CDA High-Speed Fixed Delay Lines

The CDA family of high-speed fixed delay line products is available in a surface-mount package. They are also available for a variety of logic types and in either standard or custom specifications.

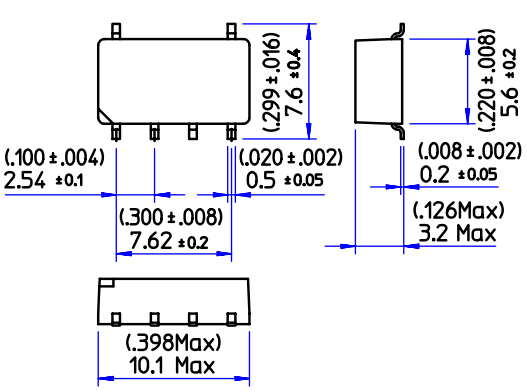
FEATURES

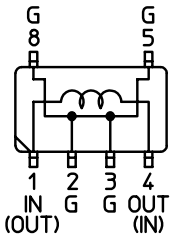
- Miniaturized high-speed fixed delay lines that combine ELMEC's high-density delay line elements in a surface-mount package.
- Suitable for use with a variety of logic elements including the ECLinPS, ECL 100KH, 10K series as well as TTL FAST, CMOS FACT and analog circuits.
- The also can be ordered in units of 500 pieces in "Tape & Reel" packaging.

COMMON SPECIFICATIONS

Waveform Distortion:	Overshoot/preshoot under ±20%
Temperature Coefficent:	0~150ppm/°C
Insulation Resistance:	DC50V, over 100MΩ
Durable Voltage:	DC50V, 1 minute
Operating Temperature Range:	-40°C to +85°C
Storage Temperature Range:	-40°C to +120°C

PACKAGE DIMENSIONS & PIN CONFIGURATION

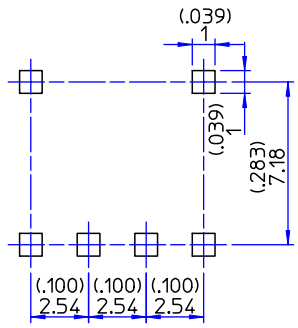




Unit:mm (inch)

SUGGESTED LAND PATTERN

Unit:mm (inch)



Note: Published specifications are subject to change without prior notice.

CDA High-Speed Fixed Delay Lines

SPECIFICATIONS

Part Number	Impedance	Delay Time	Rise Time (20-80% Max)	-3dB Passband (Minimum)	DC Resistance
*CDA0005	50Ω ±10%	50ps±50ps	100ps	3GHz	0.5Ω Max.
*CDA0105		100ps±50ps	150ps	2.0GHz	1.0Ω Max.
*CDA0205		200ps±50ps			
*CDA0305		300ps±50ps			
*CDA0405		400ps±50ps			
*CDA0505		500ps±50ps			
*CDA0605		600ps±50ps	200ps	1.5GHz	1.5Ω Max.
*CDA0705		700ps±50ps			
*CDA0805		800ps±50ps			
*CDA0905		900ps±50ps			
*CDA1005		1.0ns±50ps			
*CDA1105		1.1ns±50ps	250ps	1.0GHz	2.0Ω Max.
*CDA1205		1.2ns±50ps			
*CDA1305		1.3ns±50ps			
*CDA1405		1.4ns±50ps			
*CDA1505		1.5ns±50ps			
*CDA1605		1.6ns±50ps	300ps	800MHz	2.5Ω Max.
*CDA1705		1.7ns±50ps			
*CDA1805		1.8ns±50ps			
*CDA1905		1.9ns±50ps			
*CDA2005A		2.0ns±50ps			
*CDA2105		2.1ns±50ps	350ps	700MHz	3.0Ω Max.
*CDA2205		2.2ns±50ps			
*CDA2305		2.3ns±50ps			
*CDA2405		2.4ns±50ps			
*CDA2505A		2.5ns±50ps			
*CDA2605		2.6ns±50ps	400ps	600MHz	3.5Ω Max.
*CDA2705		2.7ns±50ps			
*CDA2805		2.8ns±50ps			
*CDA2905		2.9ns±50ps			
*CDA3005A		3.0ns+100ps/-50ps			
*CDA3505A		3.5ns±100ps	450ps	550MHz	4.0Ω Max.
CDA3505		3.5ns±0.25ns	700ps	500MHz	1.0Ω Max.
CDA4005		4.0ns±0.3ns	700ps		1.0Ω Max.
CDA4505		4.5ns±0.3ns	725ps	440MHz	
CDA5005		5.0ns±0.3ns	750ps	400MHz	
CDA5505		5.5ns±0.3ns	825ps	360MHz	2.0Ω Max.
CDA6005		6.0ns±0.3ns	900ps	330MHz	
CDA6505		6.5ns±0.4ns	975ps	300MHz	
CDA7005		7.0ns±0.4ns	1.1ns	285MHz	
CDA7505		7.5ns±0.4ns	1.2ns	250MHz	
CDA8005		8.0ns±0.4ns			
CDA8505		8.5ns±0.5ns	1.3ns	235MHz	
CDA9005		9.0ns±0.5ns	1.4ns	220MHz	
CDA9505		9.5ns±0.5ns	1.5ns	200MHz	

Note: Product numbers with an asterisk (*) are distributed constant type delay lines.

CDA High-Speed Fixed Delay Lines

SPECIFICATIONS

Part Number	Impedance	Delay Time	Rise Time (20%-80% Max)	-3dB Passband (Minimum)	DC Resistance
CDA10005	50Ω ±10%	10.0ns±0.5ns	1.5ns	200MHz	2.0Ω Max.
CDA10505		10.5ns±0.6ns	1.6ns	190MHz	3.0Ω Max.
CDA11005		11.0ns±0.6ns	1.7ns	180MHz	
CDA11505		11.5ns±0.6ns	1.8ns	165MHz	
CDA12005		12.0ns±0.6ns			
CDA12505		12.5ns±0.7ns	1.9ns	160MHz	
CDA13005		13.0ns±0.7ns	2.0ns	150MHz	
CDA13505		13.5ns±0.7ns	2.1ns	140MHz	
CDA14005		14.0ns±0.7ns			
CDA14505		14.5ns±0.8ns	2.2ns	135MHz	
CDA15005		15.0ns±0.8ns	2.3ns	130MHz	
CDA16005		16.0ns±0.8ns	2.4ns	125MHz	5.0Ω Max.
CDA17005		17.0ns±0.9ns	2.6ns	115MHz	
CDA18005		18.0ns±0.9ns	2.8ns	110MHz	
CDA19005		19.0ns±1.0ns	3.0ns	105MHz	
CDA20005		20.0ns±1.0ns	3.2ns	100MHz	
CDA22005		22.0ns±1.1ns	3.5ns	90MHz	6.0Ω Max.
CDA25005		25.0ns±1.3ns	4.0ns	80MHz	
CDA27005		27.0ns±1.4ns	4.3ns	70MHz	
CDA30005		30.0ns±1.5ns	4.8ns	60MHz	

CDA High-Speed Fixed Delay Lines

SPECIFICATIONS

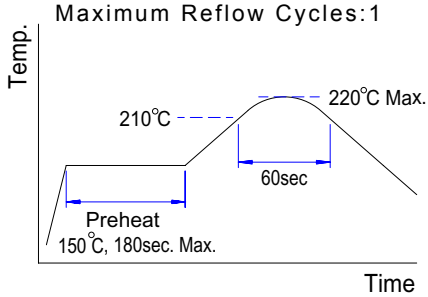
Part Number	Impedance	Delay Time	Rise Time (20%-80% Max)	-3dB Passband (Minimum)	DC Resistance
*CDA0010	100Ω±10%	50ps±25ps	200ps	1GHz	0.5Ω Max.
*CDA0510		500ps±100ps			1.0Ω Max.
CDA1010		1.0ns±100ps	300ps	900MHz	
CDA1510		1.5ns±0.15ns	550ps	700MHz	
CDA2010		2.0ns±0.2ns	600ps	600MHz	
CDA2510		2.5ns±0.2ns	700ps	500MHz	2.0Ω Max.
CDA3010		3.0ns±0.2ns			
CDA3510		3.5ns±0.25ns			
CDA4010		4.0ns±0.3ns	725ps	450MHz	
CDA4510		4.5ns±0.3ns	750ps	400MHz	
CDA5010		5.0ns±0.3ns	800ps	360MHz	
CDA5510		5.5ns±0.3ns	880ps	325MHz	3.0Ω Max.
CDA6010		6.0ns±0.3ns	960ps	300MHz	
CDA6510		6.5ns±0.4ns	1.0ns	275MHz	
CDA7010		7.0ns±0.4ns	1.1ns	255MHz	
CDA7510		7.5ns±0.4ns	1.2ns	240MHz	
CDA8010		8.0ns±0.4ns	1.3ns	225MHz	5.0Ω Max.
CDA8510		8.5ns±0.5ns	1.4ns	210MHz	
CDA9010		9.0ns±0.5ns	1.5ns	190MHz	
CDA9510		9.5ns±0.5ns			
CDA10010		10.0ns±0.5ns	1.6ns	180MHz	
CDA10510		10.5ns±0.6ns	1.7ns	170MHz	7.0Ω Max.
CDA11010		11.0ns±0.6ns	1.8ns	160MHz	
CDA11510		11.5ns±0.6ns	1.9ns	150MHz	
CDA12010		12.0ns±0.6ns			
CDA12510		12.5ns±0.7ns	2.0ns	140MHz	
CDA13010		13.0ns±0.7ns	2.1ns	135MHz	
CDA13510		13.5ns±0.7ns	2.2ns	130MHz	
CDA14010		14.0ns±0.7ns	2.3ns	125MHz	
CDA14510		14.5ns±0.8ns			9.0Ω Max.
CDA15010		15.0ns±0.8ns	2.4ns	120MHz	
CDA16010		16.0ns±0.8ns	2.6ns	110MHz	11.0Ω Max.
CDA17010		17.0ns±0.9ns	2.7ns	105MHz	
CDA18010		18.0ns±0.9ns	2.9ns	100MHz	
CDA19010		19.0ns±1.0ns	3.1ns	95MHz	
CDA20010		20.0ns±1.0ns	3.2ns	90MHz	

Note: Product numbers with an asterisk (*) are distributed constant type delay lines.

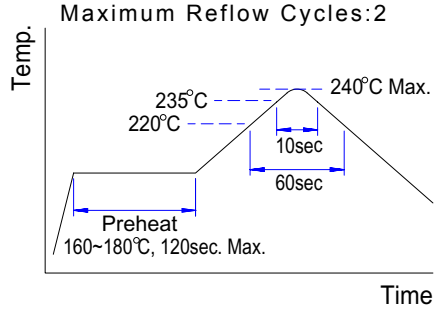
REFLOW SOLDERING CONDITIONS

ELMEC does not guarantee MSL Standards Classification. Please bake all components prior to reflow.
Baking Conditions:120°C, 24 hours; or 80°C, 100 hours
However, because baking of T&R parts is not possible, transferring to trays is recommended prior to baking.

Non-RoHS-compliant components
Maximum Reflow Cycles:1



RoHS-compliant components
Maximum Reflow Cycles:2



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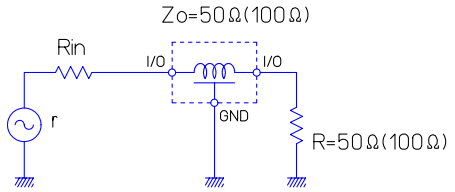
CDA High-Speed Fixed Delay Lines

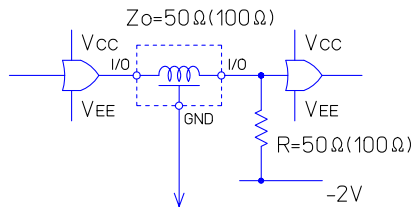
TYPICAL APPLICATIONS AND TERMINATION METHODS

(1) Analog circuit



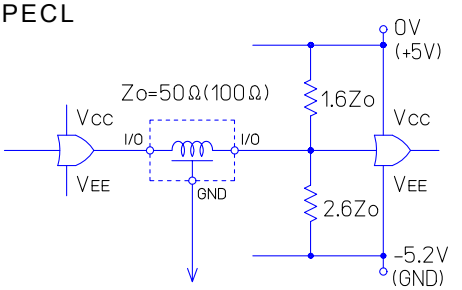
r :Impedance of signal source
Rin:Input adjustment resistance
Zo :Characteristics impedance of internal Elements (=Output impedance)
Ro :Internal adjustment resistance (=Zo)
2(r+Rin)=Zo=R

(2) ECL (-2V termination line used)



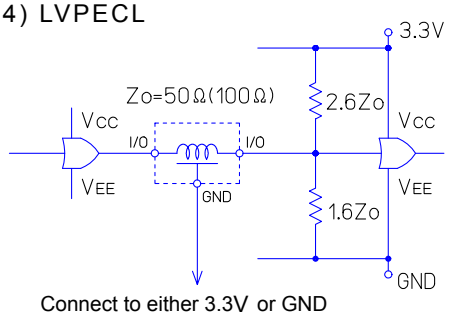
Connect to one of the V_{CC}, V_{EE} or -2V lines

(3) PECL



Connect to either V_{CC} or V_{EE} lines

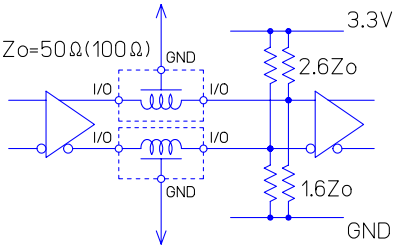
(4) LVPECL



Connect to either 3.3V or GND

(5) LVPECL Differential

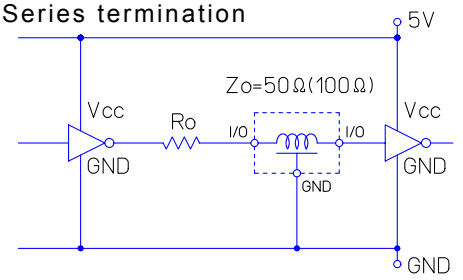
Connect to either 3.3V or GND



Connect to either 3.3V or GND

(6) TTL(FAST), CMOS(FACT)

Series termination



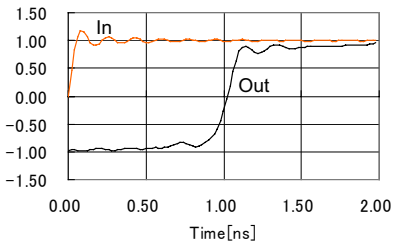
Ro should be adjusted to a value near Zo.

CDA High-Speed Fixed Delay Lines

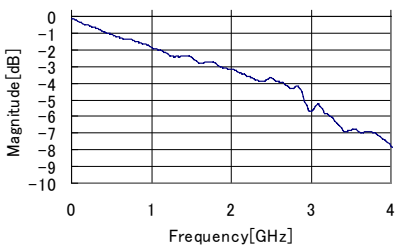
TYPICAL CHARACTERISTICS (1)

(1) CDA1005

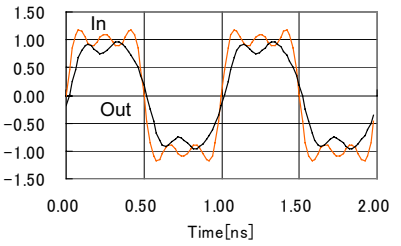
Output waveform (Step function)



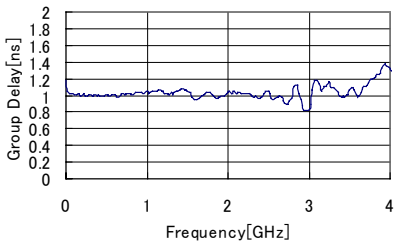
Amplitude / Frequency



Output waveform (1GHz Clock)

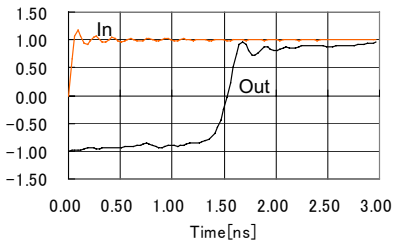


Group Delay

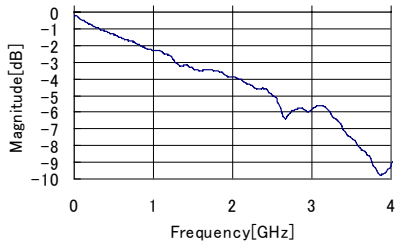


(2) CDA1505

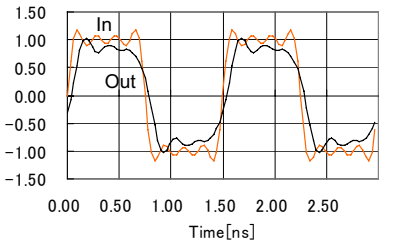
Output waveform (Step function)



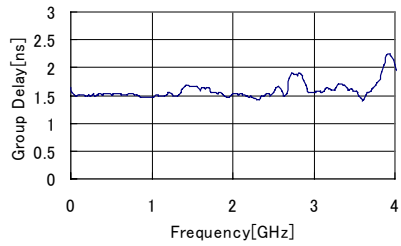
Amplitude / Frequency



Output waveform (667MHz Clock)



Group Delay

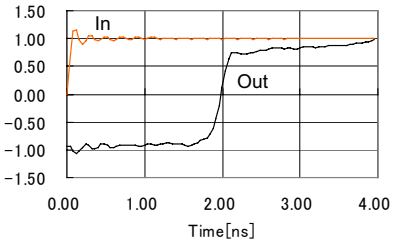


CDA High-Speed Fixed Delay Lines

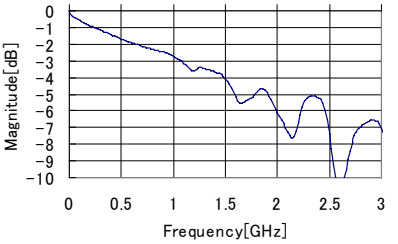
TYPICAL CHARACTERISTICS (2)

(3) CDA2005A

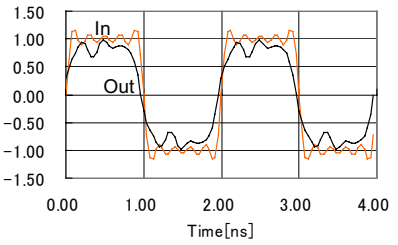
Output waveform (Step function)



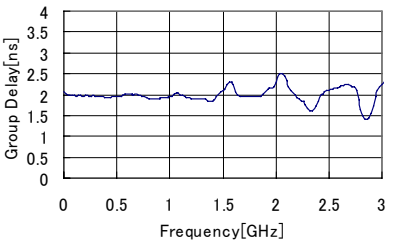
Amplitude / Frequency



Output waveform (500MHz Clock)

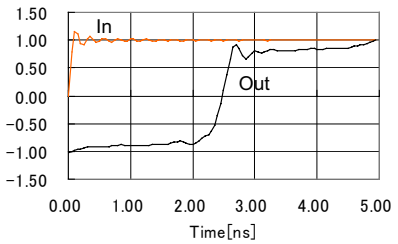


Group Delay

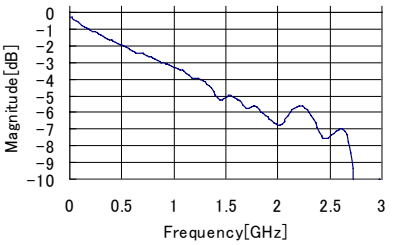


(4) CDA2505A

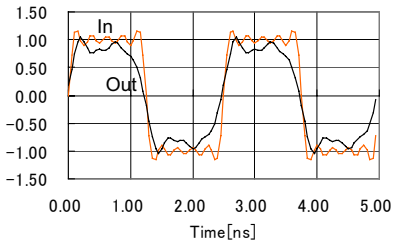
Output waveform (Step function)



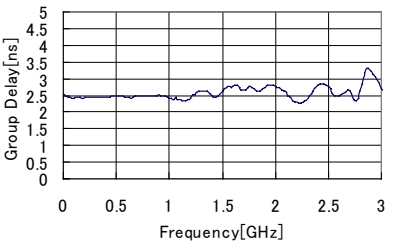
Amplitude / Frequency



Output waveform (400MHz Clock)



Group Delay

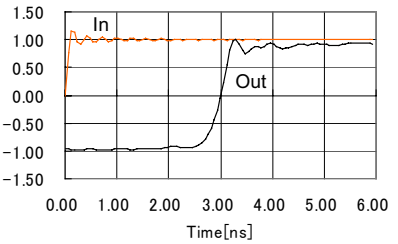


CDA High-Speed Fixed Delay Lines

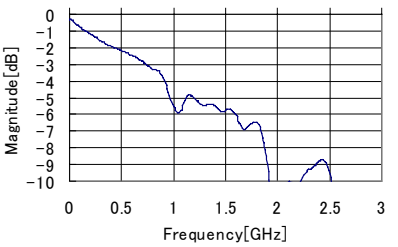
TYPICAL CHARACTERISTICS (3)

(5) CDA3005A

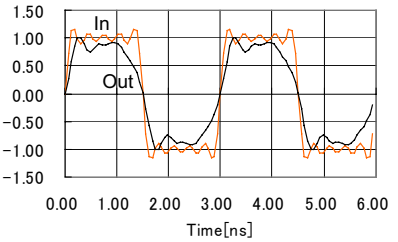
Output waveform (Step function)



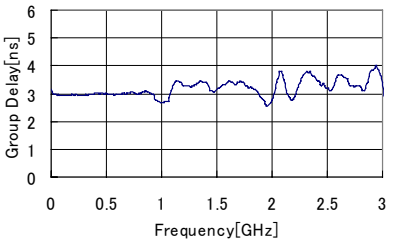
Amplitude / Frequency



Output waveform (333MHz Clock)

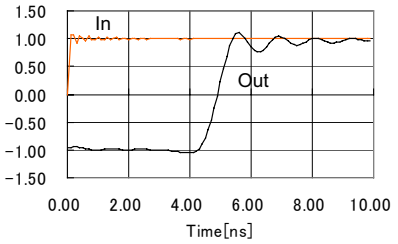


Group Delay

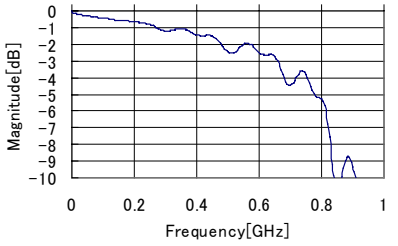


(6) CDA5005

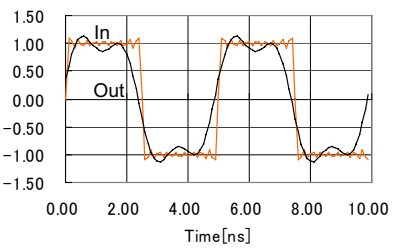
Output waveform (Step function)



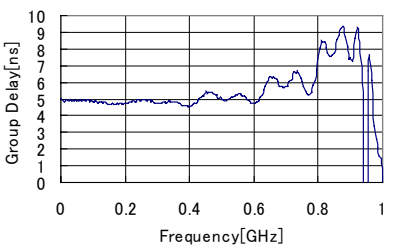
Amplitude / Frequency



Output waveform (200MHz Clock)



Group Delay

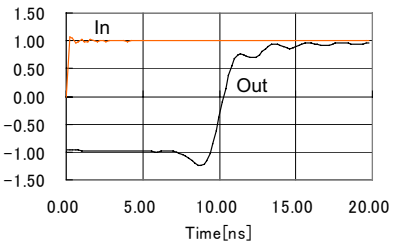


CDA High-Speed Fixed Delay Lines

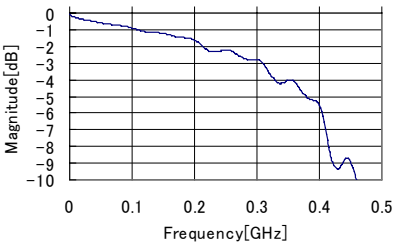
TYPICAL CHARACTERISTICS (4)

(7) CDA10005

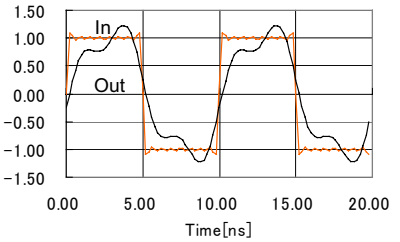
Output waveform (Step function)



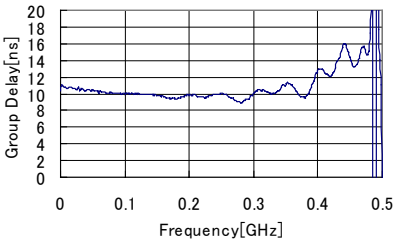
Amplitude / Frequency



Output waveform (100MHz Clock)



Group Delay



RoHS Compliance Status

1. Compliance Status

RoHS-compliant components are available. However, if RoHS-compliant components are not specified at the time of order, non-compliant stock items may be supplied until depleted. Also, as high-temperature solder containing over 85% lead is used internally, which is outside the RoHS specifications, we qualify these as RoHS-compliant components.

2. Differentiating Compliant and Non-compliant Components

Compliant and Non-compliant Components will be differentiated by Lot Numbers.
Non-compliant Components:2-digit year/month code
Compliant Components DC Type:S+2-digit year/month code (3-digit code)
Compliant Components LC Type:R+2-digit year/month code (3-digit code)

3. Terminal Plating

Non-compliant Components: Base: 99% Ni/1% B, 1.2~1.6μm
External: 60% Sn/40% Pb, over 5μm
Compliant Components DC Type: Base: 100% Ni, 0.2~0.5μm
External: 100% Sn, 5~10μm
Compliant Components LC Type: Base: 99% Ni/1% B,1.2~1.6μm
External: 100% Sn, over 5μm