

# 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**

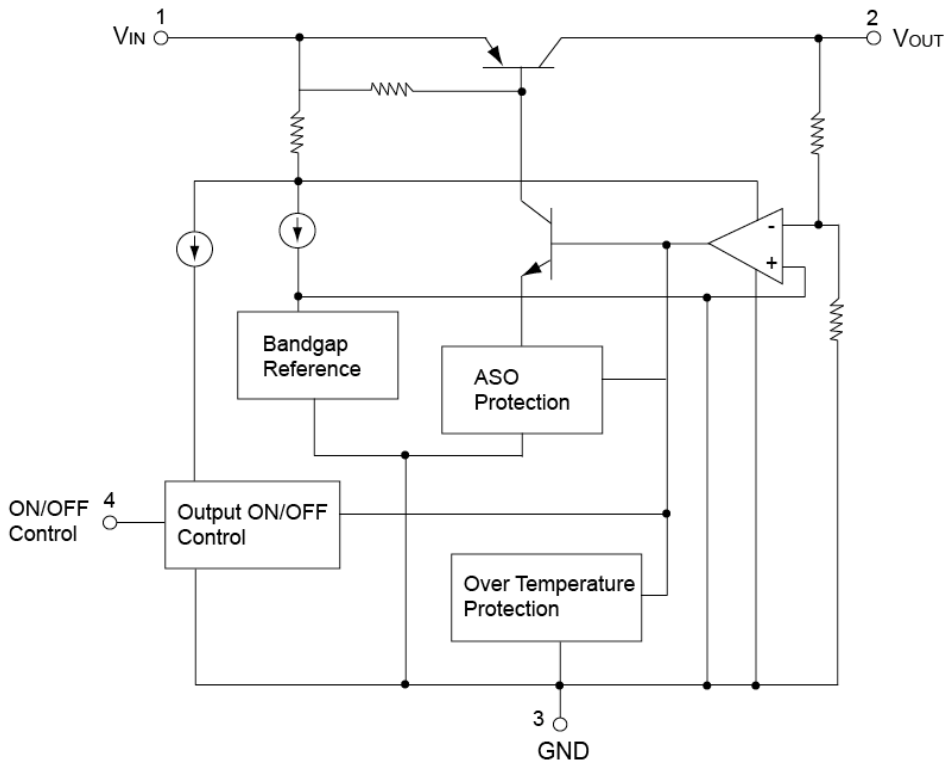
- Ultra Low Dropout performance 0.5Vmax. 3A
- Thermal Shutdown
- Over Voltage Protection, Short Circuit Protection
- With Output Disable Function
- ±2.4% Typical Total output
- TO-220 Full-Mold Package (4Pin)

**Ordering Information**

Part No.	Package	Packing
TS378RL $\underline{xx}$ CI4 C0	ITO-220-4L	50pcs / Tube

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

**Block Diagram**



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### 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	--

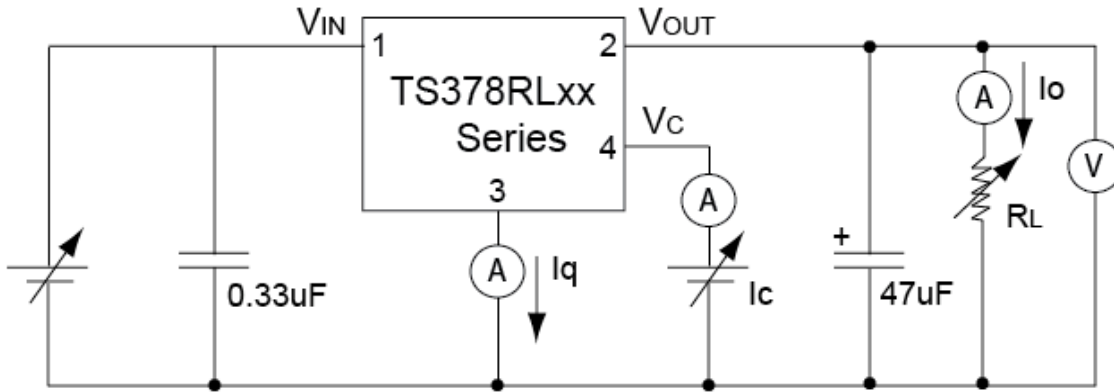
### Electrical Specifications ( $V_{IN}$ =Note 6, $I_O$ =1.0A, $T_a$ =25°C, unless otherwise specified).

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

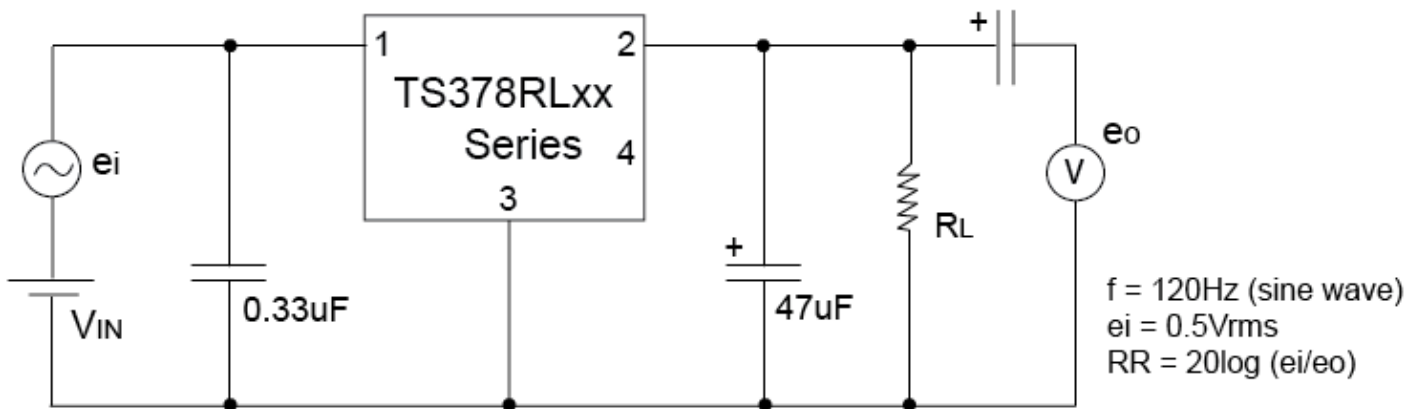
Note:

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:  $V_{IN} = 16 \sim 18V$

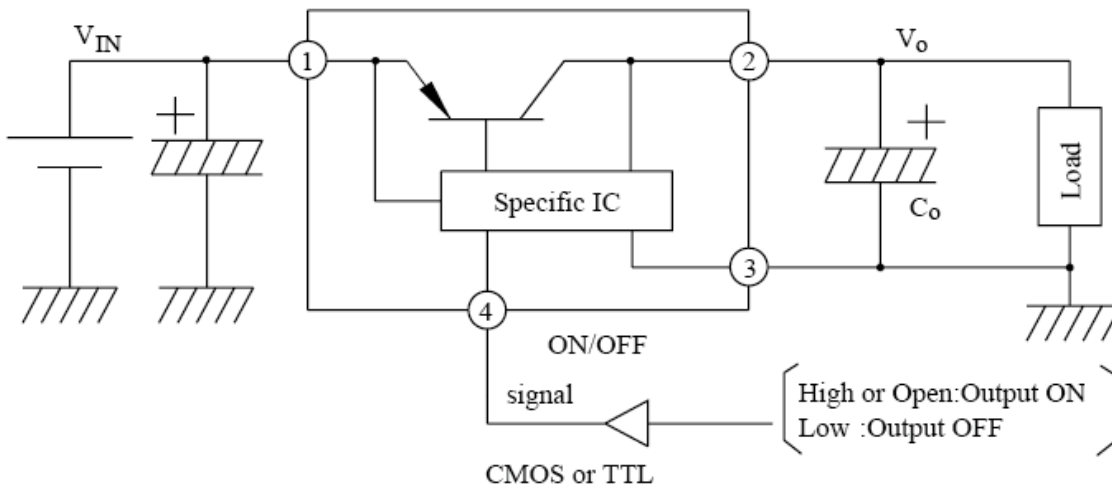
**Standard Test Circuit**



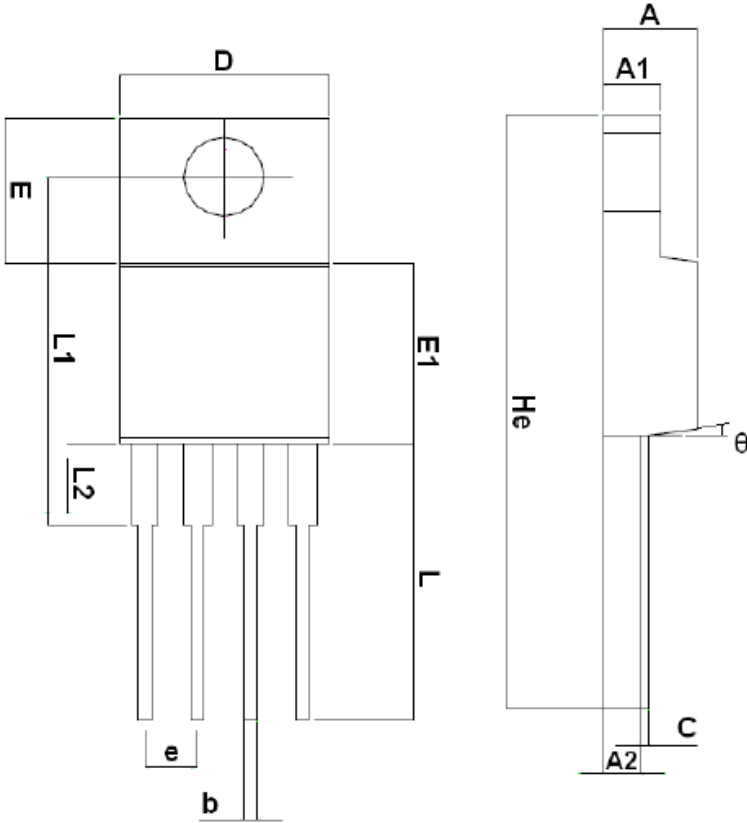
**Ripple Rejection Test Circuit**



**Standard Application Circuit**

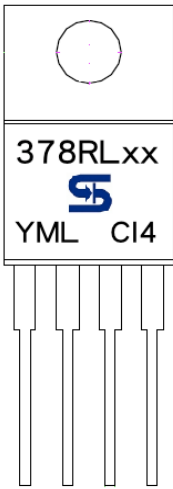


**ITO-220-4L Mechanical Drawing**



ITO-220-4L DIMENSION				
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
- C14** = Package Code for Adjustable type  
(C14 = ITO-220-4L)

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