

# Alternator Voltage Regulator FET Driver

## Description

The CS3361 integral alternator regulator integrated circuit provides the voltage regulation for automotive, 3-phase alternators.

It drives an external logic level N channel enhancement power FET for control of the alternator field current. In the event of a charge

fault, a lamp output pin is provided to drive an external darlington transistor capable of switching on a fault indicator lamp. An overvoltage or no Stator signal condition activates the lamp output.

The CS3361 is available in a 14 lead SO package.

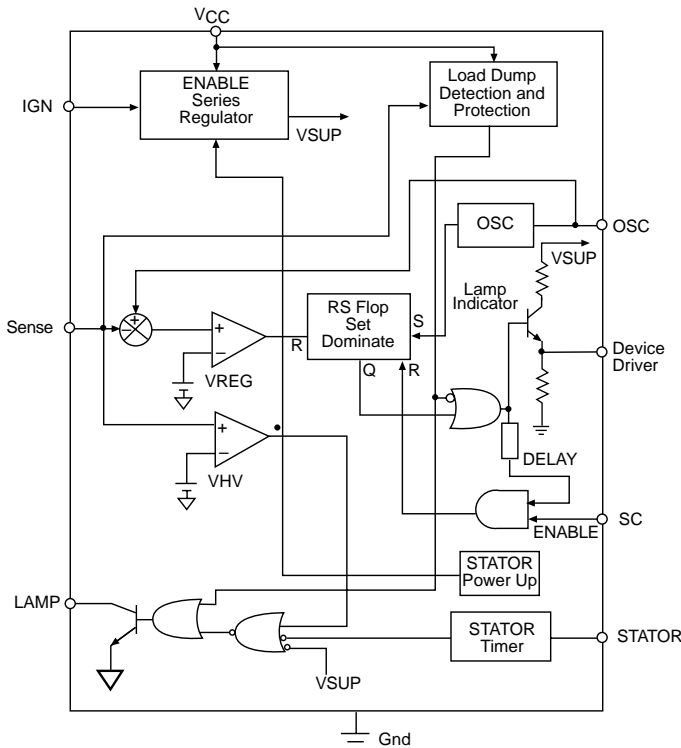
## Features

- Drives Logic Level Power NFET
- 80V Load Dump
- Temperature Compensated Regulation Voltage
- Shorted Field Protection Duty Cycle, Self Clearing

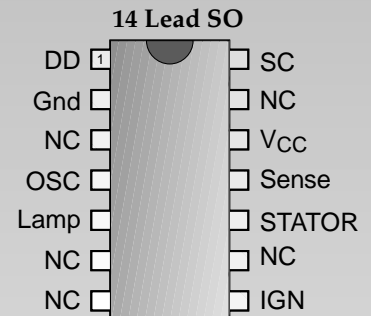
## Absolute Maximum Ratings

Storage Temperature Range .....-55°C to +165°C  
 Junction Temperature Range .....-40°C to +150°C  
 Continuous Supply .....27V  
 I<sub>CC</sub> Load Dump .....400 mA  
 Lead Temperature Soldering  
 Reflow (SMD styles only).....60 sec. max above 183°C, 230°C peak

## Block Diagram



## Package Options



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PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>■ Supply</b>					
Supply Current Enabled		–		10	mA
Supply Current Disabled		–		50	$\mu\text{A}$
<b>■ Driver Stage</b>					
Output High Voltage		5.5		12	V
Output High Current	$V_{DD} = 1.2\text{V}$	-10	-6	-4	mA
Output Low Voltage	$I_{OL} = 25\mu\text{A}$	–		0.35	V
Minimum ON Time	$C_{OSC} = 0.022\mu\text{F}$	200			$\mu\text{s}$
Minimum Duty Cycle		–	6	10	%
Short Circuit Duty Cycle		1		5	%
Field Switch Turn On Rise Time		15		75	$\mu\text{s}$
Fall Time		15		75	$\mu\text{s}$
<b>■ Stator</b>					
Input High Voltage		10			V
Input Low Voltage		–		6	V
Stator Time Out	High to Low	6	100	600	ms
<b>■ Lamp</b>					
Output High Current	$V_{LAMP} @ 3\text{V}$	–		50	$\mu\text{A}$
Output Low Voltage	$I_{LAMP} @ 30\text{mA}$	–		0.35	V
<b>■ Ignition</b>					
Input High Voltage	$I_{CC} > 1\text{mA}$	1.8		–	V
Input Low Voltage	$I_{CC} < 100\mu\text{A}$	–		0.5	V
<b>■ Oscillator</b>					
Oscillator Frequency	$C_{OSC} = 0.022\mu\text{F}$	90		210	Hz
Rise Time/Fall Time	$C_{OSC} = 0.022\mu\text{F}$		17	–	–
Oscillator High Threshold	$C_{OSC} = 0.022\mu\text{F}$	–		4.5	V
<b>■ Battery Sense</b>					
Input Current		-10		+10	$\mu\text{A}$
Regulation Voltage	@ $25^{\circ}\text{C}$ , $R_1 = 100\text{k}\Omega$ , $R_2 = 50\text{k}\Omega$	13.8		15.8	V
Proportional Control		0.10		0.25	V
High Voltage Threshold Ratio	$\frac{V_{\text{High Voltage @ Lamp On}}}{V_{\text{Regulation @ 50% Duty Cycle}}}$	1.083		1.190	
High Voltage Hysteresis		0.020		0.600	V

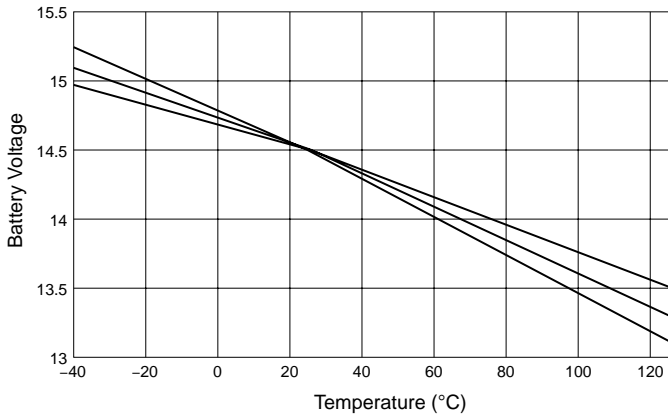
## Package Pin Description

CS3361

PACKAGE PIN #	PIN SYMBOL	FUNCTION
<b>14 Lead SO</b>		
1	Driver	Output driver for external power switch.
2	Gnd	Ground.
3, 6, 7, 9, 13	NC	No connection.
4	OSC	Timing capacitor for oscillator.
5	Lamp	Base driver for lamp driver indicates no stator signal or over-voltage condition.
8	IGN	Switched ignition power up.
10	Stator	Stator signal input for stator timer.
11	Sense	Battery sense voltage regulator comparator input and protection.
12	V <sub>CC</sub>	Supply for IC.
14	SC	Short circuit sensing.

## Typical Performance Characteristics

CS3361 Battery Voltage vs Temperature (°C)  
Over Process Variation





## Package Specification

CS3361

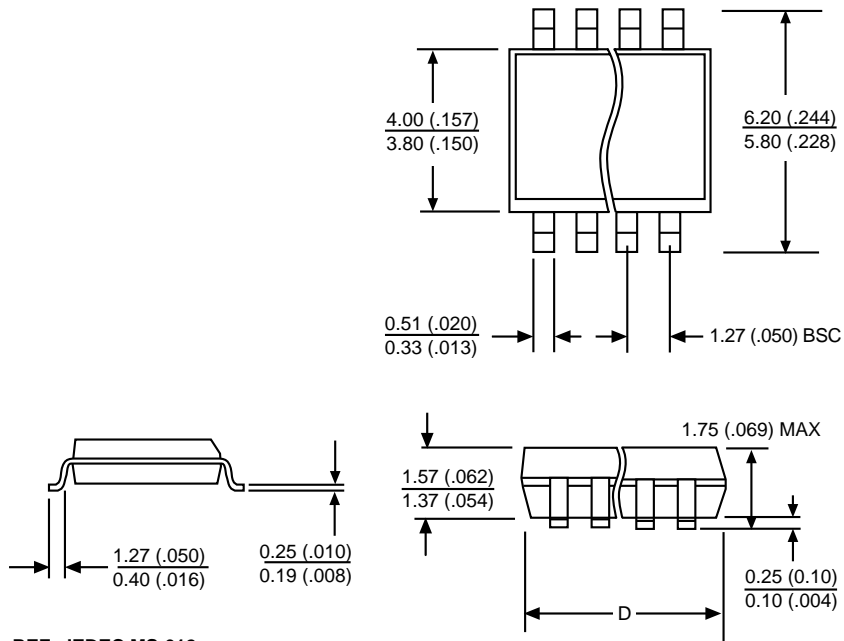
### PACKAGE DIMENSIONS IN mm (INCHES)

Lead Count	D			
	Metric		English	
	Max	Min	Max	Min
14L SO	8.75	8.55	.344	.337

### PACKAGE THERMAL DATA

Thermal Data		14L SO	
$R_{\theta JC}$	typ	30	$^{\circ}C/W$
$R_{\theta JA}$	typ	125	$^{\circ}C/W$

### Surface Mount Narrow Body (D); 150 mil wide



REF: JEDEC MS-012

### Ordering Information

Part Number	Description
CS3361YD14	14L SO
CS3361YDR14	14L SO (tape & reel)

Cherry Semiconductor Corporation reserves the right to make changes to the specifications without notice. Please contact Cherry Semiconductor Corporation for the latest available information.