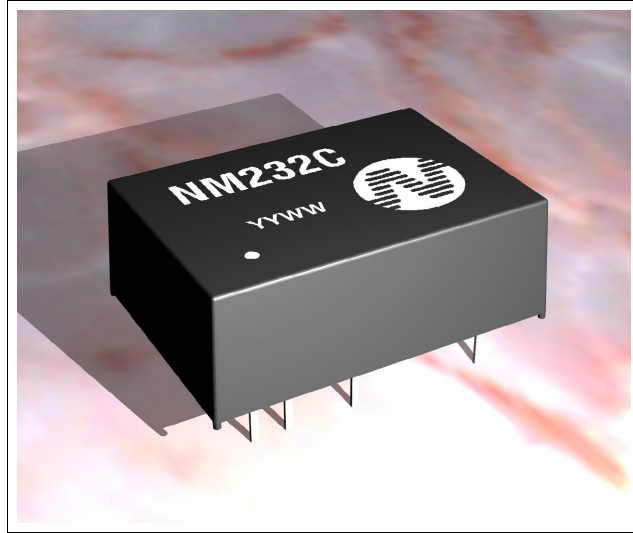


features

- 5V Only Operation
- No External Components
- Meets EIA RS-232-C Standards
- 16 Pin DIP Package Style
- Low Profile
- Low Power Consumption
- Flexible Supply Voltage Range
- TTL/CMOS Logic Compatible
- High Reliability Hybrid Circuitry

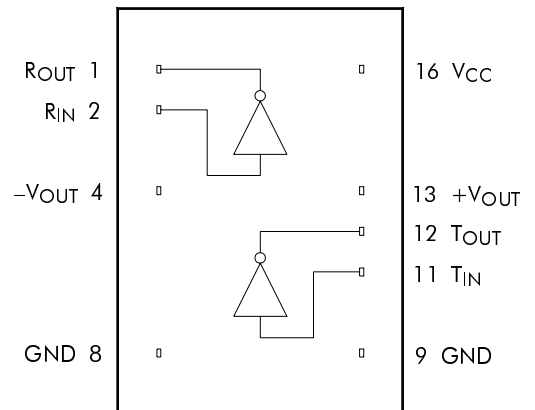


description

The NM232C is designed to interface data terminal equipment (DTE) with data communications equipment (DCE) in conformance with the specifications from the EIA RS-232-C standard. The device provides one data receive channel and one data transmit channel. Each channel is completely EIA RS-232-C compatible at the interface boundary and TTL/CMOS compatible at the logic connections. The internally generated positive and negative supplies are made available for external use at limited current levels. Total device no-load power consumption is typically 70mW.

pin connections

16 Pin DIP (top view)



absolute maximum ratings over operating free air temperature range

Supply voltage V_{CC}	4V to 7V
Input voltage at receiver	$\pm 30V$
Output current from receiver	30mA
Output voltage at transmitter	$\pm 15V$
Input voltage to transmitter	-0.3V to 30V

NM232C operating free-air temperature range	0°C to 70°C
NM232CX operating free-air temperature range	-40°C to 80°C
Storage temperature range	-55°C to 125°C
Lead temperature 1.5mm from case for 10 seconds	300°C

Current supplied by V_{OUT} or $-V_{OUT}$ singularly	15mA
Current supplied by V_{OUT} and $-V_{OUT}$ combined per output	10mA

other parameters

weight (typical)	6.5 grams
----------------------------	-----------

electrical characteristics over operating free air temperature range

Parameter	Test Conditions	Value			Unit
		MIN	TYP	MAX	
Supply Current, I_{CC}	Input at 0.8V, $R_L=3k\Omega$ at T1OUT		27		mA
	Input at 1.9V, $R_L=3k\Omega$ at T1OUT		20		
Total Power Dissipation, P_D	No Load		70	100	mW
	No Load, $V_{CC}=4.5V$		65	95	
Positive Output Voltage, V_{OUT+}	No External Load	10	11.5	13	V
	10mA External Load		10		
Negative Output Voltage, V_{OUT-}	No External Load	-13	-11.5	-10	V
	10mA External Load		-9.5		

Note : All data taken at $T_A=25^\circ C$, $V_{CC}=5V$.

transmitter

electrical characteristics over operating free air temperature range

Parameter	Test Conditions	Value			Unit
		MIN	TYP	MAX	
High Level Input Voltage, V_{IH}		1.9			V
Low Level Input Voltage, V_{IL}				0.8	V
High Level Output Voltage, V_{OH}	$V_{IL}=0.8V, R_L=3k\Omega$	8.0	9.0		V
	$V_{IL}=0.8V, R_L=3k\Omega, V_{CC}=4.5V$	8.0	8.5		
Low Level Output Voltage, V_{OL}	$V_{IH}=1.9V, R_L=3k\Omega$		-8.0	-7.5	V
	$V_{IH}=1.9V, R_L=3k\Omega, V_{CC}=4.5V$		-7.0	-6.5	
High Level Input Current, I_{IH}	$V_{IN}=5.0V$			0.25	μA
Low Level Input Current, I_{IL}	$V_{IN}=0V$			0.25	μA
Short Circuit Output Current, $I_{OS(H)}$	$V_{IN}=0.8V$	15	20		mA
Short Circuit Output Current, $I_{OS(L)}$	$V_{IN}=1.9V$	-10	-15		mA
Output Resistance Power Off, R_O	$V_{CC}=0V$	300			Ω

switching characteristics

Parameter	Test Conditions	Value			Unit
		MIN	TYP	MAX	
Propagation Delay Time L to H, T_{PLH}	$R_L=3k\Omega, C_L=30pF$		650	800	ns
Propagation Delay Time H to L, T_{PHL}	$R_L=3k\Omega, C_L=30pF$		1.0	1.2	μs
Transition Time L to H Level, T_{TLH}	$R_L=3k\Omega, C_L=30pF$		0.9	1.0	μs
	$R_L=3-7k\Omega, C_L=2500pF$		2.0	2.5	
Transition Time H to L Level, T_{THL}	$R_L=3k\Omega, C_L=30pF$		0.9	1.0	μs
	$R_L=3-7k\Omega, C_L=2500pF$		2.0	2.5	

Note : All data taken at $T_A=25^\circ C, V_{CC}=5V$.

receiver

electrical characteristics over operating free air temperature range

Parameter	Test Conditions	Value			Unit
		MIN	TYP	MAX	
Positive Going Threshold, V_{T+}			2.0	2.4	V
Negative Going Threshold, V_{T-}		1.0	1.6		V
High Level Output Voltage, V_{OH}	$V_{IN}=0.75V, I_{OH}=-0.5mA$	4.4		5.0	V
	Input Open, $I_{OH}=-0.5mA$	4.4		5.0	
Low Level output Voltage, V_{OL}	$V_{IN}=3.0V, I_{OL}=10mA$	0.05	0.1	0.2	V
High Level Input Current, I_{IH}	$V_{IN}=25V$	5.5		6.3	mA
	$V_{IN}=3.0V$		0.6	0.65	
Low Level Input Current, I_{IL}	$V_{IN}=-25V$	-6.8		-6.0	mA
	$V_{IN}=-3.0V$	-0.65	-0.6		
Short Circuit Output Current, I_{OS}	$V_{IN}=0V$		-5.0		mA

switching characteristics

($V_{IN}=\pm 6V$)

Parameter	Test Conditions ¹	Value			Unit
		MIN	TYP	MAX	
Propagation Delay Time L to H, T_{PLH}	$R_L=3.9k\Omega, C_L=30pF$		1.3		μs
Propagation Delay Time H to L, T_{PHL}	$R_L=390\Omega, C_L=30pF$		350	450	ns
Transition Time L to H Level, T_{TLH}	$R_L=3.9k\Omega, C_L=30pF$		500		ns
Transition Time H to L Level, T_{THL}	$R_L=390\Omega, C_L=30pF$		250		ns

Note : All data taken at $T_A=25^\circ C, V_{CC}=5V$.

¹ Test load is simulated TTL and STTL.

mean time to failure (MTTF) in thousands of hours

Part Number	0°C	25°C	70°C
NM232C	2118	1259	141
NM232CX			

Note : MTTF figures derived from hybrid model of MIL-HDBK-217F.

ordering information

Part Number	Function	Package Style
NM232C	5V only EIA RS-232-C Transmitter and Receiver	1
NM232CX	NM232C with Extended Temperature Range.	

outline dimensions

16 Pin DIP package style

1

