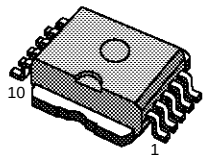
SGS-THOMSON MICROELECTRONICS

# VB921ZVSP

## HIGH VOLTAGE IGNITION COIL DRIVER POWER IC

**ADVANCE DATA**

- NO EXTERNAL COMPONENT REQUIRED
- INTEGRATED HIGH VOLTAGE CLAMP
- COIL CURRENT LIMIT INTERNALLY SET
- HIGH RUGGEDNESS



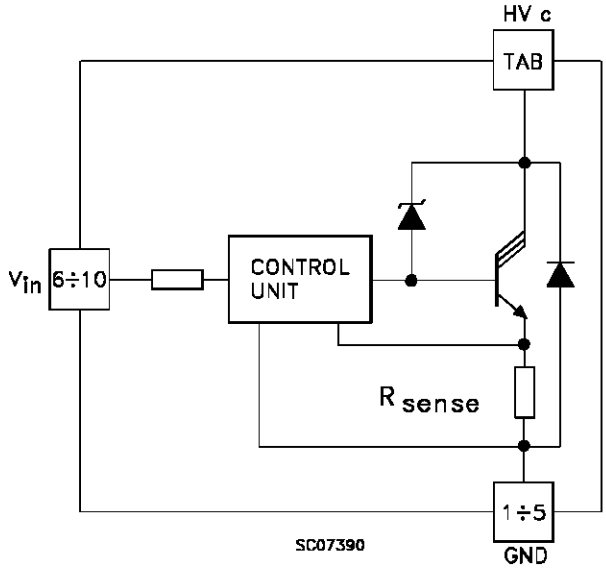

**Power SO-10™**

### DESCRIPTION

The VB921ZVSP is a monolithic high voltage integrated circuits made using SGS-THOMSON Microelectronics Vertical Intelligent Power Technology, which combines a vertical current flow power trilinton with a coil current limiting circuit and a collector voltage clamping.

The device is peculiarly suitable for application in high performance electronic car ignition, where coil current limitation and voltage clamping are required.

### INTERNAL SCHEMATIC DIAGRAM



## ABSOLUTE MAXIMUM RATING

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $HV_c$ | Collector Voltage | Internally Limited | V |
| $V_{in}$ | Maximum Input Voltage | 8 | V |
| $I_c$ | Collector Current | Internally Limited | A |
| $I_{in}$ | Input Current | 20 | mA |
| $P_{tot}$ | Total Dissipation at $T_c$ = 25 °C | 100 | W |
| $T_{stg}$ | Storage Temperature | -40 to 150 | °C |
| $T_j$ | Operating Junction Temperature | -40 to150 | °C |

## THERMAL DATA

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{thj\text{-}case}$ | Thermal Resistance Junction-case | Max | 1.25 | °C/W |
| $R_{thj\text{-}amb}$ | Thermal Resistance Junction-ambient | Max | 62.5 | °C/W |

## ELECTRICAL CHARACTERISTICS ($V_{batt}$ = 12 V, $T_{case}$ = 25 °C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{cgo}$ | Collector Cut-off Current | $V_{in}$ = 0 $HV_c$ = 250 V | | | 250 | µA |
| $V_{cl}$ * | Clamping Voltage | -40 < $T_j$ < 125 °C | 300 | | 400 | V |
| $V_{cg(sat)}$ | Power Stage Saturation Voltage | $I_c$ = 6 A $I_{in}$ = 10 mA | | | 2.5 | V |
| $I_{cl}$ * | Coil Current Limit | $V_{in}$ = 5 V -40 ≤ $T_j$ ≤ 125 °C see note 1 | 6.5 | 7 | 7.5 | A |
| $I_{in}$ | Input Current | | 8 | | | mA |
| $V_f$ ** | Diode Forward Voltage | $I_f$ = 10 A | | | 2.5 | V |
| $V_{in}$ | Input Voltage | | 4.5 | | 5.5 | V |
| $\Delta I_{cl}$ | Coil Current Variation in Respect to $V_{in}$ = 5 V | $V_{in}$ = 4.5 - 5.5 V | | | 200 | mA |

* Coil data: primary resistance $R_c$ = 0.4 - 0.8 Ω, primary inductance $L_c$ = 6 - 8 mH

** Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %

NOTE 1: $I_{cl}$ is also controlled in respect to the variation of $V_{in}$ between 0.5 to 5.5 V

## Power SO-10 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 3.45 | 3.5 | 3.55 | 0.135 | 0.137 | 0.140 |
| B | | 1.28 | 1.30 | | 0.050 | 0.051 |
| C | | | 0.15 | | | 0.006 |
| D | 9.40 | 9.50 | 9.60 | 0.370 | 0.374 | 0.378 |
| E | 4.98 | 5.08 | 5.48 | 0.196 | 0.200 | 0.216 |
| E1 | 0.40 | 0.45 | 0.60 | 0.016 | 0.018 | 0.024 |
| E2 | 1.17 | 1.27 | 1.37 | 0.046 | 0.050 | 0.054 |
| F | 9.30 | 9.40 | 9.50 | 0.366 | 0.370 | 0.374 |
| F1 | 7.95 | 8.00 | 8.15 | 0.313 | 0.315 | 0.321 |
| G | 7.40 | 7.50 | 7.60 | 0.291 | 0.295 | 0.299 |
| H | 6.80 | 6.90 | 7.00 | 0.267 | 0.417 | 0.421 |
| I | | 0.10 | | | 0.004 | |
| K | 13.80 | 14.10 | 14.40 | 0.543 | 0.555 | 0.567 |
| L | | 0.40 | 0.50 | | 0.016 | 0.020 |
| M | 1.60 | 1.67 | 1.80 | 0.063 | 0.066 | 0.071 |
| N | 0.60 | 0.08 | 1.00 | 0.024 | 0.031 | 0.039 |