



## VB927T

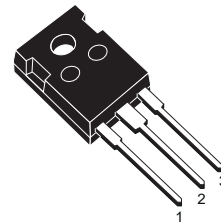
# HIGH VOLTAGE IGNITION COIL DRIVER POWER I.C.

| TYPE   | $V_{cl}$ | $I_{cl}$ | $V_{cg(sat)}$ |
|--------|----------|----------|---------------|
| VB927T | 380V     | 9.5A     | 2.5V          |

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

### DESCRIPTION

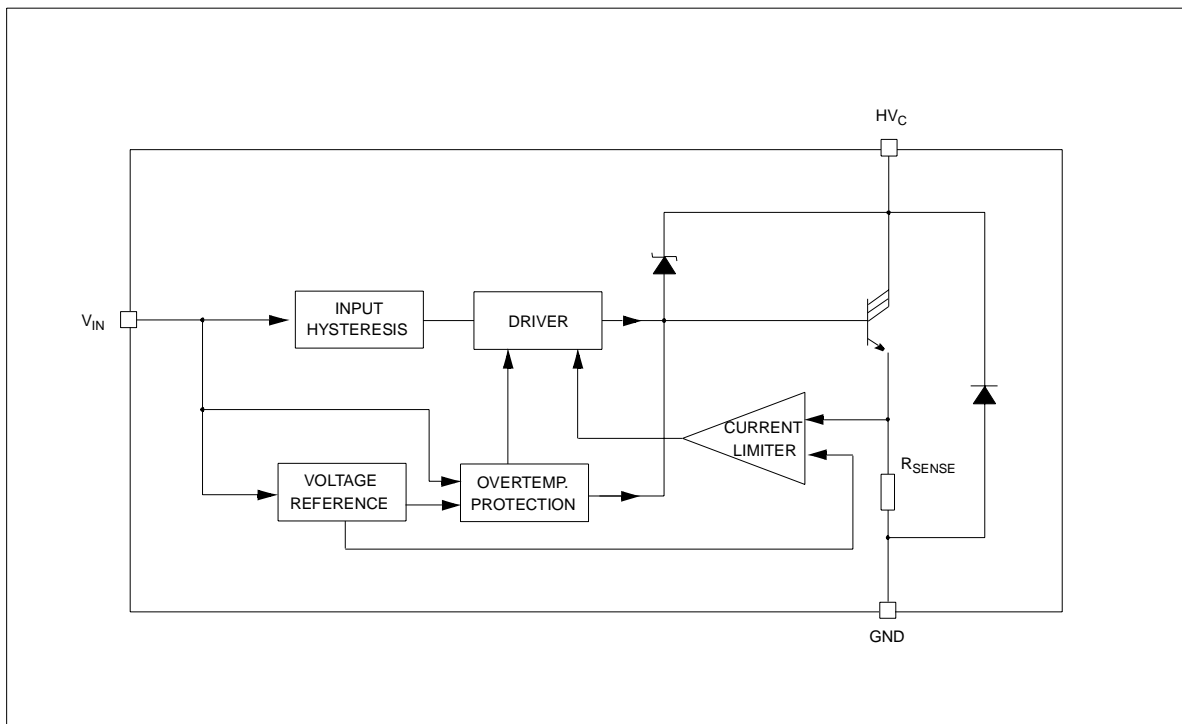
The VB927T is a monolithic high voltage integrated circuit made by using the STMicroelectronics VIPower™ technology, which combines vertical current flow power trilinton with a coil current and a collector voltage clamping. The device is particularly suitable for application in high performance electronic car ignition, where coil current limitation and voltage clamping are required.



TO-247

| ORDER CODES |        |     |
|-------------|--------|-----|
| PACKAGE     | TUBE   | T&R |
| TO-247      | VB927T | -   |

### BLOCK DIAGRAM

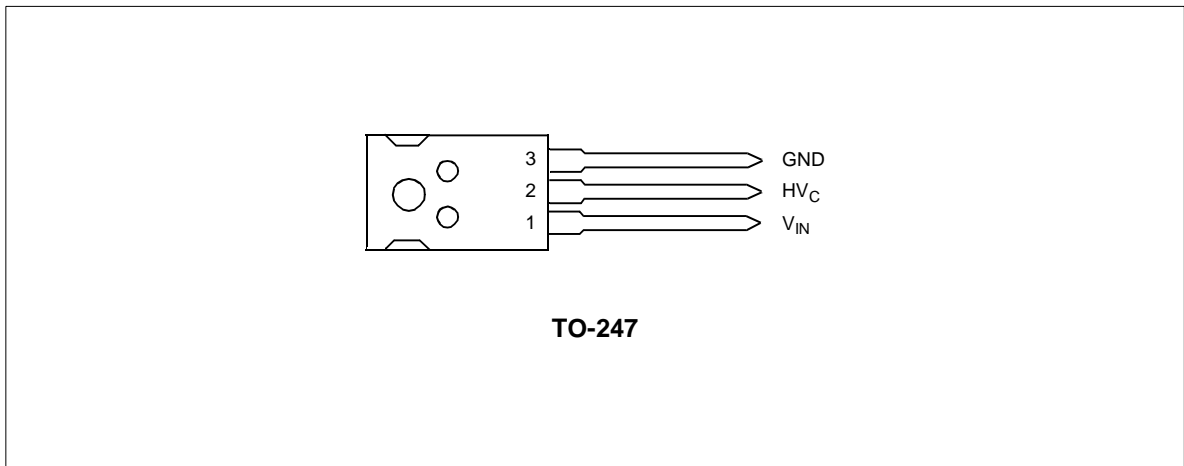


## VB927T

### ABSOLUTE MAXIMUM RATING

| Symbol    | Parameter                              | Value              | Unit        |
|-----------|--|--------------------|-------------|
| $HV_C$    | Collector Voltage                      | Internally limited | V           |
| $V_{IN}$  | Maximum Input Voltage                  | 15                 | V           |
| $I_C$     | Collector Current                      | Internally limited | A           |
| $I_{IN}$  | Input Current                          | Internally limited | mA          |
| $P_{tot}$ | Total Dissipation At $T_C=25^{\circ}C$ | 150                | W           |
| $T_{stg}$ | Storage Temperature                    | -40 to 150         | $^{\circ}C$ |
| $T_j$     | Junction Operating Temperature         | -40 to 150         | $^{\circ}C$ |

### CONNECTION DIAGRAM



## THERMAL DATA

| Symbol         | Parameter                                 | Value | Unit |
|----------------|---|-------|------|
| $R_{thj-case}$ | Thermal Resistance Junction-case (MAX)    | 0.6   | °C/W |
| $R_{thj-amb}$  | Thermal Resistance Junction-ambient (MAX) | 30    | °C/W |

ELECTRICAL CHARACTERISTICS ( $V_{CC}=14V$ ;  $-40V < T_j < 125^\circ C$  unless otherwise specified)

| Symbol         | Parameter                      | Test Conditions   | Min | Typ | Max | Unit    |
|----------------|--------------------------------|---|-----|-----|-----|---------|
| $I_{leak}$     | Collector Cut-off Current      | $V_{IN}=0V$ ; $HV_C=250V$   |     |     | 250 | $\mu A$ |
| $V_{cl} (*)$   | Clamping Voltage               | $-40^\circ C < T_j < 125^\circ C$                                 | 380 | 420 | 490 | V       |
| $V_{cg(sat)}$  | Power Stage Saturation Voltage | $I_C=5A$ ; $I_{IN}=10mA$ ; $25^\circ C \leq T_j \leq 125^\circ C$ |     |     | 2.5 | V       |
|                |                                | $I_C=6A$ ; $I_{IN}=10mA$ ; $-40^\circ C \leq T_j \leq 25^\circ C$ |     |     | 3   | V       |
| $I_{cl} (*)$   | Coil Current Limit             | $V_{IN}=5V$ ; $-40^\circ C \leq T_j \leq 125^\circ C$             | 8.5 |     | 9.5 | A       |
| $I_{IN}$       | Input Current                  | $V_{IN}=5V$ ; $I_C=5A$  |     |     | 10  | mA      |
|                |                                | $V_{IN}=5V$ ; $I_C=5A$ ; $T_j=25^\circ C$                         | 3   |     | 10  | mA      |
| $V_f (**)$     | Diode Forward Voltage          | $I_f=10A$ ; $T_j=25^\circ C$                                      | 1.2 | 2.2 | 3.2 | V       |
| $V_{INH}$      | Input Voltage (ON)             | On state input threshold  | 3.2 |     | 3.6 | V       |
| $V_{INL}$      | Input Voltage (OFF)            | Off state input threshold   | 3   |     | 3.4 | V       |
| $V_{IN(hyst)}$ | Input Voltage (Hyst.)          |   | 0.2 |     | 0.6 | V       |
| $t_{d(off)}$   | Turn-off Time                  | $I_C=5A$  |     | 30  |     | $\mu s$ |
| $T_j$          | Junction Temperature Limit     | See note 1  | 150 |     |     | °C      |

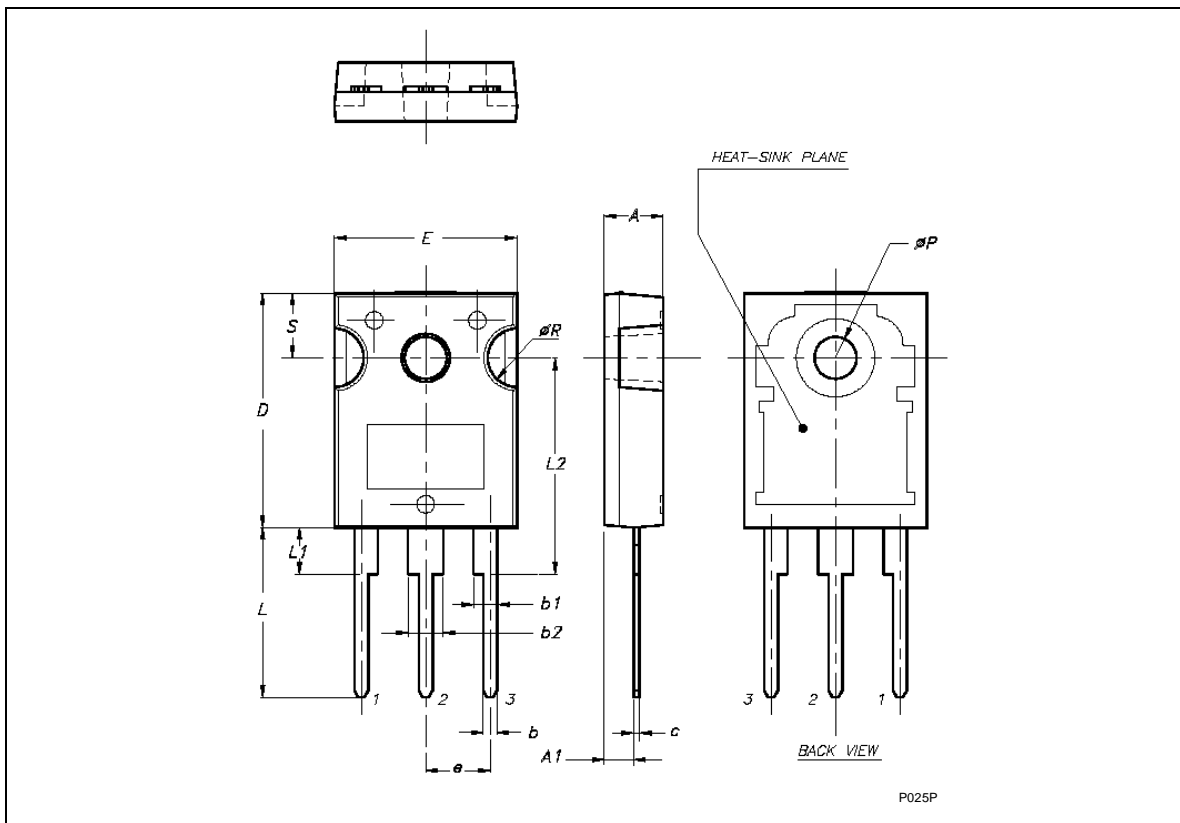
(\*) Coil data: primary resistance  $R_C=0.4 - 0.8\Omega$ ; primary inductance  $L_C=6 - 8 mH$

(\*\*) Pulsed: Pulse duration =300 $\mu s$ , duty cycle 1.5%

Note 1:  $T_{jmin}=150^\circ C$  means that the behavior of the device will not be affected for junction temperature lower than 150°C. For higher temperature, the thermal protection circuit will begin its action reducing the  $I_{cl}$  limit according with the power dissipation. Chip temperature is a function of the  $R_{th}$  of the whole system in which the device will be operating.

**TO-247 MECHANICAL DATA**

| DIM.           | mm.      |       |       |
|----------------|----------|-------|-------|
|                | MIN.     | TYP   | MAX.  |
| A              | 4.85     |       | 5.15  |
| A1             | 2.20     |       | 2.60  |
| b              | 1.0      |       | 1.40  |
| b1             | 2.0      |       | 2.40  |
| b2             | 3.0      |       | 3.40  |
| c              | 0.40     |       | 0.80  |
| D              | 19.85    |       | 20.15 |
| E              | 15.45    |       | 15.75 |
| e              |          | 5.45  |       |
| L              | 14.20    |       | 14.80 |
| L1             | 3.70     |       | 4.30  |
| L2             |          | 18.50 |       |
| ØP             | 3.55     |       | 3.65  |
| ØR             | 4.50     |       | 5.50  |
| S              |          | 5.50  |       |
| Package Weight | Gr. 4.43 |       |       |



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