

# HD74HC423A

## Dual Retriggerable Monostable Multivibrators

REJ03D0626-0200  
 (Previous ADE-205-505)  
 Rev.2.00  
 Mar 30, 2006

### Description

This multivibrator features output-pulse-duration control by two methods. The basic pulse duration is programmed by selection of external resistance and capacitance values. Once triggered, the basic pulse duration may be extended by retriggering the gated low-level-active (A) or high-level-active (B) inputs, or be reduced by use of the overriding clear. The B input is a Schmitt trigger enabling jitter-free triggering from input signals with slow transition rates.







### Features

- High Speed Operation
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage:  $V_{CC} = 2$  to 6 V
- Low Input Current: 1  $\mu$ A max
- Low Quiescent Supply Current
- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74HC423AP	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74HC423AFPEL	SOP-16 pin (JEITA)	PRSP0016DH-B (FP-16DAV)	FP	EL (2,000 pcs/reel)

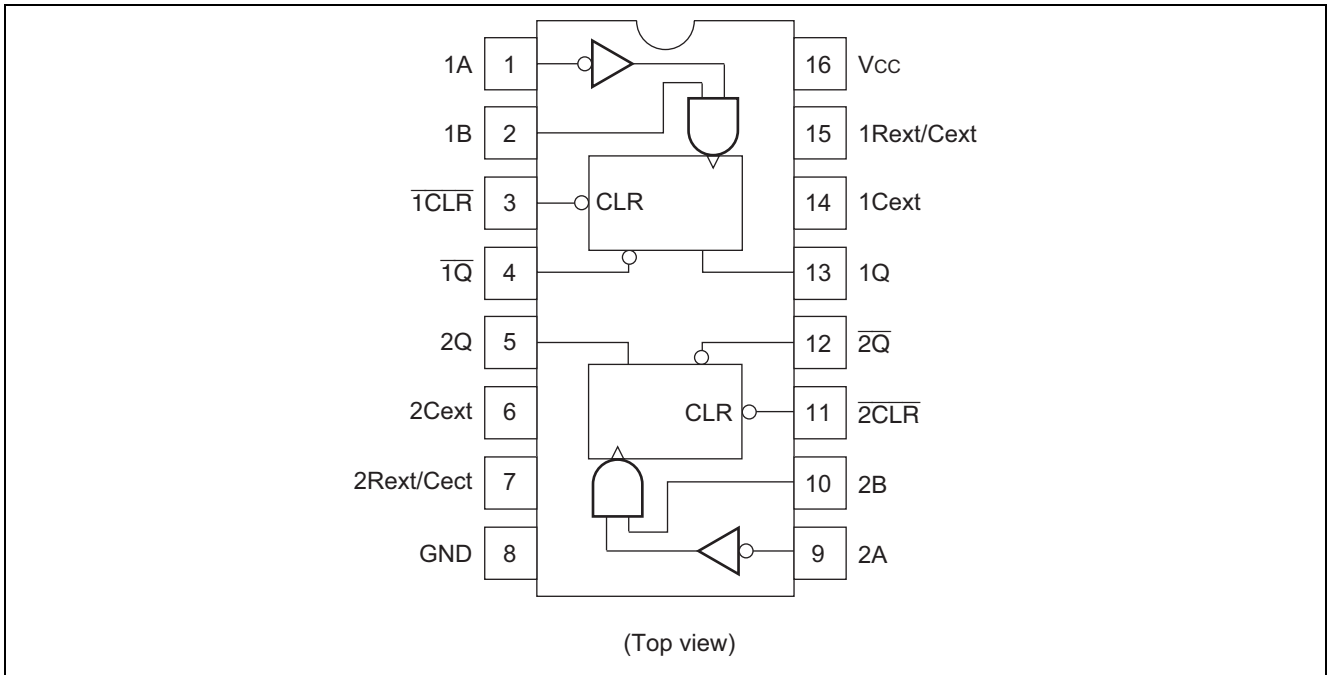
Note: Please consult the sales office for the above package availability.

### Function Table

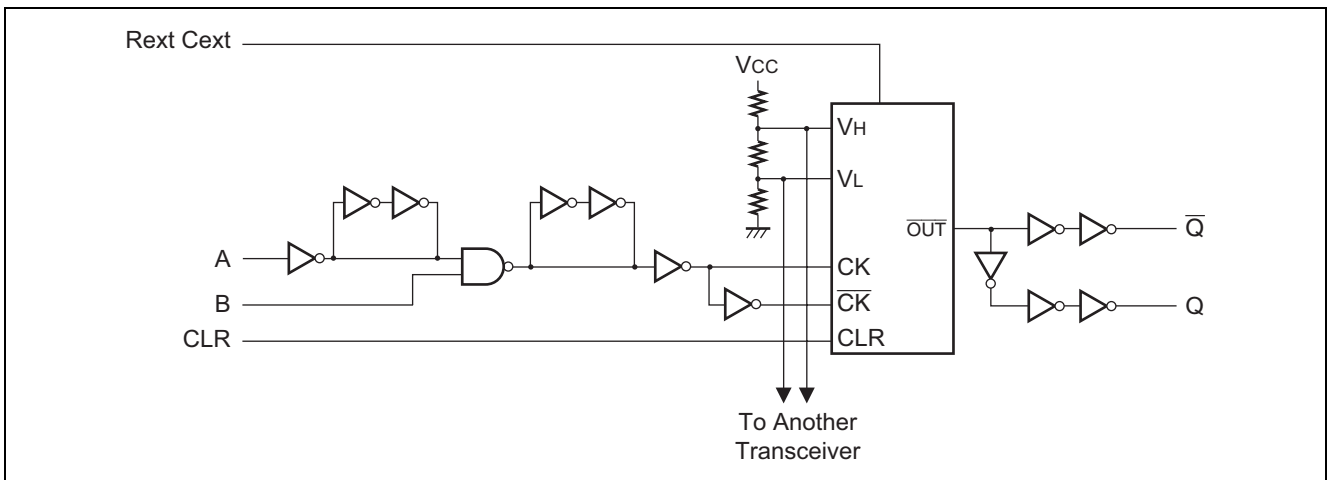
Clear	Inputs		Outputs	
	A	B	Q	$\bar{Q}$
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	L			
H		H		

Note: 1. H; High level, L; Low level, X; Irrelevant

Pin Arrangement



Logic Diagram (1/2)



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage range	$V_{CC}$	-0.5 to 7.0	V
Input / Output voltage	$V_{IN}, V_{OUT}$	-0.5 to $V_{CC} + 0.5$	V
Input / Output diode current	$I_{IK}, I_{OK}$	$\pm 20$	mA
Output current	$I_{OUT}$	$\pm 25$	mA
$V_{CC}, GND$ current	$I_{CC}$ or $I_{GND}$	$\pm 50$	mA
Power dissipation	$P_T$	500	mW
Storage temperature	$T_{stg}$	-65 to +150	$^{\circ}C$

Note: 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.

## Recommended Operating Conditions

Item	Symbol	Ratings	Unit	Conditions
Supply voltage	$V_{CC}$	2 to 6	V	
Input / Output voltage	$V_{IN}, V_{OUT}$	0 to $V_{CC}$	V	
Operating temperature	$T_a$	-40 to 85	°C	
Input rise / fall time <sup>*1</sup>	$t_r, t_f$	0 to 1000	ns	$V_{CC} = 2.0$ V
		0 to 500		$V_{CC} = 4.5$ V
		0 to 400		$V_{CC} = 6.0$ V

Note: 1. This item guarantees maximum limit when one input switches.

Waveform: Refer to test circuit of switching characteristics.

## Electrical Characteristics

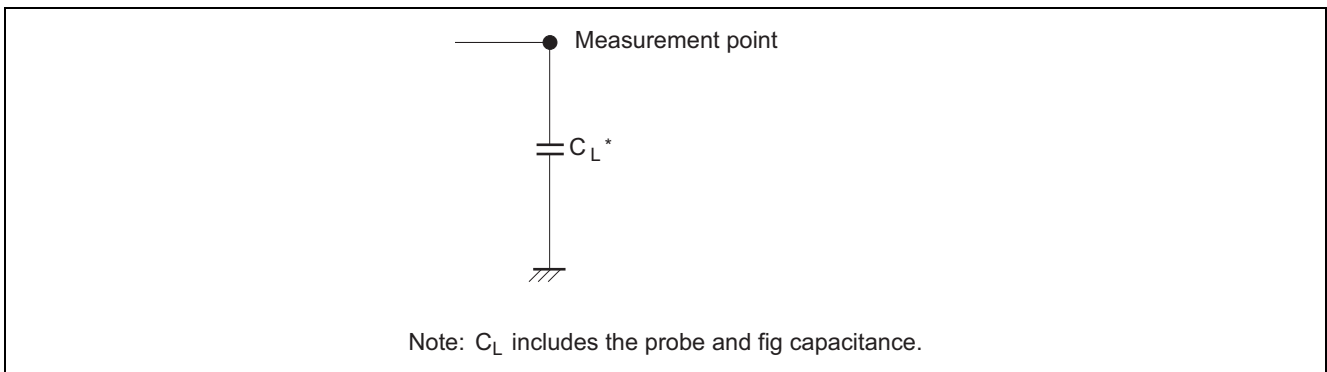
Item	Symbol	$V_{CC}$ (V)	$T_a = 25^\circ\text{C}$			$T_a = -40 \text{ to } +85^\circ\text{C}$		Unit	Test Conditions		
			Min	Typ	Max	Min	Max				
Input voltage	$V_{IH}$	2.0	1.5	—	—	1.5	—	V			
		4.5	3.15	—	—	3.15	—				
		6.0	4.2	—	—	4.2	—				
	$V_{IL}$	2.0	—	—	0.5	—	0.5	V			
		4.5	—	—	1.35	—	1.35				
		6.0	—	—	1.8	—	1.8				
Output voltage	$V_{OH}$	2.0	1.9	2.0	—	1.9	—	V	$V_{in} = V_{IH} \text{ or } V_{IL}$	$I_{OH} = -20 \mu\text{A}$	
		4.5	4.4	4.5	—	4.4	—			$I_{OH} = -4 \text{ mA}$	
		6.0	5.9	6.0	—	5.9	—			$I_{OH} = -5.2 \text{ mA}$	
		4.5	4.18	—	—	4.13	—				
		6.0	5.68	—	—	5.63	—				
	$V_{OL}$	2.0	—	0.0	0.1	—	0.1	V	$V_{in} = V_{IH} \text{ or } V_{IL}$	$I_{OL} = 20 \mu\text{A}$	
		4.5	—	0.0	0.1	—	0.1				
		6.0	—	0.0	0.1	—	0.1				
		4.5	—	—	0.26	—	0.33			$I_{OH} = 4 \text{ mA}$	
		6.0	—	—	0.26	—	0.33			$I_{OH} = 5.2 \text{ mA}$	
Input current	$I_{in}$	6.0	—	—	$\pm 0.1$	—	$\pm 1.0$	$\mu\text{A}$	$V_{in} = V_{CC} \text{ or } \text{GND}$		
Quiescent Supply current	Standby state	$I_{CC}$	6.0	—	—	130	—	220	$\mu\text{A}$	$V_{in} = V_{CC} \text{ or } \text{GND}$	$I_{OUT} = 0 \mu\text{A}$
	Active state			—	—	130	—	220			$R_{ext} / C_{ext} = 0.5 V_{CC}$

**Switching Characteristics** ( $C_L = 50 \text{ pF}$ , Input  $t_r = t_f = 6 \text{ ns}$ )

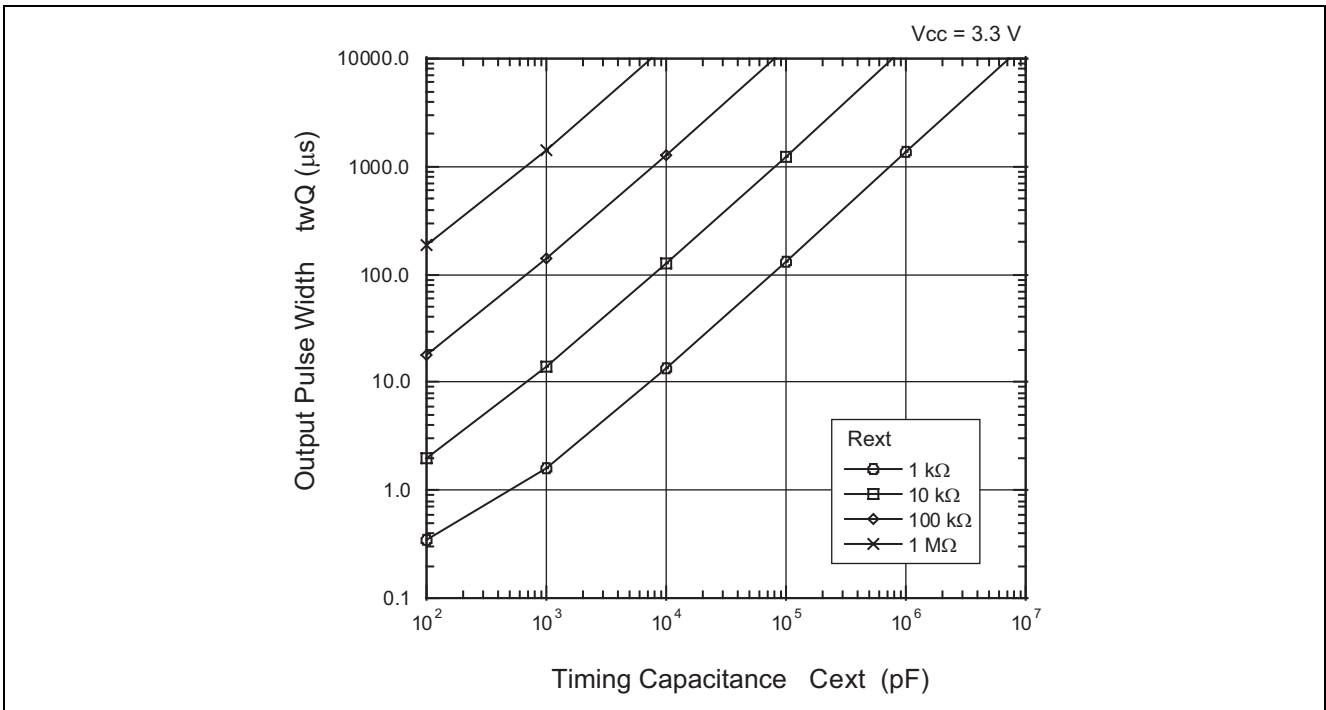
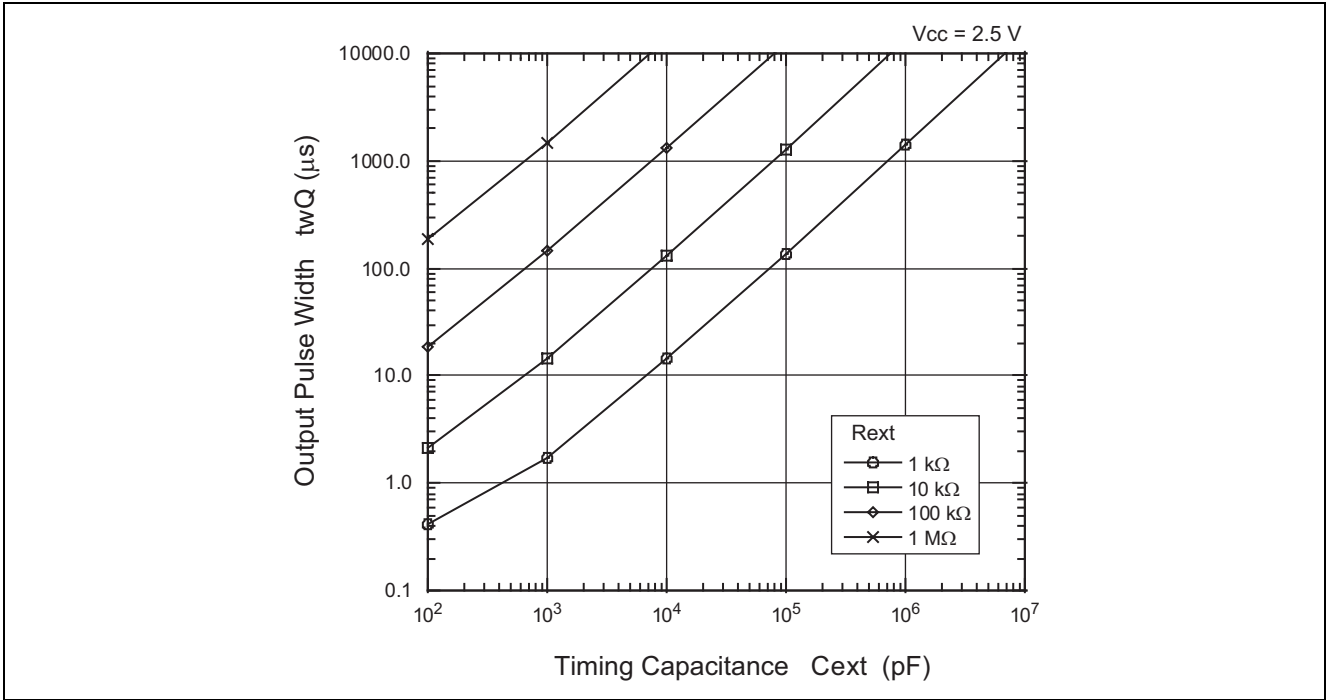
Item	Symbol	$V_{CC}$ (V)	$T_a = 25^\circ\text{C}$			$T_a = -40 \text{ to } +85^\circ\text{C}$		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Propagation delay time	$t_{PLH}$	2.0	—	—	210	—	265	ns	A or B to Q	
		4.5	—	20	42	—	53			
		6.0	—	—	36	—	45			
	$t_{PHL}$	2.0	—	—	240	—	300	ns	A or B to $\bar{Q}$	
		4.5	—	21	48	—	60			
		6.0	—	—	41	—	51			
	$t_{PHL}$	2.0	—	—	170	—	215	ns	Clear to Q	
		4.5	—	17	34	—	43			
		6.0	—	—	29	—	37			
	$t_{PLH}$	2.0	—	—	180	—	225	ns	Clear to $\bar{Q}$	
		4.5	—	15	36	—	45			
		6.0	—	—	31	—	38			
Pulse width	$t_w$	2.0	150	—	—	190	—	ns	A, B, Clear	
		4.5	30	6	—	38	—			
		6.0	26	—	—	33	—			
Removal time	$t_{rem}$	2.0	0	—	—	5	—	ns	Clear	
		4.5	0	-3	—	5	—			
		6.0	0	—	—	5	—			
Minimum output pulse width	$t_{WQ}(\text{min})$	2.0	—	1.5	—	—	—	$\mu\text{s}$	Cext = 28 pF	Rext = 6 k $\Omega$
		4.5	—	450	—	—	—			ns
		6.0	—	380	—	—	—	—	—	—
Output pulse width	$t_{WQ}$	4.5	—	1.0	—	—	—	ms	Cext = 0.1 $\mu\text{F}$ , Rext = 10 k $\Omega$	
Output rise/fall time	$t_{TLH}$ $t_{THL}$	2.0	—	—	75	—	95	ns		
		4.5	—	5	15	—	19			
		6.0	—	—	13	—	16			
Input capacitance	Cin	—	—	—	20	—	20	pF	Pins 7 & 15	
		—	—	5	10	—	10		Other pins	

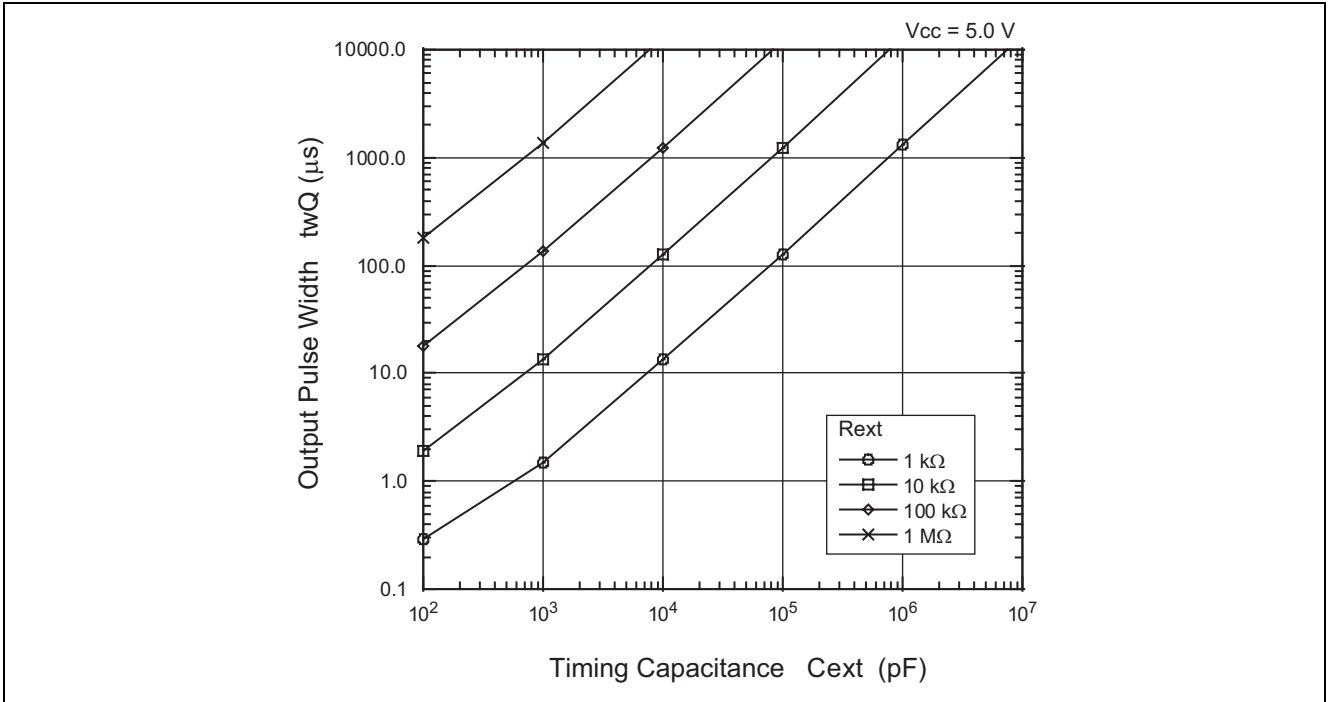
Caution in use: In order to prevent any malfunctions due to noise, connect a highfrequency performance capacitor between  $V_{CC}$  and GND, and keep the wiring between the external components and Cext, Rext/Cext pins as short as possible.

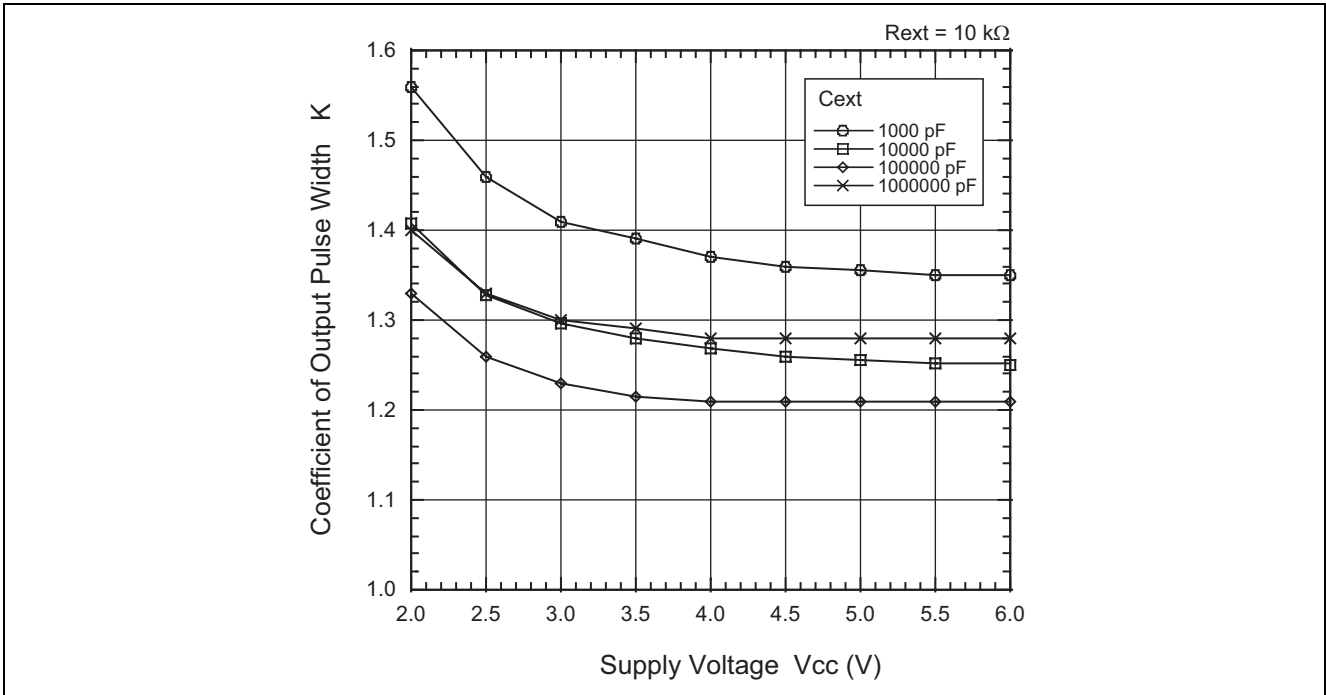
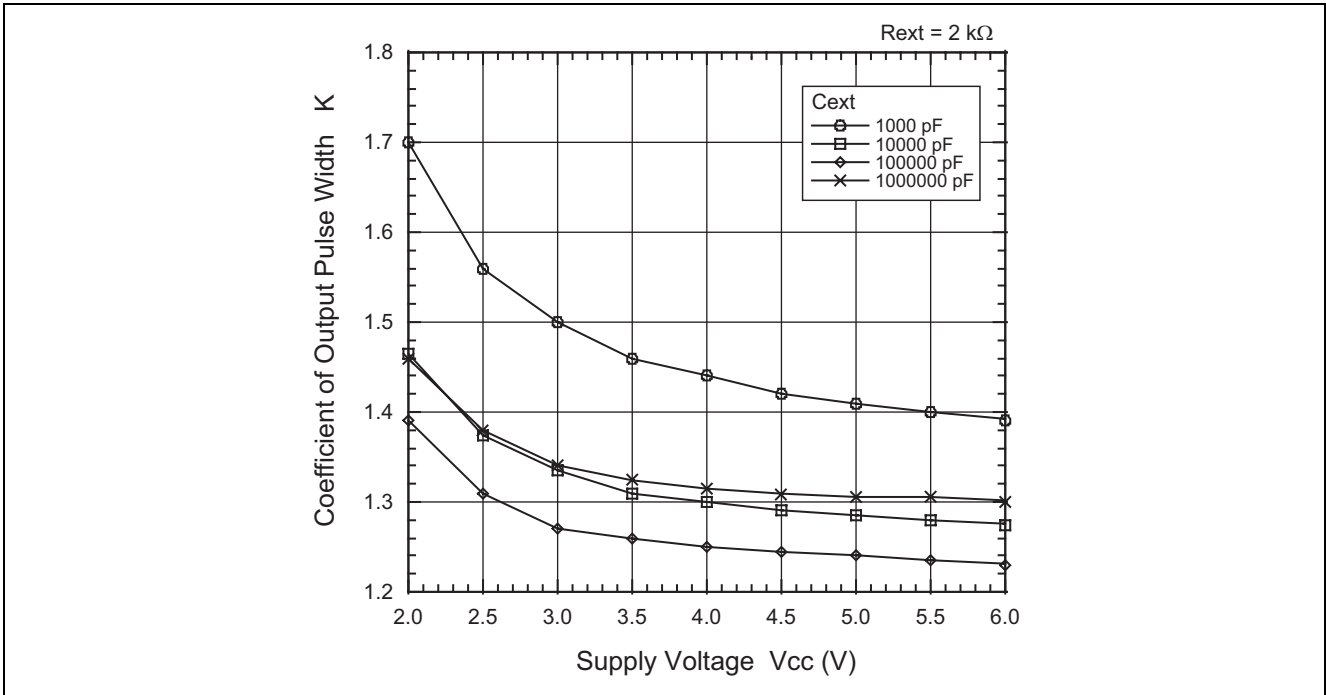
**Test Circuit**



Application Data

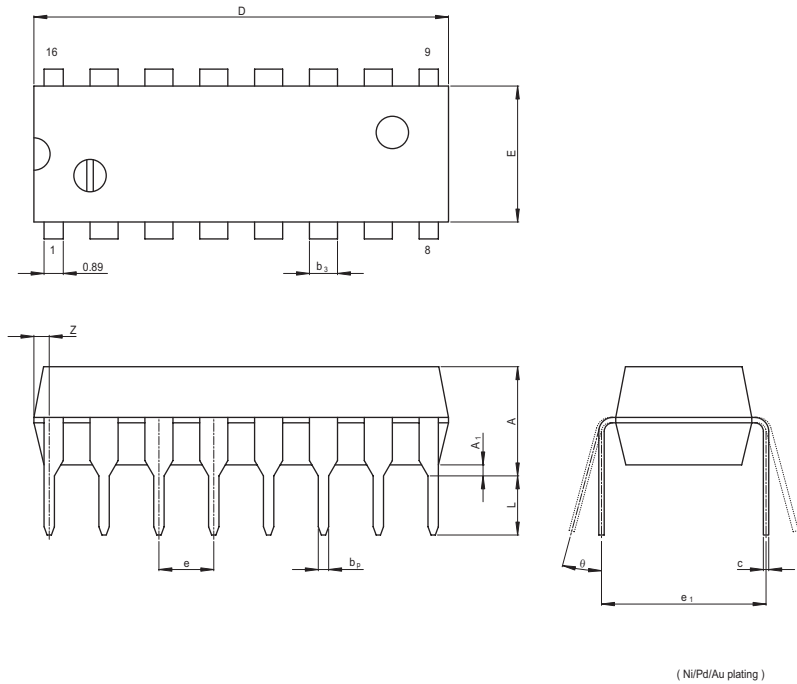






Package Dimensions

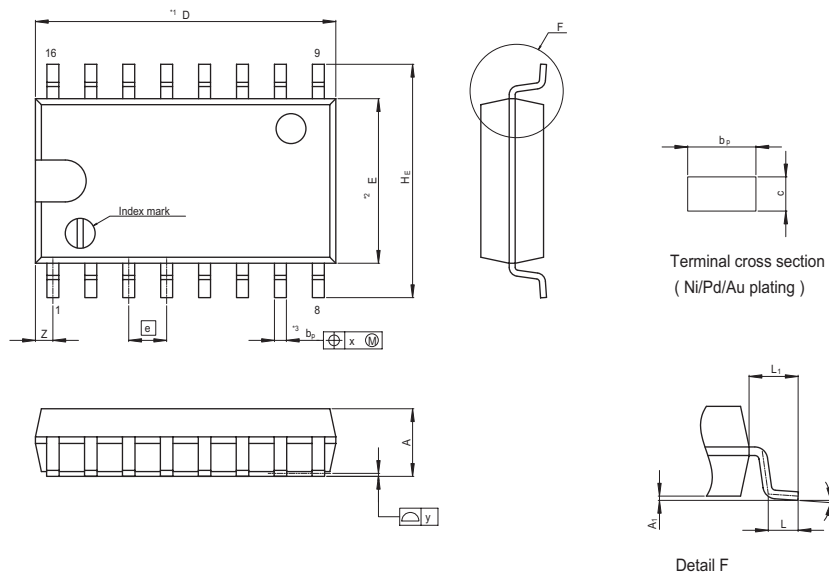
JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-DIP16-6.3x19.2-2.54	PRDP0016AE-B	DP-16FV	1.05g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e <sub>1</sub>	—	7.62	—
D	—	19.2	20.32
E	—	6.3	7.4
A	—	—	5.06
A <sub>1</sub>	0.51	—	—
b <sub>p</sub>	0.40	0.48	0.56
b <sub>3</sub>	—	1.30	—
c	0.19	0.25	0.31
θ	0°	—	15°
e	2.29	2.54	2.79
Z	—	—	1.12
L	2.54	—	—

( Ni/Pd/Au plating )

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP16-5.5x10.06-1.27	PRSP0016DH-B	FP-16DAV	0.24g



NOTE  
 1. DIMENSIONS\*\*1 (Nom)\*\*AND\*\*2\* DO NOT INCLUDE MOLD FLASH.  
 2. DIMENSION\*\*3\*DOES NOT INCLUDE TRIM OFFSET.

Terminal cross section  
 ( Ni/Pd/Au plating )

Detail F

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	10.06	10.5
E	—	5.50	—
A <sub>2</sub>	—	—	—
A <sub>1</sub>	0.00	0.10	0.20
A	—	—	2.20
b <sub>p</sub>	0.34	0.40	0.46
b <sub>1</sub>	—	—	—
c	0.15	0.20	0.25
c <sub>1</sub>	—	—	—
θ	0°	—	8°
HE	7.50	7.80	8.00
Ⓧ	—	1.27	—
x	—	—	0.12
y	—	—	0.15
Z	—	—	0.80
L	0.50	0.70	0.90
L <sub>1</sub>	—	1.15	—



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