

DIGITAL PWM IC

1. General Description

The G5175 is a high performance AC/DC power supply controller which uses digital control technology to build peak current mode PWM flyback power supplies. The device directly drives a power BJT and operates in quasi-resonant mode to provide high efficiency along with a number of key built-in protection features while minimizing the external component count, simplifying EMI design and lowering the total bill of material cost. The G5175 features a distinctive soft-start scheme, which allows for fast and yet smooth start-up with both small and large capacitive loads.

Global Semiconductor's innovative proprietary technology ensures that power supplies built with the G5175 can achieve both highest average efficiency and fast yet smooth start-up with a wide range of capacitive loads, and are ideal for network power adapter applications.

The G5175 removes the need for secondary feedback circuitry while achieving excellent line and load regulation. It also eliminates the need for loop compensation components while maintaining stability over all operating conditions. Pulse-by-pulse waveform analysis allows for a loop response that is much faster than traditional solutions, resulting in improved dynamic load response. The built-in power limit function enables optimized transformer design in universal off-line applications and allows for a wide input voltage range.

Features

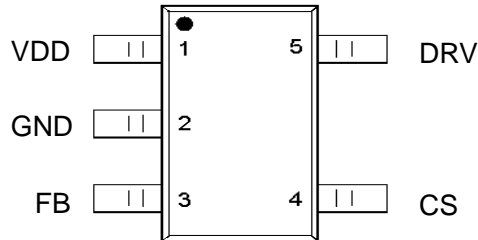
- ◆ Very tight constant voltage and constant current regulation over entire operating range
- ◆ Adaptively controlled soft start-up enables fast and smooth start-up for a wide range of capacitive loads (from 330uF to 6000 uF)
- ◆ Very tight constant voltage regulation
- ◆ Optimized 72 kHz maximum PWM switching frequency achieves best size and efficiency
- ◆ Primary-side feedback eliminates opto-isolators and simplifies design
- ◆ Intrinsically low common mode noise
- ◆ Adaptive multi-mode PWM/PFM control improves efficiency
- ◆ Quasi-resonant operation for highest overall efficiency
- ◆ Direct drive of low-cost BJT switch
- ◆ Dynamic base current control
- ◆ No external compensation components required
- ◆ Built-in short circuit protection and output overvoltage protection
- ◆ Built-in current sense resistor short circuit protection
- ◆ Constant current control enables output current limit and overload protection
- ◆ No audible noise over entire operating range

Applications

- Network power adapters for ADSL, wireless access points, routers.

2. Products Information

2.1 Pin configuration



Pin Configuration: G5175 Series (SOT23-5)

Pin Name	I/O	Description
VDD	P	Power supply for control logic.
FB	I	Analog Input Auxiliary voltage sense (used for primary regulation).
CS	I	Analog Input Primary current sense. Used for cycle-by-cycle peak current control and limit.
GND	P	Ground.
DRV	O	Base drive for BJT.

2.2 Marking Information

Part Number	Marking Information
G5175	GAXXX

2.3 Series description

Part Number	Description
G5175-00	Cable Comp = 0mV
G5175-01	Cable Comp = 150mV
G5175-03	Cable Comp = 300mV
G5175-05	Cable Comp = 450mV

2.4 Block diagram

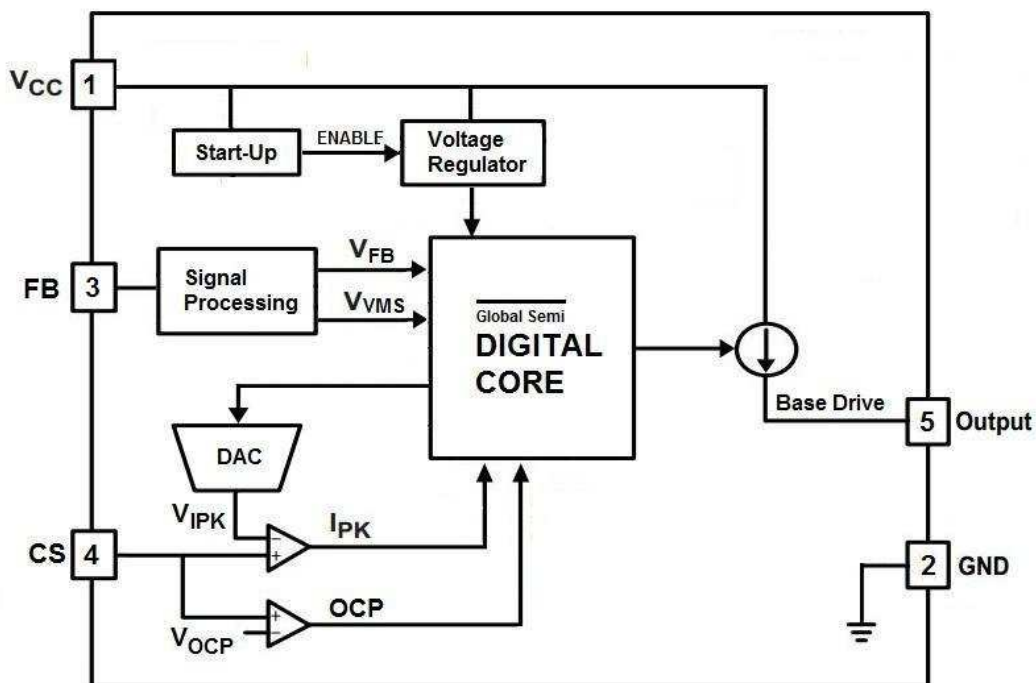


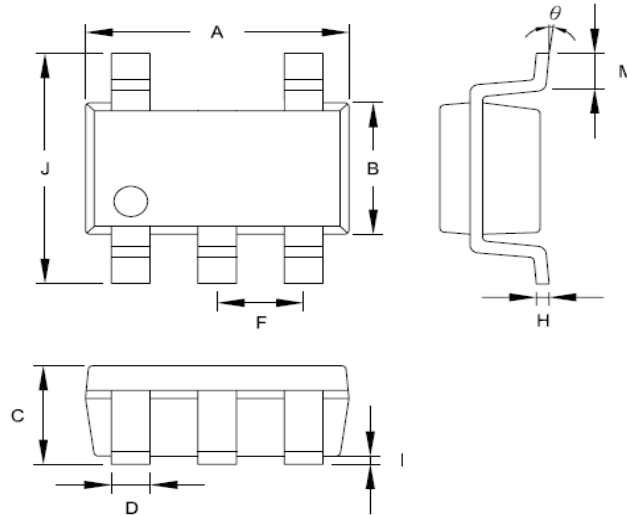
Figure2.1 G5175 Functional Block Diagram

3. Absolute Maximum Ratings

Parameter	Symbol	Value	Units
DC supply voltage range (pin 1, $I_{DD} = 20\text{mA}$ max)	V_{DD}	-0.3 to 18.0	V
Continuous DC supply current at V_{DD} pin ($V_{DD} = 15\text{V}$)	I_{DD}	20	mA
DRV output (Pin 5)		-0.3 to 4.0	V
FB input (Pin 3, $I_{FB} \leq 10\text{mA}$)		-0.7 to 4.0	V
CS input (Pin 4)		-0.3 to 4.0	V
Maximum junction temperature	$T_{J\text{MAX}}$	150	$^{\circ}\text{C}$
Storage temperature	T_{STG}	-65 to 150	$^{\circ}\text{C}$
Lead temperature during IR reflow for ≤ 15 seconds	T_{LEAD}	260	$^{\circ}\text{C}$
Thermal resistance junction-to-ambient	θ_{JA}	190	$^{\circ}\text{C}/\text{W}$
ESD rating		2,000	V
Latch-up test per JEDEC 78		± 100	mA

4. Package Information

SOT23-5



Symbol	Dimension in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	2.692	3.099	0.106	0.122
B	1.397	1.803	0.055	0.071
C	--	1.450	--	0.057
D	0.300	0.500	0.012	0.020
F	0.95		0.037	
H	0.080	0.254	0.003	0.010
I	0.050	0.150	0.002	0.006
J	2.600	3.000	0.102	0.118
M	0.300	0.600	0.012	0.024
θ	0°	10°	0°	10°

Data and specifications subject to change without notice.

This product has been designed and qualified for Industrial Level and Lead-Free.

Qualification Standards can be found on GS's Web site.

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