



Single Coil Predriver

Description

The CS464, Single Coil Predriver, provides interface control for the current through a primary ignition coil. Features include output current control, input negative

edge filtering, stall timing and over-voltage shutdown. The IC is available as a bumped flip-chip or packaged in a 16 lead SO wide package.

Features

- 40mA Driver
- Stall Timing
- Output Clamp
- Overvoltage Shutdown

Absolute Maximum Ratings

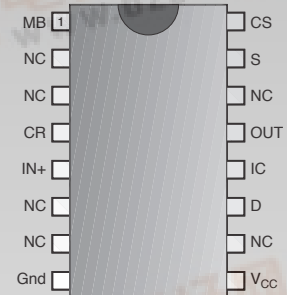
Lead Temperature Soldering

Reflow (SMD styles only).....60 sec. max above 183°C, 230°C peak
 Continuous Power Supply @ V_{BAT} , $-40^{\circ}\text{C} < T_A < 55^{\circ}\text{C}$ 5V to 24V
 Continuous Power Supply @ V_{BAT} , $55^{\circ}\text{C} < T_A < 140^{\circ}\text{C}$6V to 18V
 Frequency5 to 400Hz

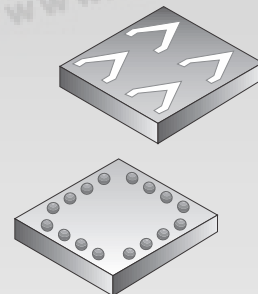
Over the extended ranges of temperature, voltage, and frequency not covered by normal operating conditions, low frequency and run related functions are allowed an additional 20% on specification limits. The degradation shall not be permanent, and upon returning to normal operating conditions shall be within the specification limits. Non-normal "Run Mode" operation is 45 hours cumulative life not exceeding a continuous run time of 10 minutes with a 10 minute "Off" time following each successive operating cycle.

Package Options

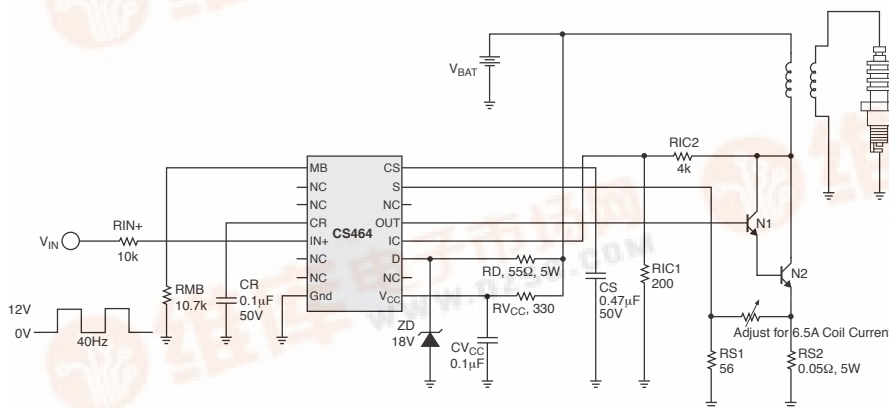
16 Lead SO Wide



Flip-Chip



Application Diagram



Electrical Characteristics: $-30^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$; $-30^{\circ}\text{C} < T_J < 125^{\circ}\text{C}$; All Parameters after V_{CC} Power-up $> 100\text{ms}$;
 $V_{BAT} = 14\text{V}$ unless otherwise specified.

PARAMETER	TEST CONDITIONS	16 Lead SO Wide			Flip Chip			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
■ Input, Current, Delay								
Positive Threshold	$V_{BAT} = 6\text{V}$ $V_{BAT} = 16\text{V}$		56.2 56.2	66 66		56.2 56.2	66 66	% of V_{BAT} % of V_{BAT}
Hysteresis	$V_{BAT} = 6\text{V}$ $V_{BAT} = 16\text{V}$	8 8	20.2 20.2		9 9	20.2 20.2		% of V_{BAT} % of V_{BAT}
I_{CC}	$V_{BAT} = 6\text{V}$ $V_{BAT} = 16\text{V}$	1 5	2.75 12	4.5 19	1 5	2.75 12	4.5 19	mA mA
Input Impedance	@10 μA @0.1mA	70	170	400	70	170	400	k Ω k Ω
IC Process Delay				15			15	μs
■ Output								
Output Current	$V_{BAT} = 6\text{V}$, 2.1V output load	40	52.5	65	40	52.5	65	mA
Output SOA Current	$V_{BAT} = 22\text{V}$ (Note 1)	40	52.5	65	40	52.5	65	mA
Output Leakage Current	$V_{BAT} = 25\text{V}$ (Note 1)		0	100		0	100	μA
Output Clamp Voltage	@ 10mA	13.7	15.35	17	13.7	15.35	17	V
Output Clamp Impedance	@ 10mA	10	42.5	80	10	42.5	80	Ω
■ Regulation Voltage								
VS Regulation Voltage	$V_{BAT} = 7.8\text{V}$	165	200	235	165	200	235	mV
VS Supply Rejection	$V_{BAT} = 6\text{V} \sim 22\text{V}$ (Note 1) $V_{BAT} = 7.8\text{V} \sim 22\text{V}$ (Note 1)	0 0	0 0	14 13	0 0	0 0	14 13	% %
■ Stall & Protection								
Stall Shutdown VS	$V_{BAT} = 6\text{V}$	-5	0	5	-1	0	1	mV
Stall Shutdown Frequency	$V_{BAT} = 14\text{V}$ $V_{BAT} = 5.5\text{V}$.4	1.4	1.47	.4	1.4	1.47	Hz Hz
Stall Shutdown Time	$V_{BAT} = 6\text{V}$	19	28	37	19	28	37	ms
Stall to Spark Output Delay		4.6	6.7	9.5	4.6	6.7	9.5	ms
I/O Signal Relationship	@ 80% Input @ 50% Input @ 30% Input	79.0 49.0 29.0	80.5 50.5 30.5	82.0 52.0 32.0	79.0 49.0 29.0	80.0 50.0 30.0	81.0 51.0 31.0	% % %
Battery Interrupt Time		25		750	25		750	ms
Battery Interrupt Recovery Time	@ 200Hz			800			800	ms
High Voltage Shutdown		25	28	32	25	28	31	V
High Frequency Cut off		1	2.5	5	1	2.5	5	kHz
Negative Threshold	$V_{BAT} = 6\text{V}$ $V_{BAT} = 16\text{V}$	28 28	36 36		30 30	36 36		% of V_{BAT} % of V_{BAT}

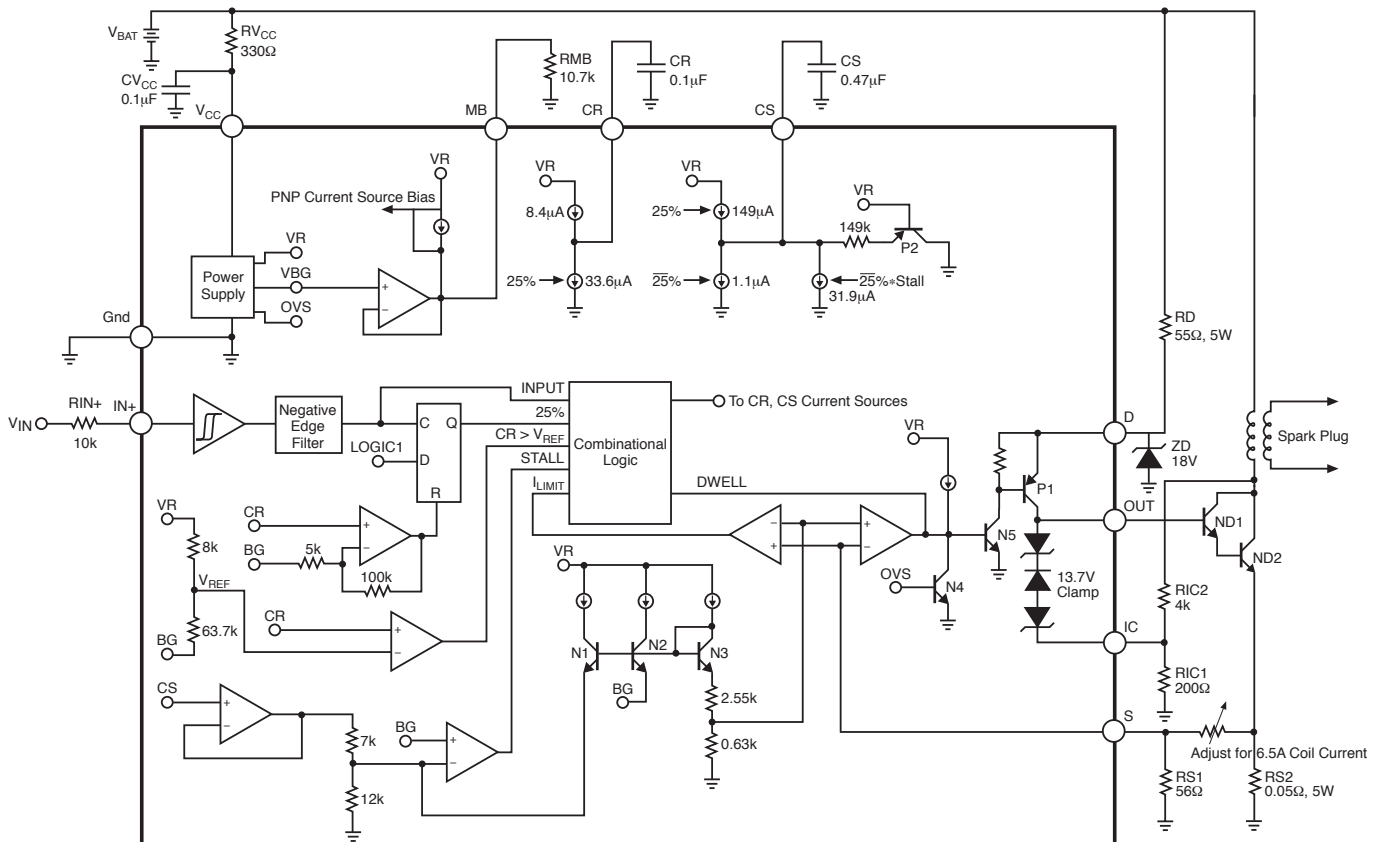
Note 1: Voltage extremes are for testing purposes only. Part in continuous operation should conform to absolute max table.

Package Pin Description

CS464

PACKAGE PIN #	PIN SYMBOL	FUNCTION	
Flip-Chip (Bump #)	16 Lead SO Wide		
1	13	OUT	Output control of darlington driver.
2	15	S	Current sense feedback input.
3	16	CS	Stall timer capacitor.
4	1	MB	Master current bias resistor.
5	2,3,6,7,10,14	NC	No connection.
6	4	CR	Reset capacitor.
7	5	IN+	Input control.
8		IN-	Negative input control (grounded in 16 Lead SO package).
9	8	Gnd	Ground.
10	9	V _{CC}	Input supply voltage.
11	11	D	Darlington drive supply input.
12	12	IC	Input collector voltage sense.
13		TEST	Test bump, grounded.

Block Diagram



Package Specification

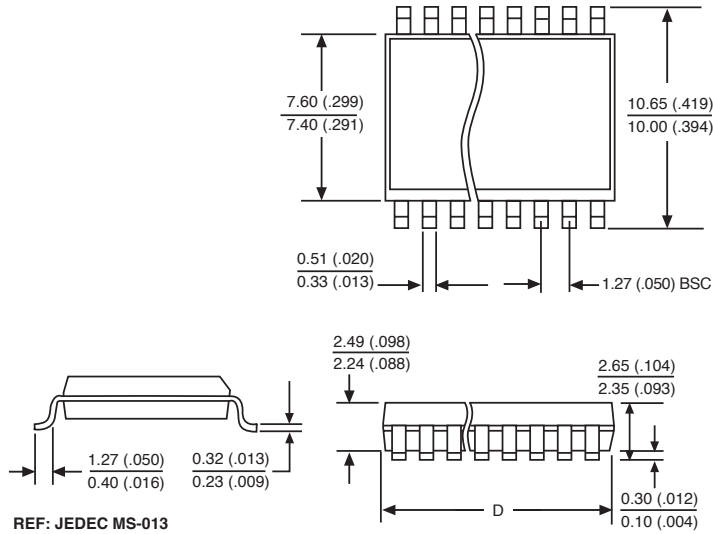
PACKAGE DIMENSIONS IN mm (INCHES)

Lead Count	D			
	Metric		English	
	Max	Min	Max	Min
16 Lead SO Wide	10.50	10.10	.413	.398

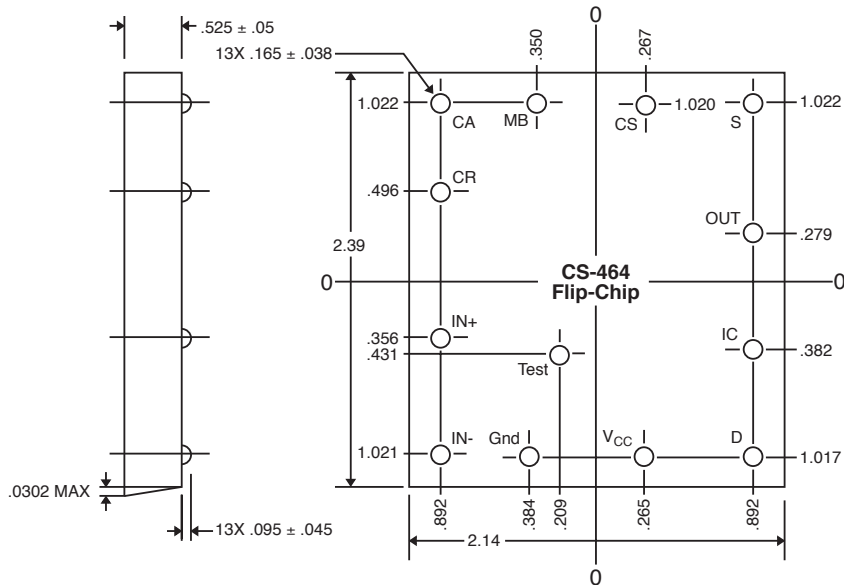
PACKAGE THERMAL DATA

Thermal Data	16 Lead SO Wide		
$R_{\theta JC}$	typ	23	$^{\circ}C/W$
$R_{\theta JA}$	typ	105	$^{\circ}C/W$

Surface Mount Wide Body (DW); 300 mil wide



Flip-Chip



Note: All dimensions in millimeters.

Bump Locations, Bump Side Up

Ordering Information

Part Number	Description
CS464	Flip-Chip
CS464YDW16	16 Lead SO Wide
CS464YDWR16	16 Lead SO Wide (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.