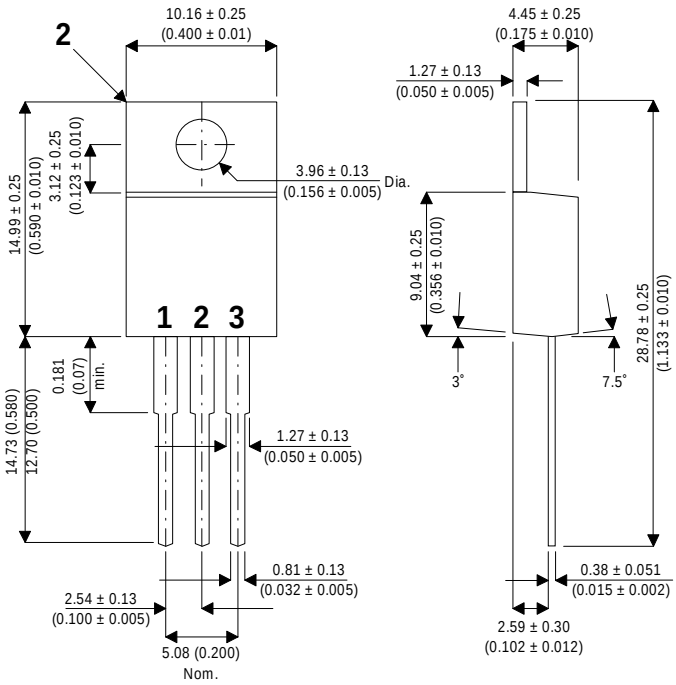
IP78T05CT
IP78T05ACT

MECHANICAL DATA
Dimensions in mm (Inches)

5 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

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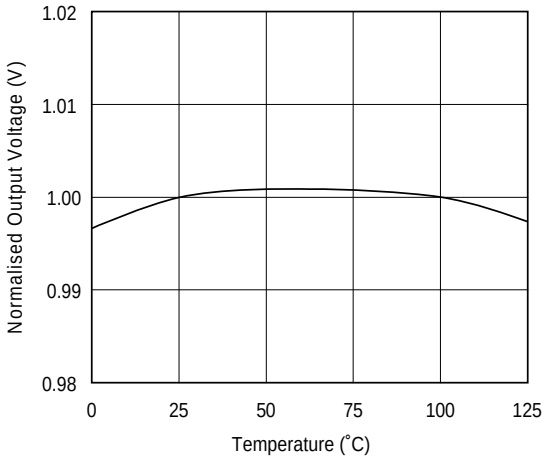
ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise stated)

Parameter	Test Conditions		IP78T05ACT Min.	IP78T05ACT Typ.	IP78T05ACT Max.	IP78T05CT Min.	IP78T05CT Typ.	IP78T05CT Max.	Units
V_O Output Voltage	I_O = 1A V_{IN} = 7.5V		4.95	5	5.05	4.8	5	5.2	V
	V_{IN} = 8V to 15V $P_{OUT} \leq$ 25W I_O = 5mA to 3A T_J = 0 to +125°C		4.85		5.15	4.75		5.25	V
ΔV_O Line Regulation	I_O = 1A V_{IN} = 7.5V to 15V T_J = 0 to +125°C				15			25	mV
ΔV_O Load Regulation	I_O = 5mA to 3A V_{IN} = 8V T_J = 0 to +125°C				50			100	mV
I_Q Quiescent Current	I_O = 5mA to 3A V_{IN} = 8V T_J = 0 to +125°C				10			14	mA
ΔI_Q Quiescent Current Change	I_O = 5mA to 3A V_{IN} = 8V T_J = 0 to +125°C				1.5			3.0	mA
	I_O = 1A V_{IN} = 7.5V to 15V T_J = 0 to +125°C				1.5			3.0	mA
V_N Output Noise Voltage	f = 10Hz to 100kHz			40			40		µVrms
$\frac{\Delta V_{IN}}{\Delta V_O}$ Ripple Rejection	f = 120Hz V_{IN} = 8V to 18V	T_J = 25°C	66	80		60	80		dB
	I_O = 1A	T_J = 0 to +125°C	60			56			
I_{SC} Short Circuit Current	V_{IN} = 15V			3			3		A
	V_{IN} = 7.5V			4			4		
Long Term Stability					35			35	mV
$R_{\theta JC}$ Thermal Resistance Junction to Case				3	4		4		°C/W

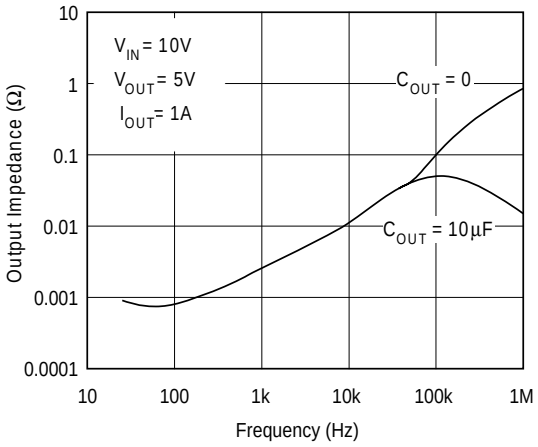
All characteristics are measured with a capacitor across the input of 0.22µF and a capacitor across the output of 0.1µF.
All characteristics except noise voltage and ripple rejection ratios are measured using pulse techniques ($t_p \leq$ 10ms , $\delta \leq$ 5%).
Output voltage changes due to changes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

TYPICAL PERFORMANCE CHARACTERISTICS

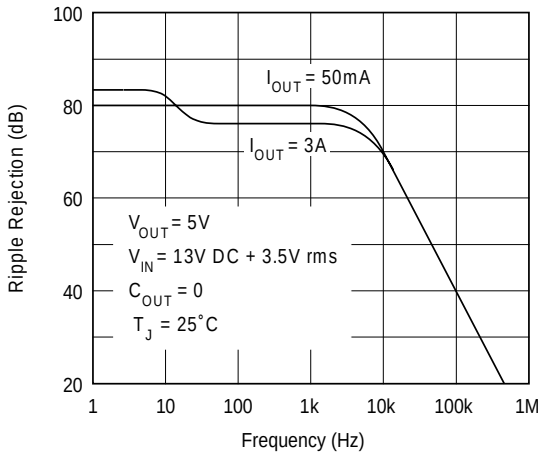
OUTPUT VOLTAGE
(Normalised to 1V at T_J = 25°C)



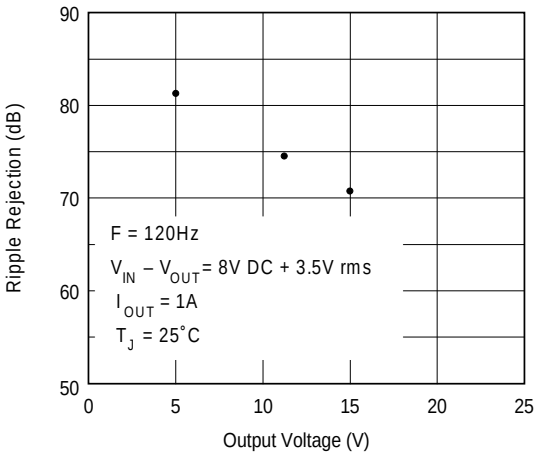
OUTPUT IMPEDANCE



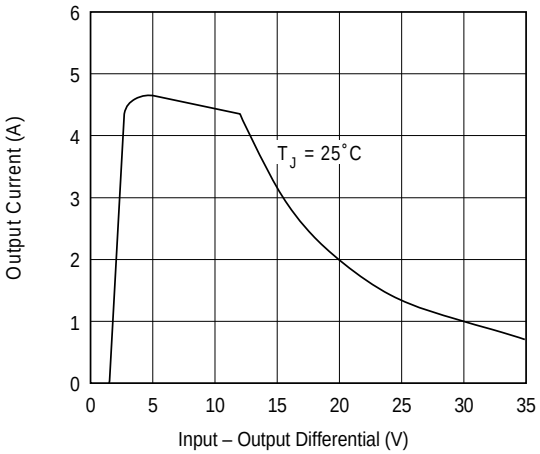
RIPPLE REJECTION



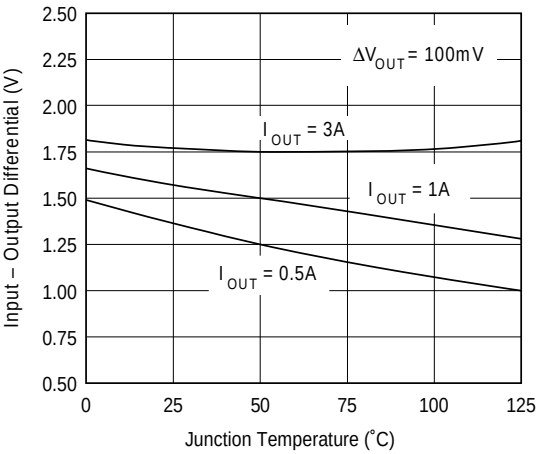
RIPPLE REJECTION



CURRENT LIMIT

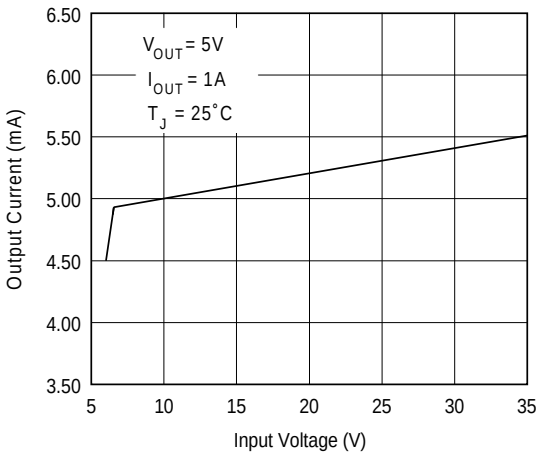


DROPOUT VOLTAGE

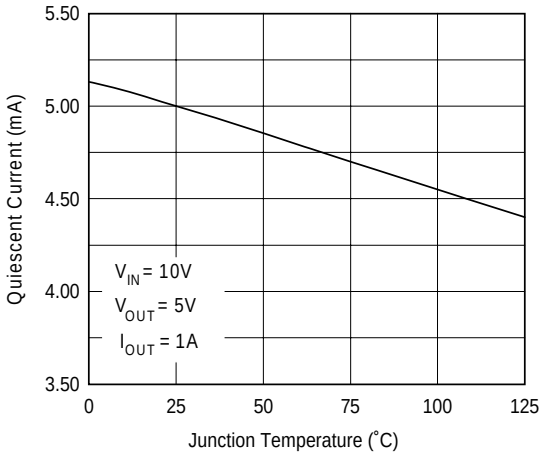


TYPICAL PERFORMANCE CHARACTERISTICS

QUIESCENT CURRENT

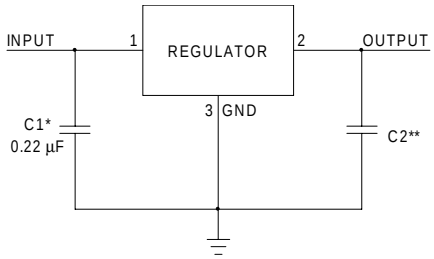


QUIESCENT CURRENT



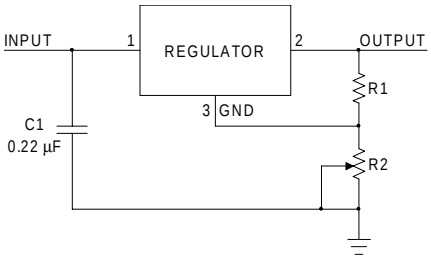
APPLICATIONS INFORMATION

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 0.1µF ceramic disk.

ADJUSTABLE OUTPUT REGULATOR

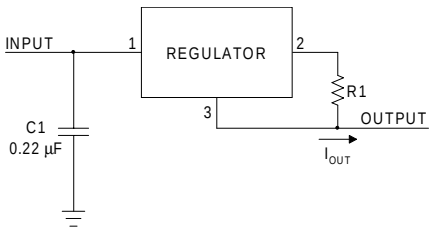


$V_{OUT} = V_{REG} + (V_{REG} / R1 + I_Q) R2$

$V_{REG} / R1 > 3 I_Q$

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

CURRENT REGULATOR



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

ΔI_Q = 3.0mA over line and load changes.