



**NEW
PRODUCTS**

3.3V/5V Stepping Down DC to DC Converter Power IC **MD1320F**



3A PWM Control Stepping Down Converter IC
It achieves High Output Power and High Efficiency
integrating high performance and high function in
compact package

■ Summary

MD1320F is a non-isolated, PWM control stepping down DC to DC converter power IC including main MOSFET switch and free wheel SBD inside. It has maximum 15W (5V 3A) output power and high efficiency in wide range. It also has wide input voltage range (12–30V) and it is possible to get 3.3V or 5V output voltage by selecting terminal. Its package is compact surface mount type and it is possible to design DC to DC converter with fewer external components and smaller mounting area.

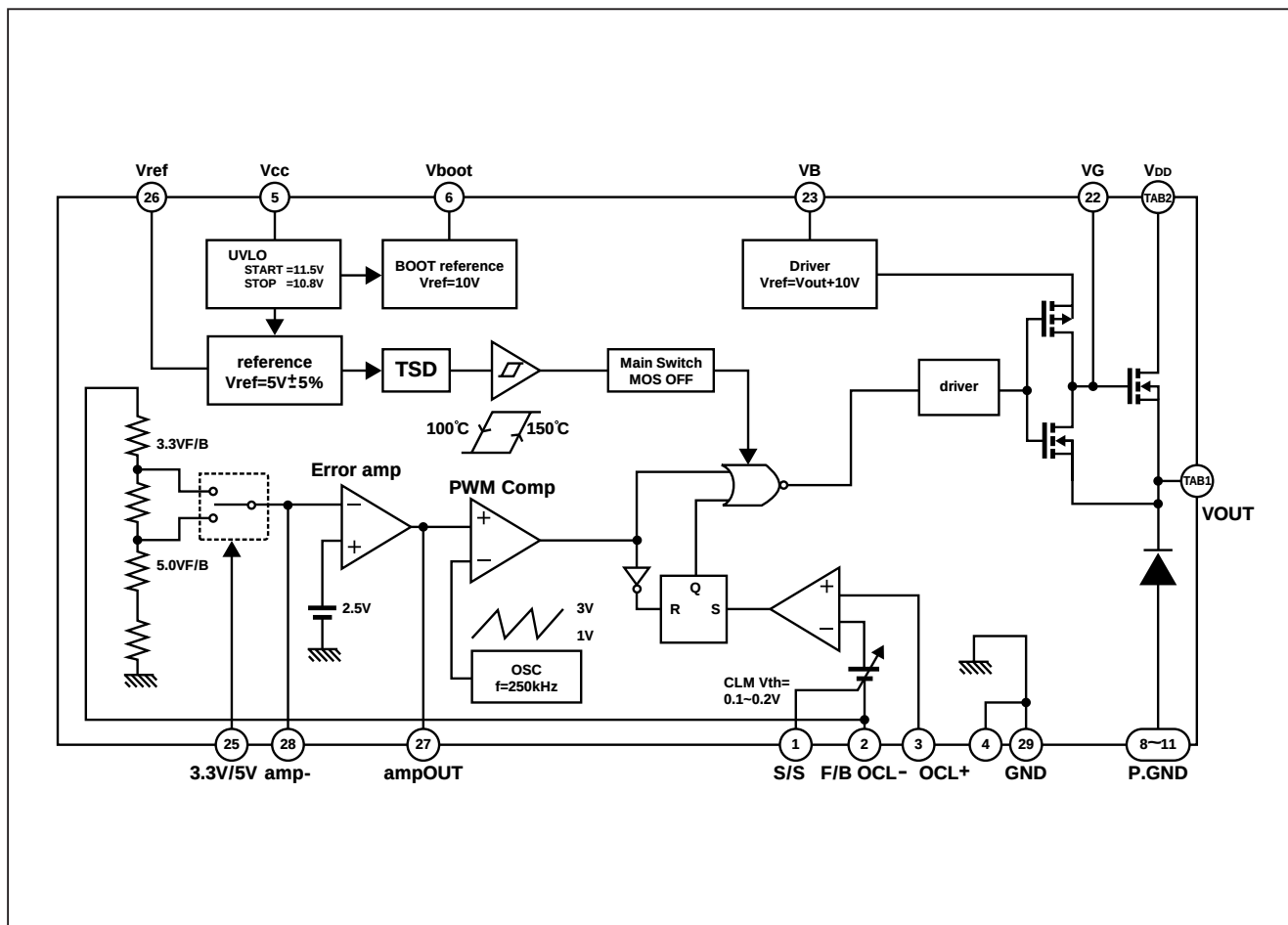
■ Feature

- Input Voltage Range 12–30V
- Maximum Output Current 3A
- Included main MOSFET switch and free wheel SBD
- Output 3.3V / 5V (Selective with output switching terminal)
- High Efficiency 90% typ (at: $V_{in}=12V$, $V_{out}=5V$, $I_{out}=1A$)
- Fixed Frequency 250kHz PWM Control
- Over Current Protection Function
- Low Input Voltage Protection Function (ULVO)
- Thermal Shut Down Function

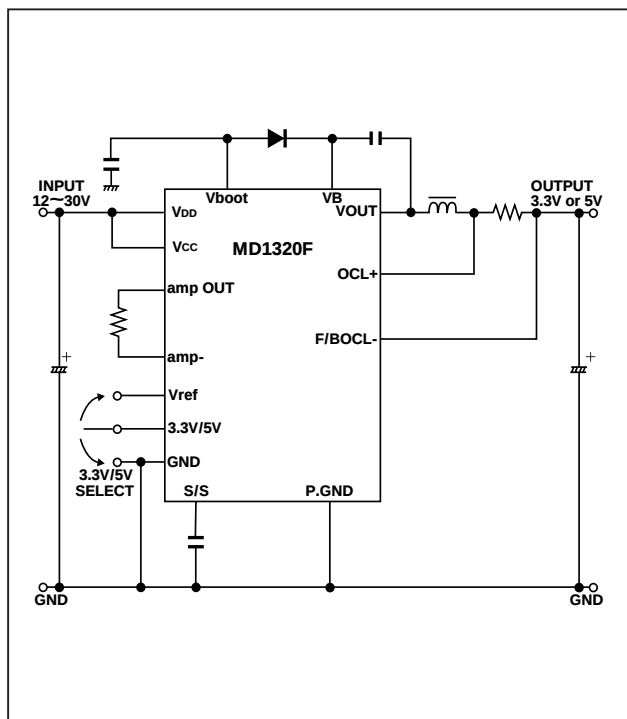
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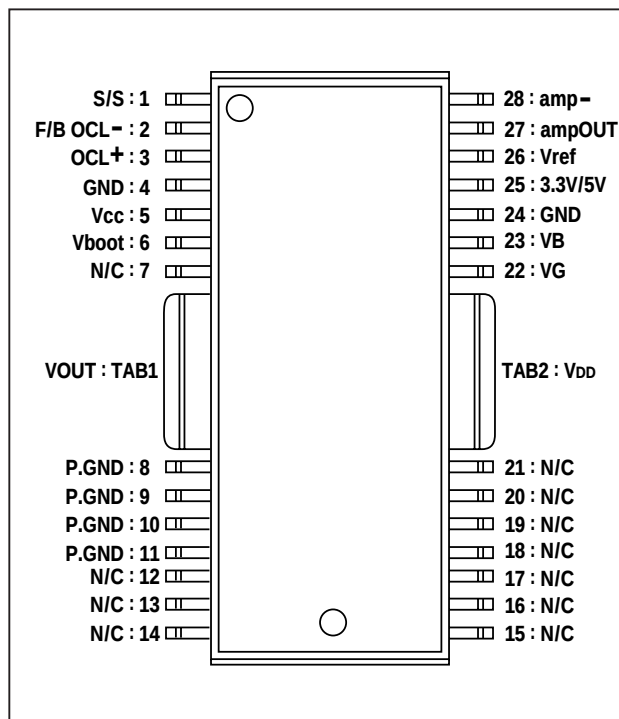
Block Diagram



Application Example



Pin Layout



■ Absolute Maximum Rating (Ta=25℃)

Item	Symbol	Rating	Unit
Power Supply Voltage	V _{IN}	32	V
Output MOS Input Voltage	V _{DD}	32	V
Output Current (A V E)	I _{OUTave}	3	A
Output Current (P E A K)	I _{OUTpeak}	4	A
Storage Temperature	T _{stg}	−40~150	℃
Junction Temperature	T _j	150	℃

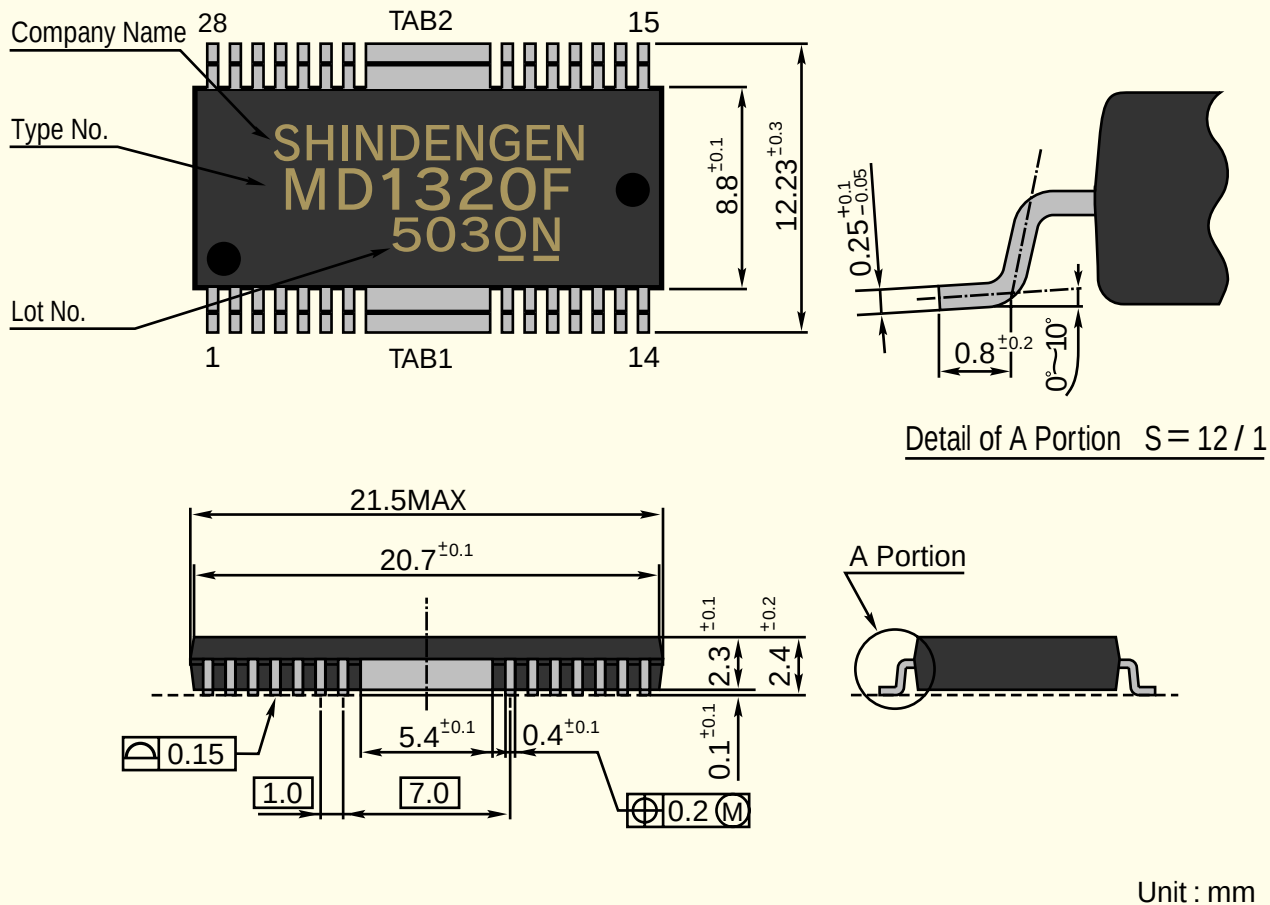
■ Electrical Characteristics (Ta=25℃)

Item	Symbol	Condition	M I N	T Y P	M A X	Unit
HighsideMOS Drain-Source Voltage	V _{dss}	I _D =1mA, V _{GS} =0V	32	—	—	V
HighsideMOS Zero Gate Voltage Drain Current	I _{dss}	V _{DS} =30V, V _{GS} =0V	—	—	10	μA
HighsideMOS Static Drain-Source On-state Resistance	R _{on}	I _D =1.2A, V _{GS} =4V	—	140	250	mΩ
HighsideMOS Source-Drain Diode Forward Voltage	V _{SD}	I _S =1.2A, V _{DS} =0V	—	—	1.5	V
LowSideSBD Maximum Reverse Voltage	V _{RM}	—	40	—	—	V
LowSideSBD Forward Voltage	V _F	I _F =1.2A	—	—	0.55	V
LowSideSBD Reverse Current	I _R	V _R =V _{RM}	—	—	2	mA
Start up Voltage	V _{cc_start}	—	10.5	11.25	11.9	V
Stopping Voltage	V _{cc_stop}	—	10	10.75	11.5	V
Start-Stop Hysteresis	V _{cc_hys}	—	—	0.5	—	V
Current Consumption (In Operation)	I _{cc}	V _{cc} =12~30V	—	8	10	mA
BOOT terminal voltage	V _{boot}	V _{cc} =12~30V	10	11	12	V
Internal voltage reference	V _{ref}	V _{cc} =12~30V	4.75	5	5.25	V
Internal oscillation frequency	f _{osc}	V _{cc} =24V	212.5	250	287.5	kHz
Over current threshold vol	V _{th_OCL}	V _{cc} =24V	0.162	0.19	0.218	V
SoftStart terminal current	I _{s/s}	V _{cc} =24V	−20	−12.5	−5	μA
“H”3.3V/5V terminal input	V _{CHGH}	—	4.5	—	V _{ref}	V
“L”3.3V/5V terminal input	V _{CHGL}	—	GND	—	0.5	V
Thermal Shut Down Operation Temp	T _{TSD}	—	—	150	—	℃

■ Recommended Operation Conditions

Item	Recommerded Value	Unit
Input Voltage	12~30	V
Operation Temp	−10~80	℃

Outline Dimensions



Unit : mm

■ The level of quality of our products shown in this catalog is intended for use in standard applications requiring ordinary reliability. In the case these products are to be used in equipment or devices for special or specific applications requiring extremely high levels of quality and reliability in which failure or malfunction of a product may directly affect human life or health, always make sure to obtain confirmation by contacting our firm in advance. The quality levels of our products are classified in the manner shown below,

Standard Applications

Computers, OA and other office equipment, communication terminal equipment, measuring instruments, AV equipment, amusement equipment, home appliances, machine tools, personal equipment, industrial robots, etc.

Home Appliances, Special Applications

Transportation equipment (automotive, marine, etc.), trunk line communication equipment, traffic signal equipment, fire prevention/anti-theft equipment, various safety devices, health care equipment, etc.

Specific Applications

Nuclear power control systems, aeronautical equipment, aerospace equipment, submarine relay equipment, devices and systems for preserving life, etc.

■ Although efforts are constantly made to improve quality and reliability, please select a product after careful examination so that personal injury, accidents and social damage can be prevented as a result of deploying measures such as a redundant design, designs that prevent the spreading of fire, designs that prevent malfunctions and so forth while taking safety into consideration as necessary.

* All specifications are subject to change without notice.



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