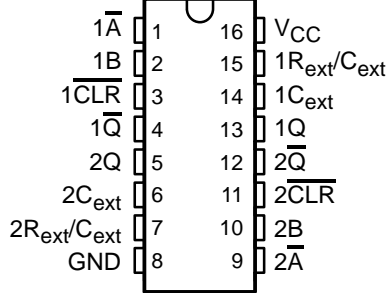


# SN54LV123A, SN74LV123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH SCHMITT-TRIGGER INPUTS

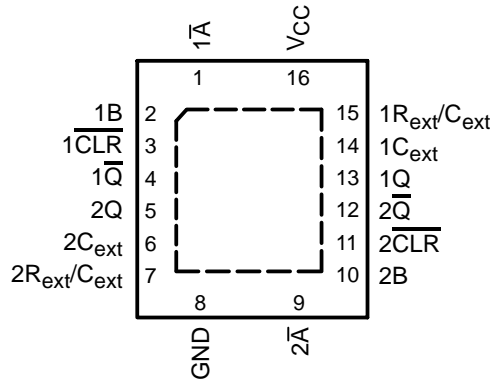
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- 2-V to 5.5-V  $V_{CC}$  Operation
- Max  $t_{pd}$  of 11 ns at 5 V
- Typical  $V_{OLP}$  (Output Ground Bounce)  $<0.8$  V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- Typical  $V_{OHV}$  (Output  $V_{OH}$  Undershoot)  $>2.3$  V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- Support Mixed-Mode Voltage Operation on All Ports
- Schmitt-Trigger Circuitry on  $\overline{A}$ , B, and  $\overline{CLR}$  Inputs for Slow Input Transition Rates
- Edge Triggered From Active-High or Active-Low Gated Logic Inputs
- $I_{off}$  Supports Partial-Power-Down Mode Operation
- Retriggerable for Very Long Output Pulses, up to 100% Duty Cycle
- Overriding Clear Terminates Output Pulse
- Glitch-Free Power-Up Reset on Outputs
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)

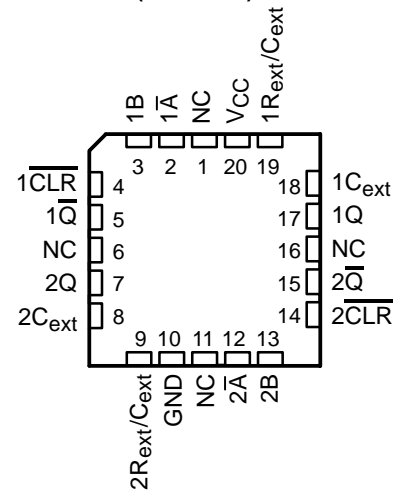
SN54LV123A ... J OR W PACKAGE  
SN74LV123A ... D, DB, DGV, NS,  
OR PW PACKAGE  
(TOP VIEW)



SN74LV123A ... RGY PACKAGE  
(TOP VIEW)



SN54LV123A ... FK PACKAGE  
(TOP VIEW)



NC – No internal connection

## description/ordering information

### ORDERING INFORMATION

T <sub>A</sub>	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
–40°C to 85°C	QFN – RGY	Tape and reel	SN74LV123ARGYR	LV123A
	SOIC – D	Tube	SN74LV123AD	LV123A
		Tape and reel	SN74LV123ADR	
	SOP – NS	Tape and reel	SN74LV123ANSR	74LV123A
	SSOP – DB	Tape and reel	SN74LV123ADBR	LV123A
	TSSOP – PW	Tube	SN74LV123APW	LV123A
		Tape and reel	SN74LV123APWR	
	TVSOP – DGV	Tape and reel	SN74LV123ADGVR	LV123A
–55°C to 125°C	CDIP – J	Tube	SNJ54LV123AJ	SNJ54LV123AJ
	CFP – W	Tube	SNJ54LV123AW	SNJ54LV123AW
	LCCC – FK	Tube	SNJ54LV123AFK	SNJ54LV123AFK

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package).

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# SN54LV123A, SN74LV123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH SCHMITT-TRIGGER INPUTS

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## description/ordering information (continued)

The 'LV123A devices are dual retriggerable monostable multivibrators designed for 2-V to 5.5-V  $V_{CC}$  operation.

These edge-triggered multivibrators feature output pulse-duration control by three methods. In the first method, the  $\bar{A}$  input is low and the B input goes high. In the second method, the B input is high and the  $\bar{A}$  input goes low. In the third method, the  $\bar{A}$  input is low, the B input is high, and the clear ( $\overline{CLR}$ ) input goes high.

The output pulse duration is programmable by selecting external resistance and capacitance values. The external timing capacitor must be connected between  $C_{ext}$  and  $R_{ext}/C_{ext}$  (positive) and an external resistor connected between  $R_{ext}/C_{ext}$  and  $V_{CC}$ . To obtain variable pulse durations, connect an external variable resistance between  $R_{ext}/C_{ext}$  and  $V_{CC}$ . The output pulse duration also can be reduced by taking  $\overline{CLR}$  low.

Pulse triggering occurs at a particular voltage level and is not directly related to the transition time of the input pulse. The  $\bar{A}$ , B, and  $\overline{CLR}$  inputs have Schmitt triggers with sufficient hysteresis to handle slow input transition rates with jitter-free triggering at the outputs.







Once triggered, the basic pulse duration can be extended by retriggering the gated low-level-active ( $\bar{A}$ ) or high-level-active (B) input. Pulse duration can be reduced by taking  $\overline{CLR}$  low. The input/output timing diagram illustrates pulse control by retriggering the inputs and early clearing.

During power up, Q outputs are in the low state, and  $\bar{Q}$  outputs are in the high state. The outputs are glitch free, without applying a reset pulse.

These devices are fully specified for partial-power-down applications using  $I_{off}$ . The  $I_{off}$  circuitry disables the outputs, preventing damaging current backflow through the devices when they are powered down.

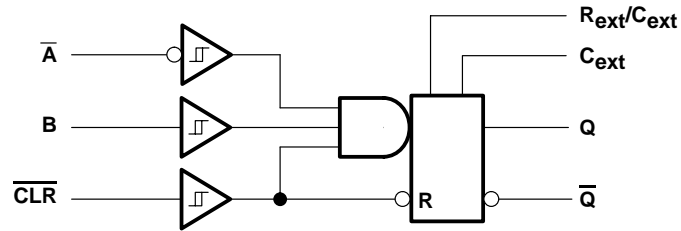
Pin assignments for these devices are identical to those of the 'AHC123A and 'AHCT123A devices for interchangeability, when allowed.

FUNCTION TABLE  
(each multivibrator)

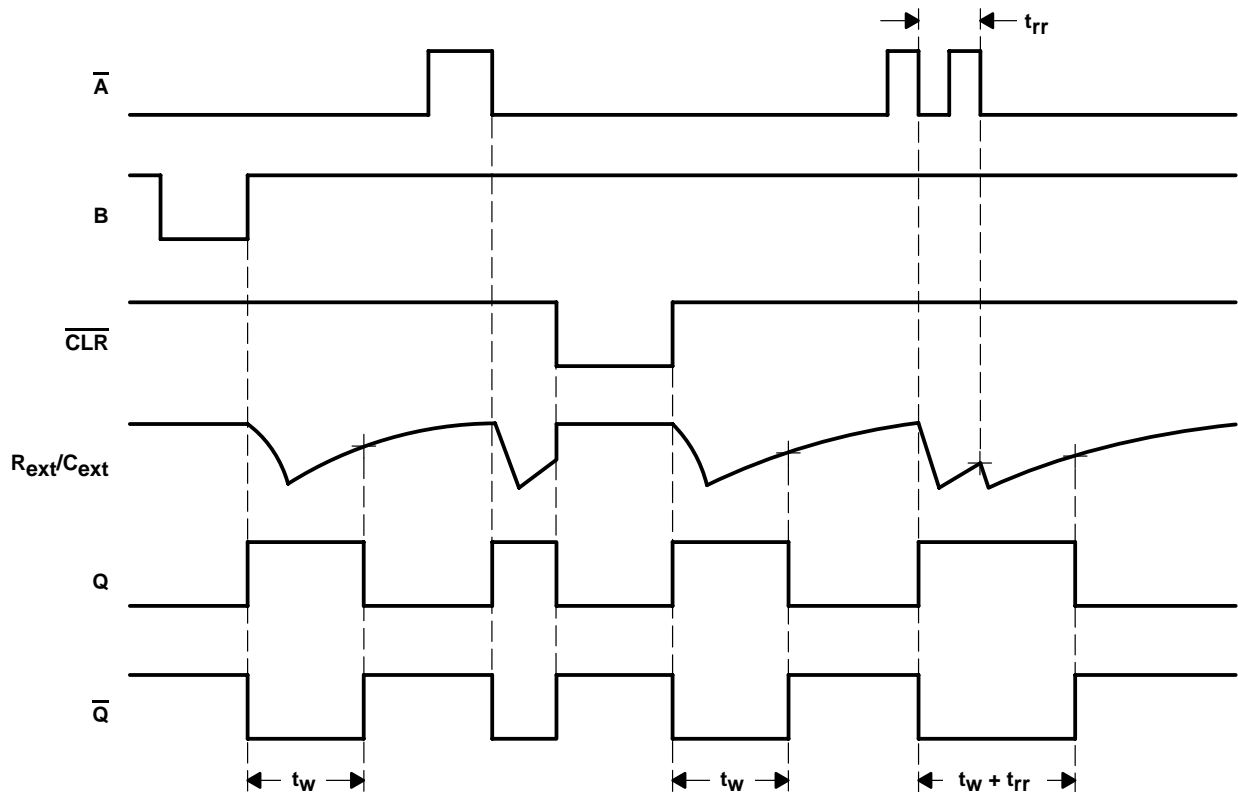
INPUTS			OUTPUTS	
$\overline{CLR}$	$\bar{A}$	B	Q	$\bar{Q}$
L	X	X	L	H
X	H	X	$L^\dagger$	$H^\dagger$
X	X	L	$L^\dagger$	$H^\dagger$
H	L	$\uparrow$		
H	$\downarrow$	H		
$\uparrow$	L	H		

$\dagger$  These outputs are based on the assumption that the indicated steady-state conditions at the  $\bar{A}$  and B inputs have been set up long enough to complete any pulse started before the setup.

logic diagram, each multivibrator (positive logic)



input/output timing diagram



# SN54LV123A, SN74LV123A

## DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS

### WITH SCHMITT-TRIGGER INPUTS

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#### absolute maximum ratings over operating free-air temperature (unless otherwise noted)†

Supply voltage range, $V_{CC}$	–0.5 V to 7 V
Input voltage range, $V_I$ (see Note 1)	–0.5 V to 7 V
Voltage range applied to any output in the high-impedance or power-off state, $V_O$ (see Note 1)	–0.5 V to 7 V
Output voltage range in high or low state, $V_O$ (see Notes 1 and 2)	–0.5 V to $V_{CC} + 0.5$ V
Output voltage range in power-off state, $V_O$ (see Note 1)	–0.5 V to 7 V
Input clamp current, $I_{IK}$ ( $V_I < 0$ )	–20 mA
Output clamp current, $I_{OK}$ ( $V_O < 0$ or $V_O > V_{CC}$ )	±50 mA
Continuous output current, $I_O$ ( $V_O = 0$ to $V_{CC}$ )	±25 mA
Continuous current through $V_{CC}$ or GND	±50 mA
Package thermal impedance, $\theta_{JA}$ (see Note 3): D package	73°C/W
(see Note 3): DB package	82°C/W
(see Note 3): DGV package	120°C/W
(see Note 3): NS package	64°C/W
(see Note 3): PW package	108°C/W
(see Note 4): RGY package	39°C/W
Storage temperature range, $T_{stg}$	–65°C to 150°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

- NOTES:
1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
  2. This value is limited to 5.5 V maximum.
  3. The package thermal impedance is calculated in accordance with JESD 51-7.
  4. The package thermal impedance is calculated in accordance with JESD 51-5.



# SN54LV123A, SN74LV123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH SCHMITT-TRIGGER INPUTS

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## recommended operating conditions (see Note 5)

			SN54LV123A		SN74LV123A		UNIT
			MIN	MAX	MIN	MAX	
V <sub>CC</sub>	Supply voltage		2	5.5	2	5.5	V
V <sub>IH</sub>	High-level input voltage	V <sub>CC</sub> = 2 V	1.5		1.5		V
		V <sub>CC</sub> = 2.3 V to 2.7 V	V <sub>CC</sub> × 0.7		V <sub>CC</sub> × 0.7		
		V <sub>CC</sub> = 3 V to 3.6 V	V <sub>CC</sub> × 0.7		V <sub>CC</sub> × 0.7		
		V <sub>CC</sub> = 4.5 V to 5.5 V	V <sub>CC</sub> × 0.7		V <sub>CC</sub> × 0.7		
V <sub>IL</sub>	Low-level input voltage	V <sub>CC</sub> = 2 V		0.5		0.5	V
		V <sub>CC</sub> = 2.3 V to 2.7 V		V <sub>CC</sub> × 0.3		V <sub>CC</sub> × 0.3	
		V <sub>CC</sub> = 3 V to 3.6 V		V <sub>CC</sub> × 0.3		V <sub>CC</sub> × 0.3	
		V <sub>CC</sub> = 4.5 V to 5.5 V		V <sub>CC</sub> × 0.3		V <sub>CC</sub> × 0.3	
V <sub>I</sub>	Input voltage		0	5.5	0	5.5	V
V <sub>O</sub>	Output voltage		0	V <sub>CC</sub>	0	V <sub>CC</sub>	V
I <sub>OH</sub>	High-level output current	V <sub>CC</sub> = 2 V		–50		–50	μA
		V <sub>CC</sub> = 2.3 V to 2.7 V		–2		–2	
		V <sub>CC</sub> = 3 V to 3.6 V		–6		–6	
		V <sub>CC</sub> = 4.5 V to 5.5 V		–12		–12	
I <sub>OL</sub>	Low-level output current	V <sub>CC</sub> = 2 V		50		50	μA
		V <sub>CC</sub> = 2.3 V to 2.7 V		2		2	
		V <sub>CC</sub> = 3 V to 3.6 V		6		6	
		V <sub>CC</sub> = 4.5 V to 5.5 V		12		12	
R <sub>ext</sub>	External timing resistance	V <sub>CC</sub> = 2 V	5k		5k		Ω
		V <sub>CC</sub> ≥ 3 V	1k		1k		
C <sub>ext</sub>	External timing capacitance		No restriction		No restriction		pF
Δt/ΔV <sub>CC</sub>	Power-up ramp rate		1		1		ms/V
T <sub>A</sub>	Operating free-air temperature		–55	125	–40	85	°C

NOTE 5: Unused R<sub>ext</sub>/C<sub>ext</sub> terminals should be left unconnected. All remaining unused inputs of the device must be held at V<sub>CC</sub> or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

# SN54LV123A, SN74LV123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH SCHMITT-TRIGGER INPUTS

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electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS	V <sub>CC</sub>	SN54LV123A			SN74LV123A			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
V <sub>OH</sub>		I <sub>OH</sub> = -50 μA	2 V to 5.5 V	V <sub>CC</sub> -0.1			V <sub>CC</sub> -0.1			V
		I <sub>OH</sub> = -2 mA	2.3 V	2			2			
		I <sub>OH</sub> = -6 mA	3 V	2.48			2.48			
		I <sub>OH</sub> = -12 mA	4.5 V	3.8			3.8			
V <sub>OL</sub>		I <sub>OL</sub> = 50 μA	2 V to 5.5 V	0.1			0.1			V
		I <sub>OL</sub> = 2 mA	2.3 V	0.4			0.4			
		I <sub>OL</sub> = 6 mA	3 V	0.44			0.44			
		I <sub>OL</sub> = 12 mA	4.5 V	0.55			0.55			
I <sub>I</sub>	R <sub>ext</sub> /C <sub>ext</sub> <sup>†</sup>	V <sub>I</sub> = 5.5 V or GND	2 V to 5.5 V	±2.5			±2.5			μA
	$\overline{A}$ , B, and $\overline{CLR}$	V <sub>I</sub> = 5.5 V or GND	0	±1			±1			
			0 to 5.5 V	±1			±1			
I <sub>CC</sub>	Quiescent	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	5.5 V	20			20			μA
I <sub>CC</sub>	Active state (per circuit)	V <sub>I</sub> = V <sub>CC</sub> or GND, R <sub>ext</sub> /C <sub>ext</sub> = 0.5 V <sub>CC</sub>	2.3 V	220			220			μA
			3 V	280			280			
			4.5 V	650			650			
			5.5 V	975			975			
I <sub>off</sub>		V <sub>I</sub> or V <sub>O</sub> = 0 to 5.5 V	0				5			μA
C <sub>i</sub>		V <sub>I</sub> = V <sub>CC</sub> or GND	3.3 V	1.9			1.9			pF
			5 V	1.9			1.9			

<sup>†</sup> This test is performed with the terminal in the off-state condition.

timing requirements over recommended operating free-air temperature range, V<sub>CC</sub> = 2.5 V ± 0.2 V (unless otherwise noted) (see Figure 1)

			TEST CONDITIONS		T <sub>A</sub> = 25°C			SN54LV123A		SN74LV123A		UNIT
					MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>w</sub>	Pulse duration	CL $\overline{R}$			6		6.5		6.5		ns	
		$\overline{A}$ or B trigger			6		6.5		6.5			
t <sub>rr</sub>	Pulse retrigger time	R <sub>ext</sub> = 1 kΩ	C <sub>ext</sub> = 100 pF	‡	94	‡		‡		ns		
			C <sub>ext</sub> = 0.01 μF	‡	2	‡		‡		μs		

‡ See retriggering data in the application information section.

timing requirements over recommended operating free-air temperature range, V<sub>CC</sub> = 3.3 V ± 0.3 V (unless otherwise noted) (see Figure 1)

			TEST CONDITIONS		T <sub>A</sub> = 25°C			SN54LV123A		SN74LV123A		UNIT
					MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>w</sub>	Pulse duration	CLR			5			5		5		ns
		A or B trigger			5			5		5		
t <sub>rr</sub>	Pulse retrigger time	R <sub>ext</sub> = 1 kΩ	C <sub>ext</sub> = 100 pF	‡	76	‡			‡		ns	
			C <sub>ext</sub> = 0.01 μF	‡	1.8	‡			‡		μs	

‡ See retriggering data in the application information section.

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# SN54LV123A, SN74LV123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH SCHMITT-TRIGGER INPUTS

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**timing requirements over recommended operating free-air temperature range,  $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$  (unless otherwise noted) (see Figure 1)**

		TEST CONDITIONS		$T_A = 25^\circ\text{C}$			SN54LV123A		SN74LV123A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$t_w$	Pulse duration	$\overline{\text{CLR}}$		5			5		5		ns
		$\overline{\text{A}}$ or B trigger		5			5		5		
$t_{rr}$	Pulse retrigger time	$R_{ext} = 1\text{ k}\Omega$	$C_{ext} = 100\text{ pF}$	†	59		†		†		ns
			$C_{ext} = 0.01\text{ }\mu\text{F}$	†	1.5		†		†		$\mu\text{s}$

† See retriggering data in the *application information* section.

**switching characteristics over recommended operating free-air temperature range,  $V_{CC} = 2.5\text{ V} \pm 0.2\text{ V}$  (unless otherwise noted) (see Figure 1)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	$T_A = 25^\circ\text{C}$			SN54LV123A		SN74LV123A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$t_{pd}$	$\overline{\text{A}}$ or B	Q or $\overline{\text{Q}}$	$C_L = 15\text{ pF}$	14.5*	31.4*		1*	37*	1	37	ns
	$\overline{\text{CLR}}$	Q or $\overline{\text{Q}}$		13*	25*		1*	29.5*	1	29.5	
	$\overline{\text{CLR}}$ trigger	Q or $\overline{\text{Q}}$		15.1*	33.4*		1*	39*	1	39	
$t_{pd}$	$\overline{\text{A}}$ or B	Q or $\overline{\text{Q}}$	$C_L = 50\text{ pF}$	16.6	36		1	42	1	42	ns
	$\overline{\text{CLR}}$	Q or $\overline{\text{Q}}$		14.7	32.8		1	34.5	1	34.5	
	$\overline{\text{CLR}}$ trigger	Q or $\overline{\text{Q}}$		17.4	38		1	44	1	44	
$t_w^\ddagger$		Q or $\overline{\text{Q}}$	$C_L = 50\text{ pF}$ , $C_{ext} = 28\text{ pF}$ , $R_{ext} = 2\text{ k}\Omega$	197	260			320		320	ns
			$C_L = 50\text{ pF}$ , $C_{ext} = 0.01\text{ }\mu\text{F}$ , $R_{ext} = 10\text{ k}\Omega$	90	100	110	90	110	90	110	$\mu\text{s}$
			$C_L = 50\text{ pF}$ , $C_{ext} = 0.1\text{ }\mu\text{F}$ , $R_{ext} = 10\text{ k}\Omega$	0.9	1	1.1	0.9	1.1	0.9	1.1	ms
$\Delta t_w^\S$			$C_L = 50\text{ pF}$		$\pm 1$						%

\* On products compliant to MIL-PRF-38535, this parameter is not production tested.

†  $t_w$  = Duration of pulse at Q and  $\overline{\text{Q}}$  outputs

§  $\Delta t_w$  = Output pulse-duration variation (Q and  $\overline{\text{Q}}$ ) between circuits in same package

# SN54LV123A, SN74LV123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH SCHMITT-TRIGGER INPUTS

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switching characteristics over recommended operating free-air temperature range,  
 $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$  (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	$T_A = 25^\circ\text{C}$			SN54LV123A		SN74LV123A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$t_{pd}$	$\overline{A}$ or B	Q or $\overline{Q}$	$C_L = 15\text{ pF}$	10.2*	20.6*		1*	24*	1	24	ns
	$\overline{CLR}$	Q or $\overline{Q}$		9.3*	15.8*		1*	18.5*	1	18.5	
	$\overline{CLR}$ trigger	Q or $\overline{Q}$		10.6*	22.4*		1*	26*	1	26	
$t_{pd}$	$\overline{A}$ or B	Q or $\overline{Q}$	$C_L = 50\text{ pF}$	11.8	24.1		1	27.5	1	27.5	ns
	$\overline{CLR}$	Q or $\overline{Q}$		10.5	19.3		1	22	1	22	
	$\overline{CLR}$ trigger	Q or $\overline{Q}$		12.3	25.9		1	29.5	1	29.5	
$t_w^\dagger$		Q or $\overline{Q}$	$C_L = 50\text{ pF}$ , $C_{ext} = 28\text{ pF}$ , $R_{ext} = 2\text{ k}\Omega$	182	240			300		300	ns
			$C_L = 50\text{ pF}$ , $C_{ext} = 0.01\text{ }\mu\text{F}$ , $R_{ext} = 10\text{ k}\Omega$	90	100	110	90	110	90	110	$\mu\text{s}$
			$C_L = 50\text{ pF}$ , $C_{ext} = 0.1\text{ }\mu\text{F}$ , $R_{ext} = 10\text{ k}\Omega$	0.9	1	1.1	0.9	1.1	0.9	1.1	ms
$\Delta t_w^\ddagger$			$C_L = 50\text{ pF}$	$\pm 1$							%

\* On products compliant to MIL-PRF-38535, this parameter is not production tested.

$^\dagger t_w$  = Duration of pulse at Q and  $\overline{Q}$  outputs

$^\ddagger \Delta t_w$  = Output pulse-duration variation (Q and  $\overline{Q}$ ) between circuits in same package

switching characteristics over recommended operating free-air temperature range,  
 $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$  (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	$T_A = 25^\circ\text{C}$			SN54LV123A		SN74LV123A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$t_{pd}$	$\overline{A}$ or B	Q or $\overline{Q}$	$C_L = 15\text{ pF}$	7.1*	12*		1*	14*	1	14	ns
	$\overline{CLR}$	Q or $\overline{Q}$		6.5*	9.4*		1*	11*	1	11	
	$\overline{CLR}$ trigger	Q or $\overline{Q}$		7.4*	12.9*		1*	15*	1	15	
$t_{pd}$	$\overline{A}$ or B	Q or $\overline{Q}$	$C_L = 50\text{ pF}$	8.3	14		1	16	1	16	ns
	$\overline{CLR}$	Q or $\overline{Q}$		7.4	11.4		1	13	1	13	
	$\overline{CLR}$ trigger	Q or $\overline{Q}$		8.7	14.9		1	17	1	17	
$t_w^\dagger$		Q or $\overline{Q}$	$C_L = 50\text{ pF}$ , $C_{ext} = 28\text{ pF}$ , $R_{ext} = 2\text{ k}\Omega$	167	200			240		240	ns
			$C_L = 50\text{ pF}$ , $C_{ext} = 0.01\text{ }\mu\text{F}$ , $R_{ext} = 10\text{ k}\Omega$	90	100	110	90	110	90	110	$\mu\text{s}$
			$C_L = 50\text{ pF}$ , $C_{ext} = 0.1\text{ }\mu\text{F}$ , $R_{ext} = 10\text{ k}\Omega$	0.9	1	1.1	0.9	1.1	0.9	1.1	ms
$\Delta t_w^\ddagger$				$\pm 1$							%

\* On products compliant to MIL-PRF-38535, this parameter is not production tested.

$^\dagger t_w$  = Duration of pulse at Q and  $\overline{Q}$  outputs

$^\ddagger \Delta t_w$  = Output pulse-duration variation (Q and  $\overline{Q}$ ) between circuits in same package

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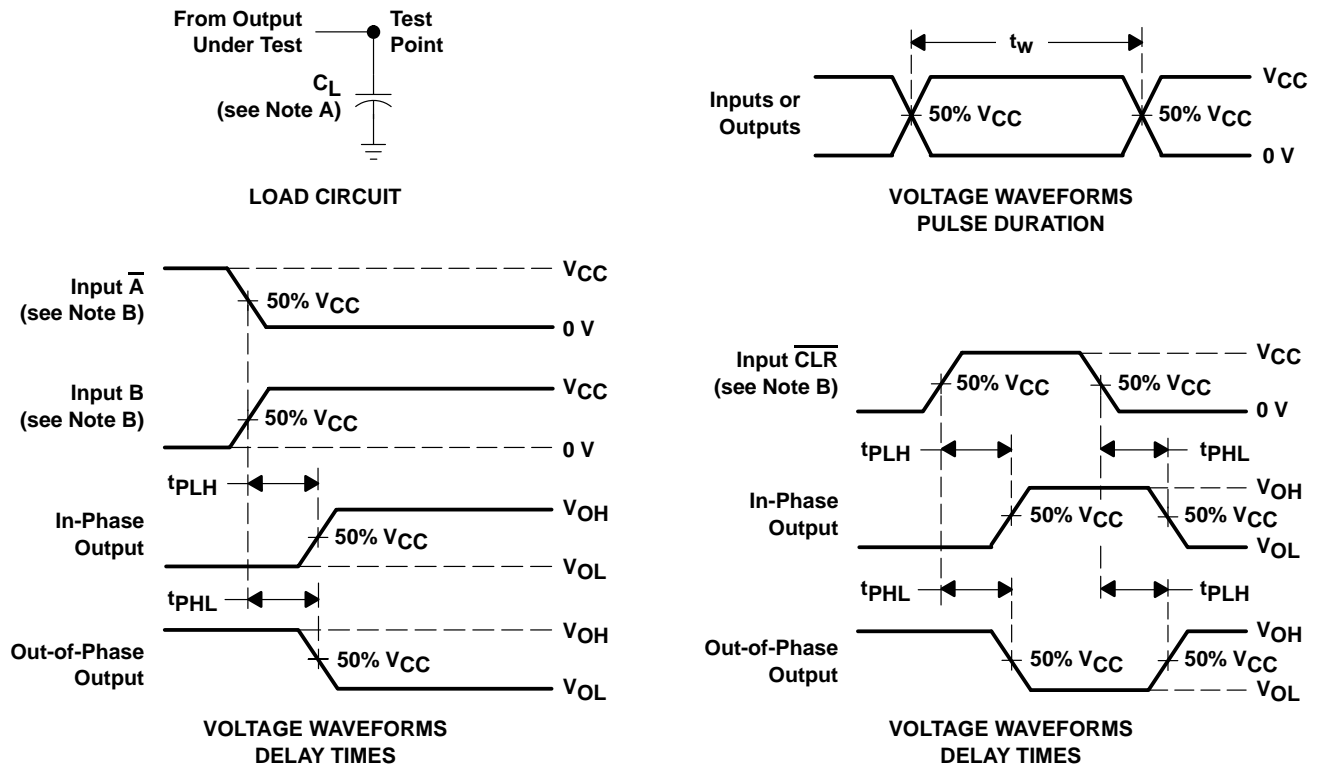
# SN54LV123A, SN74LV123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH SCHMITT-TRIGGER INPUTS

SCLS393J – APRIL 1998 – REVISED APRIL 2003

operating characteristics,  $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	$V_{CC}$	TYP	UNIT
$C_{pd}$ Power dissipation capacitance	$C_L = 50\text{ pF}, f = 10\text{ MHz}$	3.3 V	44	pF
		5 V	49	

## PARAMETER MEASUREMENT INFORMATION



- NOTES: A.  $C_L$  includes probe and jig capacitance.  
 B. All input pulses are supplied by generators having the following characteristics:  $PRR \leq 1\text{ MHz}$ ,  $Z_O = 50\ \Omega$ ,  $t_r = 3\text{ ns}$ ,  $t_f = 3\text{ ns}$ .  
 C. The outputs are measured one at a time with one input transition per measurement.

**Figure 1. Load Circuit and Voltage Waveforms**

# SN54LV123A, SN74LV123A DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH SCHMITT-TRIGGER INPUTS

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## APPLICATION INFORMATION†

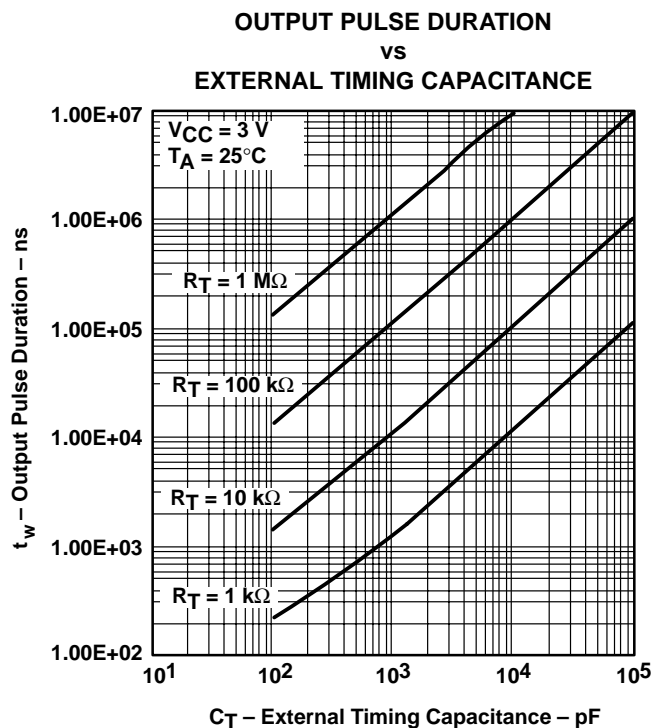


Figure 2

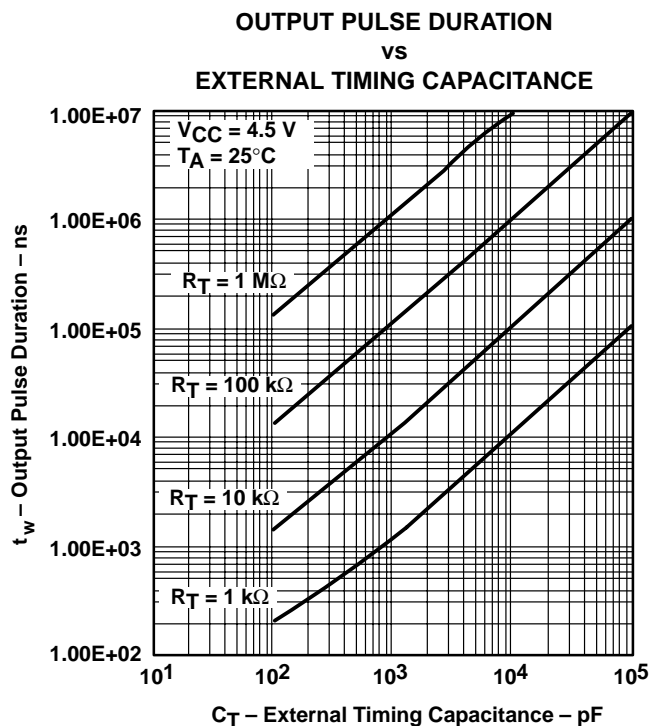


Figure 3

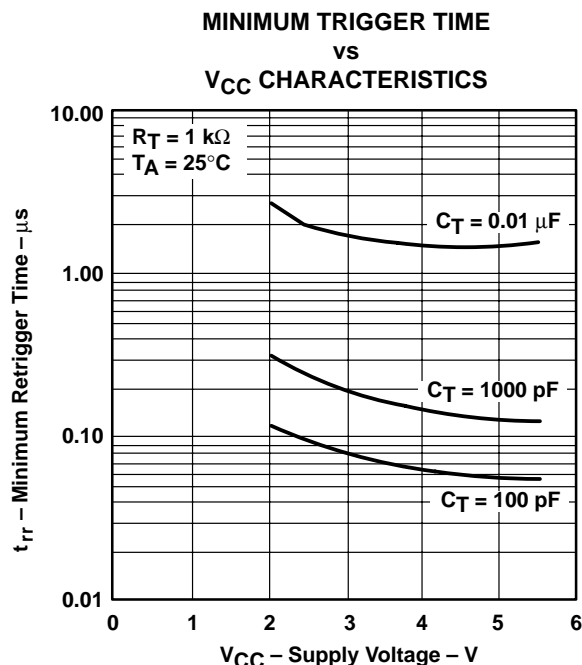


Figure 4

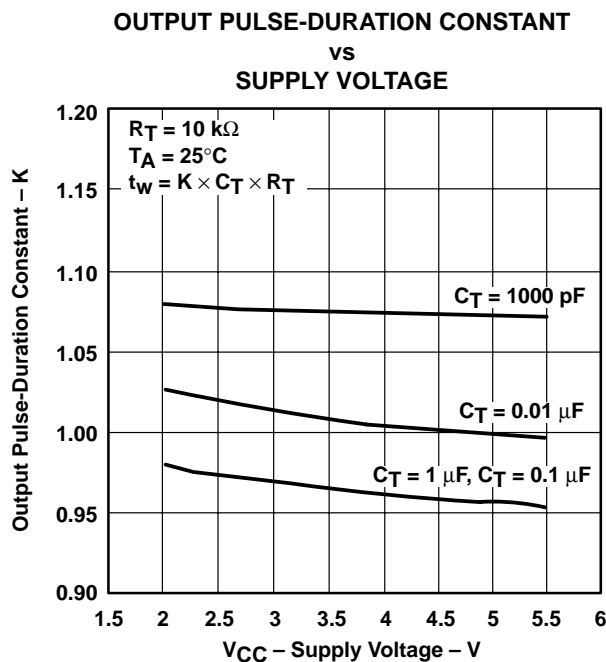


Figure 5

† Operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied.

## DGV (R-PDSO-G\*\*)

## PLASTIC SMALL-OUTLINE

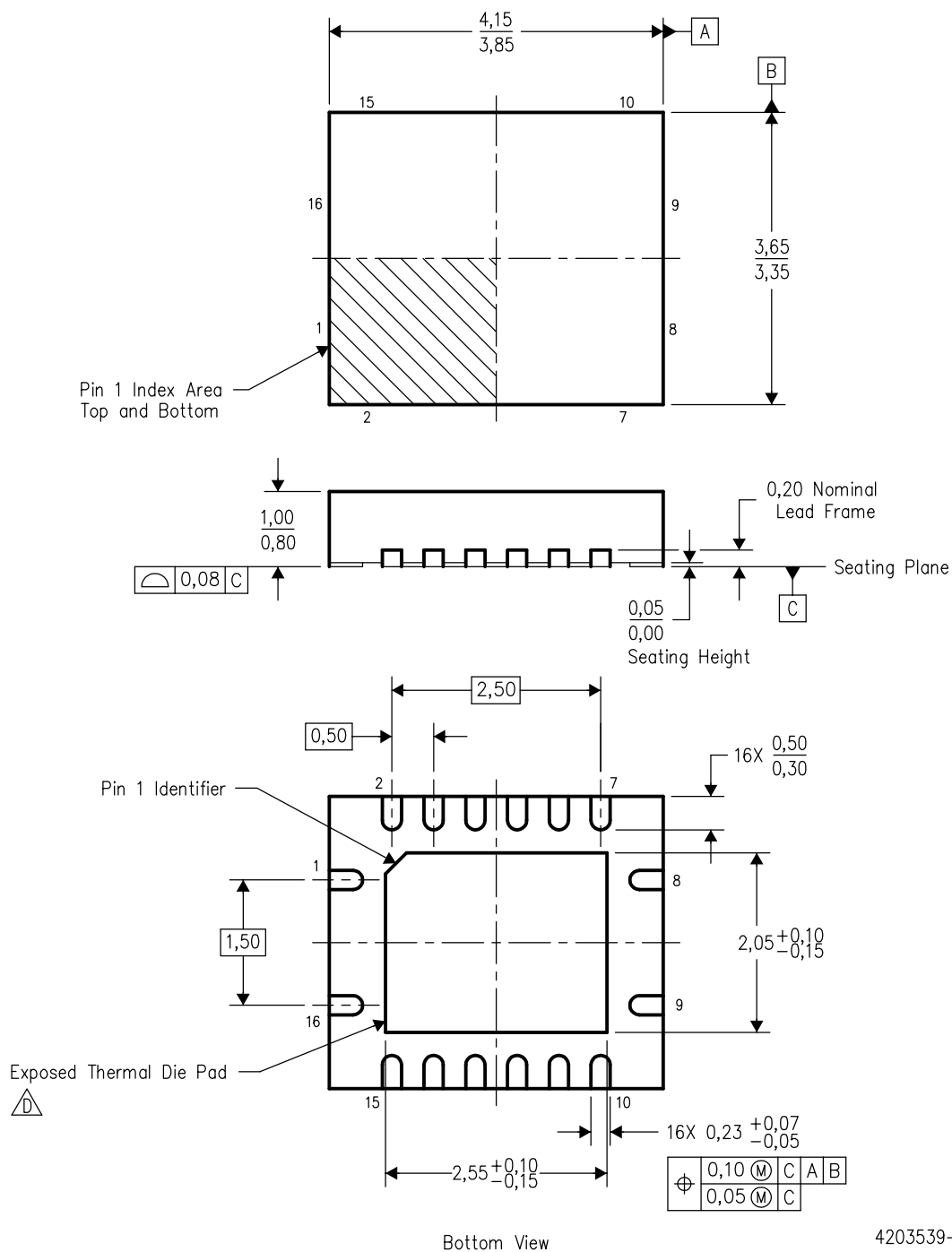
24 PINS SHOWN




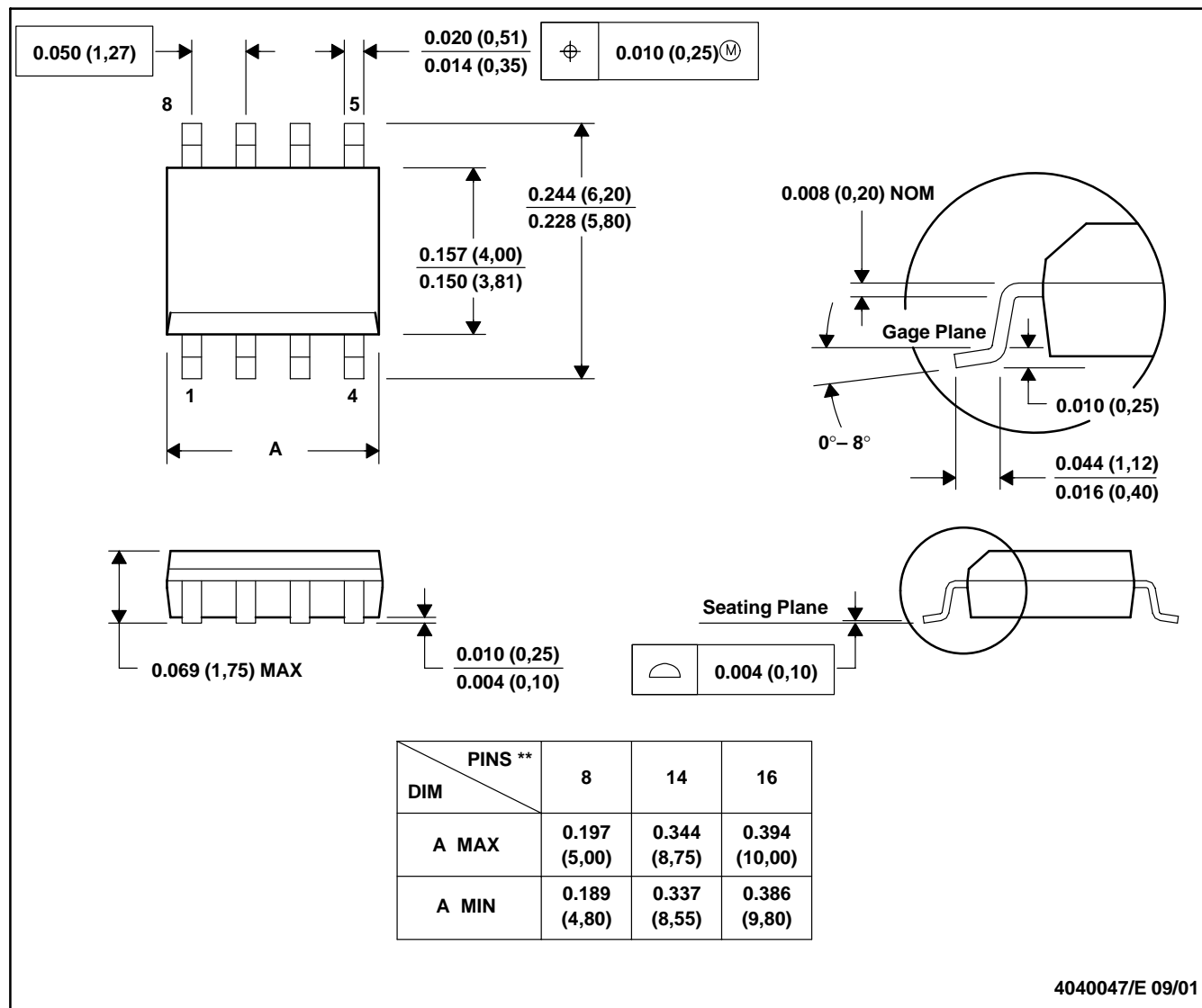
- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.  
 D. Falls within JEDEC: 24/48 Pins – MO-153  
 14/16/20/56 Pins – MO-194

## RGY (R-PQFP-N16)

## PLASTIC QUAD FLATPACK



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. QFN (Quad Flatpack No-Lead) package configuration.
  -  D. The package thermal performance may be enhanced by bonding the thermal die pad to an external thermal plane. This pad is electrically and thermally connected to the backside of the die and possibly selected ground leads.
  - E. Package complies to JEDEC MO-241 variation BB.

**D (R-PDSO-G\*\*)****PLASTIC SMALL-OUTLINE PACKAGE****8 PINS SHOWN**

- NOTES: A. All linear dimensions are in inches (millimeters).  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion, not to exceed 0.006 (0,15).  
 D. Falls within JEDEC MS-012

# MECHANICAL DATA

NS (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



DIM \ PINS **	14	16	20	24
A MAX	10,50	10,50	12,90	15,30
A MIN	9,90	9,90	12,30	14,70

4040062/C 03/03

- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

## DB (R-PDSO-G\*\*)

## PLASTIC SMALL-OUTLINE

28 PINS SHOWN



- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.  
 D. Falls within JEDEC MO-150

## PW (R-PDSO-G\*\*)

## PLASTIC SMALL-OUTLINE PACKAGE

14 PINS SHOWN



- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.  
 D. Falls within JEDEC MO-153



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