

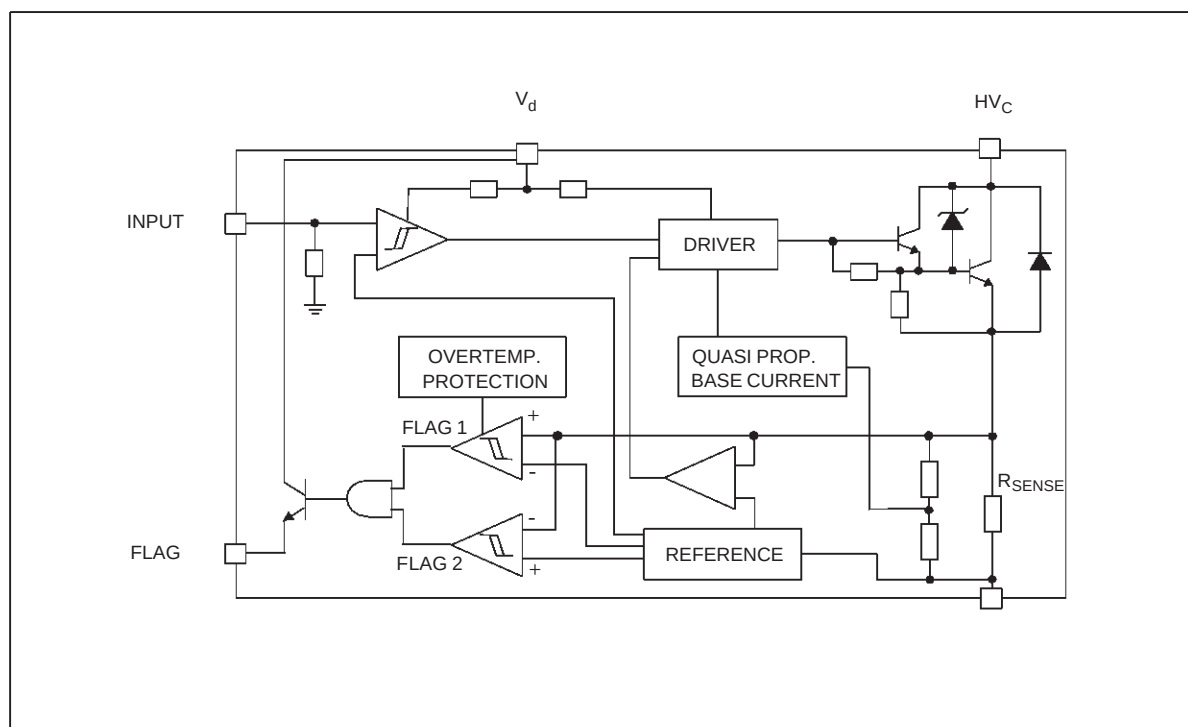


TYPE	V _{cl}	I _{cl}	I _{d(on)}
VB027BSP	320V	10.5A	160mA

- ## DESCRIPTION

PowerSO-10™

BLOCK DIAGRAM



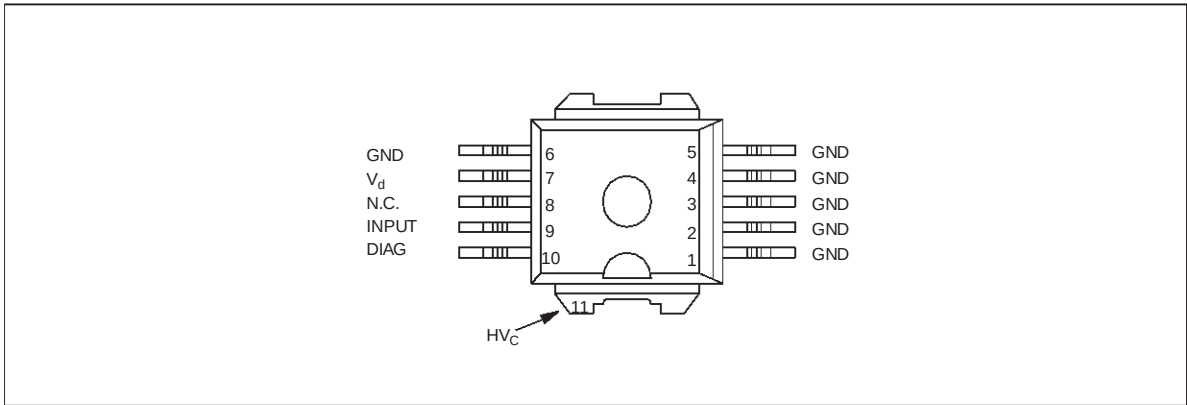
ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Unit
HV_C	Collector voltage	Internally limited	V
I_C	Collector current	Internally limited	A
V_d	Driving stage supply voltage	7	V
I_d	Driving circuitry supply current	200	mA
V_{IN}	Input voltage	10	V
T_j	Junction operating temperature	-40 to 150	°C
T_{stg}	Storage temperature	-55 to 150	°C

THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal resistance junction-case (MAX)	1.12	°C/W
$R_{thj-amb}$	Thermal resistance junction-ambient (MAX)	62.5	°C/W

CONNECTION DIAGRAM (TOP VIEW)



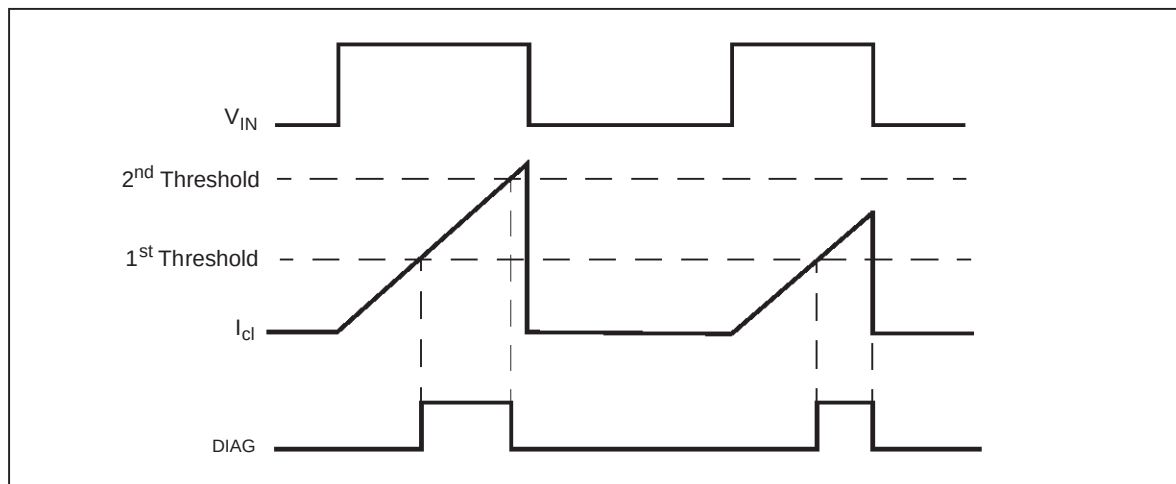
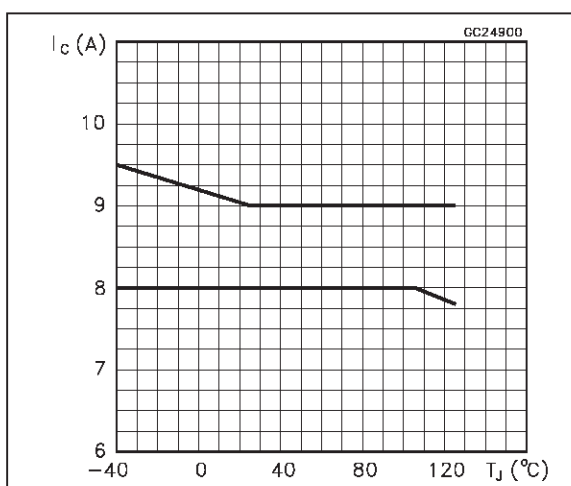
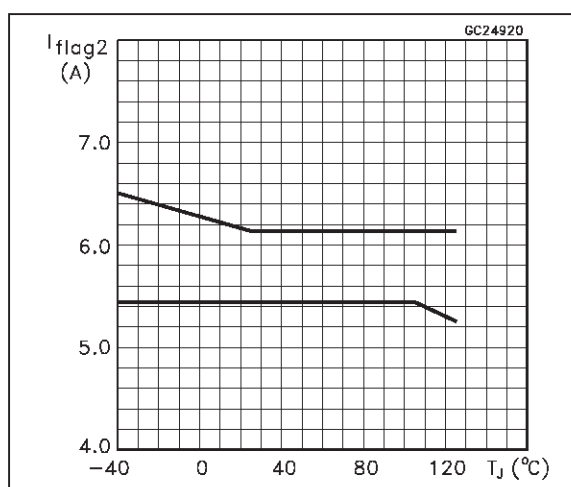
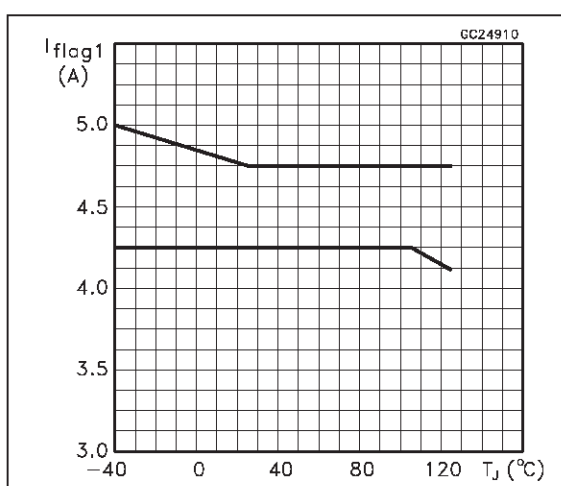
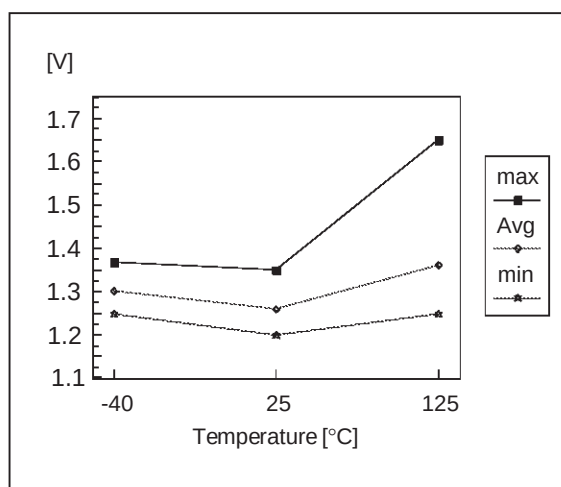
PIN FUNCTION

No	Name	Function
1÷5	GND	Emitter power ground
6(*)	GND	Control ground
7	V_d	Driving stage supply voltage
8	N.C.	
9	INPUT	Logic input channel
10	DIAG	Diagnostic output signal (when I_C is greater than 3A)
TAB	HV_C	Primary coil output signal

(*) Pin 1÷5=Power GND, Pin 6=signal GND. Pin 6 must be connected to pins 1÷5 externally.

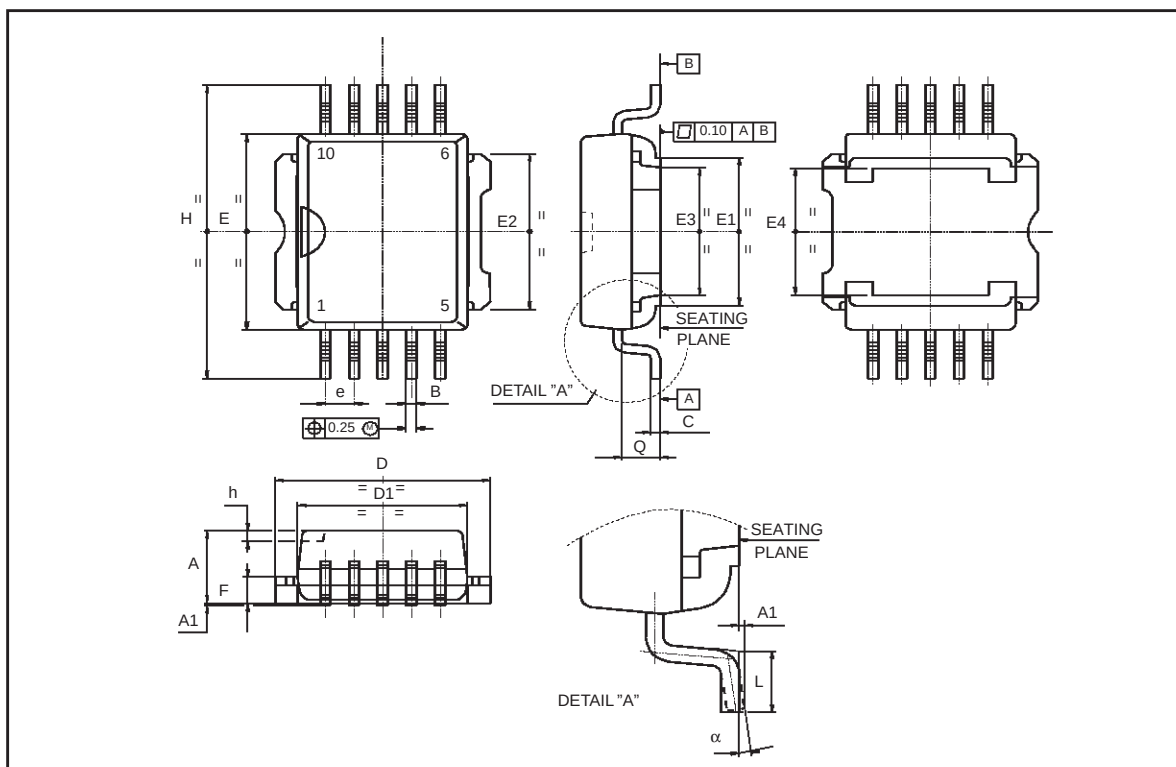
ELECTRICAL CHARACTERISTICS ($V_{CC}=13.5V$; $V_d=5V$; $T_j=25^\circ C$; $R_{coil}=510m\Omega$; $L_{coil}=7mH$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{cl}	High voltage clamp	$-40^\circ C \leq T_j \leq 125^\circ C$; $I_C=6A$	320		420	V
$V_{cg(sat)}$	Power stage saturation voltage	$I_C=6A$; $V_{IN}=4V$; $-40^\circ C \leq T_j \leq 125^\circ C$			2	V
$I_{d(off)}$	Power-off supply current	$V_{IN}=0.4V$			11	mA
$I_{d(on)}$	Power-on supply current	$V_{IN}=4V$; $I_C=6A$; $-40^\circ C \leq T_j \leq 125^\circ C$			160	mA
V_d	Driving stage supply voltage		4.5		5.5	V
I_{cl}	Collector current limit	$V_{IN}=4V$	8.5		10.5	A
$I_{cl(td)}$	Collector current limit drift with temperature	See figure 3				
I_{leak}	Collector leakage current	$V_C=125V$			100	μA
V_{INH}	High level input voltage		4		5.5	V
V_{INL}	Low level input voltage		0		0.8	V
I_{INH}	High level input current				200	μA
V_{diagH}	High level diagnostic output voltage	$R_{EXT}=15K\Omega$; $C_{EXT}=1nF$ (See figure 1)	3.5		V_d	V
V_{diagL}	Low level diagnostic output voltage	$R_{EXT}=22K\Omega$; $C_{EXT}=1nF$ (See figure 1)			0.5	V
$I_{C(diag1)}$	First threshold level collector current		4.25	4.5	4.75	A
$I_{C(diag1)td}$	First threshold level collector current drift with temperature	See figure 4				
$I_{C(diag2)}$	Second threshold level collector current		5.45	5.8	6.15	A
$I_{C(diag2)td}$	Second threshold level collector current drift with temperature	See figure 5				
I_{diagH}	Overtemperature diagnostic current		2	2.6	3.2	A
$t_{d(off)}$	Turn-off delay time of output current	$I_C=6A$	5	25	45	μs
$t_{f(off)}$	Turn-off fall time of output current	$I_C=6A$	2	8	15	μs
$E_{s/b}$	Single pulse avalanche energy		300			mJ
T_{int}	Temperature of diagnostic shift		130	150	170	$^\circ C$
T_{hys}	Thermal hysteresis			30		$^\circ C$
V_f	Diode forward voltage	$I_C = -10A$		3		V

FIGURE 2: Switching waveform**FIGURE 3:** Maximum I_{CL} VS temperature**FIGURE 5:** $I_{CL(diag2)}$ VS temperature**FIGURE 4:** $I_{CL(diag1)}$ VS temperature**FIGURE 6:** $V_{CG(sat)}$ VS temperature (at $I_C=6A$)

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	0°		8°			



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