

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D@25^{\circ}C$
1200V	60mΩ@15V	66A

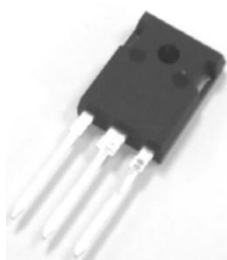
Feature

- 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
- Motor drives
- High voltage DC/DC converters

Package

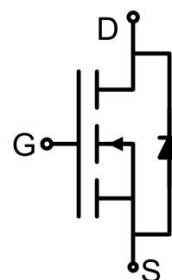


TO-247-3

Marking



Circuit diagram



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

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	V_{DSmax}	$V_{GS} = 0V, I_D = 100\mu A$	1200	V
Gate-Source Voltage	V_{GSmax}	AC ($f > 1\text{ Hz}$)	-10/+25	V
Gate-Source Voltage	V_{GSOP}	Static	-4/+15	V
Continuous Drain Current	I_D	$V_{GS}=15V$	66	A
	I_D	$V_{GS}=15V, T_C=100^{\circ}C$	47	A
Pulsed Drain Current	$I_{D,pulse}$	Pulse with t_p limited by T_{Jmax}	107	A
Power Dissipation	P_D	$T_J = 175^{\circ}C$	288	W
Thermal Resistance (Typ)	$R_{\theta JC}$	Junction-to-Case	0.52	$^{\circ}C/W$
	$R_{\theta JA}$	Junction-to-Ambient	45	$^{\circ}C/W$
Junction Temperature	T_J		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	1200			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =1200V,V _{GS} = 0V			50	μA
Gate-Source leakage current	I _{GSS}	V _{GS} =15V, V _{DS} = 0V			250	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =10mA		2.7		V
		V _{DS} =V _{GS} , I _D =10mA ,T _J =175℃		1.9		
Drain-source on-resistance	R _{DS(on)}	V _{GS} =15V, I _D =40A		42	60	mΩ
		V _{GS} =18V, I _D =40A		33		
		V _{GS} =15V, I _D =40A,T _J =175℃		64	96	
		V _{GS} =18V, I _D =40A,T _J =175℃		60		
Transconductance	g _{fs}	V _{DS} =15V, I _D =40A		23		S
		V _{DS} =15V, I _D =40A,T _J = 175℃		21		
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =1000V,V _{GS} =0V,f =100KHz V _{AC} =25mV		2691		pF
Output Capacitance	C _{oss}			121		
Reverse Transfer Capacitance	C _{rss}			14		
Total Gate Charge	Q _g	V _{DS} =800V,V _{GS} =-4V/15V, I _D =40A		65		nC
Gate-Source Charge	Q _{gs}			28.8		
Gate-Drain Charge	Q _{gd}			22.6		
Internal Gate Resistance	R _{G(int)}	f=1 MHz, V _{AC} = 25mV		1.1		Ω
Source-Drain Diode characteristics						
Diode Forward Current	I _S	V _{GS} =-4V,T _C =25℃		64		A
Diode Forward voltage	V _{SD}	V _{GS} =-4V, I _{SD} =20A		4.0		V
		V _{GS} =-4V, I _{SD} =20A,T _J =175℃		3.5		
Diode pulse Current	I _{S,pulse}	V _{GS} =-4V, pulse width t _p limited by T _{imax}		107		A

Typical Characteristics

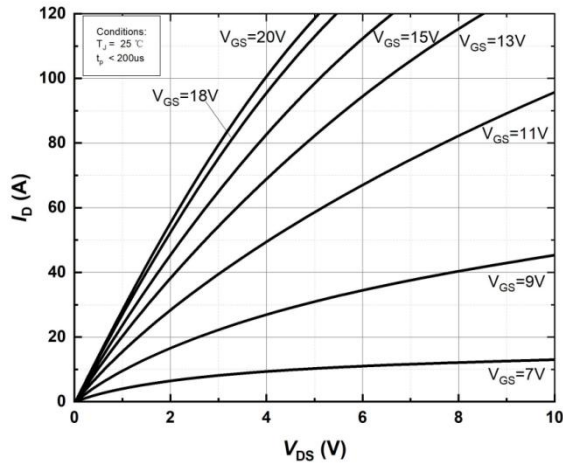


Figure 1. Output characteristics at $T_j=25^\circ\text{C}$

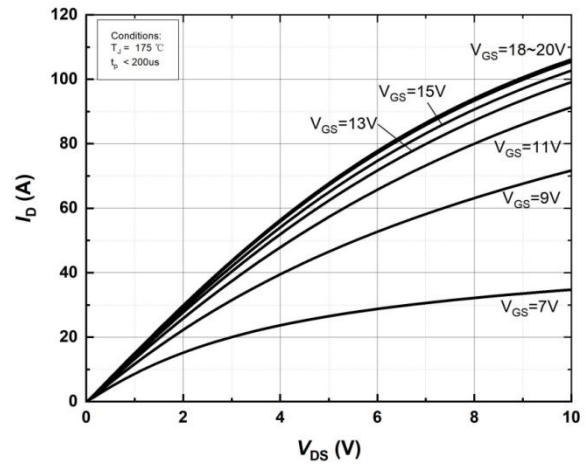


Figure 2. Output characteristics at $T_j=175^\circ\text{C}$

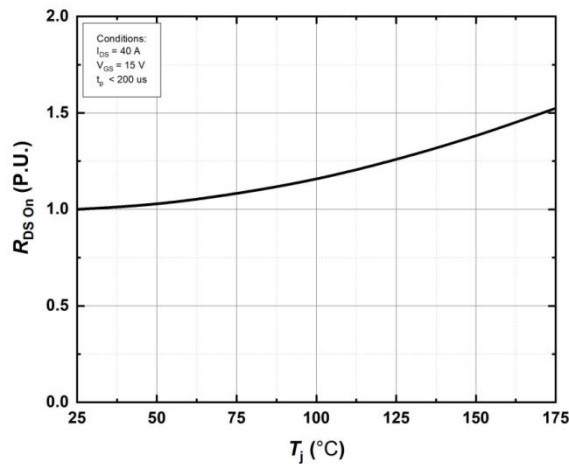


Figure 3. Normalized On-Resistance vs. Temperature

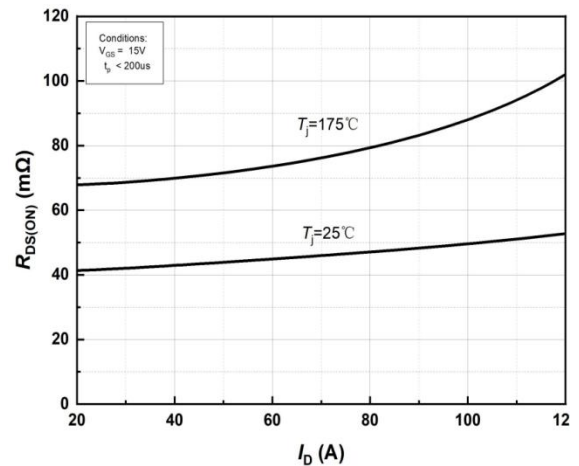


Figure 4. On-Resistance vs. Drain current for Various Temperature

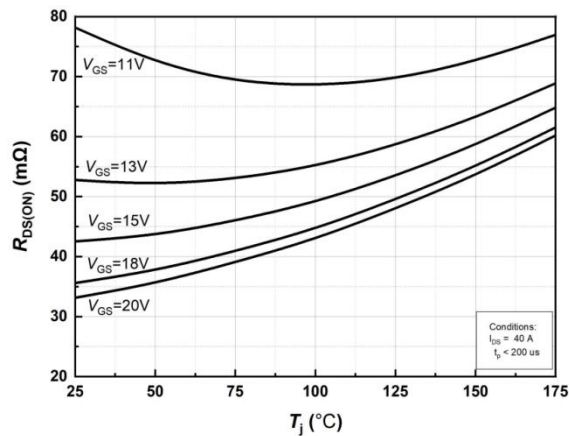


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

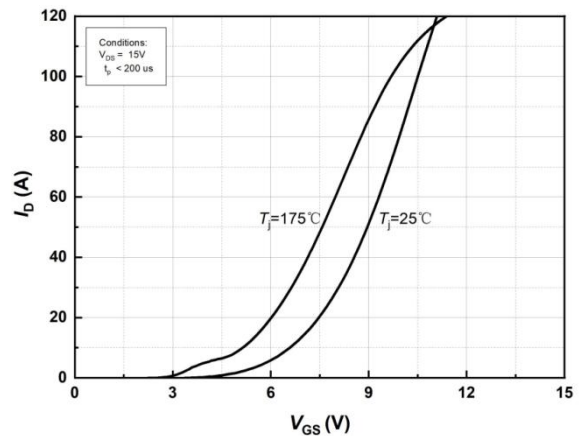


Figure 6. Transfer Characteristics for Various Junction Temperatures

Typical Characteristics

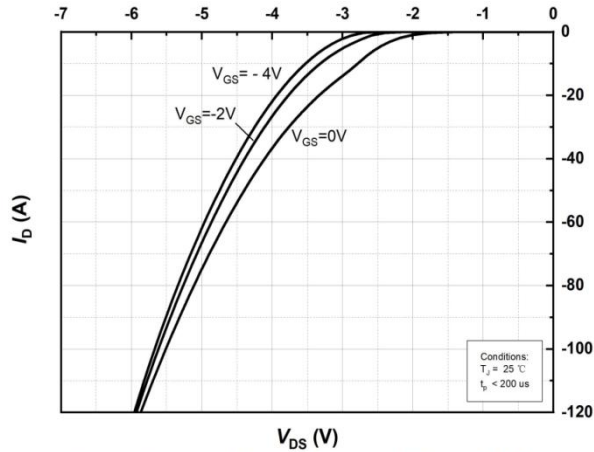


Figure 7. Body Diode Characteristics at Tj=25°C

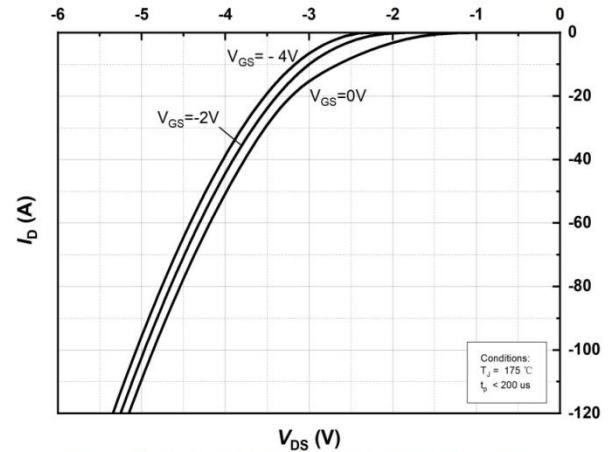


Figure 8. Body Diode Characteristics at Tj=175°C

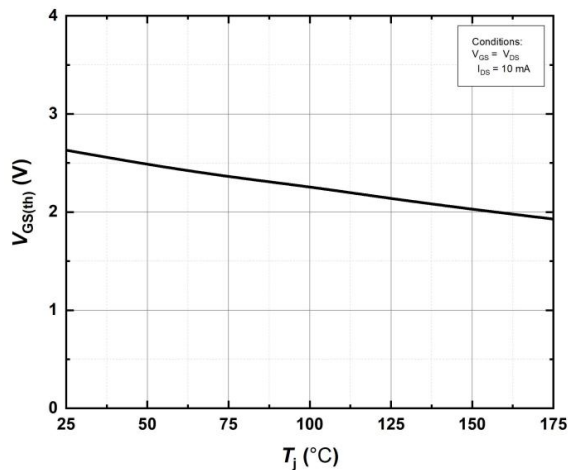


Figure 9. Threshold Voltage vs. Temperature

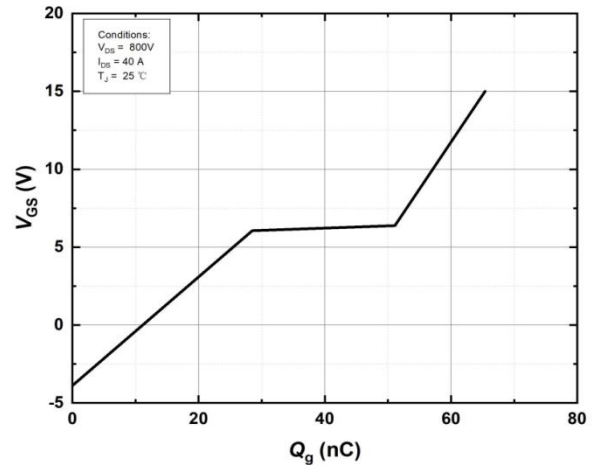


Figure 10 Gate Charge Characteristics

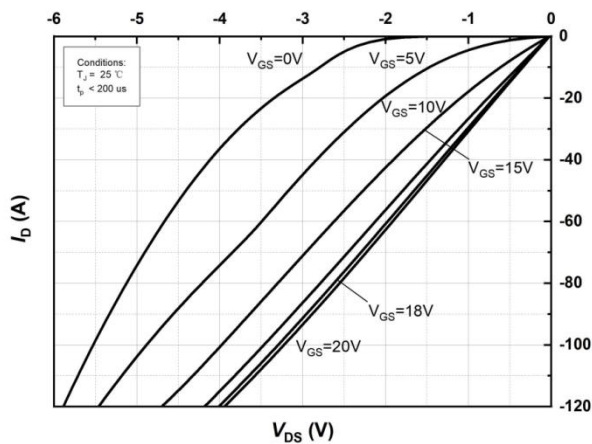


Figure 11. 3rd Quadrant Characteristic at Tj=25°C

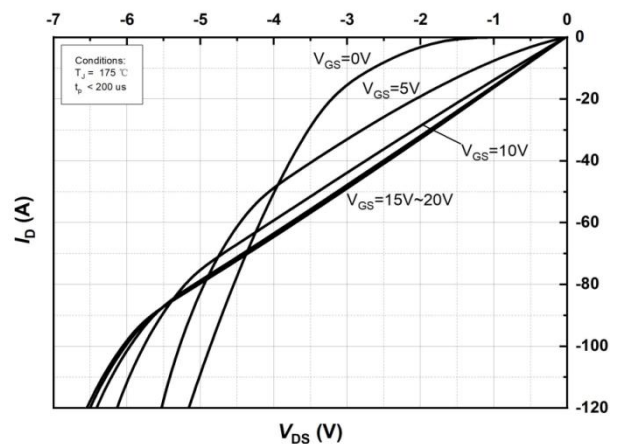


Figure 12. 3rd Quadrant Characteristic at Tj=175°C

Typical Characteristics

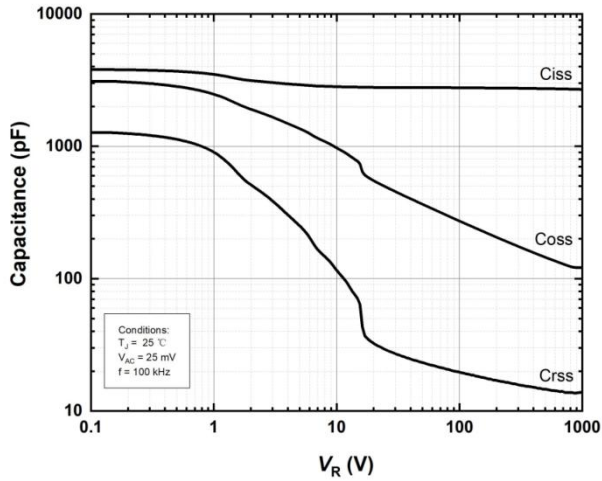


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 1000V)

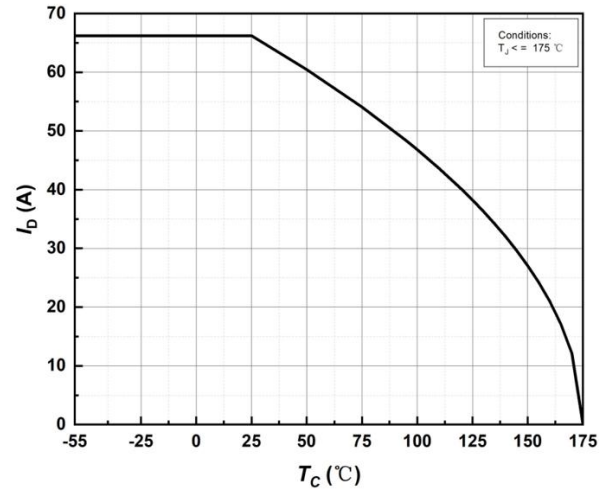


Figure 14. Continuous Drain Current

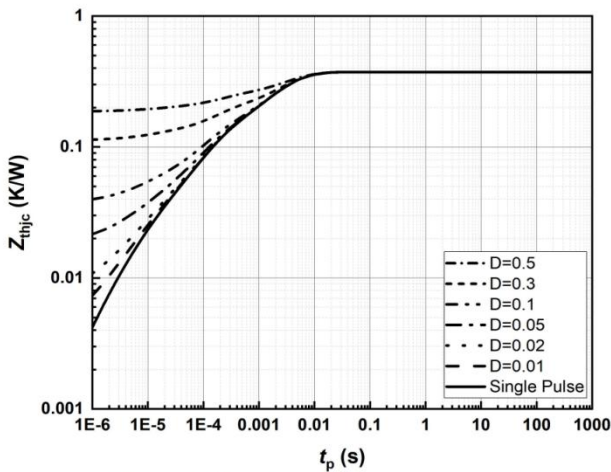


Figure 15. Transient Thermal Impedance (Junction – Case)

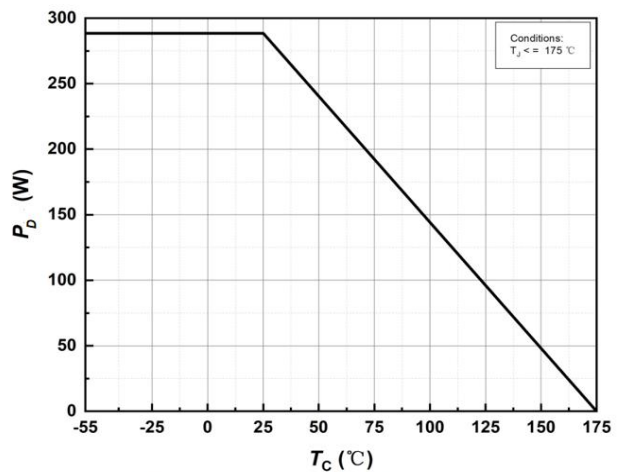


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

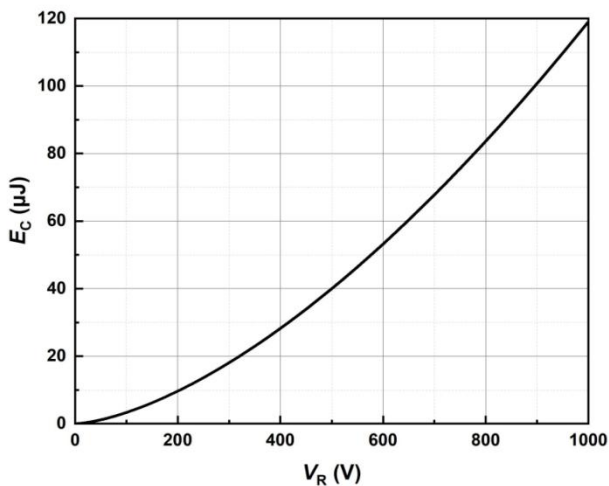


Figure 17. Output Capacitor Stored Energy

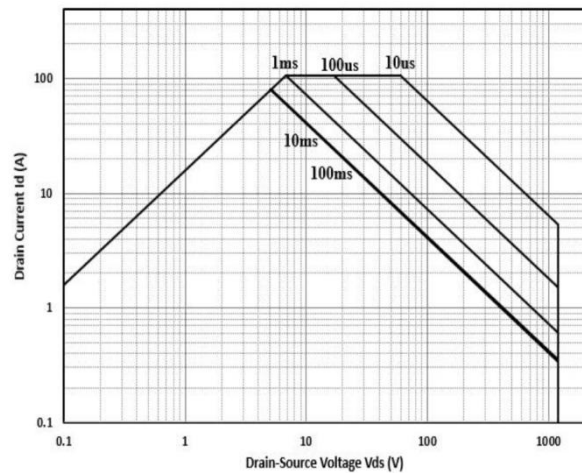
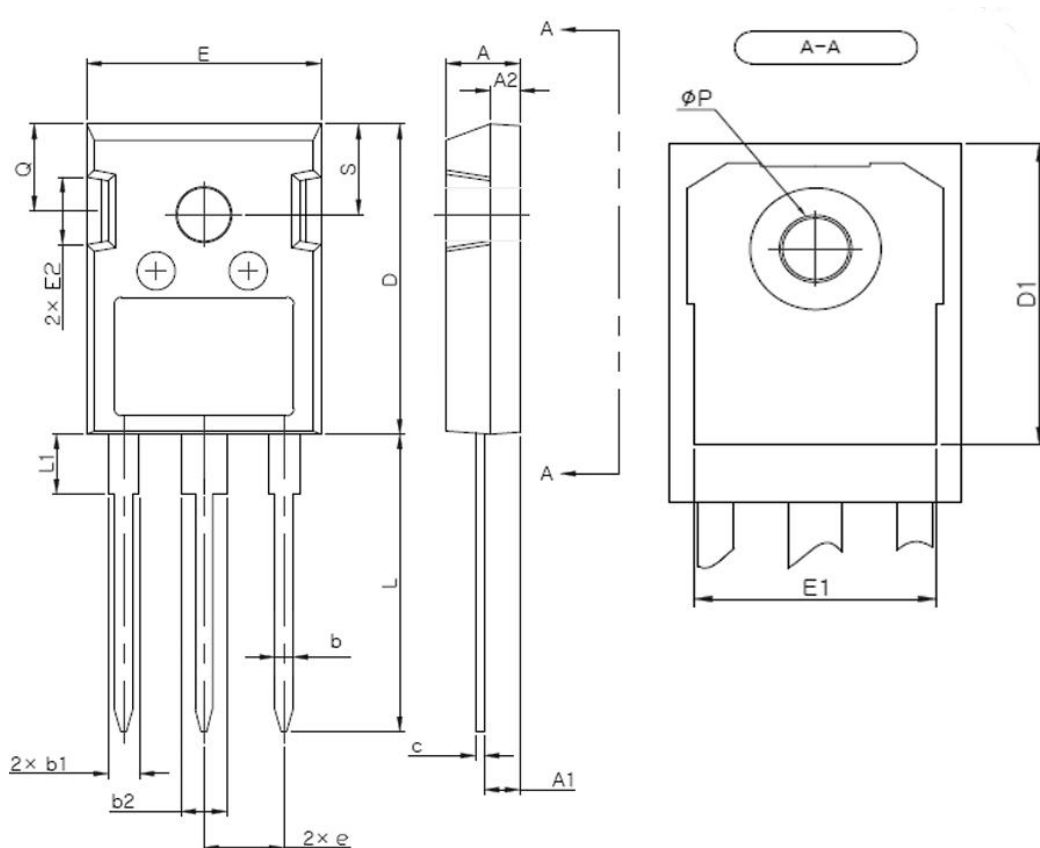


Figure 18. Safe Operating Area

TO-247-3 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.700	5.300	0.185	0.209
A1	2.240	2.580	0.088	0.102
A2	1.800	2.200	0.071	0.087
b	1.000	1.400	0.039	0.055
b1	1.600	2.600	0.063	0.102
b2	2.600	3.600	0.102	0.142
c	0.400	0.800	0.016	0.031
D	20.000	22.000	0.787	0.866
D1	15.240	17.240	0.600	0.679
E	15.500	16.010	0.610	0.630
E1	13.060	13.460	0.514	0.530
E2	4.300	4.900	0.169	0.193
e	5.440 BSC.		0.214 BSC.	
L	19.700	20.200	0.776	0.795
L1	3.850	4.450	0.152	0.175
ϕP	3.550	3.650	0.140	0.144
Q	5.890	6.400	0.232	0.252
S	6.170 BSC.		0.243 BSC.	