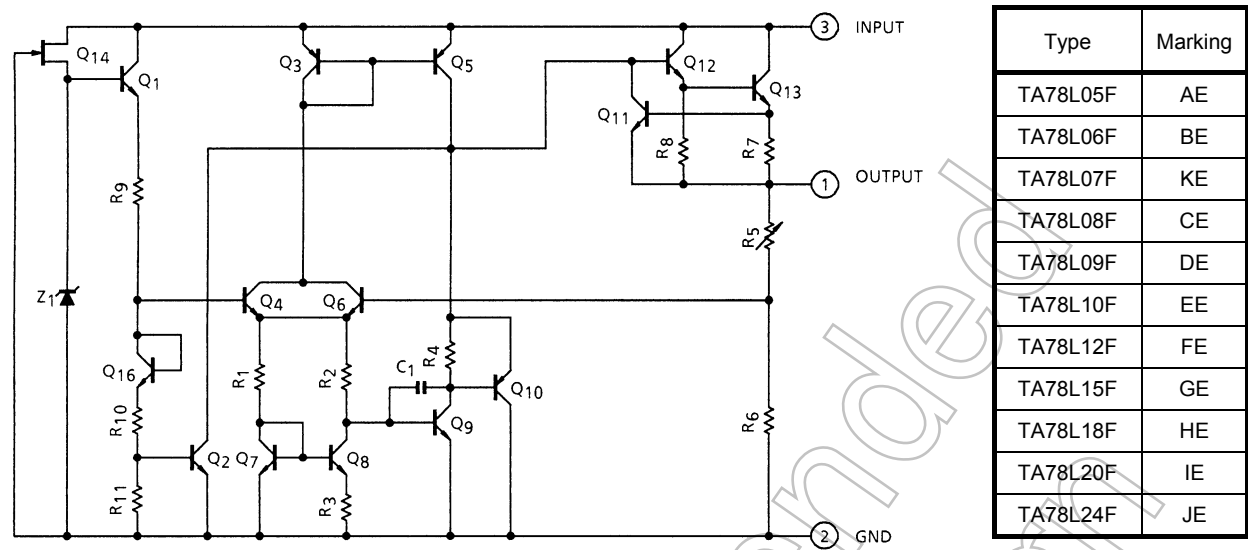


Equivalent Circuit



Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Input voltage	TA78L05F	V _{IN}	35	V
	TA78L06F			
	TA78L07F			
	TA78L08F			
	TA78L09F			
	TA78L10F			
	TA78L12F			
	TA78L15F			
	TA78L18F		40	
	TA78L20F			
	TA78L24F			
Output current		I _{OUT}	0.15	A
Power dissipation	(Ta = 25°C)	P _D	500	mW
Operating temperature		T _{opr}	-30 to 85	°C
Storage temperature		T _{stg}	-55 to 150	°C
Junction temperature		T _j	150	°C
Thermal resistance		R _{th (j-a)}	250	°C/W

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).

TA78L05F
Electrical Characteristics

 (Unless otherwise specified, $V_{IN} = 10\text{ V}$, $I_{OUT} = 40\text{ mA}$, $C_{IN} = 0.33\text{ }\mu\text{F}$, $C_{OUT} = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	4.75	5.0	5.25	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	—	55	150	mV
			$7.0\text{ V} \leq V_{IN} \leq 20\text{ V}$	—	45	100	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	—	11	60	mV
			$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	5.0	30	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	4.65	—	5.35	V
			$7.0\text{ V} \leq V_{IN} \leq 20\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	4.65	—	5.35	
			$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	4.65	—	5.35	
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$	—	3.1	6.0	mA
			$T_j = 125^\circ\text{C}$	—	—	5.5	
Quiescent current change	ΔI_B	1	$T_j = 25^\circ\text{C}$	—	—	1.5	mA
			$8.0\text{ V} \leq V_{IN} \leq 20\text{ V}$	—	—	0.1	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	40	—	μV_{rms}
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	12	—	mV/kh
Ripple rejection ratio	R.R.	3	$f = 120\text{ Hz}$, $8.0\text{ V} \leq V_{IN} \leq 18\text{ V}$, $T_j = 25^\circ\text{C}$	41	49	—	dB
Dropout voltage	V_D	1	$T_j = 25^\circ\text{C}$	—	1.7	—	V
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-0.6	—	mV/ $^\circ\text{C}$

TA78L06F

Electrical Characteristics

(Unless otherwise specified, $V_{IN} = 11\text{ V}$, $I_{OUT} = 40\text{ mA}$, $C_{IN} = 0.33\text{ }\mu\text{F}$, $C_{OUT} = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	5.7	6.0	6.3	V
Line regulation	Reg.line	1	$T_j = 25^\circ\text{C}$	—	50	150	mV
			$8.1\text{ V} \leq V_{IN} \leq 21\text{ V}$	—	45	110	
Load regulation	Reg.load	1	$T_j = 25^\circ\text{C}$	—	12	70	mV
			$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	5.5	35	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	5.58	—	6.42	V
			$8.1\text{ V} \leq V_{IN} \leq 21\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	5.58	—	6.42	
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$	—	3.1	6.0	mA
			$T_j = 125^\circ\text{C}$	—	—	5.5	
Quiescent current change	ΔI_B	1	$T_j = 25^\circ\text{C}$	—	—	1.5	mA
			$9.0\text{ V} \leq V_{IN} \leq 20\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	0.1	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	40	—	μV_{rms}
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	14	—	mV/kh
Ripple rejection ratio	R.R.	3	$f = 120\text{ Hz}$, $9.0\text{ V} \leq V_{IN} \leq 19\text{ V}$, $T_j = 25^\circ\text{C}$	39	47	—	dB
Dropout voltage	V_D	1	$T_j = 25^\circ\text{C}$	—	1.7	—	V
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-0.7	—	mV/ $^\circ\text{C}$

TA78L07F

Electrical Characteristics

(Unless otherwise specified, $V_{IN} = 12\text{ V}$, $I_{OUT} = 40\text{ mA}$, $C_{IN} = 0.33\text{ }\mu\text{F}$, $C_{OUT} = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	6.65	7.0	7.35	V
Line regulation	Reg.line	1	$T_j = 25^\circ\text{C}$	—	50	160	mV
			$10\text{ V} \leq V_{IN} \leq 22\text{ V}$	—	45	115	
Load regulation	Reg.load	1	$T_j = 25^\circ\text{C}$	—	13	75	mV
			$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	6.0	40	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	6.51	—	7.49	V
			$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	6.51	—	7.49	
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$	—	3.1	6.5	mA
			$T_j = 125^\circ\text{C}$	—	—	6.0	
Quiescent current change	ΔI_B	1	$T_j = 25^\circ\text{C}$	—	—	1.5	mA
			$10\text{ V} \leq V_{IN} \leq 22\text{ V}$	—	—	0.1	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	50	—	μV_{rms}
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	17	—	mV/kh
Ripple rejection ratio	R.R.	3	$f = 120\text{ Hz}$, $10\text{ V} \leq V_{IN} \leq 20\text{ V}$, $T_j = 25^\circ\text{C}$	37	46	—	dB
Dropout voltage	V_D	1	$T_j = 25^\circ\text{C}$	—	1.7	—	V
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-0.75	—	mV/ $^\circ\text{C}$

TA78L08F

Electrical Characteristics

(Unless otherwise specified, $V_{IN} = 14\text{ V}$, $I_{OUT} = 40\text{ mA}$, $C_{IN} = 0.33\text{ }\mu\text{F}$, $C_{OUT} = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	7.6	8.0	8.4	V
Line regulation	Reg.line	1	$T_j = 25^\circ\text{C}$	—	20	175	mV
			$10.5\text{ V} \leq V_{IN} \leq 23\text{ V}$	—	12	125	
Load regulation	Reg.load	1	$T_j = 25^\circ\text{C}$	—	15	80	mV
			$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	7.0	40	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	7.44	—	8.56	V
			$10.5\text{ V} \leq V_{IN} \leq 23\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	7.44	—	8.56	
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$	—	3.1	6.5	mA
			$T_j = 125^\circ\text{C}$	—	—	6.0	
Quiescent current change	ΔI_B	1	$T_j = 25^\circ\text{C}$	—	—	1.5	mA
			$11\text{ V} \leq V_{IN} \leq 23\text{ V}$	—	—	0.1	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	60	—	μV_{rms}
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	20	—	mV/kh
Ripple rejection ratio	R.R.	3	$f = 120\text{ Hz}$, $12\text{ V} \leq V_{IN} \leq 23\text{ V}$, $T_j = 25^\circ\text{C}$	37	45	—	dB
Dropout voltage	V_D	1	$T_j = 25^\circ\text{C}$	—	1.7	—	V
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-0.8	—	mV/ $^\circ\text{C}$

TA78L09F

Electrical Characteristics

(Unless otherwise specified, $V_{IN} = 15\text{ V}$, $I_{OUT} = 40\text{ mA}$, $C_{IN} = 0.33\text{ }\mu\text{F}$, $C_{OUT} = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	8.55	9.0	9.45	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	—	80	200	mV
			$11.4\text{ V} \leq V_{IN} \leq 24\text{ V}$	—	20	160	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	—	17	90	mV
			$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	8.0	45	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	8.37	—	9.63	V
			$11.4\text{ V} \leq V_{IN} \leq 24\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	8.37	—	9.63	
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$	—	3.2	6.5	mA
			$T_j = 125^\circ\text{C}$	—	—	6.0	
Quiescent current change	ΔI_B	1	$T_j = 25^\circ\text{C}$	—	—	1.5	mA
			$12\text{ V} \leq V_{IN} \leq 24\text{ V}$	—	—	0.1	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	65	—	μV_{rms}
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	21	—	mV/kh
Ripple rejection ratio	R.R.	3	$f = 120\text{ Hz}$, $12\text{ V} \leq V_{IN} \leq 24\text{ V}$, $T_j = 25^\circ\text{C}$	36	44	—	dB
Dropout voltage	V_D	1	$T_j = 25^\circ\text{C}$	—	1.7	—	V
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-0.85	—	mV/ $^\circ\text{C}$

TA78L10F
Electrical Characteristics

(Unless otherwise specified, $V_{IN} = 16\text{ V}$, $I_{OUT} = 40\text{ mA}$, $C_{IN} = 0.33\text{ }\mu\text{F}$, $C_{OUT} = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	9.5	10	10.5	V
Line regulation	Reg.line	1	$T_j = 25^\circ\text{C}$	—	80	230	mV
			$12.5\text{ V} \leq V_{IN} \leq 25\text{ V}$	—	30	170	
Load regulation	Reg.load	1	$T_j = 25^\circ\text{C}$	—	18	90	mV
			$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	8.5	45	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	9.3	—	10.7	V
			$12.5\text{ V} \leq V_{IN} \leq 25\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	9.3	—	10.7	
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$	—	3.2	6.5	mA
			$T_j = 125^\circ\text{C}$	—	—	6.0	
Quiescent current change	ΔI_B	1	$T_j = 25^\circ\text{C}$	—	—	1.5	mA
			$13\text{ V} \leq V_{IN} \leq 25\text{ V}$	—	—	0.1	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	70	—	μV_{rms}
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	22	—	mV/kh
Ripple rejection ratio	R.R.	3	$f = 120\text{ Hz}$, $13\text{ V} \leq V_{IN} \leq 24\text{ V}$, $T_j = 25^\circ\text{C}$	36	43	—	dB
Dropout voltage	V_D	1	$T_j = 25^\circ\text{C}$	—	1.7	—	V
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-0.9	—	mV/ $^\circ\text{C}$

TA78L12F

Electrical Characteristics

(Unless otherwise specified, $V_{IN} = 19\text{ V}$, $I_{OUT} = 40\text{ mA}$, $C_{IN} = 0.33\text{ }\mu\text{F}$, $C_{OUT} = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	11.4	12	12.6	V
Line regulation	Reg.line	1	$T_j = 25^\circ\text{C}$	—	120	250	mV
			$14.5\text{ V} \leq V_{IN} \leq 27\text{ V}$	—	100	200	
Load regulation	Reg.load	1	$T_j = 25^\circ\text{C}$	—	20	100	mV
			$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	10	50	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	11.16	—	12.84	V
			$14.5\text{ V} \leq V_{IN} \leq 27\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	11.16	—	12.84	
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$	—	3.2	6.5	mA
			$T_j = 125^\circ\text{C}$	—	—	6.0	
Quiescent current change	ΔI_B	1	$T_j = 25^\circ\text{C}$	—	—	1.5	mA
			$16\text{ V} \leq V_{IN} \leq 27\text{ V}$	—	—	0.1	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	80	—	μV_{rms}
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	24	—	mV/kh
Ripple rejection ratio	R.R.	3	$f = 120\text{ Hz}$, $15\text{ V} \leq V_{IN} \leq 25\text{ V}$, $T_j = 25^\circ\text{C}$	36	41	—	dB
Dropout voltage	V_D	1	$T_j = 25^\circ\text{C}$	—	1.7	—	V
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-1.0	—	mV/ $^\circ\text{C}$

TA78L15F
Electrical Characteristics

 (Unless otherwise specified, $V_{IN} = 23\text{ V}$, $I_{OUT} = 40\text{ mA}$, $C_{IN} = 0.33\text{ }\mu\text{F}$, $C_{OUT} = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	14.25	15	15.75	V
Line regulation	Reg.line	1	$T_j = 25^\circ\text{C}$	—	130	300	mV
			$17.5\text{ V} \leq V_{IN} \leq 30\text{ V}$	—	110	250	
Load regulation	Reg.load	1	$T_j = 25^\circ\text{C}$	—	25	150	mV
			$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	12	75	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	13.95	—	16.05	V
			$17.5\text{ V} \leq V_{IN} \leq 30\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	13.95	—	16.05	
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$	—	3.3	6.5	mA
			$T_j = 125^\circ\text{C}$	—	—	6.0	
Quiescent current change	ΔI_B	1	$T_j = 25^\circ\text{C}$	—	—	1.5	mA
			$20\text{ V} \leq V_{IN} \leq 30\text{ V}$	—	—	0.1	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	90	—	μV_{rms}
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	30	—	mV/kh
Ripple rejection ratio	R.R.	3	$f = 120\text{ Hz}$, $18.5\text{ V} \leq V_{IN} \leq 28.5\text{ V}$, $T_j = 25^\circ\text{C}$	34	40	—	dB
Dropout voltage	V_D	1	$T_j = 25^\circ\text{C}$	—	1.7	—	V
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-1.3	—	mV/ $^\circ\text{C}$

TA78L18F

Electrical Characteristics

(Unless otherwise specified, $V_{IN} = 27\text{ V}$, $I_{OUT} = 40\text{ mA}$, $C_{IN} = 0.33\text{ }\mu\text{F}$, $C_{OUT} = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	17.1	18	18.9	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	—	32	325	mV
			$22\text{ V} \leq V_{IN} \leq 33\text{ V}$	—	27	275	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	—	30	170	mV
			$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	15	75	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	16.74	—	19.26	V
			$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	16.74	—	19.26	
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$	—	3.3	6.5	mA
			$T_j = 125^\circ\text{C}$	—	—	6.0	
Quiescent current change	ΔI_B	1	$T_j = 25^\circ\text{C}$	—	—	1.5	mA
			$22\text{ V} \leq V_{IN} \leq 33\text{ V}$	—	—	0.1	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	150	—	μV_{rms}
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	45	—	mV/kh
Ripple rejection ratio	R.R.	3	$f = 120\text{ Hz}$, $23\text{ V} \leq V_{IN} \leq 33\text{ V}$, $T_j = 25^\circ\text{C}$	32	38	—	dB
Dropout voltage	V_D	1	$T_j = 25^\circ\text{C}$	—	1.7	—	V
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-1.5	—	mV/ $^\circ\text{C}$

TA78L20F
Electrical Characteristics

 (Unless otherwise specified, $V_{IN} = 29\text{ V}$, $I_{OUT} = 40\text{ mA}$, $C_{IN} = 0.33\text{ }\mu\text{F}$, $C_{OUT} = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

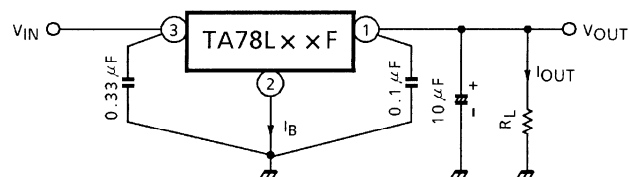
Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	19.0	20	21.0	V
Line regulation	Reg.line	1	$T_j = 25^\circ\text{C}$	—	33	330	mV
			$23.5\text{ V} \leq V_{IN} \leq 35\text{ V}$	—	28	285	
Load regulation	Reg.load	1	$T_j = 25^\circ\text{C}$	—	33	180	mV
			$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	17	90	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	18.6	—	21.4	V
			$23.5\text{ V} \leq V_{IN} \leq 35\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	18.6	—	21.4	
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$	—	3.3	6.5	mA
			$T_j = 125^\circ\text{C}$	—	—	6.0	
Quiescent current change	ΔI_B	1	$T_j = 25^\circ\text{C}$	—	—	1.5	mA
			$24\text{ V} \leq V_{IN} \leq 35\text{ V}$	—	—	0.1	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	170	—	μV_{rms}
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	49	—	mV/kh
Ripple rejection ratio	R.R.	3	$f = 120\text{ Hz}$, $25\text{ V} \leq V_{IN} \leq 35\text{ V}$, $T_j = 25^\circ\text{C}$	31	37	—	dB
Dropout voltage	V_D	1	$T_j = 25^\circ\text{C}$	—	1.7	—	V
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-1.7	—	mV/ $^\circ\text{C}$

TA78L24F
Electrical Characteristics

 (Unless otherwise specified, $V_{IN} = 33\text{ V}$, $I_{OUT} = 40\text{ mA}$, $C_{IN} = 0.33\text{ }\mu\text{F}$, $C_{OUT} = 0.1\text{ }\mu\text{F}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

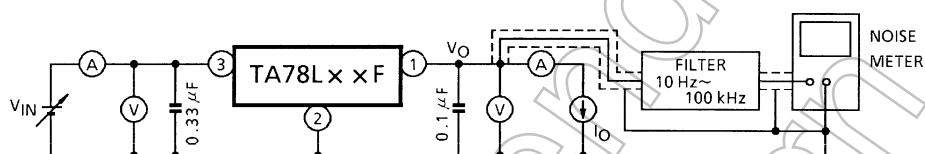
Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	22.8	24	25.2	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	—	35	350	mV
			$27.5\text{ V} \leq V_{IN} \leq 38\text{ V}$	—	30	300	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	—	40	200	mV
			$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	20	100	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	22.32	—	25.68	V
			$27.5\text{ V} \leq V_{IN} \leq 38\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	22.32	—	25.68	
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$	—	3.5	6.5	mA
			$T_j = 125^\circ\text{C}$	—	—	6.0	
Quiescent current change	ΔI_B	1	$T_j = 25^\circ\text{C}$	—	—	1.5	mA
			$28\text{ V} \leq V_{IN} \leq 38\text{ V}$	—	—	0.1	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	200	—	μV_{rms}
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	56	—	mV/kh
Ripple rejection ratio	R.R.	3	$f = 120\text{ Hz}$, $29\text{ V} \leq V_{IN} \leq 39\text{ V}$, $T_j = 25^\circ\text{C}$	31	35	—	dB
Dropout voltage	V_D	1	$T_j = 25^\circ\text{C}$	—	1.7	—	V
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-2.0	—	mV/ $^\circ\text{C}$

Test Circuit 1 / Standard Application



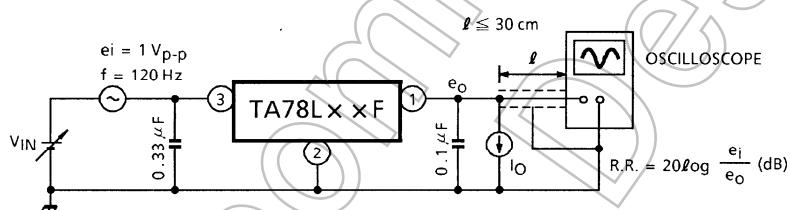
Test Circuit 2

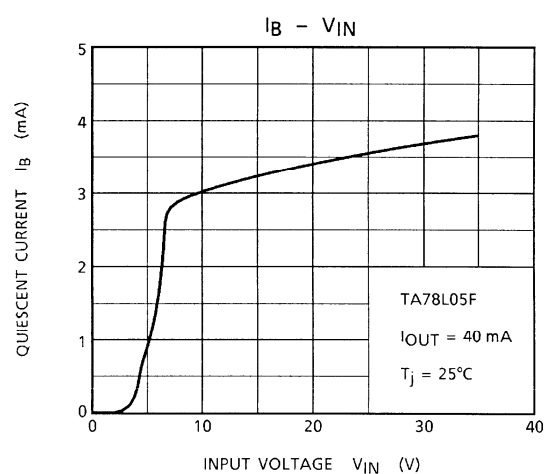
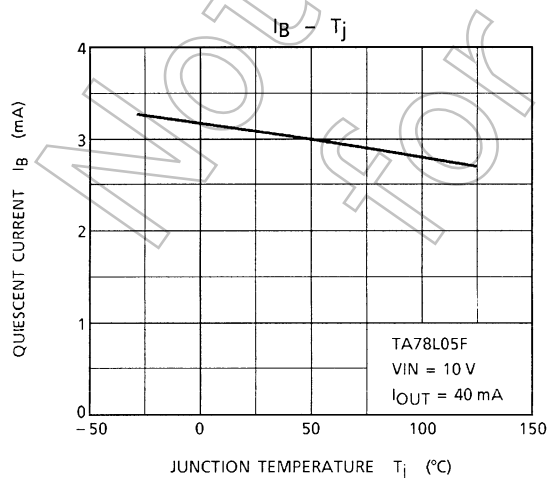
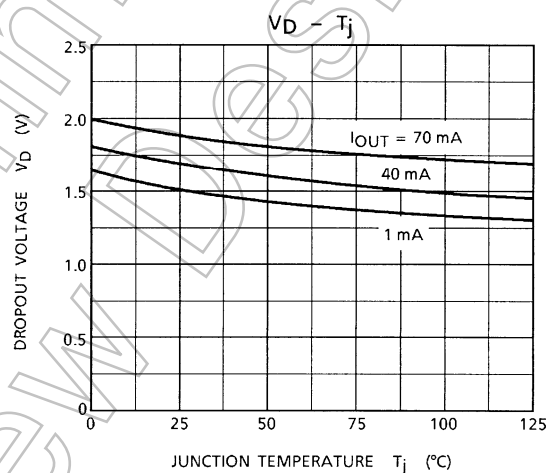
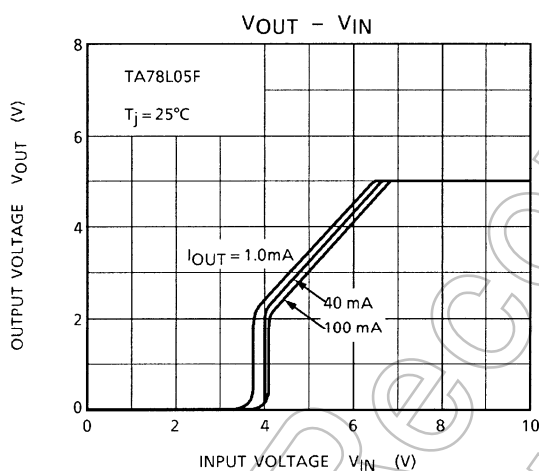
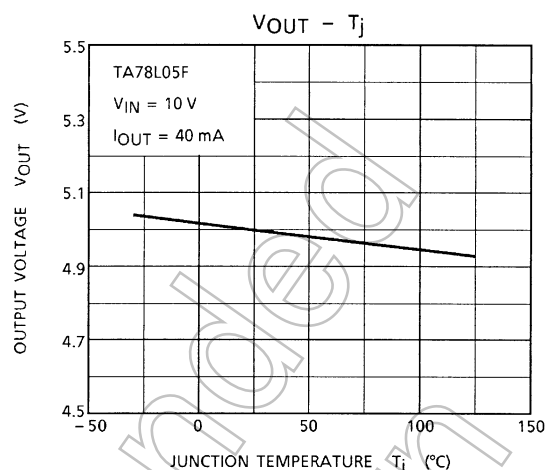
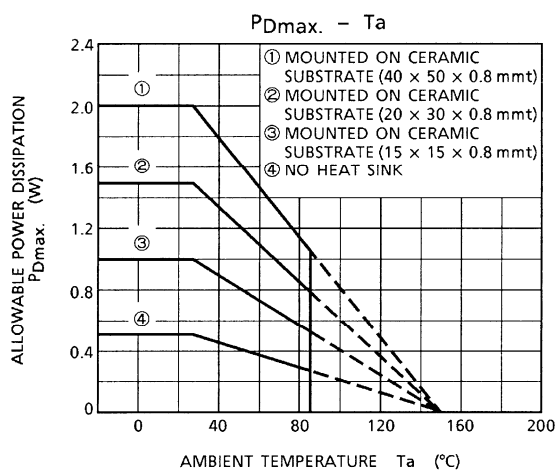
V_{NO}

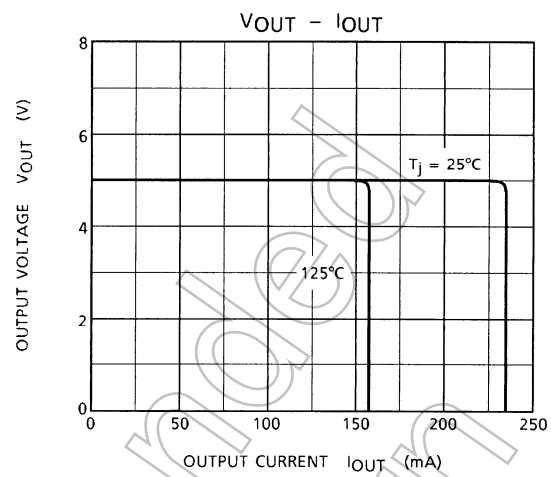
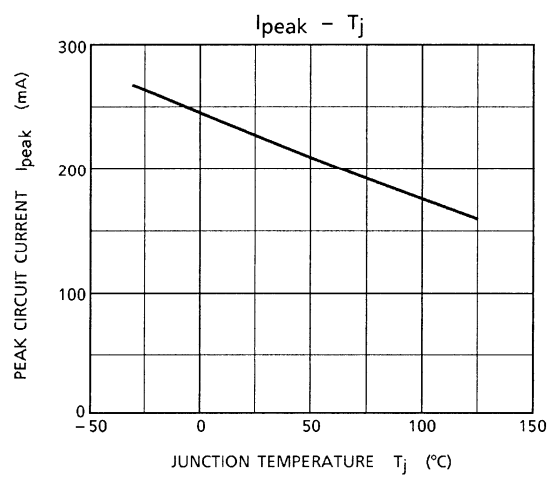


Test Circuit 3

R.R.



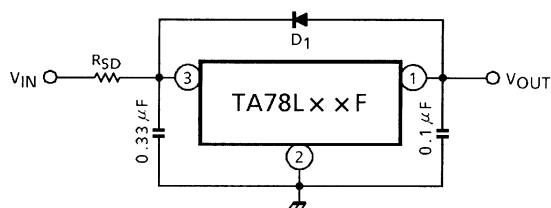




Not Recommended for New Design

Usage Precautions

Destruction of the IC may occur if high voltage in excess of the IC output voltage (typ. value) is applied to the IC output terminal. Where this possibility exists, connect a Zener diode between the output terminal and GND to prevent any application of excessive voltage.



- D₁** : IC protective diode
When surge voltage is applied to IC output terminal or $V_{IN} < V_{OUT}$ at the time of power ON/OFF, always connect the high speed switching diode D₁.
- R_{SD}** : Power limiting resistor
If V_{IN} is too high, always connect R_{SD} in order to reduce power consumption of IC.

- Low voltage

Do not apply voltage to the Product that is lower than the minimum operating voltage, or the Product's protective functions will not operate properly and the Product may be permanently damaged.

- Overcurrent Protection

The overcurrent protection circuits in the Product are designed to temporarily protect Product from minor overcurrent of brief duration. When the overcurrent protective function in the Product activates, immediately cease application of overcurrent to Product. Improper usage of Product, such as application of current to Product exceeding the absolute maximum ratings, could cause the overcurrent protection circuit not to operate properly and/or damage Product permanently even before the protection circuit starts to operate.

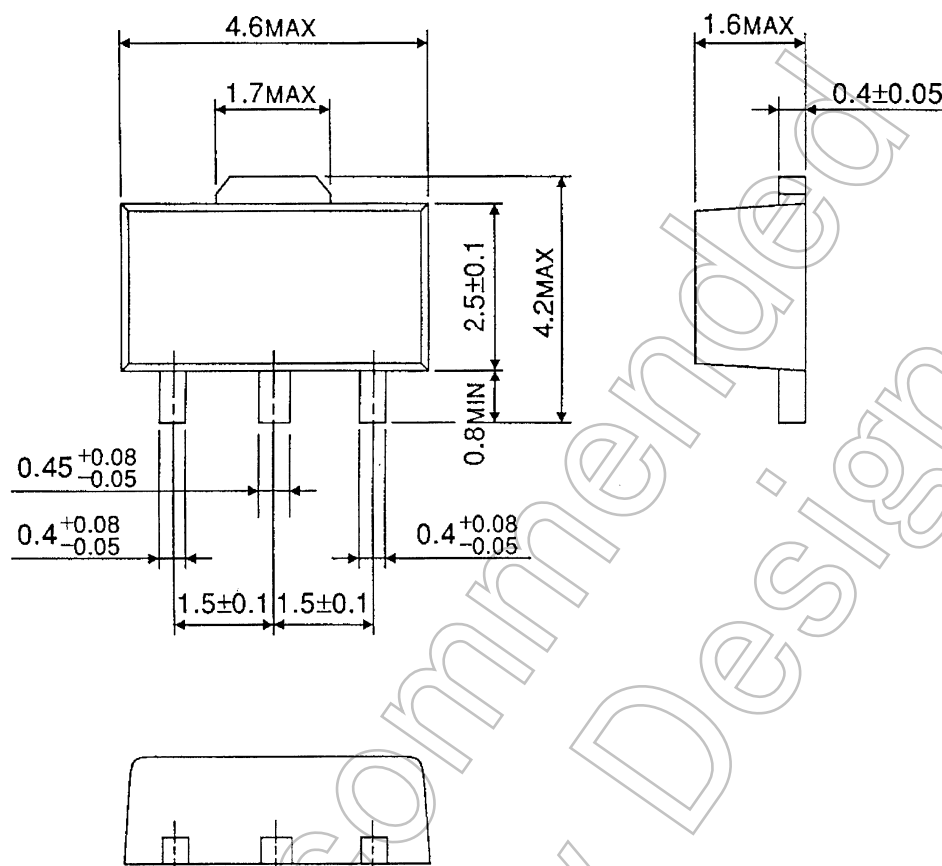
- Overheating Protection

The thermal shutdown circuits in the Product are designed to temporarily protect Product from minor overheating of brief duration. When the overheating protective function in the Product activates, immediately correct the overheating situation. Improper usage of Product, such as the application of heat to Product exceeding the absolute maximum ratings, could cause the overheating protection circuit not to operate properly and/or damage Product permanently even before the protection circuit starts to operate.

Package Dimensions

HSOP3-P-1.50

Unit : mm



Weight : 0.05 g (Typ.)

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