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## End of Life Notification

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**End of Life Notification: EOL-000055**  
**Date Issued: 10/20/2013**

Dear Semtech Customer or Distributor:

This letter is to notify your company that Semtech is discontinuing the manufacture of the EClamp2357N.TCT products. In accordance with Semtech's product discontinuation policy, we are hereby giving notice of product discontinuance as a result of our suppliers inability to obtain sufficient material for continued manufacturing.

Semtech suggests the following replacement device: EClamp2357NQTCT. Product Data Sheet has been attached to this EOL notice.

### **Last Time Buy Conditions**

As a result of our suppliers' inability to manufacture this product, Semtech Corporation is unable to offer any last time buy instructions.

### **LIMITED WARRANTY**

In general, all discontinued product orders subject to this notice shall carry Semtech's standard limited warranty; or, if applicable, the warranty set forth in a duly executed formal contract between Semtech and your company will apply; except that:

1. Semtech will accept all valid warranty claims for credit only, unless a replacement order is otherwise agreed upon by Semtech and the replacement parts can be manufactured or delivered from remaining inventory.
2. The applicable warranty period for making any return claims for discontinued products will be no later than ninety (90) days following delivery of the discontinued products.
3. Any return claims must be made under Semtech's current Return Material Authorization "RMA" procedures.

### **ADDITIONAL PROVISIONS**

SEMTECH ACCEPTS NO LIABILITY FOR EXCESS REPROCUREMENT COSTS OR FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHATSOEVER ASSOCIATED WITH THIS NOTICE, WITH ITS PRODUCTS, OR WITH THE FINAL MANUFACTURE AND PERFORMANCE AGAINST ANY LAST TIME BUY ORDERS RELATED TO THE DISCONTINUED PRODUCTS COVERED BY THIS NOTICE.

We regret the inconvenience and impact this notice may cause your company. Semtech's sales, marketing, and distribution personnel stand ready to assist you in placing your company's orders for replacement product, or in providing the product information you require.

For product inquiries or purchase order information, please contact your local Semtech sales representative.



A handwritten signature in black ink that reads 'Pat Sanchez'. The signature is fluid and cursive, with the first name 'Pat' and last name 'Sanchez' clearly legible.

Pat Sanchez  
Manager, Corporate Quality  
Semtech Corporation  
200 Flynn Road  
Camarillo, CA 93012  
Psanchez@semtech.com  
Office: (805) 480-2074  
Fax: (805) 498-3804

### PROTECTION PRODUCTS - EMIClamp®

#### Description

The EClamp®2357NQ is a low pass filter array with integrated TVS diodes. It is designed to suppress unwanted EMI/RFI signals and provide electrostatic discharge (ESD) protection in portable electronic equipment. They have been optimized for protection of touch screen displays, secure digital (SD) card interfaces, and color LCD panels in cellular phones and other portable electronics.

The device consists of six pi filter circuits comprised of TVS diodes for ESD protection, and a resistor capacitor network for EMI/RFI filtering. A series resistor value of 100Ω and a component capacitance value of 10pF are used to achieve 20dB minimum attenuation from 1.0GHz to 3GHz. The device also includes 4 discrete TVS diodes for dedicated ESD protection. All of the TVS diodes provide effective suppression of ESD voltages in excess of ±15kV (air discharge) and ±8kV (contact discharge) per IEC 61000-4-2, level 4.

The EClamp2357NQ is qualified to AEC-Q100 Grade 1 for Automotive use.

#### Features

- ◆ EMI/RFI filter with integrated ESD protection
- ◆ ESD protection to **IEC 61000-4-2 (ESD) Level4, ±15kV (air), ±8kV (contact)**
- ◆ Filter performance: **>30dB attenuation** at 1.8GHz
- ◆ TVS working voltage: 5V
- ◆ Resistor: 100Ω +/- 15%
- ◆ Component Capacitance: 10pF (VR = 0V)
- ◆ EMI & ESD protection for six lines
- ◆ Dedicated ESD protection for four lines
- ◆ Solid-state technology
- ◆ AEC-Q100 Grade 1 Qualified.

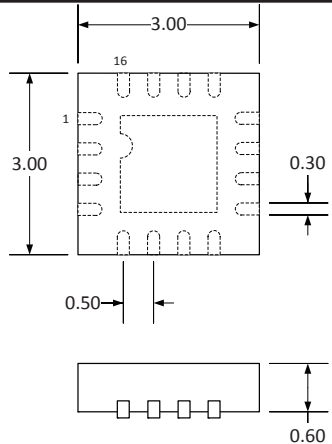
#### Mechanical Characteristics

- ◆ 16 pin QFN
- ◆ RoHS/WEEE Compliant
- ◆ Nominal Dimensions: 3.0 x 3.0 x 1.0 mm
- ◆ Lead Pitch: 0.5mm
- ◆ Lead Finish: Matte Tin
- ◆ Marking: Marking Code
- ◆ Packaging: Tape and Reel per EIA 481

#### Applications

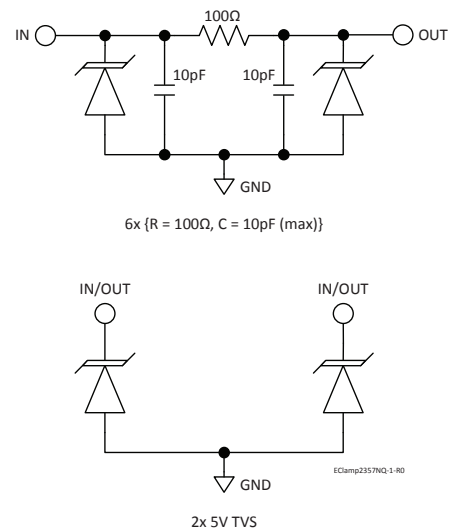
- ◆ Touch Screen Display Interfaces
- ◆ Secure Digital (SD) Memory Card Interfaces
- ◆ Multimedia Card Interfaces (MCI)
- ◆ Color LCD Panel Protection
- ◆ Cell Phone Handsets and Accessories
- ◆ Automotive Applications.

#### Package Dimensions



**16 Pin QFN (Top Side View)  
Nominal Dimensions (in mm)**

#### Schematic & Pin Configuration



## PROTECTION PRODUCTS

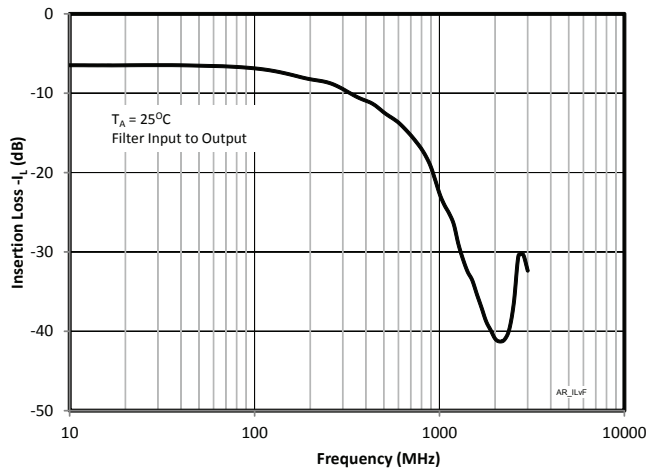
### Absolute Maximum Ratings

Rating	Symbol	Value	Units
ESD per IEC61000-4-2 (Air) ESD per IEC61000-4-2 (Contact)	$V_{ESD}$	$\pm 20$ $\pm 12$	kV
Junction Temperature	$T_J$	125	$^{\circ}\text{C}$
Operating Temperature	$T_{OP}$	-40 to +125	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 to +150	$^{\circ}\text{C}$

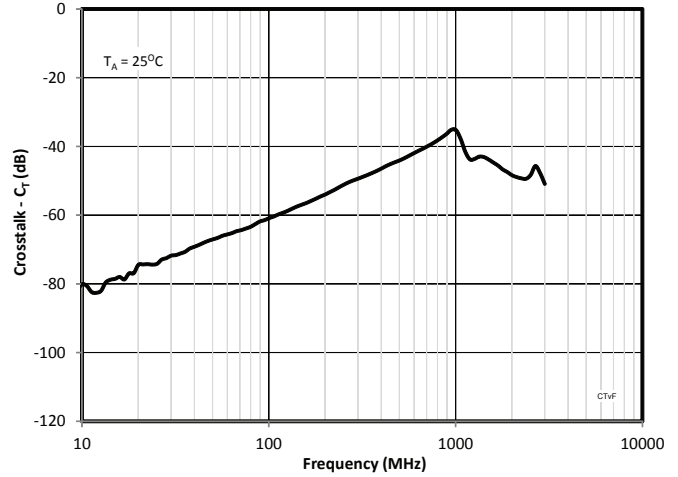
### Electrical Characteristics (T=25 $^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units	
TVS Reverse Stand-Off Voltage	$V_{RWM}$				5	V	
TVS Reverse Breakdown Voltage	$V_{BR}$	$I_t = 1\text{mA}$ $T = -40 \text{ to } +125^{\circ}\text{C}$	6	8	10	V	
TVS Reverse Leakage Current	$I_R$	$VRWM = 3.3\text{V}$ $T = -40 \text{ to } +125^{\circ}\text{C}$			0.5	$\mu\text{A}$	
Total Series Resistance	R	Each Line $T = -40 \text{ to } +125^{\circ}\text{C}$	85	100	115	$\Omega$	
Total Capacitance	$C_{IN}$	Input to Gnd Each Line $f = 1\text{MHz}$	$V_R = 0\text{V}$		20	22	pF
			$V_R = 2.5\text{V}$		12	15	

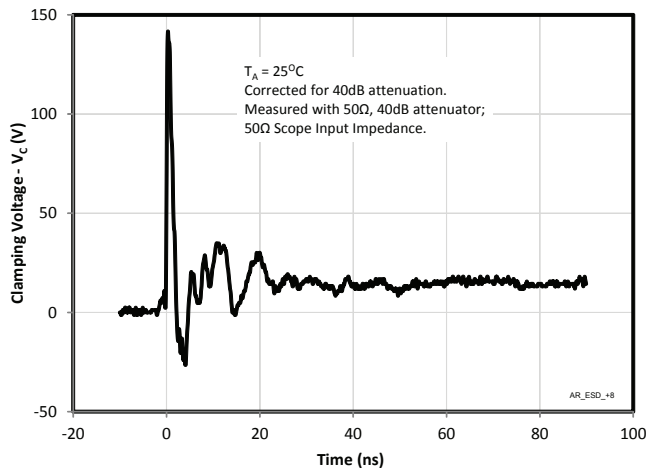
#### Typical Insertion Loss S21 (Each Filter)



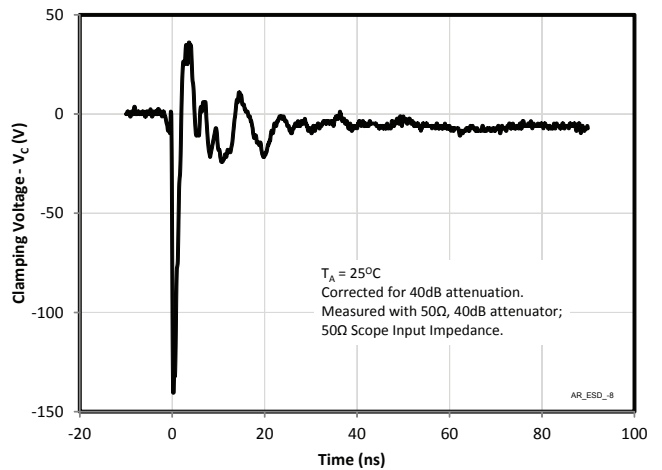
#### Analog Crosstalk (Each Line)



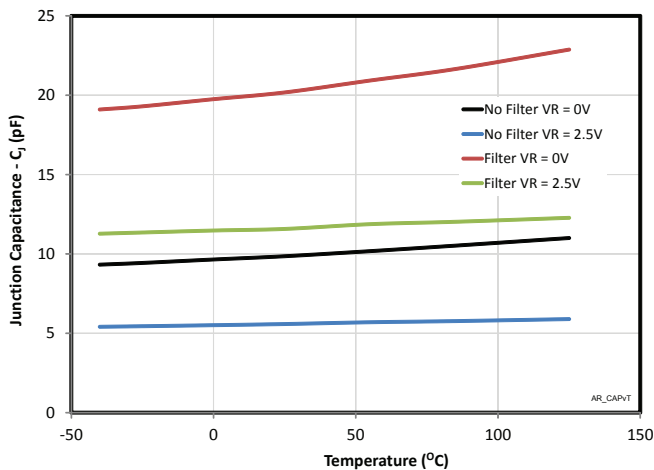
#### ESD Clamping (+8kV Contact)



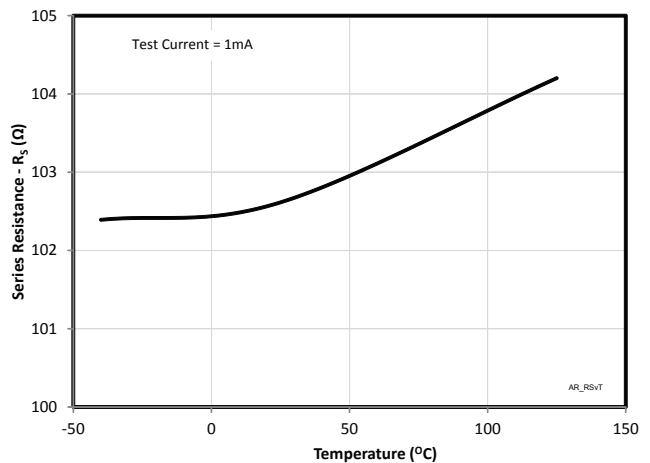
#### ESD Clamping (-8kV Contact)



#### Capacitance vs. Temperature



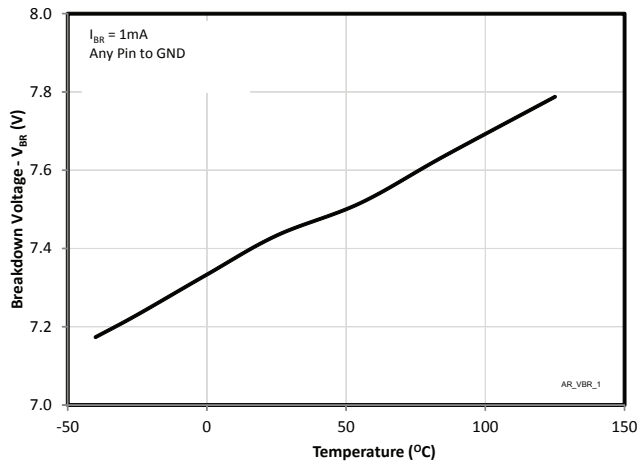
#### Series Resistance vs. Temperature



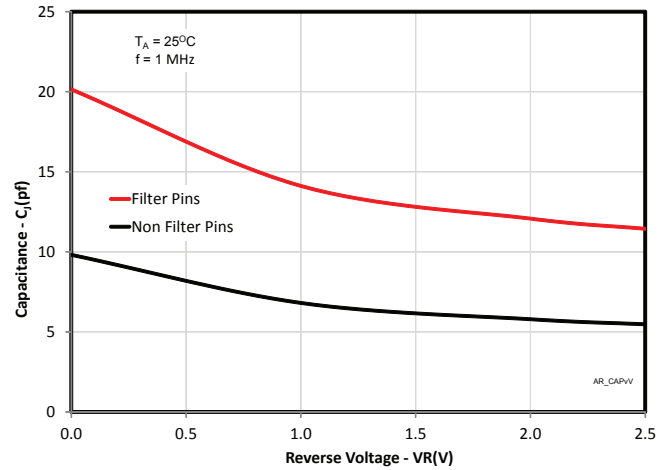
## PROTECTION PRODUCTS

### Typical Characteristics (Continued)

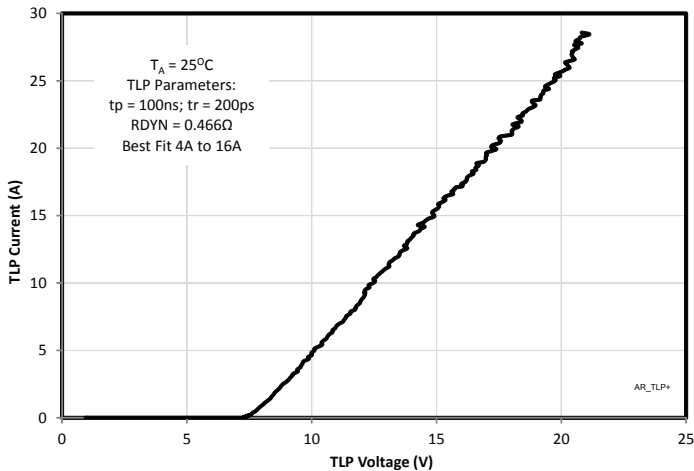
#### Breakdown Voltage vs. Temperature



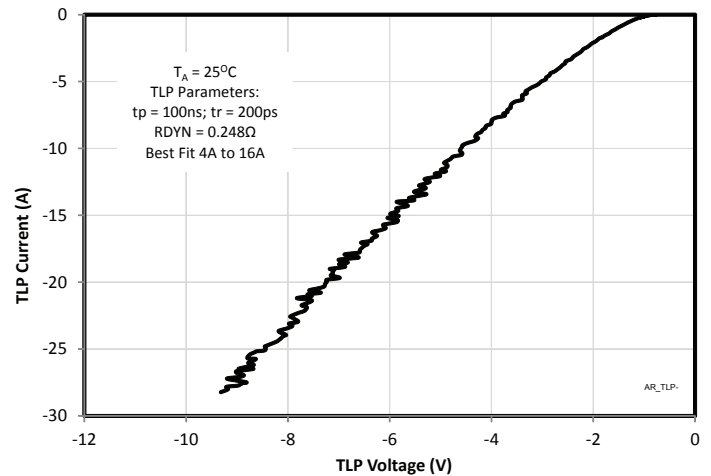
#### Capacitance vs. Reverse Voltage



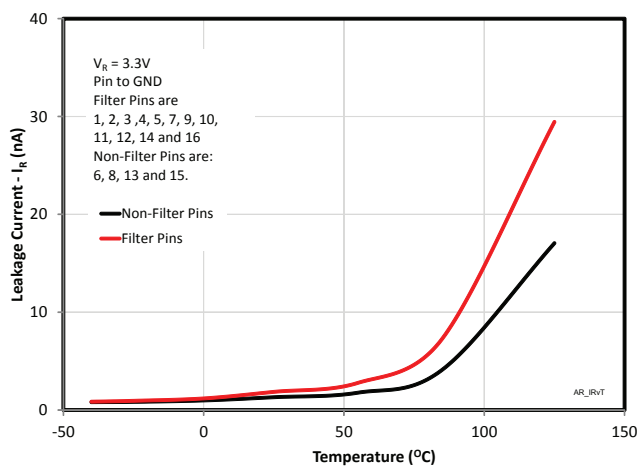
#### TLP Characteristics Positive



#### TLP Characteristics Positive



#### Leakage Current vs. Temperature



## PROTECTION PRODUCTS

### Applications Information

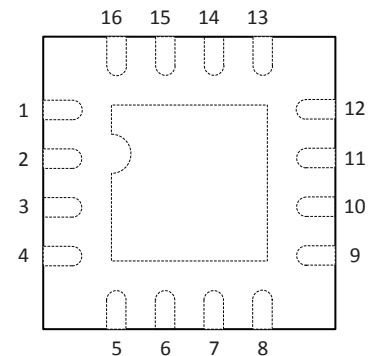
#### Device Connection

The EClamp2357NQ is comprised of six circuits each consisting of a low pass filter for EMI/RFI suppression and dual TVS diodes for ESD protection. It also includes 4 lines of TVS diodes for ESD protection of power lines or high speed I/O lines. The device is housed in a 16-pin Quad Flat No-Lead (QFN) package. Electrical connection is made via 16 pins located at the bottom of the device. A center tab serves as the ground connection. Pin connections are noted in the table to the right. The device is designed for easy PCB routing as shown in the application examples. All path lengths should be kept as short as possible to minimize the effects of parasitic inductance in the board traces.

#### Matte Tin Lead Finish

Matte tin has become the industry standard lead-free replacement for SnPb lead finishes. A matte tin finish is composed of 100% tin solder with large grains. Since the solder volume on the leads is small compared to the solder paste volume that is placed on the land pattern of the PCB, the reflow profile will be determined by the requirements of the solder paste. Therefore, these devices are compatible with both lead-free and SnPb assembly techniques. In addition, unlike other lead-free compositions, matte tin does not have any added alloys that can cause degradation of the solder joint.

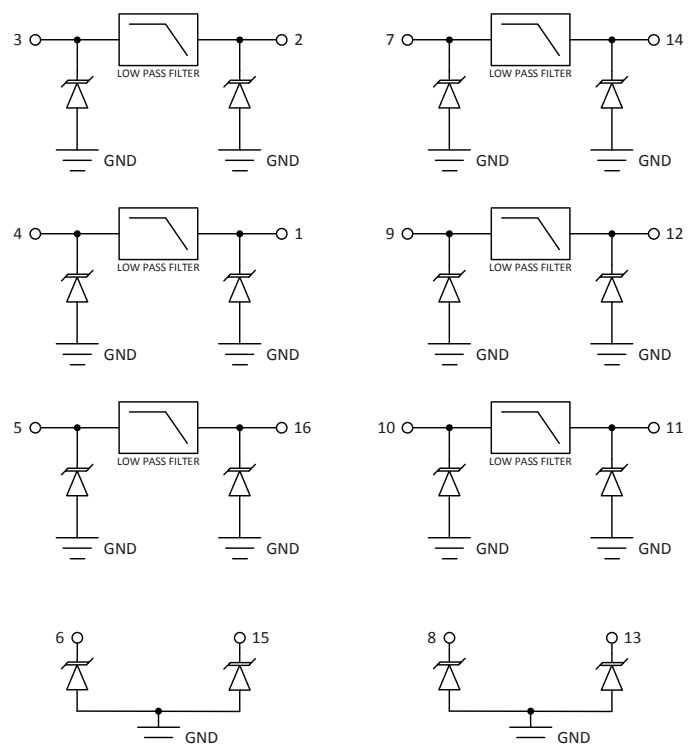
#### Pin Identification and Configuration (Top Side View)



EClamp2357NQ-3-RO

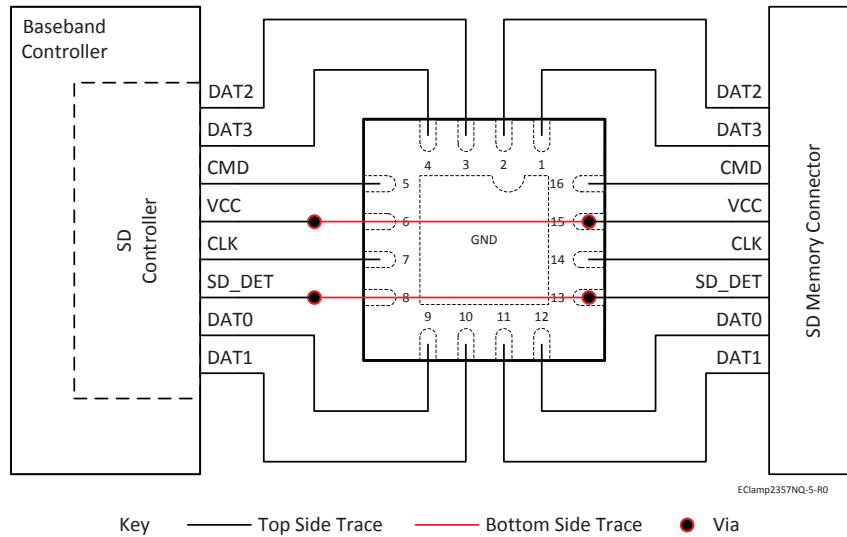
Pin	Identification
3, 4, 5, 7, 9, 10	Input EMI/ESD Protected Lines
1, 2, 11, 12, 14, 16	Output EMI/ESD Protected Lines
6, 8, 13, 15	Input/Output ESD Protected Lines
Center Tab	Ground

#### Pin Configuration and Schematic

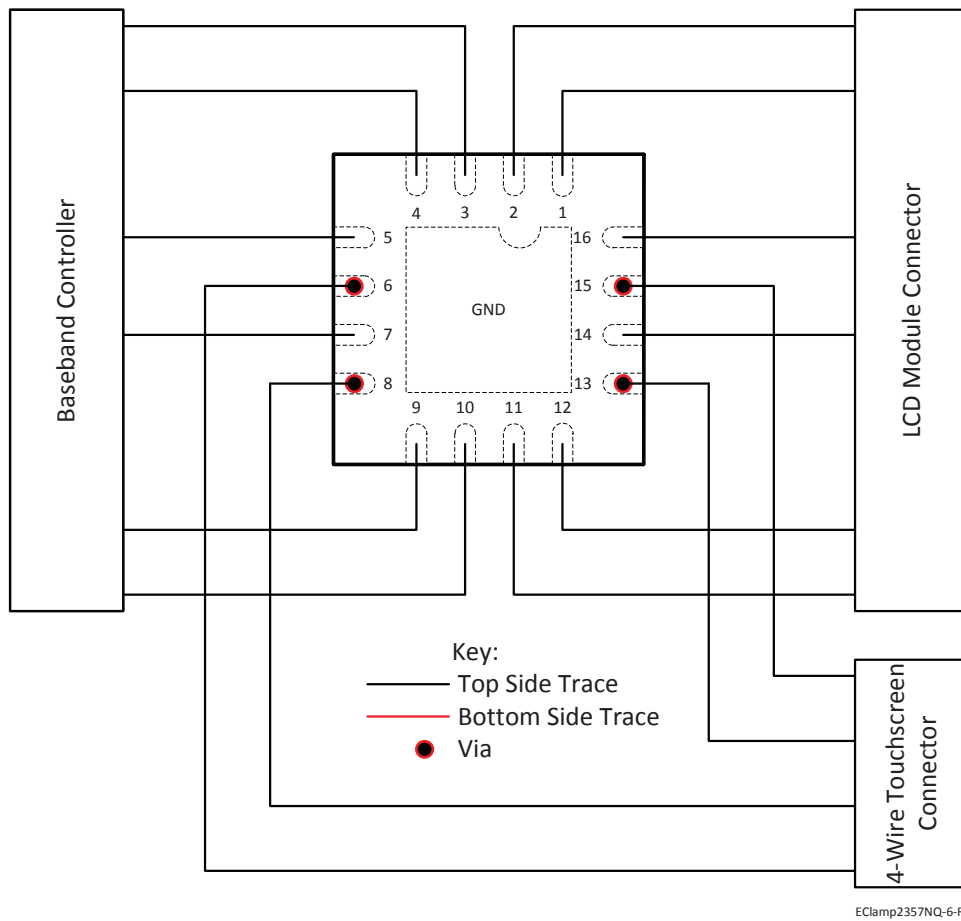


EClamp2357NQ-4-RO

EClamp2357NQ SD Memory



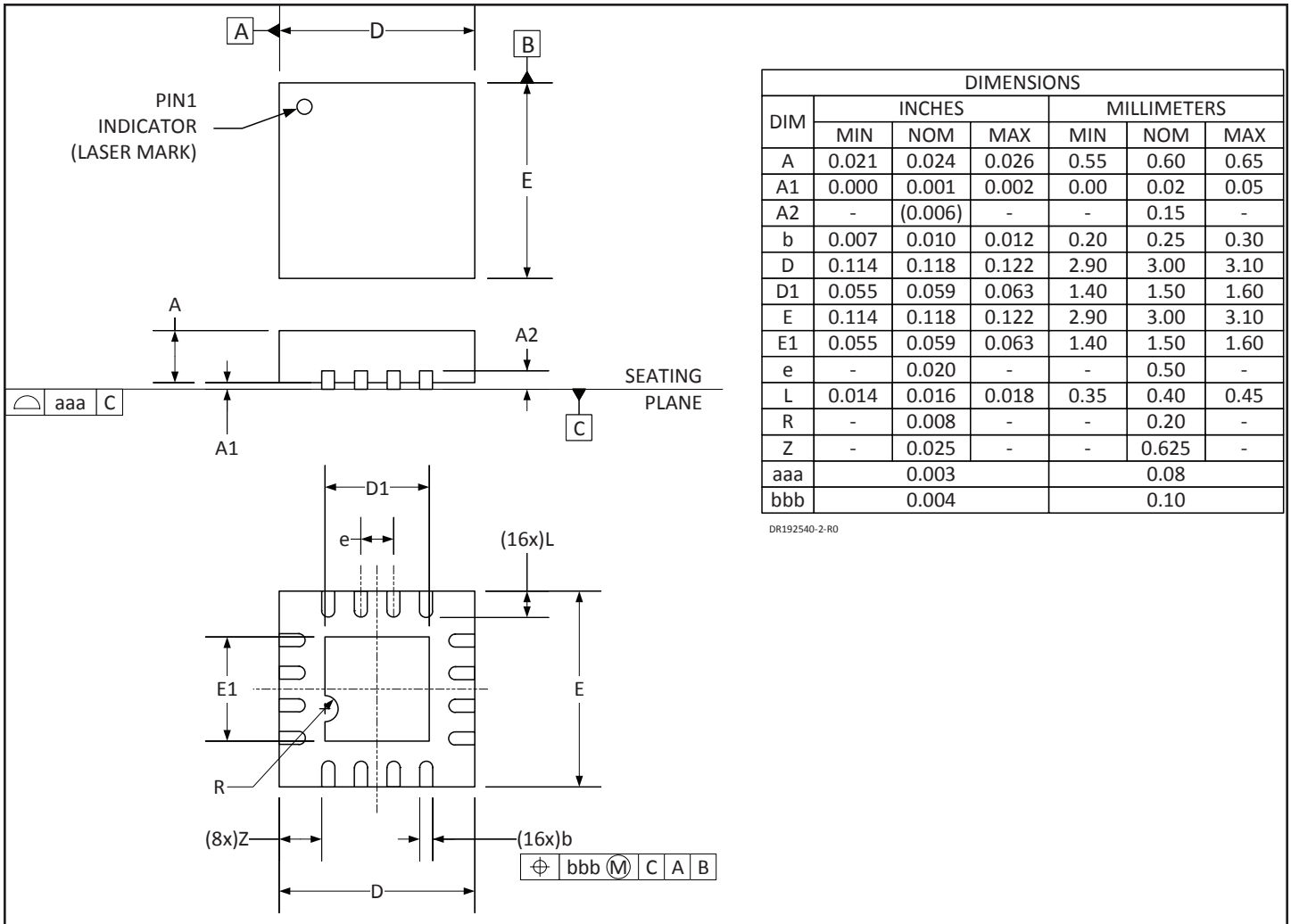
EClamp2357NQ LCD and Touch Pad



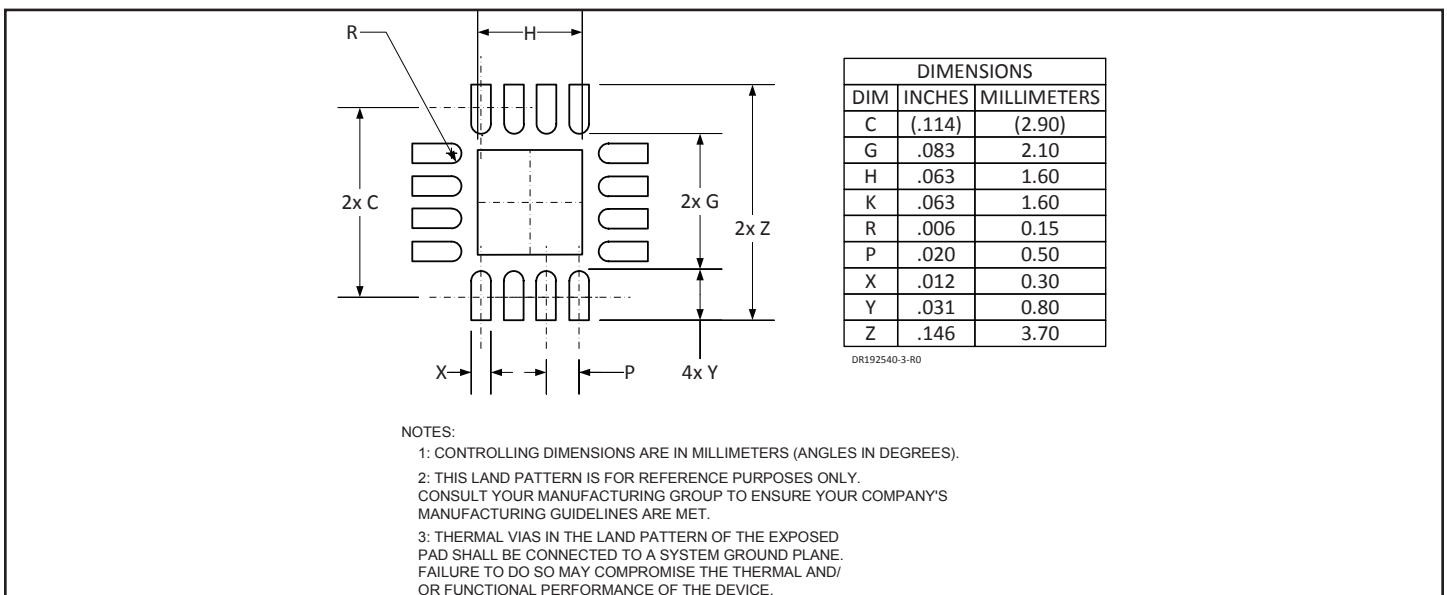


## PROTECTION PRODUCTS

### Outline Drawing - 16L QFN

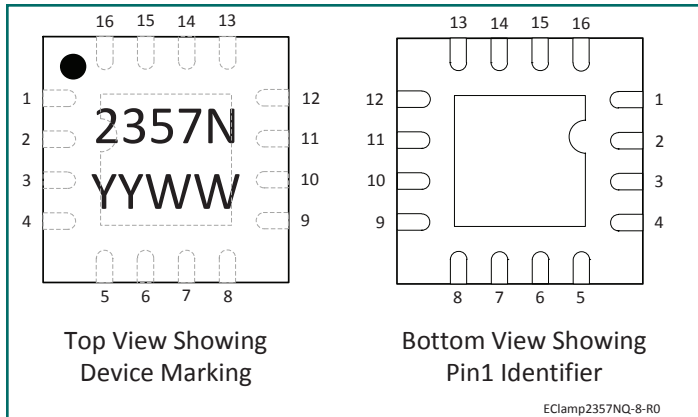


### Land Pattern - 16L QFN



## PROTECTION PRODUCTS

### Marking



### Ordering Information

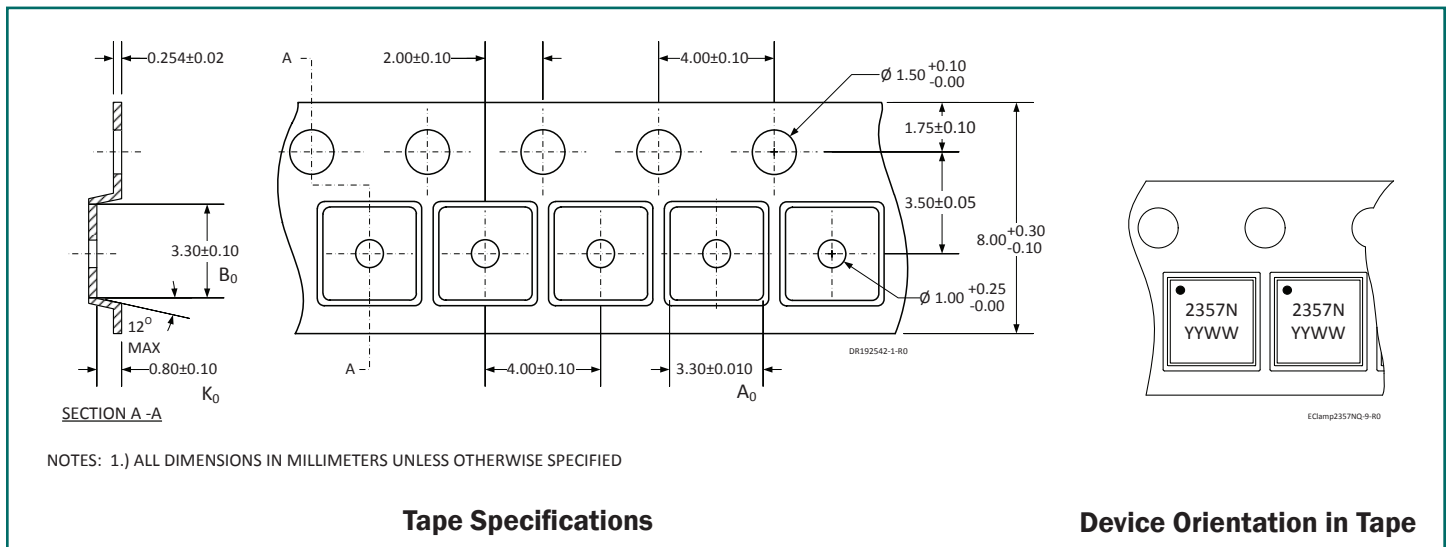
Part Number	Qty per Reel	Reel Size
EClamp2357NQ-TCT	3000	7 Inch

Note:  
EClamp and EMIClamp are registered marks of Semtech Corporation.

#### Notes:

- 1) YYWW = Date Code
- 2) Pin 1 indicated by "Mouse Bite" on the ground pad

### Tape and Reel Specification



### Contact Information

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 Protection Products Division  
 200 Flynn Rd., Camarillo, CA 93012  
 Phone: (805)498-2111 FAX (805)498-3804