

## DESCRIPTION

BM0150HV is the monolithic IC designed for step-down LED driver capable of driving 1.8A-3.3A load without additional transistor. The input voltage range is up to 60V. Its feedback voltage, VFB, is 200mV. The chip operates at a switching frequency of 52kHz. The external shutdown function is controlled by a logic level on the ON/OFF pin and then the circuit comes into the standby mode with I<sub>STBY</sub>~50μA (typ.). The ON/OFF pin may be used for the analog dimming. As the voltage on the ON/OFF pin is increased from 0.07V to 0.67V, the voltage on the FB pin falls from 200mV to 0. The self-protection features include a cycle-by-cycle current limit and a thermal protection. BM0150HV is available in standard TO-263, TO252 and PSOP-8 with power pad package.

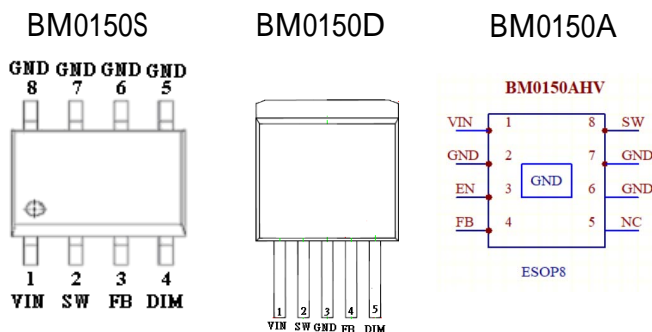
## APPLICATIONS

- DC/DC LED driver applications
- Backlighting for flat panel displays
- General purpose constant current source
- 52KHZ, no noise to Automotive-CAR audio
- Chargers

## FEATURES

- V<sub>IN</sub> Max = 60V
- V<sub>FB</sub> = 200mV, I<sub>q</sub> < 3mA
- I<sub>LED</sub> up to 3.5A with TO263-5L
- I<sub>LED</sub> up to 2.1A with PSOP-8L
- I<sub>LED</sub> up to 2.8A with TO-252-5L
- On/Off input may be used for the Analog Dimming, low=ON
- Thermal protection
- Cycle-by-cycle current limit

## PIN Configuration



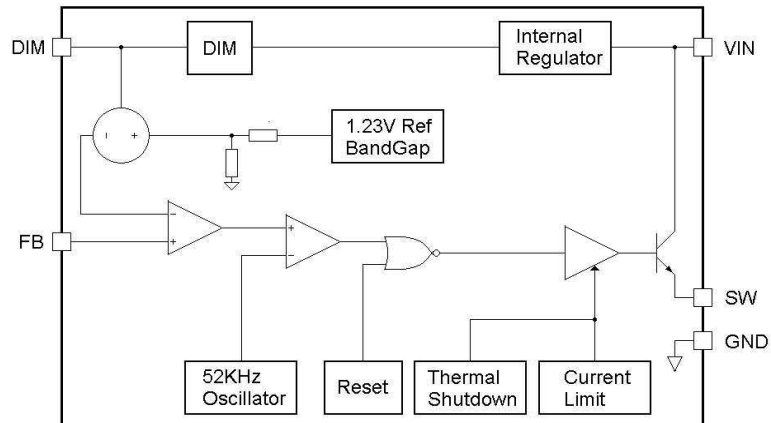
**BM0150HV can replace AP1509, AP1507, XL7005 without change PCB, the V<sub>fb</sub> = 0.2V, so need to modify one of the feedback resistor value.**

**BM0150HV can output CC-constant current, and can output CV-constant voltage.**

**(能工作于恒压,也能工作于恒流) ; 52KHZ will not affect the car radio.**

ON/OFF (DIM)	0V – 0.07V	0.07V–0.67V	>2V
ESOP8--PIN4	ON, Enable	DIMMING, PWM can control this pin to let FB voltage from 200mV down to 0V. Use 1K-2K PWM to dim	OFF Disable
TO252-5 PIN5		<用 1KHZ-2KHZ 的 PWM 信号通过 RC 回路给 DIM 脚,用来调(电流)光或调电压输出>	

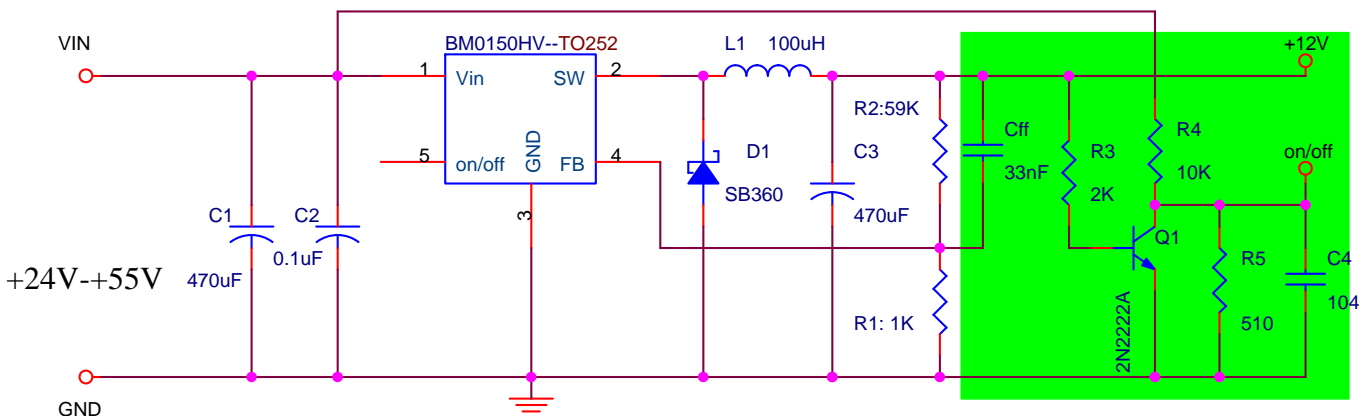
## INTERNAL BLOCK DIAGRAM



## PIN DESCRIPTION

Pin (PSOP-8L)	Pin (TO263-5)	Symbol	Description
1	1	V <sub>IN</sub>	Supply Voltage Input
2	2	SW	Switch
3	4	FB	Feedback
4	5	DIM	ON/Off and Linear Dimming
5~8	3	GND	Ground with Heat Sink

1. 在高压输入条件下,可以外加第二级输出短路保护电路.
2. 容易外加电路,实现输入输出零压差, 并保持输出稳定.



\*NOTE: There is OTP and OCP circuit inside BM0150HV. The green additional protect circuit is optional for special application. There is also low dropout circuit available outside of chip, for example, when the input +12V drop to +6V or even +5V, the output 5V can still output 5V. Pls. ask our salesoffice for technical support and apply demo board if you need.

## ABSOLUTE MAXIMUM RATINGS

( $T_A=25^{\circ}\text{C}$  Unless otherwise specified)

Parameter	Symbol	Value	Unit
DC Supply Voltage	$V_{IN}$	63	V
ON/OFF and Dimming Voltage	DIM	-0.3~ $V_{IN}$	V
SW Voltage	SW	-0.8	V
FB Voltage	FB	-0.3~ $V_{IN}$	V
Operating Temperature	$T_{OPR}$	-40 ~ 125	$^{\circ}\text{C}$
Maximum Junction Temperature	$T_{J(\text{Max})}$	150	$^{\circ}\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$ (TO263-5)	30	$^{\circ}\text{C}/\text{W}$
	$R_{\theta JA}$ (PSOP-8L)	50	$^{\circ}\text{C}/\text{W}$
Storage Temperature	$T_S$	-65 ~ 150	$^{\circ}\text{C}$

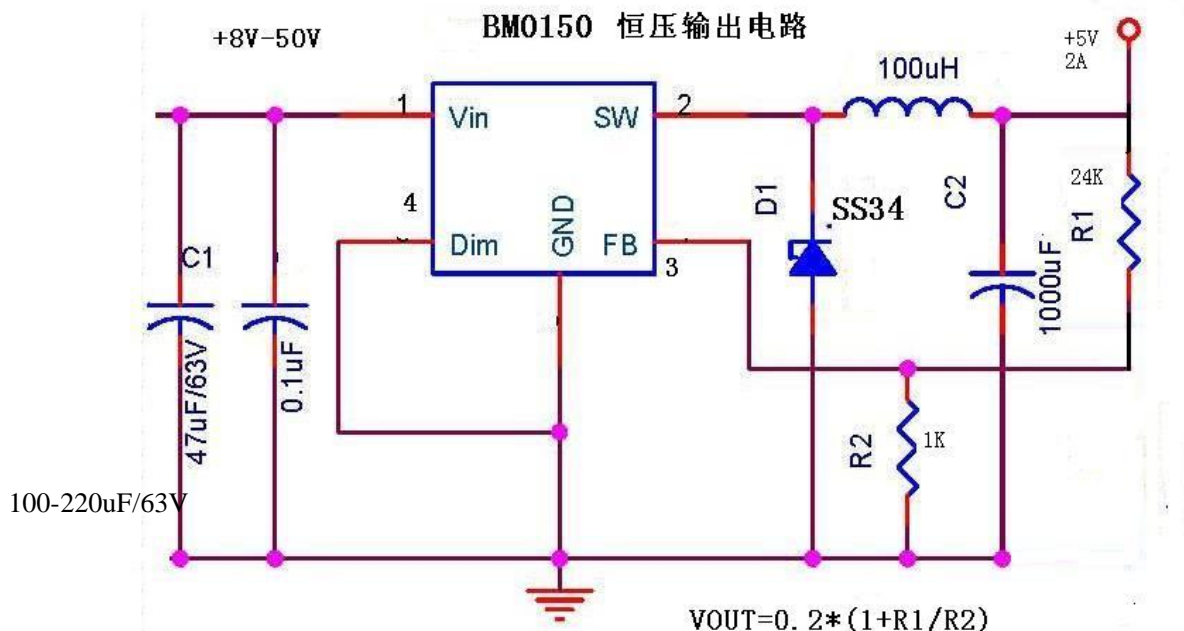
The IC has a protection circuit against static electricity. Do not apply high static electricity or high voltage that exceeds the performance of the protection circuit to the IC.

## ELECTRICAL CHARACTERISTICS

( $T_j=25^{\circ}\text{C}$ ,  $V_{IN}=12\text{V}$ ,  $I_{LOAD}=350\text{mA}$  Unless otherwise specified)

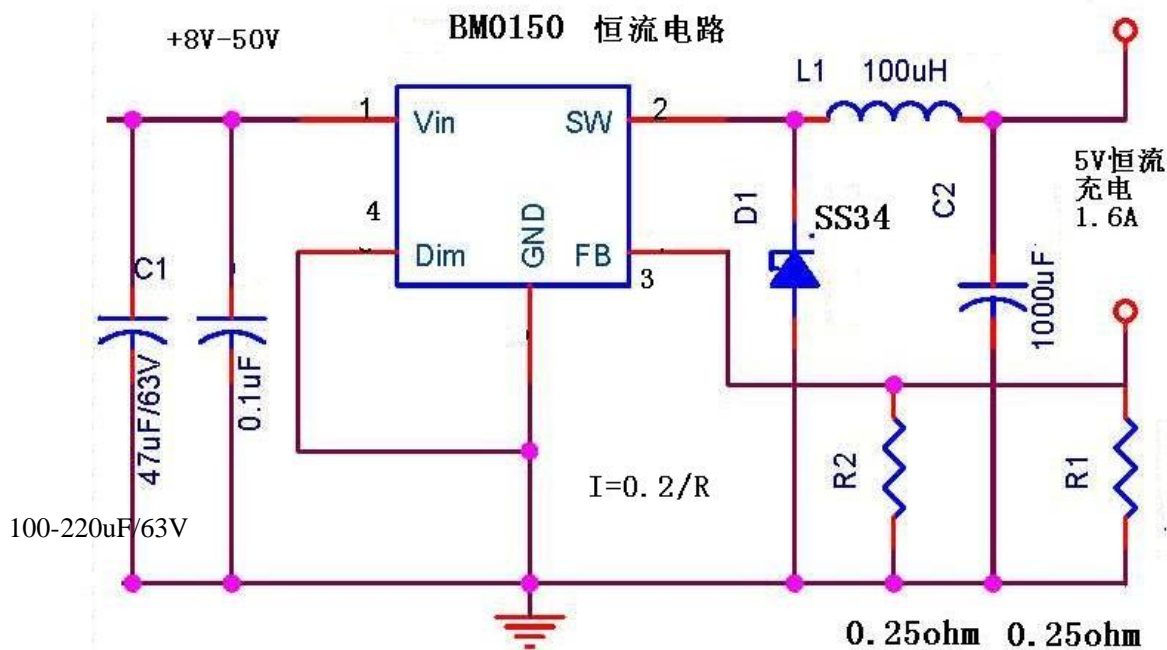
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{IN}$	Operating Voltage		5.5		60	V
$V_{FB}$	Feedback Voltage	$V_{IN} = 12\text{V}$ , $I_{LOAD} = 350\text{mA}$ , $DIM = 0\text{V}$	190	200	210	mV
		$V_{IN} = 5.5\text{V} \sim 60\text{V}$ , $I_{LOAD} = 350\text{mA}$ , $V_{DIM} = 0\text{V}$	180		220	mV
$I_{FB}$	Feedback Current	$V_{FB} = 250\text{mV}$ , $DIM = 0\text{V}$	-150	-50	150	nA
$F_{OSC}$	Oscillator Frequency		47	52	58	KHz
$V_{SAT}$	Saturation Current	$I_{SW}=1.5\text{A}$ PSOP-8L		1.35	1.5	V
		$I_{SW}=3.0\text{A}$ TO-263-5L		1.35	1.5	V
$D_{MAX}$	Max Duty				100	%
$I_{LO}$	SW Leakage Current	$V_{IN}=60\text{V}$ , $V_{FB} = 1.5\text{V}$ , $V_{SW} = 0\text{V}$	-0.3	-0.07		mA
$I_{CL}$	Current Limit	PSOP-8L	2.5		4.5	A
		TO-263-5L	4.5		6.5	A
$V_{TH}$	DIM Threshold Voltage		1.0	1.4	2.0	V
$I_{IH}$	Input Current On/Off	$V_{On/Off} = 2.5\text{V}$	-1.0	0.01	1.0	$\mu\text{A}$
$I_{IL}$	Input Current On/Off	$V_{On/Off} = 0\text{V}$	-1.0	-0.3	1.0	$\mu\text{A}$
$I_Q$	Quiescent Current	$V_{FB} = 0.2\text{mV}$			3	mA
$I_{STBY}$	Standby Current	$V_{IN}=60\text{V}$ , $V_{DIM} = 5\text{V}$		50	200	$\mu\text{A}$
$V_{DIM}$	Dimming Voltage	$V_{IN} = 12\text{V}$ , $I_{LOAD} = 0$	600	670	750	mV

## TYPICAL APPLICATION CIRCUIT-----ESOP8

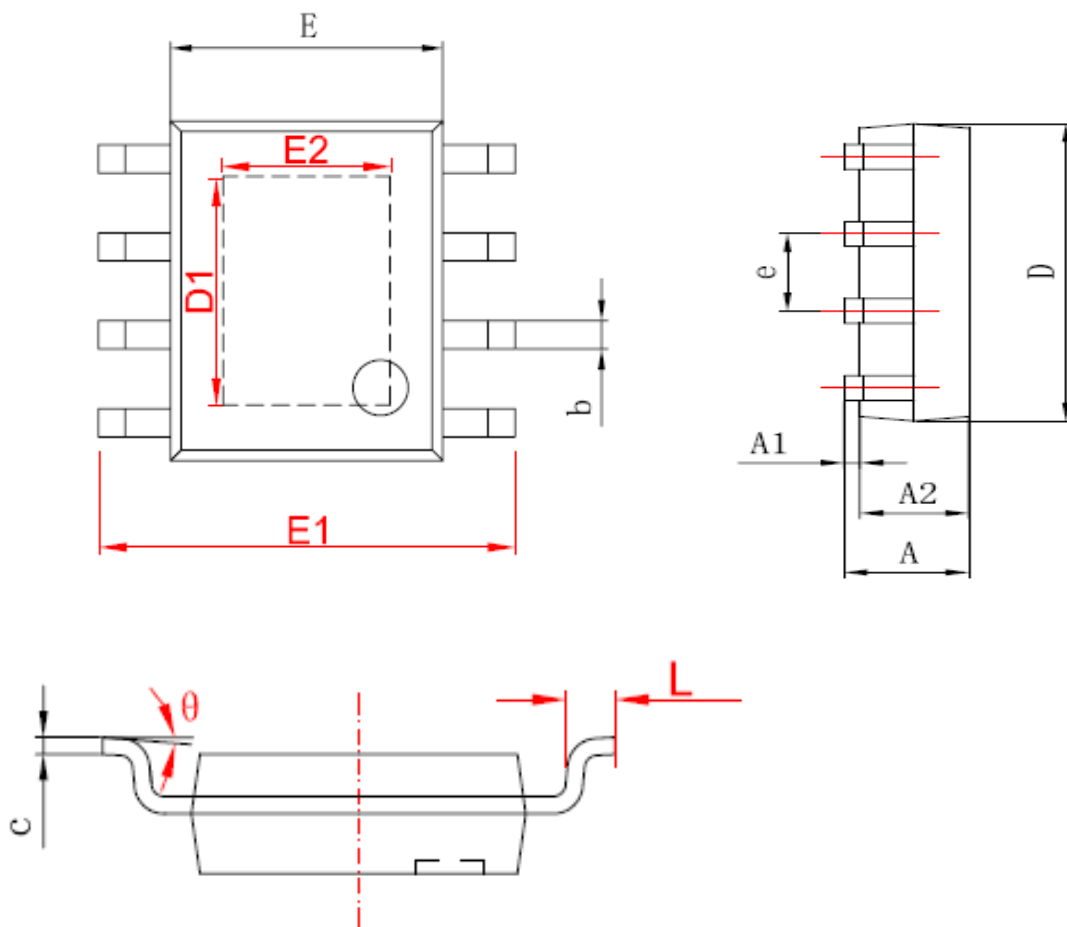


If the input voltage is high, the input capacitor C1, the larger the better, 100-2200uF

The V-dropout is around 2V. (min. difference between Vin and Vout = V-dropout)

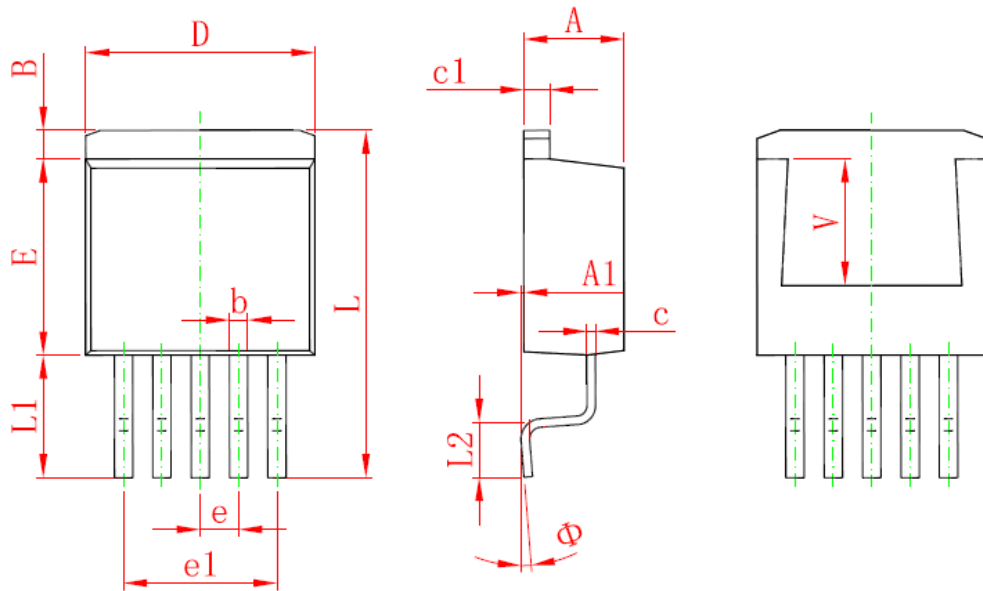


## PSOP- 8L PACKAGE OUTLINE



字符	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.050	0.150	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
D1	3.202	3.402	0.126	0.134
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
E2	2.313	2.513	0.091	0.099
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
theta	0°	8°	0°	8°

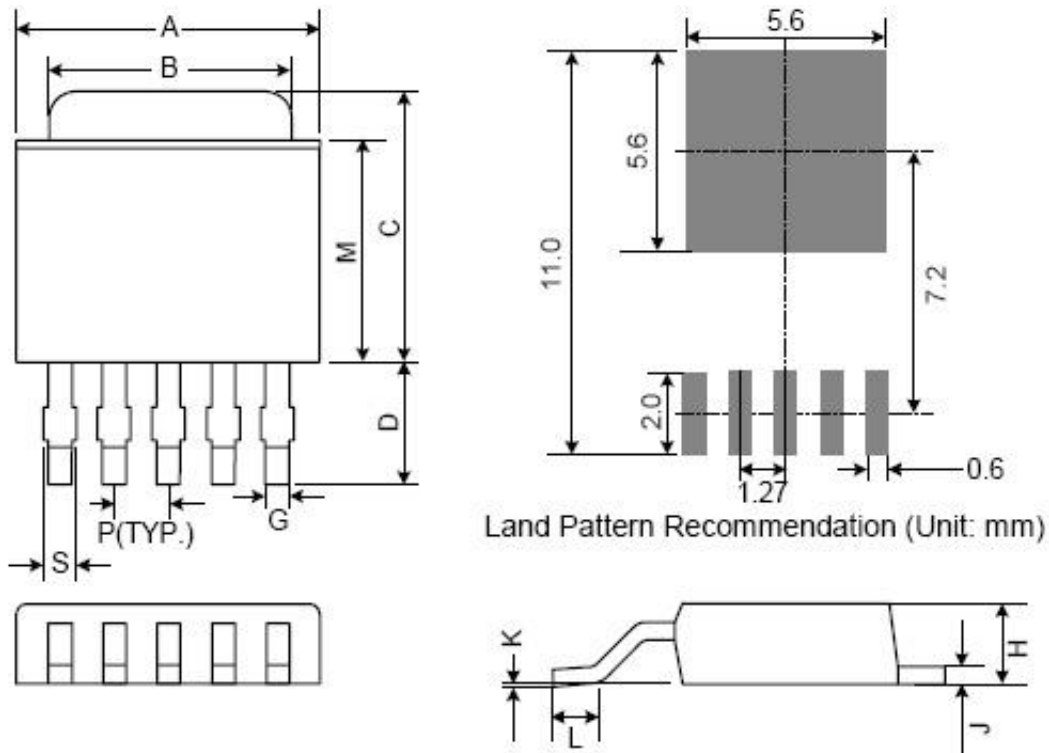
## TO-263-5L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.560	1.760	0.061	0.069
b	0.710	0.910	0.028	0.036
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	9.880	10.180	0.389	0.401
E	8.200	8.600	0.323	0.339
e	1.700 TYP.		0.067 TYP.	
e1	6.700	6.900	0.264	0.272
L	15.140	15.540	0.596	0.612
L1	5.080	5.480	0.200	0.216
L2	2.340	2.740	0.092	0.108
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	

## Package Information

### TO252-5L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	6.35	6.60	6.85	0.250	0.260	0.270
B	5.20	5.35	5.50	0.205	0.211	0.217
C	6.80	7.00	7.30	0.268	0.276	0.287
D	2.40	2.80	3.20	0.094	0.110	0.126
P	1.27 REF.			0.050 REF.		
S	0.50	0.65	0.80	0.020	0.026	0.031
G	0.40	0.50	0.63	0.016	0.020	0.025
H	2.20	2.30	2.40	0.087	0.091	0.094
J	0.45	0.52	0.58	0.018	0.020	0.023
K	0.00	0.08	0.15	0.000	0.003	0.006
L	0.90	1.20	1.63	0.035	0.047	0.064
M	5.40	5.80	6.20	0.213	0.228	0.244