

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D@25^\circ C$
650V	390mΩ@18V	14A
	450mΩ@15V	

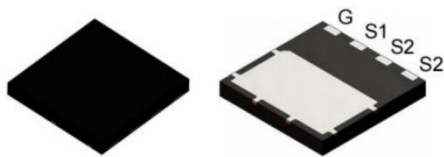
Feature

- Wide bandgap SiC MOSFET technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed switching
- Low reverse recovery(Qrr)

Application

- Switch Mode Power Supplies
- Renewable Energy
- On Board Charger
- High Voltage DC/DC Converters

Package

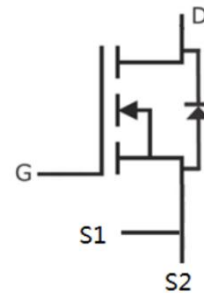


DFN8*8

Marking



Circuit diagram



Absolute maximum ratings ($T_C=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	V_{DS}	$V_{GS} = 0V, I_D = 100\mu A$	650	V
Gate-Source Voltage	V_{GSmax}	AC ($f > 1 \text{ Hz}$)	-10/+25	V
Gate-Source Voltage	V_{GSOP}	Static	-4/+18 -4/+15	V
Continuous Drain Current	I_D	$V_{GS} = 18V, T_C=25^\circ C$	14	A
	I_D	$V_{GS} = 18V, T_C=100^\circ C$	8	
Pulsed Drain Current	$I_{D,pulse}$	Pulse with t_p limited by T_{jmax} at 1ms	19	A
		Pulse with t_p limited by T_{jmax} at 100μs	34	
Power Dissipation	P_D	$T_C=25^\circ C$	75	W
Thermal Resistance (Typ)	$R_{\theta JC}$	Junction-to-Case	2	$^\circ C/W$
Junction Temperature	T_J		-55~ +175	$^\circ C$
Storage Temperature	T_{STG}		-55~ +175	$^\circ C$

Electrical characteristics (T_j=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 100μA	650			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 650V, V _{GS} = 0V			50	μA
Gate-Source leakage current	I _{GSS}	V _{GS} = 18V, V _{DS} = 0V			250	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 1.33mA		3.0		V
		V _{DS} = V _{GS} , I _D = 1.33mA, T _j = 175°C		2.1		
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 15V, I _D = 4.5A		350	450	mΩ
		V _{GS} = 18V, I _D = 4.5A		290	390	
		V _{GS} = 15V, I _D = 4.5A, T _j = 175°C		430		
		V _{GS} = 18V, I _D = 4.5A, T _j = 175°C		400		
Transconductance	g _{fs}	V _{GS} = 18V, I _D = 4.5A		4		S
		V _{GS} = 18V, I _D = 4.5A, T _j = 175°C		3		
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} = 600V, V _{GS} = 0V, f = 1 MHz V _{AC} = 25mV		184		pF
Output Capacitance	C _{oss}			22		
Reverse Transfer Capacitance	C _{rss}			3.2		
Internal Gate Resistance	R _{G(int)}	f = 1 MHz, V _{AC} = 25mV		13		Ω
Total Gate Charge	Q _g	V _{DS} = 400V, I _D = 4.5A V _{GS} = -4/18V		11.6		nC
Gate-Source Charge	Q _{gs}			2.5		
Gate-Drain Charge	Q _{gd}			6		
Source-Drain Diode characteristics						
Diode Forward Current	I _S	V _{GS} = -4V, T _C = 25°C		12		A
Diode Forward voltage	V _{SD}	V _{GS} = -4V, I _{SD} = 2.5A		4.1		V
		V _{GS} = -4V, I _{SD} = 2.5A, T _J = 175°C		3.8		V
Diode pulse Current	I _{S, pulse}	V _{GS} = -4V, pulse width t _p limited by T _{jmax}		19		A

Typical Characteristics

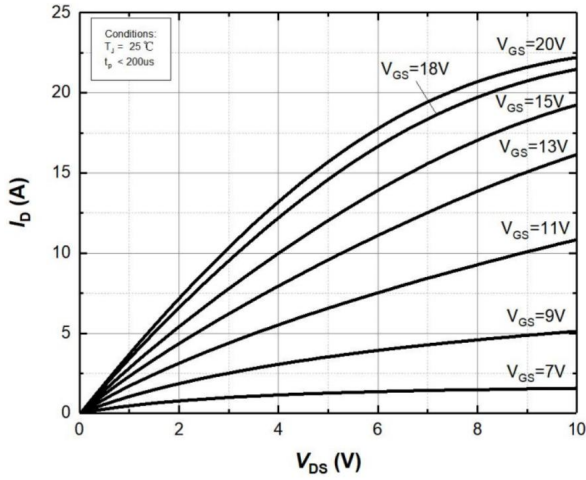


Figure 1. Output characteristics at $T_j=25^\circ\text{C}$

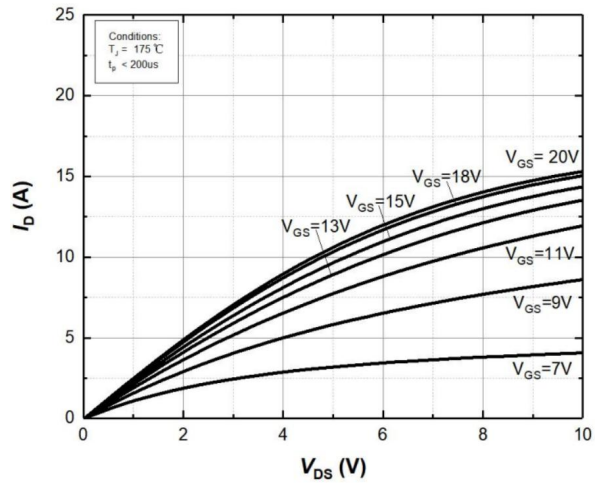


Figure 2. Output characteristics at $T_j=175^\circ\text{C}$

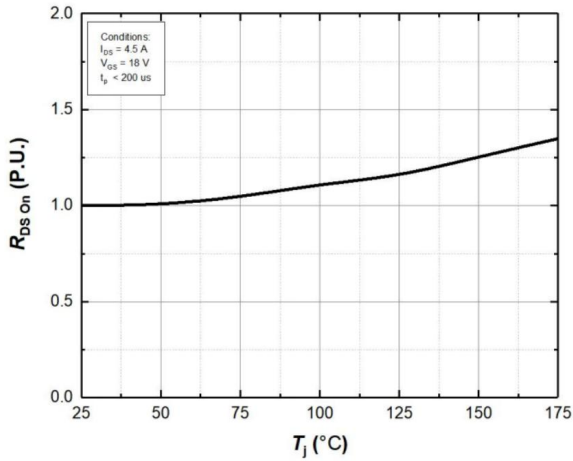


Figure 3. Normalized On-Resistance vs. Temperature

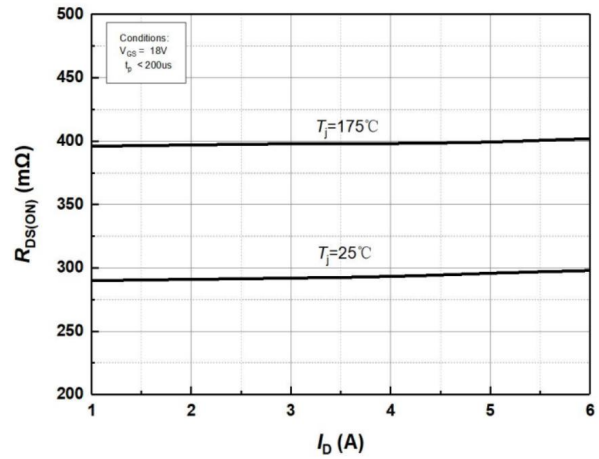


Figure 4. On-Resistance vs. Drain current for Various Temperature

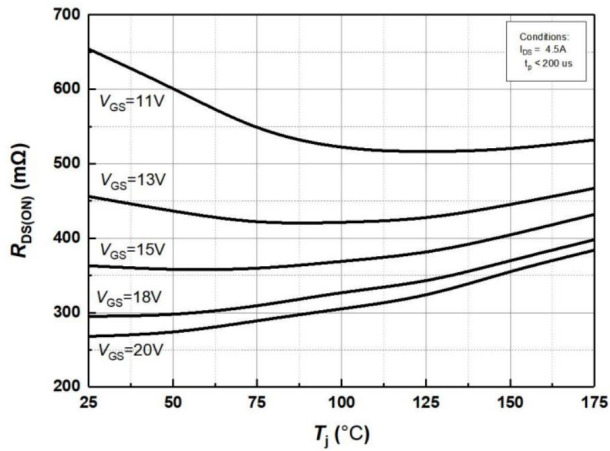


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

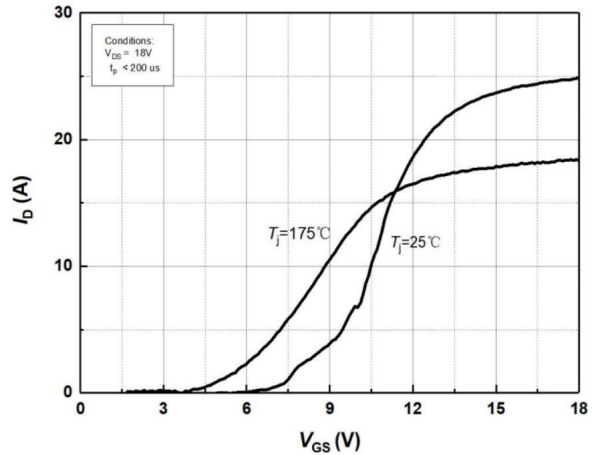


Figure 6. Transfer Characteristics for Various Junction Temperatures

Typical Characteristics

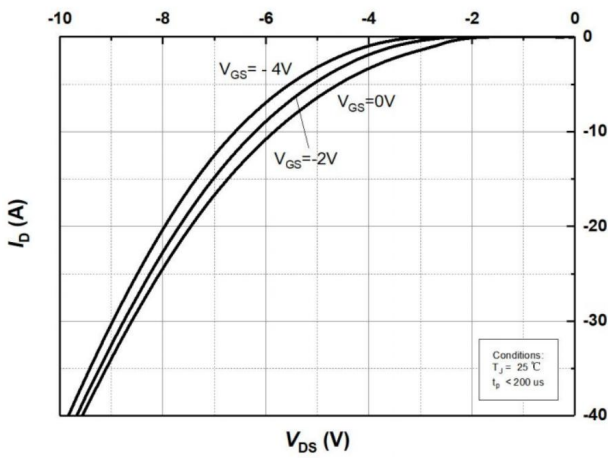


Figure 7. Body Diode Characteristics at Tj=25°C

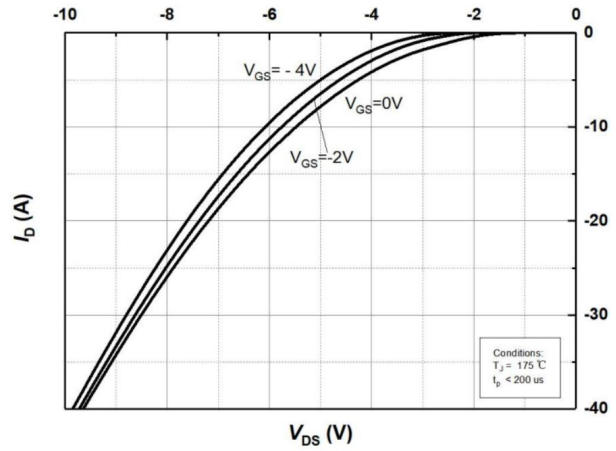


Figure 8. Body Diode Characteristics at Tj=175°C

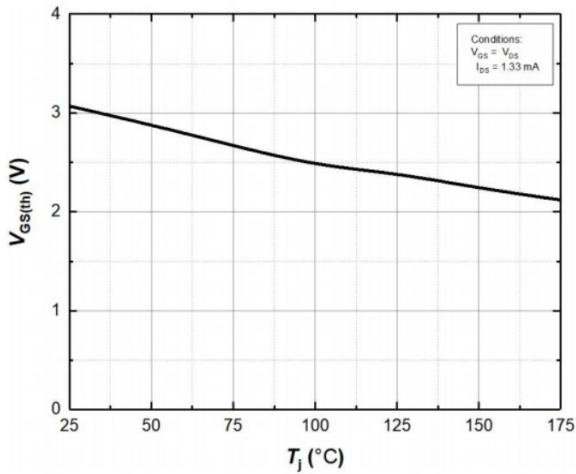


Figure 9. Threshold Voltage vs. Temperature

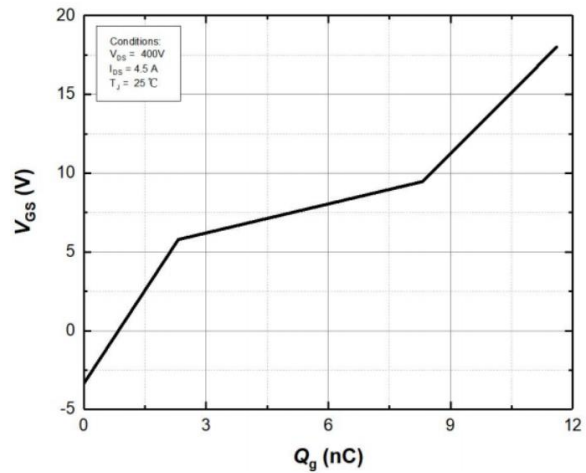


Figure 10. Gate Charge Characteristics

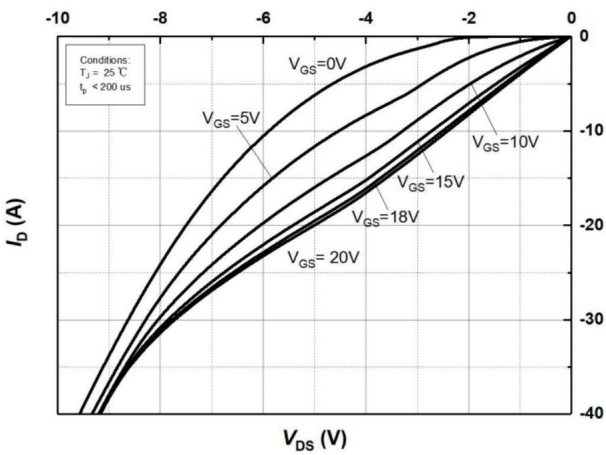


Figure 11. 3rd Quadrant Characteristic at Tj=25°C

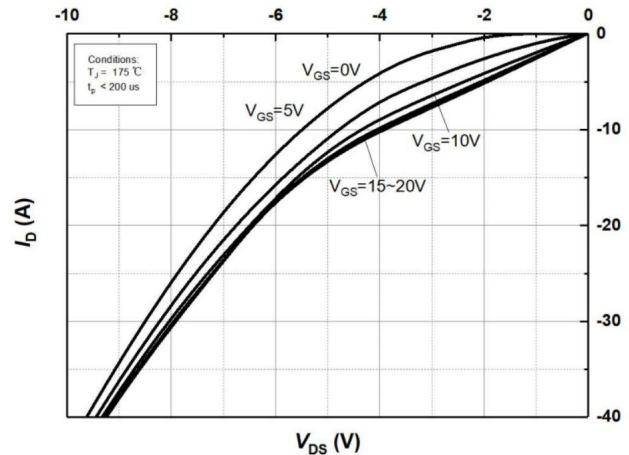


Figure 12. 3rd Quadrant Characteristic at Tj=175°C

Typical Characteristics

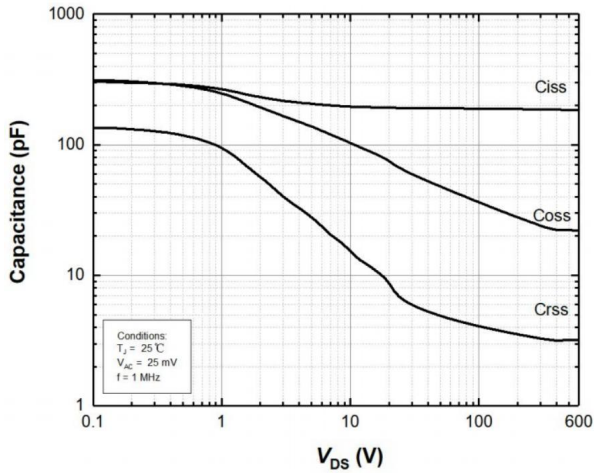


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 600V)

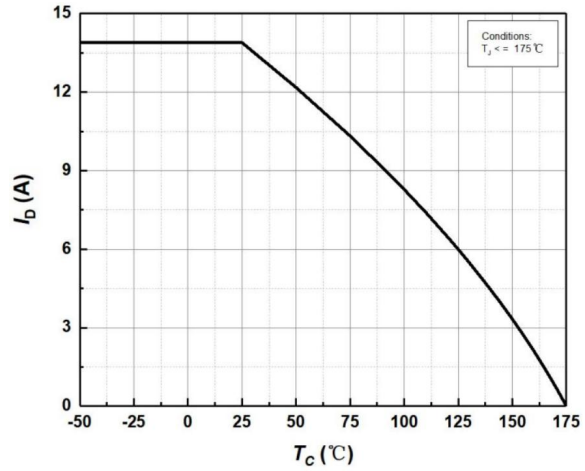


Figure 14. Continuous Drain Current Derating vs Case Temperature

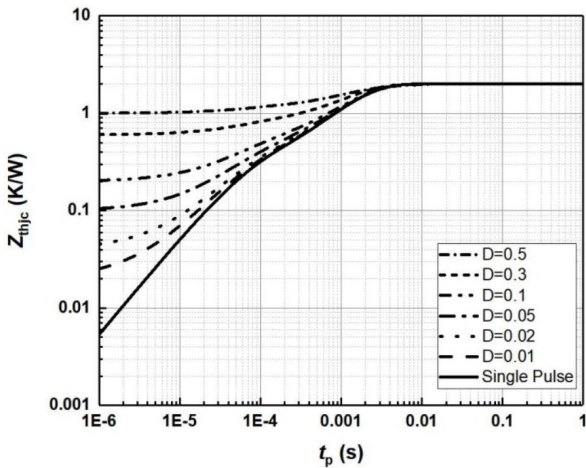


Figure 15. Transient Thermal Impedance (Junction – Case)

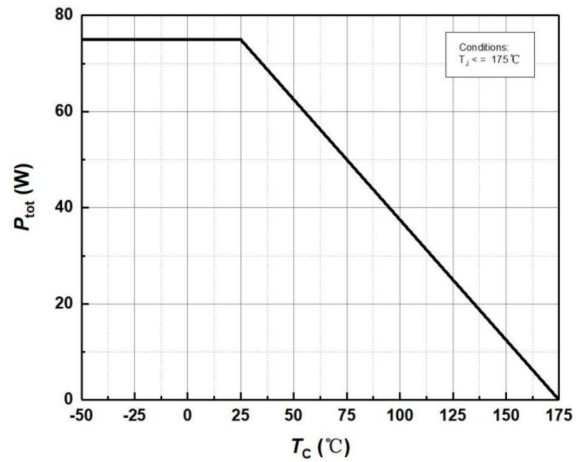


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

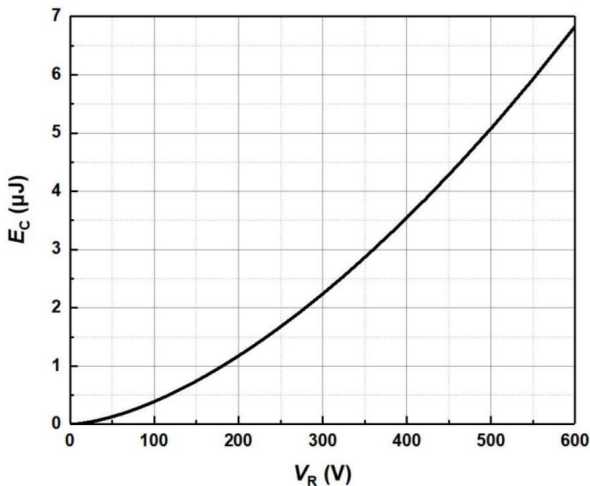


Figure 17. Output Capacitor Stored Energy

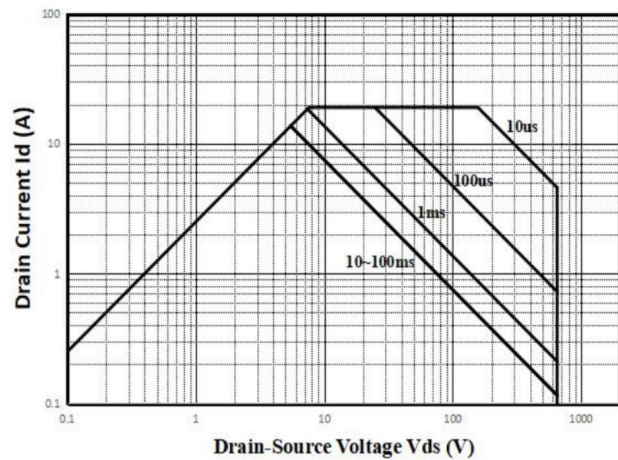
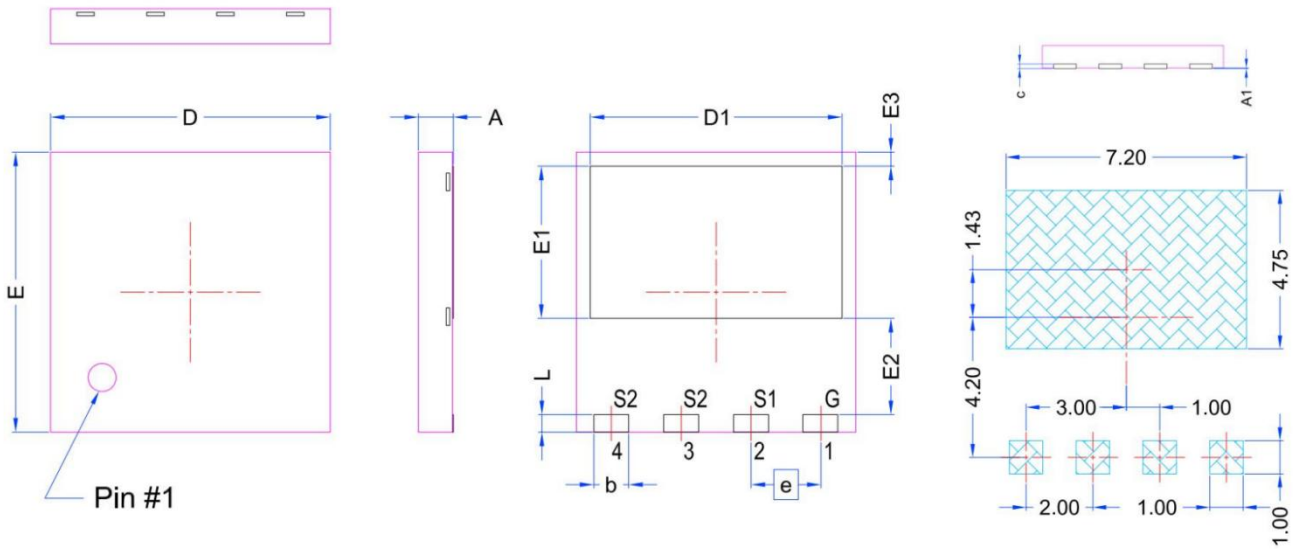


Figure 18. Safe Operating Area

DFN8*8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.050	0.000	0.002
b	0.900	1.100	0.035	0.043
c	0.100	0.300	0.004	0.012
D	7.900	8.100	0.311	0.319
D1	7.100	7.300	0.280	0.287
E	7.900	8.100	0.311	0.319
E1	4.250	4.450	0.167	0.175
E2	2.650	2.850	0.104	0.112
E3	0.300	0.500	0.012	0.020
e	2.000 BSC		0.079	0.000
L	0.400	0.600	0.016	0.024