2A Ultra Low Dropout Linear Regulator

❖ GENERAL DESCRIPTION

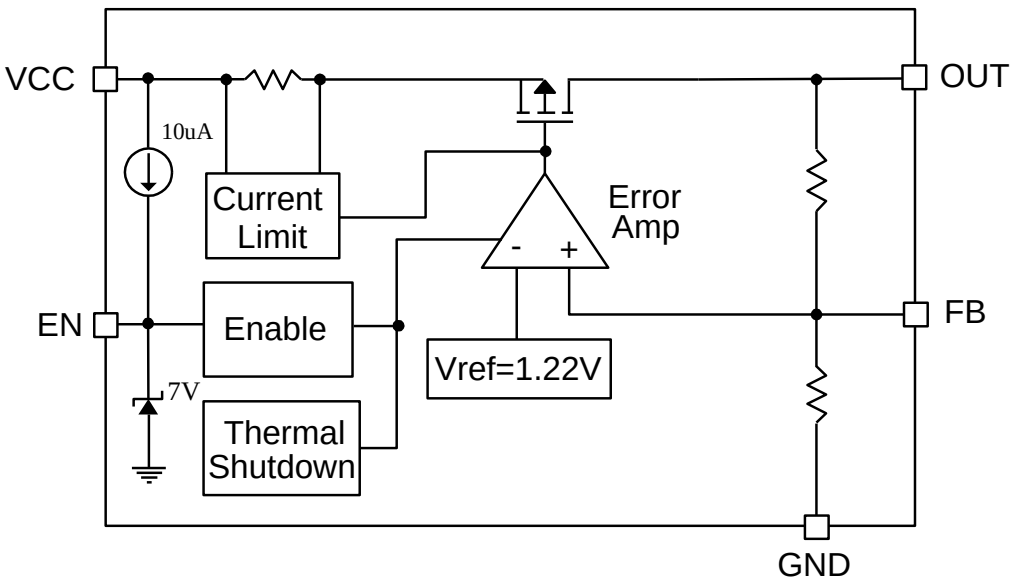
The AX1205 is a low-dropout voltage regulator suitable for various electronic equipments. It provides constant voltage power source. The dropout voltage of AX1205 is below 0.3V in full rated current (2A). This regulator has various functions such as a peak current protection, a thermal shut down, a short circuit protect.

The AX1205 is available in SOP-8L power package which features small size to reduce the junction-to-case resistance, being applicable in 0.1~1.6W applications.

❖ FEATURES

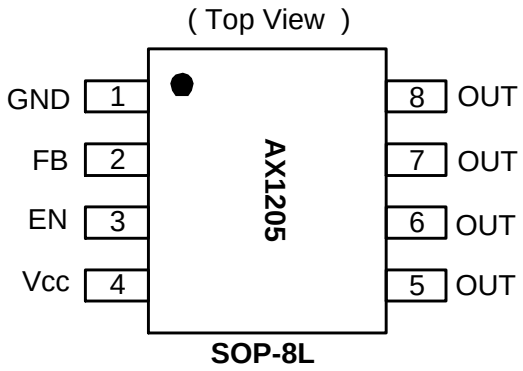
- Ultra Low Dropout - 0.3V(typical) at 2A Output Current
- Adjustable mode: 1.22V Reference Voltage
- Fixed mode:2.5V, 3.3V, 5V output voltage
- Operating voltage can be up to 12V.
- Current-Limit and Thermal Shutdown Protection
- Short circuit protection, Enable function.
- Built-in internal SW P-channel MOS
- SOP-8L Pb-Free Package.

❖ BLOCK DIAGRAM



❖ PIN ASSIGNMENT

The package of AX1205 is SOP-8L; the pin assignment is given by:



Name	Description
FB	Feedback pin
EN	Enable input, it is pull-high typically. Drive EN high or floating to turn on the regulator, driver it low to turn it off.
VCC	IC power supply pin
OUT	Output Voltage pin
GND	Ground pin

❖ ORDER/MARKING INFORMATION

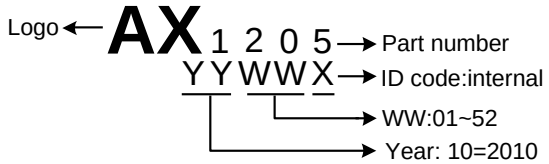
Order Information

AX1205 X XX X

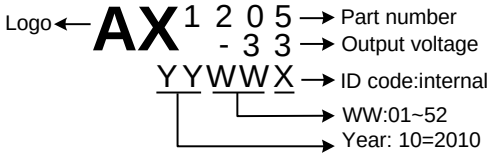
Package	Vout	Packing
S : SOP-8L	Blank : Adj 25 = 2.5V 33 = 3.3V 50 = 5.0V	Blank : Tube A : Taping

Top Marking

ADJ Version



FIXED Version (V_{OUT}=3.3V)



❖ ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

Characteristics	Symbol	Rating	Unit
V_{CC} Supply Voltage	V_{CC}	-0.3 to 16	V
EN Pin Voltage	V_{EN}	-0.3 to 7	V
FB Pin Voltage	V_{FB}	-0.3 to Vcc+0.3	V
Output current	Io	2.5	A
Power Dissipation	PD	1.6	W
Storage Temperature Range	T_{ST}	-65 to +150	°C
Junction Temperature Range	T_J	-40 to 125	°C
Operating Temperature Range	T_{OP}	-40 to +85	°C
Thermal Resistance from Junction to case	θ_{JC}	20	°C/W
Thermal Resistance from Junction to ambient	θ_{JA}	60	°C/W

Note: θ_{JA} is measured with the PCB copper area(need connect to OUT pin) of approximately 1.5 in^2 (Multi-layer).

❖ ELECTRICAL CHARACTERISTICS

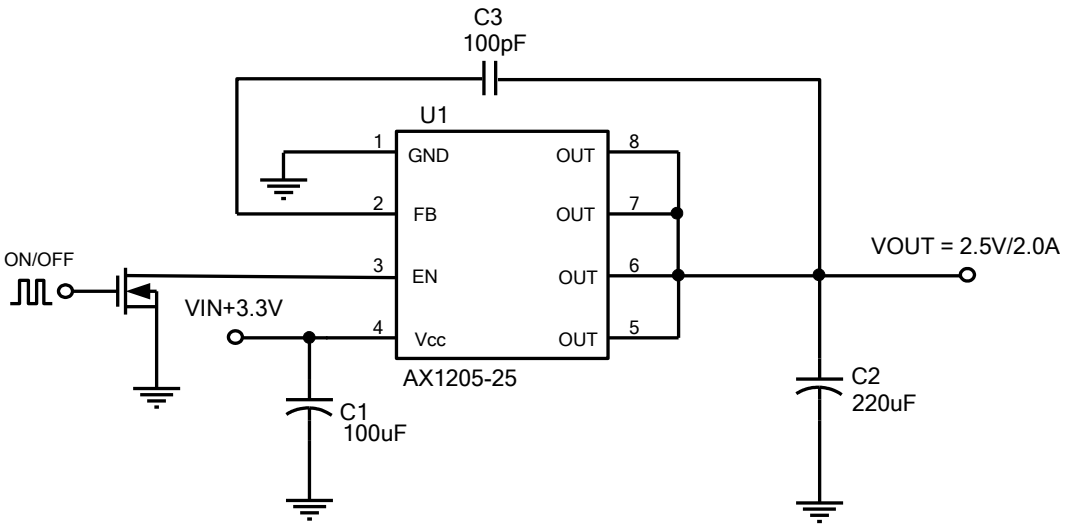
(Unless otherwise specified, T_A=25°C, V_{CC}=5V)

Characteristics	Symbol	Conditions	Min	Typ	Max	Units
V_{CC} Supply Voltage	V_{CC}	I_{OUT}=2A	3.1	-	12	V
Feedback Voltage	V_{FB}	I_{OUT}=10mA, V_{CC}=5.0V	1.196	1.22	1.244	V
Output Voltage	V_{OUT}	I_{OUT}=10mA, V_{CC}=3.2V	2.45	2.5	2.55	V
		I_{OUT}=10mA, V_{CC}=4.0V	3.234	3.3	3.366	
		I_{OUT}=10mA, V_{CC}=5.5V	4.90	5.0	5.10	
GND Current	I_{GND}	I_{OUT}= 0~2A	-	1.2	3	mA
Shutdown Current	I_{SD}	V_{EN} =0V	-	0.1	0.4	mA
Load regulation	V_{Load}	5mA < I_{OUT} < 2A	-	0.5	1.5	%
Line regulation	V_{Line}	I_{OUT} =10mA, V_{OUT}+0.5V<V_{CC}< 12V	-	0.1	0.5	%
Ripple rejection ratio	PSRR	Note1	-	65	-	dB
Dropout Voltage	V_{DROP}	I_{OUT}= 2A, V_{OUT}=3.3V	-	0.3	0.4	V
		I_{OUT}= 2A, V_{OUT}=5V	-	0.2	0.3	
Short circuit protect	Iscp	V_{OUT}<20%	-	0.6	-	A
Current Limit	CL		2.2	-	-	A
EN Pin Logic input threshold voltage	V_{ENH}	High (regulator ON)	2.0	-	-	V
	V_{ENL}	Low (regulator OFF)	-	-	0.8	V
EN Pin Input Current	I_{ENH}	V_{EN}=2.5V (ON)	-	20	-	uA
	I_{ENL}	V_{EN}=0.3V (OFF)	-	-10	-	uA
Internal MOSFET RDSON	R_{DSON}	V_{CC}=3.5V,	-	150	180	mΩ
		V_{CC}=5V,	-	100	120	
Thermal Shutdown	T_{SD}		-	140	-	℃

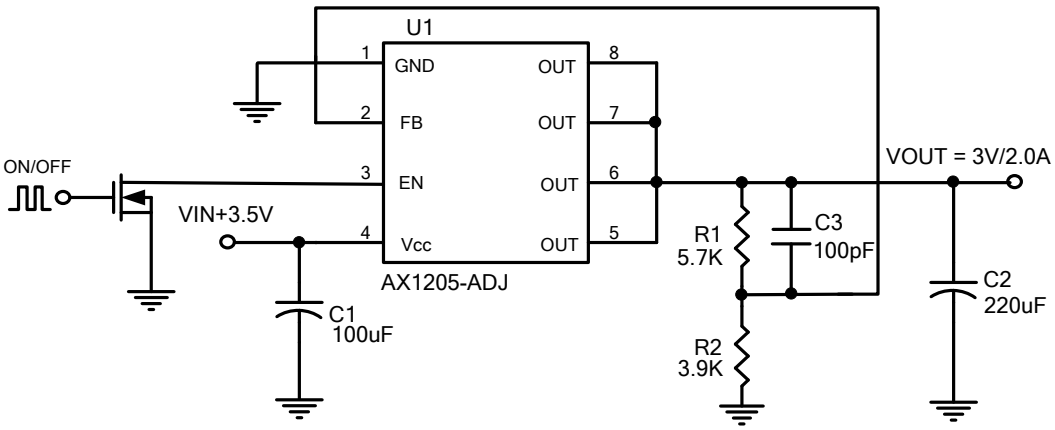
Note: These parameters, although guaranteed, are not 100% tested in production.

❖ APPLICATION CIRCUIT

1. FIXED



2. ADJ



VOUT=VFB*(1+R1/R2)

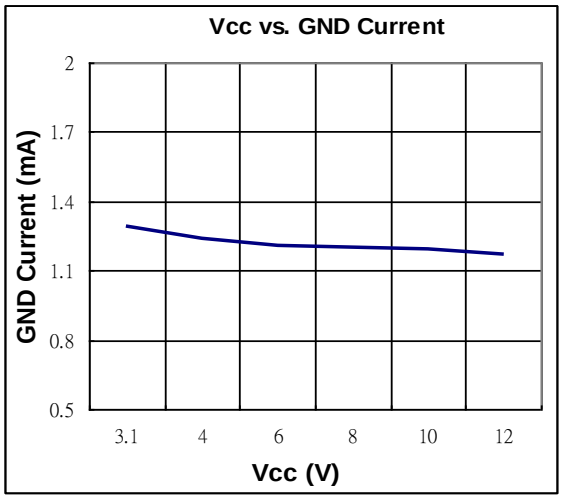
VFB = 1.22V

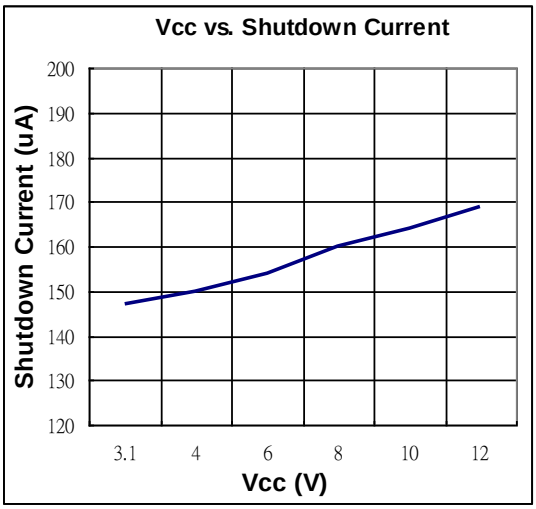
R2 suggest 1K~5.6KΩ

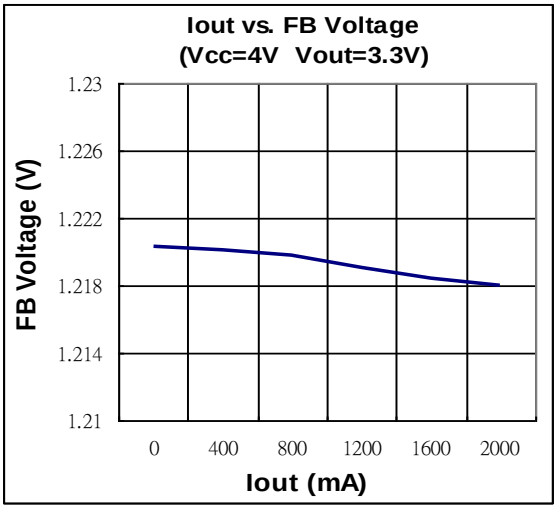
C2 choose Low ESR capacitor

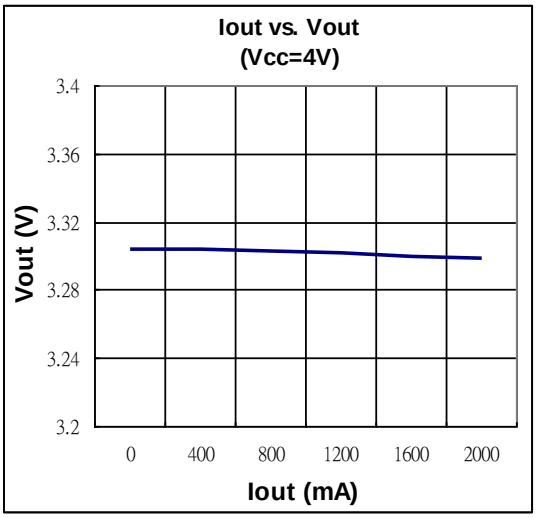
C3=47pF~100pF for stability issue

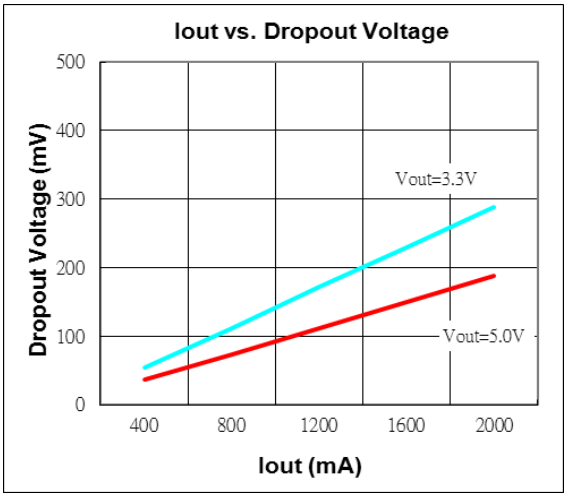
❖ TYPICAL CHARACTERISTICS

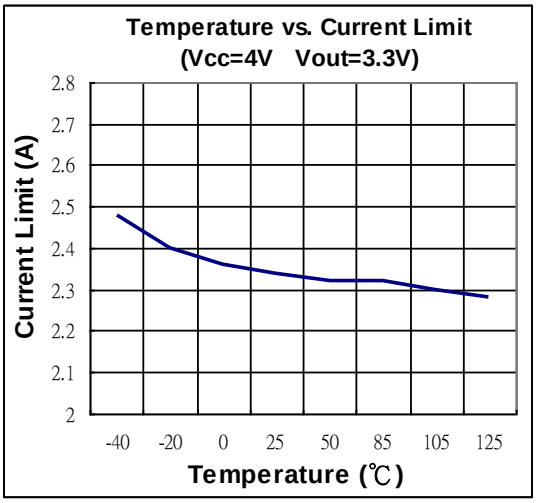




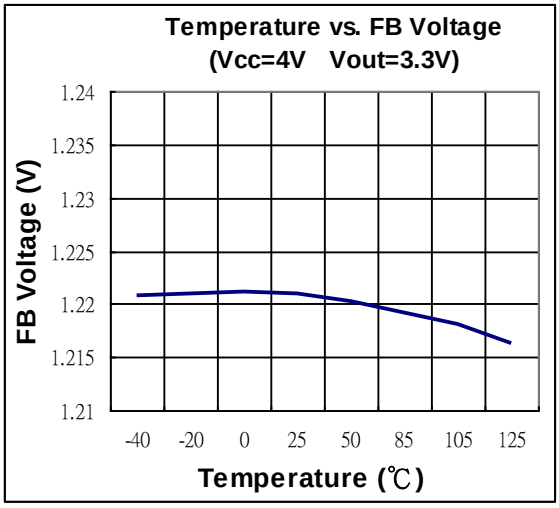


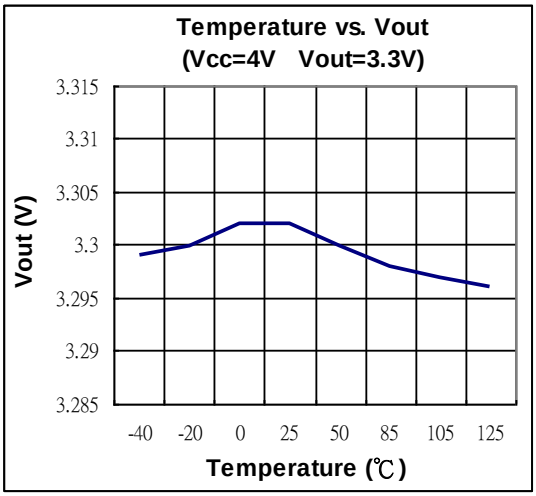


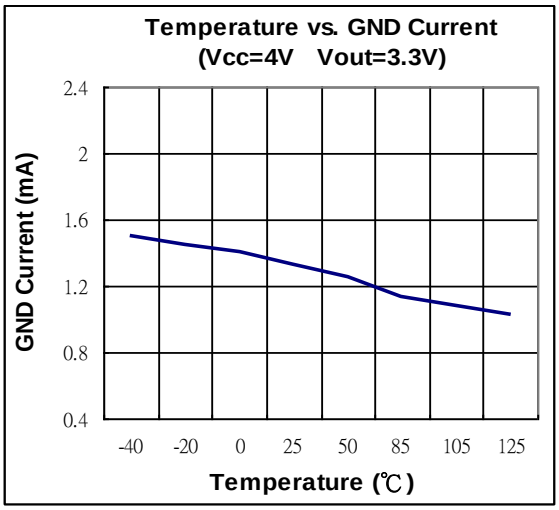


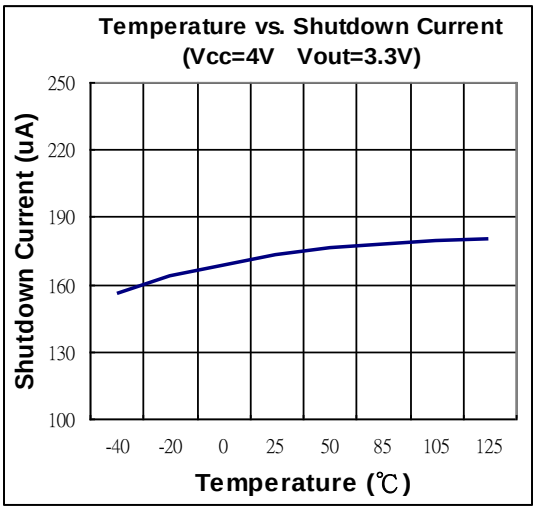


❖ TYPICAL CHARACTERISTICS (CONTINUED)

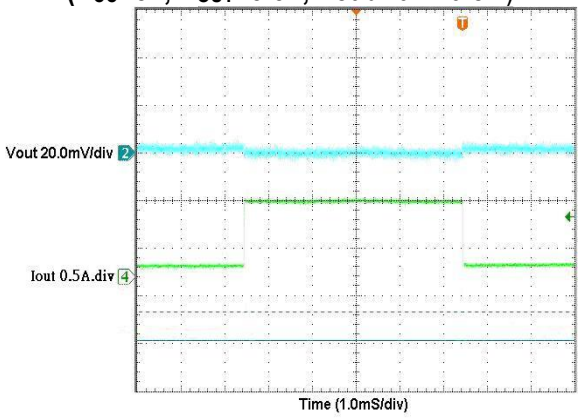




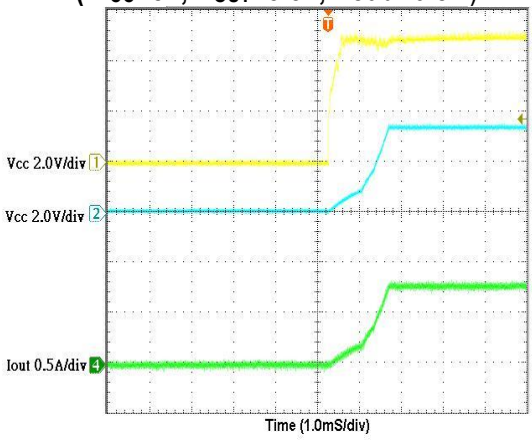




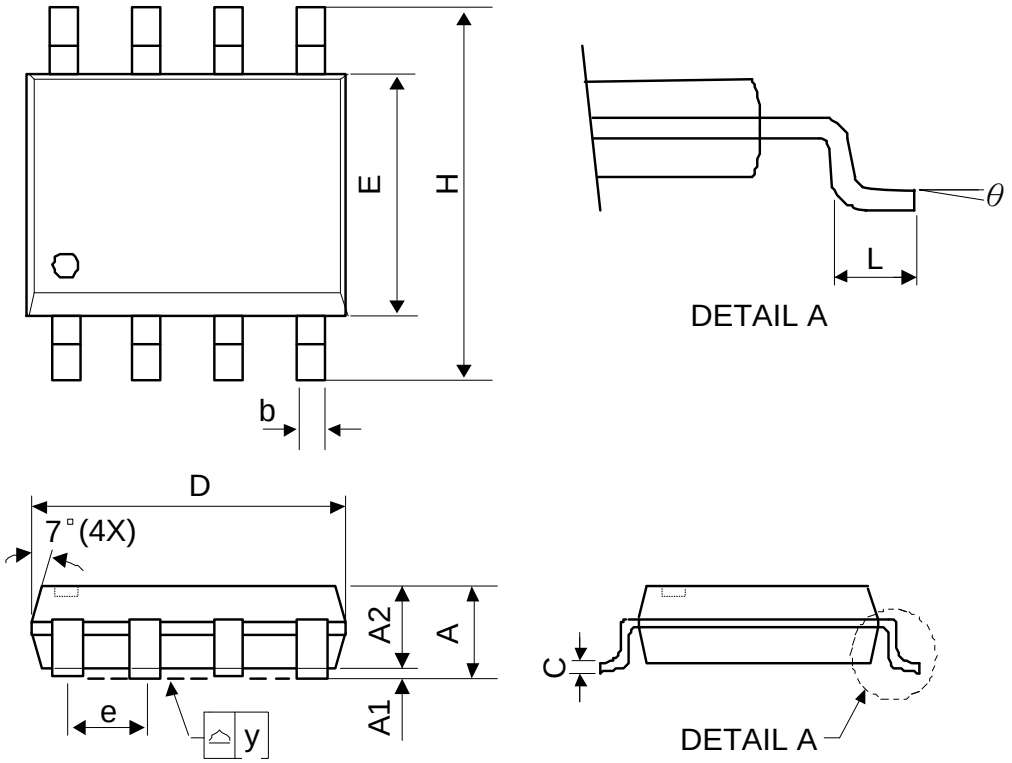
Load Transient
(V_{CC}=5V, V_{OUT}=3.3V, Load=0.1~0.8A)



Power-ON
(V_{CC}=5V, V_{OUT}=3.3V, Load=0.8A)



❖ PACKAGE OUTLINES



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	-	-	1.75	-	-	0.069
A1	0.1	-	0.25	0.04	-	0.1
A2	1.25	-	-	0.049	-	-
C	0.1	0.2	0.25	0.0075	0.008	0.01
D	4.7	4.9	5.1	0.185	0.193	0.2
E	3.7	3.9	4.1	0.146	0.154	0.161
H	5.8	6	6.2	0.228	0.236	0.244
L	0.4	-	1.27	0.015	-	0.05
b	0.31	0.41	0.51	0.012	0.016	0.02
e	1.27 BSC			0.050 BSC		
y	-	-	0.1	-	-	0.004
θ	0^{o}	-	8^{o}	0^{o}	-	8^{o}

Mold flash shall not exceed 0.25mm per side
JEDEC outline: MS-012 AA