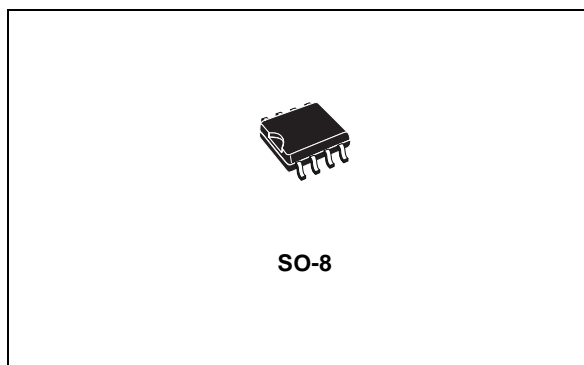


## SOLENOID CONTROLLER IC

- WIDE SUPPLY VOLTAGE RANGE: 8 TO 35V DC
- BUILD-IN GATE DRIVE VOLTAGE CLAMP TYP. 11V
- LOGIC CONTROLLED ENABLING CIRCUIT
- DIGITAL IN-RUSH TIMER
- BUILT-IN POWER-ON RESET
- INTERNALLY TRIMMED TIMING OSCILLATOR
- NO EXTERNALLY TIMING CAPACITORS NEEDED
- FIXED IN-RUSH/HOLD CURRENT RATIO
- LOW DROP CURRENT SENSING RESISTOR
- INTEGRATED FILTER IN THE FEEDBACK LOOP (TIME COSTANT OF 2 $\mu$ s TYP.)
- SO-8 PACKAGE

### DESCRIPTION

This circuit is basically switch mode current regulator with 2 modes (In-rush and Holding). In-rush current occurs in the first 64 ms of each

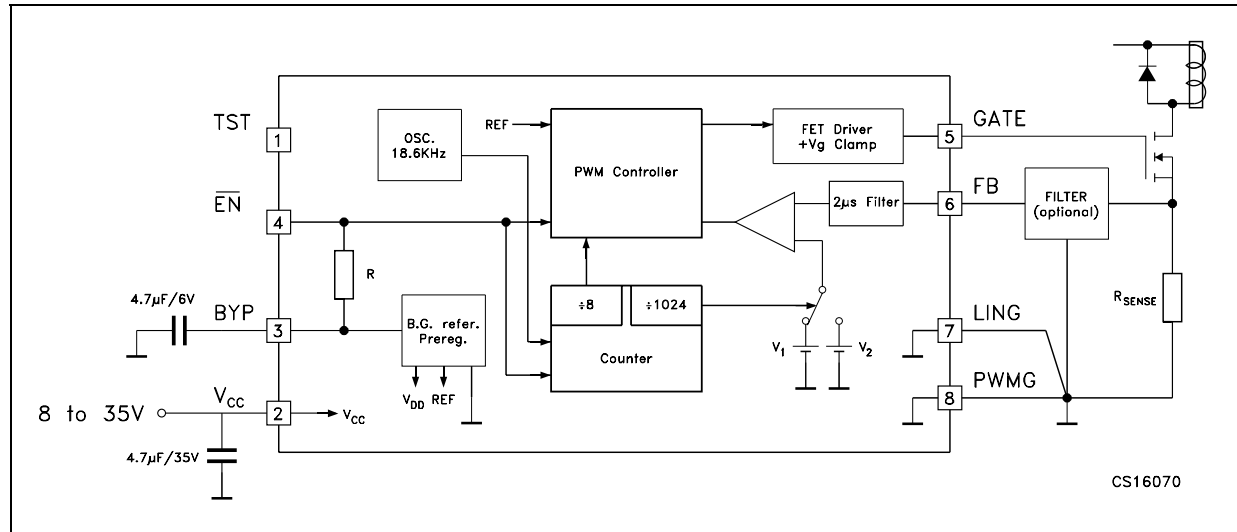


on/off cycle with the rise time dependent on the coil's resistance and inductance. The Hold-current is a partition of the In-rush current fixed by the ratio between  $V_1$  and  $V_2$ . A control pin is provided for enabling and disabling the gate control output for the external power MOS. The MOS transistor must be chosen according to the supply voltage range and the current flowing through the solenoid.

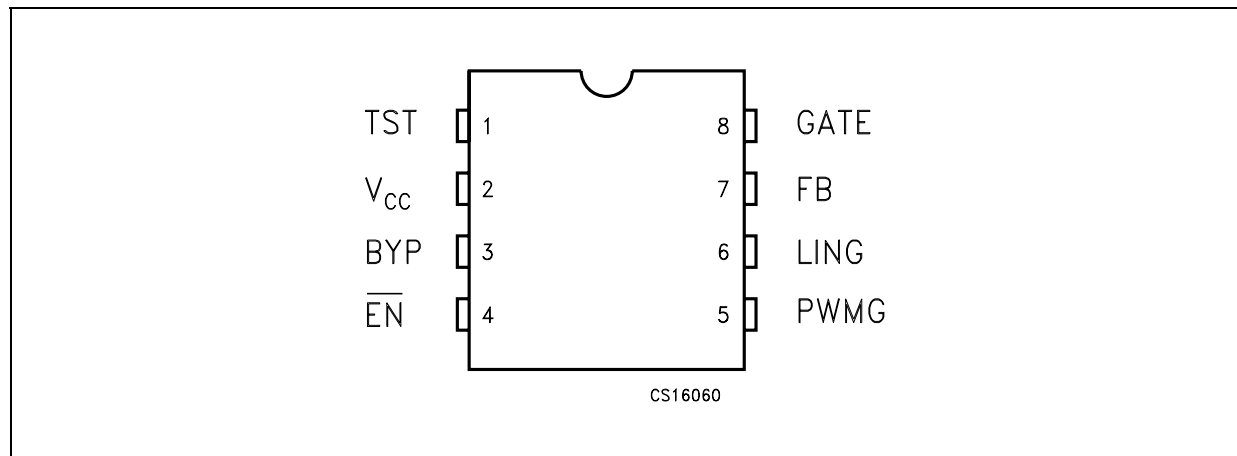
### ORDERING CODES

Type	Temperature Range	Package	Comments
STM802BD	-40 to 85 °C	SO-8 (Tube)	100 parts per tube / 20 parts per box
STM802BDR	-40 to 85 °C	SO-8 (Tape & Reel)	2500 parts per reel

## BLOCK DIAGRAM AND SCHEMATIC CIRCUIT



## PIN CONFIGURATION



## PIN DESCRIPTION

PIN N°	SYMBOL	NAME AND FUNCTION
1	TST (Note 1)	Test Input
2	V <sub>CC</sub>	Supply Voltage
3	BYP	Bypass capacitor
4	EN	Enable Input
5	PWMG	Switch Ground
6	LING	Linear Ground
7	FB	FeedBack
8	GATE	Gate Control Output

Note 1: The TST pin is for testing purpose only. Must be left FLOATING for normal operation.

## TRUTH TABLES FOR ENABLE PIN

$\overline{\text{EN}}$	DEVICE
LOW	ENABLED
HIGH	DISABLED
FLOAT	DISABLED

Note 1: The TST pin is for testing purpose only. Must be left FLOATING for normal operation.

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CC}$	Supply Voltage	-0.5 to 40	V
$V_I$	DC Input Voltage of $\overline{\text{EN}}$ , FB	-0.5 to 7	V
$I_{IK}$	DC Input Diode Current	$\pm 20$	mA
$I_{OK}$	DC Output Diode Current	-20/+5	mA
$P_D$	Maximum Power Dissipation	500	mW
$T_L$	Lead Temperature (10sec)	300	°C
$T_{STG}$	Storage Temperature Range	-65 to 150	°C

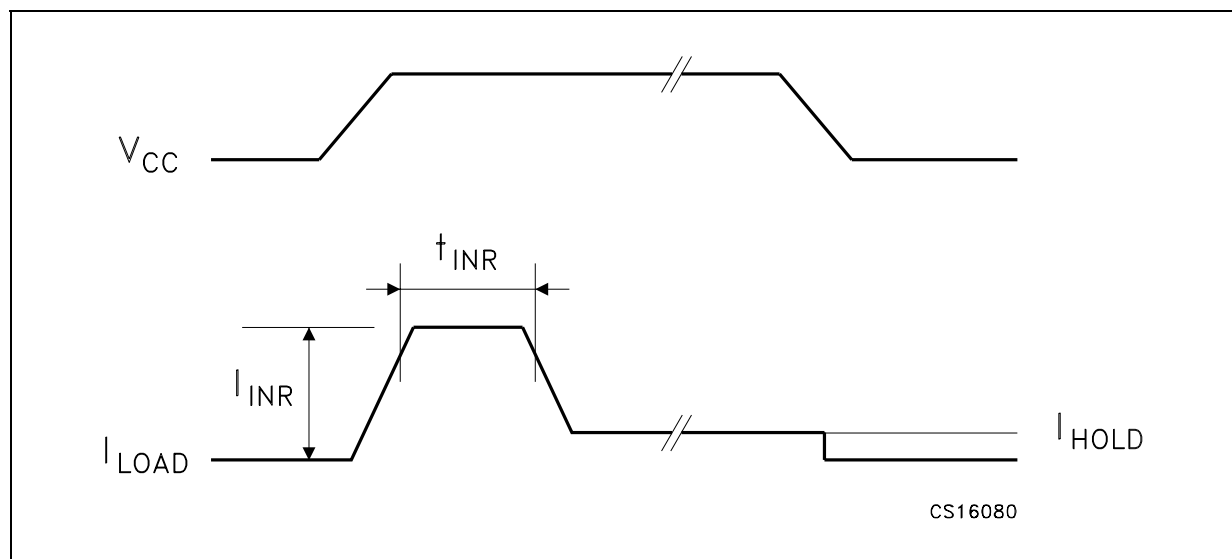
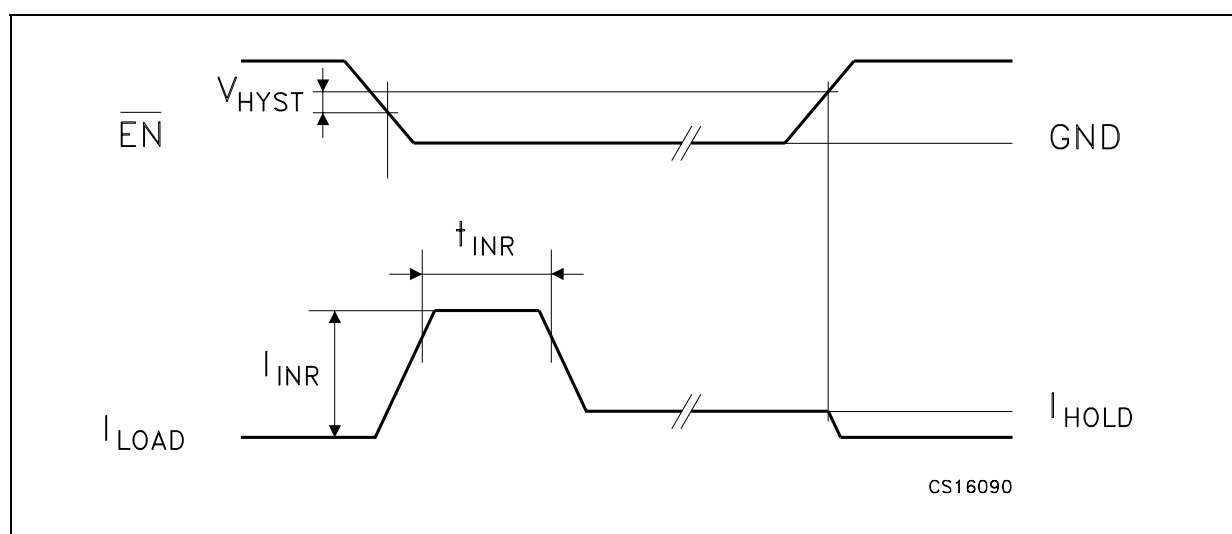
Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

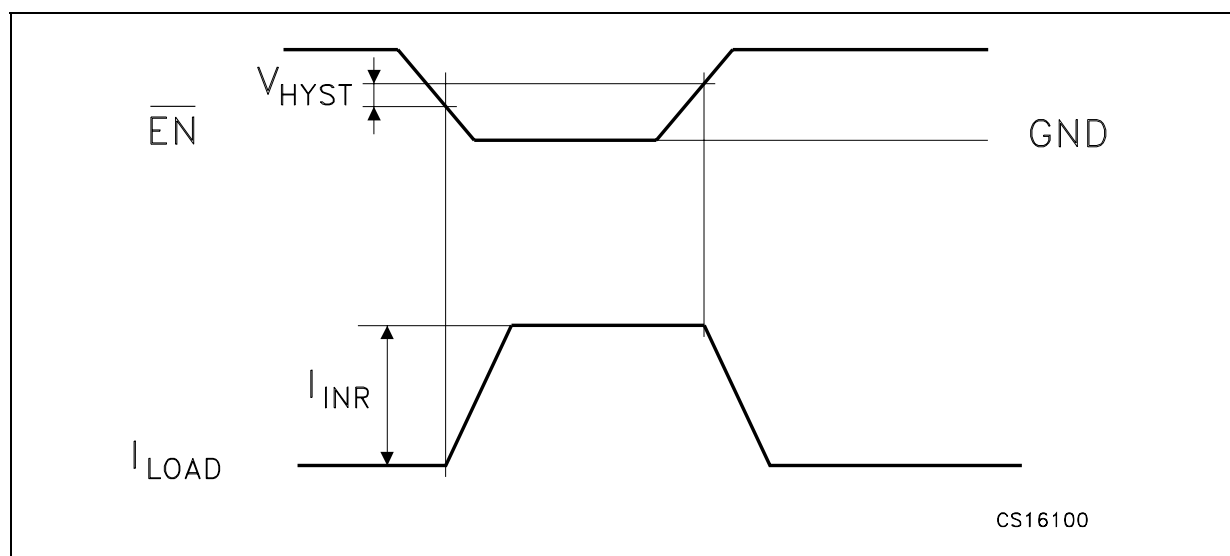
## ELECTRICAL CHARACTERISTICS OVER RECOMMENDED OPERATING CONDITIONS

(Unless otherwise noted. Typical values are at  $T_A = 25^\circ\text{C}$ )

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{CC}$	Operative Supply Voltage Range	DC only	8		35	V
$V_{IL}$	Low Level Input Thresholds of Enable		0		0.8	V
$V_{IH}$	High Level Input Thresholds of Enable		2		5	V
$V_{HYST}$	Hysteresis of Enable Input			0.3		V
$I_{IN}$	Input Leakage Current of Enable	$\overline{\text{EN}} = \text{GND}$	-100	-60	-30	$\mu\text{A}$
		$\overline{\text{EN}} = 5.5\text{V}$ , $V_{CC} = 0$ to $35\text{V}$		0.1	1	$\mu\text{A}$
$I_Q$	Quiescent Supply Current	$\overline{\text{EN}} = 5.5\text{V}$ , $V_{CC} = 9\text{V}$ , $V_{FB} = 0\text{V}$		0.4	0.9	mA
$I_{CC}$	Supply Current	$\overline{\text{EN}} = \text{GND}$ , $V_{CC} = 9\text{V}$ , $V_{FB} = 0\text{V}$ $C_{LOAD} = 1000\text{pF}$		0.7	1.2	mA
$V_{CLAMP}$	Gate drive voltage clamp	$V_{CC} > 20\text{V}$	9	11	13	V
$V_1$	Voltage reference for Inrush current		314	345	380	mV
$V_2$	Voltage reference for Hold current		70	77	86	mV
$I_{INR}/I_{HOLD}$	Inrush current to hold current ratio			4.5		
$T_{INR}$	Time duration of Inrush interval		56	64	72	ms
$I_{GH}$	Gate control output source current	$V_G = 0\text{V}$ , $V_{CC} = 13\text{V}$		-1.6	-1	mA
$I_{GL}$	Gate control output sink current	$V_G = 8\text{V}$ , $V_{CC} = 13\text{V}$	2.5	4.5		mA
$V_{BYP}$	Internal Pre-regulator output voltage	$I_{BYP} = 1\text{mA}$		4		V
$T_C$	Time constant of feedback filter			2		$\mu\text{s}$
$T_{OP}$	Operative Temperature Range		-40		85	°C

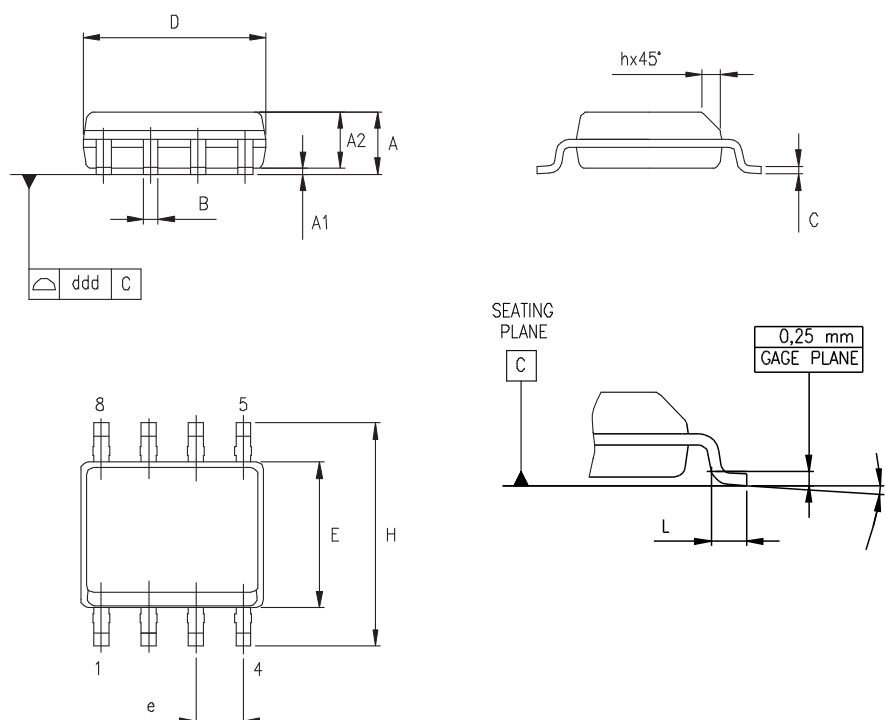
## TYPICAL CHARACTERISTICS

Figure 1 : Power on Cycle ( $\overline{\text{EN}} = \text{Low}$ )Figure 2 : Controlled by Enable ( $V_{CC} = \text{ON}$ )

**Figure 3** : Controlled by Enable ( $V_{CC} = ON$ )

## SO-8 MECHANICAL DATA

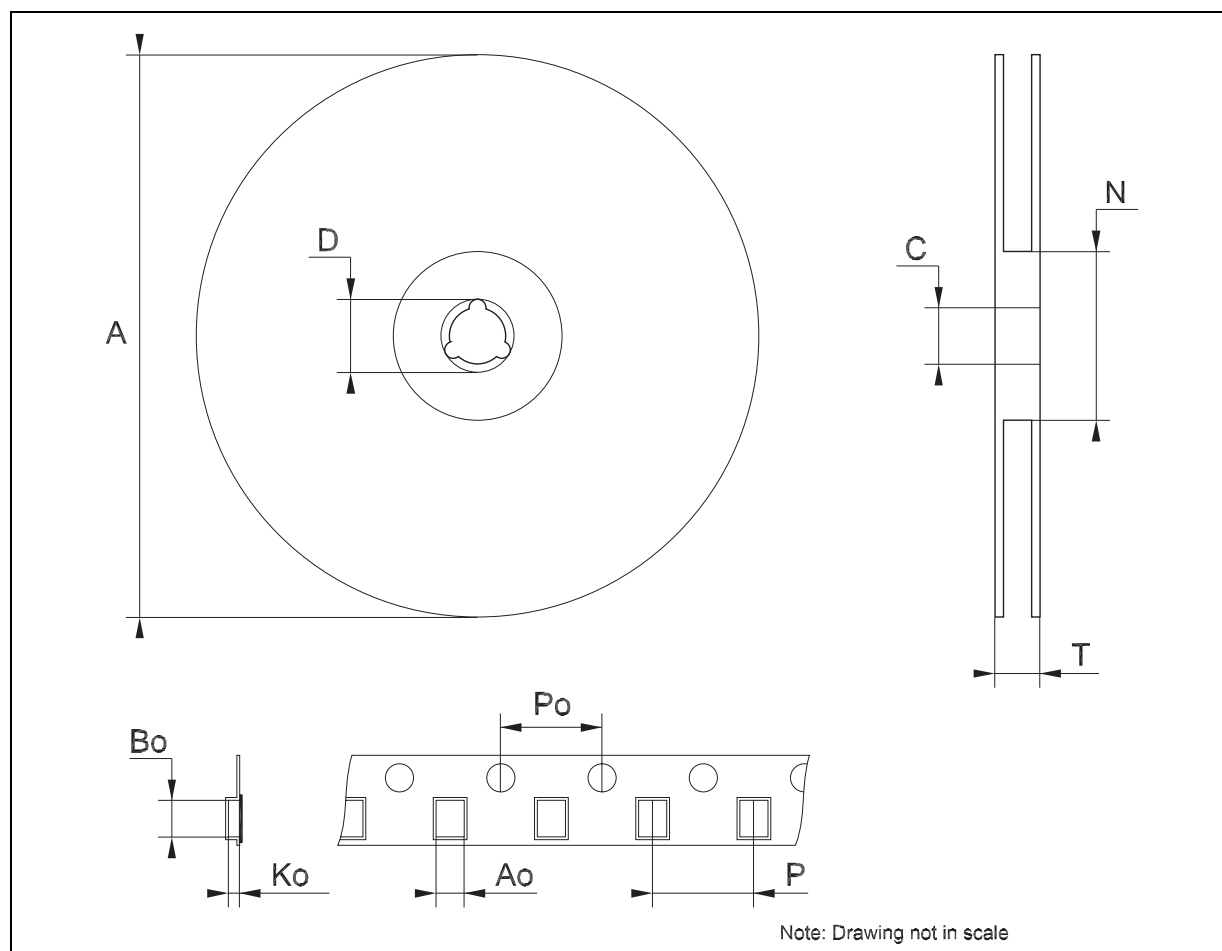
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	1.35		1.75	0.053		0.069
A1	0.10		0.25	0.04		0.010
A2	1.10		1.65	0.043		0.065
B	0.33		0.51	0.013		0.020
C	0.19		0.25	0.007		0.010
D	4.80		5.00	0.189		0.197
E	3.80		4.00	0.150		0.157
e		1.27			0.050	
H	5.80		6.20	0.228		0.244
h	0.25		0.50	0.010		0.020
L	0.40		1.27	0.016		0.050
k	8° (max.)					
ddd			0.1			0.04



0016023/C

### Tape & Reel SO-8 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			330			12.992
C	12.8		13.2	0.504		0.519
D	20.2			0.795		
N	60			2.362		
T			22.4			0.882
Ao	8.1		8.5	0.319		0.335
Bo	5.5		5.9	0.216		0.232
Ko	2.1		2.3	0.082		0.090
Po	3.9		4.1	0.153		0.161
P	7.9		8.1	0.311		0.319



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