

Step Down DC - DC Converter Power IC

MD1422N

Output adjustable

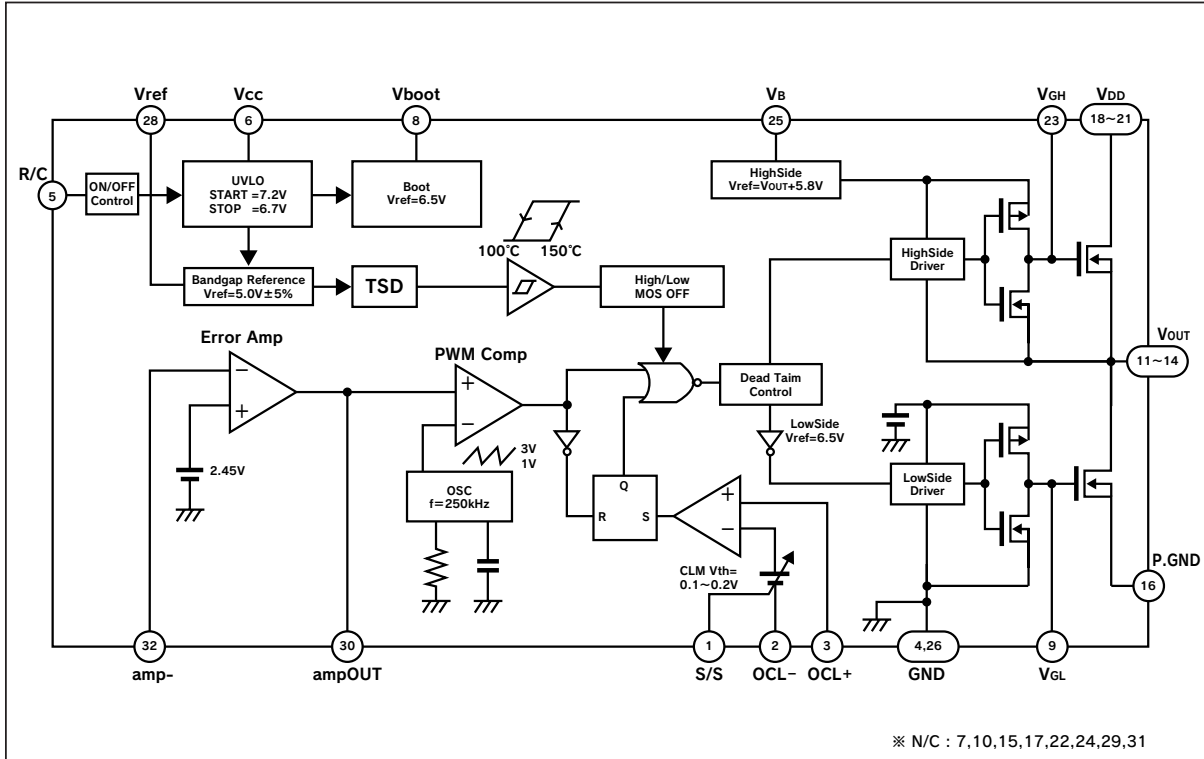
Remote On/Off

Synchronous Rectification

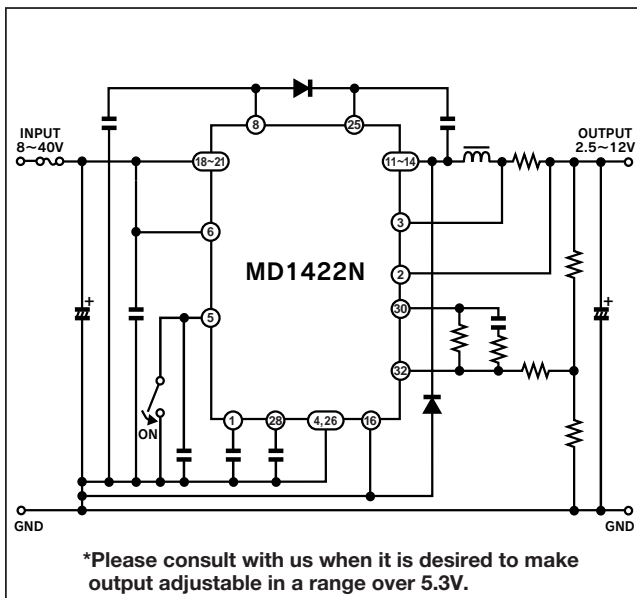
Feature

- Input Voltage range 8V to 40V
- Maximum Output Current 3A
- Built_in MOSFETs for main switch and synchronous rectification
- Adjustable output from 2.5V to 12V with external resistors
- High Efficiency typ. 95% (at:Vin=8V, Vout=5V, Iout=1A)
- Fixed Frequency 250kHz PWM Control
- Over Current Protection
- Under Voltage Lockout
- Thermal Shut Down
- Remote On / Off

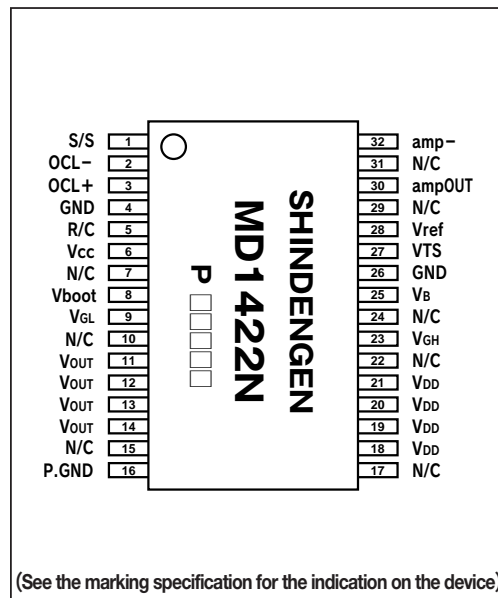
Block Diagram



Standard Connection Diagram



Pin Assignment (SSOP32)



Absolute Maximum Ratings

Unless otherwise specified : Ta=25°C

Item	Symbol	Ratings	Units
Input/Output Ratings			
Input voltage	V _{CC}	42	V
Main MOSFET input voltage	V _{DD}	42	V
Output current (ave)	I _{OUTAVE}	3	A
Output current (peak)	I _{OUTPEAK}	4	A
OCL-,OCL+ input voltage	V _{OCL}	5.5	V
Remote control voltage	V _{RC}	5.5	V
Thermal Ratings			
Power dissipation max ※1	PD	2.5	W
Operating temperature	T _{a-ope}	-30 to 85	°C
Storage temperature	T _{stg}	-40 to 150	°C
Junction temperature	T _j	150	°C
Thermal resistance ※1	θ _{ja}	50	°C/W
	θ _{jc} ※2	20	°C/W

※1 Glass-Epoxy Board : 56×39mm², Thickness : 1mm, Copper Pattern Rate : 87.1% (Top Side), 82.1% (Bottom Side), Those with through-hole.
 ※2 The measurement result in the center of case.

Recommended Operating Conditions

Item	Symbol	Recommendation	Units
Junction temperature	T _j	-30 to 125	°C
Input voltage (Ta= -10°C to 85°C)	V _i ※3	8 to 40	V
Input voltage (Ta= -30°C to -10°C)	V _i ※3	8.5 to 40	V
Output voltage setting range	V _O ※4	2.5 to 12	V

※3 Input voltage at the time of power supply operation. ※4 Output voltage at the time of power supply operation.

Electrical Characteristics

Unless otherwise specified : Ta=25°C

Item	Symbol	Condition	MIN	TYP	MAX	Units
High Side MOSFET						
Drain-source breakdown voltage	V _{DSS_H}	I _D =1mA, V _{GS} =0V	42	-	-	V
Zero gate voltage drain current	I _{DSS_H}	V _{DS} =42V, V _{GS} =0V	-	-	10	μA
Static drain-source on-state resistance	R _{ON_H}	I _D =1.2A, V _{GS} =4.5V	-	33	70	mΩ
Source-drain diode forward voltage	V _{SD_H}	I _S =1.2A, V _{GS} =0V	-	-	1.5	V
Low Side MOSFET						
Drain-source breakdown voltage	V _{DSS_L}	I _D =1mA, V _{GS} =0V	42	-	-	V
Zero gate voltage drain current	I _{DSS_L}	V _{DS} =42V, V _{GS} =0V	-	-	10	μA
Static drain-source on-state resistance	R _{ON_L}	I _D =1.2A, V _{GS} =4.5V	-	33	70	mΩ
Source-drain diode forward voltage	V _{SD_L}	I _S =1.2A, V _{GS} =0V	-	-	1.5	V
Control IC						
Undervoltage lockout threshold (start)	V _{CC_start}	-	6.5	7.2	7.9	V
Undervoltage lockout threshold (stop)	V _{CC_stop}	-	6.0	6.7	7.4	V
Undervoltage lockout hysteresis	V _{CC_hys}	-	-	0.5	-	V
Supply current	I _{CC}	V _{CC} =8 to 40V	-	10	13	mA
Supply current-remote OFF state	I _{CC_off}	V _{CC} =8 to 40V	-	1.2	1.5	mA
Remote control ON input voltage	V _{RC_on}	V _{CC} =8 to 40V	-0.2	-	0.45	V
Remote control OFF input voltage	V _{RC_off}	V _{CC} =8 to 40V	2.5	-	5.3	V
Remote control source current	I _{RC}	V _{CC} =8 to 40V	-	-	250	μA
Bootstrap voltage	V _{boot}	V _{CC} =24V	5.4	6.5	7.6	V
Reference voltage	V _{ref}	V _{CC} =8 to 40V	4.75	5	5.25	V
Initial frequency accuracy	f _{osc}	V _{CC} =24V	212.5	250	287.5	kHz
Threshold of over current limit	V _{th_OCL}	V _{CC} =24V	0.162	0.19	0.218	V
Softstart source current	I _{s/s}	V _{CC} =24V	-20	-12.5	-5	μA
Error amp reference voltage	V _{vamp}	V _{CC} =8 to 40V	2.4	2.45	2.5	V
Thermal shutdown temperature	T _{TSD}	-	-	150	-	°C