1 Description

The C220S Series, featuring Coto's smallest high-voltage MOSFET relay package, delivers high-voltage performance in a compact design. Capable of switching up to 1,200V and 120mA with a low ON resistance of 20Ω (typical) and 1,500V input-to-output isolation, the C220S is engineered for applications with critical space constraints and high-density requirements. Its compact design makes it a reliable, space-efficient solution for Automatic Test Equipment (ATE), industrial controls, and measurement & instrumentation systems. For different requirements, please contact your Coto Applications Engineer at **www.cototechnology.com** for assistance.

Device Information

Part Series	Package	Body Size (mm)
C220S	SOP	4.4 x 4.3 x 2.0

Device Package



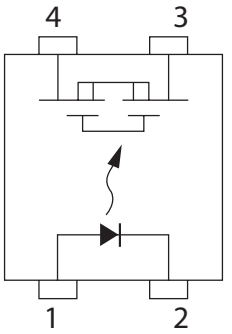
2 Features

- Contact Form: 1A
- Load Voltage: 1200V
- Load Current: 120mA
- Low On-Resistance: 20Ω Typical
- Output Capacitance: 20pF Typical
- Low Off-State Leakage Current: 1.0μA Maximum
- Input/Output Isolation: 1500Vrms
- Compact, SOP-4 package design
- Arc-Free with no Snubbing Circuits
- High-Reliability Solid State Design
- RoHS Compliant

3 Applications

- Automatic Test Equipment (ATE)
- Industrial Controls
- Instrumentation
- Measurement Equipment

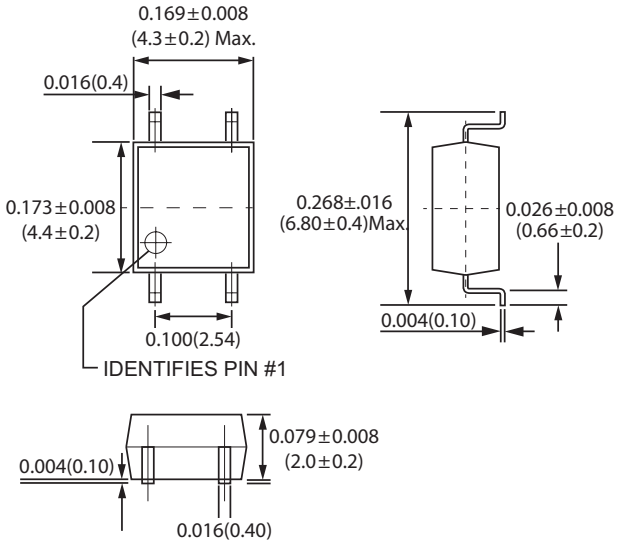
4 Device Schematic



1. LED Anode
2. LED Cathode
3, 4. Drain (MOS FET)

5 Device Dimensions

Inches (mm)



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6 Specifications

6.1 Absolute Maximum Ratings

Parameters		Symbol	Rating	Unit
Input	Continuous LED Current	I_F	50	mA
	Peak LED Current (f=100Hz Duty=1%)	I_{FP}	1000	mA
	LED Reverse Voltage	V_R	5	V
	Input Power Dissipation	P_{IN}	75	mW
Output	Load Voltage	V_L	1200	V (AC Peak or DC)
	Load Current	I_L	120	mA
	Peak Load Current 100 ms (1 pulse)	I_{PEAK}	600	mA
	Output Power Dissipation	P_{OUT}	400	mW
Total Power Dissipation		P_T	450	mW
I/O Breakdown Voltage (RH = 60%, 1 min)		$V_{I/O}$	1500	Vrms
Operating Temperature		T_{OPT}	-40 to +85	°C
Storage Temperature		T_{STG}	-40 to +100	°C
Pin Soldering Temperature (10 sec max)		T_{SOL}	260	°C

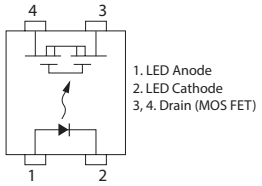
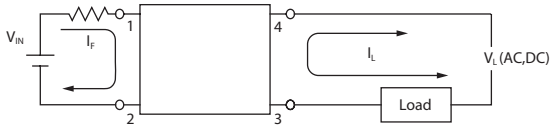
6.2 Electro-Optical Characteristics

Parameters		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	LED Forward Voltage	V_F	I_F=10mA		1.3	1.5	V
	Operation LED Current	$I_{F\,ON}$			0.5	3.0	mA
	Recovery LED Voltage	$V_{F\,Off}$		0.7			V
	Recovery LED Current	$I_{F\,OFF}$			0.35	0.5	mA
Output	On-Resistance	R_{ON}	I_F=5mA, I_L=100mA Time to flow is within 1 sec		20	24	Ω
	Off-State Leakage Current	I_{LEAK}	V_L=Rating			1.0	µA
	Output Capacitance	C_{OUT}	V_L=0, f=1MHz		20		pF
Trans-mission	Turn-On Time	T_{ON}	I_F=5mA, I_L=100mA		0.2	0.5	ms
	Turn-Off Time	T_{OFF}			0.04	0.1s	ms
Coupled	I/O Insulation Resistance	$R_{I/O}$	DC500V	10^{10}			Ω
	I/O Capacitance	$C_{I/O}$	f=1MHz		0.8	1.5	pF

Environmental Ratings:

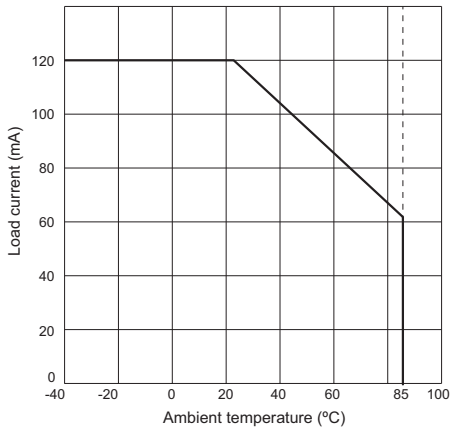
All electrical parameters measured at 25°C unless otherwise specified.

7 Schematic and Wiring Diagrams

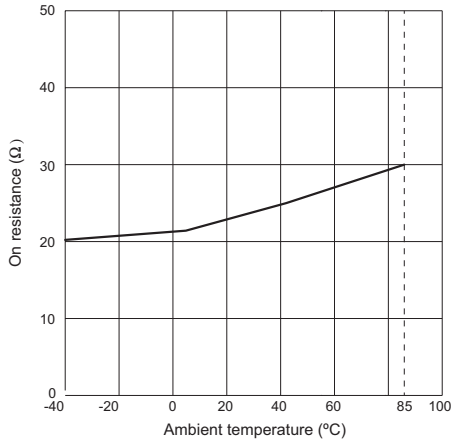
Schematic	Output Configuration	Wiring Diagram
	1a	

8 C220S Series Graphs

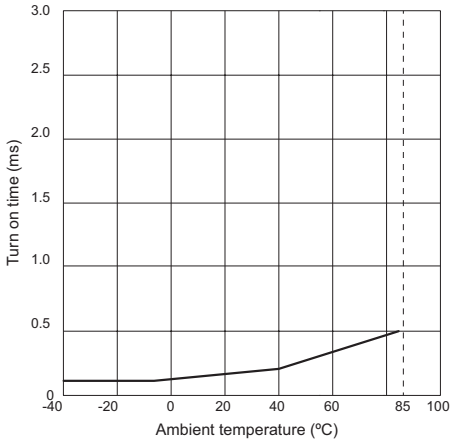
Load Current Vs. Ambient Temperature



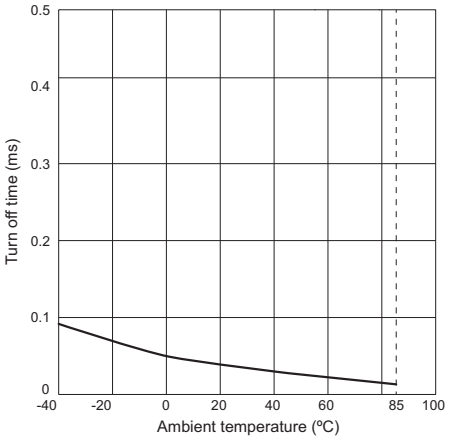
On-Resistance Vs. Ambient Temperature



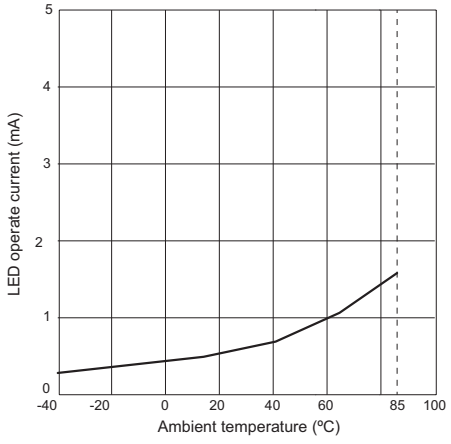
Turn-On Time Vs. Ambient Temperature



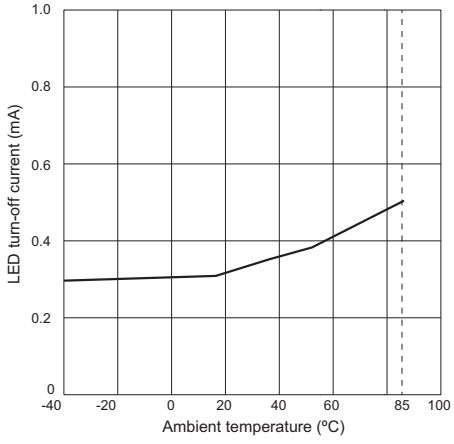
Turn-Off Time Vs. Ambient Temperature



LED Operate Current Vs. Ambient Temperature



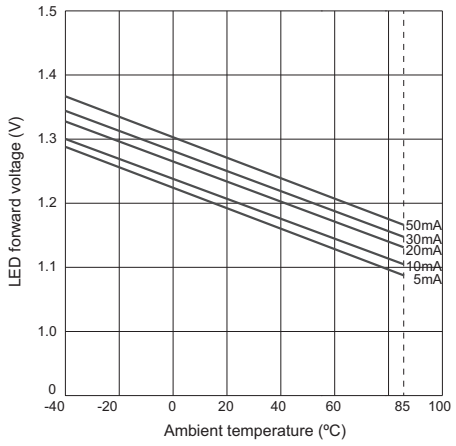
LED Turn-Off Current Vs. Ambient Temperature



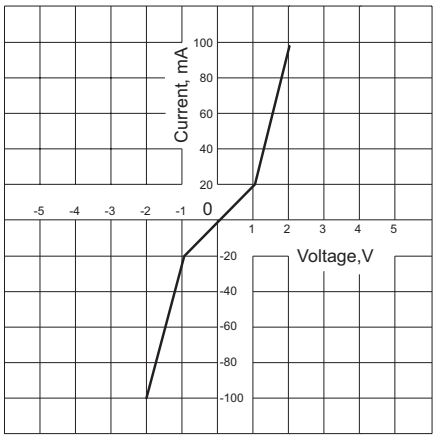
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8 C220S Series Graphs

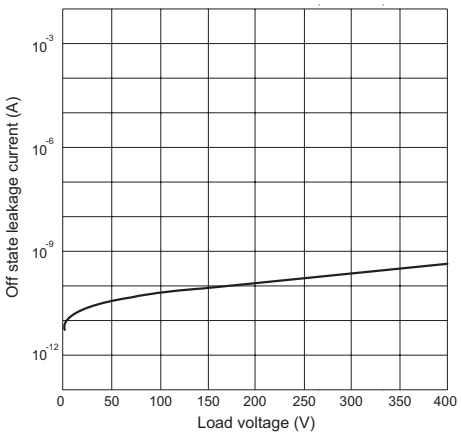
LED Forward Voltage Vs. Ambient Temperature



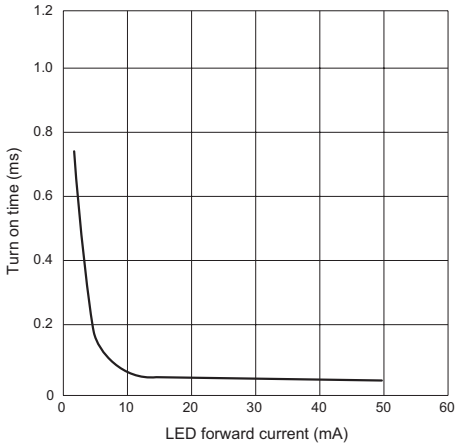
Voltage Vs. Current Characteristics of Output at MOS Portion



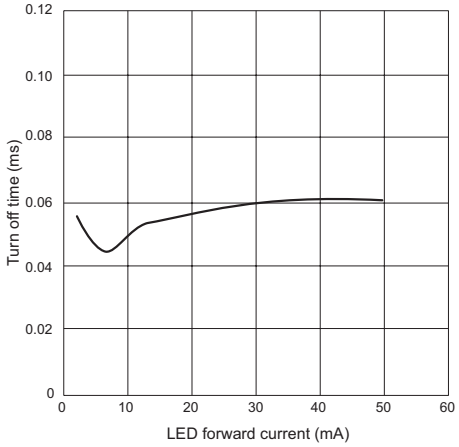
Off-State Leakage Current Vs. Load Voltage Characteristics



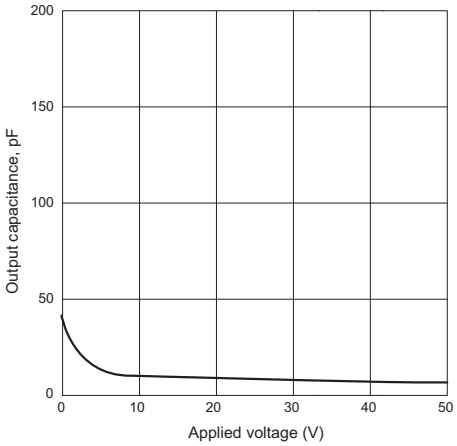
LED Forward Current Vs. Turn on Time Characteristics



LED Forward Current Vs. Turn-Off Time Characteristics



Applied Voltage Vs. Output Capacitance Characteristics

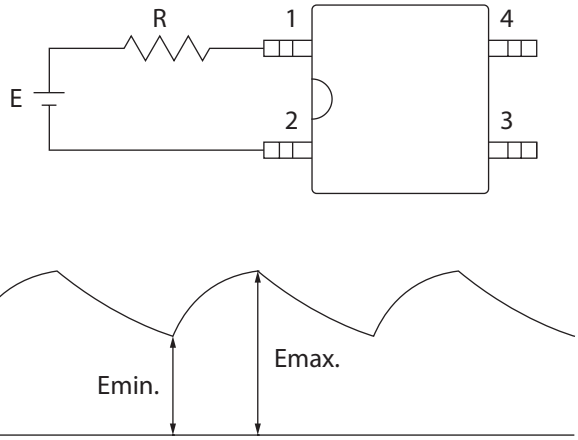


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9 Using Methods

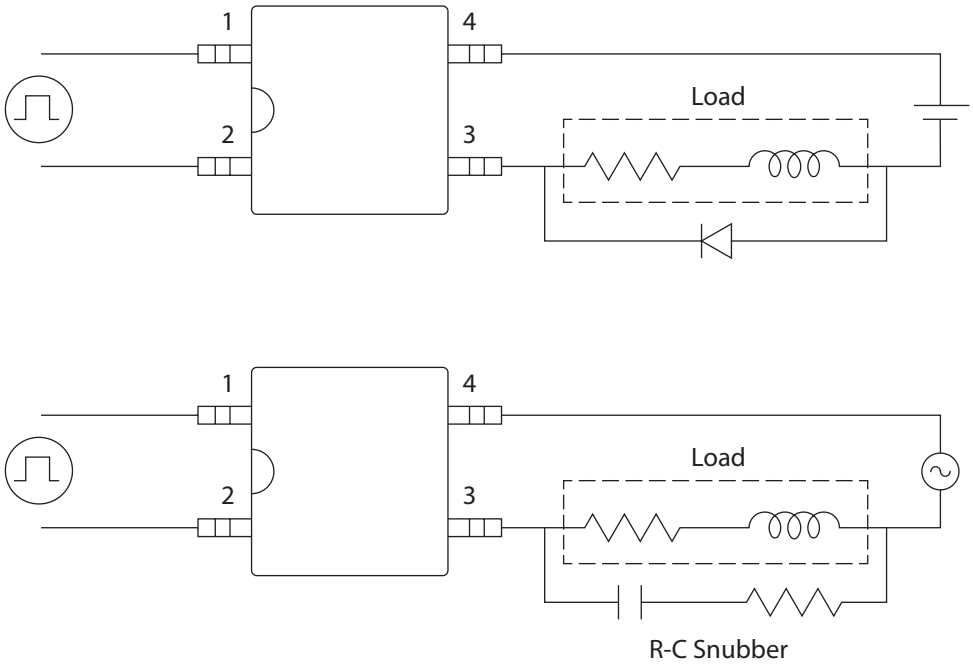
Examples of resistance value to control LED forward current (I_F=5mA)

1. LED forward current must be more than 5mA, at E min.
2. LED forward current must be less than 50mA, at E max.



E	R
3.3V	Approx. 333 Ω
5V	Approx. 640 Ω
12V	Approx. 1.9K Ω
15V	Approx. 2.5K Ω
24V	Approx. 4.1K Ω

Regulate the spike voltage generated on the inductive load as follows:



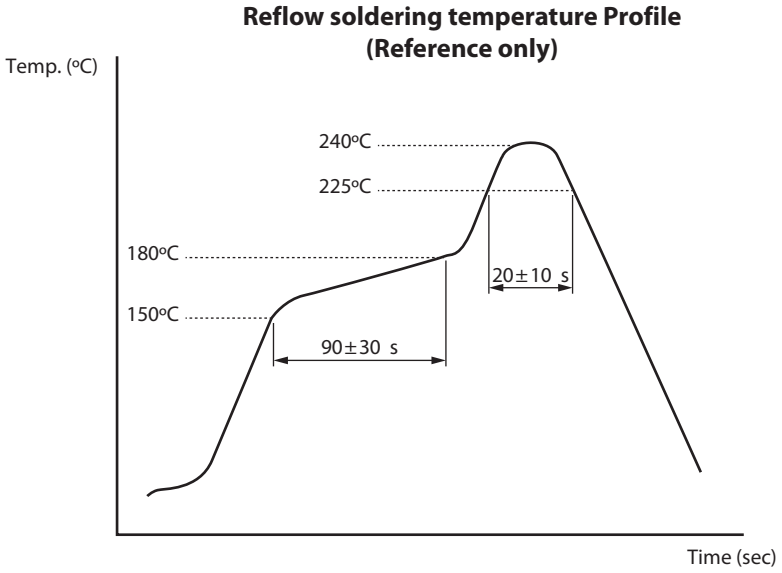
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10 Recommended Soldering Conditions

10.1 Infrared Reflow Soldering

- Peak reflow soldering: 240°C or below (package surface temperature)
- Time of peak reflow temperature: 10 seconds
- Time of temperature higher than 230°C: 30-60 seconds
- Time to preheat temperature from 180~190°C: 60-120 seconds
- Number of reflows: Two
- Flux: Rosin flux containing small amount of chlorine
  (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

10.2 Recommended Temperature Profile of Infrared Reflow



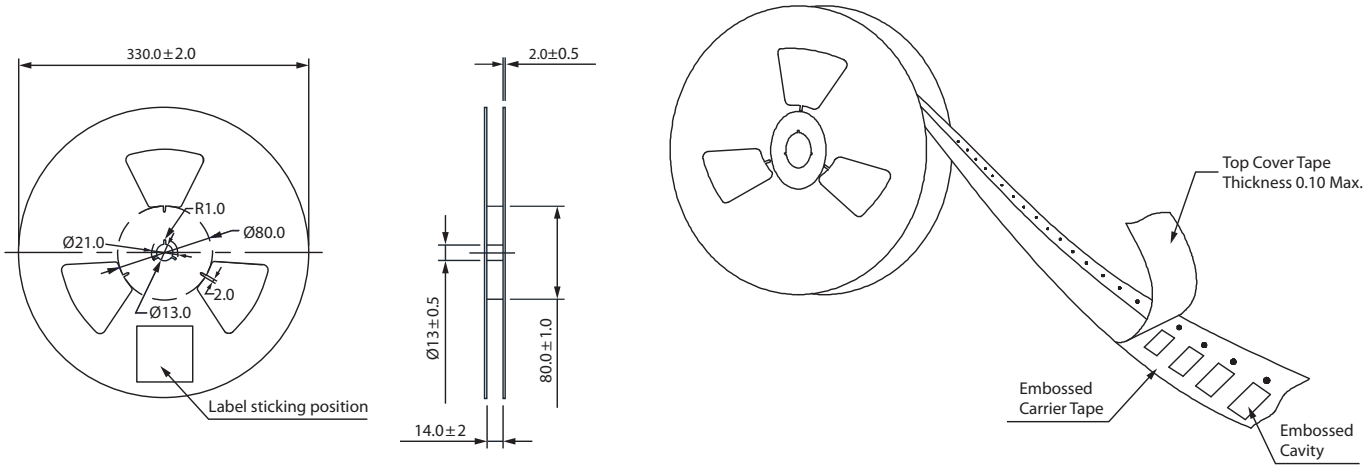
10.3 Cautions

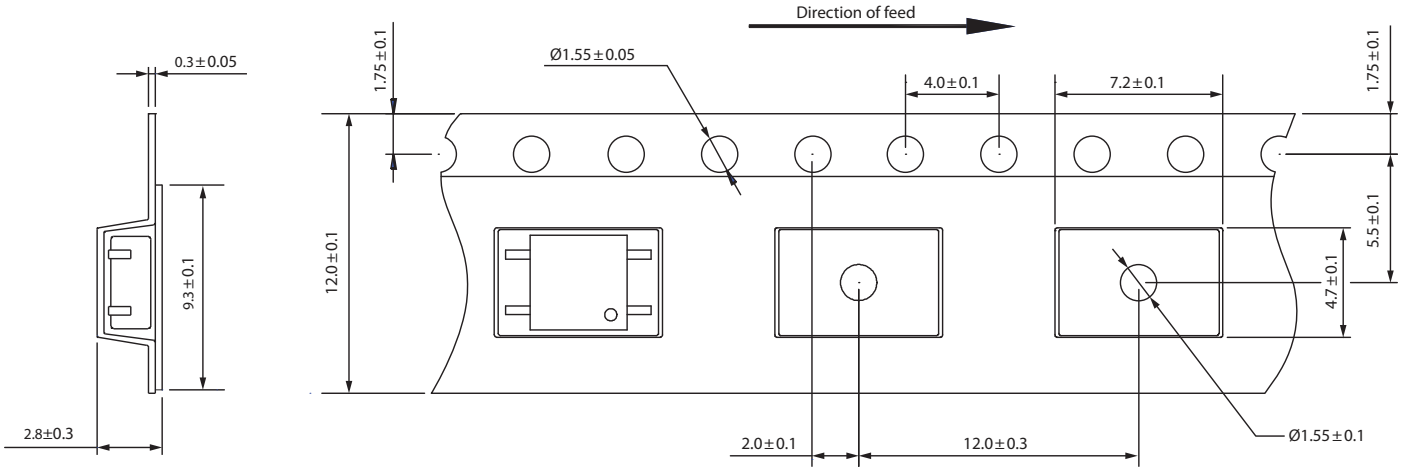
- Fluxes: Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.
- Avoid shorting between portion of frame and leads.

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11 CotoMOS Relay Packaging Information

11.1 4-pin SOP Carrier Tape & Reel *Units: mm*



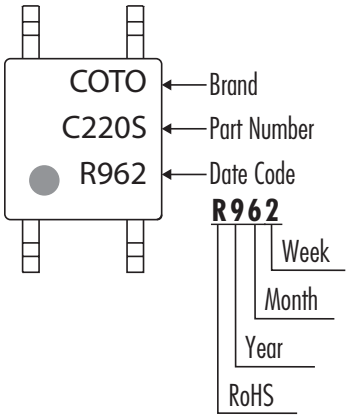


Notes

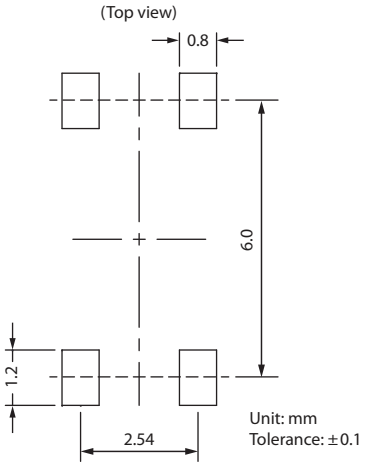
1. There is a leader of 230mm minimum which consists of carrier and/or cover tape followed by a minimum of 160mm of carrier tape sealed with cover tape.
2. There is a minimum of 160 mm of empty component pockets sealed with cover tape.
3. Device pockets are in accordance with EIA standard EIA-481-A and specifications provided above.
4. Packaging: 2000pcs per reel, 2 reels per box, 5 boxes per carton.

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11.2 Device Marking



11.3 Recommended Mounting Pad



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Revision History

	Date	Description