

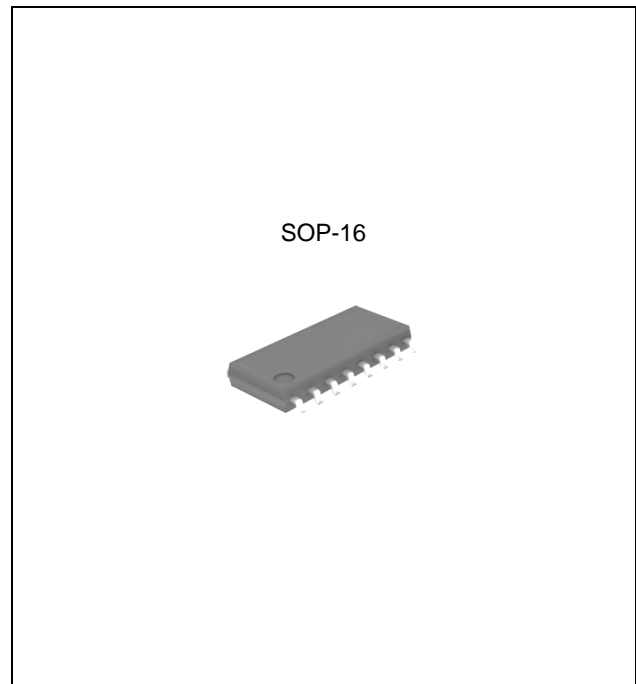
DESCRIPTION

The TJ232 is purposed for application in high-performance information processing systems and control devices of wide application.

Input voltage levels are compatible with standard CMOS levels.

FEATURES

- Output voltage levels are compatible with input levels of C-MOS, N-MOS and TTL integrated circuits.
- Meets All EIA/TIA-232E and V.28/V.24 Specifications
- Supply voltage range from 4.5 to 5.5V
- Low input current: 1.0uA; 0.1uA at T=25°C
- Output current 24mA
- Tolerable value of static potential not less than 2000V

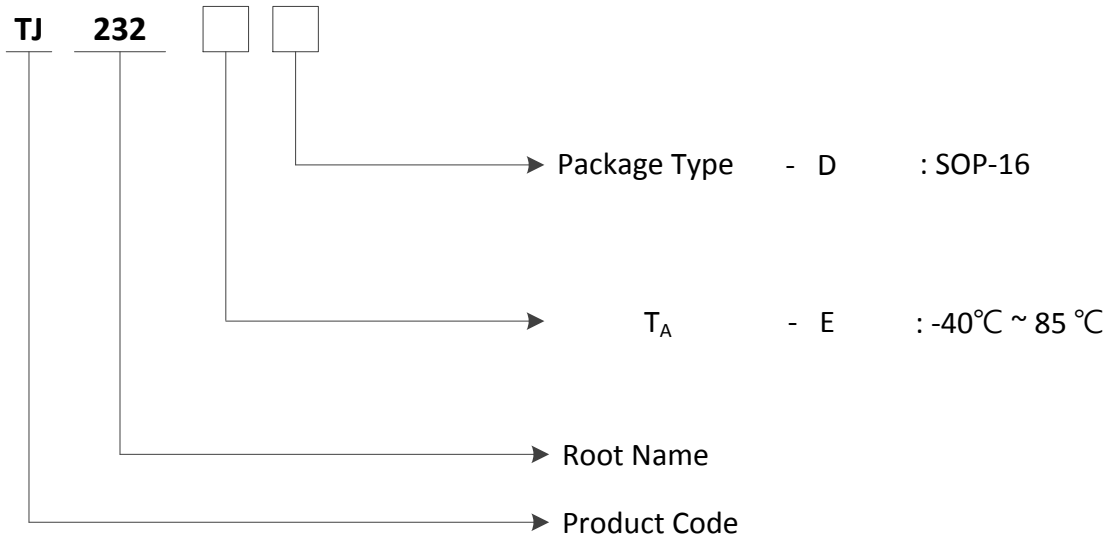
**TRUTH TABLE**

Inputs	Outputs
R_{IN}, T_{IN}	R_{OUT}, T_{OUT}
L	H
H	L
Note - H: High voltage level L: Low voltage level	

Interface transceiver of RS-232 standard with one supply voltage TJ232

Ordering Information

Package	Oder No.	Description	Marking	Compliance	Status
SOP-16	TJ232ED	Interface transceiver of RS-232	TJ232E	RoHS, Green	Active



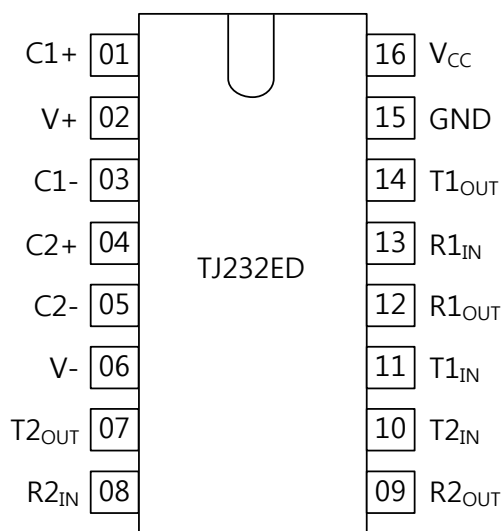
Absolute Maximum Ratings

Characteristic	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	-0.3	6.0	V
Transmitter high output voltage	V_{+}	$V_{CC}-0.3$	14	V
Transmitter low output voltage	V_{-}	-0.3	-14	V
Transmitter input voltage	V_{TIN}	-0.3	$V_{+} + 0.3$	V
Receiver input voltage	V_{RIN}	-30	30	V
Dissipated power	P_D	-	762	mW
Output current of transmitter short circuit	I_{SC}	-	continuously	mA
Storage Temperature Range	T_{STG}	-65	150	°C

Operating Ratings

Characteristic	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	4.5	5.5	V
Transmitter high output voltage	V_{+}	5.0	-	V
Transmitter low output voltage	V_{-}	-5.0	-	V
Transmitter input voltage	V_{TIN}	0	V_{CC}	V
Receiver input voltage	V_{RIN}	-30	30	V
Output current of transmitter short circuit	I_{SC}	-	±60	mA
Ambient Temperature Range	T_A	-40	+85	°C

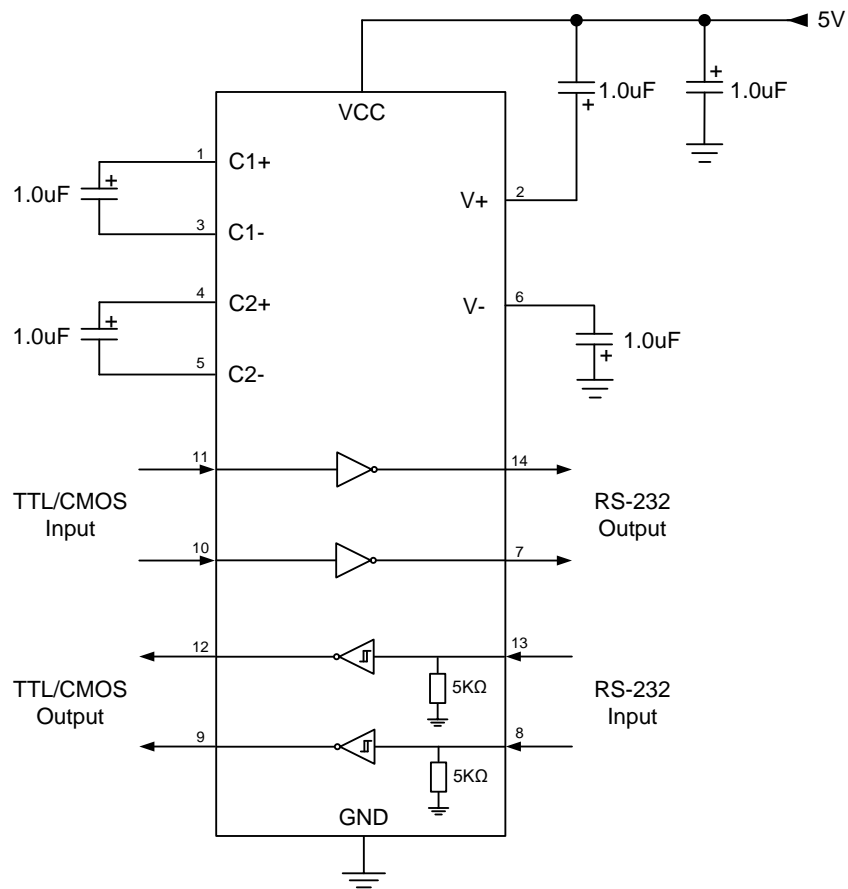
PIN CONFIGURATION



PIN DESCRIPTION

Pin No.	Symbol	Pin name
1	C1+	Output of external capacitance of positive voltage multiplier unit
2	V+	Output of positive voltage of multiplier unit
3	C1	Output of external capacitance of positive voltage multiplier unit
4	C2+	Output of external capacitance of negative voltage multiplier unit
5	C2-	Output of external capacitance of negative voltage multiplier unit
6	V-	Output of negative voltage of multiplier unit
7	T2 _{OUT}	Output of transmitter data (levels RS-232)
8	R2 _{IN}	Input of receiver data (levels RS-232)
9	R2 _{OUT}	Output of receiver data (levels TTL/CMOS)
10	T2 _{IN}	Input of transmitter data (levels TTL/CMOS)
11	T1 _{IN}	Input of transmitter data (levels TTL/CMOS)
12	R1 _{OUT}	Output of receiver data (levels TTL/CMOS)
13	R1 _{IN}	Input of receiver data (levels RS-232)
14	T1 _{OUT}	Output of transmitter data (levels RS-232)
15	GND	Common output
16	V _{CC}	Supply output of voltage source

TYPICAL APPLICATION CIRCUIT



STATIC PARAMETERS

PARAMETER	Symbol	CONDITIONS	Rate				UNITS	
			25°C		-40°C ~ 85°C			
			min	max	min	max		
Supply Current	I _{CC}	V _{CC} = 5.5V V _{IL} = 0V	-	10.0	-	14.0	mA	
Receiver electrical parameters								
Hysteresis voltage	V _h	V _{CC} = 5.0V	0.2	0.9	0.2	1.0	V	
On(operation) voltage	V _{on}	V _O ≤ 0.1V I _{OL} ≤ 20uA	-	2.4	-	2.3	V	
Off (dropout) voltage	V _{off}	V _O ≥ V _{CC} - 0.1V I _{OH} ≤ -20uA	0.8	-	0.9	-	V	
Output low voltage	V _{OL}	I _L = 3.2mA V _{CC} = 4.5V V _{IH} = 2.4V	-	0.3	-	0.4	V	
Output high voltage	V _{OH}	I _{OH} = -1.0mA V _{CC} = 4.5V V _{IL} = 0.8V	3.6	-	3.5	-	V	
Input resistance	R _i	V _{CC} = 5.0V	3.0	7.0	3.0	7.0	KΩ	
Transmitter electrical parameters								
Output low voltage	V _{OL}	V _{CC} = 4.5V V _{IH} = 2.0V R _L = 3.0KΩ	-	-5.2	-	-5.0	V	
Output high voltage	V _{OH}	V _{CC} = 4.5V V _{IL} = 0.8V R _L = 3.0KΩ	5.2	-	5.0	-	V	
Input low current	I _{IL}	V _{CC} = 5.5V V _{IL} = 0V	-	-1.0	-	-10.0	uA	
Input high current	I _{IH}	V _{CC} = 5.5V V _{IH} = V _{CC}	-	1.0	-	10.0	uA	
Speed of output front charge	SR	V _{CC} = 5.0V C _L = 50 - 1000pF R _L = 3.0 - 7.0KΩ	3.0	30	2.7	27	V/us	
Output resistance	R _O	V _{CC} = V ₊ = V ₋ = 0V V _O = ±2V	350	-	300	-	Ω	
Short circuit output current	I _{sc}	V _{CC} = 5.5V V _O = 0V	V _I = V _{CC}	-	-50	-	-60	mA
			V _I = 0	-	50	-	60	
Speed of information transmission	ST	V _{CC} = 4.5V C _L = 1000pF R _L = 3.0KΩ t _w = 7us (for extreme, t _w = 8us)	140	-	120	-	Kbit/s	

DYNAMIC PARAMETERS

PARAMETER	Symbol	CONDITIONS	Rate				UNITS
			25°C		-40°C ~ 85°C		
			min	max	min	max	
Signal propagation delay Time when switching on (off)	t_{PHLR} (t_{PLHR})	$V_{CC} = 4.5V$ $C_L = 150pF$ $V_{IL} = 0V$ $V_{IH} = 3.0V$ $t_{LH} = t_{HL} \leq 10ns$	-	9.7	-	10	us
Signal propagation delay Time when switching on (off)	t_{PLHT} (t_{PLHT})	$V_{CC} = 4.5V$ $C_L = 2500pF$ $V_{IL} = 0V$ $V_{IH} = 3.0V$ $R_L = 3K\Omega$ $t_{LH} = t_{HL} \leq 10ns$	-	5.0	-	6.0	us

CAPACITANCE

PARAMETER	Symbol	VCC [V]	Rate	UNIT
Input Capacitance	C_{IN}	5.0	9.0	pF
Dynamic Capacitance	C_{PD}	5.0	90	pF

TIMING DIAGRAM

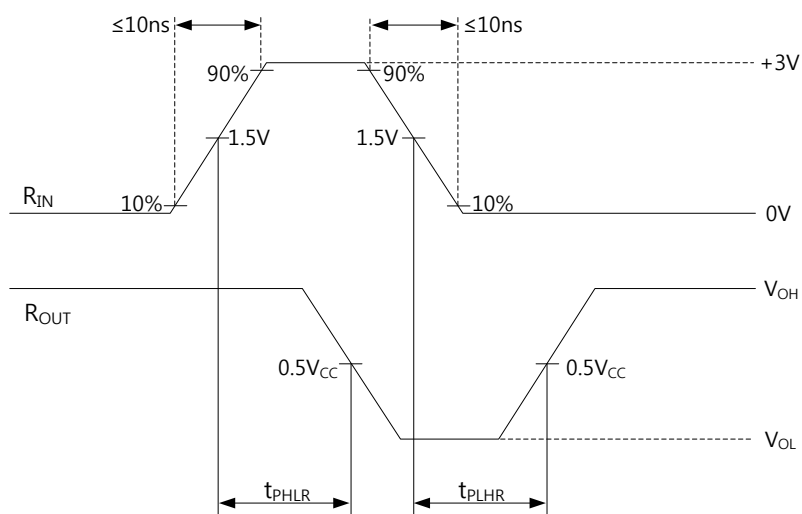


Figure 1. t_{PHL} and t_{PLH} waveforms of Receiver

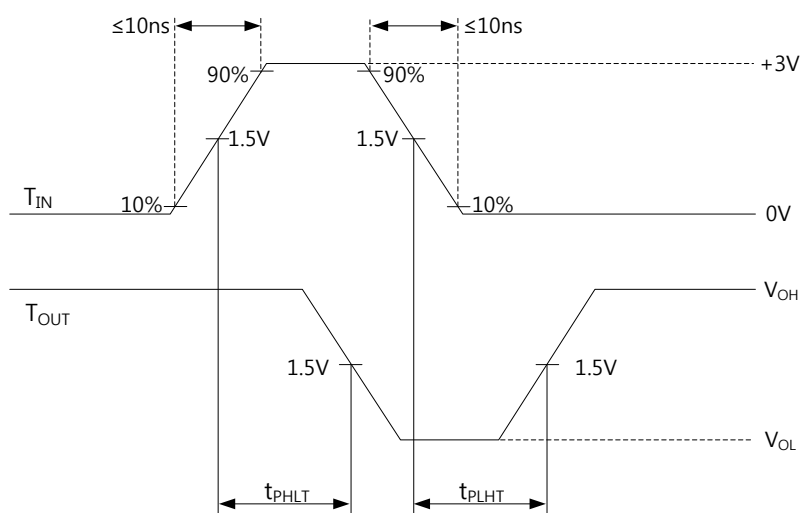


Figure 2. t_{PHL} and t_{PLH} waveforms of Transmitter

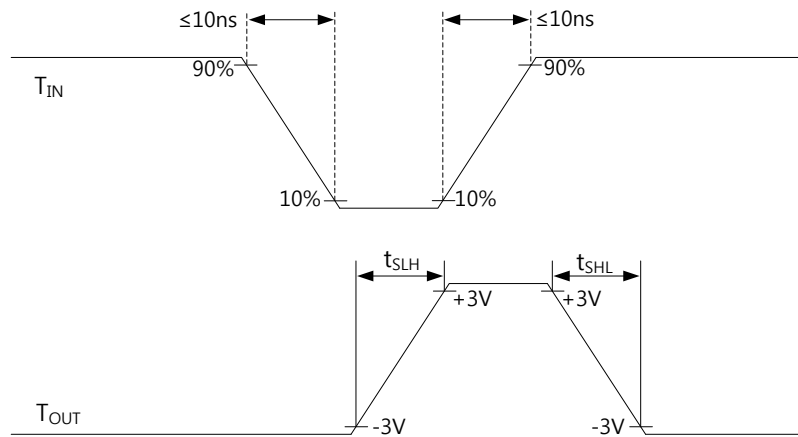


Figure 3. t_{SLH} and t_{SHL} waveforms of Transmitter

REVISION NOTICE

The description in this datasheet can be revised without any notice to describe its electrical characteristics properly.