

Features

- Low On-resistance, $R_{on}=1.5\Omega$
- Break-Before-Make Switching
- Rail-to-Rail Signal Range
- Low quiescent current over an Expanded Control Input Range
- High Bandwidth (-3dB @700MHz) Suitable For USB2.0 High-Speed Routing
- Wide Supply Range (1.5V ~ 5.5V)

Applications

- Mobile Phones, Tablets and Notebooks
- Anywhere a USB Type-C™ or Micro-B Connector is Used
- Audio and Video Signal Routing

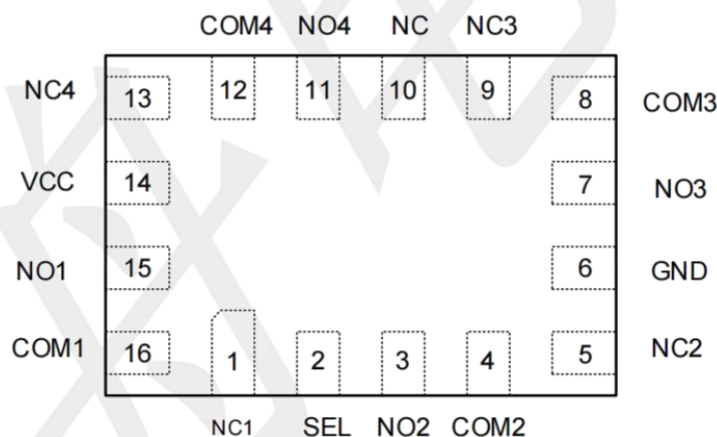
General Description

The is a high performance, quad, Single Pole Double Throw (SPDT) analog switch that features ultra-low R_{on} of 0.5Ω (typical) at 3.0V VCC. The operates over a wide VCC range of 2.3V to 4.5V and is designed for break- before-make operation. The select input is TTL-level compatible.

The is also featured with smart circuitry to minimize VCC leakage current even when the control voltage is lower than VCC supply voltage. This feature suits mobile handset applications by allowing direct interface with base band processor general-purpose IO with minimal battery consumption. In other word, there is no need of additional device to shift control level to be the same as that of VCC in real application.

PIN CONFIGURATIONS

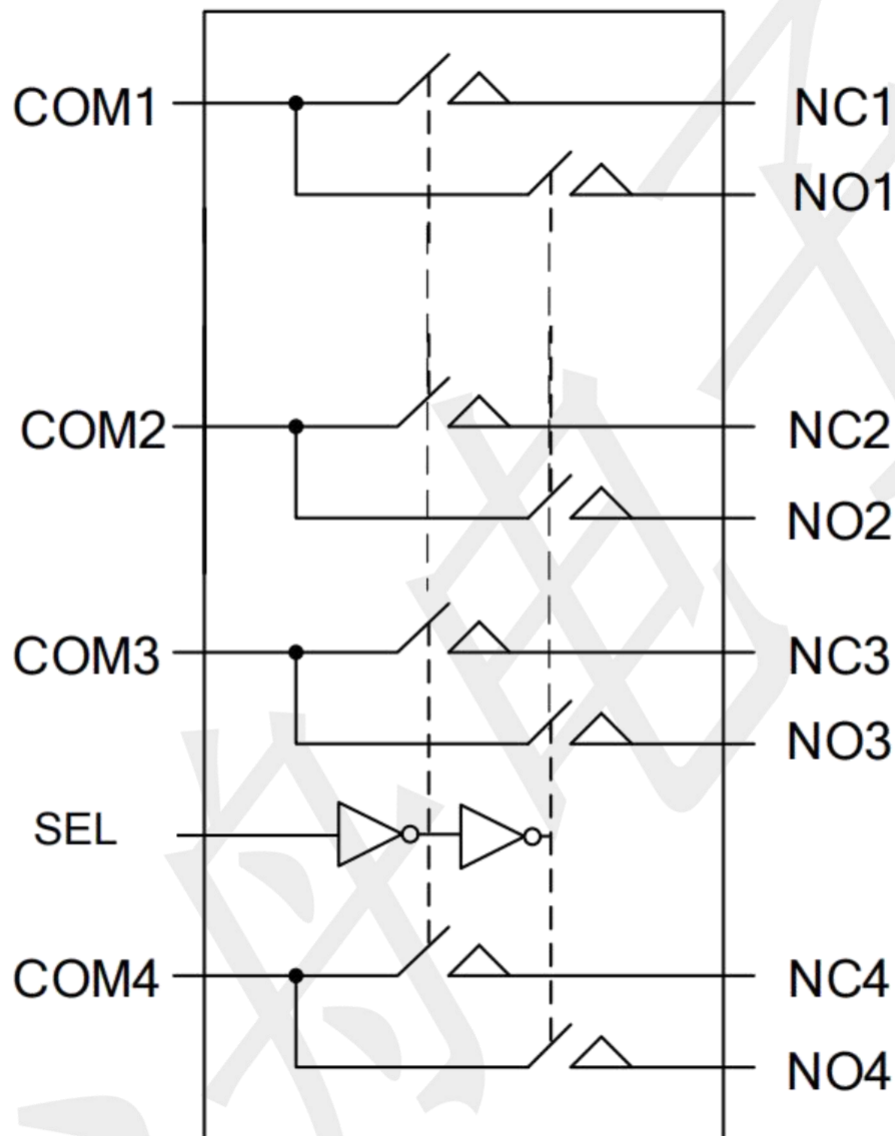
QFN1826-16L (TOP VIEW)



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION	PIN NO.	PIN NAME	DESCRIPTION
1	NC 1	Data Port (Normally closed)	9	NC 3	Data Port (Normally closed)
2	SEL	Logic Input Control	10	NC	NO Connected
3	NO 2	Data Port (Normally open)	11	NO 4	Data Port (Normally open)
4	COM2	Common Data Port	12	COM4	Common Data Port
5	NC 2	Data Port (Normally closed)	13	NC 4	Data Port (Normally closed)
6	GND	Ground	14	VCC	Positive Power Supply
7	NO 3	Data Port (Normally open)	15	NO 1	Data Port (Normally open)
8	COM3	Common Data Port	16	COM1	Common Data Port

BLOCK DIAGRAM



Function Table

SEL	Function
0	NC1 Connected to COM1, NC2 Connected to COM2 NC3 Connected to COM3, NC4 Connected to COM4
1	NO1 Connected to COM1, NO2 Connected to COM2 NO3 Connected to COM3, NO4 Connected to COM4

Absolute Maximum Ratings (Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{CC}	-0.3 ~ +6.5	V
Input Voltage	V _{IN}	-0.3 ~ +6.5	V
DC Input Voltage ⁽²⁾	V _{INPUT}	-0.3 ~ +6.5	V
Continuous Current Through NO, NC, COM		±100	mA
Peak Current Through NO, NC, COM (pulsed at 1ms 50% duty cycle)		±200	mA
Storage Temperature Range	T _{STG}	-65 ~ +150	°C
Operating Junction Temperature	T _J	150	°C
Lead Temperature (Soldering, 10 seconds)	T _L	260	°C
Power Dissipation	P _D	250	mW

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

Recommend operating ratings

(Control input must be held high or Low, it must not float)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Operating	V _{CC}	1.5 ~ 5.5	V
Control Input Voltage	V _{IN}	0 ~ V _{CC}	V
Input Signal Voltage	V _{IS}	0 ~ V _{CC}	V
Operating Temperature	T _A	-40 ~ +85	°C
Junction to Ambient	R _{θJA}	350	°C/W
Input Raise and Fall Time(Control Input V _{CC} =2.3~3.6V)	t _r , t _f	0 ~ 10	ns/V

DC Electrical Characteristics

(TA = 25°C, VC = 4.5V, unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V _{IH}	VCC=3.0V ~ 5.5V	1.6	--	--	V
		VCC=2.3V ~ 3.0V	1.4	--	--	V
Low-Level Input Voltage	V _{IL}	VCC=3.0V ~ 5.5V	--	--	0.6	V
		VCC=2.3V ~ 3.0V	--	--	0.4	V
Supply quiescent current	I _{CC}	I _A =0, V _{SEL} =0 or V _{SEL} =VCC	--	--	1.0	uA
Increase in I _{CC} per input	I _{CCT}	I _A =0, VCC=4.5V V _{SEL} >1.8 or V _{SEL} <0.5	--	--	2.0	uA
Input leakage current	I _{IN}	V _{SEL} =VCC	--	--	±1.0	uA
Off state switch leakage current	I _{OFF}		--	--	±1.0	uA
On state switch leakage current	I _{ON}		--	--	±1.0	uA
On-Resistance	R _{ON}	VCC=4.5V, V _{IS} =0~4.5V, I _{ON} =100mA,	--	1.5	--	Ω
		VCC=3.0V, V _{IS} =0~3.0V, I _{OUT} =100mA,	--	1.8	--	Ω
On-Resistance Flatness	R _{FLAT(ON)}	VCC=4.5V, V _{IS} =0~4.5V, I _{OUT} =100mA,	--	--	0.5	Ω
		VCC=3.0V, V _{IS} =0~3.0V, I _{OUT} =100mA,	--	--	0.8	Ω
On-Resistance Matching Between Channels	Δ R _{ON}	VCC=4.5V, V _{IS} =0.8V, I _{OUT} =100mA,	0.1	--	--	Ω
		VCC=3.0V, V _{IS} =0.8V, I _{OUT} =100mA,	0.14	--	--	Ω

AC Electronics Characteristics

(Ta=25°C, VCC=4.5V, unless otherwise noted)

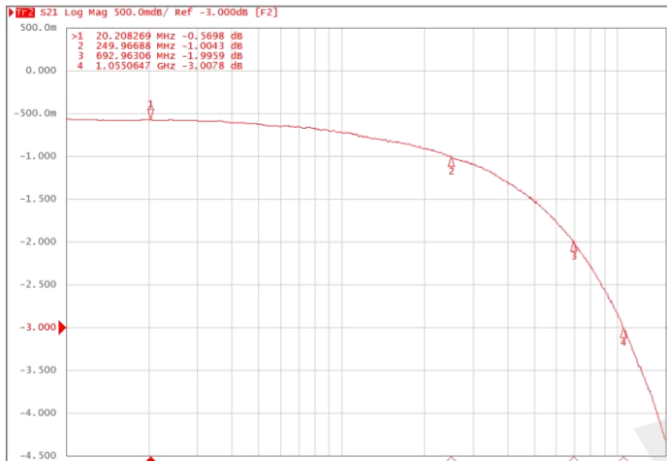
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Turn-On Time	T _{ON}	VCC=4.5V, V _{IS} =1.5V, C _L =35pF, R _L =50Ω	--	200	--	ns
Turn-Off Time	T _{OFF}	VCC=4.5V, V _{IS} =1.5V, C _L =35pF, R _L =50Ω	--	200	--	ns
Break-Before-Make time	T _{BBM}	Generate by design	--	100	--	ns
-3dB Bandwidth	BW	R _L =50Ω, C _L =0pF	--	700	--	MHz
Off isolation (Per Channel)	OIRR	F=100KHz, R _L =50Ω	--	-50	--	dB
Crosstalk (Channel to Channel)	Xtalk	F=100KHz, R _L =50Ω	--	-50	--	dB
Total Harmonic Distortion	THD	F=20Hz to 20KHz R _L =32Ω, V _{IS} =0.5Vp-p	--	-80	--	dB

Capacitance

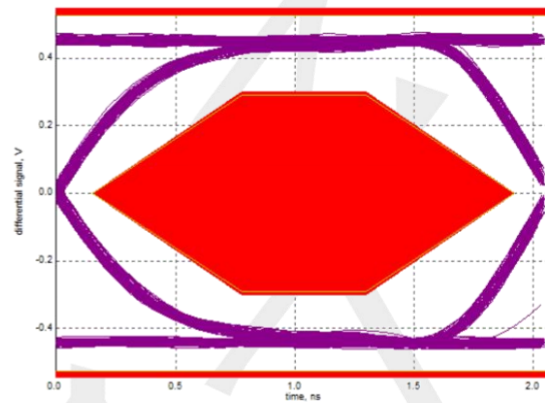
(Ta=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Off capacitance	C _{OFF}	F=1MHz, VCC=3.3V	--	5.0	--	pF
On capacitance	C _{ON}	F=1MHz, VCC=3.3V	--	8.0	--	pF

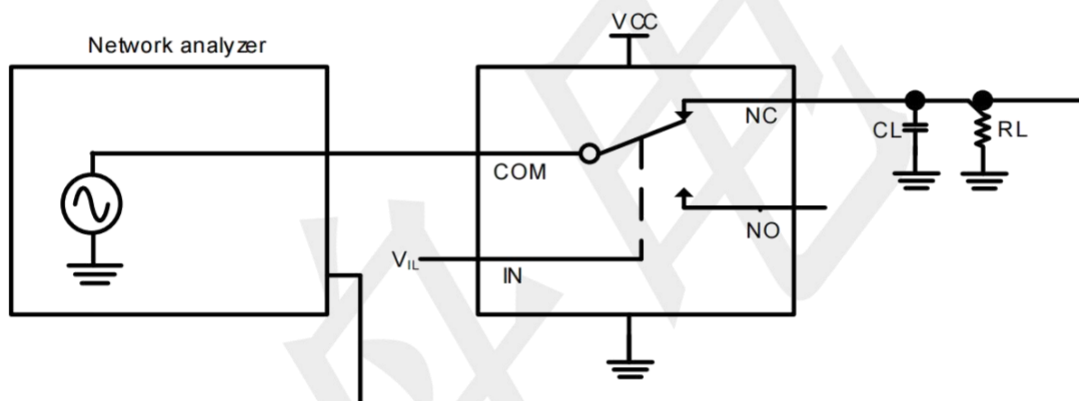
Typical Characteristics ($T_a=25^{\circ}\text{C}$, $V_{CC}=3.3\text{V}$, unless otherwise noted)



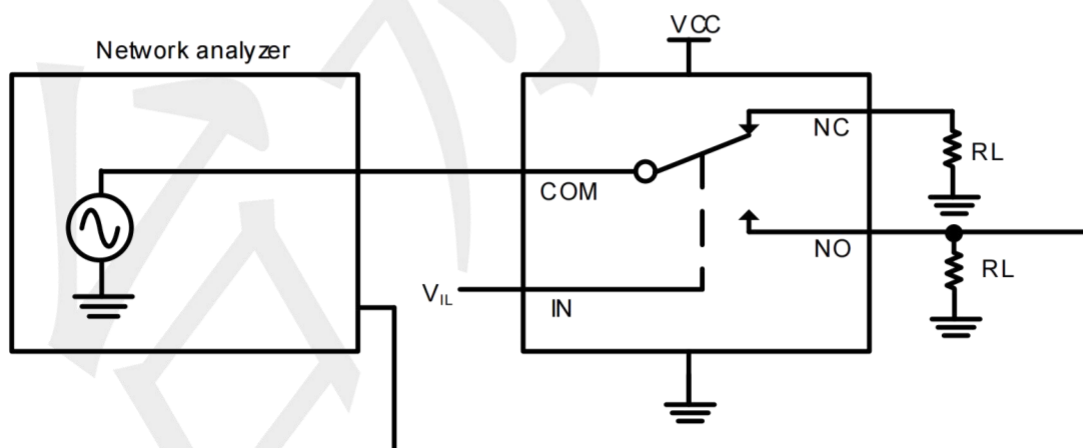
Bandwidth



Eye Diagram (480Mbps)

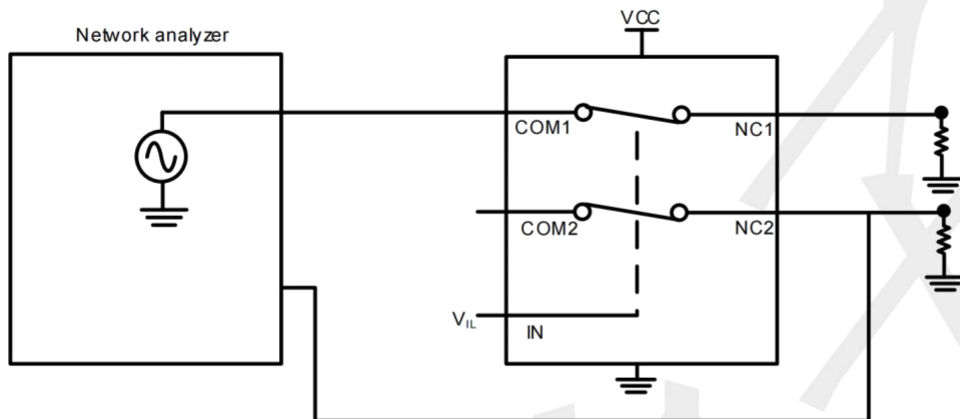


Bandwidth

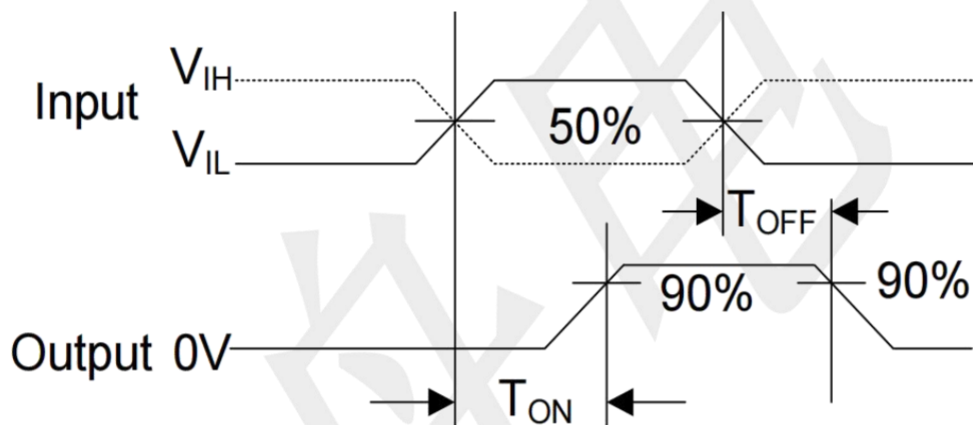


Off isolation

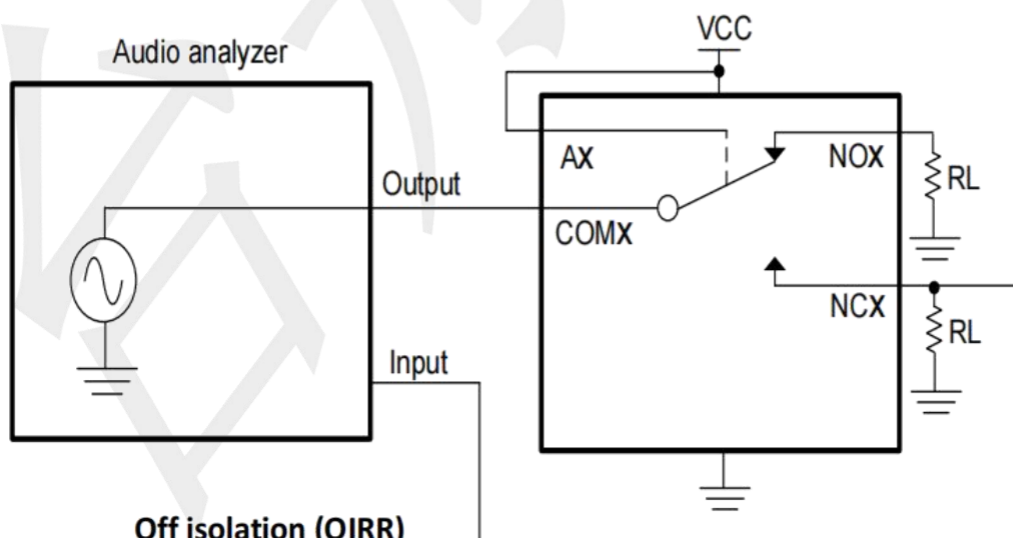
Typical Characteristics ($T_a=25^\circ\text{C}$, $V_{CC}=3.3\text{V}$, unless otherwise noted)



Crosstalk



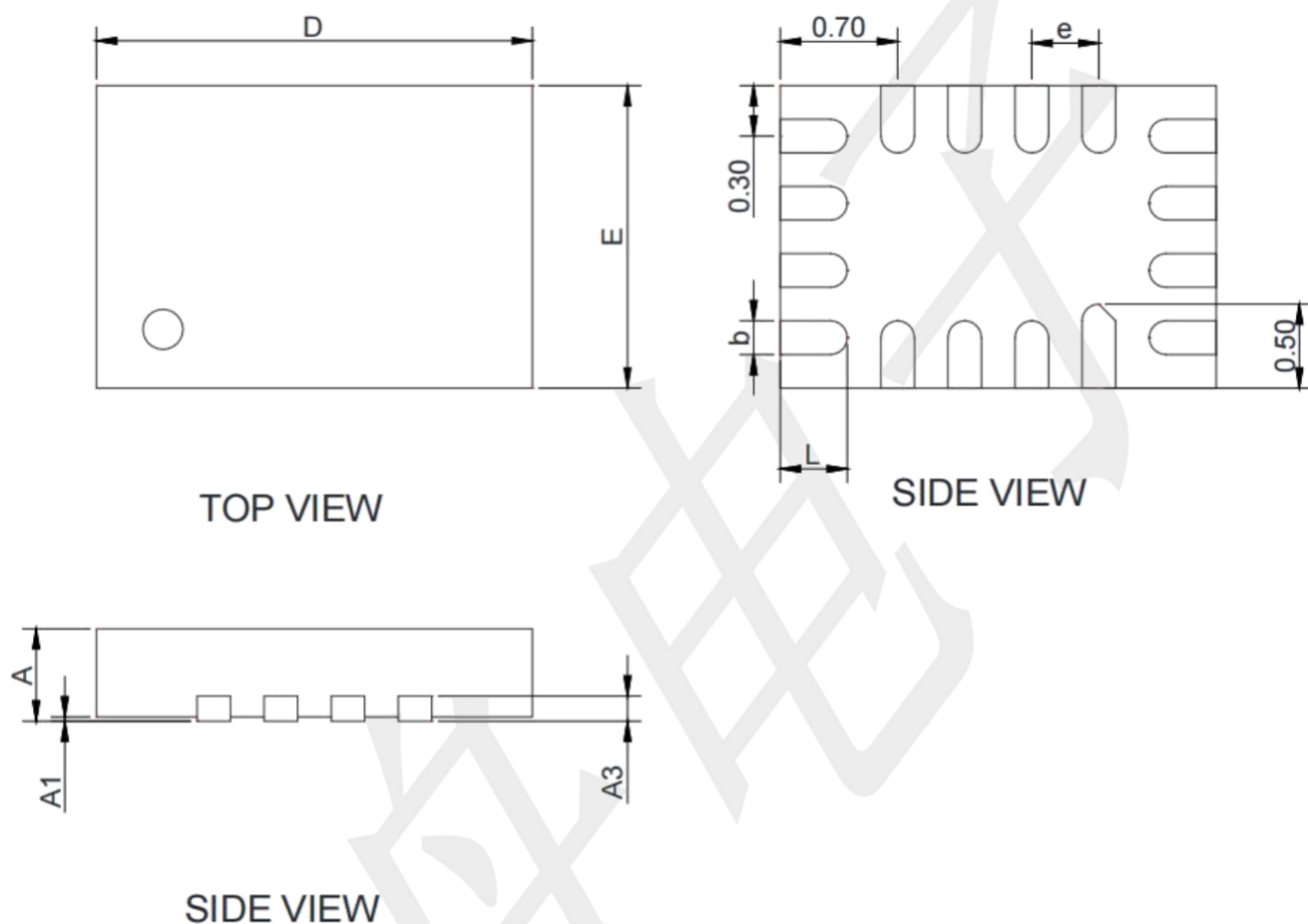
ON/OFF Time Waveforms (T_{ON} / T_{OFF})



Off isolation (OIRR)

Package informantion

QFN1826-16L (Unit: mm)



Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.50	0.55	0.60
A1	0.00	-	0.05
A3	0.15 Ref.		
D	2.55	2.60	2.65
E	1.75	1.80	1.85
L	0.30	0.40	0.50
b	0.15	0.20	0.25
e	0.40 BSC		