

## 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,  $V_{FB}$ , 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  $I_{STBY} \sim 50\mu A$  (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.

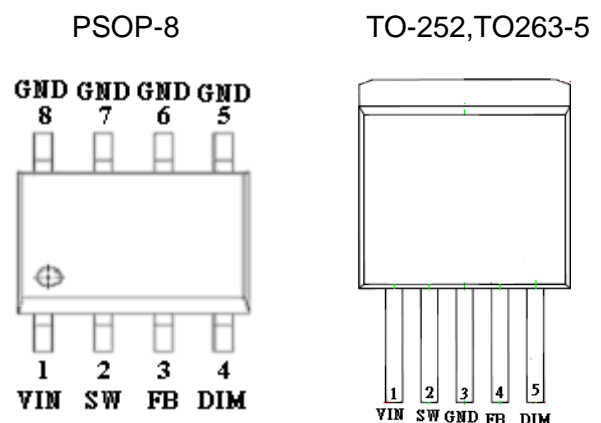
## APPLICATIONS

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

## FEATURES

- $V_{IN Max} = 60V$
- $V_{FB} = 200mV$ ,  $I_q < 3mA$
- $I_{LED}$  up to 3.5A with TO263-5L
- $I_{LED}$  up to 2.1A with PSOP-8L
- $I_{LED}$  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

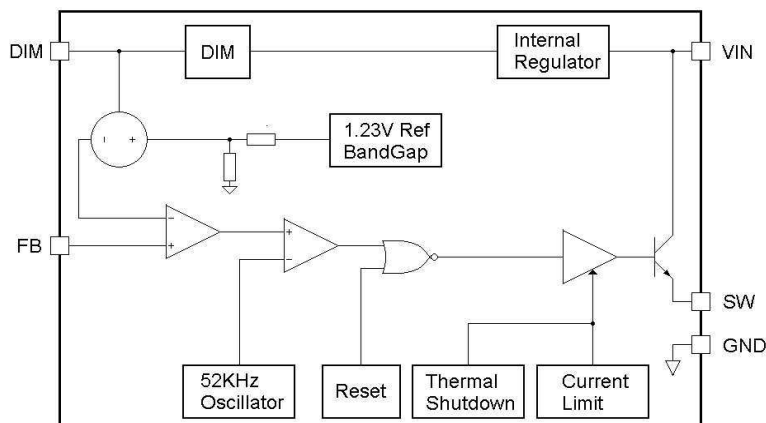


**BM0150HV can replace AP1509, AP1507, XL7005 without change PCB, the  $V_{fb} = 0.2V$ , so need to modify one of the feedback resistor value.**

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

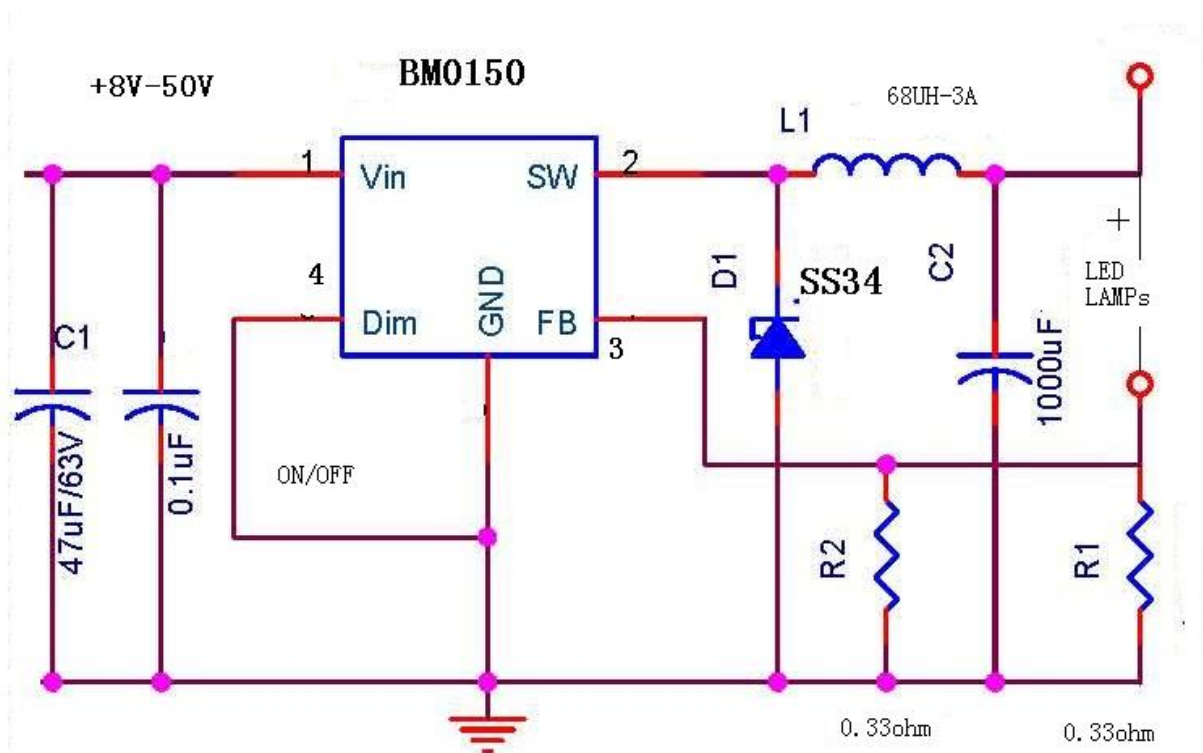
**(能工作于恒压,也能工作于恒流) ; 52KHZ will not affect the car radio.**

## 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



If V<sub>IN</sub> is high to over +12V, the C1 ≥ 100uF; when I<sub>out</sub>=1A, V-dropout=2V

## 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	$T_{J(Max)}$	150	$^{\circ}\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$ (TO263-5)	30	$^{\circ}\text{C/W}$
	$R_{\theta JA}$ (PSOP-8L)	50	$^{\circ}\text{C/W}$
Storage Temperature	$T_S$	-65 ~ 150	$^{\circ}\text{C}$

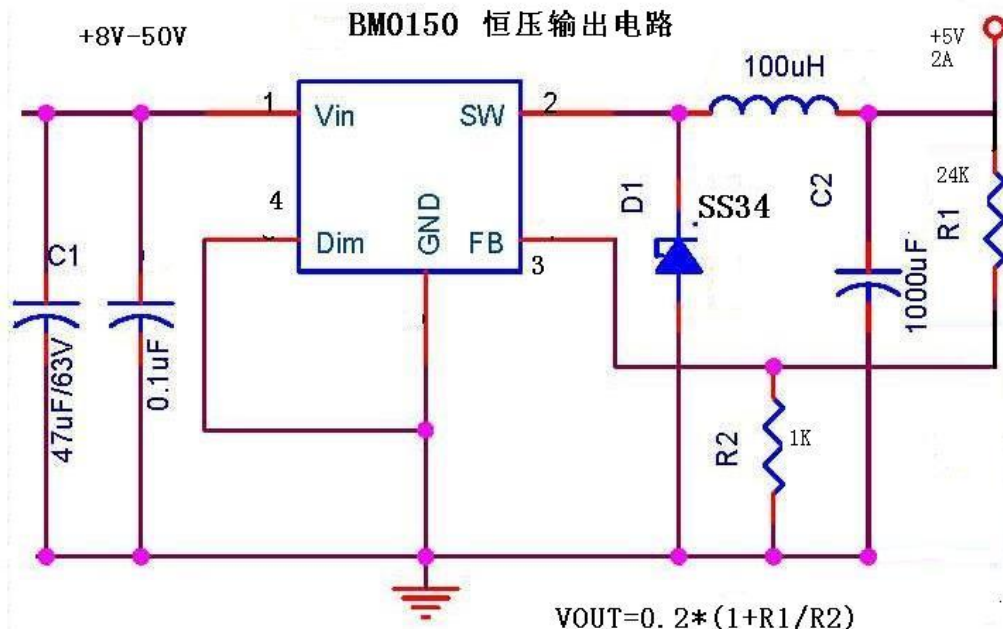
The IC has a protection circuit against static electricity. Do not apply high static electricity or high voltage that exceeds the performance of the protection circuit to the IC.

## ELECTRICAL CHARACTERISTICS

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

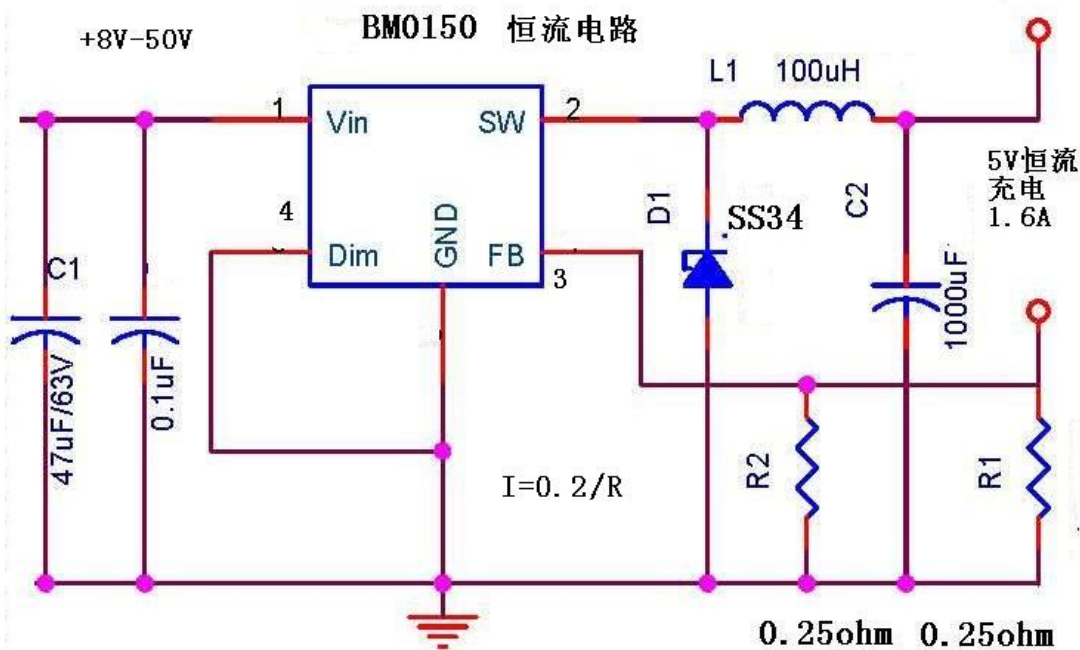
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{IN}$	Operating Voltage		5.5		60	V
$V_{FB}$	Feedback Voltage	$V_{IN} = 12\text{V}$ , $I_{LOAD} = 350\text{mA}$ , $DIM = 0\text{V}$	190	200	210	mV
		$V_{IN} = 5.5\text{V} \sim 60\text{V}$ , $I_{LOAD} = 350\text{mA}$ , $V_{DIM} = 0\text{V}$	180		220	mV
$I_{FB}$	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

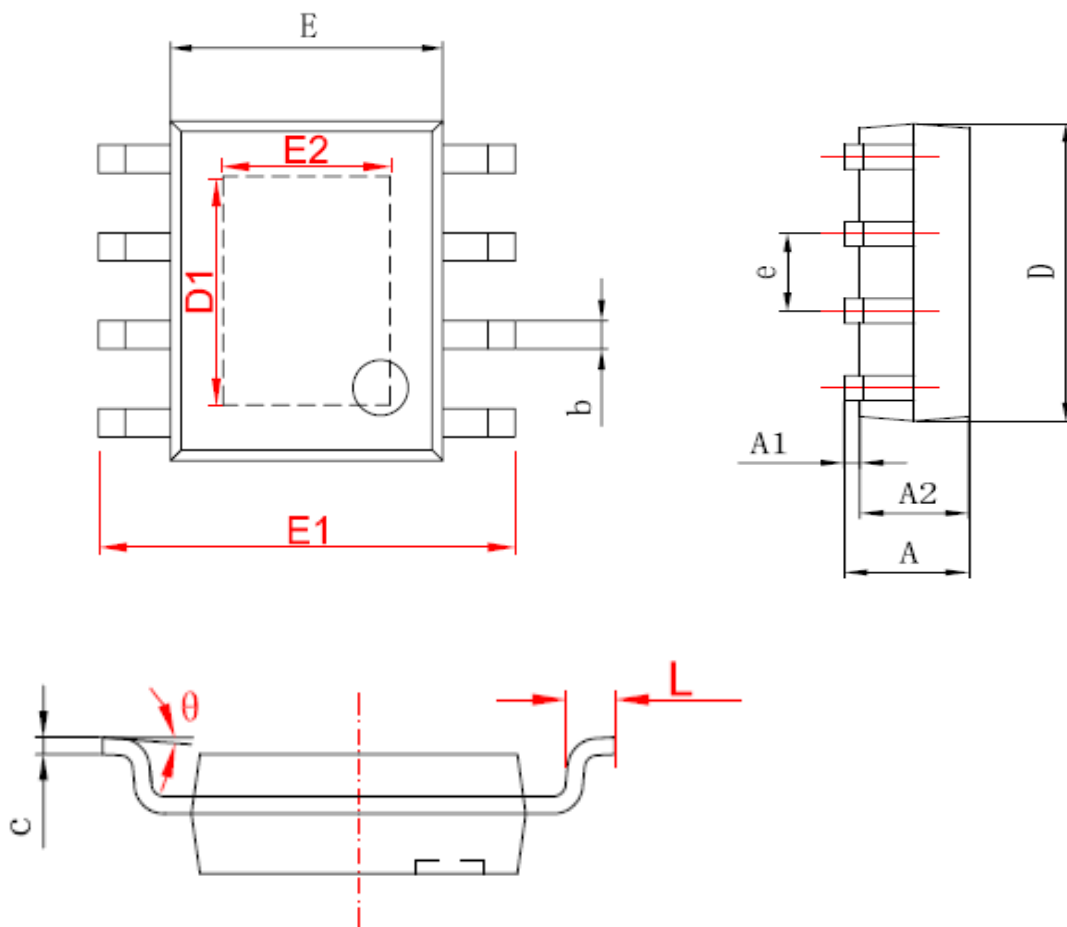


If the input voltage is high, the input capacitor C1, the larger the better, 100-2200uF

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

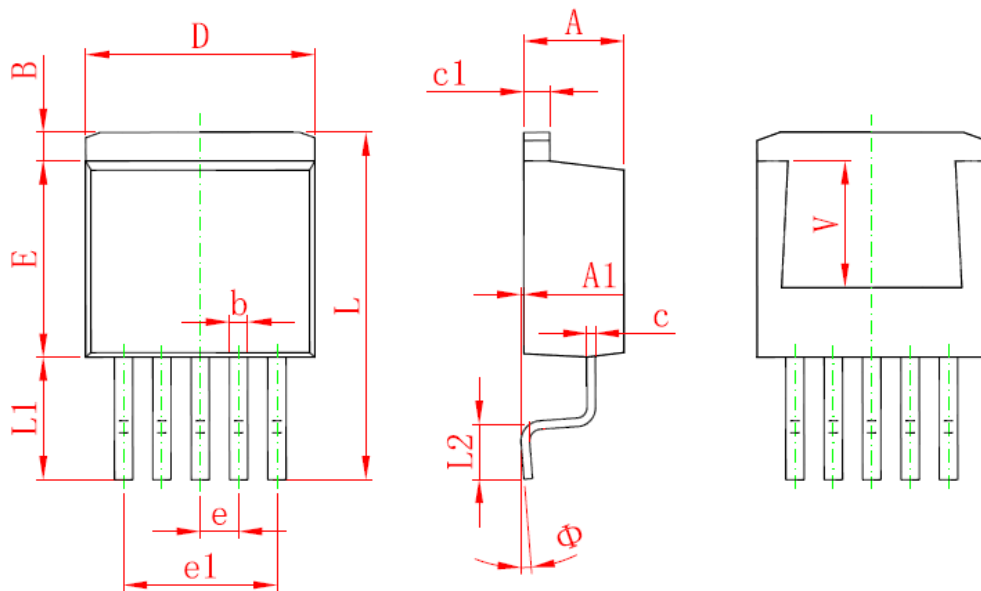


## PSOP- 8L PACKAGE OUTLINE



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°

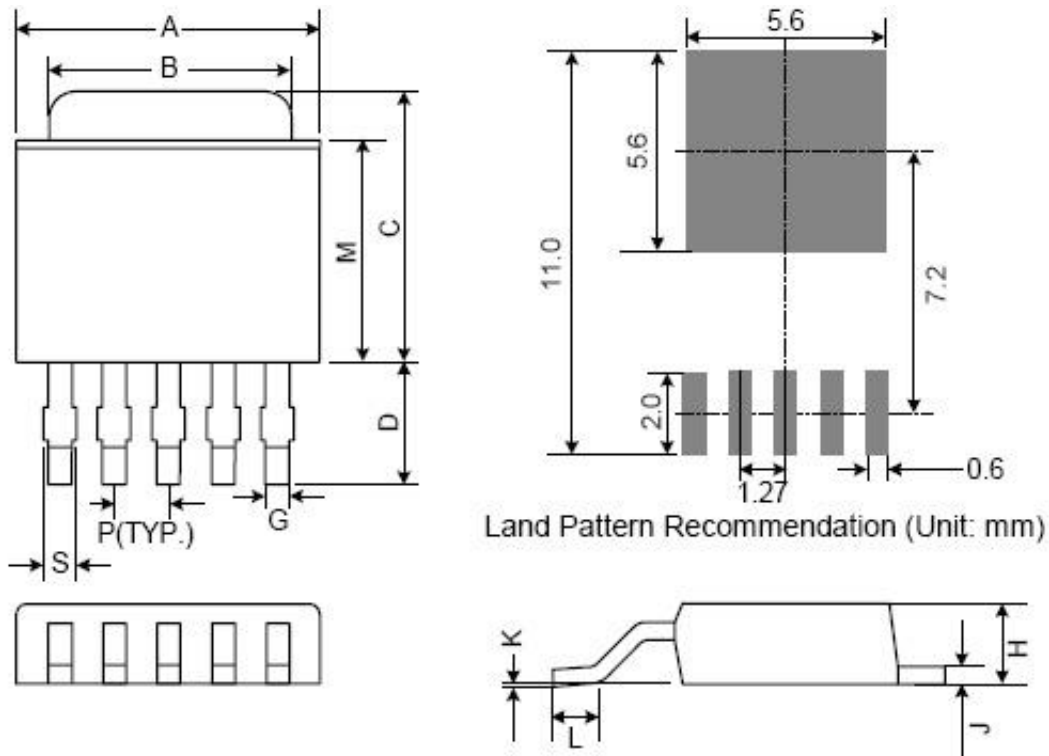
## TO-263-5L PACKAGE OUTLINE DIMENSIONS



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