



Discretes IGBT Motor Drive flexible testing platform

**Three phase, 230V_{ac} ÷ 400V_{ac}, 7.5kW to 25kW flexible platform
for discrete IGBT testing and paralleling in Motor Drive
applications and General Purpose Inverters.**

Motivation.

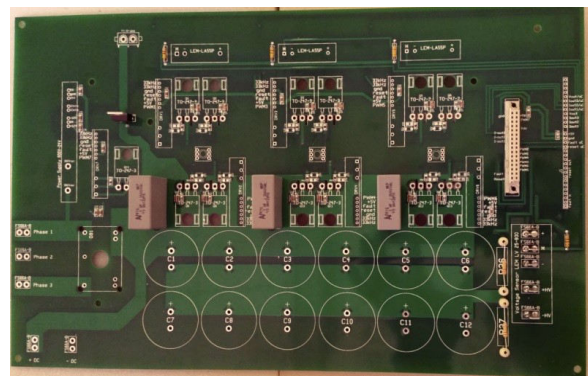
Power-stack Board for Motor Drives and General purpose inverter which provide a flexible testing platform for the following goals:

- Dynamic behaviour of discrete IGBT and FRD
- Paralleling of discretes IGBT
- Device Efficiency measurements
- Flexible Gate drivers for Benchmarking
- Thermal measurements
- IGBT and FRD benchmarking
- EMI measurement (radiated and conducted) including di/dt and dv/dt at turn on, voltage overshooting at turn-off and di/dt at turn-off
- RBSOA comparison

1. Main characteristics

■ Main Features

- General Purpose Inverter versatile testing board for discrete PTH paralleling TO-247-3 and TO-247 PLUS.
- Vin 3-Ø 230/400Vac 50-60Hz
- Vout 230Vac and 400Vac output
- variable speed 0Hz to 300Hz
- Switching frequency from 4kHz up to 25kHz
- 2xTO-247-3 per switch (600V and 1200V V_{(BR)ces}) plus 1xBrake IGBT
- 7xIsolated gate driver with floating resonant power supply
- Power supply 300...800V/±24V included
- XMC4400 microcontroller board with FOC. (OTP, OCP, shutdown SC logic)



Block diagram:

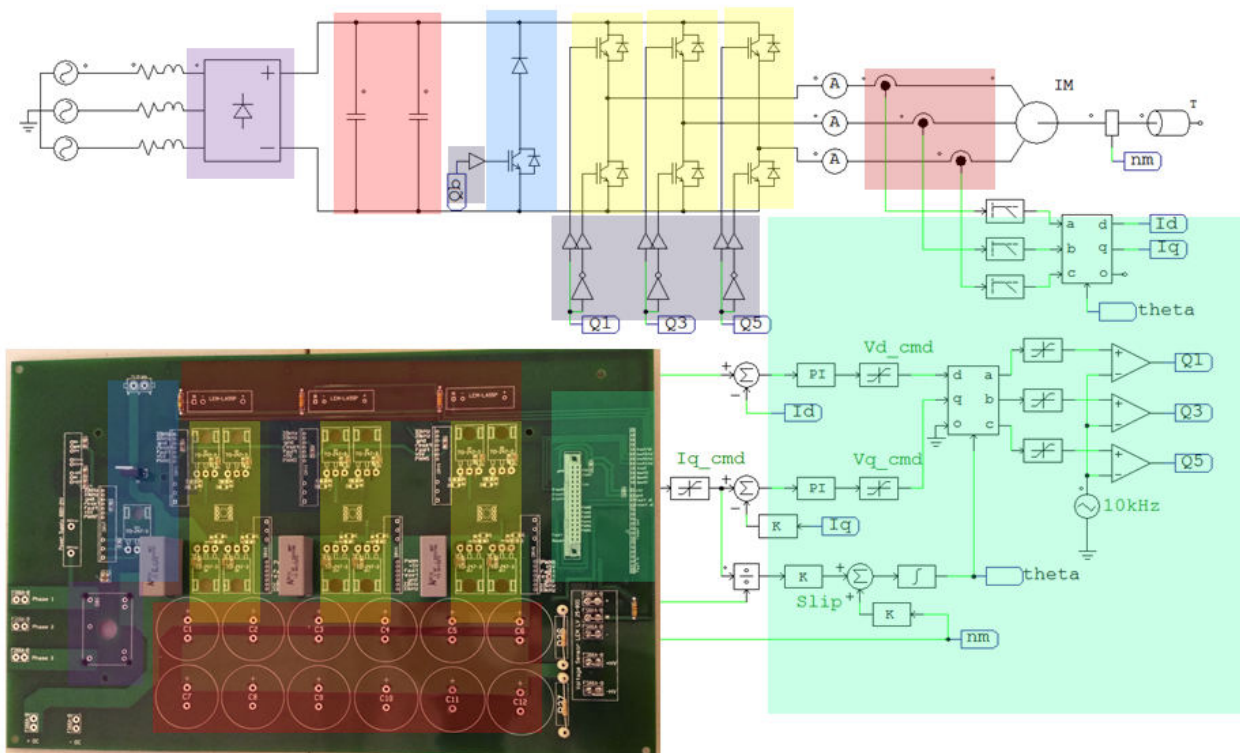
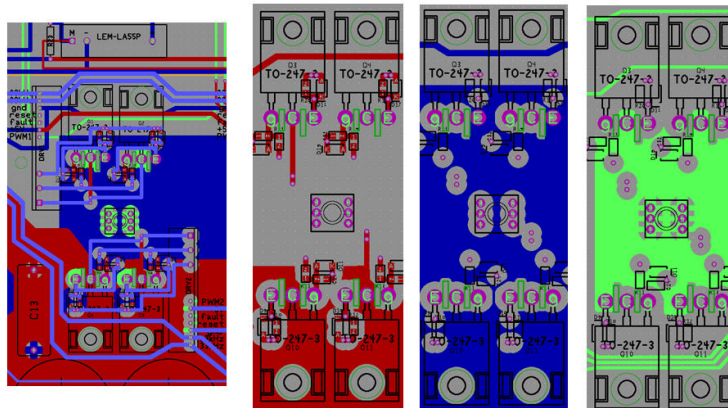
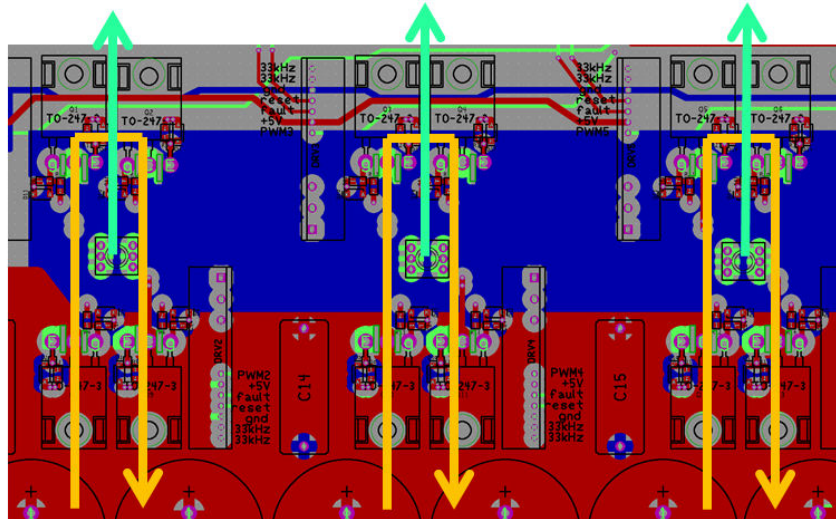


Fig. 1. Block diagram and related component placement on the original testing Board

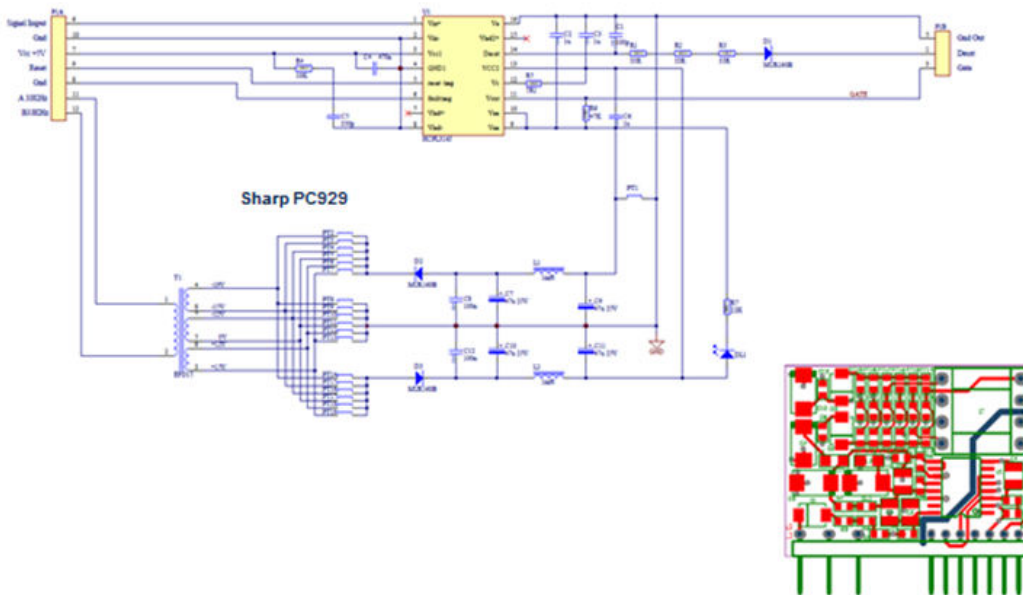
Further characteristics:

- Small power loop stray inductance due to overlapped and compensated layout.
- Small signal loop with orthogonal tracks design to reduce coupling with power stage.
- Symmetry of the output connections to reduce voltage oscillations

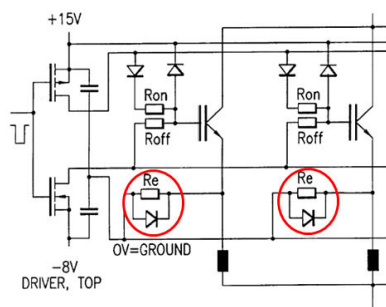




Versatile gate driver stage with original 33kHz resonant converter to reduce cost of the floating power supply improving reliability and voltage isolation via HF trafos.



Paralleling stage with Aux Emitter resistance to reduce current loops



Main Characteristics are detailed in the following Tab.1

Tab. 1

Characteristic	Value
Mains input voltage	230Vac and 400Vac 50/60 Hz, 3 phase
Output Current range	65A (230Vac) 37A (380Vac)
Max. current (EN61800)	85Arms per 60s 65Arms per 180s
Output voltage (EN61800)	230Vac / 400Vac
Max voltage overshooting at 1A/ns	45Vpk
Capacitor Bank	1,6mF / 900V / 120mArms
Current sensors	3 LEM LA25AH
Voltage sensor	1 LEM LV400
Output filter	-
Typical Efficiency	97%
Power factor	0,3...1
Heatsink Rthca	0,56K/W
Protection class	IP20
Gate drivers	7 flexible gate drivers
Power supply	24W, 800Vdc in – 33kHz 28Vac output HE resonant converter
Galvanic Isolation	8kV with HF transformers
Control	Infineon XMC 4400
Dimensions mm (L,W,H)	280x170x180
Weight	Kg