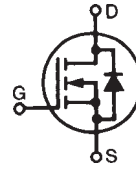


PolarHV™ HiPerFET Power MOSFET

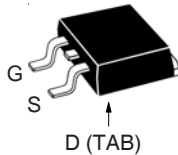
N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

IXFA10N80P
IXFP10N80P
IXFQ10N80P
IXFH10N80P

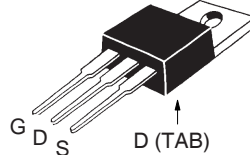


$V_{DSS} = 800V$
 $I_{D25} = 10A$
 $R_{DS(on)} \leq 1.1\Omega$
 $t_{rr} \leq 250ns$

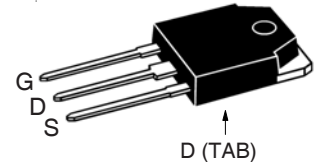
TO-263 AA (IXFA)



TO-220AB (IXFP)

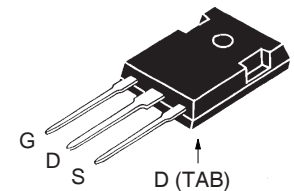


TO-3P (IXFQ)



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ C$ to $150^\circ C$	800	V
V_{DGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$	800	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ C$	10	A
I_{DM}	$T_C = 25^\circ C$, Pulse Width Limited by T_{JM}	30	A
I_A	$T_C = 25^\circ C$	5	A
E_{AS}	$T_C = 25^\circ C$	600	mJ
dV/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ C$	10	V/ns
P_D	$T_C = 25^\circ C$	300	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
T_L	1.6mm (0.062) from Case for 10s	300	$^\circ C$
T_{SOLD}	Plastic Body for 10s	260	$^\circ C$
M_d	Mounting Torque (TO-220, TO-247)	1.13 / 10	Nm/lb.in.
Weight	TO-263	2.5	g
	TO-220	3.0	g
	TO-3P	5.5	g
	TO-247	6.0	g

TO-247 (IXFH)



G = Gate D = Drain
S = Source TAB = Drain

Features

- International Standard Packages
- Avalanche Rated
- Low Package Inductance
- Easy to Drive and to Protect

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- Switched-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- Laser Drivers
- AC and DC Motor Drives
- Robotics and Servo Controls

Symbol	Test Conditions ($T_J = 25^\circ C$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	800		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 2.5mA$	3.0		V
I_{GSS}	$V_{GS} = \pm 30V$, $V_{DS} = 0V$			± 100 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 150^\circ C$			25 μA
				500 μA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 0.5 \cdot I_{D25}$, Note 1			1.1 Ω

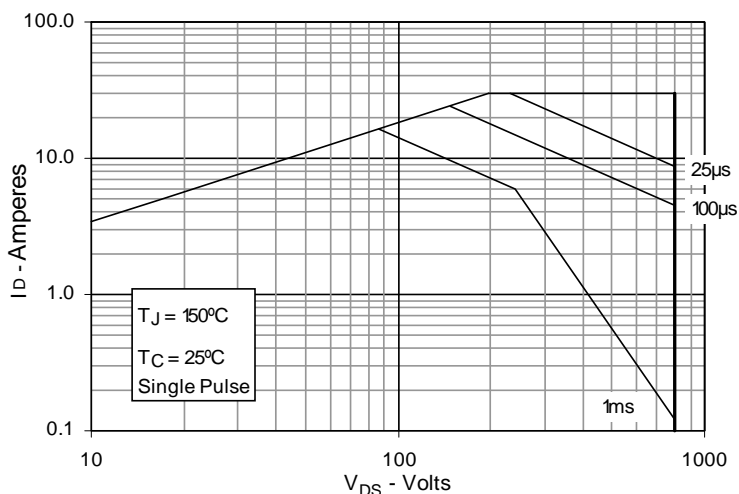
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
g_{fs}	$V_{DS} = 20\text{V}$, $I_D = 0.5 \cdot I_{D25}$, Note 1	7	11	S
C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$		2050	pF
C_{oss}			172	pF
C_{rss}			16	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ $R_G = 5\Omega$ (External)		21	ns
t_r			22	ns
$t_{d(off)}$			62	ns
t_f			22	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$		40	nC
Q_{gs}			12	nC
Q_{gd}			14	nC
R_{thJC}				0.42 $^\circ\text{C/W}$
R_{thCS}	(TO-220)		0.50	$^\circ\text{C/W}$
R_{thCS}	(TO-247 & TO-3P)		0.25	$^\circ\text{C/W}$

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max
I_S	$V_{GS} = 0\text{V}$			10 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			30 A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{V}$, Note 1			1.5 V
t_{rr}	$I_F = 10\text{A}$, $V_{GS} = 0\text{V}$ $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$		200	250 ns
I_{RM}			3.0	A
Q_{RM}			0.6	μC

Note 1. Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2\%$

Fig. 1. Forward-Bias Safe Operating Area



IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

Fig. 2. Output Characteristics
@ 25°C

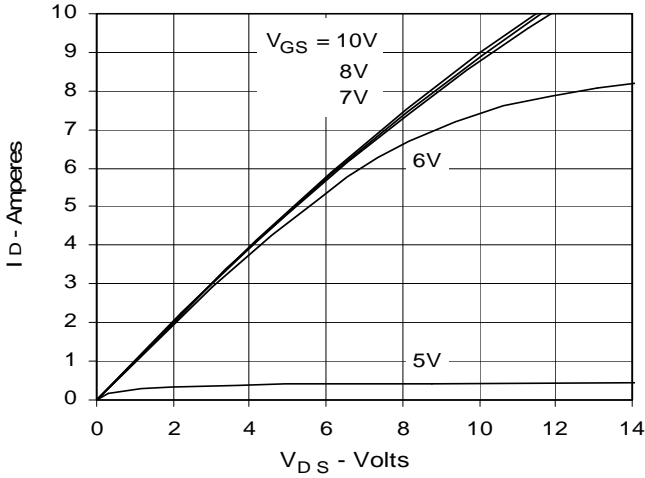


Fig. 3. Extended Output Characteristics
@ 25°C

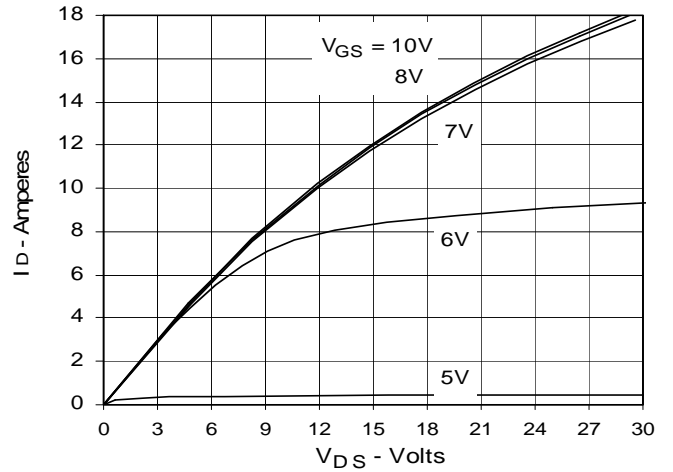


Fig. 4. Output Characteristics
@ 125°C

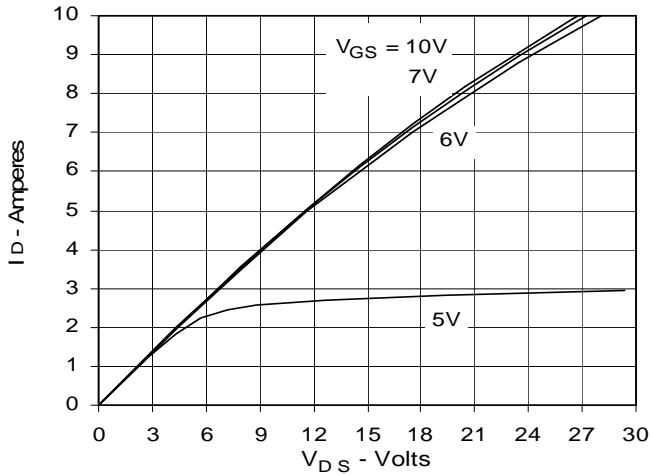


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

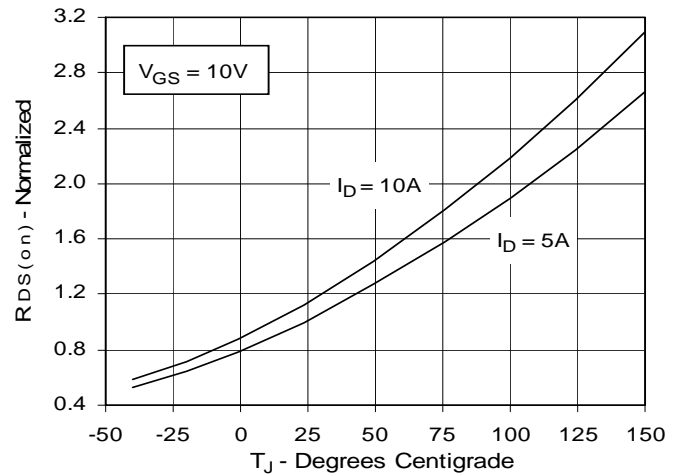


Fig. 6. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

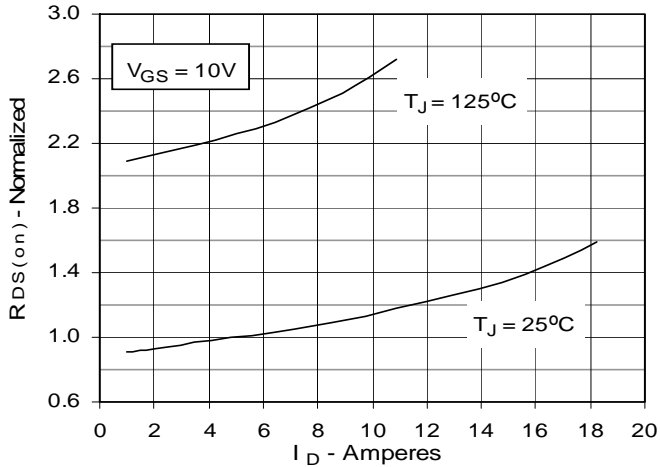


Fig. 7. Drain Current vs. Case Temperature

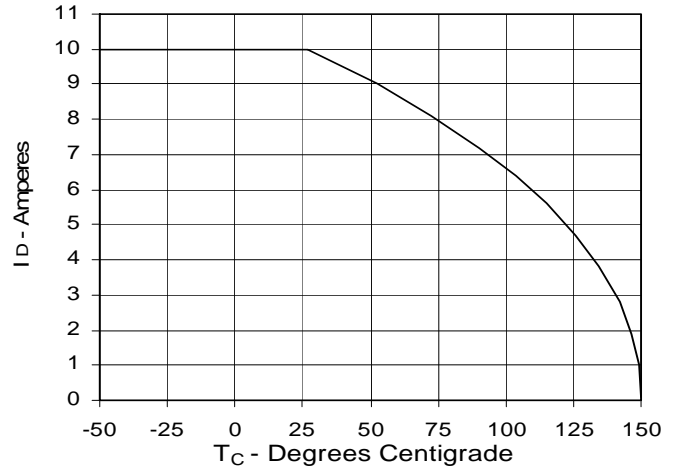


Fig. 8. Input Admittance

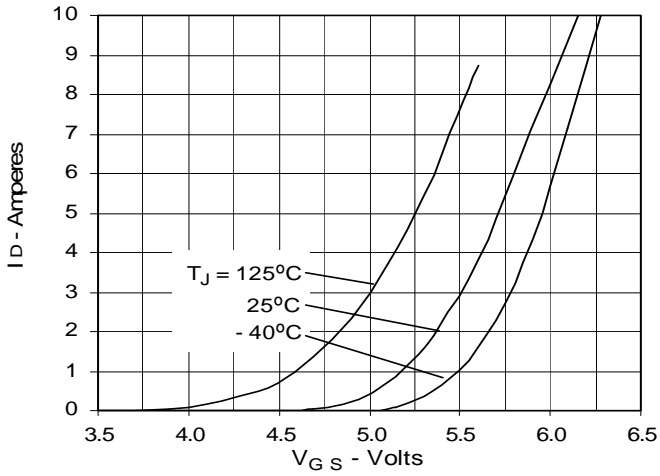


Fig. 9. Transconductance

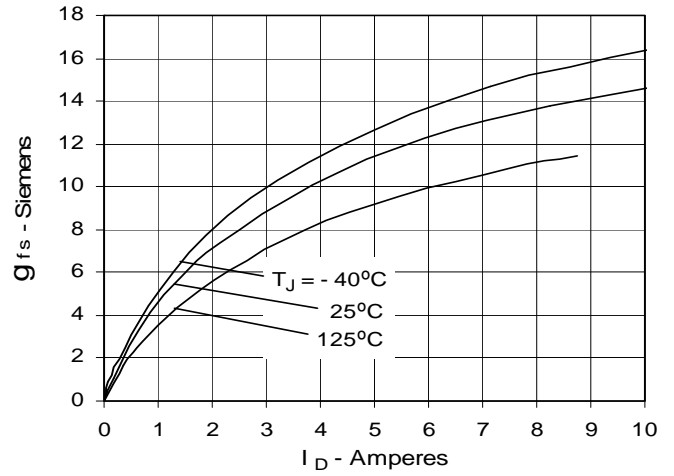


Fig. 10. Source Current vs. Source-To-Drain Voltage

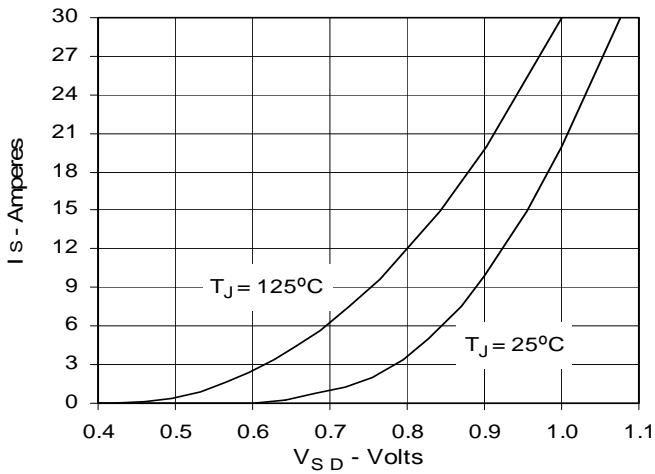


Fig. 11. Gate Charge

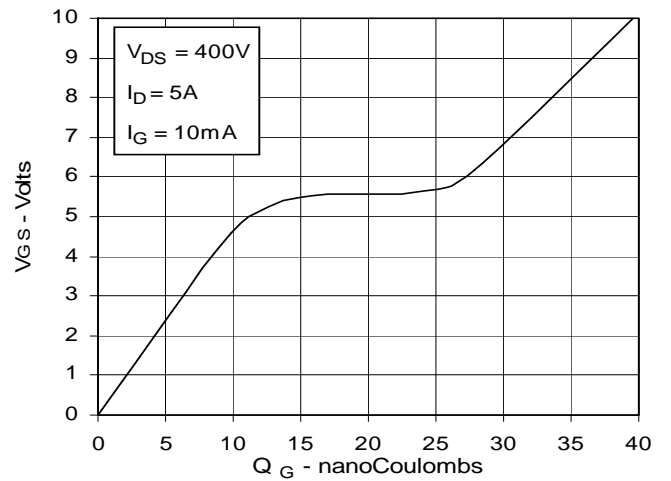


Fig. 12. Capacitance

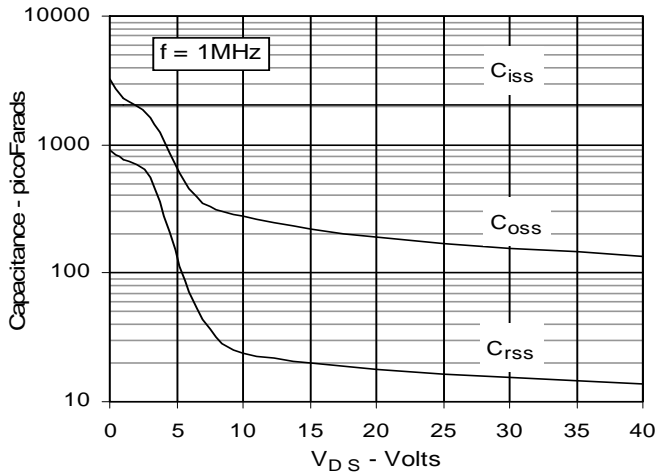
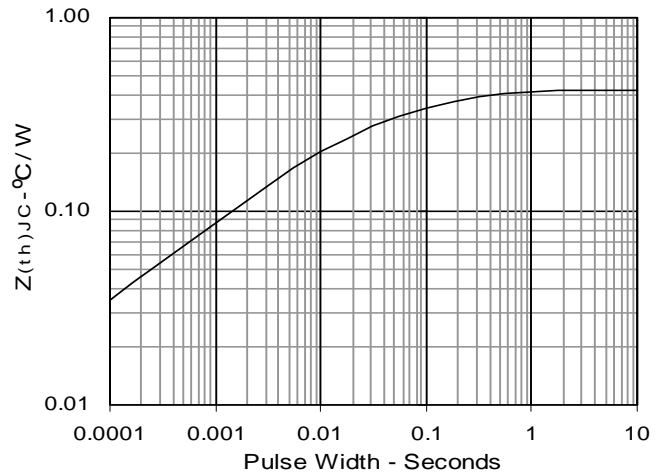
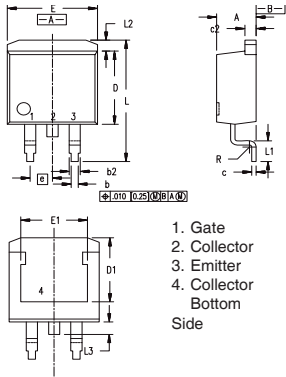


Fig. 13. Maximum Transient Thermal Impedance



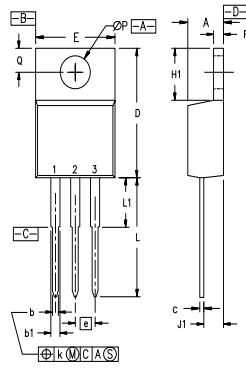
TO-263 (IXFA) Outline



- 1. Gate
- 2. Collector
- 3. Emitter
- 4. Collector Bottom Side

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.06	4.83	.160	.190
b	0.51	0.99	.020	.039
b2	1.14	1.40	.045	.055
c	0.40	0.74	.016	.029
c2	1.14	1.40	.045	.055
D	8.64	9.65	.340	.380
D1	8.00	8.89	.280	.320
E	9.65	10.41	.380	.405
E1	6.22	8.13	.270	.320
e	2.54	BSC	.100	BSC
L	14.61	15.88	.575	.625
L1	2.29	2.79	.090	.110
L2	1.02	1.40	.040	.055
L3	1.27	1.78	.050	.070
L4	0	0.13	0	.005

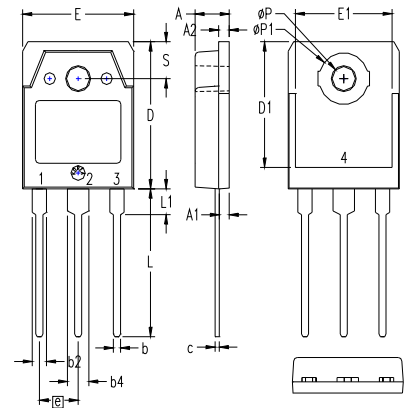
TO-220 (IXFP) Outline



- Pins: 1 - Gate
- 2 - Drain
- 3 - Source
- 4 - Drain

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70	13.97
L1	.110	.230	2.79	5.84
ØP	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

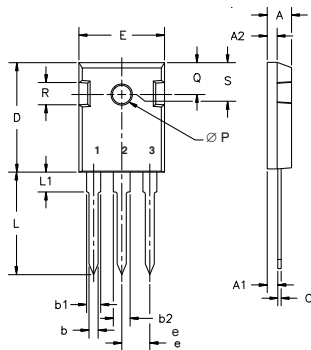
TO-3P (IXFQ) Outline



- Pins: 1 - Gate
- 2 - Drain
- 3 - Source
- 4 - Drain

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.193	4.70	4.90
A1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	0.90	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
c	.022	.031	0.55	0.80
D	.780	.799	19.80	20.30
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.50	13.70
e	.215 BSC		5.45 BSC	
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
ØP1	.126	.134	3.20	3.40
ØP	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

TO-247 (IXFH) Outline



- Pins: 1 - Gate
- 2 - Drain
- 3 - Source
- 4 - Drain

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A ₁	2.2	2.54	.087	.102
A ₂	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b ₁	1.65	2.13	.065	.084
b ₂	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15	BSC	242	BSC