

## RD3CYD08

### IGBT Driver

REJ03D0179-0600

Rev.6.00

Apr 22, 2008

### Description

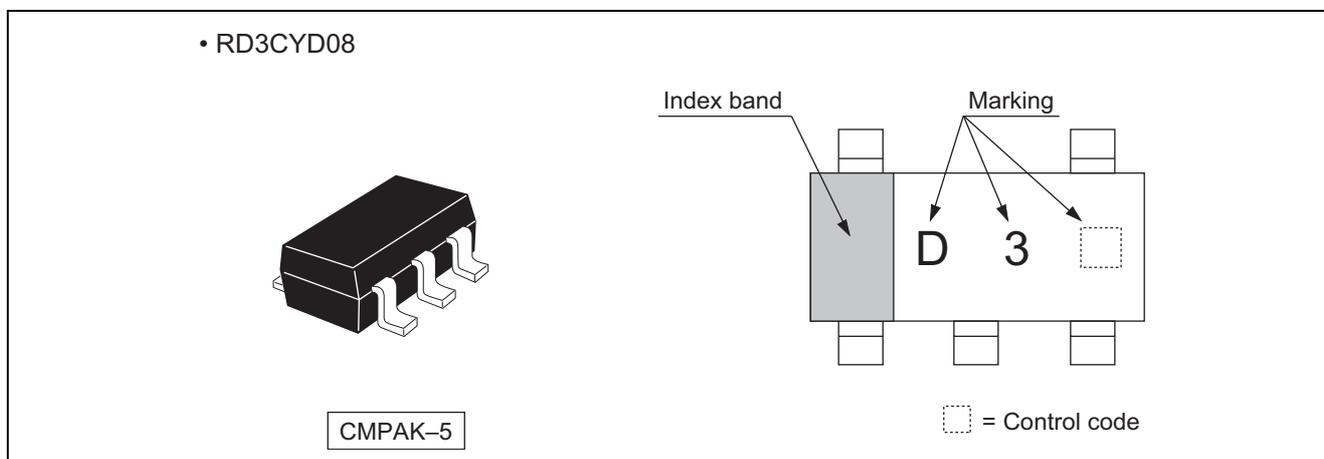
The RD3CYD08 has two-input AND gate in a 5 pin package. This product is suited as IGBT Driver IC for the strobe.

### Features

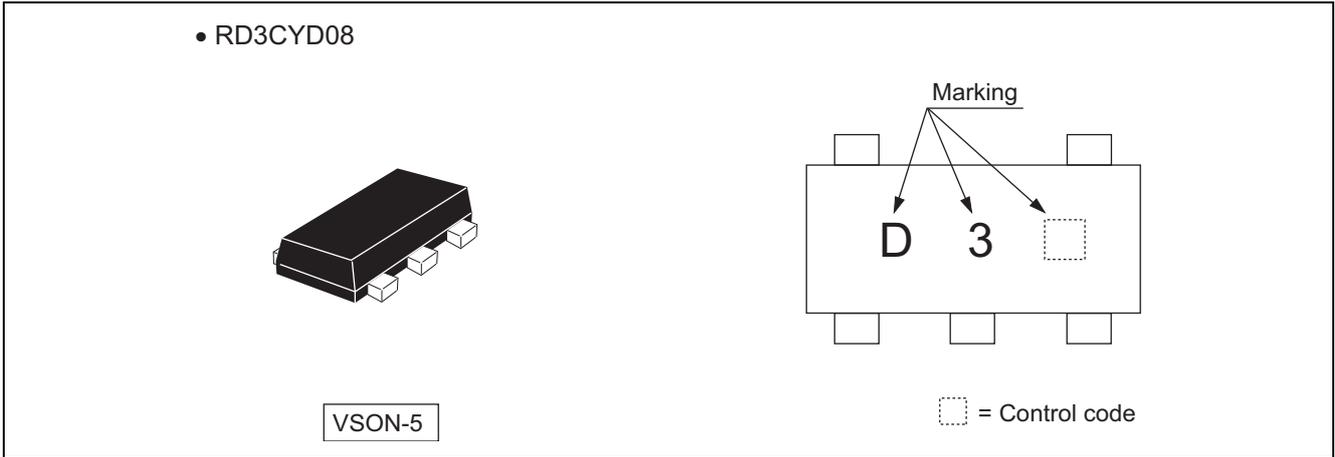
- Supplied on emboss taping for high-speed automatic mounting.
- Supply voltage range : 2.0 to 3.6 V
- Operating temperature range : -40 to +85°C
- High drive current  
 $I_{OH\ short} = -130\text{ mA (typ) (@}V_{CC} = 3.3\text{ V)}$
- Low sink current  
 $I_{OL\ short} = 45\text{ mA (typ) (@}V_{CC}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

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
RD3CYD08CME	CMPAK-5 pin	PTSP0005ZC-A (CMPAK-5V)	CM	E (3,000 pcs/reel)
RD3CYD08VSE	VSON-5pin	PUSN0005KA-A (TNP-5DV)	VS	E (3,000 pcs/reel)

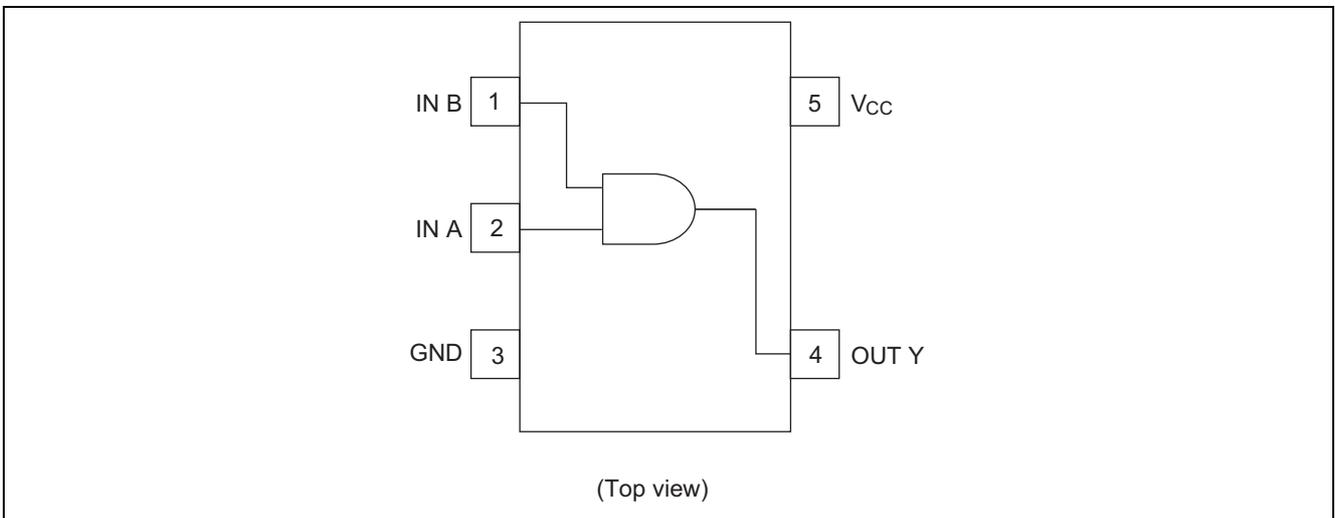
### Outline and Article Indication



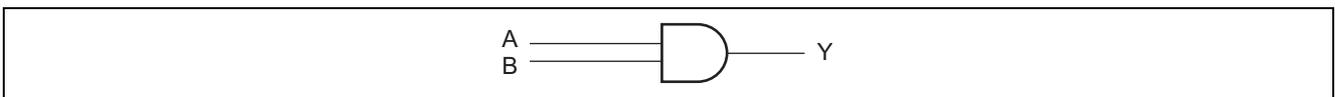
Outline and Article Indication



Pin Arrangement



Logic Diagram



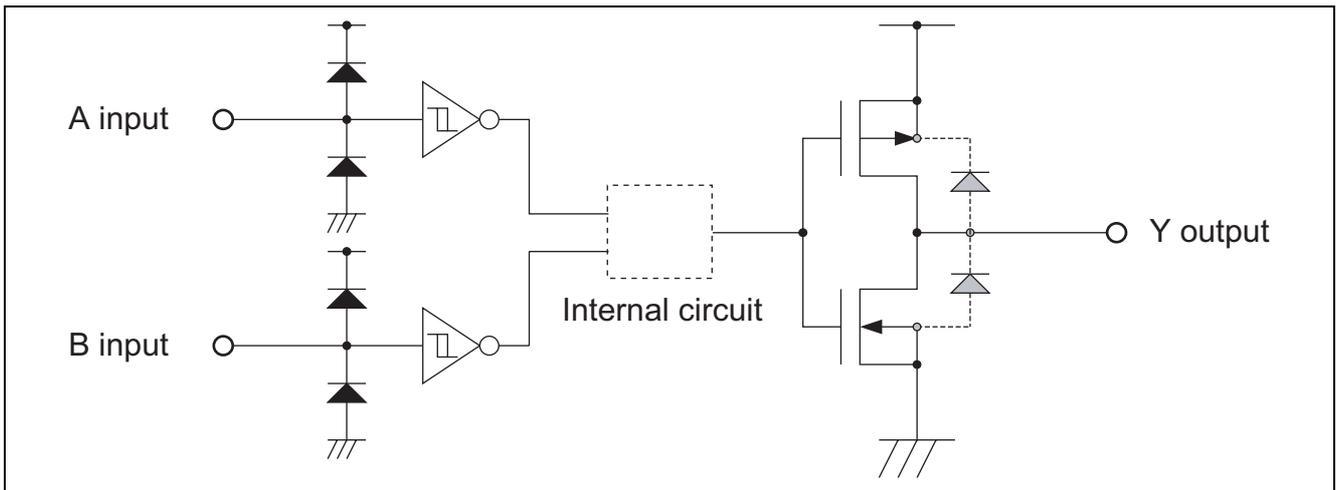
Function Table

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

H : High level

L : Low level

## 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	$I_{IK}$	$\pm 50$	mA	$V_I < 0$ or $V_I > V_{CC}$
Output clamp current	$I_{OK}$	$\pm 50$	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 $I_{GND}$	$\pm 200$	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.

- 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  $V_{CC}+1.5\text{V}$ .
- This value is limited to 4.6 V maximum.
- The maximum package power dissipation was calculated using a junction temperature of  $150^\circ\text{C}$ .

## 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

Ta = -40 to 85°C

Item	Symbol	V <sub>CC</sub> (V)	Min	Typ	Max	Unit	Test condition
Input voltage	V <sub>IH</sub>	2.5	1.7	—	—	V	
		3.0 to 3.6	2.0	—	—		
	V <sub>IL</sub>	2.5	—	—	0.7		
		3.0 to 3.6	—	—	0.8		
	V <sub>H</sub>	2.5	—	0.35	—		
		3.3	—	0.40	—		
Output current	I <sub>OH</sub> short	2.5	-55	-75	-95	mA	V <sub>O</sub> = 0 V
		3.3	-100	-130	-160		
	I <sub>OL</sub> short	2.5	20	30	40		V <sub>O</sub> = V <sub>CC</sub>
		3.3	30	45	60		
Input current	I <sub>IN</sub>	3.6	—	—	±5	μA	V <sub>IN</sub> = 3.6 V or GND
Quiescent supply current	I <sub>CC</sub>	3.6	—	—	10	μA	V <sub>IN</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0
Input capacitance	C <sub>IN</sub>	3.3	—	2.5	—	pF	V <sub>IN</sub> = V <sub>CC</sub> or GND

## Switching Characteristics

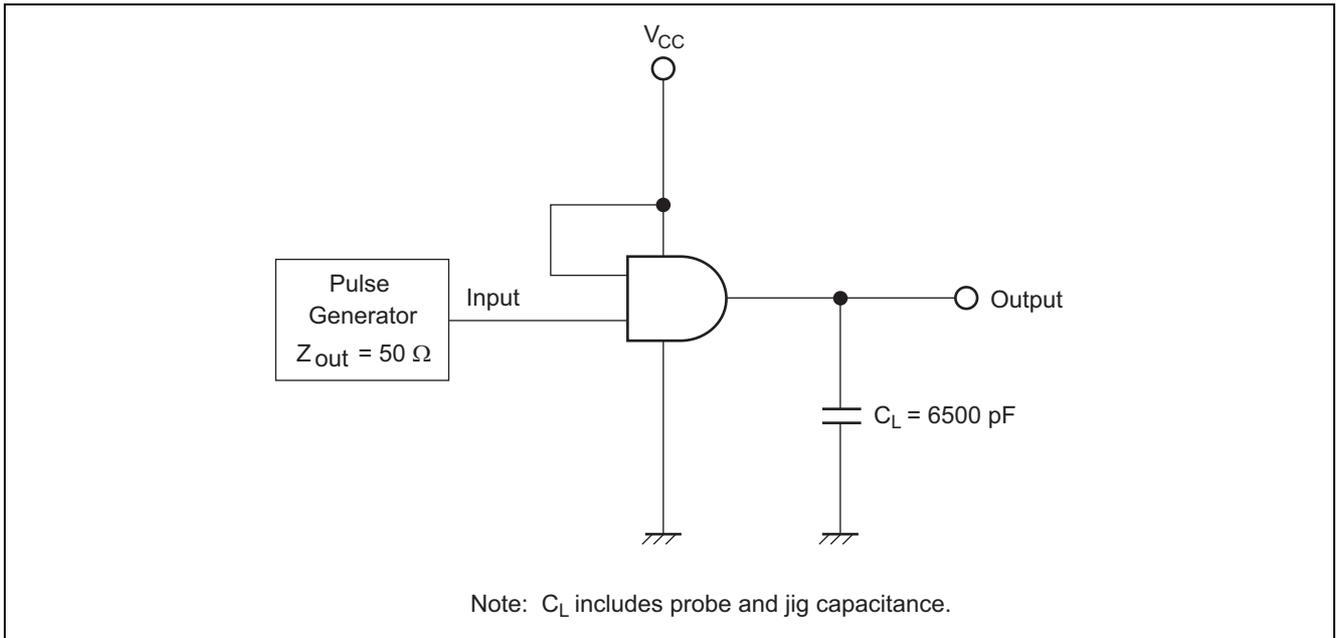
V<sub>CC</sub> = 2.5 V

Item	Symbol	Ta = -40 to 85°C			Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max				
Propagation delay time	t <sub>d(ON)</sub>	—	—	65	ns	C <sub>L</sub> = 6500 pF	A or B	Y
	t <sub>d(OFF)</sub>	—	—	200				
Output rise time	t <sub>r</sub>	—	—	700				
Output fall time	t <sub>f</sub>	—	—	2000				

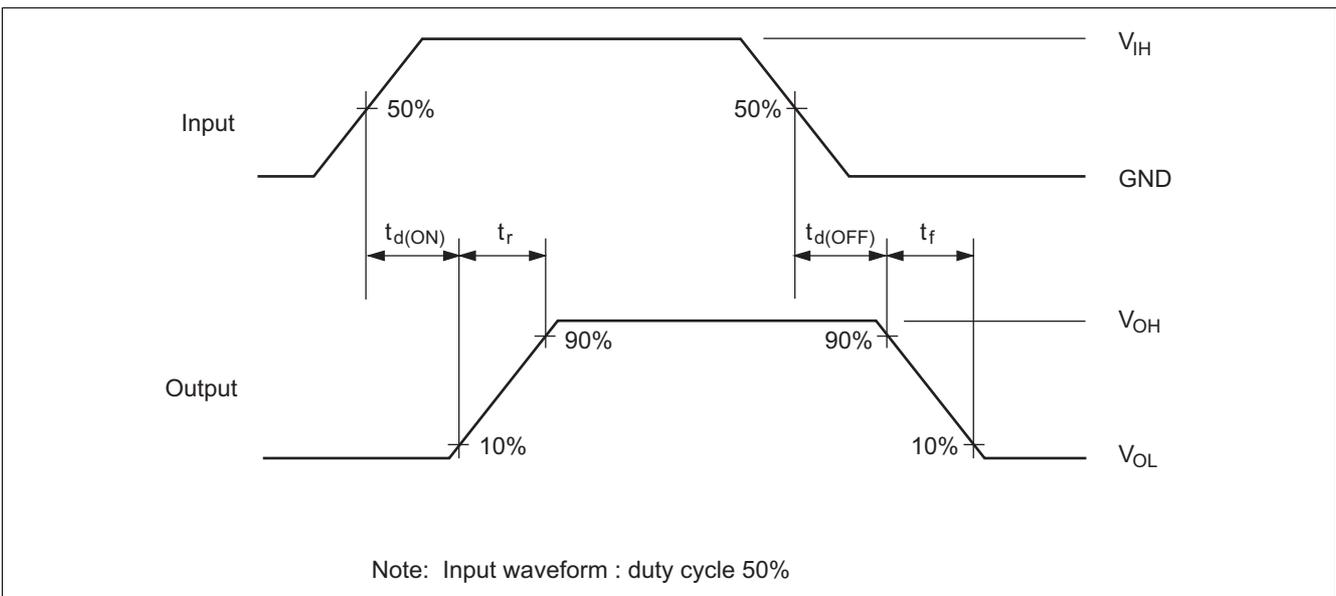
V<sub>CC</sub> = 3.3 ± 0.3 V

Item	Symbol	Ta = -40 to 85°C			Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max				
Propagation delay time	t <sub>d(ON)</sub>	—	—	50	ns	C <sub>L</sub> = 6500 pF	A or B	Y
	t <sub>d(OFF)</sub>	—	—	160				
Output rise time	t <sub>r</sub>	—	—	500				
Output fall time	t <sub>f</sub>	—	—	1500				

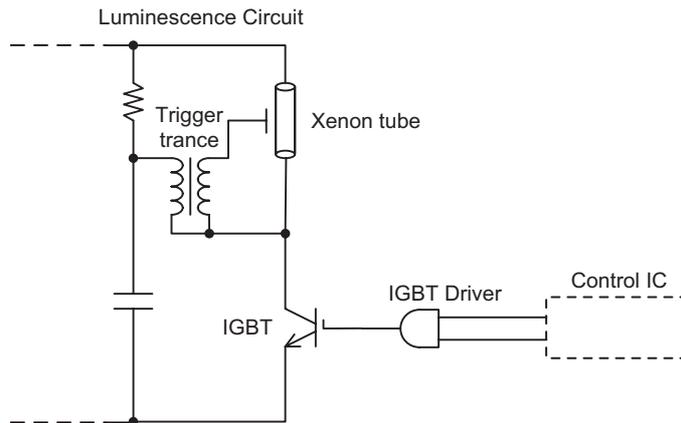
## Test Circuit



## Waveforms



## Application Note (Strobe circuit)



## Combination example

SYSTEM	IGBT	IGBT Driver	Control IC
3.3 V	RJP4002ANS RJP4002ASA	RD3CYD08 RD3CYDT08	3.3 V signal
5.0 V	RJP4003ANS RJP4003ASA	RD5CYD08 RD5CYDT08	5.0 V signal 3.3 V signal

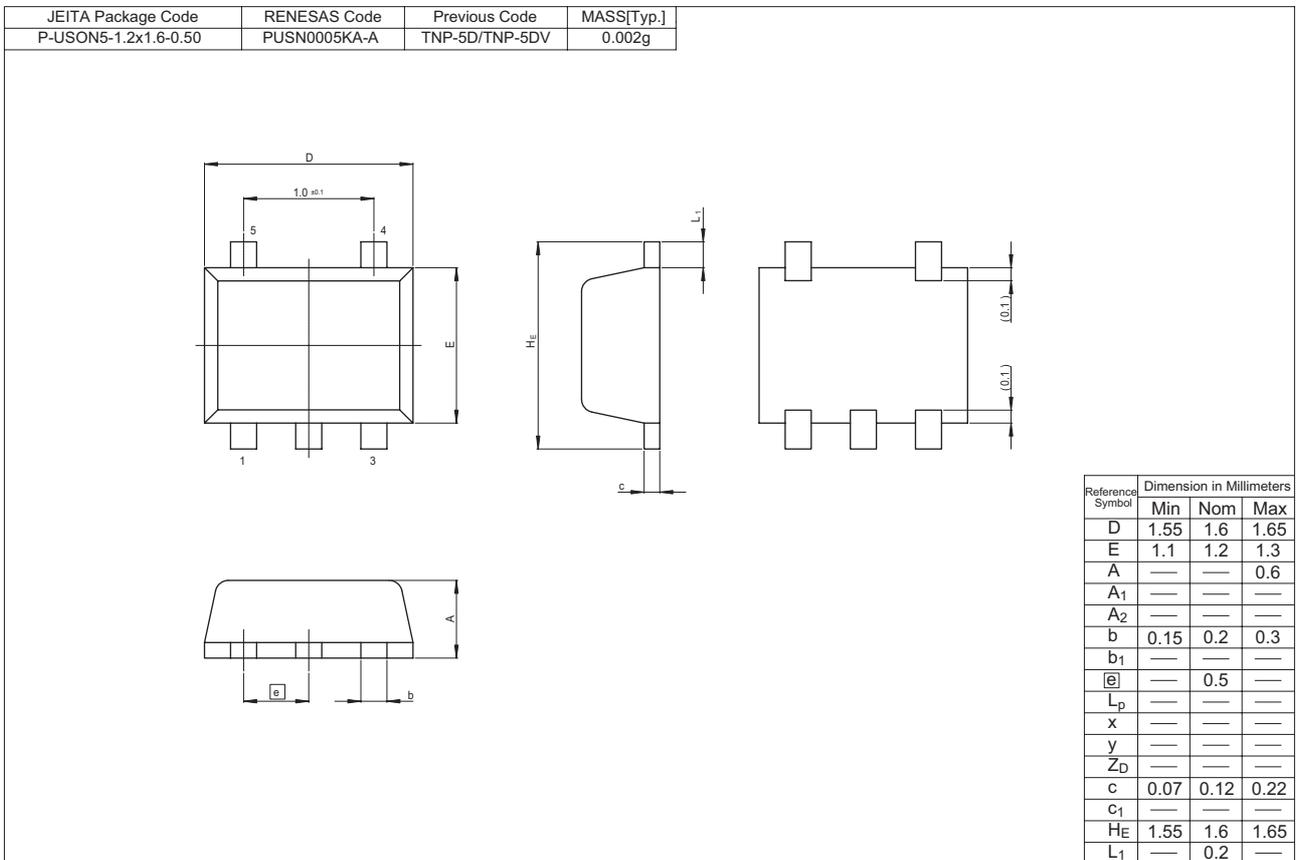
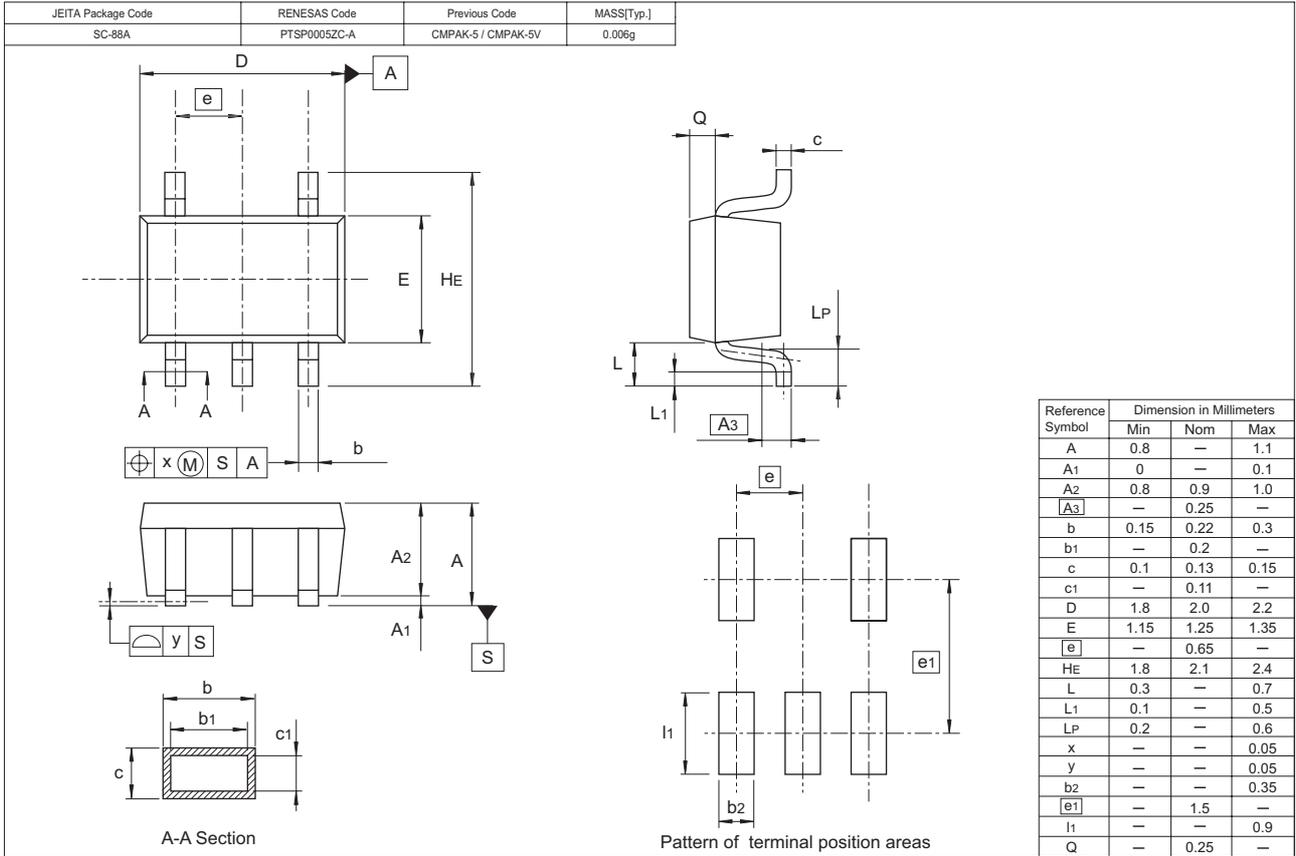
## IGBT Driver Lineup

TYPE No.	Specification	Package
RD3CYD08	$V_{CC} = 2.0$ to $3.6V$ CMOS lever input $I_{OH}(short) = -130mA(typ)$ @ $V_{CC} = 3.3V$ $I_{OL}(short) = 45mA(typ)$ @ $V_{CC} = 3.3V$	CMPAK-5 VSON-5
RD3CYDT08	$V_{CC} = 2.0$ to $3.6V$ CMOS lever 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 lever input $I_{OH}(short) = -130mA(typ)$ @ $V_{CC} = 5.0V$ $I_{OL}(short) = 40mA(typ)$ @ $V_{CC} = 5.0V$	CMPAK-5
RD5CYDT08	$V_{CC} = 4.0$ to $6.0V$ TTL lever 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
RJP4002ANS	$V_{CES} = 400V(max)$ , $I_{CP} = 150A(max)$ , 2.5V drive	VSON-8
RJP4002ASA	$V_{CES} = 400V(max)$ , $I_{CP} = 150A(max)$ , 2.5V drive	TSSOP-8
RJP4003ANS	$V_{CES} = 400V(max)$ , $I_{CP} = 150A(max)$ , 4V drive	VSON-8
RJP4003ASA	$V_{CES} = 400V(max)$ , $I_{CP} = 150A(max)$ , 4V drive	TSSOP-8

### Package Dimensions



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