1 Description

The C224S series of high-current MOSFET relays feature high current switching capability to 3.5A with a low ON resistance of 0.05Ω Nominal and are capable of providing 1,500V of input to output isolation. Designed for Automatic Test Equipment (ATE), Industrial Controls, Measurement & Instrumentation applications, the CotoMOS® C224S Series relay is capable of handling 40V load conditions. For different requirements, please contact your Coto Applications Engineer at **www.cototechnology.com** for assistance.

Device Information

Part Series	Package	Body Size (mm)
C224S	SOP	4.4 x 4.3 x 2.0

Device Package



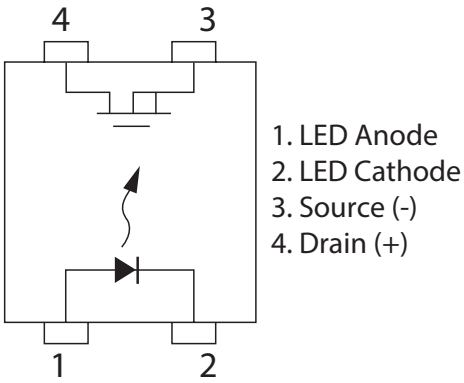
2 Features

- Contact Form: 1A
- Load Voltage: 40V
- Load Current: 3.5A
- Low ON-Resistance: 0.05Ω Nominal
- Output Capacitance: 100pF Typical
- Low Off-State Leakage Current: 0.1µA Maximum
- Input/Output Isolation: 1500Vrms
- Arc-Free with no Snubbing Circuits
- High-Reliability Solid State Design
- RoHS Compliant

3 Applications

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

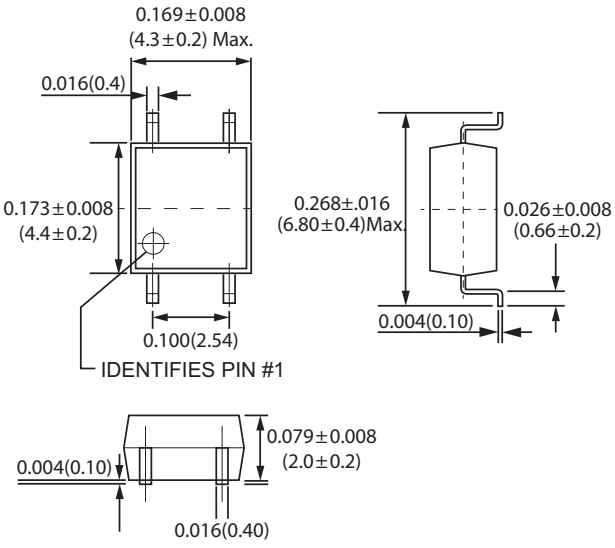
4 Device Schematic



1. LED Anode
2. LED Cathode
3. Source (-)
4. Drain (+)

5 Device Dimensions

Inches (mm)



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6 Specifications

6.1 Absolute Maximum Ratings

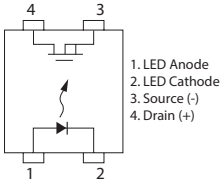
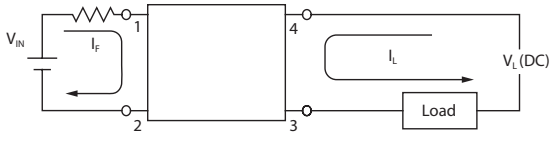
Parameters		Symbol	Rating	Unit
Input	Continuous LED Current	I_F	50	mA
	Peak LED Current (f=100Hz Duty=1%)	I_{FP}	1000	mA
	LED Reverse Voltage	V_R	5	V
	Input Power Dissipation	P_{IN}	75	mW
Output	Load Voltage	V_L	40	VDC
	Load Current	I_L	3.5	A
	Peak Load Current 300 µs (1 pulse)	I_{PEAK}	5.0	A
	Output Power Dissipation	P_{OUT}	400	mW
Total Power Dissipation		P_T	600	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		1.2	1.4	V
	Operation LED Current	$I_{F\ ON}$			0.5	2.0	mA
	Recovery LED Voltage	$V_{F\ Off}$		0.7			V
	Recovery LED Current	$I_{F\ OFF}$			0.3	0.5	mA
Output	On-Resistance	R_{ON}	I_F=5mA, I_L=100mA Time to flow is within 1 sec		0.05	0.08	Ω
	Off-State Leakage Current	I_{LEAK}	V_L=Rating			0.1	µA
	Output Capacitance	C_{OUT}	V_L=0, f=1MHz		100		pF
Trans-mission	Turn-On Time	T_{ON}	I_F=5mA, I_L=100mA		0.4	0.8	ms
	Turn-Off Time	T_{OFF}			0.03	0.05	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

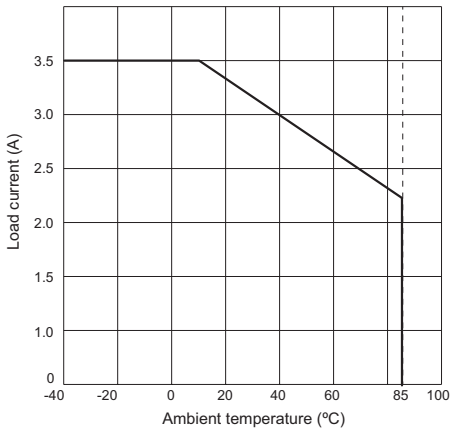
Environmental Ratings:
All electrical parameters measured at 25°C unless otherwise specified.

7 Schematic and Wiring Diagrams

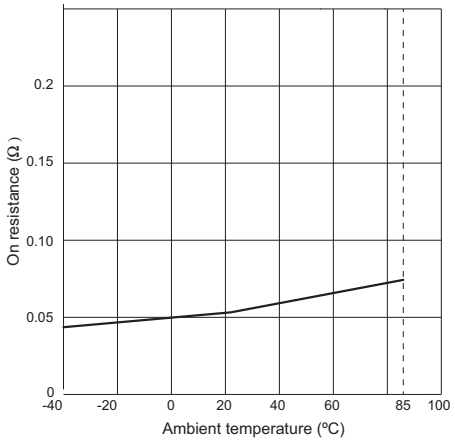
Schematic	Output Configuration	Wiring Diagram
	1a	

8 C224S Series Graphs

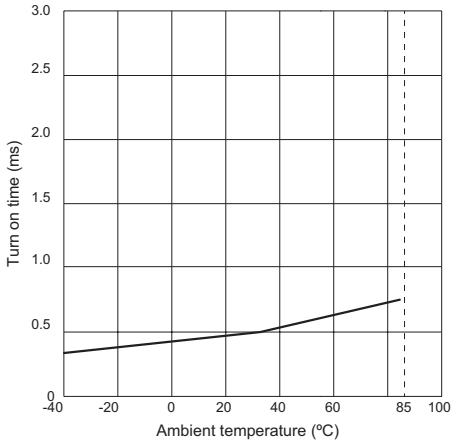
Load Current Vs. Ambient Temperature



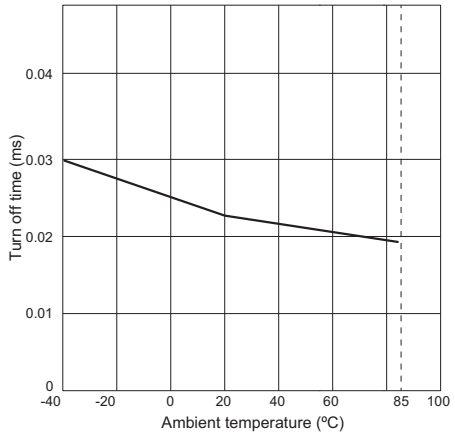
On-Resistance Vs. Ambient Temperature



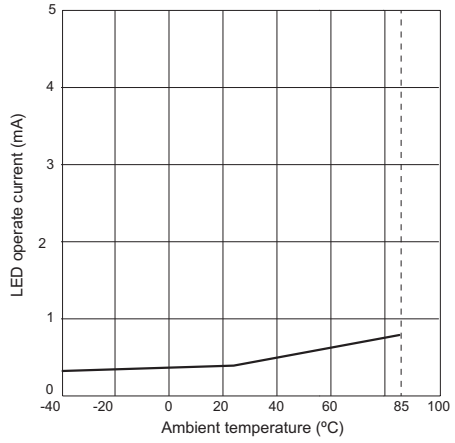
Turn-On Time Vs. Ambient Temperature



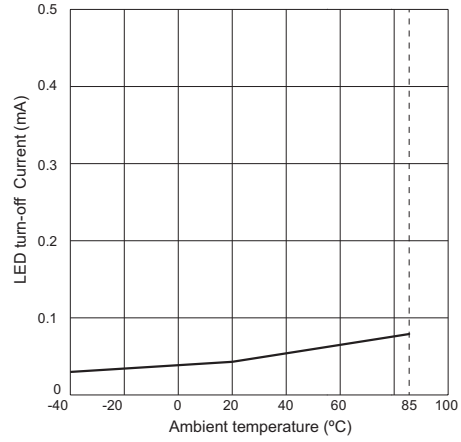
Turn-Off Time Vs. Ambient Temperature



LED Operate Current Vs. Ambient Temperature



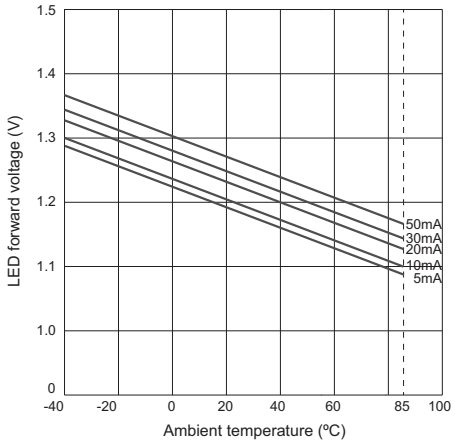
LED Turn-Off Current Vs. Ambient Temperature



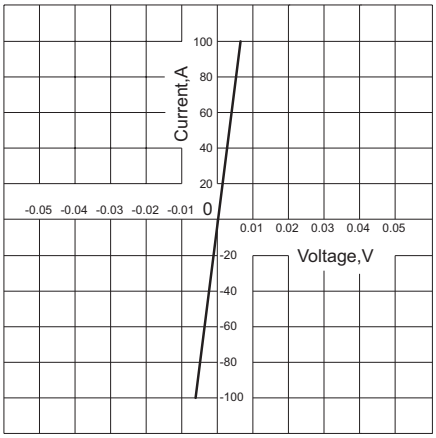
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8 C224S Series Graphs

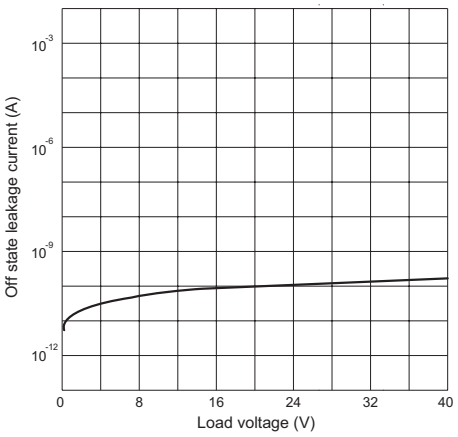
LED Forward Voltage Vs. Ambient Temperature



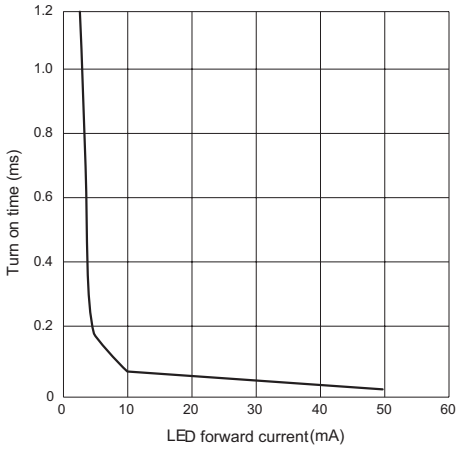
Voltage Vs. Current Characteristics of Output at MOS Portion



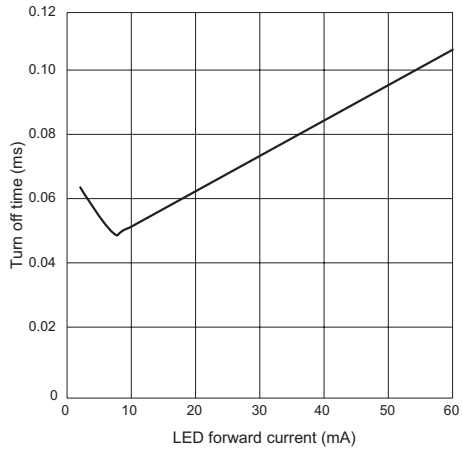
Off-State Leakage Current Vs. Load Voltage Characteristics



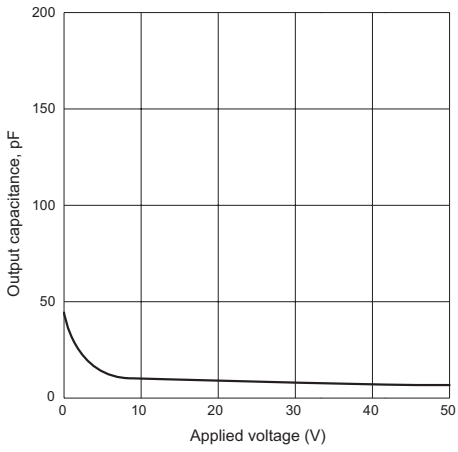
LED Forward Current Vs. Turn on Time Characteristics



LED Forward Current Vs. Turn-Off Time Characteristics



Applied Voltage Vs. Output Capacitance Characteristics

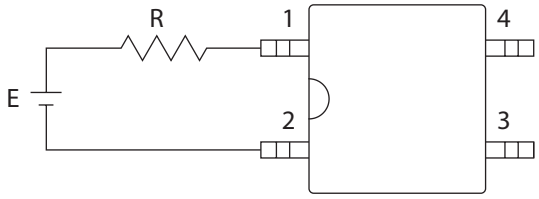


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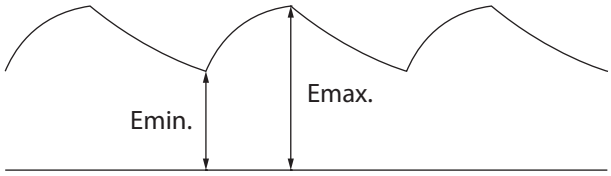
9 Using Methods

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

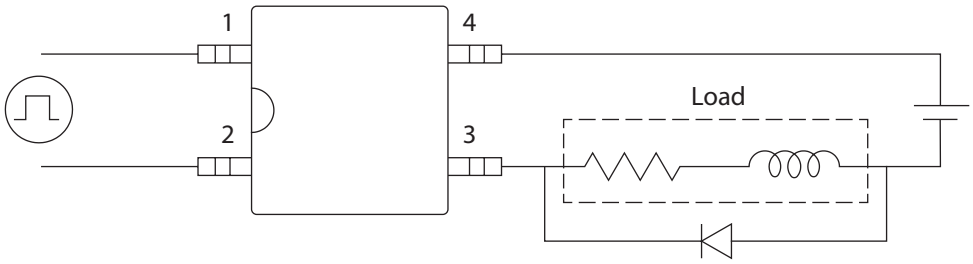
1. LED forward current must be more than 5mA, at E min.
2. LED forward current must be less than 50mA, at E max.



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:



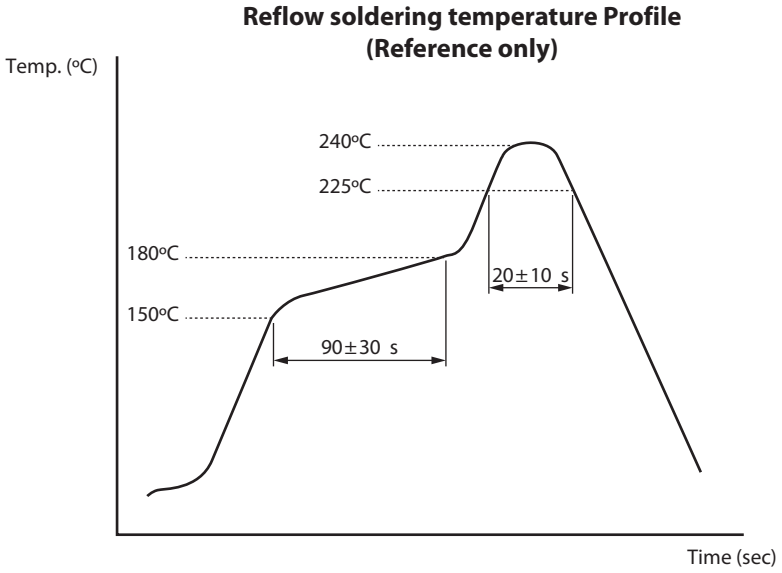
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10 Recommended Soldering Conditions

10.1 Infrared Reflow Soldering

- Peak reflow soldering: 240°C or below (package surface temperature)
- Time of peak reflow temperature: 20-30 seconds
- Time of temperature higher than 240°C: 30-60 seconds
- Time to preheat temperature from 180~190°C: 90-120 seconds
- Number of reflows: One
- 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



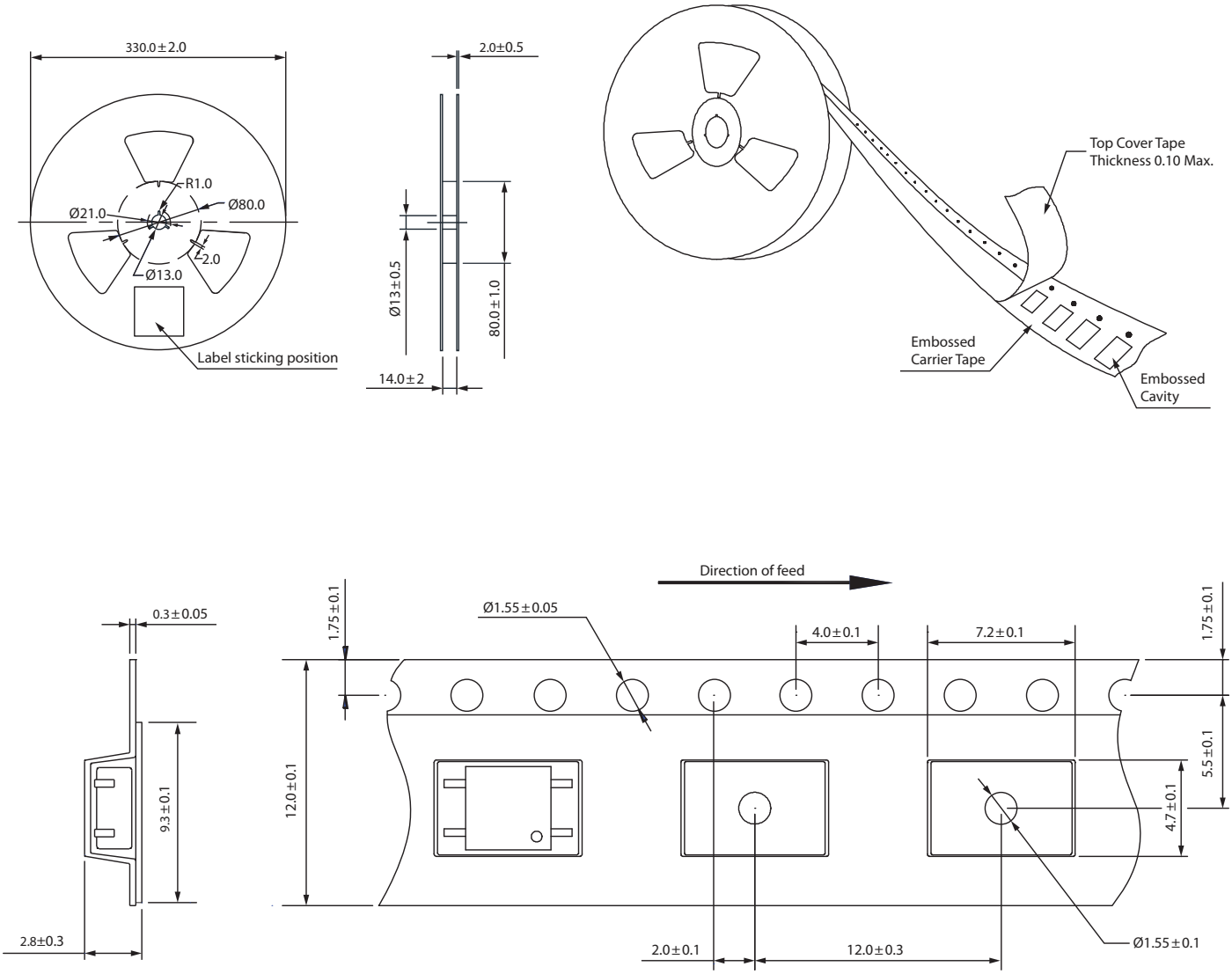
10.3 Cautions

- 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*

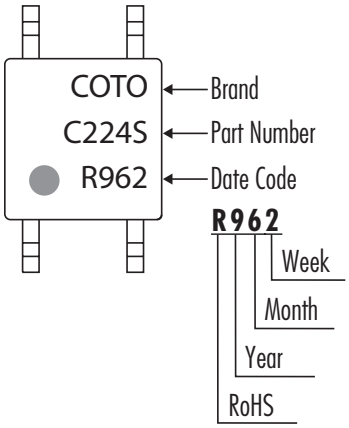


Notes

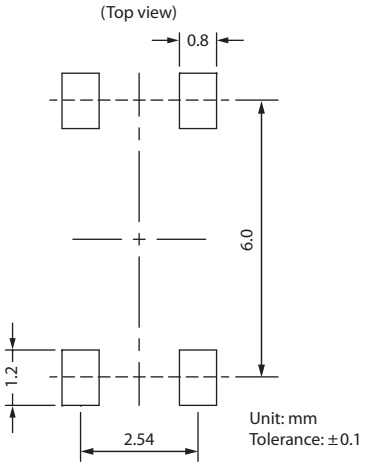
1. There is a leader of 230mm minimum which consists of carrier and/or cover tape followed by a minimum of 160mm of carrier tape sealed with cover tape.
2. There is a minimum of 160 mm of empty component pockets sealed with cover tape.
3. Device pockets are in accordance with EIA standard EIA-481-A and 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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