

DUAL SIC DRIVER HIGH NOISE IMMUNITY DIFFERENTIAL INPUT SIGNAL(±15A)



DUAL SIC DIFFRENTIAL INPUT DRIVER (±15A)

FEATURES

- Optimized for use with 34 & 64 Half- Bridge Power Modules
- High-Frequency, Ultra-Fast Switching Operation
- Onboard 2 W Isolated Power Supplies
- Dead band setable
- Primary OVLO
- Differential Inputs for Increased Noise Immunity
- Increased over current 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 -
- 1. Temperature sensing with NTC, PTC or thermal diode

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

DUAL SIC DRIVER WITH DIFFRENTIAL INPUT INTERFACING CARD

GATE DRIVER ELECTRICAL CHARACTERIZATION (TvJ = 25° C unless otherwise specified

Parameter	Symbol	Min.	Typ ·	Max.	Unit	Test Conditions
Supply Voltage	VDC	14.25	15	15.75		
Secondary Under Voltage Lockout	VUVLO		13. 5			
Secondary UVLO Hysteresis	VHYS		0.0 6		V	
Over Voltage Clamping	VOVLO	18	20	22		
High Level Logic Input Voltage	VIH	3.5		5.5		
Low Level Logic Input Voltage	VIL	0		1.5		Single -Ended Inputs
Differential Input Common Mode Range	VIDCM		±2.5	±7		Differential Inputs
Positive-going in put threshold voltage, differential input	VIT+			0.2	V	
Negative-going in put th <mark>reshold</mark> voltage, differential inp <mark>ut</mark>	VIT-	-0.2				VID=VPos- Line –Vneg -Line
Differential Output Mag <mark>nit</mark> ude	VOD	2	3.7			<mark>RL=100Ω</mark>
High level Output Voltage	VGATE,HIG H		+15		V	
Low level Output Voltage	VGATE,LO W		-5			
Working Isolation Voltage	VIOWM		210 0			VRMS
Isolation Capacitance	VISO		4.9		рF	Per Channel
Common Mode Transient Immunity	СМТІ	100			kV/μs	VCM =1500V
	RG(IC)- ON		0.4 8	0.98		Gate Driver Buffer Tested at
Output Resistance ¹	RG(IC)- OFF		0.4 7	0.81	Ω	1A
External Turn-On Resistance ²	RG(EXT)- ON		1			External SMD Resistor
External Turn-Off Resistance ²	RG(EXT)- OFF		1			2512(6432Metric)
Output Rise Time	tON		223			RG(EXT)=1Ω, CLOAD=47nF
Output Fall Time	tOFF		208			From 10% to 90%
Propagation Delay(Turn-Off)	tPHL		120		ns	RG(EXT)=1Ω,CLOAD=0nF
Propagation Delay(Turn-On)	tPHL		125			From 50% to 50%
Over-current Blanking Time	tBla nk		600			RG(EXT)=1Ω, CLOAD=47nF
Over - current Propagation Delay to FAULT Signal Low	tpd- FAULT		1.3		μs	Does Not Include Blanking
Soft - Shutdown Time	tss		1.3			RG(EXT)=1Ω, CLOAD=47nF
Soft - Shutdown Resistance ³	RSS		5			Testedat 25mA

Website: <u>www.vpelectronics.net</u>

Miller Clamp Resistance	RMC		1.1	2.75	Ω	Testedat 100mA
Miller Clamp Voltage Threshold	VMC	1.75	2	2.25	V	Referenced to Source

- 1 Output resistance of gate driver IC.
- 2 Additional output resistance is added with SMD resistors. Separate resistors to turn-on and turn-off allowing.
- 3 Soft-Shutdown network will safely turn off the gate in the even tan over current is detected.

INPUT CONNECTOR INFORMATION

Pin Number	Parameter	Description
1	V _{DC}	Power supply input pin(+15V Nominal Input)
2	Common	Common
3	HS_P_PWM	Positive line of 5V differential high-side PWM signals pair. Terminated into 120Ω
4	HS_N_PWM	Negative line of 5V differential high-side PWM signal pair. Terminated into 120Ω
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 into 120Ω
7	FAULT-P(*)	Positive line of 5V differential fault condition signal pair. Drive strength 20mA .A low state on FAULT indicates when a de saturation & power supply fault has occurred. The presence of a fault precludes the gate drive output from going high.
8	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 input logic. Pull up or leave floating to enable. Gate driver output will be held low through turn-off gate resistor 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

* Inputs 3-8 are different differential pair

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.	ТҮРЕ	MAX.
SUPPLY VOLTAGE VCC TO GND(V)	14.25	15	16.5
SUPPLY CURRENT VCC (WITH LOAD)		100mA	1

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 lout	+15 A source -15 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 CURRENT lavg	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)			
РСВ	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 °C				

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 DRIVER WITH HIGH NOISE IMMUNITY WITH DIFFERENTIAL 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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