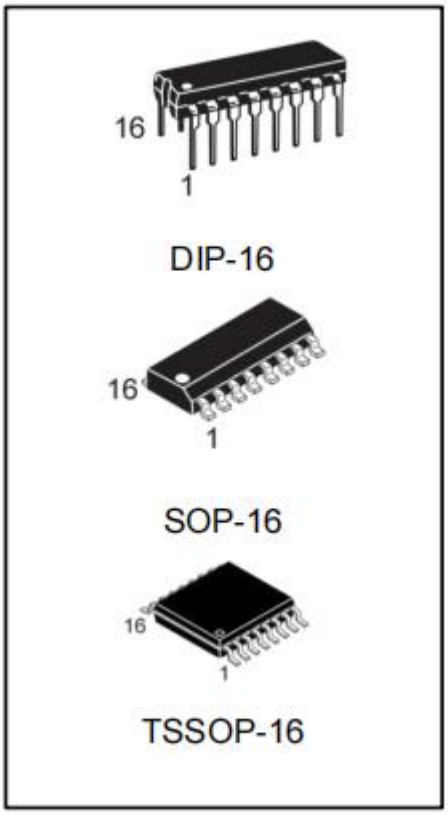
General Description

The CD4528B is a dual mono stable multi vibrator.Each device is re trigger able and reset table.Trggering can occur from either the rising or falling edge of an input pulse,resulting in an output pulse over a wide range of widths.Pulse duration and accuracy are determined by extemal timing components Rx and Cx.



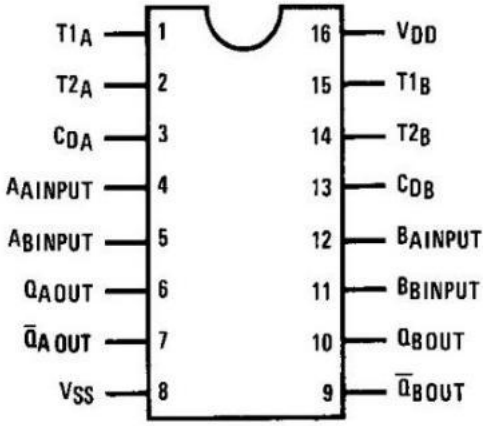
Features

- Wide supply voltage range:3.0V to 18V
- Separate reset available
- Quiescent current =5.0 nA/package (typ.)at 5.0 VDC
- Diode protection on all inputs
- Trigger able from leading or trailing edge pulse
- Capable of driving two low-power TTL loads or one low
- power Schottky TTL load over the rated temperature range

Order Information

DEVICE	Package Type	MARKING	Packing	Packing Qty
CD4528BE/ CD4528BN	DIP-16	CD4528B	TUBE	1000pcs/box
CD4528BM/TR	SOP-16	CD4528B	REEL	2500pcs/reel
CD4528BMT/TR	TSSOP-16	CD4528B	REEL	2500pcs/reel

Connection Diagram



DIP-16/SOP-16/TSSOP-16

Truth Table

Inputs			Outputs	
Clear	A	B	Q	$\bar{Q}$
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	L	↓	⎍	⎎
H	↑	H	⎍	⎎

H = HIGH Level

L = LOW Level

↑ = Transition from LOW-to-HIGH

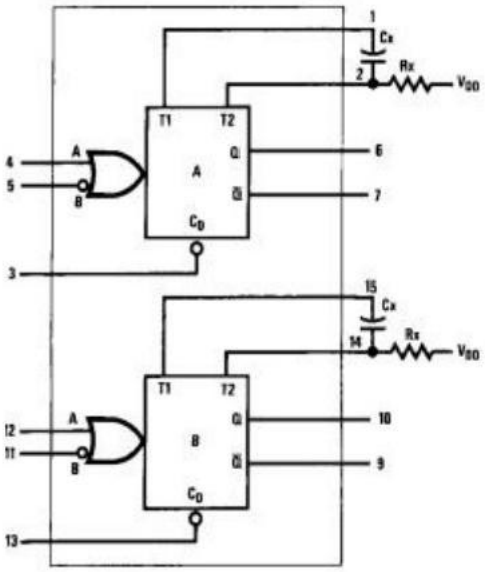
↓=Transition from HIGH-to-LOW

⎍= One HIGH Level Pulse

⎎=One LOW Level Pulse

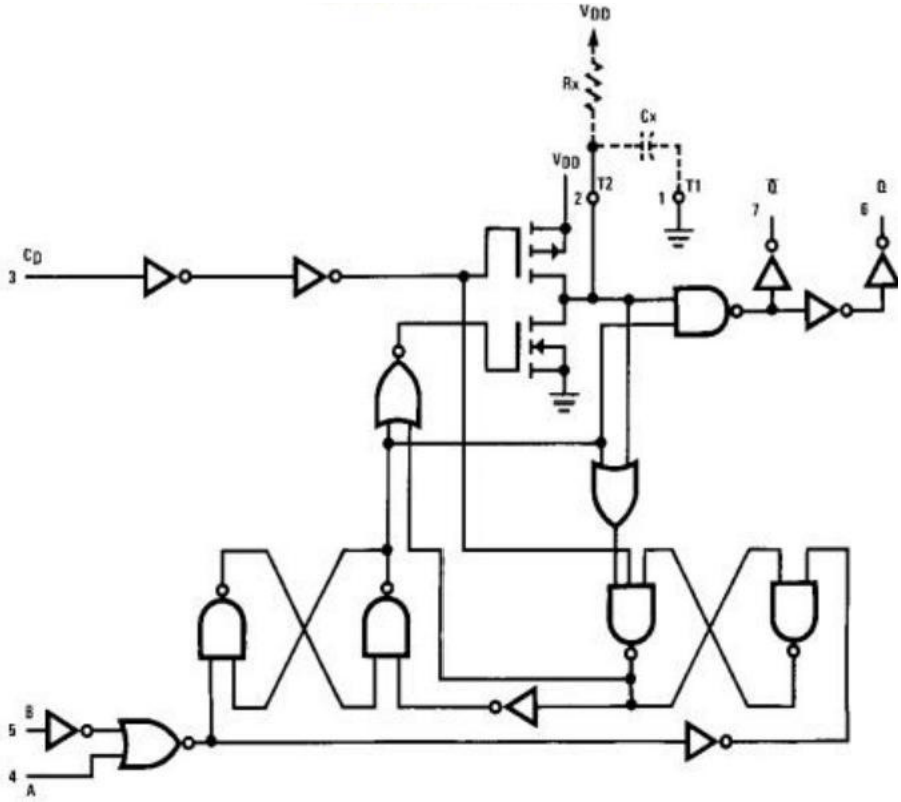
X= Irrelevant

Block Diagram



Logic Diagram

(½ of Device Shown)



Note:Extemally ground pins 1 and 15 to pin 8.

Absolute Maximum Ratings

Condition		Min	Max	UNITS
DC Supply Voltage(Voo)		-0.5	+18	Voc
Input Voltage,All Inputs(Vin)		-0.5	+0.5	Voc
Storage Temperature Range(Ts)		-65	+150	℃
Power Dissipation(Pp)	Dual-In-Line		700	mW
	Small Outline		500	mW
Lead Temperature(TL)(Soldering,10 seconds)			245	℃

Absolute Maximum Ratings indicate limits beyond which damage to the device may occur.Operating Ratings indicate conditions for which the device is intended to be functional,but specific performance is not ensured.

Recommended Operating Conditions

Condition	Min	Max	UNITS
DC Supply Voltage(Vop)	3	15	V
Input Voltage,(Vin)	0 to Voo Vbc		
Operating Temperature Range(TA)	-40	+85	℃

DC Electrical Characteristics (Note 1)

Symbol	Parameter	Conditions	40℃		25℃			85℃		Units
			Min	Max	Min	Typ	Max	Min	Max	
Ipo	Quiescent Device Current	Vop=5V Vop=10V Vpp=15V		20 40 80		0.005 0.010 0.015	20 40 80		150 300 600	μA μA μA
Vor	LOW Level Output Voltage	Vop=5V Vpp=10V Voo=15V		0.05 0.05 0.05			0.05 0.05 0.05		0.05 0.05 0.05	V V V
VoH	HIGH Level Output Voltage	Voo=5V Vop=10V Vop=15V	4.95 9.95 14.95		4.95 9.95 14.95	5.0 10.0 15.0		4.95 9.95 14.95		V V V
VL	LOW Level Input Voltage	Voo=5V,Vo=0.5V or 4.5V Voo=10V,Vo=1V or 9V Voo=15V,Vo=1.5V or 13.5V		1.5 3.0 4.0		2.25 4.50 6.75	1.5 3.0 4.0		1.5 3.0 4.0	V V V
VH	HIGH Level Input Voltage	Voo=5V,Vo=0.5V or 4.5V Voo=10V,Vo=1V or 9V Voo=15V,Vo=1.5V or 13.5V	3.5 7.0 11.0		3.5 7.0 11.0	2.75 5.50 8.25		3.5 7.0 11.0		V V V
Iol	LOW Level Output Current (Note 2)	Vod=5V,Vo =0.4V Vop=10V,Vo=0.5V Vbp=15V,Vo=1.5V	0.52 1.3 3.6		0.44 1.1 3.0	0.88 2.25 8.8		0.36 0.9 2.4		mA mA mA
IoH	HIGH Level Output Current (Note 2)	Vod=5V,Vo =4.6V Vod=10V,Vo=9.5V Voo=15V,Vo=13.5V	-0.2 -0.5 -1.4		-0.16 -0.4 -1.2	-0.36 -0.9 -3.5		-0.12 -0.3 -1.0		mA mA mA
Iin	Input Current	Voo=15V,Vin=0V Vbp=15V,Vin=15V		-0.3 0.3		-10-5 10-5	-0.3 0.3		-1.0 1.0	μA μA

Note 1:Vss =0V unless otherwise specified.

Note 2:Ioh and Iou are tested one output at a time.

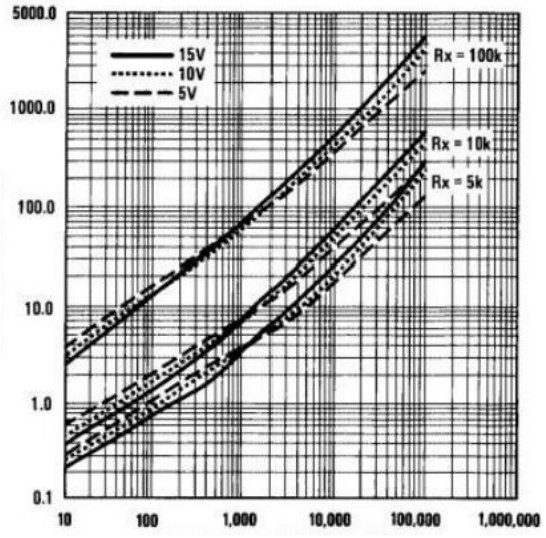
AC Electrical Characteristics (Note 3)

TA=25° C,CL=50 pF,RL=200 kQ,Input tr=tf=20 ns,unless otherwise specified

Symbol	Parameter	Conditions	Min	Typ	Max	Units
tr	Output Rise Time	tr=(3.0 ns/pF)CL+30 ns,Voo =5.0V tr=(1.5ns/pF)CL+15ns,Vbo=10.0V tr=(1.1 ns/pF)Cl+10 ns,Vop =15.0V		180 90 65	400 200 160	ns ns ns
tf	Output Fall Time	tf=(1.5 ns/pF)CL+25 ns,Voo=5.0V tf=(0.75 ns/pF)CL+12.5 ns,Vop =10V tf=(0.55 ns/pF)CL+9.5ns,Voo=15.0V		100 50 35	200 100 80	ns ns ns
tpLH tPHL	Turn-Off,Turn-On Delay A or B to Q or Q Cx=15pF,Rx=5.0 kQ	tpLh,trHL =(1.7 ns/pF)Cl+240 ns,Voo=5.0V tpLH,tpHL=(0.66 ns/pF)CL+8 ns,Vop=10.0V tpLh,tpHL=(0.5 ns/pF)Cl+65 ns,Voo=15.0V		230 100 65	500 250 150	ns ns ns
	Turn-Off,Turn-On Delay A or B to Q or G Cx=100 pF,Rx=10 kΩ	tpLH,tpHL=(1.7 ns/pF)CL+620 ns,Voo=5.0V tpLH,tpHL=(0.66 ns/pF)CL+257 ns,Vop=10.0V tpLH,tpHl=(0.5 ns/pF)Cl+185 ns,Vpo=15.0V		230 100 65	500 250 150	ns ns ns
twu twh	Minimum Input Pulse Width A or B Cx=15 pF,Rx=5.0 kΩ	VDo =5V Vbo =10.0V Vpp =15V		60 20 20	150 50 50	ns ns ns
	Cx=1000 pF,Rx=10 kQ	Voo =5V Vpp =10.0V Voo =15V		60 20 20	150 50 50	ns ns ns
PWour	Output Pulse Width Q or a For Cx<0.01 μF (See Graph for Appropriate VDD Level) Cx=15 pF,Rx=5.0 kΩ	Vpp =5V Vpp =10.0V Vpp =15V		550 350 300		ns ns ns
	For Cx>0.01 μF Use PWout =0.2 Rx Cx In [Vpo-Vss] Cx=10,000 pF,Rx=10 kΩ	VDo =5V Vpo =10.0V Vop =15V	15 10 15	29 37 42	45 90 95	μs μs μs
t-LH tpHL	Reset Propagation Delay, tPLH,tPHL Cx=15pF,Rx=5.0 kQ	VDo =5V Vpp =10.0V Voo =15V		325 90 60	600 225 170	ns ns ns
	Cx=1000 pF,Rx=10 kQ	Vpp=5V Vpo =10.0V VpD =15V		7.0 6.7 6.7		μs μs μs
txR	Minimum Retrigger Time Cx=15pF,Rx=5.0 kQ Cx=1000 pF,Rx=10 kQ	VDo =5V Vbo =10.0V Vpo =15V Voo =5V Vop =10.0V Vpo =15V		0 0 0 0 0 0		ns nS ns ns ns ns
Pulse Width Match between Circuits in the Same Package Cx =10,000 pF,Rx =10 kQ		Voo =5V Vpo =10.0V Vpp =15V		6 8 8	25 35 35	% % %

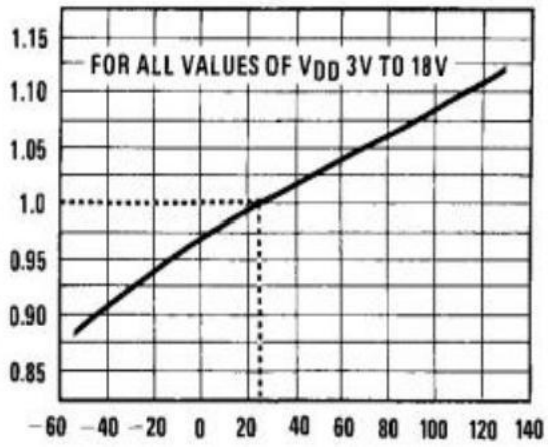
Note 3:AC parameters are guaranteed by DC correlated testing.

Pulse Widths



Cx,EXTERNAL CAPACITANCE (pF)

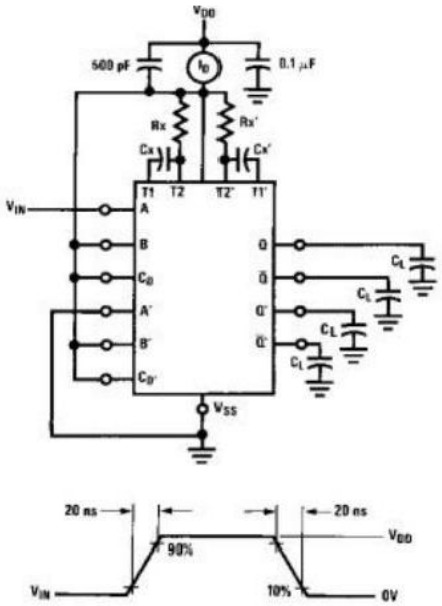
FIGURE 1.Pulse Width vs Cx



TA,AMBIENT TEMPERATURE (C)

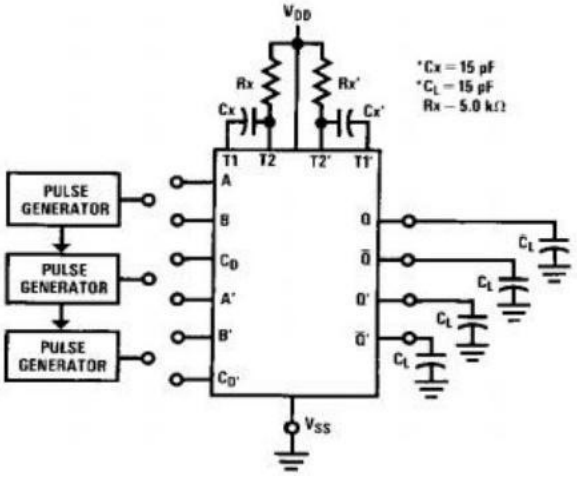
FIGURE 2.Normalized Pulse Width vs Temperature

AC Test Circuits and Wave forms



Duty Cycle =50%

FIGURE 3.Power Dissipation Test Circuit and Waveforms



*Includes capacitance of probes,wiring,and fixture parasitic.

Note:AC test waveforms for PG1,PG2,and PG3 in Figure 4.

Input Connections

Characteristics	CD	A	B
tpLH,tpHL,tr,tf, PWout,PWin	VDD	PG1	VDD
tpH,tPH tr.tf PWout,PWin	VDD	Vss	PG2
tpuH(R),tpHL(R),PWin	PG3	PG1	PG2

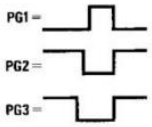


FIGURE 4.AC Test Circuit

AC Test Circuits and Wave forms (continued)

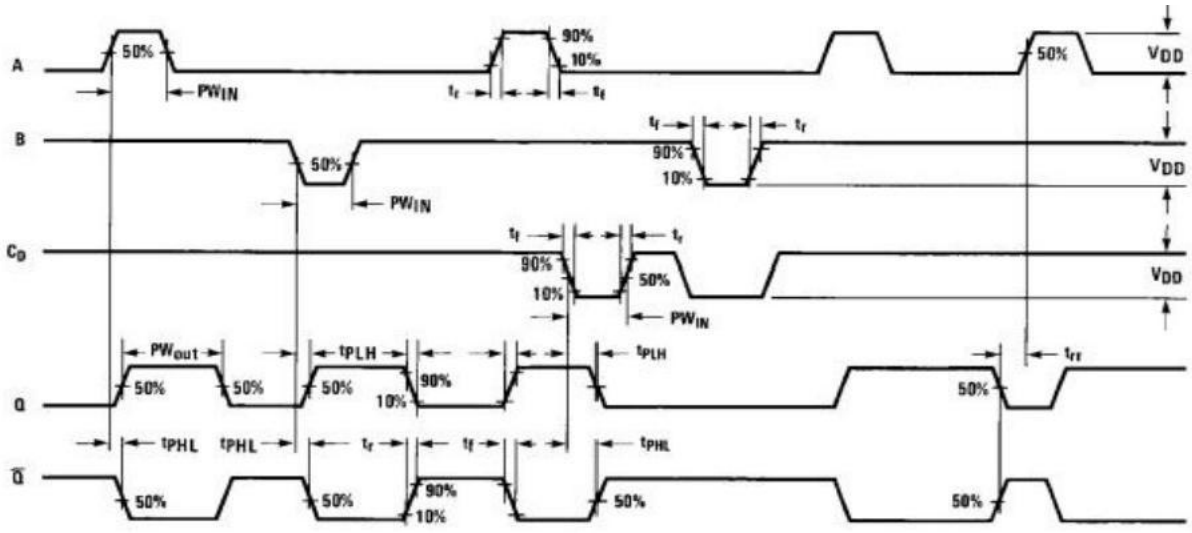
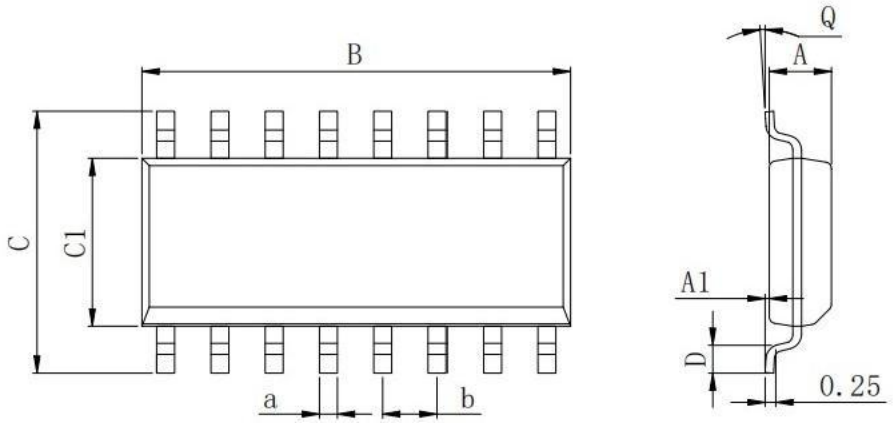


FIGURE 5.AC Test Waveforms

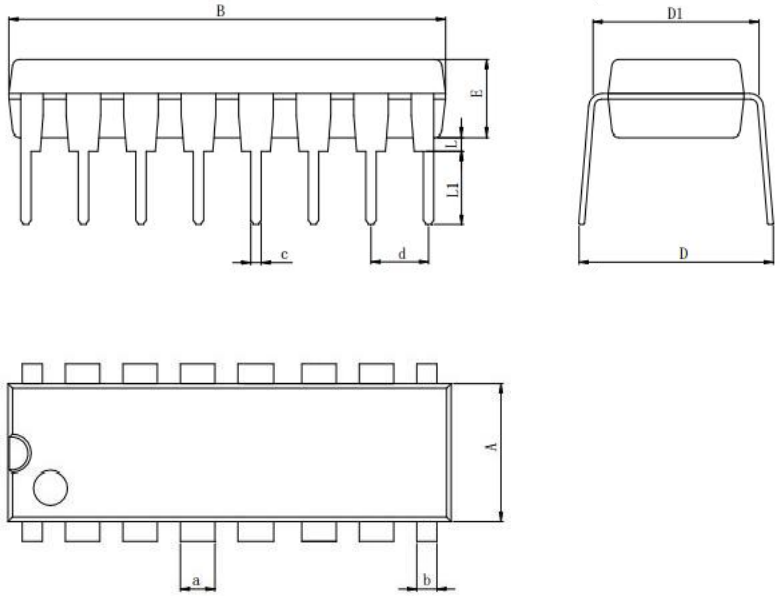
Physical Dimensions

SOP-16



Dimensions In Millimeters(SOP-16)									
Symbol:	**A**	**A1**	B	C	**C1**	**D**	**Q**	**a**	**b**
Min:	1.35	0.05	9.80	5.80	**3.80**	**0.40**	**0°**	**0.35**	**1.27 BSC**
Max:	1.55	0.20	10.0	6.20	**4.00**	**0.80**	**8°**	**0.45**	

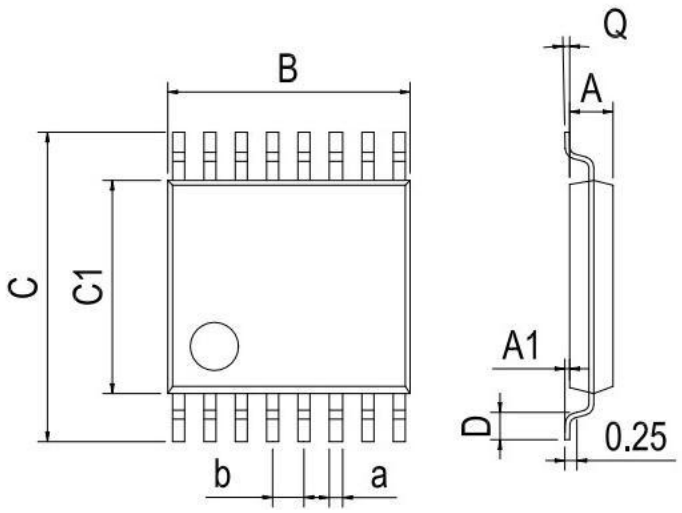
DIP-16



Dimensions In Millimeters(DIP-16)											
Symbol:	A	B	D	D1	E	L	L1	**a**	**b**	C	d
Min:	6.10	18.94	8.10	7.42	3.10	0.50	3.00	**1.50**	**0.85**	**0.40**	**2.54 BSC**
Max	6.68	19.56	10.9	7.82	3.55	0.70	3.60	**1.55**	**0.90**	**0.50**	

Physical Dimensions

TSSOP-16



Dimensions In Millimeters(TSSOP-16)									
Symbol:	**A**	**A1**	**B**	C	C1	D	Q	**a**	b
Min:	0.85	0.05	4.90	6.20	4.30	0.40	0°	0.20	0.65 BSC
Max:	0.95	0.20	5.10	6.60	4.50	0.80	8°	0.25	