

GENERAL DESCRIPTION

The SGM66155 is an internally compensated, 3MHz switching frequency, current mode, synchronous Boost switching converter. The SGM66155 offers various fixed output voltages, 5V, 5.1V, 5.2V, 5.25V, 5.3V and 5.4V. The SGM66155B implements a BYP pin to configure bypass mode when EN pin is pulled to logic low or true disconnect mode. The output voltage is disconnected by the rectifier circuit during shutdown, with no input to output leakage.

The SGM66155 implements valley current mode controls with adaptive on time architecture to regulate the output voltage. Current mode control offers excellent load and line transient performance.

Various protection features such as over-current, short-circuit and over-temperature are implemented to protect the device from various fault conditions.

The SGM66155 is available in a Green WLCSP-1.20×1.21-9B package.

FEATURES

- 1.95V to 5.5V Operating Input Voltage Range
 - 2.2V Startup Voltage
- 5.0V, 5.1V, 5.2V, 5.25V, 5.3V and 5.4V Fixed Output Voltage
- 17μA (TYP) Quiescent Current
- Up to 95% Efficiency
- 300μs/600μs (TYP) Built-in Soft-Start Time
- 4.5A (TYP) Valley Switch Current Limit
- 1.5A (MIN) Continuous Output Current for $V_{IN} = 3V$, $V_{OUT} = 5.0V$ to 5.4V
- 3MHz (TYP) Switching Frequency
- Selectable Forced PWM or Auto PFM Mode at Light Loads
- Selectable Bypass Mode when $V_{EN} = 0V$
- 5.7V OVP Threshold
- Bypass Mode when $V_{IN} \geq V_{OUT}$
- Input and Output Disconnect when $EN = 0V$:
- Hiccup Mode Output Short-Circuit Protection
- Over-Voltage Protection
- Thermal Shutdown Protection
- Available in a Green WLCSP-1.20×1.21-9B Package

APPLICATIONS

USB OTG

Boost from Single Cell Li-Ion Battery

Smart Phones and Tablets

Portable and Wearable Devices

SIMPLIFIED SCHEMATIC

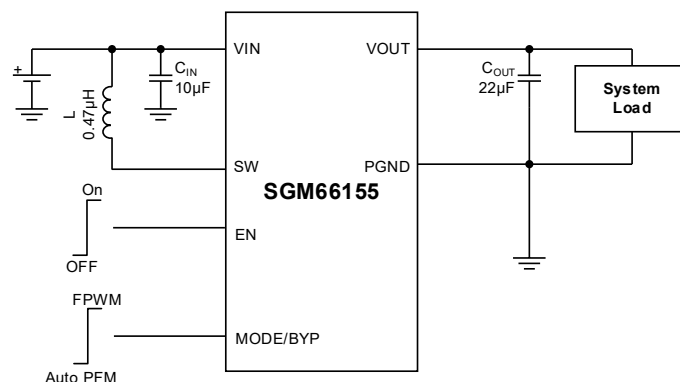


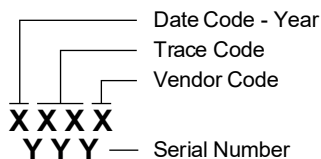
Figure 1. Simplified Schematic

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM66155-5.0	WLCSP-1.20×1.21-9B	-40°C to +125°C	SGM66155-5.0XG/TR	XXXX 243	Tape and Reel, 3000
SGM66155-5.25	WLCSP-1.20×1.21-9B	-40°C to +125°C	SGM66155-5.25XG/TR	XXXX 286	Tape and Reel, 3000
SGM66155A-5.0	WLCSP-1.20×1.21-9B	-40°C to +125°C	SGM66155A-5.0XG/TR	XXXX 287	Tape and Reel, 3000
SGM66155A-5.1	WLCSP-1.20×1.21-9B	-40°C to +125°C	SGM66155A-5.1XG/TR	XXXX 288	Tape and Reel, 3000
SGM66155A-5.2	WLCSP-1.20×1.21-9B	-40°C to +125°C	SGM66155A-5.2XG/TR	XXXX 27U	Tape and Reel, 3000
SGM66155A-5.3	WLCSP-1.20×1.21-9B	-40°C to +125°C	SGM66155A-5.3XG/TR	XXXX 289	Tape and Reel, 3000
SGM66155A-5.4	WLCSP-1.20×1.21-9B	-40°C to +125°C	SGM66155A-5.4XG/TR	XXXX 28A	Tape and Reel, 3000
SGM66155B-5.0	WLCSP-1.20×1.21-9B	-40°C to +125°C	SGM66155B-5.0XG/TR	XXXX 28B	Tape and Reel, 3000
SGM66155B-5.25	WLCSP-1.20×1.21-9B	-40°C to +125°C	SGM66155B-5.25XG/TR	XXXX 28C	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXX = Date Code, Trace Code and Vendor Code.



Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

DEVICE COMPARISON

Part Number	Output Voltage	C3 Pin	Output Discharge	Soft-Start Time	Over Voltage
SGM66155-5.0	5.0V	Mode	No Discharge	600μs	5.7V
SGM66155-5.25	5.25V	Mode	No Discharge	600μs	5.7V
SGM66155A-5.0	5.0V	Mode	100Ω	300μs	5.7V
SGM66155A-5.1	5.1V	Mode	100Ω	300μs	5.7V
SGM66155A-5.2	5.2V	Mode	100Ω	300μs	5.7V
SGM66155A-5.3	5.3V	Mode	100Ω	300μs	5.7V
SGM66155A-5.4	5.4V	Mode	100Ω	300μs	5.7V
SGM66155B-5.0	5.0V	BYP	No Discharge	600μs	5.7V
SGM66155B-5.25	5.25V	BYP	No Discharge	600μs	5.7V

ABSOLUTE MAXIMUM RATINGS

VIN, VOUT and EN Voltages	-0.3V to 6V
SW Node (DC)	-0.3V to 6V
SW Node (Transient: 10ns, 3MHz)	-1V to 8V
Voltage on Other Pins	-0.3V to 6V
Package Thermal Resistance	
WLCSP-1.20×1.21-9B, θ_{JA}	104.3°C/W
WLCSP-1.20×1.21-9B, θ_{JB}	32.2°C/W
WLCSP-1.20×1.21-9B, θ_{JC}	42.3°C/W
Junction Temperature	+150°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10s)	+260°C
ESD Susceptibility ⁽¹⁾⁽²⁾	
HBM	±4000V
CDM	±1000V

NOTES:

1. For human body model (HBM), all pins comply with ANSI/ESDA/JEDEC JS-001 specifications.
2. For charged device model (CDM), all pins comply with ANSI/ESDA/JEDEC JS-002 specifications.

RECOMMENDED OPERATING CONDITIONS

Input Voltage Range	2.2V to 5.5V
Operating Junction Temperature Range	-40°C to +125°C

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

ESD SENSITIVITY CAUTION

This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

DISCLAIMER

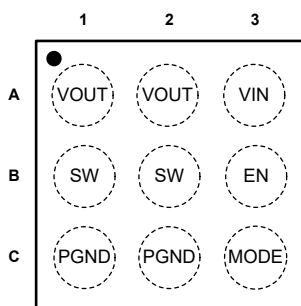
SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

SGM66155

3MHz, 5.0V to 5.4V Fixed Output Synchronous Boost Converter with 4.5A Switch

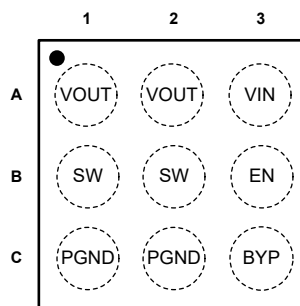
PIN CONFIGURATIONS

SGM66155/SGM66155A (TOP VIEW)



WLCSP-1.20×1.21-9B

SGM66155B (TOP VIEW)



WLCSP-1.20×1.21-9B

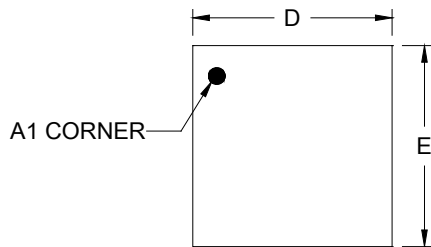
PIN DESCRIPTION

PIN	NAME	FUNCTION
A1, A2	VOUT	Boost Converter Output.
A3	VIN	Power Supply Input.
B1, B2	SW	Switching Node. Drain connection of low-side power MOSFET.
B3	EN	Device Enable Node. Pulling this pin logic high enables the device and pulling it logic low disables the device.
C1, C2	PGND	Power Ground.
C3	MODE	Mode Selection Pin. Logic high for forced PWM operation and logic low for auto PFM operation at light loads.
	BYP	Bypass Selection Pin. When EN is logic low, with logic high for bypass and logic low for true disconnect.

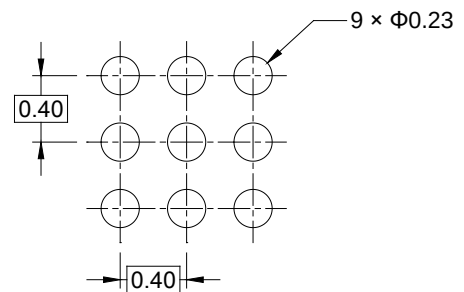
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

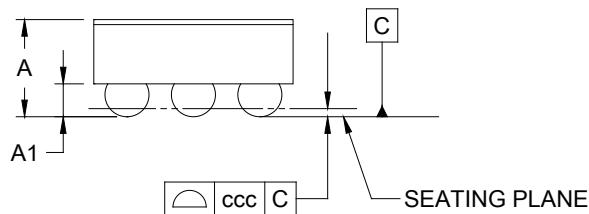
WLCSP-1.20×1.21-9B



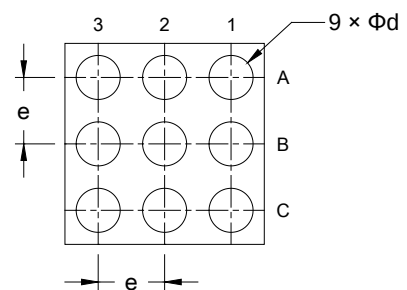
TOP VIEW



RECOMMENDED LAND PATTERN (Unit: mm)



SIDE VIEW



BOTTOM VIEW

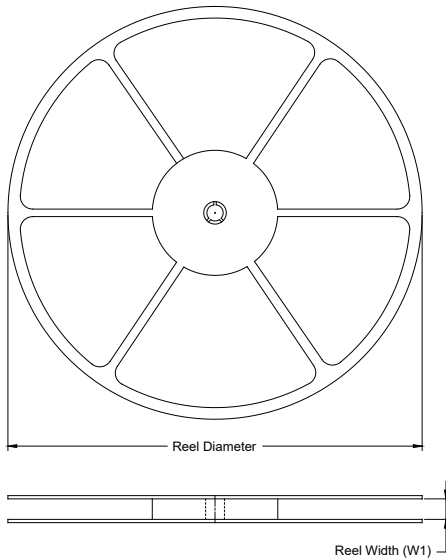
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	-	-	0.625
A1	0.178	-	0.218
D	1.171	-	1.231
E	1.180	-	1.240
d	0.235	-	0.295
e	0.400 BSC		
ccc	0.050		

NOTE: This drawing is subject to change without notice.

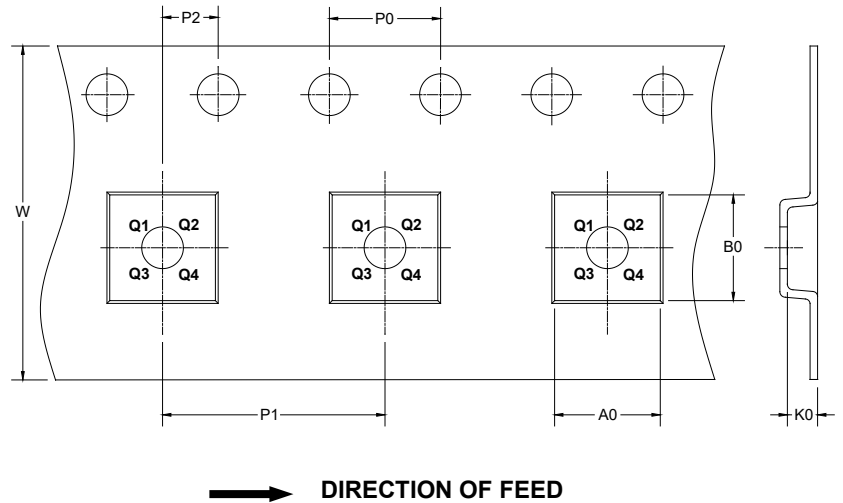
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

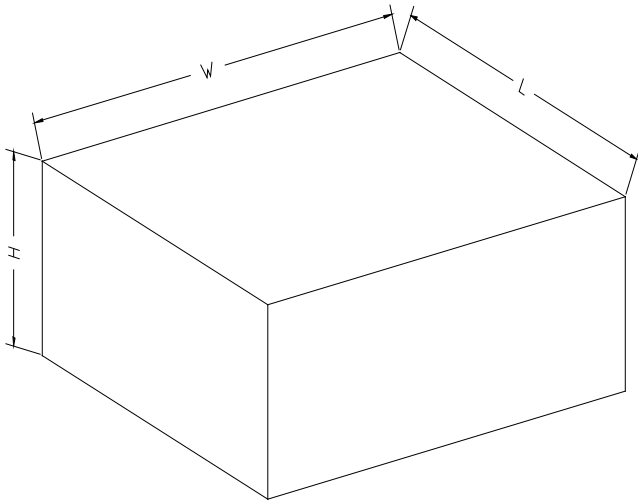
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
WLCSP-1.20×1.21-9B	7"	9.5	1.35	1.35	0.76	4.0	4.0	2.0	8.0	Q1

DD0001

PACKAGE INFORMATION

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
7" (Option)	368	227	224	8
7"	442	410	224	18

DD0002