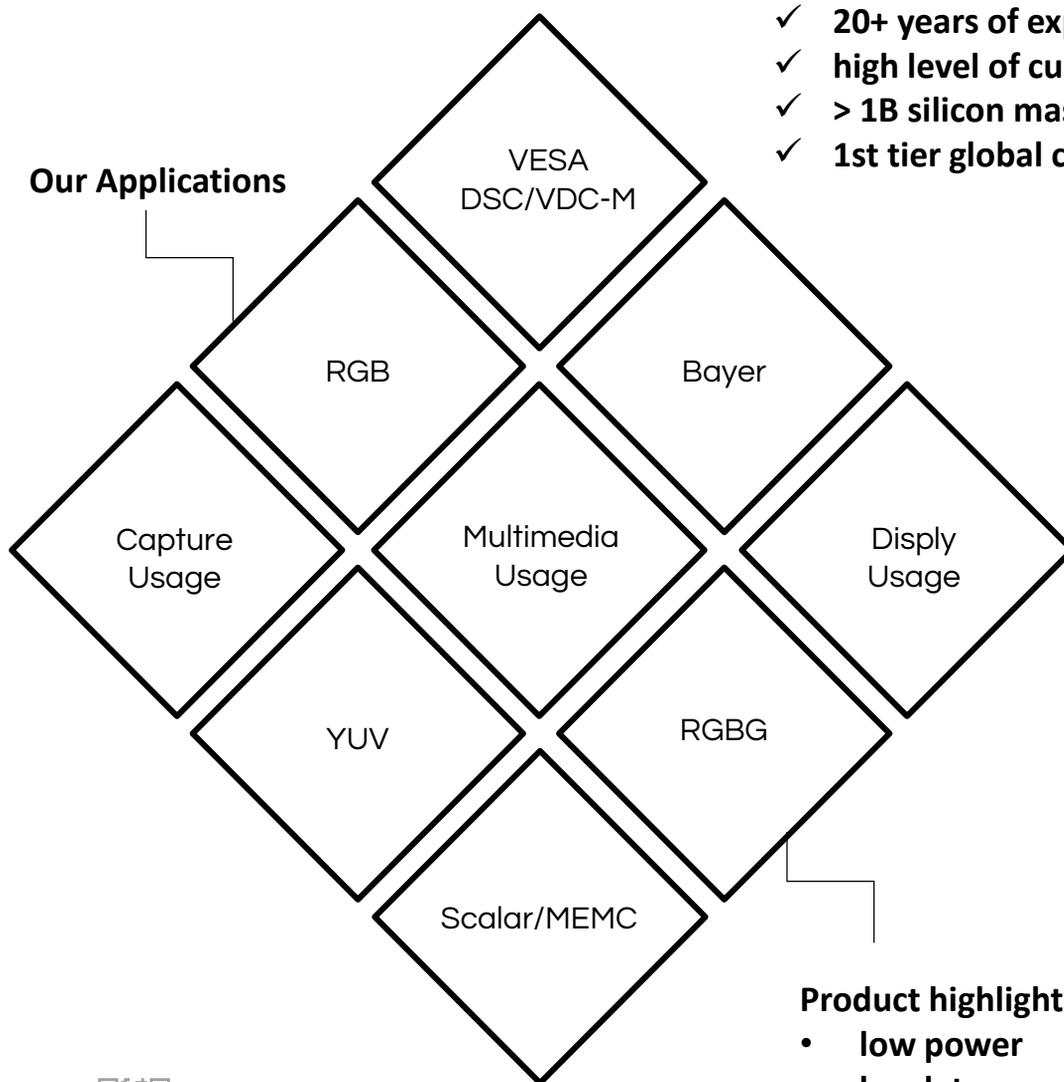


TITC

Image Compression IP specialist

- ✓ 20+ years of experience
- ✓ high level of customization
- ✓ > 1B silicon mass produced
- ✓ 1st tier global customers

Our Applications



Product highlight features:

- low power
- low latency
- small area



Tel: +886-3-5839011

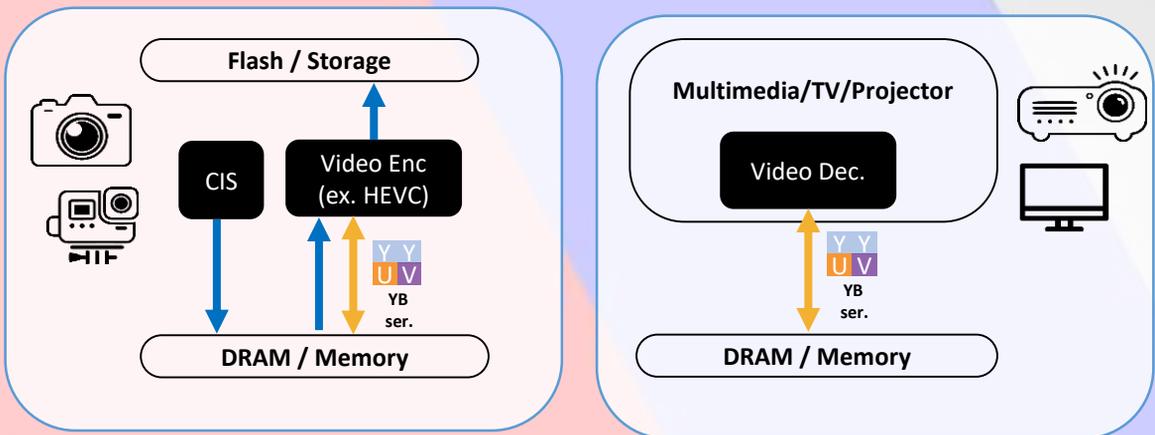
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TITC YB-Series IP

YUV for Video Encoder/Decoder

YB-series IPs are collection of proprietary algorithm which are used for real-time compress/decompress block-based YUV subsample data. These IPs/algorithm are designed for video encoding/decoding device, which facilitate temporal storage efficiency of ME(motion estimation)/MC(motion compensation) data. End products like cinema camcorder, mobile multimedia system, TV system may benefit from YB-series IPs.

YB-series IPs are featured by customized bitdepth/ratio support, reasonable hardware resources, friendly IP integration, and flexible access/store compressed bitstream. Feature support/algorithm are tailored for picture quality requirement and hardware budget via TITC engineer team.



➤ TITC YB-Series IP

Usage / Series		capture, multimedia / YB-series	
IP Name		YB v1	YB v2
Data	Type	YUV422/YUV420	YUV420/Y-Only
	Bit-Depth	8/10/12-bit	8/10-bit
Compression	Type	Lossy/Lossless	Lossy
	Ratio(Lossy)	1.33~2X	2~4X
	Unit	H4V4/ H8V8/ H8V4	H8V8
Performance	Throughput	2-pix/4-comp (per T)	64-comp (per T)
Note		* compression unit can be customized * lossless+lossy is encouraged	* focus on high ratio, high throughput

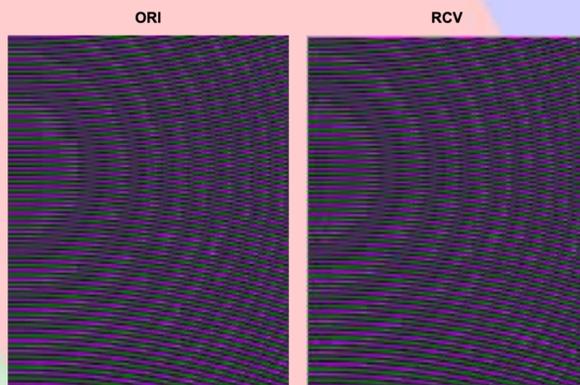
TITC S-Series IP

RGB/YUV for FRC & Scalar

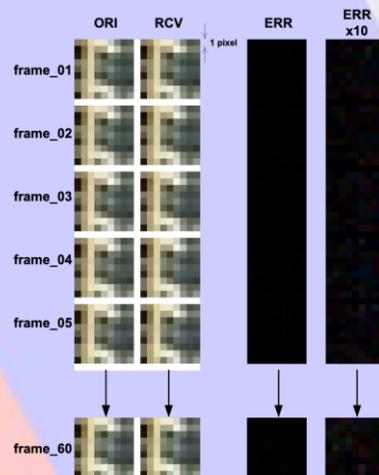
Frame Rate Conversion(FRC) and Scalar have been long developed in multimedia. FRC techniques generate pseudo image frames between at least two consecutive frames, usually by the technique of Motion Estimation and Motion Compensation (MEMC) to get better motion picture qualities. At least one frame picture stored in memory. Scalar techniques as well generate pseud image lines between at least two consecutive lines. Several image lines are required to be in memory. Both techniques need high memory i/o bandwidth when image resolution get higher.

TITC proposed segment-based or block-based, fixed-ratio, visual-lossless compression in RGB/YUV format. This mass production proven technique can ease the pain point of i/o bandwidth hunger. Supporting bit depth up to 12 meets mainstream requirement. Compression unit and bit depth can also be customized.

YUV422 / 3X (20->7 bit)

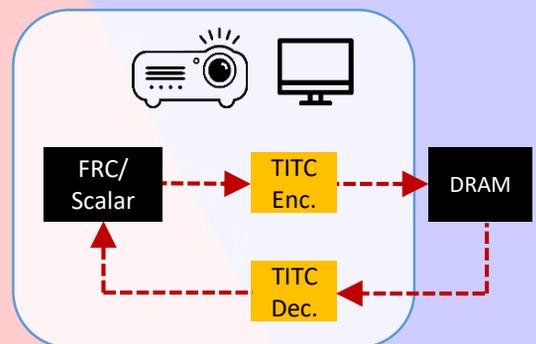


RGB / 3X (30->10 bit)



➤ TITC S-Series IP

Usage / Series		multimedia / S-series
IP Name		FRV v1
Data	Type	RGB/YUV444/YUV422
	Bit-Depth	10/12-bit
Compression	Type	Lossy
	Ratio(Lossy)	2~3X
	Unit	H64V1 / H64V2
Performance	Throughput	2-pix (per T)
Note		* compression unit can be customized

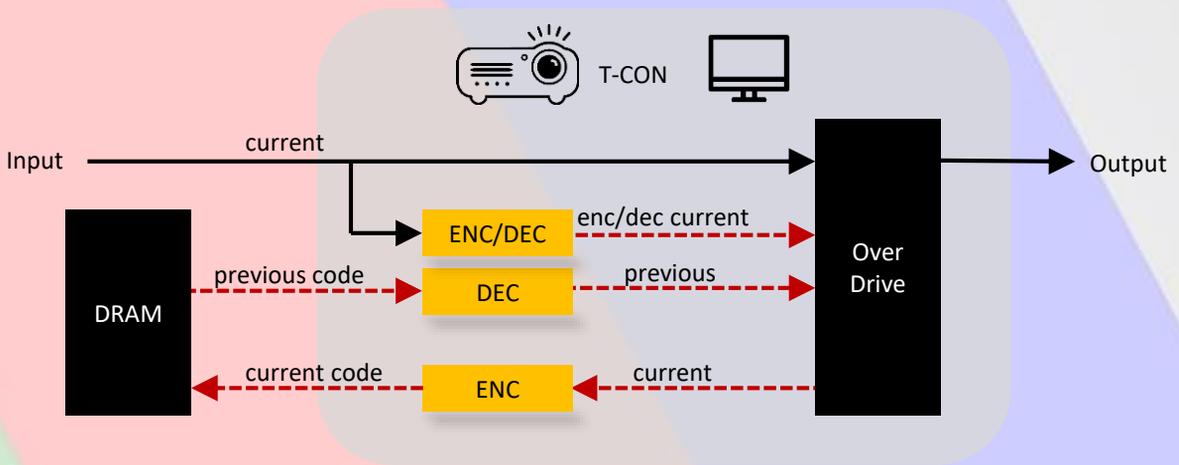


TITC O-Series IP

YUV for Video Encoder/Decoder

YB-series IPs are collection of proprietary algorithm which are used for real-time compress/decompress block-based YUV subsample data. These IPs/algorithm are designed for video encoding/decoding device, which facilitate temporal storage efficiency of ME(motion estimation)/MC(motion compensation) data. End products like cinema camcorder, mobile multimedia system, TV system may benefit from YB-series IPs.

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➤ TITC O-Series IP

Usage / Series		multimedia / O-series		
IP Name		OD v1	OD v2	OD v3
Data	Type	RGB	RGB	Y-only
	Bit-Depth	8-bit	8-bit	8-bit
Compression	Type	Lossy	Lossy	Lossy
	Ratio(Lossy)	2.28X	2/3/4/6/12X	4X
	Unit	H2V2	slice	H4V4
Performance	Throughput	4-pix (per T)	1-pix (per T)	16-pix (per T)
Note		* light resource	* high ratio	* high throughput * for DDI