

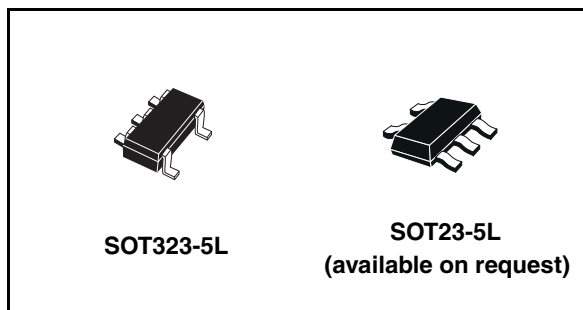
50 mA, 3 μ A supply current low drop linear regulator

Features

- 2.3 V to 12 V input voltage range
- 50 mA maximum output current
- 3 μ A quiescent current
- Available in 1.8 V, 2.5 V, 3.3 V, 5.0 V and adjustable
- 200 mV dropout voltage at 25 mA output current
- Internal thermal protection
- Available in SOT323-5L package, and SOT23-5L package (upon request)

Applications

- Portable/battery powered equipments
- Electronic sensors
- Microcontroller power
- Real time clock backup power



Description

The STLQ50 is a BiCMOS linear regulator specifically designed for operating in environment with very low power consumption constraints.

Due to the very low quiescent current (3 μ A) the device is suitable for those application that have very long stand-by time allowing extension of battery life.

The P-MOS pass element allows also a very good drop-out figure (200 mV at 25 mA I_O and 350 mV at full load) without affecting the consumption characteristics.

Housed in the very small SOT323-5L or SOT23-5L, it fulfils the space saving requirements in battery powered equipments.

Table 1. Device summary

Part number	Order codes		Output voltage
	Packages		
	SOT323-5L (T&R)	SOT23-5L (T&R) ⁽¹⁾	
STLQ50XX18	STLQ50C18R	STLQ50M18R	Fixed V _O = 1.8V
STLQ50XX25	STLQ50C25R	STLQ50M25R	Fixed V _O = 2.5V
STLQ50XX33	STLQ50C33R	STLQ50M33R	Fixed V _O = 3.3V
STLQ50XX50	STLQ50C50R	STLQ50M50R	Fixed V _O = 5.0V
STLQ50	STLQ50C-R	STLQ50M-R	Adjustable

1. Available upon request.

3 Maximum ratings

Table 3. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_I	DC Input voltage	-0.3 to +14	V
V_{FB}	FB voltage	-0.3 to +7	V
ESD	Human body model (all pins)	±2	kV
T_J	Junction temperature	-40 to 150	°C
T_{STG}	Storage temperature range	-55 to 150	°C

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

Table 4. Thermal data

Symbol	Parameter	SOT323-5L	SOT23-5L	Unit
R_{thJA}	Thermal resistance junction-ambient	331.4 ⁽¹⁾	191 ⁽¹⁾	°C/W

1. This value is referred to a 4-layer PCB, JEDEC standard test board.

4 Electrical characteristics

Table 5. Electrical characteristics

($V_I = V_{O(NOM)} + 1\text{ V}$ or $V_I = 2.5\text{ V}$ if $V_O + 1.5\text{ V}$; $T_A = -40\text{ °C}$ to 125 °C ; $I_O = 1\text{ mA}$; typical values are at $T_A = 25\text{ °C}$, $C_O = 1\text{ }\mu\text{F}$ unless otherwise specified)

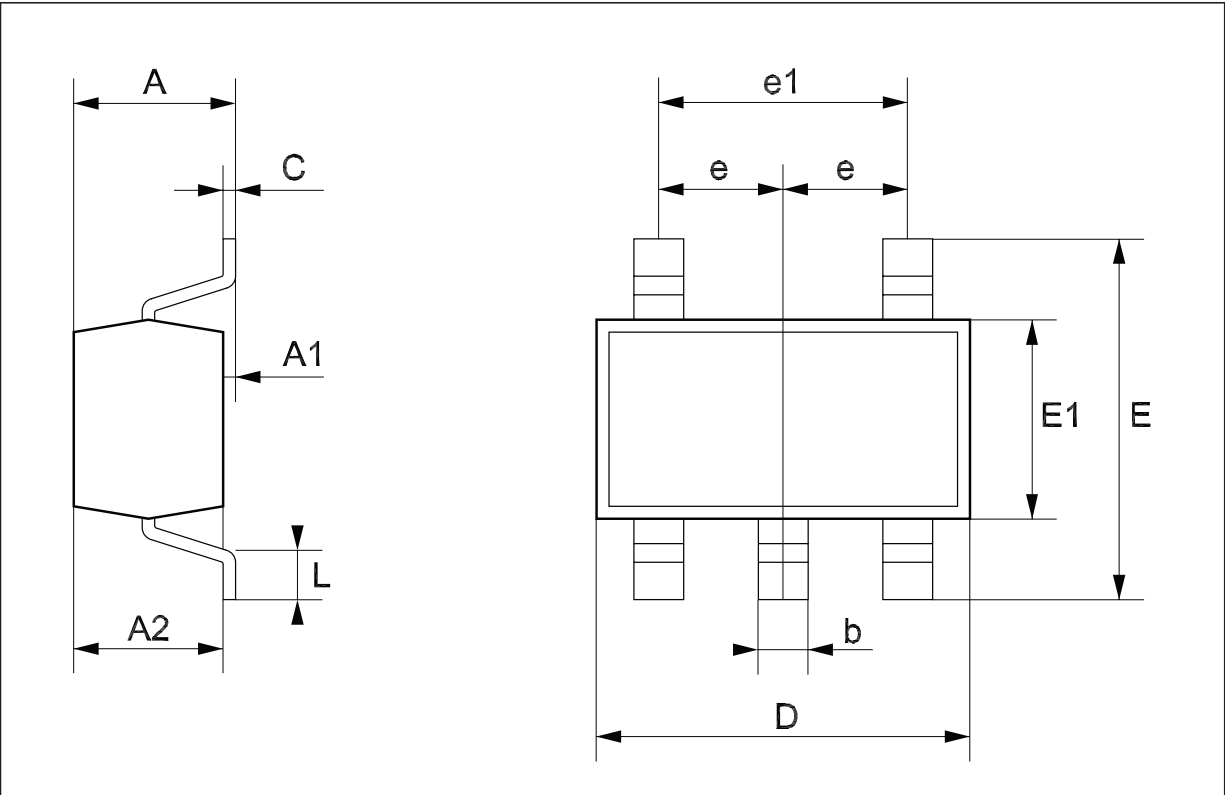
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_I	Input voltage range	$I_O = 20\text{ mA}$	2.3		12	V
		$I_O = 50\text{ mA}$	2.5		12	
I_Q	Quiescent current (Measured on ground pin, fixed version)	$V_I = 5\text{ V}$		3.5	5.0	μA
		$V_I = 12\text{ V}$		4.1	6.0	
V_O	Output voltage range (STLQ50ADJ)		1.222		11	V
	Accuracy as percentage of nominal voltage at $T_J = 25\text{ °C}$		-2		+2	%
$V_{\text{DROP-MAX}}$	Max dropout voltage ⁽¹⁾	$I_O = 50\text{ mA}$;		0.4	0.7	V
ΔV_O	Load regulation	$1\text{ mA} < I_O < 50\text{ mA}$			0.15	%/mA
ΔV_O	Line regulation	$V_O = 1.5\text{ V}$: $V_O + 1\text{ V} < V_I < 12\text{ V}$; $V_O = 1.5\text{ V}$: $2.5\text{ V} < V_I < 12\text{ V}$;			0.3	%/V
SVR	Supply voltage rejection	$V_{\text{RIPPLE}} = 0.1\text{ V}$, $I_O = 20\text{ mA}$ $f = 120\text{ Hz}$		30		dB
eN	Output noise voltage	B_W from 200Hz to 100KHz; $I_O = 10\text{ mA}$		560		μV_{RMS}
Th	Thermal protection			160		$^{\circ}\text{C}$
I_{OMAX}	Maximum output current ⁽²⁾	$V_O = 0\text{ V}$		500		mA

1. $V_I = 2.5\text{ V}$ when $V_{O(NOM)} \leq 2.1\text{ V}$

2. The maximum power dissipation must not be exceeded, see application information for details.

SOT323-5L mechanical data

Dim.	mm.			mils.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.80		1.10	31.5		43.3
A1	0.00		0.10	0.0		3.9
A2	0.80		1.00	31.5		39.4
b	0.15		0.30	5.9		11.8
C	0.10		0.18	3.9		7.1
D	1.80		2.20	70.9		86.6
E	1.80		2.40	70.9		94.5
E1	1.15		1.35	45.3		53.1
e		0.65			25.6	
e1		1.3			51.2	
L	0.10		0.30	3.9		11.8



Tape & reel SOT323-xL mechanical data

Dim.	mm.			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	175	180	185	6.889	7.086	7.283
C	12.8	13	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	59.5	60	60.5		2.362	
T			14.4			0.567
Ao		2.25			0.088	
Bo		2.7			0.106	
Ko		1.2			0.047	
Po	3.9	4	4.1	0.153	0.157	0.161
P	3.8	4	4.2	0.149	0.157	0.165

