

RD3CYD08

IGBT Driver

REJ03D0179-0300Z

Rev.3.00

May 19, 2004

Description

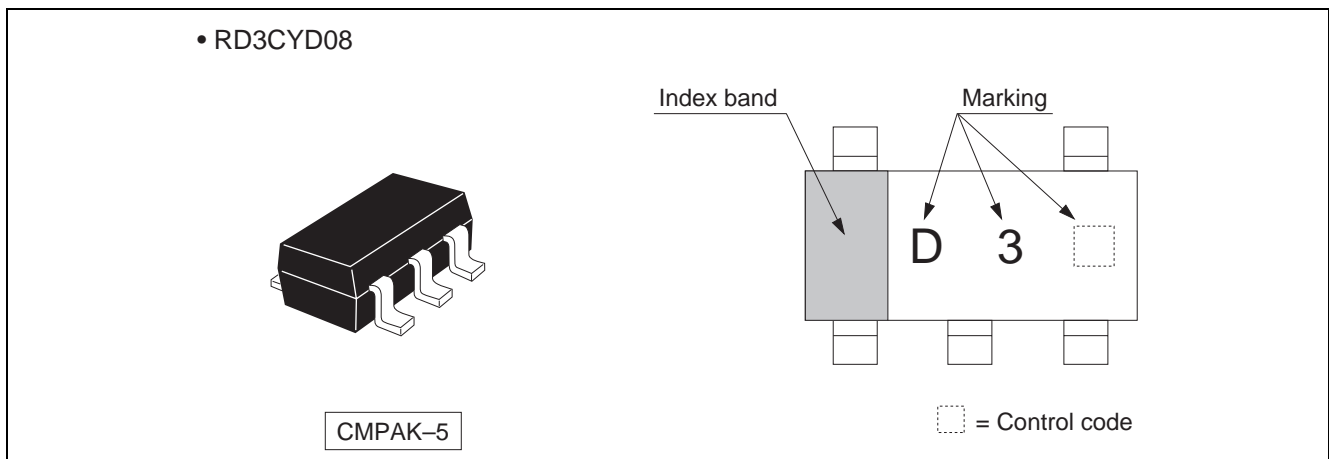
The RD3CYD08 has two-input AND gate in a 5 pin package. This product is suited as IGBT Driver IC for the strobe.

Features

- Supplied on emboss taping for high-speed automatic mounting.
- Supply voltage range : 2.0 to 3.6 V
Operating temperature range : -40 to +85°C
- High drive current
 $I_{OH\ short} = -130\text{ mA (typ) (@ }V_{CC} = 3.3\text{ V)}$
- Low sink current
 $I_{OL\ short} = 45\text{ mA (typ) (@ }V_{CC} = 3.3\text{ V)}$
- Ordering Information

Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
RD3CYD08CME	CMPAK-5 pin	CMPAK-5V	CM	E (3,000 pcs/reel)
		CMPAK-5V(O)		

Outline and Article Indication



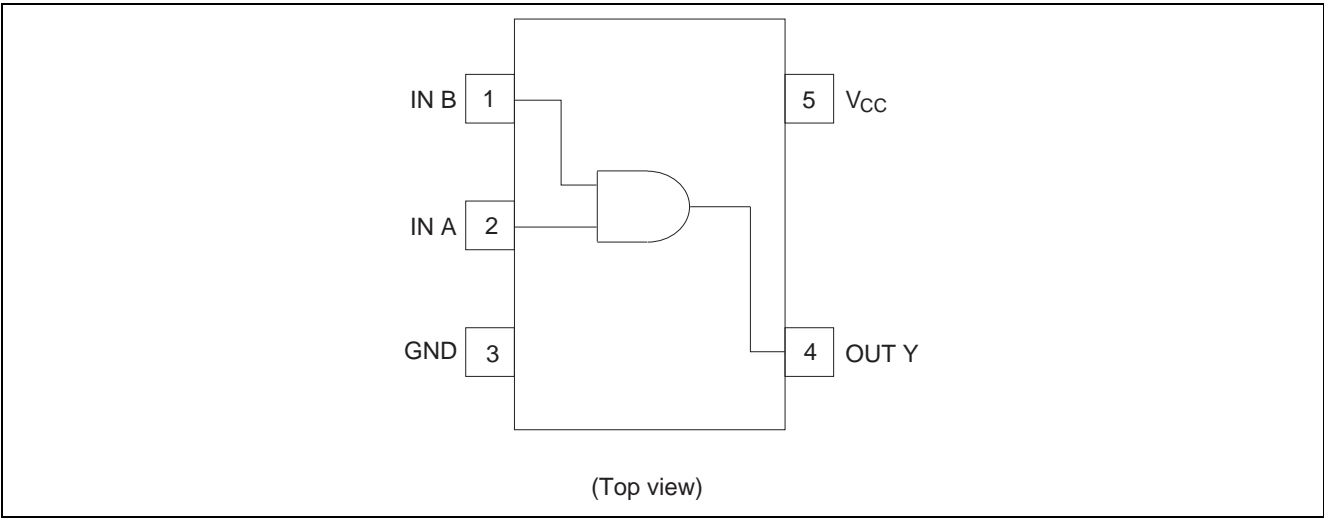
Function Table

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

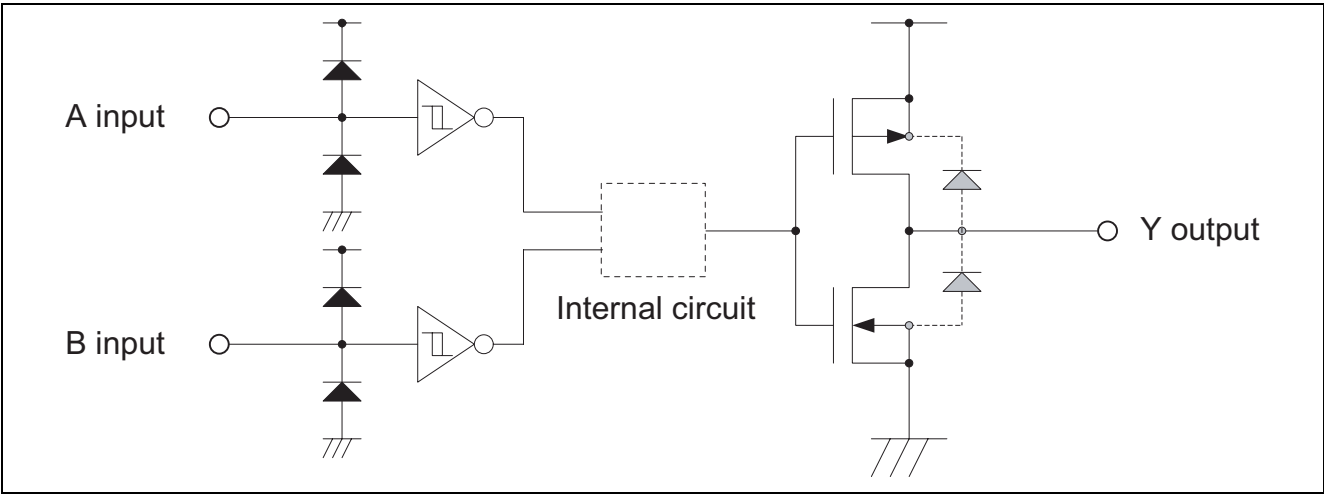
H : High level

L : Low level

Pin Arrangement



Block Diagram



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Test Conditions
Supply voltage range	V_{CC}	-0.5 to 4.6	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}	± 50	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 $T_a = 25^\circ\text{C}$ (in still air) * ³	P_T	200	mW	
Storage temperature	T_{stg}	-65 to 150	$^\circ\text{C}$	

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 -1.5 V or $V_{CC}+1.5\text{V}$.
2. This value is limited to 4.6 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}	2.0	3.6	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	$^\circ\text{C}$	

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

Electrical Characteristic

$T_a = -40$ to 85°C

Item	Symbol	V_{CC} (V)	Min	Typ	Max	Unit	Test condition
Input voltage	V_{IH}	2.5	1.7	—	—	V	
		3.0 to 3.6	2.0	—	—		
	V_{IL}	2.5	—	—	0.7		
		3.0 to 3.6	—	—	0.8		
	V_H	2.5	—	0.35	—		
		3.3	—	0.40	—		
Output current	I_{OH} short	2.5	-55	-75	-95	mA	$V_O = 0\text{ V}$
		3.3	-100	-130	-160		
	I_{OL} short	2.5	20	30	40		$V_O = V_{CC}$
		3.3	30	45	60		
Input current	I_{IN}	3.6	—	—	± 5	μA	$V_{IN} = 3.6\text{ V}$ or GND
Quiescent supply current	I_{CC}	3.6	—	—	10	μA	$V_{IN} = V_{CC}$ or GND, $I_O = 0$
Input capacitance	C_{IN}	3.3	—	2.5	—	pF	$V_{IN} = V_{CC}$ or GND

Switching Characteristics

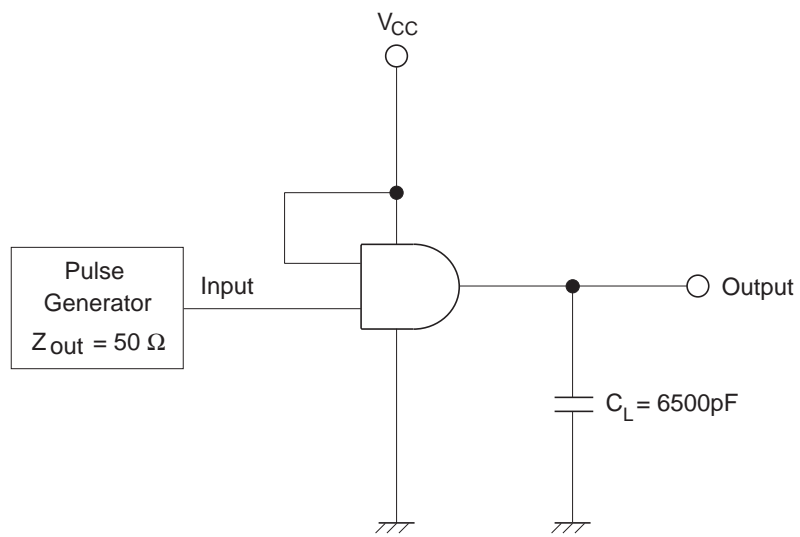
 $V_{CC} = 2.5\text{ V}$

Item	Symbol	Ta = -40 to 85°C			Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max				
Propagation delay time	$t_{d(ON)}$	—	—	65	ns	$C_L = 6500\text{ pF}$	A or B	Y
	$t_{d(OFF)}$	—	—	200				
Output rise time	t_r	—	—	700				
Output fall time	t_f	—	—	2000				

 $V_{CC} = 3.3 \pm 0.3\text{ V}$

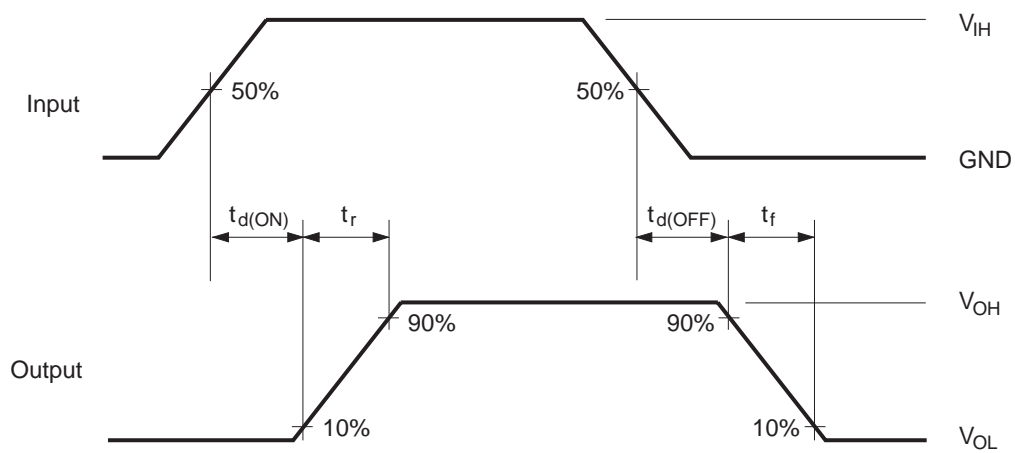
Item	Symbol	Ta = -40 to 85°C			Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max				
Propagation delay time	$t_{d(ON)}$	—	—	50	ns	$C_L = 6500\text{ pF}$	A or B	Y
	$t_{d(OFF)}$	—	—	160				
Output rise time	t_r	—	—	500				
Output fall time	t_f	—	—	1500				

Test Circuit



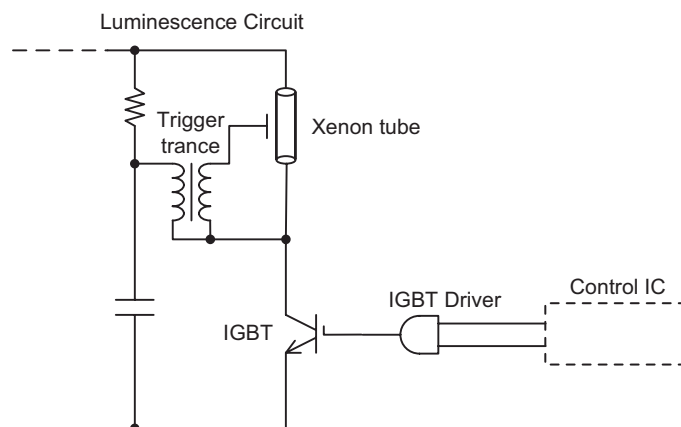
Note: C_L includes probe and jig capacitance.

• Waveforms



Note: Input waveform : duty cycle 50%

Application Note (Strobe circuit)



Combination example

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

IGBT Driver Lineup

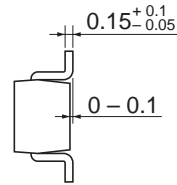
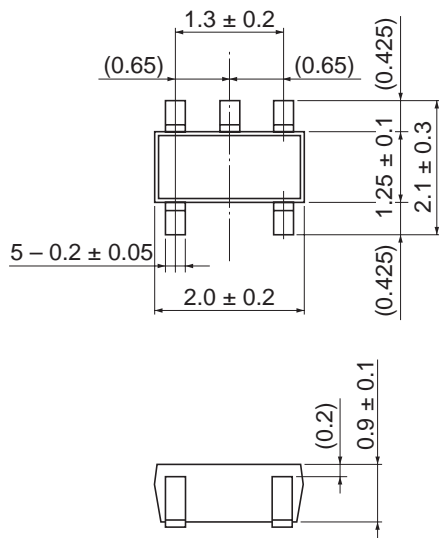
TYPE No.	Specification	Package
RD3CYD08	V _{CC} = 2.0 to 3.6V CMOS level input I _{OH} (short) = -130mA(typ) @ V _{CC} =3.3V I _{OL} (short) = 45mA(typ) @ V _{CC} =3.3V	CMPAK-5
RD5CYD08	V _{CC} = 4.0 to 6.0V CMOS level input I _{OH} (short) = -130mA(typ) @ V _{CC} =5.0V I _{OL} (short) = 40mA(typ) @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

IGBT Lineup

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

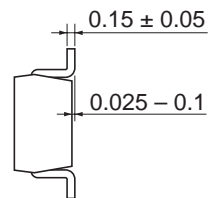
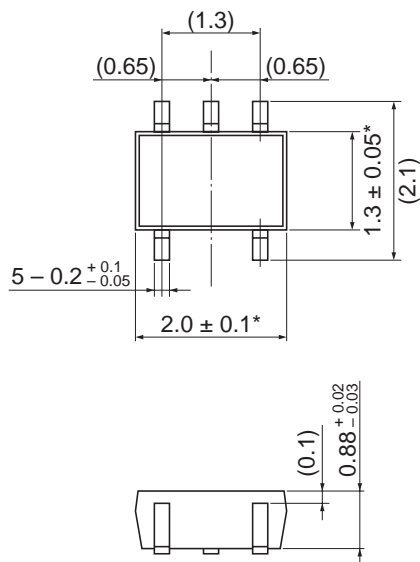
Package Dimensions

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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