FEATURES

- 1 transmitter and 1 receivers of the serial data of the standard RS-485
- Auto Shutdown function provide low power consumption
- Supply voltage range: 5.0V±5%
- Operating temperature range: -40 ~ +85℃
- ESD protection up to 2000V for transmitter input and receiver output (TTL/CMOS levels) and up to 15000V for transmitter output and receiver input (RS-485 levels)
- Latch current, min – 300mA at normal climatic condition
- Enhanced ESD Specifications:
  ±15kV IEC61000-4-2 Air Discharge
  ±8kV IEC61000-4-2 Contact Discharge

GENERAL DESCRIPTION

The CBM3085A is interface transceiver of serial data under RS-485 standard with low power consumption.

The CBM3085A is purposed for application in telecom systems under RS-485/RS-422 standards with low power dissipation, translators of the level, transceiving devices sensitive to electromagnetic radiation, industrial control systems.

Pin Description

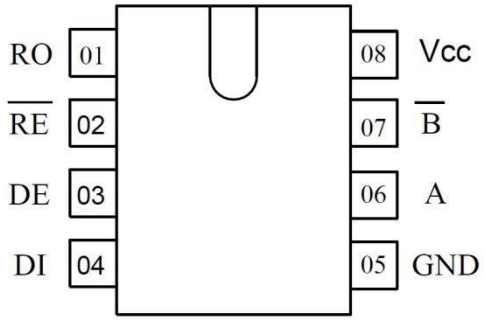


Figure 2

Pin Description

Pin Number	Symbol	Pin Description
01	RO	TTL/CMOS Receiver data output
02	RE	Receiver Output Enable.
03	DE	Transmitter Output Enable.
04	DI	Transmitter input
05	GND	Common pin
06	A	Noninverting receiver/transmitter input/output
07	B	Inverting receiver/transmitter input/output
08	VCC	Power supply

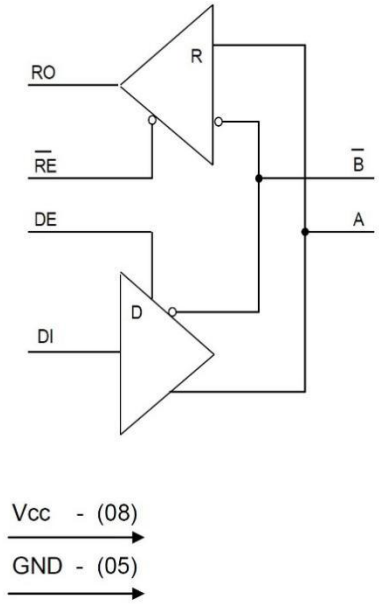


Figure 3. Block Diagram

Transmitter Truth Table

INPUTS			OUTPUTS	
RE	DE	DI	B	A
X	H	H	L	H
X	H	L	H	L
L	L	X	Z	Z
H	L	X	ZZ	

Note : H – high level, L – low level , X –don’ t care, Z – third state

Receiver Truth Table

INPUTS			OUTPUTS
RE	DE	A,B	RO
L	X	≥ –0,05 B	H
L	X	≤ –0,2 B	L
L	X	BH	H
H	H	X	Z
H	L	X	ZZ

Note : H – high level, L – low level , BH – inputs not used, X –don’ t care, Z – third state, ZZ – inputs and outputs are in the third state

Recommended Operating Condition

Symbol	Parameter	Limit		Unit
		min	max	
V_{CC}	Supply voltage	4.75	5.25	V
V_{IL}	Input low voltage DI, DE, PE pins	0	0.8	V
V_{IH}	Input high voltage DI, DE, PE pins	2.0	VCC	V
V_{OD}	Transmitter output voltage	-7.0	12.0	V
V_{IR}	Receiver input voltage	-7.0	12.0	V
V_{OR}	Receiver output voltage	0	VCC	V
V_{TH}	Receiver differential threshold voltage	±50	±200	V
T	Ambient temperature	-40	80	℃

Maximum Ratings

Symbol	Parameter	Limit		Unit
		min	max	
V_{CC}	Supply voltage	-	7.0	V
V_{IL}	Input voltage on pins DI, DE,RE	-0.3	7.0	V
V_{OD}	Transmitter output voltage	-13	13	V
V_{IR}	Receiver input voltage	-13	13	V
V_{OR}	Receiver output voltage	-0.3	V_{CC}+0.3	V

*Stresses beyond those listed under "maximum ratings" may cause permanent damage to the device.

These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied.

Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

Electrical Parameters

(V_{CC} = 5V±5%)

Symbol	Parameter	Mode	Limit		T_A,℃	Unit
			Min	Max		
I_{CC}	Idle mode supply current	V_{RE} = 0B or V_{CC} V_{DI} = 0B or V_{CC} V_{DE} = V_{CC}	-	800	25 ± 10	μA
				900	–40; 85	
		V_{RE} = 0 V V_{DI} = 0 V or V_{CC} V_{DE} = 0	-	500	25 ± 10	
				600	–40; 85	
I_{SHDN}	Shutdown mode supply current	V_{DE} = 0V V_{RE} = V_{CC}	-	9.0	25 ± 10	μA
				10	–40; 85	
I_{ILL}	Input low leakage current on control pin	V_{DE} = V_{DI} = V_{RE} = 0V	-	-0.2	25 ± 10	μA
				-2.0	–40; 85	
I_{ILH}	Input high leakage current on control pin	V_{DE} = V_{DI} = V_{RE} = V_{CC}	-	0.2	25 ± 10	μA
				2.0	–40; 85	
t_{SHDN}	Shutdown time	-	50	600	25 ± 10	ns
Receiver						
V_{OLR}	Output low voltage	V_{ID} = –200mV I_{OL}= 4.0 mA	-	0.36	25 ± 10	V
				0.4	–40; 85	
V_{OHR}	Output high voltage	V_{ID} = –50 mV I_{OH}= – 4.0 mA	V_{CC}– 1.5	-	25 ± 10	V
					–40; 85	
R_I	Input resistance	– 7.0 V≤V_{IR}≤12 V	96	-	25 ± 10	kΩ
					–40; 85	
I_I	Input current	V_{IR} = 12 V; V_{DE} = 0 V, V_{CC} = 0 or 5.25 V	-	114	25 ± 10	μA
		V_{IR} = –7.0 V		-66		
		V_{IR} = 12 V		125	–40; 85	
		V_{IR} = –7.0 V		-75		
I_{OZLR}	Output low current for OFF-state	V_{OR} = 0.4 V	-	-0.5	25 ± 10	μA
				-1.0	–40; 85	
I_{OZHR}	Output high current for OFF-state	V_{OR} = 2.4 V	-	0.5	25 ± 10	μA
				1.0	–40; 85	

I_{OSHR}	Output high short circuit current	V_{OR} = V_{CC}	8.0	87	25 ± 10	mA
			7.0	95	–40; 85	
I_{OSLR}	Output low short circuit current	V_{OR} = 0 V	-8.0	-87	25 ± 10	mA
			-7.0	-95	–40; 85	
Vh_R	Hysteresis	-	-	50	25 ± 10	mV
t_{PHLR}, t_{PLHR}	Receiver input to output switching delay	$\|V_{ID}\|$≥2.0V t_{LH} = t_{HL}≤15 ns	-	185	25 ± 10	ns
				200	–40; 85	
$t_{SKD\ R}$	Differential receiver skew	$\|V_{ID}\|$≥2.0V t_{LH} = t_{HL}≤15 ns	-	28	25 ± 10	ns
				30	–40; 85	
t_{PZHR}, t_{PZLR}	Receiver enable from OFF to output high (low)	C_L = 100 pF	-	45	25 ± 10	ns
				50	–40; 85	
$t_{LR\ (SHDN)}$, $t_{HR\ (SHDN)}$	Receiver enable from shutdown to output high (low)	C_L = 100 pF	-	3150	25 ± 10	ns
				3500	–40; 85	
Transmitter						
V_{OD1}	Differential output voltage (no load)	-	5.0	-	25 ± 10	V
					–40; 85	
V_{OD2}	Differential output voltage (no load)	R_L = 50Ω(RS-422)	2.08	-	25 ± 10	V
			2.00		–40; 85	
		R_L = 27Ω(RS-485)	1.56	-	25 ± 10	
			1.50		–40; 85	
ΔV_{OD}	Change in magnitude of differential output voltage for complementary output states	R_L = 50; 27Ω	-	0.18	25 ± 10	V
				0.2	–40; 85	
V_{OC}	Output bias voltage refer to common pin	R_L = 50; 27Ω	-	2.9	25 ± 10	V
				3.0	–40; 85	
ΔV_{OC}	Change in magnitude of bias output voltage for complementary output states	R_L = 50; 27Ω	-	0.18	25 ± 10	V
				0.20	–40; 85	
I_{OSD}	Short circuit current	–7.0V≤V_{OD}≤V_{CC}	-	±240	25 ± 10	
				±250	–40; 85	
		0V≤V_{OD}≤12V		240	25 ± 10	
				250	–40; 85	
		0V≤V_{OD}≤V_{CC}		±26	25 ± 10	
				±25	–40; 85	
Vh_D	Hysteresis	-	-	200	25±10	
$t_{PHL\ D}$, $t_{PLH\ D}$	Transmitter input to output switching delay	C_{L1} = C_{L2} = 100 pF R_{DIFF} = 54Ω	330	800	25±10	
			250	1000	–40; 85	

$t_{SKEW\ D}$	Transmitter output skew	C_{L1} = C_{L2} = 100 pF R_{DIFF} = 54Ω		90	25±10	
				100	–40; 85	
$t_{PZH\ D}$, $t_{PZL\ D}$	Transmitter enable time from OFF to output high (low)	C_L = 100 pF		2200	25±10	
				2500	–40; 85	
$t_{PHZ\ D}$, $t_{PLZ\ D}$	Transmitter disable time from output high (low) to OFF	C_L = 15 pF		90	25±10	
				100	–40; 85	
t_{RD}, t_{FD}	Rise or fall time of differential output signal	R_{DIFF} = 54Ω C_{L1} = C_{L2} = 100 pF	220	620	25±10	
			200	750	–40; 85	
$t_{LD\ (SHDN)}$, $t_{HD\ (SHDN)}$	Transmitter enable time from shutdown to output high (low)	C_L = 15 pF		4000	25±10	
				4500	–40; 85	
ST	Data rate		600		25±10	
			500		–40; 85	

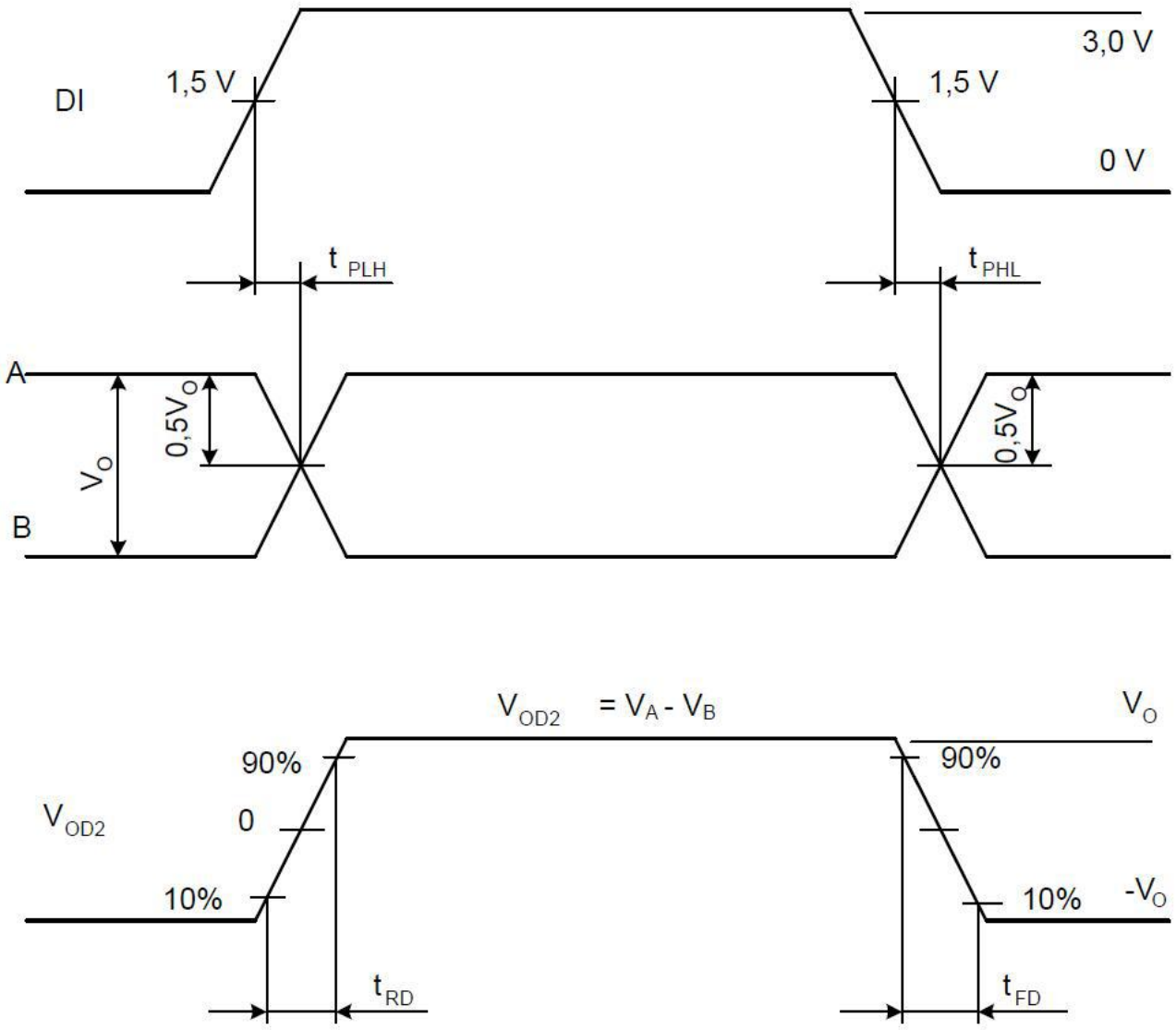
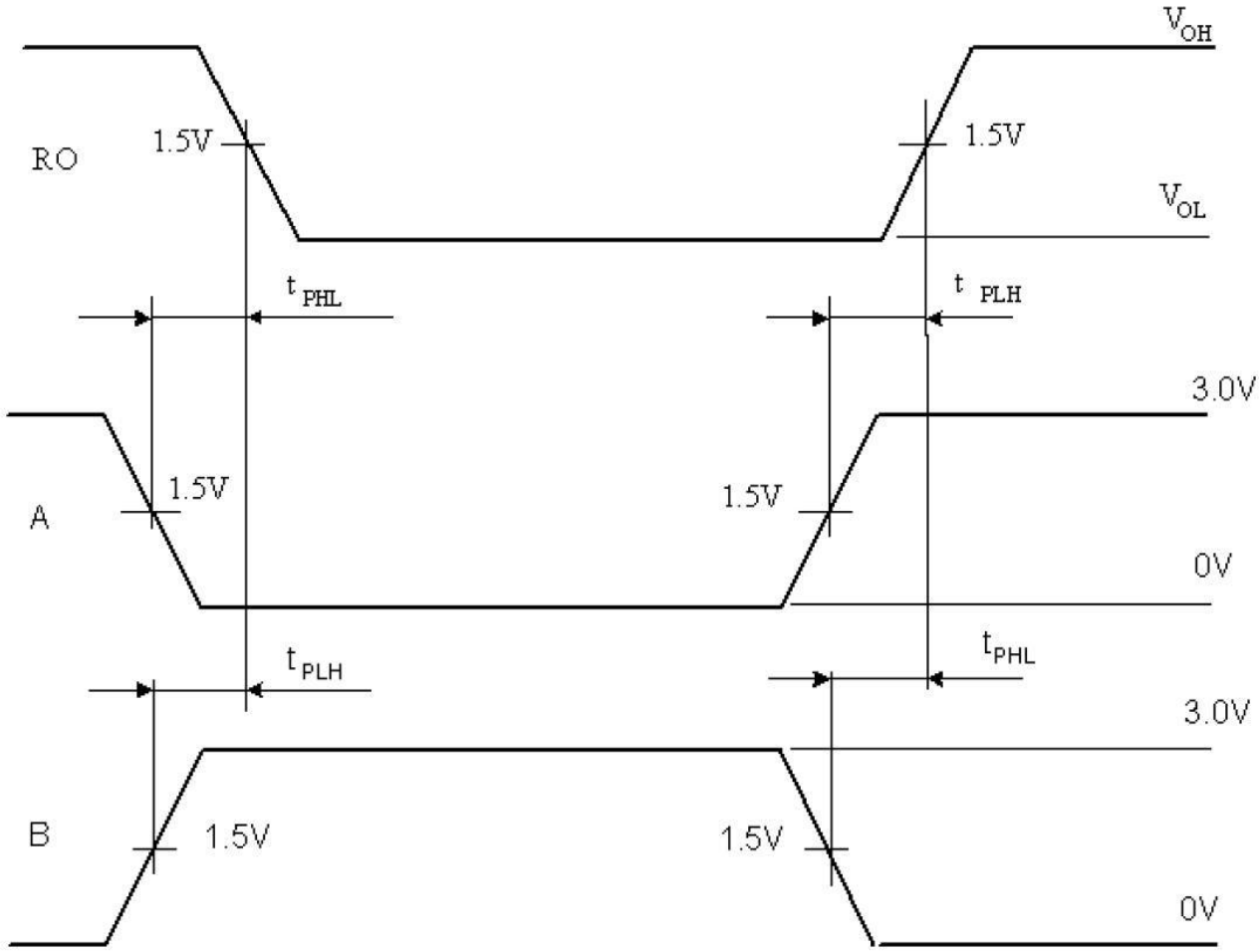


Figure 4. Transmitter output & input signals time diagram



During the input signal A is changing DC voltage 1.5 V is supplied to input B

During the input signal B is changing DC voltage 1.5 V is supplied to input A

Figure 5. Receiver output & input signals time diagram

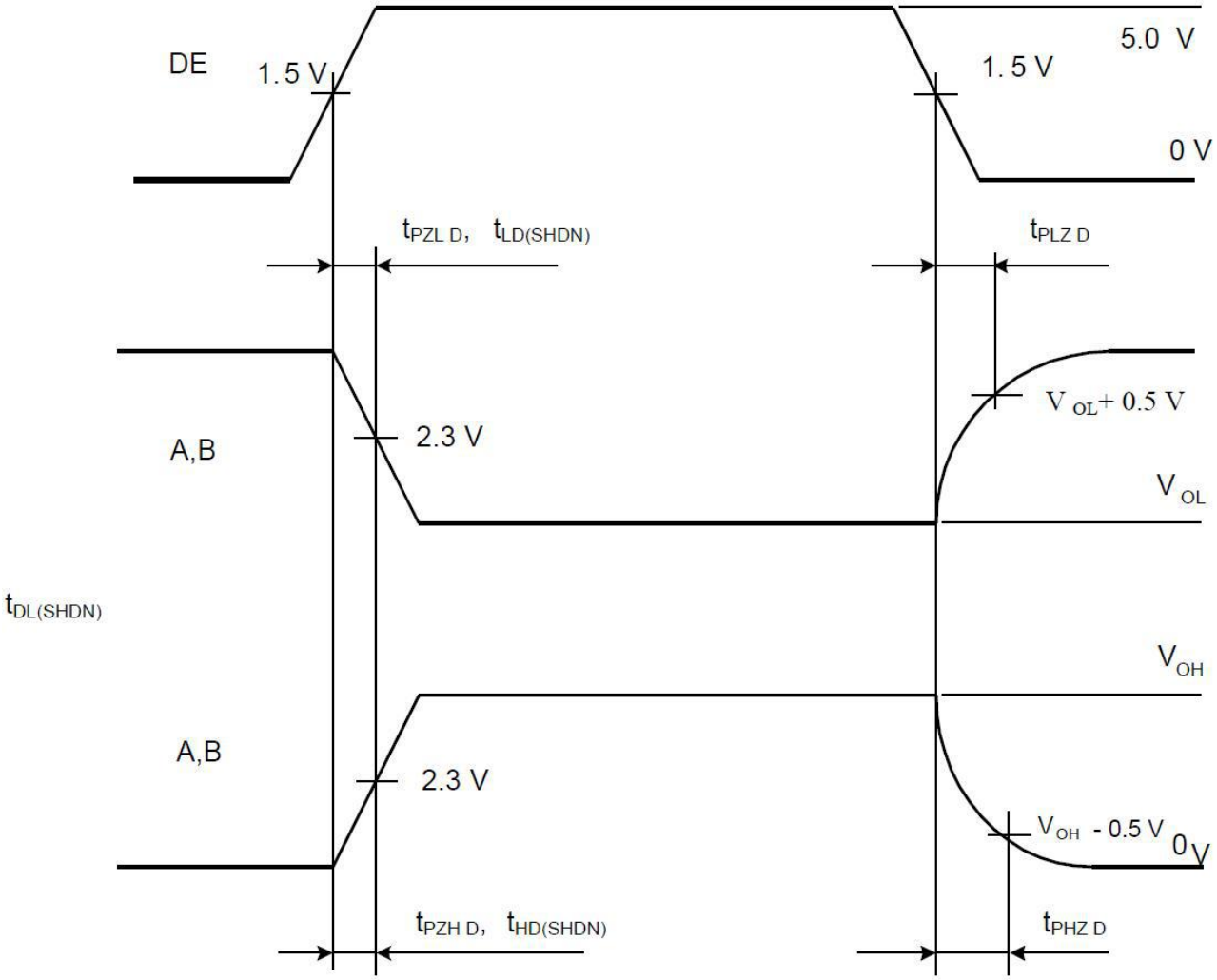


Figure 6. Transmitter output & input signals time diagram

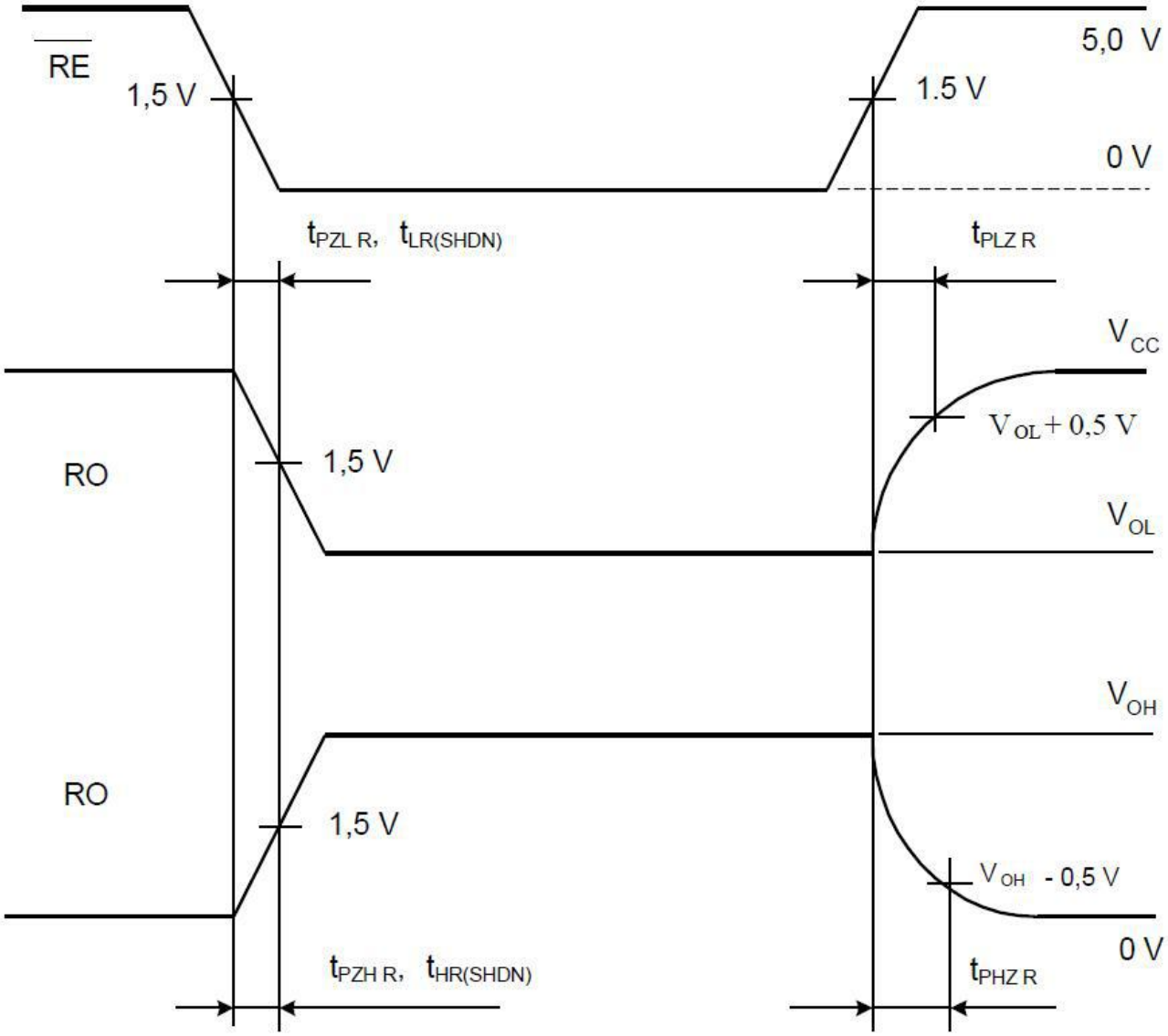
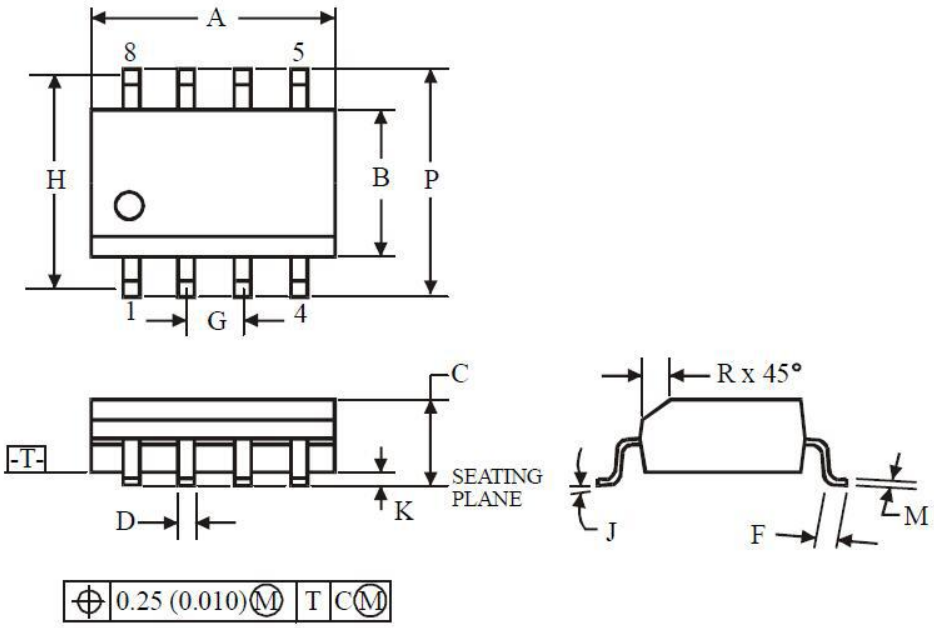


Figure 7. Receiver output & input signals time diagram

PACKAGE



NOTES: 1. Dimensions A and B do not include mold flash or protrusion.

2. Maximum mold flash or protrusion 0.15 mm (0.006) per side for A; for B - 0.25 mm (0.010) per side.

Symbol	Dimensions ,mm	
	Min	Max
A	4.8	5
B	3.8	4
C	1.35	1.75
D	0.33	0.51
F	0.4	1.27
G	1.27	
H	5.72	
J	0°	8°
K	0.1	0.25
M	0.19	0.25
P	5.8	6.2
R	0.25	0.5

PACKAGE/ORDERING INFORMATION

PRODUCT	ORDERING NUMBER	TEMPRANGE	PACKAGE	PAKEAGE MARKING	TRANSPOT MEDIA,QUANTILY
CBM3085A	CBM3085AS8	-40 ~ +85℃	SOIC-8(SOP8)	CBM3085AS	Tape and Reel,2500
	CBM3085ACS8	-0℃~70℃	SOIC-8(SOP8)	CBM3085AC	Tape and Reel,2500

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