



Product Specification

XBLW MAX3232

3V to 5.5V Dual channel RS-232 Drivers/Receivers

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DESCRIPTION

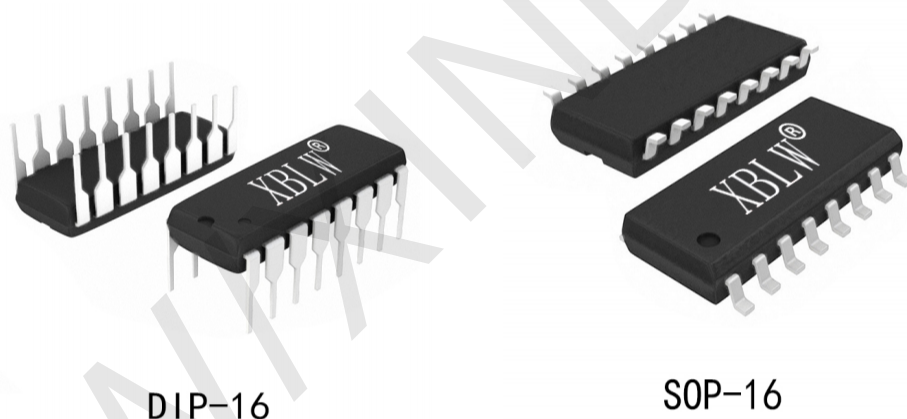
The MAX3232 is a dual driver/receiver of RS-232 standard with a single supply voltage and bipolar output voltage of the transmitter formed by a built-In voltage multiplying generator on four 1.0μF external capacitors, designed for use in state-of-the-art high performance computing systems, high-speed electronic devices with high reliability of information exchange between remote objects. Input voltage levels are compatible with standard CMOS and TTL levels.

FEATURES

- Output voltage levels are compatible with input levels of CMOS and TTL integrated circuits
- Meets All EIA/TIA-232E and V.28/V.24 Specifications
- Supply voltage range from 3V to 5.5V
- Low input current: 1.0μA at 25°C
- Available in SOP-16 and DIP-16 Package

APPLICATIONS

- Portable Computers
- Battery-Powered RS-232 Systems
- Interface Translation Low-Power Modems Terminals



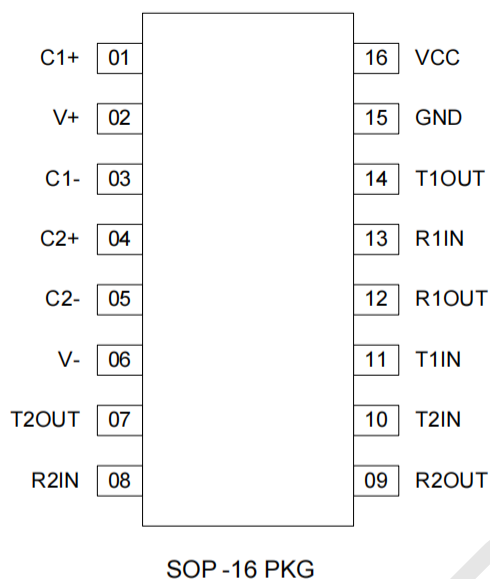
DIP-16

SOP-16

Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
XBLW MAX3232N	DIP-16	MAX3232N	Tube	1000Pcs/Box
XBLW MAX3232EDTR	SOP-16	MAX3232E	Tape	2500Pcs/Reel

PIN CONFIGURATION



PIN DESCRIPTION

Pin No.	Pin Name	Pin Description
1	C1+	Terminal for Positive Charge-Pump C1 Capacitor
2	V+	Positive Voltage Generated by the Charge-Pump
3	C1-	Terminal for Negative Charge-Pump C1 Capacitor
4	C2+	Terminal for Positive Charge-Pump C2 Capacitor
5	C2-	Terminal for Negative Charge-Pump C2 Capacitor
6	V-	Negative Voltage Generated by the Charge-Pump
7	T2OUT	RS-232 Driver Output (Levels RS-232)
8	R2IN	RS-232 Receiver Input (Levels RS-232)
9	R2OUT	RS-232 Receiver Output (Levels TTL/CMOS)
10	T2IN	RS-232 Driver Input (Levels TTL/CMOS)
11	T1IN	RS-232 Driver Input (Levels TTL/CMOS)
12	R1OUT	RS-232 Receiver Output (Levels TTL/CMOS)
13	R1IN	RS-232 Receiver Input (Levels RS-232)
14	T1OUT	RS-232 Driver Output (Levels RS-232)
15	GND	Ground
16	VCC	Supply Voltage Input

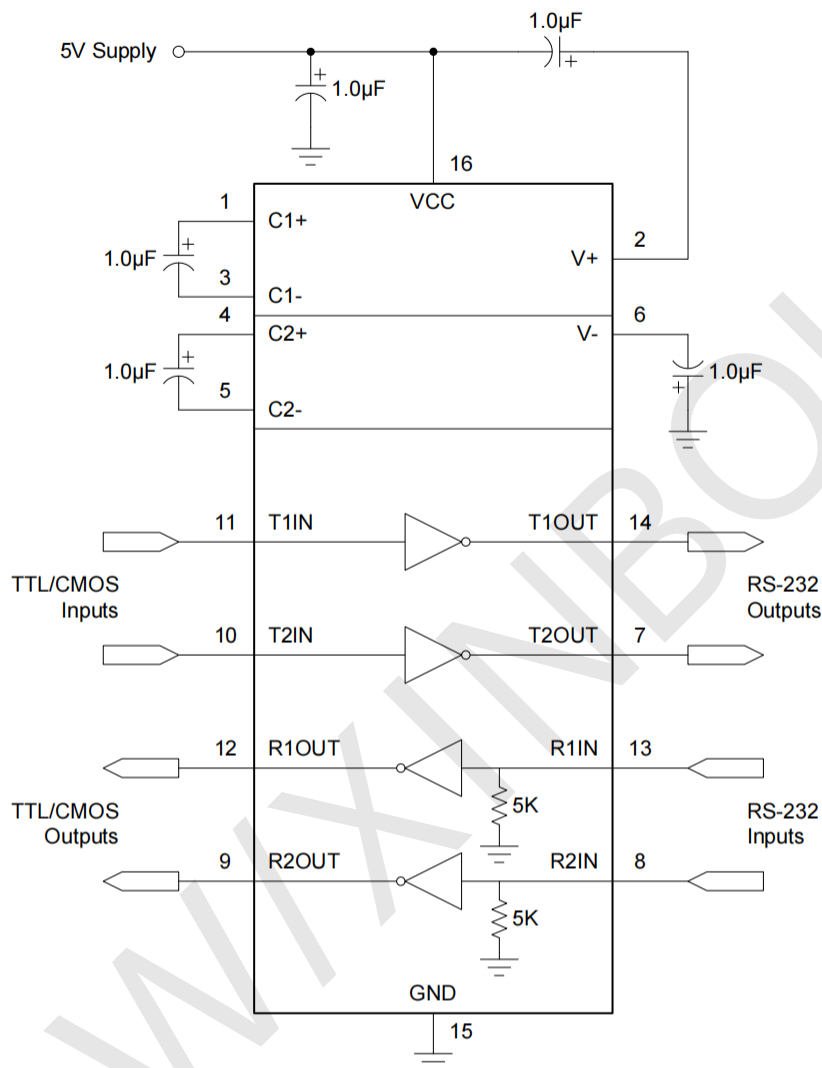
ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage	V_{CC}	-0.3	5.5	V
Transmitter High Output Voltage	V_+	$V_{CC} - 0.3$	7	V
Transmitter Low Output Voltage	V_-	-7.0	0.3	V
Transmitter Input Voltage	V_{TIN}	-0.3	$V_+ + 0.3$	V
Receiver Input Voltage	V_{RIN}	-12	12	V
Voltage Applied to Transmitter Output	V_{TOUT}	$V_- - 0.3$	$V_+ + 0.3$	V
Voltage Applied to Receiver Output	V_{ROUT}	-0.3	$V_{CC} + 0.3$	V
Storage Temperature Range	T_{STG}	-65	150	°C

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage	V_{CC}	3.0	5.5	V
Transmitter Input Voltage	V_{TIN}	0	V_{CC}	V
Receiver Input Voltage	V_{RIN}	-12	12	V
Output Current of Transmitter Short Circuit	I_{SC}	-	±60	mA
Ambient Temperature Range	T_A	-40	+85	°C

TYPICAL APPLICATION CIRCUIT



FUNCTION TABLE

INPUT (RIN, TIN)	OUTPUT (ROUT, TOUT)
L (Low Level)	H (High Level)
H (High Level)	L (Low Level)

ELECTRICAL CHARACTERISTICS

(Limits in standard typeface are for $T_A=25^{\circ}\text{C}$, and the limits in boldface type apply over full operating temperature range.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Supply Current	I _{CC}	V _{CC} = 5.5V V _{IL} = 0V	-	-	10.0	mA	
Receiver Parameters							
Hysteresis Voltage	V _h	V _{CC} = 5.0V	0.2	-	1.0	V	
On (Operation) Voltage	V _{on}	V _O ≤ 0.1V, I _{OL} ≤ 20μA	-	-	2.4	V	
Off (Dropout) Voltage	V _{off}	V _O ≥ V _{CC} - 0.1V I _{OH} ≤ -20μA	0.8	-	-	V	
Output Low Voltage	V _{OL}	I _L = 3.2mA, V _{CC} = 4.5V, V _{IH} = 2.4V	-	-	0.4	V	
Output High Voltage	V _{OH}	I _{OH} = -1.0mA, V _{CC} = 4.5V, V _{IL} = 0.8V	3.5	-	-	V	
Input Resistance	R _I	V _{CC} = 5.0V	3.0	-	7.0	kΩ	
Transmitter Parameters							
Output Low Voltage	V _{OL}	V _{CC} = 4.5V, V _{IH} = 2.0V, R _L = 3.0kΩ	-	-	-5.2	V	
Output High Voltage	V _{OH}	V _{CC} = 4.5V, V _{IL} = 0.8V, R _L = 3.0kΩ	5.0	-	-	V	
Input Low Current	I _{IL}	V _{CC} = 5.5V, V _{IL} = 0V	-	-	-10.0	μA	
Input High Current	I _{IH}	V _{CC} = 5.5V, V _{IH} =V _{CC}	-	-	10.0	μA	
Speed Of Output Front Charge	S _R	V _{CC} = 5.0V, C _L = 50 - 1000pF, R _L = 3.0 - 7.0kΩ	2.7	-	30	V/μs	
Output Resistance	R _O	V _{CC} = V ₊ = V ₋ = 0V V _O = ±2V	300	-	-	Ω	
Short Circuit Output Current	I _{SC}	V _{CC} = 5.5V V _O = 0V	V _I = V _{CC}	-	-	-60	mA
			V _I = 0	-	-	60	
Speed Of Information Transmission	ST	V _{CC} = 4.5V, C _L = 1000pF, R _L = 3.0kΩ, t _w = 7μs (for extreme, t _w = 8μs)	250	-	-	kbit/s	
Dynamic Parameters							
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} ≤ 10ns	-	-	10.0	μs	
Signal Propagation Delay Time When Switching On (Off)	t _{PHLT} (t _{PLHT})	V _{CC} = 4.5V, C _L = 2500pF, V _{IL} = 0V, V _{IH} = 3.0V, R _L = 3kΩ, t _{LH} = t _{HL} ≤ 10ns	-	-	6.0	μs	

TIMING DIAGRAM

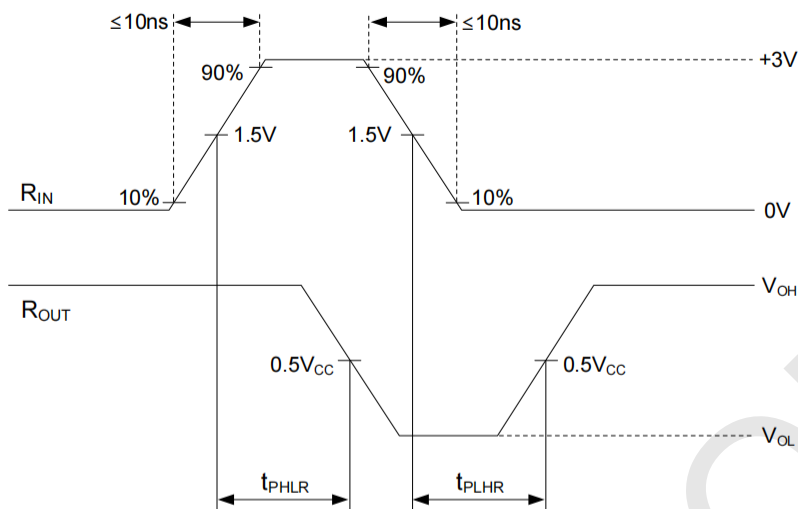


Figure 1. t_{PHL} and t_{PLH} waveforms of Receiver

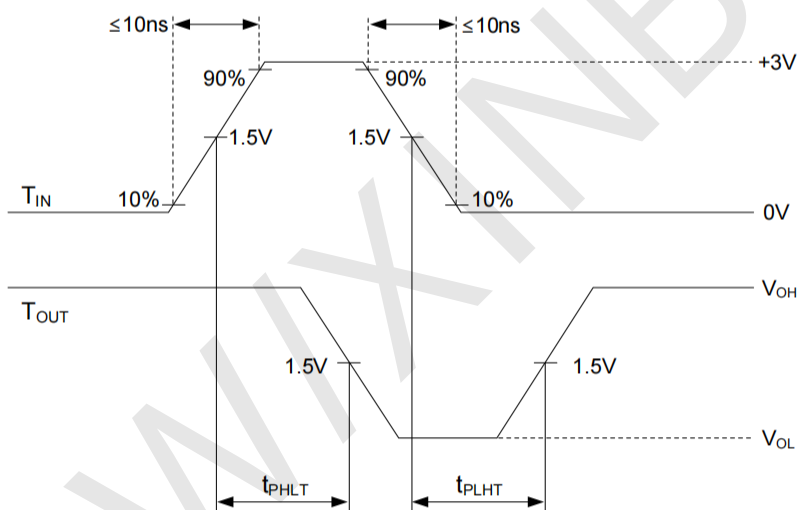


Figure 2. t_{PHL} and t_{PLH} waveforms of Transmitter

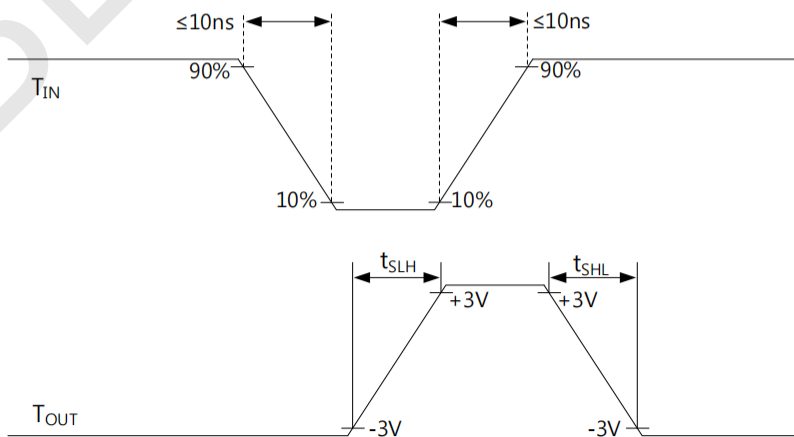
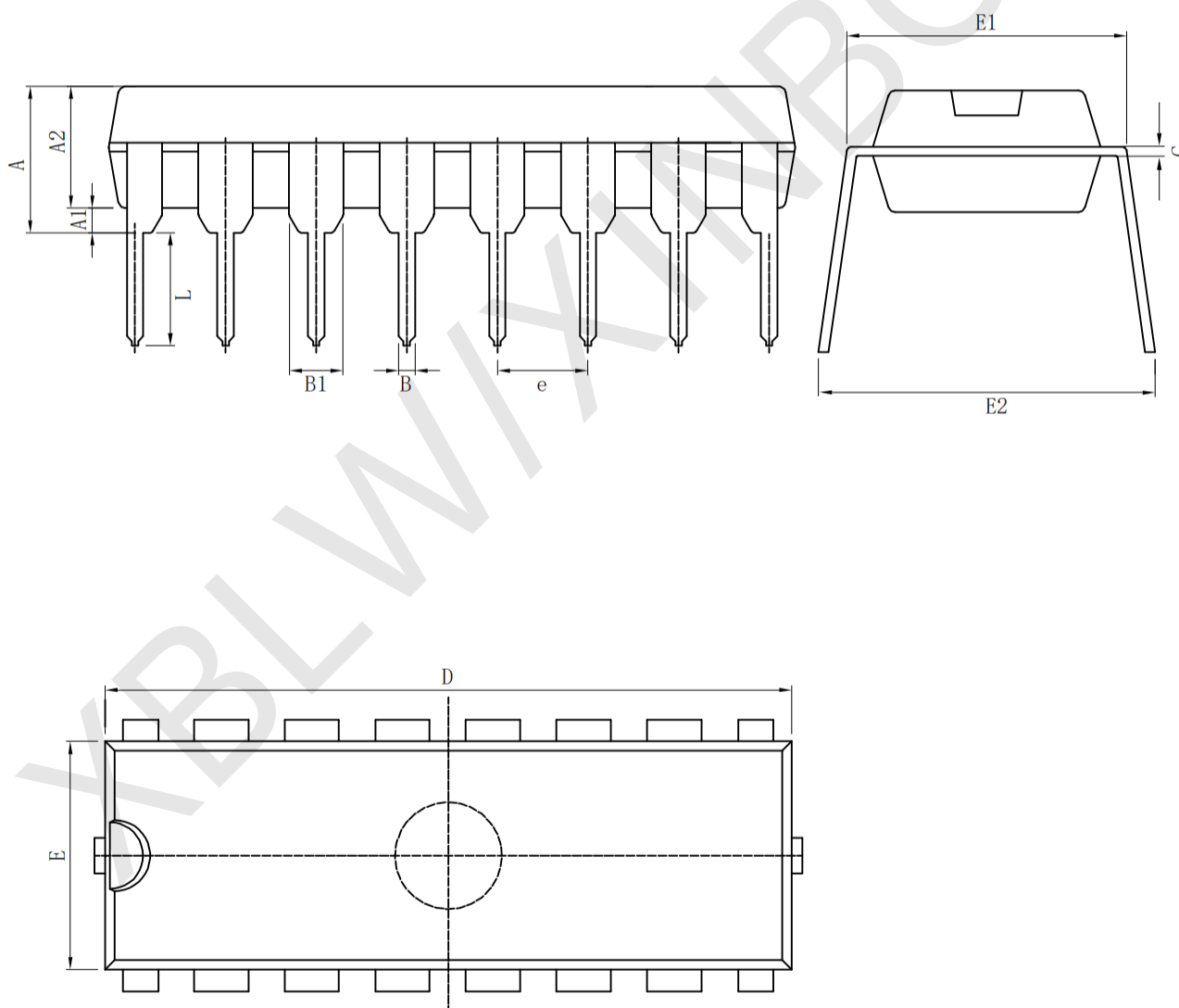


Figure 3. t_{SLH} and t_{SHL} waveforms of Transmitter

Package Information

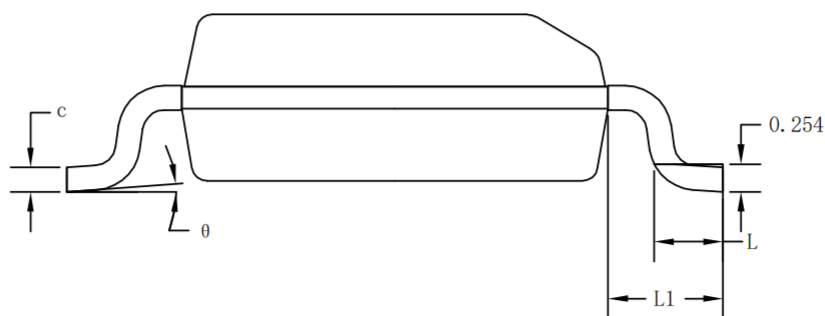
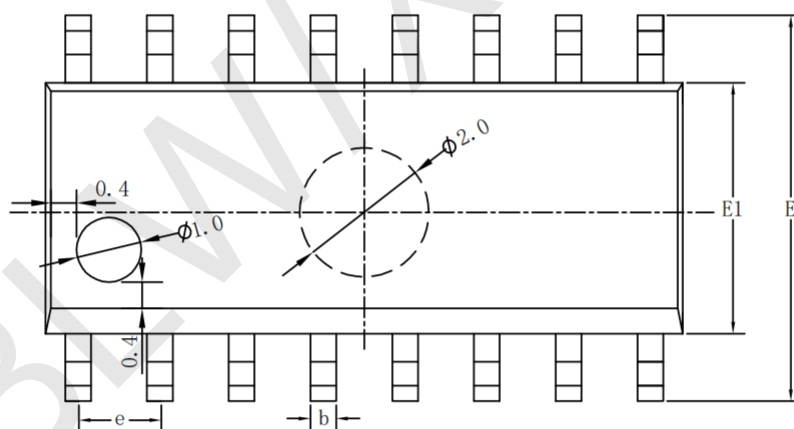
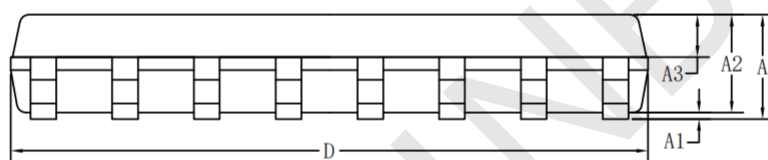
· DIP-16

Size Symbol	Dimensions In Millimeters		Size Symbol	Dimensions In Inches	
	Min(mm)	Max(mm)		Min(in)	Max(in)
A	3.710	4.310	A	0.146	0.170
A1	0.510		A1	0.020	
A2	3.200	3.600	A2	0.126	0.142
B	0.380	0.570	B	0.015	0.022
B1	1.524 (BSC)		B1	0.060 (BSC)	
C	0.204	0.360	C	0.008	0.014
D	18.80	19.20	D	0.740	0.756
E	6.200	6.600	E	0.244	0.260
E1	7.320	7.920	E1	0.288	0.312
e	2.540 (BSC)		e	0.100 (BSC)	
L	3.000	3.600	L	0.118	0.142
E2	8.400	9.000	E2	0.331	0.354



· SOP-16

Symbol	Size	Dimensions In Millimeters			Symbol	Size	Dimensions In Inches		
		Min (mm)	Nom (mm)	Max (mm)			Min (in)	Nom (in)	Max (in)
A		1.500	1.600	1.700	A		0.059	0.063	0.067
A1		0.100	0.150	0.250	A1		0.004	0.006	0.010
A2		1.400	1.450	1.500	A2		0.055	0.057	0.059
A3		0.600	0.650	0.700	A3		0.024	0.026	0.028
b		0.300	0.400	0.500	b		0.012	0.016	0.020
c		0.150	0.200	0.250	c		0.006	0.008	0.010
D		9.800	9.900	10.00	D		0.386	0.390	0.394
E		5.800	6.000	6.200	E		0.228	0.236	0.244
E1		3.850	3.900	3.950	E1		0.152	0.154	0.156
e		1.27 (BSC)			e		0.050 (BSC)		
L		0.500	0.600	0.700	L		0.020	0.024	0.028
L1		1.05 (BSC)			L1		0.041 (BSC)		
θ		0°	4°	8°	θ		0°	4°	8°



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