V_{RSM} = 400 V, $I_{F(AV)}$ = 20 A, t_{rr} = 50 ns
Fast Recovery Diode

CTLD-4204S

Data Sheet

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

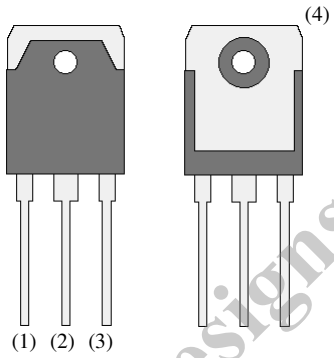
- V_{RSM} ---------- 400 V
- $I_{F(AV)}$ ---------- 20 A
- V_F ---------- 1.25 V
- t_{rr1} (I_F = I_{RP}) ---------- 50 ns
- Bare Lead Frame: Pb-free (RoHS Compliant)

Applications

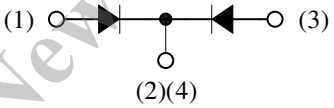
- Secondary Side Rectifier Diode
  (Flyback Converter, LLC Converter, etc.)
- Freewheel Diode
  (Offline Buck and Buck-boost Converter)

Package

TO3P-3L



Not to scale



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

Absolute Maximum Ratings

Unless otherwise specified, T_A = 25 °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 ms ≤ t ≤ 10 ms	50	A^2s
Junction Temperature	T_J		−40 to 150	°C
Storage Temperature	T_{STG}		−40 to 150	°C

Electrical Characteristics

Unless otherwise specified, T_A = 25 °C

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage Drop[1]	V_F	T_J = 25 °C, I_F =10 A	—	1.25	1.4	V
		T_J = 100 °C, I_F = 10 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 °C	—	—	200	µA
Reverse Recovery Time[1]	t_{rr1}	$I_F = I_{RP}$ = 500 mA 90% recovery point, T_J = 25 °C	—	—	50	ns
	t_{rr2}	I_F = 500 mA, I_{RP} = 1000 mA, 75% recovery point, T_J = 25 °C	—	—	30	ns
Thermal Resistance [2]	$R_{th(J-C)}$		—	—	2.0	°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

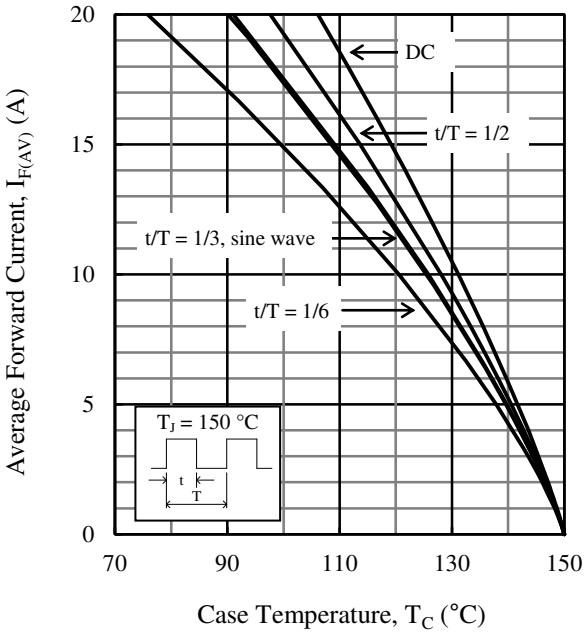


Figure 1. $I_{F(AV)}$ vs. T_C Typical Characteristics (V_R = 0 V)

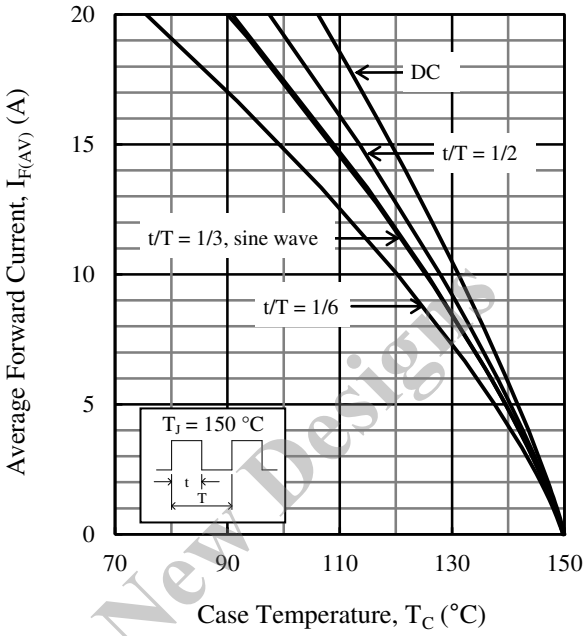


Figure 2. $I_{F(AV)}$ vs. T_C Typical Characteristics (V_R = 400 V)

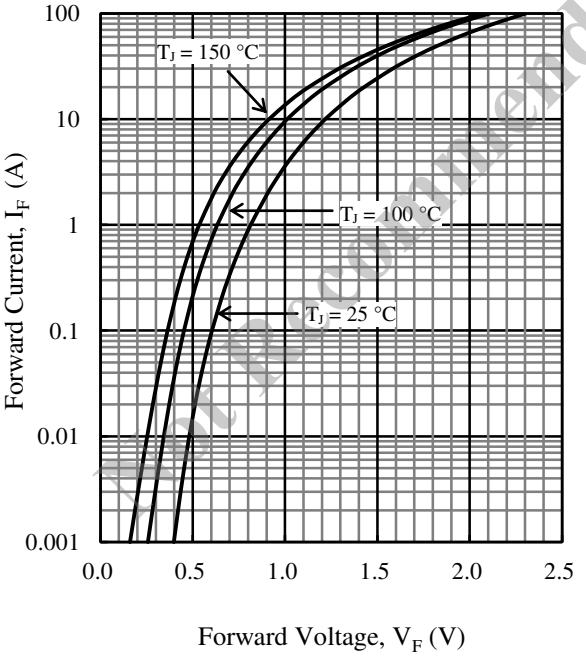


Figure 3. V_F vs. I_F Typical Characteristics

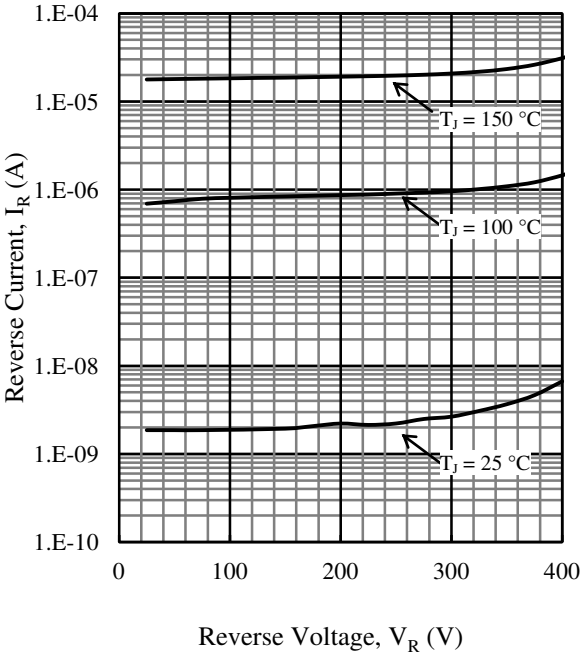
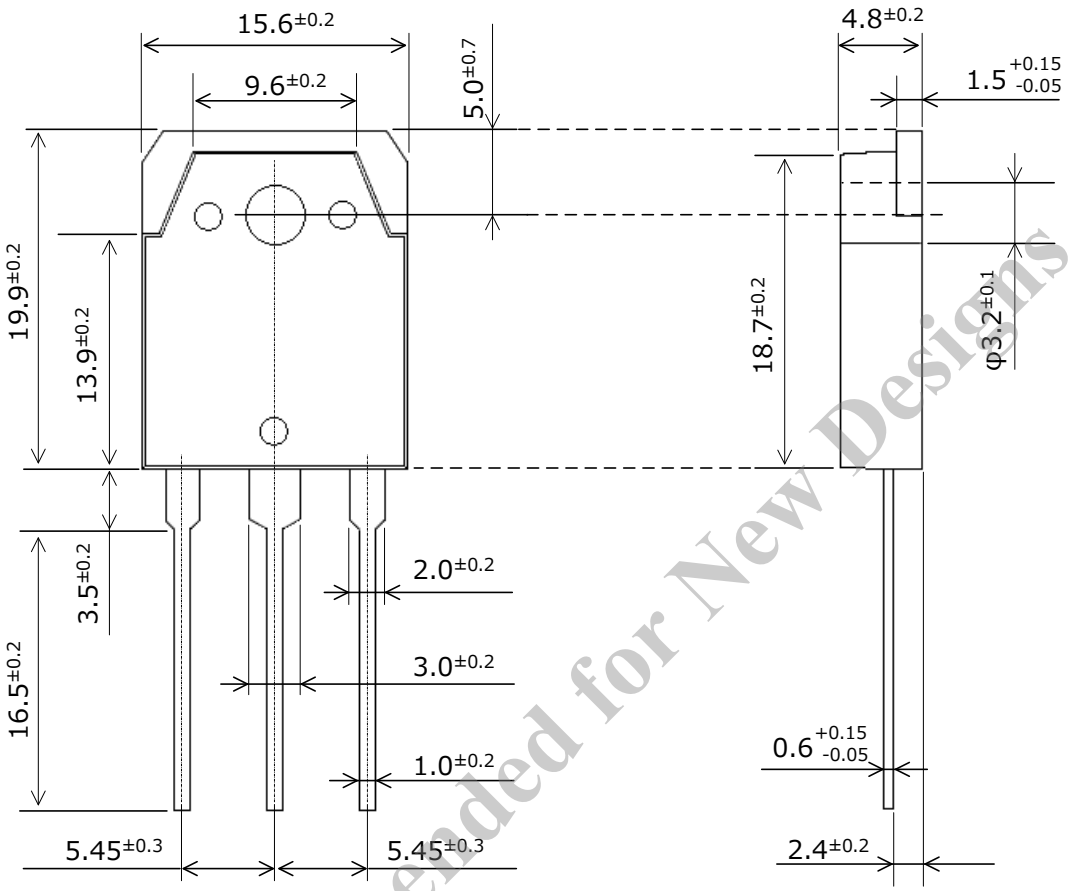


Figure 4. V_R vs. I_R Typical Characteristics

Physical Dimensions

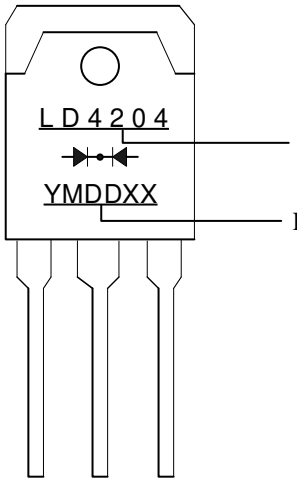
- **TO3P-3L**



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 ± 5 °C / 10 ± 1 s, 2 times
  Soldering Iron: 380 ± 10 °C / 3.5 ± 0.5 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



Specific Device Code (see Table 1)

Lot Number:
Y is the last digit of the year of manufacture (0 to 9)
M is the month of the year (1 to 9, O, N, or D)
DD is the day of the month (01 to 31)
XX is the control number

Table 1. Specific Device Code

Specific Device Code	Part Number
LD4204	CTLD-4204S

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