

# Preliminary **TS378RL00 Series** 3A Ultra Low Dropout Voltage Regulator w/Disable

**ITO-220-4L**



**Pin Definition:**

1. Input
2. Output
3. Ground
4. Enable

**General Description**

The TS378RL00 Series is a low-dropout voltage regulator suitable for various electronic equipments. It provides constant voltage power source with ITO-220 4 lead full mold package.

Dropout voltage of TS378RL00 Series is below 0.5V in full rated current (3A). This regulator has various functions such as a peak current protection, thermal shut down, over voltage protection and an output disable function.

**Features**

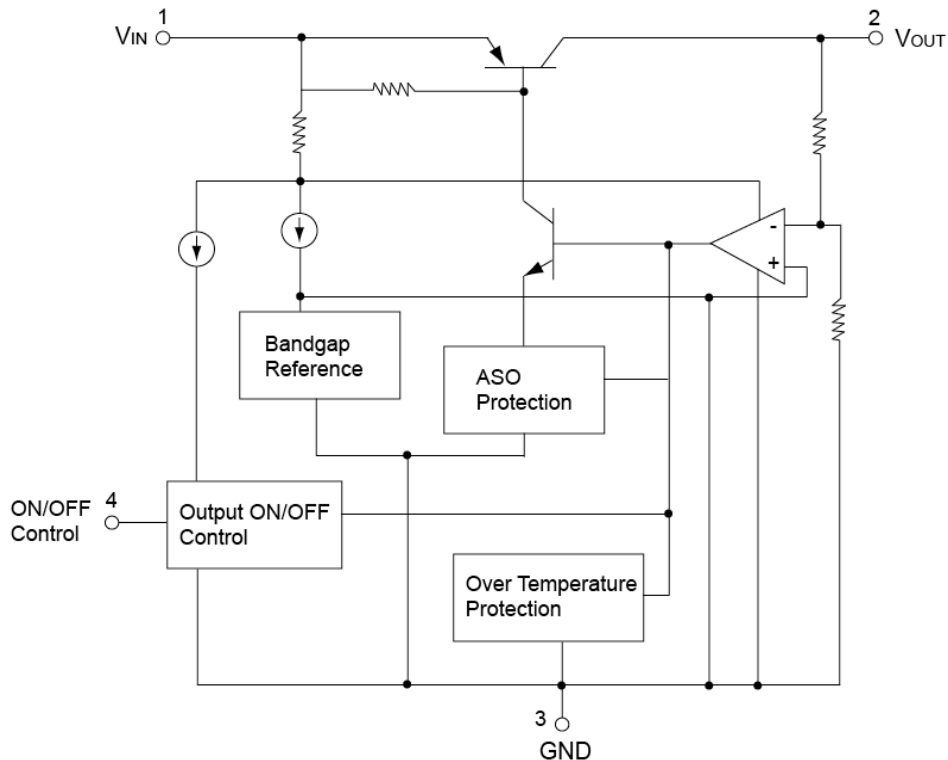
- Ultra Low Dropout performance 0.5Vmax. 3A
- Thermal Shutdown
- Over Voltage Protection, Short Circuit Protection
- With Output Disable Function
- ±2.4% Typical Total output
- TO-220 Full-Mold Package (4Pin)

**Ordering Information**

Part No.	Package	Packing
TS378RL <del>xx</del> CI4 C0	ITO-220-4L	50pcs / Tube

Note: Where **xx** denotes voltage option,  
**33=3.3V, 05=5V, 08=8V, 09=9V, 12=12V, 15=15V**

**Block Diagram**



### Absolute Maximum Rating

Parameter	Symbol	Value	Unit	Remark
Input Voltage	$V_{IN}$	18	V	--
Disable Voltage	$V_{DIS}$	18	V	--
Output Current	$I_O$	3	A	--
Power Dissipation 1	$P_D 1$	1.5	W	No heat sink
Power Dissipation 2	$P_D 2$	15	W	With heat sink
Junction Temperature	$T_J$	-40~+125	°C	--
Thermal Resistance, Junction-to Case (Note2)	$R_{\theta JC}$	4.31	°C / W	--
Thermal Resistance, Junction-to Air (Note2)	$R_{\theta JA}$	48.83	°C / W	--
Thermal Shutdown Temperature	$T_{SD}$	150	°C	--

### Electrical Specifications ( $V_{IN}$ =Note 6, $I_O$ =1.0A, $T_a$ =25°C, unless otherwise specified).

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	TS378RL33	$V_O$	3.22	3.3	3.38	V
	TS378RL05		4.88	5.0	5.12	
	TS378RL08		7.80	8.0	8.20	
	TS378RL09		8.78	9.0	9.22	
	TS378RL12		11.71	12	12.28	
	TS378RL15		14.64	15	15.36	
Load Regulation	$REG_{LOAD}$	$I_O = 5mA \sim 3A$	--	0.1	2.0	%
Line Regulation	$REG_{LINE}$	Note 7	--	0.5	2.5	%
Ripple Rejection Ratio	RR	Note1	45	55	--	dB
Dropout Voltage	$V_{DROP}$	$I_O = 3A$	--	--	0.5	V
Disable Voltage High	$V_{DIS H}$	Output Active	2.0	--	--	V
Disable Voltage Low	$V_{DIS L}$	Output Disabled	--	--	0.8	V
Disable Bias Current High	$I_{DIS H}$	$V_{DIS} = 2.7V$	--	--	20	uA
Disable Bias Current Low	$I_{DIS L}$	$V_{DIS} = 0.4V$	--	--	-0.4	mA
Quiescent Current	$I_q$	$I_O = 0A$	--	--	10	mA

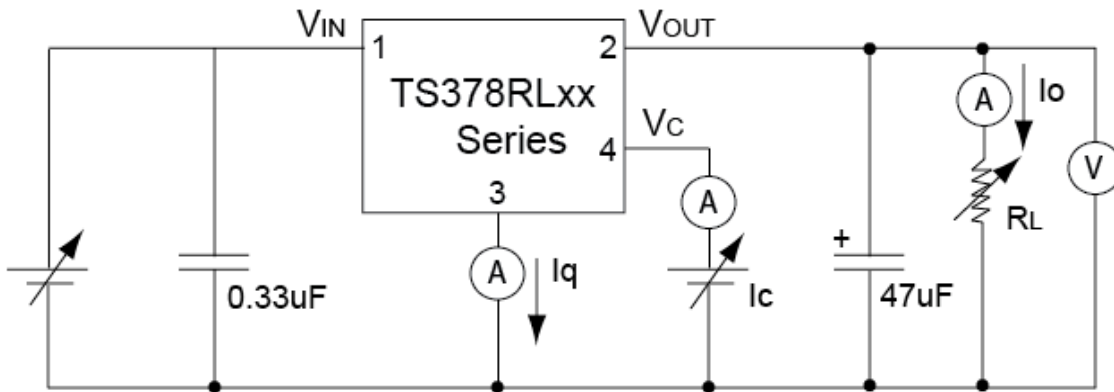
Note:

1. These parameters, although guaranteed, are not 100% tested in production.
2. Junction -to -case thermal resistance test environments.
3. Pneumatic heat sink fixture.
4. Clamping pressure 60psi through 12mm diameter cylinder.
5. Thermal grease applied between PKG and heat sink fixture
6. TS378RL33:  $V_{IN} = 5V$ , TS378RL05:  $V_{IN} = 7V$ , TS378RL08:  $V_{IN} = 10V$ , TS378RL09:  $V_{IN} = 11V$ , TS378RL12:  $V_{IN} = 15V$ , TS378RL15:  $V_{IN} = 18V$
7. TS378RL33:  $V_{IN} = 4 \sim 10V$ , TS378RL05:  $V_{IN} = 6 \sim 12V$ , TS378RL08:  $V_{IN} = 9 \sim 18V$ , TS378RL09:  $V_{IN} = 10 \sim 18V$ , TS378RL12:  $V_{IN} = 13 \sim 18V$ , TS378RL15:  $V_{IN} = 16 \sim 18V$

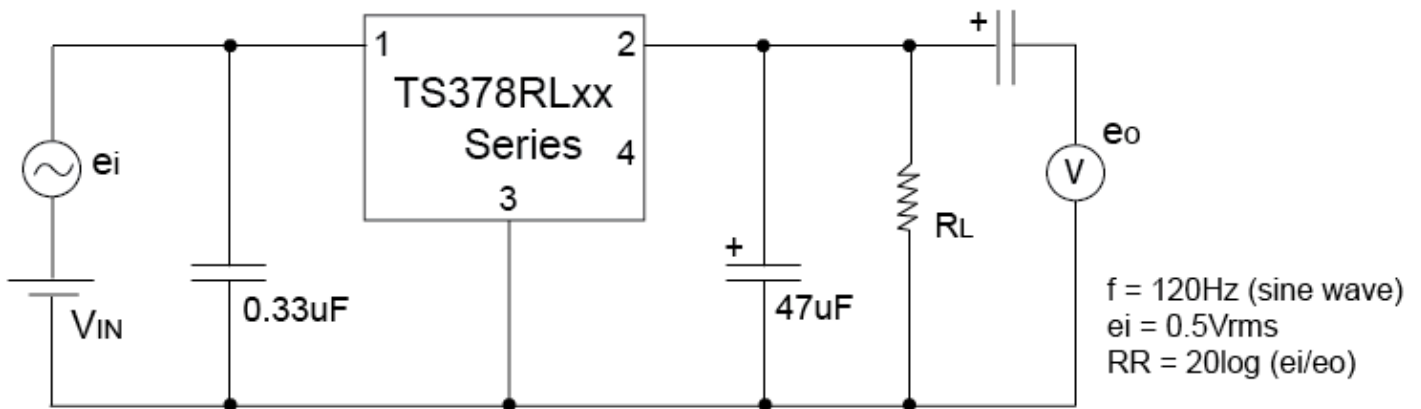
# Preliminary TS378RL00 Series

## 3A Ultra Low Dropout Voltage Regulator w/Disable

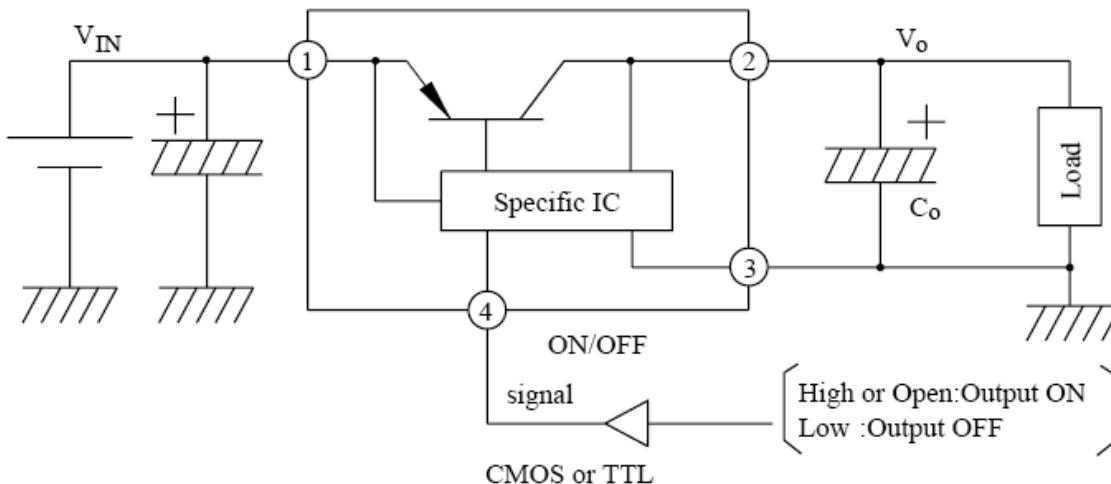
### Standard Test Circuit



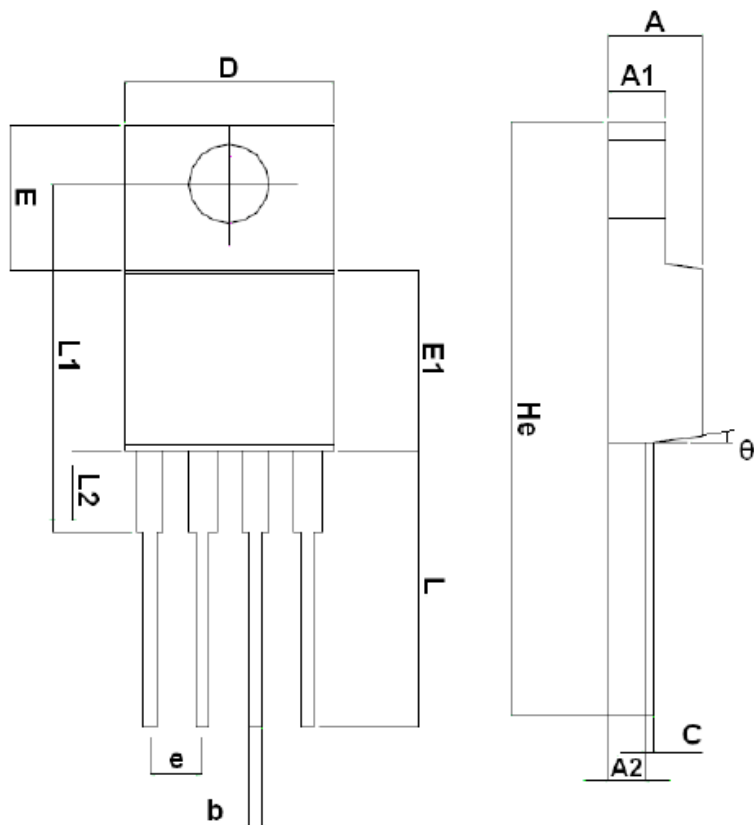
### Ripple Rejection Test Circuit



### Standard Application Circuit

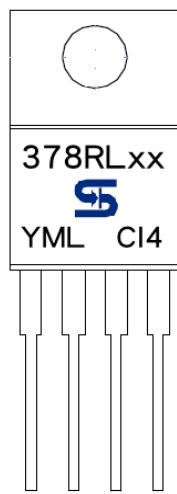


**ITO-220-4L Mechanical Drawing**



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.42	4.72	0.174	0.186
A1	2.69	2.89	0.136	0.114
A2	1.68	1.88	0.066	0.074
D	10.00	10.20	0.394	0.402
E	6.85	7.05	0.269	0.278
E1	8.54	8.74	0.336	0.344
L	13.15	13.55	0.518	0.533
L2	16.56	16.76	0.652	0.660
L2	3.60	3.80	0.142	0.150
He	28.44	28.92	1.119	1.159
C	0.48		0.019	
E	2.54(TYP)		0.1(TYP)	
b	0.635(TYP)		0.025(TYP)	
theta	4°	7°	4°	7°

**Marking Diagram**



- XX** = Voltage Code  
(33=3.3V, 05=5V, 08=8V, 09=9V, 12=12V, 15=15V)
- Y** = Year Code
- M** = Month Code  
(A=Jan, B=Feb, C=Mar, D=Apr, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
- L** = Lot Code
- CI4** = Package Code for Adjustable type  
(CI4 = ITO-220-4L)

# **Preliminary** TS378RL00 Series

## 3A Ultra Low Dropout Voltage Regulator w/Disable

### **Notice**

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.