

Features

- Output voltage levels are compatible with input levels of K-MOS, N-MOS and TTL integrated circuits
- Supply voltage : 5V
- Low input current: 1.0 μ A; 0.1 μ A at $T_A = 25^\circ\text{C}$
- Output current 24mA
- Latching current not less than 450mA at $T_A = 25^\circ\text{C}$
- Enhanced ESD Specifications:
 - ±15kV IEC61000-4-2 Air Discharge
 - ±8kV IEC61000-4-2 Contact Discharge

General Description

CBM232 is purposed for application in high-performance information processing systems and control devices of wide application.

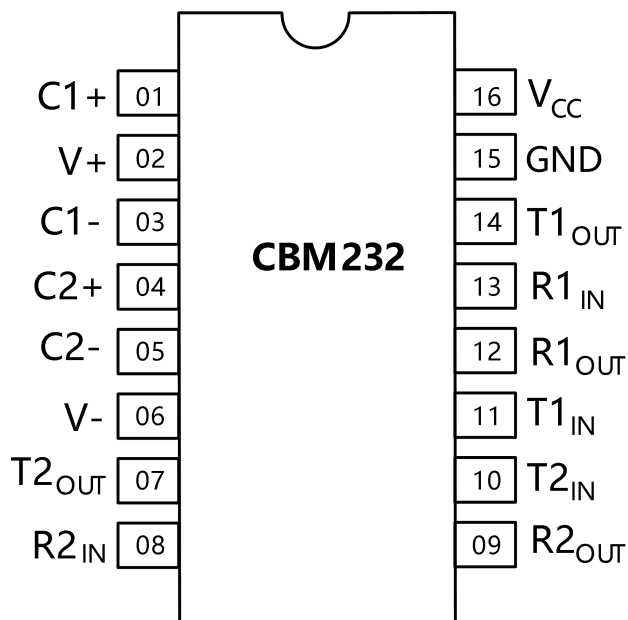
Applications

- Computers
- Peripherals
- Modems
- Printers
- Instruments

CATALOG

Features.....	
General Description.....	
Applications.....	
Pin symbols in package.....	1
Table of pin description.....	2
Absolute Maximum Ratings.....	3
Recommended Operating Conditions.....	4
Static parameters.....	5
Capacitance.....	6
Timing diagram when measuring IC dynamic parameters.....	7
Package Outline Dimensions.....	9
SOP-16.....	9
Package/Ordering Information.....	10

Pin symbols in package



Inputs	Outputs
R_{IN}, T_{IN}	R_{OVT}, T_{OVT}
H	L
L	H

Note:
H – voltage high level; L – low voltage level

Table of pin description

Pin No.	Symbol	Pin name
01	C_{1+}	Output of external capacitance of positive voltage multiplier unit
02	$V+$	Output of positive voltage of multiplier unit
03	C_{1-}	Output of external capacitance of positive voltage multiplier unit
04	C_{2+}	Output of external capacitance of negative voltage multiplier unit
05	C_{2-}	Output of external capacitance of negative voltage multiplier unit
06	$V-$	Output of negative voltage of multiplier unit
07	$T2_{OUT}$	Output of transmitter data (levels RS– 232)
08	$R2_{IN}$	Input of receiver data (levels RS – 232)
09	$R2_{OUT}$	Output of receiver data (levels TTL/KMOS)
10	$T2_{IN}$	Input of transmitter data (levels TTL/KMOS)
11	$T1_{IN}$	Input of transmitter data (levels TTL/KMOS)
12	$R1_{OUT}$	Output of receiver data (levels TTL/KMOS)
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

Absolute Maximum Ratings

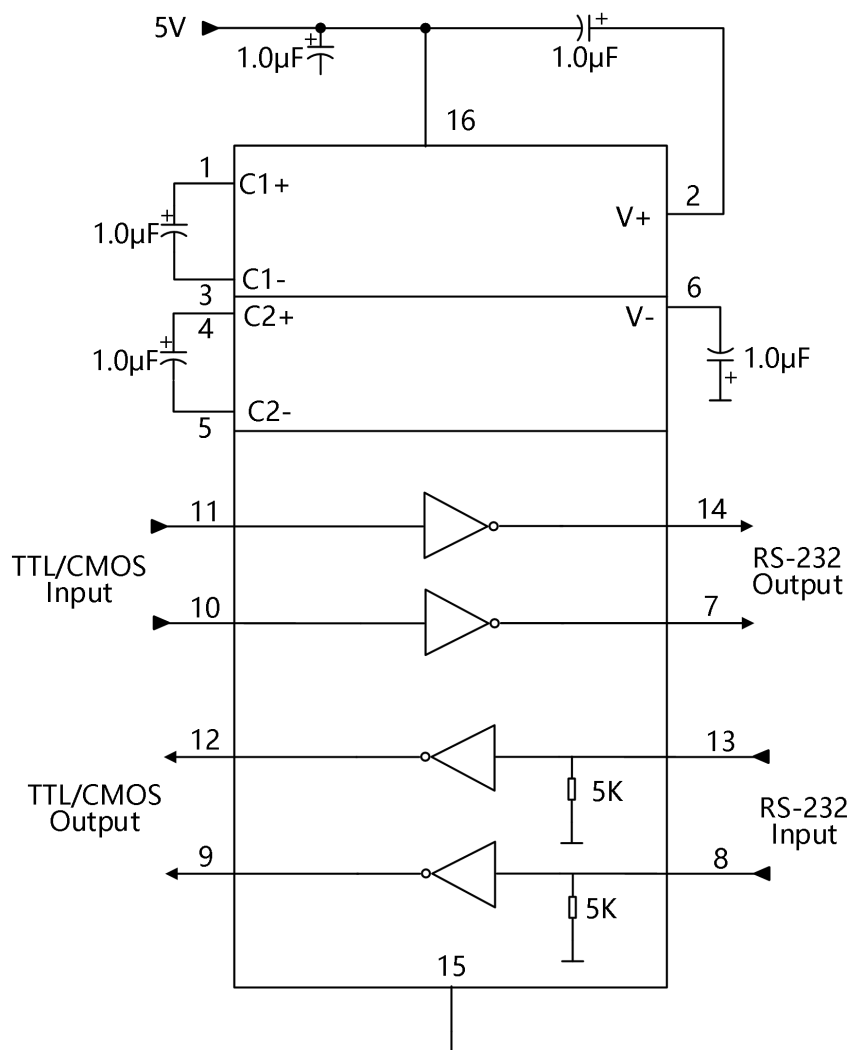
Symbol	Parameter	Rate		Unit
		Min	Max	
V _{CC}	Supply voltage	-0.3	6.0	V
V ₊	Transmitter high output voltage	V _{CC} -0.3	14	
V ₋	Transmitter low output voltage	-0.3	-14	
V _{TIN}	Transmitter input voltage	-0.3	V ₊ +0.3	
V _{RIN}	Receiver input voltage	-30	30	
P _D	Dissipated power DIP – package SO – package	-	842	mW
			762	
I _{SC}	Output current of transmitter short circuit	-	Continuously	mA
T _S	Storage temperature	-60	150	°C

* Stresses beyond those listed under “absolute 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.

Recommended Operating Conditions

Symbol	Parameter	Rate		Unit
		Min	Max	
V_{CC}	Supply voltage	4.5	5.5	V
V_{+}	Transmitter output high voltage	5.0	-	
V_{-}	Transmitter output low voltage	-5.0	-	
V_{TIN}	Transmitter input voltage	0	V_{CC}	
V_{RIN}	Receiver input voltage	-30	30	
I_{SC}	Transmitter short circuit output current	-	± 60	mA
T_A	Ambient temperature	-40	125	$^{\circ}C$



Static parameters

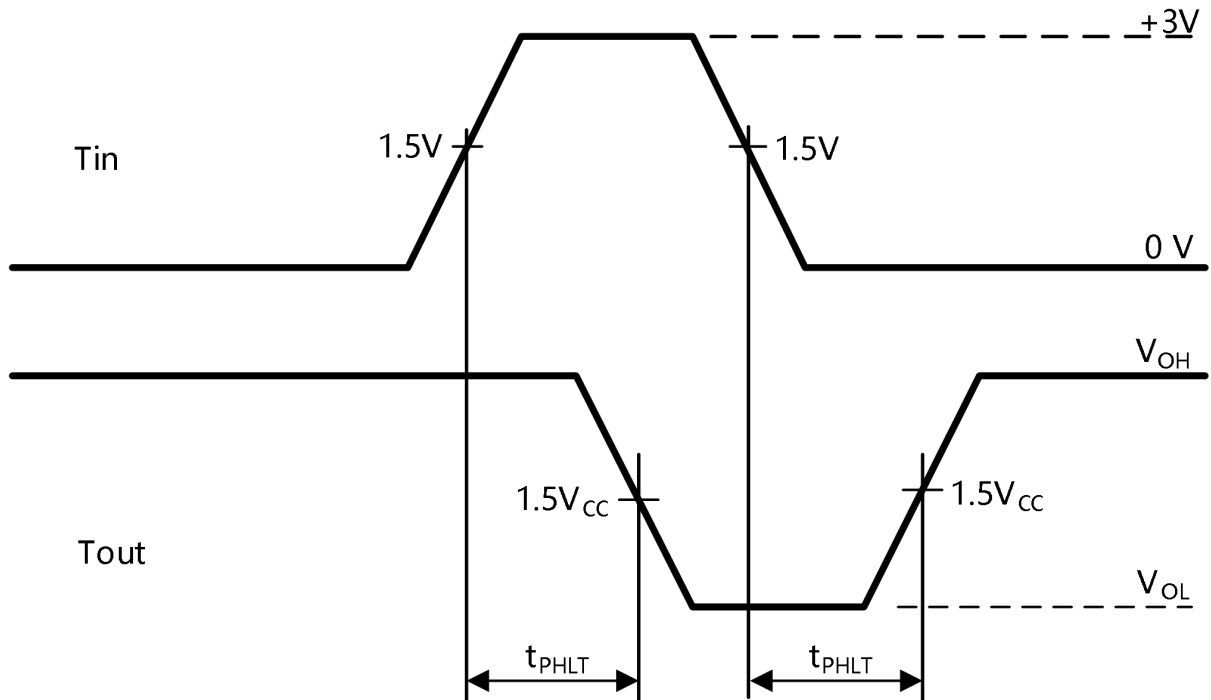
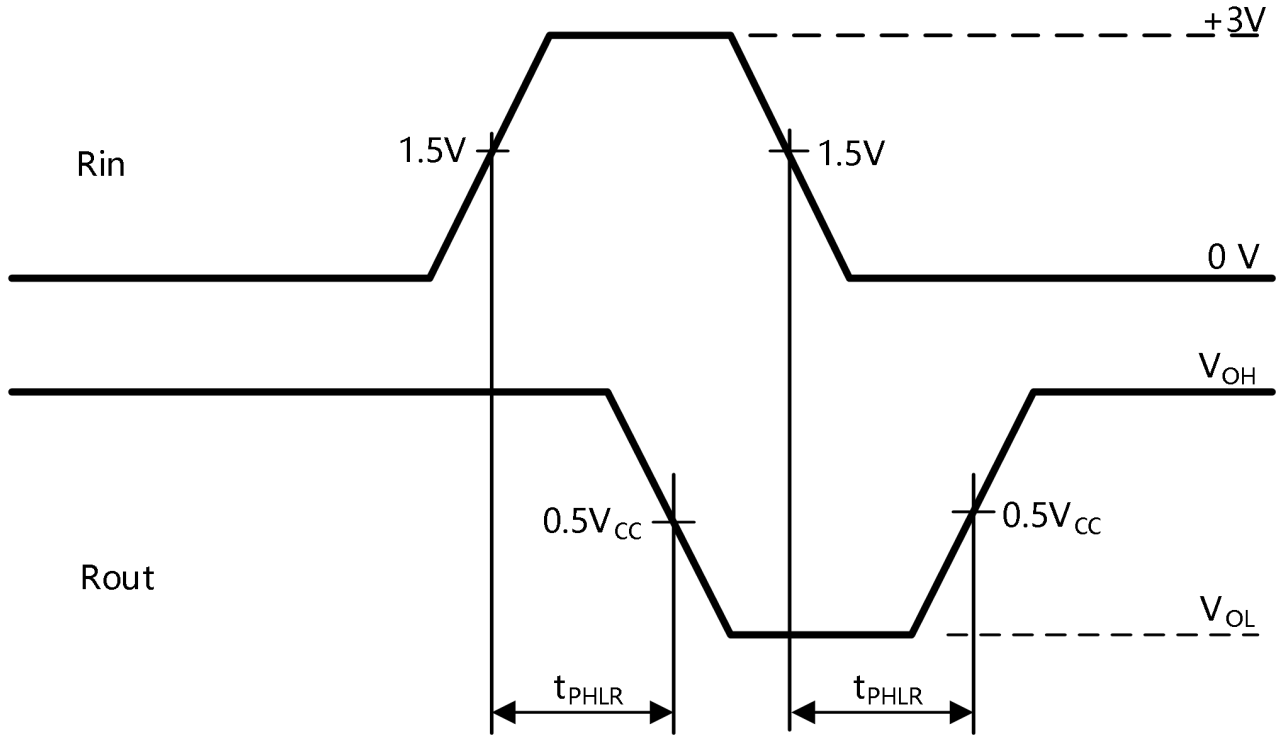
Symbol	Parameter	Test conditions	Rate				Unit
			25°C		-40°C to 125°C		
			Min	Max	Min	Max	
I_{CC}	Consumption current static	$V_{CC} = 5.0\text{ V}$ $V_{IL} = 0\text{ V}$	-	10.0	-	14.0*	mA
Receiver electrical parameters							
V_H	Hysteresis voltage	$V_{CC} = 5.0\text{ V}$	0.2	0.9	0.2	1.0	V
V_{ON}	On (operation) voltage	$V_O \leq 0.1\text{ V}$ $I_{OL} \leq 20\mu\text{A}$	-	2.4	-	2.3	
V_{OFF}	Off (dropout) voltage	$V_O \geq V_{CC} - 0.1\text{ V}$ $I_{OH} \leq -20\mu\text{A}$	0.8	-	0.9	-	
V_{OL}	Output low voltage	$I_{OL} = 3.2\text{ mA}$ $V_{CC} = 4.5\text{ V}$ $V_{IH} = 2.4\text{ V}$	-	0.3	0.4	-	
V_{OH}	Output high voltage	$I_{OH} = -1.0\text{ mA}$ $V_{CC} = 4.5\text{ V}$ $V_{IL} = 0.8\text{ V}$	3.6	-	3.5	-	
R_I	Input resistance	$V_{CC} = 5.0\text{ V}$	3.0	7.0	3.0	7.0	kOhm
Transmitter electrical parameters							
V_{OL}	Output low voltage	$V_{CC} = 4.5\text{ V}$ $V_{IH} = 2.0\text{ V}$ $R_L = 3.0\text{ kOhm}$	-	-5.2	-	5.0	V
V_{OH}	Output high voltage	$V_{CC} = 4.5\text{ V}$ $V_{IL} = 0.8\text{ V}$ $R_L = 3.0\text{ kOhm}$	5.2	-	5.0	-	
I_{IL}	Input low current	$V_{CC} = 5.5\text{ V}$ $V_{IL} = 0\text{ V}$	-	-1.0	-	-10.0	uA
I_{IH}	Input high current	$V_{CC} = 5.5\text{ V}$ $V_{IH} = V_{CC}$	-	1.0	-	10.0	
SR	Speed of output front change	$V_{CC} = 5.0\text{ V}$ $C_L = 50 - 1000\text{ pF}$ $R_L = 3.0 - 7.0\text{ kOhm}$	3.0	30	2.7	27	V/ μs
R_O	Output resistance	$V_{CC} = V_+ = V_- = 0\text{ V}$ $V_O = 2\text{ V}$	350	-	300	-	Ohm
I_{SC}	Short circuit output current	$V_{CC} = 5.5\text{ V}$					mA

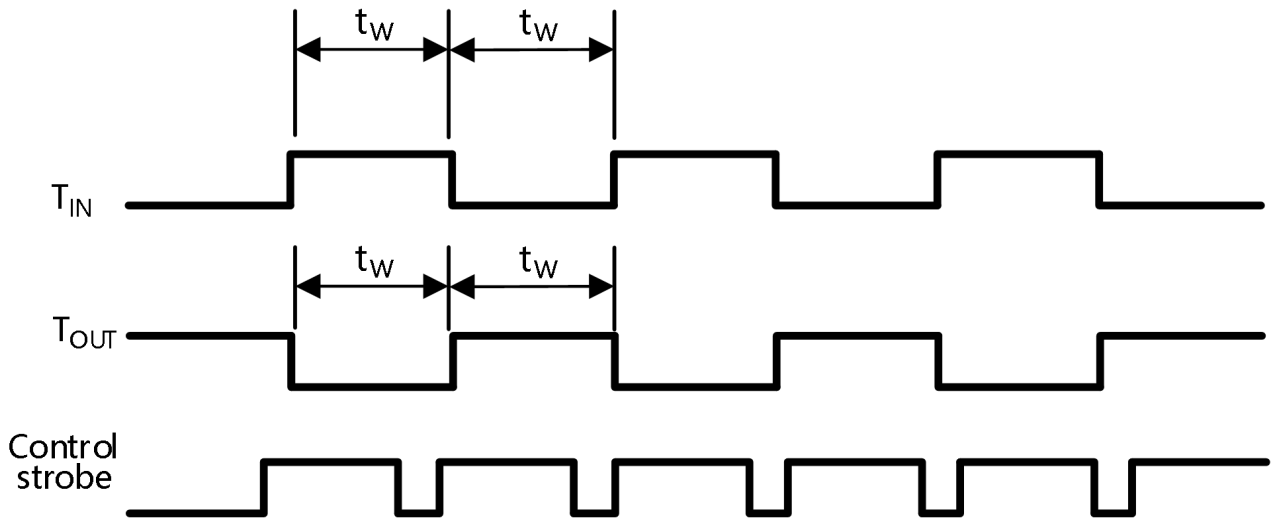
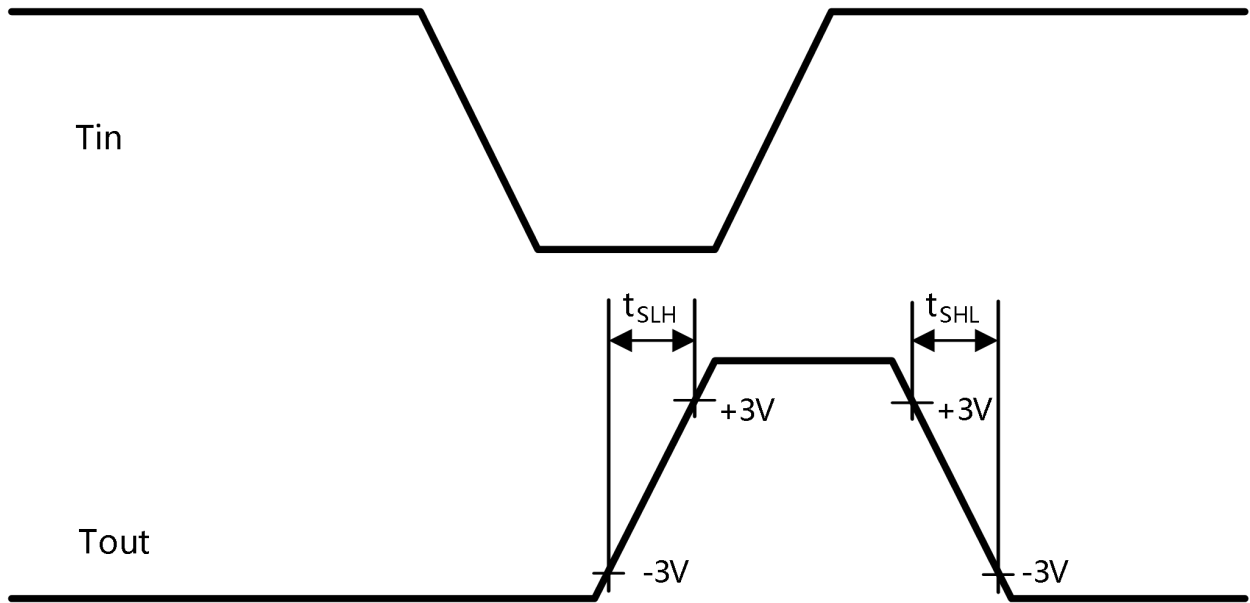
		$V_O = 0\text{ V}$ $V_I = V_{CC}$ $V_I = 0\text{ V}$		-50 50		-60 60	
ST	Speed of information transmission	$V_{CC} = 4.5\text{ V}$ $C_L = 1000\text{ pF}$ $R_L = 3.0\text{ k}\Omega$ $T_W = 7\text{ us}$ (for extreme $-T_W = 8\text{ us}$)	140	-	120	-	kbps
Dynamic parameters							
T_{PHLR} (T_{PLHR})	Signal propagation delay time when switching on (off)	$V_{CC} = 4.5\text{ V}$ $C_L = 150\text{ pF}$ $V_{IL} = 0\text{ V}$ $V_{IH} = 3.0\text{ V}$ $T_{LH} = T_{HL} \leq 10\text{ ns}$	-	9.7	-	10	
T_{PHLT} (T_{PLHT})	Signal propagation delay time when switching on (off)	$V_{CC} = 4.5\text{ V}$ $C_L = 2500\text{ pF}$ $V_{IL} = 0\text{ V}$ $V_{IH} = 3.0\text{ V}$ $R_L = 3\text{ k}\Omega$ $T_{LH} = T_{HL} \leq 10\text{ ns}$	-	5.0*		6.0*	us

Capacitance

Symbol	Parameter	V_{CC}	Rate	Unit
C_{IN}	Input capacitance	5.0	9.0	pF
C_{PD}	Dynamic capacitance		90	

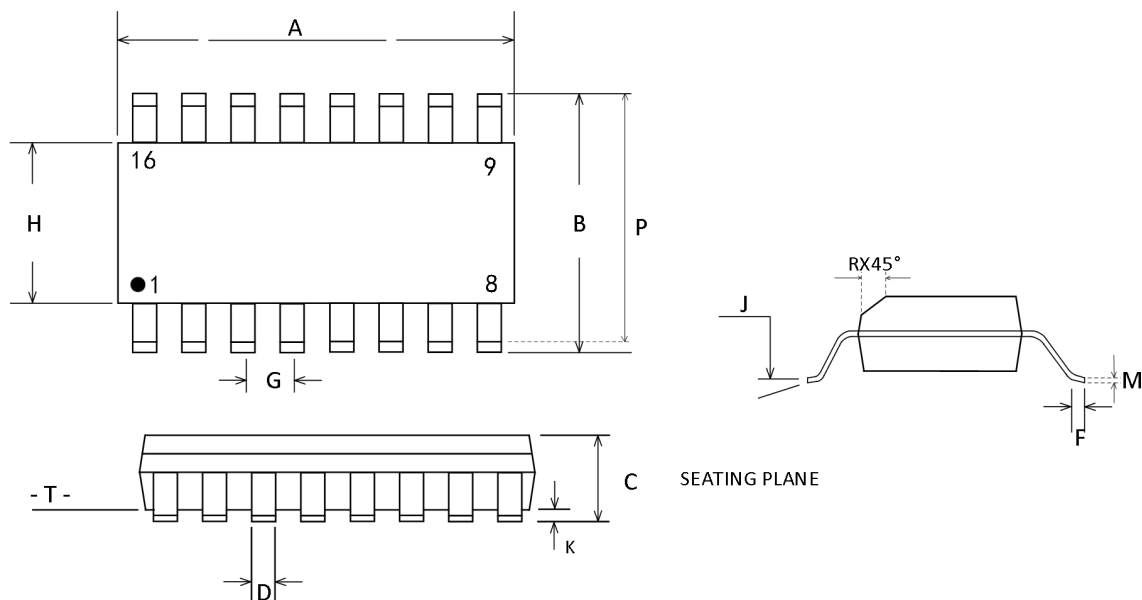
Timing diagram when measuring IC dynamic parameters





Package Outline Dimensions

SOP-16



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	9.8	10
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 TYPE	OPERATING TEMPERATURE	PACKAGE	PACKAGE MARKING	NUMBER OF PACKAGES
CBM232AS16	-40°C~125°C	SOP-16	CBM232AS	Tape and Reel, 2500
CBM232AS16-RL	-40°C~125°C	SOP-16	CBM232AS	Tape and Reel, 3000
CBM232AS16-REEL	-40°C~125°C	SOP-16	CBM232AS	Tape and Reel, 4000