

**TA78DM05S, TA78DM08S, TA78DM09S, TA78DM12S**

**5V, 8V, 9V, 12V**

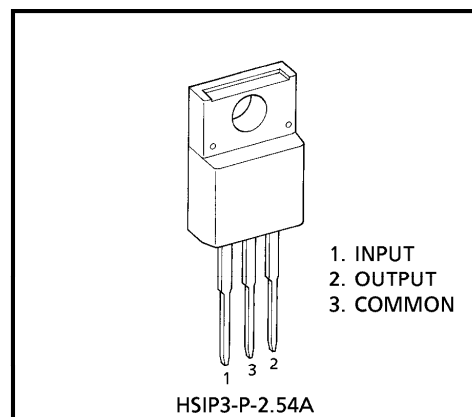
**LOW DROPOUT VOLTAGE REGULATOR**

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.

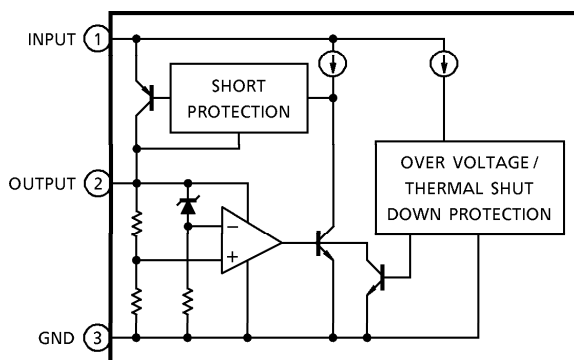
**FEATURES**

- Low Standby Current of 800 $\mu$ 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**



961001EBA1

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**MAXIMUM RATINGS (Ta = 25°C)**

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

**TA78DM05S**

**ELECTRICAL CHARACTERISTICS**

(Unless otherwise specified, V<sub>IN</sub> = 14V, I<sub>OUT</sub> = 250mA, T<sub>j</sub> = 25°C, C<sub>IN</sub> = 0.1μF, C<sub>OUT</sub> = 100μF)

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

**TA78DM08S**

**ELECTRICAL CHARACTERISTICS**

(Unless otherwise specified, V<sub>IN</sub> = 16V, I<sub>OUT</sub> = 250mA, T<sub>j</sub> = 25°C, C<sub>IN</sub> = 0.1μF, C<sub>OUT</sub> = 100μF)

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

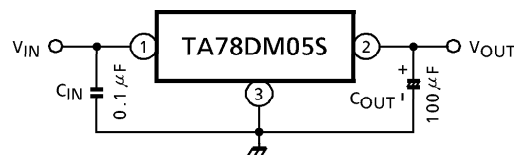
TA78DM12S

**ELECTRICAL CHARACTERISTICS**

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

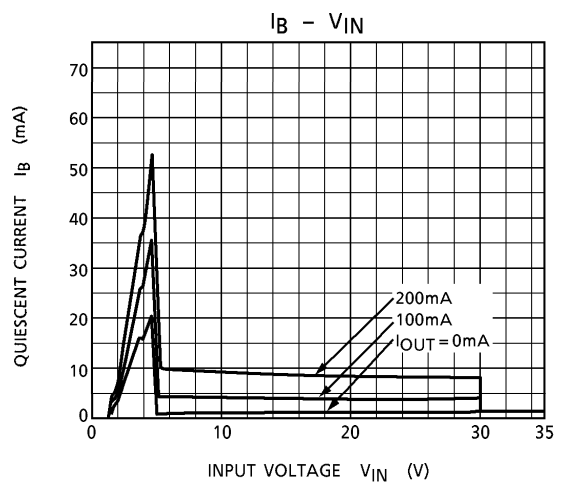
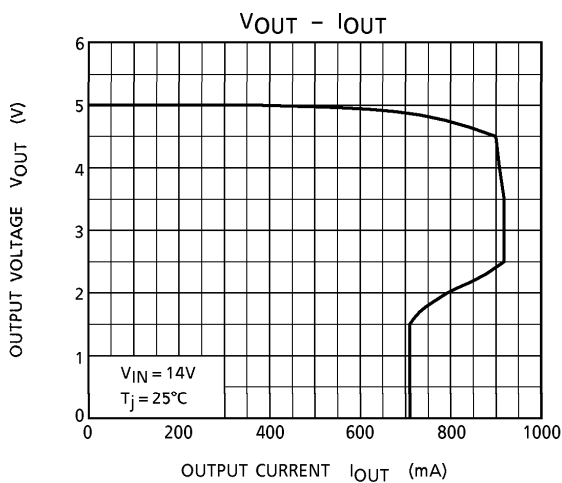
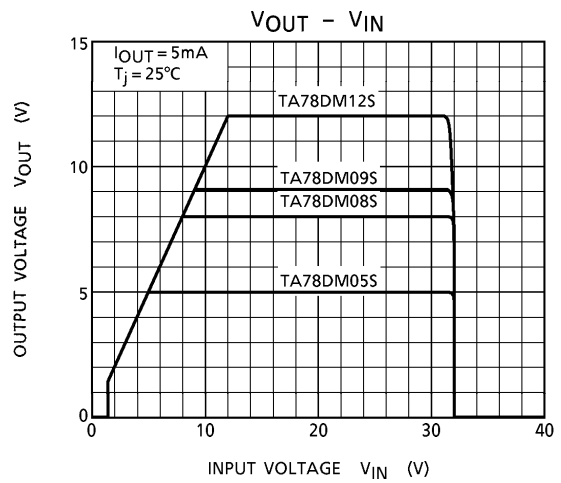
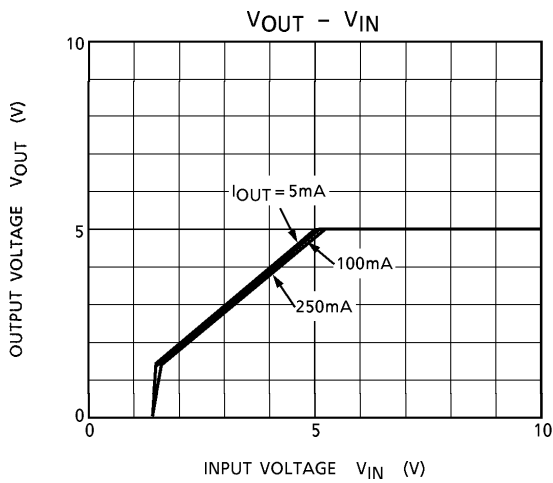
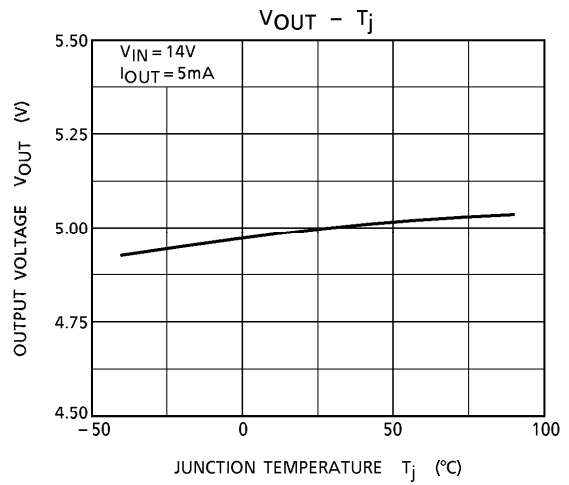
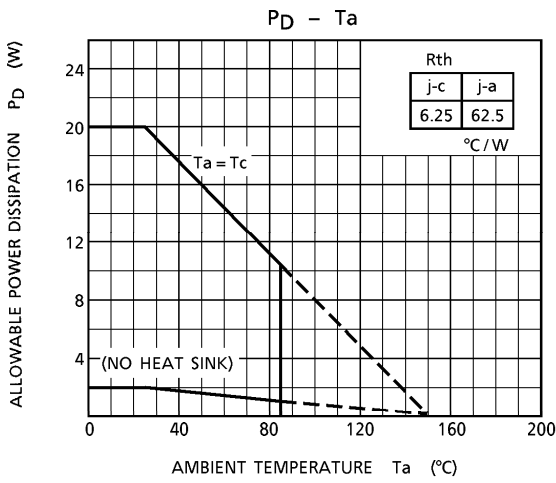
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{OUT}$	—	—	11.4	12	12.6	V
			$13V \leq V_{IN} \leq 26V$ , $5mA \leq I_{OUT} \leq 250mA$	11.28	—	12.72	
Line Regulation	Reg·line	—	$13V \leq V_{IN} \leq 26V$	—	10	72	mV
Load Regulation	Reg·load	—	$V_{IN} = 13V$ , $5mA \leq I_{OUT} \leq 500mA$	—	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

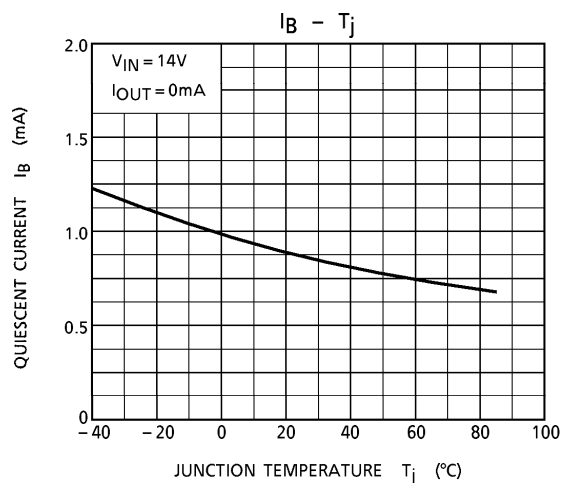
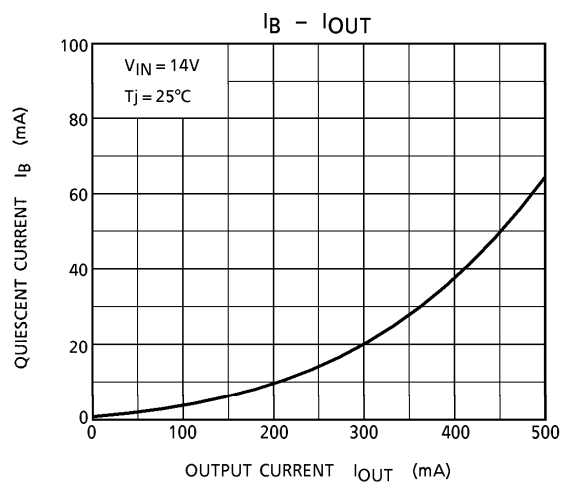
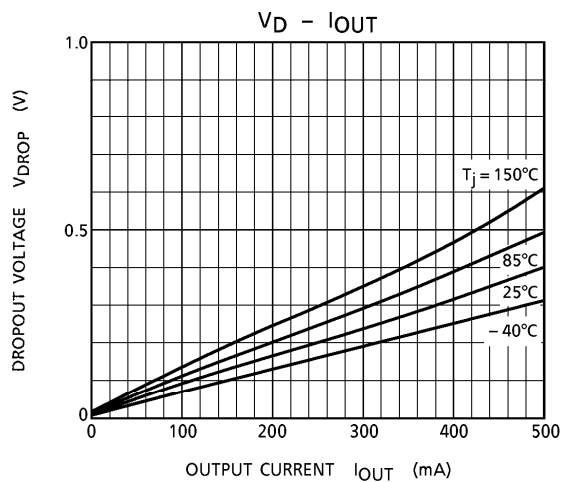
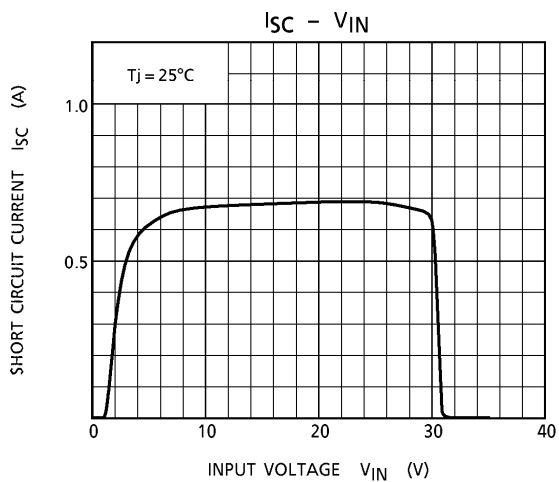
**APPLICATION CIRCUITS**



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

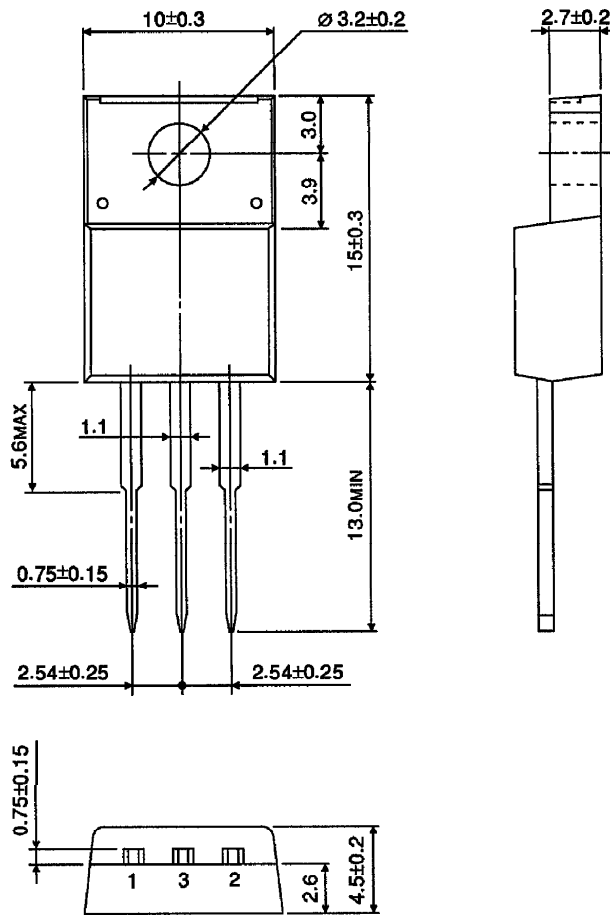
$100\mu F$  is a suitable value to suppress the oscillation phenomenon at the output terminal.





**OUTLINE DRAWING**  
HSIP3-P-2.54A

Unit : mm



Weight : 1.7g (Typ.)