



# ACE78LXXG

## 100mA Positive Voltage Regulator

### Description

The ACE78LXXG series of positive regulators are available in the SOT-89-3 package and with 5V, 6V, 8V, 9V, 10V, 12V, 15V, 18V and 24V fixed output voltages, marking it useful in a wide range of applications. These regulators can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each type employs internal current limiting, thermal shut-down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 100mA output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents. ACE78LXXG is characterized for operation from 0°C to +125°C.

### Features

- Internal Short-Circuit Current Limiting
- Internal Thermal Overload Protection
- No External Components Required

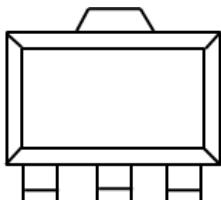
### Absolute Maximum Ratings

Parameter	Max	Unit
Input Voltage	ACE78L05~10G	30
	ACE78L12~18G	35
	ACE78L24G	40
Output current	100	mA
Operating junction temperature range	0 ~125	°C
Storage temperature range	- 55 ~ 150	°C
Power Dissipation	350*	mW

\* When tested in free air condition, without heat sinking.

### Packaging Type

SOT-89-3



Vout GND Vin



# ACE78LXXG

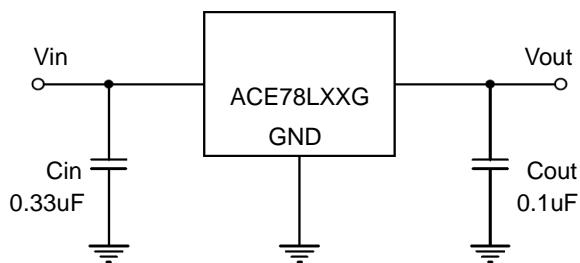
## 100mA Positive Voltage Regulator

### Ordering information

ACE78L XX G XX + H



### Typical Application



### Electrical Characteristics

ACE78L05G (Refer to the test circuits,  $T_J=0\sim125^\circ C$ ,  $I_O=40mA$ ,  $V_{IN}=10V$ ,  $C_{in}=0.33\mu F$ ,  $C_o=0.1\mu F$  unless otherwise specified) (Note1)

Symbol		Test Condition	Min	Typ	Max	Unit
VO	B-Rank (5%)	$V_{IN}=10V$ , $I_O=40mA$ , $T_J=25^\circ C$ $7V \leq V_{IN} \leq 20V$ , $1mA \leq I_O \leq 40mA$ $7V \leq V_{IN} \leq V_{max}$ , $1mA \leq I_O \leq 70mA$ (Note2)	4.75		5.25	V
$\Delta V_O$ (Line Regulation)		$7V \leq V_{IN} \leq 20V$ , $I_O=40mA$ , $T_J=25^\circ C$		18	75	mV
		$8V \leq V_{IN} \leq 20V$ , $I_O=40mA$ , $T_J=25^\circ C$		10	54	
$\Delta V_O$ (Load Regulation)		$V_{IN}=10V$ , $1mA \leq I_O \leq 100mA$ , $T_J=25^\circ C$		20	60	mV
		$V_{IN}=10V$ , $1mA \leq I_O \leq 40mA$ , $T_J=25^\circ C$		5	30	
IQ		$V_{IN}=10V$ , $I_O=0mA$ , $T_J=25^\circ C$		3.0	5.0	mA
$\Delta IQ$		$V_{IN}=10V$ , $1mA \leq I_O \leq 40mA$			0.1	mA
		$8V \leq V_{IN} \leq 20V$ , $I_O=40mA$			1.0	
Vn		$10Hz \leq f \leq 100KHz$		40		$\mu V$
RR		$8V \leq V_{IN} \leq 20V$ , $I_O=40mA$ , $f=120Hz$ , $T_J=25^\circ C$	47	62		dB
VD		$I_O=100mA$ , $T_J=25^\circ C$		1.7		V
$\Delta V_O/\Delta T_J$		$I_O=5mA$ , $0^\circ C \leq T_J \leq 125^\circ C$		-0.65		$mV/^\circ C$



# ACE78LXXG

## 100mA Positive Voltage Regulator

ACE78L06G (Refer to the test circuits,  $T_J=0\sim125^\circ C$ ,  $I_O=40mA$ ,  $V_{IN}=12V$ ,  $C_{in}=0.33\mu F$ ,  $Co=0.1\mu F$  unless otherwise specified) (Note1)

Symbol		Test Condition	Min	Typ	Max	Unit
VO	B-Rank (5%)	$V_{IN}=12V$ , $I_O=40mA$ , $T_J=25^\circ C$ $8.5V \leq V_{IN} \leq 20V$ , $1mA \leq I_O \leq 40mA$ $8.5V \leq V_{IN} \leq V_{max}$ , $1mA \leq I_O \leq 70mA$ (Note2)	5.70		6.30	V
$\Delta V_O$ (Line Regulation)		$8.5V \leq V_{IN} \leq 20V$ , $I_O=40mA$ , $T_J=25^\circ C$		65	175	mV
		$9V \leq V_{IN} \leq 20V$ , $I_O=40mA$ , $T_J=25^\circ C$		54	125	
$\Delta V_O$ (Load Regulation)		$V_{IN}=12V$ , $1mA \leq I_O \leq 100mA$ , $T_J=25^\circ C$		12.8	80	mV
		$V_{IN}=12V$ , $1mA \leq I_O \leq 70mA$ , $T_J=25^\circ C$		5.8	40	
IQ		$V_{IN}=12V$ , $I_O=0mA$ , $T_J=25^\circ C$		3.9	6.0	mA
$\Delta IQ$		$V_{IN}=12V$ , $1mA \leq I_O \leq 40mA$			0.1	mA
		$9V \leq V_{IN} \leq 20V$ , $I_O=40mA$			1.5	
Vn		$10Hz \leq f \leq 100KHz$		49		µV
RR		$10V \leq V_{IN} \leq 20V$ , $I_O=40mA$ , $f=120Hz$ , $T_J=25^\circ C$	40	46		dB
VD		$I_O=100mA$ , $T_J=25^\circ C$		1.7		V
$\Delta V_O/\Delta T_J$		$I_O=5mA$ , $0^\circ C \leq T_J \leq 125^\circ C$		0.75		mV/°C

ACE78L08G (Refer to the test circuits,  $T_J=0\sim125^\circ C$ ,  $I_O=40mA$ ,  $V_{IN}=14V$ ,  $C_{in}=0.33\mu F$ ,  $Co=0.1\mu F$  unless otherwise specified) (Note1)

Symbol		Test Condition	Min	Typ	Max	Unit
VO	B-Rank (5%)	$V_{IN}=14V$ , $I_O=40mA$ , $T_J=25^\circ C$ $10.5V \leq V_{IN} \leq 23V$ , $1mA \leq I_O \leq 40mA$ $10.5V \leq V_{IN} \leq V_{max}$ , $1mA \leq I_O \leq 70mA$ (Note2)	7.60		8.40	V
$\Delta V_O$ (Line Regulation)		$10.5V \leq V_{IN} \leq 23V$ , $I_O=40mA$ , $T_J=25^\circ C$		10	175	mV
		$11V \leq V_{IN} \leq 23V$ , $I_O=40mA$ , $T_J=25^\circ C$		8	125	
$\Delta V_O$ (Load Regulation)		$V_{IN}=14V$ , $1mA \leq I_O \leq 100mA$ , $T_J=25^\circ C$		15	80	mV
		$V_{IN}=14V$ , $1mA \leq I_O \leq 70mA$ , $T_J=25^\circ C$		8	40	
IQ		$V_{IN}=14V$ , $I_O=0mA$ , $T_J=25^\circ C$		2.0	5.5	mA
$\Delta IQ$		$V_{IN}=14V$ , $1mA \leq I_O \leq 40mA$			0.1	mA
		$11V \leq V_{IN} \leq 23V$ , $I_O=40mA$			1.5	
Vn		$10Hz \leq f \leq 100KHz$		49		µV
RR		$11V \leq V_{IN} \leq 21V$ , $I_O=40mA$ , $f=120Hz$ , $T_J=25^\circ C$	39	45		dB
VD		$I_O=100mA$ , $T_J=25^\circ C$		1.7		V
$\Delta V_O/\Delta T_J$		$I_O=5mA$ , $0^\circ C \leq T_J \leq 125^\circ C$		0.75		mV/°C



# ACE78LXXG

## 100mA Positive Voltage Regulator

ACE78L09G (Refer to the test circuits,  $T_J=0\sim125^\circ C$ ,  $I_O=40mA$ ,  $V_{IN}=15V$ ,  $C_{in}=0.33\mu F$ ,  $Co=0.1\mu F$  unless otherwise specified) (Note1)

Symbol		Test Condition	Min	Typ	Max	Unit
VO	B-Rank (5%)	$V_{IN}=15V$ , $I_O=40mA$ , $T_J=25^\circ C$ $11.5V \leq V_{IN} \leq 24V$ , $1mA \leq I_O \leq 40mA$ $11.5V \leq V_{IN} \leq V_{max}$ , $1mA \leq I_O \leq 70mA$ (Note2)	8.55		9.45	V
$\Delta V_O$ (Line Regulation)		$11.5V \leq V_{IN} \leq 24V$ , $I_O=40mA$ , $T_J=25^\circ C$		90	200	mV
		$13V \leq V_{IN} \leq 24V$ , $I_O=40mA$ , $T_J=25^\circ C$		100	150	
$\Delta V_O$ (Load Regulation)		$V_{IN}=15V$ , $1mA \leq I_O \leq 100mA$ , $T_J=25^\circ C$		20	90	mV
		$V_{IN}=15V$ , $1mA \leq I_O \leq 40mA$ , $T_J=25^\circ C$		10	45	
IQ		$V_{IN}=15V$ , $I_O=0mA$ , $T_J=25^\circ C$		2.0	6.0	mA
$\Delta IQ$		$V_{IN}=15V$ , $1mA \leq I_O \leq 40mA$			0.1	mA
		$13V \leq V_{IN} \leq 24V$ , $I_O=40mA$			1.5	
Vn		$10Hz \leq f \leq 100KHz$		49		$\mu V$
RR		$12V \leq V_{IN} \leq 23V$ , $I_O=40mA$ , $f=120Hz$ , $T_J=25^\circ C$	38	44		dB
VD		$I_O=100mA$ , $T_J=25^\circ C$		1.7		V
$\Delta V_O/\Delta T_J$		$I_O=5mA$ , $0^\circ C \leq T_J \leq 125^\circ C$		0.75		$mV/^\circ C$

ACE78L10G (Refer to the test circuits,  $T_J=0\sim125^\circ C$ ,  $I_O=40mA$ ,  $V_{IN}=17V$ ,  $C_{in}=0.33\mu F$ ,  $Co=0.1\mu F$  unless otherwise specified) (Note1)

Symbol		Test Condition	Min	Typ	Max	Unit
VO	B-Rank (5%)	$V_{IN}=17V$ , $I_O=40mA$ , $T_J=25^\circ C$ $13V \leq V_{IN} \leq 25V$ , $1mA \leq I_O \leq 40mA$ $13V \leq V_{IN} \leq V_{max}$ , $1mA \leq I_O \leq 70mA$ (Note2)	9.50		10.5	V
$\Delta V_O$ (Line Regulation)		$13V \leq V_{IN} \leq 25V$ , $I_O=40mA$ , $T_J=25^\circ C$		51	175	mV
		$14V \leq V_{IN} \leq 25V$ , $I_O=40mA$ , $T_J=25^\circ C$		42	125	
$\Delta V_O$ (Load Regulation)		$V_{IN}=17V$ , $1mA \leq I_O \leq 100mA$ , $T_J=25^\circ C$		20	90	mV
		$V_{IN}=17V$ , $1mA \leq I_O \leq 40mA$ , $T_J=25^\circ C$		11	40	
IQ		$V_{IN}=17V$ , $I_O=0mA$ , $T_J=25^\circ C$		4.2	6.0	mA
$\Delta IQ$		$V_{IN}=17V$ , $1mA \leq I_O \leq 40mA$			0.1	mA
		$14V \leq V_{IN} \leq 25V$ , $I_O=40mA$			1.5	
Vn		$10Hz \leq f \leq 100KHz$		62		$\mu V$
RR		$15V \leq V_{IN} \leq 25V$ , $I_O=40mA$ , $f=120Hz$ , $T_J=25^\circ C$	37	44		dB
VD		$I_O=100mA$ , $T_J=25^\circ C$		1.7		V



# ACE78LXXG

## 100mA Positive Voltage Regulator

ACE78L12G (Refer to the test circuits,  $T_J=0\sim125^\circ C$ ,  $I_O=40mA$ ,  $V_{IN}=19V$ ,  $C_{in}=0.33\mu F$ ,  $Co=0.1\mu F$  unless otherwise specified) (Note1)

Symbol	Test Condition		Min	Typ	Max	Unit
VO	B-Rank (5%)	$V_{IN}=19V$ , $I_O=40mA$ , $T_J=25^\circ C$ $14.5V \leq V_{IN} \leq 27V$ , $1mA \leq I_O \leq 40mA$ $14.5V \leq V_{IN} \leq V_{max}$ , $1mA \leq I_O \leq 70mA$ (Note2)	11.40		12.60	V
$\Delta V_O$ (Line Regulation)		$14.5V \leq V_{IN} \leq 27V$ , $I_O=40mA$ , $T_J=25^\circ C$		25	300	mV
		$16V \leq V_{IN} \leq 27V$ , $I_O=40mA$ , $T_J=25^\circ C$		20	250	
$\Delta V_O$ (Load Regulation)		$V_{IN}=19V$ , $1mA \leq I_O \leq 100mA$ , $T_J=25^\circ C$		25	150	mV
		$V_{IN}=19V$ , $1mA \leq I_O \leq 40mA$ , $T_J=25^\circ C$		12	75	
IQ		$V_{IN}=19V$ , $I_O=0mA$ , $T_J=25^\circ C$		2.0	6.0	mA
$\Delta IQ$		$V_{IN}=19V$ , $1mA \leq I_O \leq 40mA$			0.1	mA
		$16V \leq V_{IN} \leq 27V$ , $I_O=40mA$			1.5	
Vn		$10Hz \leq f \leq 100KHz$		80		µV
RR		$15V \leq V_{IN} \leq 25V$ , $I_O=40mA$ , $f=120Hz$ , $T_J=25^\circ C$	37	65		dB
VD		$I_O=100mA$ , $T_J=25^\circ C$		1.7		V
$\Delta V_O/\Delta T_J$		$I_O=5mA$ , $0^\circ C \leq T_J \leq 125^\circ C$		-1.0		mV/°C

ACE78L15G (Refer to the test circuits,  $T_J=0\sim125^\circ C$ ,  $I_O=40mA$ ,  $V_{IN}=23V$ ,  $C_{in}=0.33\mu F$ ,  $Co=0.1\mu F$  unless otherwise specified) (Note1)

Symbol	Test Condition		Min	Typ	Max	Unit
VO	B-Rank (5%)	$V_{IN}=23V$ , $I_O=40mA$ , $T_J=25^\circ C$ $17.5V \leq V_{IN} \leq 30V$ , $1mA \leq I_O \leq 40mA$ $17.5V \leq V_{IN} \leq V_{max}$ , $1mA \leq I_O \leq 70mA$ (Note2)	14.25		15.75	V
$\Delta V_O$ (Line Regulation)		$17.5V \leq V_{IN} \leq 30V$ , $I_O=40mA$ , $T_J=25^\circ C$		25	150	mV
		$20V \leq V_{IN} \leq 30V$ , $I_O=40mA$ , $T_J=25^\circ C$		15	75	
$\Delta V_O$ (Load Regulation)		$V_{IN}=23V$ , $1mA \leq I_O \leq 100mA$ , $T_J=25^\circ C$		20	150	mV
		$V_{IN}=23V$ , $1mA \leq I_O \leq 70mA$ , $T_J=25^\circ C$		25	150	
IQ		$V_{IN}=23V$ , $I_O=0mA$ , $T_J=25^\circ C$		2.2	6.5	mA
$\Delta IQ$		$V_{IN}=23V$ , $1mA \leq I_O \leq 40mA$			0.1	mA
		$20V \leq V_{IN} \leq 30V$ , $I_O=40mA$			1.5	
Vn		$10Hz \leq f \leq 100KHz$		90		µV
RR		$18.5V \leq V_{IN} \leq 28.5V$ , $I_O=40mA$ , $f=120Hz$ , $T_J=25^\circ C$	34	63		dB
VD		$I_O=100mA$ , $T_J=25^\circ C$		1.7		V
$\Delta V_O/\Delta T_J$		$I_O=5mA$ , $0^\circ C \leq T_J \leq 125^\circ C$		-1.3		mV/°C



# ACE78LXXG

## 100mA Positive Voltage Regulator

ACE78L18G (Refer to the test circuits,  $T_J=0\sim125^\circ C$ ,  $I_O=40mA$ ,  $V_{IN}=27V$ ,  $C_{in}=0.33\mu F$ ,  $Co=0.1\mu F$  unless otherwise specified) (Note1)

Symbol	Test Condition		Min	Typ	Max	Unit
VO	B-Rank (5%)	$V_{IN}=27V$ , $I_O=40mA$ , $T_J=25^\circ C$ $21V \leq V_{IN} \leq 33V$ , $1mA \leq I_O \leq 40mA$ $21V \leq V_{IN} \leq V_{max}$ , $1mA \leq I_O \leq 70mA$ (Note2)	17.10		18.9	V
$\Delta V_O$ (Line Regulation)		$21V \leq V_{IN} \leq 33V$ , $I_O=40mA$ , $T_J=25^\circ C$		145	300	mV
		$22V \leq V_{IN} \leq 33V$ , $I_O=40mA$ , $T_J=25^\circ C$		135	250	
$\Delta V_O$ (Load Regulation)		$V_{IN}=27V$ , $1mA \leq I_O \leq 100mA$ , $T_J=25^\circ C$		30	170	mV
		$V_{IN}=27V$ , $1mA \leq I_O \leq 40mA$ , $T_J=25^\circ C$		15	85	
IQ		$V_{IN}=27V$ , $I_O=0mA$ , $T_J=25^\circ C$		2.0	6.0	mA
$\Delta IQ$		$V_{IN}=27V$ , $1mA \leq I_O \leq 40mA$			0.1	mA
		$21V \leq V_{IN} \leq 33V$ , $I_O=40mA$			1.5	
Vn		$10Hz \leq f \leq 100KHz$		150		µV
RR		$23V \leq V_{IN} \leq 33V$ , $I_O=40mA$ , $f=120Hz$ , $T_J=25^\circ C$	34	48		dB
VD		$I_O=100mA$ , $T_J=25^\circ C$		1.7		V
$\Delta V_O/\Delta T_J$		$I_O=5mA$ , $0^\circ C \leq T_J \leq 125^\circ C$		-1.8		mV/°C

ACE78L24G (Refer to the test circuits,  $T_J=0\sim125^\circ C$ ,  $I_O=40mA$ ,  $V_{IN}=33V$ ,  $C_{in}=0.33\mu F$ ,  $Co=0.1\mu F$  unless otherwise specified) (Note1)

Symbol	Test Condition		Min	Typ	Max	Unit
VO	B-Rank (5%)	$V_{IN}=33V$ , $I_O=40mA$ , $T_J=25^\circ C$ $27V \leq V_{IN} \leq 38V$ , $1mA \leq I_O \leq 40mA$ $27V \leq V_{IN} \leq V_{max}$ , $1mA \leq I_O \leq 70mA$ (Note2)	22.80		25.20	V
$\Delta V_O$ (Line Regulation)		$27V \leq V_{IN} \leq 38V$ , $I_O=40mA$ , $T_J=25^\circ C$		160	300	mV
		$28V \leq V_{IN} \leq 38V$ , $I_O=40mA$ , $T_J=25^\circ C$		150	250	
$\Delta V_O$ (Load Regulation)		$V_{IN}=33V$ , $1mA \leq I_O \leq 100mA$ , $T_J=25^\circ C$		40	200	mV
		$V_{IN}=33V$ , $1mA \leq I_O \leq 40mA$ , $T_J=25^\circ C$		20	100	
IQ		$V_{IN}=33V$ , $I_O=0mA$ , $T_J=25^\circ C$		2.2	6.0	mA
$\Delta IQ$		$V_{IN}=33V$ , $1mA \leq I_O \leq 40mA$			0.1	mA
		$27V \leq V_{IN} \leq 38V$ , $I_O=40mA$			1.5	
Vn		$10Hz \leq f \leq 100KHz$		200		µV
RR		$27V \leq V_{IN} \leq 38V$ , $I_O=40mA$ , $f=120Hz$ , $T_J=25^\circ C$	34	45		dB
VD		$I_O=100mA$ , $T_J=25^\circ C$		1.7		V
$\Delta V_O/\Delta T_J$		$I_O=5mA$ , $0^\circ C \leq T_J \leq 125^\circ C$		-2.0		mV/°C



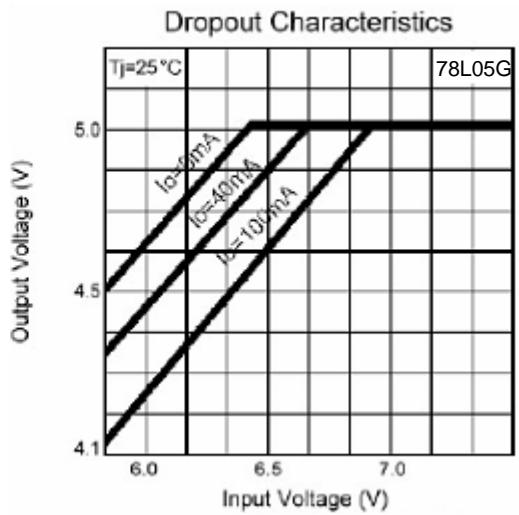
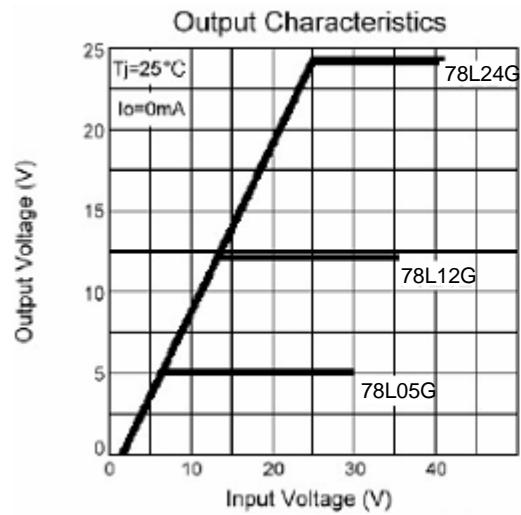
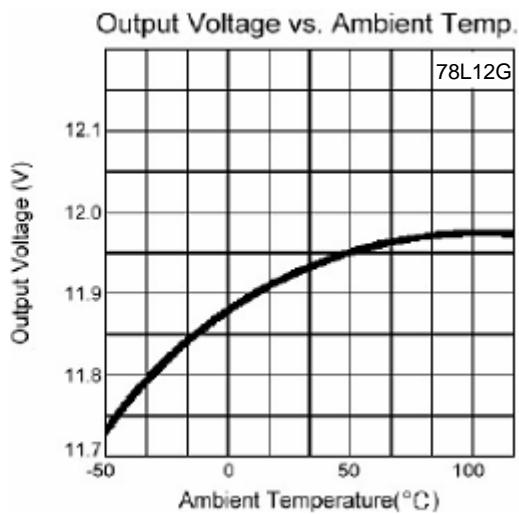
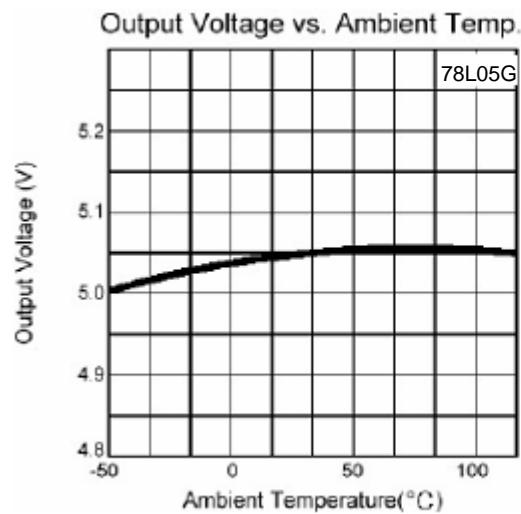
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## 100mA Positive Voltage Regulator

Note 1: The Maximum steady state usable output current is dependent on input voltage, heat sinking, lead length of the package and copper of PCB. The data above represent pulse test conditions with junction temperatures specified at the initiation of test.

Note 2: Power dissipation<0.5W.

### Characteristics Curve

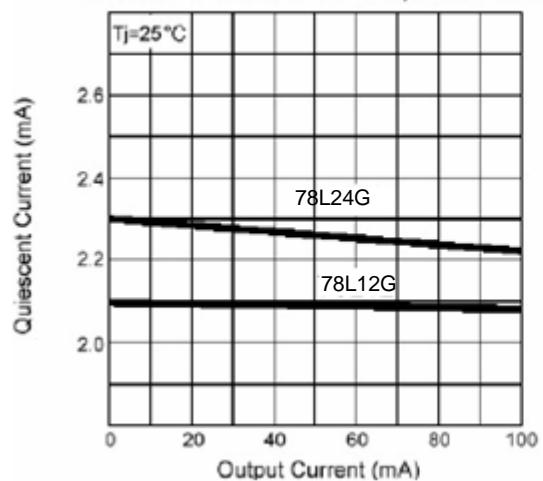




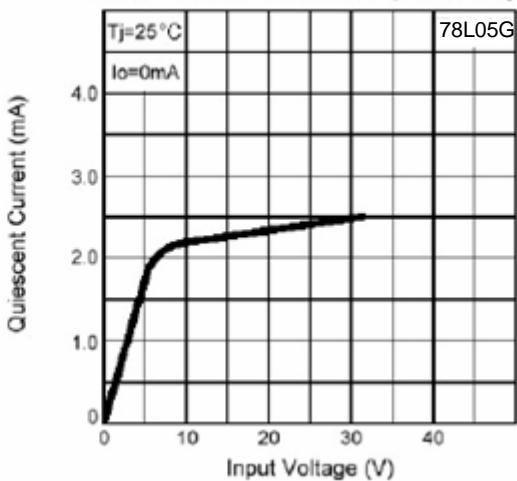
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100mA Positive Voltage Regulator

Quiescent Current vs. Output Current



Quiescent Current vs. Input Voltage

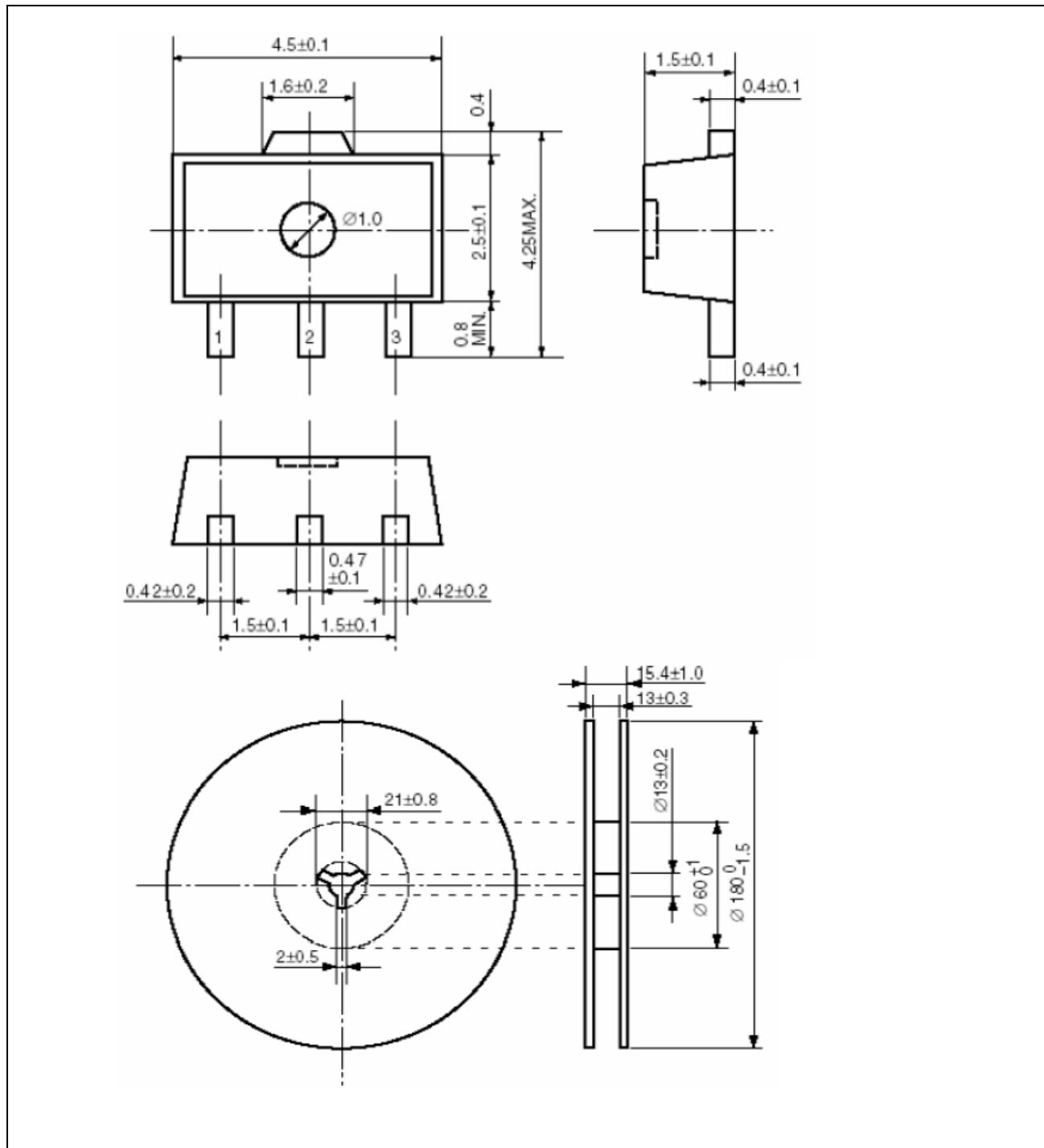




**ACE78LXXG**  
100mA Positive Voltage Regulator

**Packing Information**

**SOT-89-3**





# ACE78LXXG

## 100mA Positive Voltage Regulator

### Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As sued herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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