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VE-Trac™ Direct Kit

Public Information

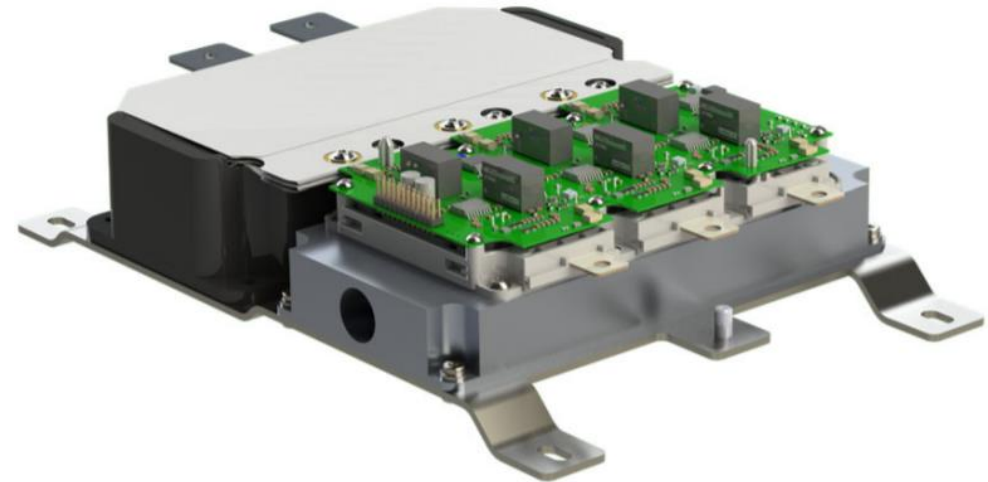


VE-Trac™ Direct Kit - Introduction

Goal- To demonstrate **150KW traction inverter** solution for HEV based on ON Semiconductor's automotive power module **VE-Trac Direct NVH820S75L4SPB** platform.

Design features:

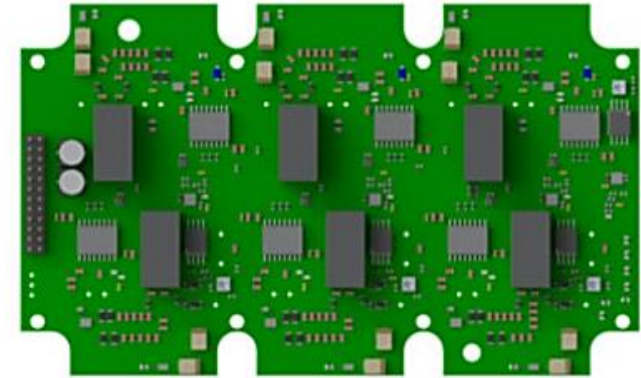
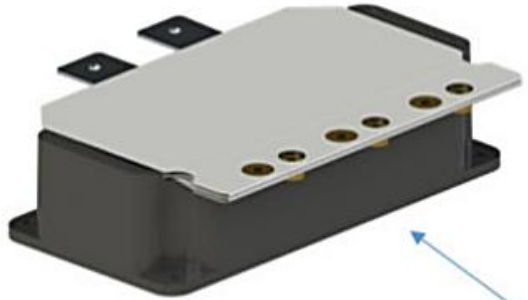
- ✓ Inverter evaluation Hardware kit for EV/HEV Traction
- ✓ Inverter applications (up to 150 kW)
- ✓ VE-Trac Direct NVH820S75L4SPB with 820 A, 750 V
- ✓ Field stop 4 IGBT/Diode chipset.



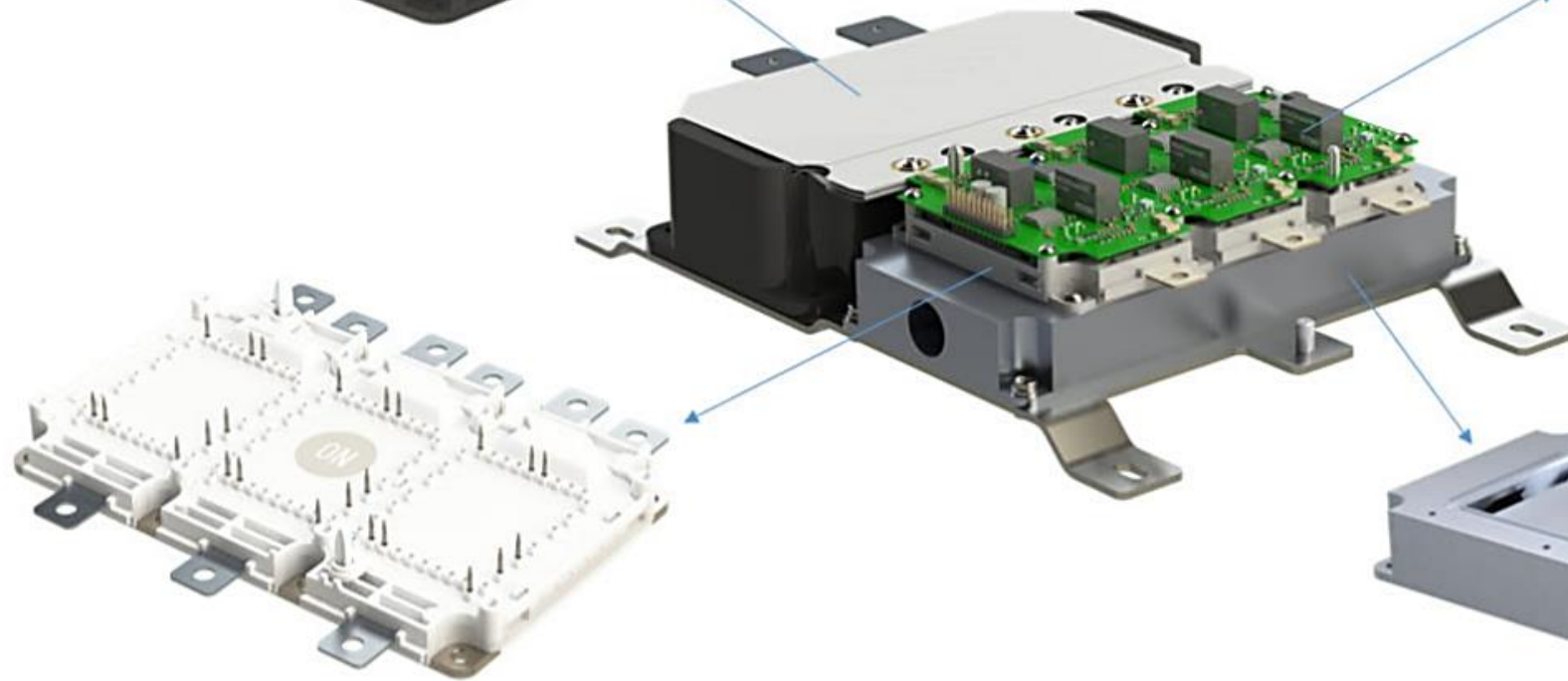
Parameter	Symbol	Min	Max	Conditions
Gate Driver Board Control Power	V_{Driv}	9 V	15 V	
DC Link Voltage	V_{BUS}	0V	500V	Limited by Capacitor
Peak Collector Phase Current (1ms)	I_{CPEAK}	-1640 A	1640 A	Limited by $T_{\text{vj_Max}}$
Maximum IGBT/FWD Junction Temperature	$T_{\text{VJ_Max}}$	-40°C	175°C	
Wait time after short circuit	SC	1s	-	
PCB Temperature	T_{PCB}		85°C	
Switching frequency	F_{SW}		12 kHz	
Coolant Temperature	T_{c}	-40°C	65°C	

VE-Trac™ Direct Kit – Major component

DC Link Capacitor /w laminated bus structure



6-ch Gate Driver Board



Liquid Cooling Jacket

VE-Trac™ Direct 6-pak Power Module

VE-Trac SSSDC Kit- Walkthrough



VE-Trac™ Direct Kit Featured Product - NVH820S75L4SPx

General Information

The NVH820S75L4SPx is a power module from the VE-Trac™ Direct family of highly integrated power modules with industry-standard footprints for Hybrid and Electric Vehicle (HEV) traction inverter application. The module integrates six Field Stop 4 (FS4) 750V Narrow Mesa IGBTs in a 6-pack configuration. FS4 IGBTs show low power losses during lighter loads, which helps to improve overall system efficiency in automotive applications. For assembly ease and reliability, a new generation of press-fit pins is integrated into the power module signal terminals.

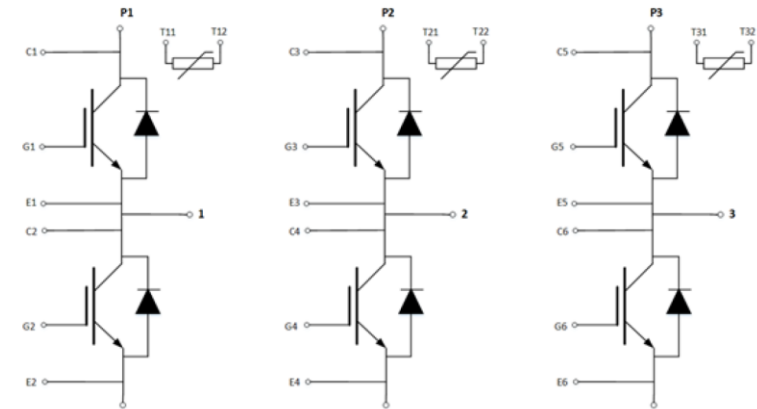
Features

- Direct Cooling with Integrated Pin-Fin Heatsink
- Ultra-low Stray Inductance of 8nH
- $T_{jmax} = 175^{\circ}\text{C}$ continuous operation
- Low V_{CESAT} and Switching losses
- AQC324 Qualified FS4 750V Narrow Mesa IGBT and UFS 1200V Trench IGBT
- Highly Integrated 6-pack Topology

Benefits

- Low System Cost
- Lower Energy Losses
- Higher Inverter Peak Output Power
- Improved Inverter Efficiency
- Optimized for Automotive Traction Applications
- Easy Design and Integration

Block Diagram



Package



6

SPB Package

SPC Package

Public Information



VE-Trac™ Direct Demo Featured Product - NCV57000

General Information

NCV57000 is a high-current single channel IGBT driver with internal galvanic isolation, designed for high system efficiency and reliability in high power applications. Its features include complementary inputs, open drain FAULT and Ready outputs, active Miller clamp, accurate UVLOs, DESAT protection, soft turn-off at DESAT, and separate high and low (OUTH and OUTL) driver outputs for system design convenience

Features

- High Current Output(+4/-6 A) at IGBT Miller Plateau Voltages
- Short Propagation Delays with Accurate Matching
- DESAT with Soft Turn Off
- Active Miller Clamp and Negative Gate Voltage
- High Transient & Electromagnetic Immunity
- 5 kV Galvanic Isolation

Benefits

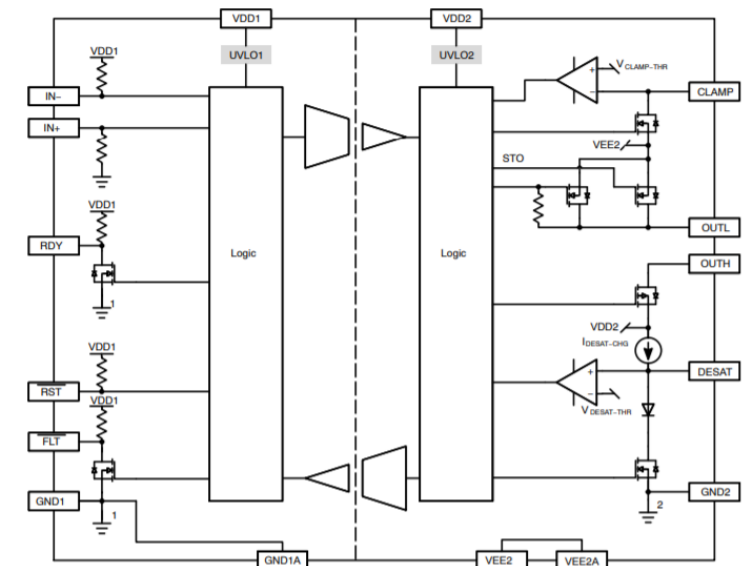
- Improves system efficiency
- Improves PWM signal integrity
- Protection against overload and short circuits
- Prevents spurious gate turn-on
- Ruggedness in fast slew rate high voltage and high current switching applications
- Galvanic isolation to separate high voltage and low voltage sides to provide safety and protection

Package



1
SCALE 1:1

Block Diagram



Thank you!

<https://www.onsemi.com/products/power-modules/igbt-modules/>

