

TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

## TA79L005P, TA79L006P, TA79L008P, TA79L009P, TA79L010P, TA79L012P, TA79L015P, TA79L018P, TA79L020P, TA79L024P

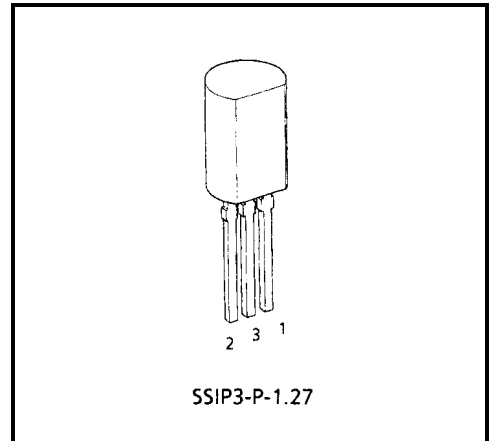
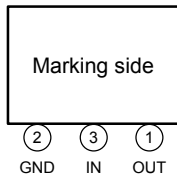
-5 V, -6 V, -8 V, -9 V, -10 V, -12 V, -15 V, -18 V, -20 V, -24 V

Three-Terminal Negative Voltage Regulators

### Features

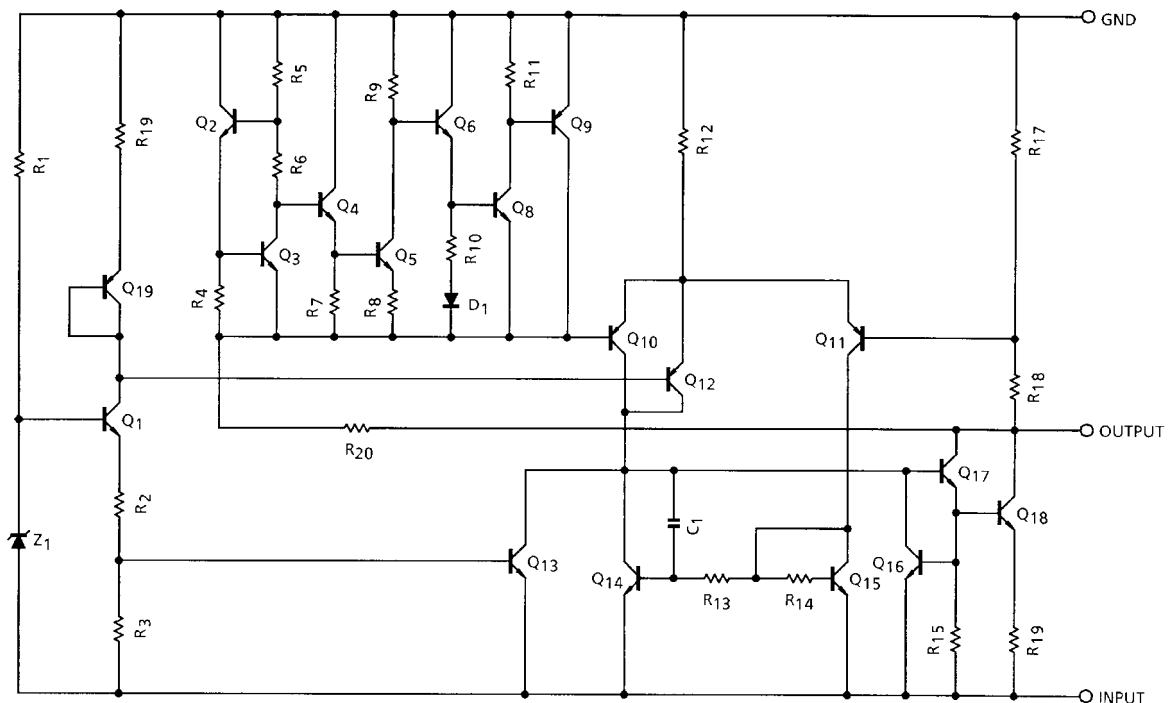
- Best suited to a power supply for TTL and C<sup>2</sup>MOS.
- Built-in overcurrent protective circuit.
- Built-in thermal protective circuit.
- Maximum output current of 150 mA ( $T_j = 25^\circ\text{C}$ ).
- Packaged in TO-92MOD.

### Pin Assignment



Weight: 0.36 g (Typ.)

### Equivalent Circuit



## Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Input voltage	TA79L005P	V <sub>IN</sub>	-35	V
	TA79L006P			
	TA79L008P			
	TA79L009P			
	TA79L010P			
	TA79L012P		-40	
	TA79L015P			
	TA79L018P			
	TA79L020P			
	TA79L024P			
Power dissipation	(Ta = 25°C)	P <sub>D</sub>	800	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>	156	°C/W

## TA79L005P

### 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	60	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	5.0	30	
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	$\Delta I_B$	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			$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	40	—	$\mu\text{V}_{rms}$	
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	—	$\text{mV}/^\circ\text{C}$	

## TA79L006P

### 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	70	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	5.5	35	
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	$\Delta I_B$	1	$T_j = 25^\circ\text{C}$	$-21\text{ V} \leq V_{IN} \leq -9.0\text{ V}$ $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	1.5	mA
	$\Delta I_{BO}$	1			—	—	0.1	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	40	—	$\mu\text{V}_{rms}$	
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	—	$\text{mV}/^\circ\text{C}$	

## TA79L008P

### 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	80	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	7.0	40	
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	$\Delta I_B$	1	$T_j = 25^\circ\text{C}$	$-23\text{ V} \leq V_{IN} \leq -11\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1			$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	
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	—	$\text{mV}/^\circ\text{C}$	

## TA79L009P

### 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	90	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	8.0	45	
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	$\Delta I_B$	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	—	$\mu\text{V}_{rms}$	
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	—	$\text{mV}/^\circ\text{C}$	

## TA79L010P

### 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	90	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	8.5	45	
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	$\Delta I_B$	1	$T_j = 25^\circ\text{C}$	$-25\text{ V} \leq V_{IN} \leq -13\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1			$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	
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	—	$\text{mV}/^\circ\text{C}$	

## TA79L012P

### 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	100	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	10	50	
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	$\Delta I_B$	1	$T_j = 25^\circ\text{C}$	$-27\text{ V} \leq V_{IN} \leq -16\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1			$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	
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	—	$\text{mV}/^\circ\text{C}$	



## TA79L015P

### 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	150	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	12	75	
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	$\Delta I_B$	1	$T_j = 25^\circ\text{C}$	$-30\text{ V} \leq V_{IN} \leq -20\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1			$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	90	—	$\mu\text{V}_{rms}$	
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	—	$\text{mV}/^\circ\text{C}$	

## TA79L018P

### 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	170	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	15	75	
Output voltage	$V_{OUT}$	1	$T_j = 25^\circ\text{C}$	$-33\text{ V} \leq V_{IN} \leq -20.9\text{ V}$ , $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	-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	$\Delta I_B$	1	$T_j = 25^\circ\text{C}$	$-33\text{ V} \leq V_{IN} \leq -21\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1			$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	150	—	$\mu\text{V}_{rms}$	
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	—	$\text{mV}/^\circ\text{C}$	

## TA79L020P

### 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	180	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	17	90	
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	$\Delta I_B$	1	$T_j = 25^\circ\text{C}$	$-35\text{ V} \leq V_{IN} \leq -24\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1			$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	
Output noise voltage	$V_{NO}$	2	$T_a = 25^\circ\text{C}$ , $10\text{ Hz} \leq f \leq 100\text{ kHz}$	—	170	—	$\mu\text{V}_{rms}$	
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	—	$\text{mV}/^\circ\text{C}$	

## TA79L024P

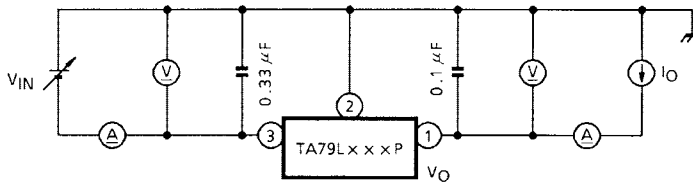
### Electrical Characteristics

(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	200	mV
				$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	20	100	
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	$\Delta I_B$	1	$T_j = 25^\circ\text{C}$	$-38\text{ V} \leq V_{IN} \leq -28\text{ V}$	—	—	1.5	mA
	$\Delta I_{BO}$	1			$1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$	—	—	
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	—	$\text{mV}/^\circ\text{C}$	

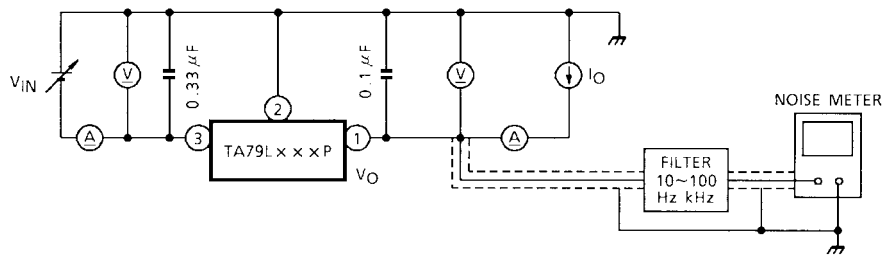
**Test Circuit 1**

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



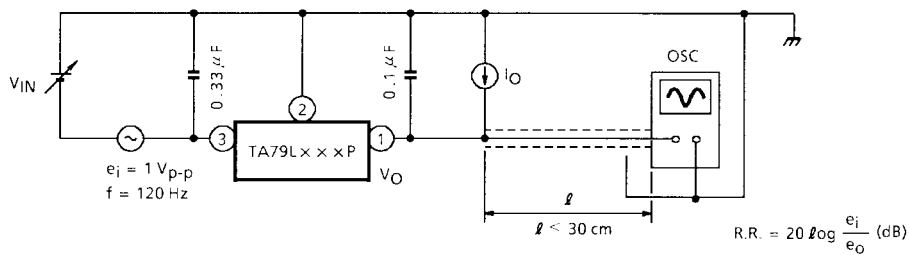
**Test Circuit 2**

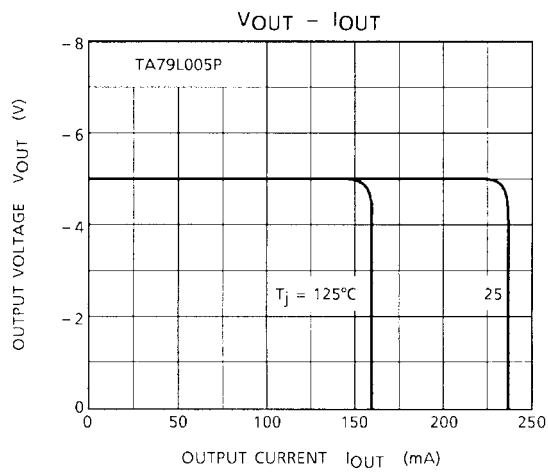
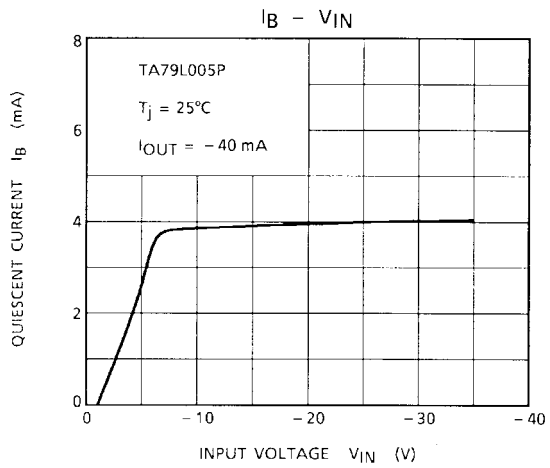
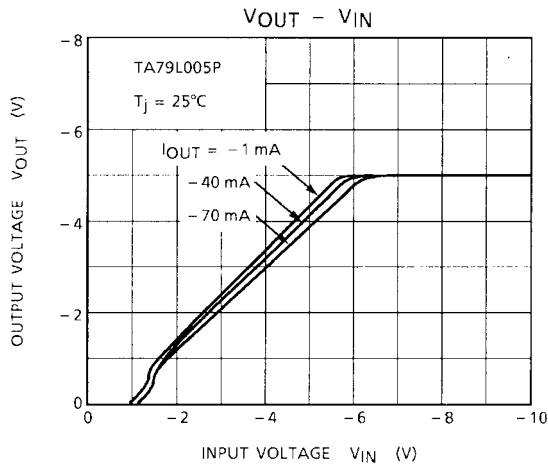
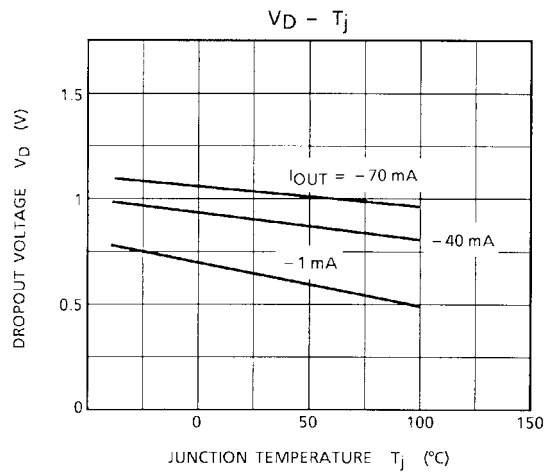
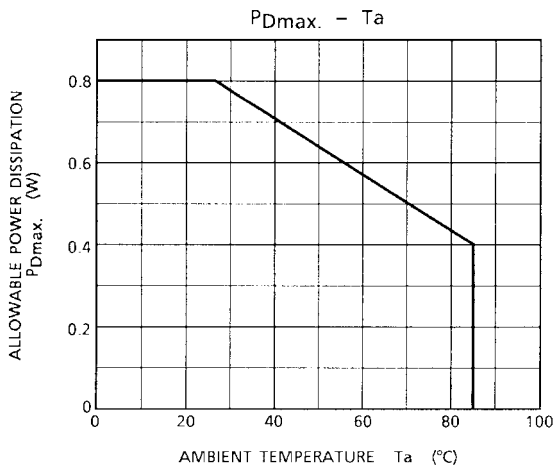
$V_{NO}$



**Test Circuit 3**

R.R.

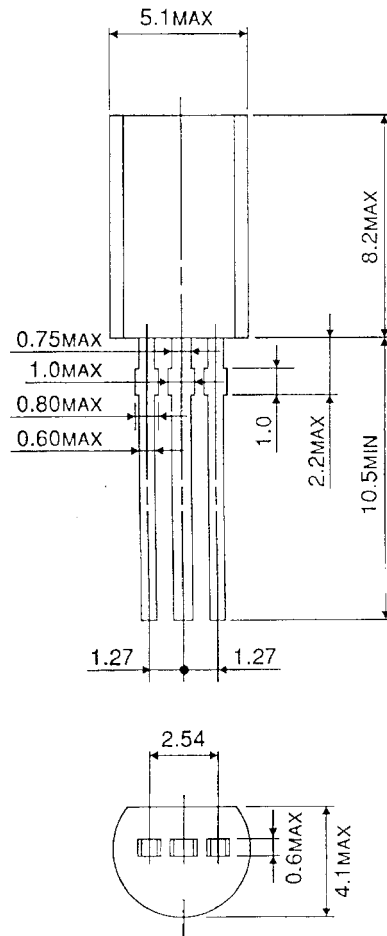




**Package Dimensions**

SSIP3-P-1.27

Unit : mm



Weight : 0.36 g (Typ.)

**RESTRICTIONS ON PRODUCT USE**

000707EBA

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.  
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.