

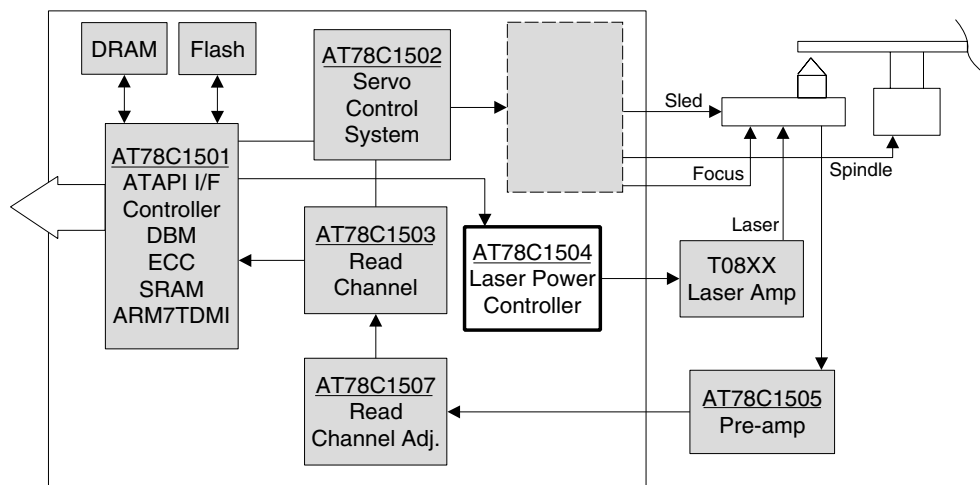
Features

- Preprogrammed for All Current DVD and CD Write Strategies
- Five 10-bit DACs for Controlling a Laser Power Amplifier
- Separate DVD and CD APC Provided
- On-board Bandgap Reference
- Timing Programmable by User
- Adaptive Pulse Shift
- Programmable End Pulses
- Serial Interface for Programming Device
- Small Die Size Enables Inclusion on OPU

Description

AT78C1504 is a preprogrammed automatic device for controlling the write, read and erase pulses to a laser diode power amplifier. All of the present DVD and CD write strategies are provided in the device. Automatic power control (APC) and optimum power control (OPC) are also included. Though the device is preprogrammed to provide signal conditioning of the NRZI data stream, it is possible through a serial interface to adjust pulse timing, width and amplitude. Five DACs are provided to individually control the laser diode power amplifier. The device is particularly suited to controlling the laser diode power amplifiers from Atmel's RF Division. Packaging for inclusion on the PCBA or on the optical pickup unit (OPU) is available.

Figure 1. DVD System Block Diagram



DVD/CD ALPC

AT78C1504



Figure 2. Pin-out

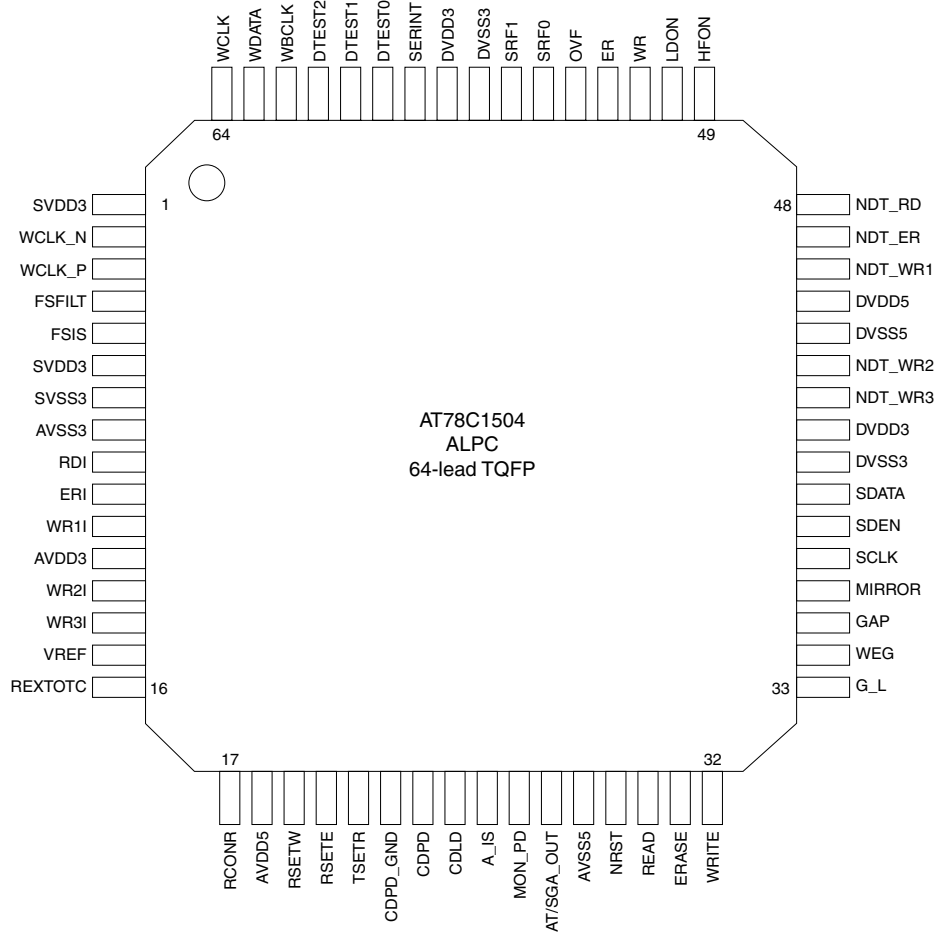


Table 1. DC Parameters

Symbol	Parameter	Min	Nom	Max	Units	Notes
V _{CC}	Supply Voltage	3.0	3.3	3.6	V	
V _{DD}	Supply Voltage	4.5	5.0	5.5	V	
I _{CC}	Operating Current			300	mA	Note 1

Note: 1. Values listed are advance information and are likely to change as production silicon is characterized.

External Pin Definition

P = Power or ground, B = Bidirectional, I = Digital Input, O = Digital Output

AI = Analog Input, AO = Analog Output

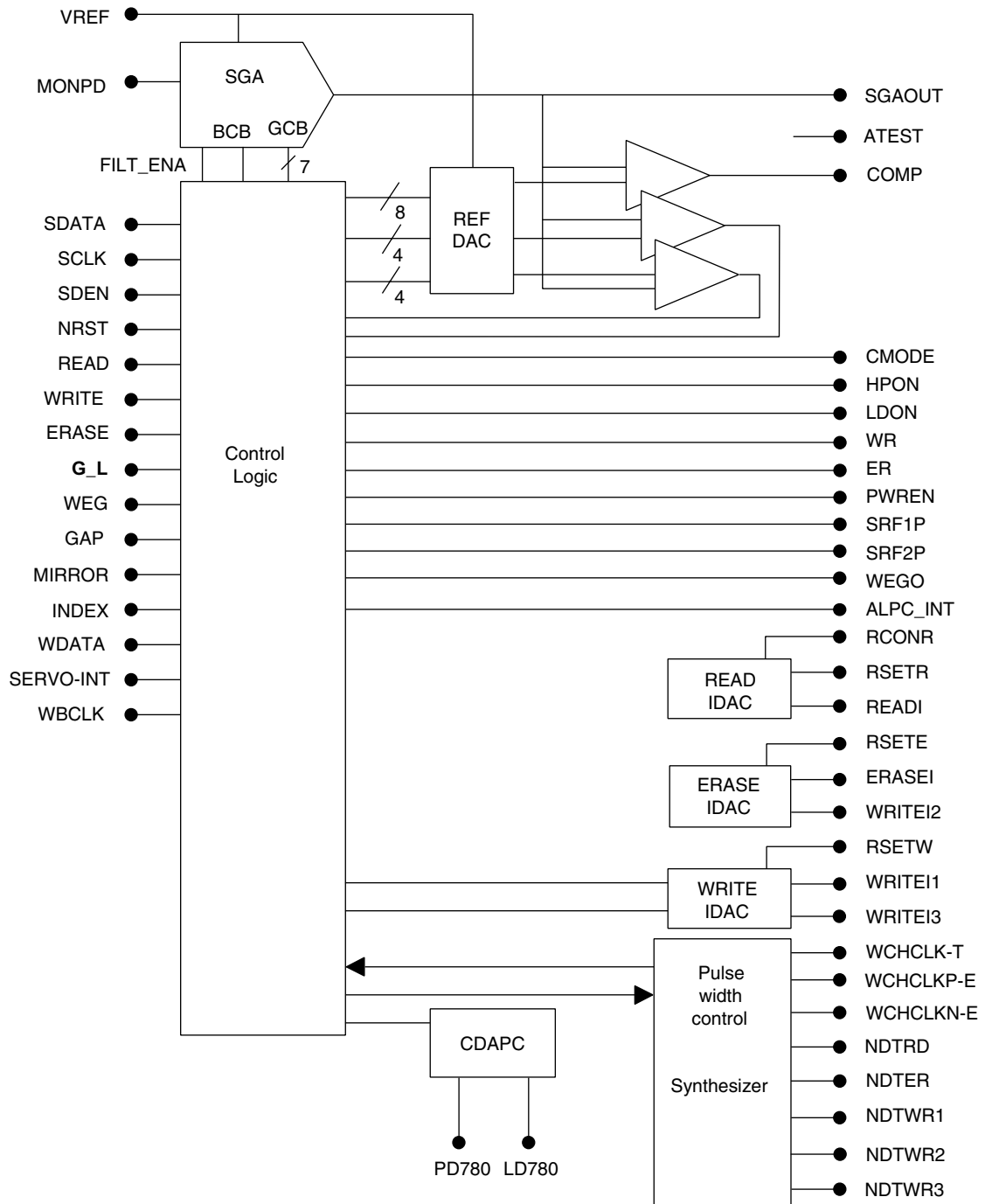
Table 1. External Pin Definition

Pin #	Symbol	Type	Pad Types	Description
1	SVDD3	P	Ana_VDD	3.3V Synthesizer Power
2	WCLK_N	AO	Ana_HighI	PECL WCLK Negative Output
3	WCLK_P	AO	Ana_HighI	PECL WCLK Positive Output
4	FSFILT	AO	Ana_HighI	Frequency Synthesizer Filter
5	FSIS	AI	Ana_HighI	Frequency Synthesizer CP Iset Resistor
6	SVDD3	P	Ana_VDD	3.3V Synthesizer Power
7	SVSS3	P	Ana_GND	3.3V Synthesizer Ground
8	AVSS3	P	Ana_GND	3.3V Analog Ground
9	RDI	AO	Ana_HighI	Read Level Current DAC Output
10	ERI	AO	Ana_HighI	Erase Level Current DAC Output
11	WR1I	AO	Ana_HighI	Write1 Level Current DAC Output
12	AVDD3	P	Ana_VDD	3.3V Analog Power
13	WR2I	AO	Ana_HighI	Write2 Level Current DAC Output
14	WR3I	AO	Ana_HighI	Write3 Level Current DAC Output
15	VREF	AO	Ana_HighI	2.5V Output Reference Voltage
16	REXTOTC	AI	Ana_HighI	External Current Setting Resistor
17	RCONR	AI	Ana_HighI	Laser Diode Constant Current Setting R
18	AVDD5	P	Ana_VDD	5V Analog Power
19	RSETW	AI	Ana_HighI	Write DACs Current Setting R
20	RSETE	AI	Ana_HighI	Erase DACs Current Setting R
21	RSETR	AI	Ana_HighI	Read DACs Current Setting R
22	CDPD_GND	AI	Ana_HighI	Ground Return for CDPD
23	CDPD	AI	Ana_HighI	CD Photo Diode Input
24	CDLD	AO	Ana_HighI	CD Laser Diode Output
25	A_IS	P	Ana	Analog Isolation – Ground
26	MON_PD	AI	Ana_HighI	Monitor Photo Diode Input
27	AT/SGA_OUT	AO	Ana_HighI	Analog Test Monitor/SGA_OUT
28	AVSS5	P	Ana_GND	5V Analog Ground
29	NRST	I	PIC	Chip Reset
30	READ	I	PIC	Read Input from Controller
31	ERASE	I	PIC	Read Input from Controller
32	WRITE	I	PIC	Read Input from Controller
33	G_L	I	PIC	Grove (High)/Land Input from Controller
34	WEG	I	PIC	Write or Erase Gate Input from Controller

Table 1. External Pin Definition (Continued)

Pin #	Symbol	Type	Pad Types	Description
35	GAP	I	PIC	Gap Input
36	MIRROR	I	PIC	Mirror Input
37	SCLK	I	PIC	Serial Interface Clock
38	SDEN	I	PIC	Serial Data Enable
39	SDATA	B	PB2C	Serial Data
40	DVSS3	P	PP0I	3.3V Digital Ground
41	DVDD3	P	PP3I	3.3V Digital Power
42	NDT_WR3	O	PO2	Laser Diode Driver Output for Write3
43	NDT_WR2	O	PO2	Laser Diode Driver Output for Write2
44	DVSS5	P	PP0E	5V Digital Ground
45	DVDD5	P	PP5E	5V Digital Power
46	NDT_WR1	O	PO2	Laser Diode Driver Output for Write1
47	NDT_ER	O	PO2	Laser Diode Driver Output for Erase
48	NDT_RD	O	PO2	Laser Diode Driver Output for Read
49	HFON	O	PO2	High Frequency Module Enable
50	LDON	O	PO2	Laser Diode Enable
51	WR	O	PO2	Write Mode Monitor Output
52	ER	O	PO2	Erase Mode Monitor Output
53	OVF	O	PO2	Overflow Interrupt to Controller
54	SRF0	O	PO2	I/V Gain Control Output to Pickup
55	SRF1	O	PO2	I/V Gain Control Output to Pickup
56	DVSS3	P	PP0I	3.3V Digital Ground
57	DVDD3	P	PP3I	3.3V Digital Power
58	SERINT	I	PIC	Servo Interrupt
59	DTEST0	O	PO2	Digital Test Output
60	DTEST1	O	PO2	Digital Test Output
61	DTEST2	O	PO2	Digital Test Output
62	WBCLK	I	PIC	Wobble Clock or Oscillator Input
63	WDATA	I	PIC	Write Data Input from Controller
64	WCLK	O	PO2	Write Channel Clock Output

Figure 3. AT78C1504 Block Diagram





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