

$V_{RSM} = 400\text{ V}$, $I_{F(AV)} = 20\text{ A}$, $t_{rr} = 50\text{ ns}$
Fast Recovery Diode
CTLD-4204S

Description

The CTLD-4204S is a fast recovery diode of 400 V / 20 A. The maximum t_{rr} of 50 ns is realized by optimizing a life-time control.

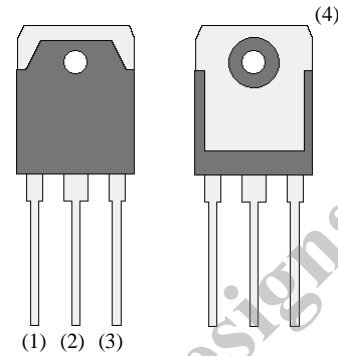
The low thermal resistance package achieves high performance in terms of heat dissipation.

Features

- V_{RSM} ----- 400 V
- $I_{F(AV)}$ ----- 20 A
- V_F ----- 1.25 V
- t_{rr1} ($I_F = I_{RP}$) ----- 50 ns
- Bare Lead Frame: Pb-free (RoHS Compliant)

Package

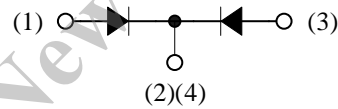
TO3P-3L



Not to scale

Applications

- Secondary Side Rectifier Diode
(Flyback Converter, LLC Converter, etc.)
- Freewheel Diode
(Offline Buck and Buck-boost Converter)



- (1) Anode
- (2) Cathode
- (3) Anode
- (4) Cathode

Not Recommended for New Designs

CTLD-4204S

Absolute Maximum Ratings

Unless otherwise specified, $T_A = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Conditions	Rating	Unit
Peak Repetitive Reverse Voltage	V_{RSM}		400	V
Repetitive Reverse Voltage	V_{RM}		400	V
Average Forward Current	$I_{F(AV)}$	See Figure 1 and Figure 2	20	A
Surge Forward Current ⁽¹⁾	I_{FSM}	Half cycle sine wave, positive side, 10 ms, 1 shot	100	A
I^2t Limiting Value ⁽¹⁾	I^2t	$1\text{ ms} \leq t \leq 10\text{ ms}$	50	A^2s
Junction Temperature	T_J		-40 to 150	$^\circ\text{C}$
Storage Temperature	T_{STG}		-40 to 150	$^\circ\text{C}$

Electrical Characteristics

Unless otherwise specified, $T_A = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage Drop ⁽¹⁾	V_F	$T_J = 25\text{ }^\circ\text{C}$, $I_F = 10\text{ A}$	—	1.25	1.4	V
		$T_J = 100\text{ }^\circ\text{C}$, $I_F = 10\text{ A}$	—	1.0	—	V
Reverse Leakage Current ⁽¹⁾	I_R	$V_R = V_{RM}$	—	—	20	μA
Reverse Leakage Current Under High Temperature ⁽¹⁾	$H \cdot I_R$	$V_R = V_{RM}$, $T_J = 150\text{ }^\circ\text{C}$	—	—	200	μA
Reverse Recovery Time ⁽¹⁾	t_{rr1}	$I_F = I_{RP} = 500\text{ mA}$ 90% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	50	ns
	t_{rr2}	$I_F = 500\text{ mA}$, $I_{RP} = 1000\text{ mA}$, 75% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	30	ns
Thermal Resistance ⁽²⁾	$R_{th(J-C)}$		—	—	2.0	$^\circ\text{C/W}$

⁽¹⁾ The rating of one chip.

⁽²⁾ $R_{th(J-C)}$ is thermal resistance between junction and the case

Rating and Characteristic Curves

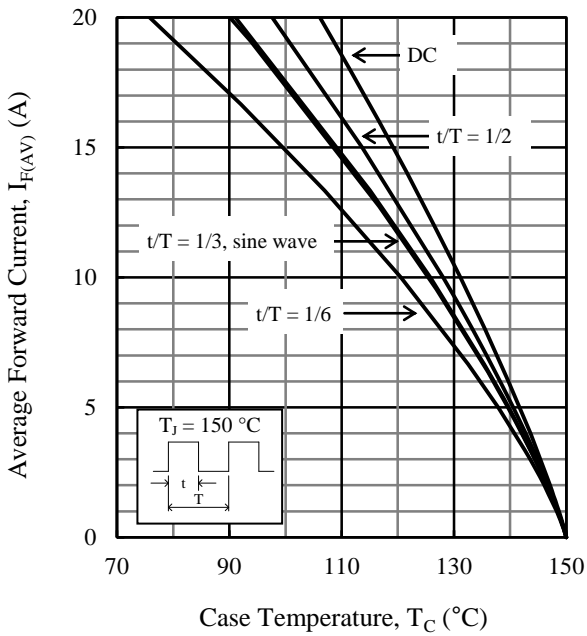


Figure 1. $I_{F(AV)}$ vs. T_C Typical Characteristics ($V_R = 0\text{ V}$)

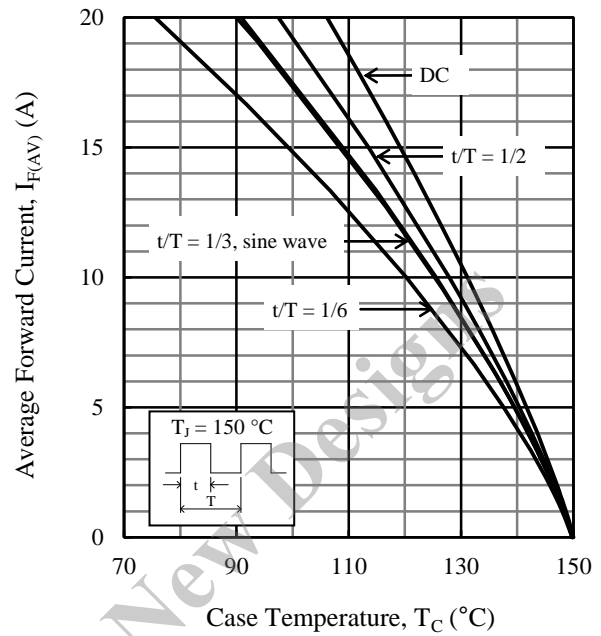


Figure 2. $I_{F(AV)}$ vs. T_C Typical Characteristics ($V_R = 400\text{ V}$)

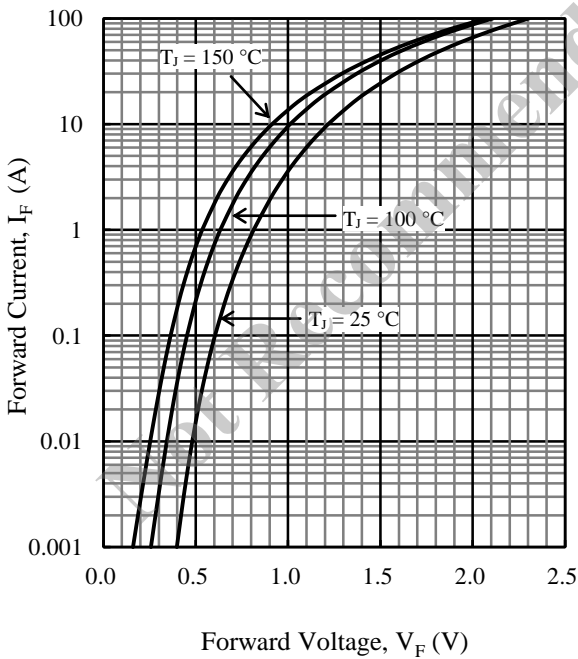


Figure 3. V_F vs. I_F Typical Characteristics

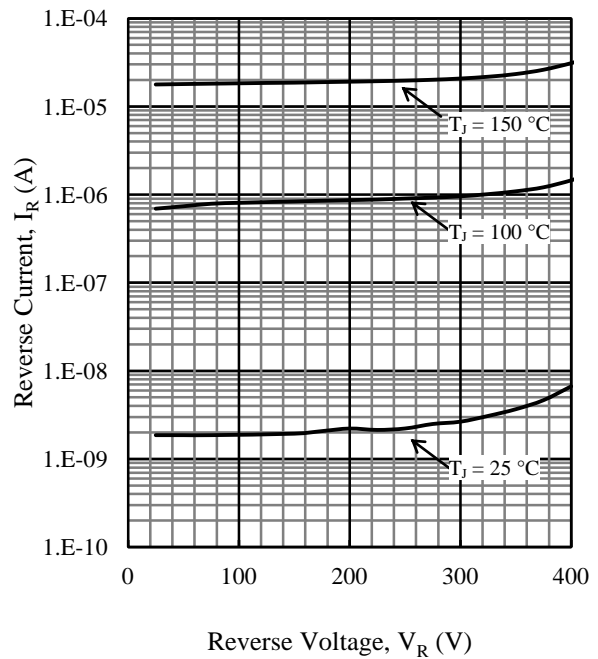
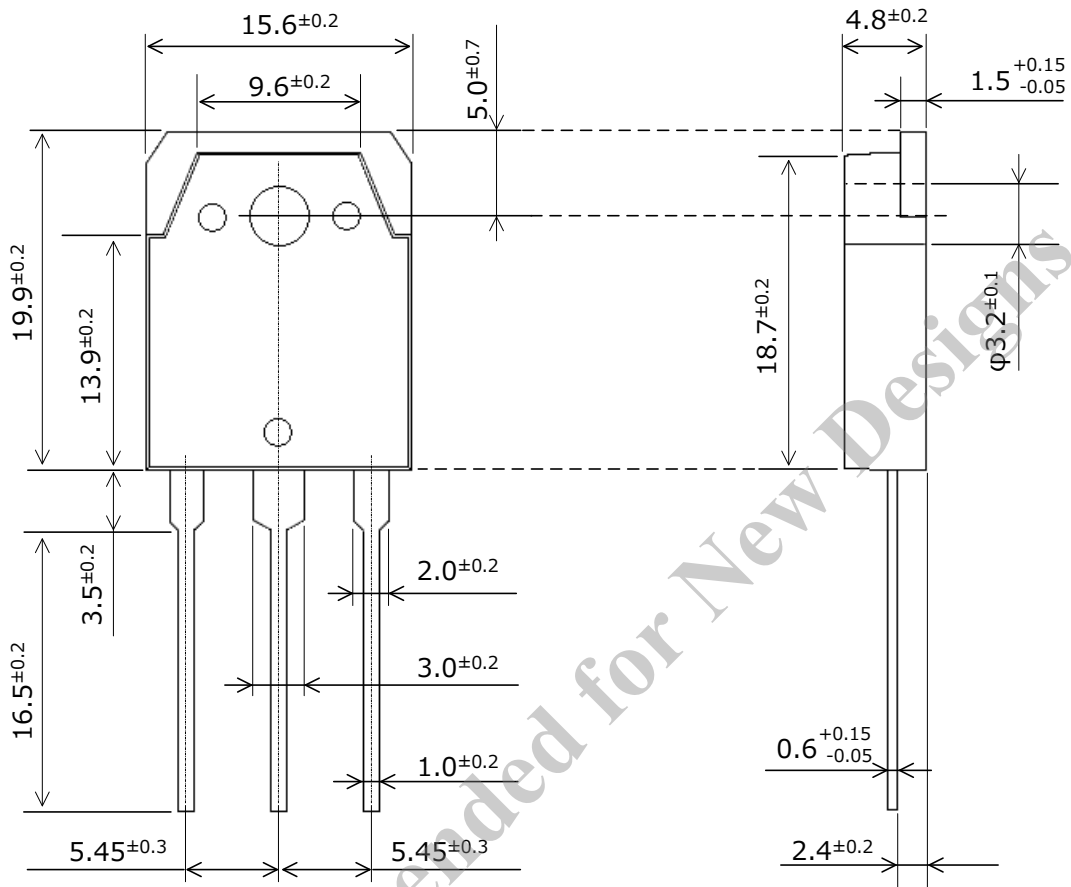


Figure 4. V_R vs. I_R Typical Characteristics

CTLD-4204S

Physical Dimensions

- TO3P-3L



NOTES:

- Dimensions in millimeters
- Bare lead frame: Pb-free (RoHS compliant)
- When soldering the products, it is required to minimize the working time, within the following limits:
Flow: $260 \pm 5 \text{ }^\circ\text{C} / 10 \pm 1 \text{ s}$, 2 times
Soldering Iron: $380 \pm 10 \text{ }^\circ\text{C} / 3.5 \pm 0.5 \text{ s}$, 1 time (Soldering should be at a distance of at least 1.5 mm from the body of the product.)
- Recommended screw torque for TO3P: 0.686 N·m to 0.882 N·m (7 kgf·cm to 9 kgf·cm)

Marking Diagram

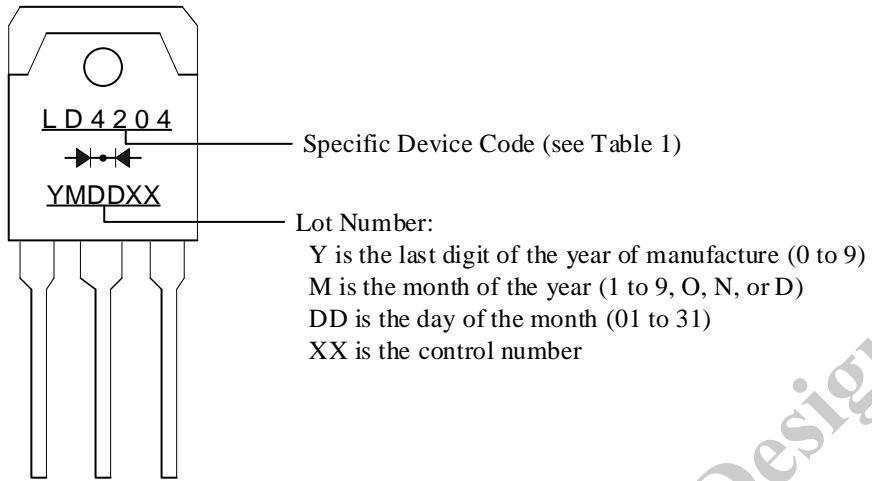


Table 1. Specific Device Code

Specific Device Code	Part Number
LD4204	CTLD-4204S

Not Recommended for New Designs

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