



# Product Catalog

World-Leading FPGA Design Services



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## Branches

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- 3 China**  
Tel: +86-27-8774-5390  
Tel: +86-27-8774-5391  
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# New Products




TR10a-HL



DE10-Standard









ADC - SoC



A-Cute Car





DE5a-Net








DE10-Lite




DE10-Nano









RFS



Spider Robot Kit





6

SoC Platform  
(With ARM or  
ATOM  
Processor)

The SoC FPGA with ARM core or  
ATOM processor and its abundant  
development platform allow users to  
build complex systems with speed.

NEW!



DE10-Standard

NEW!



DE10-Nano

NEW!



ADC-SoC



DE1-SoC



DE2i-150

FPGA Device	Cyclone V 5CSXFC6D6F31C6N	Cyclone V 5CSEBA6U23I7N	Cyclone V 5CSEMA4U23C6N	Cyclone V 5CSEMA5F31C6	Cyclone IV EP4CGX150DF31
Speed Grade	C6	I7	C6	C6	C7
FPGA Logic Elements (K)	110	110	40	85	149.76
Hard Processor	ARM Cortex-A9 Dual-Core	ARM Cortex-A9 Dual-Core	ARM Cortex-A9 Dual-Core	ARM Cortex-A9 Dual-Core	Intel® Atom™ Processor N2600
USB Blaster	USB Blaster II	USB Blaster II	USB Blaster II	USB Blaster II	USB Blaster
Memory Interface	1GB DDR3 (HPS)	1GB DDR3 (HPS)	1GB DDR3 (HPS)	1GB DDR3 (HPS)	128MB SDRAM
	64MB SDRAM	EPCS128	EPCS128	64MB SDRAM	4MB SSRAM
Memory Interface	EPCS128	MicroSD Card Socket (HPS)	MicroSD Card Socket (HPS)	EPCS128	DDR3 SO-DIMM (CPU)
	MicroSD Card Socket (HPS)	---	---	MicroSD Card Socket (HPS)	SD Card Socket / mSATA (CPU)
Communication Interface	1GbE Port (HPS)	1GbE Port (HPS)	1GbE Port (HPS)	1GbE Port (HPS)	1GbE Port (CPU)
	2 USB 2.0 Host Ports (HPS)	USB 2.0 OTG Port (HPS)	USB 2.0 OTG Port (HPS)	USB 2.0 Host Port (HPS)	10 / 100 Ethernet Port
Communication Interface	UART to USB (HPS)	UART to USB (HPS)	UART to USB (HPS)	UART to USB (HPS)	Wifi (CPU) / Bluetooth 4.0 (CPU)
	PS/2	---	---	PS/2	4 USB Host Ports (CPU)
Communication Interface	IR TX / RX	---	---	IR TX / RX	1 PCI Express x1 Connector (FPGA to CPU)
	---	---	---	---	SATA (CPU) / RS232
Multimedia Interface	24-bit Audio Codec	HDMI TX	---	24-bit Audio Codec	SMA Clock Input / Output
	TV Decoder	---	---	TV Decoder	Audio Codec
Multimedia Interface	24-bit VGA DAC	---	---	24-bit VGA DAC	TV Decoder
	---	---	---	---	VGA-out Connector (CPU)
Expansion Ports	---	---	---	---	VGA DAC
	---	---	---	---	HDMI Out (CPU)
Expansion Ports	HSMC Connector	40-pin GPIO Connector x2	40-Pin GPIO Connector	40-pin GPIO Connector x2	HSMC Connector
	40-pin GPIO Connector	Arduino Connector	Arduino Connector	10-pin ADC Input Header	40-pin GPIO Connector
Sensors	LTC Connector (HPS)	LTC Connector (HPS)	LTC Connector (HPS)	LTC Connector (HPS)	XDP Debug Header (CPU)
	Accelerometer (HPS)	Accelerometer (HPS)	Accelerometer (HPS)	Accelerometer (HPS)	Accelerometer
User I/O Interface	8 Channel ADC	8 Channel ADC	8 Channel ADC	8 Channel ADC	---
	10+1 (HPS) LEDs	8+1 (HPS) LEDs	8+1 (HPS) LEDs	10+1 (HPS) LEDs	18 Switches
Extra Features	10 Switches	4 Switches	4 Switches	10 Switches	4 Push Buttons
	4+1 (HPS) Push Buttons	2+1 (HPS) Push Buttons	2+1 (HPS) Push Buttons	4+1 (HPS) Push Buttons	18 Red and 9 Green LEDs
Extra Features	7-segment x6	---	---	7-segment x6	7-segment x8
	128x64 dots LCD Module (HPS)	---	2 Channels High Speed ADC RTC (HPS)	---	16x2 LCD Module IR RX / RTC (CPU)

7

Terasic utilizes the "Flagship FPGA" of the industry, the Altera Stratix. The device includes full-featured FPGA capabilities, such as all kinds of high-speed transmission interfaces (QSFP/PCIE/SATA), and highspeed memory

(DDR2/DDR3 or QDRII+) with large bandwidth. It is the most ideal platform in the OpenCL, High Performance Computing (HPC), High Frequency Trading (HFT), and other areas of development.

FPGA Systems

NEW!



TR10a-HL

NEW!



DE5a-Net



DE5-Net



TR5-F40W



TR5-Lite



DE4

FPGA Device	Arria 10 10AX115N2F45E1SG		Arria 10 10AX115N3F45E1SG		Stratix V 5SGXEA7N2F45C2N		Stratix V 5SGXEA3K2F40C3		Stratix V 5SGXEA7N2F45C2N		Stratix IV EP4SGX230 EP4SGX530	
Speed Grade	E1		E1 / I2		C2		C3		C2		C2	
FPGA Logic Elements (K)	1150		1,150 / 900		622		340		622		228 / 531	
USB Blaster	USB Blaster II		USB Blaster II		USB Blaster II		USB Blaster II		USB Blaster II		USB Blaster	
Memory Interface	---		DDR3 SODIMM Socket x2		DDR3 SODIMM Socket x2		---		2GB DDR3 SDRAM		DDR2 SODIMM Socket x2	
	48MB QDRII+ SRAM (6 Chips)		32MB QDRII+ SRAM (4 Chips)		32MB QDRII+ SRAM (4 Chips)		2MB SSRAM		32MB QDRII+ SRAM (4 Chips)		2MB SSRAM	
	2Gb Flash		2Gb Flash		2Gb Flash		2Gb Flash		2Gb Flash		512Mb Flash	
	---		---		---		---		---		SD Card Socket	
Communication Interface	PCI Express x8 GEN3 Connector		PCI Express x8 GEN3 Connector		PCI Express x8 GEN3 Connector		PCI Express x8 GEN3 Connector		PCI Express x8 GEN3 Connector		PCI Express x8 GEN2 Connector	
	QSFP+ Connector x4		QSFP+ Connector x4		SFP+ Connector x4		SFP+ Connector x4		SFP+ Connector x2		GbE Port x4	
	---		---		SATA Host / Device x2		SATA Host / Device x1		SATA Host x1		SATA Host / Device x2	
	SMA Clock Input / Output		SMA Clock Input / Output		SMA Clock Input / Output		SMA Clock Input / Output		---		SMA Clock Input / Output	
Expansion Ports	RS422		RS422		RS422		RS422		RS422		RS232	
	---		---		---		---		---		USB Host / Slave Controller	
	2x4 GPIO connector		---		---		HSMC Connector		---		HSMC Connector x2	
	---		---		---		---		---		40-pin GPIO Connector x2	
Sensors	Temperature Sensor		Temperature Sensor		Temperature Sensor		---		Temperature Sensor		Temperature Sensor	
	Power Monitor		Power Monitor		---		---		Power Monitor		Power Monitor	
User I/O Interface	4 LEDs		8 LEDs		10 LEDs		4 LEDs		4 LEDs + LED Array		8 LEDs	
	2 Switches		2 Switches		4 Switches		4 Switches		2 Switches		4 Switches	
	4 Push Buttons		4 Push Buttons		4 Push Buttons		4 Push Buttons		2 Push Buttons		4 Push Buttons	
	---		7-segment x2		7-segment x2		---		---		7-segment x2	
Extra Features	On-board Programmable PLL		On-board Programmable PLL		On-board Programmable PLL		On-board Programmable PLL		On-board Programmable PLL		On-board Programmable PLL	

The ASIC Prototyping Board possesses a large capacity of FPGA LE and rich I/O interface. It also includes a variety of flexible expansion interface sub-cards to

create a user-specific system. It is suitable for ASIC pre-development verification.

NEW!



TR5



TR4

FPGA Device	Stratix V 5SGXEA7N2F45C2N / 5SGXEABN2F45C2N		Stratix IV EP4SGX230 / EP4SGX530	
Speed Grade	C2		C2	
FPGA Logic Elements (K)	622 / 952		230 / 530 (228 / 531.2)	
USB Blaster	USB Blaster II		USB Blaster	
Memory Interface	DDR3 SODIMM Socket		DDR3 SODIMM Socket	
	128MB Flash		64MB Flash	
	2MB SSRAM		2MB SSRAM	
	MicroSD Socket		---	
Communication Interface	SMA Clock Input / Output		SMA Clock Input / Output	
	PCI Express x4 GEN3 Connector		2 PCI Express x4 GEN2 Connectors	
	SATA Host / Device		---	
	UART to USB		---	
Expansion Ports	FMC Conenctor x4 (496 User I/O)		HSMC Connector x6 (492 User I/O)	
	40-Pin GPIO Connector		40-pin GPIO Connector x2	
Sensors	Temperature Sensor		Temperature Sensor	
	Power Monitor		---	
User I/O Interface	4 LEDs		4 LEDs	
	4 Switches		4 Switches	
	4 Push Buttons		4 Push Buttons	
	---		---	



Classic FPGA Development Board

The classic FPGA is used as the core of the development board during teaching experiments and light system development applications.

NEW!



DE10-Lite



DE2-115



C5G



DE0-CV

FPGA Device	MAX 10 10M50DAF484C7G	Cyclone IV EP4CE115F29C7	Cyclone V 5CGXFC5C6F27C7N	Cyclone V 5CEBA4F23C7N
Speed Grade	C7	C7	C7	C7
FPGA Logic Elements (K)	50	114.48	77	49
USB Blaster	USB Blaster	USB Blaster	USB Blaster	USB Blaster
Memory Interface	64MB SDRAM	EPCS64	EPCQ256	EPCS64
	---	128MB SDRAM	4Gb LPDDR2	64MB SDRAM
	---	2MB SRAM	4Mb SRAM	MicroSD Card Socket
	---	8MB Flash	MicroSD Card Socket	---
	---	32Kb EEPROM	---	---
Communication Interface	---	SD Card Socket	---	---
	---	2GbE Port	UART to USB	PS/2
	---	USB Type A and B	---	---
	---	DB9 Serial Connector	---	---
	---	PS/2	---	---
Multimedia Interface	---	Infrared Remote-Control Receiver	---	---
	---	SMA Connector	---	---
	4-bit Resistor VGA	24-bit Audio Codec	24-bit Audio Codec	4-bit Resistor VGA
	---	TV Decoder	HDMI TX	---
Expansion Ports	---	24-bit VGA DAC	---	---
	---	16x2 LCD Module	---	---
	40-pin GPIO Connector	40-pin GPIO Connector	40-pin GPIO Connector	40-pin GPIO Connector x2
	---	HSMC Connector	HSMC Connector	---
Sensors	Arduino Uno R3 Connector	---	Arduino Connector	---
	Accelerometer	---	---	---
User I/O Interface	10 Slide Switches	18 Slide Switches	10 Slide Switches	10 LEDs
	2 Push Buttons	4 Push Buttons	4 Push Buttons	10 Slide Switches
	10 LEDs	18 Red and 9 Green LEDs	18 LEDs	4 Push Buttons
	7-segment x6	7-segment x8	7-segment x4	7-segment x6

FPGA Systems

Multimedia Platform

The MultiMedia Platform is built with sensors to help with multimedia projects.

NEW!



VEEK-MT2S

NEW!



VEEK-MT2

NEW!



MAX 10 NEEK



DE1-SoC-MTL2

FPGA Device	Cyclone V 5CSXFC6D6F31C6N	Cyclone IV EP4CE115F29C7	MAX 10 10M50DAF484C6G	Cyclone V 5CSEMA5F31C6
Speed Grade	C6	C7	C6	C6
FPGA Logic Elements (K)	110	114.48	50	85
Hard Processor	ARM Cortex-A9 Dual-Core			ARM Cortex-A9 Dual-Core
USB Blaster	USB Blaster II	USB Blaster	USB Blaster II	USB Blaster II
Memory Interface	1GB DDR3 (HPS)	EPCS64	1Gb DDR3	1GB DDR3 (HPS)
	64MB SDRAM	128MB SDRAM	1Gb DDR3	64MB SDRAM
	EPCS128	2MB SRAM	512Mb QSPI FLASH	EPCQ256
	MicroSD Card Socket (HPS)	8MB Flash	SD Card Slot	MicroSD Card Socket (HPS)
	---	32Kb EEPROM	---	---
Communication Interface	---	SD Card Socket	---	---
	2GbE Port	2GbE Port	1GbE Port	1GbE Port (HPS)
	USB Type A and B	USB Type A and B	UART to USB	USB 2.0 Host Port x2 (HPS)
	DB9 Serial Connector	DB9 Serial Connector	PS/2	UART to USB (HPS)
	PS/2	PS/2	---	PS/2
Multimedia Interface	SMA Connector	SMA Connector	---	IR TX / RX
	---	---	---	---
	7" Multi-Touch LCD	7" Multi-Touch LCD	7" Multi-Touch LCD	7" Multi-Touch LCD
	24-bit Audio Codec	24-bit Audio Codec	24-bit Audio Codec	24-bit Codec
	TV Decoder	TV Decoder	HDMI Video Input	TV Decoder
Expansion Ports	8-megapixel Digital Image Sensor	8-megapixel Digital Image Sensor	8-megapixel Digital Image Sensor	---
	VGA-out Connector	VGA-out Connector	---	---
	HSMC Port	HSMC Port	2x6 TMD Expansion Header	40-Pin GPIO Connector x2
	40-Pin GPIO Connector	40-Pin GPIO Connector	---	10-pin ADC Input Header
Sensors	16x2 LCD Module	16x2 LCD Module	---	LTC Connector
	Ambient Light Sensor	Ambient Light Sensor	Humidity and Temperature Sensor	Accelerometer
	Accelerometer / Gyroscope / Magnetometer	Accelerometer / Gyroscope / Magnetometer	Accelerometer / Gyroscope / Magnetometer	---
	---	---	Light Sensor	---
	---	---	Power Monitor	---
User I/O Interface	18 Slide Switches	18 Slide Switches	10 Slide Switches	10+1 (HPS) LEDs
	4 Push Buttons	4 Push Buttons	5 Push Buttons	10 Switches
	18 Red and 9 Green LEDs	18 Red and 9 Green LEDs	10 Red User LEDs	4+1 (HPS) Push Buttons
	7-segment x8	7-segment x8	7-segment x2	7-segment x6
Extra Features	Infrared Remote-control Receiver Module	Infrared Remote-control Receiver Module	MAX 10 FPGA ADC SMA Input x2 / Potentiometer Input to ADC / On-board Mic Input to ADC / 2x10 Header for MAX 10 FPGA ADC Input / One DAC Output	24-bit VGA DAC
	---	---		8 Channel ADC

FPGA Systems

For over 20 years, Terasic has maintained a strong heritage in providing countless industry-standard FPGA products and services in high performance computing (HPC), data centers, medical, communication, military, and aerospace. Terasic's COTS boards allow users to easily deploy the latest validated intellectual property (IP) onto the proven production boards to lower the system design and take calculated risks when implementing complex high-performance systems.

Terasic's COTS boards include:



DE5a-Net

The DE5a-Net platform was designed and developed by Terasic and INTEL. It provides features to meet various performance-demanding applications including High-Frequency Trading, Scientific Computation, Military, and Data Acquisition. It has been adopted by top-tier financial service companies.

DE5a-Net uses a powerful Altera Arria 10 FPGA to deliver ultra-low latency, 10/40 GigE, PCIe interfacing, high performance per watt for data analytics, and algorithmic acceleration. The QDRII and DDR3 memory on the platform provide lower application latency and higher application throughput.

In addition, the DE5a-Net is an excellent High Performance Computing (HPC) platform; it has a wide range of end markets including Medical Imaging, Bioscience, Data Warehousing, Military, and Data Compression.



VPX-A5SoC

VPX-A5SoC is a high-performance, reconfigurable 6U VPX card powered by the Altera Arria V SOC FPGA. This FPGA is embedded with dual-core ARM Cortex-A9 Processor running up to 1.05 GHz, which can be used for controlling plane interfaces such as Ethernet, USB, SD Card and UART, etc.

The board features up to 1 GB of DDR3 SDRAM as well as Flash memory for booting the FPGAs. The PCI Express ports x4 lanes in the VPX expansion plane, with up to PCI Express Gen2 (5Gbps) throughput offers a high performance interface to mainstream peripherals and I/O cards.

Tow VITA 57 FMC sites are provided to enhance the board's I/O and processing capabilities. The A5-VPX-A5SoC is a powerful, feature-rich solution for the next generation of compute-intensive embedded applications.



TR5

TR5 is a COTS board which is custom built and designed by Terasic, in particular for clients who require large Logic Elements (LEs), and multiple external I/Os.

The TR5 board has an Altera Stratix V GX FPGA with a capacity up to 952K LEs to meet all kinds of complex designs. It contains four VITA FMC connectors, which contribute up to 496 FPGA free user I/Os, and provide high bandwidth data transfer and an elastic expansion of various interfaces. TR5 has an external PCIe x4 connector to process board-to-board or board to PC connection to transfer data. To the 8GB DDR3 So-Dimm provides efficient high-speed memory bandwidth for up to 800 Mhz.

Based on the above specifications, TR5 enables users to create a unique application system to reduce the development time. Plus, it allows users to develop projects repeatedly to reduce the development costs.



OpenPET

Terasic and US Larence Berkely National Laboratory jointly developed OpenPET, a combination of circuit board, firmware, and software system. The purpose of the OpenPET is to provide for positron radiation type computer tomography and single photon emission computer tomography. After three years of research and development, testing and debugging, we have reached a near-perfect level of development.

With these unprecedented capabilities, Terasic has become the "Icon" of OpenPET manufacturer and remains to be the one to date. Our participation in developing and manufacturing the OpenPET platform further solidifies our extensive heritage in providing complex FPGA systems to the cutting-edge medical imaging and PET application.



## Multimedia

- 01 HDMI Receiver Daughter Card **HSMC**
- 02 SDI-FMC Card **FMC**
- 03 MTL2 **GPIO**
- 04 HDMI-HSTC\_1.4 Card **HSTC**
- 05 SDI-HSMC Card **HSMC**
- 06 HDMI Transmitter Daughter Card **HSMC**
- 29 HDMI-FMC **FMC**

## Video & Image

- 07 D8M-GPIO **GPIO**
- 08 D8M-FMC **FMC**
- 09 D5M **GPIO**
- 03 MTL2 **GPIO**
- 10 LT24 Card **GPIO**
- 11 CLR-HSMC Camera Link Receiver Card **HSMC**
- 12 AHA-HSMC **HSMC**
- 01 HDMI Receiver Daughter Card **HSMC**
- 06 HDMI Transmitter Daughter Card **HSMC**
- 13 DVI-HSMC Card **HSMC**
- 04 HDMI-HSTC\_1.4 Card **HSTC**
- 05 SDI-HSMC Card **HSMC**
- 02 SDI-FMC **FMC**

## Networking

- 14 Ethernet-HSMC Card **HSMC**
- 15 DUAL XAUI TO SFP+ HSMC Card **HSMC**
- 16 ICB-HSMC Card **HSMC**
- 17 SFP-HSMC Card **HSMC**
- 18 HSMC Communication Card **HSMC**
- 19 SATA/SAS HSMC Card **HSMC**
- 28 NET-FMC **FMC**

## AD/DA

- 20 High-Speed AD/DA Card **GPIO** **HSMC**
- 21 AD/DA Data Conversion Card **HSMC**

## Interface Conversion

- 22 PCIe x4 Cable Adapter (PCA)
- 19 SATA/SAS HSMC Card **HSMC**
- 23 XTS-HSMC Card **HSMC**
- 24 GPIO-HSTC Card **HSTC** **GPIO**
- 21 AD/DA Data Conversion Card **HSMC**
- 20 High-speed AD/DA Card **HSMC** **GPIO**
- 27 XTS-FMC **FMC**
- 31 Servo Motor Kit **GPIO**

## RF

- 25 BTS-TMD **TMD**
- 26 HSMC ARRadio Daughter Card **HSMC**
- 30 RFS **GPIO**

## Interface Cards

14



01



02



13



14



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04



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Interface  
Cards

## Interface Cards

15



Follow Terasic's foot trails!

Want to breathe new life into your project?



## A-Cute Car

A-Cute Car is an FPGA-based 3-wheeled robotic car kit. This car possesses higher operation performance than the MCU based robotic car. A simple reason: the FPGA provides more computing power than the MCU.

Robot Kits

16



# Robot Kits

17

## Terasic Spider

Terasic spider can be controlled remotely via a blue tooth enable android device. With the software app our team developed, users can control Terasic spider by giving it orders such as moving in 4 directions, swinging (base on the G-sensor data), and performing a dance with the pre-defined movements.

Use Terasic's robotic kits to build your own bespoke creative wonderland!





# Accessories

USB Blaster Download Cable
PCIe x4 Gen.2 Cable
HSTC High Speed Cable
HSMC High Speed Cable
USB Cable
HSMC Debug & Loopback Connector Package
Battery for Terasic Spider
16X2 LCD Module (No Backlight)
Adapter DC 12V/2A ( for DE1-SoC/ DE2-115 / DE2-70 / C5G / NEEK in US)
Adapter DC 9V/1.3A (for DE2 in UK)
Adapter DC 9V/1.3A (for DE2)
Adapter DC 7.5V/0.8A (for DE0 / DE1)
Adapter DC 9V/2.6A (for TREN-S2 Stratix II FPGA Prototyping System)
AC Power Cord (EURO)
AC Power Cord (UK)
Universal AC Adapter 250V/2.5A (Convert to EU)
American AC power socket with UK plug adapter 250V / 5A



# Services

**Design to Order Service (DTOS)**  
With twenty years of experience in developing solutions for the industrial and FPGA system market, Terasic is uniquely-positioned to meet the various needs of our customers. We provide superior quality of support and service in chip/board/system level design as well as software development. Each project often ends with satisfactory results.

**IP Design Service**  
Terasic delivers a complete array of unrivaled IPs (Intellectual Property), including digital TV controllers, LCD panel controllers, digital camera solutions, machine vision, AOI inspection, and Qsys/SOPC library. These IPs and software tools, designed specifically for ease-of-use and rapid development, deliver powerful functions for many advanced industrial design projects. Terasic's market-proven IP cores are designed to meet the needs of designers and the requirements of this ever-changing industry.





# Product Catalog

Terasic offers expertise ranging from FPGA/ASIC board design, layout, to drivers, signal integrity analysis, and embedded system solutions. Our cutting-edge designs and manufacturing capabilities provide state-of-the-art products and exceptional services to our esteemed customers. By working with world-renowned partners such as Intel, Cypress, Linear, ISSI, TI, Microchip, and ADI, we continue to work in industry-leading technologies for future FPGA platforms and solutions. Choose Terasic, and see how we pave the fastest path to convert your concept into reality. We are your perfect partner in this highly competitive business world.



[www.terasic.com](http://www.terasic.com)