

### POSITIVE VOLTAGE STABILIZED POWER SUPPLY

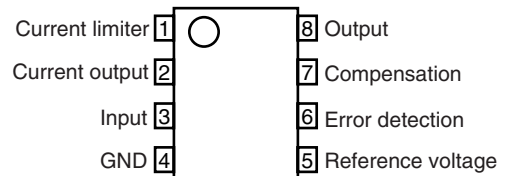
#### DESCRIPTION

The  $\mu$  PC305 is a high-performance stabilized power supply that can supply a constant voltage in a wide temperature range even if the input voltage or load voltage fluctuates, by integrating a high-gain error amplifier and a temperature-compensating constant-voltage diode on a single chip.

#### FEATURES

- Wide output voltage variable range:  $V_o = 4.5$  to  $30$  V,  $V_{DIF} = 3$  to  $30$  V
- Excellent load stability:  $0.02\%$
- Good ripple rejection ratio:  $0.003\%/V$

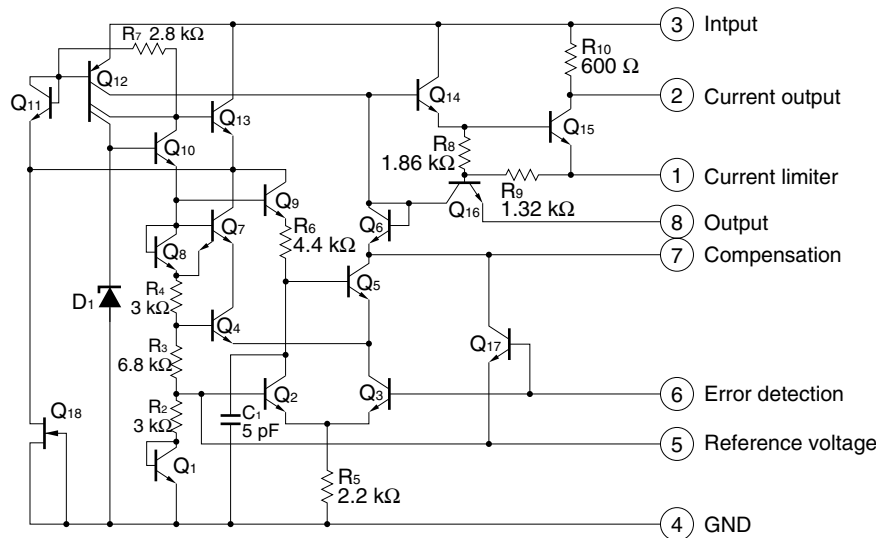
#### PIN CONFIGURATION (Top view)



#### ORDERING INFORMATION

Part Number	Package
$\mu$ PC305G2	8-pin plastic SOP (5.72 mm (225) )

#### EQUIVALENT CIRCUIT



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**ELECTRICAL SPECIFICATIONS**

**Absolute Maximum Ratings (T<sub>A</sub> = 25°C, unless otherwise specified.)**

Parameter	Symbol	Ratings	Unit
Input Voltage	V <sub>IN</sub>	-0.3 to +40	V
Input - Output Voltage Difference	V <sub>DIF</sub>	40	V
Maximum Output Current	I <sub>O</sub>	50	mA
Total Loss	P <sub>T</sub>	440 <sup>Note</sup>	mW
Operating Temperature	T <sub>A</sub>	0 to +70	°C
Storage Temperature	T <sub>stg</sub>	-55 to +125	°C

**Note** Where T<sub>A</sub> > 25°C, perform derating at T<sub>j</sub> = 125°C MAX., -4.4 mW/°C.

**Caution** Product quality may suffer if the absolute maximum rating is exceed even momentarily for any parameter. That is, the absolute maximum ratings are rated values at which the product is on the verge of suffering physical damage, and therefore the product must be used under conditions that ensure that the absolute maximum ratings are not exceed.

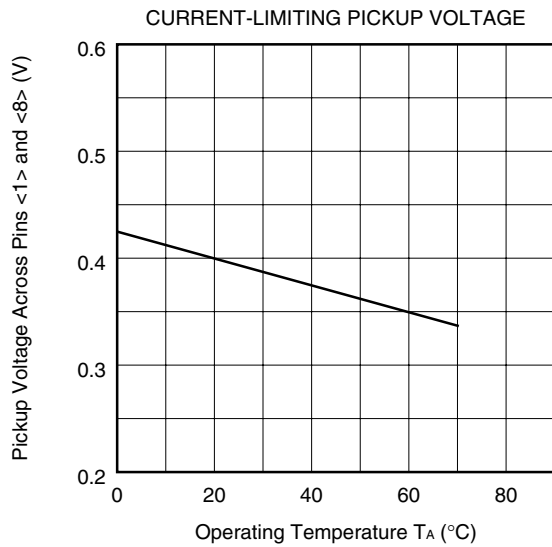
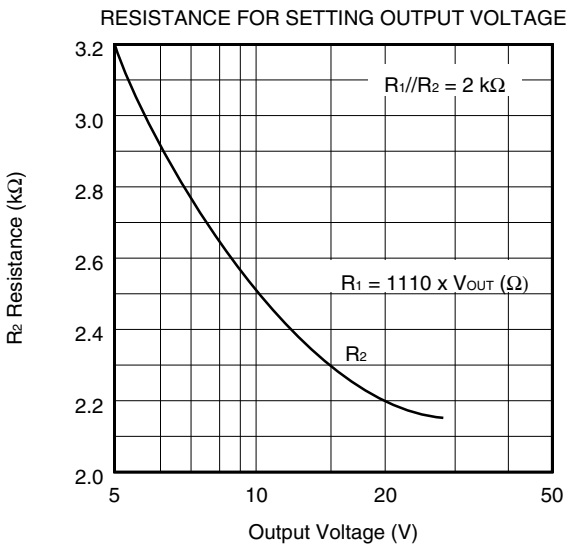
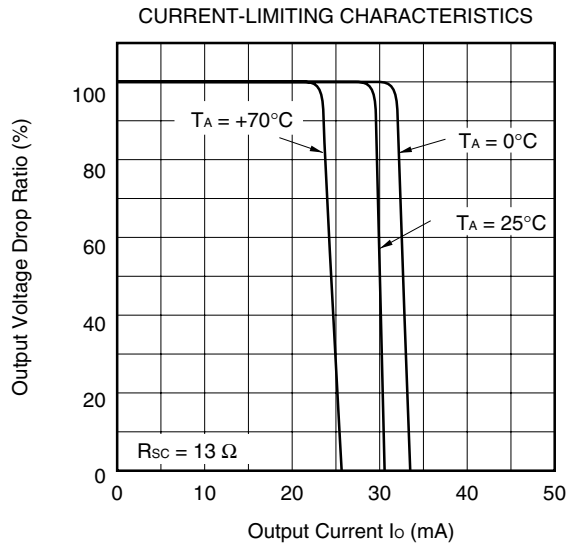
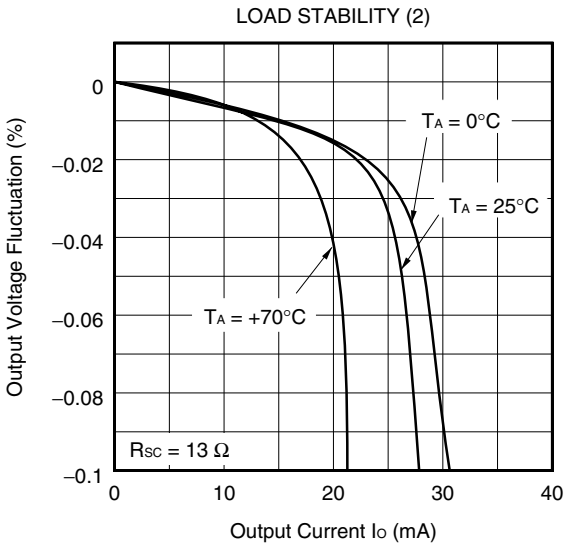
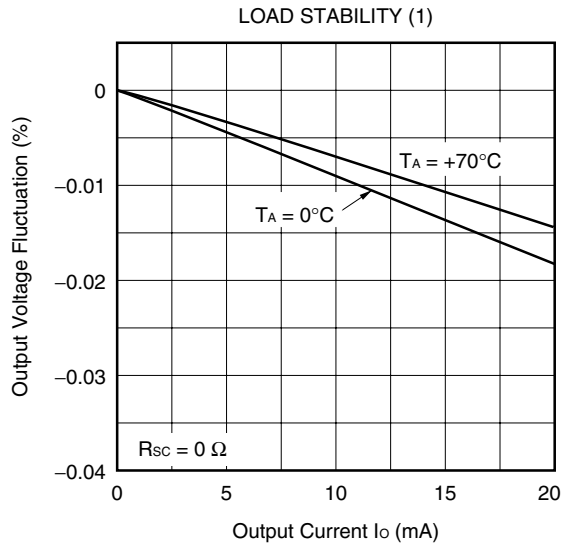
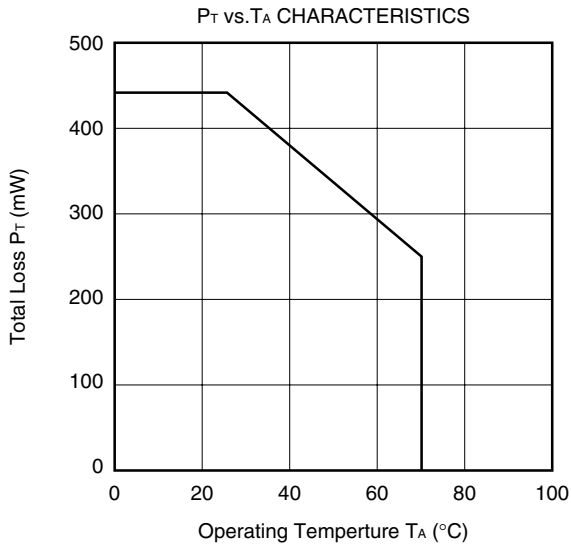
**Electrical Characteristics (T<sub>A</sub> = 25°C, unless otherwise specified.)**

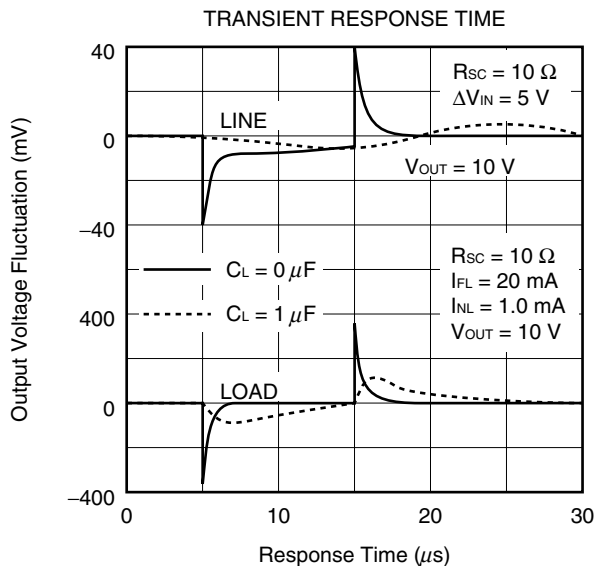
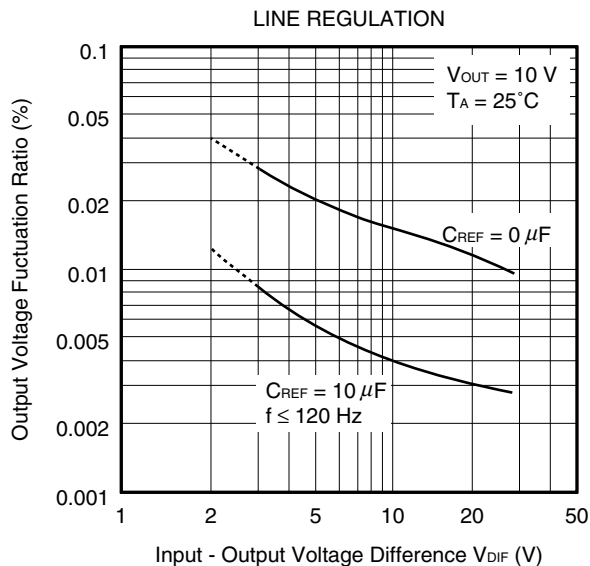
Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Input Voltage Range	V <sub>IN</sub>		8.0		40	V
Output Voltage Range	V <sub>OUT</sub>		4.5		30	V
Input - Output Voltage Difference	V <sub>DIF</sub>		3.0		30	V
Load Stability	REG <sub>L</sub>	0 ≤ I <sub>O</sub> ≤ 12 mA, R <sub>SC</sub> = 18 Ω		0.02	0.05	%
Input Stability	REG <sub>IN</sub>	V <sub>IN</sub> - V <sub>OUT</sub> ≤ 5 V		0.025	0.06	%/V
		V <sub>IN</sub> - V <sub>OUT</sub> > 5 V		0.015	0.03	%/V
Ripple Rejection Ratio	REJ	C <sub>REF</sub> = 10 μF, f = 120 Hz		0.003		%/V
Temperature Stability		0°C ≤ T <sub>A</sub> ≤ 70°C		0.3	1.0	%
Reference Voltage	V <sub>REF</sub>		1.65	1.8	1.90	V
Output Noise Voltage	V <sub>N</sub>	10 Hz ≤ f ≤ 10 kHz, C <sub>REF</sub> = 0 μF		0.005		%
		C <sub>REF</sub> = 0.1 μF		0.002		%
Long-time Stability				0.1		%
Supply Current under No Load	I <sub>CC</sub>	V <sub>IN</sub> = 40 V		1.0	2.0	mA

**Remark** R<sub>sc</sub>: Current-limiting resistor

C<sub>REF</sub>: Bypass capacitor of reference voltage pin

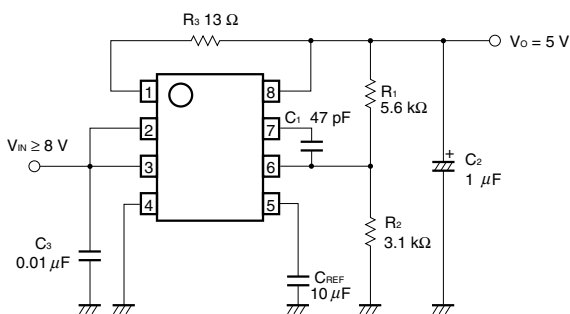
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ , unless otherwise specified. Reference values)



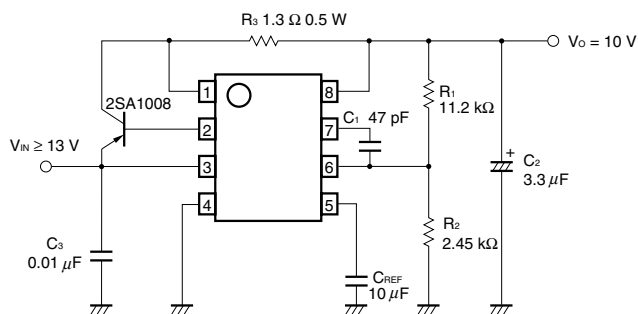


## APPLICATION CIRCUIT EXAMPLES

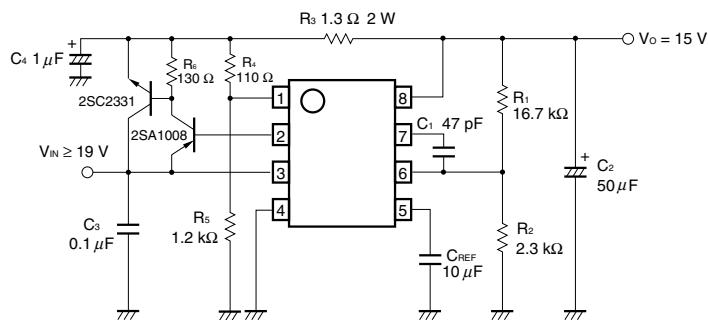
**5 V - 15 mA Regulator**



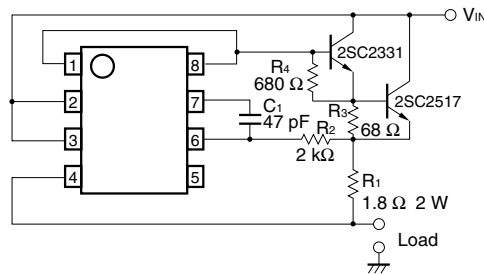
**10 V - 200 mA Regulator (Drooping Characteristics)**



★ **15 V - 1 A Regulator (Fold-back Characteristics)**



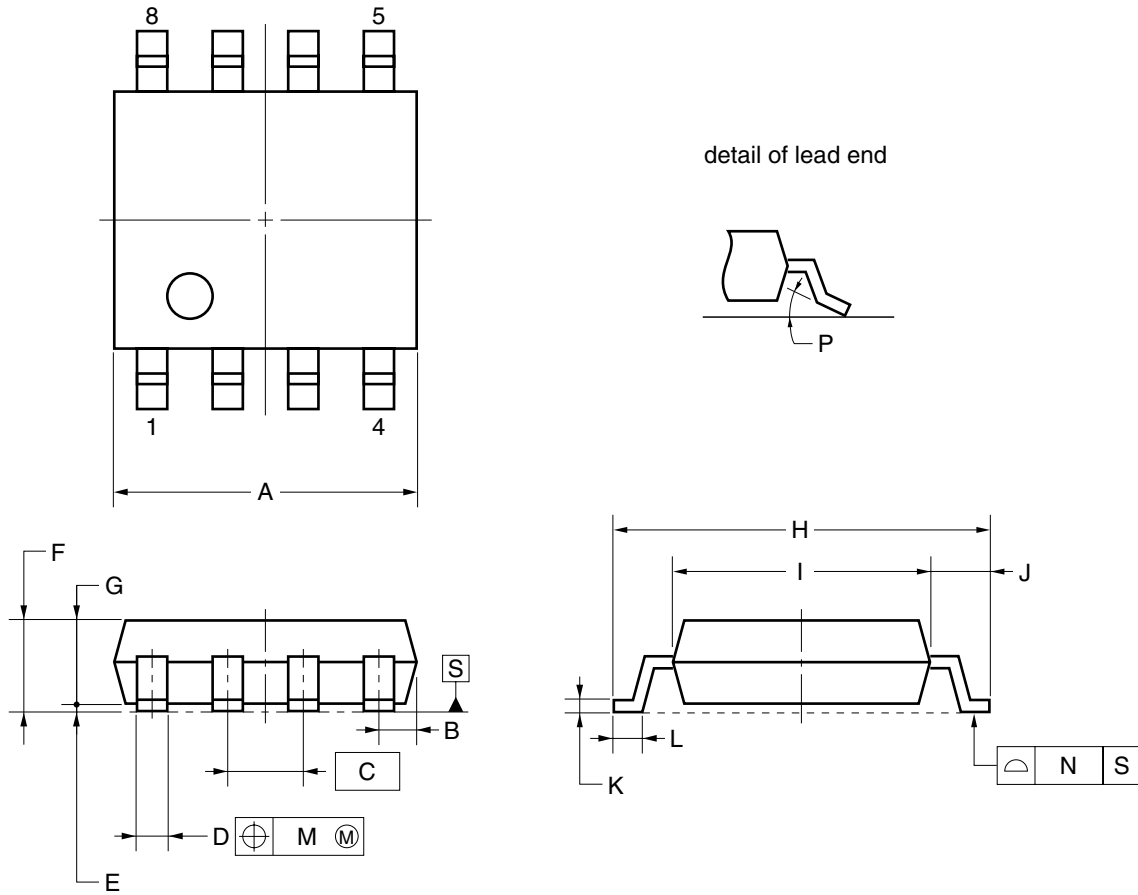
★ **1 A Constant-current Regulator**



**Caution** Note the power consumption of the  $\mu$  PC305 when the output pin is short-circuited and that of the external transistor.

PACKAGE DRAWING

8-PIN PLASTIC SOP (5.72 mm (225))



NOTE

Each lead centerline is located within 0.12 mm of its true position (T.P.) at maximum material condition.

ITEM	MILLIMETERS
A	5.2 <sup>+0.17</sup> / <sub>-0.20</sub>
B	0.78 MAX.
C	1.27 (T.P.)
D	0.42 <sup>+0.08</sup> / <sub>-0.07</sub>
E	0.1±0.1
F	1.59±0.21
G	1.49
H	6.5±0.3
I	4.4±0.15
J	1.1±0.2
K	0.17 <sup>+0.08</sup> / <sub>-0.07</sub>
L	0.6±0.2
M	0.12
N	0.10
P	3° <sup>+7°</sup> / <sub>-3°</sub>

S8GM-50-225B-6

★ RECOMMENDED SOLDERING CONDITIONS

The μ PC305 should be soldered and mounted under the following recommended conditions.

For soldering methods and conditions other than those recommended below, contact an NEC Electronics sales representative.

For technical information, see the following website.

**Semiconductor Device Mount Manual (<http://www.necel.com/pkg/en/mount/index.html>)**

**Type of Surface Mount Device**

μ PC305G2: 8-pin plastic SOP (5.72 mm (225) )

Process	Conditions	Symbol
Infrared reflow	Package peak temperature: 230°C, time: 30 sec MAX. (210°C MIN.), number of times: once	IR30-00-1
VPS	Package peak temperature: 215°C, time: 40 sec MAX. (200°C MIN.), number of times: once	VP15-00-1
Wave soldering	Solder bath temperature: 260°C MAX., time: 10 sec MAX., number of times: once, preheating temperature: 120°C MAX. (package surface temperature)	WS60-00-1

**Caution Do not use different soldering methods together (except for partial heating) .**

**★ REFERENCE DOCUMENTS**

Usage of Three-terminal Regulators (G12702E)

Quality Grades on NEC Semiconductor Devices (C11531E)

Review of Quality and Reliability Handbook (C12769E)

Semiconductor Selection Guide -Products and Packages- (X13769X)

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