CP1032

Chopper Regulators

■ Features

- Maximum switching current: 3.5A
- Built-in ON/OFF control function
- Built-in soft start function to suppress overshoot of output voltage in power on sequence or ON/OFF control sequence
- Built-in oscillation circuit (Oscillation frequency: TYP. 150kHz)
- Built-in overheat protection function, overcurrent shut-down function
- Sleeve-packaged product
- Variable output voltage
  (Output variable range: Vref to 35V/–Vref to –30V)
  [Possible to select step-down output/inversing output
  according to external connection circuit]

■ Applications

- LCD monitors
- Car navigation systems
- Switching power supplies

■ Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
※1 Input voltage	V_{IN}	40	V
Error input voltage	V_{ADJ}	7	V
Input-output voltage	V_{I-O}	41	V
※2 Output – COM voltage	V_{OUT}	–1	V
※3 V_{soft} terminal voltage	V_{soft}	–0.3 to +40	V
Switching current	I_{SW}	3.5	A
※4 Power dissipation	P_D	35	W
※5 Junction temperature	T_j	150	˚C
Operating temperature	T_{opr}	–20 to +85	˚C
Storage temperature	T_{stg}	–40 to +150	˚C
Soldering temperature	T_{sol}	260 (10s)	˚C

※1 Voltage between V_{IN} terminal and COM terminal
※2 Voltage between V_{OUT} terminal and COM terminal
※3 Voltage between V_{SOFT} terminal and COM terminal
※4 P_D:With infinite heat sink
※5 Overheat protection may operate at T_j=125˚C to 150˚C

• Please refer to the chapter " Handling Precautions ".

* All specs and applications shown above subject to change without prior notice.

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■ Electrical Characteristics

(CP1032-ADJ) (Unless otherwise specified, condition shall be V_{IN}=12V, I_O=0.5A, V_O=5V, V_{soft} terminal=0.1μF, Ta=25˚C)

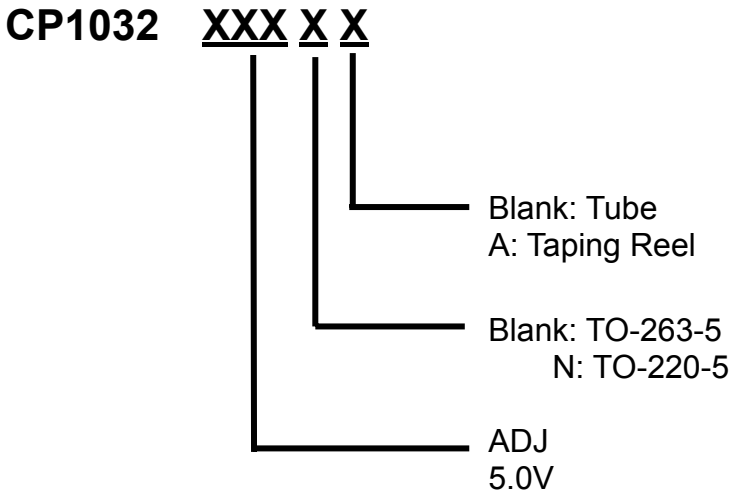
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output saturation voltage	V_{SAT}	I_{SW}=3A	–	1.4	1.8	V
Reference voltage	V_{ref}	–	1.235	1.26	1.285	V
Reference voltage temperature fluctuation	ΔV_{ref}	T_j=0 to 125˚C	–	±0.5	–	%
Load regulation	$\|R_{egL}\|$	I_O=0.5 to 3A	–	0.2	1.5	%
Line regulation	$\|R_{egI}\|$	V_{IN}=8 to 35V	–	1	2.5	%
Efficiency	η	I_O=3A	–	80	–	%
Oscillation frequency	f_O	–	135	150	165	kHz
Oscillation frequency temperature fluctuation	Δf_O	T_j=0 to 125˚C	–	±2	–	%
Overcurrent detecting level	I_L	–	3.6	4.2	5.8	A
Charge current	I_{CHG}	②,④ terminals is open,⑤ terminal	–	−10	–	μA
Input threshold voltage	V_{THL}	Duty ratio=0%,④ terminal=0V,⑤ terminal	–	1.3	–	V
	V_{THH}	Duty ratio=100%,④ terminals is open,⑤ terminal	–	2.3	–	V
ON threshold voltage	$V_{TH(ON)}$	④ terminal=0V,⑤ terminal	0.7	0.8	0.9	V
Overcurrent shutdown threshold voltage	V_{THIL}	⑤ terminal	3.8	4.6	5.5	V
Stand-by current	I_{SD}	V_{IN}=40V,⑤ terminal=0V	–	140	400	μA
Output OFF-state dissipation current	I_{QS}	V_{IN}=40V,⑤ terminal=0.9V	–	8	16	mA

(CP1032-5.0V) (Unless otherwise specified, condition shall be V_{IN}=12V, I_O=0.5A, V_O=5V, V_{soft} terminal=0.1⌈F, Ta=25°C)

Parameter	Symbol	Conditions		MIM.	TYP.	MAX.	Unit.
Output Voltage	V_{OUT}	Test circuit of Figure2		4.9	5.0	5.1	V
		$0.5 \leqq I_{LOAD} \leqq 3A$ Test circuit of Figure2 $0.5 \leqq I_{LOAD} \leqq 3A$	$8V \leqq V_{IN} \leqq 40V$	4.8	5.0	5.2	V
		$-40°C \leqq T_J \leqq 125°C$ Test circuit of Figure2	$8V \leqq V_{IN} \leqq 40V$	4.75	5.0	5.25	V
Efficiency	η	I_{LOAD}=3A			80		%
Oscillator Frequency	fosc			135	150	165	kHz

■ **Order Information**

Package	Part Number	Packing Type	Marking
TO-263-5	CP1032 ADJ	Tape/Tube	CP1032 ADJ
	CP1032 5.0	Tape/Tube	CP1032 5.0
TO-220-5	CP1032 ADJ N	Tape/Tube	CP1032 ADJ
	CP1032 5.0 N	Tape/Tube	CP1032 5.0



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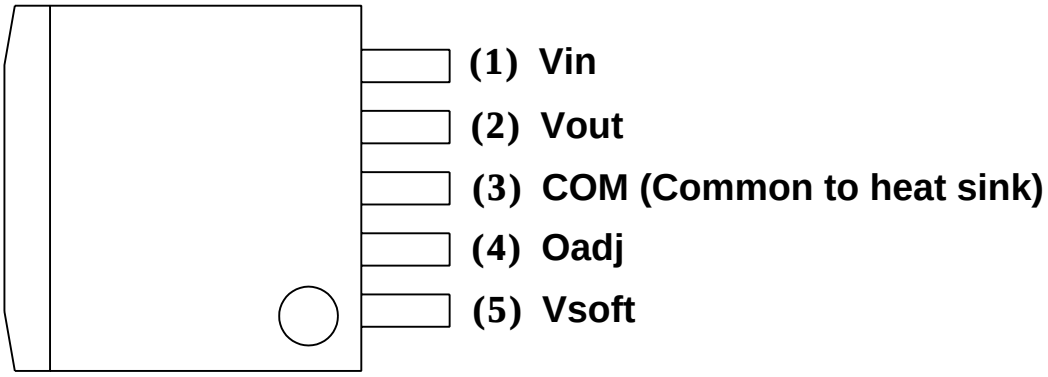
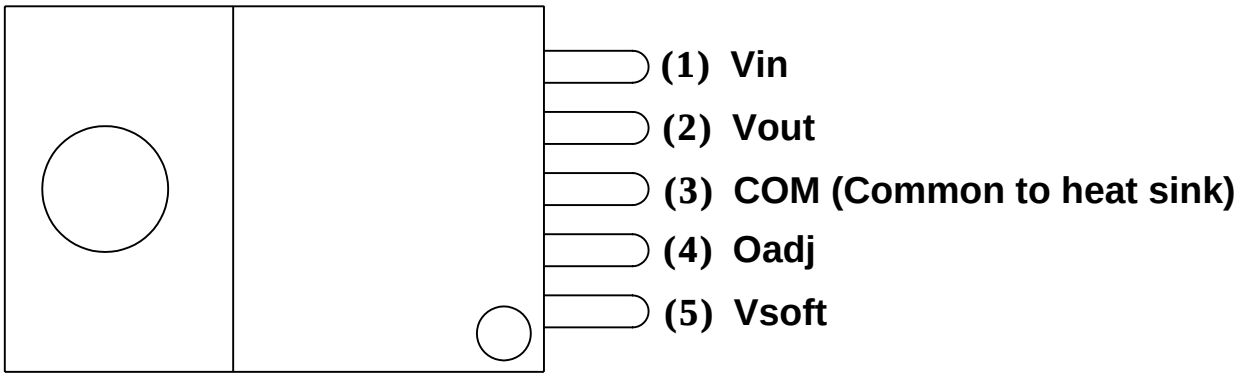
■ **Connection Diagrams**



(TO-263-5)



(TO-220-5)

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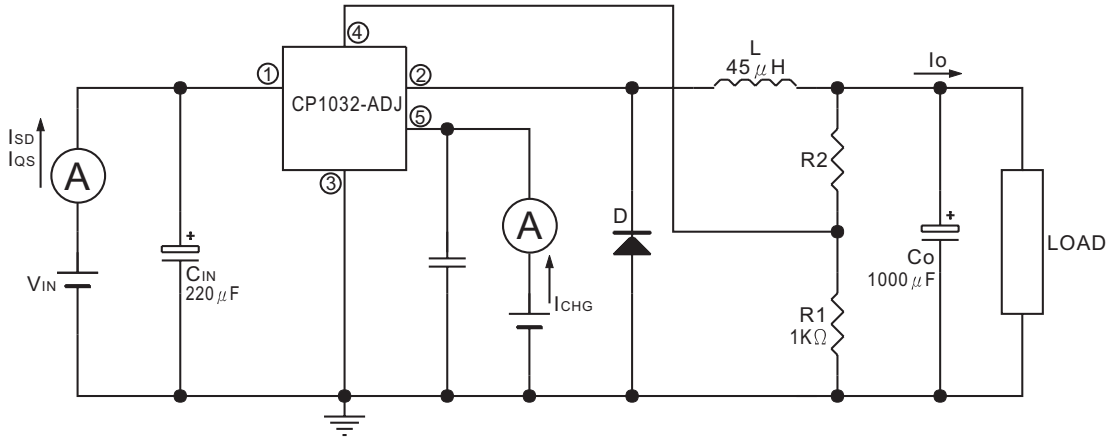
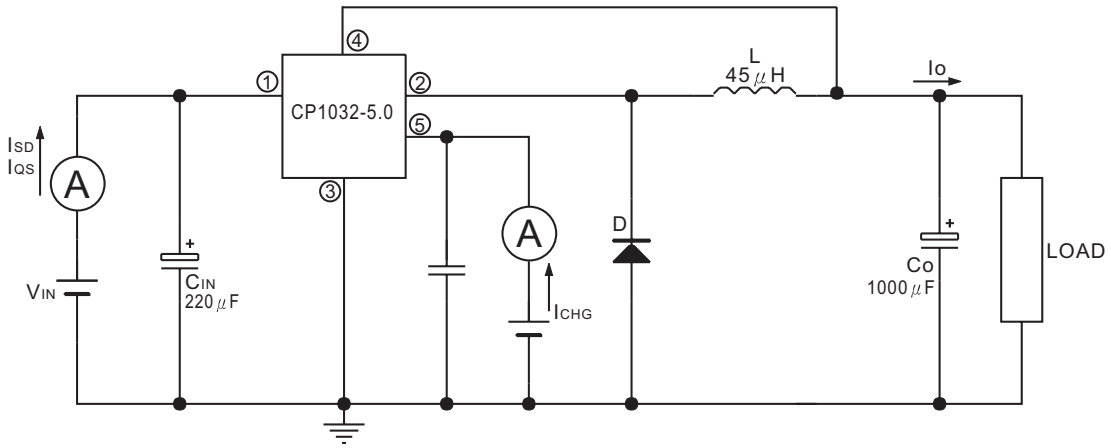
Fig.1 Test Circuit



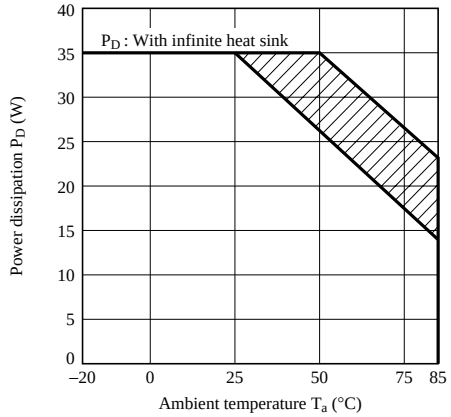
5 terminal	Vo output
LOW	OFF
HIGH	ON
OPEN	ON

Fig.2 Test Circuit



5 terminal	Vo output
LOW	OFF
HIGH	ON
OPEN	ON

Fig.3 Power Dissipation vs. Ambient Temperature



Note) Oblique line portion:Overheat protection may operate in this area.

Fig.4 Overcurrent Protection Characteristics (Typical Value)

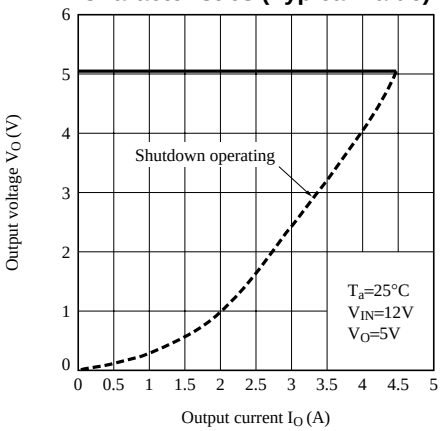


Fig.5 Efficiency vs. Input Voltage

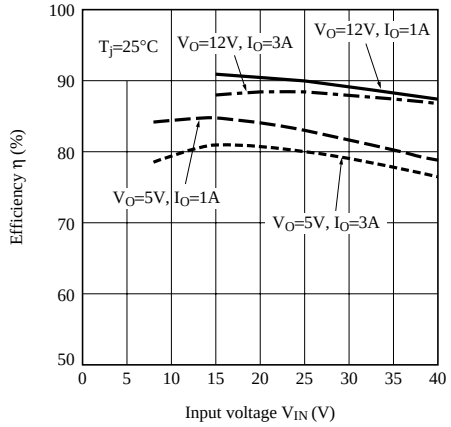


Fig.6 Switching Current vs. Output Saturation Voltage

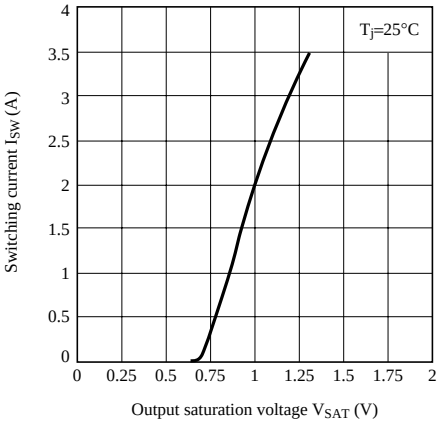


Fig.7 Operating Dissipation Current vs. Input Voltage

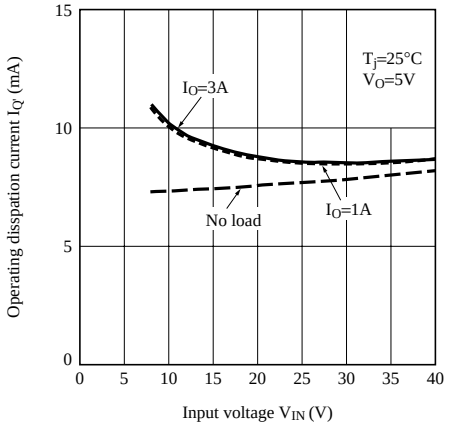


Fig.8 Reference Voltage Fluctuation vs. Junction Temperature

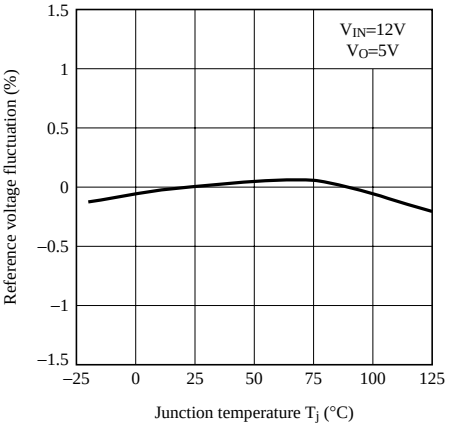


Fig.9 Load Regulation vs. Output Current

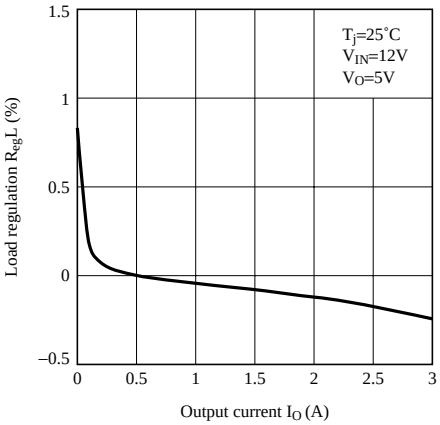


Fig.10 Line Regulation vs. Input Voltage

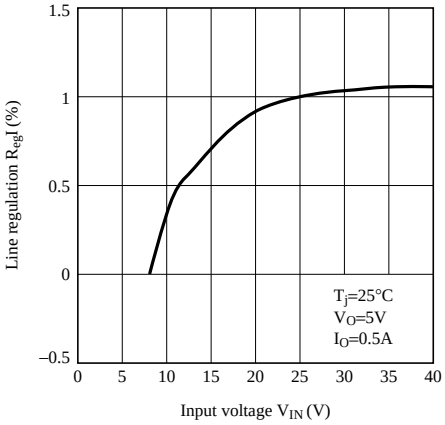


Fig.11 Oscillation Frequency Fluctuation vs. Junction Temperature

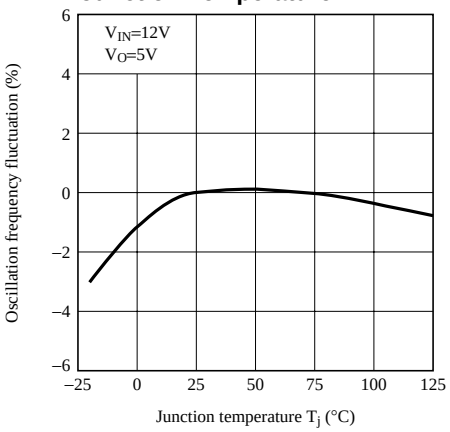


Fig.12 Overcurrent Detecting Level Fluctuation vs. Junction Temperature

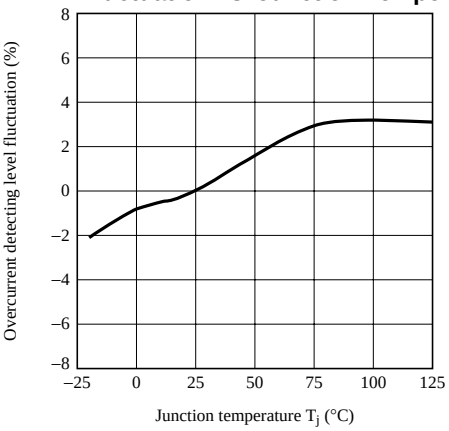


Fig.13 On Threshold Voltage vs. Junction Temperature

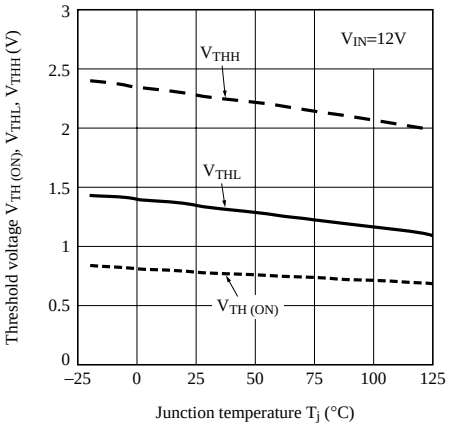


Fig.14 Overcurrent Shutdown Threshold Voltage vs. Junction Temperature

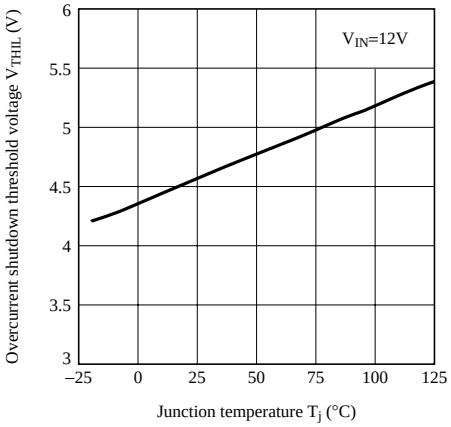
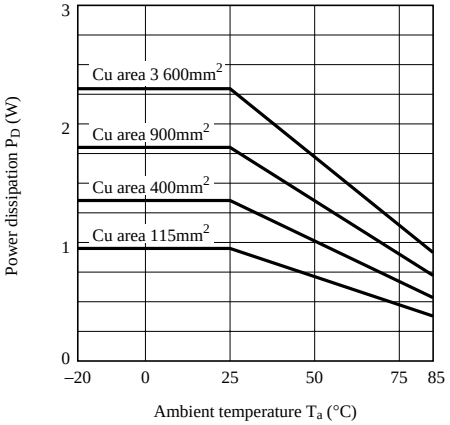
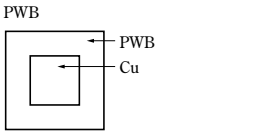


Fig.15 Power Dissipation vs. Ambient Temperature (Typical Value)





Material : Glass-cloth epoxy resin
Size : 60×60×1.6mm
Cu thickness : 65μm

Fig.16 Block Diagram

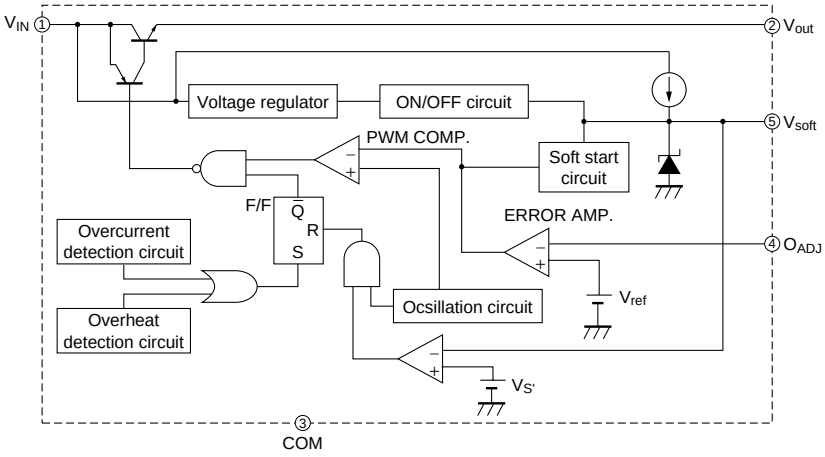


Fig.17 Step Down Type Circuit Diagram

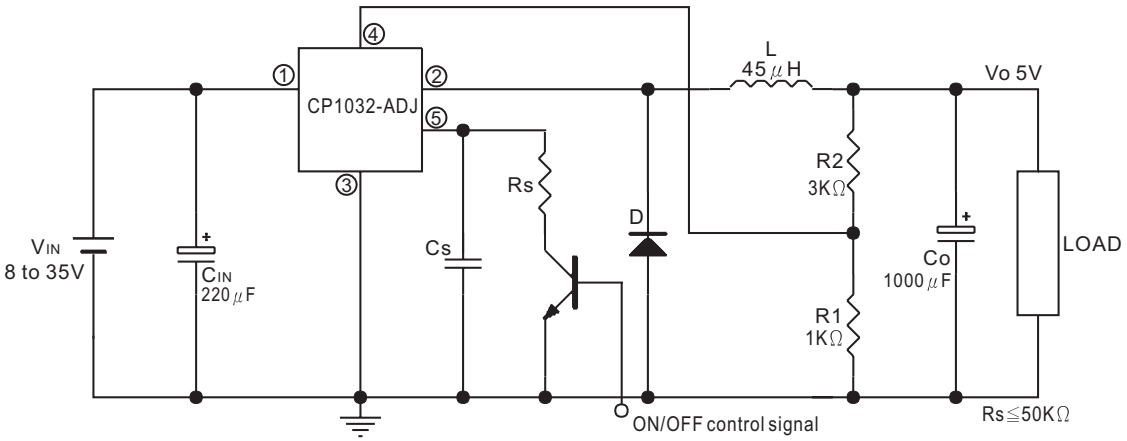


Fig.18 Polarity Inversion Type Circuit Diagram

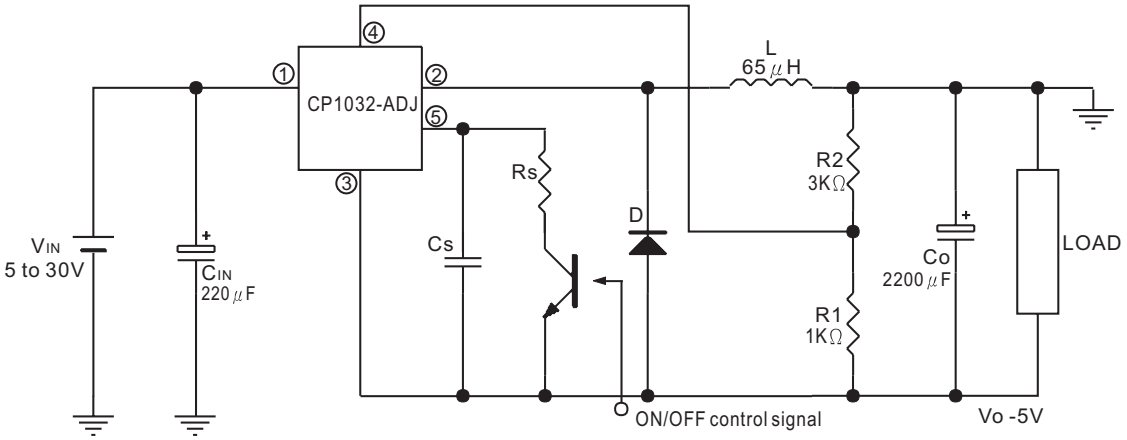


Fig.19 Step Down Type Circuit Diagram

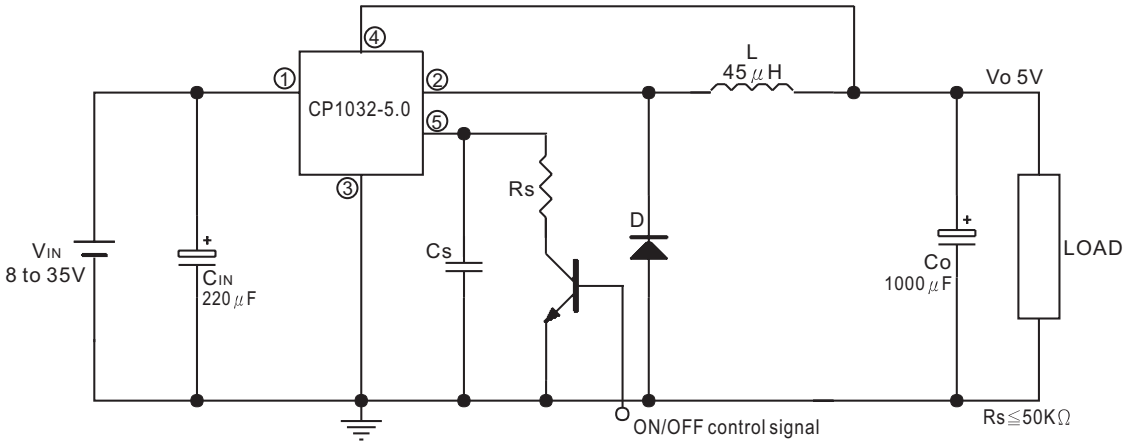
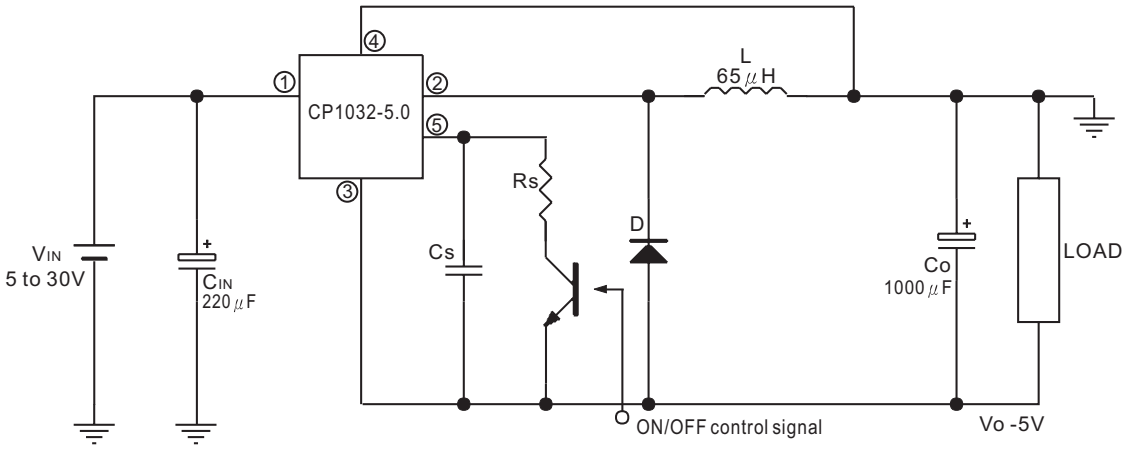
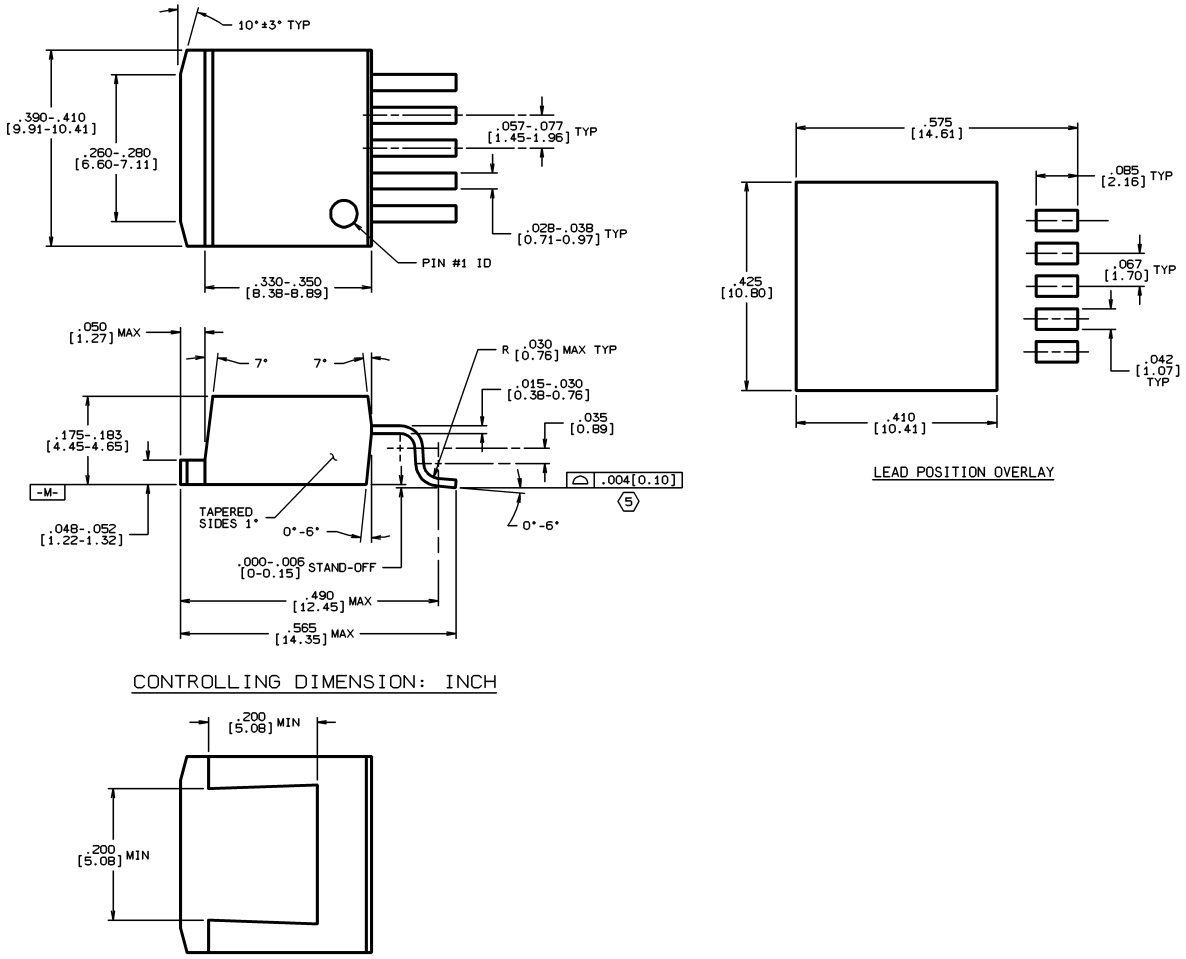


Fig.20 Polarity Inversion Type Circuit Diagram



■ **Physical Dimensions** inch(millimeters)

(TO-263-5)



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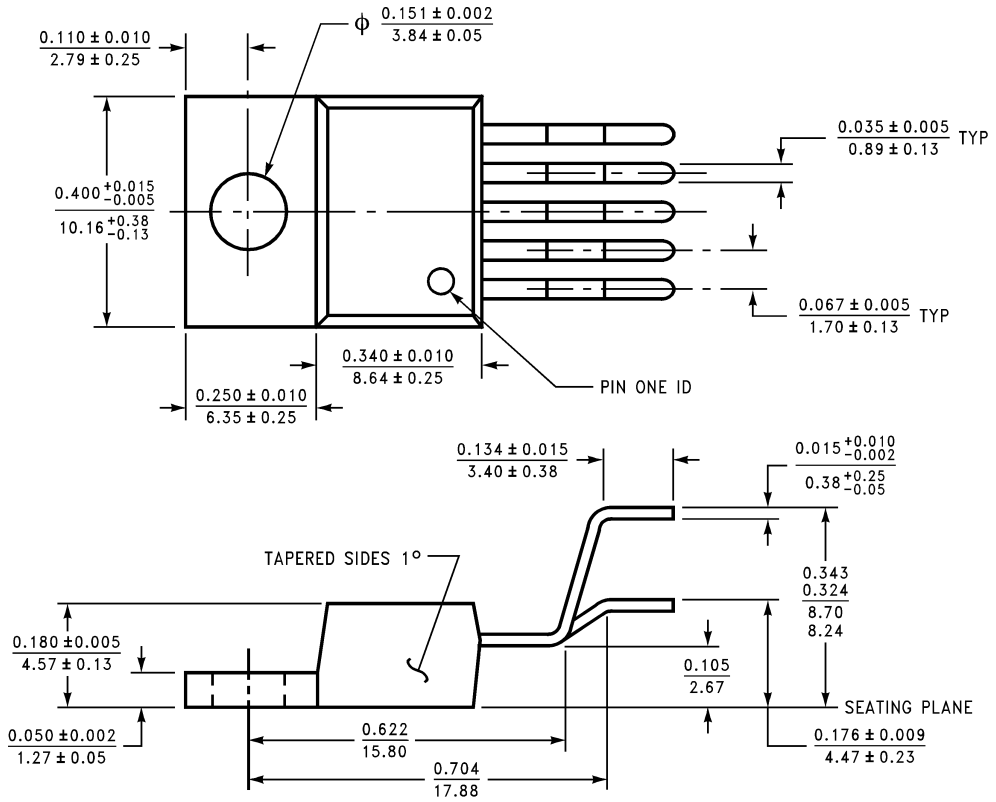

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