

### General Description

The IZ1583 is a step-down regulator with a built in internal power MOSFET. The IC provide 3A continuous output current over a wide supply voltage range. The IC can be used as distributed power source, battery charger, pre-regulator for linear regulators.

### Features

- Wide supply voltage range 4,75 ... 23 V.
- Wide operating temperature range -40 ... +85 °C.
- Active mode consumption current (max.) 1,2 mA .
- Chip dimensions 1,91 × 1,42 mm.
- ICs are available for shipment in chip form on unsawn wafers

### • Functionality

IC performs driving of power built in MOSFET switch, quantity of energy transferred to load is regulated by means of MOSFET on-time (pulse-width modulation). So output voltage practically do not depends from load.

**Table 1 – Contact pad description**

Pad number	Symbol	Description
01	BS	n-channel power output MOSFET switch drive input
02 V	cc	IC supply pin. Connected to 6,5V ... 32 V power source. Bypass Vcc to GND with a suitably large capacitor to eliminate noise on the input to the IC.
03	SW	Power switch output. SW has to be connected by output LC filter to the output load and by mentioned capacitor to BS.
04	GND	Common pin (ground)
05 FB		Feedback Input, has to be connected by a resistive voltage divider to output voltage
06	COMP	Frequency compensation Node has to be connected by series RC network to GND
07	EN	Digital enable/disable input. High level applied to EN turns IC ON and low level – turns it OFF. For automatic startup, leave EN unconnected.
08	SS	Soft Start. SS is purposed to control the soft start period. To set soft start mode connect SS & GND by capacitor. A 0.1µF capacitor sets the soft-start period to 10ms. To disable the soft-start feature, leave SS unconnected.



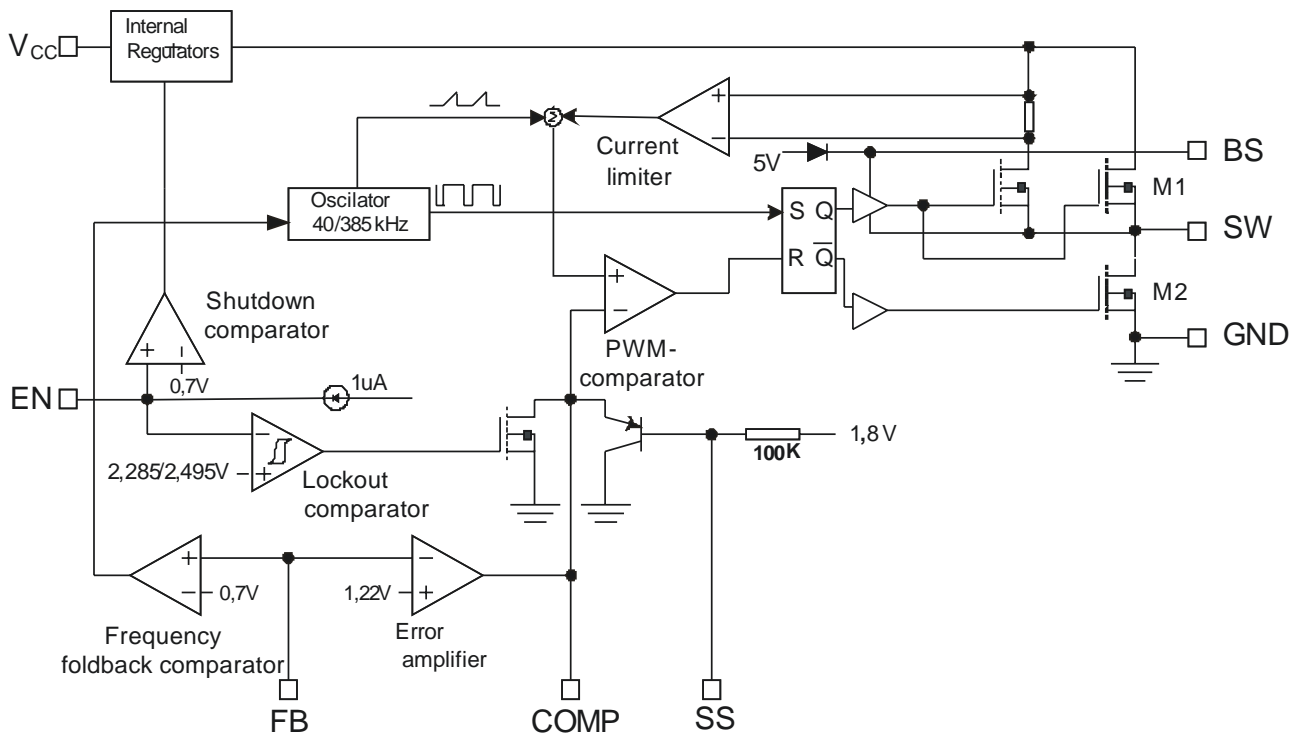


Fig. 1 – Electric block diagram

Table 2 – Maximum &amp; Absolute Maximum Ratings

Parameter, unit	Symbol	Recommended Operating Conditions		Absolute Maximum Ratings	
		Norm		Norm	
		Min.	Max.	Min.	Max.
Supply Voltage, V	$U_{CC}$ 4,75		23	-0,3	28
SW Pin Voltage, V	$U_{SW}$	–	–	-1,0	$U_{CC} + 0,3$
BS Pin Voltage, V	$U_{BS}$ –		–	$U_{SW} - 0,3$	$U_{SW} + 6,0$
Junction Temperature	$T_J$			- 40*	150
Thermal; resistance «junction – ambient», °C/W	$R_{thj-a}$	150			
Ambient Temperature, °C	$T_A$ -	40	85		

Note – Maximum permissible power  $P_{tot}$ , W, dissipated by IC in conditional package for ambient temperature  $T_A$ , °C, is calculated by formula:

$$P_{tot} = \frac{125 - T_A}{R_{thj-a}}, \quad (1)$$

125 – is maximum permissible operating junction temperature, °C ;  
 $R_{thj-a}$  - thermal resistance junction-ambient of IC (without heatsink).

Table 3 – Electric parameters of IC IZ1583 (on default  $U_{CC} = 12\text{ V}$ ,  $T_A = 25\text{ °C}$ )

Parameter, unit	Symbol	Measurement mode	Norm	
			Min	Max
Shutdown Supply Current, uA	$I_{SD}$	$U_{EN} = 0\text{ V}$		30
Supply Current, mA	$I_S$	$U_{EN} = 2,6\text{ V}$ $U_{FB} = 1,4\text{ V}$		1,2
Feedback Voltage, V	$U_{FB}$	$4,75\text{ V} \leq U_{CC} \leq 23\text{ V}$	1,194	1,250
Error amplifier transconductance, uA/V	S	$\Delta I_{COMP} = \pm 10\text{ uA}$	500	1120
Output power switch Leakage Current, uA	$I_{LEAK}$	$U_{EN} = 0\text{ V}$ $U_{SW} = 0\text{ V}$		10
Operating frequency, kHz	f		335	435
Short Circuit Oscillation Frequency, kHz	F	$U_{FB} = 0\text{ V}$	25	55
Minimum Duty Cycle, %	$\eta_{MIN}$	$U_{FB} = 1,5\text{ V}$		0
EN Threshold Voltage, V	$U_{EN}$		0,9	1,5
Bias current, uA	$I_{IN}$	$U_{EN} = 0\text{ V}$	1,1	2,5

Table 4 – Typical parameters

Parameter, unit	Symbol	Mode	Typical value
Error Amplifier Voltage Gain, V	K		400
Power output switch ON resistance, mOhm	R1		100
Pumping transistor ON resistance, Ohm	R <sub>M2</sub>		10
Current Sense to COMP Transconductance, A/V	S <sub>COMP</sub>		3,8
Maximum Duty Cycle, %	$\eta_{MAX}$	$U_{FB} = 1,0\text{ V}$	90
Under Voltage Lockout Threshold Hysteresis, mV	$U_{HIS}$		210
Soft Start Period, ms	t <sub>SS</sub>	$C_{SS} = 10\text{ uF}$	10
Current limit, A	$I_{LIM}$		5,5
Thermal shutdown threshold, °C	T <sub>S</sub>		160

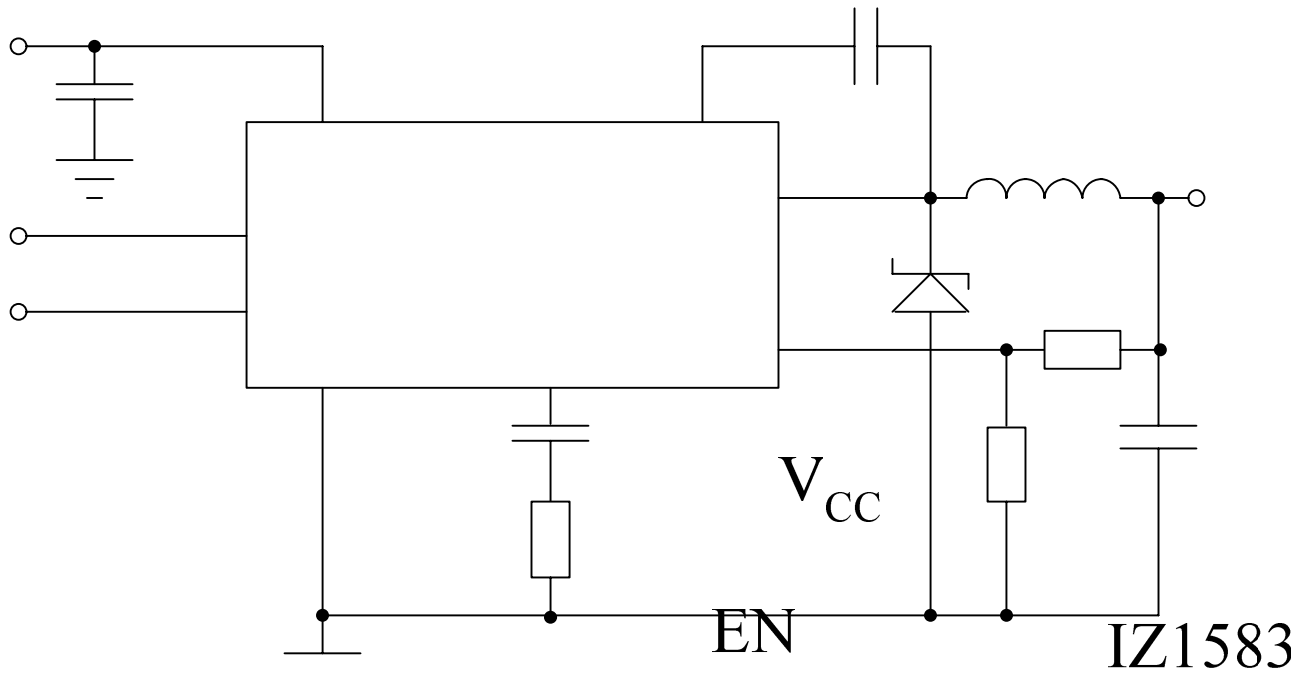


Fig 2 – Application diagram

SS

GND

COMP