4 CHANNEL LED DRIVER
LED CURRENT PROGRAMMABLE W/EXTERNAL RESISTOR

A8243

Description

The A8243 is a LED driver providing matched current source bias for any color LED, including white and blue. LED current is programmable using an external resistor.

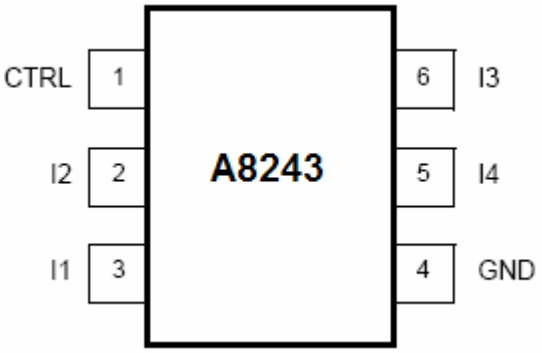
The A8243 current is typical 230 x I_{SET} (per LED) at an LED cathode voltage of 150mA and typical 325 x I_{SET} at an LED cathode voltage of 1V where I_{SET} is the current through the external resistor connected to the CTRL pin.

The A8243 is available in 6pin SC70 Package.

Features

- Ultra-Low Voltage Drop: Less than 150mV(for Li-ion Battery Support)
- LED Driver for Parallel-Connected LEDs
- Up to 40mA per LED
- Current-Matching Requires w/o External Components
- Analog and PWM Brightness Control
- ＜1uA Low Shutdown-Current
- No Electromagnetic Interference, No Switching Noise
- The A8243 is available 6pin SC70 Package.

Ordering Information



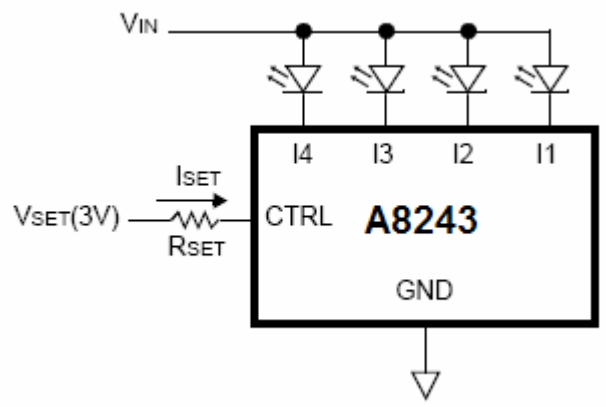
Diode Control	Part Number
4	A8243C6

C6= 6pin SC-70 package

Application

- LED Display
- Keyboard Backlight
- Portable DVD Player
- MP3, CD Player, Mobile, PDA
- Cordless Displays
- Consumer Electronics.

Typical Application



Pin Description

Pin #	Name	Description
1	CTRL	Set LED Current, Connect to External Resistor.
2	I2	Connect to Cathode of LED.
3	I1	Connect to Cathode of LED.
4	GND	Ground Pin
5	I4	Connect to Cathode of LED.
6	I3	Connect to Cathode of LED.

Absolute Maximum Ratings

V_{I1}, V_{I2}, V_{I3}, V_{I4} and CTRL to GND	-0.3~5V
Power Dissipation T_A=85°C (SC-70-6)	200mW
I1, I2, I3, I4 Steady State Current	100mA
Lead Temperature (Soldering, 10s)	260°C
Junction Temperature	150°C
Storage Temperature	-65°C ~ +150°C
Electrostatic Discharge Protection (ESD) Level	2KV

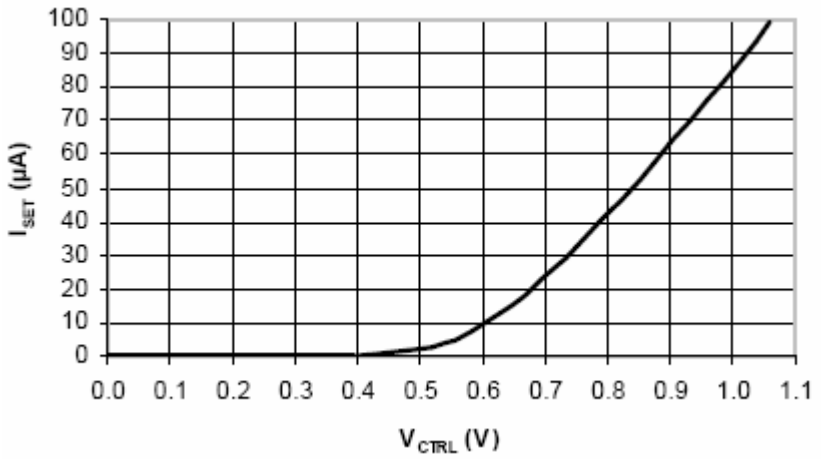
Electrical Characteristics (T_A=25°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
I_{SET} Range	I_{SET}		25		150	uA
LED-to-LED Current Matching	Match		-3		3	%
I_{SET} in OFF Mode	$I_{SET,OFF}$	V_{CTRL}=3V, V_{SAT}=3V, T_A=25°C		0.1	1	uA
I_{IN} in OFF Mode	$I_{IN,OFF}$	V_{CTRL}=3V, V_{SAT}=3V		0.1	14	uA
Peak Efficiency*	EFF	V_{IN}=3V	95			%
Output Current Multiplication Ratio	OCMR	I_{SAT}=25uA,V_{SAT}=150mV	175	250	325	uA
		I_{SAT}=40uA,V_{SAT}=150mV	170	240	310	
		I_{SAT}=75uA,V_{SAT}=150mV	145	210	275	
		I_{SAT}=25uA,V_{SAT}=600mV	215	310	405	
		I_{SAT}=40uA,V_{SAT}=600mV	215	305	395	
		I_{SAT}=75uA,V_{SAT}=600mV	205	295	385	
		I_{SAT}=25uA,V_{SAT}=1000mV	235	335	435	
		I_{SAT}=40uA,V_{SAT}=1000mV	230	330	430	
		I_{SAT}=75uA,V_{SAT}=1000mV	220	315	410	

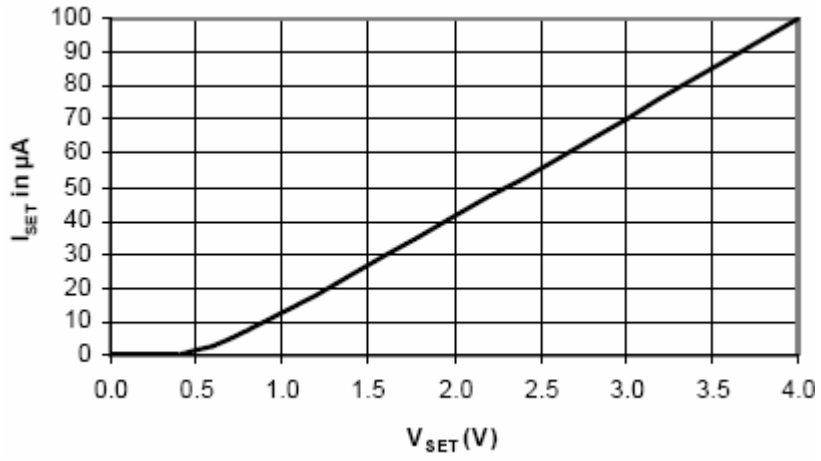
*Efficiency=(V_{IN}-V_{SAT})/V_{IN}.

Typical Characteristics

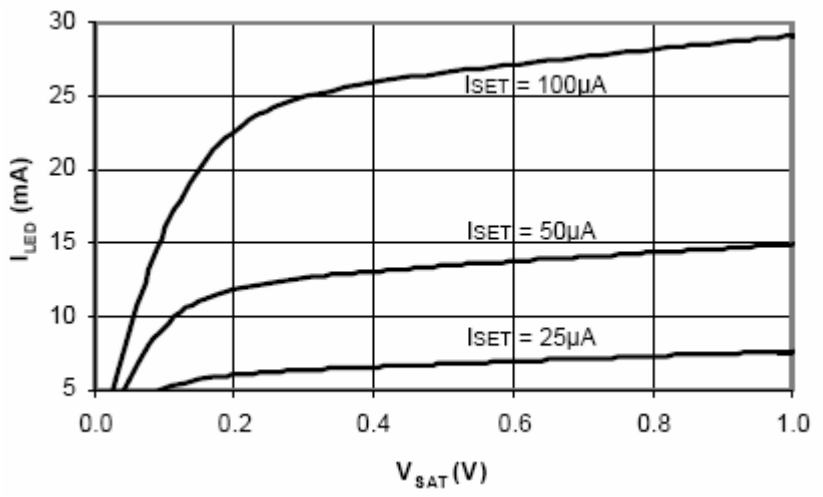
1. I_{SET} vs V_{CTRL}



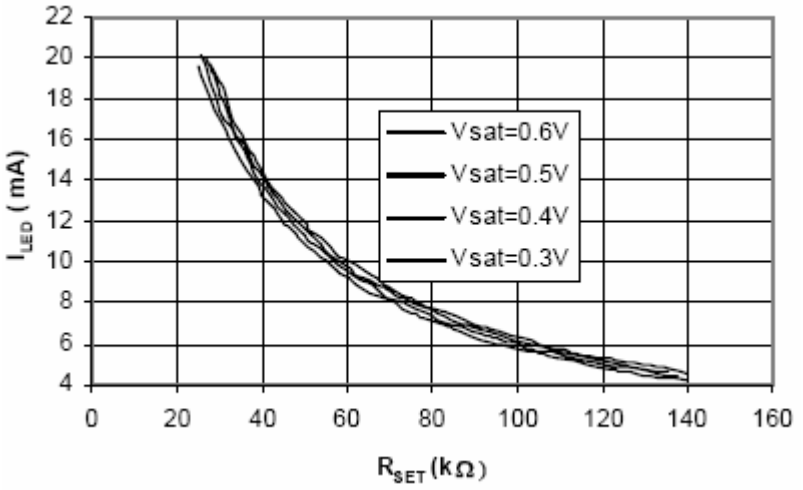
2. I_{SET} vs V_{SAT} (R_{SET}=30KΩ)



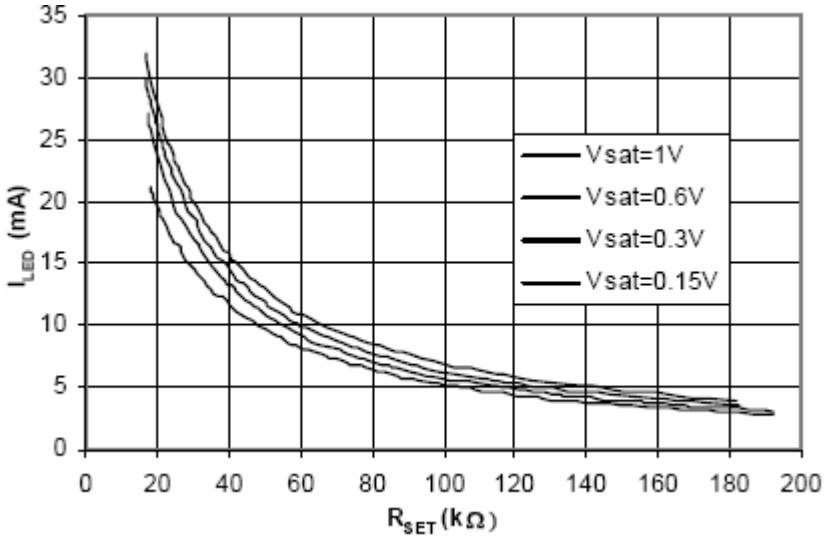
3. I_{LED} vs V_{SAT}



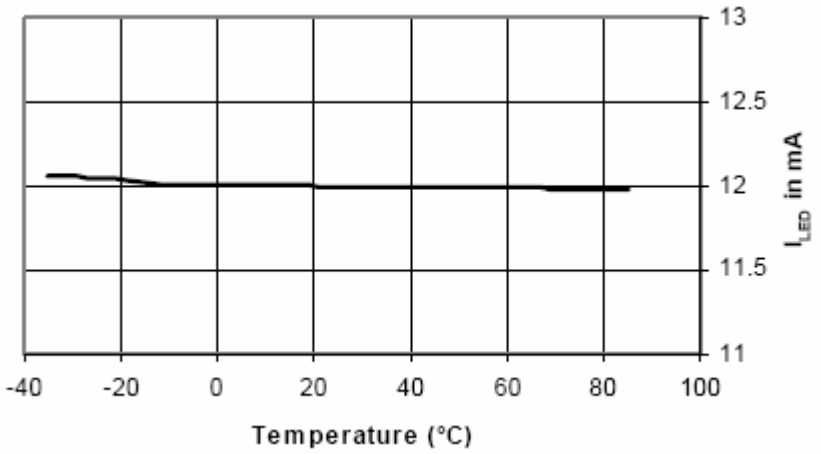
4. I_{LED} vs R_{SET}



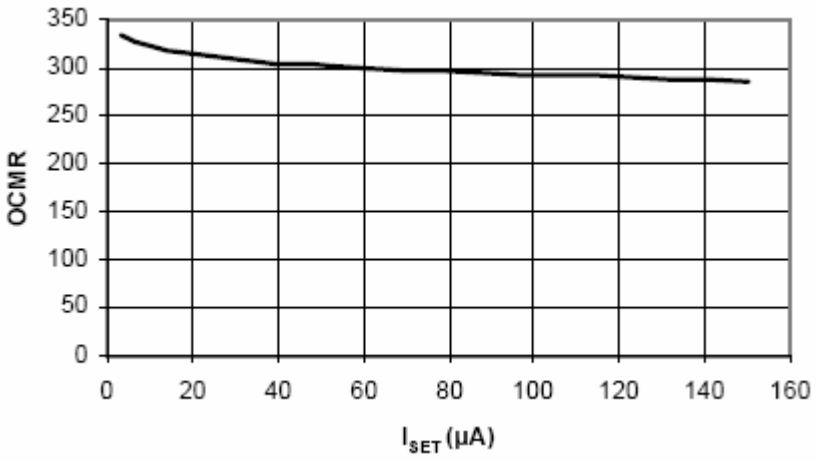
5. I_{LED} vs R_{SET}



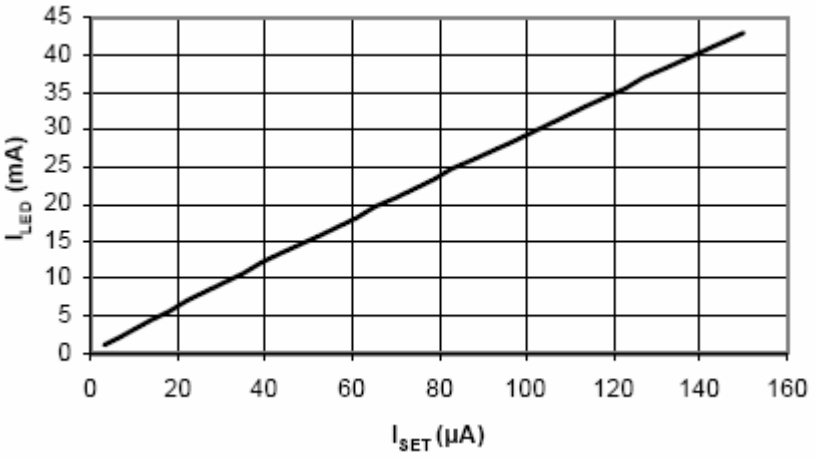
6. I_{LED} vs Temperature (V_{LED} = 0.25V, I_{SET} = 50uA)



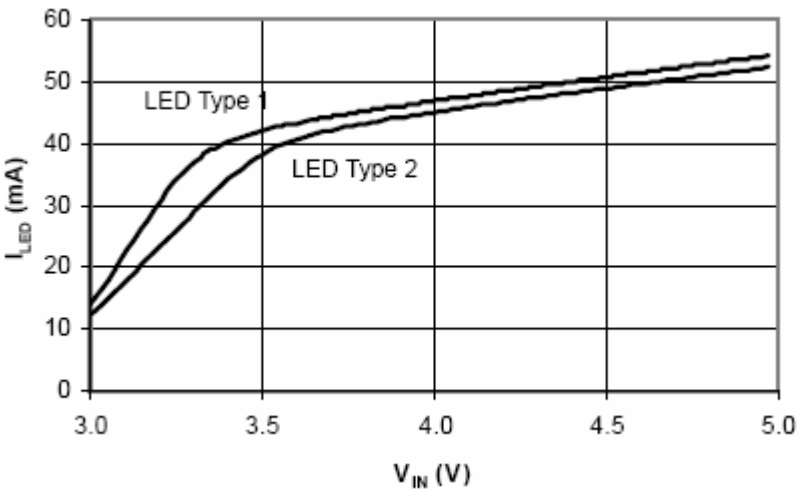
7. OCMR vs. I_{SET}



8. I_{LED} vs. I_{SET}



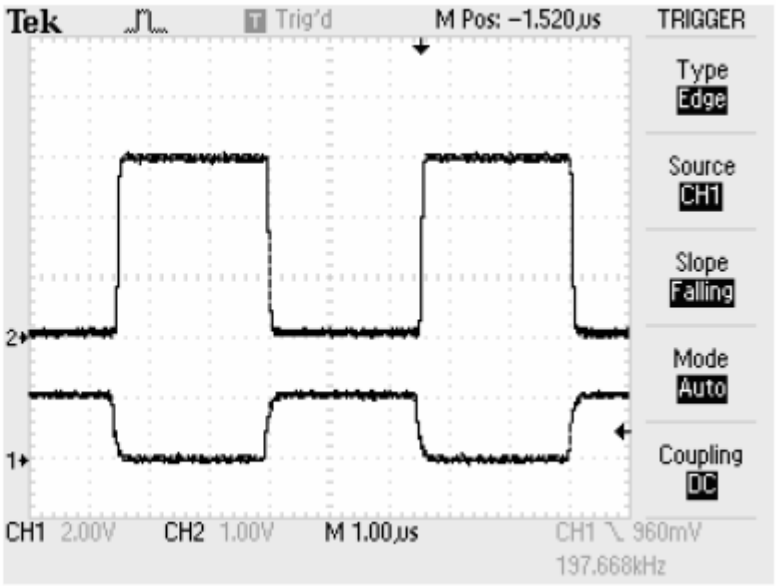
9. I_{LED} vs. V_{IN}



10. Control Voltage Transient Response

CH2: LED Current (10mA/Div)

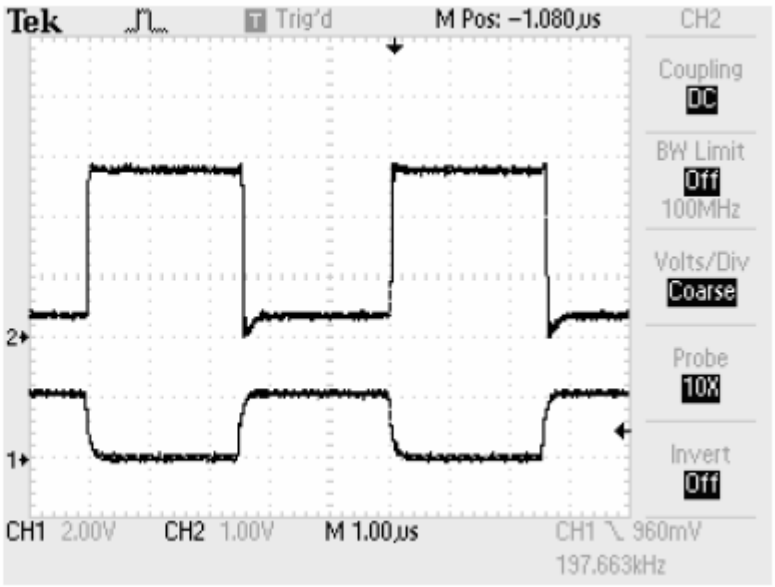
CH1: Control Voltage (2V/Div)



11. Enable Voltage Transient Response

CH2: LED Current (10mA/Div)

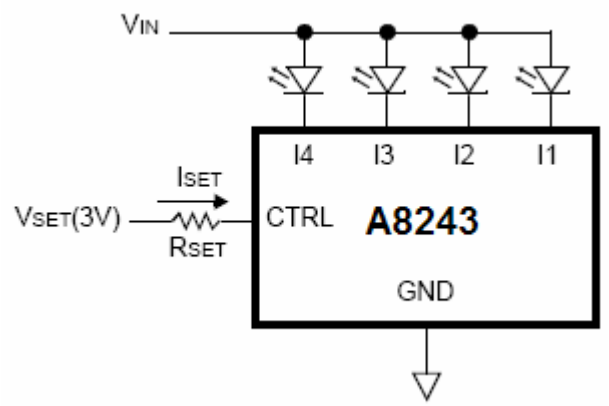
CH1: Enable Voltage (2V/Div)



Application Information

Typical Application Diagram

4 Diode Control



Setting the LED Current

The current going into the LEDs is approximately OCMR times greater than the current I_{SET}. LED current is controlled by V_{SET} and R_{SET} according to the formula:

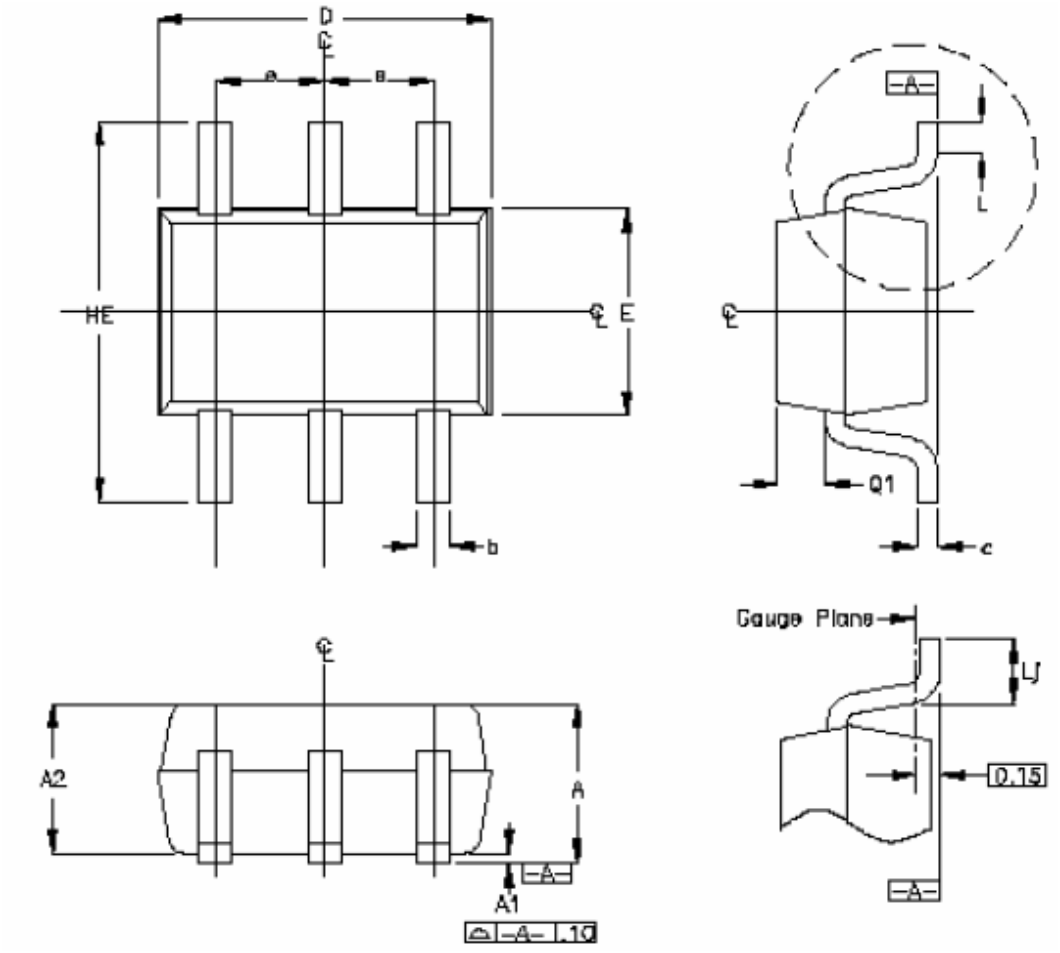
$$I_{LED} = OCMR \times (V_{SET} - V_{CTRL}) / R_{SET}$$

For V_{SET} =3V and a specific LED current, the R_{SET} value can be determined using the diagram shown in previous Typical Performance Characteristics. For any other option, the value of I_{SET} can be determined using the graph " I_{SET} vs. V_{CTRL} ".

LED Brightness be adjusted by driving pin CTRL with a PWM signal.

Package Information

Dimension in 6-pin SC-70 Package (Unit: mm)



Symbol	Min	Max
e	0.65 BSC	
D	1.80	2.20
b	0.15	0.30
E	1.15	1.35
HE	1.80	2.40
Q1	0.10	0.40
A2	0.80	1.00
A1	0.00	0.10
A	0.80	1.10
c	0.10	0.18
L	0.10	0.30
L1	0.26	0.46

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