Triple 10-Bits, voltage output DAC - 10Mhz
3.3V and 1.3V full-scale (compact layout version)

Overview:

This IP is a triple channel 10-bits 10 MS/s general purpose voltage output DAC, optimized for analog LCD controller application and designed for industry standard 0.18um 1P6M CMOS technology supplied at 3.3V.

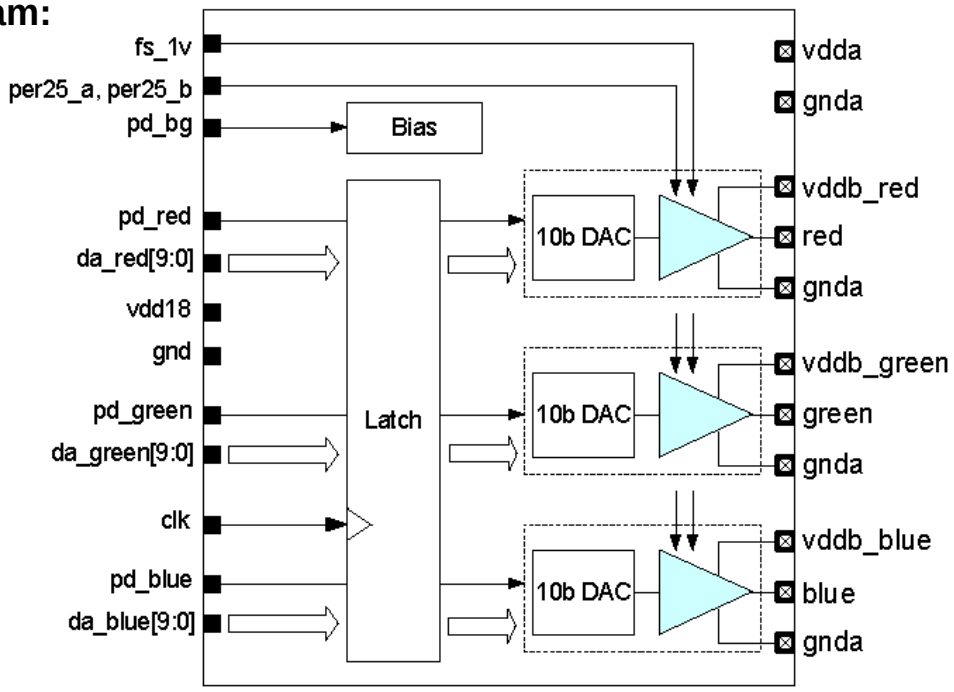
Each independent DAC uses an internal segmented current steering architecture, with at least 10-bit of intrinsic static accuracy, combined with an high slewrate (120V/uS), and high output current (up to 36mA), rail to rail voltage output driver.

A 1V full scale option allow the DAC to also deliver standard video signals on a 37.5Ω termination.

Features:

- 10 Bits resolution.
- 10MS/s update rate.
- Programmable full scale : 3V or 1V.
- Adjustable max output current 24, 30 or 36mA.
- 3.3V ±10% supply voltage, -40/+125°C temperature.
- 1P6M layout structure based on 0.18um 1P6M 3.3V/1.8V generic logic process.
- Individual DAC channel Power down.
- Do not require extra external bias circuit.
- Very small cell area: 0.6 mm2 (without I/Os)
- Built in I/Os with ESD protection on 75um pad pitch.
- Antenna diodes on each digital input.

Block Diagram:



10 Bits Triple Voltage Output DAC

Application:

- Flat panel analog display controller
- General signal generation either 3V or 1V full scale

Electrical Specification:

Symbol	*Parameter*	*Min*	*Typ*	*Max*	*Units*
Tj	Junction Temperature	0	70	125	ºC
vdda	Analog power supply	3.0	3.3	3.6	V
vddb_*	Channel power supply	3.0	3.3	3.6	V
vdd18	Core power supply	1.62	1.8	1.98	V

Symbol	*Parameter*	*Conditions*	*Min*	*Typ*	*Max*	*Units*
Res	Resolution			10		Bits
Freq	Max DAC update frequency				10	Mhz
F-3db	Voltage driver -3dB Bandwith			45		Mhz
Iquies	Voltage driver quiescent current	per channel		5		mA
Iout	Current output drive	per25_a=1, per25_b=1			36	mA
Vout	Output voltage range		0.3		vddb-0.3	V
Vcm	Output common mode level	Rload= ?				V
Code	Input code			binary		
ENOB	Effective number of bits	Fin=300khz, Fs=10Mhz				#
INL				± 1	± 2	LSB
DNL				± 0.5	± 1	LSB
SFDR						dB
SNR		Fin=300khz, Fs=10Mhz				dB
THD		Fin=300khz, Fs=10Mhz			-73	dB
PSRR	Power supply rejection	Fin=300khz, Fs=10Mhz				dB
Idiss	Current consumption	FF corner, 0degC, 3.6V/1.98V @10Mb/s	-	-	contact us	mA
Ileak	Power down current leakage	FF corner, 0degC, 3.6V/1.98V @10Mb/s	-	-		uA
Td	Analog output delay	from CLK=Vih(min) to 50% of full scale transistion				ns
Thold	Input hold time					ps
Tsetup	Input data setup time					ps

ESD immunity

+/-2KV HBM based on Mil Std. 883 Method 3015.7
+/-500V CDM,
+/-200V MM

Latch-up immunity

minimum +/-300mA injection at 100C based on EIA/JESD78

Deliverables:

V-Trans provides 2 separate kits depending on licensing agreement.
In most cases, the physical is merged on foundry site.

Design Kit

Design kit includes :

- LEF view and abstract gdsII
- Verilog HDL behavioral model
- Liberty (.lib) timing constraints for typical, worse and best corner case
- Full Datasheet /Application Note with integration guidelines document
- Silicon characterization report when available

Tapeout Kit

Tapeout kit includes the design kit plus plysical view:

- gdsII
- LVS netlist and report
- DRC/ERC/ESD/ANT report

Portfolio and Design Services:

V-Trans Microelectronics has been combining all the best practices and methodologies in analog and mixed-signal high speed interfaces design to answer the demanding market of high performance analog IPs using cheaper technologies such as 0.18um.

Our Portfolio covers a wide range of applications and can be customized on demand to answer exactly your specific needs.

Custom layout and back-end services are also available if you have a tied project schedule.
Our experience includes high integration circuit such as network SOC, CPU and FPGA which allow us to provide a full solution for even more complex chip.

Please contact us to tell us how we could help you or for any analog IP information.

- High speed interfaces (LVDS serdes, Display Interfaces, DDRII, DDR3, PCI-X, HDMI rev1.1)
- Converters (video ADC 10b 170Mhz, Triple video DAC)
- Timing circuits (Audio PLL, Video PLL, DDR memory PLL, custom PLL.)
- Low noise Crystal Oscillators
- Power management (LDO regulators, Power On Reset..)
- Video and WIMAX Analog Front end

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