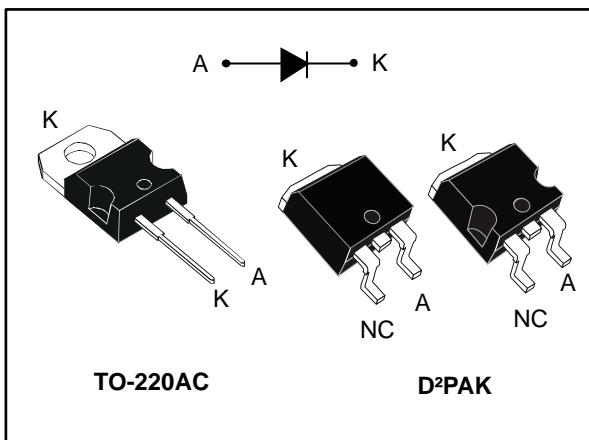


## Low drop OR-ing power Schottky diode

Datasheet - production data



### Description

Packaged in TO-220AC or D<sup>2</sup>PAK, this device is especially intended for use as an OR-ing diode in fault tolerant power supply equipments.

**Table 1: Device summary**

Symbol	Value
I <sub>F(AV)</sub>	20 A
V <sub>RRM</sub>	15 V
V <sub>F</sub> (typ.)	0.28 V
T <sub>j</sub> (max.)	125 °C

### Features

- Very low forward voltage drop for less power dissipation and reduced heatsink size
- Reverse voltage suited to OR-ing of 3 V, 5 V and 12 V rails
- Avalanche capability specified
- ECOPACK®2 compliant component for D<sup>2</sup>PAK on demand

# 1 Characteristics

Table 2: Absolute ratings (limiting values at 25 °C, unless otherwise specified)

Symbol	Parameter	Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage	15	V
I <sub>F(RMS)</sub>	Forward rms current	30	A
I <sub>F(AV)</sub>	Average forward current	20	A
I <sub>FSM</sub>	Surge non repetitive forward current	310	A
P <sub>ARM</sub>	Repetitive peak avalanche power	970	W
T <sub>stg</sub>	Storage temperature range	-65 to +150	°C
T <sub>j</sub>	Maximum operating junction temperature <sup>(1)</sup>	125	

**Notes:**

<sup>(1)</sup>(dP<sub>tot</sub>/dT<sub>j</sub>) < (1/R<sub>th(j-a)</sub>) condition to avoid thermal runaway for a diode on its own heatsink.

Table 3: Thermal parameters

Symbol	Parameter	Max. value	Unit
R <sub>th(j-c)</sub>	Junction to case	1.6	°C/W

Table 4: Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> <sup>(1)</sup>	Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>R</sub> = 15 V	-		6	mA
		T <sub>j</sub> = 100 °C		-	200	500	
V <sub>F</sub> <sup>(1)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 19 A	-		0.41	V
			I <sub>F</sub> = 40 A	-		0.52	
		T <sub>j</sub> = 125 °C	I <sub>F</sub> = 19 A	-	0.28	0.33	
			I <sub>F</sub> = 40 A		0.42	0.50	

**Notes:**

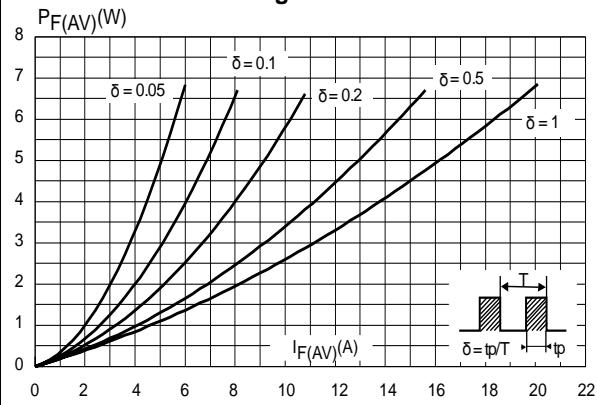
<sup>(1)</sup>Pulse test: t<sub>p</sub> = 380 μs, δ < 2%

To evaluate the maximum conduction losses, use the following equation:

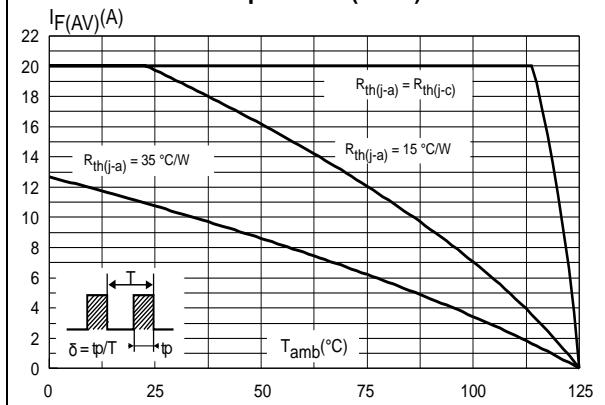
$$P = 0.18 \times I_{F(AV)} + 8.10^{-3} \times I_{F(RMS)}^2$$

## 1.1 Characteristics (curves)

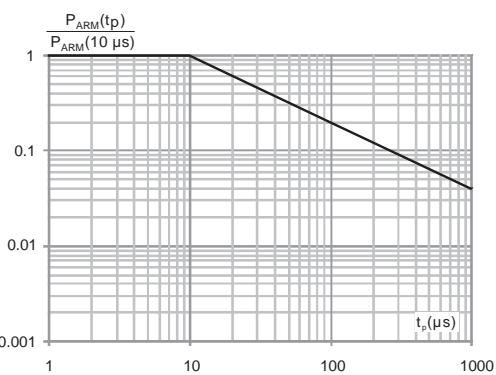
**Figure 1: Average forward power dissipation versus average forward current**



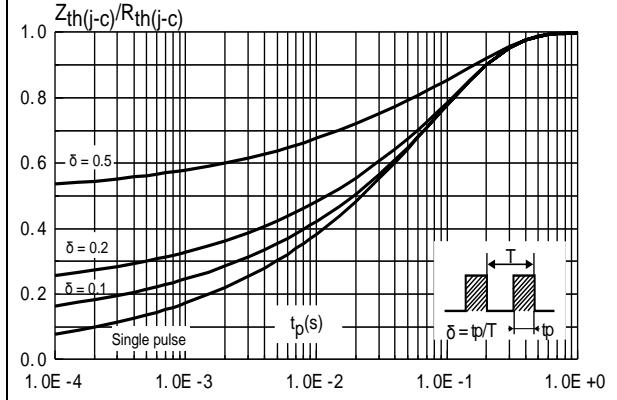
**Figure 2: Average forward current versus ambient temperature ( $\delta = 1$ )**



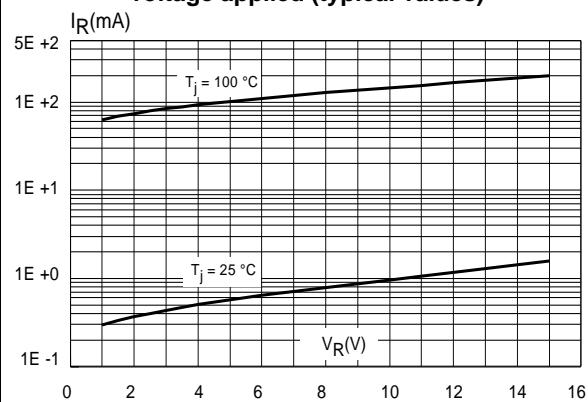
**Figure 3: Normalized avalanche power derating versus pulse duration ( $T_j = 125$  °C)**



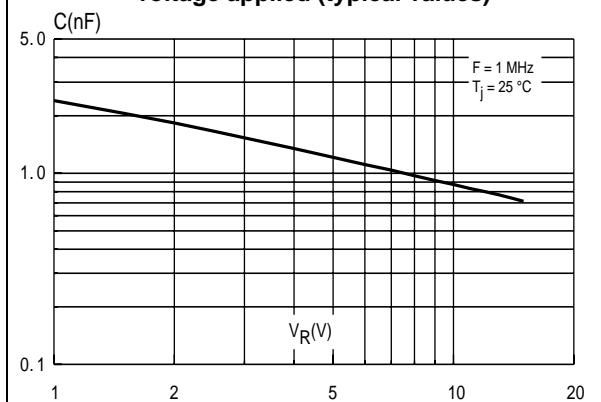
**Figure 4: Relative variation of thermal impedance junction to case versus pulse duration**

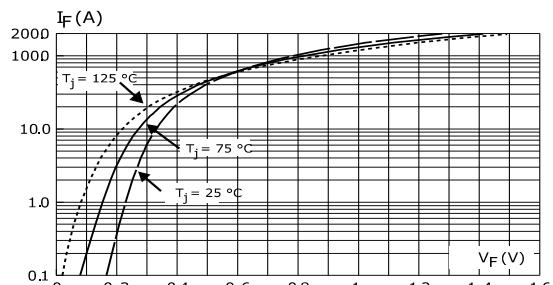
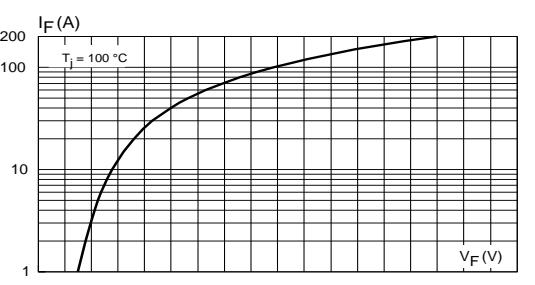
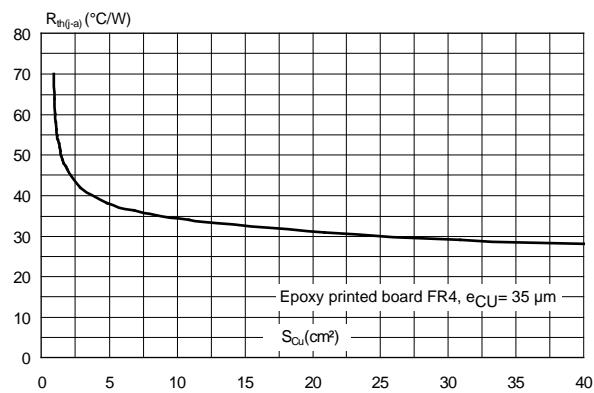


**Figure 5: Reverse leakage current versus reverse voltage applied (typical values)**



**Figure 6: Junction capacitance versus reverse voltage applied (typical values)**



**Figure 7: Forward voltage drop versus forward current (typical values)****Figure 8: Forward voltage drop versus forward current (maximum values)****Figure 9: Thermal resistance junction to ambient versus copper surface under tab for D<sup>2</sup>PAK**

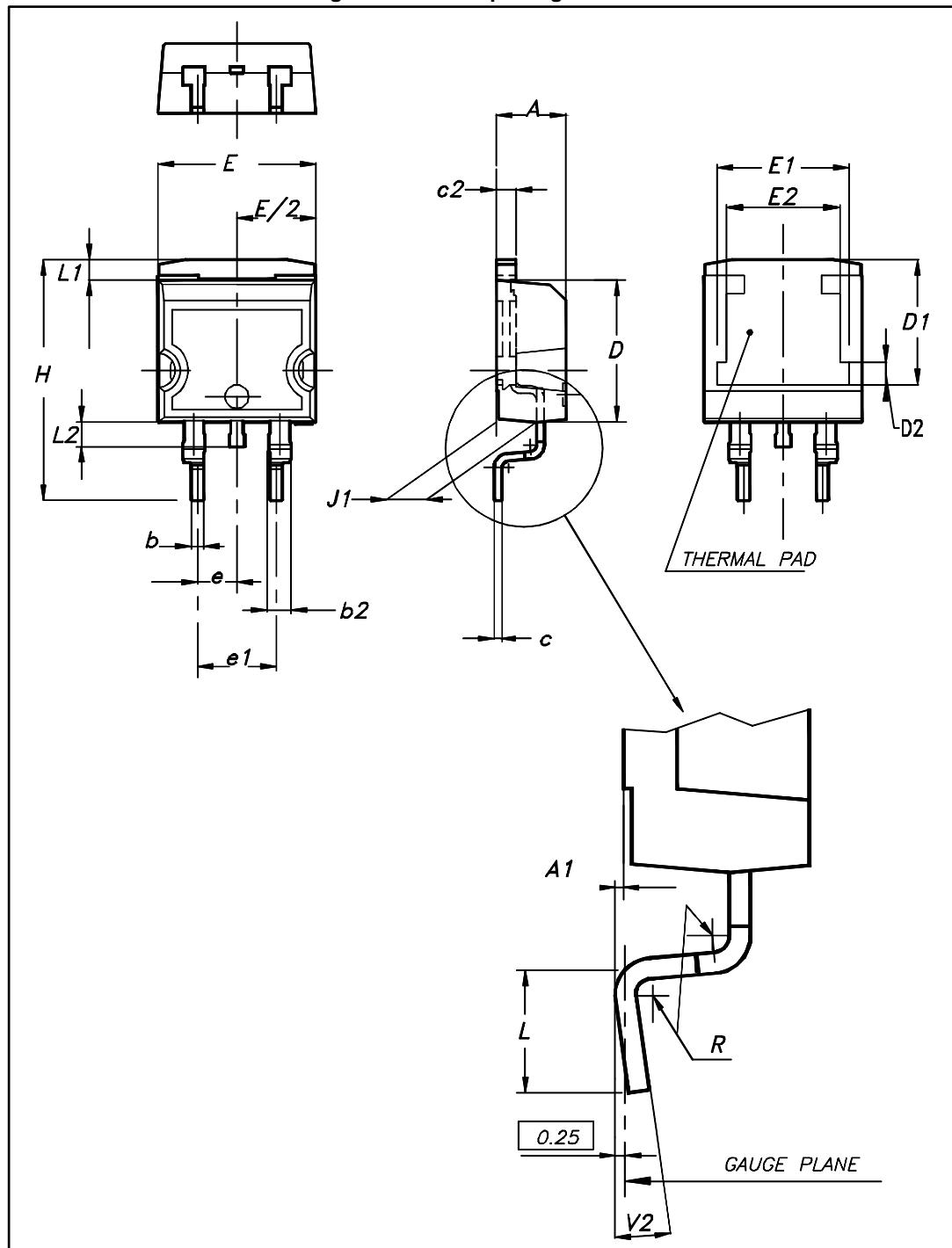
## 2 Package information

In order 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](http://www.st.com).  
ECOPACK® is an ST trademark.

- Cooling method: by conduction (C)
- Epoxy meets UL 94,V0
- Recommended torque value: 0.55 N·m (for TO-220AC)
- Maximum torque value: 0.7 N·m (for TO-220AC)

## 2.1 D<sup>2</sup>PAK package information

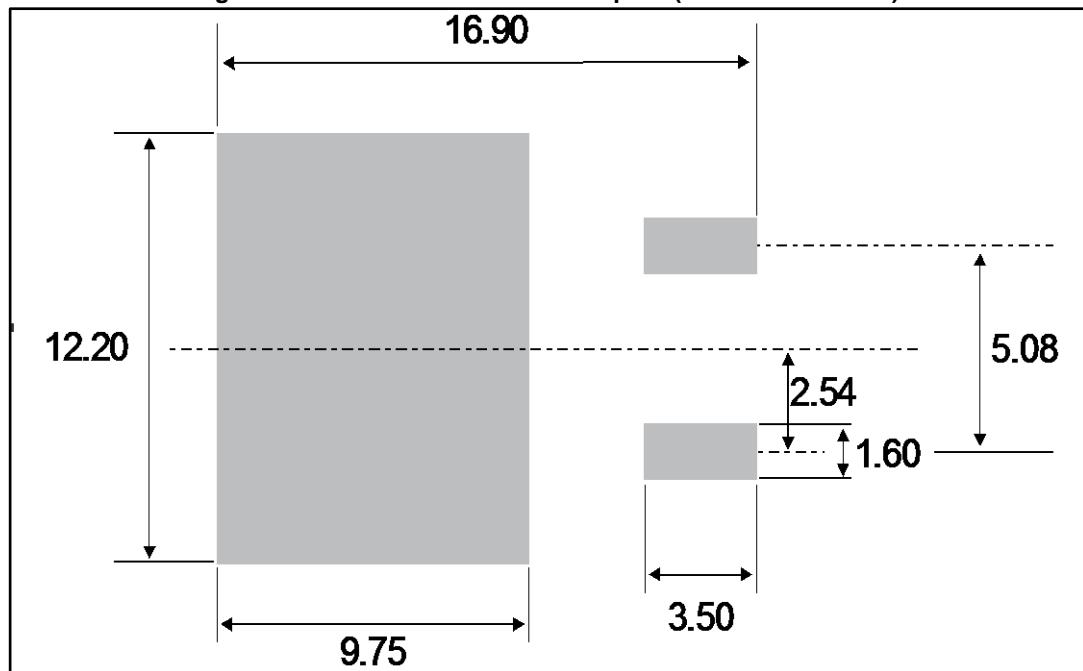
Figure 10: D<sup>2</sup>PAK package outline



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

Table 5: D<sup>2</sup>PAK package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.36	4.60	0.172	0.181
A1	0.00	0.25	0.000	0.010
b	0.70	0.93	0.028	0.037
b2	1.14	1.70	0.045	0.067
c	0.38	0.69	0.015	0.027
c2	1.19	1.36	0.047	0.053
D	8.60	9.35	0.339	0.368
D1	6.90	8.00	0.272	0.311
D2	1.10	1.50	0.043	0.060
E	10.00	10.55	0.394	0.415
E1	8.10	8.90	0.319	0.346
E2	6.85	7.25	0.266	0.282
e	2.54 typ.		0.100	
e1	4.88	5.28	0.190	0.205
H	15.00	15.85	0.591	0.624
J1	2.49	2.90	0.097	0.112
L	1.90	2.79	0.075	0.110
L1	1.27	1.65	0.049	0.065
L2	1.30	1.78	0.050	0.070
R	0.4 typ.		0.015	
V2	0°	8°	0°	8°

Figure 11: D<sup>2</sup>PAK recommended footprint (dimensions in mm)

## 2.2 TO-220AC package information

Figure 12: TO-220AC package outline

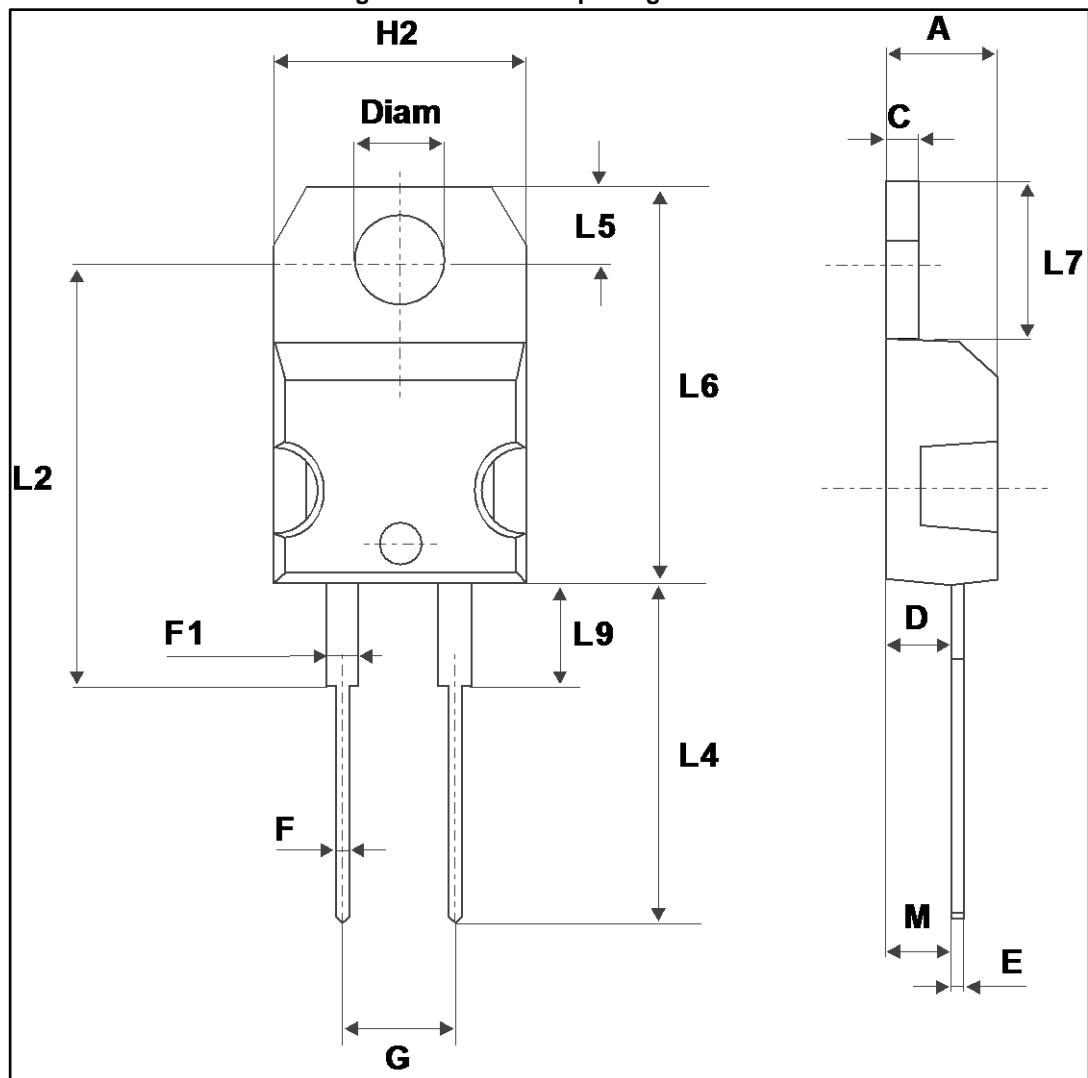


Table 6: TO-220AC package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
H2	10.00	10.40	0.393	0.409
L2	16.40 typ.		0.645 typ.	
L4	13.00	14.00	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam	3.75	3.85	0.147	0.151

### 3 Ordering information

Table 7: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS20L15D	STPS20L15D	TO-220AC	1.86 g	50	Tube
STPS20L15G-TR	STPS20L15G	D <sup>2</sup> PAK	1.38 g	1000	Tape and reel

### 4 Revision history

Table 8: Document revision history

Date	Revision	Changes
24-Jul-2012	3	
13-Oct-2016	4	Updated cover page, <i>Section 3.1: "Characteristics (curves)"</i> , <i>Section 3: "Characteristics"</i> , <i>Section 4.2: "D<sup>2</sup>PAK package information"</i> and <i>Table 7: "Ordering information"</i> .

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