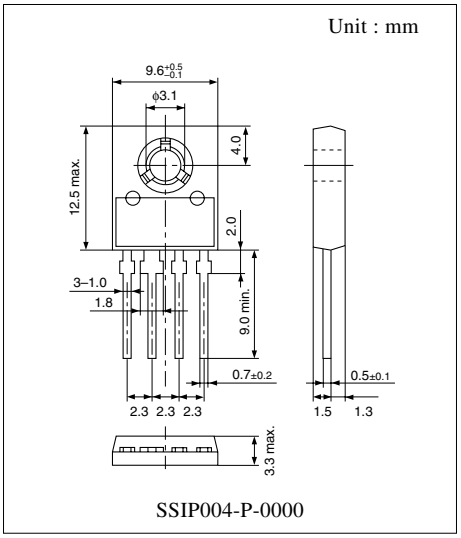
AN6540

4-pin 8.5V output voltage regulator with adjustable rise time

■ Overview

The AN6540 is an integrated circuit designed for a 4-pin 8.5V output voltage regulator with adjustable rise time. An external capacitor allows any setting of output voltage rise time and noise reduction at power on. This IC is best suited for power circuits with current capacity of up to 240mA. It can be used up to the minimum input/output voltage difference 0.3V (typ.).

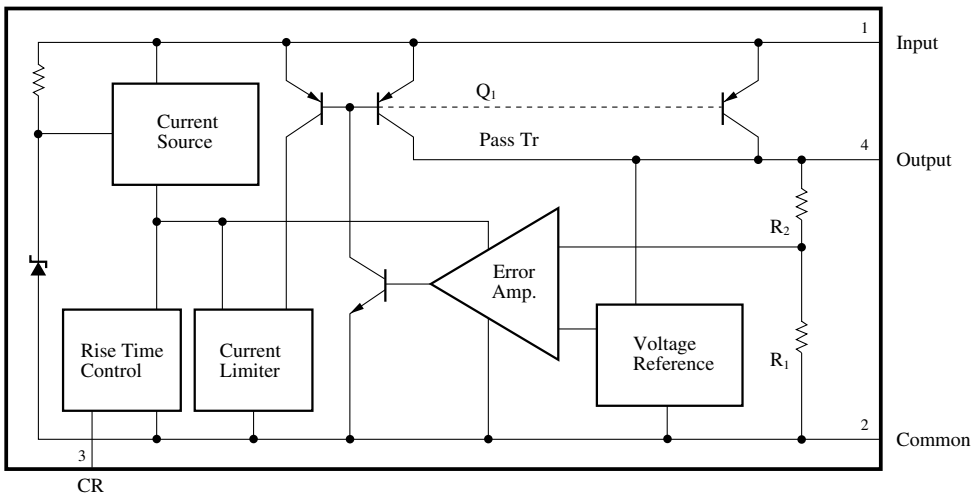


SSIP004-P-0000

■ Features

- Low dropout voltage: 0.3V (typ.)
- Control of output voltage rise time
- Built-in output current limit protection circuit
- Low temperature coefficient of output voltage
- Output voltage: 8.5V (typ.)

■ Block Diagram



■ Absolute Maximum Ratings at T_a = 25°C

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	20	V
Supply surge voltage	V_{surge} *	40	V
Power dissipation (T_C = 25°C)	P_D	6	W
Operating ambient temperature	T_{opr}	−30 to +80	°C
Storage temperature	T_{stg}	−40 to +150	°C

* t = 200ms

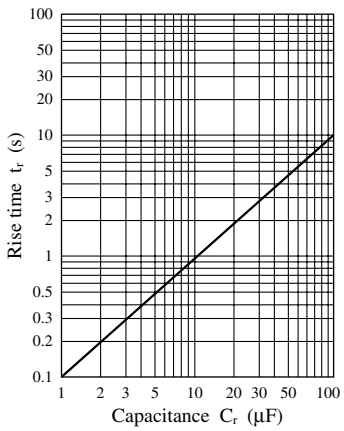
■ Electrical Characteristics T_a = 25°C

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Output voltage	V_O	V_I = 13.2V, I_O = 200mA	8.1	8.5	8.9	V
Bias current	I_{Bias}	V_I = 13.2V, I_O = 200mA	—	25	50	mA
Load regulation	ΔV_1	V_I = 13.2V, I_O = 0 to 200mA	—	—	±50	mV
Line regulation	ΔV_2	V_I = 9.5 to 16V, I_O = 100mA	—	—	±50	mV
Output voltage temperature coefficient	$\Delta V_O/T_a$	V_I = 13.2V, I_O = 100mA, T_{opr} = −30 to +80°C	—	±0.01	—	%/°C
Minimum input/output voltage difference	$V_{DIF(min)}$	Input/output voltage difference with input voltage 8.0V, I_O = 100mA	—	0.3	0.6	V
Ripple rejection ratio	Regin	V_I = 13.2V, I_O = 100mA, f = 100Hz, e_{in} = 1V[p-p]	50	—	—	dB
Maximum output current	$I_{O(max)}$	V_I = 13.2V	240	—	600	mA
Output short-circuit current	I_{OS}	V_I = 13.2V	50	—	160	mA
Rise time	t_r	C_r = 10µF±10%	0.5	1	2	s

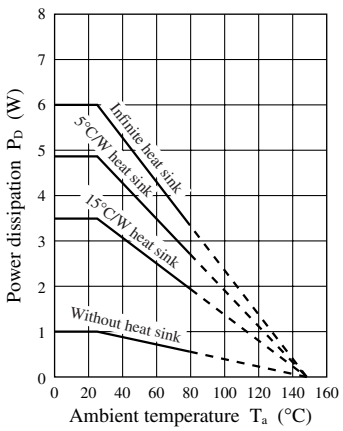
Note) After the load short, return with I_O = 230mA or over.

■ Main Characteristics

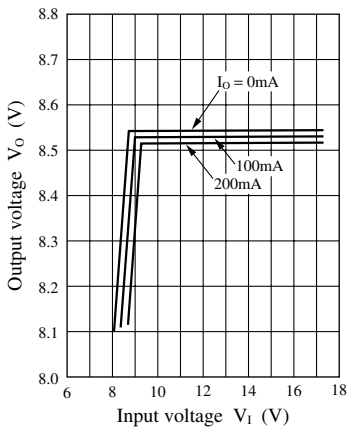
t_r — C_r



P_D — T_a

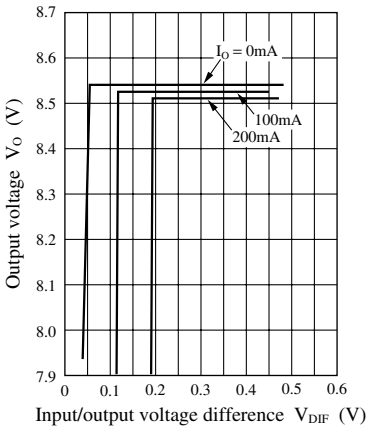


V_O — V_I

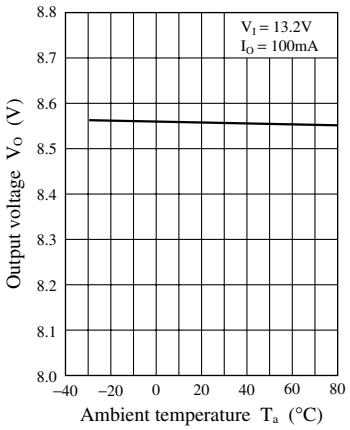


■ Main Characteristics (continued)

V_O — V_{DIF}

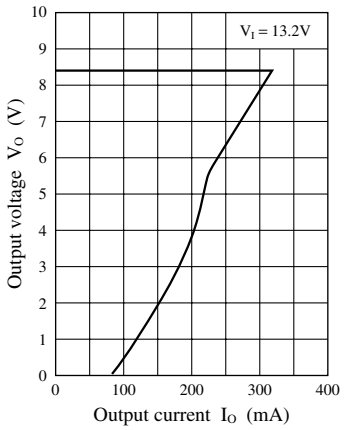


V_O — T_a

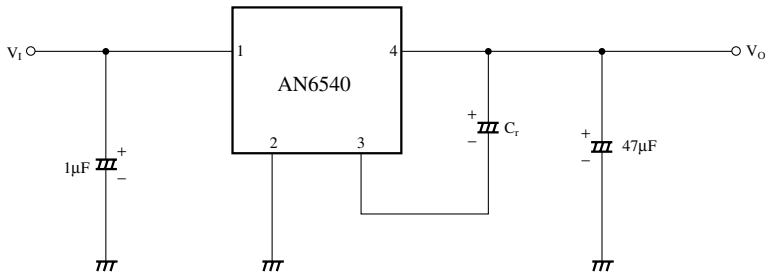


Current limit characteristic

V_O — I_O



■ Basic Regulator Circuit



- Choose the oscillation control capacitor 47µF which has a small capacitance reduction even at a low temperature. For example, use the tantalum capacitor.

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