

RC5056

Programmable Synchronous DC-DC Converter for Low Voltage Microprocessors and Vtt Linear Regulator

Features

- Programmable output from 1.8V to 3.5V using an integrated 5-bit DAC
- 85% efficiency typical at full load
- Adjustable operation from 50KHz to 1MHz
- Integrated Power Good and Enable/Soft Start functions
- Overvoltage protection pin controls external SCR
- Short circuit protection with current limiting
- Drives N-channel MOSFETs
- 20 pin SOIC package
- Meets Intel Pentium II specifications using minimum number of external components
- On board LDO for GTL termination

Applications

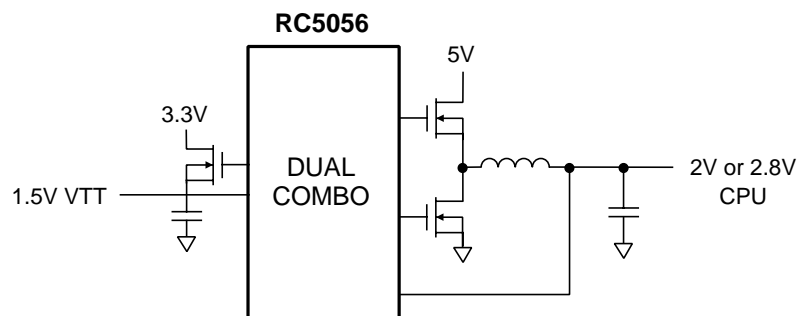
- Power supply for Pentium® II
- VRM for Pentium II processor
- Programmable step-down power supply

Description

The RC5056 is a synchronous mode DC-DC controller IC which provides an accurate, programmable output voltage for all Pentium II CPU applications. The RC5056 uses a 5-bit D/A converter to program the output voltage from 1.8V to 3.5V. The RC5056 uses a high level of integration to deliver load currents in excess of 17A from a 5V source with minimal external circuitry. Synchronous-mode operation offers optimum efficiency over the entire specified output voltage range, and the internal oscillator can be programmed from 50KHz to 1MHz for additional flexibility in choosing external components. An on-board precision low TC reference achieves tight tolerance voltage regulation without expensive external components. The RC5056 also offers integrated functions including Power Good, Output Enable/Soft Start, over-voltage protection and current limiting. The linear regulator is specified at 2% precision.

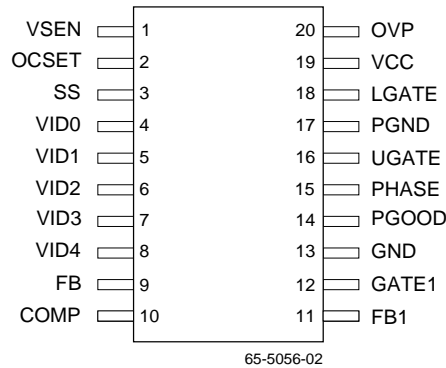
Preliminary Information

Block Diagram



65-5056-01

Pin Assignments



Preliminary Information

Pin Definitions

Pin Number	Pin Name	Pin Function Description
1	VSEN	This pin is connected to the converters. The PGOOD and OVP comparator circuits use this signal to report output voltage status and for overvoltage protection.
2	OCSET	Connect a resistor (ROCSET) from this pin to the drain of the upper MOSFET. ROCSET, an internal 200uA current source (locs) and the upper MOSFET Rdson set the converter peak over-current trip point : $I_{peak} = locs * Rocset / Rdson$
3	SS	Soft Start.
4-8	VID0-4	DAC inputs
9	FB	PWM Loop Voltage Feedback. Inverting input of error amplifier.
10	COMP	PWM Loop Error amplifier output.
11	FB1	First LDO Error Amplifier Negative Input.
12	GATE1	First LDO Error Amplifier Output.
13	GND	Signal Ground.
14	PGOOD	Power good.
15	PHASE	Connect the PHASE to the upper MOSFET source.
16	UGATE	Upper gate driver
17	PGND	Power ground.
18	LGATE	Low gate driver.
19	VCC	12V bias supply.
20	OVP	Over Voltage Protection. This pin drives an external SCR.

Absolute Maximum Ratings

Power Input Voltage, V_{in}	6V
Supply Voltage V_{cc} and $V_{BOOT-VPHASE}$	13.5V
V_{cc} or I/O Voltage	$V_{cc}+0.3V$
ESD Classification	Class 2

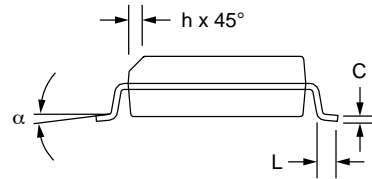
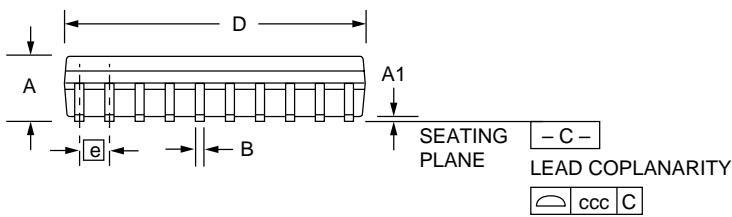
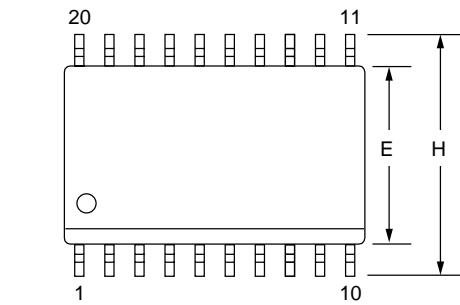
Package Dimensions

20-pin SOIC package

Symbol	Inches		Millimeters		Notes
	Min.	Max.	Min.	Max.	
A	.093	.104	2.35	2.65	
A1	.004	.012	0.10	0.30	
B	.013	.020	0.33	0.51	
C	.009	.013	0.23	0.32	5
D	.496	.512	12.60	13.00	2
E	.291	.299	7.40	7.60	2
e	.050 BSC		1.27 BSC		
H	.394	.419	10.00	10.65	
h	.010	.029	0.25	0.75	
L	.016	.050	0.40	1.27	3
N	20		20		6
α	0°	8°	0°	8°	
ccc	—	.004	—	0.10	

Notes:

1. Dimensioning and tolerancing per ANSI Y14.5M-1982.
2. "D" and "E" do not include mold flash. Mold flash or protrusions shall not exceed .010 inch (0.25mm).
3. "L" is the length of terminal for soldering to a substrate.
4. Terminal numbers are shown for reference only.
5. "C" dimension does not include solder finish thickness.
6. Symbol "N" is the maximum number of terminals.



Preliminary Information

Ordering Information

Product Number	Package
RC5056M	20 pin SOIC

Preliminary Information

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