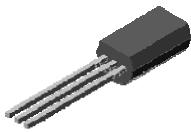
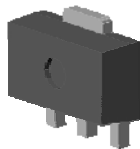
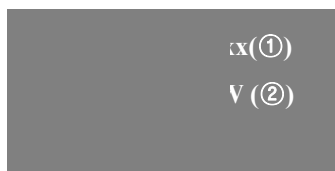

TO-92

TO-92L

SOT-89

ORDERING INFORMATION

Product	Marking	Package
SN78Lxx	78Lxx	TO-92
SN78LxxL	78Lxx	TO-92L
SN78LxxF	78Lxx	SOT-89

▲ Marking Detail Information



- ① Device Code
- ② Grade & Year & Week Code

Description

The SN78Lxxx series are three-terminal positive regulators providing over 150mA output current with internal current limiting, thermal shutdown and safe area protection. These regulators are useful in a wide range of applications. Although they are just fixed voltage regulators, the SN78Lxxx series can be used with external components to obtain adjustable voltages and currents. It also contains the TCE Cell to protect internal circuit from ESD damage.

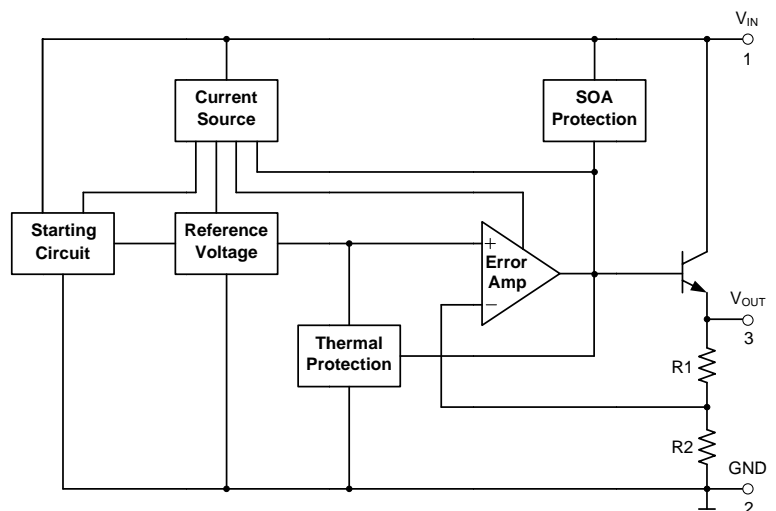
Application

- ◆ Consumer and personal electronics
- ◆ SMPS post-regulator / dc-to-dc modules
- ◆ High-efficiency linear power supplies

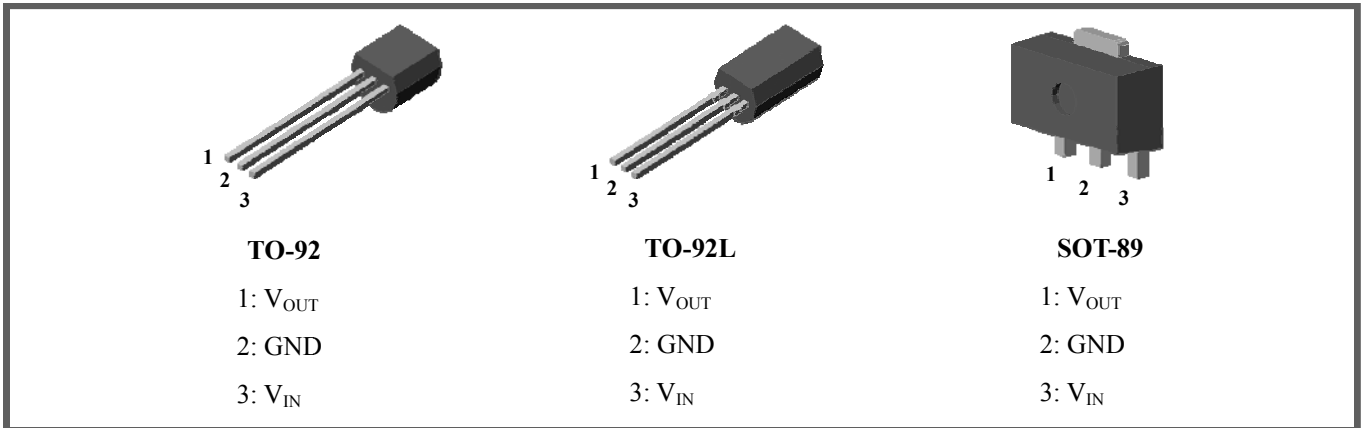
Features and Benefits

- ◆ Maximum Output Current up to 150mA
- ◆ Output Voltage : 5, 6, 8, 9, 10, 12, 15, 18, 24V
- ◆ Built in OVP, Short Circuit Current Limiting.
- ◆ Built in TSD Protection.
- ◆ No External Components Required.
- ◆ Ultra High level of ESD [Built in ESD Protection Cell]

MM : 500V / HBM 5KV ↑



◆ Pin Configuration



◆ Product Line-up

Product Name	V _{OUT}	Operating Temperature	Package
SN78L05	5.0V	-40~125°C	TO-92
SN78L06	6.0V	-40~125°C	TO-92
SN78L08	8.0V	-40~125°C	TO-92
SN78L09	9.0V	-40~125°C	TO-92
SN78L10	10V	-40~125°C	TO-92
SN78L12	12V	-40~125°C	TO-92
SN78L15	15V	-40~125°C	TO-92
SN78L18	18V	-40~125°C	TO-92
SN78L24	24V	-40~125°C	TO-92
SN78L05L	5.0V	-40~125°C	TO-92L
SN78L06L	6.0V	-40~125°C	TO-92L
SN78L08L	8.0V	-40~125°C	TO-92L
SN78L09L	9.0V	-40~125°C	TO-92L
SN78L10L	10V	-40~125°C	TO-92L
SN78L12L	12V	-40~125°C	TO-92L
SN78L15L	15V	-40~125°C	TO-92L
SN78L18L	18V	-40~125°C	TO-92L
SN78L24L	24V	-40~125°C	TO-92L
SN78L05F	5.0V	-40~125°C	SOT-89
SN78L06F	6.0V	-40~125°C	SOT-89
SN78L08F	8.0V	-40~125°C	SOT-89
SN78L09F	9.0V	-40~125°C	SOT-89
SN78L10F	10V	-40~125°C	SOT-89
SN78L12F	12V	-40~125°C	SOT-89
SN78L15F	15V	-40~125°C	SOT-89
SN78L18F	18V	-40~125°C	SOT-89
SN78L24F	24V	-40~125°C	SOT-89

◆ Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Parameter		Symbol	Limits	Unit
Input Voltage		V_{IN}	40.0 ($V_O = 24V$)	V
			35.0 ($V_O = 12$ to $18V$)	
			30.0 ($V_O = 5$ to $10V$)	
Power Dissipation	TO-92	P_d	625	mW
	TO-92L		800	mW
	SOT-89		800	mW
Junction Temperature		T_J	150	$^\circ\text{C}$
Operate Temperature Range		T_{opr}	-40 ~ +125	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55 ~ +150	$^\circ\text{C}$

Absolute maximum ratings indicate limits beyond which damage to the component may occur. Electrical specifications do not apply when operating the device outside of its operating ratings. The maximum allowable power dissipation is a function of the maximum junction temperature, $T_{J(max)}$, the junction-to-ambient thermal resistance, θ_{JA} , and the ambient temperature, T_A .

The maximum allowable power dissipation at any ambient temperature is calculated using:

$PD(max) = (T_{J(max)} - T_A) \div \theta_{JA}$. Exceeding the maximum allowable power dissipation will result in excessive die temperature, and the regulator will go into thermal shutdown.

◆ Electrical characteristics

($V_{IN}=10V$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1 \mu F$, $I_{OUT} = 40mA$, $T_J=0^{\circ}C \sim 125^{\circ}C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*		SN78L05x			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_O	$T_J = 25^{\circ}C$		4.80	5.0	5.20	V
		$7.0V \leq V_{IN} \leq 20.0V$ $1.0mA \leq I_O \leq 40mA$		4.75	5.0	5.25	
Line Regulation	$\Delta V_{O(\Delta V_I)}$	$7.0V \leq V_{IN} \leq 20.0V$	$T_J = 25^{\circ}C$	-	8.0	150	mV
		$8.0V \leq V_{IN} \leq 20.0V$		-	6.0	100	
Load Regulation	$\Delta V_{O(\Delta I_L)}$	$1.0mA \leq I_O \leq 100 mA$	$T_J = 25^{\circ}C$	-	11	60	mV
		$1.0mA \leq I_O \leq 40 mA$		-	5.0	30	
Quiescent Current	I_{QC}	$T_J = 25^{\circ}C$		-	2.0	5.5	mA
Quiescent Current Change	ΔI_{QC}	$8.0V \leq V_{IN} \leq 20V$		-	-	1.5	mA
		$1.0mA \leq I_O \leq 40mA$		-	-	0.1	
Ripple Rejection	RR	$8.0V \leq V_{IN} \leq 18.0V$, $I_O=500 mA$ $f=120 Hz$		41	80	-	dB
Dropout Voltage	V_{DROP}	$T_J = 25^{\circ}C$		-	1.7	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^{\circ}C$	-	40	-	$\mu V / V_O$
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O=5.0 mA$		-	-0.65	-	$mV/^{\circ}C$

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN}=12V$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1 \mu F$, $I_{OUT} = 40mA$, $T_J=0^{\circ}C \sim 125^{\circ}C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*	SN78L06x			Unit	
			Min.	Typ.	Max.		
Output Voltage**	V_O	$T_J = 25^{\circ}C$	5.75	6.0	6.25	V	
		$8.5V \leq V_{IN} \leq 20V$ $1.0mA \leq I_O \leq 40mA$	5.70	6.0	6.30		
Line Regulation	$\Delta V_{O(\Delta V_I)}$	$8.5V \leq V_{IN} \leq 20.0V$	-	64	175	mV	
		$9.0V \leq V_{IN} \leq 20.0V$	-	54	125		
Load Regulation	$\Delta V_{O(\Delta I_L)}$	$1.0mA \leq I_O \leq 100mA$	-	12.8	80	mV	
		$1.0mA \leq I_O \leq 70 mA$	-	5.8	40		
Quiescent Current	I_{QC}	$T_J = 25^{\circ}C$	-	-	5.5	mA	
Quiescent Current Change	ΔI_{QC}	$9.0V \leq V_{IN} \leq 20.0V$	-	-	1.5	mA	
		$1.0mA \leq I_O \leq 40mA$	-	-	0.1		
Ripple Rejection	RR	$10.0V \leq V_{IN} \leq 20.0V$ $f=120 Hz$	40	46	-	dB	
Dropout Voltage	V_{DROD}	$T_J = 25^{\circ}C$	-	1.7	-	V	
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^{\circ}C$	-	40	-	$\mu V / V_O$
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 mA$	-	0.75	-	mV/ $^{\circ}C$	

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN}=14V$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1 \mu F$, $I_{OUT} = 40mA$, $T_J=0^{\circ}C \sim 125^{\circ}C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*		SN78L08x			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_O	$T_J = 25^{\circ}C$		7.7	8.0	8.3	V
		$10.5V \leq V_{IN} \leq 23.0V$ $1.0mA \leq I_O \leq 40mA$		7.6	8.0	8.4	
Line Regulation	$\Delta V_{O(\Delta V_I)}$	$10.5V \leq V_{IN} \leq 23.0V$	$T_J = 25^{\circ}C$	-	10	175	mV
		$11.0V \leq V_{IN} \leq 23.0V$		-	8.0	125	
Load Regulation	$\Delta V_{O(\Delta I_L)}$	$1.0mA \leq I_O \leq 100mA$	$T_J = 25^{\circ}C$	-	15	80	mV
		$1.0mA \leq I_O \leq 40 mA$		-	8.0	40	
Quiescent Current	I_{QC}	$T_J = 25^{\circ}C$		-	2.0	5.5	mA
Quiescent Current Change	ΔI_{QC}	$11.0V \leq V_{IN} \leq 23.0V$		-	-	1.5	mA
		$1.0mA \leq I_O \leq 40mA$		-	-	0.1	
Ripple Rejection	RR	$11.5=0V \leq V_{IN} \leq 21.0V$ $f=120 Hz$		39	70	-	dB
Dropout Voltage	V_{DROD}	$T_J = 25^{\circ}C$		-	1.7	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^{\circ}C$	-	60	-	$\mu V / V_O$
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 mA$		-	-0.8	-	$mV / ^{\circ}C$

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN}=15V$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1 \mu F$, $I_{OUT} = 40mA$, $T_J=0^\circ C \sim 125^\circ C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*		SN78L09x			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_O	$T_J = 25^\circ C$		8.64	9.0	9.36	V
		$11.5V \leq V_{IN} \leq 24.0V$ $1.0mA \leq I_O \leq 40mA$		8.55	9.0	9.45	
Line Regulation	$\Delta V_{O(\Delta V_I)}$	$11.5V \leq V_{IN} \leq 24.0V$	$T_J = 25^\circ C$	-	90	200	mV
		$13.0V \leq V_{IN} \leq 24.0V$		-	100	150	
Load Regulation	$\Delta V_{O(\Delta I_L)}$	$1.0mA \leq I_O \leq 100mA$	$T_J = 25^\circ C$	-	20	90	mV
		$1.0mA \leq I_O \leq 40mA$		-	10	45	
Quiescent Current	I_{QC}	$T_J = 25^\circ C$		-	2.1	6.0	mA
Quiescent Current Change	ΔI_{QC}	$13.0V \leq V_{IN} \leq 24.0V$		-	-	1.5	mA
		$1.0mA \leq I_O \leq 40mA$		-	-	0.1	
Ripple Rejection	RR	$12.0V \leq V_{IN} \leq 22.0V$ $f=120 \text{ Hz}$		38	44	-	dB
Dropout Voltage	V_{DROP}	$T_J = 25^\circ C$		-	2.0	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	70	-	$\mu V / V_O$
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 \text{ mA}$		-	-0.9	-	$mV / ^\circ C$

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN}=16V$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1 \mu F$, $I_{OUT} = 40mA$, $T_J=0^{\circ}C \sim 125^{\circ}C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*		SN78L10x			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_O	$T_J = 25^{\circ}C$		9.6	10.0	10.4	V
		$12.5V \leq V_{IN} \leq 25.0V$ $1.0mA \leq I_O \leq 40mA$		9.5	10.0	10.5	
Line Regulation	$\Delta V_{O(\Delta VI)}$	$12.5V \leq V_{IN} \leq 25.0V$	$T_J = 25^{\circ}C$	-	100	220	mV
		$14.0V \leq V_{IN} \leq 25.0V$		-	100	170	
Load Regulation	$\Delta V_{O(\Delta IL)}$	$1.0mA \leq I_O \leq 100mA$	$T_J = 25^{\circ}C$	-	20	94	mV
		$1.0mA \leq I_O \leq 40mA$		-	10	47	
Quiescent Current	I_{QC}	$T_J = 25^{\circ}C$		-	-	6.0	mA
Quiescent Current Change	ΔI_{QC}	$12.5V \leq V_{IN} \leq 25V$		-	-	1.5	mA
		$1.0mA \leq I_O \leq 40mA$		-	-	0.1	
Ripple Rejection	RR	$15.0V \leq V_{IN} \leq 25.0V$ $f=120 \text{ Hz}$		38	43	-	dB
Dropout Voltage	V_{DROP}	$T_J = 25^{\circ}C$		-	1.7	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^{\circ}C$	-	74	-	$\mu V / V_O$
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 \text{ mA}$		-	0.95	-	$mV / ^{\circ}C$

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN}=19V$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1 \mu F$, $I_{OUT} = 40mA$, $T_J=0^\circ C \sim 125^\circ C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*		SN78L12x			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_O	$T_J = 25^\circ C$		11.5	12.0	12.5	V
		$14.5V \leq V_{IN} \leq 27.0V$ $1.0mA \leq I_O \leq 40mA$		11.4	12.0	12.6	
Line Regulation	$\Delta V_{O(\Delta VI)}$	$14.5V \leq V_{IN} \leq 27.0V$	$T_J = 25^\circ C$	-	20	250	mV
		$16.0V \leq V_{IN} \leq 27.0V$		-	15	200	
Load Regulation	$\Delta V_{O(\Delta IL)}$	$1.0mA \leq I_O \leq 100mA$	$T_J = 25^\circ C$	-	20	100	mV
		$1.0mA \leq I_O \leq 40mA$		-	10	50	
Quiescent Current	I_{QC}	$T_J = 25^\circ C$		-	2.1	6.0	mA
Quiescent Current Change	ΔI_{QC}	$16.0V \leq V_{IN} \leq 27.0V$		-	-	1.5	mA
		$1.0mA \leq I_O \leq 40mA$		-	-	0.1	
Ripple Rejection	RR	$15.0V \leq V_{IN} \leq 25.0V$, $f=120 \text{ Hz}$		37	65	-	dB
Dropout Voltage	V_{DROP}	$T_J = 25^\circ C$		-	2.0	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	80	-	$\mu V / V_O$
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 \text{ mA}$		-	-1.0	-	$mV / ^\circ C$

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN}=23V$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1 \mu F$, $I_{OUT} = 40mA$, $T_J=0^{\circ}C \sim 125^{\circ}C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*	SN78L15x			Unit	
			Min.	Typ.	Max.		
Output Voltage**	V_O	$T_J = 25^{\circ}C$	14.4	15.0	15.6	V	
		$17.5V \leq V_{IN} \leq 30.0V$ $1.0mA \leq I_O \leq 40mA$	14.25	15.0	15.75		
Line Regulation	$\Delta V_{O(\Delta V_I)}$	$17.5V \leq V_{IN} \leq 30.0V$	-	25	300	mV	
		$20.0V \leq V_{IN} \leq 30.0V$	-	20	250		
Load Regulation	$\Delta V_{O(\Delta I_L)}$	$1.0mA \leq I_O \leq 100mA$	-	25	150	mV	
		$1.0mA \leq I_O \leq 40mA$	-	12	75		
Quiescent Current	I_{QC}	$T_J = 25^{\circ}C$	-	2.1	6.0	mA	
Quiescent Current Change	ΔI_{QC}	$20.0V \leq V_{IN} \leq 30.0V$	-	-	1.5	mA	
		$1.0mA \leq I_O \leq 40mA$	-	-	0.1		
Ripple Rejection	RR	$18.5V \leq V_{IN} \leq 28.5V$ $f=120 \text{ Hz}$	34	60	-	dB	
Dropout Voltage	V_{DROD}	$T_J = 25^{\circ}C$	-	1.7	-	V	
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^{\circ}C$	-	90	-	$\mu V / V_O$
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 \text{ mA}$	-	-1.3	-	$mV / ^{\circ}C$	

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN}=27V$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1 \mu F$, $I_{OUT} = 40mA$, $T_J=0^{\circ}C \sim 125^{\circ}C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*		SN78L18x			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_O	$T_J = 25^{\circ}C$		17.3	18.0	18.7	V
		$21.0V \leq V_{IN} \leq 33.0V$ $1.0mA \leq I_O \leq 40mA$		17.1	18.0	18.9	
Line Regulation	$\Delta V_{O(\Delta V_I)}$	$21.0V \leq V_{IN} \leq 33.0V$	$T_J = 25^{\circ}C$	-	145	300	mV
		$22.0V \leq V_{IN} \leq 33.0V$		-	135	250	
Load Regulation	$\Delta V_{O(\Delta I_L)}$	$1.0mA \leq I_O \leq 100mA$	$T_J = 25^{\circ}C$	-	30	170	mV
		$1.0mA \leq I_O \leq 40mA$		-	15	85	
Quiescent Current	I_{QC}	$T_J = 25^{\circ}C$		-	2.2	6.0	mA
Quiescent Current Change	ΔI_{QC}	$21.0V \leq V_{IN} \leq 33.0V$		-	-	1.5	mA
		$1.0mA \leq I_O \leq 40mA$		-	-	0.1	
Ripple Rejection	RR	$23.0V \leq V_{IN} \leq 33.0V$ $f=120 \text{ Hz}$		34	48	-	dB
Dropout Voltage	V_{DROP}	$T_J = 25^{\circ}C$		-	1.7	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^{\circ}C$	-	150	-	$\mu V / V_O$
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta \text{Temp}}$	$I_O = 5.0 \text{ mA}$		-	-1.8	-	$mV / ^{\circ}C$

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

◆ Electrical characteristics

($V_{IN}=33V$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1 \mu F$, $I_{OUT} = 40mA$, $T_J=0^\circ C \sim 125^\circ C$; unless otherwise specified)

Characteristic	Symbol	Test Condition*		SN78L24x			Unit
				Min.	Typ.	Max.	
Output Voltage**	V_O	$T_J = 25^\circ C$		23.0	24.0	25.0	V
		$27.0V \leq V_{IN} \leq 38.0V$ $1.0mA \leq I_O \leq 40mA$, $P_D \leq 15W$		22.8	24.0	25.2	
Line Regulation	$\Delta V_{O(\Delta V_I)}$	$27.0V \leq V_{IN} \leq 38.0V$	$T_J = 25^\circ C$	-	160	300	mV
		$28.0V \leq V_{IN} \leq 38.0V$		-	150	250	
Load Regulation	$\Delta V_{O(\Delta I_L)}$	$1.0mA \leq I_O \leq 100mA$	$T_J = 25^\circ C$	-	40	200	mV
		$1.0mA \leq I_O \leq 4mA$		-	20	100	
Quiescent Current	I_{QC}	$T_J = 25^\circ C$		-	2.2	6.0	mA
Quiescent Current Change	ΔI_{QC}	$28.0V \leq V_{IN} \leq 38.0V$		-	-	1.5	mA
		$1.0mA \leq I_O \leq 40mA$		-	-	0.1	
Ripple Rejection	RR	$28.0V \leq V_{IN} \leq 38.0V$ $f=120 \text{ Hz}$		34	45	-	dB
Dropout Voltage	V_{DROP}	$T_J = 25^\circ C$		-	1.7	-	V
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	$T_A = 25^\circ C$	-	200	-	$\mu V / V_O$
Temperature coefficient of Output voltage	$\frac{\Delta V_O}{\Delta Temp}$	$I_O = 5.0 \text{ mA}$		-	-2.0	-	$mV / ^\circ C$

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

Fig.1 Quiescent Current vs. Junction Temperature

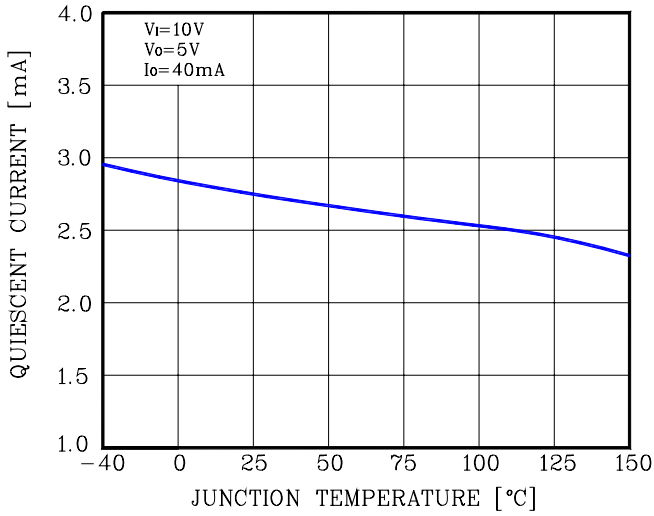


Fig.2 Output Peak Current vs. Input to Output Differential

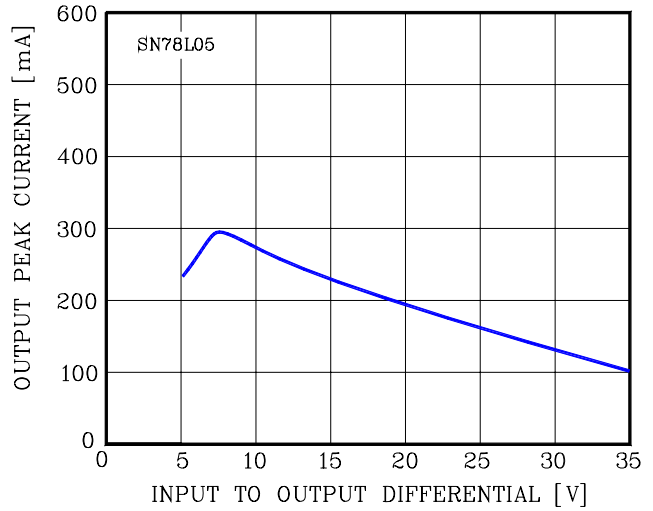


Fig.3 Output Voltage vs. Junction Temperature

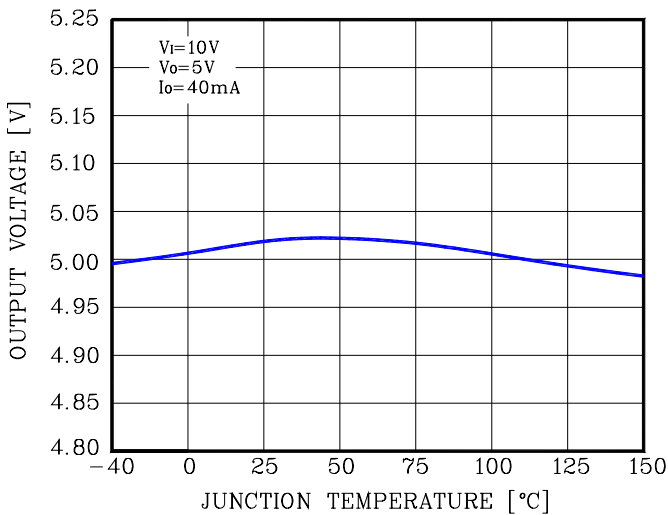


Fig.4 Dropout Voltage vs. Input Voltage

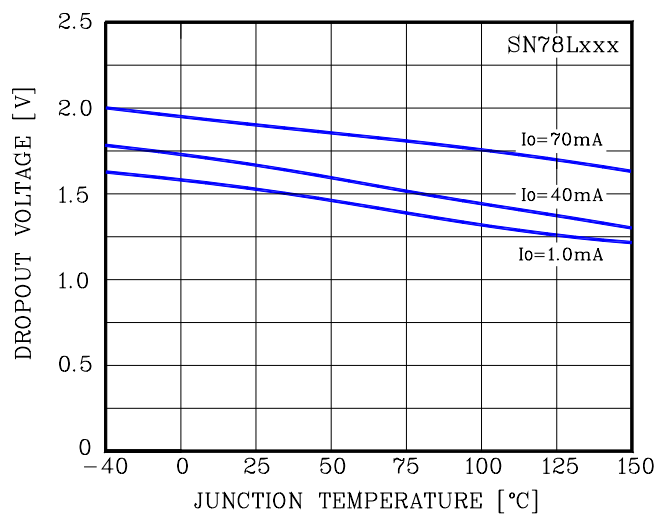


Fig.5 Line Transient Response

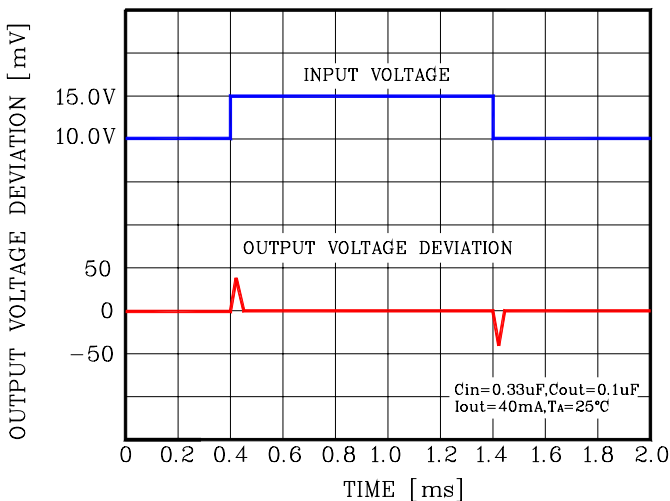
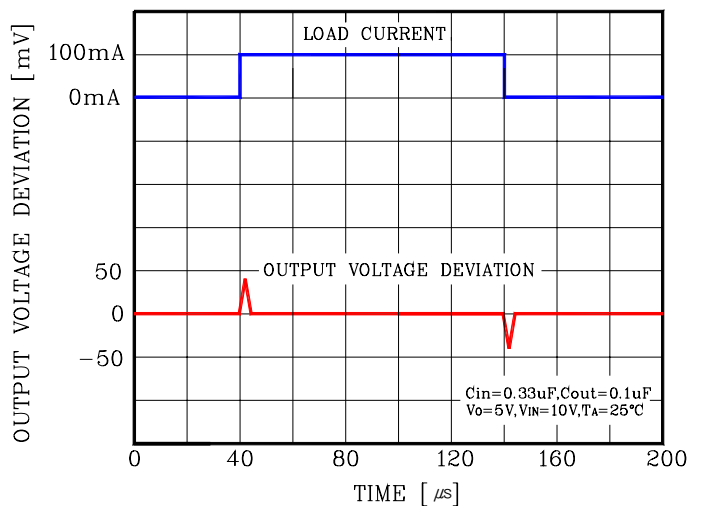
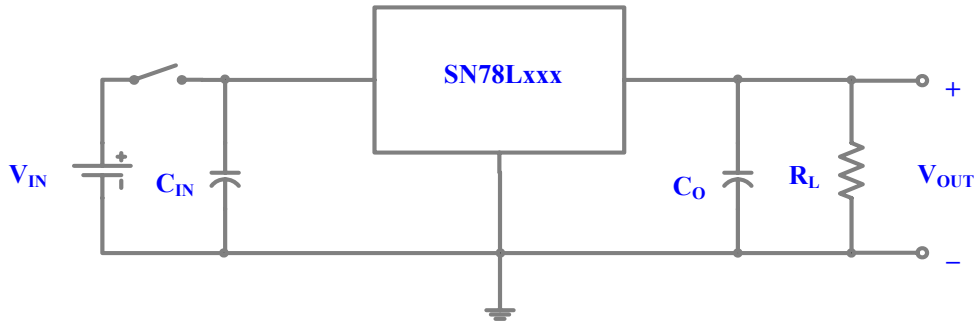


Fig.6 Load Transient Response



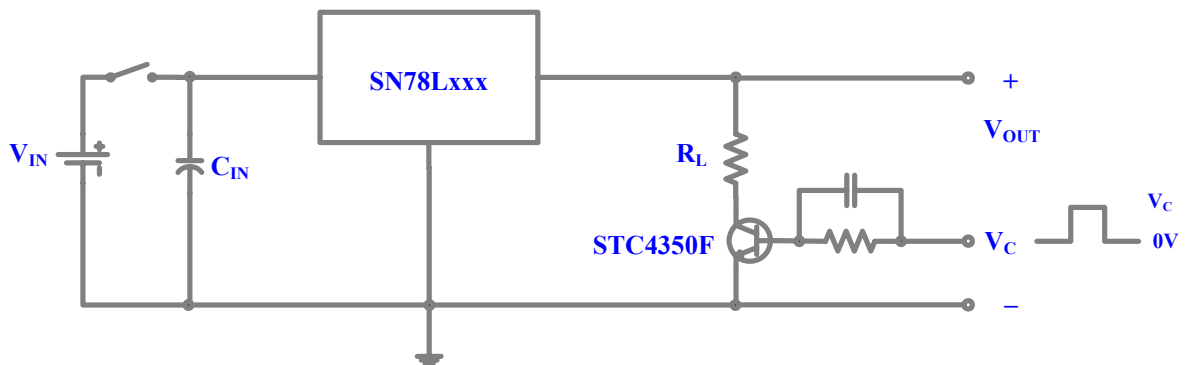
Typical Application

Fixed Output Regulator

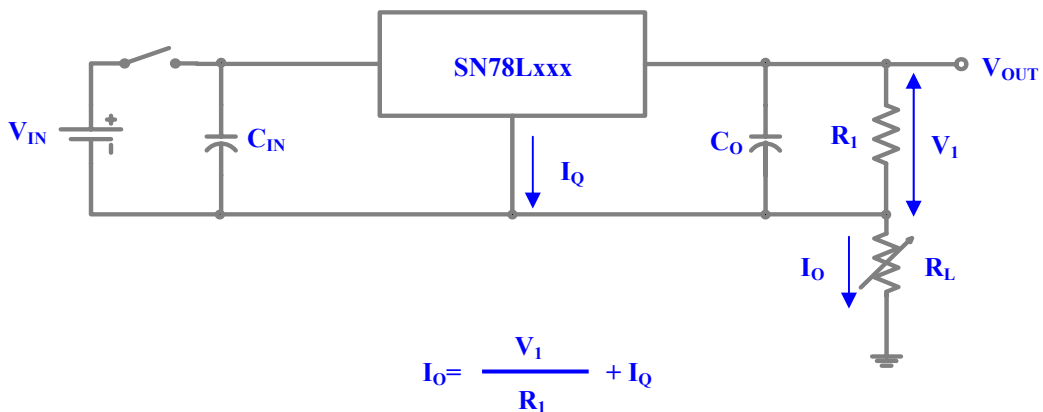


- 1) C_{IN} should be required if regulators are located far from power supply filter
- 2) C_O improves output stability and transient response

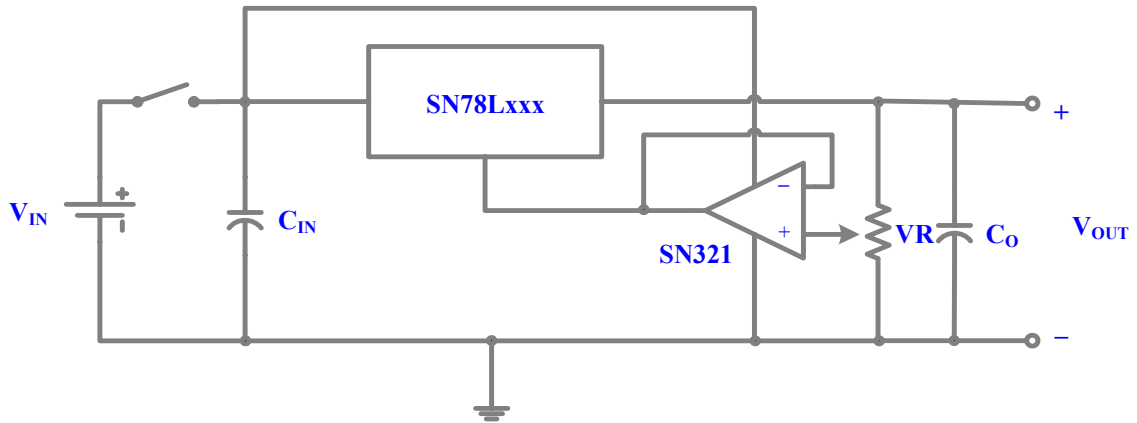
Load Regulation



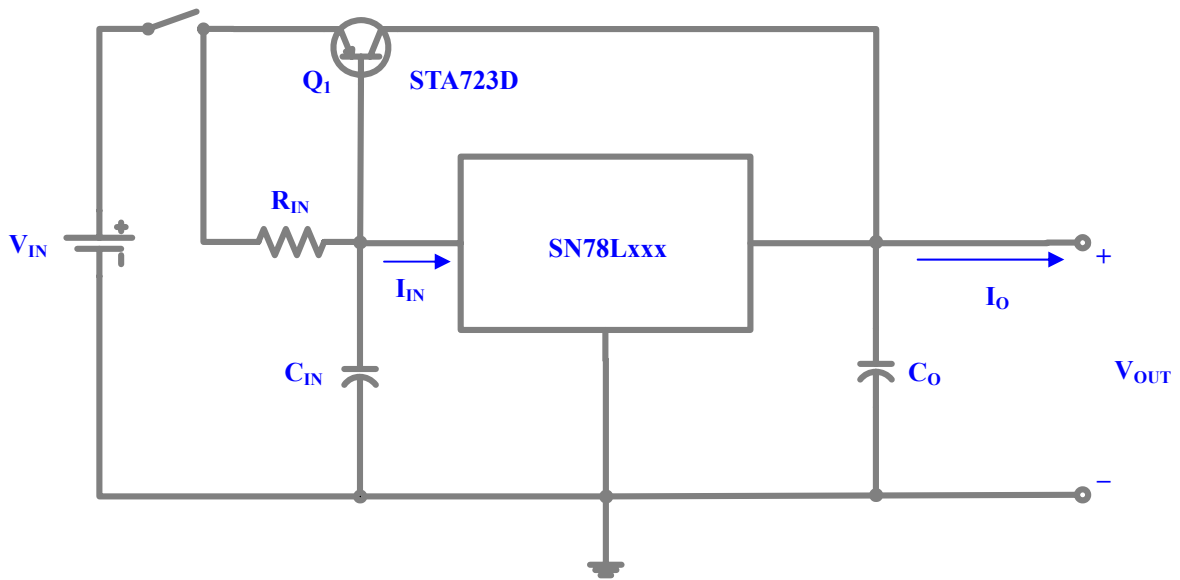
Constant Current Regulator



Adjustable Output Regulator

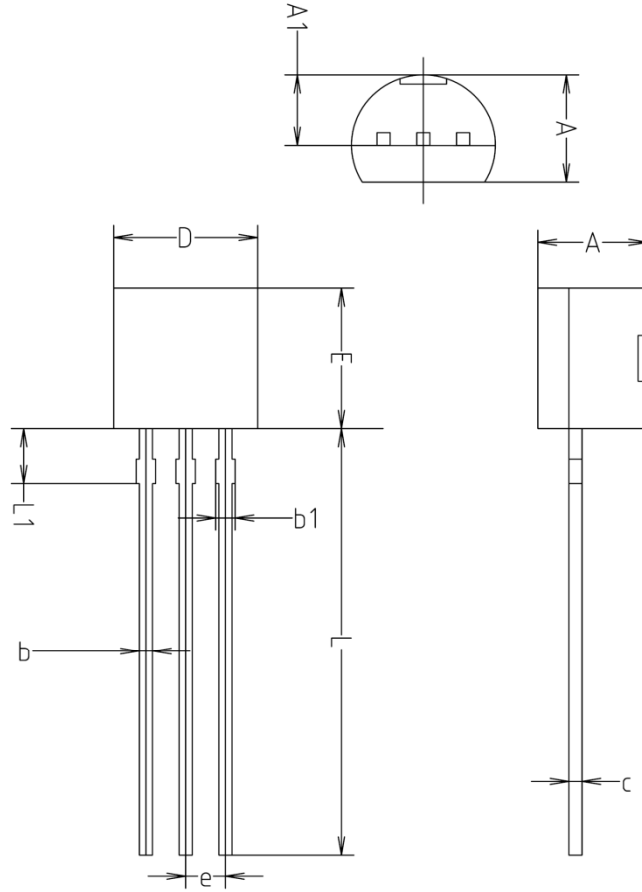


High Current Voltage Regulator



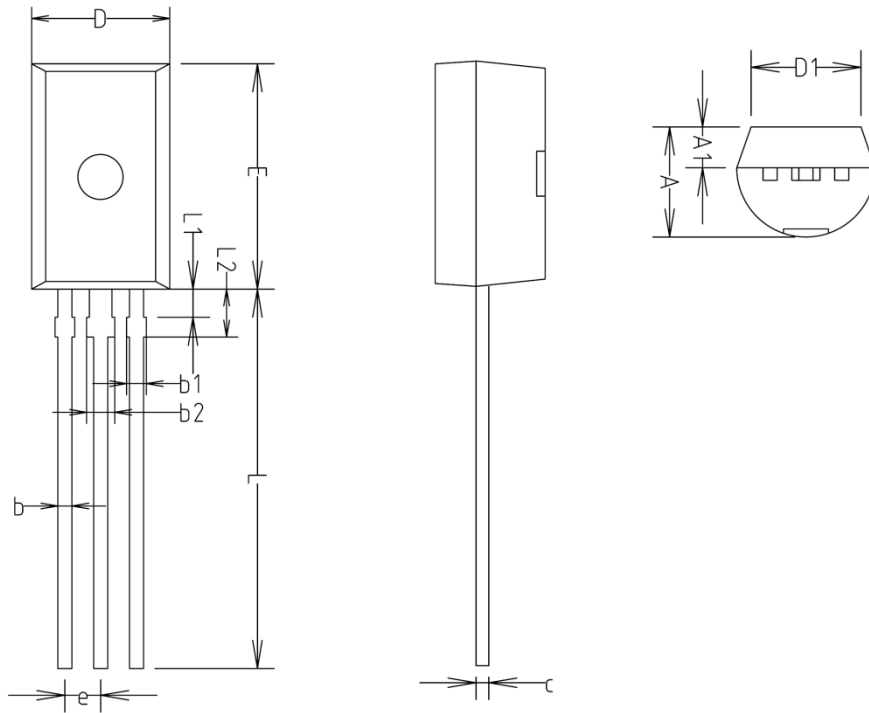
$$I_O = I_{IN} + \beta_{Q1}(I_{IN} - V_{BEQ1} / R_{IN})$$

◆ TO-92 Outline Dimension (Unit : mm)



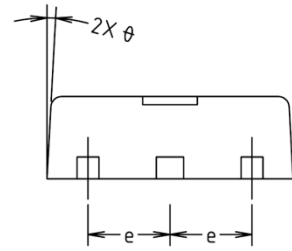
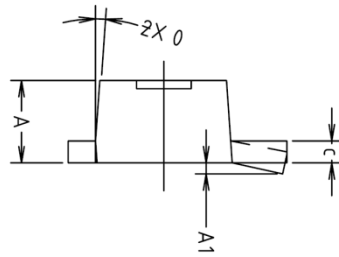
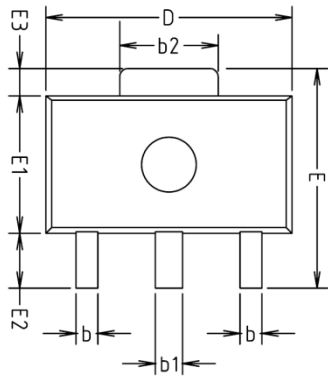
SYMBOL	MILLIMETERS(mm)		
	MINIMUM	NOMINAL	MAXIMUM
A	3.40	3.50	3.66
A1	2.46	2.51	2.59
b	0.39	0.44	0.53
b1	0.39	-	0.63
c	0.35	0.42	0.47
D	4.48	4.60	4.70
E	4.48	4.60	4.70
e	1.17	1.27	1.37
L	13.70	14.00	14.77
L1	1.55	1.70	2.15

◆ TO-92L Outline Dimension (Unit : mm)



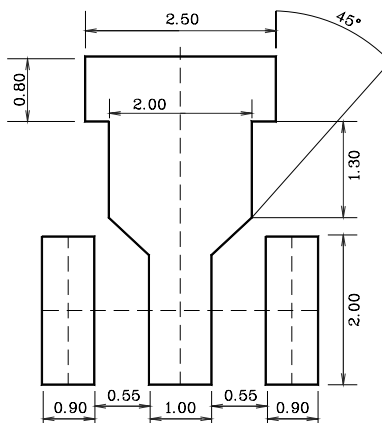
SYMBOL	MILLIMETERS(mm)			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	3.70	3.90	4.10	
A1	1.25	1.45	1.65	
b	0.40	0.50	0.60	
b1	—	—	0.70	
b2	—	—	1.00	
c	0.35	0.45	0.55	
D	4.70	4.90	5.10	
D1	3.70	3.90	4.10	
E	7.80	8.00	8.20	
e	1.27 TYP			
L	13.10	13.50	13.90	
L1	0.90	1.00	1.10	
L2	1.50	1.70	1.90	

◆ SOT-89 Outline Dimension (Unit : mm)



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	1.40	1.50	1.60	
A1	0.00	-	0.10	
b	0.38	0.42	0.48	
b1	0.48	0.52	0.58	
b2	1.79	1.82	1.87	
c	0.40	0.42	0.46	
D	4.40	4.50	4.70	
E	3.70	4.00	4.30	
E1	2.40	2.50	2.70	
E2	0.80	1.00	1.20	
E3	0.40	0.50	0.60	
e	1.50 TYP.			
θ	4° TYP.			

※ Recommend PCB solder land [Unit: mm]



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