



# M12 X-coded 10G transformer receptacles



## GENERAL INFORMATION

No. of contacts	8 poles
Contact resistance	< 5 mOhm
Working temperature range	-40°C - +85°C
Termination technology	SMT
Reflow processing temperature	245°C Max.
Total insertion force	30N Max. according to IEC 61076-2-109
Total withdrawal force	30N Max. according to IEC 61076-2-109
Mating cycles	100 mating cycles, according to IEC 61076-2-109
Shock and vibration proof	according to IEC 61076-2-109
RoHS - compliant	Yes
Lead free	Yes
PSL level acc. ECA/IPC/JEDEC J-STD-075	R7

## INSULATION MATERIAL

Material	LCP (liquid crystalline polymer)
Color	Black
UL classification	UL94-V0
Material group acc. IEC 60664-1	IIIa (175 ≤ CTI < 400)

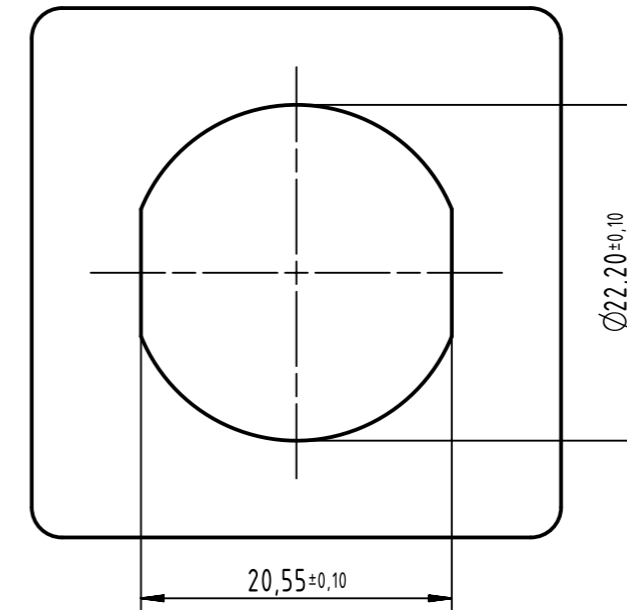
## CONTACT MATERIAL

Contact material	Copper alloy
Plating termination zone	Tin
Plating contact sliding side	Gold

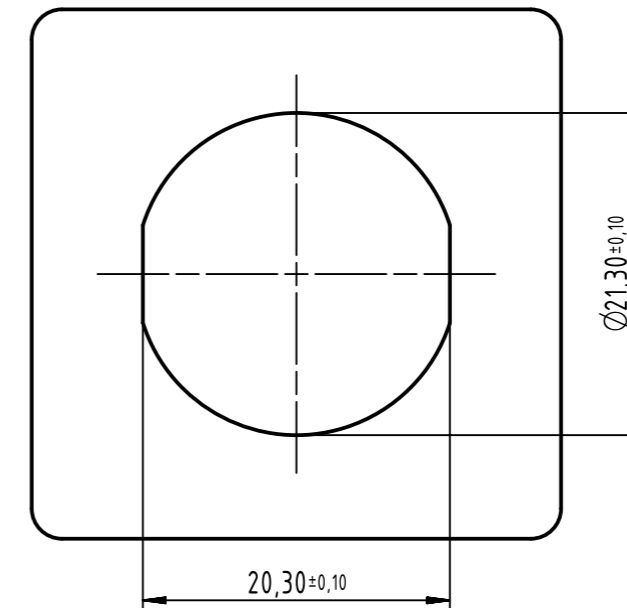
## SHIELDING MATERIAL

Shielding material	Copper alloy
Plating	Tin

## Recommended Panel cut out



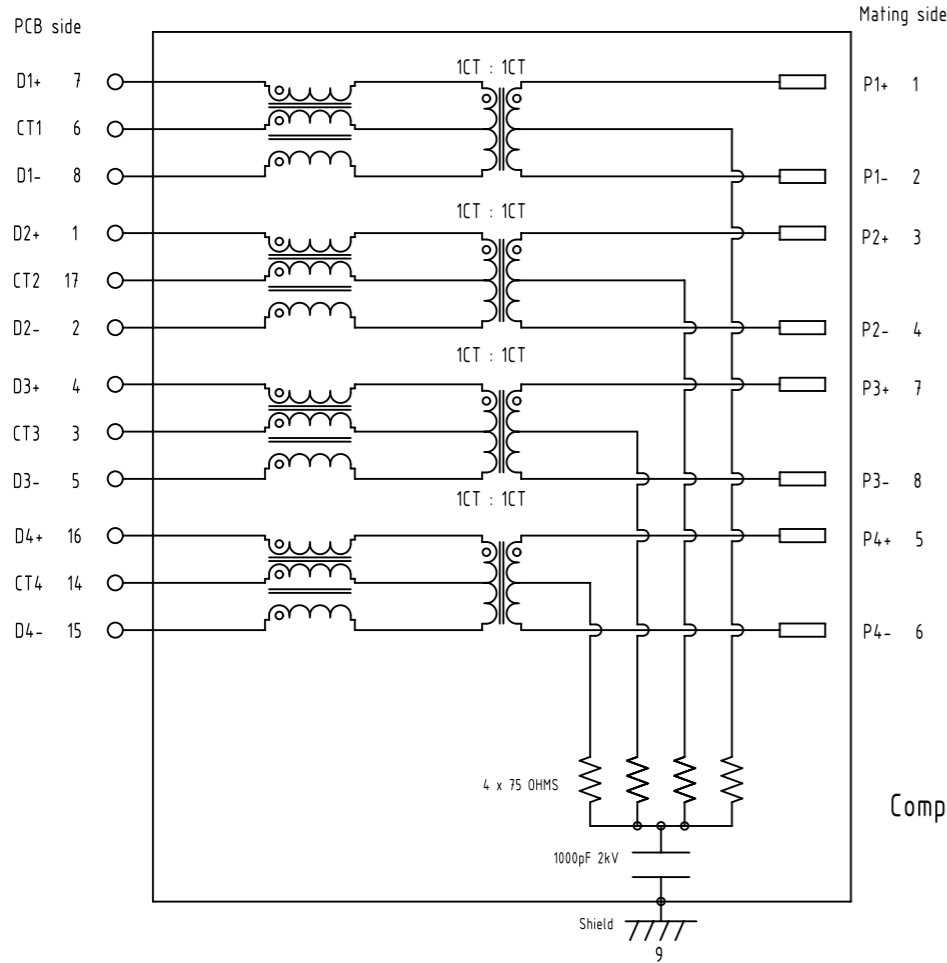
Front mounting use  
Detail see drawing 21033012006



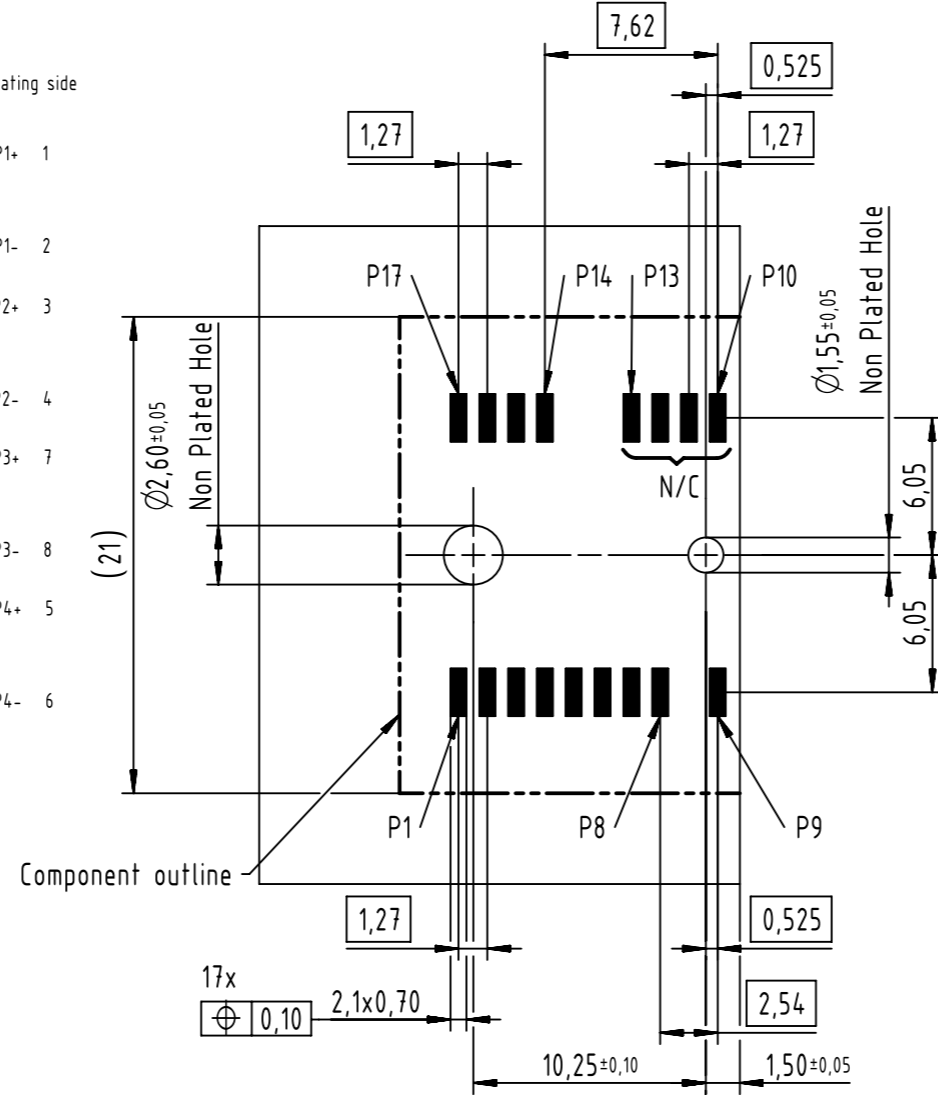
Rear mounting use  
Detail see drawing 21033012007

	All Dimensions in mm Original Size DIN A3	Scale 1:1	Free size tol.	Ref.
				Sub.
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	Department EL PD	Date 2021-03-15		State Final Release
HARTING D-32339 Espelkamp		Title M12 transformer receptacles X-coded 10G angled, SMT		Doc-Key / ECM-Nr. 100723745/UGD/001/E 500000191093
		Type DS	Number 21033810203	Rev. E Page 1/4

## Schematic



## Recommended PCB layout



Electrical Characteristics @+25°C unless otherwise noted  
Meets IEEE802.3 specification  
RoHS compliant

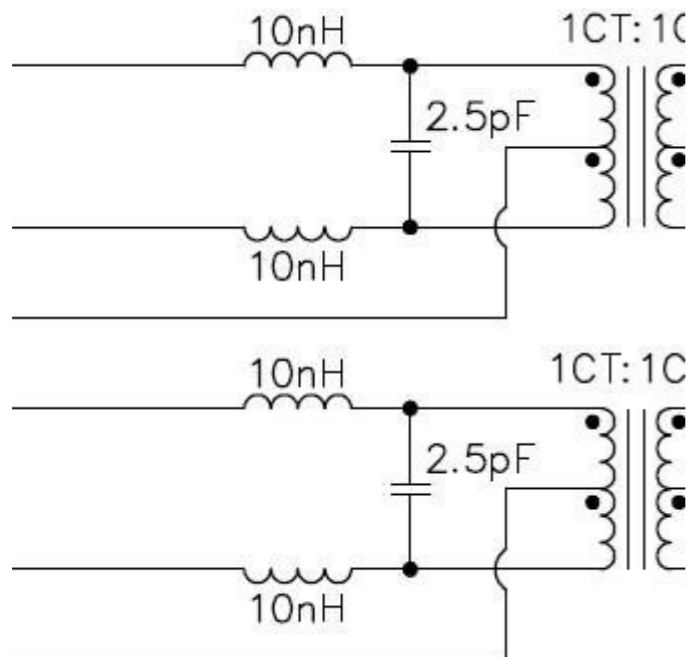
Parameter	Specification/ Limit Values
Operating Temperature	40°C - +85°C
Turn Ratio (+/- 2%)	1CT : 1CT
Current Capacity Pins 1-8 / VC1-VC4	750mA
OCL	min 120µH @ 100KHz , 100mV with 18mA bias current
Isolation (Input- Output)	2.25kV VDC , for 60sec. min
	0.1MHz < f ≤ 500 MHz
Insertion Loss	3.1 db
Return Loss	5 db
Crosstalk	23 db
CMRR	20 db
CDMR	20 db

NOTE: 1. f is the frequency in MHz

2. The Product has been tested for DC isolation. HARTING assumes no liability or obligation for AC isolation testing.

3. Please note that the M12 Magnetics connector generates less high frequency losses (1-3GHz) compared to an RJ45 with magnetics. In combination with Chipsets that require high frequency losses to pass the PSD test, it is recommended to add a Lowpass filtering network to the M12 10G Magnetics PCB-side for 10GBASE-t signalling (see Detail A)

## Detail A

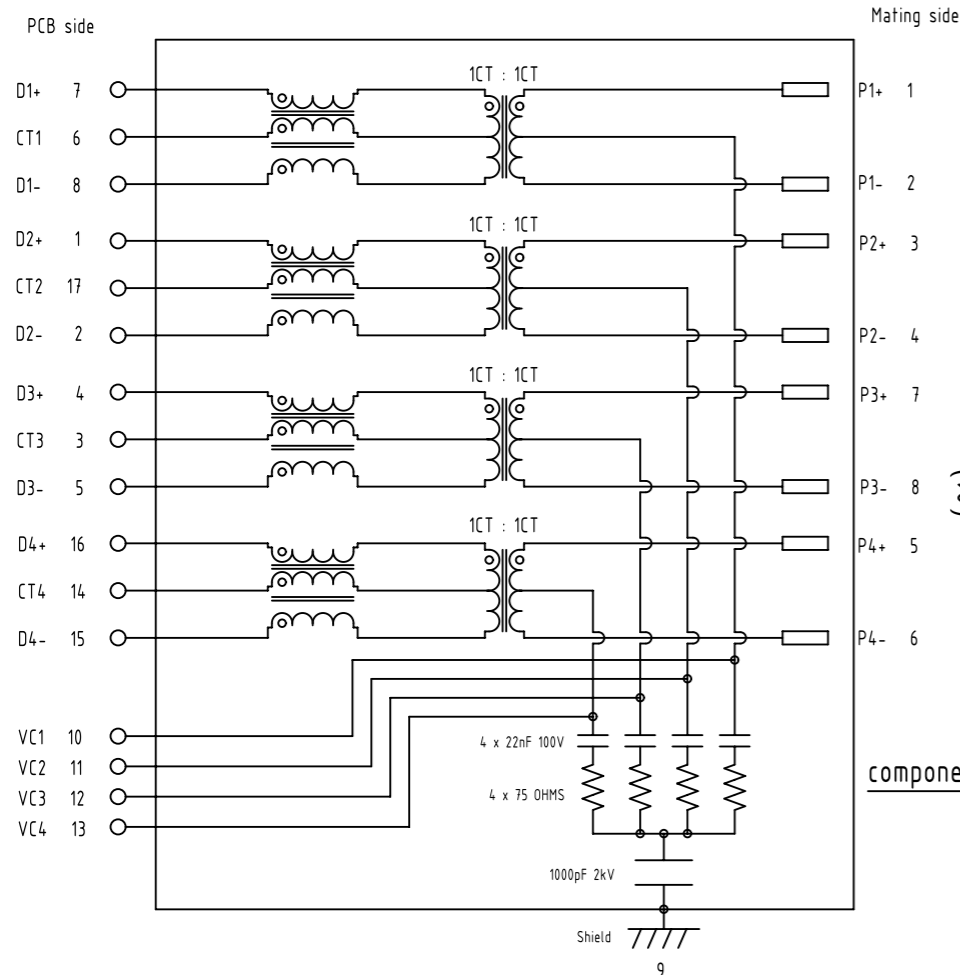


For X-coded 10G without PoE version only

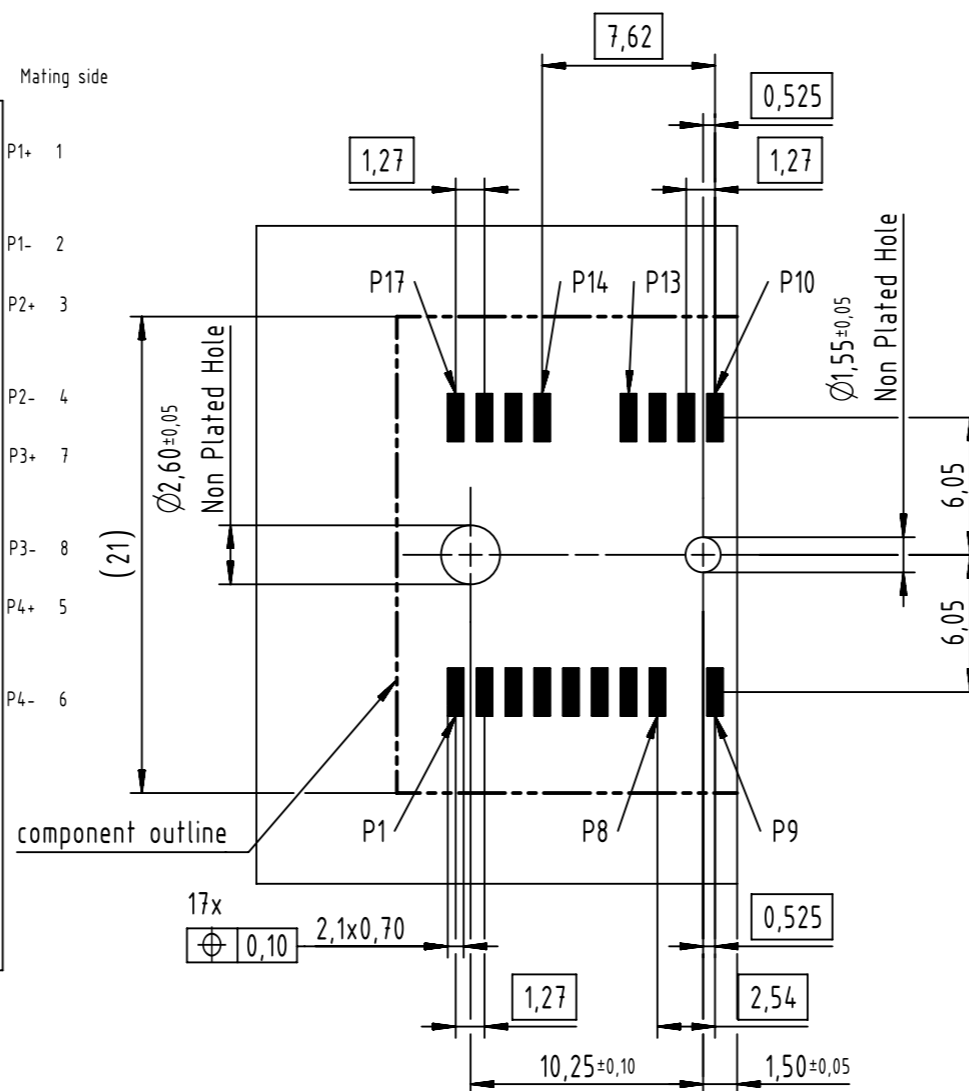
N/C: leave all pins floating. Do not connect to any of the pins to any net

	All Dimensions in mm Original Size DIN A3	Scale 2:1	Free size tol.	Ref.
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## Schematic



## Recommended PCB layout

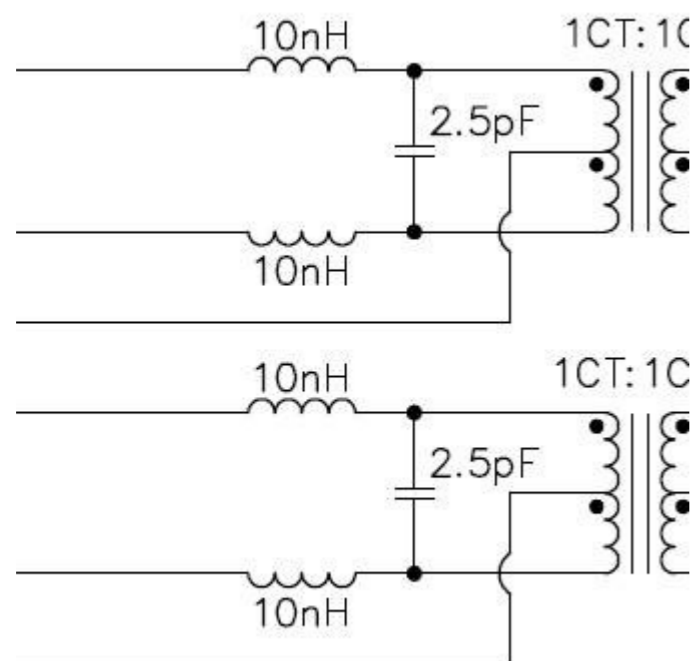


Electrical Characteristics @+25°C unless otherwise noted  
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Parameter	Specification/ Limit Values
Operating Temperature	-40°C - +85°C
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3. Please note that the M12 Magnetics connector generates less high frequency losses (1-3GHz) compared to an RJ45 with magnetics. In combination with Chipsets that require high frequency losses to pass the PSD test, it is recommended to add a Lowpass filtering network to the M12 10G Magnetics PCB-side for 10GBASE-t signalling (see Detail A)

## Detail A



For X-coded 10G with PoE+ version only

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**TAPE LAYOUT & PACKAGING**

RECOMMENDATION FOR SOLDER PROCESSING

1. PCB pad plating

The M12 transformer receptacle connectors are solderable on lead-free pad surfaces like HAL,NiAu,Immersion Sn.

2. Stencil recommendation

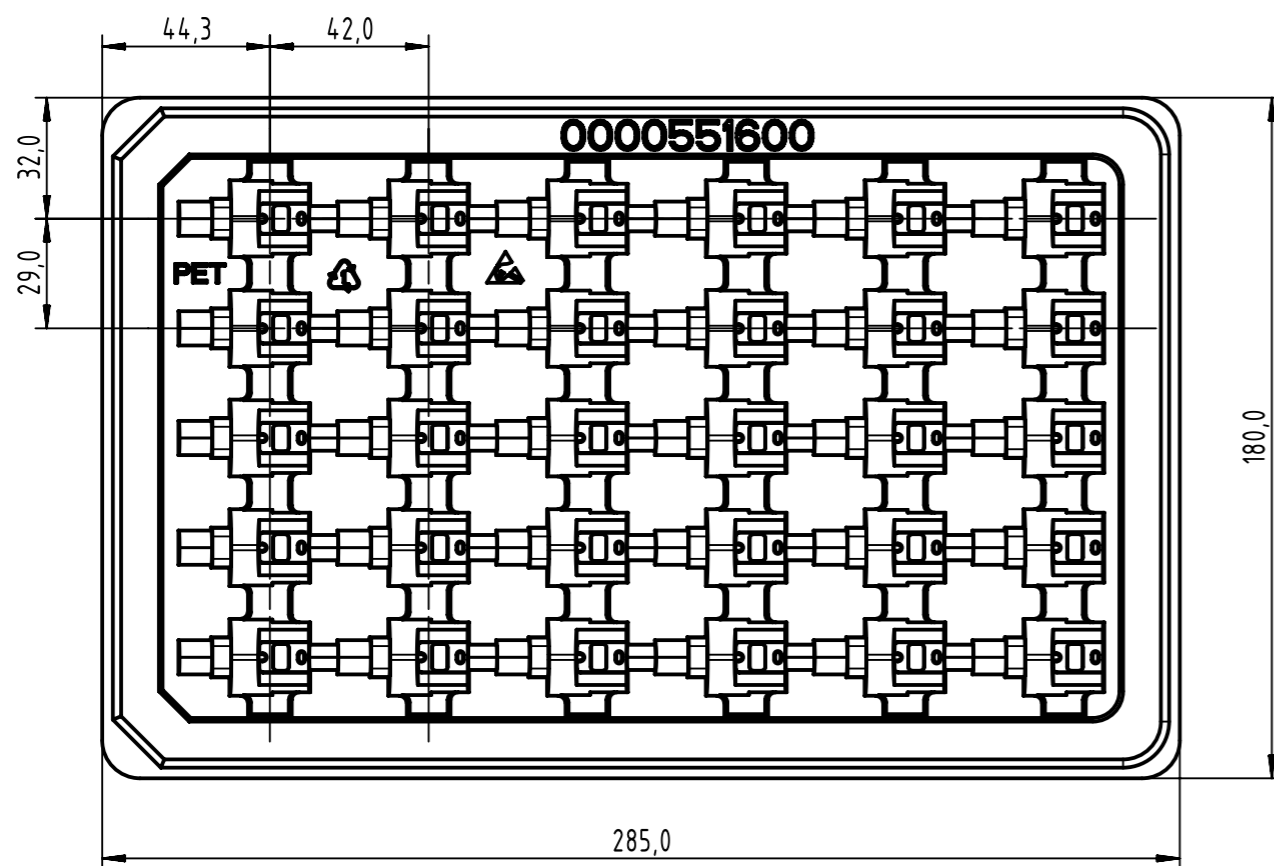
The size of the solder stencil apertures is depending on the thickness of the stencil.

In general, thinner stencils will need larger apertures to result in the required volume of solder paste.

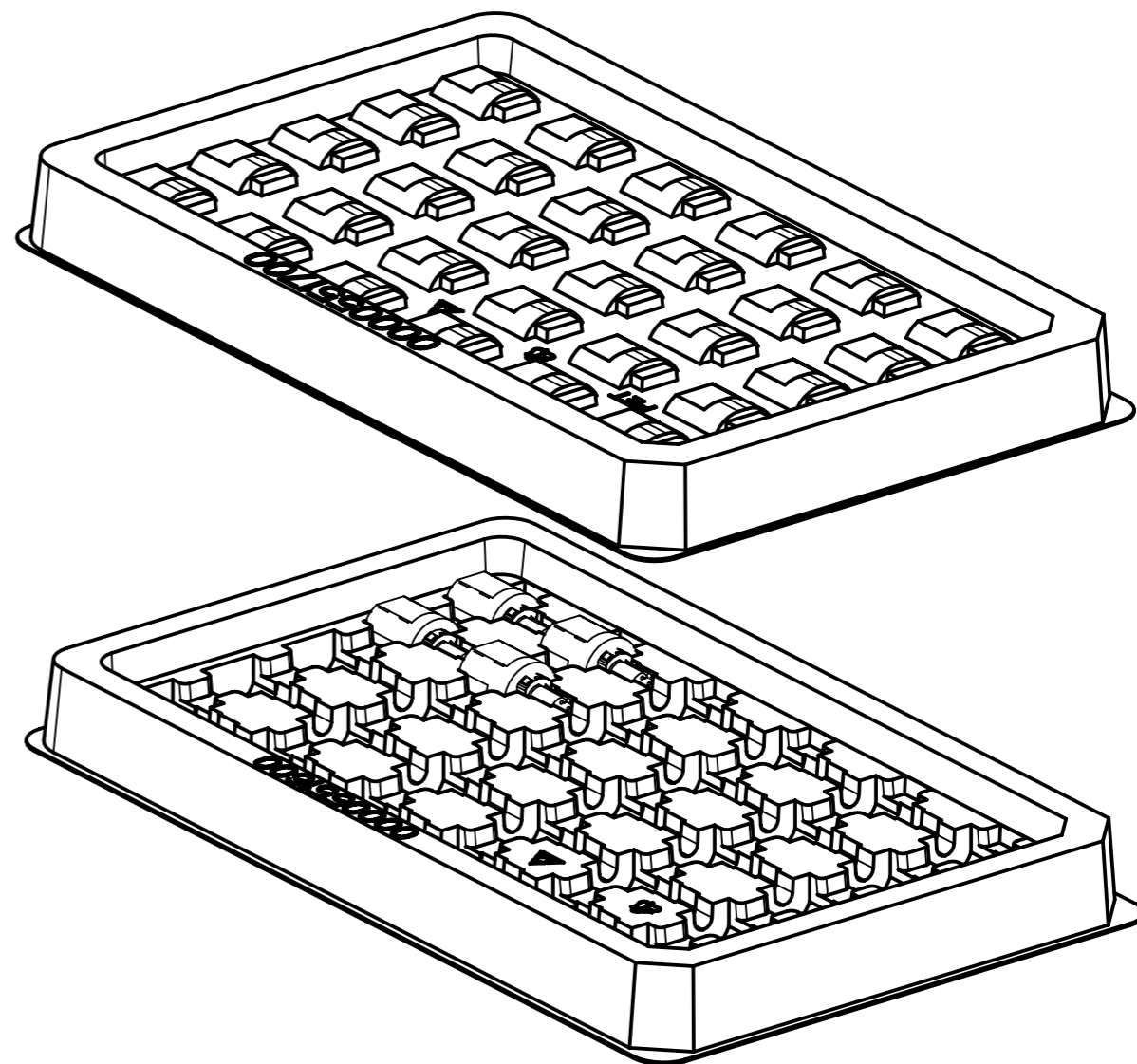
The minimum required solder paste volume for the signal pins is 0,160mm<sup>3</sup>,For example, this can be achieved with the following stencil data :

Single pin			
Stencil thickness	PCB pad size	proposal stencil aperture size	calculated solder paste volume
120 µm	2,1 x 0,7 mm	2,05 x 0,65 mm	0,160 mm <sup>3</sup>

HARD TRAY LAYOUT & PACKAGING



**APPLICATION INFORMATION**



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