Features

- Transient protection for high-speed data lines
  - IEC 61000-4-2 (ESD) ±30kV (Air)
    ±30kV (Contact)
  - IEC 61000-4-4 (EFT) 40A (5/50 ns)
  - IEC 61000-4-5 (Surge) 24A (8/20 μs)
- Package optimized for high-speed lines
- Provides protection for two line pairs
- Low capacitance:2.0pF@3.0V(Typical)
- Low leakage current:0.1uA@V_{RWM}(Typical)
- Low operating and clamping voltage
- Each I/O pie can withstand over 1000 ESD strikes for ±8kV contact discharge

Description

S2814VU is an ultra low-capacitance Transient Voltage Suppressor (TVS) array designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 1.0pF only,S2814VU is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC61000-4-2 (ESD),Level 4 (±15kV air,±8kV contact discharge),IEC61000-4-4(electrical fast transient-EFT)(40A,5/50ns),IEC61000-4-5 (Surge)(24A,8/20μs), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

S2814VU is in an SOP-8 package.Each S2814VU device can protect two high-speed line pairs. The "flow-thru" design minimizes trace inductance and reduces voltage overshoot associated with ESD events. The combined features of low capacitance and high ESD robustness make S2814VU idaeal for high-speed data port and high-frequency line (e.g., Gigabit Ethernet Port) applications. The low clamping voltage of the S2814VU guarantees a minimum stress on the protected IC.

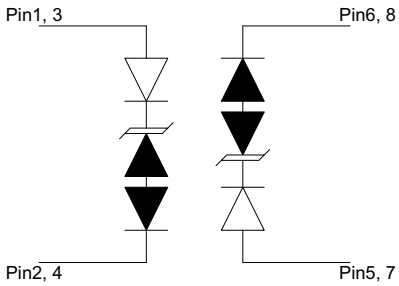
Applications

- 10/100/1000M Ethernet Ports
- WAN/LAN Equipment
- Desktops, Servers and Notebooks
- Cellular Phones
- Switching Systems
- Audio/Video Inputs

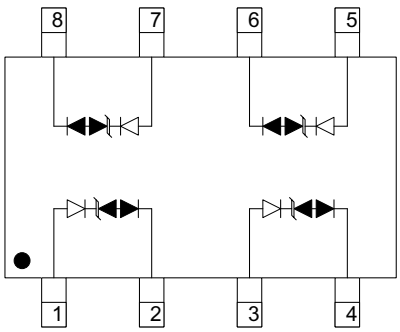
Mechanical Characteristics

- SOP-8 package
- Flammability Rating: UL 94V-0
- Packaging: Tape and Reel

Circuit Diagram



Pin Configuration



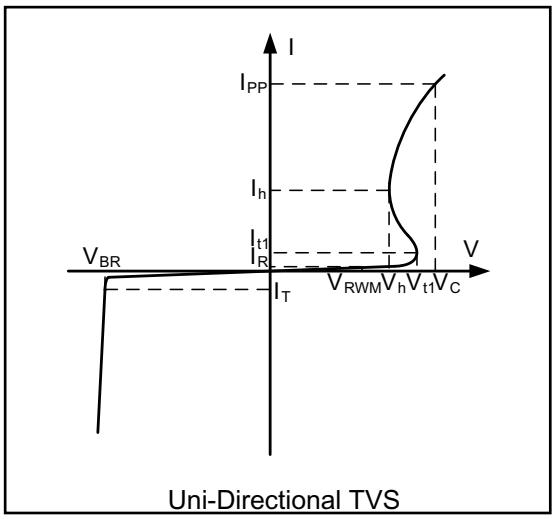
SOP-8
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current (8/20us)	30	A
P_{PK}	Peak Pulse Power (8/20us)	450	Watts
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±30 ±30	kV
T_{OPT}	Operating Temperature	-55 to +125	°C
T_{STG}	Storage Temperature	-55 to +150	°C
T_{LST}	Lead Soldering Temperature	260 (10 seconds)	°C

Electrical Characteristics (T=25°C)

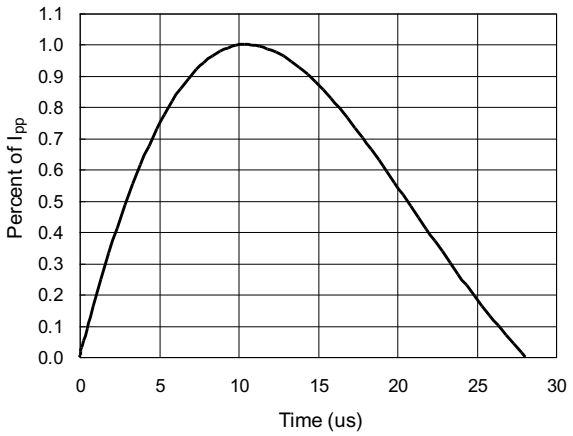
Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current@V_{RWM}
V_{t1}	Trigger Voltage
I_{t1}	Trigger Current @ V_{t1}
V_h	Holding Voltage
I_h	Holding Current @ V_h
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
V_{BR}	Breakdown Voltage @ I_T
C_{ESD}	Parasitic Capacitance



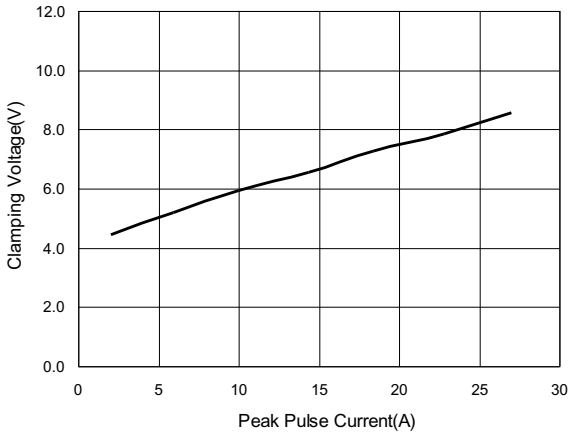
Uni-Directional TVS

Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				2.8	V
I_R	V_{RWM} = 2.8V, T = 25°C		0.1	1.0	μA
V_{t1}	I_{t1} = 1μA	3.0	3.7	4.5	V
V_h	I_h = 1mA	3.0		4.0	V
V_C	I_{PP} = 2A, t_p = 8/20μs (Each Line)			5.0	V
V_C	I_{PP} = 10A, t_p = 8/20μs (Each Line)			8.0	V
V_C	I_{PP} = 24A, t_p = 8/20μs (Each Line)			14.0	V
C_{ESD}	V_R = 3.0V, f = 1MHz (Each Line)		2.0	3.0	pF

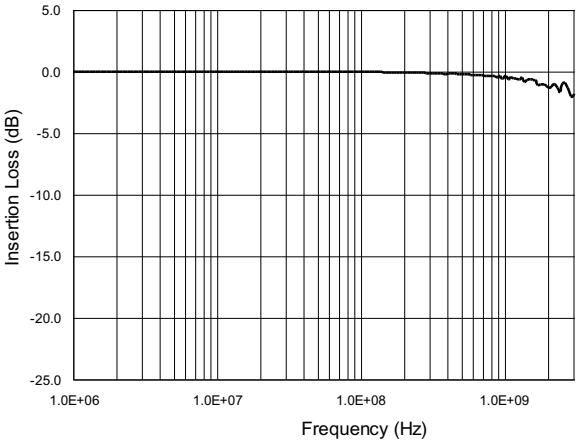
8/20μs Pulse Waveform



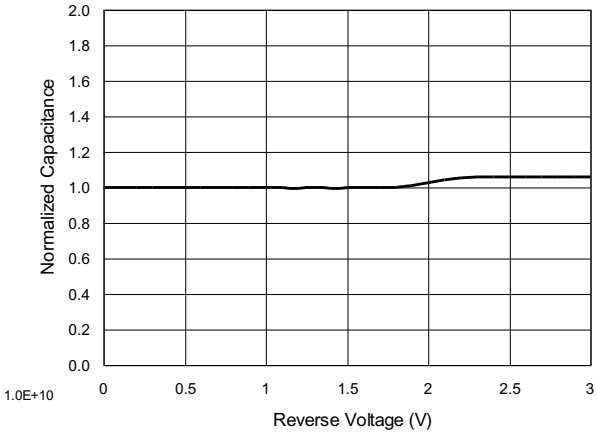
Clamping Voltage V_C vs. Current I_{PP}



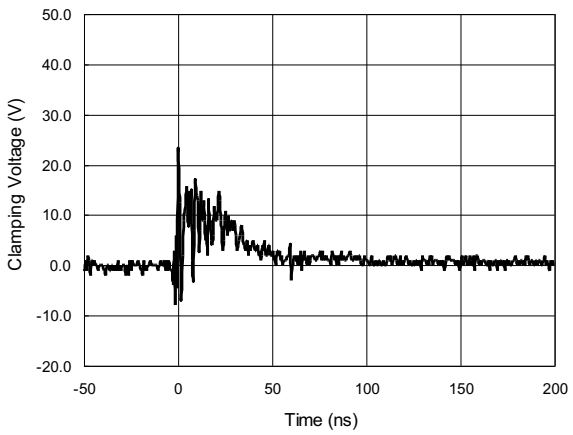
Insertion Loss S21



Normalized Capacitance vs. Voltage



ESD Clamping of I/O to GND (+8kV Contact per IEC 61000 -4-2)



Application Information

Electronic equipment is susceptible to damage caused by a variety of sources, including Electrostatic Discharge (ESD), Electrical Fast Transients (EFT) and Lightning strikes. The S2814VU was designed to protect the sensitive equipment from damage which may be induced by such transient events. This product canbe configured in different connections to meet the requirement of common-mode and differential-mode asfollows:

Four Lines Protection

The S2814VU can provide protection for four high speed data lines as depicted in figure 1:
Pin 1 is connected to Line 1
Pin 3 is connected to Line 2
Pin 5 is connected to Line 3
Pin 7 is connected to Line 4
Pin 2, 4, 6 and 8 are connected to ground

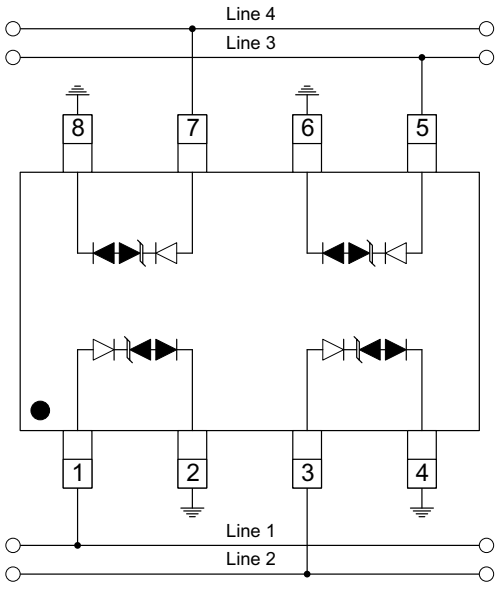


Figure 1 Four lines protection configuration

Two Lines Bidirectional Protection

The S2814VU can provide bidirectional protection for two high speed data lines as depicted in figure 2:
Pin 1 & 4 is connected to Line 1
Pin 5 & 8 is connected to Line 2
Pin 2, 3, 6 and 7 are connected to ground

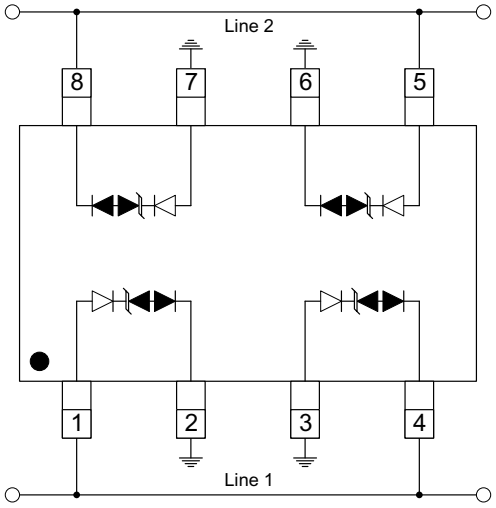


Figure 2 Two lines bidirectional protection

Two Line Pairs Differential Protection

The S2814VU can provide differential protection for two high speed data line pairs as depicted in figure 3
Pin 1, 2, 7 and 8 are connected to Line Pair 1
Pin 3, 4, 5 and 6 are connect to Line Pair 2

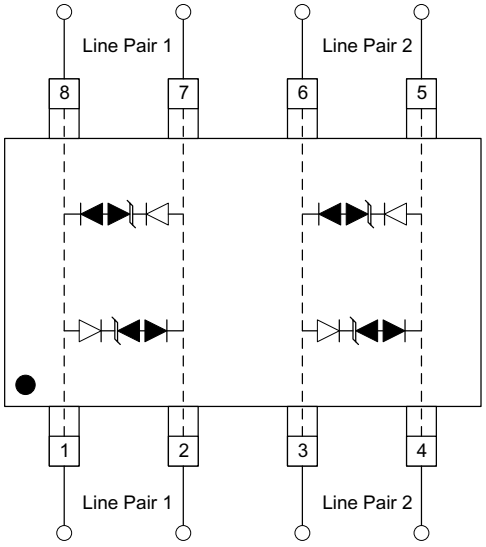
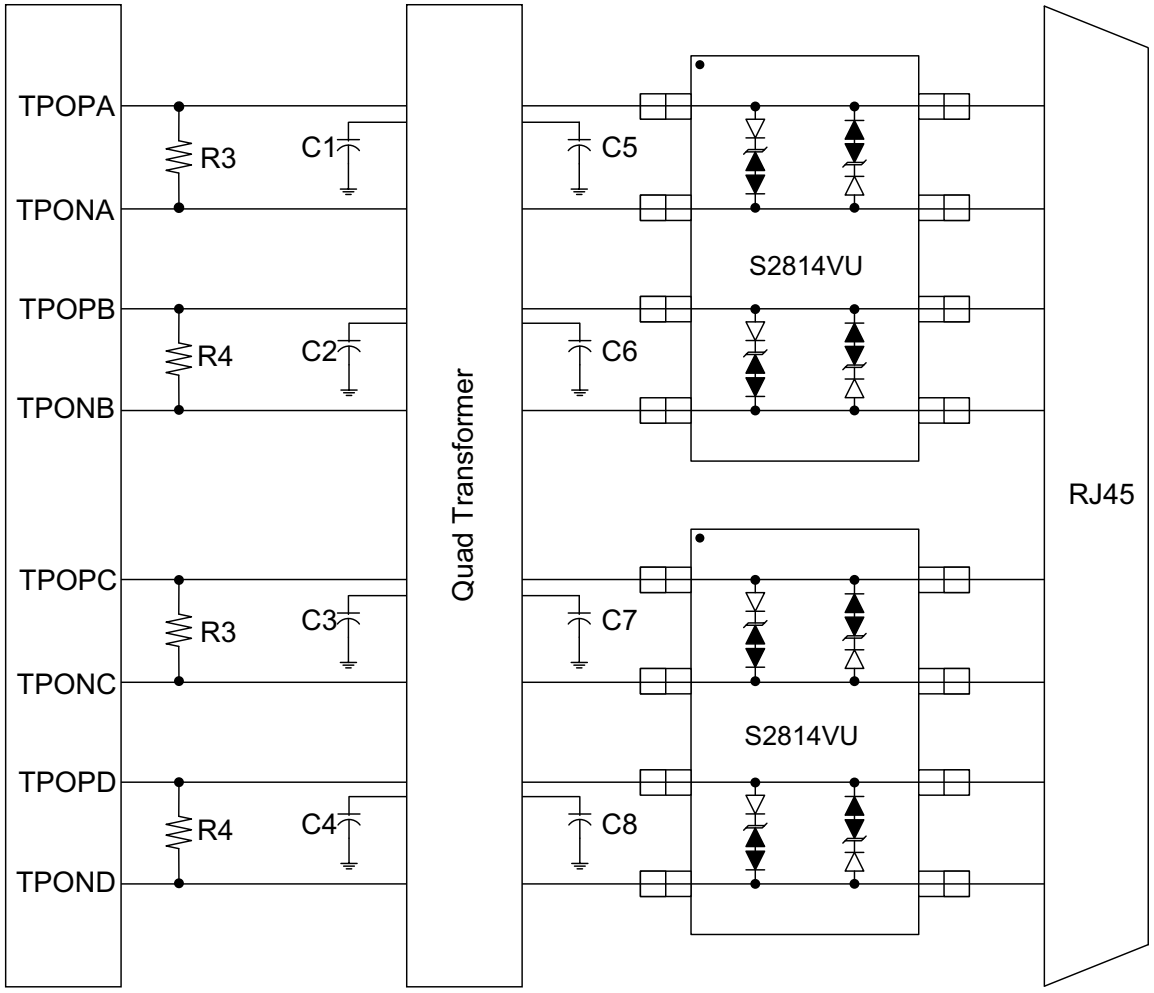


Figure 3 Two line pairs differential protection

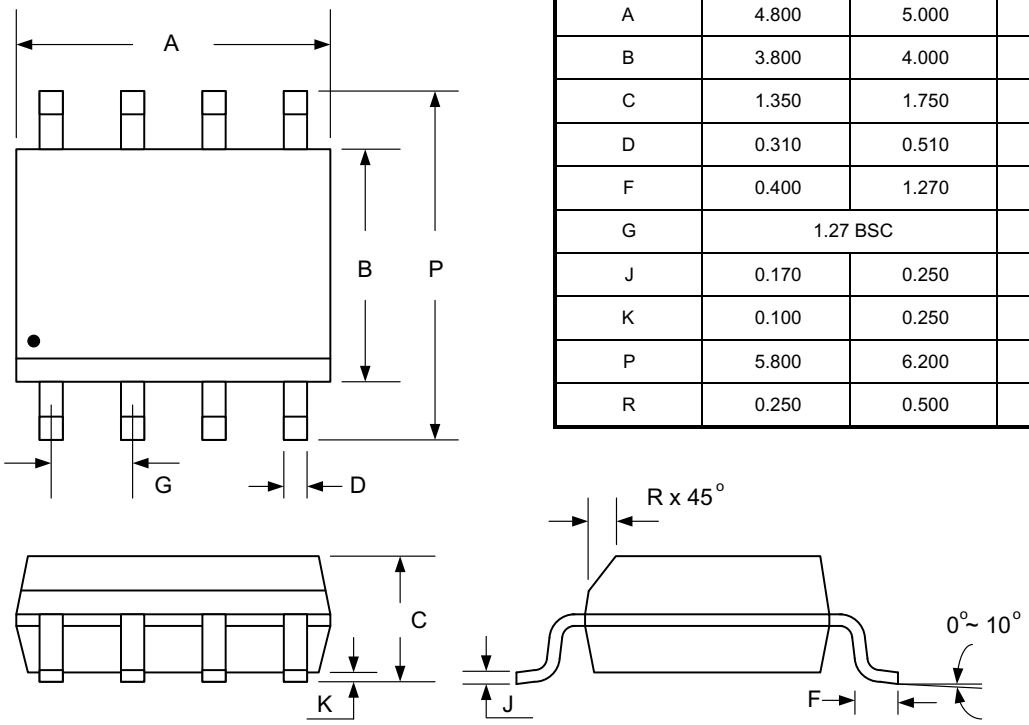
Application Information



Schematic Diagram for Gigabit Ethernet ESD/Surge Protection

Package Outline

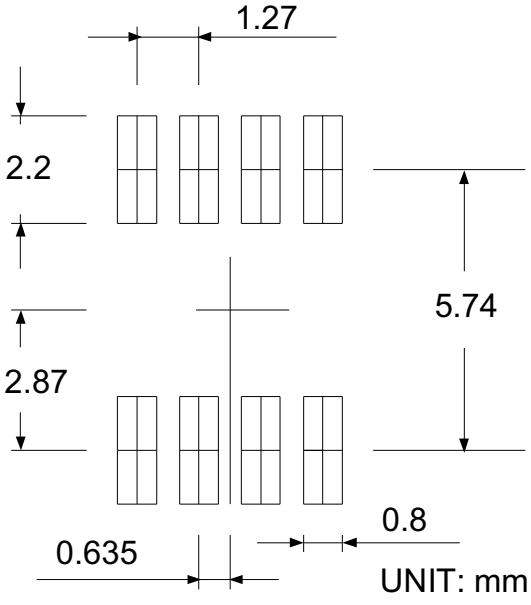
SOP-8 package

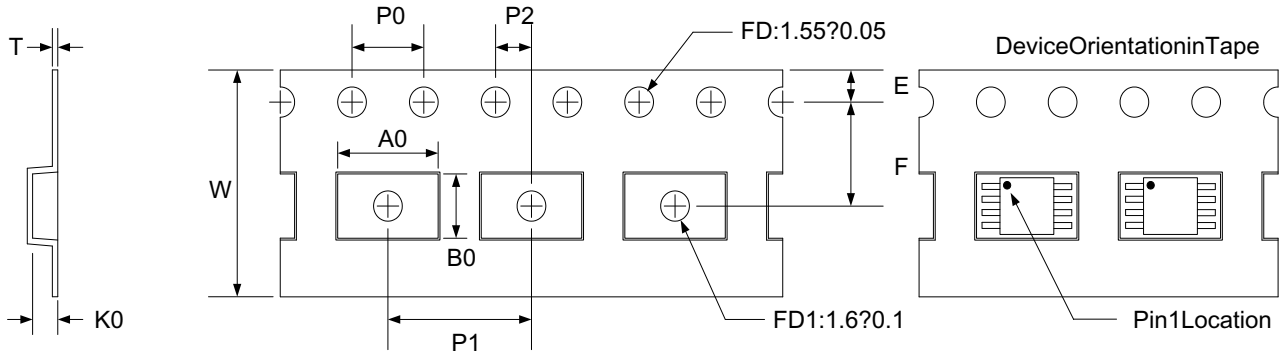


Symbol	Dimensions (mm)		Dimensions (inches)	
	Minimum	Maximum	Minimum	Maximum
A	4.800	5.000	0.189	0.196
B	3.800	4.000	0.150	0.157
C	1.350	1.750	0.054	0.068
D	0.310	0.510	0.012	0.020
F	0.400	1.270	0.016	0.050
G	1.27 BSC		0.05 BSC	
J	0.170	0.250	0.007	0.009
K	0.100	0.250	0.004	0.008
P	5.800	6.200	0.229	0.244
R	0.250	0.500	0.010	0.019

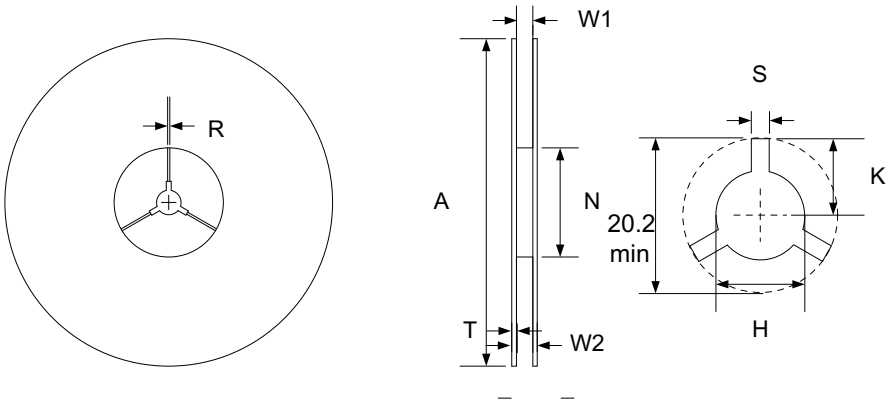
Package Dimensions (Controlling dimensions are in millimeters)

RECOMMENDED LAND PATTERN



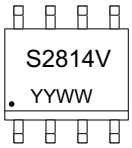


Symbol	W	A0	B0	K0	E	F	P1	P0	P2	T
Dimensions (mm)	12.00±0.3	6.40±0.1	5.2±0.1	2.10±0.1	1.75±0.1	5.50±0.1	8.00±0.1	4.0±0.1	2.0±0.1	0.3±0.05



Symbol	Reel Size	A	N	W2	W1	H	T	S	K	R
Dimensions (mm)	Φ330	330.0±2.0	100.0±2.0	18.4 max	12.4+2.0 -0.0	13.0+0.5 -0.2	2.0±0.2	1.5 min	10.1 min	2.5 min

Marking Codes



Note:

(1) "S2814VU" is the part number,fixed

(2) "YYWW" is date code. "YY" is year(2013 is "13");while"WW" is the assembly week in a year.

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
S2814VU	2.8V	3,000	13 Inch

- CITC reserves the right to make changes to this document and its products and specifications at any time without notice.
- Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.
- CITC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does CITC assume any liability for application assistance or customer product design.
- CITC does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.
- No license is granted by implication or otherwise under any intellectual property rights of CITC.
- CITC products are not authorized for use as critical components in life support devices or systems without express written approval of CITC.

http://www.citcorp.com.tw/ Tel:886-3-5600628 Fax:886-3-5600636
Add:Rm. 3, 2F., No.32, Taiyuan St., Zhubei City, Hsinchu County 302, Taiwan (R.O.C.)

Document ID : DS-22V04
Revised Date : 2016/08/30
Revision : C