

200 mA high accuracy and high PSRR voltage regulator



Maturity status link

[LDK320](#)

Features

- Input voltage from 2.5 to 18 V
- Very low-dropout voltage (100 mV typ. @ 100 mA load)
- Low quiescent current (typ. 60 μ A, 1 μ A in off mode)
- High PSRR: 88 dB @ 120 Hz
- Low noise
- Output voltage tolerance: $\pm 0.5\%$ @ 25 °C (LDK320A) or $\pm 2\%$ 25 °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 °C to 125 °C

Applications

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

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.

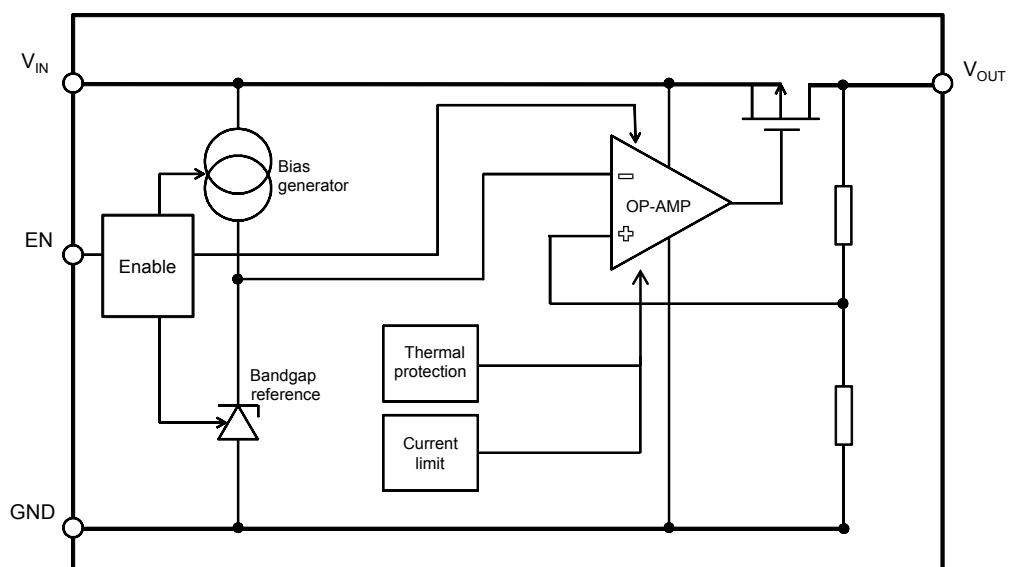
The very good dynamic characteristic, combined with low drop voltage and low quiescent current make it suitable for low power battery-powered applications.

The enable logic control function allows the **LDK320** to be in shutdown mode by consuming a total current lower than 1 μ A.

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

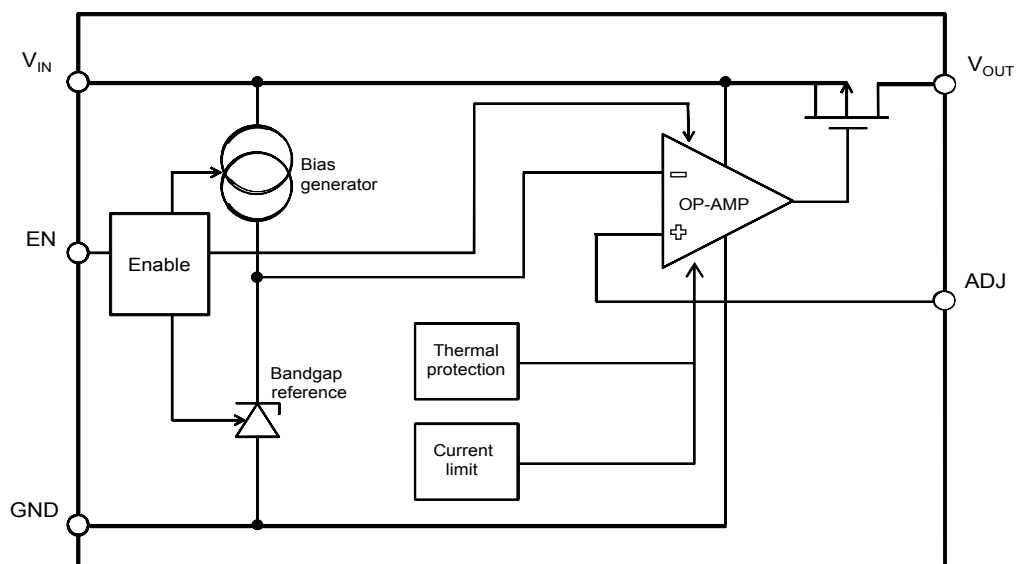
1 Diagram

Figure 1. Block diagram (fixed version)



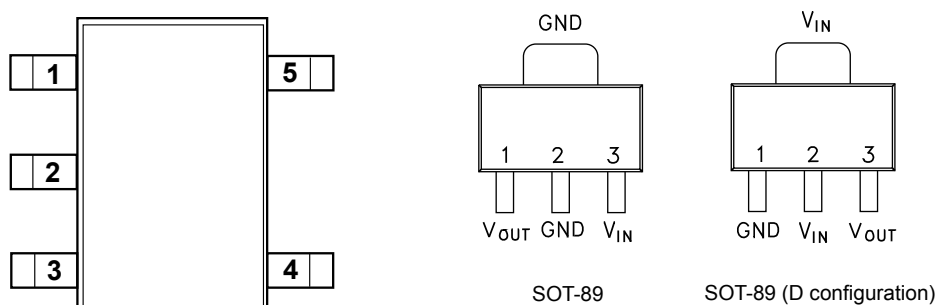
GIPD030820151330MT

Figure 2. Block diagram (adjustable version)



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)

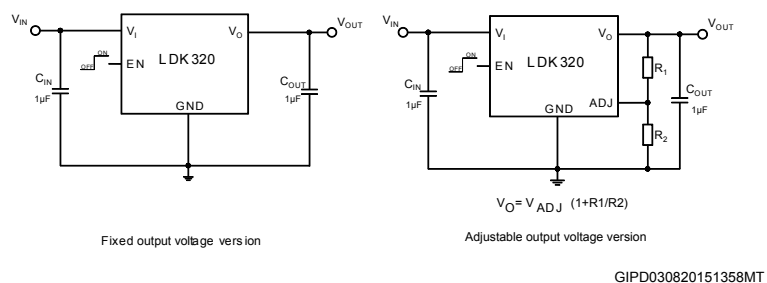
Pin n°	Symbol	Function
1	OUT	Output voltage of the LDO
2	GND	Common ground
3	IN	Input voltage of the LDO
TAB	GND	Common ground

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

$T_J = 25\text{ }^{\circ}\text{C}$, $V_{IN} = V_{OUT(NOM)} + 1\text{ V}$, $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$, $I_{OUT} = 1\text{ mA}$, $V_{EN} = V_{IN}$, 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	$T_J = 25\text{ }^{\circ}\text{C}$	-2		2	%
		$-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$	-3		3	%
	V_{OUT} 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	%
ΔV_{OUT}	Static line regulation	$V_{OUT} + 1\text{ V} \leq V_{IN} \leq 18\text{ V}$		0.001	0.05	%/V
ΔV_{OUT}	Static load regulation (SOT23-5L)	$I_{OUT} = 1\text{ mA to } 200\text{ mA}$, $V_{OUT} \leq 2\text{ V}$		10	15	mV
		$I_{OUT} = 1\text{ mA to } 200\text{ mA}$, $V_{OUT} > 2\text{ V}$		0.001	0.003	%/mA
ΔV_{OUT}	Static load regulation (SOT-89)	$I_{OUT} = 1\text{ mA to } 200\text{ mA}$, $V_{OUT} \leq 2\text{ V}$		10	25	mV
		$I_{OUT} = 1\text{ mA to } 200\text{ mA}$, $V_{OUT} > 2\text{ V}$		0.001	0.004	%/mA
V_{DROP}	Dropout voltage ⁽¹⁾	$I_{OUT} = 100\text{ mA}$, $V_{OUT} = 3.3\text{ V}$		100		
		$I_{OUT} = 200\text{ mA}$, $V_{OUT} = 3.3\text{ V}$ $-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$		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	$V_{OUT} + 1\text{ V}$, $V_{IN} = 18\text{ V}$, $I_{OUT} = 0\text{ mA}$, $-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$		60	90	μA
		$V_{IN} = V_{OUT} + 1\text{ V}$, $I_{OUT} = 200\text{ mA}$, $-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$		70	100	
		V_{IN} input current in OFF mode: $V_{EN} = G_{ND}$, $T_J = 25\text{ }^{\circ}\text{C}$		0.2	1	
I_{SC}	Short-circuit current	$R_L = 0$		330		mA
		$R_L = 0$, $V_{IN} = 16\text{ V}$		200		

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	μF

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)

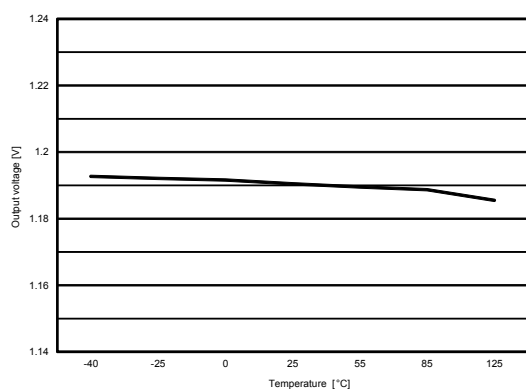
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_{IN}	Operating input voltage		2.5		18	V
V_{ADJ}	Adjustable voltage	$T_J = 25\text{ }^{\circ}\text{C}$		1.185		V
	Adjustable voltage accuracy	$T_J = 25\text{ }^{\circ}\text{C}$	-2		+2	%
		$-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$	-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	
ΔV_{OUT}	Static line regulation	$V_{OUT} + 1\text{ V} \leq V_{IN} \leq 18\text{ V}$		0.001	0.05	%/V
ΔV_{OUT}	Static load regulation	$I_{OUT} = 1\text{ mA to } 200\text{ mA}$		0.0002	0.003	%/mA
V_{DROP}	Dropout voltage ⁽¹⁾	$I_{OUT} = 100\text{ mA}, V_{OUT} = 3.3\text{ V}$		100		mV
		$I_{OUT} = 200\text{ mA}, V_{OUT} = 3.3\text{ V}$ $-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$		200	350	
e_N	Output noise voltage	10 Hz to 100 kHz $I_{OUT} = 10\text{ mA}$		60		μVRMS
I_{ADJ}	Adjust pin current				1	μA
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		
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	μA
		$V_{IN} = V_{OUT} + 1\text{ V},$ $I_{OUT} = 200\text{ mA},$ $-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$		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		

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C _{OUT}	Output capacitor	Capacitance (see Section 6: Typical characteristics)	1		22	μF

6 Typical characteristics

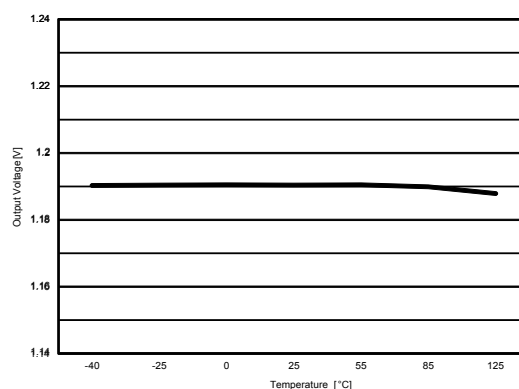
Unless otherwise specified: $T_J = 25\text{ }^{\circ}\text{C}$, $V_{IN} = V_{OUT(NOM)} + 1\text{ V}$, $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$.

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



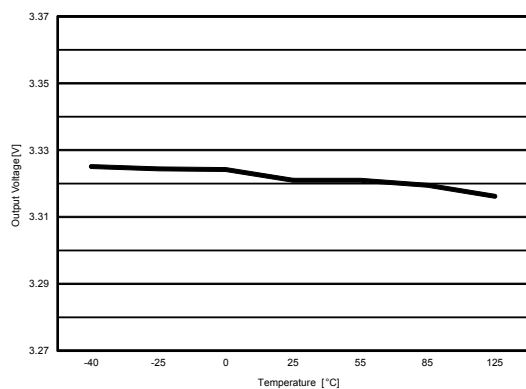
GIPD040820151207MT

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



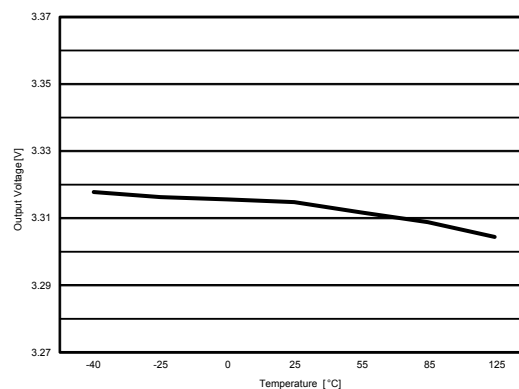
GIPD040820151208MT

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



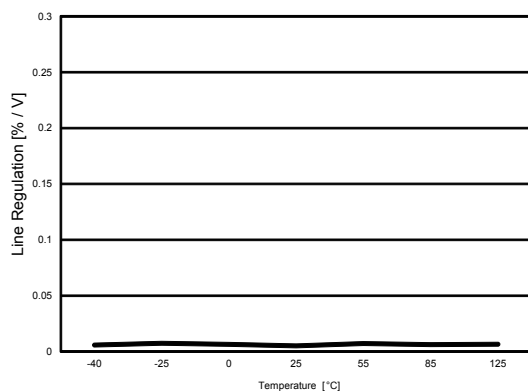
GIPD040820151209MT

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



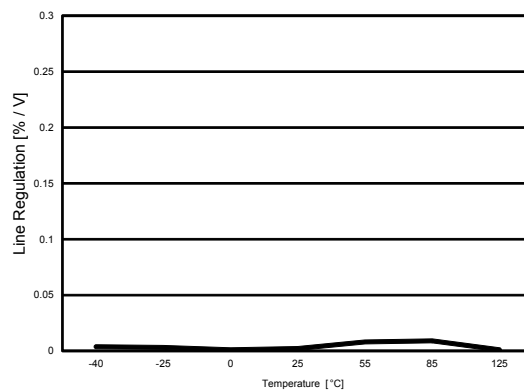
GIPD040820151210MT

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



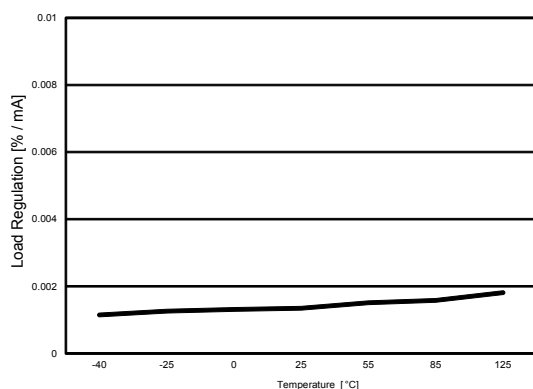
GIPD040820151211MT

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



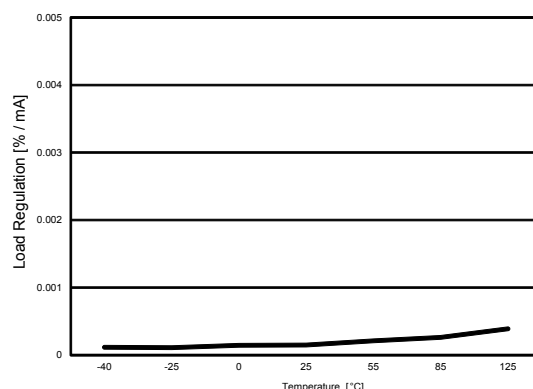
GIPD040820151212MT

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



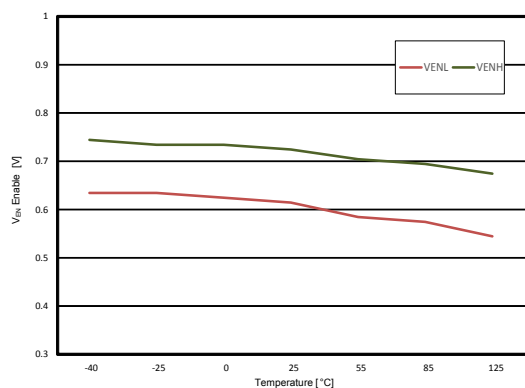
GIPD040820151213MT

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



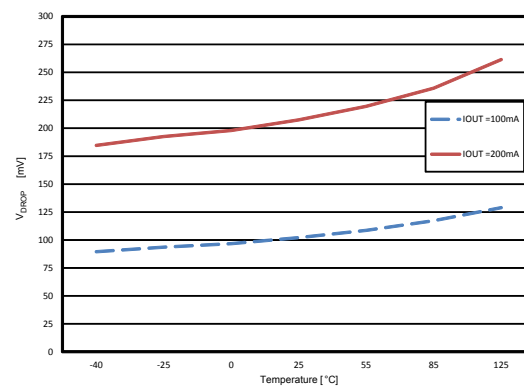
GIPD040820151214MT

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



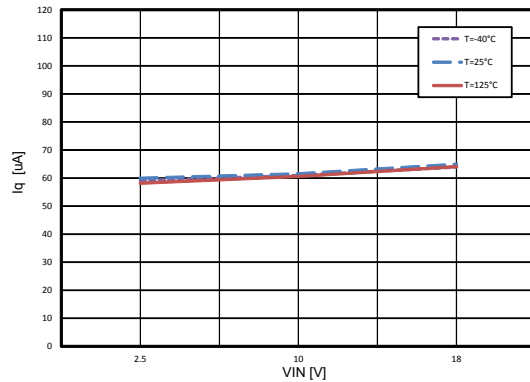
GIPD040820151215MT

Figure 14. Dropout voltage vs. temperature



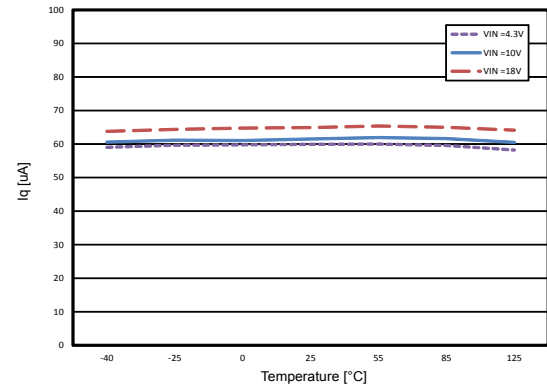
GIPD040820151216MT

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



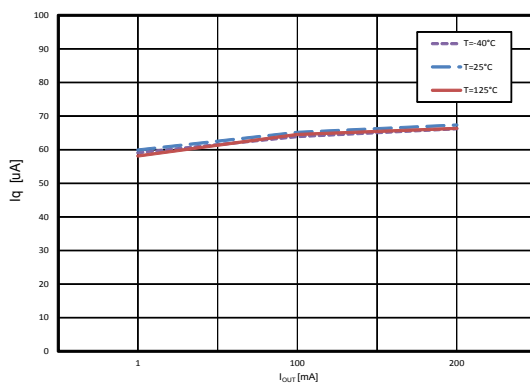
GIPD040820151217MT

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



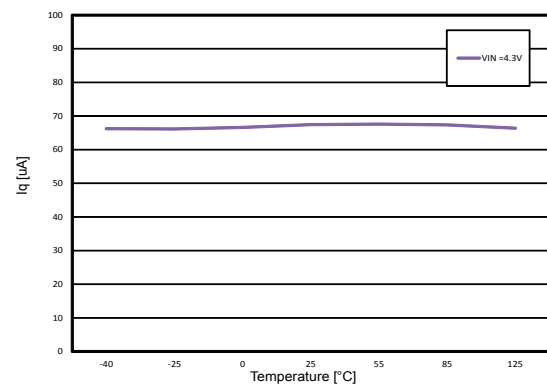
GIPD040820151218MT

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



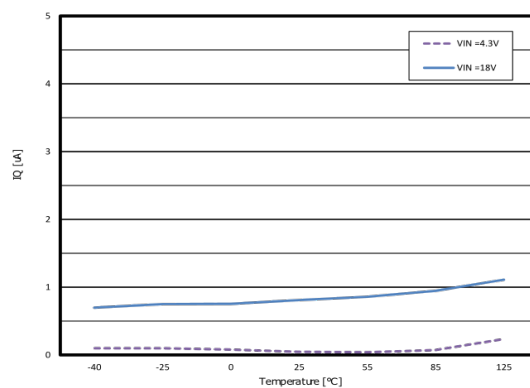
GIPD040820151219MT

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



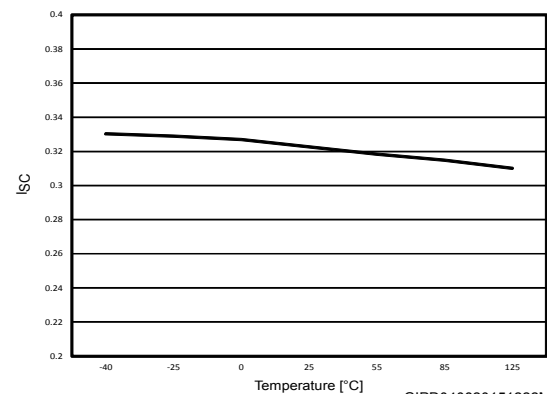
GIPD040820151220MT

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}

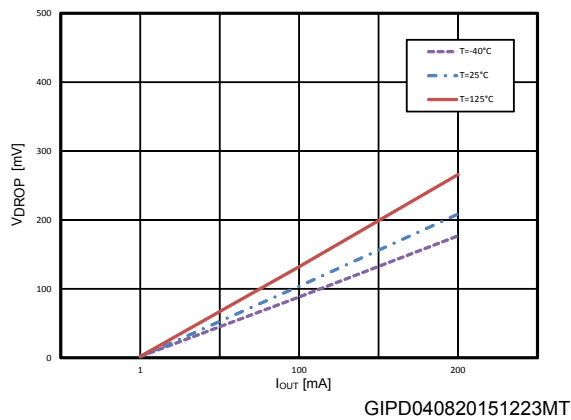


Figure 22. Short-circuit current vs. drop voltage

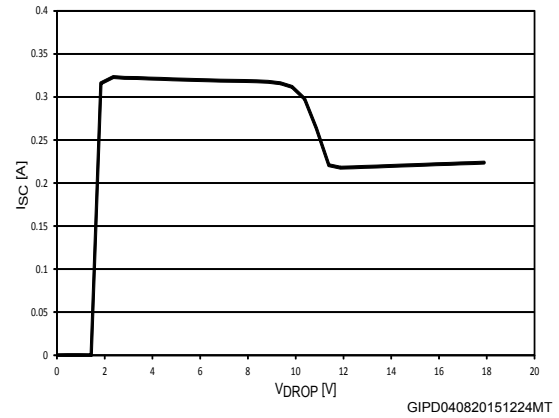


Figure 23. SVR vs. frequency

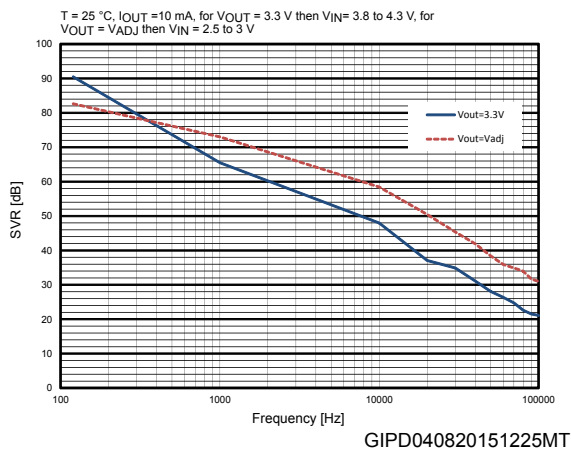


Figure 24. Output noise spectral density

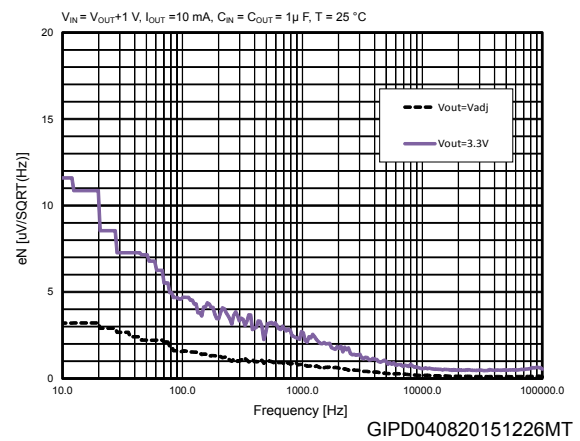


Figure 25. Stability plan ($V_{OUT} = 3.3\text{ V}$)

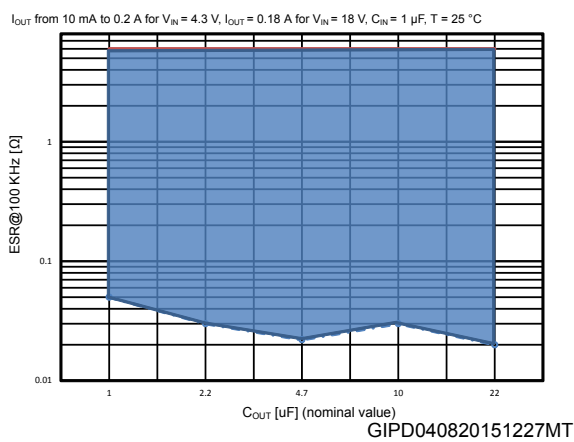


Figure 26. Stability plan ($V_{OUT} = V_{ADJ}$)

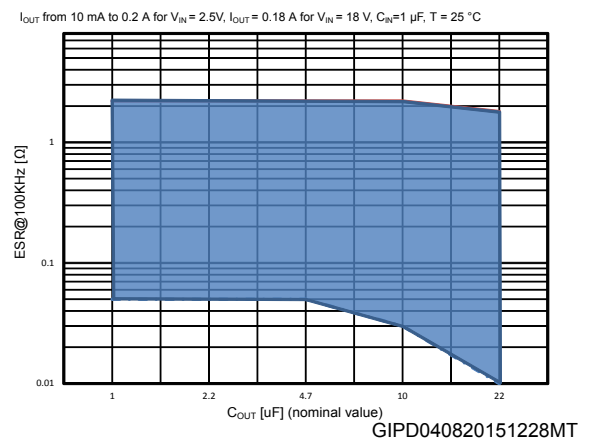
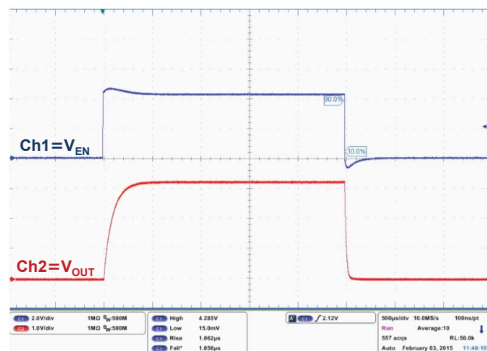


Figure 27. Startup with enable ($V_{OUT} = 3.3\text{ V}$)

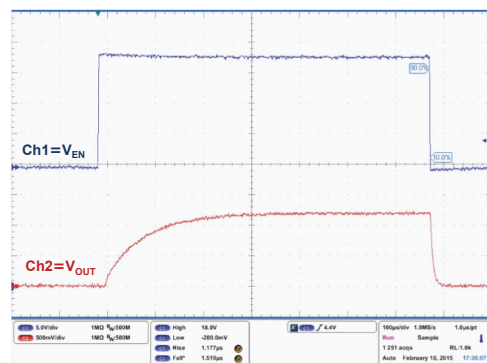
VIN = 4.3 V, VEN = from 0 to Vin, IOUT = 200 mA, CIN = COUT = 1 μ F trise = tfall = 1 μ s



GIPD040820151229MT

Figure 28. Startup with enable ($V_{OUT} = V_{ADJ}$)

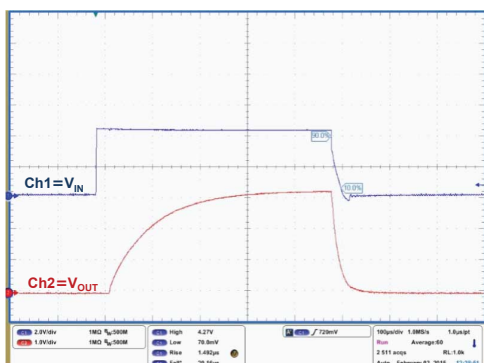
$V_{IN} = 18\text{ V}$, $V_{EN} = \text{from } 0 \text{ to } V_{IN}$, $I_{OUT} = 200\text{ mA}$, $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$ $t_{rise} = t_{fall} = 1\text{ }\mu\text{s}$



GIPD040820151230MT

Figure 29. Turn-on time ($V_{OUT} = 3.3\text{ V}$)

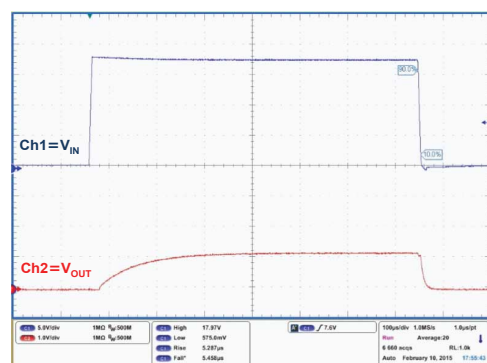
V_{IN} = V_{EN} = from 0 to 4.3 V, I_{OUT} = 200 mA, C_{IN} = C_{OUT} = 1 μF, T_{rise} = 1 μs



GIPD040820151231MT

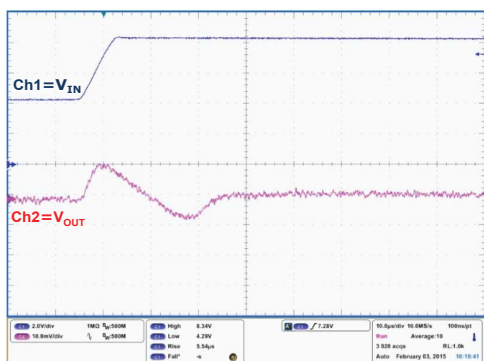
Figure 30. Turn-on time ($V_{OUT} = V_{ADJ}$)

$V_{IN} = V_{EN} =$ from 0 to 18 V, $I_{OUT} = 200$ mA $V_{OUT} = V_{REF}$, $C_{IN} = C_{OUT} = 1$ μ F $T_{rise} = 5$ μ s



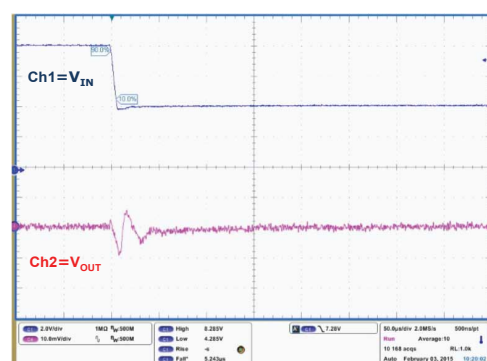
GIPD040820151232MT

Figure 31. Line transient ($V_{OUT} = 3.3\text{ V}$, rise)

$$V_{IN} = V_{FN} = \text{from 4.3 to 8.3 V, } I_{OUT} = 10 \text{ mA, } C_{IN} = C_{OUT} = 1 \mu\text{F } T_{rise} = 5 \mu\text{s}$$


GIPD040820151233MT

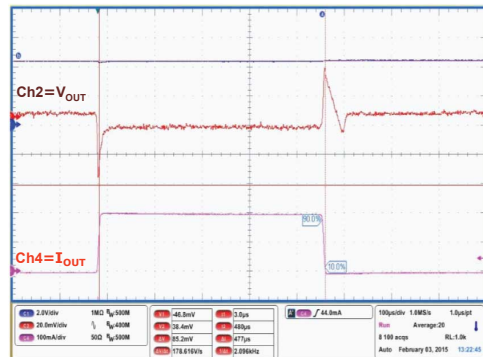
Figure 32. Line transient ($V_{OUT} = 3.3\text{ V}$, fall)

$$V_{IN} = V_{EN} = \text{from 4.3 to 8.3 V, } I_{OUT} = 10 \text{ mA, } C_{IN} = C_{OUT} = 1 \mu\text{F } T_{fall} = 5 \mu\text{s}$$


GIPD040820151234MT

Figure 33. Load transient ($V_{OUT} = 3.3\text{ V}$, rise)

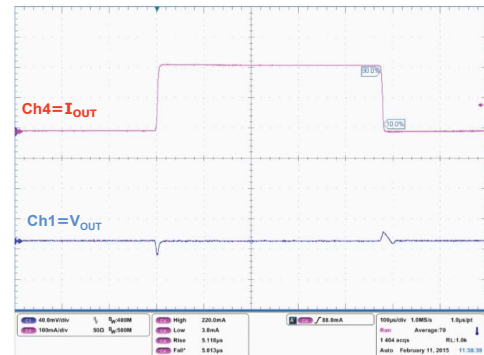
$V_{IN} = V_{EN} = 4.3\text{ V}$, I_{OUT} = from 1 to 200 mA, $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$ $T_{rise} = 5\text{ }\mu\text{s}$



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, $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$ $T_{rise} - T_{fall} = 5\text{ }\mu\text{s}$



GIPD040820151237bMT

7 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.

7.1 SOT23-5L package information

Figure 35. SOT23-5L package outline (option A)

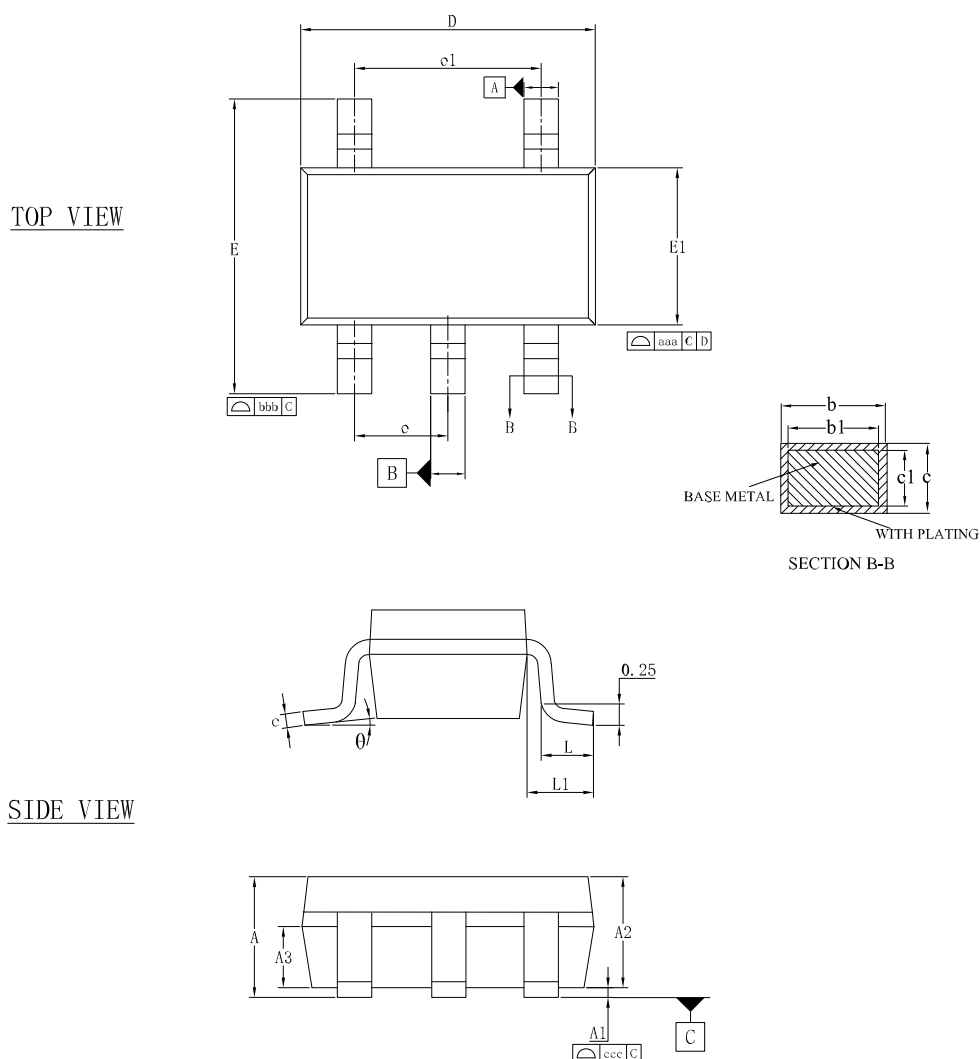
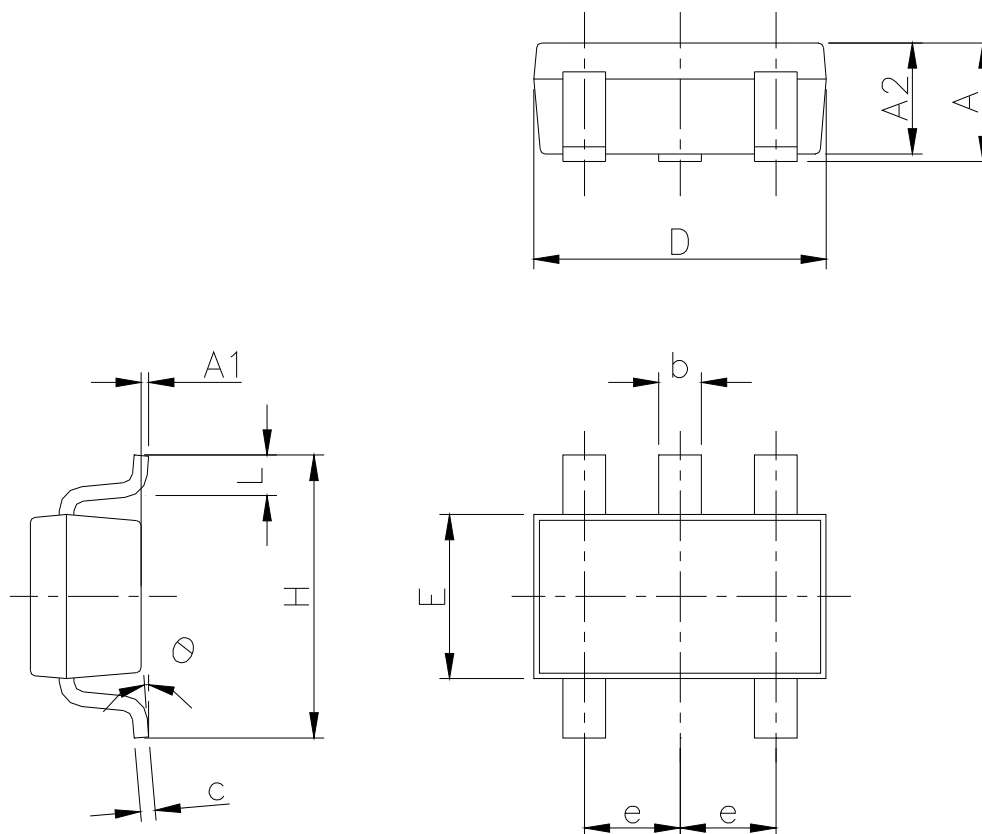


Table 8. SOT23-5L mechanical data (option A)

Dimensions (mm)			
Symbol	Min.	Nom.	Max.
A	-	-	1.25
A1	0.04	-	0.10
A2	1.00	1.10	1.20
b	0.33	-	0.41
b1	0.32	0.35	0.38
c	0.15	-	0.19
c1	0.14	0.15	0.16
D	2.82	2.92	3.02
E	2.60	2.80	3.00
E1	1.50	1.60	1.70
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	-	0.60
Θ	0°		8°

7.2 SOT23-5L package information

Figure 36. SOT23-5L package outline

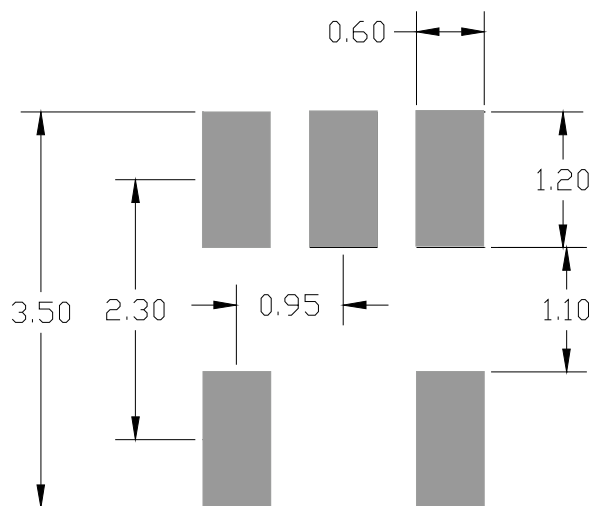


7049676_k

Table 9. 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 37. SOT23-5L recommended footprint



Note: *Dimensions are in mm*

7.3 SOT23-5L packing information

Figure 38. SOT23-5L tape and reel outline

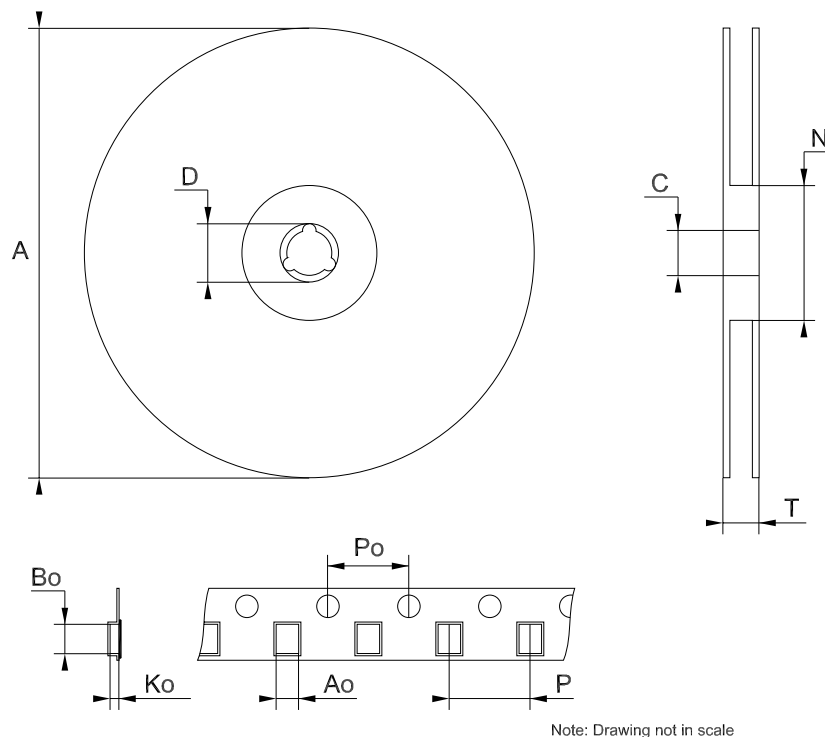
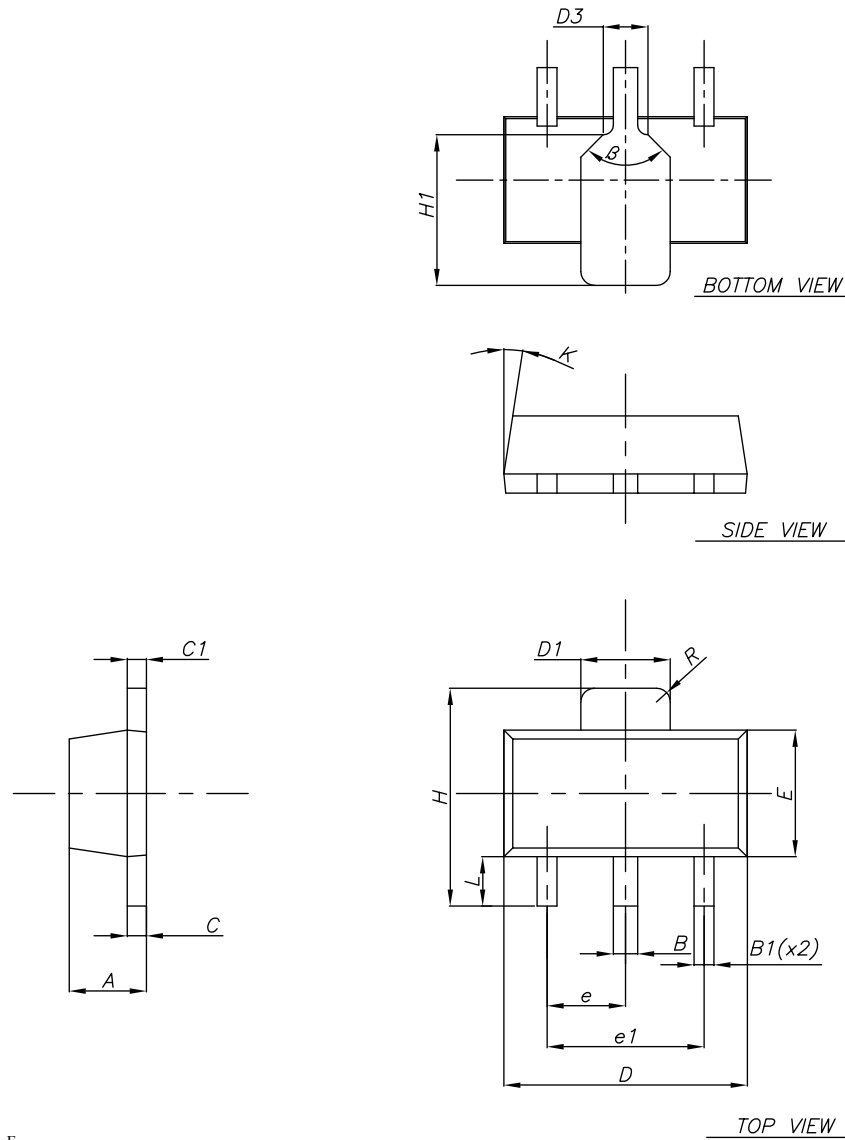


Table 10. SOT23-5L tape and reel mechanical data

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

7.4 SOT-89 package information

Figure 39. SOT-89 package outline

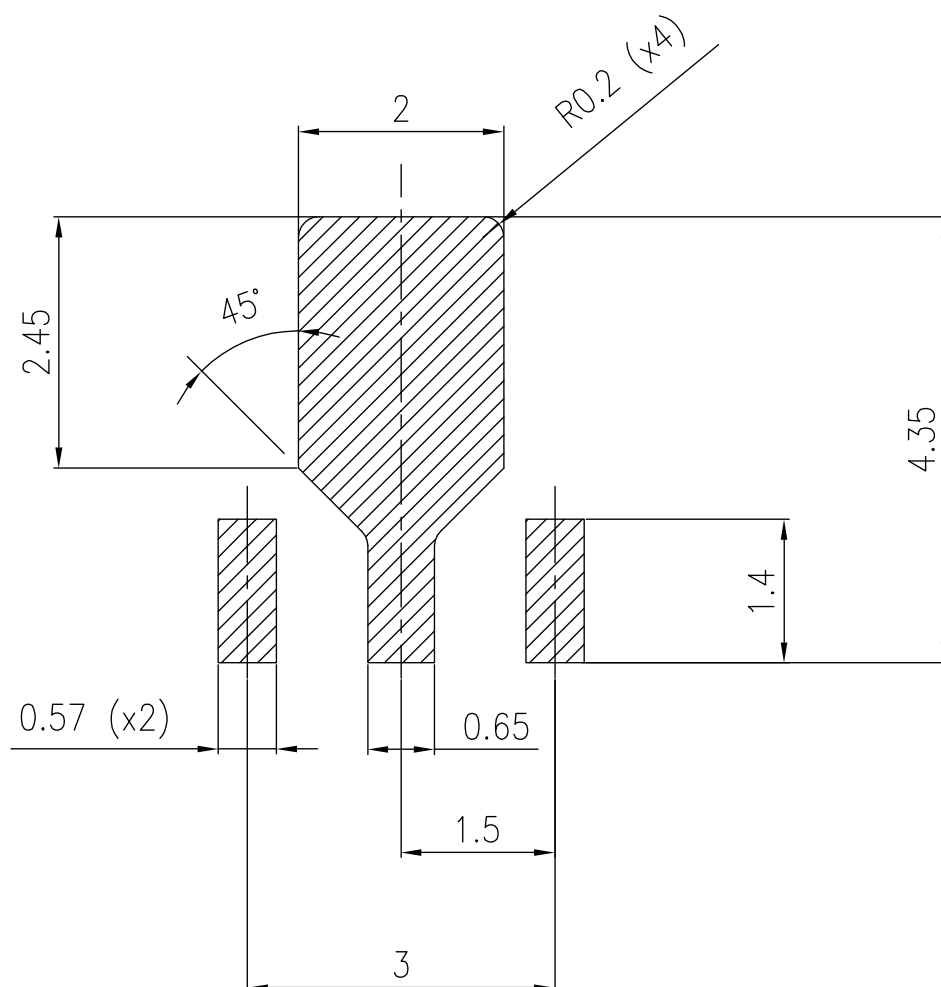


7098166_REV_F

Table 11. 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		1.20
R		0.25	
β		90°	

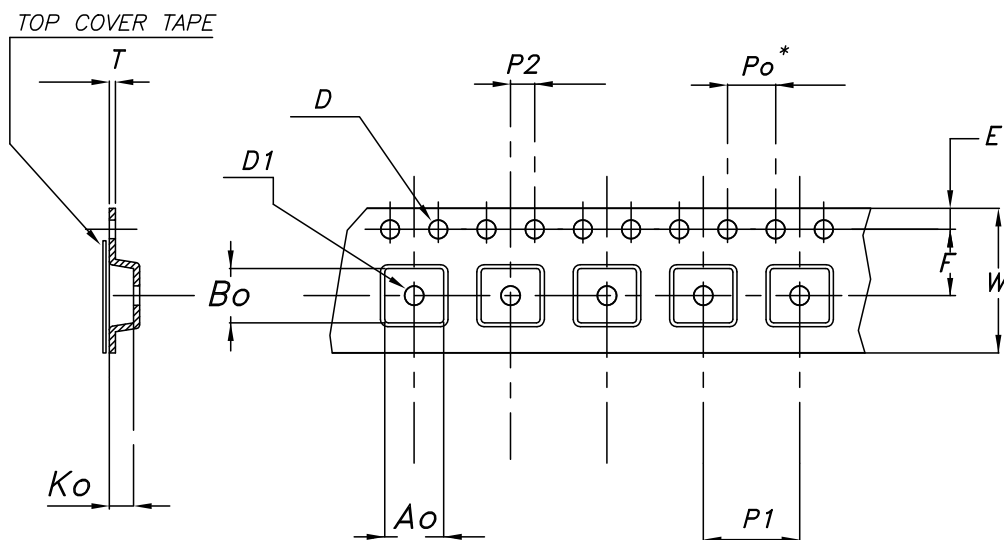
Figure 40. SOT-89 recommended footprint



Footprint

7.5 SOT-89 packing information

Figure 41. SOT-89 carrier tape outline



7111762_5

Figure 42. SOT-89 device orientation

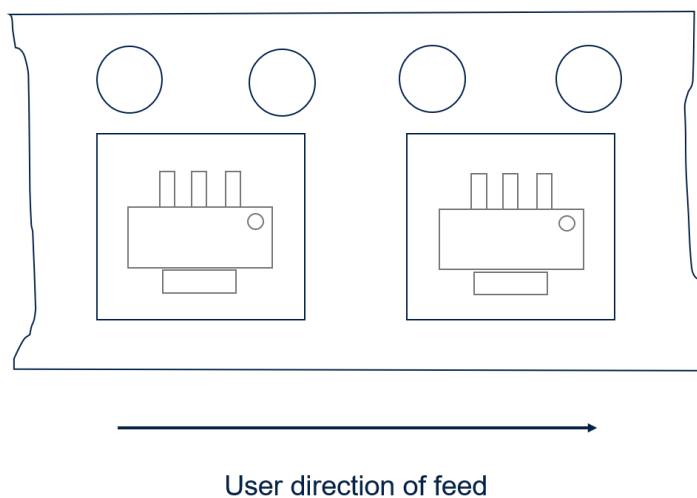
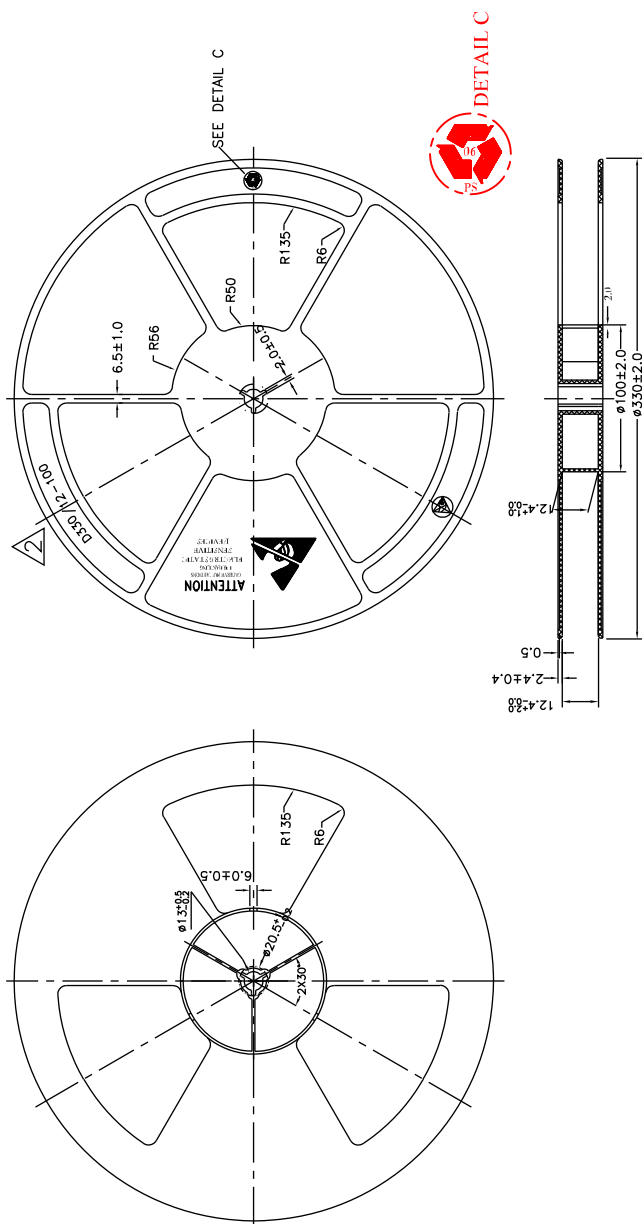


Table 12. SOT-89 carrier tape mechanical data

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	Ø 1.55	± 0.05
D1	Ø 1.60	± 0.10

Figure 43. SOT-89 reel drawing



8 Ordering information

Table 13. Order code

SOT23-5L	SOT-89 (D configuration)	SOT-89	Marking	Accuracy (%)	Output voltage
LDK320AM-R			ADA	0.5	ADJ
LDK320M-R			KAD	2	
LDK320AM12R ⁽¹⁾				0.5	1.2
LDK320M12R ⁽¹⁾				2	
LDK320AM15R ⁽¹⁾			15A	0.5	1.5
LDK320AM18R ⁽¹⁾			18A	0.5	1.8
LDK320M18R			K18	2	
LDK320AM25R			25A	0.5	2.5
LDK320M25R			K25	2	
LDK320AM30R			30A	0.5	3
	LDK320ADU30R		30	0.5	
LDK320M30R			K30	2	
LDK320AM33R			33A	0.5	3.3
	LDK320ADU33R		33	0.5	
		LDK320AU33R	E3	0.5	
LDK320M33R			K33	2	3.6
LDK320AM36R			36A	0.5	
LDK320AM50R			50A	0.5	5
	LDK320ADU50R		50	0.5	
		LDK320AU50R	E0	0.5	
LDK320M50R			K50	2	
LDK320AM120R			120A	0.5	12
	LDK320ADU120R		A2	0.5	
LDK320M120R ⁽¹⁾				2	

1. Available on request.

Revision history

Table 14. 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 ΔV_{OUT} test condition in Table 6. LDK320 electrical characteristics (fixed output version). Added new order code LDK320AU50R in Table 12. Order code.
28-Oct-2019	5	Added ΔV_{OUT} for SOT-89 in Table 6. LDK320 electrical characteristics (fixed output version).
23-Jul-2020	6	Updated Figure 2. Block diagram (adjustable version).
10-Nov-2020	7	Updated Table 12. Order code.
12-Nov-2020	8	Added new Marking column in Table 13. Order code.
26-Apr-2022	9	Updated Section 7.2. Added new Section 7.1 SOT23-5L package information.
05-Dec-2023	10	Updated VADJ and VDROD test conditions in Table 7.
04-Jun-2024	11	Updated Figure 35.
10-Mar-2025	12	Added new order code LDK320AU33R in Table 13 .
20-Jun-2025	13	Updated Figure 35 .

Contents

1	Diagram	2
2	Pin configuration	3
3	Typical application.....	4
4	Maximum ratings	5
5	Electrical characteristics.....	6
6	Typical characteristics	10
7	Package information.....	16
7.1	SOT23-5L package information.....	16
7.2	SOT23-5L package information.....	18
7.3	SOT23-5L packing information	20
7.4	SOT-89 package information	21
7.5	SOT-89 packing information	24
8	Ordering information	27
	Revision history	28
	List of tables	30
	List of figures.....	31

List of tables

Table 1.	Pin description (SOT23-5L)	3
Table 2.	Pin description (SOT-89)	3
Table 3.	Pin description (SOT-89, D configuration)	3
Table 4.	Absolute maximum ratings	5
Table 5.	Thermal data	5
Table 6.	LDK320 electrical characteristics (fixed output version)	6
Table 7.	LDK320 electrical characteristics (ADJ version)	8
Table 8.	SOT23-5L mechanical data (option A)	17
Table 9.	SOT23-5Lpackage mechanical data	18
Table 10.	SOT23-5L tape and reel mechanical data	20
Table 11.	SOT-89 mechanical data	22
Table 12.	SOT-89 carrier tape mechanical data	25
Table 13.	Order code	27
Table 14.	Document revision history	28

List of figures

Figure 1.	Block diagram (fixed version)	2
Figure 2.	Block diagram (adjustable version)	2
Figure 3.	Pin connection (top view)	3
Figure 4.	Typical application circuits	4
Figure 5.	Output voltage vs. temperature ($V_{IN} = 2.5\text{ V}$, $V_{OUT} = V_{ADJ}$, $I_{OUT} = 1\text{ mA}$)	10
Figure 6.	Output voltage vs. temperature ($V_{IN} = 2.5\text{ V}$, $V_{OUT} = V_{ADJ}$, $I_{OUT} = 200\text{ mA}$)	10
Figure 7.	Output voltage vs. temperature ($V_{IN} = 4.3\text{ V}$, $V_{OUT} = 3.3\text{ V}$, $I_{OUT} = 1\text{ mA}$)	10
Figure 8.	Output voltage vs. temperature ($V_{IN} = 4.3\text{ V}$, $V_{OUT} = 3.3\text{ V}$, $I_{OUT} = 200\text{ mA}$)	10
Figure 9.	Line regulation vs. temperature ($V_{IN} = 4.3\text{ to }18\text{ V}$, $V_{OUT} = 3.3\text{ V}$, $I_{OUT} = 1\text{ mA}$)	11
Figure 10.	Line regulation vs. temperature ($V_{IN} = 2.5\text{ to }18\text{ V}$, $V_{OUT} = V_{ADJ}$, $I_{OUT} = 1\text{ mA}$)	11
Figure 11.	Load regulation vs. temperature ($V_{IN} = 4.3\text{ V}$, $V_{OUT} = 3.3\text{ V}$, $I_{OUT} = 1\text{ to }200\text{ mA}$)	11
Figure 12.	Load regulation vs. temperature ($V_{IN} = 2.5\text{ V}$, $V_{OUT} = V_{ADJ}$, $I_{OUT} = 1\text{ to }200\text{ mA}$)	11
Figure 13.	Enable thresholds vs. temperature ($I_{OUT} = 1\text{ mA}$)	11
Figure 14.	Dropout voltage vs. temperature	11
Figure 15.	Quiescent current vs. input voltage ($I_{OUT} = 1\text{ mA}$)	12
Figure 16.	Quiescent current vs. temperature ($I_{OUT} = 1\text{ mA}$)	12
Figure 17.	Quiescent current vs. output current ($V_{IN} = 4.3\text{ V}$)	12
Figure 18.	Quiescent current vs. temperature ($I_{OUT} = 200\text{ mA}$)	12
Figure 19.	Off-state current vs. temperature	12
Figure 20.	Short-circuit current vs. temperature ($V_{IN} = 4.3\text{ V}$)	12
Figure 21.	Dropout voltage vs. I_{OUT}	13
Figure 22.	Short-circuit current vs. drop voltage	13
Figure 23.	SVR vs. frequency	13
Figure 24.	Output noise spectral density	13
Figure 25.	Stability plan ($V_{OUT} = 3.3\text{ V}$)	13
Figure 26.	Stability plan ($V_{OUT} = V_{ADJ}$)	13
Figure 27.	Startup with enable ($V_{OUT} = 3.3\text{ V}$)	14
Figure 28.	Startup with enable ($V_{OUT} = V_{ADJ}$)	14
Figure 29.	Turn-on time ($V_{OUT} = 3.3\text{ V}$)	14
Figure 30.	Turn-on time ($V_{OUT} = V_{ADJ}$)	14
Figure 31.	Line transient ($V_{OUT} = 3.3\text{ V}$, rise)	14
Figure 32.	Line transient ($V_{OUT} = 3.3\text{ V}$, fall)	14
Figure 33.	Load transient ($V_{OUT} = 3.3\text{ V}$, rise)	15
Figure 34.	Load transient ($V_{OUT} = V_{ADJ}$, fall)	15
Figure 35.	SOT23-5L package outline (option A)	16
Figure 36.	SOT23-5L package outline	18
Figure 37.	SOT23-5L recommended footprint	19
Figure 38.	SOT23-5L tape and reel outline	20
Figure 39.	SOT-89 package outline	21
Figure 40.	SOT-89 recommended footprint	23
Figure 41.	SOT-89 carrier tape outline	24
Figure 42.	SOT-89 device orientation	24
Figure 43.	SOT-89 reel drawing	26

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. 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.

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. 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