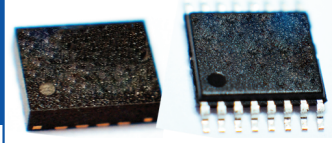
CRYSTAL-LESS PCI EXPRESS DUAL OUTPUT ULTRA MINIATURE PURE SILICON™ SMD CLOCK GENERATOR



3.2 x 2.5 x 0.85 mm (14 Pin QFN)
5.1 x 4.5 x 1.1 mm (16 Pin TSSOP)

AB-557-03 Series

Moisture Sensitivity Level
MSL 1 – 14 QFN
MSL 3 – 16 TSSOP

RoHS/RoHS II compliant

FEATURES:

- Meets PCIe Gen1, Gen2, & Gen3 specs.
- High Performance MEMS Technology by Discera
- Available Mixed Output Formats: HCSL, LVPECL, LVDS or LVCMOS
- 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

STANDARD SPECIFICATIONS:

Parameters		Minimum	Typical	Maximum	Unite	Notes
Frequency	f_0	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_{DD}	+2.25		+3.6	V	
Supply Current- Enabled	I_{DD}		60		mA	R_L=50Ω, F_{01}=F_{02}=100.00MHz
Supply Current- Disabled	I_{DD}		21	23	mA	
Startup Time	t_{su}			5	ms	
Enable Time	t_{EN}			20	ns	
Disable Time	t_{DA}			5	ns	
Tri-state Function (Standby/Disable)		"1" (VIH≥0.75*Vdd) or Open: Oscillation "0" (VIL<0.25*Vdd) : Hi Z			V	40kΩ pull-up resistor embedded
Aging		-5.0		+5.0	ppm	First year
Output Offset Voltage	V_{OH}	0.725			V	R_L=50 Ω
	V_{OL}			0.10		
Peak to Peak Output Swing			750		mV	Single-Ended
Rise Time	t_r	200		400	ps	R_L=50 Ω, C_L=2pF
Fall Time	t_f	200		400	ps	20% to 80%
Duty Cycle	SYM	48		52	%	Differential
Period Jitter	J_{PER}		2.5		ps_{RMS}	F_{01}=F_{02}=100.00MHz
Integrated Phase Noise (Common Clock Architecture)	R_J		0.540		ps_{RMS}	PCIe Gen 1.1 T_J= D_J + 14.069 x R_J (BER 10-12)
	D_J		0.832	41.9	ps_{p-p}	
	T_J		8.536	86.0		
	$J_{RMS-CCHF}$		0.458	3.1	ps_{RMS}	PCIe Gen 2.1 1.5 MHz to Nyquist
	$J_{RMS-CCLF}$		0.030	3.0		PCIe Gen 2.1 10kHz to 1.5 MHz
	J_{RMS-CC}		0.165	1.0	ps_{RMS}	PCIe Gen 3.0
Integrated Phase Noise (Data Clock Architecture)	$J_{RMS-DCHF}$		0.561	4.0	ps_{RMS}	PCIe Gen 2.1 1.5 MHz to Nyquist
	$J_{RMS-DCLF}$		1.778	7.5		PCIe Gen 2.1 10kHz to 1.5 MHz
	J_{RMS-DC}		0.147	1.0	ps_{RMS}	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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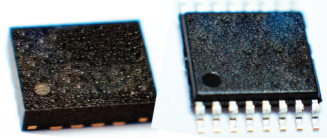
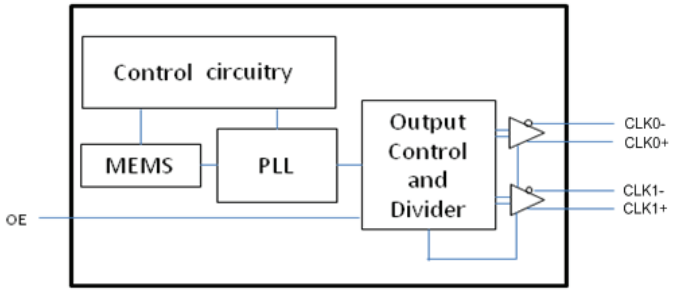


3.2 x 2.5 x 0.85 mm (14 Pin QFN)
5.1 x 4.5 x 1.1 mm (16 Pin TSSOP)

Absolute Maximum Ratings

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

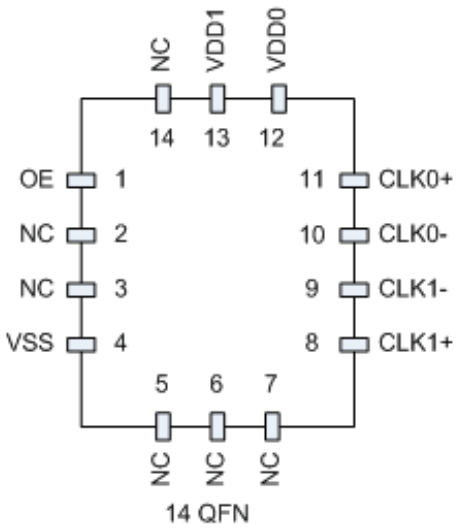
Block Diagram:



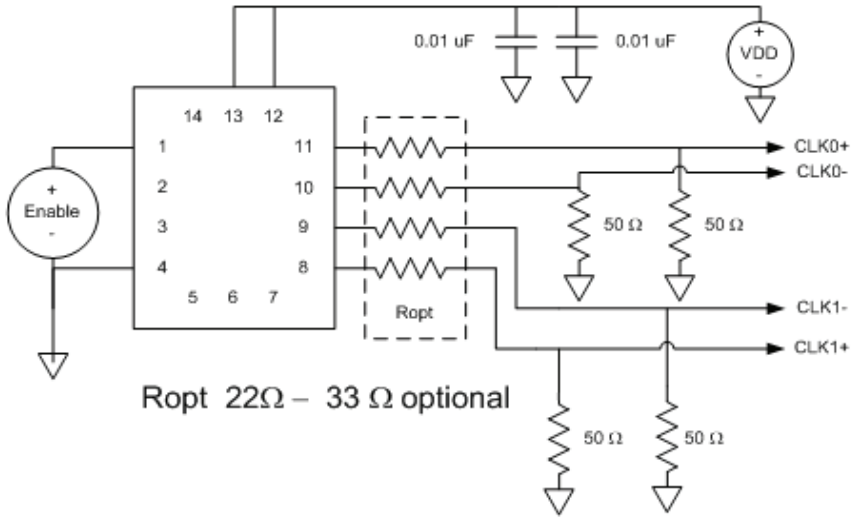
PIN LAYOUT:

14 Pin QFN:

Pin Diagram



Connection Diagram
Two HCSL Outputs



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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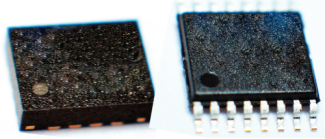
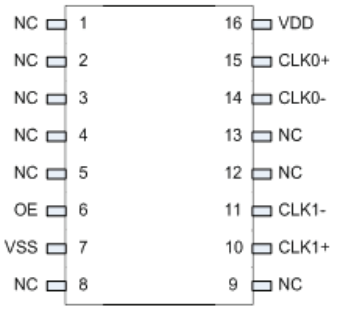


3.2 x 2.5 x 0.85 mm (14 Pin QFN)
5.1 x 4.5 x 1.1 mm (16 Pin TSSOP)

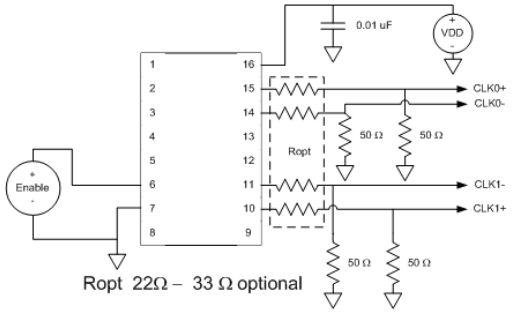
16 Pin TSSOP:

Pin Diagram



16-pin TSSOP

Connection Diagram
Two HCSL Outputs



Pin No.	Pin Name	Pin Type	Description
1	NC	NA	Leave Unconnected
2	NC	NA	Leave Unconnected
3	NC	NA	Leave Unconnected
4	NC	NA	Leave Unconnected
5	NC	NA	Leave Unconnected
6	OE	I	Output Enable; active high
7	VSS	Power	Ground
8	NC	NA	Leave Unconnected
9	NC	NA	Leave Unconnected
10	CLK1+	O	True output of differential pair
11	CLK1-	O	Complement output of differential pair
12	NC	NA	Leave Unconnected
13	NC	NA	Leave Unconnected
14	CLK0-	O	Complement output of differential pair
15	CLK0+	O	True output of differential pair
16	VDD	Power	Power Supply

PART IDENTIFICATION:

AB-557-03-□□-□-□-□-□

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

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

Package Type
F: 14-QFN
S: 16-TSSOP

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

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

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

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

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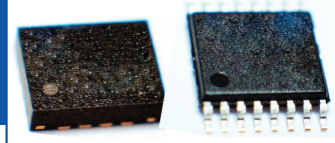

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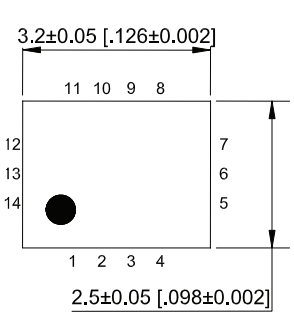
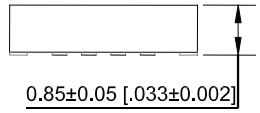
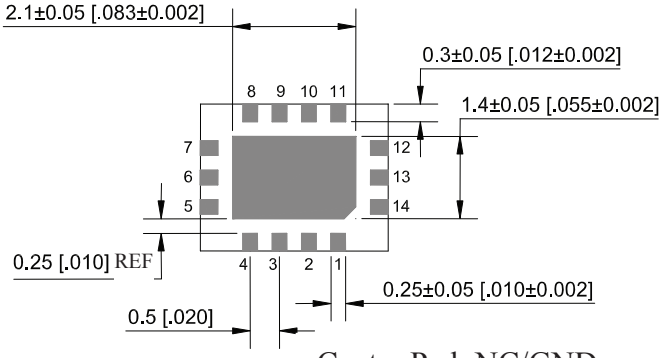
OUTLINE DRAWING:

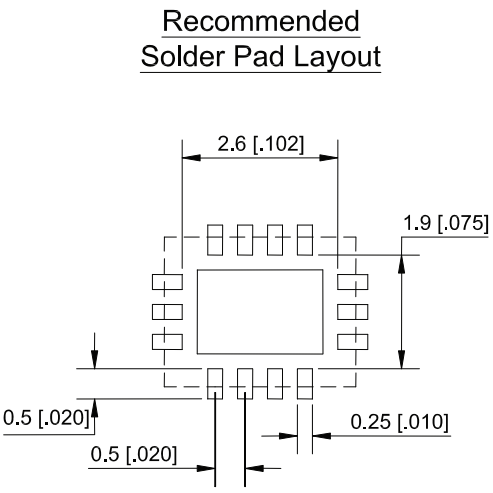
14 Pin QFN:



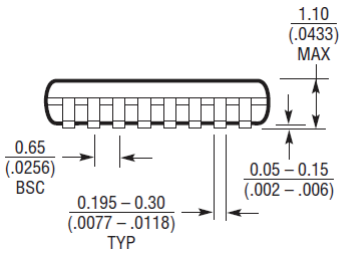


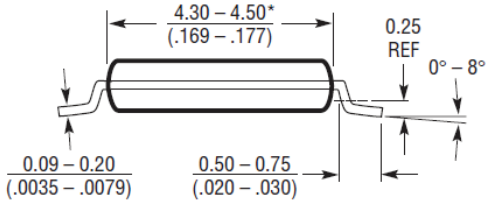


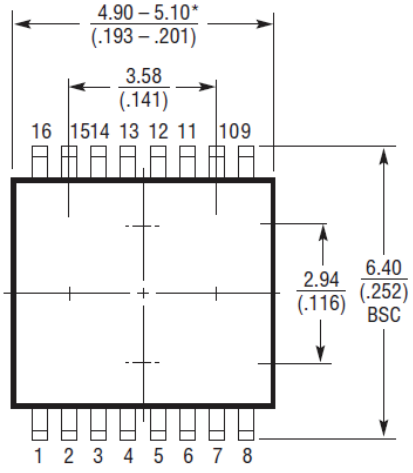
Center Pad: NC/GND

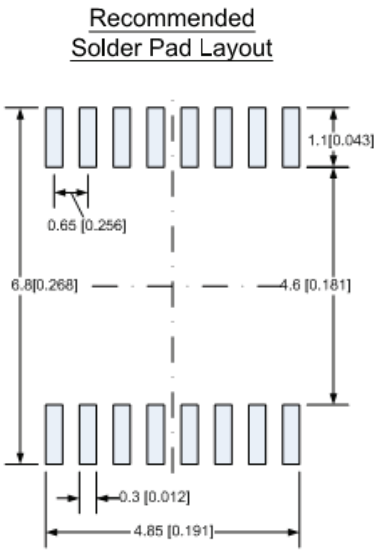


16 Pin TSSOP:









* Dimensions do not include mold flash. Mold flash shall not exceed 0.150mm(.006 inches) per side.

Dimensions: mm (inches)

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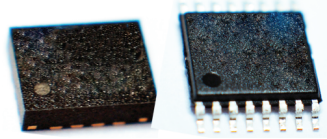

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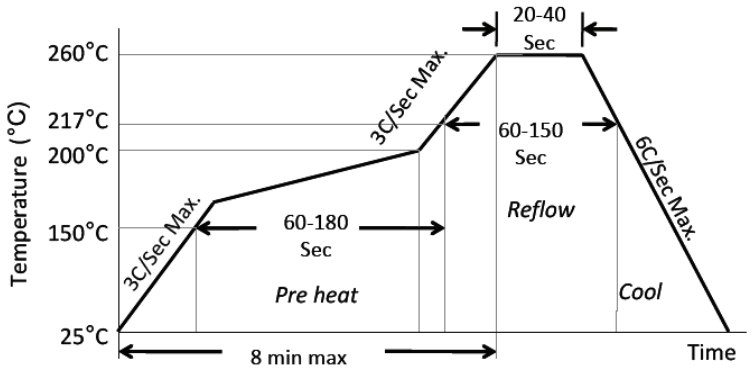
REFLOW PROFILE:

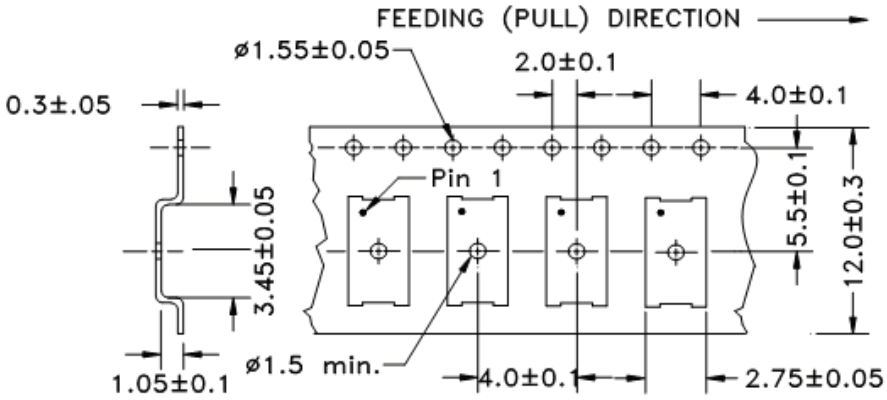


Ramp-Up Rate (200°C to Peak Temp)	3°C/Sec Max.
Preheat Time 150°C to 200°C	60-180 Sec
Time maintained above 217°C	60-150 Sec
Peak Temperature	255-260°C
Time within 5°C of actual Peak	20-40 Sec
Ramp-Down Rate	6°C/Sec Max.
Time 25°C to Peak Temperature	8 min Max.

TAPE & REEL:

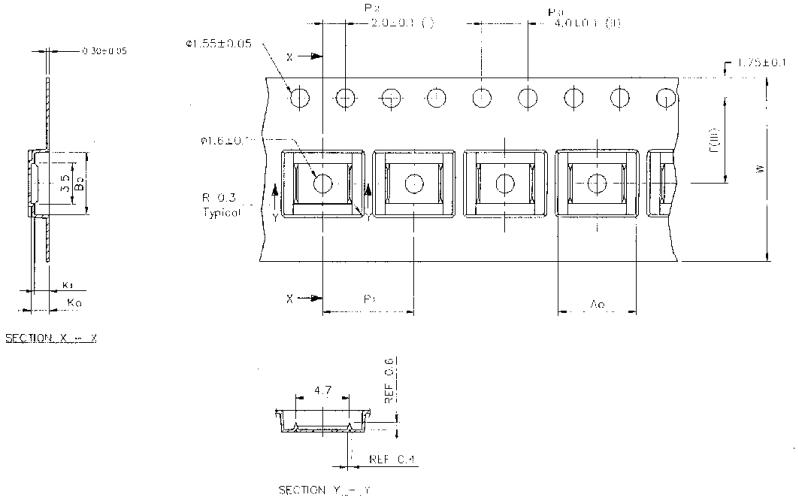
14 Pin QFN Tape Drawing:

T= 1,000pcs/reel
T3= 3,000pcs/reel



16 Pin TSSOP Tape Drawing

T= 1, 000pcs/reel
T3= 3,000pcs/reel



A0	B0	K0	K1	F	P1	W
6.80±0.1	5.40±0.1	1.60±0.1	1.30±0.1	5.50±0.1	8.00±0.1	12.00±0.3

Dimensions: mm

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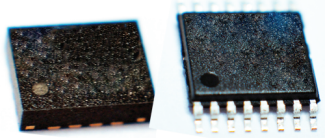

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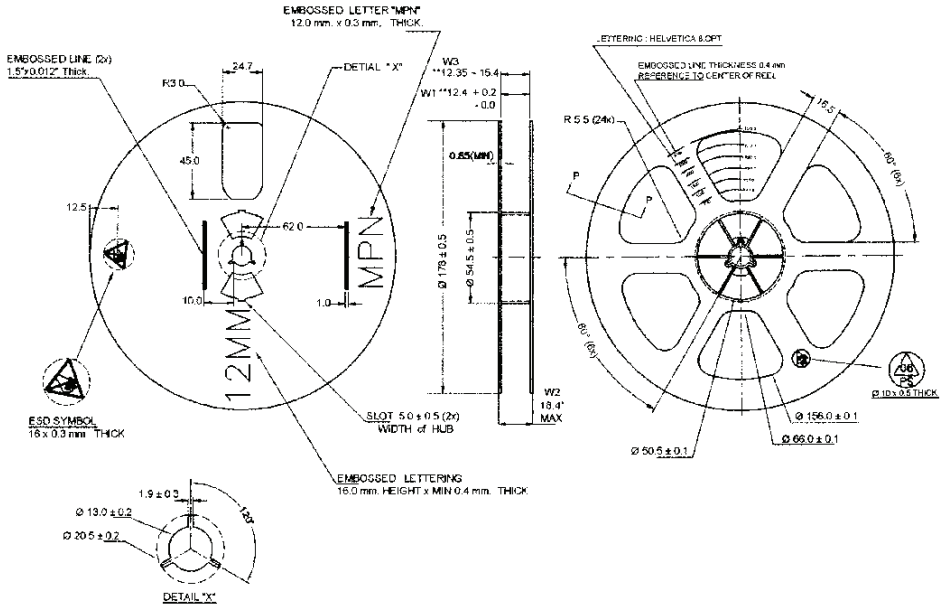
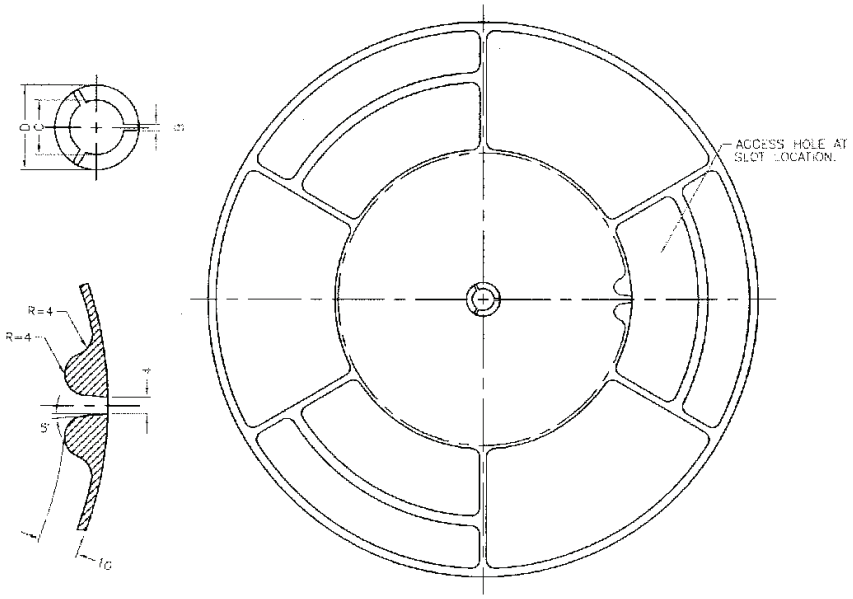
7” Reel Drawing (1000pcs/reel)



Dimensions: mm

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