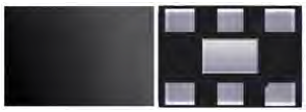
PERFORMANCE PLASTIC PACKAGE ULTRA MINIATURE PURE SILICON™ CLOCK OSCILLATOR



7.0 x 5.0 x 0.85mm

ASVMP

RoHS/RoHS II compliant

Moisture Sensitivity Level – MSL 1

FEATURES:

- Ultra Miniature Pure Silicon™ Clock Oscillator
- High Performance MEMS Technology by Discera
- Low Power Consumption for high speed communication
- Exceptional Stability Over Temp. at -40 to +85°C, ±15ppm
- Extended Automotive Grade Temp. stability at -55 to +125°C, ±25ppm
- Available in 50kG Shock Resistance Configuration upon request
- MIL-STD-883 shock and vibration compliant
- Durable QFN Plastic Compact Packaging
- Standby or Disable Tri-state function
- Low jitter (Period jitter RMS and Phase jitter RMS)
- High power supply noise reduction, -50dBc

APPLICATIONS:

- Storage Area Networks (SATA, SAS, Fiber Channel)
- Passive Optical Networks (EPON, 10G-EPON, GPON, 10G-PON)
- Ethernet (1G, 10GBASE-T,/KR/LR/SR, FCoE
- PCI Express
- Display port

Low Jitter
High Performance
3G MEMS Technology!

STANDARD SPECIFICATIONS:

Common Key Electrical Specifications – CMOS, LVPECL, LVDS, and HCSL

Parameters		Minimum	Typical	Maximum	Units	Notes
Frequency Range	CMOS	2.3000*		170.0000	MHz	Commercial, Industrial temp. range
	CMOS	2.3000*		100.0000		Automotive temp range -55 ~ +125°C
	LVPECL	2.3000*		460.0000		Commercial, Industrial temp. range
	LVDS	2.3000*		460.0000		Commercial, Industrial temp range
	HCSL	2.3000*		460.0000		Commercial, Industrial temp. range
Operating Temperature		-20		+70	°C	See options
Storage Temperature		-55		+150	°C	
Overall Frequency Stability		-50		+50	ppm	See options
Supply Voltage (Vdd)		+2.25		+3.6	V	
Startup Time				5	ms	
Enable Time				20	ns	STD (Tri-state)
				5	ms	PD option (Power Down)
Disable Time				5	ns	
Disable Current			20	22	mA	STD (Tri-state)
				0.095		PD option (Power Down)
Tri-state Function (Standby/Disable)		"1" (VIH≥0.75*Vdd) or Open: Oscillation "0" (VIL<0.25*Vdd) : Hi Z			V	40kΩ pull-up resister embedded
Aging		-5.0		+5.0	ppm	First year

*** For 2.3000MHz ≤ F0 ≤ 9.9999MHz, 6-8 weeks lead-time applies**

Key Electrical Specifications – CMOS

Parameters		Minimum	Typical	Maximum	Units	Notes
Supply Current (I_{dd})			31	35	mA	CL=15pF, 125MHz
Output Logic Level	V_{OH}	0.9*V_{dd}			V	I=±6mA
	V_{OL}			0.1*V_{dd}	V	
Rise Time	Tr		1.1	2.0	ns	CL=15pF
Fall Time	Tf		1.3	2.0	ns	20% to 80%
Duty Cycle		45		55	%	
Integrated Phase Jitter (J_{PH})			0.30	2	ps	200kHz ~ 20MHz@125MHz
			0.38	2		100kHz ~ 20MHz@125MHz
			1.70	2		12kHz ~ 20MHz@125MHz
Period Jitter RMS (J_{PER})			3.0		ps	

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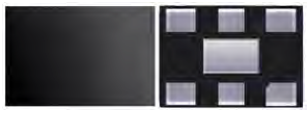

7.0 x 5.0 x 0.85mm

Key Electrical Specifications – LVPECL

Parameters		Minimum	Typical	Maximum	Units	Notes
Supply Current (I_{dd})			56.5	58	mA	RL=50Ω
Output Logic Level	V_{OH}	V_{dd}-1.08			V	RL=50Ω
	V_{OL}			V_{dd}-1.55	V	
Peak to Peak Output Swing (V_{pp})			800		mV	Single ended
Rise Time	Tr		250		ps	RL=50Ω , CL=0pF 20% to 80%
Fall Time	Tf		250			
Duty Cycle		48		52	%	Differential
Integrated Phase Jitter (J_{PH})			0.25	2	ps	200kHz ~ 20MHz @156.25MHz
			0.38	2		100kHz ~ 20MHz @156.25MHz
			1.70	2		12kHz ~ 20MHz @156.25MHz
Period Jitter RMS (J_{PER})			2.5		ps	

Key Electrical Specifications – LVDS

Parameters		Minimum	Typical	Maximum	Units	Notes
Supply Current (I_{dd})			29	32	mA	RL=100Ω
Output Offset Voltage (V_{OS})		1.125		1.4	V	RL=100Ω differential
Delta Offset Voltage (ΔV_{OS})				50	mV	
Peak to Peak Output Swing (V_{pp})			350		mV	Single ended
Rise Time	Tr		200		ps	RL=50Ω , CL=2pF 20% to 80%
Fall Time	Tf		200			
Duty Cycle		48		52	%	Differential
Integrated Phase Jitter (J_{PH})			0.28	2	ps	200kHz ~ 20MHz @156.25MHz
			0.40	2		100kHz ~ 20MHz @156.25MHz
			1.70	2		12kHz ~ 20MHz @156.25MHz
Period Jitter RMS (J_{PER})			2.5		ps	

Key Electrical Specifications – HCSL

Parameters		Minimum	Typical	Maximum	Units	Notes
Supply Current (I_{dd})			40	42	mA	RL=50Ω
Output Logic Level	V_{OH}	0.725			V	RL=50Ω
	V_{OL}			0.1	V	
Peak to Peak Output Swing (V_{pp})			750		mV	Single ended
Rise Time	Tr	200		400	ps	RL=50Ω , CL=2pF 20% to 80%
Fall Time	Tf	200		400		
Duty Cycle		48		52	%	Differential
Integrated Phase Jitter (J_{PH})			0.25	2	ps	200kHz ~ 20MHz @156.25MHz
			0.37	2		100kHz ~ 20MHz @156.25MHz
			1.70	2		12kHz ~ 20MHz @156.25MHz
Period Jitter RMS (J_{PER})			2.5		ps	

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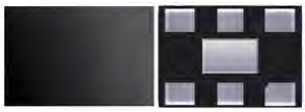

7.0 x 5.0 x 0.85mm

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			V	
HBM		4,000		
MM		400		
CDM		1,500		

OPTIONS AND PART IDENTIFICATION: (Left Blank if Standard)

Programmed Orders (Quantity > 1,000pcs)

ASVMP ☐ - ☐☐☐☐☐☐ MHz - ☐☐ - ☐ - ☐

Output Type
C: CMOS
LP: LVPECL
LV: LVDS
HC: HCSL

Frequency in MHz
e.g. 156.2500 MHz (Maximum 4 digits after decimal)

Operating Temp.
Blank: -20°C ~ +70°C
L: -40°C ~ +85°C
X: -40°C ~ +105°C
Z**: -55°C ~ +125°C

Overall Freq. Stability
Blank: ±50ppm
Y: ±10ppm*
R: ±25 ppm

Tri-state (Pin 1)
Blank: Tri-state
PD: Power Down

Packaging
Blank***: Tube (50pcs / Tube)
T: Tape & Reel (1kpcs / reel)
T3: Tape & Reel (3kpcs / reel)

* Temp option L, X or -20°C ~ +70°C, only
** CMOS output only
*** For Quick turn-around programmable orders < 1000pcs: Due to the immediate availability of stock and the qty of the order, the parts may be delivered as BULK: Cut Tape, Loose parts in Antistatic Bag or in Tube(s). The MOQ per the series will still apply for Tube packaging.

Un-Programmed Orders

Blank un-programmed oscillators and our low cost portable programmer are available for quick turn engineering requirements. Please call ABRACON or visit MEMSpeed Pro II site http://www.abracon.com/memspeedpro/MEMSpeedProFlyerII.pdf for more information.

ASVMP ☐ - BLANK - ☐☐ - ☐ - ☐

Output Type
C: CMOS
LP: LVPECL
LV: LVDS
HC: HCSL

Operating Temp.
Blank: -20°C ~ +70°C
L: -40°C ~ +85°C
X: -40°C ~ +105°C
Z**: -55°C ~ +125°C

Overall Freq. Stability
Blank: ±50ppm
Y: ±10ppm*
R: ±25 ppm

Tri-state (Pin 1)
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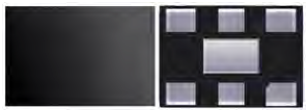
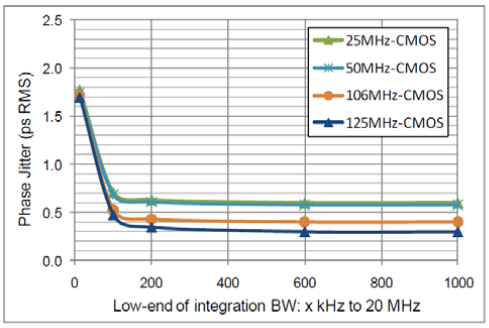


7.0 x 5.0 x 0.85mm

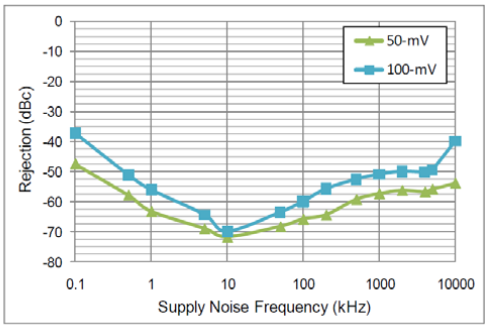
PERFORMANCE PARAMETERS

(Unless specified otherwise: T=25° C, VDD=3.3 V)

CMOS OUTPUT

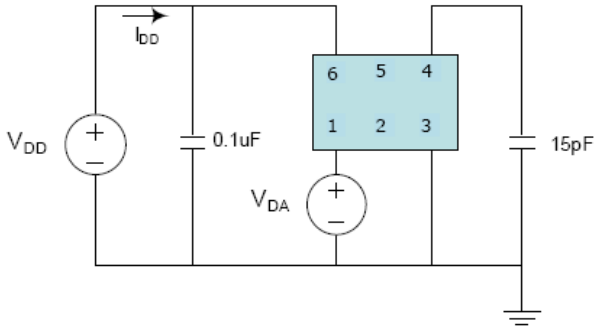


Phase jitter (integrated phase noise)

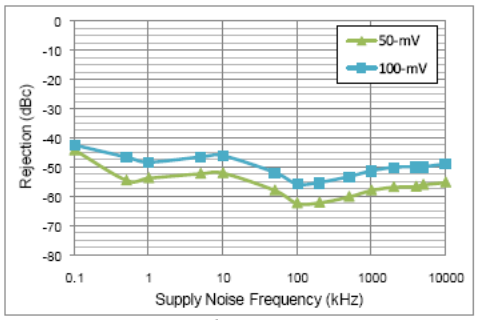


Power supply rejection ratio

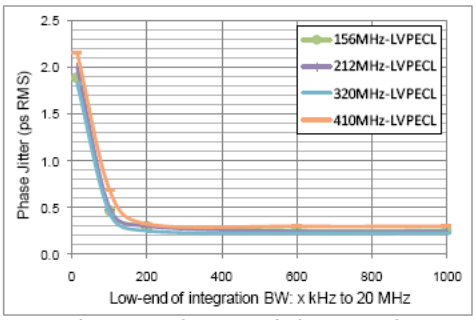
Test Circuit



LVPECL output

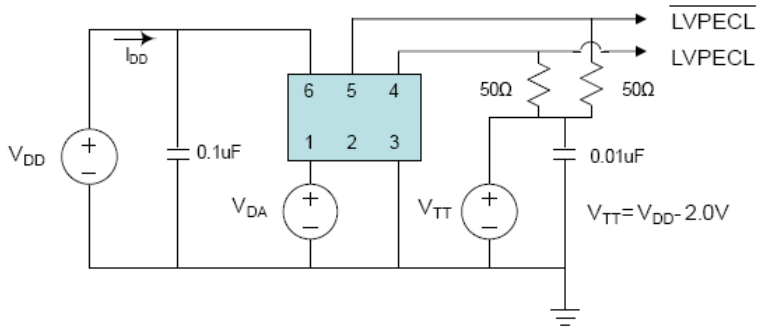


Power supply rejection ratio



Phase jitter (integrated phase noise)

Test Circuit



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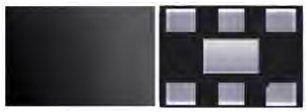
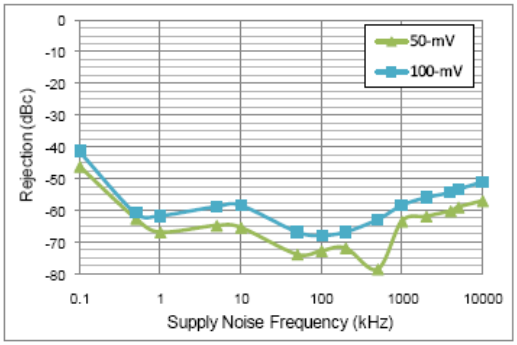
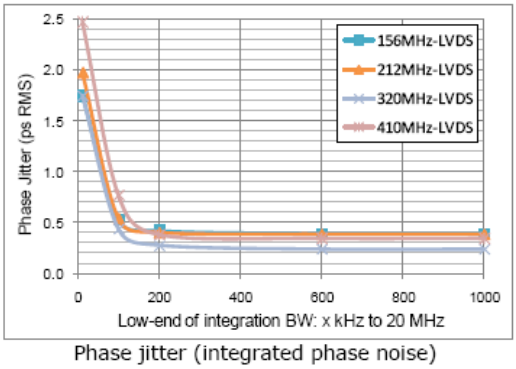


7.0 x 5.0 x 0.85mm

LVDS OUTPUT

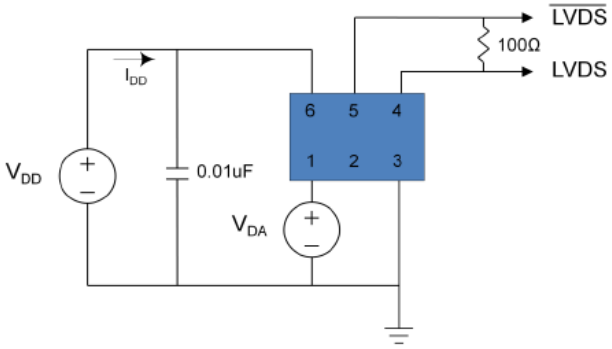


Power supply rejection ratio

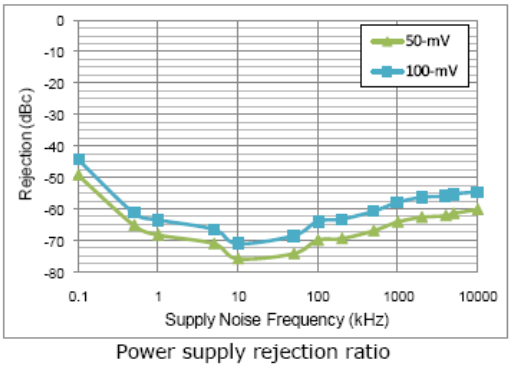


Phase jitter (integrated phase noise)

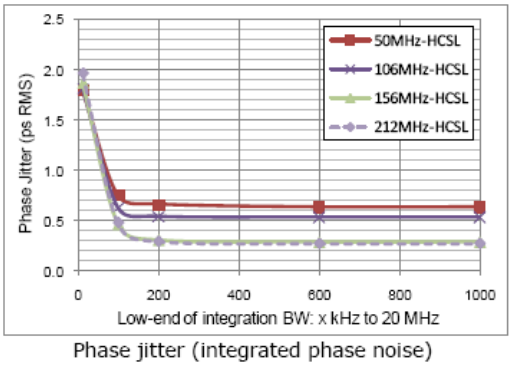
Test Circuit



HCSL OUTPUT

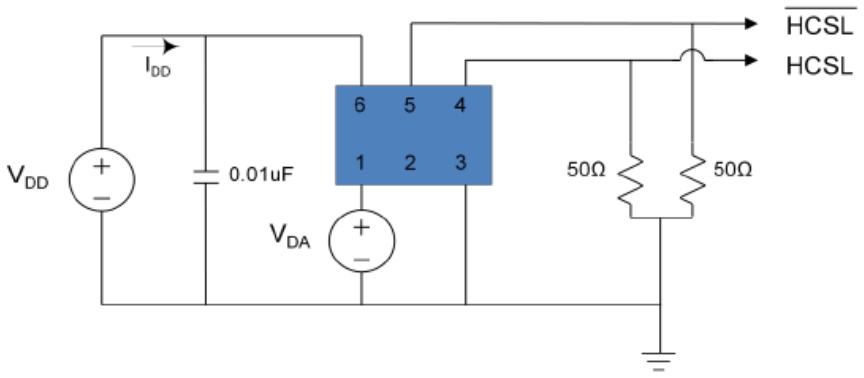


Power supply rejection ratio



Phase jitter (integrated phase noise)

Test Circuit



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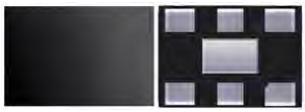
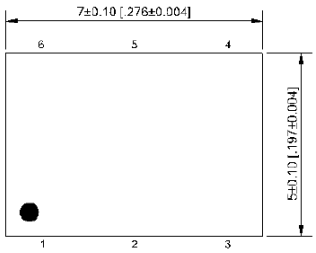
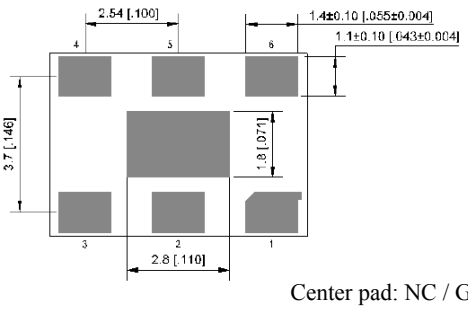


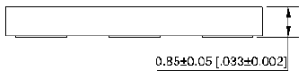
7.0 x 5.0 x 0.85mm

OUTLINE DIMENSIONS:



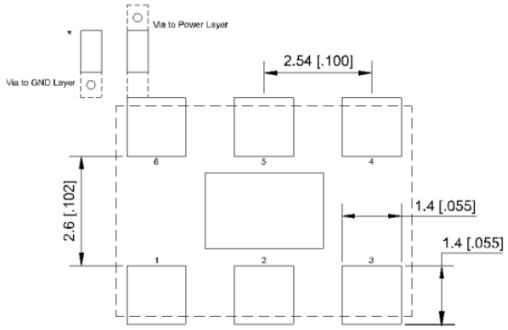


Center pad: NC / GND

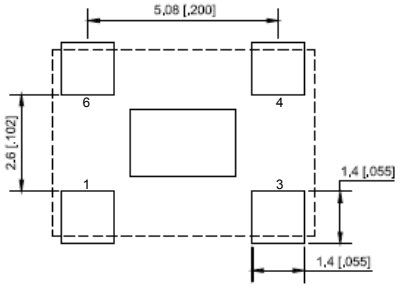


Pin #	Function
1	Tri-state
2	NC
3	GND
4	Output
5	NC (CMOS) Output (LVPECL, LVDS, HCSL)
6	Vdd

Note: Recommend using an approximately 0.01uF bypass capacitor between PIN 6 and 3.



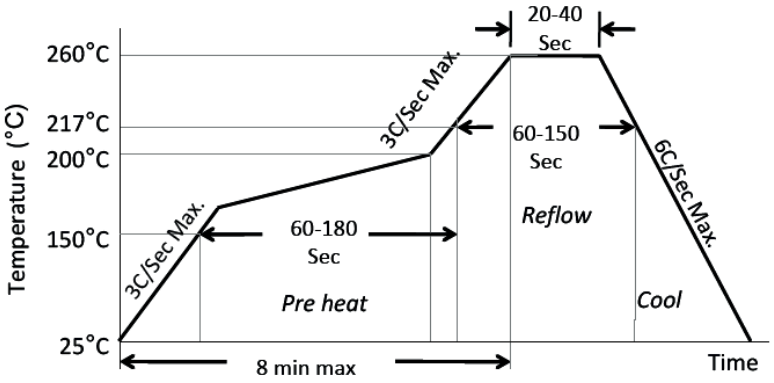
Recommended Land Pattern for LVPECL, LVDS, HCSL



Recommended Land Pattern for CMOS

Dimensions: mm (inches)

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.

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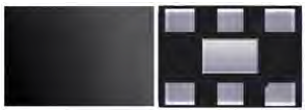
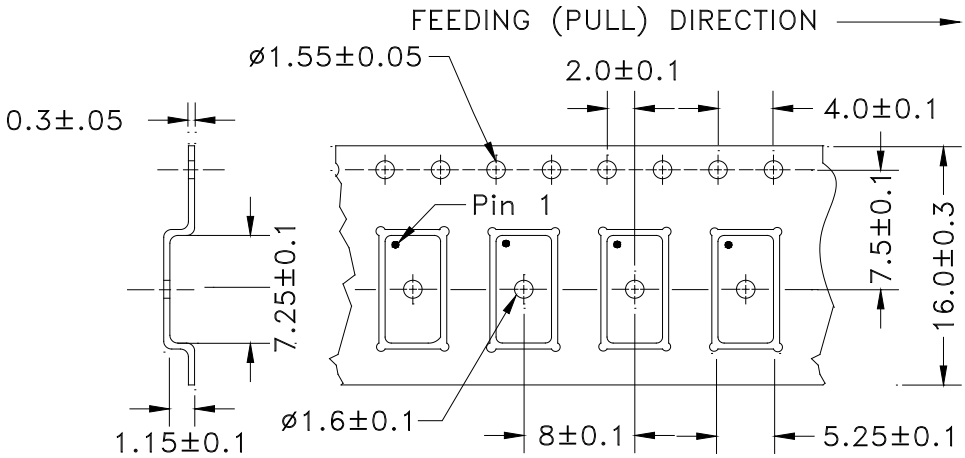
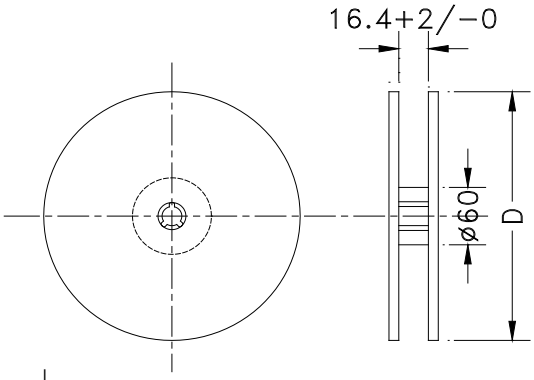


7.0 x 5.0 x 0.85mm

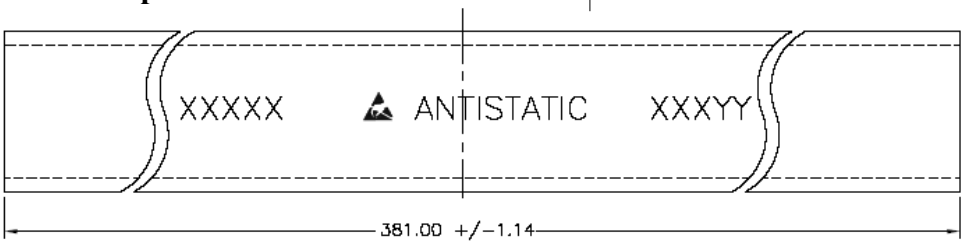
TAPE AND REEL:

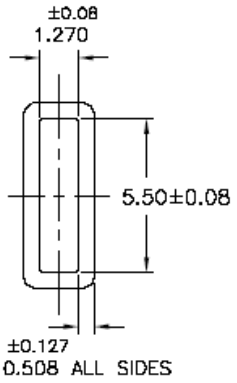
T= 1,000pcs/reel (D=180mm)
T3= 3,000pcs/reel (D=330mm)





Tube: 50 pcs/tube





Unit orientation in tube:

Dimensions: mm

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ABRACON:

ASVMPLV- ADAPTER-KIT ASVMPC-10.000MHZ-LR-T ASVMPC-10.000MHZ-LY-T3 ASVMPC-10.000MHZ-T3 ASVMPC-10.000MHZ-Z-T ASVMPC-100.000MHZ-LR-T ASVMPC-100.000MHZ-LY-T3 ASVMPC-100.000MHZ-T3 ASVMPC-100.000MHZ-Z-T ASVMPC-106.250MHZ-LR-T ASVMPC-106.250MHZ-LY-T3 ASVMPC-106.250MHZ-T3 ASVMPC-106.250MHZ-Z-T ASVMPC-11.0592MHZ-LR-T ASVMPC-11.0592MHZ-LY-T3 ASVMPC-11.0592MHZ-T3 ASVMPC-11.0592MHZ-Z-T ASVMPC-12.000MHZ-LR-T ASVMPC-12.000MHZ-LY-T3 ASVMPC-12.000MHZ-T3 ASVMPC-12.000MHZ-Z-T ASVMPC-12.288MHZ-LR-T ASVMPC-12.288MHZ-LY-T3 ASVMPC-12.288MHZ-T3 ASVMPC-12.288MHZ-Z-T ASVMPC-12.352MHZ-LR-T ASVMPC-12.352MHZ-LY-T3 ASVMPC-12.352MHZ-T3 ASVMPC-12.352MHZ-Z-T ASVMPC-12.500MHZ-LR-T ASVMPC-12.500MHZ-LY-T3 ASVMPC-12.500MHZ-T3 ASVMPC-12.500MHZ-Z-T ASVMPC-120.000MHZ-LR-T ASVMPC-120.000MHZ-LY-T3 ASVMPC-120.000MHZ-T3 ASVMPC-120.000MHZ-Z-T ASVMPC-125.000MHZ-LR-T ASVMPC-125.000MHZ-LY-T3 ASVMPC-125.000MHZ-T3 ASVMPC-125.000MHZ-Z-T ASVMPC-13.000MHZ-LR-T ASVMPC-13.000MHZ-LY-T3 ASVMPC-13.000MHZ-T3 ASVMPC-13.000MHZ-Z-T ASVMPC-133.333MHZ-LR-T ASVMPC-133.333MHZ-LY-T3 ASVMPC-133.333MHZ-T3 ASVMPC-133.333MHZ-Z-T ASVMPC-14.31818MHZ-LR-T ASVMPC-14.31818MHZ-LY-T3 ASVMPC-14.31818MHZ-T3 ASVMPC-14.31818MHZ-Z-T ASVMPC-14.7456MHZ-LR-T ASVMPC-14.7456MHZ-LY-T3 ASVMPC-14.7456MHZ-T3 ASVMPC-14.7456MHZ-Z-T ASVMPC-15.000MHZ-LR-T ASVMPC-15.000MHZ-LY-T3 ASVMPC-15.000MHZ-T3 ASVMPC-15.000MHZ-Z-T ASVMPC-150.000MHZ-LR-T ASVMPC-150.000MHZ-LY-T3 ASVMPC-150.000MHZ-T3 ASVMPC-150.000MHZ-Z-T ASVMPC-16.000MHZ-LR-T ASVMPC-16.000MHZ-LY-T3 ASVMPC-16.000MHZ-T3 ASVMPC-16.000MHZ-Z-T ASVMPC-16.384MHZ-LR-T ASVMPC-16.384MHZ-LY-T3 ASVMPC-16.384MHZ-T3 ASVMPC-16.384MHZ-Z-T ASVMPC-18.432MHZ-LR-T ASVMPC-18.432MHZ-LY-T3 ASVMPC-18.432MHZ-T3 ASVMPC-18.432MHZ-Z-T ASVMPC-19.440MHZ-LR-T ASVMPC-19.440MHZ-LY-T3 ASVMPC-19.440MHZ-T3 ASVMPC-19.440MHZ-Z-T ASVMPC-20.000MHZ-LR-T ASVMPC-20.000MHZ-LY-T3 ASVMPC-20.000MHZ-T3 ASVMPC-20.000MHZ-Z-T ASVMPC-24.000MHZ-LR-T ASVMPC-24.000MHZ-LY-T3 ASVMPC-24.000MHZ-T3 ASVMPC-24.000MHZ-Z-T ASVMPC-24.576MHZ-LR-T ASVMPC-24.576MHZ-LY-T3 ASVMPC-24.576MHZ-T3 ASVMPC-24.576MHZ-Z-T ASVMPC-25.000MHZ-LR-T ASVMPC-25.000MHZ-LY-T3 ASVMPC-25.000MHZ-T3 ASVMPC-25.000MHZ-Z-T ASVMPC-26.000MHZ-LR-T ASVMPC-26.000MHZ-LY-T3 ASVMPC-26.000MHZ-T3