

TA78DM05S, TA78DM08S, TA78DM09S, TA78DM12S

5V, 8V, 9V, 12V

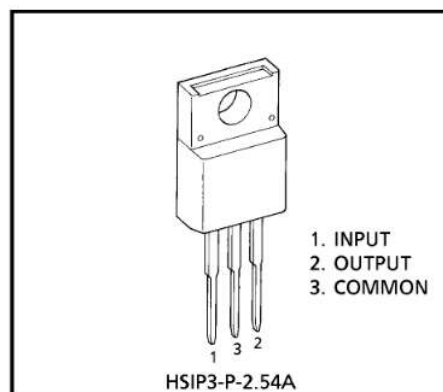
LOW DROPOUT VOLTAGE REGULATOR

The TA78DMxxS series consists of positive fixed output voltage regulator IC capable of sourcing current up to 500mA.

Due to the features of low dropout voltage and low standby current, these devices are useful for battery powered equipment.

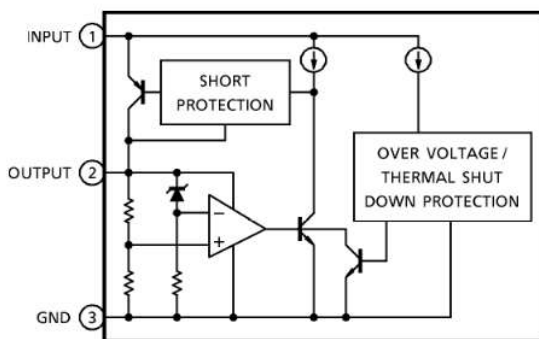
FEATURES

- Low Standby Current of 800 μ A Typical.
- Maximum Output Current Up to 500mA.
- Low Dropout Voltage of Less than 0.75V (IO = 0.5A).
- Multi-protection : Reverse Connection of Power Supply, 60V Load Dump, Thermal Shut Down and Current Limiting.
- Metal Fin (Tab) is Fully Covered with Mold Resin. (TO-220 NIS package)



Weight : 1.7g (Typ.)

BLOCK DIAGRAM



951001EBA1

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MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|--------------------------|----------------------|-------------|------|
| Operating Input Voltage | V _{IN} | 29 | V |
| Input Voltage of Surge | V _{IN} | 60 | V |
| Power Dissipation | P _D | (Ta = 25°C) | 2 |
| | | (Tc = 25°C) | 20 |
| Operating Temperature | T _{opr} | -40~85 | °C |
| Storage Temperature | T _{stg} | -55~150 | °C |
| Thermal Resistance | R _{th(j-c)} | 6.25 | °C/W |
| | R _{th(j-a)} | 62.5 | |
| Storage Temperature·Time | T _{sol} | 260 (10s) | °C |

TA78DM05S

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, V_{IN} = 14V, I_{OUT} = 250mA, T_j = 25°C, C_{IN} = 0.1μF, C_{OUT} = 100μF)

| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|-------------------|---------------|---|------|------|------|------|
| Output Voltage | V _{OUT} | — | — | 4.75 | 5 | 5.25 | V |
| | | | 6V ≤ V _{IN} ≤ 26V, 5mA ≤ I _{OUT} ≤ 250mA | 4.7 | — | 5.3 | |
| Line Regulation | Reg·line | — | 6V ≤ V _{IN} ≤ 26V | — | 3 | 30 | mV |
| Load Regulation | Reg·load | — | V _{IN} = 6V, 5mA ≤ I _{OUT} ≤ 500mA | — | 66 | 240 | mV |
| | | | V _{IN} = 26V, 5mA ≤ I _{OUT} ≤ 500mA | — | 40 | 240 | |
| Quiescent Current | I _{CC} | — | 6V ≤ V _{IN} ≤ 26V, I _{OUT} = 0mA | — | 0.8 | 1.4 | mA |
| | | | 6V ≤ V _{IN} ≤ 26V, I _{OUT} = 250mA | — | 14 | 27 | |
| Dropout Voltage | V _{DROP} | — | I _{OUT} = 250mA | — | 0.2 | 0.35 | V |
| | | | I _{OUT} = 500mA | — | 0.4 | 0.75 | |
| Short Circuit Current Limit | I _{SC} | — | — | — | 0.7 | — | A |

TA78DM08S

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, V_{IN} = 16V, I_{OUT} = 250mA, T_j = 25°C, C_{IN} = 0.1μF, C_{OUT} = 100μF)

| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|-------------------|---------------|---|------|------|------|------|
| Output Voltage | V _{OUT} | — | — | 7.6 | 8 | 8.4 | V |
| | | | 9V ≤ V _{IN} ≤ 26V, 5mA ≤ I _{OUT} ≤ 250mA | 7.52 | — | 8.48 | |
| Line Regulation | Reg·line | — | 9V ≤ V _{IN} ≤ 26V | — | 6 | 48 | mV |
| Load Regulation | Reg·load | — | V _{IN} = 9V, 5mA ≤ I _{OUT} ≤ 500mA | — | 54 | 380 | mV |
| | | | V _{IN} = 26V, 5mA ≤ I _{OUT} ≤ 500mA | — | 47 | 380 | |
| Quiescent Current | I _{CC} | — | 9V ≤ V _{IN} ≤ 26V, I _{OUT} = 0mA | — | 0.9 | 1.5 | mA |
| | | | 9V ≤ V _{IN} ≤ 26V, I _{OUT} = 250mA | — | 16 | 27 | |
| Dropout Voltage | V _{DROP} | — | I _{OUT} = 250mA | — | 0.2 | 0.35 | V |
| | | | I _{OUT} = 500mA | — | 0.4 | 0.75 | |
| Short Circuit Current Limit | I _{SC} | — | — | — | 0.7 | — | A |

TA78DM09S

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, $V_{IN} = 16V$, $I_{OUT} = 250mA$, $T_j = 25^\circ C$, $C_{IN} = 0.1\mu F$, $C_{OUT} = 100\mu F$)

| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|------------|---------------|---|------|------|------|------|
| Output Voltage | V_{OUT} | — | — | 8.55 | 9 | 9.45 | V |
| | | | $10V \leq V_{IN} \leq 26V$, $5mA \leq I_{OUT} \leq 250mA$ | 8.46 | — | 9.54 | |
| Line Regulation | Reg-line | — | $10V \leq V_{IN} \leq 26V$ | — | 9 | 54 | mV |
| Load Regulation | Reg-load | — | $V_{IN} = 10V$, $5mA \leq I_{OUT} \leq 500mA$ | — | 47 | 430 | mV |
| | | | $V_{IN} = 26V$, $5mA \leq I_{OUT} \leq 500mA$ | — | 50 | 430 | |
| Quiescent Current | I_{CC} | — | $10V \leq V_{IN} \leq 26V$, $I_{OUT} = 0mA$ | — | 0.9 | 1.6 | mA |
| | | | $10V \leq V_{IN} \leq 26V$, $I_{OUT} = 250mA$ | — | 16 | 27 | |
| Dropout Voltage | V_{DROP} | — | $I_{OUT} = 250mA$ | — | 0.2 | 0.35 | V |
| | | | $I_{OUT} = 500mA$ | — | 0.4 | 0.75 | |
| Short Circuit Current Limit | I_{SC} | — | — | — | 0.7 | — | A |

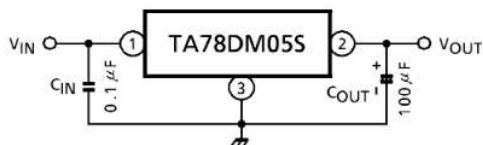
TA78DM12S

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, $V_{IN} = 18V$, $I_{OUT} = 250mA$, $T_j = 25^\circ C$, $C_{IN} = 0.1\mu F$, $C_{OUT} = 100\mu F$)

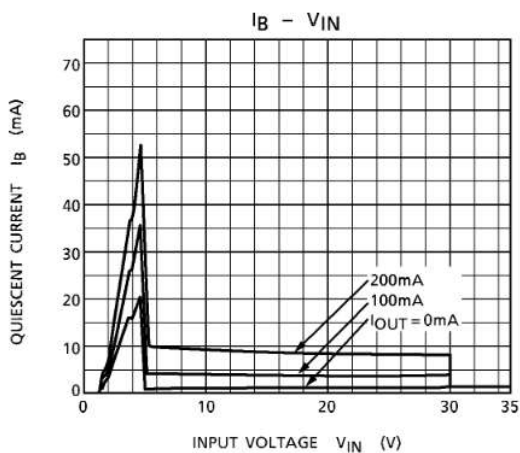
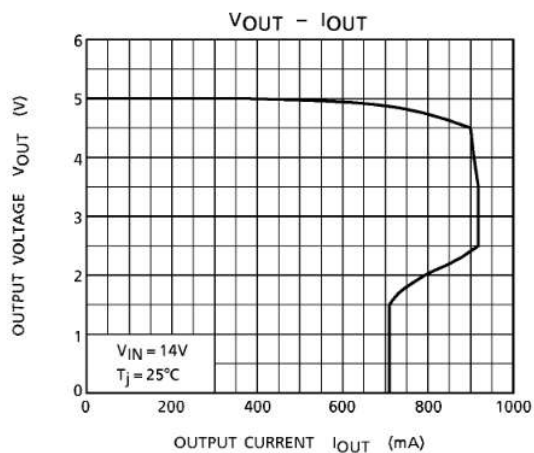
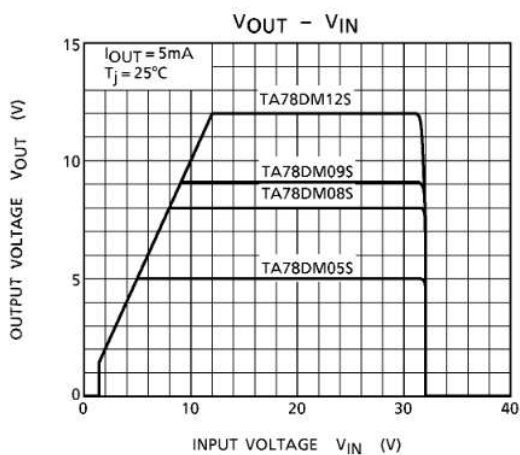
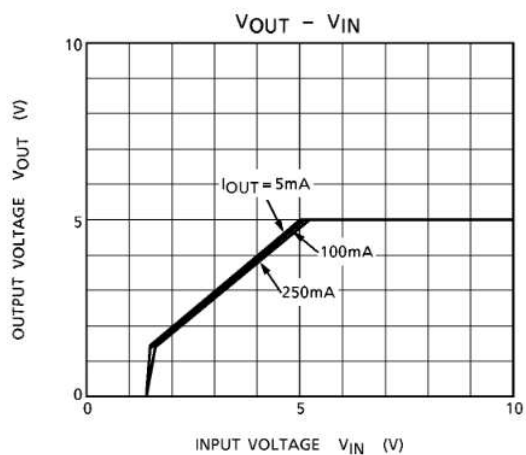
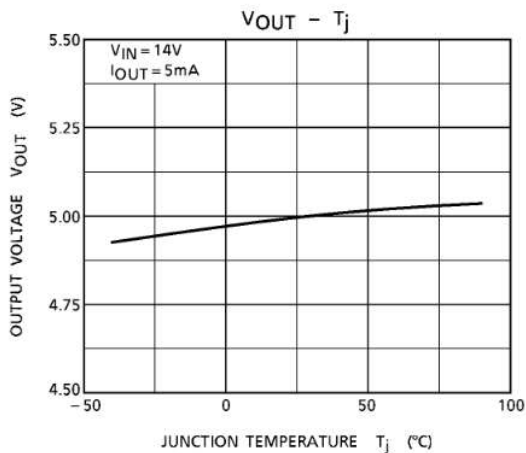
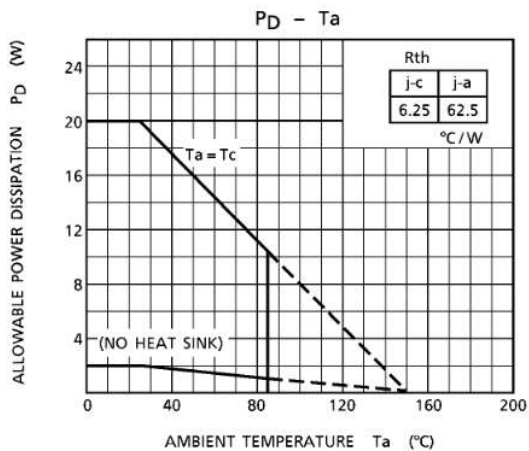
| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|------------|---------------|---|-------|------|-------|------|
| Output Voltage | V_{OUT} | — | — | 11.4 | 12 | 12.6 | V |
| | | | $13V \leq V_{IN} \leq 26V$, $5mA \leq I_{OUT} \leq 250mA$ | 11.28 | — | 12.72 | |
| Line Regulation | Reg-line | — | $13V \leq V_{IN} \leq 26V$ | — | 10 | 72 | mV |
| Load Regulation | Reg-load | — | $V_{IN} = 13V$, $5mA \leq I_{OUT} \leq 500mA$ | — | 84 | 580 | mV |
| | | | $V_{IN} = 26V$, $5mA \leq I_{OUT} \leq 500mA$ | — | 45 | 580 | |
| Quiescent Current | I_{CC} | — | $13V \leq V_{IN} \leq 26V$, $I_{OUT} = 0mA$ | — | 1.0 | 1.7 | mA |
| | | | $13V \leq V_{IN} \leq 26V$, $I_{OUT} = 250mA$ | — | 16 | 27 | |
| Dropout Voltage | V_{DROP} | — | $I_{OUT} = 250mA$ | — | 0.2 | 0.35 | V |
| | | | $I_{OUT} = 500mA$ | — | 0.4 | 0.75 | |
| Short Circuit Current Limit | I_{SC} | — | — | — | 0.7 | — | A |

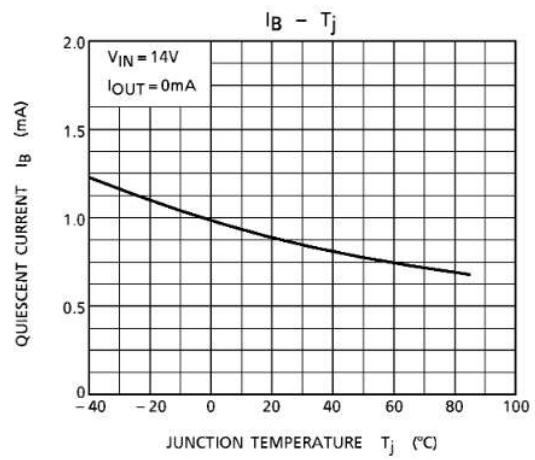
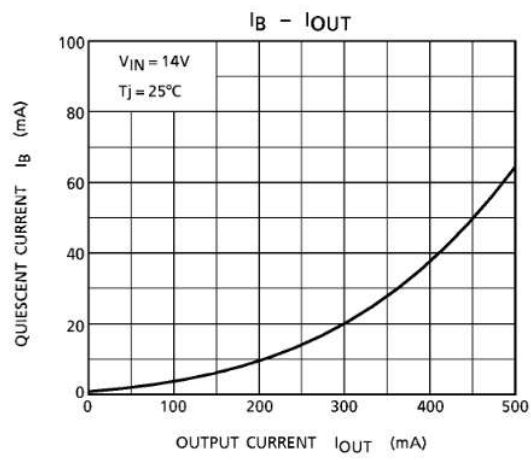
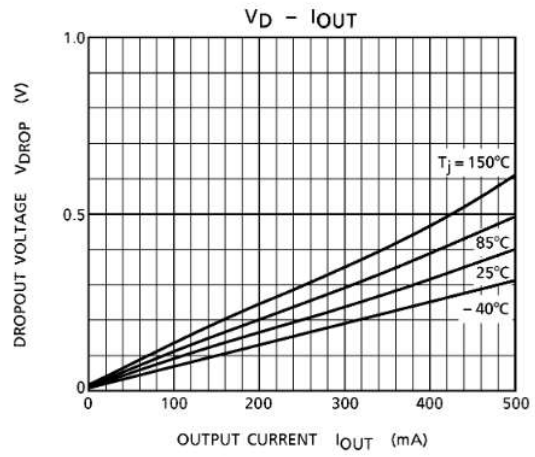
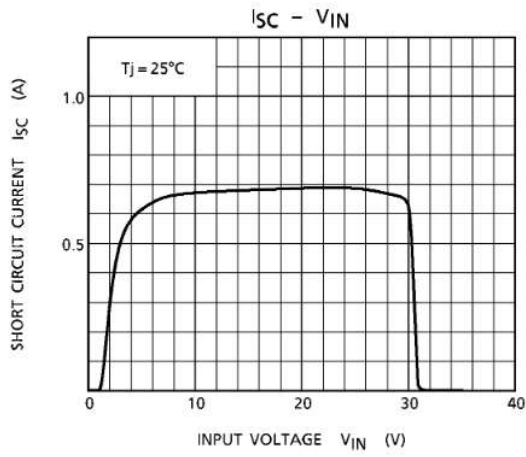
APPLICATION CIRCUITS



Capacitor C_2 must be guaranteed to operate of the temperature range that the regulator should be operated correctly.

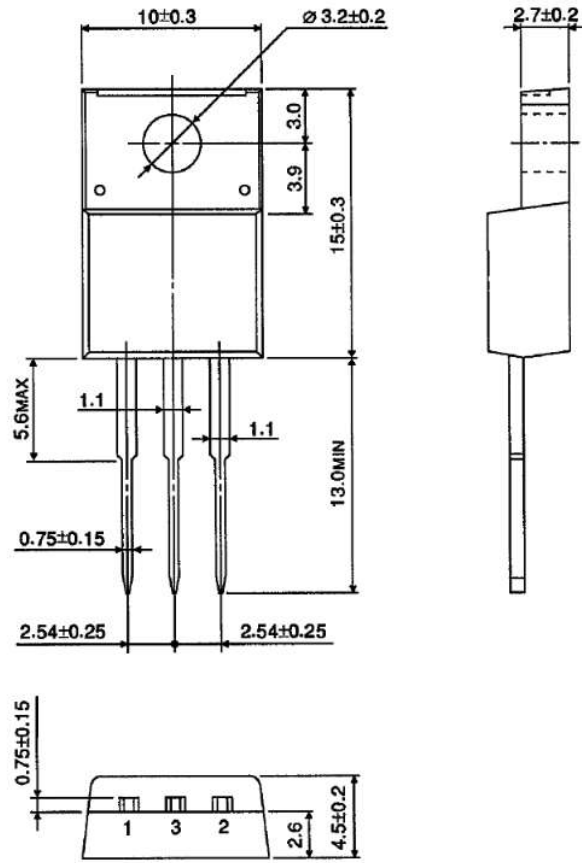
$100\mu F$ is a suitable value to suppress the oscillation phenomenon at the output terminal.





OUTLINE DRAWING
HSIP3-P-2.54A

Unit : mm



Weight : 1.7g (Typ.)