

ADM705/ADM706/ADM707/ADM708

FEATURES

- Guaranteed $\overline{\text{RESET}}$ valid with $V_{CC} = 1\text{ V}$
- 190 μA quiescent current
- Precision supply voltage monitor
 - 4.65 V (ADM705/ADM707)
 - 4.40 V (ADM706/ADM708)
- 200 ms reset pulse width
- Debounce TTL/CMOS manual reset input ($\overline{\text{MR}}$)
- Independent watchdog timer (ADM705/ADM706)
- 1.60 sec timeout (ADM705/ADM706)
- Active high reset output (ADM707/ADM708)
- Voltage monitor for power-fail or low battery warning
- Superior upgrade for MAX705 to MAX708

APPLICATIONS

- Microprocessor systems
- Computers
- Controllers
- Intelligent instruments
- Critical microprocessor supply monitoring

GENERAL DESCRIPTION

The ADM705/ADM706/ADM707/ADM708 microprocessor supervisory circuits are suitable for monitoring 5 V power supplies/batteries and can also monitor microprocessor activity.

The ADM705/ADM706 provide power-supply monitoring circuitry that generate a reset output during power-up, power-down, and brownout conditions. The reset output remains operational with V_{CC} as low as 1 V. Independent watchdog monitoring circuitry is also provided. This is activated if the watchdog input has not been toggled within 1.60 seconds.

In addition, there is a 1.25 V threshold detector to warn of power-failures, to detect low battery conditions, or to monitor an additional power supply. An active low, debounced manual reset input ($\overline{\text{MR}}$) is also included.

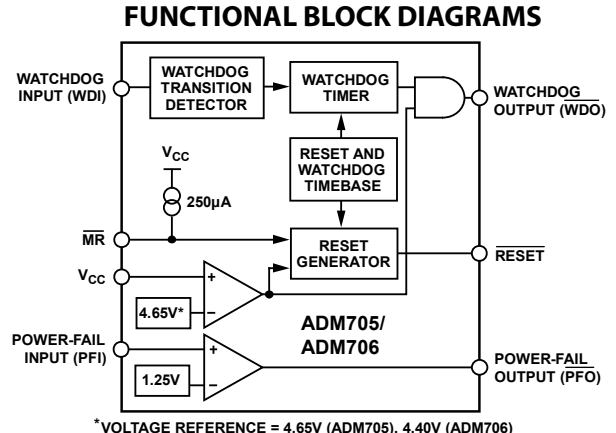


Figure 1. ADM705/ADM706

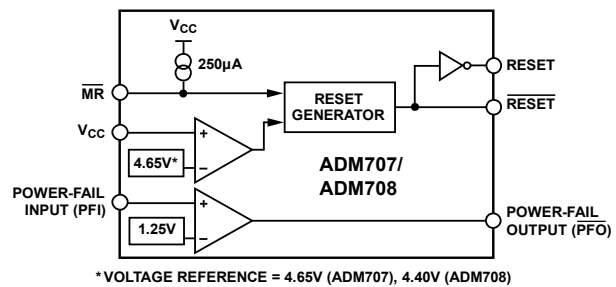


Figure 2. ADM707/ADM708

The ADM705 and ADM706 are identical except for the reset threshold monitor levels, which are 4.65 V and 4.40 V, respectively.

The ADM707 and ADM708 provide a similar functionality to the ADM705 and ADM706 and only differ in that a watchdog timer function is not available. Instead, an active high reset output (RESET) is available as well as the active low reset output ($\overline{\text{RESET}}$). The ADM707 and ADM708 are identical except for the reset threshold monitor levels, which are 4.65 V and 4.40 V, respectively.

All parts are available in narrow 8-lead PDIP and 8-lead SOIC packages.

SPECIFICATIONS

$V_{CC} = 4.75\text{ V to }5.5\text{ V}$, $T_A = T_{MIN}$ to T_{MAX} , unless otherwise noted.

Table 1.

Parameter	Min	Typ	Max	Unit	Test Conditions/Comments
POWER SUPPLY					
V_{CC} Operating Voltage Range	1.0		5.5	V	
Supply Current		190	250	μA	
LOGIC OUTPUT					
Reset Threshold	4.5	4.65	4.75	V	ADM705/ADM707
	4.25	4.40	4.50	V	ADM706/ADM708
Reset Threshold Hysteresis		40		mV	
RESET PULSE WIDTH	160	200	280	ms	
RESET OUTPUT VOLTAGE	$V_{CC} - 1.5$		0.4	V	$I_{SOURCE} = 800\ \mu\text{A}$
			0.3	V	$I_{SINK} = 3.2\ \text{mA}$
			0.3	V	$V_{CC} = 1\ \text{V}$, $I_{SINK} = 50\ \mu\text{A}$
			0.3	V	$V_{CC} = 1.2\ \text{V}$, $I_{SINK} = 100\ \mu\text{A}$
RESET OUTPUT VOLTAGE	$V_{CC} - 1.5$		0.4	V	ADM707/ADM708, $I_{SOURCE} = 800\ \mu\text{A}$
			0.4	V	ADM707/ADM708, $I_{SINK} = 1.2\ \text{mA}$
WATCHDOG TIMEOUT PERIOD (t_{WD})	1.00	1.60	2.25	sec	$V_{IL} = 0.4\ \text{V}$, $V_{IH} = V_{CC} \times 0.8$, $WDI = V_{CC}$
WDI Pulse Width (t_{WP})	50			ns	
WATCHDOG INPUT					
WDI Input Threshold			0.8	V	
Logic Low				V	
Logic High	3.5			V	
WDI Input Current		50	150	μA	$WDI = 0\ \text{V}$
	-150	-50		μA	$WDI = 0\ \text{V}$
WDO OUTPUT VOLTAGE	$V_{CC} - 1.5$		0.4	V	$I_{SOURCE} = 800\ \mu\text{A}$
			0.4	V	$I_{SINK} = 1.2\ \text{mA}$
MANUAL RESET INPUT					
$\overline{\text{MR}}$ Pull-Up Current	100	250	600	μA	$\overline{\text{MR}} = 0\ \text{V}$
$\overline{\text{MR}}$ Pulse Width	150			ns	
MR INPUT THRESHOLD					
Logic Low			0.8	V	
Logic High	2.0			V	
MR TO RESET OUTPUT DELAY			250	ns	
POWER-FAIL INPUT					
PFI Input Threshold	1.2	1.25	1.3	V	
PFI Input Current	-25	+0.01	+25	nA	
PFO OUTPUT VOLTAGE	$V_{CC} - 1.5$		0.4	V	$I_{SOURCE} = 800\ \mu\text{A}$
			0.4	V	$I_{SINK} = 3.2\ \text{mA}$

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ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise noted.

Table 2.

Parameter	Rating
V _{CC}	−0.3 V to +6 V
All Other Inputs	−0.3 V to V _{CC} + 0.3 V
Input Current	
V _{CC}	20 mA
GND	20 mA
Digital Output Current	20 mA
Power Dissipation, N-8 PDIP	727 mW
θ _{JA} Thermal Impedance	135°C/W
Power Dissipation, R-8 SOIC	470 mW
θ _{JA} Thermal Impedance	110°C/W
Power Dissipation, RM-8 MSOP	900 mW
θ _{JA} Thermal Impedance	206°C/W
Operating Temperature Range	
Industrial (Version A)	−40°C to +85°C
Lead Temperature (Soldering, 10 sec)	300°C
Vapor Phase (60 sec)	215°C
Infrared (15 sec)	220°C
Storage Temperature Range	−65°C to +150°C
ESD Rating	>4.5 kV

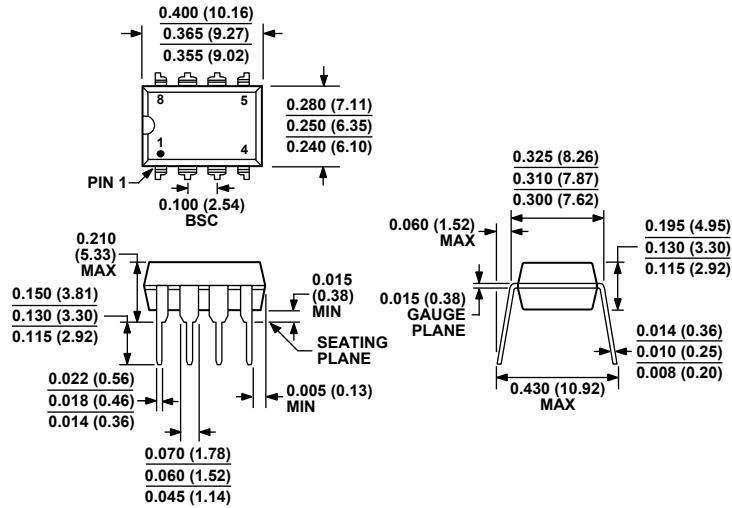
Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ESD CAUTION



ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

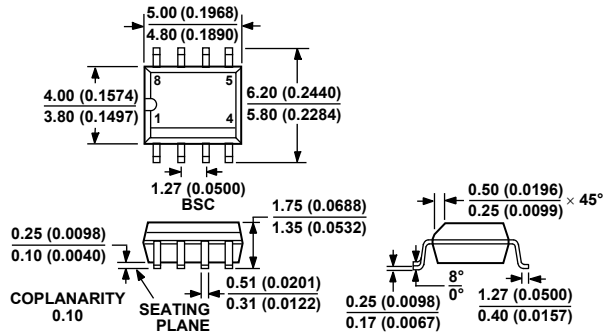
OUTLINE DIMENSIONS



COMPLIANT TO JEDEC STANDARDS MS-001-BA
 CONTROLLING DIMENSIONS ARE IN INCHES; MILLIMETER DIMENSIONS (IN PARENTHESES) ARE ROUNDED-OFF INCH EQUIVALENTS FOR REFERENCE ONLY AND ARE NOT APPROPRIATE FOR USE IN DESIGN. CORNER LEADS MAY BE CONFIGURED AS WHOLE OR HALF LEADS.

Figure 22. 8-Lead Plastic Dual-in-Line Package [PDIP] Narrow Body (N-8)

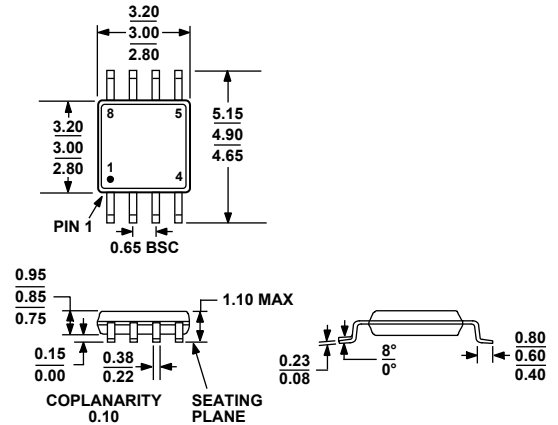
Dimensions shown in inches and (millimeters)



COMPLIANT TO JEDEC STANDARDS MS-012-AA
 CONTROLLING DIMENSIONS ARE IN MILLIMETERS; INCH DIMENSIONS (IN PARENTHESES) ARE ROUNDED-OFF MILLIMETER EQUIVALENTS FOR REFERENCE ONLY AND ARE NOT APPROPRIATE FOR USE IN DESIGN.

Figure 23. 8-Lead Standard Small Outline Package [SOIC_N] (R-8)

Dimensions shown in millimeters and (inches)



COMPLIANT TO JEDEC STANDARDS MO-187-AA

Figure 24. 8-Lead Mini Small Outline Package [MSOP] (RM-8)

Dimensions shown in millimeters

ADM705/ADM706/ADM707/ADM708

ORDERING GUIDE

Model	Temperature Range	Package Description	Package Option	Branding
ADM705AN	-40°C to +85°C	8-Lead Plastic Dual-in-Line Package [PDIP]	N-8	
ADM705ANZ ¹	-40°C to +85°C	8-Lead Plastic Dual-in-Line Package [PDIP]	N-8	
ADM705AR	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM705AR-REEL	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM705AR-REEL7	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM705ARZ ¹	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM705ARZ-REEL ¹	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM705ARZ-REEL7 ¹	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM706AN	-40°C to +85°C	8-Lead Plastic Dual-in-Line Package [PDIP]	N-8	
ADM706ANZ ¹	-40°C to +85°C	8-Lead Plastic Dual-in-Line Package [PDIP]	N-8	
ADM706AR	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM706AR-REEL	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM706AR-REEL7	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM706ARZ ¹	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM706ARZ-REEL ¹	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM706ARZ-REEL7 ¹	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM707AN	-40°C to +85°C	8-Lead Plastic Dual-in-Line Package [PDIP]	N-8	
ADM707ANZ ¹	-40°C to +85°C	8-Lead Plastic Dual-in-Line Package [PDIP]	N-8	
ADM707AR	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM707AR-REEL	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM707ARZ ¹	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM707ARZ-REEL ¹	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM708AN	-40°C to +85°C	8-Lead Plastic Dual-in-Line Package [PDIP]	N-8	
ADM708ANZ ¹	-40°C to +85°C	8-Lead Plastic Dual-in-Line Package [PDIP]	N-8	
ADM708AR	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM708AR-REEL	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM708ARZ ¹	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM708ARZ-REEL ¹	-40°C to +85°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
ADM708ARM	-40°C to +85°C	8-Lead Mini Small Outline Package [MSOP]	RM-8	AD70, M8
ADM708ARM-REEL	-40°C to +85°C	8-Lead Mini Small Outline Package [MSOP]	RM-8	AD70, M8
ADM708ARMZ ¹	-40°C to +85°C	8-Lead Mini Small Outline Package [MSOP]	RM-8	M8F
ADM708ARMZ-REEL ¹	-40°C to +85°C	8-Lead Mini Small Outline Package [MSOP]	RM-8	M8F

¹ Z = RoHS Compliant Part.