

PROTECTION PRODUCTS

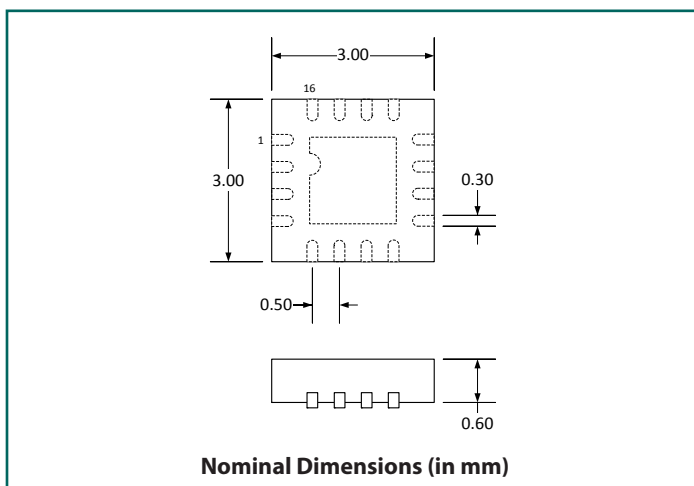
Description

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 π filter circuits comprised of TVS diodes for ESD protection, and a resistor capacitor network for EMI/RFI filtering. A series resistor value of 100 Ω 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 ± 20 kV (air discharge) and ± 12 kV (contact discharge) per IEC 61000-4-2, level 4.

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

Package Dimensions



Features

- EMI/RFI filter with integrated ESD protection
- ESD protection to IEC 61000-4-2 (ESD) Level 4, ± 20 kV (air), ± 12 kV (contact)
- Filter performance: >30dB attenuation at 1.8GHz
- TVS working voltage: 2.5V
- Resistor: 100 Ω $\pm$ 15%
- Capacitance: 10pF typ. ($V_R = 0$ V for non filter pins)
- EMI & ESD protection for six lines
- Dedicated ESD protection for four lines
- Solid-state technology
- AEC-Q100 Grade 1 Qualified

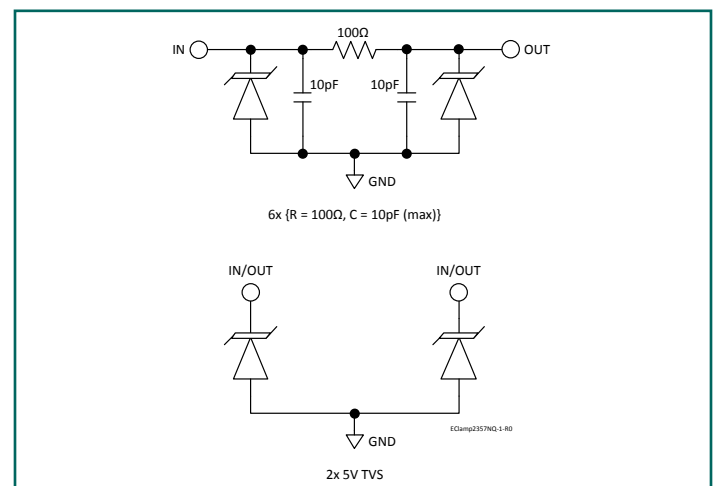
Mechanical Characteristics

- SLP3030P16 package
- Pb-Free, Halogen Free, RoHS/WEEE compliant
- Nominal Dimensions: 3.0 x 3.0 x 0.6 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

Schematic & Pin Configuration



Absolute Maximum Ratings

Rating	Symbol	Value	Units
ESD per IEC 61000-4-2 (Contact) ⁽¹⁾ ESD per IEC 61000-4-2 (Air) ⁽¹⁾	V_{ESD}	± 12 ± 20	kV
Junction Temperature	T_J	125	°C
Operating Temperature	T_{OP}	-40 to +125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Characteristics (T=25°C unless otherwise specified)

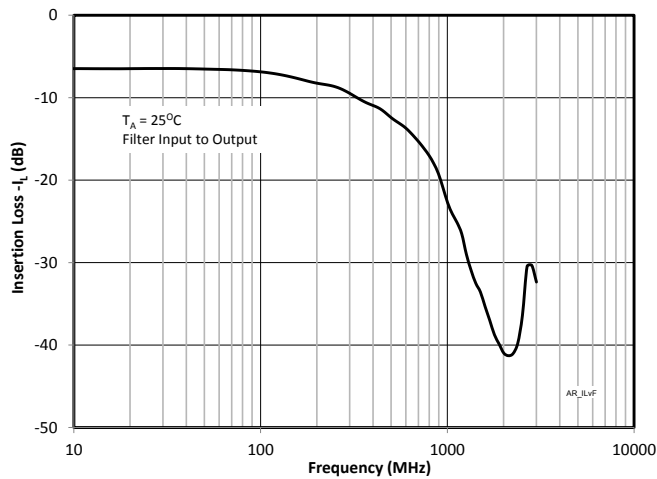
Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V _{RWM}	-40°C to 125°C, any I/O to GND				2.5	V
Reverse Breakdown Voltage	V _{BR}	I _t = 1mA, any I/O to GND	-40°C to 125°C	6	8	10	V
Reverse Leakage Current	I _R	V _{RWM} = 2.5V, any I/O to GND	-40°C to 125°C			0.5	μA
Total Series Resistance	R	Each line, T = -40 °C to 125 °C		85	100	115	Ω
Total Capacitance	C _{IN}	Input to Gnd, each Line, f = 1 MHz	V _R = 0V		20	22	pF
			V _R = 2.5V		12	15	

Notes:

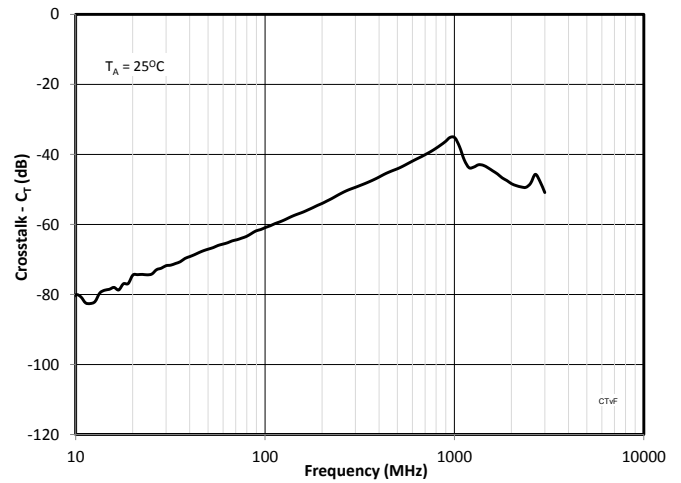
(1): ESD Gun return path to Ground Reference Plane (GRP)

Typical Characteristics

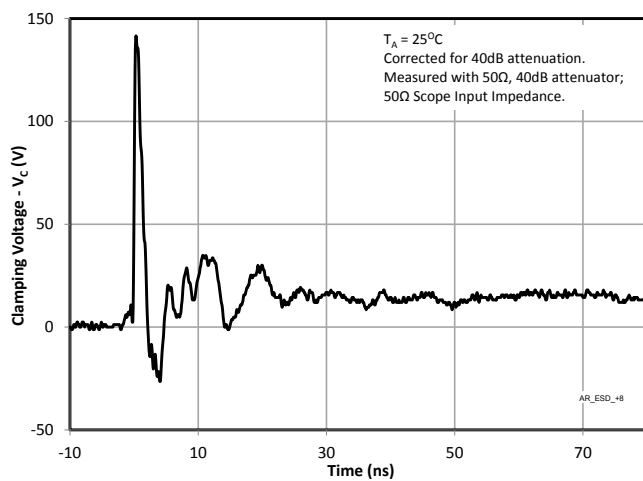
Typical Insertion Loss -S21 (Each Filter)



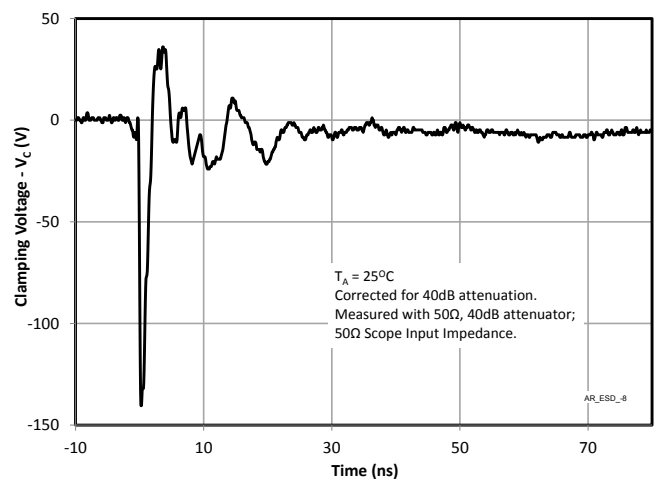
Analog Crosstalk (Each Line)



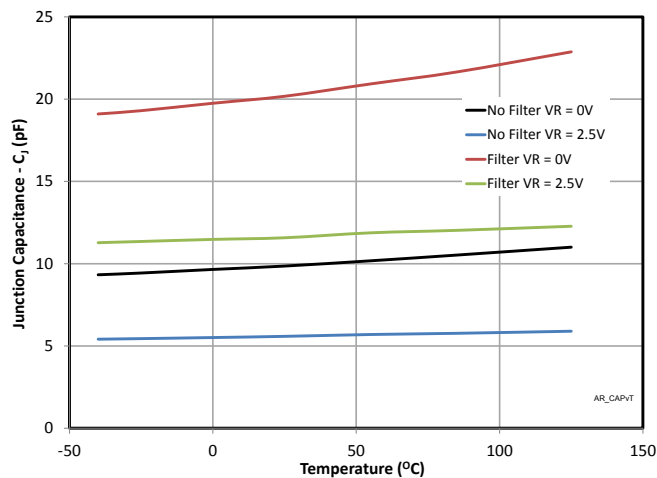
ESD Clamping (+8kV Contact per IEC 61000-4-2)



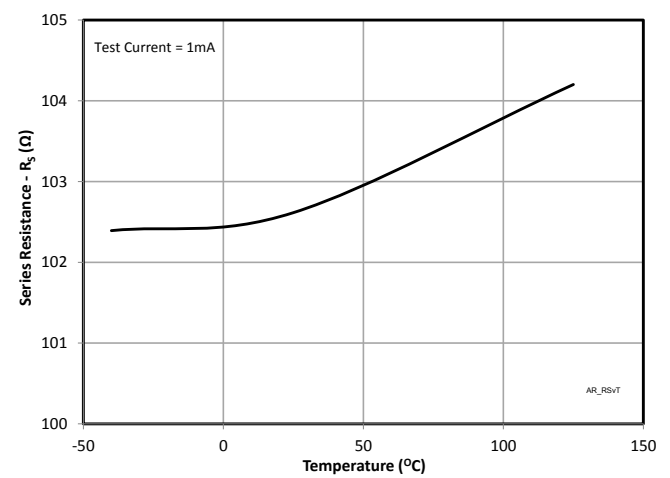
ESD Clamping (-8kV Contact per IEC 61000-4-2)



Capacitance vs. Temperature

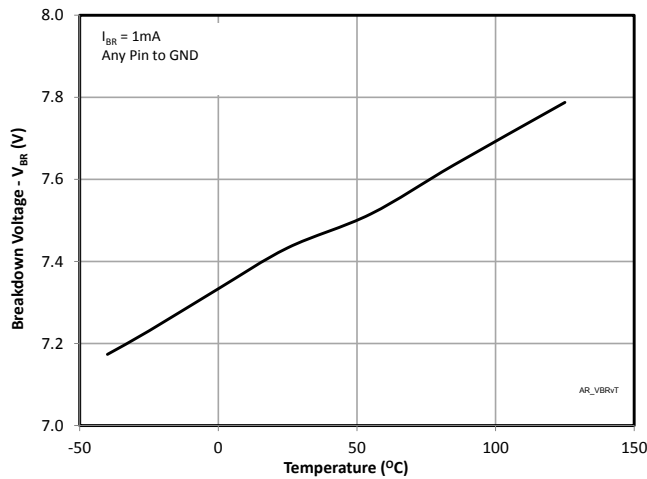


Series Resistance vs. Temperature

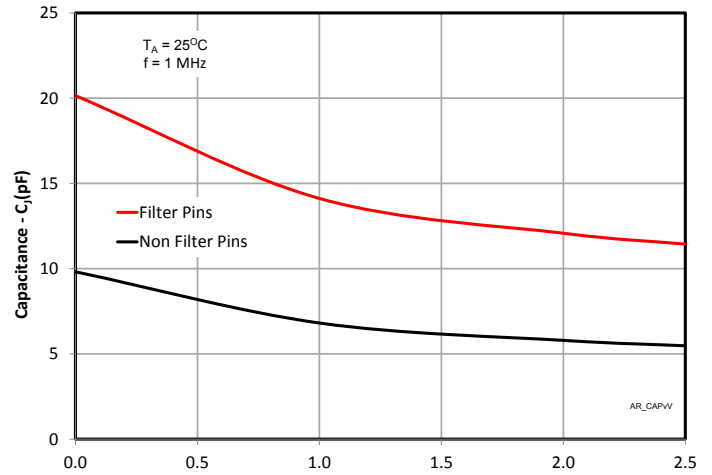


Typical Characteristics (Continued)

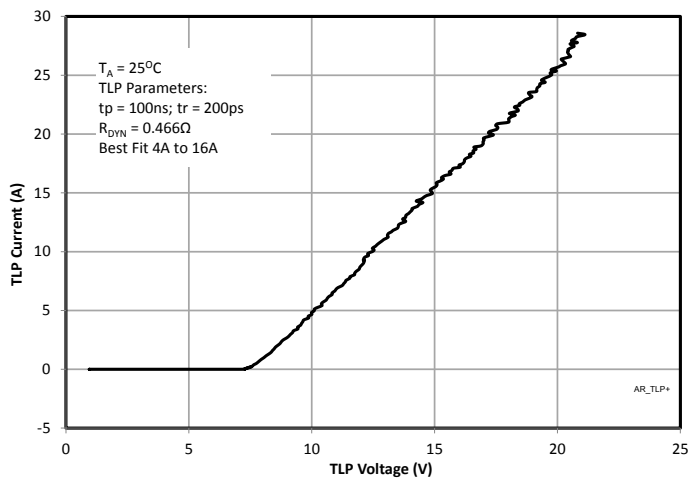
Breakdown Voltage vs. Temperature



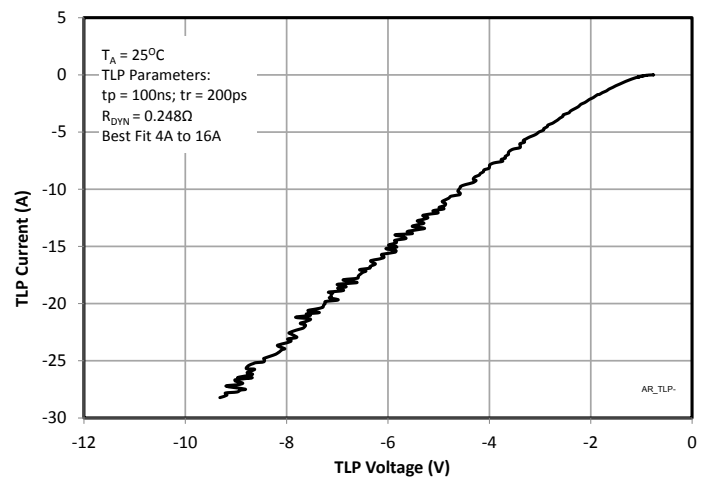
Capacitance vs. Reverse Voltage



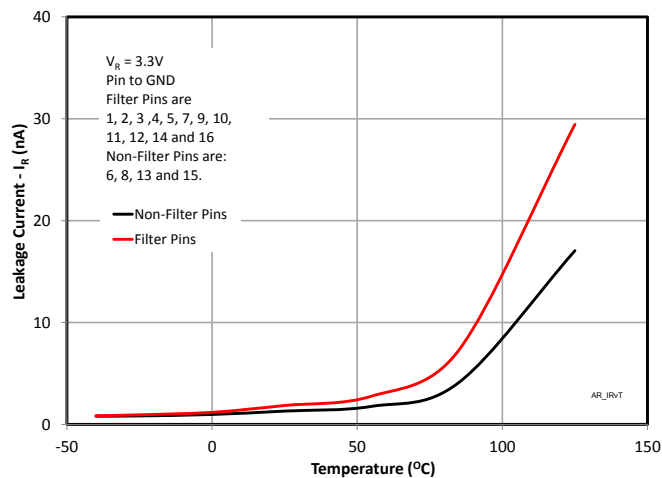
TLP Characteristics (Positive)



TLP Characteristics (Negative)

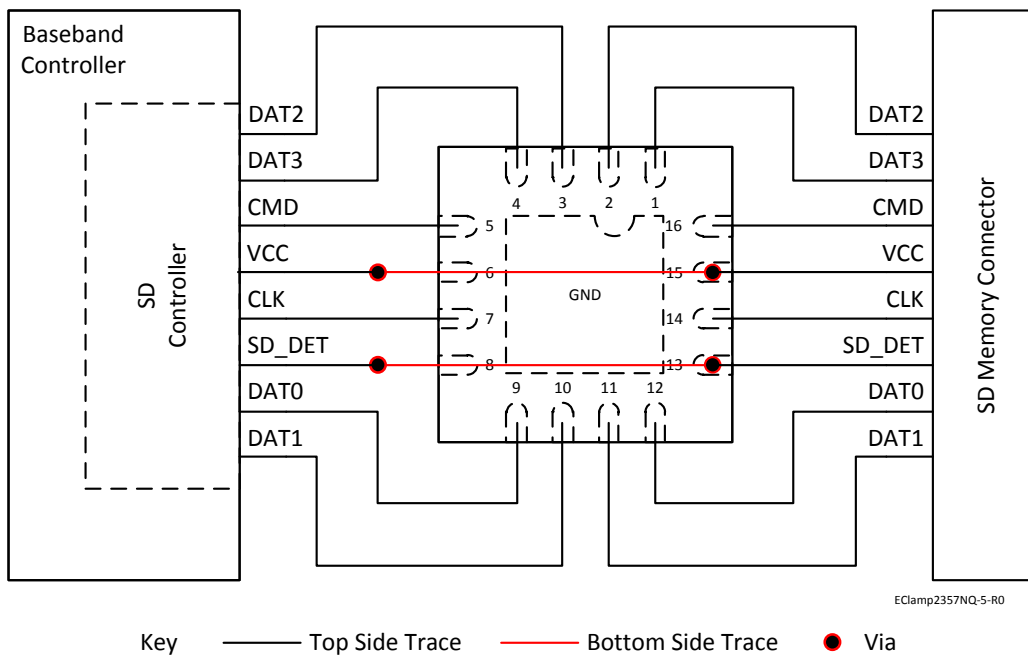


Leakage Current vs. Temperature

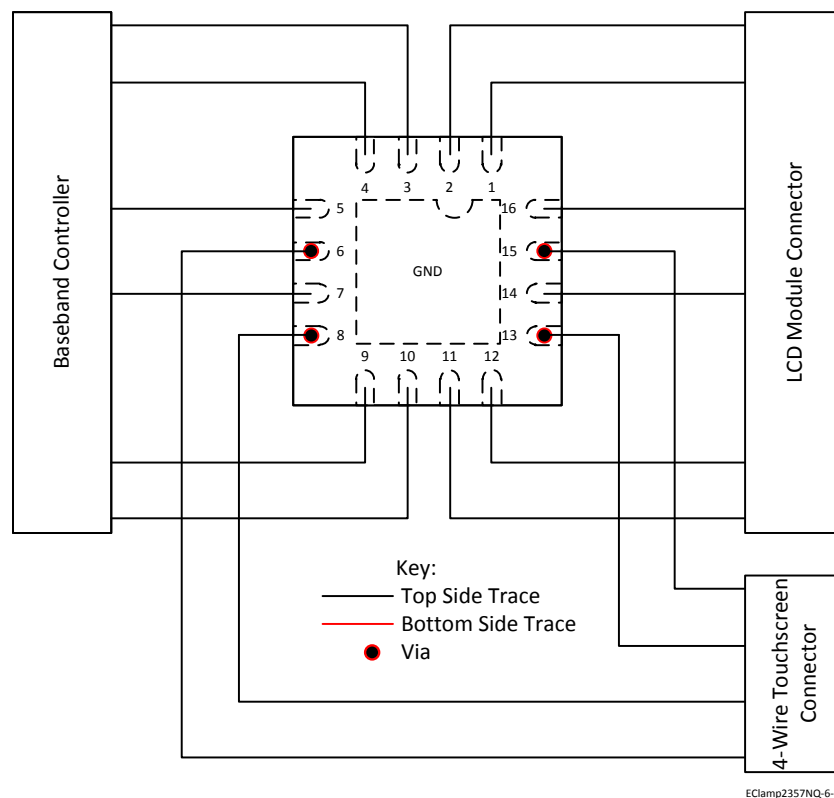


Application Information

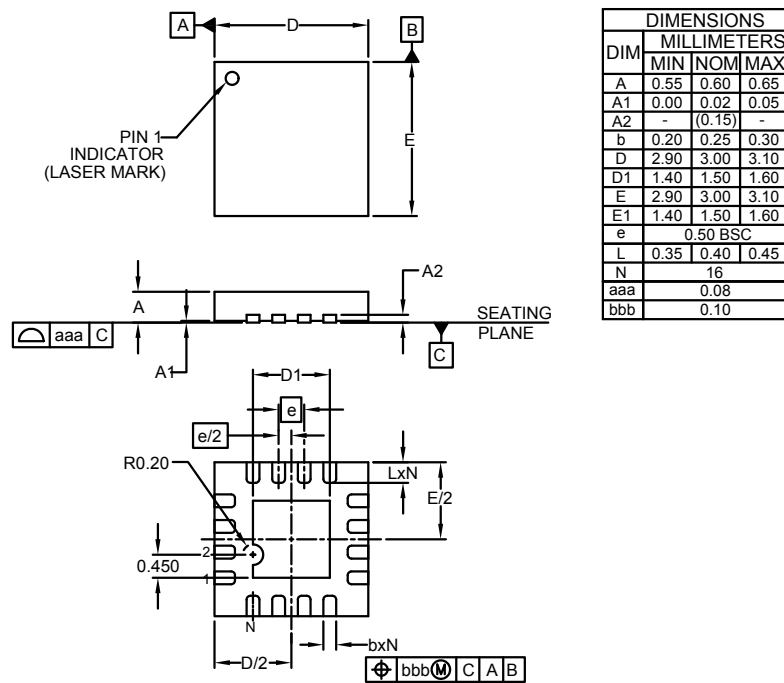
EClamp2357NQ SD Memory



EClamp2357NQ LCD and Touch Pad



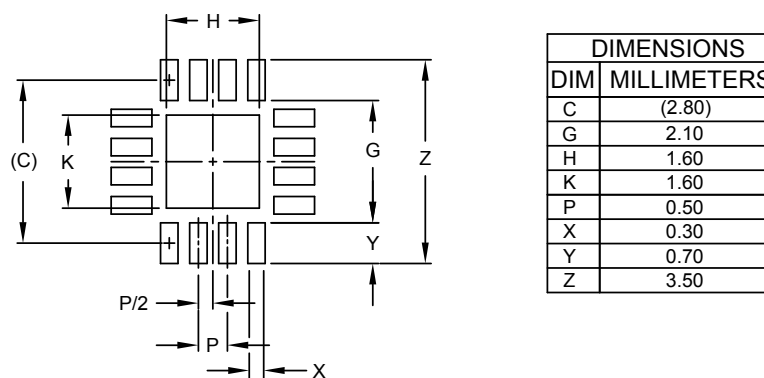
Outline Drawing - SLP3030P16



NOTES:

1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

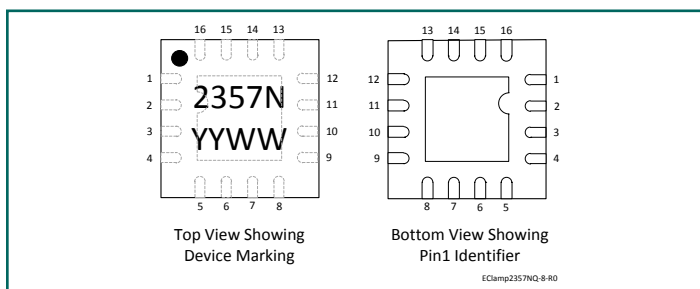
Land Pattern - SLP3030P16



NOTES:

1. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY. CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.
2. DO NOT PLACE VIAS BETWEEN THE CORNER LEADS INSIDE THE 3X3MM PACKAGE FOOTPRINT.
3. THERMAL VIAS IN THE LAND PATTERN OF THE EXPOSED PAD SHALL BE CONNECTED TO A SYSTEM GROUND PLANE. FAILURE TO DO SO MAY COMPROMISE THE THERMAL AND/OR FUNCTIONAL PERFORMANCE OF THE DEVICE.

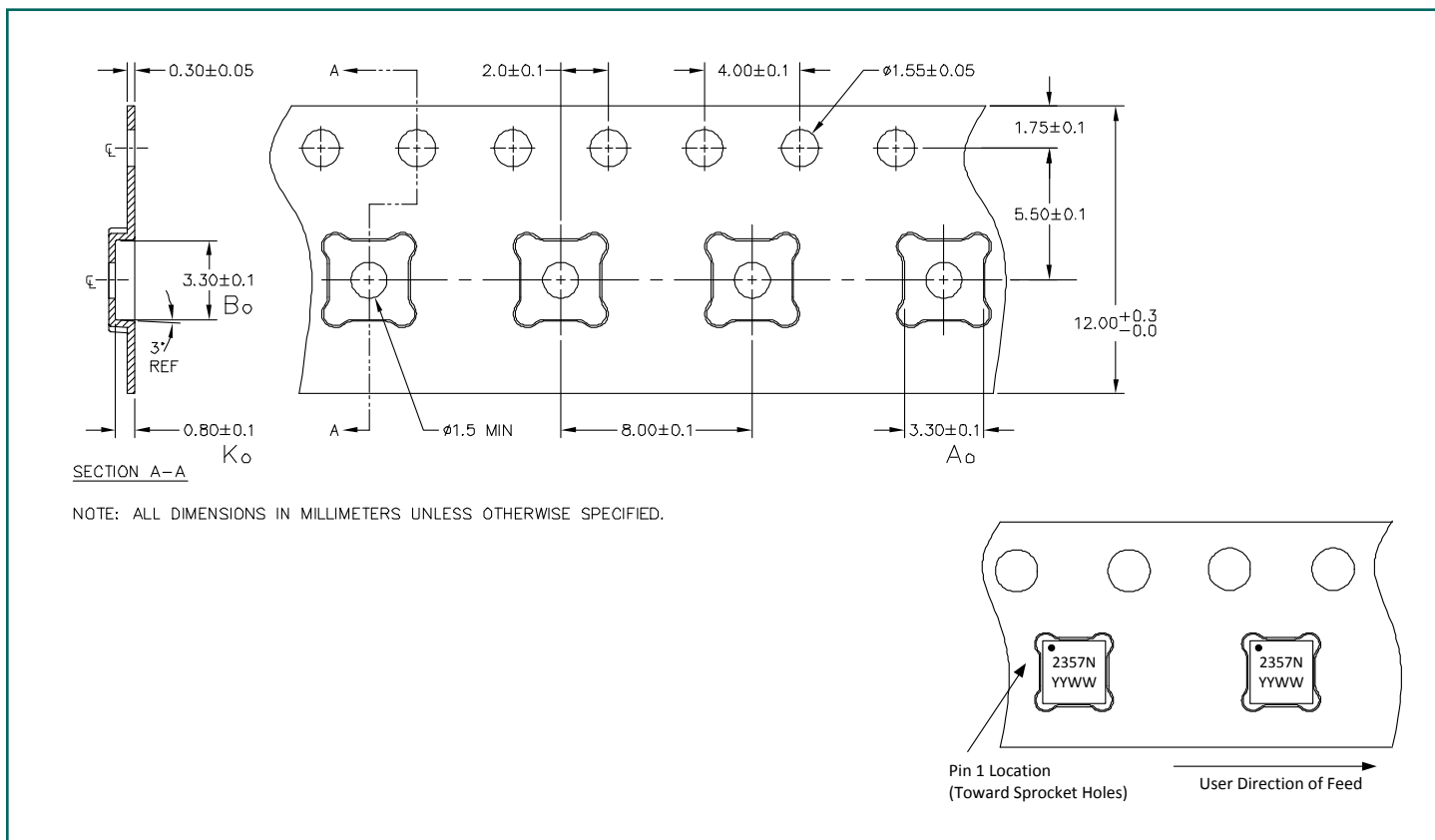
Marking Code



Notes:

1. YYWW = Alphanumeric character Date Code
2. Pin 1 indicated by "Mouse Bite" on the ground pad

Tape and Reel Specification - Plastic Tape



Ordering Information

Part Number	Qty per Reel	Reel Size
EClamp2357NQTLT	3000	13 Inch
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