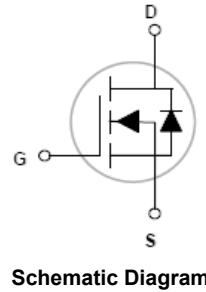
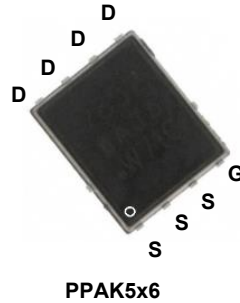


Main Product Characteristics

V_{DS}	30V
$R_{DS(ON)}$	2.35m Ω
I_D	120A



Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The GSGP03120 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous(Silicon limited)	I_D	120	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)		84.8	A
Drain Current-Pulsed(Package limited)	I_{DM}	340	A
Single Pulse Avalanche Energy ⁵	E_{AS}	600	mJ
Maximum Power Dissipation	P_D	75	W
Derating Factor		0.6	W/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	1.67	$^\circ\text{C}/\text{W}$
Storage Temperature Range	T_{STG}	-55 To +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics³						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=60A$	-	1.95	2.35	m Ω
		$V_{GS}=4.5V, I_D=60A$	-	2.85	3.35	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.7	2.2	V
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=60A$	-	60	-	S
Dynamic and Switching Characteristics⁴						
Total Gate Charge	Q_g	$V_{DS}=15V, I_D=60A, V_{GS}=10V$	-	63	72	nC
Gate-Source Charge	Q_{gs}		-	10	-	
Gate-Drain Charge	Q_{gd}		-	9.5	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=15V, R_{GEN}=1.6\Omega, V_{GS}=10V, I_D=60A$	-	9	-	nS
Turn-On Rise Time	t_r		-	4	-	
Turn-Off Delay Time	$t_{d(off)}$		-	44	-	
Turn-Off Fall Time	t_f		-	7	-	
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, F=1MHz$	-	3550	4200	pF
Output Capacitance	C_{oss}		-	950	1100	
Reverse Transfer Capacitance	C_{rss}		-	63	78	
Drain-Source Diode Characteristics						
Diode Forward Current ²	I_S		-	-	120	A
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=60A$	-	-	1.2	V
Reverse Recovery Time	T_{rr}	$T_J=25^\circ\text{C}, I_F=I_S, di/dt=100A/\mu s^3$	-	-	26	nS
Reverse Recovery Charge	Q_{rr}		-	-	95	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition : $T_J=25^\circ\text{C}, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25\Omega$

Typical Electrical and Thermal Characteristic Curves

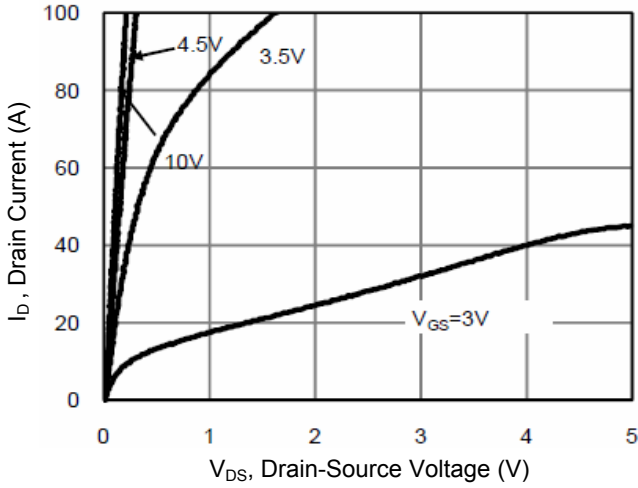


Figure 1. Output Characteristics

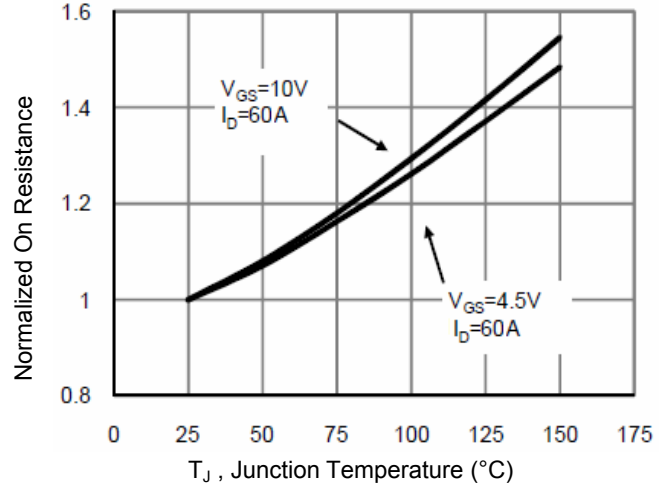


Figure 2. Rdson-Junction Temperature

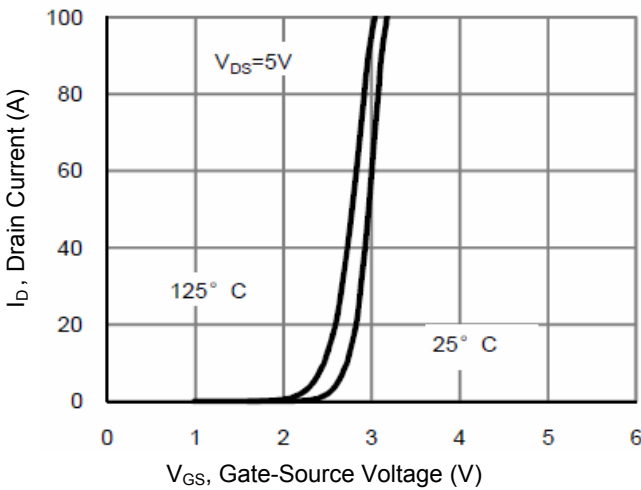


Figure 3. Transfer Characteristics

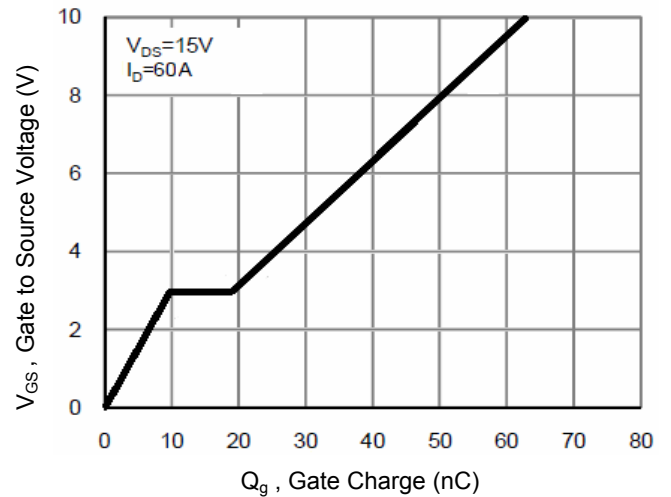


Figure 4. Gate Charge

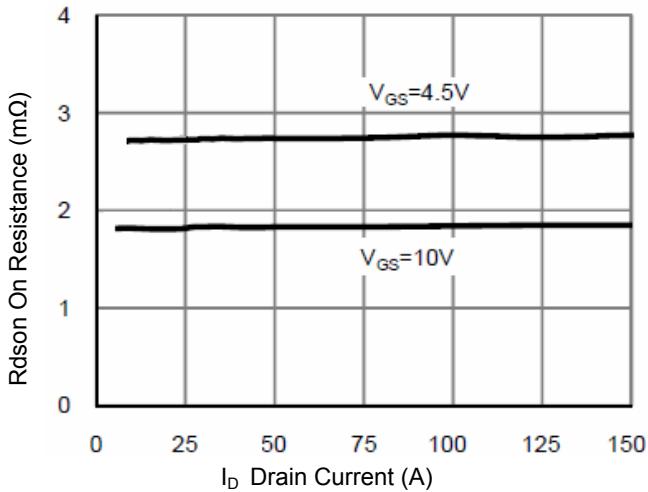


Figure 5. Rdson-Drain Current

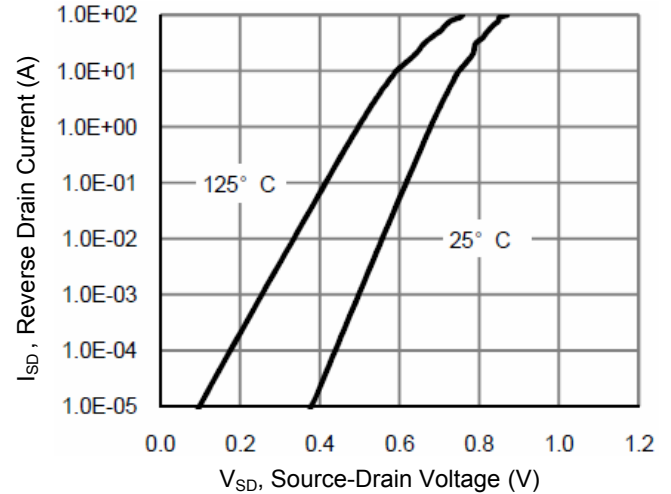


Figure 6. Source-Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

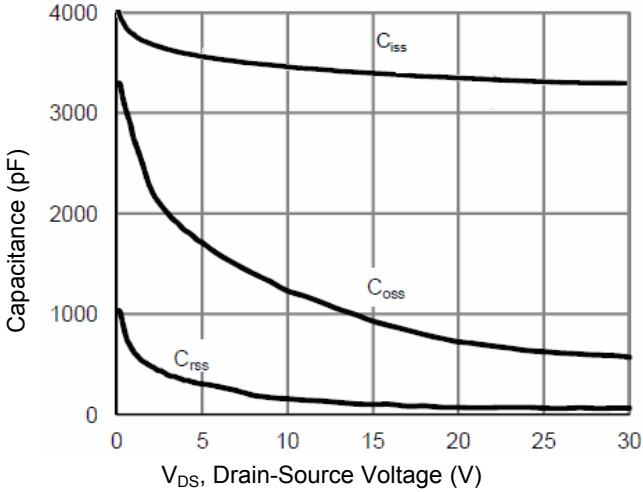


Figure 7. Capacitance Characteristics

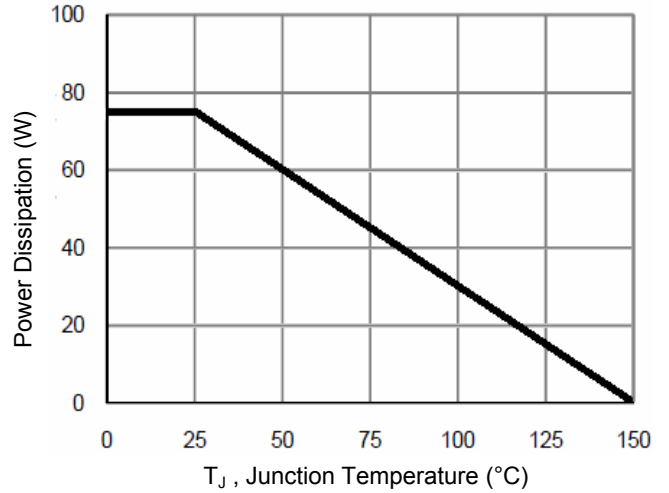


Figure 8. Power De-Rating

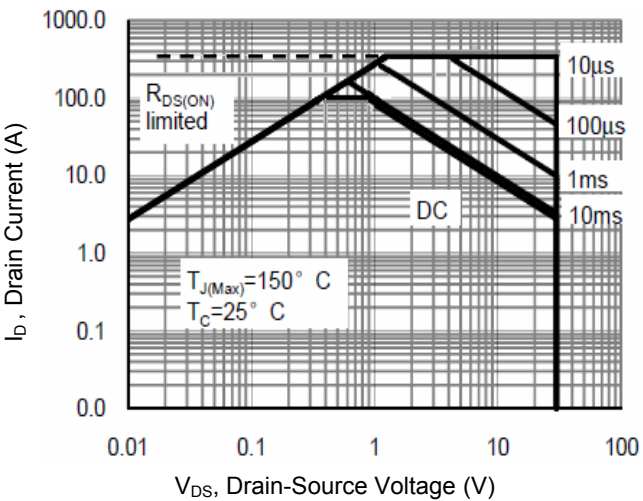


Figure 9. Safe Operation Area

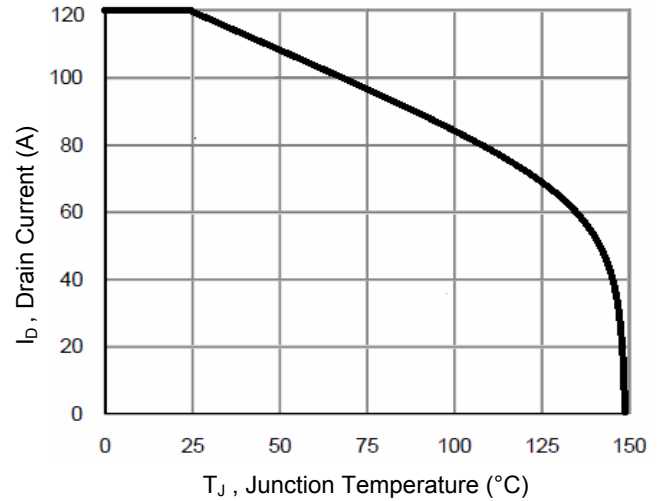


Figure 10. Current De-Rating

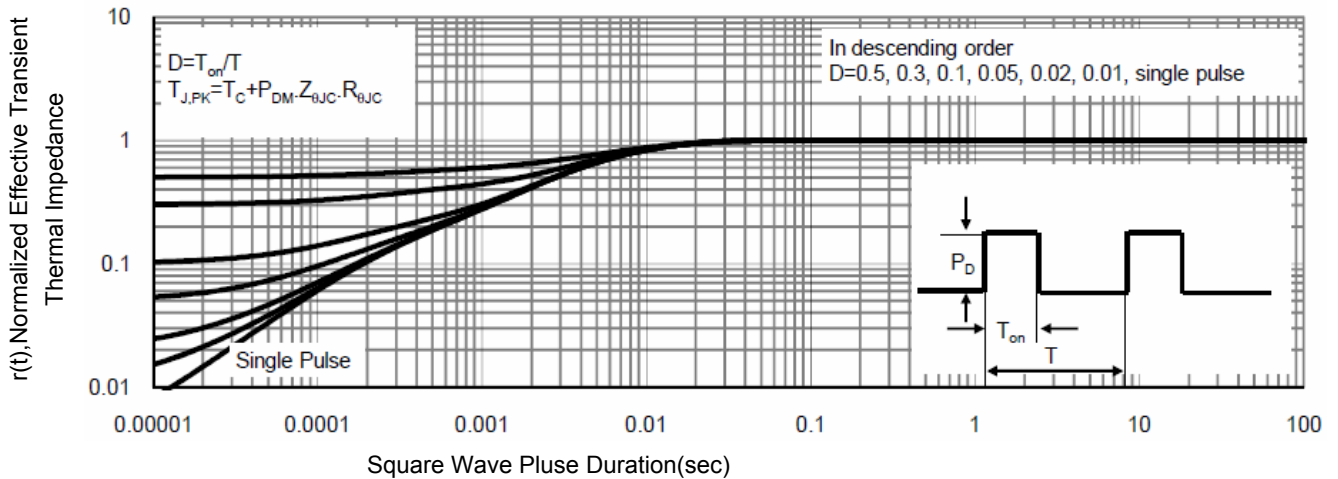


Figure 11 Normalized Maximum Transient Thermal Impedance

Typical Electrical and Thermal Characteristic Curves

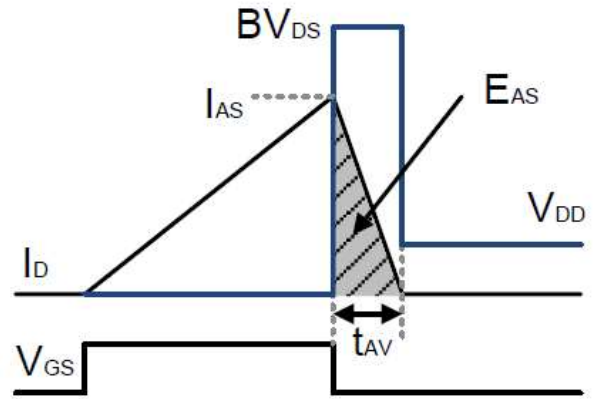
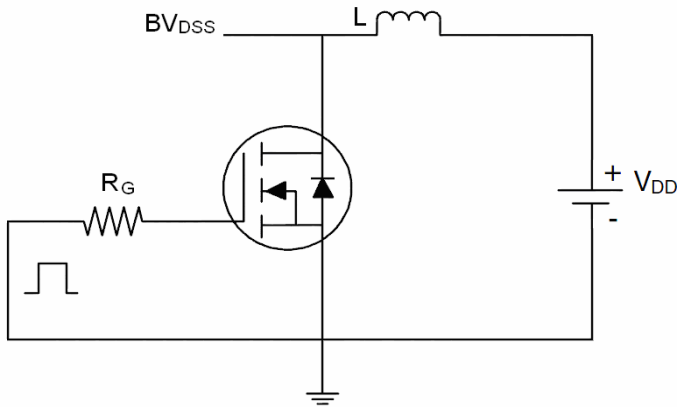


Figure 12. E_{AS} Test Circuit and waveforms

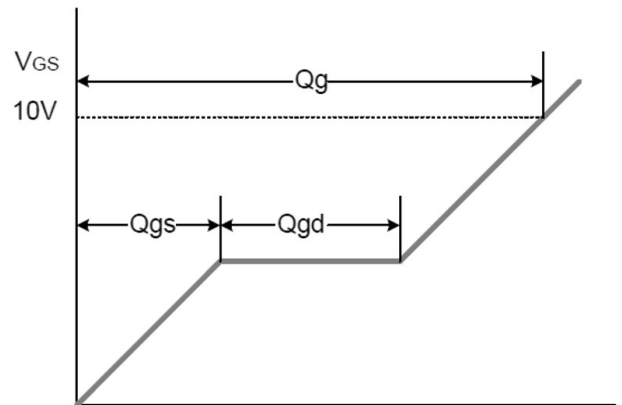
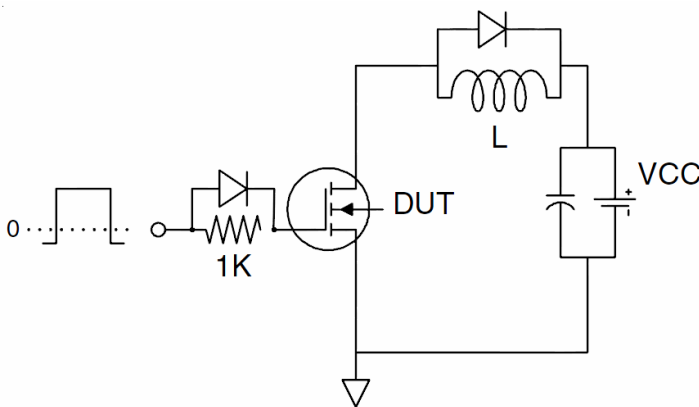


Figure 13. Gate Charge Test Circuit and waveforms

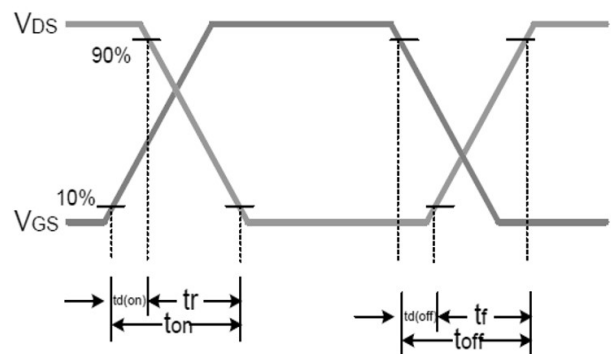
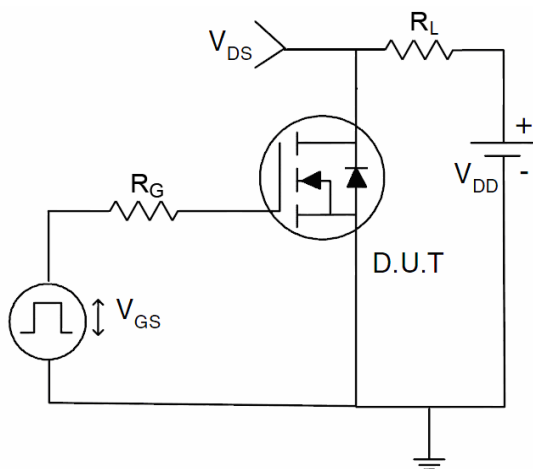
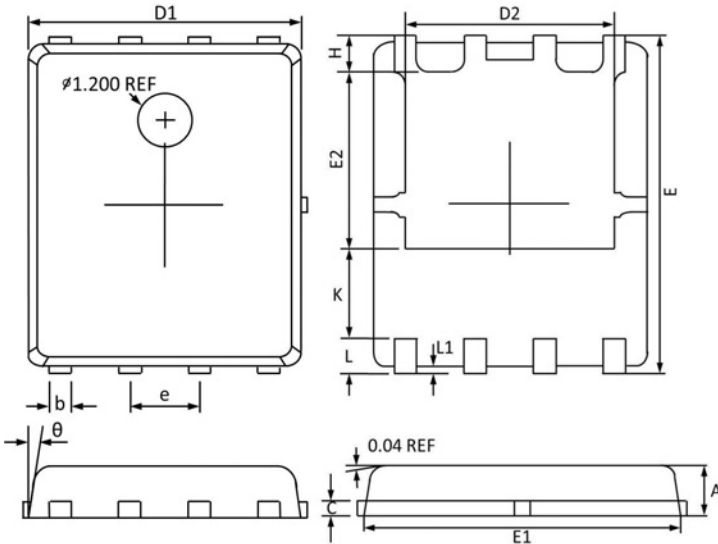


Figure 14. Switch Time Test Circuit and waveforms

Package Outline Dimensions (PPAK5x6)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
b	0.510	0.330	0.020	0.013
C	0.300	0.200	0.012	0.008
D1	5.100	4.800	0.201	0.189
D2	4.100	3.610	0.161	0.142
E	6.200	5.900	0.244	0.232
E1	5.900	5.700	0.232	0.224
E2	3.780	3.350	0.149	0.132
e	1.27BSC		0.05BSC	
H	0.700	0.410	0.028	0.016
K	1.500	1.100	0.059	0.043
L	0.710	0.510	0.028	0.020
L1	0.200	0.060	0.008	0.002
θ	12°	0°	12°	0°