

OMNIMATE Data - RJ45 jacks transformer RJ45M R12D 3.2N4G/Y RL

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RJ45 transmitter sockets (magnetics) for gigabit applications (1000 base-T) with integrated compensation actively counteracts inductive and capacitive couplings and saves space on the PCB.

The product range encompasses the following designs:

- 90°, lying (horizontal) and 180°, standing (vertical)
- latch up / latch down
- THT, THR or SMD soldering processes
- Wide range of different design types, also with integrated LEDs and shield contact tabs
- Transmission rates of up to 1 Gbps
- Packed either in a tray (TY) or on a roll (tape-on-reel, RL)
- Compatible with modular RJ45 connector according to ANSI / TIA-1096-A and IEC 60603
- Dielectric strength ≥ 1500 V AC RMS (2250 V AC peak value) according to IEEE 802.3
- Dielectric strength ≥ 1500 V AC (peak value) or ≥ 1500 V DC according to IEC 60603
- Compliance with IEEE 802.3 requirements (1000Base-T, 1 Gbps, IEEE 802.3ab or 100Base-Tx, 100 Mbps, IEEE 802.3u)

Properties and advantages:

- Extended temperature range of -40 °C to $+85$ °C for maximum performance
- Reinforced gold layer (30 μ m) for improved corrosion protection

- At least 3 mm stand-off ensures a perfect soldering result

General ordering data

Type	RJ45M R12D 3.2N4G/Y RL
Order No.	2551900000
Version	PCB plug-in connector, RJ45 jacks transformer, 10/100 MBit/s, THT/THR solder connection, 90°, Latch option: bottom, Shield tabs: none, 30-80 μ m Ni / 30- μ m Au, LED: Yes, green, yellow, No. of poles: 8, Tape
GTIN (EAN)	4050118562187
Qty.	200 pc(s).
Packaging	Tape

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Technical data**Dimensions and weights**

Width	31.2 mm	Width (inches)	1.228 inch
Height	16.7 mm	Height (inches)	0.657 inch
Height of lowest version	13.5 mm	Depth	21.35 mm
Depth (inches)	0.841 inch	Net weight	7.07 g

Temperatures

Operating temperature, max.	85 °C	Operating temperature, min.	-40 °C
Storage temperature, max.	85 °C	Storage temperature, min.	-40 °C

Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
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System specifications

Colour of left LED	green	Colour of right LED	yellow
LED	Yes	Latch option	bottom
Mounting onto the PCB	THT/THR solder connection	No. of poles	8
Number of solder pins per pole	1	Outgoing elbow	90°
Pitch in inches (P)	0.05 inch	Pitch in mm (P)	1.27 mm
Plugging cycles	750	Product family	OMNIMATE Data - RJ45 jacks transformer
Protection degree	IP20	Shield surface	nickel-plated
Shield tabs	none	Shielding	Yes
Shielding material	Brass	Solder eyelet hole diameter (D)	0.9 mm
Solder eyelet hole diameter tolerance (D)± 0.1 mm		Transmission rate	10/100 MBit/s
Type of connection	Socket connector		

Electrical properties

Dielectric strength, contact / contact	≥ 1000 V DC	Dielectric strength, contact / shield	1500 V DC
Insulation strength	> 500 MΩ	Rated current	1.5 A
Rated voltage	125 V AC		

Material data

Insulating material	PA 9T	Colour	black
Colour chart (similar)	RAL 9011	Insulating material group	II
CTI	≥ 500	Insulation strength	> 500 MΩ
Moisture Level (MSL)	1	UL 94 flammability rating	V-0
Contact base material	Phosphorus bronze	Contact surface	Gold over nickel
Layer structure of plug contact	30-80 μ" Ni / 30- μ" Au	Storage temperature, min.	-40 °C
Storage temperature, max.	85 °C	Operating temperature, min.	-40 °C
Operating temperature, max.	85 °C		

Packing

Packaging	Tape	VPE length	0 m
VPE width	0 m	VPE height	0 m
Tape reel diameter Ø (A)	330 mm	Surface resistance	Rs = 10 ⁹ - 10 ¹² Ω

Data sheet

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Classifications

ETIM 6.0	EC002637	eClass 6.2	27-25-05-04
eClass 9.0	27-44-04-02	eClass 9.1	27-44-04-02

Approvals

Approvals



ROHS Conform

Downloads

Engineering Data [STEP](#)

Data sheet

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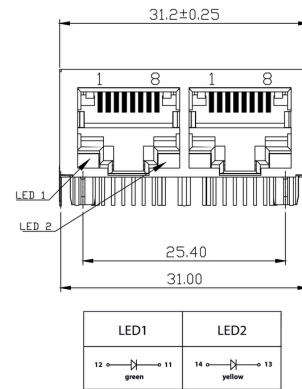
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Drawings

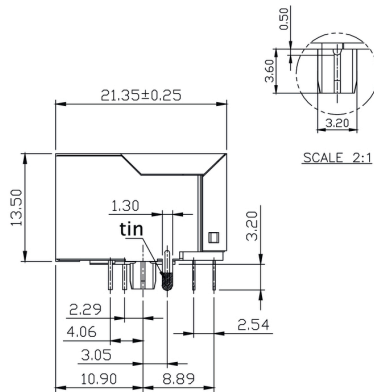
Dimensioned drawing



Dimensioned drawing



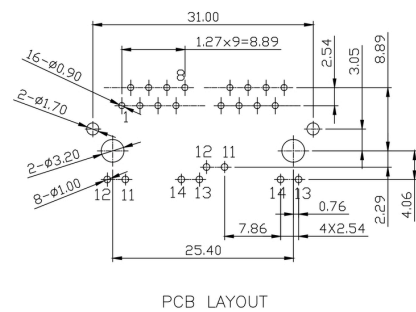
Dimensioned drawing



Dimensioned drawing

Wiring diagram

PCB design



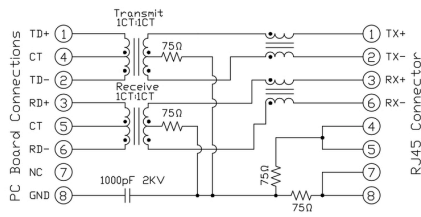
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Drawings

Wiring diagram



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Drawings

Schematic

Characteristics

Inductance	350 µH min. @ 100 kHz, 100 mV, 8 mA DC Bias
Leakage Inductance	0.3 µH max. @ 100 kHz, 100 mV
Insertion Loss	1.1 dB max. @ (1 - 100) MHz
Return Loss	18 dB min. @ (1 - 30) MHz 16 dB min. @ (30 - 60) MHz 12 dB min. @ (60 - 80) MHz
Cross Talk	30 dB min. @ (1 - 100) MHz
Common Mode Rejection	30 dB min. @ (1 - 100) MHz

Type codes

Type Code	Parameter	Value	Description
RJ45	Product	RJ45	Product
G1	Performance Category	G1	Category 1
R	Assembly on PCB	R	Through Hole Reflow - THR
U	Direction, latch style	U	Horizontal (90°, side entry), latch up
3.2	Solder Pin length	3.2	3.2 mm
E	EMI tabs (ground fingers)	E	E = with EMI tabs
4	Contact surface thickness	4	1 = 3µ", 2 = 6µ", 3 = 15µ", 4 = 30µ", 5 = 50µ"
GY/GY	LED	GY/GY	Green-Yellow/Green-Yellow
TY	Packaging	TY	Tray in box (manual assembly)
		RL	Tape on Reel (automated assembly)
		Y/G	Yellow/Green
		G/Y	Green/Yellow (standard)
		GY/GY	Green-Yellow/Green-Yellow
		O/G	Orange/Green
		R/O	Red/Orange
	 (further combinations possible)
		N	without LED
		N	without EMI tabs
		D	SMD
		S	Surface Mount Technology - SMT
		T	Through Hole Technology - THT
		MP	10/100 Mbit with POE
		MP+	10/100 Mbit with POE+

Recommended wave soldering profiles

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Single Wave:



Double Wave:



Wave soldering profiles

Wired connection elements should be processed in accordance with the DIN EN 61760-1 standard. We have included two recommendations for practical wave soldering profiles, with which Weidmüller PCB terminals and connectors are qualified.

When choosing a suitable profile for your application, the following factors also need to be considered:

- PCB thickness
- Proportion of Cu in the layers
- Single/double-sided assembly
- Product range
- Heating and cooling rates

The single and double wave profiles each indicate the recommended operating range, including the maximum soldering temperature of 260°C. In practice, the maximum soldering temperature is quite often well below the above maximum profile.

Recommended reflow soldering profile

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Reflow soldering profile

The perfect soldering profile for SMT Surface Mount Technology is one the most exiting question in SMT production. But there are more than one correct answer: The diagram of temperature-on-time is related to processing features of solder paste and to maximum load of components.

We have to consider the following parameters:

- Time for pre heating
- Maximum temperature
- Time above melting point
- Time for cooling
- Maximum heating rate
- Maximum cooling rate

We recommend a typical solder profile with associated process limits. With preheating components and board are prepared smoothly for the solder phase. Heating rate is typically $\leq +3\text{K/s}$. In parallel the solder paste is ‚activated‘. The time above melting point of 217°C the paste gets liquid and components and boards begin to connect. The maximum temperature of 245°C to 254°C should stay between 10 and 40 seconds. In the cooling phase at $\geq -6\text{K/s}$ solder is cured. Board and components cool down while avoiding cold cracks.