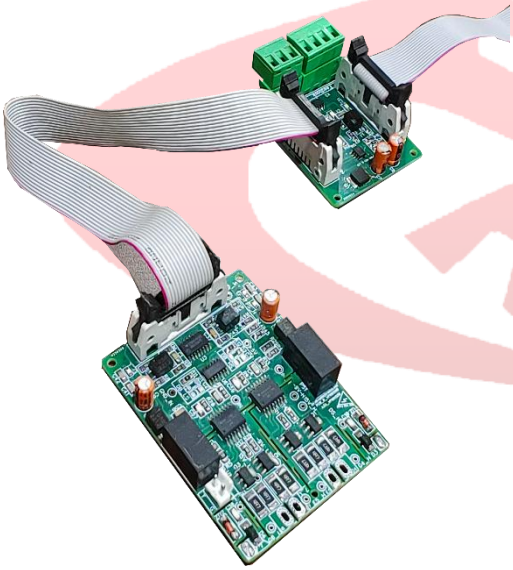
DUAL SIC HIGH NOISE IMMUNITY DIFFRENTIAL INPUT DRIVER(±10A)

DUAL SIC DIFFRENTIAL INPUT DRIVER (±15A)

FEATURES

- Optimized for use with 34 & 64 Half- Bridge SIC & IGBT Power Modules
- High-Frequency, Ultra-Fast Switching Operation
- Onboard 2 W Isolated Power Supplies
- Dead band settable
- Primary OVLO and Reverse Polarity Protection
- Differential Inputs for Increased Noise Immunity
- Increased overcurrent trip level versatility
- Low Power dual channel driver 2X1 Watt Output Power
- Up to 2100V DC BUS
- Active shut down
- 4A Internal Active Miller clamp function
- 400-mA soft turn-off when fault happens
- 5.7 KVrms isolation
- Switching frequency up to 100 KHz
- Less than 130 ns propagation delay time
- Primary/Sec. Supply under voltage lockout
- Vce monitoring for short circuit protection
- 200 ns response time fast DESET protection
- Isolated analog sensor with PWM output for -
- Temperature sensing with NTC, PTC or thermal diode



DUAL SIC DRIVER WITH DIFFRENTIAL INPUT INTERFACING CARD

ADVANTAGE

- On board isolated DC-DC converter - No need of separate SMPS.
- Interface for 3.3V...5 V logic level - Direct compatible with any Controller.
- Common fault feedback signal to interface with controller - Avoid Extra component.
- Field configurable blocking time - Flexibility in your hand, use any make SIC.
- User Selectable Rg-on & off

APPLICATIONS

- Drives
- EV Charger/Battery Charger
- Converter - Inverter
- UPS
- Solar Inverter
- Medical X-Ray

GATE DRIVER ELECTRICAL CHARACTERIZATION ($T_{VJ = 25}$°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	TestConditions
Supply Voltage	V_{DC}	14.25	15	15.75	V	
Secondary Under Voltage Lockout	V_{UVLO}		13.5			
Secondary UVLO Hysteresis	V_{HYS}		0.06			
Over Voltage Clamping	V_{OVLO}	18	20	22		
HighLevelLogicInputVoltage	V_{IH}	3.5		5.5		Single-EndedInputs
Low Level Logic Input Voltage	V_{IL}	0		1.5		
Differential Input Common Mode Range	V_{IDCM}		±2.5	±7		Differential Inputs
Positive-going input threshold voltage, differential input	V_{IT+}			0.2	V	V_{ID}= $V_{Pos-Line}$-$V_{Neg-Line}$
Negative-going input threshold voltage, differential input	V_{IT-}	-0.2				
Differential Output Magnitude	V_{OD}	2	3.7		V	R_L=100Ω
High level Output Voltage	$V_{GATE,HIGH}$		+15			
Low level Output Voltage	$V_{GATE,LOW}$		-5			
Working Isolation Voltage	V_{IOWM}		2100			V_{RMS}
Isolation Capacitance	V_{ISO}		4.9		pF	Per Channel
Common Mode Transient Immunity	CMTI	100			kV/µs	V_{CM}=1500V
Output Resistance[1]	$R_{G(IC)-ON}$		0.48	0.98	Ω	Gate Driver Buffer Tested at 1A
	$R_{G(IC)-OFF}$		0.47	0.81		
ExternalTurn-OnResistance[2]	$R_{G(EXT)-ON}$		1			External SMD Resistor2512 (6432Metric)
ExternalTurn-OffResistance[2]	$R_{G(EXT)-OFF}$		1			
OutputRiseTime	t_{ON}		223		ns	$R_{G(EXT)}$=1Ω ,C_{LOAD}=47nF From 10% to 90%
OutputFallTime	t_{OFF}		208			
Propagation Delay(Turn-Off)	t_{PHL}		120			$R_{G(EXT)}$=1Ω , C_{LOAD}=0nF From 50% to 50%
Propagation Delay(Turn-On)	t_{PHL}		125			
Over-current Blanking Time	t_{Blank}		600			$R_{G(EXT)}$= 1Ω, C_{LOAD}= 47nF
Over-current Propagation Delay to FAULT Signal Low	$t_{PD-FAULT}$		1.3		µs	Does Not Include Blanking
Soft-Shutdown Time	t_{SS}		1.3			$R_{G(EXT)}$ =1Ω, C_{LOAD}=47nF
Soft-Shutdown Resistance[3]	R_{SS}		5		Ω	Testedat 25mA
Miller Clamp Resistance	R_{MC}		1.1	2.75		Tested at 100mA
Miller Clamp Voltage Threshold	V_{MC}	1.75	2	2.25	V	Referenced to Source

1 OutputresistanceofgatedriverIC.

2 AdditionaloutputresistanceisaddedwithSMDresistors.Separateresistorstoturn-onandturn-offallowing.

3 Soft-Shutdownnetworkwillsafelyturnoffthegateintheeventanovercurrentisdetected

INPUT CONNECTOR INFORMATION

Pin Number	Parameter	Description
1	V_{DC}	Power supply input pin (+15VNomin all input)
2	Common	Common
3	HS_P_PWM	Positive line of 5V differential high-side PWM signals pair. Terminatedinto120Ω
4	HS_N_PWM	Negative line of 5V differential high-side PWM signal pair.TerminatedMinto120Ω
5	LS_P_PWM	Positive line of 5V differential low-side PWM signals pair. Terminated into120Ω
6	LS_N_PWM	Negative line of 5V differential low-side PWM signal pair . Terminated into120Ω
7	$\overline{\text{FAULT-P}}$(*)	Positive line of 5V differential fault condition signal pair. Drives strength 20mA.Alow state on FAULT indicates when a desideration & power supply fault has occurred. The presence of a fault precludes the gate drive output from going high.
8	$\overline{\text{FAULT-N}}$(*)	Negative line of 5V differential fault condition signal pair. Drive strength 20mA.
9	RTD_P	Positive line of 5V differential fault condition signal pair. Drive strength 20mA
10	RTD_N	Negative line of 5V differential fault condition signal pair. Drive strength 20mA.
11	NC	Unused, do not connect
12	Common	Common
13	PWM-EN	Pull down to disable PWM in put logic. Pull up or leave floating to enable .Gate driver output will be held low through turn-off gate resist or if power supplies are enabled.
14	Common	Common
15	Reset	When a fault exists, bring this pin high 5V to clear the fault.
16	Common	Common

* Inputs3-8aredifferentdifferentialpair

LOGICAL INPUTS & OUTPUTS

• Interface Logic level	• 3.3 TO 5.0 V
• Fault output for Deset and Power supply failure	• Active Low (0V) for Fault and Normal for Active High (5v)
• External Reset	• Reset by active high (5V) • Before use external reset please remove R48 & 49 mention in driver at bottom side. • By default auto reset available
• Enable	• Active high (5V) when normal else • active low Enable and both PWM disable
• RTD Output (Isolated temperature Reading of device)	• 0.6 to 1.6V (25° to 135°C)

SHORT CIRCUIT PROTECTION

VCE MONITORING THRESHOLD	9.2 V (Internally fix)
AVAILABLE RESPONSE TIME	1µSec (User selectable)
MINIMUM RESPONSE TIME	1.0 µSec
MINIMUN BLOCKING TIME	1.0 µSec

POWER SUPPLY

POWER SUPPLY & MONITORING	MIN.	TYPE	MAX.
SUPPLY VOLTAGE VCC TO GND(V)	14.25	15	16.5
SUPPLY CURRENT VCC (WITH LOAD)	100mA		

TIMING CHARACTERISTIC

TURN ON DELAY-T	185 ns
TURN OFF DELAY-T	185 ns
OUTPUT RISE TIME T	35 ns MAX
OUTPUT FALL TIME T	35 ns MAX
TRANSMISSON DELAY OF FAULT IME	330 ns

PROTECTION AVAILABLE ON DRIVER MODE

- Primary/Secondary Under voltage monitoring.

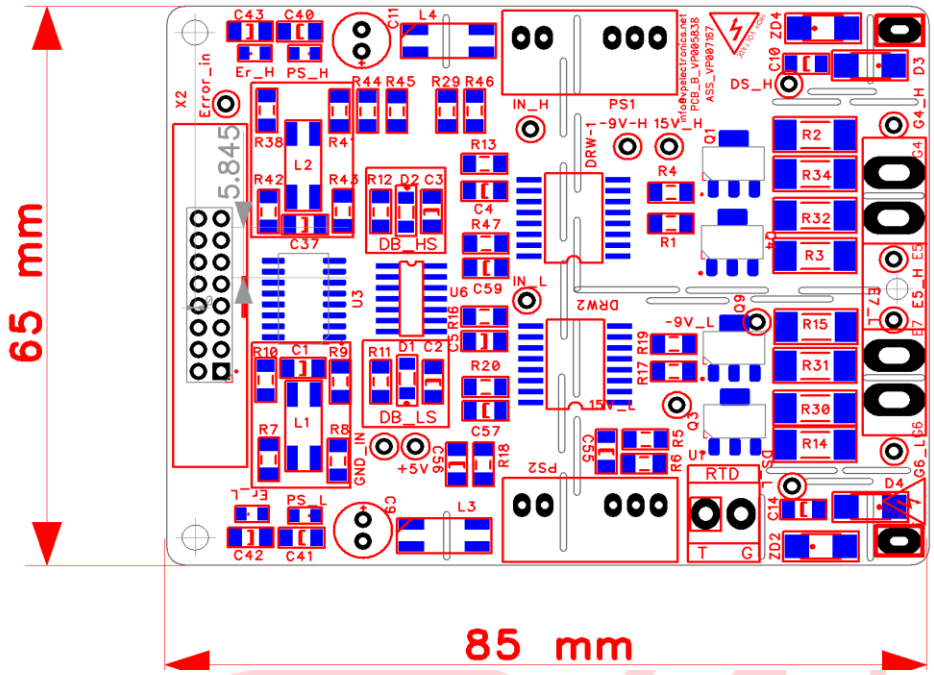
• Power supply short circuit & reverse polarity protection.
• Vce monitoring for circuit protection
• Schmitt trigger at the Input stage, highly susceptible to noise
• Interlocking when both pulse high
• Soft Shut down for Over Voltage Protection

OUTPUT VOLTAGE / CURRENT / POWER	
TURN ON VOLTAGE , V	14.5- 15.5V, any load condition
TURN OFF VOLTAGE , V	-4 to –5.5V, No load
GATE PEAK CURRENT Iout	+10 A source -10 A sink
INTERNAL GATE RESISTANCE	0.0Ω
EXTERNAL GATE RESISTANCE	1.5 Ω-10 Ω
SWITCHING FREQUENCY , F	100Khz
OUTPUT POWER	2.4 W @105°C
GATE AVERAGE CURRENTIavg	100ma

ELECTRICAL ISOLATION Test Voltage (50HZ/60SEC)	
Primary to Secondary side	5.7 KV
Secondary to Secondary side	5.7 KV

MECHANICAL DIMENSION (OPTION 2)	
PCB	85 X 65 mm
Mounting Hole	53.5 X 28.5 X 2 mm

Panel Mounted	Direct SIC module mounting
Enclosure	Open Frame
Weight	0.3 Kg
Layer	4 Layer



ENVIRONMENTAL TEMPERATURE	
Working temperature	-40 to 105 ºC
Storage temperature	-40 to 90 ºC

DRIVING CAPABILITY

All usual SIC-MOSFET up to 400A /1700V.

Driving power depends on switching frequency so in case of any doubt during selection process please contact us.

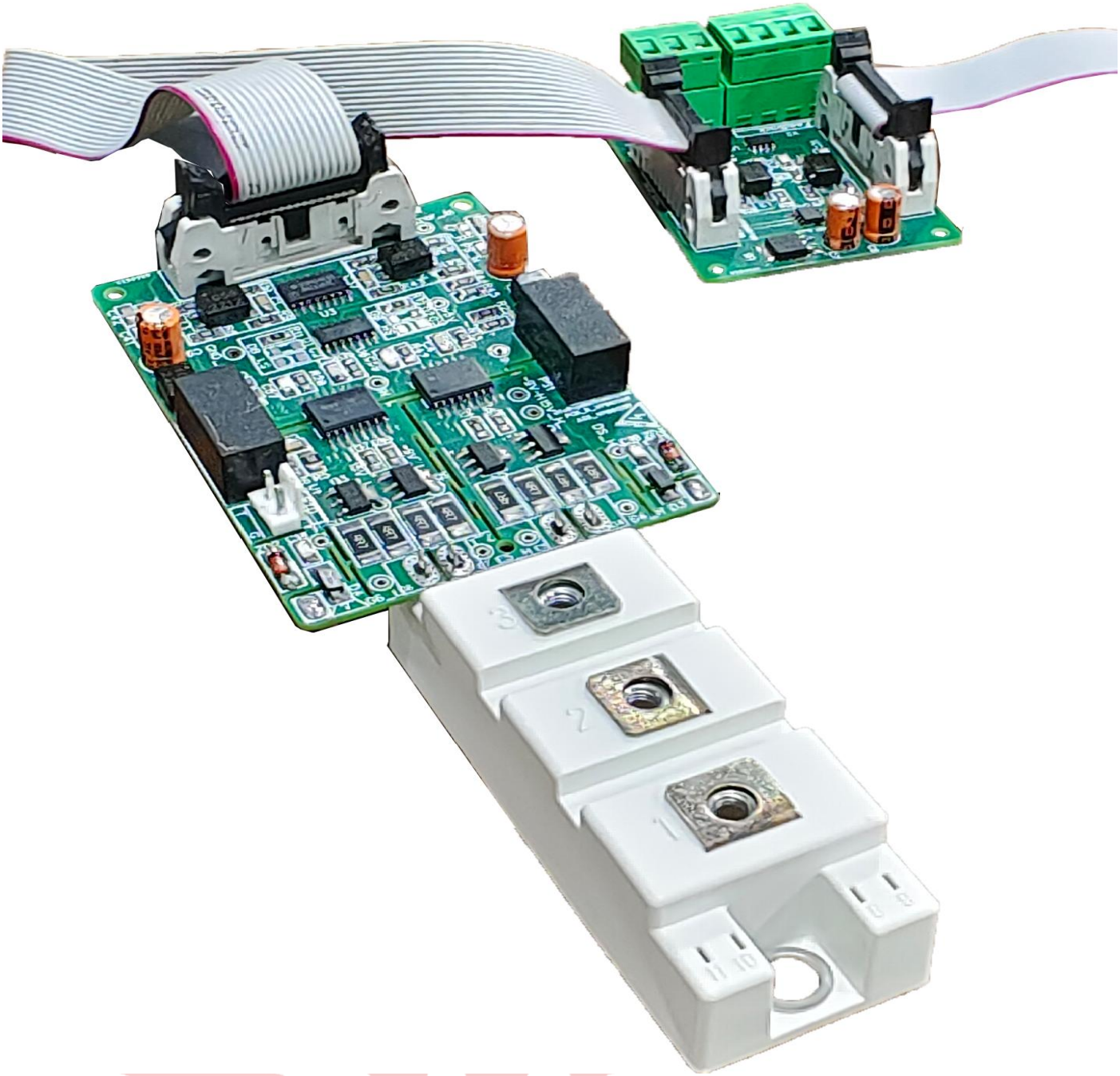
INTERFACING WITH CONTROL UNIT

1. ERROR: High to Low (FLT)
2. Power supply monitoring High to Low. (Rdy)

LED INDICATION

Power ON: Green (Normally OFF, ON during Power supply fault)
ERROR: RED (ON during Under Voltage / DESAT/ IGBT Fault)

Dead Band Tunning	
C2 & C3	**DEAD BAND TIME (uSec)**
47PF	1
100PF	3
220PF	6
330PF	7



SIC DRIVE WITH HIGH NOISE IMMUNITY WITH DIFFRENTIAL INPUT DRIVER (±15A)

SAFETY NOTICE!

ATTENTION PLEASE! THIS DEVICE IS ESD SENSITIVE AND NEEDS TO BE HANDLED WITH CARE. HIGH VOLTAGE CONDITION MAY OCCUR DURING OPERATION OF THE DEVICE, AND HENCE USER IS SOLELY RESPONSIBLE OF EQUIPMENT AND PERSONNEL SAFETY. VP ELECTRONICS SHALL NOT BE HOLD LIABLE FOR ANY DAMAGE TO PERSONNEL AND/OR PROPERTIES AS A RESULT OF USING THIS DEVICE. USER MUST TAKE ADEQUATE STEPS TO ENSURE ELECTRICAL AND MECHANICAL SAFETLY OF THE DEVICE IN USE.

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