

TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

## TA79L05F, TA79L06F, TA79L08F, TA79L09F, TA79L10F, TA79L12F, TA79L15F, TA79L18F, TA79L20F, TA79L24F

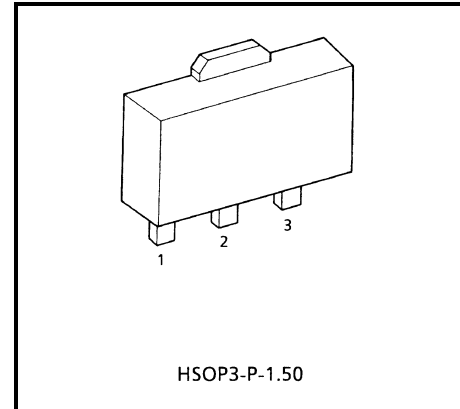
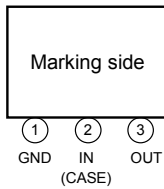
### Three-Terminal Negative Voltage Regulators

-5 V, -6 V, -8 V, -9 V, -10 V, -12 V, -15 V, -18 V, -20 V, -24 V

### Features

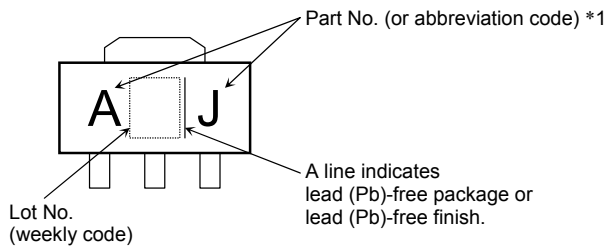
- Best suited to a power supply for TTL and C<sup>2</sup>MOS.
- Built-in over-current protective circuit.
- Built-in thermal protective circuit.
- Maximum output current of 150 mA (T<sub>j</sub> = 25°C).
- Packaged in Power Mini. (SOT-89).

### Pin Assignment



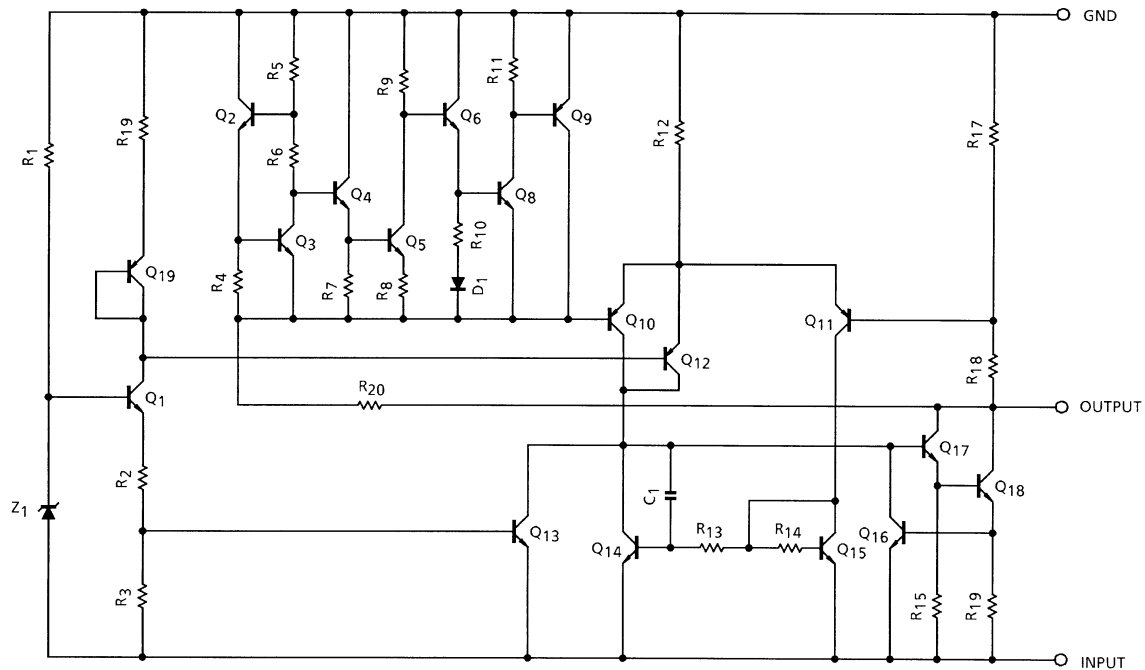
Weight: 0.05 g (Typ.)

### Marking



	Part No. (or abbreviation code)	Part No.
	*1	AJ
BJ		TA79L06F
CJ		TA79L08F
DJ		TA79L09F
EJ		TA79L10F
FJ		TA79L12F
GJ		TA79L15F
HJ		TA79L18F
IJ		TA79L20F
JJ		TA79L24F

## Equivalent Circuit



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

Characteristics	Symbol	Rating	Unit
Input voltage	TA79L05F	-35	V
	TA79L06F		
	TA79L08F		
	TA79L09F		
	TA79L10F		
	TA79L12F		
	TA79L15F		
	TA79L18F		
	TA79L20F		
	TA79L24F		
			-40
Power dissipation (Ta = 25°C)	P <sub>D</sub>	500	mW
Operating temperature	T <sub>opr</sub>	-30~85	°C
Storage temperature	T <sub>stg</sub>	-55~150	°C
Junction temperature	T <sub>j</sub>	150	°C
Thermal resistance	R <sub>th(j-a)</sub>	250	°C/W

Type No.	Marking
TA79L05F	AJ
TA79L06F	BJ
TA79L08F	CJ
TA79L09F	DJ
TA79L10F	EJ
TA79L12F	FJ
TA79L15F	GJ
TA79L18F	HJ
TA79L20F	IJ
TA79L24F	JJ

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).

## TA79L05F

### 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	$T_j = 25^\circ\text{C}$	-5.2	-5.0	-4.8	V	
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	$-20\text{ V} \leq V_{IN} \leq -7.0\text{ V}$	—	55	150	mV
				$-20\text{ V} \leq V_{IN} \leq -8.0\text{ V}$	—	45	100	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	11	100	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	5.0	50	
Output voltage	$V_{OUT}$	1	$T_j = 25^\circ\text{C}$	$-20\text{ V} \leq V_{IN} \leq -7.0\text{ V}$ , $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	-5.25	—	-4.75	V
				$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	-5.25	—	-4.75	
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	$\Delta I_{BI}$	1	$T_j = 25^\circ\text{C}$	$-20\text{ V} \leq V_{IN} \leq -8.0\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1		$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	0.1	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	40	—	$\mu\text{V}_{\text{rms}}$	
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	12	—	mV/kh	
Ripple rejection ratio	R.R.	3	$-18\text{ V} \leq V_{IN} \leq -8.0\text{ V}$ , $T_j = 25^\circ\text{C}$ , $f = 120\text{ Hz}$	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	—	$\text{mV}/^\circ\text{C}$	

## TA79L06F

### 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	$T_j = 25^\circ\text{C}$	-6.24	-6.0	-5.76	V	
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	$-21\text{ V} \leq V_{IN} \leq -8.1\text{ V}$	—	50	150	mV
				$-21\text{ V} \leq V_{IN} \leq -9.0\text{ V}$	—	45	110	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	12	120	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	5.5	60	
Output voltage	$V_{OUT}$	1	$T_j = 25^\circ\text{C}$	$-21\text{ V} \leq V_{IN} \leq -8.1\text{ V}$ , $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	-6.3	—	-5.7	V
				$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	-6.3	—	-5.7	
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	$\Delta I_{BI}$	1	$T_j = 25^\circ\text{C}$	$-20\text{ V} \leq V_{IN} \leq -9.0\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1		$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	0.1	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	40	—	$\mu\text{V}_{\text{rms}}$	
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	14	—	mV/kh	
Ripple rejection ratio	R.R.	3	$-19\text{ V} \leq V_{IN} \leq -9.0\text{ V}$ , $T_j = 25^\circ\text{C}$ , $f = 120\text{ Hz}$	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	—	$\text{mV}/^\circ\text{C}$	

## TA79L08F

### 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	$T_j = 25^\circ\text{C}$	-8.3	-8.0	-7.7	V	
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	$-23\text{ V} \leq V_{IN} \leq -10.5\text{ V}$	—	20	175	mV
				$-23\text{ V} \leq V_{IN} \leq -11\text{ V}$	—	12	125	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	15	155	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	7.0	75	
Output voltage	$V_{OUT}$	1	$T_j = 25^\circ\text{C}$	$-23\text{ V} \leq V_{IN} \leq -10.5\text{ V}$ , $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	-8.4	—	-7.6	V
				$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	-8.4	—	-7.6	
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	$\Delta I_{BI}$	1	$T_j = 25^\circ\text{C}$	$-23\text{ V} \leq V_{IN} \leq -11\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1		$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	0.1	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	60	—	$\mu\text{V}_{rms}$	
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	20	—	mV/kh	
Ripple rejection ratio	R.R.	3	$-23\text{ V} \leq V_{IN} \leq -12\text{ V}$ , $T_j = 25^\circ\text{C}$ , $f = 120\text{ Hz}$	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	—	$\text{mV}/^\circ\text{C}$	

## TA79L09F

### 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	$T_j = 25^\circ\text{C}$	-9.36	-9.0	-8.64	V	
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	$-24\text{ V} \leq V_{IN} \leq -11.4\text{ V}$	—	80	200	mV
				$-24\text{ V} \leq V_{IN} \leq -12\text{ V}$	—	20	160	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	17	175	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	8.0	80	
Output voltage	$V_{OUT}$	1	$T_j = 25^\circ\text{C}$	$-24\text{ V} \leq V_{IN} \leq -11.4\text{ V}$ , $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	-9.45	—	-8.55	V
				$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	-9.45	—	-8.55	
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	$\Delta I_{BI}$	1	$T_j = 25^\circ\text{C}$	$-24\text{ V} \leq V_{IN} \leq -12\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1		$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	0.1	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	65	—	$\mu\text{V}_{\text{rms}}$	
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	21	—	mV/kh	
Ripple rejection ratio	R.R.	3	$-24\text{ V} \leq V_{IN} \leq -12\text{ V}$ , $T_j = 25^\circ\text{C}$ , $f = 120\text{ Hz}$	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	—	$\text{mV}/^\circ\text{C}$	

## TA79L10F

### 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	$T_j = 25^\circ\text{C}$	-10.4	-10.0	-9.6	V	
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	$-25\text{ V} \leq V_{IN} \leq -12.5\text{ V}$	—	80	230	mV
				$-25\text{ V} \leq V_{IN} \leq -13\text{ V}$	—	30	170	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	18	190	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	8.5	90	
Output voltage	$V_{OUT}$	1	$T_j = 25^\circ\text{C}$	$-25\text{ V} \leq V_{IN} \leq -12.5\text{ V}$ , $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	-10.5	—	-9.5	V
				$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	-10.5	—	-9.5	
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	$\Delta I_{BI}$	1	$T_j = 25^\circ\text{C}$	$-25\text{ V} \leq V_{IN} \leq -13\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1		$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	0.1	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	70	—	$\mu\text{V}_{rms}$	
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	22	—	mV/kh	
Ripple rejection ratio	R.R.	3	$-24\text{ V} \leq V_{IN} \leq -13\text{ V}$ , $T_j = 25^\circ\text{C}$ , $f = 120\text{ Hz}$	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	—	$\text{mV}/^\circ\text{C}$	

## TA79L12F

### 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	$T_j = 25^\circ\text{C}$	-12.5	-12.0	-11.5	V	
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	$-27\text{ V} \leq V_{IN} \leq -14.5\text{ V}$	—	120	250	mV
				$-27\text{ V} \leq V_{IN} \leq -16\text{ V}$	—	100	200	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	20	225	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	10	105	
Output voltage	$V_{OUT}$	1	$T_j = 25^\circ\text{C}$	$-27\text{ V} \leq V_{IN} \leq -14.5\text{ V}$ , $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	-12.6	—	-11.4	V
				$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	-12.6	—	-11.4	
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	$\Delta I_{BI}$	1	$T_j = 25^\circ\text{C}$	$-27\text{ V} \leq V_{IN} \leq -16\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1		$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	0.1	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	80	—	$\mu\text{V}_{rms}$	
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	24	—	mV/kh	
Ripple rejection ratio	R.R.	3	$-25\text{ V} \leq V_{IN} \leq -15\text{ V}$ , $T_j = 25^\circ\text{C}$ , $f = 120\text{ Hz}$	37	42	—	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	—	$\text{mV}/^\circ\text{C}$	



## TA79L15F

### 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	$T_j = 25^\circ\text{C}$	-15.6	-15.0	-14.4	V	
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	$-30\text{ V} \leq V_{IN} \leq -17.5\text{ V}$	—	130	300	mV
				$-30\text{ V} \leq V_{IN} \leq -20\text{ V}$	—	110	250	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	25	280	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	12	130	
Output voltage	$V_{OUT}$	1	$T_j = 25^\circ\text{C}$	$-30\text{ V} \leq V_{IN} \leq -17.5\text{ V}$ , $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	-15.75	—	-14.25	V
				$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	-15.75	—	-14.25	
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	$\Delta I_{BI}$	1	$T_j = 25^\circ\text{C}$	$-30\text{ V} \leq V_{IN} \leq -20\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1		$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	0.1	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	90	—	$\mu\text{V}_{\text{rms}}$	
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	30	—	mV/kh	
Ripple rejection ratio	R.R.	3	$-28.5\text{ V} \leq V_{IN} \leq -18.5\text{ V}$ , $T_j = 25^\circ\text{C}$ , $f = 120\text{ Hz}$	34	39	—	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	—	$\text{mV}/^\circ\text{C}$	

## TA79L18F

### 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	$T_j = 25^\circ\text{C}$	-18.7	-18.0	-17.3	V	
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	$-33\text{ V} \leq V_{IN} \leq -20.7\text{ V}$	—	32	325	mV
				$-33\text{ V} \leq V_{IN} \leq -21\text{ V}$	—	27	275	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	30	335	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	15	155	
Output voltage	$V_{OUT}$	1	$T_j = 25^\circ\text{C}$	$-33\text{ V} \leq V_{IN} \leq -20.9\text{ V}$ , $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	-18.9	—	-17.1	V
				$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	-18.9	—	-17.1	
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	$\Delta I_{BI}$	1	$T_j = 25^\circ\text{C}$	$-33\text{ V} \leq V_{IN} \leq -21\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1		$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	0.1	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	150	—	$\mu\text{V}_{\text{rms}}$	
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	45	—	mV/kh	
Ripple rejection ratio	R.R.	3	$-33\text{ V} \leq V_{IN} \leq -23\text{ V}$ , $T_j = 25^\circ\text{C}$ , $f = 120\text{ Hz}$	33	48	—	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	—	$\text{mV}/^\circ\text{C}$	

## TA79L20F

### 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	$T_j = 25^\circ\text{C}$	-20.8	-20.0	-19.2	V	
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	$-35\text{ V} \leq V_{IN} \leq -23.5\text{ V}$	—	33	330	mV
				$-35\text{ V} \leq V_{IN} \leq -24\text{ V}$	—	28	285	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	33	370	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	17	170	
Output voltage	$V_{OUT}$	1	$T_j = 25^\circ\text{C}$	$-35\text{ V} \leq V_{IN} \leq -23.5\text{ V}$ , $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	-21.0	—	-19.0	V
				$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	-21.0	—	-19.0	
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	$\Delta I_{BI}$	1	$T_j = 25^\circ\text{C}$	$-35\text{ V} \leq V_{IN} \leq -24\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1		$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	0.1	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	170	—	$\mu\text{V}_{\text{rms}}$	
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	49	—	mV/kh	
Ripple rejection ratio	R.R.	3	$-35\text{ V} \leq V_{IN} \leq -27\text{ V}$ , $T_j = 25^\circ\text{C}$ , $f = 120\text{ Hz}$	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	—	$\text{mV}/^\circ\text{C}$	

## TA79L24F

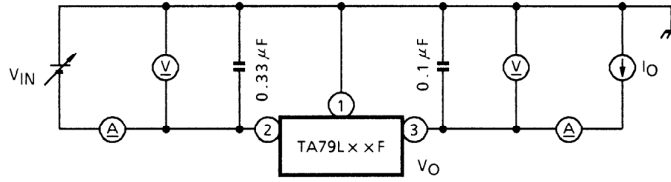
### Electrical Characteristics

(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	$T_j = 25^\circ\text{C}$	-25.0	-24.0	-23.0	V	
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	$-38\text{ V} \leq V_{IN} \leq -27\text{ V}$	—	35	350	mV
				$-38\text{ V} \leq V_{IN} \leq -28\text{ V}$	—	30	300	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	$1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$	—	40	440	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	20	200	
Output voltage	$V_{OUT}$	1	$T_j = 25^\circ\text{C}$	$-38\text{ V} \leq V_{IN} \leq -27\text{ V}$ , $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	-25.2	—	-22.8	V
				$1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$	-25.2	—	-22.8	
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	$\Delta I_{BI}$	1	$T_j = 25^\circ\text{C}$	$-38\text{ V} \leq V_{IN} \leq -28\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1		$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	0.1	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	200	—	$\mu\text{V}_{rms}$	
Long term stability	$\Delta V_{OUT}/\Delta t$	1	—	—	56	—	mV/kh	
Ripple rejection ratio	R.R.	3	$-35\text{ V} \leq V_{IN} \leq -29\text{ V}$ , $T_j = 25^\circ\text{C}$ , $f = 120\text{ Hz}$	31	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	$I_{OUT} = 5\text{ mA}$	—	2.0	—	$\text{mV}/^\circ\text{C}$	

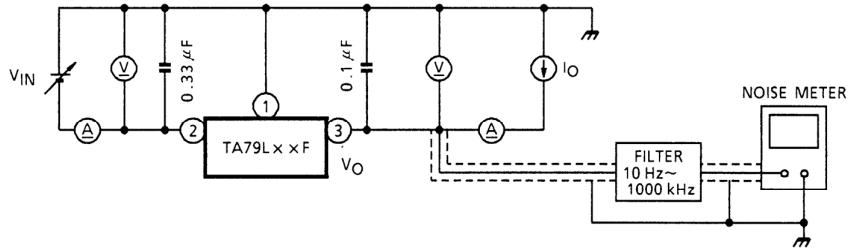
**Test Circuit 1**

$V_{OUT}$ , Reg-line, Reg-load,  $I_B$ ,  $\Delta I_B$ ,  $\Delta V_{OUT}/\Delta t$ ,  $V_D$ ,  $T_{CVO}$



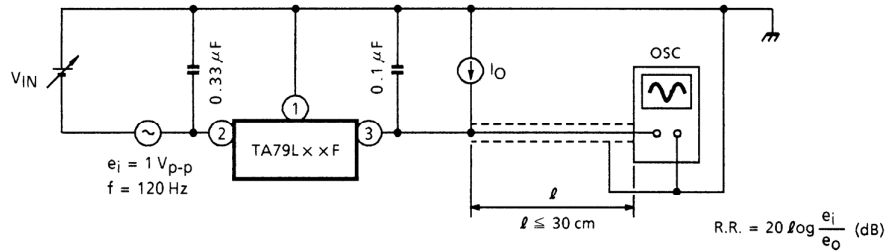
**Test Circuit 2**

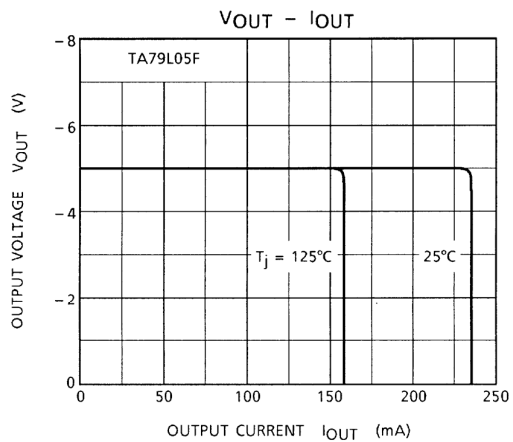
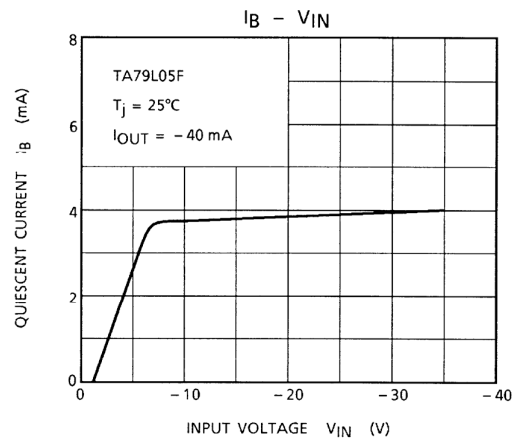
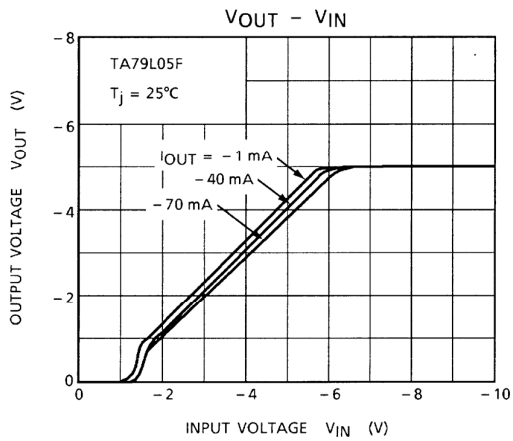
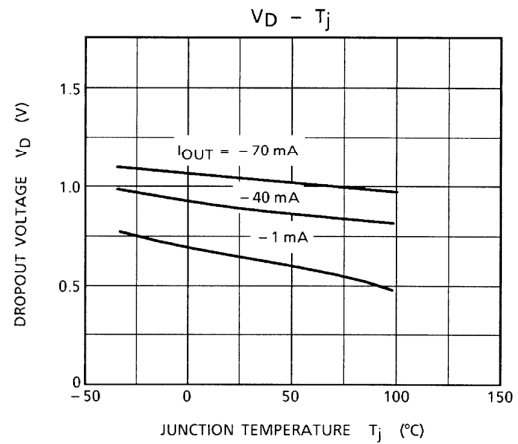
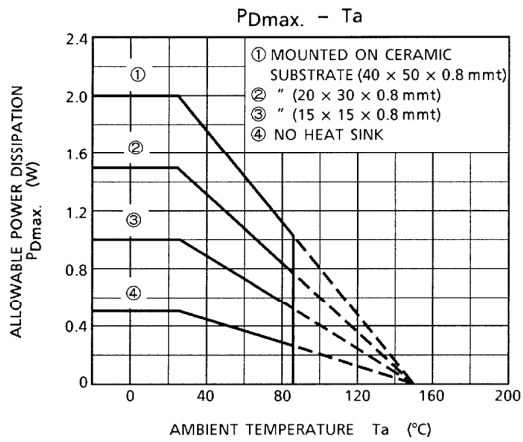
$V_{NO}$



**Test Circuit 3**

R.R.

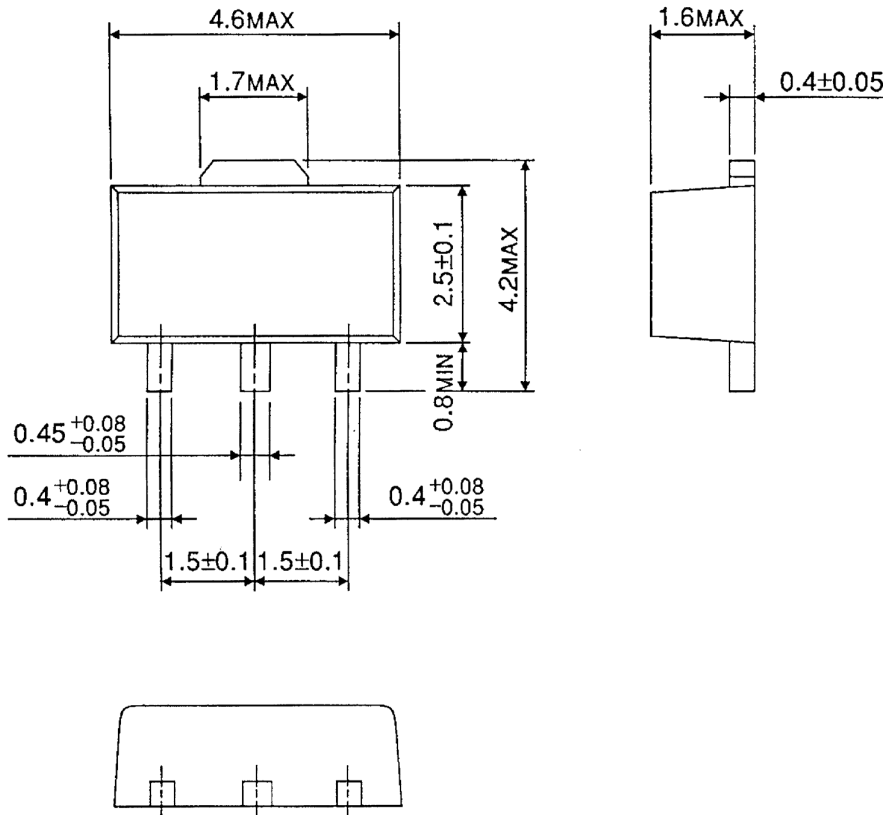




## Package Dimensions

HSOP3-P-1.50

Unit : mm



Weight : 0.05 g (Typ.)

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20070701-EN

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