

1.Description

UMW 1084 is a low dropout three-terminal linear voltage regulator circuit with positive voltage output. The voltage drop is 1.5v at 5A output current. UMW 1084 is divided into two versions: fixed voltage output version and adjustable voltage output version. The fixed output voltage is 1.5v, 1.8v, 2.5v, 3.3v and 5.0v and the voltage accuracy of the adjustable version is 1.5%. UMW 1084 internal overheat protection and current limiting circuit, suitable for all kinds of electronic products.

3.Applications

- The fixed output voltage is 1.5V, 1.8V, 2.5V, 3.3V 5.0V and the voltage accuracy of the adjustable version is 1.5%
- Low dropout voltage: only 1.5V dropout at 5A output current
- Current limiting current: 6.5A

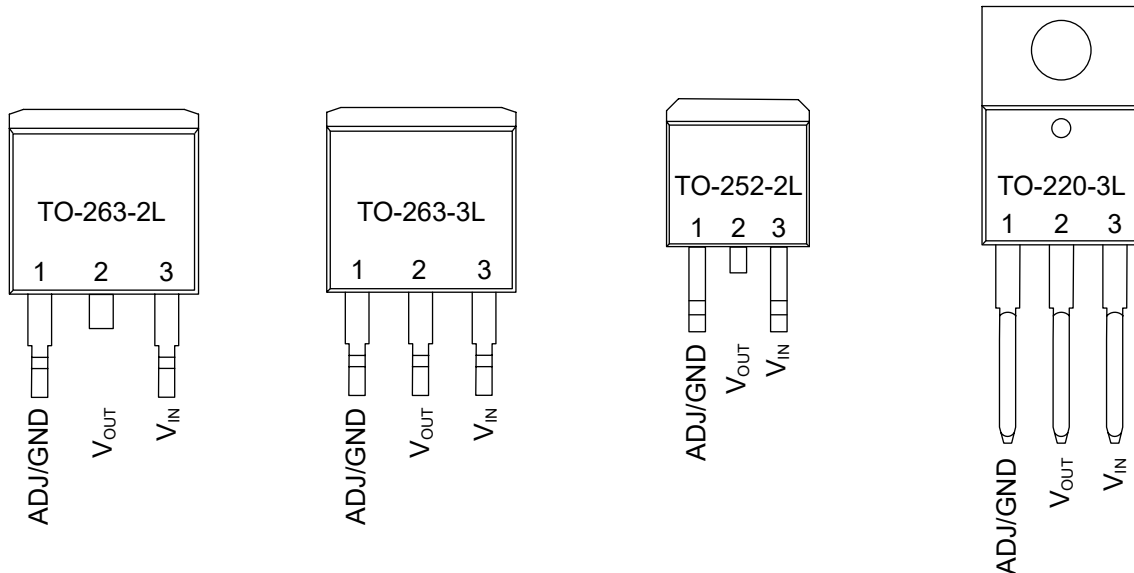
2.Applications

- High efficiency linear regulator
- Post regulator for switching power supply
- Battery charger
- Microprocessor power supply
- Desktop computer, RISC and built - in processor power supply

- Overheat protection
- Line regulation: 0.015% (adjustable version: typical value)
- Load regulation: 0.1% (adjustable version: typical value)
- Temperature Range: -40 ~ 125°C



4. Pinning Information



Pin Functions

Pin	Name	I/O	Description
1	GND/ADJ	G/O	GROUND / ADJ
2	V _{OUT}	O	Output Voltage
3	V _{IN}	I	Input Operating Voltage

5. Function Description

UMW 1084 is a low voltage dropout regulator. Its voltage regulator is composed of a pnp driven npn tube. The voltage drop is defined as: $v_{drop} = v_{be} + v_{sat}$.

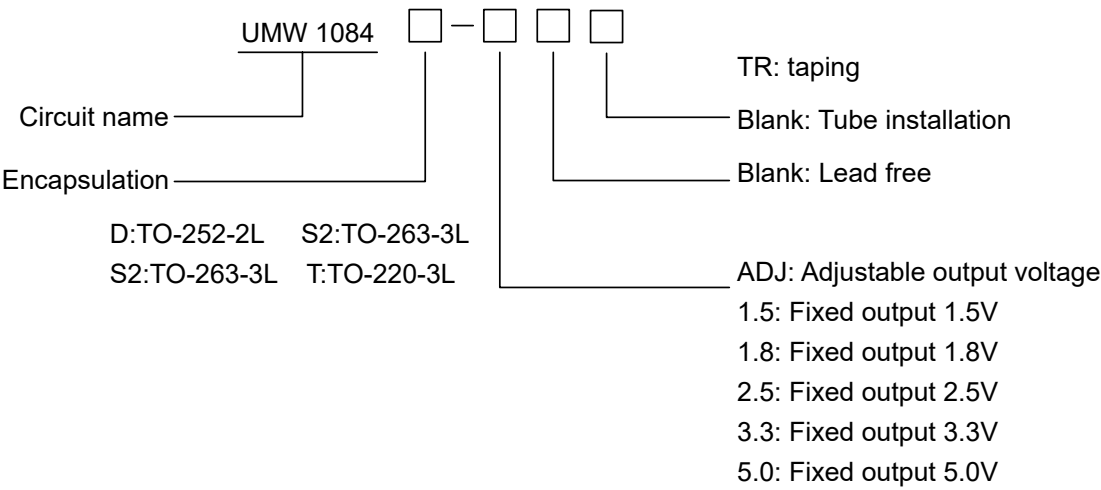
UMW1084 is available in fixed and adjustable versions, and the output voltage can be: 1.5v, 1.8v, 2.5v, 3.3v and 5.0v. The on-chip thermal cut-off circuit provides overload and overheating protection.

To ensure the stability of the umw 1084, a tantalum output capacitor of at least 22μf is required. The capacitance value can be changed according to the actual application needs with output load and temperature changes.

Generally, the stability of a linear regulator decreases as the output current increases.



6.Product Specification Classification (Temperature Range: 0 ~ 125°C)



Product Name	Package Type	Print Name	Material	Packaging
UMW 1084D-ADJ	TO-252-2L	UMW 1084D-ADJ	Lead Free	Tube
UMW 1084D-ADJTR		UMW 1084D-ADJ	Lead Free	Tape
UMW 1084D-1.5		UMW 1084D-1.5	Lead Free	Tube
UMW 1084D-1.5TR		UMW 1084D-1.5	Lead Free	Tape
UMW 1084D-1.8		UMW 1084D-1.8	Lead Free	Tube
UMW 1084D-1.8TR		UMW 1084D-1.8	Lead Free	Tape
UMW 1084D-2.5		UMW 1084D-2.5	Lead Free	Tube
UMW 1084D-2.5TR		UMW 1084D-2.5	Lead Free	Tape
UMW 1084D-3.3		UMW 1084D-3.3	Lead Free	Tube
UMW 1084D-3.3TR		UMW 1084D-3.3	Lead Free	Tape
UMW 1084D-5.0		UMW 1084D-5.0	Lead Free	Tube
UMW 1084D-5.0TR		UMW 1084D-5.0	Lead Free	Tape

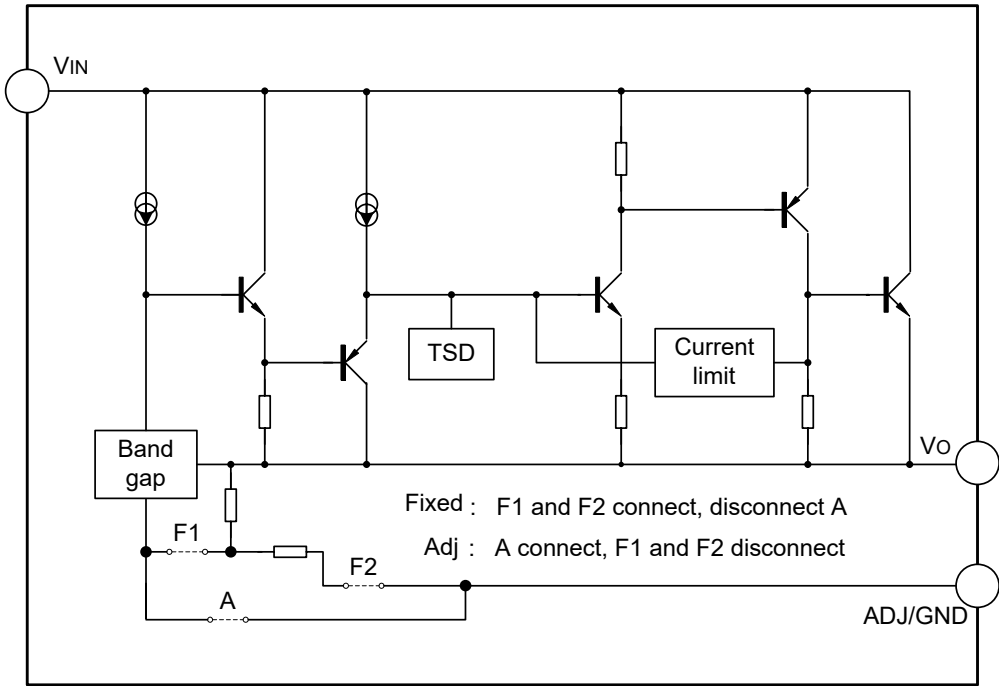


Product Name	Package Type	Print Name	Material	Packaging
UMW 1084CM-ADJ	TO-263-3L	UMW 1084CM-ADJ	Lead Free	Tube
UMW 1084CM-ADJTR		UMW 1084CM-ADJ	Lead Free	Tape
UMW 1084CM-1.5		UMW 1084CM-1.5	Lead Free	Tube
UMW 1084CM-1.5TR		UMW 1084CM-1.5	Lead Free	Tape
UMW 1084CM-1.8		UMW 1084CM-1.8	Lead Free	Tube
UMW 1084CM-1.8TR		UMW 1084CM-1.8	Lead Free	Tape
UMW1084CM-2.5		UMW 1084CM-2.5	Lead Free	Tube
UMW 1084CM-2.5TR		UMW 1084CM-2.5	Lead Free	Tape
UMW 1084CM-3.3		UMW 1084CM-3.3	Lead Free	Tube
UMW 1084CM-3.3TR		UMW 1084CM-3.3	Lead Free	Tape
UMW 1084CM-5.0		UMW 1084CM-5.0	Lead Free	Tube
UMW 1084CM-5.0TR		UMW 1084CM-5.0	Lead Free	Tape
UMW 1084T-ADJ	TO-220-3L	UMW 1084T-ADJ	Lead Free	Tube
UMW 1084T-1.5		UMW 1084T-1.5	Lead Free	Tube
UMW 1084T-1.8		UMW 1084T-1.8	Lead Free	Tube
UMW 1084T-2.5		UMW 1084T-2.5	Lead Free	Tube
UMW 1084T-3.3		UMW 1084T-3.3	Lead Free	Tube
UMW 1084T-5.0		UMW 1084T-5.0	Lead Free	Tube
UMW 1084S2-ADJ	TO-263-2L	UMW 1084S2-ADJ	Lead Free	Tube
UMW 1084S2-ADJTR		UMW 1084S2-ADJ	Lead Free	Tape
UMW 1084S2-1.5		UMW 1084S2-1.5	Lead Free	Tube
UMW 1084S2-1.5TR		UMW 1084S2-1.5	Lead Free	Tape
UMW 1084S2-1.8		UMW 1084S2-1.8	Lead Free	Tube
UMW 1084S2-1.8TR		UMW 1084S2-1.8	Lead Free	Tape
UMW 1084S2-2.5		UMW 1084S2-2.5	Lead Free	Tube



Product Name	Package Type	Print Name	Material	Packaging
UMW 1084S2-2.5TR	TO-263-2L	UMW 1084S2-2.5	Lead Free	Taping
UMW 1084S2-3.3		UMW 1084S2-3.3	Lead Free	Tube
UMW 1084S2-3.3TR		UMW 1084S2-3.3	Lead Free	Taping
UMW 1084S2-5.0		UMW 1084S2-5.0	Lead Free	Tube
UMW 1084S2-5.0TR		UMW 1084S2-5.0	Lead Free	Taping

7.Internal Block Diagram





8. Limit Parameters

Parameter		Symbol	Range	Unit
Input Operating Voltage		V_{IN}	20	V
Lead Temperature (Soldering 5 Seconds)		T_{LEAD}	260	°C
Operating Junction Temperature Range		T_J	150	°C
Storage Temperature		T_S	-65 to 150	V
Power Dissipation		P_D	Internal Limits (Note 1)	mW
ESD Capability (Minimum)		ESD	2000	V
Thermal Resistance	TO-263-3L	θ_{JA}	60	°C/W
	TO-263-2L		60	°C/W
	TO-220-3L		60	°C/W
	TO-252-2L		100	°C/W

Note 1:

The maximum allowable power dissipation is a function of the maximum operating junction temperature $T_{J(max)}$, the junction-to-air thermal resistance θ_{JA} , and the ambient temperature T_{amb} . The maximum allowable power dissipation at a given ambient temperature is: $P_{D(max)} = (T_{J(max)} - T_{amb})/\theta_{JA}$. Exceeding the maximum allowable power dissipation will cause the chip temperature to be too high, so the regulator will enter the overtemperature cutoff state. The junction-to-air thermal resistance θ_{JA} of different package types is different, which is determined by the packaging technology.

9. Recommended Operating Conditions

Parameter	Symbol	Range	Unit
Input Voltage	V_{IN}	12	V
Operating Junction Temperature Range	T_J	0 to 125	°C



10. Electrical Characteristics

(unless otherwise specified, $T_{amb}=25^{\circ}\text{C}$, normal operating junction temperature range 0°C to 125°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Reference Voltage	V_{REF}	UMW 1084-ADJ, $I_{OUT}=10\text{mA}$, $V_{IN}-V_{OUT}=3\text{V}$	1.231	1.250	1.269	V
		$10\text{mA}\leq I_{OUT}\leq 5\text{A}$, $1.5\text{V}\leq V_{IN}-V_{OUT}\leq 5\text{V}$	1.225	1.250	1.275	V
Output Voltage	V_{OUT}	UMW 1084-1.5, $I_{OUT}=10\text{mA}$,	1.478	1.5	1.523	V
		$V_{IN}=4.5\text{V}$, $10\text{mA}\leq I_{OUT}\leq 5\text{A}$, $3.0\text{V}\leq V_{IN}\leq 6\text{V}$	1.47	1.5	1.53	V
		UMW 1084-1.8, $I_{OUT}=10\text{mA}$, $V_{IN}=4.8\text{V}$	1.773	1.8	1.827	V
		$10\text{mA}\leq I_{OUT}\leq 5\text{A}$, $3.3\text{V}\leq V_{IN}\leq 6\text{V}$	1.764	1.8	1.836	V
		UMW 1084-2.5, $I_{OUT}=10\text{mA}$, $V_{IN}=5.5\text{V}$	2.462	2.5	2.537	V
		$10\text{mA}\leq I_{OUT}\leq 5\text{A}$, $4.0\text{V}\leq V_{IN}\leq 7\text{V}$	2.45	2.5	2.55	V
		UMW 1084-3.3, $I_{OUT}=10\text{mA}$, $V_{IN}=6.3\text{V}$	3.225	3.3	3.350	V
		$10\text{mA}\leq I_{OUT}\leq 5\text{A}$, $4.8\text{V}\leq V_{IN}\leq 8\text{V}$	3.234	3.3	3.366	V
		UMW 1084-5.0, $I_{OUT}=10\text{mA}$,	4.925	5	5.075	V
		$V_{IN}=8\text{V}$, $10\text{mA}\leq I_{OUT}\leq 5\text{A}$, $6.5\text{V}\leq V_{IN}\leq 10\text{V}$	4.9	5	5.1	V
Linear Adjustment	ΔV_{OUT}	UMW 1084-ADJ, $I_{OUT}=10\text{mA}$,		0.015	0.2	%
		$2.85\text{V}\leq V_{IN}\leq 10\text{V}$		0.035	0.2	%
		UMW 1084-1.5, $I_{OUT}=10\text{mA}$,		0.5	6	mV
		$3.0\text{V}\leq V_{IN}\leq 10\text{V}$		1	6	mV
		UMW 1084-1.8, $I_{OUT}=10\text{mA}$,		0.5	6	mV
		$3.3\text{V}\leq V_{IN}\leq 10\text{V}$		1	6	mV
		UMW 1084-2.5, $I_{OUT}=10\text{mA}$,		0.5	6	mV
		$4.0\text{V}\leq V_{IN}\leq 10\text{V}$		1	6	mV
		UMW 1084-3.3, $I_{OUT}=10\text{mA}$,		0.5	6	mV
		$4.8\text{V}\leq V_{IN}\leq 10\text{V}$		1	6	mV
		UMW 1084-5.0, $I_{OUT}=10\text{mA}$,		0.5	10	mV
		$6.5\text{V}\leq V_{IN}\leq 10\text{V}$		1	10	mV



Parameter	Symbol	Conditions	Min	Typ	Max	Units
Load Regulation	ΔV_{OUT}	UMW1084-ADJ, $0mA \leq I_{OUT} \leq 5A$		0.1	0.3	%
		$V_{IN}-V_{OUT}=3V$		0.2	0.4	%
		UMW1084-1.5, $0mA \leq I_{OUT} \leq 5A$		3	15	mV
		$V_{IN}-V_{OUT}=3V$		7	20	mV
		UMW1084-1.8, $0mA \leq I_{OUT} \leq 5A$		3	15	mV
		$V_{IN}-V_{OUT}=3V$		7	20	mV
		UMW1084-2.5,, $0mA \leq I_{OUT} \leq 5A$		3	15	mV
		$V_{IN}-V_{OUT}=3V$		7	20	mV
		UMW 1084-3.3,, $0mA \leq I_{OUT} \leq 5A$		3	15	mV
		$V_{IN}-V_{OUT}=3V$		7	20	mV
		UMW1084-5.0, $0mA \leq I_{OUT} \leq 5A$		5	20	mV
		$V_{IN}-V_{OUT}=3V$		10	35	mV
Dropout Voltage	V_{DROP}	$I_{OUT}=5A$, ΔV_{REF} , $\Delta V_{OUT}=1\%$		1.45	1.5	V
Current Limit	I_{LIMIT}	$V_{IN}-V_{OUT}=3V$	5.5	6.5		A
Minimum Load Current	$I_{LOAD(MIN)}$	$V_{IN}=10V$ (UMW1084-ADJ)		3	10	mA
Quiescent Current	I_Q	$V_{IN}=10V$ (UMW1084)		5	10	mA
Ripple Rejection Ratio	PSRR	fRIPPLE=120Hz, $C_{OUT}=25\mu F$ tantalum capacitor, $I_{OUT}=5A$, $V_{IN}-V_{OUT}=3V$	60	72		dB
Adjustable Pin Current	I_{ADJ}	$V_{IN}=4.25V$, $I_{OUT}=10mA$		55	120	μA
Adjustable Pin Current Variation	ΔI_{ADJ}	$10mA \leq I_{OUT} \leq 5A$, $1.5V \leq (V_{IN}-V_{OUT}) \leq 4.5V$		0.2	5	μA
Temperature Stability		$I_{OUT}=10mA$, $V_{IN}-V_{OUT}=1.5V$		0.5		%
Long Term Stability		$T_{amb}=125^\circ C$, 1000Hrs		0.5		%
RMS NOISE (% of V_{OUT})		$10Hz \leq f \leq 10kHz$		0.003		%



11. Typical Application Circuit Diagram

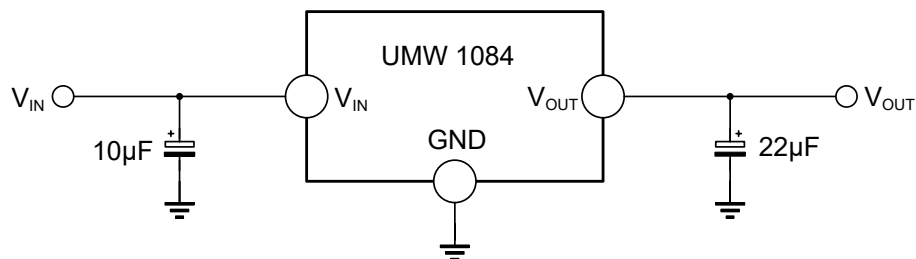


Figure 1. Typical fixed output voltage

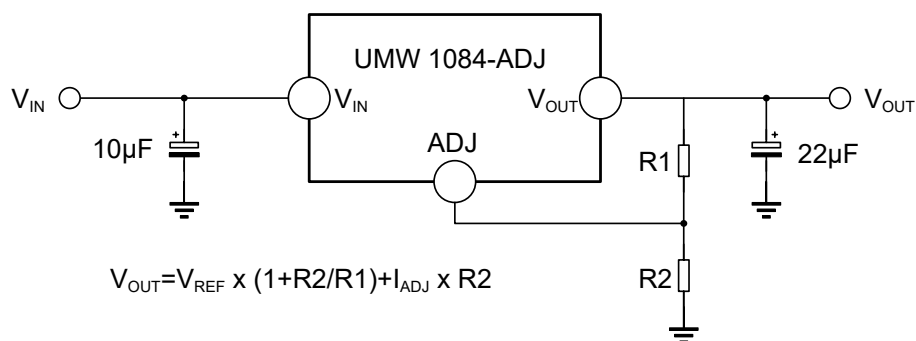


Figure 2. Typical adjustable output voltage

Note: The above circuits and parameters are for reference only. For actual application circuits, please set the parameters based on sufficient actual measurements.



12. Typical Characteristics

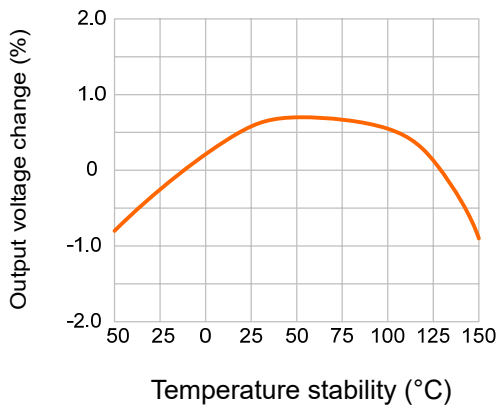


Figure 1: Output voltage variation vs. temperature stability

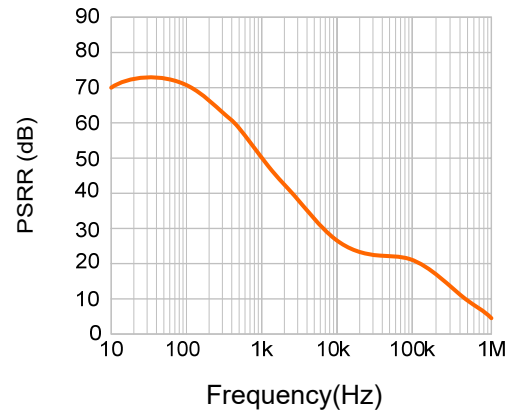


Figure 2: PSRR vs. Frequency

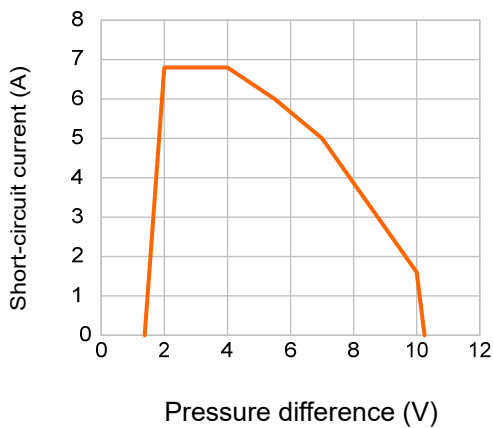


Figure 3: Short-circuit current vs. voltage drop

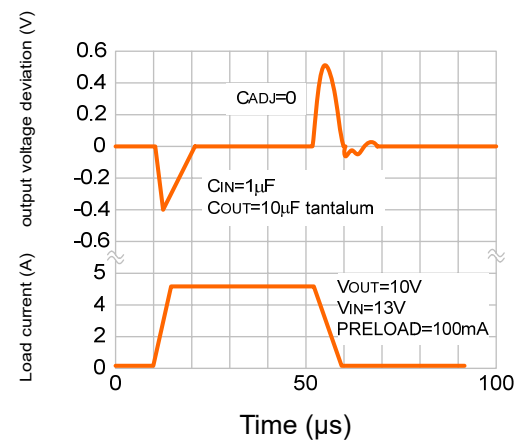


Figure 4: Load transient response

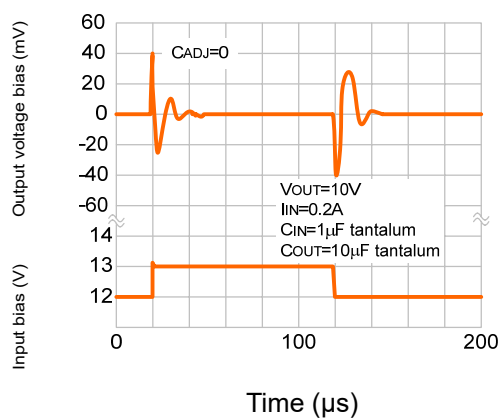


Figure 5: Linear transient response

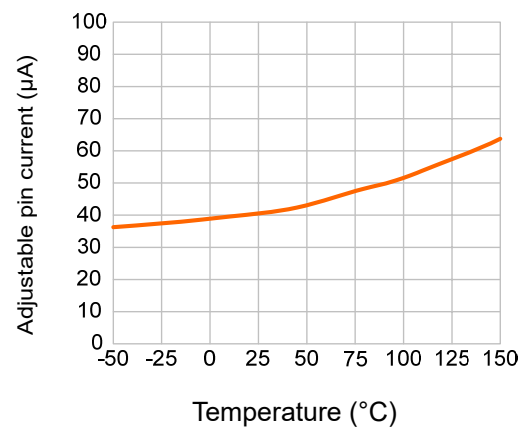
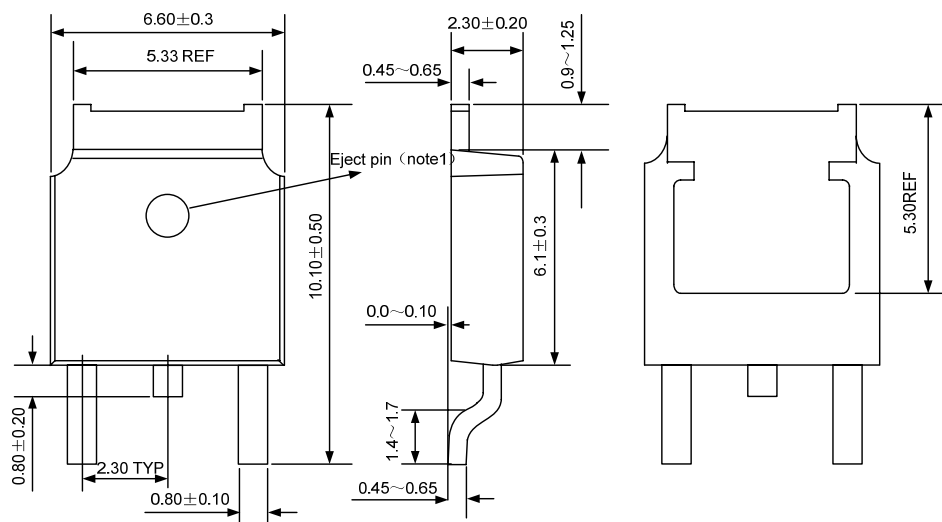
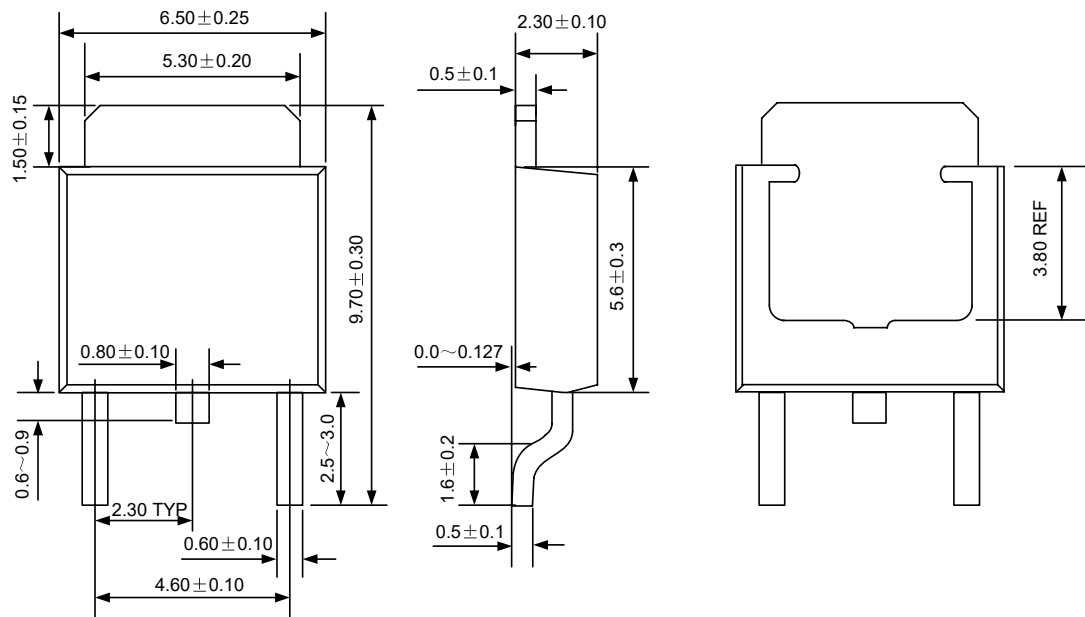


Figure 6: Adjustable pin current vs. temperature



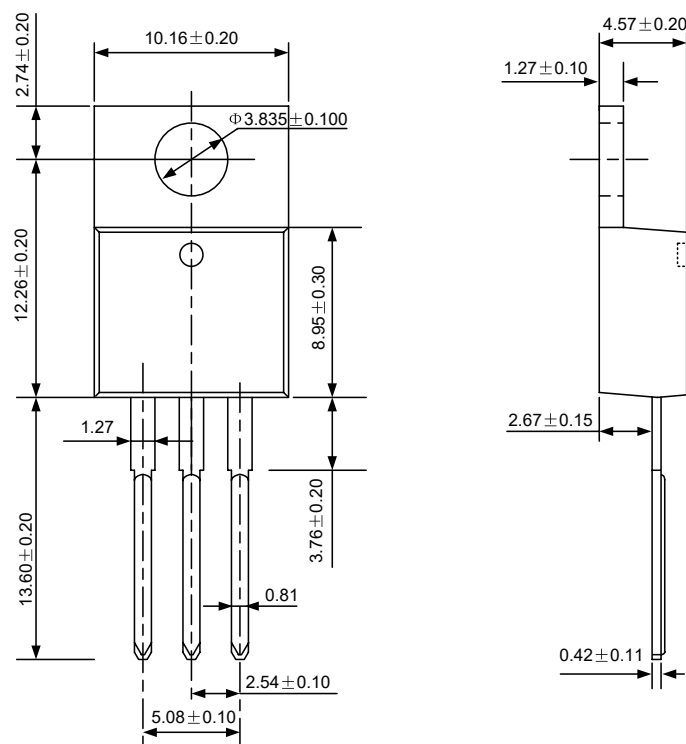
13.1 TO-252-2L Package Outline Dimensions



注：该位置分有顶针孔和无顶针孔两种情况。

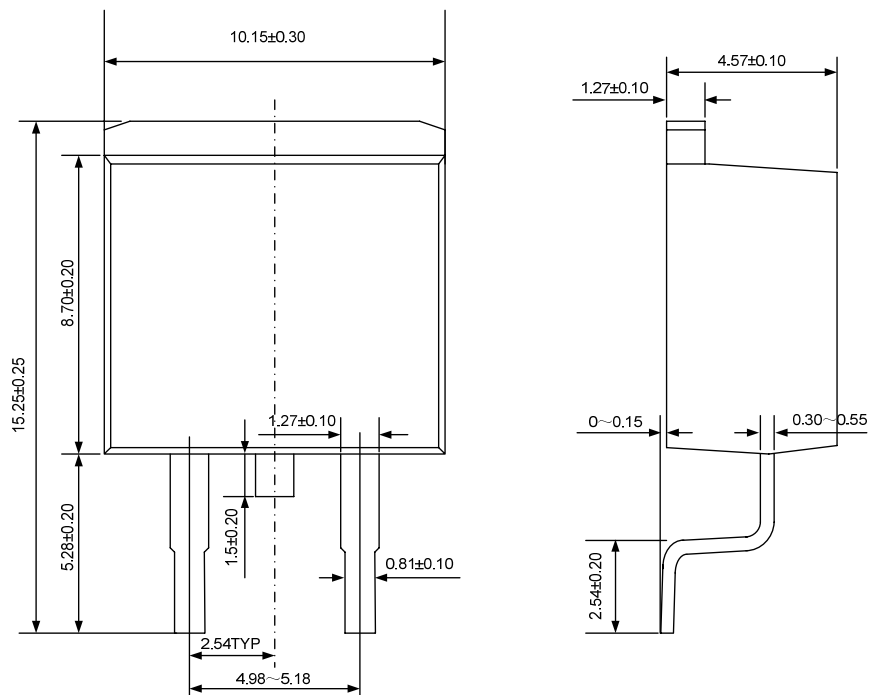


13.2 TO-220-3L Package Outline Dimensions



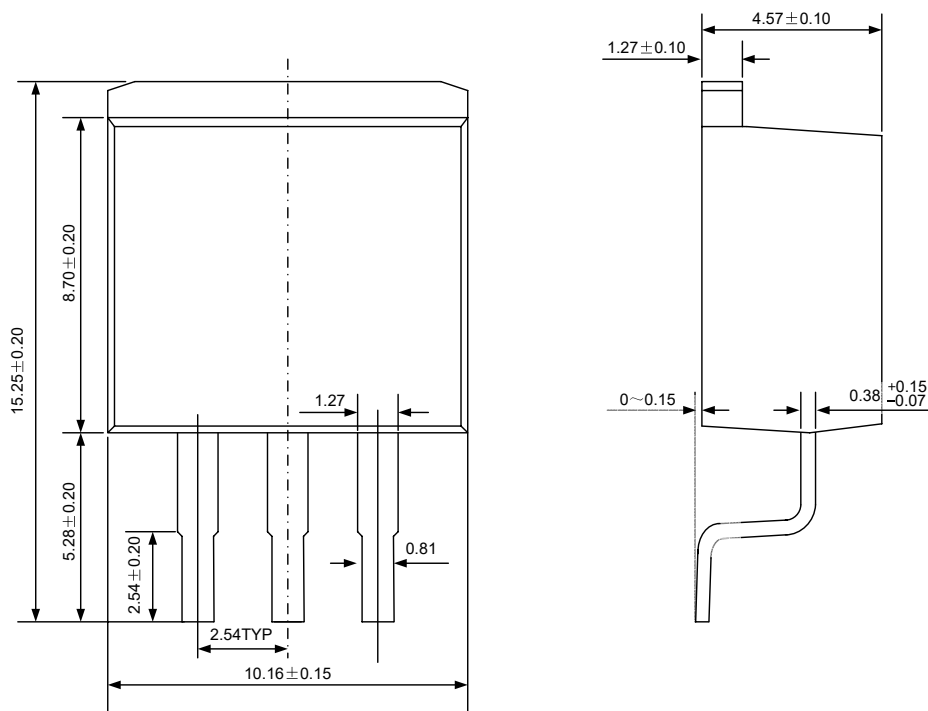


13.3 TO-263-2L Package Outline Dimensions



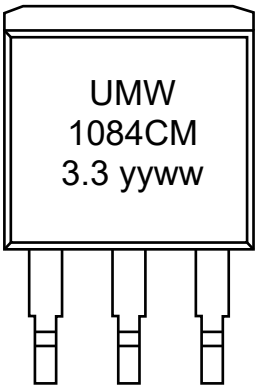


13.4 TO-263-3L Package Outline Dimensions





14.Ordering Information



yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW AMS1084CM-3.3	1084CM 3.3	TO-263-3L	800	Tape and reel
UMW AMS1084CM-ADJ	1084CM ADJ	TO-263-3L	800	Tape and reel



15.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

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