



# VB921ZVFI VB921ZVSP

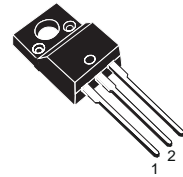
## HIGH VOLTAGE IGNITION COIL DRIVER POWER I.C.

TYPE	V <sub>cl</sub>	I <sub>cl</sub>	V <sub>cg(sat)</sub>
VB921ZVFI	340V	7.5A	2.5V
VB921ZVSP			

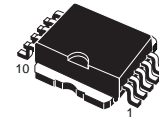
- NO EXTERNAL COMPONENT REQUIRED
- INTEGRATED HIGH VOLTAGE CLAMP
- COIL CURRENT LIMIT INTERNALLY SET
- HIGH RUGGEDNESS

### DESCRIPTION

The VB921ZVFI, VB921ZVSP is a monolithic high voltage integrated circuit made using the STMicroelectronics VIPower™ M1-2 technology, which combines a vertical current flow power triline with a coil current limiting circuit 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.



ISOWATT220



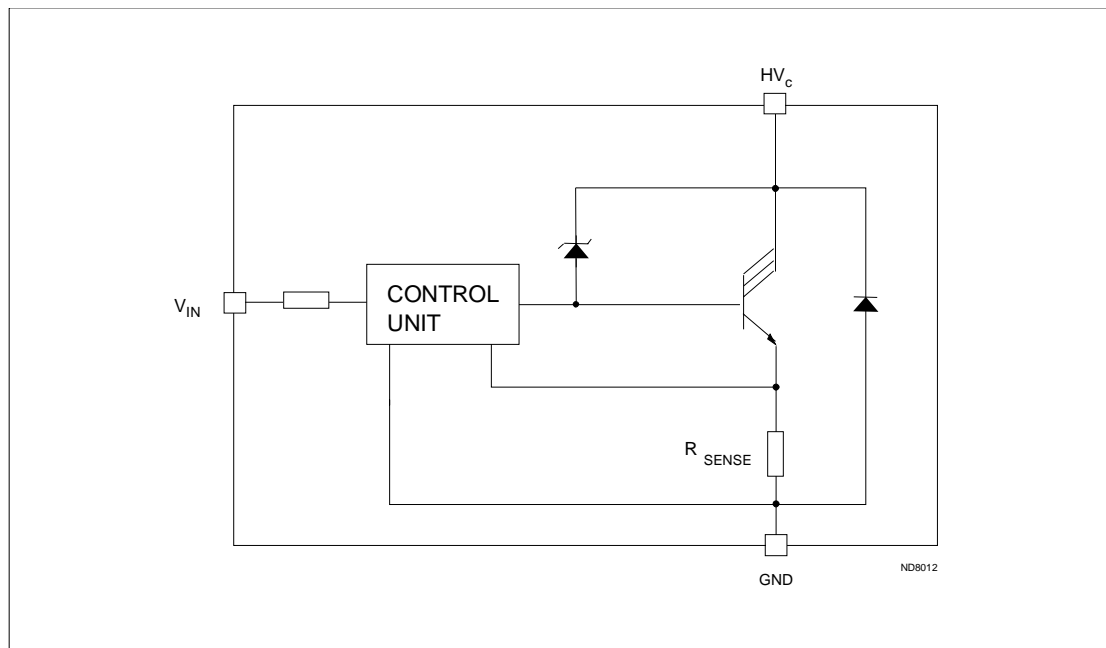
PowerSO-10™

### ORDER CODES:

ISOWATT220  
POWERSO-10™

VB921ZVFI  
VB921ZVSP

### BLOCK DIAGRAM



## VB921ZVFI / VB921ZVSP

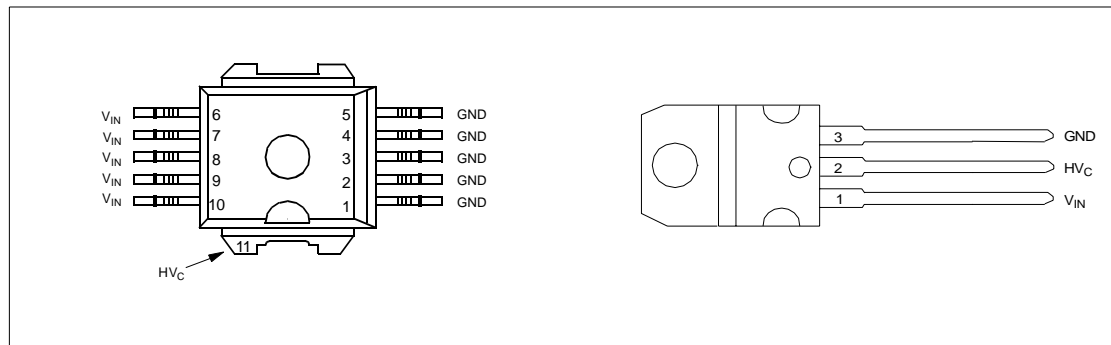
### ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value		Unit
		ISOWATT220	PowerSO-10	
$HV_C$	Collector Voltage	Internally limited		V
$I_C$	Collector Current	Internally limited		A
$V_{IN}$	Maximum Input Voltage	8		V
$I_{IN}$	Input current	10		mA
$P_{tot}$	Total dissipation at $T_C=25^\circ\text{C}$	40	100	W
$T_j$	Junction operating temperature	- 40 to 150		$^\circ\text{C}$
$T_{stg}$	Storage temperature	- 40 to 150		$^\circ\text{C}$

### THERMAL DATA

Symbol	Parameter		Value		Unit
			ISOWATT220	PowerSO-10	
$R_{thj-case}$	Thermal resistance junction-case	(MAX)	3.12	1.25	$^\circ\text{C}/\text{W}$
$R_{thj-amb}$	Thermal resistance junction-ambient	(MAX)	62.5	62.5	$^\circ\text{C}/\text{W}$

### CONNECTION DIAGRAM (TOP VIEW)



### ELECTRICAL CHARACTERISTICS ( $V_{CC}=12\text{V}$ ; $T_{case}=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{IN}$	Input Voltage		4.2		5.5	V
$I_{IN}$	Input Current	$V_{IN}=4.2\text{V}$ ; $I_C=5\text{A}$ (See test circuit) $V_{IN}=5\text{V}$ ; $I_C=5\text{A}$			5 10	mA mA
$I_{cgo}$	Collector Cut-off Current	$V_{IN}=0\text{V}$ ; $HV_C=250\text{V}$			250	$\mu\text{A}$
$V_{cl}^*$	High voltage clamp	$-40^\circ\text{C} < T_j < 125^\circ\text{C}$	340		440	V
$I_{cl}^*$	Coil Current Limit	$V_{IN}=4.2\text{V}$ ; $-40^\circ\text{C} < T_j < 125^\circ\text{C}$ $V_{IN}=5\text{V}$ ; $-40^\circ\text{C} < T_j < 125^\circ\text{C}$ (See note 1)	6 6.5		7.5	A A
$V_{cg(sat)}$	Power Stage Saturation Voltage	$I_C=5\text{A}$ ; $I_{IN}=10\text{mA}$			2.5	V
$V_f^{**}$	Diode Forward Voltage	$I_f=10\text{A}$			3.5	V
$\Delta I_{cl}$	Coil current variation in respect to $V_{IN}=5\text{V}$	$V_{IN}=4.5 \div 5.5\text{V}$			200	mA

(\*) Coil data: primary resistance  $R_C=0.4 \div 0.8\Omega$ , primary inductance  $L_C=6 \div 8\text{mH}$

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

NOTE 1:  $I_{cl}$  is also controlled in respect to the variation of  $V_{IN}$  between 4.5 and 5.5V

FIGURE 1: Delay-off time Vs Temperature

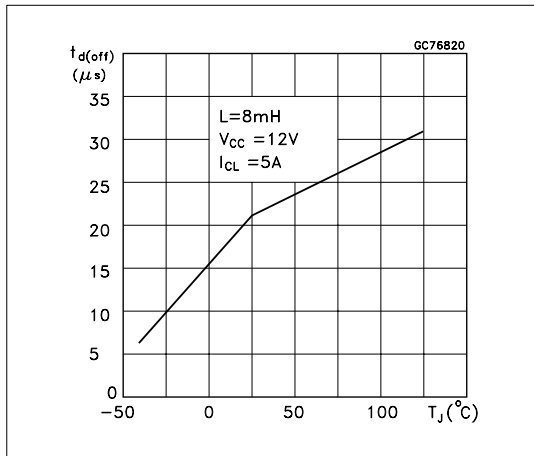


FIGURE 2: Input current Vs Temperature

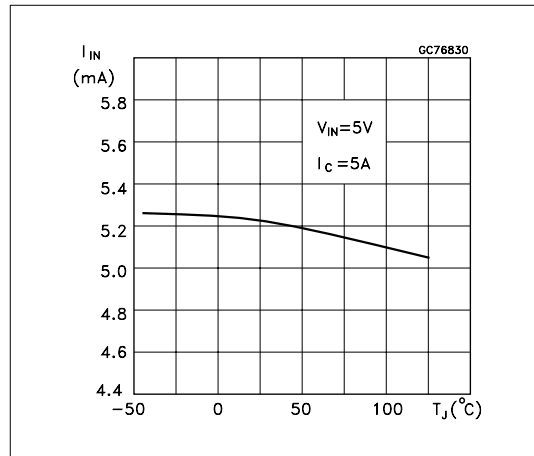


FIGURE 3: Saturation Voltage VS Collector Current

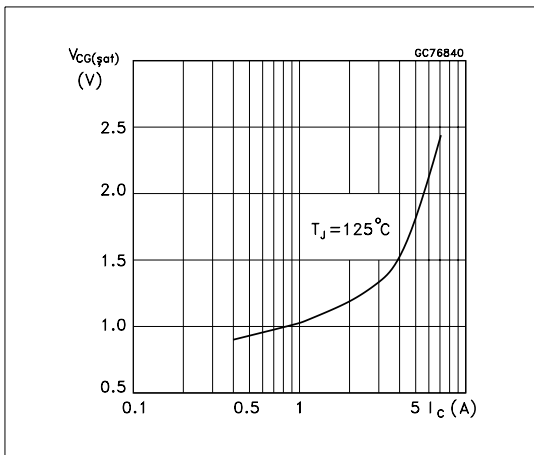


FIGURE 4: Diode Forward Voltage VS Temperature

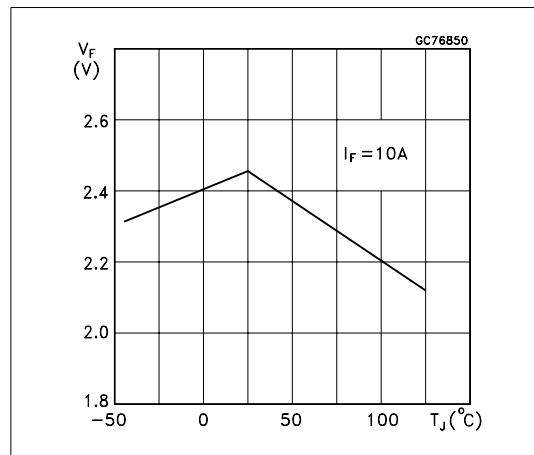


FIGURE 5: Coil Current Limit Vs Temperature

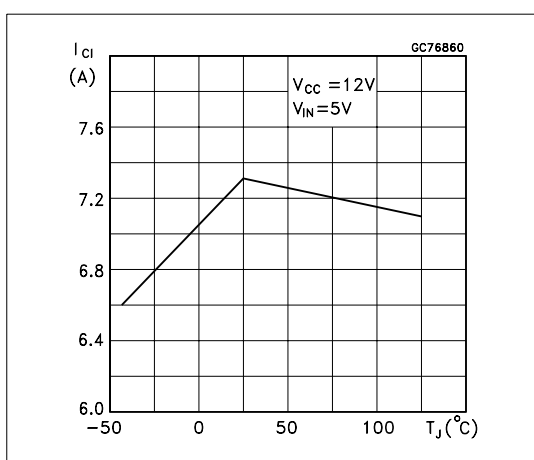
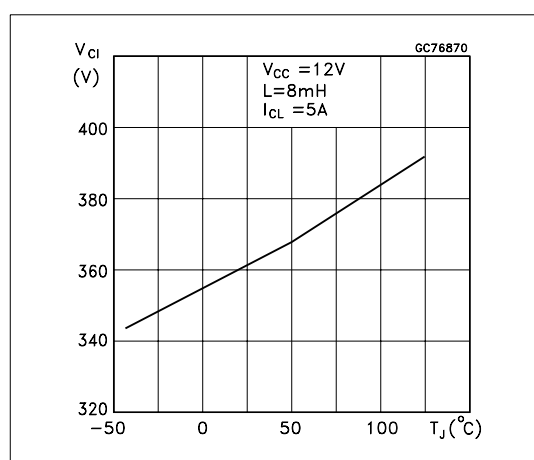
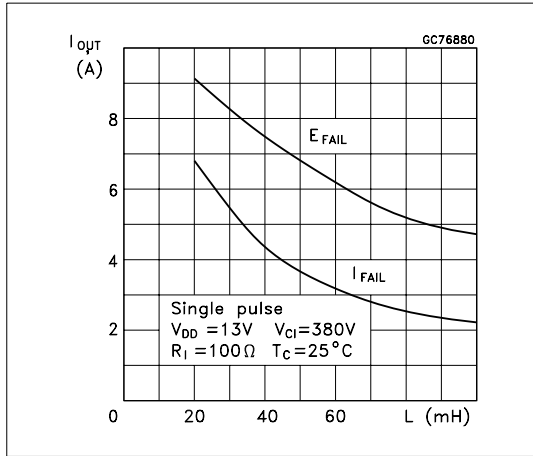


FIGURE 6: Clamping Voltage VS Temperature



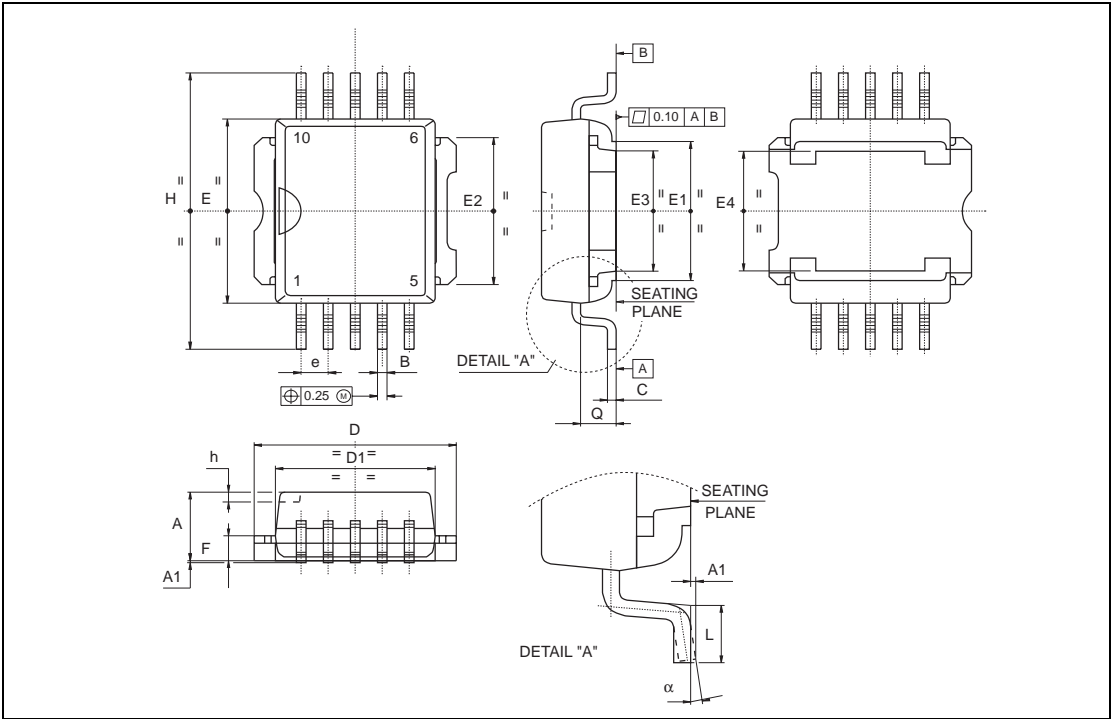
## VB921ZVFI / VB921ZVSP

**FIGURE 7:** Maximum Energy and Output Current Unclamped



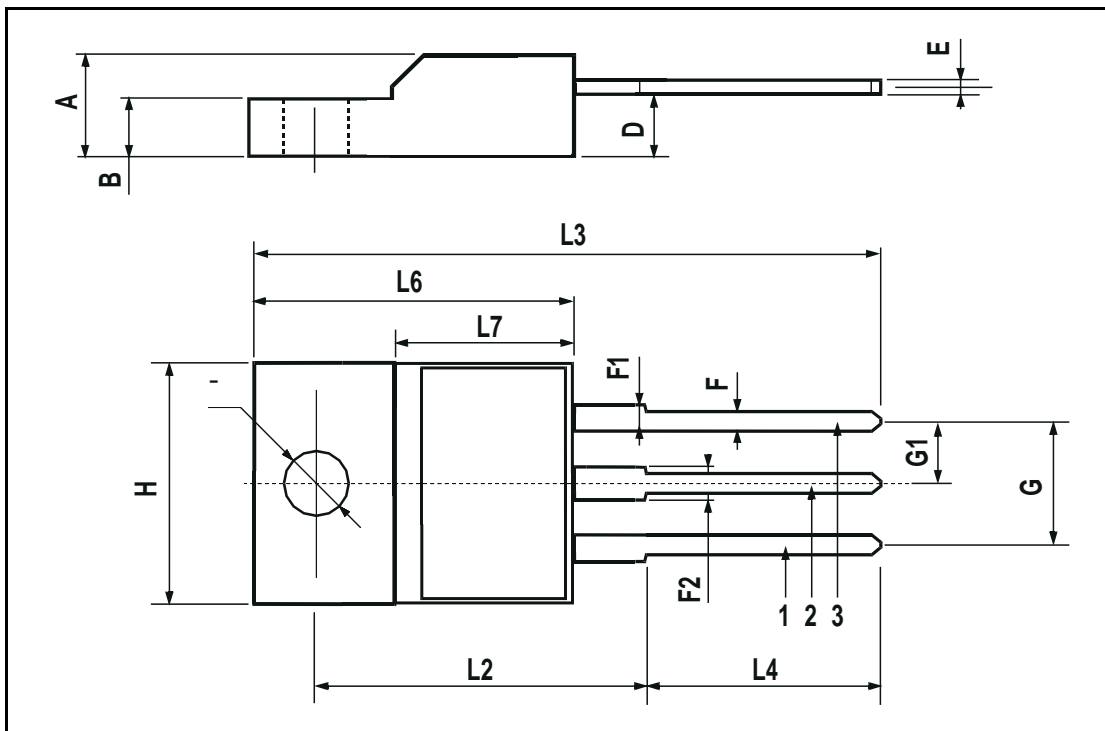
**PowerSO-10™ MECHANICAL DATA**

DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	3.35		3.65	0.132		0.144
A1	0.00		0.10	0.000		0.004
B	0.40		0.60	0.016		0.024
c	0.35		0.55	0.013		0.022
D	9.40		9.60	0.370		0.378
D1	7.40		7.60	0.291		0.300
E	9.30		9.50	0.366		0.374
E1	7.20		7.40	0.283		0.291
E2	7.20		7.60	0.283		0.300
E3	6.10		6.35	0.240		0.250
E4	5.90		6.10	0.232		0.240
e		1.27			0.050	
F	1.25		1.35	0.049		0.053
H	13.80		14.40	0.543		0.567
h		0.50			0.002	
Q		1.70			0.067	
$\alpha$	0°		8°			



**ISOWATT220 MECHANICAL DATA**

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
B	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
E	0.4		0.7	0.015		0.027
F	0.75		1	0.030		0.039
F1	1.15		1.7	0.045		0.067
F2	1.15		1.7	0.045		0.067
G	4.95		5.2	0.195		0.204
G1	2.4		2.7	0.094		0.106
H	10		10.4	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	0.385		0.417
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
	3		3.2	0.118		0.126



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 2000 STMicroelectronics - Printed in ITALY- All Rights Reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia - Malta -  
Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>

