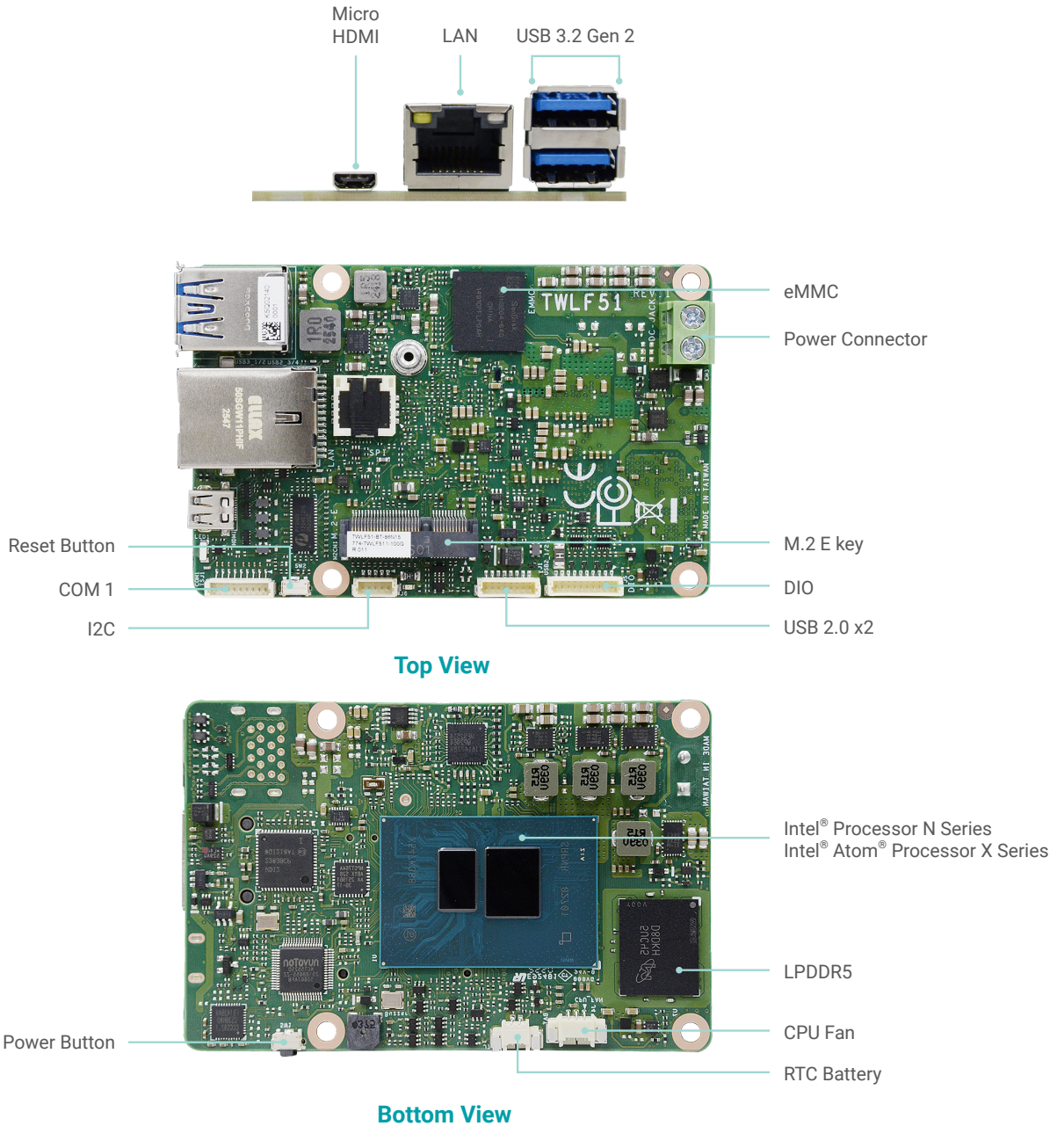


TWLF51



Atom

Intel® Processor N Series
Intel® Atom® Processor X Series
1.8" SBC



KEY FEATURES



1.8" SBC

Small form factor 1.8" SBC for space-limited applications



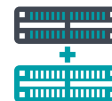
LPDDR5 onboard

Single Channel LPDDR5 memory down up to 8GB



4K High Resolution

HDMI 2.0 resolution supports up to 4096x2160 @ 60Hz



Expansions

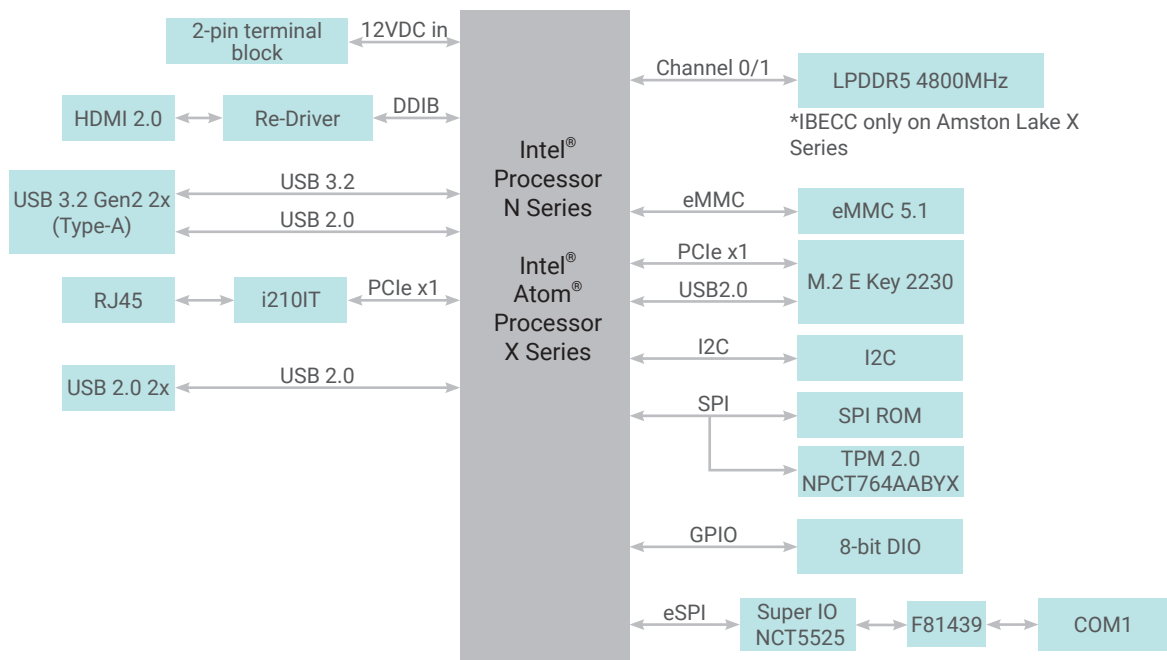
1 M.2 E key,
1 I2C/SMBus (Opt.)



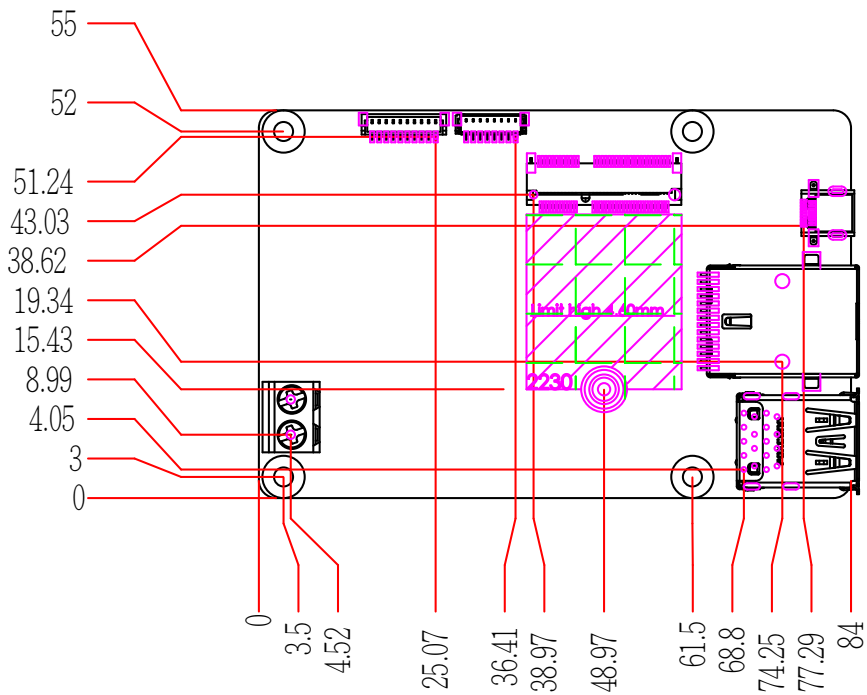
Rich I/O

1 Intel GbE, 1 COM,
2 USB 3.2 Gen2,
2 USB 2.0, 1 Micro HDMI, 1 DIO

BLOCK DIAGRAM



MECHANICAL DRAWING



SPECIFICATION

SYSTEM	Processor	Intel® Processor N series (Code Name: Twin Lake) Intel® Core™ 3 Processor N355, 8 Cores, 1.8~3.9 GHz, 15W Intel® Processor N150, 4 Cores, 1.0~3.6 GHz, 6W Intel Atom® Processor X Series (Code Name: Amston Lake) Intel Atom® Processor x7835RE, 8 Cores, 1.3~3.6 GHz, 12 W Intel Atom® Processor x7433RE, 4 Cores, 1.5~3.4 GHz, 9 W Intel Atom® Processor x7211RE, 2 Cores, 1.0~3.2 GHz, 6 W	
	Memory	LPDDR5 memory down up to 8GB Single-channel LPDDR5 4800MHz	
	BIOS	AMI SPI 256Mbit	
GRAPHICS	Controller	Intel® UHD Graphics	
	Feature	OpenGL 4.6, Direct X 12.1, OpenCL 3.0 HW Decode: HEVC, VP9, AV1, AVC HW Encode: HEVC, VP9, AVC	
	Display	1 x Micro HDMI	HDMI 2.0: resolution up to 4096x2160 @ 60Hz
EXPENSION	Interface	1 x M.2 E key 2230 (PCIe Gen3 x1/USB 2.0)	
ETHERNET	Controller	1 x Intel® i210IT(10/100/1000Mbps)	
REAR I/O	Ethernet	1 x GbE (RJ-45)	
	USB	2 x USB 3.2 Gen2, 10Gbps (Type-A)	
	Display	1 x Micro HDMI (HDMI 2.0)	
INTERNAL I/O	DIO	1 x 8-bit DIO	
	I2C/SMBus	I2C/SMBus (Opt.)	
STORAGE	eMMC	Default 64GB, up to 128GB	
WATCHDOG TIMER	Output & Interval	Software Reset, Programmable via Software from 1 to 655,353 Seconds	
SECURITY	TPM	dTPM 2.0	
POWER	Type	Single 12V +/-5% DC	
	Connector	2-pin Terminal Block	
	Consumption	Typical: x7835RE (w/Cooler), 12V @ 0.39A (4.68W) Max: x7835RE (w/Cooler), 12V @ 3.33A (39.96W)	
	RTC Battery	CR2032 Coin Cell	
OS SUPPORT	Microsoft	Windows 11 IoT Enterprise	
	Linux	Linux	
ENVIRONMENT	Temperature	Operating: -5 to 65°C / -20 to 70°C	
		Storage: -40 to 85°C	
	Humidity	Operating: 5 to 90% RH	
Storage: 5 to 90% RH			
MTBF	Model: TWLF51-ET-86X78 MTBF (hrs): 693,447 hrs @ 25°C; 510,973 hrs @ 45°C; 372,643 hrs @ 60°C; 291,272 hrs @ 70°C Calculation model: Telcordia Issue 4 Environment: GB, GC – Ground Benign, Controlled		
MECHANISM	Dimensions	1.8" SBC Form Factor	84mm (3.31") x 55mm (2.17")
	Height	PCB: 1.60mm	Top Side: 16.35mm, Bottom Side: 4.00mm
STANDARDS AND CERTIFICATIONS	Certifications	CE, FCC, RoHS, UKCA	

ORDERING INFORMATION

Model Name	P/N	Processor	Memory	eMMC	Display	GbE	RS-232/422/485	USB 3.2 Gen2	USB 2.0	Power	Thermal	Temp.
TWLF51-BT-86N35	770-TWLF511-000G	Intel® Core™ 3 N355, 8C, 15W	8 GB	64 GB	Micro HDMI	1	1	2	2	12 VDC	Fanless	-5~65°C
TWLF51-BT-86N15	770-TWLF511-100G	Intel® N150, 4C, 6W										-5~65°C
TWLF51-ET-86X78	770-TWLF511-200G	Intel Atom® x7835RE, 8C, 12W										-20~70°C
TWLF51-ET-86X74	770-TWLF511-300G	Intel Atom® x7433RE, 4C, 9W										-20~70°C
TWLF51-ET-86X72	770-TWLF511-400G	Intel Atom® x7211RE, 2C, 6W										-20~70°C

PACKING LIST

• 1 TWLF51 board	
• 1 Cooler for (-20 to 70°C), (Height: 22mm)	A71-108317-000G
or 1 Heatsink for (-5 to 65°C), (Height: 29.36mm)	A71-008376-000G

OPTIONAL ITEMS

• USB 2.0 cable (Length: 200mm, 2 ports)	A81-001201-018G
• COM Port cable (Length: 250mm, 1 port)	A81-015130-018G
• DIO cable (Length: 200mm)	A81-009715-018G
• SMBus cable (Length: 200mm)	A81-009716-018G
• Power adapter (60W, 12V, DC jack)	671-106012-000G
• 2-pole terminal to DC Jack cable	A81-004013-000G
• Heat spreader (Height: 7.5mm)	A71-808378-000G