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TSM100

SINGLE OPERATIONAL AMPLIFIER AND SINGLE COMPARATOR

NOT FOR NEW DESIGN

OPERATIONAL AMPLIFIER

- LOW INPUT OFFSET VOLTAGE: 0.5mV typ.
- MEDIUM BANDWIDTH (unity gain): 0.9MHz
- LARGE OUTPUT VOLTAGE SWING : 0V to (V_{cc} 1.5V)
- INPUT COMMON MODE VOLTAGE RANGE INCLUDES GROUND
- WIDE POWER SUPPLY RANGE: 5 to 30V ±2.5 TO ±15V
- ESD PROTECTION: 2kV

COMPARATOR (OPEN COLLECTOR)

- INPUT COMMON MODE VOLTAGE RANGE INCLUDES GROUND
- LOW OUTPUT SATURATION VOLTAGE : $250 \text{mV} \otimes \text{I}_{\text{o}} = 4 \text{mA}$

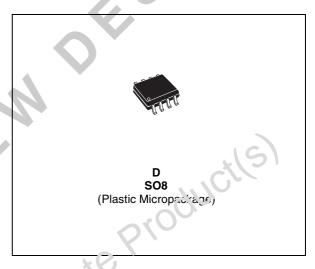
DESCRIPTION

The TSM100 is a monolithic IC that includes one independent op-amp and one independent comparator. This device is offering space and cost saving in many applications like power supply management or data acquisition systems

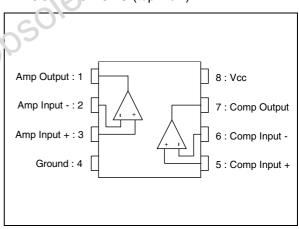
ORDER CODE

Part Number	Temperative Range	Package
Part Number	Range	D
TSM100I	-40°C, +105°C	•

D = Small Outline Package (SO) - also available in Tape & Reel (DT)



PIN CCN'VECTIONS (top view)



March 2005 1/5

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage	32	V
V _{id}	Differential Input Voltage	32	V
V _i	Input Voltage	-03. to +32	V
T _{oper}	Operating Free-air Temperature Range	-40 to +105	°C
T _j	Maximum Junction Temperature	150	°C
T _I	Maximum Lead Temperature (10 seconds maximum)	260	°C
R _{thja}	Thermal Resistance Junction to Ambient	175	°C/W

I _{CC} Total Supply Current	ELECTRICAL CHARACTERISTICS Symbol Parameter Min. Typ. Max. U I _{CC} Total Supply Current Vcc+ = 5V, no load Vcc+ = 30V, no load 1.8	ELECTRIC	AL CHARACTERISTICS Parameter Total Supply Current Vcc+ = 5V, no load		0.9	Max. 1.4 1.8	Ur
SymbolParameterMin.Typ.Max.Unit of the parameterICCTotal Supply Current Vcc+ = 5V, no load Vcc+ = 5V, no load Vcc+ = 30V, no load0.91.4 1.8	Symbol Parameter Min. Typ. Max. U I _{CC} Total Supply Current Vcc+ = 5V, no load Vcc+ = 30V, no load Vcc+ = 30V, no load Vcc+ = 30V, no load	Symbol	Parameter Total Supply Current Vcc+ = 5V, no load		0.9	1.4 1.8	m
I _{CC} Total Supply Current	I _{CC} Total Supply Current Vcc+ = 5V, no load Vcc+ = 30V, no load 1.8		Total Supply Current Vcc+ = 5V, no load		0.9	1.4 1.8	m
Vcc+ = 5V, no load 0.9 1.4 Vcc+ = 30V, no load 1.8	Vcc+ = 5V, no load Vcc+ = 30V, no load	I _{CC}	Vcc+ = 5V, no load			1.8	
	Obsolete Productle		VCC+ = 30V, No load		P	1	ile
			X	-hsole			

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OPERATIONAL AMPLIFIER

 V_{CC}^{+} = +5V, V_{CC} = Ground, V_{o} = 1.4V, T_{amb} = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Тур.	Max.	Unit
V _{io}	Input Offset Voltage $T_{amb} = 25^{\circ}C$ $T_{min.} \le T_{amb} \le T_{max.}$		0.5	3 4	mV
DV _{io}	Input Offset Voltage Drift		7		μV/°C
I _{io}	Input Offset Current		2	30	nA
I _{ib}	Input Bias Current		20	150	nA
Avd	Large Signal Voltage Gain V _{CC} = 15V, R _L = 2k, Vo = 1.4V to 11.4V	50	100		V/mV
SVR	Supply Voltage Rejection Ratio V _{CC} = 5V to 30V	65	100		dB
Vicm	Input Common Mode Voltage Range V _{CC} = +30V - see note ¹⁾	0		(V _{CC} +) -1.5	V
CMR	Common Mode Rejection Ratio	65	85		dB
I _{source}	Output Current Source V _{CC} = +15V, Vo = 2V, V _{id} = +1V	20	40		mA
I _o	Short Circuit to Ground V _{CC} = +15V		40	60	mA
I _{sink}	Output Current Sink $V_{id} = -1V,$ $V_{CC} = +15V, V_{o} = 2V$ $V_{CC} = +15V, V_{o} = 0.2V$	10 12	20 50	O. a	mΑ μΑ
V _{OH}	High Level Output Voltage $V_{CC}^{+} = 30V$ $T_{amb} = 25^{\circ}C, R_{L} = 2k$ $T_{amb} = 25^{\circ}C, R_{L} = 10k$	26 27	27 28		V
V _{OL}	Low Level Output Voltage R _L = 10k		5	15	mV
SR	Slew Rate at Unity Gain $V_i = 0.5$ to 3V, $V_{CC} = 15V$ $R_L = 2k$, $C_L = 100pF$, unity gain	0.2	0.4		V/µs
GBP	Gain Bandwidth Product $V_{CC} = 30V, R_L = 2k, C_L = 100pF$ $f = 100kHz, V_{in} = 10mV$	0.5	0.9		MHz
THD	Total Harmonic Distortion f = 1kHz $A_V = 20dB, R_L = 2k, V_{CC} = 30V$ $C_L = 100pF, V_o = 2V_{pp}$		0.015		%
e _n	Equivalent Input Noise Voltage f = 1kHz, Rs = 100Ω Vcc = 30V		40		nV/√Hz

^{1.} The input common-mode voltage of either input signal voltage should not be allowed to go negative by more than 0.3V. The upper end of the common-mode voltage range is V_{CC}^+ - 1.5V. But both inputs can go to Vcc+ +0.3V without damage.

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COMPARATOR

 V_{CC}^{+} = +5V, V_{CC} = Ground, T_{amb} = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Тур.	Max.	Uni
V_{io}	Input Offset Voltage T _{amb} = 25°C		1	5	mV
I _{io}	Input Offset Current		5	50	nA
l _{ib}	Input Bias Current		25	250	nA
Avd	Large Signal Voltage Gain V _{CC} = 15V, R _L = 15k, Vo = 1V to 11V		200		V/m
Vicm	Input Common Mode Voltage Range 1)	0		(V _{CC} +) -1.5	V
I _{sink}	Output Sink Current $V_{id} = -1V, V_{o} = 1.5V$	6	16		m <i>A</i>
V _{OL}	Low Level Output Voltage $V_{id} = -1V, I_{sink} = 4mA$		250	400	m\
I _{OH}	High Level Output Current V _{id} = 1V, V _{cc} = V _o = 30V	•	0.1		n <i>A</i>
t _{re}	Response Time $R_L = 5.1k \text{ to } V_{CC} + {}^{2)}$		1.3	ال	μs
t _{rel}	Large Signal Response Time V _i = TTL, V _{ref} = +1.4V, R _L = 5.1k to V _{CC} +		300	71 / Cg	ns
the common But either of	emmon-mode voltage of either input signal voltage should not be a n-mode voltage range is $V_{\rm CC}^+$ - 1.5V. both inputs can go to 36V without damage. See time is specified for a 100mV input step with 5mV overdrive. For	or larger overdi	rive signals 30)	
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The input common-mode voltage of either input signal voltage should not be allowed to go negative by more than 0.3V. The upper end of the common-mode voltage range is V_{CC}⁺ - 1.5V. But either of both inputs can go to 36V without damage.

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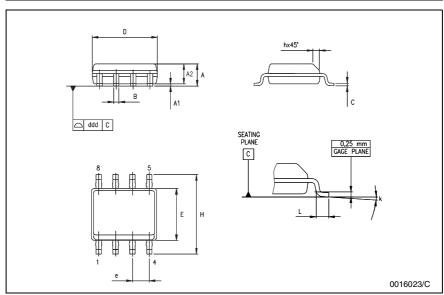
^{2.} The response time is specified for a 100mV input step with 5mV overdrive. For larger overdrive signals, 300ns can be obtained

PACKAGE MECHANICAL DATA

8 PINS - PLASTIC MICROPACKAGE (SO)

SO-8 MECHANICAL DATA

DIM.	mm.				inch	
DIW.	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
Α	1.35		1.75	0.053		0.069
A1	0.10		0.25	0.04		0.010
A2	1.10		1.65	0.043		0.065
В	0.33		0.51	0.013		0.020
С	0.19		0.25	0.007		0.010
D	4.80		5.00	0.189		0.197
E	3.80		4.00	0.150		0.157
е		1.27			0.050	
Н	5.80		6.20	0.228		0.244
h	0.25		0.50	0.010		0.020
L	0.40		1.27	0.016		0.050
k			8° (r	max.)		
ddd			0.1			0.04



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