



# SGM3132 4-Channel One-Wire Dimming LED Driver with Ultra-Low Dropout Current Source

## GENERAL DESCRIPTION

The SGM3132 is a 4-channel white LED driver with ultra-low dropout current sources. Low 35mV dropout voltage makes the SGM3132 ideal for battery-powered applications.

The SGM3132 integrates an internal resistor to set the LED bias current and a deglitch circuit for filtering the noise on the EN pin. 16-step LED current levels can be set by a serial pulse input signal into the EN pin.

The SGM3132 is available in Green TQFN-3×3-16L, TDFN-2×2-8L and MSOP-8 packages. It operates over an ambient temperature range of -40°C to +85°C.

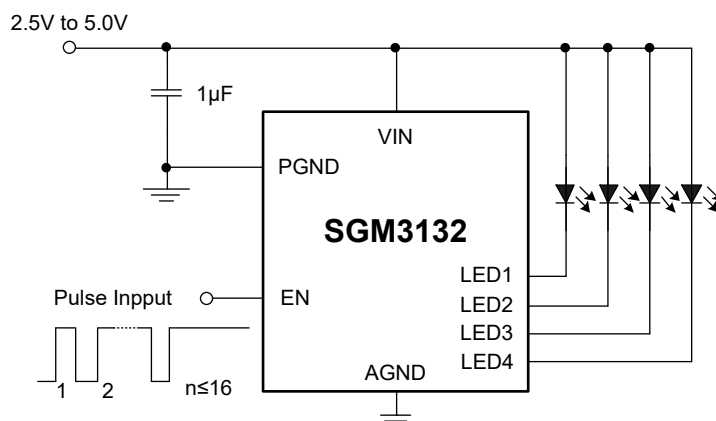
## FEATURES

- Support up to 4 LEDs
- Ultra-Low 35mV Dropout Voltage at a 20mA Load
- 16-Step Brightness Control through One-Wire Interface
- LED Sink Current: 20mA
- ±3% Regulated LED Current Matching
- Internal Deglitch Circuit
- Thermal Shutdown
- No EMI and Switch Noise
- Operating Temperature Range: -40°C to +85°C
- Available in Green TQFN-3×3-16L, TDFN-2×2-8L and MSOP-8 Packages

## APPLICATIONS

Wireless Handsets  
Mobile Phones, Digital Cameras, Camcorders  
Portable Equipment  
PDAs, Palmtops, and Handy Terminals  
Battery-Powered Equipment

## TYPICAL APPLICATION



**PACKAGE/ORDERING INFORMATION**

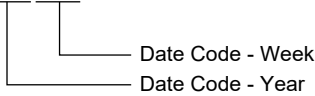
| MODEL   | PACKAGE DESCRIPTION | SPECIFIED TEMPERATURE RANGE | ORDERING NUMBER  | PACKAGE MARKING          | PACKING OPTION      |
|---------|---------------------|-----------------------------|------------------|--------------------------|---------------------|
| SGM3132 | TQFN-3×3-16L        | -40°C to +85°C              | SGM3132YTQ16G/TR | 3132TQ<br>XXXXX          | Tape and Reel, 3000 |
|         | TDFN-2×2-8L         | -40°C to +85°C              | SGM3132YDE8G/TR  | 3132<br>XXXX             | Tape and Reel, 3000 |
|         | MSOP-8              | -40°C to +85°C              | SGM3132YMS8G/TR  | SGM3132<br>YMS8<br>XXXXX | Tape and Reel, 3000 |

**MARKING INFORMATION**

NOTE: XXXX = Date Code. XXXXX = Date Code and Vendor Code.

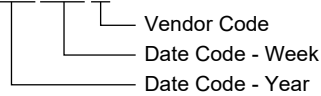
**TDFN-2×2-8L**

**XXXX**



**TQFN-3×3-16L/ MSOP-8**

**XXXXX**



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.

**ABSOLUTE MAXIMUM RATINGS**

|   |                 |
|---|-----------------|
| V <sub>IN</sub> to GND.....   | -0.3V to 6V     |
| The Other Pins to GND.....  | -0.3V to 6V     |
| Power Dissipation <sup>(1)</sup> , P <sub>D</sub> @ T <sub>A</sub> = 25°C |                 |
| TQFN-3×3-16L.....   | 1.47W           |
| TDFN-2×2-8L.....  | 0.61W           |
| MSOP-8.....   | 0.57W           |
| Operating Temperature Range.....  | -40°C to +85°C  |
| Junction Temperature.....   | +125°C          |
| Storage Temperature Range.....  | -40°C to +150°C |
| Lead Temperature (Soldering, 10s).....                                    | +260°C          |
| ESD Susceptibility  |                 |
| HBM.....  | 4000V           |
| MM.....   | 400V            |

**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.

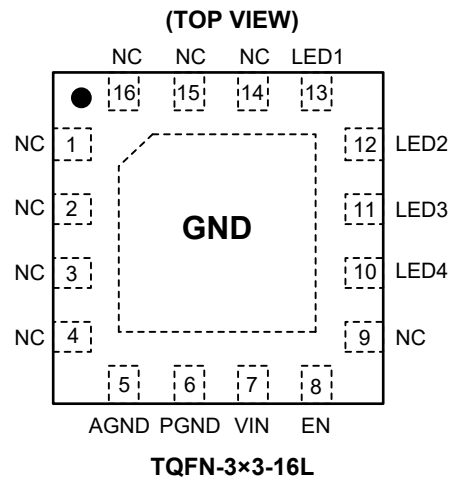
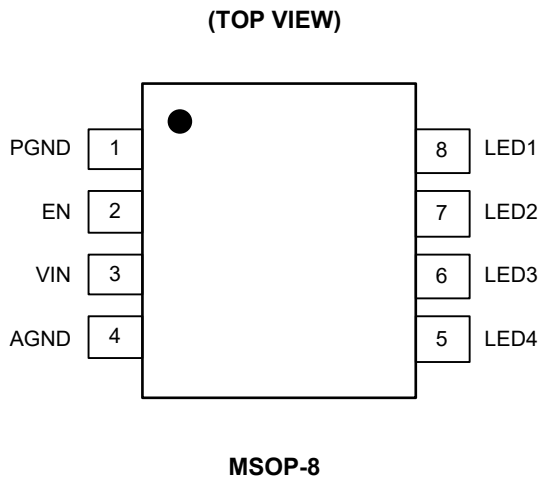
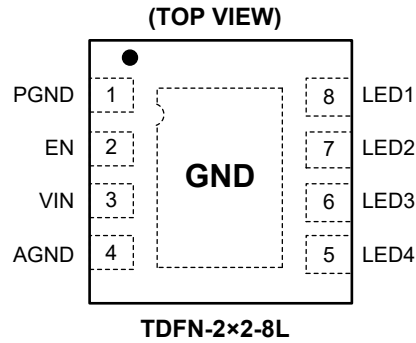
**DISCLAIMER**

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

**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.

PIN CONFIGURATIONS



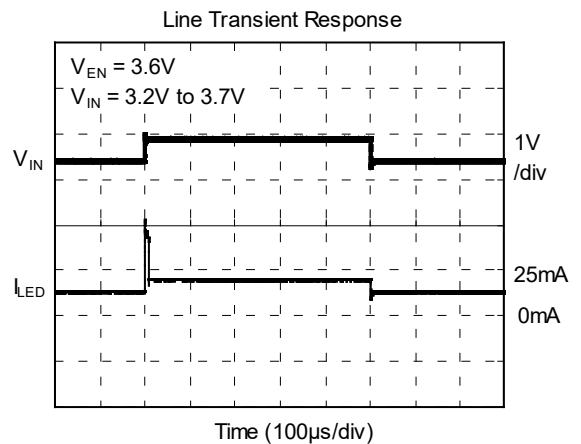
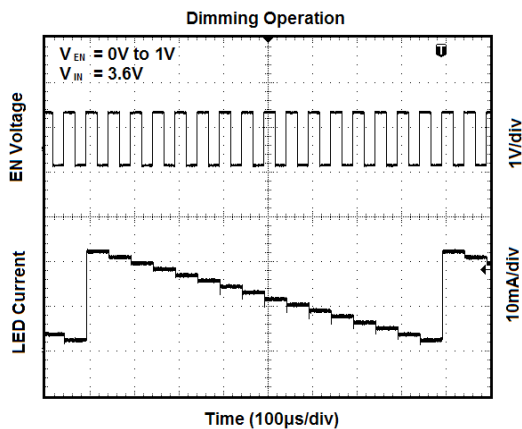
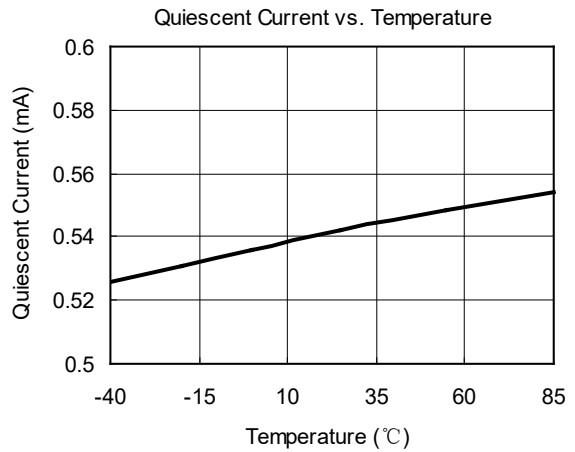
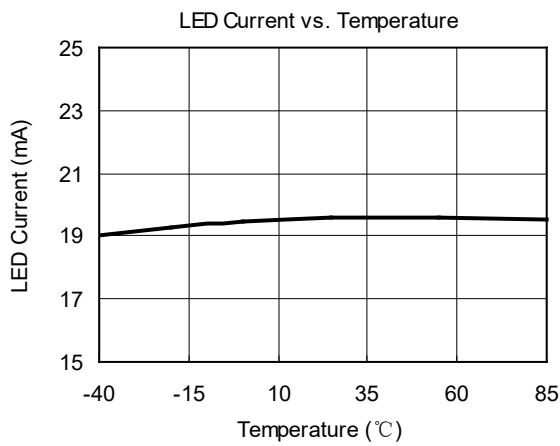
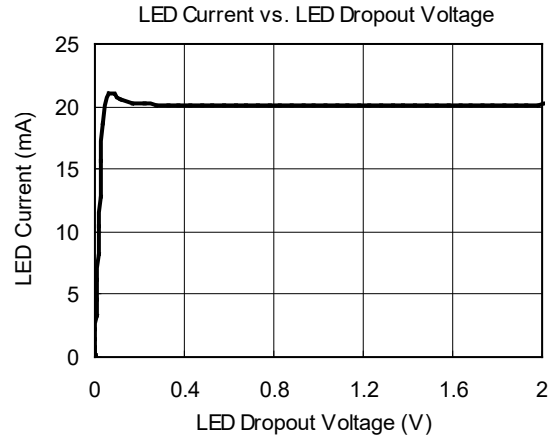
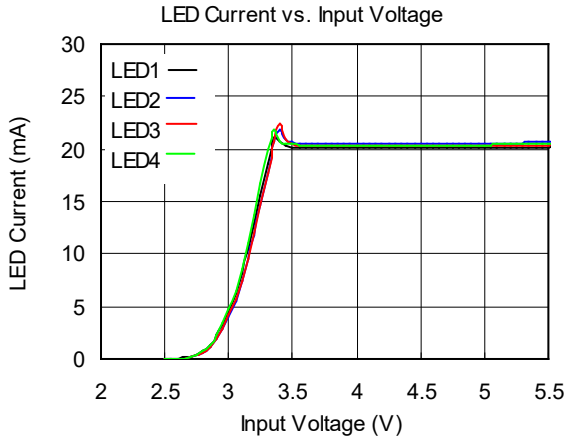
PIN DESCRIPTION

| PIN                |             |        | NAME | FUNCTION  |
|--------------------|-------------|--------|------|---|
| TQFN-3×3-16L       | TDFN-2×2-8L | MSOP-8 |      |   |
| 5                  | 4           | 4      | AGND | Analog Ground Pin.  |
| 6                  | 1           | 1      | PGND | Power Ground Pin.   |
| 7                  | 3           | 3      | VIN  | Input Supply Pin.   |
| 8                  | 2           | 2      | EN   | Active-High Enable Pin. Connect it to the GPIO pin of MCU.            |
| 10                 | 5           | 5      | LED4 | Current Sink 4. Connect to the cathode of the LED.                    |
| 11                 | 6           | 6      | LED3 | Current Sink 3. Connect to the cathode of the LED.                    |
| 12                 | 7           | 7      | LED2 | Current Sink 2. Connect to the cathode of the LED.                    |
| 13                 | 8           | 8      | LED1 | Current Sink 1. Connect to the cathode of the LED.                    |
| 1,2,3,4,9,14,15,16 | —           | —      | NC   | No Connection.  |
| Exposed Pad        | Exposed Pad | —      | GND  | Exposed pad. It should be soldered to PCB board and connected to GND. |

**ELECTRICAL CHARACTERISTICS**(V<sub>IN</sub> = 3.6V, C<sub>IN</sub> = 1μF, T<sub>A</sub> = +25°C, unless otherwise noted.)

| PARAMETER                      |                    | SYMBOL               | CONDITIONS  | MIN | TYP  | MAX | UNITS |
|--------------------------------|--------------------|----------------------|---|-----|------|-----|-------|
| Operation Voltage Range        |                    | V <sub>IN</sub>      |   | 2.5 |      | 5.0 | V     |
| EN Pull Low Current            |                    |                      | V <sub>EN</sub> = 1.8V  |     | 0.01 |     | μA    |
| Quiescent Power Supply Current |                    | I <sub>Q</sub>       | V <sub>IN</sub> = 5.0V, LED OFF   |     | 0.55 |     | mA    |
| Shutdown Current               |                    | I <sub>SHDN</sub>    | V <sub>EN</sub> = 0V, V <sub>IN</sub> = 5.0V  |     | 0.1  | 5   | μA    |
| I <sub>LEDx</sub> Accuracy     |                    | I <sub>LED-ERR</sub> |   | -10 |      | +10 | %     |
| LED Current Deviation Matching |                    | D <sub>LED</sub>     |   | -3  |      | +3  | %     |
| LED Dropout Voltage            |                    | V <sub>LED</sub>     | I <sub>LEDx</sub> = 20mA, V <sub>LED</sub> @ I <sub>LEDx</sub> = 90% × I <sub>LED</sub> |     | 35   |     | mV    |
| EN Low Time for Shutdown       |                    | T <sub>SHDN</sub>    |   |     | 1.6  |     | ms    |
| EN Low Time for Dimming        |                    | T <sub>LO</sub>      |   | 0.5 |      | 500 | μs    |
| EN High Time for Dimming       |                    | T <sub>HI</sub>      |   | 0.5 |      |     | μs    |
| EN Threshold                   | Logic-High Voltage | V <sub>IH</sub>      | V <sub>EN</sub> > V <sub>IH</sub> for Enable IH   | 1.2 |      |     | V     |
|                                | Logic-Low Voltage  | V <sub>IL</sub>      | V <sub>EN</sub> < V <sub>IL</sub> for Disable IL  |     |      | 0.5 | V     |
| Thermal Shutdown Temperature   |                    |                      |   |     | 150  |     | °C    |
| Hysteresis Temperature         |                    |                      |   |     | 10   |     | °C    |

TYPICAL PERFORMANCE CHARACTERISTICS



**REVISION HISTORY**

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

| <b>JANUARY 2013 – REV.A.1 to REV.A.2</b>     | <b>Page</b> |
|--|-------------|
| Added Recommended Land Pattern section.....  | 8, 9, 10    |
| Added Tape and Reel Information section..... | 11, 12      |

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| <b>MAY 2011 – REV.A to REV.A.1</b> | <b>Page</b> |
|------------------------------------|-------------|
| Changed Package Description .....  | All         |

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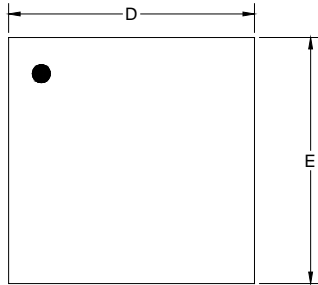
| <b>Changes from Original (MARCH 2010) to REV.A</b>   | <b>Page</b> |
|--|-------------|
| Changed from product preview to production data..... | All         |

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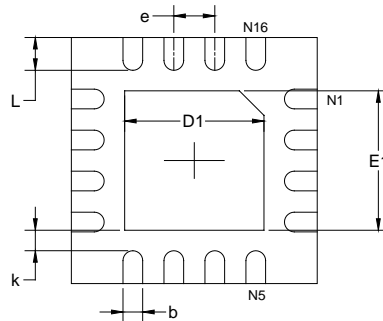
# PACKAGE INFORMATION

## PACKAGE OUTLINE DIMENSIONS

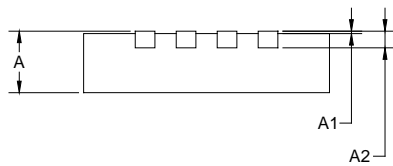
### TQFN-3x3-16L



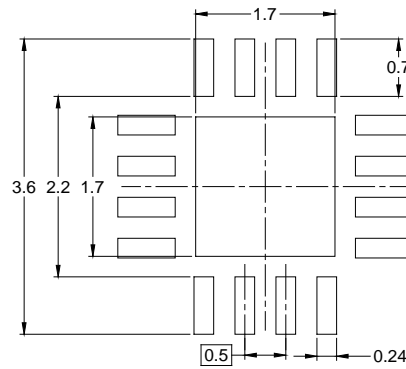
TOP VIEW



BOTTOM VIEW



SIDE VIEW

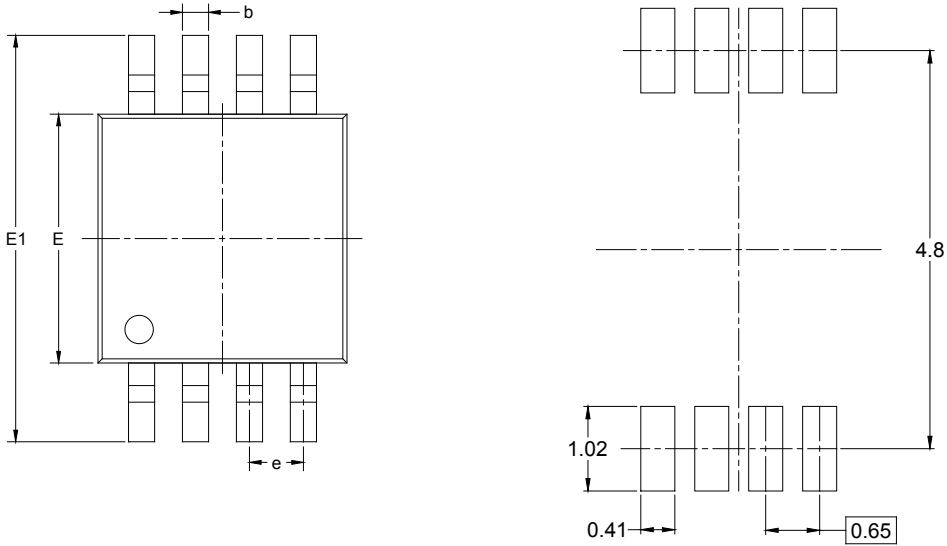


RECOMMENDED LAND PATTERN (Unit: mm)

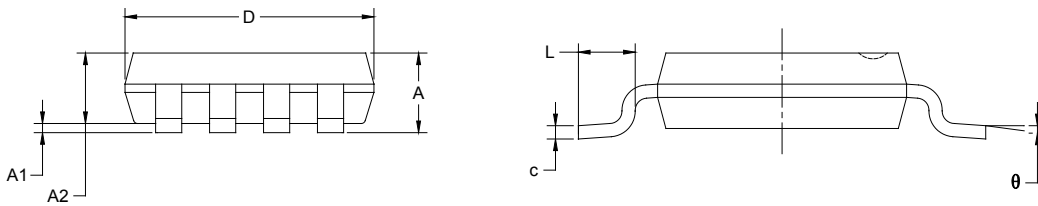
| Symbol | Dimensions<br>In Millimeters |       | Dimensions<br>In Inches |       |
|--------|------------------------------|-------|-------------------------|-------|
|        | MIN                          | MAX   | MIN                     | MAX   |
| A      | 0.700                        | 0.800 | 0.028                   | 0.031 |
| A1     | 0.000                        | 0.050 | 0.000                   | 0.002 |
| A2     | 0.203 REF                    |       | 0.008 REF               |       |
| D      | 2.900                        | 3.100 | 0.114                   | 0.122 |
| D1     | 1.600                        | 1.800 | 0.063                   | 0.071 |
| E      | 2.900                        | 3.100 | 0.114                   | 0.122 |
| E1     | 1.600                        | 1.800 | 0.063                   | 0.071 |
| k      | 0.200 MIN                    |       | 0.008 MIN               |       |
| b      | 0.180                        | 0.300 | 0.007                   | 0.012 |
| e      | 0.500 TYP                    |       | 0.020 TYP               |       |
| L      | 0.300                        | 0.500 | 0.012                   | 0.020 |

PACKAGE OUTLINE DIMENSIONS

MSOP-8



RECOMMENDED LAND PATTERN (Unit: mm)

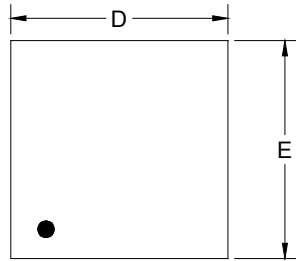


| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | MIN                       | MAX   | MIN                  | MAX   |
| A      | 0.820                     | 1.100 | 0.032                | 0.043 |
| A1     | 0.020                     | 0.150 | 0.001                | 0.006 |
| A2     | 0.750                     | 0.950 | 0.030                | 0.037 |
| b      | 0.250                     | 0.380 | 0.010                | 0.015 |
| c      | 0.090                     | 0.230 | 0.004                | 0.009 |
| D      | 2.900                     | 3.100 | 0.114                | 0.122 |
| E      | 2.900                     | 3.100 | 0.114                | 0.122 |
| E1     | 4.750                     | 5.050 | 0.187                | 0.199 |
| e      | 0.650 BSC                 |       | 0.026 BSC            |       |
| L      | 0.400                     | 0.800 | 0.016                | 0.031 |
| θ      | 0°                        | 6°    | 0°                   | 6°    |

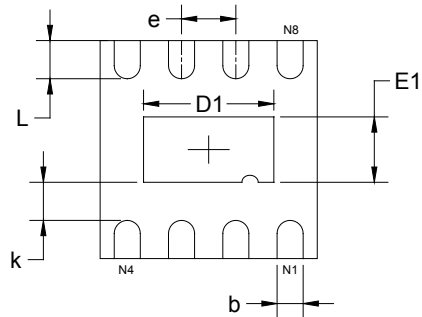


PACKAGE OUTLINE DIMENSIONS

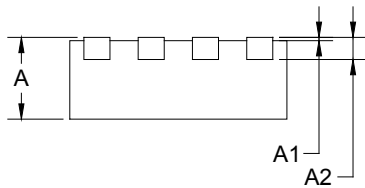
TDFN-2x2-8L



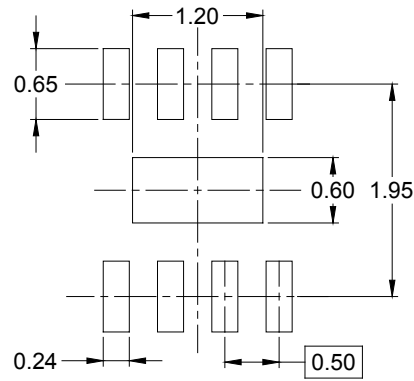
TOP VIEW



BOTTOM VIEW



SIDE VIEW



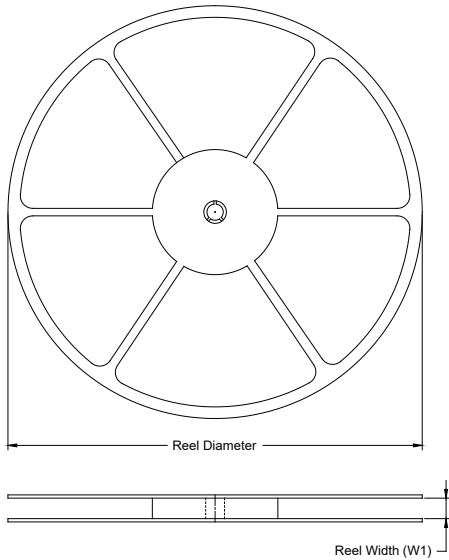
RECOMMENDED LAND PATTERN (Unit: mm)

| Symbol | Dimensions<br>In Millimeters |       | Dimensions<br>In Inches |       |
|--------|------------------------------|-------|-------------------------|-------|
|        | MIN                          | MAX   | MIN                     | MAX   |
| A      | 0.700                        | 0.800 | 0.028                   | 0.031 |
| A1     | 0.000                        | 0.050 | 0.000                   | 0.002 |
| A2     | 0.203 REF                    |       | 0.008 REF               |       |
| D      | 1.900                        | 2.100 | 0.075                   | 0.083 |
| D1     | 1.100                        | 1.300 | 0.043                   | 0.051 |
| E      | 1.900                        | 2.100 | 0.075                   | 0.083 |
| E1     | 0.500                        | 0.700 | 0.020                   | 0.028 |
| k      | 0.200 MIN                    |       | 0.008 MIN               |       |
| b      | 0.180                        | 0.300 | 0.007                   | 0.012 |
| e      | 0.500 TYP                    |       | 0.020 TYP               |       |
| L      | 0.250                        | 0.450 | 0.010                   | 0.018 |

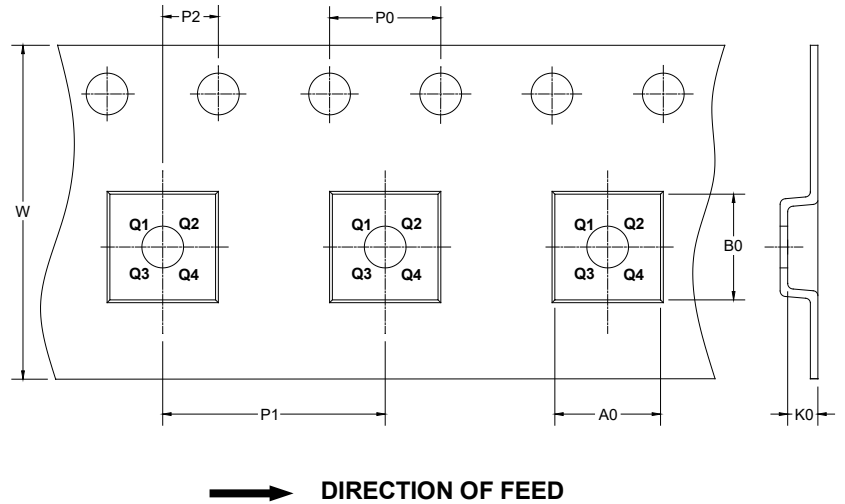
# PACKAGE INFORMATION

## TAPE AND REEL INFORMATION

### REEL DIMENSIONS



### TAPE DIMENSIONS



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

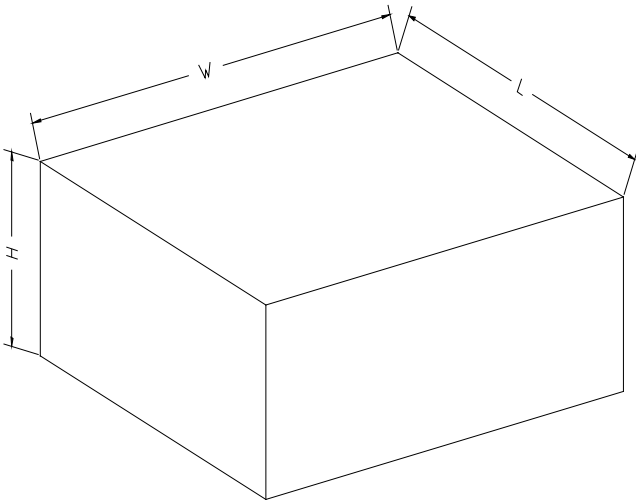
### KEY PARAMETER LIST OF TAPE AND REEL

| Package Type | Reel Diameter | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P0 (mm) | P1 (mm) | P2 (mm) | W (mm) | Pin1 Quadrant |
|--------------|---------------|--------------------|---------|---------|---------|---------|---------|---------|--------|---------------|
| TQFN-3×3-16L | 13"           | 12.4               | 3.35    | 3.35    | 1.13    | 4.0     | 8.0     | 2.0     | 12.0   | Q1            |
| MSOP-8       | 13"           | 12.4               | 5.20    | 3.30    | 1.50    | 4.0     | 8.0     | 2.0     | 12.0   | Q1            |
| TDFN-2×2-8L  | 7"            | 9.5                | 2.30    | 2.30    | 1.10    | 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           |
| 13"         | 386         | 280        | 370         | 5            |

DD0002

单击下面可查看定价，库存，交付和生命周期等信息

[>>SGMICRO\(圣邦微电子\)](#)