



SGM9144

Capless Output Coupling

Low Voltage Video Amplifier with LPF

PRODUCT DESCRIPTION

The SGM9144 is a low voltage video amplifier with 5th-order LPF circuit. With the internal negative charge pump circuit, output coupling capacitor is unnecessary.

The SGM9144 features low power and small package. It is suitable for low power design on downsizing of portable video system and system with video output.

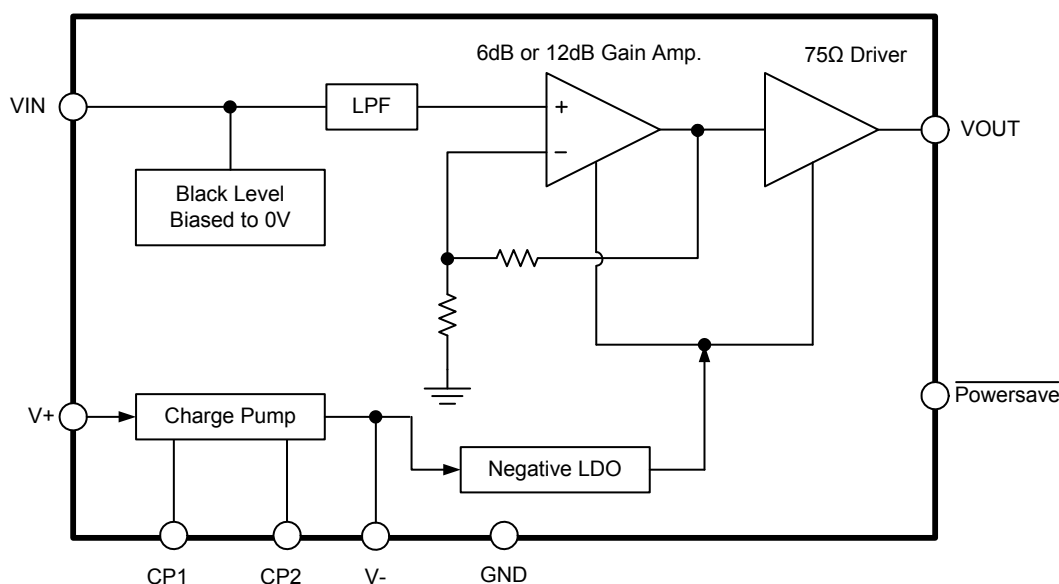
SGM9144 provides two different gain options (6dB or 12dB) for different applications.

The SGM9144 is available in Green MSOP-8 and TDFN-2×2-8L packages. It operates over an ambient temperature range of -40°C to +125°C.

FEATURES

- 2.5V to 4.0V Operating Voltage Range
- Capless Output Coupling
- 6dB or 12dB Gain
- Internal 75Ω Driver Circuit
- Internal 5th-Order 14MHz LPF
- Power Save Circuit and 1.8V Logical Control
- Quiescent Current: 11.8mA
- Available in Green MSOP-8 and TDFN-2×2-8L Packages
- -40°C to +125°C Operating Temperature Range

BLOCK DIAGRAM



PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	MARKING INFORMATION	PACKING OPTION
SGM9144B (6dB Gain)	MSOP-8	-40°C to +125°C	SGM9144BXMS8G/TR	SGM9144B XMS8 XXXXX	Tape and Reel, 4000
	TDFN-2×2-8L	-40°C to +125°C	SGM9144BXTDE8G/TR	SUA XXXX	Tape and Reel, 3000
SGM9144C (12dB Gain)	MSOP-8	-40°C to +125°C	SGM9144CXMS8G/TR	SGM9144C XMS8 XXXXX	Tape and Reel, 4000
	TDFN-2×2-8L	-40°C to +125°C	SGM9144CXTDE8G/TR	SUB XXXX	Tape and Reel, 3000

NOTE: XXXX = Date Code, XXXXX = Date 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.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage, V+ 5.0V
 Junction Temperature 150°C
 Storage Temperature Range -65°C to +150°C
 Lead Temperature (Soldering, 10s)..... 260°C
 ESD Susceptibility
 HBM..... 8000V
 MM..... 400V
 VOUT Pin IEC 61000-4-2 Contact Discharge 8000V

RECOMMENDED OPERATING CONDITIONS

Input Voltage Range 2.5V to 4.0V
 Operating Temperature Range -40°C to +125°C

OVERSTRESS CAUTION

Stresses beyond those listed may cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational section of the specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

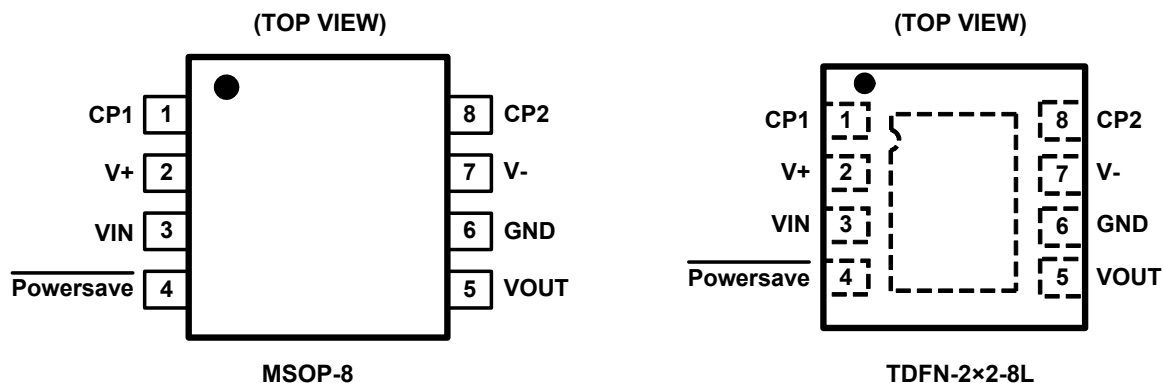
ESD SENSITIVITY CAUTION

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. 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 very small parametric changes could cause the device not to meet its published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, specification or other related things if necessary without notice at any time

PIN CONFIGURATIONS



PIN DESCRIPTION

PIN		NAME	FUNCTION
MSOP-8	TDFN-2x2-8L		
1	1	CP1	Flying Capacitor Terminal.
2	2	V+	V+ Power Supply.
3	3	VIN	Input.
4	4	$\overline{\text{Powersave}}$	Power Save Control.
5	5	VOUT	Output.
6	6	GND	Ground.
7	7	V-	V- Power Supply.
8	8	CP2	Flying Capacitor Terminal.
–	Exposed Pad	–	Exposed Paddle. Can be connected to GND or left floating.

CONTROL TERMINAL

PARAMETER	STATUS	NOTE
$\overline{\text{Powersave}}$	H	Power Save: OFF
	L	Power Save: ON (Mute)
	Floating	Power Save: ON (Mute)

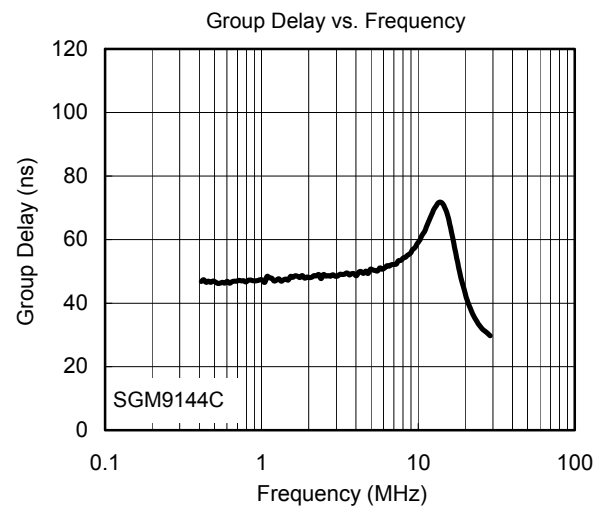
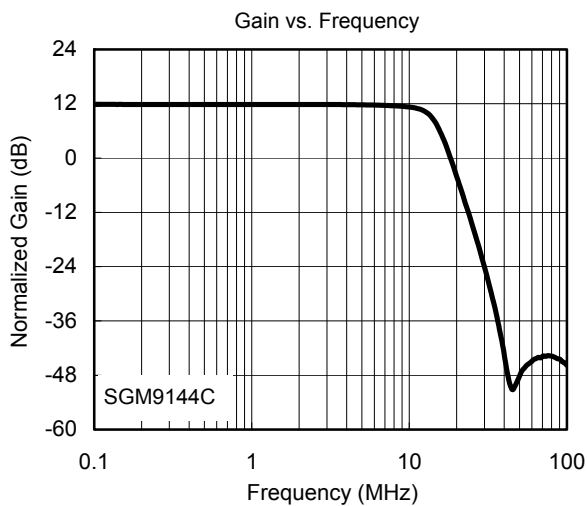
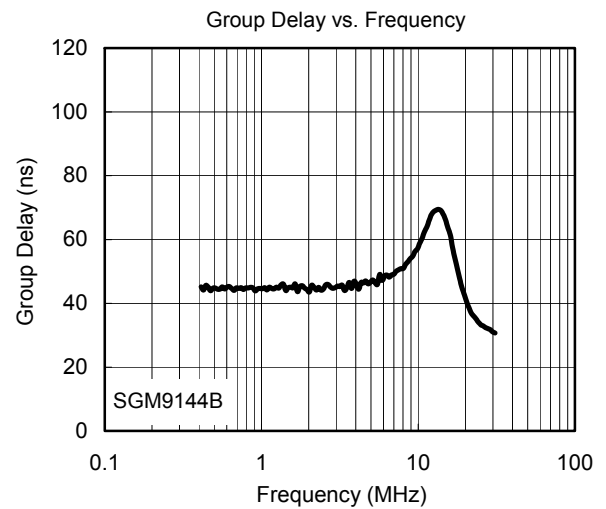
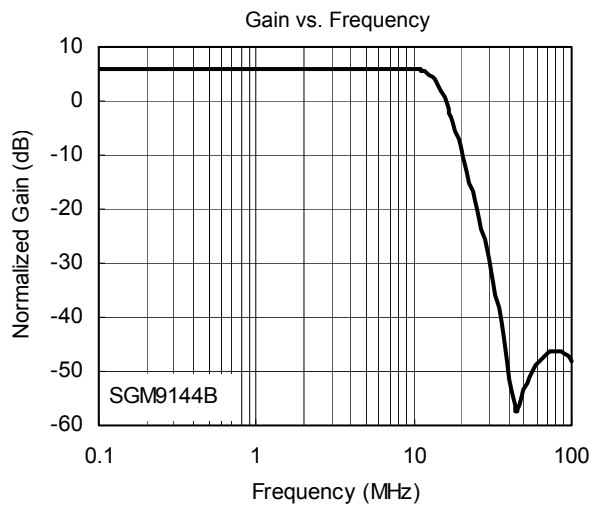
ELECTRICAL CHARACTERISTICS

(V₊ = 3.0V, SGM9144B V_{IN} = 1V_{PP}, SGM9144C V_{IN} = 0.5V_{PP}, T_A = 25°C, output is capless coupled into 150Ω, referenced to 400kHz, unless otherwise noted.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
DC ELECTRICAL CHARACTERISTICS					
Operating Voltage Range (V ₊)		2.5		4.0	V
Quiescent Current (I _Q)	No Signal		11.8	15.5	mA
Power Save Mode Current (I _{SAVE})	No Signal, Power Save Mode		0.1	1	μA
Voltage Gain of SGM9144B (A _V)	R _L = 150Ω	5.6	6	6.4	dB
Voltage Gain of SGM9144C (A _V)	R _L = 150Ω	11.6	12	12.4	dB
Power Save Input Voltage	Power Save Mode Enable			0.4	V
	Power Save Mode Disable	1.5			
Power Save Pin Internal Pull Low Resistor			500		kΩ
STANDARD DEFINITION MODE ELECTRICAL CHARACTERISTICS					
-1dB Bandwidth of SGM9144B	R _L = 150Ω		12.5		MHz
-3dB Bandwidth of SGM9144B	R _L = 150Ω		14		MHz
-1dB Bandwidth of SGM9144C	R _L = 150Ω		11.7		MHz
-3dB Bandwidth of SGM9144C	R _L = 150Ω		14		MHz
Filter Response (Normalized Gain)	f _{IN} = 400kHz to 54MHz		60		dB
Slew Rate	2V output step, 80% to 20%		60		V/μs
Differential Gain (DG)			0.4		%
Differential Phase (DP)			0.25		deg
Charge Pump Frequency (F _{CP})			200		kHz
Fall Time	2V output step, 80% to 20%		20		ns
Rise Time	2V output step, 80% to 20%		20		ns
Signal to Noise Ratio (SNR) of SGM9144B	100kHz to 6.5MHz, 150Ω		70		dB
Signal to Noise Ratio (SNR) of SGM9144C	100kHz to 6.5MHz, 150Ω		65		dB

TYPICAL PERFORMANCE CHARACTERISTICS

$V_+ = 3.0V$, SGM9144B $V_{IN} = 1V_{PP}$, SGM9144C $V_{IN} = 0.5V_{PP}$, $T_A = 25^\circ C$, output is capless coupled into 150Ω , referenced to 400kHz, unless otherwise noted.



TYPICAL APPLICATION CIRCUITS

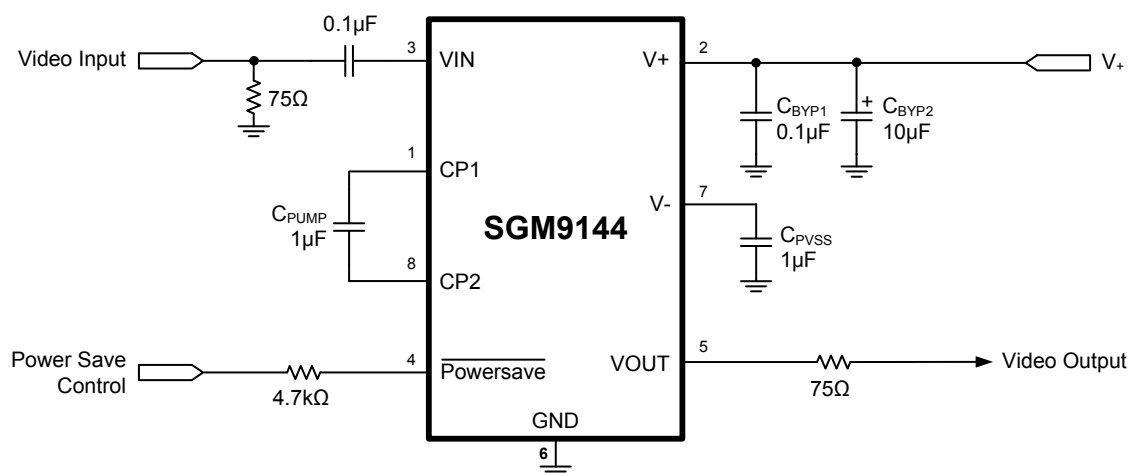


Figure 1. Standard Circuit

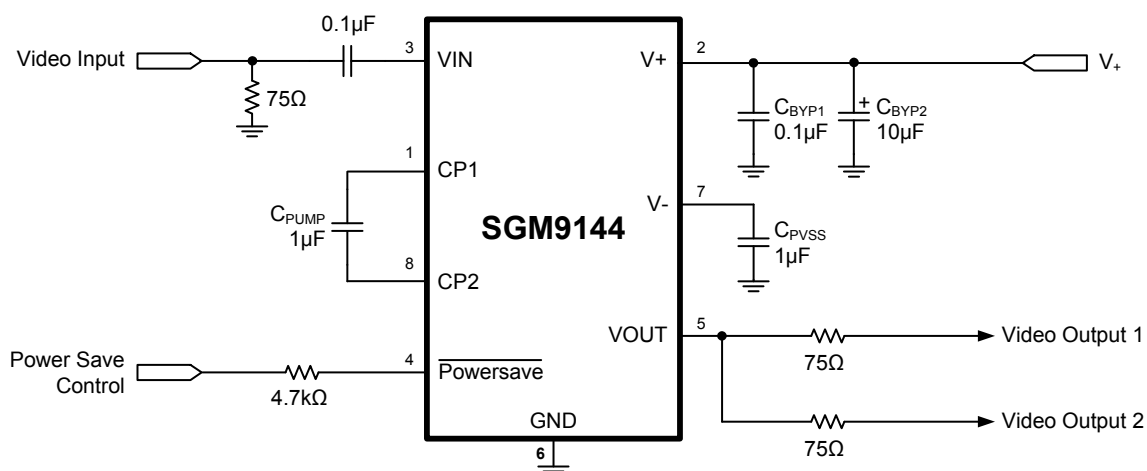


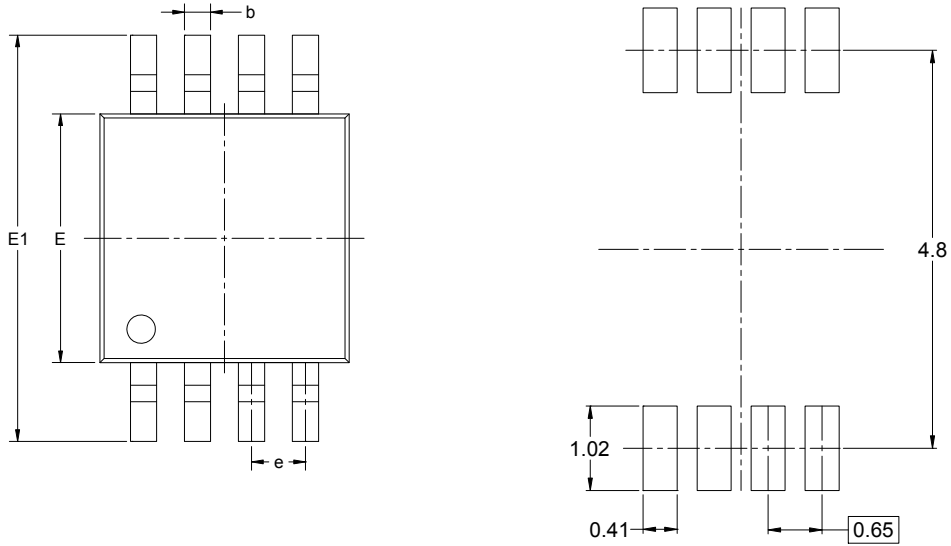
Figure 2. Driving Dual 75Ω Loading

NOTE:

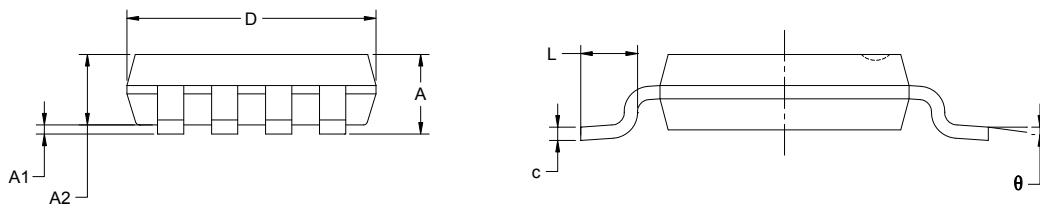
In order to get good performance, it's important to select the right C_{PUMP} , C_{PVSS} , C_{BYP1} and C_{BYP2} in applications. All tests are performed with circuit set up with X5R and X7R capacitors. Capacitors having high dissipative loss, such as Y5V capacitor, may cause performance degradation and unexpected system behavior.

PACKAGE OUTLINE DIMENSIONS

MSOP-8



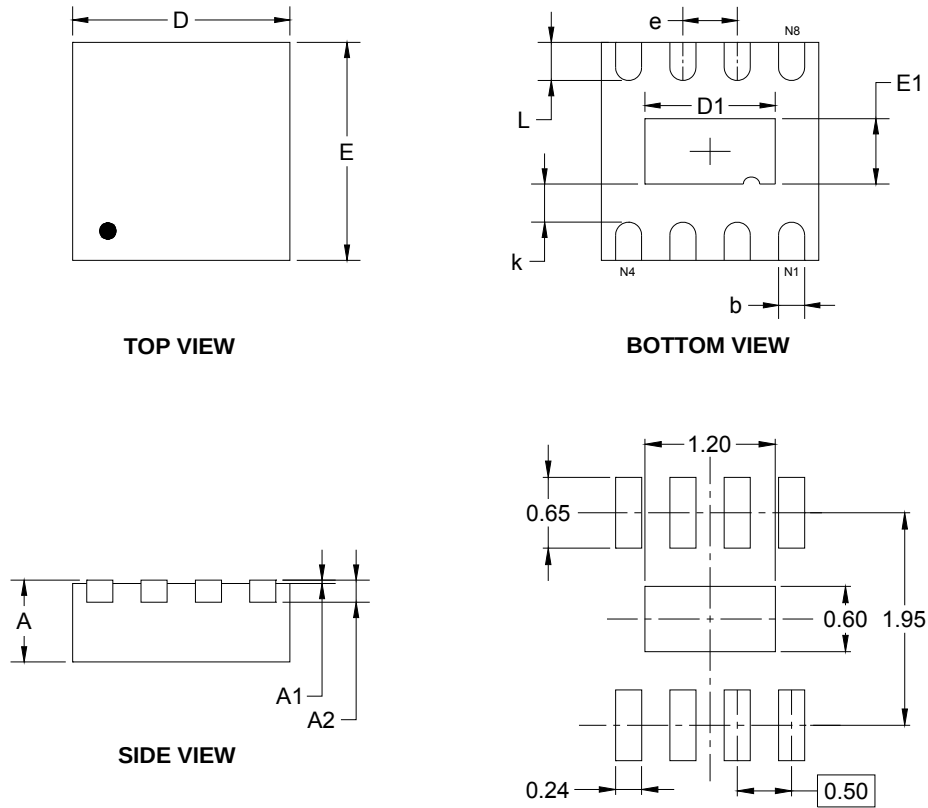
RECOMMENDED LAND PATTERN (Unit: mm)



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-2×2-8L

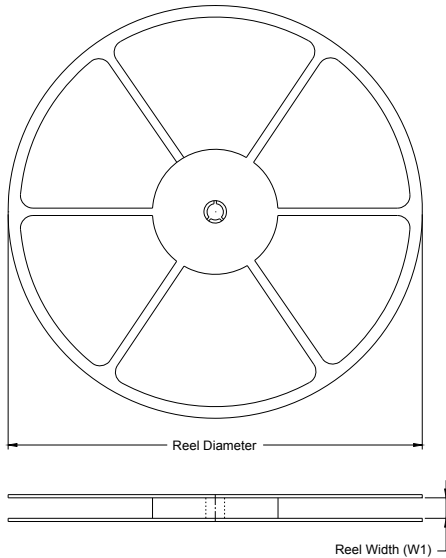


RECOMMENDED LAND PATTERN (Unit: mm)

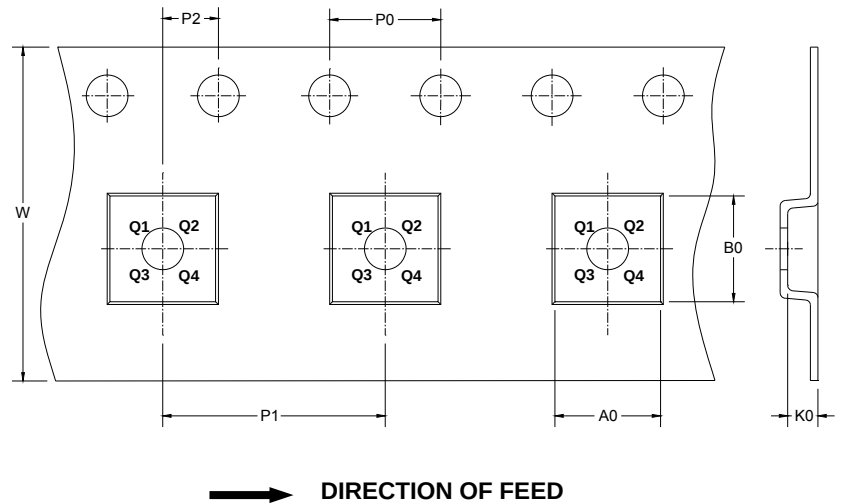
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	1.900	2.100	0.075	0.083
D1	1.100	1.300	0.043	0.051
E	1.900	2.100	0.075	0.083
E1	0.500	0.700	0.020	0.028
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007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

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

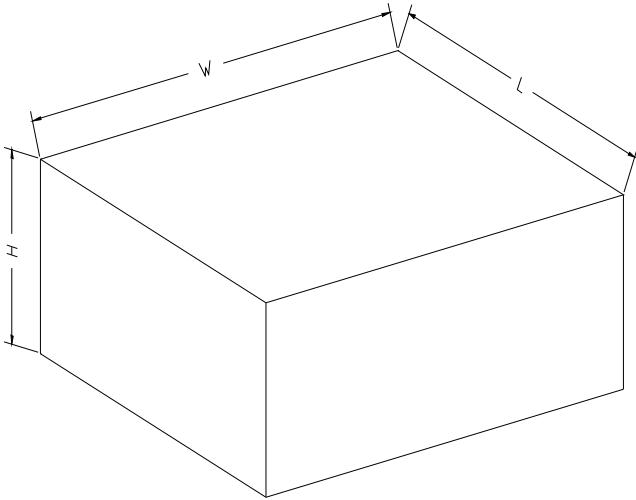
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
MSOP-8	13"	12.4	5.2	3.3	1.5	4.0	8.0	2.0	12.0	Q1
TDFN-2x2-8L	7"	9.5	2.30	2.30	1.10	4.00	4.00	2.00	8.00	Q1

DD00001

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