

Technical Information

RES-600-V02

Intelligent ARCP IGBT-Module

Description

alpitronic RES-600-V02 Intelligent Power Module with integrated ARCP resonant circuit is a half bridge module designed for power switching applications operating at frequencies up to 50kHz.

The built-in resonant circuit ensures absolute zero voltage on switching of the main switches and provides a smooth resonant up and down swing of the phase output voltage minimizing EMI. Switching losses are drastically reduced in order of 50% - 70% in comparison to conventional hard switching half bridges.

The integrated intelligent gate driver stage is controlled by two 5V TTL PWM signals and drives the main and auxiliary switches. No additional control efforts in comparison to hard switching half bridges are needed.



Figure 1: 600V / 250Arms ARCP intelligent power module

Main Features

- Half bridge module **600V / 250 Arms**, up to **50kHz** operating frequency
- Drastically reduced **switching losses**, **50% -70%** load dependent
- Very **low EMI emissions** even on high PWM control frequency
- Module integrated resonant ARCP circuit for **absolute zero voltage switching**
- **No additional control efforts** in comparison to "hard switching" bridges

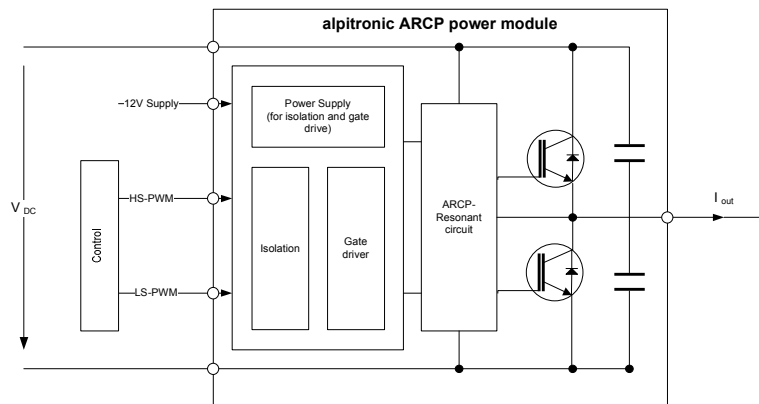


Figure 2: Block diagram of the alpitronic ARCP intelligent power module

Diagrams

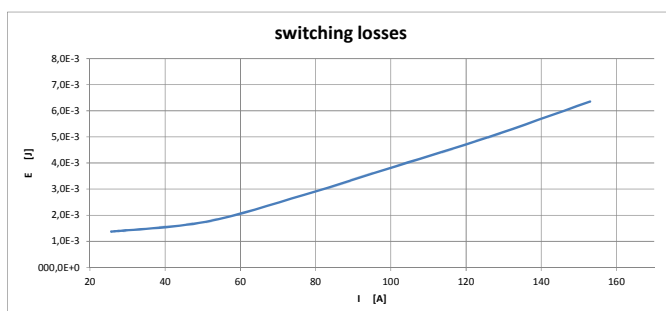


Figure 3: Switching losses (IGBT Eon + Eoff, Diode and ARCP circuit) of the RES-600-V02 @ UDC=300V, TJ = 125°C

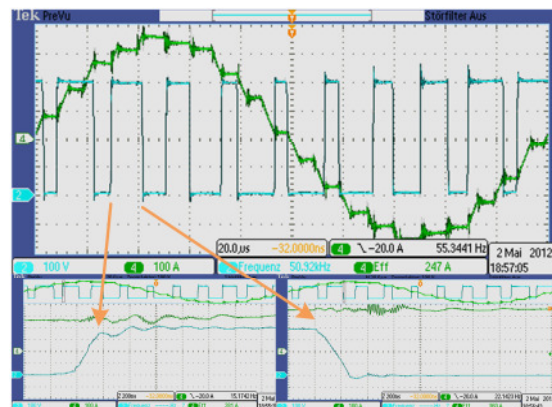
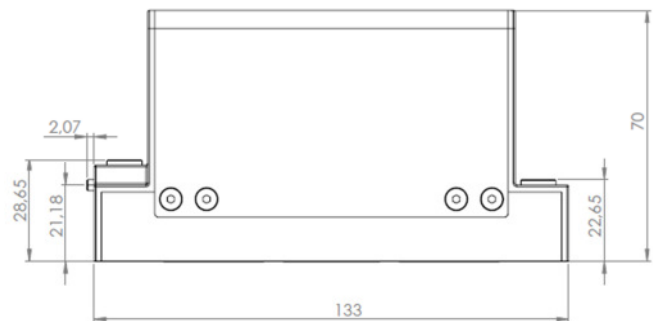
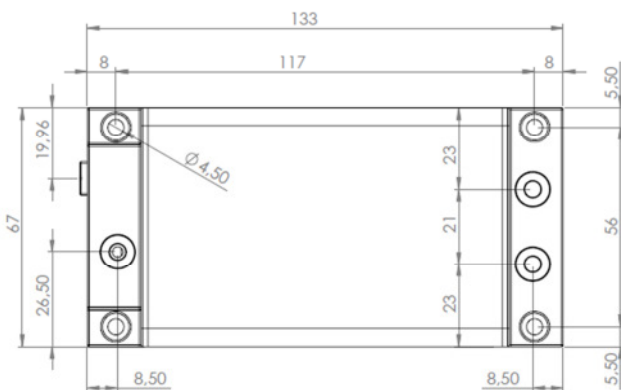


Figure 4: Phase current (green) and voltage (blue) at 5kHz EMF frequency (top), PWM up and down swing (bottom)

Technical Data

Maximum Ratings RES-600-V02				
Parameter	Conditions	Symbol	Values	Unit
Half Bridge IGBT				
Collector-emitter break down voltage		V_{CE}	600	V
DC collector current	$T_j=175^{\circ}\text{C}$, $T_c=80^{\circ}\text{C}$	I_C	250	A
Implemented collector current		I_{CN}	400	A
Repetitive peak collector current	T_p limited by T_j max	$I_{C\text{ PULS}}$	1200	A
Power dissipation per IGBT	$T_j=175^{\circ}\text{C}$, $T_c=80^{\circ}\text{C}$	P_{tot}	550	W
Half Bridge Diode				
DC forward current	$T_j=175^{\circ}\text{C}$, $T_c=80^{\circ}\text{C}$	I_F	250	A
Repetitive peak forward current	T_p limited by T_j max	I_C	1200	A
Power dissipation per diode	$T_j=175^{\circ}\text{C}$, $T_c=80^{\circ}\text{C}$	P_{tot}	724	W
Control interface				
PWM control voltage		V_{ctrl}	0-5	V
Supply Voltage				
Gate driver supply voltage		V_{supp}	12	V
Thermal properties				
max. Chip temperature		$T_{j\text{max}}$	175	$^{\circ}\text{C}$
Storage temperature		T_{stg}	-40...+125	$^{\circ}\text{C}$

Dimensions



For further information please contact:

alpitronic GmbH
 Siemensstraße 19
 39100 Bozen (BZ)
 Italy

Tel.: +39 0471 068 230
 Fax: +39 0471 068 234
 Email: info@alpitronic.it
 Homepage: www.alpitronic.it