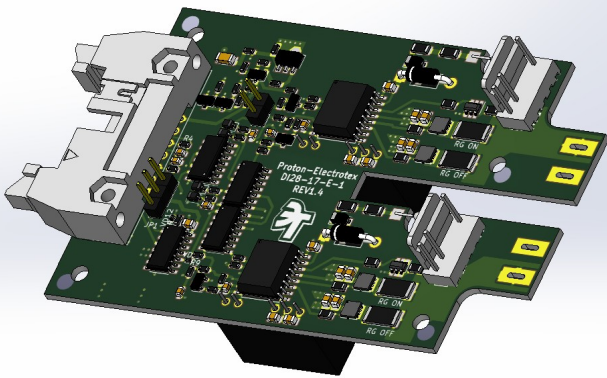




Typical application

- Converters for solar and wind energy
- Uninterruptible Power Supply (UPS)
- Electric transport
- Frequency converter
- Active rectifiers

DI28-17-E-1 two-channel plug and play IGBT driver designed for IGBT modules with a base width of 62 mm and voltage up to 1700 V.

Features

- Two channel IGBT driver
- Drives IGBTs up to $V_{CE} = 1700V$
- Plug-and-play solution
- Gate peak current $I_{OUT} \pm 8 A$
- Gate output voltage $V_{OUT} +15/-9 V$
- Selectable level of +15 V or +5 V control input signals
- Interlock protection in "half-bridge" mode
- Isolation testing voltage 4 kV AC
- Frequency PWM up to 15 kHz
- IGBT short-circuit protection with soft switch-off
- Power-supply monitoring (UVLO)
- Compact design 105x60x26 mm

Maximum rated values

Definition	Symbol	Conditions	Value	Unit
Supply voltage V_{CC}	V_{SUP}		15.5	V
Logic input voltage	$V_{IN_A/B}$		15.5	V
Gate peak current	I_{OUT}		± 8	A
Frequency PWM	f_{SW}	Gate charge $Q_G = 5600 \mu C$	15	kHz
Isolation voltage	V_{ISOL}	First to second side, 2 sec	4 000	V rms
Output power	P_{OUT}	For 1 channel	2	W
dV/dt	dV/dt	Rate of change of input to output voltage	50	kV/ μs
DC-link voltage	V_{DC}		1100	V
Collector-Emitter voltage	V_{CE}		1700	V
Operating temperature	T_{OP}		-40..+85	°C
Storage temperature	T_{STOR}		-40..+85	°C

Characteristics

Definition	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Supply voltage V_{CC}	V_{SUP}		14.5	15	15.5	V
UVLO threshold	V_{UVLO}	Switch-off threshold 13.7 V Switch-on threshold 14.3 V	13.7		14.3	V
Supply current I_{CC}	$I_{S(idle)}$	Without load		80		mA
Average supply current	$I_{S(max)}$	$f_{SW} = 15 \text{ kHz}$ $Q_G = 5600 \mu C$		390		mA
Turn-on threshold	$V_{(on)}$	Amplitude of control signals 15 V	8.2			V
Turn-off threshold	$V_{(off)}$				6.4	V
Input resistance switching channels	$R_{IN(sw)}$			3		k Ω
Control channel input capacity	$C_{IN(sw)}$			100		pF
Turn-on delay	$t_{d(on)}$			250		ns
Turn-off delay	$t_{d(off)}$			250		ns
Dead time	t_{IDT}	Half-bridge mode		3.2		us
Input resistance F out A/B channels	$R_{IN_F(A)}$ $R_{IN_F(B)}$			4.7		k Ω



Turn-on output voltage	$V_{G(on)}$		15	V
Turn-off output voltage	$V_{G(off)}$		-9	V
V_{CE} monitoring threshold	$V_{CE(ref)}$		8.2	V
Response time	$t_{bl(VCE)}$		8	us
Turn-on gate resistor	$R_{G(on)}$		1	Ω
Turn-off gate resistor	$R_{G(off)}$		1	Ω
Creepage distance primary to secondary side	$l_{clear(PS)}$		7.7	mm
Creepage distance secondary to secondary side	$l_{clear(SS)}$		5.8	mm
Weight	W		34.2	g

Operating mode «F out»

The driver is in a working state if the output of the contact «F out» is logical 1 (+15). If the contact output contains F out logic 0 (0 V), the driver is in an error state for one or more of the following reasons:

1. Channel A is in error.
2. Channel B is in error.
3. Driver supply voltage below minimum (+13.7 V)

Operating mode "F out A / B"

Output of channel A / B has logic "1" (+15 V) in normal state. If the output of the contact F out A / F out B has logic 0 (0 V), the driver is in an error state for one or more of the following reasons:

1. Reduced voltage of the secondary side of the channel A / B
2. The DESAT circuit has triggered (collector-emitter voltage is more than + 8V or is open circuit.)

Selects the level of the Signal A / B control input signals

To select the amplitude of the input control signals Signal A and Signal B, you must set jumper JP1 to 15 V or 5 V.

Operation mode selection

If jumper JP2 is closed, then the "direct" mode is selected - that is, channel A and channel B are independent of each other and can be turned on simultaneously.

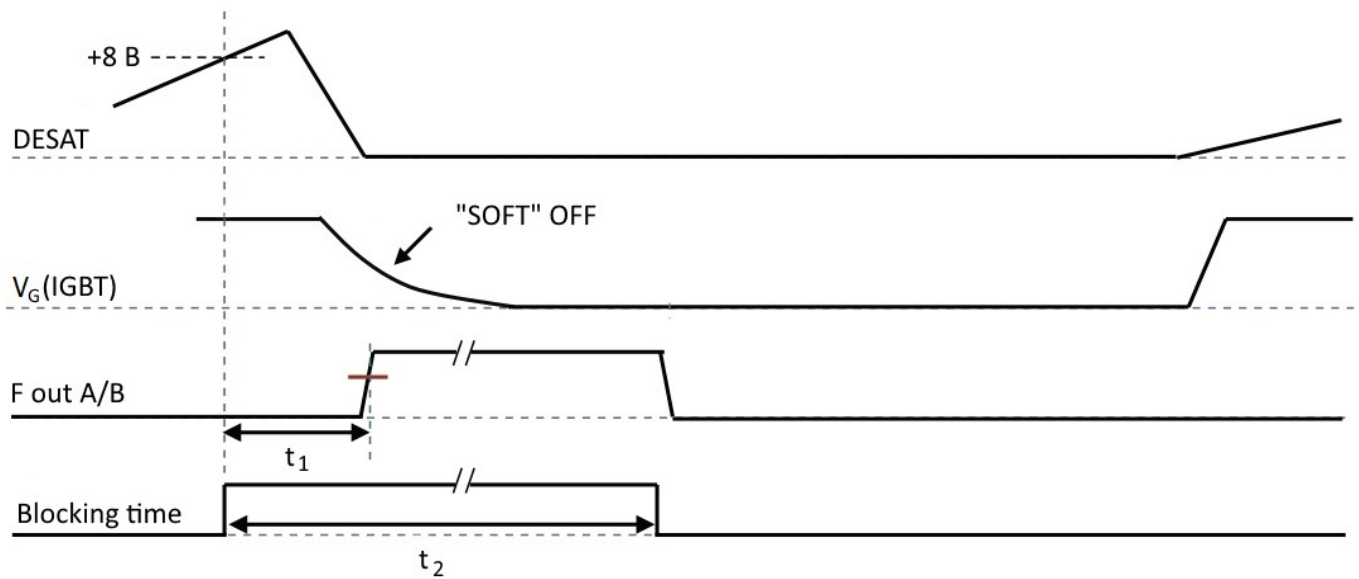
If jumper JP2 is open, then the "half-bridge" mode is selected — that is, the simultaneous activation of channel A and channel B. A delay (dead time t_{DT}) of 3.2 μ s appears between channel state switching.

Operating mode of UVLO

If the V_{CC} supply voltage drops below +13.7 V, the driver will go into an error state and block the control. To exit the error state, the V_{CC} supply voltage must be raised to +14.5 V.

DESAT circuit mode

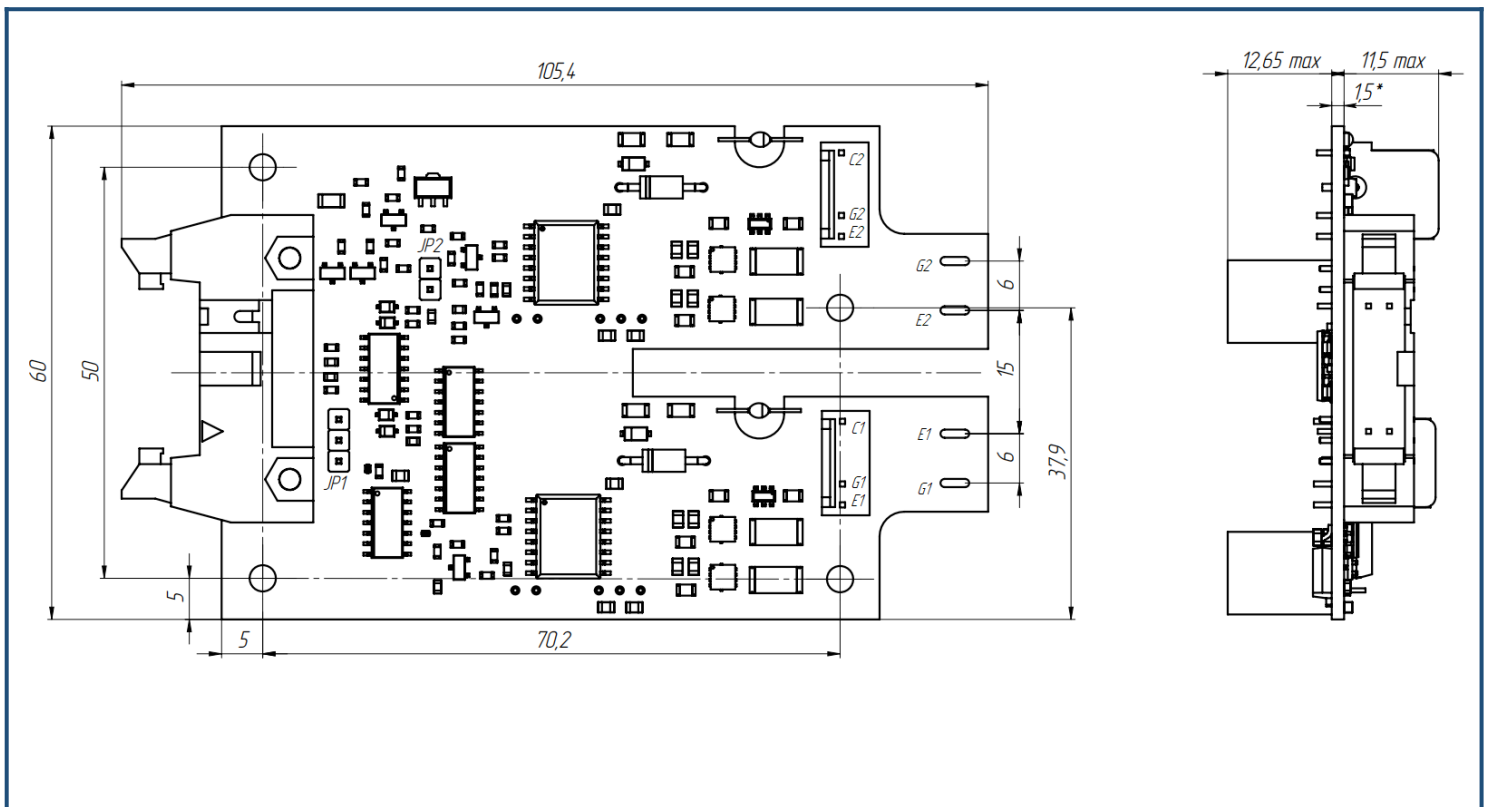
The DESAT circuit is a protective driver circuit that protects the IGBT module from high-amplitude currents. A circuit with a delay of 8 μ s after the start of switching on the IGBT starts monitoring the voltage drop of the IGBT transistor between the collector-emitter terminals. If the voltage drop exceeds the value + 8V, the driver will turn off the IGBT module with a delay of 350 ns using the "soft" shutdown function with next blocking the input control signals. The outputs of the F out A / B driver and F out will be put into an error state.

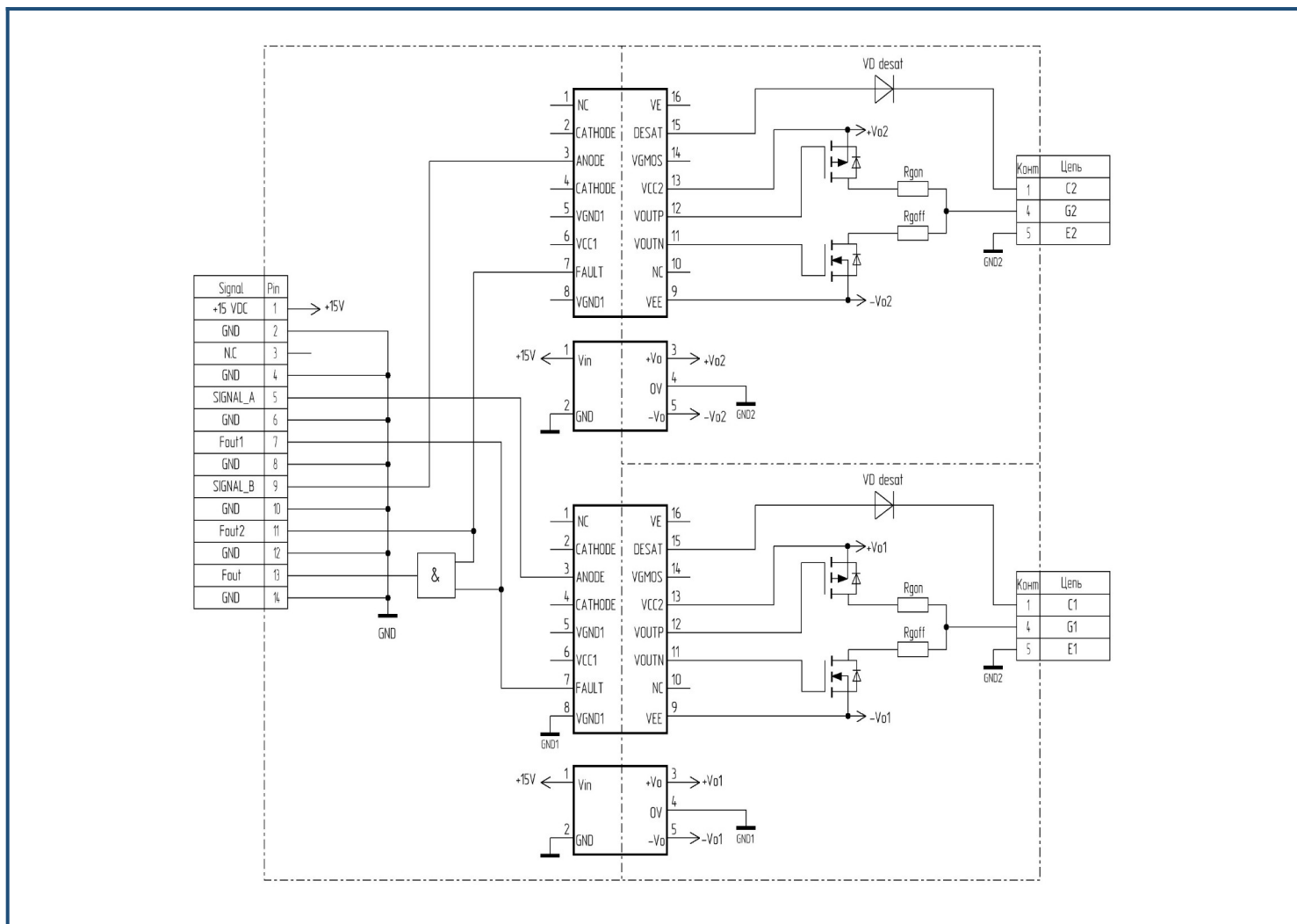


t_1 – error enable delay time 500 ns

t_2 – channel control lock time 1.5 ms

Overall dimensions



Functional diagram

Pin Designation (IDCC 14MR)

№ pin	Function	№ pin	Function
1	Power +15V	2	GND
3	Not connected	4	GND
5	Signal A	6	GND
7	F out 1	8	GND
9	Signal B	10	GND
11	F out 2	12	GND
13	F out (common)	14	GND

Part numbering guide

DI	2	8	-	17	-	E	-	1	
DI									IGBT driver
	2								Number of Output Channels
		8							Maximum pulse output current
				17					IGBT module class
						E			Electrical interface
								1	Version for IGBT modules type MIAA

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