

$V_{RM} = 600\text{ V}$, $I_{F(AV)} = 30\text{ A}$, $t_{rr} = 35\text{ ns}$
Fast Recovery Diode
CTXS-5306S

Description

The CTXS-5306S is a fast recovery diode of 600 V / 30 A. The maximum t_{rr} of 35 ns is realized by optimizing a life-time control. The low thermal resistance package achieves high performance in terms of heat dissipation.

Features

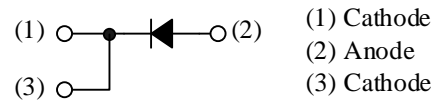
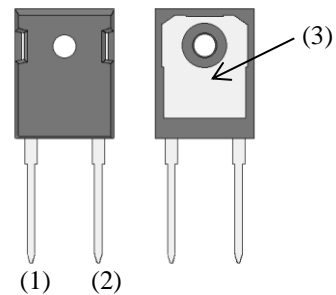
- V_{RM} -----600 V
- $I_{F(AV)}$ -----30 A
- V_F -----1.7 V
- t_{rr} -----35 ns
- Bare Lead Frame: Pb-free (RoHS Compliant)
- Flammability: Equivalent to UL94V-0

Applications

- PFC Circuit
- Inverter Circuit

Package

TO247-2L



Not to scale

Absolute Maximum Ratings

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

| Parameter | Symbol | Conditions | Rating | Unit |
|------------------------------------|-------------|--|------------|----------------------|
| Nonrepetitive Peak Reverse Voltage | V_{RSM} | | 600 | V |
| Repetitive Peak Reverse Voltage | V_{RM} | | 600 | V |
| Average Forward Current | $I_{F(AV)}$ | See Figure 1 and Figure 2 | 30 | A |
| Surge Forward Current | I_{FSM} | Half cycle sine-wave, positive side, 10 ms, 1 shot | 160 | A |
| I^2t Limiting Value | I^2t | $1\text{ ms} \leq t \leq 10\text{ ms}$ | 128 | 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 | V_F | $T_J = 25\text{ }^\circ\text{C}$, $I_F = 30\text{ A}$ | — | — | 1.7 | V |
| | | $T_J = 100\text{ }^\circ\text{C}$, $I_F = 30\text{ A}$ | — | 1.4 | — | V |
| Reverse Leakage Current | I_R | $V_R = V_{RM}$ | — | — | 100 | μA |
| Reverse Leakage Current under High Temperature | $H \cdot I_R$ | $V_R = V_{RM}$, $T_J = 150\text{ }^\circ\text{C}$ | — | — | 30 | mA |
| Reverse Recovery Time | t_{rr} | $I_F = I_{RP} = 500\text{ mA}$, 90% recovery point, $T_J = 25\text{ }^\circ\text{C}$ | — | — | 35 | ns |
| Thermal Resistance ⁽¹⁾ | $R_{th(J-C)}$ | | — | — | 1.5 | $^\circ\text{C/W}$ |

Mechanical Characteristics

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|--------------------------------|------------|-------|------|-------|------|
| Heatsink Mounting Screw Torque | | 0.686 | — | 0.882 | N·m |
| Package Weight | | — | 6.1 | — | g |

⁽¹⁾ $R_{th(J-C)}$ is thermal resistance between junction and case

Derating Curves

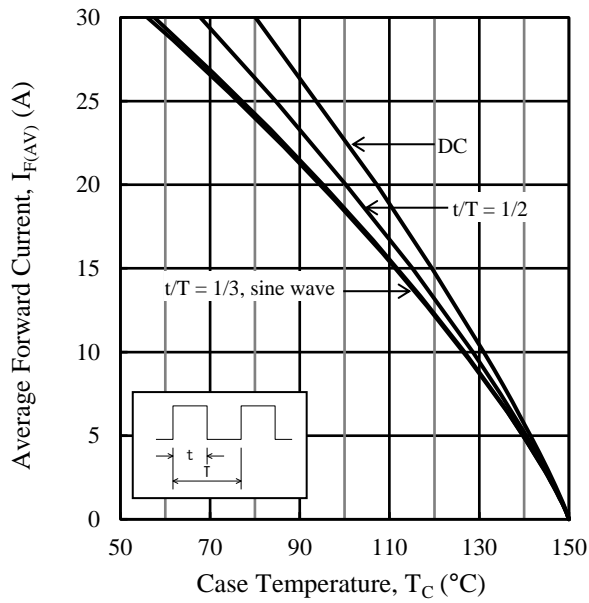


Figure 1. Typical Characteristics: $I_{F(AV)}$ vs. T_C
($V_R = 0$ V)

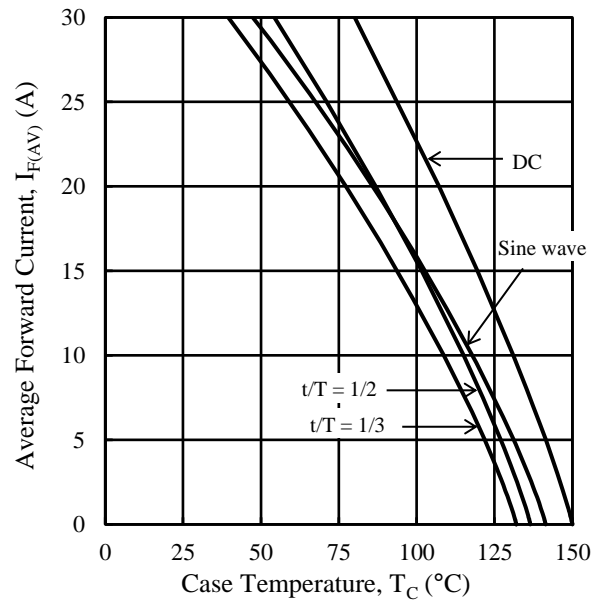


Figure 2. Typical Characteristics $I_{F(AV)}$ vs. T_C
($V_R = 600$ V)

Characteristic Curves

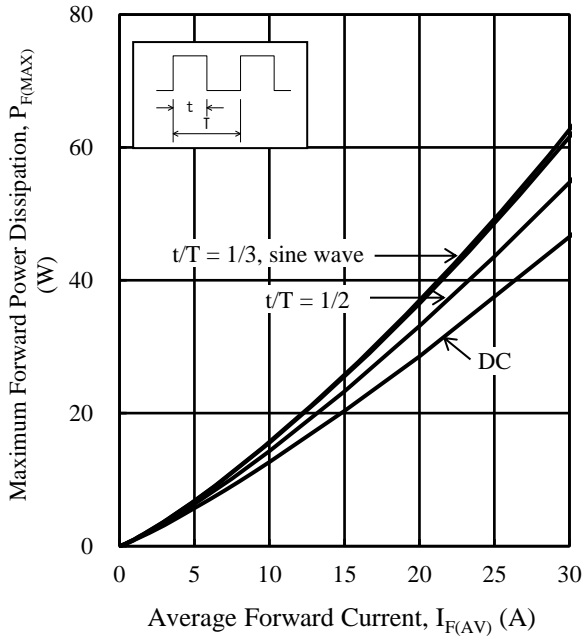


Figure 3. $P_{F(MAX)}$ vs. $I_{F(AV)}$ ($T_J = 150\text{ }^\circ\text{C}$)

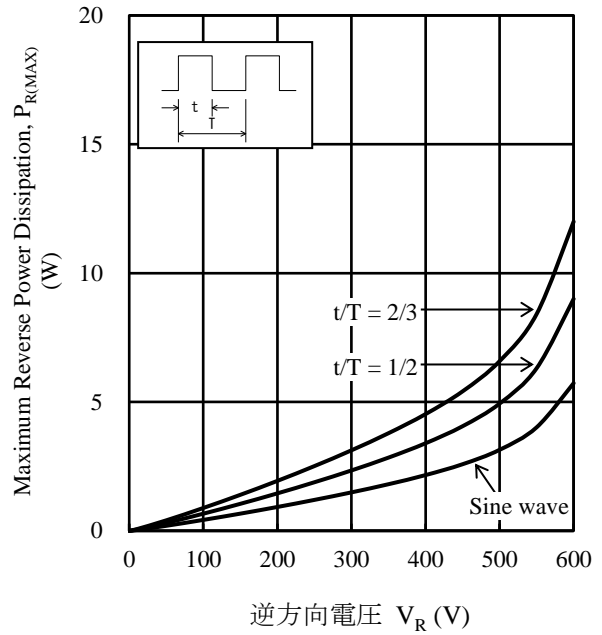


Figure 4. $P_{R(MAX)}$ vs. V_R ($T_J = 150\text{ }^\circ\text{C}$)

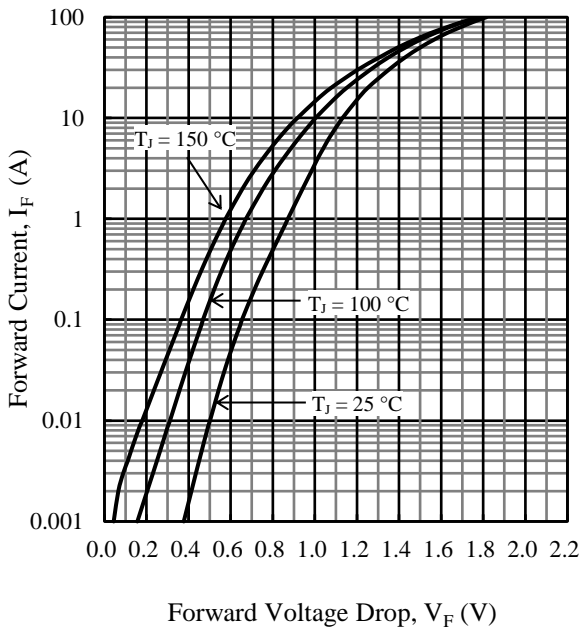


Figure 5. Typical Characteristics: I_F vs. V_F

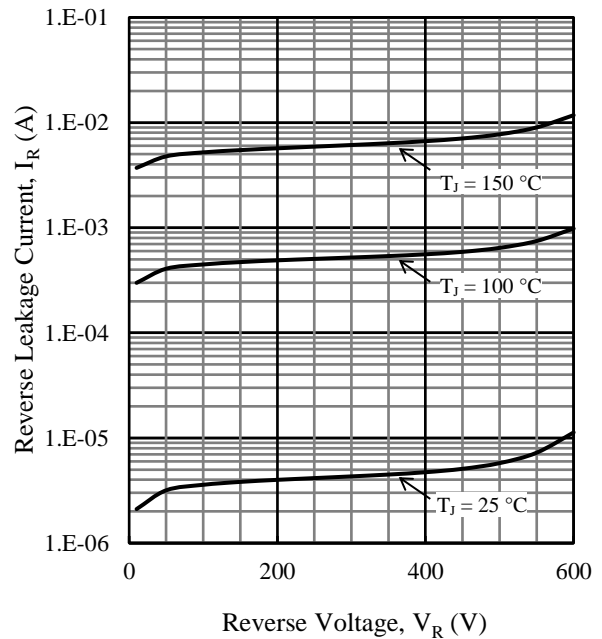


Figure 6. Typical Characteristics: I_R vs. V_R

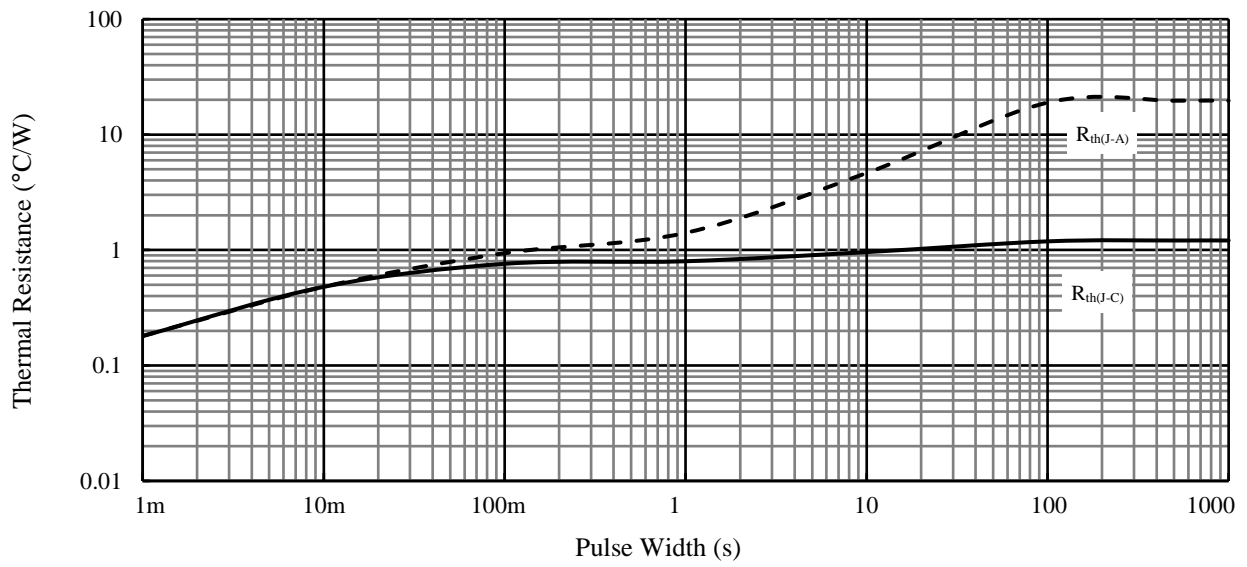
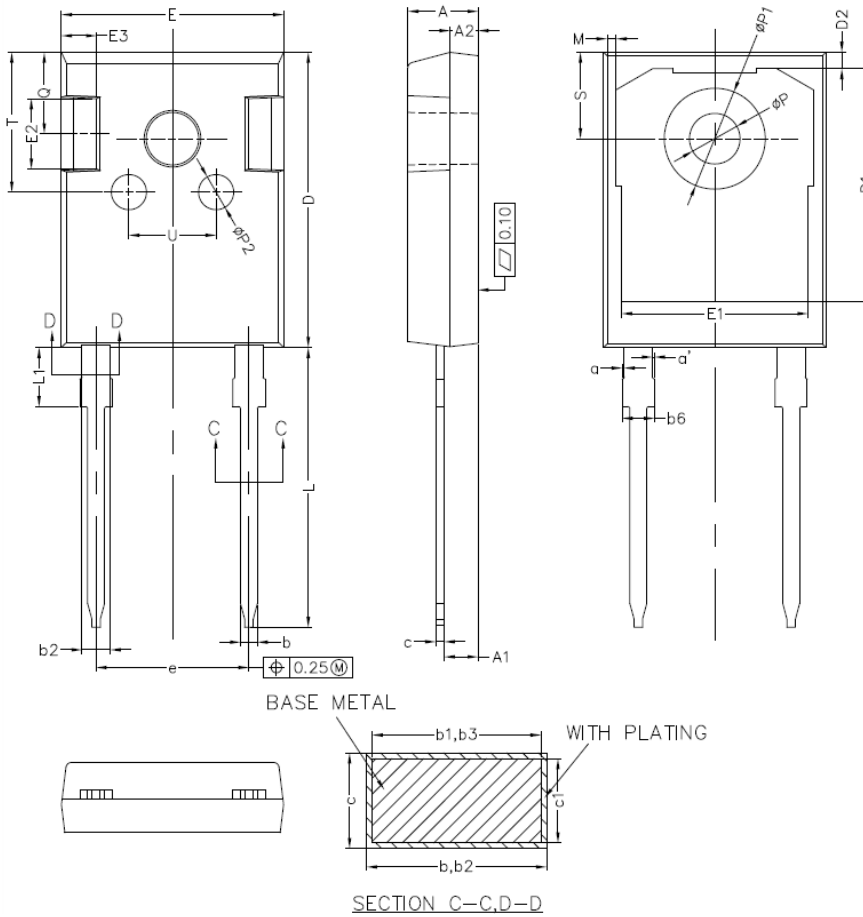


Figure 7. Typical Transient Thermal Resistance Characteristics

CTXS-5306S

Physical Dimensions

• TO247-2L



| Symbol | Min. | Typ. | Max. |
|--------|-------|-------|-------|
| A | 4.90 | 5.00 | 5.10 |
| A1 | 2.31 | 2.41 | 2.51 |
| A2 | 1.90 | 2.00 | 2.10 |
| a | 0 | — | 0.15 |
| a' | 0 | — | 0.15 |
| b | 1.16 | — | 1.26 |
| b1 | 1.15 | 1.20 | 1.25 |
| b2 | 1.96 | — | 2.06 |
| b3 | 1.95 | 2.00 | 2.02 |
| b6 | — | — | 2.25 |
| c | 0.59 | — | 0.66 |
| c1 | 0.58 | 0.60 | 0.62 |
| D | 20.90 | 21.00 | 21.10 |
| D1 | 16.25 | 16.55 | 16.85 |
| D2 | 1.05 | 1.20 | 1.35 |
| E | 15.70 | 15.80 | 15.90 |
| E1 | 13.06 | 13.26 | 13.46 |
| E2 | 4.90 | 5.00 | 5.10 |
| E3 | 2.40 | 2.50 | 2.60 |
| e | 10.78 | 10.88 | 10.98 |
| L | 19.80 | 19.92 | 20.10 |
| L1 | 3.93 | — | 4.46 |
| M | 0.35 | — | 0.95 |
| P | 3.50 | 3.60 | 3.70 |
| P1 | 7.00 | — | 7.40 |
| P2 | 2.40 | 2.50 | 2.60 |
| Q | 5.60 | — | 6.00 |
| S | 6.05 | 6.15 | 6.25 |
| T | 9.80 | — | 10.20 |
| U | 6.00 | — | 6.40 |

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 °C / 10 s, 1 time
 - Soldering Iron: 350 °C / 3.5 s, 1 time
 - Soldering should be at a distance of at least 1.5 mm from the body of the product.

CTXS-5306S

Marking Diagram

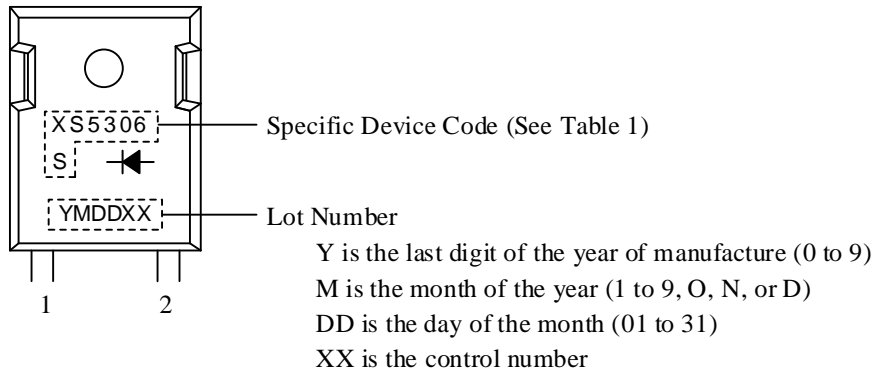


Table 1. Specific Device Code

| Specific Device Code | Part Number |
|----------------------|-------------|
| XS5306S | CTXS-5306S |

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