

## Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Operating input voltage		V <sub>IN</sub>	29	V
Input voltage of surge		V <sub>IN</sub>	60	V
Power dissipation	(Ta = 25°C)	P <sub>D</sub>	2	W
	(Tc = 25°C)		20	
Operating temperature		T <sub>opr</sub>	-40~85	°C
Storage temperature		T <sub>stg</sub>	-55~150	°C
Junction temperature		T <sub>j</sub>	150	°C
Thermal resistance		R <sub>th</sub> (j-c)	6.25	°C/W
		R <sub>th</sub> (j-a)	62.5	
Storage temperature-time		T <sub>sol</sub>	260 (10s)	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

## TA78DL05AS

### Electrical Characteristics (Unless otherwise specified, V<sub>IN</sub> = 14 V, I<sub>OUT</sub> = 10 mA, T<sub>j</sub> = 25°C)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V <sub>OUT</sub>	—	5.35 V ≤ V <sub>IN</sub> ≤ 26 V, -40°C ≤ Ta ≤ 85°C	4.75	5.0	5.25	V
Line regulation	Reg-line	—	9 V ≤ V <sub>IN</sub> ≤ 16 V	—	2	10	mV
			6 V ≤ V <sub>IN</sub> ≤ 26 V	—	4	30	
Load regulation	Reg-load	—	10 mA ≤ I <sub>OUT</sub> ≤ 200 mA	—	14	50	mV
Quiescent current	I <sub>B</sub>	—	I <sub>OUT</sub> ≤ 10 mA, 6 V ≤ V <sub>IN</sub> ≤ 26 V	—	0.5	1	mA
Dropout voltage	V <sub>D</sub>	—	I <sub>OUT</sub> = 50 mA	—	0.15	0.3	V
			I <sub>OUT</sub> = 200 mA	—	0.4	0.6	
Max operating voltage	V <sub>IN</sub>	—	—	29	33	—	V

## TA78DL06AS

Electrical Characteristics (Unless otherwise specified,  $V_{IN} = 14\text{ V}$ ,  $I_{OUT} = 10\text{ mA}$ ,  $T_j = 25^\circ\text{C}$ )

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	$V_{OUT}$	—	$6.35\text{ V} \leq V_{IN} \leq 26\text{ V}$ , $-40^\circ\text{C} \leq T_a \leq 85^\circ\text{C}$	5.7	6.0	6.3	V
Line regulation	Reg.line	—	$10\text{ V} \leq V_{IN} \leq 17\text{ V}$	—	2	12	mV
			$7\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	5	36	
Load regulation	Reg.load	—	$10\text{ mA} \leq I_{OUT} \leq 200\text{ mA}$	—	17	60	mV
Quiescent current	$I_B$	—	$I_{OUT} \leq 10\text{ mA}$ , $7\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	0.55	—	mA
Dropout voltage	$V_D$	—	$I_{OUT} = 50\text{ mA}$	—	0.15	0.3	V
			$I_{OUT} = 200\text{ mA}$	—	0.4	0.6	
Max operating voltage	$V_{IN}$	—	—	29	33	—	V

## TA78DL08AS

Electrical Characteristics (Unless otherwise specified,  $V_{IN} = 16\text{ V}$ ,  $I_{OUT} = 10\text{ mA}$ ,  $T_j = 25^\circ\text{C}$ )

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	$V_{OUT}$	—	$8.35\text{ V} \leq V_{IN} \leq 26\text{ V}$ , $-40^\circ\text{C} \leq T_a \leq 85^\circ\text{C}$	7.6	8	8.4	V
Line regulation	Reg.line	—	$12\text{ V} \leq V_{IN} \leq 19\text{ V}$	—	3	16	mV
			$9\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	6	45	
Load regulation	Reg.load	—	$10\text{ mA} \leq I_{OUT} \leq 200\text{ mA}$	—	22	80	mV
Quiescent current	$I_B$	—	$I_{OUT} \leq 10\text{ mA}$ , $9\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	0.6	—	mA
Dropout voltage	$V_D$	—	$I_{OUT} = 50\text{ mA}$	—	0.15	0.3	V
			$I_{OUT} = 200\text{ mA}$	—	0.4	0.6	
Max operating voltage	$V_{IN}$	—	—	29	33	—	V

## TA78DL09AS

Electrical Characteristics (Unless otherwise specified,  $V_{IN} = 16\text{ V}$ ,  $I_{OUT} = 10\text{ mA}$ ,  $T_j = 25^\circ\text{C}$ )

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	$V_{OUT}$	—	$9.35\text{ V} \leq V_{IN} \leq 26\text{ V}$ , $-40^\circ\text{C} \leq T_a \leq 85^\circ\text{C}$	8.55	9	9.45	V
Line regulation	Reg.line	—	$13\text{ V} \leq V_{IN} \leq 20\text{ V}$	—	3	18	mV
			$10\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	7	50	
Load regulation	Reg.load	—	$10\text{ mA} \leq I_{OUT} \leq 200\text{ mA}$	—	25	90	mV
Quiescent current	$I_B$	—	$I_{OUT} \leq 10\text{ mA}$ , $10\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	0.65	—	mA
Dropout voltage	$V_D$	—	$I_{OUT} = 50\text{ mA}$	—	0.15	0.3	V
			$I_{OUT} = 200\text{ mA}$	—	0.4	0.6	
Max operating voltage	$V_{IN}$	—	—	29	33	—	V

## TA78DL10AS

Electrical Characteristics (Unless otherwise specified,  $V_{IN} = 16\text{ V}$ ,  $I_{OUT} = 10\text{ mA}$ ,  $T_j = 25^\circ\text{C}$ )

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	$V_{OUT}$	—	$10.35\text{ V} \leq V_{IN} \leq 26\text{ V}$ , $-40^\circ\text{C} \leq T_a \leq 85^\circ\text{C}$	9.5	10	10.5	V
Line regulation	Reg.line	—	$14\text{ V} \leq V_{IN} \leq 21\text{ V}$	—	4	20	mV
			$11\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	8	60	
Load regulation	Reg.load	—	$10\text{ mA} \leq I_{OUT} \leq 200\text{ mA}$	—	28	100	mV
Quiescent current	$I_B$	—	$I_{OUT} \leq 10\text{ mA}$ , $11\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	0.7	—	mA
Dropout voltage	$V_D$	—	$I_{OUT} = 50\text{ mA}$	—	0.15	0.3	V
			$I_{OUT} = 200\text{ mA}$	—	0.4	0.6	
Max operating voltage	$V_{IN}$	—	—	29	33	—	V

## TA78DL12AS

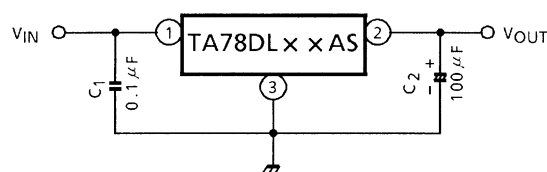
Electrical Characteristics (Unless otherwise specified,  $V_{IN} = 18\text{ V}$ ,  $I_{OUT} = 10\text{ mA}$ ,  $T_j = 25^\circ\text{C}$ )

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	$V_{OUT}$	—	$12.35\text{ V} \leq V_{IN} \leq 26\text{ V}$ , $-40^\circ\text{C} \leq T_a \leq 85^\circ\text{C}$	11.4	12	12.6	V
Line regulation	Reg.line	—	$16\text{ V} \leq V_{IN} \leq 23\text{ V}$	—	5	24	mV
			$13\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	10	70	
Load regulation	Reg.load	—	$10\text{ mA} \leq I_{OUT} \leq 200\text{ mA}$	—	33	120	mV
Quiescent current	$I_B$	—	$I_{OUT} \leq 10\text{ mA}$ , $13\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	0.8	—	mA
Dropout voltage	$V_D$	—	$I_{OUT} = 50\text{ mA}$	—	0.15	0.3	V
			$I_{OUT} = 200\text{ mA}$	—	0.4	0.6	
Max operating voltage	$V_{IN}$	—	—	29	33	—	V

## TA78DL15AS

Electrical Characteristics (Unless otherwise specified,  $V_{IN} = 20\text{ V}$ ,  $I_{OUT} = 10\text{ mA}$ ,  $T_j = 25^\circ\text{C}$ )

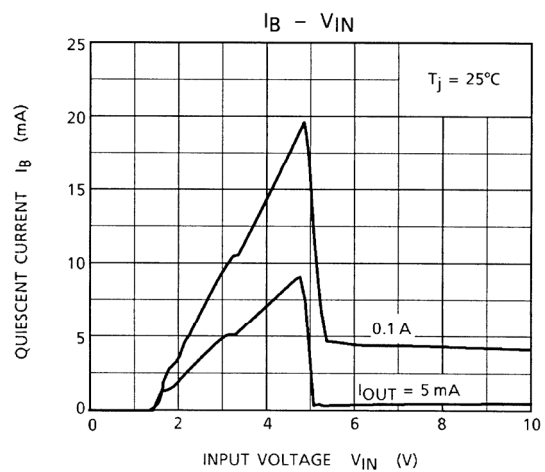
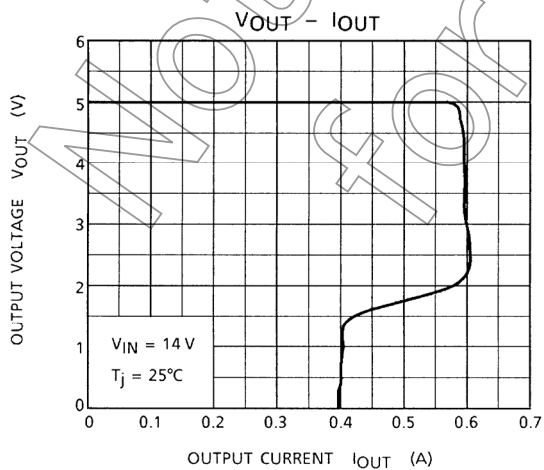
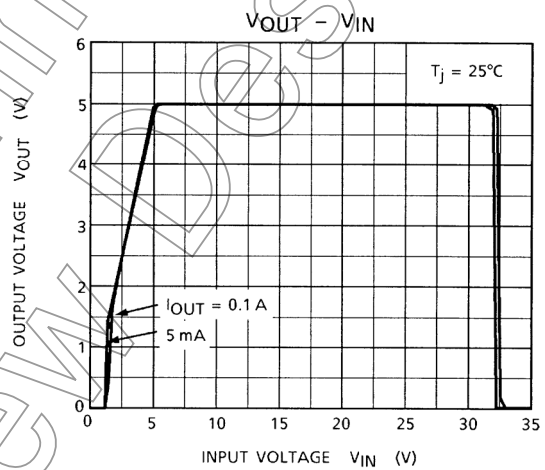
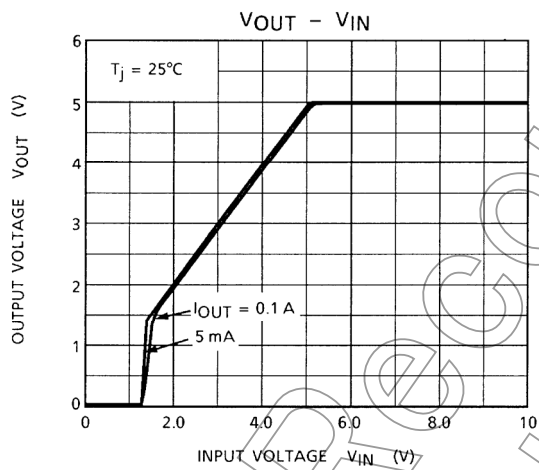
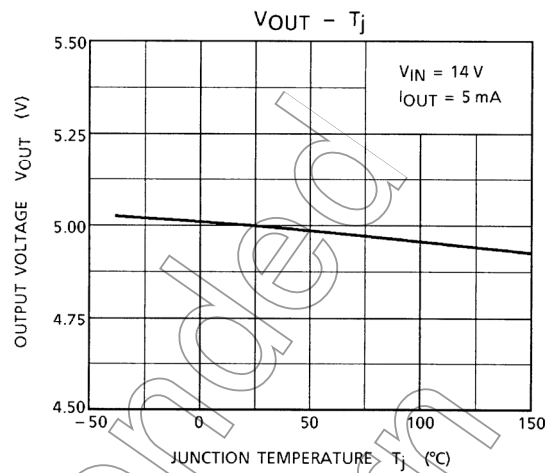
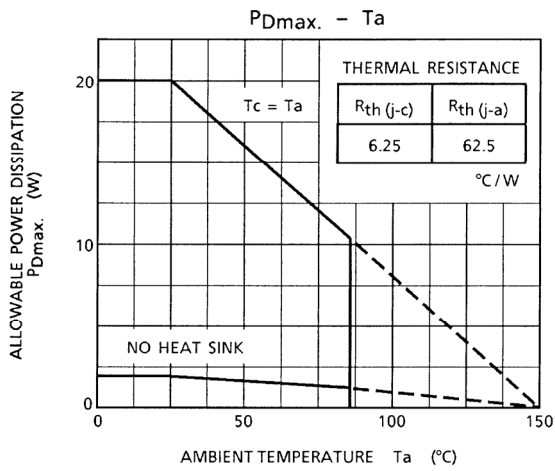
Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	$V_{OUT}$	—	$15.35\text{ V} \leq V_{IN} \leq 26\text{ V}$ , $-40^\circ\text{C} \leq T_a \leq 85^\circ\text{C}$	14.25	15	15.75	V
Line regulation	Reg.line	—	$19\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	6	30	mV
			$16\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	12	80	
Load regulation	Reg.load	—	$10\text{ mA} \leq I_{OUT} \leq 200\text{ mA}$	—	40	150	mV
Quiescent current	$I_B$	—	$I_{OUT} \leq 10\text{ mA}$ , $16\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	0.9	—	mA
Dropout voltage	$V_D$	—	$I_{OUT} = 50\text{ mA}$	—	0.15	0.3	V
			$I_{OUT} = 200\text{ mA}$	—	0.4	0.6	
Max operating voltage	$V_{IN}$	—	—	29	33	—	V

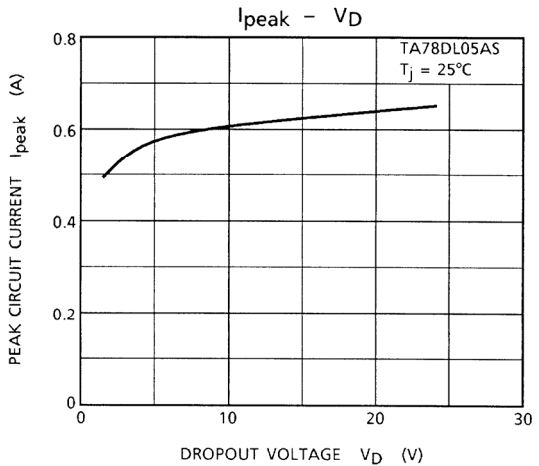
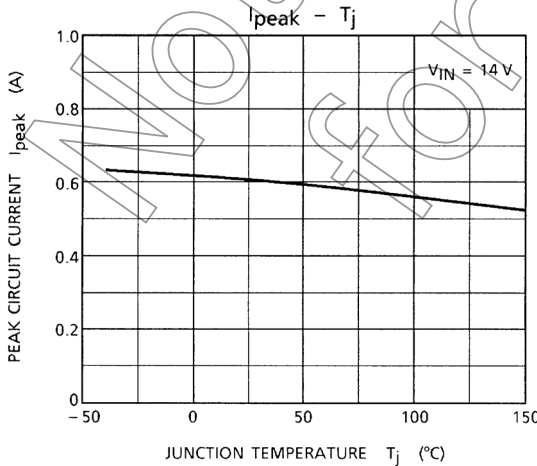
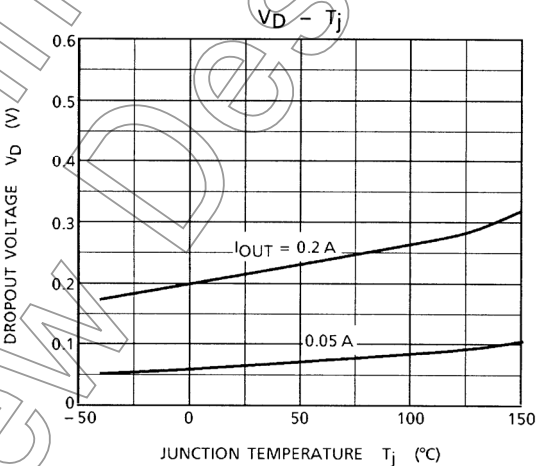
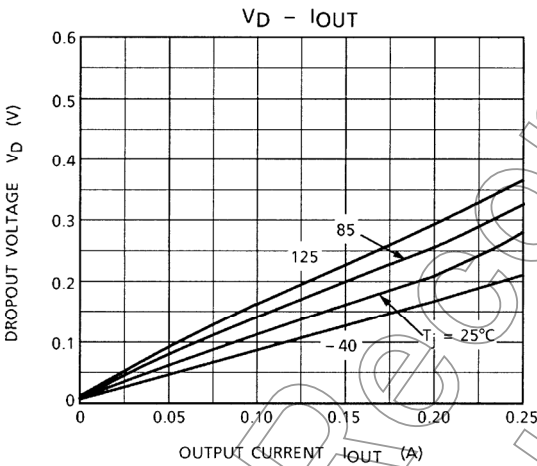
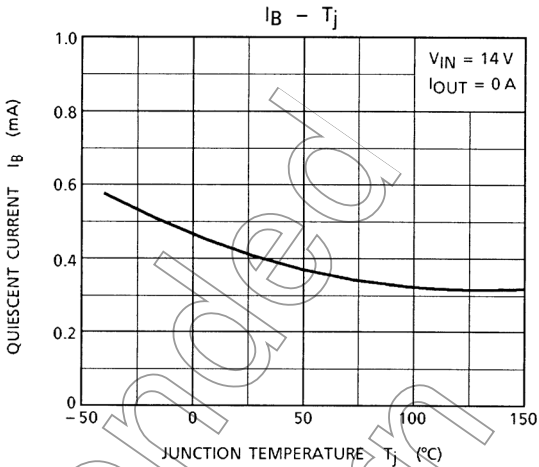
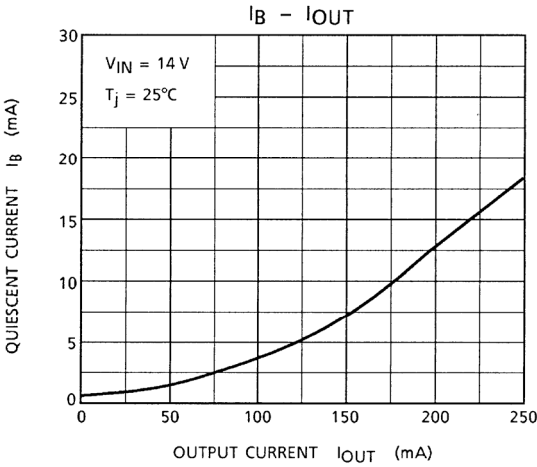
**Application Circuit**

Capacitor  $C_{IN}/C_{OUT}$  must be guaranteed to operate of the temperature range that the regulator should be operated correctly.

The equivalent series resistance (ESR) of  $C_{OUT}$  must be less than 1  $\Omega$  in operating temperature range.

Not Recommended  
for New Design

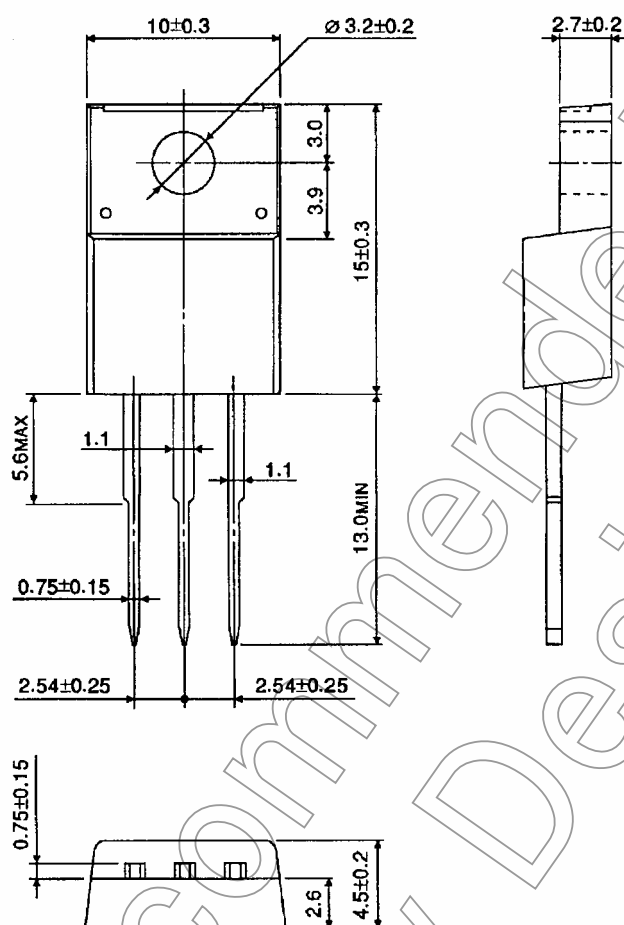




## Package Dimensions

HSIP3-P-2.54A

Unit: mm



Weight: 1.7 g (typ.)

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20070701-EN

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