



## 1A LOW DROPOUT LINEAR REGULATOR

### CJA1117B-XXX

#### FEATURES

- Low Dropout Voltage: 1.15V at 1A Output Current
- Trimmed Current Limit
- On-Chip Thermal Shutdown
- Three-Terminal Adjustable or Fixed 1.8V, 2.5V, 3.3V, 5V
- Operation Junction Temperature: -25 °C to 125°C

#### GENERAL DESCRIPTION

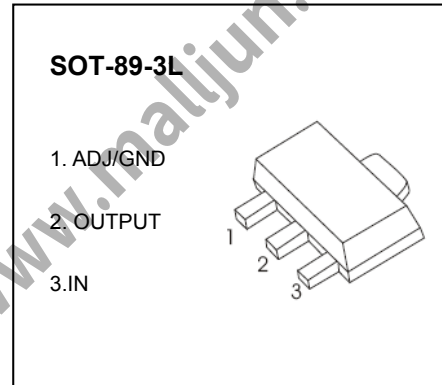
The CJA1117B-XXX is a series of low dropout three-terminal regulators with a dropout of 1.15V at 1A output current.

The CJA1117B-XXX series provides current limiting and thermal shutdown. Its circuit includes a trimmed bandgap reference to assure output voltage accuracy to be within 1.5%. Current limit is trimmed to ensure specified output current and controlled short-circuit current. On-chip thermal shutdown provides protection against any combination of overload and ambient temperature that would create excessive junction temperature.

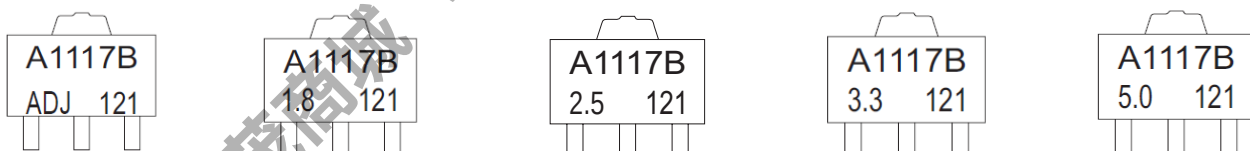
The CJA1117B-XXX has an adjustable version, that can provide the output voltage from 1.25V to 5V with only 2 external resistors.

#### APPLICATIONS

- PC Motherboard
- LCD Monitor
- Graphic Card
- DVD-Video Player
- NIC/Switch
- Telecom Modem
- ADSL Modem
- Printer and other peripheral Equipment



#### Marking:



**ORDERING INFORMATION**

| Package   | Operating Junction Temperature Range | Part NO.     |
|-----------|--------------------------------------|--------------|
| SOT-89-3L | -25 to 125°C                         | CJA1117B-ADJ |
|           |                                      | CJA1117B-1.8 |
|           |                                      | CJA1117B-2.5 |
|           |                                      | CJA1117B-3.3 |
|           |                                      | CJA1117B-5.0 |

**ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)**

| Parameter                                   | Symbol           | Value    | Unit |
|---------------------------------------------|------------------|----------|------|
| Input Voltage                               | V <sub>i</sub>   | 20       | V    |
| Maximum Junction Temperature                | T <sub>j</sub>   | 150      | °C   |
| Storage Temperature                         | T <sub>stg</sub> | -55~+150 | °C   |
| Thermal Resistance from Junction to Ambient | R <sub>θJA</sub> | 250      | °C/W |
| Lead Temperature (Soldering, 10sec.)        | T <sub>L</sub>   | 260      | °C   |
| ESD Voltage (Machine Model)                 | V <sub>ESD</sub> | 400      | V    |

Note: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional 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.

**RECOMMENDED OPERATING CONDITIONS**

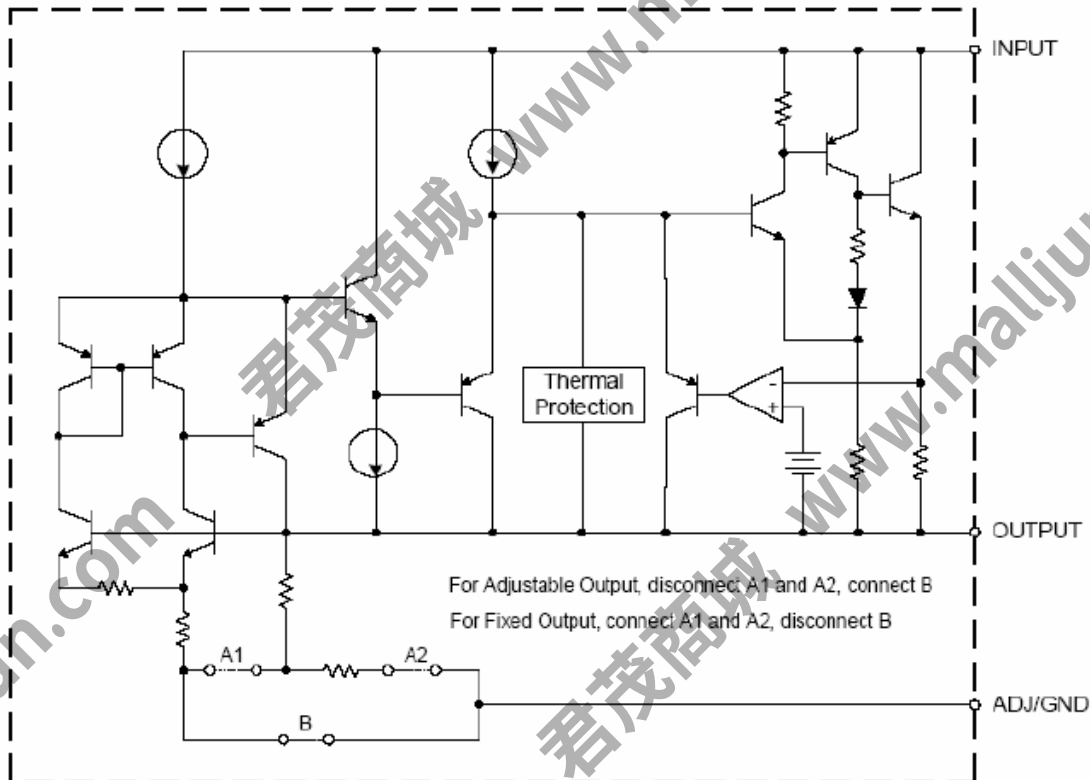
| Parameter                      | Symbol         | Value    | Unit |
|--------------------------------|----------------|----------|------|
| Input Voltage                  | V <sub>i</sub> | 15       | V    |
| Operating Junction Temperature | T <sub>j</sub> | -25~+125 | °C   |

**ELECTRICAL CHARACTERISTICS ( $V_{IN} \leq 10V$ ,  $T_J = 25^\circ C$  unless otherwise specified. )**

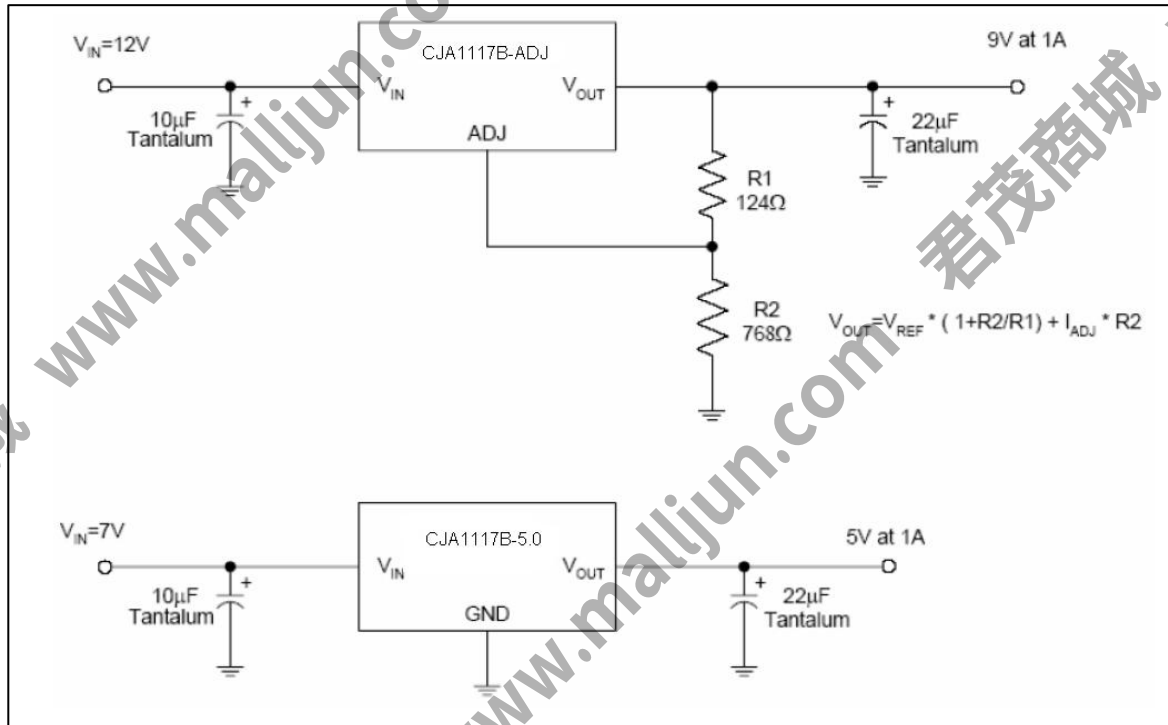
| Parameter                          | Symbol      | Part NO.     | Test conditions                                                               | Min   | Typ   | Max   | Unit       |
|------------------------------------|-------------|--------------|-------------------------------------------------------------------------------|-------|-------|-------|------------|
| Reference Voltage                  | $V_{IROC}$  | CJA1117B-ADJ | $I_{OUT}=10mA$ , $V_{IN}-V_{OUT}=3.23$                                        | 1.231 | 1.250 | 1.269 | V          |
|                                    |             |              | $10mA \leq I_{OUT} \leq 1A$ , $2.75V \leq V_{IN}-V_{OUT} \leq 13.25V$         | 1.225 | 1.250 | 1.275 |            |
| Output Voltage                     | $V_O$       | CJA1117B-1.8 | $I_{OUT}=10mA$ , $V_{IN}=3.8V$                                                | 1.773 | 1.8   | 1.827 | V          |
|                                    |             |              | $10mA \leq I_{OUT} \leq 1A$ , $3.3V \leq V_{IN} \leq 12V$                     | 1.764 | 1.8   | 1.836 |            |
|                                    |             | CJA1117B-2.5 | $I_{OUT}=10mA$ , $V_{IN}=4.5V$                                                | 2.463 | 2.5   | 2.538 | V          |
|                                    |             |              | $10mA \leq I_{OUT} \leq 1A$ , $4V \leq V_{IN} \leq 12V$                       | 2.450 | 2.5   | 2.550 |            |
|                                    |             | CJA1117B-3.3 | $I_{OUT}=10mA$ , $V_{IN}=5.3V$                                                | 3.251 | 3.3   | 3.350 | V          |
|                                    |             |              | $10mA \leq I_{OUT} \leq 1A$ , $4.8V \leq V_{IN} \leq 12V$                     | 3.234 | 3.3   | 3.366 |            |
|                                    |             | CJA1117B-5.0 | $I_{OUT}=10mA$ , $V_{IN}=7.0V$                                                | 4.925 | 5.0   | 5.075 | V          |
|                                    |             |              | $10mA \leq I_{OUT} \leq 1A$ , $6.5V \leq V_{IN} \leq 12V$                     | 4.9   | 5.0   | 5.1   |            |
| Line Regulation                    | LNR         | CJA1117B-ADJ | $I_{OUT}=10mA$ , $1.5V \leq V_{IN}-V_{OUT} \leq 12V$                          |       | 0.035 | 0.2   | mV         |
|                                    |             | CJA1117B-1.8 | $I_{OUT}=10mA$ , $1.5V \leq V_{IN}-V_{OUT} \leq 10.2V$                        |       | 1     | 7     |            |
|                                    |             | CJA1117B-2.5 | $I_{OUT}=10mA$ , $1.5V \leq V_{IN}-V_{OUT} \leq 9.5V$                         |       | 1     | 7     |            |
|                                    |             | CJA1117B-3.3 | $I_{OUT}=10mA$ , $1.5V \leq V_{IN}-V_{OUT} \leq 8.7V$                         |       | 1     | 7     |            |
|                                    |             | CJA1117B-5.0 | $I_{OUT}=10mA$ , $1.5V \leq V_{IN}-V_{OUT} \leq 7V$                           |       | 1     | 10    |            |
| Load Regulation                    | LDR         | CJA1117B-ADJ | $V_{IN}-V_{OUT}=1.5V$ , $10mA \leq I_{OUT} \leq 1A$                           |       | 0.2   | 0.4   | mV         |
|                                    |             | CJA1117B-1.8 |                                                                               |       |       | 7.2   |            |
|                                    |             | CJA1117B-2.5 |                                                                               |       |       | 10    |            |
|                                    |             | CJA1117B-3.3 |                                                                               |       |       | 13.2  |            |
|                                    |             | CJA1117B-5.0 |                                                                               |       |       | 20    |            |
| Dropout Voltage                    | $V_D$       |              | $\Delta V_{REF}=1\%$ , $I_{OUT}=1.0A$                                         |       |       | 1.3   | V          |
| Current Limit                      | $I_{limit}$ |              | $V_{IN}-V_{OUT}=2V$                                                           | 1     |       |       | A          |
| Adjust Pin Current                 |             |              |                                                                               |       | 60    | 120   | $\mu A$    |
| Minimum Load Current               | $I_L$       |              | $1.5V \leq V_{IN}-V_{OUT} \leq 12V$ (ADJ only)                                |       | 1.7   | 5     | $\mu A$    |
| Quiescent Current                  | $I_q$       |              | $V_{IN}=V_{OUT}+1.25V$ (ADJ except)                                           |       | 5     | 10    | mA         |
| Ripple Rejection                   | RR          |              | $f=120Hz$ , $C_{OUT}=22\mu F$ Tantalum,<br>$V_{IN}-V_{OUT}=3V$ , $I_{OUT}=1A$ | 60    | 75    |       | dB         |
| Temperature Stability              |             |              |                                                                               |       | 0.5   |       | %          |
| Long-Term Stability                |             |              | $T_A=125^\circ C$ , 1000hrs                                                   |       | 0.3   |       | %          |
| RMS Output Noise (% of $V_{OUT}$ ) |             |              | $T_A=25^\circ C$ , $10Hz \leq f \leq 10kHz$                                   |       | 0.003 |       | %          |
| Thermal Shutdown Hysteresis        |             |              |                                                                               |       | 25    |       | $^\circ C$ |

\* With package soldering to copper area over backside ground plane or internal power plane  $R_{\theta JA}$  can vary from  $46^\circ C/W$  to  $>90^\circ C/W$  depending on mounting technique and the size of the copper area

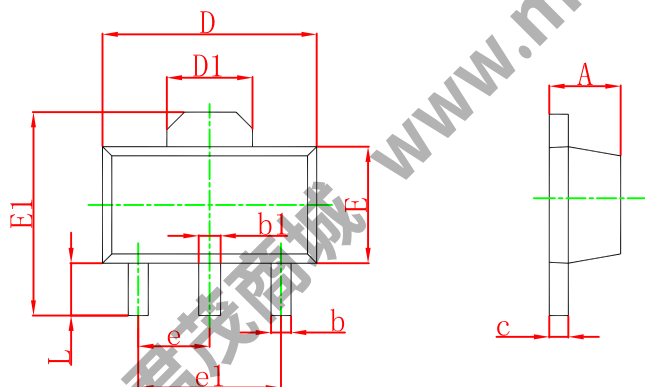
## FUNCTIONAL BLOCK DIAGRAM



## TYPICAL APPLICATION CIRCUIT

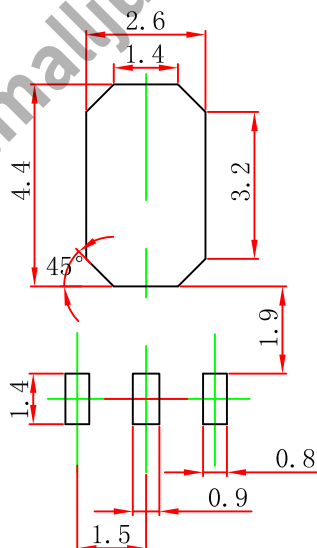


## SOT-89-3L Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.400                     | 1.600 | 0.055                | 0.063 |
| b      | 0.320                     | 0.520 | 0.013                | 0.020 |
| b1     | 0.400                     | 0.580 | 0.016                | 0.023 |
| c      | 0.350                     | 0.440 | 0.014                | 0.017 |
| D      | 4.400                     | 4.600 | 0.173                | 0.181 |
| D1     | 1.550 REF.                |       | 0.061 REF.           |       |
| E      | 2.300                     | 2.600 | 0.091                | 0.102 |
| E1     | 3.940                     | 4.250 | 0.155                | 0.167 |
| e      | 1.500 TYP.                |       | 0.060 TYP.           |       |
| e1     | 3.000 TYP.                |       | 0.118 TYP.           |       |
| L      | 0.900                     | 1.200 | 0.035                | 0.047 |

## SOT-89-3L Suggested Pad Layout



Note:

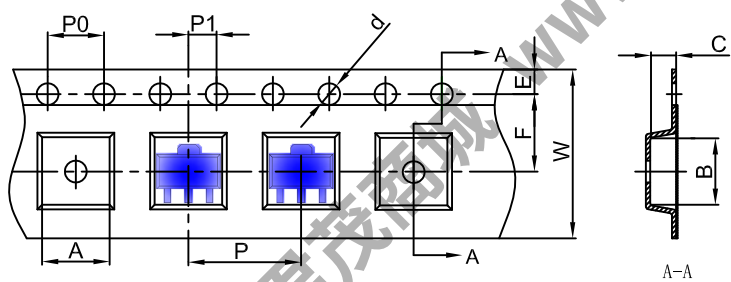
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

### NOTICE

JCET reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JCET does not assume any liability arising out of the application or use of any product described herein.

SOT-89-3L Tape and Reel

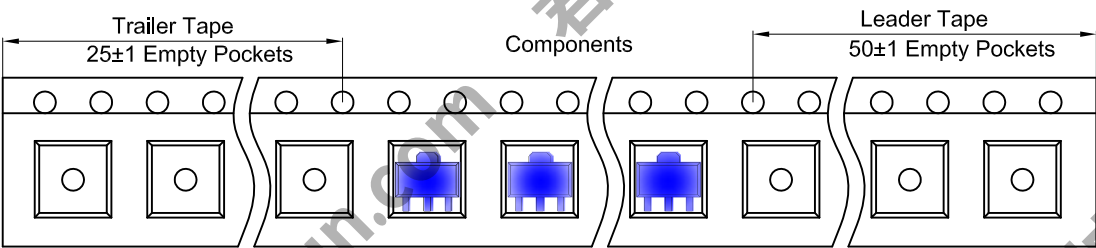
SOT-89-3L Embossed Carrier Tape



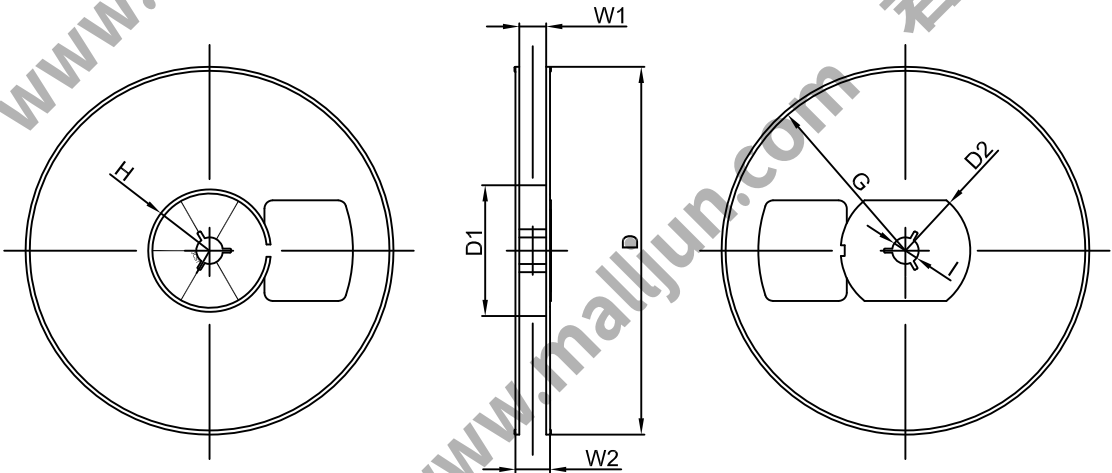
Packaging Description:  
SOT-89-3L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 1,000 units per 7" or 18.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |       |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| Pkg type                     | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W     |
| SOT-89-3L                    | 4.85 | 4.45 | 1.85 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |

SOT-89-3L Tape Leader and Trailer



SOT-89-3L Reel



| Dimensions are in millimeter |         |       |        |        |        |        |       |       |
|------------------------------|---------|-------|--------|--------|--------|--------|-------|-------|
| Reel Option                  | D       | D1    | D2     | G      | H      | I      | W1    | W2    |
| 7"Dia                        | Ø180.00 | 60.00 | R32.00 | R86.50 | R30.00 | Ø13.00 | 13.20 | 16.50 |

| REEL     | Reel Size | Box        | Box Size(mm) | Carton     | Carton Size(mm) | G.W.(kg) |
|----------|-----------|------------|--------------|------------|-----------------|----------|
| 1000 pcs | 7 inch    | 10,000 pcs | 203×203×195  | 40,000 pcs | 438×438×220     |          |