

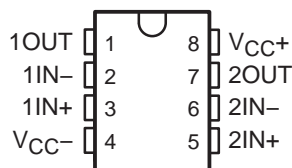
RC4558

DUAL GENERAL-PURPOSE OPERATIONAL AMPLIFIER

SLOS073C – MARCH 1976 – REVISED APRIL 2004

- Continuous Short-Circuit Protection
- Wide Common-Mode and Differential Voltage Ranges
- No Frequency Compensation Required
- Low Power Consumption
- No Latch-Up
- Unity-Gain Bandwidth . . . 3 MHz Typ
- Gain and Phase Match Between Amplifiers
- Low Noise . . . 8 nV/√Hz Typ at 1 kHz

D, DGK, P, PS, OR PW PACKAGE
(TOP VIEW)



description/ordering information

The RC4558 device is a dual general-purpose operational amplifier, with each half electrically similar to the μ A741, except that offset null capability is not provided.

The high common-mode input voltage range and the absence of latch-up make this amplifier ideal for voltage-follower applications. The device is short-circuit protected, and the internal frequency compensation ensures stability without external components.

ORDERING INFORMATION

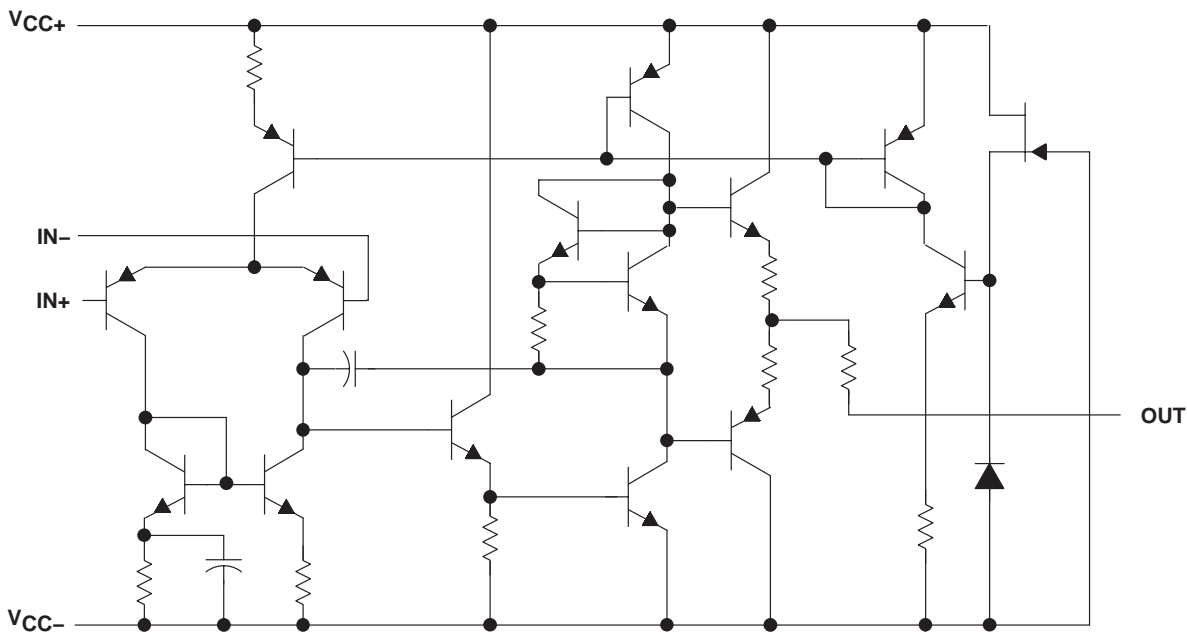
T _A	V _{IO} MAX AT 25°C	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 70°C	6 mV	MSOP/VSSOP (DGK)	Reel of 2500	RC4558DGKR	YRS
		PDIP (P)	Tube of 50	RC4558P	RC4558P
		SOIC (D)	Tube of 75	RC4558D	RC4558
			Reel of 2500	RC4558DR	
		SOP (PS)	Reel of 2000	RC4558PSR	R4558
		TSSOP (PW)	Tube of 150	RC4558PW	R4558
Reel of 2000	RC4558PWR				

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

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schematic (each amplifier)



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

Supply voltage (see Note 1): V_{CC+}	18 V
V_{CC-}	-18 V
Differential input voltage, V_{ID} (see Note 2)	± 30 V
Input voltage, V_I (any input, see Notes 1 and 3)	± 15 V
Duration of output short circuit to ground, one amplifier at a time (see Note 4)	Unlimited
Package thermal impedance, θ_{JA} (see Notes 5 and 6):	
D package	97°C/W
DGK package	172°C/W
P package	85°C/W
PS package	95°C/W
PW package	149°C/W
Operating virtual junction temperature, T_J	150°C
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. All voltage values, unless otherwise noted, are with respect to the midpoint between V_{CC+} and V_{CC-} .
 2. Differential voltages are at IN+ with respect to IN-.
 3. The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15 V, whichever is less.
 4. Temperature and/or supply voltages must be limited to ensure that the dissipation rating is not exceeded.
 5. Maximum power dissipation is a function of $T_J(\max)$, θ_{JA} , and T_A . The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(\max) - T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can affect reliability.
 6. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions

		MIN	MAX	UNIT
V_{CC+}	Supply voltage	5	15	V
V_{CC-}		-5	-15	
T_A	Operating free-air temperature	0	70	°C



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electrical characteristics at specified free-air temperature, $V_{CC+} = 15\text{ V}$, $V_{CC-} = -15\text{ V}$

PARAMETER		TEST CONDITIONS†	MIN	TYP	MAX	UNIT
V_{IO}	Input offset voltage	$V_O = 0$	25°C	0.5	6	mV
			Full range		7.5	
I_{IO}	Input offset current	$V_O = 0$	25°C	5	200	nA
			Full range		300	
I_{IB}	Input bias current	$V_O = 0$	25°C	150	500	nA
			Full range		800	
V_{ICR}	Common-mode input voltage range	25°C	±12	±14		V
V_{OM}	Maximum output voltage swing	$R_L = 10\text{ k}\Omega$	25°C	±12	±14	V
			25°C	±10	±13	
		$R_L = 2\text{ k}\Omega$	Full range	±10		
A_{VD}	Large-signal differential voltage amplification	$R_L \geq 2\text{ k}\Omega$, $V_O = \pm 10\text{ V}$	25°C	20	300	V/mV
			Full range	15		
B_1	Unity-gain bandwidth	25°C		3		MHz
r_i	Input resistance	25°C	0.3	5		M Ω
CMRR	Common-mode rejection ratio	25°C	70	90		dB
k_{SVS}	Supply-voltage sensitivity ($\Delta V_{IO}/\Delta V_{CC}$)	$V_{CC} = \pm 15\text{ V}$ to $\pm 9\text{ V}$	25°C	30	150	$\mu\text{V/V}$
V_n	Equivalent input noise voltage (closed loop)	$A_{VD} = 100$, $R_S = 100\ \Omega$, $f = 1\text{ kHz}$, $BW = 1\text{ Hz}$	25°C	8		$\text{nV}/\sqrt{\text{Hz}}$
I_{CC}	Supply current (both amplifiers)	$V_O = 0$, No load	25°C	2.5	5.6	mA
			$T_A(\text{min})$	3	6.6	
			$T_A(\text{max})$	2.3	5	
P_D	Total power dissipation (both amplifiers)	$V_O = 0$, No load	25°C	75	170	mW
			$T_A(\text{min})$	90	200	
			$T_A(\text{max})$	70	150	
V_{O1}/V_{O2}	Crosstalk attenuation	Open loop	$R_S = 1\text{ k}\Omega$, $f = 10\text{ kHz}$	25°C	85	dB
		$A_{VD} = 100$		105		

† All characteristics are measured under open-loop conditions with zero common-mode input voltage, unless otherwise specified. Full range is 0°C to 70°C. $T_A(\text{min})$ is 0°C. $T_A(\text{max})$ is 70°C.

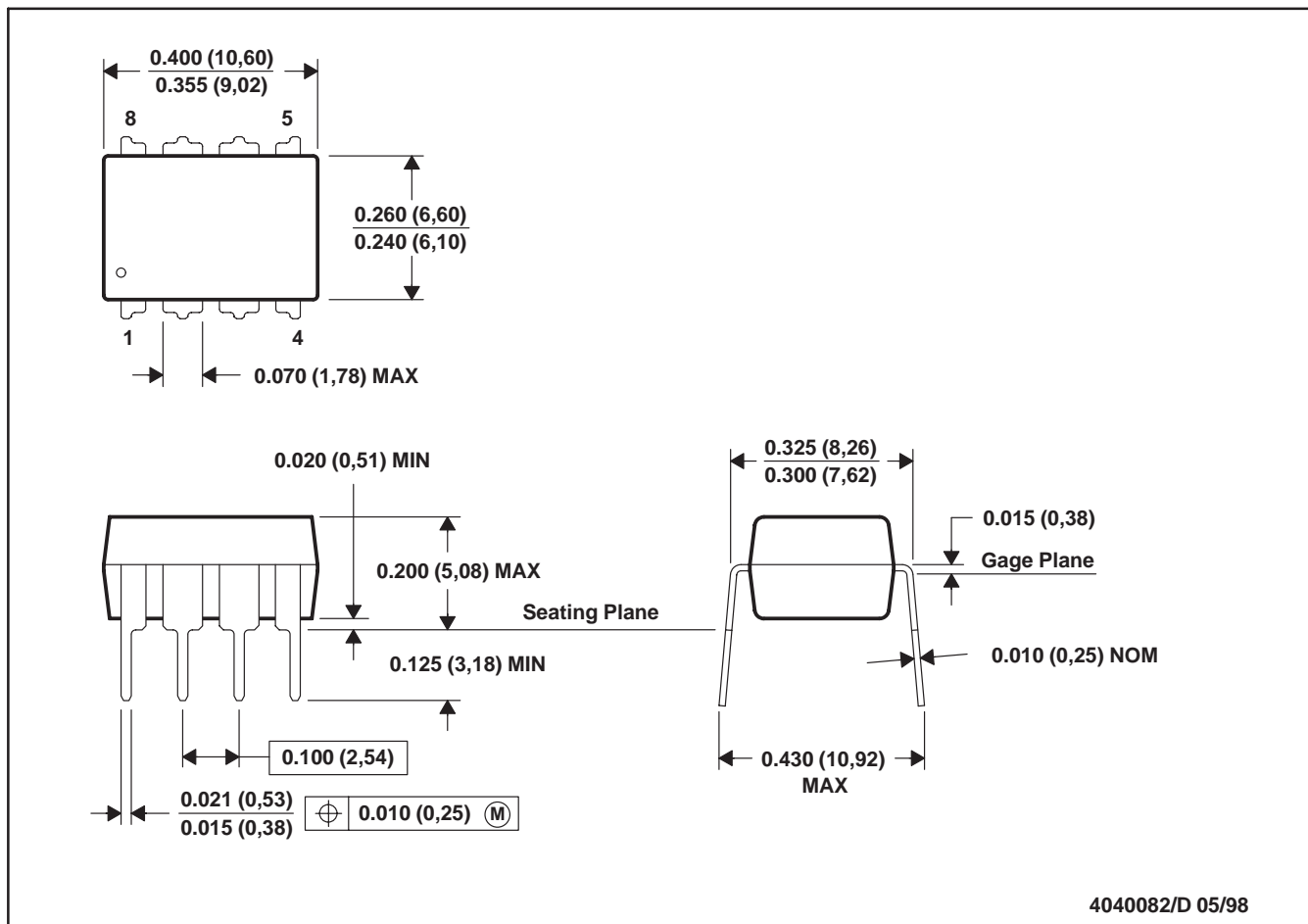
operating characteristics, $V_{CC+} = 15\text{ V}$, $V_{CC-} = -15\text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT
t_r	Rise time	$V_I = 20\text{ mV}$,	$R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$		0.13		ns
	Overshoot	$V_I = 20\text{ mV}$,	$R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$		5		%
SR	Slew rate at unity gain	$V_I = 10\text{ V}$,	$R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$	1.1	1.7		V/ μs



P (R-PDIP-T8)

PLASTIC DUAL-IN-LINE

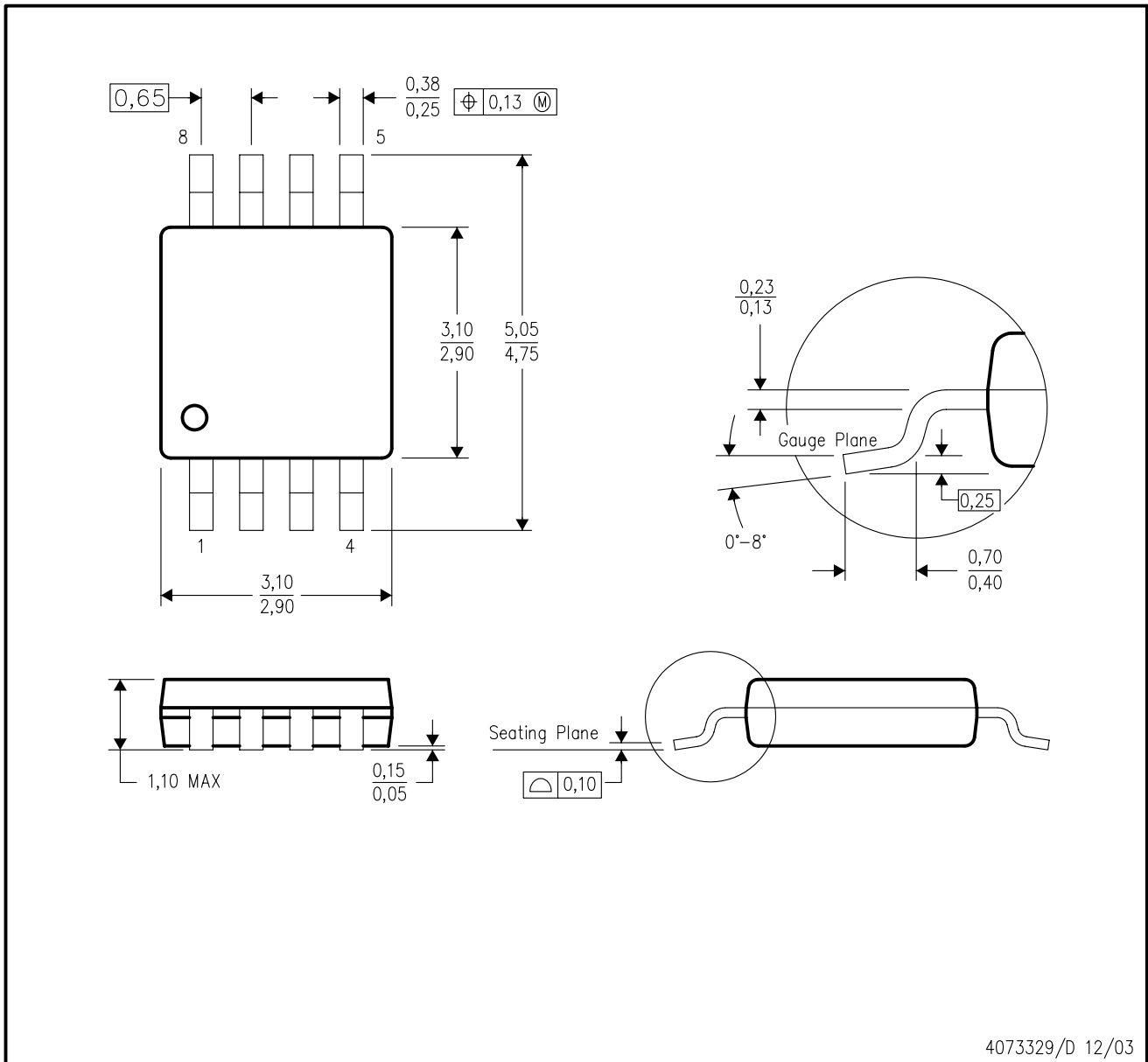


- NOTES: A. All linear dimensions are in inches (millimeters).
 B. This drawing is subject to change without notice.
 C. Falls within JEDEC MS-001

For the latest package information, go to http://www.ti.com/sc/docs/package/pkg_info.htm

DGK (S-PDSO-G8)

PLASTIC SMALL-OUTLINE PACKAGE

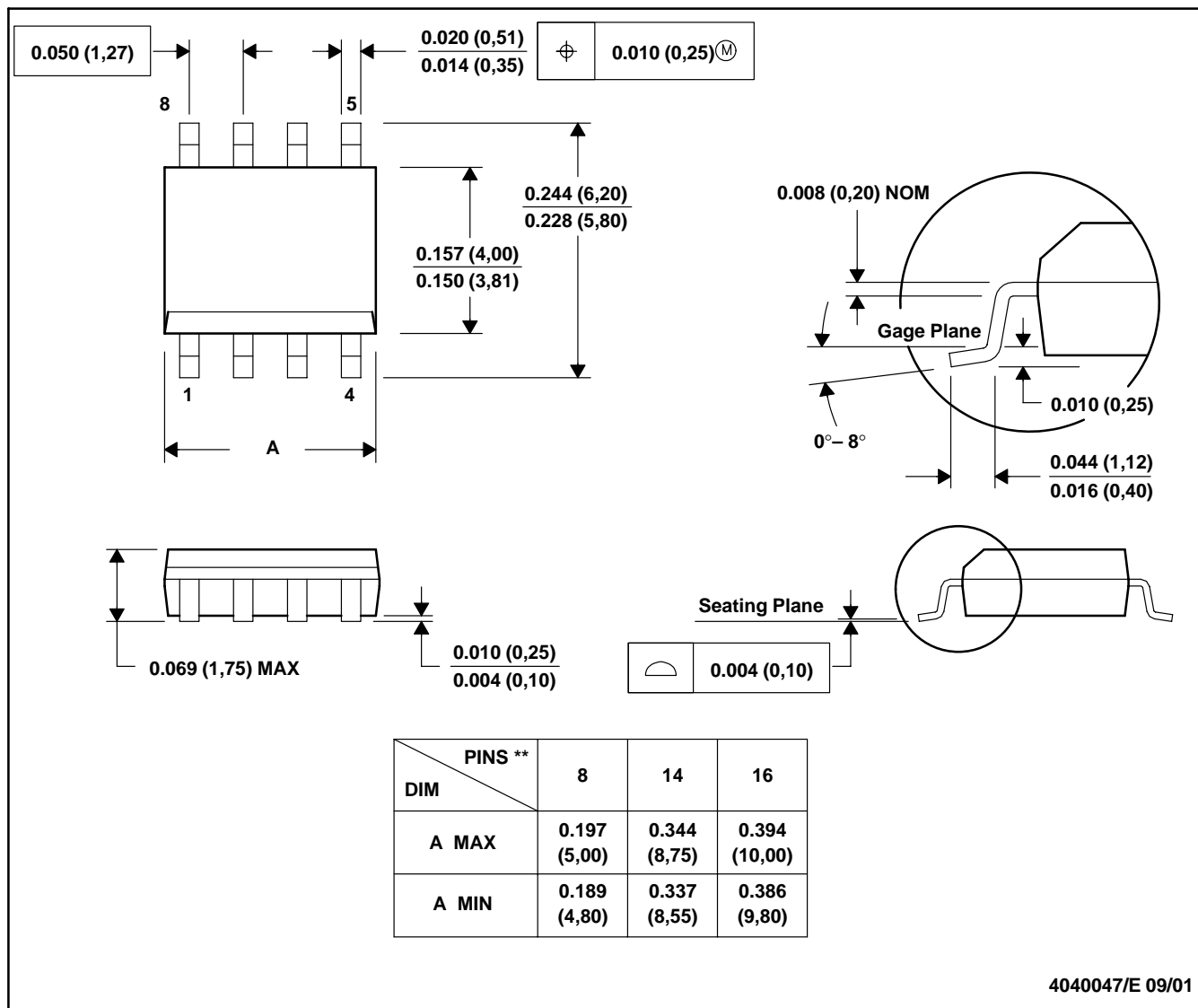


- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion.
 - D. Falls within JEDEC MO-187 variation AA.

D (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

8 PINS SHOWN

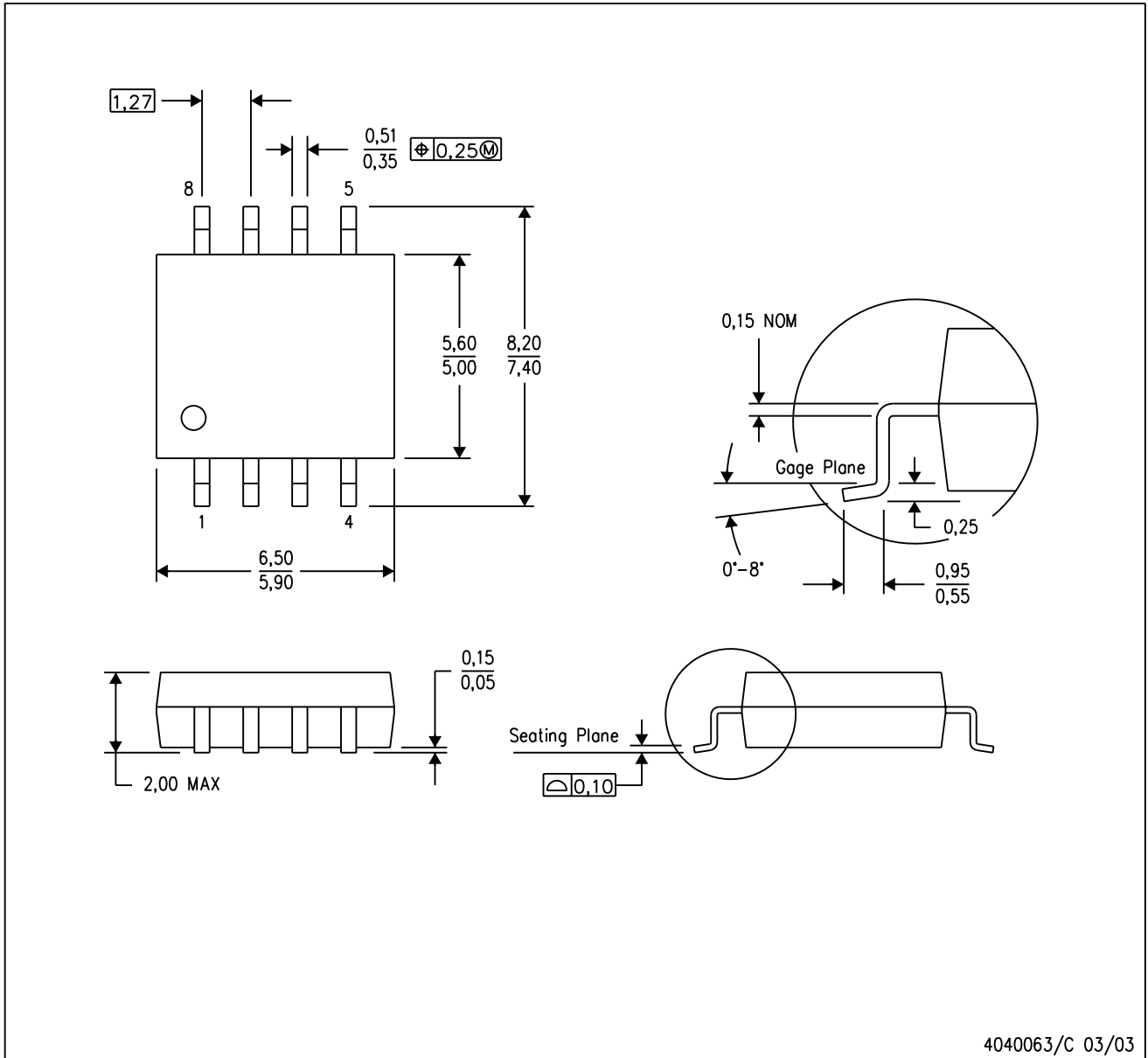


- NOTES: A. All linear dimensions are in inches (millimeters).
 B. This drawing is subject to change without notice.
 C. Body dimensions do not include mold flash or protrusion, not to exceed 0.006 (0,15).
 D. Falls within JEDEC MS-012

MECHANICAL DATA

PS (R-PDSO-G8)

PLASTIC SMALL-OUTLINE PACKAGE

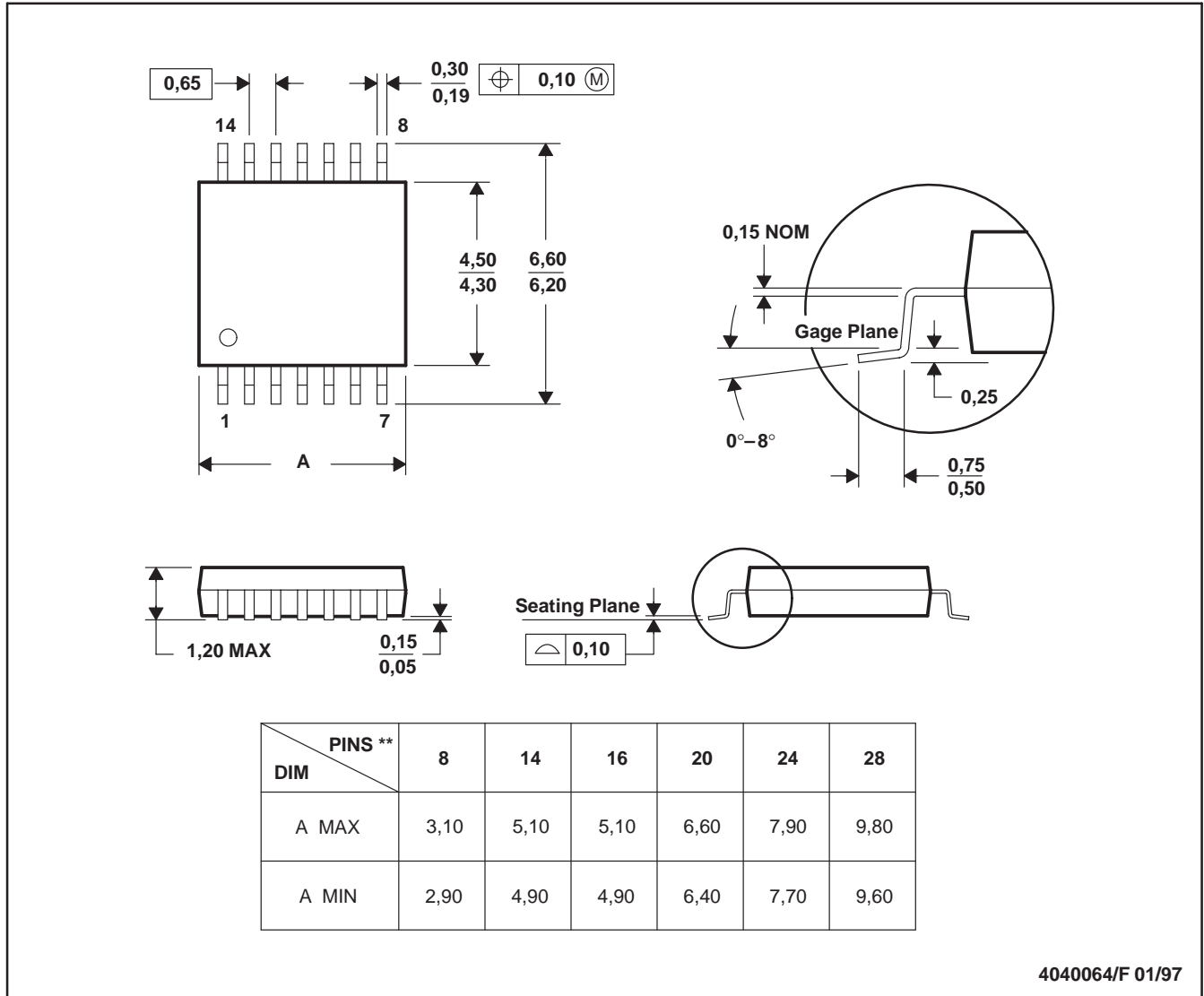


- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

PW (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

14 PINS SHOWN



4040064/F 01/97

- 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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