

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

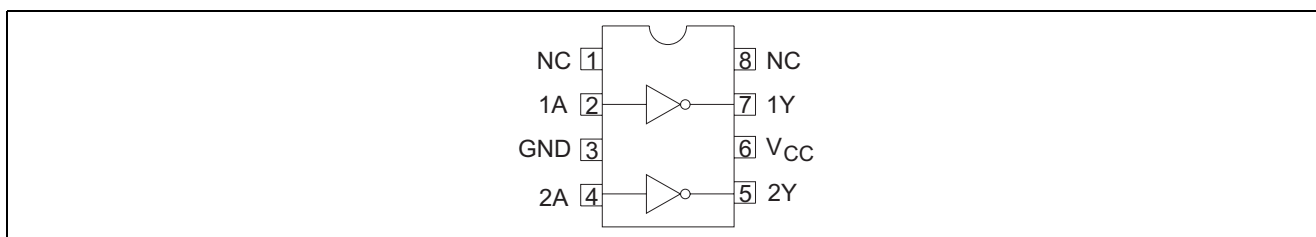
Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD29026AFPEL	SOP-8 pin (JEITA)	FP-8DGV	FP	EL (2,500 pcs/reel)
HD29027FPEL	SOP-8 pin (JEITA)	FP-8DGV	FP	EL (2,500 pcs/reel)

Function Table

Input A	Output Y
H	L
L	H

Note: H: High level
L: Low level

Pin Arrangement



Absolute Maximum Ratings

Item		Symbol	Rating	Unit
Supply voltage	HD29026A	V_{CC}^{*1}	15	V
	HD29027		10	
Input voltage		V_I	7	V
Output peak current		$I_{O(peak)}$	± 1	A
Operating temperature range		T_a	-20 to +75	°C
Storage temperature range		T_{stg}	-65 to +150	°C
Junction temperature		T_J	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 $T_a = 25^\circ\text{C}$. Heat dissipation is required for large-capacitance, high-frequency drivers, so derating of 5.9 mW/°C are required.

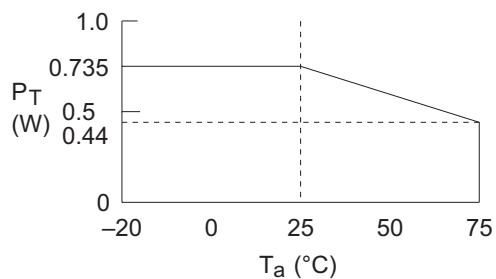


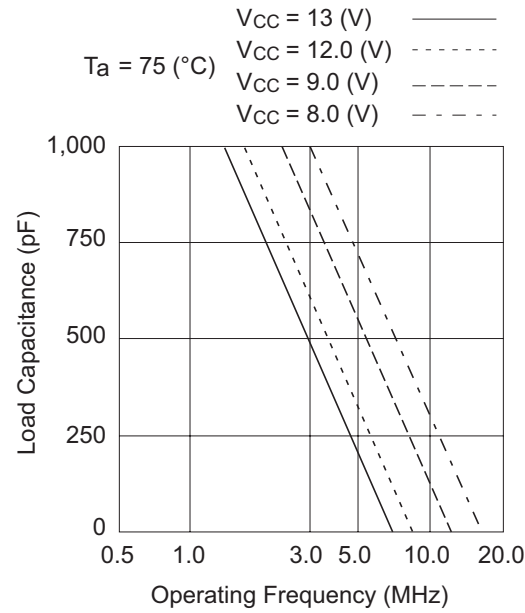
Figure 1 Package Derating Curves

Recommended Operating Conditions

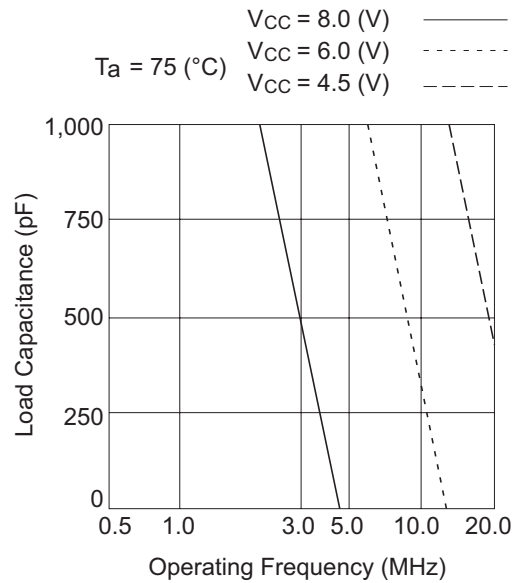
Item		Symbol	Min	Typ	Max	Unit
Supply voltage	HD29026A	V_{CC}	8	12	13	V
	HD29027	V_{CC}	4.5	6	8	
Operating temperature		T_a	-20	25	75	°C

Recommended Operating Frequency Area

HD29026A



HD29027



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

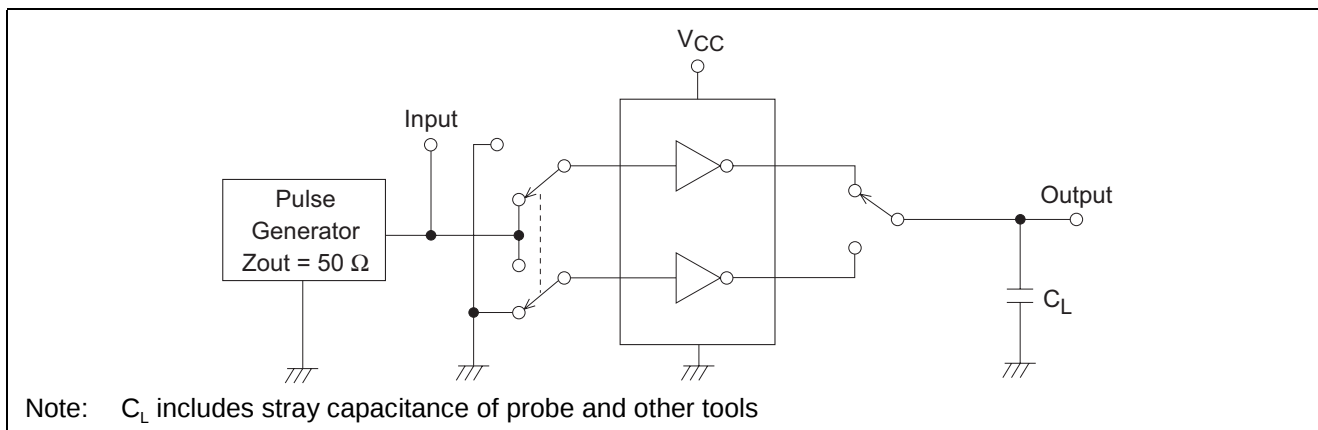
Item		Symbol	Min	Typ	Max	Unit	Test Conditions
Input voltage		V _{IH}	2.0	—	—	V	
		V _{IL}	—	—	0.6		
Output voltage		V _{OH}	V _{CC} -1	—	—	V	V _{IL} = 0.6 V, I _{OH} = -1 mA
		V _{OL}	—	—	0.5		V _{IH} = 2.0 V, I _{OL} = 1 mA
Input current		I _{IH}	—	—	20	μA	V _I = 2.7 V
	HD29026A	I _{IL}	—	—	-100		V _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 VHD29027: V_{CC} = 4.5 to 8 V**Switching Characteristics** (Ta = 25°C)

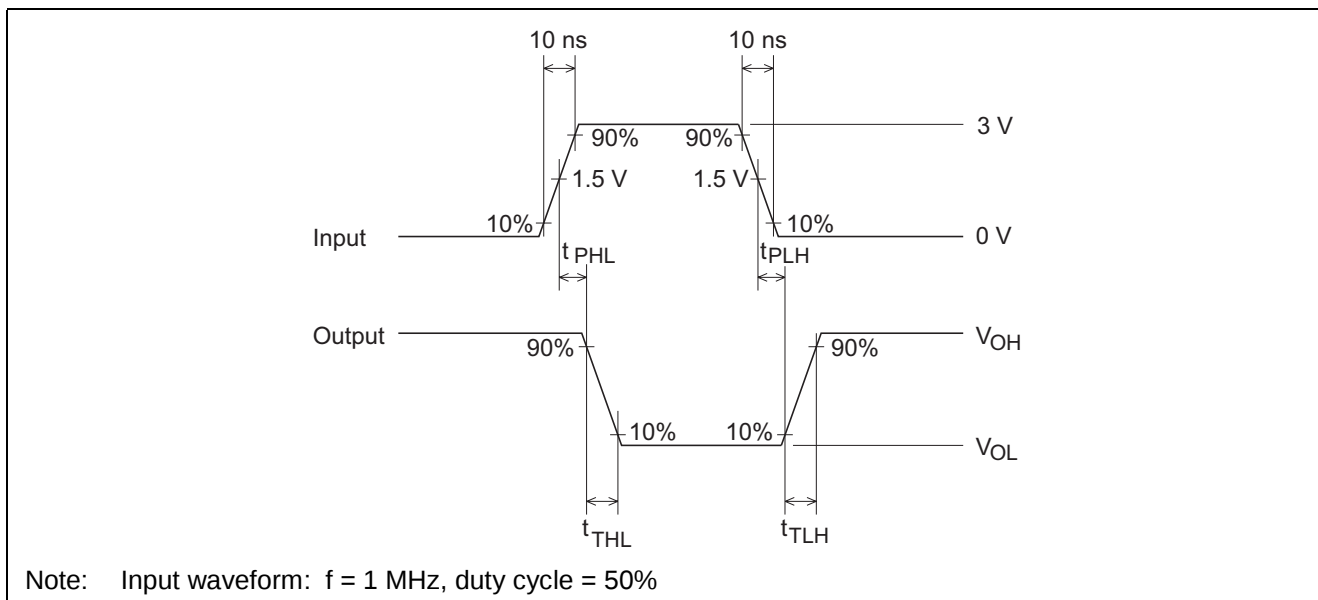
Item		Symbol	Min	Typ	Max	Unit	Test Conditions	
Fall propagation delay time	HD29026A	t _{PHL}	—	16	20	ns	C _L = 1000 pF	V _{CC} = 8 V
			—	11	15			V _{CC} = 12 V
	HD29027		—	10	15			V _{CC} = 6 V
Rise propagation delay time	HD29026A	t _{PLH}	—	18	25	ns	C _L = 1000 pF	V _{CC} = 8 V
			—	13	20			V _{CC} = 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
			—	9	14			V _{CC} = 6 V
	HD29026A		—	20	23		C _L = 500 pF	V _{CC} = 8 V
			—	15	18			V _{CC} = 12 V
			—	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	C _L = 250 pF	V _{CC} = 8 V
			—	10	15			V _{CC} = 12 V
			—	9	14			V _{CC} = 6 V
	HD29026A		—	21	25		C _L = 500 pF	V _{CC} = 8 V
			—	16	20			V _{CC} = 12 V
			—	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

Switching Time Test Method

Test circuit



Waveforms



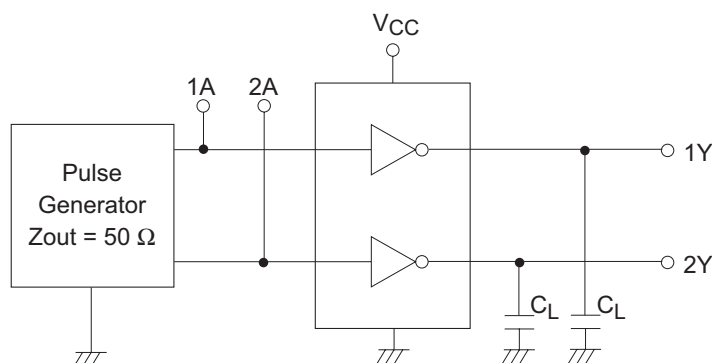
Output Timing Characteristics (Ta = 25°C)

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

HD29027; $V_{CC} = 6 \text{ V}$

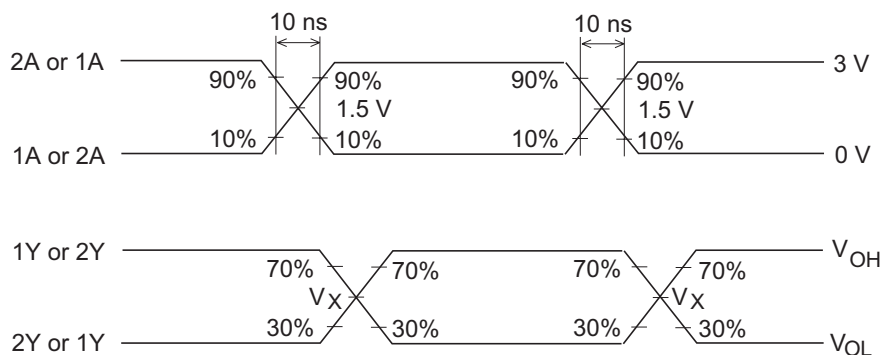
Output Timing Characteristics Test Method (HD29027)

Test circuit



Note: C_L includes stray capacitance of probe and other tools

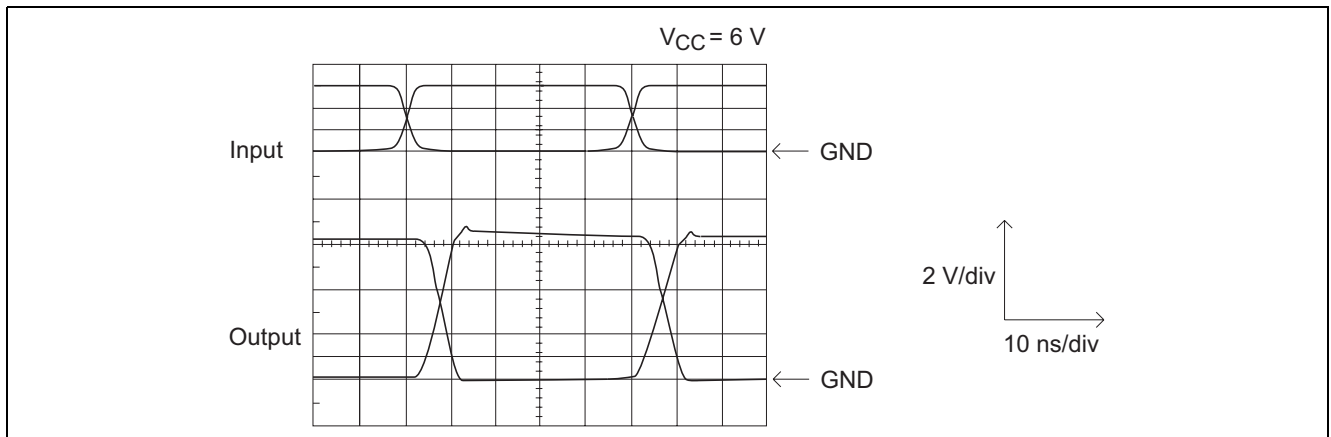
Waveform



Note: Input waveform: $f = 1 \text{ MHz}$, duty cycle = 50%

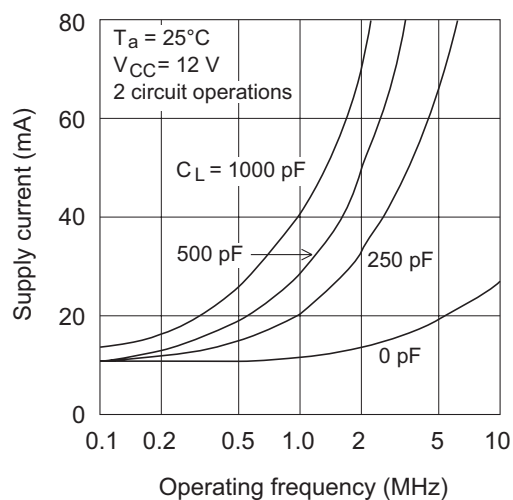
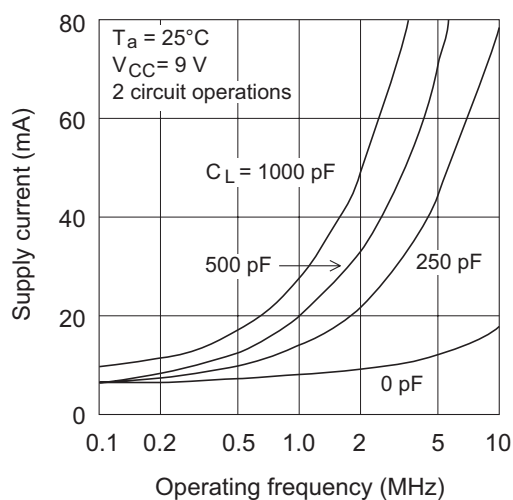
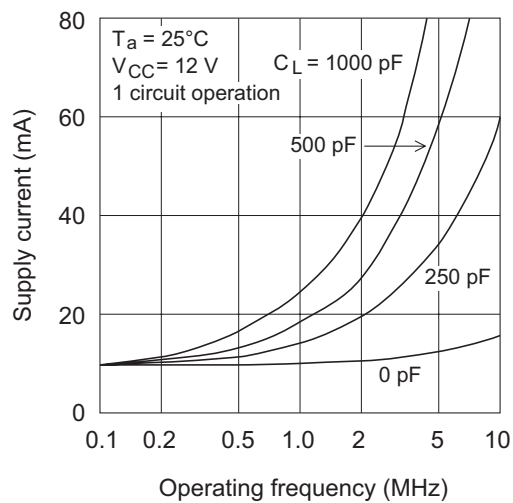
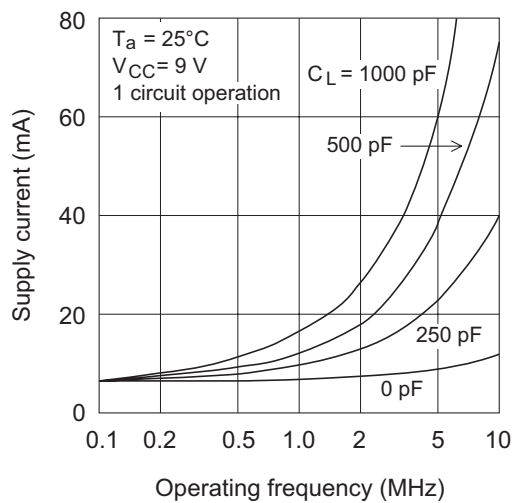
Output Timing Characteristics

HD29027

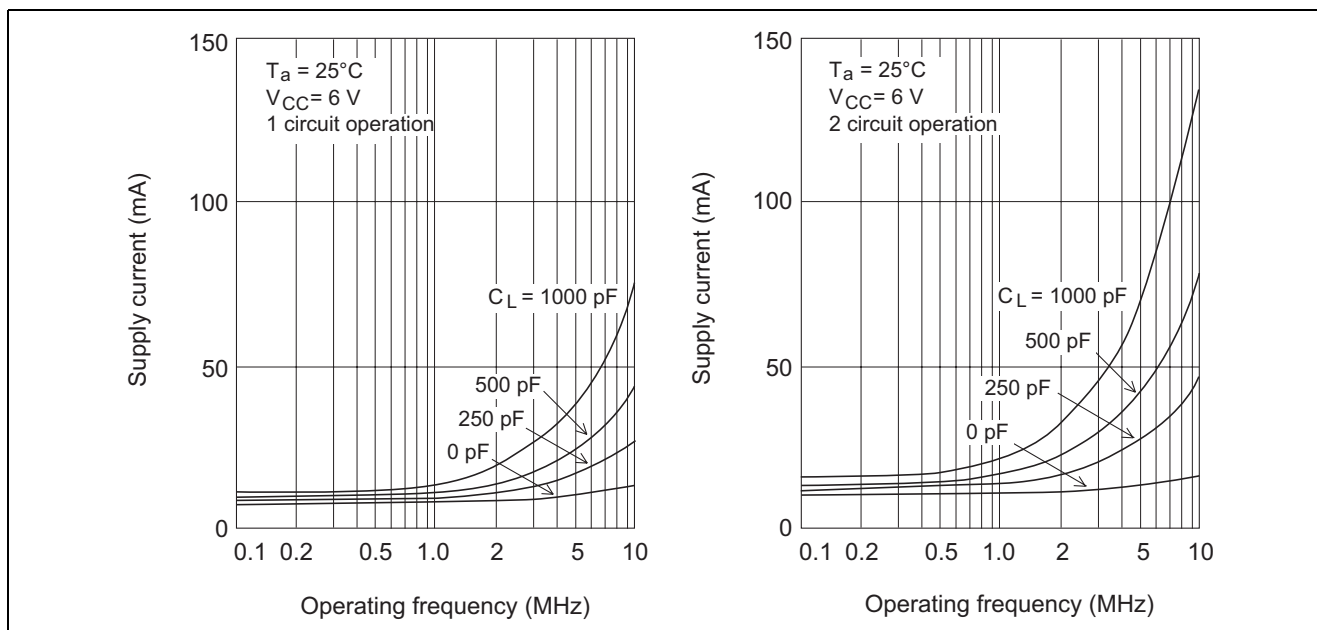


Typical Characteristic Curves

Supply current vs. operating frequency (HD29026A)



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 .

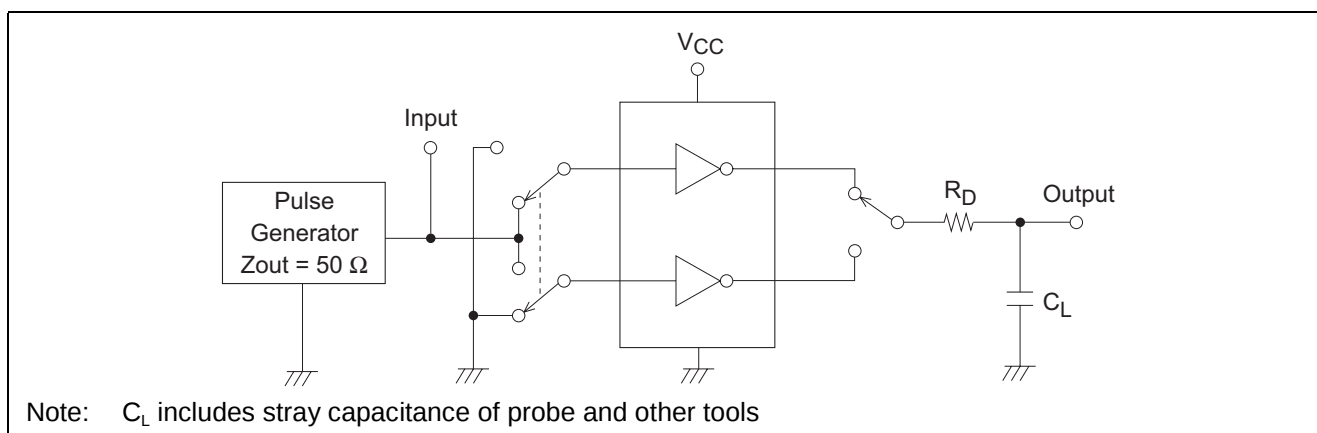
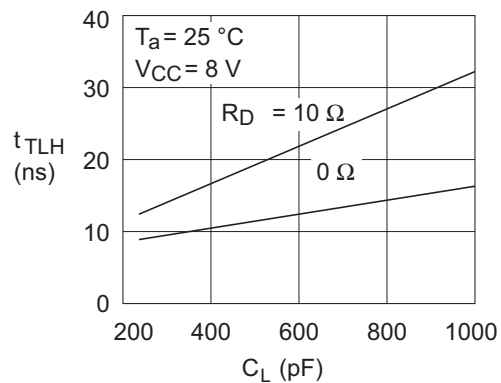
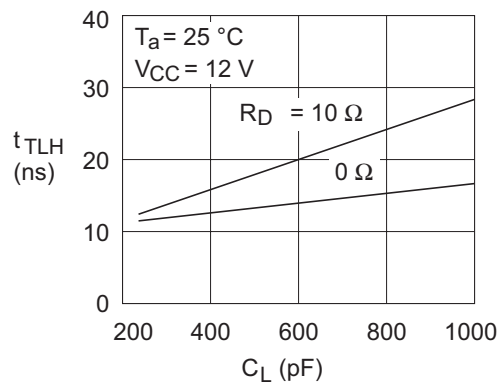


Figure 2

t_{TLH} vs C_L



t_{THL} vs C_L

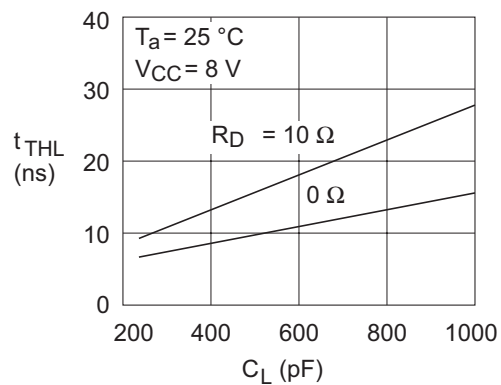
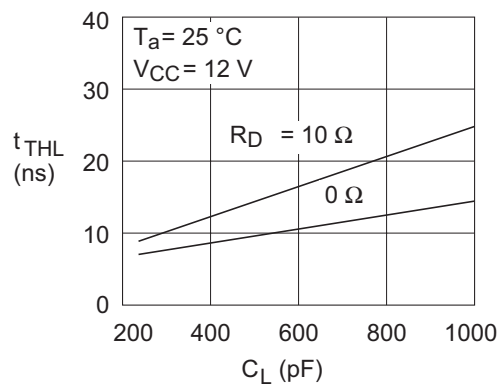
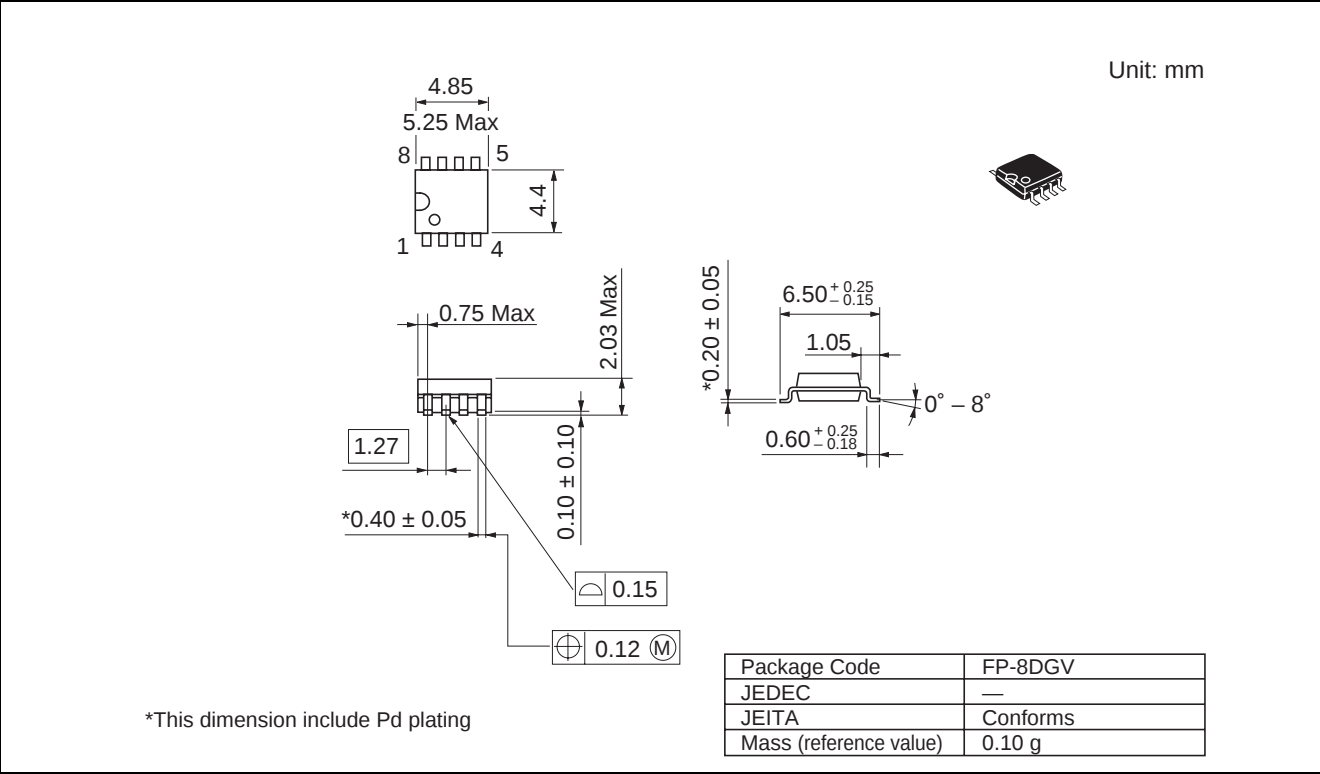


Figure 3

Package Dimensions



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