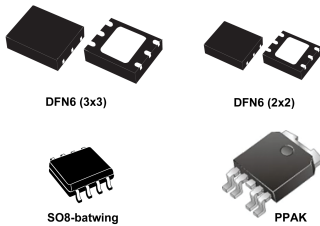


## 1.2 A low quiescent current LDO with reverse current protection



### Features

- Input voltage from 1.6 to 5.5 V
- Very low-dropout voltage (300 mV typ. at 1 A load)
- Low quiescent current (35  $\mu$ A typ. at no-load, 1  $\mu$ A max. in off mode)
- Output voltage tolerance:  $\pm$  2.0% at 25 °C
- 1.2 A guaranteed output current
- Wide range of output voltages available on request: 0.8 V to 5 V with 50 mV step and adjustable
- Logic-controlled electronic shutdown
- Compatible with ceramic capacitor  $C_{OUT} = 1 \mu$ F
- Internal current and thermal limit
- Available in DFN6 (2x2), DFN6 (3x3) mm, SO8-batwing and PPAK packages
- Temperature range: -40 °C to 125 °C
- Reverse current protection
- Output discharge function (optional)

### Applications

- Consumer
- Computer
- Battery-powered systems
- Low voltage point-of-load
- USB-powered devices

Maturity status link

[LDL112](#)

### Description

The [LDL112](#) is a low-dropout linear regulator, which can provide a maximum current of 1.2 A, with a typical dropout voltage of 300 mV.

It is stabilized with a ceramic capacitor on the output.

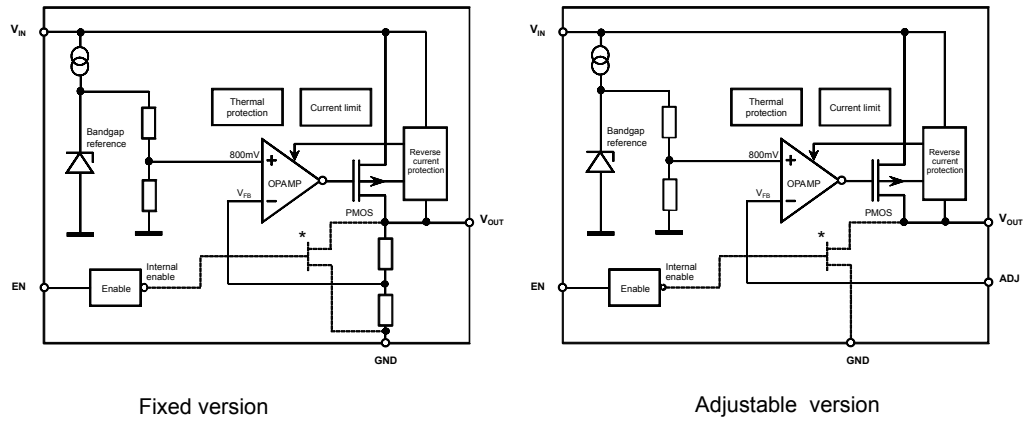
The very low drop voltage, low quiescent current and reverse current protection features make it suitable for low power battery-powered applications.

The enable logic control function puts the [LDL112](#) in shutdown mode allowing a total current consumption lower than 1  $\mu$ A.

The device is equipped with current limit and thermal protection.

1 Diagram

Figure 2. Block diagram



AM14036V1

Note: (\*) The output discharge function is optional.

## 2 Pin configuration

Figure 3. Pin connection DFN6 (3x3) and DFN6 (2x2) (top view)

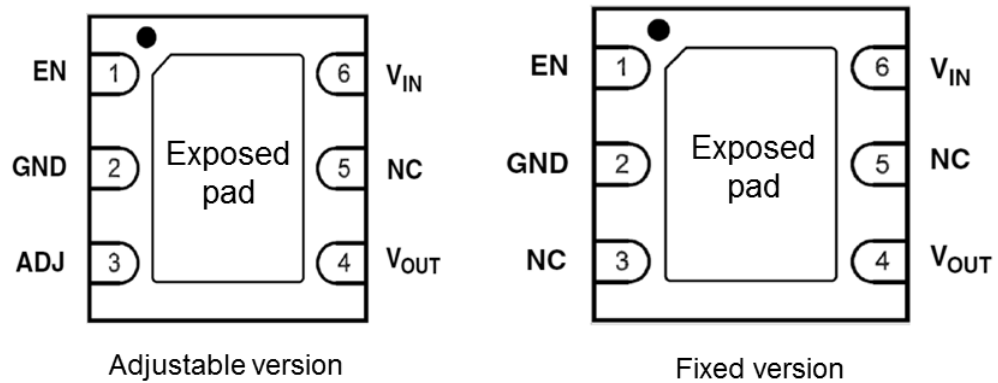
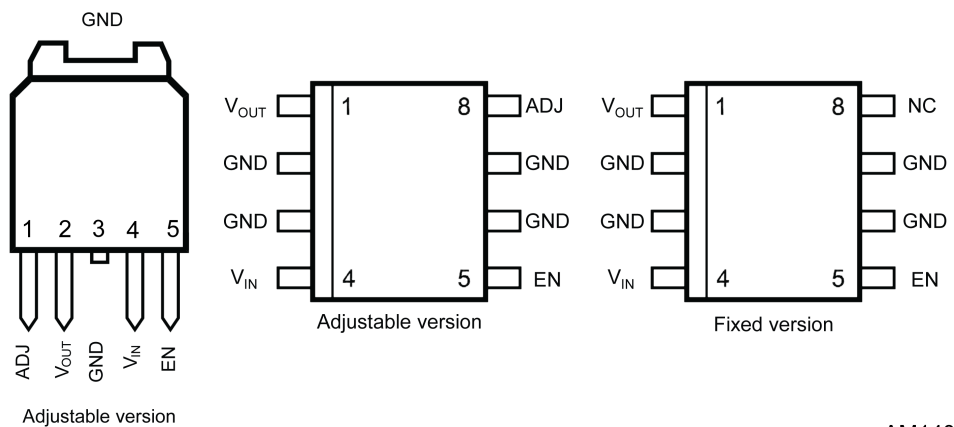


Figure 4. Pin connection PPAK and SO8 (top view)



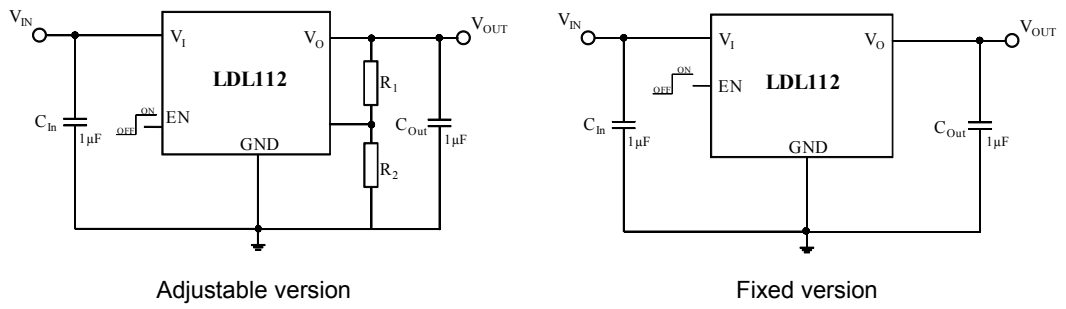
AM14038V1

Table 1. Pin description

Symbol	Function
$V_{IN}$	LDO input voltage
GND	Common ground
EN	Enable pin logic input: low = shutdown, high = active. Don't leave this pin floating
ADJ	Adjustable pin (on adjustable version)
$V_{OUT}$	LDO output voltage
Exposed pad	Must be connected to GND
NC	Not connected

### 3 Typical application

Figure 5. Typical application circuits



AM14039V1

## 4 Maximum ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{IN}$	DC input voltage	- 0.3 to 7	V
$V_{OUT}$	DC output voltage	- 0.3 to $V_I + 0.3$	V
$V_{EN}$	Enable input voltage	- 0.3 to $V_I + 0.3$	V
$V_{ADJ}$	ADJ pin voltage	2	V
$I_{OUT}$	Output current	Internally limited	mA
$P_D$	Power dissipation	Internally limited	mW
$T_{STG}$	Storage temperature range	- 65 to 150	°C
$T_{OP}$	Operating junction temperature range	- 40 to 125	°C

*Note:* Absolute maximum ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. All values are referred to GND.

**Table 3. Thermal data**

Symbol	Parameter	DFN6 (3x3)	DFN6 (2x2)	SO8	PPAK	Unit
$R_{thJA}$	Thermal resistance junction-ambient	55	65	55 <sup>(1)</sup>	100	°C/W
$R_{thJC}$	Thermal resistance junction-case	10	15	20	8	°C/W

1. Considering 6 cm<sup>2</sup> of copper board heatsink.

## 5 Electrical characteristics

$T_J = 25\text{ °C}$ ,  $V_{IN} = V_{OUT(NOM)} + 0.5\text{ V}$  (for  $V_{OUT(NOM)} \leq 1\text{ V}$ ,  $V_{IN} = 2.1\text{ V}$ ),  $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$ ,  $I_{OUT} = 5\text{ mA}$ ,  $V_{EN} = V_{IN}$ , unless otherwise specified.

**Table 4. LDL112 electrical characteristics (fixed version)**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{IN}$	Operating input voltage		1.6		5.5	V
$V_{OUT}$	$V_{OUT}$ accuracy	$I_{OUT} = 5\text{ mA}$ , $T_J = 25\text{ °C}$	-2.0		2.0	%
		$I_{OUT} = 5\text{ mA}$ , $-40\text{ °C} < T_J < 125\text{ °C}$	-3.0		3.0	%
$\Delta V_{OUT}$	Static line regulation <sup>(1)</sup>	$V_{OUT(NOM)} + 0.5\text{ V} < V_{IN} \leq 5.5\text{ V}$ <sup>(2)</sup>		0.05	0.1	%/V
$\Delta V_{OUT}$	Static load regulation	$I_{OUT} = 0\text{ mA}$ to $1.2\text{ A}$ , $V_{IN} > 2.1\text{ V}$		15	30	mV
$V_{DROP}$	Dropout voltage <sup>(3)</sup>	$I_{OUT} = 1\text{ A}$ , $V_{OUT} = 3.3\text{ V}$		300		mV
		$I_{OUT} = 1.2\text{ A}$ , $V_{OUT} = 3.3\text{ V}$ $-40\text{ °C} < T_J < 125\text{ °C}$		350	600	
$e_N$	Output noise voltage	10 Hz to 100 kHz, $I_{OUT} = 10\text{ mA}$ $V_{OUT} = 3.3\text{ V}$		135		$\mu\text{V}_{RMS}$
SVR	Supply voltage rejection	$V_{IN} = V_{OUT(NOM)} + 0.5\text{ V} \pm V_{RIPPLE}$ <sup>(2)</sup> $V_{RIPPLE} = 0.2\text{ V}$ frequency = 1 kHz $I_{OUT} = 10\text{ mA}$		57		dB
$I_Q$	Quiescent current	$I_{OUT} = 0\text{ mA}$ , $-40\text{ °C} < T_J < 125\text{ °C}$		35	70	$\mu\text{A}$
		$I_{OUT} = 1.2\text{ A}$ , $V_{OUT(NOM)} + 1\text{ V}$ , $-40\text{ °C} < T_J < 125\text{ °C}$ <sup>(2)</sup>		250	400	
		$V_{IN}$ input current in off mode: $V_{EN} = \text{GND}$		0.1	1	
$I_{SC}$	Short-circuit current	$R_L = 0$ , $V_{IN} > 2.1\text{ V}$	1.4	2		A
$V_{EN}$	Enable input logic low	$V_{IN} = V_{OUT(NOM)} + 0.5\text{ V}$ to $5.5\text{ V}$ , $-40\text{ °C} < T_J < 125\text{ °C}$ <sup>(2)</sup>			0.35	V
	Enable input logic high	$V_{IN} = V_{OUT(NOM)} + 0.5\text{ V}$ to $5.5\text{ V}$ , $-40\text{ °C} < T_J < 125\text{ °C}$ <sup>(2)</sup>	1.4			
$I_{EN}$	Enable pin input current	$V_{EN} = V_{IN}$			100	nA
$T_{SHDN}$	Thermal shutdown			165		$^{\circ}\text{C}$
	Hysteresis			20		
$C_{OUT}$	Output capacitor	Capacitance (see <a href="#">Section 7 Typical performance characteristics</a> )	1		10	$\mu\text{F}$

1. Not applicable for  $V_{out(nom)} > 4.5\text{ V}$ .

2. For  $V_{OUTNOM}$  lower than or equal to  $1\text{ V}$ ,  $V_{IN} = 2.1\text{ V}$ .

3. Dropout voltage is the input-to-output voltage difference at which the output voltage is  $100\text{ mV}$  below its nominal value.

$T_J = 25\text{ °C}$ ,  $V_{IN} = 2.1\text{ V}$ ,  $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$ ,  $I_{OUT} = 5\text{ mA}$ ,  $V_{EN} = V_{IN}$ , unless otherwise specified.

**Table 5. LDL112 electrical characteristics (adjustable version)**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{IN}$	Operating input voltage		1.6		5.5	V
$V_{ADJ}$	$V_{ADJ}$ accuracy	$I_{OUT} = 5\text{ mA}$ , $T_J = 25\text{ °C}$	784	800	816	mV
		$I_{OUT} = 5\text{ mA}$ , $-40\text{ °C} < T_J < 125\text{ °C}$	-3.0		3.0	%
$\Delta V_{OUT}$	Static line regulation <sup>(1)</sup>	$2.1\text{ V} \leq V_{IN} \leq 5.5\text{ V}$ , $I_{OUT} = 1\text{ mA}$ <sup>(2)</sup>		0.05	0.1	%/V
$\Delta V_{OUT}$	Static load regulation	$I_{OUT} = 0\text{ mA}$ to $1.2\text{ A}$ , $V_{IN} > 2.1\text{ V}$		6	20	mV
$V_{DROP}$	Dropout voltage <sup>(3)</sup>	$I_{OUT} = 1\text{ A}$ , $V_{OUT} = 3.3\text{ V}$		300		mV
		$I_{OUT} = 1.2\text{ A}$ , $V_{OUT} = 3.3\text{ V}$ $-40\text{ °C} < T_J < 125\text{ °C}$		350	600	
$e_N$	Output noise voltage	10 Hz to 100 kHz, $I_{OUT} = 10\text{ mA}$		60		$\mu\text{V}_{RMS}$
$I_{ADJ}$	Adjust pin current			0.130	1	$\mu\text{A}$
SVR	Supply voltage rejection	$V_{IN} = V_{OUTNOM} + 0.5\text{ V} \pm V_{RIPPLE}$ $V_{RIPPLE} = 0.2\text{ V}$ , freq. = 1 kHz, $I_{OUT} = 10\text{ mA}$ <sup>(2)</sup>		53		dB
$I_Q$	Quiescent current	$I_{OUT} = 0\text{ mA}$ , $-40\text{ °C} < T_J < 125\text{ °C}$		35	70	$\mu\text{A}$
		$I_{OUT} = 1.2\text{ A}$ , $2.1\text{ V} < V_{IN} < 5.5\text{ V}$ , $-40\text{ °C} < T_J < 125\text{ °C}$		240	400	
		$V_{IN}$ input current in off mode: $V_{EN} = \text{GND}$		0.1	1	
$I_{SC}$	Short-circuit current	$R_L = 0$ , $V_{IN} > 2.1\text{ V}$	1.4	2		A
$V_{EN}$	Enable input logic low	$V_{IN} = 2\text{ V}$ to $5.5\text{ V}$ , $-40\text{ °C} < T_J < 125\text{ °C}$ <sup>(2)</sup>		0	0.35	V
	Enable input logic high	$V_{IN} = 2\text{ V}$ to $5.5\text{ V}$ , $-40\text{ °C} < T_J < 125\text{ °C}$ <sup>(2)</sup>	1.4			
$I_{EN}$	Enable pin input current	$V_{EN} = V_{IN}$			100	nA
$T_{SHDN}$	Thermal shutdown			165		$^{\circ}\text{C}$
	Hysteresis			20		
$C_{OUT}$	Output capacitor	Capacitance (see <a href="#">Section 7 Typical performance characteristics</a> )	1		10	$\mu\text{F}$

1. Not applicable for  $V_{out(nom)} > 4.5\text{ V}$ .

2. For  $V_{OUT}$  lower than or equal to  $1\text{ V}$ ,  $V_{IN} = 2.1\text{ V}$ .

3. Dropout voltage is the input-to-output voltage difference at which the output voltage is  $100\text{ mV}$  below its nominal value.

## 6 Application information

### 6.1 Thermal and short-circuit protections

The LDL112 is self-protected from short-circuit condition and overtemperature. When the output load is higher than the one supported by the device, the output current increases until the limit of typically 2 A is reached, at this point the current is kept constant even when the load impedance is zero.

Thermal protection acts when the junction temperature reaches 165 °C, therefore the IC shuts down. As soon as the junction temperature falls again below the thermal hysteresis value the device starts working again.

In order to calculate the maximum power that the device can dissipate, keeping the junction temperature below the  $T_{OP}$ , the following formula is used:

**Equation 1**

$$P_{DMAX} = (125 - T_{AMB}) / R_{THJA}$$

### 6.2 Output voltage setting for ADJ version

In the adjustable version, the output voltage can be set from 0.8 V up to the input voltage minus the voltage drop across the pass transistor (dropout voltage), by connecting a resistor divider between the ADJ pin and the output, thus allowing remote voltage sensing.

The resistor divider could be selected by the following equation:

**Equation 2**

$$V_{OUT} = V_{ADJ} (1 + R1 / R2), \text{ with } V_{ADJ} = 0.8 \text{ V (typ.)}$$

It is recommended to use resistors with values in the range of 10 kΩ to 50 kΩ. Lower values can also be suitable, but current consumption increases.

### 6.3 Reverse current protection

The device avoids the reverse current to flow from output to input during any operating condition (with enable pin in high or low status). The reverse current protection acts in particular during fast turning on/off operations or when another power supply (with higher voltage than the input one) is connected to the output port. If a power supply with lower voltage than the LDO output voltage is connected to  $V_{OUT}$  pin, LDO enters the current protection status, causing high power dissipation.

In the application, the LDL112 reverse current protection acts in the following cases:

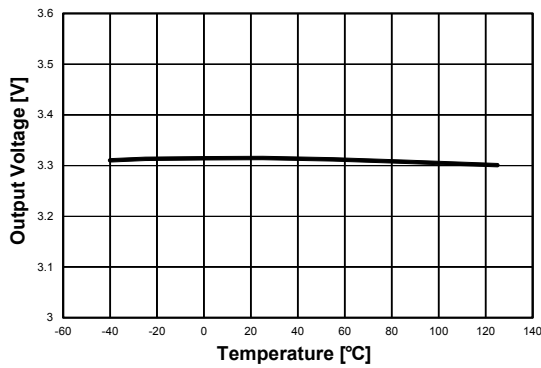
1. **Off-state, EN pin is at GND level,  $V_{OUT} > [V_{IN} + 100 \text{ mV}]$ .** In this case the device power pass element (MOSFET) is off, the bulk and gate are switched to  $V_{OUT}$  and therefore all possible current paths from  $V_{OUT}$  to  $V_{IN}$  are interrupted.
2. **On-state, EN pin is at high level and  $V_{OUT} > V_{OUT(nominal)}$ .** In this condition,  $V_{OUT}$  is higher than the nominal level, so the device op-amp works in open loop and the power element is off.  $V_{GS}$  is zero, the bulk and gate are switched to  $V_{OUT}$  (where  $V_{OUT} > [V_{IN} + 100 \text{ mV}]$ ) therefore all possible current paths from  $V_{OUT}$  to  $V_{IN}$  are interrupted.
3. **On-state, EN pin is at high level and  $V_{OUT} < V_{OUT(nominal)}$ .** In this condition  $V_{OUT}$  is lower than the nominal level, so the op-amp works in open loop with the power MOSFET on.  $V_{GS}$  is maximal so the power channel conducts with very low  $R_{DS(on)}$ . When  $V_{OUT} > V_{IN}$  the current can flow from  $V_{OUT}$  to  $V_{IN}$  until the condition  $V_{OUT} > (V_{IN} + 100 \text{ mV})$  is reached.



## 7 Typical performance characteristics

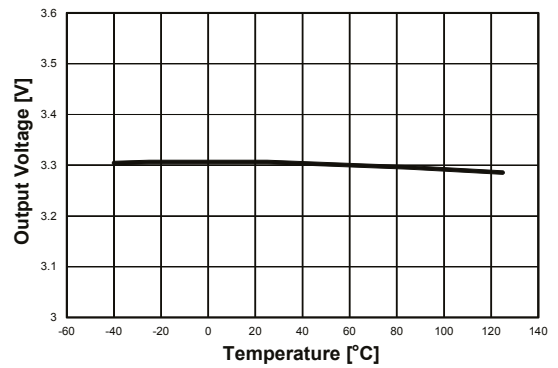
( $C_{IN} = C_{OUT} = 1 \mu F$ ,  $V_{EN}$  to  $V_{IN}$ ,  $T = 25 \text{ }^\circ\text{C}$  unless otherwise specified)

**Figure 8. Output voltage vs. temperature**  
( $V_{OUT} = 3.3 \text{ V}$ ,  $I_{OUT} = 5 \text{ mA}$ )



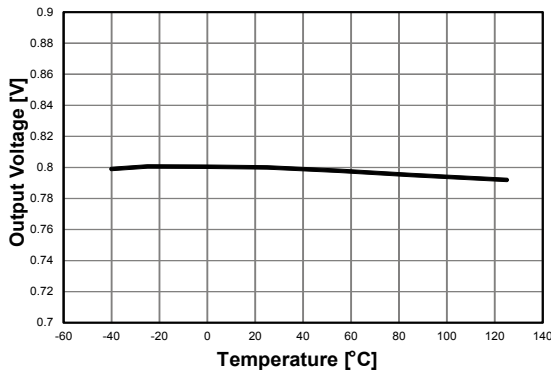
$V_{IN}=3.8\text{V}$ ,  $I_{OUT}=5\text{mA}$ ,  $V_{OUT}=3.3\text{V}$  AM14040V1

**Figure 9. Output voltage vs. temperature**  
( $V_{OUT} = 3.3 \text{ V}$ ,  $I_{OUT} = 1.2 \text{ A}$ )



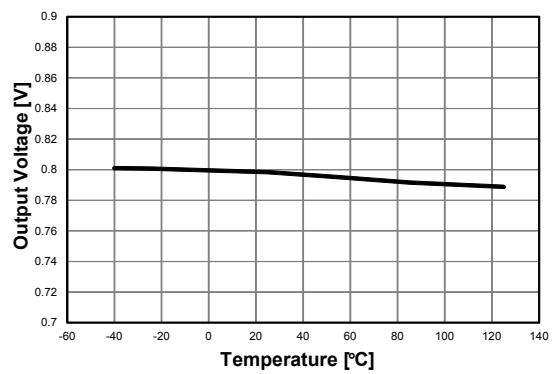
$V_{IN}=3.8\text{V}$ ,  $I_{OUT}=1.2\text{A}$ ,  $V_{OUT}=3.3\text{V}$  AM14041V1

**Figure 10. Output voltage vs. temperature**  
( $V_{OUT} = V_{ADJ}$ ,  $I_{OUT} = 5 \text{ mA}$ )

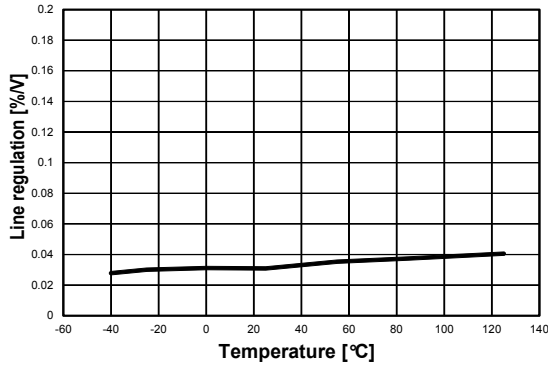
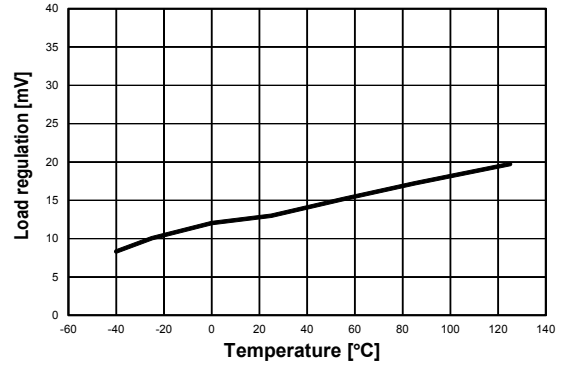
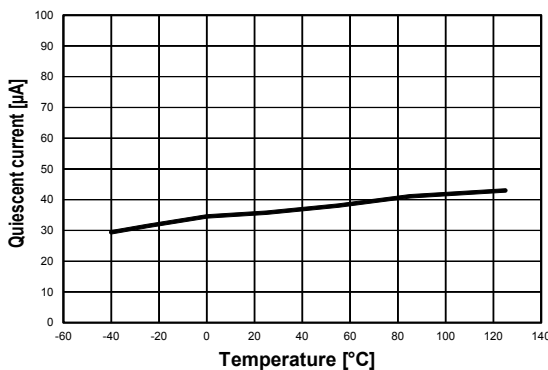
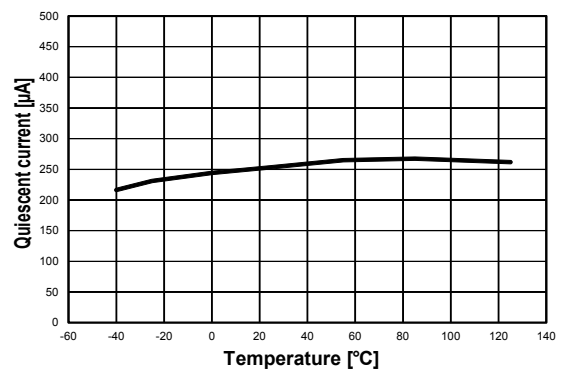
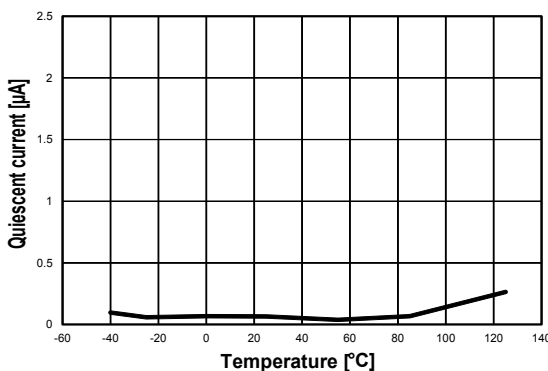
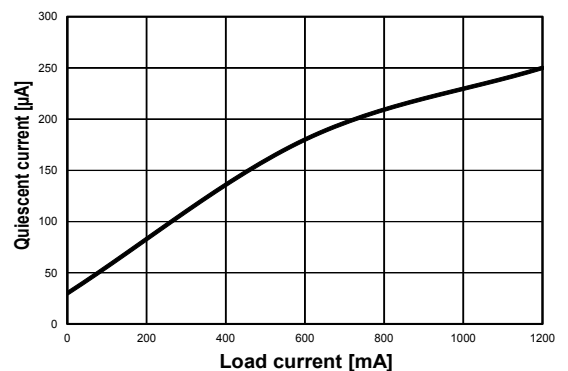


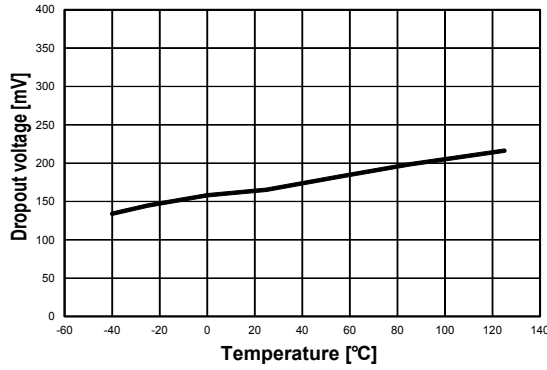
$V_{IN}=1.6\text{V}$ ,  $I_{OUT}=5\text{mA}$ ,  $V_{OUT}=V_{ADJ}$  AM14042V1

**Figure 11. Output voltage vs. temperature**  
( $V_{OUT} = V_{ADJ}$ ,  $I_{OUT} = 1.2 \text{ A}$ )

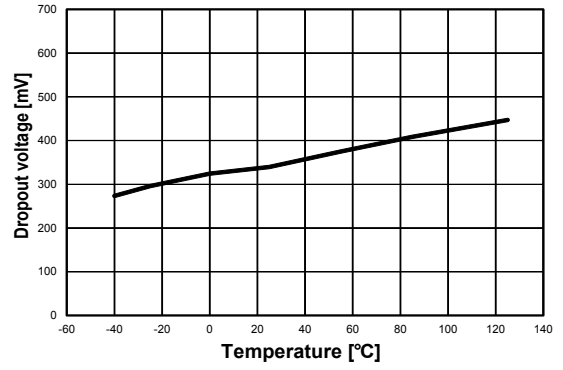


$V_{IN}=2\text{V}$ ,  $I_{OUT}=1.2\text{A}$ ,  $V_{OUT}=V_{ADJ}$  AM14043V1

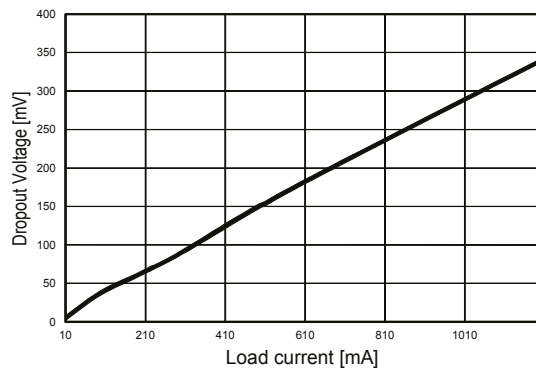
**Figure 12. Line regulation vs. temperature**

 $V_{IN}=3.8V$  to  $5.5V$ ,  $I_{OUT}=1.2A$ ,  $V_{OUT}=3.3V$  **AM14044V1**
**Figure 13. Load regulation vs. temperature**

 $V_{IN}=3.8V$ ,  $I_{OUT}$ =from 0mA to 1.2A,  $V_{OUT}=3.3V$  **AM14045V1**
**Figure 14. Quiescent current vs. temperature ( $I_{OUT} = 0$  mA)**

 $V_{IN}=3.8V$ ,  $I_{OUT}=0$ mA,  $V_{OUT}=3.3V$  **AM14046V1**
**Figure 15. Quiescent current vs. temperature ( $I_{OUT} = 1.2$  A)**

 $V_{IN}=3.8V$ ,  $I_{OUT}=1.2A$ ,  $V_{OUT}=3.3V$  **AM14047V1**
**Figure 16. Shutdown current vs. temperature**

 $V_{IN}=2V$ ,  $V_{EN}=GND$ ,  $V_{OUT}=V_{ADJ}$  **AM14048V1**
**Figure 17. Quiescent current vs. load current**

 $V_{IN}=2V$ ,  $V_{OUT}=V_{ADJ}$ ,  $T=25$ °C **AM14049V1**

**Figure 18. Dropout voltage vs. temperature**  
 ( $I_{OUT} = 600 \text{ mA}$ )

 $I_{OUT} = 0.6 \text{ A}, V_{OUT} = 3.3 \text{ V}$ 

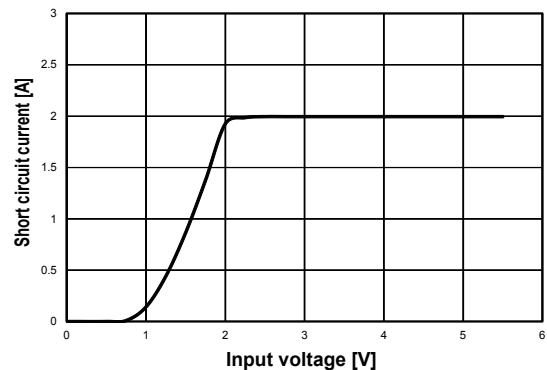
AM14050V1

**Figure 19. Dropout voltage vs. temperature**  
 ( $I_{OUT} = 1.2 \text{ A}$ )

 $I_{OUT} = 1.2 \text{ A}, V_{OUT} = 3.3 \text{ V}$ 

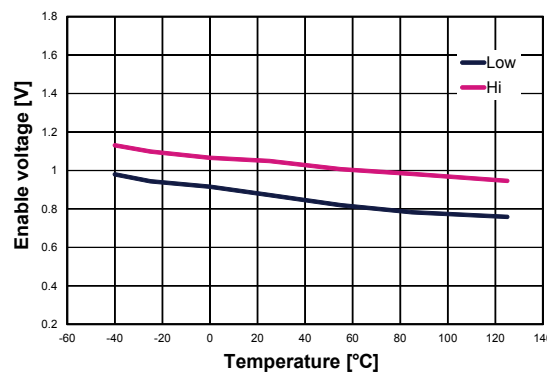
AM14051V1

**Figure 20. Dropout voltage vs. load current**

 $T = 25^\circ \text{C}$ 

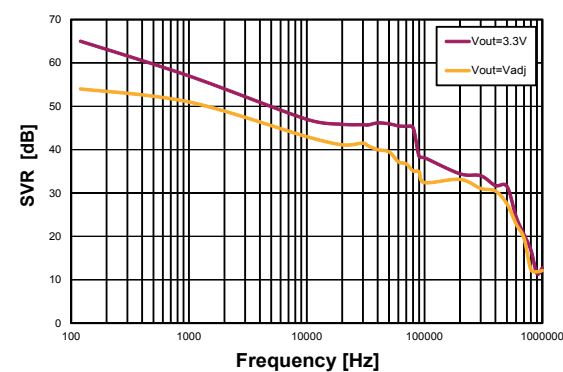
AM14052V1

**Figure 21. Short-circuit current vs. input voltage**

 $V_{OUT} = 3.3 \text{ V}, T = 25^\circ \text{C}$ 

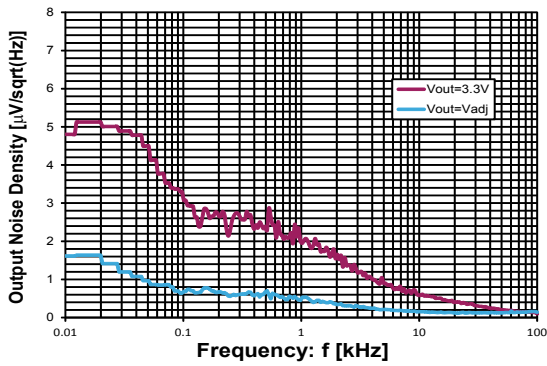
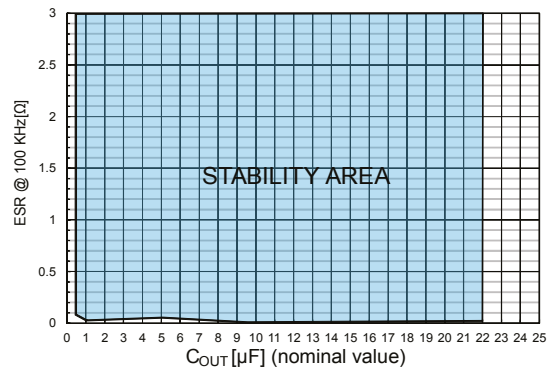
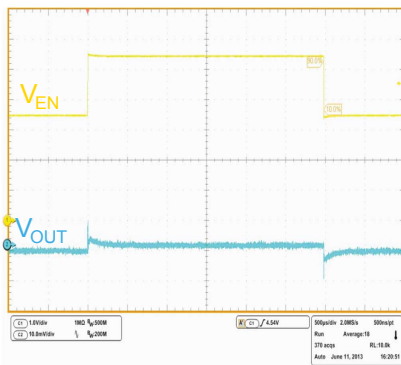
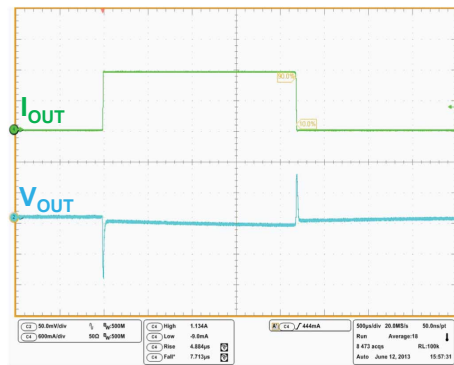
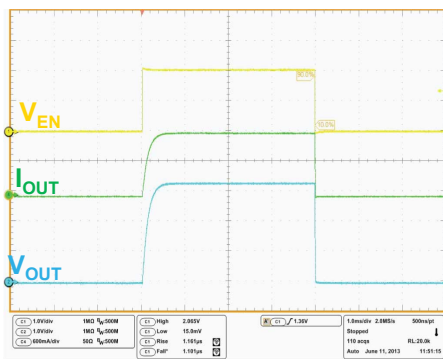
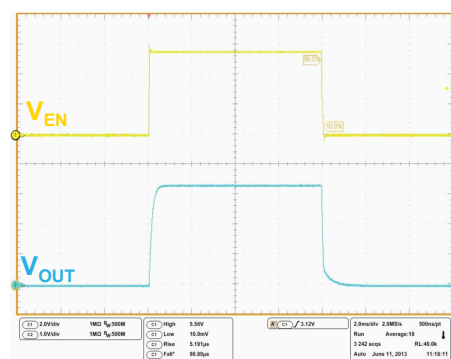
AM14053V1

**Figure 22. Enable thresholds vs. temperature**

 $V_{IN} = 3.8 \text{ V}$ 

AM14054V1

**Figure 23. SVR vs. frequency**

 $V_{IN} = 1.6 \text{ V or } 3.8 \text{ V } \pm 200 \text{ mV}, I_{OUT} = 10 \text{ mA}, C_{OUT} = 1 \mu \text{ F}$ 

AM14055V1

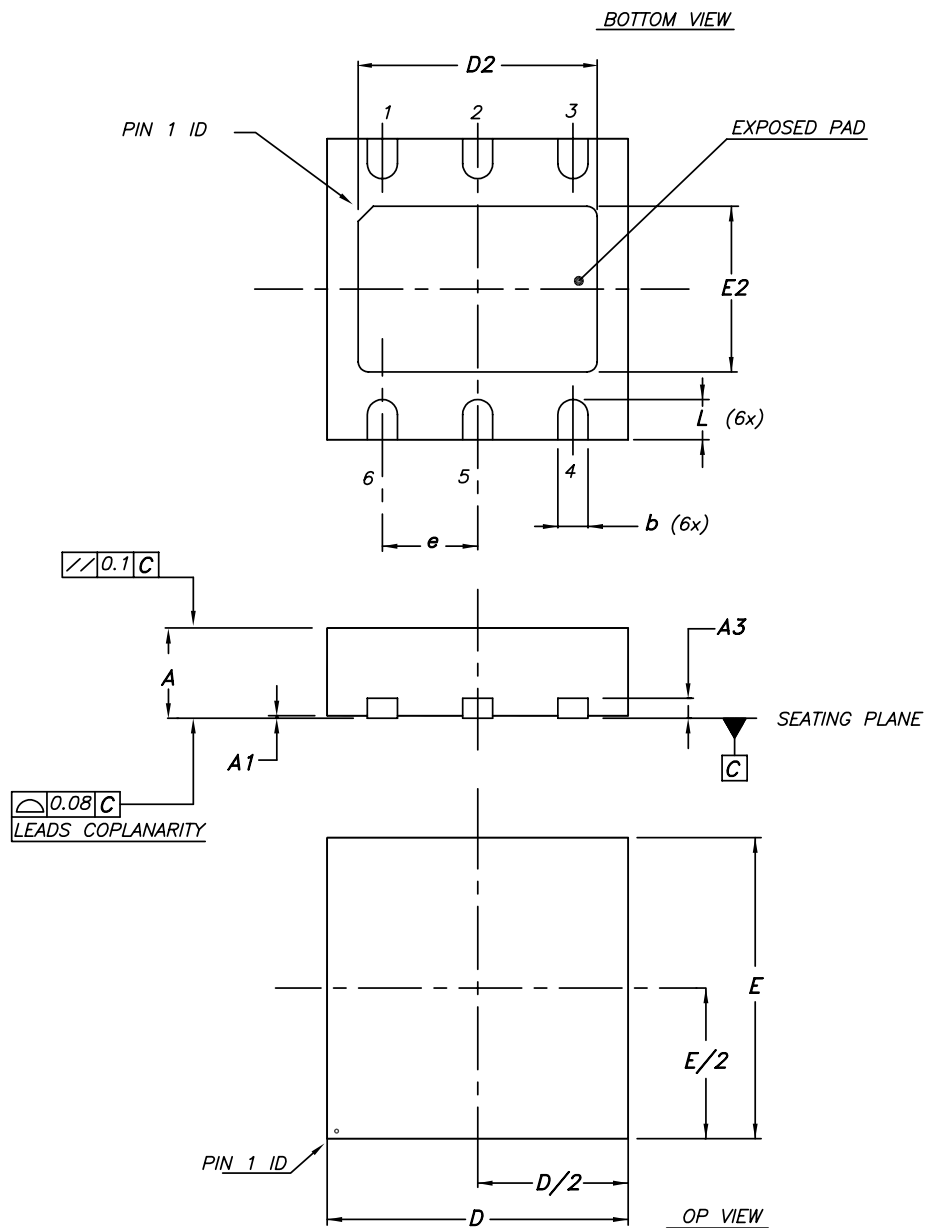
**Figure 24. Output noise spectral density**

 $V_{IN} = 1.6V \text{ or } 3.8V, C_{IN} = C_{OUT} = 1\mu F$  **AM14057V1**
**Figure 25. Stability plan vs.  $C_{OUT}$ , ESR**

 $V_{IN}$  from 2 to 5.5V,  $I_{OUT}$  from 0 to 1.2A,  $C_{IN} = 1\mu F$  **AM14057V2**
**Figure 26. Line transient**

 $V_{IN}$  from 3.5V to 5.5V,  $V_{EN} = 2V, I_{OUT} = 10mA, V_{OUT} = 3.3V, C_{OUT} = 1\mu F, t_r = t_f = 5\mu s$ 
**AM14058V1**
**Figure 27. Load transient**

 $V_{IN} = V_{EN} = 4V, I_{OUT}$  from 5mA to 1.2A,  $V_{OUT} = 3.3V, t_r = t_f = 5\mu s$ 
**AM14059V1**
**Figure 28. Enable transient**

 $V_{IN} = 4V, V_{EN} = 0V \text{ to } 2V, I_{OUT} = 1.2A, V_{OUT} = 3.3V, t_r = t_f = 1\mu s$ 
**AM14060V1**
**Figure 29. Turn-on time**

 $V_{IN} = V_{EN}$  from 0V to 5.5V,  $I_{OUT} = 5mA, V_{OUT} = 3.3V, t_r = t_f = 5\mu s$ 
**AM14061V1**

## 8 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

### 8.1 DFN6 (3x3) package information

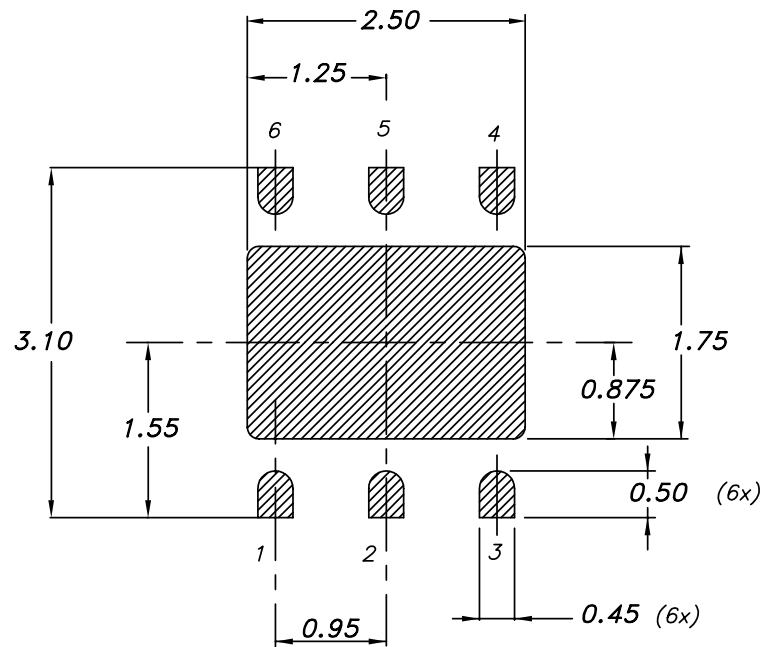
Figure 30. DFN6 (3x3) package outline



7946637\_C

**Table 6. DFN6 (3x3) mechanical data**

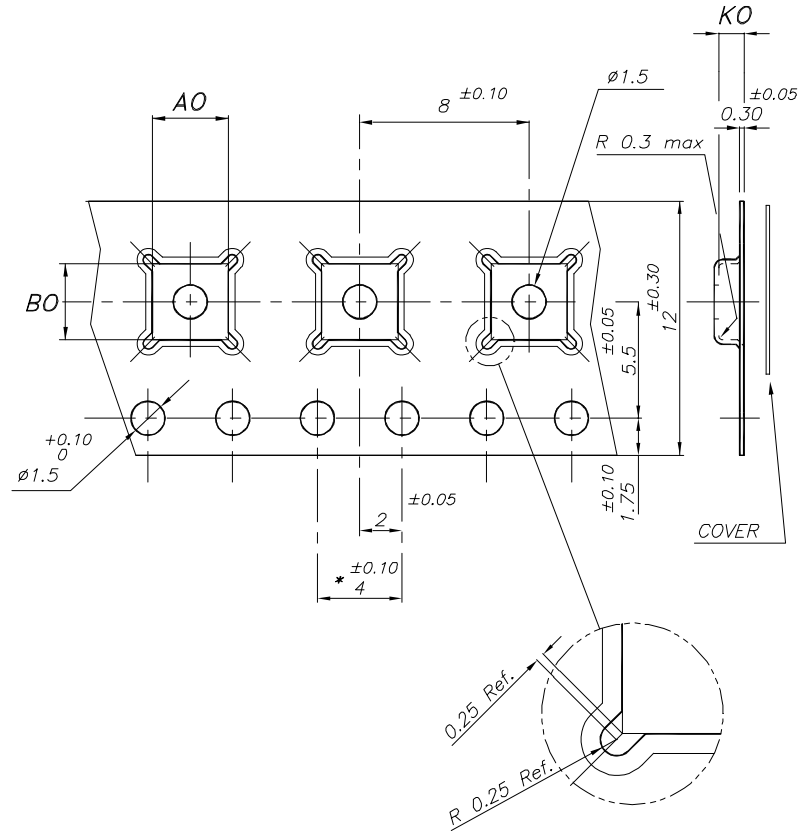
Dim.	mm		
	Min.	Typ.	Max.
A	0.80		1
A1	0	0.02	0.05
A3		0.20	
b	0.23		0.45
D	2.90	3	3.10
D2	2.23		2.50
E	2.90	3	3.10
E2	1.50		1.75
e		0.95	
L	0.30	0.40	0.50

**Figure 31. DFN6 (3x3) recommended footprint**
**FOOTPRINT RECOMMENDED**


7946637\_C

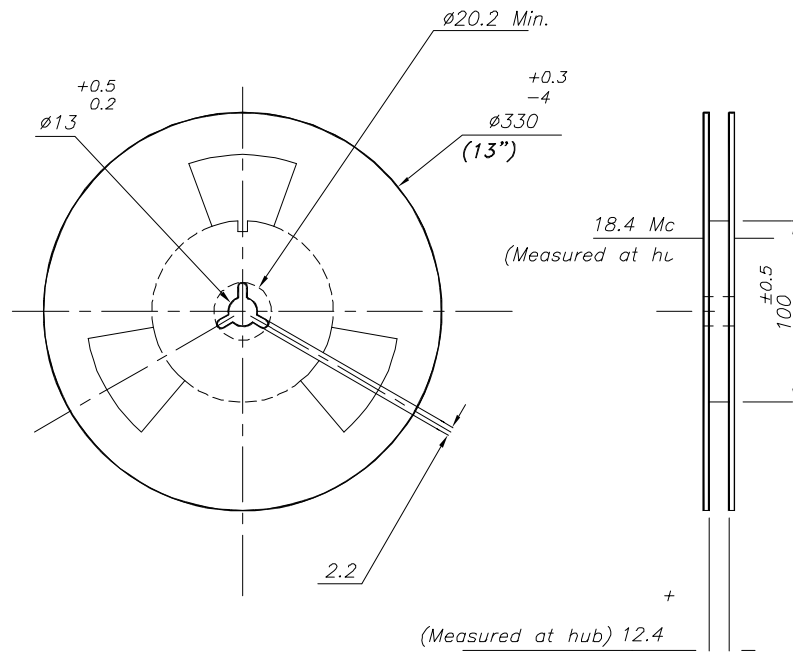
## 8.2 DFN6 (3x3) packing information

Figure 32. DFN6 (3x3) tape outline



\* - 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE  $\pm 0.20$

7875978\_N

**Figure 33. DFN6 (3x3) reel outline**


7875978\_N

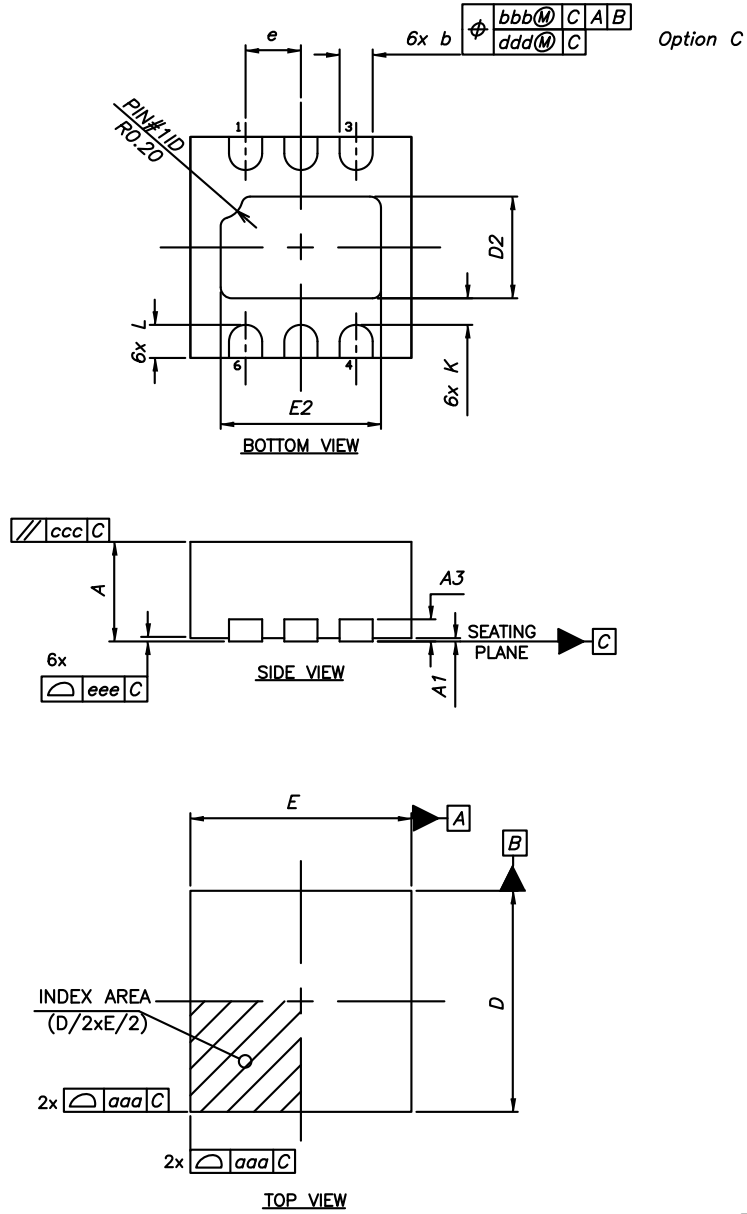
**Table 7. DFN6 (3x3) tape and reel mechanical data**

Dim.	mm		
	Min.	Typ.	Max.
A0	3.20	3.30	3.40
B0	3.20	3.30	3.40
K0	1	1.10	1.20



### 8.3 DFN6 (2x2) package information

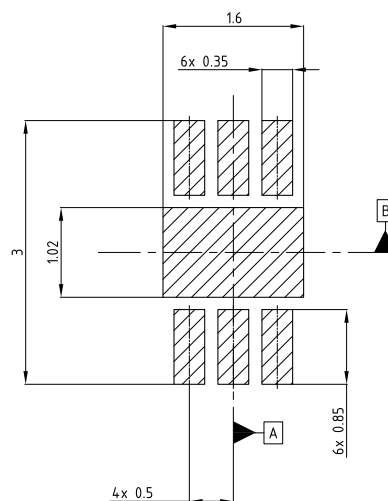
Figure 34. DFN6 (2x2) package outline



7733060

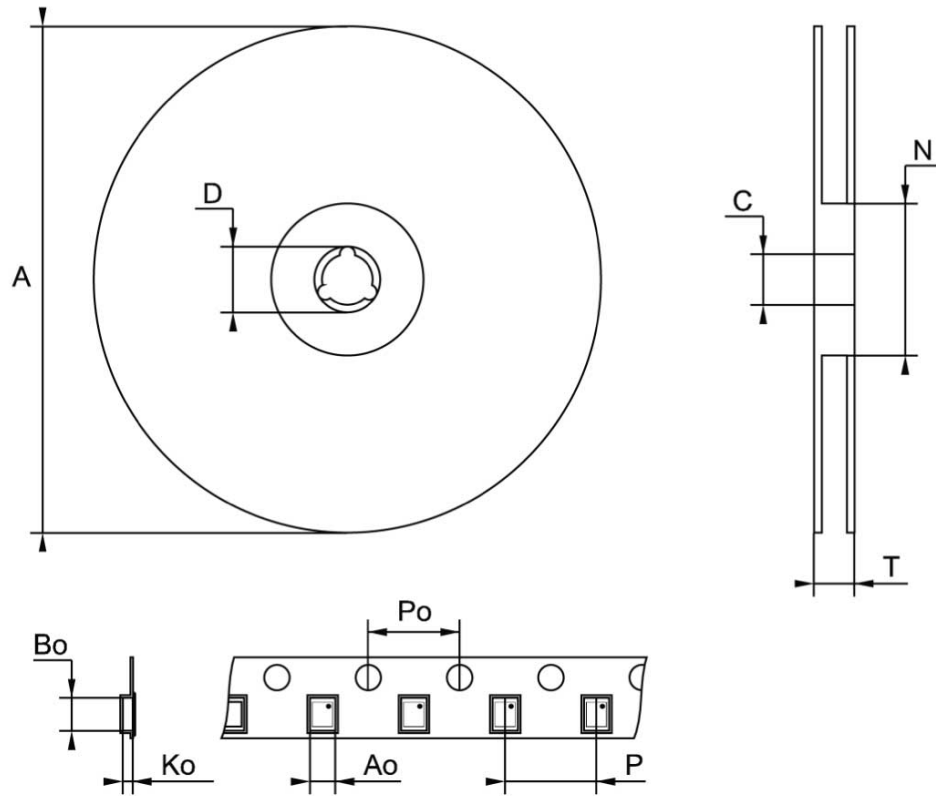
**Table 8. DFN6 (2x2) mechanical data**

Dim.	mm		
	Min.	Typ.	Max.
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A3	-	0.203 ref	-
b	0.25	0.30	0.35
D	-	2.00	-
E	-	2.00	-
e	-	0.50	-
D2	0.77	0.92	1.02
E2	1.30	1.45	1.55
K	0.15	-	-
L	0.20	0.30	0.40
aaa	-	0.05	-
bbb	-	0.10	-
ccc	-	0.10	-
ddd	-	0.05	-
eee	-	0.08	-

**Figure 35. DFN6 (2x2) recommended footprint**

**Notes:**

- 1) This footprint is able to ensure insulation up to 32 Vrms (according to CEI IEC 664-1)
- 2) The device must be positioned within  $\oplus 0.02$  A B

7733060 revE

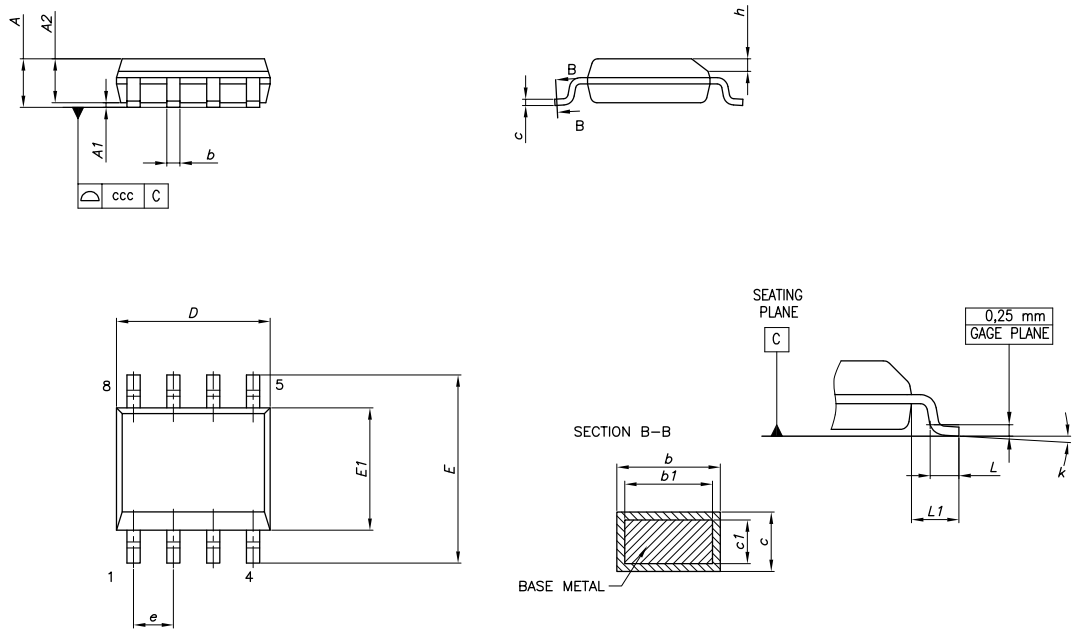
**8.4 DFN6 (2x2) packing information**
**Figure 36. DFN6 (2 x 2 mm) reel outline**


Note: Drawing not in scale

**Table 9. DFN6 (2 x 2 mm) tape and reel mechanical data**

Dim.	mm		
	Min.	Typ.	Max.
A			180
C	12.8		13.2
D	20.2		
N	60		
T			14.4
A0		2.4	
B0		2.4	
K0		1.3	
P0		4	
P		4	

## 8.5 SO8 package information

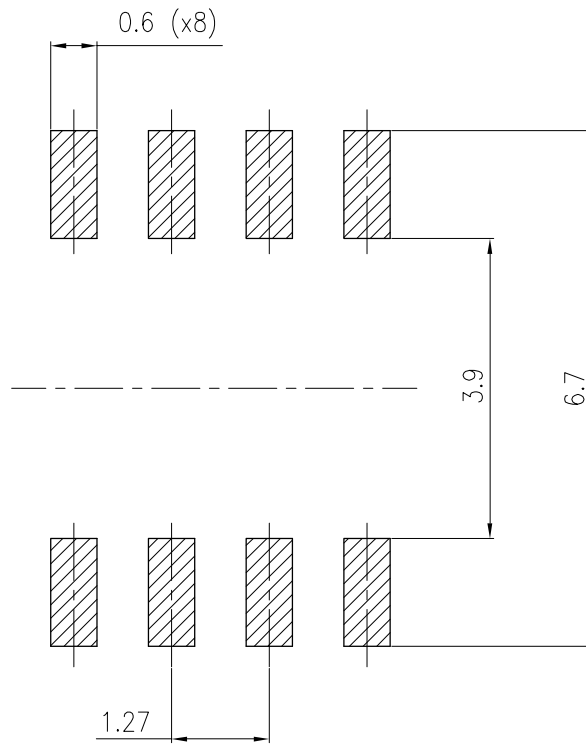
**Figure 37. SO-8 batwing package outline**


0016023\_G

**Table 10. SO-8 batwing mechanical data**

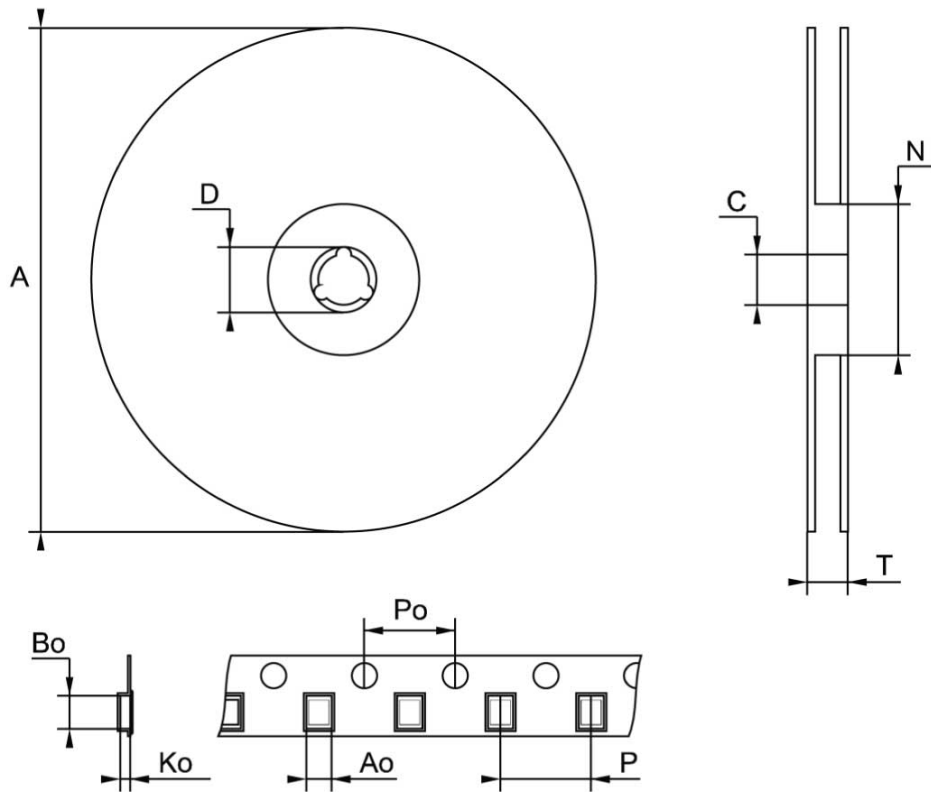
Dim.	mm		
	Min.	Typ.	Max.
A			1.75
A1	0.10		0.25
A2	1.25		
b	0.31		0.51
b1	0.28		0.48
c	0.10		0.25
c1	0.10		0.23
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e		1.27	
h	0.25		0.50
L	0.40		1.27
L1		1.04	
L2		0.25	
k	0°		8°
ccc			0.10

Figure 38. SO-8 batwing recommended footprint



0016023\_GU

## 8.6 SO8-batwing packing information

**Figure 39. SO8-batwing tape and reel outline**


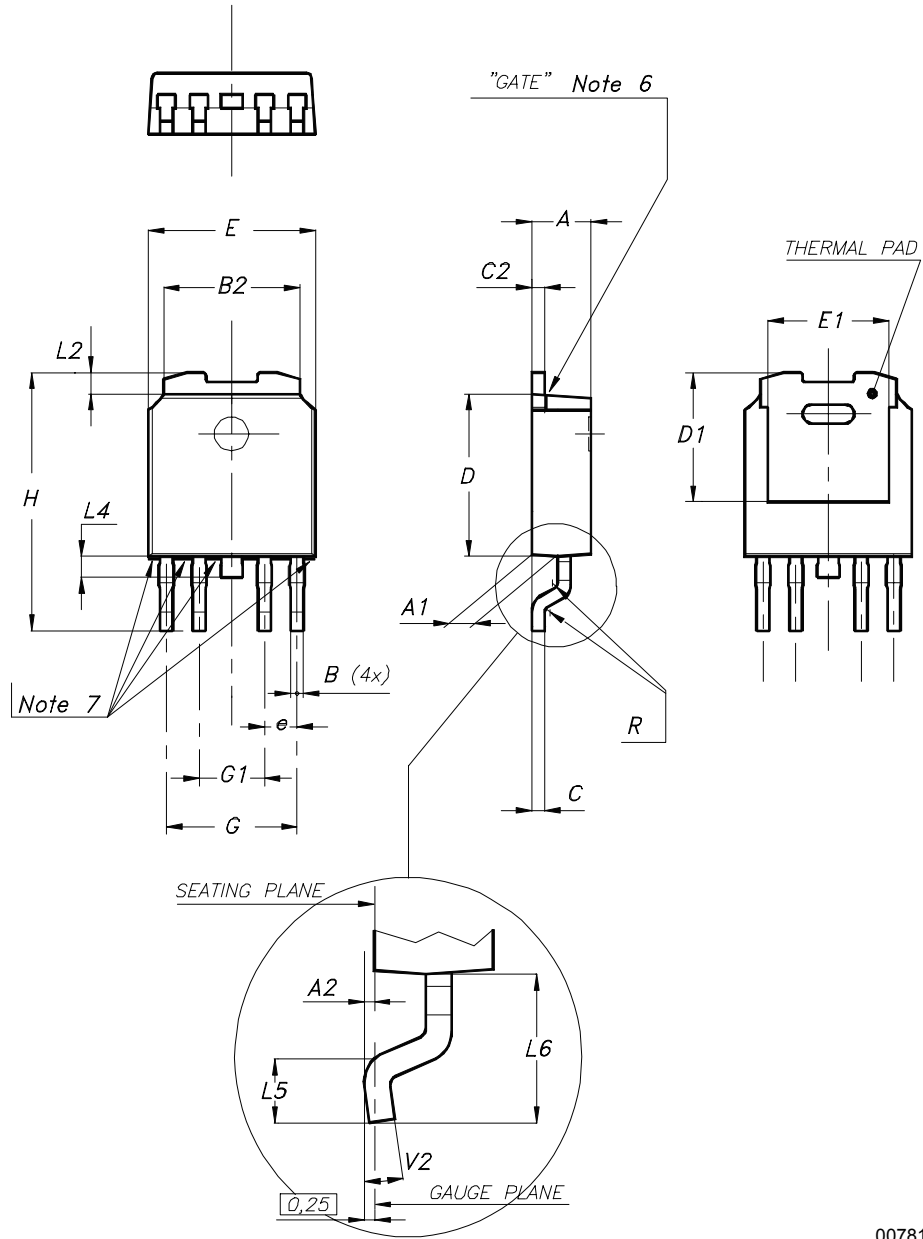
Note: Drawing not in scale

**Table 11. SO8-batwing mechanical data**

Dim.	mm		
	Min.	Typ.	Max.
A			330
C	12.8		13.2
D	20.2		
N	60		
T			22.4
A0	8.1		8.5
B0	5.5		5.9
K0	2.1		2.3
P0	3.9		4.1
P	7.9		8.1

### 8.7 PPAK package information

Figure 40. PPAK package outline



0078180\_F

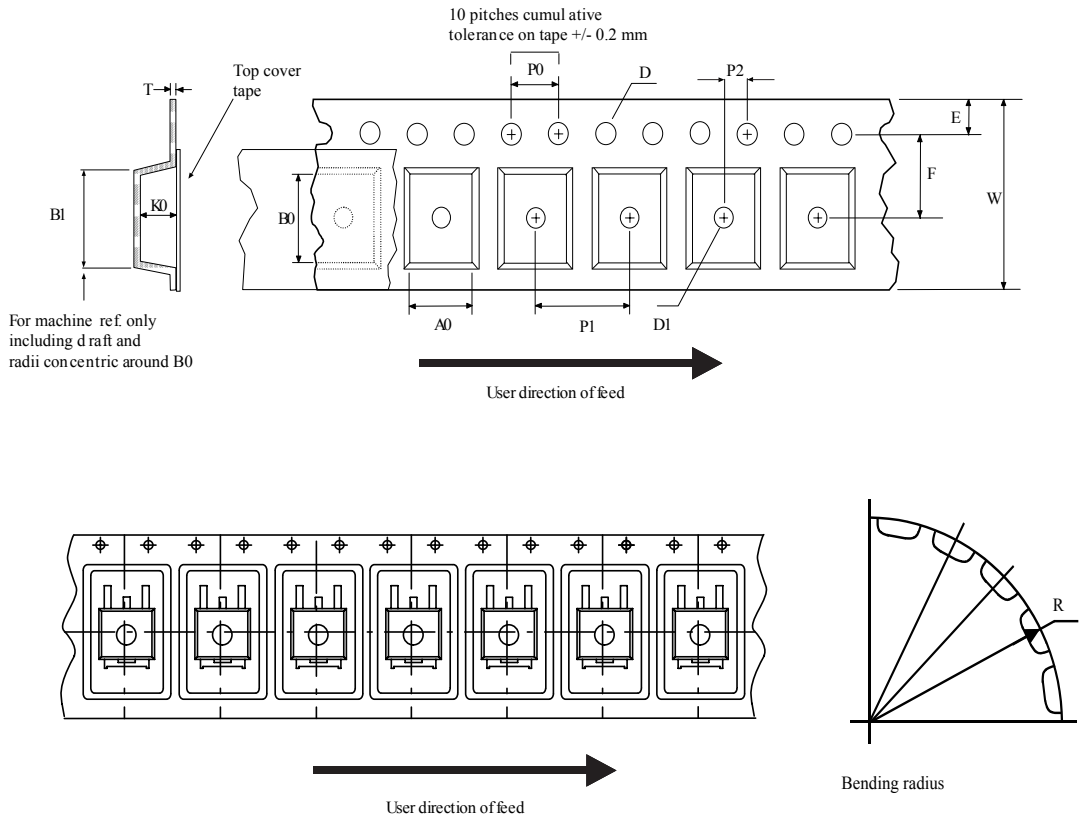
**Table 12. PPAK mechanical data**

Dim.	mm		
	Min.	Typ.	Max.
A	2.2		2.4
A1	0.9		1.1
A2	0.03		0.23
B	0.4		0.6
B2	5.2		5.4
C	0.45		0.6
C2	0.48		0.6
D	6		6.2
D1		5.1	
E	6.4		6.6
E1		4.7	
e		1.27	
G	4.9		5.25
G1	2.38		2.7
H	9.35		10.1
L2		0.8	1
L4	0.6		1
L5	1		
L6		2.8	
R		0.20	
V2	0°		8°

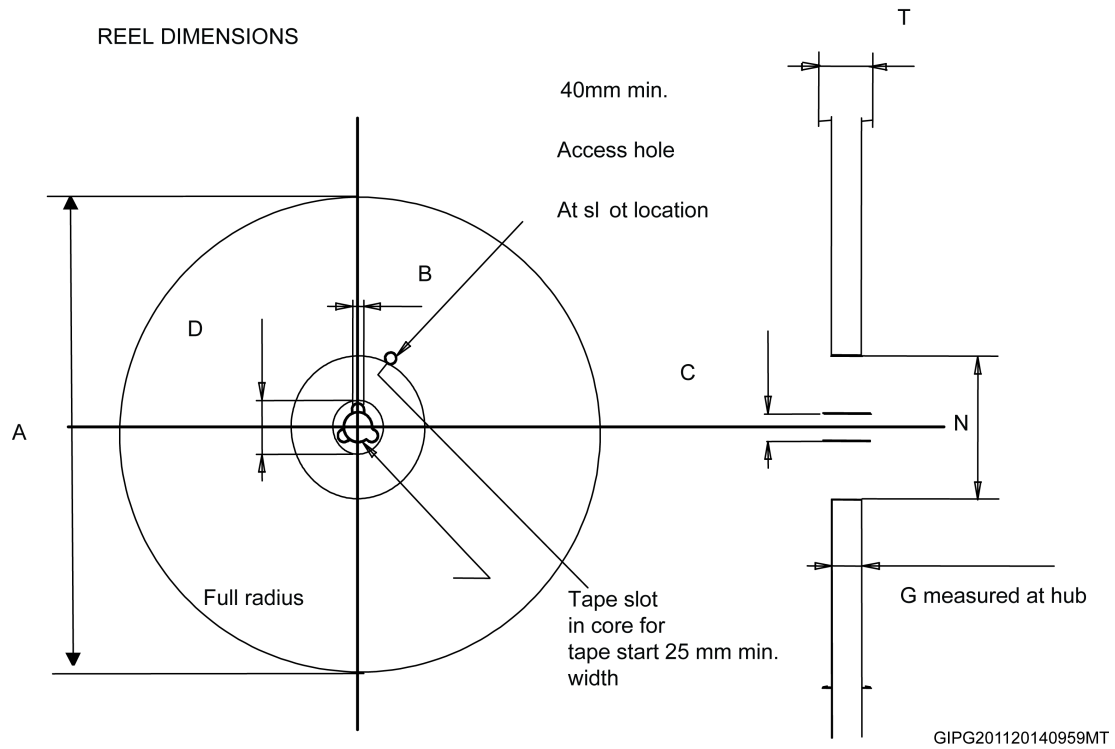


8.8 PPAK packing information

Figure 41. PPAK tape outline



AM08852v1

**Figure 42. PPAK reel outline**

**Table 13. PPAK mechanical data**

Dim.	Tape		Dim.	Reel	
	mm			mm	
	Min.	Max.		Min.	Max.
A0	6.8	7	A		330
B0	10.4	10.6	B	1.5	
B1		12.1	C	12.8	13.2
D	1.5	1.6	D	20.2	
D1	1.5		G	16.4	18.4
E	1.65	1.85	N	50	
F	7.4	7.6	T		22.4
K0	2.55	2.75			
P0	3.9	4.1	Base qty.		2500
P1	7.9	8.1	Base qty.		2500
P2	1.9	2.1			
R	40				
T	0.25	0.35			
W	15.7	16.3			

## 9 Ordering information

**Table 14. Order codes**

DFN6 (3x3)	DFN6 (2x2)	SO8-batwing	PPAK	Output voltage (V)
LDL112PV10R	LDL112PU10R	LDL112D10R		1.0
LDL112PV12R	LDL112PU12R	LDL112D12R		1.2
LDL112PV15R				1.5
LDL112PV18R	LDL112PU18R	LDL112D18R		1.8
	LDL112PU30R			3.0
LDL112PV33R	LDL112PU33R	LDL112D33R		3.3
LDL112PVR	LDL112PUR	LDL112DR	LDL112PT-TR	Adj

## Revision history

**Table 15. Document revision history**

Date	Revision	Changes
21-Nov-2014	1	Initial release.
28-Oct-2016	2	Updated Figure 32. DFN6 (2x2) package outline. Modified Table 9. Order codes. Minor text changes.
20-Feb-2019	3	Updated <a href="#">Table 14</a> . <a href="#">Order codes</a> .

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