1   Subject

Affected Products	conga-TS67, conga-TS77, conga-TC87
Subject	Feature comparison.
(Confidential/Public)	Confidential – only for internal use
Date (yyyy.mm.dd)	2013.11.25

Author	CJR

2   Affected Article Numbers

Article Number(s)	Product
046901, 046503, 046402	conga-TC87/i7-4650, conga-TS77/i7-3517UE, conga-TS67/i7-2610UE

3   Information

The following table helps to compare the Core i7 ULV feature sets of the Intel 2nd Gen (Sandy Bridge), 3rd Gen (Ivy Bridge) and 4th Gen (Haswell U).

In order to adequately compare the congatec COM Express modules listed in section 1, the chipset features in addition to the processor and graphics features of the respective platforms are listed.

Feature	conga-TS67 Core i7-2610UE	conga-TS77 Core i7-3517UE	conga-TC87 Core i7-4650	Comment
Formfactor				
COM Express	Basic	Basic	Compact	
Processor				
Intel Launch	Q1/11	Q2/12	Q3/13	
Lithographie	32 nm	22 nm	22 nm	
Upgrade Path	Yes, TS77	No	Yes, Broadwell ULT	Next generation Intel Broadwell ULT will be footprint compatible!
Max TDP	17W + 3.9W PCH	17W + 4.1W PCH	15W	Haswell U and Broadwell ULT are single chip solutions.
Clock Speed	1.5 GHz	1.7 GHz	1.7 GHz	
Max Turbo Frequency	2.4 GHz	2.8 GHz	3.3 GHz	
AVX Instruction Set	1.0	1.0	2.0	
Memory				
Memory Configuration	16GB / DDR3-1333	16GB / DDR3-1600	16GB / DDR3L-1600	DDR3L is new standard and consumes less power.
Graphics				
Integrated Graphics	HD3000	HD4000	HD5000	
Base Frequency	350 MHz	350 MHz	200 MHz	

Max Dynamic Frequency	850 MHz	1 GHz	1.1 GHz	
DirectX	10.1	11	11.1	
OpenGL	3.0	3.1	4.0	
OpenCL	No	1.1	1.2	
Simultaneous displays	2	3	3	
DDIs	3 (HDMI/DP)	3 (HDMI/DP)	2 (HDMI/DP)	
DP / HDMI spec	1.1 / 1.3	1.1 / 1.4	1.2 / 1.4a	
SDVO	Yes	Yes	No	
CRT Interface	Yes	Yes	No	
I/O				
PEG Port	Yes, Gen2	Yes, Gen3	No	Can also be used as either 2 x8 or 1 x8 and 2 x4 GP root ports on TS67 and TS77.
GP PCIe Lanes	7x Gen2	7x Gen2	4x Gen2	
SATA Ports	2x SATAIII + 2x SATAII	2x SATAIII + 2x SATAII	4x SATA III	
USB Ports	8x USB2.0	8x USB2.0, 4x USB3.0	8x USB2.0, 2x USB3.0	
Optional CEX UARTs	No	No	Yes	UARTs supported by new congatec board controller implementation.
Deep Sx Support	No	No	Yes	To minimize power consumption in S3/S4/S5.
iRST	No	Yes	Yes	Intel Rapid Start Technology
Benchmarks				See CTN 20131008 001.pdf for more bechmark results
3D Vantage CPU Score	5958	9189	8566	
3D Vantage GPU Score	6543	13523	16994	

4   Summary

The Core i7 processor SKUs compared above are all dual core processors with 4MB cache and have various Intel processor feature sets in common. The table highlights only the most important differences.

In addition to the processor, memory and graphics features provided by the Core i7 SKUs, the table also lists some chipset related feature/interface differences to get an overall view of the whole platform used on the COM Express modules.

For most mobile applications, the new conga-TC87 will most likely be the best option mainly because of its longer product life time, lower power consumption, Deep Sx support and smaller foot print.

In case the cost of the conga-TC87/Core i7-4650 is too high, consider the Core i5 or even the Core i3 product variants.

5   Revision History

Revision	Date (yyyy.mm.dd)	Author	Changes
1.0	2013.11.25	CJR	Initial release.
1.1	2014.01.30	CJR	iRST feature comparison added