

System On Module GTSS15



TI OMAP-L138 + Spartan-6 System On Module

The GTSS15 is a highly configurable, very small form-factor processor card that features a Texas Instruments OMAP-L138 456 MHz (max) Applications Processor (OMAP) tightly integrated with the Xilinx Spartan-6 Field Programmable Gate Array (FPGA), FLASH (NAND/NOR) and mDDR2 memory subsystems. The GTSS15 provides a complete and flexible digital processing infrastructure for the most demanding embedded applications development.

APPLICATIONS: Embedded Instrumentation, Industrial Automation, Embedded Control Processing, Network Enabled Data Acquisition, Test and Measurement, Software Defined Radio



SPECIFICATIONS

SOC OMAP-L138 Dual Core	BOARD to BOARD INTERFACES
456 MHz (Max) C674x VLIW DSP	Standard SO-DIMM-200
Floating Point DSP	96 FPGA User I/O Pins
32 KB L1 Program/Data Cache	10/100 EMAC MII / MDIO
256 KB L2 cache	2 UARTs
1024 KB Boot ROM, JTAG	2 McBSPs
456 MHz (Max) ARM926EJ-S MPU	2 USB Ports
16 KB L1 Program/Data Cache	Video Output
8KB RAM and 64KB Boot ROM	Camera/Video Input
JTAG Emulation/Debug	MMC/SD
On-Board Xilinx Spartan-6 FPGA	SATA Support (option)
Up to 6SLX45 with 2,088 Kb BRAM	Single 3.3V Power Supply
- Up to 43,661 Logic Cells	OS Support:
- Up to 6,822 Slices	Linux
1050 Mbps data rate, JTAG	QNX 6.4
Memory and Storage	Windows Embedded CE Ready
Up to 256 MB mDDR2 CPU RAM	ThreadX Real Time OS
Up to 512 MB NAND FLASH	Operating Temperature:
Up to 16 MB SPI NOR FLASH	-40°C to +85°C

HIGHLIGHTS

TI OMAP-L138 Dual Core Application Processor

- 456 MHz (Max) C674x VLIW DSP

- 456 MHz (Max) ARM926EJ-S MPU

On-Board Xilinx Spartan-6 Up to XC6SLX45 FPGA

Up to 256 MB mDDR2 CPU RAM

Up to 512 MB Parallel NAND FLASH

Up to 16 MB SPI based NOR FLASH

Integrated Power Management

Rapid Development / Deployment

Multiple Connectivity and Interface Options

Rich User Interfaces

Fixed & Floating Point Operations in Single CPU

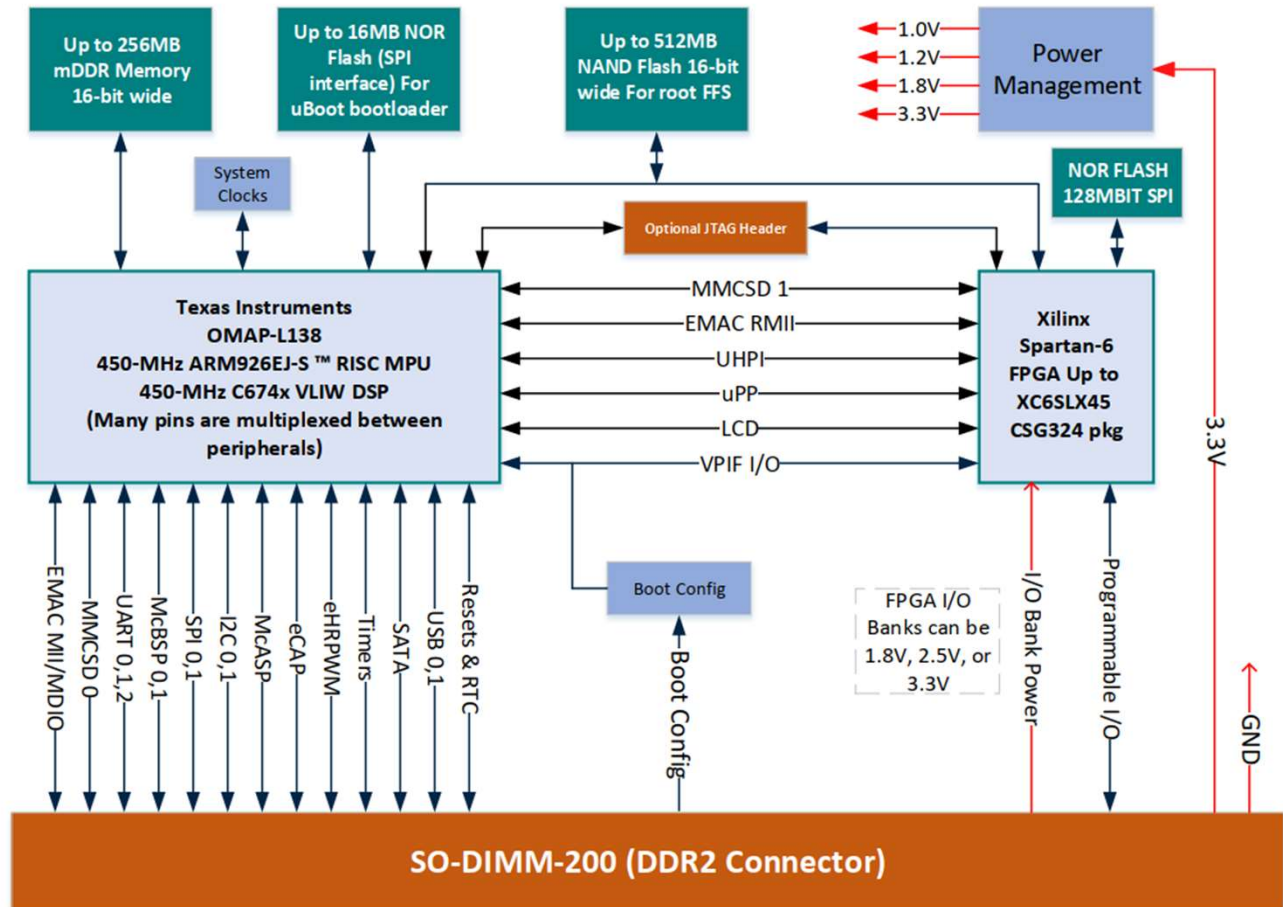
Embedded Digital Signal Processing

10+ Years availability

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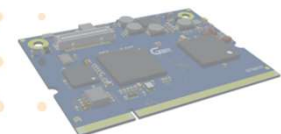
BLOCK DIAGRAM



The product can be ordered online from the GTEK Website <https://www.gtek-vn.com>

SOM SELECTION

Module P/N	CPU	FPGA	RAM	NOR	NAND	Temp
GTSS15-16C42C-AAB	456 MHz	6SLX16	128MB	16MB	256MB	0°C - 70°C
GTSS15-16C32I-AAB	375 MHz	6SLX16	128MB	16MB	256MB	-40°C - 85°C
GTSS15-45C42I-BAC	456 MHz	6SLX45	256MB	16MB	512MB	-40°C - 70°C
GTSS15-45C32I-BAC	375 MHz	6SLX45	256MB	16MB	512MB	-40°C - 85°C



Note: GTEK reserves the right to change these specifications without notice as part of GTEK's ongoing efforts to meet the best specifications. Registered trademarks are exclusive to their respective owners.



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SODIMM PIN DESCRIPTION

Pin	Ball	Type	I/O	Signal	Pin	Ball	Type	I/O	Signal
1	-	PWR	-	+3.3 V in	2	-	PWR	-	+3.3 V in
3	-	PWR	-	+3.3 V in	4	-	PWR	-	+3.3 V in
5	-	PWR	-	+3.3 V in	6	-	PWR	-	+3.3 V in
7	-	PWR	-	GND	8	-	PWR	-	GND
9	-	PWR	-	GND	10	-	PWR	-	GND
11	K14	D	I	RESET_IN#	12	-	D		EXT_BOOT#
13 ⁵	J1	D	O	SATA_TX_P	14	A4	M	I/O	GP0_7
15 ⁵	J2	D	O	SATA_TX_N	16	A3	M	I/O	GP0_10
17 ⁵	L1	D	I	SATA_RX_P	18	A2	M	I/O	GP0_11
19 ⁵	L2	D	I	SATA_RX_N	20	A1	M	I/O	GP0_15
21	P16	D	I	USB0_ID	22	B4	M	I/O	GP0_6
23	P18	D	I/O	USB1_D_N	24	B1	M	I/O	GP0_14
25	P19	D	I/O	USB1_D_P	26	B2	M	I/O	GP0_12
27	N19	D	O	USB0_VBUS	28	B3	M	I/O	GP0_5
29	M18	D	I/O	USB0_D_N	30	C2	M	I/O	GP0_13
31	M19	D	I/O	USB0_D_P	32	C3	M	I/O	GP0_1
33	K18	D	O	USB0_DRVVBUS	34	C4	M	I/O	GP0_4
35	-	D	-	3V RTC Battery	36	C5	M	I/O	GP0_3
37	-	PWR	-	+3.3 V in	38	-	PWR	-	+3.3 V in
39	-	PWR	-	+3.3 V in	40	-	PWR	-	+3.3 V in
41	-	PWR	-	GND	42	-	PWR	-	GND
43	H17	D	I/O	SPI1_MISO	44	D4	M	I/O	GP0_2
45	G17	D	I/O	SPI1_MOSI	46	E4	M	I/O	GP0_0
47	H16	D	I/O	SPI1_ENA	48	F4	M	I/O	GP0_8
49 ¹	G19	D	I/O	SPI1_CLK	50	D5	M	I/O	GP0_9



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Pin	Ball	Type	I/O	Signal	Pin	Ball	Type	I/O	Signal
51	F18	M	I/O	SPI1_SCS1	52	A12	M	I/O	MMCSDB0_DAT7
53	-	D	I/O	Reserved	54	C11	M	I/O	MMCSDB0_DAT6
55 ²	G16	D	I/O	I2C0_SCL	56	E12	M	I/O	MMCSDB0_DAT5
57 ²	G18	D	I/O	I2C0_SDA	58	B11	M	I/O	MMCSDB0_DAT4
59	F16	M	I/O	UART2_TXD/ I2C1_SDA	60	E11	M	I/O	MMCSDB0_DAT3
61	F17	M	I/O	UART2_RXD/ I2C1_SCL	62	C10	M	I/O	MMCSDB0_DAT2
63	-	PWR	I/O	GND	64	-	PWR	I/O	GND
65	F19	M	I/O	UART1_TXD	66	A11	M	I/O	MMCSDB0_DAT1
67	E18	M	I/O	UART1_RXD	68	B10	M	I/O	MMCSDB0_DAT0
69	E16	M	I/O	MDIO_CLK	70	A10	M	I/O	MMCSDB0_CMD
71	D17	M	I/O	MDIO_DAT	72	E9	M	I/O	MMCSDB0_CLK
73	D19	M	I/O	MII_RXCLK	74	D3	M	I/O	MII_TXCLK
75	C17	M	I/O	MII_RXDV	76	E3	M	I/O	MII_TXD3
77	D16	M	I/O	MII_RXD0	78	E2	M	I/O	MII_TXD2
79	E17	M	I/O	MII_RXD1	80	E1	M	I/O	MII_TXD1
81	D18	M	I/O	MII_RXD2	82	F3	M	I/O	MII_TXD0
83	C19	M	I/O	MII_RXD3	84	C1	M	I/O	MII_TXEN
85	-	PWR	-	GND	86	-	PWR	-	GND
87	C18	M	I/O	MII_CRS	88	D1	M	I/O	MII_COL
89	C16	M	I/O	MII_RXER	90 ⁴	R16	F	I/O	FPGA_SUSPEND
91	U17	F	I/O	B1_47_P.U17	92	M14	F	I/O	B1_48_P.M14
93	U18	F	I/O	B1_47_N.U18	94	N14	F	I/O	B1_48_N.N14
95	T17	F	I/O	B1_45_P.T17	96	N15	F	I/O	B1_46_P.N15
97	T18	F	I/O	B1_45_N.T18	98	N16	F	I/O	B1_46_N.N16
99	P17	F	I/O	B1_43_P.P17	100	L12	F	I/O	B1_44_P.L12



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Pin	Ball	Type	I/O	Signal	Pin	Ball	Type	I/O	Signal
101	P18	F	I/O	B1_43_N.P18	102	L13	F	I/O	B1_44_N.L13
103	N17	F	I/O	B1_41_P.N17	104	K12	F	I/O	B1_42_P.K12
105	N18	F	I/O	B1_41_N.N18	106	K13	F	I/O	B1_42_N.K13
107	-	PWR	-	GND	108	-	PWR	-	GND
109	M16	F	I/O	B1_39_P.M16	110	L15	F	I/O	B1_40_P.L15
111	M18	F	I/O	B1_39_N.M18	112	L16	F	I/O	B1_40_N.L16
113	L17	F	I/O	B1_37_P.L17	114	K15	F	I/O	B1_38_P.K15
115	L18	F	I/O	B1_37_N.L18	116	K16	F	I/O	B1_38_N.K16
117	K17	F	I/O	B1_35_P.K17	118	J13	F	I/O	B1_36_P.J13
119	K18	F	I/O	B1_35_N.K18	120	K14	F	I/O	B1_36_N.K14
121	J16	F	I/O	B1_33_P.J16	122	H15	F	I/O	B1_34_P.H15
123	J18	F	I/O	B1_33_N.J18	124	H16	F	I/O	B1_34_N.H16
125	H17	F	I/O	B1_31_P.H17	126	H13	F	I/O	B1_32_P.H13
127	H18	F	I/O	B1_31_N.H18	128	H14	F	I/O	B1_32_N.H14
129	-	PWR	-	GND	130	-	PWR	-	GND
131	G16	F	I/O	B1_29_P.G16	132	F15	F	I/O	B1_30_P.F15
133	G18	F	I/O	B1_29_N.G18	134	F16	F	I/O	B1_30_N.F16
135	F17	F	I/O	B1_27_P.F17	136	H12	F	I/O	B1_28_P.H12
137	F18	F	I/O	B1_27_N.F18	138	G13	F	I/O	B1_28_N.G13
139	E16	F	I/O	B1_25_P.E16	140	F14	F	I/O	B1_26_P.F14
141	E18	F	I/O	B1_25_N.E18	142	G14	F	I/O	B1_26_N.G14
143	D17	F	I/O	B1_23_P.D17	144	F13	F	I/O	B0_24_P.F13
145	D18	F	I/O	B1_23_N.D18	146	E13	F	I/O	B0_24_N.E13
147	C17	F	I/O	B1_21_P.C17	148	D14	F	I/O	B0_22_P.D14
149	C18	F	I/O	B1_21_N.C18	150	C14	F	I/O	B0_22_N.C14



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Pin	Ball	Type	I/O	Signal	Pin	Ball	Type	I/O	Signal
151	-	PWR	-	GND	152	-	PWR	-	GND
153	B16	F	I/O	B0_19_P.B16	154 ³	F12	F	I/O ³	B0_20_P.F12 ³
155	A16	F	I/O	B0_19_N.A16	156 ³	E12	F	I/O ³	B0_20_N.E12 ³
157	C15	F	I/O	B0_17_P.C15	158 ³	D12	F	I/O ³	B0_18_P.D12 ³
159	A15	F	I/O	B0_17_N.A15	160 ³	C12	F	I/O ³	B0_18_N.C12 ³
161	B14	F	I/O	B0_15_P.B14	162 ³	F11	F	I/O ³	B0_16_P.F11 ³
163	A14	F	I/O	B0_15_N.A14	164 ³	E11	F	I/O ³	B0_16_N.E11 ³
165	C13	F	I/O	B0_13_P.C13	166	D11	F	I/O	B0_14_P.D11
167	A13	F	I/O	B0_13_N.A13	168	C11	F	I/O	B0_14_N.C11
169	B12	F	I/O	B0_11_P.B12	170 ³	E7	F	I/O ³	B0_12_P.E7 ³
171	A12	F	I/O	B0_11_N.A12	172 ³	E8	F	I/O ³	B0_12_N.E8 ³
173	-	PWR	-	GND	174	-	PWR	-	GND
175	B11	F	I/O	B0_9_P.B11	176	D9	F	I/O	B0_10_P.D9
177	A11	F	I/O	B0_9_N.A11	178	C9	F	I/O	B0_10_N.C9
179	C10	F	I/O	B0_7_P.C10	180	D8	F	I/O	B0_8_P.D8
181	A10	F	I/O	B0_7_N.A10	182	C8	F	I/O	B0_8_N.C8
183	B9	F	I/O	B0_5_P.B9	184	D6	F	I/O	B0_6_P.D6
185	A9	F	I/O	B0_5_N.A9	186	C6	F	I/O	B0_6_N.C6
187	B8	F	I/O	B0_3_P.B8	188	B6	F	I/O	B0_4_P.B6
189	A8	F	I/O	B0_3_N.A8	190	A	F	I/O	B0_4_N.A6
191	C7	F	I/O	B0_1_P.C7	192	C5	F	I/O	B0_2_P.C5
193	A7	F	I/O	B0_1_N.A7	194	A5	F	I/O	B0_2_N.A5
195	-	PWR	-	GND	196	-	PWR	-	GND
197	-	PWR	-	VCCO_1	198	-	PWR	-	VCCO_0
199	-	PWR	-	VCCO_1	200	-	PWR	-	VCCO_0

Note: Please reach out to GTEK at technical@gtek-vn.com for the details.

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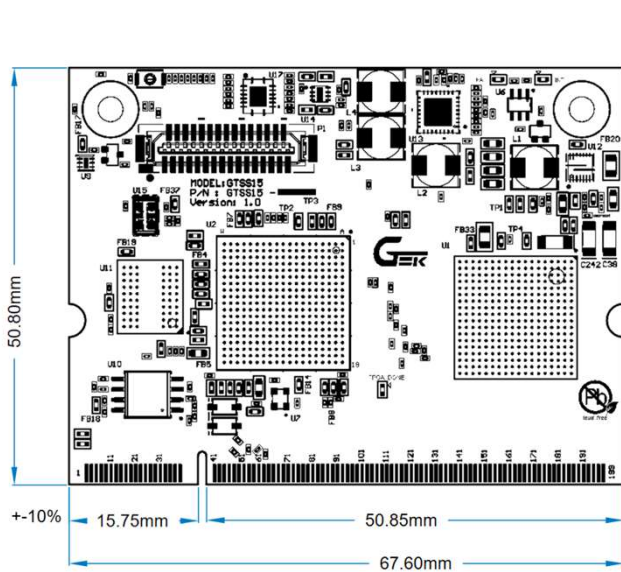
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ELECTRICAL CHARACTERISTICS

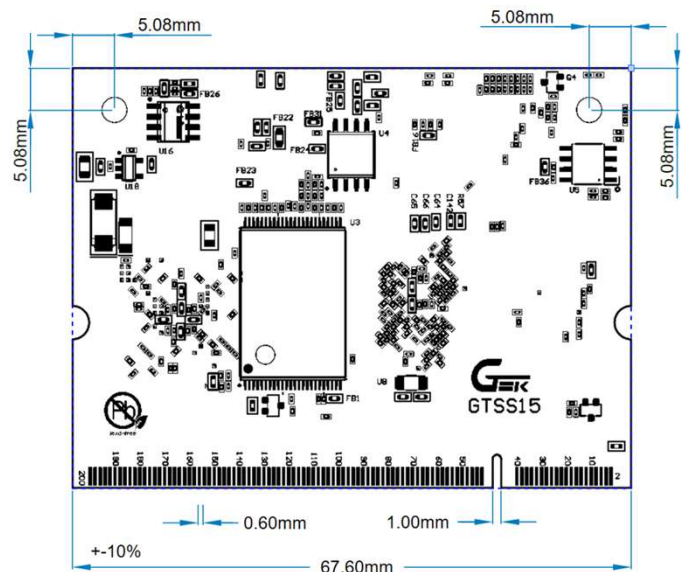
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V33	Voltage supply, 3.3 voltage input.		3.2	3.3	3.4	Volts
I33	Quiescent Current draw, 3.3 voltage input			340 ^{1,2}	TBS ^{1,2}	mA
I33-max	Max current draw, positive 3.3 volt input.			TBS ^{1,2}	2200 ^{1,2}	mA
V3V_RTC_Battery	Voltage supply, RTC Battery			3.0	5.0V	Volts
I3V_RTC_Battery	Current, RTC Battery, V33 = 0V			10		uA
FCPU	CPU internal clock Frequency (PLL output)		25	300	456	MHz
FEMIF	EMIF bus frequency	Must be ½ CPU	-	100	-	MHz

1. Power utilization of the GTSS15 is heavily dependent on end-user applications. Major factors include ARM CPU PLL configuration, DSP Utilization, FPGA utilization, and external DDR2 RAM utilization.
2. For power utilization information, please reach out to GTEK at technical@gtek-vn.com

DIMENSIONS



TOP VIEW



BOTTOM VIEW

Note: Please reach out to GTEK at technical@gtek-vn.com for the details.

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