

$V_{RSM} = 600\text{ V}$, $I_{F(AV)} = 30\text{ A}$, $t_{rr} = 100\text{ ns}$
Fast Recovery Diode
CTNS-4306S

Description

The CTNS-4306S is a 600 V, 30 A, fast recovery diode. The typical V_F of 1.15 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

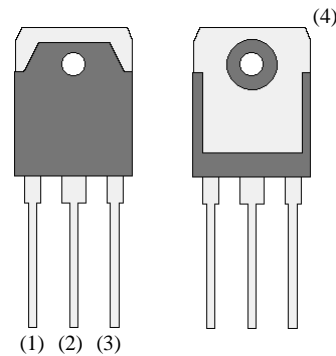
- V_{RSM} ----- 600 V
- $I_{F(AV)}$ ----- 30 A
- V_F ----- 1.15 V
- $t_{rr1} (I_F = I_{RP})$ ----- 100 ns
- Bare Lead Frame: Pb-free (RoHS Compliant)

Applications

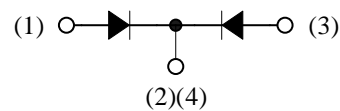
- PFC Circuit (DCM and CRM)
- Freewheel Diode
 (Offline Buck and Buck-boost Converter)

Package

TO3P-3L



Not to scale



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

CTNS-4306S

Absolute Maximum Ratings

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

Parameter	Symbol	Conditions	Rating	Unit
Peak Repetitive Reverse Voltage	V_{RSM}		600	V
Repetitive Reverse Voltage	V_{RM}		600	V
Average Forward Current	$I_{F(AV)}$	See Figure 1 and Figure 2	30	A
Surge Forward Current ⁽¹⁾	I_{FSM}	Half cycle sine wave, positive side, 10 ms, 1 shot	140	A
I^2t Limiting Value ⁽¹⁾	I^2t	$1\text{ ms} \leq t \leq 10\text{ ms}$	98	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	$T_J = 25\text{ }^\circ\text{C}$, $I_F = 15\text{ A}$	—	1.15	1.3	V
		$T_J = 100\text{ }^\circ\text{C}$, $I_F = 15\text{ A}$	—	1.1	—	V
Reverse Leakage Current ⁽¹⁾	I_R	$V_R = V_{RM}$	—	—	100	μA
Reverse Leakage Current Under High Temperature ⁽¹⁾	$H \cdot I_R$	$V_R = V_{RM}$, $T_J = 150\text{ }^\circ\text{C}$	—	—	10	mA
Reverse Recovery Time ⁽¹⁾	t_{rr1}	$I_F = I_{RP} = 100\text{ mA}$ 90% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	100	ns
	t_{rr2}	$I_F = 100\text{ mA}$, $I_{RP} = 200\text{ mA}$, 75% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	50	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

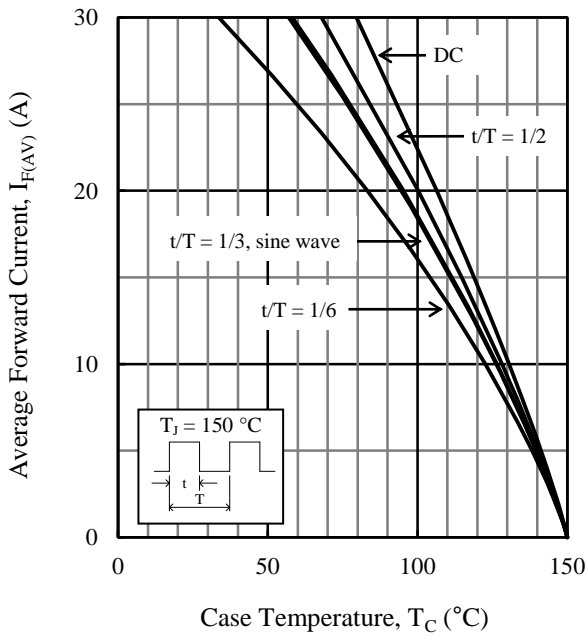


Figure 1. $I_{F(AV)}$ vs. T_C Typical Characteristics ($V_R = 0\text{ V}$)

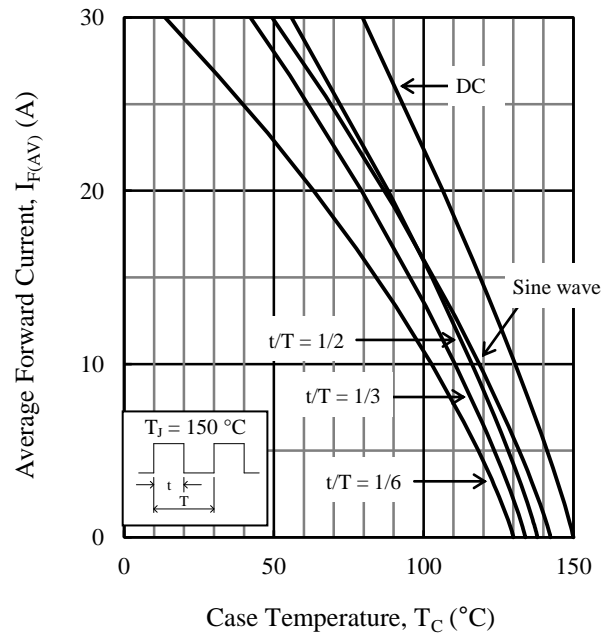


Figure 2. $I_{F(AV)}$ vs. T_C Typical Characteristics ($V_R = 600\text{ V}$)

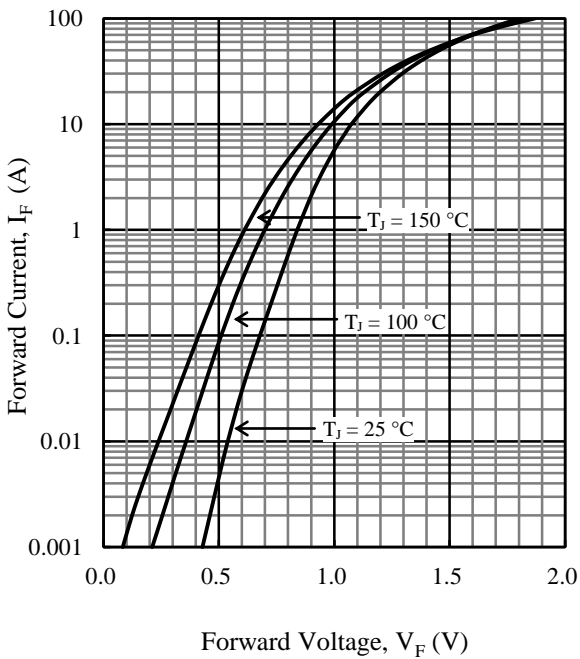


Figure 3. V_F vs. I_F Typical Characteristics

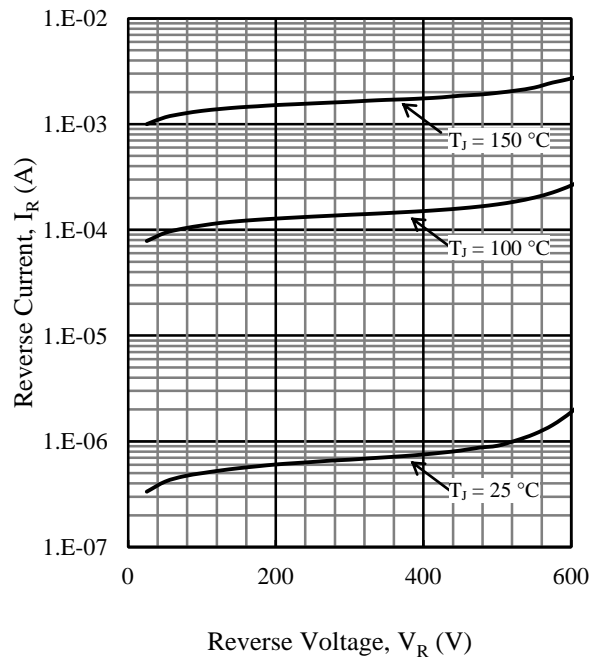
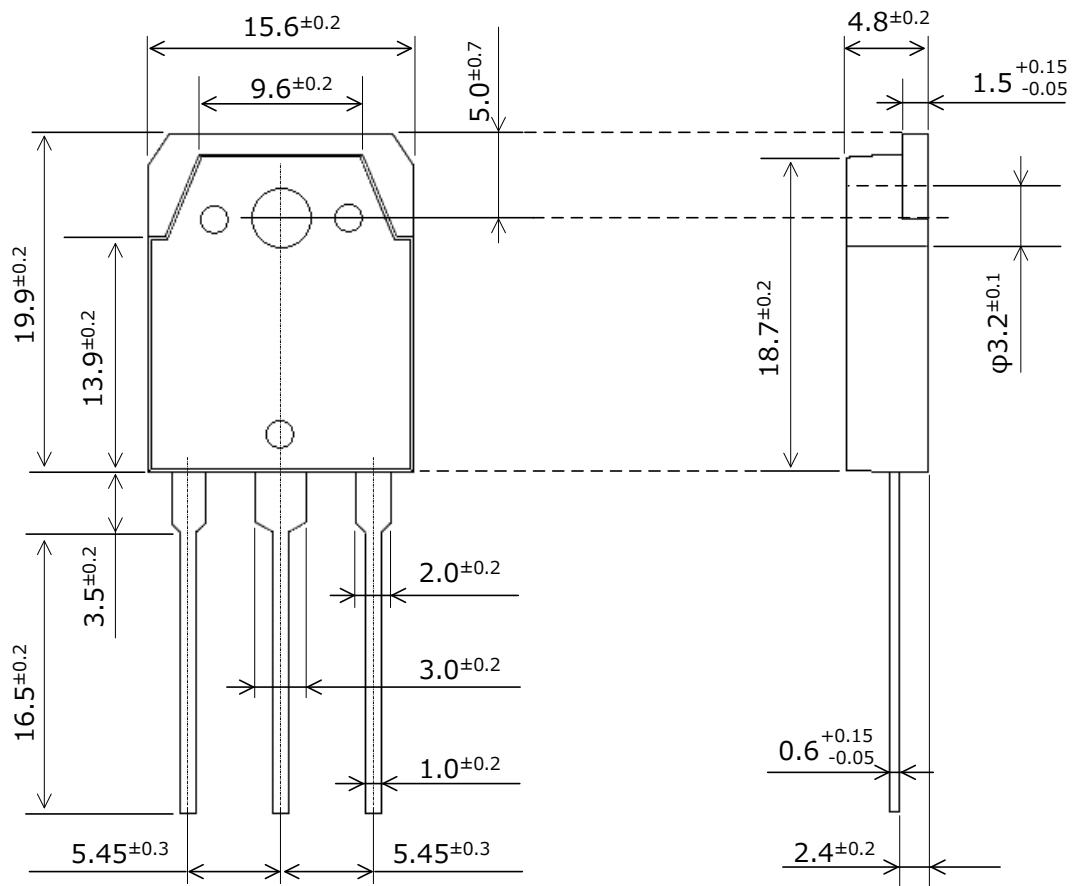


Figure 4. V_R vs. I_R Typical Characteristics

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.)
- Recommended screw torque for TO3P: 0.686 N·m to 0.882 N·m (7 kgf·cm to 9 kgf·cm)

Marking Diagram

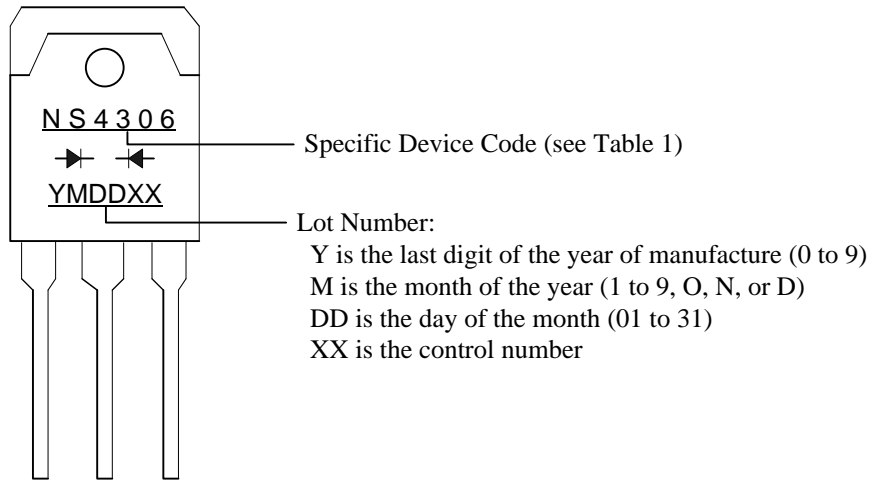


Table 1. Specific Device Code

Specific Device Code	Part Number
NS4306	CTNS-4306S

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