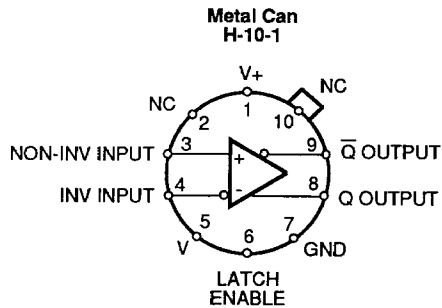


Advanced Micro Devices

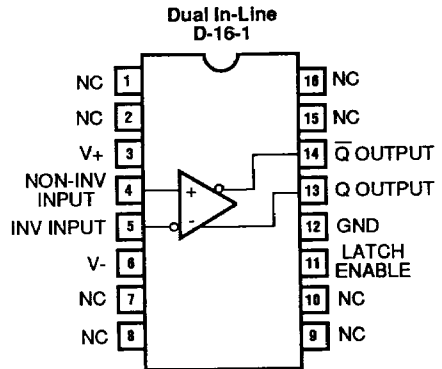
CONNECTION DIAGRAM

Top View

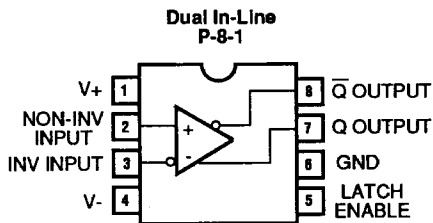


03938-002

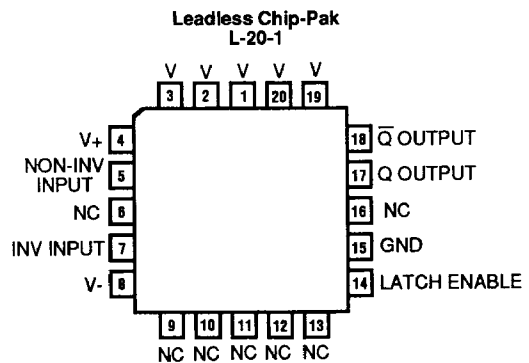
Note: On metal package, pin 5 is connected to case. On DIP, pin 6 is connected to case.



03938-004



03938-003

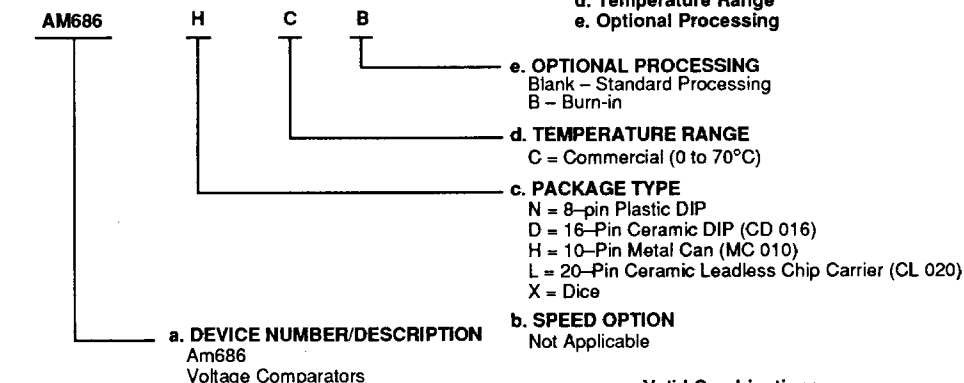


03938-005

ORDERING INFORMATION

Standard Products

AMD standard products are available in several packages and operating ranges. The ordering number (Valid Combination) is formed by a combination of:



Valid Combinations	
AM686	HC, DC, CN, CN-1, XC, XM, LMB

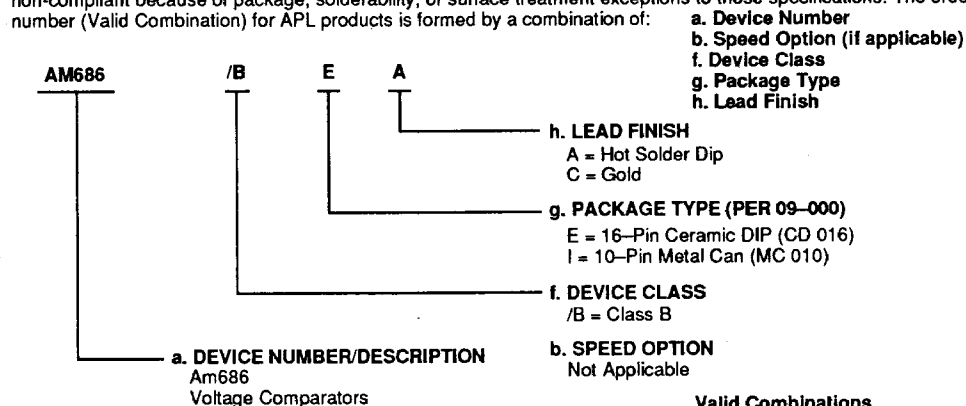
Valid Combinations

Valid Combinations list configurations planned to be supported in volume for this device. Consult the local AMD sales office to confirm availability of specific valid combinations, to check on newly released combinations, and to obtain additional data on AMD's standard military grade products.

MILITARY ORDERING INFORMATION

APL Products

AMD products for Aerospace and Defense applications are available in several packages and operating ranges. APL (Approved Products List) products are fully compliant with MIL-M-38510 and MIL-STD-883C requirements. CPL (Controlled Products List) products are processed in accordance with MIL-STD-883C, but are inherently non-compliant because of package, solderability, or surface treatment exceptions to those specifications. The order number (Valid Combination) for APL products is formed by a combination of:



Valid Combinations	
AM686	/BEA /BIC

Valid Combinations

Valid Combinations list configurations planned to be supported in volume for this device. Consult the local AMD sales office to confirm availability of specific valid combinations, to check on newly released combinations.

Group A Tests

Group A Tests consist of sub-groups 1, 2, 3, 4, 5, 6, 9

MAXIMUM RATINGS

Positive Supply Voltage	+7 V
Negative Supply Voltage	-7 V
Input Voltage	± 4 V
Differential Input Voltage	± 6 V
Power Dissipation (Note 1)	600 mW
Lead Temperature (Soldering, 60 sec.)	300°C
Storage Temperature Range	-65°C to +150°C

OPERATING RANGES

Am686C and Am686C-1*	0°C to +70°C
Am686 Military	-55°C to +125°C
Operating Supply Voltage Range	
Am686C and Am686C-1	V+ = +5.0 V $\pm 5\%$, V- = -6.0 V $\pm 5\%$,
Am686 Military	V+ = +5.0 V $\pm 10\%$, V- = -6.0 V $\pm 10\%$,
Minimum Operating Voltage (V+ to V-)	9.7 V

Stresses above those listed under **ABSOLUTE MAXIMUM RATINGS** may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability.

* To duplicate high power steady state operation, parts are pulse tested at these correlated temperatures: 686C = -10°C to +100°C, 686M = -35°C to +150°C

Operating ranges define those limits between which the functionality of the device is guaranteed.

ELECTRICAL CHARACTERISTICS

Over the operating temperature ranges (unless otherwise specified)

DC Characteristics (Included in Group A, Subgroup 1,2,3,4,5,6, unless noted)

Parameter Symbol	Parameter Description	Test Conditions (Note 2)	COM'L		MIL		Unit
			Min.	Max.	Min.	Max.	
V _{OS}	Input Offset Voltage	R _S = 100 Ω , T _A = 25°C R _S = 100 Ω CN-1		3.0 3.5 6.0 10.0		2.0 3.0	mV mV
$\Delta V_{OS}/\Delta T$	Average Temperature Coefficient of Input Offset Voltage	R _S = 100 Ω (Note 4)		10		10	$\mu V/^{\circ}C$
I _{OS}	Input Offset Current	25°C $\leq$ T _A $\leq$ T _A (max) T _A = T _A (min)		1.0 1.3		1.0 1.6	μA μA
I _B	Input Bias Current	25°C $\leq$ T _A $\leq$ T _A (max) T _A = 25°C		10 13		10 16	μA μA
V _{CM}	Input Voltage Range		-3.3	+2.7	-3.3	+2.7	V
CMMR	Common Mode Rejection Ratio	R _S = 100 Ω , -3.3 V < V _{CM} < +2.7 V	80		80		dB
SVRR	Supply Voltage Rejection Ratio	R _S = 100 Ω	60		60		dB
V _{OH}	Output HIGH Voltage	I _L = -1.0 mA, V _S = V _S (min)	2.7		2.5		V
V _{OL}	Output LOW Voltage	I _L = 10 mA, V _S = V _S (max)		0.5		0.5	V
I ₊	Positive Supply Current			42		40	mA
I ₋	Negative Supply Current			34		32	mA
P _{DISS}	Power Dissipation			415		400	mW

Switching Characteristics ($V_+ = +5.0\text{ V}$, $V_- = -6.0\text{ V}$, $V_{IN} = 100\text{ mV}$, $V_{OD} = 5.0\text{ mV}$, $C_L = 15\text{ pF}$) (Note 3)
Included in Group A Subgroup 9 unless noted.

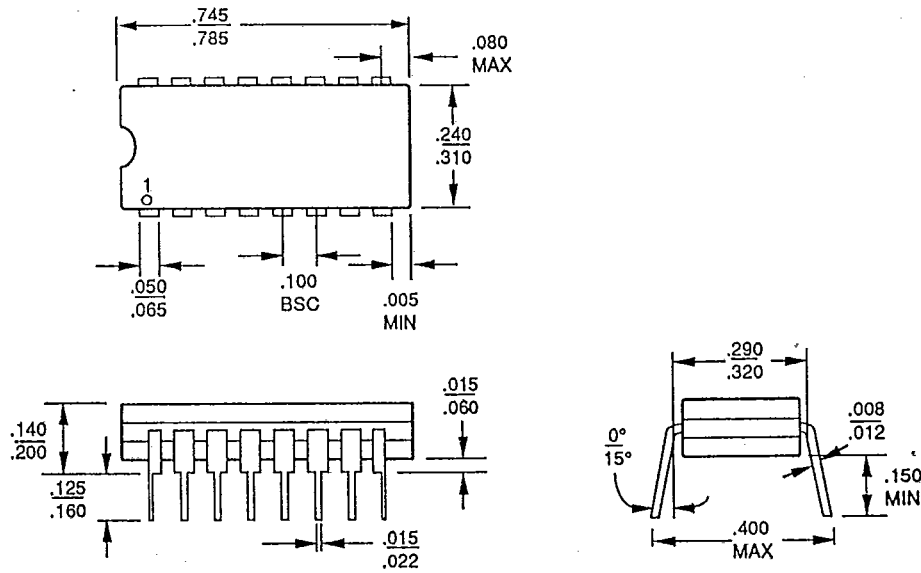
Parameter Symbol	Parameter Description	Test Conditions	COM'L		MIL		Unit
			Min.	Max.	Min.	Max.	
t_{pd+}	Propagation Delay Input to Output HIGH	$T_A (\text{min}) \leq T_A \leq 25^\circ\text{C}$ $T_A = T_A (\text{max})$ (Note 5)		12 15		12 15	ns ns
t_{pd-}	Propagation Delay Input to Output LOW	$T_A (\text{min}) \leq T_A \leq 25^\circ\text{C}$ $T_A = T_A (\text{max})$ (Note 5)		12 15		12 15	ns ns
Δt_{pd}	Difference in Propagation Delay between Outputs	$T_A = 25^\circ\text{C}$ (Note 4)		2.0		2.0	ns

Notes:

- 1) For the metal can package, derate at $6.8\text{ mW}/^\circ\text{C}$ for operation at ambient temperatures above $+95^\circ\text{C}$, for the dual-in-line package, derate at $9\text{ mW}/^\circ\text{C}$ for operation at ambient temperatures above 115°C .
- 2) Unless otherwise specified, $V_+ = +5.0\text{ V}$, $V_- = -6.0\text{ V}$ and the Latch Enable input is at V_{OL} . The switching characteristics are for a 100 mV input step with 5.0 mV overdrive.
- 3) The outputs of the Am686 are unstable when biased into their linear range. In order to prevent oscillation, the rate-of-change of the input signal as it passes through the threshold of the comparator must be at least $1\text{ V}/\mu\text{s}$. For slower input signals, a small amount of external positive feedback may be applied around the comparator to give a few millivolts of hysteresis.
- 4) Guaranteed by characterization, not tested.
- 5) Not 100% tested, Group A sample only.

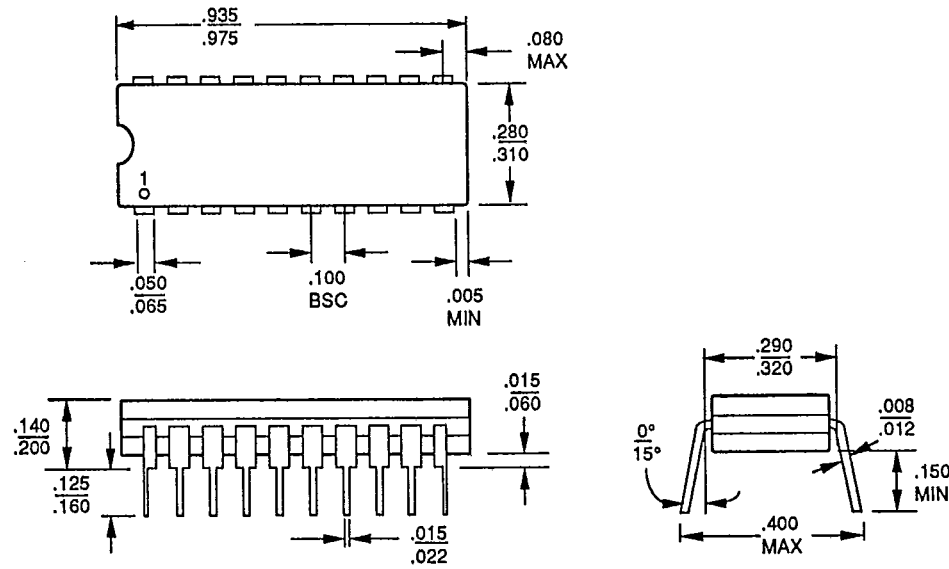
PHYSICAL DIMENSIONS
CD 016

T-90-20



07319B

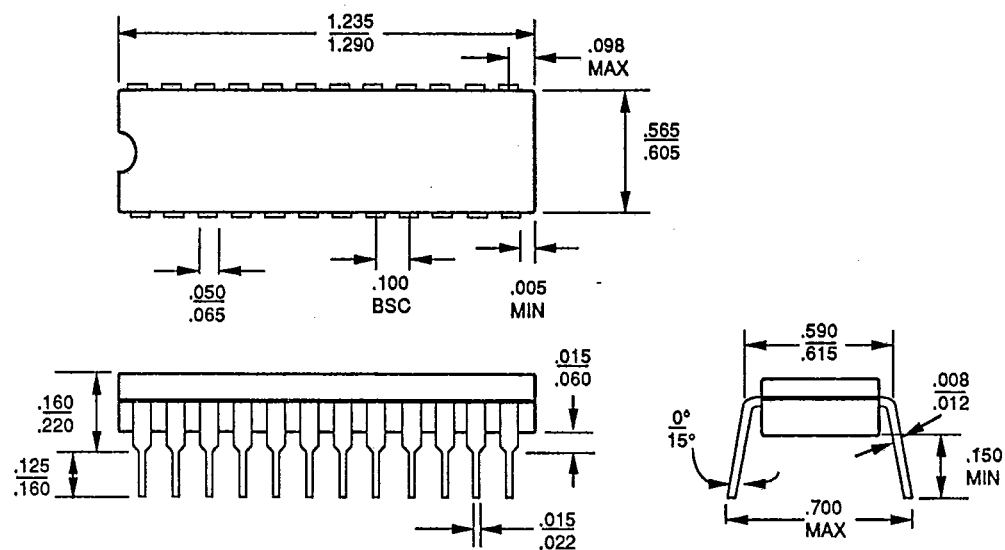
CD 020



03941-004C

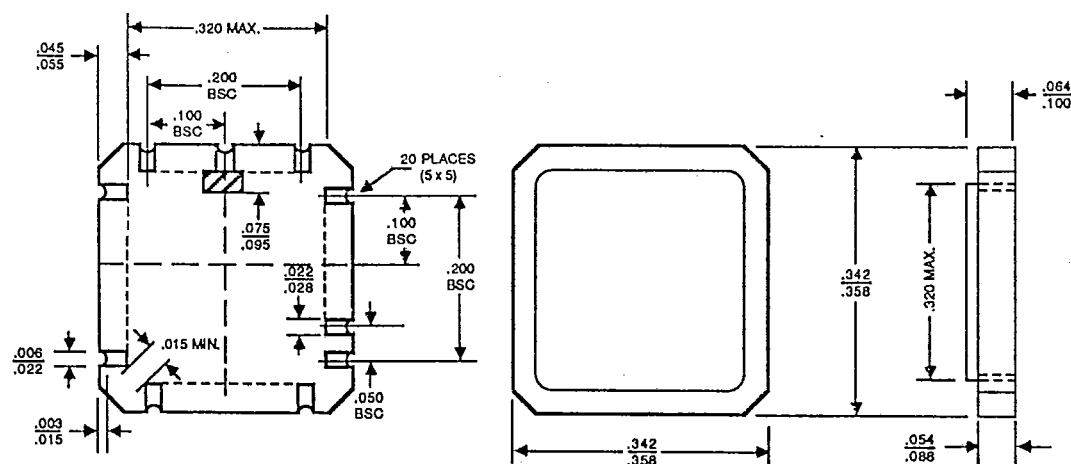
PHYSICAL DIMENSIONS (continued)
CD 024

T-90-20



03067-008A

CL 020



PID #07318C

PHYSICAL DIMENSIONS (continued)
MC 010



1.010
1.040

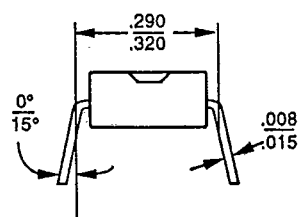
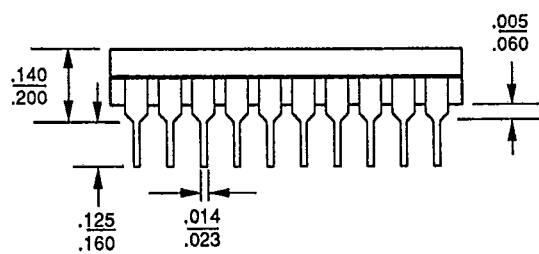
0.240
0.290

0.100

0.045
0.065

0.090
0.110

0.005
MIN.



03941-005C