

GENERAL DESCRIPTION

AP2205-50YR-13-JSM are a set of Low Dropout Linear Regulator ICs implemented in CMOS technology. They can withstand voltage 24V. And they are available with low voltage drop and low quiescent current widely used in audio, video and communication appliances.

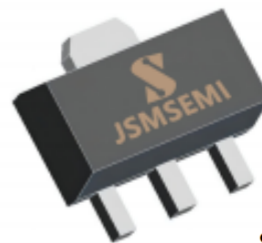
FEATURES

- Low Power Consumption
- Low Voltage Drop
- Low Temperature Coefficient
- Withstanding Voltage 24V
- Quiescent Current 3.0 μ A
- Output Voltage Accuracy: tolerance $\pm 2\%$
- High output current: 300mA

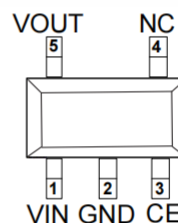
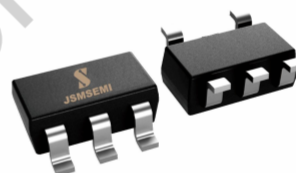
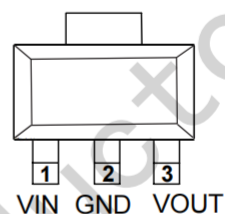
TYPICAL APPLICATIONS

- Battery-powered Equipments
- Communication Equipments
- Audio/Video Equipments

PIN CONFIGURATION



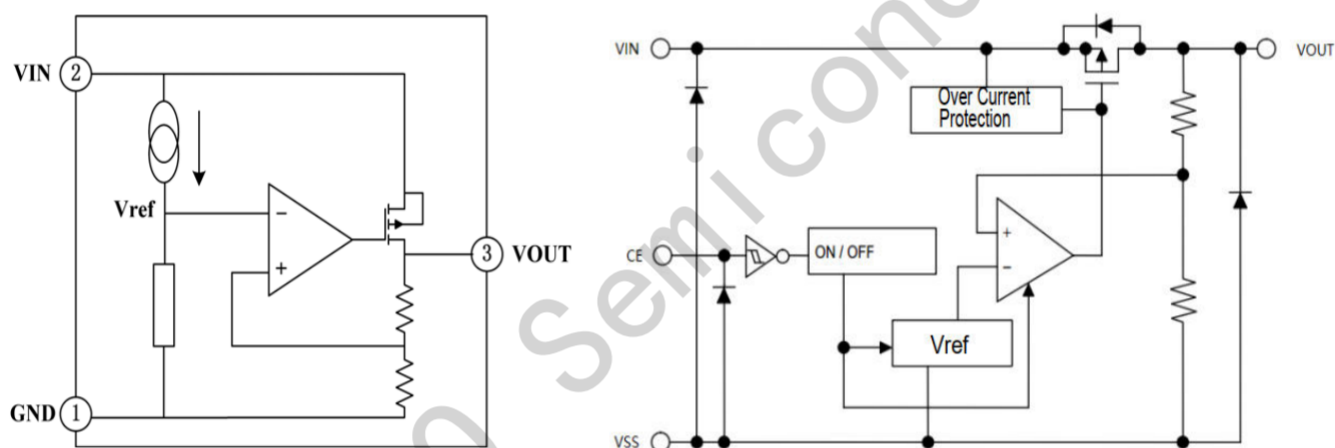
SOT89



PIN DESCRIPTION

PIN No.			Name	Functions Description
SOT23-5	SOT89 Y	SOT89 YR		
2	2	2	GND	ground
1	1	3	V _{IN}	input
5	3	1	V _{OUT}	output
3			CE	ON / OFF Control
4			NC	No Connect

FUNCTIONAL BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Description	Symbol	Value range	Unit
Limit Power Voltage	V_{IN}	$-0.3 \sim +26$	V
Storage Temperature Range	T_{STG}	$-50 \sim +125$	°C
Operating Free-air Temperature Range	T_A	$-40 \sim +85$	°C

Note : Stresses greater than 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 Ratings” for extended periods may affect device reliability.

HEAT DISSIPATION

Description	Symbol	Package	Value range	Unit
Thermal resistance	θ_{JA}	SOT89	200	°C/W
		SOT23-5	500	°C/W
Power dissipation	P_W	SOT89	500	mW
		SOT23-5	200	mW

DC CHARACTERISTICS (unless otherwise noted $T_A = +25^{\circ}\text{C}$)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Input Voltage	V_{IN}		3.0		24	V
Output Voltage	V_{OUT}		3.0		5.0	V
Voltage Accuracy		$I_{OUT} = 1\text{mA}$	-2		+2	%
Output Current	I_{OUT}	$V_{IN} = V_{OUT} + 2.0\text{V}$	—	300	—	mA
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT} + 2.0\text{V}$ $1\text{mA} \leq I_{OUT} \leq 150\text{mA}$	—	15	—	mV
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT} + 1.0\text{V} \leq V_{IN} \leq 20\text{V}$ $I_{OUT} = 10\text{mA}$	—	0.015	0.2	%/V
Voltage Drop	$V_{DIF}^{\text{①}}$	$I_{OUT} = 100\text{mA}, V_{OUT} = 3.3\text{V}$	—	200	—	mV
Quiescent Current	I_{SS}	$V_{CE} = V_{IN}$	—	3.0	5.0	μA
Standby Current	$I_{STANDBY}$	$V_{CE} = V_{SS}$			0.2	μA
--	V_{CEH}	$V_{IN} = V_{OUT} + 2.0\text{V}$	1.7		24	V
--	V_{CEL}	$V_{IN} = V_{OUT} + 2.0\text{V}$	0		0.3	V
short-circuit current	I_{SHORT}	$V_{IN} = V_{OUT} + 2.0\text{V}$	—	400	—	mA
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ $I_{OUT} = 10\text{mA}$ $-40^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	—	± 100	—	ppm/ $^{\circ}\text{C}$
Discharge Resistor	$R_{DIS}^{\text{②}}$	$V_{CE} < 0.5\text{V}$		300		Ω

Note : When $V_{IN} = V_{OUT} + 2.0\text{V}$, as the output voltage declined 2%, the $V_{DIF} = V_{IN} - V_{OUT}$.

Output active discharge resistor R_{DIS} , As the input voltage increases, it decreases.

FUNCTIONAL DESCRIPTION

AP2205-50YR-13-JSM series are linear voltage regulator ICs withstanding 24V voltage.

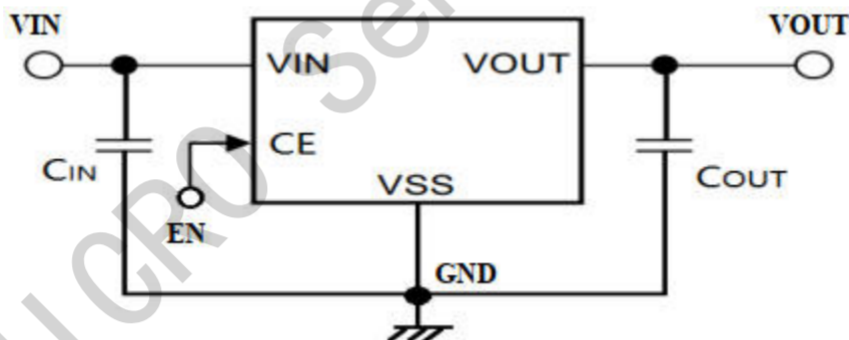
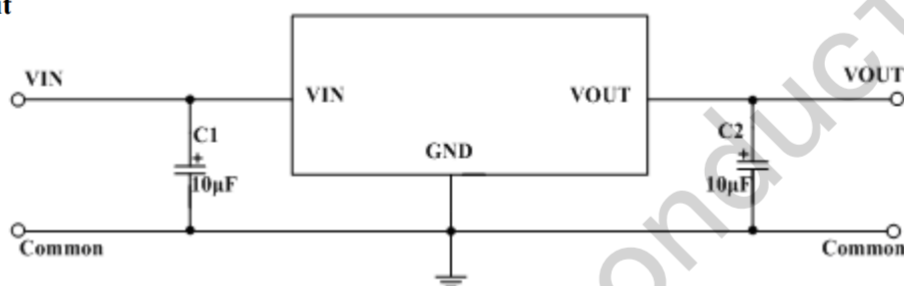
The series IC consists of a voltage reference, an error amplifier, a current limiter and a phase compensation circuit plus a driver transistor.

The output stabilization capacitor is also compatible with low ESR ceramic capacitors.

The over current protection circuit and the over voltage protection circuit are built-in. The protection circuit will operate when the output current or input voltage reaches limit level.

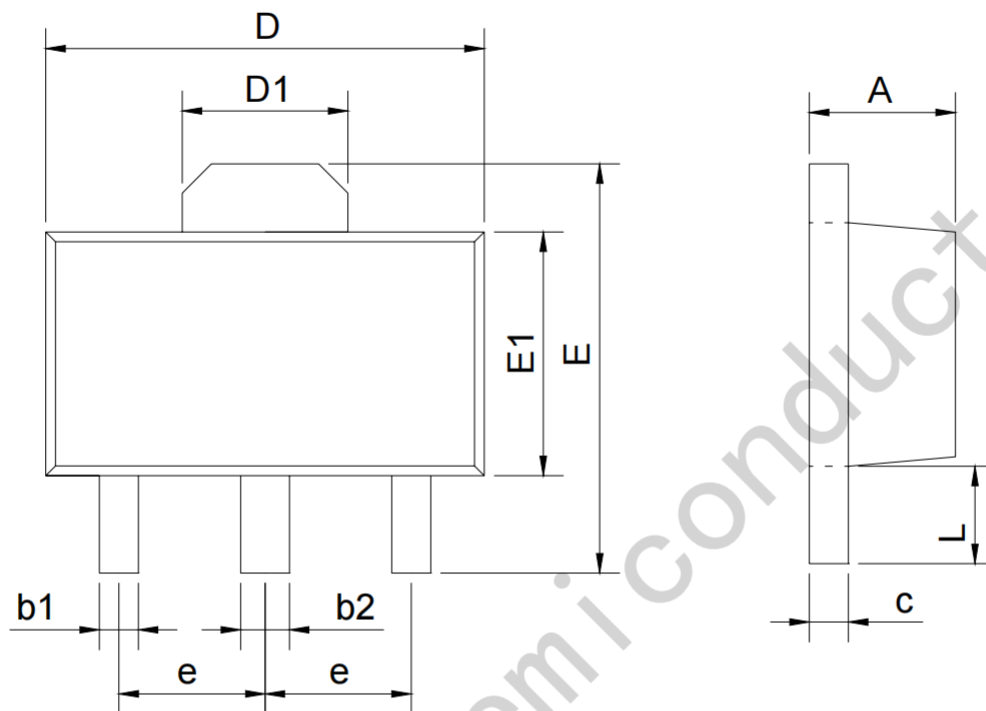
TYPICAL APPLICATION CIRCUIT

Basic Circuit



Package Information

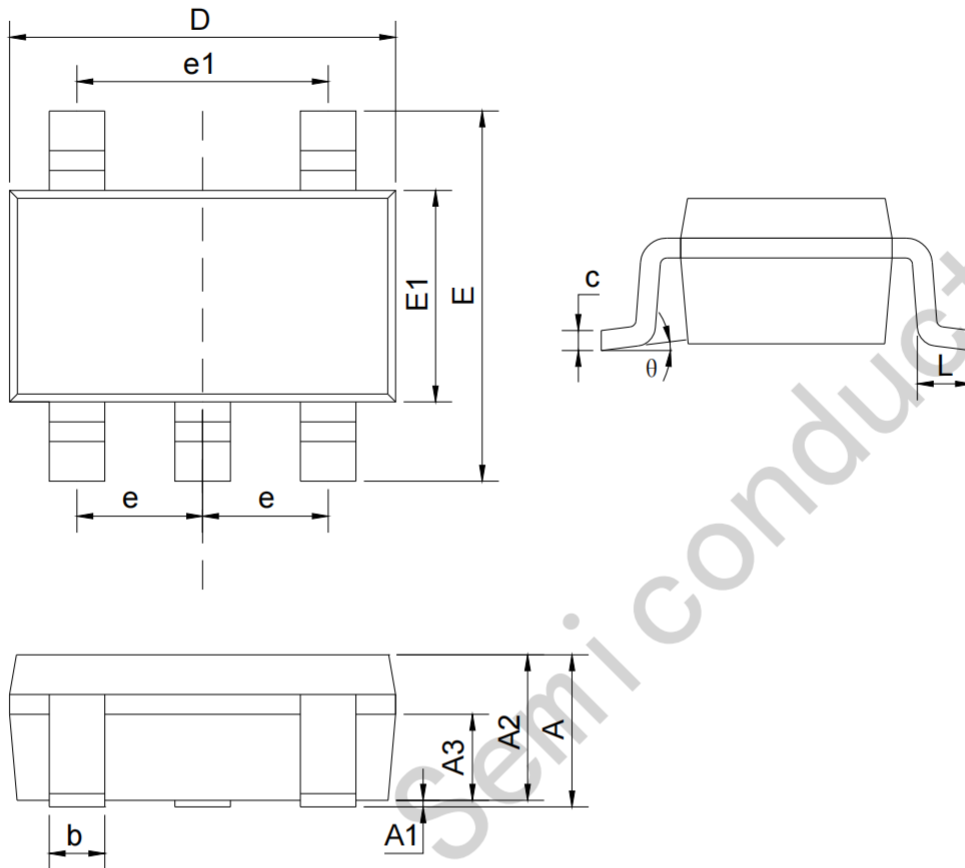
SOT-89



SYMBOL	mm	
	min	max
A	1.40	1.60
b1	0.35	0.50
b2	0.45	0.60
c	0.36	0.46
D	4.30	4.70
D1	1.40	1.80
E	4.00	4.40
E1	2.30	2.70
e	1.50BSC	
L	0.80	1.20

Package Information

SOT23-5



SYMBOL	mm	
	min	max
A		1.35
A1	0.04	0.15
A2	1.00	1.20
A3	0.55	0.75
b	0.38	0.48
c	0.10	0.25
D	2.72	3.12
E	2.60	3.00
E1	1.40	1.80
e	0.95BSC	
e1	1.90BSC	
L	0.30	0.60
θ	0	8°