

JC34063 series

1.5A DC TO DC
CONVERTER CONTROL

Description

JC34063 series have all the functions required for DC-to-DC converters: an internal Temperature-compensated reference, comparator, controlled duty cycle oscillator with an active current limit circuit, driver, and high current output switch.

JC34063 series are designed for step-down, step-up and voltage-inverting applications by using a minimum number of external components.

For JC34063E can operate for a temperature range from -40°C to 125°C while JC34063F can operate from -25°C to 85°C.

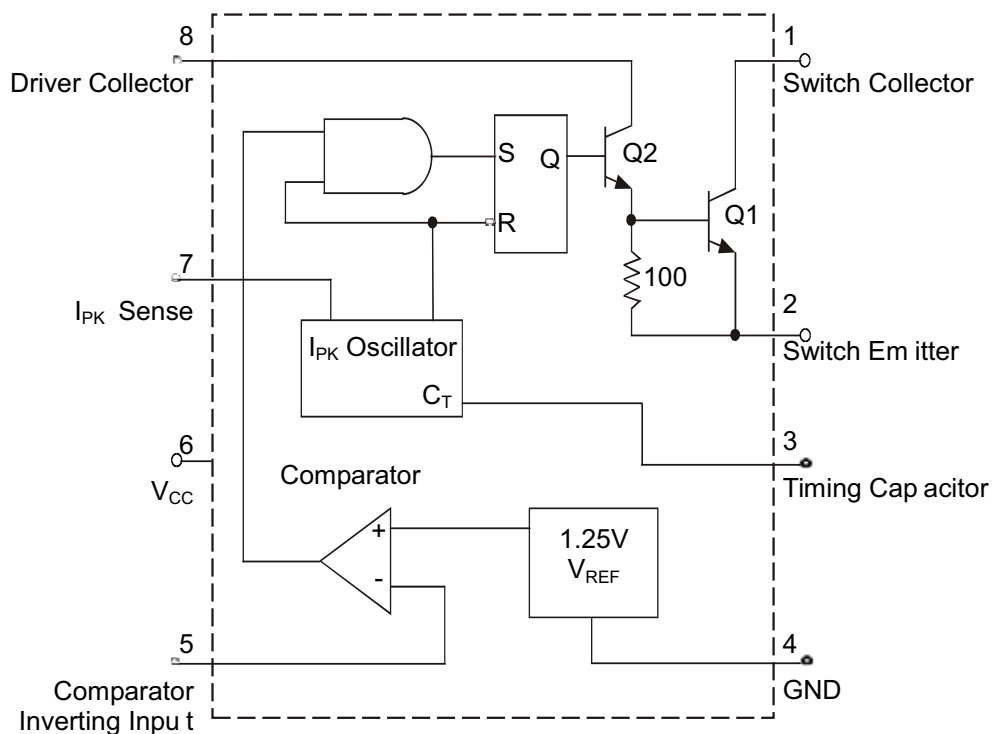
Features

- ◆ 3.0V to 40V Input
- ◆ Adjustable Output Voltage
- ◆ Output Switch Current to 1.5A
- ◆ Low Standby Current
- ◆ Operating Frequency to 100kHz
- ◆ Precision 1 % Reference available

Application

- CD-ROM
- Motherboards
- SMPS Power Supply
- Battery Chargers
- DSL Modem

Schematic Diagram



JC34063 series

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Pin Configurations

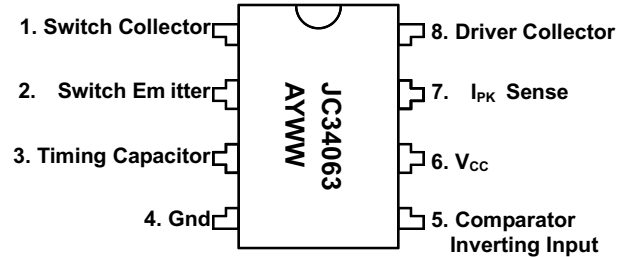
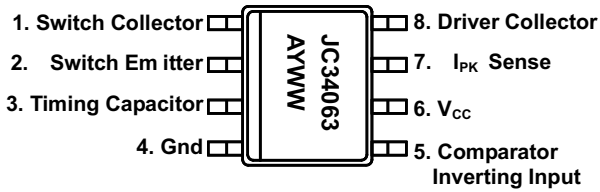
Pin 1	Switch Collector
Pin 2	Switch Emitter
Pin 3	Timing Capacitor
Pin 4	Gnd
Pin 5	Comparator Inverting Input
Pin 6	V _{CC}
Pin 7	I _{PK} Sense
Pin 8	Driver Collector

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Marking Information, JC34063 – Pb Free Product

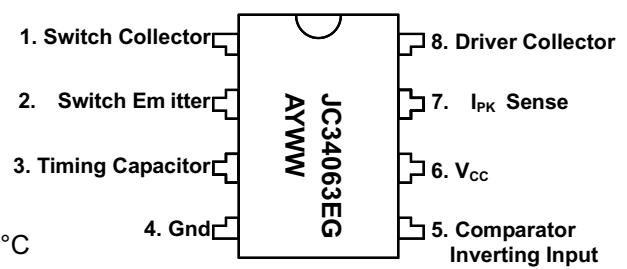
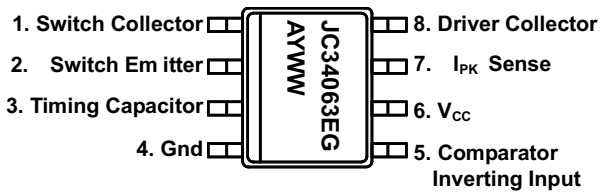
SO8 DIP8



A: Assembly / Test site code
Y: Year
WW: Week

Marking Information, JC34063E – Green Product

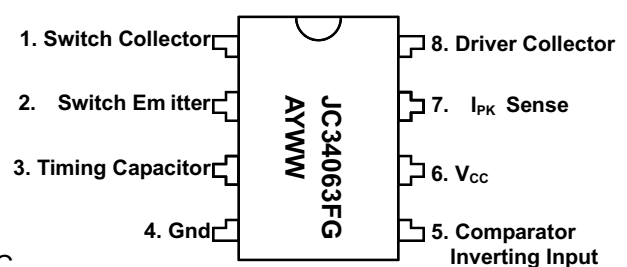
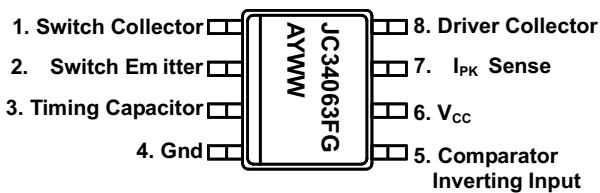
SO8 DIP8



E: Operating Temperature Range: -40°C to 125°C
G: Green Product
A: Assembly / Test site code
Y: Year

Marking Information, JC34063F – Green Product

SO8 DIP8



F: Operating Temperature Range: -25°C to 85°C
G: Green Product
A: Assembly / Test site code
Y: Year

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Ordering Information

JC34063 – Pb Free Product		
Ordering Number	Package	Shipping
JC34063D8T	DIP-8	60 Units / Tube
JC34063S8T	SOP-8	100 Units / Tube
JC34063S8R	SOP-8	2,500 Units / Tape & Reel

JC34063E – Green Product		
Ordering Number	Package	Shipping
JC34063ED8TG	DIP-8	60 Units / Tube
JC34063ES8TG	SOP-8	100 Units / Tube
JC34063ES8RG	SOP-8	2,500 Units / Tape & Reel

JC34063F – Green Product		
Ordering Number	Package	Shipping
JC34063FD8TG	DIP-8	60 Units / Tube
JC34063FS8TG	SOP-8	100 Units / Tube
JC34063FS8RG	SOP-8	2,500 Units / Tape & Reel

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Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Power Supply Voltage	V_{CC}	40	Vdc
Comparator Input Voltage Range	V_{IR}	-0.3 to +40	Vdc
Switch Collector Voltage	$V_{C(switch)}$	40	Vdc
Switch Emitter Voltage ($P_{IN1} = 40V$)	$V_{E(switch)}$	40	Vdc
Switch Collector Emitter Voltage	$V_{CE(switch)}$	40	Vdc
Driver Collector Voltage	$V_{C(driver)}$	40	Vdc
Driver Collect Current (Note 1)	$I_{C(driver)}$	100	mA
Switch Current	I_{SW}	1.5	A
Power dissipation	DIP 8	780	mW
	SO 8	510	
Operating Temperature Range	JC34063	0 to 70	°C
	JC34063E	-40 to 125	
	JC34063F	-25 to 85	
Storage Temperature		- 65 to 150	°C
Lead Temperature (soldering 10 sec.)		260	°C

Note 1. Maximum package power dissipation limits must be observed

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Electrical Characteristics ($V_{CC} = 5.0V$, $T_A = 25^\circ C$ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OSCILLATOR						
Frequency	f_{OSC}	$V_{PIN5} = 0V$, $C_T = 1.0nF$	24	33 42		kHz
Charge Current	I_{chg}	$V_{CC} = 5.0V$ to $40V$	24	35 42		μA
Discharge Current	I_{dischg}	$V_{CC} = 5.0V$ to $40V$	140	220 260		μA
Discharge to Charge Current Ratio	I_{dischg}/I_{chg}	Pin 7 to V_{CC}	5.2	6.5 7.5		-
Current Limit Sense Voltage	$V_{ipk(sense)}$	$I_{chg} = I_{dischg}$	250	300 350		mV
OUTPUT SWITCH (Note 2)						
Saturation Voltage 1	$V_{CE(sat1)}$	Darlington Connection, $I_{SW} = 1.0A$, Pins 1, 8 Connected $T_A =$ Full range		1.0	1.3	V
Saturation Voltage 2 (Note 3)	$V_{CE(sat2)}$	Darlington Connection, $I_{SW} = 1.0A$, $R_{PIN8} = 82\Omega$ to V_{CC} , Forced $\beta = 20$, $T_A =$ Full range		0.45 0.7		V
DC Current Gain	h_{FE}	$I_{SW} = 1.0A$, $V_{CE} = 5V$	50	75		-
Collector Off-State Current	$I_{C(OFF)}$	$V_{CE} = 40V$, $T_A =$ Full range	-	40 100		μA
COMPARATOR						
Threshold Voltage	V_{th}		1.225	1.25	1.275	V
		Note 4	1.238	1.25 1.263		
		$T_A =$ Full range	1.21		1.29	
Threshold Voltage Line Regulation	Reg_{line}	$V_{CC} = 5.0V$ to $40V$, $T_A =$ Full range	-	1.4 5.0		mV
Input Bias Current	I_{IB}	$V_{in} = 0V$, $T_A =$ Full range		-20 -400		nA
TOTAL DEVICE						
Supply Current	I_{CC}	$V_{CC} = 5V$ to $40V$, $C_T = 1.0nF$, Pin 7 = V_{CC} , $V_{pin 5} > V_{th}$, Pin 2 = Gnd, remaining pins open $T_A =$ Full range	50	75		mA

Note 2. Low duty cycle pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

Note 3. If the output switch is driven into hard saturation (non-Darlington configuration) at low switch currents (≤ 300 mA) and high driver currents (≥ 30 mA), it may take up to 2.0 ms for it to come out of saturation. This condition will shorten the off time at frequencies 30 kHz, and is magnified at high temperatures. This condition does not occur with a Darlington configuration, since the output switch cannot saturate. If a non-Darlington configuration is used, the following output drive condition is recommended:

Forced β of output switch:

$$\frac{I_c \text{ output}}{I_c \text{ driver} - 7.0 \text{ mA}^*} \geq 10$$

* The 100 Ω resistor in the emitter of the driver device requires about 7.0 mA before the output switch conducts.

Note 4. 1% accuracy is available upon special request

Typical Performance Characteristics

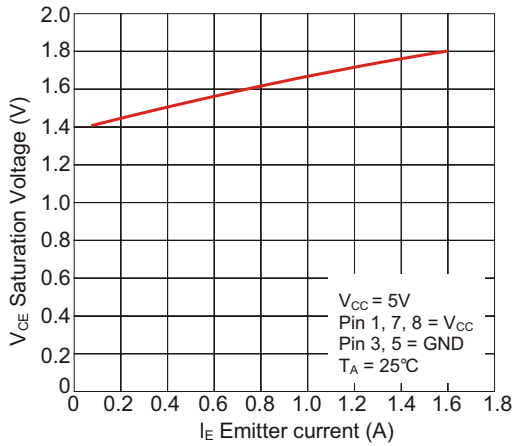


Figure 1: Emitter Follows Configuration Output

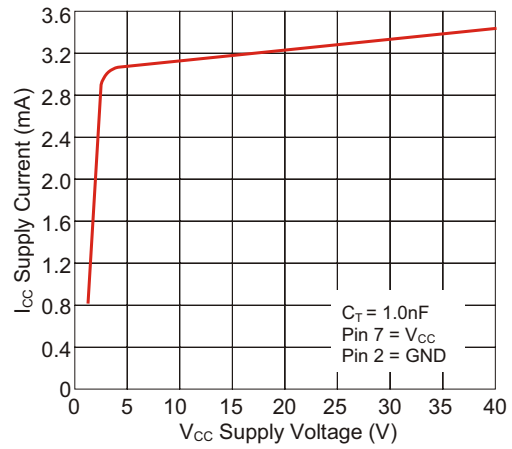


Figure 2: Standby Supply Current vs. Supply Voltage

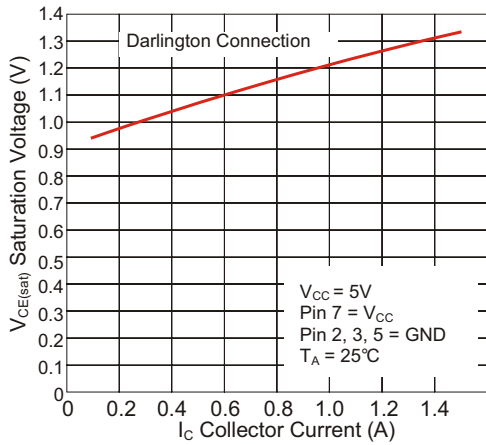


Figure 3: Common Emitter Configuration Output Switch Saturation Voltage vs. Collector Current

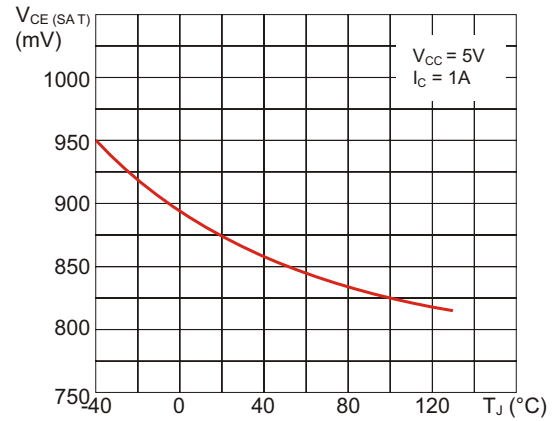


Figure 4: Darlington Configuration Collector Emitter Saturation Voltage ($V_{CE(SAT)}$) vs. Temperature

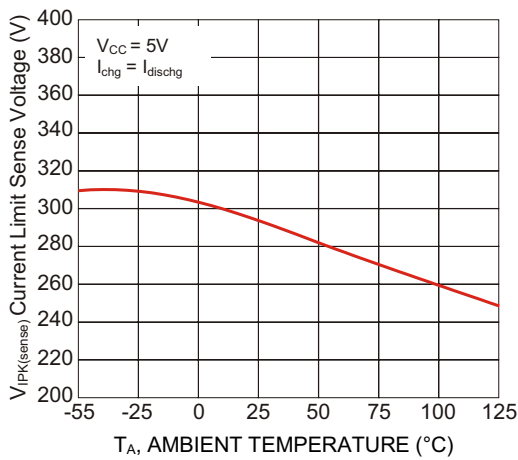


Figure 5: Current Limit Sense Voltage Vs. Temperature

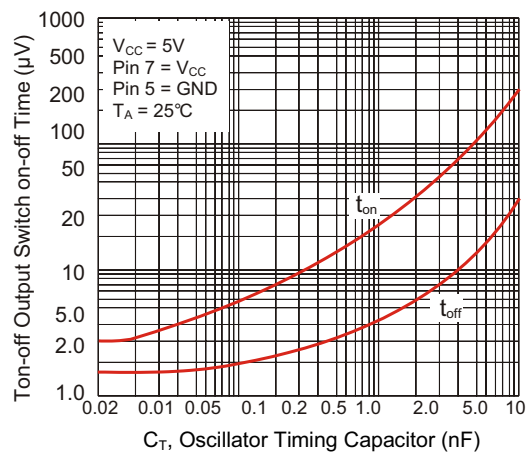
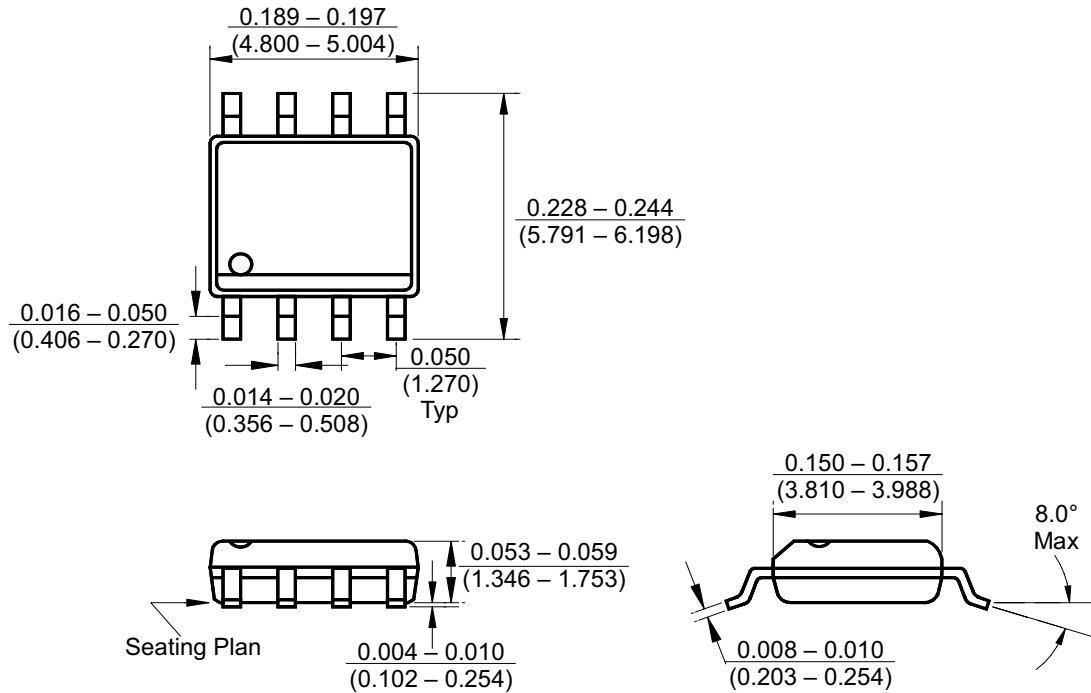


Figure 6: Output Switch On-Off Time vs. Oscillator Timing Capacitor

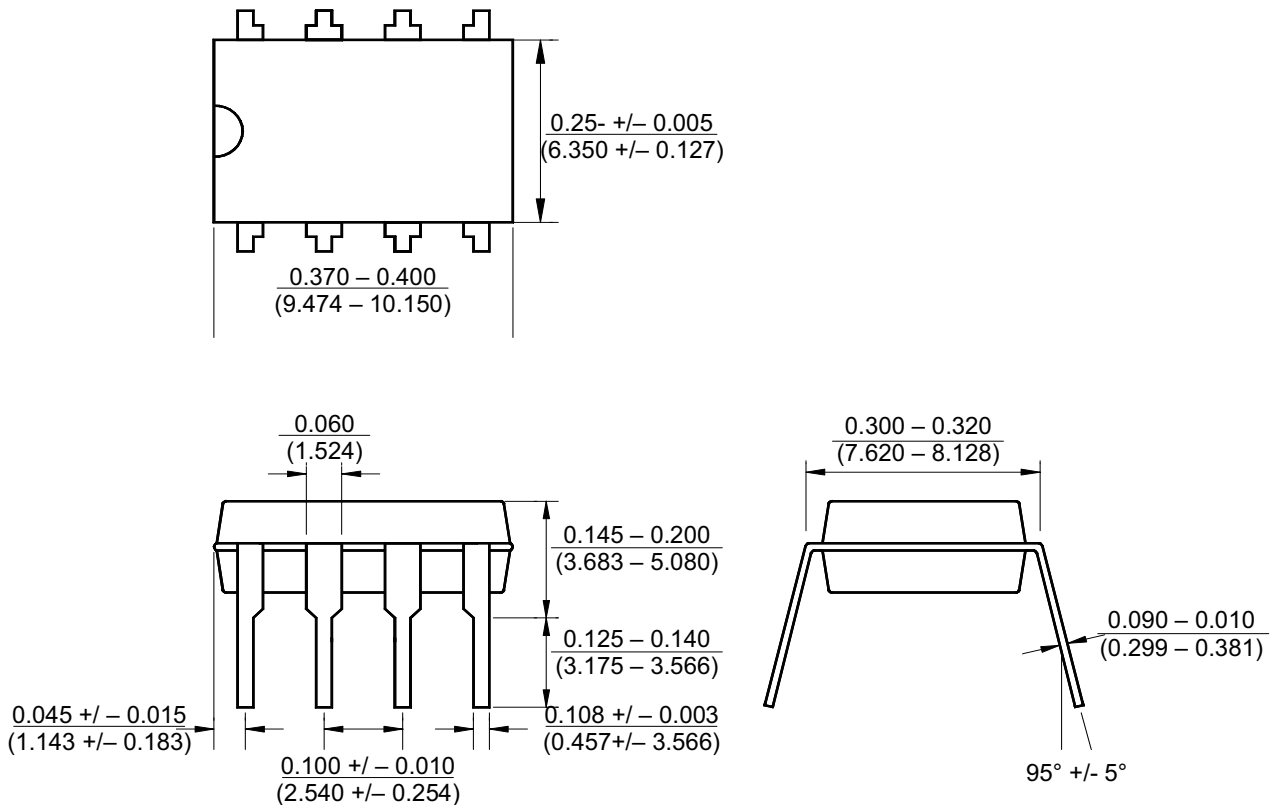
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Package Outline Dimensions – SO 8



Package Outline Dimensions – DIP 8



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Ordering Number

JC 34063E S8 R G

Jing Cheng	Circuit Type	Package Type	Shipping Type	Blank:
	34063	S8: SO 8	R: Taping & Reel	Pb-free
	34063E	D8: DIP 8	T: Tube	G: Green
	34063F			

Note:

Pb-free products:

- ◆ RoHS compliant and compatible with the current requirements of IPC/JEDEC J-STD-020.
- ◆ Suitable for use in Pb-free soldering processes with 100% matte tin (Sn) plating.

Green products:

- ◆ Lead-free (RoHS compliant)
- ◆ Halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight)