

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D@25^{\circ}C$
750V	11m Ω @18V	189A

Feature

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

Application

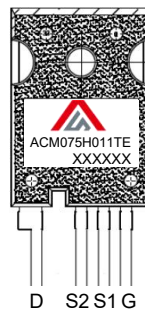
- Switch mode power supplies
- Renewable Energy
- On Board Charger
- High voltage DC/DC Converters

Package

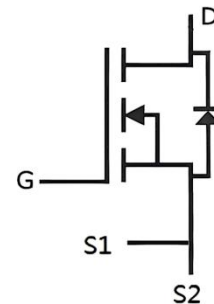


TO-247-4L

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}	$V_{GS}=0V, I_D=100\mu A$	750	V
Gate-Source Voltage	V_{GSmax}	AC ($f > 1\text{ Hz}$)	-10/+25	V
Gate-Source Voltage	V_{GSOP}	Static	-4/+18	V
Continuous Drain Current	I_D	$V_{GS}=18V$	189	A
	I_D	$V_{GS}=18V, T_C=100^{\circ}C$	133	A
Pulsed Drain Current	$I_{D,pulse}$	Pulse with t_p limited by T_{Jmax} at 1 ms	356	A
		Pulse with t_p limited by T_{Jmax} at 100 μs	698	A
Power Dissipation	P_D	$T_J=175^{\circ}C$	577	W
Thermal Resistance (Typ)	$R_{\theta JC}$	Junction to Case	0.26	$^{\circ}C/W$
Operating 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	750			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =750V, V _{GS} =0V			50	μA
Gate-Source leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =18V			250	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =36mA		2.8		V
		V _{DS} =V _{GS} , I _D =36mA, T _J =175°C		2		
Drain-source on-resistance	R _{DS(on)}	V _{GS} =18V, I _D =80A		11	15	mΩ
		V _{GS} =18V, I _D =80A, T _J =175°C		14		
Transconductance	g _{fs}	V _{GS} =18V, I _D =80A		60		S
		V _{GS} =18V, I _D =80A, T _J =175°C		54		
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =600V, V _{GS} =0V V _{AC} =25mV, f =1MHz		5670		pF
Output Capacitance	C _{oss}			383		
Reverse Transfer Capacitance	C _{rss}			37		
Total Gate Charge	Q _g	V _{DS} =400V, V _{GS} =-4V/18V I _D =80A		235		nC
Gate-Source Charge	Q _{gs}			84		
Gate-Drain Charge	Q _{gd}			62		
Internal Gate Resistance	R _{G(int)}	V _{AC} =25mV, f =1MHz		1.2		Ω
Source-Drain Diode characteristics						
Diode Forward Current	I _S	V _{GS} =-4V, T _C =25°C		130		A
Diode Forward voltage	V _{SD}	V _{GS} =-4V, I _{SD} =40A		3.9		V
		V _{GS} =-4V, I _{SD} =40A, T _J =175°C		3.4		

Typical Characteristics

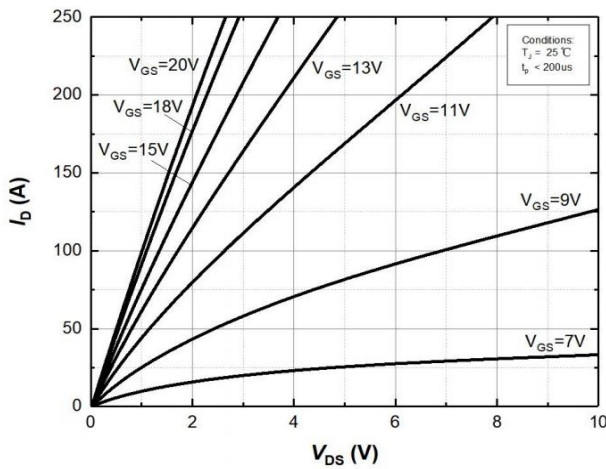


Figure 1. Output characteristics at $T_j=25^{\circ}\text{C}$

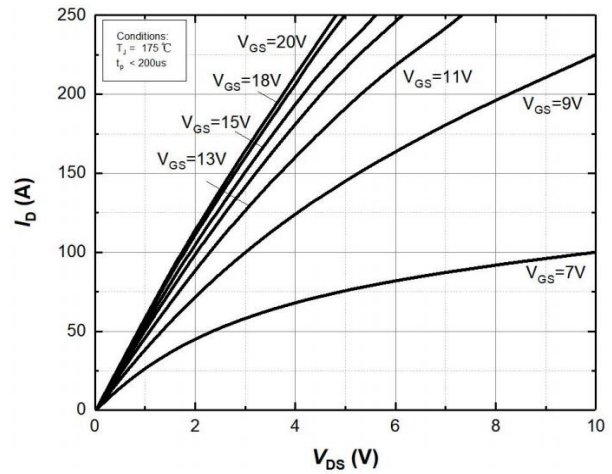


Figure 2. Output characteristics at $T_j=175^{\circ}\text{C}$

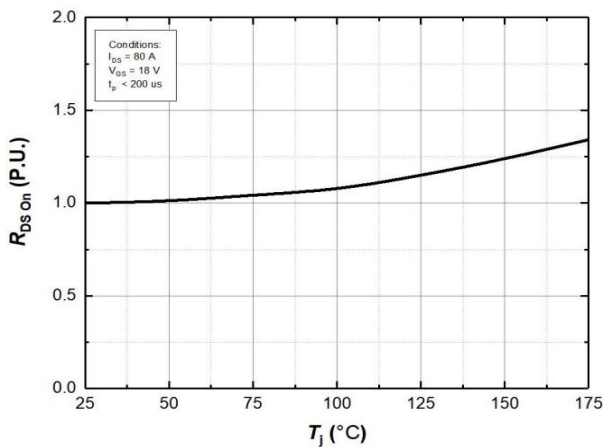


Figure 3. Normalized On-Resistance vs. Temperature

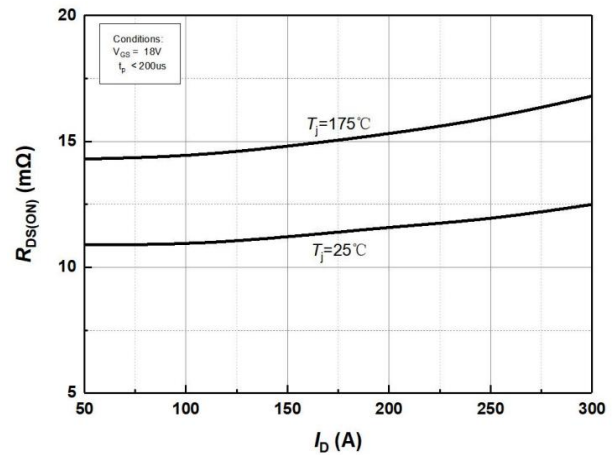


Figure 4. On-Resistance vs. Drain current for Various Temperature

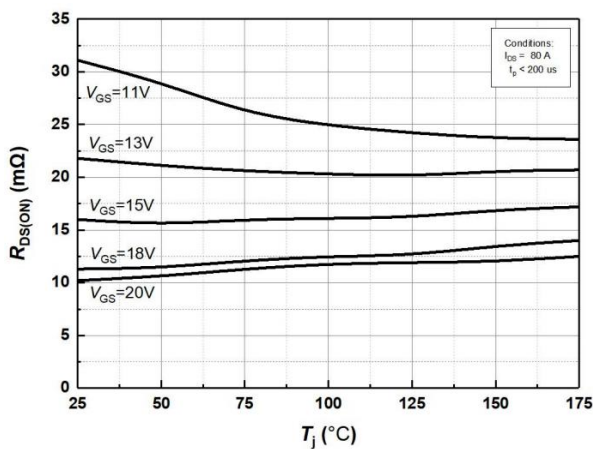


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

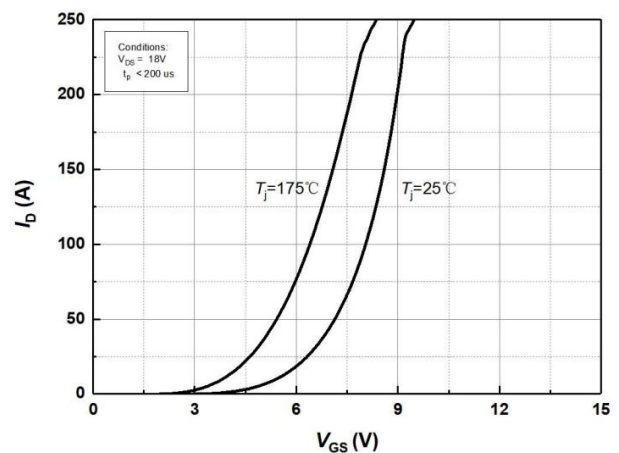


Figure 6. Transfer Characteristics for Various Junction Temperatures

Typical Characteristics

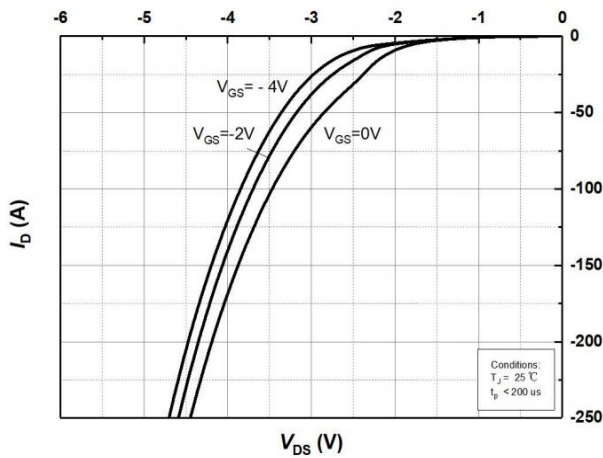


Figure 7. Body Diode Characteristics at $T_j=25^{\circ}\text{C}$

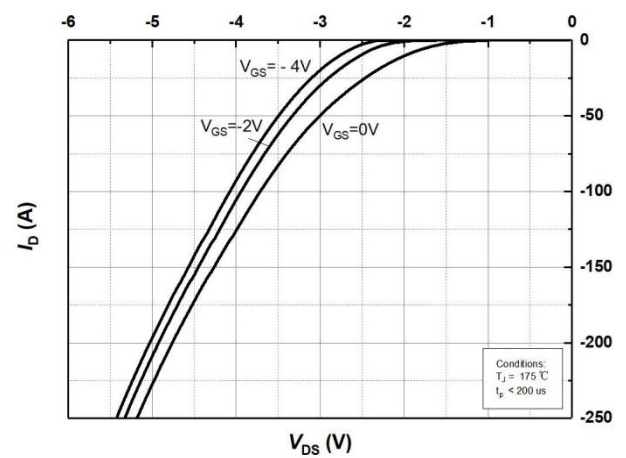


Figure 8. Body Diode Characteristics at $T_j=175^{\circ}\text{C}$

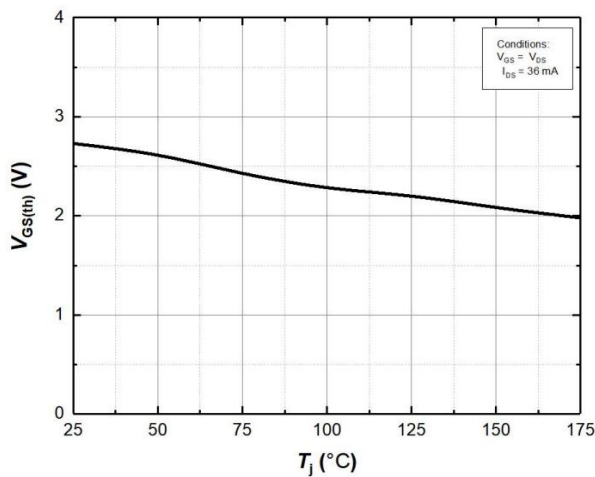


Figure 9. Threshold Voltage vs. Temperature

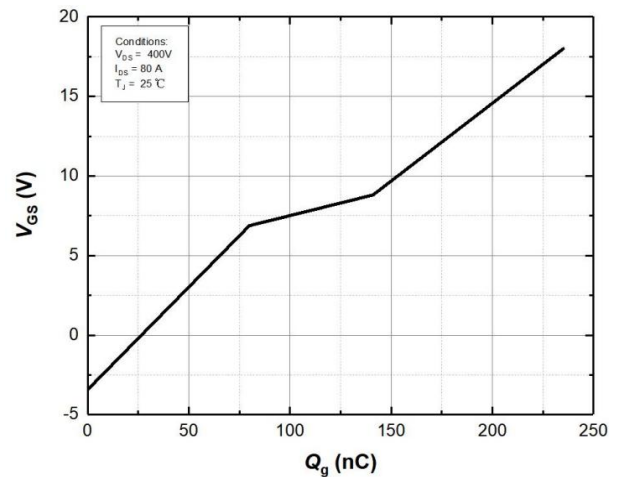


Figure 10 Gate Charge Characteristics

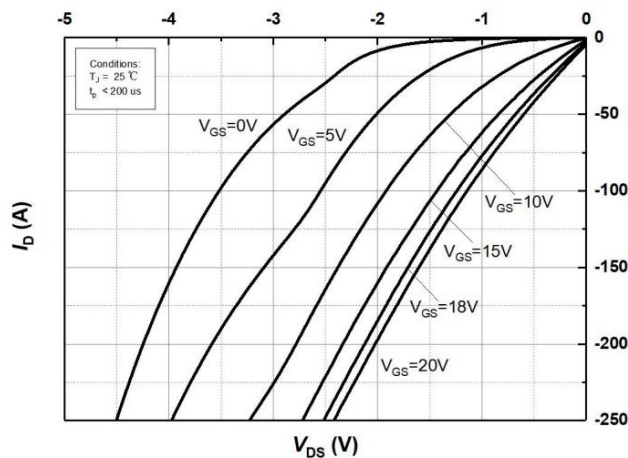


Figure 11. 3rd Quadrant Characteristic at $T_j=25^{\circ}\text{C}$

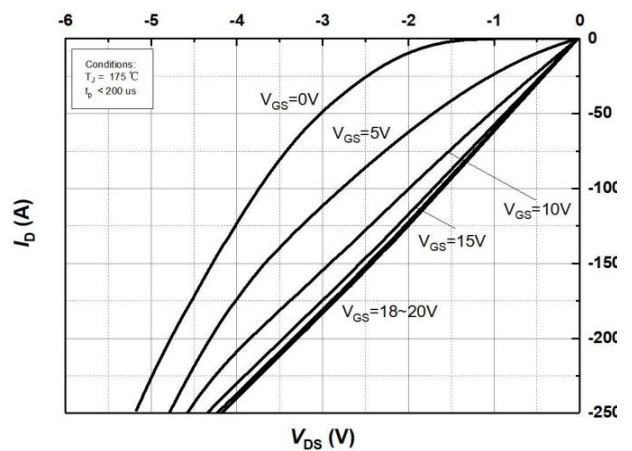


Figure 12. 3rd Quadrant Characteristic at $T_j=175^{\circ}\text{C}$

Typical Characteristics

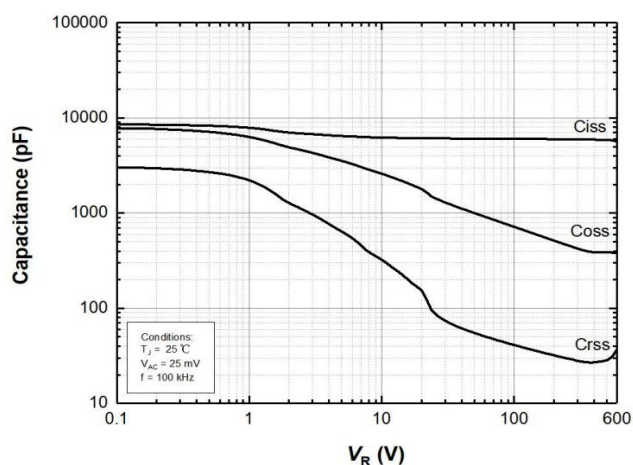


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 600V)

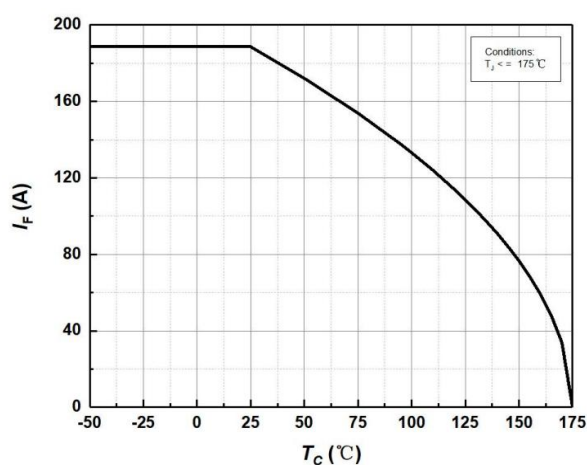


Figure 14. Continuous Drain Current Derating vs Case Temperature

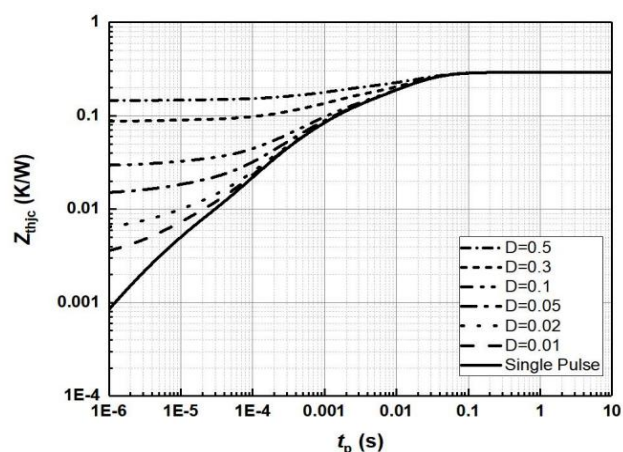


Figure 15. Transient Thermal Impedance (Junction – Case)

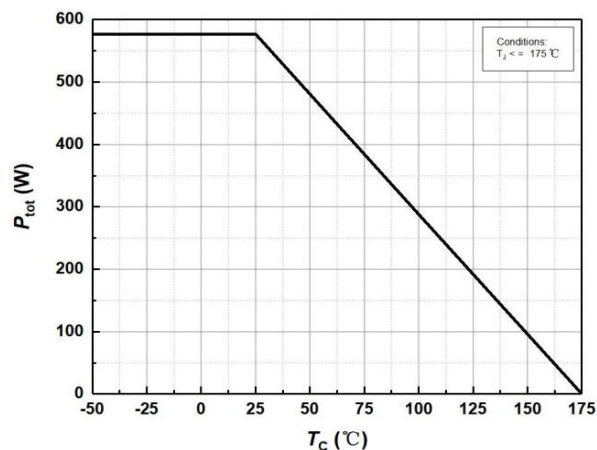


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

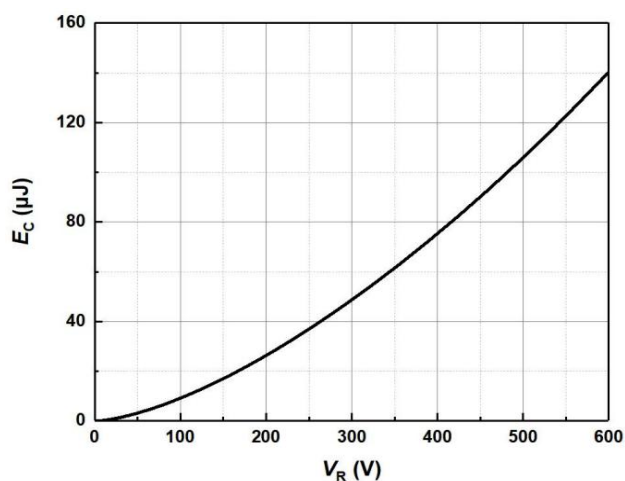


Figure 17. Output Capacitor Stored Energy

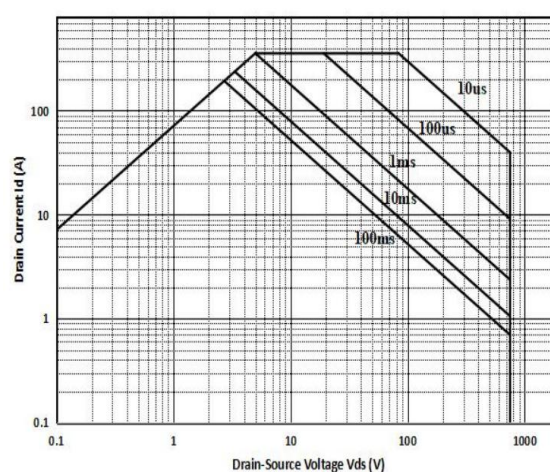
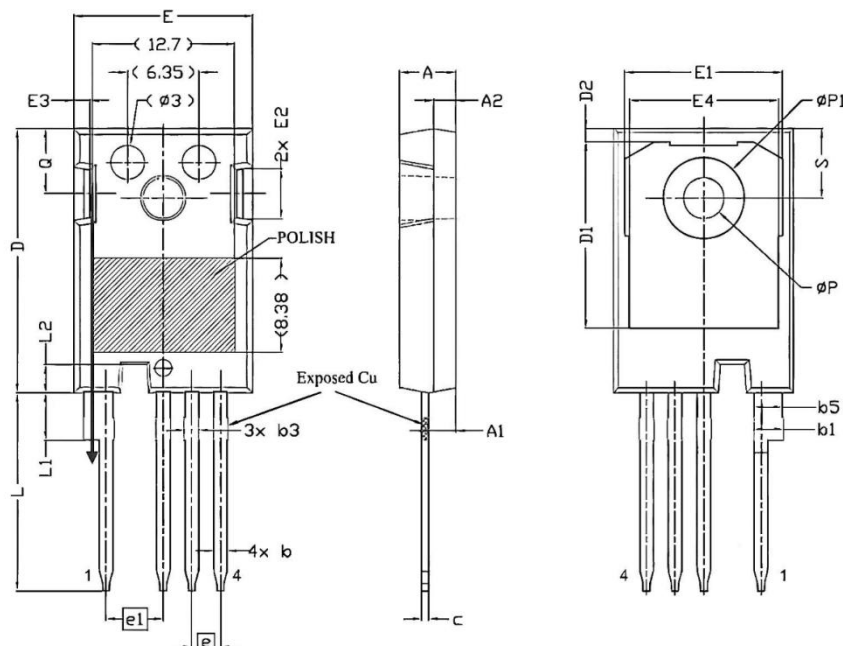


Figure 18. Safe Operating Area

TO-247-4L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.800	5.210	0.189	0.205
A1	2.290	2.540	0.090	0.100
A2	1.910	2.160	0.075	0.085
b	1.070	1.330	0.042	0.052
b1	2.390	2.940	0.094	0.116
b3	1.070	1.600	0.042	0.063
b5	2.390	2.690	0.094	0.106
c	0.550	0.680	0.022	0.027
D	23.300	23.600	0.917	0.929
D1	16.250	17.650	0.640	0.695
D2	0.950	1.250	0.037	0.049
E	15.750	16.130	0.620	0.635
E1	13.100	14.150	0.516	0.557
E2	3.680	5.100	0.145	0.201
E3	1.000	1.900	0.039	0.075
E4	12.380	13.430	0.487	0.529
e	2.540 BSC.		0.100 BSC.	
e1	5.080 BSC.		0.200 BSC.	
L	17.310	17.820	0.681	0.702
L1	3.970	4.370	0.156	0.172
L2	2.350	2.650	0.093	0.104
ΦP	3.510	3.650	0.138	0.144
ΦP1	7.190 REF.		0.283 REF.	
Q	5.490	6.000	0.216	0.236
S	6.040	6.300	0.238	0.248