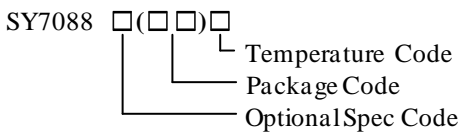


2.3V Minimum Input and 5.5V Maximum Output 3A Peak Current Synchronous Boost with Output Disconnect

General Description

SY7088 is a high efficiency synchronous boost regulator that converts up to 5.5V output voltage. It adopts NMOS for the main switch and PMOS for the synchronous switch. It can disconnect the output from input during the shutdown mode.

Ordering Information



Ordering Number	Package type	Note
SY7088DGC	DFN2x3-8	----

Features

- 2.3-5.0V input voltage range
- Adjustable output voltage from 2.5V to 5.5V
- Pseudo-constant frequency: 1MHz
- 3A peak current limit
- Input under voltage lockout
- Load disconnect during shutdown
- Output over voltage protection
- Low $R_{DS(ON)}$ (main switch/synchronous switch) at 5.0V output: 70/85m Ω
- Compact package: DFN2x3-8

Applications

- All Single Cell Li or Dual Cell Battery Operated Products as MP-3 Player, PDAs, and Other Portable Equipment.

Typical Applications

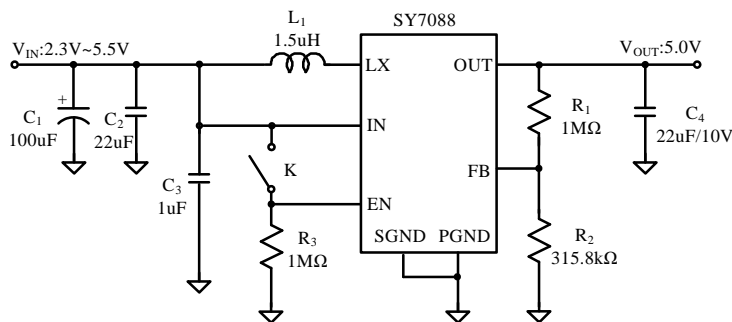


Figure 1. Schematic Diagram

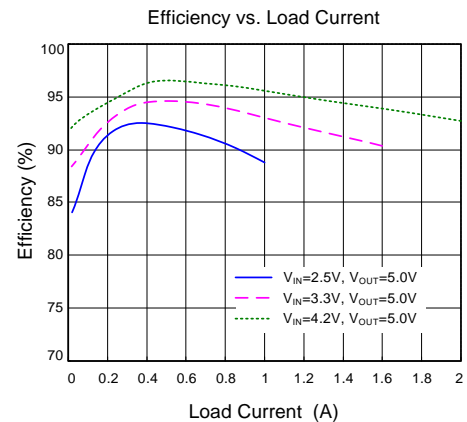
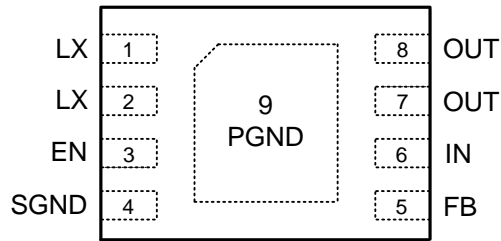


Figure 2. Efficiency Figure

Pinout (top view)

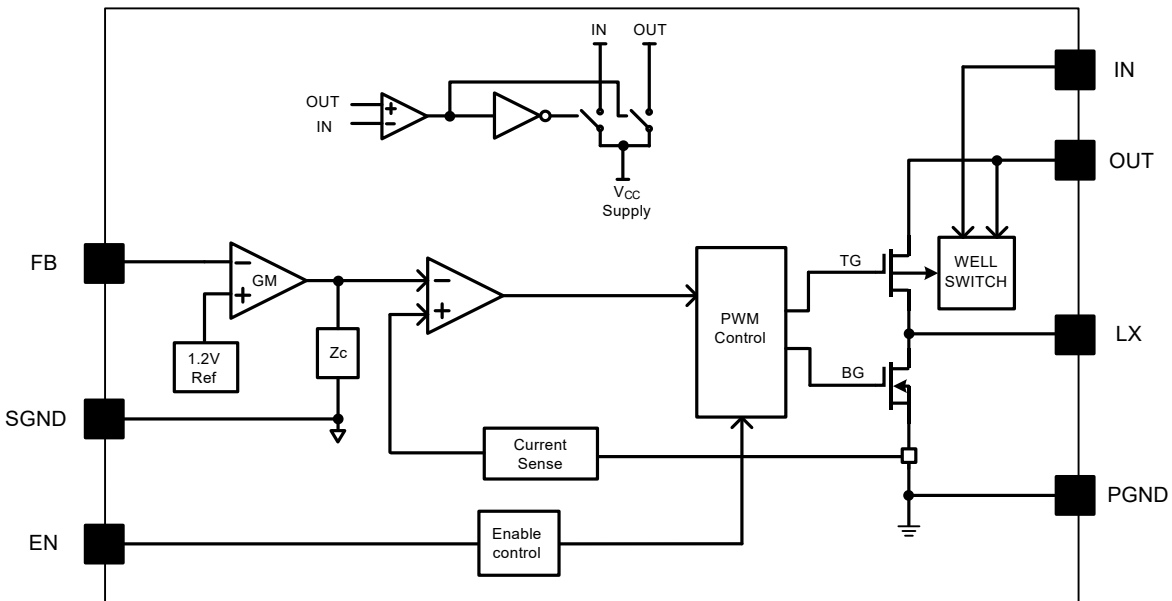


(DFN2x3-8)

Top mark: VTxyz (Device code: VT, x=year code, y=week code, z=lot number code)

Name	DFN2x3-8	Description
LX	1, 2	Inductor node. Connect an inductor between IN pin and LX pin.
EN	3	Enable pin. Internal integrated with 1Mohm pull down resistor.
SGND	4	Signal ground pin.
FB	5	Feedback pin. Connect a resistor R_H between OUT and FB, and a resistor R_L between FB and GND to program the output voltage. $V_{OUT}=1.2V*(R_H/R_L+1)$.
IN	6	Signal input pin. Decouple this pin to GND pin with at least 1.0uF ceramic cap for noise immunity consideration.
OUT	7, 8	Power output pin. Decouple this pin to GND pin with at least 10uF ceramic cap.
PGND	9	Power ground pin.

Block Diagram



Absolute Maximum Ratings (Note 1)

EN-----	V _{OUT} +0.3V
Other Pins-----	6V
Power Dissipation, P _D @ T _A =25°C DFN2x3-8-----	1.5W
Package Thermal Resistance (Note 2)	
θ _{JA} -----	65°C/W
θ _{JC} -----	16°C/W
Junction Temperature Range -----	150°C
Lead Temperature (Soldering, 10 sec.) -----	260°C
Storage Temperature Range -----	-65°C to 150°C
Dynamic LX voltage in 10ns duration -----	OUT+3V to GND-3V

Recommended Operating Conditions (Note 3)

IN-----	2.3V to 5.25V
OUT-----	2.5V to 5.5V
EN, FB-----	0V to V _{OUT} +0.3V
Junction Temperature Range -----	-40°C to 125°C
Ambient Temperature Range -----	-40°C to 85°C

FOI

Electrical Characteristics

($V_{IN}=2.4V$, $V_{OUT}=5V$, $I_{OUT}=500mA$, $T_A = 25^{\circ}C$ unless otherwise specified)

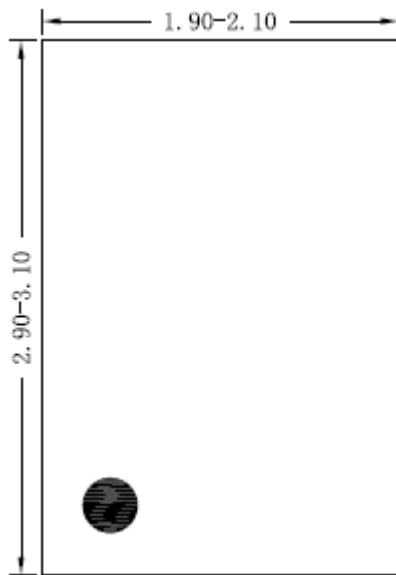
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage	V_{IN}		2.3		5.25	V
Output Voltage Range	V_{OUT}		2.5		5.5	V
Quiescent Current	V_{IN}	$I_O=0A, V_{EN}=V_{IN}=2.3V,$ $V_{OUT}=5.0V$		2		μA
	V_{OUT}			30		μA
Shutdown Current	I_{SHDN}	$V_{EN}=0V, V_{IN}=2.4V$		0.1	1	μA
Linear charge current	I_{CHARGE}	$V_{OUT}<1V$		2		A
		$1V \leq V_{OUT} < V_{IN} - 0.2V$		1.2		
Soft-start time	T_{SS}			0.5		ms
Input Vin UVLO threshold	V_{UVLO}				2.3	V
Vin UVLO hysteresis	V_{hys}			0.1		V
EN Rising Threshold	V_{ENH}		1.2			V
EN Falling Threshold	V_{ENL}				0.4	V
Low Side Main FET R_{ON}	$R_{DS(ON)1}$	$V_{OUT}=5.0V$		70		$m\Omega$
Synchronous FET R_{ON}	$R_{DS(ON)2}$	$V_{OUT}=5.0V$		85		$m\Omega$
Main FET Current Limit	I_{LIM}		3			A
Feedback Reference Voltage	V_{REF}		1.182	1.2	1.218	V
Minimum on time	T_{ON_MIN}			100		ns
Minimum off time	T_{OFF_MIN}			100		ns
Max on time	T_{ON_MAX}			2		μs
OUT pin OVP protection	V_{OVP}			6		V
OUT pin OVP hysteresis	V_{OVP_HYS}			0.2		V
Thermal Shutdown Temperature	T_{SD}			150		$^{\circ}C$
Thermal Shutdown hysteresis	T_{HYS}			20		$^{\circ}C$

Note 1: Stresses beyond the “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specification is not implied. Exposure to absolute maximum rating conditions may affect device reliability.

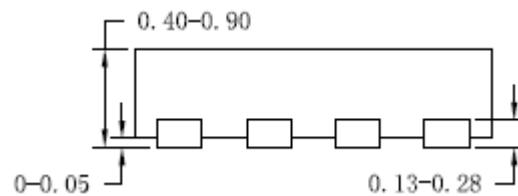
Note 2: θ_{JA} is measured in the natural convection at $T_A = 25^{\circ}C$ on a two-layer Silergy Evaluation Board.

Note 3: The device is not guaranteed to function outside its operating conditions.

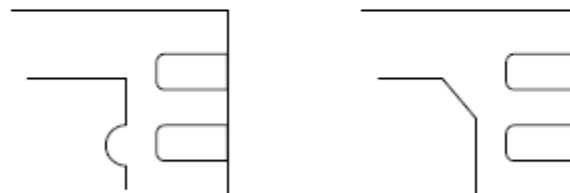
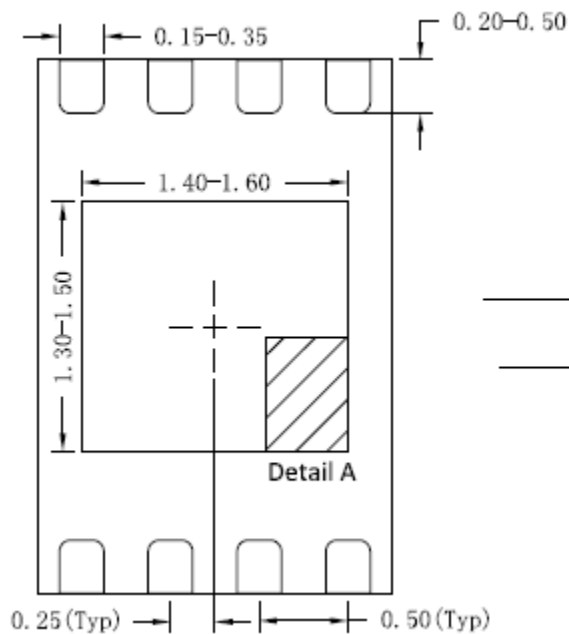
DFN2x3-8 Package Outline



Top View



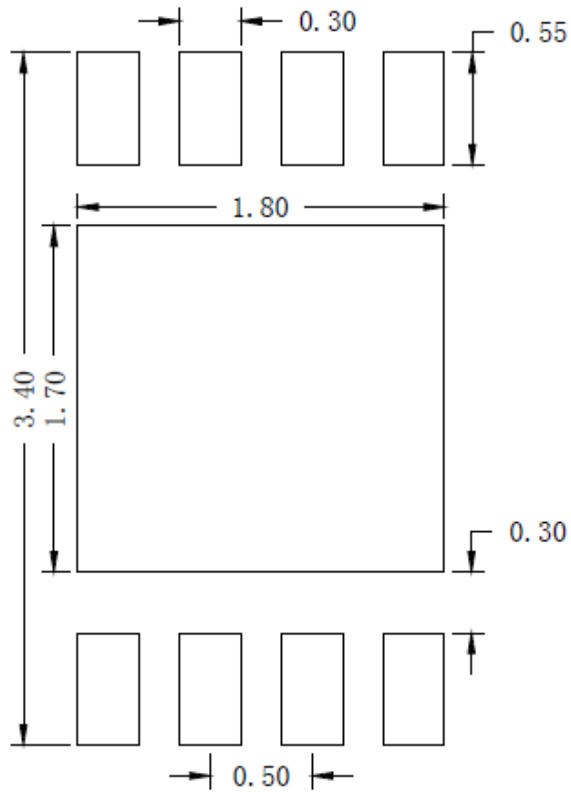
Side View



Detail A

Pin1 Identifier: two options

Bottom View

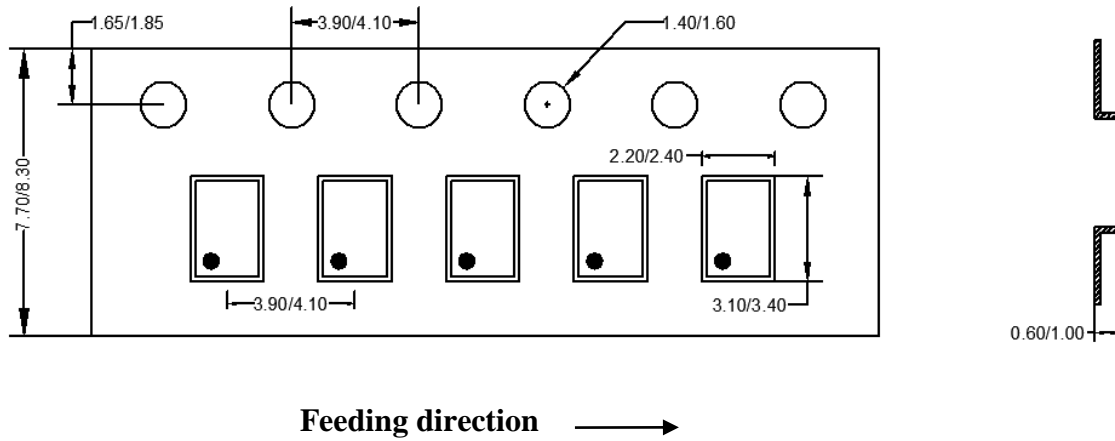


**Recommended PCB layout
(Reference only)**

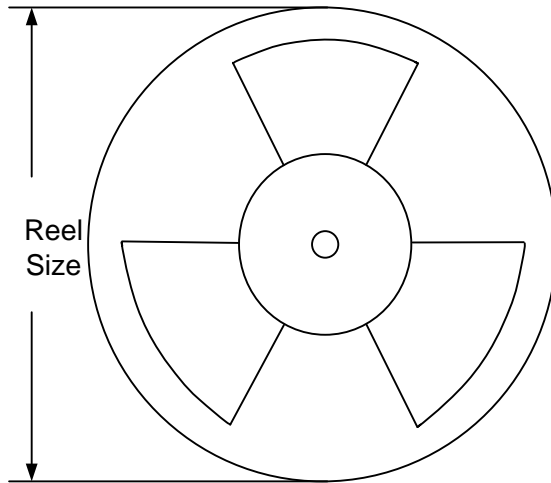
Notes: All dimension in MM and exclude mold flash & metal burr

Taping & Reel Specification

1. DFN2x3-8 taping orientation



2. Carrier Tape & Reel specification for packages



Package type	Tape width (mm)	Pocket pitch(mm)	Reel size (Inch)	Trailer length(mm)	Leader length (mm)	Qty per reel
DFN2x3	8	4	7"	400	160	3000

3. Others: NA