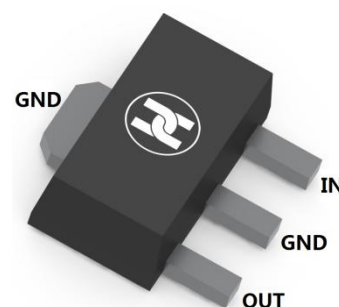
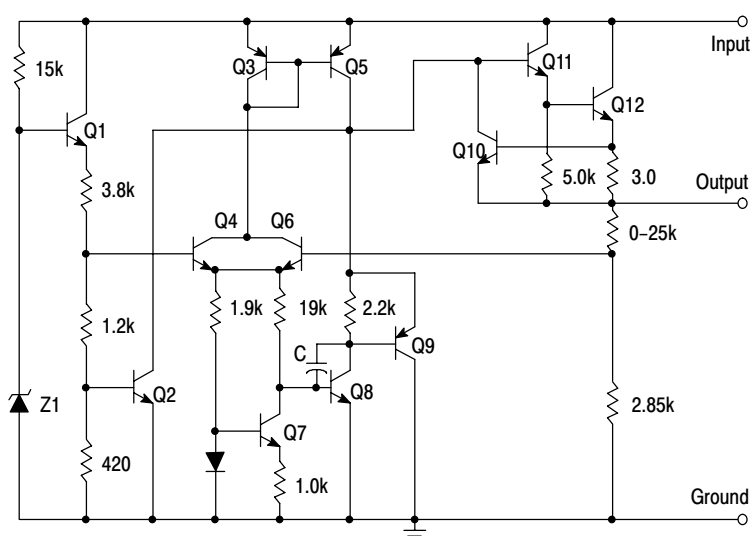


## PLASTIC-ENCAPSULATE VOLTAGE REGULATORS

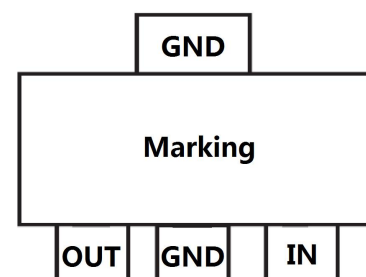
### FEATURES

- Maximum Output Current  $I_o$ : 0.1 A
- Output Voltage  $V_o$ : 5 V
- Continuous Total Dissipation  
 $P_D$ : 0.60 W ( $T_a = 25^\circ\text{C}$ )
- Surface Mount device

### SCHEMATIC DIAGRAM



**SOT-89**



### MECHANICAL DATA

- Case: SOT-89
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.055 grams (approximate)
- Marking: 78L05

### MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

| Parameter                                   | Symbol          | Value           | Unit                      |
|---------------------------------------------|-----------------|-----------------|---------------------------|
| Input Voltage                               | $V_i$           | 30              | V                         |
| Power Dissipation                           | $P_D$           | 600             | mW                        |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 160             | $^\circ\text{C}/\text{W}$ |
| Operating Temperature                       | $T_{opr}$       | $-40 \sim +125$ | $^\circ\text{C}$          |
| Storage Temperature Range                   | $T_{STG}$       | $-55 \sim +150$ | $^\circ\text{C}$          |

## PLASTIC-ENCAPSULATE VOLTAGE REGULATORS

### ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE ( $V_i=10V, I_o=40mA, C_i=0.33\mu F, C_o=0.1\mu F$ , unless otherwise specified )

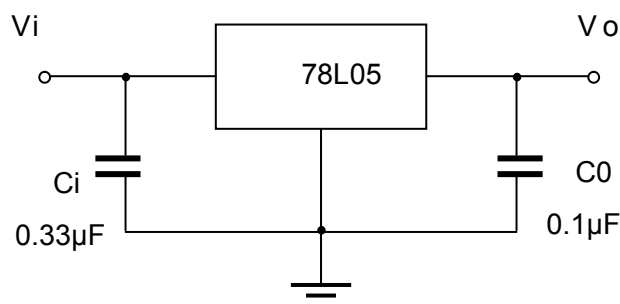
| Parameter                | Symbol       | Min  | Typ | Max  | Unit        | Conditions                                                                        |
|--------------------------|--------------|------|-----|------|-------------|-----------------------------------------------------------------------------------|
| Output voltage           | $V_o$        | 4.80 | 5.0 | 5.20 | V           | $T_J=+25^{\circ}C$                                                                |
|                          |              | 4.75 | 5.0 | 5.25 | V           | $7V \leq V_i \leq 20V, I_o=1mA \sim 40mA, 0^{\circ}C \leq T_J \leq +125^{\circ}C$ |
|                          |              | 4.75 | 5.0 | 5.25 | V           | $7V \leq V_i \leq 20V, I_o=1mA \sim 70mA, 0^{\circ}C \leq T_J \leq +125^{\circ}C$ |
| Load Regulation          | $\Delta V_o$ |      | 15  | 60   | mV          | $I_o=1mA \sim 100mA, T_J=+25^{\circ}C$                                            |
|                          |              |      | 8   | 30   | mV          | $I_o=1mA \sim 40mA, T_J=+25^{\circ}C$                                             |
| Line regulation          | $\Delta V_o$ |      | 32  | 150  | mV          | $7V \leq V_i \leq 20V$                                                            |
|                          |              |      | 26  | 100  | mV          | $8V \leq V_i \leq 20V, T_J=+25^{\circ}C$                                          |
| Quiescent Current        | $I_q$        |      | 3.8 | 6    | mA          | $T_J=+25^{\circ}C$                                                                |
| Quiescent Current Change | $\Delta I_q$ |      |     | 1.5  | mA          | $8V \leq V_i \leq 20V, 0^{\circ}C \leq T_J \leq +125^{\circ}C$                    |
|                          |              |      |     | 0.1  | mA          | $1mA \leq I_o \leq 40mA, 0^{\circ}C \leq T_J \leq +125^{\circ}C$                  |
| Output Noise Voltage     | $V_N$        |      | 42  |      | $\mu V/V_o$ | $10Hz \leq f \leq 100kHz, T_J=+25^{\circ}C$                                       |
| Ripple Rejection         | RR           | 41   | 49  |      | dB          | $8V \leq V_i \leq 20V, f=120Hz, 0^{\circ}C \leq T_J \leq +125^{\circ}C$           |
| Dropout Voltage          | $V_d$        |      | 1.7 |      | V           | $T_J=+25^{\circ}C$                                                                |

\*Pulse Test

### CLASSIFICATION OF $V_o(T_A=+25^{\circ}C)$

| Rank        | 5%        | 4%       | 3%        | 2%        |
|-------------|-----------|----------|-----------|-----------|
| $V_o$ Range | 4.75-5.25 | 4.8-5.20 | 4.85-5.15 | 4.90-5.10 |

### TYPICAL APPLICATION

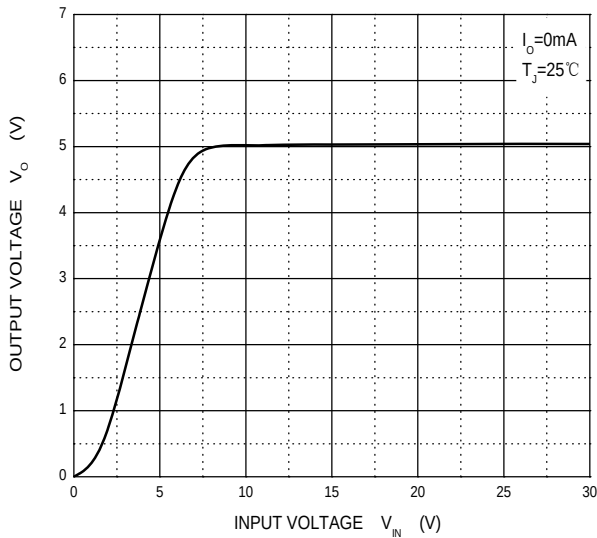


Note: Bypass capacitors are recommended for optimum stability and transient response and should be located as close as Possible to the regulators.

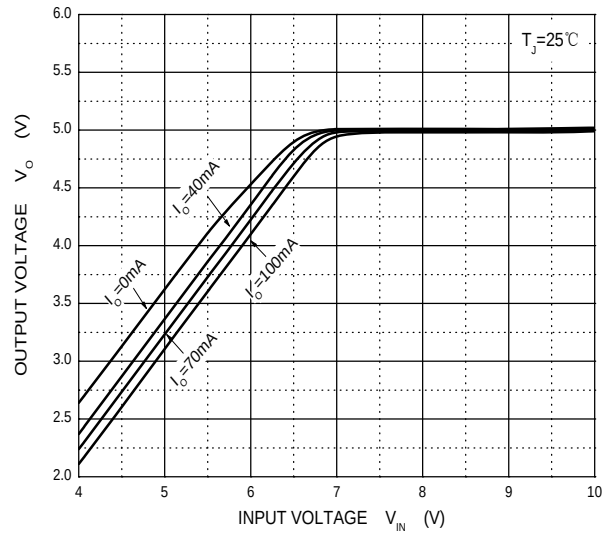
## PLASTIC-ENCAPSULATE VOLTAGE REGULATORS

### Typical Characteristics

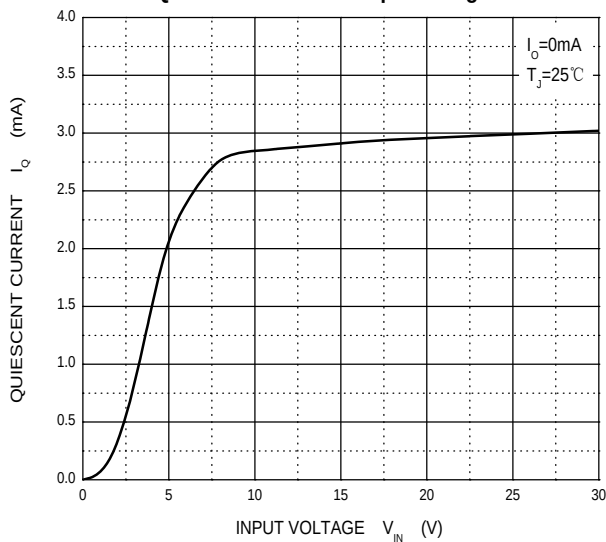
**Output Characteristics**



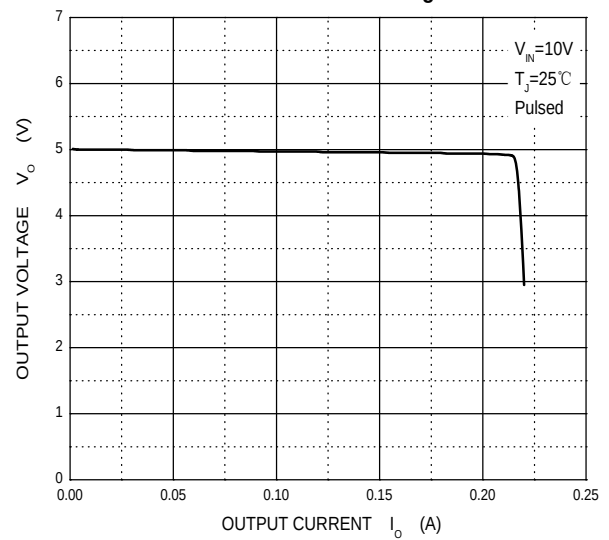
**Dropout Characteristics**



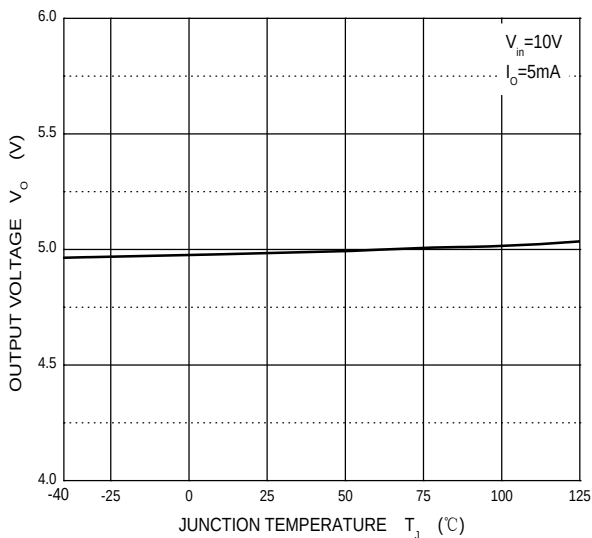
**Quiescent Current vs Input Voltage**



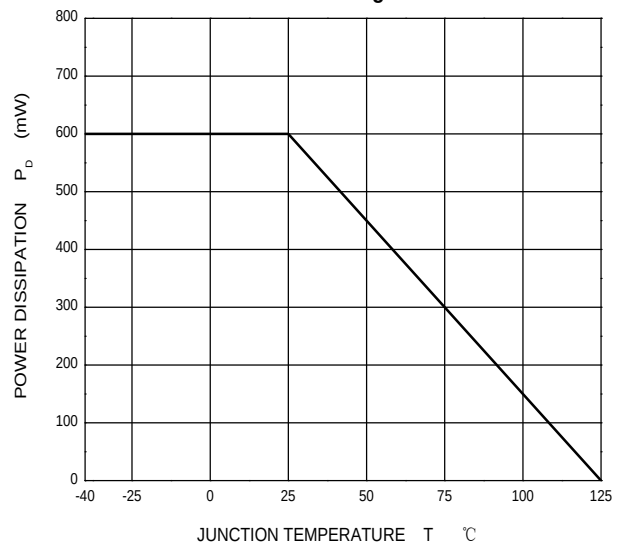
**Current Cut-off Grid Voltage**



**Output Voltage vs Junction Temperature**

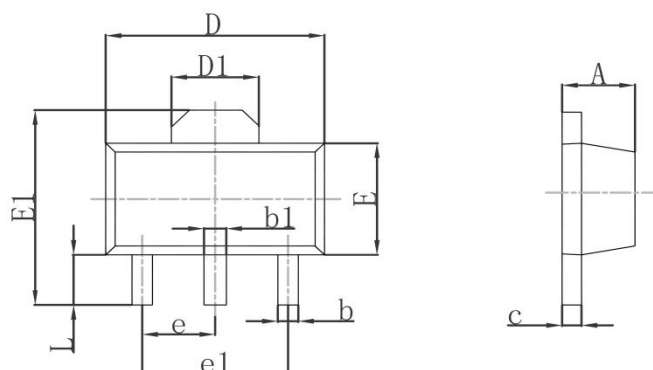


**Power Derating Curve**



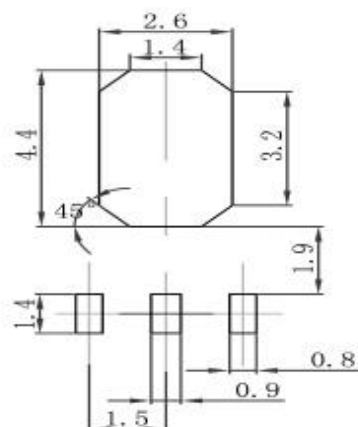
## PLASTIC-ENCAPSULATE VOLTAGE REGULATORS

### SOT-89 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     | 1.550REF                  |       | 0.061REF             |       |
| E      | 2.300                     | 2.600 | 0.091                | 0.102 |
| E1     | 3.940                     | 4.250 | 0.155                | 0.167 |
| e      | 1.500TYP                  |       | 0.060TYP             |       |
| e1     | 3.000TYP                  |       | 0.118TYP             |       |
| L      | 0.900                     | 1.200 | 0.035                | 0.047 |

### SOT-89 Suggested Pad Layout



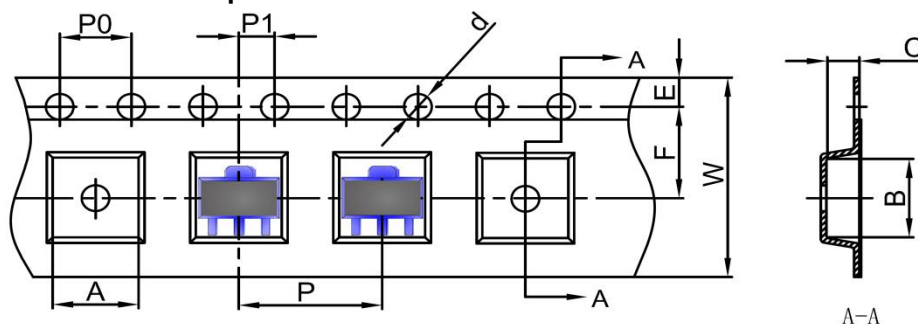
#### Note:

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

# PLASTIC-ENCAPSULATE VOLTAGE REGULATORS

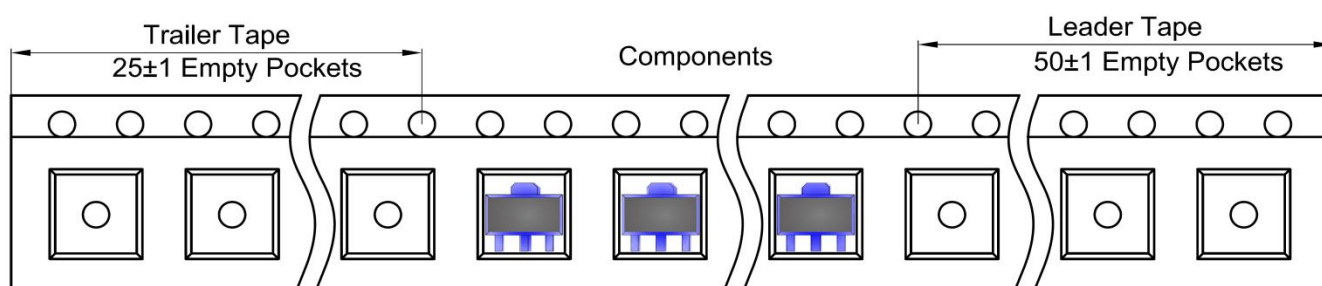
## SOT-89 Tape and Reel

### SOT-89 Embossed Carrier Tape

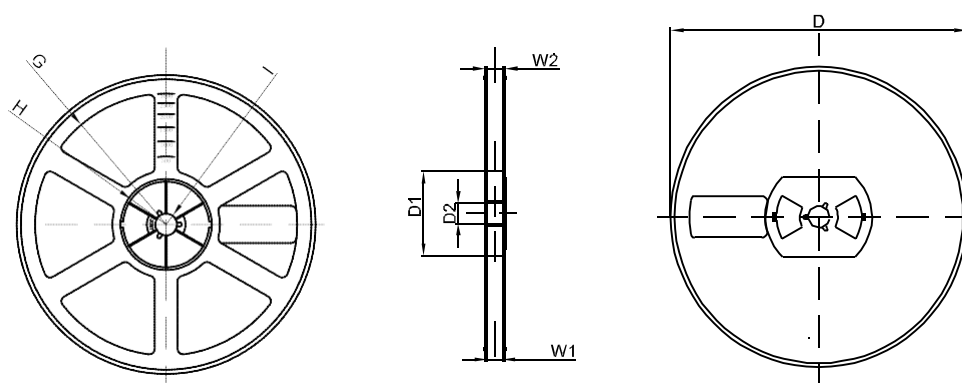


| DIMENSIONS ARE IN MILLIMETER |      |      |      |       |      |      |      |      |      |       |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| TYPE                         | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W     |
| SOT-89                       | 4.85 | 4.45 | 1.85 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |
| TOLERANCE                    | ±0.1 | ±0.1 | ±0.1 | ±0.1  | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1  |

### SOT-89 Tape Leader and Trailer



### SOT-89 Reel



| DIMENSIONS ARE IN MILLIMETER |      |       |       |     |        |       |       |       |
|------------------------------|------|-------|-------|-----|--------|-------|-------|-------|
| REEL OPTION                  | D    | D1    | D2    | G   | H      | I     | W1    | W2    |
| 7" DIA                       | Ø178 | 54.40 | 13.00 | R78 | R25.60 | R6.50 | 13.20 | 16.50 |
| TOLERANCE                    | ±2   | ±1    | ±1    | ±1  | ±1     | ±1    | ±1    | ±1    |