



AME7700/AME7701/AME7702

Switched Capacitor Voltage Doublers

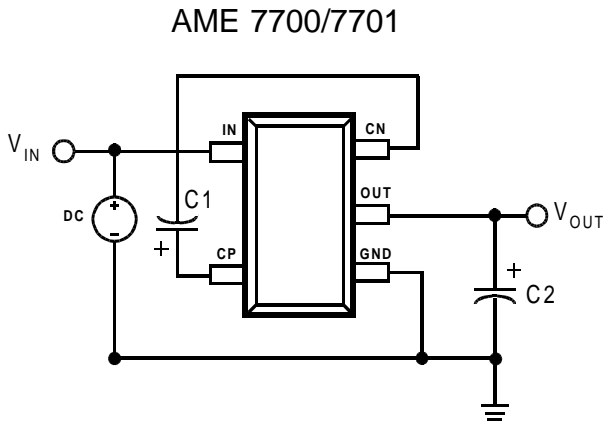
General Description

The AME7700 series of economical, Charge-Pump Converters efficiently double a +1.5V to +5.5V input to +3.0V to +11V, with a working current exceeding 100mA. Due to their simplicity, small size, and performance, these CMOS converters have numerous applications.

For most cases, only (2) external capacitors are required, however, in some cases, a single capacitor is acceptable. Minimum capacitance is obtained with the AME7701, while the AME7700 offers the lowest stand-by current. The AME7702 has a Frequency-Select pin for added flexibility. The input voltage can be tripled or quadrupled by cascading 2 Charge-Pumps. A single alkaline battery

With it's low start-up voltage, a single alkaline battery can be configured with (2) AME7700's to quadruple the voltage and produce 5V out. Alternately, with a 5V source, (2) AME7700's can be configured to triple the voltage and produce 15V out.

Typical Connection



Features

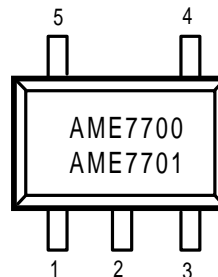
- Small packages: SOT-25, SOT-26
• +1.5V to +5.5V Input Range
• 60uA Quiescent Current ( AME7700)
• 99% Conversion Efficiency
• Output Current Exceeding 100mA
• User Selectable Frequency ( AME7702)

Applications

- Cellular Phones
• Digital Cameras
• Battery Chargers
• High Tech Flashlights
• PDA's - LCD displays
• Consumer Electronics
• Pagers
• Portable Electronics

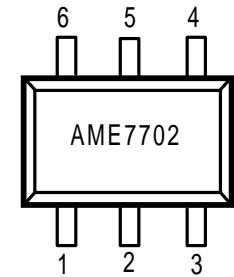
Pin Configuration

SOT-25 Top View



- 1: GND 4: IN
2: OUT 5: CP
3: CN

SOT-26 Top View



- 1: GND 4: IN
2: CN 5: FC
3: OUT 6: CP



■ Pin Description

AME7700AEEV/ AME7701AEEV

Pin	Designation	Function
1	GND	Ground (-Supply)
2	OUT	Power Output
3	CN	Capacitor (-)
4	IN	Power Input
5	CP	Capacitor (+)

AME7702AEEY

Pin	Designation	Function
1	GND	Ground (-Supply)
2	CN	Capacitor(-)
3	OUT	Power Output
4	IN	Power Input
5	FC	Frequency Control
6	CP	Capacitor (+)

■ Order Information

Part Number	Package	Operating Temp.
AME7700AEEV	SOT-25	-40°C to +85°C
AME7701AEEV	SOT-25	-40°C to +85°C
AME7702AEEY	SOT-26	-40°C to +85°C



■ Absolute Maximum Ratings

Parameter	Maximum	Unit
Supply Voltage	6	V
ESD Classification	B	

■ Recommended Operating Conditions

Parameter	Rating
Supply Voltage	1.5 - 5.5 V
Ambient Temperature Range	-40 to +85 °C
Junction Temperature	-40 to +125 °C

■ Thermal Information

Parameter	Maximum	Unit
Thermal Resistance (SOT-25,26)	250	°C/W
Maximum Junction Temperature	150	°C
Maximum Lead Temperature ( 10 Sec)	300	°C

*Caution: Stress above the listed absolute rating may cause permanent damage to the device*



■ Electrical Specification

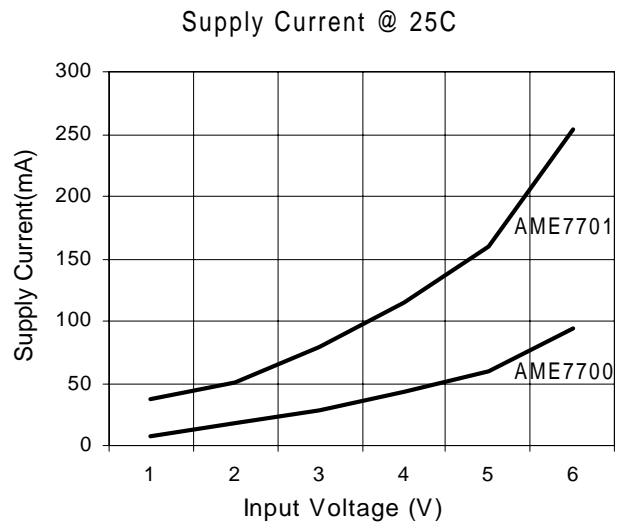
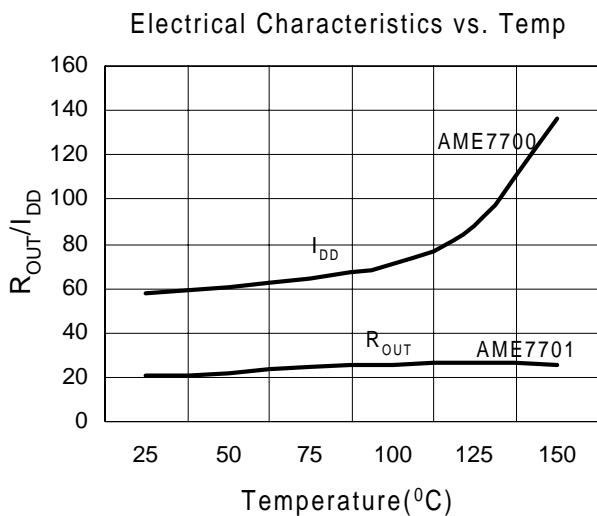
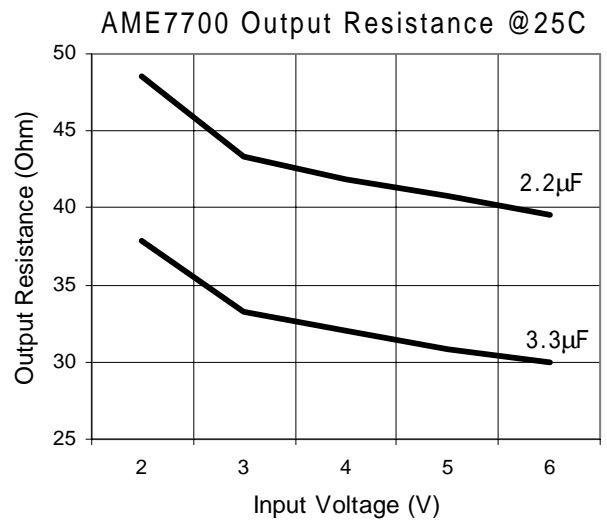
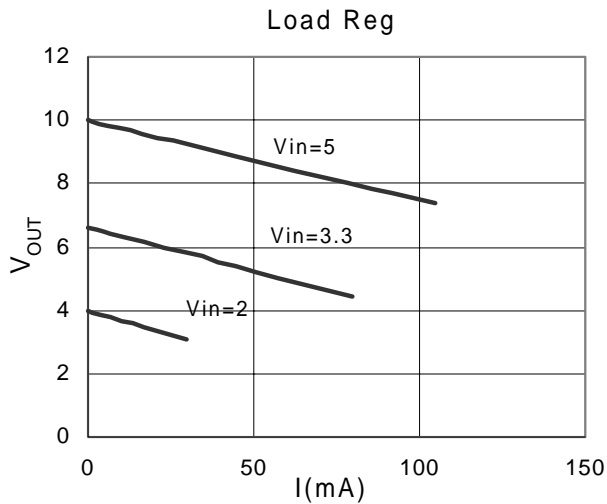
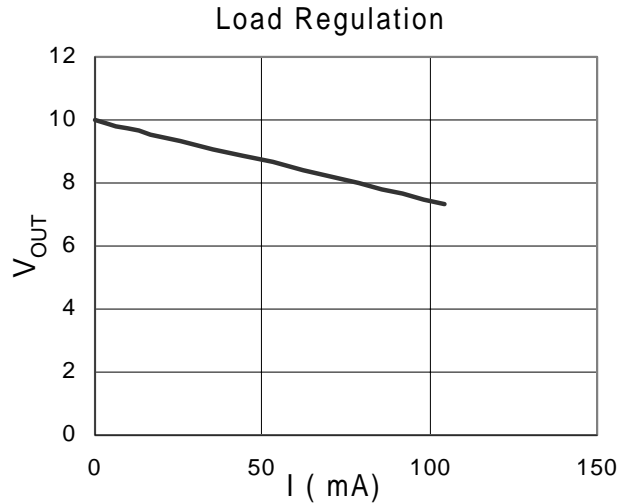
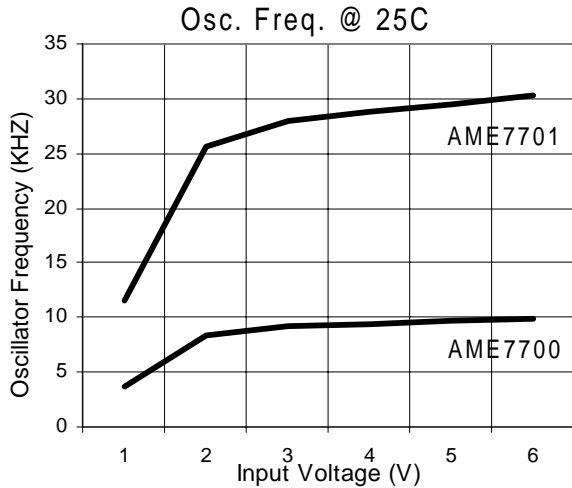
$T_A = 25\text{ C}$ ,  $V_{IN} = 5\text{ V}$  unless otherwise noted,  $C_1 = C_2 = 3.3\mu\text{F}$

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
No Load Current	$I_{IN}$	AME7700 AME7702 FC is LO		60	100	$\mu\text{A}$
		AME7701 AME7702 FC is HI		215	300	
Supply Voltage Range	$V_{IN}$	$R_L = 10\text{ K}$	1.5		5.5	V
Oscillator Frequency	$F_{OSC}$	AME7700 AME7702 FC is LO	8.5	12	15.5	KHz
		AME7701 AME7702 FC is HI	24.5	35	45.5	
Output Resistance	$R_o$	AME7700 AME7702 FC is LO		40	50	ohms
		AME7701 AME7702 FC is HI		20	35	
Voltage Conversion Efficiency	$V_{EFF}$	No load	97	99		%
Power Efficiency	$P_{EFF}$	$R_L = 10\text{ K}$	88	92		%



AME7700/AME7701/AME7702

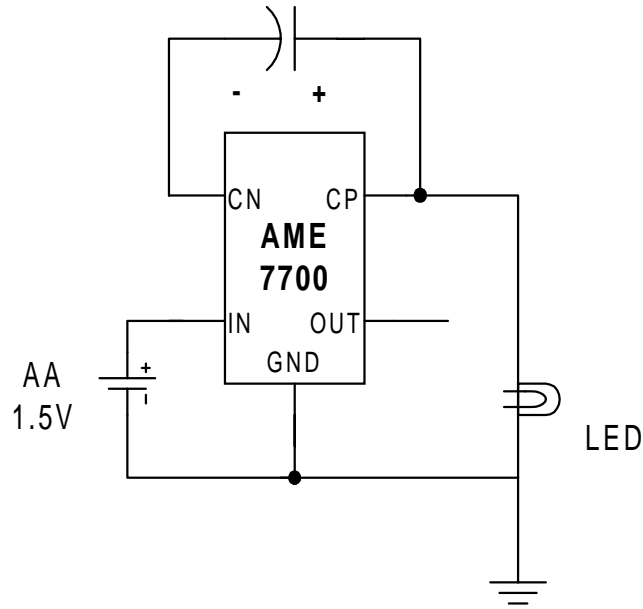
Switched Capacitor Voltage Doublers



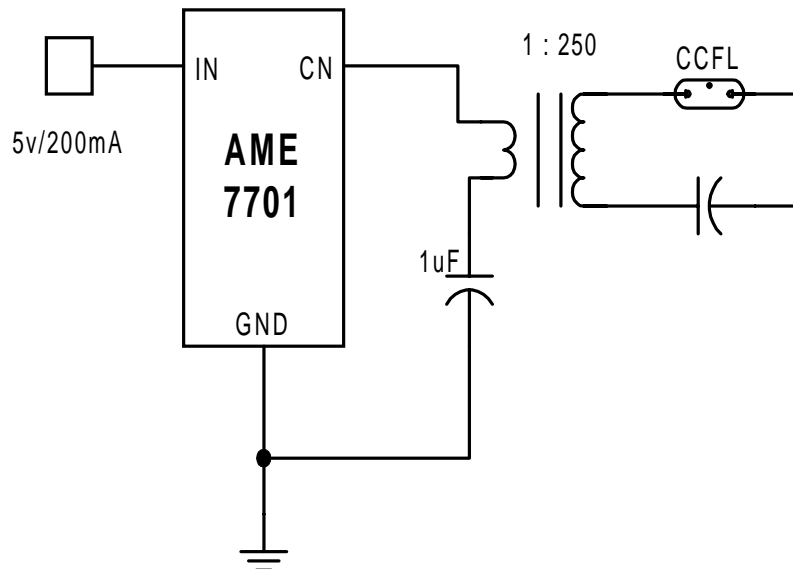


■ Applications

### Single Cell Led Flashlight



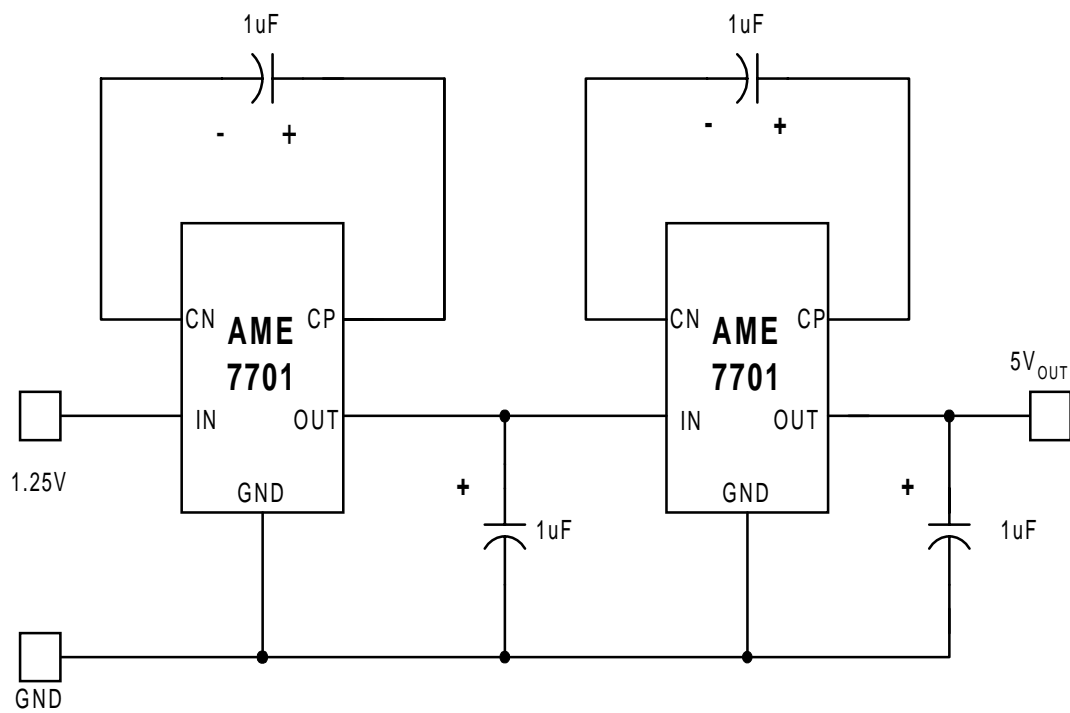
### 1 Watt Fluorescent Lamp Driver





■ Applications(Continued)

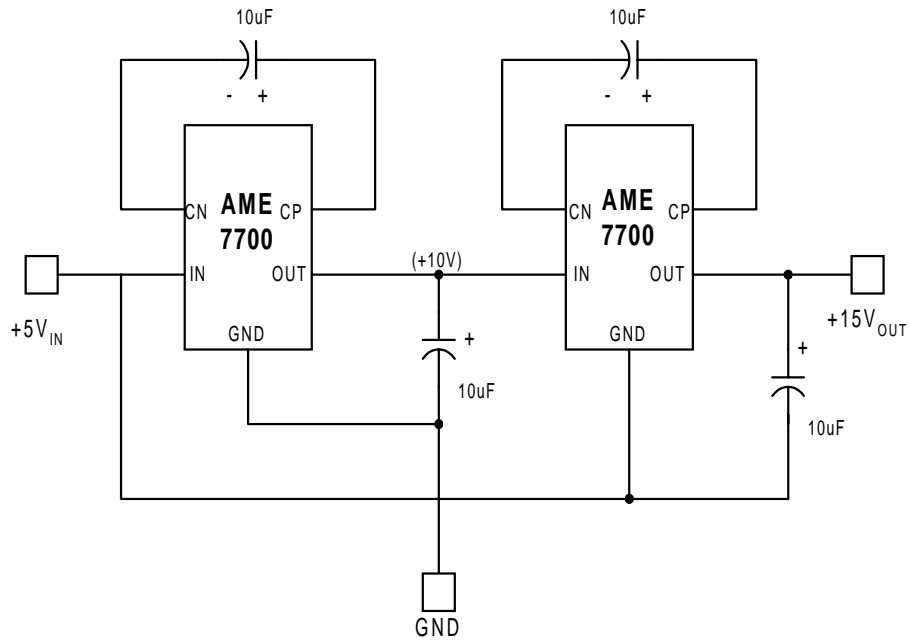
### 1.25V to 5.0V Converter



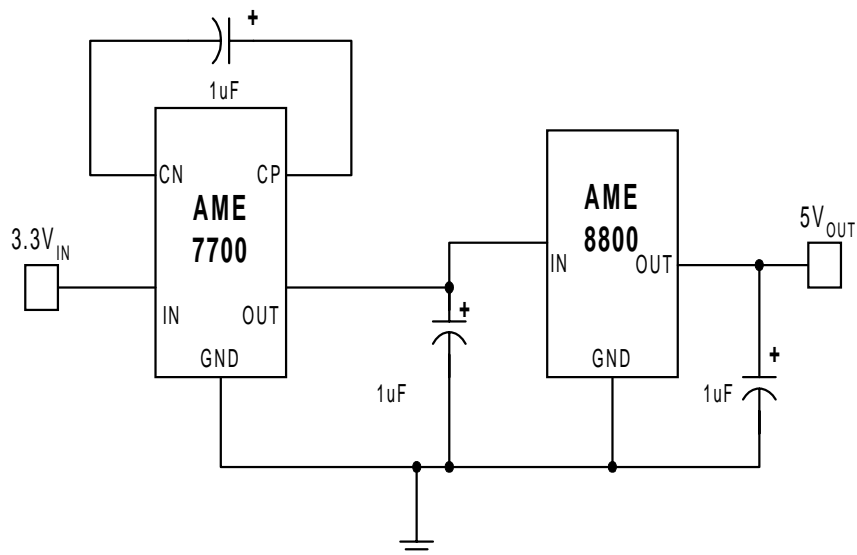


■ Applications(Continued)

### +5V to +15V Converter



### 3.3V-Input to Regulated 5V-Output Converter

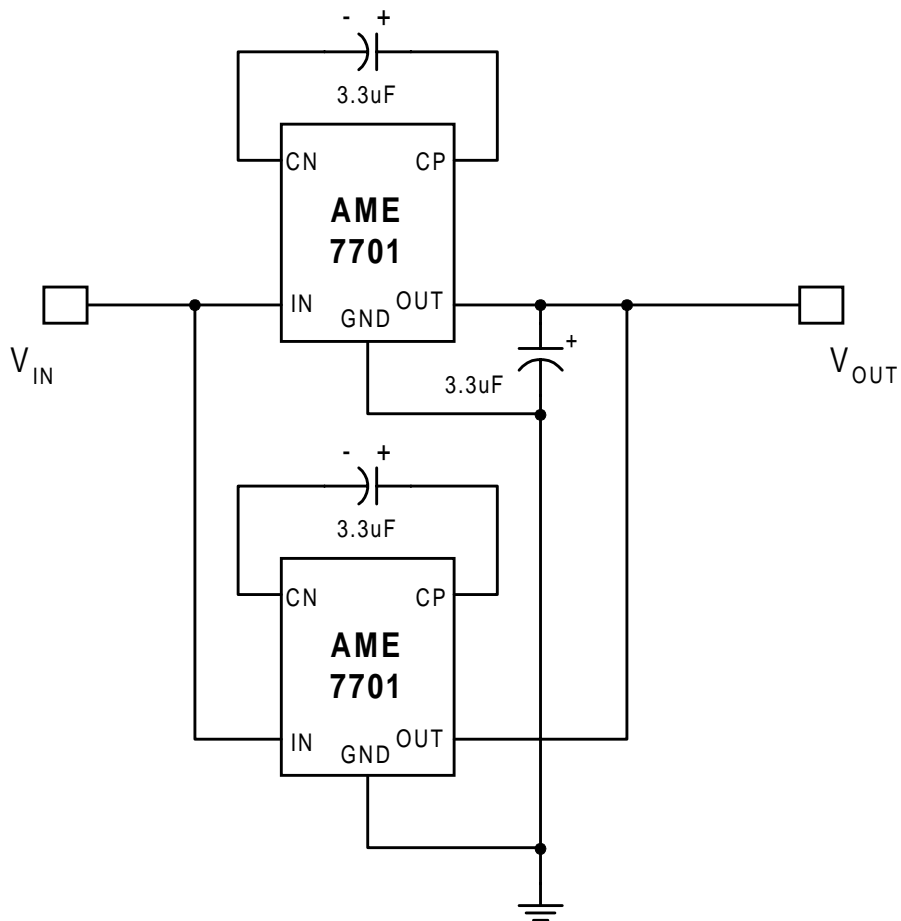






■ Applications(Continued)

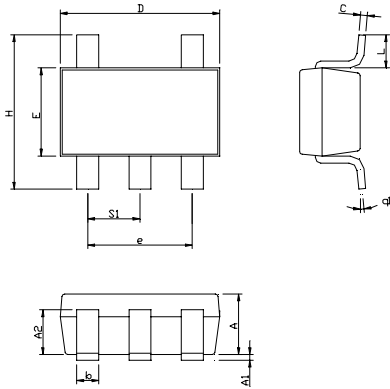
Paralleling Devices





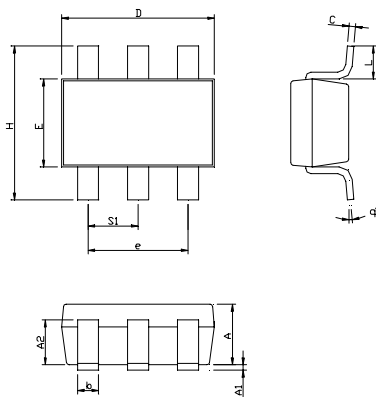
■ Package Dimension

SOT-25



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.00	1.45	0.0394	0.0571
A <sub>1</sub>	0.00	0.15	0.0000	0.0591
A <sub>2</sub>	0.70	1.25	0.0276	0.0492
b	0.35	0.55	0.0138	0.0217
C	0.08	0.25	0.0031	0.0098
D	2.70	3.10	0.1063	0.1220
E	1.40	1.80	0.0551	0.0709
e	1.90 BSC		0.07480 BSC	
H	2.60	3.00	0.1024	0.1181
L	0.30	-	0.0118	-
θ <sub>1</sub>	0°	10°	0°	10°
S <sub>1</sub>	0.85	1.05	0.0335	0.0413

SOT-26



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.00	1.40	0.0394	0.0551
A <sub>1</sub>	0.00	0.15	0.0000	0.0591
A <sub>2</sub>	0.70	1.25	0.0276	0.0492
b	0.35	0.50	0.0138	0.0197
C	0.08	0.25	0.0031	0.0098
D	2.70	3.10	0.1063	0.1220
E	1.40	1.80	0.0551	0.0709
e	1.90 BSC		0.0748 BSC	
H	2.60	3.00	0.1024	0.1181
L	0.35	-	0.0138	-
θ <sub>1</sub>	0°	9°	0°	9°
S <sub>1</sub>	0.85	1.05	0.0335	0.0413



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