



VD8101

300nA I_Q , 300mA Low-Dropout Linear Regulator

General Description

The VD8101 ultra-low quiescent current regulator features low dropout voltage and low current in the standby mode. With less than 500nA quiescent current at no load, the VD8101 is ideally suited for standby micro-control-unit systems, especially for always-on applications like portable, and other battery-operated systems. The VD8101 retains all the features that are common to low dropout regulators including a low dropout PMOS pass device, short circuit protection, and thermal shutdown.

The VD8101 has a 6V maximum operating voltage limit, a 0°C to 100°C operating temperature range, and $\pm 2\%$ output voltage tolerance over the entire output current, input voltage, and temperature range. The VD8101 is available in SOT89-3, SOT23-5, SOT23-3, and DFN1X1 surface mount packages.

Ordering Information

Part Number	Package	Vout
VD8101	SOT89-3	1.2V
	SOT23-5	To
	SOT23-3	5.0V
	DFN1X1-4L	

Features

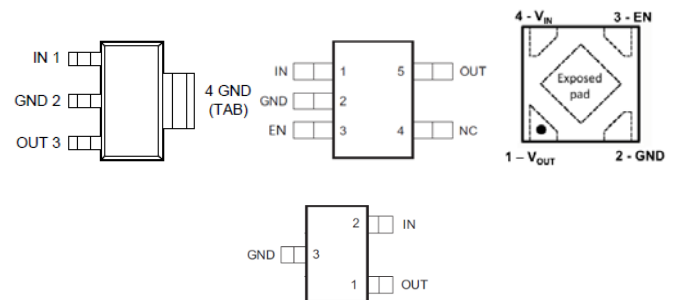
- V_{IN} Range up to 6V
- Output Voltage Tolerances of $\pm 2\%$ Over the Temperature Range
- Output Current of 300mA
- Ultra Low Quiescent Current ($I_Q = 500nA$)
- Dropout Voltage Typically 400mV at $I_{OUT} = 300mA$

- Internal Thermal Overload Protection
- Internal Short-Circuit Current Limit
- Ceramic Capacitor Stable

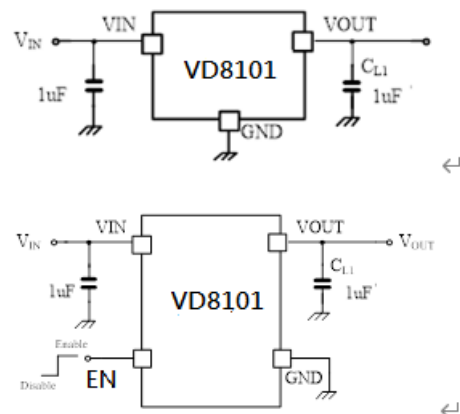
Applications

- Portable, Battery Powered Equipment
- Ultra Low Power Microcontroller
- Notebook computers

Pin Configuration



Typical Application Circuit



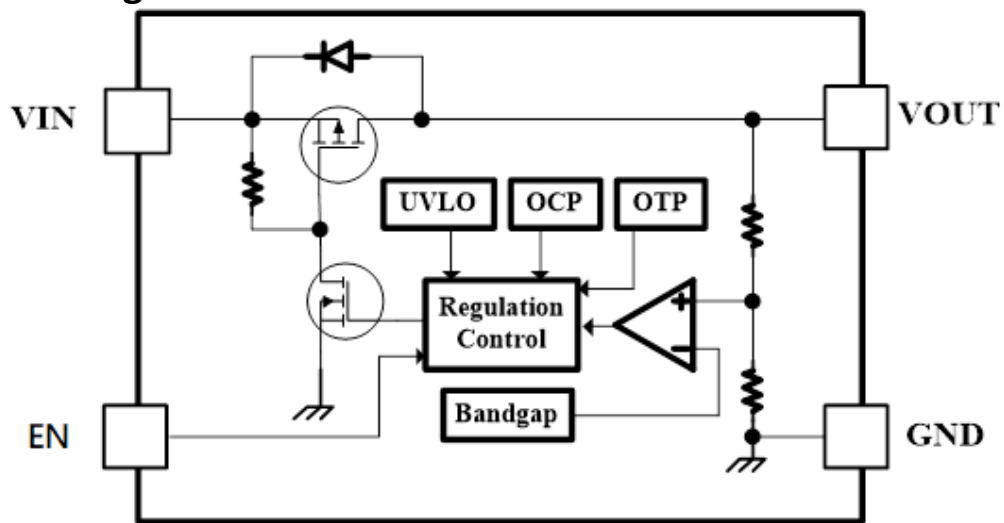
Ceramic Capacitor Stable



Pin Assignment

Pin Name	Pin No. SOT89-3	Pin No. SOT23-5	Pin No. DFN1X1	Pin Function
VOUT	3	5	1	Output Voltage Pin
GND	2,4	2	2	Ground
VIN	1	1	4	Input Voltage pin.
EN	--	3	3	Enable

Function Block Diagram





Absolute Maximum Ratings (Note1)

- V_{IN} ----- -0.3V to +6.5V
- Junction Temperature----- 125°C
- Lead Temperature (Soldering, 10 sec.)----- 300°C
- Storage Temperature ----- -65°C to 150°C

Recommended Operating Conditions

- Input Voltage, V_{IN} ----- +2.5V to +5.5V
- Junction Temperature ----- 0°C to 125°C

Electrical Characteristics

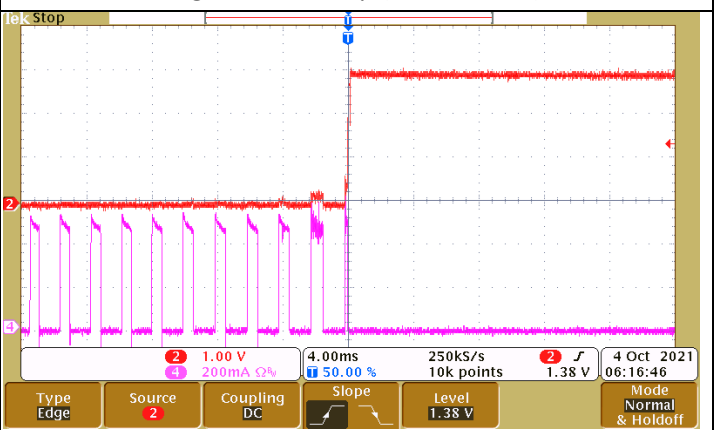
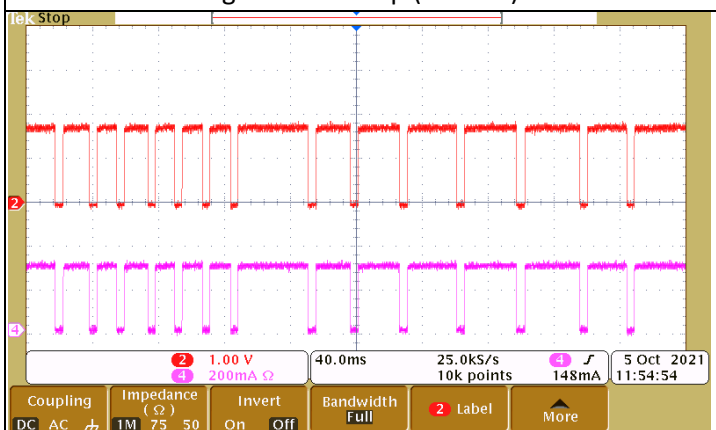
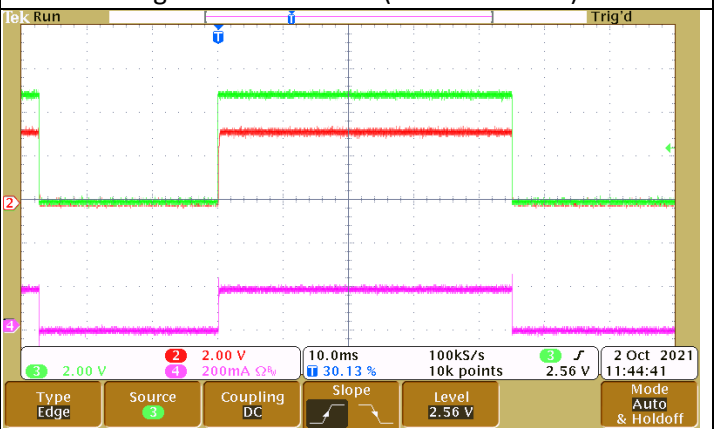
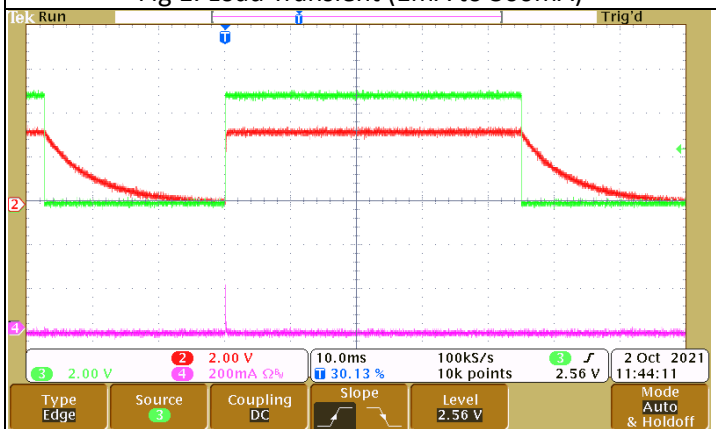
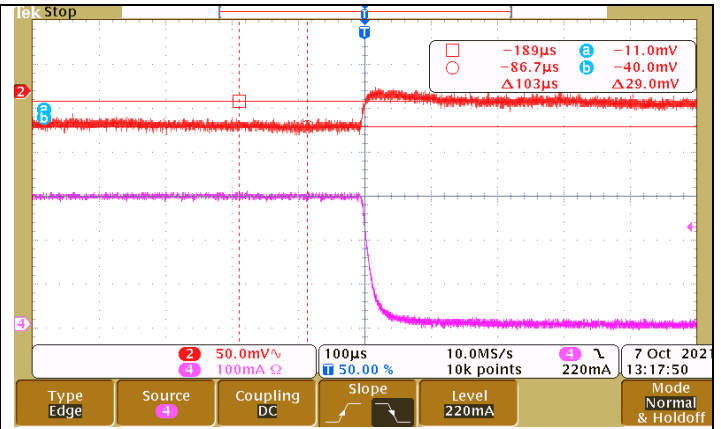
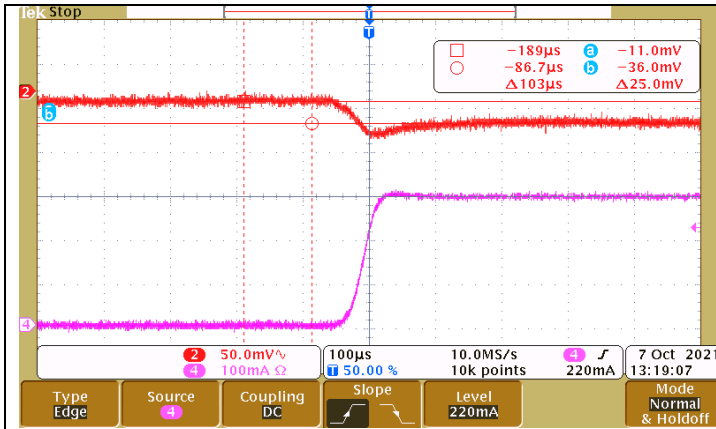
$V_{IN} = V_{OUT} + 1V$, $I_{OUT} = 1mA$, $C_{IN} = C_{OUT} = 1\mu F$, $T_J = 25^\circ C$, unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Output Voltage Accuracy	ΔV_{OUT}		-2%		2%	V
Line Regulation	ΔV_{LINE}	$V_{IN} = V_{OUT} + 1V$ to 5.5V		0.6	1.5	%
Load Regulation	ΔV_{LOAD}	$I_{OUT} = 1mA$ to 150mA			1	%
		$I_{OUT} = 1mA$ to 300mA			1.5	
Dropout Voltage	V_{DROP}	$I_{OUT} = 100mA$, $V_{OUT} = 3.3V$		130		mV
		$I_{OUT} = 300mA$, $V_{OUT} = 3.3V$		400		mV
		$I_{OUT} = 100mA$, $V_{OUT} = 1.8V$		200		mV
Quiescent Current	I_Q	$T_J = 25^\circ C$		0.5	1	uA
Current Limit	I_{CL}		360	560		mA
Enable high level	V_{ENHI}		0.6			V
Enable low level	V_{ENLO}				0.2	V
Power-supply rejection ratio	PSRR	$f = 1kHz$		60		dB
Thermal Shutdown	T_{SD}			150		°C
Thermal Shutdown Hy	T_{SDHY}			20		°C



Typical Characteristics

$V_{IN} = V_{OUT} + 1V$, $I_{OUT} = 1mA$, $V_{OUT} = 3.3V$, $C_{IN} = C_{OUT} = 1\mu F$, $T_J = 25^\circ C$, unless otherwise specified





VD8101

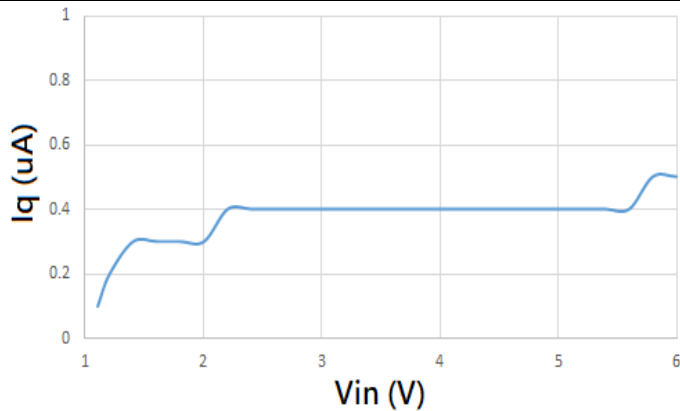


Fig 7. I_q vs V_{in} ($I_{OUT} = 0mA$)

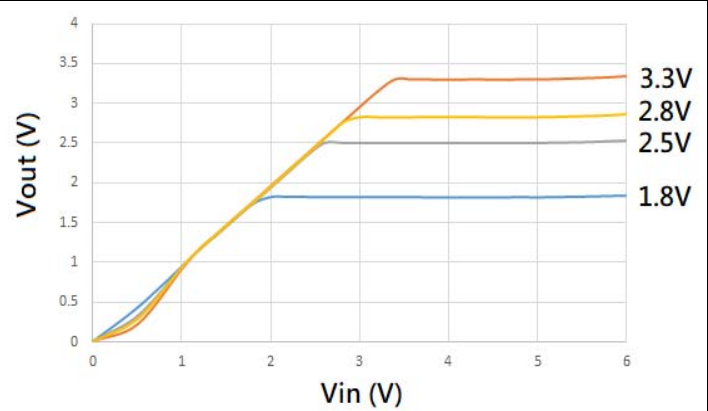


Fig 8. V_{OUT} vs V_{in} ($I_{OUT} = 1mA$)

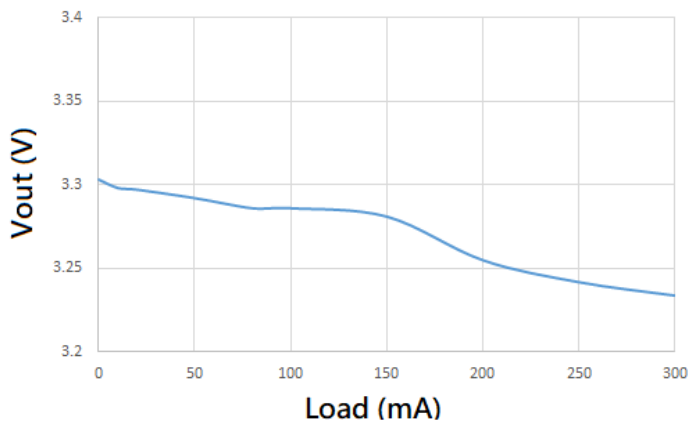


Fig 9. V_{OUT} vs Load

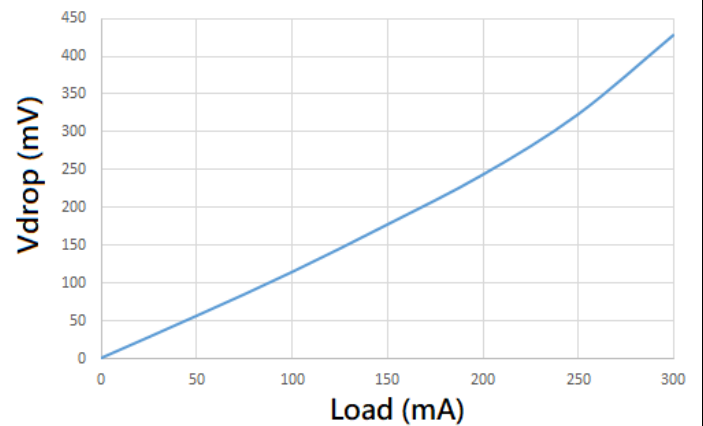


Fig 10. V_{DROP} vs Load

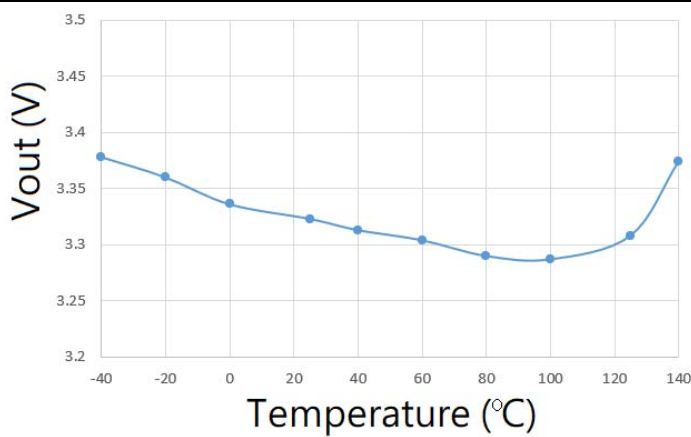


Fig 11. V_{OUT} vs Temperature ($I_{OUT} = 1mA$)

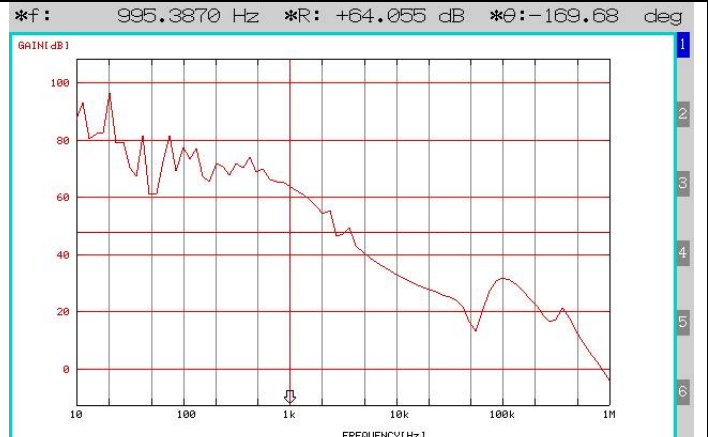
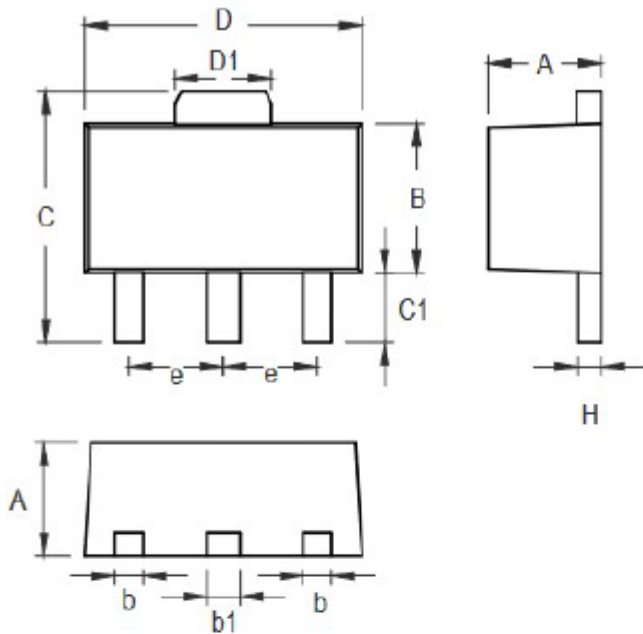


Fig 12. PSRR vs Frequency ($V_{IN} = 4.8V$, $V_{OUT} = 1.8V$)



Package Information

SOT89-3



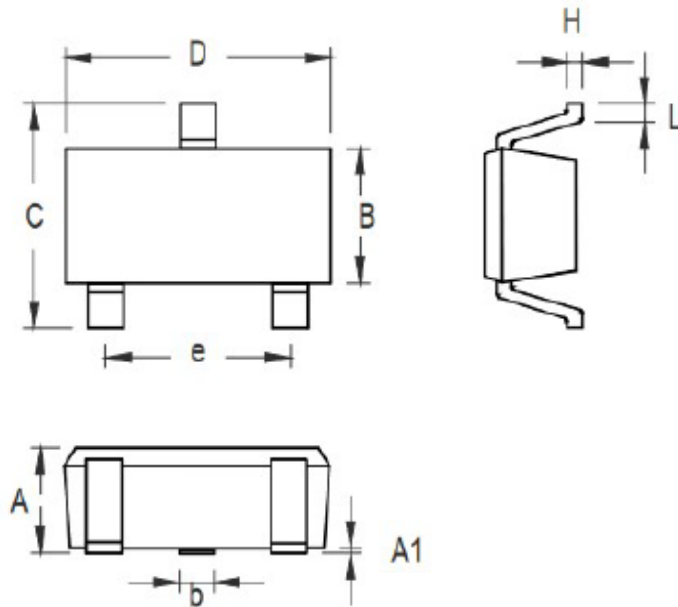
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.397	1.600	0.055	0.063
b	0.356	0.483	0.014	0.019
B	2.388	2.591	0.094	0.102
b1	0.406	0.533	0.016	0.021
C	3.937	4.242	0.155	0.167
C1	0.787	1.194	0.031	0.047
D	4.394	4.597	0.173	0.181
D1	1.397	1.753	0.055	0.069
e	1.448	1.549	0.057	0.061
H	0.356	0.432	0.014	0.017

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SOT23-3

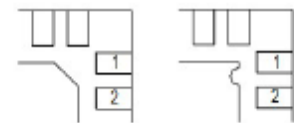
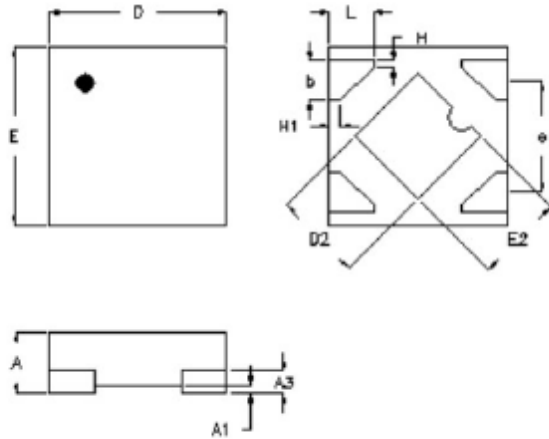
Outline Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.889	1.295	0.035	0.051
A1	0.000	0.152	0.000	0.006
B	1.397	1.803	0.055	0.071
b	0.356	0.508	0.014	0.020
C	2.591	2.997	0.102	0.118
D	2.692	3.099	0.106	0.122
e	1.803	2.007	0.071	0.079
H	0.080	0.254	0.003	0.010
L	0.300	0.610	0.012	0.024



DFN 1*1 4L



DETAILA

Pin #1 ID and Tie Bar Mark Options

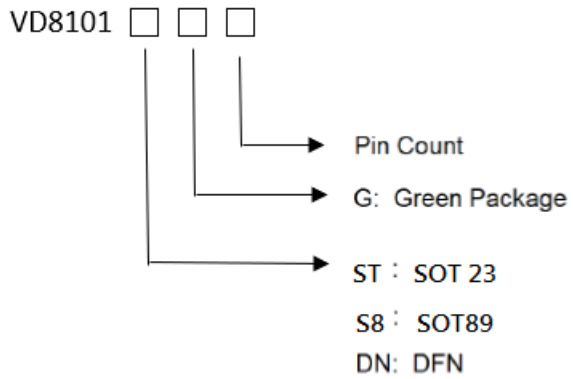
Note : The configuration of the Pin #1 identifier is optional, but must be located within the zone indicated.

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.300	0.400	0.012	0.016
A1	0.000	0.050	0.000	0.002
A3	0.117	0.162	0.005	0.006
b	0.175	0.275	0.007	0.011
D	0.900	1.100	0.035	0.043
D2	0.450	0.550	0.018	0.022
E	0.900	1.100	0.035	0.043
E2	0.450	0.550	0.018	0.022
e	0.625		0.025	
L	0.200	0.300	0.008	0.012
H	0.039		0.002	
H1	0.064		0.003	



VD8101

Ordering Information



Part No.	Q`ty/Reel
VD8101STG3	4000
VD8101S8G-3	4000
VD8101DNG4	4000

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