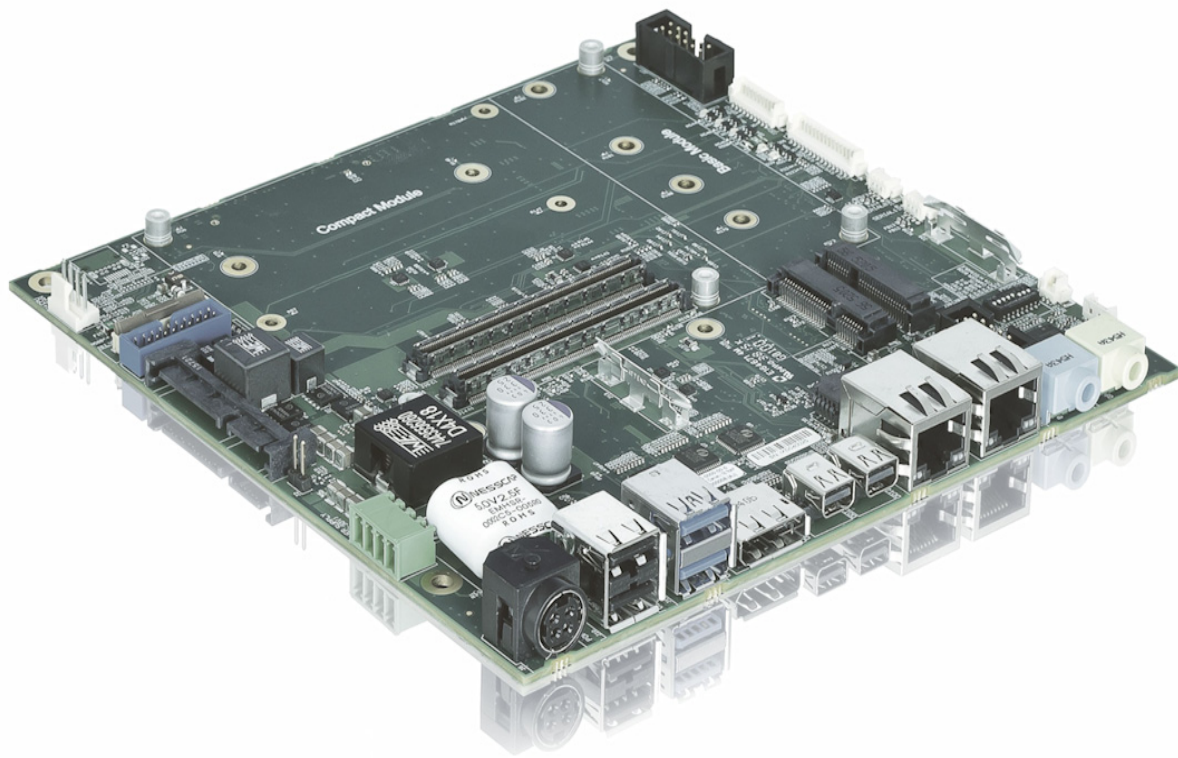


» User Guide «



COMe Ref. Carrier-i T6 TMI

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Date: April 15, 2019

Revision History

Revision	Brief Description of Changes	Date of Issue
1.0	Initial issue	24-Jun-2016
1.1	Update of table numbers Included 1.4 Accessories	05-Aug-2016
1.2	2.1.1 SPI Flash update 2.3.14 DIP Switch update of table 16, poition 6	23-Aug-2017
1.3	2.3.15 Added Power connector (J1) mating connector information	15-Apr-2019

Imprint

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Warranty

This Kontron product is warranted against defects in material and workmanship for the warranty period from the date of shipment. During the warranty period, Kontron will at its discretion decide to repair or replace defective products.

Within the warranty period, the repair of products is free of charge as long as warranty conditions are observed.

The warranty does not apply to defects resulting from improper or inadequate maintenance or handling by the buyer, unauthorized modification or misuse, operation outside of the product's environmental specifications or improper installation or maintenance.

Kontron will not be responsible for any defects or damages to other products not supplied by Kontron that are caused by a faulty Kontron product.

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This product has been manufactured to satisfy environmental protection requirements where possible. Many of the components used (structural parts, printed circuit boards, connectors, batteries, etc.) are capable of being recycled.

Final disposition of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.

1 Introduction

1.1 Carrier Overview

The COMe Reference Carrier-i Type 6 Thin-MiniITX (hereinafter referred to as COMe Ref. Carrier-i T6 TMI) is a COM Express® pinout Type 6, Thin-mITX form factor-compliant reference carrier designed to accommodate a basic/compact Type 6 COM Express® Computer-on-Module compliant with the PICMG COM.0 specification Rev 2.1.

The COMe Ref. Carrier-i T6 TMI comes in three variants:

- » COMe Reference Carrier-i Type 6 Thin-MiniITX Professional (COMe Ref. Carrier-i T6 TMIP),
- » COMe Reference Carrier-i Type 6 Thin-MiniITX Value (COMe Ref. Carrier-i T6 TMIV), and
- » COMe Reference Carrier-i Type 6 Thin-MiniITX Entry (COMe Ref. Carrier-i T6 TMIE).

The following table provides information about the features implemented on the COMe Ref. Carrier-i T6 TMI variants.

Table 1: COMe Ref. Carrier-i T6 TMI Variants

	COMe Ref. Carrier-i T6 TMIP (P/N 38115-0000-00-0)	COMe Ref. Carrier-i T6 TMIV (P/N 38115-0000-00-1)	COMe Ref. Carrier-i T6 TMIE (P/N 38115-0000-00-2)
SPI BIOS Socket	x	x	x
Carrier EEPROM	x	x	x
DDI1 - DP++	x	x	x
DDI2 - mDP++	x	x	--
DDI3 - mDP++	x	x	--
LVDS	x	x	x
mDP++ (eDP)	--	--	--
mPCIe0	x	x	x
mPCIe1 / mSATA	x	x	--
GBLan0 (Module)	x	x	x
GBLan1 (Carrier)	x	x	--
SATA0 (top)	x	x	x
SATA3 (bottom)	x	--	--
M.2	x	--	--
USB 2.0 / 3.0 I/O	x	x	x
USB 3.0 Pin Header	x	x	--
HDA Codec	x	x	--
Line-In/Out	x	x	--
FP Audio	x	x	--
S/PDIF	x	x	--
SERO/1	x	x	x
GPIO	x	x	x
SIM	x	x	--
Sys Signals	x	x	x
Sys Panel	x	x	x
CPU Fan	x	x	x

Table 1: COMe Ref. Carrier-i T6 TMI Variants (Continued)

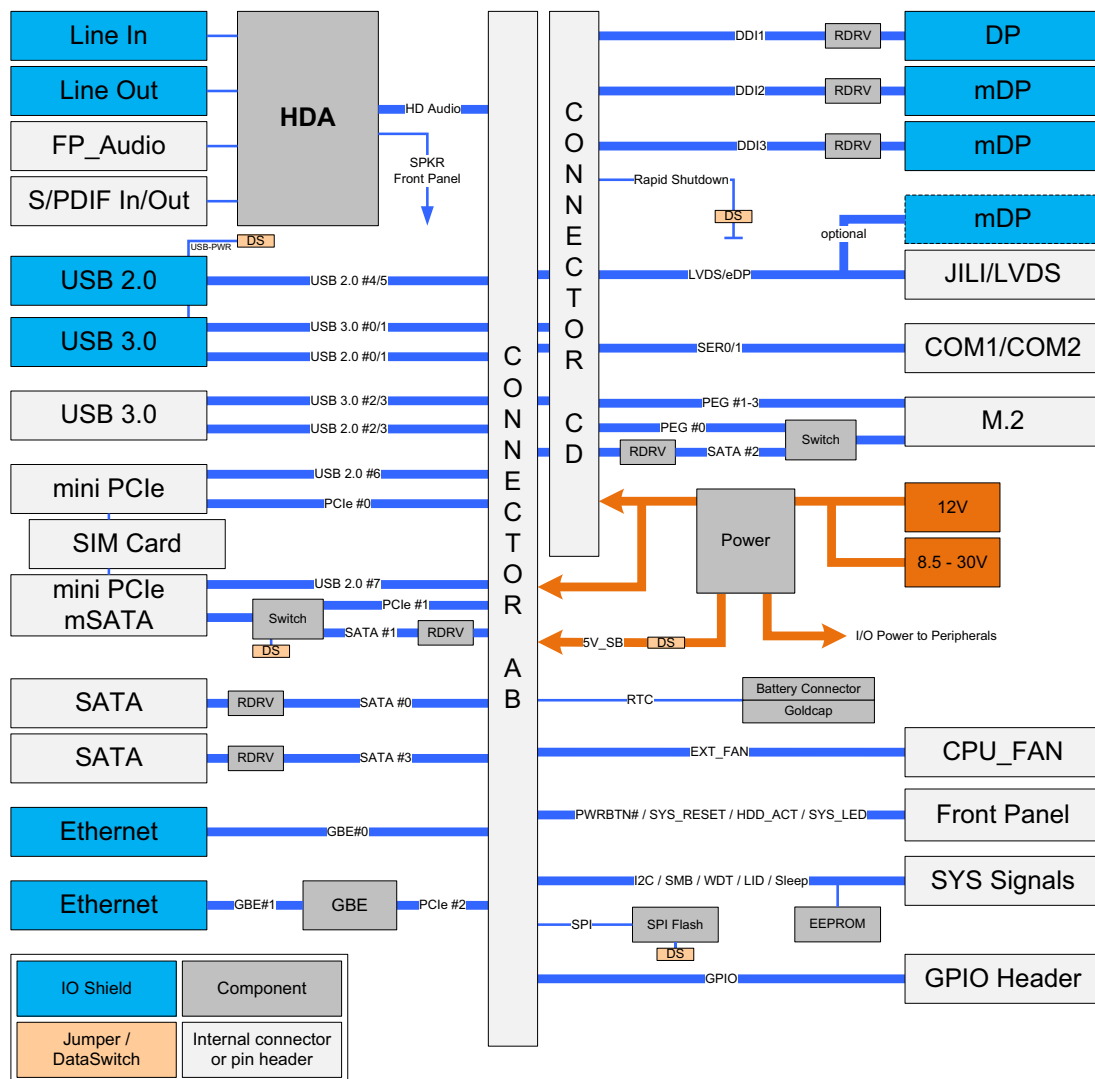
	COMe Ref. Carrier-i T6 TMIP (P/N 38115-0000-00-0)	COMe Ref. Carrier-i T6 TMIV (P/N 38115-0000-00-1)	COMe Ref. Carrier-i T6 TMIE (P/N 38115-0000-00-2)
RTC connector	X	X	X
Goldcap 1.5F	--	X	--
Goldcap 2.5F	X	--	--
12V Input	X	X	X
8.5 - 30V Input	X	--	--
Rubber Feet	X	--	--

1.2 Board Diagrams

The following diagrams provide additional information concerning board functionality and component layout.

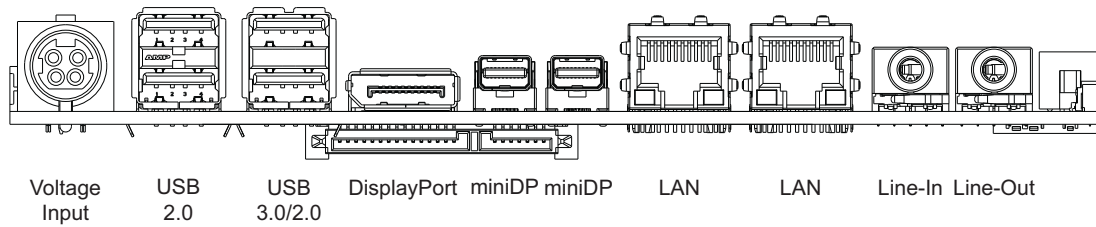
1.2.1 Functional Block Diagram

Figure 1: COMe Ref. Carrier-i T6 TMI Functional Block Diagram



1.2.2 Rear Panel

Figure 2: COMe Ref. Carrier-i T6 TMI Rear Panel



1.2.3 Board Layout

Figure 3: COMe Ref. Carrier-i T6 TMI Layout - Top View

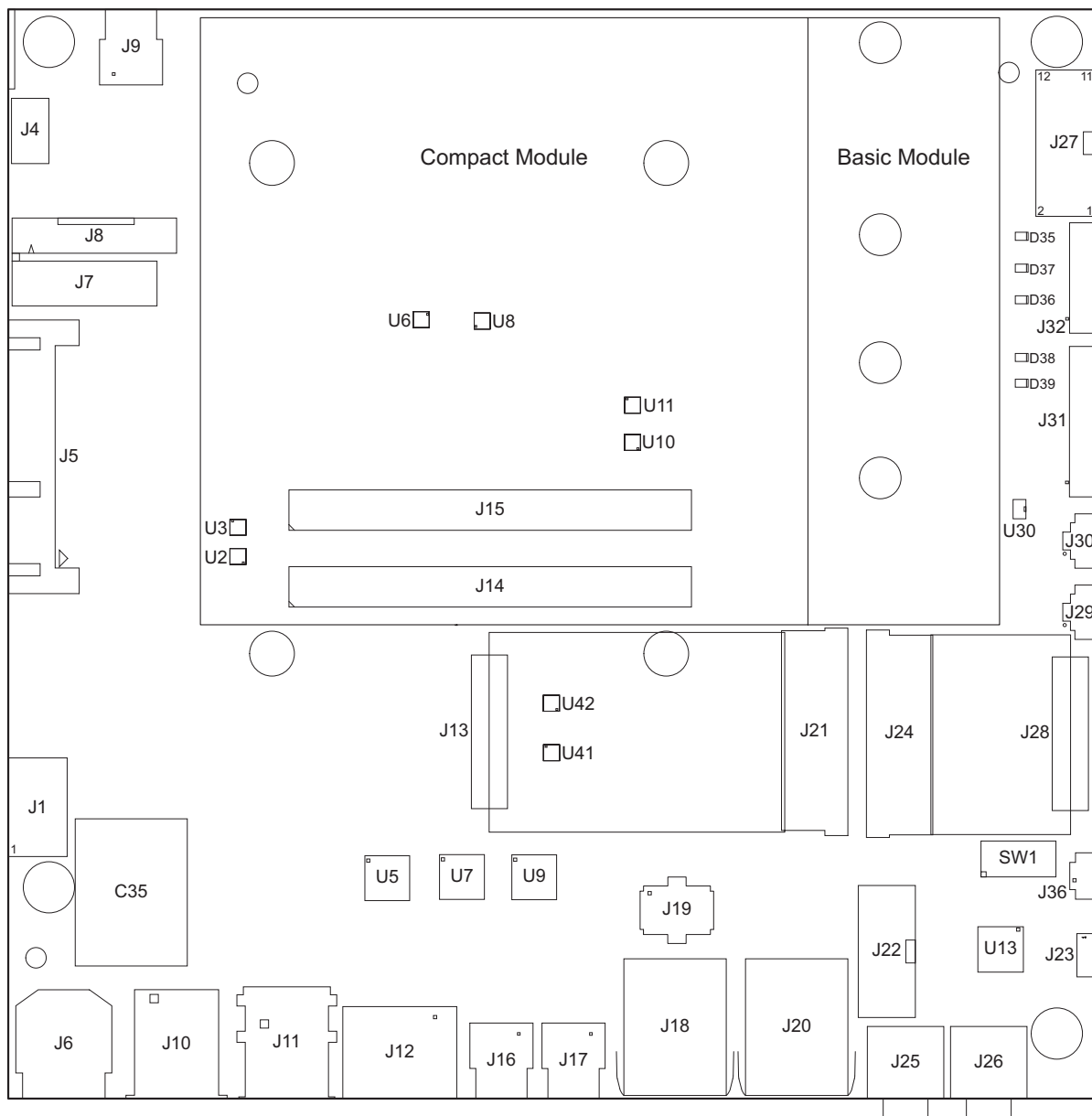
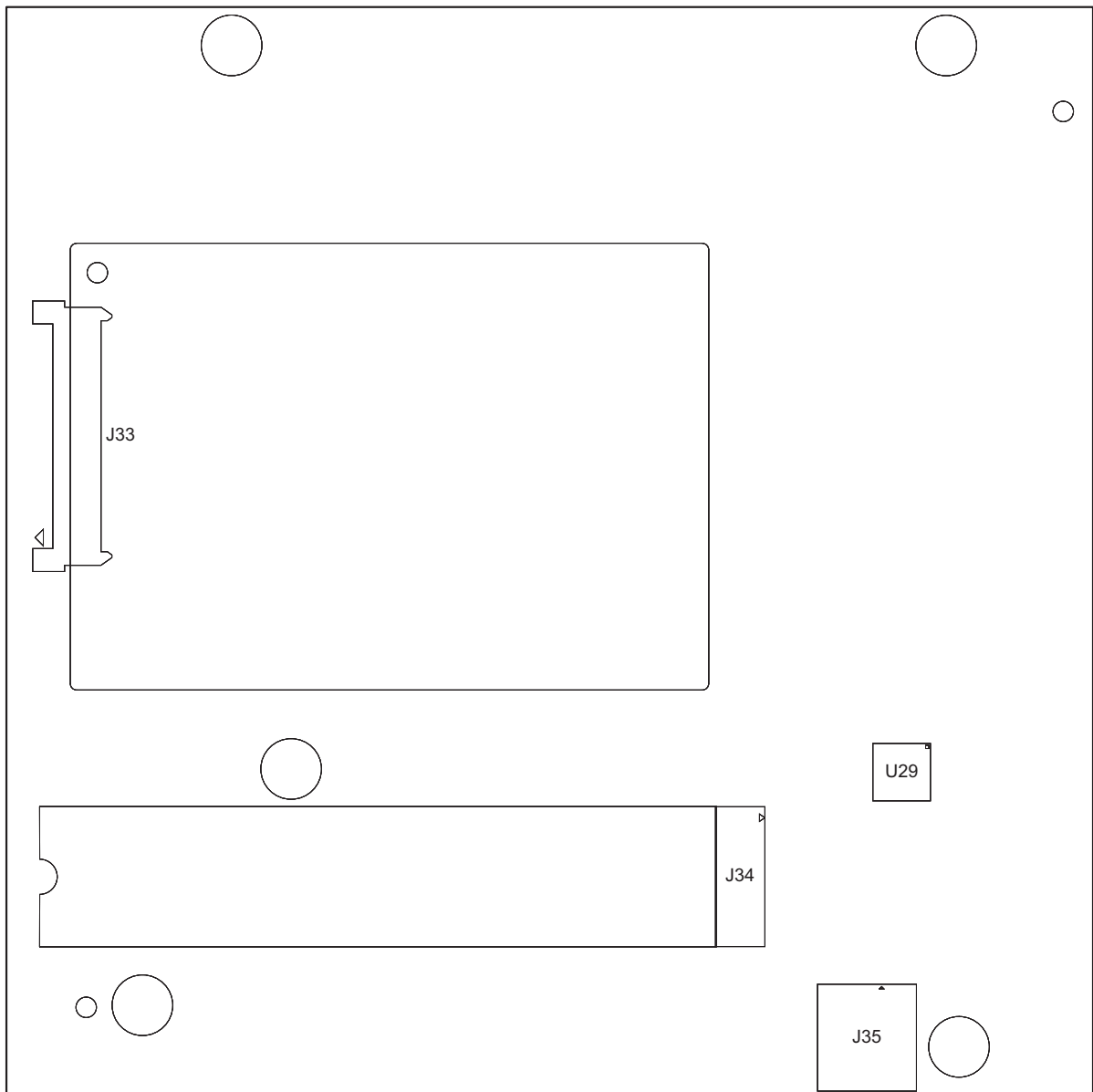


Figure 4: COMe Ref. Carrier-i T6 TMI Layout - Bottom View



1.2.3.1 Component Overview

Table 2: Component Overview

COMPONENT	DESCRIPTION
C35	Goldcap
D35	Status LED: SUS_S3
D36	Status LED: SUS_S4
D37	Status LED: SUS_S5
D38	Status LED: V12_S5
D39	Status LED: V5.0_V3.3_PG00D
J1	Power connector (8.5V – 30V input voltage)
J4	PWM fan connector
J5	SATA plug connector (with power connector)
J6	DC jack (12V only)
J7	USB 3.0/2.0 pin header
J8	LVDS / JILI connector
J9	Mini DisplayPort++ connector (eDP option)
J10	USB 2.0 double-stack connector
J11	USB 3.0/2.0 double-stack connector
J12	DisplayPort++ connector (DDI1)
J13	Mini PCIe card latch (full-size) / mSATA socket
J14	COMe connector (Row A and B)
J15	COMe connector (Row C and D)
J16	Mini DisplayPort++ connector (DDI3)
J17	Mini DisplayPort++ connector (DDI2)
J18	RJ45 Ethernet connector
J19	SPI BIOS socket
J20	RJ45 Ethernet connector
J21	Mini PCIe card slot (full-size) / mSATA socket
J22	Front panel HD audio header
J23	S/PDIF Header
J24	Mini PCIe card slot (half-size)
J25	Rear panel line-in connector
J26	Rear panel SPK / line-out connector
J27	Front panel connector
J28	Mini PCIe card latch (half-size)
J29	COM port pin header (COM2/SER1)
J30	COM port pin header (COM1/SER0)
J31	SYS_Signals / embedded interfaces pin header
J32	GPIO pin header
J33	SATA receptacle connector (with power connector)
J34	M.2 socket
J35	SIM card slot
J36	CMOS battery connector

Table 2: Component Overview (Continued)

COMPONENT	DESCRIPTION
SW1	DIP switch
U2	Redriver IC for SATA interfacing (SATA#0)
U3	Redriver IC for SATA interfacing (SATA#0)
U5	Redriver IC for DP interfacing (DDI1)
U6	Redriver IC for SATA interfacing (SATA#3)
U7	Redriver IC for DP interfacing (DDI3)
U8	Redriver IC for SATA interfacing (SATA#3)
U9	Redriver IC for DP interfacing (DDI2)
U10	Redriver IC for SATA interfacing (SATA#1)
U11	Redriver IC for SATA interfacing (SATA#1)
U13	HD Audio Codec IDT / Tempo Semi 92HD73C
U29	Intel® Ethernet Controller I210-IT
U30	Carrier EEPROM (FRUPROM)
U41	Redriver IC for SATA interfacing (SATA#2)
U42	Redriver IC for SATA interfacing (SATA#2)

1.3 Technical Specification

Table 3: COMe Ref. Carrier-i T6 TMI Main Specifications

FEATURES		SPECIFICATIONS
CPU	Processor & Chipset	Via COMe basic/compact Type 6 module
Memory	System Memory	Via COMe basic/compact Type 6 module
	Flash Memory	One SPI BIOS socket for SPI flash ICs with up to 16 MB flash memory
	EEPROM	EEPROM with 32 kbit on the carrier (FRUPROM)
Graphics Interfaces	Digital Display Interfaces	Three digital display interfaces (DDI): <ul style="list-style-type: none"> » DDI1: DisplayPort++ connector from COMe DDI1 with redriver IC, J12 » DDI2: Mini DisplayPort++ connector from COMe DDI2 with redriver IC, J17 » DDI3: Mini DisplayPort++ connector from COMe DDI3 with redriver IC, J16
	LVDS	LVDS / JILI connector (24-bit, dual-channel LVDS), J8
	Embedded DisplayPort	Mini DisplayPort++ connector via eDP (optional, instead of LVDS), J9
	PEG	Four PEG lanes (PEG#[0-3]) used for the M.2 interface
System Interfaces	PCI Express	Three PCIe interfaces: <ul style="list-style-type: none"> » PCIe#0 for Mini PCIe 2.0 half-size card slot connected to the SIM card slot, J24 » PCIe#1 for Mini PCIe 2.0 full-size card slot muxed with SATA#1 (mSATA) and connected to the SIM card slot, J21 » PCIe#2 for the onboard Gigabit Ethernet controller
	SATA	Four SATA 6 Gb/s interfaces: <ul style="list-style-type: none"> » SATA#0 via the 22-pin SATA plug connector (with redriver ICs), J5 » SATA#1 for the mSATA socket / Mini PCIe full-size card slot (with redriver ICs), J21 » SATA#2 muxed with PEG#0 for the M.2 interface (with redriver ICs) » SATA#3 via the 22-pin SATA receptacle connector (with redriver ICs), J33
	M.2	M.2 socket via PEG#[0-3] and SATA#2 (muxed with PEG#0), J34
	Ethernet	Two Gigabit Ethernet interfaces: <ul style="list-style-type: none"> » GbE#0 on RJ45 connector, J18, via COMe basic/compact Type 6 module » GbE#1 on RJ45 connector, J20, via the onboard GbE controller (Intel® Ethernet Controller I210-IT)
	USB 2.0	Eight USB 2.0 interfaces: <ul style="list-style-type: none"> » Two USB 2.0 interfaces (USB#[0;1]) for USB 3.0/2.0 double-stack connector, J11 » Two USB 2.0 interfaces (USB#[2;3]) for USB 3.0/2.0 pin header, J7 » Two USB 2.0 interfaces (USB#[4;5]) for USB 2.0 double-stack connector, J10 » One USB 2.0 interface (USB#6) for PCIe#0 (Mini PCIe half-size interface) » One USB 2.0 interface (USB#7) for PCIe#1 (Mini PCIe full-size/mSATA interface)
	USB 3.0	Four USB 3.0 interfaces: <ul style="list-style-type: none"> » Two USB 3.0 interfaces (USB_SS#[0;1]) for USB 3.0/2.0 double-stack connector, J11 » Two USB 3.0 interfaces (USB_SS#[2;3]) for USB 3.0/2.0 pin header, J7

Table 3: COMe Ref. Carrier-i T6 TMI Main Specifications (Continued)

	FEATURES	SPECIFICATIONS
System Interfaces	HD Audio	Four HD Audio interfaces: <ul style="list-style-type: none"> » Rear panel line-in connector, J25 » Rear panel SPK/line-out connector, J26 » Front panel HD audio header, J22 » S/PDIF header, J23
	UART	Two RS-232 COM ports (RX/TX only) via pin headers, J30 (COM1/SER0) and J29 (COM2/SER1)
System Interfaces	GPIO	Four GPIs and four GPOs via the 10-pin GPIO pin header, J32
	SIM	SIM card slot connected to both Mini PCIe interfaces, J35
	I ² C	I ² C interface via 15-pin SYS_Signals / embedded interfaces pin header, J31
	SMBus	SMBus interface via 15-pin SYS_Signals / embedded interfaces pin header, J31
	LID/SLEEP	LID/SLEEP signals via 15-pin SYS_Signals / embedded interfaces pin header, J31
	CPU Fan	One 4-pin PWM fan connector, J4
	LEDs	Two status LEDs available via the front panel connector, J27: <ul style="list-style-type: none"> » Power LED » HDD Activity LED
Switch	DIP Switch	One 8-position DIP switch, SW1, for board configuration
Power Supply and Management	Power Supply	Power input 1: 12V only Power input 2: 8.5V - 30V wide input range
	Power / Reset Button	Available via the front panel connector, J27
	RTC	2-pin connector for external CMOS battery, J36 Goldcap for RTC backup, C35
General	BIOS	Via COMe basic/compact Type 6 module
	Temperature Range	Operational: -40°C to +85°C Storage: -40°C to +85°C Note: When additional components are installed, refer to their operational specifications as this will influence the operational and storage temperature of the COMe Ref. Carrier-i T6 TMI.
	Climatic Humidity	93% RH at 40 °C, non-condensing (acc. to IEC 60068-2-78)
	Form Factor	COM Express® carrier, pinout Type 6, Thin-mITX form factor
	Dimensions	170 mm x 170 mm (mITX) Max. component height: Top side: 16.2 mm Bottom side: 5.4 mm

1.4 Accessories

The following accessories are available for the COMe Ref. Carrier-i T6 TMI.

Table 4: COMe Ref. Carrier-i T6 TMI Accessories

Part Number	Part Name	Description
96006-0000-00-2	COMe Post T6	NFCB POST Code / Debug card
38019-0000-00-0	ADA-COMe-Height-Dual	EERC height adapter
38017-0000-00-5	COMe Mount Kit 5 mm 1 set	Mounting Kit for 1 module including screws for 5 mm connectors
38017-0100-00-5	COMe Mount Kit 5 mm 100 sets	Mounting Kit for 100 modules including screws for 5 mm connectors
38017-0000-00-0	COMe Mount Kit 8 mm 1 set	Mounting Kit for 1 module including screws for 8 mm connectors
38017-0100-00-0	COMe Mount Kit 8 mm 100 sets	Mounting Kit for 100 modules including screws for 8 mm connectors
9-5000-0352	ADA-LVDS_DVI 18 bit	18 bit LVDS to DVI converter
9-5000-0353	ADA-LVDS_DVI 24 bit	24 bit LVDS to DVI converter
96006-0000-00-8	ADA-DP-LVDS	DP to LVDS adapter
96082-0000-00-0	KAB-ADAPT-DP-DVI	DP to DVI adapter cable
96083-0000-00-0	KAB-ADAPT-DP-VGA	DP to VGA adapter cable
96084-0000-00-0	KAB-ADAPT-DP-HDMI	DP to HDMI adapter cable

1.5 Standards

This product complies with the requirements of the following standards.

Table 5: Standards

TYPE	ASPECT	STANDARD	REMARKS
CE	Emission	EN61000-6-3, EN55022	--
	Electrical Safety	Directive 2014/35/EU	Low Voltage Directive (LVD)
		EN60950-1	--
	Product Safety	Directive 2001/95/EC	General Product Safety Directive
EMC	Directive 2014/30/EU	Electromagnetic Compatibility	
Environmental	Climatic Humidity	IEC60068-2-78 (see note below)	--
	WEEE	Directive 2002/96/EC	Waste electrical and electronic equipment
	RoHS 2	Directive 2011/65/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment
Environmental	Vibration (Sinusoidal)	IEC60068-2-6	Test parameters: 9-150 (Hz) frequency range 1 (g) acceleration 1 (oct/min) sweep rate 10 cycles/axis 3 axes
	Single Shock	IEC60068-2-27	Test parameters: 15 (g) acceleration 11 (ms) shock duration half sine 3 number of shocks per direction (total: 18) 6 directions 5 (s) recovery time

Note: Customers desiring to perform further environmental testing of the COMe Ref. Carrier-i T6 TMI must contact Kontron for assistance prior to performing any such testing.

Boards **without conformal coating** must not be exposed to a change of temperature which can lead to condensation, as it may cause irreversible damage especially when the board is powered up again.

Kontron does not accept any responsibility for damage to products resulting from destructive environmental testing.

1.6 Related Publications

The following publications contain information relating to this product.

Table 6: Related Publications

PRODUCT	PUBLICATION
COM Express®	COM Express® Carrier Design Guide Rev 2.0 COM Express® Module Base Specification Rev 2.1
SATA	Serial ATA Specification Revision 3.0
PCI Express	PCI Express Base Specification Rev 2.0 PCI Express M.2 Specification Rev 1.0
DisplayPort	Display Port 1.1a Standard Display Port 1.2 Standard
USB	Universal Serial Bus (USB) 2.0 Specification Rev 2.0 Universal Serial Bus (USB) 3.0 Specification Rev 1.0
I ² C	I2C Bus Specification Version 4.0
SMBus	SMBus Specification Version 2.0
ACPI	ACPI spec Rev 5.0

2 Functional Description

2.1 Memory

2.1.1 SPI Flash

The COMe Ref. Carrier-i T6 TMI provides one SPI BIOS socket, J19, for SPI flash ICs with up to 16 MB flash memory for use with an external Carrier BIOS. Recommended SPI flash ICs include Winbond W25Q64FVSSIG (8 MB) and W25Q128FVSIG (16 MB), depending on the COMe module used. Booting from the Carrier SPI flash can be enabled or disabled via the onboard DIP switch SW1.

2.1.2 Carrier EEPROM

The COMe Ref. Carrier-i T6 TMI comes with an onboard 32-kbit I²C EEPROM, U30, for storage of manufacturer records or COMe module information.

2.2 Graphics Interfaces

2.2.1 Digital Display Interfaces

The COMe Ref. Carrier-i T6 TMI provides the following digital display interfaces (DDIs):

- » DDI1 from the COMe module is directly mapped to the DisplayPort++ connector, J12, through a redriver IC, U5
- » DDI2 from the COMe module is directly mapped to the Mini DisplayPort++ connector, J17, through a redriver IC, U9
- » DDI3 from the COMe module is directly mapped to the Mini DisplayPort++ connector, J16, through a redriver IC, U7

Note: The Mini DisplayPort++ connectors J16 and J17 are available as a standard feature on the COMe Ref. Carrier-i T6 TMIV (Value) and the COMe Ref. Carrier-i T6 TMIP (Professional) versions.

2.2.2 LVDS/eDP Interface

The COMe Ref. Carrier-i T6 TMI supports a 24-bit, dual-channel LVDS interface via the LVDS/JILI connector, J8.

The following figure and table provide pinout information for the LVDS/JILI connector, J8.

Figure 5: LVDS/JILI Connector J8

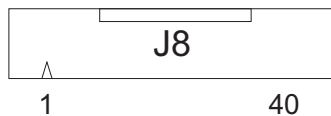


Table 7: LVDS/JILI Connector J8 Pinout

PIN	SIGNAL	PIN	SIGNAL
1	LVDS_BKLT_CTRL	21	LVDS_B1+
2	LVDS_A0-	22	GND
3	LVDS_A0+	23	LVDS_B2-
4	LVDS_VDD_EN	24	LVDS_B2+
5	LVDS_A1-	25	GND
6	LVDS_A1+	26	LVDS_B_CK-
7	NC	27	LVDS_B_CK+
8	LVDS_A2-	28	GND
9	LVDS_A2+	29	LVDS_B3-
10	GND	30	LVDS_B3+
11	LVDS_A_CK-	31	+5V
12	LVDS_A_CK+	32	+5V
13	GND	33	+5V
14	LVDS_A3-	34	+5V
15	LVDS_A3+	35	LVDS_BKLT_EN
16	LVDS_I2C_DAT	36	GND
17	LVDS_B0-	37	GND
18	LVDS_B0+	38	+12V
19	LVDS_IC2_CK	39	+12V
20	LVDS_B1-	40	+12V

If eDP support is required, the COMe Ref. Carrier-i T6 TMI may optionally be equipped with a Mini DisplayPort++ connector, J9, instead of the LVDS/JILI connector, J8.

Note: In order to use the eDP interface, the COMe module installed must also support eDP.

2.2.3 PEG Lanes

The COMe Ref. Carrier-i T6 TMI provides four PEG lanes (PEG#[0-3]) used for the M.2 socket, J34. PEG#0 is muxed with SATA#2.

2.3 System Interfaces

2.3.1 PCI Express Interfaces

The COMe Ref. Carrier-i T6 TMI provides three general-purpose PCI Express (PCIe) lanes:

- » PCIe#0 for the Mini PCIe half-size card slot, J24, connected to the SIM card socket, J35
- » PCIe#1 for Mini PCIe full-size card slot, J21, muxed with SATA#1 (mSATA), connected to the SIM card socket, J35. Mini PCIe may be enabled via the onboard DIP switch SW1.
- » PCIe#2 for onboard Gigabit Ethernet Controller, U29

Note: The MiniPCIe full-size card slot, J21, is available as a standard feature on the COMe Ref. Carrier-i T6 TMIV (Value) and the COMe Ref. Carrier-i T6 TMIP (Professional) versions.

2.3.2 SATA Interfaces

The COMe Ref. Carrier-i T6 TMI supports up to four SATA 6 Gb/s interfaces:

- » SATA#0 via the 22-pin SATA plug connector, J5, through the redriver ICs, U2 and U3
- » SATA#1 for the mSATA socket / Mini PCIe full-size card slot, J21, through the redriver ICs, U10 and U11, muxed with PCIe#1 (Mini PCIe). mSATA may be enabled via the onboard DIP switch, SW1.
- » SATA#2 through the redriver ICs, U41 and U42, muxed with PEG#0 for the M.2 interface, J34
- » SATA#3 via the 22-pin SATA receptacle connector, J33, through the redriver ICs, U6 and U8, for the SATA 2.5" HDD mounting.

Note: The mSATA socket, J21, is available as a standard feature on the COMe Ref. Carrier-i T6 TMIV (Value) and the COMe Ref. Carrier-i T6 TMIP (Professional) versions.

Note: The SATA receptacle, J33, is available as a standard feature on the COMe Ref. Carrier-i T6 TMIP (Professional) version only.

2.3.3 M.2 Interface

The COMe Ref. Carrier-i T6 TMI provides an M.2 socket, J34, via PEG#[0-3] and SATA#2 (muxed with PEG#0), which supports 3M key pinning and 2242, 2260 and 2280 M.2 modules.

Note: The M.2 socket, J34, is available as a standard feature on the COMe Ref. Carrier-i T6 TMIP (Professional) version only.

2.3.4 Gigabit Ethernet Interfaces

The COMe Ref. Carrier-i T6 TMI provides up to two Gigabit Ethernet interfaces via two single RJ45 connectors:

- » GBE#0 on RJ45 Ethernet connector, J18, directly via the COMe basic / compact Type 6 module
- » GBE#1 on RJ45 Ethernet connector, J20, via the onboard Intel® Ethernet Controller I210-IT, U29 (on PCIe#2)

The Ethernet connector LEDs have the following states:

LINK (green):	Ethernet Link
ACT (green):	1000BASE-T Ethernet Speed
ACT (yellow):	100BASE-TX Ethernet Speed
ACT (off) + LINK (on):	10BASE-T Ethernet Speed

Note: The RJ45 Ethernet connector, J20, and the Intel® Ethernet Controller I210-IT, U29, are available as a standard feature on the COMe Ref. Carrier-i T6 TMIV (Value) and the COMe Ref. Carrier-i T6 TMIP (Professional) versions.

2.3.5 USB 2.0 Interfaces

The COMe Ref. Carrier-i T6 TMI supports eight high-speed USB 2.0 interfaces used as host:

- » USB#[0;1] are used for USB 3.0/2.0 double-stack connector, J11. 5V standby power for wake events may be enabled and disabled via the onboard DIP switch, SW1.
- » USB#[2;3] are used for USB 3.0/2.0 pin header, J7
- » USB#[4;5] are routed to the USB 2.0 double-stack connector, J10. 5V Standby Power for wake events may be enabled or disabled via the onboard DIP switch, SW1.
- » USB#6 is used for the Mini PCIe half-size interface to enable usage of USB 2.0 high-speed Mini PCIe form factor devices.
- » USB#7 is used for the Mini PCIe full-size / mSATA interface to enable usage of USB 2.0 high-speed Mini PCIe form factor devices.

2.3.6 USB 3.0 Interfaces

The COMe Ref. Carrier-i T6 TMI supports four super-speed USB 3.0 interfaces used as host:

- » USB_SS#[0;1] are routed to the USB 3.0/2.0 double-stack connector, J11.
- » USB_SS#[2;3] are routed to the 20-pin USB 3.0/2.0 pin header, J7.

The following figure and table provide pinout information for the USB 3.0/2.0 pin header, J7.

Figure 6: USB 3.0/2.0 Pin Header J7

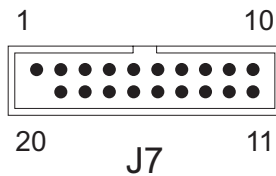


Table 8: Pinout of USB 3.0/2.0 Pin Header J7

PIN	SIGNAL	PIN	SIGNAL
1	Power	20	--
2	SSRX2-	19	Power
3	SSRX2+	18	SSRX3-
4	GND	17	SSRX3+
5	SSTX2-	16	GND
6	SSTX2+	15	SSTX3-
7	GND	14	SSTX3+
8	USB2-	13	GND
9	USB2+	12	USB3-
10	NC	11	USB3+

Note: The USB 3.0/2.0 pin header, J7, is available as a standard feature on the COMe Ref. Carrier-i T6 TMIV (Value) and the COMe Ref. Carrier-i T6 TMIP (Professional) versions.

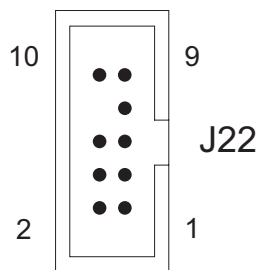
2.3.7 HD Audio Interfaces

The COMe Ref. Carrier-i T6 TMI provides HD Audio via the industrial grade HD Audio Codec IDT / Tempo Semi 92HD73C (U13) through the following analog and digital audio connectors:

- » Rear panel line-in connector, J25
- » Rear panel SPK / line-out connector, J26
- » Front panel HD audio header, J22
- » S/PDIF header, J23

The following figure and table provide pinout information for the front panel HD audio header, J22.

Figure 7: Front Panel HD Audio Header J22 **Table 9: Front Panel HD Audio Header J22 Pinout**



PIN	SIGNAL	PIN	SIGNAL
10	LINE2_JD	9	LINE2_L
8	-	7	SENSE
6	MIC2_JD	5	LINE2_R
4	PRESENCE#	3	MIC2_R
2	GND	1	MIC2_L

The following figure and table provide pinout information for the S/PDIF header, J23.

Figure 8: S/PDIF Header J23



Table 10: S/PDIF Header J23 Pinout

PIN	SIGNAL
1	SPDIF_OUT
2	GND
3	SPDIF_IN
4	GND

Note: The HD Audio Codec including all of its functions is available as a standard feature on the COMe Ref. Carrier-i T6 TMIV (Value) and the COMe Ref. Carrier-i T6 TMIP (Professional) versions.

2.3.8 UART Interfaces

The COMe Ref. Carrier-i T6 TMI provides two RS232 COM ports (RX/TX only) via the pin headers J30 (COM1/SER0) and J29 (COM2/SER1).

The following figure and table provide pinout information for the pin headers J30 (COM1/SER0) and J29 (COM2/SER1).

Figure 9: Pin Headers J30 and J29

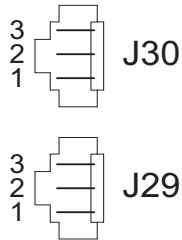


Table 11: Pinout of Pin Headers J30 and J29

PIN	SIGNAL ON J30	SIGNAL ON J29
3	GND	GND
2	SER0_RX	SER1_RX
1	SER0_TX	SER1_TX

2.3.9 GPIO Interfaces

The COMe Ref. Carrier-i T6 TMI provides four GPIs and four GPOs via a 10-pin GPIO pin header, J32.

The following figure and table provide pinout information for the GPIO pin header J32.

Figure 10: GPIO Pin Header J32

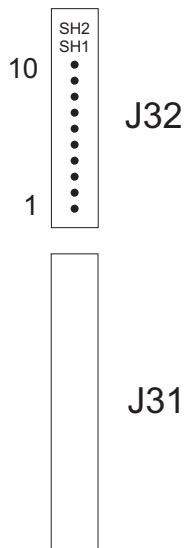


Table 12: GPIO Pin Header J32

PIN	SIGNAL
10	GND
9	GPO3
8	GPO2
7	GPO1
6	GPO0
5	GPI3
4	GPI2
3	GPI1
2	GPI0
1	VCC 3.3V

2.3.10 SIM Interface

The COMe Ref. Carrier-i T6 TMI provides a SIM card socket, J35, connected to both Mini PCIe interfaces, PCIe#0 and PCIe#1, to support radio-based services on Mini PCIe.

Note: The SIM card socket is available as a standard feature on the COMe Ref. Carrier-i T6 TMIV (Value) and the COMe Ref. Carrier-i T6 TMIP (Professional) versions.

2.3.11 SYS_Signals / Embedded Interfaces

On the COMe Ref. Carrier-i T6 TMI, a pin header for various SYS_Signals / embedded interfaces, J31, is available and provides access to the following I/Os:

- » I2C
- » SMBus
- » Watchdog
- » LID
- » SLEEP

The following figure and table provide pinout information for the pin header J31.

Figure 11: Pin Header J31

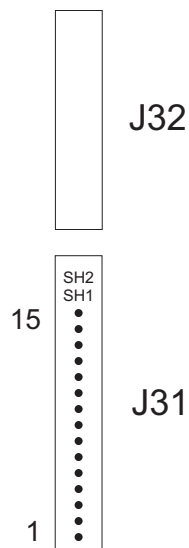


Table 13: Pin Header J31

PIN	SIGNAL
15	GND
14	GND
13	GND
12	RAPID_SHDWN_IN
11	THRM#
10	LPC_SERIRQ
9	SLEEP#
8	LID#
7	WAKE1#
6	WDT
5	SMB_ALERT#
4	SMB_DAT
3	SMB_CK
2	I2C_DAT
1	I2C_CK

2.3.12 CPU Fan Interface

The COMe Ref. Carrier-i T6 TMI provides a 4-pin PWM fan connector, J4, directly controlled by the module fan output.

The following figure and table provide pinout information for the PWM fan connector J4.

Figure 12: PWM Fan Connector J4

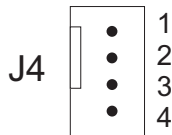


Table 14: PWM Fan Connector J4

PIN	SIGNAL
1	GND
2	12V
3	SENSE
4	PWM Control

2.3.13 Front Panel Interface

The COMe Ref. Carrier-i T6 TMI provides a front panel connector, J27, with access to the following signals:

- » HDD activity LED
- » Power LED
- » Power button
- » Reset button
- » Speaker -out (Beep)

The following figure and table provide pinout information for the front panel connector J27.

Figure 13: Front Panel Connector J27

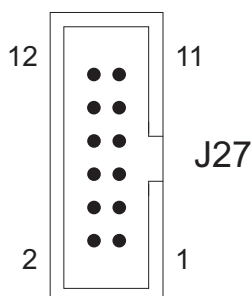


Table 15: Front Panel Connector J27 Pinout

PIN	SIGNAL	PIN	SIGNAL
12	BEEP#	11	GND
10	GND	9	SYS_RESET#
8	GND	7	GND
6	BEEP+	5	PWRBTN#
4	GND	3	ATA_ACT#
2	Power_LED+	1	HDD_LED+

2.3.14 DIP Switch

The COMe Ref. Carrier-i T6 TMI provides one 8-position DIP switch, SW1, for board configuration.

Figure 14: DIP Switch SW1

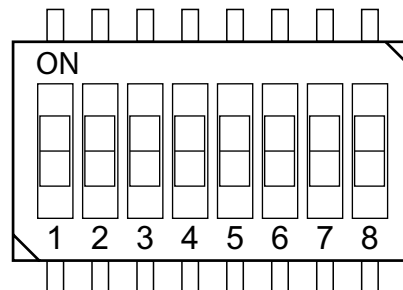


Table 16: DIP Switch SW1 Functionality

POSITION	SETTING	FUNCTIONALITY
1	ON	Disable rapid shutdown support for Kontron RXT modules
	OFF	Enable rapid shutdown support for Kontron RXT modules
2	ON	Enable 5V standby power supply on COMe module for ATX function (S-States)
	OFF	Disable 5V standby power supply on COMe module for ATX function (S-States)
3	ON	Enable 5V standby power to USB ports USB#[4;5] for wake events
	OFF	Disable 5V standby power to USB ports USB#[4;5] for wake events
4	ON	Enable 5V standby power to USB ports USB#[0;1] for wake events
	OFF	Disable 5V standby power to USB ports USB#[0;1] for wake events
5	ON	Enable mSATA on full-size Mini PCIe / mSATA interface
	OFF	Disable mSATA on full-size MiniPCIe / mSATA interface
6	ON	Enable booting from COMe module SPI Flash
	OFF	Disable booting from COMe module SPI Flash-Carrier BIOS enabled
7	ON	Wireless disable for Mini PCIe
	OFF	Wireless enable for Mini PCIe
8	ON	Reserved
	OFF	

The default setting is indicated by using italic bold.

2.3.15 Power Supply and Management

The COMe Ref. Carrier-i T6 TMI supports fixed input voltage (12V only) as a standard feature via the DC jack, J6.

Note: The COMe Ref. Carrier-i T6 TMIP (Professional) version also supports a wide input voltage range (8.5V - 30V) by default via a wired power connector, J1. The COMe Ref. Carrier-i T6 TMIP can be powered up either through the J1 or the J6 connector.

Warning: Powering up the COMe Ref. Carrier-i T6 TMIP through power both connectors (J1 and J6) at the same time may result in damage to the power supply unit/power adapter.

The following 12V power supply unit is recommended for use with the COMe Ref. Carrier-i T6 TMI:

- » DELTA ELECTRONICS. MDS-150AAS12B

The following figure and table provide pinout information for the wired power connector, J1.

Figure 15: Power Connector J1

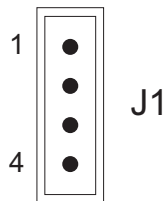


Table 17: Power Connector J1 Pinout

PIN	SIGNAL
1	V_IN
2	V_IN
3	GND
4	GND

Note: The rapid shutdown feature is only available on the COMe Ref. Carrier-i T6 TMIV (Value) and the COMe Ref. Carrier-i T6 TMIE (Entry) versions if rapid shutdown is supported by the COMe module used and enabled via the onboard DIP switch, SW1.

The following mating power connectors are recommended for use with the COMe Ref. Carrier-i T6 TMI:

- » Würth Electronics, Part Numbers: 691361100004 / 691363110004
- » TE Connectivity AMP Connectors, Part Numbers: 284506-4 / 1986692-4 / 1986693-4

2.3.16 RTC

The COMe Ref. Carrier-i T6 TMI provides a 2-pin connector, J36, for an external CMOS battery. In addition, the following versions provide a goldcap, C35, for RTC backup:

- » COMe Ref. Carrier-i T6 TMIP (Professional): 2.5F goldcap
- » COMe Ref. Carrier-i T6 TMIV (Value): 1.5F goldcap

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