

# Automotive Electronics

## Product Information

### CR665 – Alternator Regulator with LIN-Interface



**BOSCH**  
Invented for life



#### Customer benefits:

- ▶ Fully integrated alternator regulator
- ▶ LIN single wire bi-directional interface to motor control unit
- ▶ Advanced load response behavior
- ▶ Small TO220-5 package or tiny bare die
- ▶ TO220-5 ready for welding
- ▶ Compliant to VDA (German Car Makers Association) alternator regulator standard
- ▶ Customer end of line programming options exceed VDA, ready for worldwide application

#### Functions to protect alternator and battery:

- ▶ Emergency start via V pin and default operation if COM (LIN) pin is disconnected or shorted to B+ or GND
- ▶ Continuous B+ measurement and appropriate response
- ▶ Power stage shutdown at extreme temperature
- ▶ Short circuit protection on COM and DF power stage

#### Features

- ▶ Precise voltage control of 14V automotive synchronous alternators
- ▶ High-side DMOS regulates dynamo field (DF) by fixed frequency PWM
- ▶ Full DF duty cycle range 0% to 100%, no compromise
- ▶ Integrated active freewheeling MOSFET on DF
- ▶ Applicable for any pole pair count. 6, 7 and 8 as default
- ▶ Voltage set point trimmed in production
- ▶ Examples for LIN communication in operation:
  - Write: Set voltage, excitation current limitation, speed thresholds, load response parameters, behavior at high temperature
  - Read: Filtered duty cycle, excitation current, various internal measurement values and status flags
- ▶ Examples for customer end of line programming:
  - ID, defaults for functions like load response, offsets
- ▶ Active handling of load dump and over-voltage
- ▶ Very low stand-by current
- ▶ No data loss down to 4V
- ▶ Accepts jump start with 28V
- ▶  $\pm 8\text{kV}$  ESD handling robustness on all pins (HBM)

#### Communication features:

- ▶ LIN2.1 conformant physical interface to MCU
- ▶ LIN2.1 and LIN 1.3 compatible data link layer
- ▶ Customer end of line programming via COM pin

#### TO220-5 package pin list

Pin		Function
1	DF+	Dynamo field high side driver
2	B+	Battery
3	GND	Alternator ground terminal
4	COM	LIN communication terminal
5	V	Alternator phase terminal

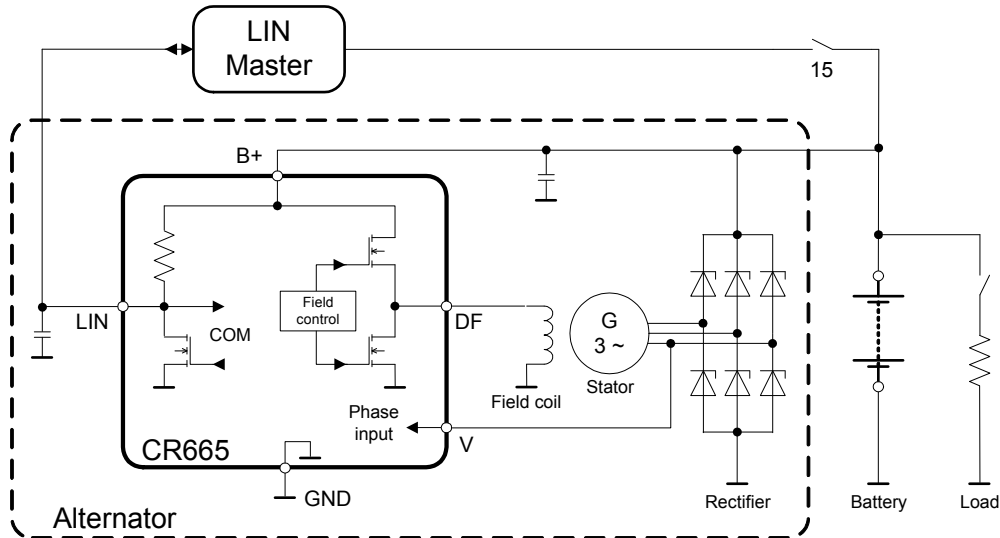
TO220-5 package from top



Key parameters

Parameter			min	max
Voltage set range by LIN	V <sub>SET</sub>	V	10.6	16
Voltage set 4 step default	V <sub>SET</sub>	V	13.7	14.6
Operating supply voltage	V <sub>B+</sub>	V	6.5	18
Supply with no data loss	V <sub>B+</sub>	V	4	37
Transient over-voltage t<0.5s	V <sub>B+</sub>	V		57
Field driver on-resistance typ. at 25°C / 8A	R <sub>on</sub>	mΩ		70
Standby current typ. incl. power stages	I <sub>STBY</sub> Y	μA		100
Load resp. cut-off range Option:always on	n <sub>LR</sub>	rpm	2400	8000
DF duty cycle range		%	0	100

Application Diagram



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