



LA5602

Low-Dropout Voltage Regulator with Reset and On-Off Function

Overview

The LA5602 incorporates both a 5.0V voltage regulator function and reset generator function into a single-chip for micro controller power supply application. The LA5602 supports improvements in efficiency and set compactness by permitting operation at low input-output voltage differences.

Functions

- Low dropout regulator with 350mA and 5.0V output
- Power supply reset generator function
- Supports on-off control of 5V using equipped enable pin (high active)

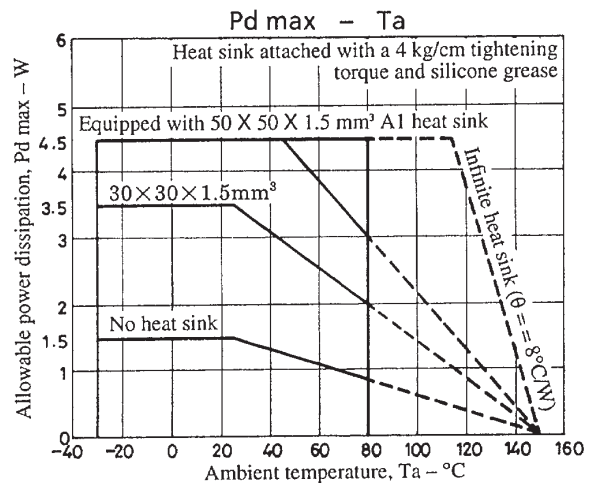
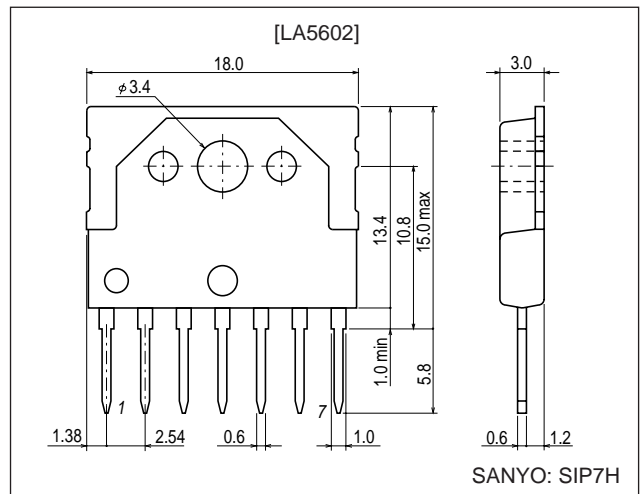
Features

- Low minimal input-output voltage difference (0.5V typ.)
- Supports setting of reset output delay time using external capacitor
- Built-in fold back current limiting circuit and excessive heat protection circuit
- Reset output using active pull-up for simpler noise reduction

Package Dimensions

unit : mm

3075-SIP7H



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LA5602

Specifications

Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum input voltage	$V_{IN\ max}$		18	V
Enable pin voltage	$V_{EN\ max}$		$V_{IN\ max}$	V
Reset output pin voltage	$V_{RES\ max}$		18	V
Allowable power dissipation	$P_d\ max$		1.5	W
Operating temperature	T_{opg}		-30 to +80	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	V_{IN}		5.6 to 17	V
Output current	I_{OUT}		0 to 350	mA
Reset output source current	I_{ORH}		0 to 200	μA
Reset output synch current	I_{ORL}		0 to 2	mA

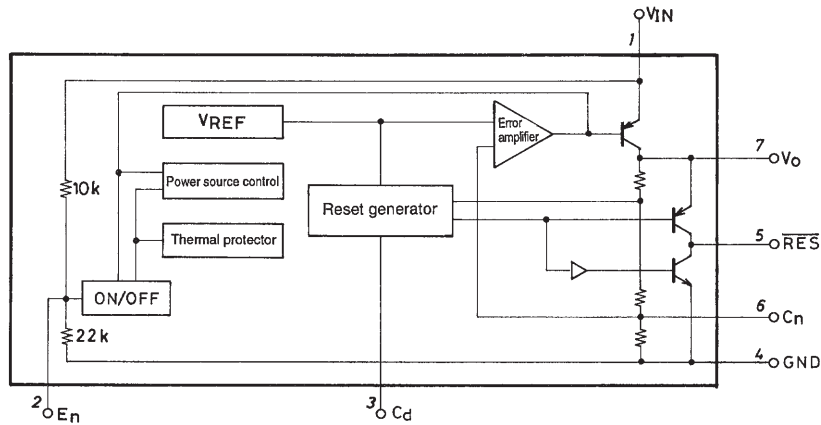
Operating Characteristics at $T_a = 25^\circ\text{C}$, $V_{IN} = 8\text{ V}$, $I_{OUT} = 350\text{ mA}$, $C_{OUT} = 47\mu\text{F}$, according to specified Test Circuit

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[Power Supply Section]						
Output voltage	V_{OUT}		4.75	5.0	5.25	V
Drop-out voltage	V_{DROP}			0.5	1.0	V
Line regulation	ΔV_{OLN}	$5.6 \leq V_{IN} \leq 17\text{V}$		20	100	mV
Load regulation	ΔV_{OLD}	$5\text{mA} \leq I_O \leq 350\text{mA}$		50	150	mV
Peak output current	I_{OP}		350	500		mA
Output short current	I_{OSC}			100	400	mA
Current dissipation	I_{Q1}	$I_{OUT} = 0$		2.1	4	mA
	I_{Q2}			10	50	mA
Output noise voltage	V_{N5}	$10\text{Hz} \leq f \leq 100\text{kHz}$		70		μV_{rms}
Temperature coefficient of output voltage	$\Delta V_O / \Delta T_a$	$T_j = 25\text{ to }125^\circ\text{C}$		1.6		$\text{mV}/^\circ\text{C}$
Ripple rejection	R_{ref}	$f = 120\text{Hz}$, $6\text{V} \leq V_{IN} \leq 17\text{V}$		60		dB
Output on-control voltage	V_{ENH}		2.6			V
Output off-control voltage	V_{ENL}				1.0	V
Low output voltage	$V_{O\ OFF}$				0.3	V
[Reset Section]						
High reset output voltage	V_{ORH}	$I_{ORH} = 200\mu\text{A}$, Cd pin open	4.73	4.98	5.23	V
Low reset output voltage	V_{ORL}	$I_{SRL} = 2\text{mA}$, Cd - GND shorted		100	200	mV
Reset threshold voltage	V_{RT}		3.95	4.2	4.45	V
Reset hysteresis voltage	V_{hys}		50	100	200	mV
Reset output delay time	t_d	Cd = $0.1\mu\text{F}$	7.5	10	12.5	ms

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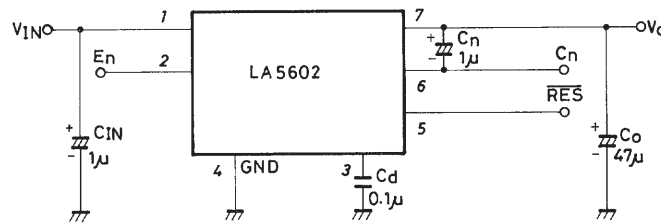
Equivalent Circuit Block Diagram

Unit (resistance: Ω)



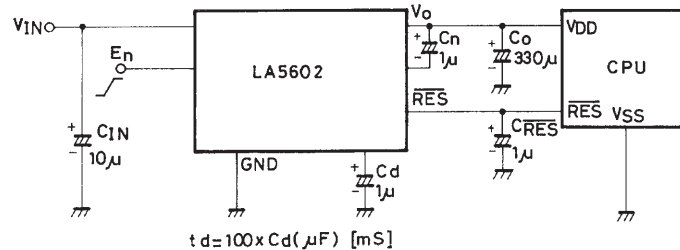
Specified Test Circuit

Unit (capacitance: F)



Application Circuit Example

Unit (capacitance: F)

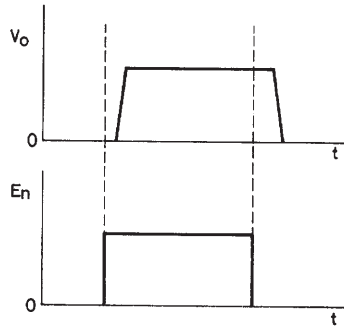


- Notes:
- 1) Capacitors C_n and $C_{\overline{RES}}$ are only required if problems are experienced with noise from external sources. If capacitor C_n is present, ensure that C_o is at least more than one-third of the value of C_{in} in order to prevent output noise at power-down due to capacitor discharge timing.
 - 2) Use a low temperature coefficient capacitor for the delay time capacitor C_d .
 - 3) The minimum recommended value of output capacitor C_o is $47\mu F$.

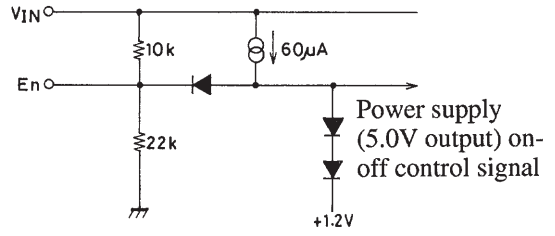
Function Table

V_{IN}	V_O
L	L
H	H

* V_{EN} = high or open

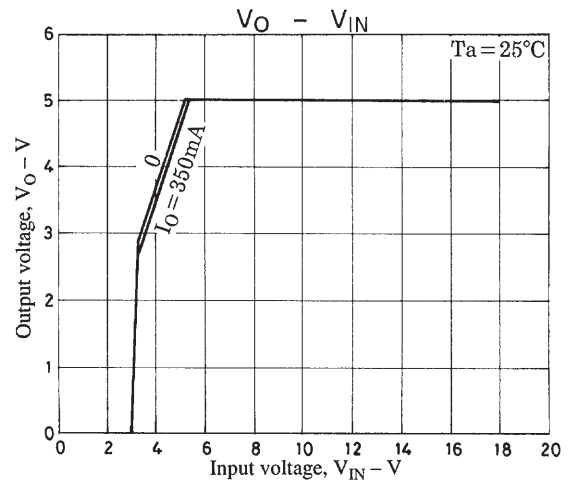
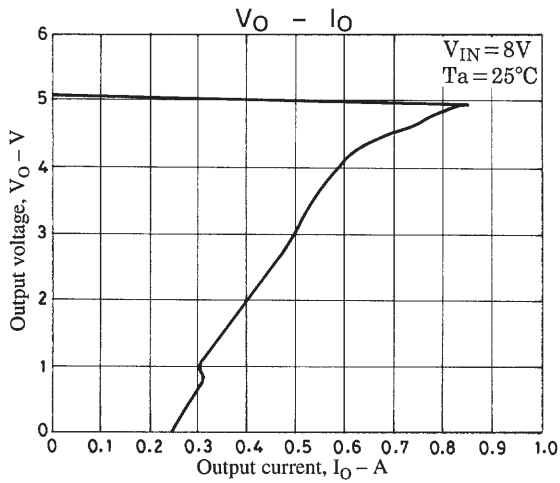
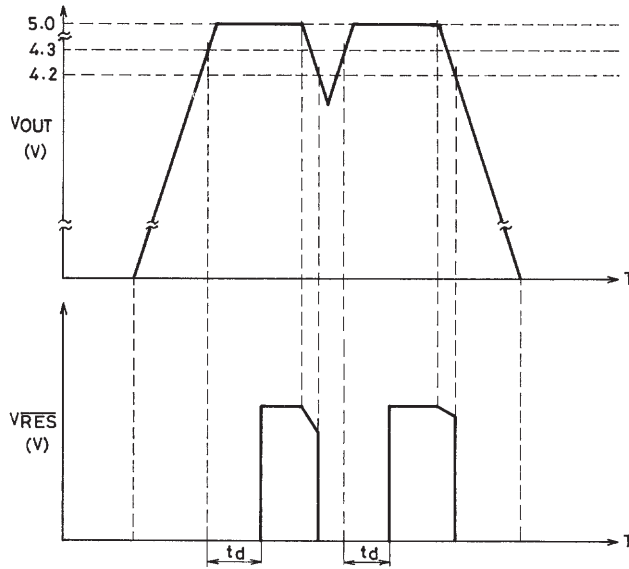


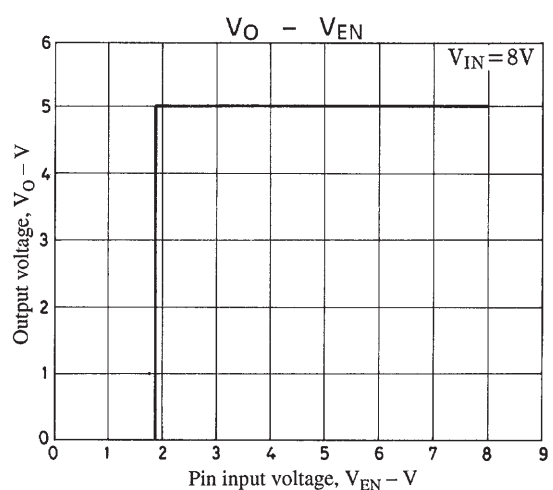
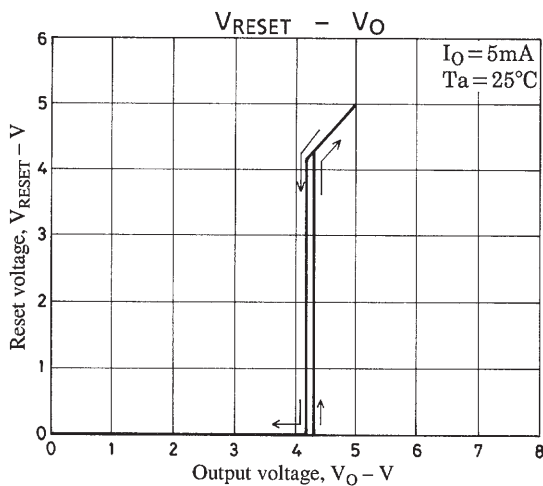
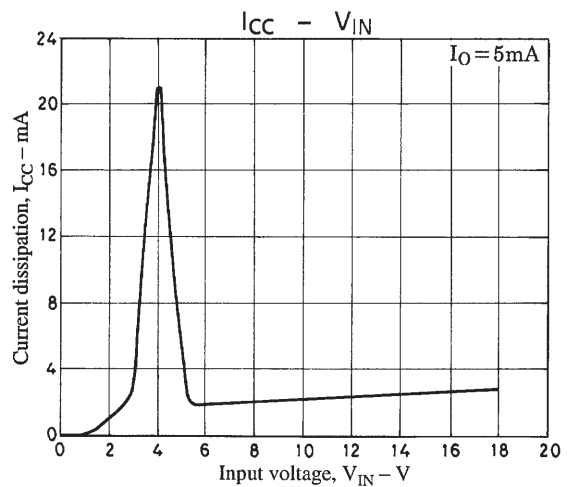
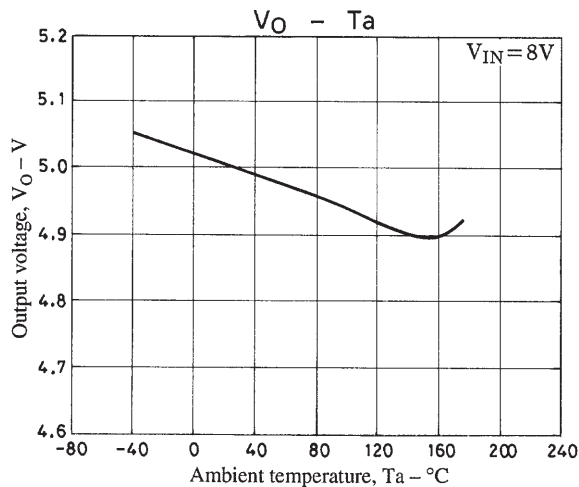
Enable Input Equivalent Circuit



Unit (resistance: Ω)

Reset Operation





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