

Ordering number: EN 2895A

Monolithic Linear IC

	No.2895A	LA5690D, 5690S
	Voltage Regulator Driver with Watchdog Timer	

The LA5690 is a single-chip voltage regulator for microcomputer system monitor use that performs the functions of 5V output voltage control, watchdog timer, and voltage detector. The LA5690 uses a minimum number of parts to provide the basic functions.

Applications

- Microcomputer system for car equipment, refrigeration/heating equipment, office automation equipment

Functions

- Output voltage 5Vcontrol
- Watchdog timer
- Power-ON reset function
- Positive/negative logic output for reset

Features

- An external PNP transistor can be used to provide a low-saturation voltage regulator.
- CK input with edge detector
- Variable detection voltage
- Reset output with pull-up resistor of 10k Ω

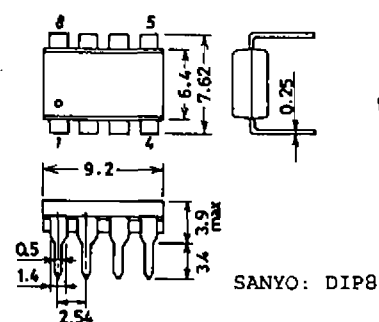
Maximum Ratings at Ta=25°C		unit		unit
Control Pin Voltage	V _{CONT} max	1sec	60	V
Control Pin Voltage	V _{CONT} max		41	V
Control Pin Current	I _{CONT} max	*V _{CC} $\geq$ 6V	11	mA
CK Input Voltage	V _{CK} max		25	V
Reset Pin Voltage	V _{RES} max, V _{RES} max		41	V
Allowable Power Dissipation	P _d max		500	mW
Operating Temperature	T _{opr}		-40 to +85	°C
Storage Temperature	T _{stg}		-55 to +150	°C

*: A PNP transistor is connected to the LA5690D, 5690S externally to provide a low-saturation voltage regulator. Therefore, I_{CONT}=100mA will flow, as starting current, in the V_{CC} range where the output cannot be regulated.

Operating Conditions at Ta=25°C			unit
Control Pin Voltage	V _{CONT}	6 to 40	V
Control Pin Current	I _{CONT} max	10	mA
Reset Output Current	I _{RES} max, I _{RES} max	External R pull-up	8
Reset Detection Voltage	V _S min		4

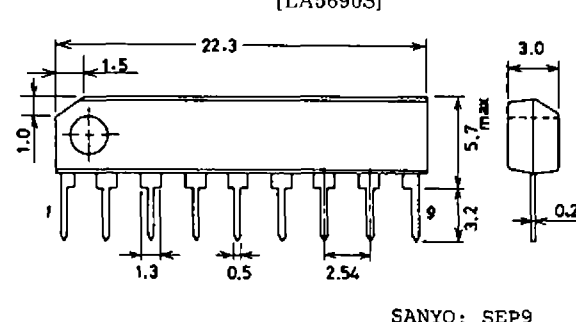
Package Dimensions (unit: mm)

3001B



Package Dimensions (unit: mm)

3017B



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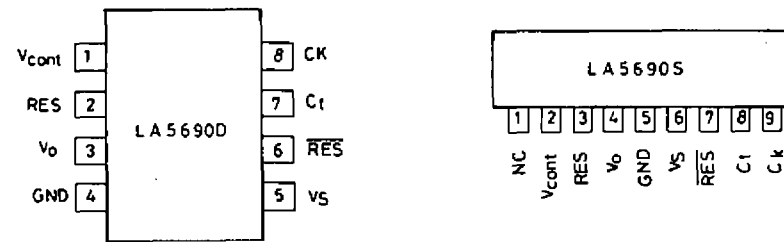
D219YT/8099YT/9088YT, TS No.2895-1/5

LA5690D,5690S

Operating Characteristics at Ta = 25°C, VCC = 14V, IO = 50mA, unless otherwise specified

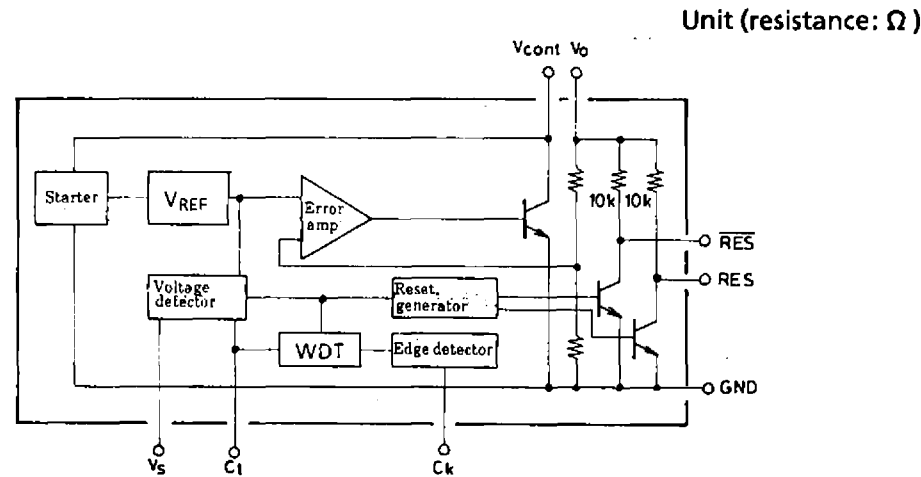
			min	typ	max	unit
Operating Voltage	VO		4.8	5.0	5.2	V
Line Regulation	ΔVOLN1	9V ≤ VCC ≤ 16V		2	10	mV
	ΔVOLN2	6V ≤ VCC ≤ 40V		4	30	mV
Load Regulation	ΔVOLD	1mA ≤ IO ≤ 50mA		4	30	mV
Current Dissipation	ICC	IO = 0		4.9	6.5	mA
Output Noise Voltage	VNO	10Hz ≤ f ≤ 100kHz, VCK = 0		200		μV
Temperature Coefficient of Output Voltage	ΔVO / ΔTa	IO = 5mA, -40°C ≤ Ta ≤ +85°C		±0.2		mV/°C
Reference Voltage	VREF		1.13	1.18	1.23	V
"H"-Level CK Input Voltage	VIH		2			V
"L"-Level CK Input Voltage	VIL				0.8	V
"H"-Level CK Input Current	IIH	VCK = 5V		0.3	0.7	mA
"L"-Level CK Input Current	IIL	VCK = 0	-1.0	-0.1		μA
"H"-Level Reset Output Voltage	VORH/VORH		4.8	5.0	5.2	V
"L"-Level Reset Output Voltage	VORL1/VORL1			40	200	mV
"L"-Level Reset Output Voltage	VORL2/VORL2	IRES = IRES = 8mA		0.16	0.8	V
CK Input Pulse Width	tCKW	VCK = 5V		3		μs
Reset Output Delay Time	td	Ct = 1μF	7.5	10	12.5	ms
Watchdog Time	tWD	Ct = 1μF	3.8	5.0	6.2	ms
Watchdog Reset Time	tWR	Ct = 1μF	0.1	0.25	0.4	ms
Reset Hysteresis Voltage	Vhys	VS = 4.5V	100	200	300	mV

Pin Assignment



The NC pin, which is left open, must not be used for wiring.

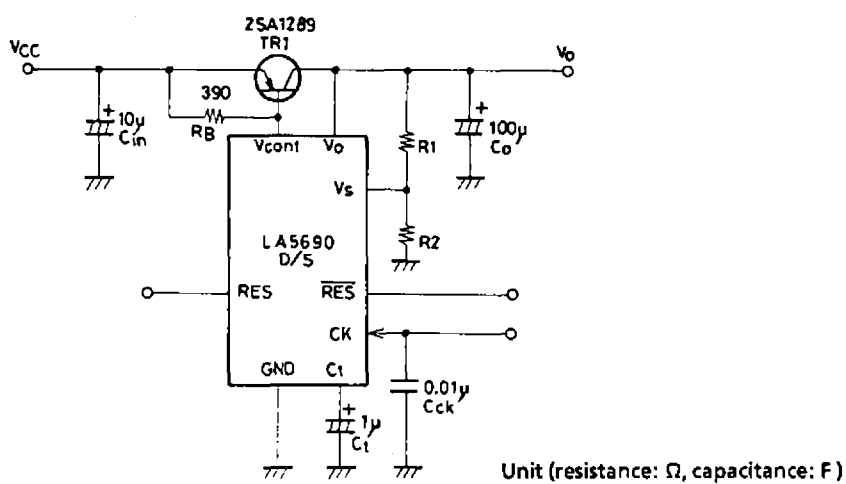
Equivalent Circuit Block Diagram



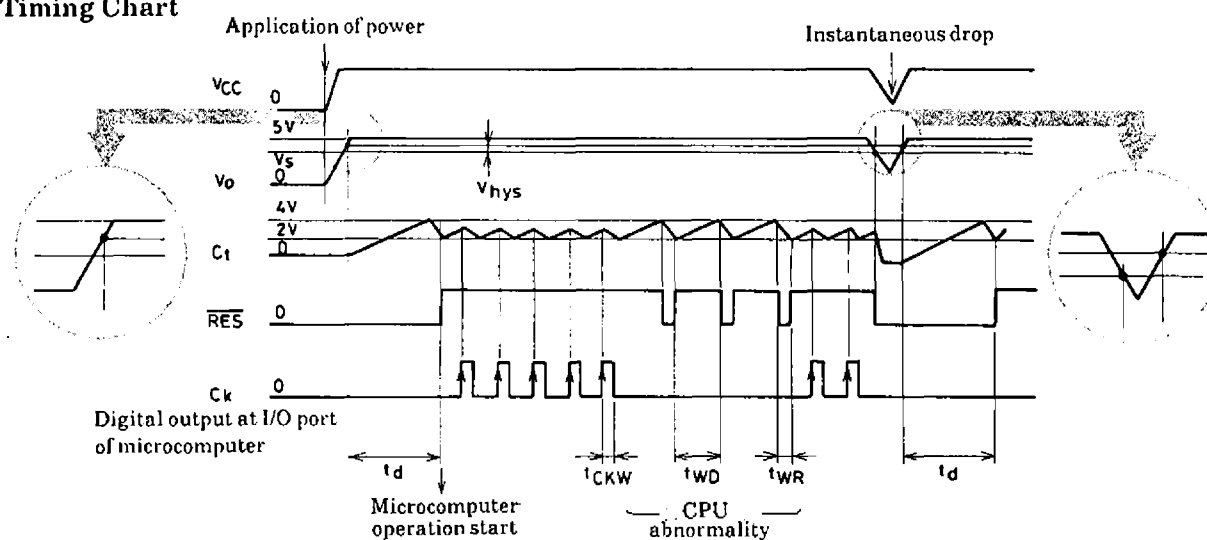
The reset output contains a pull-up resistor of 10kΩ.

LA5690D,5690S

Test Circuit

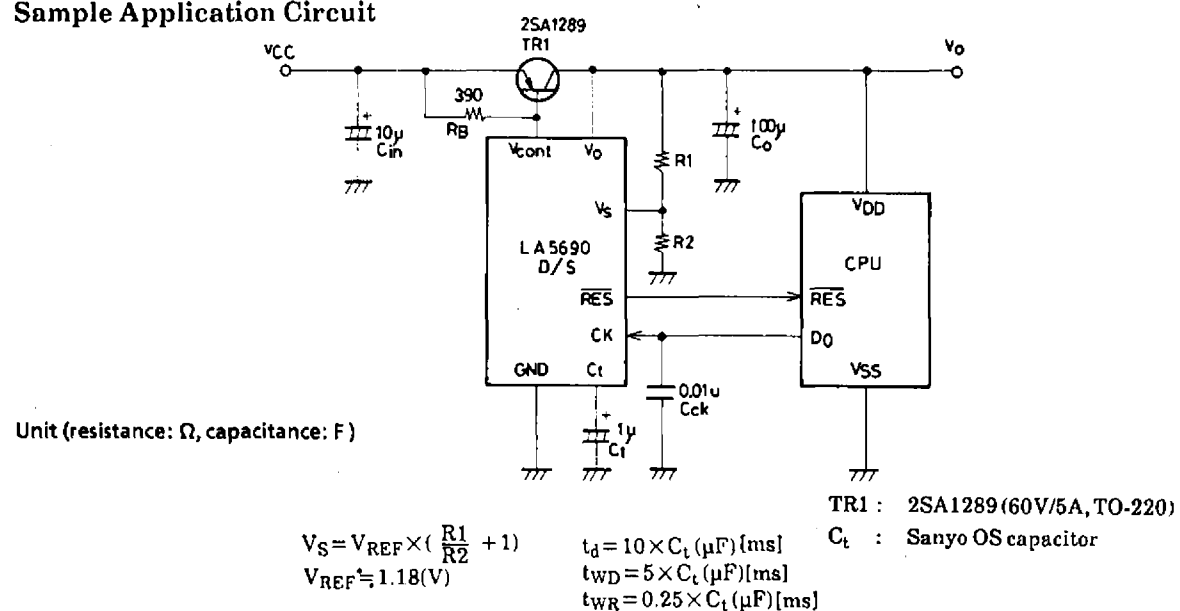


Timing Chart



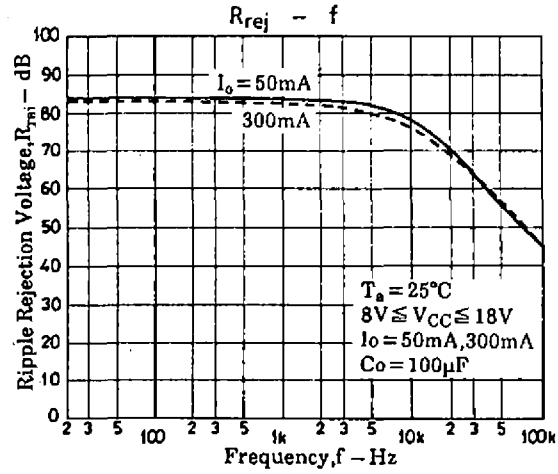
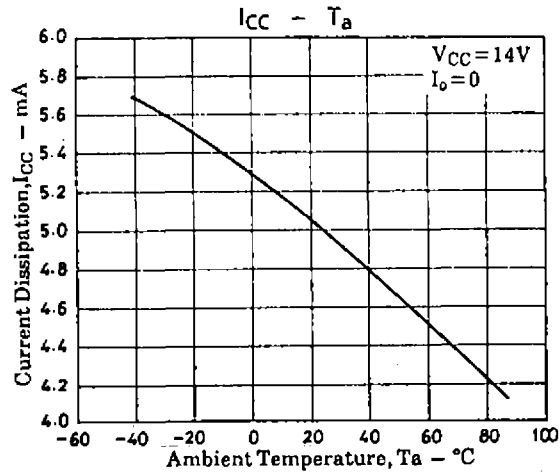
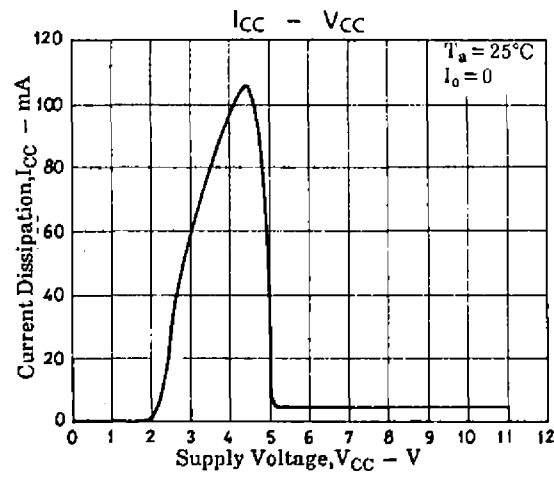
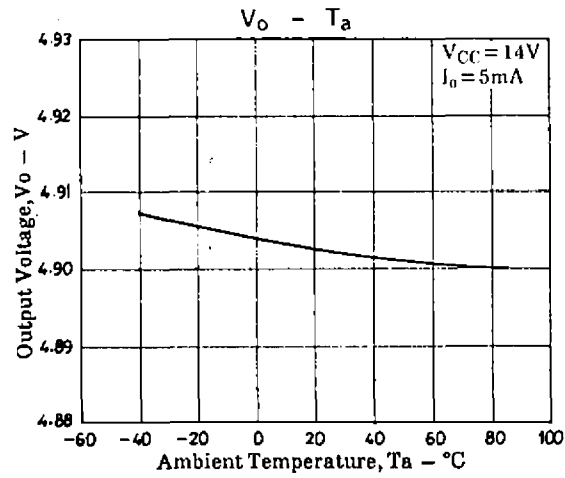
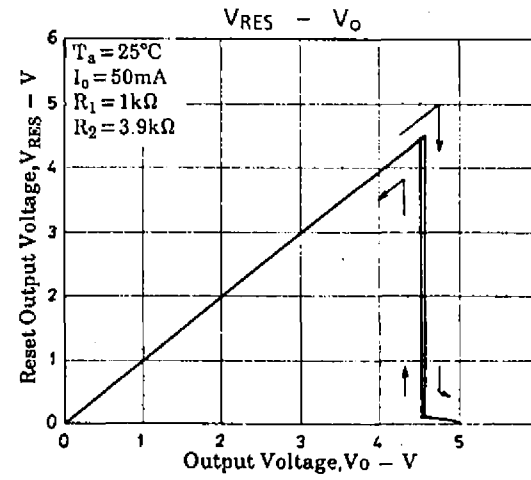
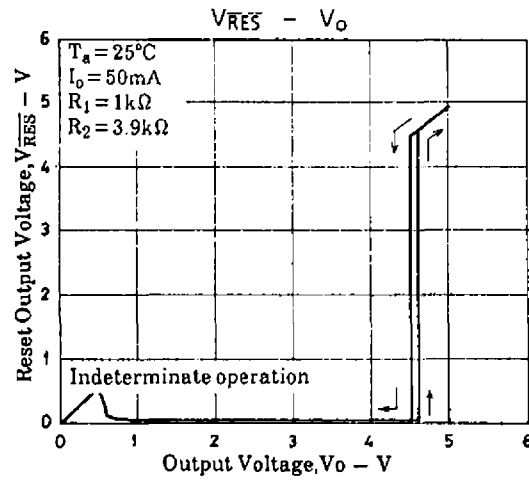
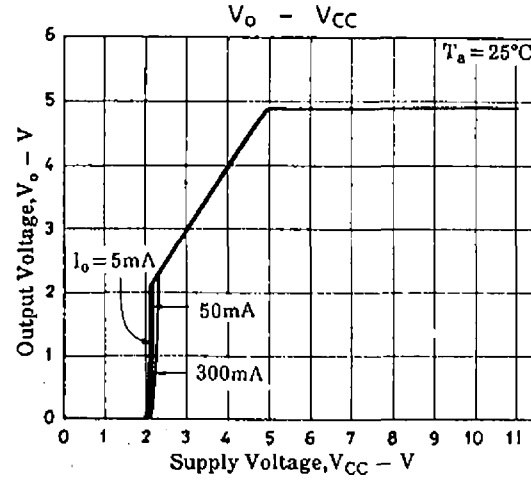
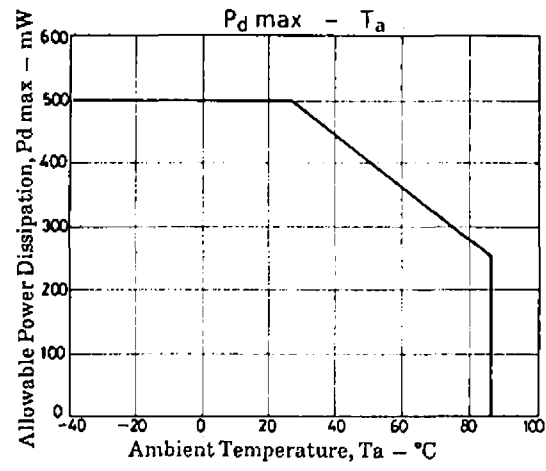
Note : Edge-triggered at the point indicated by the arrow of C_K signal.

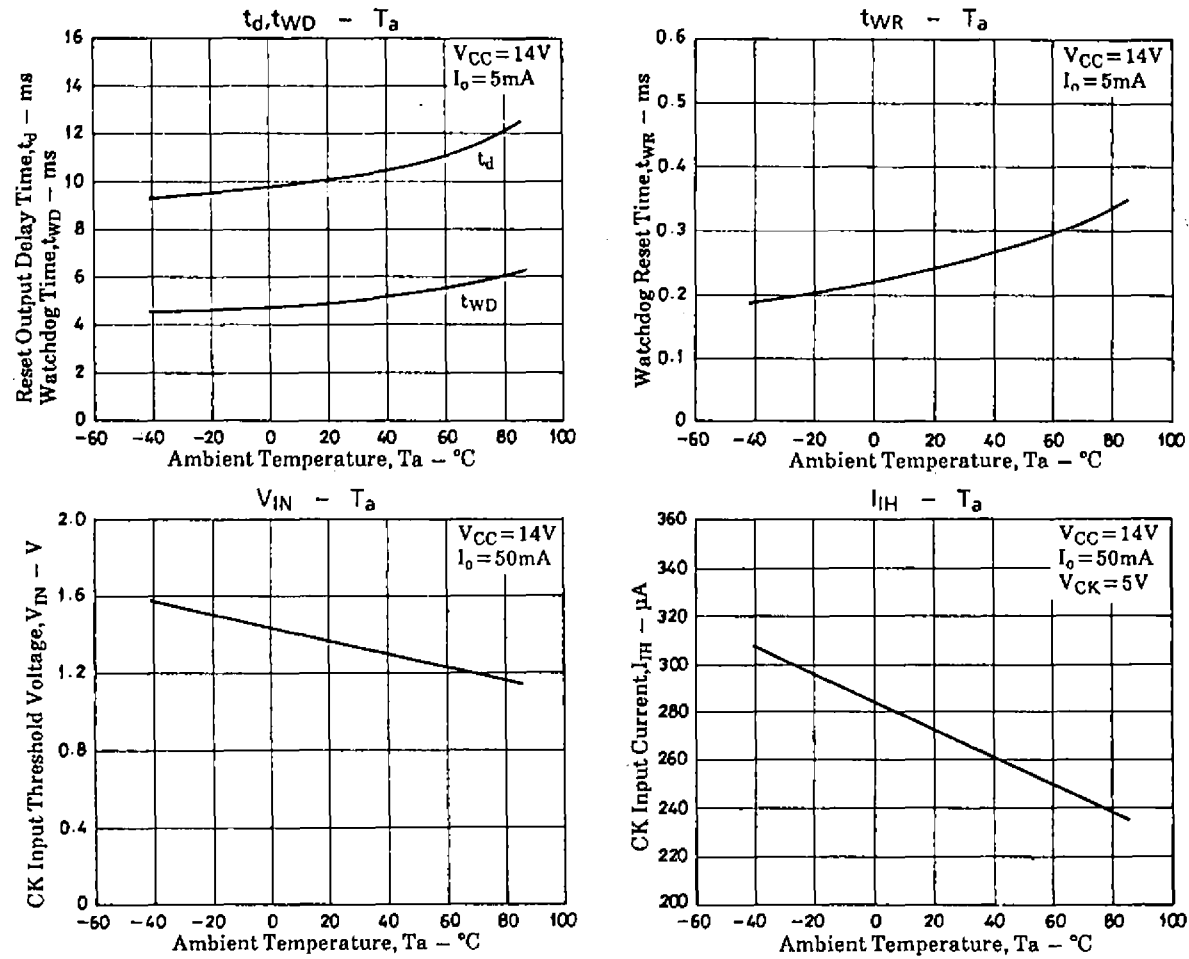
Sample Application Circuit



- C_t, C_o : Capacitors whose value does not vary with temperature very much.
- C_{CK} : Must be used to eliminate noise in the reset output.

LA5690D,5690S





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