



Features

- High isolation
 - ◆ MFP : 3750V
 - ◆ 4/6/8 PIN : 5000V
- OFF-state output terminal voltage: 80 V (min)
- Operating temperature range - 40 °C to 100 °C
- Creepage distance
 - ◆ MFP \geq 5mm
 - ◆ 4/6/8 PIN \geq 7.4mm
- Distance through insulation > 0.4mm
- RoHS compliance
- REACH compliance
- Halogen free
- Regulatory Approvals
 - ◆ UL - UL1577
 - ◆ VDE - EN60747-5-5(VDE0884-5)
 - ◆ CQC – GB4943.1, GB8898
 - ◆ IEC60065, IEC60950

Description

The CTR215 consists of two MOSFET and one photovoltaic chip optically coupled to a gallium arsenide Infrared-emitting diode in different package and lead forming options.

Applications

- Battery Management System (BMS)
- Security Systems
- Smart Meters
- Mechanical relay replacements
- General telecom switching
- Industrial controls
- Automatic measurement equipment

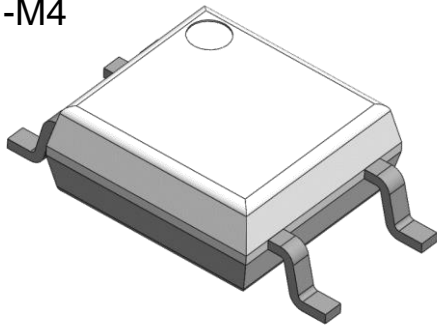
Package Type Naming Code

- MFP : CTR215-M4
- 4PIN : CTR215-4L
- 6PIN : CTR215-6L
- 8PIN : CTR215-8L

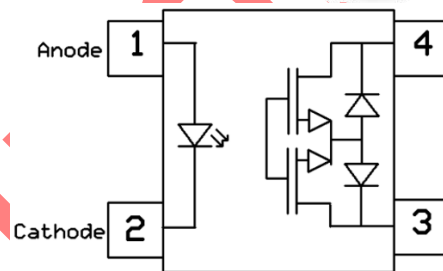
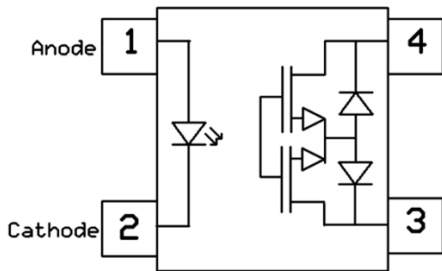
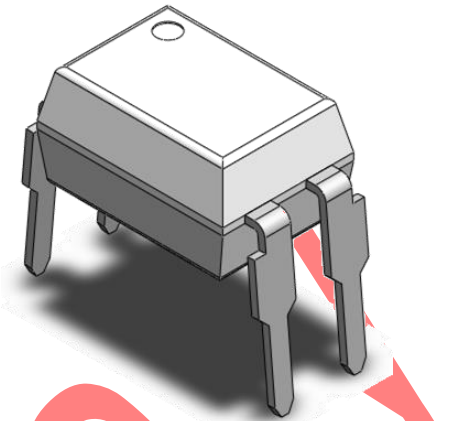


Package Type

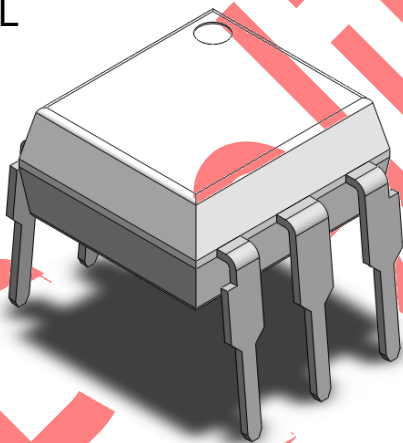
-M4



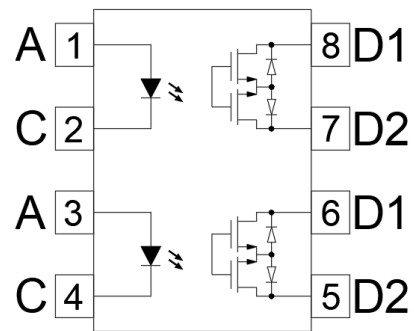
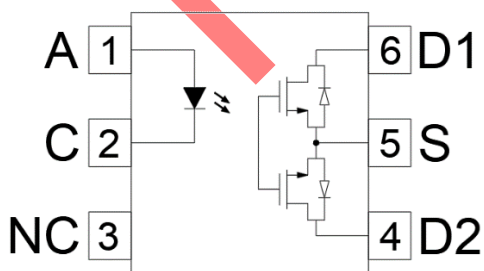
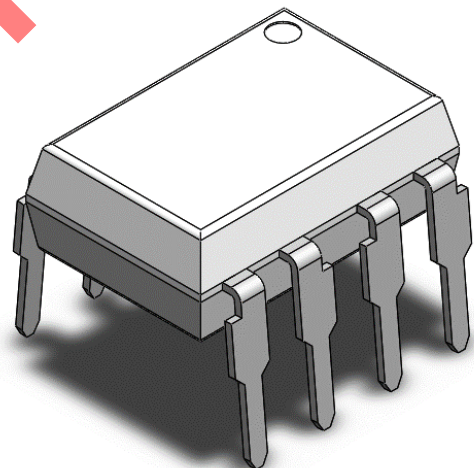
-4L



-6L



-8L



Note: Different bending options available. See package dimension.



CTR215

80V PhotoMOS Relays

Absolute Maximum Rating at 25°C

Symbol	Parameters		Ratings	Units	Notes
V _{iso}	Isolation voltage	M4	3750	Vrms	1
		4/6/8L	5000	Vrms	1
T _{OPR}	Operating temperature		-40 ~ +110	°C	
T _{STG}	Storage temperature		-55 ~ +125	°C	
T _{SOL}	Soldering temperature		260	°C	
Emitter					
I _F	LED forward current		20	mA	
I _{FP}	LED forward current (pulsed) (≤1μs P.W,300pps)		100	mA	
V _R	LED reverse voltage		5	V	
P _{in}	Power dissipation		32	mW	
T _j	Junction Temperature		115	°C	
Detector					
V _{OFF}	OFF-state output terminal Voltage		80	V	
I _{ON}	ON-state Current	CTR215	700	mA	2
P _o	Output Power dissipation	CTR215	500	mW	2
T _j	Junction Temperature		125	°C	

Note:

1: AC , 60s

2: Pulse Duty : 20%



Electrical Characteristics

Typical values are measured at $T_A = 25^\circ\text{C}$

Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_F	Forward voltage	$I_F = 10\text{mA}$	-	1.4	1.6	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{OFF}	OFF-state Current	$V_{OFF} = 80\text{V}$	-	0.2	1	μA	
C_{OFF}	Output Capacitance	$V_O = 0\text{V}$, $f = 1\text{MHz}$	-	22	-	pF	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{FT}	Trigger LED Current	$I_{ON} = 100\text{mA}$	-	-	3	mA	
R_{ON}	ON-state resistance	$I_{ON} = 100\text{mA}$, $I_F = 5\text{mA}$, $t < 1\text{s}$	-	0.6	1	Ω	

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
T_{on}	Turn-on Time	See Fig. 7,	-	0.4	1	ms	
T_{off}	Turn-off Time	$R_L = 200\Omega$, $V_{DD} = 20\text{V}$, $I_F = 10\text{mA}$ $f = 100\text{Hz}$	-	0.4	1	ms	

Note:

3. Pulse duty: 20 %



Typical Characteristic Curves

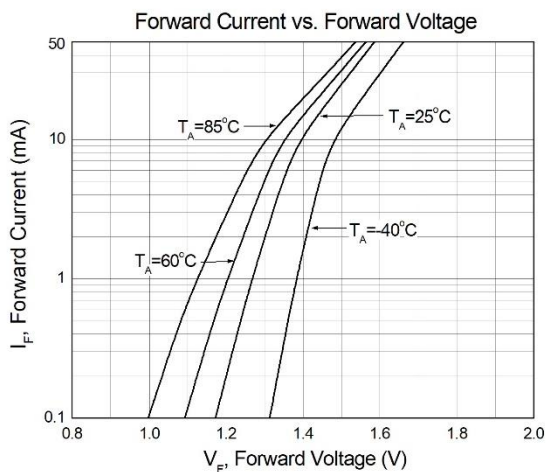


Figure 1

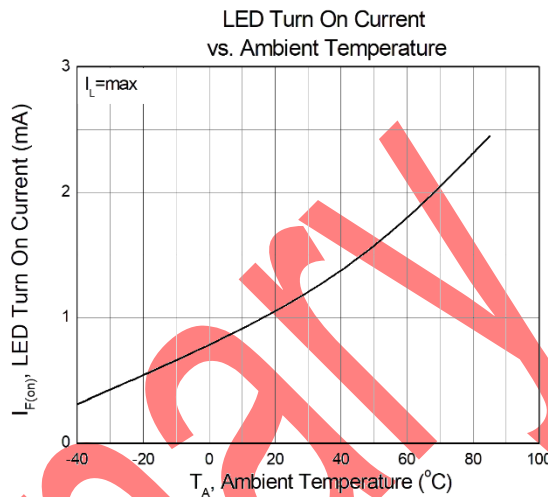


Figure 2

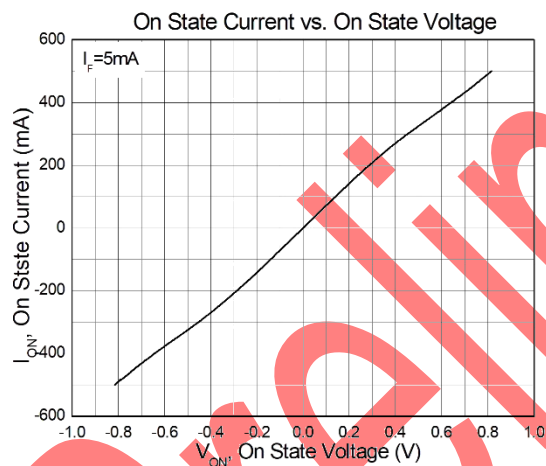


Figure 3

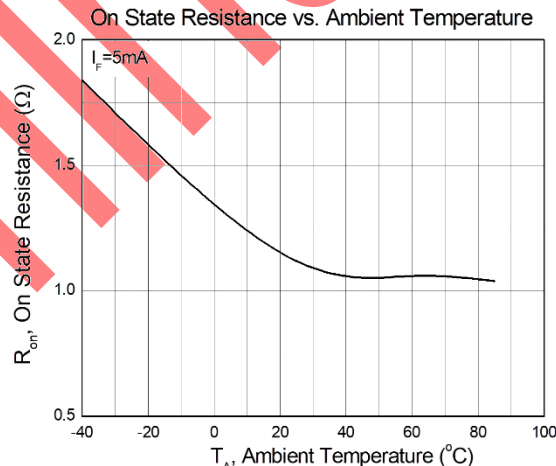


Figure 4

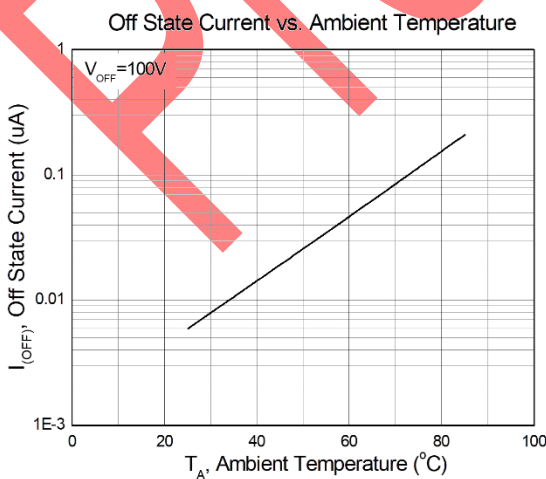


Figure 5

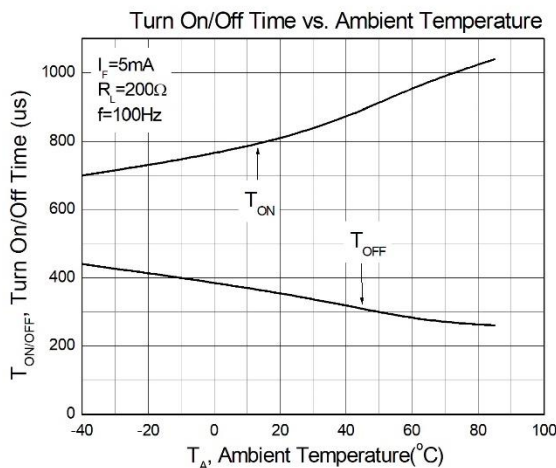


Figure 6

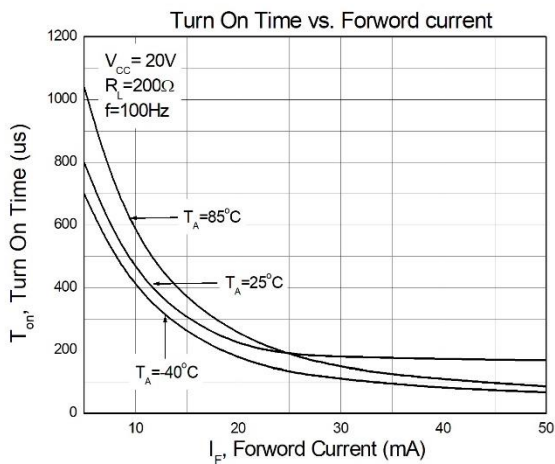


Figure 7

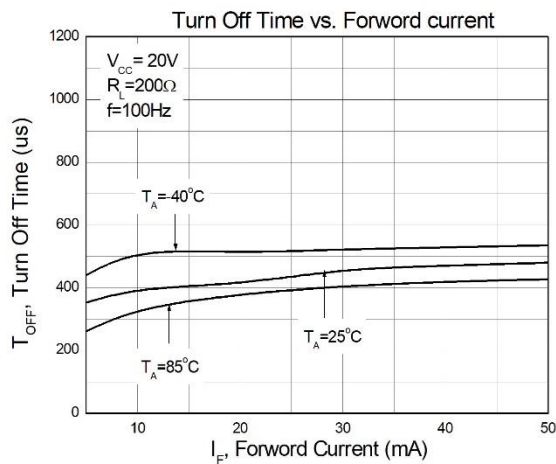


Figure 8

Test Circuit

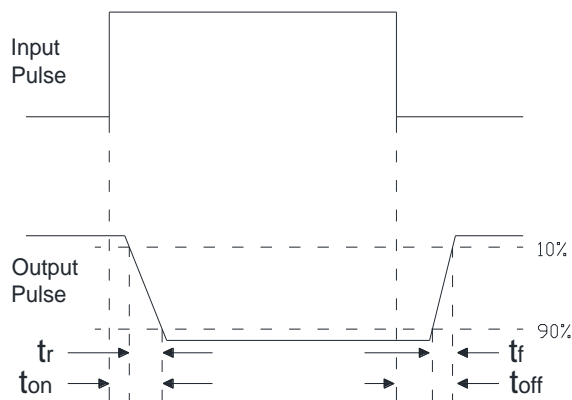
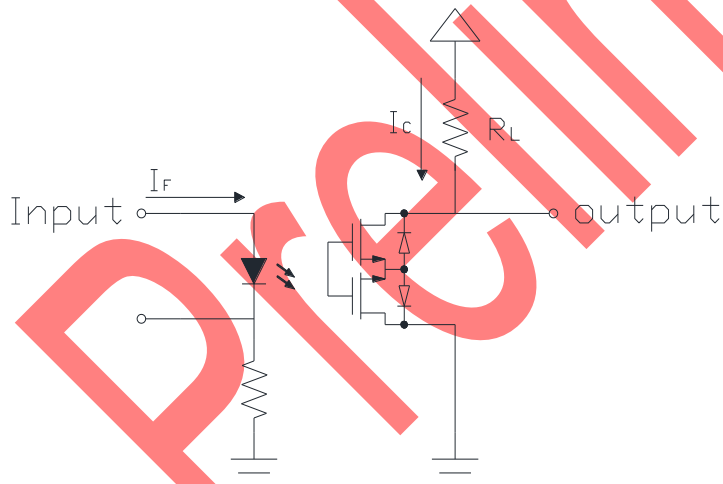
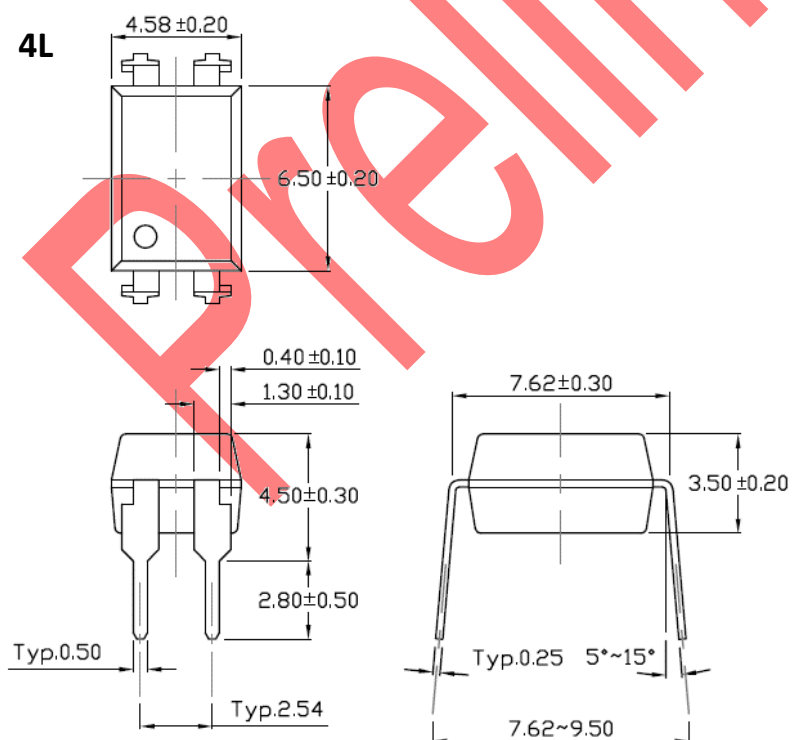
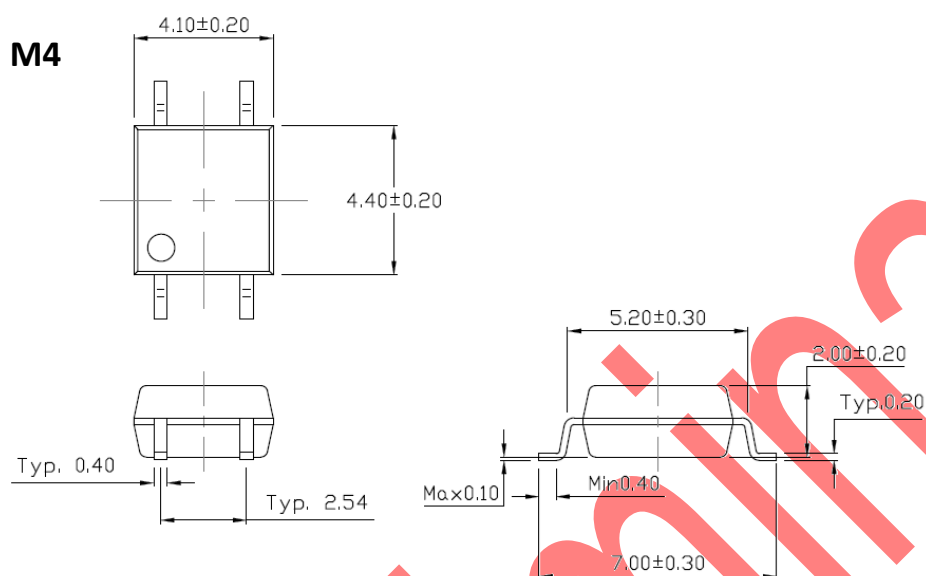


Figure 9: Switching Time Test Circuits



Package Dimension *Dimensions in mm unless otherwise stated*

Standard

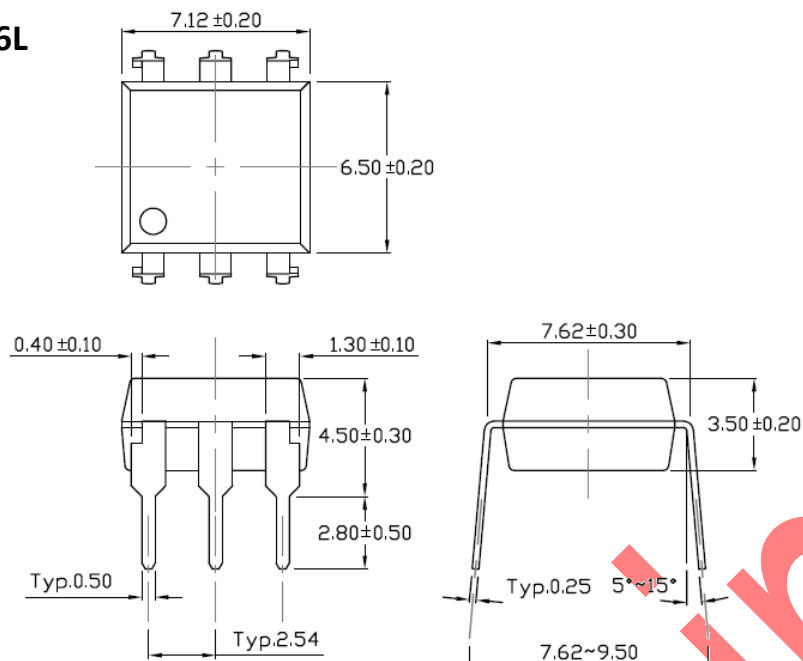




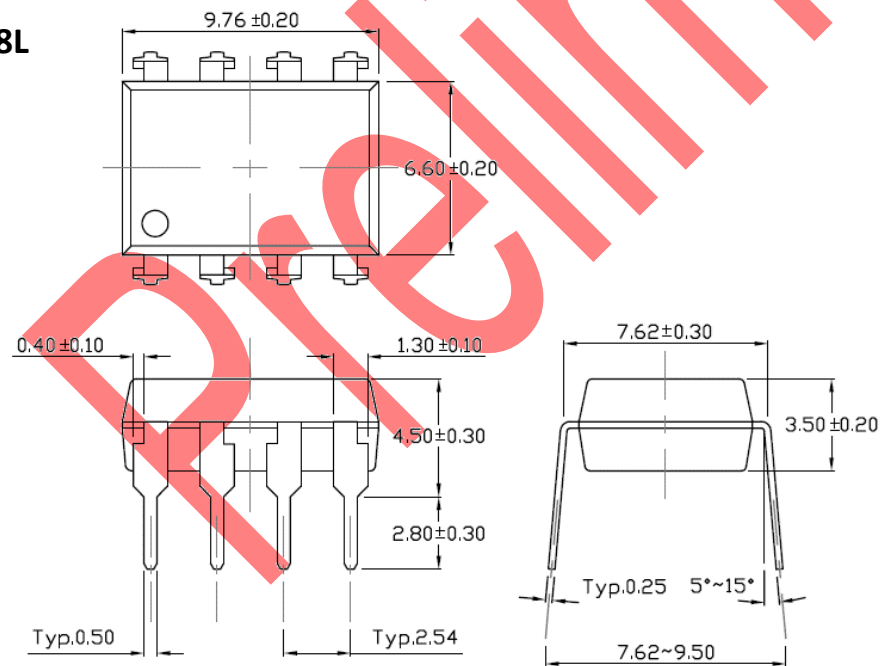
CTR215

80V PhotoMOS Relays

6L



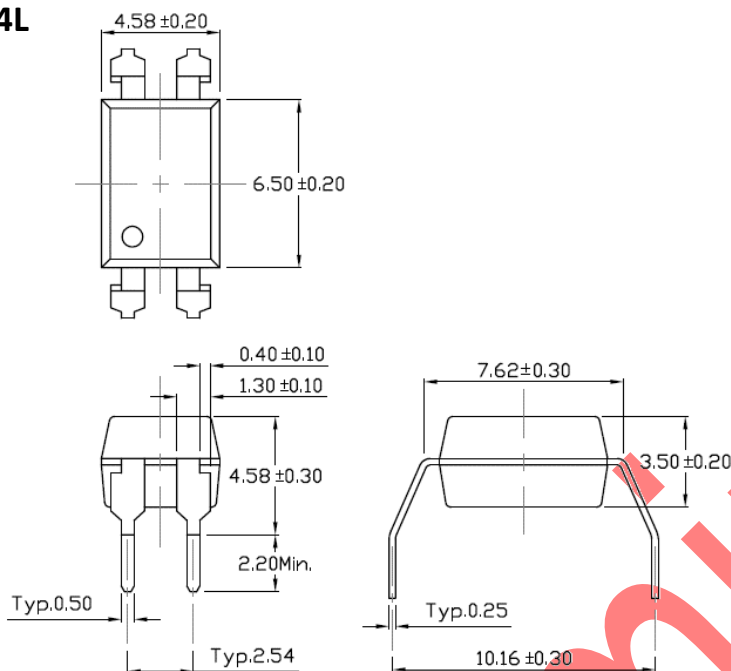
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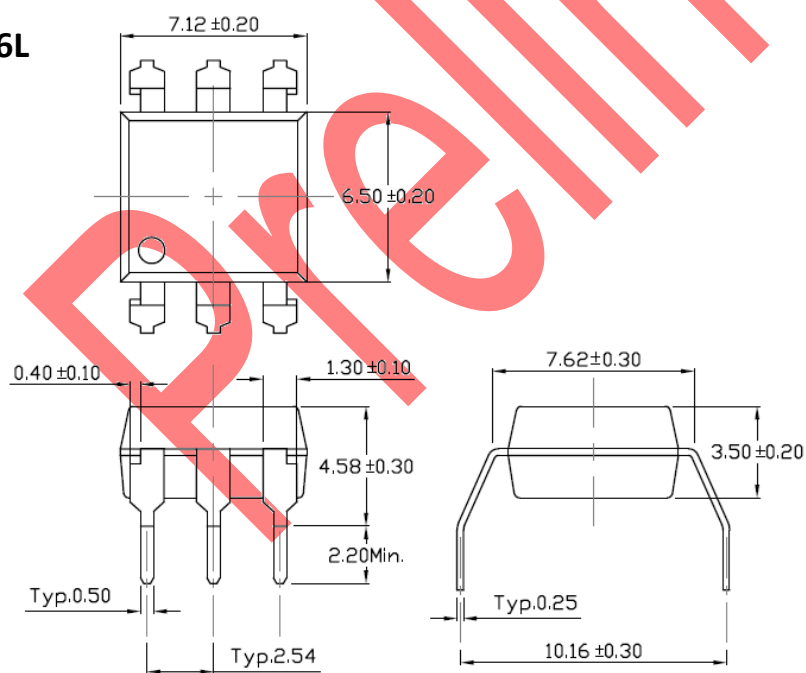


Wide Lead Forming – Through Hole (M Type)

4L



6L

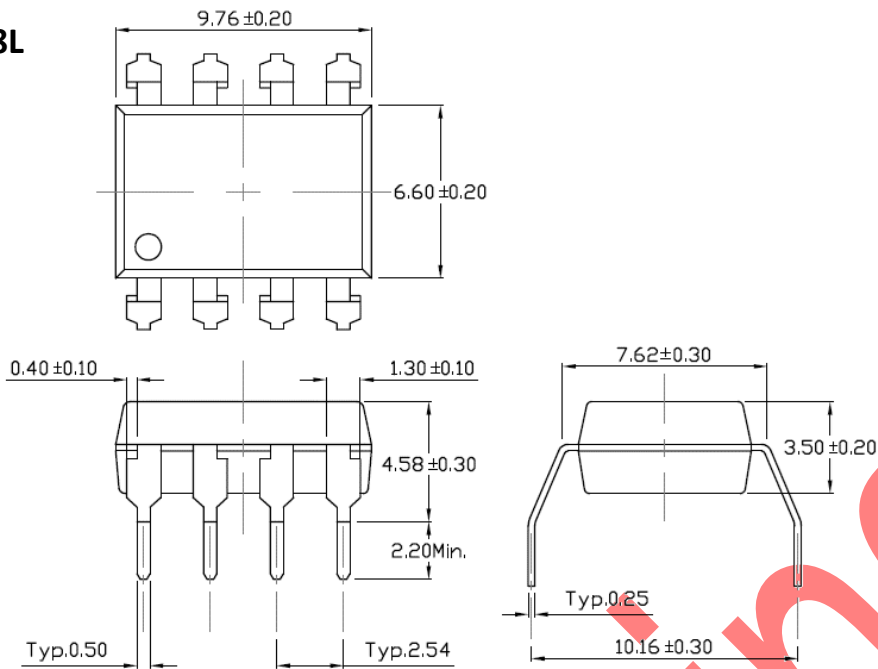




CTR215

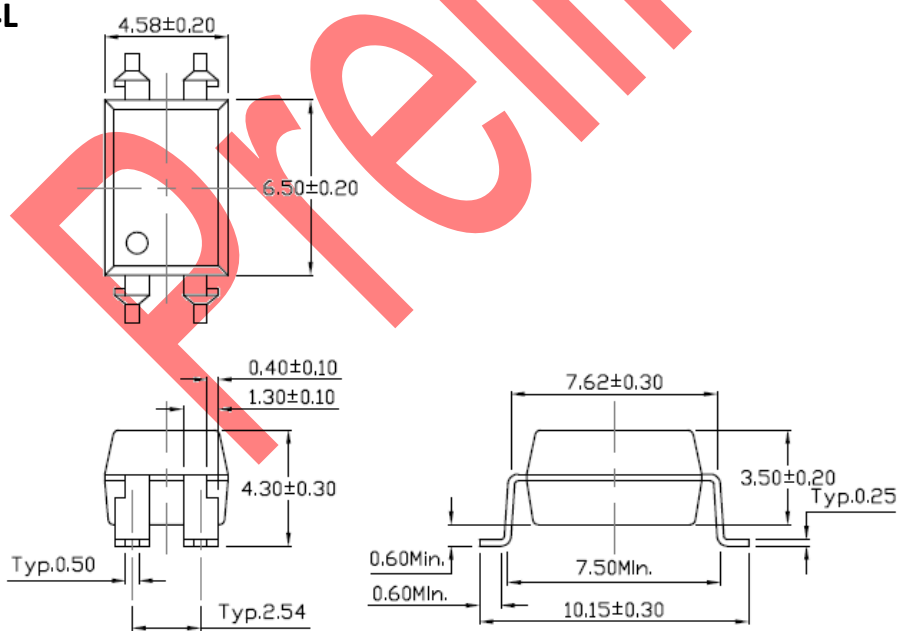
80V PhotoMOS Relays

8L



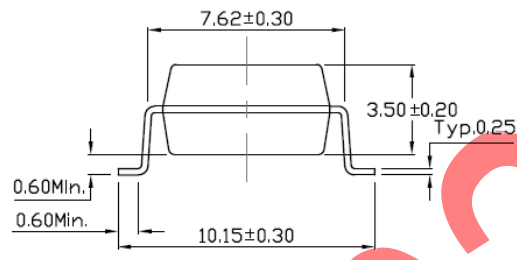
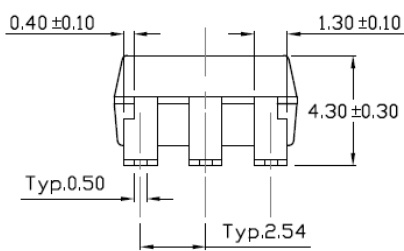
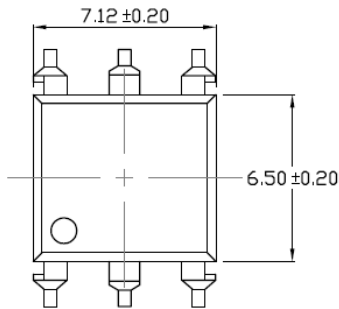
Surface Mount Forming (S Type)

4L

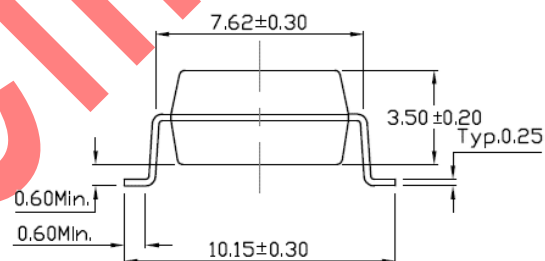
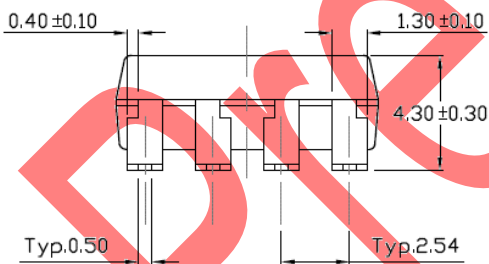
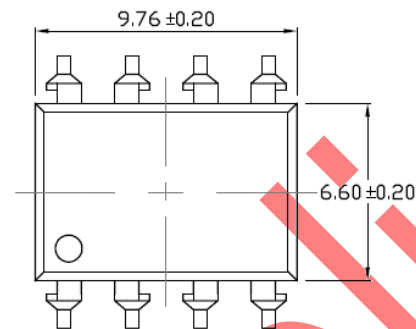




6L



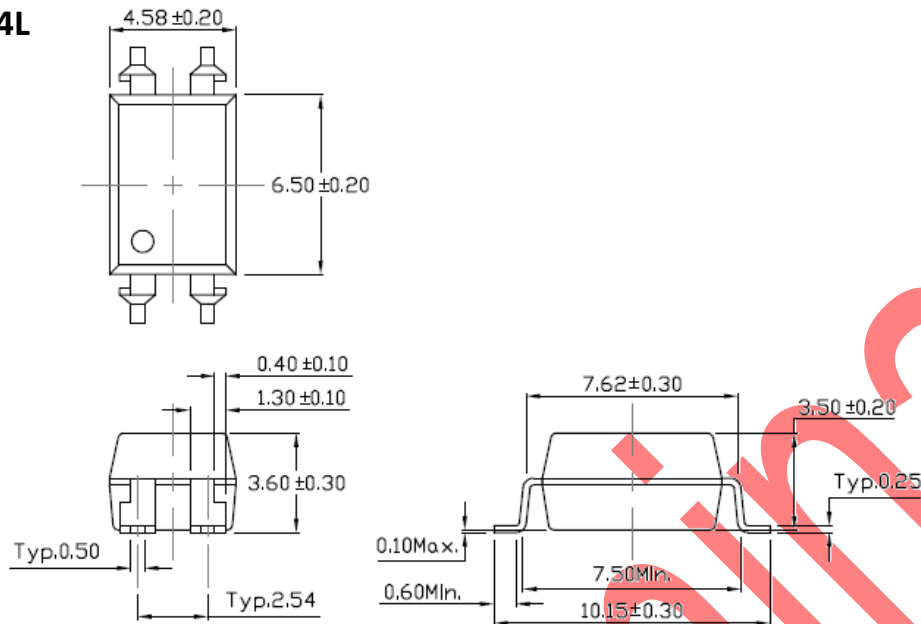
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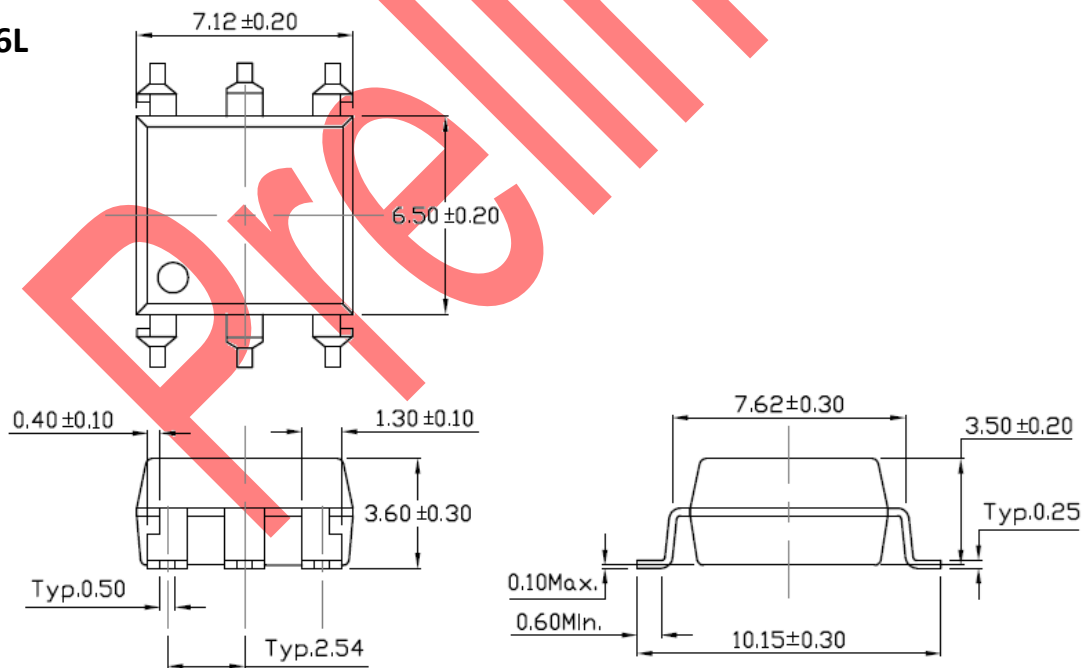


Surface Mount (Low Profile) Lead Forming (SL Type)

4L



6L

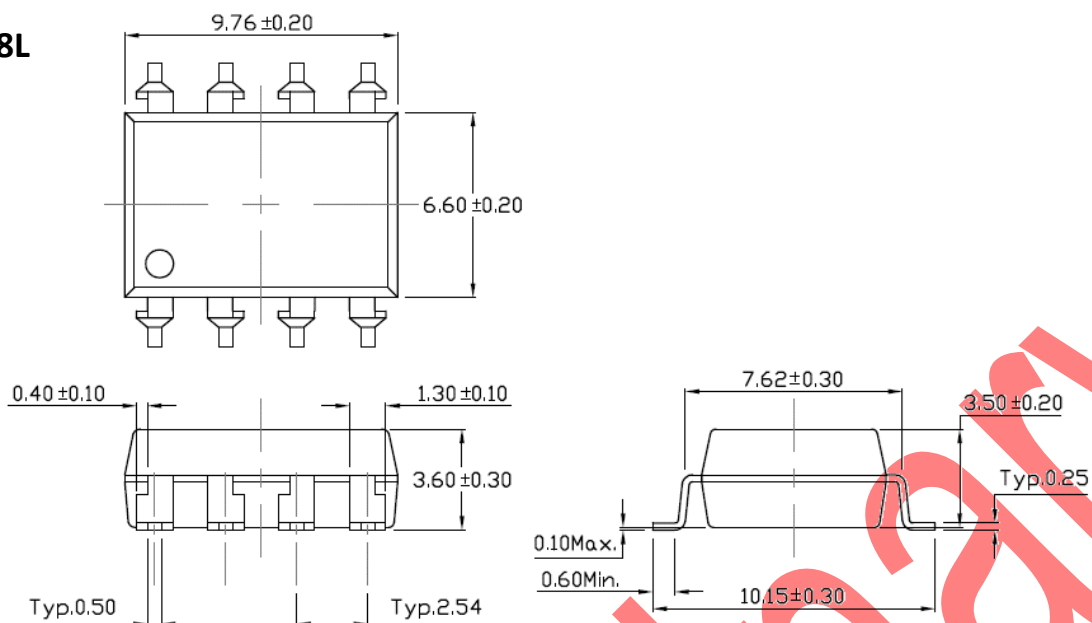




CTR215

80V PhotoMOS Relays

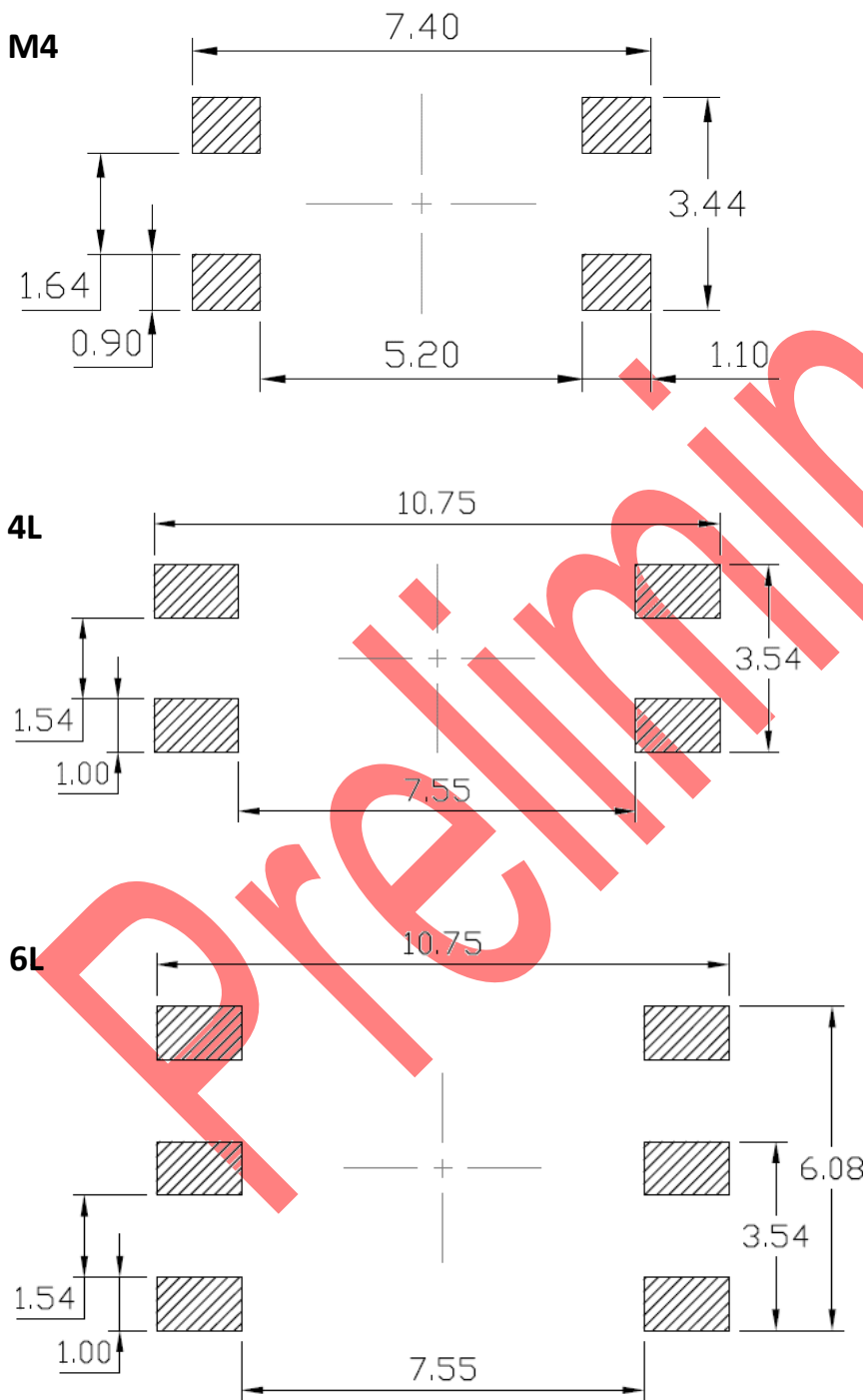
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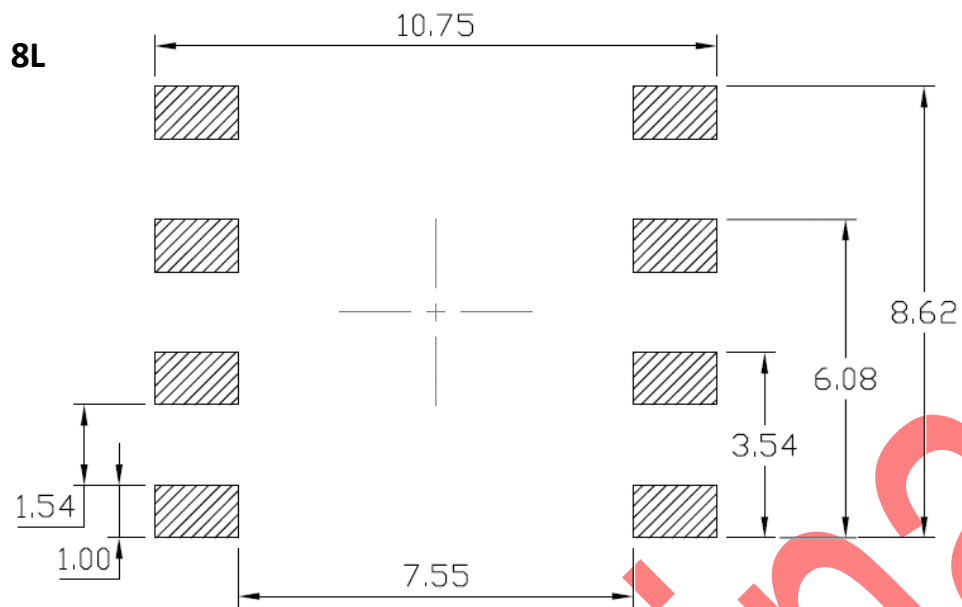




Recommended Solder Mask *Dimensions in mm unless otherwise stated*

Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming

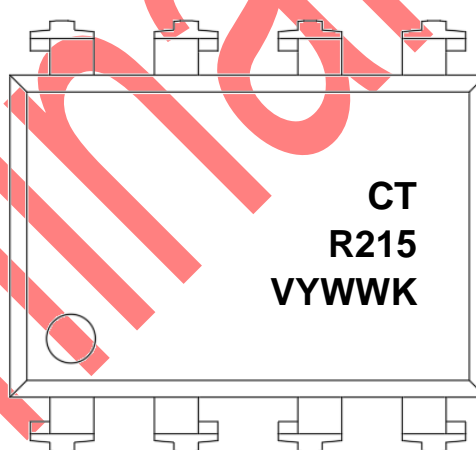
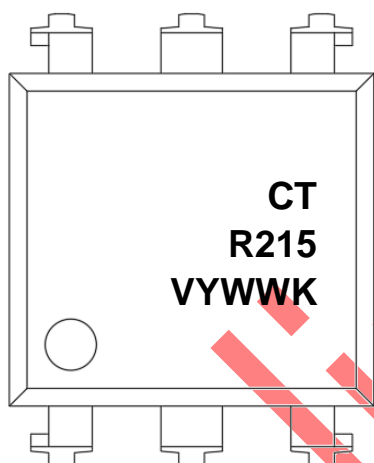
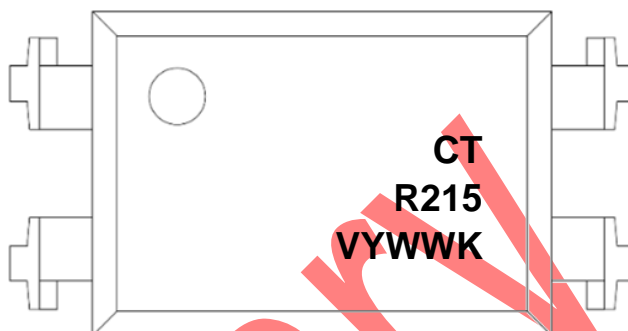




Preliminary



Marking Information



Note:

- CT : Denotes "CT Micro"
- R215 : Part Number
- V : VDE Certification Mark Option
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Code



Ordering Information

CTR215(V)(Y)(Z) – M4

- CT = Denotes “CT Micro”
- R215 = Product Number
- V = VDE Certification Mark Option
- Y = Lead form option (M, S, SL or none)
- M4 = Package Type (M4 = M4 , 4L ,6L , 8L)
- Z = Tape and Reel Option (T1 or T2)

Option	M4 Description	Quantity
T1	Surface Mount Lead Forming – With Option 1 Tapping	3000 Units/Reel
T2	Surface Mount Lead Forming – With Option 2 Tapping	3000 Units/Reel

Option	4L Description	Quantity
None	Standard 4 Pin DIP	100 Units/Tube
M	Gullwing (400mil) Lead Forming	100 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1500 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1500 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1500 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming – With Option 2 Taping	1500 Units/Reel

Option	6L Description	Quantity
None	Standard 6 Pin Dip	50Units/Tube
M	Gullwing (400mil) Lead Forming	50Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1000 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1000 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming – With Option 2 Taping	1000 Units/Reel



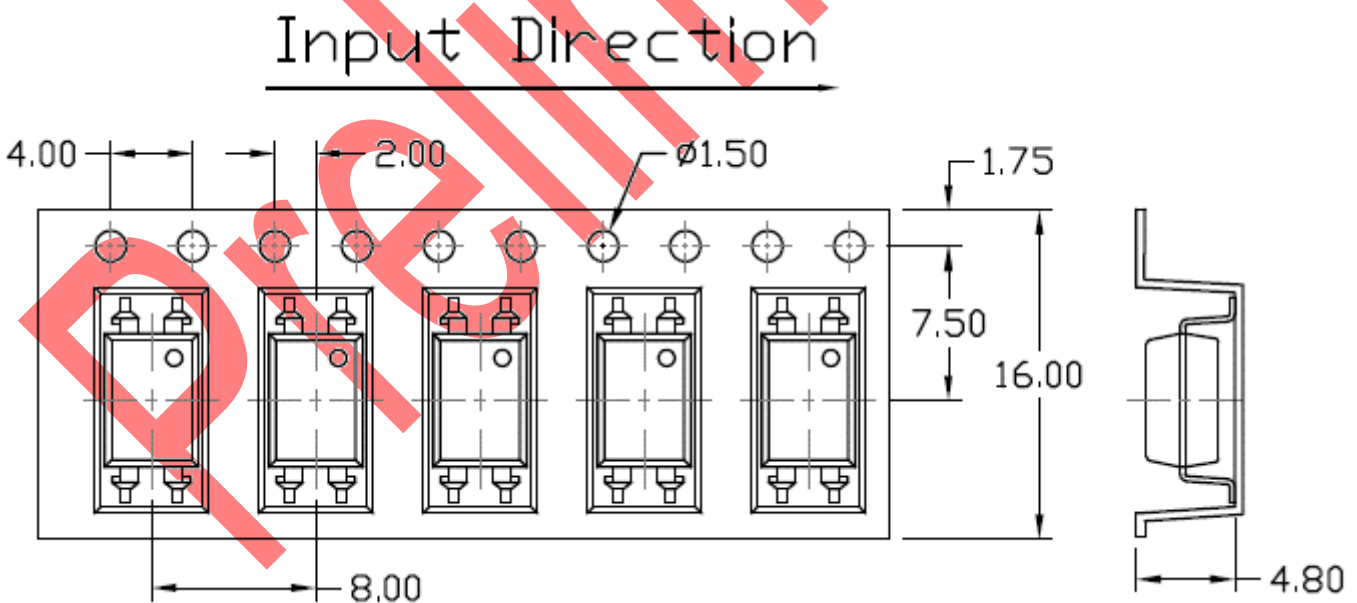
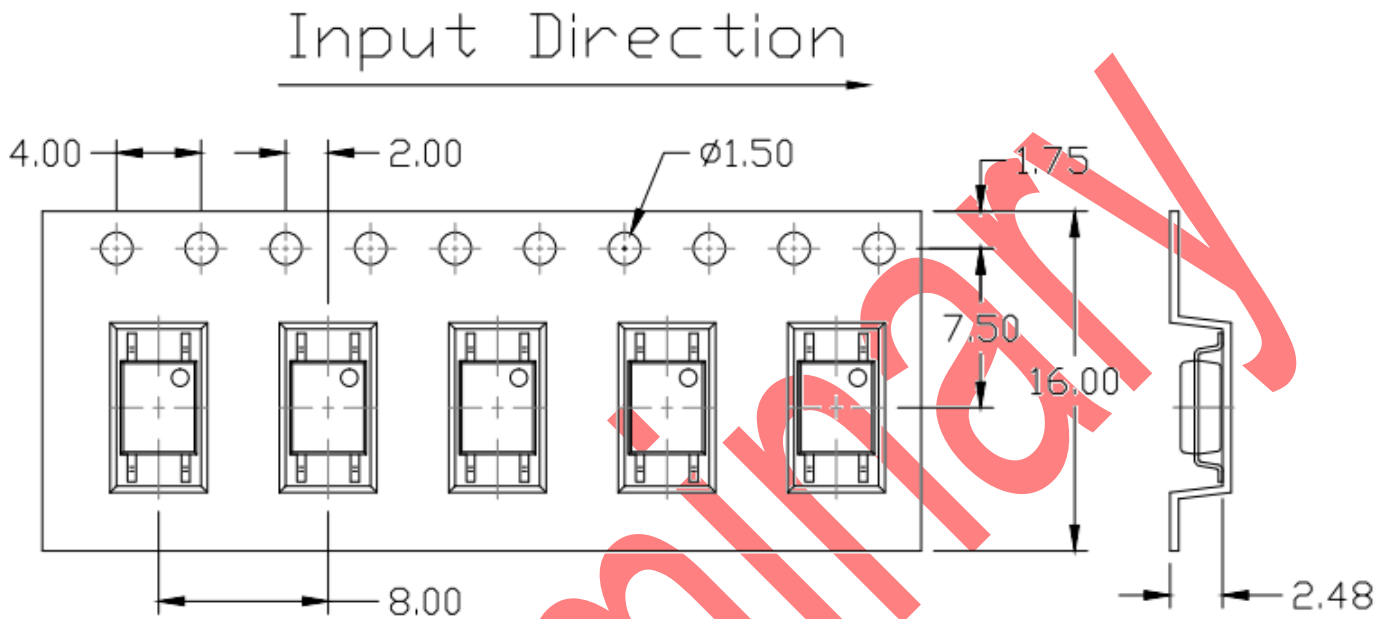
Option	8L Description	Quantity
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M	Gullwing (400mil) Lead Forming	40 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1000 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1000 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming– With Option 2 Taping	1000 Units/Reel

Preliminary



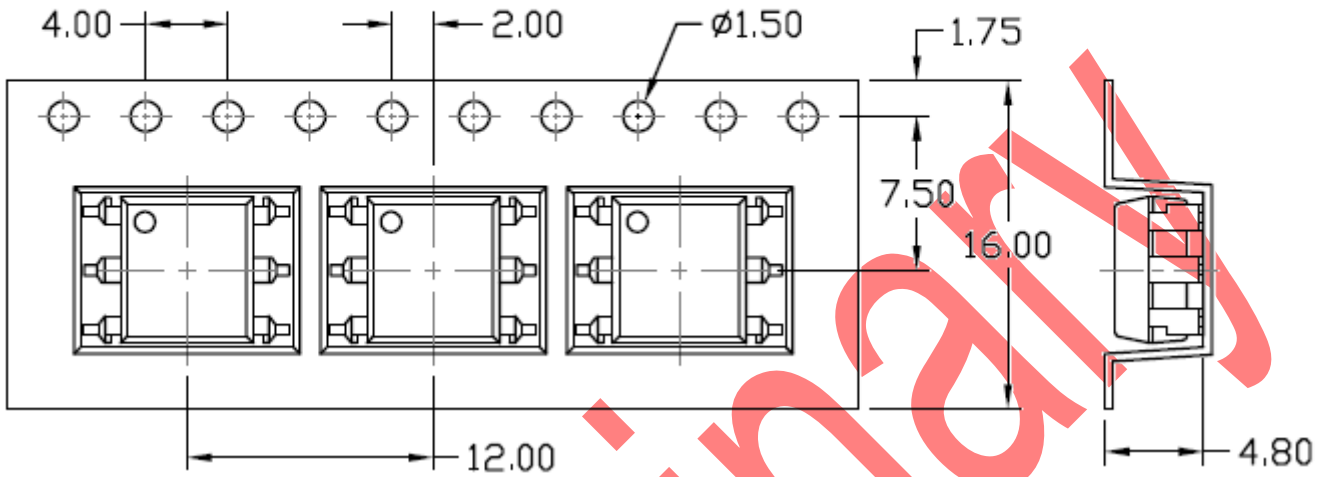
Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

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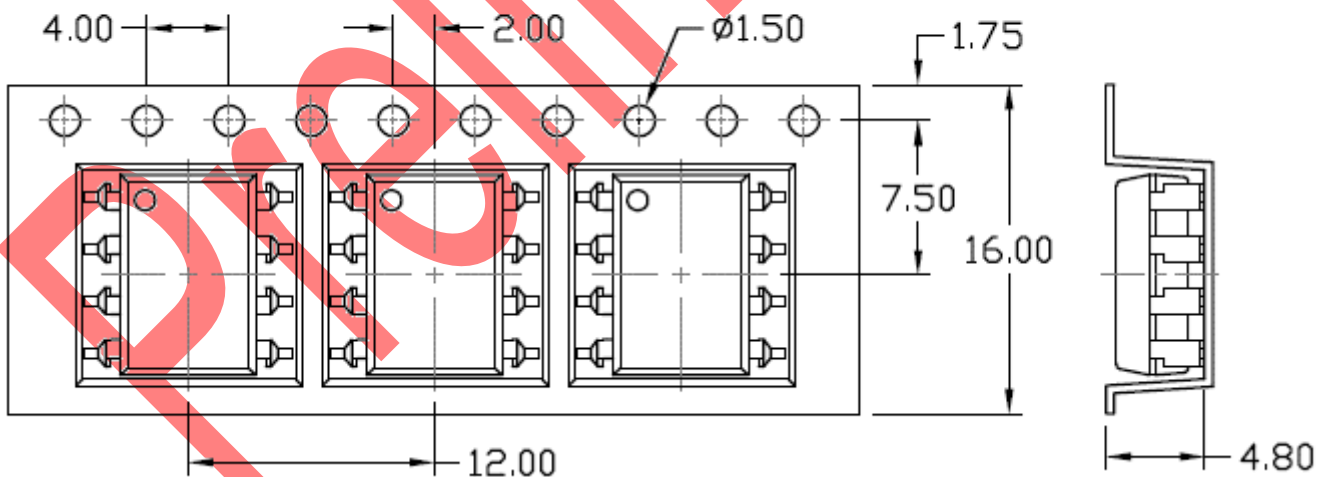




Input Direction



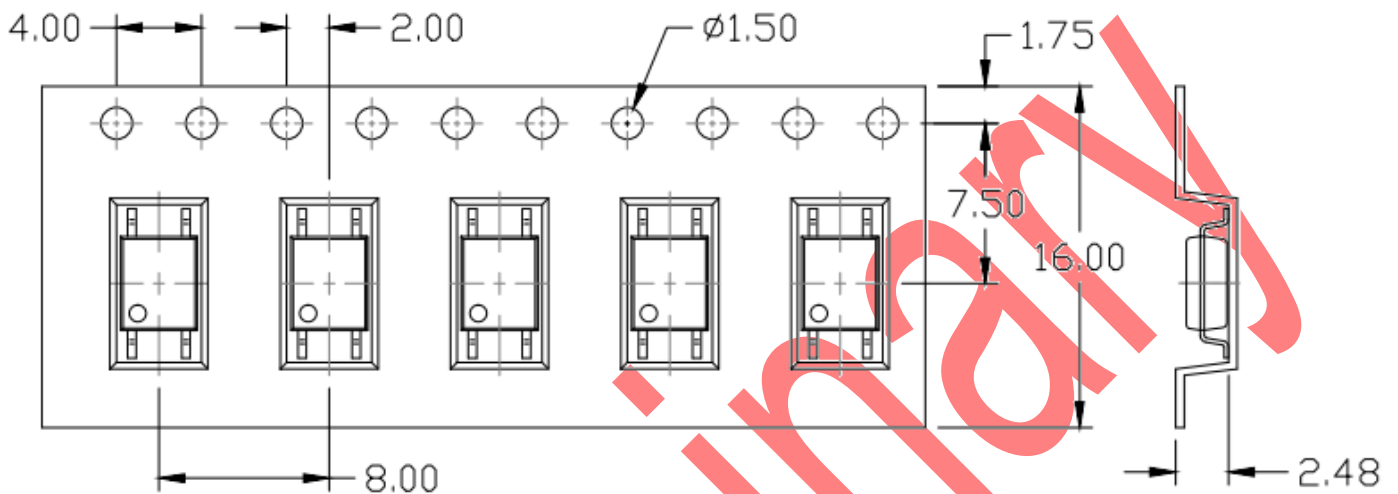
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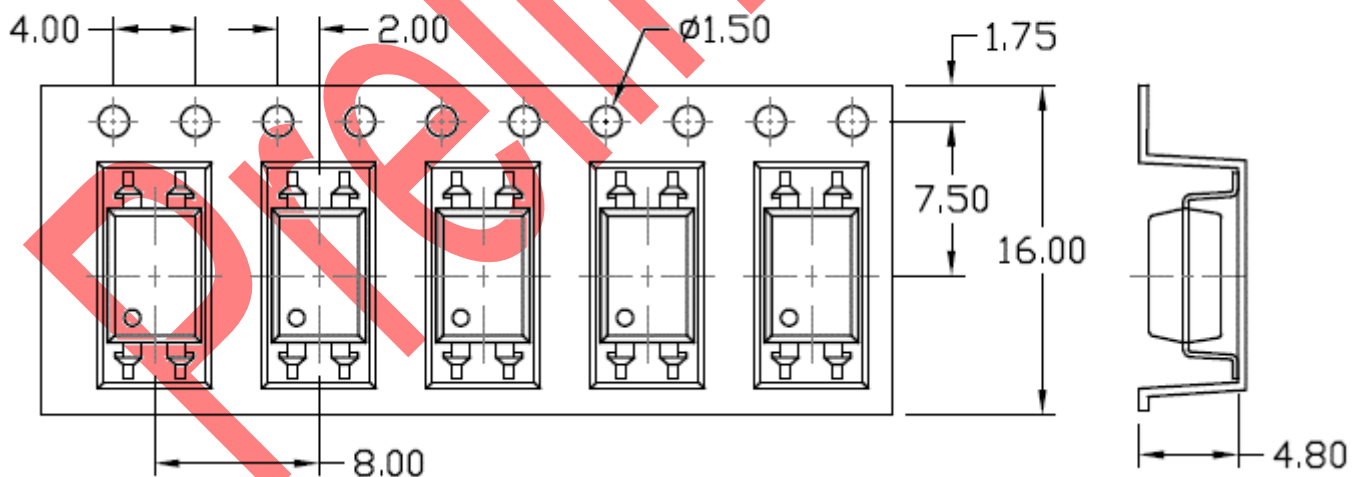


Option (S)(SL) T2

Input Direction

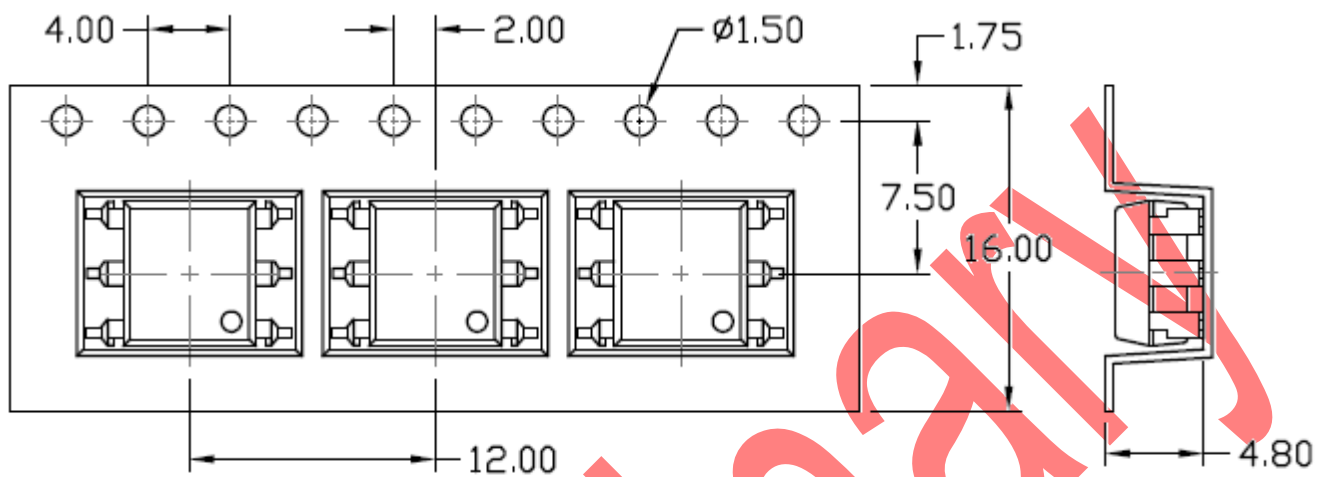


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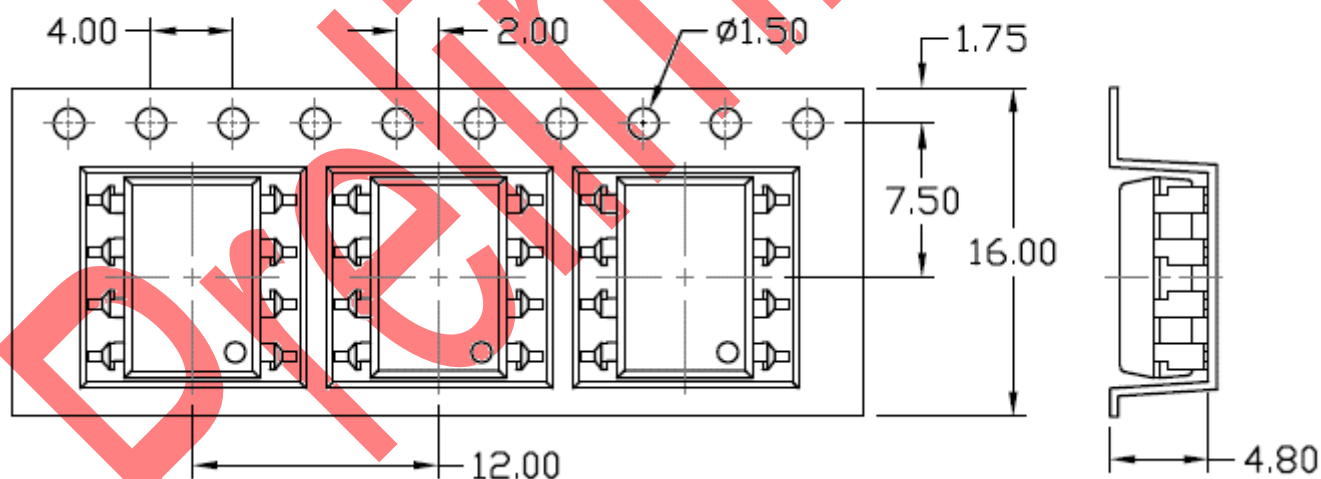




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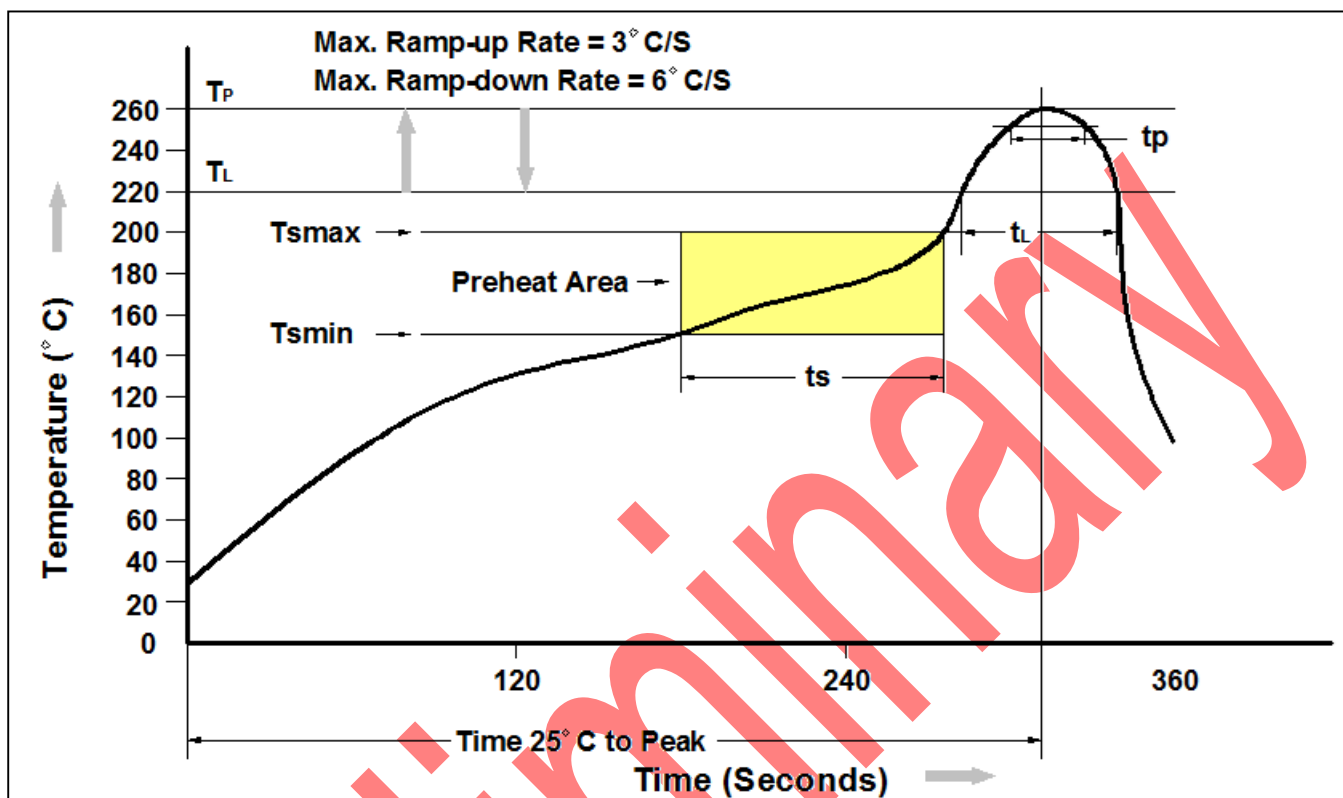


Input Direction





Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Ramp-up Rate (tL to tP)	3°C/second max.
Liquidous Temperature (TL)	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (tP) within 5°C of 260°C	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.



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- 2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.*