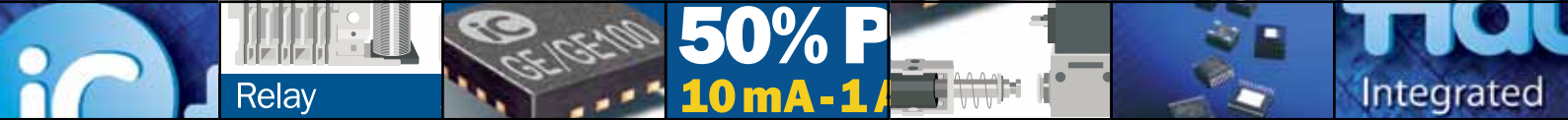


iC-GE / iC-GE100

POWER SAVING PWM SOLENOID DRIVER



iC-GE and iC-GE100 are PWM drivers for inductive loads, such as relays, valves and other inductive actuators.

The setpoints for the coil's energizing and hold current are pre-set by means of external resistors RACT and RHOLD. These currents can be set in a range from 100 mA to 1 A (iC-GE) resp. 10 to 100 mA (iC-GE100).

The drivers intrinsically switch from energizing to hold mode after 50 ms, provided that the energizing current has been reached. A capacitor at TACT prolongs the time before the switching to hold mode occurs (iC-GE only).

The changeover between energizing and hold modes is suitable for typical relays, requiring a powerful initial energizing current, which can then be reduced after closing the air gap in the magnetic circuit.

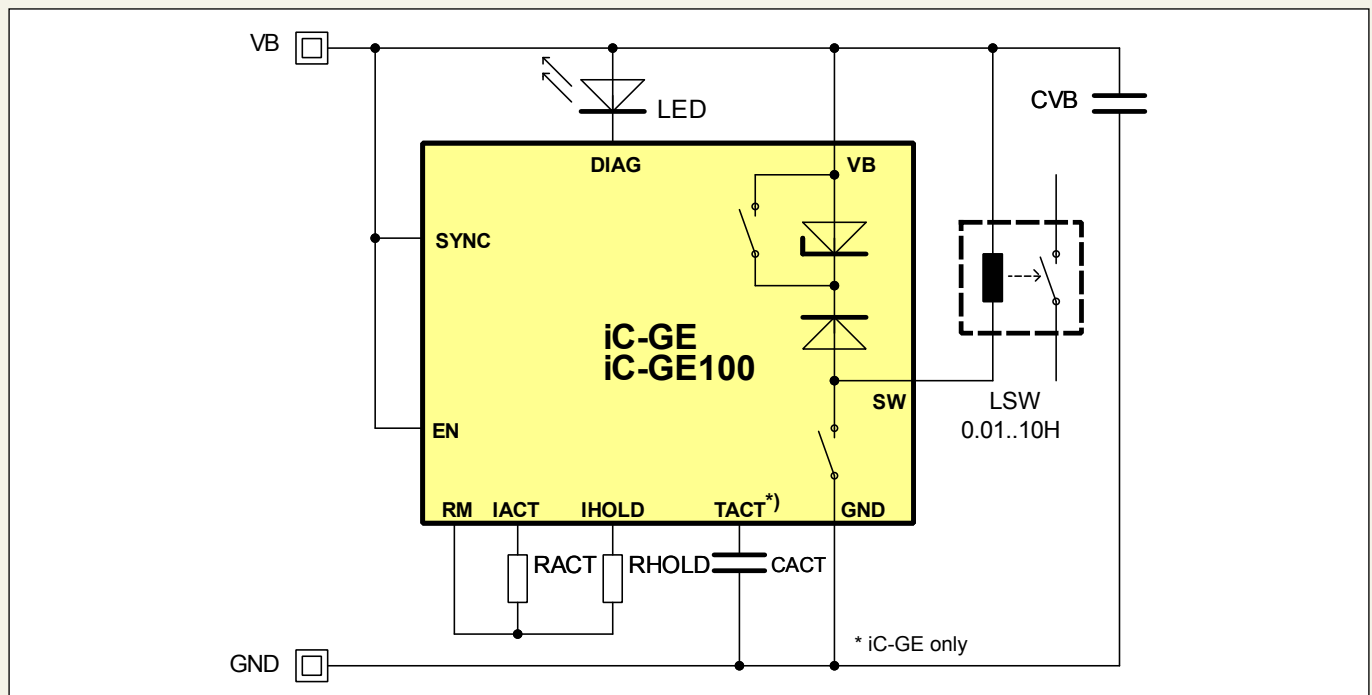
The quadratic dependence on the current means that reducing the current by e.g. 30% reduces the power dissipation by more than 50%.

Applications

- PWM driver for inductive loads (e.g. 6/12 V relays, actuators, electrovalves) from 24 V

Features

- Current control for inductive actuators at 24 V (10 to 36 V)
- High efficient current control up to 1 A (iC-GE100: 100 mA max.)
- Power saving and power dissipation reduced switching
- Individual setting of energizing and hold current
- Energizing time of 50 ms prolongable with external capacitor (iC-GE only)
- Monitoring of coil current, supply voltage and chip temperature
- Status indication via LED or logic output
- Contact preserving zero load switching of relays
- Shutdown with overtemperature and undervoltage
- Fast demagnetising due to 15 V countervoltage
- High PWM frequency with spreading for low EMI



iC-GE / iC-GE100

POWER SAVING PWM SOLENOID DRIVER

The device is shutdown by a Low signal at input EN or the removal of the power supply; the current depletion in the coil is supported by switching the free-wheeling circuit to a higher voltage. To this end a Zener diode is activated for a quicker demagnetising of the coil. The status indicator LED is constantly ON when hold mode is functioning correctly and flashes with low voltage, excessive temperature or when the coil current in energize mode has not reached the setpoint. The driver output is shutdown with low voltage or excessive temperature. Alternatively to using it as an LED output DIAG signals the correct operating by outputting a logic high signal. The input signal at EN can be synchronised with the zero crossing at input SYNC. Thus by using an external R/C network, the switching of the coil can be synchronised with the load current of e.g. a relay.

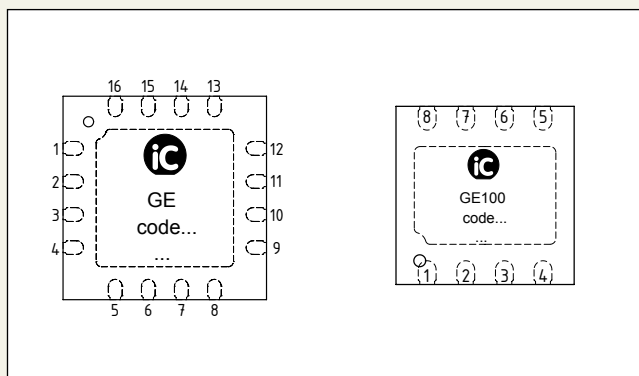
Pin Functions iC-GE

No.	Name	Function
1	EN	Enable Input
2-4	GND	Ground
5-7	SW	PWM Output
8-10	VB	+10...36 V Supply Voltage
11	DIAG	Status Output
12	SYNC	Sync Input
13	RM	Reference Ground for RACT and RHOLD
14	TACT	Energizing Time Prolongation
15	IHOLD	Hold Current Setup
16	IACT	Energizing Current Setup

Pin Functions iC-GE100

No.	Name	Function
1	GND	Ground
2	SW	PWM Output
3	VB	+10...36 V Supply Voltage
4	IHOLD	Hold Current Setup
5	IACT	Energizing Current Setup
6	DIAG	Status Output
7	SYNC	Sync Input
8	EN	Enable Input

Pin Configuration QFN16-4x4 / DFN8-3x3



Key Specifications

Total Device	
Permissible Supply Voltage Range	10 ... 36 V

Driver Output SW	
PWM-Current Range	
iC-GE	100 ... 1000 mA
iC-GE100	10 ... 100 mA

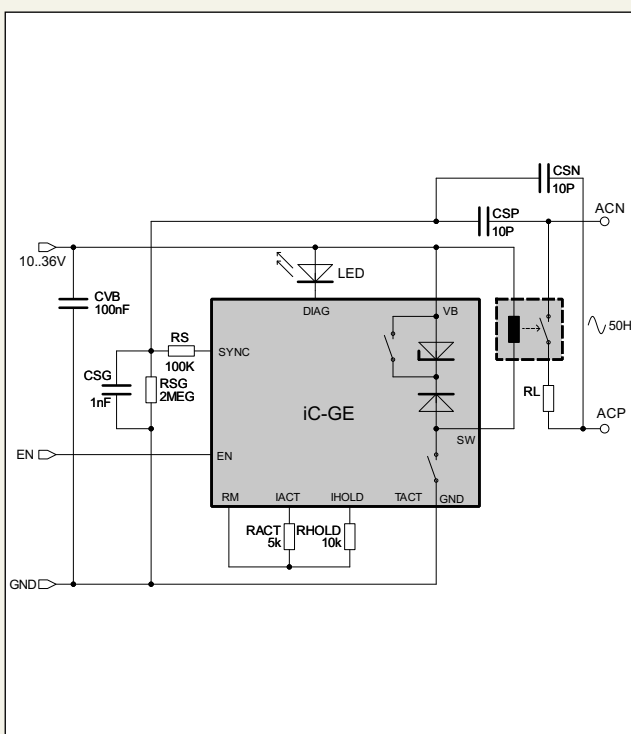
Status Monitor DIAG	
Frequency on Error	typ. 2.4 Hz
Thermal Shutdown Temperature	140 ... 170 °C

Reference IACT and IHOLD	
Reference Voltage at IACT and IHOLD	typ. 1.27
Transfer Value for Energizing Current $RACT = K1 / I(SW)_{act}$	typ. 5000
Transfer Value for Hold Current $RHOLD = K2 / I(SW)_{hold}$	typ. 5000

Energizing Time Prolongation TACT	
Propagation Delay from EN = hi to changeover from IACT to IHOLD TACT not connected	typ. 50 ms
Energizing Time Prolongation (iC-GE only) $tp_{PWM} = tp_{PWMlo} + K3 * CACT$	typ. 1 ms/nF

Oscillator	
Mean Oscillator Frequency	typ. 80 kHz
Frequency Variation	12 ... 15%

Application Example



This preliminary information is not tantamount to a guarantee of device characteristics. All rights to technical changes reserved.