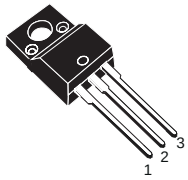
VB921ZVFI
VB921ZVSP

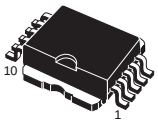
HIGH VOLTAGE IGNITION COIL DRIVER POWER I.C.

TYPE	V_{cl}	I_{cl}	$V_{cg(sat)}$
VB921ZVFI VB921ZVSP	340V	7.5A	2.5V

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



ISOWATT220



PowerSO-10™

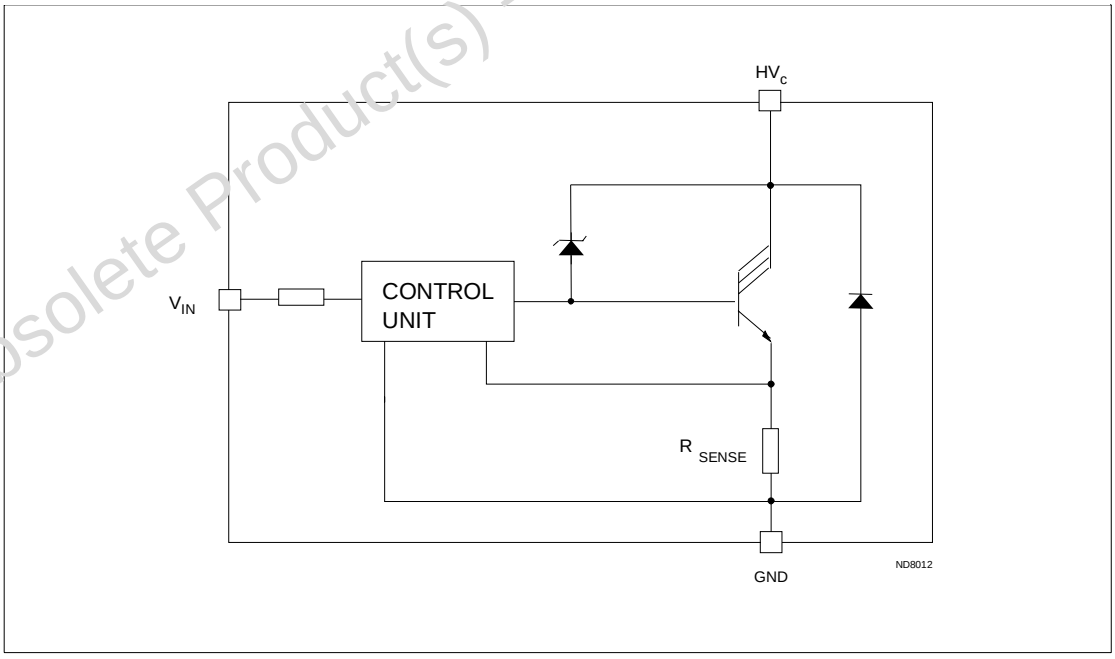
ORDER CODES:

ISOWATT220	VB921ZVFI
POWERSO-10™	VB921ZVSP

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 trilinton 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.

BLOCK DIAGRAM



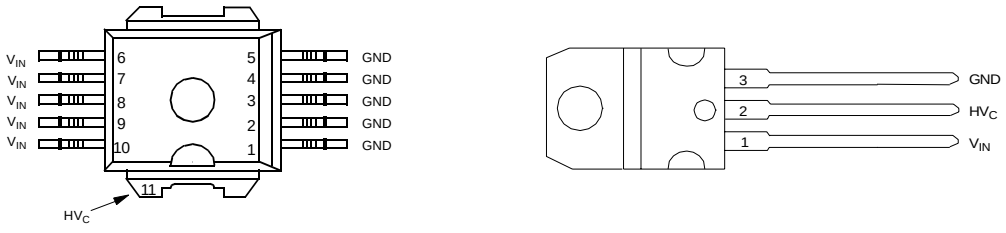
ABSOLUTE MAXIMUM RATING

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 °C	40	100	W
T_j	Junction operating temperature	- 40 to 150		°C
T_{stg}	Storage temperature	- 40 to 150		°C

THERMAL DATA

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

CONNECTION DIAGRAM (TOP VIEW)



ELECTRICAL CHARACTERISTICS (V_{CC}=12V; T_{case}=25ºC 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}=4.2V; I_C=5A (See test circuit) V_{IN}=5V; I_C=5A			5 10	mA mA
I_{cgo}	Collector Cut-off Current	V_{IN}=0V; HV_C=250V			250	µA
V_{cl} (*)	High voltage clamp	-40°C<T_j<125°C	340		440	V
I_{cl} (*)	Coil Current Limit	V_{IN}=4.2V; -40°C<T_j<125°C V_{IN}=5V; -40°C<T_j<125°C (See note 1)	6 6.5		7.5	A A
$V_{cg(sat)}$	Power Stage Saturation Voltage	I_C=5A; I_{IN}=10mA			2.5	V
V_f (**)	Diode Forward Voltage	I_f=10A			3.5	V
ΔI_{cl}	Coil current variation in respect to V_{IN}=5V	V_{IN}=4.5 ÷ 5.5V			200	mA

(*) Coil data: primary resistance R_C=0.4 ÷ 0.8Ω, primary inductance L_C=6 ÷ 8mH
(**) Pulsed: pulse duration= 300µs, 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

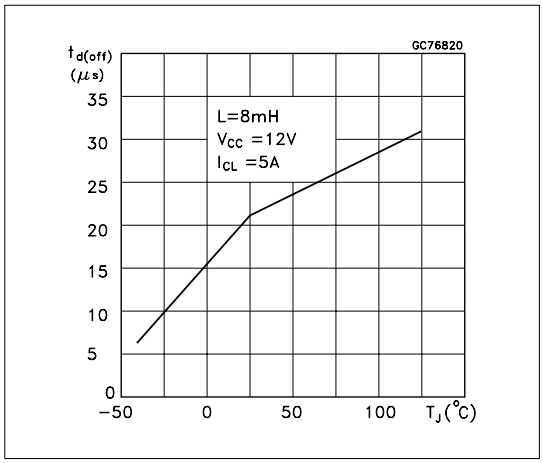


FIGURE 2: Input current Vs Temperature

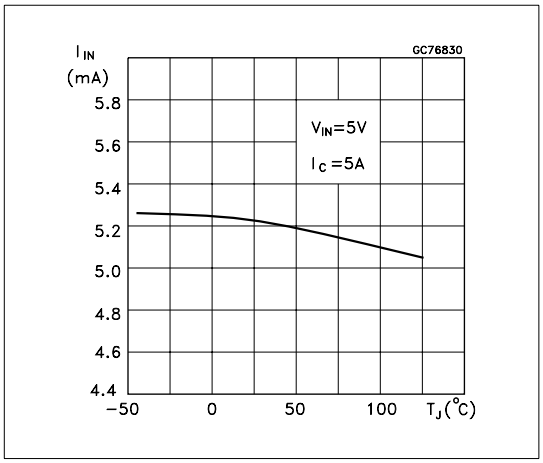


FIGURE 3: Saturation Voltage VS Collector Current

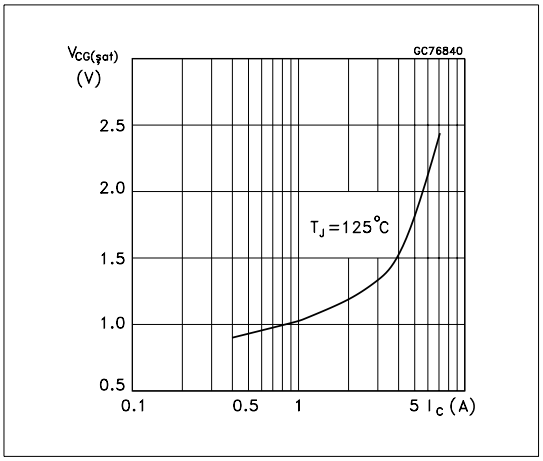


FIGURE 4: Diode Forward Voltage VS Temperature

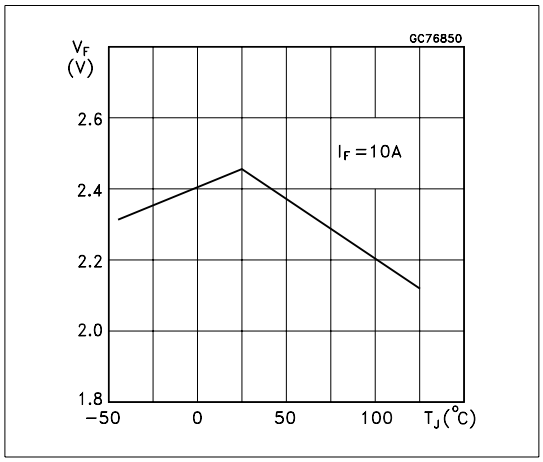


FIGURE 5: Coil Current Limit Vs Temperature

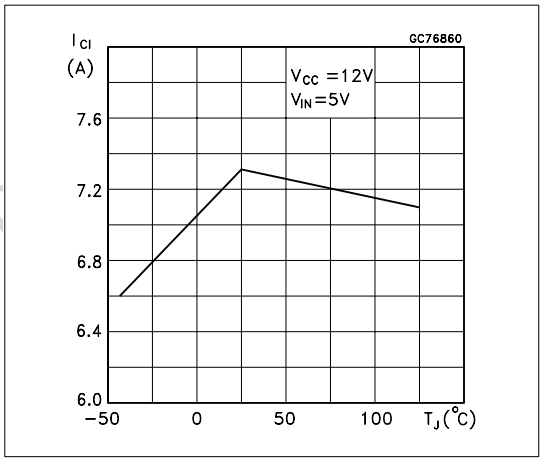


FIGURE 6: Clamping Voltage VS Temperature

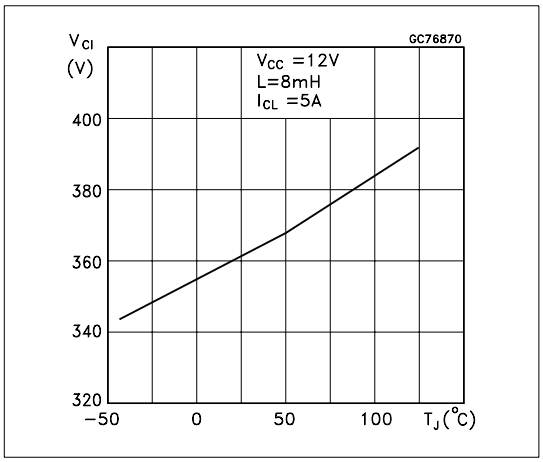
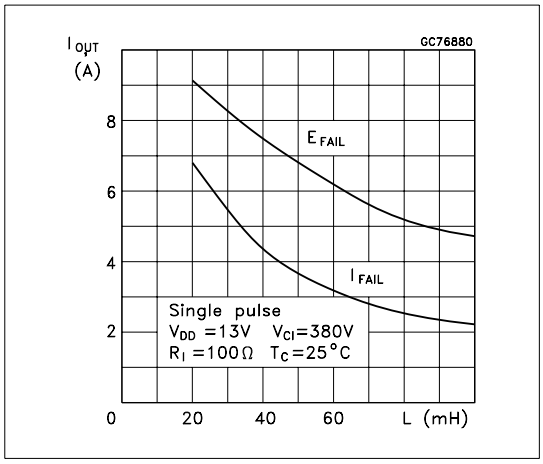
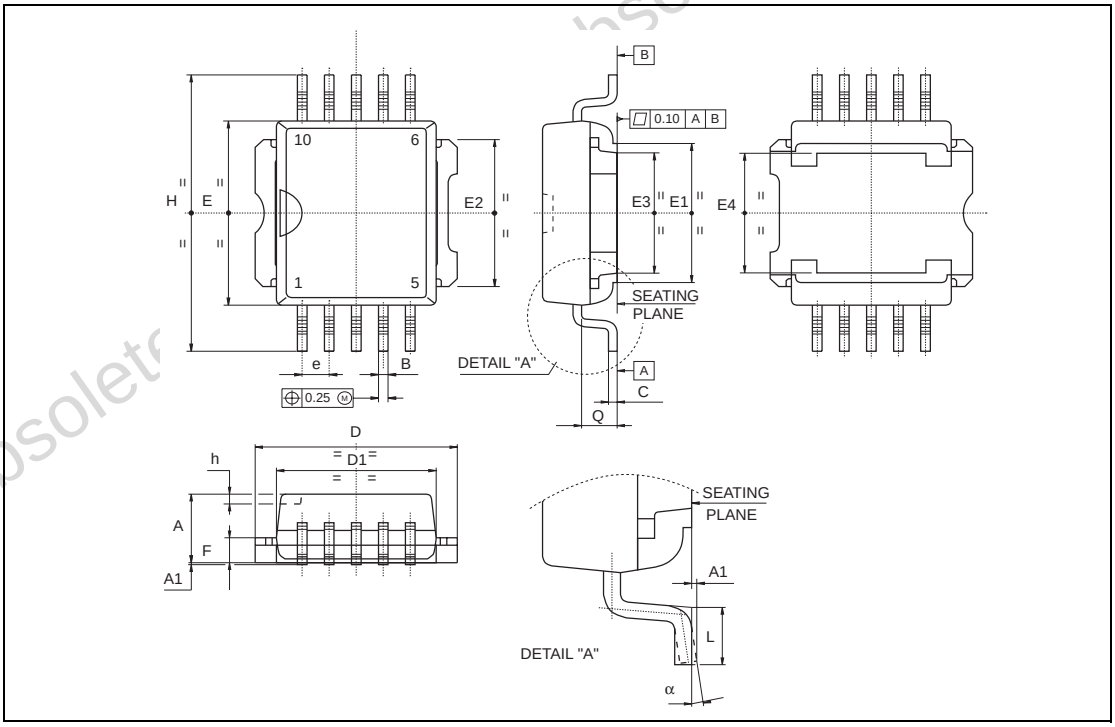


FIGURE 7: Maximum Energy and Output Current Unclamped



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		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	
α	0º		8º			



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