

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 μ 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)

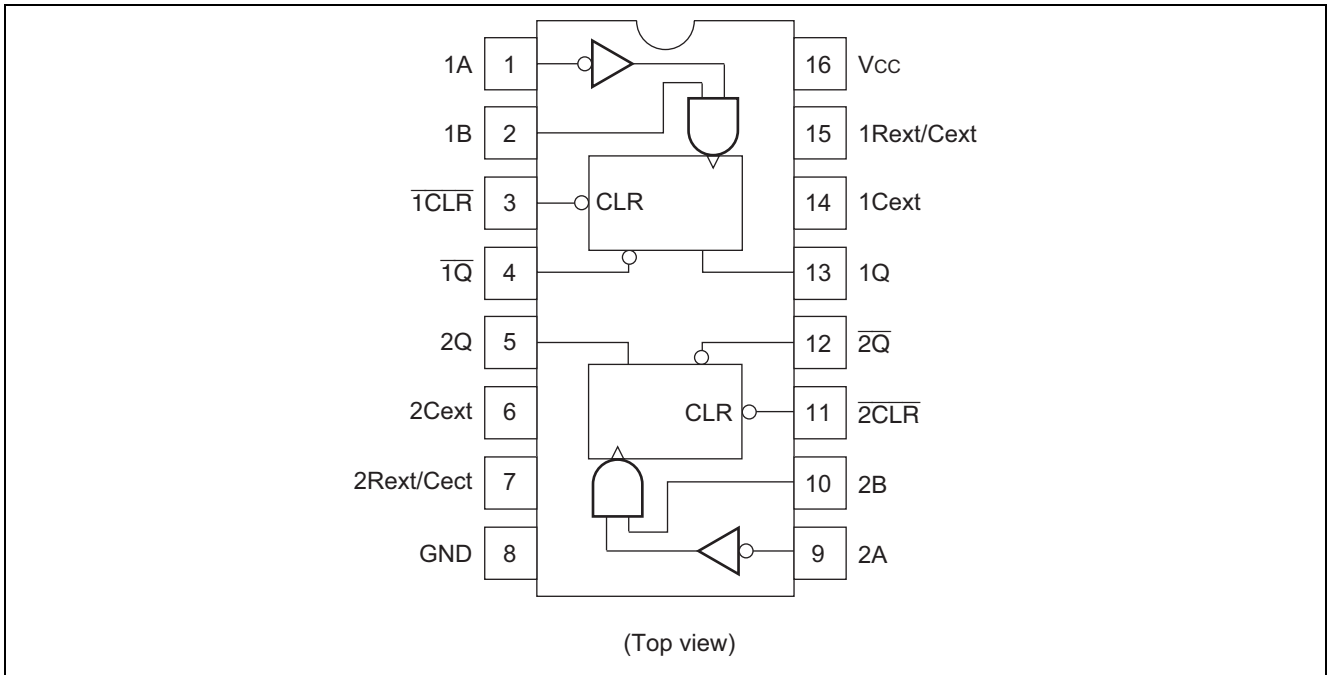
Note: Please consult the sales office for the above package availability.

Function Table

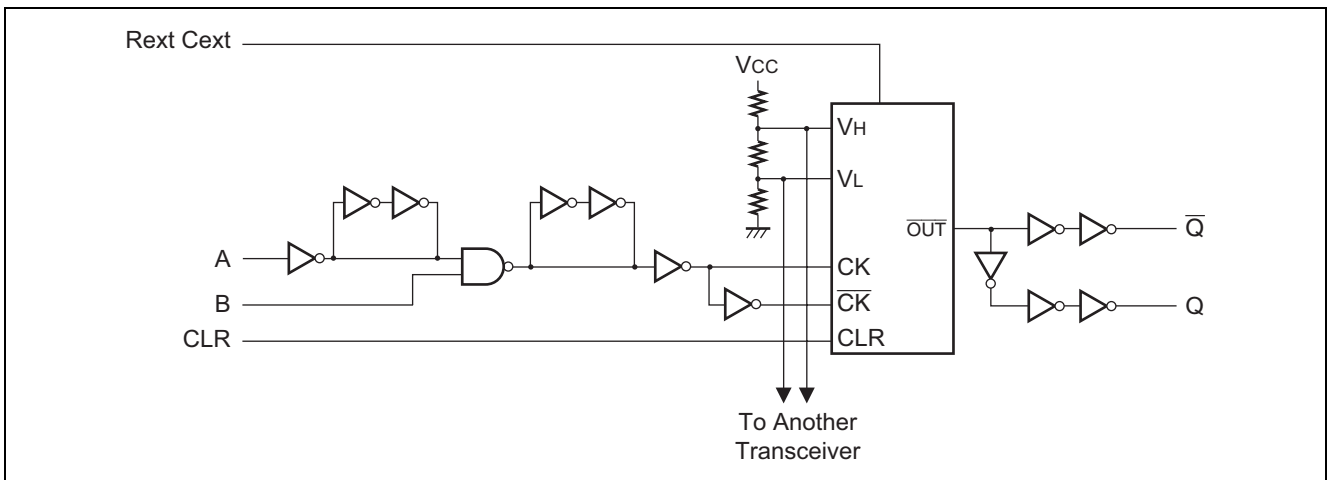
Clear	Inputs		Outputs	
	A	B	Q	\bar{Q}
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	L			
H		H		

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}	± 20	mA
Output current	I_{OUT}	± 25	mA
V_{CC}, GND current	I_{CC} or I_{GND}	± 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 ^{*1}	t_r, t_f	0 to 1000	ns	$V_{CC} = 2.0\text{ V}$
		0 to 500		$V_{CC} = 4.5\text{ V}$
		0 to 400		$V_{CC} = 6.0\text{ V}$

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

Waveform: Refer to test circuit of switching characteristics.

Electrical Characteristics

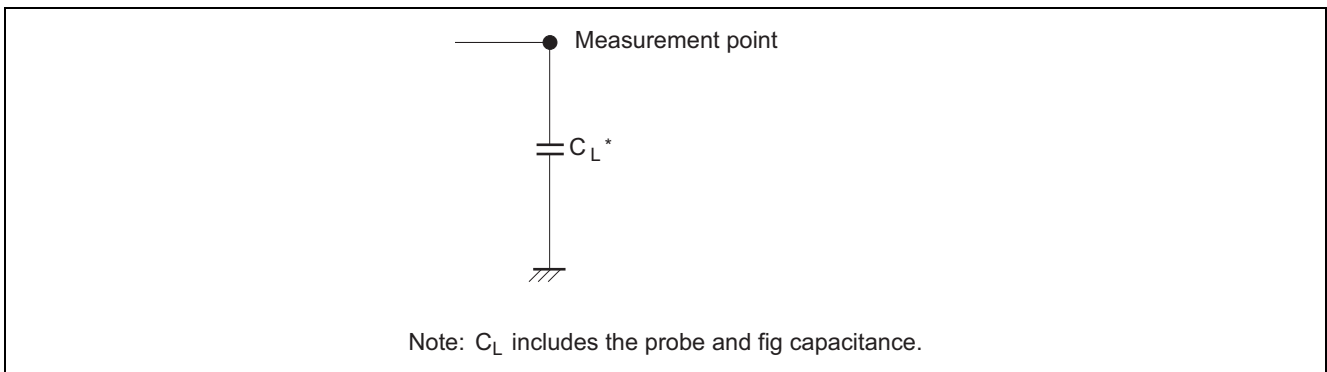
Item	Symbol	V_{CC} (V)	$T_a = 25^\circ\text{C}$			$T_a = -40\text{ to }+85^\circ\text{C}$		Unit	Test Conditions		
			Min	Typ	Max	Min	Max				
Input voltage	V_{IH}	2.0	1.5	—	—	1.5	—	V			
		4.5	3.15	—	—	3.15	—				
		6.0	4.2	—	—	4.2	—				
	V_{IL}	2.0	—	—	0.5	—	0.5	V			
		4.5	—	—	1.35	—	1.35				
		6.0	—	—	1.8	—	1.8				
Output voltage	V_{OH}	2.0	1.9	2.0	—	1.9	—	V	$V_{in} = V_{IH}$ 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	$V_{in} = V_{IH}$ 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	—	—	± 0.1	—	± 1.0	μA	$V_{in} = V_{CC}$ or GND		
Quiescent Supply current	Standby state	I_{CC}	6.0	—	—	130	—	220	μA	$V_{in} = V_{CC}$ or 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 $t_r = t_f = 6 \text{ ns}$)

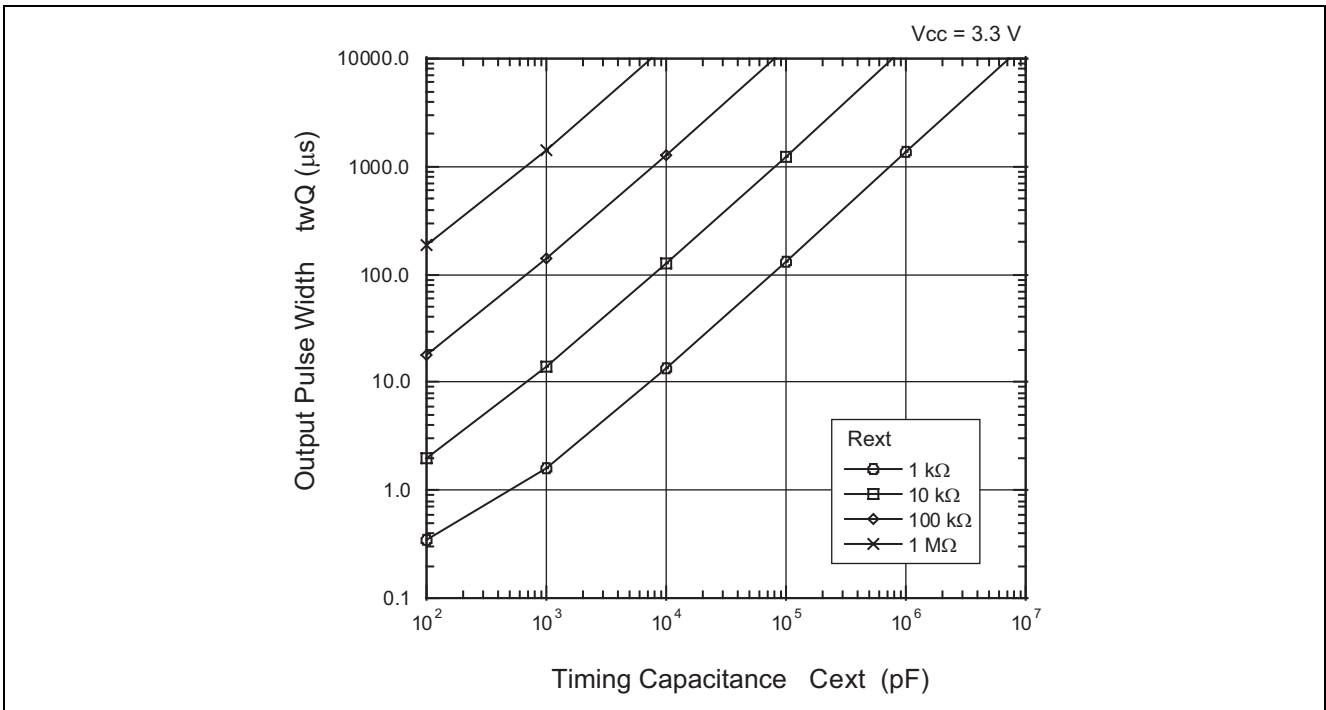
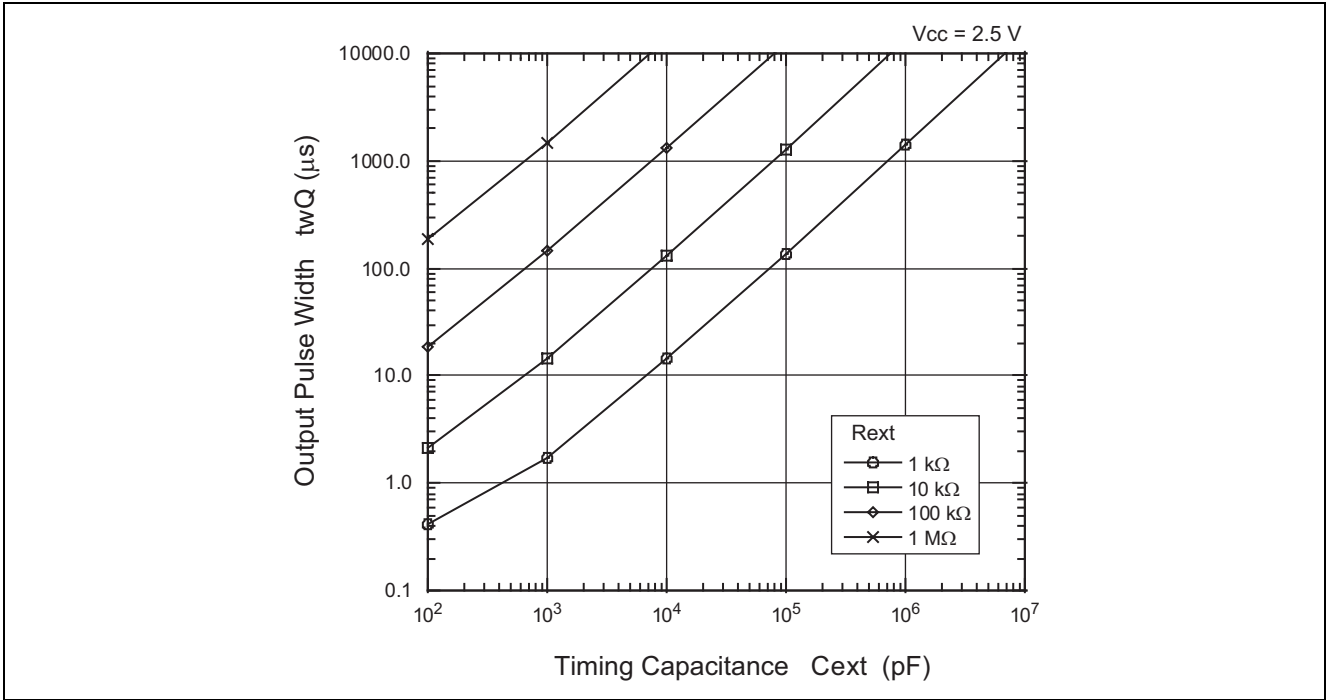
Item	Symbol	V_{CC} (V)	$T_a = 25^\circ\text{C}$			$T_a = -40 \text{ to } +85^\circ\text{C}$		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Propagation delay time	t_{PLH}	2.0	—	—	210	—	265	ns	A or B to Q	
		4.5	—	20	42	—	53			
		6.0	—	—	36	—	45			
	t_{PHL}	2.0	—	—	240	—	300	ns	A or B to \bar{Q}	
		4.5	—	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	—	—	—	μs	Cext = 28 pF	Rext = 6 k Ω
		4.5	—	450	—	—	—			ns
		6.0	—	380	—	—	—			
Output pulse width	t_{WQ}	4.5	—	1.0	—	—	—	ms	Cext = 0.1 μF , Rext = 10 k Ω	
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	

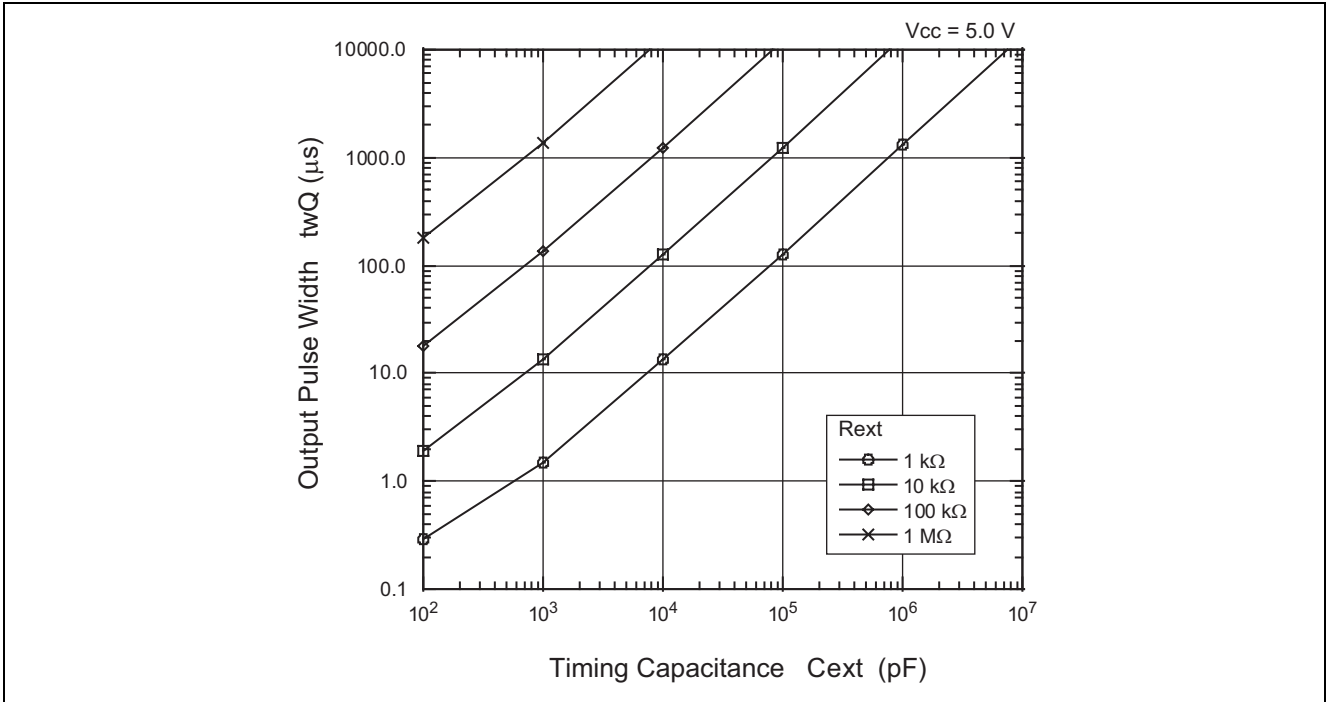
Caution in use: In order to prevent any malfunctions due to noise, connect a highfrequency performance capacitor between V_{CC} and GND, and keep the wiring between the external components and Cext, Rext/Cext pins as short as possible.

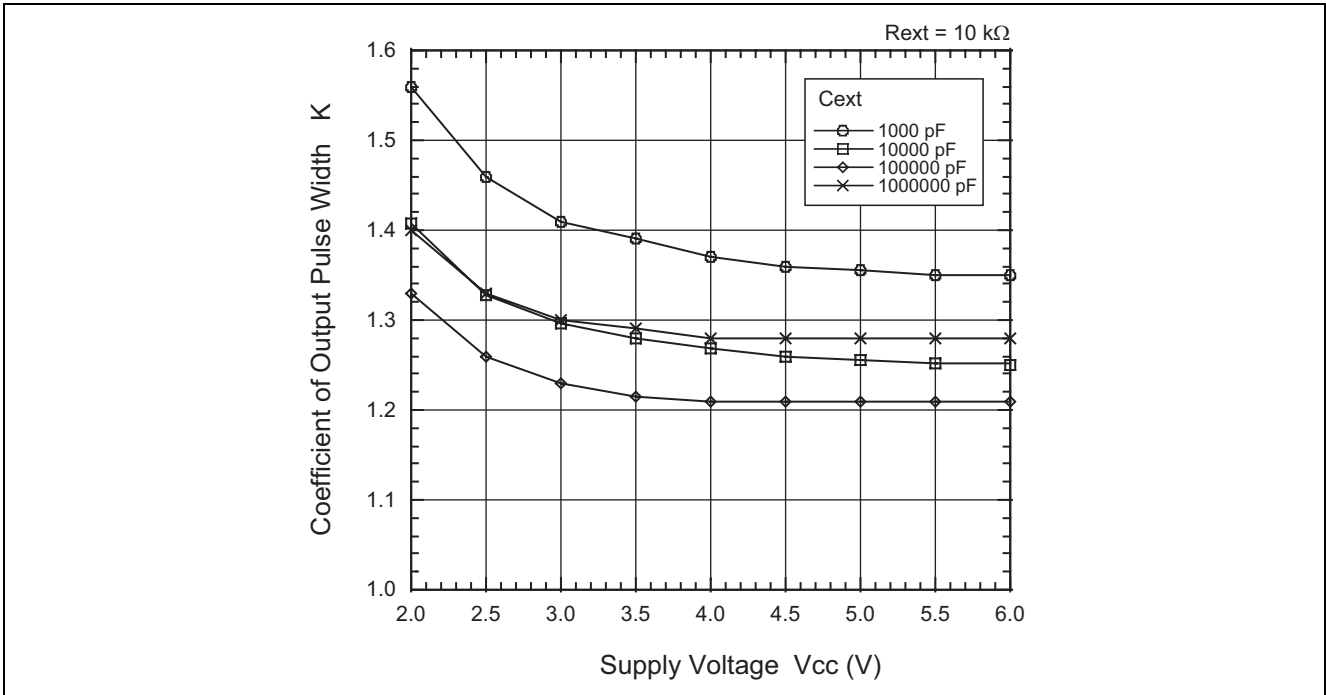
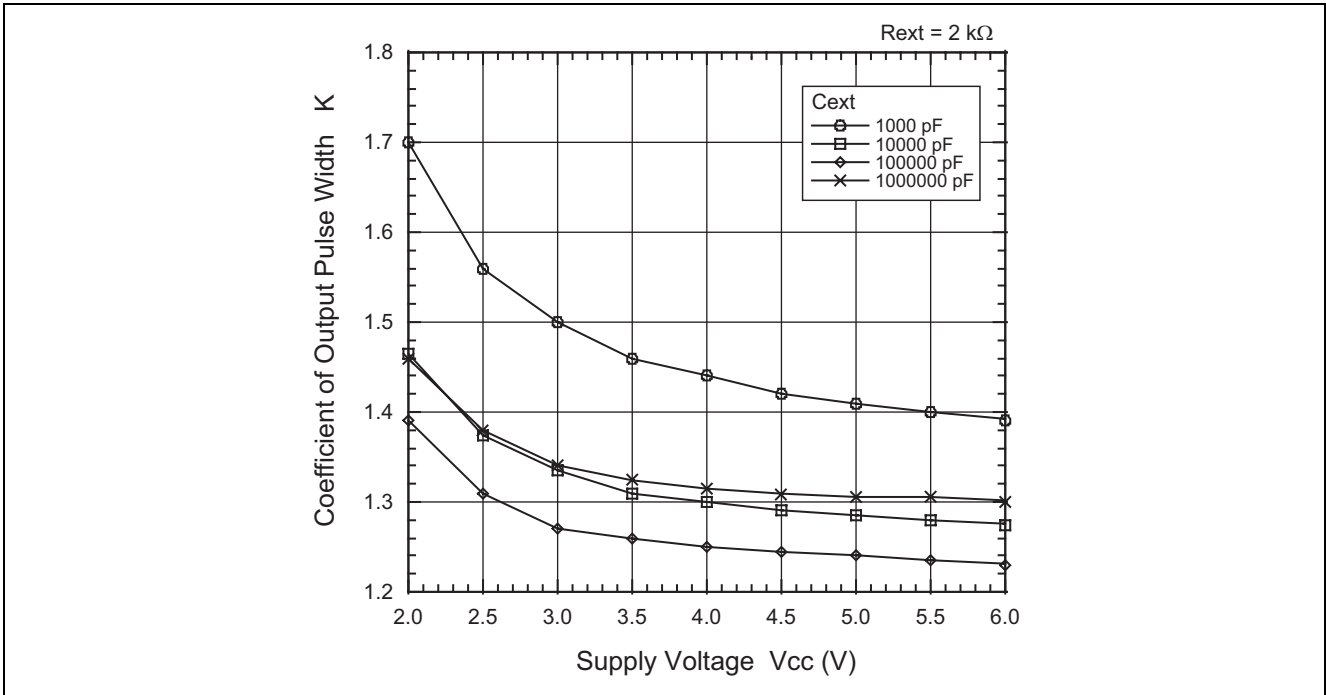
Test Circuit



Application Data

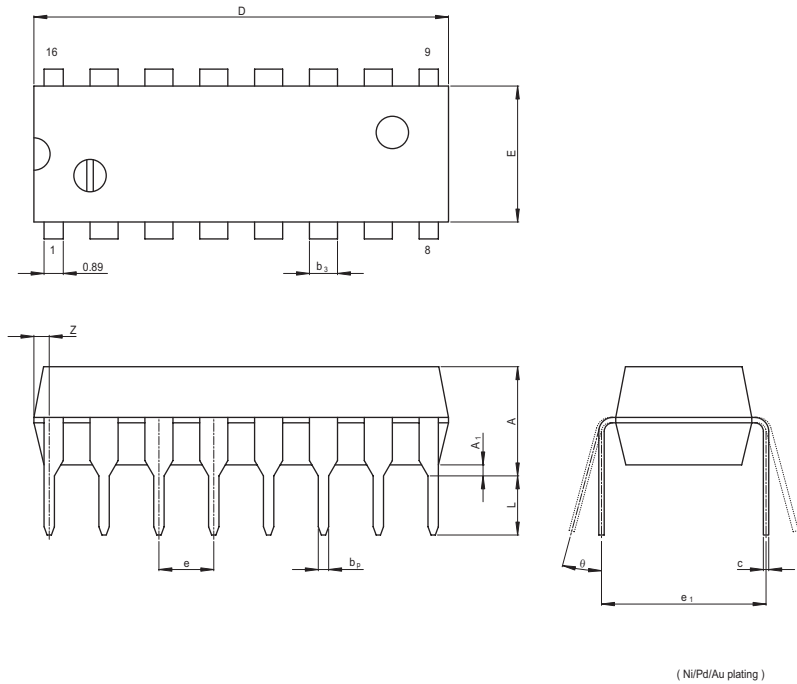






Package Dimensions

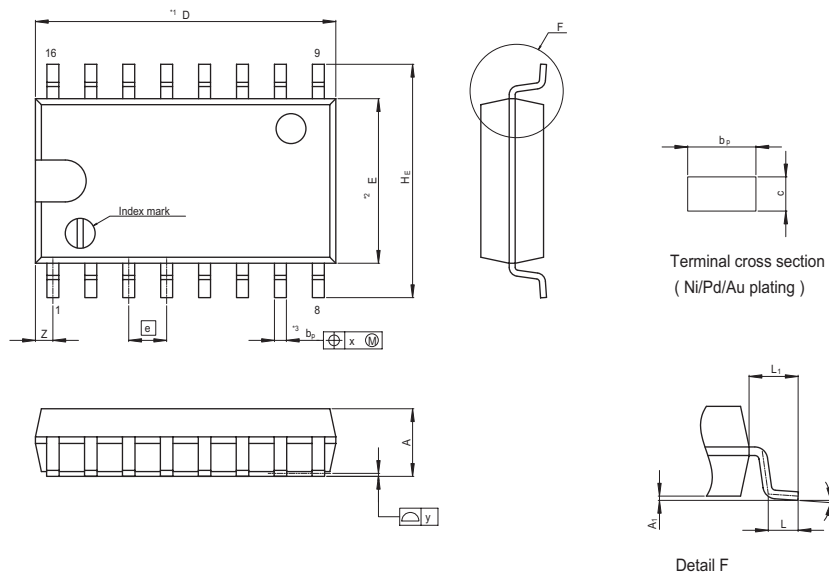
JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-DIP16-6.3x19.2-2.54	PRDP0016AE-B	DP-16FV	1.05g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e ₁	—	7.62	—
D	—	19.2	20.32
E	—	6.3	7.4
A	—	—	5.06
A ₁	0.51	—	—
b _p	0.40	0.48	0.56
b ₃	—	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 ₂	—	—	—
A ₁	0.00	0.10	0.20
A	—	—	2.20
b _p	0.34	0.40	0.46
b ₁	—	—	—
c	0.15	0.20	0.25
c ₁	—	—	—
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 ₁	—	1.15	—

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