AME

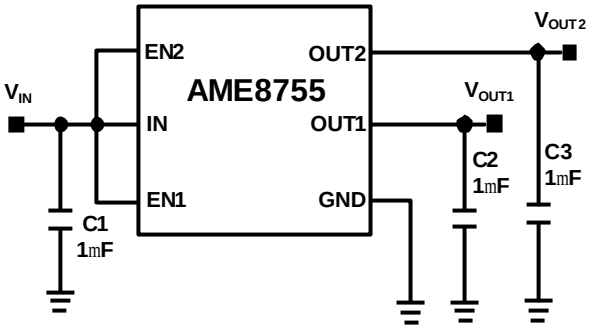
AME8755

High PSRR, Low Quiescent Current, 150mA Dual CMOS LDO

■ General Description

The AME8755 is highly accurate, dual channel, high PSRR, low quiescent current CMOS LDO. The AME8755 includes a reference voltage source, error amplifiers, over current limit and thermal shutdown and consumes only 70μA(typical) quiescent current at no load with both channels enabled. The EN function allows the output of each channel to be turned on and off independently.

■ Typical Application



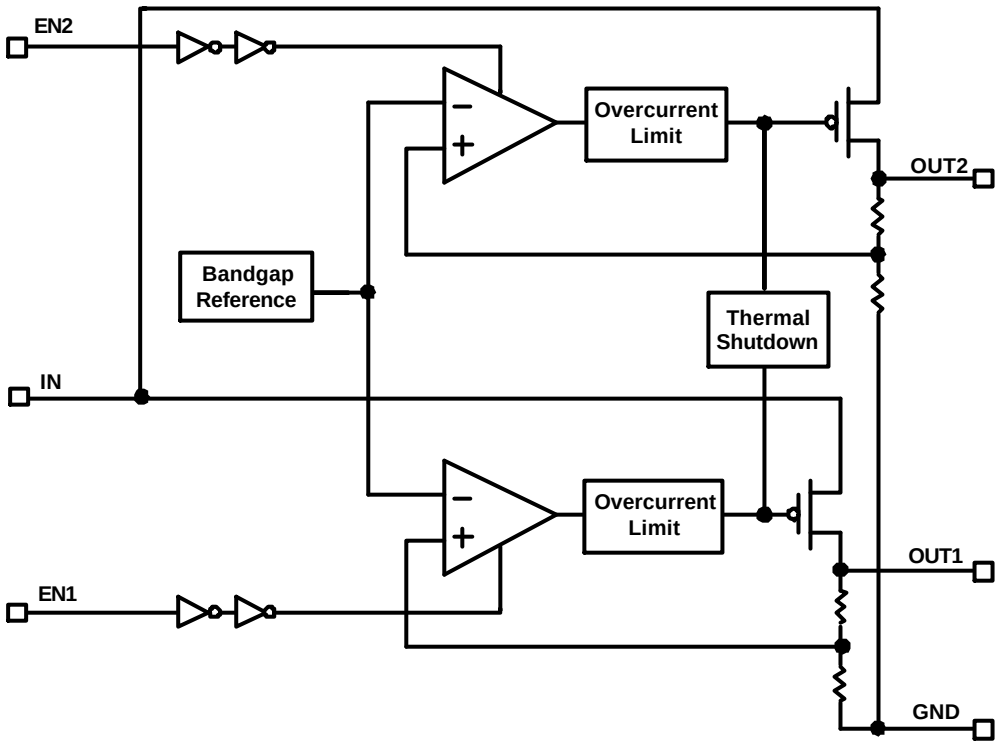
■ Features

- Guaranteed 150mA Output
- Accurate to within ± 2%
- 1.2V to 3.3V Factory-Preset Output
- Over Current Protection
- Over Temperature Shutdown
- High PSRR (Typ. 70dB)
- Low Quiescent Current (Typ. 70μA)
- All AME's Green Products Meet RoHS Standards.

■ Applications

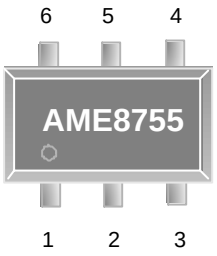
- Mobile Phones
- Digital Cameras
- PDAs
- Wireless LAN Applications

■ Function Block Diagram



■ Pin Configuration

SOT-26
Top View

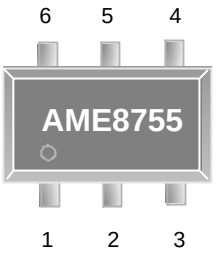


AME8755-AEYxxxxxx

1. OUT1
2. IN
3. OUT2
4. EN2
5. GND
6. EN1

*** Die Attach:**
Conductive Epoxy

SOT-26
Top View



AME8755-BEYxxxxxx

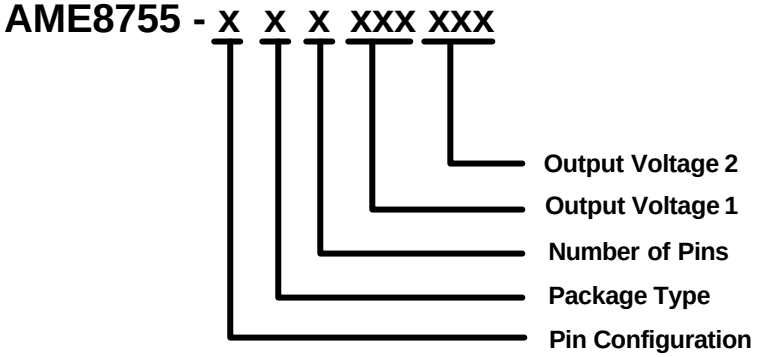
1. EN1
2. IN
3. EN2
4. OUT2
5. GND
6. OUT1

*** Die Attach:**
Conductive Epoxy

■ Pin Description

Pin Name	Pin Description
OUT1	LDO voltage regulator output pin. It should be decoupled with a 1μF or greater value low ESR ceramic capacitor.
IN	Input voltage pin. It should be decoupled with 1μF or greater capacitor.
OUT2	LDO voltage regulator output pin. It should be decoupled with a 1μF or greater value low ESR ceramic capacitor.
EN2	Enable pin. When pulled low, the PMOS pass transistor turns off OUT2, current consuming less than 1μA.
GND	Ground connection pin.
EN1	Enable pin. When pulled low, the PMOS pass transistor turns off OUT1, current consuming less than 1μA.

■ Ordering Information



Pin Configuration	Package Type	Number of Pins	Output Voltage1 (Dual LDOs)	Output Voltage2 (Dual LDOs)
A 1. OUT1 (SOT-26) 2. IN 3. OUT2 4. EN2 5. GND 6. EN1 B 1. EN1 (SOT-26) 2. IN 3. EN2 4. OUT2 5. GND 6. OUT1	E: SOT-2X	Y: 6	330: 3.3V 300: 3.0V 285: 2.85V 280: 2.8V 180: 1.8V 120: 1.2V	330: 3.3V 300: 3.0V 285: 2.85V 280: 2.8V 180: 1.8V 120: 1.2V

■ Available Options

Part Number	Marking	Output Voltage	Package	Operating Ambient Temperature Range
AME8755-AEY180280	BXHMXX	V_{OUT1}=1.8V V_{OUT2}=2.8V	SOT-26	-40^{O}C to +85^{O}C
AME8755-BEY180280	BYGMXX	V_{OUT1}=1.8V V_{OUT2}=2.8V	SOT-26	-40^{O}C to +85^{O}C

Note:
1. The first 3 places represent product code. It is assigned by AME such as BXH.
2. A bar on top of first letter represents Green Part such as $\overline{B}$XH.
3. The last 3 places MXX represent Marking Code. It contains M as date code in "month", XX as LN code and that is for AME internal use only. Please refer to date code rule section for detail information.
4. Please consult AME sales office or authorized Rep./Distributor for the availability of output voltage and package type.

■ Absolute Maximum Ratings

Parameter	Maximum	Unit
Input Voltage	-0.3 to +6	V
Output Current	P_D / [$2V_{IN}$-(V_{OUT1}+V_{OUT2})]	mA
Output Voltage	GND-0.3 to V_{IN}+0.3	V

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

■ Recommended Operating Conditions

Parameter	Symbol	Rating	Unit
Ambient Temperature Range	T_A	-40 to +85	^oC
Junction Temperature Range	T_J	-40 to +125	
Storage Temperature Range	T_{STG}	-65 to +150	

■ Thermal Information

Parameter	Package	Die Attach	Symbol	Maximum	Unit
Thermal Resistance* (Junction to Case)	SOT-26	Conductive Epoxy	θ_{JC}	81	^oC / W
Thermal Resistance (Junction to Ambient)			θ_{JA}	260	
Internal Power Dissipation			P_D	400	mW
Solder Iron (10Sec)**				350	^oC

* Measure θ_{JC} on backside center of molding compund if IC has no tab.

** MIL-STD-202G 210F

■ Electrical Specifications

V_{IN} = V_{OUT} + 1V or 2.7V, whichever is higher, where V_{OUT} is the higher one of $V_{OUT1(nom)}$ and $V_{OUT2(nom)}$, I_{OUT} = 1mA, V_{EN} = V_{IN} and C_{OUT} = 1µF(X7R), C_{IN} = 1µF unless otherwise noted. Typical values are at T_A = 25°C.

Parameter	Symbol	Test Conditions		Min	Typ	Max	Units
Input Voltage	V_{IN}			2.7		5.5	V
Output Voltage Accuracy	V_{OUT}			-2		2	%
Output Current	I_{OUT}				150		mA
Quiescent Current	I_Q	V_{EN} = V_{IN}, I_{OUT} = 0mA			70	120	µA
Dropout Voltage	V_{DROP}	I_{OUT}=150mA	3.00V ≦ V_{OUT} ≦ 3.30V		250	350	mV
			2.50V ≦ V_{OUT} ≦ 2.95V		300	450	
			2.20V ≦ V_{OUT} ≦ 2.45V		350	550	
			V_{OUT} ≦2.15V		Note 1		
Output Voltage Line Regulation (Note2)	REG_{LINE}	V_{OUT}+Vdrop< V_{IN} < 5.5V, where V_{OUT} is the higher one of $V_{OUT1(nom)}$ and $V_{OUT2(nom)}$		-0.1	0.025	0.1	%/V
Output Voltage Load Regulation (Note3)	REG_{LOAD}	1mA < I_{OUT} < 150mA		-0.005	0.0025	0.005	%/mA
Output Current Limit	I_{LIM}	R_{OUT} = 1Ω		300	550		mA
Shutdown Current	I_{SHDN}	V_{EN} = 0V, $V_{IN(min)}$ < V_{IN} < $V_{IN(max)}$			0.1	1	µA
Power Supply Ripple Rejection	PSRR	f = 1kHz, I_{OUT} = 1mA			70		dB
Enable High (enabled)	$V_{EN(HI)}$	$V_{IN(min)}$ < V_{IN} < $V_{IN(max)}$		1.4		V_{IN}	V
Enable Low (shutdown)	$V_{EN(LO)}$	$V_{IN(min)}$ < V_{IN} < $V_{IN(max)}$		0		0.4	V
Enable Pin Current (enabled)	I_{EN}	V_{EN} = V_{IN}			0.1	1	µA
Thermal Shutdown Temperature	T_{SHDN}	Shutdown, temperature increasing			160		°C
	T_{RS}	Restore, temperature decreasing			140		

Note 1. For V_{OUT} ≦2.15V, V_{DROP}=2.7V-V_{OUT}

Note 2. (△V_{OUT}/△V_{IN})*% / V_{OUT}

Note 3. (△V_{OUT}/V_{OUT})*% / △I_{OUT}

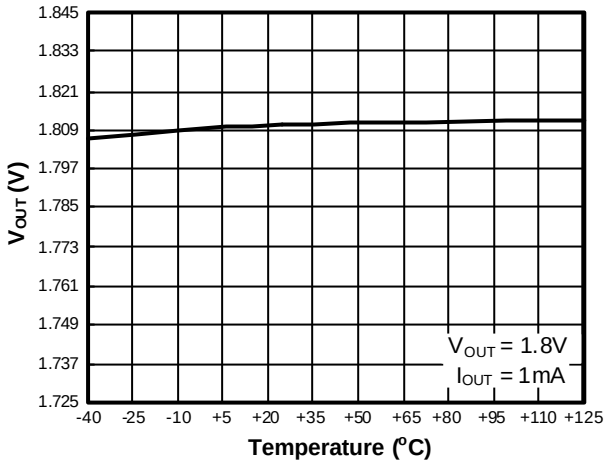
■ Detailed Description

The AME8755 contains two PMOS pass transistors, a reference voltage source, error amplifiers, over current protection, and thermal shutdown. The P-channel pass transistor receives data from the error amplifier, over current limit, and thermal protection circuits. During normal operation, the error amplifier compares the output voltage to a precision reference. The output voltages are controlled and stabilized by a system of negative feedback.

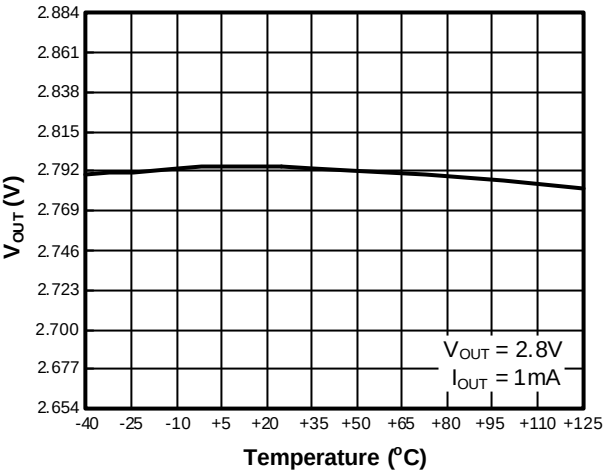
The AME8755 requires an output capacitor connected between the output and ground to stabilize the internal control loops. The minimum recommended output capacitor is 1μF. The IC's internal circuitry can be turned on and off via the signal from the EN1 and EN2 pins, for example: OUT1 is turned on when EN1 is greater than 1.4V. And OUT1 is turned off when EN1 is less than 0.4V, resulting in greatly reduced power consumption, same operation for EN2 and OUT2.

The AME8755's over current limit and thermal shutdown protection prevent the IC from damaging. The internal over current protection helps protect the regulator during fault conditions. During over current protection, the output will be pulled down and source a nearly fixed amount of current that is largely independent of the output voltage. Thermal shutdown protection disables both outputs when the junction temperature of either channel rises to approximately 160°C, allowing the device to cool. When the junction temperature cools to approximately 140°C, the output circuitry is again enabled. This limits the dissipation of the regulator, protecting it from damage due to over heating.

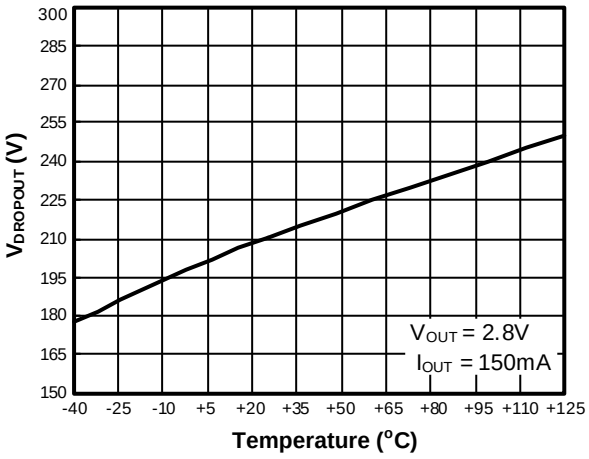
V_{OUT} vs. Temperature



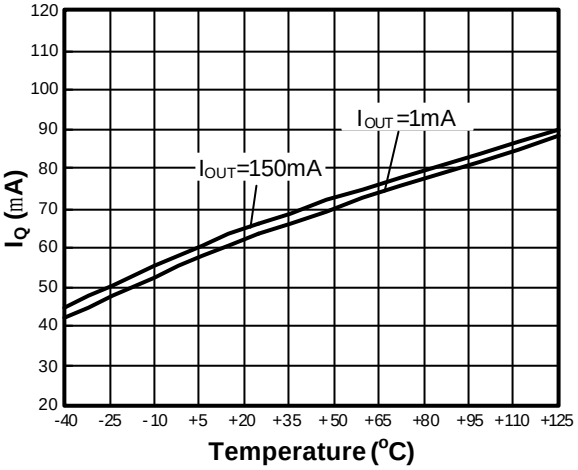
V_{OUT} vs. Temperature



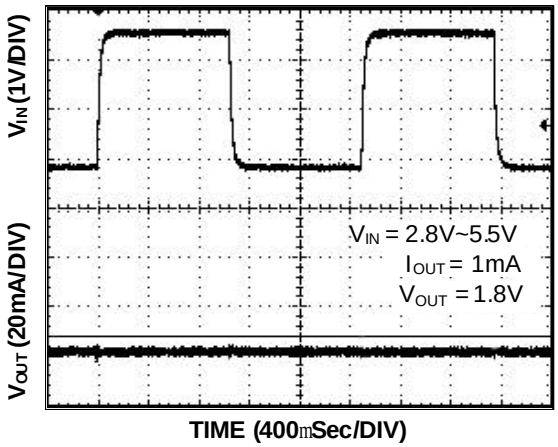
$V_{DROPOUT}$ vs. Temperature



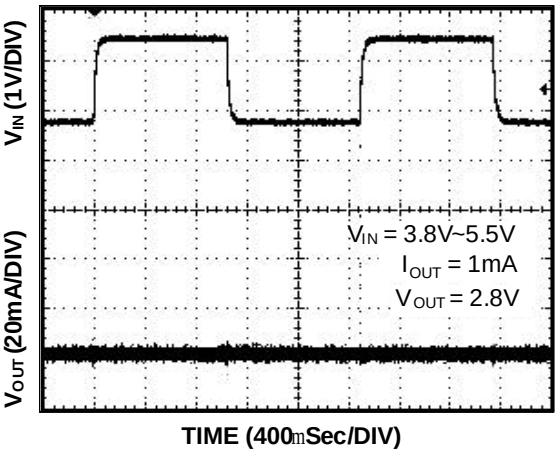
I_Q vs. Temperature



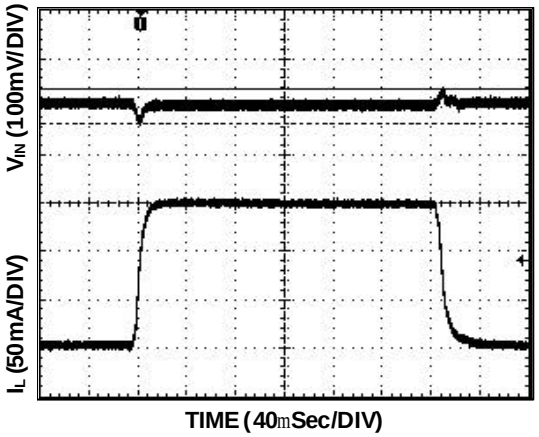
Line Transient Response



Line Transient Response

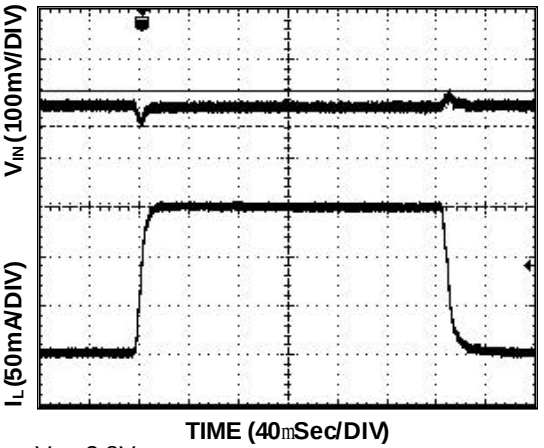


Load Transient Response



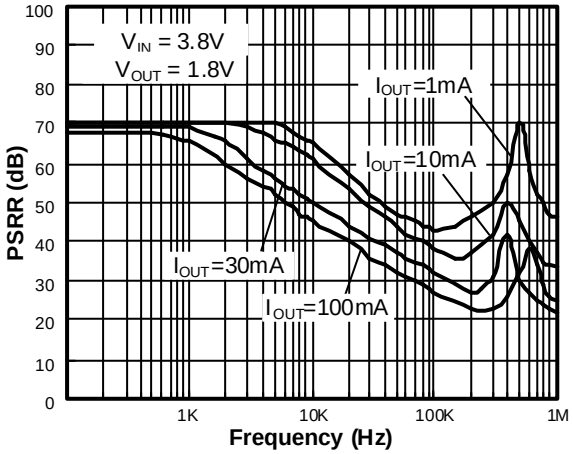
V_{IN} = 2.8V
V_{OUT} = 1.8V
I_{OUT} = 1mA~150mA

Load Transient Response

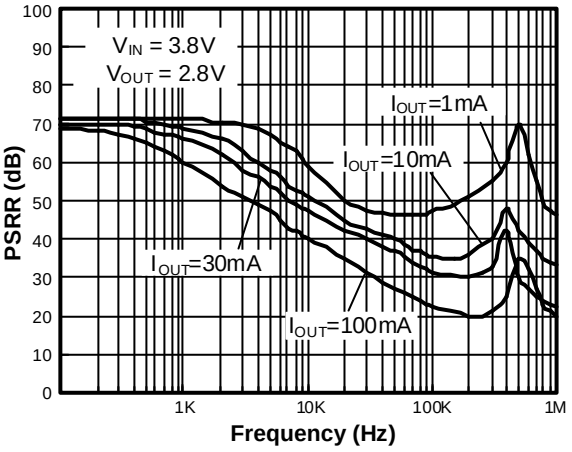


V_{IN} =3.8V
V_{OUT} = 2.8V
I_{OUT} = 1mA~150mA

Power Supply Rejection Ratio



Power Supply Rejection Ratio



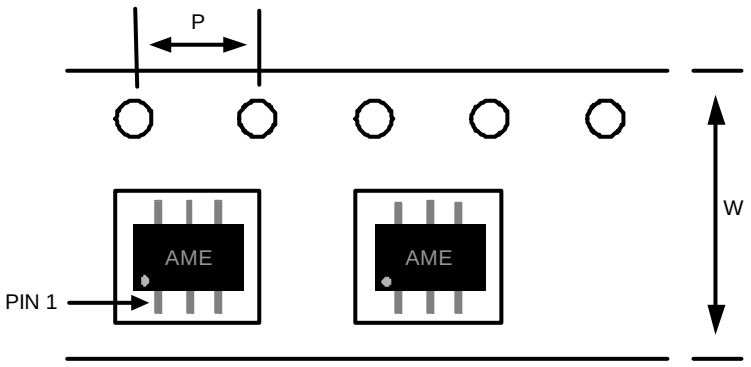
■ Date Code Rule

Month Code	
1: January	7: July
2: February	8: August
3: March	9: September
4: April	A: October
5: May	B: November
6: June	C: December

Marking						Year
A	A	A	M	X	X	xxx0
A	A	A	M	X	X	xxx1
A	A	A	M	X	X	xxx2
A	A	A	M	X	X	xxx3
A	A	A	M	X	X	xxx4
A	A	A	M	X	X	xxx5
A	A	A	M	X	X	xxx6
A	A	A	M	X	X	xxx7
A	A	A	M	X	X	xxx8
A	A	A	M	X	X	xxx9

■ Tape and Reel Dimension

SOT-26



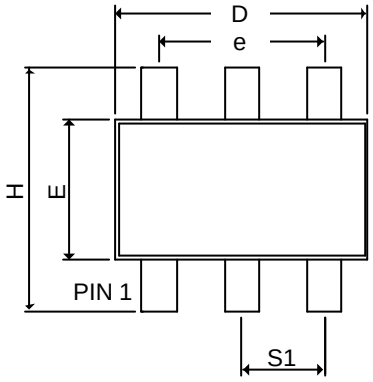
Carrier Tape, Number of Components Per Reel and Reel Size

Package	Carrier Width (W)	Pitch (P)	Part Per Full Reel	Reel Size
SOT-26	8.0±0.1 mm	4.0±0.1 mm	3000pcs	180±1 mm

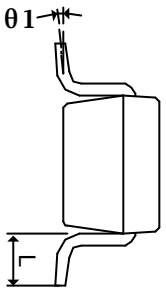
■ Package Dimension

SOT-26

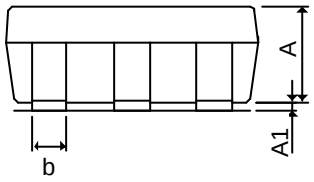
Top View



Side View



Front View



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.30	0.0354	0.0512
A_1	0.00	0.15	0.0000	0.0059
b	0.30	0.55	0.0118	0.0217
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	0.10236	0.11811
L	0.37BSC		0.0146BSC	
q1	0^o	10^o	0^o	10^o
S_1	0.95BSC		0.0374BSC	

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