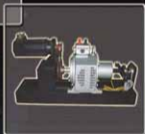


POWER ELECTRONICS AND DIGITAL DRIVES

For Educational Institutions & Research Scholars



Product Selection Guide

2007 - 2008



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TMS320F2407 DSP CONTROLLER

Micro-2407A, a powerful TMS320F2407A based DSP Trainer. It is a cost effective, algorithm development based motion control application tool. Its basic configuration is similar to (both hardware and software) Texas Instruments EVM Kit.

On Chip Features :

- # 16 PWM Outputs
- # Auto sequenced 10 bit ADC with dual sequencer (8 Channels in a sequencer) with conversion time 350 ns
- # 40 GPIO lines
- # 6 Capture Inputs 2QEP



Memory :

- # 48K x 16 bit EPROM for monitor, Assembler and Dis-assembler
- # 16K x 16 bit RAM for program memory
- # 32K x 16 bit RAM for Data memory

Additional Features :

- # Opto isolated serial port terminated with 9 pin D male connector upto 38 k baud rate
- # 3 Switches are provided for user applications like Increment & Decrement.
- # ADC inputs are protected by Zener diodes
- # 16 LEDs provided to indicate the various status of user program
- # 6 Capture lines are protected.

dsPIC30F4011 Microcontroller based Controller



On-Chip Memory :

- * 48Kb Flash program memory
- * 1Kb Data EEPROM
- * 2Kb Data RAM

Additional Features :

- * One RS232 Compatible Opto isolated serial port & terminated with 9 pin D male connector
- * 6 PWM, and Two capture inputs and two compare outputs are terminated at 34 pin FRC connector.
- * SPI based 8 channel, 12 bit DAC using ADS328.
- * 4 Channels of DAC output & 6 channels of ADC inputs are terminated at 26 pin FRC connector
- * LCD Display
- * 3 Switches for user function

On Chip Peripherals

- # Three 16 bit Timers/counters
- # Four 16 bit Capture inputs
- # Two 16 bit Compare / PWM outputs
- # Six PWM outputs for Motor control
- # One 3 channel CEP I/P
- # 6 Channel 10 bit ADC of 500 MSPS conversion time.
- # SPI, I2C, USART

TMS320F2812 DSP CONTROLLER



Memory :

- # 48Kx 16 bit EPROM for monitor, Assembler and Dis-assembler
- # 16K x 16 bit RAM for program memory
- # 32K x 16 bit RAM for Data memory

Additional Features :

- # Opto isolated serial port terminated with 9 pin D male connector upto 38 k baud rate
- # 3 Switches are provided for user applications like Increment, Decrement.
- # ADC inputs are protected by Zener diodes
- # 16 LEDs provided to indicate the various status of user program
- # 6 Capture lines are protected.

DUAL SPARTAN 3 CONTROLLER (VDAD-12)



- * 2 Nos of Spartan 3 with each 400K gates provided.
- * Each FPGA has configuration Flash PROM and JTAG interface facility.
- * 16 x 2 or 20 x 4 LCD Display
- * 8 Nos of push button keys for various functions
- * 8 channel 12 bit serial DAC and output terminated at 10 pin connector
- * 2 Channel DAC outputs also terminated at 4 pin screw type connector
- * 2 FPGA's can be interconnected through I/O lines.



3 HP IPM BASED POWER MODULE (PEC16DSMO3)



- Power Module is designed for Motor control Applications upto 3 HP by using the 3rd Generation of IGBT & DiODE Technology.
- 1200V, 25A converter Bridge for AC-DC power conversion with filter capacitor
- 4 Nos of Hall Effect current sensors provided for DC Link current & 3 output currents measurement.
- 1 No of Hall Effect Voltage sensor provided DC Link voltage measurement.
- All the PWM signals are isolated using opto isolator
- Protection circuit for over current with LED indication
- Optically Isolated Fault signal from the IPM is given to the FPGA / μ C/ DSP controllers for protection.
- Independent Power supplies for all Isolated circuits.
- 0-900V DC Voltmeter to Indicate the DC Link Voltage
- All current, sensor OIPs, PWMS are terminated at Front panel

- FRC Connectors are provided to Interface with the FPGA / μ C / DSP controllers
- Power Input/Output Lines are Terminated at Banana sockets
- Built - in over voltage, under voltage, over current & over Temperature protection

SRM POWER MODULE (PECDSMO15)



- Power Module is designed for 4 phase
- SWITCHED' Reluctance Motor control applications
- Individual 4 Nos of IGBT to form power circuit for SR Motor.
- Uncontrolled bridge rectifier for AC to DC conversion with filter capacitor
- Hall sensors are provided to sense DC Link current and 4 output currents.
- All the PWM signals are isolated using optoisolators
- Over current protection with LED indication
- 34 pin & 26 pin FRC connectors are provided to interface with controllers
- Analog DC voltmeter to indicate the DC link voltage
- Power input and Output
 - Input : 1phase 50Hz AC
 - Output : Suitable for 1 HP

SINGLE PHASE IGBT MODULE (PEC16M3)



- Four no. gate signal to trigger four IGBT / MOSFET.
- IC Based carrier (triangular) wave generation with variable frequency.
- One no. potentiometer used to vary the carrier frequency (2KHz to KHz).
- IC Based reference sine / square / trapezoidal wave generation with variable amplitude & frequency.
- One no. rotary switch to select different type of reference waves.
- Two no. potentiometer used to vary the frequency, amplitude of reference signal.
- LM311 Based comparator circuit. It compares carrier & reference wave.
- One no. rotary switch to select PWM for different types of modulation sin / trapezoidal/ square.
- One no. toggle switch with debounce logic for PWM ON/OFF.
- All four PWM outputs are terminated on the front panel for device module
- interface (PEC16M2 / M3).
- 230V AC Input, +15V / -15V DC for control circuits.

- This module can be interfaced with IGBT module.
- The following experiments can be done using this firing module & device Module Combination.

CHOPPER CONTROL CIRCUITRY MODULE (PEC16M5)



- Four no. gate signal to trigger four IGBT/MOSFET.
- IC Based carrier (triangular) wave generation with variable frequency.
- Potentiometer used to vary the carrier frequency (2KHz to 4KHz).
- LM311 Based comparator circuit. It compares carrier & control voltage.
- One no. potentiometer used to vary the control voltage so as to vary the duty cycle ratio of PWM (5% to 95%).
- IC Based control logic circuits for generation of PWM for different type of chopper (Single/Two/Four quadrant).
- One no. rotary switch to select PWM for different types of chopper circuits.
- One no. toggle switch for PWM ON/OFF.
- All four PWM outputs are terminated on the front panel for device module interface (PEC16M2/M3).
- 230V AC Input, +15V / -15V DC control circuits.
- This module can be interfaced with IGBT module (PEC16M3) or MOSFET module (PEC16M2) optionally.

SINGLE PHASE MOSFET MODULE (PEC16M2)



- Four no. IRGBC - 20S IGBT with heatsink and snubber circuit.
- 6N137 high speed opto for gate PWM isolation.
- IR2112 / 2110 Driver IC for gate PWM drive.
- IC Based dead time logic for delay circuit.
- Built in 50 / 30V, 2Amp DC for power circuit input.
- Over current protection circuit with LED indication.
- All devices terminated individually for different configuration.
- By suitable interface with external firing module (PEC16M4 / M5) it can be work as
- All four device gate pulse inputs are terminated on the front panel for external interface (MP / MC / DSP, etc..).
- 230V AC Input , +15V / -15V DC for control circuits.
- Optionally a hall-effect current transducer provided for current measurement.

PWM INVERTER CONTROL MODULE (PEC16M4#1)



- Four no. gate signal to trigger four IGBT / MOSFET.
 - IC Based carrier (triangular) wave generation with variable frequency.
 - One no. potentiometer used to vary the carrier frequency (2KHz to KHz).
 - IC Based reference sine / square / trapezoidal wave generation with variable amplitude & frequency.
 - One no. rotary switch to select different type of reference waves.
 - Two no. potentiometer used to vary the frequency, amplitude of reference signal.
 - LM311 Based comparator circuit. it compares carrier & reference wave.
 - One no. rotary switch to select PWM for different types of modulation sin / trapezoidal/ square.
 - One no. toggle switch with debounce logic for PWM ON/OFF.
 - All four PWM outputs are terminated on the front panel for device module interface (PEC16M2 / M3).
- 230V AC Input, +15V / -15V DC for control circuits.
 - This module can be interfaced with IGBT module.
 - The following experiments can be done using this firing module & device module combination.

THREE PHASE IGBT POWER MODULE (VPET - 106)



- Power Module is designed for Motor control Applications and UPS Application.
 - IGBT & DIODE used as power device.
 - Input : 1 Phase 50 Hz AC.
 - Output : i. 3 ϕ AC (V/F) control for 3 ϕ drive applications
ii. 3 ϕ AC Output for UPS
 - Applications (Voltage control)
 - 1200V, 25A, 3 Phase IGBT Inverter Bridge
 - 1 No. of Hall Effect current sensors to sense the output current of the Inverter Bridge
 - All the PWM signals are isolated using Opto Isolator
 - Protection circuit for over current with LED indication
 - Independent Power supplies for all Isolated circuits.
 - Voltmeter to indicate the DC Link Voltage
 - All current, PWMS & Feedbacks are terminated at Front panel.
- FRC Connectors are provided to Interface with the External digital controllers
 - All the Input/Output Lines are Terminated at Banana sockets.

FOUR QUADRANT CHOPER CONTROL MODULE (PEC16HV3)



- Four no. gate signal to trigger four IGBT/MOSFET.
 - IC Based carrier (triangular) wave generation with variable frequency.
 - Potentiometer used to vary the carrier frequency (2KHz to 4KHz).
 - LM311 Based comparator circuit. it compares carrier & control voltage.
 - One no. potentiometer used to vary the control voltage so as to vary the duty cycle ratio of PWM (5% to 95%).
 - IC Based control logic circuits for generation of PWM for different type of chopper (Single/Two/Four quadrant).
 - One no. rotary switch to select PWM for different types of chopper circuits.
 - One no. toggle switch for PWM ON/OFF.
 - All four PWM outputs are terminated on the front panel for device module interface (PEC16M2/M3).
- 230V AC Input, +15V / -15V DC control circuits.
 - This module can be interfaced with IGBT module (PEC16M3) or MOSFET module (PEC16M2) optionally.

3PHASE SPWM CONTROL MODULE (PEC16M4#3Φ)



- It generates 6 Nos. of PWM to trigger the 6 IGBTs provided in the device module for Inverter application.
- Sine PWM technique is used.
- 3 Phase sine wave (with 120° phase shift) generated through ICS
- Frequency and amplitude (V/F or V/F) can be controlled by adjusting potentiometer
- One no. of carrier wave generation block (Generate 3KHz Frequency)
- 3 Nos. of PWM IC generate PWM with comparison of each phase & carrier wave
- 3 PWM inverted by using NOT gate
- Final output of 6 PWM used to trigger 6 Nos. of IGBT/MOSFET (Device module) with frequency, amplitude control
- Test points are provided to check the waveforms at various stages of the PWM circuitry
- Built in power supplies for the control circuitry, 230V, 50Hz, $\pm 15V$ & 5V.
- The module is bought out in a sleek box.

SCR PARALLEL INVERTER MODULE (PEC14M7)



- 230V, 50Hz AC input, +15V DC / 1AMP for control circuit.
- One no. fuse provided for power supply protection, necessary test points provided.

- Consists of SCR power circuit and firing circuit.
- 4046 IC Based square wave generation with adjustable frequency.
- One no. potentiometer used to vary the frequency (50 - 100Hz).
- 1:1 Pulse transformer used for gate pulse isolation.
- Pulse output terminated in the PCB for user patching.
- Power circuit consists of two No's SCR (TNY612), inverter transformer with flay back winding.
- One no. Iron core inductor provided for power circuit.
- One no. AC capacitor for SCR commutation.
- LM 723 Based 24V / 2A DC power supply with LED indication.
- One no. toggle switch used to ON/OFF 24V DC power supply.
- Over load and short circuit protection provided for DC power supply.

SCR SERIES INVERTER MODULE (PEC14M6)



- Consists of SCR power circuit and firing circuit.
- IC Based firing pulse generation to trigger SCR.
- One no. pot used to vary the frequency of firing pulse (300 - 600Hz).
- One no. toggle switch to ON/OFF SCR gate pulses.
- 1:1 Pulse transformer used for gate pulse isolation.
- Pulse output terminated in the PCB for user patching.
- Power circuit consists of two No's SCR (TNY612), center tapped inductor center tapped capacitor.
- LM 723 Based 24V / 2A DC power supply with LED indication.
- One no. toggle switch used to ON/OFF 24V DC power supply.
- Over load and short circuit protection of input DC.
- 230V, 50Hz AC input, +15V DC / 1AMP for control circuit.
- One no. output PI - filter to filter series inverter output voltage.
- One no. fuse provided for power supply protection, necessary test points provided.

SCR BRIDGE INVERTER MODULE (PEC14M14#INV)



- Four isolated gate pulses are provided to fire the four SCRs
- One potentiometer provided to vary the frequency of the inverter
- One potentiometer provided to vary the amplitude of the inverter
- Gate pulses are terminated through proper connectors for patching with SCRs.
- Four SCRS rated 600V/12A provided
- Four diodes rated 600V/6A provided
- Commutating capacitors and inductors are also provided
- +15v regulated DC power supply for control circuitry
- 24V DC regulated for inverter power circuit.



SINGLE PHASE SCR CONVERTER (PEC14M14FW)



- * Four nos. of SCRs rated for 1200Volts – VAK & 25Amps IA
- * One diode for free wheeling
- * Each device is provided with
 - # RC Snubber for dv / dt protection
 - # Fuses to avoid overload
- * All the G, A, K & MT terminals are terminated on connectors to use patch chords to form any converter / Inverter circuitry
- * 24V AC @ 2Amp regulated output for low voltage operation
- * In the low voltage operation the student can see the waveform using an oscilloscope without any Isolation Transformer
- * One fixed Resistive Load
- * One fixed Inductive Load
- * All points are terminated at the front panel for wiring for each experiment

THREE PHASE AC INDUCTION MOTOR

Spring Balance



Eddy Current Load

Generator Load



- * 1 HP, 1440 RPM 3 ϕ AC induction motor Fixed on a mechanical frame.
- * Make : Benn / Siemens
- * Eddy current loading setup coupled with AC induction motor
- * Torque indicator
- * Electronic controller provided to vary the load torque
- * Quadrature optical encoder fixed on the motor shaft for speed feedback and measurement

3 PHASE SCR CONVERTER MODULE (PEC14HV5A&5B)



- * Power circuit consists of two No. SCR (TNY1225) rating at 1200V, 25AMP two no. power diode rating at 1200V, 50AMP).
- * All terminals of diode and SCRs terminated on the front panel for external connection.
- * One No. MCB provided to ON/OFF input three phase AC, and over current protection.
- * Indicator and fuse provided for mains R,Y,B.
- * Input : [0 - 440V] AC, 50KHz,
- * Output : [0 - 600V] DC, 5AMP / 10AMP (optional), Three phase converter. 0 - 440V AC , 5AMP / 10AMP (optional), Three phase regulator.

- * Line synchronized op-amp based three phase linear triggering circuit.
- * One No. potentiometer used to vary the triggering angle (0° - 180°).
- * Line synchronization achieved but three phase step-down transformer.
- * Carrier logic implemented for SCR self - starting. One No. Toggle switch with debounce logic for pulse ON/OFF.
- * Six No's 1:1 pulse transformer used for gate pulse isolation.
- * All six pulses output terminated in the front panel for device module interface.

DC SHUNT MOTOR

Generator Load



Spring Balance



Eddy Current Load



- * 1 HP, 1500RPM separately excited DC Shunt motor Fixed on a mechanical frame.
- * Make : Benn / Siemens
- * Eddy current loading setup coupled with DC shunt motor
- * Torque indicator
- * Electronic controller provided to vary the load torque
- * Quadrature optical encoder fixed on the motor shaft

BRUSHLESS DC MOTOR

- * 1.1hp Permanent Magnet Brush Less DC Motor with Trapezoidal Back EMF
- * Fixed on a mechanical frame.
- * Eddy current / Spring Balance loading arrangement.
- * Hall sensor for position sensing
- * Speed 6000rpm
- * Make : SEM

Eddy Current Load



Spring Balance Load



PMSM MOTOR

- * 1.2HP Permanent Magnet Synchronous Motor with Sinusoidal Back EMF
- * Fixed on a mechanical frame.
- * Spring Balance / Eddy current loading arrangement.
- * Resolver for Position Sensing
- * Speed : 6300 rpm , 325V & 3A
- * 1.5 N-M continuous Torque

Eddy Current Load



Spring Balance Load



SWITCHED RELUCTANCE MOTOR

- * 1 HP
- * Upto 10,000 rpm
- * 150V in each coil
- * 3 Amp current rating
- * Coupled with specially designed motor load suitable for 1hp SR-Motor
- * Electronic torque controller for load variation
- * One no. of digital/analog torque indicator.

Eddy Current Load



SINGLE PHASE AC INDUCTION MOTOR

- * 1 HP,1440RPM single phase induction motor fixed on a mechanical frame.
- * Make : Benn / Siemens / Crompton Greaves
- * Eddy current loading setup coupled with AC motor
- * Torque indicator
- * Electronic controller provided to vary the load torque
- * Quadrature optical encoder fixed on the motor

Eddy Current Load



Generator Load



Spring Balance Load



DC - DC CONVERTER TRAINER

FPGA Based MOSFET Buck Converter [VSMPS-05]

- One number MOSFET used as power switch.
- Opto provided for PWM isolation.
- Driver IC IR2110 & Filter circuit provided.
- I/P voltage : 15V DC, Output voltage: 5V
- Voltage feed back circuit and resistive load provided.
- Connectors provided for PWM input (PWM given from FPGA Controller)



FPGA Based MOSFET Forward Converter [VSMPS-08]

- One number MOSFET used as power switch
- One number of high frequency transformer provided
- Opto provided for PWM isolation
- Driver IC IR2110 & Filter circuit provided.
- I/P voltage : 15V DC, Output voltage: 5V
- Voltage feed back circuit and resistive load provided
- Connectors provided for PWM input (PWM given from FPGA Controller)



FPGA Based MOSFET Boost Converter [VSMPS-06]

- One number MOSFET used as power switch.
- Opto provided for PWM isolation.
- Driver IC IR2110 & Filter circuit provided.
- I/P voltage : 15V DC, Output voltage: 30V
- Voltage feed back circuit and resistive load provided.
- Connectors provided for PWM input (PWM given from FPGA Controller)



FPGA Based MOSFET Flyback Converter [VSMPS-09]

- One number MOSFET used as power switch
- One number of high frequency transformer provided
- Opto provided for PWM isolation
- Driver IC IR2110 & Filter circuit provided.
- I/P voltage : 15V DC, Output voltage: 5V
- Voltage feed back circuit and resistive load provided



FPGA Based MOSFET Buck-Boost Converter [VSMPS-07]

- One number MOSFET used as power switch.
- Opto provided for PWM isolation.
- Driver IC IR2110 & Filter circuit provided.
- I/P voltage : 15V DC, Output voltage: 30V
- Voltage feed back circuit and resistive load provided.
- Connectors provided for PWM input (PWM given from FPGA Controller)



DUAL SPARTAN 3 CONTROLLER [VDAD-12]

- 2 Nos of Spartan 3 with each 400K gates provided.
- Each FPGA has configuration Flash PROM and JTAG interface facility.
- 16 x 2 or 20 x 4 LCD Display
- 8 Nos of push button keys for various functions
- 8 channel 12 bit serial DAC and output terminated at 10 pin connector
- 2 Channel DAC outputs also terminated at 4 pin screw type connector.
- 2 FPGA's can be interconnected through I/O lines.



SALES WING



VLSI



DSP



EMBEDDED



POWER ELECTRONICS



MICROPROCESSOR



PLC



MECHATRONICS



COMMUNICATION



More than 50 well groomed marketing Executives takes care of our sales.

Customer Support Division



Around 120 well trained Engineers continuously strive for customer satisfaction and earn in respect by offering best value.

Projects & Training



A separate wing to provide hands on experience for both students and staffs, training them in Projects & Researches under all areas.

Vi Microsystems Pvt. Ltd., established in the year 1986 is headed by a well known Educationalist and Ex-Scientist from Government of India, with vast experience gained in Research & Development.

This organisation was started with a prime motto to "Design and Develop the Hardware and Software products" to keep in tune with the emerging technological development and also to offer good sales support with effective Service backup and Technical support.

The Company has its own factory with a builtin area of about 18,000 square feet at Chennai. The company has its own R&D wing, effectively handled by qualified and dedicated engineers. The R&D centre is also recognised by Department of Scientific & Industrial Research, Government of India. By increasing its operations multifold, the company has created Employment opportunities to more people and it has now a work force of about 400 people working in different departments.

To start with, the company was engaged in the manufacture of Microprocessor Trainer Kits and all types of Interface Boards. By putting more & more R&D efforts, the company has expanded its activities in other areas also like Microcontroller, Process Control Instrumentation, Digital Signal Processing, Power Electronics & Drives, Data Acquisition Systems, Personal Computer Trainer Systems, VLSI & Embedded Systems etc. Now our annual turnover is around Rs.18 Crores.

Apart from its Head office in chennai, the company has expanded its sales and service support facilities in major cities in India as given below:

Coimbatore, Madurai, Trichy, Salem, Thirunelveli, Yillanur, Vellore, New Delhi, Bhubaneswar, Nagpur, Jabalpur, Calcutta, Vijayawada, Hyderabad, Vishakapatnam, Bangalore, Trivandrum, Cochin, Calicut.

The company has built up a high degree of reputation and credibility by its dedicated after sales service support. At present, the company is concentrating in various new fields like Advanced Control Systems, Image Processing, Robotics, Nuclear Electronics, Defence projects etc. The company is strengthening its R&D, Sales & Service Department in various places of India for much better results.

The company is also actively involved in the distribution of some of the good products manufactured by other manufacturers.

Research & Development



More than 60 qualified engineers working round the clock in product development and new product designing.



HEAD OFFICE



Production



More than 25 experienced Engineers engaged in PCB assembling, Fabrication & Final Quality checking of our products.

Testing & Quality Control



OUR PRESTIGIOUS PARTNERS

