MC34063ADR

DC-DC conversion control circuit

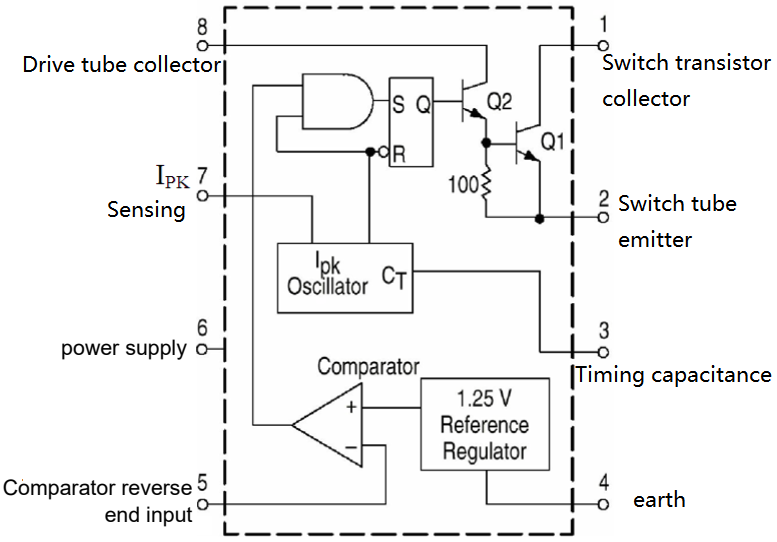
1.Description

MC34063ADR is a single-chip DC-DC converter integrated circuit with a reference voltage source for temperature compensation (1.25V), comparator, oscillator, driver and high current output switch tube which can effectively limit the current and control the working cycle. With a few external components, the DC-DC converter with boost, buck and voltage reversal can be formed.The circuit is packaged in SOP8.

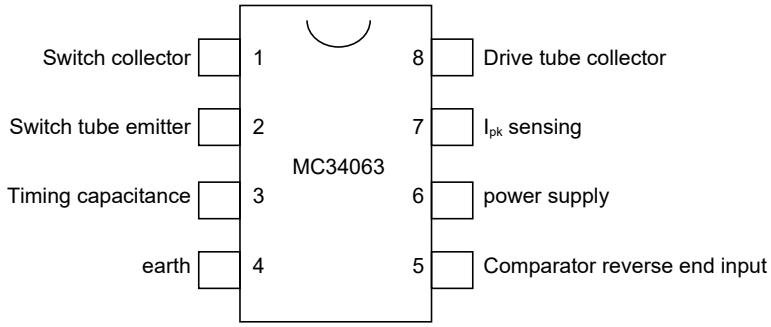
2.Features

- The working voltage range is 3.0V-32V
- The static current is small
- Pin layout
- It has output current limit function and output current protection function
- The limit current of the output switch is 1.2A
- Adjustable output voltage
- The working frequency can reach 100kHz
- Internal reference voltage accuracy 2%

3.Functional Block Diagram



4.Pinning Information



SOP-8

Pin Descriptions

Balloon	Function	Symbol	Balloon	Function	Symbol
1	Switch collector	SC	5	Comparator reverse end input	FB
2	Switch tube emitter	SE	6	power supply	V_{CC}
3	Timing capacitance	CT	7	I_{PK} sensing	I_{pk}
4	earth	GND	8	Driving tube collector	DC

5.Limit Value

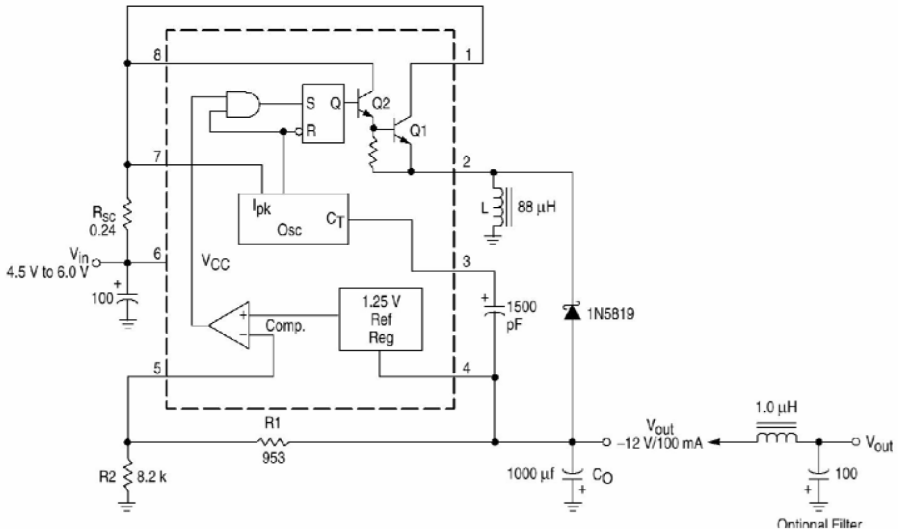
Explain	Symbol	Min	Max	Company
supply voltage	V_{CC}		32	V
Comparator input voltage range	V_{IR}	-0.3	30	V
Output collector voltage	$V_{C(switch)}$		32	V
Output tube emitter voltage (V_{PIN1}=32V)	$V_{E(switch)}$		32	V
Voltage between collector and emitter of output tube	$V_{CE(switch)}$		32	V
Driving tube collector voltage	$V_{C(driver)}$		32	V
Driving tube collector current	$I_{C(driver)}$		100	mA
Output current	I_{SW}		1.2	A
Power waste	P_D		1.25	W
Working environment temperature	T_A	0	70	°C
Storage temperature	T_{STG}	-65	150	°C

6. Electrical Characteristics (V_{CC}=5.0V, T_A=0°C~70°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Oscillator part						
Oscillation frequency	f_{osc}	V_{PIN5}=0V, C_T=1nF, T_A=25°C	24	33	42	KHz
Charging current	I_{chg}	V_{CC}=5V~32V, T_A=25°C	24	33	42	μA
Discharge current	I_{dischg}	V_{CC}=5V~32V, T_A=25°C	140	200	260	μA
Ratio of discharge to charging current	$I_{dischg/Ichg}$	V_{PIN7}=V_{CC}, T_A=25°C	5.2	6.2	7.5	
Current limiter	V_{IPK}	I_{chg}=I_{dischg}, T_A=25°C	250	300	350	mV
Output part						
Saturation pressure drop	$V_{CE(sat)}$	I_{SW}=1A, pin1, 8 connection		1	1.3	V
Saturation pressure drop	$V_{CE(sat)}$	I_{SW}=1A, R_{PIN8}=82 to V_{CC}		0.45	0.7	V
DC amplification factor	h_{FE}	I_{SW}=1A, V_{CE}=5V, T_A=25°C	50	120		
Collector leakage current	$I_{C(off)}$	V_{CE}=30V		0.01	100	μA
Comparator part						
Threshold voltage	V_{th}	T_A=25°C, T_A=0~70°C	1.23	1.25	1.27	V
			1.21		1.29	V
Input bias current	I_{IB}	V_{IN}=0V		-40	-400	nA
Threshold voltage linear adjustment rate	Regline	V_{CC}=3V~30V		1.4	5	mV
Overall part						
Power supply current	I_{CC}	V_{CC}=5V~30V, C_T=1nF, V_{PIN7}=V_{CC},V_{PIN5}>V_{th},V_{PIN2}=GND others are suspended		2.5	4	mA

7.Application Circuit Diagram

MC34063 as reverse DC-DC converter



As shown in Fig. 3, the voltage ripple and noise can be further reduced after the LC filter is added. The characteristics are shown in the table below

Parameter	Test Conditions	Result
Linear adjustment rate	V_{IN}=4.5~6.0V, I_O=100mA	3.0mV=0.012%
Load adjustment rate	V_{IN}=5V, I_O=10~100mA	0.022V=+0.09%
Output ripple	V_{IN}=5V, I_O=100mA	500mV_{pp}
Circuit limiting current	V_{IN}=5V, R_L=0.1	910mA
Efficiency	V_{IN}=5V, I_O=100mA	64.5%
Output ripple	V_{IN}=5V, I_O=100mA	70mV_{pp}

8.Typical Characteristic

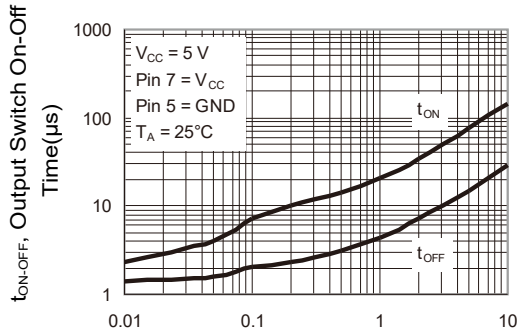


Figure 1: Output Switch On-Off Time vs Oscillator Timing Capacitor

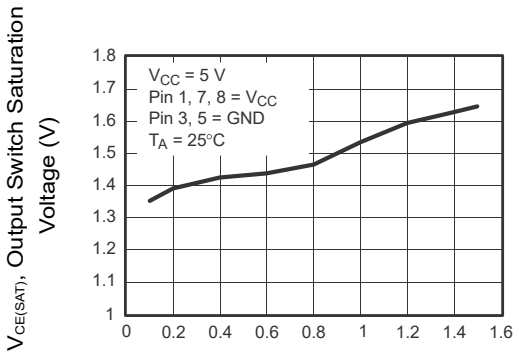


Figure 2: Output Switch Saturation Voltage vs Emitter Current (Emitter-Follower Configuration)

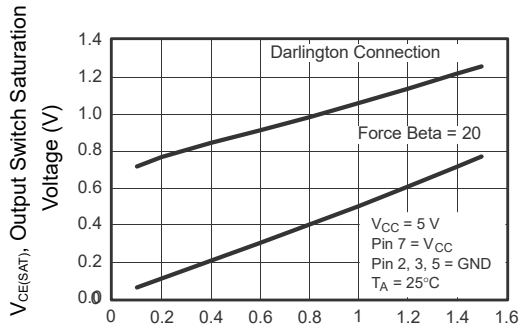


Figure 3: Output Switch Saturation Voltage vs Collector Current (Common-Emitter Configuration)

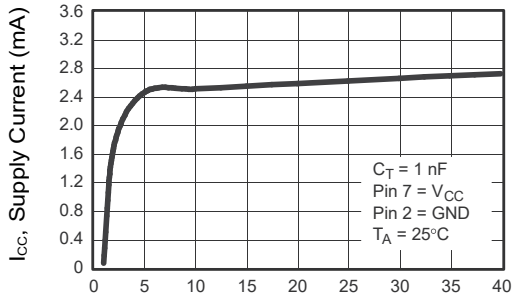
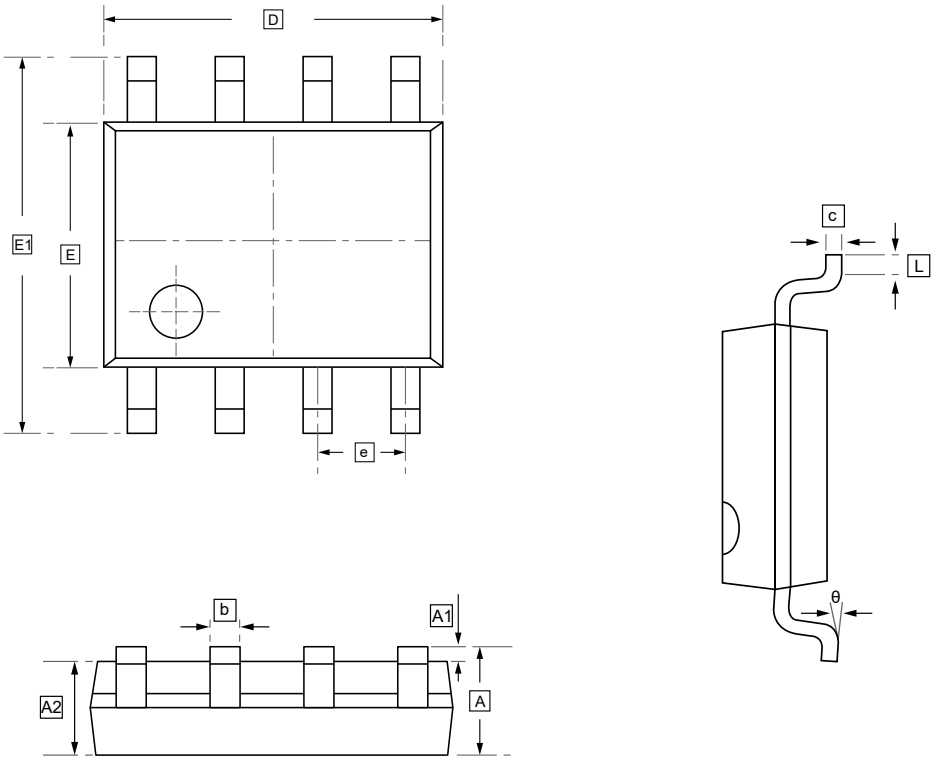


Figure 4: Standby Supply Current vs Supply Voltage

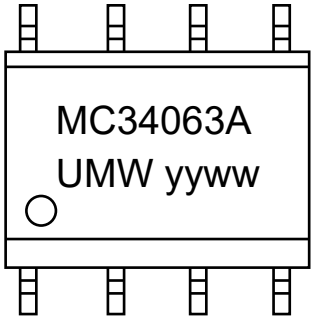
9.SOP-8 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	8°

10.Ordering Information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW MC34063ADR	SOP-8	2500	Tape and reel

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