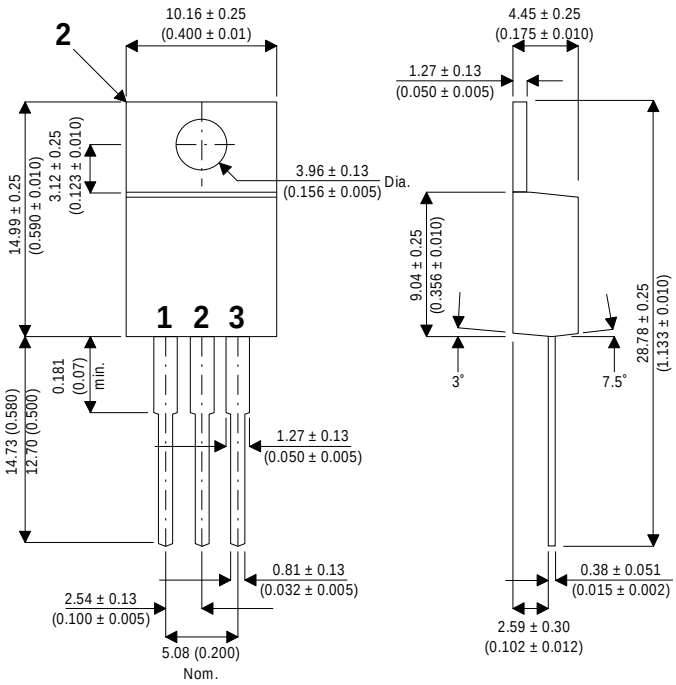
SEME LAB

IP78T12CT
IP78T12ACT

MECHANICAL DATA
Dimensions in mm (Inches)

12 VOLT, 3 AMP POSITIVE VOLTAGE REGULATOR

T Package — TO–220 Plastic Package



Pin 1 – V_{IN} Pin 2 – Gnd Pin 3 – V_{OUT}

FEATURES

- **0.04%/V LINE REGULATION**
- **0.3%/A LOAD REGULATION**
- **THERMAL OVERLOAD PROTECTION**
- **SHORT CIRCUIT PROTECTION**
- **SAFE OPERATING AREA PROTECTION**
- **1% TOLERANCE**
- **START–UP WITH NEGATIVE VOLTAGE (± SUPPLIES) ON OUTPUT**
- **ALTERNATE PACKAGE STYLES AVAILABLE**

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

V_I	DC Input Voltage	35V
P_D	Power Dissipation	Internally limited
T_j	Operating Junction Temperature Range	0°C to +125°C
T_{stg}	Storage Temperature Range	–65°C to +150°C
T_L	Lead Temperature (Soldering, 10 sec)	300°C

Semelab plc. Telephone +44(0)1455 556565. Fax +44(0)1455 552612.
E-mail: sales@semelab.co.uk Website: http://www.semelab.co.uk

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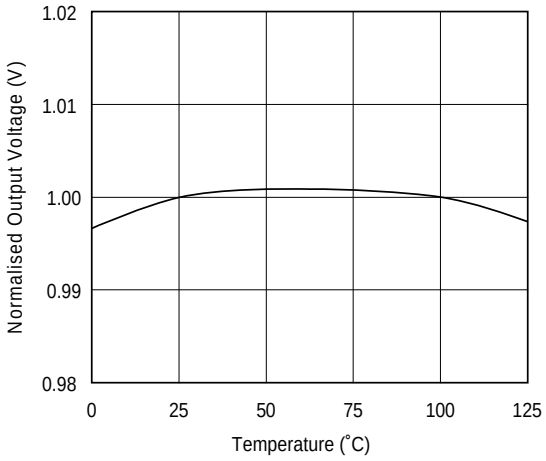
ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise stated)

Parameter	Test Conditions		IP78T12ACT Min.	IP78T12ACT Typ.	IP78T12ACT Max.	IP78T12CT Min.	IP78T12CT Typ.	IP78T12CT Max.	Units
V_O Output Voltage	I_O = 1A V_{IN} = 14.8V		11.88	12	12.12	11.5	12	12.5	V
	V_{IN} = 15.4V to 22V P_{OUT} £ 25W I_O = 5mA to 3A T_J = 0 to +125°C		11.64		12.36	11.4		12.6	V
DV_O Line Regulation	I_O = 1A V_{IN} = 14.8V to 22V T_J = 0 to +125°C				36			60	mV
DV_O Load Regulation	I_O = 5mA to 3A V_{IN} = 15.4V T_J = 0 to +125°C				75			150	mV
I_Q Quiescent Current	I_O = 5mA to 3A V_{IN} = 15.4V T_J = 0 to +125°C				10			14	mA
DI_Q Quiescent Current Change	I_O = 5mA to 3A V_{IN} = 15.4V T_J = 0 to +125°C				1.5			3.0	mA
	I_O = 1A V_{IN} = 14.8V to 22V T_J = 0 to +125°C				1.5			3.0	mA
V_N Output Noise Voltage	f = 10Hz to 100kHz			75			75		mVrms
$\frac{DV_{IN}}{DV_O}$ Ripple Rejection	f = 120Hz V_{IN} = 15.4V to 25.4V I_O = 1A	T_J = 25°C	58	72		52	72		dB
		T_J = 0 to +125°C	52			48			
I_{SC} Short Circuit Current	V_{IN} = 15.4V			3			3		A
I_{pk} Peak Output Current	V_{IN} = 15.4V			4			4		
Long Term Stability					84			84	
R_{qJC} Thermal Resistance Junction to Case				3	4		4		mV

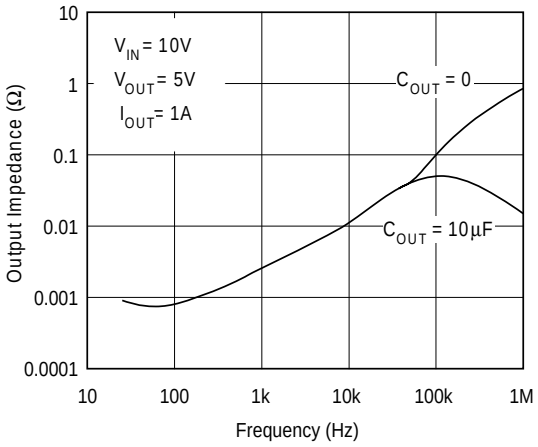
All characteristics are measured with a capacitor across the input of 0.22mF and a capacitor across the output of 0.1mF.
All characteristics except noise voltage and ripple rejection ratios are measured using pulse techniques (t_p £ 10ms , d £ 5%).
Output voltage changes due to changes into internal temperature must be taken into account separately.

TYPICAL PERFORMANCE CHARACTERISTICS

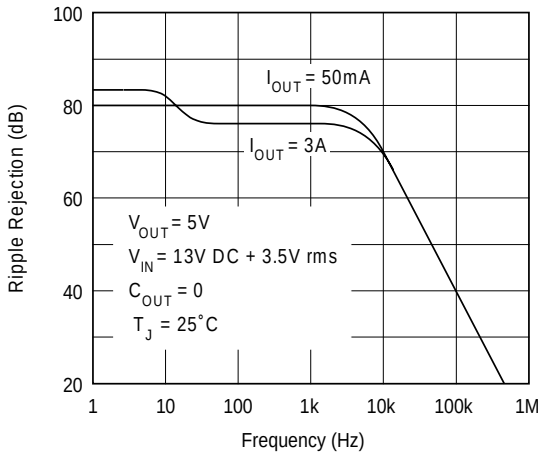
OUTPUT VOLTAGE
(Normalised to 1V at T_J = 25°C)



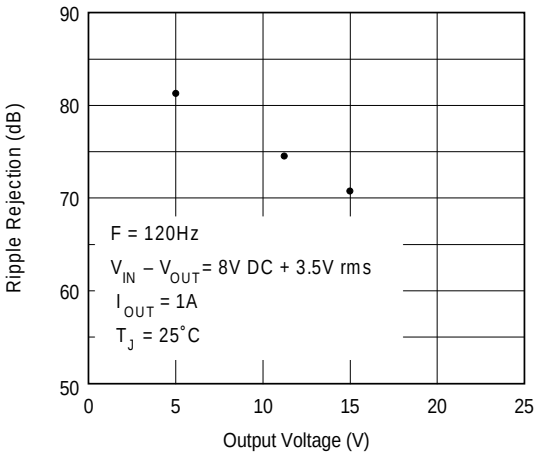
OUTPUT IMPEDANCE



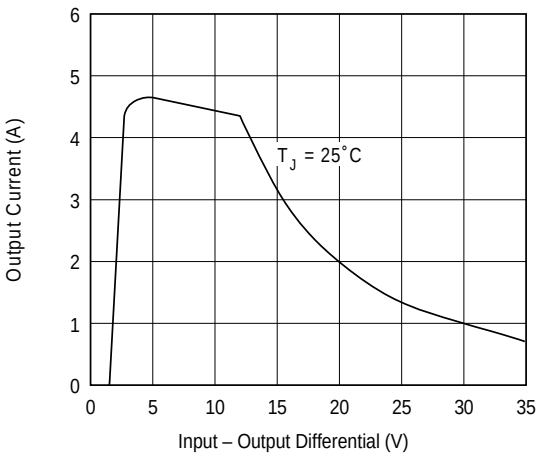
RIPPLE REJECTION



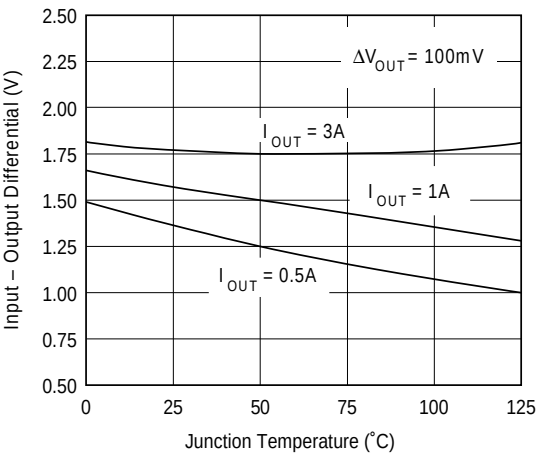
RIPPLE REJECTION



CURRENT LIMIT

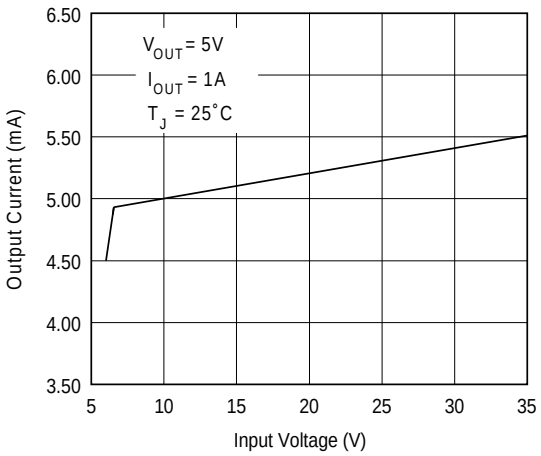


DROPOUT VOLTAGE

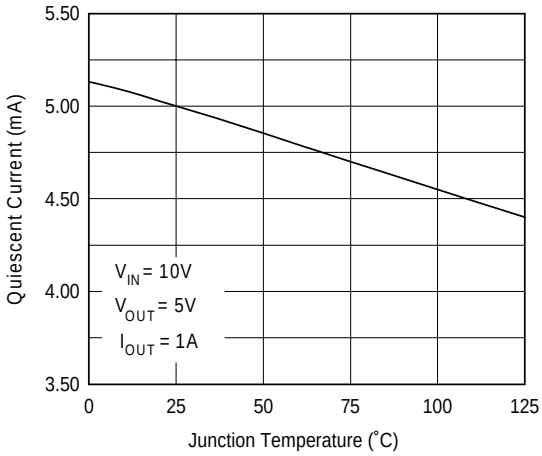


TYPICAL PERFORMANCE CHARACTERISTICS

QUIESCENT CURRENT

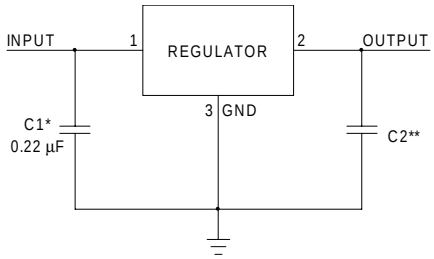


QUIESCENT CURRENT



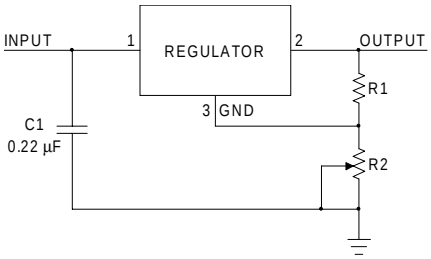
APPLICATIONS INFORMATION

FIXED OUTPUT REGULATOR



* Required if the regulator is located far from the power supply filter.
** Although no output capacitor is needed for stability, it does help transient response. If needed, use a 0.1mF ceramic disk.

ADJUSTABLE OUTPUT REGULATOR

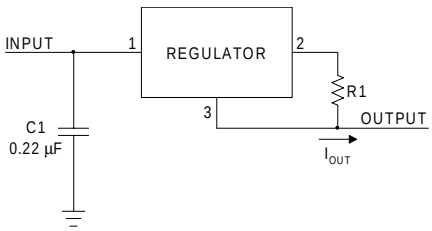


$V_{OUT} = V_{REG} + (V_{REG} / R1 + I_Q) R2$

$V_{REG} / R1 > 3 I_Q$

Load Regulation (L_r) » $\left[\frac{(R1 + R2)}{R1}\right]$ (L_R of regulator)

CURRENT REGULATOR



$$I_{OUT} = \frac{V_{REG}}{R1} + I_Q$$

DI_Q = 3.0mA over line and load changes.