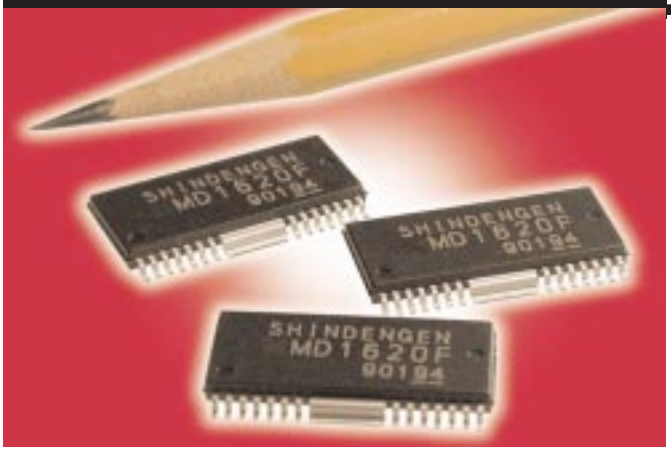
5V Output MD1620F

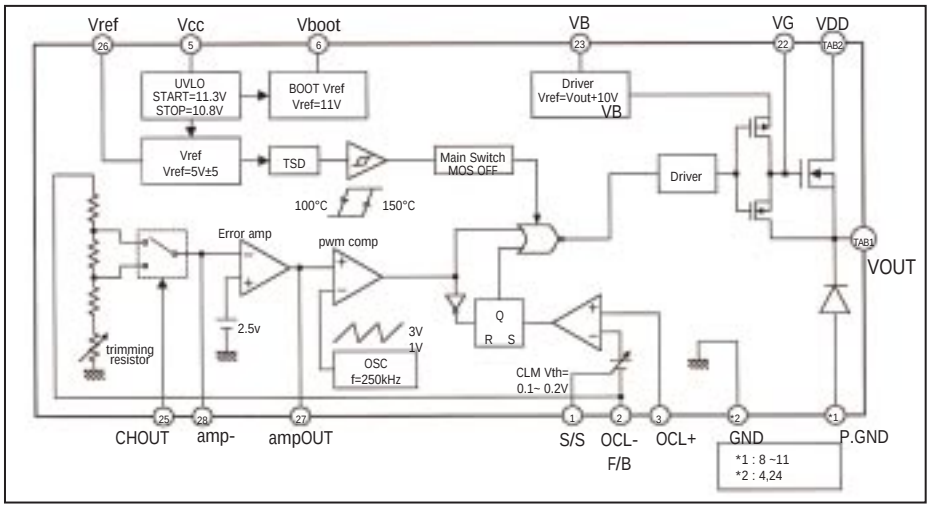
Shindengen America, Inc.



DESCRIPTION

The MD1620F is a high-efficiency step down DC-DC converter power integrated circuit with main MOSFET switch and Schottky Barrier Diode. MD1620F can deliver 10watts maximum (5V, 2.0V) with high efficiency over a wide input voltage range. With the MD1620F you can construct a complete DC-DC converter using only a few external components. Featuring an HSOP 28 pin surface mount package, the MD 1620F allows you to incorporate a very small and thin power supply on your circuit board.

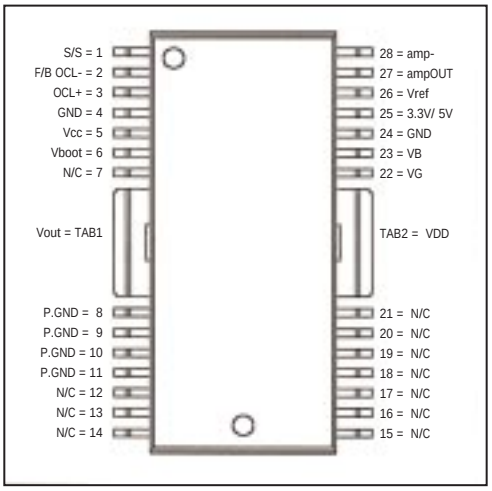
BLOCK DIAGRAM



FEATURES

- Wide input voltage load range
  - 12VDC to 57VDC
  - Up to 2ADC
- Internal Switching power device
  - Main MOSFET for switch
  - SBD for rectification
- Fixed 250kHz PWM frequency
  - Without external resistor and capacitor
- Overcurrent protection
- Thermal shutdown function

PIN ASSIGNMENT



- **Vref** - Temperature compensated internal voltage. You can pull 1mA maximum for external circuit.
- **OSC** - MD1620F uses internal oscillator without external component. Frequency (Saw tooth wave form) is trimmed to 250kHz on chip.
- **Error Amp** - Error Amp detects output voltage of DC-DC converter and controls PWM signal. You can adjust the loop gain when you connect feedback resistor and capacitor between AmpOUT and Amp (-). It will provide stable phase compensation.
- **Overcurrent protection** - MD1620F uses pulse-by-pulse current protection. Current will be sensed voltage drop of external current sensing resistor. Threshold of OCL is 0.19V.

Pin#	Symbol	Function description
1	S/S	Capacitor for softstart
2	F/B OCL-	Overcurrent protection (OCL) (-) and output voltage feedback
3	OCL+	Overcurrent protection (OCL) (+)
4	GND	Signal GND
5	Vcc	Input voltage
6	Vboot	High side drive supply for main MOS
7	N/C	Non-connection
8 ~ 11	P.GND	Power GND
12 ~ 21	N/C	Non-connection
22	VG	Gate terminal of main MOS
23	VB	Bootstrap capacitor between VB and VOUT
24	GND	Signal GND
25	CHOUT	Should be connected to pin#24
26	Vref	Internal voltage reference
27	AmpOUT	Error Amp out
28	amp-	Error Amp (-) input
TAB1	VOUT	Power stage output
TAB2	VDD	Drain of main MOS Switch

ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

Parameter	Symbol	Rating	Units
Input voltage	VIN	60	V
Main MOS voltage	VDD	60	V
Output current (ave)	IOUTave	2	A
Output Current (peak)	IOUTpeak	3	A
Storage temperature	Tstg	-40 ~ 150	°C
Junction temperature	Tj	150	°C

RECOMMENDED OPERATION CONDITIONS

Parameter	Recommendation	Units
Input voltage	12 ~ 57	V
Operation temperature	-10 ~ 80	°C

ELECTRIC CHARACTERISTICS

(Ta=25°C)

Parameter	Symbol	Conditions	MIN	TYP	MAX	Units
High side MOS D - S Voltage	Vdss	ID=1mA, VGS=0V	60	-	-	V
High side MOS Drain Leakage Current	Idss	VSD=60V, VGS=0V	-	-	10	uA
High side MOS On State Resistance	Ron	ID=1.2A, VGS=4V	-	270	550	m
High side MOS Bodydiode forward drop	VSD	IS=1.2A, VDS=0V	-	-	1.5	V
Low side SBD Output voltage	VRM	-	60	-	-	V
Low side SBD Forward drop	VF	IF=1.2A	-	-	0.58	V
Low side SBD Leakage Current	IR	VR=VRM	-	-	2.5	mA
Under-Voltage Lockout Threshold(start)	Vcc_start	-	10.5	11.25	11.9	V
Under-Voltage Lockout Threshold(stop)	Vcc_stop	-	10	10.75	11.5	V
Under-Voltage Lockout Hysteresis	Vcc_hys	-	-	0.5	-	V
VCC Current - run mode	Icc	Vcc=12V ~ 57V	-	11	13	mA
Vboot Regulation	Vboot	Vcc=12V ~ 57V	10	11	12.5	V
Reference Voltage	Vref	Vcc=12V ~ 57V	4.75	5	5.25	V
Initial Frequency Accuracy	fosc	Vcc=48V	212.5	250	287.5	kHz
Threshold of OCL	Vth_OCL	Vcc=48V	0.162	0.19	0.218	V
Input current of Softstart terminal	IS/S	Vcc=48V	-20	-12.5	-5	uA
“CHG” High input voltage	VCHGH	-	4.5	-	Vref	V
“CHG” Low input voltage	VCHGL	-	GND	-	0.5	V
Thermal shutdown temperature	T_TSD	-	-	150	-	°C