To our customers,

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April 1st, 2010
Renesas Electronics Corporation

EOL Product

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HD29026A/HD29027

Dual CCD Drivers

REJ03D0302–0200Z
(Previous ADE-205-001 (Z))
Rev.2.00
Jul.16.2004

Description

HD29026A and HD29027 include two on-chip drivers on a single chip, making it the optimal choice as a CCD driver. Operation is provided with a TTL level input, and output current of 1 A is available for both sink and source.

Features

- High speed output rise and fall (20 ns typ) at load capacitance (C_L) of 1000 pF
- Direct drive of input block by TTL eliminates the need for external components
- Output swing voltage of 12 V; output current of 1 A available for both sink and source
- Output wave cross point 50% typ

- Ordering Information

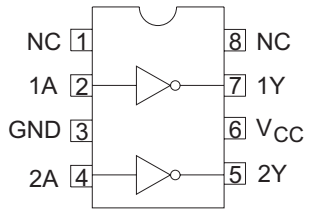
Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD29026AFPEL	SOP-8 pin (JEITA)	FP-8DGV	FP	EL (2,500 pcs/reel)
HD29027FPEL	SOP-8 pin (JEITA)	FP-8DGV	FP	EL (2,500 pcs/reel)

Function Table

Input A	Output Y
H	L
L	H

Note: H: High level
L: Low level

Pin Arrangement



EOL Product

Absolute Maximum Ratings

Item		Symbol	Rating	Unit
Supply voltage	HD29026A	V_{CC}*1	15	V
	HD29027		10	
Input voltage		VI	7	V
Output peak current		$I_{O(peak)}$	±1	A
Operating temperature range		Ta	–20 to +75	°C
Storage temperature range		Tstg	–65 to +150	°C
Junction temperature		Tj	150	°C
Total dissipation		P_T*2	0.735	W

Notes: 1. If no value is specified, the voltage is defined by the GND pin.
2. Value when Ta = 25°C. Heat dissipation is required for large-capacitance, high-frequency drivers, so derating of 5.9 mW/°C are required.

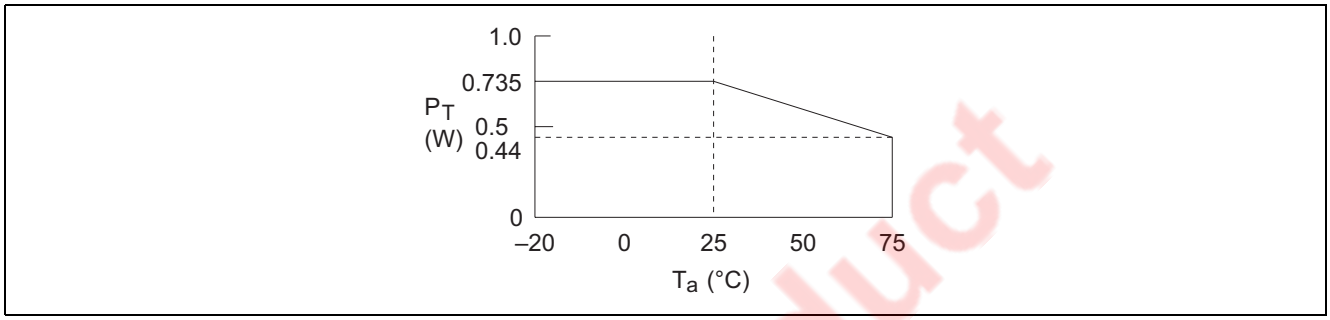


Figure 1 Package Derating Curves

Recommended Operating Conditions

Item		Symbol	Min	Typ	Max	Unit
Supply voltage	HD29026A	V_{CC}	8	12	13	V
	HD29027	V_{CC}	4.5	6	8	
Operating temperature		Ta	–20	25	75	°C

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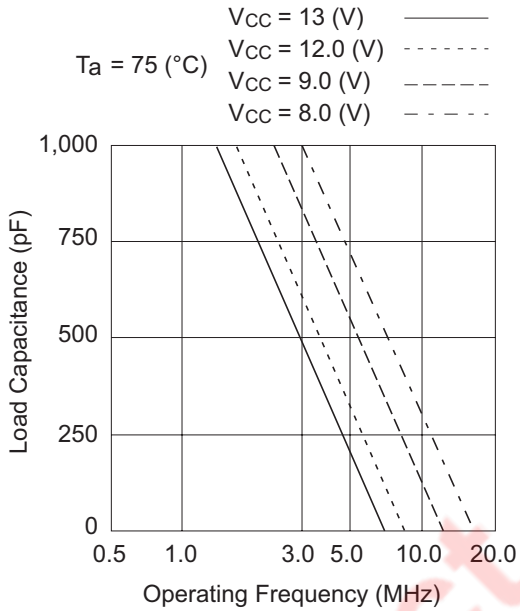
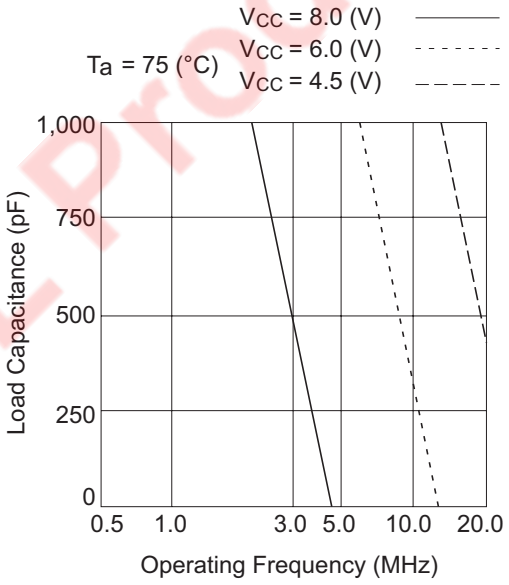
Recommonded Operating Frequency Area

HD29026A



HD29027



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Electrical Characteristics (Ta = –20 to +75°C)

Item		Symbol	Min	Typ	Max	Unit	Test Conditions
Input voltage		V_{IH}	2.0	—	—	V	
		V_{IL}	—	—	0.6		
Output voltage		V_{OH}	V_{CC}–1	—	—	V	V_{IL} = 0.6 V, I_{OH} = –1 mA
		V_{OL}	—	—	0.5		V_{IH} = 2.0 V, I_{OL} = 1 mA
Input current		I_{IH}	—	—	20	µA	V_I = 2.7 V
	HD29026A	I_{IL}	—	—	–100		V_I = 0.4 V
	HD29027		—	—	–200		
Supply current	HD29026A	I_{CCH}	—	—	12	mA	
	HD29027		—	—	20		
	HD29026A	I_{CCL}	—	—	20		
	HD29027		—	—	30		
Input current		I_I	—	—	100	µA	V_I = 7 V
Input clamp voltage		V_{IK}	—	—	–1.5	V	I_{IN} = –18 mA

Note: HD29026A: V_{CC} = 8 to 13 V
HD29027: V_{CC} = 4.5 to 8 V

Switching Characteristics (Ta = 25°C)

Item		Symbol	Min	Typ	Max	Unit	Test Conditions	
Fall propagation delay time	HD29026A	t_{PHL}	—	16	20	ns	C_L = 1000 pF	V_{CC} = 8 V
			—	11	15			V_{CC} = 12 V
	HD29027		—	10	15			V_{CC} = 6 V
Rise propagation delay time	HD29026A	t_{PLH}	—	18	25	ns	C_L = 1000 pF	V_{CC} = 8 V
			—	13	20			V_{CC} = 12 V
	HD29027		—	10	15			V_{CC} = 6 V
Fall (transition) time	HD29026A	t_{THL}	—	17	21	ns	C_L = 250 pF	V_{CC} = 8 V
			—	12	16			V_{CC} = 12 V
	HD29027		—	9	14			V_{CC} = 6 V
	HD29026A		—	20	23		CL = 500 pF	V_{CC} = 8 V
			—	15	18			V_{CC} = 12 V
	HD29027		—	12	17			V_{CC} = 6 V
	HD29026A		—	25	40		C_L = 1000 pF	V_{CC} = 8 V
			—	20	35			V_{CC} = 12 V
	HD29027		—	20	25			V_{CC} = 6 V
Rise (transition) time	HD29026A	t_{TLH}	—	15	20	ns	CL = 250 pF	V_{CC} = 8 V
			—	10	15			V_{CC} = 12 V
	HD29027		—	9	14			V_{CC} = 6 V
	HD29026A		—	21	25		C_L = 500 pF	V_{CC} = 8 V
			—	16	20			V_{CC} = 12 V
	HD29027		—	12	17			V_{CC} = 6 V
	HD29026A		—	22	30		C_L = 1000 pF	V_{CC} = 8 V
			—	17	25			V_{CC} = 12 V
	HD29027		—	20	25			V_{CC} = 6 V

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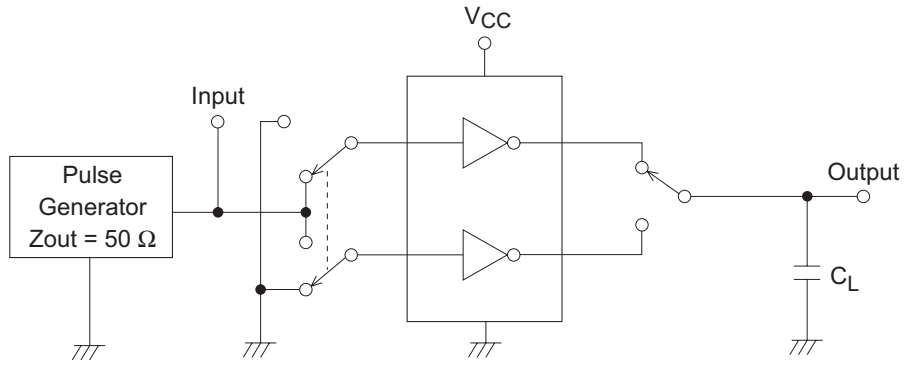
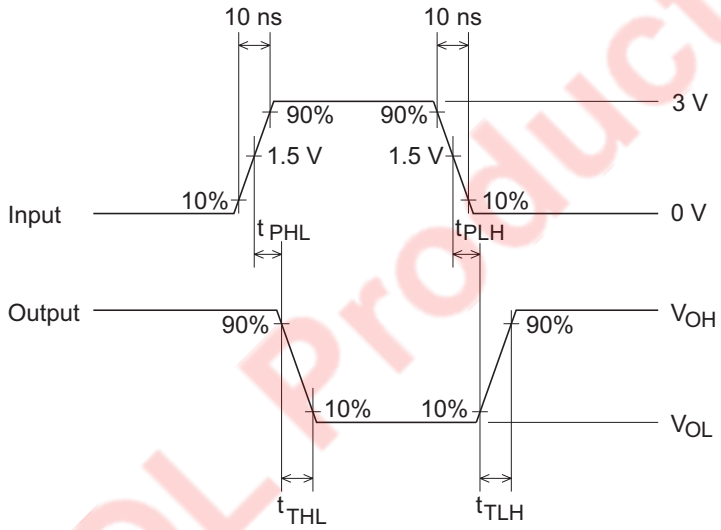
Switching Time Test Method

Test circuit



Note: C_L includes stray capacitance of probe and other tools

Waveforms



Note: Input waveform: f = 1 MHz, duty cycle = 50%

EOL Product

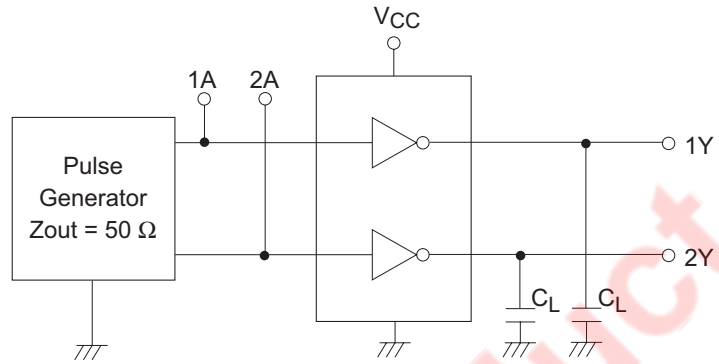
Output Timing Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output wave cross point	V_X	30	50	70	%	C_L = 250 pF
		30	50	70		C_L = 500 pF
		30	50	70		C_L = 1000 pF

HD29027; V_{CC} = 6 V

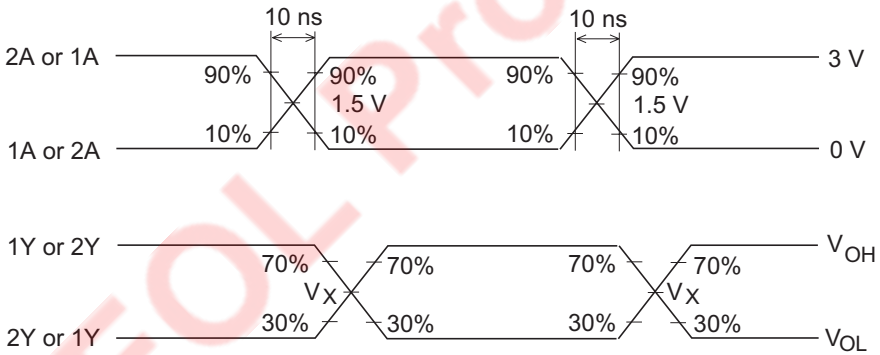
Output Timing Characteristics Test Method (HD29027)

Test circuit



Note: C_L includes stray capacitance of probe and other tools

Waveform

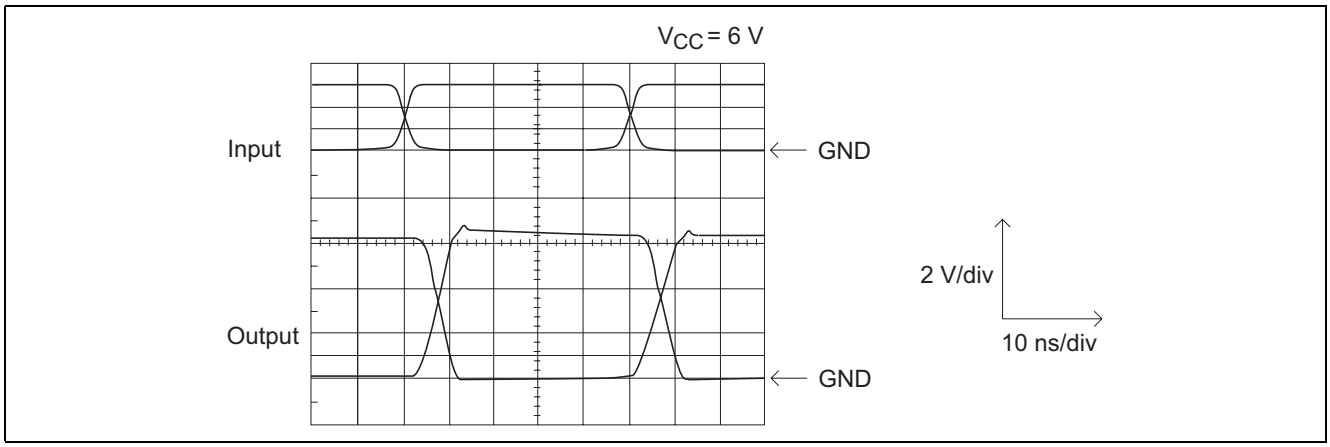


Note: Input waveform: f = 1 MHz, duty cycle = 50%

EOL Product

Output Timing Characteristics

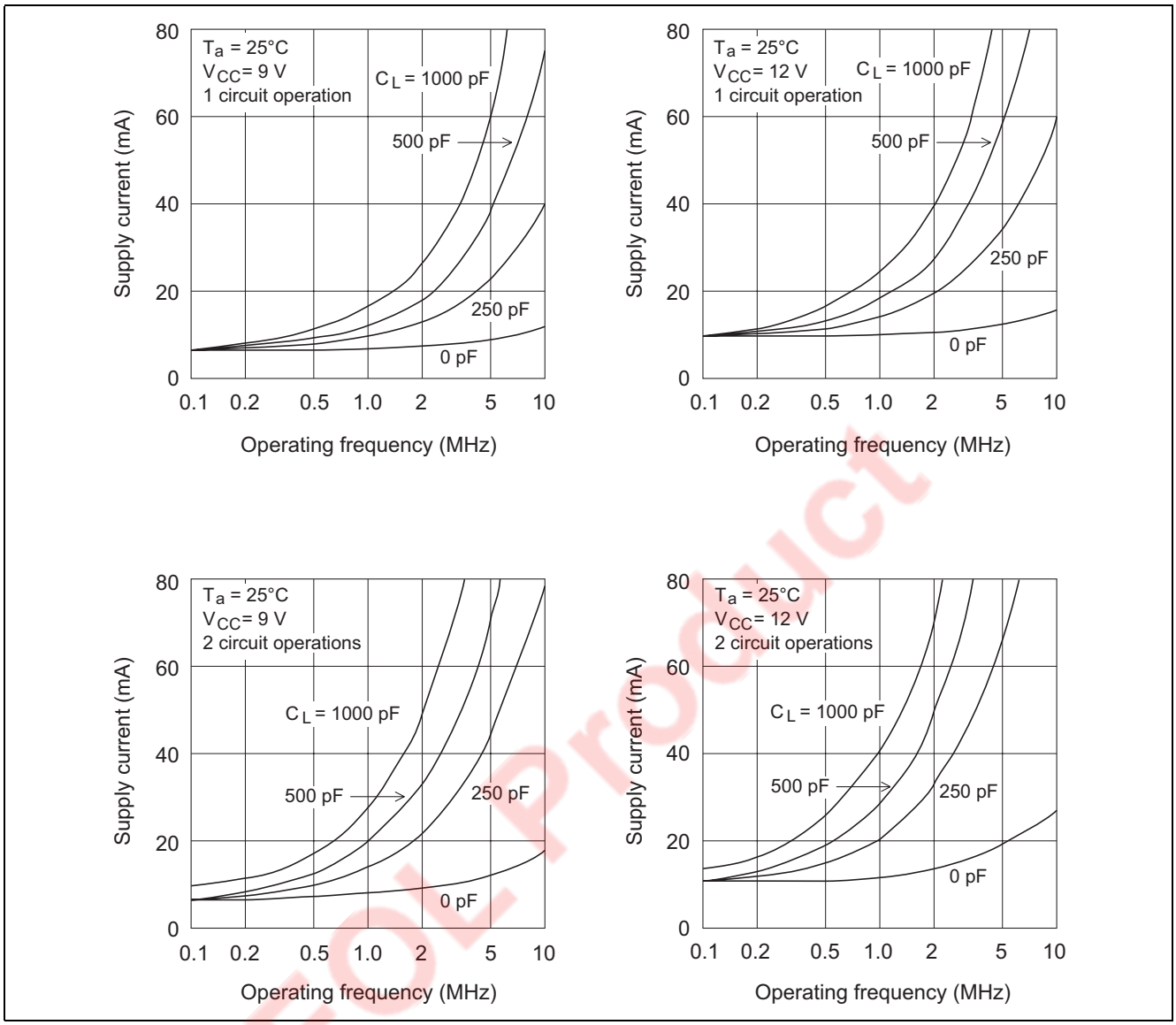
HD29027



EOL Product

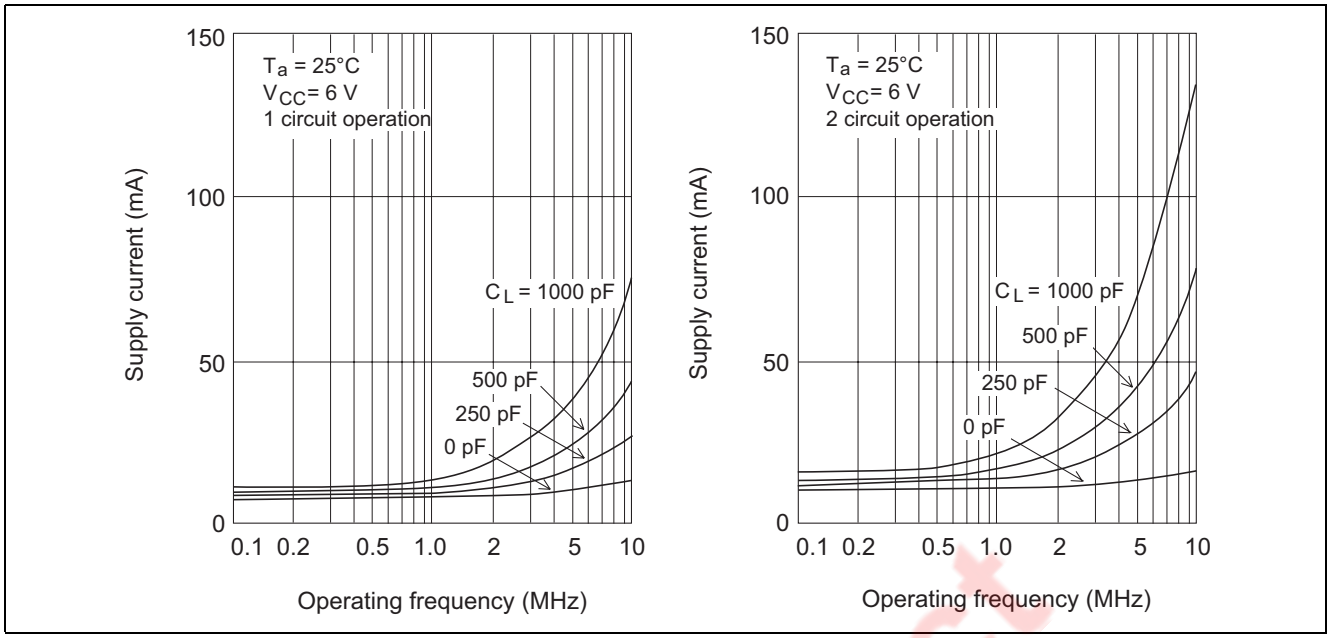
Typical Characteristic Curves

Supply current vs. operating frequency (HD29026A)



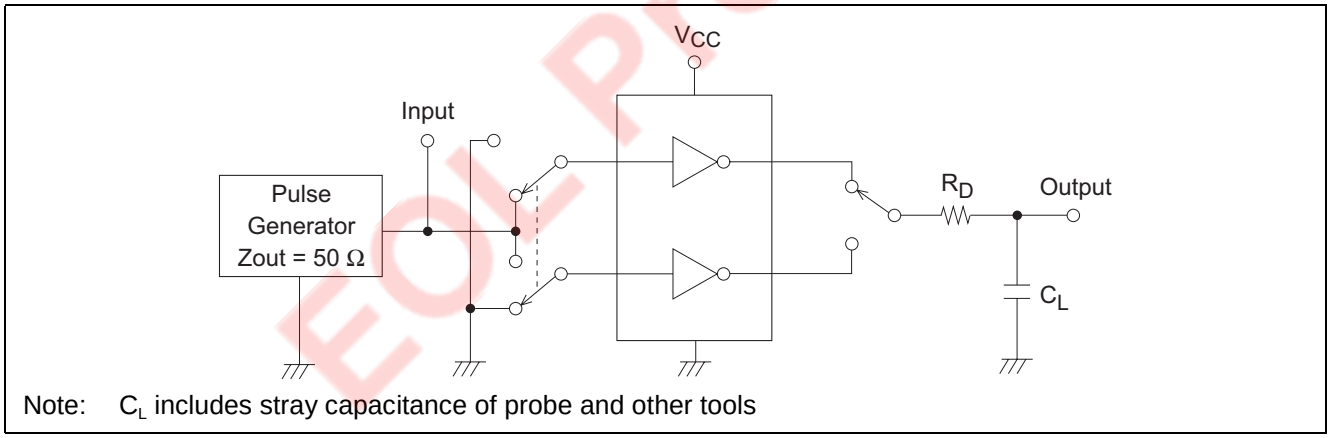
EOL Product

Supply current vs. operating frequency (HD29027)



Cautions (HD29026A only)

The short output rise and fall time, as well as the large output amplitude of this product tends to generate overshooting and undershooting. The connection of 5 to 15 Ω damping resistance (R_D) to the output as illustrated in figure 2 serves to increase the output rise and fall time, making it possible to reduce the chance of overshooting and undershooting. Figure 3 shows the characteristics that result for a damping resistance (R_D) of 10 Ω.

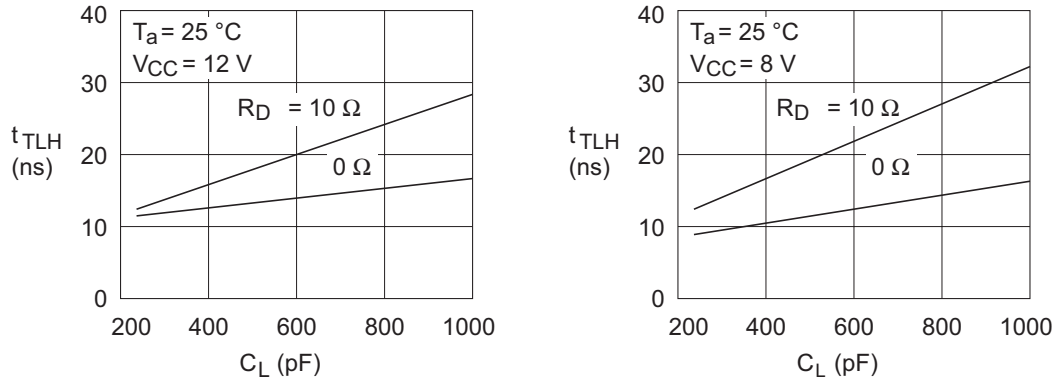


Note: C_L includes stray capacitance of probe and other tools

Figure 2

EOL Product

t_{TLH} vs C_L



t_{THL} vs C_L

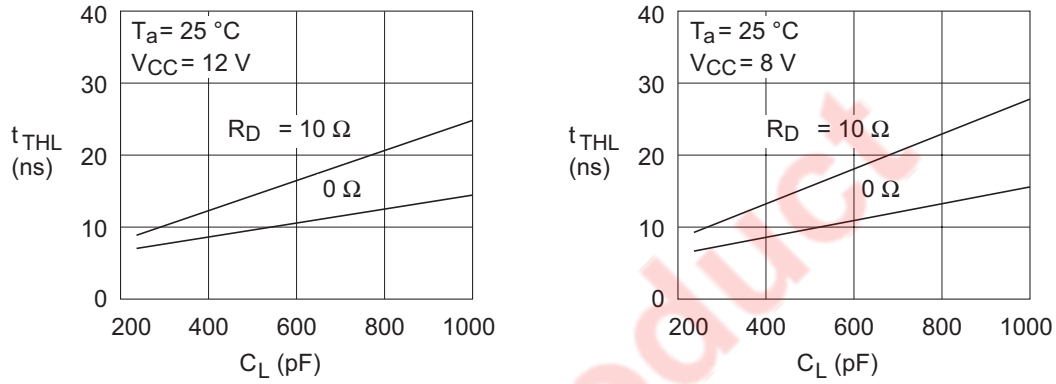
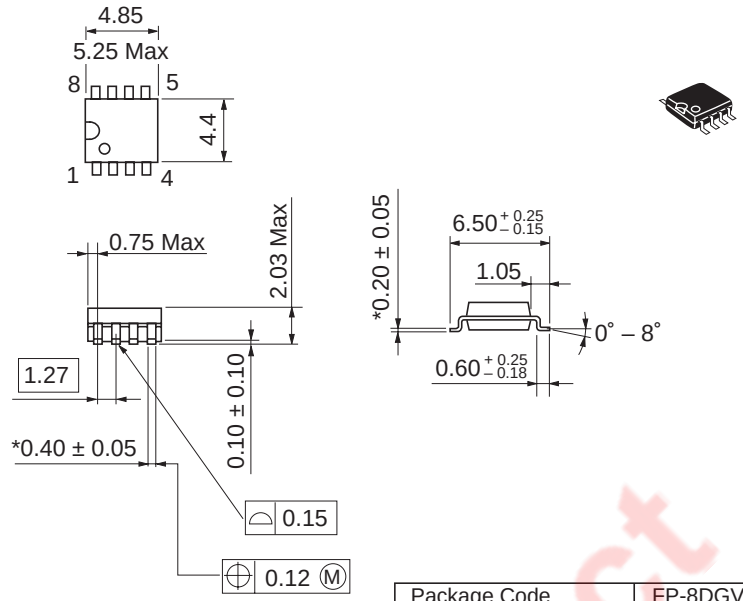


Figure 3

EOL Product

Package Dimensions

Unit: mm



*This dimension include Pd plating

Package Code	FP-8DGV
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.10 g

EOL Product

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