

- Power-On Reset Generator
- Automatic Reset Generation After Voltage Drop
- Precision Voltage Sensor
- Temperature-Compensated Voltage Reference
- Programmable Delay Time by External Capacitor
- Supply Voltage Range . . . 2 V to 6 V
- Defined  $\overline{\text{RESET}}$  Output from  $V_{\text{DD}} \geq 1 \text{ V}$
- Power-Down Control Support for Static RAM With Battery Backup
- Maximum Supply Current of 16  $\mu\text{A}$
- Power Saving Totem-Pole Outputs
- Temperature Range . . .  $-40^\circ\text{C}$  to  $125^\circ\text{C}$

### description

The TLC77xx family of micropower supply voltage supervisors provide reset control, primarily in microcomputer and microprocessor systems.

During power-on,  $\overline{\text{RESET}}$  is asserted when  $V_{\text{DD}}$  reaches 1 V. After minimum  $V_{\text{DD}} (\geq 2 \text{ V})$  is established, the circuit monitors SENSE voltage and keeps the reset outputs active as long as SENSE voltage ( $V_{\text{I}(\text{SENSE})}$ ) remains below the threshold voltage. An internal timer delays return of the output to the inactive state to ensure proper system reset. The delay time,  $t_{\text{d}}$ , is determined by an external capacitor:

$$t_{\text{d}} = 2.1 \times 10^4 \times C_{\text{T}}$$

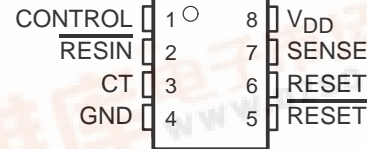
Where

$C_{\text{T}}$  is in farads

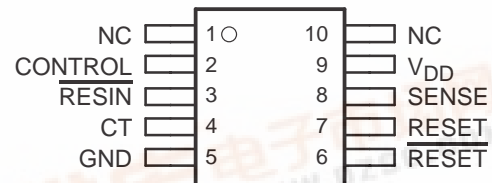
$t_{\text{d}}$  is in seconds

Except for the TLC7701, which can be customized with two external resistors, each supervisor has a fixed SENSE threshold voltage set by an internal voltage divider. When SENSE voltage drops below the threshold voltage, the outputs become active and stay in that state until SENSE voltage returns above threshold voltage and the delay time,  $t_{\text{d}}$ , has expired.

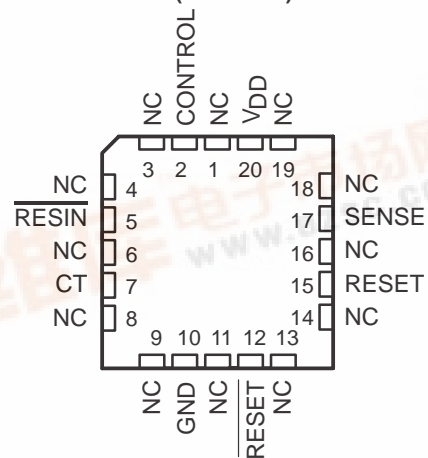
D, JG, P OR PW PACKAGE  
(TOP VIEW)



U PACKAGE  
(TOP VIEW)



FK PACKAGE  
(TOP VIEW)



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# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

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## description (continued)

In addition to the power-on-reset and undervoltage-supervisor function, the TLC77xx adds power-down control support for static RAM. When CONTROL is tied to GND, RESET will act as active high. The voltage monitor contains additional logic intended for control of static memories with battery backup during power failure. By driving the chip select ( $\overline{CS}$ ) of the memory circuit with the RESET output of the TLC77xx and with the CONTROL driven by the memory bank select signal ( $\overline{CSH1}$ ) of the microprocessor (see Figure 10), the memory circuit is automatically disabled during a power loss. (In this application the TLC77xx power has to be supplied by the battery.)

The TLC77xxI is characterized for operation over a temperature range of  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ ; the TLC77xxQ is characterized for operation over a temperature range of  $-40^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ ; and the TLC77xxM is characterized for operation over the full Military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ .

### AVAILABLE OPTIONS

T <sub>A</sub>	THRESHOLD VOLTAGE (V)	PACKAGED DEVICES					
		SMALL OUTLINE (D) <sup>†</sup>	CHIP CARRIER (FK)	CERAMIC DIP (JG)	CERAMIC DUAL FLATPACK (U)	PLASTIC DIP (P)	THIN SHRINK SMALL OUTLINE (PW) <sup>‡</sup>
-40°C to 85°C	1.1	TLC7701ID	—	—	—	TLC7701IP	TLC7701IPW
	2.25	TLC7725ID	—	—	—	TLC7725IP	TLC7725IPW
	2.63	TLC7703ID	—	—	—	TLC7703IP	TLC7703IPW
	2.93	TLC7733ID	—	—	—	TLC7733IP	TLC7733IPW
	4.55	TLC7705ID	—	—	—	TLC7705IP	TLC7705IPW
-40°C to 125°C	1.1	TLC7701QD	—	—	—	TLC7701QP	TLC7701QPW
	2.25	TLC7725QD	—	—	—	TLC7725QP	TLC7725QPW
	2.63	TLC7703QD	—	—	—	TLC7703QP	TLC7703QPW
	2.93	TLC7733QD	—	—	—	TLC7733QP	TLC7733QPW
	4.55	TLC7705QD	—	—	—	TLC7705QP	TLC7705QPW
-55°C to 125°C	2.93	—	TLC7733MFK	TLC7733MJG	—	—	—
	4.55	—	TLC7705MFK	TLC7705MJG	TLC7705MU	—	—

<sup>†</sup> The D package is available taped and reeled. Add the suffix R to the device type when ordering (e.g., TLC7705QDR).

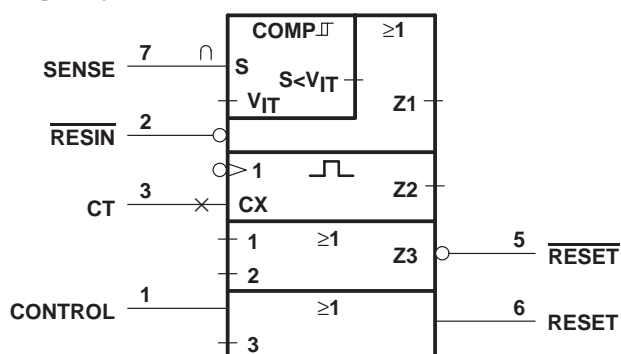
<sup>‡</sup> The PW package is only available left-end taped and reeled (indicated by the LE suffix on the device type; e.g., TLC7705QPWLE).

### FUNCTION TABLE

CONTROL	$\overline{RESIN}$	$V_{I(SENSE)} > V_{IT+}$	RESET	$\overline{RESET}$
L	L	False	H	L
L	L	True	H	L
L	H	False	H	L
L	H	True	L <sup>§</sup>	H <sup>§</sup>
H	L	False	H	L
H	L	True	H	L
H	H	False	H	L
H	H	True	H	H <sup>§</sup>

<sup>§</sup> RESET and  $\overline{RESET}$  states shown are valid for  $t > t_d$ .

### logic symbol<sup>¶</sup>

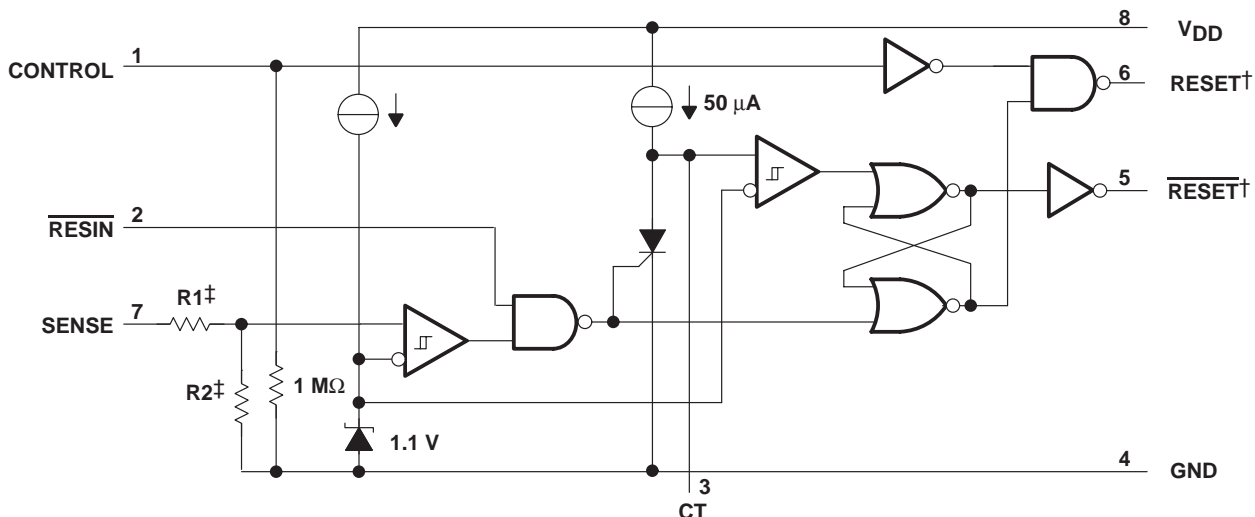


<sup>¶</sup> This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

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## functional block diagram

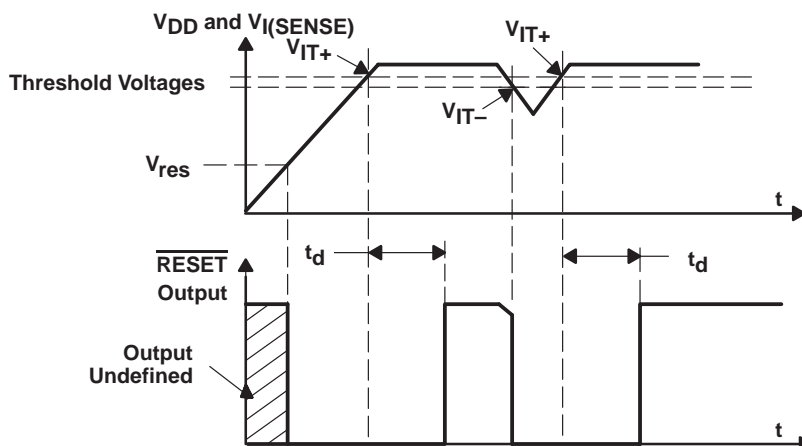


† Outputs are totem-pole configuration. External pullup or pulldown resistors are not required.

‡ Nominal values:

	R1 (Typ)	R2 (Typ)
TLC7701	0	$\infty$
TLC7725	600 k $\Omega$	600 k $\Omega$
TLC7703	698 k $\Omega$	502 k $\Omega$
TLC7733	750 k $\Omega$	450 k $\Omega$
TLC7705	910 k $\Omega$	290 k $\Omega$

## timing diagram





# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

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**electrical characteristics over recommended operating conditions (see Note 2) (unless otherwise noted)**

PARAMETER		TEST CONDITIONS	TLC77xx			UNIT	
			MIN	TYP†	MAX		
V <sub>OH</sub>	High-level output voltage	I <sub>OH</sub> = -20 μA	V <sub>DD</sub> = 2 V	1.8		V	
			V <sub>DD</sub> = 2.7 V	2.5			
			V <sub>DD</sub> = 4.5 V	4.3			
		I <sub>OH</sub> = -2 mA	V <sub>DD</sub> = 4.5 V	3.7			
V <sub>OL</sub>	Low-level output voltage	I <sub>OL</sub> = 20 μA	V <sub>DD</sub> = 2 V	0.2		V	
			V <sub>DD</sub> = 2.7 V	0.2			
			V <sub>DD</sub> = 4.5 V	0.2			
		I <sub>OL</sub> = 2 mA	V <sub>DD</sub> = 4.5 V	0.5			
V <sub>IT-</sub>	Negative-going input threshold voltage, SENSE (see Note 3)	TLC7701	V <sub>DD</sub> = 2 V to 6 V	1.04	1.1	1.16	V
		TLC7725		2.18	2.25	2.32	
		TLC7703		2.56	2.63	2.70	
		TLC7733		2.86	2.93	3	
		TLC7705		4.47	4.55	4.63	
V <sub>hys</sub>	Hysteresis voltage, SENSE	TLC7701	V <sub>DD</sub> = 2 V to 6 V	30		mV	
		TLC7725	V <sub>DD</sub> = 2 V to 6 V	70		mV	
		TLC7703,					
		TLC7733,					
		TLC7705					
V <sub>res</sub>	Power-up reset voltage‡	I <sub>OL</sub> = 20 μA	1		V		
I <sub>I</sub>	Input current	RESIN	V <sub>I</sub> = 0 V to V <sub>DD</sub>	2		μA	
		CONTROL	V <sub>I</sub> = V <sub>DD</sub>	7	15		
		SENSE	V <sub>I</sub> = 5 V	5	10		
		SENSE, TLC7701 only	V <sub>I</sub> = 5 V	2			
I <sub>DD</sub>	Supply current	RESIN = V <sub>DD</sub> , SENSE = V <sub>DD</sub> ≥ V <sub>ITmax</sub> + 0.2 V CONTROL = 0 V, Outputs open	9 16		μA		
I <sub>DD(d)</sub>	Supply current during t <sub>d</sub>	V <sub>DD</sub> = 5 V, V <sub>CT</sub> = 0, RESIN = V <sub>DD</sub> , SENSE = V <sub>DD</sub> , CONTROL = 0 V, Outputs open	120 150		μA		
C <sub>I</sub>	Input capacitance, SENSE	V <sub>I</sub> = 0 V to V <sub>DD</sub>	50		pF		

† Typical values apply at T<sub>A</sub> = 25°C.

‡ The lowest supply voltage at which RESET becomes active. The symbol V<sub>res</sub> is not currently listed within EIA or JEDEC standards for semiconductor symbology. Rise time of V<sub>DD</sub> ≥ 15 μs/V.

NOTES: 2. All characteristics are measured with C<sub>T</sub> = 0.1 μF.

3. To ensure best stability of the threshold voltage, a bypass capacitor (ceramic, 0.1 μF) should be connected near the supply terminals.

# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

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electrical characteristics over recommended operating conditions (see Note 2) (unless otherwise noted)

PARAMETER		TEST CONDITIONS		TLC77xxM			UNIT
				MIN	TYP†	MAX	
V <sub>OH</sub>	High-level output voltage	I <sub>OH</sub> = -20 μA	V <sub>DD</sub> = 2 V,	T <sub>A</sub> = 25°C	1.8		V
				T <sub>A</sub> = -55°C to 125°C	1.7		
			V <sub>DD</sub> = 2.7 V	T <sub>A</sub> = 25°C	2.5		
		T <sub>A</sub> = -55°C to 125°C		2.3			
		V <sub>DD</sub> = 4.5 V	T <sub>A</sub> = 25°C	4.3			
			T <sub>A</sub> = -55°C to 125°C	4.2			
I <sub>OH</sub> = -2 mA	V <sub>DD</sub> = 4.5 V	T <sub>A</sub> = 25°C	3.7				
		T <sub>A</sub> = -55°C to 125°C	3.6				
V <sub>OL</sub>	Low-level output voltage	I <sub>OL</sub> = 20 μA	V <sub>DD</sub> = 2 V	T <sub>A</sub> = 25°C	0.2		V
				T <sub>A</sub> = -55°C to 125°C	0.2		
			V <sub>DD</sub> = 2.7 V	T <sub>A</sub> = 25°C	0.2		
				T <sub>A</sub> = -55°C to 125°C	0.2		
		V <sub>DD</sub> = 4.5 V	T <sub>A</sub> = 25°C	0.2			
			T <sub>A</sub> = -55°C to 125°C	0.2			
		I <sub>OL</sub> = 2 mA	V <sub>DD</sub> = 4.5 V	T <sub>A</sub> = 25°C	0.5		
				T <sub>A</sub> = -55°C to 125°C	0.5		
V <sub>IT-</sub>	Negative-going input threshold voltage, SENSE (see Note 3)	TLC7733	V <sub>DD</sub> = 2 V to 6 V	2.86	2.93	3.1	V
		TLC7705		4.3	4.5	4.8	
V <sub>hys</sub>	Hysteresis voltage, SENSE	V <sub>DD</sub> = 2 V to 6 V	V <sub>DD</sub> = 2 V to 6 V	70		mV	
V <sub>res</sub>	Power-up reset voltage‡	I <sub>OL</sub> = 20 μA		1		V	
I <sub>I</sub>	Input current	RESIN	V <sub>I</sub> = 0 V to V <sub>DD</sub>		2		μA
		CONTROL	V <sub>I</sub> = V <sub>DD</sub>		7	15	
		SENSE	V <sub>I</sub> = 5 V		5	10	
		SENSE, TLC7701 only	V <sub>I</sub> = 5 V		2		
I <sub>DD</sub>	Supply current	RESIN = V <sub>DD</sub> , SENSE = V <sub>DD</sub> ≥ V <sub>ITmax</sub> + 0.2 V CONTROL = 0 V, Outputs open		9	16	μA	
I <sub>DD(d)</sub>	Supply current during t <sub>d</sub>	TLC7733	V <sub>CT</sub> = 0, RESIN = V <sub>DD</sub> , CONTROL = 0 V, SENSE = V <sub>DD</sub> , Outputs open	V <sub>DD</sub> = 3.3 V	250		μA
		TLC7705	V <sub>DD</sub> = 5 V		120	150	
C <sub>I</sub>	Input capacitance, SENSE	V <sub>I</sub> = 0 V to V <sub>DD</sub>		50		pF	

† Typical values apply at T<sub>A</sub> = 25°C.

‡ The lowest supply voltage at which **RESET** becomes active. The symbol V<sub>res</sub> is not currently listed within EIA or JEDEC standards for semiconductor symbology. Rise time of V<sub>DD</sub> ≥ 15 μs/V.

NOTES: 2. All characteristics are measured with C<sub>T</sub> = 0.1 μF.

3. To ensure best stability of the threshold voltage, a bypass capacitor (ceramic, 0.1 μF) should be placed near the supply terminals.

# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

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**switching characteristics at  $V_{DD} = 5\text{ V}$ ,  $R_L = 2\text{ k}\Omega$ ,  $C_L = 50\text{ pF}$ ,  $T_A = 25^\circ\text{C}$**

PARAMETER	MEASURED		TEST CONDITIONS	TLC77xx			UNIT
	FROM (INPUT)	TO (OUTPUT)		MIN	TYP	MAX	
$t_d$ Delay time	$V_{I(\text{SENSE})} \geq V_{IT+}$	$\overline{\text{RESET}}$ and $\overline{\text{RESET}}$	$\overline{\text{RESIN}} = 0.7 \times V_{DD}$ , $\text{CONTROL} = 0.2 \times V_{DD}$ , $C_T = 100\text{ nF}$ , See timing diagram	1.1	2.1	4.2	ms
$t_{PLH}$ Propagation delay time, low-to-high-level output	SENSE	$\overline{\text{RESET}}$	$V_{IH} = V_{IT+max} + 0.2\text{ V}$ , $V_{IL} = V_{IT-min} - 0.2\text{ V}$ , $\overline{\text{RESIN}} = 0.7 \times V_{DD}$ , $\text{CONTROL} = 0.2 \times V_{DD}$ , $C_T = \text{NC}^\dagger$	20			$\mu\text{s}$
$t_{PHL}$ Propagation delay time, high-to-low-level output		$\overline{\text{RESET}}$		5			
$t_{PLH}$ Propagation delay time, low-to-high-level output		$\overline{\text{RESET}}$		5			
$t_{PHL}$ Propagation delay time, high-to-low-level output		$\overline{\text{RESET}}$		20			
$t_{PLH}$ Propagation delay time, low-to-high-level output	$\overline{\text{RESIN}}$	$\overline{\text{RESET}}$	$V_{IH} = 0.7 \times V_{DD}$ , $V_{IL} = 0.2 \times V_{DD}$ , $\text{SENSE} = V_{IT+max} + 0.2\text{ V}$ , $\text{CONTROL} = 0.2 \times V_{DD}$ , $C_T = \text{NC}^\dagger$	20			$\mu\text{s}$
$t_{PHL}$ Propagation delay time, high-to-low-level output		$\overline{\text{RESET}}$		40			ns
$t_{PLH}$ Propagation delay time, low-to-high-level output		$\overline{\text{RESET}}$		45			
$t_{PHL}$ Propagation delay time, high-to-low-level output		$\overline{\text{RESET}}$		20			$\mu\text{s}$
$t_{PLH}$ Propagation delay time, low-to-high-level output	CONTROL	$\overline{\text{RESET}}$	$V_{IH} = 0.7 \times V_{DD}$ , $V_{IL} = 0.2 \times V_{DD}$ , $\text{SENSE} = V_{IT+max} + 0.2\text{ V}$ , $\overline{\text{RESIN}} = 0.7 \times V_{DD}$ , $C_T = \text{NC}^\dagger$	38			ns
$t_{PHL}$ Propagation delay time, high-to-low-level output				38			ns
Low-level minimum pulse duration to switch $\overline{\text{RESET}}$ and $\overline{\text{RESET}}$	SENSE		$V_{IH} = V_{IT+max} + 0.2\text{ V}$ , $V_{IL} = V_{IT-min} - 0.2\text{ V}$ , $V_{IL} = 0.2 \times V_{DD}$ , $V_{IH} = 0.7 \times V_{DD}$	3			$\mu\text{s}$
	$\overline{\text{RESIN}}$			1			
$t_r$ Rise time		$\overline{\text{RESET}}$ and $\overline{\text{RESET}}$	10% to 90%	8			ns/V
$t_f$ Fall time			90% to 10%	4			

$^\dagger$  NC = No capacitor, and includes up to 100-pF probe and jig capacitance.

# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

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## switching characteristics at $V_{DD} = 5\text{ V}$ , $R_L = 2\text{ k}\Omega$ , $C_L = 50\text{ pF}$

PARAMETER	MEASURED		TEST CONDITIONS	T <sub>A</sub>	TLC77xxM			UNIT
	FROM (INPUT)	TO (OUTPUT)			MIN	TYP	MAX	
t <sub>d</sub> Delay time	$V_{I(\text{SENSE})} \geq V_{IT+}$	RESET and RESET	RESIN = 2.7 V, CONTROL = 0.4 V, C <sub>T</sub> = 100 nF, See timing diagram	25°C	1.1	2.1	4.2	ms
t <sub>PLH</sub> Propagation delay time, low-to-high-level output	SENSE	RESET	$V_{IH} = V_{IT+max} + 0.2\text{ V}$ , $V_{IL} = V_{IT-min} - 0.2\text{ V}$ , RESIN = 2.7 V, CONTROL = 0.4 V, C <sub>T</sub> = NC†	25°C	20		μs	
		Full range		24				
		RESET		25°C	5		μs	
		Full range		7				
t <sub>PHL</sub> Propagation delay time, high-to-low-level output	SENSE	RESET	$V_{IH} = V_{IT+max} + 0.2\text{ V}$ , $V_{IL} = V_{IT-min} - 0.2\text{ V}$ , RESIN = 2.7 V, CONTROL = 0.4 V, C <sub>T</sub> = NC†	25°C	5		μs	
		Full range		7				
		RESET		25°C	20		μs	
		Full range		24				
t <sub>PLH</sub> Propagation delay time, low-to-high-level output	RESIN	RESET	$V_{IH} = 2.7\text{ V}$ , $V_{IL} = 0.4\text{ V}$ , SENSE = $V_{IT+max} + 0.2\text{ V}$ , CONTROL = 0.4 V, C <sub>T</sub> = NC†	25°C	20		μs	
		Full range		24				
		RESET		25°C	45		ns	
		Full range		65				
t <sub>PHL</sub> Propagation delay time, high-to-low-level output	RESIN	RESET	$V_{IH} = 2.7\text{ V}$ , $V_{IL} = 0.4\text{ V}$ , SENSE = $V_{IT+max} + 0.2\text{ V}$ , CONTROL = 0.4 V, C <sub>T</sub> = NC†	25°C	40		ns	
		Full range		60				
		RESET		25°C	20		μs	
		Full range		24				
t <sub>PLH</sub> Propagation delay time, low-to-high-level output	CONTROL	RESET	$V_{IH} = 2.7\text{ V}$ , $V_{IL} = 0.4\text{ V}$ , SENSE = $V_{IT+max} + 0.2\text{ V}$ , RESIN = 2.7 V, C <sub>T</sub> = NC†	25°C	38		ns	
Full range				58				
t <sub>PHL</sub> Propagation delay time, high-to-low-level output	CONTROL	RESET	$V_{IH} = 2.7\text{ V}$ , $V_{IL} = 0.4\text{ V}$ , SENSE = $V_{IT+max} + 0.2\text{ V}$ , RESIN = 2.7 V, C <sub>T</sub> = NC†	25°C	38		ns	
Full range				58				
Low-level minimum pulse duration	SENSE		$V_{IH} = V_{IT+max} + 0.2\text{ V}$ , $V_{IL} = V_{IT-min} - 0.2\text{ V}$ , $V_{IL} = 0.4\text{ V}$ , $V_{IH} = 2.7\text{ V}$	Full range	3		μs	
	RESIN				1			
t <sub>r</sub> Rise time		RESET and RESET	10% to 90%	Full range	8		ns/V	
t <sub>f</sub> Fall time		RESET and RESET	90% to 10%		4			

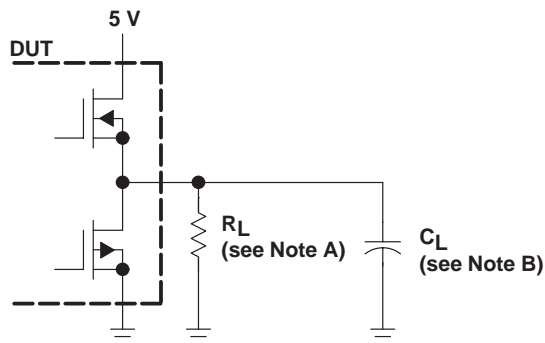
† NC = No capacitor, and includes up to 100-pF probe and jig capacitance.



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## PARAMETER MEASUREMENT INFORMATION



- NOTES: A. For switching characteristics,  $R_L = 2\text{ k}\Omega$ .  
 B.  $C_L = 50\text{ pF}$  includes jig and probe capacitance.

Figure 1. RESET AND  $\overline{\text{RESET}}$  Output Configurations

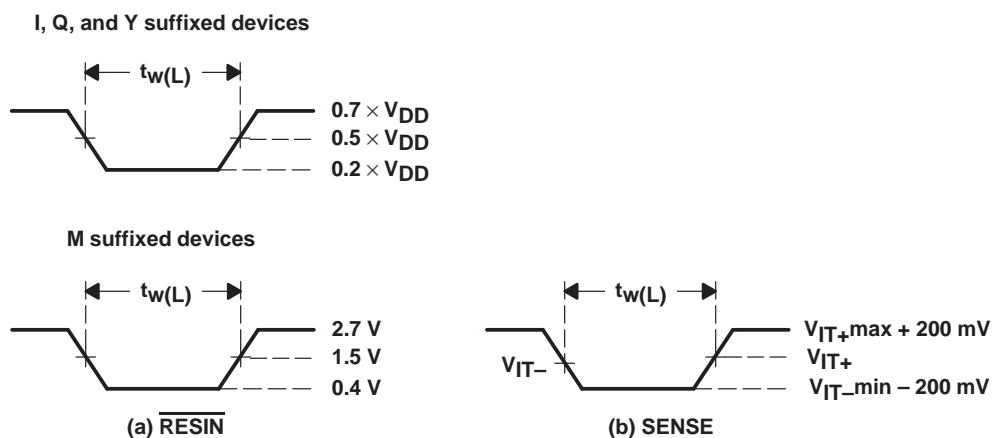


Figure 2. Input Pulse Definition Waveforms

# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

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## TYPICAL CHARACTERISTICS

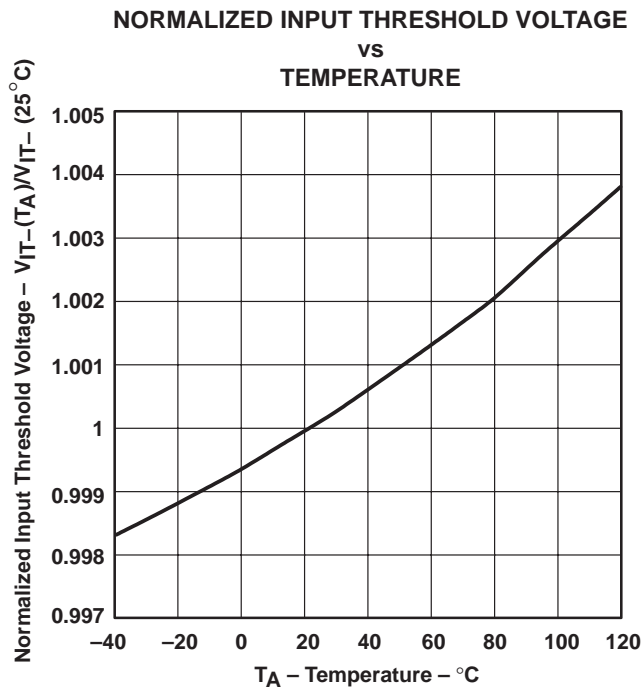


Figure 3

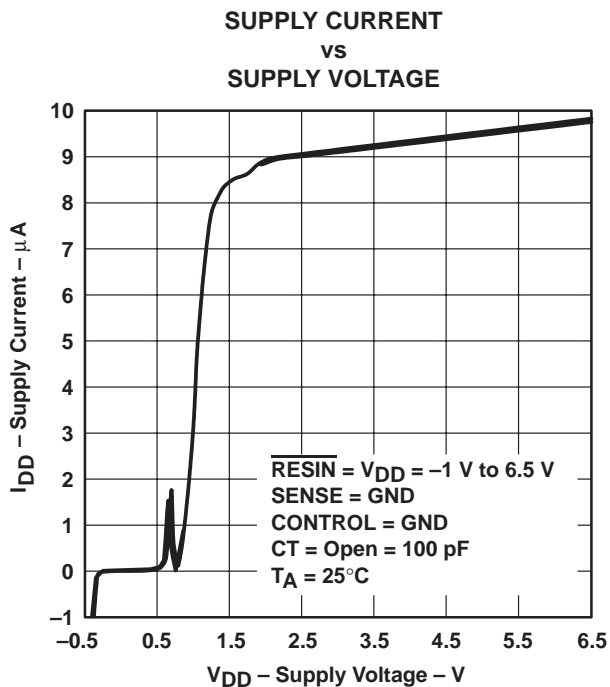


Figure 4

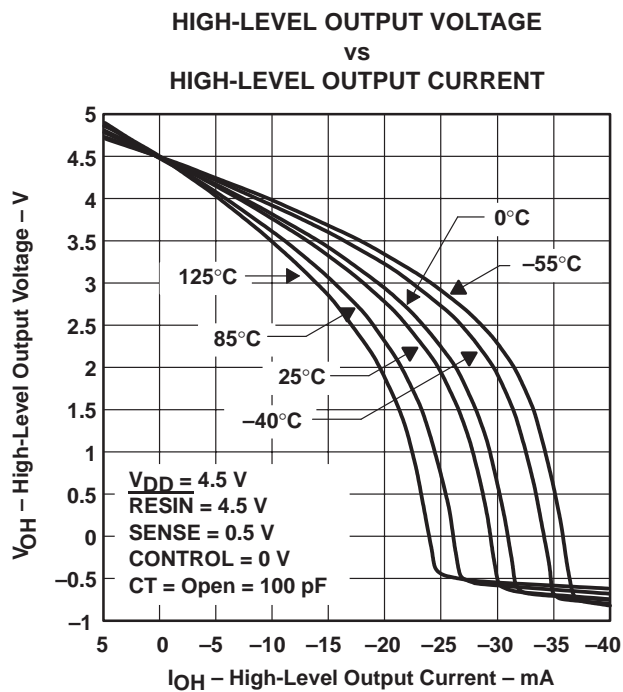


Figure 5

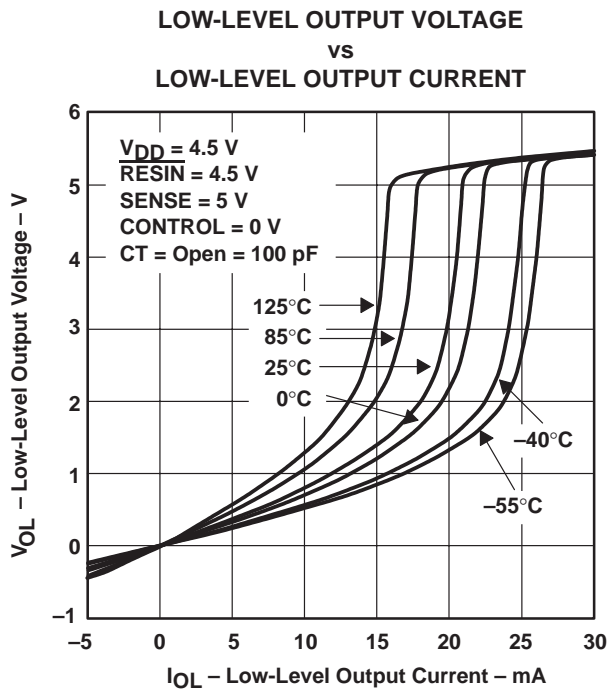
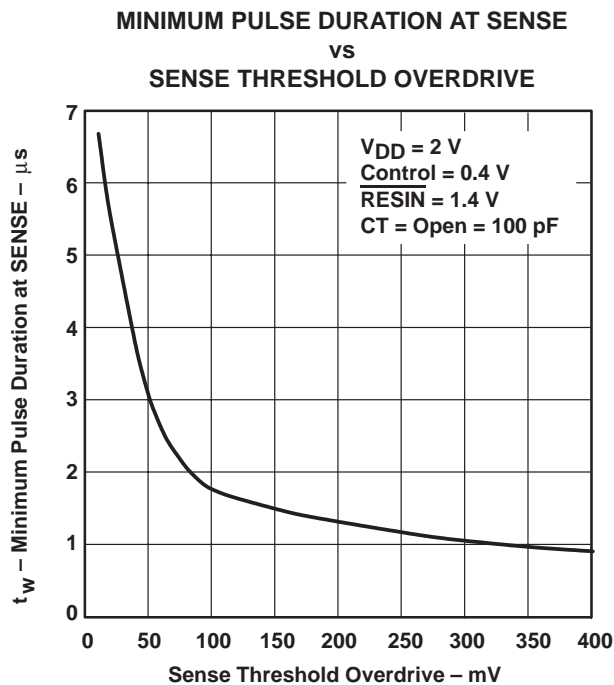
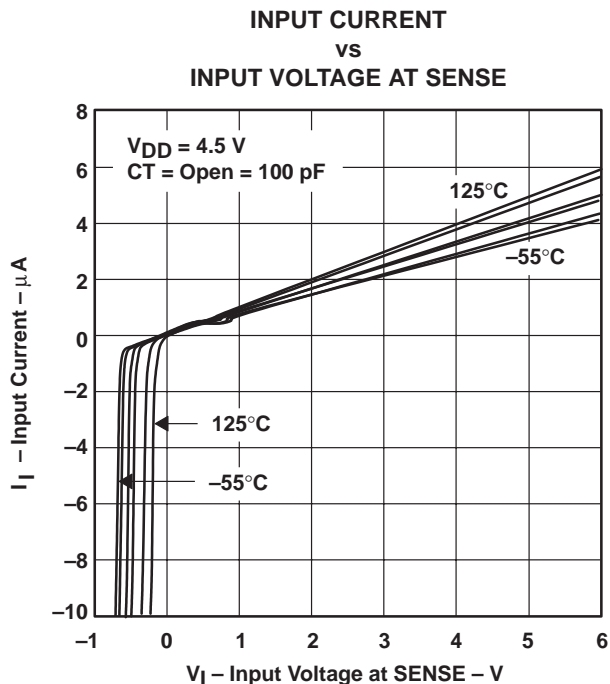


Figure 6

# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

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## TYPICAL CHARACTERISTICS



# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

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## APPLICATION INFORMATION

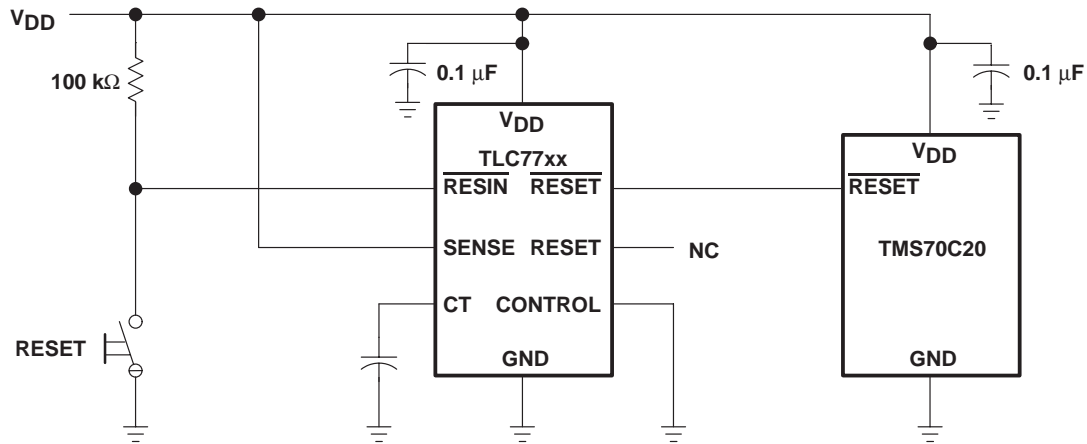


Figure 9. Reset Controller in a Microcomputer System

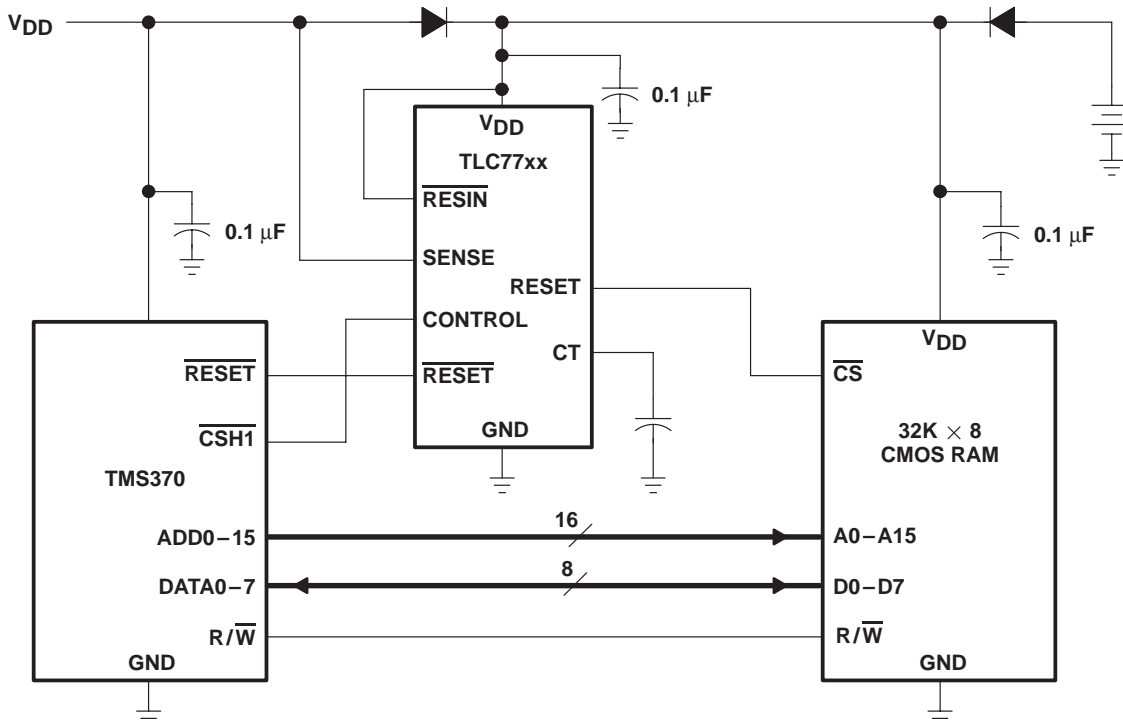


Figure 10. Data Retention During Power Down Using Static CMOS RAMs

# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

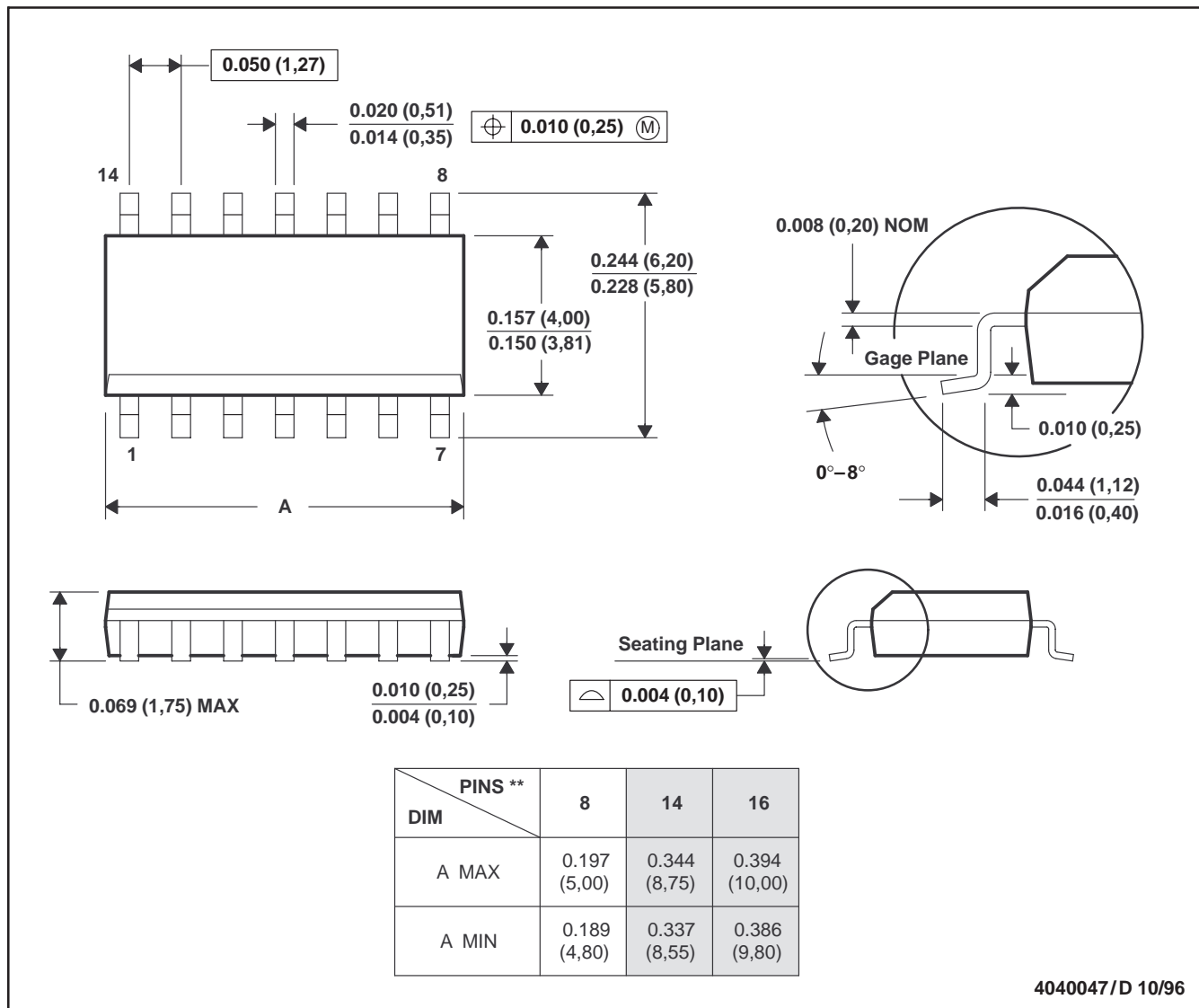
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## MECHANICAL DATA

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

PLASTIC SMALL-OUTLINE PACKAGE

14 PIN 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

# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

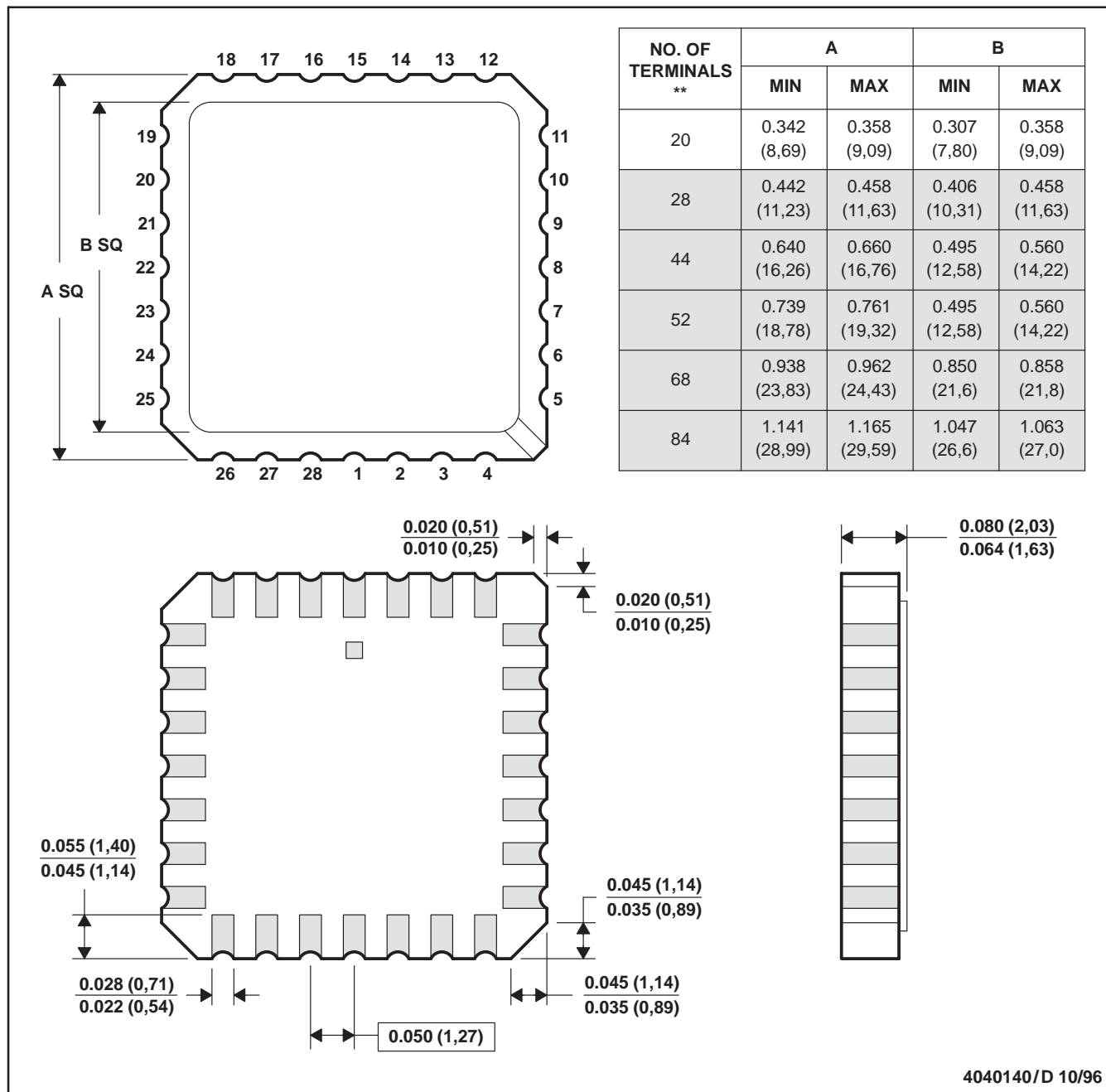
SLVS087K – DECEMBER 1994 – REVISED JULY 1999

## MECHANICAL DATA

FK (S-CQCC-N\*\*)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



- 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 metal lid.
  - D. The terminals are gold plated.
  - E. Falls within JEDEC MS-004

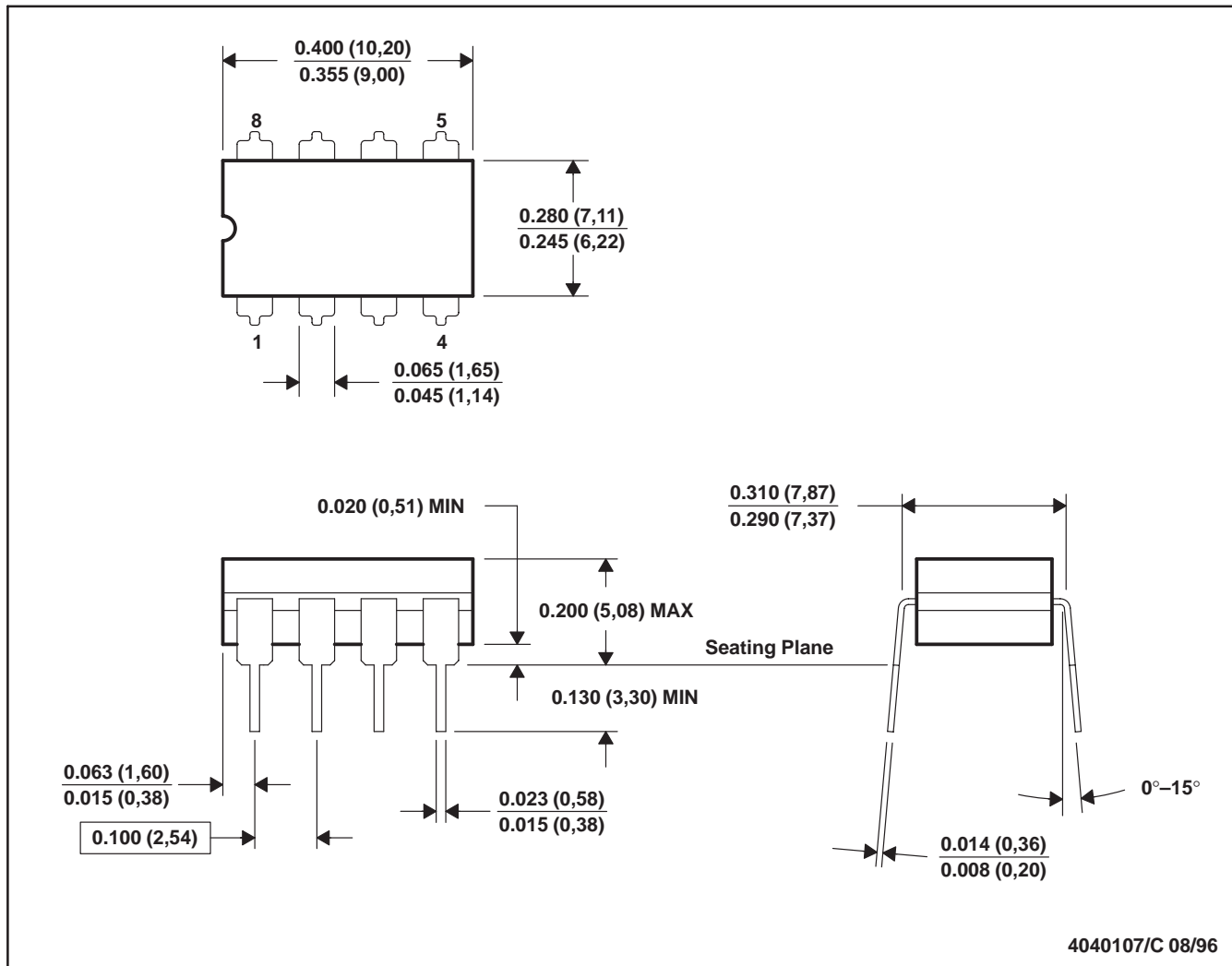
# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

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## MECHANICAL DATA

JG (R-GDIP-T8)

CERAMIC DUAL-IN-LINE PACKAGE



- 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 only on press ceramic glass frit seal only.  
 E. Falls within MIL-STD-1835 GDIP1-T8

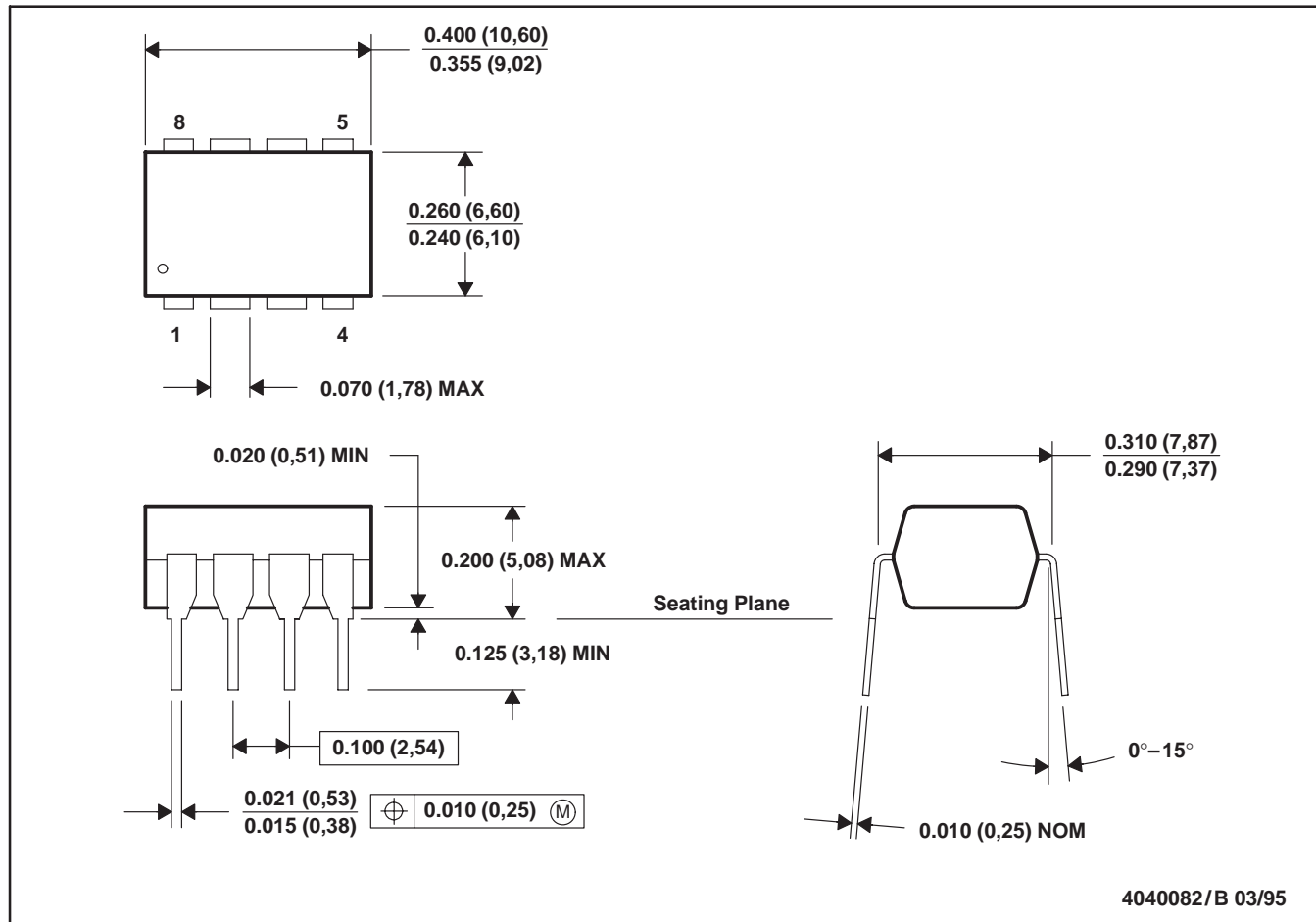
# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

SLVS087K – DECEMBER 1994 – REVISED JULY 1999

## MECHANICAL DATA

P (R-PDIP-T8)

PLASTIC DUAL-IN-LINE PACKAGE



- NOTES: A. All linear dimensions are in inches (millimeters).  
 B. This drawing is subject to change without notice.  
 C. Falls within JEDEC MS-001



# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

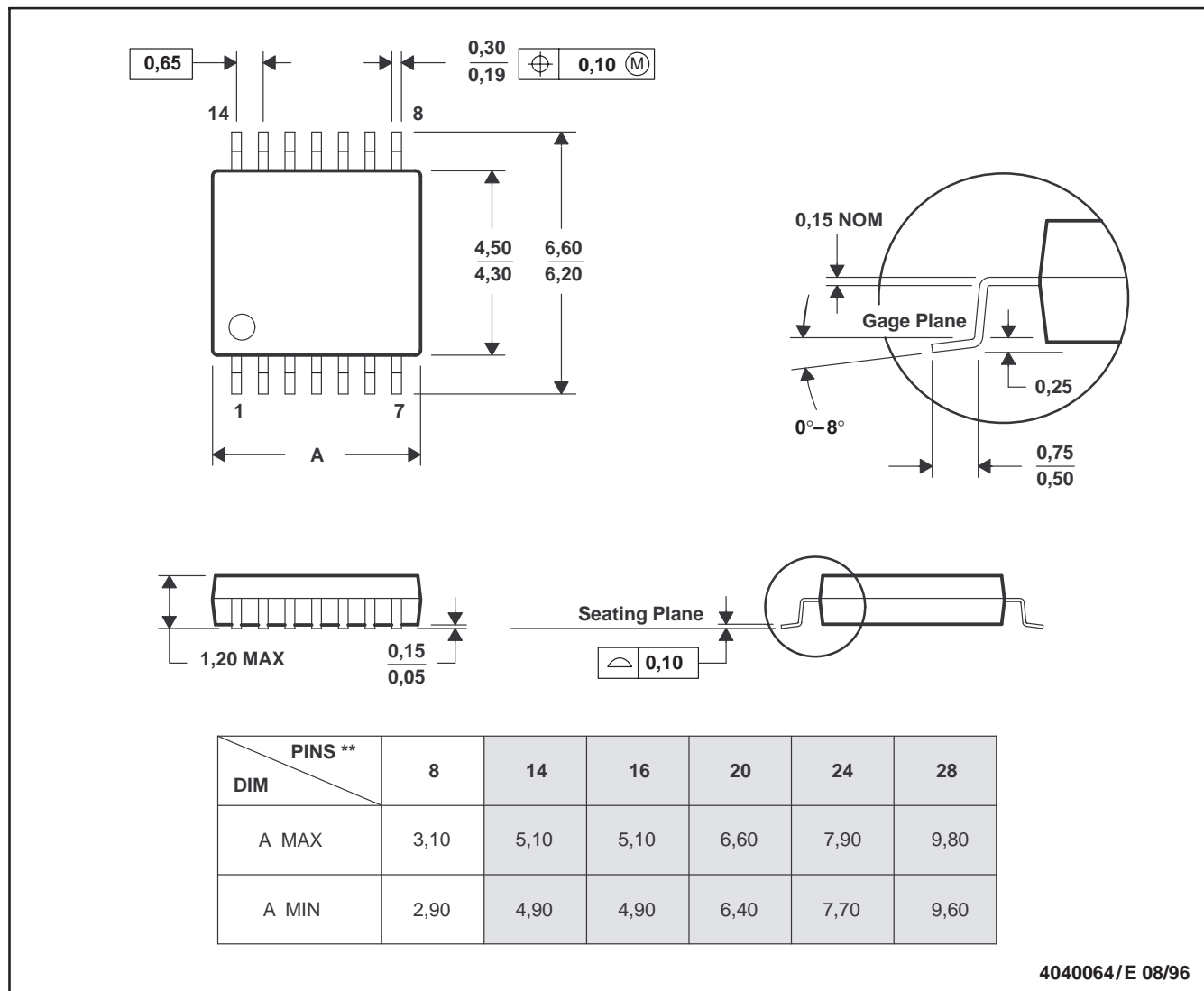
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## MECHANICAL DATA

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

PLASTIC SMALL-OUTLINE PACKAGE

14 PIN SHOWN



4040064/E 08/96

- 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

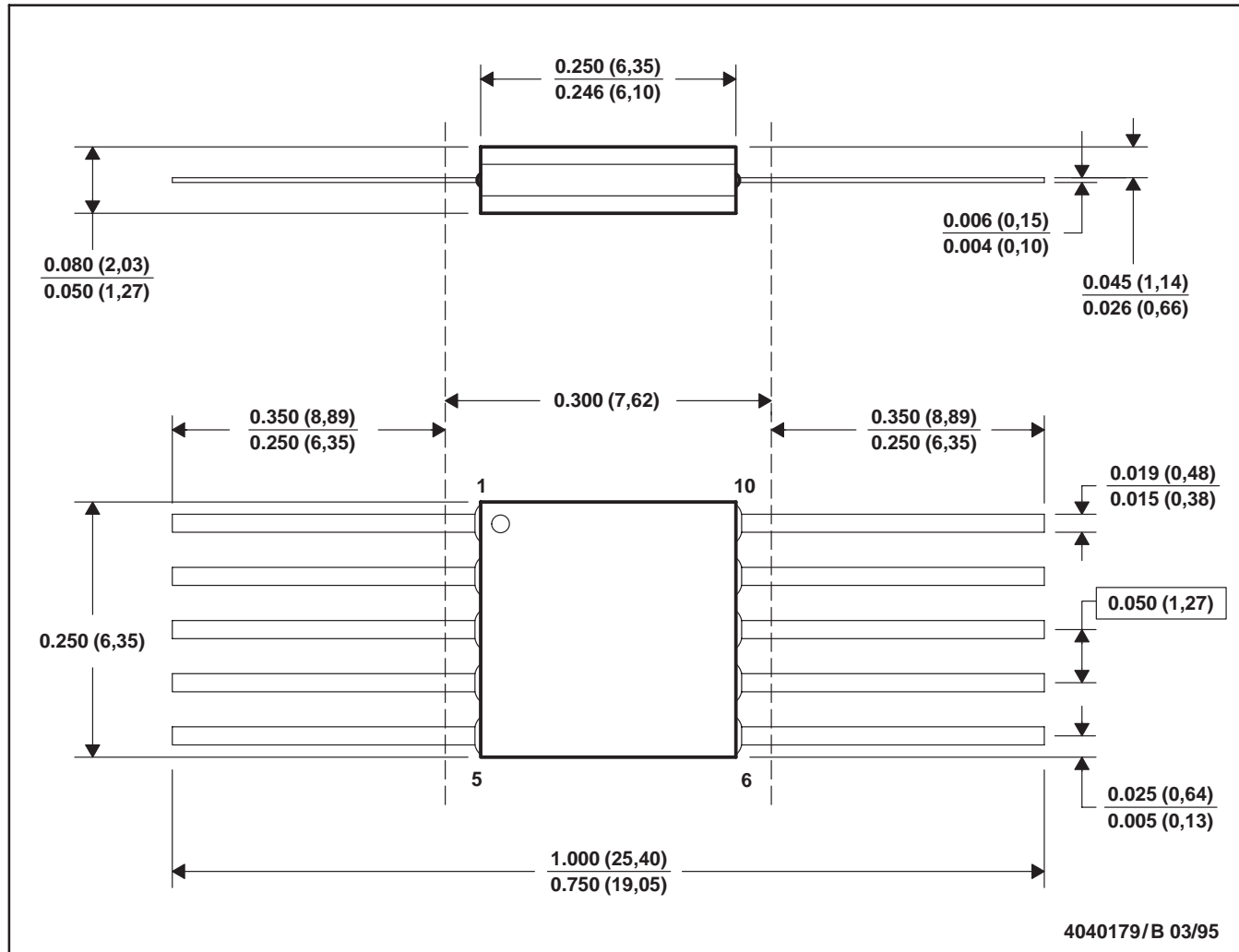
# TLC7701, TLC7725, TLC7703, TLC7733, TLC7705 MICROPOWER SUPPLY VOLTAGE SUPERVISORS

SLVS087K – DECEMBER 1994 – REVISED JULY 1999

## MECHANICAL DATA

U (S-GDFP-F10)

CERAMIC DUAL FLATPACK



4040179/B 03/95

- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package can be hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification only.
  - Falls within MIL STD 1835 GDFP1-F10 and JEDEC MO-092AA

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