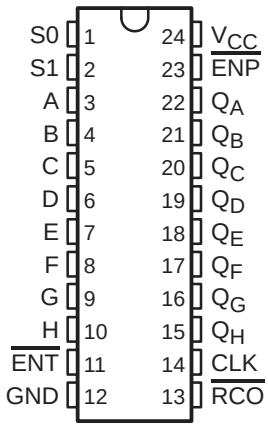
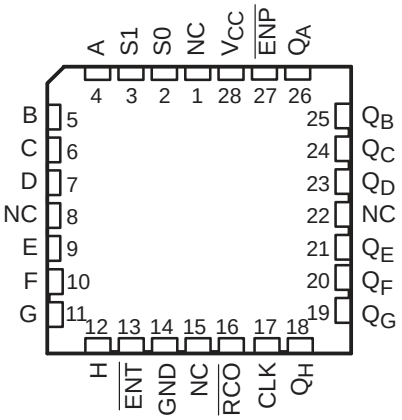
- **Fully Programmable With Synchronous Counting and Loading**
- **SN74ALS867A and ′AS867 Have Asynchronous Clear; SN74ALS869 and ′AS869 Have Synchronous Clear**
- **Fully Independent Clock Circuit Simplifies Use**
- **Ripple-Carry Output for n-Bit Cascading**
- **Package Options Include Plastic Small-Outline (DW) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (NT) and Ceramic (JT) 300-mil DIPs**

SN54AS867, SN54AS869 . . . JT PACKAGE
SN74ALS867A, SN74ALS869, SN74AS867, SN74AS869 . . . DW OR NT PACKAGE
(TOP VIEW)



SN54AS867, SN54AS869 . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

description

These synchronous, presettable, 8-bit up/down counters feature internal-carry look-ahead circuitry for cascading in high-speed counting applications. Synchronous operation is provided by having all flip-flops clocked simultaneously so that the outputs change coincidentally with each other when so instructed by the count-enable ($\overline{ENP}$, $\overline{ENT}$) inputs and internal gating. This mode of operation eliminates the output counting spikes normally associated with asynchronous (ripple-clock) counters. A buffered clock (CLK) input triggers the eight flip-flops on the rising (positive-going) edge of the clock waveform.

These counters are fully programmable; they may be preset to any number between 0 and 255. The load-input circuitry allows parallel loading of the cascaded counters. Because loading is synchronous, selecting the load mode disables the counter and causes the outputs to agree with the data inputs after the next clock pulse.

The carry look-ahead circuitry provides for cascading counters for n-bit synchronous applications without additional gating. Two count-enable ($\overline{ENP}$ and $\overline{ENT}$) inputs and a ripple-carry ($\overline{RCO}$) output are instrumental in accomplishing this function. Both $\overline{ENP}$ and $\overline{ENT}$ must be low to count. The direction of the count is determined by the levels of the select (S0, S1) inputs as shown in the function table. $\overline{ENT}$ is fed forward to enable $\overline{RCO}$. $\overline{RCO}$ thus enabled produces a low-level pulse while the count is zero (all outputs low) counting down or 255 counting up (all outputs high). This low-level overflow-carry pulse can be used to enable successive cascaded stages. Transitions at $\overline{ENP}$ and $\overline{ENT}$ are allowed regardless of the level of CLK. All inputs are diode clamped to minimize transmission-line effects, thereby simplifying system design.

These counters feature a fully independent clock circuit. With the exception of the asynchronous clear on the SN74ALS867A and ′AS867, changes at S0 and S1 that modify the operating mode have no effect on the Q outputs until clocking occurs. For the ′AS867 and ′AS869, any time $\overline{ENP}$ and/or $\overline{ENT}$ is taken high, $\overline{RCO}$ either goes or remains high. For the SN74ALS867A and SN74ALS869, any time $\overline{ENT}$ is taken high, $\overline{RCO}$ either goes or remains high. The function of the counter (whether enabled, disabled, loading, or counting) is dictated solely by the conditions meeting the stable setup and hold times.

description (continued)

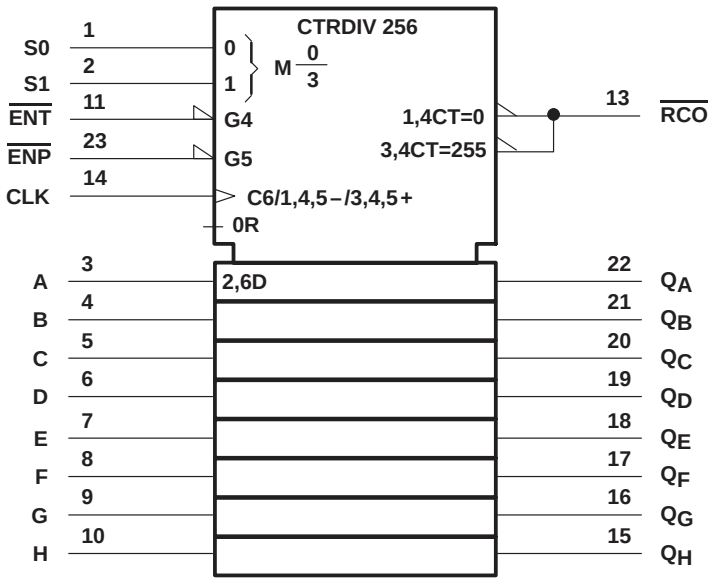
The SN54AS867 and SN54AS869 are characterized for operation over the full military temperature range of –55°C to 125°C. The SN74ALS867A, SN74ALS869, SN74AS867, and SN74AS869 are characterized for operation from 0°C to 70°C.

FUNCTION TABLE

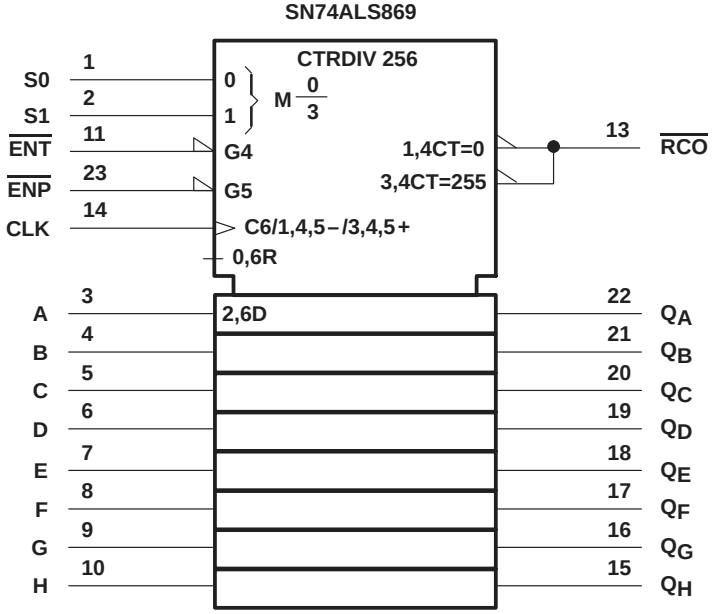
S1	S0	FUNCTION
L	L	Clear
L	H	Count down
H	L	Load
H	H	Count up

logic symbols†

SN74ALS867A

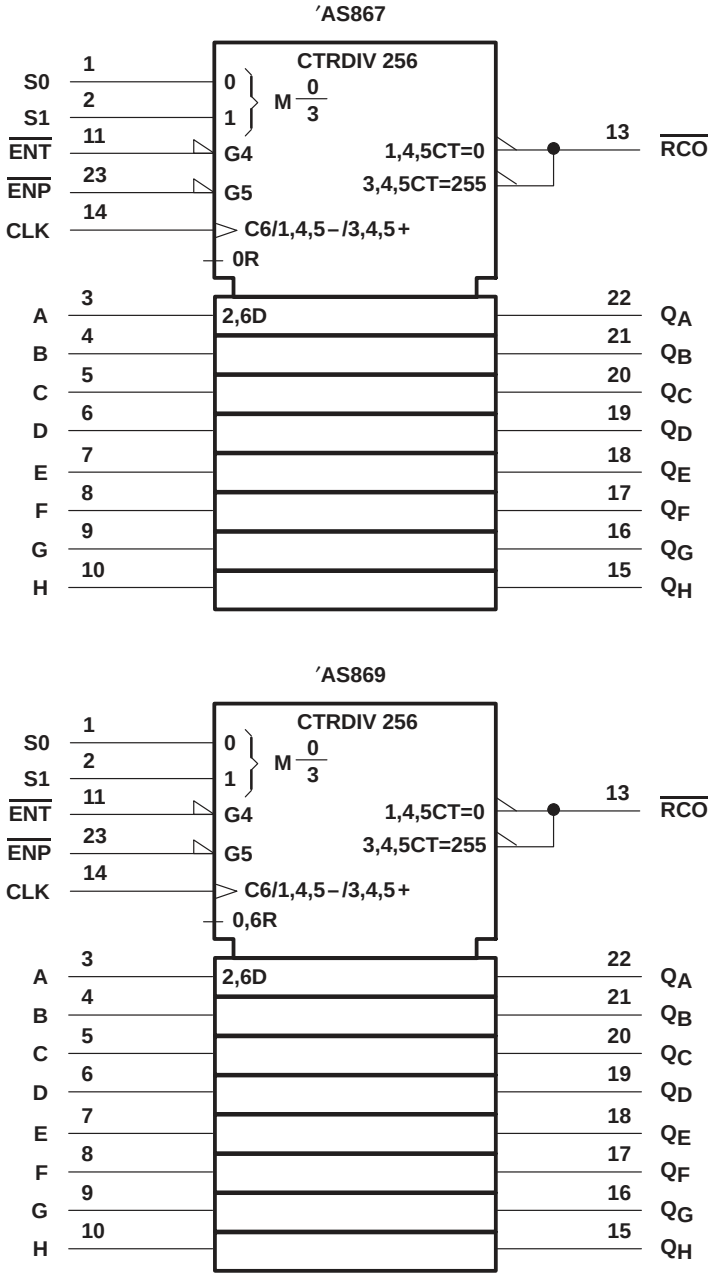


SN74ALS869



† These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for the DW, JT, and NT packages.

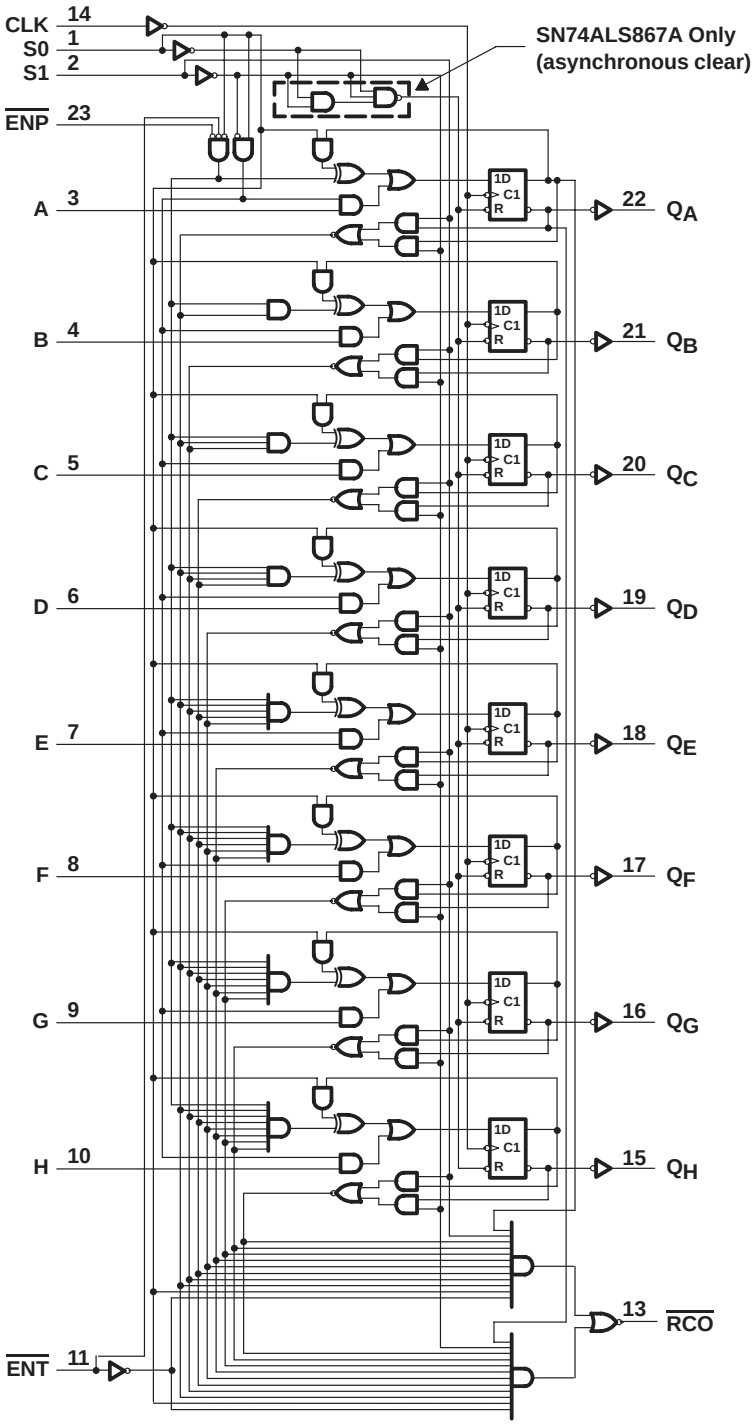
logic symbols (continued)†



† These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for the DW, JT, and NT packages.

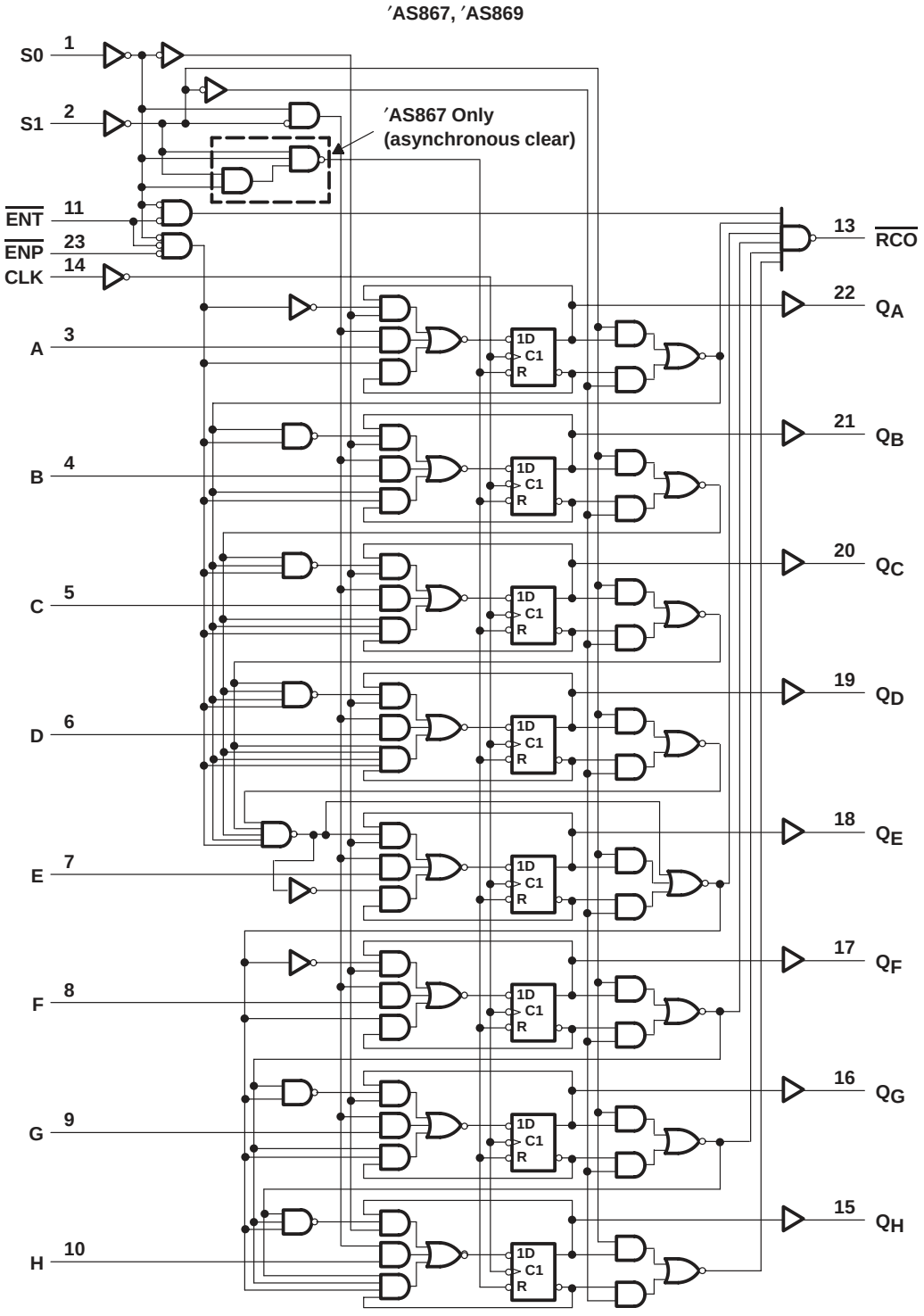
logic diagram (positive logic)

SN74ALS867A, SN74ALS869



Pin numbers shown are for the DW, JT, and NT packages.

logic diagram (positive logic)

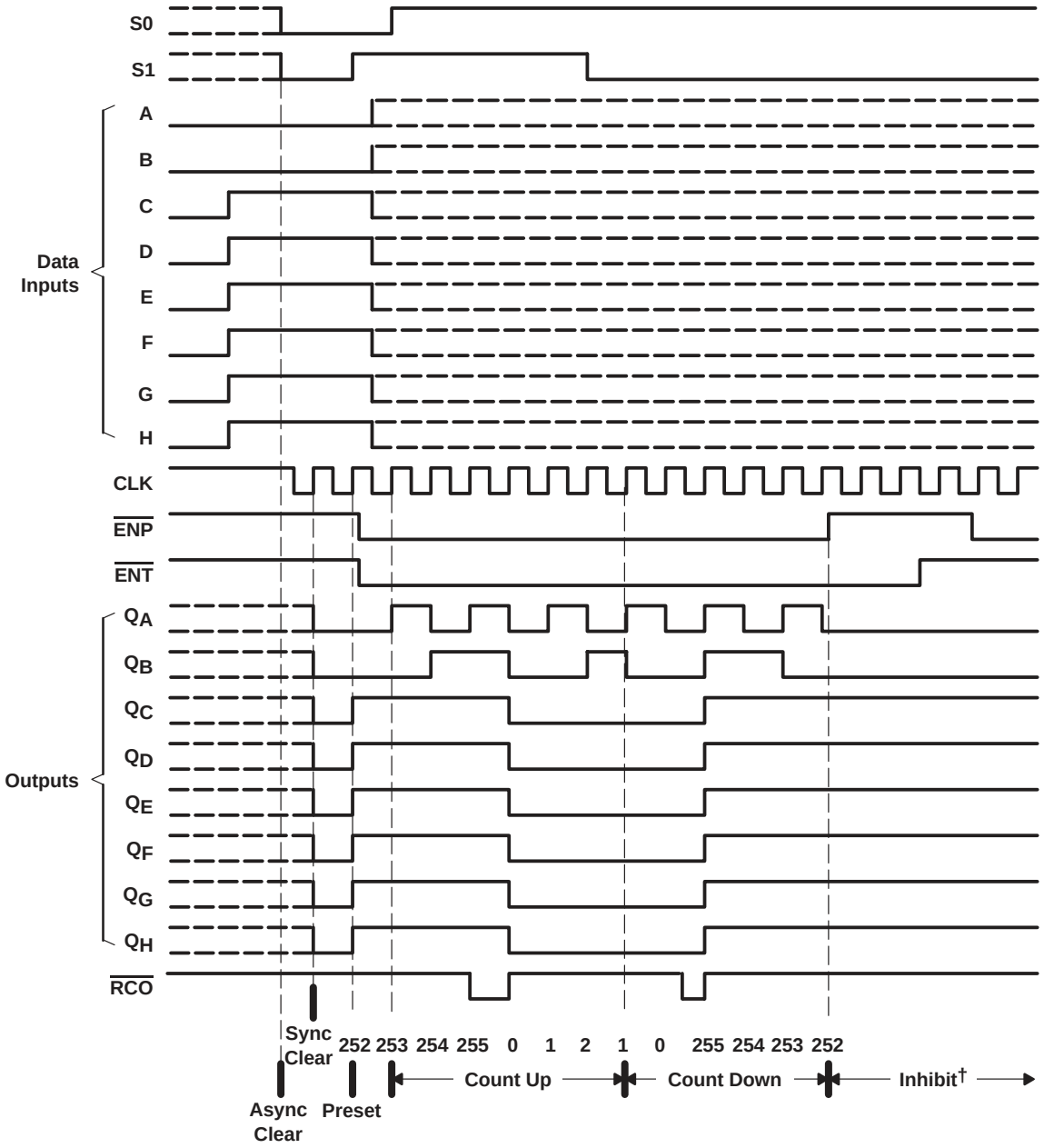


Pin numbers shown are for the DW, JT, and NT packages.

typical clear, preset, count, and inhibit sequences

The following sequence is illustrated below:

1. Clear outputs to zero (SN74ALS867A and ′AS867 are asynchronous; SN74ALS869 and ′AS869 are synchronous.)
2. Preset to binary 252
3. Count up to 253, 254, 255, 0, 1, and 2
4. Count down to 1, 0, 255, 254, 253, and 252
5. Inhibit



† $\overline{\text{ENT}}$ and $\overline{\text{ENP}}$ both must be low for counting to occur.

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

Supply voltage, V_{CC} . . . . . 7 V
Input voltage, V_I . . . . . 7 V
Operating free-air temperature range, T_A: SN74ALS867A . . . . . 0°C to 70°C
Storage temperature range . . . . . –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.

recommended operating conditions

			SN74ALS867A			UNIT
			MIN	NOM	MAX	
V_{CC}	Supply voltage		4.5	5	5.5	V
V_{IH}	High-level input voltage		2			V
V_{IL}	Low-level input voltage				0.8	V
I_{OH}	High-level output current				–0.4	mA
I_{OL}	Low-level output current				8	mA
f_{clock}	Clock frequency		0		35	MHz
$t_{w(clock)}$	Pulse duration, CLK high or low		14			ns
$t_{w(clear)}$	Pulse duration of clear pulse, S0 and S1 low		10			ns
t_{su}	Setup time before CLK↑	Data inputs A–H	10			ns
		$\overline{ENP}$ or $\overline{ENT}$	15			
		S0 low and S1 high (load)	12			
		S0 high and S1 low (count down)	12			
		S0 and S1 high (count up)	12			
t_h	Hold time after CLK↑	S0 high after S1↑ or S1 high after S0↑	3			ns
		Data inputs A–H	0			
T_A	Operating free-air temperature		0		70	°C

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

PARAMETER	TEST CONDITIONS		SN74ALS867A			UNIT
			MIN	TYP‡	MAX	
V_{IK}	V_{CC} = 4.5 V,	I_I = –18 mA			–1.2	V
V_{OH}	V_{CC} = 4.5 V to 5.5 V,	I_{OH} = –0.4 mA	V_{CC} –2			V
V_{OL}	V_{CC} = 4.5 V	I_{OL} = 4 mA		0.25	0.4	V
		I_{OL} = 8 mA		0.35	0.5	
I_I	V_{CC} = 5.5 V,	V_I = 7 V			0.1	mA
I_{IH}	V_{CC} = 5.5 V,	V_I = 2.7 V			20	µA
I_{IL}	V_{CC} = 5.5 V,	V_I = 0.4 V			–0.2	mA
I_O§	V_{CC} = 5.5 V,	V_O = 2.25 V	–30		–112	mA
I_{CC}	V_{CC} = 5.5 V			28	45	mA

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.
§ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS}.

switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = MIN to MAX†		UNIT
			SN74ALS867A		
			MIN	MAX	
f_{max}			35		MHz
t_{PLH}	CLK	$\overline{RCO}$	4	14	ns
t_{PHL}			4	14	
t_{PLH}	CLK	Any Q	3	16	ns
t_{PHL}			3	16	
t_{PLH}	$\overline{ENT}$	$\overline{RCO}$	3	14	ns
t_{PHL}			2	9	
t_{PHL}	S0 or S1 (clear mode)	Any Q	8	26	ns
t_{PLH}	S0 or S1 (count up/down)	$\overline{RCO}$	4	16	ns
t_{PHL}			4	16	
t_{PLH}	S0 or S1 (clear mode)	$\overline{RCO}$	4	16	ns

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

Supply voltage, V_{CC} . . . . . 7 V
Input voltage, V_I . . . . . 7 V
Operating free-air temperature range, T_A: SN74ALS869 . . . . . 0°C to 70°C
Storage temperature range . . . . . –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.

recommended operating conditions

			SN74ALS869			UNIT
			MIN	NOM	MAX	
V_{CC}	Supply voltage		4.5	5	5.5	V
V_{IH}	High-level input voltage		2			V
V_{IL}	Low-level input voltage				0.8	V
I_{OH}	High-level output current				–0.4	mA
I_{OL}	Low-level output current				8	mA
f_{clock}	Clock frequency		0		35	MHz
$t_{w(clock)}$	Pulse duration, CLK high or low		14			ns
t_{su}	Setup time before CLK↑	Data inputs A–H	10			ns
		$\overline{ENP}$ or $\overline{ENT}$	15			
		S0 and S1 low (clear)	13			
		S0 low and S1 high (load)	13			
		S0 high and S1 low (count down)	13			
		S0 and S1 high (count up)	13			
t_h	Hold time after CLK↑	S0 high after S1↑ or S1 high after S0↑	3			ns
		Data inputs A–H	0			
T_A	Operating free-air temperature		0		70	°C

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

PARAMETER	TEST CONDITIONS		SN74ALS869			UNIT
			MIN	TYP‡	MAX	
V_{IK}	V_{CC} = 4.5 V,	I_I = –18 mA			–1.2	V
V_{OH}	V_{CC} = 4.5 V to 5.5 V,	I_{OH} = –0.4 mA	V_{CC} –2			V
V_{OL}	V_{CC} = 4.5 V	I_{OL} = 4 mA		0.25	0.4	V
		I_{OL} = 8 mA		0.35	0.5	
I_I	V_{CC} = 5.5 V,	V_I = 7 V			0.1	mA
I_{IH}	V_{CC} = 5.5 V,	V_I = 2.7 V			20	µA
I_{IL}	V_{CC} = 5.5 V,	V_I = 0.4 V			–0.2	mA
I_O§	V_{CC} = 5.5 V,	V_O = 2.25 V	–30		–112	mA
I_{CC}	V_{CC} = 5.5 V			28	45	mA

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.
§ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS}.

switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = MIN to MAX†		UNIT
			SN74ALS869		
			MIN	MAX	
f_{max}			35		MHz
t_{PLH}	CLK	$\overline{RCO}$	4	14	ns
t_{PHL}			4	14	
t_{PLH}	CLK	Any Q	3	16	ns
t_{PHL}			3	16	
t_{PLH}	$\overline{ENT}$	$\overline{RCO}$	3	14	ns
t_{PHL}			2	9	
t_{PLH}	S1 (count up/down)	$\overline{RCO}$	4	15	ns
t_{PHL}			4	15	
t_{PLH}	S0 (clear/load)	$\overline{RCO}$	4	16	ns
t_{PHL}			4	12	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

Supply voltage, V_{CC} . . . . . 7 V
Input voltage, V_I . . . . . 7 V
Operating free-air temperature range, T_A: SN54AS867 . . . . . –55°C to 125°C
SN74AS867 . . . . . 0°C to 70°C
Storage temperature range . . . . . –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.

recommended operating conditions

			SN54AS867			SN74AS867			UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage		4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage		2			2			V
V_{IL}	Low-level input voltage				0.8			0.8	V
I_{OH}	High-level output current				–2			–2	mA
I_{OL}	Low-level output current				20			20	mA
f_{clock}*	Clock frequency		0		40	0		50	MHz
$t_{w(clock)}$*	Pulse duration, CLK high or low		12.5			10			ns
$t_{w(clear)}$*	Pulse duration of clear pulse, S0 and S1 low		12.5			10			ns
t_{su}*	Setup time before CLK↑	Data inputs A–H	5			4			ns
		$\overline{ENP}$ or $\overline{ENT}$	9			8			
		S0 low and S1 high (load)	11			10			
		S0 and S1 low (clear)	11			10			
		S0 high and S1 low (count down)	42			40			
		S0 and S1 high (count up)	42			40			
t_h*	Hold time after CLK↑	Data inputs A–H	0			0			ns
t_{skew}*	Skew time between S0 and S1 (maximum to avoid inadvertent clear)				8			7	ns
T_A	Operating free-air temperature		–55		125	0		70	°C

* On products compliant to MIL-STD-883, Class B, this parameter is based on characterization data but is not production tested.

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

PARAMETER		TEST CONDITIONS		SN54AS867			SN74AS867			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}		V_{CC} = 4.5 V,	I_I = –18 mA			–1.2			–1.2	V
V_{OH}		V_{CC} = 4.5 V to 5.5 V,	I_{OH} = –2 mA	V_{CC} –2			V_{CC} –2			V
V_{OL}	$\overline{RCO}$	V_{CC} = 4.5 V	I_{OL} = 20 mA, V_{IL} on $\overline{ENT}$ = 0.7 V		0.34	0.5				V
	Other outputs		I_{OL} = 20 mA					0.34	0.5	
I_I		V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
I_{IH}	$\overline{ENT}$	V_{CC} = 5.5 V,	V_I = 2.7 V			40			40	µA
	Other inputs					20			20	
I_{IL}	$\overline{ENT}$	V_{CC} = 5.5 V,	V_I = 0.4 V			–4			–4	mA
	Other inputs					–2			–2	
I_O‡		V_{CC} = 5.5 V,	V_O = 2.25 V	–30		–112	–30		–112	mA
I_{CC}		V_{CC} = 5.5 V			134	195		134	195	mA

† All typical values are at V_{CC} = 5 V, T_A = 25°C.
‡ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS}.

switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = MIN to MAX§				UNIT
			SN54AS867		SN74AS867		
			MIN	MAX	MIN	MAX	
f_{max}*			40		50		MHz
t_{PLH}	CLK	$\overline{RCO}$	5	31	5	22	ns
t_{PHL}			6	19	6	16	
t_{PLH}	CLK	Any Q	3	12	3	11	ns
t_{PHL}			4	16	4	15	
t_{PLH}	$\overline{ENT}$	$\overline{RCO}$	3	19	3	10	ns
t_{PHL}			5	21	5	17	
t_{PLH}	$\overline{ENP}$	$\overline{RCO}$	5	16	5	14	ns
t_{PHL}			5	21	5	17	
t_{PHL}	Clear (S0 or S1 low)	Any Q	7	23	7	21	ns

* On products compliant to MIL-STD-883, Class B, this parameter is based on characterization data but is not production tested.
§ For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

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

Supply voltage, V_{CC} . . . . . 7 V
Input voltage, V_I . . . . . 7 V
Operating free-air temperature range, T_A: SN54AS869 . . . . . –55°C to 125°C
SN74AS869 . . . . . 0°C to 70°C
Storage temperature range . . . . . –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.

recommended operating conditions

			SN54AS869			SN74AS869			UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage		4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage		2			2			V
V_{IL}	Low-level input voltage				0.7			0.8	V
I_{OH}	High-level output current				–2			–2	mA
I_{OL}	Low-level output current				20			20	mA
f_{clock}*	Clock frequency				40			45	MHz
$t_{w(clock)}$*	Pulse duration, CLK high or low		12.5			11			ns
t_{su}*	Setup time before CLK↑	Data inputs A–H	6			5			ns
		$\overline{ENP}$ or $\overline{ENT}$	10			9			
		S0 low and S1 high (load)	13			11			
		S0 and S1 low (clear)	13			11			
		S0 high and S1 low (count down)	52			50			
		S0 and S1 high (count up)	52			50			
t_h*	Hold time after CLK↑	Data inputs A–H	0			0			ns
T_A	Operating free-air temperature		–55		125	0		70	°C

* On products compliant to MIL-STD-883, Class B, this parameter is based on characterization data but is not production tested.

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

PARAMETER		TEST CONDITIONS		SN54AS869			SN74AS869			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}		V_{CC} = 4.5 V,	I_I = –18 mA			–1.2			–1.2	V
V_{OH}		V_{CC} = 4.5 V to 5.5 V,	I_{OH} = –2 mA				V_{CC} –2			V
		V_{CC} = 4.5 V,	I_{OH} = –2 mA	V_{CC} –2*						
V_{OL}	$\overline{RCO}$	V_{CC} = 4.5 V	I_{OL} = 20 mA, V_{IL} on $\overline{ENT}$ = 0.7 V		0.34	0.5				V
	Other outputs		I_{OL} = 20 mA					0.34	0.5	
I_I		V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
I_{IH}	$\overline{ENT}$	V_{CC} = 5.5 V,	V_I = 2.7 V			40			40	µA
	Other inputs					20			20	
I_{IL}	$\overline{ENT}$	V_{CC} = 5.5 V,	V_I = 0.4 V			–4			–4	mA
	Other inputs					–2			–2	
I_O‡		V_{CC} = 5.5 V,	V_O = 2.25 V	–30		–112	–30		–112	mA
I_{CC}		V_{CC} = 5.5 V			134	195		134	195	mA

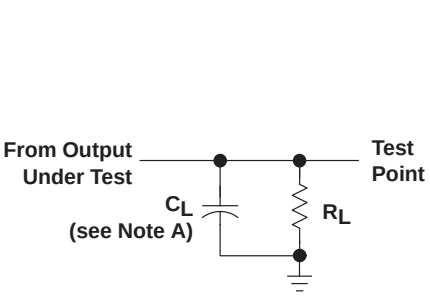
† All typical values are at V_{CC} = 5 V, T_A = 25°C.
‡ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS}.

switching characteristics (see Figure 1)

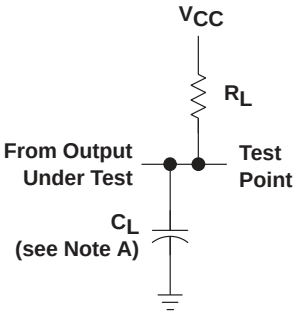
PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = MIN to MAX§				UNIT
			SN54AS869		SN74AS869		
			MIN	MAX	MIN	MAX	
f_{max}*			40		45		MHz
t_{PLH}	CLK	$\overline{RCO}$	6	35	6	35	ns
t_{PHL}			6	20	6	18	
t_{PLH}	CLK	Any Q	3	12	3	11	ns
t_{PHL}			4	16	4	15	
t_{PLH}	$\overline{ENT}$	$\overline{RCO}$	3	25	3	15	ns
t_{PHL}			6	21	6	17	
t_{PLH}	$\overline{ENP}$	$\overline{RCO}$	5	27	5	19	ns
t_{PHL}			6	21	6	18	

* On products compliant to MIL-STD-883, Class B, this parameter is based on characterization data but is not production tested.
§ For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

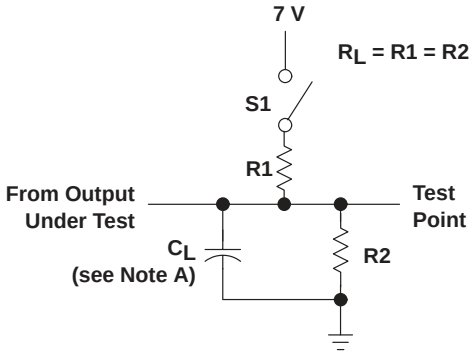
PARAMETER MEASUREMENT INFORMATION
SERIES 54ALS/74ALS AND 54AS/74AS DEVICES



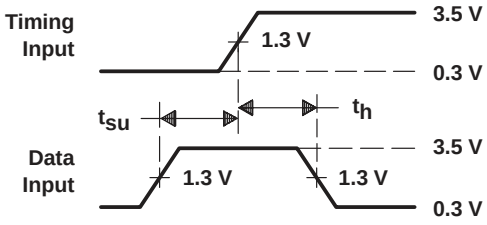
LOAD CIRCUIT FOR
BI-STATE
TOTEM-POLE OUTPUTS



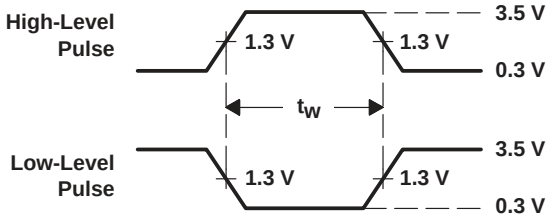
LOAD CIRCUIT
FOR OPEN-COLLECTOR OUTPUTS



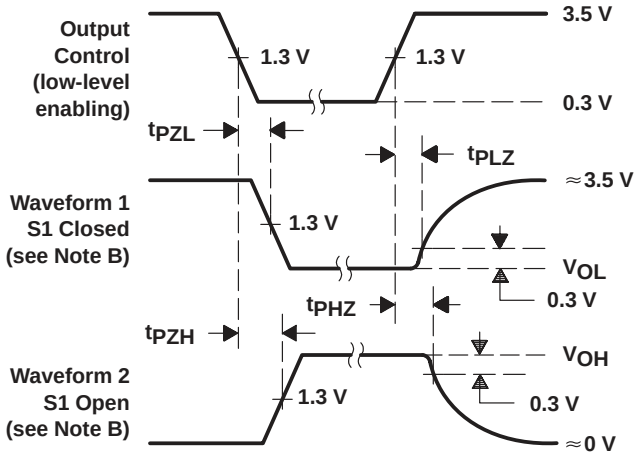
LOAD CIRCUIT
FOR 3-STATE OUTPUTS



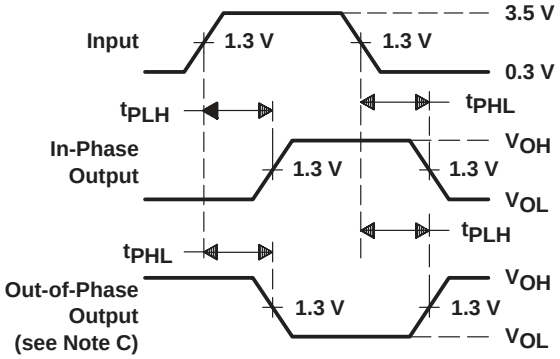
VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES



VOLTAGE WAVEFORMS
PULSE DURATIONS



VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES, 3-STATE OUTPUTS



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES

NOTES: A. C_L includes probe and jig capacitance.
B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
C. When measuring propagation delay items of 3-state outputs, switch S1 is open.
D. All input pulses have the following characteristics: PRR ≤ 1 MHz, $t_r = t_f = 2$ ns, duty cycle = 50%.
E. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuits and Voltage Waveforms

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
5962-8966801LA	ACTIVE	CDIP	JT	24	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-8966801LA SNJ54AS867JT	Samples
SN54AS867JT	ACTIVE	CDIP	JT	24	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	SN54AS867JT	Samples
SN54AS869JT	ACTIVE	CDIP	JT	24	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	SN54AS869JT	Samples
SN74ALS867ADW	ACTIVE	SOIC	DW	24	25	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	0 to 70	ALS867A	Samples
SN74ALS869DW	ACTIVE	SOIC	DW	24	25	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	0 to 70	ALS869	Samples
SN74ALS869DWE4	ACTIVE	SOIC	DW	24	25	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	0 to 70	ALS869	Samples
SN74AS869DW	ACTIVE	SOIC	DW	24	25	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	0 to 70	AS869	Samples
SNJ54AS867JT	ACTIVE	CDIP	JT	24	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-8966801LA SNJ54AS867JT	Samples
SNJ54AS869JT	ACTIVE	CDIP	JT	24	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-8952601LA SNJ54AS869JT	Samples

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".
RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.
Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

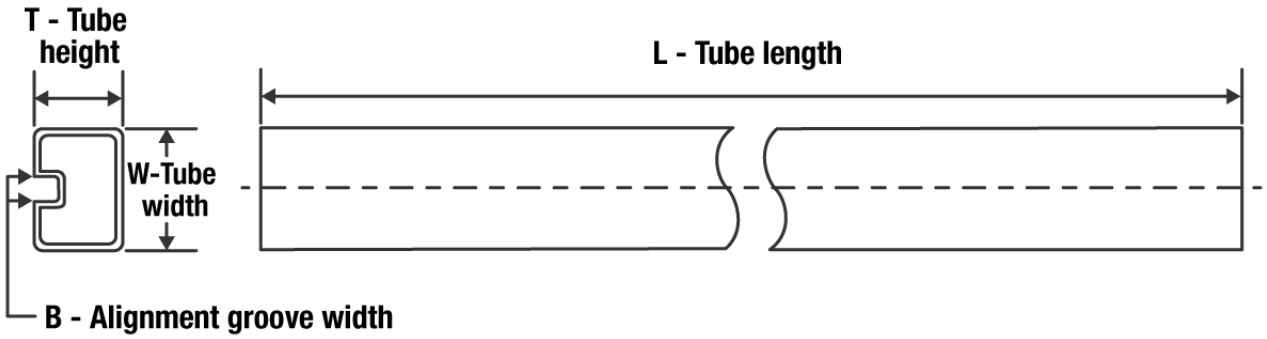
OTHER QUALIFIED VERSIONS OF SN54AS869, SN74AS869 :

- Catalog : SN74AS869
- Military : SN54AS869

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
- Military - QML certified for Military and Defense Applications

TUBE



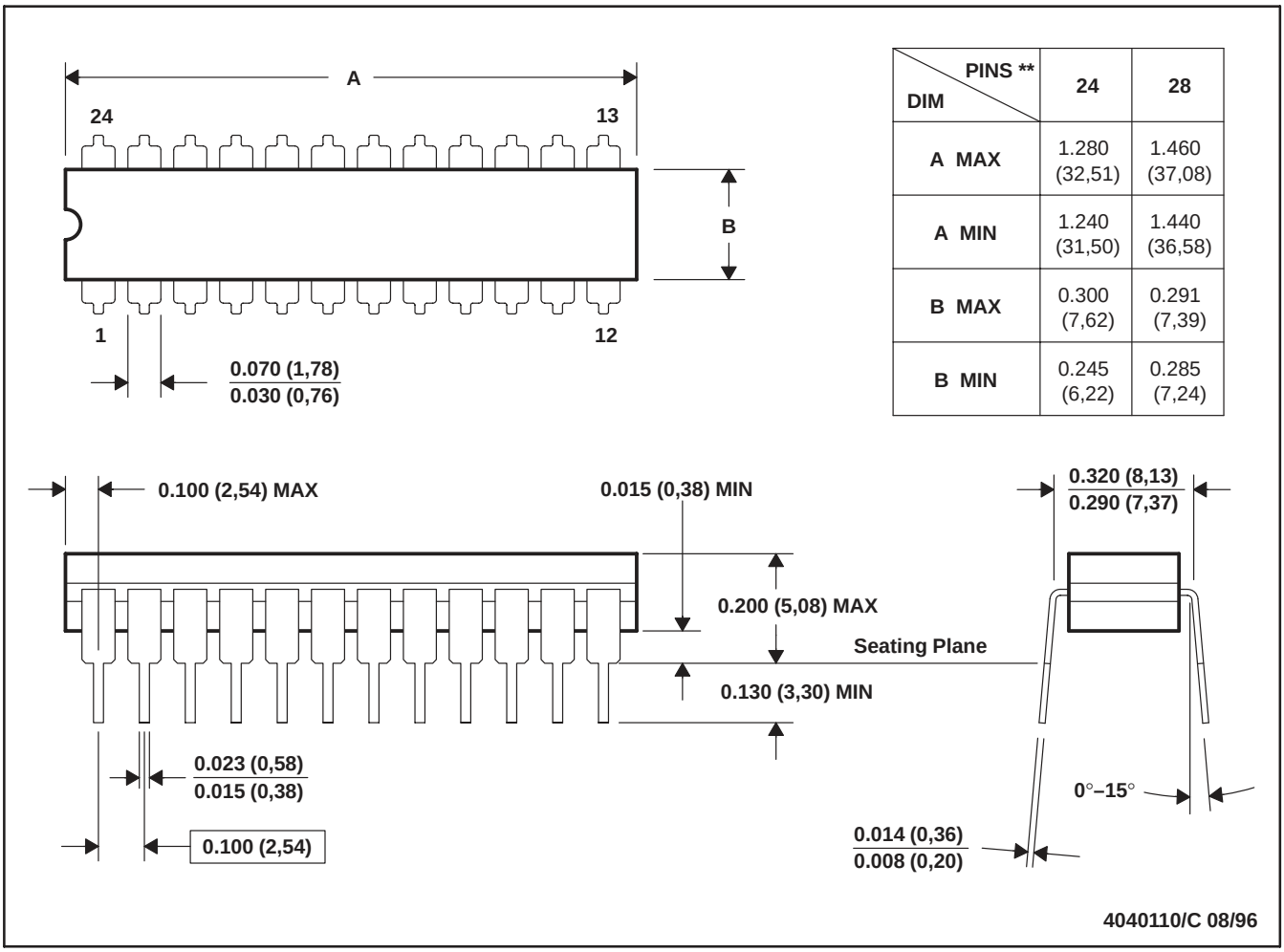
*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
SN74ALS867ADW	DW	SOIC	24	25	506.98	12.7	4826	6.6
SN74ALS869DW	DW	SOIC	24	25	506.98	12.7	4826	6.6
SN74ALS869DWE4	DW	SOIC	24	25	506.98	12.7	4826	6.6
SN74AS869DW	DW	SOIC	24	25	506.98	12.7	4826	6.6

MCER004A – JANUARY 1995 – REVISED JANUARY 1997

JT (R-GDIP-T)** **CERAMIC DUAL-IN-LINE**

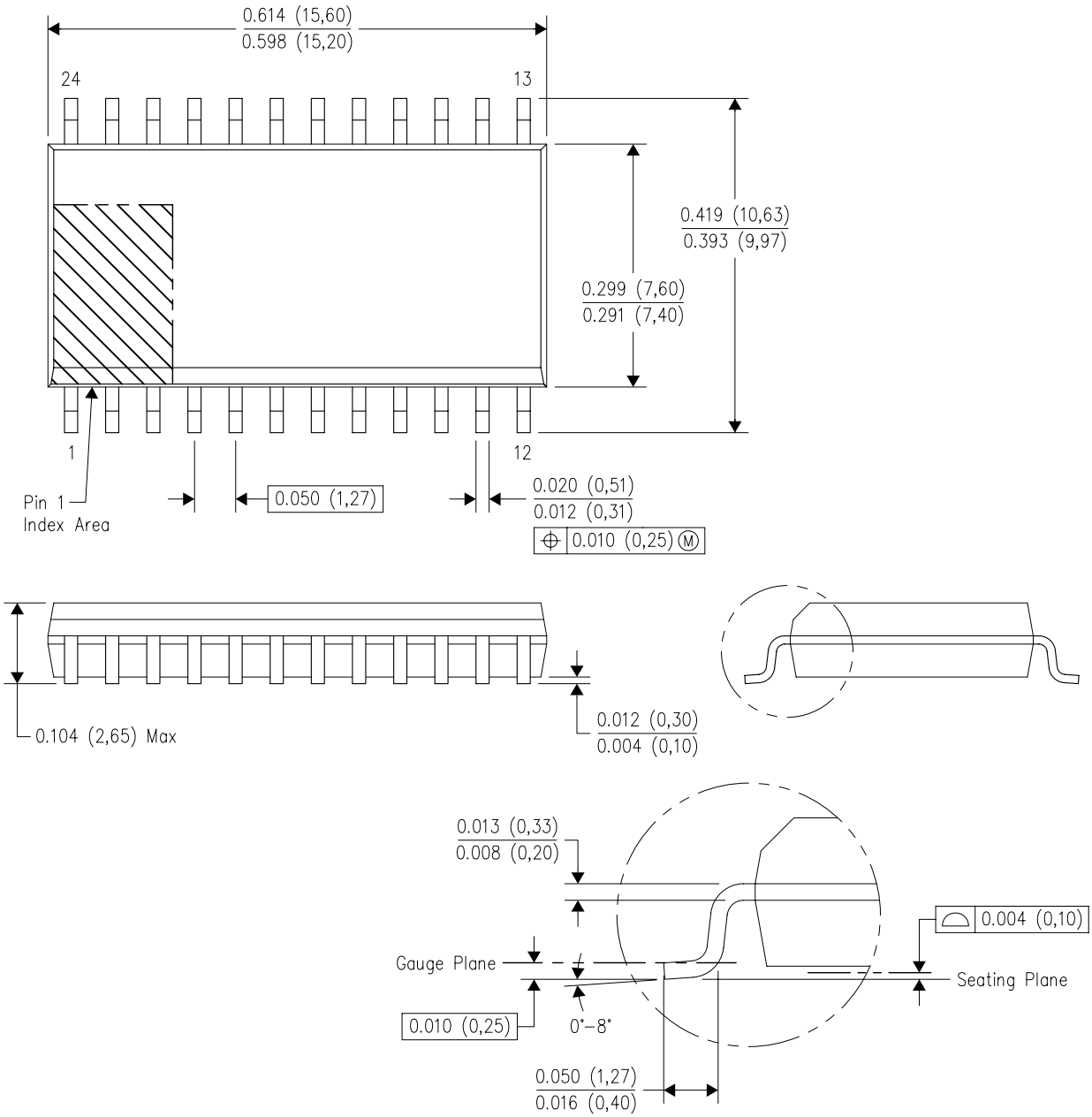
24 LEADS SHOWN



DIM \ PINS **	24	28
A MAX	1.280 (32,51)	1.460 (37,08)
A MIN	1.240 (31,50)	1.440 (36,58)
B MAX	0.300 (7,62)	0.291 (7,39)
B MIN	0.245 (6,22)	0.285 (7,24)

NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. This package can be hermetically sealed with a ceramic lid using glass frit.
D. Index point is provided on cap for terminal identification.
E. Falls within MIL STD 1835 GDIP3-T24, GDIP4-T28, and JEDEC MO-058 AA, MO-058 AB

DW (R–PDSO–G24) PLASTIC SMALL OUTLINE



NOTES:
A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M–1994.
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–013 variation AD.

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265