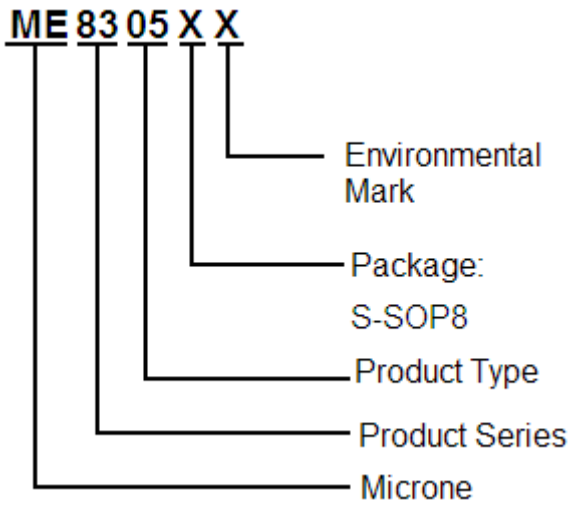
LOW-Power Off-line Primary Side Regulation Controller ME8305

General Description

The ME8305 is a high performance AC/DC power supply controller for battery charger and adapter applications. The device uses Pulse Frequency Modulation(PFM) method to build discontinuous conduction mode (DCM) flyback power supplies.

The ME8305 provides accurate constant voltage, constant current (CV/CC) regulation while removing the opto-coupler and secondary control circuitry. It also eliminates the need of loop compensation circuitry while maintaining stability. The ME8305 achieves excellent regulation and high average efficiency, yet meets the requirement for no-load consumption less than 30mW.

Selection Guide



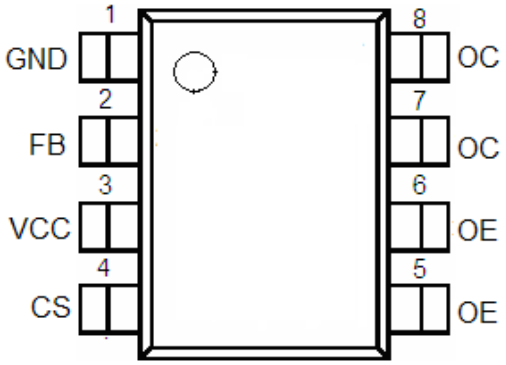
Features

- Set-in high-voltage power switch tube of 700V and few peripheral components.
- Primary Side Control for Rectangular Constant Current and Constant Voltage Output
- Sub-microampere Start-up Current
- 30mW No-load Input Power Feasible
- Tight CV Regulation Performance
- Eliminates Opto-coupler and Secondary CV/CC Control Circuitry
- Eliminates Control Loop Compensation Circuitry
- Flyback Topology in DCM Operation
- Random Frequency Modulation to Reduce System EMI
- Built-in Soft Start
- Thermal Shutdown Protection
- Short Circuit Protection
- SOP8 Package

Typical Application

- Adapters/Chargers for Cell/Cordless Phones, PDAs, MP3 and Other Portable Apparatus
- LED Drivers
- Standby and Auxiliary Power Supplies

Pin Configuration



Pin Assignment

Pin Number	Pin Name	Function
1	GND	Ground
2	FB	The voltage feedback from the auxiliary winding
3	VCC	Supply voltage
4	CS	The primary current sense
5,6	OE	Emitter electrode of power tube
7,8	OC	Output pins, meet switching transformer

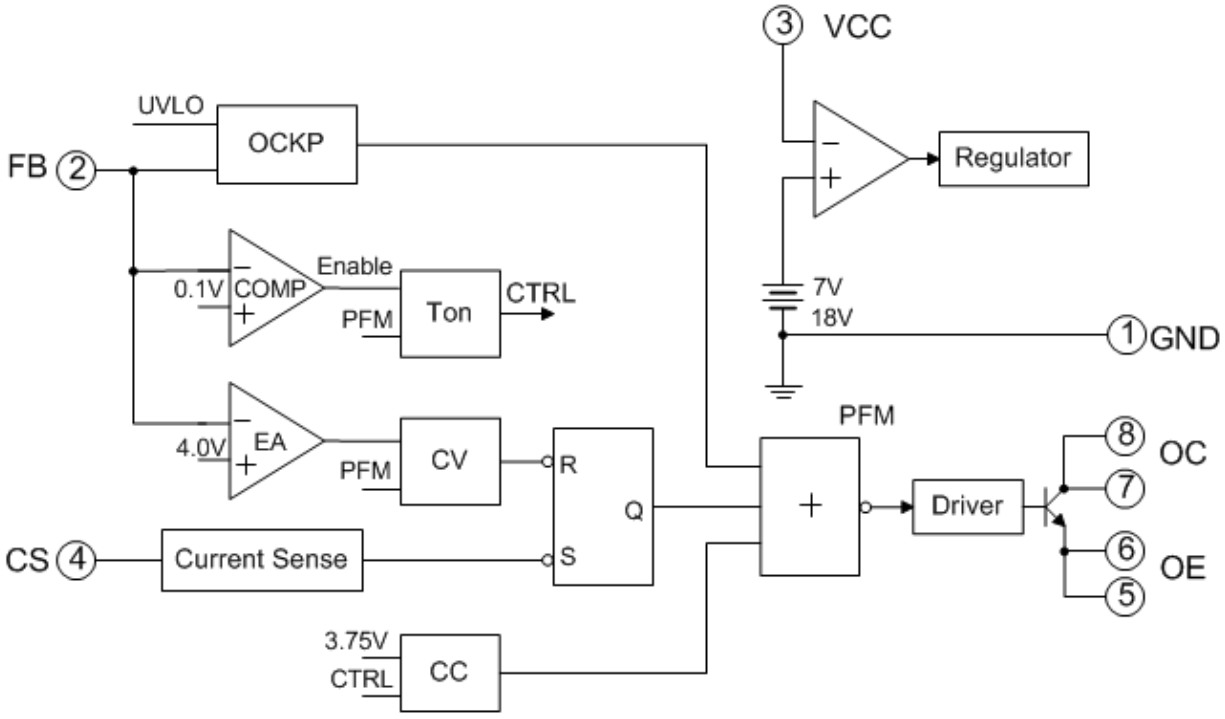
Absolute Maximum Ratings (Note)

Parameter	Value	Unit
Supply Voltage V_{CC}	-0.3 to 30	V
Voltage at CS to GND	-0.3 to 7	V
FB input	-40 to 10	V
Endurance voltage of OC collector	-0.3-700	V
Switching current of peak value	800	mA
Operating Junction Temperature	125	℃
Storage Temperature	-65 to 150	℃
Lead Temperature (Soldering, 10s)	300	℃
Thermal Resistance Junction-to-Ambient	250	℃/W
ESD (Machine Model)	200	V
ESD (Human Body Model)	2000	V

Note : The absolute maximum ratings are rated values exceeding which the product could suffer physical damage.

These values must therefore not be exceeded under any conditions.

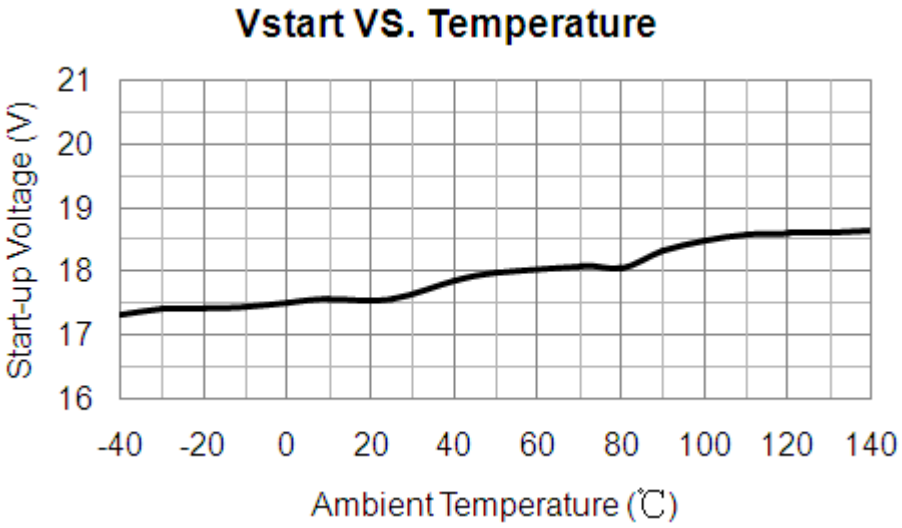
Block Diagram

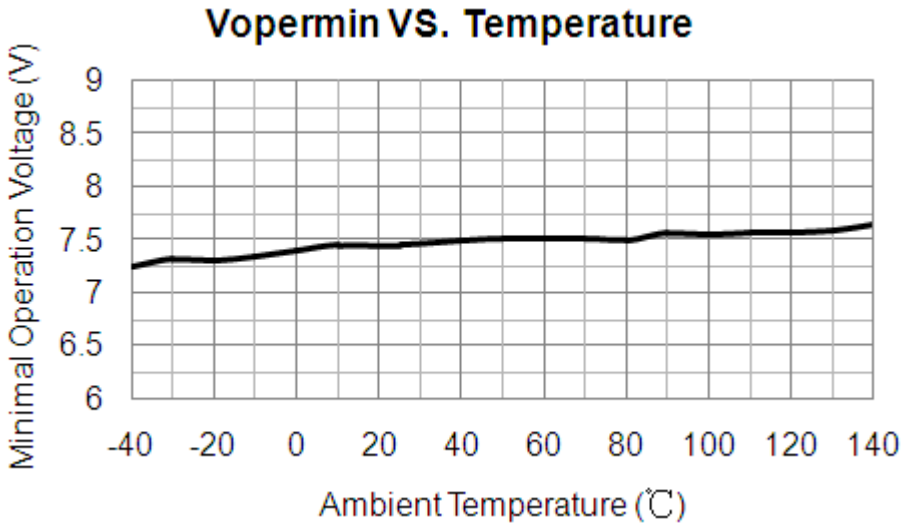


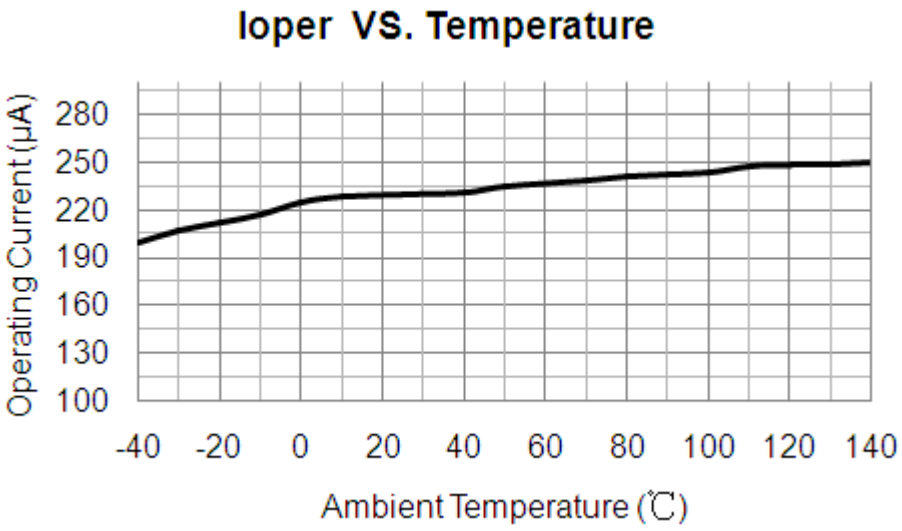
Electrical Characteristics (V_{CC}=20V, T_A=25℃, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
UVLO Section						
Start-up Threshold	$V_{TH\ (ST)}$		15	17	19	V
Minimal Operating Voltage	$V_{OPR(min)}$		6	7.5	9	V
Standby Current Section						
Start-up Current	I_{ST}	V_{CC} = $V_{TH\ (ST)}$-0.5V,	-	-	0.5	μA
Operating Current	$I_{CC(OPR)}$	Static	-	200	300	μA
Current Sense Section						
Current Sense Threshold	V_{CS}		470	500	530	mV
Pre-Current Sense	$V_{CS(PRE)}$		370	400	430	mV
Leading Edge Blanking			-	500	-	ns
Feedback Input Section						
Feedback Pin Input Leakage Current	I_{FB}	V_{FB}=4V	2.0	2.5	3.1	μA
Feedback Threshold Voltage	V_{FB}		3.89	3.95	4.01	V
Output						
Maximum pressure resistance of switching tube	V_{OC}(max)	Ioc=1mA, I_E=0	700	-	-	V
on-saturation pressure drop	V_{CE}(sat)	Ioc=600mA	-	-	1	V
Output limit current		Tj=0-100℃	465	500	535	mA
Thermal Shutdown Protection						
Thermal Shutdown Protection	T_{sd}			150		℃

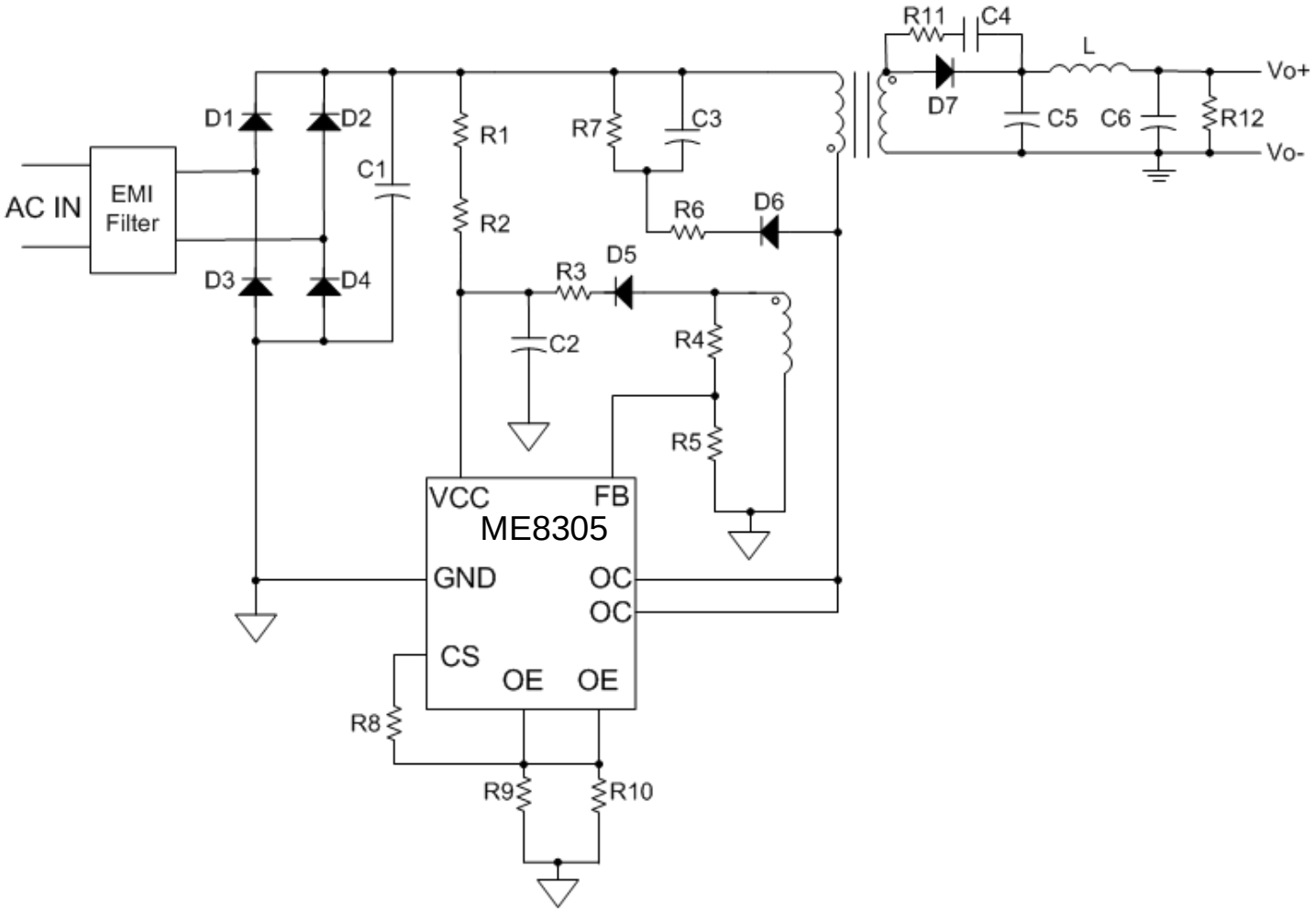
Type Characteristics





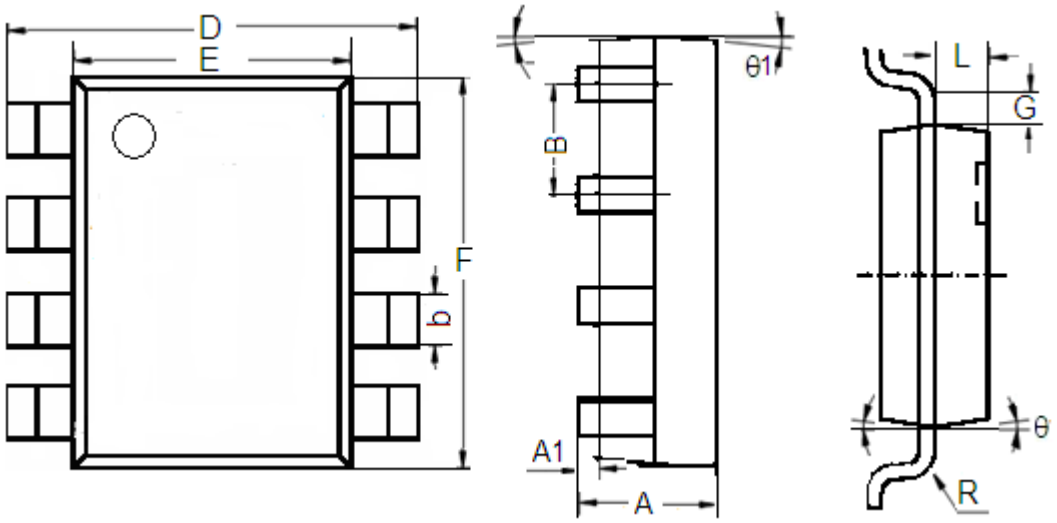


Typical Application



Packaging Information

Package type:SOP8 Unit:mm(inch)



Character	Dimension (mm)		Dimension (Inches)	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.1	0.3	0.004	0.012
B	1.27(Typ.)		0.05(Typ.)	
b	0.330	0.510	0.013	0.020
D	5.8	6.2	0.228	0.244
E	3.800	4.000	0.150	0.157
F	4.7	5.1	0.185	0.201
L	0.675	0.725	0.027	0.029
G	0.32(Typ.)		0.013(Typ.)	
R	0.15(Typ.)		0.006(Typ.)	
θ1	7°		7°	
θ	8°		8°	

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