°C
85°C
125°C

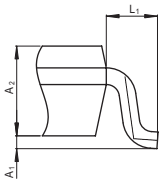
Package Dimensions

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_2	0.6	0.7	0.8
A_1	0	—	0.1
A	—	—	—
b_p	0.15	0.22	0.3
b_1	—	0.20	—
c	0.08	0.13	0.23
c_1	—	0.11	—
θ	—	—	—
H_E	2.8	3.1	3.4
e	—	(0.5)	—
x	—	—	—
y	—	—	—
Z	—	—	—
L	—	—	—
L_1	—	(0.4)	—

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