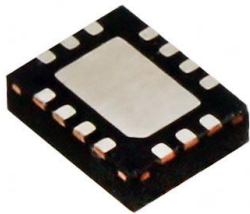


# AB-557-03-HCHC-F-L-C-T Datasheet

[www.digi-electronics.com](http://www.digi-electronics.com)



DiGi Electronics Part Number	AB-557-03-HCHC-F-L-C-T-DG
Manufacturer	<a href="#">Abracon LLC</a>
Manufacturer Product Number	AB-557-03-HCHC-F-L-C-T
Description	IC PCIE CLOCK GEN 100MHZ 14QFN
Detailed Description	PCI Express (PCIe), Clock Generator Clock/Frequency Generator IC 460MHz 1 Output 14-QFN (3.2x2.5)

<https://www.DiGi-Electronics.com>



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RFQ Email: [Info@DiGi-Electronics.com](mailto:Info@DiGi-Electronics.com)

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## Purchase and inquiry

Manufacturer Product Number:

AB-557-03-HCHC-F-L-C-T

Series:

Pure Silicon™

DiGi-Electronics Programmable:

Not Verified

Main Purpose:

PCI Express (PCIe), Clock Generator

Output:

HCSL

Ratio - Input:Output:

0:2

Frequency - Max:

460MHz

Operating Temperature:

-40°C ~ 85°C

Package / Case:

14-VFQFN Exposed Pad

Manufacturer:

Abracon LLC

Product Status:

Active

PLL:

Yes

Input:

-

Number of Circuits:

1

Differential - Input:Output:

No/Yes

Voltage - Supply:

2.25V ~ 3.6V

Mounting Type:

Surface Mount

Supplier Device Package:

14-QFN (3.2x2.5)

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8542.39.0001

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

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ESD Sensitive



3.2 x 2.5 x .85 mm (14 pin QFN)

RoHS/RoHS II Compliant

MSL Level = 1

**Features**

- Meets PCIe Gen1, Gen2, & Gen3 specs.
- High Performance MEMS Technology by Discera
- Available Mixed Output Formats: HCSL, LVPECL, LVDS or LVC MOS
- Wide Temperature Range: -40° to 105° C
- Wide Supply Range: 2.25V to 3.6 V
- Low Power Consumption
- Excellent Shock & Vibration Immunity

**Applications**

- Solid State Storage
- Storage Area Networks
- Passive Optical Networks
- Ethernet: 1G, 10GBASE-T/KR/LR/SR, and FCoE
- TV and other Consumer Electronics
- Industrial and Medical
- Scanner, Printer

**Key Electrical Specifications**

Parameters		Minimum	Typical	Maximum	Units	Notes
Frequency	f <sub>0</sub>	2.3	100	460*1	MHz	
Operating Temperature		-20		+70	°C	See options
Storage Temperature		-55		+150	°C	
Overall Freq. Stability*2	Δf	-100		+100	ppm	See options
Supply Voltage	V <sub>DD</sub>	+2.25		+3.6	V	
Supply Current- Enabled	I <sub>DD</sub>		60		mA	R <sub>L</sub> =50Ω,
Supply Current- Disabled	I <sub>DD</sub>		21	23	mA	
Startup Time	t <sub>su</sub>			5	ms	
Enable Time	t <sub>EN</sub>			20	ns	
Disable Time	t <sub>DA</sub>			5	ns	
Tri-state Function (Standby/Disable)		"1" (V <sub>IH</sub> ≥0.75*V <sub>dd</sub> ) or Open:			V	40kΩ pull-up
Aging		-5.0		+5.0	ppm	First year
Output Offset Voltage	V <sub>OH</sub>	0.725			V	R <sub>L</sub> =50 Ω
	V <sub>OL</sub>			0.10		
Peak to Peak Output Swing			750		mV	Single-Ended
Rise Time	t <sub>r</sub>	200		400	ps	R <sub>L</sub> =50 Ω, C <sub>L</sub> =2pF
Fall Time	t <sub>f</sub>	200		400	ps	20% to 80%
Duty Cycle	SYM	48		52	%	Differential
Period Jitter	J <sub>PER</sub>		2.5		ps <sub>RMS</sub>	F <sub>01</sub> =F <sub>02</sub> =100.00MHz
Integrated Phase Noise (Common Clock Architecture)	R <sub>J</sub>		0.540		ps <sub>RMS</sub>	PCIe Gen 1.1 T <sub>J</sub> = D <sub>J</sub> + 14.069 x R <sub>J</sub> (BER 10-12)
	D <sub>J</sub>		0.832	41.9	ps <sub>P-P</sub>	
	T <sub>J</sub>		8.536	86.0		
	J <sub>RMS-</sub>		0.458	3.1	ps <sub>RMS</sub>	PCIe Gen 2.1
	J <sub>RMS-</sub>		0.030	3.0		PCIe Gen 2.1
	J <sub>RMS-CC</sub>		0.165	1.0		PCIe Gen 3.0
Integrated Phase Noise (Data Clock Architecture)	J <sub>RMS-</sub>		0.561	4.0	ps <sub>RMS</sub>	PCIe Gen 2.1
	J <sub>RMS-</sub>		1.778	7.5		PCIe Gen 2.1
	J <sub>RMS-CC</sub>		0.147	1.0		PCIe Gen 3.0

\*1. For frequency other than 100MHz, please contact ABRACON or consider using ASEMDxx series

2. Frequency stability includes frequency variations due to initial tolerance, temp. and power supply voltage



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**AB-557-03 Series**

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3.2 x 2.5 x .85 mm (14 pin QFN)

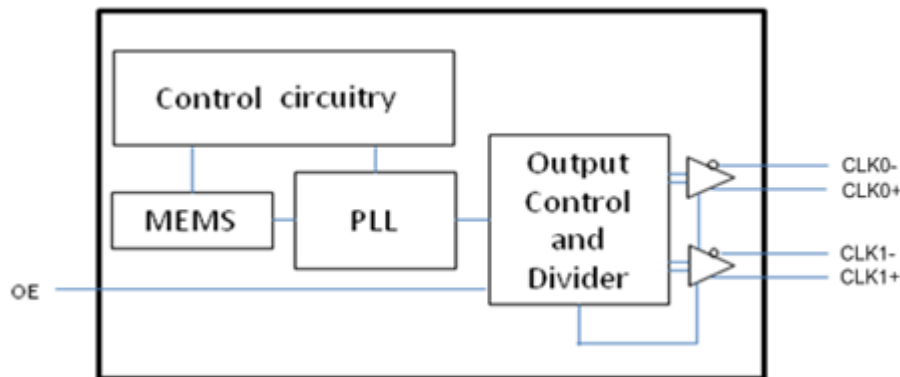
RoHS/RoHS II Compliant

MSL Level = 1

**Absolute Maximum Ratings**

Item	Minimum	Maximum	Unit	Condition
Supply Voltage	-0.3	+4.0	V	
Input Voltage	-0.3	V <sub>dd</sub> +0.3	V	
Junction Temp.		+150	°C	
Storage Temp.	-55	+150	°C	
Soldering Temp.		+260	°C	40sec max
ESD				
HBM		4,000	V	
MM		400		
CDM		1,500		

**Block Diagram**



**CRYSTAL-LESS PCI EXPRESS DUAL OUTPUT ULTRA MINIATURE PURE SILICON™ SMD CLOCK GENERATOR**

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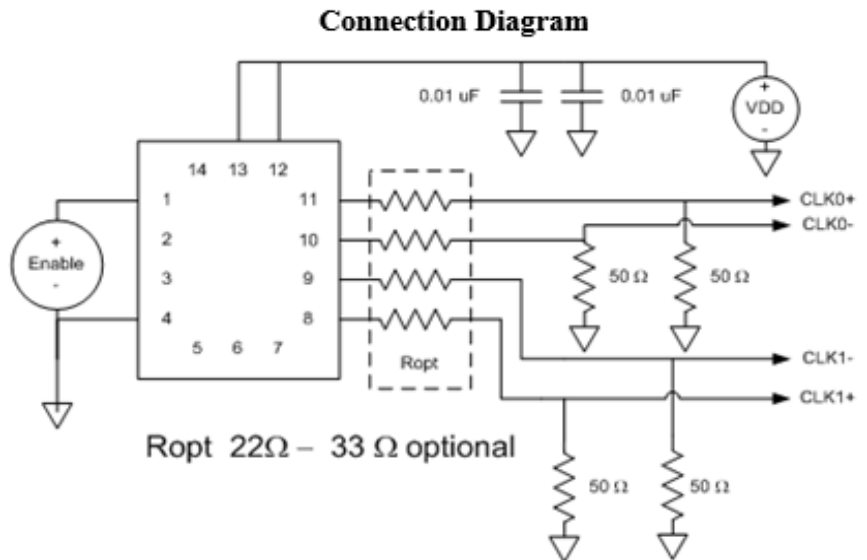
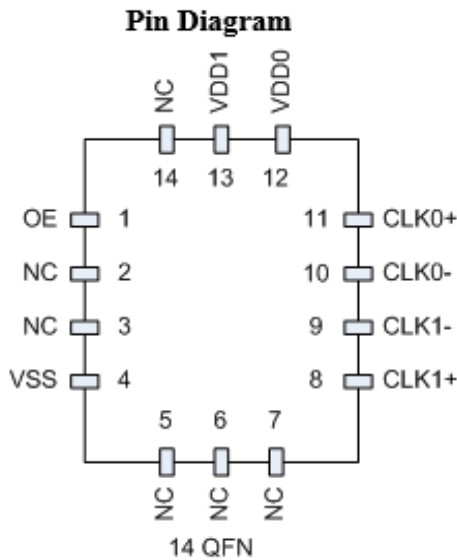
3.2 x 2.5 x .85 mm (14 pin QFN)

RoHS/RoHS II Compliant

MSL Level = 1

**Pin Layout:**

**14 Pin QFN:**



Pin No.	Pin Name	Pin Type	Description
1	OE	I	Output Enable; active high
2	NC	NA	Ground Connected or Leave Unconnected
3	NC	NA	Ground Connected or Leave Unconnected
4	VSS	Power	Ground
5	NC	NA	Ground Connected or Leave Unconnected
6	NC	NA	Ground Connected or Leave Unconnected
7	NC	NA	Ground Connected or Leave Unconnected
8	CLK1+	O	True output of differential pair
9	CLK1-	O	Complement output of differential pair
10	CLK0-	O	Complement output of differential pair
11	CLK0+	O	True output of differential pair
12	VDD0	Power	Power Supply for Output 0 (CLK+/- 0)
13	VDD1	Power	Power Supply for Core and Output 1 (CLK +/- 1)
14	NC	NA	Ground Connected or Leave Unconnected



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3.2 x 2.5 x .85 mm (14 pin QFN)

RoHS/RoHS II Compliant

MSL Level = 1

**Options and Part Identification (left blank if standard):**

AB-557-03-□□-□-□-□-□

Output Format, Clk1
C: LVCMOS
LP: LVPECL
LV:LVDS
HC:HCSL

Packaging
Blank: Bulk
T: Tape & Reel(1kpcs / reel)
T3: Tape & Reel(3kpcs/reel)

Overall Freq. Stability
Blank: ±100ppm
C: ±50ppm

Output Format, Clk0
C: LVCMOS
LP: LVPECL
LV:LVDS
HC:HCSL

Package Type
F: 14-QFN

Operating Temp.
E: -20°C ~ +70°C
L: -40°C ~ +85°C
X: -40°C ~ +105°C

Note: For frequency other than 100MHz, please contact ABRACON or consider using ASEMDxx series



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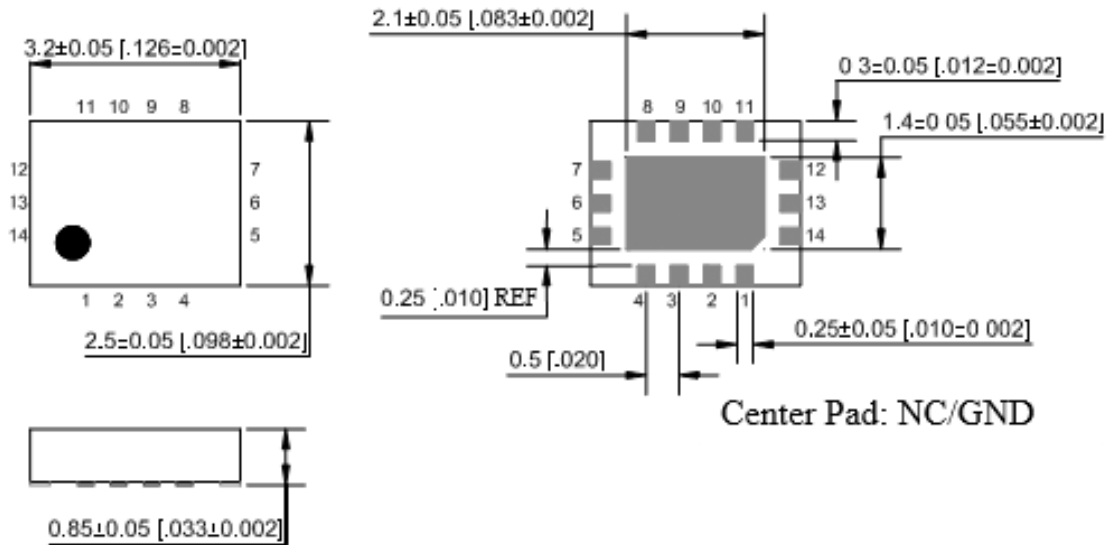
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RoHS/RoHS II Compliant

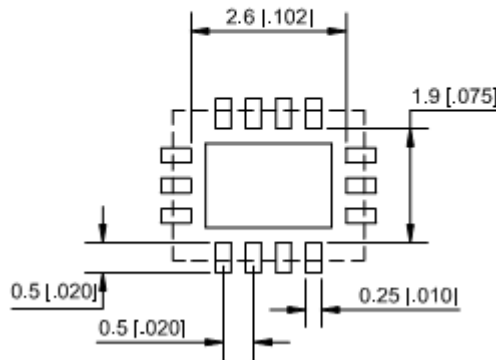
MSL Level = 1

**Mechanical Dimensions:**

**14 pin QFN:**



**Recommended Solder Pad Layout**



**Dimensions: mm [inches]**



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Reflow Profile [JEDEC J-STD-020]

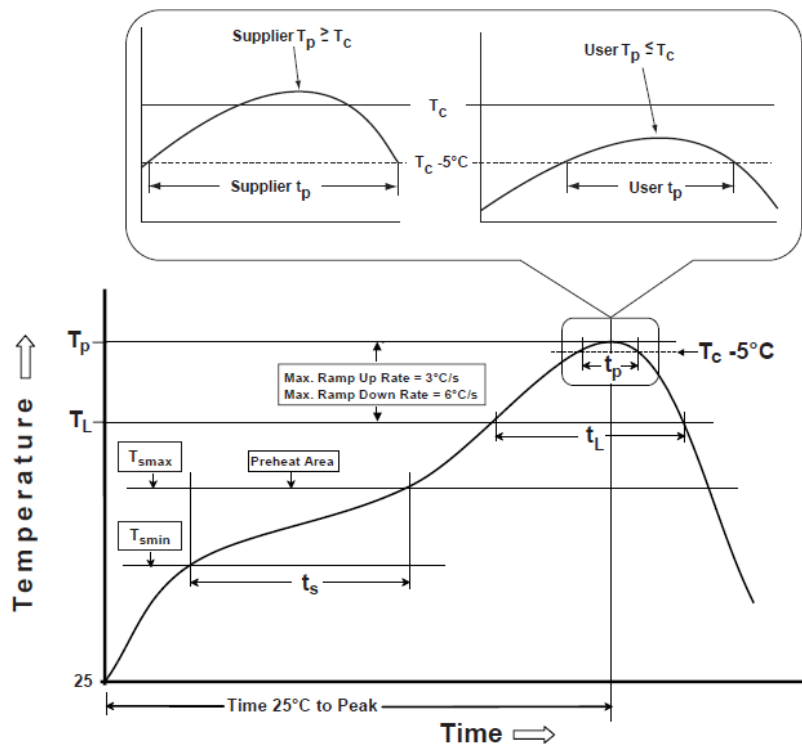


Table 1

SnPb Eutectic Process Classification Temperatures ( $T_c$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2

Pb-Free Process Classification Temperatures ( $T_c$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum ( $T_{smin}$ )	100°C	150°C
Temperature maximum ( $T_{smax}$ )	150°C	200°C
Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate ( $T_{smax}$ to $T_p$ )	3°C/sec. max	3°C/sec. max
Liquidous temperature ( $T_L$ )	183°C	217°C
Time at liquidous ( $t_L$ )	60 - 150 sec.	60 - 150 sec.
Peak package body temperature ( $T_p$ )*	see Table 1	see Table 2
Time ( $t_p$ )** within 5°C of the specified classification temperature ( $T_C$ )	20 sec.	30 sec.
Ramp-down rate ( $T_p$ to $T_{smax}$ )	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

\*Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

\*\*Tolerance for time at peak profile temperature ( $t_p$ ) is defined as supplier minimum and a user maximum.



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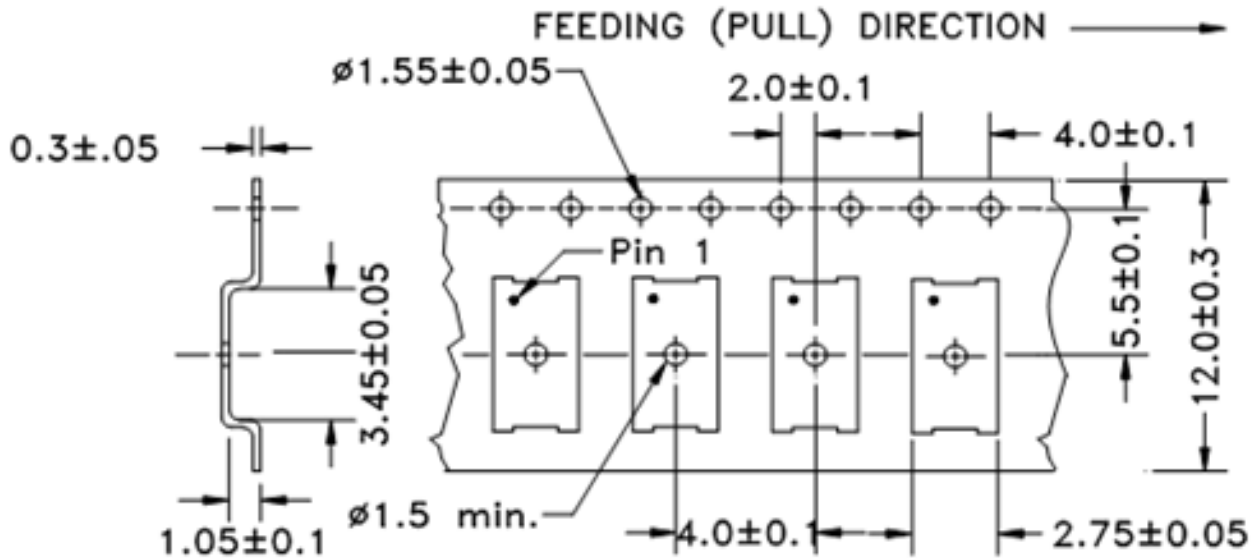
**Packaging**

**14 Pin QFN Tape Drawing:**

T= 1,000pcs/reel

T3= 3,000pcs/reel

Reel Size = 7" diameter



Dimensions: mm



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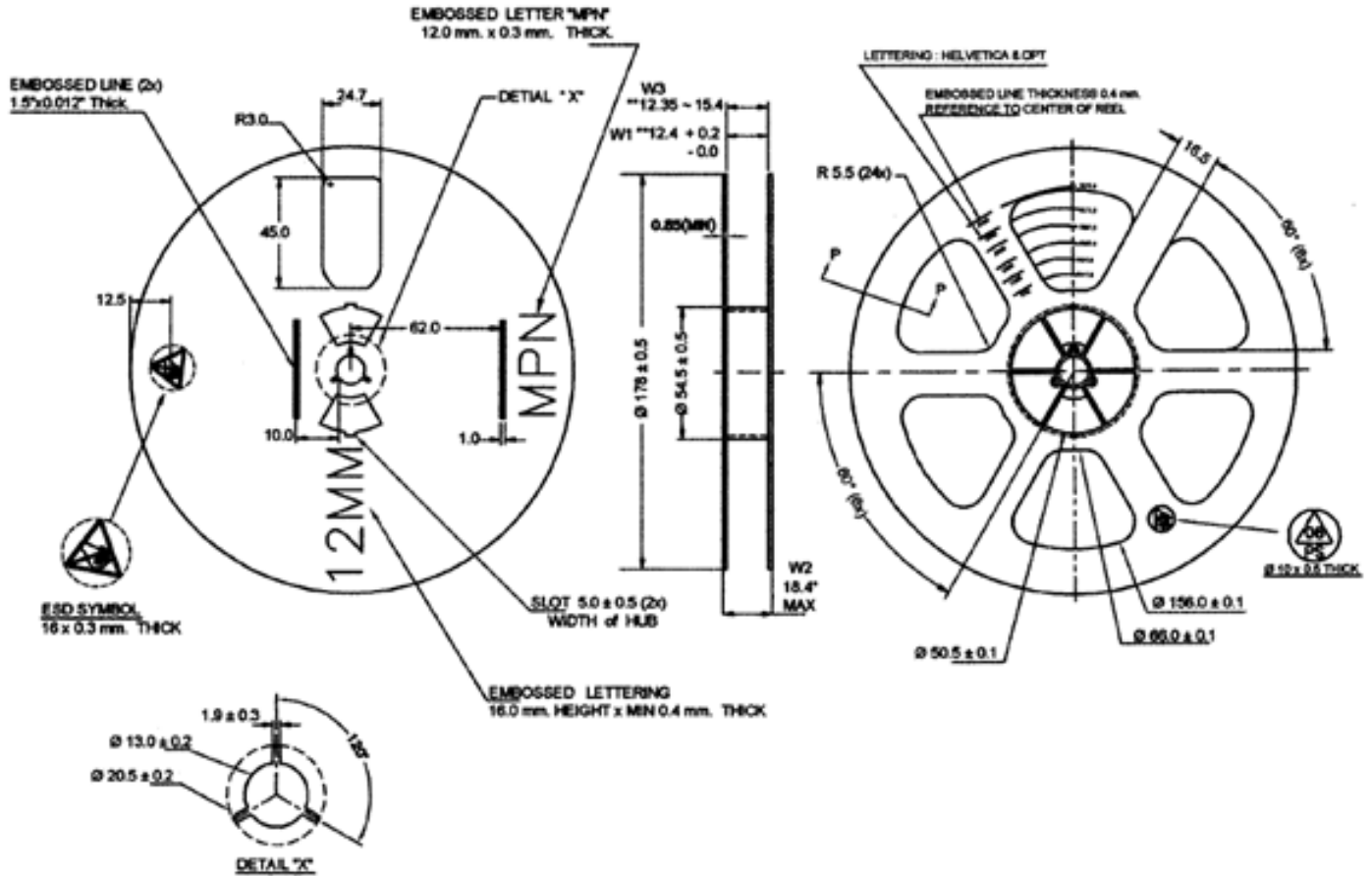


3.2 x 2.5 x .85 mm (14 pin QFN)

RoHS/RoHS II Compliant

MSL Level = 1

**7" Reel Drawing (1000pcs/reel):**



Dimensions: mm



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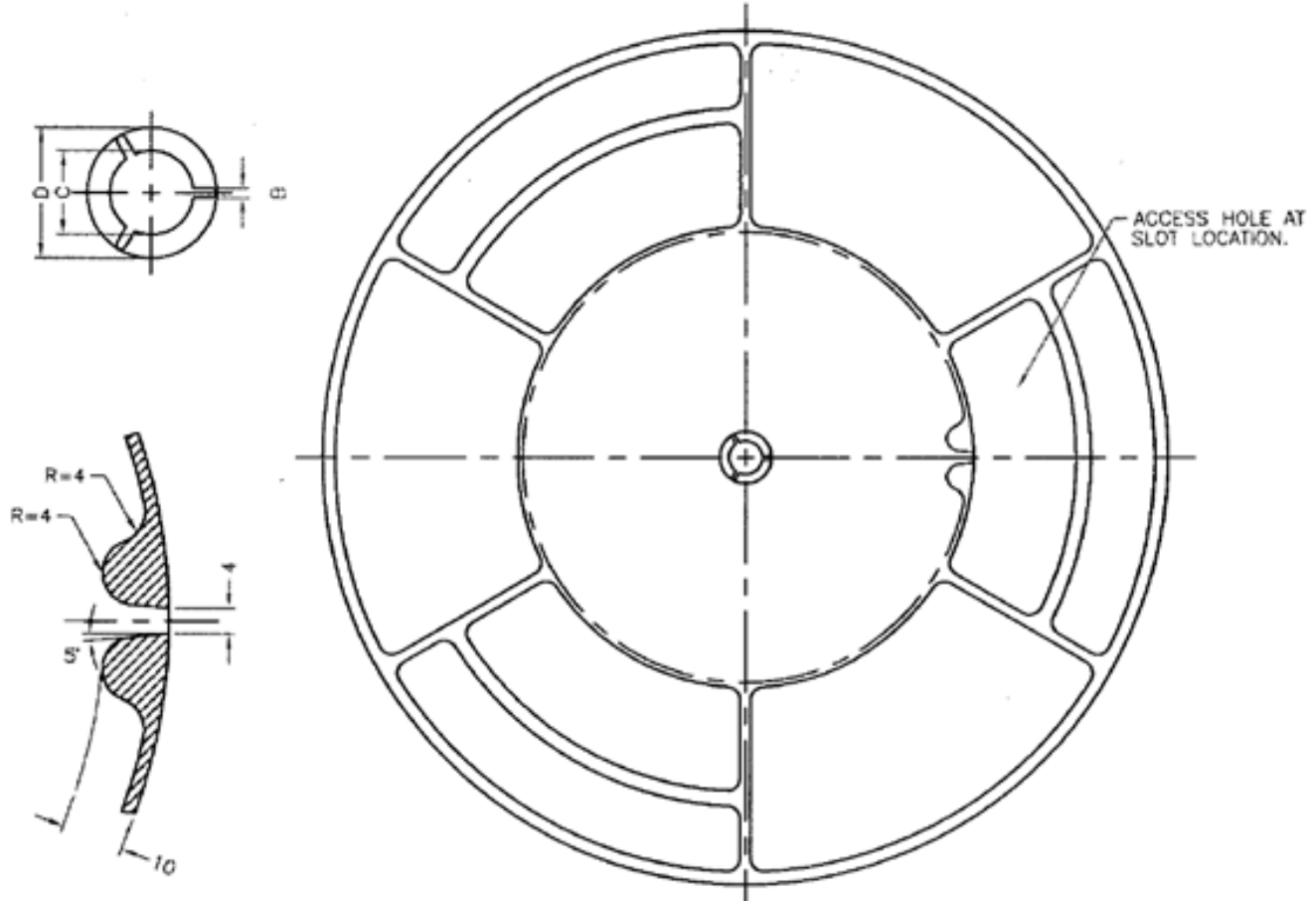


3.2 x 2.5 x .85 mm (14 pin QFN)

RoHS/RoHS II Compliant

MSL Level = 1

**13" Reel Drawing (3000pcs/reel):**



A	N	W1	W2	W3	D	B	C	Tape Width
330 (13")	178 (7") max.	12.4+2/-0	18.4 max.	12.35 min. 15.40 max.	20.2 min.	1.5 min	13.0+0.5/-0.2	12

**Dimensions: mm**

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