

$V_{RM} = 300\text{ V}$, $I_{F(AV)} = 60\text{ A}$, $t_{rr} = 100\text{ ns}$
Fast Recovery Diode
CTNS-4603S

Description

The CTNS-4603S is a 300 V, 60 A, fast recovery diode. The maximum V_F of 1.2 V and the maximum t_{rr} of 100 ns ($I_F : I_{RP} = 1 : 1$) are realized by optimizing the trade-off relationship between V_F and t_{rr} . The low thermal resistance package achieves high performance in terms of heat dissipation.

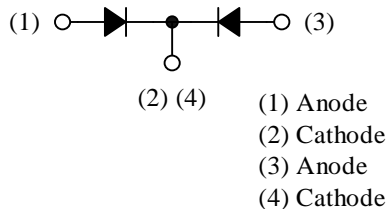
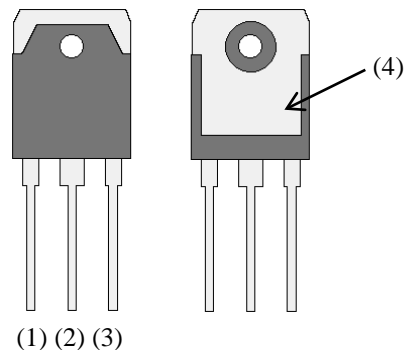
Features

- V_{RM} ----- 300 V
- $I_{F(AV)}$ ----- 60 A
- V_F ----- 1.2 V
- t_{rr1} ----- 100 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



CTNS-4603S

Absolute Maximum Ratings

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

Parameter	Symbol	Rating	Unit	Conditions
Peak Repetitive Reverse Voltage	V_{RSM}	300	V	
Repetitive Reverse Voltage	V_{RM}	300	V	
Average Forward Current	$I_{F(AV)}$	60	A	See Figure 1 and Figure 2
Surge Forward Current	I_{FSM}	400	A	Half cycle sine wave, positive side, 10 ms, 1 shot
I^2t Limiting Value	I^2t	800	A^2s	$1\text{ ms} \leq t \leq 10\text{ ms}$
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	V_F	$T_J = 25\text{ }^\circ\text{C}, I_F = 30\text{ A}$	—	—	1.2	V
		$T_J = 100\text{ }^\circ\text{C}, I_F = 30\text{ A}$	—	0.85	—	V
Reverse Leakage Current	I_R	$V_R = V_{RM}$	—	—	100	μA
Reverse Leakage Current Under High Temperature	$H \cdot I_R$	$V_R = V_{RM}, T_J = 150\text{ }^\circ\text{C}$	—	—	10	mA
Reverse Recovery Time	t_{rr1}	$I_F = I_{RP} = 500\text{ mA}$ 90% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	100	ns
Thermal Resistance ⁽¹⁾	$R_{th(J-C)}$		—	—	1.0	$^\circ\text{C/W}$

⁽¹⁾ $R_{th(J-C)}$ is thermal resistance between junction and the case. The case temperature is measured at the back side near the screw hole.

Rating and Characteristic Curves

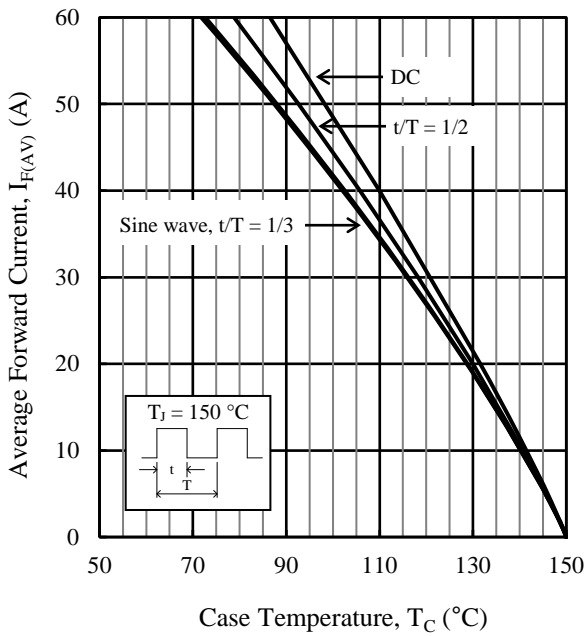


Figure 1. $I_{F(AV)}$ vs. T_C Typical Characteristics ($V_R = 0\text{ V}$)

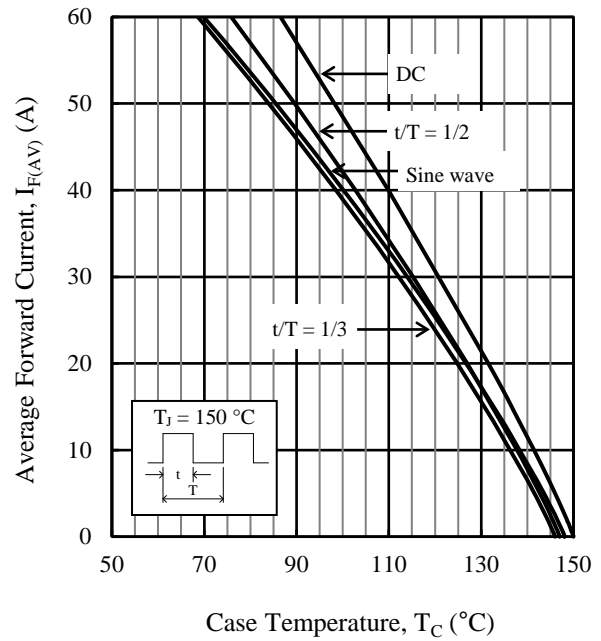


Figure 2. $I_{F(AV)}$ vs. T_C Typical Characteristics ($V_R = 300\text{ V}$)

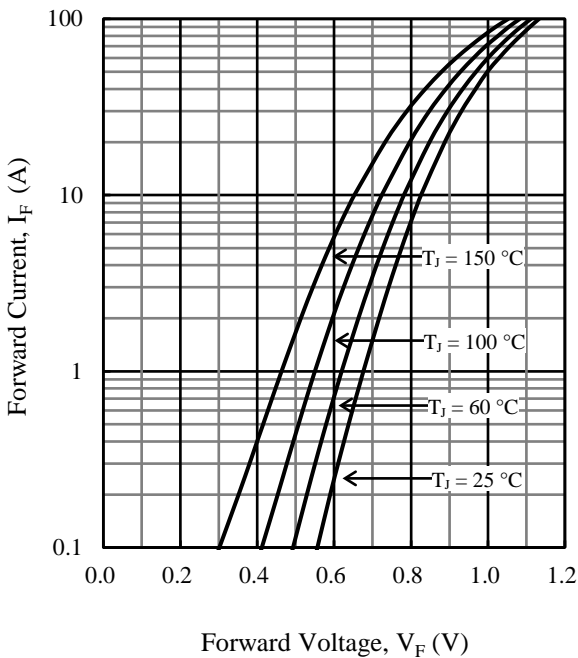


Figure 3. V_F vs. I_F Typical Characteristics

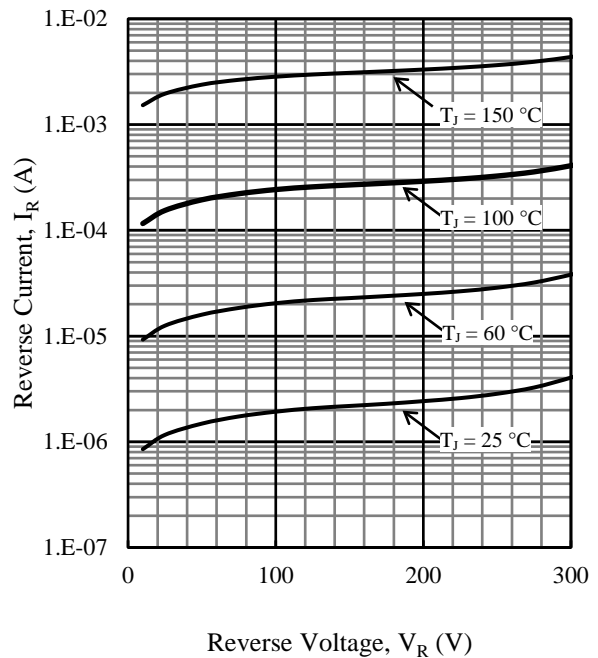
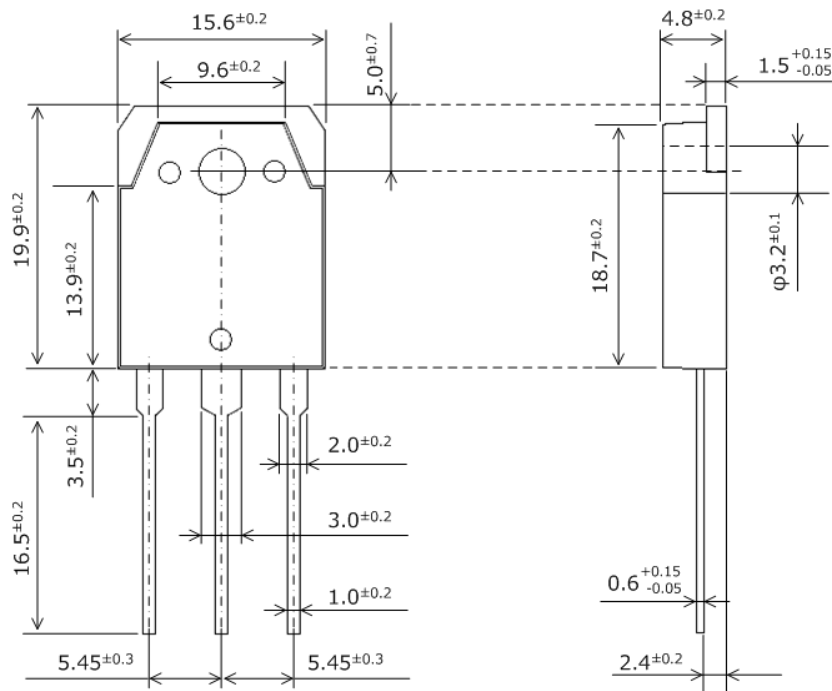


Figure 4. V_R vs. I_R Typical Characteristics

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: $260 \pm 5 \text{ }^\circ\text{C} / 10 \pm 1 \text{ s}$, 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.
- The recommended screw torque for TO3P: 0.686 to 0.882 N·m (7 to 9 kgf·cm)

Marking Diagram

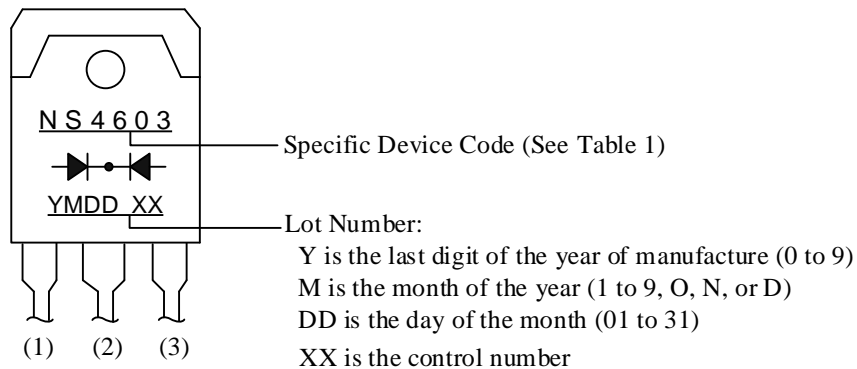


Table 1. Specific Device Code

Specific Device Code	Part Number
NS4603	CTNS-4603S

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