

# BIPOLAR ANALOG INTEGRATED CIRCUT $\mu PC305$

#### POSITIVE VOLTAGE STABILIZED POWER SUPPLY

#### **DESCRIPTION**

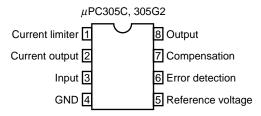
The  $\mu$ PC305 is a high-performance stabilized power supply that can supply a constant voltage in a wide temperature range even if the input voltage or load voltage fluctuates, by integrating a high-gain error amplifier and a temperature-compensating constant-voltage diode on a single chip.

#### **FEATURES**

#### • Wide output voltage variable range Vo: 4.5 to 30 V, VDIF: 3 to 30 V

Excellent load stability 0.02%
Good ripple rejection ratio 0.003%/V

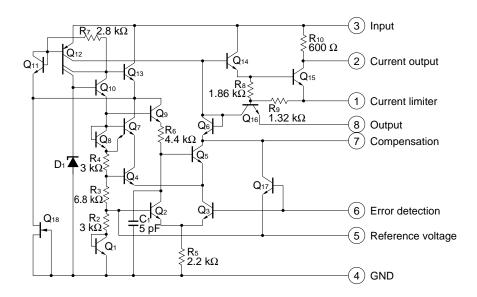
## PIN CONFIGURATION (Top View)



#### ORDERING INFORMATION

Part Number	Package
μPC305C	8-pin plastic DIP (7.62 mm (300))
μPC305G2	8-pin plastic SOP (5.72 mm (225))

#### **EQUIVALENT CIRCUIT**



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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.



#### ABSOLUTE MAXIMUM RATINGS (Unless otherwise specified, T<sub>A</sub> = 25°C)

Parameter	Symbol	μPC305C	μPC305G2	Unit
Input Voltage	VIN	-0.3 to +40		
Input – Output Voltage Difference	VDIF	40		
Maximum Output Current	lo	50		
Total Loss	Рт	350 <sup>Note 1</sup>	440 <sup>Note 2</sup>	mW
Operating Temperature	TA	0 to +70		
Storage Temperature	T <sub>stg</sub>	−55 to +125		

**Notes 1.** Where  $T_A > +55^{\circ}C$ , perform derating at  $T_J$  MAX.  $125^{\circ}C$ , -5 mW/°C.

2. Where  $T_A > +25$ °C, perform derating at  $T_J$  MAX. 125°C, -4.4 mW/°C.

Caution If any of the parameters exceeds the absolute maximum ratings, even momentarily, the quality of the product may be impaired. The absolute maximum ratings are values that may physically damage the product(s). Be sure to use the product(s) within the ratings.

ELECTRICAL SPECIFICATIONS (Unless otherwise specified, TA = 25°C)

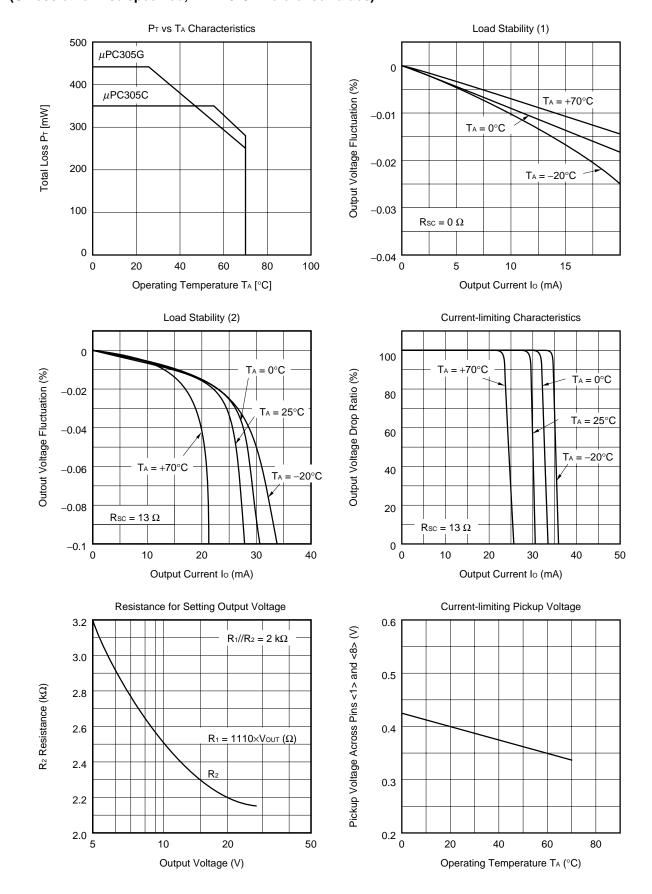
Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Input Voltage Range	Vin		8.0		40	٧
Output Voltage Range	Vоит		4.5		30	V
Input – Output Voltage Difference	VDIF		3.0		30	<b>V</b>
Load Stability	REG∟	$0 \le lo \le 12 \text{ mA}, \text{ Rsc} = 18 \Omega$		0.02	0.05	%
Input Stability	REGIN	VIN − VOUT ≤ 5 V		0.025	0.06	%/V
		VIN - VOUT > 5 V		0.015	0.03	%/V
Ripple Rejection Ratio	REJ	$C_{REF} = 10 \mu F, f = 120 Hz$		0.003		%/V
Temperature Stability		$0^{\circ}C \le T_A \le 70^{\circ}C$		0.3	1.0	%
Reference Voltage	VREF		1.65	1.8	1.90	٧
Output Noise Voltage	Vn	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	Icc	V <sub>IN</sub> = 40 V		1.0	2.0	mA

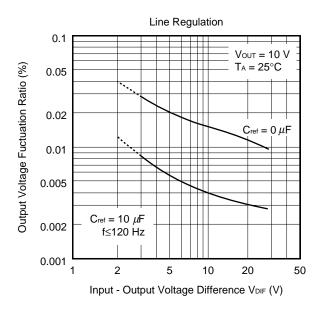
Remark Rsc : Current-limiting resistor

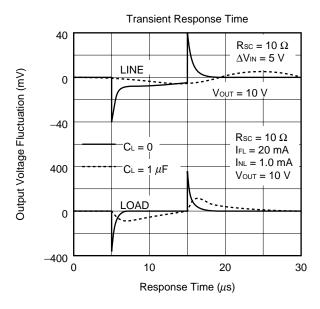
CREF: Bypass capacitor of reference voltage pin



# STANDARD CHARACTERISTIC CURVES (Unless otherwise specified, T<sub>A</sub> = 25°C. Reference values)

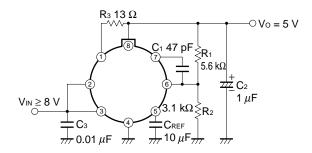




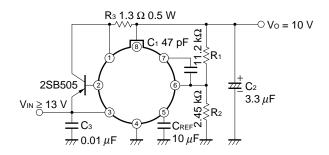


#### **APPLICATION CIRCUIT EXAMPLES**

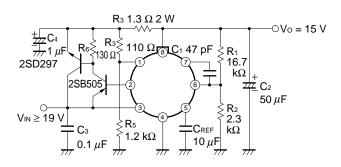
5 V-15 mA Regulator



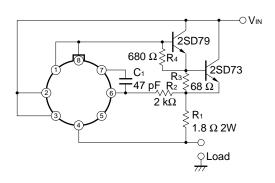
10 V-200 mA Regulator (Drooping Characteristics)



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



1A Constant-current Regulator

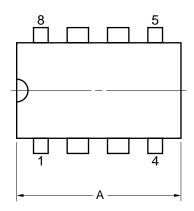


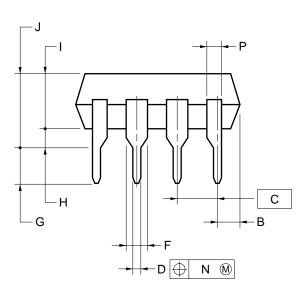
Caution Note the power consumption of the  $\mu$ PC305 when the output pin is short-circuited and that of the external transistor.

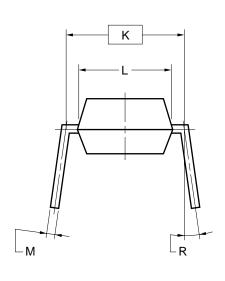


#### **PACKAGE DRAWINGS**

## 8-PIN PLASTIC DIP (7.62mm(300))







#### **NOTES**

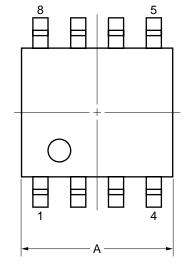
- 1. Each lead centerline is located within 0.25 mm of its true position (T.P.) at maximum material condition.
- 2. Item "K" to center of leads when formed parallel.

ITEM	MILLIMETERS
Α	10.16 MAX.
В	1.27 MAX.
С	2.54 (T.P.)
D	0.50±0.10
F	1.4 MIN.
G	3.2±0.3
Н	0.51 MIN.
I	4.31 MAX.
J	5.08 MAX.
K	7.62 (T.P.)
L	6.4
М	0.25 <sup>+0.10</sup> -0.05
N	0.25
P	0.9 MIN.
R	0~15°

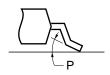
P8C-100-300B,C-2

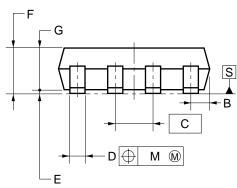
5

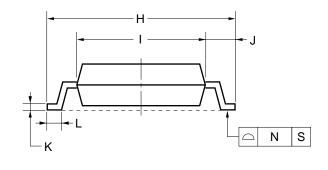
## 8-PIN PLASTIC SOP (5.72 mm (225))



detail of lead end







#### NOTE

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

ITEM	MILLIMETERS
Α	$5.2_{-0.20}^{+0.17}$
В	0.78 MAX.
С	1.27 (T.P.)
D	$0.42^{+0.08}_{-0.07}$
E	0.1±0.1
F	1.59±0.21
G	1.49
Н	6.5±0.3
I	4.4±0.15
J	1.1±0.2
K	$0.17^{+0.08}_{-0.07}$
L	0.6±0.2
М	0.12
N	0.10
Р	3°+7°
	COCM ED SSED

S8GM-50-225B-6



#### **RECOMMENDED SOLDERING CONDITIONS**

Solder this product under the following recommended conditions.

For details of the recommended soldering conditions, refer to information document **Semiconductor Device Mounting Technology Manual (C10535E)**.

For soldering methods and conditions other than those recommended, consult NEC.

#### **Surface Mount Type**

#### μPC305G2: 8-pin plastic SOP (5.72 mm (225))

Soldering Method	Soldering Conditions	Recommended 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 two or more soldering methods in combination (except partial heating).

#### **Through Hole type**

μPC305C: 8-pin plastic DIP (7.62 mm (300))

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Soldering Method	Soldering Conditions	Recommended
		Conditions Symbol
Wave soldering	Solder bath temperature: 260°C max., Time: 10 sec max.	

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