RD5CYDT08

IGBT Driver / CMOS Logic Level Shifter

REJ03D0181–0400Z
Rev.4.00
Jul. 12, 2004

Description

The RD5CYDT08 has two–input AND gate in a 5 pin package. This product is suited as IGBT Driver IC for the strobe.

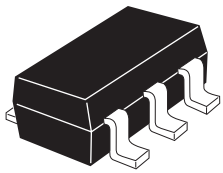
Features

- Supplied on emboss taping for high-speed automatic mounting.
- TTL compatible input level
  Supply voltage range : 4.0 to 6.0 V
  Operating temperature range: –40 to +85°C
- Logic–level translate function
  3.0 V CMOS logic → 5.0 V CMOS logic
- High drive current
  I_{OH} short = –130 mA (min) (@V_{CC} = 5.0 V)
- Low sink current
  I_{OL} short = 40 mA (max) (@V_{CC} = 5.0 V)
- Ordering Information

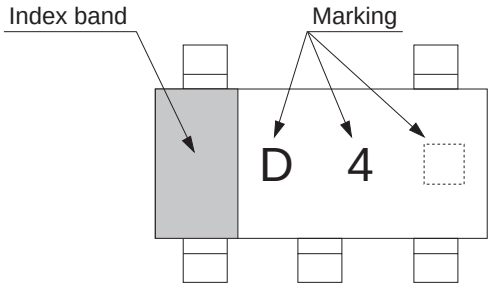
Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
RD5CYDT08CME	CMPAK–5 pin	CMPAK–5V	CM	E (3,000 pcs/reel)
		CMPAK–5V(O)		

Outline and Article Indication

• RD5CYDT08



CMPAK–5



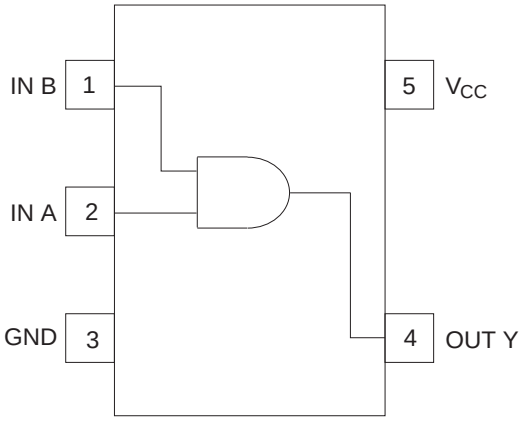
Function Table

Inputs		Output Y
A	B	
L	L	L
H	L	L
L	H	L
H	H	H

H : High level

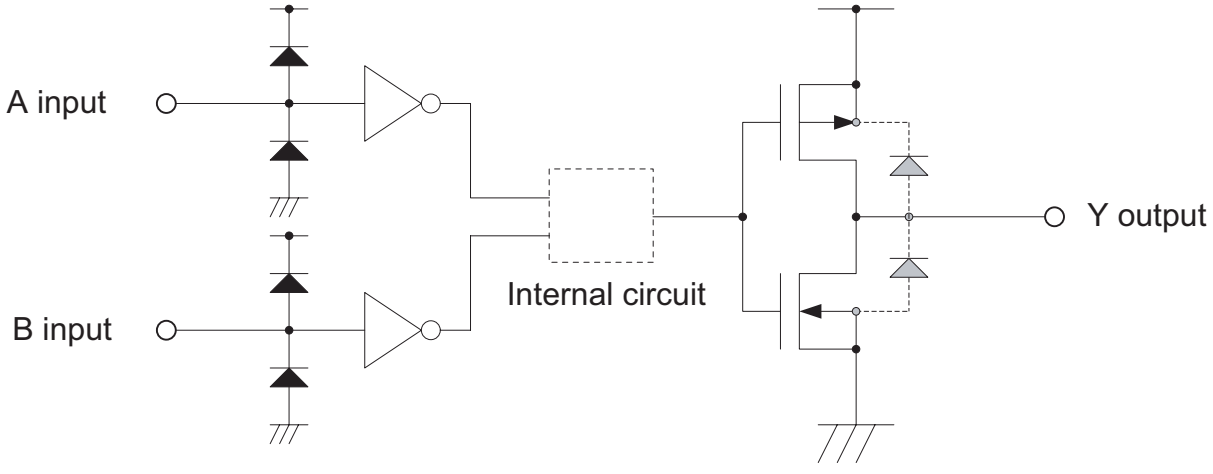
L : Low level

Pin Arrangement



(Top view)

Block Diagram



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Test Conditions
Supply voltage range	V_{CC}	–0.5 to 7.0	V	
Input voltage range [*1]	V_I	–0.5 to V_{CC} + 0.5	V	
Output voltage range [*1, 2]	V_O	–0.5 to V_{CC} + 0.5	V	
Input clamp current	I_{IK}	±20	mA	V_I < 0 or V_I > V_{CC}
Output clamp current	I_{OK}	±50	mA	V_O < 0 or V_O > V_{CC}
Continuous output current	I_O	–200	mA	V_O = 0
		100		V_O = V_{CC}
Continuous current through V_{CC} or GND	I_{CC} or I_{GND}	±200	mA	
Maximum power dissipation at Ta = 25°C (in still air) [*3]	P_T	200	mW	
Storage temperature	Tstg	–65 to 150	°C	

Notes: The absolute maximum ratings are values, which must not individually be exceeded, and furthermore no two of which may be realized at the same time.

1. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed. When Over shoot / Under shoot pulse width is under 10 ns, input and output voltage permit to –15 V or V_{CC}+1.5 V.
2. This value is limited to 5.5 V maximum.
3. The maximum package power dissipation was calculated using a junction temperature of 150°C.

Recommended Operating Conditions

Item	Symbol	Min	Max	Unit	Conditions
Supply voltage range	V_{CC}	4.0	6.0	V	
Input voltage range	V_I	0	V_{CC}	V	
Output voltage range	V_O	0	V_{CC}	V	
Operating free-air temperature	T_a	–40	85	°C	

Note: Unused or floating inputs must be held high or low.

Electrical Characteristic

Ta = –40 to 85°C

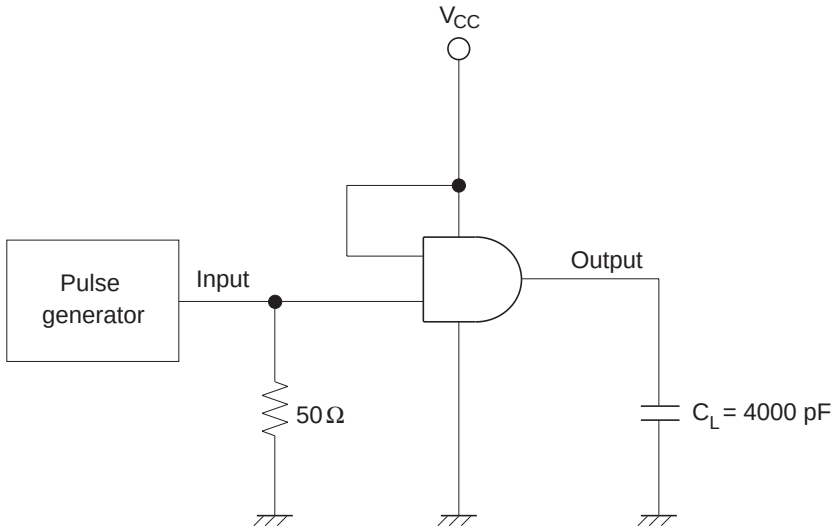
Item	Symbol	V_{CC} (V)	Min	Typ	Max	Unit	Test condition
Input voltage	V_{IH}	4.5 to 5.5	2.0	—	—	V	
	V_{IL}	4.5 to 5.5	—	—	0.8		
Output current	I_{OH} short	5.0	–100	–130	–160	mA	V_O = 0 V
	I_{OL} short	5.0	30	40	50		V_O = V_{CC}
Input current	I_{IN}	5.5	—	—	±5	µA	V_{IN} = 5.5 V or GND
Quiescent supply current	I_{CC}	5.5	—	—	10	µA	V_{IN} = V_{CC} or GND, I_O = 0
Input capacitance	C_{IN}	5.0	—	2.5	—	pF	V_{IN} = V_{CC} or GND

Switching Characteristics

V_{CC} = 5.0 ± 0.5 V

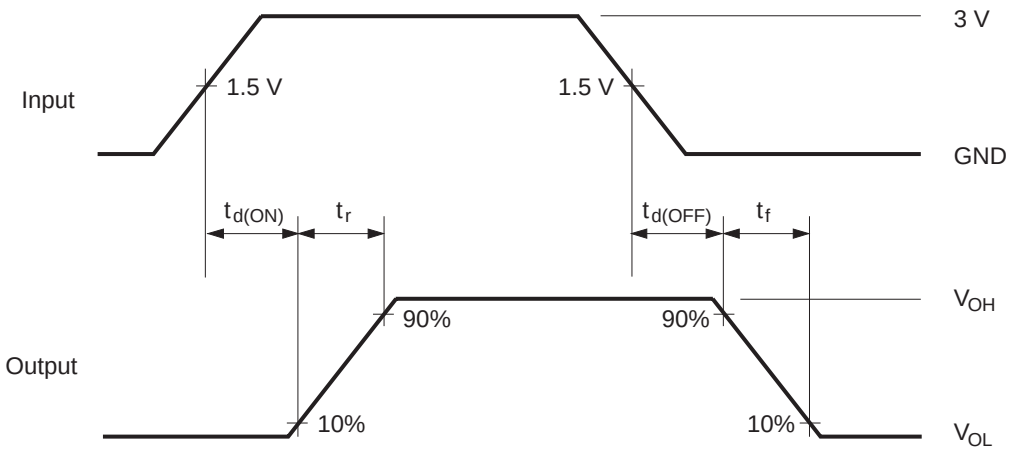
Item	Symbol	Ta = –40 to 85°C			Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max				
Propagation delay time	$t_{d(ON)}$	—	—	70	ns	C_L = 4000 pF	A or B	Y
	$t_{d(OFF)}$	—	—	140				
Output rise time	t_r	—	—	800				
Output fall time	t_f	—	—	1500				

Test Circuit



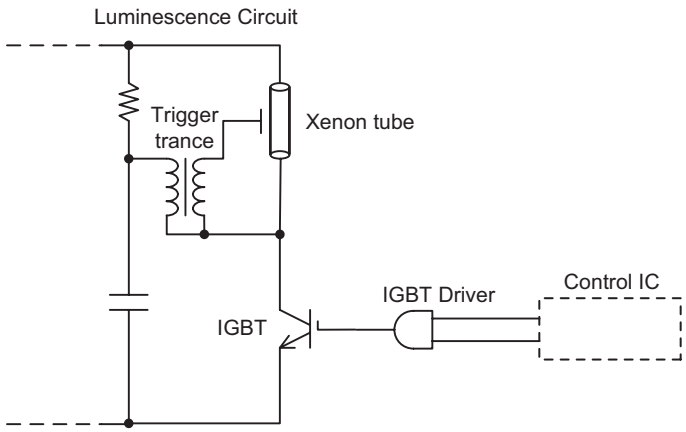
Note: C_L includes probe and jig capacitance.

• **Waveforms**



Note: Input waveform : duty cycle 50%

Application Example (Strobe circuit)



Combination example

SYSTEM	IGBT	IGBT Driver	Control IC
5.0 V	CY25BAJ –8F CY25AAJ –8F	RD5CYD08 RD5CYDT08	5.0 V signal 3.3 V signal
3.3 V	CY25BAH–8F	RD3CYD08	3.3 V signal

IGBT Driver Lineup

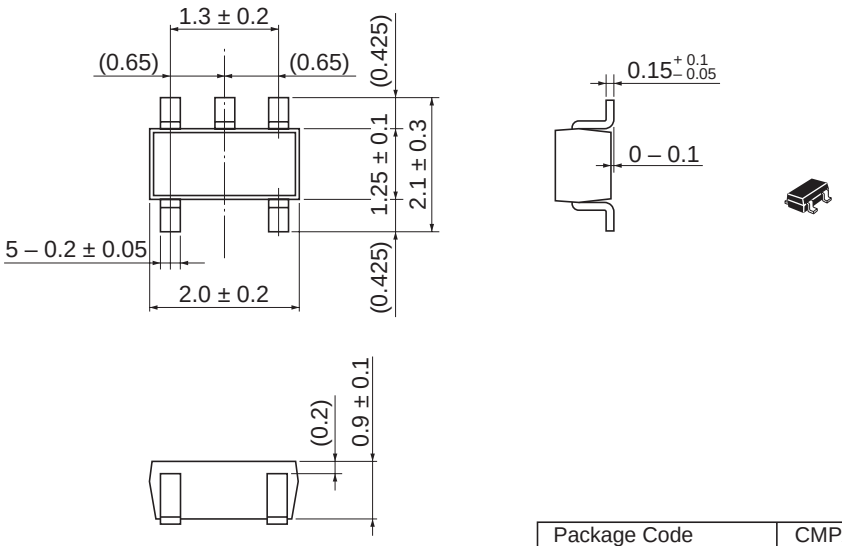
TYPE No.	Specification	Package
RD5CYDT08	Vcc = 4.0 to 6.0V TTL level input I_{OH}(short) = -130mA(typ) @ Vcc=5.0V I_{OL}(short) = 40mA(typ) @ Vcc=5.0V	CMPAK-5
RD5CYD08	Vcc = 4.0 to 6.0V CMOS level input I_{OH}(short) = -130mA(typ) @ Vcc=5.0V I_{OL}(short) = 40mA(typ) @ Vcc=5.0V	
RD3CYD08	Vcc = 2.0 to 3.6V CMOS level input I_{OH}(short) = -130mA(typ) @ Vcc=3.3V I_{OL}(short) = 45mA(typ) @ Vcc=3.3V	

IGBT Lineup

TYPE No.	Specification	Package
CY25AAJ-8F	V_{CES} = 400V(max), I_{CP} = 150A(max), 4V drive	TSSOP-8
CY25BAJ-8F	V_{CES} = 400V(max), I_{CP} = 150A(max), 4V drive	
CY25BAH-8F	V_{CES} = 400V(max), I_{CP} = 150A(max), 2.5V drive	SOP-8

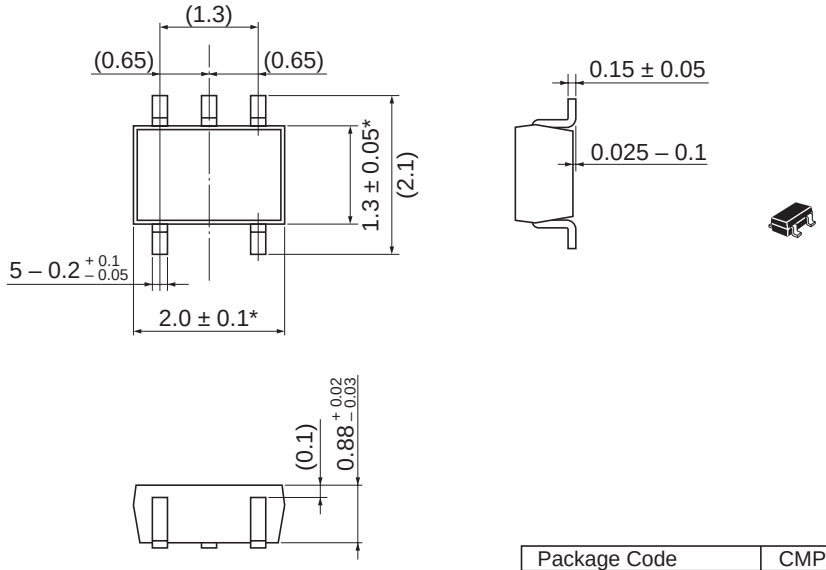
Package Dimensions

Unit: mm



Package Code	CMPAK–5V
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.006 g

Unit: mm



* The value does not include Resin Bar.
(One side: 0.15 mm (max))

Package Code	CMPAK–5V(O)
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.006 g

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