钍地半导体
Tudi Semiconductor

Product Specification

TUDI-SP232A

Enhanced RS-232 Line Drivers/Receivers

网址 www.sztdbdt.com

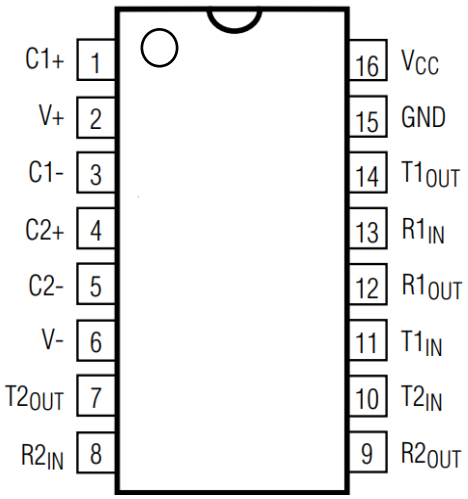
用芯智造·卓越品质

semiconductor device manufacturer

- Design
- research and development
- production
- and sales

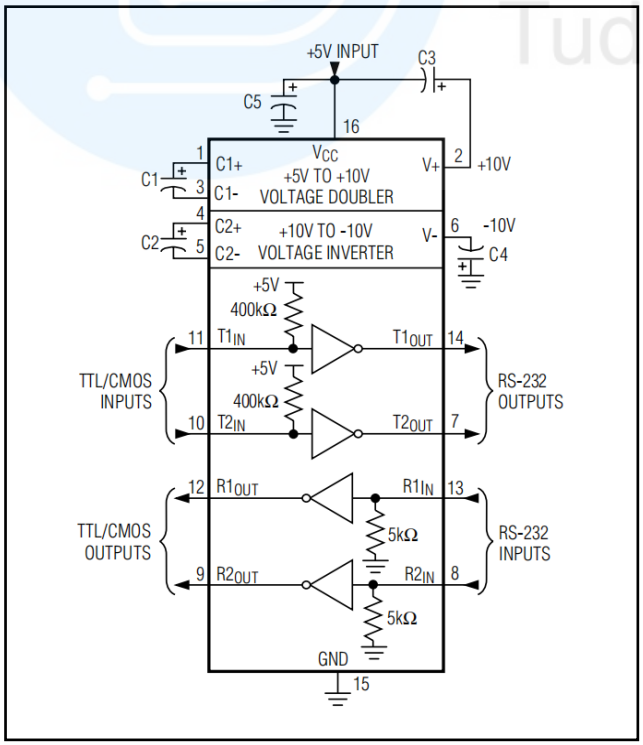
Features

- Operates from a Single +5V Power Supply
- Meets all RS-232F and ITU V.28 Specifications
- Operates with 0.1μF Ceramic Capacitors
- High Data rate - 120kbps under load
- Low power CMOS Operation
- +/-2kV Human Body Model ESD Protection
- Lead Free packaging available



Description

The SP232A is a line driver and receiver pair that meets the specifications of RS-232 and V .28 serial protocols. This device is pin-to-pin compatible with popular industry standard pinouts. The SP232A offers 120kbps data rate under load, small ceramic type 0.1μF charge pump capacitors and overall ruggedness for comercial applications. Allows for low -power operation without sacrificing performance. This device is avaialble in plastic DIP, SOICW and nSOIC packages operating over the commercial and industrial temperature ranges.



Typical Operating Circuit

Pin description

Pin No	Symbol	Pin name
01	C1+	Output of external capacitance of positive voltage multiplier unit
02	V+	Output of positive voltage of multiplier unit
03	C1-	Output of external capacitance of positive voltage multiplier unit
04	C2+	Output of external capacitance of negative voltage multiplier unit
05	C2-	Output of external capacitance of negative voltage multiplier unit
06	V-	Output of negative voltage of multiplier unit
07	T2oUT	Output of transmitter data(levels RS-232)
08	R2IN	Input of receiver data(levels RS-232)
09	R2oUT	Output of receiver data(levels TTL/KMOS)
10	T2IN	Input of transmitter data(levels TTL/KMOS)
11	T1n	Input of transmitter data(levels TTL/KMOS)
12	R1oUT	Output of receiver data(levels TTL/KMOS)
13	R1n	Input of receiver data(levels RS-232)
14	TloUT	Output of transmitter data(levels RS-232)
15	GND	Common output
16	Vcc	Supply output of voltage source

Recommended Operating Conditions				
Symbol	Parameter	Rate		Unit
		min	max	
Vcc	Supply voltage	4.5	5.5	V
V+	Transmitter output high voltage	5.0	-	
V-	Transmitter output low voltage	-5.0	-	
VTIN	Transmitter input voltage	0	Vcc	
VRIN	Receiver input voltage	-30	30	
Isc	Transmitter short circuit output current	-	±60	mA
Ta	Ambient temperature	-40	85	C
Maximum conditions				
Symbol	Parameter	Rate		Unit
		min	max	
Vcc	Supply voltage	-0.3	6.0	V
V+	Transmitter high output voltage	Vcc-0.3	14	
V-	Transmitter low output voltage	-0.3	-14	
VTIN	Transmitter input voltage	-0.3	V++0.3	
VRIN	Receiver input voltage	-30	30	
Pp	Dissipated powerDIP-package	-		mW
Isc	Output current of transmitter short circuit	-	Continuously	mA
Ta	Ambient temperature	-60	150	C

Receiver electrical parameters							
Symbol	Parameter	Test conditions	Rate				Unit
			25℃		-40℃ to 85℃		
			min	max	min	max	
Vh	Hysteresis voltage	Vcc=5.0V	0.2	0.9	0.2	1.0	V
Von	On(operation)voltage	Vo≤0.1VIoL ≤20 uA		2.4		2.3	
Voff	Off(dropout)voltage	Vo≥Vcc-01VIoH ≤-20 uA	0.8		0.9		
VoL	Output low voltage	IoL=3.2 mA Vcc=4.5V	-	0.3		0.4	
VoH	Output high voltage	IoH=-1.0 mA Vcc=4.5V	3.6		3.5	-	
RI	Input resistance	Vcc=5.0V	3.0	7.0	3.0	7.0	kOhm

Transmitter electrical parameters							
Symbol	Parameter	Test conditions	Rate				Unit
			25℃		-40℃ to 85℃		
			min	max	min	max	
VoL	Output low voltage	Vcc=4.5V VH=2.0V	-	-5.2		-5.0	V
VoH	Output high voltage	Vcc=4.5V VL=0.8V	5.2		5.0	-	
I	Input low current	Vcc=5.5V Vπ= 0V	-	-1.0		-10.0	uA
IH	Input high current	Vcc=5.5V VH=Vcc		1.0		10.0	
SR	Speed of output frontchange	Vcc=5.0V CL=50 -1000 pF	3.0	30	2.7	27	V/uS
Ro	Output resistance	Vcc=V+=V-=0V Vo=±2V	350	-	300	-	Ohm
Isc	Short circuit outputcurrent	Vcc=5.5V Vo=0V		-5050		-6060	mA kbps
ST	Speed of information transmission	Vcc=4.5V CL=1000 pF	140		120	-	

Dynamic parameters							
Symbol	Parameter	Test conditions	Rate				Unit
			25℃		-40℃ to 85℃		
			min	max	min	max	
tPHLR (tPLHR)	Signal propagation delay time	Vcc=4.5V CL=150 pF		9.7	-	10	us
tPHLT (tPLHT)	Signal propagation delay time	Vcc=4.5V CL=2500 pF		5.0*		6.0*	

Capacitance							
Symbol	Parameter	Test conditions	Rate				Unit
			25℃		-40℃ to 85℃		
			min	max	min	max	
CIN	Input capacitance	5.0	9.0				pF
CpD	Dynamic capacitance		90				

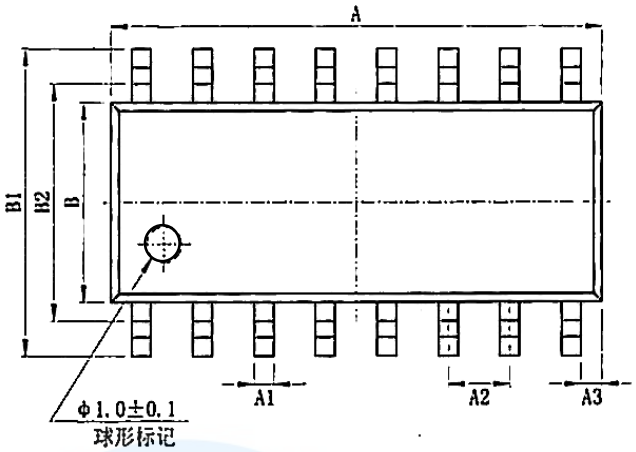
Static parameters							
Symbol	Parameter	Test conditions	Rate				Unit
			25℃		-40℃ to 85℃		
			min	max	min	max	
Icc	Consumption current static	Vcc=5.0V Vπ=0V		10.0		14	mA

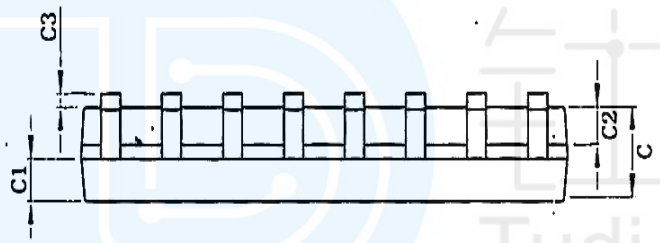
Truth table			
Inputs	RIn,TIN	H	L
Outputs	RovT,TovT	L	H
H-voL-l	Note: Itage high level; ow voltage level		

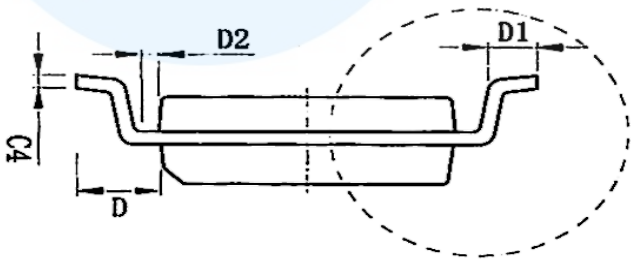
Order information

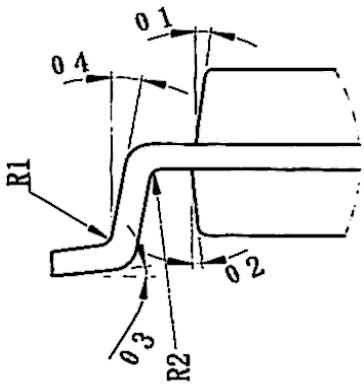
Order Number	Package	Package Quantity	Marking On The park	Temperature
SP232ACN-L/TR-TUDI	SOP16	Tape,Reel,2500	SP232ACN	0℃ to 70℃
SP232ACT-L/TR-TUDI	SMD16	Tape,Reel,1000	SP232ACT	
SP232ACP-L-TUDI	DIP16	Tube,25,A box of 1000	SP232ACP	
SP232AEN-L/TR-TUDI	SOP16	Tape,Reel,2500	SP232AEN	- 40°C to 85°C
SP232AET-L/TR-TUDI	SMD16	Tape,Reel,1000	SP232AET	
SP232AEP-L-TUDI	DIP16	Tube,25,A box of 1000	SP232AEP	

Package SOP16



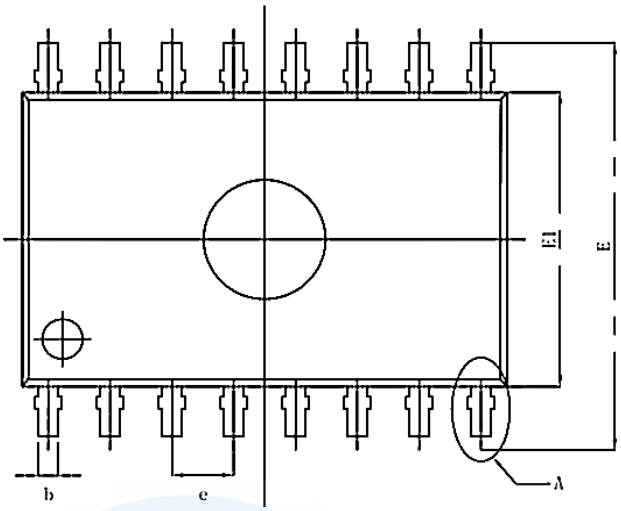


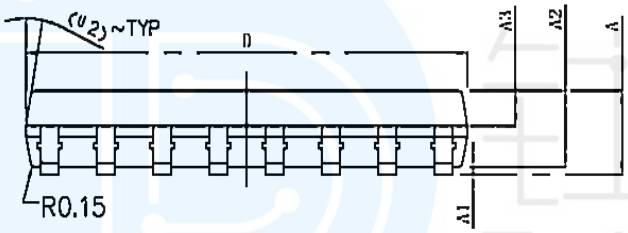


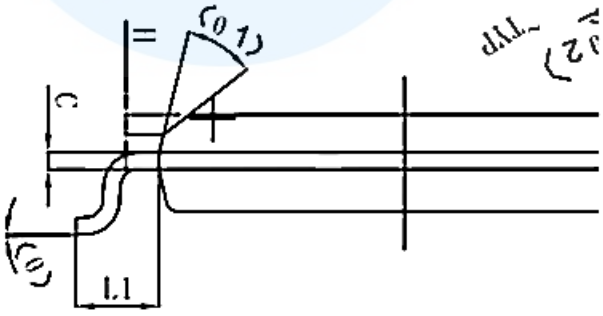


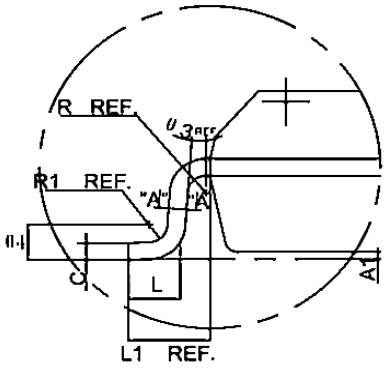
SIZE / SYMBOL	MIN./mm	MAX./mm
A	9.80	10.00
A1	0.356	0.456
A2	1.27TYP	
A3	0.302TYP	
B	3.85	3.95
B1	5.84	6.24
B2	5.00 TYP	
C	1.40	1.60
C1	0.61	0.71
C2	0.54	0.64
C3	0.05	0.25
C4	0.203	0.233
D	1.05 TYP	
D1	0.40	0.70
D2	0.15	0.25
R1	0.20TYP	
R2	0.20TYP	
01	8°~12°TYP4	
02	8°~12°TYP4	
03	0°~8°	
04	4°~12°	

Package SMD16



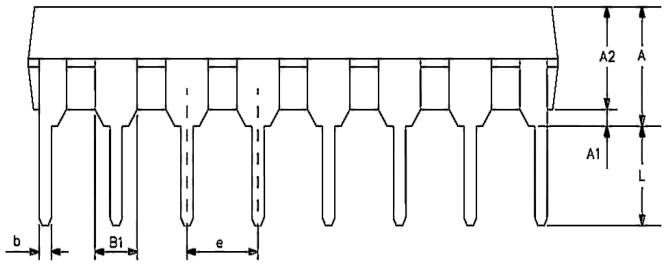


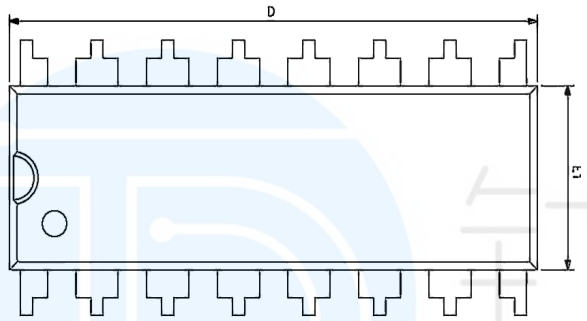


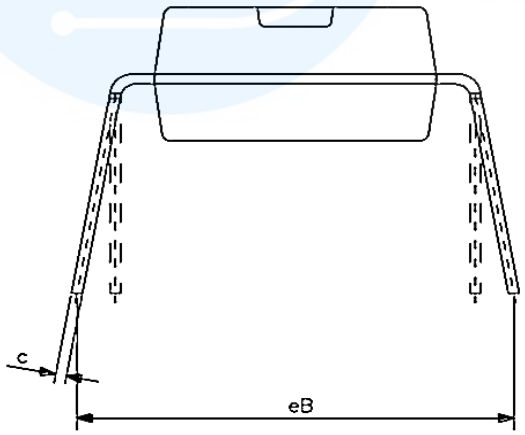


SIZE / SYMBOL	MIN./mm	MAX./mm
A	_	2.65
A1	0.10	0.30
A2	2.25	2.35
A3	0.97	1.07
D	10.10	10.50
E	10.26	10.60
E1	7.30	7.70
e	1.27BSC	
L	0.55	0.85
L1	1.4BSC	
H	0.345	0.365
R	0.20TYP	
R1	0.30TYP	
θ	0°	8°
θ1	45° TYP	
02	12° TYP	
03	0°	8°
04	0°	10°

Package DIP16







SIZE / SYMBOL	MIN./mm	MAX./mm
A2	3.20	3.60
A1	0.51	___
A	3.60	5.33
L	3.00	3.60
b	0.36	0.56
B1	1.52	
D	18.80	19.94
E1	6.20	6.60
e	2.54	
C	0.20	0.36
eB	7.62	9.30
R	0.20TYP	
R1	0.30TYP	
θ	0°	8°
θ1	45°TYP	
02	12°TYP	
03	0°	8°
04	0°	10°

Important statement:

●TUDI Semiconductor reserves the right to modify the product manual without prior notice! Before placing an order, customers need to confirm whether the obtained information is the latest version and verify the completeness of the relevant information.

●Any semi-guide product is subject to failure or malfunction under specified conditions. It is the buyer's responsibility to comply with safety standards when using TUDI Semiconductor products for system design and whole machine manufacturing.And take the appropriate safety measures to avoid the potential in the risk of loss of personal injury or loss of property situation!

●TUDI Semiconductor products have not been licensed for life support, military, and aerospace applications,and therefore TUDI Semiconductor is not responsible for any consequences arising from the use of this product in these areas.

●If any or all TUDI Semiconductor products (including technical data, services) described or contained in this document are subject to any applicable local export control laws and regulations, they may not be exported without an export license from the relevant authorities in accordance with such laws.

●The specifications of any and all TUDI Semiconductor products described or contained in this document specify the performance, characteristics, and functionality of said products in their standalone state, but do not guarantee the performance, characteristics, and functionality of said products installed in Customer's products or equipment. In order to verify symptoms and conditions that cannot be evaluated in a standalone device, the Customer should ultimately evaluate and test the device installed in the Customer's product device.

●TUDI Semiconductor documentation is only allowed to be copied without any alteration of the content and with the relevant authorization.TUDI Semiconductor assumes no responsibility or liability for altered documents.

●TUDI Semiconductor is committed to becoming the preferred semiconductor brand for customers, and TUDI Semiconductor will strive to provide customers with better performance and better quallity products.