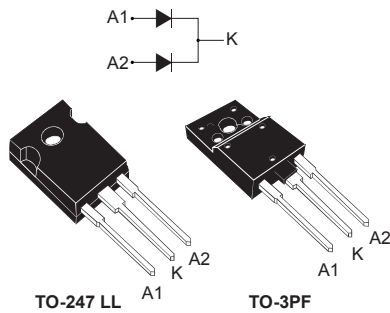


600 V, 2 x 15 A ultrafast high voltage diode



Features

- Ultrafast switching
- Low reverse current
- Low thermal resistance
- Reduces switching and conduction losses
- Insulated package TO-3PF:
 - Insulated voltage: 2500 V_{DC}

Applications

- Air conditioning equipment
- Power supplies and converters
- Boost PFC
- Rectification diode
- Freewheeling diode

Description

The **STTH30AC06C** uses ST Turbo 2 600 V technology. It is suited as boost diode specially for use in air conditioning equipment as continuous mode interleaved power factor correction.

Product status link

[STTH30AC06C](#)

Product summary

I_{F(AV)}	2 x 15 A
V_{RRM}	600 V
t_{rr} (typ)	40 ns
V_F (typ)	1.15 V
T_j	175 °C

1 Characteristics

Table 1. Absolute ratings (limiting values per diode at 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		600	V
$I_{F(RMS)}$	Forward rms current		30	A
$I_{F(AV)}$	Average forward current	Per diode	15	A
		Per device	30	
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms sinusoidal	140	A
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Maximum operating junction temperature		175	°C

Table 2. Thermal parameters

Symbol	Parameter			Max. value	Unit
$R_{th(j-c)}$	Junction to case	TO247 LL	Per diode	1.5	°C/W
			Total	0.85	
		TO-3PF	Per diode	3.5	
			Total	2.7	
$R_{th(c)}$	Coupling	TO247 LL		0.2	
		TO-3PF		1.9	

For more information, refer to the following application note :

- [AN5088](#): Rectifiers thermal management, handling and mounting recommendations

Table 3. Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25$ °C	$V_R = V_{RRM}$	-		10	μ A
		$T_j = 150$ °C		-	40	400	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25$ °C	$I_F = 15$ A	-		1.95	V
		$T_j = 150$ °C		-	1.15	1.45	
		$T_j = 25$ °C	$I_F = 30$ A	-		2.25	
		$T_j = 150$ °C		-	1.42	1.8	

1. Pulse test: $t_p = 5$ ms, $\delta < 2\%$

2. Pulse test: $t_p = 380$ μ s, $\delta < 2\%$

To evaluate the conduction losses, use the following equation:

$$P = 1.1 \times I_{F(AV)} + 0.023 \times I_{F(RMS)}^2$$

For more information, refer to the following application notes related to the power losses :

- [AN604](#): Calculation of conduction losses in a power rectifier
- [AN5028](#): Calculation of turn-off power losses generated by an ultrafast diode

Table 4. Dynamic characteristics (per diode)

Symbol	Parameters	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25\text{ °C}$	$I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$	-		30	ns
			$I_F = 1\text{ A}$ $dI_F/dt = 50\text{ A/}\mu\text{s}$ $V_R = 30\text{ V}$	-	40	55	
I_{RM}	Reverse recovery current	$T_j = 125\text{ °C}$	$I_F = 15\text{ A}$ $dI_F/dt = 100\text{ A/}\mu\text{s}$ $V_R = 400\text{ V}$	-	4	5.5	A
t_{fr}	Forward recovery time	$T_j = 25\text{ °C}$	$I_F = 15\text{ A}$ $dI_F/dt = 100\text{ A/}\mu\text{s}$ $V_{FR} = 1.9\text{ V}$	-		100	ns
V_{FP}	Forward recovery voltage			-	2.5		V

1.1 Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current (per diode)

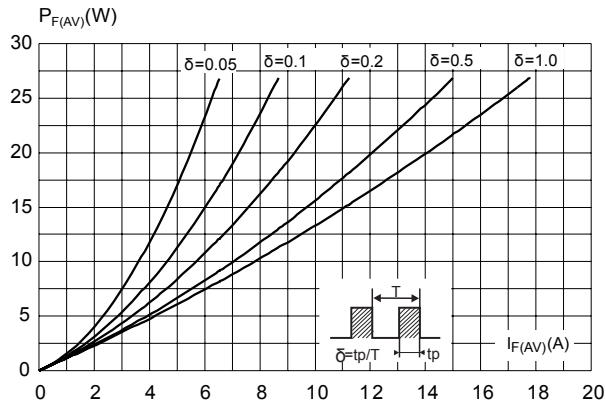


Figure 2. Forward voltage drop versus forward current (typical values, per diode)

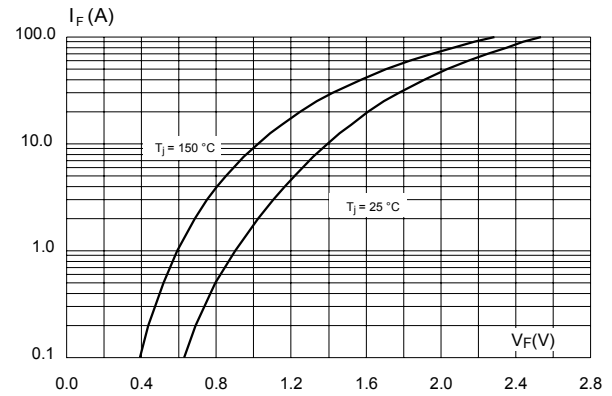


Figure 3. Forward voltage drop versus forward current (maximum values, per diode)

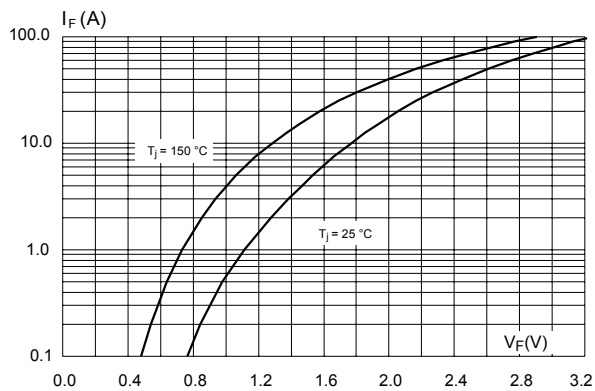


Figure 4. Relative variation of thermal impedance, junction to case, versus pulse duration

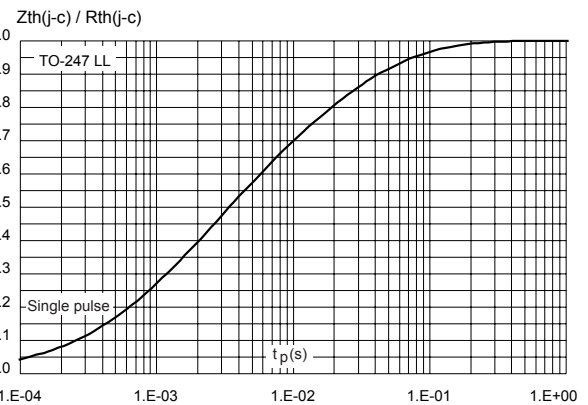


Figure 5. Relative variation of thermal impedance, junction to case, versus pulse duration

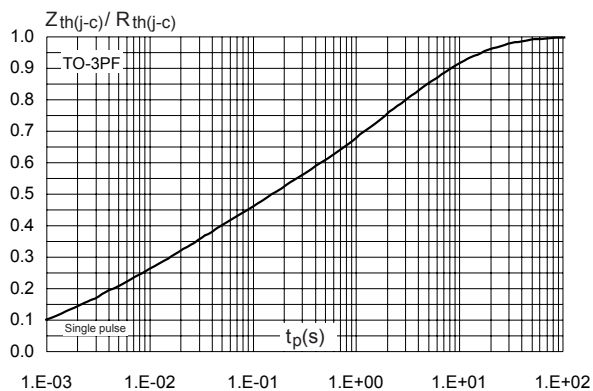


Figure 6. Peak reverse recovery current versus di_F/dt (typical values, per diode)

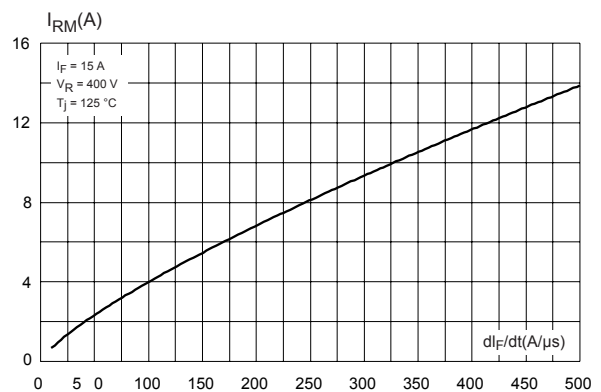


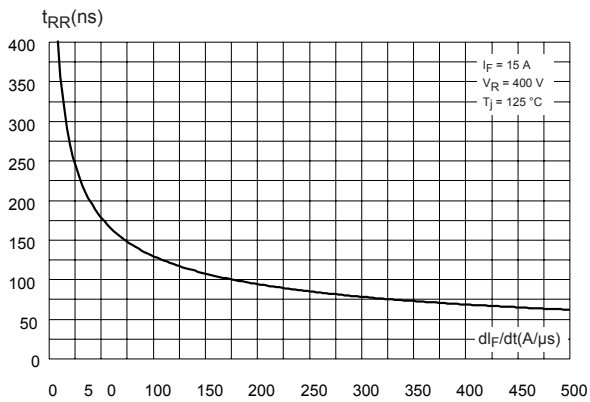
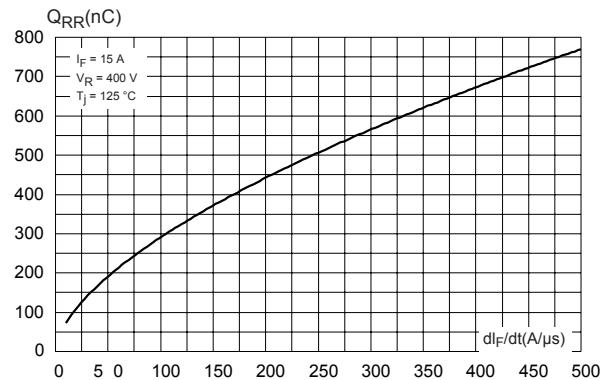
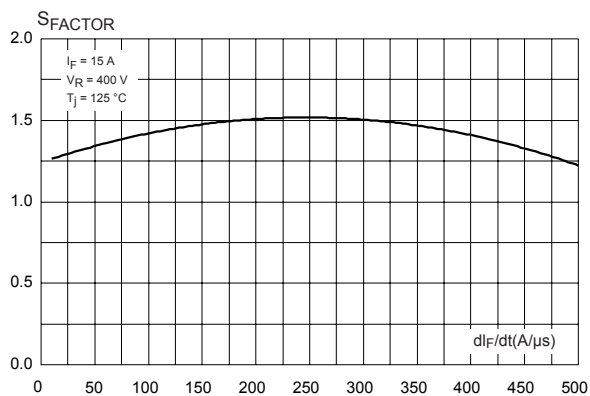
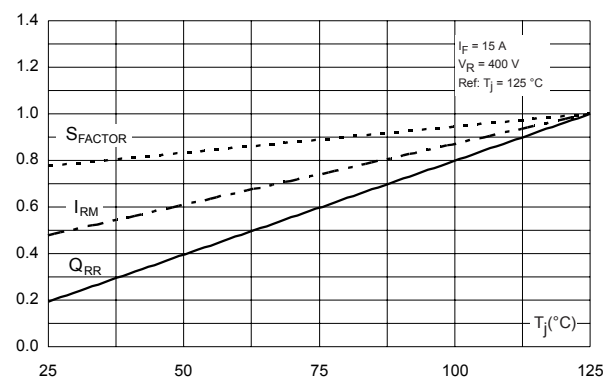
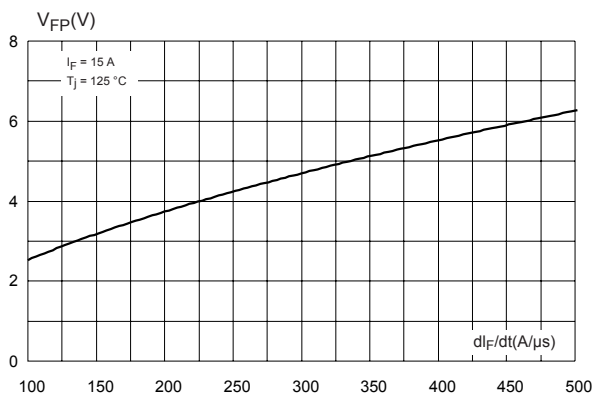
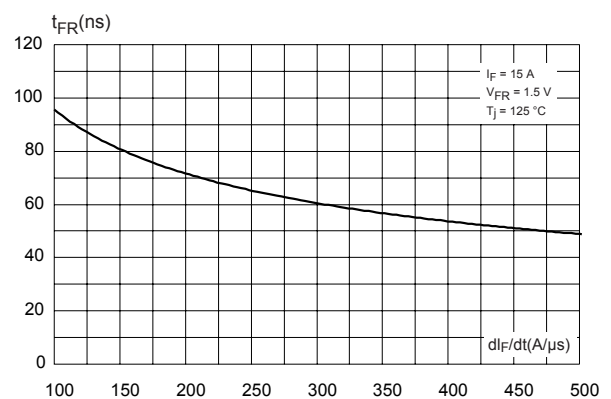
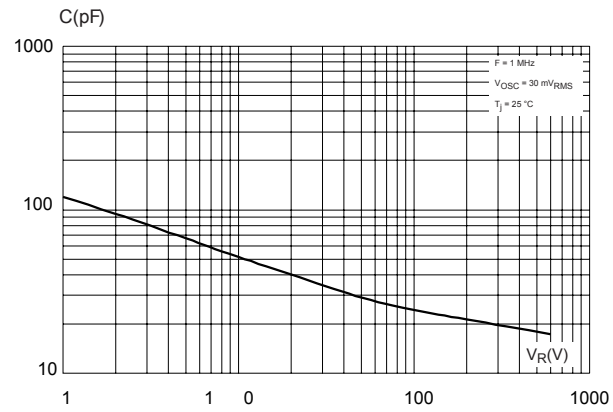
Figure 7. Reverse recovery time versus dl_F/dt
 (typical values, per diode)

Figure 8. Reverse recovery charges versus dl_F/dt
 (typical values, per diode)

Figure 9. Reverse recovery softness factor versus dl_F/dt
 (typical values, per diode)

Figure 10. Relative variations of dynamic parameters versus junction temperature

Figure 11. Transient peak forward voltage versus dl_F/dt
 (typical values, per diode)

Figure 12. Forward recovery time versus dl_F/dt
 (typical values, per diode)


Figure 13. Junction capacitance versus reverse voltage applied (typical values, per diode)



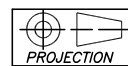
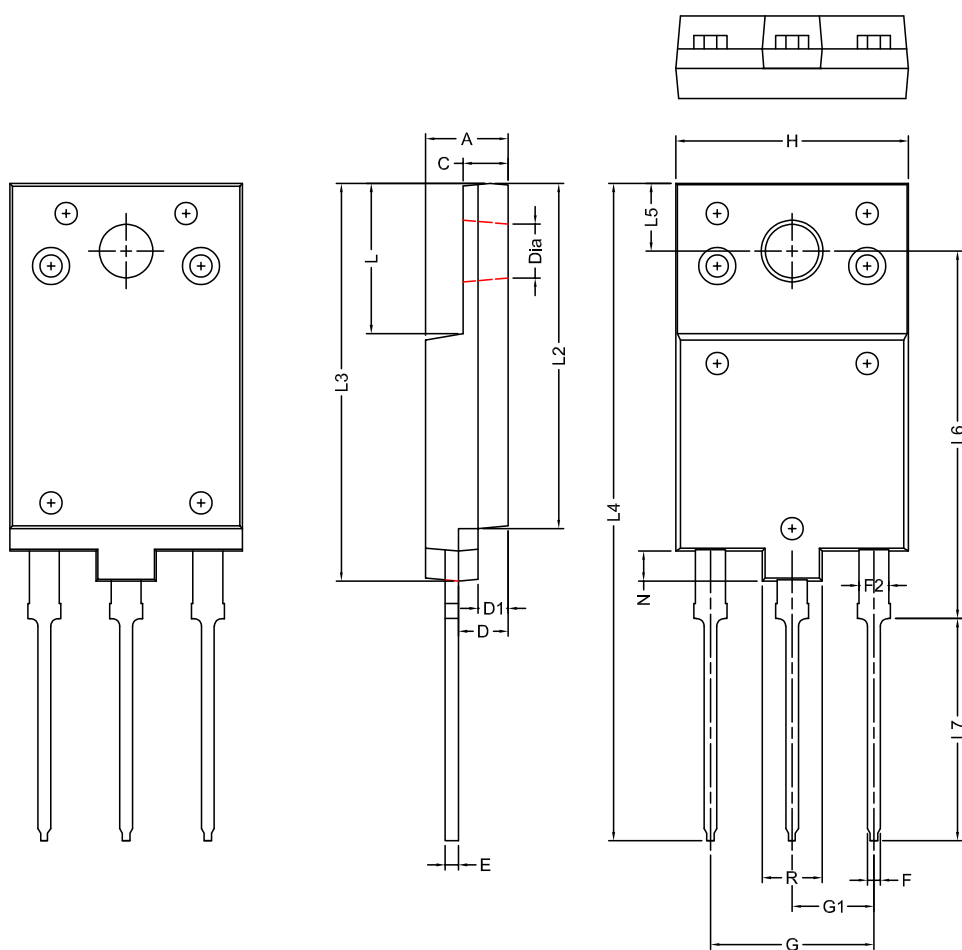
2 Package information

To meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions, and product status are available at: www.st.com. ECOPACK is an ST trademark.

2.1 TO-3PF package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque: 0.8 to 1.0 N·m

Figure 14. TO-3PF package outline



7627132_2_9

Note: This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

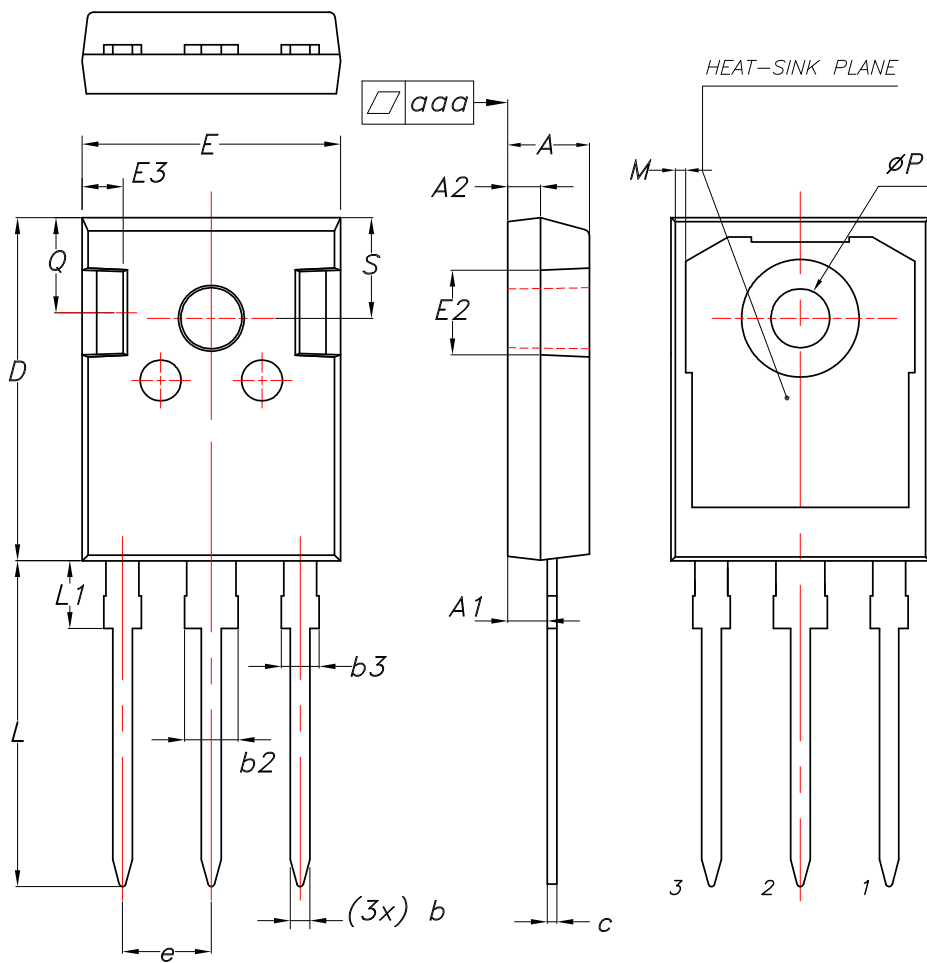
Table 5. TO-3PF mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	5.30	5.50	5.70
C	2.80	3.00	3.20
D	3.10	3.30	3.50
D1	1.80	2.00	2.20
E	0.80	0.95	1.10
F	0.65	0.80	0.95
F2	1.80	2.00	2.20
G	10.30	10.90	11.50
G1		5.45	
H	15.30	15.50	15.70
L	9.80	10.00	10.20
L2	22.80	23.00	23.20
L3	26.30	26.50	26.70
L4	43.20	43.80	44.40
L5	4.30	4.50	4.70
L6	24.30	24.50	24.70
L7	14.60	14.80	15.00
N	1.80	2.00	2.20
R	3.80	4.00	4.20
Dia	3.40	3.60	3.80

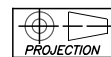
2.2 TO-247 LL package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 N·m
- Maximum torque value: 1.0 N·m

Figure 15. TO-247 LL package outline



BACK VIEW



8463846_6

Table 6. TO-247 LL package mechanical data

Dim.	mm.			Inches (only for reference)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.90	5.00	5.10	0.192	0.196	0.200
A1	2.31	2.41	2.51	0.090	0.094	0.098
A2	1.90	2.00	2.10	0.074	0.078	0.082
b	1.16		1.26	0.045		0.049
b2			3.25			0.128
b3			2.25			0.089
c	0.59		0.66	0.0232		0.0260
D	20.90	21.00	21.10	0.8228	0.826	0.830
E	15.70	15.80	15.90	0.6181	0.622	0.626
E2	4.90	5.00	5.10	0.192	0.196	0.200
E3	2.40	2.50	2.60	0.094	0.098	0.102
e	5.34	5.44	5.54	0.2102	0.2142	0.2181
L	19.80	19.92	20.10	0.779	0.784	0.792
L1			4.30			0.170
M	0.35		0.95	0.013		0.038
P	3.50	3.60	3.70	0.137	0.141	0.145
Q	5.60		6.00	0.220		0.236
S	6.05	6.15	6.25	0.238	0.242	0.246
aaa		0.04	0.10		0.001	0.004

3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STTH30AC06CPF	TH30AC06C	TO-3PF	5.6 g	30	Tube
STTH30AC06CWL	STTH30AC06CWL	TO-247 LL	4.36 g	30	

Revision history

Table 8. Document revision history

Date	Version	Changes
13-Nov-2013	1	Initial release.
25-Jun-2015	2	Update of cover page and <i>Table 7</i> . Format updated to current standard.
01-Jul-2015	3	Updated <i>Features</i> .
05-Sep-2016	4	Updated <i>Figure 16</i> .
18-Apr-2018	5	Updated TO247LL POA drawing.
30-Oct-2025	6	Added Section Applications , and updated Section 2: Package information . Removed TO3P-3L package information.

IMPORTANT NOTICE – READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice.

In the event of any conflict between the provisions of this document and the provisions of any contractual arrangement in force between the purchasers and ST, the provisions of such contractual arrangement shall prevail.

The purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgment.

The purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of the purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

If the purchasers identify an ST product that meets their functional and performance requirements but that is not designated for the purchasers' market segment, the purchasers shall contact ST for more information.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2025 STMicroelectronics – All rights reserved