

## 200 mA high accuracy and high PSRR voltage regulator



SOT23-5L



SOT-89

### Features

- Input voltage from 2.5 to 18 V
- Very low-dropout voltage (100 mV typ. @ 100 mA load)
- Low quiescent current (typ. 60  $\mu$ A, 1  $\mu$ A in off mode)
- High PSRR: 88 dB @ 120 Hz
- Low noise
- Output voltage tolerance:  $\pm 0.5\%$  @ 25  $^{\circ}$ C (LDK320A) or  $\pm 2\%$  25  $^{\circ}$ C
- Output current up to 200 mA
- Wide range of output voltages available on request: fixed from 1.2 V to 12 V with 100 mV step and adjustable
- Logic-controlled electronic shutdown
- Compatible with ceramic capacitor  $C_{OUT} = 1 \mu$ F
- Current, SOA and thermal protections
- Available in SOT23-5L and SOT-89 packages
- Temperature range: -40  $^{\circ}$ C to 125  $^{\circ}$ C

### Applications

- DSC
- TV
- BD, DVD
- PC
- Industrial

Maturity status link

[LDK320](#)

### Description

The [LDK320](#) is a low drop voltage regulator, which provides a maximum output current of 200 mA from an input voltage in the range of 2.5 V to 18 V, with a typical dropout voltage of 100 mV.

It is stabilized with a ceramic capacitor on the output.

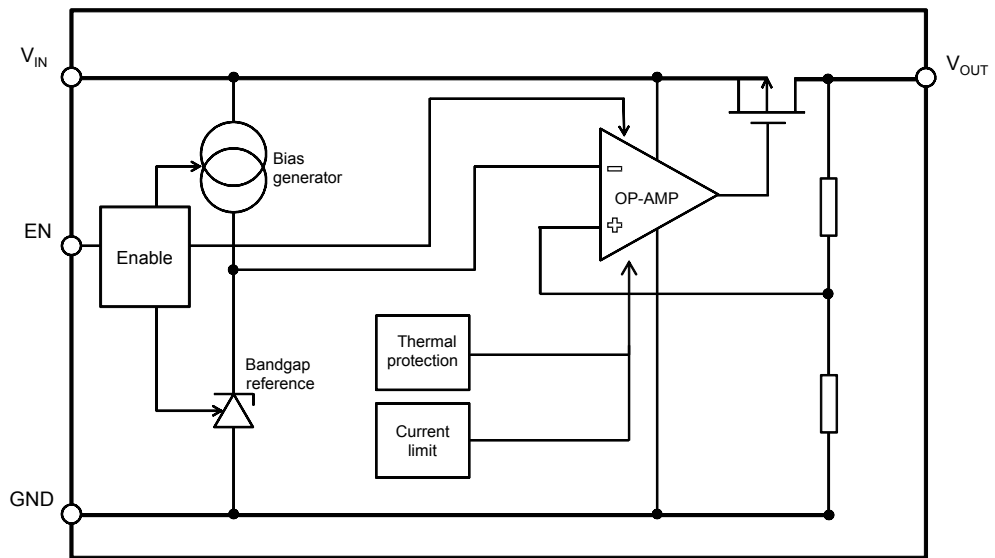
The very good dynamic characteristic, combined with low drop voltage and low quiescent current make it suitable for low power battery-powered applications.

The enable logic control function allows the [LDK320](#) to be in shutdown mode by consuming a total current lower than 1  $\mu$ A.

This device also includes a short-circuit current limiting, thermal and SOA protections.

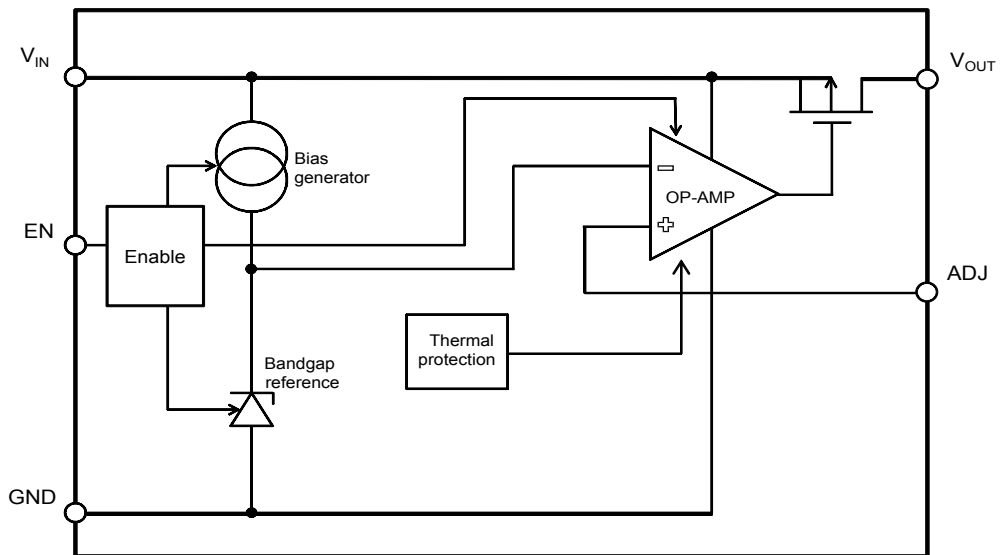
1 Diagram

Figure 1. Block diagram (fixed version)



GIPD030820151330MT

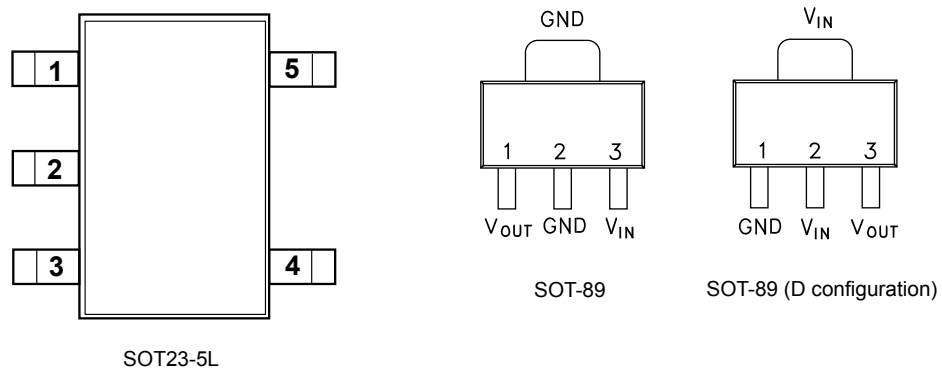
Figure 2. Block diagram (adjustable version)



GIPD030820151331MT

## 2 Pin configuration

**Figure 3. Pin connection (top view)**



GIPD030820151343MT

**Table 1. Pin description (SOT23-5L)**

Pin n°	Symbol	Function
1	IN	Input voltage of the LDO
2	GND	Common ground
3	EN	Enable pin logic input: low = shutdown, high = active
4	ADJ/NC	Adjustable pin on ADJ version, not connected on fixed version
5	OUT	Output voltage of the LDO

**Table 2. Pin description (SOT-89)**

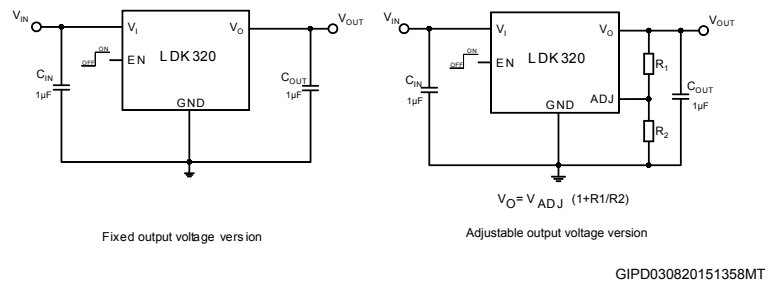
Pin n°	Symbol	Function
1	OUT	Output voltage of the LDO
2	GND	Common ground
3	IN	Input voltage of the LDO
TAB	GND	Common ground

**Table 3. Pin description (SOT-89, D configuration)**

Pin n°	Symbol	Function
1	GND	Common ground
2	IN	Input voltage of the LDO
3	OUT	Output voltage of the LDO
TAB	IN	Input voltage of the LDO

### 3 Typical application

**Figure 4. Typical application circuits**



*Note: Adjustable version and enable pin are not available on SOT-89 package.*

## 4 Maximum ratings

**Table 4. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{IN}$	DC input voltage	- 0.3 to 20	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	- 0.3 to 2	V
$I_{OUT}$	Output current	Internally limited	mA
$P_D^{(1)}$	Power dissipation	Internally limited	mW
$T_{STG}$	Storage temperature range	- 65 to 150	°C
$T_{OP}$	Operating junction temperature range	- 40 to 125	°C

1. Maximum power dissipation must be calculated by taking into account the package and thermal performance.

**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 5. Thermal data**

Symbol	Parameter	SOT23-5L	SOT-89	Unit
$R_{thJA}$	Thermal resistance junction-ambient	160	110	°C/W
$R_{thJC}$	Thermal resistance junction-case	68	15	°C/W

## 5 Electrical characteristics

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

**Table 6. LDK320 electrical characteristics (fixed output version)**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{IN}$	Operating input voltage		2.5		18	V
$V_{OUT}$	$V_{OUT}$ accuracy	$T_J = 25\text{ °C}$	-2		2	%
		$-40\text{ °C} < T_J < 125\text{ °C}$	-3		3	%
	$V_{OUT}$ accuracy, LDK320A	$T_J = 25\text{ °C}$	-0.5		0.5	%
		$-40\text{ °C} < T_J < 125\text{ °C}$	-1.5		1.5	%
$\Delta V_{OUT}$	Static line regulation	$V_{OUT} + 1\text{ V} \leq V_{IN} \leq 18\text{ V}$		0.001	0.05	%/V
$\Delta V_{OUT}$	Static load regulation	$I_{OUT} = 1\text{ mA to }200\text{ mA}$ , $V_{OUT} \leq 2\text{ V}$		10	15	mV
		$I_{OUT} = 1\text{ mA to }200\text{ mA}$ , $V_{OUT} > 2\text{ V}$		0.001	0.003	%/mA
$V_{DROP}$	Dropout voltage <sup>(1)</sup>	$I_{OUT} = 100\text{ mA}$ , $V_{OUT} = 3.3\text{ V}$		100		
		$I_{OUT} = 200\text{ mA}$ , $V_{OUT} = 3.3\text{ V}$ $40\text{ °C} < T_J < 125\text{ °C}$		200	350	mV
$e_N$	Output noise voltage	10 Hz to 100 kHz, $I_{OUT} = 10\text{ mA}$		63		$\mu\text{V}_{RMS}/\text{V}$
SVR	Supply voltage rejection	$f = 120\text{ Hz}$ , $I_{OUT} = 10\text{ mA}$ , $V_{OUT} = 3.3\text{ V}$		88		dB
		$f = 1\text{ kHz}$ , $I_{OUT} = 10\text{ mA}$ , $V_{OUT} = 3.3\text{ V}$		65		
		$f = 10\text{ kHz}$ , $I_{OUT} = 10\text{ mA}$ , $V_{OUT} = 3.3\text{ V}$		48		
$I_Q$	Quiescent current	$V_{OUT} + 1\text{ V}$ , $V_{IN} 18\text{ V}$ , $I_{OUT} = 0\text{ mA}$ , $-40\text{ °C} < T_J < 125\text{ °C}$		60	90	$\mu\text{A}$
		$V_{IN} = V_{OUT} + 1\text{ V}$ , $I_{OUT} = 200\text{ mA}$ , $-40\text{ °C} < T_J < 125\text{ °C}$		70	100	
		$V_{IN}$ input current in OFF mode: $V_{EN} = G_{ND}$ , $T_J = 25\text{ °C}$		0.2	1	
$I_{SC}$	Short-circuit current	$R_L = 0$		330		mA
		$R_L = 0$ , $V_{IN} = 16\text{ V}$		200		

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{EN}$	Enable input logic low	$V_{IN} = 2.5 \text{ V to } 18 \text{ V}$ , $-40 \text{ }^\circ\text{C} < T_J < 125 \text{ }^\circ\text{C}$			0.4	V
	Enable input logic high	$V_{IN} = 2.5 \text{ V to } 18 \text{ V}$ , $-40 \text{ }^\circ\text{C} < T_J < 125 \text{ }^\circ\text{C}$	1.2			
$I_{EN}$	Enable pin input current	$V_{EN} = V_{IN}$		0.1	100	nA
$T_{SHDN}$	Thermal shutdown			160		$^\circ\text{C}$
	Hysteresis			20		
$C_{OUT}$	Output capacitor	Capacitance (see Section 6 Typical characteristics)	1		22	$\mu\text{F}$

1. Dropout voltage is the input-to-output voltage difference at which the output voltage is 100 mV below its nominal value.

$T_J = 25 \text{ }^\circ\text{C}$ ,  $V_{IN} = 2.5 \text{ V}$ ,  $C_{IN} = C_{OUT} = 1 \text{ } \mu\text{F}$ ,  $I_{OUT} = 1 \text{ mA}$ ,  $V_{EN} = V_{IN}$ , unless otherwise specified.

**Table 7. LDK320 electrical characteristics (ADJ version)**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{IN}$	Operating input voltage		2.5		18	V
$V_{ADJ}$	Adjustable voltage	$T_J = 25 \text{ }^\circ\text{C}$		1.185		V
	Adjustable voltage accuracy	$T_J = 25 \text{ }^\circ\text{C}$	-2		+2	%
		$40 \text{ }^\circ\text{C} < T_J < 125 \text{ }^\circ\text{C}$	-3		+3	
	Adjustable voltage, LDK320A	$T_J = 25 \text{ }^\circ\text{C}$		1.2		V
Adjustable voltage accuracy, LDK320A	$T_J = 25 \text{ }^\circ\text{C}$	-0.5		+0.5	%	
	$40 \text{ }^\circ\text{C} < T_J < 125 \text{ }^\circ\text{C}$	-1.5		+1.5		
$\Delta V_{OUT}$	Static line regulation	$V_{OUT} + 1 \text{ V} \leq V_{IN} \leq 18 \text{ V}$		0.001	0.05	%/V
$\Delta V_{OUT}$	Static load regulation	$I_{OUT} = 1 \text{ mA to } 200 \text{ mA}$		0.0002	0.003	%/mA
$V_{DROP}$	Dropout voltage <sup>(1)</sup>	$I_{OUT} = 100 \text{ mA}$ , $V_{OUT} = 3.3 \text{ V}$		100		mV
		$I_{OUT} = 200 \text{ mA}$ , $V_{OUT} = 3.3 \text{ V}$		200	350	
		$40 \text{ }^\circ\text{C} < T_J < 125 \text{ }^\circ\text{C}$				
$e_N$	Output noise voltage	10 Hz to 100 kHz $I_{OUT} = 10 \text{ mA}$		60		$\mu\text{V}_{RMS}$
$I_{ADJ}$	Adjust pin current				1	$\mu\text{A}$
SVR	Supply voltage rejection	$f = 120 \text{ Hz}$ $I_{OUT} = 10 \text{ mA}$ , $V_{OUT} = V_{ADJ}$		83		dB
		$f = 1 \text{ kHz}$ $I_{OUT} = 10 \text{ mA}$ , $V_{OUT} = V_{ADJ}$		73		
		$f = 10 \text{ kHz}$ $I_{OUT} = 10 \text{ mA}$ , $V_{OUT} = V_{ADJ}$		58		

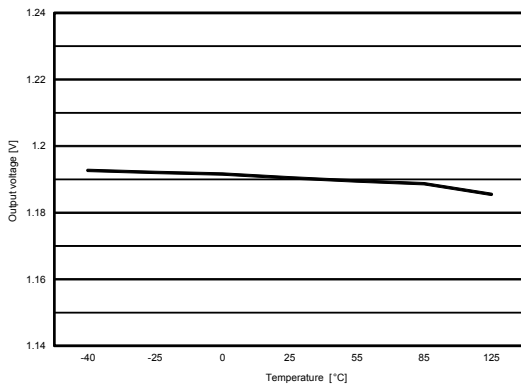
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_Q$	Quiescent current	$V_{OUT} + 1\text{ V} \leq V_{IN} \leq 18\text{ V}$ , $I_{OUT} = 0\text{ mA}$ , $-40\text{ }^\circ\text{C} < T_J < 125\text{ }^\circ\text{C}$		50	90	$\mu\text{A}$
		$V_{IN} = V_{OUT} + 1\text{ V}$ , $I_{OUT} = 200\text{ mA}$ , $-40\text{ }^\circ\text{C} < T_J < 125\text{ }^\circ\text{C}$		60	100	
		$V_{IN}$ input current in OFF mode: $V_{EN} = \text{GND}$ , $T_J = 25\text{ }^\circ\text{C}$		0.2	1	
$I_{SC}$	Short-circuit current	$R_L = 0$		330		mA
		$R_L = 0$ , $V_{IN} = 16\text{ V}$		200		
$V_{EN}$	Enable input logic low	$V_{IN} = 2.5\text{ V to }18\text{ V}$ , $-40\text{ }^\circ\text{C} < T_J < 125\text{ }^\circ\text{C}$			0.4	V
	Enable input logic high	$V_{IN} = 2.5\text{ V to }18\text{ V}$ , $-40\text{ }^\circ\text{C} < T_J < 125\text{ }^\circ\text{C}$	1.2			
$I_{EN}$	Enable pin input current	$V_{EN} = V_{IN}$		0.1	100	nA
$T_{SHDN}$	Thermal shutdown			160		$^\circ\text{C}$
	Hysteresis			20		
$C_{OUT}$	Output capacitor	Capacitance (see <a href="#">Section 6 Typical characteristics</a> )	1		22	$\mu\text{F}$



## 6 Typical characteristics

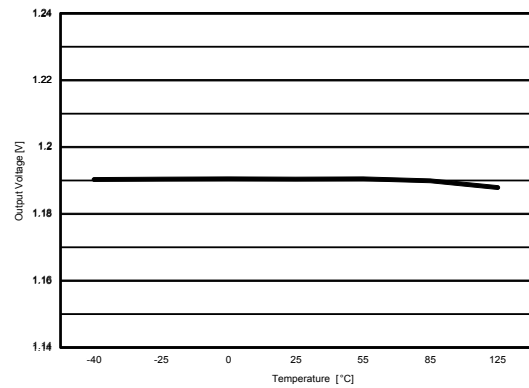
Unless otherwise specified:  $T_J = 25\text{ }^\circ\text{C}$ ,  $V_{IN} = V_{OUT(NOM)} + 1\text{ V}$ ,  $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$ .

**Figure 5. Output voltage vs. temperature ( $V_{IN} = 2.5\text{ V}$ ,  $V_{OUT} = V_{ADJ}$ ,  $I_{OUT} = 1\text{ mA}$ )**



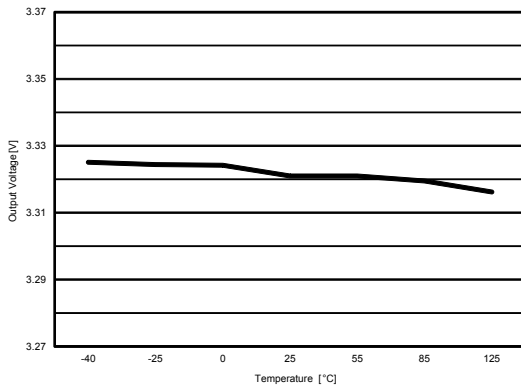
GIPD040820151207MT

**Figure 6. Output voltage vs. temperature ( $V_{IN} = 2.5\text{ V}$ ,  $V_{OUT} = V_{ADJ}$ ,  $I_{OUT} = 200\text{ mA}$ )**



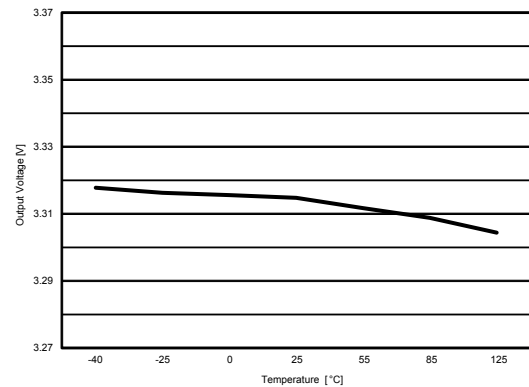
GIPD040820151208MT

**Figure 7. Output voltage vs. temperature ( $V_{IN} = 4.3\text{ V}$ ,  $V_{OUT} = 3.3\text{ V}$ ,  $I_{OUT} = 1\text{ mA}$ )**

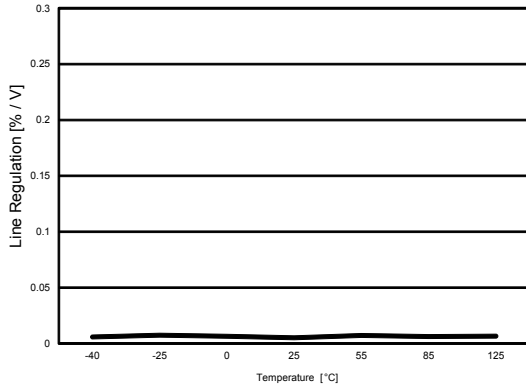


GIPD040820151209MT

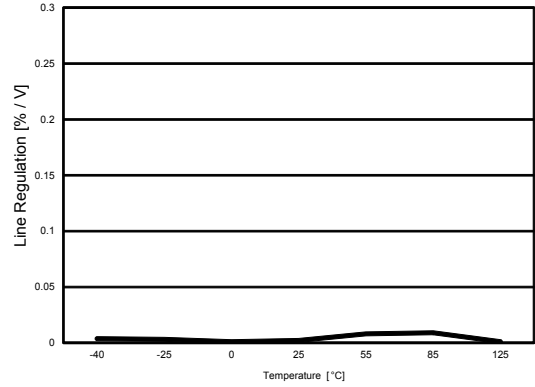
**Figure 8. Output voltage vs. temperature ( $V_{IN} = 4.3\text{ V}$ ,  $V_{OUT} = 3.3\text{ V}$ ,  $I_{OUT} = 200\text{ mA}$ )**



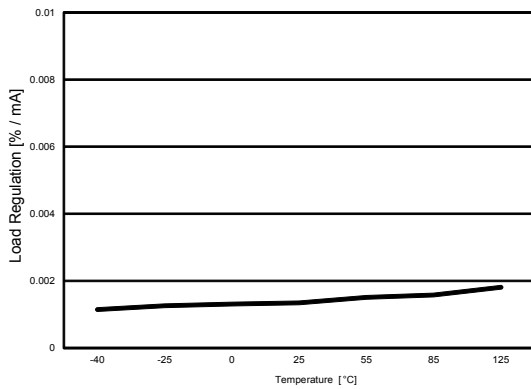
GIPD040820151210MT

**Figure 9. Line regulation vs. temperature ( $V_{IN} = 4.3$  to 18 V,  $V_{OUT} = 3.3$  V,  $I_{OUT} = 1$  mA)**


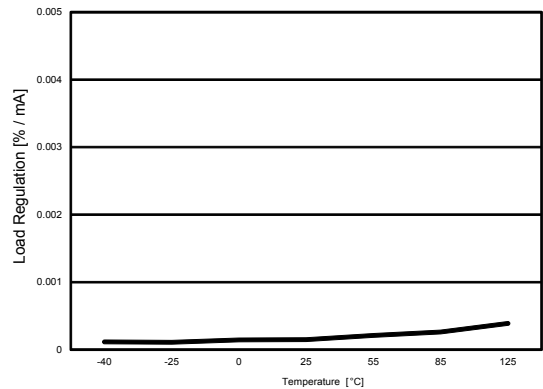
GIPD040820151211MT

**Figure 10. Line regulation vs. temperature ( $V_{IN} = 2.5$  to 18 V,  $V_{OUT} = V_{ADJ}$ ,  $I_{OUT} = 1$  mA)**


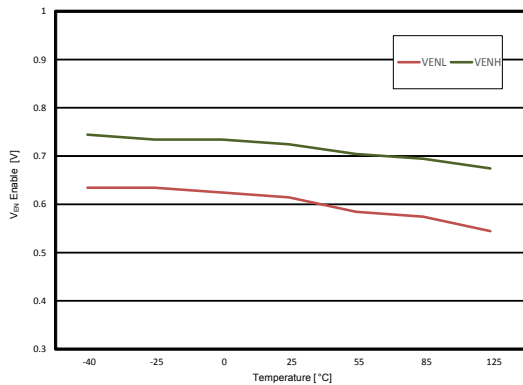
GIPD040820151212MT

**Figure 11. Load regulation vs. temperature ( $V_{IN} = 4.3$  V,  $V_{OUT} = 3.3$  V,  $I_{OUT} = 1$  to 200 mA)**


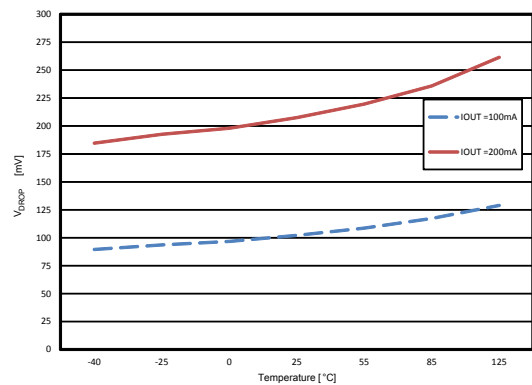
GIPD040820151213MT

**Figure 12. Load regulation vs. temperature ( $V_{IN} = 2.5$  V,  $V_{OUT} = V_{ADJ}$ ,  $I_{OUT} = 1$  to 200 mA)**


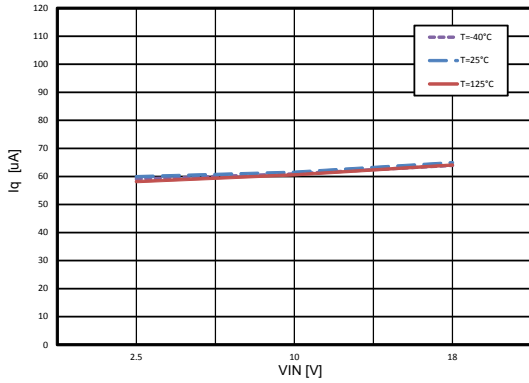
GIPD040820151214MT

**Figure 13. Enable thresholds vs. temperature ( $I_{OUT} = 1$  mA)**


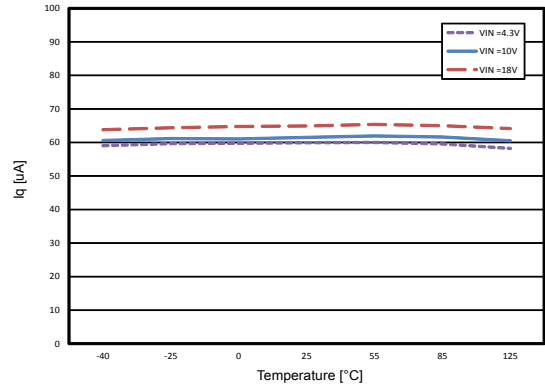
GIPD040820151215MT

**Figure 14. Dropout voltage vs. temperature**


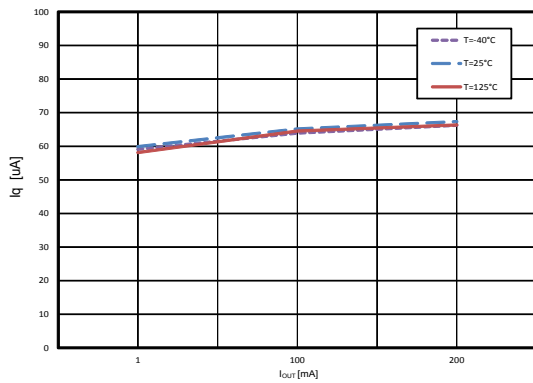
GIPD040820151216MT

**Figure 15. Quiescent current vs. input voltage**  
 ( $I_{OUT} = 1 \text{ mA}$ )


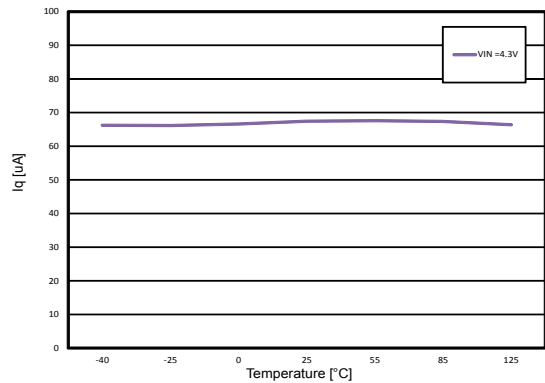
GIPD040820151217MT

**Figure 16. Quiescent current vs. temperature** ( $I_{OUT} = 1 \text{ mA}$ )


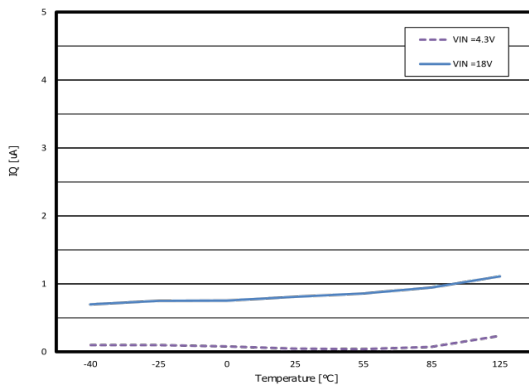
GIPD040820151218MT

**Figure 17. Quiescent current vs. output current**  
 ( $V_{IN} = 4.3 \text{ V}$ )


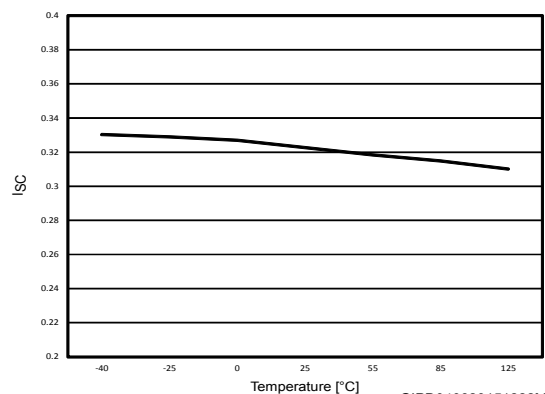
GIPD040820151219MT

**Figure 18. Quiescent current vs. temperature**  
 ( $I_{OUT} = 200 \text{ mA}$ )


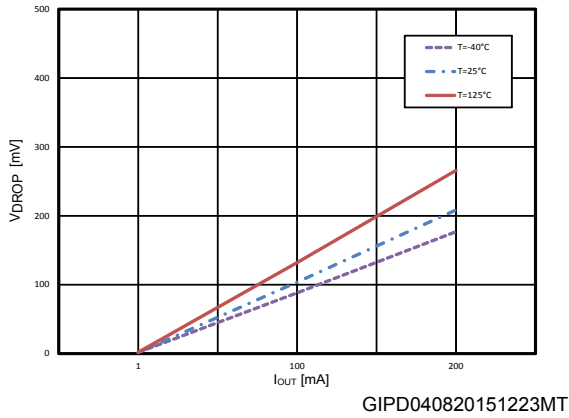
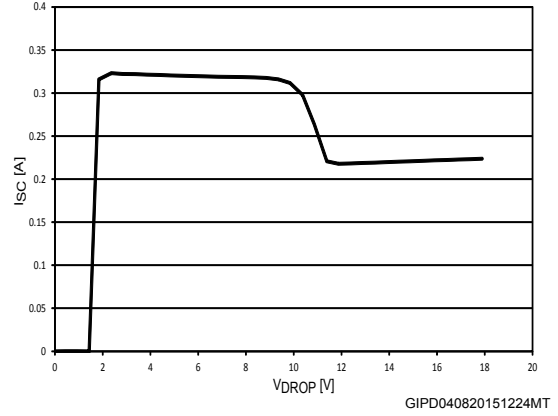
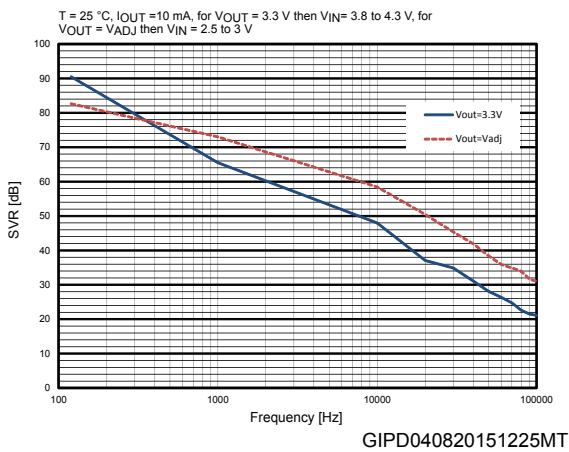
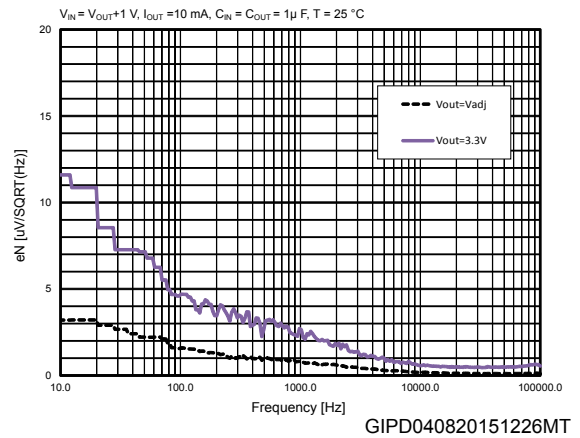
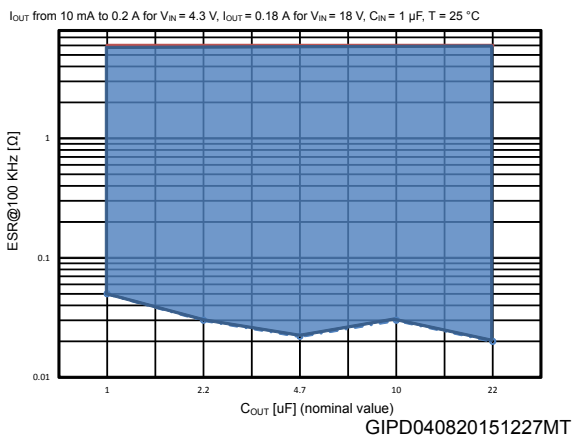
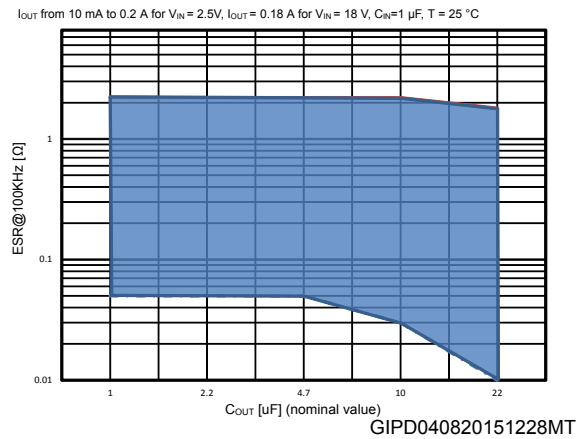
GIPD040820151220MT

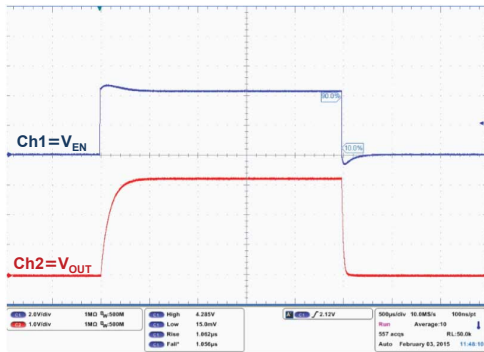
**Figure 19. Off-state current vs. temperature**


GIPD040820151221MT

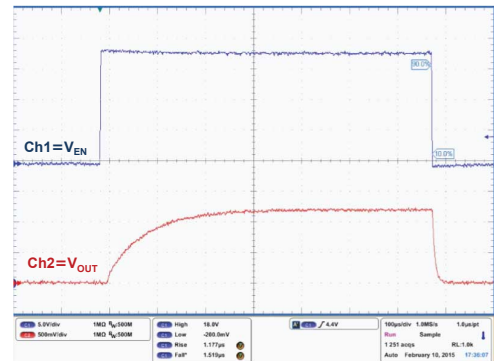
**Figure 20. Short-circuit current vs. temperature**  
 ( $V_{IN} = 4.3 \text{ V}$ )


GIPD040820151222MT

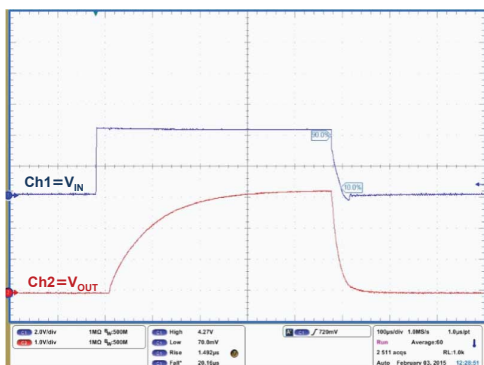
**Figure 21. Dropout voltage vs.  $I_{OUT}$** 

**Figure 22. Short-circuit current vs. drop voltage**

**Figure 23. SVR vs. frequency**

**Figure 24. Output noise spectral density**

**Figure 25. Stability plan ( $V_{OUT} = 3.3\text{ V}$ )**

**Figure 26. Stability plan ( $V_{OUT} = V_{ADJ}$ )**


**Figure 27. Startup with enable ( $V_{OUT} = 3.3\text{ V}$ )**
 $V_{IN} = 4.3\text{ V}$ ,  $V_{EN}$  = from 0 to  $V_{IN}$ ,  $I_{OUT} = 200\text{ mA}$ ,  $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$   $t_{rise} = t_{fall} = 1\text{ }\mu\text{s}$ 


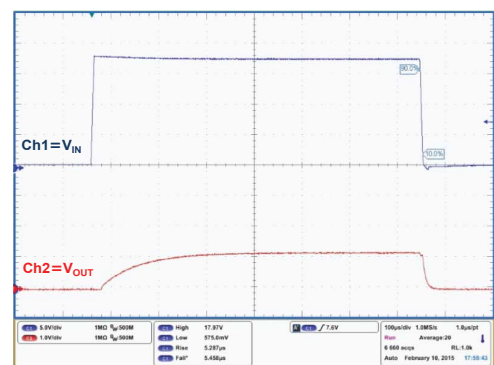
GIPD040820151229MT

**Figure 28. Startup with enable ( $V_{OUT} = V_{ADJ}$ )**
 $V_{IN} = 18\text{ V}$ ,  $V_{EN}$  = from 0 to  $V_{IN}$ ,  $I_{OUT} = 200\text{ mA}$ ,  $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$   $t_{rise} = t_{fall} = 1\text{ }\mu\text{s}$ 


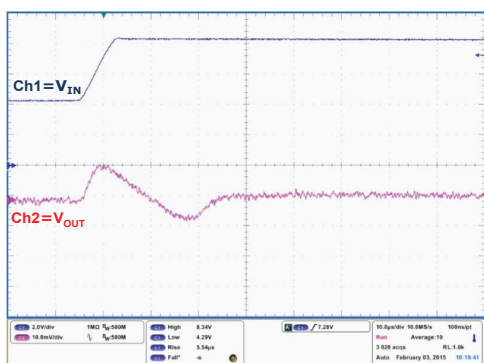
GIPD040820151230MT

**Figure 29. Turn-on time ( $V_{OUT} = 3.3\text{ V}$ )**
 $V_{IN} = V_{EN}$  = from 0 to  $4.3\text{ V}$ ,  $I_{OUT} = 200\text{ mA}$ ,  $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$ ,  $T_{rise} = 1\text{ }\mu\text{s}$ 


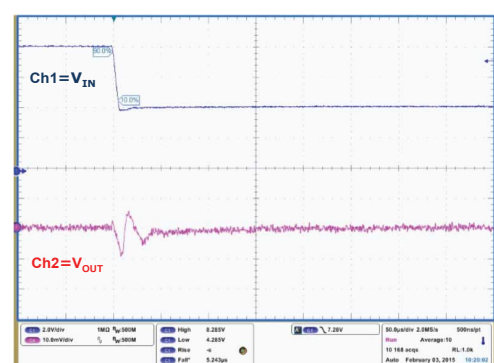
GIPD040820151231MT

**Figure 30. Turn-on time ( $V_{OUT} = V_{ADJ}$ )**
 $V_{IN} = V_{EN}$  = from 0 to  $18\text{ V}$ ,  $I_{OUT} = 200\text{ mA}$ ,  $V_{OUT} = V_{REF}$ ,  $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$   $T_{rise} = 5\text{ }\mu\text{s}$ 


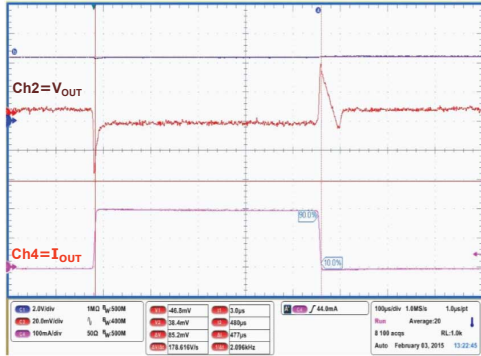
GIPD040820151232MT

**Figure 31. Line transient ( $V_{OUT} = 3.3\text{ V}$ , rise)**
 $V_{IN} = V_{EN}$  = from  $4.3\text{ to }8.3\text{ V}$ ,  $I_{OUT} = 10\text{ mA}$ ,  $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$   $T_{rise} = 5\text{ }\mu\text{s}$ 


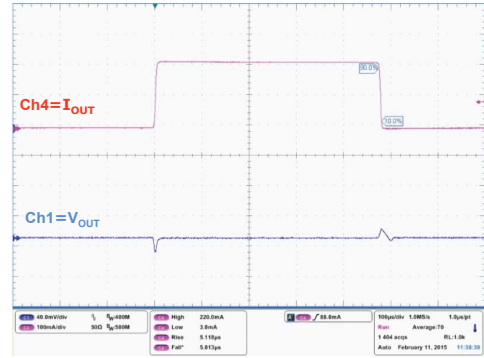
GIPD040820151233MT

**Figure 32. Line transient ( $V_{OUT} = 3.3\text{ V}$ , fall)**
 $V_{IN} = V_{EN}$  = from  $4.3\text{ to }8.3\text{ V}$ ,  $I_{OUT} = 10\text{ mA}$ ,  $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$   $T_{fall} = 5\text{ }\mu\text{s}$ 


GIPD040820151234MT

**Figure 33. Load transient ( $V_{OUT} = 3.3\text{ V}$ , rise)**
 $V_{IN} = V_{EN} = 4.3\text{ V}$ ,  $I_{OUT}$  = from 1 to 200 mA,  $C_{IN} = C_{OUT} = 1\ \mu\text{F}$   $T_{rise} = 5\ \mu\text{s}$ 


GIPD040820151236MT

**Figure 34. Load transient ( $V_{OUT} = V_{ADJ}$ , fall)**
 $V_{IN} = V_{EN} = 2.5\text{ V}$ ,  $I_{OUT}$  = from 1 to 200 mA,  $C_{IN} = C_{OUT} = 1\ \mu\text{F}$   $T_{rise} - T_{fall} = 5\ \mu\text{s}$ 


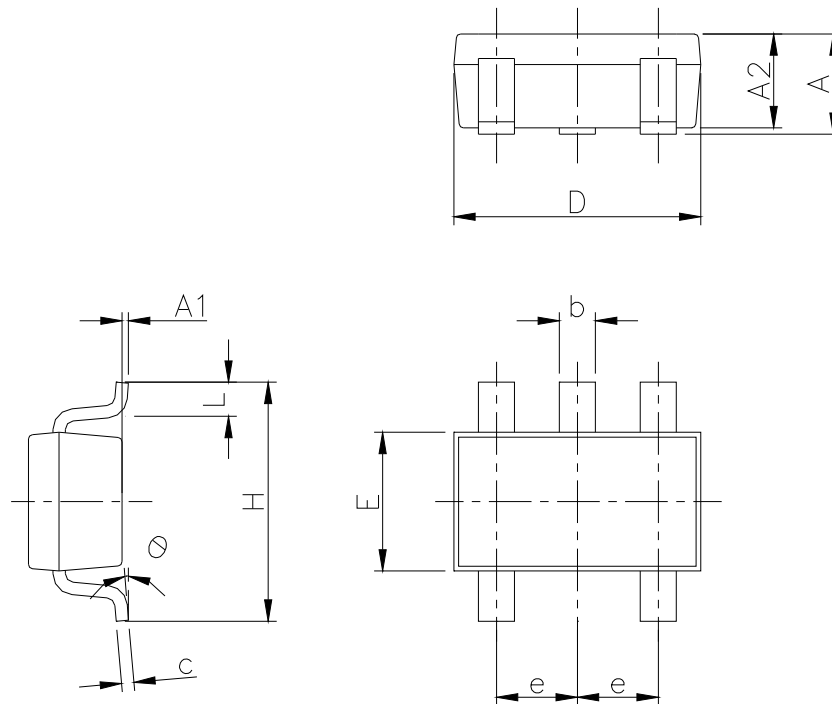
GIPD040820151237bMT

## **7** 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.

## 7.1 SOT23-5L package information

**Figure 35. SOT23-5L package outline**


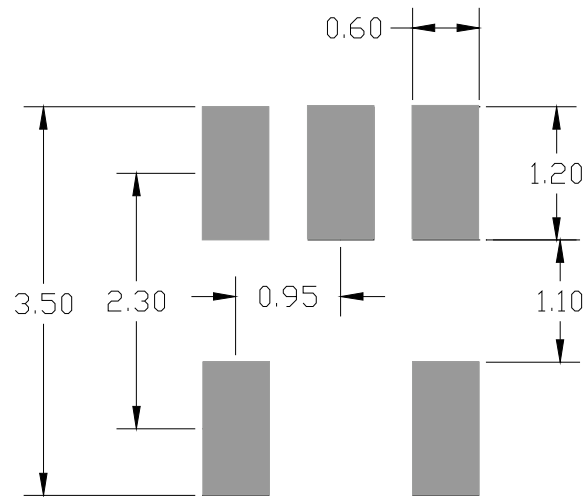
7049676\_k

**Table 8. SOT23-5L package mechanical data**

Dim.	mm		
	Min.	Typ.	Max.
A	0.90		1.45
A1	0		0.15
A2	0.90		1.30
b	0.30		0.50
c	0.09		0.20
D		2.95	
E		1.60	
e		0.95	
H		2.80	
L	0.30		0.60
θ	0°		8°

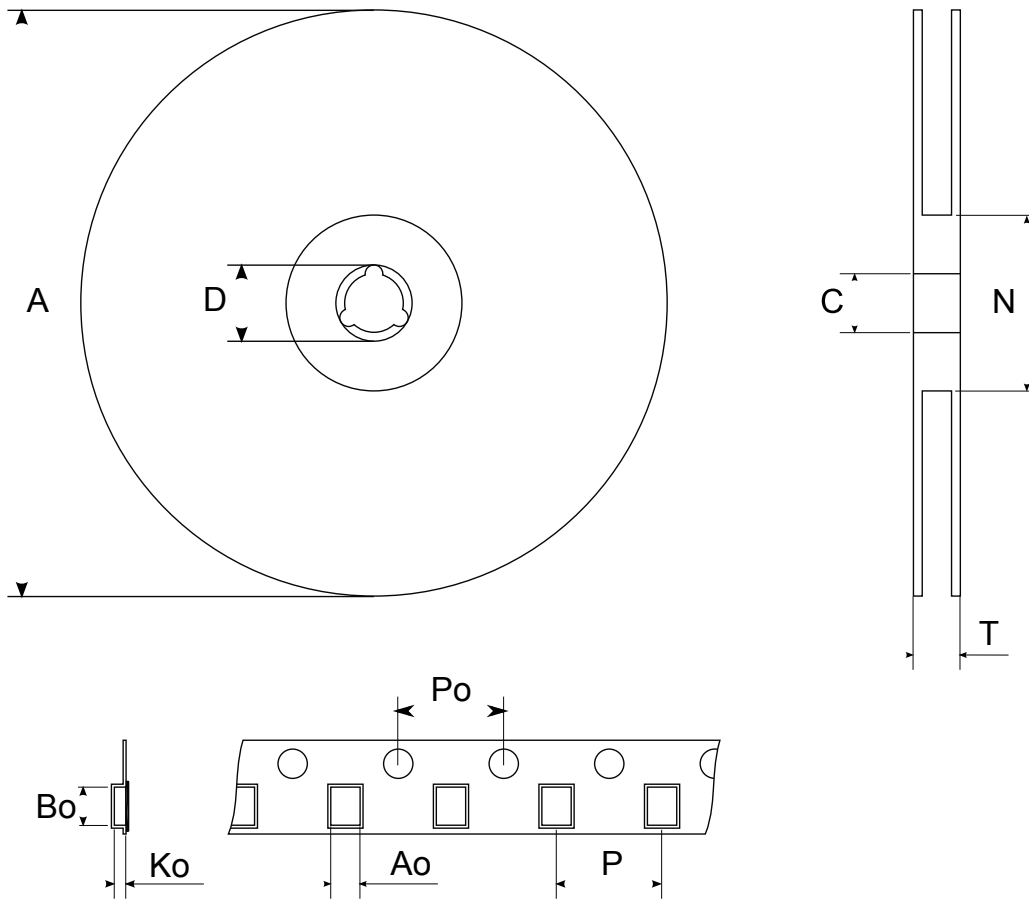


Figure 36. SOT23-5L recommended footprint

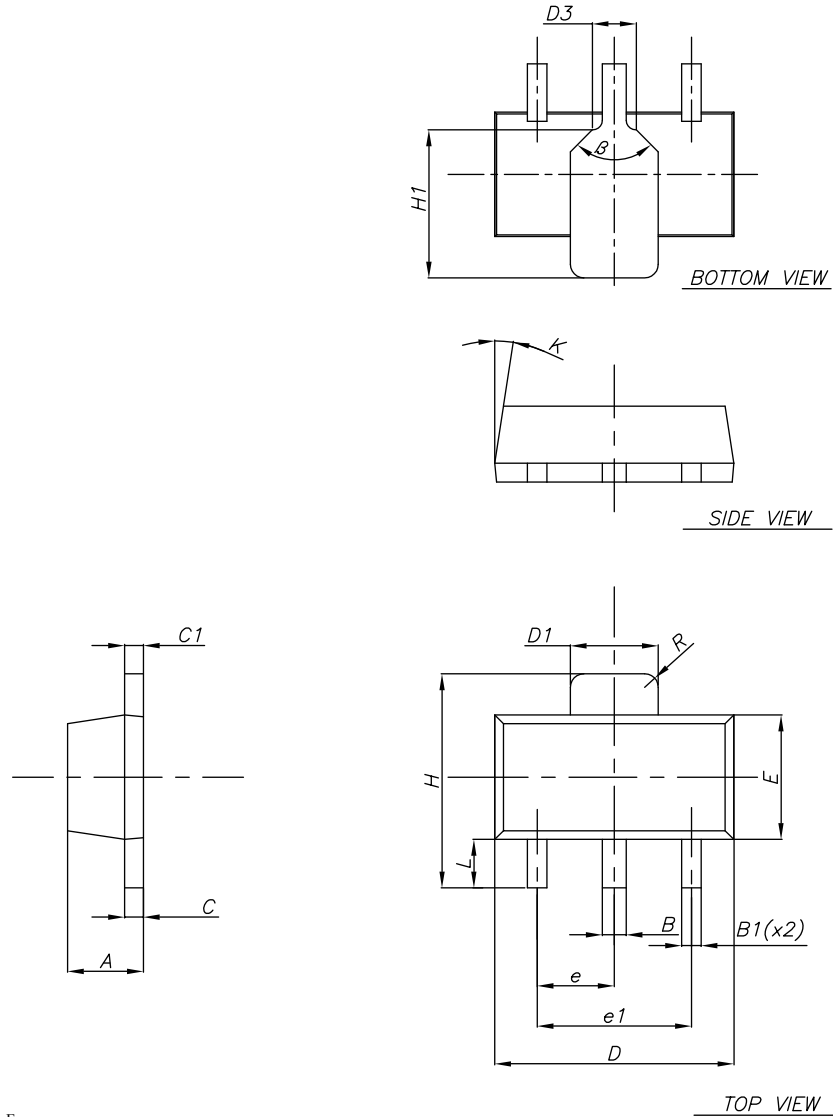


Note: Dimensions are in mm

## 7.2 SOT23-5L packing information

**Figure 37. SOT23-5L tape and reel outline**

**Table 9. SOT23-5L tape and reel mechanical data**

Dim.	mm		
	Min.	Typ.	Max.
A			180
C	12.8	13.0	13.2
D	20.2		
N	60		
T			14.4
Ao	3.13	3.23	3.33
Bo	3.07	3.17	3.27
Ko	1.27	1.37	1.47
Po	3.9	4.0	4.1
P	3.9	4.0	4.1

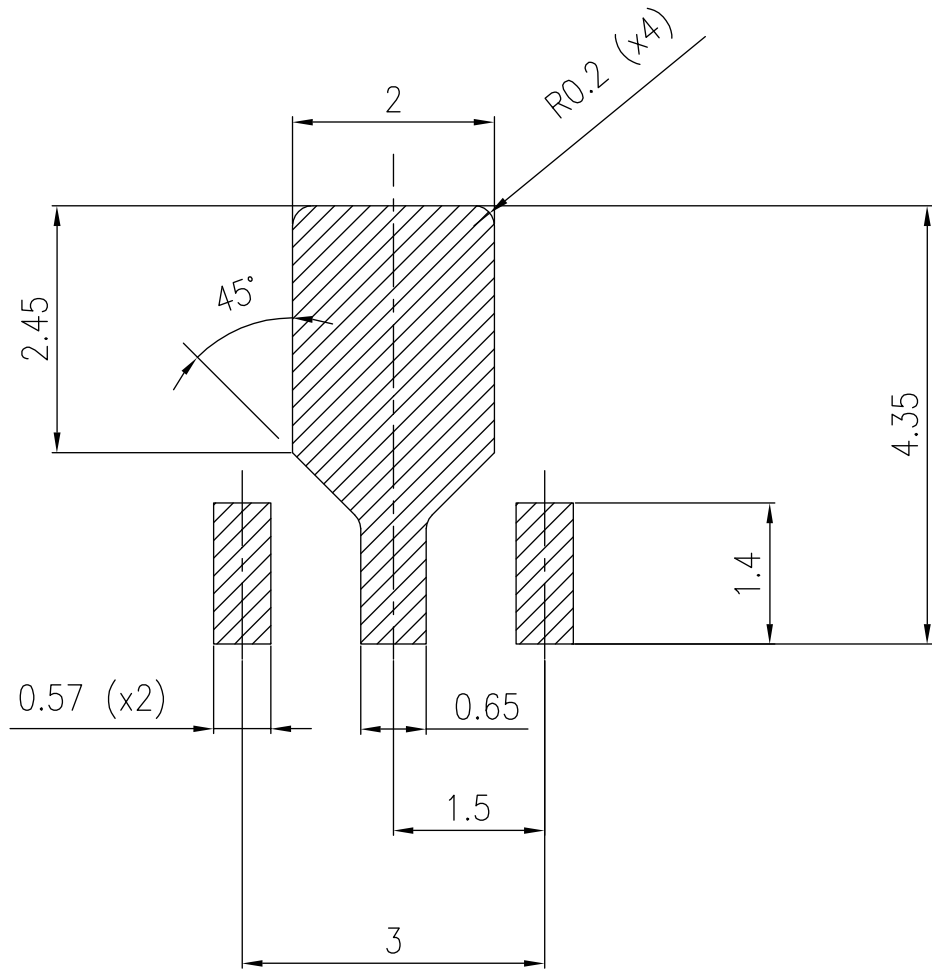
**7.3 SOT-89 package information**
**Figure 38. SOT-89 package outline**


7098166\_REV\_F

**Table 10. SOT-89 mechanical data**

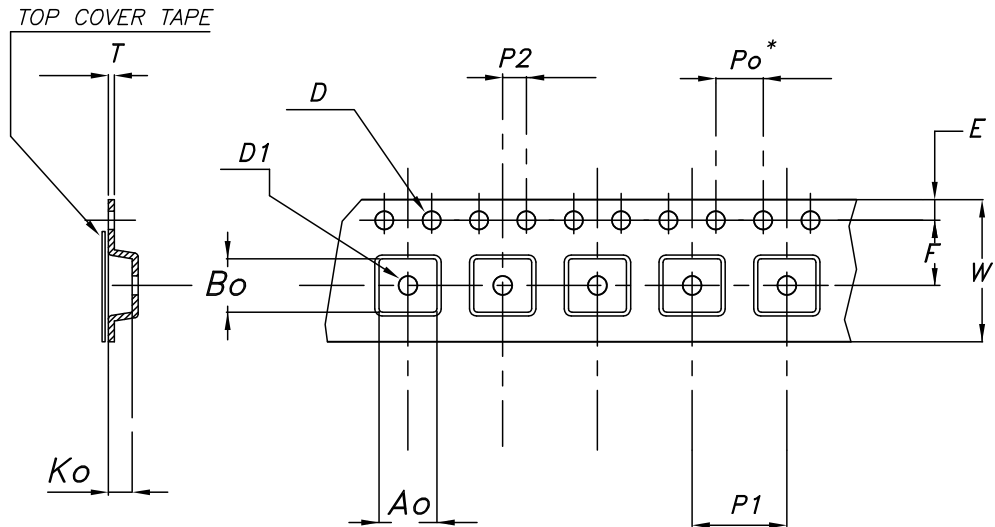
Dim.	mm		
	Min.	Typ.	Max.
A	1.40		1.60
B	0.44		0.56
B1	0.36		0.48
C	0.35		0.44
C1	0.35		0.44
D	4.40		4.60
D1	1.62		1.83
D3		0.90	
E	2.29		2.60
e	1.42		1.57
e1	2.92		3.07
H	3.94		4.25
H1	2.70		3.10
K	1°		8°
L	0.89		120
R		0.25	
$\beta$		90°	

Figure 39. SOT-89 recommended footprint



Footprint

## 7.4 SOT-89 packing information

**Figure 40. SOT-89 carrier tape outline**


7111762\_5

**Table 11. SOT-89 carrier tape mechanical data**

Dim.	mm	
	Value	Tolerance
Ao	4.91	± 0.10
Bo	4.52	± 0.10
Ko	1.90	± 0.10
F	5.50	± 0.10
E	1.75	± 0.10
W	12	± 0.30
P2	2	± 0.10
Po	4	± 0.10
P1	8	± 0.10
T	0.30	± 0.10
D	∅ 1.55	± 0.05
D1	∅ 1.60	± 0.10

## 8 Ordering information

**Table 12. Order code**

SOT23-5L	SOT-89 (D configuration)	SOT-89	Accuracy (%)	Output voltage
LDK320AM-R			0.5	ADJ
LDK320M-R			2	
LDK320AM12R <sup>(1)</sup>			0.5	1.2
LDK320M12R <sup>(1)</sup>			2	
LDK320AM15R <sup>(1)</sup>			0.5	1.5
LDK320M15R <sup>(1)</sup>			2	
LDK320AM18R <sup>(1)</sup>			0.5	1.8
LDK320M18R <sup>(1)</sup>			2	
LDK320AM25R <sup>(1)</sup>			0.5	2.5
LDK320M25R <sup>(1)</sup>			2	
LDK320AM30R	LDK320ADU30R <sup>(1)</sup>		0.5	3
LDK320M30R			2	
LDK320AM33R	LDK320ADU33R		0.5	3.3
LDK320M33R			2	
LDK320AM36R <sup>(1)</sup>			0.5	3.6
LDK320M36R <sup>(1)</sup>			2	
LDK320AM50R	LDK320ADU50R	LDK320AU50R	0.5	5
LDK320M50R			2	
LDK320AM120R <sup>(1)</sup>	LDK320ADU120R <sup>(1)</sup>		0.5	12
LDK320M120R <sup>(1)</sup>			2	

1. Available on request.

## Revision history

**Table 13. Document revision history**

Date	Revision	Changes
16-Nov-2015	1	First release.
01-Jun-2016	2	Document status promoted from preliminary data to production data. Updated title and features in cover page. Updated Section 8: "Ordering information". Minor text changes.
05-Jul-2017	3	Updated Section 8: "Ordering information". Minor text changes.
09-Oct-2018	4	Updated $\Delta V_{OUT}$ test condition in <a href="#">Table 6. LDK320 electrical characteristics (fixed output version)</a> . Added new order code LDK320AU50R in <a href="#">Table 12. Order code</a> .



## Contents

<b>1</b>	<b>Diagram</b> .....	<b>2</b>
<b>2</b>	<b>Pin configuration</b> .....	<b>3</b>
<b>3</b>	<b>Typical application</b> .....	<b>4</b>
<b>4</b>	<b>Maximum ratings</b> .....	<b>5</b>
<b>5</b>	<b>Electrical characteristics</b> .....	<b>6</b>
<b>6</b>	<b>Typical characteristics</b> .....	<b>9</b>
<b>7</b>	<b>Package information</b> .....	<b>15</b>
7.1	SOT23-5L package information.....	16
7.2	SOT23-5L packing information .....	17
7.3	SOT-89 package information .....	18
7.4	SOT-89 packing information .....	21
<b>8</b>	<b>Ordering information</b> .....	<b>23</b>
	<b>Revision history</b> .....	<b>24</b>
	<b>Contents</b> .....	<b>25</b>
	<b>List of tables</b> .....	<b>26</b>
	<b>List of figures</b> .....	<b>27</b>

## List of tables

<b>Table 1.</b>	Pin description (SOT23-5L) . . . . .	3
<b>Table 2.</b>	Pin description (SOT-89) . . . . .	3
<b>Table 3.</b>	Pin description (SOT-89, D configuration) . . . . .	3
<b>Table 4.</b>	Absolute maximum ratings . . . . .	5
<b>Table 5.</b>	Thermal data . . . . .	5
<b>Table 6.</b>	LDK320 electrical characteristics (fixed output version) . . . . .	6
<b>Table 7.</b>	LDK320 electrical characteristics (ADJ version) . . . . .	7
<b>Table 8.</b>	SOT23-5L package mechanical data . . . . .	16
<b>Table 9.</b>	SOT23-5L tape and reel mechanical data . . . . .	18
<b>Table 10.</b>	SOT-89 mechanical data . . . . .	20
<b>Table 11.</b>	SOT-89 carrier tape mechanical data . . . . .	22
<b>Table 12.</b>	Order code . . . . .	23
<b>Table 13.</b>	Document revision history . . . . .	24

## List of figures

<b>Figure 1.</b>	Block diagram (fixed version) . . . . .	2
<b>Figure 2.</b>	Block diagram (adjustable version) . . . . .	2
<b>Figure 3.</b>	Pin connection (top view) . . . . .	3
<b>Figure 4.</b>	Typical application circuits . . . . .	4
<b>Figure 5.</b>	Output voltage vs. temperature ( $V_{IN} = 2.5\text{ V}$ , $V_{OUT} = V_{ADJ}$ , $I_{OUT} = 1\text{ mA}$ ) . . . . .	9
<b>Figure 6.</b>	Output voltage vs. temperature ( $V_{IN} = 2.5\text{ V}$ , $V_{OUT} = V_{ADJ}$ , $I_{OUT} = 200\text{ mA}$ ) . . . . .	9
<b>Figure 7.</b>	Output voltage vs. temperature ( $V_{IN} = 4.3\text{ V}$ , $V_{OUT} = 3.3\text{ V}$ , $I_{OUT} = 1\text{ mA}$ ) . . . . .	9
<b>Figure 8.</b>	Output voltage vs. temperature ( $V_{IN} = 4.3\text{ V}$ , $V_{OUT} = 3.3\text{ V}$ , $I_{OUT} = 200\text{ mA}$ ) . . . . .	9
<b>Figure 9.</b>	Line regulation vs. temperature ( $V_{IN} = 4.3\text{ to }18\text{ V}$ , $V_{OUT} = 3.3\text{ V}$ , $I_{OUT} = 1\text{ mA}$ ) . . . . .	10
<b>Figure 10.</b>	Line regulation vs. temperature ( $V_{IN} = 2.5\text{ to }18\text{ V}$ , $V_{OUT} = V_{ADJ}$ , $I_{OUT} = 1\text{ mA}$ ) . . . . .	10
<b>Figure 11.</b>	Load regulation vs. temperature ( $V_{IN} = 4.3\text{ V}$ , $V_{OUT} = 3.3\text{ V}$ , $I_{OUT} = 1\text{ to }200\text{ mA}$ ) . . . . .	10
<b>Figure 12.</b>	Load regulation vs. temperature ( $V_{IN} = 2.5\text{ V}$ , $V_{OUT} = V_{ADJ}$ , $I_{OUT} = 1\text{ to }200\text{ mA}$ ) . . . . .	10
<b>Figure 13.</b>	Enable thresholds vs. temperature ( $I_{OUT} = 1\text{ mA}$ ) . . . . .	10
<b>Figure 14.</b>	Dropout voltage vs. temperature . . . . .	10
<b>Figure 15.</b>	Quiescent current vs. input voltage ( $I_{OUT} = 1\text{ mA}$ ) . . . . .	11
<b>Figure 16.</b>	Quiescent current vs. temperature ( $I_{OUT} = 1\text{ mA}$ ) . . . . .	11
<b>Figure 17.</b>	Quiescent current vs. output current ( $V_{IN} = 4.3\text{ V}$ ) . . . . .	11
<b>Figure 18.</b>	Quiescent current vs. temperature ( $I_{OUT} = 200\text{ mA}$ ) . . . . .	11
<b>Figure 19.</b>	Off-state current vs. temperature . . . . .	11
<b>Figure 20.</b>	Short-circuit current vs. temperature ( $V_{IN} = 4.3\text{ V}$ ) . . . . .	11
<b>Figure 21.</b>	Dropout voltage vs. $I_{OUT}$ . . . . .	12
<b>Figure 22.</b>	Short-circuit current vs. drop voltage . . . . .	12
<b>Figure 23.</b>	SVR vs. frequency . . . . .	12
<b>Figure 24.</b>	Output noise spectral density . . . . .	12
<b>Figure 25.</b>	Stability plan ( $V_{OUT} = 3.3\text{ V}$ ) . . . . .	12
<b>Figure 26.</b>	Stability plan ( $V_{OUT} = V_{ADJ}$ ) . . . . .	12
<b>Figure 27.</b>	Startup with enable ( $V_{OUT} = 3.3\text{ V}$ ) . . . . .	13
<b>Figure 28.</b>	Startup with enable ( $V_{OUT} = V_{ADJ}$ ) . . . . .	13
<b>Figure 29.</b>	Turn-on time ( $V_{OUT} = 3.3\text{ V}$ ) . . . . .	13
<b>Figure 30.</b>	Turn-on time ( $V_{OUT} = V_{ADJ}$ ) . . . . .	13
<b>Figure 31.</b>	Line transient ( $V_{OUT} = 3.3\text{ V}$ , rise) . . . . .	13
<b>Figure 32.</b>	Line transient ( $V_{OUT} = 3.3\text{ V}$ , fall) . . . . .	13
<b>Figure 33.</b>	Load transient ( $V_{OUT} = 3.3\text{ V}$ , rise) . . . . .	14
<b>Figure 34.</b>	Load transient ( $V_{OUT} = V_{ADJ}$ , fall) . . . . .	14
<b>Figure 35.</b>	SOT23-5L package outline . . . . .	16
<b>Figure 36.</b>	SOT23-5L recommended footprint . . . . .	17
<b>Figure 37.</b>	SOT23-5L tape and reel outline . . . . .	18
<b>Figure 38.</b>	SOT-89 package outline . . . . .	19
<b>Figure 39.</b>	SOT-89 recommended footprint . . . . .	21
<b>Figure 40.</b>	SOT-89 carrier tape outline . . . . .	22

**IMPORTANT NOTICE – PLEASE 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. 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 acknowledgement.

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 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.

ST and the ST logo are trademarks of ST. 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.

© 2018 STMicroelectronics – All rights reserved

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## STMicroelectronics:

[LDK320M-R](#) [LDK320AM30R](#) [LDK320M30R](#) [LDK320AM-R](#) [LDK320M33R](#) [LDK320AM33R](#) [LDK320AM50R](#)  
[LDK320M50R](#) [LDK320M18R](#) [LDK320ADU33R](#) [LDK320ADU50R](#) [LDK320AM15R](#) [LDK320AM25R](#) [LDK320ADU120R](#)  
[LDK320M25R](#) [LDK320AM120R](#) [LDK320AU50R](#) [LDK320ADU30R](#)