

FH8818K

N- Channel Enhancement Mode Power MOSFET

Description

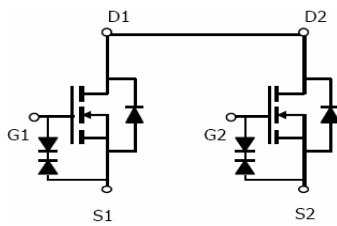
The FH8818K uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications. It is ESD protected.

Application

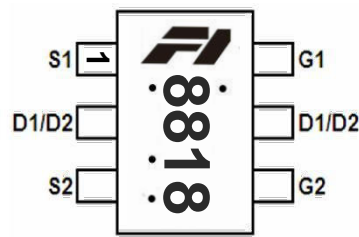
- Uni-directional load switch
- Bi-directional load switch

General Features

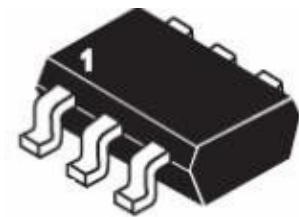
- $V_{DS} = 20V, I_D = 6.5A$
- $R_{DS(ON)} < 18\text{ m}\Omega$ (Typ) @ $V_{GS} = 4.5V$
- $R_{DS(ON)} < 18.5\text{ m}\Omega$ (Typ) @ $V_{GS} = 3.7V$
- $R_{DS(ON)} < 19.5\text{ m}\Omega$ (Typ) @ $V_{GS} = 3.1V$
- $R_{DS(ON)} < 21\text{ m}\Omega$ (Typ) @ $V_{GS} = 2.5V$
- High power and current handling capability
- Lead free product is acquired
- Surface mount package
- ESD Rating: 2000V HBM



Schematic diagram



Marking and pin Assignment



SOT23-6 top view

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

Parameter	Symbol	Limit	Unit
Drain Source Voltage	V_{DS}	20	V
Gate Source Voltage	V_{GS}	± 12	V
Drain Current Continuous	I_D	6.5	A
Drain Current-Pulsed (Note 1)	I_{DM}	26	A
Maximum Power Dissipation	P_D	1.25	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ\text{C}$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	100	$^\circ\text{C/W}$
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Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =18V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	-	-	±10	μA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.45	0.7	1.0	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =4.5A		18	19.5	mΩ
		V _{GS} =3.7V, I _D =4A	-	18.5	20.5	mΩ
		V _{GS} =3.1V, I _D =4A	-	19.5	22	mΩ
		V _{GS} =2.5V, I _D =2A	-	21	25	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =6A	-	35	-	S
Dynamic Characteristics ^(Note 4)						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, F=1.0MHz		993		PF
Output Capacitance	C _{oss}		-	210	-	PF
Reverse Transfer Capacitance	C _{rss}			139		PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =10V, R _L =1.2Ω V _{GS} =8V, R _{GEN} =3Ω	-	2.5		nS
Turn-on Rise Time	t _r		-	7.2		nS
Turn-Off Delay Time	t _{d(off)}		-	49		nS
Turn Off Fall Time	t _f		-	10.8		nS
Total Gate Charge	Q _g	V _{DS} =10V, I _D =6A, V _{GS} =4.5V	-	14.2		nC
Gate-Source Charge	Q _{gs}		-	1.5	-	nC
Gate-Drain Charge	Q _{gd}		-	4.7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V, I _S =1A	-	-	1.2	V
Diode Forward Current ^(Note 2)	I _S		-	-	3	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

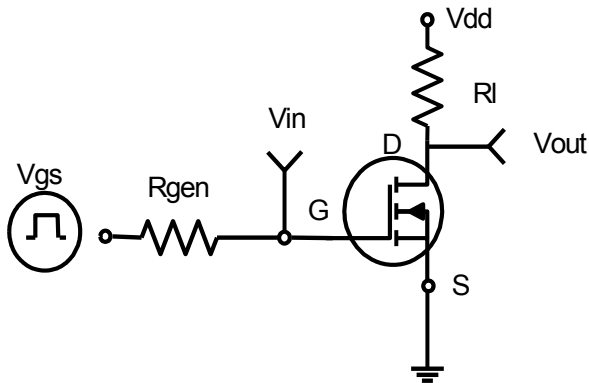


Figure 1: Switching Test Circuit

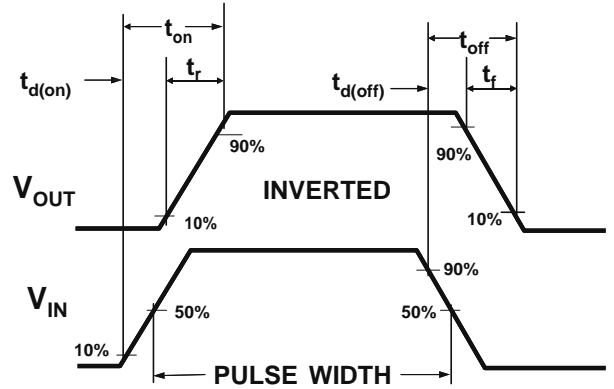


Figure 2: Switching Waveforms

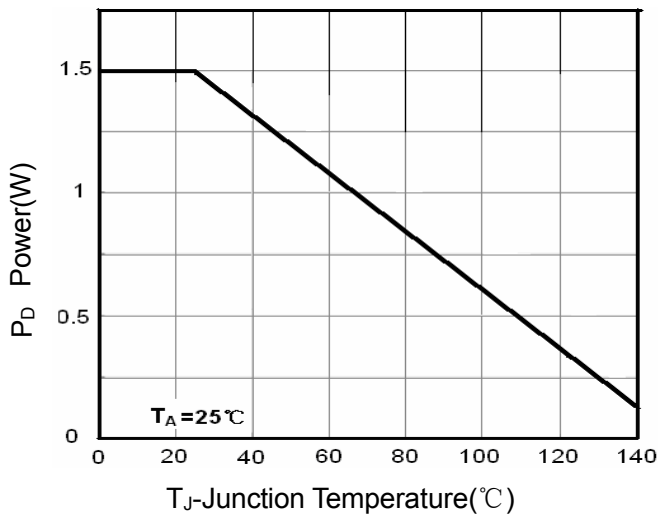


Figure 3 Power Dissipation

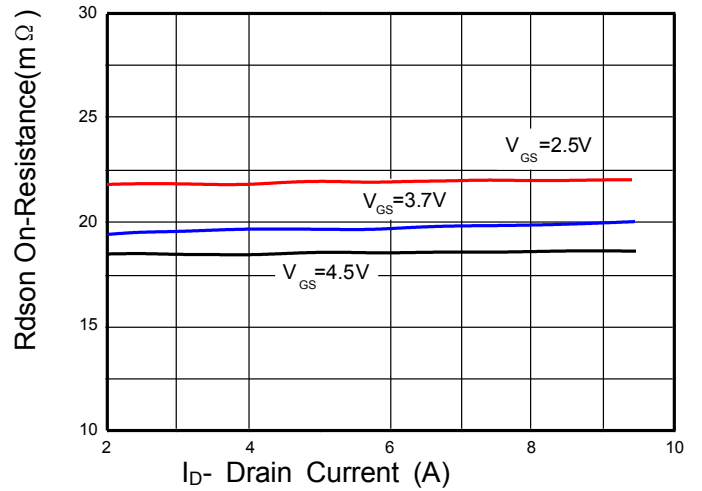


Figure 6 Drain-Source On-Resistance

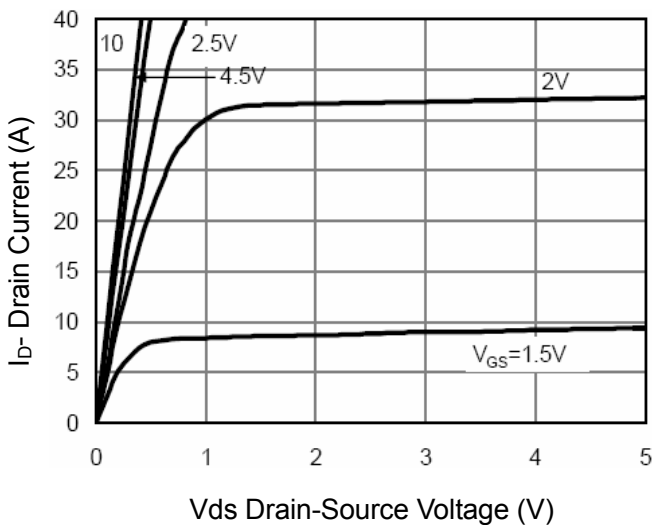


Figure 5 Output Characteristics

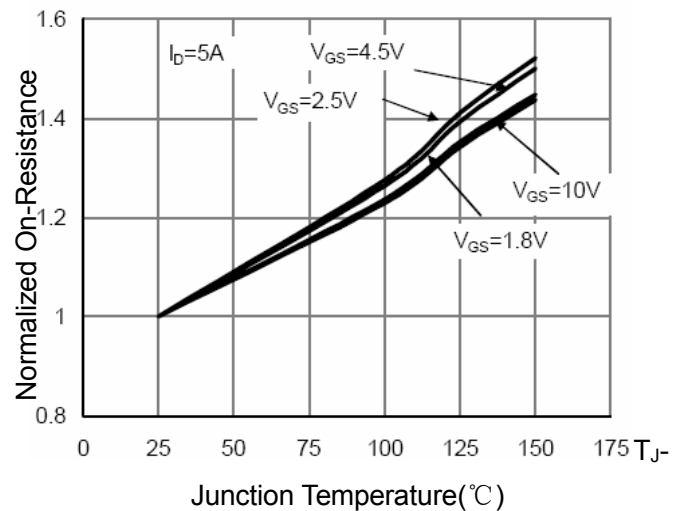


Figure 8 Drain-Source On-Resistance

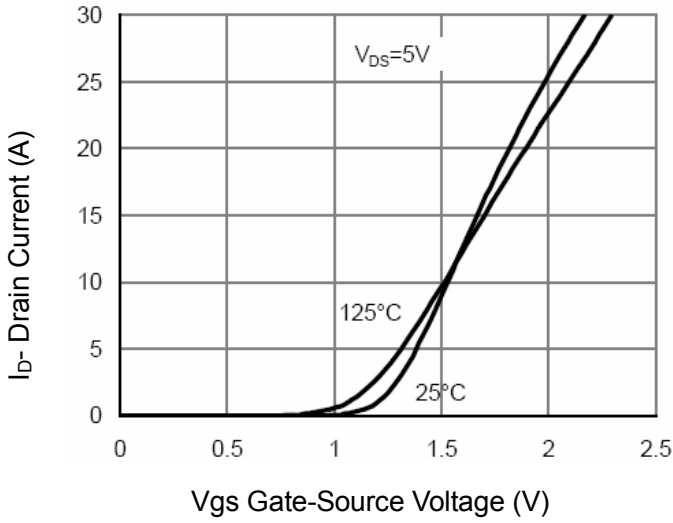


Figure 7 Transfer Characteristics

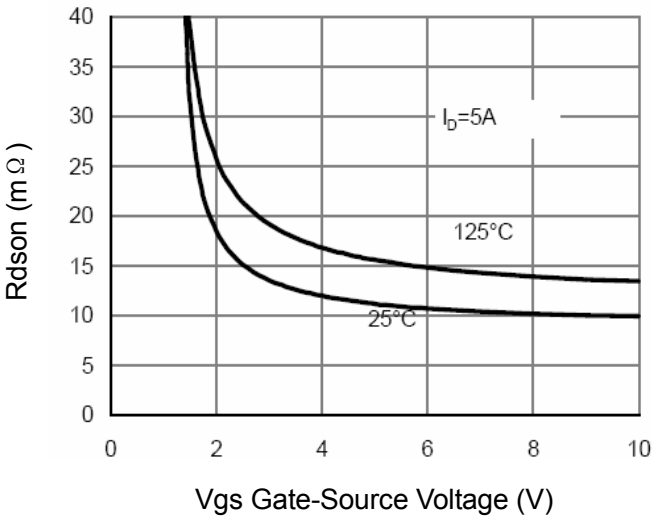


Figure 9 $R_{DS(on)}$ vs V_{GS}

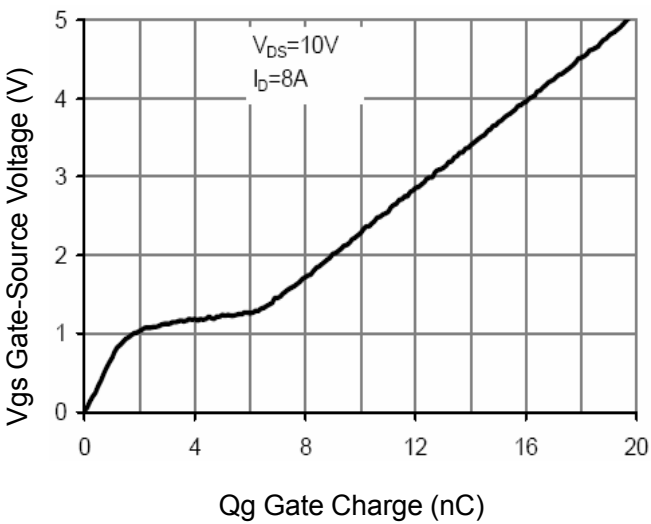


Figure 11 Gate Charge

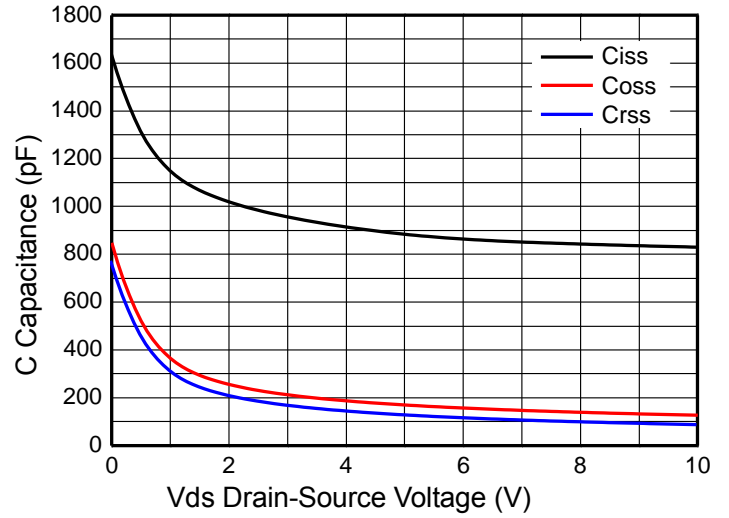


Figure 8 Capacitance vs V_{DS}

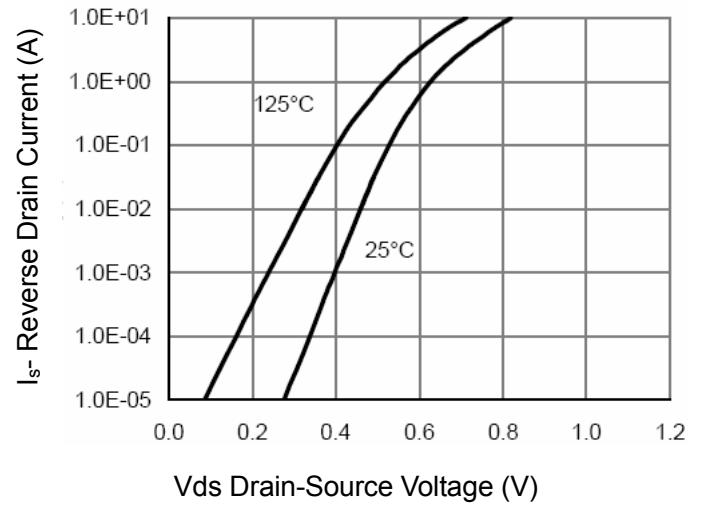


Figure 10 Capacitance vs V_{DS}

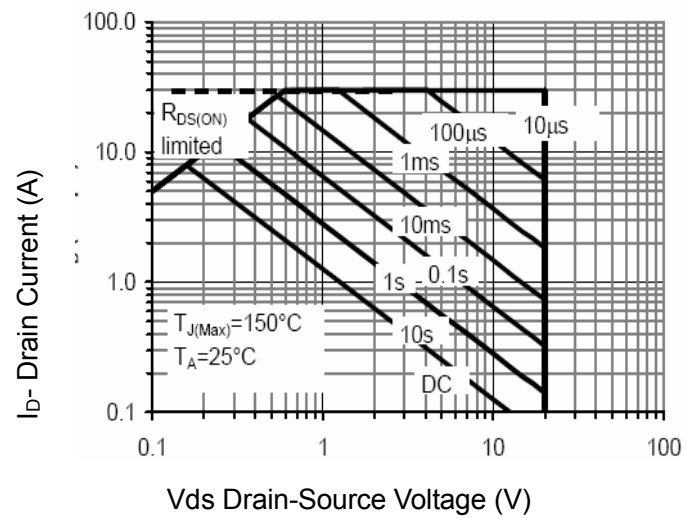


Figure 13 Safe Operation Area

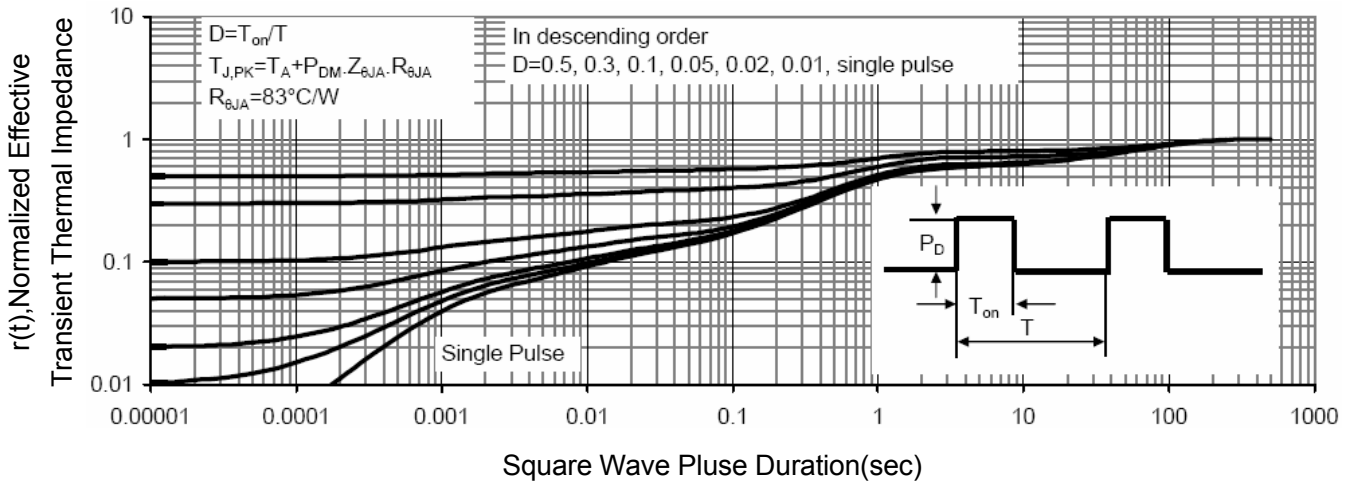
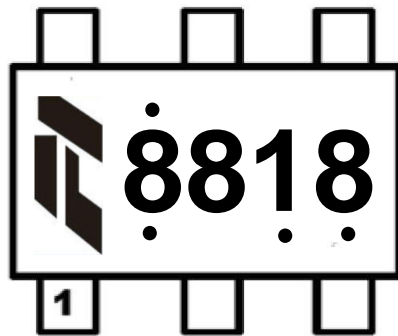


Figure 14 Normalized Maximum Transient Thermal Impedance

MARKING DESCRIPTION

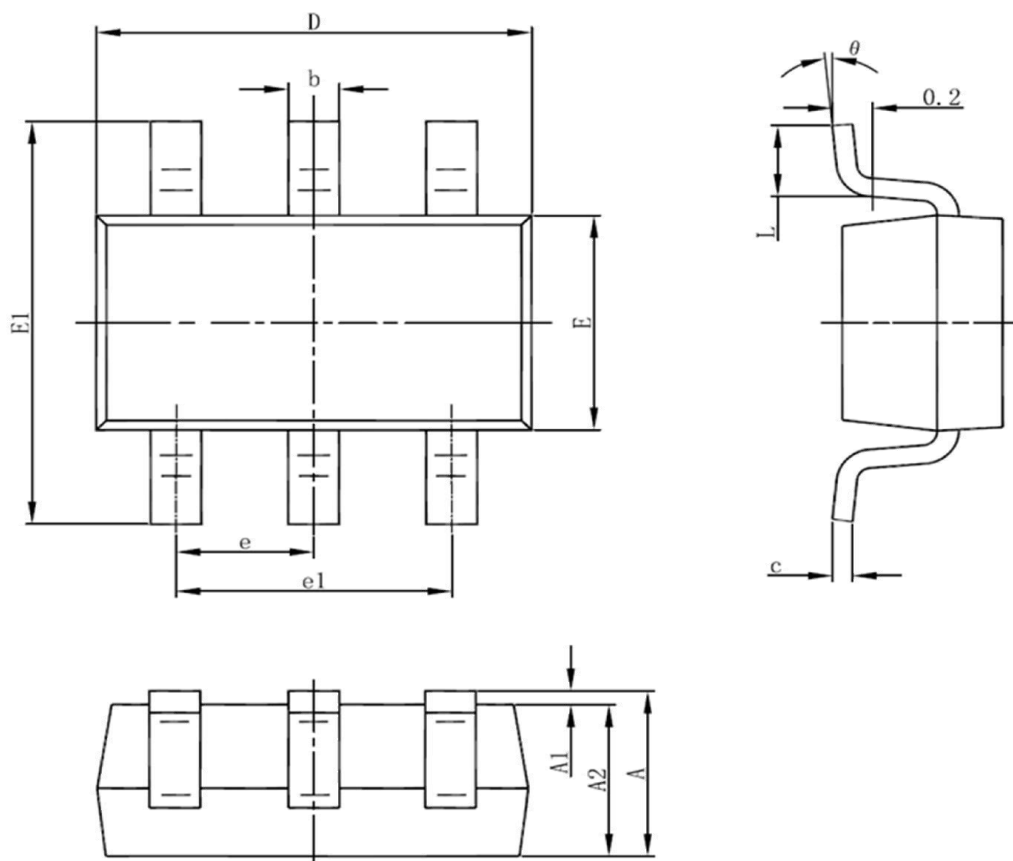
SOT23-6



Note:

The printing points above and below the product model are the internal identification of the company. Each batch of products may be in different locations.

Package Information : SOT23-6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°