

With true shutdown function, high efficiency pfm synchronous boost dc-dc converter

Overview

GT2208 is a series of high efficiency, low power consumption, pfm controlled synchronous boost dc-dc converters with true shutdown and short-circuit protection. Built-in true shutdown function is built-in. When the shutdown is enabled, the input and output are truly Disconnect, the system consumes extremely low current, and has a short circuit protection function, which improves the equipment life cycle and reliability.

GT2208 can provide 1.8V ~ 5.0V output voltage in steps of 0.1V. When the chip is 0.9V input, it can start to output 3.3V voltage with a load of 1mA or more. It is suitable for single-cell alkaline and nickel-hydrogen dry battery-powered equipment. Synchronous boost, SOT23 In a -5 package, only four components are needed on the periphery to boost the low input battery voltage to the required operating voltage.

Application occasion

- Electronic equipment with 1 ~ 3 dry batteries, single-cell lithium-ion power supply equipment
- Digital cameras, led flashlights, led lights, sphygmomanometers, remote control toys,

Features

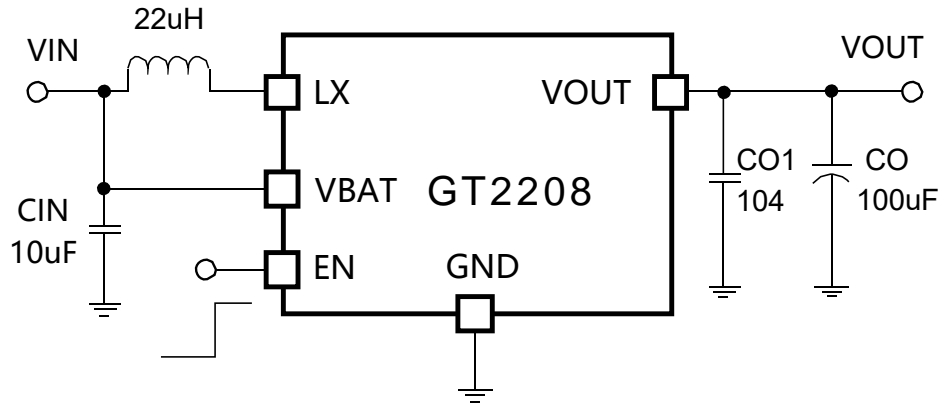
- High efficiency: 93%
- Low-voltage startup: 0.9V@IOUT=1mA
- Low quiescent current: 7.5uA
- Frequency: 320KHz
- Output voltage: 1.8v ~ 5.0v
- Output accuracy: $\pm 2\%$
- Output current: 300mA or more
- Enable true shutdown
- Short circuit protection
- Synchronous rectification

wireless headphones, wireless mouse keyboards, medical equipment, car alarms, chargers, vcr, pda and other handheld electronic devices

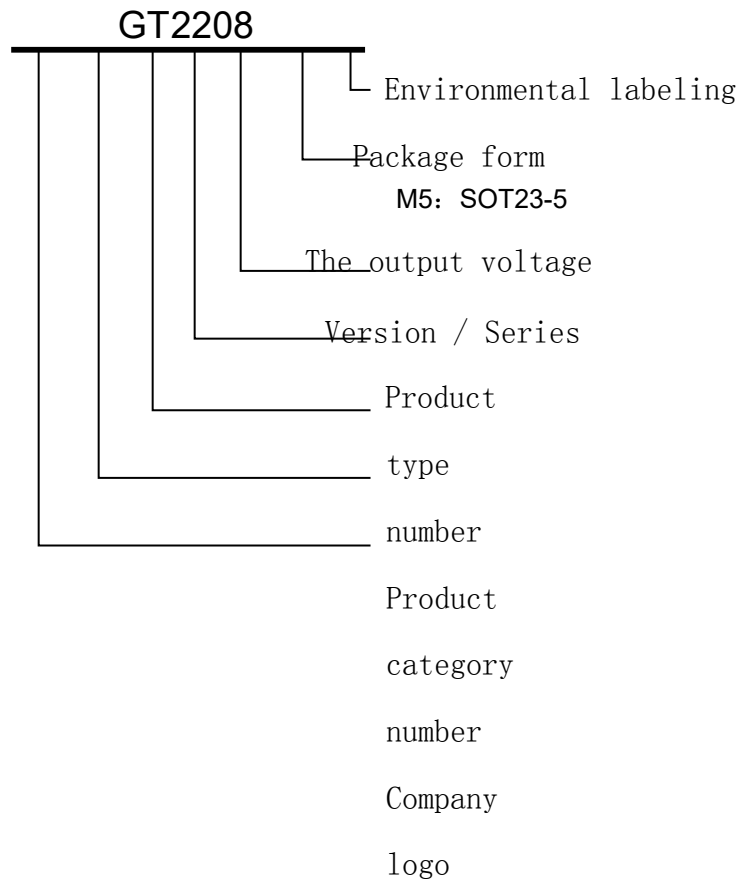
Package form

- 5-pin SOT23-5

Typical application diagram



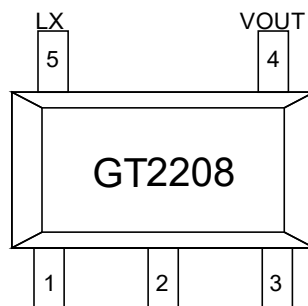
Selection Guide



Product number	product manual
GT2208A30M5G	vout = 3.0v; package form: sot23-5
GT2208A33M5G	vout = 3.3v; package form: sot23-5
GT2208A50M5G	vout = 5.0v; package form: sot23-5

Note: If you need products with other voltage values or packages, please contact our sales staff.

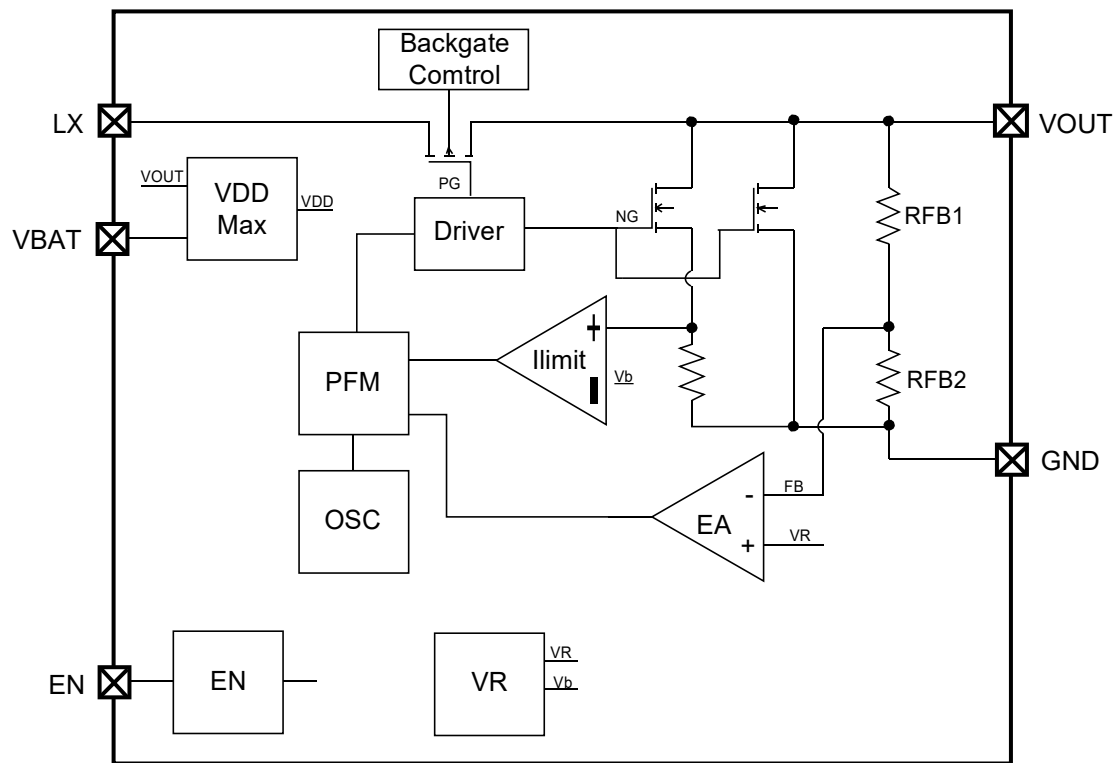
Product pin map



description

Pin function

pin	Symbolic name	Function Description
1	EN	Enable
2	GND	Ground
3	VBAT	Input
4	VOUT	Output
5	LX	Energy converter

Chip function diagram

Absolute Maximum Rating

parameter	symbol	Limit value	unit
vbat input voltage	VBAT	-0.3~6	V
en input voltage	EN	-0.3~6	V
lx pin voltage	LX	-0.3~6	V
lx pin current	ILXmax	1000	mA
vout pin voltage	VOUT	-0.3~6	V
Working environment temperature	TOPR	-40~85	°C
Storage temperature range	TSTG	-55~150	°C
Junction temperature range	TJ	-40~150	°C
Welding temperature	TL	260	°C
Package power consumption	PD	0.6	W
Package thermal resistance	θJA	210	°C/W

Note: The absolute maximum rating is the maximum physical injury limit that this product can withstand, please do not exceed this rating under any circumstances.

List of peripheral component requirements

Component name	symbol	Value	unit
inductance	L	22	μH
Input capacitance	CIN	10	μF
Output capacitance	CO	100	μF
Output capacitance	CO1	0.1	μF

Electrical parameters

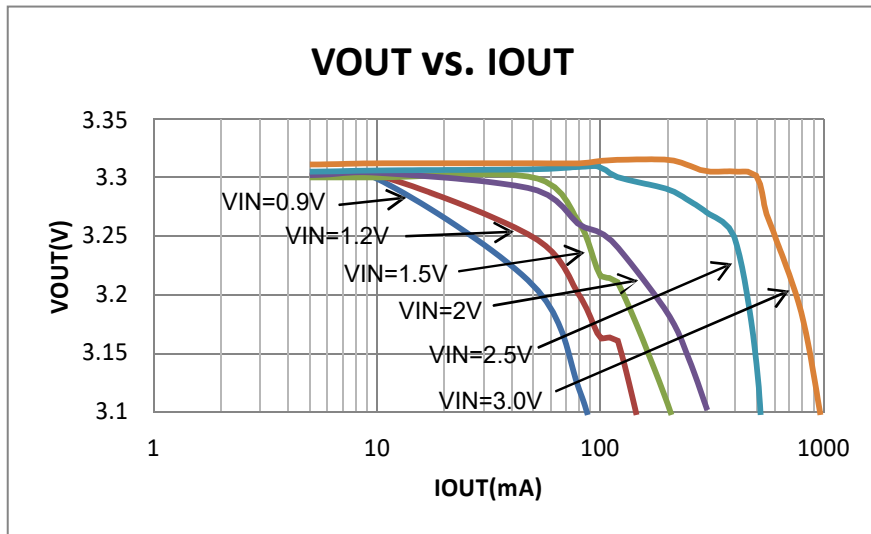
Normal conditions TA = 25 °C, VIN = VEN = 2V, VOUT = 3.3V, L = 22uH, CIN = 10uF, CO = 100uF tantalum, CO1 = 104

parameter	symbol	Test Conditions	Minimum	Typical	Max	unit
Starting voltage	Vstart	ILOAD=1mA,VIN:0→2V	-	0.9	1.0	V
Holding voltage	Vhold	ILOAD=1mA,VIN:2→0V	0.5	-	-	V
Input voltage	Vinmax		0.9	-	5.5	V
Output voltage	Vout	ILOAD=1mA	-2	-	+2	%
Power adjustment	ΔVout1	VIN=1V-2V,IOUT=10mA	-	5	20	mV
Load regulation	ΔVout2	IOUT=0-100mA,VIN=2V	-	20	30	mV
Chip quiescent	ISS	VOUT=VOUT+0.5	-	7.5	10	uA
Chip off current	ISS0	VCE=0V	-	0	0.1	uA
Limiting*	Ilimit		-	1000	-	mA
No-load input	Iin0	VIN=2V	-	15	-	uA
Shutdown input	Iin1	VIN=1.5V,VEN=0	-	0.45	1	uA
Short-circuit current *	Ishort	VIN=2V,Vout<3.6V	-	300	-	mA
		VIN=2V,3.6V≤Vout≤5V	-	500	-	mA
effectiveness		VIN=2V,IOUT=100mA	-	93	96	%
Oscillation		VIN=VOUT=VEN=3V	-	320	-	KHz
Oscillation Signal	DCosc	VIN=VOUT=VEN=3V	-	80	-	%
high input	VENH	VIN=2V,VEN:0→2V	-	-	0.8*VIN	V
		VIN=2V,VEN:0→2V(VOUT=5.0V)	-	1.0	1.5	V
low input	VENL	VIN=2V,VEN:2→0V	0.2* VIN	-	-	V
		VIN=2V,VEN:2→0V(VOUT=5.0V)	0.4V	-	-	V

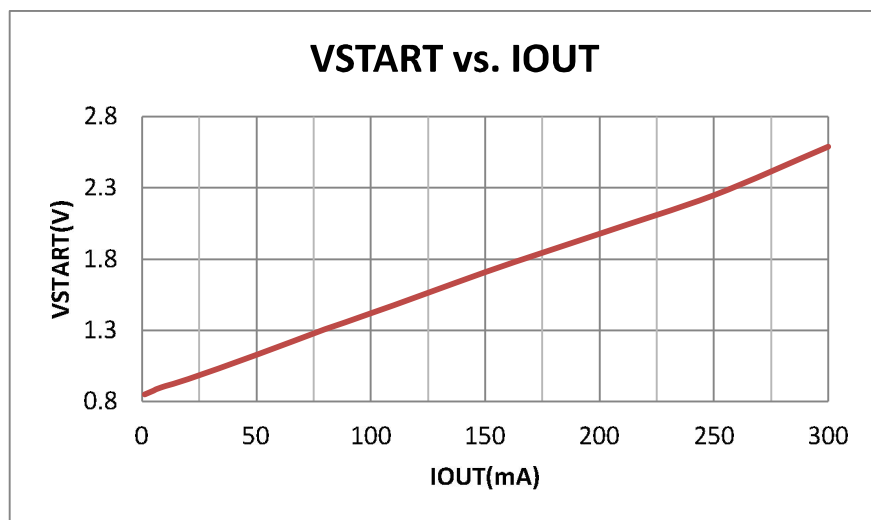
Note: Items with "*" are design guarantee parameter items.

Typical parameter curve

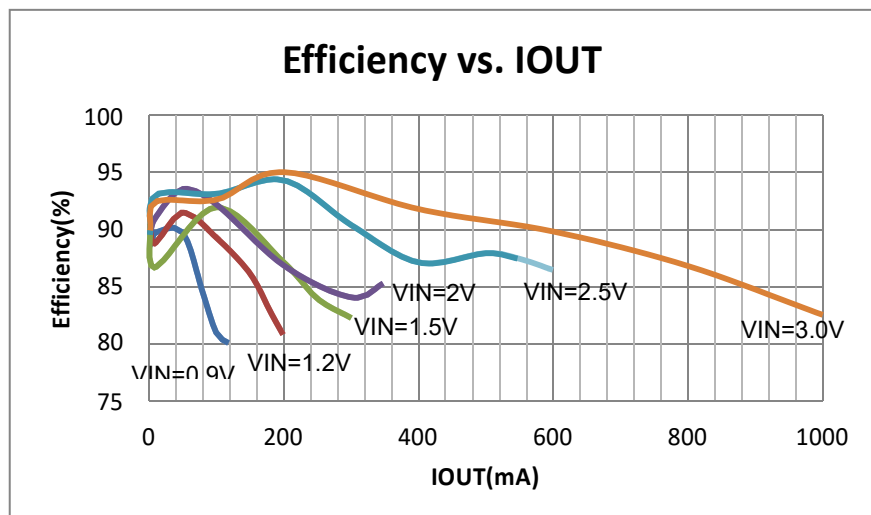
1. Output voltage and output current ($v_{out} = 3.3v$)



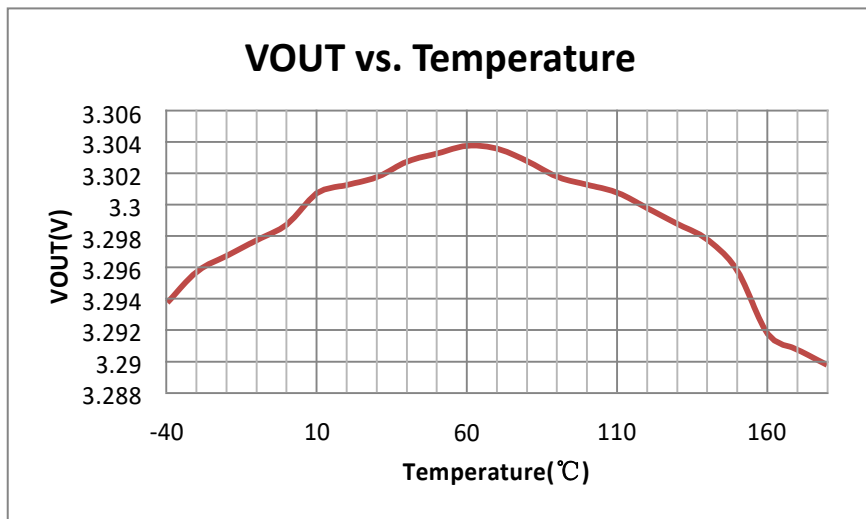
3. Starting voltage and output current



4. Efficiency and output current



4. Output voltage and temperature



Selection and considerations of external devices

Peripheral circuits have a great impact on the performance of GT2208. External components need to be selected reasonably:

The external capacitor value should not be less than 40 μf (too small capacitance value will cause excessive output ripple), and at the same time, it must have good frequency characteristics (it is best to use tantalum capacitors). In addition, because the lx switch drive transistor will turn off a peak voltage, The capacitance value of the capacitor is at least 3 times the design output voltage; (the ordinary aluminum electrolytic capacitor has an esr value that is too high, so you can purchase aluminum electrolytic capacitors, such as os-con capacitors, which are specially used in switched dc / dc converters.)

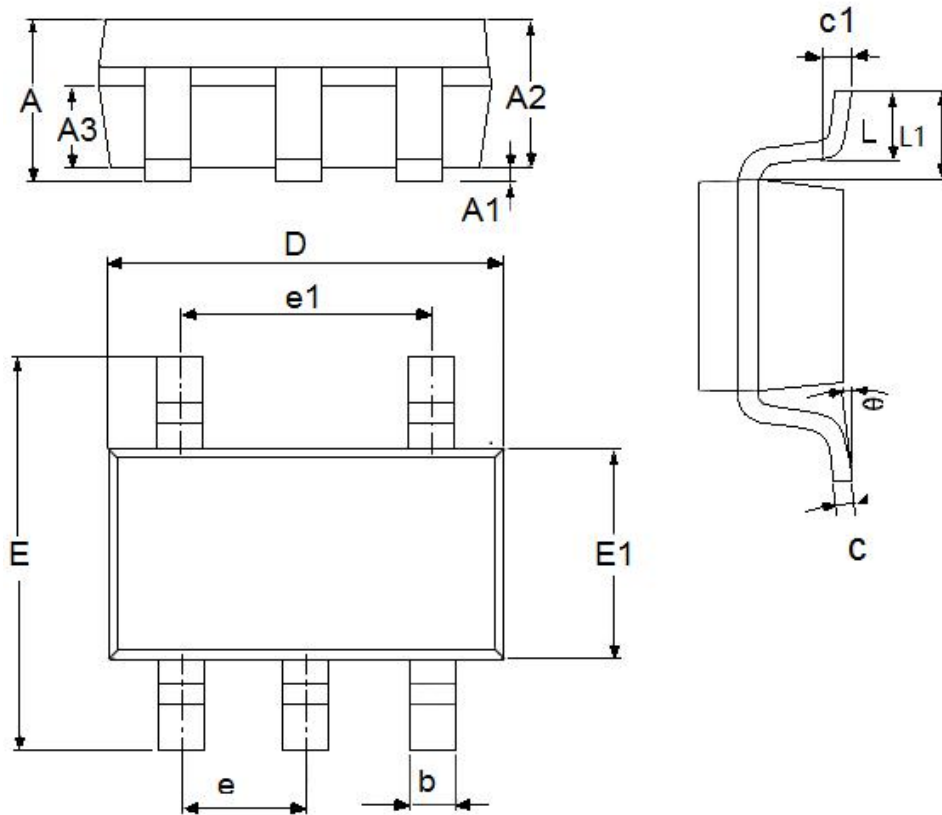
The external inductor value must be small enough to store enough energy even at the lowest input voltage and the shortest lx switching time, and at the same time, the inductor value must be large enough to prevent ilxmax from exceeding the maximum at the highest input voltage and the longest lx switching time. In addition, the DC resistance of the external inductor should be small, the current capacity should be high, and it should not reach magnetic saturation during operation;

PCBLayout matters needing attention:

The smaller the distance between the external components and the chip, the better, and the shorter the connection, the better. Especially the components connected to the vout end should be as short as possible with the capacitor; it is recommended to connect a 0.1μf at both ends of the chip vout and gnd. The ceramic capacitor .gnd should be fully grounded, otherwise the zero potential inside the chip will change with the switching current, causing unstable working conditions;

Package information

- Package type: sot23-5



parameter	Size (mm)		Size (Inch)	
	Minimum value	Max	Minimum value	Max
A	1.05	1.45	0.0413	0.0571
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
c	0.1	0.23	0.0039	0.0091
D	2.82	3.05	0.1110	0.1201
e1	1.9(TYP)		0.0748(TYP)	
E	2.6	3.05	0.1024	0.1201
E1	1.5	1.75	0.0512	0.0689
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	

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