PicoMODA9

Single Board Computer with Cortex-A9

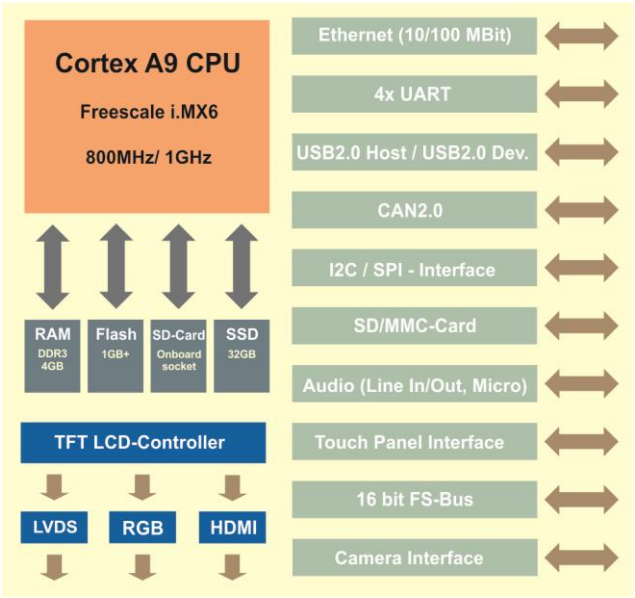
Characteristics

- Cortex-A9 Dual-/ Single-Core up to 1GHz
- up to 4GB RAM and 1GB SLC Flash
- TFT LCD-Controller up to WXGA resolution
- 2D/ 3D graphics
- Multiformat CODEC (MPEG4, H.264, WMV9)
  H.264 30fps (1080@30fps)
- RGB Interface (LVDS opt.)
- Ethernet 10/ 100Mbit,
- CAN, 4x Seriell, I²C, SPI
- USB2.0 Device (High Speed), USB2.0 Host (HS)
- micro SD-Card Slot, max. 64 I/ O
- optional WLAN
- Audio & Touch Controller
- Windows CE 6.0/ WEC 7/ Linux
- 3.3V Low Power Design

Description

The powerful PicoMODA9 is especially suited for applications needing high performance graphics (2D/ 3D/ OpenGL/ Direct 3D Mobile) and for playing movies (MPEG4/ H.264/ WMV9). The compact size (80x50mm) and the optionally extensible temperature range (-40°C - +85°C) can realize portable devices in rough environments easily. The board offers 128MB Flash and 1GB DDR3 RAM. Numerous interfaces like Serial, Ethernet, USB2.0 HS, CAN2.0, I²C, SPI, I/ O, Audio, Touch and SD Card offer a wide range of applications. WLAN is optional for the PicoMODA9. All common TFT displays with RGB and LVDS interfaces up to 1280x800 (WXGA) can be controlled. The PicoMODA9 is supplied with 3,3V. All signals are available via a robust 140-poles plug connector (0,8mm Pitch, Tyco). The plug assignment is pin compatible to PicoMOD3/ 4/ 6/ 7A.

Block Diagram



On-Board Operating System

Windows Embedded Partner

Windows CE6.0R3/ WEC7 offers bootloader, interface driver and kernel with (e.g) Silverlight, Mediaplayer or IE. This high-performance real-time operating system offers with Compact Framework 3.5 an ideal base for software development.

The Linux Board Support Package (BSP) (3.3., uboot, buildroot, QT, GStreamer) with interface driver (in Source Code) is available, as well as a toolchain for developing own bootloaders, images and application software.

Starterkit

The PicoMODA9-SKIT is offered in two versions: Linux and Windows Embedded Compact. The starterkit consists of a base board with standard connectors (in PicoITX format), fitting cable kit, and the access data to the download area (documentation and software). Optionally we can offer displays (RGB/ LVDS), Touch (capacitive and resistive), display cables and adapters. A 4-hour workshop and the F&S forum complete our support offer.

F&S Elektronik Systeme

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Connector Assignment

J1 – System-Connector

1	I/O64 (SPI CS)	21	I/O5 (COM3 TxD)	41	I/O14	61	*I/O32 (LCD VD0)**	81	*I/O52 (LCD VM)**	101	A2 (Address 2)	121	D11 (Data 11)
2	I/O65 (SPI CLK)	22	I/O4 (COM3 RxD)	42	I/O13	62	GND (System Ground)	82	*I/O51 (LCD VFRAME)**	102	A3 (Address 3)	122	D12 (Data 12)
3	I/O66 (SPI MISO)	23	I/O7 (COM1 TxD)	43	I/O16	63	*I/O34 (LCD VD2)**	83	GND (System Ground)	103	A4 (Address 4)	123	D13 (Data 13)
4	I/O67 (SPI MOSI)	24	I/O6 (COM1 RxD)	44	I/O15	64	*I/O33 (LCD VD1)**	84	GND (System Ground)	104	A5 (Address 5)	124	D14 (Data 14)
5	CAN-TX (COM4 TxD)	25	OTGDM (USB)	45	I/O18 (SD-CLK)	65	*I/O36 (LCD VD4)**	85	GND (System Ground)	105	A6 (Address 6)	125	D15 (Data 15)
6	CAN-RX (COM4 RxD)	26	USBDN (USB Host -)	46	I/O17	66	*I/O35 (LCD VD3)**	86	*I/O53 (LCD VCLK)**	106	A7 (Address 7)	126	I/O75
7	RX- (Ethernet)	27	OTGDP (USB)	47	I/O20 (SD-DAT0)	67	*I/O38 (LCD VD6)**	87	I/O70	107	A8 (Address 8)	127	CS0 (FS-Bus CS)
8	TX- (Ethernet)	28	USBDP (USB Host +)	48	I/O19 (SD-CMD)	68	*I/O37 (LCD VD5)**	88	I/O71	108	A9 (Address 9)	128	ETH-ACT (Ethernet)
9	RX+ (Ethernet)	29	I/O9	49	I/O22 (SD-DAT2)	69	*I/O40 (LCD VD12)**	89	nWAIT	109	A10 (Address 10)	129	STA1 (Status 1)
10	TX+ (Ethernet)	30	I/O8 (USB Power1)	50	I/O21 (SD-DAT1)	70	*I/O39 (LCD VD7)**	90	I/O72	110	D0 (Data 0)	130	STA2 (Status 2)
11	+3,3V (Power Supply)	31	I/O11 (I2C-SDA)	51	I/O24 (SD-Detect)	71	*I/O42 (LCD VD14)**	91	CS4	111	D1 (Data 1)	131	LOUT (Audio L. Out)
12	+3,3V (Power Supply)	32	I/O10 (USB Power2)	52	I/O23 (SD-DAT3)	72	*I/O41 (LCD VD13)**	92	CS5	112	D2 (Data 2)	132	ROUT (Audio R. Out)
13	GND (System Ground)	33	I/O76	53	I/O26 (SD-Write Prot.)	73	*I/O44 (LCD VD18)**	93	I/O73	113	D3 (Data 3)	133	LIN (Audio Left In)
14	GND (System Ground)	34	I/O12 (I2C-SCL)	54	I/O25 (SD-Power En.)	74	*I/O43 (LCD VD15)**	94	I/O75	114	D4 (Data 4)	134	RIN (Audio Right In)
15	nPONRES (Res CPU)	35	BOOTSEL0	55	*I/O28 (LCD DEN)*	75	*I/O46 (LCD VD20)**	95	I/O76	115	D5 (Data 5)	135	MICIN (Micro In)
16	VBAT (RTC Supply)	36	I/O77	56	*I/O27 (LCD Enable)*	76	*I/O45 (LCD VD19)**	96	nOE	116	D6 (Data 6)	136	MICBIAS (Micro Bias)
17	I/O1 (COM2 TxD)	37	*BOOTSEL1*	57	I/O30 (LCD BL On)	77	*I/O48 (LCD VD22)**	97	nWE	117	D7 (Data 7)	137	X+ (Touch X+)
18	I/O0 (COM2 RxD)	38	BOOTSEL2	58	*I/O29 (LCD VLCD On)*	78	*I/O47 (LCD VD21)**	98	I/O74	118	D8 (Data 8)	138	X- (Touch X-)
19	I/O3 (COM2 RTS/ COM4 TxD)	39	GND (System Ground)	59	GND (System Ground)	79	*I/O50 (LCD VLINE)**	99	A0 (Address 0)	119	D9 (Data 9)	139	Y+ (Touch Y+)
20	I/O2 (COM2 CTS /COM4 RxD)	40	GND (System Ground)	60	I/O31 (LCD BL PWM)	80	*I/O49 (LCD VD23)**	100	A1 (Address1)	120	D10 (Data 10)	140	Y- (Touch Y-)

* different function at camera mounting option

LCD Connection

Pico-MODA9	RGB	
	12 bit	18 bit
VD0	-	G0
VD1	-	G1
VD2	-	B0
VD3	-	B1
VD4	B0	B2
VD5	B1	B3
VD6	B2	B4
VD7	B3	B5
VD12	G0	G2
VD13	G1	G3
VD14	G2	G4
VD15	G3	G5
VD18	-	R0
VD19	-	R1
VD20	R0	R2
VD21	R1	R3
VD22	R2	R4
VD23	R3	R5
VCLK	DCLK	DCLK
VLINE	HSYNC	HSYNC
VFRAME	VSYNC	VSYNC
VM	DE	DE
DEN	-	-

Pico-MODA9	LVDS Plug	
	6 bit	8 bit
1	VLCD *	VLCD *
2	VLCD *	VLCD *
3	GND	GND
4	GND	GND
5	LVDS_DATA0-	LVDS_DATA0-
6	LVDS_DATA0+	LVDS_DATA0+
7	GND	GND
8	LVDS_DATA1-	LVDS_DATA1-
9	LVDS_DATA1+	LVDS_DATA1+
10	GND	GND
11	LVDS_DATA2-	LVDS_DATA2-
12	LVDS_DATA2+	LVDS_DATA2+
13	GND	GND
14	LVDS_CLK-	LVDS_CLK-
15	LVDS_CLK+	LVDS_CLK+
16	GND	GND
17	-	LVDS_DATA3-
18	-	LVDS_DATA3+
19	GND	GND
20	GND	GND
21	GND	GND
22	GND	GND
23	VLCD*	VLCD*
24	VLCD*	VLCD*
25	BL PWM	BL PWM

Technical Data

Power Supply:	+3.3VDC/±5%
Power Consumption:	t.b.d.
Digital I/ O:	max. 64 I/O port lines
Touch Screen:	4-wire, analogue resistive
Interfaces:	1x Ethernet 10/ 100 MBit 3-4x Serial (1x with RTS/CTS) 1x USB2.0 Host 1x USB2.0 Device 1x CAN2.0 1x I^2C 1x SPI 1x Audio Line IN/ OUT/ MIC 1x micro SD-Card slot 1x SD-Card Slot (external) 1x Address/ Data Bus 1x WLANIF (optional) 1x camera interface/ HDMI-DVI (opt.)
TFT LCD-Interface:	TFT up to WXGA (RGB and LVDS)
RAM:	256MB DDR3-RAM(opt. up to 4GB)
Program Memory:	128MB (opt. up to 1GB)
Processor:	Freescale i.MX 6 Cortex-A9 (Dual-/ Single-Core) 800MHz/ 1GHz
Temperature Range:	-25°C - +85°C (-25°C - +85°C, -40°C - +85°C)
Dimension:	80mm x 50mm x 10mm (l x w x d)
Weight:	~ 20g

Standard Versions/ Order Notations

PMODA9-V2-WEC7
DualLite, 512MB RAM, 256MB Flash, Audio, Ethernet, CAN, RGB, LVDS, 0°C - +70°C, WEC 7

PMODA9-V2-LIN
DualLite, 512MB RAM, 256MB Flash, Audio, Ethernet, CAN, RGB, LVDS, 0°C - +70°C, Linux

PMODA9-V1-WEC7
Solo, 512MB RAM, 256MB Flash, Audio, Ethernet, CAN, RGB, 0°C - +70°C, WEC7

PMODA9-V1-LIN
Solo, 512MB RAM, 256MB Flash, Audio, Ethernet, CAN, RGB, 0°C - +70°C, Linux

Minimum Order Quantity for Special Versions: 500 pieces

Order Key

PicoMODA9-SKIT
Freely configurable, see document PicoMODA9 Starterkit or online.

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