



# THE DATASHEET OF ST763ACDTR

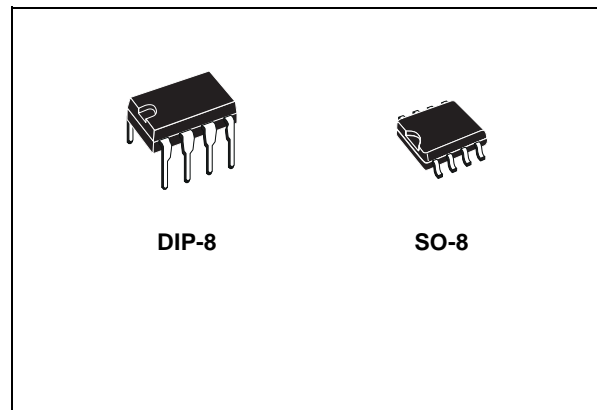




# ST763A SERIES

## 3.3V STEP DOWN CURRENT MODE PWM DC-DC CONVERTERS

- OUTPUT VOLTAGE 3.3V
- SUPPLY VOLTAGE RANGE FROM 3.3V TO 11V
- GUARANTEED OUTPUT CURRENT: 500mA
- TYPICAL OPERATION FREQUENCY: 200KHz
- VERY LOW QUIESCENT CURRENT: 0.6mA ON MODE 0.2 $\mu$ A OFF MODE
- SWITCH ON/OFF CONTROL
- TYPICAL EFFICENCY: 90%
- OPERATING TEMPERATURE RANGE: -40°C TO 85°C
- AVAILABLE IN SO-8 AND DIP-8 PACKAGES



### DESCRIPTION

The ST763A is a step-down switching regulator. It operates from 3.3V to 11V giving a fixed 3.3V output voltage, delivering up to 500mA. The main features are typical efficiency of 90%, quiescent current of 0.6mA, and only 0.2 $\mu$ A in shut-down.

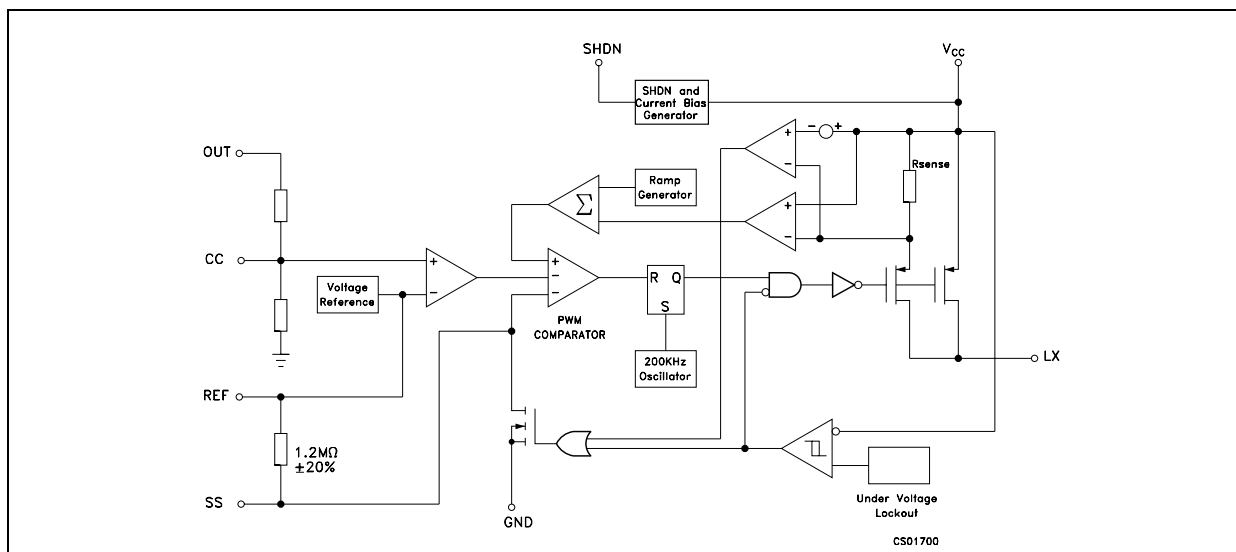
The PWM current mode control provides precise output regulation and very good transient response. Output voltage accuracy is guaranteed to be  $\pm 5\%$  over line, load and temperature variations. A minimum number of external

components is used and the fixed frequency switching allows easy filtering of output ripple and noise.

Other features of this device are cycle-by-cycle current limiting, overcurrent limiting, under voltage lockout and programmable soft-start protection. A 22 $\mu$ H inductor works in most applications, so no sophisticated design is necessary.

Package available are SO-8 and DIP-8. Typical application are in 5V to 3.3V converters, cellular phones, portable instruments, hand-held computers, and peripherals.

### SCHEMATIC DIAGRAM



## ST763A SERIES

### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter <sup>2</sup>	Value	Unit
V <sub>CC</sub>	DC Input Voltage	-0.3 to 12	V
V <sub>LX</sub>	Switch Pin Voltage	-0.3 to (V <sub>CC</sub> + 0.3)	V
V <sub>SHDN</sub>	Shutdown Voltage (SHDN)	-0.3 to (V <sub>CC</sub> + 0.3)	V
V <sub>S</sub> , V <sub>C</sub>	Soft Start (SS) and Compensation Capacitor (CC) Pins Voltage	-0.3 to (V <sub>CC</sub> + 0.3)	V
I <sub>LX</sub>	Switching Peak Current	2	A
I <sub>REF</sub>	Reference Current	2.5	mA
P <sub>TOT</sub>	Continuous Power Dissipation at T <sub>A</sub> =70°C (DIP-8) (SO-8)	550 344	mW mW
T <sub>stg</sub>	Storage Temperature Range	-40 to +150	°C
T <sub>op</sub>	Operating Junction Temperature Range (AC series) (AB series)	0 to +70 -40 to +85	°C °C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

### THERMAL DATA

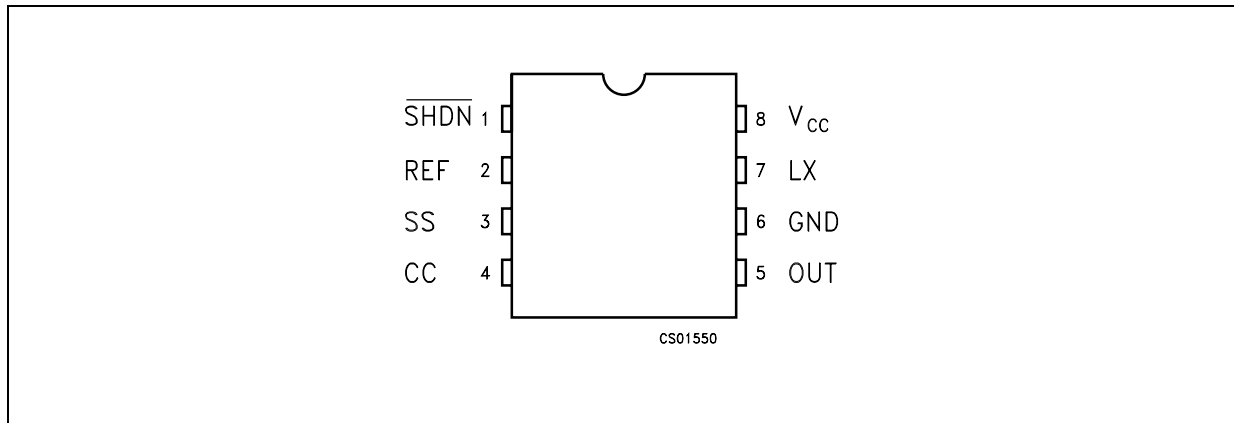
Symbol	Parameter	SO-8	DIP-8	Unit
R <sub>thj-amb</sub>	Thermal Resistance Junction-ambient (*)	160	100	°C/W

(\*) This value depends from thermal design of PCB on which the device is mounted.

### ORDERING CODES

TYPE	DIP8	SO-8	SO-8 (T&R)
ST763AB	ST763ABN	ST763ABD	ST763ABDTR
ST763AC	ST763ACN	ST763ACD	ST763ACDTR

## CONNECTION DIAGRAM (top view)



## PIN DESCRIPTION

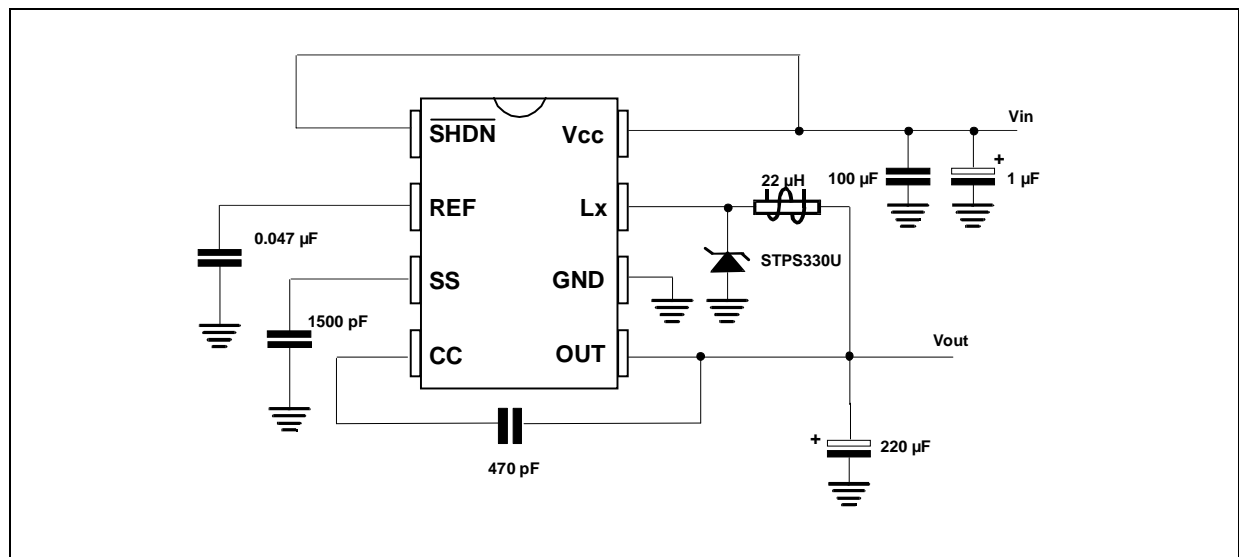
Pin N°	Symbol	Name and Function
1	SHDN	Shutdown control (active low): If connected to GND the IC is in shutdown. Connect to V <sub>CC</sub> for normal operation (ON MODE)
2	REF	Reference Output Voltage:(1.25V): Bypass to GND with 47nF capacitor
3	SS	Soft Start: a capacitor between SS and GND provides soft-start and short-circuit protections.
4	CC	Compensation Capacitor Input: externally compensates the outer (voltage) feedback loop. Connect to OUT with 330pF capacitor
5	OUT	Output Voltage Sense Input: provides regulation of feedback sensing. Connect to 3.3V output.
6	GND	Ground
7	LX	Switch Output. Drain of internal P-Channel Power MOSFET
8	V <sub>CC</sub>	Supply Voltage Input. Bypass to GND with 1μF ceramic capacitance and large value electrolytic capacitor in parallel. The 1μF capacitor must be as close as possible to the GND and V <sub>CC</sub> pins

## ST763A SERIES

**ELECTRICAL CHARACTERISTICS** ( $V_{CC}=5V$ ,  $I_O=0mA$ ,  $T_A=T_{MIN}$  to  $T_{MAX}$ , unless otherwise specified.)

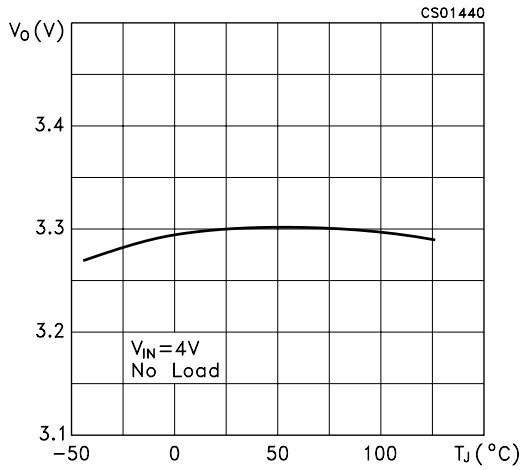
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{CC}$	Input Voltage		3.3		11	V
$V_O$	Output Voltage	$V_{CC} = 4$ to $11V$ $I_O = 0$ to $300mA$ $V_{CC} = 4.75$ to $11V$ $I_O = 0$ to $500mA$	3.135 3.135	3.3 3.3	3.465 3.465	V V
$\Delta V_O$	Line Regulation			0.13		%/V
$\Delta V_O$	Load Regulatio	$I_O = 1$ to $500mA$		0.005		%/mA
$\eta$	Power Efficiency	$I_O = 300mA$ $I_O = 100mA$		88 90		% %
$I_{SUPPLY}$	Supply Current	ON Mode (Including Switch Current) OFF Mode		0.6 0.2	2.5 100	mA $\mu A$
$V_{IH}$	SHDN Input High Threshold		2			V
$V_{IL}$	SHDN Input Low Threshold				0.25	V
$I_{SHDN}$	Shutdown Input Leakage Current				1	$\mu A$
$V_{LOCK}$	Under Voltage Lockout	$V_{CC}$ Falling		2.7	3	V
$R_{DS(on)}$	LX On Resistance	$I_{LX}=500mA$		1		$\Omega$
$I_{LEAK}$	LX Leakage Current	$V_{CC} = 12V$ $V_{LX} = 0V$		10		nA
$V_{REF}$	Reference Voltage	$T_A = 25^\circ C$	1.18	1.25	1.32	V
$\Delta V_{REF}$	Temperature Reference Drift	$T_A = T_{MIN}$ to $T_{MAX}$		50		ppm/ $^\circ C$
$f_{OSC}$	Switching Frequency		159	200	212.5	KHz
$R_C$	Compensation Pin Impedance			7500		$\Omega$

### TYPICAL APPLICATION CIRCUIT

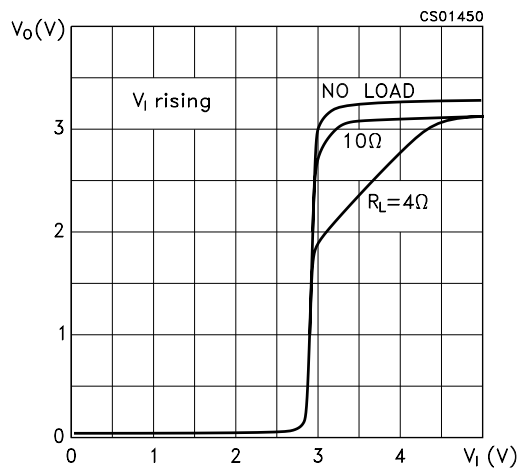


**TYPICAL PERFORMANCE CHARACTERISTICS** (unless otherwise specified  $T_j = 25^\circ\text{C}$ )

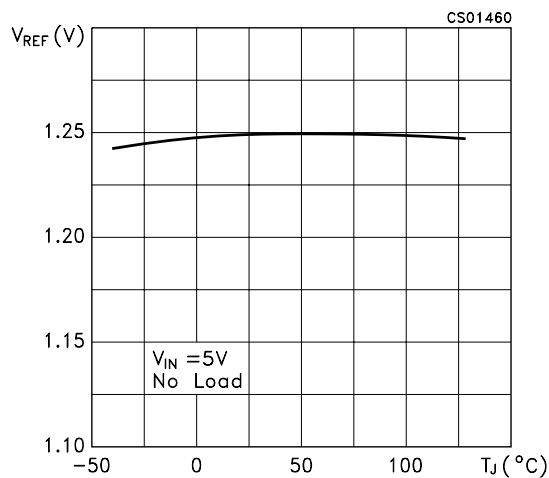
**Figure 1 : Output Voltage vs Temperature**



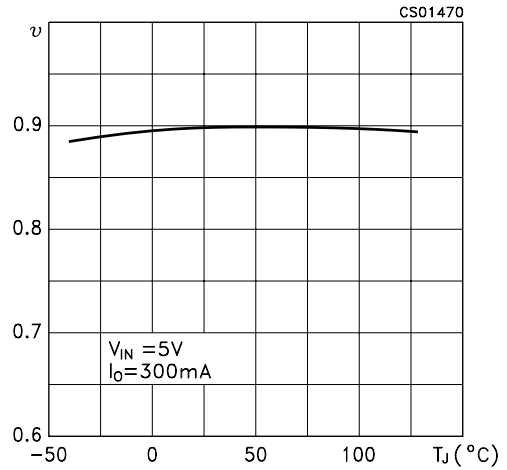
**Figure 2 : Output Voltage vs Input Voltage**



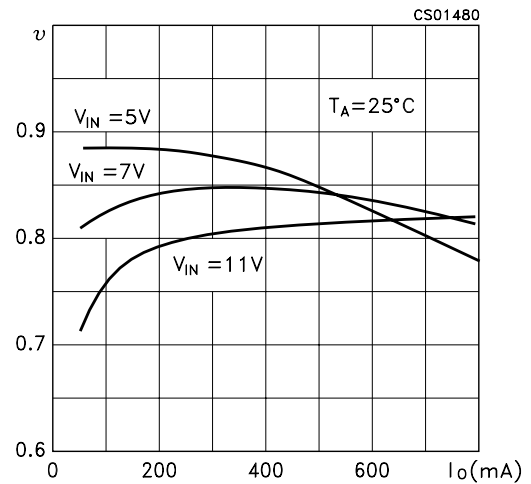
**Figure 3 : Reference Voltage vs Temperature**



**Figure 4 : Efficiency vs Temperature**



**Figure 5 : Efficiency vs Output Current**



**Figure 6 : LX Leakage Current vs Temperature**

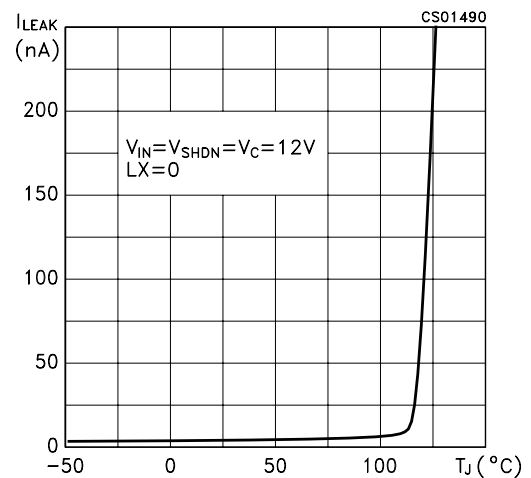


Figure 7 : LX ON Resistance vs Temperature

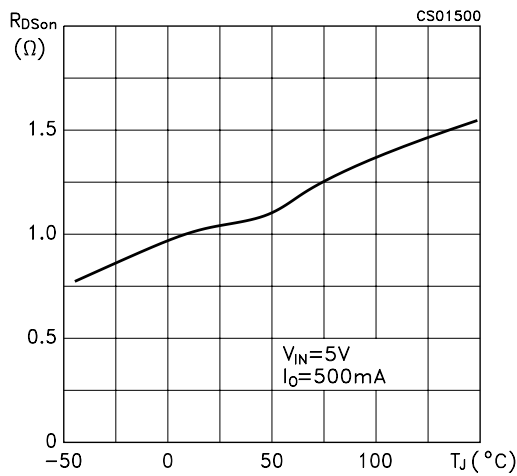


Figure 10 : Oscillator Frequency vs Temperature

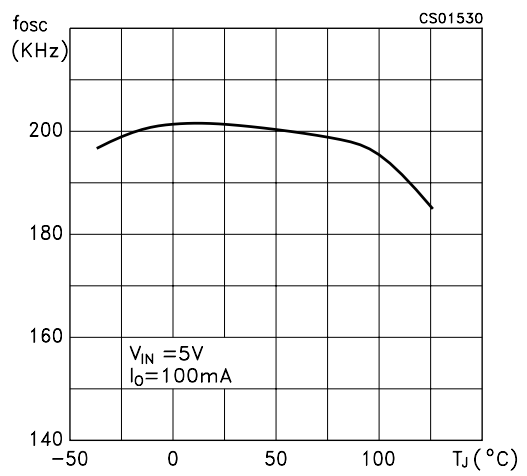


Figure 8 : Shutdown Input Threshold vs Temperature

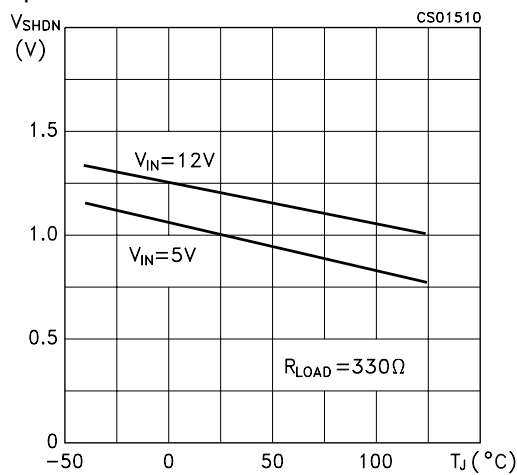


Figure 11 : Oscillator Frequency vs Input Voltage

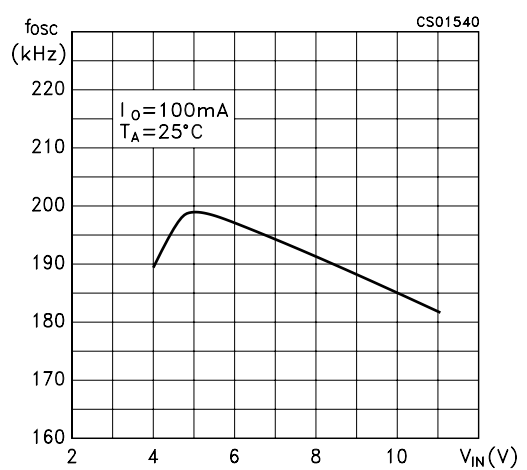


Figure 9 : Shutdown Input Leakage Current vs Temperature

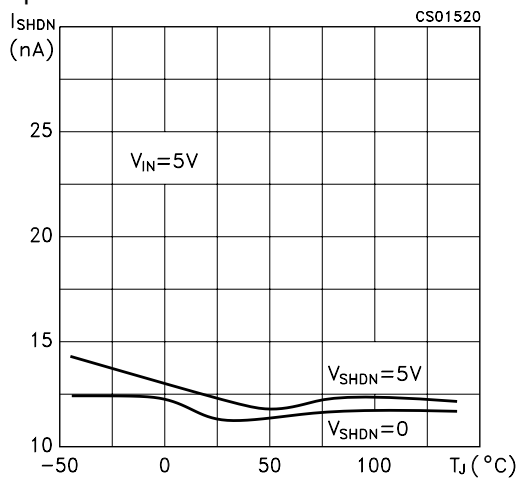
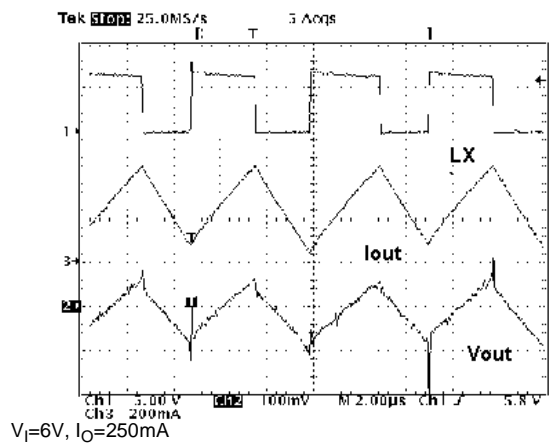
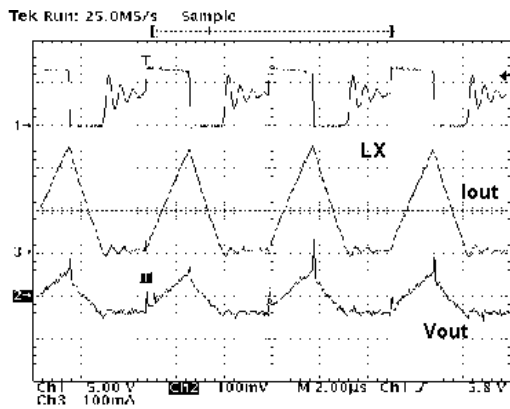


Figure 12 : Switching Waveforms, Continuous Conduction

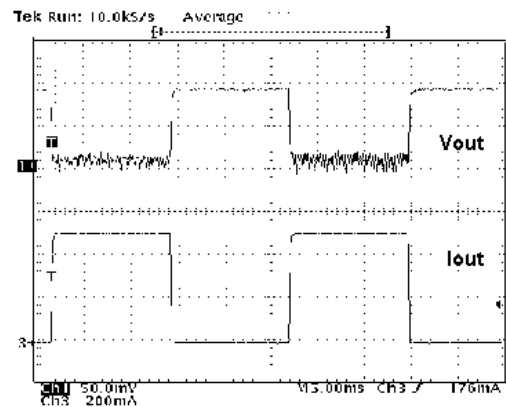


**Figure 13 : Switching Waveforms, Discontinuous Conduction**



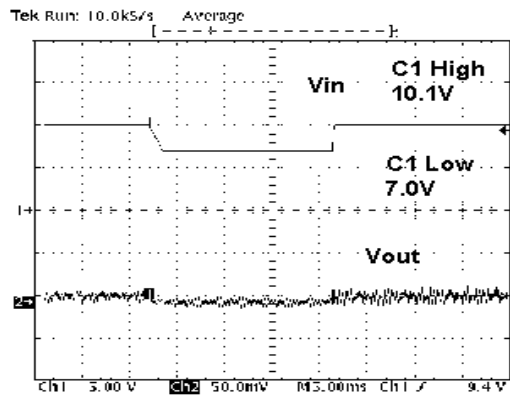
$V_I=6V, I_O=75mA$

**Figure 15 : Load Transient**



$V_I=5V, I_O=0 \text{ to } 500mA$

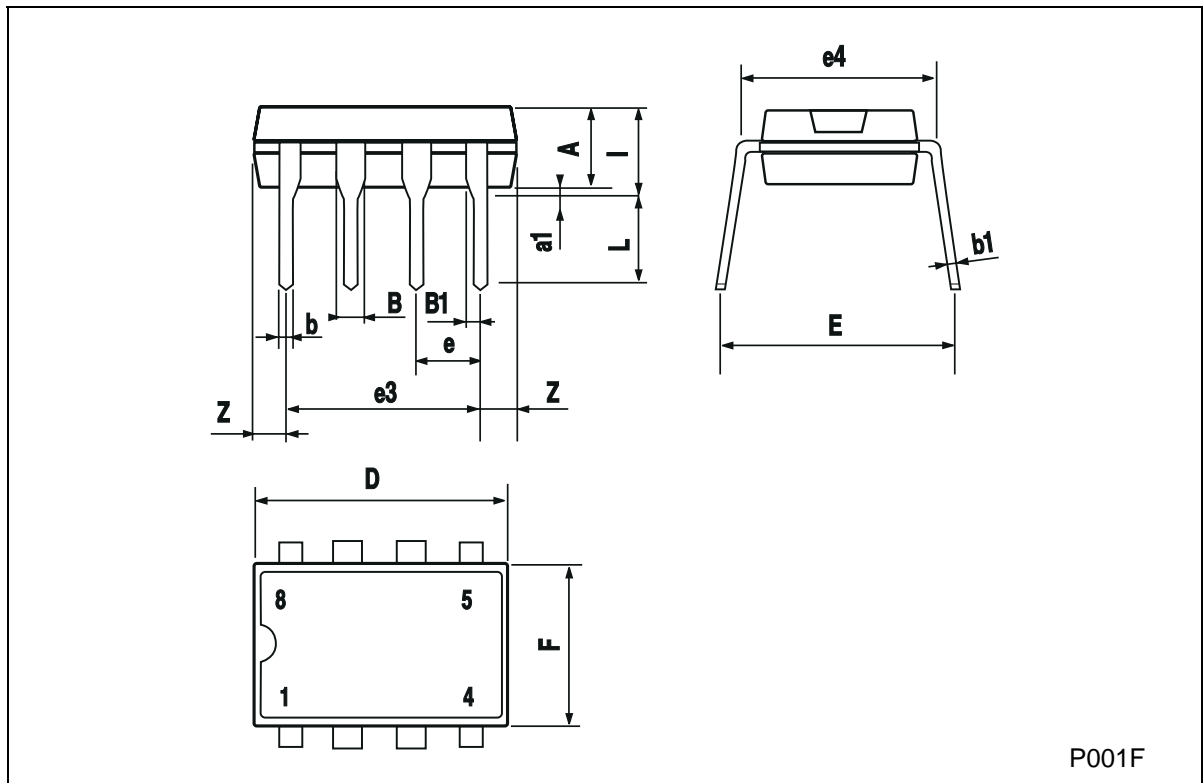
**Figure 14 : Line Transient**



$i_O=350mA$

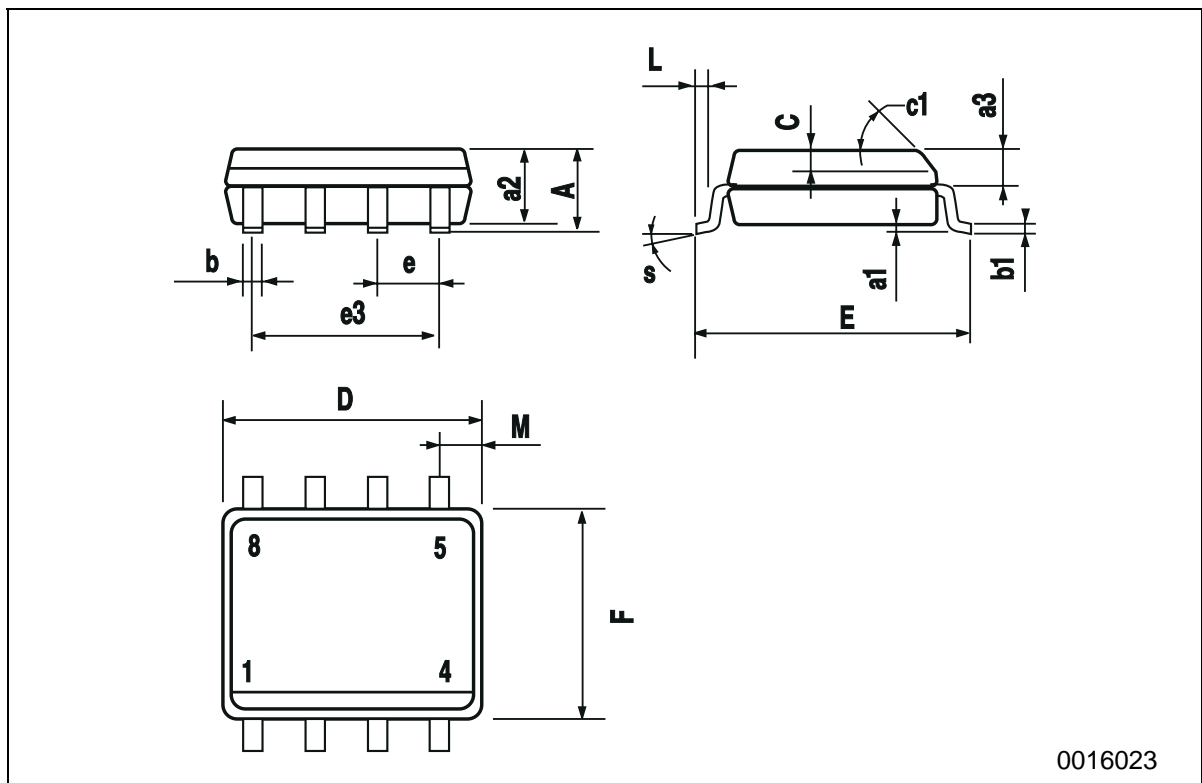
Plastic DIP-8 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.3			0.130	
a1	0.7			0.028		
B	1.39		1.65	0.055		0.065
B1	0.91		1.04	0.036		0.041
b		0.5			0.020	
b1	0.38		0.5	0.015		0.020
D			9.8			0.386
E		8.8			0.346	
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			7.1			0.280
l			4.8			0.189
L		3.3			0.130	
Z	0.44		1.6	0.017		0.063



## SO-8 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.25	0.003		0.009
a2			1.65			0.064
a3	0.65		0.85	0.025		0.033
b	0.35		0.48	0.013		0.018
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.019
c1	45 (typ.)					
D	4.8		5.0	0.188		0.196
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.14		0.157
L	0.4		1.27	0.015		0.050
M			0.6			0.023
S	8 (max.)					



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