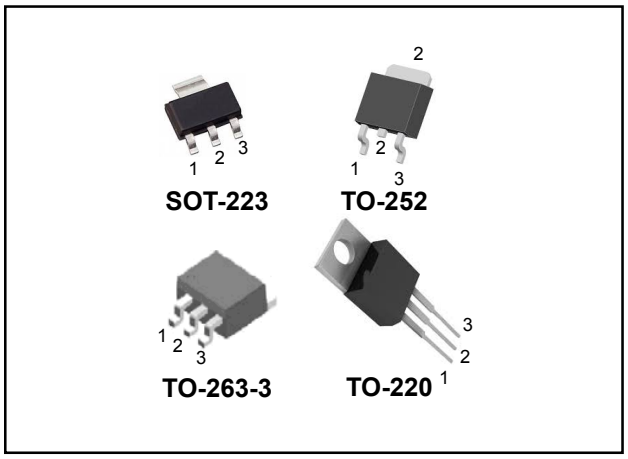
LOW DROPOUT VOLTAGE REGULATOR

FEATURES

- Output Current Capability of 1.0A
- Trimmed Current Limit
- Adjustable Output Voltage from 1.25V to 13.8V with Only Two External Resistors
- Fixed Output Voltage of 1.2V, 1.8V, 2.5V, 2.85V, 3.3V and 5.0V
- On-Chip Thermal Shutdown
- Fast Transient Response
- Operation Junction Temperature: 0°C ~ 125°C



DESCRIPTION

The ***STComponent*** AMS1117 is a series of low-dropout positive voltage regulators with an output current capability of 1.0A. It consists of adjustable output voltage and fixed output voltage version which uses trimming technique to guarantee output voltage accuracy with ±1%.

DEVICE SUMMARY

Ordering Code (1)	Pin Configuration			Package Material	Package Type	Shipping	Marking (2)
	GND/ ADJ	V_{OUT}	V_{IN}				
AMS1117-☐☐-SA	1	2	3	Lead Free	SOT-223	Taping reel	AMS1117 XX YYMM
AMS1117-☐☐-SAG	1	2	3	Halogen Free		Taping reel	
AMS1117-☐☐-U	1	2	3	Lead Free	TO-252	Taping reel	
AMS1117-☐☐-UG	1	2	3	Halogen Free		Taping reel	
AMS1117-☐☐-M	1	2	3	Lead Free	TO-263-3	Taping reel	
AMS1117-☐☐-MG	1	2	3	Halogen Free		Taping reel	
AMS1117-☐☐-X	1	2	3	Lead Free	TO-220	Tube	
AMS1117-☐☐-XG	1	2	3	Halogen Free		Tube	

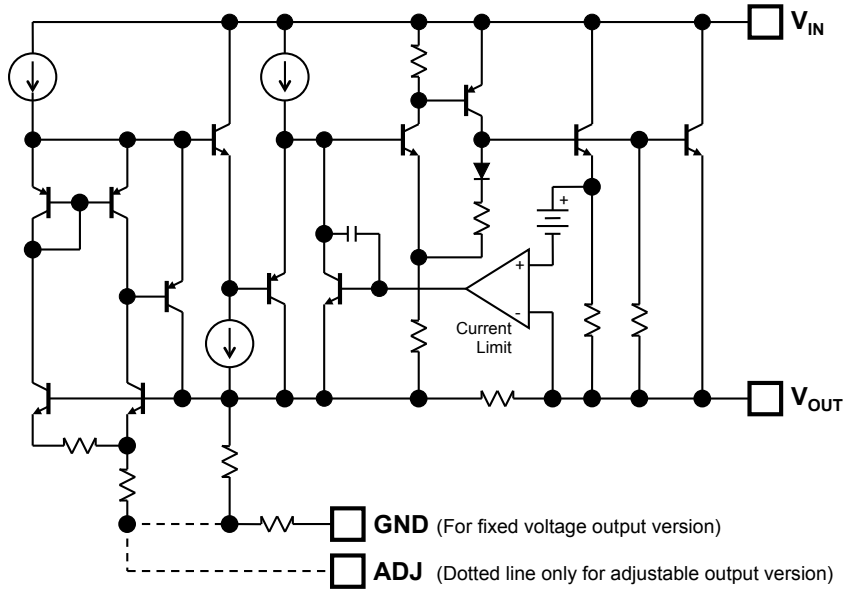
Note 1: ☐☐: Fixed output voltage (1.2V → 12; 1.8V → 18; 2.5V → 25; 2.85V → 2F; 3.3V → 33; 5.0V → 50; Adjustable → ADJ).

Note 2: XX: Fixed output voltage or ADJ version (see the Note 1).

YY: Year code

MM: Month code

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS (3)

T_A = 25°C, All voltage respect to GND unless otherwise specified.

PARAMETER		SYMBOL	RATINGS	UNIT
Maximum Input Voltage		V_{IN}	15	V
Power Dissipation (4)	SOT-223	P_D	900	mW
	TO-252		1200	mW
	TO-263-3		1750	mW
	TO-220		2000	mW
Operating Junction Temperature Range		T_J	0 ~ +125	°C
Storage Temperature Range		T_{stg}	-55 ~ +150	°C
Soldering Temperature & Time		T_{solder}	260°C, 10 sec.	

Note 3: Absolute Maximum Ratings are those values beyond which the device could be permanently damaged. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

Thermal Data

PARAMETER		SYMBOL	RATINGS	UNIT
Thermal Resistance,	SOT-223	$R_{\theta JA}$	130	°C/W
(Junction-to-Ambient)	TO-252		100	°C/W
	TO-263-3		70	°C/W
	TO-220		60	°C/W

ELECTRICAL CHARACTERISTICS

T_J = 25°C, C_{IN} = 10μF, C_{OUT} = 10μF, unless otherwise noted.

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Reference Voltage		V_{REF}	I_O = 10mA, V_{IN} – V_{OUT} = 2V	1.238	1.25	1.262	V
			I_O = 10mA ~ 1A, V_{IN} – V_{OUT} = 1.4V ~ 8V	1.225	1.25	1.270	V
Output Voltage (4)	1.2V	V_O	I_O = 10mA, V_{IN} = 3.2V	1.182	1.2	1.218	V
			I_O = 10mA ~ 1A, V_{IN} = 3V ~ 12V	1.176	1.2	1.224	V
	1.5V	V_O	I_O = 10mA, V_{IN} = 3.5V	1.477	1.5	1.523	V
			I_O = 10mA ~ 1A, V_{IN} = 3.5V ~ 12V	1.47	1.5	1.53	V
	1.8V	V_O	I_O = 10mA, V_{IN} = 3.8V	1.773	1.8	1,827	V
			I_O = 10mA ~ 1A, V_{IN} = 3.8V ~ 12V	1,764	1.8	1.836	V
	2.5V	V_O	I_O = 10mA, V_{IN} = 4.5V	2.463	2.5	2.537	V
			I_O = 10mA ~ 1A, V_{IN} = 4.5V ~ 12V	2.45	2.5	2.55	V
	2.85V	V_O	I_O = 10mA, V_{IN} = 4.85V	2.807	2.85	2.893	V
			I_O = 10mA ~ 1A, V_{IN} = 4.85V ~ 12V	2.793	2.85	2.907	V
	3.3V	V_O	I_O = 10mA, V_{IN} = 5V	3.25	3.3	3.35	V
			I_O = 10mA ~ 1A, V_{IN} = 5.3V ~ 12V	3.234	3.3	3.366	V
	5.0V	V_O	I_O = 10mA, V_{IN} = 7V	4.925	5	5.075	V
			I_O = 10mA ~ 1A, V_{IN} = 7V ~ 12V	4.9	5	5.1	V
Line Regulation (5)	ADJ	$\Delta V_O/\Delta V_{IN}$	I_O = 10mA, V_{IN} – V_{OUT} = 1.5V ~ 12V			0.3	%
	Fixed	ΔV_O	I_O = 10mA, V_{IN} = 4.8V ~ 15V		4	10	mV
Load Regulation (5)	ADJ	$\Delta V_O/V_{OUT}$	I_O = 10mA ~ 1A, V_{IN} – V_{OUT} = 2V			0.5	%
	Fixed	ΔV_O	I_O = 10mA ~ 1A, V_{IN} – V_{OUT} = 1.5V (6)		6	15	mV
Quiescent Current		I_Q	For fixed version, V_{IN} ≤ 15V		3	10	mA
Dropout Voltage		V_D	I_O = 1A, (ΔV_{OUT} = 1%)		1.15	1.5	V
Current Limit		I_{LMT}	V_{IN} – V_{OUT} = 2V	1.2			A
Minimum Load Current (7)		$I_{O(min)}$	V_{IN} – V_{OUT} = 1.5V ~ 12V		3	10	mA
Ripple Rejection (8)		PSRR	V_{IN} – V_{OUT} = 3V, I_O = 1A	60	75		dB
Adjust Pin Current		I_{adj}	V_{IN} – V_{OUT} =1.5V ~ 7V, I_O =10mA ~ 1A		60	120	μA
Adjust Pin Current Change		I_{change}			0.2	5	μA
Temperature Stability		T_s			0.5		%

Note 4: Low duty pulse testing with Kelvin connections required.
Note 5: The parameters of Line Regulation and Load Regulation in table are tested under constant junction temperature.
Note 6: When I_O varies from 0 to 1A, V_{IN} – V_{OUT} varies from 1.5V to 12V under constant junction temperature, the parameter is satisfied the criterion in table. If temperature varies between 0°C and 125°C, it needs output current to be larger than 10mA to satisfy the criterion.
Note 7: Minimum Load Current is defined as the minimum output current required to maintain regulation.
Note 8: f = 120Hz, C_{OUT} = 22μF.

TYPICAL APPLICATION CIRCUIT

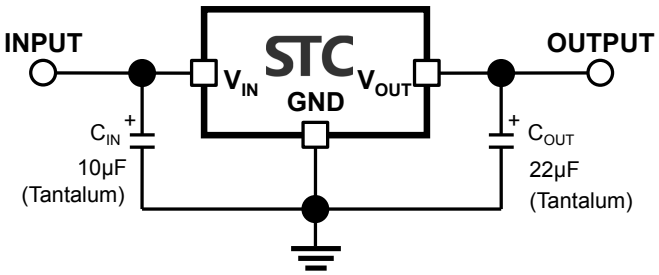


Figure 1: AMS1117 Fixed Version Application Circuit

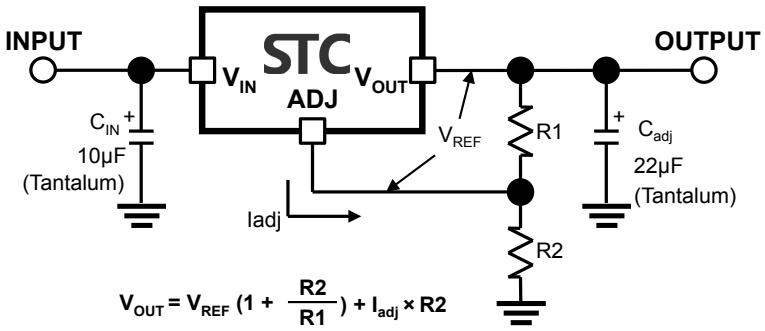
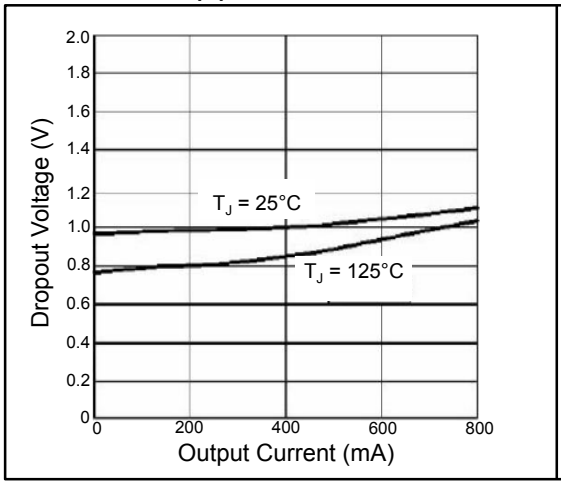


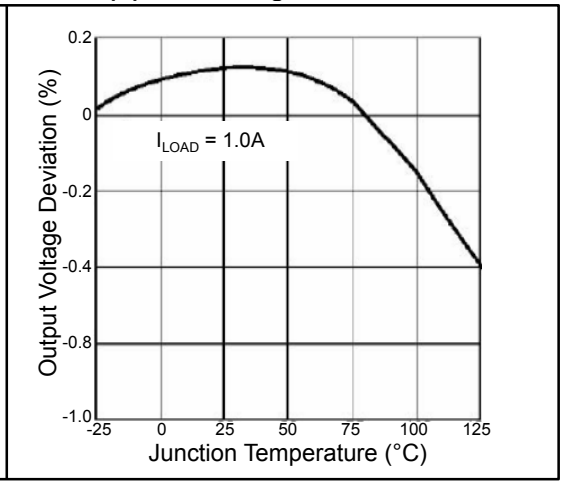
Figure 2: AMS1117 Adjustable Version Application Circuit

ELECTRICAL CHARACTERISTICS CURVES

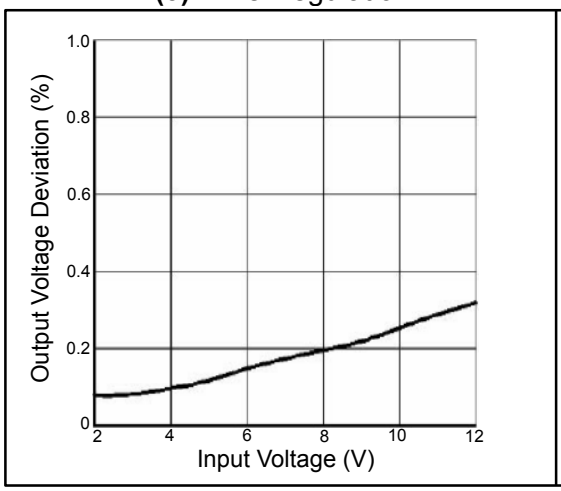
(1). V_D vs. I_O



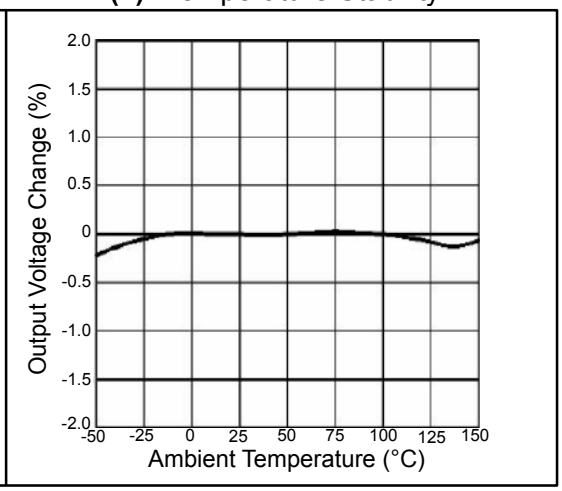
(2). Load Regulation vs. T_J



(3). Line Regulation



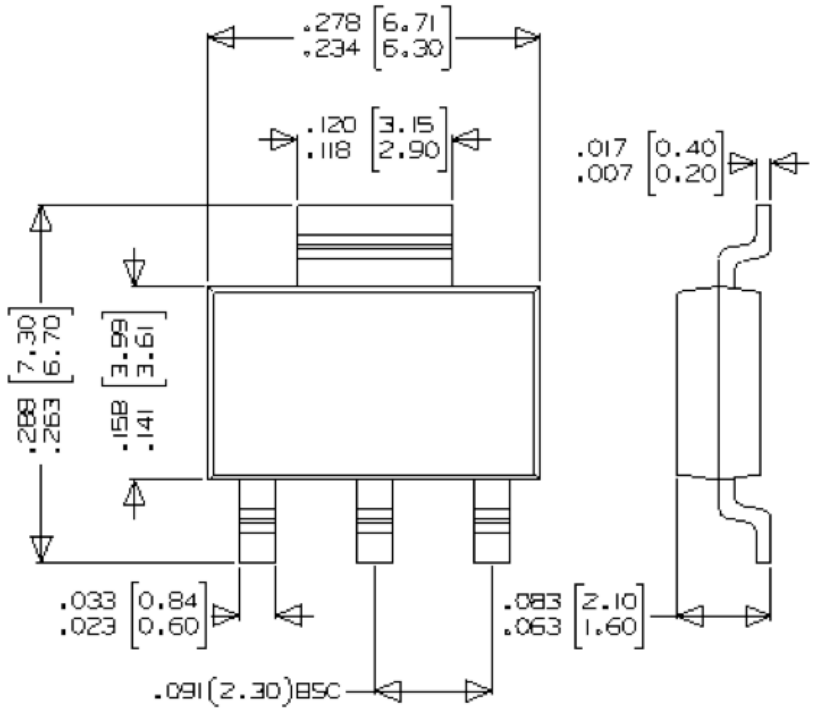
(4). Temperature Stability



PACKAGE DIMENSION

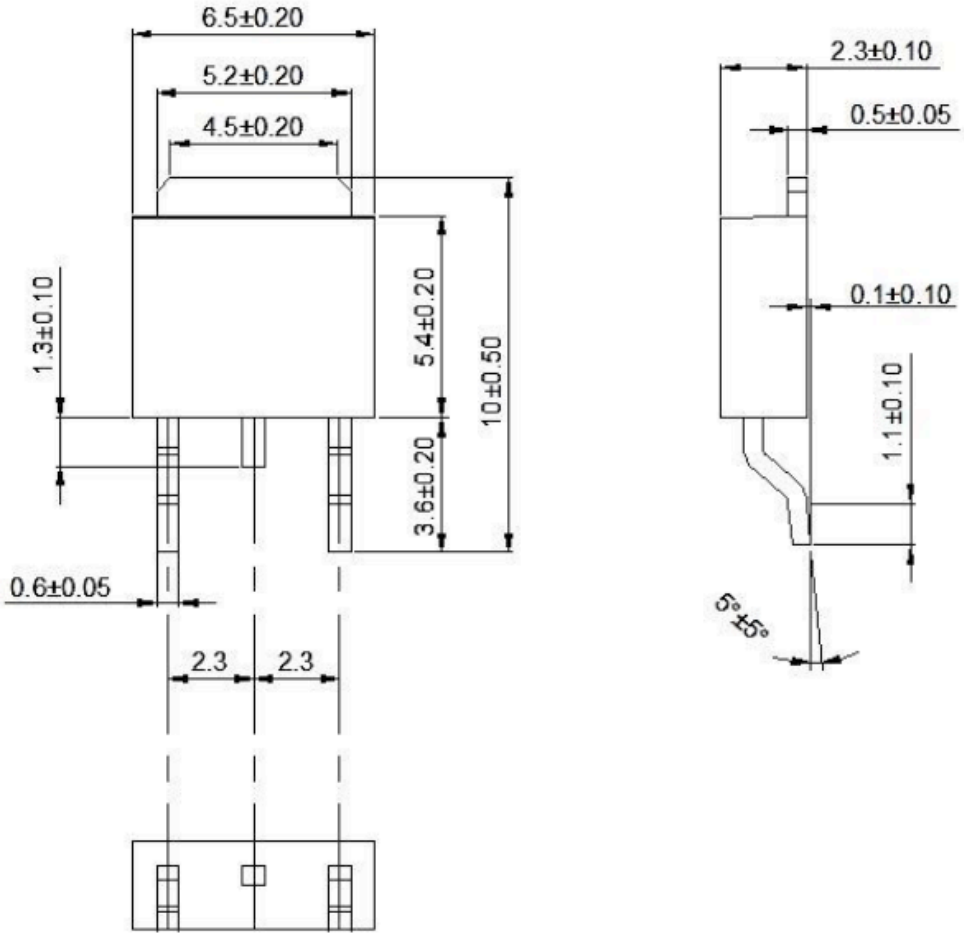
SOT-223

Unit: Inch [Millimeter]



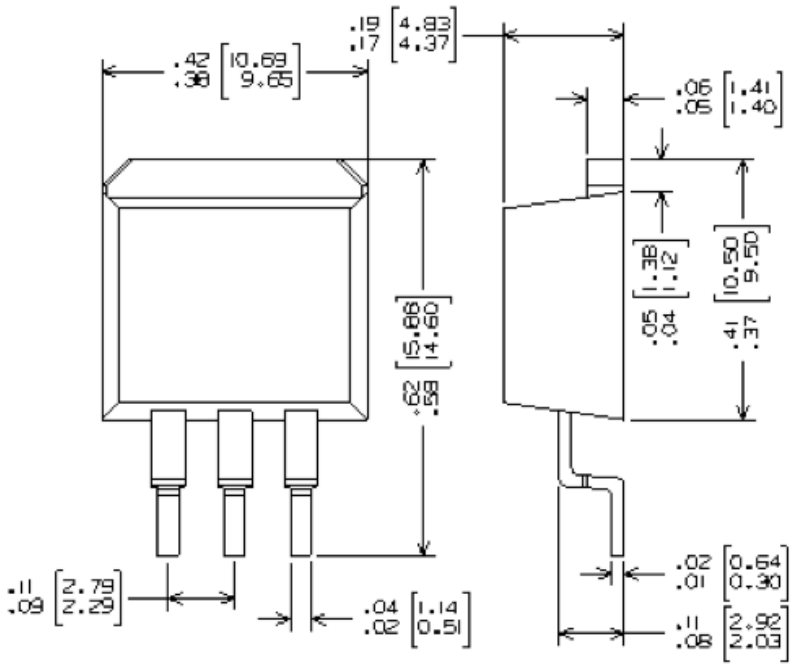
TO-252

Unit: Millimeter]



TO-263-3

Unit: Inch [Millimeter]



TO-220

Unit: Inch [Millimeter]