



**VB922**

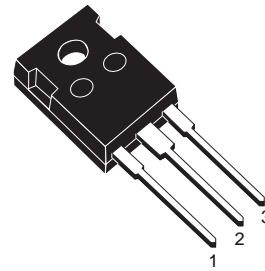
## HIGH VOLTAGE IGNITION COIL DRIVER POWER IC

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

### DESCRIPTION

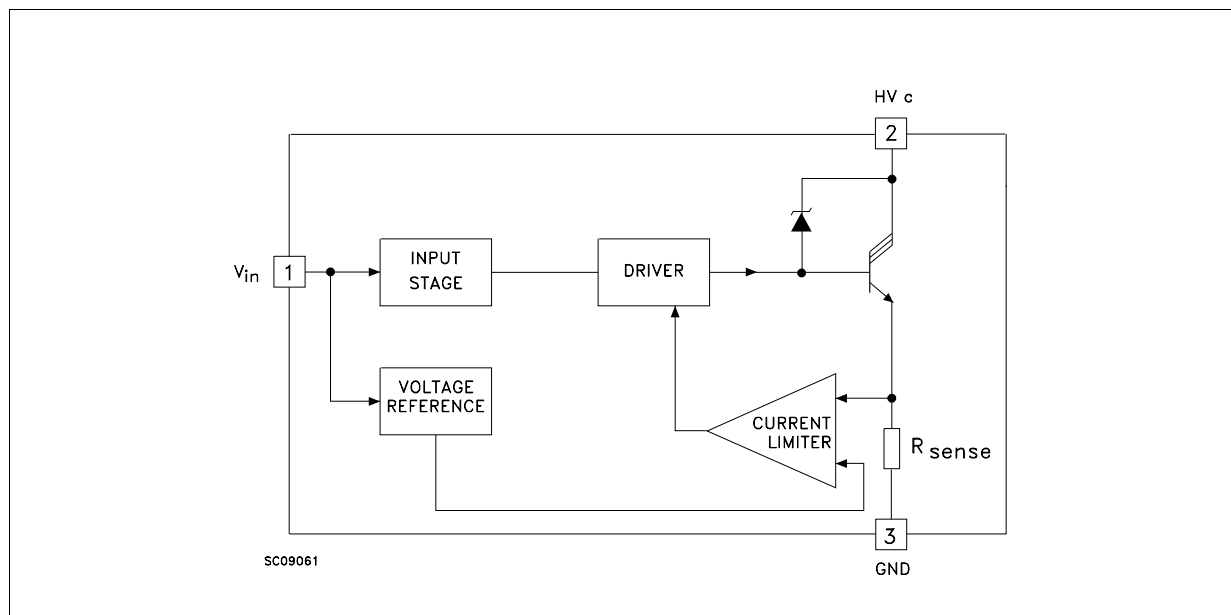
The VB922 is a monolithic high voltage integrated circuits made using STMicroelectronics VIPower Technology, which combines a vertical current flow power trilinton with a coil current limiting circuit and a collector voltage clamping.

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



**TO-247**

### BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATING

| Symbol    | Parameter   | Value              | Unit             |
|-----------|---|--------------------|------------------|
| $HV_c$    | Collector Voltage                                     | Internally Limited | V                |
| $I_c$     | Collector Current                                     | Internally Limited | A                |
| $I_{in}$  | Input Current   | 40                 | mA               |
| $P_{tot}$ | Total Dissipation at $T_c = 25\text{ }^\circ\text{C}$ | 150                | W                |
| $T_{stg}$ | Storage Temperature                                   | -40 to 150         | $^\circ\text{C}$ |
| $T_j$     | Operating Junction Temperature                        | -40 to 150         | $^\circ\text{C}$ |
| $E_{s/b}$ | Avalanche Energy                                      | 350                | mJ               |

## THERMAL DATA

| Symbol         | Parameter                           | Value    | Unit                      |
|----------------|-------------------------------------|----------|---------------------------|
| $R_{thj-case}$ | Thermal Resistance Junction-case    | Max 0.83 | $^\circ\text{C}/\text{W}$ |
| $R_{thj-amb}$  | Thermal Resistance Junction-ambient | Max 30   | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS ( $V_{batt} = 14\text{ V}$ , HEI Coil = xx,  $T_{case} = 25\text{ }^\circ\text{C}$ )

unless otherwise specified)

| Symbol        | Parameter                      | Test Conditions  | Min.       | Typ.       | Max.       | Unit          |
|---------------|--------------------------------|--|------------|------------|------------|---------------|
| $I_{cgo}$     | Collector Cut-off Current      | $V_{in} = 0$ $HV_c = 200\text{ V}$   |            |            | 250        | $\mu\text{A}$ |
| $V_{cl}$      | Clamping Voltage               | $-40 < T_j < 125\text{ }^\circ\text{C}$ $I_c = 5\text{ A}$   | 350        | 400        | 500        | V             |
| $V_{cg(sat)}$ | Power Stage Saturation Voltage | $I_c = 5\text{ A}$ $V_{in} = 4\text{ V}$   |            | 2          | 2.5        | V             |
| $I_{cl}^*$    | Coil Current Limit             | $50 \leq T_j \leq 150\text{ }^\circ\text{C}$<br>$-30 \leq T_j \leq 50\text{ }^\circ\text{C}$           | 6.7<br>6.4 | 7.3<br>7.3 | 7.9<br>8.1 | A             |
| $V_f^{**}$    | Diode Forward Voltage          | $I_f = 10\text{ A}$  |            |            | 3.5        | V             |
| $V_{inCL}$    | Input Voltage During On State  | $-30 \leq T_j \leq 120\text{ }^\circ\text{C}$ $I_c = 5\text{ A}$<br>$I_{in} = 10\text{ mA}$ see note 1 |            |            | 4          | V             |
| $V_{inTH}$    | Threshold Input Voltage        | $-30 \leq T_j \leq 120\text{ }^\circ\text{C}$ $I_c = 5\text{ A}$<br>see note 2                         | 0.5        |            | 4          | V             |
| $t_{d(off)}$  | Switching Time                 | $I_c = 3\text{ A}$ $L = 6\text{ mH}$ (see fig.1)   | 15         |            | 40         | $\mu\text{s}$ |

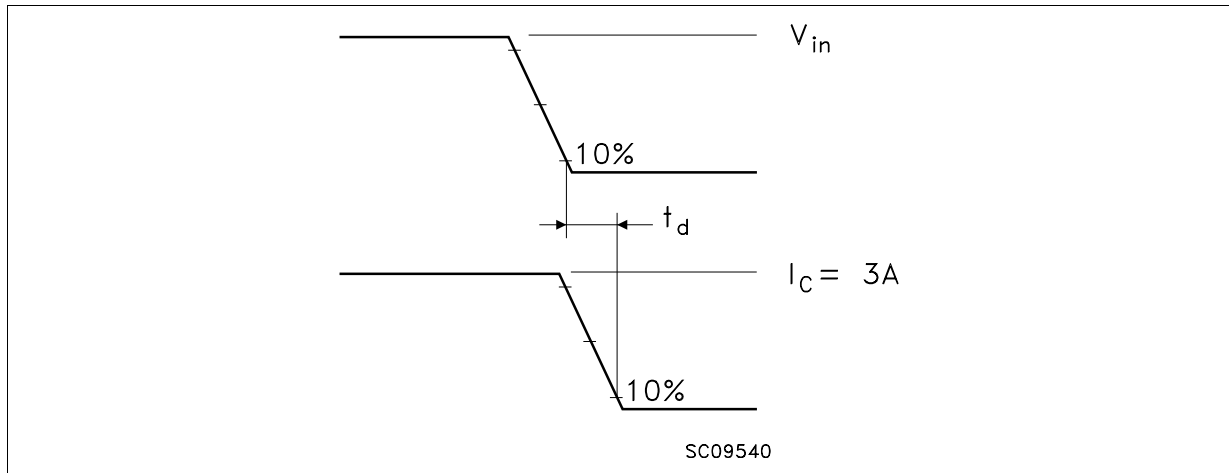
\*  $I_{CL}$  is measured 1ms after the maximum peak

\*\* Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle 1.5 %

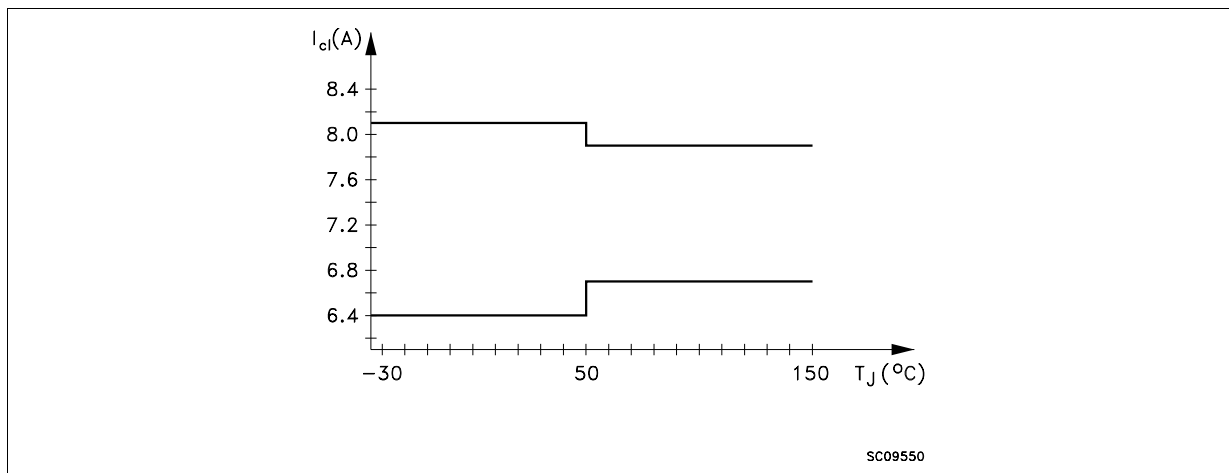
**Note 1:** After adjusting input signal (frequency and duty) to be  $I_c = 5\text{ A}$ ,  $V_{in}$  (Tr ON) should be measured.

**Note 2:** The device is biased with 14V on collector with respect to emitter. Then a voltage ramp (0 to 5V) is put on input.  $V_{inTH}$  is the input voltage when the device is in on-state with  $I_c=5\text{ A}$

**Fig. 1** Switching Time

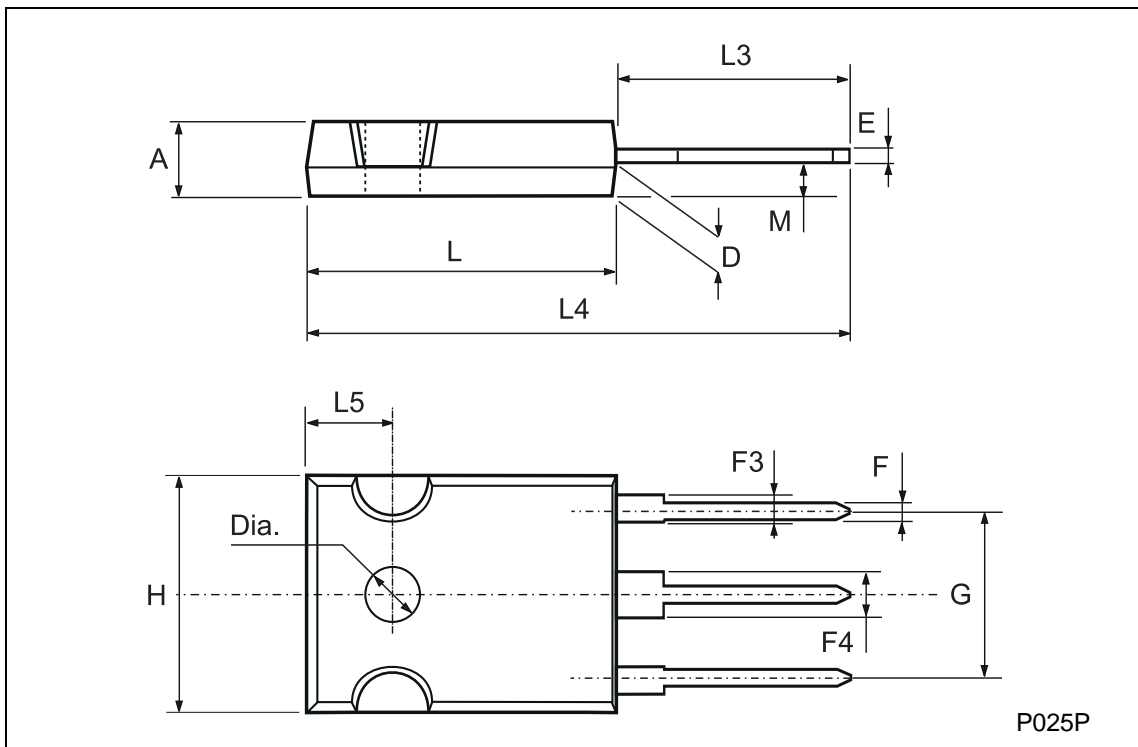


**Fig. 2** Coil Current Limit Spread



**TO-247 MECHANICAL DATA**

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 4.7  |      | 5.3  | 0.185 |       | 0.209 |
| D    | 2.2  |      | 2.6  | 0.087 |       | 0.102 |
| E    | 0.4  |      | 0.8  | 0.016 |       | 0.031 |
| F    | 1    |      | 1.4  | 0.039 |       | 0.055 |
| F3   | 2    |      | 2.4  | 0.079 |       | 0.094 |
| F4   | 3    |      | 3.4  | 0.118 |       | 0.134 |
| G    |      | 10.9 |      |       | 0.429 |       |
| H    | 15.3 |      | 15.9 | 0.602 |       | 0.626 |
| L    | 19.7 |      | 20.3 | 0.776 |       | 0.779 |
| L3   | 14.2 |      | 14.8 | 0.559 | 0.413 | 0.582 |
| L4   |      | 34.6 |      |       | 1.362 |       |
| L5   |      | 5.5  |      |       | 0.217 |       |
| M    | 2    |      | 3    | 0.079 |       | 0.118 |
| Dia  | 3.55 |      | 3.65 | 0.140 |       | 0.144 |



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